

**TV** Reception and Distribution



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Leading company in the design, manufacturing and marketing of innovative products and solutions for telecommunications.

Thanks to a constant technological and industrial development since its establishment in 1988, ALCAD is now a reference brand in:

- Products for reception, processing and distribution of TV signals
- Communication and access control systems
- Nurse call system
- IPTV solutions



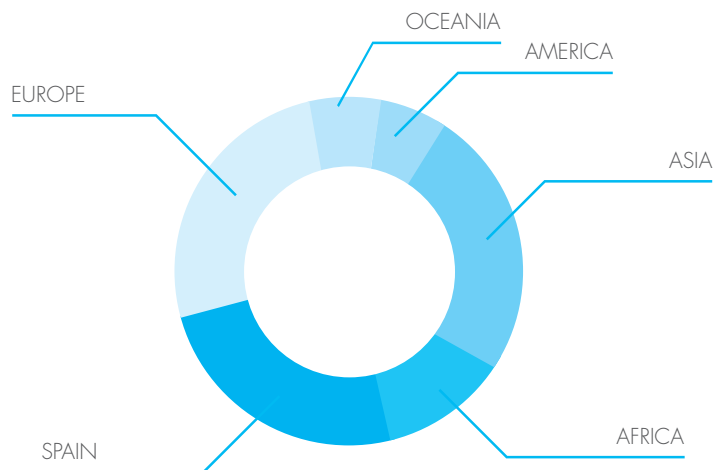
Whether you are a distributor or a professional... Wherever you are... ALCAD speaks your language!

The highly qualified technical services team efficiently answers any installation challenge you may have.

Our engineering services team is at your service to assist you in the design of your projects.

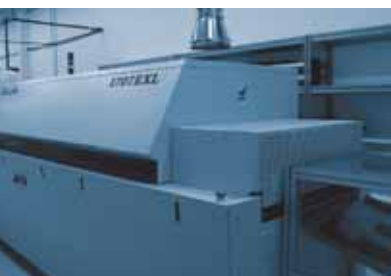
ALCAD has allocated over 1000 sqm to the R&D Department, and working within this area there are forty telecommunication engineers and other highly skilled staff.

Thanks to in-house patents and designs, ALCAD controls all steps of industrialization. ALCAD manufactures in its European plants, thereby guaranteeing the highest quality standards in its products and solutions.



Over 20 million people in more than 40 countries watch TV with ALCAD or communicate through ALCAD communication systems.

ALCAD is an international corporation based in Spain, with commercial operations in Czech Republic, Turkey and United Arab Emirates.



ALCAD has its own laboratory in their facilities with the necessary instrumentation to perform required tests for CE marking self certification, as E.M.C. , electrical safety, test reports, etc. Ensuring the highest standards of quality, security and safety.



ALCAD quality system has been awarded with the ISO 9001 certificate since 1996. ALCAD products meet or exceed the requirements of the applicable European norms, as accredited by the CE label.



ALCAD premises include more than 5.000 sqm of storage area destined to guarantee a stock of products that allows us a logistic service with answering record times.

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# Antennas

Compact multiband amplifiers to carry out community or individual TV installations. If used together with a cluster filter they allow quality reception in adverse conditions.

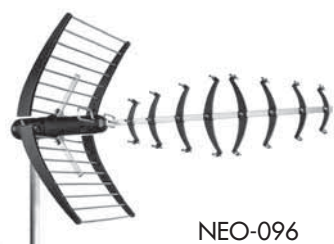
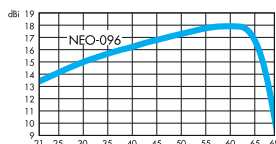


# 900 TERRESTRIAL ANTENNAS

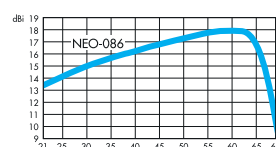
UHF antennas model NEO LTE compatible



NEO-086



NEO-096



## Description

Antennas for optimal reception of DTT channels, with the best available gain (18 dBi). Designed to cover the UHF band up to 790 MHz while rejecting the LTE mobile telephone band. Easy to mount and adjust, providing maximum robustness and ensuring complete safety of installation. With a stylish design which perfectly reflects the excellent electrical and mechanical qualities of the antenna.

## Applications

Digital and analogue terrestrial TV installations, collective or individual, where rejection of the LTE band is necessary and high gain and directivity are required. The reflectors prevent interference produced by the signals received from the rear of the antenna.

## Characteristics

Rejection of LTE and GSM signals. Manufactured in aluminium, zamak, weather-resistant plastic and galvanised steel. Innovative spring-loaded clamp system for attaching to the mast, making installation even easier. The simplified pointing system with the antenna already fastened to the mast enables adjustments using a single hand. System for changing polarisation without removing the antenna from the mast. Watertight matching transformer casing (IP55). Matching transformer, with F-type connector, protected inside the casing. System of front-fixing reflectors for greater ease of assembly. No tools required for installation. Supplied in an individual pack.

## Accessories

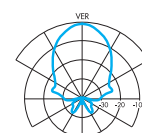
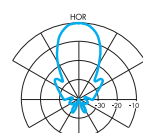
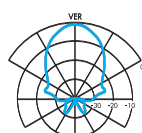
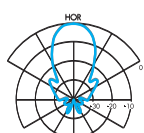
9010013 BR-421 UHF preamp. for antenna box, F-type connector (24 V<sub>~</sub>).  
9010014 BR-431 UHF preamp. for antenna box, F-type connector (12 V<sub>~</sub>).  
9010015 BR-451 UHF preamp. for antenna box, F-type connector (5 V<sub>~</sub>).

CODE		9000196	9000186
MODEL		NEO-096	NEO-086
Frequency range	MHz	470-790	
Channel		21-60	
Elements		42	
Gain	dBi	18	
Front/back ratio	dB	32	
Impedance	Ω	75	
Return loss	dB	≥ 10	
Polarity		H/V	
Beam width	°H	30	
	°V	28	
Lenght	mm	1160	
Wind loading	N	130	
	V	100	
Connection		F female	
Protection index		IP 55	
Colour		Black/Aluminium	
Pack x Code x Unit/Pallet		22 x 1 x 1	33 x 1 x 1
Packing weight	Kg	4,0	3,10
Pallet weight	Kg	103	117,30
Packing dimensions	mm	1200 x 405 x 185	800 x 405 x 185
Pallet dimensions	mm	1200 x 800 x 2200	1200 x 800 x 2000



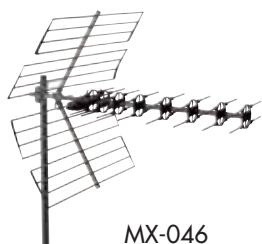
NEO-096

NEO-086

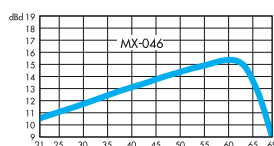


# 900 TERRESTRIAL ANTENNAS

UHF antennas model MX LTE compatible



MX-046



## Description

Quadruple array antennas with very high gain. Designed to cover the UHF band up to 790 MHz while rejecting the LTE mobile telephone band. Fast and easy assembly, all the components are pre-mounted and do not require tools for their assembly.

## Applications

Digital and analogue terrestrial TV installations, collective or individual, where rejection of the LTE band is necessary and high gain and directivity are required. The reflectors avoid interferences received from behind.

## Characteristics

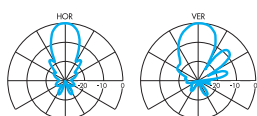
Rejection of LTE and GSM signals as well as signals coming from the bottom of the antenna. Robust antenna with great resistance to both sun and saltpetre. Made from aluminium, weather-resistant plastics and galvanised steel. Large size reflector, elevation angle adjustment, mounting in either horizontal or vertical polarity. Includes a balun (symmetrizer), specially designed for the antenna, with F-type connector protected inside the balun box. Packed individually.

## Accessories

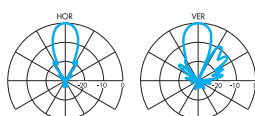
9010008 BR-401 UHF preamp. for antenna box, F connector (24 V~).  
9010009 BR-411 UHF preamp. for antenna box, F connector (12 V~).

CODE		9000085	9000088
MODEL		MX-046	MX-076
Frequency range	MHz	470-790	
Channel		21-60	
Elements		51	79
Gain	dBd	15.5	17.5
Front/back ratio	dB	27	35
Impedance	$\Omega$	75	
Return loss	dB	$\geq 10$	
Polarity		H/V	
Beam width	$^{\circ}$ H	32	22
	$^{\circ}$ V	33	29
Length	mm	1152	1792
Wind loading	N	H	158
		V	167
Connection		F female	
Protection index		IP 53	
Colour		Black/Aluminium	
Pack x Code x Unit/Pallet		36 x 1 x 1	27 x 1 x 1
Packing weight	Kg	2.18	3.2
Pallet weight	Kg	93.5	101.4
Packing dimensions	mm	800 x 448 x 125	1084 x 455 x 125
Pallet dimensions	mm	1200 x 800 x 2000	

MX-046



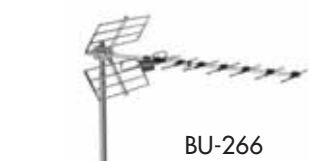
MX-076



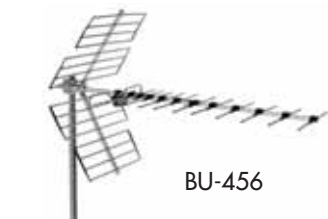
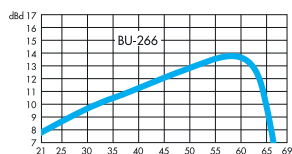


# 900 TERRESTRIAL ANTENNAS

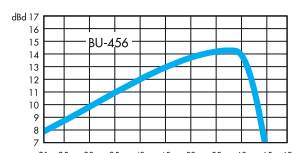
## UHF antennas model BU LTE compatible



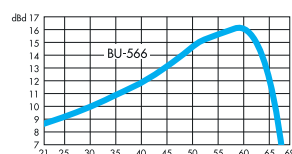
BU-266



BU-456



BU-566



### Description

Double array antennas covering the complete gain range. Designed to cover the UHF band up to 790 MHz while rejecting the LTE mobile telephone band. Fast and easy assembly, all the components are pre-mounted and no tools are required for their assembly.

### Applications

Digital and analogue terrestrial TV installations, collective or individual, where rejection of the LTE band is necessary.

### Characteristics

Rejection of LTE and GSM signals as well as signals coming from the bottom of the antenna. Robust antenna with great resistance to both sun and saltpetre. Made from aluminium, weather-resistant plastic and galvanised steel. Elevation angle adjustment, mounting in either horizontal or vertical polarity. Includes a balun (symmetrizer), specially designed for the antenna, with F-type connector protected inside the balun box. Packed individually, in multiple packs or unassembled.

### Accessories

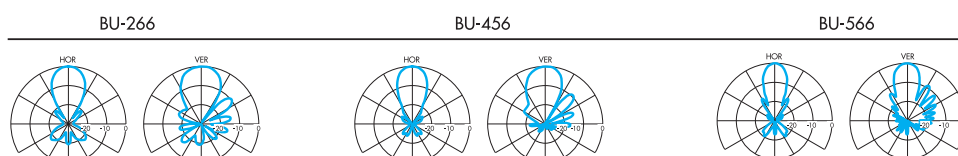
9010008 BR-401 UHF preamplifier for antenna box (24 V~).

9010009 BR-411 UHF preamplifier for antenna box (12 V~).

9010012 BR-441 UHF preamp. for antenna box, F-type connector (5 V~).

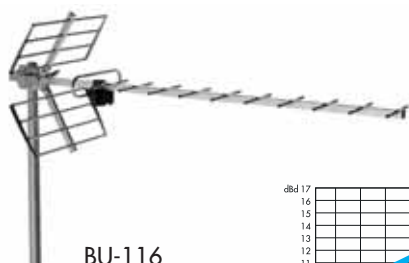
Antennas BU-266, BU-456 and BU-566 are also supplied in multiple packs (see page 21).

CODE		9000082	9000083	9000089
MODEL		BU-266	BU-456	BU-566
Frequency range	MHz	470-790		
Channel		21-60		
Elements		27	43	45
Gain	dBd	13	14	16
Front/back ratio	dB	23	25	25
Impedance	$\Omega$	75		
Return loss	dB	$\geq 10$		
Polarity		H/V		
Beam width	$^{\circ}$ H	26	24	20
	$^{\circ}$ V	31	32	21
Lenght	mm	1087	1298	2050
Wind loading	N			
	H	48	89	83
	V	70	93	104
Connection		F female		
Protection index		IP 53		
Colour		Black/Aluminium		
Pack x Code x Unit/Pallet		80 x 1 x 1	56 x 1 x 1	27 x 1 x 1
Packing weight	Kg	1,48	1,85	2,40
Pallet weight	Kg	133,4	118,6	79,8
Packing dimensions	mm	600 x 400 x 90	700 x 425 x 90	1084 x 455 x 125
Pallet dimensions	mm	1200 x 800 x 2000		

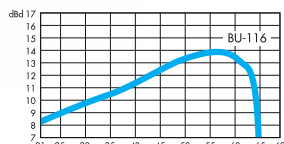


# 900 TERRESTRIAL ANTENNAS

## UHF Yagi antennas LTE compatible



BU-116



### Description

Yagi antennas designed to cover the UHF band up to 790 MHz while rejecting the LTE mobile telephone band. Fast and easy reflector assembly, all the components are pre-mounted and no tools are required for their assembly.

### Applications

Digital and analogue terrestrial TV installations, collective or individual, where rejection of the LTE band is necessary.

### Characteristics

Rejection of LTE and GSM signals as well as signals coming from the lower part of the antenna. Robust antenna with great resistance to both sun and saltpetre. Made from aluminium, weather-resistant plastic and galvanised steel.

Reduced size reflector to facilitate assembly and installation. Elevation angle adjustment, mounting in either horizontal or vertical polarity. Includes a balun (symmetrizer), specially designed for the antenna, with F-type connector protected inside the balun box. Packed individually.

### Accessories

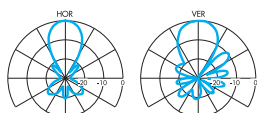
9010008 BR-401 UHF preamplifier for antenna box (24 V $\overline{\text{~}}$ ).

9010009 BR-411 UHF preamplifier for antenna box (12 V $\overline{\text{~}}$ ).

9010012 BR-441 UHF preamp. for antenna box, F-type connector (5 V $\overline{\text{~}}$ ).

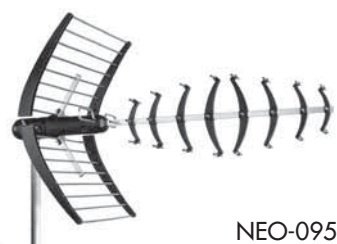
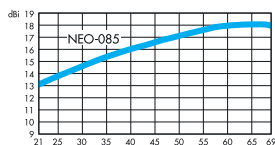
CODE		9000084
MODEL		BU-116
Frequency range	MHz	470-790
Channel		21-60
Elements		19
Gain	dBd	12,5
Front/back ratio	dB	21
Impedance	$\Omega$	75
Return loss	dB	$\geq 10$
Polarity		H/V
Beam width	$^{\circ}\text{H}$	34
	$^{\circ}\text{V}$	35
Lenght	mm	1146
Wind loading	N	
	H	40
	V	48
Connection		F female
Protection index		IP 53
Colour		Black/Aluminium
Pack x Code x Unit/Pallet		12 x 12 x 1
Packing weight	Kg	13,3
Pallet weight	Kg	174,6
Packing dimensions	mm	1200 x 400 x 302
Pallet dimensions	mm	1200 x 800 x 2000

BU-116

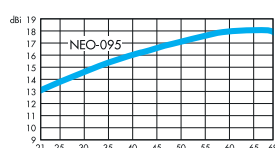




NEO-085



NEO-095



### Description

Antennas for optimal reception of DTT channels, with the best gain (18 dBi) on the market. Easy to mount and adjust, providing maximum robustness and ensuring complete safety of installation. With a stylish design which perfectly reflects the excellent electrical and mechanical qualities of the antenna.

### Applications

Digital and analogue terrestrial TV installations, collective or individual, where high gain and directivity are required. The reflectors prevent interference produced by the signals received from the rear of the antenna.

### Characteristics

Rejection of GSM signals. Manufactured in aluminium, zamak, weather-resistant plastic and galvanised steel. Innovative spring-loaded clamp system for attaching to the mast, making installation even easier. The simplified pointing system with the antenna already fastened to the mast enables adjustments using a single hand. System for changing polarisation without removing the antenna from the mast. Watertight balun casing (IP55). Balun, with F-type connector, protected inside the box. System of front-fixing reflectors for greater ease of mounting. No tools required for installation. Supplied in an individual pack.

### Accessories

9010013 BR-421 UHF preamplifier for antenna box, F-type connector (24 V $\rightarrow$ ).

9010014 BR-431 UHF preamplifier for antenna box, F-type connector (12 V $\rightarrow$ ).

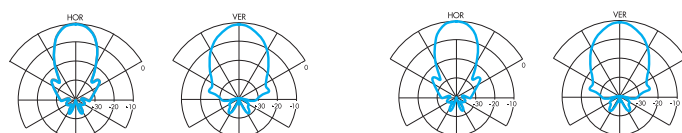
9010015 BR-451 UHF preamplifier for antenna box, F-type connector (5 V $\rightarrow$ ).

CODE		9000195	9000185
MODEL		NEO-095	NEO-085
Frequency range	MHz	470-862	
Channel		21-69	
Elements		42	
Gain	dBi	18	
Front/back ratio	dB	32	
Impedance	$\Omega$	75	
Return loss	dB	$\geq 10$	
Polarity		H/V	
Beam width	$^{\circ}$ H	30	
	$^{\circ}$ V	28	
Lenght	mm	1160	
Wind loading	N	H	130
			V
Connection		F female	
Protection index		IP 55	
Colour		Black/Aluminium	
Pack x Code x Unit/Pallet		22 x 1 x 1	30 x 1 x 1
Packing weight	Kg	4.0	4.0
Pallet weight	Kg	103	103
Packing dimensions	mm	1200 x 405 x 185	1200 x 405 x 185
Pallet dimensions	mm	1200 x 800 x 2200	



NEO-095

NEO-085

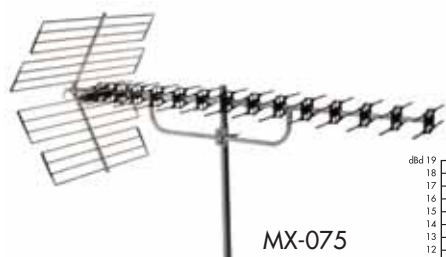
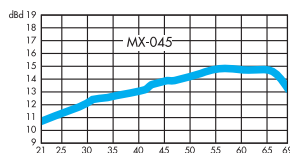


# 900 TERRESTRIAL ANTENNAS

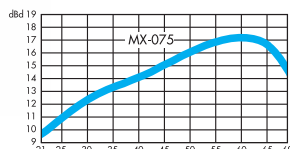
## UHF antennas model MX



MX-045



MX-075



### Description

Quadruple array antennas with very high gain. Designed to cover all the UHF band with maximum flatness. Fast and easy assembly, all the components are pre-mounted and do not require tools for their assembly.

### Applications

Individual and MATV digital and analogue terrestrial TV installations, where high gain and directivity are required. The reflectors avoid interferences received from behind.

### Characteristics

Rejects GSM signals as well as signals coming from the lower part of the antenna. Robust antenna with great resistance to both sun and saltpetre. Made from aluminium, weather-resistant plastics and galvanised steel. Large size reflector, elevation angle adjustment, mounting in either horizontal or vertical polarity. Includes a balun (symmetrizer), specially designed for the antenna, with F-type connector protected inside the balun box. Packed individually.

### Accessories

9010008 BR-401 UHF preamp. for antenna box, F connector (24 V $\approx$ ).

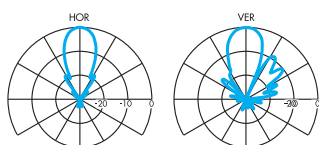
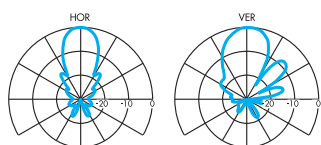
9010009 BR-411 UHF preamp. for antenna box, F connector (12 V $\approx$ ).

9010012 BR-441 UHF preamp. for antenna box, F-type connector (5 V $\approx$ ).

CODE	9000044		9000045
MODEL	MX-045		MX-075
Frequency range	MHz	470-862	
Channel		21-69	
Elements		51	79
Gain	dB $\mu$ V	15.5	17.5
Front/back ratio	dB	27	35
Impedance	$\Omega$	75	
Return loss	dB	$\geq 10$	
Polarity		H/V	
Beam width	$^{\circ}$ H	32	22
	$^{\circ}$ V	33	29
Lenght	mm	1152	1995
Wind loading	N	H	111
		V	126
Connection		F female	
Protection index		IP 53	
Colour		Black/Aluminium	
Pack x Code x Unit/Pallet		36 x 1 x 1	27 x 1 x 1
Packing weight	Kg	2.18	3.2
Pallet weight	Kg	93.5	101.4
Packing dimensions	mm	800 x 448 x 125	1084 x 455 x 125
Pallet dimensions	mm	1200 x 800 x 2000	

MX-045

MX-075



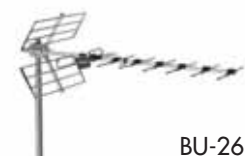
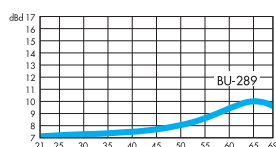


# 900 TERRESTRIAL ANTENNAS

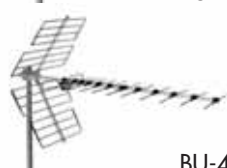
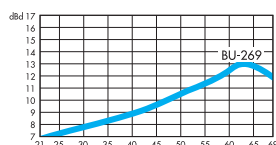
## Small reflector UHF antennas



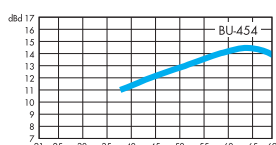
BU-289



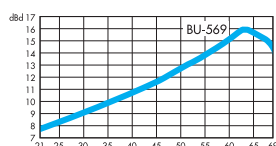
BU-269



BU-454



BU-569



### Description

Double array antennas covering the complete gain range, in UHF broadband or for groups of channels. Fast and easy assembly, all the components are pre-mounted and no tools are required for their assembly.

### Applications

Individual or MATV digital and analogue terrestrial TV installations where reception conditions are favourable.

### Characteristics

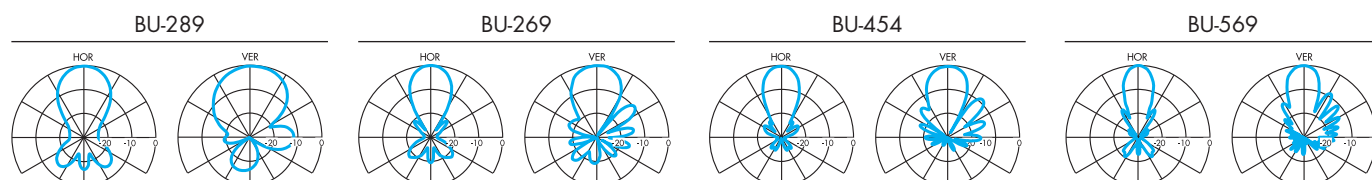
Rejects GSM signals as well as signals coming from the lower part of the antenna. Robust antenna with great resistance to both sun and saltpetre. Made from aluminium, weather-resistant plastic and galvanised steel. Reduced size reflector to facilitate assembly and installation. Elevation angle adjustment, mounting in either horizontal or vertical polarity. Includes a balun (symmetrizer), specially designed for the antenna, with F-type connector protected inside the balun box. Packed individually, in multiple packs or unassembled.

### Accessories

- 9010008 BR-401 UHF preamp. for antenna box, F connector (24 V<sub>DC</sub>).
- 9010009 BR-411 UHF preamp. for antenna box, F connector (12 V<sub>DC</sub>).
- 9010012 BR-441 UHF preamp. for antenna box, F-type connector (5 V<sub>DC</sub>).

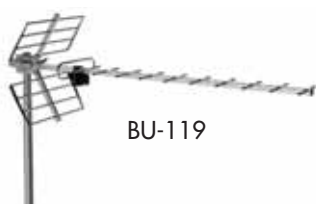
CODE		9000039	9000042	9000036	9000043
MODEL		BU-289	BU-269	BU-454	BU-569
Frequency range	MHz	470-862			
Channel		21-69			
Elements		19	27	43	45
Gain	dBd	9.2	13	14	16
Front/back ratio	dB	19	23	25	25
Impedance	Ω	75			
Return loss	dB	≥ 9.5	≥ 10	≥ 9.5	≥ 10
Polarity		H/V			
Beam width	°H	46	26	24	20
	°V	58	31	32	21
Lenght	mm	495	1087	1298	2050
Wind loading	N				
	H	41	48	89	83
	V	57	70	93	104
Connection		F female			
Colour		Black/Aluminium			
Pack x Code x Unit/Pallet		72 x 1 x 1	84 x 1 x 1	56 x 1 x 1	25 x 1 x 1
Packing weight	Kg	1.02	1.48	1.85	2.4
Pallet weight	Kg	88.4	139.3	118.6	75
Packing dimensions	mm	590 x 400 x 95	600 x 400 x 90	700 x 425 x 90	1,084 x 455 x 125
Pallet dimensions	mm	1,200 x 800 x 2,000			

The BU-269, BU-454 and BU-569 are also in multiple packs (see page 21)

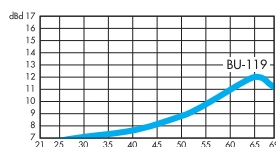


# 900 TERRESTRIAL ANTENNAS

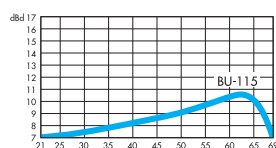
## Yagi UHF antennas



BU-119



BU-115



### Description

Yagi antennas in UHF broadband. Fast and easy reflector assembly, all the components are pre-mounted and no tools are required for their assembly.

### Applications

Individual or MATV digital and analogue terrestrial TV installations.

### Characteristics

Reject GSM signals as well as signals coming from the lower part of the antenna. Robust antenna with great resistance to both sun and saltpetre. Made from aluminium, weather-resistant ASA plastic and galvanised steel. Reduced size reflector to facilitate assembly and installation. Elevation angle adjustment, mounting in either horizontal or vertical polarity. Includes a balun (symmetrizer), specially designed for the antenna, with F-type connector protected inside the balun box. Packed individually, except for the BU-119 antenna which is supplied in a multiple pack.

### Accessories

9010008 BR-401 UHF preamp. for antenna box, F connector (24 V<sub>cc</sub>).

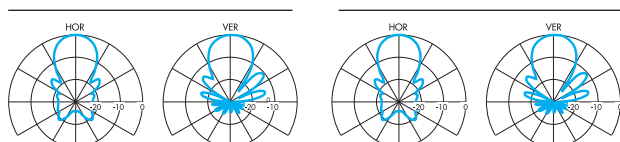
9010009 BR-411 UHF preamp. for antenna box, F connector (12 V<sub>cc</sub>).

9010012 BR-441 UHF preamp. for antenna box, F-type connector (5 V<sub>cc</sub>).

CODE		9000046		9000077	
MODEL		BU-119		BU-115	
Frequency range	MHz	470-862			
Channel		21-69			
Elements		19		15	
Gain	dB $\mu$ V	12.5		10.5	
Front/back ratio	dB	21			
Impedance	$\Omega$	75			
Return loss	dB	$\geq 10$			
Polarity		H/V			
Beam width	$^{\circ}$ H	34		36	
	$^{\circ}$ V	35		38	
Lenght	mm	1146		800	
Wind loading	N	H	40		38
		V	48		46
Connection		F female			
Protection index		IP 53			
Colour		Black/Aluminium			
Pack x Code x Unit/Pallet		12 x 12 x 1		18 x 18 x 1	
Packing weight	Kg	13.3		13.5	
Pallet weight	Kg	174.6		177	
Packing dimensions	mm	1200 x 400 x 302			
Pallet dimensions	mm	1200 x 800 x 2000			

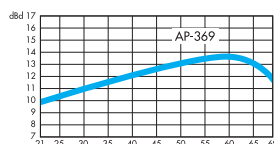
BU-119

BU-115





AP-369



## Description

Quadruple array antennas. Designed to cover all the UHF band with maximum flatness. Fast and easy assembly, all the components are pre-mounted and do not require tools for their assembly.

## Applications

Individual and MATV digital and analogue terrestrial TV installations, where high gain and directivity are required. The reflectors avoid interferences received from behind.

## Characteristics

Rejects GSM signals as well as signals coming from the lower part of the antenna. Robust antenna with great resistance to both sun and saltpetre. Made from aluminium, weather-resistant plastics and galvanised steel. Large size reflector, elevation angle adjustment, mounting in either horizontal or vertical polarity. Includes a balun (symmetrizer), specially designed for the antenna, with F-type connector protected inside the balun box. Packed individually.

## Accessories

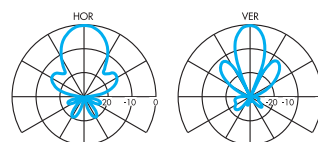
9010003 BR-103 UHF preamplifier for antenna box (24 V $\approx$ ).

9010004 BR-105 UHF preamplifier for antenna box (12 V $\approx$ ).

9010012 BR-441 UHF preamp. for antenna box, F-type connector (5 V $\approx$ ).

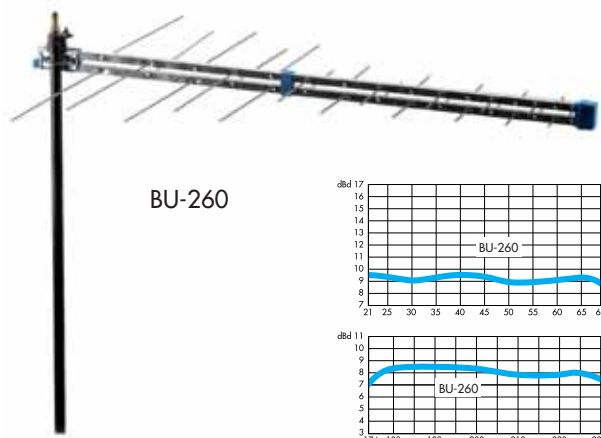
CODE		9000057
MODEL		AP-369
Frequency range	MHz	470-862
Channel		21-69
Elements		28
Gain	dB $\mu$ V	13.5
Front/back ratio	dB	20
Impedance	$\Omega$	75
Return loss	dB	10
Polarity		H/V
Beam width	$^{\circ}$ H	46
	$^{\circ}$ V	27
Lenght	mm	840 x 670
Wind loading	N	70
	V	-
Connection		F female
Protection index		IP 53
Colour		Black/Aluminium
Pack x Code x Unit/Pallet		17 x 2 x 1
Packing weight	Kg	3.75
Pallet weight	Kg	78.8
Packing dimensions	mm	860 x 765 x 140
Pallet dimensions	mm	1200 x 800 x 2000

AP-369

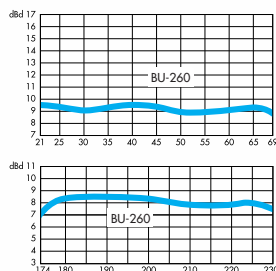


# 900 TERRESTRIAL ANTENNAS

Logarithmic UHF/BIII antennas



BU-260



## Description

Multiband UHF and BIIL logarithmic antennas. The antenna is supplied fully assembled and no tools are required for its fixing to the mast.

## Applications

Individual or MATV digital and analogue terrestrial TV installations. Suitable for those installations where there is not enough space for the installation of two separate UHF and BIIL antennas. The absence of reflectors facilitates installation.

## Characteristics

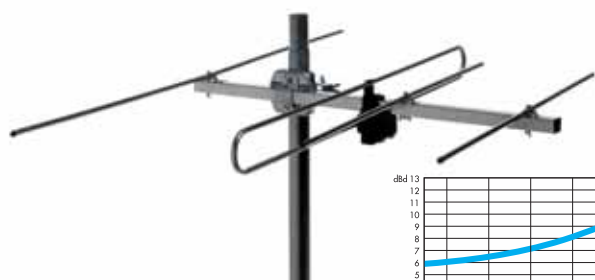
Robust antenna with great resistance to both sun and saltpetre. Made from aluminium, plastic and galvanised steel. The logarithmic antenna does not need a balun; the coaxial cable is connected directly to the antenna via the F-type connector. Provided in an individual or multiple pack.

CODE		9000081	
MODEL		BU-260	
Frequency range	MHz	174-230	470-862
Channel		E5-E12 / L5-L10	21-69
Elements		32	
Gain	dBpV	8	9
Front/back ratio	dB	≥ 20	≥ 25
Impedance	Ω	75	
Return loss	dB	≥ 9.5	
Polarity		H	
Beam width	°	80	70
Lenght	mm	1120	
Wind loading	N	H	14
		V	27
Connection		F	
Colour		Blue/Aluminium	
Pack x Code x Unit/Pallet		13 x 10 x 1	
Packing weight	Kg	7,34	
Pallet weight	Kg	66,4	
Packing dimensions	mm	1165 x 865 x 250	
Pallet dimensions	mm	1200 x 800 x 2000	

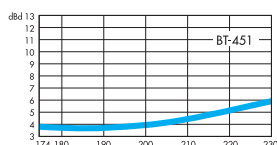
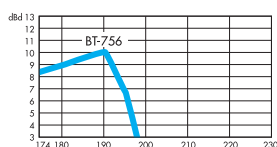
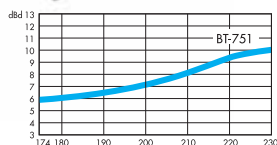


# 900 TERRESTRIAL ANTENNAS

## BIII antennas



BT-751  
BT-756  
BT-451



### Description

4 and 7 element Yagi antenna, BIII broadband or by channel groups. Fast and easy mounting, no tools are required for its assembly.

### Applications

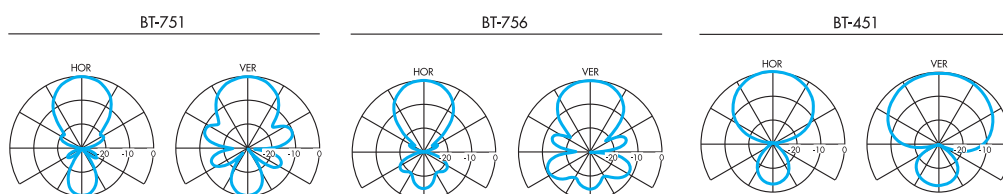
Individual and MATV digital and analogue terrestrial TV installations. Antenna consisting of 7 elements for use where reception is weak and of 4 elements where reception is good.

### Characteristics

Robust antenna with great resistance to both sun and saltpetre. Made from aluminium, weather-resistant plastic and galvanised steel. Elevation angle adjustment, mounting in either horizontal or vertical polarity. Includes a balun (symmetrizer), specially designed for the antenna, with F-type connector protected inside the balun box. Provided in an individual or multiple pack.

CODE	9000063		9000060		9000070	
MODEL		BT-751	BT-756		BT-451	
Frequency range	MHz	174-230	174-191		174-230	
Channel		E5-E12 / L5-L10	E5-E6 / L5-L6		E5-E12 / L5-L10	
Elements		7			4	
Gain	dBd	10			6	
Front/back ratio	dB	10				
Impedance	Ω	75				
Return loss	dB	≥ 10				
Polarity		H/V				
Beam width	°H	44	46		64	
	°V	49	52		99	
Lenght	mm	1594	1944		594	
Wind loading	N	H	48		55	
		V	56		63	
Connection		F female				
Protection index		IP 53				
Colour		Black/Aluminium				
Pack x Code x Unit/Pallet		90 x 1 x 1				
Packing weight	Kg	1.36	1.35		1.24	
Pallet weight	Kg	137.4	136.5		126.6	
Packing dimensions	mm	1065 x 140 x 110				
Pallet dimensions	mm	1200 x 800 x 2000				

The BT-751 is also available in multiple packs (see page 21).

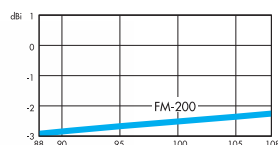


# 900 TERRESTRIAL ANTENNAS

FM antennas



FM-102



FM-200

## Description

Omnidirectional FM broadband dipole antennas. Fast and easy mounting, the components are pre-mounted and no tools are required for their assembly.

## Applications

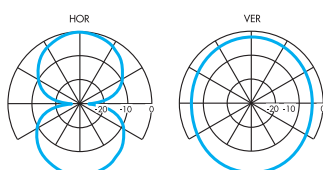
Individual or MATV analogue terrestrial FM radio installations. The FM antenna, together with an amplifier, allows radio signals to be added to the TV installation, considerably improving their reception with regard to telescopic antennas.

## Characteristics

Robust antenna with great resistance to both sun and saltpetre. Made from aluminium, weather-resistant plastic and galvanised steel. Includes a balun (symmetrizer), specially designed for the antenna, with F-type connector protected inside the balun box. Supplied in an individual and multiple pack.

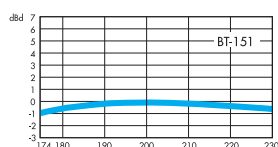
CODE	9000040		9000005
MODEL		FM-102	FM-200
Frequency range	MHz	87.5 - 108.0	
Gain	dBd	H	-2.15
		V	-3
Impedance	$\Omega$	75	
Return loss	dB	$\geq 9.5$	
Polarity		H	H/V
Beam width	$^{\circ}$	360	
Wind loading	N	23	21
Connection		F female	
Protection index		IP 53	
Colour		Black/Aluminium	
Pack x Code x Unit/Pallet		64 x 2 x 1	64 x 1 x 1
Packing weight	Kg	1.32	0.75
Pallet weight	Kg	99.5	63.0
Packing dimensions	mm	525 x 325 x 115	
Pallet dimensions	mm	1200 x 800 x 2000	

FM-200





BT-151



### Description

Broadband dipole antennas, omnidirectional, for DAB radio. Fast and easy mounting, no tools are required for their assembly.

### Applications

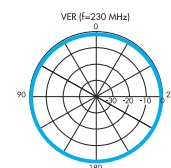
Terrestrial DAB digital radio installations, both collective and individual. The DAB antenna used together with an amplifier allows digital radio broadcasts to be added to the TV installation, resulting in reception of better quality than with analogue radio broadcasting in FM.

### Characteristics

Robust antenna with great resistance to both sun and salt residue. Made from aluminium, weather-resistant plastic and galvanised steel. Elevation angle adjustment, mounting in either horizontal or vertical polarity. Includes a balun (symmetrizer), specially designed for the antenna, with F-type connector protected inside the balun box. Supplied in an individual pack.

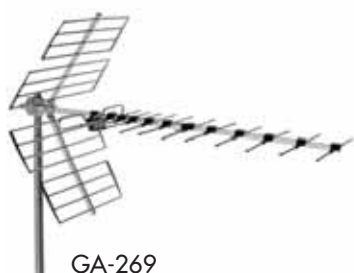
CODE		9000071
MODEL		BT-151
Frequency range	MHz	174-240
Channels		5A-13F
Gain	dBd	0.25
Impedance	$\Omega$	75
Return loss	dB	$\geq 10$
Polarity		V
Beam width	$^{\circ}$	360 (omnidirectional)
Length	mm	300
Wind loading	N	19
Connection		F female
Protection index		IP 53
Colour		Black/Aluminium
Pack x Code x Unit/Pallet		90 x 2 x 1
Packing weight	Kg	1.44
Pallet weight	Kg	144.6
Packing dimensions	mm	1065 x 140 x 110
Pallet dimensions	mm	1200 x 800 x 2000

BT-151

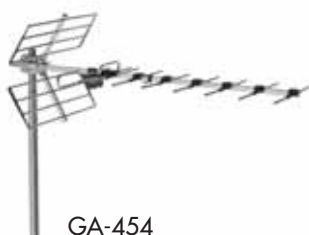


# 900 TERRESTRIAL ANTENNAS

Special packaging



GA-269



GA-454



GA-569

## Description

The antennas supplied in a multiple pack are pre-mounted and individually packaged in a plastic bag which are then packed into a single carton box.

The dismantled antennas in a multiple pack are supplied with the loose parts of each antenna packaged in plastic bags, and all the antennas are packed into one carton box.

A multiple pack will be supplied for each ordered unit. Orders should indicate the number of multiple packs and not the number of antennas.

## Applications

The antennas in a multiple pack reduce the volume of each order, resulting in reduced transportation costs.

## Characteristics

The electrical characteristics of the antennas in a multiple pack – pre-mounted or dismantled – are identical to those of equivalent models.

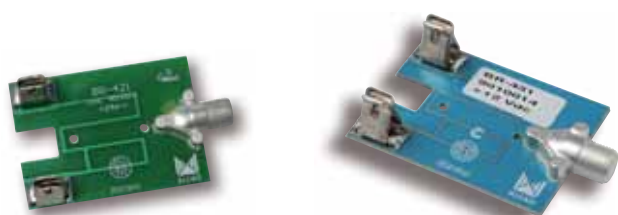
CODE		9000086	9000090	9000097	9000080
MODEL		GA-266	GA-566	GA-456	GA-751
Equivalent model		BU-266	BU-566	BU-456	BT-751
Colour		Black/Aluminium			
Cod x Units / Pallets		1 x 12	1 x 6	1 x 6	1 x 20
Pack x Code x Unit/Pallet		10 x 1 x 12	8 x 1 x 6	12 x 1 x 6	12 x 1 x 20
Packing weight	Kg	14.53	11.7	10	20.3
Pallet weight	Kg	160.3	108.6	35	258.6
Packing dimensions	mm	800 x 600 x 372	1100 x 400 x 452	700 x 415 x 437	1200 x 400 x 302
Pallet dimensions	mm	1200 x 800 x 2000			

CODE		9000065	9000059	9000058
MODEL		GA-269	GA-569	GA-454
Equivalent model		BU-269	BU-569	BU-456
Colour		Black/Aluminium		
Cod x Units / Pallets		1 x 12	1 x 6	1 x 6
Pack x Code x Unit/Pallet		10 x 1 x 12	8 x 1 x 6	12 x 1 x 6
Packing weight	Kg	14.53	11.7	10
Pallet weight	Kg	160.3	108.6	35
Packing dimensions	mm	800 x 600 x 372	1100 x 400 x 452	700 x 415 x 437
Pallet dimensions	mm	1200 x 800 x 2000		

# 901

## PREAMPLIFIERS

### UHF preamplifiers model NEO



BR-421

BR-431



BR-451

#### Description

UHF preamplifier for the NEO antenna box, powered through the coaxial cable. As well as amplifying the signals it adapts the antenna impedance from 300Ω to 75Ω. The noise level is extremely low in order to amplify the signals without losing quality.

#### Applications

Individual or MATV digital and analogue terrestrial TV installations where reception levels are very weak. The amplifier is installed as a replacement of the matching transformer of the antenna in order to amplify the signal before it is degraded by the attenuations of the installation. Its use achieves the best possible signal to noise ratio.

#### Characteristics

Designed specially for NEO antennas. Connection to the antenna by means of fast-on connections and to the coaxial cable by means of a screw terminal.

CODE		9010013	9010014	9010015
MODEL		BR-421	BR-431	BR-451
Inputs		1		
Frequency range	Band	UHF		
	MHz	470-862		
Gain	dB	14		
Maximum output level	dBμV	100		
Noise figure	dB	1.4		
Input impedance	Ω	300		
Output impedance	Ω	75		
Output connection		F female		
Supply	V <sub>cc</sub>	+24	+12	+5
	mA	8		
Protection index		IP 53		
Units per packaging		1		
Packing weight	Kg	0.04		
Packing dimensions	mm	160 x 120 x 30		





BR-401



BR-411



BR-441

**Description**

UHF preamplifier for the antenna box, powered through the coaxial cable. As well as amplifying the signals it adapts the antenna impedance from 300Ω to 75Ω. The noise level is extremely low in order to amplify the signals without losing quality.

**Applications**

Individual or MATV digital and analogue terrestrial TV installations where reception levels are very weak. The amplifier is installed as a replacement of the matching transformer of the antenna in order to amplify the signal before it is degraded by the attenuations of the installation. Its use achieves the best possible signal to noise ratio.

**Characteristics**

Designed specially for MX, BU and AP antennas (except BU-260). Connection to the antenna by means of fast-on connections and to the coaxial cable by means of a screw terminal.

CODE		9010008	9010009	9010012
MODEL		BR-401	BR-411	BR-441
Inputs		1		
Frequency range	Band	UHF		
	MHz	470-862		
Gain	dB	14		
Maximum output level	dBμV	100		
Noise figure	dB	1.4		
Input impedance	Ω	300		
Output impedance	Ω	75		
Output connection		F female		
Supply	V <sub>+</sub>	+24	+12	+5
	mA	8		
Protection index		IP 53		
Units per packaging		1		
Packing weight	Kg	0.04		
Packing dimensions	mm	160 x 120 x 30		

# 912 SATELLITE DISHES AND LNBS

## Offset dishes



PF-220  
PF-420  
PF-620

### Description

Offset type parabolic antenna with high gain and efficiency. The assembly of the antenna is simple, once installed it is very robust and assures great orientation stability. The packaging includes fittings which avoid damage to the dish during transportation.

### Applications

Suitable for satellite TV installations, collective or individual. The antenna is available in three sizes: 100 x 95 cm for collective installations; 85 x 80 cm and 65 x 60 cm for individual installations.

### Characteristics

Robust antenna with great resistance to sun and saltpetre. The dish is made from epoxy covered galvanised steel and the accessories are of galvanised iron.

### Accessories

9980009 PI-101 Dish stand.  
9980018 BE-201 Base for dish stand for embedding.  
9980063 BZ-400 Dish support.

CODE		9120156		9120160		9120216	
MODEL			PF-220	PF-420		PF-620	
Diameter	cm		66.5 x 60	85 x 80		100 x 95	
Mast mount	mm ø		25.. 50	30.. 60		35.. 60	
Reflector			Electro zinc plated steel with polyester coating				
Band	GHz		10.70.. 12.75				
Gain	db	10,70 GHz	35.4	37.2		39.7	
		11,70 GHz	36.2	37.5		40.0	
		12,50 GHz	36.8	38.3		40.2	
		12,75 GHz	37.0	38.5		40.3	
Beamwidth {-3 dB}	°	11.70 GHz	2.8	2.4		1.9	
Adjustment range	° El		2.. 88	0.. 90			
Wind loading operational	Km/h		72				
Wind loading safety	Km/h		140				
Units per packaging			1				
Packing weight	Kg		5.16	6.89		10.4	
Packing dimensions	mm		740 x 705 x 160	860 x 800 x 165		1080 x 990 x 225	

# 912 SATELLITE DISHES AND LNBS

## Steel offset dishes with LNB



PF-223



UE-003

### Description

Offset type parabolic antenna with high gain and efficiency with universal single LNB included. The assembly of the antenna is simple, once installed it is very robust and assures great orientation stability. The packaging includes fittings which avoid damage to the dish during transportation.

### Applications

Suitable for individual satellite TV installations. The antenna is available in two sizes: 85 cm x 80 cm and 65 cm x 60 cm.

### Characteristics

Robust antenna with great resistance to sun and saltpetre. The dish is made from epoxy covered galvanised steel and the accessories are of galvanised iron. Supplied in an individual or multiple pack.

### Accessories

9980009 PI-101 Dish stand.  
9980018 BE-201 Base for dish stand for embedding.  
9980063 BZ-400 Dish support.

CODE		9120157	9120158	9120161	9120162
MODEL		PF-223	PF-224	PF-423	PF-424
Equivalent model		PF-220 + universal LNB	PF-220 + universal LNB	PF-420 + universal LNB	PF-420 + universal LNB
Units per packing		1	5	1	5
LNB equivalent model		UE-003			
Cod x Units / Pallet		1 x 15	1 x 15	1 x 12	1 x 12
Pack x Code x Unit / Pallet		1 x 1 x 15	5 x 1 x 15	1 x 1 x 12	5 x 1 x 12
Packing weight	Kg	5.32	19.68	7.05	27.25
Pallet weight	Kg	94.73	310.13	99.34	340.74
Packing dimensions	mm	740 x 705 x 160		860 x 800 x 165	
Pallet dimensions	mm	1200 x 800 x 1590		1200 x 800 x 1800	

# 912 SATELLITE DISHES AND LNBS



## Fibreglass offset dishes



PF-431

### Description

Fibreglass offset parabolic antenna with high gain and efficiency. The assembly of the antenna is simple, once installed it is very robust and assures great orientation stability. The packaging includes fittings which avoid damage to the dish during transportation.

### Applications

Suitable for individual satellite TV or SMATV installations. The antenna measures 89cm x 78cm.

### Characteristics

Highly robust antenna with great resistance to sun and saltpetre. The dish is made of polyester with an inserted metallic mesh. The accessories for fixing the antenna are made of galvanised iron.

### Accessories

- 9980009 PI-101 Dish stand.
- 9980018 BE-201 Base for dish stand for embedding.
- 9980063 BZ-400 Dish support.

CODE		9120122
MODEL		PF-431
Diameter	cm	89 x 78
Mast mount	mm ø	30-60
Reflector		Polyester
Band	GHz	10.70-12.75
Gain	db	38.9 (12.6 GHz)
Offset angle	°	24
Beamwidth (-3 dB)	°	2.2 (11.7 GHz)
Adjustment range	° El	20-50
Wind loading operational	Km/h	120
Wind loading safety	Km/h	160
Units per packaging		1
Packing weight	Kg	6
Packing dimensions	mm	920 x 820 x 165

# 912 SATELLITE DISHES AND LNBS



Fibreglass offset dishes with LNB



PF-230

## Description

Fibreglass parabolic antenna with universal LNB. The antenna is an offset type with high gain and efficiency. The assembly of the dish is simple, once installed it is very robust and assures great orientation stability. The high resistance of the fibreglass dish means that the antenna is practically indestructible during transportation as well as in later use.

## Applications

Suitable for individual satellite TV installations. The antenna measures 60cm x 60cm.

## Characteristics

Highly robust antenna with great resistance to sun and saltpetre. The dish is made of polyester with an inserted metallic mesh. The accessoires for fixing the antenna are made of galvanised iron.

## Accessories

- 9980009 PI-101 Dish stand.
- 9980018 BE-201 Base for dish stand for embedding.
- 9980063 BZ-400 Dish support.
- 9980023 SA-010 Support 2 LNB.

CODE		9120030			
MODEL		PF-230			
Diameter	cm	60			
Mast mount	mm ø	30-60			
Reflector		Polyester			
Band	GHz	10.70-12.75			
Gain	db	36.4 (11.8 GHz)			
Offset angle	°	23			
Beamwidth (-3 dB)	°	2.9 (11.7 GHz)			
Adjustment range	° El	20-50			
Wind loading operational	Km/h	120			
Wind loading safety	Km/h	160			
LNB					
Outputs		1			
Connector		F female			
Input frequency	GHz	Low band 10.70-11.70		High band 11.70-12.75	
Output frequency	MHz	Low band 950-1950		High band 1100-2150	
Polarities		Low vertical	Low horizontal	High vertical	High horizontal
Gain	dB	55			
Noise figure	dB	1.2 max			
L.O. frequency	GHz	9.75 ±3 MHz 10.60 ±3 MHz			
Image frequency rejection	dB	>45			
Power supply/switching	V---	Low vertical 11.5 - 14.0	Low horizontal 16.0 - 19.0	High vertical 11.5 - 14.0/22 KHz	High horizontal 16.0 - 19.0/22 KHz
Consumption	mA	150			
Operating temperature	°C	-40..+60			
Units per packaging		1			
Packing weight	Kg	5.40			
Packing dimensions	mm	640 x 630 x 160			

# 912 SATELLITE DISHES AND LNBS



Special packaging



PF-222  
PF-422

## Description

Offset type parabolic antenna with high gain and efficiency with universal single LNB included. The assembly of the antenna is simple, once installed it is very robust and assures great orientation stability. The packaging includes fittings which avoid damage to the dish during transportation.

## Applications

Suitable for individual satellite TV installations. The antenna is available in two sizes: 85 cm x 80 cm and 65 cm x 60 cm.

## Characteristics

Robust antenna with great resistance to sun and saltpetre. The dish is made from epoxy covered galvanised steel and the accessories are of galvanised iron. Supplied on pallets, each of which holds 300 units.

## Accessories

9980009 PI-101 Dish stand.  
9980018 BE-201 Base for dish stand for embedding.  
9980063 BZ-400 Dish support.

CODE		9120159	9120163
MODEL		PF-222	PF-422
Equivalent model		PF-220	PF-420
Units per packing		300	
Pallet weight	Kg	1054	1495
Pallet dimensions	mm	770 x 890 x 2210	1220 x 1020 x 1670



# 912 SATELLITE DISHES AND LNBS



LNB for satellite dishes



UE-003



UE-202



UE-300



UE-403

## Description

LNB for offset parabolic antennas. The range consists of universal single, twin and quad LNBs for individual installations; and universal quattro LNBs for collective installations.

## Characteristics

Characterised by its high stability in frequency and high gain. The very low noise level provides quality reception in areas of weak signal.

CODE		9120192	9120204	9120205	9120198
MODEL		UE-003	UE-202	UE-300	UE-403
Outputs		1	2	4	4
Type		Single	Twin	Quad	Quattro
Connector		F female			
Input frequency	GHz	Low band 10.70 - 11.70 High band 11.70 - 12.75			
Output frequency	MHz	950 - 2150			
Polarities		Low vertical Low horizontal High vertical High horizontal			
Gain	dB±TOL	55 ±5			
Noise figure	dB	> 0.2 (0,6 typ.)			> 0.2 (0,5 typ.)
L.O. frequency	GHz	Low band 9.75 High band 10.60			
Power supply/switching	V $\overline{\text{---}}$	14-18 / 0-22 KHz	13-18 / 0-22 KHz	13-18 / 0-22 KHz	8 - 18
Consumption	mA	85 (max.)	200 (max.)	300 (max.)	250 (max.)
Operating temperature	°C	-40...+60			
Units per packaging		1			
Packing weight	Kg	0.13	0.17	0.28	0,28
Packing dimensions	mm	70 x 68 x 100	64 x 65 x 131	75 x 85 x 100	75 x 85 x 100



TS-015



TI-025



TS-025

**Description**

Triangular shaped tower (180x180x180 mm), formed by several intermediate sections and an upper section where the antenna mast is fixed. The tower is fixed to the roof or floor by means of a tower base which can be fitted into the roof or floor or secured by metal bolts. The tiltable base allows the tower to be lowered for maintenance work.

**Applications**

Installations where a high elevation for the antennas is required or where traditional antenna masts do not offer sufficient strength.

**Characteristics**

Made from zinc-coated iron, with round tubes of 20Øx1.5 mm and M8 rod. The different sections and the base are assembled by means of three rods which fit inside the next round tube and are fixed by means of an M8 screw.

**Accessories**

9980055	BE-001	Tower base for embedding.
9980017	BA-001	Tiltable tower base for embedding.
9980053	BF-003	Tower base for fixing with metal bolts.
9980003	MT-410	Galvanised iron mast.
9980062	CT-001	Steel wire rope.
9980059	AC-013	Wire rope grip.
9980014	TE-014	Turnbuckle.

CODE		9980051	9980052	9980050
MODEL		TI-025	TS-015	TS-025
Section		Intermediate	Top	
Height	mm	2500	1500	2500
Base	mm	180 x 180 x 180		
Maximum mast diameter	mm	45		
Material		Zinc coated iron		
Units per packaging		1		
Packing weight	Kg	8.00	5.00	9.00
Packing dimensions	mm	2500 x 180 x 180	1470 x 180 x 180	2700 x 180 x 180

Fixed tower base, zinc-plated



9980053	
BF-003	
Units per packaging	1
Packing weight	1,50 Kg
Packing dimensions	295 x 275 x 90

Tiltable tower base, zinc-plated



9980017	
BA-001	
Units per packaging	1
Packing weight	3,40 Kg
Packing dimensions	290 x 215 x 190

Tower base for embedding, zinc-plated



9980055	
BE-001	
Units per packaging	1
Packing weight	2,00 Kg
Packing dimensions	260 x 210 x 180

# 998 MECHANICAL ACCESSORIES

## Masts



### Description

Masts for antennas. Several sections of the mast can be added to extend its length. Secured to the roof by means of a special mast base for roof-tiles, to the wall by means of two brackets or to the chimney by means of a special clamp.

### Applications

Used as a support for the installation of terrestrial TV and radio antennas.

### Characteristics

Made from round galvanised iron tube. The different sections of the mast are assembled by inserting the upper part of the mast into the lower part of the other section, securing them with an M6 screw which passes through the tubes.

### Accessories

9980020	TA-001	Tiltable mast base for roof-tiles.
9980099	CH-030	Chimney clamp.
9980065	RS-500	Single arm.
9980011	JV-335	Mast ring for guy wires.
9980062	CT-001	Steel wire rope.
9980059	AC-013	Wire rope grip.
9980014	TE-014	Turnbuckles.
9980057	GM-050	Wall bracket for embedding.

CODE		9980002	9980003	9980102
MODEL		MT-210	MT-410	MT-411
Mast		Drawable		
Height	mm	1500	2500	
Diameter	mm		35	40
Thickness	mm	1.5		2.0
Maximum momentum	Nm	223		384
Material		Gasvanised iron		
Units per packaging		6		
Packing weight	Kg	10.4	17.6	25.5
Packing dimensions	mm	1500 x 105 x 70	2500 x 105 x 70	2500 x 125 x 80

Tiltable base for roof-tiles for Ø40 mm mast, zinc-plated



9980020	
TA-001	
Units per packaging	1
Packing weight	1,20 Kg
Packing dimensions	225 x 200 x 150

# 998 MECHANICAL ACCESSORIES

## Masts



MT-325  
MT-332  
MT-338  
MT-345  
MT-352

### Description

Masts for antennas. Several sections can be assembled telescopically to make a longer mast. Secured to the roof by means of a mast base for roof-tiles, to the wall by means of two brackets or to the chimney by means of a special clamp.

### Applications

Used as a support for installations of terrestrial TV or radio antennas. Installations where a high elevation for the antennas is required or where traditional antenna masts do not offer sufficient strength. The telescopic system allows the mast to be lowered without having to dismount the mast or release its guy wires.

### Characteristics

Made from round, zinc-coated iron tube. The different sections of the mast are assembled by inserting the upper part of the mast into the lower part of the other section securing them with an M10 screw.

### Accessories

- 9980020 TA-001 Tiltable mast base for roof-tiles (Ø40 mm).
- 9980099 CH-030 Chimney clamp.
- 9980065 RS-500 Single arm.
- 9980011 JV-335 Mast ring for guy wires (Ø40 mm).
- 9980062 CT-001 Steel wire rope.
- 9980059 AC-013 Wire rope grip.
- 9980014 TE-014 Turnbuckles.
- 9980057 GM-050 Wall bracket for embedding.

CODE		9980004	9980005	9980006	9980007	9980008
MODEL		MT-325	MT-332	MT-338	MT-345	MT-352
Mast		Telescopic				
Height	mm	3000				
Diameter	mm	25	30	35	40	45
Thickness	mm	1.5/2.0	1.5			
Maximum momentum	Nm	140	161	223	294	376
Material		Zinc coated iron				
Units per packaging		1				
Packing weight	Kg	2.50	3.00	3.50	4.00	4.50
Packing dimensions	mm	3000 x 25 x 25	3000 x 30 x 30	3000 x 35 x 35	3000 x 40 x 40	3000 x 45 x 45

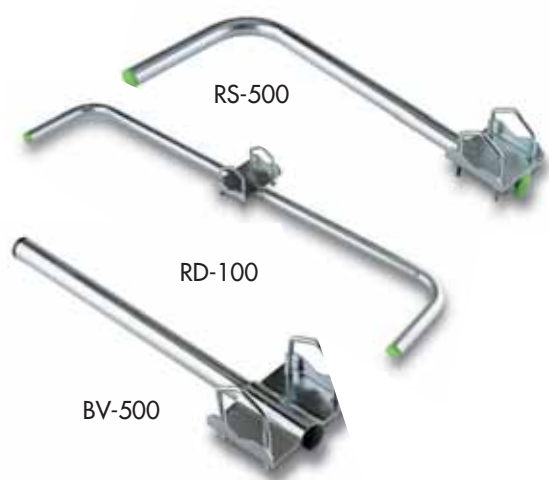
Tiltable base for roof-tiles for Ø40 mm mast, zinc-plated



9980020	
TA-001	
Units per packaging	1
Packing weight	1,20 Kg
Packing dimensions	225 x 200 x 150

# 998 MECHANICAL ACCESSORIES

## Arms



### Description

Arms for antenna masts, single or double, and another model to install antennas in vertical polarity.

### Applications

Used as a support for several terrestrial TV and radio antennas with short masts. The use of arms reduces the necessary length of the mast and the flexor moment at its base.

### Characteristics

Made from round zinc-coated iron tube Ø30x1.5 mm with a securing system of two M8 fixing clamps.

CODE		9980065	9980066	9980061
MODEL		RS-500	RD-100	BV-500
Support		Single	Double	Single
Length	mm	590	1180	755
Diameter	mm	30		
Thickness	mm	1.5		
Maximum diameter	mm	60		
Maximum load	N	300		
Arm material		Zinc coated iron		
Flange material		Zinc coated iron		
Units per packaging		1		
Packing weight	Kg	1.20	2.00	1.20
Packing dimensions	mm	590 x 300 x 120	1180 x 300 x 120	755 x 120 x 120



GM-026



GM-200



GM-040



GM-350



GM-050



GM-515



SE-090

**Description**

Brackets to secure the mast to a wall, to be fitted into the wall itself or to secure by means of metal bolts. Different strengths and lengths of brackets.

**Applications**

Two brackets are used to secure the mast to a wall.

**Characteristics**

Made from zinc-coated iron with an M8 clamp fixing system.

CODE		9980016	9980056	9980057	9980067	9980068	9980100	9980069
MODEL		GM-026	GM-040	GM-050	GM-200	GM-350	GM-515	SE-090
Fixing		Embedded			With lag-screws			
Lenght	mm	285	300	480	200	300	500	165
Maximum mast diameter	mm	50						
Clamp material		Zinc coated iron						
Flange material		Zinc coated iron						
Units per packaging		1						
Packing weight	Kg	0,28	0,43	1,03	0,51	0,75	1,23	0,29
Packing dimensions	mm	285x115x30	300x115x40	480x115x40	200x120x115	300x120x115	500x160x160	190x125x30



# 998 MECHANICAL ACCESSORIES

Steel wire rope Ø2 mm



9980062	
CT-001	
Units per packaging	100m
Packing weight	1,80 Kg
Packing dimensions	185 x 185 x 50 mm

**Description**

Material for the installation of guy wires in masts, telescopic masts or towers of great length.

**Applications**

The wire ropes are fixed to the mast by means of a ring clamp for masts up to Ø40 mm or are fixed directly to the three tubes of the tower. Ring-headed expanding bolts are used to secure them to the floor or roof.

**Characteristics**

Steel wire ropes of Ø3 mm. Wire rope grips for wire ropes of Ø3 mm and Ø6 mm and turnbuckles.

1/4" turnbuckle



9980014	
TE-014	
Units per packaging	1
Packing weight	0,10 Kg
Packing dimensions	150 x 25 x 20 mm

Wire rope grip Ø6 mm



9980058	
AC-014	
Units per packaging	1
Packing weight	0,02 Kg
Packing dimensions	33 x 30 x 15 mm

Wire rope grip Ø3 mm



9980059	
AC-013	
Units per packaging	1
Packing weight	0,01 Kg
Packing dimensions	25 x 22 x 12 mm

Mast ring for guy wires Ø40 mm



9980011	
JV-335	
Units per packaging	1
Packing weight	0,13 Kg
Packing dimensions	100 x 100 x 20 mm

Steel wire rope Ø3 mm



9980114	
CT-003	
Units per packaging	100
Packing weight	2 Kg
Packing dimensions	195 x 195 x 60 mm

# 998 MECHANICAL ACCESSORIES



Ø35 mm

9980099	
CH-030	
Units per packaging	1
Packing weight	2,00 Kg
Packing dimensions	410 x 410 x 130 mm

## Chimney clamp

### Description

Chimney clamp to fix the mast to a chimney which is held firmly in place by means of a wire rope which goes around the chimney and a system of turnbuckles.

### Applications

Used as an alternative to wall brackets in installations which do not require very long masts. It allows antennas to be installed without having to carry out any work to the facade of the building.

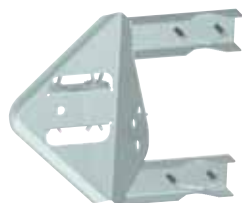
### Characteristics

Made from round zinc-coated iron tube of Ø30x1.5 mm or Ø35x1.5mm and L-shaped profiles with a system of two long M8 turnbuckles. M8 clamps for Ø50 mm masts.



30 mm

9980101	
CH-031	
Units per packaging	6
Packing weight	11,1 Kg
Packing dimensions	510 x 480 x 460 mm



9980106	
CH-210	
Units per packaging	6
Packing weight	13,1 Kg
Packing dimensions	515 x 475 x 275 mm

## Chimney Clamp for steel strap

### Description

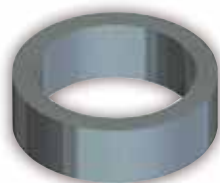
Chimney clamp to fix the mast to a chimney which is held firmly in place by means of 1 or 2 steel strap.

### Applications

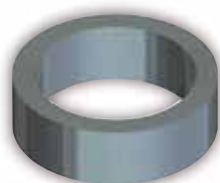
Used as an alternative to wall brackets in installations which do not require very long masts. It allows antennas to be installed without having to carry out any work to the facade of the building.



9980107	
CH-310	
Units per packaging	6
Packing weight	11,3 Kg
Packing dimensions	515 x 305 x 220 mm



9980108	
FJ-301	
Units per packaging	10
Packing weight	7,9 Kg
Packing dimensions	230 x 160 x 160 mm



9980109	
FJ-303	
Units per packaging	5
Packing weight	19,5 Kg
Packing dimensions	230 x 160 x 160 mm

# 998 MECHANICAL ACCESSORIES

Support for dish



9980063	
BZ-400	
Units per packaging	1
Packing weight	2,60 Kg
Packing dimensions	520 x 470 x 20 mm

## Dish stands and supports

### Description

Chimney clamp to fix the mast to a chimney which is held firmly in place by means of a wire rope which goes around the chimney and a system of turnbuckles.

### Applications

Used as an alternative to wall brackets in installations which do not require very long masts. It allows antennas to be installed without having to carry out any work to the façade of the building.

### Characteristics

Made from round zinc-coated iron tube of Ø30x1.5 mm and L-shaped profiles with a system of two long M8 turnbuckles. M8 clamps for Ø50 mm masts.

Stand for dish



9980009	
PI-101	
Units per packaging	1
Packing weight	3,20 Kg
Packing dimensions	870 x 200 x 200 mm

Base for embedding



9980018	
BE-201	
Units per packaging	1
Packing weight	2,60 Kg
Packing dimensions	280 x 200 x 200 mm

Support for 2 LNB



9980023	
SA-010	
Units per packaging	1
Packing weight	0,09 Kg
Packing dimensions	170 x 20 x 15 mm

## Support for LNB

### Description

Support for 2 LNB for offset dishes PF-230 and PF-431.

### Applications

The support is used to receive the satellites Hot Bird 13°E and Astra 19.2°E with a single satellite dish, or any other pair of satellites separated 6° between them.

### Characteristics

Made from galvanised iron.

Ø60 mm clamp, zinc-plated



9980013	
BB-001	
Units per packaging	1
Packing weight	0,10 Kg
Packing dimensions	170 x 100 x 28 mm

## Clamps

### Description

U-shaped clamp with one or three mast-fixing clamps.

### Applications

Used to secure a mast to a railing or tube.

### Characteristics

Made from M8 zinc-coated threaded rod with galvanised iron clamps for a Ø60 mm mast.

Ø60 mm double clamp, zinc-plated



9980012	
BB-002	
Units per packaging	1
Packing weight	0,20 Kg
Packing dimensions	170 x 100 x 28 mm

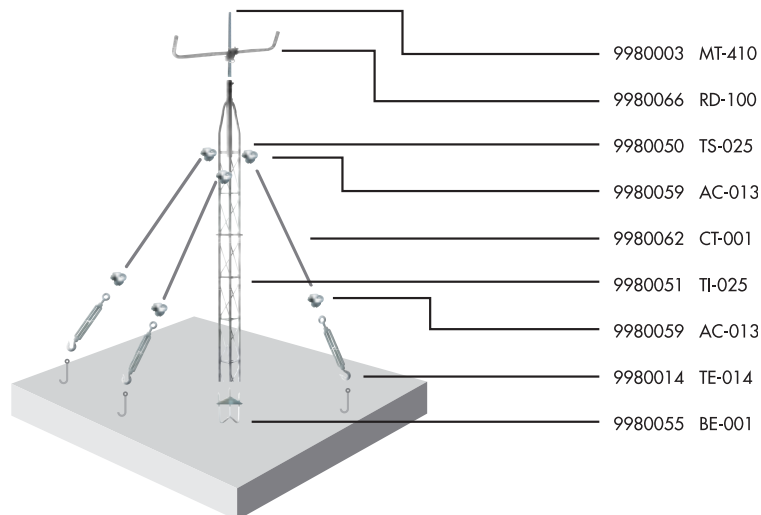
Ø35 mm mast clamp



9980116	
AB-010	
Units per packaging	10
Packing weight	1,20 Kg
Packing dimensions	260 x 170 x 50 mm

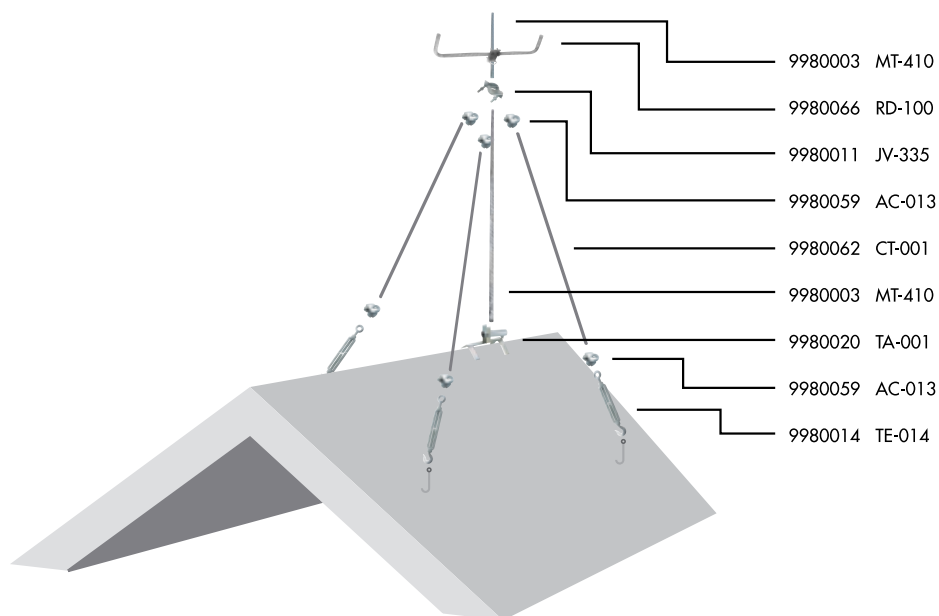
## Installation of a tower

The towers are assembled using several intermediate sections and a top section. They are fixed to the floor by means of a tower stand and are strengthened by means of guy wires. The guy wires are fixed to the tower by means of wire rope grips so that the tower is held perfectly vertical. The base of the tower and the anchoring points for the guy wires should be fixed to concreted parts of the roof.



## Installation of a mast on a roof

The masts are assembled using several sections which are fixed to the floor with a special base for roof tiles and are secured by guy wires. The guy wires are fixed to the mast by means of a mast ring and wire rope grips. The cables are then tensed so that the mast is perfectly vertical. The anchoring points for the guy wires should be fixed to the roof.

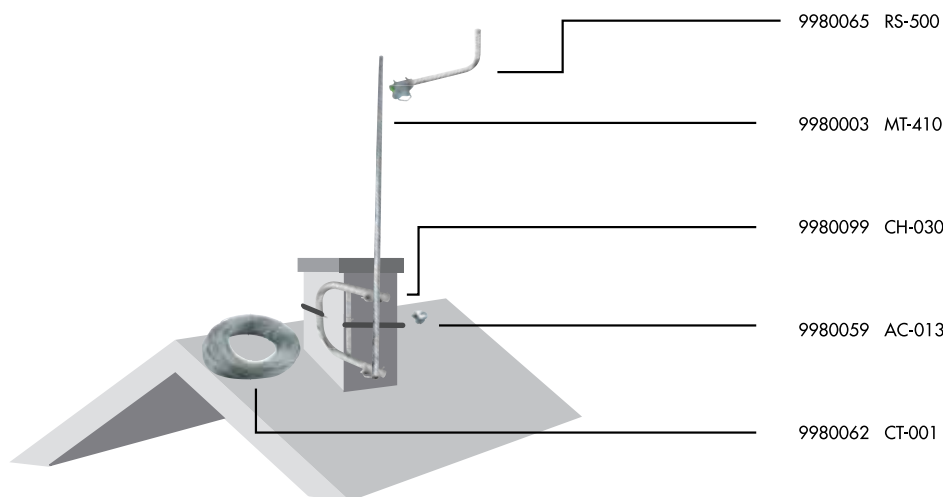


## 998

## INSTALLATION EXAMPLES

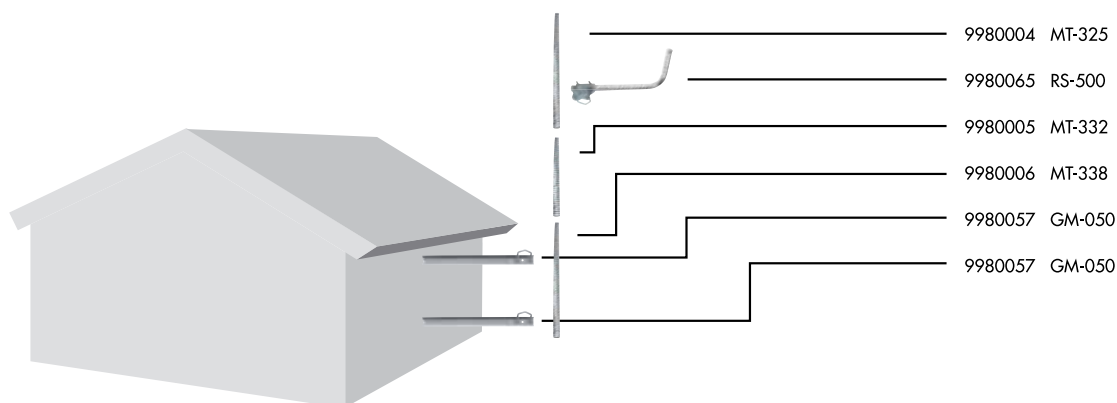
## Installation of a mast on a chimney

A mast can be installed easily with the use of a chimney clamp. The chimney clamp is fixed to the chimney by means of a securing wire rope and turnbuckles. The edges of the chimney should be protected against the erosion caused by the wire rope which should then be tensed by means of the turnbuckles. The mast is then fixed to the chimney clamp by means of the two mast clamps.



## Installation of a mast on a wall

The masts are assembled using several sections and are fixed to the wall by means of two brackets. The brackets are fixed to the wall by means of metal bolts or are embedded into the concrete of the wall. There should be a distance of 1 metre between the brackets. The mast is fixed by means of the bracket mast clamps.



# 998

## INSTALLATION EXAMPLES

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### Installation of a dish on a terrace

The dish should be mounted on a stand which is fixed to the terrace by means of metal bolts or using a stand base which is embedded in the terrace floor or on a concrete part of the floor.



9120042 PF-430



9980009 PI-101



9980018 BE-201

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### Installation of a dish on a wall

The dish is mounted on a wall support which has been fixed to the wall by means of metal screws or bolts.



9120006 PF-420



9980063 BZ-400

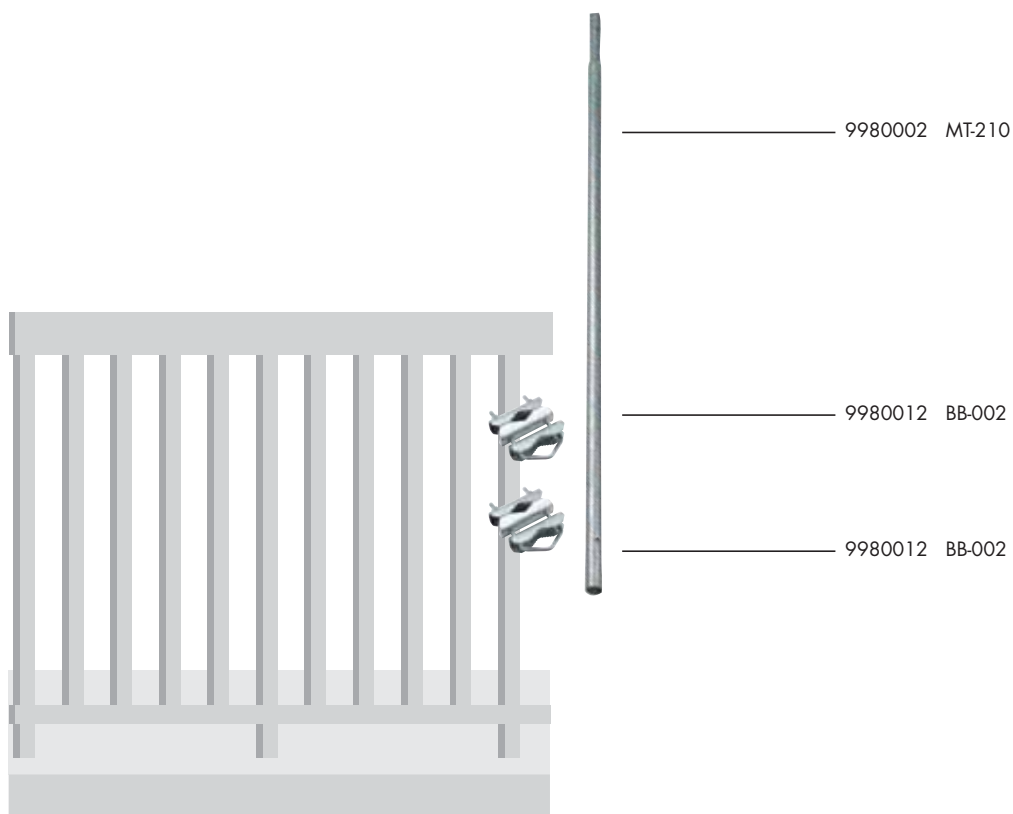


# 998

## INSTALLATION EXAMPLES

### Installation of a mast on a railing

The mast can be fixed to the vertical tube of a railing by means of two double clamps.







# Individual installations

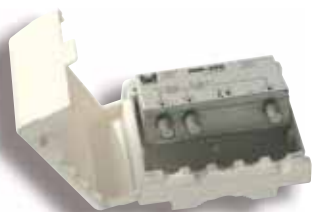
Most multiplexers and amplifiers  
for individual TV installations.  
A wide range of models with  
different configurations for each  
particular installation.

# 902 MAST MULTIPLEXERS

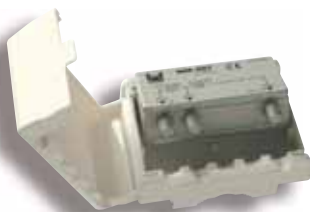
Multiplexers - 2 inputs



MM-200



MM-208



MM-207

## Description

Multiplexers for masts, universal or by bands, of two inputs. They mix the signals from several antennas in a single coaxial cable. They incorporate switchable DC paths to permit the feeding of a preamplifier.

## Applications

Individual digital and analogue terrestrial TV installations. In installations where the reception levels are adequate (60 to 75 dBμV) the signals of all the antennas can be combined to distribute them in the building with a single coaxial cable.

## Characteristics

Shielded zamak chassis, covered by an ABS plastic box for outdoor use. Fixed to the mast by means of a polyamide clamp. F-type connectors. Supplied in individual or multiple packs.

## Accessories

9120039 CM-004 Male F connector for Ø6.6mm coaxial.  
9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.

CODE		9020041		9020018		9020040	
MODEL		MM-200		MM-208		MM-207	
Connection		F female					
Inputs		2		2		2	
Frequency range	Band	FM/TV	FM/TV	VHF	UHF	VHF	UHF
	MHz	40-862	40-862	40-260	470-862	40-260	470-862
Insertion loss	dB±TOL	4.5 ±0,7		0.5 ±0,4	0.7 ±0,2	0.5 ±0,4	0.6 ±0,2
Flatness response	dB	±0.5		±0.25			
Isolation between inputs	dB	20		-			
Rejection between inputs	dB	-		≥30			
Return loss I/O	dB	14		≥10	≥12	≥10	≥12
Switchable DC path	mA	60		60	60	-	-
Chroma-luminance delay	ns	-		<1			
Operating temperature	°C	-10..+65					
Protection index		IP 53					
Units per packaging		1			24		
Packing weight	Kg	0.16			4.1		
Packing dimensions	mm	113 x 103 x 45			310 x 205 x 250		

# 902

## MAST MULTIPLEXERS

Multiplexers - 3 inputs



MM-307



MM-303

### Description

Multiplexers for masts, or by bands, of three inputs. They mix the signals from several antennas in a single coaxial cable.

### Applications

Individual digital and analogue terrestrial TV installations. In installations where the reception levels are adequate (60 to 75 dBμV) the signals of all the antennas can be combined to distribute them in the building with a single coaxial cable.

### Characteristics

Shielded zamak chassis, covered by an ABS plastic box for outdoor use. Fixed to the mast by means of a polyamide clamp. F-type connectors. Supplied in individual or multiple packs.

### Accessories

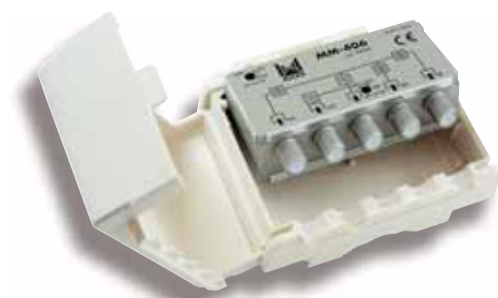
9120039 CM-004 Male F connector for Ø6.6mm coaxial.  
9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.

CODE		9020017			9020042		
MODEL		MM-303			MM-307		
Connection		F female					
Inputs		3			3		
Frequency range	Band	FM	BIII	UHF	VHF	UHF1	UHF2
	MHz	88-108	160-260	470-862	10-260	470-862	
Insertion loss	dB±TOL	0.2 ±0,6		1.5 ±0,5	0.5 ±0,3	4.0 ±0,6	
Flatness response	dB	±0.3			±0.25		
Isolation between inputs	dB	-			-	≥15	
Rejection between inputs	dB	-			≥30		
Return loss I/O	dB	≥10			11	13	
Fixed DC path	mA	-		60 (switchable)	-		200
Chroma-luminance delay	ns	-			<1		
Operating temperature	°C	-10..+65					
Protection index		IP 53					
Units per packaging		1			24		
Packing weight	Kg	0.16			4.1		
Packing dimensions	mm	113 x 103 x 45			310 x 205 x 250		



# 902 MAST MULTIPLEXERS

## Multiplexers - 4 inputs



MM-406



MM-407

### Description

Multiplexers for masts for bands of four inputs. They mix the signals from several antennas into a single coaxial cable. They incorporate DC paths to permit the feeding of a preamplifier.

### Applications

Individual digital and analogue terrestrial TV installations. In installations where the reception levels are adequate (60 to 75 dBμV) the signals of all the antennas can be combined to distribute them in the building with a single coaxial cable.

### Characteristics

Shielded zamak chassis, covered by an ABS plastic box for outdoor use. Fixed to the mast by means of a polyamide clamp. F-type connectors. Supplied in individual or multiple packs.

### Accessories

9120039 CM-004 Male F connector for Ø6.6mm coaxial.

9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.

CODE	9020043					9020044			
MODEL		MM-406				MM-407			
Connection		F female							
Inputs		4				4			
Frequency range	Band	BI	FM	BIII	UHF	BI/FM	BIII	UHF1	UHF2
	MHz	40-70	88-108	160-260	470-862	10-108	160-260	470-862	
Insertion loss	dB±TOL	1.2 ±0,6			1.5 ±0,5	0.9 ±0,4		4.7 ±0,8	
Flatness response	dB	±0.3				±0.3			
Isolation between inputs	dB	-				-		≥20	
Rejection between inputs	dB	-				≥30			
Return loss I/O	dB	≥10				≥10			
Switchable DC path	mA	-		60	60	-	60	-	60
Chroma-luminance delay	ns	<1							
Operating temperature	°C	-10..+65							
Protection index		IP 53							
Units per packaging		1				24			
Packing weight	Kg	0.16				4.1			
Packing dimensions	mm	113 x 103 x 45				310 x 205 x 250			



# 902

## MAST MULTIPLEXERS

### Multiplexers - SAT TV



MM-214

#### Description

Multiplexers for masts which combine the signals of terrestrial TV and FM radio with the IF satellite signal from the LNB. The resulting signal is distributed by a single coaxial cable.

#### Applications

Individual or SMATV installations. The mast multiplexer enables the distribution of the satellite signal to the interior of the building when it is not possible to add a new cable for the satellite.

#### Characteristics

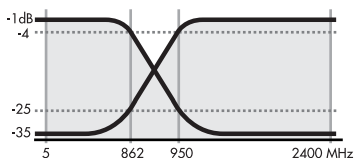
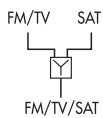
Shielded zamak chassis, covered by an ABS plastic box for outdoor use. Fixed to the mast by means of a polyamide clamp. F-type connectors. Supplied in individual or multiple packs.

#### Accessories

- 9120039 CM-004 Male F connector for Ø6.6mm coaxial.
- 9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.

CODE		9020045	
MODEL		MM-214	
Connection		F female	
Inputs		2	
Frequency range	Band	FM/TV	SAT
	MHz	5-862	950-2.400
Insertion loss	dB±TOL	1 ±0,5	
Flatness response	dB	±0.1	±0.3
Channel flatness response	dB	±0.1	
Rejection between inputs	dB	≥35	
Return loss I/O	dB	≥10	
Fixed DC path	mA	-	0-500
	MHz	-	0-3
Pass 22 KHz/DiSEqC		-	Yes
Chroma-luminance delay	ns	<1	-
Operating temperature	°C	-10...+65	
Protection index		IP 53	
Units per packaging		1	24
Packing weight	Kg	0.16	4.1
Packing dimensions	mm	11 x 103 x 45	310 x 205 x 250

MM-214





FR-619

#### Description

Rejection filter for mast, cutting out interference from LTE, GSM and TETRA mobile phone signals. It incorporates a DC path to allow power to be supplied to a preamplifier.

#### Applications

Suitable for individual and collective terrestrial TV installations affected by the transmission of LTE mobile phone signals in the 790-862 MHz band, and by the transmission of GSM and TETRA signals in the 870-960 MHz band. The filter eliminates interference signals before amplification of the TV signals in the head-end of the installation, obtaining a rejection in the LTE band of up to -60dB.

#### Characteristics

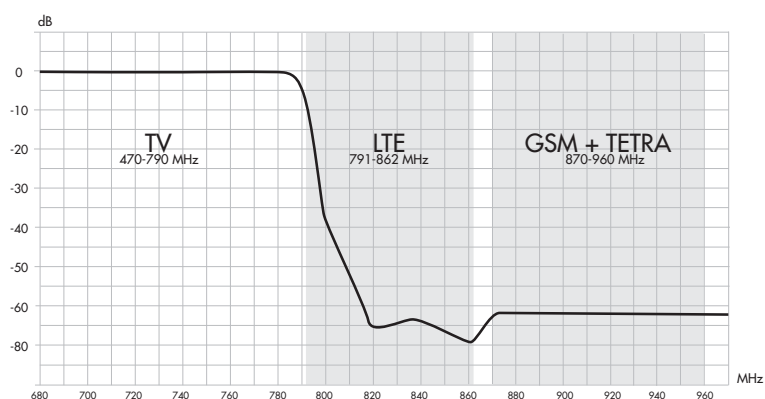
Shielded zamak chassis, covered by a weather-resistant plastic casing. Easy to open and close, the chassis can be tilted to facilitate manipulation. The filter can be installed either on a mast, by means of a polyamide clamp, or on a wall. Resistant to sun and water (IP53). F-type connector.

#### Accessories

- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial.
- 9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.
- 9080030 MC-304 Male compression F connector for RG-6 coaxial Ø7.0 mm.

CODE		9020048	
MODEL		FR-619	
Connection		F female	
Inputs		1	
Frequency range	Band	FM/DAB/TV	
	MHz	0 - 790	
Insertion loss	dB±TOL	1 ±2,0	
LTE band rejection 791-862 MHz	dB	60	
GSM-TETRA band rejection 870-960 MHz	dB	60	
DC path	V <sub>DC</sub>	+24	
	mA	300	
Operating temperature	°C	-10..+65	
Protection index		IP 53	
Units per packaging		1	24
Packing weight	Kg	0,25	6,21
Packing dimensions	mm	110 x 125 x 45	345 x 200 x 280

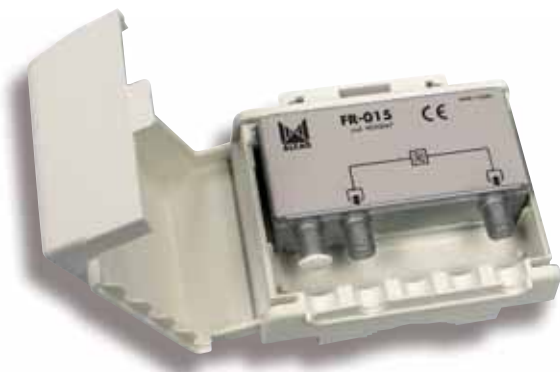
#### FREQUENCY RESPONSE OF THE FILTER



# 902

## MAST FILTERS

### TETRA rejection filters



FR-015

#### Description

Rejection filter for masts, cutting out interference signals in the TETRA band.

#### Applications

Suitable for individual and collective terrestrial TV installations affected by the transmission of TETRA signals in the 460-470 MHz band. The filter eliminates interference signals before amplification of the TV signals in the head-end of the installation.

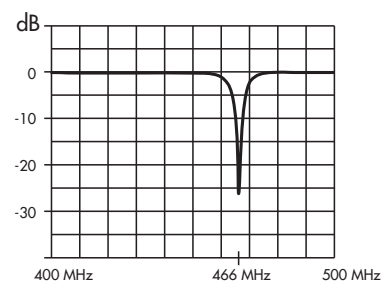
#### Characteristics

Shielded zamak chassis, covered by a weather-resistant plastic casing. Filter can be installed either on a mast, by means of a polyamide clamp. F-type connector.

#### Accessories

9120039 CM-004 Male F connector for Ø6.6 mm coaxial.  
9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.

CODE		9020047	
MODEL		FR-015	
Connection		F female	
Inputs		1	
Frequency range	Band	FM/DAB/TV	
	MHz	47-862	
Insertion loss	dB±TOL	1 ±0,2	
Rejection to 466 MHz	dB	>25	
Operating temperature	°C	-10..+65	
Protection index		IP 53	
Units per packaging		1	24
Packing weight	Kg	0,22	5,78
Packing dimensions	mm	115 x 105 x 45	130 x 205 x 250



**Description**

Rejection filter for masts, composed of 4 narrow filters which enable any one of the audio or video carriers of one or various TV channels to be rejected independently. Each filter can be tuned to any UHF frequency.

**Applications**

Individual or MATV installations of a digital or analogue type where interfering signals in adjacent channels exist. The filter enables the elimination of the audio or video carrier of the interfering signal, a higher rejection level can be achieved adjusting several filters to the same carrier. Alternate filters should be used if two filters are adjusted to the same frequency.

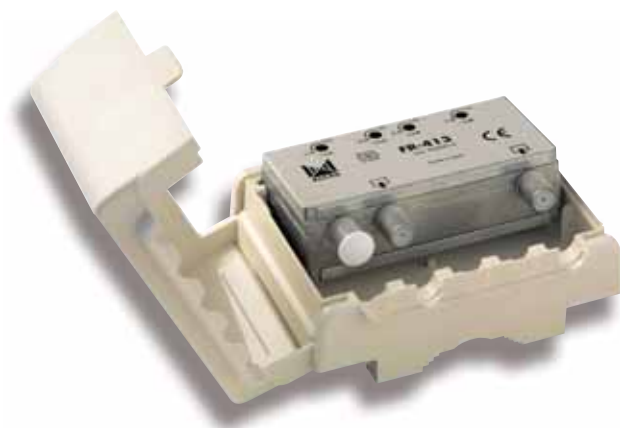
**Characteristics**

Shielded zamak chassis, covered by an ABS plastic box for outdoor use. Fixed to the mast by means of a polyamide clamp. F- type connectors. Supplied in individual or multiple packs.

**Accessories**

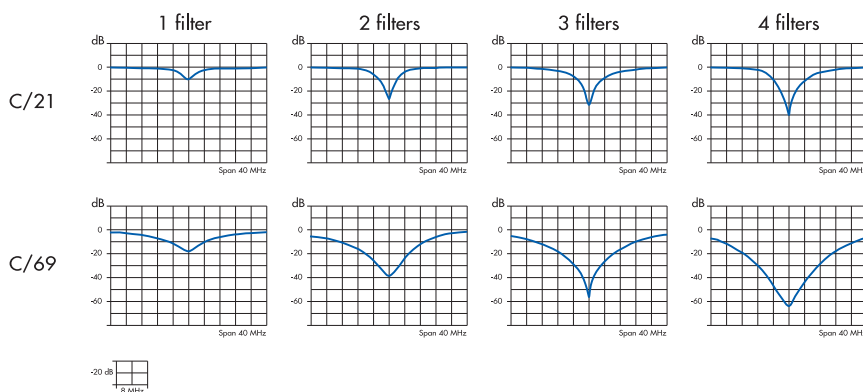
9120039 CM-004 Male F connector for Ø6.6mm coaxial.

9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.



FR-413

CODE		9020016	
MODEL		FR-413	
Connection		F female	
Number of filters		4 adjustables	
Inputs		1	
Frequency range	Band	UHF	
	MHz	470-862	
Insertion loss	dB	1 ±0,2	
Filters/channel - rejection	dB	1 filters > 14 ±4.0	
		2 <sup>(1)</sup> filters > 33 ±6.0	
		3 filters > 44 ±12,0	
		4 filters > 52 ±12,0	
Operating temperature	°C	-10...+65	
Protection index		IP 53	
Units per packaging		1	24
Packing weight	Kg	0.18	4.6
Packing dimensions	mm	113 x 103 x 45	310 x 230 x 185





AM-160

**Description**

Broadband amplifiers for masts, compatible with LTE mobile telephone signals with amplification band in UHF 470-790 MHz. They have one or two inputs to amplify and combine the signals from the antennas. They are fed through the coaxial cable from a power supply unit installed inside the building. They incorporate a switchable DC path, allowing power to be supplied to a preamplifier.

**Applications**

Individual digital and analogue terrestrial TV installations which are affected by the transmission of LTE mobile phone signals and which require low gain. They amplify and mix the signals from several antennas. The signal obtained can be distributed to a large number of TV outlets by means of a single coaxial cable.

**Characteristics**

Shielded zamak chassis, covered by a weather-resistant plastic casing. Easy to open and close, the chassis can be tilted to facilitate manipulation. It can be installed either on a mast, by means of a polyamide clamp, or on a wall. Resistant to sun and water (IP53). Greater insulation between inputs and outputs. F-type connectors for screwing or crimping.

**Accessories**

9030086	AL-100	24 V $\overline{=}$ power supply unit.
9120039	CM-004	Male F connector for Ø6.6 mm coaxial.
9080023	MC-302	Male F connector for RG-6 coaxial, Ø7.0 mm.
9080030	MC-304	Male compression F connector for RG-6 coaxial, Ø7.0 mm.

CODE		9030165	9030166			9030172			
MODEL		AM-160	AM-262			AM-362			
Connection		F female							
Inputs		1	2			3			
Frequency range	Band	UHF	FM	DAB	UHF	FM	DAB	UHF1	UHF2
	MHz	470-790	88-108	160-260	470-790	88-108	160-260	470-790	470-790
Gain	dB±	20	10		20	10		20	
Flatness response	dB	±2	±1		±2	±1		±2	
Adjustable gain range	dB	16	20		16	20		16	
Output level	dBµV	108 DIN 45004B 105 (IMD3 - 66 dB) 93 (IMD2 - 60 dB)							
Return loss	dB	≥10	≥10			≥10			
Noise figure	dB	3±1	5±1		3±1	5±1		5,5±1	
Rejection between inputs	dB	≥30							
Power supply	V~	24							
	mA	30							
Switchable DC path	V~	24	-		24	-		24	
	mA	50	-		50	-		50	
Operating temperature	°C	-10..+65							
Protection index		IP 53							
Units per packaging		1			24				
Packing weight	Kg	0.22			5.78				
Packing dimensions	mm	110 x 125 x 45			345 x 200 x 280				

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
 IMD3 - 66 dB: 3 unequal carriers, EN 50083-5  
 IMD2 - 60 dB: 2 equal carriers, EN 50083-5

The AM-160, AM-262 and AM-362 amplifiers are available in kit format (see page 65).

# 903 MAST AMPLIFIERS

LTE compatible amplifiers - High gain



AM-165

## Description

Broadband amplifiers for masts, compatible with LTE mobile telephone signals with amplification band in UHF 470-790 MHz. They have one or two inputs to amplify and combine the signals from the antennas. They are fed through the coaxial cable from a power supply unit installed inside the building. They incorporate a switchable DC path, allowing power to be supplied to a preamplifier.

## Applications

Individual digital and analogue terrestrial TV installations which are affected by the transmission of LTE mobile phone signals and which require high gain. They amplify and mix the signals from several antennas. The signal obtained can be distributed to a large number of TV outlets by means of a single coaxial cable.

## Characteristics

Shielded zamak chassis, covered by a weather-resistant plastic casing. Easy to open and close, the chassis can be tilted to facilitate manipulation. It can be installed either on a mast, by means of a polyamide clamp, or on a wall. Resistant to sun and water (IP53). Greater insulation between inputs and outputs. F-type connectors for screwing or crimping.

## Accessories

- 9030086 AL-100 +24 V= power supply unit.
- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial.
- 9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.
- 9080030 MC-304 Male compression F connector for RG-6 coaxial Ø7.0 mm.

CODE		9030163	9030164			9030171			
MODEL		AM-165	AM-266			AM-366			
Connection		F female							
Inputs		1	2			3			
Frequency range	Band	UHF	FM	DAB	UHF	FM	DAB	UHF1	UHF2
	MHz	470-790	88-108	160-260	470-790	88-108	160-260	470-790	470-790
Gain	dB	32	20		32	20		32	
Flatness response	dB	±2	±1		±2	±1		±2	
Adjustable gain range	dB	16	20		16	20		16	
Output level	dBμV	108 DIN 45004B 105 (IMD3 - 66 dB) 93 (IMD2 - 60 dB)							
Return loss	dB	≥10	≥10			≥10			
Noise figure	dB	3±1	5±1		3±1	5±1		5,5±1	
Rejection between inputs	dB	≥30							
Power supply	V~	24							
	mA	30							
Switchable DC path	V~	24	-		24	-		24	
	mA	50	-		50	-		50	
Operating temperature	°C	-10..+65							
Protection index		IP 53							
Units per packaging		1			24				
Packing weight	Kg	0.22			5.78				
Packing dimensions	mm	110 x 125 x 45			345 x 200 x 280				

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
 IMD3 - 66 dB: 3 unequal carriers, EN 50083-5  
 IMD2 - 60 dB: 2 equal carriers, EN 50083-5

The AM-165, AM-266 and AM-366 amplifiers are available in kit format (see page 65).

# 903 MAST AMPLIFIERS

LTE compatible amplifiers - Low Gain, 12 V $\overline{\text{DC}}$



AM-270

## Description

Broadband amplifiers for masts, compatible with LTE mobile telephone signals with amplification band in UHF 470-790 MHz. Includes a rejection filter to suppress LTE signals. They have one or two inputs to amplify and combine the signals from the antennas. They are fed through the coaxial cable from a power supply unit installed inside the building. They incorporate a switchable DC path, allowing power to be supplied to a preamplifier.

## Applications

Individual digital and analogue terrestrial TV installations which are affected by the transmission of LTE mobile phone signals and which require low gain. They amplify and mix the signals from several antennas. The signal obtained can be distributed to a large number of TV outlets by means of a single coaxial cable.

## Characteristics

Shielded zamak chassis, covered by a weather-resistant plastic casing. Easy to open and close, the chassis can be tilted to facilitate manipulation. It can be installed either on a mast, by means of a polyamide clamp, or on a wall. Resistant to sun and water (IP53). Greater insulation between inputs and outputs. F-type connectors for screwing or crimping.

## Accessories

- 9030087 AL-105 +12 V $\overline{\text{DC}}$  power supply unit.
- 9120011 RS-275 Type F load of 75 $\Omega$ .
- 9120039 CM-004 Male F connector for  $\varnothing 6.6$  mm coaxial.
- 9080023 MC-302 Male F connector for RG-6 coaxial,  $\varnothing 7.0$  mm.
- 9080030 MC-304 Male compression F connector for RG-6 coaxial  $\varnothing 7.0$  mm.

CODE		9030178	9030175
MODEL		AM-173	AM-270
Connection		F female	
Inputs		1	2
Frequency range	Band	BIII/DAB/UHF	
	MHz	160-260	470-790
Gain	dB	10	20
Flatness response	dB	$\pm 1$	$\pm 2$
Adjustable gain range	dB	20	16
Output level	dB $\mu$ V	108 DIN 45004B 105 (IMD3 - 66 dB) 93 (IMD2 - 60 dB)	
Return loss	dB	$\geq 10$	
Noise figure	dB	5 $\pm 1$	3,5 $\pm 1$
Rejection between inputs	dB	$\geq 30$	
Power supply	V $\overline{\text{DC}}$	12	
	mA	30	
Switchable DC path	V $\overline{\text{DC}}$	-	12
	mA	-	50
Operating temperature	$^{\circ}\text{C}$	-10...+65	
Protection index		IP 53	
Units per packaging		1	24
Packing weight	Kg	0.25	5.78
Packing dimensions	mm	110 x 125 x 45	345 x 200 x 280

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
 IMD3 - 66 dB: 3 unequal carriers, EN 50083-5  
 IMD2 - 60 dB: 2 equal carriers, EN 50083-5





AM-274

**Description**

Broadband amplifiers for masts, compatible with LTE mobile telephone signals with amplification band in UHF 470-790 MHz. Includes a rejection filter to suppress LTE signals. They have two or three inputs to amplify and combine the signals from the antennas. They are fed through the coaxial cable from a power supply unit installed inside the building. They incorporate a switchable DC path, allowing power to be supplied to a preamplifier.

**Applications**

Individual digital and analogue terrestrial TV installations which are affected by the transmission of LTE mobile phone signals and which require high gain. They amplify and mix the signals from several antennas. The signal obtained can be distributed to a large number of TV outlets by means of a single coaxial cable.

**Characteristics**

Shielded zamak chassis, covered by a weather-resistant plastic casing. Easy to open and close, the chassis can be tilted to facilitate manipulation. It can be installed either on a mast, by means of a polyamide clamp, or on a wall. Resistant to sun and water (IP53). Greater insulation between inputs and outputs. F-type connectors for screwing or crimping.

**Accessories**

9030087	AL-105	+12 V $\overline{\text{DC}}$ power supply unit.
9120011	RS-275	Type F load of 75 $\Omega$ .
9120039	CM-004	Male F connector for $\varnothing 6.6$ mm coaxial.
9080023	MC-302	Male F connector for RG-6 coaxial, $\varnothing 7.0$ mm.
9080030	MC-304	Male compression F connector for RG-6 coaxial $\varnothing 7.0$ mm.

CODE		9030176	9030177
MODEL		AM-274	AM-374
Connection		F female	
Inputs		2	3
Frequency range	Band	BIII/DAB	BIII/DAB
	MHz	160-260	160-260
Gain	dB	20	34
Flatness response	dB	$\pm 1$	$\pm 2$
Adjustable gain range	dB	20	16
Output level	dB $\mu$ V	108 DIN 45004B 105 (IMD3 - 66 dB) 93 (IMD2 - 60 dB)	
Return loss	dB	$\geq 10$	
Noise figure	dB	5 $\pm 1$	6 $\pm 1$
Rejection between inputs	dB	$\geq 30$	
Power supply	V $\overline{\text{DC}}$	12	
	mA	30	
Switchable DC path	V $\overline{\text{DC}}$	-	12
	mA	50	50
Operating temperature	$^{\circ}\text{C}$	-10...+65	
Protection index		IP 53	
Units per packaging		1	24
Packing weight	Kg	0.25	5.78
Packing dimensions	mm	110 x 125 x 45	345 x 200 x 280

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
 IMD3 - 66 dB: 3 unequal carriers, EN 50083-5  
 IMD2 - 60 dB: 2 equal carriers, EN 50083-5

# 903 MAST AMPLIFIERS

Low gain amplifiers



AM-140

## Description

Broadband amplifiers for masts. They have one, two or three inputs to amplify and combine the signals from the antennas. They are fed through the coaxial cable from a power supply unit installed inside the building. They incorporate a switchable DC path, allowing power to be supplied to a preamplifier.

## Applications

Individual digital and analogue terrestrial TV installations which require low gain. They amplify and mix the signals from several antennas. The signal obtained can be distributed to a large number of TV outlets by means of a single coaxial cable.

## Characteristics

Shielded zamak chassis, covered by a weather-resistant plastic casing. Easy to open and close, the chassis can be tilted to facilitate manipulation. It can be installed either on a mast, by means of a polyamide clamp, or on a wall. Resistant to sun and water (IP53). Greater insulation between inputs and outputs. F-type connectors for screwing or crimping.

## Accessories

9030086	AL-100	+24 V= power supply unit.
9120039	CM-004	Male F connector for Ø6.6 mm coaxial.
9080023	MC-302	Male F connector for RG-6 coaxial, Ø7.0 mm.
9080030	MC-304	Male compression F connector for RG-6 coaxial Ø7.0 mm.

CODE		9030144	9030145			9030155			
MODEL		AM-140	AM-242			AM-342			
Connection		F female							
Inputs		1	2			3			
Frequency range	Band	UHF	FM	DAB	UHF	FM	DAB	UHF1	UHF2
	MHz	470-790	88-108	160-260	470-862	88-108	160-260	470-862	470-862
Gain	dB	20	10		20	10		20	
Flatness response	dB	±2	±1		±2	±1		±2	
Adjustable gain range	dB	16	20		16	20		16	
Output level	dBµV	108 DIN 45004B 105 (IMD3 - 66 dB) 93 (IMD2 - 60 dB)							
Return loss	dB	≥10	≥10			≥10			
Noise figure	dB	3±1	5±1		3±1	5±1		5,5±1	
Rejection between inputs	dB	≥30							
Power supply	V~	24							
	mA	30							
Switchable DC path	V~	24	-		24	-		24	
	mA	50	-		50	-		50	
Operating temperature	°C	-10..+65							
Protection index		IP 53							
Units per packaging		1			24				
Packing weight	Kg	0.22			5.78				
Packing dimensions	mm	110 x 125 x 45			345 x 200 x 280				

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
 IMD3 - 66 dB: 3 unequal carriers, EN 50083-5  
 IMD2 - 60 dB: 2 equal carriers, EN 50083-5

The AM-140, AM-242 and AM-342 amplifiers are available in other power voltages and in kit format (see 67 and 70 pages).

# 903 MAST AMPLIFIERS

## High gain amplifiers



AM-145

### Description

Broadband amplifiers for masts. They have one, two or three inputs to amplify and combine the signals from the antennas. They are fed through the coaxial cable from a power supply unit installed inside the building. They incorporate a switchable DC path, allowing power to be supplied to a preamplifier.

### Applications

Individual digital and analogue terrestrial TV installations which require high gain. They amplify and mix the signals from several antennas. The signal obtained can be distributed to a large number of TV outlets by means of a single coaxial cable.

### Characteristics

Shielded zamak chassis, covered by a weather-resistant plastic casing. Easy to open and close, the chassis can be tilted to facilitate manipulation. It can be installed either on a mast, by means of a polyamide clamp, or on a wall. Resistant to sun and water (IP53). Greater insulation between inputs and outputs. F-type connectors for screwing or crimping.

### Accessories

- 9030086 AL-100 +24 VDC power supply unit.
- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial.
- 9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.
- 9080030 MC-304 Male compression F connector for RG-6 coaxial Ø7.0 mm.

CODE		9030141	9030142			9030153			
MODEL		AM-145	AM-246			AM-346			
Connection		F female							
Inputs		1	2			3			
Frequency range	Band	UHF	FM	DAB	UHF	FM	DAB	UHF1	UHF2
	MHz	470-862	88-108	160-260	470-862	88-108	160-260	470-862	470-862
Gain	dB	32	20		32	20		32	
Flatness response	dB	±2	±1		±2	±1		±2	
Adjustable gain range	dB	16	20		16	20		16	
Output level	dBµV	108 DIN 45004B 105 (IMD3 - 66 dB) 93 (IMD2 - 60 dB)							
Return loss	dB	≥10	≥10			≥10			
Noise figure	dB	3±1	5±1		3±1	5±1		5,5±1	
Rejection between inputs	dB	≥30							
Power supply	V~	24							
	mA	30							
Switchable DC path	V~	24	-		24	-		24	
	mA	50	-		50	-		50	
Operating temperature	°C	-10..+65							
Protection index		IP 53							
Units per packaging									
Packing weight	Kg								
Packing dimensions	mm								

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
 IMD3 - 66 dB: 3 unequal carriers, EN 50083-5  
 IMD2 - 60 dB: 2 equal carriers, EN 50083-5

The AM-145 amplifier is available in other power voltages and in kit format (see 67 and 70 pages).

# 903

## MAST AMPLIFIERS



Medium gain amplifiers - 3 inputs



AM-301

### Description

Broadband amplifiers for masts. They have three inputs to amplify and combine the signals from the antennas. The attenuator located at each input makes it possible to control the gain to obtain an output with all the bands equalised. They are fed through the coaxial cable from a power supply unit installed inside the building. They incorporate a switchable DC path, allowing power to be supplied to a preamplifier.

### Applications

Individual digital and analogue terrestrial TV installations which require high gain. They amplify and mix the signals from several antennas. The signal obtained can be distributed to a large number of TV outlets by means of a single coaxial cable.

### Characteristics

Shielded zamak chassis, covered by a weather-resistant plastic casing. It can be installed on a mast by means of a polyamide clamp. F-type connectors.

### Accessories

- 9030086 AL-100 +24 VDC power supply unit.  
 9120039 CM-004 Male F connector for Ø6.6 mm coaxial.  
 9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.

CODE		9030030				
MODEL		AM-301				
Connection		F female				
Inputs		3				
Frequency range	Band	BI	FM	BIII/DAB	UHF1	UHF2
	MHz	41-70	88-108	160-260	470-862	470-862
Gain	dB	22 ±1.0	12 ±1.0	22 ±1.0	30 ±1.0	
Flatness response	dB	±1.5			±2.5	
Adjustable gain range	dB	20			16	
Output level	dBμV	106 DIN 45004B 103 (IMD3 - 66 dB) 90 (IMD2 - 60 dB)				
Return loss	dB	10				
Noise figure	dB	5.0 ±2.0				
Rejection between inputs	dB	30				
Power supply	V~	24				
	mA	45				
Switchable DC path	V~	-			24	
	mA	-			50	
Operating temperature	°C	-10..+65				
Protection index		IP 53				
Units per packaging		1			24	
Packing weight	Kg	0.22			5.6	
Packing dimensions	mm	115 x 105 x 45			310 x 205 x 250	

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
 IMD3 - 66 dB: 3 unequal carriers, EN 50083-5  
 IMD2 - 60 dB: 2 equal carriers, EN 50083-5

# 903 MAST AMPLIFIERS

## High gain amplifiers - 1 input



AM-105

### Description

Broadband amplifiers for masts, with one input. The high gain together with the attenuator allows them to be used with a wide range of signals. They are fed through the coaxial cable from a power supply unit installed inside the building. They incorporate a switchable DC path, allowing power to be supplied to a preamplifier.

### Applications

Individual digital and analogue terrestrial TV installations which require high gain. It amplifies the BI, BII/DAB and UHF signals received through the same input. The signal obtained can be distributed to a large number of TV outlets by means of a single coaxial cable.

### Characteristics

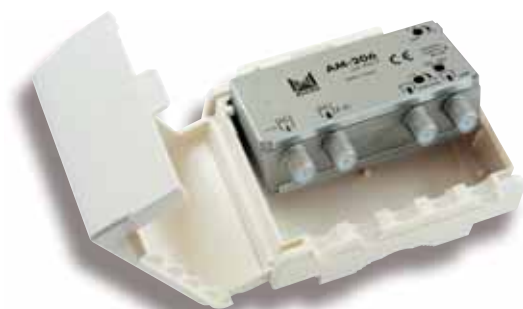
Shielded zamak chassis, covered by a weather-resistant plastic casing. It can be installed on a mast by means of a polyamide clamp. F-type connectors.

### Accessories

- 9030086 AL-100 +24 VDC power supply unit.
- 9120011 RS-275 Type F load of 75Ω.
- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial.
- 9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.

CODE		9030008		
MODEL		AM-105		
Connection		F female		
Inputs		1		
Frequency range	Band	BI	BII/DAB	UHF
	MHz	41-70	160-260	470-790
Gain	dB±TOL	30 ±2.0		36 ±2.0
Flatness response	dB	±0.5		±1.5
Adjustable gain range	dB	22		16
Output level	dB	108 DIN 45004B 105 (IMD3 - 66 dB) 93 (IMD2 - 60 dB)		
Return loss	dB	≥10		
Noise figure	dB	50 ±0.5		25 ±0.2
Power supply	VDC	24		
	mA	45		
Switchable DC path	VDC	24		
	mA	50		
Operating temperature	°C	-10...+65		
Protection index		IP 53		
Units per packaging		1	24	
Packing weight	Kg	0.22	5.78	
Packing dimensions	mm	115 x 105 x 45	345 x 200 x 280	

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
 IMD3 - 66 dB: 3 unequal carriers, EN 50083-5  
 IMD2 - 60 dB: 2 equal carriers, EN 50083-5



AM-206



AM-903



AM-205

**Description**

Broad band amplifiers for masts, with two inputs to amplify and combine the signals from several antennas. The high gain together with the attenuator allows them to be used with a wide range of signals. The attenuator located at each input makes it possible to control the gain to obtain an output with all the bands equalised. They are fed through the coaxial cable from a power supply unit installed inside the building. They incorporate a DC path to allow the feeding of a preamplifier.

**Applications**

Individual digital and analogue terrestrial TV installations. They amplify and mix the signals from several antennas. The signal obtained can be distributed to a large number of TV outlets by means of a single coaxial cable.

**Characteristics**

Shielded zamak chassis, covered by an ABS plastic box for outdoor use. Fixed to the mast by means of a polyamide clamp. F type connectors.

**Accessories**

9030086 AL-100 +24 V $\overline{\text{---}}$  power supply unit.  
 9120039 CM-004 Male F connector for Ø6.6 mm coaxial.  
 9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.

CODE		9030015		9030016			9030017			
MODEL		AM-903		AM-205			AM-206			
Connection		F female								
Inputs		2		2			2			
Frequency range	Band	VHF/FM	UHF	BI	BII/DAB	UHF	BI	FM	BIII/DAB	UHF
	MHz	48.5-230	470-862	40-70	160-260	470-862	40-70	88-108	160-260	470-862
Gain	dB±TOL	29 ±2.0	40 ±1,8	24 ±2.0		36 ±2.0	24 ±2.0	14 ±2.0	24 ±2.0	36 ±2.0
Flatness response	dB	±1.1	±1.5	±0.5		±1.5	±0.5			±1.5
Adjustable gain range	dB	24	16	24		16	24			16
Output level	dB	108 DIN 45004B 105 (IMD3 - 66 dB) 93 (IMD2 - 60 dB)								
Return loss	dB	≥10								
Noise figure	dB	4.0 ±0.3	2.5 ±0.4	<4.5		<2.5	<4.5			<2.5
Rejection between inputs	dB	>30								
Power supply	V---	24								
	mA	45								
Switchable DC path	V---	-	24	-		24	-			24
	mA	-	50	-		50	-			50
Operating temperature	°C	-10...+65								
Protection index		IP 53								
Units per packaging		1				24				
Packing weight	Kg	0.22				5.78				
Packing dimensions	mm	115 x 105 x 45				345 x 200 x 280				

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
 IMD3 - 66 dB: 3 unequal carriers, EN 50083-5  
 IMD2 - 60 dB: 2 equal carriers, EN 50083-5

# 903 MAST AMPLIFIERS

## High gain amplifiers - 3 inputs



AM-305



AM-306

### Description

Broad band amplifiers for masts, with three inputs to amplify and combine the signals from several antennas. The high gain together with the attenuator allows them to be used with a wide range of signals. The attenuator located at each input makes it possible to control the gain to obtain an output with all the bands equalised. They are fed through the coaxial cable from a power supply unit installed inside the building. They incorporate a DC path to allow the feeding of a preamplifier.

### Applications

Individual digital and analogue terrestrial TV installations. They amplify and mix the signals from several antennas. The signal obtained can be distributed to a large number of TV outlets by means of a single coaxial cable.

### Characteristics

Shielded zamak chassis, covered by an ABS plastic box for outdoor use. Fixed to the mast by means of a polyamide clamp. F type connectors.

### Accessories

- 9030086 AL-100 +24 V $\cdot$  power supply unit.
- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial.
- 9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.

CODE	9030024					9030029				
MODEL		AM-305				AM-306				
Connection		F female								
Inputs		3				3				
Frequency range	Band	BI	BIII/DAB	UHF 1	UHF 2	BI	FM	BIII/DAB	UHF 1	UHF 2
	MHz	40-70	160-260	470-862	470-862	40-70	88-108	160-260	470-862	470-862
Gain	dB±TOL	30 ±2.0		40 ±2.0		30 ±2.0	20 ±2.0	30 ±2.0	40 ±2.0	
Flatness response	dB	±0.5		±3.0		±0.5			±3.0	
Adjustable gain range	dB	22		16		22			16	
Output level	dB	108 DIN 45004B 105 (IMD3 - 66 dB) 93 (IMD2 - 60 dB)								
Return loss	dB	≥10								
Noise figure	dB	5.0 ±1.0			2.5 ±0.4	<4.0			<5.0	
Rejection between inputs	dB	≥30								
Power supply	V---	24								
	mA	45								
Switchable DC path	V---	-	24		-			24		
	mA	-	50		-			50		
Operating temperature	°C	-10...+65								
Protection index		IP 53								
Units per packaging		1				24				
Packing weight	Kg	0.22				5.6				
Packing dimensions	mm	115 x 105 x 45				310 x 205 x 250				

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
 IMD3 - 66 dB: 3 unequal carriers, EN 50083-5  
 IMD2 - 60 dB: 2 equal carriers, EN 50083-5

The AM-305 and AM-306 amplifiers are available in kit format (see page 64).



# 903 MAST AMPLIFIERS

## High gain amplifiers - 4 inputs



AM-406



AM-407

### Description

Broad band amplifiers for masts, with four inputs to amplify and combine the signals from several antennas. The high gain together with the attenuator allows them to be used with a wide range of signals. The attenuator located at each input makes it possible to control the gain to obtain an output with all the bands equalised. They are fed through the coaxial cable from a power supply unit installed inside the building. They incorporate a DC path to allow the feeding of a preamplifier.

### Applications

Individual digital and analogue terrestrial TV installations. They amplify and mix the signals from several antennas. The signal obtained can be distributed to a large number of TV outlets by means of a single coaxial cable.

### Characteristics

Shielded zamak chassis, covered by an ABS plastic box for outdoor use. Fixed to the mast by means of a polyamide clamp. F type connectors.

### Accessories

- 9030086 AL-100 +24 VDC power supply unit.
- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial.
- 9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.

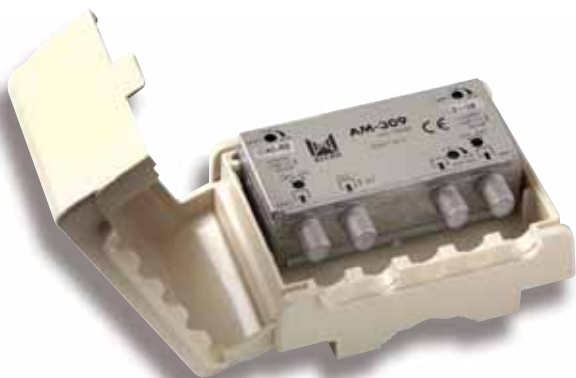
CODE	9030032					9030031			
MODEL		AM-406				AM-407			
Connection		F female							
Inputs		4				4			
Frequency range	Band	BI	FM	BIII/DAB	UHF	BI/FM	BIII/DAB	UHF 1	UHF 2
	MHz	41-70	88-108	160-260	470-862	41-108	160-260	470-862	470-862
Gain	dB±TOL	26 ±2.0			38 ±2.0	26 ±2.0		38 ±2.0	
Flatness response	dB	±0.4	±0.2	±1.0	±0.8	±1.3	±1.0	±1.5	
Adjustable gain range	dB	22			16	22		16	
Output level	dB	108 DIN 45004B 105 (IMD3 - 66 dB) 93 (IMD2 - 60 dB)							
Return loss	dB	10							
Noise figure	dB	55 ±0.5			2.5 ±0.2	5.0 ±0.5		5.5 ±0.5	
Rejection between inputs		30							
Power supply	V---	24							
	mA	45							
Switchable DC path	V---	-			24	-		24	
	mA	-			50	-		50	
Operating temperature	°C	-10..+65							
Protection index		IP 53							
Units per packaging		1				24			
Packing weight	Kg	0.22				5.6			
Packing dimensions	mm	115 x 105 x 45				310 x 205 x 250			

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
 IMD3 - 66 dB: 3 unequal carriers, EN 50083-5  
 IMD2 - 60 dB: 2 equal carriers, EN 50083-5

The AM-406 and AM-407 amplifiers are available in kit format (see page 64).

# 903 MAST AMPLIFIERS

## Configurable amplifiers



AM-309

### Description

Configurable amplifiers for masts. The UHF inputs can be configured by adding low pass, high pass, band pass, monochannel, band rejection and channel rejection filters. The filters are installed during the factory manufacturing process and cannot be readjusted by the user. The attenuator located at each input makes it possible to control the gain to obtain an output with all the bands equalised. Available filters on page 72.

### Applications

Individual digital and analogue terrestrial TV installations which require an amplifier adapted to the specific needs of the area. The interference from undesired channels can be avoided through the use of the built-in filters. The type of filter and the initial and final channels should be specified in the order.

### Characteristics

Shielded zamak chassis, covered by an ABS plastic box for outdoor use. Fixed to the mast by means of a polyamide clamp. F type connectors.

### Accessories

- 9030086 AL-100 +24 V $\overline{\text{---}}$  power supply unit.
- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial.
- 9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.

CODE		9030048				
MODEL		AM-309				
Connection		F female				
Inputs		3				
Frequency range	Band	BI	FM	BIII/DAB	UHF 1	UHF 2
	MHz	40-70	88-108	160-260	470-790	
Gain	dB±TOL	30 ±1.0	20 ±1.0	30 ±1.0	36 ±1.5	
Flatness response	dB	±1,5			±2,0	
Adjustable gain range	dB	20			16	
Output level	dB	106 DIN 45004B 103 (IMD3 - 66 dB) 90 (IMD2 - 60 dB)				
Return loss	dB	30				
Noise figure	dB	3.5 ±1.0			2.5 ±1.0	
Rejection between inputs	dB	≥30				
Power supply	V---	24				
	mA	30				
Switchable DC path	V---	24				
	mA	50				
Operating temperature	°C	-10..+65				
Protection index		IP 53				
Units per packaging		1			24	
Packing weight	Kg	0.22			5.78	
Packing dimensions	mm	110 x 125 x 45			345 x 200 x 280	

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
 IMD3 - 66 dB: 3 unequal carriers, EN 50083-5  
 IMD2 - 60 dB: 2 equal carriers, EN 50083-5

AM-309 amplifier is available in other power voltages. (See page 64).

# 903 MAST AMPLIFIERS

## Configurable amplifiers - 1 input



AM-107

### Description

Broad band amplifiers for mast with one input to amplify the signal from an antenna. The high gain together with the attenuator allows them to be used with a wide range of signals. They are fed through the coaxial cable from a power supply unit installed inside the building. They incorporate a DC path to allow the feeding of a preamplifier.

### Applications

Individual digital and analogue terrestrial TV installations. They amplify the signals and reject. The signal obtained can be distributed to a large number of TV outlets by means of a single coaxial cable.

### Characteristics

Shielded zamak chassis, covered by an ABS plastic box for outdoor use, Fixed to the mast by means of a polyamide clamp. F type connectors.

### Accessories

9030086 AL-100 +24 V $\overline{\text{DC}}$  power supply unit.  
9120039 CM-004 Male F connector for Ø6.6 mm coaxial.  
9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.

CODE		9030130
MODEL		AM-107
Connection		F female
Inputs		1
Frequency range	Band	UHF
	MHz	470-862
Gain	dB	36
Flatness response	dB	$\pm 1.5$
Adjustable gain range	dB	16
Output level	dB	108 DIN 45004B
		105 (IMD3 - 66 dB)
		93 (IMD2 - 60 dB)
Return loss	dB	$\geq 10$
Noise figure	dB	2.2 $\pm 0.2$
Rejection between inputs	dB	$\geq 30$
Power supply	V $\overline{\text{DC}}$	24
	mA	45
Switchable DC path	V $\overline{\text{DC}}$	24
	mA	50
Operating temperature	°C	-10...+65
Protection index		IP 53
Units per packaging		1
Packing weight	Kg	0.22
Packing dimensions	mm	110 x 125 x 45
		24
		5.78
		345 x 200 x 280

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
IMD3 - 66 dB: 3 unequal carriers, EN 50083-5  
IMD2 - 60 dB: 2 equal carriers, EN 50083-5

AM-107 is available in kit format. (See page 64).

# 903 MAST AMPLIFIERS

Amplifier and power supply unit kits



## Description

Kits consisting of a mast amplifier and a power supply unit. Both products are included in a single pack.

## Characteristics

The characteristics are identical to those of the products which are supplied independently.

## Accessories

9120039 CM-004 Male F connector for Ø6.6 mm coaxial.  
9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.

CODE		9030043	9030131	9030012	9030013
MODEL		BO-105	BO-107	BO-205	BO-206
Included amplifier		AM-105	AM-107	AM-205	AM-206
Included power supply		AL-100			
Power supply	V $\cdots$	24			
Mains voltage	V $\sim$	230 $\pm$ 10% 50/60 Hz			

CODE		9030041	9030042	9030046	9030047
MODEL		BO-305	BO-306	BO-406	BO-407
Included amplifier		AM-305	AM-306	AM-406	AM-407
Included power supply		AL-100			
Power supply	V $\cdots$	24			
Mains voltage	V $\sim$	230 $\pm$ 10% 50/60 Hz			
Units per packing		1		24	
Packing weight	Kg	0.68		16.81	
Packing dimensions	mm	130 x 180 x 50		405 x 410 x 215	

# 903 MAST AMPLIFIERS

## Amplifiers and power units Kits



BO-160

### Description

Kits consisting of a mast amplifier and a power supply unit. Both products are included in a single pack.

### Characteristics

The characteristics are identical to those of the products which are supplied independently.

### Accessories

9120039 CM-004 Male F connector for Ø6.6 mm coaxial.

9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.

CODE		9030169	9030170	9030174	9030167	9030168	9030173
MODEL		BO-160	BO-262	BO-362	BO-165	BO-266	BO-366
Included amplifier		AM-160	AM-262	AM-362	AM-165	AM-266	AM-366
Included power supply		AL-100					
Power supply	V $\overline{\text{---}}$	24					
Mains voltage	V $\sim$	230 $\pm$ 10% 50/60 Hz					
Units per packing		1			24		
Packing weight	Kg	0.68			16.81		
Packing dimensions	mm	130 x 180 x 50			405 x 410 x 215		

CODE		9030157	9030158	9030159	9030160	9030161	9030162
MODEL		BO-140	BO-242	BO-342	BO-145	BO-246	BO-346
Included amplifier		AM-140	AM-242	AM-342	AM-145	AM-246	AM-346
Included power supply		AL-100					
Power supply	V $\overline{\text{---}}$	24					
Mains voltage	V $\sim$	230 $\pm$ 10% 50/60 Hz					
Units per packing		1			24		
Packing weight	Kg	0.68			16.81		
Packing dimensions	mm	130 x 180 x 50			405 x 410 x 215		



AL-110



AL-100



AL-110  
AL-130

### Description

Power supply units for mast amplifiers, 24 voltages. The power supply unit converts the mains supply into DC voltage and injects it into the coaxial cable to feed the amplifier. The signal coming from the antenna is distributed to its outputs. The power supply unit is available with two, four or five outputs. The power supply units are protected against overloads and short circuits. Available on request in 125 or 240 .

### Applications

Individual digital and analogue terrestrial TV installations where mast amplifiers or antenna box preamplifiers are used. The feed voltage should be selected according to the amplifier installed.

### Characteristics

Shielded zamak chassis, covered by an ABS plastic box for outdoor use. Power supply unit insulated from the high frequency circuit, complying with safety standards for both the installer and the user. Fixed to the wall by means of supplied wallplugs and screws. F type connectors. Supplied in individual or multiple packs.

### Accessories

9120039 CM-004 Male F connector for Ø6.6 mm coaxial cable  
9080023 MC-302 Male F connector for Ø7.0mm coaxial cable.  
9120011 RS-275 Type F load of 75 Ω.  
9040078 DI-007 DIN rail adaptor.

CODE	9030086			9030103		9030134		
MODEL			AL-100		AL-110		AL-130	
Connection			F female					
Inputs / outputs			1/2		1/4		1/5	
Frequency range	MHz		40-862		5-2,400			
Insertion loss	dB ±TOL	5/40-47 MHz	4.8±0.5		7.5-7.5 ±1.0		8.0-8.5 ±1.0	
		47-862 MHz	4.8±0.5		7.5-8.5 ±1.0		8.5-9.5 ±1.0	
		950-2150 MHz	-		8.5-11 ±1.0		9.5-12 ±1.0	
		2150-2400 MHz	-		11-12.5 ±1.0		12-13.5 ±1.0	
Output voltage	V---		+24					
	mA		0-100					
Peak to peak ripple voltage	mV		-		<150			
Mains voltage	V~		230±10% 50/60 Hz					
	VA		7					
Operating temperature	°C		+5...+55					
Protection index			IP 30					
Units per packaging			1	24	1		24	
Packing weight	Kg		0.27	7.10	0.45		11,30	
Packing dimensions	mm		150 x 115 x 50	360 x 315 x 225	125 x 102x 45		312 x 210 x 275	



AL-105  
AL-125  
AL-205

### Description

Power supply units for mast amplifiers, 12 voltages. The power supply unit converts the mains supply into DC voltage and injects it into the coaxial cable to feed the amplifier. The signal coming from the antenna is distributed to its outputs. The power supply units are protected against overloads and short circuits. Available on request in 125 or 240 .

### Applications

Individual digital and analogue terrestrial TV installations where mast amplifiers or antenna box preamplifiers are used. The feed voltage should be selected according to the amplifier installed.

### Characteristics

Shielded zamak chassis, covered by an ABS plastic box for outdoor use. Power supply unit insulated from the high frequency circuit, complying with safety standards for both the installer and the user. Fixed to the wall by means of supplied wallplugs and screws. F type connectors. Supplied in individual or multiple packs.

### Accessories

9120039 CM-004 Male F connector for Ø6.6 mm coaxial cable  
9080023 MC-302 Male F connector for Ø7.0mm coaxial cable.  
9120011 RS-275 Type F load of 75 Ω.  
9040078 DI-007 DIN rail adaptor.

CODE			9030087	9030119	9030135
MODEL			AL-105	AL-125	AL-205
Connection			F female		
Inputs / outputs			1/2		
Frequency range	MHz		40-862		
Insertion loss	dB ±TOL	5/40-47 MHz	4.8±0.5		
		47-862 MHz	4.8±0.5		
		950-2150 MHz	-		
		2150-2400 MHz	-		
Output voltage	V $\overline{\text{---}}$		+12		
	mA		0-100		0-200
Peak to peak ripple voltage	mV		-	<150	
Mains voltage	V $\sim$		230±10% 50/60 Hz		
	VA		7		
Operating temperature	°C		+5..+55		
Protection index			IP 30		
Units per packaging			24		24
Packing weight	Kg		7.10		7.10
Packing dimensions	mm		360 x 315 x 225		360 x 315 x 225



AM-930

**Description**

Broadband mast amplifier. Has one input and four outputs, to amplify and distribute the signal from the antenna to several points. Is powered through the coaxial cable from a power supply unit installed inside the building.

**Applications**

Individual digital and analogue terrestrial TV installations. Amplifies the signal from the antenna and distributes it to its outputs. The signal obtained at each output can be distributed on one or several TV outlets.

**Characteristics**

Shielded zamak chassis, covered with an ABS plastic box for outdoor use. Fixed to the mast by means of a polyamide clamp. F-type connectors.

**Accessories**

9030087	AL-105	Power supply unit, +12 V $\overline{\text{---}}$ .
9030119	AL-125	Power supply unit, +12 V $\overline{\text{---}}$ , with UK plug.
9120039	CM-004	Male F connector for Ø6.6mm coaxial cable.
9080023	MC-302	Male F connector for Ø7.0mm coaxial cable.

CODE		9030122	
MODEL		AM-930	
Connection		F female	
Outputs		4	
Inputs		1	
Frequency range	Band	UHF	
	MHz	470-862	
Gain	dB $\pm$ TOL	24 $\pm$ 2.0	
Flatness response	dB	$\pm$ 1.5	
Adjustable gain range	dB	15	
Output level	dB $\mu$ V	98 DIN 45004B 95 (IMD3 - 66 dB)	
Return loss	dB	$\geq$ 10	
Noise figure	dB	2.5 $\pm$ 0.2	
Rejection between inputs		10	
Power supply	V $\overline{\text{---}}$	12	
	mA	45	
Operating temperature	°C	-10..+65	
Protection index		IP 53	
Units per packaging		1	24
Packing weight	Kg	0.22	5.6
Packing dimensions	mm	11 x 105 x 45	310 x 205 x 250

CODE		9030126	
MODEL		BO-930	
Included amplifier		AM-930	
Included power supply		AL-125	
Power supply	V $\overline{\text{---}}$	12	
Mains voltage	V $\sim$	230 $\pm$ 10% 50/60 Hz	
Units per packing		1	18
Packing weight	Kg	0.68	12.85
Packing dimensions	mm	187 x 123 x 57	395 x 395 x 200



# 903

## MAST AMPLIFIERS

### Medium gain - 5 inputs



AM-515

### Description

Broadband amplifier for masts, with multiple inputs and various configurations for bands IV and V. The high gain together with the attenuator allows them to be used with a wide range of signals. They are fed through the coaxial cable from a power supply unit installed inside the building. It incorporates automatic DC paths, allowing power to be supplied to a preamplifier at each input.

### Applications

Individual digital and analogue terrestrial TV installations which require high gain. It amplifies and mixes the BI, BIII/DAB, BIV, BV and UHF signals received from several antennas. The signal obtained can be distributed to a large number of TV outlets by means of a single coaxial cable.

### Characteristics

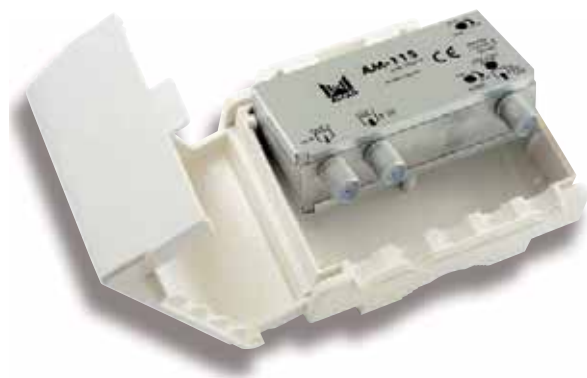
Shielded zamak chassis, covered by a weather-resistant plastic casing. It can be installed on a mast by means of a polyamide clamp. F-type connectors.

### Accessories

9030087	AL-105	Power supply unit, +12 V $\overline{\text{DC}}$ .
9030119	AL-125	Power supply unit, +12 V $\overline{\text{DC}}$ , with UK plug.
9120039	CM-004	Male F connector for Ø6.6mm coaxial cable.
9080023	MC-302	Male F connector for Ø7.0mm coaxial cable.
9120011	RS-275	Type F load of 75Ω.

CODE		9030136				
MODEL		AM-515				
Connection		F female				
Inputs		5				
Frequency range	Band	BI	BIII/DAB	BIV	BV	UHF1
	MHz	40-70	160-260	470-F1 <sup>(1)</sup>	F2-862 <sup>(1)</sup>	470-790
Gain	dB±TOL	25 ±1.0		30 ±1.0		
Adjustable gain range	dB	20		16		
Output level	dBµV	114 DIN 45004B 108 (IMD3 -66dB) 105 (IMD2 -60dB)				
Return loss	dB	≥10				
Noise figure	dB	5.0 ±0.5		7.0 ±0.5		
Rejection between inputs		≥30				
Power supply	V---	12				
	mA	130				
Switchable DC path	V---	12				
	mA	100				
Operating temperature	°C	-10..+65				
Protection index		IP 53				
Units per packaging		2			14	
Packing weight	Kg	0.76			5.88	
Packing dimensions	mm	265 x 165 x 55			385 x 370 x 205	

CODE		9030137				
MODEL		BO-515				
Included amplifier		AM-515				
Included power supply		AL-205				
Power supply	V $\overline{\text{DC}}$	12				
Mains voltage	V $\sim$	230 $\pm$ 10% 50/60 Hz				
Units per packing		1			7	
Packing weight	Kg	0.86			6.53	
Packing dimensions	mm	265 x 165 x 55			385 x 370 x 205	



AM-115

## Description

Amplifiers equivalent to the basic models but with different feed voltages.

## Characteristics

The electrical characteristics are identical to those of the equivalent products, except for the feed voltages.

## Accessories

- 9030087 AL-105 Power supply unit, +12 V $\overline{\text{--}}$ .
- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial cable
- 9080023 MC-302 Male F connector for Ø7.0mm coaxial cable.

CODE		9030011	9030089	9030078	9030051	9030052	9030076	9030099
MODEL		AM-115	AM-215	AM-216	AM-315	AM-316	AM-416	AM-417
Equivalent model		AM-105	AM-205	AM-206	AM-305	AM-306	AM-405	AM-407
Power supply	V $\overline{\text{--}}$	12						
	mA	45						
DC path	V $\overline{\text{--}}$	12						
	mA	50						

CODE		9030150	9030147	9030151	9030148	9030152	9030149	9030023
MODEL		AM-150	AM-155	AM-252	AM-256	AM-352	AM-356	AM-319
Equivalent model		AM-140	AM-145	AM-242	AM-246	AM-342	AM-346	AM-309
Power supply	V $\overline{\text{--}}$	12						
	mA	45						
DC path	V $\overline{\text{--}}$	12						
	mA	50						

# 903

## MAST SPLITTERS

### Mast active splitter



AM-910

#### Description

Active splitter for mast. It has one input and four outputs, enabling distribution of the signal from one antenna to several points. It is fed through the coaxial cable from a power supply unit installed inside the building or from a TV receiver. It incorporates automatic DC paths, allowing power to be supplied to a preamplifier.

#### Applications

Individual digital and analogue terrestrial TV installations. It distributes the VHF and UHF signals received in a single cable through the four outputs with which it is equipped. Compatible with receivers which use the return path.

#### Characteristics

Shielded zamak chassis, covered by a weather-resistant plastic casing. It can be installed on a mast by means of a polyamide clamp. F-type connectors.

#### Accessories

- 9030135 AL-205 +12V $\overline{\text{---}}$  power supply unit.
- 9120011 RS-275 Type F load of 75 $\Omega$ .
- 9120039 CM-004 Male F type connector for  $\varnothing 6.6$  mm coaxial.
- 9080023 MC-302 Male F connector for RG-6 coaxial,  $\varnothing 7.0$  mm.

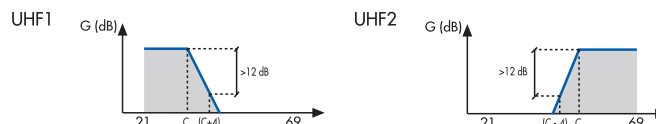
CODE		9030140	
MODEL		AM-910	
Connection		F Female	
Outputs		4	
Inputs		1	
Frequency range	Band	VR	TV
	MHz	10-20	88-862
Gain	dB $\pm$ TOL	0 $\pm$ 2.0	4 $\pm$ 2.0
Flatness response	dB	$\pm 1,5$	
Output level	dB	85 DIN 45004B	
		82 (IMD3 -66 dB)	
		75 (IMD2 -60 dB)	
Return loss I/O	dB	$\geq 10$	
Noise figure	dB	17 $\pm$ 1.0	4 $\pm$ 1.0
Isolation between outputs	dB	$\geq 15$	
Power supply	V $\overline{\text{---}}$	9..12	
	mA	50	
DC path	V $\overline{\text{---}}$	8,5..11,5	
	mA	4x30	
Operating temperature	$^{\circ}\text{C}$	-10..+65	
Protection index		IP 53	
Units per packaging		1	24
Packing weight	Kg	0.22	5.6
Packing dimensions	mm	115 x 105 x 45	310 x 205 x 250

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
 IMD3 - 66 dB: 3 unequal carriers, EN 50083-5  
 IMD2 - 60 dB: 2 equal carriers, EN 50083-5

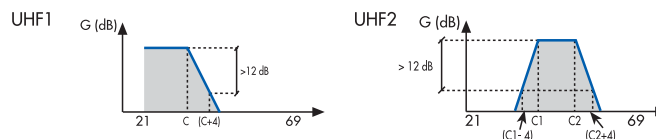
Data published in compliance with the definitions and measurement methods of the following standards : EN 50083-3, EN 50083-4 and EN 50083-5

Filters for the UHF inputs of the configurable amplifiers, the filters are mounted and adjusted during the manufacturing process. Orders should specify the initial and final channels of each filter and if the filter is a pass or rejection filter. With the AM-309 and AM-319 amplifiers all filters can be used.

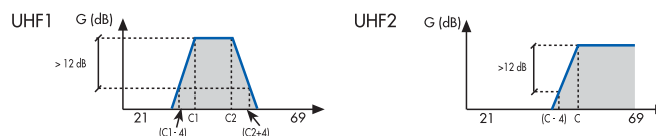
### 1- Low and high pass filter



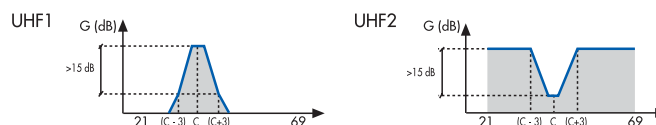
### 2- Low pass and band pass filter



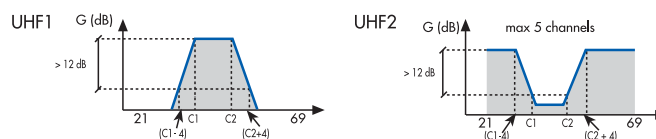
### 3- Band pass and high pass filter



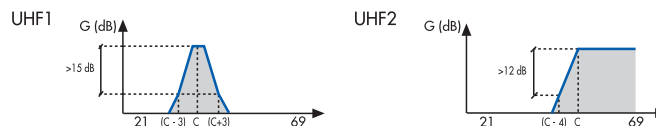
### 4- Monochannel and channel rejection filter



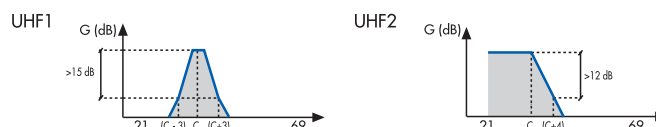
### 5- Band pass and band rejection filter



### 6- Monochannel and high pass filter



### 7- Monochannel and low pass filter

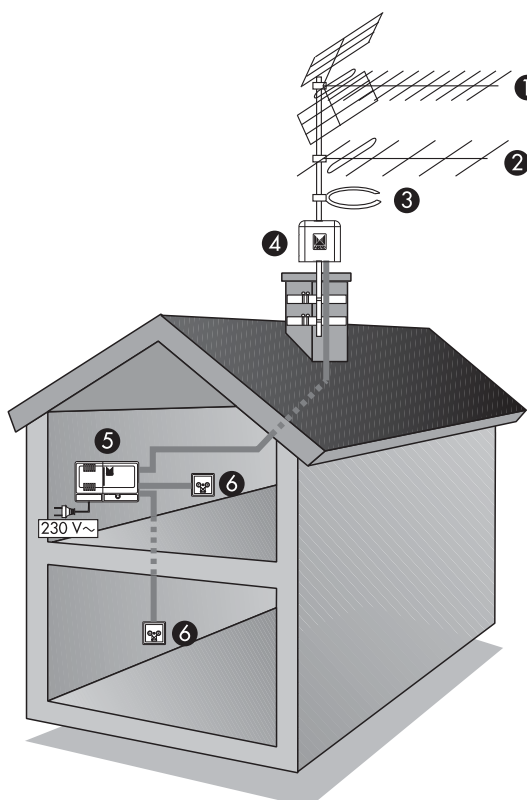


# 902/903

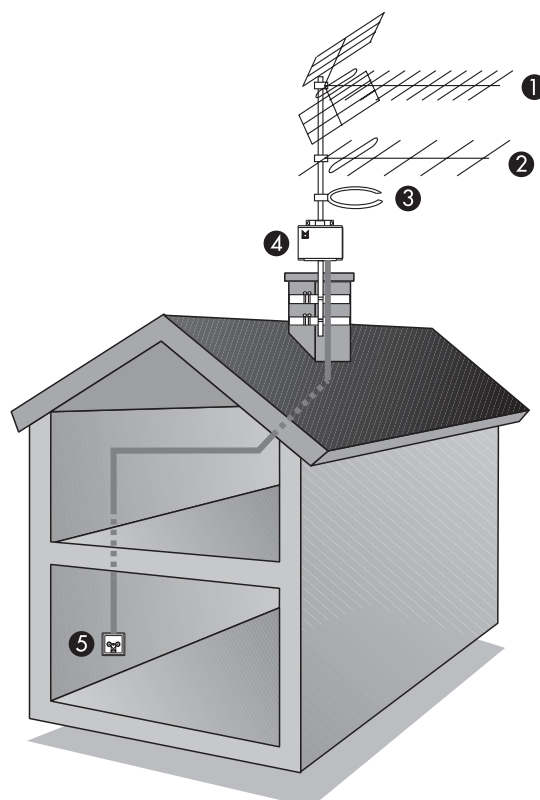
## INSTALLATION EXAMPLES

### Individual installation with amplifier or mast multiplexer

The multiplexer makes it possible to carry out installations when the levels of the received signal are high. If the levels are not high or the installation has several TV outlets then the use of an amplifier and power supply unit will be necessary.



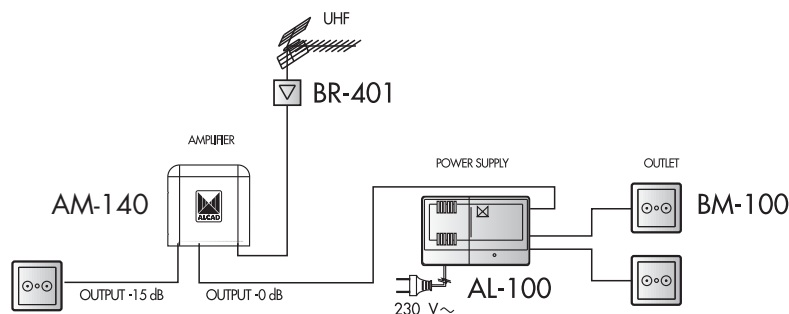
1	2	3	4	5	6
9000036	9000063	9000040	9030143	9030086	9030037
<b>BU-454</b>	<b>BT-751</b>	<b>FM-102</b>	<b>AM-346</b>	<b>AL-100</b>	<b>BM-100</b>
UHF ANTENNA	BIII ANTENNA	FM ANTENNA	AMPLIFIER	POWER SUPPLY	OUTLET



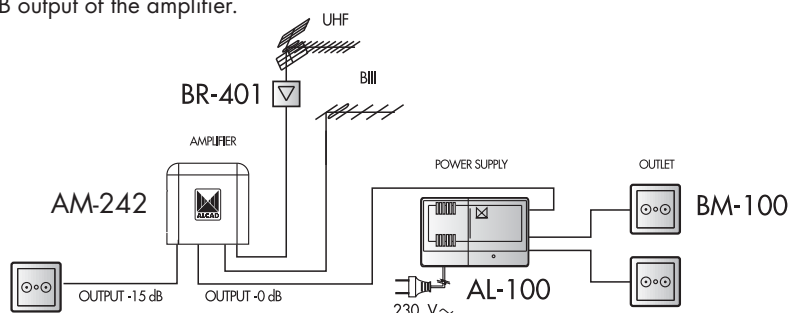
1	2	3	4	5
9000036	9000063	9000040	9020044	9030037
<b>BU-454</b>	<b>BT-751</b>	<b>FM-102</b>	<b>MM-407</b>	<b>BM-100</b>
UHF ANTENNA	BIII ANTENNA	FM ANTENNA	MULTIPLEXER	OUTLET

## Installation diagrams of installation with a mast amplifier

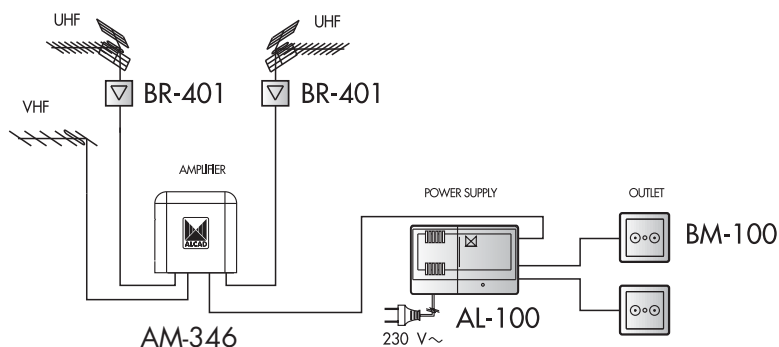
Installation with a UHF antenna and with an antenna preamplifier which is used when the signal level is very low. To activate the power supply of the preamplifier, the DC path switch should be in the ON position. There are two outlets connected to the outputs of the amplifier and a third outlet connected to the -15 dB output of the amplifier.



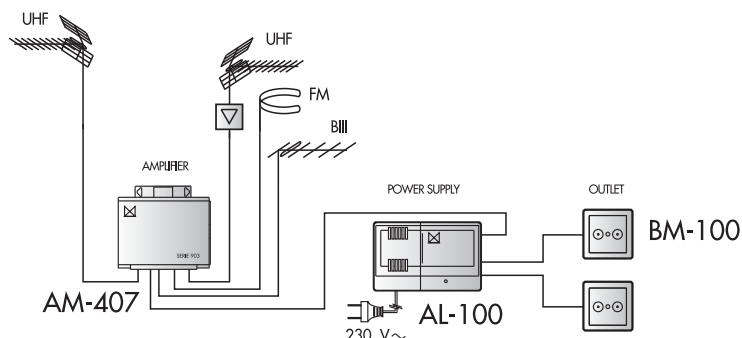
Installation with two antennas, of UHF and BIII, and with a preamplifier for the UHF antenna. The antenna preamplifier is used when the signal level is very low. To activate the power supply of the preamplifier, the DC path switch should be in the ON position. There are two outlets connected to the outputs of the amplifier and a third outlet connected to the -15 dB output of the amplifier.



Installation with three antennas, two of UHF and one of VHF (BIII or BI), and with two preamplifiers for the UHF antennas. The levels of the signals of each antenna are adjusted with the gain controllers so that the output level of all the channels is similar.



Installation with four antennas, two of UHF, one of BIII and one of FM. One of the UHF antennas has a preamplifier. The levels of the signals of each antenna are adjusted with the gain controllers so that the output level of all the channels is similar.

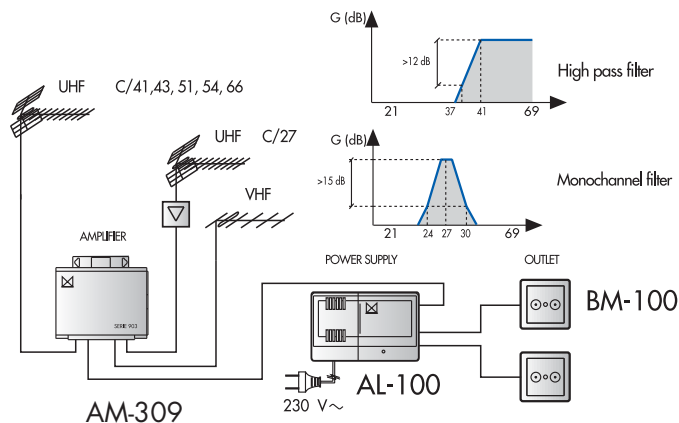


# 903

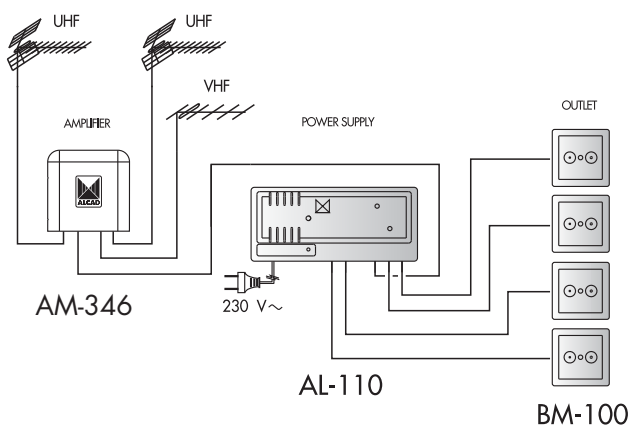
## INSTALLATION EXAMPLES

### Installation diagrams of installation with a mast amplifier

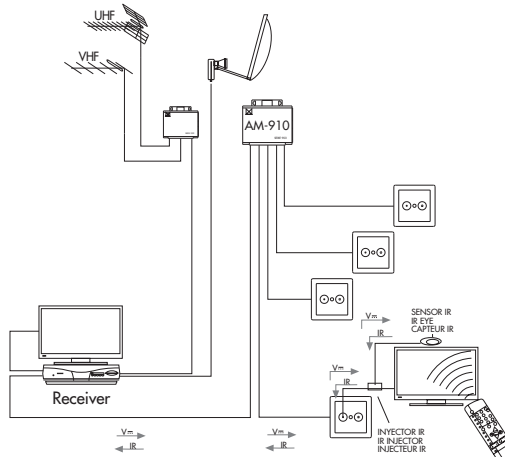
Installation with two antennas, of UHF and VHF (BIII or BI). The amplifier is configured with a low gain C/21-29 low pass filter and a high gain C/32-69 high pass filter, the filters should be separated by two channels. The levels of the channels of each filter can be adjusted independently by means of the two gain controllers.



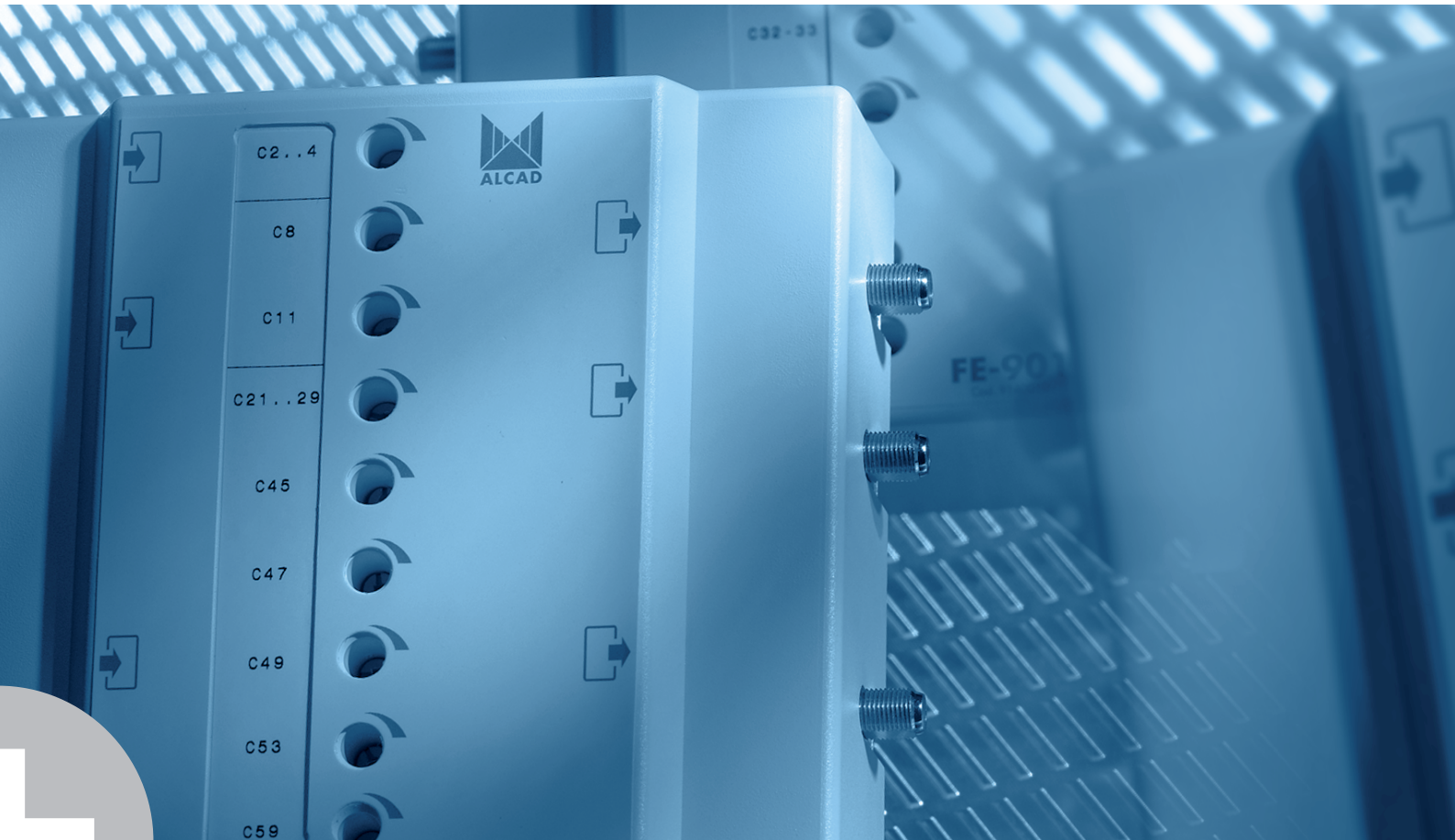
Installation with three antennas, two of UHF and one of de VHF (BIII o BI). The amplifier is powered with the AL-110 power supply that distributes the signal to four rooms.



Installation with three antennas: one VHF and one UHF, both connected to a mast amplifier, plus a satellite dish connected to a satellite receiver. The AM-910 distributes the terrestrial and satellite signal to four outlets, making up for the distribution losses with 4 dB gain. Has a return path for remote handling of receivers through the distribution network by installing an IR injector.









# Broadband TV equipment

Compact multiband amplifiers to carry out community or individual TV installations. If used together with a cluster filter they allow quality reception in adverse conditions.

# 914 CLUSTER FILTERS

## Cluster filters



### Description

Cluster filters consisting of independent filters on the UHF, VHF and FM bands. Each cluster filter can incorporate up to 9 filters, with one or several inputs. Each filter has an attenuator which permits the equalisation of the channels. The filters can be of a monochannel, multichannel or broadband type. They permit the passing of a feed path from the outputs to any one of the inputs.

### Applications

Designed for installations of analogue or digital terrestrial TV in MATV or individual installations. Areas where reception is difficult, with large differences in level between channels. They complement the head-end broadband amplifiers, and allow the amplifier to deliver maximum output power and to avoid intermodulation.

### Characteristics

Low insertion loss. Made from ABS plastic, with a metal plate internal chassis which gives maximum shielding. F type connectors which gives a connection with minimum mismatching and high shielding.

### Accessories

- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial cable.
- 9080023 MC-302 Male F connector for RG-6 coaxial cable, 7.0 mm.
- 9040011 CA-311 UHF-VHF broadband head-end amplifier.
- 9040033 CF-511 UHF-UHF-BIII-BI-FM broadband head-end amplifier.

CODE		9140000	9140001	9140002	9140003	9140004
MODEL		FE-009	FE-008	FE-007	FE-006	FE-005
TV System		AM-TV DVB-T				
Connection		F female				
Number of filters		9	8	7	6	5
Number of inputs		1-9	1-8	1-7	1-6	1-5
Number of outputs		1-5				
Insertion loss	dB±TOL	5.0 ±1,0				
DC path		Optional				
Operating temperature	°C	-10...+65				
Units per packaging		1				
Packing weight	Kg	1.00				
Packing dimensions	mm	300 x 300 x 150				

The filters are also provided in kit format. Each kit is composed of a cluster filter and a CF-511 or CF-512 broadband amplifier (consult us for availability). See the list of cluster filters and kits available for different areas or transmitters in the current price list. Consult us for availability of filters and kits for new areas or transmitters.

# 914 CLUSTER FILTERS

## Cluster filters for adjacent channels



### Description

Cluster filters consisting of independent filters on the UHF, VHF and FM bands. Each cluster filter can incorporate up to 9 filters, with one or several inputs. Each filter has an attenuator which permits the equalisation of the channels. The filters can be of a monochannel, multichannel or broadband type. The monochannel filters can be conventional or for operation with adjacent channels. They permit the passing of a feed path from the outputs to any one of the inputs.

### Applications

Designed for installations of analogue or digital terrestrial TV in MATV or individual installations. Areas where reception is difficult, with large differences in level between channels. They complement the head-end broadband amplifiers, and allow the amplifier to deliver maximum output power and to avoid intermodulations.

### Characteristics

Low insertion loss. Made from ABS plastic, with a metal plate internal chassis which gives maximum shielding. F type connectors which gives a connection with minimum mismatching and high shielding.

### Accessories

- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial cable.
- 9080023 MC-302 Male F connector for RG-6 coaxial cable, 7.0 mm.
- 9040011 CA-311 UHF-VHF broadband head-end amplifier.
- 9040033 CF-511 UHF-UHF-BIII-BI-FM broadband head-end amplifier.

CODE		9140005	9140006	9140007	9140008	9140009
MODEL		FE-019	FE-018	FE-017	FE-016	FE-015
TV System		AM-TV DVB-T				
Connection		F female				
Number of filters		9	8	7	6	5
Number of inputs		1-9	1-8	1-7	1-6	1-5
Number of outputs		1-5				
Insertion loss	dB±TOL	7.0 ±1,0				
DC path		Optional				
Operating temperature	°C	-10..+65				
Units per packaging		1				
Packing weight	Kg	1.00				
Packing dimensions	mm	300 x 300 x 150				

The filters are also provided in kit format. Each kit is composed of a cluster filter and a CF-511 or CF-512 broadband amplifier (consult us for availability). See the list of cluster filters and kits available for different areas or transmitters in the current price list. Consult us for availability of filters and kits for new areas or transmitters.



CA-340

**Description**

Broadband amplifiers for head-end, compatible with transmission of LTE mobile telephone signals. Includes a rejection filter for LTE signals. Equipped with two or three inputs to amplify and combine the signals coming from the antennas. Power supplied automatically to preamplifier. Available on request in 125 and 240 V~.

**Applications**

Medium-sized individual digital and analogue terrestrial TV installations which are affected by the transmission of LTE mobile telephone signals. It is used as the head-end amplifier of the installation. The two outputs models facilitate star-shaped distribution from the head-end through the use of splitters.

**Characteristics**

Made from ABS plastic, with an internal zamak chassis of which provides maximum shielding. F type connectors which affords a connection with minimum mismatching and high shielding. Power supply unit insulated from the rest of the high frequency circuit, complying with all safety standards. F-type connectors for screwing on or crimping.

**Accessories**

9120039 CM-004 Male F connector for Ø6.6 mm coaxial.  
 9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.  
 9080030 MC-304 Male compression F connector for RG-6 coaxial, Ø7.0 mm.  
 9120011 RS-275 Type F load of 75Ω.

CODE		9040116					9040117			
MODEL		CA-340					CA-342			
TV System		AM-TV / DVB-T								
Connection		F female								
Number of outputs		2								
Number of inputs		3					4			
Frequency range	Band	BI	FM	BIII	UHF1	UHF2	BI/FM	BIII	UHF1	UHF2
	MHz	47-70	88-108	160-260	470-790		40-108	160-260	470-790	
Gain	dB + TOL	35 ±1.0	25 ±1.0	35 ±1.0	45 ±2.0		20 ±1.0	20 ±1.0	30 ±1.0	
Adjustable gain range		20			16		20		16	
Flatness response	dB	±1.5 ±0.25(8MHz)					±1.5		±0.25	
Output level	dBµV	2 x 110 DIN 45004B 2 x 107 (IMD3 -60 dB) 2 x 100 (IMD2 -60 dB)								
Insolation between inputs/ outputs	dB	13								
Output voltage	V~	-			24 Auto	-	-	-	24 Auto	-
	mA	-			50	-	-	-	50	-
Return loss	dB	10								
Chroma - luminance delay	ns	<10								
Noise figure	dB	5.5±1.5					6.5±1.5		5.5±1.5	
Mains voltage	V~	230±10% 50/60 Hz								
	VA	7								
Operating temperature	°C	-10...+65								
Protection index		IP20								
Units per packaging		1					24			
Packing weight	Kg	0.58					14.42			
Packing dimensions	mm	165 x 100 x 50					385 x 370 x 205			

# 904 MULTIBAND AMPLIFIERS

LTE compatible head-end amplifier



CA-541

## Description

Broadband amplifier for head-end, with several inputs and different frequency configurations, compatible with the transmission of LTE mobile telephone signals. The built-in power supply unit can feed up to five preamplifiers automatically. Output test-point to adjust the installation without having to disconnect the TV signal. Available on request in 125 and 240 V~.

## Applications

Large-scale collective digital and analogue terrestrial TV installations which are affected by the transmission of LTE mobile telephone signals. Suitable for installations where the channels of each band are received at similar levels. Adjustment by means of regulators which control the gain at each input.

## Characteristics

Made from zamak and galvanised steel plate to provide maximum shielding. Independent housings for the power supply unit and the high frequency circuit. Input and output connectors in the lower part facilitate installation. F-type connectors for screwing on or crimping.

## Accessories

9120039 CM-004 Male F connector for Ø6.6 mm coaxial.  
 9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.  
 9080030 MC-304 Male compression F connector for RG-6 coaxial, Ø7.0 mm.  
 9120011 RS-275 Type F load of 75Ω.

CODE		9040118				
MODEL		CA-541				
TV System		AM-TV / DVB-T				
Connection		F female				
Number of outputs		1 +test				
Number of inputs		5				
Frequency range	Band	BI	FM	BIII/DAB	UHF1	UHF2
	MHz	47-70	88-108	160-260	470-790	
Gain	dB	40			45	
Adjustable gain range		20				
Flatness response	dB	±2				
Output test point	dB	-28 ±1		-30 ±1	-34 ±2	
Output level	dBµV	115 DIN 45004B 112 (IMD3 -60 dB) 105 (IMD2 -60 dB)				
Return loss	dB	10				
Chroma - luminance delay	ns	<10				
Noise figure	dB	8				
Output voltage	V~	24 Auto				
	mA	60				
Fuse	V~ /A	220 / 1.6				
Mains voltage	V~	230±10% 50/60 Hz				
	VA	8				
Operating temperature	°C	-20..+60				
Protection index		IP50D				
Units per packaging		1				
Packing weight	Kg	1.8				
Packing dimensions	mm	220 x 200 x 60				

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
 IMD3 - 66 dB: 3 unequal carriers, EN 50083-5  
 IMD2 - 60 dB: 2 equal carriers, EN 50083-5



# 904 MULTIBAND AMPLIFIERS

Head-end amplifiers



CA-310



CA-210



CA-311

## Description

Broadband head-end amplifiers with several inputs. Built on a compact chassis, they are capable of supplying a signal to a large number of outlets. Some of the models have two identical outputs in order to increase the number of outlets. Available on request in 125 or 240 V~.

## Applications

Designed for analogue and digital terrestrial TV installations in medium-sized MATV networks or individual installations. They are used as the head-end amplifier of the installation. The two outputs models facilitate star-shaped distribution from the head-end through the use of splitters.

## Characteristics

Made from ABS plastic, with an internal zamak chassis of which provides maximum shielding. F type connectors which affords a connection with minimum mismatching and high shielding. Power supply unit insulated from the rest of the high frequency circuit, complying with all safety standards.

## Accessories

- 9140000 FE-009 Cluster filter.
- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial cable.
- 9080023 MC-302 Male F connector for RG-6 coaxial cable, Ø7.0 mm.
- 9080030 MC-304 Male compression F connector for RG-6 coaxial, Ø7.0 mm.
- 9120011 RS-275 F load 75Ω.

CODE		9040060		9040014					9040011	
MODEL		CA-210		CA-310					CA-311	
TV System		AM-TV / DVB-T								
Connection		F female								
Number of outputs		2		2+Test					2	
Number of inputs		1		3					2	
Frequency range	Band	VHF/FM/DAB	UHF	BI	FM	BIII	UHF 1	UHF 2	VHF/FM/DAB	UHF
	MHz	40-400	470-862	40-70	88-108	160-260	470-862		40-260	470-862
Gain	dB±TOL	24 ±1,0	25 ±1,5	35 ±1,0	25 ±1,0	35 ±1,0	42 ±2,0		33 ±1,0	42 ±2,0
Flatness response	dB	±1.2	±1.5	±1.5 ±0.25 (8MHz)						
Adjustable gain range	dB	16	12	20		16		20		16
Output test point	dB	-		-30 ±0.5					-	
Output level	dBµV	2x102 DIN 45004B 2x99 (IMD3-60 dB) 2x86 (IMD2-60 dB)		2x110 DIN 45004B 2x107 (IMD3-66 dB) 2x100 (IMD2-60 dB)						
Isolation between inputs/outputs	db	-		13						
Output voltage	V~	24 Switchable		-		24 Auto	-	-	24 Auto	
	mA	55		-		50	-	-	50	
Return loss	dB	10								
Chroma - luminance delay		-		<10						
Noise figure	dB	<4.5	<3.0	5 ±1,5					4 ±1,5	3 ±1,0
Mains voltage	V~	230 ±10% 50/60 Hz								
	VA	7								
Operating temperature	°C	-5...+60			-10...+65					
Protection index		IP 20								
Units per packaging		1								
Packing weight	Kg	0.38					0.58			
Packing dimensions	mm	115 x 102 x 45					160 x 100 x 50			

The CA-210 amplifier is available in other preamplifier power voltages (see page 94).

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> -60 dB: 2 equal carriers, EN 50083-3



# 904 MULTIBAND AMPLIFIERS

Head-end amplifiers



CA-312



CA-313

## Description

Broadband head-end amplifier with several inputs and different band configurations. The built-in power supply unit can feed up to five preamplifiers automatically. Output test-point to adjust the installation without having to disconnect the TV signal.

## Applications

Designed to build large analogue and digital terrestrial MATV installations. Suitable for installations where the channels of each band are received at similar levels. Adjustment by means of regulators which control the gain at each input.

## Characteristics

Made from zamak and galvanised steel plate to provide maximum shielding. Independent housings for the power supply unit and the high frequency circuit. F type connectors in nickel-plated iron which gives a connection with minimum mismatching and maximum shielding. Input and output connectors in the lower part facilitate installation.

## Accessories

- 9140000 FE-009 Cluster filter.
- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial cable.
- 9080023 MC-302 Male F connector for RG-6 coaxial cable, Ø7.0 mm.
- 9080030 MC-304 Male compression F connector for RG-6 coaxial, Ø7.0 mm.
- 9120011 RS-275 F load 75Ω.

CODE	9040039					9040058				
MODEL		CA-312				CA-313				
TV System		AM-TV / DVB-T								
Connection		F female								
Number of outputs		2				1				
Number of inputs		4				5				
Frequency range	Band	BI / FM	BIII	UHF 1	UHF 2	BI	BIII	BIV	BV	UHF
	MHz	40-108	160-260	470-862		40-88	160-260	470-590	614-862	470-862
Gain	dB±TOL	20 ±1,0	20 ±1,0	30 ±1,0		25 ±1,5		34 ±1,5		
Flatness response	dB	±1.5		±0.25		±1.5 ±0.25 (8MHz)				
Adjustable gain range	dB	20		16		20		16		
Output level	dBµV	2x110 DIN 45004B 2x107 (IMD3 - 66 dB) 2x100 (IMD2 - 60 dB)				114 DIN 45004B 111 (IMD3 - 66 dB) 104 (IMD2 - 60 dB)				
Isolation between inputs/outputs	db	13				-				
Output voltage	V~	-		24 Auto	-	-		12 Auto		
	mA	50								
Return loss	dB	10								
Chroma - luminance delay		<10								
Noise figure	dB	6.5 ±1,5		5.5 ±1,5		6.5 ±1,5		5.5 ±1,5		
Mains voltage	V~	230 ±10% 50/60 Hz				230 ±15% 50/60 Hz				
	VA	7				6				
Operating temperature	°C	-10..+65								
Protection index		IP 20								
Units per packaging		1								
Packing weight	Kg	0.58								
Packing dimensions	mm	160 x 100 x 50								

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> - 60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> - 60 dB: 2 equal carriers, EN 50083-3

# 904 MULTIBAND AMPLIFIERS

Medium gain head-end amplifiers



CA-511

## Description

Broadband head-end amplifier with several inputs. The built-in power supply unit can feed up to five preamplifiers automatically. Output test-point to adjust the installation without having to disconnect the TV signal.

## Applications

Designed to perform analogue and digital terrestrial MATV installations of medium size. Suitable for installations where the channels of each band are received at similar levels. Adjustment by means of regulators which control the gain at each input.

## Characteristics

Made from zamak and galvanised steel plate to provide maximum shielding. Independent housings for the power supply unit and the high frequency circuit. F type connectors in nickel-plated iron which gives a connection with minimum mismatching and maximum shielding. Input and output connectors in the lower part facilitate installation.

## Accessories

- 9140000 FE-009 Cluster filter.
- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial cable.
- 9080023 MC-302 Male F connector for RG-6 coaxial cable, Ø7.0 mm.
- 9080030 MC-304 Male compression F connector for RG-6 coaxial, Ø7.0 mm.

CODE		9040064				
MODEL		CA-511				
TV System		AM-TV / DVB-T				
Connection		F female				
Number of outputs		1 + Test				
Number of inputs		5				
Frequency range	Band	BI/FM	BIII/DAB	UHF 1	UHF 2	UHF 3
	MHz	47-108	160-260	470-862		
Gain	dB±TOL	30 ±1,0		33 ±2,0		
Adjustable gain range	dB	20				
Flatness response	dB	±2				
Output test point	dB	30 ±0,5				
Output level	dBµV	115 DIN 45004B 112 (IMD3 - 60 dB) 105 (IMD2 - 60 dB)				
Return loss	dB	10				
Chroma - luminance delay	ns	<20				
Noise figure	dB	8 ±1,0		10 ±1,0		
Output voltage	V $\overline{\sim}$	24 Auto				
	mA	60				
Fuse	V $\sim$	250				
	VA	1.6				
Mains voltage	V $\sim$	230 ±10% 50/60 Hz				
	VA	8				
Operating temperature	°C	-10..+65				
Protection index		IP 50D				
Units per packaging		1				
Packing weight	Kg	1.8				
Packing dimensions	mm	220 x 200 x 60				

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
IMD<sub>2</sub> -60 dB: 2 equal carriers, EN 50083-3

# 904 MULTIBAND AMPLIFIERS

High gain head-end amplifiers



CF-511



CF-512

## Description

Broadband head-end amplifier with several inputs and different band configurations. The built-in power supply unit can feed up to five preamplifiers automatically. Output test-point to adjust the installation without having to disconnect the TV signal.

## Applications

Designed to build large analogue and digital terrestrial MATV installations. Suitable for installations where the channels of each band are received at similar levels. Adjustment by means of regulators which control the gain at each input.

## Characteristics

Made from zamak and galvanised steel plate to provide maximum shielding. Independent housings for the power supply unit and the high frequency circuit. F type connectors in nickel-plated iron which gives a connection with minimum mismatching and maximum shielding. Input and output connectors in the lower part facilitate installation.

## Accessories

- 9140000 FE-009 Cluster filter.
- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial cable.
- 9080023 MC-302 Male F connector for RG-6 coaxial cable, Ø7.0 mm.
- 9120011 RS-275 F load 75Ω.
- 9080030 MC-304 Male compression F connector for RG-6 coaxial, Ø7.0 mm.

CODE	9040033						9040034					
MODEL		CF-511					CF-512					
TV System		AM-TV / DVB-T										
Connection		F female										
Number of outputs		1+Test										
Number of inputs		5					5					
Frequency range	Band	UHF 1	UHF 2	BIII/DAB	FM	BI	UHF 1	UHF 2	UHF 3	BIII/DAB	BI/FM	
	MHz	470-862		160-260	88-108	47-68	470-862			160-260	47-108	
Gain	dB	45		40			45			40		
Adjustable gain range	dB	20										
Flatness response	dB	±2										
Output test point	dB±TOL	-34 ±2		-30 ±1	-25 ±1		-34 ±2			-30 ±1	-28 ±1	
Output level	dBµV	115 DIN 45004B 112 (IMD3 - 60 dB) 105 (IMD2 - 60 dB)										
Return loss	dB	10										
Chroma - luminance delay	ns	<20										
Noise figure	dB	8					10			8		
Output voltage	V $\cdots$	24 Auto										
	mA	60										
Mains voltage	V $\sim$	230 ±10% 50/60 Hz										
	VA	8										
Operating temperature	°C	-20..+60										
Protection index		IP 50D										
Units per packaging		1										
Packing weight	Kg	1.8										
Packing dimensions	mm	220 x 200 x 60										

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> - 60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> - 60 dB: 2 equal carriers, EN 50083-3

# 904 MULTIBAND AMPLIFIERS

TV High gain head-end amplifiers



CA-710

## Description

Broadband amplifier for head-end, with several inputs and different frequency configurations. The built-in power supply unit can feed up to five preamplifiers automatically. Output test-point to adjust the installation without having to disconnect the TV signal. Available on request in 125 and 240 V~.

## Applications

Designed for medium to large analogue and digital SMATV installations with a high output level required. Suitable for installations where the channels of each band are received at similar levels. Adjustment by means of regulators which control the gain at each input.

## Characteristics

Made from zamak and galvanised steel plate to provide maximum shielding. Independent housings for the power supply unit and the high frequency circuit. Input and output connectors in the lower part facilitate installation. F-type connectors for screwing on or crimping.

## Accessories

- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial.
- 9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.
- 9080030 MC-304 Male compression F connector for RG-6 coaxial, Ø7.0 mm.
- 9120011 RS-275 Type F load of 75Ω.

CODE		9040103				
MODEL		CA-710				
TV System		AM-TV / DVB-T / FM-TV				
Connection		F female				
Number of outputs		1				
Number of inputs		5				
Frequency range	Band	BIII/DAB	BI/FM	UHF 1	UHF 2	UHF 3
	MHz	47-108	160-254	470-862		
Gain	dB±TOL	41 ±2,0			51 ±2,0	
Adjustable gain range	dB	20				
Flatness response	dB	±2.0				
Output level	dBµV	122 DIN 45004B 119 (IMD3 - 60 dB) 112 (IMD2 - 60 dB)				
Return loss	dB	14				
Chroma - luminance delay	ns	<20				
Noise figure	dB	<10			<9	
Output voltage	V $\cdots$	24 Auto				
	mA	60				
Fuse	V $\sim$	250				
	VA	1.6				
Mains voltage	V $\sim$	230 ±10% 50/60 Hz				
	VA	32				
Operating temperature	°C	-10..+65				
Protection index		IP 50D				
Units per packaging		1				
Packing weight	Kg	1.8				
Packing dimensions	mm	220 x 200 x 60				

# 904 MULTIBAND AMPLIFIERS

## TV-SAT head-end amplifiers



CA-220

### Description

TV and SAT broadband head-end amplifier. They independently amplify the terrestrial TV and satellite IF bands, distribute both bands through their four outputs continuously. The built-in power supply unit can automatically feed a preamplifier. The LNB is fed from the SAT receiver, through the amplifier.

### Applications

Designed for use in individual, analogue and digital, terrestrial and satellite TV installations, with several TV outlets. Used as a single piece of equipment to treat all terrestrial and satellite TV signals, greatly simplifying the installation. An individual satellite receiver can be connected to any of the outlets of the building.

### Characteristics

Made from ABS plastic with an internal chassis of zamak giving maximum shielding. F type connectors in nickel-plated iron which affords a connection of minimum mismatching and maximum shielding. The power supply unit is insulated from the rest of the high frequency circuit, complying with safety standards for both the installer and the user.

### Accessories

- 9020040 MM-207 UHF and VHF/FM multiplexer.
- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial cable.
- 9080023 MC-302 Male F connector for RG-6 coaxial cable, Ø 7.0 mm.
- 9120011 RS-275 F load 75 Ω.
- 9080030 MC-304 Male compression F connector for RG-6 coaxial, Ø7.0 mm.

CODE		9040073	
MODEL		CA-220	
TV System		AM-TV / DVB-T / DVB-S	
Connection		F female	
Number of outputs		4	
Number of inputs		2	
Frequency range	Band	TV	SAT
	MHz	47-862	950-2150
Gain	dB±TOL	22 ±1.0	25 ±2.0
Flatness response	dB	±1.5	±2.5
Adjustable gain range	dB	16	13
Fixed equalization		3	8
Output level	dBµV	4x107 DIN 45004B 4x104 (IMD3-60 dB) 4x88 (IMD2-60 dB)	4x107 DIN 45004B 4x91 (IMD3-35 dB)
Isolation between outputs		13 (47-862 MHz) 9 (950-2150 MHz)	
Return loss	dB	10 (47-862 MHz) 10 (950-2150 MHz) 8.7 (1750-2150 MHz)	
Chroma - luminance delay	ns	<1.3	
Noise figure	dB	<6	<7
Output voltage	V~	24	-
	mA	60	-
DC path	mA	-	400
Path 22 KHz/DiSeqC		-	Yes
Mains voltage	V~	230 ±15% 50/60 Hz	
	VA	7	
Operating temperature	°C	-10..+60	
Protection index		IP 20	
Units per packaging		1	
Packing weight	Kg	0.58	
Packing dimensions	mm	160 x 100 x 50	

IMD<sub>3</sub> - 35 dB: 2 equal carriers, EN 50083-5  
IMD<sub>2</sub> - 35 dB: 2 equal carriers, EN 50083-5



CA-620

**Description**

TV-SAT Broadband head-end amplifier with several inputs. They independently amplify the terrestrial TV and satellite IF bands, distribute both bands through the output. Has two outputs, one with both terrestrial and satellite TV amplified, the other with the terrestrial TV amplified but with the satellite signal from the SAT2 multiplexing input unamplified. It has a voltage switch and 22 KHz tone in order to select the polarity of an individual LNB. The built-in power supply unit can feed up to five preamplifiers and a LNB automatically.

**Applications**

Designed for medium to large analogue and digital SMATV installations. Used as a single piece of equipment to treat all terrestrial and satellite TV signals, greatly simplifying the installation. To amplify the second satellite polarity, it is necessary to add an external SAT amplifier.

**Characteristics**

Made from zamak and galvanised plate for maximum shielding. Separate housings for the power supply unit and the high frequency circuit. F-type connectors, located on the lower part to make installation easier.

**Accessories**

- 9040003 CA-730 Head-end SAT amplifier.
- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial cable.
- 9080023 MC-302 Male F connector for RG-6 coaxial cable, Ø7.0 mm.
- 9080030 MC-304 Male compression F connector for RG-6 coaxial, Ø7.0 mm.

CODE		9040102					
MODEL		CA-620					
TV System		AM-TV / DVB-T / FM-TV / DVB-S					
Connection		F female					
Number of outputs		2					
	Band	TV+SAT			TV		
Number of inputs		6					
Frequency range	Band	BIII/DAB	BI/FM	UHF 1	UHF 2	UHF 3	SAT
	MHz	47-108	160-254	470-862			950-2150
Gain	dB±TOL	37 ±2,0			47 ±2,0		45 ±2,0
Adjustable gain range	dB	20					
Flatness response	dB	±2.0					±3.0 ±1.5 (36 MHz)
Fixed equalization	dB	-					5
Adjustable equalization range	dB	-					7
Output level	dBµV	118 DIN 45004B 115 (IMD3 - 60 dB) 108 (IMD2 - 60 dB)					120 (IMD3 - 35 dB) 110 (IMD2 - 35 dB)



CA-620

CODE		9040102		
MODEL		CA-620		
Return loss	dB	14		
Chroma - luminance delay	ns	<20		
Noise figure	dB	<10	<9	<10
Output voltage	V $\cdots$	24 Auto		-
	mA	60		-
LNB power supply	V $\cdots$ mA Tone	-		+13/+18 350 max 0/22 KHz
Fuse	V $\sim$	250		
	A	1.6		
Mains voltage	V $\sim$	230 $\pm$ 10% 50/60 Hz		
	VA	32		
Operating temperature	$^{\circ}$ C	-10.. $+$ 65		
Protection index		IP 50D		
Units per packaging		1		
Packing weight	Kg	1.8		
Packing dimensions	mm	220 x 200 x 60		

DIN 45004B:	3 unequal carriers, IMD <sub>3</sub> at 60 dB	IMD <sub>3</sub> – 35 dB:	2 equal carriers, EN 50083-5
IMD <sub>3</sub> - 60 dB:	2 equal carriers, EN 50083-3	IMD <sub>2</sub> – 35 dB:	2 equal carriers, EN 50083-5
IMD <sub>2</sub> - 60 dB:	2 equal carriers, EN 50083-3		





CA-720

**Description**

TV-SAT Broadband head-end amplifier with several inputs. They independently amplify the terrestrial TV and satellite IF bands, distribute both bands through the output. It has a voltage switch and 22 KHz tone in order to select the polarity of an individual LNB. The built-in power supply unit can feed up to five preamplifiers and a LNB automatically.

**Applications**

Designed for medium to large analogue and digital SMATV installations. Used as a single piece of equipment to treat all terrestrial and satellite TV signals, greatly simplifying the installation. Adjusted by means of a gain controller and a variable slope control for SAT.

**Characteristics**

Made from zamak and galvanised plate for maximum shielding. Separate housings for the power supply unit and the high frequency circuit. F-type connectors, located on the lower part to make installation easier.

**Accessories**

- 9040003 CA-730 Head-end SAT amplifier.
- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial cable.
- 9080023 MC-302 Male F connector for RG-6 coaxial cable, Ø7.0 mm.
- 9080030 MC-304 Male compression F connector for RG-6 coaxial, Ø7.0 mm.

CODE		9040077					
MODEL		CA-720					
TV System		AM-TV / DVB-T / FM-TV / DVB-S					
Connection		F female					
Number of outputs		1					
Number of inputs		6					
Frequency range	Band	BIII/DAB	BI/FM	UHF 1	UHF 2	UHF 3	SAT
	MHz	47-108	160-254	470-862			950-2150
Gain	dB±TOL	41 ±2,0			51 ±2,0		45 ±2,0
Adjustable gain range	dB	20					
Flatness response	dB	±2.0					±3.0 ±1.5 (36 MHz)
Fixed equalization	dB	-					5
Adjustable equalization range	dB	-					7
Output level	dBµV	122 DIN 45004B 119 (IMD3 - 60 dB) 112 (IMD2 - 60 dB)					120 (IMD3 - 35 dB) 110 (IMD2 - 35 dB)



CA-720

CODE		9040077		
MODEL		CA-720		
Return loss	dB	14		
Chroma - luminance delay	ns	<20		
Noise figure	dB	<10	<9	<10
Output voltage	V $\cdots$	24 Auto		-
	mA	60		-
LNB power supply	V $\cdots$			+13/+18
	mA			350 max
	Tone			0/22 KHz
Fuse	V $\sim$	250		
	A	1.6		
Mains voltage	V $\sim$	230 $\pm$ 10% 50/60 Hz		
	VA	32		
Operating temperature	$^{\circ}$ C	-10...+65		
Protection index		IP 50D		
Units per packaging		1		
Packing weight	Kg	1.8		
Packing dimensions	mm	220 x 200 x 60		

DIN 45004B:	3 unequal carriers, IMD <sub>3</sub> at 60 dB	IMD <sub>3</sub> – 35 dB:	2 equal carriers, EN 50083-5
IMD <sub>3</sub> - 60 dB:	2 equal carriers, EN 50083-3	IMD <sub>2</sub> – 35 dB:	2 equal carriers, EN 50083-5
IMD <sub>2</sub> - 60 dB:	2 equal carriers, EN 50083-3		



CA-730

### Description

IF satellite broadband amplifier for head-end. It has a voltage switch and 22 KHz tone in order to select the polarity of an individual LNB. The built-in power supply unit has the capacity to feed the LNB. A terrestrial TV input permits the multiplexing of terrestrial and satellite TV bands.

### Applications

Designed for medium to large analogue and digital SMATV installations. Used as a head-end amplifier for bouquets which have all their transponders in a single polarity. Adjusted by means of a gain controller and a variable slope control.

### Characteristics

Made from zamak and galvanised plate for maximum shielding. Separate housings for the power supply unit and the high frequency circuit. Input and output connectors on the base to facilitate installation.

### Accessories

- 9120039 CM-004 Male F type connector for Ø6.6 mm coaxial.
- 9120011 RS-275 F load 75 Ω.
- 9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø 7.0 mm.
- 9080030 MC-304 Male compression F connector for RG-6 coaxial, Ø7.0 mm.

CODE		9040003
MODEL		CA-730
TV system		FM-TV / DVB-S
Number of inputs		1
Number of outputs		1
Frequency range	Band	SAT
	MHz	950 - 2.150
Gain	dB±TOL	42 ±2,0
Flatness response	dB	±3.0
		±1.5 (36 MHz)
Gain adjustment	dB	15
Fixed equalization	dB	10
Adjustable equalization range	dB	7
Output test point	dB±TOL	30 ±1,5
Extension input loss	dB±TOL	2.5 ±0,5
Maximum output level	dBµV	120 (IMD3 - 35 dB)
		110 (IMD2 - 35 dB)
Return loss	dB	10
Noise figure	dB	<8
LNB power supply	V---	+13/OFF/+17
	mA	350 max
	Tone	0/22 KHz
Fuse	V~	250
	A	1,6 (Type F)
Connectors		F female
Mains voltage	V~	230 ±15% 50/60 Hz
	VA	10
Operating temperature	°C	-10...+65
Protection index		IP 50D
Units per packing		1
Packing weight	Kg	1.8
Packing dimensions	mm	220 x 200 x 60

IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-5  
 IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-5

# 904 MULTIBAND AMPLIFIERS

## Configurable head-end amplifiers



CF-513



CA-510

### Description

Broadband head-end amplifier with five inputs. They have three UHF inputs which can be configured on request by adding low pass filters, high pass, band pass, monochannel, band rejection and channel rejection. The filters are installed during the factory manufacturing process and cannot be readjusted by the user.

### Applications

Designed for use in large, digital and analogue terrestrial MATV installations which require an amplifier adapted to the specific needs of the area. The interference from undesired channels can be avoided through the use of the built-in filters. The type of filter and the initial and final channels should be specified in the order.

### Characteristics

Made from zamak and galvanised steel plate to obtain maximum shielding. Independent housings for the power supply unit and the high frequency circuit. F type connectors in nickel-plated iron which affords a connection of minimum mismatching and maximum shielding. Input and output connectors in the lower part facilitate installation.

### Accessories

9120039 CM-004 Male F connector for Ø6.6 mm coaxial cable.

9080023 MC-302 Male F connector for RG-6 coaxial cable, Ø7.0 mm.

9080030 MC-304 Male compression F connector for RG-6 coaxial, Ø7.0 mm.

CODE	9040006						9040035					
MODEL		CA-510					CF-513					
TV System		AM-TV / DVB-T										
Connection		F female										
Number of outputs		1+Test										
Number of inputs		5					5					
Frequency range	Band	UHF 1	UHF 2	UHF 3	BIII	BI/FM	UHF 1	UHF 2	UHF 3	BIII	BI/FM	
	MHz	470-862			175-230	47-108	470-862			175-230	47-108	
Gain	dB±TOL	33 ±2.0			30 ±1.0		45			40		
Adjustable gain range	dB	20										
Flatness response	dB	±2										
Output test point	dB	-34 ±2						-30 ±1		-28 ±1		
Output level	dBµV	115 DIN 45004B 112 (IMD3 - 60 dB) 105 (IMD2 - 60 dB)										
Return loss	dB	10										
Chroma - luminance delay	ns	<20										
Noise figure	dB	≤10			≤8		≤10			≤8		
Output voltage	V---	12 Auto					24 Auto					
	mA	60										
Mains voltage	V~	230 ±15% 50/60 Hz										
	VA	8										
Operating temperature	°C	-20..+60										
Protection index		IP 50D										
Units per packaging		1										
Packing weight	Kg	1.8										
Packing dimensions	mm	220 x 200 x 60										

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB

IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3

IMD<sub>2</sub> -60 dB: 2 equal carriers, EN 50083-3

# 904 MULTIBAND AMPLIFIERS



Head-end amplifiers - 12 V $\ddot{=}$

## Description

The amplifiers are equivalent to the basic models but with different preamplifier feed voltages.

## Characteristics

The electrical characteristics are identical to those of the equivalent products, except for the preamplifier feed voltages.

## Accessories

- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial cable.
- 9080023 MC-302 Male F connector for RG-6 coaxial cable, Ø7.0 mm.
- 9120011 RS-275 F load 75Ω.



CA-215

CODE		9040061
MODEL		CA-215
Equivalent model		CA-210
Output voltage	V $\ddot{=}$	12 Switchable
	mA	60

# 904 MULTIBAND AMPLIFIERS

Accessories



DIN Rail adapter

9040078	
DI-007	
Units per packaging	1
Packing weight	0,070 Kg
Packing dimensions	182 x 70 x 12 mm

Adaptor for mounting 904 series and 906 series modules on DIN rail. This adaptor enables standard electrical boxes with DIN rail to be used for the TV connections panel.

# 904 MULTIBAND AMPLIFIERS

## Accessories



FL-100

### Description

The FL-100 filter is a rejection filter for interfering GSM mobile phone signals. The FL-200 filter consists of two combined filters high pass C/66-69 and low pass which rejects C/66-69.

### Applications

The GSM rejection filter eliminates the interference to individual and MATV terrestrial TV installations caused by mobile telephone antennas. The C/66-69 pass and reject filter is especially designed as to complement the broadband head-end amplifiers and modular equipment which amplify digital channels.

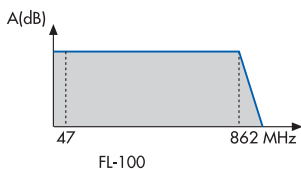
### Characteristics

Shielded zamak chassis and F type connectors.

### Accessories

- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial cable.
- 9080023 MC-302 Male F connector for RG-6 coaxial cable, Ø7.0 mm.
- 9080030 MC-304 Male compression F connector for RG-6 coaxial, Ø7.0 mm.

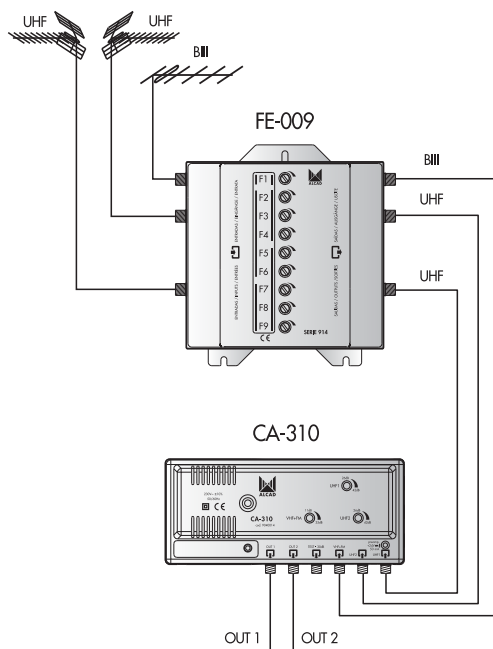
CODE		9040029
MODEL		FL-100
Connection		F female
Frequency range	MHz	47-862
Insertion loss	dB	3.5
Flatness response	dB	±0.5 ±0.25 (8 MHz)
Rejection	dB	20 (890 MHz) 35 (890 MHz)
DC path	V <sub>cc</sub>	24
	mA	500
Return loss I/O	dB	>10
Chroma - luminance delay	ns	<10
Operating temperature	°C	-10..+65
Protection index		IP 43
Units per packaging		6
Packing weight	Kg	0.45
Packing dimensions	mm	155 x 95 x 40



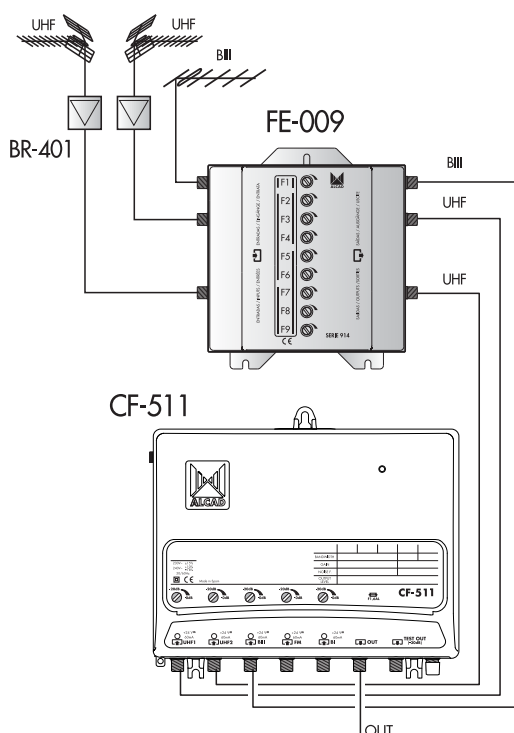
# 914 EXAMPLES OF INSTALLATION

## Head-end amplifier with cluster filter

Head-end equipment for terrestrial TV consisting of a cluster filter and a broadband amplifier. The levels of all the channels can be equalised by adjusting the attenuators of the filter before amplification. In this way the intermodulation is reduced in the broadband amplifier and an improved output level is obtained.



Head-end equipment for terrestrial TV consisting of a cluster filter and a broadband amplifier. The levels of all the channels can be equalised by adjusting the attenuators of the filter before amplification. In this way the intermodulation is reduced in the broadband amplifier and an improved output level is obtained. The amplifier automatically feeds the preamplifiers of the UHF antennas.



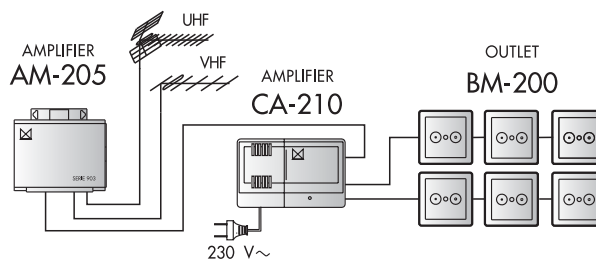


# 904

## INSTALLATION EXAMPLES

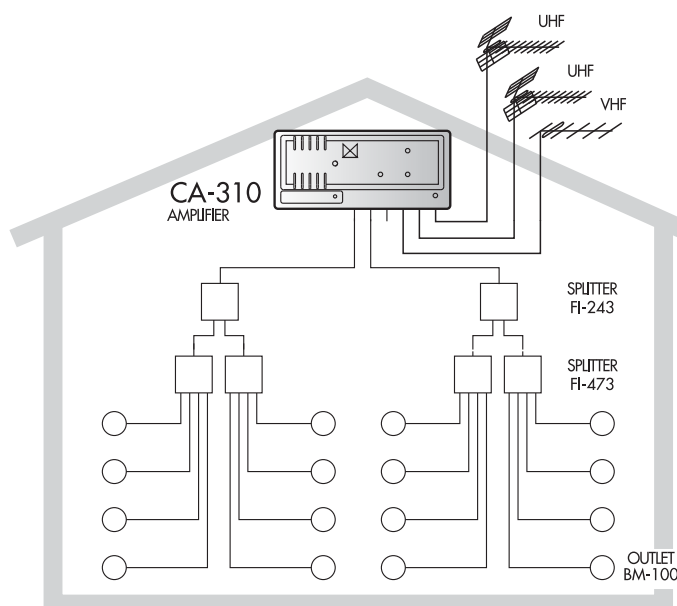
### Individual installation with head-end equipment

Individual installation of terrestrial TV with a head-end amplifier and a mast amplifier used as a preamplifier. The preamplifier is fed from the head-end amplifier. This configuration is suitable when the received signal levels are very weak.



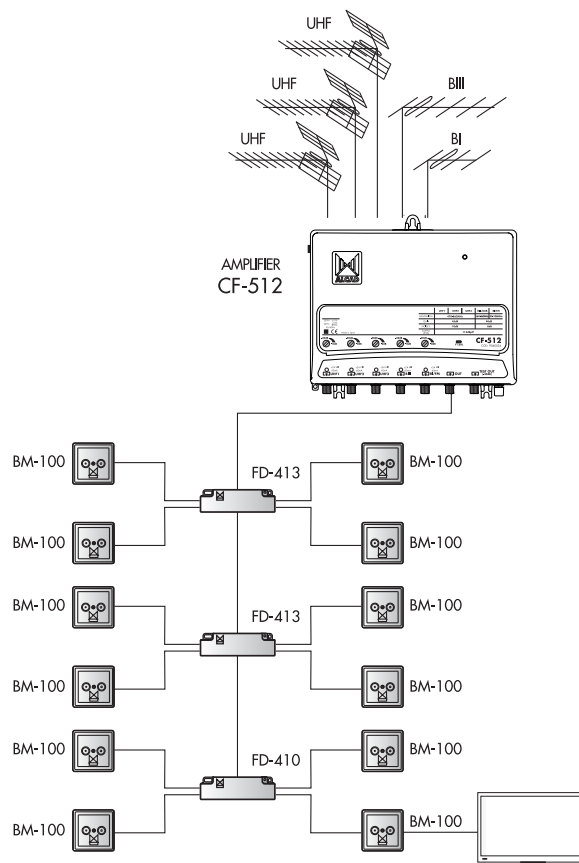
### Head-end amplifier with star-shaped distribution

MATV installation of terrestrial TV with a head-end broadband amplifier. The gain control of each input of the amplifier permits the adjustment of the levels of each antenna. The distribution is made in a star-shape using the two outputs of the amplifier and splitters. This type of installation permits the maximum number of outlets at the expense of using more coaxial cable.



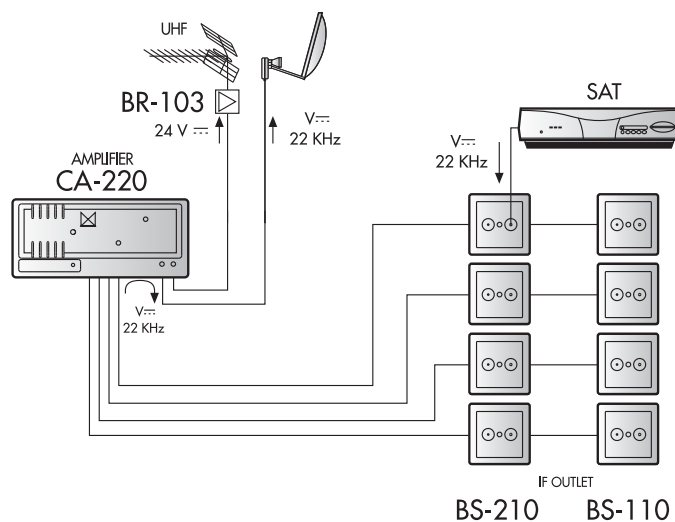
## Head-end amplifier in a tree-shaped distribution

MATV installation of terrestrial TV with a head-end broadband amplifier. The gain control of each input of the amplifier permits the adjustment of the levels of each antenna. The distribution is made in a tree-shape using tap-offs. This type of distribution permits the equalisation of the signal levels in all the outlets of the installation.



## Individual installation with TV-SAT head-end amplifier

Individual installation of terrestrial and satellite TV. The head-end amplifier is connected to a UHF antenna and to an individual parabolic antenna. A mast multiplexer should be used if the signal is received from several terrestrial TV antennas. The LNB is fed and controlled from the individual receiver, through the head-end amplifier.

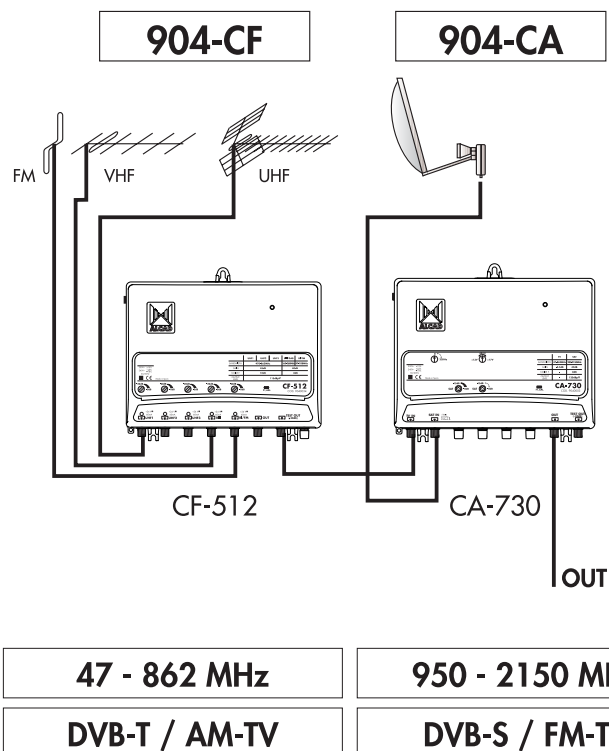


# 912

## EXAMPLES OF INSTALLATIONS

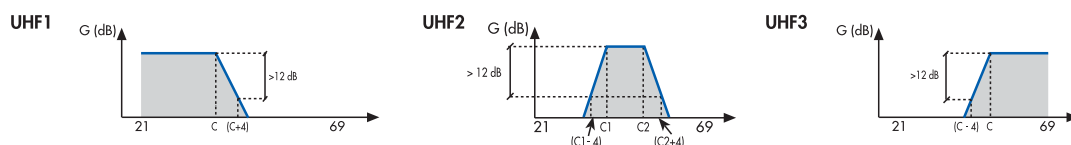
### TV-SAT head-end with broadband TV and SAT amplifiers

Terrestrial and satellite head-end reception consisting of a broadband SAT amplifier for one polarity with distribution on the IF band and a broadband amplifier for terrestrial TV.

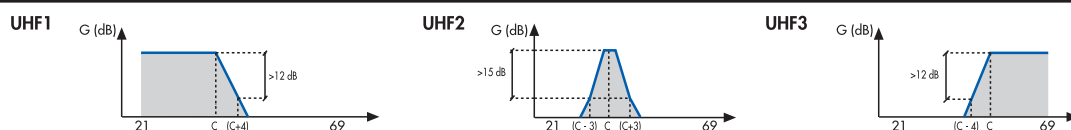


Filters for the UHF inputs of the configurable amplifiers, the filters are mounted and adjusted during the manufacturing process. Orders should specify the initial and final channels of each filter and if the filter is a pass or rejection filter.

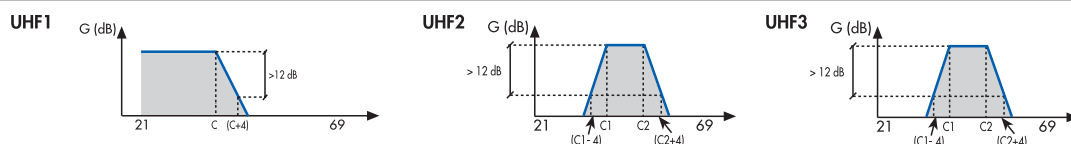
### 1 - Low pass filter, band pass and high pass



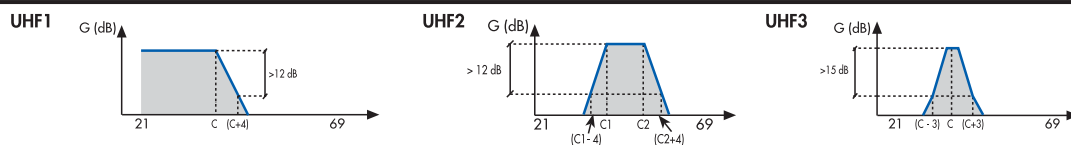
### 2 - Low pass filter, monochannel and high pass



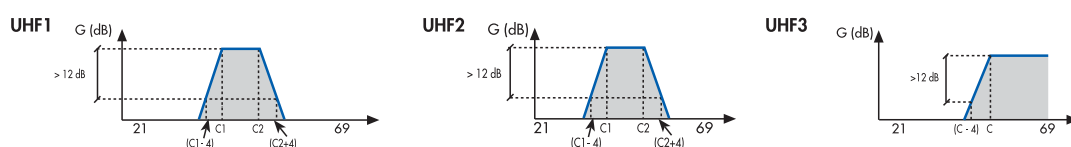
### 3 - Low pass filter, band pass and band pass



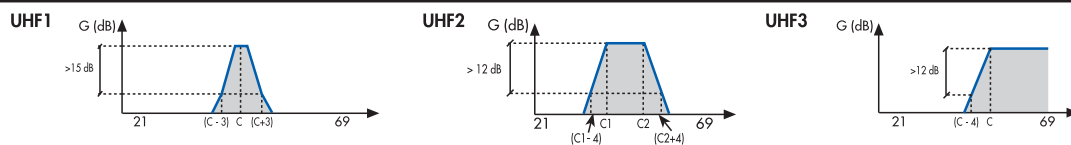
### 4 - Low pass filter, band pass and monochannel



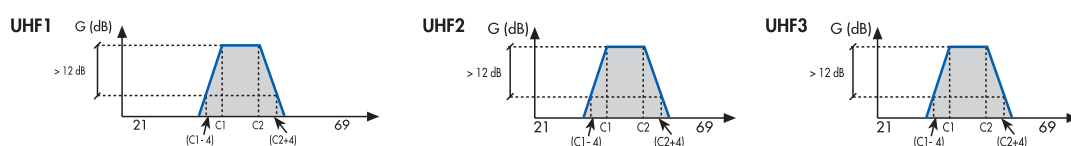
### 5 - Band pass filter, band pass and high pass



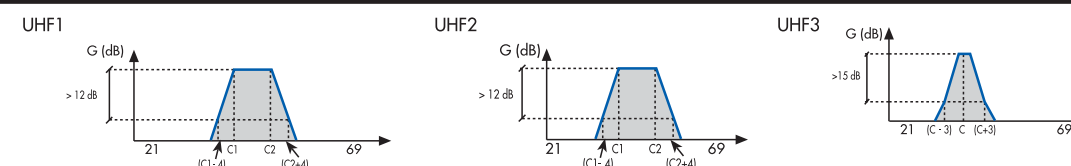
### 6 - Monochannel filter, band pass and high pass



### 7 - Band pass filter, band pass and band pass



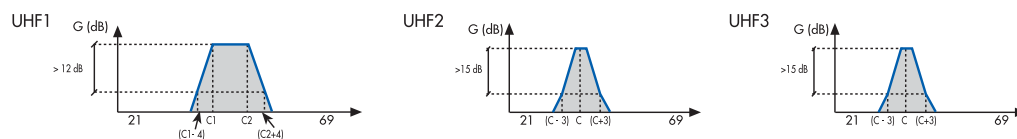
### 8 - Band pass filter, band pass and monochannel



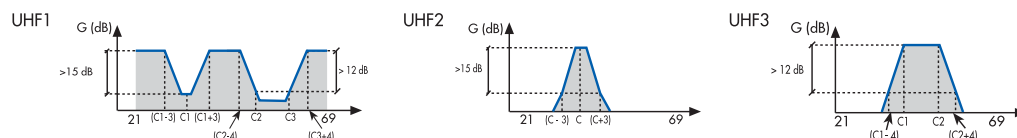
# 904 AMPLIFIER FILTERS

Filters available for configurable amplifiers

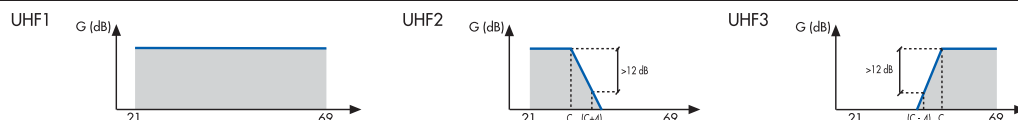
9 - Band pass filter, monochannel and monochannel



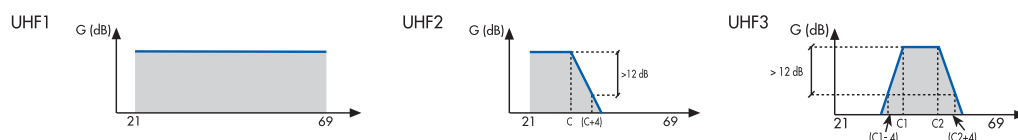
10 - Channel and band rejection filter, monochannel and band pass



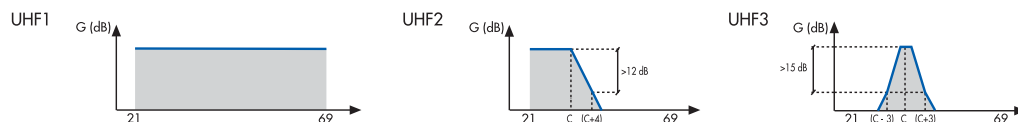
11 - Without filter, low pass filter and high pass



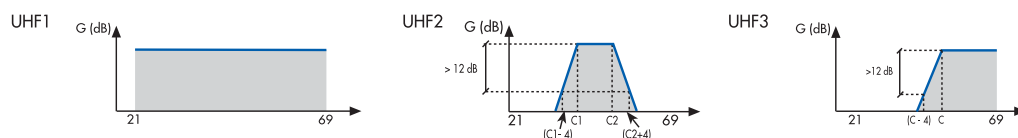
12 - Without filter, low pass filter and band pass



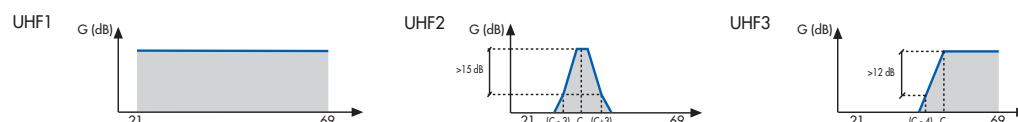
13 - Without filter, low pass filter and monochannel



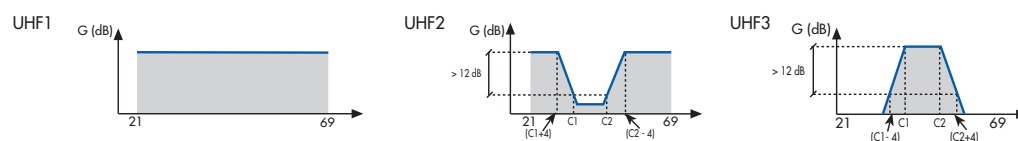
14 - Without filter, band pass filter and high pass



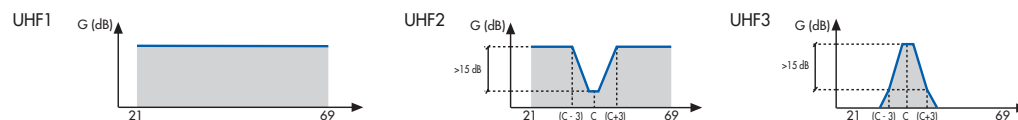
15 - Without filter, monochannel filter and high pass

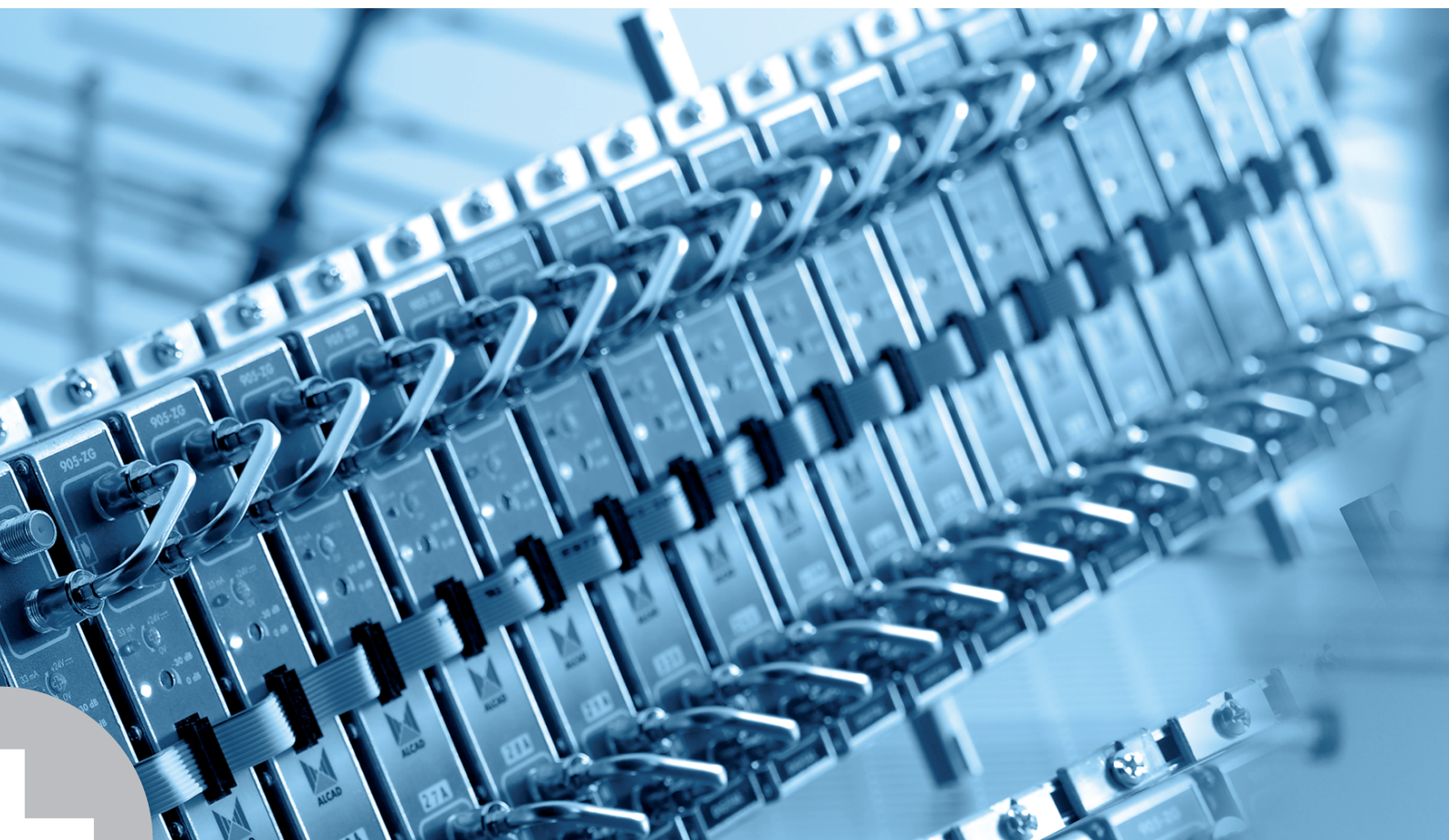


16 - Without filter, band rejection filter and band pass



17 - Without filter, channel rejection filter and monochannel









# Terrestrial TV equipment

Transmodulators, channel processors or modular amplifying equipment for large MATV installations. Channel converter equipment to organize the spectrum according to your needs.





**Description**

Modular receiver equipment of digital terrestrial TV, or COFDM-PAL transmodulators. The equipment converts DVB-T digital TV programs into terrestrial band, analogue TV channels. Consisting of a power supply unit, an amplifier and up to 6 transmodulators, which are mounted on a support frame. The modules are compatible with the B/G, D/K and I standards.

**Applications**

Digital MATV installations, where the users do not have individual terrestrial digital receiver. Areas where the reception of the analogue channels is difficult, with great differences in level between channels and for adjacent channels. Compatible with all community TV installations because the channels are distributed in the terrestrial band. Equipment recommended for installations in hotels, hospitals and other big buildings.

It is not necessary to install individual digital terrestrial TV receivers for each TV.

**Characteristics**

Reinsertion of teletext, support and inversion of dual audio, support of subtitles and programmable 4:3 or 16:9. An essential feature of this equipment is its generous operating temperature margin, which gives it great reliability. Zamak chassis with metal side covers. F type connectors. Fast and easy assembly.

**Accessories**

See page 150.



TO-559

### Description

Receiver of free-to-air digital terrestrial TV programs, or COFDM-PAL transmodulator, with a built-in modulator. Each module selects a TV program from a DVB-T digital channel and converts it into a terrestrial band analogue TV channel. Modulator with analogue stereo audio (ITU-BS 707-4) or mono. The different modules cover the B/G, D/K and I standards.

### Applications

Digital MATV installations where it is necessary to distribute digital terrestrial channels which have been converted to analogue channels. Compatible with all the MATV installations as the channels are distributed in the terrestrial band. It is not necessary to install individual receivers for each TV.

### Characteristics

Very robust DVB-T decoder with an automatic reset system in the event of the detection of errors in order to reduce maintenance of the installation. Automatic detection of the audio mode. Decoding of mono, stereo and dual audio. Modulator in VSB vestigial side band, filtered by means of a SAW surface acoustic wave filter, designed to work with adjacent channels. Supplied with multiplexing bridge and power cable.

CODE		9050147		
MODEL		TO-559		
TV System		DVB-T → AM-TV PAL B/G CCIR	DVB-T → AM-TV PAL I UK	DVB-T → AM-TV PAL D/K OIRT
Audio		Mono / Stereo / Dual (Analogue)	Mono	Mono/Stereo DK3 Dual (Analogue)
<b>COFDM receiver</b>				
Band		BIII	UHF	
Frequency range	MHz	170 - 230	470 - 862	
Frequency step	KHz	0,25		
Input level	dBμV	45..100		
Range of capture	MHz	±0,5		
Output voltage	V---	+24		
	mA	60		
Mode	Mbaud	2 K, 8 K (DVB: EN 300744)		
Modulation		QPSK, 16 QAM, 64 QAM (DVB: EN 300744)		
F.E.C.		Auto, 1/2, 2/3, 3/4, 5/6, 7/8 (DVB: EN 300744)		
Guard interval		1/4, 1/8, 1/16, 1/32 (DVB: EN 300744)		
Diplexing through loss	dB±TOL	1.0 ±0,2		
<b>RF Modulator</b>				
Frequency range	MHz	46 - 862		
Frequency step	KHz	250		
Output channel		2 - 4 5 - 12 21 - 69 S1 - S41	R1 - R4 R5 - R12 21 - 69 S1 - S41	
Modulation		VSB		



TO-559

CODE		9050147			
MODEL		TO-559			
Output level	dB $\mu$ V $\pm$ TOL	85 $\pm$ 2.0			
Output level adjustment	dB	>15			
Carrier / noise ratio (C/N)	dB	>60			
Audio signal / noise ratio	dB	>45			
Chroma-luminance delay	ns	<10			
No lineality of luminance	%	<3			
Differential gain	%	<3			
Differential phase	°	<3			
Response to the 2T pulse	%	<2			
Multiplexing through loss	%	0.9 $\pm$ 0,1			
<b>General features</b>					
Return loss		>15			
Connectors		F female			
Power supply	V $\equiv$	+3.3	+5.2	+12.0	+24.0
	mA	670	310	110	0+Preamp
Operating temperature	°C	-10..+65			
Room temp with/without fan		-10..+55/+45			
Protection index		IP 20C			
Units per packing		1			
Packing weight	Kg	1.10			
Packing dimensions	mm	265 x 165 x 40			

Programmable with PS-011



TO-569

### Description

Receiver of free-to-air digital terrestrial TV programs, or COFDM-PAL transmodulator, with a built-in modulator. Each module selects a TV program from a DVB-T digital channel and converts it into a terrestrial band analogue TV channel. Modulator with analogue stereo audio (ITU-BS 707-4) or mono. The different modules cover the B/G, D/K and I standards.

### Applications

Digital MATV installations where it is necessary to distribute digital terrestrial channels which have been converted to analogue channels. Compatible with all the MATV installations as the channels are distributed in the terrestrial band. It is not necessary to install individual receivers for each TV.

### Characteristics

Very robust DVB-T decoder with an automatic reset system in the event of the detection of errors in order to reduce maintenance of the installation. Automatic detection of the audio mode. Decoding of mono, stereo and dual audio. Modulator in VSB vestigial side band, filtered by means of a SAW surface acoustic wave filter, designed to work with adjacent channels. Supplied with multiplexing bridge and power cable.

CODE		9050155		
MODEL		TO-569		
TV System		DVB-T → AM-TV PAL B/G CCIR	DVB-T → AM-TV PAL I UK	DVB-T → AM-TV PAL D/K OIRT
Audio		Mono / Stereo / Dual (Analogue)	Mono	Mono/Stereo DK3 Dual (Analogue)
Conditional access				
Standard		DVB-CI: EN 50221 (Common Interface)		
COFDM receiver				
Band		III	UHF	
Frequency range	MHz	170 - 230	470 - 862	
Frequency step	KHz	0,25		
Input level	dBμV	45..100		
Range of capture	MHz	±0,5		
Output voltage	V <sub>cc</sub>	+24		
	mA	60		
Mode	Mbaud	2 K, 8 K (DVB: EN 300744)		
Modulation		QPSK, 16 QAM, 64 QAM (DVB: EN 300744)		
F.E.C.		Auto, 1/2, 2/3, 3/4, 5/6, 7/8 (DVB: EN 300744)		
Guard interval		1/4, 1/8, 1/16, 1/32 (DVB: EN 300744)		
Diplexing through loss	dB±TOL	1.0 ±0,2		
RF Modulator				
Frequency range	MHz	46 - 862		
Frequency step	KHz	0.25		
Output channel		2 - 4 5 - 12 21 - 69 S1 - S41	R1 - R4 R5 - R12 21 - 69 S1 - S41	



TO-569

CODE		9050155			
MODEL		TO-569			
Modulation		BLV			
Output level	dBμV±TOL	85 ±2.0			
Output level adjustment	dB	>15			
Carrier / noise ratio (C/N)	dB	>60			
Audio signal / noise ratio	dB	>45			
Chroma-luminance delay	ns	<10			
No lineality of luminance	%	<3			
Differential gain	%	<3			
Differential phase	°	<3			
Response to the 2T pulse	%	<2			
Multiplexing through loss	%	0.9 ±0,1			
General features					
Return loss		>15			
Connectors		F female			
Power supply	V---	+3.3	+5.2	+12.0	+24.0
	mA	670	310+CAM	110	0+Preamp
Operating temperature	°C	-10..+65			
Room temp with/without fan		-10..+55/+45			
Protection index		IP 20C			
Units per packing		1			
Packing weight	Kg	1.10			
Packing dimensions	mm	265 x 165 x 40			

Programable with PS-011



PA-720

**Description**

Broadband amplifier for ALCAD equipment. It has one inputs to amplify the signal coming from all the modules of the installation, and a mutliplexing input for the rest of the channels of the installation. The output level can be controlled by means of an attenuator.

**Applications**

All MATV installations where modulators are incorporated and monochannel amplifiers are not used.

**Characteristics**

Amplifier with high output level, power stage with a hybrid amplifier. Supplied with power cable.

CODE		9120093
MODEL		PA-720
TV System		AM-TV / DVB-T / DVB-C
Number of inputs		1
Frequency range	MHz	40 - 894
Gain	dB±TOL	44 ±1,0
Gain adjustment	dB	15
Output level	dBµV	119 DIN 45004B 116 (IMD3 - 60 dB) 110 (IMD2 - 60 dB) 103 (CTB - 60 dB) 103 (CSO - 60 dB) 104 (XMOD - 60 dB)
Output test point	dB±TOL	-30 ±1,0
Extension input loss	dB±TOL	0 ±2,0
Noise figure	dB	35 ±0,5
Return loss	dB	>14 - 1.5 / eighth >10
Chroma-luminance delay	ns	<10
Connectors		F female
Power supply	V---	+24
	mA	320
Operating temperature	°C	-10..+45
Room temperature with/ without fan	°C	-10..+55/+45
Protection index		IP 20C
Units per packaging		1
Packing weight	Kg	1.16
Packing dimensions	mm	265 x 165 x 40

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
 IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> -60 dB: 2 equal carriers, EN 50083-3

CTB -60 dB: 42 equal carriers, EN 50083-3  
 CSO -60 dB: 42 equal carriers, EN 50083-3  
 XMOD -60 dB: 42 equal carriers, EN 50083-3

## Power supply units



FA-310



FA-312

**Description**

Switching power supply, which permits the installation of an amplifier and different modules on the support frame. Power supply with a flat cable of 20 lines for different feed voltages.

**Applications**

Required for feeding the modules of the equipment.

**Characteristics**

Protected against power surges, overloads and short-circuits. Zamak chassis with side gills to facilitate proper ventilation. Supplied with power cable.

CODE		9120046				9120168			
MODEL		FA-310				FA-312			
Output voltage	V $\cdots$	+3.3	+5.2	+12.0	+24	+3.3	+5.2	+12.0	+24
	mA	5500	2500	1500	500	10000	5000	1500	500
Peak to peak ripple voltage	mV	>50				100			
Mains voltage	V $\sim$	230 $\pm$ 20% 50/60 Hz		240 $\begin{smallmatrix} +15\% \text{ 50/60 Hz} \\ -20\% \text{ 50/60 Hz} \end{smallmatrix}$		90..264 $\begin{smallmatrix} +15\% \text{ 50/60 Hz} \\ -20\% \text{ 50/60 Hz} \end{smallmatrix}$			
	W	72				85			
Operating temp. close to equipment	$^{\circ}\text{C}$	-10..+65							
Room tmperature with/without fan	$^{\circ}\text{C}$	-10..+55/+45							
Protection index		IP 20C							
Units per packaging		1							
Packing weight	Kg	1.43				1.65			
Packing dimensions	mm	270 x 165 x 60							

See table on page 454 for more information





### **Description**

Modular channel processing equipment for digital and analogue terrestrial TV. The equipment filters channels with high selectivity, regulates the channel level and, if necessary, converts the frequency. It consists of a power supply unit and processor modules which are mounted on a support frame. Any combination of channels can be handled, including adjacent channels with large differences of level. All its features, including the choice of input and output channels, are programmable using a programmer.

### **Applications**

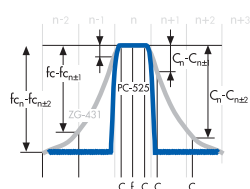
Collective digital and analogue terrestrial TV installations in areas where reception is difficult, with great differences of level between adjacent channels. Automatic gain control (AGC) enables installations to be carried out in areas where the reception level is variable. Suitable also for installations in which it is necessary to convert the frequency of the digital channels.

### **Characteristics**

Zamak chassis with metal side plates. Female F-type connectors, connection of power supply by means of flat ribbon cable with 20-pin polarised connectors. Fast and easy assembly. Filtering and frequency conversion by means of surface acoustic wave filter (SAW). The main advantages of this equipment are its high selectivity, which prevents interference between channels, and its frequency conversion without any incompatibilities.

### **Accessories**

See page 150.



PC-525

### Description

Channel processor for the UHF band, designed to work with adjacent digital and analogue channels. High selectivity and automatic gain control (AGC). Compatible B/G, I, D/K and L standards.

### Applications

For use in MATV installations of digital and analogue terrestrial TV where adjacent digital or analogue channels exist with very different levels. By selecting the same input and output channel, the processor works as a filter with AGC, handling the channels independently and eliminating interference. In this way, a perfect equalisation is obtained of all the channels received. By selecting different input and output channels, the processor functions as a programmable digital or analogue channel converter.

### Characteristics

Each module consists of an intermediate frequency converter, a double surface acoustic wave filter (SAW) and channel converter. Adjustable frequency for analogue channels in steps of 250KHz, or for digital channels in steps of 1/6 of a MHz. Automatic gain control (AGC) of 30 dB. Permits a feed path to supply power to preamplifiers.

CODE		9050146	
MODEL		PC-525	
Connection		F female	
TV System		AM-TV / DVB-T	
Input frequency range	MHz	47-862	
Output frequency range	MHz	47-862	
Bandwidth	MHz	7/8	
Frequency step I/O	MHz	0.25 AM-TV 0.5 DVB-T	
I/O Offset	MHz	-3/6, -2/6, -1/6, 0, 1/6, 2/6, 3/6 DVB-T	
Input level	dBμV	max.	85 AM-TV 75 DVB-T (dif. 16dB)
		min.	55 AM-TV 45 DVB-T
Output level	dBμV	83 ±3,0	
Output level stability	dB	±1	
Output level adjustment	dB	25	
Automatic gain control	dB	>30	
Selectivity	dB	$f_c - f_{c_{n+1}}$ $f_c - f_{c_{n+2}}$	>7 7 MHz >80 Bandwidth
		$f_c - f_{c_{n+1}}$ $f_c - f_{c_{n+2}}$	>19 8 MHz >80 Bandwidth
Channel flatness response	dB	±1	

$C_n - C_{n\pm1}$ :  $CV_n - CA_n - 1 \circ CA_n - CV_n + 1$   
 $C_n - C_{n\pm2}$ :  $CV_n - CA_n - 2 \circ CA_n - CV_n + 2$



PC-525

CODE		9050146			
MODEL		PC-525			
Frequency stability	KHz	$\pm 20$			
Multiplexing/diplexing through loss	dB	$1.4 \pm 0,2 / 0.8 \pm 0,2$			
Noise figure	dB	$13.5 \pm 1,0$			
Superious in band	dB	<58			
Return loss	dB	>14			
Phase noise	dBc/Hz	80 @ 1KHz 84 @ 10KHz 99 @ 100KHz			
Equivalent noise degradation	dB	<1.0			
DC path	V $\cdots$	24			
	mA	60			
Power supply	V $\cdots$	3.3	5.2	12.0	24.0
	mA	350	250	120	0+Preamp.
Operating temperature close to equipment	°C	-10..+65			
Room temperature with/without fan	°C	-10..+55/+45			
Protection index		IP 20C			
Units per packaging		1			
Packing weight	Kg	1,16			
Packing dimensions	mm	265 x 165 x 40			

Difference in levels with regard to adjacent channels.

Programmable with PS-011



PA-720

**Description**

Broadband amplifier for ALCAD equipment. It has one inputs to amplify the signal coming from all the modules of the installation, and a mutliplexing input for the rest of the channels of the installation. The output level can be controlled by means of an attenuator.

**Applications**

All MATV installations where modulators are incorporated and monochannel amplifiers are not used.

**Characteristics**

Amplifier with high output level, power stage with a hybrid amplifier. Supplied with power cable.

CODE		9120093
MODEL		PA-720
TV System		AM-TV / DVB-T / DVB-C
Number of inputs		1
Frequency range	MHz	40 - 894
Gain	dB±TOL	44 ±1,0
Gain adjustment	dB	15
Output level	dBµV	119 DIN 45004B 116 (IMD3 - 60 dB) 110 (IMD2 - 60 dB) 103 (CTB - 60 dB) 103 (CSO - 60 dB) 104 (XMOD - 60 dB)
Output test point	dB±TOL	-30 ±1,0
Extension input loss	dB±TOL	0 ±2,0
Noise figure	dB	35 ±0,5
Return loss	dB	>14 - 1.5 / eighth >10
Chroma-luminance delay	ns	<10
Connectors		F female
Power supply	V---	+24
	mA	320
Operating temperature	°C	-10..+45
Room temperature with/ without fan	°C	-10..+55/+45
Protection index		IP 20C
Units per packaging		1
Packing weight	Kg	1.16
Packing dimensions	mm	265 x 165 x 40

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
IMD<sub>2</sub> -60 dB: 2 equal carriers, EN 50083-3

CTB -60 dB: 42 equal carriers, EN 50083-3  
CSO -60 dB: 42 equal carriers, EN 50083-3  
XMOD -60 dB: 42 equal carriers, EN 50083-3

# 905 CHANNEL PROCESSING EQUIPMENT 905-PC



Power supply unit



FA-310



FA-312

## Description

Switching power supply, which permits the installation of an amplifier and different modules on the support frame. Power supply with a flat cable of 20 lines for different feed voltages.

## Applications

Required for feeding the modules of the equipment.

## Characteristics

Protected against power surges, overloads and short-circuits. Zamak chassis with side gills to facilitate proper ventilation. Supplied with power cable.

CODE		9120046				9120168			
MODEL		FA-310				FA-312			
Output voltage	V---	+3.3	+5.2	+12.0	+24	+3.3	+5.2	+12.0	+24
	mA	5500	2500	1500	500	10000	5000	1500	500
Peak to peak ripple voltage	mV	>50				100			
Mains voltage	V~	230 ±20% 50/60 Hz		240 +15% 50/60 Hz -20% 50/60 Hz		90..264 50/60 Hz			
	W	72				85			
Operating temp. close to equipment	°C	-10..+65							
Room tmperature with/ without fan	°C	-10..+55/+45							
Protection index		IP 20C							
Units per packaging		1							
Packing weight	Kg	1.43				1.65			
Packing dimensions	mm	270 x 165 x 60							

See table on page 454 for more information



**Description**

Programmable equipment for regenerating modulated digital DVB-T channels for the BIII and UHF bands. The equipment regenerates DVB-T digital terrestrial channels, completely rebuilding the channels throughout the VHF-UHF band and obtaining optimal signal quality. This is a modular system composed of a power supply unit, an amplifier and up to 10 regenerators, which are mounted on a support frame. All functions are programmable using PC software and/or a wireless programmer.

**Applications**

Collective digital terrestrial TV installations and installations of signal transmission or re-transmission where it is necessary to regenerate an entire DVB-T channel. Areas where the reception of digital channels is difficult due to orographic conditions or where it is desired to boost the quality of the channel considerably. Compatible with all collective TV installations since the channels are distributed throughout the terrestrial band, BI, BIII, BS and UHF.

**Characteristics**

The main features of this equipment are its great simplicity of use and the high quality of the regenerated output channel. The frequency of input channels is adjustable in steps of 250 KHz. The high selectivity prevents interference between channels and enables frequencies to be converted without incompatibilities. Zamak chassis with metal side panels. F-type connectors. The equipment can be assembled quickly and easily.

**Accessories**

See page 150.



## DVB-T Regenerator



RG-101

**Description**

DVB-T digital channel regenerator for the BIII and UHF bands. Completely rebuilds the channel throughout the VHF-UHF band, obtaining optimal signal quality. Programmable using PC software and a wireless programmer.

**Applications**

Collective digital terrestrial TV installations and signal transmission or retransmission installations where it is necessary to regenerate an entire DVB-T channel. Compatible with all collective TV installations since the channels are distributed throughout the terrestrial band, BI, BIII, BS and UHF.

**Characteristics**

Outstanding quality of the regenerated output channel. The frequency of input channels is adjustable in steps of 250 KHz. The high selectivity prevents interference between channels and enables frequencies to be converted without incompatibilities. Zamak chassis with metal side covers. F-type connectors. Supplied with diplexing and multiplexing bridges.

CODE		9050159	
MODEL		RG-101	
Connection		F female	
TV system		DVB-T / DVB-H → DVB-T / DVB-H EN 3000744	
<b>COFDM receiver</b>			
Frequency range	Band	BIII	UHF
	MHz	170-230	470-862
Frequency step	MHz	0.25	
Input offset	MHz	-3/6, -2/6, -1/6, Auto, +1/6, +2/6, +3/6	
Bandwidth	MHz	8, 7, 6	
Input level	dBμV	45..100	
Output voltage	V <sub>cc</sub>	+24	
	mA	60	
Mode		2K, 8K, 4K (DVB-H) DVB: EN 300744	
Modulation		QPSK, 16QAM, 64QAM DVB: EN 300744	
F.E.C.		1/2, 2/3, 3/4, 5/6, 7/8 DVB: EN 300744	
Guard interval		1/4, 1/8, 1/16, 1/32 DVB: EN 300744	
MER	dB	39 ±2,0	



RG-101

CODE		9050159
MODEL		RG-101
<b>RF output</b>		
Frequency range	MHz	0,9±1
Frequency step	MHz	0.25
Output level	dBμV	80 ±2,0
Output level adjustment	dB	20
Bandwidth	MHz	8, 7, 6, 5 DVB-H
Noise figure	dB	35 ±0,5
Return loss	dB	>14 - 1.5 / eighth >10
Chroma-luminance delay	ns	<10
Connectors		F female
Power supply	V---	+24
	mA	320
Operating temperature	°C	-10..+45
Room temperature with/ without fan	°C	-10..+55/+45
Protection index		IP 20C
Units per packaging		1
Packing weight	Kg	1.16
Packing dimensions	mm	265 x 165 x 40

Programmable with PS-011 and ASP.



PA-720

**Description**

Broadband amplifier for ALCAD equipment. It has one inputs to amplify the signal coming from all the modules of the installation, and a mutliplexing input for the rest of the channels of the installation. The output level can be controlled by means of an attenuator.

**Applications**

All MATV installations where modulators are incorporated and monochannel amplifiers are not used.

**Characteristics**

Amplifier with high output level, power stage with a hybrid amplifier. Supplied with power cable.

CODE		9120093
MODEL		PA-720
TV System		AM-TV / DVB-T / DVB-C
Number of inputs		1
Frequency range	MHz	40 - 894
Gain	dB±TOL	44 ±1,0
Gain adjustment	dB	15
Output level	dBµV	119 DIN 45004B 116 (IMD3 - 60 dB) 110 (IMD2 - 60 dB) 103 (CTB - 60 dB) 103 (CSO - 60 dB) 104 (XMOD - 60 dB)
Output test point	dB±TOL	-30 ±1,0
Extension input loss	dB±TOL	0 ±2,0
Noise figure	dB	35 ±0,5
Return loss	dB	>14 - 1.5 / eighth >10
Chroma-luminance delay	ns	<10
Connectors		F female
Power supply	V---	+24
	mA	320
Operating temperature	°C	-10..+45
Room temperature with/ without fan	°C	-10..+55/+45
Protection index		IP 20C
Units per packaging		1
Packing weight	Kg	1.16
Packing dimensions	mm	265 x 165 x 40

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
 IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> -60 dB: 2 equal carriers, EN 50083-3

CTB -60 dB: 42 equal carriers, EN 50083-3  
 CSO -60 dB: 42 equal carriers, EN 50083-3  
 XMOD -60 dB: 42 equal carriers, EN 50083-3

905

## SIGNAL REGENERATOR EQUIPMENT 905-RG

CE

## Power supply units



FA-310



FA-312

**Description**

Switching power supply, which permits the installation of an amplifier and different modules on the support frame. Power supply with a flat cable of 20 lines for different feed voltages.

**Applications**

Required for feeding the modules of the equipment.

**Characteristics**

Protected against power surges, overloads and short-circuits. Zamak chassis with side gills to facilitate proper ventilation. Supplied with power cable.

CODE		9120046				9120168			
MODEL		FA-310				FA-312			
Output voltage	V $\cdots$	+3.3	+5.2	+12.0	+24	+3.3	+5.2	+12.0	+24
	mA	5500	2500	1500	500	10000	5000	1500	500
Peak to peak ripple voltage	mV	>50				100			
Mains voltage	V $\sim$	230 $\pm$ 20% 50/60 Hz		240 $\begin{smallmatrix} +15\% \text{ 50/60 Hz} \\ -20\% \text{ 50/60 Hz} \end{smallmatrix}$		90..264 50/60 Hz			
	W	72				85			
Operating temp. close to equipment	$^{\circ}$ C	-10..+65							
Room tmperature with/without fan	$^{\circ}$ C	-10..+55/+45							
Protection index		IP 20C							
Units per packaging		1							
Packing weight	Kg	1.43				1.65			
Packing dimensions	mm	270 x 165 x 60							

See table on page 454 for more information

# 905 MODULAR AND PROGRAMMABLE AMPLIFIER EQUIPMENT 905-ZA

CE



**Description**

Double programmable selective filter: each module filters two adjacent channels or groups of channels. Each filter is individually programmed to be set to one channel or one group of two to four channels. The level of the channels can be adjusted automatically or manually from the broadband amplifier of the equipment.

**Applications**

Medium-sized and large digital and analogue terrestrial MATV installations. For use in areas where reception is difficult, with considerable differences in level between the channels. Normally the channel group filtering is used with one analogue channel next to several digital channels.

**Characteristics**

Filters programmable by channel or filter. Automatic gain adjustment. Filters remain highly stable in spite of variations in temperature. Automatic power supply from preamplifiers with protection against short circuits. Programmable using PC software and a wireless programmer.

**Accessories**

See page 153.



ZA-411

**Description**

Double programmable selective filter: each module filters two adjacent channels or groups of channels. Each filter is individually programmed to be set to one channel or one group of two to six channels. The level of the channels can be adjusted automatically or manually from the broadband amplifier of the equipment.

**Applications**

Medium-sized and large digital and analogue terrestrial MATV installations. For use in areas where reception is difficult, with considerable differences in level between the channels. Normally the channel group filtering is used with one analogue channel next to several digital channels.

**Characteristics**

Filters programmable by channel or filter. Automatic gain adjustment. Filters remain highly stable in spite of variations in temperature. Automatic power supply from preamplifiers with protection against short circuits.

CODE			9050126
MODEL			ZA-411
TV System			AM-TV / DVB-T
Connection			F female
Filters per module			2
Frequency range	Band		UHF
	MHz		470-862
Bandwidth of each filter	MHz		8 / 16 / 24 / 32 / 40 / 48
Frequency step I/O	MHz		0.25 AM-TV
			1.0 DVB-T
Input level	dBμV	max.	80 AM-TV 70 DVB-T
		min.	60 AM-TV 50 DVB-T
Output level	dBμV		70 ±3,0 AM-TV
			60 ±3,0 DVB-T
Maximun output level	dBμV		78 ±3,0 AM-TV DVB-T (manual adjustment)
Output level stability	dB		<1
Selectivity	dB	$P_n - P_{n\pm2}$ $P_n - P_{n\pm3}$	> 17 > 29 AM-TV
		$f_c - f_{c\pm12 \text{ MHz}}$	>22 DVB-T

$C_n - C_{n\pm1}$ :  $CV_n - CA_n - 1$  o  $CA_n - CV_n + 1$   
 $C_n - C_{n\pm2}$ :  $CV_n - CA_n - 2$  o  $CA_n - CV_n + 2$



ZA-411

CODE		9050126	
MODEL		ZA-411	
Channel flatness response	dB	$\pm 0,75$	
Diplexing through loss	dB	$0,5 \pm 0,3$ (174-862 MHz)	
Multiplexing through loss	dB	$1,0 \pm 0,1$	
Noise figure	dB	$5,0 \pm 1,0$	
Return loss	dB	$> 14$	
Output voltage	V---	+24	
	mA	60	
Power supply	V---	+5.7	+24
	mA	130	5 + Preamp.
Operating temperature close to equipment	°C	$-10..+65$	
Room temperature with/without fan	°C	$-10..+55/+45$	
Protection index		IP 20	
Units per packaging		1	
Packing weight	Kg	0,48	
Packing dimensions	mm	196 x 76 x 32	

Programmable with PS-011.





ZA-431  
ZA-331

### Description

Programmable monochannel filters for VHF and UHF with high selectivity. Each module is programmed to be set to a channel in the VHF or UHF range. The level of the channels is adjusted automatically or manually from the broadband amplifier of the equipment. Programmable using PC software and a wireless programmer.

### Applications

Medium-sized collective digital and analogue terrestrial TV installations. For use in areas where the reception is difficult, with substantial differences in level between channels.

### Characteristics

Filter which can be programmed by channel or frequency. The high selectivity makes it possible to use the filters in adjacent channels. Automatic gain adjustment. The filters remain highly stable with variations in temperature. Preamplifiers powered automatically with protection against short circuits.

CODE		9050139		9050122			
MODEL				ZA-331		ZA-431	
TV System				AM-TV / DVB-T			
Connection				F female			
Filters per module				1			
Frequency range		Band		VHF		UHF	
		MHz		174 - 238		470 - 862	
Bandwidth of each filter		MHz		7 / 8			
Frequency step I/O		MHz		0.25 AM-TV			
				0.5 DVB-T			
Input / output offset		MHz		-3/6, -2/6, -1/6, 0, +1/6, +2/6, +3/6 DVB-T			
Input level		dBμV		80 AM-TV			
				70 DVB-T			
				60 AM-TV			
				50 DVB-T			
Output level		dBμV		70 ±3,0 AM-TV			
				60 ±3,0 DVB-T			
Maximun output level		dBμV		78 ±3,0 AM-TV DVB-T (manual adjustment)			
Output level stability		dB		<1			
Selectivity		8 MHz	dB	C <sub>n</sub> - C <sub>n±1</sub>		>70 AM-TV	
				f <sub>C</sub> - f <sub>C±4 MHz</sub>		>9 DVB-T	
				f <sub>C</sub> - f <sub>C±8 MHz</sub>		>70	
Selectivity		7 MHz	dB	C <sub>n</sub> - C <sub>n+1</sub>		>70 AM-TV	
				C <sub>n</sub> - C <sub>n-1</sub>		>22	
				f <sub>C</sub> - f <sub>C±3.5 MHz</sub>		>4 DVB-T	
				f <sub>C</sub> - f <sub>C±7 MHz</sub>		>70	



ZA-431  
ZA-331

CODE		9050139		9050122	
MODEL			ZA-331	ZA-431	
Channel flatness response	dB		±0,5		
Diplexing through gain	dB		0.5 ±0,3 (174-862 MHz)		
Multiplexing through loss	dB		1.0 ±0,1		
Noise figure	dB		8.5 ±1,0		
Return loss	dB		>14		
Output voltage	V---		+24		
	mA		60		
Power supply	V---		+5.7	+24	
	mA		350	5+Preamp.	
Operating temperature close to equipment	°C		-10..+65		
Room temperature with/without fan	°C		-10..+55/ +45		
Protection index			IP 20		
Units per packing			1		
Packing weight	Kg		0.48		
Packing dimensions	mm		196 x 76 x 32		

Programmable with PS-011.



PA-320

**Description**

Broadband amplifier for the terrestrial TV filters and processors of the equipment, for analogue FM radio and digital DAB. Has built-in programming and control system for the channel filtering and processing modules. It has one input to amplify the signal coming from all the terrestrial TV modules of the equipment, plus two inputs for BIII/DAB and FM. Adjustable output level by means of an attenuator.

**Applications**

Required in all the MATV installations where any filter or process modules, of 905-ZA series, are used.

**Characteristics**

High output level amplifier. Bidirectional communication by means of the infrared universal programmer.

CODE		9050129		
MODEL		PA-320		
TV System		FM-R / DAB-T / AM-TV / DVB-T		
Number of inputs		3		
Frequency range	Band	FM	BIII / DAB-T	VHF / UHF
	MHz	87.5 - 108	170 - 230	174 - 862
Gain	dB $\mu$ V $\pm$ TOL	28 $\pm$ 2,0	36 $\pm$ 2,0	43 $\pm$ 2,0
Gain adjustment		20		20
Input level	dB $\mu$ V	65 .. 85	50 .. 70	52 .. 92
Output level	dB $\mu$ V	117 DIN45004B 114 (IMD <sub>3</sub> - 60dB) 117 (IMD <sub>2</sub> - 60dB) 101 (CTB - 60dB) 101 (CSO - 60dB) 101 (XMOD - 60dB)		
Noise figure	dB	13 typ.	10 $\pm$ 2,0	5 $\pm$ 1,0



PA-320

CODE		9050129	
MODEL		PA-320	
Return loss	dB	> 14-1.5 / Octave >10	
Chroma-luminance delay	ns	<10	
Connectors		F female	
Power supply	V $\overline{--}$	+5.7	+24
	mA	100	250
Operating temperature close to equipment	°C	-10..+65	
Room temperature with/without fan	°C	-10..+55/+45	
Protection index		IP 20	
Units per packaging		1	
Packing weight		0,49	
Packing dimensions		196 x 76 x 32	

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
IMD<sub>2</sub> -60 dB: 2 equal carriers, EN 50083-3

CTB -60 dB: 42 equal carriers, EN 50083-3  
CSO -60 dB: 42 equal carriers, EN 50083-3  
XMOD -60 dB: 42 equal carriers, EN 50083-3



AS-326

**Description**

Compact switching power supply units which permits the installation of up to 17 modules on the support frame.

**Applications**

Necessary to supply the amplification modules of the equipment. The number of modules which it can feed varies according to the consumption of the modules and of the consumption of the LNBs in the case of SAT amplifier modules. 17 modules can be fed in the case of double programmable filters.

**Characteristics**

Protected against overloads and short-circuits. Made from an aluminium profile and galvanised plate. It includes a protection fuse which the installer can access.

CODE		9050128	
MODEL		AS-326	
Output voltage	V---	+5.7	+24
Maximum output current	mA	2,800	1300
Fuse	V~	250	
	VA	5 (Type F)	
Peak to peak ripple voltage	mV	<150	
Mains voltage	V~	230 +15% 50/60 Hz	240 +10% 50/60 Hz -18% 50/60 Hz
	VA	130	
Operating temperature close to equipment	°C	-10..+65	
Room temperature with/without fan	°C	-10..+55/+45	
Protection index		IP 20	
Units per packaging		1	
Packing weight	Kg	0.50	
Packing dimensions	mm	190 x 85 x 65	

# 905

## AMPLIFICATION EQUIPMENT 905-ZG



### Description

Modular amplification equipment for analogue and digital terrestrial TV, and for analogue FM radio and DAB radio. Consists of a power supply unit and amplification modules which are mounted on a support frame. Any combination of channels can be treated, including adjacent channels with monochannel or multichannel treatment. Easily assembled and readily adaptable to any particular situation thanks to its input diplexing and output multiplexing system.

### Applications

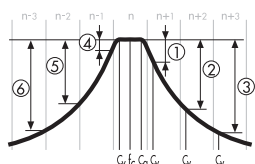
Large digital and analogue MATV installations in areas where reception is difficult, with great differences in level among channels. This equipment is recommended for installation in hotels, hospitals and other large buildings with a great number of channels.

### Characteristics

An essential feature of the equipment is its low power consumption, which makes it highly reliable. Zamak chassis with metal side plates. High-quality mechanized female F-type connectors. Connection of power supply by means of ribbon cable with 10-pin polarised connectors. Fast and easy assembly. The principal advantage of this equipment is the rapid equalisation and adjustment of all the channels in the installation in any reception conditions, including the most adverse. The equipment is compatible with the previous 905-ZG range.

### Accessories

See page 153.



ZG-611

### Description

Monochannel amplifiers designed to work with non-adjacent channels. The different modules cover the I, III and interband bands. Supplied for all the standards and tables of channels. High gain and output level. The channel should be specified in the order.

### Applications

Large, digital and analogue terrestrial MATV installations. The modules cover all the terrestrial reception signals and the interbands for channels generated locally from SAT, DVD, videos or security cameras.

### Characteristics

Each module consists of a three-stage input filter, an amplifier and an output filter which is three-stage in the higher interband and two-stage in other bands. In the higher interband, the filters are cavities. Filters remain highly stable with variations in temperature. Attenuator using an active MOSMIC regulator reduces the noise figure. 30dB multiturn attenuator. Switch to supply power to preamplifiers with protection against short circuits.

CODE		9050074			
MODEL			ZG-611		
TV System			AM-TV / DVB-T		
Connection			F female		
Number of channels			1		
Frequency range	Band		BI	BIII	Interbands
	MHz		42-70	174-231	68-175 230-470
Gain	dB±TOL		52 ±3,0		
Adjustable gain range	dB		30		
Maximun output level	dBµV		2x123.5 DIN 45004K 2x123.5 (IMD3 - 54dB) AM-TV 2x118.5 (IMD3 - 35dB) DVB-T		
Selectivity	dB	P <sub>n</sub> - P <sub>n±2</sub>	34	30	28
		P <sub>n</sub> - P <sub>n±3</sub>	50	45	42
		f <sub>c</sub> - f <sub>c±12MHz</sub>	30	27	25
Noise figure	dB		9 ±2,0		
Return loss	dB		≥ 10		
Output voltage	V <sub>cc</sub>		+24		
	mA		33		
Power supply	V <sub>cc</sub>		+24		
	mA		80		
Operating temperature close to quipment	°C		-10..+65		
Room temperature with/without fan	°C		-10..+55/+45		
Protection index			IP 20		
Units per packaging			1		40
Packing weight	Kg		0.39		16.3
Packing dimensions	mm		196 x 76 x 32		385 x 385 x 225

DIN 45004K: 3 unequal carriers, IMD<sub>3</sub> at 54 dB

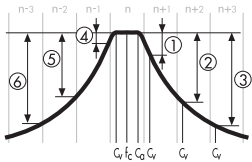
IMD<sub>3</sub> -54 dB: 3 unequal carriers, EN 50083-5

IMD<sub>3</sub> -35 dB: 2 unequal carriers, EN 50083-5

Gain and noise figure after applying gain reduction by diplexing.

$C_n - C_{n\pm 2}$ :  $CV_n - CA_{n-2} \circ CA_n - CV_{n+2}$

$C_n - C_{n\pm 3}$ :  $CV_n - CA_{n-3} \circ CA_n - CV_{n+3}$



ZG-431

**Description**

Monochannel amplifier for the UHF band designed to work with adjacent channels. It has a high gain and output level. The channel should be specified in the order.

**Applications**

Large, digital and analogue terrestrial MATV installations where adjacent analogue or digital channels exist. The different channels can be treated independently with this module, which results in a perfect equalisation of all the received channels.

**Characteristics**

Each module consists of a three-stage input filter, an amplifier and an output filter which is three-stage, the filters are cavities. Filters remain highly stable with variations in temperature. Attenuator using an active MOSMIC regulator reduces the noise figure. 30dB multistage attenuator. Switch to supply power to preamplifiers with protection against short circuits.

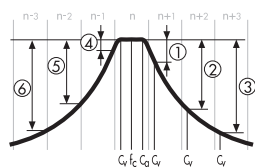
CODE		9050022	
MODEL		ZG-431	
TV System		AM-TV / DVB-T	
Connection		F female	
Number of channels		1	
Frequency range	Band	UHF	
	MHz	470-862	
Gain	dB±TOL	51 ±3,0	
Adjustable gain range	dB	30	
Maximum output level	dBµV	123 DIN 45004K	
		123 (IMD <sub>3</sub> - 54dB) AM-TV	
		118 (IMD <sub>3</sub> - 35dB) DVB-T	
Selectivity	dB	$P_n - P_{n\pm1}$	15.5
		$P_n - P_{n\pm2}$	61.0
		$f_c - f_{c\pm4MHz}$	7.5
		$f_c - f_{c\pm12MHz}$	58.0
Noise figure	dB	10 ±2,0	
Return loss	dB	≥ 10	
Output voltage	V <sub>DC</sub>	+24	
	mA	33	
Power supply	V <sub>DC</sub>	+24	
	mA	80	
Operating temperature close to equipment	°C	-10..+65	
Room temperature with/without fan	°C	-10..+55/+45	
Protection index		IP 20	
Units per packaging		1	40
Packing weight	Kg	0.42	17.5
Packing dimensions	mm	196 x 76 x 32	385 x 385 x 225

DIN 45004K: 3 unequal carriers, IMD<sub>3</sub> at 54 dB  
 IMD<sub>3</sub> -54 dB: 3 unequal carriers, EN 50083-5  
 IMD<sub>3</sub> -35 dB: 2 unequal carriers, EN 50083-5

$C_n - C_{n\pm1}$ :  $CV_n - CA_{n-1} \circ CA_n - CV_{n+1}$   
 $C_n - C_{n\pm2}$ :  $CV_n - CA_{n-2} \circ CA_n - CV_{n+2}$

Gain and noise figure after applying gain reduction by diplexing.





ZG-412  
ZG-413  
ZG-414

### Description

Multichannel amplifier for the UHF band designed to work with a group of adjacent channels. Each module permits the amplification and equalisation of two to four channels. The level of the group of channels can be adjusted but not each channel independently. High gain and output level. The initial channel of the group should be specified in the order.

### Applications

Large digital and analogue terrestrial MATV installations where adjacent analogue or digital channels exist. Recommended for use in areas of reception where the relation in levels between analogue and digital channels is constant. Normally used to amplify one analogue channel along with several digital channels.

### Characteristics

Each module consists of a three-stage input filter, an amplifier and an output filter which is three-stage, the filters are cavities. Filters remain highly stable with variations in temperature. Attenuator using an active MOSMIC regulator reduces the noise figure. 30dB multiturn attenuator. Switch to supply power to preamplifiers with protection against short circuits.

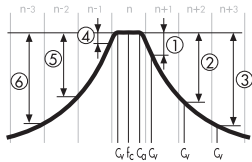
CODE			9050023	9050024	9050026
MODEL			ZG-412	ZG-413	ZG-414
TV System			AM-TV / DVB-T		
Connection			F female		
Number of channels			2	3	4
Frequency range	Band		UHF		
	MHz		470-862		
Gain	dB $\pm$ TOL		53 $\pm$ 3,0		
Adjustable gain range	dB		30		
Maximun output level	dB $\mu$ V		2x123.5 DIN 45004K 2x109.0 (IMD <sub>3</sub> - 54dB) AM-TV 2x106.0 (IMD <sub>3</sub> - 66dB) AM-TV 2x118.5 (IMD <sub>3</sub> - 35dB) DVB-T		
Selectivity	dB	$P_n - P_{n\pm 2}$	28	23	21
		$P_n - P_{n\pm 3}$	44	33	31
		$f_c - f_{c\pm 12\text{MHz}}$	26	21	19
Noise figure	dB		9 $\pm$ 2,0		
Return loss	dB		$\geq 10$		
Output voltage	V $\cdots$		+24		
	mA		33		
Power supply	V $\cdots$		+24		
	mA		80		
Operating temperature close to quipment	$^{\circ}\text{C}$		-10..+65		
Room temperature with/without fan	$^{\circ}\text{C}$		-10..+55/+45		
Protection index			IP 20		
Units per packaging			1	40	
Packing weight	Kg		0.38	15.9	
Packing dimensions	mm		196 x 76 x 32	385 x 385 x 225	

DIN 45004K: 3 unequal carriers, IMD<sub>3</sub> at 54 dB  
 DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> -66 dB: 3 unequal carriers, EN 50083-5  
 IMD<sub>3</sub> -35 dB: 2 equal carriers

Consult the table of maximum output levels when analogue and digital channels are amplified (page 160).  
 Gain and noise figure after applying gain reduction by duplexing.

$$C_n - C_{n\pm 2}: CV_n - CA_n - 2 \text{ o } CA_n - CV_n + 2$$

$$C_n - C_{n\pm 3}: CV_n - CA_n - 3 \text{ o } CA_n - CV_n + 3$$

ZG-901  
ZG-902**Description**

Multichannel amplifier for the C/66-69 or C/65-69 channels of the UHF band. Designed to work with the basic group of adjacent digital channels. Each module allows the amplification of four digital channels and the ZG-902 model also amplifies an analogue channel. The level of the group of channels can be adjusted but not each channel independently. High gain and output level.

**Applications**

Large digital and analogue terrestrial MATV installations where the group of adjacent digital channels is incorporated. Recommended for use in areas of reception where the relation in levels between analogue and digital channels is constant.

**Characteristics**

Each module consists of a three-stage input filter, an amplifier and an output filter which is three-stage, the filters are cavities. Filters remain highly stable with variations in temperature. Attenuator using an active MOSMIC regulator reduces the noise figure. 30dB multistage attenuator. Switch to supply power to preamplifiers with protection against short circuits.

CODE		9050037		9050073	
MODEL			ZG-901	ZG-902	
TV System			AM-TV / DVB-T		
Connection			F female		
Number of channels			4	5	
Frequency range	Band		C/66-69	C/65-69	
	MHz		830-862	822-862	
Gain	dB±TOL		53 ±3,0		
Adjustable gain range	dB		30		
Maximun output level	dBµV		2x123.5 DIN 45004K 2x109.0 (IMD3 - 54dB) AM-TV 2x106.0 (IMD3 - 66dB) AM-TV 2x118.5 (IMD3 - 35dB) DVB-T		
Selectivity	dB	P <sub>n</sub> - P <sub>n±1</sub>	19		
		P <sub>n</sub> - P <sub>n±2</sub>	30		
		f <sub>c</sub> - f <sub>c±12MHz</sub>	17		
Noise figure	dB		9 ±2,0		
Return loss	dB		10		
Output voltage	V---		+24		
	mA		33		
Power supply	V---		+24		
	mA		80		
Operating temperature close to quipment	°C		-10..+65		
Room temperature with/without fan	°C		-10..+55/+45		
Protection index			IP 20		
Units per packaging			1	40	
Packing weight	Kg		0.38	15.9	
Packing dimensions	mm		196 x 76 x 32	385 x 385 x 225	

DIN 45004K: 3 unequal carriers, IMD<sub>3</sub> at 54 dB  
 DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> -66 dB: 3 unequal carriers, EN 50083-5  
 IMD<sub>3</sub> -35 dB: 2 equal carriers

$C_n - C_{n\pm2}$ :  $CV_n - CA_n - 2 \circ CA_n - CV_n + 2$   
 $C_n - C_{n\pm3}$ :  $CV_n - CA_n - 3 \circ CA_n - CV_n + 3$

Consult the table of maximum output levels when analogue and digital channels are amplified (page 160).  
 Gain and noise figure after applying gain reduction by diplexing.



ZG-211  
ZG-212  
ZG-611

### Description

Analogue FM and DAB radio broadband amplifier which amplifies the entire FM or DAB radio band. Amplifies the whole FM or DAB radio band. High gain and output level. The ZG-611 amplifier amplifies the DAB digital radio by groups of channels (which should be specified when ordering). The FM amplifier is also available for OIRT frequencies (when ordering model ZG-611, please specify FM OIRT if required).

### Applications

MATV installations that include FM or DAB radio distribution.

### Characteristics

This module is compatible with other equipment for TV in the 905-ZG range. It allows distribution of FM and DAB radio and of television signals to be combined using a single piece of equipment. Attenuator by means of active MOSMIC regulator to reduce the noise figure. 30dB multiturn attenuator. Switch to supply power to preamplifiers with protection against short circuits.

CODE		9050106	9050074	9050035	9050074
MODEL		ZG-212	ZG-611	ZG-211	ZG-611
Radio System		DAB-R		FM-R	
Connection		F female			
Band width	MHz	37	6 - 12	20,5	8
Frequency range	Band	DAB-T 8A-13A	DAB-T 5A-13F	FM	FM OIRT
	MHz	195-232	174-240	87.5-108.0	66-74
Gain	dB±TOL	53 ±3,0	52 ±3,0		
Adjustable gain range	dB	30			
Maximun output level	dBµV	2x109.0 DIN 45004K 2x118.5 (IMD3 - 35dB) DVB-T			
Noise figure	dB	9 ±2,0			
Return loss	dB	≥ 10			
Output voltage	V---	+24			
	mA	33			
Power supply	V---	+24			
	mA	80			
Operating temperature close to quipment	°C	-10..+65			
Room temperature with/without fan	°C	-10..+55/+45			
Protection index		IP 20			
Units per packaging		1		40	
Packing weight	Kg	0.38		15.9	
Packing dimensions	mm	196 x 76 x 32		385 x 385 x 225	

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB

IMD<sub>3</sub> -60 dB: 3 unequal carriers, EN 50083-5

IMD<sub>3</sub> -35 dB: 2 equal carriers

Gain and noise figure after applying gain reduction by diplexing.

# 905

## AMPLIFICATION EQUIPMENT 905-ZG

### SAT amplifiers



ZF-712

#### Description

IF broadband amplifier for one polarity which amplifies the IF band from an LNB and mixes the terrestrial TV signal coming from the rest of the equipment. It feeds the LNB with the power voltage and 22 KHz signal required to obtain the desired polarity.

#### Applications

SMATV installations requiring the distribution of one satellite polarity together with the rest of the terrestrial TV channels. The distribution is made in the terrestrial TV band and the satellite IF band. Especially appropriate for bouquets which have all their transponders in a single polarity.

#### Characteristics

This module is compatible with the rest of the range of 905-ZG TV equipment. It allows the distribution of the terrestrial TV and satellite signals in a unified form from a single piece of equipment.

CODE		9050116	
MODEL		ZF-712	
TV System		FM-TV / DVB-S	
Connection		F female	
Frequency range	MHz	950-2150	
Gain	dB $\pm$ TOL	45 $\pm$ 1,0	
Flatness response	dB	$\pm$ 0,5	
Adjustable gain range	dB	20	
Fixed equalization	dB	10	
Extension input loss	dB	2.0 $\pm$ 0,5	
Output level	dB $\mu$ V	123.0 (IMD <sub>3</sub> - 35dB) 115.0 (IMD <sub>2</sub> - 35dB)	
Return loss I/O	dB	>10.0	
Noise figure	dB	7.0 $\pm$ 1,0	
LNB power supply	V $\cdots$	+12/0/+18	
	mA	350 max.	
	Tone	0/22 KHz	
Supply	V $\cdots$	+24	
	mA	145 + LNB	
Operating temperature close to quipment	°C	-10..+65	
Room temperature with/without fan	°C	-10..+55/+45	
Protection index		IP 20	
Units per packaging		1	40
Packing weight	Kg	0.50	20.0
Packing dimensions	mm	196 x 76 x 32	385 x 385 x 225

The power supply must also feed the LNB (consumption between 150 and 250 mA).

IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-5

IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-5



AS-125

**Description**

Compact switching power supply units which permits the installation of up to 18 modules on the support frame.

**Applications**

Necessary to supply the amplification modules of the equipment. The number of modules which it can feed varies according to the consumption of the modules and of the consumption of the LNBs in the case of SAT amplifier modules. 18 modules can be fed in the case of monochannel amplifiers.

**Characteristics**

Protected against overloads and short-circuits. Made from an aluminium profile and galvanised plate. It includes a protection fuse which the installer can access. Supplied with power cable with faston connector for IEC connector equipment.

CODE		9050083
MODEL		AS-125
Output voltage	V---	+24
Maximum output current	mA	1700
Fuse	V~	250
	VA	5 (Type F)
Peak to peak ripple voltage	mV	<200
Mains voltage	V~	230 +15% 50/60 Hz      240 +10% 50/60 Hz -18% 50/60 Hz
	VA	70
Operating temperature close to equipment	°C	-10...+65
Protection index		IP 20
Units per packaging		1
Packing weight	Kg	0.49
Packing dimensions	mm	190 x 85 x 65

# 905

## AMPLIFICATION EQUIPMENT 905-ZP

CE



### Description

Modular amplification equipment for analogue and digital terrestrial TV, and for analogue FM radio and DAB radio. Consists of a power supply unit and amplification modules which are mounted on a support frame. It allows the treatment of any combination of channels, including adjacent channels with monochannel or multichannel treatment. Easy assembly and easily adaptable to any particular situation due to its input diplexing and output multiplexing system.

### Applications

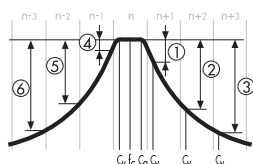
Medium-sized to large analogue and digital terrestrial MATV installations, in areas where reception is difficult, with large differences in level among the channels. Recommended equipment for installations in apartment buildings with a great number of channels.

### Characteristics

An essential feature of the equipment is its low consumption, and, as such, its excellent reliability. Zamak chassis with metal side plates. High-quality mechanized female F-type connectors. Connection of power supply by means of ribbon cable with 10-pin polarised connectors. Fast and easy assembly. The principal advantage of this equipment is the rapid equalisation and adjustment of all the channels in the installation in any reception conditions, including the most adverse. The equipment is compatible with the previous 905-ZP range.

### Accessories

See page 153.



ZP-611

### Description

Monochannel amplifiers designed to work with non-adjacent channels. The different modules cover the I, III and interband bands. Supplied for all the standards and tables of channels. The channel should be specified in the order.

### Applications

Medium-sized and large digital and analogue terrestrial MATV installations. The modules cover all the terrestrial reception signals and the interbands for channels generated locally from SAT, DVD, videos or security cameras.

### Characteristics

Each module consists of a three-stage input filter, an amplifier and an output filter which is three-stage in the higher interband and two-stage in other bands. In the higher interband, the filters are cavities. Filters remain highly stable with variations in temperature. Attenuator using an active MOSMIC regulator reduces the noise figure. 30dB multiturn attenuator. Switch to supply power to preamplifiers with protection against short circuits.

CODE		9050098			
MODEL			ZP-611		
TV System			AM-TV / DVB-T		
Connection			F female		
Number of channels			1		
Frequency range	Band		BI	BIII	Interbands
	MHz		40-70	160-230	68-175 230-470
Gain	dB±TOL		40 ±3,0		
Adjustable gain range	dB		30		
Maximun output level	dBµV		2x115.5 DIN 45004K 2x115.5 (IMD3 - 54dB) AM-TV 2x110.5 (IMD3 - 35dB) DVB-T		
Selectivity	dB	P <sub>n</sub> - P <sub>n±2</sub>	34	30	28
		P <sub>n</sub> - P <sub>n±3</sub>	50	45	42
		f <sub>c</sub> - f <sub>c±12MHz</sub>	30	27	25
Noise figure	dB		9 ±2,0		
Return loss	dB		≥ 10		
Output voltage	V <sub>cc</sub>		+24		
	mA		50		
Power supply	V <sub>cc</sub>		+24		
	mA		45		
Operating temperature close to quipment	°C		-10..+65		
Room temperature with/without fan	°C		-10..+55/+45		
Protection index			IP 20		
Units per packaging			1	40	
Packing weight	Kg		0.39	16.3	
Packing dimensions	mm		196 x 76 x 32	385 x 385 x 225	

DIN 45004K: 3 unequal carriers, IMD<sub>3</sub> at 54 dB

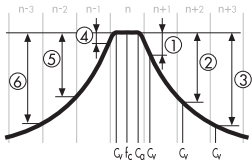
IMD<sub>3</sub> -54 dB: 3 unequal carriers, EN 50083-5

IMD<sub>3</sub> -35 dB: 2 unequal carriers, EN 50083-5

Gain and noise figure after applying gain reduction by diplexing.

$C_n - C_{n\pm 2}$ :  $CV_n - CA_{n-2} \circ CA_n - CV_{n+2}$

$C_n - C_{n\pm 3}$ :  $CV_n - CA_{n-3} \circ CA_n - CV_{n+3}$



ZP-431

### Description

Monochannel amplifier for the UHF band designed to work with adjacent channels. It has a high selectivity which permits equalize each channel independently. The channel should be specified in the order.

### Applications

Medium to large digital and analogue terrestrial MATV installations where adjacent analogue or digital channels exist. The different channels can be treated independently with this module, which results in a perfect equalisation of all the received channels.

### Characteristics

Each module consists of a three-stage input filter, an amplifier and an output filter which is three-stage, the filters are cavities. Filters remain highly stable with variations in temperature. Attenuator using an active MOSMIC regulator reduces the noise figure. 30dB multiturn attenuator. Switch to supply power to preamplifiers with protection against short circuits.

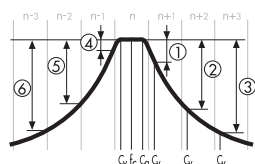
CODE		9050092	
MODEL		ZP-431	
TV System		AM-TV / DVB-T	
Connection		F female	
Number of channels		1	
Frequency range	Band	UHF	
	MHz	470-862	
Gain	dB±TOL	39 ±3,0	
Adjustable gain range	dB	30	
Maximun output level	dBµV	115.0 DIN 45004K	
		115.0 (IMD <sub>3</sub> - 54dB) AM-TV	
		115.0 (IMD <sub>3</sub> - 35dB) DVB-T	
Selectivity	dB	$P_n - P_{n\pm1}$	15.5
		$P_n - P_{n\pm2}$	61.0
		$f_c - f_{c\pm4MHz}$	7.5
		$f_c - f_{c\pm12MHz}$	58.0
Noise figure	dB	10 ±2,0	
Return loss	dB	≥ 10	
Output voltage	V <sub>cc</sub>	+24	
	mA	33	
Power supply	V <sub>cc</sub>	+24	
	mA	45	
Operating temperature close to quipment	°C	-10..+65	
Room temperature with/without fan	°C	-10..+55/+45	
Protection index		IP 20	
Units per packaging		1	40
Packing weight	Kg	0.38	15.9
Packing dimensions	mm	196 x 76 x 32	385 x 385 x 225

DIN 45004K: 3 unequal carriers, IMD<sub>3</sub> at 54 dB  
 IMD<sub>3</sub> -54 dB: 3 unequal carriers, EN 50083-5  
 IMD<sub>3</sub> -35 dB: 2 unequal carriers, EN 50083-5

$C_n - C_{n\pm1}$ :  $CV_n - CA_n - 1$  o  $CA_n - CV_n + 1$   
 $C_n - C_{n\pm2}$ :  $CV_n - CA_n - 2$  o  $CA_n - CV_n + 2$

Gain and noise figure after applying gain reduction by diplexing.





ZP-412  
ZP-413  
ZP-414

### Description

Multichannel amplifier for the UHF band designed to work with a group of adjacent channels. Each module permits the amplification and equalisation of two to four channels. The level of the group of channels can be adjusted but not each channel independently. High gain and output level. The initial channel of the group should be specified in the order.

### Applications

Medium to large digital and analogue terrestrial MATV installations where adjacent analogue or digital channels exist. Recommended for use in areas of reception where the relation in levels between analogue and digital channels is constant. Normally used to amplify one analogue channel along with several digital channels.

### Characteristics

Each module consists of a three-stage input filter, an amplifier and an output filter which is three-stage, the filters are cavities. Filters remain highly stable with variations in temperature. Attenuator using an active MOSMIC regulator reduces the noise figure. 30dB multiturn attenuator. Switch to supply power to preamplifiers with protection against short circuits.

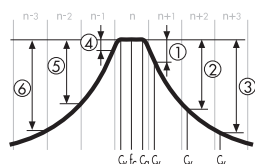
CODE	9050093		9050094		9050096
MODEL			ZP-412	ZP-413	ZP-414
TV System			AM-TV / DVB-T		
Connection			F female		
Number of channels			2	3	4
Frequency range	Band		UHF		
	MHz		470-862		
Gain	dB±TOL		40 ±3,0		
Adjustable gain range	dB		30		
Maximun output level	dBµV		2x115.5 DIN 45004K 2x98.0 (IMD3 - 66dB) AM-TV 2x110.5 (IMD3 - 35dB) DVB-T		
Selectivity	dB	P <sub>n</sub> - P <sub>n±2</sub>	28	23	21
		P <sub>n</sub> - P <sub>n±3</sub>	44	33	31
		f <sub>C</sub> - f <sub>C±12MHz</sub>	26	17	19
Noise figure	dB		9 ±2,0		
Return loss	dB		10		
Power supply	V---		+24		
	mA		45		
Operating temperature close to quipment	°C		-10..+65		
Room temperature with/ without fan	°C		-10..+55/+45		
Protection index			IP 20		
Units per packaging			1	40	
Packing weight	Kg		0.38	15.9	
Packing dimensions	mm		196 x 76 x 32	385 x 385 x 225	

DIN 45004K: 3 unequal carriers, IMD<sub>3</sub> at 54 dB  
DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
IMD<sub>3</sub> -66 dB: 3 unequal carriers, EN 50083-5  
IMD<sub>3</sub> -35 dB: 2 equal carriers

Consult the table of maximum output levels when analogue and digital channels are amplified (page 160).  
Gain and noise figure after applying gain reduction by diplexing.

$$C_n - C_{n\pm 2}: CV_n - CA_n - 2 \text{ o } CA_n - CV_n + 2$$

$$C_n - C_{n\pm 3}: CV_n - CA_n - 3 \text{ o } CA_n - CV_n + 3$$

ZP-901  
ZP-902**Description**

Multichannel amplifier for the C/66-69 or C/65-69 channels of the UHF band. Designed to work with the basic group of adjacent digital channels. Each module allows the amplification of four digital channels and the ZP-902 model also amplifies an analogue channel. The level of the group of channels can be adjusted but not each channel independently.

**Applications**

Medium to large digital and analogue terrestrial MATV installations where the group of adjacent digital channels is incorporated. Recommended for use in areas of reception where the relation in levels between analogue and digital channels is constant.

**Characteristics**

Each module consists of a three-stage input filter, an amplifier and an output filter which is three-stage, the filters are cavities. Filters remain highly stable with variations in temperature. Attenuator using an active MOSMIC regulator reduces the noise figure. 30dB multistage attenuator. Switch to supply power to preamplifiers with protection against short circuits.

CODE	9050132		9050133
MODEL	ZP-901		ZP-902
TV System	AM-TV / DVB-T		
Connection	F female		
Number of channels	4		5
Frequency range	Band	UHF	UHF
	MHz	830-862	822-862
Gain	dB±TOL	40 ±3,0	
Adjustable gain range	dB	30	
Maximum output level	dBµV	2x115.5 DIN 45004K 2x101.0 (IMD <sub>3</sub> - 54dB) AM-TV 2x98.0 (IMD <sub>3</sub> - 66dB) AM-TV 2x110.5 (IMD <sub>3</sub> - 35dB) DVB-T	
Selectivity	dB	$P_n - P_{n\pm 1}$	17
		$P_n - P_{n\pm 2}$	28
		$f_c - f_{c\pm 12MHz}$	15
Noise figure	dB	10 ±2,0	
Return loss	dB	≥ 10	
Output voltage	V <sub>---</sub>	+24	
	mA	33	
Power supply	V <sub>---</sub>	+24	
	mA	45	
Operating temperature close to equipment	°C	-10...+65	
Room temperature with/without fan	°C	-10...+55/+45	
Protection index		IP 20	
Units per packaging		1	40
Packing weight	Kg	0.51	21.0
Packing dimensions	mm	200 x 80 x 40	375 x 375 x 225

DIN 45004K: 3 unequal carriers, IMD<sub>3</sub> at 54 dB  
 DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> -66 dB: 3 unequal carriers, EN 50083-5  
 IMD<sub>3</sub> -35 dB: 2 equal carriers

$C_n - C_{n\pm 2}$ :  $CV_n - CA_n - 2 \circ CA_n - CV_n + 2$   
 $C_n - C_{n\pm 3}$ :  $CV_n - CA_n - 3 \circ CA_n - CV_n + 3$

Consult the table of maximum output levels when analogue and digital channels are amplified (page 160).  
 Gain and noise figure after applying gain reduction by diplexing.



ZP-211  
ZP-212  
ZP-611

### Description

Analogue FM and DAB radio broadband amplifier which amplifies the entire FM or DAB radio band. Amplifies the whole FM or DAB radio band. High gain and output level. The ZG-611 amplifier amplifies the DAB digital radio by groups of channels (which should be specified when ordering). The FM amplifier is also available for OIRT frequencies (when ordering model ZG-611, please specify FM OIRT if required).

### Applications

MATV installations that include FM or DAB radio distribution.

### Characteristics

This module is compatible with other equipment for TV in the 905-ZG range. It allows distribution of FM and DAB radio and of television signals to be combined using a single piece of equipment. Attenuator by means of active MOSMIC regulator to reduce the noise figure. 30dB multiturn attenuator. Switch to supply power to preamplifiers with protection against short circuits

CODE		9050108	9050098	9050097	9050098
MODEL		ZP-212	ZP-611	ZP-211	ZP-611
Radio System		DAB-R		FM-R	
Connection		F female			
Band width	MHz	37	6 - 12	20,5	8
Frequency range	Band	DAB-T 8A-13A	DAB-T 5A-13F	FM	FM OIRT
	MHz	195-232	174-240	87.5-108.0	66-74
Gain	dB±TOL	40 ±3,0			
Adjustable gain range	dB	30			
Maximun output level	dBµV	2x101 DIN 45004K 2x110.5 (IMD3 - 35dB) FM			
Noise figure	dB	9 ±2,0			
Return loss	dB	≥ 10			
Output voltage	V---	+24			
	mA	33			
Power supply	V---	+24			
	mA	45			
Operating temperature close to quipment	°C	-10..+65			
Room temperature with/without fan	°C	-10..+55/+45			
Protection index		IP 20			
Units per packaging		1		40	
Packing weight	Kg	0.38		15.9	
Packing dimensions	mm	196 x 76 x 32		385 x 385 x 225	

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB

IMD<sub>3</sub> -60 dB: 3 unequal carriers, EN 50083-5

IMD<sub>3</sub> -35 dB: 2 equal carriers

Gain and noise figure after applying gain reduction by diplexing.



ZF-712

**Description**

IF broadband amplifier for one polarity which amplifies the IF band from an LNB and mixes the terrestrial TV signal coming from the rest of the equipment. It feeds the LNB with the power voltage and 22 KHz signal required to obtain the desired polarity.

**Applications**

SMATV installations requiring the distribution of one satellite polarity together with the rest of the terrestrial TV channels. The distribution is made in the terrestrial TV band and the satellite IF band. Especially appropriate for bouquets which have all their transponders in a single polarity.

**Characteristics**

This module is compatible with the rest of the range of 905-ZP TV equipment. It allows the distribution of the terrestrial TV and satellite signals in a unified form from a single piece of equipment.

CODE		9050116	
MODEL		ZF-712	
TV System		FM-TV / DVB-S	
Connection		F female	
Frequency range	MHz	950-2150	
Gain	dB $\pm$ TOL	45 $\pm$ 1,0	
Flatness response	dB	$\pm$ 0,5	
Adjustable gain range	dB	20	
Fixed equalization	dB	10	
Extension input loss	dB	2.0 $\pm$ 0,5	
Output level	dB $\mu$ V	123.0 (IMD <sub>3</sub> - 35dB) 115.0 (IMD <sub>2</sub> - 35dB)	
Return loss I/O	dB	>10.0	
Noise figure	dB	7.0 $\pm$ 1,0	
LNB power supply	V---	+12/0/+18	
	mA	350 max.	
	Tone	0/22 KHz	
Supply	V---	+24	
	mA	145 + LNB	
Operating temperature close to quipment	°C	-10..+65	
Room temperature with/without fan	°C	-10..+55/+45	
Protection index		IP 20	
Units per packaging		1	40
Packing weight	Kg	0.50	20.0
Packing dimensions	mm	196 x 76 x 32	385 x 385 x 225

The power supply must also feed the LNB (consumption between 150 and 250 mA).

IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-5

IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-5



AS-125

**Description**

Compact switching power supply units which permits the installation of up to 18 modules on the support frame.

**Applications**

Necessary to supply the amplification modules of the equipment. The number of modules which it can feed varies according to the consumption of the modules and of the consumption of the LNBs in the case of SAT amplifier modules. 18 modules can be fed in the case of monochannel amplifiers.

**Characteristics**

Protected against overloads and short-circuits. Made from an aluminium profile and galvanised plate. It includes a protection fuse which the installer can access. Supplied with power cable with faston connector for IEC connector equipment.

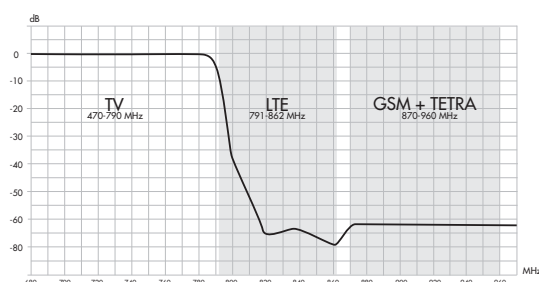
CODE		9050083
MODEL		AS-125
Output voltage	V---	+24
Maximum output current	mA	1700
Fuse	V~	250
	VA	5 (Type F)
Peak to peak ripple voltage	mV	<200
Mains voltage	V~	230 +15% 50/60 Hz      240 +10% 50/60 Hz -18% 50/60 Hz
	VA	70
Operating temperature close to equipment	°C	-10..+65
Protection index		IP 20
Units per packaging		1
Packing weight	Kg	0.49
Packing dimensions	mm	190 x 85 x 65

# 905 ACCESSORIES

## Reject LTE Filter



RB-609



### Description

Rejection filter for head-end, suppressing interfering mobile telephone signals: LTE, GSM and TETRA. Incorporates DC path to allow power to be supplied to a preamplifier.

### Applications

Suitable for collective terrestrial TV installations which are affected by the transmission of LTE mobile telephone signals in the 790-862 MHz band, and by GSM and TETRA transmissions in the 870-960 MHz band. The filter suppresses interfering signals before amplification of the TV signals at the head-end of the installation, obtaining a rejection of up to -60dB in the LTE band.

### Characteristics

Shielded zamak chassis, metal-plated, with F-type connectors. Connectors situated at the bottom to facilitate connections. Its compact design means it can be installed in a 100 x 100 mm box.

### Accessories

- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial.
- 9080023 MC-302 Male F connector for RG-6 coaxial, Ø7.0 mm.
- 9080030 MC-304 Male F-type connector for crimping on to Ø7.0mm coaxial cable.

CODE		9090041
MODEL		RB-609
Connection		F female
Inputs		1
Frequency range	Band	FM/DAB/TV
	MHz	0 - 790
Insertion Loss	dB ±TOL	1.0 ±2,0
LTE band rejection 791-862 MHz	dB	60
GSM-TETRA band rejection 870-960 MHz	dB	60
DC path	V <sub>DC</sub>	+24
	mA	300
Operating temperature	°C	-10..+65
Protection index		IP 53
Units per packaging		6
Packing weight	Kg	0.60
Packing dimensions	mm	200 x 80 x 40



Programmer

9120144	
PS-011	
Units per packaging	1
Packing weight	0,490 Kg
Packing dimensions	200 x 200 x 60 mm

Programmer for use with the entire range of ALCAD products. Two-way communication with all devices via infrared (IrDA standard). Can be updated to add new product ranges and functionalities. 3.4" colour screen. Internal memory which can be expanded via USB port and SD cards. Includes rechargeable batteries and charger. (See page 419).



Programming interface

9120100	
IP-001	
Units per packaging	1
Packing weight	0,05 Kg
Packing dimensions	85 x 20 x 40 mm

Module interface that updates the software (firmware) of the equipment and also configures the module or equipment to a computer using the software ASP. It is connected to the flat 20 lines power cable and to a PC computer, via serial RS-232 or USB.



Frame for 11 modules

9120130	
SP-226	
Units per packaging	1
Packing weight	0,74 Kg
Packing dimensions	520 x 345 x 25 mm

Support frame for power supply unit, amplifier and 10 modules or power supply unit and 11 modules. Other combinations include 2 power supply units, an amplifier and 8 modules, or 2 power supply units and 9 modules. Required for mounting the different modules of the equipment.



Frame for 9 modules for 19" rack

9120136	
SP-725	
Units per packaging	1
Packing weight	2.035 Kg
Packing dimensions	490 x 340 x 35 mm

Support frame for 19" rack with a capacity for a power supply unit, amplifier and 8 modules or power supply unit and 9 modules. Required for mounting the different modules of the equipment on a 19" rack.



Cabinet - 11 modules

9120131	
CP-226	
Units per packaging	1
Packing weight	7,88 Kg
Packing dimensions	610 x 540 x 230 mm

Metal cabinet with cover with key but without back. For the installation of equipment comprising a power supply unit, amplifier and 10 modules or power supply unit and 11 modules. Also it is possible to assemble equipment with 2 power supply units, an amplifier and 8 modules, or 2 power supply units and 9 modules. The SP-226 support frame is not included. VE-500 ventilator available as an option.

# 905 ACCESSORIES



## Accessories for equipment 905-TO/PC/RG



Cabinet - 22 modules

9120032	
CP-426	
Units per packaging	1
Packing weight	10,12 Kg
Packing dimensions	820 x 610 x 230 mm

Metal cabinet with cover with key but without back. For the installation of two modular sets of equipment with power supply unit, amplifier and 10 modules or power supply unit and 11 modules. Other combinations include 2 power supply units, an amplifier and 8 modules, or 2 power supply units and 9 modules. The SP-226 support frame is not included. VE-500 ventilator optionally available.



Multiplexers for head-ends

912-MF
--------

Multiplexers with two inputs which combine the output channels of the satellite receivers in installations with a great number of channels, maintaining a high carrier to C/N noise ratio. (See page 394).



Male type F connector

9120039	
CM-004	
Units per packaging	100
Packing weight	0,340 Kg
Packing dimensions	130 x 100 x 20 mm

Shielded male F connector to screw onto shielded RG-6 coaxial cable of Ø 6.5mm to Ø 6.8mm



Male type F connector

9080023	
MC-302	
Units per packaging	25
Packing weight	0,10 Kg
Packing dimensions	80 x 80 x 100 mm

Male F connector to screw onto RG-6 coaxial cable, Ø6.9 - 7.2 mm.



F load

9120011	
RS-275	
Units per packaging	10
Packing weight	0,03 Kg
Packing dimensions	80 x 50 x 15 mm

F charge of 75  $\Omega$  to charge the unused inputs and outputs..



Dispensing bridge, F-type

9120064	
PU-101	
Units per packaging	12
Packing weight	0,14 Kg
Packing dimensions	120 x 60 x 35 mm

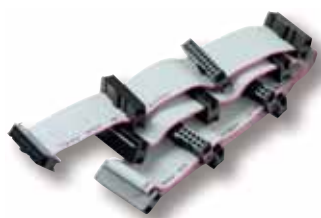
Multiplexing and diplexing bridge with high-speed male F-type connector, to combine the signal of the modules.



# 905 ACCESSORIES



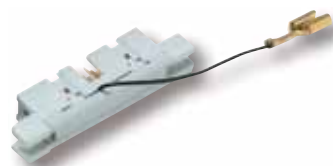
## Accessories for equipment 905-TO/PC/RG



Power and data cable

9120105	
LS-207	
Units per packaging	1
Packing weight	0,05 Kg
Packing dimensions	190 x 25 x 100 mm

Flat power cable of 20 lines, to connect the power supply and 11 modules.



Voltage adapter

9120102	
LA-100	
Units per packaging	1
Packing weight	0,01 Kg
Packing dimensions	80 x 70 x 20 mm

Power cable with voltage adapter which permits the addition of 905-ZG or 905-ZP modules to equipment with a FA-310 power supply unit.



Ventilator

9050043	
VE-500	
Units per packaging	1
Packing weight	0,62 Kg
Packing dimensions	150 x 120 x 50 mm

Ventilator for CP-710 cabinet – this may be required in warm environments to keep the equipment within its operating temperature margins.



UHF Preamplifier

9090028	
PR-200	
Units per packaging	1
Packing weight	0,02 Kg
Packing dimensions	100 x 80 x 15 mm

14dB UHF preamplifier, remote-fed at 24 Vdc with F type connectors.



UHF Preamplifier

9090029	
PR-310	
Units per packaging	100
Packing weight	0,340 Kg
Packing dimensions	130 x 100 x 20 mm

10dB 5-2400MHz preamplifier with dc path, remote-fed at 13/18Vdc with F type connectors.

# 905 ACCESSORIES



## Accessories for equipment 905-ZA/ZG/ZP



Support frame for 12 modules

<b>9050100</b>	
<b>SP-126</b>	
Units per packaging	1
Packing weight	0,53 Kg
Packing dimensions	520 x 270 x 25 mm

Support frame for power supply unit and 12 modules. Required for mounting the different modules of the equipment.



Support frame for 18 modules

<b>9050125</b>	
<b>SP-128</b>	
Units per packaging	1
Packing weight	0,71 Kg
Packing dimensions	725 x 270 x 25 mm

Support frame for power supply and 18 modules. Required for mounting the different modules of the equipment.



Support frame for 4 modules

<b>9050099</b>	
<b>SP-122</b>	
Units per packaging	1
Packing weight	0,23 Kg
Packing dimensions	270 x 235 x 25 mm

Support frame for power supply unit and 4 modules. For increasing the size of an installation or installing SAT amplifiers for the four polarities of a satellite.



Cabinet - 12 modules

<b>9050124</b>	
<b>CP-126</b>	
Units per packaging	1
Packing weight	4,96 Kg
Packing dimensions	610 x 360 x 175 mm

Metallic cabinet without back and with cover with key. Permits the installation of equipment with a power supply unit and 12 modules. The SP-122 support frame is not included.



Cabinet - 18 modules

<b>9050136</b>	
<b>CP-128</b>	
Units per packaging	1
Packing weight	6,13 Kg
Packing dimensions	820 x 360 x 175 mm

Metallic cabinet without back and with cover with key. Permits the installation of equipment with a power supply unit and 18 modules. The SP-128 support frame is not included.



Cabinet - 22 modules

<b>9120132</b>	
<b>CP-426</b>	
Units per packaging	1
Packing weight	10,12 Kg
Packing dimensions	820 x 610 x 230 mm

Metal cabinet with cover with key but without back. For the installation of two modular sets of equipment with power supply unit, amplifier and 10 modules or power supply unit and 11 modules. Other combinations include 2 power supply units, an amplifier and 8 modules, or 2 power supply units and 9 modules. The SP-226 support frame is not included. VE-500 ventilator optionally available.



GSM rejection filter

9040029	
FL-100	
Units per packaging	6
Packing weight	0,45 Kg
Packing dimensions	155 x 95 x 40 mm

Rejection filter for interfering GSM mobile telephony signals (see page 95).



UHF Preamplifier

9090028	
PR-200	
Units per packaging	1
Packing weight	0,02 Kg
Packing dimensions	100 x 80 x 15 mm

14dB UHF preamplifier, remote-fed at 24 Vdc with F type connectors.



UHF Preamplifier

9090044	
PR-201	
Units per packaging	100
Packing weight	0,340 Kg
Packing dimensions	130 x 100 x 20 mm

14 dB UHF preamplifier, with Faston connector to be powered at 24Vdc.



Preamplifier

9090029	
PR-310	
Units per packaging	100
Packing weight	0,340 Kg
Packing dimensions	130 x 100 x 20 mm

10dB 5-2400MHz preamplifier with dc path, remote-fed at 13/18Vdc with F type connectors.



Current injector 24 Vdc

9090043	
IM-123	
Units per packaging	1
Packing weight	0,020 Kg
Packing dimensions	15 x 80 x 100 mm

Power injector for preamplifiers, fed from the power supply unit of the equipment via a Faston connector.



Male type F connector

9120039	
CM-004	
Units per packaging	100
Packing weight	0,340 Kg
Packing dimensions	130 x 100 x 20 mm

Shielded male F connector to screw onto shielded RG-6 coaxial cable of Ø6.5mm to Ø 6.8mm



Programmer

9120144	
PS-011	
Units per packaging	1
Packing weight	0,490 Kg
Packing dimensions	200 x 200 x 60 mm

Programmer for use with the entire range of ALCAD products. Two-way communication with all devices via infrared (IrDA standard). Can be updated to add new product ranges and functionalities. 3.4" colour screen. Internal memory which can be expanded via USB port and SD cards. Includes rechargeable batteries and charger. (See page 419).

# 905 ACCESSORIES



## Accessories for equipment 905-ZA/ZG/ZP



Programming interface

<b>9120100</b>	
<b>IP-001</b>	
Units per packaging	1
Packing weight	0,05 Kg
Packing dimensions	85 x 20 x 40 mm

Module interface that allows connect ALCAD equipments to a computer in order to configure or update them. It is connected to the flat 20 lines power cable and to a computer via serial RS-232 or USB.



Programming interface

<b>9050148</b>	
<b>IP-102</b>	
Units per packaging	1
Packing weight	0.530 Kg
Packing dimensions	30 x 90 x 130mm

Module interface that configure the 905-ZA equipment without PA-320. It is connected to the flat 10 lines power cable and receives via infrared the commands from PS-011 programmer.



Shielded male IEC connector

<b>9080025</b>	
<b>MC-000</b>	
Units per packaging	10
Packing weight	0,350 Kg
Packing dimensions	150 x 100 x 20 mm

Shielded Ø9.52mm right-angle IEC male connector. Avoids feedback in head-end equipment.



Shielded male IEC connector

<b>9080006</b>	
<b>MC-001</b>	
Units per packaging	10
Packing weight	0,11 Kg
Packing dimensions	150 x 120 x 20 mm

Shielded male IEC connector, Ø9.52 mm, for head-end equipment with IEC connector, suitable for frequencies ranging from 5 to 2,400 MHz. Shielding of 70 dB between 5 and 862 MHz, and of 60 dB between 950 and 2,400 MHz. Avoids feedback in head-end equipment.



Diplexing bridge, F-type

<b>9050102</b>	
<b>PZ-010</b>	
Units per packaging	10
Packing weight	0,11 Kg
Packing dimensions	130 x 175 x 15 mm

Multiplexing and diplexing bridge with high-speed male F-type connector, to combine the signal of the modules or for the distribution of the signal from one antenna to several modules. For equipment with prototype connector.



F-IEC diplexing bridge

<b>9050119</b>	
<b>PZ-020</b>	
Units per packaging	10
Packing weight	0,18 Kg
Packing dimensions	80 x 50 x 15 mm

Multiplexing and diplexing bridge with F-type male connector and IEC male Ø9.52 mm connector for combining signals from all modules or for distributing the signal from one antenna to several modules. Can be used to add a module to or to replace a module with IEC connector using modules with F-type connector.



F load insulated

<b>9080019</b>	
<b>RC-110</b>	
Units per packaging	10
Packing weight	0,18 Kg
Packing dimensions	80 x 50 x 15 mm

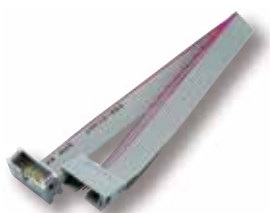
Insulated load of 75 Ω with F-type male connector, to load all the unused inputs and outputs. In equipment with F-type connectors, it is necessary to use insulated loads.



Ribbon power cable

9050104	
LT-107	
Units per packaging	1
Packing weight	0,07 Kg
Packing dimensions	250 x 125 x 4 mm

Ribbon power cable with 10-pin connectors for 1 power supply unit, 18 modules and control module.



Flat power supply cable extension

9050118	
LT-100	
Units per packaging	1
Packing weight	0,01 Kg
Packing dimensions	110 x 80 x 15 mm

Extension of flat power supply cable to feed modules installed on a separate support frame.



Power supply cable adaptor

9050121	
LT-112	
Units per packaging	1
Packing weight	0,01 Kg
Packing dimensions	10 x 80 x 1105 mm

Double faston connector adaptor to 10-pin female connector, for replacing a module with an IEC connector with a module with an F-type connector.



Power supply cable adaptor

9050120	
LT-102	
Units per packaging	1
Packing weight	0,01 Kg
Packing dimensions	10 x 80 x 1105 mm

Faston connector adaptor to 10-pin male connector, for adding modules with F-type connectors to the end of equipment with IEC connectors. An LT-107 power supply cable is also required.



Ventilator

9050043	
VE-500	
Units per packaging	1
Packing weight	0,62Kg
Packing dimensions	150 x 1200 x 50 mm

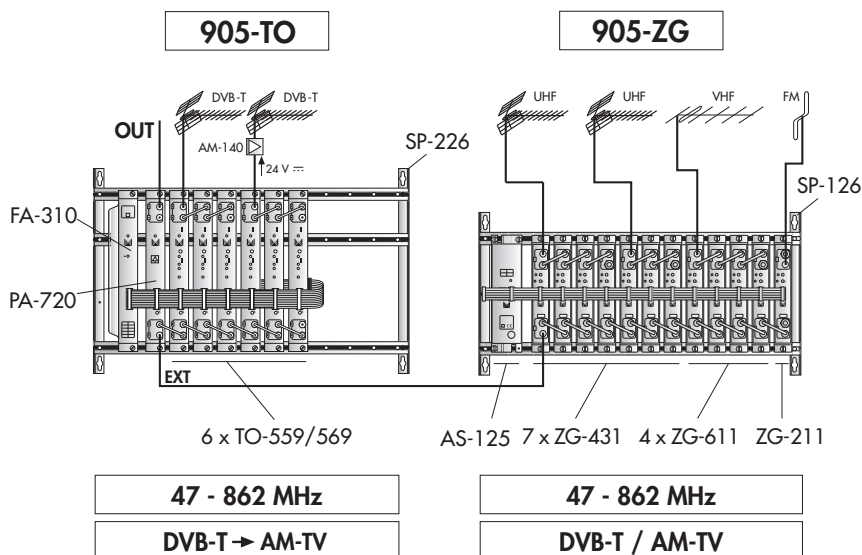
Ventilator for CP-710 cabinet – this may be required in warm environments to keep the equipment within its operating temperature margins.

# 905

## EXAMPLES OF INSTALLATION

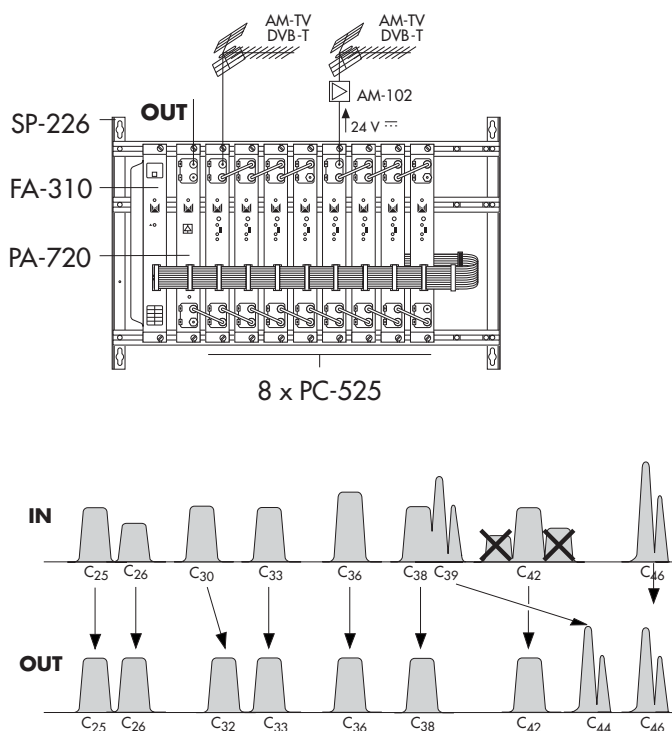
### TV head-end with COFDM-PAL transmodulators

Analogue and digital terrestrial head-end reception consisting of a set of COFDM-PAL Transmodulators for digital terrestrial channels with RF distribution and a set of monochannel amplifiers for analogue terrestrial TV.



### Equipment with channel processors

Channel processor equipment (905-PC) installed with monochannel amplifiers where it is shown how to mount the modules. It is recommended to connect the multiplexing and demultiplexing bridge as referred in the schema. It is necessary to use isolated F loads to avoid shortcircuits on the diplexing in case a preamplifier is used on the installation.

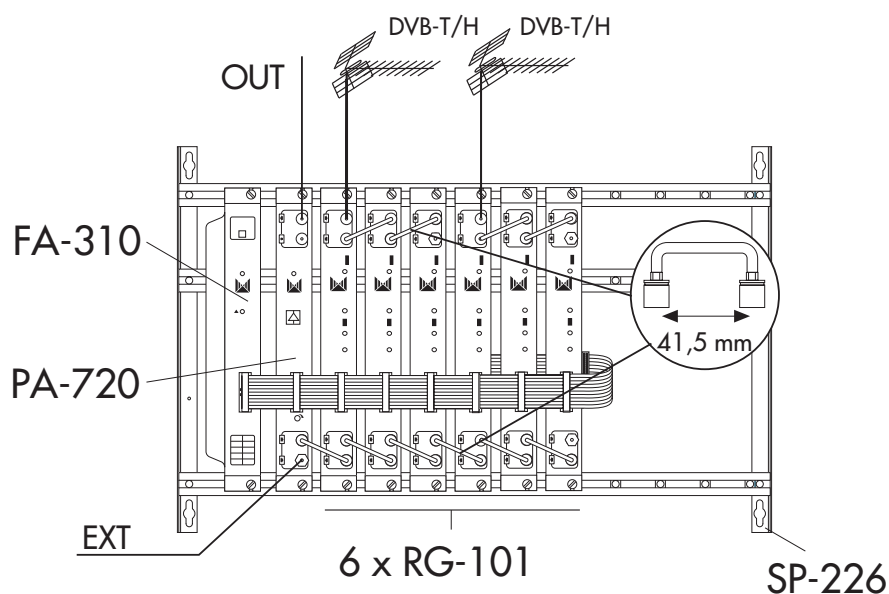


# 905

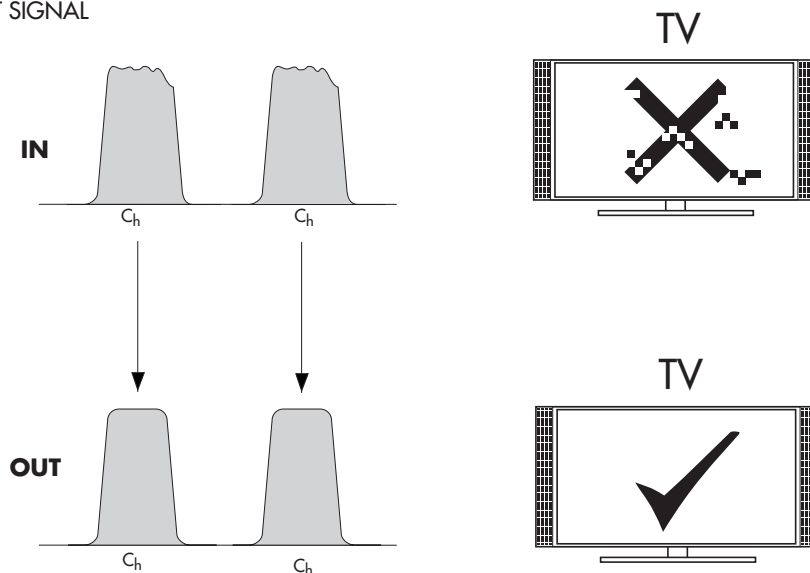
## EXAMPLES OF INSTALLATION

### Equipment with DVB-T/H signal regenerators

905-RG channel regeneration equipment showing how the equipment is assembled and the operation of the modules. Each module regenerates a digital channel in DVB-T, ensuring that the signal quality of the channel is optimised for distribution.



#### DVB-T SIGNAL

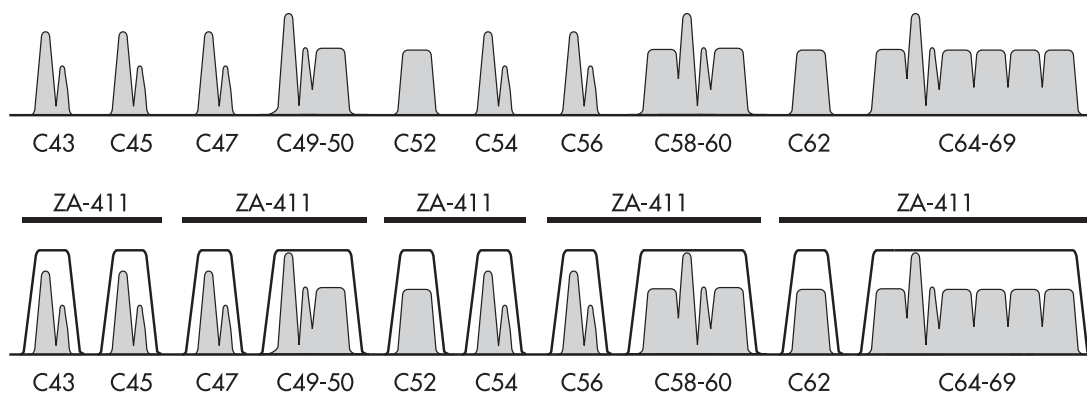


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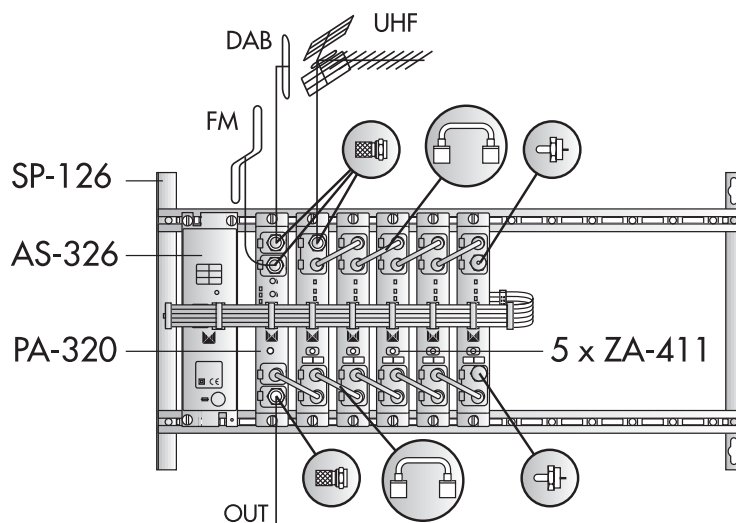
## EXAMPLES OF INSTALLATION

### Programmable amplification equipment

Complete equipment of 905-ZA series where it is shown how to mount the modules and how the work. Each module can be programmed as monochannel filter or multichannel filter (amplifying several channels), typically one analogic channel and some digital channels.



The minimum separation between filters must be 8 Mhz



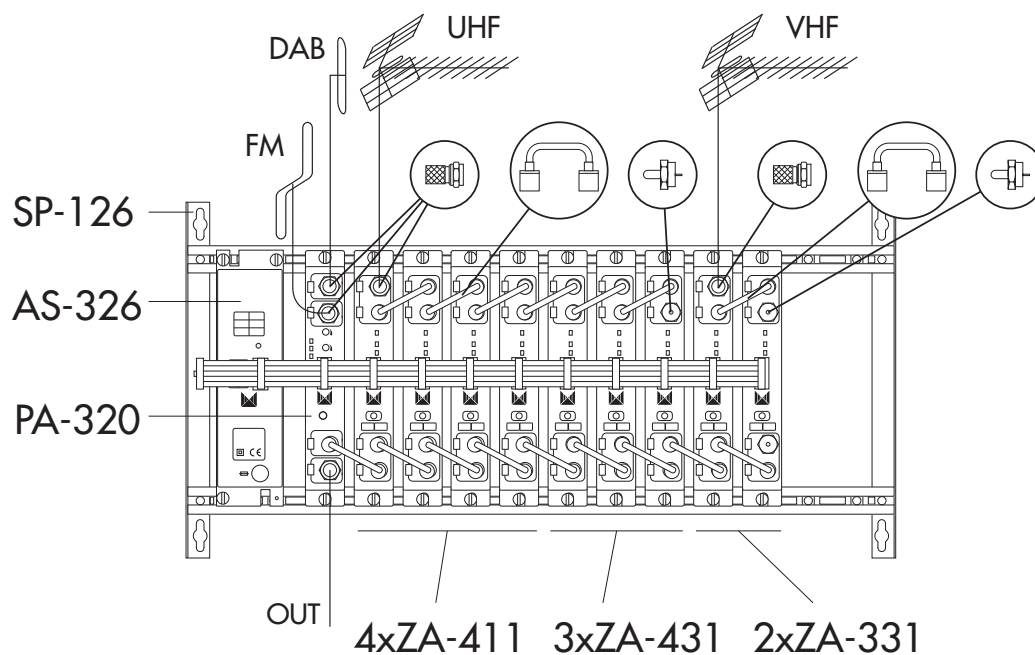
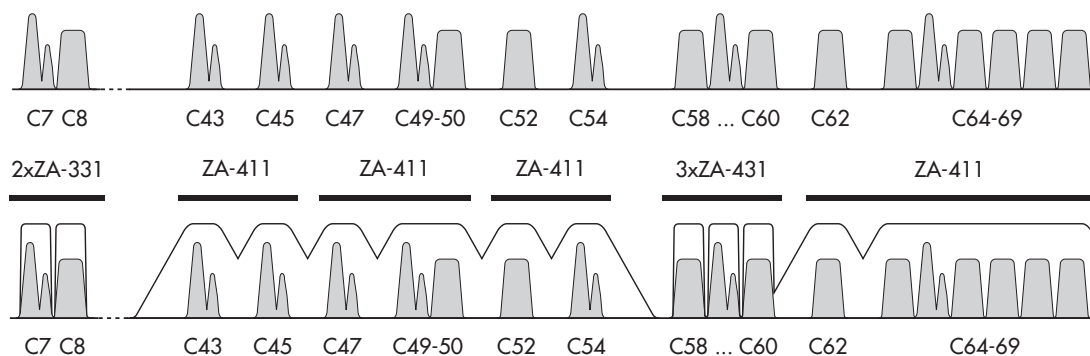


# 905

## EXAMPLES OF INSTALLATION

### Programmable amplification equipment

Complete equipment of 905-ZA series where it is shown how to mount the modules and how the work. Each module ZA-411 can be programmed as double multichannel filter, the ZA-431 can be programmed as high selectivity filter for UHF adjacent channels. The ZA-331 can be programmed as high selectivity filter for VHF adjacent channels.

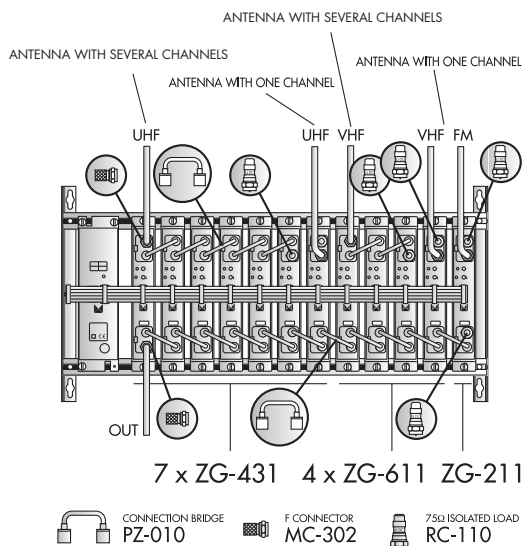


# 905

## EXAMPLES OF INSTALLATION

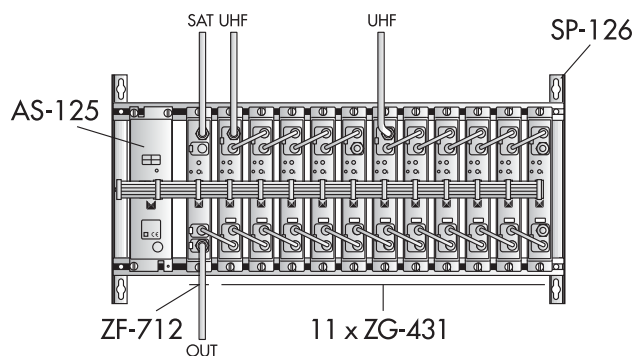
### Equipment with monochannel amplifiers

Complete 905-ZG or 905-ZP equipment showing the method of assembly. The modules should be connected with the multiplexing and diplexing bridges as shown in the drawing. Insulated F loads of 75Ω should be used to avoid short circuits in the diplexing bridge when the power supply of the preamplifiers is activated.



### Equipment with monochannel amplifiers

Complete 905-ZG or 905-ZP equipment with a satellite module. The modules of the terrestrial channels are mixed with the SAT module by means of a multiplexing bridge. It is advisable to check that the consumption of all the modules and of the LNB does not exceed the capacity of the power supply unit.

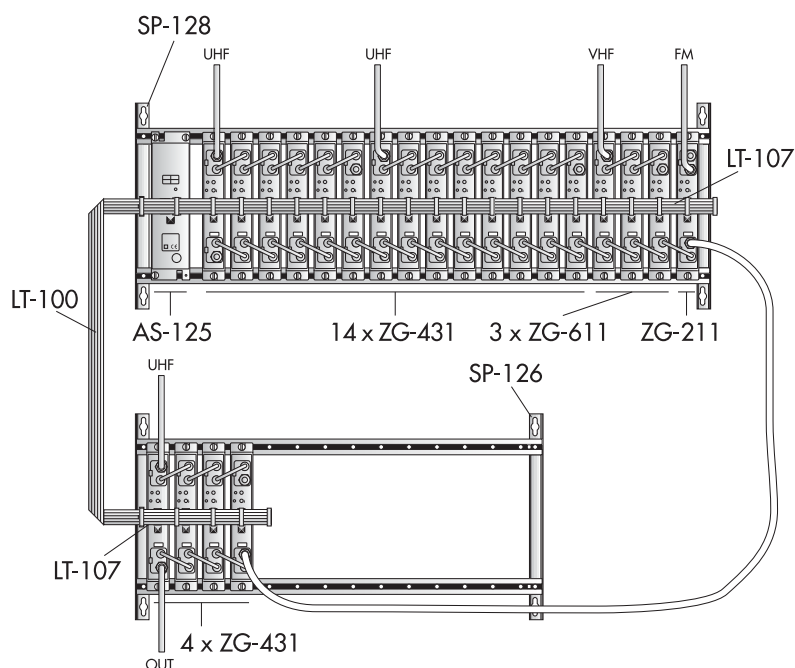


# 905

## EXAMPLES OF INSTALLATION

### Equipment with two support frames

905-ZG or 905-ZP equipment mounted on two support frames to increase the number of modules. With the SP-128 frame it is possible to mount up to 18 modules. With two SP-128 support frames, it is possible to mount up to 36 modules. The maximum possible number of modules is determined by the maximum current which the power supply unit is able to provide.

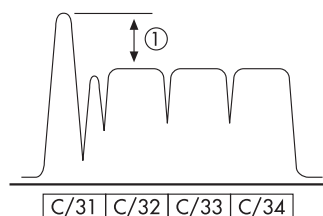


### Output level for multichannel amplifiers

The multichannel amplifiers can amplify several analogue and digital channels, normally one analogue channel and several digital channels. In this case, the maximum output level will depend on the difference in level between the analogue channel and the digital channels.

ZG-412/413/414		
ZG-901/902		
① Difference	Analogue AM-TV	Digital DVB-T
dB	dB $\mu$ V	dB $\mu$ V
0	117.0	117.0
3	120.0	117.0
5	122.0	117.0
7	123.5	116.5
<b>10</b>	<b>123.5</b>	<b>113.5</b>
15	123.5	108.5
20	123.5	103.5

	Analogue AM-TV
	Digital DVB-T

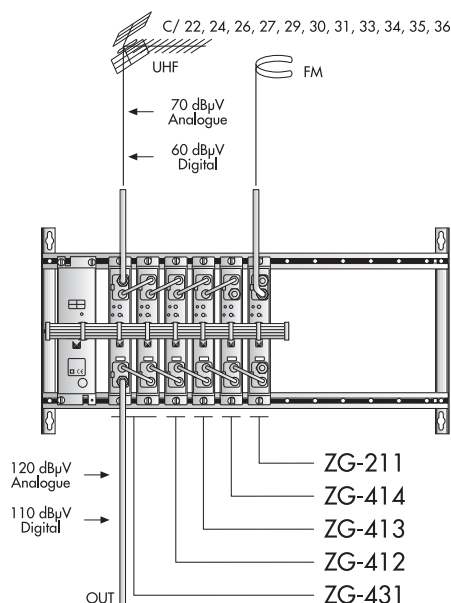
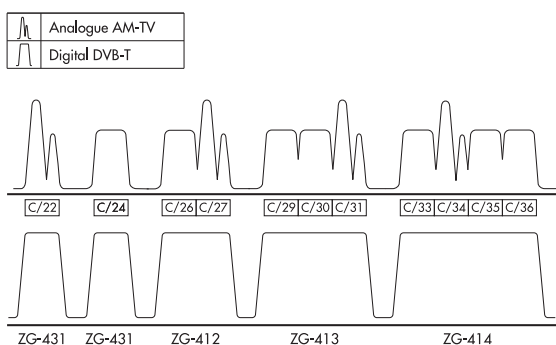


# 905

## EXAMPLES OF INSTALLATION

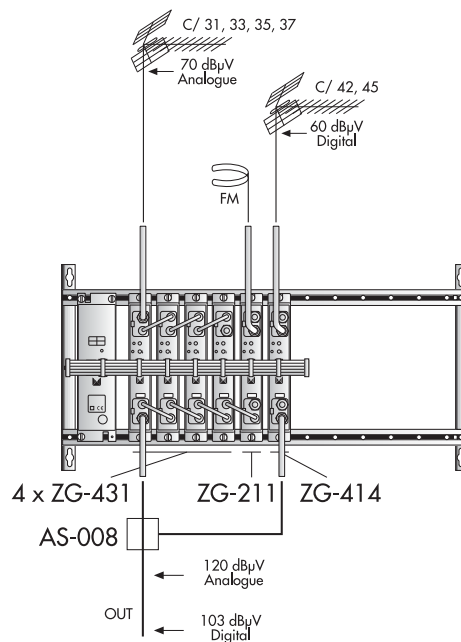
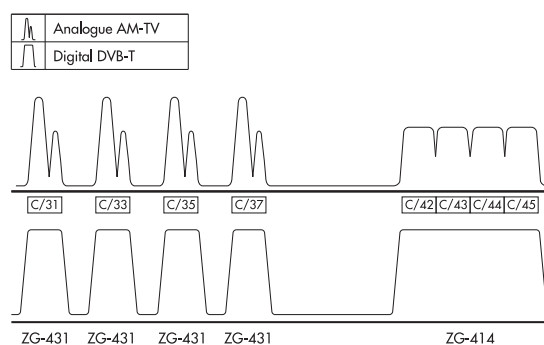
### Equipment with multichannel amplifiers

Complete 905-ZG or 905-ZP equipment showing the method of assembly. Each multichannel module amplifies several channels, normally one analogue channel and several digital channels.



### Equipment with multichannel amplifiers and couplers for digital channels

Complete 905-ZG or 905-ZP equipment showing the method of assembly. Each multichannel module amplifies several channels, normally one analogue channel and several digital channels. The coupler permits the addition of digital channels to an existing equipment with the minimum insertion loss.







# TV modulator equipment

Modulator equipment which generate TV channels and which complete the community TV installations in large buildings and hotels with security video cameras, videos or DVD.





### Description

TV modulator equipment which, from audio and video signals, generates a digital TV channel, DVB-T or DVB-C. This is a modular system consisting of a power supply unit, an amplifier and modulators, which are mounted on a support frame. All functions are programmable using PC software and/or a wireless programmer. Multi-standard equipment.

### Applications

Collective installations of digital terrestrial TV or cable where it is necessary to incorporate channels generated locally from SAT receivers, DVDs, videos or surveillance cameras.

### Characteristics

The main features of this equipment are its great simplicity of use and the high quality of the generated output channel. Zamak chassis with metal side covers. F-type connectors. The equipment can be assembled quickly and easily.

### Accessories

See page 184.



# 912 DIGITAL MODULATOR EQUIPMENT 912-DM

## A/V to DVB-T Modulator



DM-102

### Description

Digital modulator designed to generate a digital terrestrial TV channel in DVB-T from one or two audio/video signals. Programmable using PC software and a wireless programmer.

### Applications

Collective digital terrestrial TV installations where it is necessary to generate an entire DVB-T channel which contains one or two services generated locally from SAT receivers, DVD or video-surveillance cameras. Compatible with all collective TV installations since the channels are distributed throughout the terrestrial band: BI, BIII, BS and UHF.

### Characteristics

Outstanding quality of the generated output channel. Audio/Video signal inputs via 3.5 mm mini-jack connectors. Zamak chassis with metal side covers. F-type connectors. Supplied with diplexing and multiplexing bridges.

CODE		9120194	
MODEL		DM-102	
<b>A/V input</b>			
Number of inputs		2	
Input connector		A/V minijack	
Video input signal		CVBS	
Video input standard		PAL/SECAM/NTSC	
Video input level	Vpp	MPEG-2/H.262 (ISO/IEC-13818-2 MP@ML)	
Resolution		PAL/SECAM: 720x576 @25fps NTSC: 720x480 @30fps	
Audio input level	Vpp	0,3 - 1	
Audio codification	dB	MPEG-1/Layer 2 (ISO/IEC-11172-3)	
<b>COFDM modulator</b>			
TV system		DVB-T / DVB-H DVB: EN 300744	
Output offset	MHz	-1/6, -1/8, 0, +1/8, +1/6 DVB-T	
Mode		2K, 8K, 4K (DVB-H) DVB: EN 300744	
Modulation		QPSK, 16QAM, 64QAM DVB: EN 300744	
F.E.C.		1/2, 2/3, 3/4, 5/6, 7/8 DVB: EN 300744	
Guard interval		1/4, 1/8, 1/16, 1/32 DVB: EN 300744	
MER	dB	39 ±2,0	
<b>Output RF</b>			
Output connector		F female	
Frequency range	MHz	47-862	
Frequency step	MHz	0,25	
Output level	dBμV	80 ±2,0	
Output level adjust	dB	20	
Bandwidth	MHz	8, 7, 6, 5 DVB-H	
Through loss in the mixture	dB	0,9 ±0,1	
<b>General features</b>			
Power supply	V---	+3,3	+5,2 +12
	mA	1050	835 50
Operating T close equipment		-10...+65	
Room T with / without fan		-10...+55/+45	
Protection index		IP30	
Units per packing		1	
Packing weight	Kg	1.22	
Packing dimensions	mm	270 x 170 x 38	

Programmable with PS-011 and ASP software



# 912 DIGITAL MODULATOR EQUIPMENT 912-DM

A/V to DVB-C Modulator



DM-302

## Description

Digital modulator designed to generate a cable TV channel in DVB-C from one or two audio/video signals. Can be programmed using PC software and a wireless programmer.

## Applications

Collective TV installations by digital cable where it is necessary to generate an entire DVB-C channel containing one or two services generated locally from SAT receivers, DVD or video-surveillance cameras. Compatible with all collective TV installations since the channels can be distributed throughout the 47 to 862MHz band.

## Characteristics

Outstanding quality of the generated output channel. Audio/Video signal inputs (PAL, NTSC, SECAM) by means of 3.5 mini-jack connectors. Zamak chassis with metal side covers. F-type connectors. Supplied with diplexing and multiplexing bridges.

CODE	9120210			
MODEL	DM-302			
<b>A/V input</b>				
Number of inputs		2		
Input connector		A/V minijack		
Video input signal		CVBS		
Video input standard		PAL/SECAM/NTSC		
Video input level	Vpp	0,5 - 1,4		
Video codification		MPEG-2/H.262 (ISO/IEC-13818-2 MP@ML)		
Resolution		PAL/SECAM: 720x576 @25fps NTSC: 720x480 @30fps		
Audio input level	Vpp	0,3 - 1		
Audio codification	dB	MPEG-1/Layer 2 (ISO/IEC-11172-3)		
<b>DVB-C modulator</b>				
TV system		DVBC EN300429		
Modulation		16 - 32 - 64 -128 - 256 QAM		
Bandwidth	MHz	9.2 max		
MER	dB	38 ±2,0		
Symbol rate	Mbaud	1..8		
<b>Output RF</b>				
Output connector		F female		
Frequency range	MHz	47-862		
Frequency step	MHz	0,25		
Output level	dBµV	80 ±2,0		
Output level adjust	dB	20		
Spureous in band	dB	>60		
Roll off factor	%	15		
Carrier / Noise ratio (C/N)	dB	38		
Diplexing through loss	dB	0.9 ±0,1		
<b>General features</b>				
Power supply	V~	+3,3	+5,2	+12
	mA	1050	775	50
Operarting T close equipment		-10..+65		
Room T with / without fan		-10..+55/+45		
Protection index		IP30		
Units per packing		1		
Packing weight	Kg	1.22		
Packing dimensions	mm	270 x 170 x 38		

Programmable with PS-011 and ASP software



PA-720

### Description

Broadband amplifier for modulator equipment. It has one inputs to amplify the signal coming from all the modulators of the installation, and a mutliplexing input for the rest of the channels of the installation. The output level can be controlled by means of an attenuator.

### Applications

All MATV installations where modulators are incorporated and monochannel amplifiers are not used.

### Characteristics

Amplifier with high output level, power stage with a hybrid amplifier. Supplied with power cable.

CODE		9120093
MODEL		PA-720
TV System		AM-TV / DVB-T / DVB-C
Number of inputs		1
Frequency range	MHz	40 - 894
Gain	dB±TOL	44 ±1,0
Gain adjustment	dB	15
Output level	dBµV	119 DIN 45004B 116 (IMD3 - 60 dB) 110 (IMD2 - 60 dB) 103 (CTB - 60 dB) 103 (CSO - 60 dB) 104 (XMOD - 60 dB)
Output test point	dB±TOL	-30 ±1,0
Extension input loss	dB±TOL	0 ±2,0
Noise figure	dB	35 ±0,5
Return loss	dB	>14 - 1.5 / eighth >10
Chroma-luminance delay	ns	<10
Connectors		F female
Power supply	V---	+24
	mA	320
Operating temperature	°C	-10..+45
Room temperature with/ without fan	°C	-10..+55/+45
Protection index		IP 20C
Units per packaging		1
Packing weight	Kg	1.16
Packing dimensions	mm	265 x 165 x 40

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
IMD<sub>2</sub> -60 dB: 2 equal carriers, EN 50083-3

CTB -60 dB: 42 equal carriers, EN 50083-3  
CSO -60 dB: 42 equal carriers, EN 50083-3  
XMOD -60 dB: 42 equal carriers, EN 50083-3



FA-310



FA-312

**Description**

Switching power supply, which permits the installation of an amplifier and different modules on the support frame. Power supply with a flat cable of 20 lines for different feed voltages.

**Applications**

Required for feeding the modules of the equipment.

**Characteristics**

Protected against power surges, overloads and short-circuits. Zamak chassis with side gills to facilitate proper ventilation. Supplied with power cable.

CODE		9120046				9120168			
MODEL		FA-310				FA-312			
Output voltage	V $\overline{\rule{0.5em}{0.4pt}}$	+3.3	+5.2	+12.0	+24	+3.3	+5.2	+12.0	+24
	mA	5500	2500	1500	500	10000	5000	1500	500
Peak to peak ripple voltage	mV	>50				100			
Mains voltage	V $\sim$	230 $\pm$ 20% 50/60 Hz		240 $\begin{smallmatrix} +15\% \text{ 50/60 Hz} \\ -20\% \text{ 50/60 Hz} \end{smallmatrix}$		90..264 50/60 Hz			
	W	72				85			
Operating temp. close to equipment	$^{\circ}$ C	-10..+65							
Room tmperature with/without fan	$^{\circ}$ C	-10..+55/+45							
Protection index		IP 20C							
Units per packaging		1							
Packing weight	Kg	1.43				1.65			
Packing dimensions	mm	270 x 165 x 60							

See table on page 454 for more information

# 912 ANALOGUE MODULATOR EQUIPMENT 912-MS



## Description

Modular equipment of TV modulators, which generates an analogue TV channel from the audio and video signals. Consisting of a power supply unit, an amplifier and the modulators which are mounted on a support frame. All the functions are programmable through a programmer. Available in different standards and channel tables.

## Applications

MATV installations where it is necessary to incorporate channels generated locally from SAT, DVD, videos or security cameras.

## Characteristics

The main advantage of this equipment is the modulation in vestigial side band (VSB) by means of surface acoustic wave filtering (SAW), which makes it possible to work with adjacent channels. The frequency or output channel is programmable and any TV channel may be selected, including the interbands. There is a high carrier to noise ration, which makes it possible to combine head-ends of up to 100 channels. Depth of modulation and video to audio ratio are programmable. Chassis in zamak with metal side covers. Fast and easy assembly.

## Accessories

See page 184.





MS-551

**Description**

Analogue stereo modulator (ITU BS-707-4) in VSB vestigial side band, designed to work with adjacent channels. The audio input can be mono, stereo or dual by selecting the audio mode of the modulator by means of the programmer. Available in B/G standard.

**Applications**

MATV installations where it is necessary to generate an analogue TV channel with stereo or dual sound from the audio and video signal from an equipment that has mono, stereo or dual sound.

**Characteristics**

Essential features of this equipment are the high carrier to noise ratio together with a very reduced spurious level in the band. Modulation in VSB vestigial side band filtered by means of a SAW surface acoustic wave filter in any TV channel, including the interbands. F type connector and mini-DIN connector for audio/video. Supplied with the multiplexing bridge.

CODE		9120106		
MODEL		MS-551		
TV System		AM-TV B/G CCIR		
Frequency range	MHz	46-894		
Frequency step	KHz	250		
Output channel		2 - 4 5 - 12 21 - 69 S1 - S41		
Video input level	Vpp	0.7-1.4 (75 Ω)		
Audio input level	Vpp	0.2-2.0 (>20 Ω)		
Audio		Unbalanced		
Output level	dBpV±TOL	84 ±2,0		
Output level adjust	dB	15		
Output level stability	dB	0.5		
Multiplexing through loss	dB±TOL	0.9 ±0,1		
Carrier/noise ratio (C/N)	dB	60		
Audio signal/noise ratio	dB	>50		
Return loss	dB	15		
Chroma-luminance delay	ns	<40		
No-linearity of luminance	%	<2		
Differential gain	%	<3		
Differential phase	°	<3		
Response to the 2T pulse	%	<3		
Connectors		F female		
Audio/video connector		miniDIN (8 pin)		
Power supply	V---	+3.3	+5.2	+12
	mA	90	205	135
Operating temperature	°C	-10...+65		
Protection index		IP 20C		
Units per packing		1		
Packing weight	Kg	1.22		
Packing dimensions	mm	265 x 165 x 40		

Programmable with PS-011.

# 912 ANALOGUE MODULATOR EQUIPMENT 912-MS

## Mono modulators



MS-541  
MS-544  
MS-543  
MS-545

### Description

Modulator of mono audio in VSB vestigial side band, designed to work with adjacent channels. The audio input can be mono or stereo, in which case the channel will be modulated with a mono audio containing the two stereo channels. The different models cover the B/G, D/K and I standards.

### Applications

MATV installations where it is necessary to generate an analogue TV channel with mono sound from the audio and video signal from equipment with mono or stereo sound.

### Characteristics

Essential features of this equipment are the high carrier to noise ratio together with a very reduced spurious level in the band. Modulation in VSB vestigial side band filtered by means of a SAW surface acoustic wave filter in any TV channel, including the interbands. F type connector and miniDIN connector for audio/video. Supplied with the multiplexing bridge.

CODE		9120107	9120109	9120110	9120138
MODEL		MS-541	MS-543	MS-544	MS-545
TV System		AM-TV B/G CCIR	AM-TV I UK	AM-TV D/K OIRT	AM-TV M - N
Frequency range	MHz	46-894	46-894	46-894	46-894
Frequency step	KHz	250			
Output channel		2 - 4	2 - 4	R1 - R4	2 .. 6
		5 - 12	5 - 12	R5 - R12	A5 .. A1
		21 - 69	21 - 69	21 - 69	A .. I
		S1 - S41	S1 - S41	S1 - S41	7 .. 13
Video input level	Vpp	0.7-1.4 (75 Ω)			
Audio input level	Vpp	0.2-2.0 (>20 Ω)			
Audio		Unbalanced			
Output level	dBuV±TOL	84 ±2,0			
Output level adjust	dB	15			
Output level stability	dB	0.5			
Multiplexing through loss	dB±TOL	0.9 ±0,1			
Carrier/noise ratio (C/N)	dB	60			
Audio signal/noise ratio	dB	>50			
Return loss	dB	>15			
Chroma-luminance delay	ns	<40			
No-lineality of luminance	%	<2			
Differential gain	%	<3			
Differential phase	°	<3			
Response to the 2T pulse	%	<3			
Connectors		F female			
Audio/video connector		miniDIN (8 pin)			
Power supply	V	+3.3	+5.2	+12	
	mA	50	205	115	
Operating temperature	°C	-10...+65			
Protection index		IP 20C			
Units per packing		1			
Packing weight	Kg	1.22			
Packing dimensions	mm	265 x 165 x 40			

Programmable with PS-011.



PA-720

**Description**

Broadband amplifier for modulator equipment. It has one inputs to amplify the signal coming from all the modulators of the installation, and a mutliplexing input for the rest of the channels of the installation. The output level can be controlled by means of an attenuator.

**Applications**

All MATV installations where modulators are incorporated and monochannel amplifiers are not used.

**Characteristics**

Amplifier with high output level, power stage with a hybrid amplifier. Supplied with power cable.

CODE		9120093
MODEL		PA-720
TV System		AM -TV / DVB-T / DVB - C
Number of inputs		1
Frequency range	MHz	40-894
Gain	dB±TOL	44 ±1,0
Gain adjustment	dB	15
Output level	dBpV	119 DIN45004B 116 (IMD <sub>3</sub> - 60dB) 110 (IMD <sub>2</sub> - 60dB) 103 (CTB - 60dB) 104 (CSO - 60dB) 104 (XMOD - 60dB)
Output test point	dB±TOL	-30 ±1,0
Extension input loss	dB±TOL	0 ±2,0
Noise figure	dB	3.5 ±0,5
Return loss	dB	>14-1,5/eighth >10
Chroma-luminance delay	ns	<10
Connectors		F female
Power supply	V---	+24
	mA	320
Operating temperature	°C	-10..+65
Room temperature with/ without fan	°C	-10..+55/+45
Protection index		IP 20C
Units per packing		1
Packing weight	Kg	1.16
Packing dimensions	mm	265 x 165 x 40

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3

CTB -60 dB: 42 equal carriers, EN 50083-3  
 CSO -60 dB: 42 equal carriers, EN 50083-3  
 XMOD -60 dB: 42 equal carriers, EN 50083-3

# 912 ANALOGUE MODULATOR EQUIPMENT 912-MS



## Power supply units



FA-310



FA-312

### Description

Switching power supply, which permits the installation of an amplifier and different modules on the support frame. Power supply with a flat cable of 20 lines for different feed voltages.

### Applications

Required for feeding the modules of the equipment.

### Characteristics

Protected against power surges, overloads and short-circuits. Zamak chassis with side gills to facilitate proper ventilation. Supplied with power cable.

CODE		9120046				9120168			
MODEL		FA-310				FA-312			
Output voltage	V $\cdots$	+3.3	+5.2	+12.0	+24	+3.3	+5.2	+12.0	+24
	mA	5500	2500	1500	500	10000	5000	1500	500
Peak to peak ripple voltage	mV	>50				100			
Mains voltage	V $\sim$	230 $\pm$ 20% 50/60 Hz		240 $\begin{smallmatrix} +15\% \text{ 50/60 Hz} \\ -20\% \text{ 50/60 Hz} \end{smallmatrix}$		90..264 $\text{ 50/60 Hz}$			
	W	72				85			
Operating temp. close to equipment	$^{\circ}\text{C}$	-10..+65							
Room tmperature with/without fan	$^{\circ}\text{C}$	-10..+55/+45							
Protection index		IP 20C							
Units per packaging		1							
Packing weight	Kg	1.43				1.65			
Packing dimensions	mm	270 x 165 x 60							

See table on page 454 for more information



# 912 MODULATOR EQUIPMENT

Filtered multiplexers for head-ends



MF-201



MF-202



MF-205

## Description

Multiplexers with two inputs which combine the head-end equipment outputs. Each input of the multiplexers has a low or high pass filter for a group of channels.

## Applications

Used to combine the output channels of the modulators or of satellite receivers in installations with a great number of channels. The multiplexers by channel groups make it possible to combine the different channels of the equipment, maintaining a high carrier to noise ratio. By combining the seven available filters, a system of mixing channels is obtained using band pass filters with 8 groups of 11 channels. See the application example on page 189.

## Characteristics

Shielded zamak chassis with F type connectors. Supplied in a multiple pack.

## Accessories

9120039 CM-004 Male F type connector for Ø6.6 mm coaxial cable.

9080023 MC-302 Male F type connector for Ø7.0 mm coaxial cable.

CODE		9120090		9120091		9120092	
MODEL		MF-201		MF-202		MF-205	
Number of inputs		2					
Frequency range	MHz	47-244	251-430	470-662	678-862	47-430	470-862
	Channel	2-S12	S14-S36	21-44	47-69	2-S36	21-69
Insertion loss	dB±TOL	2.0 ±0,5	2.5 ±0,5	2.0 ±0,5	3.0 ±1,0	1.5 ±1,0	1.5 ±1,0
Selectivity	dB	>6 (7 MHz) >20 (49 MHz)		>6 (16 MHz) >20 (112 MHz)		>6 (40 MHz) >20 (104 MHz)	
Flatness response	dB	±0,5					
Return loss	dB	>10					
Connectors		F female					
Operating temperature	°C	-10..+65					
Protection index		IP 43					
Units per packing		6					
Packing weight	Kg	0.45					
Packing dimensions	mm	155 x 95 x 40					



DMH-141

**Description**

Digital modulator designed to generate a digital terrestrial TV channel in DVB-T from one HDMI signal or from one A/V signal. Can be programmed using built-in keyboard and display.

**Applications**

It modulates the audio and video signal of a satellite receiver, DVD, video or surveillance camera, in order to distribute it in the TV installation of the house. The audio and video signals are obtained from the HDMI connector, for HD signals, and RCA connector, for SD signals, from the video source.

**Characteristics**

The output channel can be selected by means of switches. Programs codified in MPEG-4. Essential features of this equipment are the high carrier to noise ratio together with a very reduced spurious level in the band. F type connector. HDMI and RCA connectors for audio/video.

CODE		9510070
MODEL		DMH-141
HDMI input		
Video encoding		MPEG-4 AVC/H.264
Video resolution		1920x1080_60 p, 1920x1080_50 p, 1920x1080_60 i, 1920x1080_50 i, 1280x720_60 p
Video bit rate	Mbps	0.500.. 19.500
Audio encoding	MHz	MPEG1 layer II
Audio sample rate	KHz	48
Audio bit rate	Kbps	64, 96, 128, 192, 256, 320, 384
Interface		HDMI female connector
YPbPr/CVBS/S-Video input		
Video encoding		MPEG-4 AVC/H.264
CVBS & S-Video resolution		720x576_50 i(PAL), 720x480_60 i(NTSC)
YPbPr		1920x1080_60 i, 1920x1080_50 i, 1280x720_60 p, 1280x720_50 p
Video bit rate	Mbps	0.500.. 19.500
Audio encoding	MHz	MPEG1 layer II
Audio sample rate	KHz	48
Audio bit rate	Kbps	64, 96, 128, 192, 256, 320, 384
Interface		3xRCA female connector (YPbPr), 3xRCA female connector (CVBS), 1x MINIDIN female connector(S-Video)
COFDM modulator		
TV system		DVB-T
Modulation		QPSK, 16QAM, 64QAM (DVB:EN300744)
F.E.C.		1/2, 2/3, 3/4, 5/6, 7/8 (DVB:EN300744)
Guard Interval		1/32, 1/16, 1/8, 1/4 (DVB:EN300744)
MER	MHz	≥42
Output RF		
Output connector		F female
Frequency range	MHz	30.. 960
Frequency step	MHz	1
Bandwidth	MHz	6, 7, 8
Output level	dBμV	92
Output level adjust	dB	20
Through loss in the mixture	dB	10 ±1
General features		
Data interface		USB
Power supply	V---/mA	12 / 2000
Operating temperature	°C	0.. 45
Units per packaging		1
Packing weight	Kg	1.073
Packing dimensions	mm	203 x 182 x 150



DM-141

**Description**

Digital modulator designed to generate a digital terrestrial TV channel in DVB-T from one A/V signal. Can be programmed using built-in keyboard and display.

**Applications**

It modulates the audio and video signal of a satellite receiver, DVD, video or surveillance camera, in order to distribute it in the TV installation of the house. The audio and video signals are obtained from RCA connector from the video source.

**Characteristics**

The output channel can be selected by means of switches. Programs codified in MPEG-2. Essential features of this equipment are the high carrier to noise ratio together with a very reduced spurious level in the band. F type connector. RCA connectors for audio/video.

CODE		9510069
MODEL		DM-141
<b>A/V input</b>		
Video encoding		MPEG-2 MP@ML(4:2:0)
Video resolution		720x576_50 i(PAL), 720x480_60 i(NTSC)
Video bit rate	Mbps	1.000.. 19.500
Audio encoding	MHz	MPEG1 layer II
Audio sample rate	KHz	48
Audio bit rate	Kbps	64, 96, 128, 192, 256, 320, 384
Interface		3xRCA female connector (CVBS)
<b>COFDM modulator</b>		
TV system		DVB-T
Modulation		QPSK, 16QAM, 64QAM (DVB:EN300744)
F.E.C.		1/2, 2/3, 3/4, 5/6, 7/8 (DVB:EN300744)
Guard Interval		1/32, 1/16, 1/8, 1/4 (DVB:EN300744)
MER	MHz	≥42
<b>Output RF</b>		
Output connector		F female
Frequency range	MHz	30.. 960
Frequency step	MHz	1
Bandwith	MHz	6, 7, 8
Output level	dBμV	92
Output level adjust	dB	20
Through loss in the mixture	dB	10 ±1
<b>General features</b>		
Data interface		USB
Power supply	V---/mA	12 / 2000
Operating temperature	°C	0.. 45
Units per packaging		1
Packing weight	Kg	0.900
Packing dimensions	mm	203 x 182 x 150

## 951

## STANDALONE DIGITAL MODULATORS

## HDMI to DVB-C Compact modulators



DMH-341

**Description**

Digital modulator designed to generate a digital terrestrial TV channel in DVB-C from one HDMI signal or from one A/V signal. Can be programmed using built-in keyboard and display.

**Applications**

It modulates the audio and video signal of a satellite receiver, DVD, video or surveillance camera, in order to distribute it in the TV installation of the house. The audio and video signals are obtained from the HDMI connector, for HD signals, and RCA connector, for SD signals, from the video source.

**Characteristics**

The output channel can be selected by means of switches. Programs codified in MPEG-4. Essential features of this equipment are the high carrier to noise ratio together with a very reduced spurious level in the band. F type connector. HDMI and RCA connectors for audio/video.

CODE		9510071		
MODEL		DMH-341		
HDMI input				
Video encoding		MPEG-4 AVC/H.264		
Video resolution		1920x1080_60 p, 1920x1080_50 p, 1920x1080_60 i, 1920x1080_50 i, 1280x720_60 p		
Video bit rate	Mbps	0.500.. 19.500		
Audio encoding	MHz	MPEG1 layer II		
Audio sample rate	KHz	48		
Audio bit rate	Kbps	64, 96, 128, 192, 256, 320, 384		
Interface		HDMI female connector		
YPbPr/CVBS/S-Video input				
Video encoding		MPEG-4 AVC/H.264		
CVBS & S-Video resolution		720x576_50 i(PAL), 720x480_60 i(NTSC)		
YPbPr		1920x1080_60 i, 1920x1080_50 i, 1280x720_60 p, 1280x720_50 p		
Video bit rate	Mbps	0.500.. 19.500		
Audio encoding	MHz	MPEG1 layer II		
Audio sample rate	KHz	48		
Audio bit rate	Kbps	64, 96, 128, 192, 256, 320, 384		
Interface		3xRCA female connector (YPbPr), 3xRCA female connector (CVBS), 1x MINIDIN female connector(S-Video)		
COFDM modulator				
TV system		J.83A (DVB-C)	J.83B	J.83C
Modulation		16/32/64/128/256QAM	64/ 256 QAM	64/ 256 QAM
Bandwith	MHz	8MHz	6MHz	6MHz
MER	MHz	≥42		
Output RF				
Output connector		F female		
Frequency range	MHz	30.. 960		
Frequency step	MHz	1		
Bandwidth	MHz	6, 7, 8		
Output level	dBμV	92		
Output level adjust	dB	20		
Through loss in the mixture	dB	10 ±1		
General features				
Data interface		USB		
Power supply	V---/mA	12 / 2000		
Operating temperature	°C	0.. 45		
Units per packaging		1		
Packing weight	Kg	1.073		
Packing dimensions	mm	203 x 182 x 150		



MD-531

**Description**

TV modulator with stereo audio, which generates an analogue TV channel from the audio and video signals. The generated channel is mixed with the rest of the channels of the TV installation. It modulates the output channel for any channel of the terrestrial band based on the B/G CCIR standard.

**Applications**

It modulates the audio and video signal of a satellite receiver, DVD, video or surveillance camera, in order to distribute it in the TV installation of the house. The audio and video signals are obtained from the scart connector of the video.

**Characteristics**

The output channel can be selected by means of switches. Essential features of this equipment are the high carrier to noise ratio together with a very reduced spurious level in the band. Modulation in DSB double side band. F type connector and RCA connector for audio/video.

**Accessories**

9510066 CR-101 A/V input cable.

9510068 CR-103 Euroconnector cable to RCA stereo.

CODE		9510067
MODEL		MD-531
TV System		AM-TV B/G CCIR
Frequency range	MHz	47-862
Output channel		2 - 4 5 - 12 21 - 69 S1 - S41
Video input level	Vpp	1,0 (75Ω)
Audio input level	Vpp	0,2 - 2,0 (10Ω)
Audio		Unbalanced
Output level	dBuV±TOL	84 ±2,0
Output level adjust	dB	15
Output level stability	dB	0,5
Multiplexing through loss	dB±TOL	0,9 ±0,1
Carrier/noise ratio (C/N)	dB	>58
Audio signal/noise ratio	dB	>45
Return loss	dB	>15
Chroma-luminance delay	ns	<40
No-linearity of luminance	%	<3
Differential gain	%	<3
Differential phase	°	<3
Response to the 2T pulse	%	<3
Connectors		F female
Audio/video connector		2 x RCA Audio stereo 1 x RCA Video
Power supply	V~	230 ± 10% 50/60 Hz
	mA	5
Operating temperature	°C	-10..+65
Protection index		IP 20
Units per packing		1
Packing weight	Kg	0,58
Packing dimensions	mm	165 x 100 x 50

951

## STANDALONE ANALOGUE MODULATORS

CE

Compact modulators

MD-310  
MD-410**Description**

TV modulator with mono audio, which generates an analogue TV channel from the audio and video signals. The generated channel is mixed with the rest of the channels of the TV installation. Available in different bands, with different standards and channel tables.

**Applications**

It modulates the audio and video signal of a satellite receiver, DVD, video or surveillance camera, in order to distribute it in the TV installation of the house. The audio and video signals are obtained from the scart connector of the video.

**Characteristics**

The output channel can be selected by means of switches. Essential features of this equipment are the high carrier to noise ratio together with a very reduced spurious level in the band. Modulation in DSB double side band. F type connector and RCA connector for audio/video.

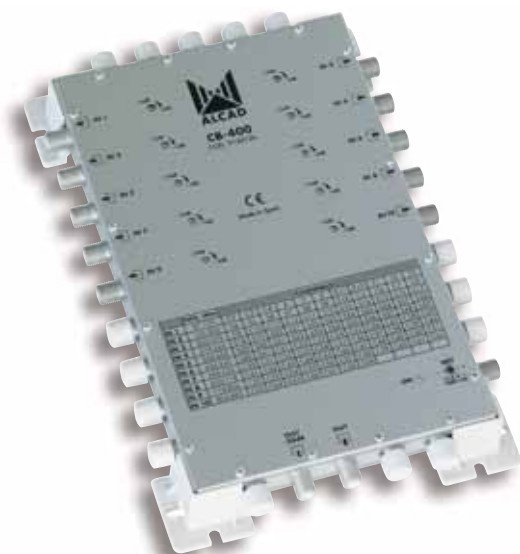
**Accessories**

9510066 CR-101 A/V input cable.

CODE		9510064	9510065
MODEL		MD-310	MD-410
TV System		AM-TV B CCIR B ITALY D OIRT D POLAND I IRELAND I SOUTH AFRICA	AM-TV G CCIR K OIRT I UK L FRANCE
Frequency range	MHz	174-302	470-862
Video input level	V <sub>pp</sub>	0,7 - 1,4 (75Ω)	
Audio input level	V <sub>pp</sub>	0,2 - 2,0 (>10 KΩ)	
Audio		Unbalanced	
Output level	dB <sub>pV±TOL</sub>	86 ±2,0	
Output level adjust	dB	15	20
Output level stability	dB	0.5	
Multiplexing through loss	dB±TOL	0.9 ±0,1	
Carrier/noise ratio (C/N)	dB	>58	
Audio signal/noise ratio	dB	>45	
Return loss	dB	>15	
Chroma-luminance delay	ns	<50	
No-linearity of luminance	%	<3	
Differential gain	%	<4	
Differential phase	°	<8	
Response to the 2T pulse	%	<5	
Connectors		F female	
Audio/video connector		2 x RCA (mono)	
Power supply	V~	230 ± 10% 50/60 Hz	
	mA	7	
Operating temperature	°C	-10...+65	
Protection index		IP 20	
Units per packing		1	
Packing weight	Kg	0.4	
Packing dimensions	mm	115 x 102 x45	

# 912 COMBINER EQUIPMENT 912-CB

## Combiner amplifier



CB-400

### Description

Combiner amplifier with 10 inputs in the terrestrial band. Combines and amplifies 10 groups of filtered channels separately, obtaining an output of up to 100 amplified channels with a very reduced level of noise, equivalent to that of fewer than 10 channels. Equipped with a separate gain control for each input.

### Applications

Large collective installations of digital or analogue terrestrial TV with a high number of channels (from 30 channels upwards), which require amplification and the least noise possible. Compatible with all collective TV installations in the terrestrial band. Ideal for installations with a high number of modulators.

### Characteristics

One of the main features of the equipment is its exceptional response to noise in installations of up to 100 channels, due to filtering and independent amplification by groups of channels. Shielded zamak chassis with plastic supports. F-type connectors. Power supply connector is 9.5 x 2.1 mm jack.

### Accessories

9130054 FU-513 Power supply unit, 7.5 V $\pm$

CODE		9120126									
MODEL		CB-400									
TV System		AM-TV / DVB-T / DVB-C									
Connection		F female									
Inputs		10									
Frequency range	MHz	47-125	125-202	202-279	279-366	366-454	454-542	542-630	630-718	718-806	806-862
Gain	dB $\pm$ TOL	29 $\pm$ 3.0									
Gain adjustment	dB	10									
Selectivity	dB	30 (77 MHz VHF) (88 MHz UHF)									
Output test point	dB $\pm$ TOL	-30 $\pm$ 1.0									
Output level	dB $\mu$ V	118 DIN 45004B 115 (IMD3 -60 dB) 118 (IMD2 -60 dB) 105 (CTB -60 dB) 105 (CSO -60 dB) 105 (XMOD -60 dB)									
Noise figure	dB	6 $\pm$ 1.0									
I/O return loss	dB	310									
Chroma-luminance delay	ns	<10									
Power supply	V $\pm$	6,5..9,0									
	mA	1150									
Operating temperature close to equipment	°C	-10..+65									
Room temperature with/without fan	°C	-10..+55/+45									
Protection index		IP 30									
Units per packing		1					9				
Packing weight	Kg	0.7					6.5				
Packing dimensions	mm	245 x 160 x 35					312 x 190 x 225				

912

## MULTIPLEXOR EQUIPMENT 912-AMU

CE

Active multiplexer



AMU-600

**Description**

Active multiplexer with 6 inputs in the terrestrial band. Thanks to these 6 inputs, the equipment mixes a high number of channels in the terrestrial band. The amplification of 7 dB compensates for losses during multiplexing.

**Applications**

Medium-sized collective analogue or digital terrestrial TV installations. The device is installed at the head-end in the step preceding installation of the broadband amplifiers. This obtains an equalised output with no loss of quality. Compatible with all collective TV installations in the terrestrial band. Is adjusted using a gain controller.

**Characteristics**

Regulation of the output level to meet the level required by the head-end amplifier of the installation. Shielded zamak chassis with metal side covers. F-type connectors.

CODE		9120212	
MODEL		AMU-600	
Number of inputs		6	
Connection		F female	
Frequency range	MHz	47-862	
Number of outputs		1 + test(-20dB)	
Gain	dB	7	
Input level	dB $\mu$ V	65.. 75	
Output test point	dB $\pm$ TOL	-30 $\pm$ 1.0	
Output level	dB $\mu$ V	87 (CTB -60 dB) 87 (CSO -60 dB)	
Adjustable gain range	dB	15	
Power supply	V $\cdots$	24	12
	mA	120	105
Operating temperature	°C	-10..+65	
Room temperature with/ without fan	°C	-10..+55/+45	
Protection index		IP 30	
Units per packing		1	
Packing weight	Kg	1.4	
Packing dimensions	mm	270 x 170 x 38	

CSO/CTB -75dB: 42 equal carriers, EN 50083-3  
 CSO/CTB -63dB: 60 equal carriers, EN 50083-3





Programmer

<b>9120144</b>	
<b>PS-011</b>	
Units per packaging	1
Packing weight	0,490 Kg
Packing dimensions	200 x 200 x 60 mm

Programmer for use with the entire range of ALCAD products. Two-way communication with all devices via infrared (IrDA standard). Can be updated to add new product ranges and functionalities. 3.4" colour screen. Internal memory which can be expanded via USB port and SD cards. Includes rechargeable batteries and charger. (See page 419).



Programming interface

<b>9120100</b>	
<b>IP-001</b>	
Units per packaging	1
Packing weight	0,05 Kg
Packing dimensions	85 x 20 x 40 mm

Module interface that allows connect ALCAD equipments to a computer in order to configure or update them. It is connected to the flat 20 lines power cable and to a computer via serial RS-232 or USB.



Subrack 7U. 9 modules + FA

<b>9120181</b>	
<b>SK-100</b>	
Units per packaging	1
Packing weight	0.800 Kg
Packing dimensions	410 x 585 x 10 mm

Support frame to be installed in 19" rack cabinets with capacity for a power supply unit and 9 modules. Equipped with handles to facilitate assembly. Manufactured in anodised aluminium. Height: 7U. (See page 242 for more info.)



Frame for 11 modules

<b>9120130</b>	
<b>SP-226</b>	
Units per packaging	1
Packing weight	0,74 Kg
Packing dimensions	520 x 345 x 25 mm

Support frame for power supply unit, amplifier and 10 modules or power supply unit and 11 modules. Other combinations include 2 power supply units, an amplifier and 8 modules, or 2 power supply units and 9 modules. Required for mounting the different modules of the equipment.



Frame for 9 modules for 19" rack

<b>9120136</b>	
<b>SP-725</b>	
Units per packaging	1
Packing weight	2.035 Kg
Packing dimensions	490 x 340 x 35 mm

Support frame for 19" rack with a capacity for a power supply unit, amplifier and 8 modules or power supply unit and 9 modules. Required for mounting the different modules of the equipment on a 19" rack.



Cabinet - 11 modules

<b>9120131</b>	
<b>CP-226</b>	
Units per packaging	1
Packing weight	7,88 Kg
Packing dimensions	610 x 540 x 230 mm

Metal cabinet with cover with key but without back. For the installation of equipment comprising a power supply unit, amplifier and 10 modules or power supply unit and 11 modules. Also it is possible to assemble equipment with 2 power supply units, an amplifier and 8 modules, or 2 power supply units and 9 modules. The SP-226 support frame is not included. VE-500 ventilator available as an option.

# 912 ACCESSORIES



Cabinet - 22 modules

<b>9120032</b>	
<b>CP-426</b>	
Units per packaging	1
Packing weight	10,12 Kg
Packing dimensions	820 x 610 x 230 mm

Metal cabinet with cover with key but without back. For the installation of two modular sets of equipment with power supply unit, amplifier and 10 modules or power supply unit and 11 modules. Other combinations include 2 power supply units, an amplifier and 8 modules, or 2 power supply units and 9 modules. The SP-226 support frame is not included. VE-500 ventilator optionally available.



A/V connection cable

<b>9120098</b>	
<b>CD-003</b>	
Units per packaging	1
Packing weight	0,10 Kg
Packing dimensions	160 x 90 x 30 mm

A/V input cable with mono/stereo euroconnector.



A/V connection cable

<b>9120094</b>	
<b>CD-113</b>	
Units per packaging	1
Packing weight	0,08 Kg
Packing dimensions	120 x 40 x 20 mm

A/V input cable with RCA mono/stereo connectors.



A/V input cable

<b>9120079</b>	
<b>CD-011</b>	
Units per packaging	1
Packing weight	0,08 Kg
Packing dimensions	120 x 40 x 20 mm

A/V input cable with RCA mono connectors.



A/V input cable

<b>9150049</b>	
<b>CST-200</b>	
Units per packaging	1
Packing weight	0.020 Kg
Packing dimensions	120 x 40 x 20mm

A/V mini-jack to stereo RCA cable. 1.5m of length.



A/V Input cable

<b>9510066</b>	
<b>CR-101</b>	
Units per packaging	1
Packing weight	0,08 Kg
Packing dimensions	120 x 40 x 20 mm

Euroconnector input cable to RCA mono. For modulator 951-MD.



Male F type connector

9120039	
CM-004	
Units per packaging	100
Packing weight	0,340 Kg
Packing dimensions	130 x 100 x 20 mm

Male F connector to screw onto shielded RG-6 coaxial cable of Ø 6.5mm to Ø 6.8mm.



Male F connector

9080023	
MC-302	
Units per packaging	25
Packing weight	0,10 Kg
Packing dimensions	80 x 80 x 100 mm

Male F connector to screw into RG-6 coaxial cable, Ø6.9 - 7.2 mm.



F load

9120011	
RS-275	
Units per packaging	10
Packing weight	0,03 Kg
Packing dimensions	80 x 5 x 15 mm

75 Ω load, for loading unused inputs and outputs.



Multiplexing bridge

9120064	
PU-101	
Units per packaging	12
Packing weight	0,14 Kg
Packing dimensions	120 x 60 x 35 mm

Multiplexing bridge, to combine the signal of all the modules.



Power supply and data cable

9120105	
LS-207	
Units per packaging	1
Packing weight	0,05 Kg
Packing dimensions	190 x 25 x 100 mm

Flat 20-wire power cable to connect the power supply unit and 11 modules.



Ventilator

9050043	
VE-500	
Units per packaging	1
Packing weight	0,62 Kg
Packing dimensions	80 x 70 x 20 mm

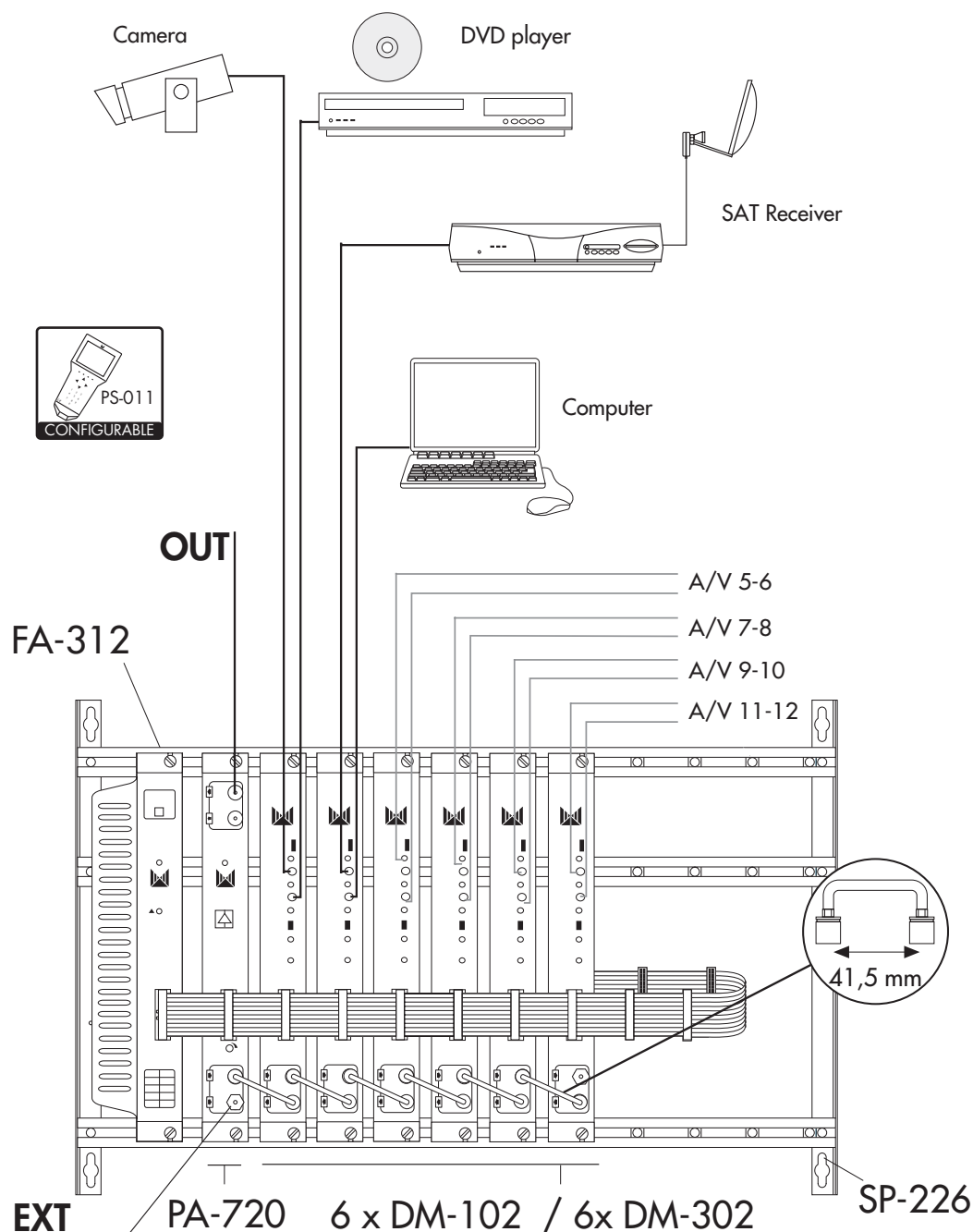
Ventilator for CP-710 cabinet – this may be required in warm environments to keep the equipment within its operating temperature margins.

# 912

## EXAMPLES OF INSTALLATIONS

### A/V to DVB-T/DVB-C modulators equipment

Complete set of digital modulators for terrestrial digital television (DVB-T) or for digital cable television (DVB-C). Each modulator is equipped with two audio/video inputs via 2.5 mm mini-jack connectors to modulate the signals coming from individual satellite receivers, DVD players, cameras, computers or any such device with an audio/video output.

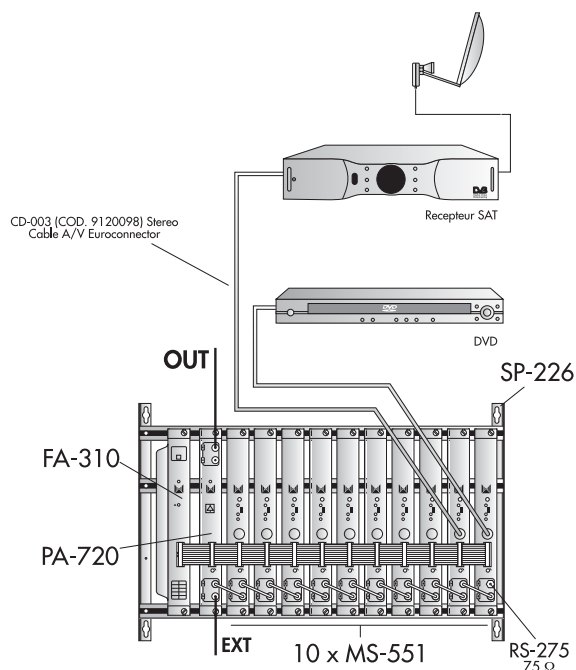


# 912

## EXAMPLES OF INSTALLATION

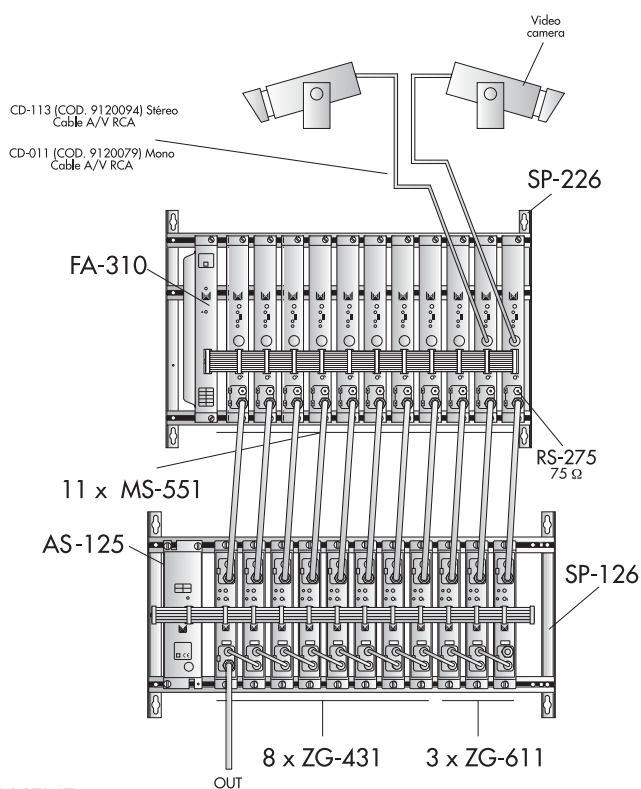
### Modulator equipment with broadband amplifier

Complete equipment of stereo or mono modulators, the channels generated by the equipment are amplified by a built-in broadband amplifier. In this example the audio and video signals for the modulators come from an individual satellite receiver and from a video.



### Modulator equipment with monochannel amplification

Complete equipment of stereo or mono modulators, the channels generated by the equipment are amplified by 905-ZG or 905-ZP equipment. The output of each modulator is directly connected to the monochannel amplifier. In this example the audio and video signals for the modulators come from two video cameras.

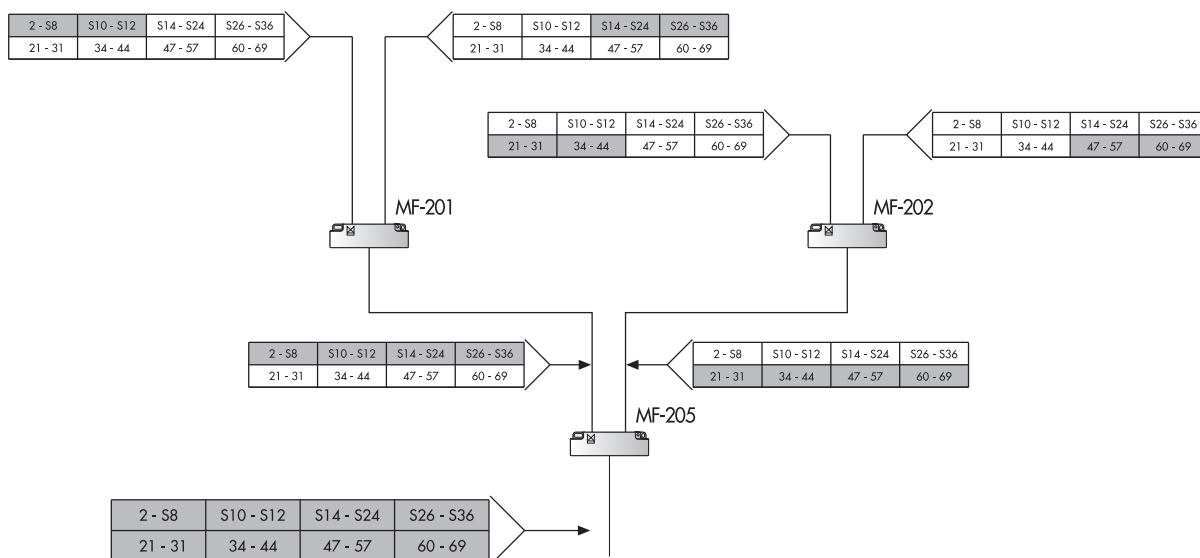


# 912

## EXAMPLES OF INSTALLATION

### Use of filtered multiplexers to combine head-ends

The outputs of the head-end equipment combine with multiplexers by groups of channels significantly to improve the carrier to noise (C/N) ratio of the head-end. Finally, all the channels coming from the equipment are amplified by a broadband amplifier. To adapt the terrestrial TV channels to the planned frequencies of the head-end equipment, channel conversion equipment can be employed; this uses those channels which have been left free in the planning of channels. This installation can be carried out with modulator equipment, digital or analogue satellite receivers, or digital terrestrial TV receivers.



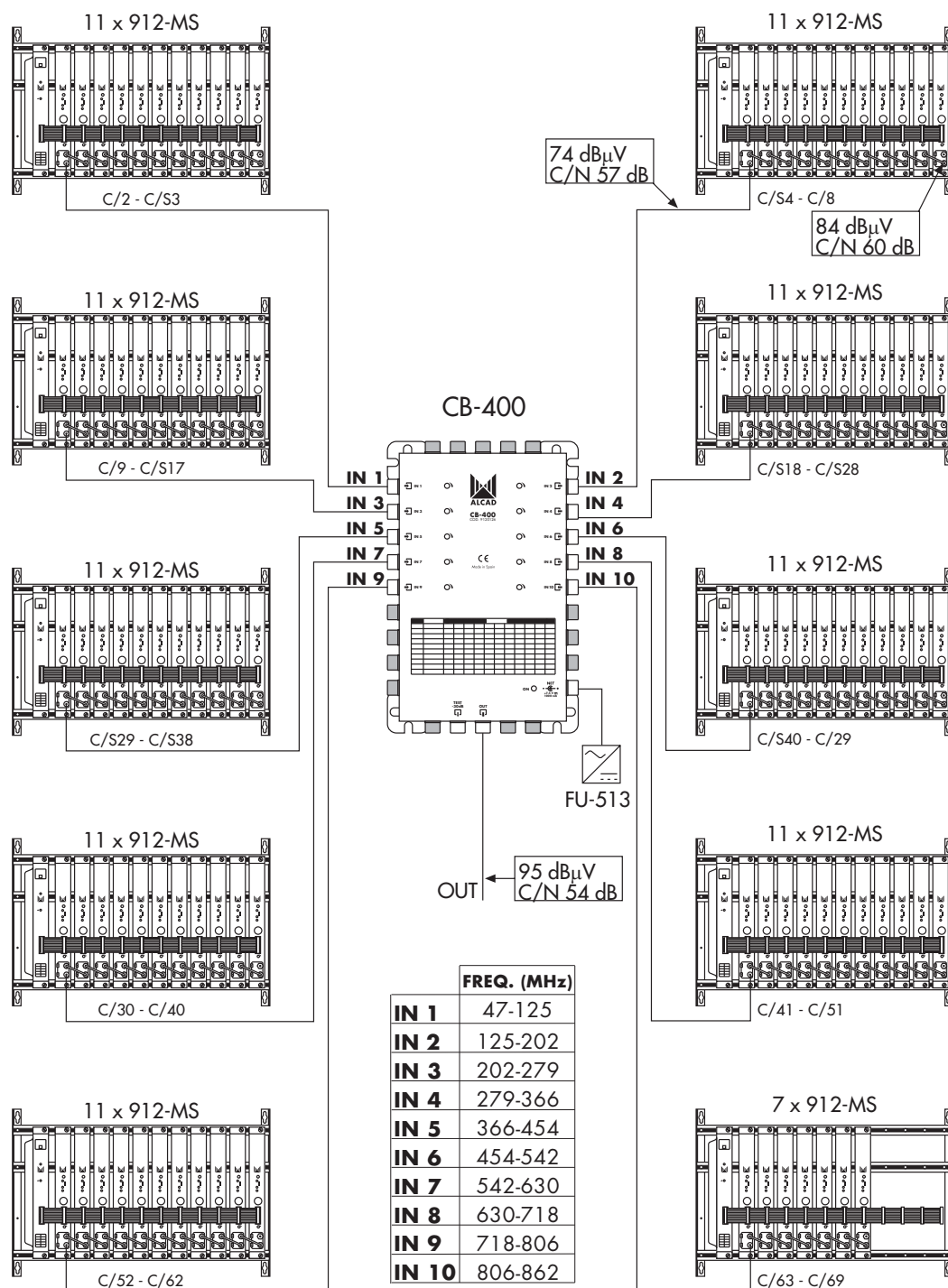
	2	3	4	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	5	6	7	8	9	10	11	12	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40	S41									
MF-201	Input 1														47 - 244 MHz														Input 2														251 - 430 MHz																		
MF-205	Input 1																																															47 - 430 MHz													
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69												
MF-202	Input 1														470 - 662 MHz														Input 2														678 - 862 MHz																		
MF-205	Input 2														470 - 862 MHz																																														

# 912

## EXAMPLES OF INSTALLATION

### Head-end of modulators with 106 channels

Head-end formed by 10 modulator sets, wich generate 106 channels. The amplification is made by CB-400 combiner amplifier. The filtered inputs allow to amplify signal with a low level of noise.



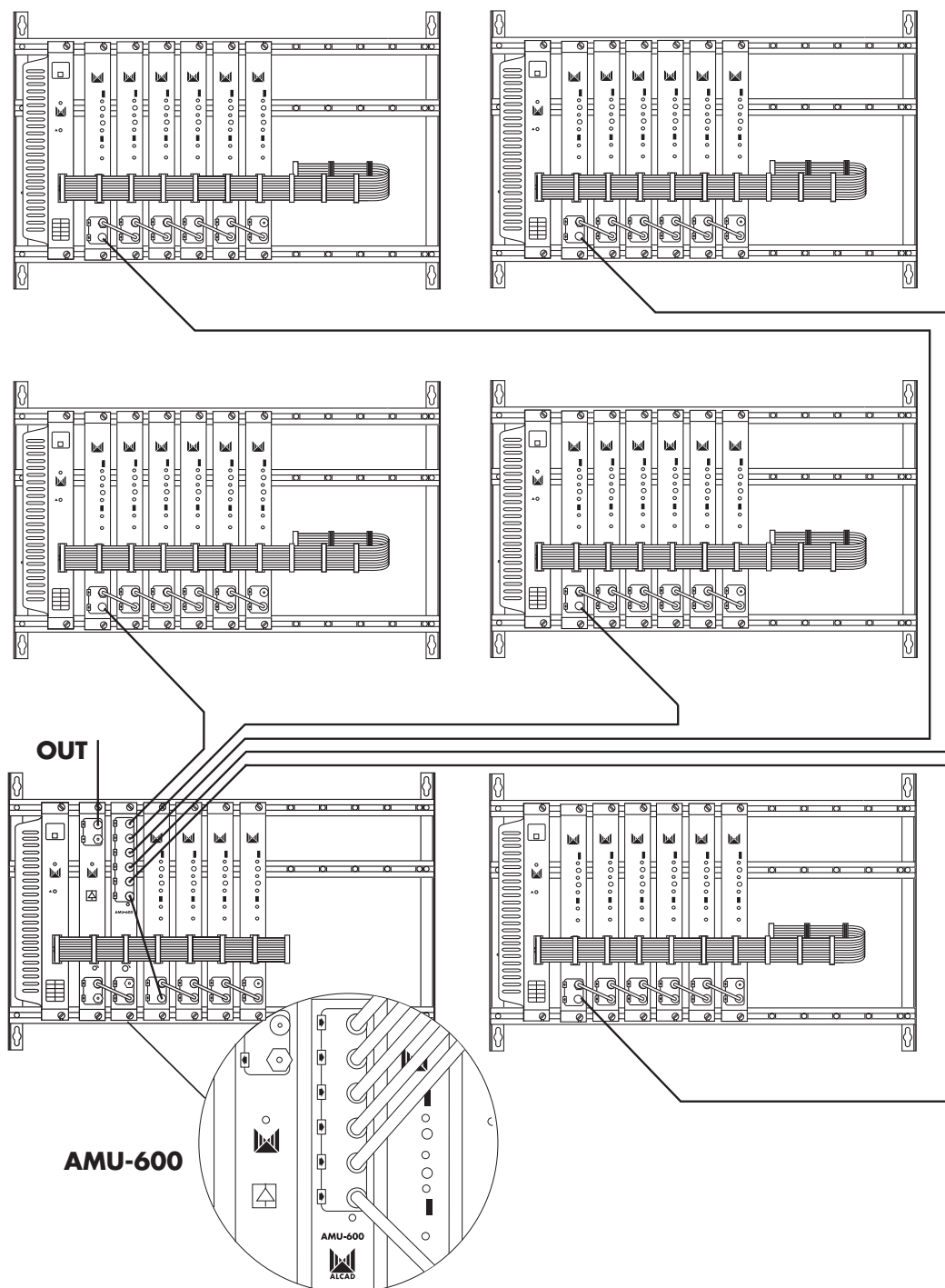
Note: Adjusting the levels is possible to make similar installation with digital modulators 912-DM.

# 912

## EXAMPLES OF INSTALLATION

Head-end of modulators with 34 digital channels and multiplexer

912-DM SERIES or 912-MS SERIES





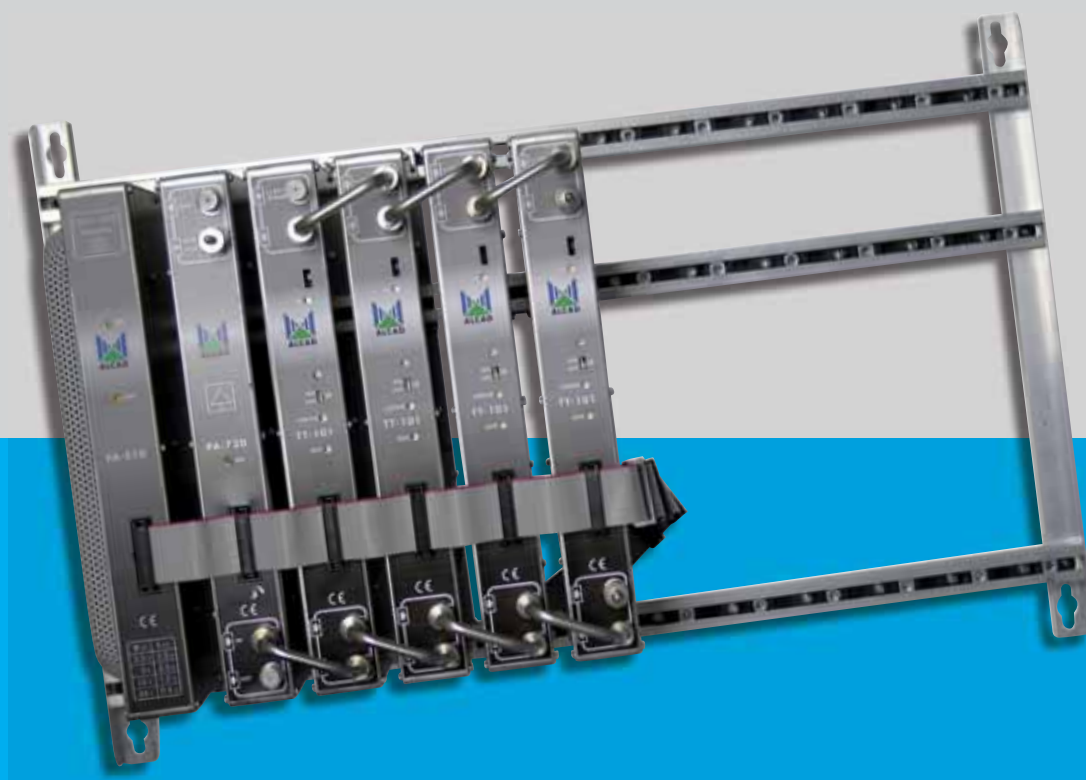




## **SAT TV** equipment

Reception and processing equipment  
for analogue and digital TV via  
satellite. The wide range of equipment  
contemplates all the different  
possibilities of treating satellite signals.

Pendiente cambios



**Description**

Modular TV modulator equipment which, from a satellite digital television signal, generates a terrestrial digital TV channel. The equipment converts satellite digital television services in DVB-S/S2 into programmes included in a terrestrial digital TV channel and modulated into DVB-T. It consists of a power supply unit, an amplifier and up to 8 transmodulators, depending on the model. All features can be programmed using PC software and/or a wireless programmer.

**Applications**

Collective terrestrial digital television installations where it is necessary to generate an entire DVB-T channel containing services coming from satellite digital signals modulated to DVB-S/S2, both free to air and encrypted. It is unnecessary to install individual satellite receivers. Compatible with all collective TV installations since the channels can be distributed throughout the terrestrial band. Compatible with remote control systems.

**Characteristics**

Enables insertion of NIT tables. Output channel programming by frequency or using the channel plan. Generated channel of outstanding quality. Zamak chassis with metal side covers. F-type connectors. The equipment can be assembled quickly and easily.

**Accessories**

See page 243.



TT-201

### Description

Transmodulator of unencrypted satellite digital television services to terrestrial digital television. Each module selects the free-to-air services of a DVB-S/S2 satellite transponder and includes them in a DVB-T channel. Programmable using PC software and a wireless programmer.

### Applications

Collective terrestrial digital television installations where it is necessary to distribute FTA satellite television services while avoiding the installation of satellite receivers. Compatible with all collective TV installations since the channels can be distributed throughout the terrestrial band.

### Characteristics

Automatic error-detection system which greatly reduces maintenance work on the installation. Generated output channel of outstanding quality. Zamak chassis with metal side panels. F-type connectors. The equipment can be assembled quickly and easily.

CODE		9120145
MODEL		TT-201
TV system		DVB-S / DVB-S2 → DVB-T/DVB-H EN 300421 EN 302307 EN 300744
<b>DVB-S/S2 receiver</b>		
Frequency range	MHz	950 - 2.150
Frequency step	KHz	1
LNB power supply	V $\cdots$	+12
	mA	350 máx
Symbol rate	Mbaud	1..45
Diplexing through loss	dB $\pm$ TOL	1.0 $\pm$ 0,2
<b>DVB-S2 receiver</b>		
Input level	dB $\mu$ V	45..95
	dBm	-63..-13
F.E.C. QPSK		Auto, 1/2, 3/5, 2/3, 3/4, 4/5 5/6, 8/9, 9/10 DVB: EN 302307
F.E.C. 8PSK		Auto, 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 DVB: EN 302307
Roll-Off	dB	0,35/0,25/0,20
<b>DVB-S receiver</b>		
Input level	dB $\mu$ V	40..95
	dBm	-68..-13
F.E.C. QPSK		Auto, 1/2, 2/3, 3/4, 5/6, 7/8 DVB: EN 300421
<b>COFDM modulator</b>		
TV system		DVB-T / DVB-H DVB: EN 300744
Output offset	MHz	-1/6, -1/8, 0, +1/8, +1/6 DVB-T
Mode		2K, 8K, 4K (DVB-H) DVB: EN 300744





TT-201

CODE		9120145	
MODEL		TT-201	
Modulation		QPSK, 16QAM, 64QAM DVB: EN 300744	
F.E.C.		1/2, 2/3, 3/4, 5/6, 7/8 DVB: EN 300744	
Guard interval		1/4, 1/8, 1/16, 1/32 DVB: EN 300744	
MER	dB	39 ±2,0	
RF output			
Frequency range	MHz	47-862	
Frequency step	MHz	0,25	
Output level	dBµV	80 ±2,0	
Opout level adjust	dB	20	
Bandwidth	MHz	8, 7, 6, 5 DVB-H	
Through loss in the mixture	dB	0,9 ±0,1	
General features			
Power supply	V~	+3,3	+5,2 +12
	mA	1200	390+CAM 70+LNB
Operating temperature close to equipment		-10..+65	
Room temperature with/without fan		-10..+55/+45	
Protection index		IP30	
Units per packing		1	
Packing weight	Kg	1,4	
Packing dimensions	mm	270 x 170 x 38	

Programmable with PS-011 and ASP software



TT-211

### Description

Transmodulator of encrypted satellite digital television services to terrestrial digital television. Each module selects the services of a DVB-S/S2 satellite transponder and includes them in a DVB-T channel. Equipped with a Common Interface slot for insertion of the CAM and the subscriber's card. Programmable using PC software and a wireless programmer.

### Applications

Collective terrestrial digital television installations where the aim is to distribute encrypted satellite television services while avoiding the installation of satellite receivers. Compatible with all collective TV installations since the channels can be distributed throughout the terrestrial band.

### Characteristics

Automatic error-detection system which greatly reduces maintenance work on the installation. Generated output channel of outstanding quality. Does not include the CAM or the decoder card. Zamak chassis with metal side panels. F-type connectors. The equipment can be assembled quickly and easily.

CODE		9120147
MODEL		TT-211
TV system		DVB-S / DVB-S2 → DVB-T/DVB-H EN 300421 EN 302307 EN 300744
<b>DVB-S/S2 receiver</b>		
Frequency range	MHz	950 - 2.150
Frequency step	KHz	1
LNB power supply	V---	+12
	mA	350 máx
Symbol rate	Mbaud	1..45
Diplexing through loss	dB±TOL	1.0 ±0,2
<b>DVB-S2 receiver</b>		
Input level	dBμV	45..95
	dBm	-63..-13
F.E.C. QPSK		Auto, 1/2, 3/5, 2/3, 3/4, 4/5 5/6, 8/9, 9/10 DVB: EN 302307
F.E.C. 8PSK		Auto, 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 DVB: EN 302307
Roll-Off	dB	0,35/0,25/0,20
<b>DVB-S receiver</b>		
Input level	dBμV	40..95
	dBm	-68..-13
F.E.C. QPSK		Auto, 1/2, 2/3, 3/4, 5/6, 7/8 DVB: EN 300421
<b>Conditional access</b>		
Standard		DVB-CI: EN 50221 Common Interface
Compatibility	MHz	Viaccess, Mediaguard, Videoguard, Seca, Betacryp, Nagravision, Irdeto, Cryptoworks, Conax

Programmable with PS-011 and ASP software



TT-211

CODE		9120147		
MODEL		TT-211		
<b>COFDM modulator</b>				
TV system		DVB-T / DVB-H DVB: EN 300744		
Output offset	MHz	-1/6, -1/8, 0, +1/8, +1/6 DVB-T		
Mode		2K, 8K, 4K (DVB-H) DVB: EN 300744		
Modulation		QPSK, 16QAM, 64QAM DVB: EN 300744		
F.E.C.		1/2, 2/3, 3/4, 5/6, 7/8 DVB: EN 300744		
Guard interval		1/4, 1/8, 1/16, 1/32 DVB: EN 300744		
MER	dB	39 ±2,0		
<b>RF output</b>				
Frequency range	MHz	47-862		
Frequency step	MHz	0,25		
Output level	dBμV	80 ±2,0		
Output level adjust	dB	20		
Bandwidth	MHz	8, 7, 6, 5 DVB-H		
Through loss in the mixture	dB	0,9 ±0,1		
<b>General features</b>				
Power supply	V~	+3,3	+5,2	+12
	mA	1200	390+CAM	70+LNB
Operating T close to equipment		-10...+65		
Room T with/without fan		-10...+55/+45		
Protection index		IP30		
Units per packing		1		
Packing weight	Kg	1,4		
Packing dimensions	mm	270 x 170 x 38		





TT-311

### Description

Transmodulator of encrypted satellite digital television services to terrestrial digital television with DiSEqC. Each module selects the services of a DVB-S/S2 satellite transponder and includes them in a DVB-T channel. Equipped with a Common Interface slot for insertion of the CAM and the subscriber's card. Programmable using PC software and a wireless programmer.

### Applications

Collective terrestrial digital television installations where the aim is to distribute encrypted satellite television services while avoiding the installation of satellite receivers. Allows channels from different satellites to be selected thanks to its DiSEqC control. Compatible with all collective TV installations since the channels can be distributed throughout the terrestrial band.

### Characteristics

Automatic error-detection system which greatly reduces maintenance work on the installation. Generated output channel of outstanding quality. Does not include the CAM or the decoder card. Zamak chassis with metal side panels. F-type connectors. The equipment can be assembled quickly and easily.

CODE		9120189
MODEL		TT-311
TV system		DVB-S / DVB-S2 → DVB-T/DVB-H EN 300421 EN 302307 EN 300744
<b>DVB-S/S2 receiver</b>		
Frequency range	MHz	950 - 2.150
Frequency step	KHz	1
LNB power supply	V...	DiSEqC 2.0 +13 / +18 (0/22KHz)
	mA	350 máx
Symbol rate	Mbaud	1..45
Diplexing through loss	dB±TOL	1.0 ±0,2
<b>DVB-S2 receiver</b>		
Input level	dBµV	45..95
	dBm	-63..-13
F.E.C. QPSK		Auto, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 DVB: EN 302307
F.E.C. 8PSK		Auto, 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 DVB: EN 302307
Roll-Off	dB	0,35/0,25/0,20
<b>DVB-S receiver</b>		
Input level	dBµV	40..95
	dBm	-68..-13
F.E.C. QPSK		Auto, 1/2, 2/3, 3/4, 5/6, 7/8 DVB: EN 300421
<b>Conditional access</b>		
Standard		DVB-CI: EN 50221 Common Interface
Compatibility	MHz	Viaccess, Mediaguard, Videoguard, Seca, Betacryp, Nagravision, Irdeto, Cryptoworks, Conax

Programmable with PS-011 and ASP software



TT-311

CODE		9120189		
MODEL		TT-311		
<b>COFDM modulator</b>				
TV system		DVB-T / DVB-H DVB: EN 300744		
Output offset	MHz	-1/6, -1/8, 0, +1/8, +1/6 DVB-T		
Mode		2K, 8K, 4K (DVB-H) DVB: EN 300744		
Modulation		QPSK, 16QAM, 64QAM DVB: EN 300744		
F.E.C.		1/2, 2/3, 3/4, 5/6, 7/8 DVB: EN 300744		
Guard interval		1/4, 1/8, 1/16, 1/32 DVB: EN 300744		
MER	dB	39 ±2,0		
<b>RF output</b>				
Frequency range	MHz	47-862		
Frequency step	MHz	0,25		
Output level	dBμV	80 ±2,0		
Output level adjust	dB	20		
Bandwidth	MHz	8, 7, 6, 5 DVB-H		
Through loss in the mixture	dB	0,9 ±0,1		
<b>General features</b>				
Power supply	V~	+3,3	+5,2	+12
	mA	1200	390+CAM	70+LNB
Operating T close to equipment		-10..+65		
Room T with/without fan		-10..+55/+45		
Protection index		IP30		
Units per packing		1		
Packing weight	Kg	1,4		
Packing dimensions	mm	270 x 170 x 38		



TT-401

### Description

Transmodulator of free-to-air satellite digital television services to terrestrial digital television with DiSEqC. Each module selects the free-to-air services of two DVB-S/S2 satellite transponders and includes them in a DVB-T channel. Programmable using PC software and a wireless programmer.

### Applications

Collective terrestrial digital television installations where it is necessary to distribute FTA satellite television services while avoiding the installation of satellite receivers. Allows channels from different satellites to be selected thanks to its DiSEqC control. Compatible with all collective TV installations since the channels can be distributed throughout the terrestrial band.

### Characteristics

Two independent tuners. Automatic error-detection system which greatly reduces maintenance work on the installation. Generated output channel of outstanding quality. Zamak chassis with metal side panels. F-type connectors. The equipment can be assembled quickly and easily.

CODE		9120200
MODEL		TT-401
TV system		DVB-S / DVB-S2 → DVB-T / DVB-H EN 300421 EN 302307 EN 300744
Connection		F female
Number of inputs		1 with duplexing or 2 independents
<b>DVB-S/S2 receiver</b>		
Frequency range	MHz	950 - 2.150
Frequency step	KHz	1
LNB power supply	V---	DiSEqC 2.0 +13 / +18 (0/22KHz)
	mA	350 máx
Symbol rate	Mbaud	1..45
Diplexing through loss	dB±TOL	1.0 ±0,2
<b>DVB-S2 receiver</b>		
Input level	dBμV	45..95
	dBm	-63..-13
F.E.C. QPSK		Auto, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 DVB: EN 302307
F.E.C. 8PSK		Auto, 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 DVB: EN 302307
Roll-Off	dB	0,35/0,25/0,20
<b>DVB-S receiver</b>		
Input level	dBμV	40..95
	dBm	-68..-13
F.E.C. QPSK		Auto, 1/2, 2/3, 3/4, 5/6, 7/8 DVB: EN 300421

Programmable with PS-011 and ASP software



TT-401

CODE		9120200		
MODEL		TT-401		
<b>COFDM modulator</b>				
TV system		DVB-T / DVB-H DVB: EN 300744		
Output offset	MHz	-1/6, -1/8, 0, +1/8, +1/6 DVB-T		
Mode		2K, 8K, 4K (DVB-H) DVB: EN 300744		
Modulation		QPSK, 16QAM, 64QAM DVB: EN 300744		
F.E.C.		1/2, 2/3, 3/4, 5/6, 7/8 DVB: EN 300744		
Guard interval		1/4, 1/8, 1/16, 1/32 DVB: EN 300744		
MER	dB	39 ±2,0		
<b>RF output</b>				
Frequency range	MHz	47-862		
Frequency step	MHz	0,25		
Output level	dBμV	80 ±2,0		
Output level adjust	dB	20		
Bandwidth	MHz	8, 7, 6, 5 DVB-H		
Through loss in the mixture	dB	0,9 ±0,1		
<b>General features</b>				
Power supply	V~	+3,3	+5,2	+12
	mA	1600	320	40+LNB
Operating T close to equipment		-10...+65		
Room T with/without fan		-10...+55/+45		
Protection index		IP30		
Units per packing		1		
Packing weight	Kg	1,4		
Packing dimensions	mm	270 x 170 x 38		



TT-411

### Description

Transmodulator of encrypted satellite digital television services to terrestrial digital television with DiSEqC. Each module selects the free-to-air services of two DVB-S/S2 satellite transponders and includes them in a DVB-T channel. Equipped with a Common Interface slot for insertion of the CAM and the subscriber's card. Programmable using PC software and a wireless programmer.

### Applications

Collective terrestrial digital television installations where the aim is to distribute encrypted satellite television services while avoiding the installation of satellite receivers. Allows channels from different satellites to be selected thanks to its DiSEqC control. Compatible with all collective TV installations since the channels can be distributed throughout the terrestrial band.

### Characteristics

Two independent tuners. Automatic error-detection system which greatly reduces maintenance work on the installation. Generated output channel of outstanding quality. Does not include the CAM or the decoder card. Zamak chassis with metal side panels. F-type connectors. The equipment can be assembled quickly and easily.

CODE		9120201
MODEL		TT-411
TV system		DVB-S / DVB-S2 → DVB-T / DVB-H EN 300421 EN 302307 EN 300744
Connection		F female
Number of inputs		1 with duplexing or 2 independents
<b>DVB-S/S2 receiver</b>		
Frequency range	MHz	950 - 2.150
Frequency step	KHz	1
LNB power supply	V...	DiSEqC 2.0 +13 / +18 (0/22KHz)
	mA	350 máx
Symbol rate	Mbaud	1..45
Duplexing through loss	dB±TOL	1.0 ±0,2
<b>DVB-S2 receiver</b>		
Input level	dBµV	45..95
	dBm	-63..-13
F.E.C. QPSK		Auto, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 DVB: EN 302307
F.E.C. 8PSK		Auto, 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 DVB: EN 302307
Roll-Off	dB	0,35/0,25/0,20
<b>DVB-S receiver</b>		
Input level	dBµV	40..95
	dBm	-68..-13
F.E.C. QPSK		Auto, 1/2, 2/3, 3/4, 5/6, 7/8 DVB: EN 300421
<b>Conditional access</b>		
Standard		DVB-CI: EN 50221 Common Interface
Compatibility		Viaccess, Mediaguard, Videoguard, Seca, Betacryp, Nagravision, Irdeto, Cryptoworks, Conax



TT-411

Programmable with PS-011 and ASP software

CODE		9120201	
MODEL		TT-411	
<b>COFDM modulator</b>			
TV system		DVB-T / DVB-H DVB: EN 300744	
Output offset	MHz	-1/6, -1/8, 0, +1/8, +1/6 DVB-T	
Mode		2K, 8K, 4K (DVB-H) DVB: EN 300744	
Modulation		QPSK, 16QAM, 64QAM DVB: EN 300744	
F.E.C.		1/2, 2/3, 3/4, 5/6, 7/8 DVB: EN 300744	
Guard interval		1/4, 1/8, 1/16, 1/32 DVB: EN 300744	
MER	dB	39 ±2,0	
<b>RF output</b>			
Frequency range	MHz	47-862	
Frequency step	MHz	0,25	
Output level	dBμV	80 ±2,0	
Output level adjust	dB	20	
Bandwidth	MHz	8, 7, 6, 5 DVB-H	
Through loss in the mixture	dB	0,9 ±0,1	
<b>General features</b>			
Power supply	V~	+3,3	+5,2 +12
	mA	1600	320+CAM 40+LNB
Operating T close to equipment		-10..+65	
Room T with/without fan		-10..+55/+45	
Protection index		IP30	
Units per packing		1	
Packing weight	Kg	1,4	
Packing dimensions	mm	270 x 170 x 38	



PA-720

### Description

Broadband amplifier for ALCAD equipment. It has one inputs to amplify the signal coming from all the modules of the installation, and a mutliplexing input for the rest of the channels of the installation. The output level can be controlled by means of an attenuator.

### Applications

All MATV installations where modulators are incorporated and monochannel amplifiers are not used.

### Characteristics

Amplifier with high output level, power stage with a hybrid amplifier. Supplied with power cable.

CODE		9120093
MODEL		PA-720
TV System		AM-TV / DVB-T / DVB - C
Number of inputs		1
Frequency range	MHz	40-894
Gain	dB±TOL	44 ±1,0
Gain adjustment	dB	15
Output level	dBµV	119 (DIN45004B) 116 (IMD <sub>3</sub> - 60dB) 110 (IMD <sub>2</sub> - 60dB) 103 (CTB - 60dB) 104 (CSO - 60dB) 104 (XMOD - 60dB)
Output test point	dB±TOL	-30 ±1,0
Extension input loss	dB±TOL	0 ±2,0
Noise figure	dB	3.5 ±0,5
Return loss	dB	>14-1,5/eighth >10
Chroma-luminance delay	ns	<10
Connectors		F female
Power supply	V---	+24
	mA	320
Operating temperature	°C	-10..+65
Room temperature with/ without fan	°C	-10..+55/+45
Protection index		IP 20C
Units per packing		1
Packing weight	Kg	1.16
Packing dimensions	mm	265 x 165 x 40

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3

CTB -60 dB: 42 equal carriers, EN 50083-3  
CSO -60 dB: 42 equal carriers, EN 50083-3  
XMOD -60 dB: 42 equal carriers, EN 50083-3

# 912

## DIGITAL SAT EQUIPMENT 912-TT

### Power supply units



FA-310



FA-312

#### Description

Switching power supply, which permits the installation of an amplifier and up to 6 modules on the support frame. Power supply with a flat cable of 20 lines for different feed voltages.

#### Applications

Required for feeding the modules of the equipment.

#### Characteristics

Protected against power surges, overloads and short-circuits. Zamak chassis with side grills to facilitate proper ventilation. Supplied with power cable.

CODE		9120046				9120168			
MODEL		FA-310				FA-312			
Output voltage	V $\cdots$	+3.3	+5.2	+12.0	+24	+3.3	+5.2	+12.0	+24
	mA	5500	2500	1500	500	10000	5000	1500	500
Peak to peak ripple voltage	mV	>50				100			
Mains voltage	V $\sim$	230 $\pm$ 20% 50/60 Hz		240 $\begin{smallmatrix} +15\% \text{ 50/60 Hz} \\ -20\% \text{ 50/60 Hz} \end{smallmatrix}$		90..264 $\begin{smallmatrix} +15\% \text{ 50/60 Hz} \\ -20\% \text{ 50/60 Hz} \end{smallmatrix}$			
	W	72				85			
Operating temp. close to equipment	$^{\circ}$ C	-10..+65							
Room tmperature with/without fan	$^{\circ}$ C	-10..+55/+45							
Protection index		IP 20C							
Units per packaging		1							
Packing weight	Kg	1.43				1.65			
Packing dimensions	mm	270 x 165 x 60							

See table on page 454 for more information.





**Description**

Modular transmodulator equipment which, from a satellite digital television signal generates a digital cable TV channel. The equipment converts DVB-S/S2 satellite digital television services to programmes included in a digital cable TV channel and modulated to DVB-C. Allows channels from different satellites to be selected thanks to its DiSEqC control. It consists of a power supply unit, an amplifier and up to 8 transmodulators, depending on the model. All features can be programmed using PC software and/or a wireless programmer.

**Applications**

Collective digital cable TV installations where it is necessary to generate an entire DVB-C channel containing services coming from satellite digital signals, modulated to DVB-S/S2, both free to air and encrypted. It is unnecessary to install individual satellite receivers. Compatible with all collective cable TV installations since the channels can be distributed throughout the 47-862 MHz band. Compatible with remote control systems.

**Characteristics**

Enables insertion of NIT tables. Output channel programming by frequency or using the channel plan. Generated channel of outstanding quality. Zamak chassis with metal side covers. F-type connectors. The equipment can be assembled quickly and easily.

**Accessories**

See page 243.



TQ-532

**Description**

Transmodulator of FTA satellite digital television services to terrestrial digital television with DiSEqC. Each module selects the free-to-air services from a DVB-S/S2 satellite transponder and includes them in a DVB-C channel. Programmable using PC software and a wireless programmer.

**Applications**

Collective digital cable TV installations where the aim is to distribute FTA satellite television services while avoiding the installation of satellite receivers. Allows channels from different satellites to be selected thanks to its DiSEqC control. Compatible with all collective TV installations since the channels can be distributed throughout the 47-862 MHz band.

**Characteristics**

Automatic error-detection system which greatly reduces maintenance work on the installation. Generated output channel of outstanding quality. Zamak chassis with metal side panels. F-type connectors. The equipment can be assembled quickly and easily.

CODE		9120150
MODEL		TQ-532
TV system		DVB-S / DVB-S2 → DVB-C EN 300421 EN 302307 EN 300429
<b>DVB-S/S2 receiver</b>		
Frequency range	MHz	950-2150
Frequency step	MHz	1
Automatic frequency control	MHz	±2
Range of capture	MHz	±5
LNB power supply	V	DiSEqC 2.0 13-18v (0-22Khz)
	mA	350 max
Symbol rate	Mbaud	1..45
Diplexing through loss	dB	1 ±0.2
<b>DVB-S2 receiver</b>		
Input level	dBμV	45..95
	dBm	-63..-13
F.E.C. QPSK		Auto, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 DVB: EN 302307
F.E.C. 8PSK		Auto, 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 DVB: EN 302307
Roll off		0.35/0.25/0.20
<b>DVB-S receiver</b>		
Input level	dBμV	40..95
	dBm	-68..-13
F.E.C. QPSK		Auto, 1/2, 2/3, 3/4, 5/6, 7/8 DVB: EN 302307
<b>DVB-C modulator</b>		
Modulation		16 - 32 - 64 - 128 - 256 QAM
Bandwidth	MHz	9.2 max
MER	dB	38 ± 2.0
Symbol rate	Mbaud	1..8



TQ-532

CODE		9120150	
MODEL		TQ-532	
<b>RF output</b>			
Frequency range	MHz	47-862	
Frequency step	MHz	0.25	
Output level	dB $\mu$ V	80 $\pm$ 2.0	
Output level adjustment	dB	20	
Spurious in band	dB	>60	
Roll off factor	%	15	
Carrier / Noise ratio (C/N)	dB	38	
Diplexing through loss	dB	0.9 $\pm$ 0.1	
<b>General features</b>			
Return loss	dB	>20	
Power supply	V $\cdots$	+3,3	+5,2 +12
	mA	1100	390 70+LNB
Operating T close to equipment		-10.. $\pm$ 65	
Room T with/without fan		-10.. $\pm$ 55/ $\pm$ 45	
Protection index		IP30	
Units per packing		1	
Packing weight	Kg	1.4	
Packing dimensions	mm	270 x 170 x 38	

Programmable with PS-011 and ASP software



TQ-533

### Description

Transmodulator of encrypted satellite digital television services to terrestrial digital television with DiSEqC. Each module selects the services from a DVB-S/S2 satellite transponder and includes them in a DVB-C channel. Equipped with a Common Interface slot for the insertion of the CAM and the subscriber's card. Programmable using PC software and a wireless programmer.

### Applications

Collective digital cable TV installations where the aim is to distribute encrypted satellite television services while avoiding the installation of satellite receivers. Allows channels from different satellites to be selected thanks to its DiSEqC control. Compatible with all collective TV installations since the channels can be distributed throughout the 47-862 MHz band.

### Characteristics

Automatic error-detection system which greatly reduces maintenance work on the installation. Generated output channel of outstanding quality. Does not include the CAM or the decoder card. Zamak chassis with metal side panels. F-type connectors. The equipment can be assembled quickly and easily.

CODE		9120191
MODEL		TQ-533
TV system		DVB-S / DVB-S2 → DVB-C EN 300421 EN 302307 EN 300429
<b>DVB-S/S2 receiver</b>		
Frequency range	MHz	950-2150
Frequency step	MHz	1
Automatic frequency control	MHz	±2
Range of capture	MHz	±5
LNB power supply	V	DiSEqC 2.0 +13V +18V 0/22KHz
	mA	350 max
Symbol rate	Mbaud	1..45
Diplexing through loss	dB	1 ±0.2
<b>DVB-S2 receiver</b>		
Input level	dBμV	45..95
	dBm	-63..-13
F.E.C. QPSK		Auto, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 DVB: EN 302307
F.E.C. 8PSK		Auto, 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 DVB: EN 302307
Roll off		0.35/0.25/0.20
<b>DVB-S receiver</b>		
Input level	dBμV	40..95
	dBm	-68..-13
F.E.C. QPSK		Auto, 1/2, 2/3, 3/4, 5/6, 7/8 EN 302307
<b>DVB-C modulator</b>		
Modulation		16 - 32 - 64 - 128 - 256 QAM
Bandwidth	MHz	9.2 max



TQ-533

CODE		9120191		
MODEL		TQ-533		
MER	dB	38 ± 2.0		
Symbol rate	Mbaud	1..8		
<b>RF output</b>				
Frequency range	MHz	47-862		
Frequency step	MHz	0.25		
Output level	dBμV	80 ± 2.0		
Output level adjustment	dB	20		
Spurious in band	dB	>60		
Roll off factor	%	15		
Carrier / Noise ratio (C/N)	dB	38		
Diplexing through loss	dB	0.9 ± 0.1		
<b>General features</b>				
Return loss	dB	>20		
Connection		F female		
Power supply	V <sub>cc</sub>	+3,3	+5,2	+12
	mA	1100	410+CAM	70+LNB
Operating T close to equipment		-10..+65		
Room T with/without fan		-10..+55/+45		
Protection index		IP30		
Units per packing		1		
Packing weight	Kg	1.4		
Packing dimensions	mm	270 x 170 x 38		

Programmable with PS-011 and ASP software.



TQ-542

### Description

Transmodulator of free-to-air satellite digital television services to terrestrial digital television with DiSEqC. Each module selects the free-to-air services of two DVB-S/S2 satellite transponders and includes them in a DVB-C channel. Programmable using PC software and a wireless programmer.

### Applications

Collective terrestrial digital television installations where it is necessary to distribute FTA satellite television services while avoiding the installation of satellite receivers. Allows channels from different satellites to be selected thanks to its DiSEqC control. Compatible with all collective TV installations since the channels can be distributed throughout the 47-862 MHz band.

### Characteristics

Two independent tuners. Automatic error-detection system which greatly reduces maintenance work on the installation. Generated output channel of outstanding quality. Zamak chassis with metal side panels. F-type connectors. The equipment can be assembled quickly and easily.

CODE		9120217
MODEL		TQ-542
TV system		DVB-S / DVB-S2 → DVB-C EN 300421 EN 302307 EN 300429
Number of inputs		1 with duplexing or 2 independents
<b>DVB-S/S2 receiver</b>		
Frequency range	MHz	950-2150
Frequency step	MHz	1
LNB power supply	V	DiSEqC 2.0 +13V +18V 0/22KHz
	mA	350 max
Symbol rate	Mbaud	1..45
Diplexing through loss	dB	1 ±0.2
<b>DVB-S2 receiver</b>		
Input level	dBμV	45..95
	dBm	-63..-13
F.E.C. QPSK		Auto, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 DVB: EN 302307
F.E.C. 8PSK		Auto, 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 DVB: EN 302307
Roll off		0.35/0.25/0.20
<b>DVB-S receiver</b>		
Input level	dBμV	40..95
	dBm	-68..-13
F.E.C. QPSK		Auto, 1/2, 2/3, 3/4, 5/6, 7/8 EN 302307
<b>DVB-C modulator</b>		
Modulation		16 - 32 - 64 - 128 - 256 QAM
Bandwidth	MHz	9.2 max



TQ-542

CODE		9120217	
MODEL		TQ-542	
MER	dB	38 ± 2.0	
Symbol rate	Mbaud	1..8	
<b>RF output</b>			
Frequency range	MHz	47-862	
Frequency step	MHz	0.25	
Output level	dBµV	80 ± 2.0	
Output level adjustment	dB	20	
Spurious in band	dB	>60	
Roll off factor	%	15	
Carrier / Noise ratio (C/N)	dB	38	
Diplexing through loss	dB	0.9 ±0.1	
<b>General features</b>			
Return loss	dB	>20	
Connection		F female	
Power supply	V <sub>cc</sub>	+3,3	+5,2 +12
	mA	1600	320 40+LNB
Operating T close to equipment		-10..+65	
Room T with/without fan		-10..+55/+45	
Protection index		IP30	
Units per packing		1	
Packing weight	Kg	1.4	
Packing dimensions	mm	270 x 170 x 38	

Programmable with PS-011 and ASP software





TQ-543

### Description

Transmodulator of encrypted satellite digital television services to terrestrial digital television with DiSEqC. Each module selects the free-to-air services of two DVB-S/S2 satellite transponders and includes them in a DVB-C channel. Equipped with a Common Interface slot for insertion of the CAM and the subscriber's card. Programmable using PC software and a wireless programmer.

### Applications

Collective terrestrial digital television installations where the aim is to distribute encrypted satellite television services while avoiding the installation of satellite receivers. Allows channels from different satellites to be selected thanks to its DiSEqC control. Compatible with all collective TV installations since the channels can be distributed throughout the 47-862 MHz band.

### Characteristics

Two independent tuners. Automatic error-detection system which greatly reduces maintenance work on the installation. Generated output channel of outstanding quality. Does not include the CAM or the decoder card. Zamak chassis with metal side panels. F-type connectors. The equipment can be assembled quickly and easily.

CODE		9120218
MODEL		TQ-543
TV system		DVB-S / DVB-S2 → DVB-C EN 300421 EN 302307 EN 300429
Number of inputs		1 with duplexing or 2 independents
<b>DVB-S/S2 receiver</b>		
Frequency range	MHz	950-2150
Frequency step	MHz	1
LNB power supply	V	DiSEqC 2.0 +13V +18V 0/22KHz
	mA	350 max
Symbol rate	Mbaud	1..45
Diplexing through loss	dB	1 ±0.2
<b>DVB-S2 receiver</b>		
Input level	dBμV	45..95
	dBm	-63..-13
F.E.C. QPSK		Auto, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 DVB: EN 302307
F.E.C. 8PSK		Auto, 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 DVB: EN 302307
Roll off		0.35/0.25/0.20
<b>DVB-S receiver</b>		
Input level	dBμV	40..95
	dBm	-68..-13
F.E.C. QPSK		Auto, 1/2, 2/3, 3/4, 5/6, 7/8 EN 302307
<b>DVB-C modulator</b>		
Modulation		16 - 32 - 64 - 128 - 256 QAM
Bandwidth	MHz	9.2 max



TQ-543

CODE		9120218		
MODEL		TQ-543		
MER	dB	38 ± 2.0		
Symbol rate	Mbaud	1..8		
<b>RF output</b>				
Frequency range	MHz	47-862		
Frequency step	MHz	0.25		
Output level	dBμV	80 ± 2.0		
Output level adjustment	dB	20		
Spurious in band	dB	>60		
Roll off factor	%	15		
Carrier / Noise ratio (C/N)	dB	38		
Diplexing through loss	dB	0.9 ± 0.1		
<b>General features</b>				
Return loss	dB	>20		
Connection		F female		
Power supply	V---	+3,3	+5,2	+12
	mA	1600	320+CAM	40+LNB
Operating T close to equipment		-10..+65		
Room T with/without fan		-10..+55/+45		
Protection index		IP30		
Units per packing		1		
Packing weight	Kg	1,4		
Packing dimensions	mm	270 x 170 x 38		

Programmable with PS-011 and ASP software



PA-720

### Description

Broadband amplifier for ALCAD equipment. It has one inputs to amplify the signal coming from all the modules of the installation, and a mutliplexing input for the rest of the channels of the installation. The output level can be controlled by means of an attenuator.

### Applications

All MATV installations where modulators are incorporated and monochannel amplifiers are not used.

### Characteristics

Amplifier with high output level, power stage with a hybrid amplifier. Supplied with power cable.

CODE		9120093
MODEL		PA-720
TV System		AM -TV / DVB-T / DVB - C
Number of inputs		1
Frequency range	MHz	40-894
Gain	dB±TOL	44 ±1,0
Gain adjustment	dB	15
Output level	dBpV	119 DIN45004B 116 (IMD <sub>3</sub> - 60dB) 110 (IMD <sub>2</sub> - 60dB) 103 (CTB - 60dB) 104 (CSO - 60dB) 104 (XMOD - 60dB)
Output test point	dB±TOL	-30 ±1,0
Extension input loss	dB±TOL	0 ±2,0
Noise figure	dB	3.5 ±0,5
Return loss	dB	>14-1,5/eighth >10
Chroma-luminance delay	ns	<10
Connectors		F female
Power supply	V---	+24
	mA	320
Operating temperature	°C	-10..+65
Room temperature with/ without fan	°C	-10..+55/+45
Protection index		IP 20C
Units per packing		1
Packing weight	Kg	1.16
Packing dimensions	mm	265 x 165 x 40

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3

CTB -60 dB: 42 equal carriers, EN 50083-3  
CSO -60 dB: 42 equal carriers, EN 50083-3  
XMOD -60 dB: 42 equal carriers, EN 50083-3

# 912

## DIGITAL SAT EQUIPMENT 912-TQ



### Power supply units



FA-310



FA-312

#### Description

Switching power supply, which permits the installation of an amplifier and up to 6 modules on the support frame. Power supply with a flat cable of 20 lines for different feed voltages.

#### Applications

Required for feeding the modules of the equipment.

#### Characteristics

Protected against power surges, overloads and short-circuits. Zamak chassis with side grills to facilitate proper ventilation. Supplied with power cable.

CODE		9120046				9120168			
MODEL		FA-310				FA-312			
Output voltage	V $\cdots$	+3.3	+5.2	+12.0	+24	+3.3	+5.2	+12.0	+24
	mA	5500	2500	1500	500	10000	5000	1500	500
Peak to peak ripple voltage	mV	>50				100			
Mains voltage	V $\sim$	230 $\pm$ 20% 50/60 Hz		240 $\begin{smallmatrix} +15\% \text{ 50/60 Hz} \\ -20\% \text{ 50/60 Hz} \end{smallmatrix}$		90..264 50/60 Hz			
	W	72				85			
Operating temp. close to equipment	$^{\circ}$ C	-10..+65							
Room tmperature with/ without fan	$^{\circ}$ C	-10..+55/+45							
Protection index		IP 20C							
Units per packaging		1							
Packing weight	Kg	1.43				1.65			
Packing dimensions	mm	270 x 165 x 60							

See table on page 454 for more information.



**Description**

Modular receiver equipment of digital TV via satellite, or DVB-S to PAL transmodulators. The equipment converts DVB-S digital TV programs into terrestrial and, analogue TV channels. Consisting of a power supply unit, an amplifier and up to 8 transmodulators, or 5 transmodulators if they are for channels with conditional access, which are mounted on a support frame. All the functions are programmable by means of a programmer. Available in different standards and tables of channels.

**Applications**

Digital SMATV installations, with a limited number of channels, typically between 5 and 20 programs. Compatible with all MATV or SMATV installations as the channels are distributed in terrestrial band. It is not necessary to install individual receivers for each TV. IF processing equipment of the 912-UC model or QPSKQAM transmodulators are recommended for the distribution of a greater number of programs.

**Characteristics**

Multistandard; programmable TV standard. Reinsertion of teletext, support and inversion of dual audio, support of subtitles and programmable 4:3 or 16:9 image format. An essential feature of this equipment is its generous operating temperature margin which gives it great reliability. Zamak chassis with metal side covers. F type connectors. Fast and easy assembly.

**Accessories**

See page 243.



TP-559

**Description**

Receiver of free-to-air digital satellite TV programs, or DVB-S to PAL transmodulator, with a built-in modulator. Each module selects a TV program from a DVB-S digital transponder and converts it into a terrestrial band analogue TV channel. Multistandard modulator with analogue stereo audio (ITU-BS 707-4) or mono. Standards: B/G stereo, D/K stereo, and I mono.

**Applications**

Digital SMATV installations where it is necessary to distribute digital channels which have been converted to analogue channels. Compatible with all the MATV installations as the channels are distributed in terrestrial band. It is not necessary to install individual receivers for each TV.

**Characteristics**

Very robust DVB-S decoder with an automatic reset system in the event of the detection of errors in order to reduce maintenance of the installation. Automatic detection of the audio mode. Decoding of mono, stereo and dual audio. Reinsertion of digital teletext in the analogue channel. Modulator in VSB vestigial side band, filtered by means of a SAW surface acoustic wave filter, designed to work with adjacent channels. Supplied with diplexing and multiplexing bridges and power cable.

CODE		9120129		
MODEL		TP-559		
TV System		DVB-S → AM-TV PAL B/G CCIR	DVB-S → AM-TV PAL I UK	DVB-S → AM-TV PAL D/K OIRT
Audio		Mono / Stereo Dual (Analogue)	Mono	Mono / Stereo DK3 Dual (Analogue)
<b>QPSK reception</b>				
Frequency range	MHz	950 - 2.150		
Frequency step	KHz	1		
Input level	dBμV	38..83		
	dBm	-70..-25		
Range of capture	MHz	±5		
LNB power supply	V---	+12		
	mA	350 máx		
Symbol rate	Mbaud	1..45		
F.E.C.		Auto, 1/2, 2/3, 3/4, 5/6, 7/8 (DVB: EN 300429)		
Diplexing through loss	dB±TOL	1.0 ±0,2		
<b>RF Modulator</b>				
Frequency range	MHz	46 - 894		
Frequency step	KHz	250		
Output channel		2 - 4 5 - 12 21 - 69 S1 - S41	R1 - R4 R5 - R12 21 - 69 S1 - S41	
Modulation		VSB		
Output level	dBμV±TOL	85 ±2,0		



TP-559

CODE		9120129		
MODEL		TP-559		
Output level adjustment	dB	15		
Carrier/noise ratio (C/N)	dB	>60		
Audio signal/noise ratio	dB	>45		
Chroma-luminance delay	ns	<10		
No-lineality of luminance	%	<3		
Differential gain	%	<3		
Differential phase	°	<3		
Response to the 2T pulse	%	<2		
Multiplexing through loss	dB	0.9 ±0,1		
<b>General features</b>				
Return loss	dB	>15		
Connectors		F female		
Power supply	V---	+3.3	+5.2	+12.0
	mA	704	340	80+LNB
Operating temperature	°C	-10..+65		
Room temperature with/ without fan	°C	-10..+55/+45		
Protection index		IP 20C		
Units per packaging		1		
Packing weight	Kg	1.10		
Packing dimensions	mm	265 x 165 x 40		

Programmable with programmer PS-011





TP-569

### Description

Receiver of encrypted digital satellite TV programs, or DVB-S to PAL transmodulator, with a built-in modulator. It has a Common Interface slot to introduce the CAM and the card of the subscriber. Each module selects a TV program from a DVB-S digital transponder and converts it into a terrestrial band analogue TV channel. Multi-standard modulator with analogue stereo audio (ITU-BS 707-4) or mono. Standards: B/G stereo, D/K stereo, and I mono.

### Applications

Digital SMATV installations where it is necessary to distribute digital channels which have been converted to analogue channels. Compatible with all the MATV installations as the channels are distributed in terrestrial band. It is not necessary to install individual receivers for each TV.

### Characteristics

Very robust DVB-S decoder with an automatic reset system in the event of the detection of errors in order to reduce maintenance of the installation. Automatic detection of the audio mode. Decoding of mono, stereo and dual audio. Modulator in VSB vestigial side band, filtered by means of a SAW surface acoustic wave filter, designed to work with adjacent channels. It does not include CAM or card decoder. Supplied with diplexing and multiplexing bridges.

CODE		9120128		
MODEL		TP-569		
TV System		DVB-S → AM-TV PAL B/G CCIR	DVB-S → AM-TV PAL I UK	DVB-S → AM-TV PAL D/K OIRT
Audio		Mono / Stereo Dual (Analogue)	Mono	Mono / Stereo DK3 Dual (Analogue)
Conditional access				
Standard		DVB-CI: EN 50221 (Common Interface)		
QPSK reception				
Frequency range	MHz	950 - 2.150		
Frequency step	MHz	1		
Input level	dBμV	38..83		
	dBm	-70..-25		
Range of capture	MHz	±5		
LNB power supply	V...	+12		
	mA	350 máx		
Symbol rate	Mbaud	1..45		
F.E.C.		Auto, 1/2, 2/3, 3/4, 5/6, 7/8 (DVB: EN 300429)		
Diplexing through loss	dB±TOL	1.0 ±0,2		
RF Modulator				
Frequency range	MHz	46 - 894		
Frequency step	KHz	250		
Output channel		2 - 4 5 - 12 21 - 69 S1 - S41	R1 - R4 R5 - R12 21 - 69 S1 - S41	
Modulation		VSB		
Output level	dBμV±TOL	85 ±2,0		



TP-569

CODE		9120128	
MODEL		TP-569	
Output level adjustment	dB	15	
Carrier/noise ratio (C/N)	dB	>60	
Audio signal/noise ratio	dB	>45	
Chroma-luminance delay	ns	<10	
No-lineality of luminance	%	<3	
Differential gain	%	<3	
Differential phase	°	<3	
Response to the 2T pulse	%	<2	
Multiplexing through loss	dB	0.9 ±0,1	
<b>General features</b>			
Return loss	dB	>15	
Connectors		F female	
Power supply	V---	+3.3	+5.2 +12.0
	mA	530	300+CAM 110+LNB
Operating temperature	°C	-10..+65	
Room temperature with/ without fan	°C	-10..+55/+45	
Protection index		IP 20C	
Units per packaging		1	
Packing weight	Kg	1.16	
Packing dimensions	mm	265 x 165 x 40	

Programmable with programmer PS-011



TP-579

### Description

Transmodulator of unencrypted satellite digital television services to analogue television with DiSEqC. Each module selects a free-to-air service from a DVB-S satellite transponder and converts it to an analogue (PAL) television channel in the terrestrial band. Multi-standard modulator with analogue stereo or mono audio. Programmable using PC software and a wireless programmer.

### Applications

Collective analogue television installations where the aim is to distribute satellite television services while avoiding the installation of individual receivers. Compatible with all terrestrial collective TV installations since the channels can be distributed throughout the terrestrial band. Compatible with remote control systems.

### Characteristics

Automatic error-detection system which greatly reduces maintenance work on the installation. Generated output channel of outstanding quality. Vestigial sideband (VSB) modulator with surface acoustic wave (SAW) filtering. Designed to work with adjacent channels. Zamak chassis with metal side panels. F-type connectors. The equipment can be assembled quickly and easily.

CODE		9120196		
MODEL		TP-579		
TV System		DVB-S → AM-TV PAL B/G CCIR	DVB-S → AM-TV PAL I UK	DVB-S → AM-TV PAL D/K OIRT
Audio		Mono / Stereo Dual (Analogue)	Mono	Mono / Stereo DK3 Dual (Analogue)
<b>QPSK reception</b>				
Frequency range	MHz	950 - 2.150		
Frequency step	MHz	1		
Input level	dBμV	38..83		
	dBm	-70..-25		
Range of capture	MHz	±5		
LNB power supply	V---	DiSEqC 2.0 +13 / +18 / (0/22KHz)		
	mA	350 max		
Symbol rate	Mbaud	1..45		
F.E.C.		Auto, 1/2, 2/3, 3/4, 5/6, 7/8 (DVB: EN 300429)		
Diplexing through loss	dB±TOL	1.0 ±0,2		
<b>RF Modulator</b>				
Frequency range	MHz	46 - 894		
Frequency step	KHz	250		
Output channel		2 - 4 5 - 12 21 - 69 S1 - S41		R1 - R4 R5 - R12 21 - 69 S1 - S41
Modulation		VSB		



TP-579

CODE		9120196		
MODEL		TP-579		
Output channel	dBpV $\pm$ TOL	85 $\pm$ 2,0		
Output level adjustment	dB	15		
Carrier/noise ratio (C/N)	dB	>60		
Audio signal/noise ratio	dB	>45		
Chroma-luminance delay	ns	<10		
No-linearity of luminance	%	<3		
Differential gain	%	<3		
Differential phase	°	<3		
Response to the 2T pulse	%	<2		
Multiplexing through loss	dB	0.9 $\pm$ 0,1		
<b>General features</b>				
Return loss	dB	>15		
Connectors		F female		
Power supply	V $\equiv$	+3.3	+5.2	+12.0
	mA	725	385+CAM	80+LNB
Operating temperature	°C	-10.. $\pm$ 65		
Room temperature with/ without fan	°C	-10.. $\pm$ 55/ $\pm$ 45		
Protection index		IP 20C		
Units per packaging		1		
Packing weight	Kg	1.16		
Packing dimensions	mm	265 x 165 x 40		

Programmable with PS-011 and ASP software



TP-589

### Description

Transmodulator of encrypted satellite digital television services to analogue television with DiSEqC. Each module selects a free-to-air service from a DVB-S satellite transponder and converts it to an analogue (PAL) television channel in the terrestrial band. Multi-standard modulator with analogue stereo or mono audio. Equipped with a Common Interface slot for the insertion of the CAM and the subscriber's card. Programmable using PC software and a wireless programmer.

### Applications

Collective analogue television installations where the aim is to distribute encrypted satellite television services while avoiding the installation of individual receivers. Compatible with all terrestrial collective TV installations since the channels can be distributed throughout the terrestrial band. Compatible with remote control systems.

### Characteristics

Automatic error-detection system which greatly reduces maintenance work on the installation. Generated output channel of outstanding quality. Vestigial sideband (VSB) modulator with surface acoustic wave (SAW) filtering. Designed to work with adjacent channels. Does not include the CAM or the decoder card. Zamak chassis with metal side panels. F-type connectors. The equipment can be assembled quickly and easily.

CODE		9120197		
MODEL		TP-589		
TV System		DVB-S → AM-TV PAL B/G CCIR	DVB-S → AM-TV PAL I UK	DVB-S → AM-TV PAL D/K OIRT
Audio		Mono / Stereo Dual (Analogue)	Mono	Mono / Stereo DK3 Dual (Analogue)
<b>Conditional access</b>				
Standard		DVB-CI: EN 50221 (Common Interface)		
<b>QPSK receiver</b>				
Frequency range	MHz	950 - 2.150		
Frequency step	MHz	1		
Input level	dBμV	38..83		
	dBm	-70..-25		
Range of capture	MHz	±5		
LNB power supply	V <sub>DC</sub>	DiSEqC 2.0 +13 / +18 / (0/22KHz)		
	mA	350 max		
Symbol rate	Mbaud	1..45		
F.E.C.		Auto, 1/2, 2/3, 3/4, 5/6, 7/8 (DVB: EN 300429)		
Diplexing through loss	dB±TOL	1.0 ±0,2		
<b>RF Modulator</b>				
Frequency range	MHz	46 - 894		
Frequency step	KHz	250		
Output channel		2 - 4 5 - 12 21 - 69 S1 - S41		R1 - R4 R5 - R12 21 - 69 S1 - S41



TP-589

CODE		9120197		
MODEL		TP-589		
Modulation		VSB		
Output channel	dBpV±TOL	85 ±2,0		
Output level adjustment	dB	15		
Carrier/noise ratio (C/N)	dB	>60		
Audio signal/noise ratio	dB	>45		
Chroma-luminance delay	ns	<10		
No-lineality of luminance	%	<3		
Differential gain	%	<3		
Differential phase	°	<3		
Response to the 2T pulse	%	<2		
Multiplexing through loss	dB	0.9 ±0,1		
<b>General features</b>				
Return loss	dB	>15		
Connectors		F female		
Power supply	V---	+3.3	+5.2	+12.0
	mA	725	385+CAM	80+LNB
Operating temperature	°C	-10..+65		
Room temperature with/ without fan	°C	-10..+55/+45		
Protection index		IP 20C		
Units per packaging		1		
Packing weight	Kg	1.16		
Packing dimensions	mm	265 x 165 x 40		

Programmable with PS-011 and ASP software



PA-720

### Description

Broadband amplifier for ALCAD equipment. It has one inputs to amplify the signal coming from all the modules of the installation, and a multiplexing input for the rest of the channels of the installation. The output level can be controlled by means of an attenuator.

### Applications

All MATV installations where modulators are incorporated and monochannel amplifiers are not used.

### Characteristics

Amplifier with high output level, power stage with a hybrid amplifier. Supplied with power cable.

CODE		9120093
MODEL		PA-720
TV System		AM -TV / DVB-T / DVB - C
Number of inputs		1
Frequency range	MHz	40-894
Gain	dB±TOL	44 ±1,0
Gain adjustment	dB	15
Output level	dBµV	119 DIN45004B 116 (IMD <sub>3</sub> - 60dB) 110 (IMD <sub>2</sub> - 60dB) 103 (CTB - 60dB) 104 (CSO - 60dB) 104 (XMOD - 60dB)
Output test point	dB±TOL	-30 ±1,0
Extension input loss	dB±TOL	0 ±2,0
Noise figure	dB	3.5 ±0,5
Return loss	dB	>14-1,5/eighth >10
Chroma-luminance delay	ns	<10
Connectors		F female
Power supply	V---	+24
	mA	320
Operating temperature	°C	-10..+65
Room temperature with/ without fan	°C	-10..+55/+45
Protection index		IP 20C
Units per packing		1
Packing weight	Kg	1.16
Packing dimensions	mm	265 x 165 x 40

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3

CTB -60 dB: 42 equal carriers, EN 50083-3  
CSO -60 dB: 42 equal carriers, EN 50083-3  
XMOD -60 dB: 42 equal carriers, EN 50083-3

# 912

## DIGITAL SAT EQUIPMENT 912-TP

### Power supply units



FA-310



FA-312

#### Description

Switching power supply, which permits the installation of an amplifier and up to 6 modules on the support frame. Power supply with a flat cable of 20 lines for different feed voltages.

#### Applications

Required for feeding the modules of the equipment.

#### Characteristics

Protected against power surges, overloads and short-circuits. Zamak chassis with side grills to facilitate proper ventilation. Supplied with power cable.

CODE		9120046				9120168			
MODEL		FA-310				FA-312			
Output voltage	V $\cdots$	+3.3	+5.2	+12.0	+24	+3.3	+5.2	+12.0	+24
	mA	5500	2500	1500	500	10000	5000	1500	500
Peak to peak ripple voltage	mV	>50				100			
Mains voltage	V $\sim$	230 $\pm$ 20% 50/60 Hz		240 $\begin{smallmatrix} +15\% \text{ 50/60 Hz} \\ -20\% \text{ 50/60 Hz} \end{smallmatrix}$		90..264 50/60 Hz			
	W	72				85			
Operating temp. close to equipment	$^{\circ}$ C	-10..+65							
Room tmperature with/without fan	$^{\circ}$ C	-10..+55/+45							
Protection index		IP 20C							
Units per packaging		1							
Packing weight	Kg	1.43				1.65			
Packing dimensions	mm	270 x 165 x 60							

See table on page 454 for more information.





**Description**

Modular IF processor equipment which converts the frequency of the channels or transponders of analogue or digital satellite TV inside the IF band. Consisting of a power supply unit, and amplifier and up to 8 processors, which are mounted on a support frame. All functions are programmable by means of a programmer.

**Applications**

Medium to large analogue or digital SMATV installations. The equipment permits the distribution of up to 30 transponders, 240 digital programs, of different satellites and polarities, through a single coaxial cable. Compatible with IF band SMATV installations (950 to 2,150 MHz). It is necessary to install individual analogue or digital DVB-S receivers with each television. The QPSK-QAM transmodulator equipment (model 912-TQ) is recommended for larger installations.

**Characteristics**

The equipment equalises the levels of all the transponders and maintains the levels by means of an AGC automatic gain control. Zamak chassis with metal side covers. F type connectors. Fast and easy assembly.

**Accessories**

See page 243.

# 912 IF PROCESSOR EQUIPMENT 912-UC

## Processors



UC-233

### Description

Modular IF processor equipment with analogue LNB switching. The equipment converts the frequency of the satellite digital TV transponders to the IF band. It is composed of a power supply unit, an amplifier and up to 8 processors, which are mounted on a support frame. Can be programmed using PC software and a wireless programmer.

### Applications

Medium to large analogue or digital SMATV installations. The equipment permits the distribution of up to 30 transponders, 240 digital programs, of different satellites and polarities, through a single coaxial cable. Compatible with single, twin, quad and multiswitch LNBs thanks to its analogue switching (+13V/+17V 0/22KHz) and with collective installations in the IF band (950 to 2150 MHz). It is necessary to install individual digital DVB-S/S2 receivers with each television.

### Characteristics

The equipment equalises the levels of all the transponders and maintains the levels by means of an AGC automatic gain control. Zamak chassis with metal side covers. F type connectors. Fast and easy assembly.

CODE		9120154
MODEL		UC-233
Connection		F female
TV System		FM-TV / DVB-S / DVB-S2
Number of inputs		1 with duplexing or 2 independents
Processors by module		2
Input frequency range	MHz	950 - 2.150
Output frequency range	MHz	950 - 2.150
Frequency step	MHz	1
Band width	MHz	6..64
Input level	dB $\mu$ V	45..85
	dBm	-20..-60
Output level	dB $\mu$ V	85 $\pm$ 1.0
Output level stability	dB	<1
Output level adjust	dB	20
Automatic gain control	dB	40 Typical
Single-channel selectivity	MHz	40 (BW 36 MHz)
		30 (BW 27 MHz)
		20 (BW 15 MHz)
Channel flatness response	dB	<3
Through loss	dB	<1



UC-233

CODE		9120154			
MODEL		UC-233			
Noise figure	dB	10			
Spurious in band	dB	<40			
Return loss	dB	>15			
Phase noise	dBc/Hz	85 @ 100KHz			
Equivalent noise degradation	dB	<0.5			
LNB power supply	V---	13/18 (0/22KHz)			
	mA	350 max.			
Power supply	V---	+3.3	+5	+12	+24
	mA	600	366	105	15+LNB
Operating temperature close to equipment	°C	-10..+65			
Room temperature with/without fan	°C	-10..+55/+45			
Protection index		IP 20C			
Units per packaging		1			
Packing weight	Kg	1.1			
Packing dimensions	mm	270 x 170 x 38			

The operation of an installation using transponders with a symbol rate (SR) of less than 6000 Kbaud is not guaranteed since correct functioning depends on the receiver (or field meter) used.

Programmable with the PS-011 programmer.  
Supplied with the diplexing and multiplexing bridges

# 912 IF PROCESSOR EQUIPMENT 912-UC

## Amplifiers



ZF-712

### Description

Broadband amplifier for the IF band for processor equipment. It has one input to amplify the IF signal coming from all the processors of the installation, and a terrestrial band multiplexing input for the rest of the channels of the installation. The output level can be controlled by means of attenuator.

### Applications

All SMATV installations where IF processors are incorporated.

### Characteristics

Amplifier with high output level. Zamak chassis with metal side plates. Mechanized female F-type connectors. Connection of power supply by means of flat cable with 10-pin polarised connectors. Needs LA-102, 20-pin flat cable adaptor, not included.

### Accessories

9120124 LA-102 20-pin flat cable adaptor.

CODE		9050116
MODEL		ZF-712
TV system		FM-TV / DVB-S
Connection		F female
Frequency range	MHz	950 - 2150
Gain	dB±TOL	45 ±1,0
Flatness response	dB	±0,5
Adjustable gain range	dB	20
Fixed equalization	dB	10
Extension input loss	dB	20 ±0,5
Output level	dBµV	123.0 (IMD3 - 35 dB) 115.0 (IMD2 - 35 dB)
Return loss I/O	dB	>10.0
LNB power supply	V---	+13/0/+18
	mA	350 max.
	Tone	0/22 KHz
Supply	V---	+24
	mA	145+LNB
Operating temperature close to equipment	°C	-10..+65
Room temperature with/without fan	°C	-10..+55/45
Protection index		IP 20
Units per packaging		1
Packing weight	Kg	0.50
Packing dimensions	mm	196 x 76 x 32
		385 x 385 x 225

The power supply must also feed the LNB (consumption between 150 and 250 mA).

IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-5

IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-5

# 912 IF PROCESSOR EQUIPMENT 912-UC

## Power supply units



FA-310



FA-312

### Description

Switching power supply which permits the installation of an amplifier and up to 6 modules on the support frame. Power supply system with 20 wire flat cable for different feed voltage.

### Applications

Required for feeding the modules of the equipment.

### Characteristics

Protected against power surges, overloads and short-circuits. Zamak chassis with side grills to facilitate proper ventilation. Supplied with power cable.

CODE		9120046				9120168			
MODEL		FA-310				FA-312			
Output voltage	V $\cdots$	+3.3	+5.2	+12.0	+24	+3.3	+5.2	+12.0	+24
	mA	5500	2500	1500	500	10000	5000	1500	500
Peak to peak ripple voltage	mV	>50				100			
Mains voltage	V $\sim$	230 $\pm$ 20% 50/60 Hz		240 $\begin{smallmatrix} +15\% \text{ 50/60 Hz} \\ -20\% \text{ 50/60 Hz} \end{smallmatrix}$		90..264 $\text{ 50/60 Hz}$			
	W	72				85			
Operating temp. close to equipment	$^{\circ}\text{C}$	-10..+65							
Room tmperature with/without fan	$^{\circ}\text{C}$	-10..+55/+45							
Protection index		IP 20C							
Units per packaging		1							
Packing weight	Kg	1.43				1.65			
Packing dimensions	mm	270 x 165 x 60							

See table on page 454 for more information.



## Description

Complementary equipment for analogue or digital terrestrial TV and satellite TV installations, compounds by remote management and supervision modules, active multiplexer and combiners.

## Applications

Large collective installations of digital or analogue terrestrial TV and satellite TV with a large number of channels, which require amplification and the less noise possible. Equipment for large head-end installed remotely, which gives the installer the possibility to manage and supervise the functionality of the installation.

## Characteristics

PC software for the remote management of the installation is not required, web server built into the equipment. Zamak chassis. F type connectors.

## Accessories

See page 243.

# 912 REMOTE CONTROL EQUIPMENT 912-SM



Remote management and supervision module



SM-010

## Description

Equipment which makes it possible to monitor and manage ALCAD installations of up to 160 modules remotely by means of GSM/GPRS, LAN and PSTN connectivity via serial port.

## Applications

Collective satellite or terrestrial TV installations where a considerable number of modules require constant maintenance. Monitoring of the power level and signal quality in the digital channels to program alarms. Remote management of ALCAD devices allows the installer to reprogram the devices. Remote updating of firmware of ALCAD equipment. Management of backup models. Avoids unnecessary trips to the installation.

## Characteristics

Web server built into the equipment. Event logging and alarms. Equipped with RJ45 connector for integration with Ethernet network (LAN/WAN), slot for SIM cards for connection via GSM/GPRS mobile telephone network. Also equipped with RS-232 connections for external modems. SMA antenna connector. Zamak chassis with metal side panels. F-type connectors. The equipment can be assembled quickly and easily.

## Accessories

- 9120208 SMA-000 GSM/GPRS magnetic indoor antenna, with cable and SMA male connector.  
9120199 LA-103 Bus extender, 20-pin to two RJ45 connectors.

CODE		9120187	
MODEL		SM-010	
<b>Input RF</b>			
Connector		F female	
TV system		FM-TV, DVB-T, DVB-S/S2, DVB-C	
Frequency range	MHz	47.. 862 / 950.. 2.150	
Input level	dBμV	40..100	
Frequency step	dB	± 2	
<b>Ethernet LAN/WAN</b>			
Connector		RJ45	
Data speed	Mbps	10/100	
Protocol		TCP/IP	
<b>GSM /GPRS</b>			
Frequency bands	MHz	GSM900 band: 850.. 900 - GSM1800 band: 1.800.. 1.900	
Sensitivity	dBm	< -102	
Removable SIM		Yes	
Antenna		SMA female 50Ω	
<b>PSTN</b>			
Connector		9 pins SUB-D male	
Interface		RS-232	
<b>General features</b>			
Power supply	V~	+3,3	+5,2
	mA	110	1600
Operating T close to equipment	°C	-10..+65	
Room T with/without fan	°C	-10..+55/+45	
Protection index		IP30	
Units per packing		1	
Packing weight	Kg	1.04	
Packing dimensions	mm	270 x 170 x 38	



# 912 COMBINER EQUIPMENT 912-CB

## Combiner amplifier



CB-400

### Description

Combiner amplifier with 10 inputs in the terrestrial band. Combines and amplifies 10 groups of filtered channels separately, obtaining an output of up to 100 amplified channels with a very reduced level of noise, equivalent to that of fewer than 10 channels. Equipped with a separate gain control for each input.

### Applications

Large collective installations of digital or analogue terrestrial TV with a high number of channels (from 30 channels upwards), which require amplification and the least noise possible. Compatible with all collective TV installations in the terrestrial band. Ideal for installations with a high number of modulators.

### Characteristics

One of the main features of the equipment is its exceptional response to noise in installations of up to 100 channels, due to filtering and independent amplification by groups of channels. Shielded zamak chassis with plastic supports. F-type connectors. Power supply connector is 9.5 x 2.1 mm jack.

### Accessories

9130054 FU-513 Power supply unit, 7.5 V $\pm$

CODE		9120126									
MODEL		CB-400									
TV System		AM-TV / DVB-T / DVB-C									
Connection		F female									
Inputs		10									
Frequency range	MHz	47-125	125-202	202-279	279-366	366-454	454-542	542-630	630-718	718-806	806-862
Gain	dB $\pm$ TOL	29 $\pm$ 3.0									
Gain adjustment	dB	10									
Selectivity	dB	30 (77 MHz VHF) (88 MHz UHF)									
Output test point	dB $\pm$ TOL	-30 $\pm$ 1.0									
Output level	dB $\mu$ V	118 DIN 45004B 115 (IMD3 -60 dB) 118 (IMD2 -60 dB) 105 (CTB -60 dB) 105 (CSO -60 dB) 105 (XMOD -60 dB)									
Noise figure	dB	6 $\pm$ 1.0									
I/O return loss	dB	310									
Chroma-luminance delay	ns	<10									
Power supply	V $\pm$	6,5..9,0									
	mA	1150									
Operating temperature close to equipment	°C	-10..+65									
Room temperature with/without fan	°C	-10..+55/+45									
Protection index		IP 30									
Units per packing		1					9				
Packing weight	Kg	0.7					6.5				
Packing dimensions	mm	245 x 160 x 35					312 x 190 x 225				

# 912 MULTIPLEXOR EQUIPMENT 912-AMU

## Active multiplexer



AMU-600

### Description

Active multiplexer with 6 inputs in the terrestrial band. Thanks to these 6 inputs, the equipment mixes a high number of channels in the terrestrial band. The amplification of 7 dB compensates for losses during multiplexing.

### Applications

Medium-sized collective analogue or digital terrestrial TV installations. The device is installed at the head-end in the step preceding installation of the broadband amplifiers. This obtains an equalised output with no loss of quality. Compatible with all collective TV installations in the terrestrial band. Is adjusted using a gain controller.

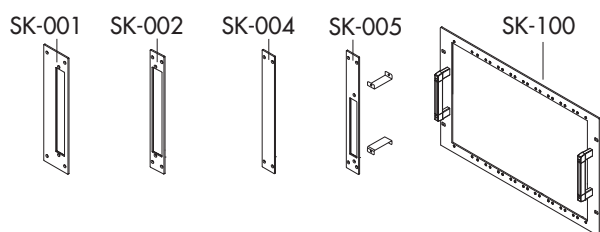
### Characteristics

Regulation of the output level to meet the level required by the head-end amplifier of the installation. Shielded zamak chassis with metal side covers. F-type connectors.

CODE		9120212	
MODEL		AMU-600	
Number of inputs		6	
Connection		F female	
Frequency range	MHz	47-862	
Number of outputs		1 + test(-20dB)	
Gain	dB	7	
Input level	dB $\mu$ V	65.. 75	
Output test point	dB $\pm$ TOL	-30 $\pm$ 1.0	
Output level	dB $\mu$ V	87 (CTB -60 dB) 87 (CSO -60 dB)	
Adjustable gain range	dB	15	
Power supply	V $\cdots$	24	12
	mA	120	105
Operating temperature	°C	-10..+65	
Room temperature with/ without fan	°C	-10..+55/+45	
Protection index		IP 30	
Units per packing		1	
Packing weight	Kg	1.4	
Packing dimensions	mm	270 x 170 x 38	

CSO/CTB -75dB: 42 equal carriers, EN 50083-3  
CSO/CTB -63dB: 60 equal carriers, EN 50083-3

### ELEMENTS OF THE SUBRACK

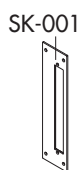


Subrack 7U. 9 modules + FA

9120181	
SK-100	
Units per packaging	1
Packing weight	0.800 Kg
Packing dimensions	410 x 585 x 10 mm

Set consisting of a support frame and front panels to be installed in 19" rack cabinets with capacity for 1 power supply unit and 9 modules. The support frame is equipped with handles to facilitate assembly. The different front panels are designed to adapt to the characteristics of the various modules, and the blank front panels to fit into the appropriate holes. The modules are attached to the front panels, then each of these is attached to the frame. All the components are manufactured in anodised aluminium. Height: 7U.

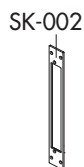
Support frame to be installed in 19" rack cabinets with capacity for a power supply unit and 9 modules. Equipped with handles to facilitate assembly. Manufactured in anodised aluminium. Height: 7U.



Front plate 7U for power supply

9120182	
SK-001	
Units per packaging	1
Packing weight	0.050 Kg
Packing dimensions	13 x 38 x 3 mm

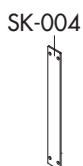
Front panel for power supply unit. The power supply unit is fixed by screws to the front panel and to the support frame. Manufactured in anodised aluminium. Height: 7U.



Front plate 7U for module 23 cm

9120183	
SK-002	
Units per packaging	1
Packing weight	0.050 Kg
Packing dimensions	13 x 38 x 3 mm

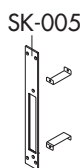
Front panel for modules which are 23 cm high. The module is attached to the front panel and the support frame with 2 screws. Manufactured in anodised aluminium. Height: 7U.



Blanking plate 7U module

9120185	
SK-004	
Units per packaging	1
Packing weight	0.010 Kg
Packing dimensions	13 x 38 x 3 mm

Blank front panel to fit into appropriate holes. The front panel is attached to the support frame with 2 screws. Manufactured in anodised aluminium. Height: 7U.



Front plate 7U for module 16 cm

9120188	
SK-005	
Units per packaging	1
Packing weight	0.250 Kg
Packing dimensions	15 x 40 x 160 mm

Front panel for modules which are 16 cm high. The module is fixed to the front cover and to the support frame with 4 screws. Manufactured in anodised aluminium. Height: 7U.

# 912 ACCESSORIES



Programmer

9120144	
PS-011	
Units per packaging	1
Packing weight	0,490 Kg
Packing dimensions	200 x 200 x 60 mm

Programmer for use with the entire range of ALCAD products. Two-way communication with all devices via infrared (IrDA standard). Can be updated to add new product ranges and functionalities. 3.4" colour screen. Internal memory which can be expanded via USB port and SD cards. Includes rechargeable batteries and charger. (See page 419).



Programming interface

9120100	
IP-001	
Units per packaging	1
Packing weight	0,05 Kg
Packing dimensions	85 x 20 x 40 mm

Module interface that allows connect ALCAD equipments to a computer in order to configure or update them. It is connected to the flat 20 lines power cable and to a computer via serial RS-232 or USB.



Frame for 11 modules

9120130	
SP-226	
Units per packaging	1
Packing weight	0,74 Kg
Packing dimensions	520 x 345 x 25 mm

Support frame for power supply unit, amplifier and 10 modules or power supply unit and 11 modules. Other combinations include 2 power supply units, an amplifier and 8 modules, or 2 power supply units and 9 modules. Required for mounting the different modules of the equipment.



Frame for 9 modules for 19" rack

9120136	
SP-725	
Units per packaging	1
Packing weight	2.035 Kg
Packing dimensions	490 x 340 x 35 mm

Support frame for 19" rack with a capacity for a power supply unit, amplifier and 8 modules or power supply unit and 9 modules. Required for mounting the different modules of the equipment on a 19" rack.



Cabinet - 11 modules

9120131	
CP-226	
Units per packaging	1
Packing weight	7,88 Kg
Packing dimensions	610 x 540 x 230 mm

Metal cabinet with cover with key but without back. For the installation of equipment comprising a power supply unit, amplifier and 10 modules or power supply unit and 11 modules. Also it is possible to assemble equipment with 2 power supply units, an amplifier and 8 modules, or 2 power supply units and 9 modules. The SP-226 support frame is not included. VE-500 ventilator available as an option.



Cabinet - 22 modules

9120132	
CP-426	
Units per packaging	1
Packing weight	10 Kg
Packing dimensions	805 x 600 x 216mm

Metal cabinet with cover with key but without back. For the installation of two modular sets of equipment with power supply unit, amplifier and 10 modules or power supply unit and 11 modules. Other combinations include 2 power supply units, an amplifier and 8 modules, or 2 power supply units and 9 modules. The SP-226 support frame is not included. VE-500 ventilator optionally available.



Amplification equipment

905-ZG	
--------	--

Monochannel amplifier equipment which can replace the broadband amplifier when a high output level and carrier to C/N noise ratio are required. (See page 133).



Multiplexers for head-ends

912-MF

Multiplexers with two inputs which combine the output channels of the satellite receivers in installations with a great number of channels, maintaining a high carrier to C/N noise ratio. (See page 394).



Male type F connector

9120039

CM-004

Shielded male F connector to screw onto shielded RG-6 coaxial cable of Ø 6.5mm to Ø6.8mm.

Units per packaging	100
Packing weight	0,340 Kg
Packing dimensions	130 x 100 x 20 mm



Male type F connector

9080023

MC-302

Male F connector to screw onto RG-6 coaxial cable, Ø6.9 - 7.2 mm.

Units per packaging	1
Packing weight	0,49 Kg
Packing dimensions	210 x 200 x 60 mm



F load

9120011

RS-275

F charge of 75Ω, to charge the unused inputs and outputs.

Units per packaging	10
Packing weight	0,03 Kg
Packing dimensions	80 x 50 x 15 mm



Diplexing bridge, F-type

9120064

PU-101

Multiplexing and diplexing bridge with high-speed male F-type connector, to combine the signal of the modules.

Units per packaging	12
Packing weight	0,14 Kg
Packing dimensions	120 x 60 x 35 mm



Power and data cable

9120105

LS-207

Flat power cable of 20 lines, to connect the power supply and 11 modules.

Units per packaging	1
Packing weight	0,05 Kg
Packing dimensions	190 x 25 x 100 mm

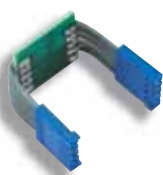
# 912 ACCESSORIES



Voltage adapter

9120102	
LA-100	
Units per packaging	1
Packing weight	0,01 Kg
Packing dimensions	80 x 70 x 20 mm

Power cable with voltage adapter which permits the addition of 905-ZG or 905-ZP modules to equipment with a FA-310 power supply unit.



Voltage adapter

9120051	
LA-001	
Units per packaging	1
Packing weight	0,01 Kg
Packing dimensions	80 x 70 x 20 mm

Power cable with voltage adapter which permits the addition of modulators to equipment with a FA-202 power supply unit.



Voltage adaptor from FA-310 power supply to AS-125

9120124	
LA-102	
Units per packaging	1
Packing weight	0,15 Kg
Packing dimensions	70 x 80 x 25 mm

Power cable with voltage adapter which permits the addition of an IF amplifier (ZF-712) to equipment with a FA-310 power supply unit.



Ventilator

9050043	
VE-500	
Units per packaging	10
Packing weight	0,62 Kg
Packing dimensions	150x 120 x 50 mm

Ventilator for CP-710 cabinet – this may be required in warm environments to keep the equipment within its operating temperature margins.



Connectors

9120199	
LA-103	
Units per packaging	1
Packing weight	0,06 Kg
Packing dimensions	200 x 70 x 25 mm

Bus extender, 20-pins to two RJ45 connectors.



Indoor antenna

9120208	
SMA-000	
Units per packaging	1
Packing weight	0,05 Kg
Packing dimensions	200 x 65 x 40 mm

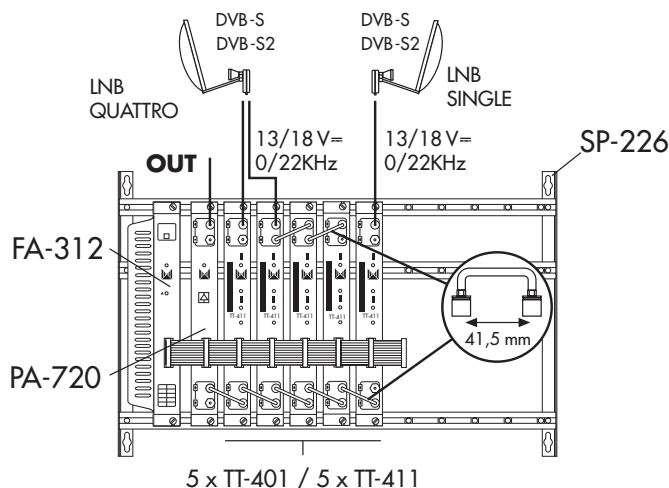
GSM/GPRS magnetic indoor antenna, with cable and SMA male connector.

# 912

## EXAMPLES OF INSTALLATIONS

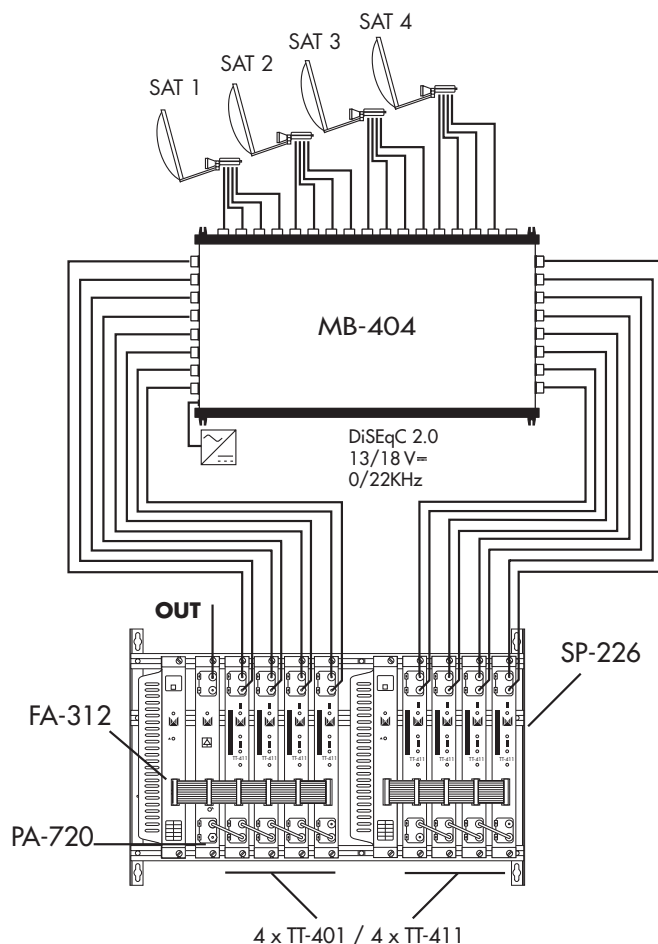
### TV-SAT head-end with DVB-S/S2 to DVB-T/H transmodulators

Complete set of DVB-S/S2 satellite digital television transmodulators to DVB-T terrestrial digital television, with double input tuner and DiSEqC, showing how the equipment is assembled. The channels generated by the equipment are amplified by a built-in broadband amplifier.



### TV-SAT head-end with DVB-S/S2 to DVB-T/H transmodulators and multiswitches

Installation of transmodulators connected to a multiswitch with 16 polarities and 16 users. Thanks to DiSEqC, each of the transmodulators selects in its two inputs the source of the services which it will modulate in the generated DVB-T channel. The channels generated by the equipment are amplified by a built-in broadband amplifier.



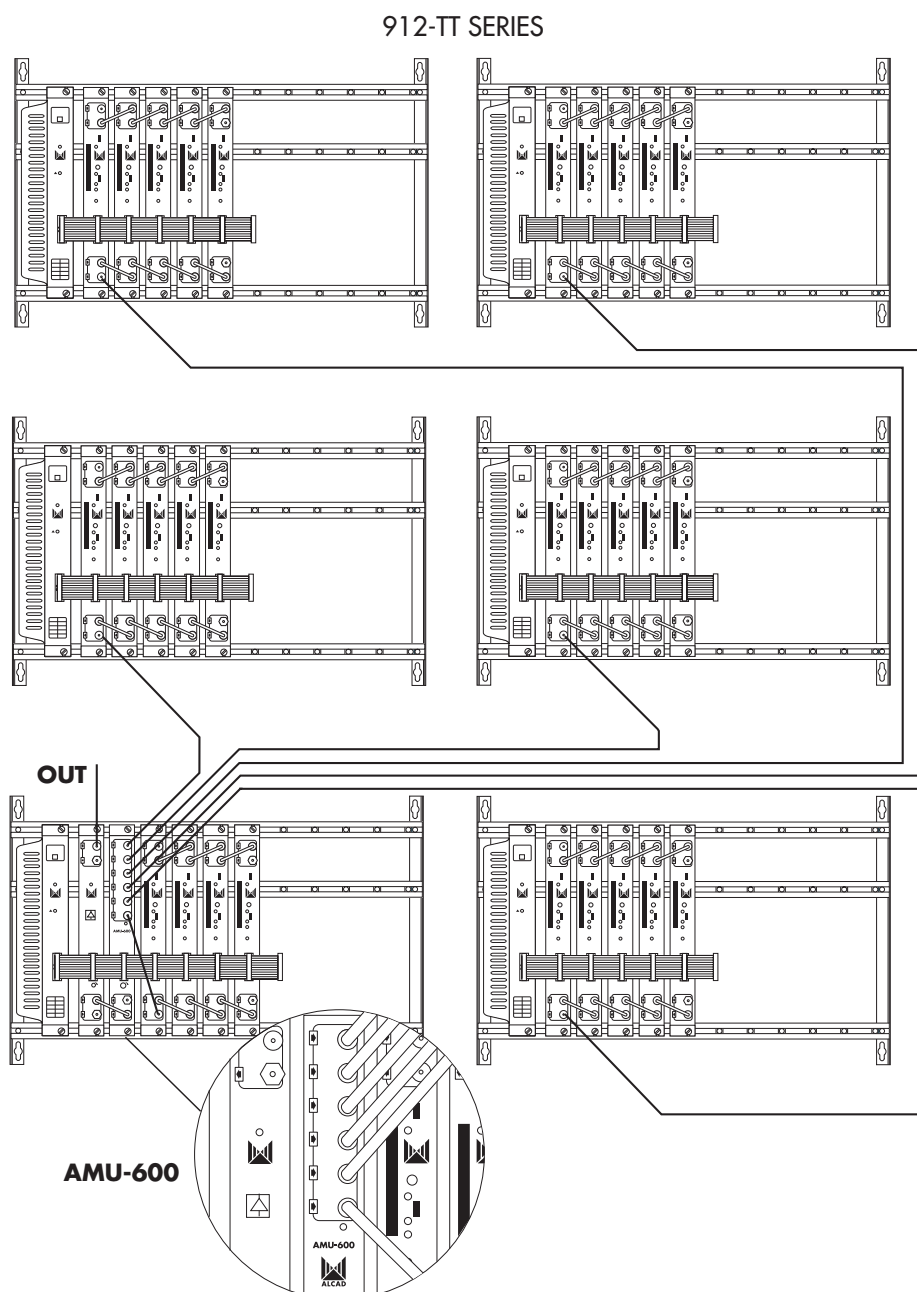
# 912

## EXAMPLES OF INSTALLATIONS

### TV-SAT head-end with DVB-S/S2 to DVB-T/H transmodulators with active multiplexer

Installation of several transmodulators connected to an active multiplexer with 6 inputs. In the AMU-600 active multiplexer the channels generated are combined via the transmodulators, compensating for the losses caused by multiplexing with a small gain of 7 dB in each of the inputs. All the channels are subsequently amplified using a broadband amplifier.

#### AMU-600 CONNECTION DIAGRAM

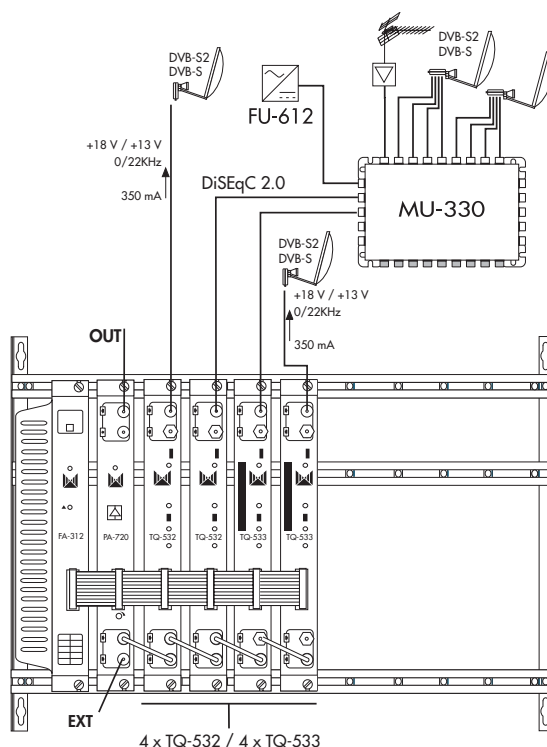




# 912 EXAMPLES OF INSTALLATIONS

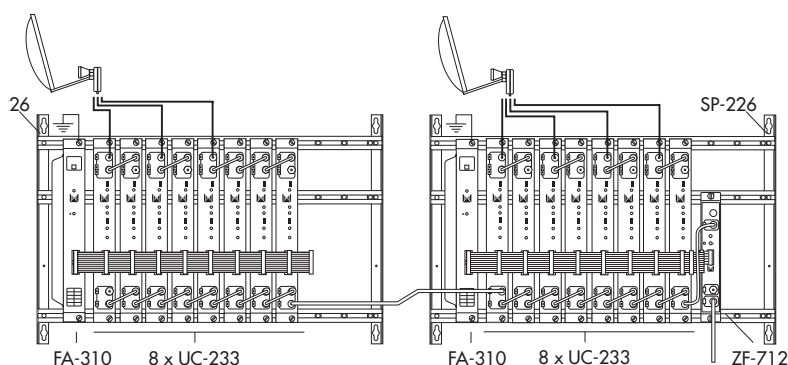
## TV-SAT head-end with DVB-S/S2 to DVB-C transmodulators

Equipment for transmodulating DVB-S/S2 satellite digital television to DVB-C cable digital television with DiSEqC. The equipment is connected to a multiswitch with 8 polarities and a universal LNB which selects the source of the services to be modulated to the DVB-C channels generated. The channels generated by the equipment are amplified by a built-in broadband amplifier.



## TV-SAT head-end with IF processors

Complete IF-processing head-end for 1 complete polarity, composed of 2 sets of 8 double IF processing modules. Each module can process 2 different transponders.

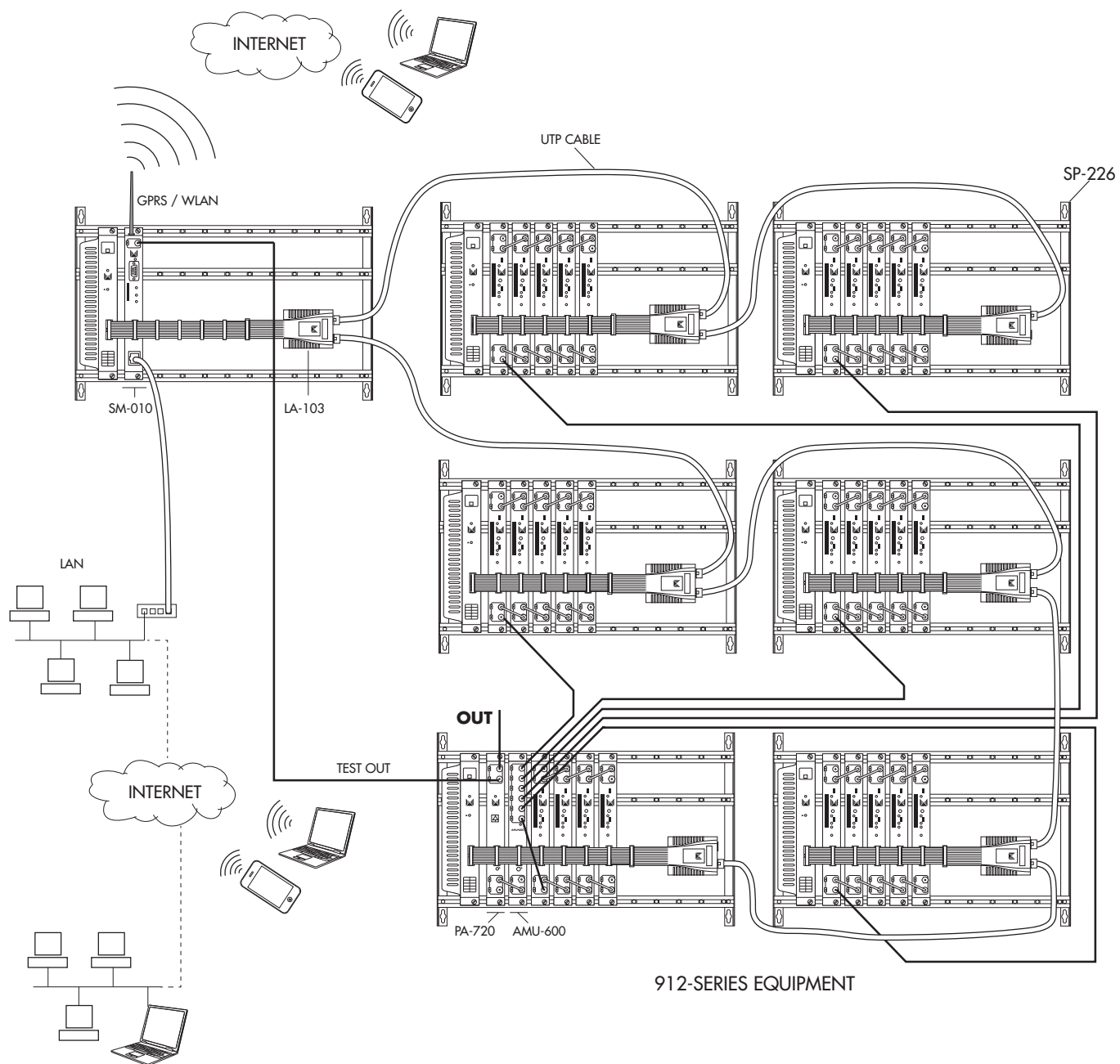


# 912

## EXAMPLES OF INSTALLATIONS

### TV-SAT head-end with remote management

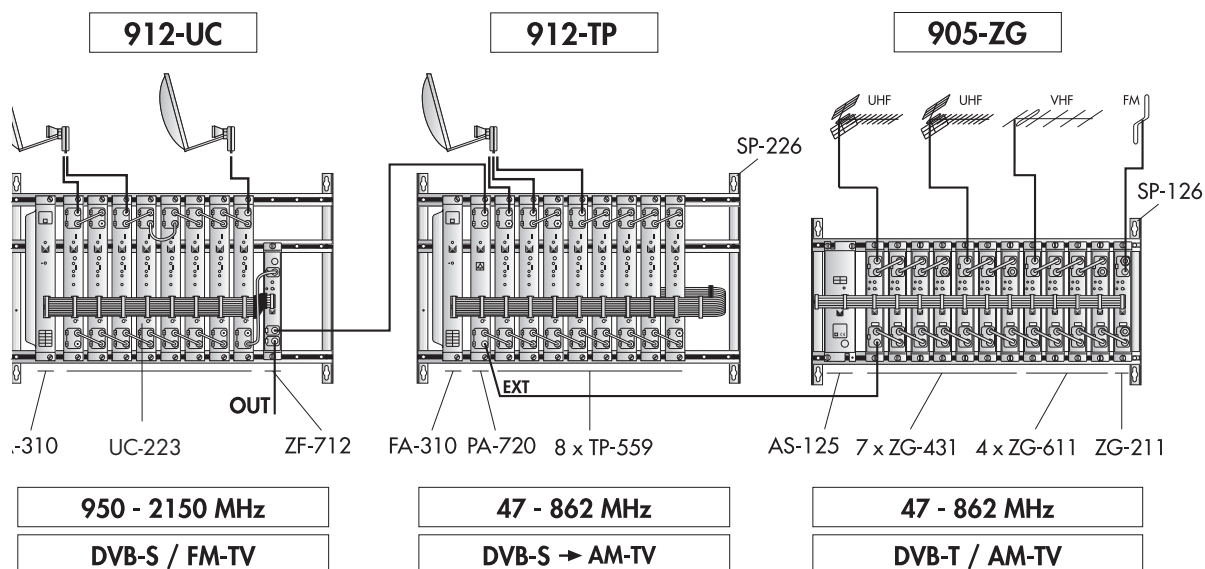
Remote management module connected to a complete head-end of satellite transmodulators using LA-103 bus extenders. The SM-010 is connected to Internet either via GSM/GPRS or via a LAN.



# 912 EXAMPLES OF INSTALLATIONS

## TV-SAT head-end with IF processors and digital receivers

Terrestrial and satellite head-end reception consisting of a set of IF processors for digital SAT channels with distribution in the IF band, a set of digital SAT receivers with distribution of analogue channels on terrestrial band and a set of monochannel amplifiers for terrestrial TV.

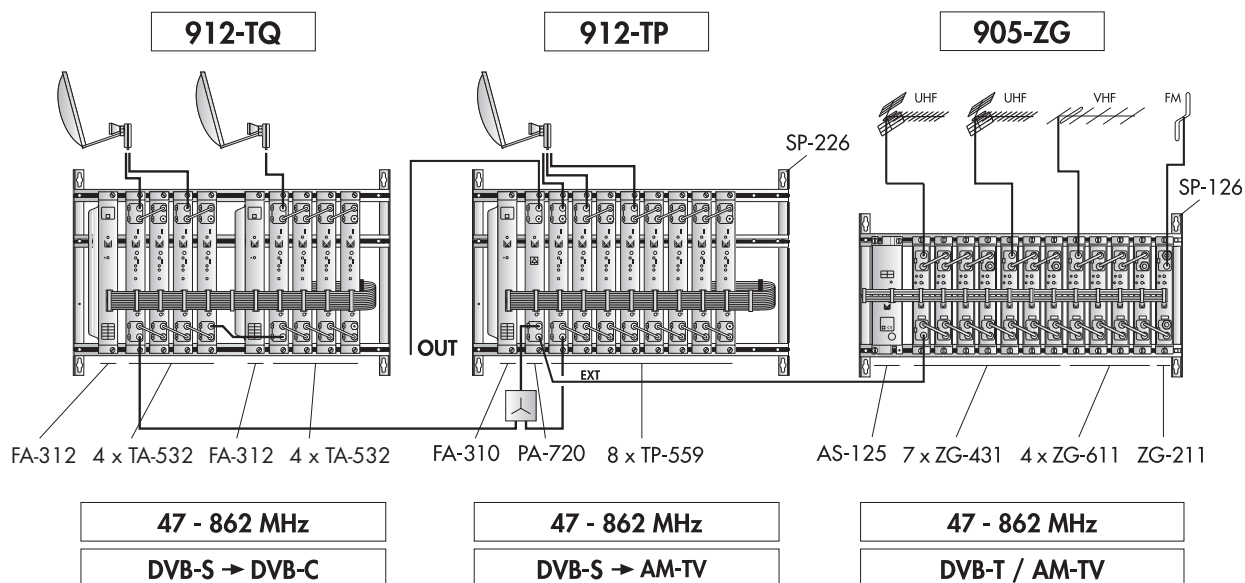


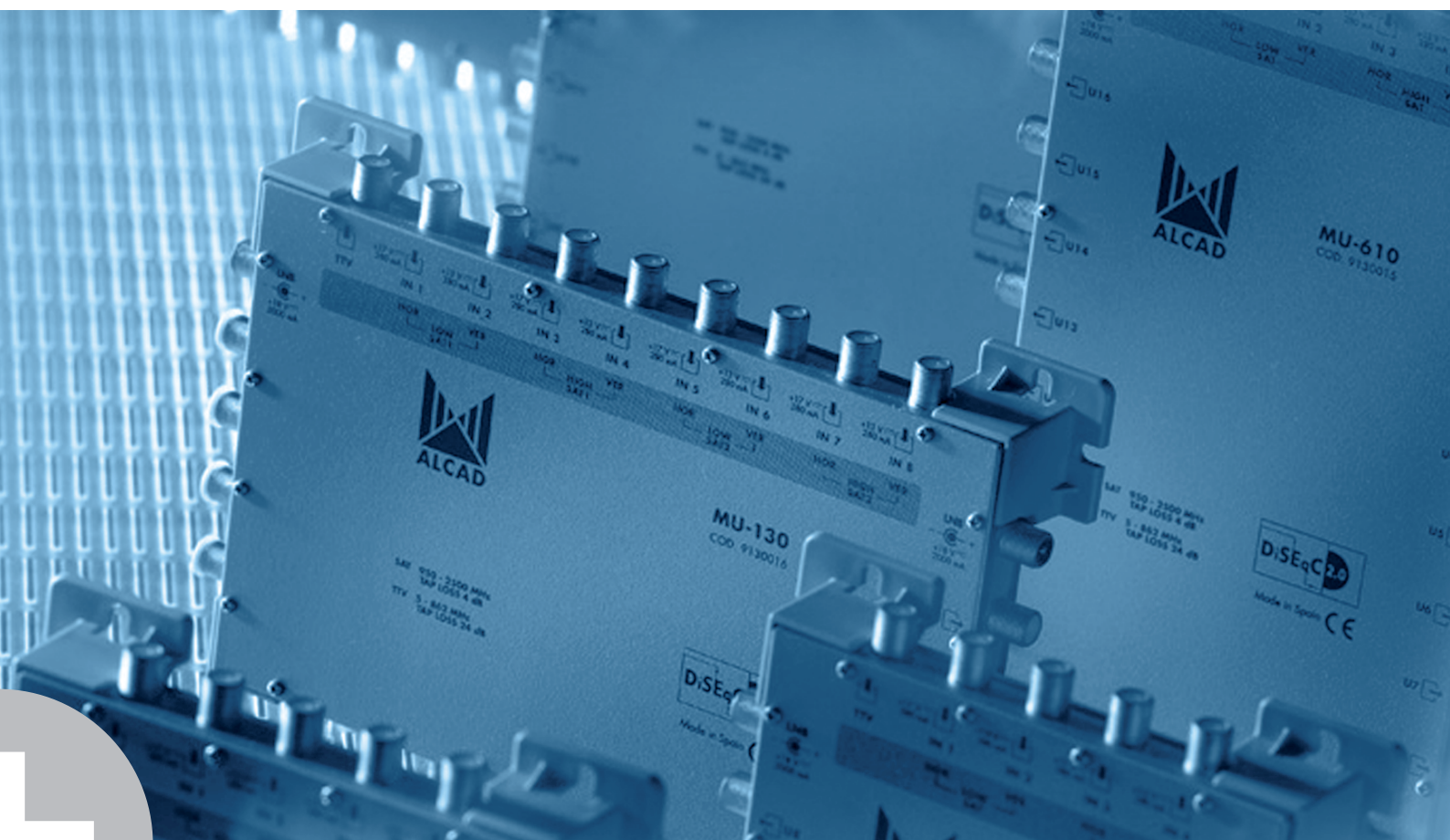
# 912

## EXAMPLES OF INSTALLATIONS

### TV-SAT head-end with transmodulators and digital receivers

Terrestrial and satellite head-end reception consisting of a set of QPSK-QAM transmodulators for digital SAT channels with distribution in terrestrial band, a set of digital SAT receivers with distribution of analogue channels on terrestrial band and a set of monochannel amplifiers for terrestrial TV.







# Multi**switches**

Multiswitches for the reception and distribution of digital and analogue TV via satellite.

From the simplest equipment for individual installations to cascadable equipment for large installations.



# 913 FINAL MULTISWITCHES 2,500 MHz



4 polarities and TV multiswitches



MU-110

## Description

Multiswitches for 4 polarities and terrestrial TV with 4, 8 or 16 outputs, for star-shaped installations. The tap outputs are amplified on the IF satellite band. Must be powered from each individual receiver to feed the switching and amplification of each tap output. To feed the LNBs, the FU-612 power supply unit is used.

## Applications

Individual or SMATV installations, up to 16 TV outlets. Starshaped distribution from the multiswitch, with a single coaxial cable to each TV outlet. The multiswitch distributes a satellite polarity together with the terrestrial TV for each output. The polarity is selected from the individual receiver by means of the LNB control signals.

## Characteristics

Return path included from 5 to 65 MHz. Shielded zamak chassis with plastic supports. F type connectors. Two power supply jacks, 9.5mm x 2.1mm. Distances of more than 75 m between multiswitch and outlet.

## Accessories

9130054 FU-612 Power supply unit for multiswitch, 18V= 2000 mA.

CODE		9130013			9130014			9130015		
MODEL		MU-110			MU-310			MU-610		
TV system		FM-TV / DVB-S / AM-TV / DVB-T								
Connection		F female								
Inputs		5								
Tap outputs		4			8			16		
Frequency range	MHz	5-862	950-2.150	2.150-2.500	5-862	950-2.150	2.150-2.500	5-862	950-2.150	2.150-2.500
Tap loss	dB±TOL	24 ±3,0	4 ±3,0	4 ±3,0	24 ±3,0	4 ±3,0	4 ±3,0	24 ±3,0	4 ±3,0	4 ±3,0
Tap equalization	dB	9	8	-	9	8	-	9	8	-
Flatness response	dB	±3,0								
Output level	dBµV	-	100 (IMD3 - 35 dB) 90 (IMD2 - 35 dB)		-	100 (IMD3 - 35 dB) 90 (IMD2 - 35 dB)		-	100 (IMD3 - 35 dB) 90 (IMD2 - 35 dB)	
Rejection between bands	dB	>25 TV/SAT >65 SAT/TV								
Isolation between bands	dB	>40 TV >30 SAT								

IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-3

IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-3





MU-310



MU-610

CODE		9130013		9130014		9130015	
MODEL		MU-110		MU-310		MU-610	
Isolation of switching	dB	>30 SAT/SAT					
Switching the outputs		DiSEqC 2.0 13 V $\cdots$ /17 V $\cdots$ 0/22 KHz					
Power supply of the LNB		2000 mA/18 V $\cdots$					
Input return loss	dB	>20					
Output voltage	V $\cdots$	13/17					
Consumption from the receiver	mA	50 $\pm$ 2,0 (12.. 20 V $\cdots$ )					
Operating temperature close to equipment	°C	-10..+65					
Room temperature with/without fan	°C	-10..+55/+45					
Protection index		IP 30					
Units per packing		1	9	1	9	1	9
Packing weight	Kg	0.5	4.7	0.5	4.7	0.7	6.5
Packing dimensions	mm	170x160x35	310x185x250	170x160x35	310x205x250	245x160x35	312x190x255



# 913 FINAL MULTISWITCHES 2,500 MHz

## 8 and 16 polarities and TV multiswitches



MU-130

### Description

Multiswitches for 8 polarities and terrestrial TV with 4, 8 or 16 outputs, for star-shaped installations. The tap outputs are amplified on the IF satellite and terrestrial TV bands. The tap outputs are amplified on the IF satellite band. Must be powered from each individual receiver to feed the switching and amplification of each tap output. To feed the LNBs, the FU-612 power supply unit is used.

### Applications

Individual or SMATV installations, up to 16 TV outlets. Star-shaped distribution from the multiswitch, with a single coaxial cable to each TV outlet. The multiswitch distributes a satellite polarity together with the terrestrial TV for each output. The polarity is selected from the individual receiver by means of the LNB and tone burst control signals, or the DiSEqC (Version 1.0 and later) signal.

### Characteristics

Return path included from 5 to 65 MHz. Shielded zamak chassis with plastic supports. F type connectors. Power supply jack, 9.5mm x 2.1mm. Distances of more than 75 m between multiswitch and outlet.

### Accessories

9130050 CN-611 DiSEqC switch for 16 polarities.

9130054 FU-612 Power supply unit for multiswitch, 18V= 2000 mA.

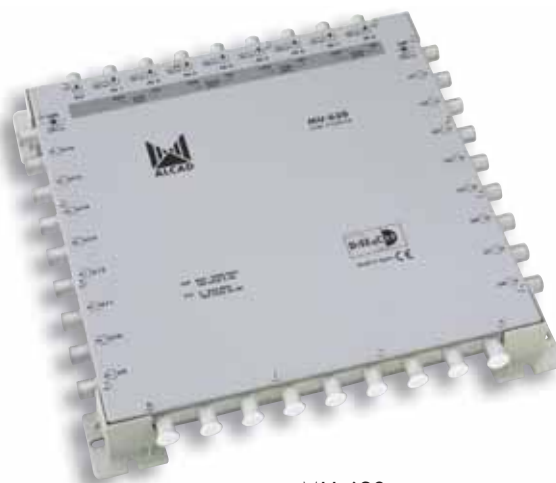
CODE		9130016			9130017			9130018		
MODEL		MU-130			MU-330			MU-630		
TV system		FM-TV / DVB-S / AM-TV / DVB-T								
Connection		F female								
Inputs		9								
Tap outputs		4			8			16		
Frequency range	MHz	5-862	950-2.150	2.150-2.500	5-862	950-2.150	2.150-2.500	5-862	950-2.150	2.150-2.500
Tap loss	dB±TOL	24 ±3,0	4 ±3,0	4 ±3,0	24 ±3,0	4 ±3,0	4 ±3,0	24 ±3,0	4 ±3,0	4 ±3,0
Tap equalization	dB	7	5	-	7	5	-	7	5	-
Flatness response	dB	±3,0								
Output level	dBµV	-	100 (IMD3 - 35 dB) 90 (IMD2 - 35 dB)		-	100 (IMD3 - 35 dB) 90 (IMD2 - 35 dB)		-	100 (IMD3 - 35 dB) 90 (IMD2 - 35 dB)	
Rejection between bands	dB	>25 TV/SAT >65 SAT/TV								
Isolation between bands	dB	>40 TV >30 SAT								

IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-3

IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-3



MU-330



MU-630

CODE		9130016		9130017		9130018	
MODEL		MU-130		MU-330		MU-630	
Isolation of switching	dB	>30 SAT/SAT					
Switching the outputs		DiSEqC 2.0 13 V $\cdots$ /17 V $\cdots$ 0/22 KHz					
Power supply of the LNB		2000 mA/18 V $\cdots$					
Input return loss	dB	>20					
Output voltage	V $\cdots$	13/17					
Consumption from the receiver	mA	50 $\pm$ 2,0 (12.. 20 V $\cdots$ )					
Operating temperature close to equipment	°C	-10..+65					
Room temperature with/without fan	°C	-10..+55/+45					
Protection index		IP 30					
Units per packing		1	9	1	9	1	5
Packing weight	Kg	0.7	6.5	0.7	6.3	1	3.5
Packing dimensions	mm	245x160x35	312x190x255	245x160x35	312x190x255	245x240x35	312x160x255

# 913 CASCADABLE MULTISWITCHES 2,500 MHz



Passive multiswitches for 4 polarities and TV



MU-320

## Description

Multiswitches for 4 polarities and terrestrial TV with 8 or 16 outputs, for installations in cascade. The tap outputs are amplified on the IF satellite band. Power must be supplied from each individual receiver to feed the switching and amplification of each tap output.

## Applications

Medium-sized to large MATV and SMATV installations. Enables distribution to up to 120 TV outlets in a single line, with power supplied only at the head-end of the cascade. By dividing the installation into lines of 120 outlets and distributing the 4 polarities and the terrestrial TV to all the lines, it is possible to reach more than 2,000 outlets. Distribution in cascade from the first multiswitch, with 5 coaxial cables between multiswitches and a single coaxial cable to each TV outlet. For each outlet, the multiswitch distributes a satellite polarity as well as the terrestrial TV. The polarity is selected from the individual receiver using the LNB control signals.

## Characteristics

Return path included from 5 to 65MHz. Shielded zamak chassis with plastic supports. F type connectors. Distances of more than 75m between multiswitch and outlet. Up to 100 terrestrial TV channels.

## Accessories

9130041 AU-620 SAT amplifier for 4 polarities.

9130057 FU-513 Power supply for active multiswitches, 7.5V $\pm$  3840 mA.

9130054 FU-612 Power supply unit for multiswitch, 18V $\pm$  2000 mA.

CODE		9130033				9130034		
MODEL		MU-320			MU-620			
TV system		FM-TV / DVB-S / AM-TV / DVB-T						
Connection		F female						
Inputs		5						
Outputs		5						
Tap outputs		8			16			
Frequency range	MHz	5-862	950-2.150	2.150-2.500	5-862	950-2.150	2.150-2.500	
Tap loss	dB±TOL	24 ±2,0	6 ±2,0	6.1 ±2,0	24 ±3,0	7 ±3,0	7.1 ±3,0	
Tap equalization	dB	9	7	-	9	6	-	
Tap flatness response	dB	±3						
Output level	dBµV	-	100 (IMD3 - 35 dB) 90 (IMD2 - 35 dB)		-	100 (IMD3 - 35 dB) 90 (IMD2 - 35 dB)		
Through loss	dB	3.1 ±0,2	1.7 ±0,2	1.9 ±0,2	6 ±0,2	2.5 ±0,2	2.8 ±0,2	
Through equalization	dB	1.2	1.1	-	3	2	-	
Path flatness response	dB	±0.25						
Rejection between bands	dB	>25 TV/SAT >65 SAT/TV						

IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-3

IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-3



MU-620

CODE		9130033		9130034	
MODEL		MU-320		MU-620	
Isolation between users	dB	>40 TV >30 SAT			
Isolation of switching	dB	>30 SAT/TV			
Trunk isolation	dB	>40 SAT/TV >30 SAT/SAT			
Switching the outputs		DiSEqC 2.0 13 V <sub>DC</sub> /17 V <sub>DC</sub> 0/22 KHz			
Input return loss		>20			
Output return loss		>20			
Consumption from the receiver	mA	50 ±2,0 (12.. 20 V <sub>DC</sub> )			
Operating temperature close to equipment	°C	-10..+65			
Room temperature with/without fan	°C	-10..+55/+45			
Protection index		IP 30			
Units per packing		1	9	1	5
Packing weight	Kg	0.5	4.7	0.7	6.5
Packing dimensions	mm	170 x 160 x 35	310 x 205 x 250	245 x 160 x 35	312 x 190 x 225

# 913 CASCADABLE MULTISWITCHES 2,500 MHz



Active multiswitches for 4 polarities and TV



MU-321

## Description

Multiswitches for 4 polarities and terrestrial TV with 4, 8 or 16 outputs, for installations in cascade. The inputs of the 4 polarities and the terrestrial TV are amplified. The tap outlets are amplified on the IF satellite band. Power must be supplied from the inputs or the through outputs to feed the built-in line amplifiers. Must be powered from each individual receiver to feed the switching and amplification of each tap output. To feed the active multiswitches, the FU-513 power unit is used; it is connected to the AU-620 amplifier of the cascade.

## Applications

Medium-sized to large MATV and SMATV installations. Enables distribution to up to 120 TV outlets in a single line, with power supplied only at the head-end of the cascade. By dividing the installation into lines of 120 outlets and distributing the 4 polarities and the terrestrial TV to all the lines, it is possible to reach more than 2,000 outlets. Distribution in cascade from the first multiswitch, with 5 coaxial cables between multiswitches and a single coaxial cable to each TV outlet. For each outlet, the multiswitch distributes a satellite polarity as well as the terrestrial TV. The polarity is selected from the individual receiver using the LNB control signals.

## Characteristics

Return path included from 5 to 65MHz. Shielded zamak chassis with plastic supports. F-type connectors. Distances of more than 75m between multiswitch and outlet. Up to 100 terrestrial TV channels.

CODE	9130020					9130021			
MODEL		MU-321				MU-621			
TV system		FM-TV / DVB-S / AM-TV / DVB-T							
Connection		F female							
Inputs		5							
Outputs		5							
Tap outputs		8				16			
Frequency range	MHz	5-65	86-862	950-2150	2150-2500	5-65	86-862	950-2150	2150-2500
Tap loss	dB±TOL	18 ±1,0	11 ±2,0	-	-	19 ±1,0	11 ±2,0	-	-
Tap gain		-	-	3 ±2,0	3 ±2,0	-	-	2 ±3,0	2 ±3,0
Tap equalization	dB	-	14	11	-	-	14	13	-
Tap flatness response	dB	±3							
Output level	dBµV	-		100 (IMD3 - 35 dB) 90 (IMD2 - 35 dB)		-		100 (IMD3 - 35 dB) 90 (IMD2 - 35 dB)	
Through gain	dB	9 ±1,0	8.5 ±0,5	7.5 ±0,5		8 ±1,0	6 ±0,5	6.5 ±0,5	
Through equalization	dB	1	3	4.5	-	1	3	4	-
Through flatness response	dB	±0.25							
Through output level	dBµV	119 DIN45004B 116 (IMD3 - 60 dB) 109 (IMD2 - 60 dB) 106 (CTB - 60 dB) 110 (CSO - 60 dB) 106 (XMOD - 60 dB)		114 (IMD3 - 35 dB) 110 (IMD2 - 35 dB)		116 DIN45004B 113 (IMD3 - 60 dB) 106 (IMD2 - 60 dB) 106 (CTB - 60 dB) 110 (CSO - 60 dB) 106 (XMOD - 60 dB)		111 (IMD3 - 35 dB) 107 (IMD2 - 35 dB)	

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> -60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-3

CTB -60 dB: 42 equal carriers, EN 50083-3  
 CSO -60 dB: 42 equal carriers, EN 50083-3  
 XMOD -60 dB: 42 equal carriers, EN 50083-3



MU-621

### Accessories

9130041 AU-620 SAT amplifier for 4 polarities.

9130057 FU-513 Power supply for active multiswitches, 7.5V $\pm$  3840 mA.

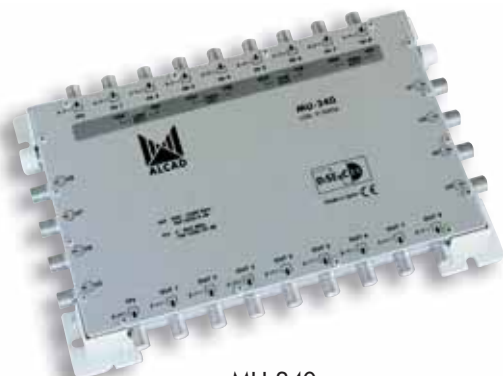
9130054 FU-612 Power supply unit for multiswitch, 18V $\pm$  2000 mA.

CODE		9130020		9130021	
MODEL		MU-321		MU-621	
Rejection between bands	dB	>25 TV/SAT >65 SAT/TV			
Isolation between users	dB	>40 TV >30 SAT			
Isolation of switching	dB	>30 SAT/TV			
Trunk isolation	dB	>30 SAT/TV >30 SAT/SAT			
Noise figure		6.2 ±2,5	10 ±5,0	6.2 ±2,5	10 ±5,0
Switching the outputs		DiSEqC 2.0 13 V $\pm$ /17 V $\pm$ 0/22 KHz			
Input return loss	dB	>20			
Output return loss	dB	>15			
Consumption from the receiver	mA	50 ±2,0 (12.. 20 V $\pm$ )			
Operating temperature close to equipment	°C	-10..+65			
Room temperature with/without fan	°C	-10..+55/+45			
Protection index		IP 30			
Units per packing		1	9	1	5
Packing weight	Kg	0.5	4.7	0.7	6.5
Packing dimensions	mm	170 x 160 x 35	310 x 205 x 250	245 x 160 x 35	312 x 190 x 225

# 913 CASCADABLE MULTISWITCHES 2,500 MHz



Passive multiswitches for 8 and 16 polarities and TV



MU-340

## Description

Multiswitches for 8 and 16 polarities and terrestrial TV with 8 or 16 outputs, for installations in cascade. The inputs of the 8 polarities and the terrestrial TV are amplified. The tap outlets are amplified on the IF satellite band. For 16 polarities, 2 stacked multiswitches of 8 polarities are installed and an external DiSEqC switch (CN-611) for each output. Power must be supplied from each individual receiver to feed the switching and amplification of each tap output.

## Applications

Medium-sized to large MATV and SMATV installations. Enables distribution to up to 128 TV outlets in a single line, with power supplied only at the head-end of the cascade. By dividing the installation into lines of 128 outlets and distributing the 8 or 16 polarities and the terrestrial TV to all the lines, it is possible to reach more than 2,000 outlets. Distribution in cascade from the first multiswitch, with 9 or 17 coaxial cables between multiswitches and a single coaxial cable to each TV outlet. For each outlet, the multiswitch distributes a satellite polarity as well as the terrestrial TV. For 8 polarities, the polarity is selected from the individual receiver using the LNB control signals and tone burst or using the DiSEqC signals (version 1.0 or higher); for 16 polarities, polarity is selected using only the DiSEqC signals.

## Characteristics

Return path included from 5 to 65MHz. Shielded zamak chassis with plastic supports. F-type connectors. Distances of more than 75m between multiswitch and outlet. Up to 100 terrestrial TV channels.

CODE		9130036				9130037		
MODEL		MU-340			MU-640			
TV system		FM-TV / DVB-S / AM-TV / DVB-T						
Connection		F female						
Inputs		9						
Outputs		9						
Tap outputs		8			16			
Frequency range	MHz	5-862	950-2.150	2.150-2.500	5-862	950-2.150	2.150-2.500	
Tap loss	dB±TOL	24 ±2,0	6 ±2,0	6.1 ±2,0	24 ±3,0	7 ±3,0	7.1 ±3,0	
Tap equalization	dB	9	7	-	9	6	-	
Tap flatness response	dB	±3						
Output level	dBµV	-	100 (IMD3 - 35 dB) 90 (IMD2 - 35 dB)		-	100 (IMD3 - 35 dB) 90 (IMD2 - 35 dB)		
Through loss	dB	3.1 ±0,2	1.7 ±0,2	1.9 ±0,2	6 ±0,2	2.5 ±0,2	2.8 ±0,2	
Through equalization	dB	1.2	1.1	-	3	2	-	
Path flatness response	dB	±0.25						
Rejection between bands	dB	>25 TV/SAT >65 SAT/TV						

IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-3

IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-3



MU-640

**Accessories**

- 9130042 AU-640 SAT amplifier for 4 polarities.
- 9130050 CN-611 DiSEqC switch for 16 polarities.
- 9130057 FU-513 Power supply for active multiswitches, 7.5V--- 3840 mA.
- 9130054 FU-612 Power supply unit for multiswitch, 18V--- 2000 mA.

CODE		9130036		9130037	
MODEL		MU-340		MU-640	
Isolation between users	dB	>40 TV >30 SAT			
Isolation of switching	dB	>30 SAT/SAT			
Trunk isolation	dB	>40 SAT/TV >40 SAT/SAT			
Switching the outputs		DiSEqC 2.0 13 V $\overline{\text{---}}$ /17 V $\overline{\text{---}}$ 0/22 KHz			
Input return loss		>20			
Output return loss		>20			
Comsupton from the receiver	mA	50 $\pm$ 2,0 (12.. 20 V $\overline{\text{---}}$ )			
Operating temperature close to equipment	°C	-10..+65			
Room temperature with/without fan	°C	-10..+55/+45			
Protection index		IP 30			
Units per packing		1	9	1	5
Packing weight	Kg	0.7	6.3	1	5
Packing dimensions	mm	245 x 160 x 35	312 x 190 x 225	245 x 240 x 35	312 x 190 x 255



# 913 CASCADABLE MULTISWITCHES 2,500 MHz



Active multiswitches for 8 and 16 polarities and TV

## Description

Multiswitches for 8 and 16 polarities and terrestrial TV with 8 or 16 outputs, for installations in cascade. The inputs of the 8 polarities and the terrestrial TV are amplified. For 16 polarities, 2 stacked multiswitches of 8 polarities are installed and an external DiSEqC switch (CN-611) for each output. The tap outlets are amplified on the IF satellite band. Power must be supplied from the inputs or the through outputs to feed the built-in line amplifiers. Power must be supplied from each individual receiver to feed the switching and amplification of each tap output. To feed the active multiswitches, the FU-513 power unit is used; it is connected to the AU-620 amplifier of the cascade.

## Applications

Medium-sized to large MATV and SMATV installations. Enables distribution to up to 128 TV outlets in a single line, with power supplied only at the head-end of the cascade. By dividing the installation into lines of 128 outlets and distributing the 8 polarities and the terrestrial TV to all the lines, it is possible to reach more than 2,000 outlets. Distribution in cascade from the first multiswitch, with 9 coaxial cables between multiswitches and a single coaxial cable to each TV outlet. For each outlet, the multiswitch distributes a satellite polarity as well as the terrestrial TV. For 8 polarities, the polarity is selected from the individual receiver using the LNB control signals and tone burst or using the DiSEqC signals (version 1.0 or higher); for 16 polarities, polarity is selected using only the DiSEqC signals.

## Characteristics

Return path included from 5 to 65MHz. Shielded zamak chassis with plastic supports. F-type connectors. Distances of more than 75m between multiswitch and outlet. Up to 100 terrestrial TV channels.

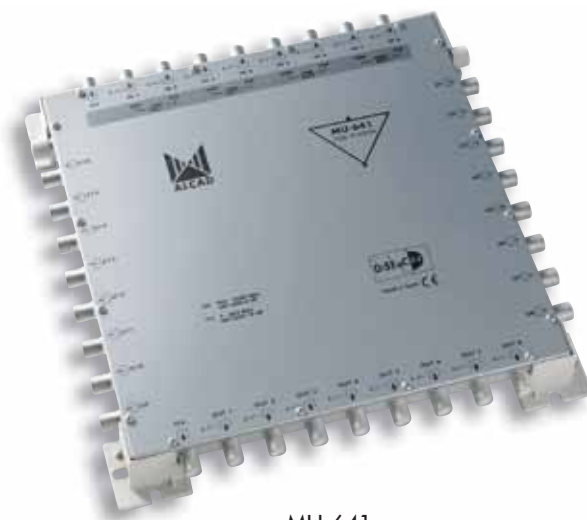


MU-341

CODE	9130023					9130024			
MODEL		MU-341				MU-641			
TV system		FM-TV / DVB-S / AM-TV / DVB-T							
Connection		F female							
Inputs		9							
Outputs		9							
Tap outputs		8				16			
Frequency range	MHz	5-65	86-862	950-2150	2150-2500	5-65	86-862	950-2150	2150-2500
Tap loss	dB±TOL	18 ±1,0	11 ±2,0	-	-	19 ±1,0	11 ±2,0	-	-
Tap gain		-	-	3 ±2,0	3 ±2,0	-	-	2 ±3,0	2 ±3,0
Tap equalization	dB	-	14	11	-	-	14	13	-
Tap flatness response	dB	±3							
Output level	dBµV	-		100 (IMD3 - 35 dB) 90 (IMD2 - 35 dB)		-		100 (IMD3 - 35 dB) 90 (IMD2 - 35 dB)	
Through gain	dB	9 ±1,0	8.5 ±0,5	7.5 ±0,5		8 ±1,0	6 ±0,5	6.5 ±0,5	
Through equalization	dB	1	3	4.5	-	1	3	4	-
Through flatness response	dB	±0.25							
Through output level	dBµV	119 DIN45004B 116 (IMD3 - 60 dB) 109 (IMD2 - 60 dB) 106 (CTB - 60 dB) 110 (CSO - 60 dB) 106 (XMOD - 60 dB)		114 (IMD3 - 35 dB) 110 (IMD2 - 35 dB)		116 DIN45004B 113 (IMD3 - 60 dB) 106 (IMD2 - 60 dB) 106 (CTB - 60 dB) 110 (CSO - 60 dB) 106 (XMOD - 60 dB)		111 (IMD3 - 35 dB) 107 (IMD2 - 35 dB)	

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> -60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-3

CTB -60 dB: 42 equal carriers, EN 50083-3  
 CSO -60 dB: 42 equal carriers, EN 50083-3  
 XMOD -60 dB: 42 equal carriers, EN 50083-3



MU-641

**Accessories**

9130042	AU-640	SAT amplifier for 4 polarities.
9130050	CN-611	DiSEqC switch for 16 polarities.
9130057	FU-513	Power supply for active multiswitches, 7.5V $\pm$ 3840 mA.
9130054	FU-612	Power supply unit for multiswitch, 18V $\pm$ 2000 mA.

CODE		9130023		9130024	
MODEL		MU-341		MU-641	
Rejection between bands	dB	>25 TV/SAT >65 SAT/TV			
Isolation between users	dB	>40 TV >30 SAT			
Isolation of switching	dB	>30 SAT/TV			
Trunk isolation	dB	>30 SAT/TV >30 SAT/SAT			
Noise figure		6.2 ±2,5	10 ±5,0	6.2 ±2,5	10 ±5,0
Switching the outputs		DiSEqC 2.0 13 V $\pm$ /17 V $\pm$ 0/22 KHz			
Input return loss	dB	>20			
Output return loss	dB	>15			
Power supply	V $\pm$	7 ±0,5			
	mA	590			
Consumption from the receiver	mA	50 ±2,0 (12.. 20 V $\pm$ )			
Operating temperature close to equipment	°C	-10..+65			
Room temperature with/without fan	°C	-10..+55/+45			
Protection index		IP 30			
Units per packing		1	9	1	5
Packing weight	Kg	0.7	6.3	1	5
Packing dimensions	mm	245 x 160 x 35	312 x 190 x 225	245 x 240 x 35	312 x 190 x 255

# 913 AMPLIFIERS

Amplifiers for 4, 8 and 16 polarities - High Gain



AU-620



AU-640

## Description

SAT amplifier for 4, 8 or 16 polarities, for installations in cascade. For 16 polarities, two stacked amplifiers of 8 polarities are installed. Equipped with gain control and independent equaliser for each polarity. Requires the FU-513 power supply unit, from the NET power supply connector, to feed the amplifier and intermediate active multiswitches. To power the LNB, the FU-612 power supply unit is used.

## Applications

Medium-sized to large MATV and SMATV installations. Enables distribution to up to 128 TV outlets in a single line, with a single amplifier and FU-513 power supply unit. By dividing the installation into lines of 128 outlets and distributing the 4 or 8 polarities and the terrestrial TV to all the lines, it is possible to reach more than 2,000 outlets. Amplifies and equalises all the polarities before the cascade of multiswitches.

## Characteristics

Return path included from 5 to 65MHz. Shielded zamak chassis with plastic supports. F-type connectors. Two power supply jacks, 9.5mm x 2.1mm for the NET cascade and for the LNB.

## Accessories

9130050 CN-611 DiSeqC switch for 16 polarities.

9130057 FU-513 Power supply for active multiswitches, 7.5V $\pm$  3840 mA.

9130054 FU-612 Power supply unit for multiswitch, 18V $\pm$  2000 mA.

CODE	9130041			9130042	
MODEL		AU-620		AU-640	
TV system		FM-TV / DVB-S / AM-TV / DVB-T			
Connection		F female			
Inputs		5		9	
Outputs		5		9	
Frequency range	Bande	VR/TV	SAT	VR/TV	SAT
	MHz	5-862	950-2500	5-862	950-2500
Through loss	dB±TOL	1.5 ±0,5	-	1.5 ±0,5	-
Gain	dB±TOL	-	43 ±1,0	-	43 ±1,0
Flatness response	dB	±0,75			
Gain adjustment		-	20	-	20
Adjustable equalization range	dB	-	8 conmutable	-	8 conmutable
Output level	dBµV	-	118.5 (IMD3 - 35 dB) 112.0 (IMD2 - 35 dB)	-	118.5 (IMD3 - 35 dB) 112.0 (IMD2 - 35 dB)
Trunk isolation	dB	>30 SAT/TV >28 SAT/SAT			
Noise figure	dB	-	13 ±3,0	-	13 ±3,0
Return loss I/O	dB	>14			
Power supply of the LNB		-	2000 mA (18V $\overline{\text{---}}$ )	-	2000 mA (18V $\overline{\text{---}}$ )
Output voltage	V $\overline{\text{---}}$	-	6.5	-	6.5
	mA	-	3040	-	2240
Power supply	V $\overline{\text{---}}$	7.5			
	mA	800		1600	
Operating temperature close to equipment	°C	-10..+65			
Room temperature with/without fan	°C	-10..+55/+45			
Protection index		IP 30			
Units per packing		1	9	1	5
Packing weight	Kg	0.5	4.7	0.7	6.5
Packing dimensions	mm	170 x 160 x 35	310 x 205 x 250	245 x 160 x 35	312 x 190 x 225

# 913 AMPLIFIERS



Amplifiers for 4, 8 and 16 polarities - Low Gain



AU-621

## Description

SAT amplifier for 4, 8 or 16 polarities, for installations in cascade. For 16 polarities, two stacked amplifiers of 8 polarities are installed. Equipped with gain control and independent equaliser for each polarity. Requires the FU-513 power supply unit, from the NET power supply connector, to feed the amplifier and intermediate active multiswitches. To power the LNB, the FU-612 power supply unit is used.

## Applications

Medium-sized to large MATV and SMATV installations. Enables distribution to up to 128 TV outlets in a single line, with a single amplifier and FU-513 power supply unit. By dividing the installation into lines of 128 outlets and distributing the 4 or 8 polarities and the terrestrial TV to all the lines, it is possible to reach more than 2,000 outlets. Amplifies and equalises all the polarities before the cascade of multiswitches.

## Characteristics

Return path included from 5 to 65MHz. Shielded zamak chassis with plastic supports. F-type connectors. Two power supply jacks, 9.5mm x 2.1mm for the NET cascade and for the LNB.

## Accessories

9130050 CN-611 DiSEqC switch for 16 polarities.

9130057 FU-513 Power supply for active multiswitches, 7.5V $\pm$  3840 mA.

9130054 FU-612 Power supply unit for multiswitch, 18V $\pm$  2000 mA.

CODE	9130168				9130169	
MODEL		AU-621		AU-641		
TV System		FM-TV / DVB-S / AM-TV / DVB-T				
Connection		F Female				
Outputs		5		9		
Frequency range	Bande	VR/TV	SAT	VR/TV	SAT	
	MHz	5-862	950-2500	5-862	950-2500	
Through loss	dB±TOL	1.5 ±0,5	-	1.5 ±0,5	-	
Gain	dB±TOL	-	23 ±1,0	-	23 ±1,0	
Flatness response	dB	±0,75				
Gain adjustment	dB	-	20	-	20	
Adjustable equalization range	dB	-	8 conmutable	-	8 conmutable	
Output level	dBpV	-	118.5 (IMD <sub>3</sub> -35dB) 110.0 (IMD <sub>2</sub> -35dB)	-	118.5 (IMD <sub>3</sub> -35dB) 110.0 (IMD <sub>2</sub> -35dB)	
Trunk isolation	dB	>30 SAT/TV > 28 SAT/TV				
Noise figure	dB	-	13 ±3,0	-	13 ±3,0	
Return loss I/O	dB	>14				
Power supply of the LNB		-	2000 mA (18V $\pm$ )	-	2000 mA (18V $\pm$ )	
Output voltage	V $\pm$	-	6.5	-	6.5	
	mA	-	3040	-	2240	
Power supply	V $\pm$	7.5				
	mA	675		1350		
Operating temperature close to equipment	°C	-10..+65				
Room T with/without fan	°C	-10..+55/+45				
Protection index		IP 30				
Units per packing		1	9	1	5	
Packing weight	Kg	0.5	4.7	0.7	6.5	
Packing dimensions	mm	170 x 160 x 35	310 x 230 x 185	245 x 160 x 35	312 x 275 x 210	

# 913 POWER SUPPLY UNITS

## Power supply units



FU-612



FU-513

### Description

Power sources feeding LNBs, amplifiers and active multiswitches to obtain the total necessary current for all the elements of the installation, including the LNBs.

### Applications

Model FU-612 is used for installations with final and cascable multiswitches and to supply power to the LNBs. The number of LNBs which can be powered varies, depending on the consumption of the LNBs ( $2.000\text{mA} = 8 \text{ LNB} \times 250\text{mA/LNB}$ ). Model FU-513 is used for installations in cascade, and to supply power to amplifiers and active multiswitches.

### Characteristics

Switched power sources protected against power surges and short circuits. They include a fuse which the installer can access. Power supply cables are provided for connection to the network and to the multiswitch or amplifier. Power supply jack connector, 9.5mm x 2.1mm

CODE		9130054	9130057
MODEL		FU-612	FU-513
Connection		Jack 9.5 x 2.1 mm	
Output voltage	V $\cdots$	18	7.5
	mA	2000 (In continuous operation)	3840 (In continuous operation)
Peak to peak ripple voltage	mV	50	200
Mains voltage	V $\sim$	230 $\pm 15\%$ 240 $+15\%$ 50/60Hz -18% 50/60Hz	
	VA	105	95
Operating temperature	$^{\circ}\text{C}$	-10..+65	
Protection index		IP 20	
Units per packing		1	
Packing weight	Kg	0.58	
Packing dimensions	mm	190 x 85 x 65	

# 913 FINAL MULTISWITCHES

## 4 polarities and terrestrial TV



MB-102

### Description

Final multiswitches for 4 polarities and terrestrial TV with 8, 12 and 16 outputs. The outputs are amplified in the satellite IF band. In the terrestrial band they can be configured to function in either active or passive mode. Need to be powered from each individual receiver so that the switching and the amplification of each derived output will function correctly. The external power supply units provide the required voltage to the LNBs for them to function properly.

### Applications

Medium-sized collective satellite and terrestrial TV installations. Installed individually, they can distribute to as many as 16 TV outlets. When combined with cascable multiswitches, with intermediary amplifiers in place, it is possible to distribute to 64 outlets on a single line.

### Characteristics

Shielded metal chassis with plastic supports. F-type connectors. Power supply connector is a 9.5 x 2.1 mm jack to feed the LNBs.

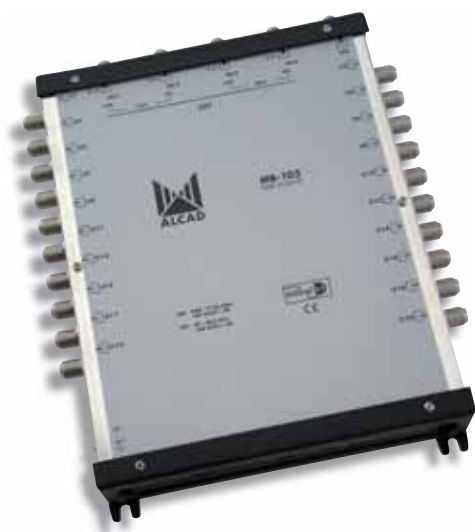
### Accessories

9090033 AV-315 Variable attenuator, 5-2400 MHz, 18 dB with DC path.  
9090029 PR-310 Pre-amplifier, 5-2400 MHz, 10 dB with DC path.  
9090038 BL-300 Current blocker.

CODE	9130144			9130145		9130146	
MODEL		MB-102		MB-103		MB-104	
TV system		FM-TV / DVB-S / AM-TV / DVB-T					
Connection		F female					
Inputs		5					
Tap outputs		8		12		16	
Frequency range	MHz	47-862	950-2150	47-862	950-2150	47-862	950-2150
PASSIVE MODE							
Tap loss	dB±TOL	19 ±3.0	-2.5 ±4.0	20 ±3.0	-1 ±4.0	20 ±3.0	-1 ±4.0
Output level	dBµV	-	100 (IMD <sub>3</sub> -35 dB) 95 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 92 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 92 (IMD <sub>2</sub> -35 dB)
ACTIVE MODE							
Tap loss	dB±TOL	-1 ±3.0	2.5 ±4.0	0.0 ±3.0	-1 ±4.0	0.0 ±3.0	-1 ±4.0
Output level	dBµV	99 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 95 (IMD <sub>2</sub> -35 dB)	96 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 92 (IMD <sub>2</sub> -35 dB)	96 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 92 (IMD <sub>2</sub> -35 dB)
ACTIVE / PASSIVE MODE							
Tap equalization	dB	4	4	4	4	4	2
Rejection between bands	dB	> 20 TV/SAT > 65 SAT/TV					
Isolation between users	dB	> 20 TV > 20 SAT					
Isolation of switching	dB	> 30 TV/SAT					
Switching the outputs		DiSEqC 2.0 14V <sup>---</sup> /18V <sup>---</sup> 0/22 kHz					
Power supply of the LNB		1050 mA /13 V <sup>---</sup>					
Output voltage	V <sup>---</sup>	13 V <sup>---</sup>					
Consumption from the receiver	mA	42 ±2.0 (14/18V <sup>---</sup> )					
Operating temperature close to equipment	°C	-10..+65					
Room temperature with/without fan	°C	-10..+55/+45					
Protection index		IP 30					
Units per packing		1	5	1	5	1	5
Packing weight	Kg	0.30	2.00	0.42	2.60	0.55	3.25
Packing dimensions	mm	205 x 105 x 45	225 x 115 x 250	260 x 245 x 55	290 x 270 x 270	260 x 245 x 55	290 x 270 x 270

# 913 FINAL MULTISWITCHES

## 4 polarities and terrestrial TV



MB-105

### Description

Final multiswitches for 4 polarities and terrestrial TV with 20, 24 and 32 outputs. The outputs are amplified in the satellite IF band. In the terrestrial band they can be configured to function in either active or passive mode. Need to be powered from each individual receiver so that the switching and the amplification of each derived output will function correctly. The external power supply units provide the required voltage to the LNBs for them to function properly.

### Applications

Medium-sized collective satellite and terrestrial TV installations. Installed individually, they can distribute to as many as 32 TV outlets. When combined with cascadable multiswitches, with intermediary amplifiers in place, it is possible to distribute to 128 outlets on a single line.

### Characteristics

Shielded metal chassis with plastic supports. F-type connectors. Power supply connector is a 9.5x2.1 mm jack to feed the LNBs.

### Accessories

9090033 AV-315 Variable attenuator, 5-2400 MHz, 18 dB with DC path.

9090029 PR-310 Preampifier, 5-2400 MHz, 10 dB with DC path.

9090038 BL-300 Current blocker.

CODE		9130147		9130148		9130160	
MODEL		MB-105		MB-106		MB-108	
TV system		FM-TV / DVB-S / AM-TV / DVB-T					
Connection		F female					
Inputs		5					
Tap outputs		20		24		32	
Frequency range	MHz	47-862	950-2150	47-862	950-2150	47-862	950-2150
PASSIVE MODE							
Tap loss	dB±TOL	21 ±3.0	-1 ±4.0	21 ±3.0	-1 ±4.0	21 ±3.0	-1 ±4.0
Output level	dBµV	-	100 (IMD <sub>3</sub> -35 dB) 91 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 91 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 91 (IMD <sub>2</sub> -35 dB)
ACTIVE MODE							
Tap loss	dB±TOL	1 ±3.0	-1 ±4.0	1 ±3.0	-1 ±4.0	1 ±2.0	-1 ±2.0
Output level	dBµV	95 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 91 (IMD <sub>2</sub> -35 dB)	95 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 91 (IMD <sub>2</sub> -35 dB)	95 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 91 (IMD <sub>2</sub> -35 dB)
ACTIVE / PASSIVE MODE							
Tap equalization	dB	7	4	7	4	7	2
Rejection between bands	dB	> 20 TV/SAT > 65 SAT/TV					
Isolation between users	dB	> 20 TV > 20 SAT					
Isolation of switching	dB	> 30 TV/SAT					
Switching the outputs		DiSEqC 2.0 14V $\overline{\overline{}}$ /18V $\overline{\overline{}}$ 0/22 kHz					
Power supply of the LNB		1050 mA /13 V $\overline{\overline{}}$					
Output voltage	V $\overline{\overline{}}$	13 V $\overline{\overline{}}$					
Consumption from the receiver	mA	42 ±2.0 (14/18V $\overline{\overline{}}$ )					
Operating temperature close to equipment	°C	-10..+65					
Room temperature with/without fan	°C	-10..+55/+45					
Protection index		IP 30					
Units per packing		1	5	1	5	1	5
Packing weight	Kg	0.65	4.05	0.71	4.05	0.93	5.13
Packing dimensions	mm	260 x 245 x 55	290 x 270 x 270	260 x 245 x 55	290 x 270 x 270	333 x 245 x 55	345 x 305 x 270



# 913 FINAL MULTISWITCHES

## 8 polarities and terrestrial TV



MB-202

### Description

Final multiswitches for 8 polarities and terrestrial TV with 8, 12 and 16 outputs. The outputs are amplified in the satellite IF band. In the terrestrial band they can be configured to function in either active or passive mode. Need to be powered from each individual receiver so that the switching and the amplification of each derived output will function correctly. The external power supply units provide the required voltage to the LNBs for them to function properly.

### Applications

Medium-sized collective satellite and terrestrial TV installations. Installed individually, they can distribute to as many as 16 TV outlets. When combined with cascable multiswitches, with intermediary amplifiers in place, it is possible to distribute to 64 outlets on a single line.

### Characteristics

Shielded metal chassis with plastic supports. F-type connectors. Power supply connector is a 9.5 x 2.1 mm jack to feed the LNBs.

### Accessories

9090033 AV-315 Variable attenuator, 5-2400 MHz, 18 dB with DC path.  
9090029 PR-310 Preamplifier, 5-2400 MHz, 10 dB with DC path.  
9090038 BL-300 Current blocker.

CODE	9130069			9130070		9130071	
MODEL		MB-202		MB-203		MB-204	
TV system		FM-TV / DVB-S / AM-TV / DVB-T					
Connection		F female					
Inputs		9					
Tap outputs		8		12		16	
Frequency range	MHz	47-862	950-2150	47-862	950-2150	47-862	950-2150
PASSIVE MODE							
Tap loss	dB±TOL	19 ±2.0	0 ±2.0	19 ±2.0	1 ±2.0	19 ±2.0	1 ±2.0
Output level	dBµV	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
ACTIVE MODE							
Tap loss	dB±TOL	-2 ±2.0	0 ±2.0	-1 ±2.0	1 ±2.0	-1 ±2.0	1 ±2.0
Output level	dBµV	99 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	98 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	98 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
ACTIVE / PASSIVE MODE							
Tap equalization	dB	0	3	0	3	0	3
Rejection between bands	dB	> 25 TV/SAT > 65 SAT/TV					
Isolation between users	dB	> 25 TV > 30 SAT					
Isolation of switching	dB	> 30 SAT/SAT					
Switching the outputs		DiSEqC 2.0 14V $\overline{\text{---}}$ /18V $\overline{\text{---}}$ 0/22 kHz					
Power supply of the LNB		2050 mA /13 V $\overline{\text{---}}$					
Output voltage	V $\overline{\text{---}}$	13 V $\overline{\text{---}}$					
Consumption from the receiver	mA	42 ±2.0 (14/18V $\overline{\text{---}}$ )					
Operating temperature close to equipment	°C	-10..+65					
Room temperature with/without fan	°C	-10..+55/+45					
Protection index		IP 30					
Units per packing		1	5	1	5	1	5
Packing weight	Kg	0.86	4.46	1.10	5.95	1.12	6.10
Packing dimensions	mm	260 x 245 x 55	290 x 270 x 270	335 x 245 x 55	345 x 300 x 270	335 x 245 x 55	345 x 300 x 270



# 913 FINAL MULTISWITCHES

## 8 polarities and terrestrial TV



MB-205

### Description

Final multiswitches for 8 polarities and terrestrial TV with 8, 12 and 16 outputs. The outputs are amplified in the satellite IF band. In the terrestrial band they can be configured to function in either active or passive mode. Need to be powered from each individual receiver so that the switching and the amplification of each derived output will function correctly. The external power supply units provide the required voltage to the LNBs for them to function properly.

### Applications

Medium-sized collective satellite and terrestrial TV installations. Installed individually, they can distribute to as many as 16 TV outlets. When combined with cascadable multiswitches, with intermediary amplifiers in place, it is possible to distribute to 64 outlets on a single line.

### Characteristics

Shielded metal chassis with plastic supports. F-type connectors. Power supply connector is a 9.5 x 2.1 mm jack to feed the LNBs.

### Accessories

9090033 AV-315 Variable attenuator, 5-2400 MHz, 18 dB with DC path.  
9090029 PR-310 Preampifier, 5-2400 MHz, 10 dB with DC path.  
9090038 BL-300 Current blocker.

CODE		9130072		9130073		9130170	
MODEL		MB-205		MB-206		MB-208	
TV system		FM-TV / DVB-S / AM-TV / DVB-T					
Connection		F female					
Inputs		9					
Tap outputs		20		24		32	
Frequency range	MHz	47-862	950-2150	47-862	950-2150	47-862	950-2150
PASSIVE MODE							
Tap loss	dB±TOL	20 ±2.0	2 ±2.0	20 ±2.0	2 ±2.0	25 ±2.0	3 ±2.0
Output level	dBµV	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
ACTIVE MODE							
Tap loss	dB±TOL	0 ±2.0	2 ±2.0	0 ±2.0	2 ±2.0	5 ±2.0	3 ±2.0
Output level	dBµV	97 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	97 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	97 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
ACTIVE / PASSIVE MODE							
Tap equalization	dB	0	3	0	3	0	3
Rejection between bands	dB	> 20 TV/SAT > 65 SAT/TV					
Isolation between users	dB	> 25 TV > 30 SAT					
Isolation of switching	dB	> 30 TV/SAT					
Switching the outputs		DiSEqC 2.0 14V $\overline{\text{---}}$ / 18V $\overline{\text{---}}$ 0/22 kHz					
Power supply of the LNB		2050 mA / 13 V $\overline{\text{---}}$					
Output voltage	V $\overline{\text{---}}$	13 V $\overline{\text{---}}$					
Consumption from the receiver	mA	42 ±2.0 (14/18V $\overline{\text{---}}$ )					
Operating temperature close to equipment	°C	-10..+65					
Room temperature with/without fan	°C	-10..+55/+45					
Protection index		IP 30					
Units per packing		1	5	1	5	1	5
Packing weight	Kg	1.38	7.35	1.40	7.45	1.34	6.80
Packing dimensions	mm	395 x 245 x 55	400 x 290 x 270	395 x 245 x 55	400 x 290 x 270	390 x 255 x 53	410 x 275x 285

# 913 FINAL MULTISWITCHES

## 12 polarities and terrestrial TV



MB-302

### Description

Final multiswitches for 12 polarities and terrestrial TV with 8, 12 and 16 outputs. The outputs are amplified in the satellite IF band. In the terrestrial band they can be configured to function in either active or passive mode. Need to be powered from each individual receiver so that the switching and the amplification of each derived output will function correctly. The external power supply units provide the required voltage to the LNBs for them to function properly.

### Applications

Medium-sized collective satellite and terrestrial TV installations. Installed individually, they can distribute to as many as 16 TV outlets. When combined with cascable multiswitches, with intermediary amplifiers in place, it is possible to distribute to 64 outlets on a single line.

### Characteristics

Shielded metal chassis with plastic supports. F-type connectors. Power supply connector is a 9.5 x 2.1 mm jack to feed the LNBs.

### Accessories

9090033 AV-315 Variable attenuator, 5-2400 MHz, 18 dB with DC path.  
9090029 PR-310 Preamplifier, 5-2400 MHz, 10 dB with DC path.  
9090038 BL-300 Current blocker.

CODE		9130079		9130080		9130081	
MODEL		MB-302		MB-303		MB-304	
TV system		FM-TV / DVB-S / AM-TV / DVB-T					
Connection		F female					
Inputs		13					
Tap outputs		8		12		16	
Frequency range	MHz	47-862	950-2150	47-862	950-2150	47-862	950-2150
<b>PASSIVE MODE</b>							
Tap loss	dB±TOL	20 ±2.0	0 ±2.0	21 ±2.0	1 ±2.0	21 ±2.0	1 ±2.0
Output level	dBµV	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
<b>ACTIVE MODE</b>							
Tap loss	dB±TOL	0 ±2.0	0 ±2.0	1 ±2.0	1 ±2.0	1 ±2.0	1 ±2.0
Output level	dBµV	99 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	96 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	96 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
<b>ACTIVE / PASSIVE MODE</b>							
Tap equalization	dB	3	3	2	3	2	3
Rejection between bands	dB	> 25 TV/SAT > 65 SAT/TV					
Isolation between users	dB	> 25 TV > 30 SAT					
Isolation of switching	dB	> 30 SAT/SAT					
Switching the outputs		DiSEqC 2.0 14V $\overline{\text{---}}$ / 18V $\overline{\text{---}}$ 0/22 kHz					
Power supply of the LNB		2050 mA / 13 V $\overline{\text{---}}$					
Output voltage	V $\overline{\text{---}}$	13 V $\overline{\text{---}}$					
Consumption from the receiver	mA	42 ±2.0 (14/18V $\overline{\text{---}}$ )					
Operating temperature close to equipment	°C	-10...+65					
Room temperature with/without fan	°C	-10...+55/+45					
Protection index		IP 30					
Units per packing		1	5	1	5	1	5
Packing weight	Kg	1.19	6.50	1.44	7.75	1.46	7.80
Packing dimensions	mm	333 x 245 x 55	345 x 305 x 270	333 x 245 x 55	345 x 305 x 270	333 x 245 x 55	345 x 305 x 270

IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-5

IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-5

Data published in compliance with the definitions and measurement methods of the following standards: EN 50083-3, EN 50083-4 and EN 50083-5

# 913 FINAL MULTISWITCHES

## 12 polarities and terrestrial TV



MB-305

### Description

Final multiswitches for 12 polarities and terrestrial TV with 8, 12 and 16 outputs. The outputs are amplified in the satellite IF band. In the terrestrial band they can be configured to function in either active or passive mode. Need to be powered from each individual receiver so that the switching and the amplification of each derived output will function correctly. The external power supply units provide the required voltage to the LNBs for them to function properly.

### Applications

Medium-sized collective satellite and terrestrial TV installations. Installed individually, they can distribute to as many as 16 TV outlets. When combined with cascadable multiswitches, with intermediary amplifiers in place, it is possible to distribute to 64 outlets on a single line.

### Characteristics

Shielded metal chassis with plastic supports. F-type connectors. Power supply connector is a 9.5 x 2.1 mm jack to feed the LNBs.

### Accessories

9090033 AV-315 Variable attenuator, 5-2400 MHz, 18 dB with DC path.  
9090029 PR-310 Preampifier, 5-2400 MHz, 10 dB with DC path.  
9090038 BL-300 Current blocker.

CODE		9130082		9130083		9130172	
MODEL		MB-305		MB-306		MB-308	
TV system		FM-TV / DVB-S / AM-TV / DVB-T					
Connection		F female					
Inputs		13					
Tap outputs		20		24		32	
Frequency range	MHz	47-862	950-2150	47-862	950-2150	47-862	950-2150
PASSIVE MODE							
Tap loss	dB±TOL	22 ±2.0	2 ±2.0	20 ±2.0	2 ±2.0	24 ±2.0	5 ±2.0
Output level	dBµV	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
ACTIVE MODE							
Tap loss	dB±TOL	2 ±2.0	2 ±2.0	2 ±2.0	2 ±2.0	4 ±2.0	5 ±2.0
Output level	dBµV	95 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	95 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	95 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
ACTIVE / PASSIVE MODE							
Tap equalization	dB	1	2	1	2	1	2
Rejection between bands	dB	> 25 TV/SAT > 65 SAT/TV					
Isolation between users	dB	> 25 TV > 30 SAT					
Isolation of switching	dB	> 30 TV/SAT					
Switching the outputs		DiSEqC 2.0 14V $\overline{\text{---}}$ / 18V $\overline{\text{---}}$ 0/22 kHz					
Power supply of the LNB		2050 mA / 13 V $\overline{\text{---}}$					
Output voltage	V $\overline{\text{---}}$	13 V $\overline{\text{---}}$					
Consumption from the receiver	mA	42 ±2.0 (14/18V $\overline{\text{---}}$ )					
Operating temperature close to equipment	°C	-10..+65					
Room temperature with/without fan	°C	-10..+55/+45					
Protection index		IP 30					
Units per packing		1	5	1	5	1	10
Packing weight	Kg	1.70	9.03	1.72	9.13	1.81	18.2
Packing dimensions	mm	395 x 245 x 55	400 x 290 x 270	395 x 245 x 55	400 x 290 x 270	383 x 315 x 44	405 x 335 x 460

# 913 FINAL MULTISWITCHES

## 16 polarities and terrestrial TV



MB-402

### Description

Final multiswitches for 16 polarities and terrestrial TV with 8, 12 and 16 outputs. The outputs are amplified in the satellite IF band. In the terrestrial band they can be configured to function in either active or passive mode. Need to be powered from each individual receiver so that the switching and the amplification of each derived output will function correctly. The external power supply units provide the required voltage to the LNBs for them to function properly.

### Applications

Medium-sized collective satellite and terrestrial TV installations. Installed individually, they can distribute to as many as 16 TV outlets. When combined with cascable multiswitches, with intermediary amplifiers in place, it is possible to distribute to 64 outlets on a single line.

### Characteristics

Shielded metal chassis with plastic supports. F-type connectors. Power supply connector is a 9.5 x 2.1 mm jack to feed the LNBs.

### Accessories

9090033 AV-315 Variable attenuator, 5-2400 MHz, 18 dB with DC path.  
9090029 PR-310 Preamplifier, 5-2400 MHz, 10 dB with DC path.  
9090038 BL-300 Current blocker.

CODE	9130089			9130090		9130091	
MODEL		MB-402		MB-403		MB-404	
TV system		FM-TV / DVB-S / AM-TV / DVB-T					
Connection		F female					
Inputs		17					
Tap outputs		8		12		16	
Frequency range	MHz	47-862	950-2150	47-862	950-2150	47-862	950-2150
PASSIVE MODE							
Tap loss	dB±TOL	20 ±2.0	0 ±2.0	21 ±2.0	1 ±2.0	21 ±2.0	1 ±2.0
Output level	dBµV	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
ACTIVE MODE							
Tap loss	dB±TOL	0 ±2.0	0 ±2.0	1 ±2.0	1 ±2.0	1 ±2.0	1 ±2.0
Output level	dBµV	99 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	96 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	96 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
ACTIVE / PASSIVE MODE							
Tap equalization	dB	3	3	2	3	2	3
Rejection between bands	dB	> 25 TV/SAT > 65 SAT/TV					
Isolation between users	dB	> 25 TV > 30 SAT					
Isolation of switching	dB	> 30 SAT/SAT					
Switching the outputs		DiSEqC 2.0 14V---/18V--- 0/22 kHz					
Power supply of the LNB		2050 mA /13 V---					
Output voltage	V---	13 V---					
Consumption from the receiver	mA	42 ±2.0 (14/18V---					
Operating temperature close to equipment	°C	-10..+65					
Room temperature with/without fan	°C	-10..+55/+45					
Protection index		IP 30					
Units per packing		1	5	1	5	1	5
Packing weight	Kg	1.20	6.50	1.45	7.75	1.47	7.80
Packing dimensions	mm	333 x 245 x 55	345 x 305 x 270	333 x 245 x 55	345 x 305 x 270	333 x 245 x 55	345 x 305 x 270

IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-5

IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-5

Data published in compliance with the definitions and measurement methods of the following standards: EN 50083-3, EN 50083-4 and EN 50083-5

# 913 FINAL MULTISWITCHES

## 16 polarities and terrestrial TV



MB-405

### Description

Final multiswitches for 16 polarities and terrestrial TV with 20, 24 and 32 outputs. The outputs are amplified in the satellite IF band. In the terrestrial band they can be configured to function in either active or passive mode. Need to be powered from each individual receiver so that the switching and the amplification of each derived output will function correctly. The external power supply units provide the required voltage to the LNBs for them to function properly.

### Applications

Medium-sized collective satellite and terrestrial TV installations. Installed individually, they can distribute to as many as 32 TV outlets. When combined with cascadable multiswitches, with intermediary amplifiers in place, it is possible to distribute to 128 outlets on a single line.

### Characteristics

Shielded metal chassis with plastic supports. F-type connectors. Power supply connector is a 9.5x2.1 mm jack to feed the LNBs.

### Accessories

9090033 AV-315 Variable attenuator, 5-2400 MHz, 18 dB with DC path.  
9090029 PR-310 Preampifier, 5-2400 MHz, 10 dB with DC path.  
9090038 BL-300 Current blocker.

CODE	9130092				9130093		9130174	
MODEL		MB-405		MB-406		MB-408		
TV system		FM-TV / DVB-S / AM-TV / DVB-T						
Connection		F female						
Inputs		17						
Tap outputs		20		24		32		
Frequency range	MHz	47-862	950-2150	47-862	950-2150	47-862	950-2150	
PASSIVE MODE								
Tap loss	dB±TOL	22 ±2.0	2 ±2.0	22 ±2.0	2 ±2.0	25 ±2.0	6 ±2.0	
Output level	dBµV	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	
ACTIVE MODE								
Tap loss	dB±TOL	2 ±2.0	2 ±2.0	2 ±2.0	2 ±2.0	5 ±2.0	6 ±2.0	
Output level	dBµV	95 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	95 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	95 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	
ACTIVE / PASSIVE MODE								
Tap equalization	dB	1	2	1	2	1	2	
Rejection between bands	dB	> 25 TV/SAT > 65 SAT/TV						
Isolation between users	dB	> 25 TV > 30 SAT						
Isolation of switching	dB	> 30 TV/SAT						
Switching the outputs		DiSEqC 2.0 14V <sup>---</sup> /18V <sup>---</sup> 0/22 kHz						
Power supply of the LNB		2050 mA /13 V <sup>---</sup>						
Output voltage	V <sup>---</sup>	13 V <sup>---</sup>						
Consumption from the receiver	mA	42 ±2.0 (14/18V <sup>---</sup> )						
Operating temperature close to equipment	°C	-10..+65						
Room temperature with/without fan	°C	-10..+55/+45						
Protection index		IP 30						
Units per packing		1	5	1	5	1	5	
Packing weight	Kg	1.70	9.03	1.74	9.13	1.79	9.35	
Packing dimensions	mm	395 x 245 x 55	400 x 290 x 270	395 x 245 x 55	400 x 290 x 270	316 x 384 x 45	400 x 290 x 270	

IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-5

IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-5

Data published in compliance with the definitions and measurement methods of the following standards: EN 50083-3, EN 50083-4 and EN 50083-5

# 913 CASCADABLE MULTISWITCHES

4 polarities and terrestrial TV



MB-102

## Description

Cascadable multiswitches for 4 polarities and terrestrial TV with 8, 12 and 16 outputs. The outputs are amplified in the satellite IF band. In the terrestrial band they can be configured to function in either active or passive mode. Need to be powered from each individual receiver so that the switching and amplification of each derived output will function.

## Applications

Medium-sized collective satellite and terrestrial TV installations. It is essential that they be mounted along with end multiswitches, so as to obtain distributions of up to 64 outlets on a single line if they are installed with intermediary amplifiers.

## Characteristics

Shielded metal chassis with plastic supports. F-type connectors. Earth.

## Accessories

9090033 AV-315 Variable attenuator, 5-2400 MHz, 18 dB with DC path.  
9090029 PR-310 Preamplifier, 5-2400 MHz, 10 dB with DC path.  
9090038 BL-300 Current blocker.

CODE	9130149			9130150		9130151	
MODEL		ML-102		ML-103		ML-104	
TV system		FM-TV / DVB-S / AM-TV / DVB-T					
Connection		F female					
Inputs		5/5					
Tap outputs		8		12		16	
Frequency range	MHz	47-862	950-2150	47-862	950-2150	47-862	950-2150
PASSIVE MODE							
Tap loss	dB±TOL	23 ±2.0	-2.5 ±4.0	24 ±3.0	-1 ±4.0	24 ±3.0	-1 ±4.0
Output level	dBµV	-	100 (IMD <sub>3</sub> -35 dB) 95 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 92 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 92 (IMD <sub>2</sub> -35 dB)
ACTIVE MODE							
Tap loss	dB±TOL	3 ±3.0	-2.5 ±4.0	4 ±3.0	-1 ±4.0	4 ±3.0	-1 ±4.0
Output level	dBµV	99 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 95 (IMD <sub>2</sub> -35 dB)	96 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 92 (IMD <sub>2</sub> -35 dB)	96 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 92 (IMD <sub>2</sub> -35 dB)
ACTIVE / PASSIVE MODE							
Tap equalization	dB	4	4	4	4	4	2
Rejection between bands	dB	> 20 TV/SAT > 65 SAT/TV					
Isolation between users	dB	> 20 TV > 20 SAT					
Isolation of switching	dB	> 30 SAT/SAT					
Switching the outputs		DiSEqC 2.0 14V⋯ /18V⋯ 0/22 kHz					
Power supply of the LNB		1050 mA /13 V⋯					
Output voltage	V⋯	13 V⋯					
Consumption from the receiver	mA	42 ±2.0 (14/18V⋯)					
Operating temperature close to equipment	°C	-10..+65					
Room temperature with/without fan	°C	-10..+55/+45					
Protection index		IP 30					
Units per packing		1	5	1	5	1	5
Packing weight	Kg	0.16	1.28	0.30	2.00	0.40	2.50
Packing dimensions	mm	205 x 105 x 45	225 x 115 x 250	260 x 245 x 55	290 x 270 x 270	260 x 245 x 55	290 x 270 x 270

IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-5

IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-5

Data published in compliance with the definitions and measurement methods of the following standards: EN 50083-3, EN 50083-4 and EN 50083-5



# 913 CASCADABLE MULTISWITCHES

4 polarities and terrestrial TV



ML-105

## Description

Cascadable multiswitches for 4 polarities and terrestrial TV with 20, 24 and 30 outputs. The outputs are amplified in the satellite IF band. In the terrestrial band they can be configured to function in either active or passive mode. Need to be powered from each individual receiver so that the switching and amplification of each derived output will function.

## Applications

Medium-sized collective satellite and terrestrial TV installations. It is essential that they be mounted along with end multiswitches, so as to obtain distributions of up to 128 outlets on a single line if they are installed with intermediary amplifiers.

## Characteristics

Shielded metal chassis with plastic supports. F-type connectors. Earth.

## Accessories

9090033 AV-315 Variable attenuator, 5-2400 MHz, 18 dB with DC path.

9090029 PR-310 Preamplifier, 5-2400 MHz, 10 dB with DC path.

9090038 BL-300 Current blocker.

CODE		9130152		9130153		9130159	
MODEL		ML-105		ML-106		ML-108	
TV system		FM-TV / DVB-S / AM-TV / DVB-T					
Connection		F female					
Inputs/outputs		5/5					
Tap outputs		20		24		32	
Frequency range	MHz	47-862	950-2150	47-862	950-2150	47-862	950-2150
PASSIVE MODE							
Tap loss	dB±TOL	25 ±3.0	-1 ±4.0	25 ±3.0	-1 ±4.0	25 ±3.0	-1 ±2.0
Output level	dBµV	-	100 (IMD <sub>3</sub> -35 dB) 91 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 91 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 91 (IMD <sub>2</sub> -35 dB)
ACTIVE MODE							
Tap loss	dB±TOL	5 ±3.0	-1 ±4.0	5 ±3.0	-1 ±4.0	5 ±2.0	-1 ±2.0
Output level	dBµV	95 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 91 (IMD <sub>2</sub> -35 dB)	95 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 91 (IMD <sub>2</sub> -35 dB)	95 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 91 (IMD <sub>2</sub> -35 dB)
ACTIVE / PASSIVE MODE							
Tap equalization	dB	7	4	7	4	7	3
Rejection between bands	dB	> 20 TV/SAT > 65 SAT/TV					
Isolation between users	dB	> 20 TV > 20 SAT					
Isolation of switching	dB	> 30 SAT/SAT					
Switching the outputs		DiSEqC 2.0 14V---/18V--- 0/22 kHz					
Power supply of the LNB		1050 mA /13 V---					
Output voltage	V---	13 V---					
Consumption from the receiver	mA	42 ±2.0 (14/18V---					
Operating temperature close to equipment	°C	-10..+65					
Room temperature with/without fan	°C	-10..+55/+45					
Protection index		IP 30					
Units per packing		1	5	1	5	1	5
Packing weight	Kg	0.56	3.30	0.58	3.40	0.78	4.40
Packing dimensions	mm	260 x 245 x 55	290 x 270 x 270	260 x 245 x 55	290 x 270 x 270	330 x 245 x 55	345 x 305 x 270

IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-5

IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-5

Data published in compliance with the definitions and measurement methods of the following standards: EN 50083-3, EN 50083-4 and EN 50083-5

# 913 CASCADABLE MULTISWITCHES

## 8 polarities and terrestrial TV



ML-202

### Description

Cascadable multiswitches for 8 polarities and terrestrial TV with 8, 12 and 16 outputs. The outputs are amplified in the satellite IF band. In the terrestrial band they can be configured to function in either active or passive mode. Need to be powered from each individual receiver so that the switching and amplification of each derived output will function.

### Applications

Medium-sized collective satellite and terrestrial TV installations. It is essential that they be mounted along with end multiswitches, so as to obtain distributions of up to 64 outlets on a single line if they are installed with intermediary amplifiers.

### Characteristics

Shielded metal chassis with plastic supports. F-type connectors. Earth.

### Accessories

9090033 AV-315 Variable attenuator, 5-2400 MHz, 18 dB with DC path.  
9090029 PR-310 Preamplifier, 5-2400 MHz, 10 dB with DC path.  
9090038 BL-300 Current blocker.

CODE		9130094		9130095		9130096	
MODEL		ML-202		ML-203		ML-204	
TV system		FM-TV / DVB-S / AM-TV / DVB-T					
Connection		F female					
Inputs		9/9					
Tap outputs		8		12		16	
Frequency range	MHz	47-862	950-2150	47-862	950-2150	47-862	950-2150
PASSIVE MODE							
Tap loss	dB±TOL	22 ±2.0	0 ±2.0	23 ±2.0	1 ±2.0	23 ±2.0	1 ±2.0
Output level	dBµV	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
ACTIVE MODE							
Tap loss	dB±TOL	2 ±2.0	0 ±2.0	3 ±2.0	1 ±2.0	3 ±2.0	1 ±2.0
Output level	dBµV	99 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	98 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	98 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
ACTIVE / PASSIVE MODE							
Tap equalization	dB	0	3	0	3	0	3
Throuhg <sup>t</sup> loss	dB±TOL	4.5 ±1.0	2.0 ±1.0	4.5 ±1.0	3.0 ±1.0	4.5 ±1.0	4.0 ±1.0
Rejection between bands	dB	> 25 TV/SAT > 65 SAT/TV					
Isolation between users	dB	> 25 TV > 30 SAT					
Isolation of switching	dB	> 30 SAT/SAT					
Switching the outputs		DiSEqC 2.0 14V---/18V--- 0/22 kHz					
Power supply of the LNB		2050 mA /13 V---					
Output voltage	V---	13 V---					
Consumption from the receiver	mA	42 ±2.0 (14/18V---					
Operating temperature close to equipement	°C	-10..+65					
Room temperature with/without fan	°C	-10..+55/+45					
Protection index		IP 30					
Units per packing		1	5	1	5	1	5
Packing weight	Kg	0.75	4.15	0.85	4.65	0.95	5.15
Packing dimensions	mm	260 x 245 x 55	285 x 270 x 260	260 x 245 x 55	285 x 270 x 260	260 x 245 x 55	285 x 270 x 260

IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-5

IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-5

Data published in compliance with the definitions and measurement methods of the following standards: EN 50083-3, EN 50083-4 and EN 50083-5



# 913 CASCADABLE MULTISWITCHES

8 polarities and terrestrial TV



ML-205

## Description

Cascadable multiswitches for 8 polarities and terrestrial TV with 20, 24 and 32 outputs. The outputs are amplified in the satellite IF band. In the terrestrial band they can be configured to function in either active or passive mode. Need to be powered from each individual receiver so that the switching and amplification of each derived output will function.

## Applications

Medium-sized collective satellite and terrestrial TV installations. It is essential that they be mounted along with end multiswitches, so as to obtain distributions of up to 128 outlets on a single line if they are installed with intermediary amplifiers.

## Characteristics

Shielded metal chassis with plastic supports. F-type connectors. Earth.

## Accessories

9090033 AV-315 Variable attenuator, 5-2400 MHz, 18 dB with DC path.

9090029 PR-310 Preamplifier, 5-2400 MHz, 10 dB with DC path.

9090038 BL-300 Current blocker.

CODE		9130097		9130098		9130171	
MODEL		ML-205		ML-206		ML-208	
TV system		FM-TV / DVB-S / AM-TV / DVB-T					
Connection		F female					
Inputs/outputs		9/9					
Tap outputs		20		24		32	
Frequency range	MHz	47-862	950-2150	47-862	950-2150	47-862	950-2150
PASSIVE MODE							
Tap loss	dB±TOL	24 ±2.0	2 ±2.0	24 ±2.0	2 ±2.0	23 ±2.0	3 ±2.0
Output level	dBµV	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
ACTIVE MODE							
Tap loss	dB±TOL	4 ±2.0	2 ±2.0	4 ±2.0	2 ±2.0	3 ±2.0	3 ±2.0
Output level	dBµV	97 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	97 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	97 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
ACTIVE / PASSIVE MODE							
Tap equalization	dB	0	2	0	2	4	1
Rejection between bands	dB	> 25 TV/SAT > 65 SAT/TV					
Isolation between users	dB	> 25 TV > 30 SAT					
Isolation of switching	dB	> 30 SAT/SAT					
Switching the outputs		DiSEqC 2.0 14V $\overline{\text{---}}$ /18V $\overline{\text{---}}$ 0/22 kHz					
Power supply of the LNB		2050 mA /13 V $\overline{\text{---}}$					
Output voltage	V $\overline{\text{---}}$	13 V $\overline{\text{---}}$					
Consumption from the receiver	mA	42 ±2.0 (14/18V $\overline{\text{---}}$ )					
Operating temperature close to equipment	°C	-10..+65					
Room temperature with/without fan	°C	-10..+55/+45					
Protection index		IP 30					
Units per packing		1	5	1	5	1	5
Packing weight	Kg	1.15	6.15	1.25	6.65	1.21	6.10
Packing dimensions	mm	335 x 245 x 55	340 x 290 x 260	335 x 255 x 55	335 x 290 x 260	332 x 255 x 53	352 x 275 x 285

IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-5

IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-5

Data published in compliance with the definitions and measurement methods of the following standards: EN 50083-3, EN 50083-4 and EN 50083-5

# 913 CASCADABLE MULTISWITCHES

12 polarities and terrestrial TV



ML-302

## Description

Cascadable multiswitches for 12 polarities and terrestrial TV with 8, 12 and 16 outputs. The outputs are amplified in the satellite IF band. In the terrestrial band they can be configured to function in either active or passive mode. Need to be powered from each individual receiver so that the switching and amplification of each derived output will function.

## Applications

Medium-sized collective satellite and terrestrial TV installations. It is essential that they be mounted along with end multiswitches, so as to obtain distributions of up to 64 outlets on a single line if they are installed with intermediary amplifiers.

## Characteristics

Shielded metal chassis with plastic supports. F-type connectors. Earth.

## Accessories

9090033 AV-315 Variable attenuator, 5-2400 MHz, 18 dB with DC path.

9090029 PR-310 Preamplifier, 5-2400 MHz, 10 dB with DC path.

9090038 BL-300 Current blocker.

CODE	9130114			9130115		9130116	
MODEL		ML-302		ML-303		ML-304	
TV system		FM-TV / DVB-S / AM-TV / DVB-T					
Connection		F female					
Inputs		13/13					
Tap outputs		8		12		16	
Frequency range	MHz	47-862	950-2150	47-862	950-2150	47-862	950-2150
<b>PASSIVE MODE</b>							
Tap loss	dB±TOL	22 ±2.0	0 ±2.0	24 ±2.0	1 ±2.0	24 ±2.0	1 ±2.0
Output level	dBµV	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
<b>ACTIVE MODE</b>							
Tap loss	dB±TOL	2 ±2.0	0 ±2.0	4 ±2.0	1 ±2.0	4 ±2.0	1 ±2.0
Output level	dBµV	99 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	96 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	96 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
<b>ACTIVE / PASSIVE MODE</b>							
Tap equalization	dB	3	3	2	3	2	3
Throuhg <sup>t</sup> loss	dB±TOL	4.5 ±1.0	2.0 ±1.0	4.5 ±1.0	3.0 ±1.0	4.5 ±1.0	4.0 ±1.0
Rejection between bands	dB	> 25 TV/SAT > 65 SAT/TV					
Isolation between users	dB	> 25 TV > 30 SAT					
Isolation of switching	dB	> 30 SAT/SAT					
Switching the outputs		DiSEqC 2.0 14V <sup>---</sup> /18V <sup>---</sup> 0/22 kHz					
Power supply of the LNB		2050 mA /13 V <sup>---</sup>					
Output voltage	V <sup>---</sup>	13 V <sup>---</sup>					
Consumption from the receiver	mA	42 ±2.0 (14/18V <sup>---</sup> )					
Operating temperature close to equipement	°C	-10..+65					
Room temperature with/ without fan	°C	-10..+55/+45					
Protection index		IP 30					
Units per packing		1	5	1	5	1	5
Packing weight	Kg	0.92	5.00	1.05	5.65	1.20	6.40
Packing dimensions	mm	335 x 245 x 55	340 x 290 x 260	335 x 245 x 55	340 x 290 x 260	335 x 245 x 55	340 x 290 x 260

IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-5

IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-5

Data published in compliance with the definitions and measurement methods of the following standards: EN 50083-3, EN 50083-4 and EN 50083-5

# 913 CASCADABLE MULTISWITCHES



12 polarities and terrestrial TV



ML-305

## Description

Cascadable multiswitches for 12 polarities and terrestrial TV with 20, 24 and 32 outputs. The outputs are amplified in the satellite IF band. In the terrestrial band they can be configured to function in either active or passive mode. Need to be powered from each individual receiver so that the switching and amplification of each derived output will function.

## Applications

Medium-sized collective satellite and terrestrial TV installations. It is essential that they be mounted along with end multiswitches, so as to obtain distributions of up to 128 outlets on a single line if they are installed with intermediary amplifiers.

## Characteristics

Shielded metal chassis with plastic supports. F-type connectors. Earth.

## Accessories

9090033 AV-315 Variable attenuator, 5-2400 MHz, 18 dB with DC path.  
9090029 PR-310 Preampifier, 5-2400 MHz, 10 dB with DC path.  
9090038 BL-300 Current blocker.

CODE		9130117		9130118		9130173	
MODEL		ML-305		ML-306		ML-308	
TV system		FM-TV / DVB-S / AM-TV / DVB-T					
Connection		F female					
Inputs/outputs		13/13					
Tap outputs		20		24		32	
Frequency range	MHz	47-862	950-2150	47-862	950-2150	47-862	950-2150
PASSIVE MODE							
Tap loss	dB±TOL	26 ±2.0	2 ±2.0	26 ±2.0	2 ±2.0	26 ±2.0	4 ±2.0
Output level	dBµV	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
ACTIVE MODE							
Tap loss	dB±TOL	6 ±2.0	2 ±2.0	6 ±2.0	2 ±2.0	6 ±2.0	4 ±2.0
Output level	dBµV	95 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	95 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	95 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
ACTIVE / PASSIVE MODE							
Tap equalization	dB	1	2	1	2	1	2
Rejection between bands	dB	> 25 TV/SAT > 65 SAT/TV					
Isolation between users	dB	> 25 TV > 30 SAT					
Isolation of switching	dB	> 30 SAT/SAT					
Switching the outputs		DiSEqC 2.0 14V $\overline{\text{---}}$ /18V $\overline{\text{---}}$ 0/22 kHz					
Power supply of the LNB		2050 mA /13 V $\overline{\text{---}}$					
Output voltage	V $\overline{\text{---}}$	13 V $\overline{\text{---}}$					
Consumption from the receiver	mA	42 ±2.0 (14/18V $\overline{\text{---}}$ )					
Operating temperature close to equipment	°C	-10..+65					
Room temperature with/without fan	°C	-10..+55/+45					
Protection index		IP 30					
Units per packing		1	5	1	5	1	5
Packing weight	Kg	1.35	7.25	1.45	7.75	1.55	15.5
Packing dimensions	mm	395 x 245 x 55	340 x 290 x 260	395 x 245 x 55	340 x 290 x 260	333 x 315 x 44	355 x 335 x 460

IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-5

IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-5

Data published in compliance with the definitions and measurement methods of the following standards: EN 50083-3, EN 50083-4 and EN 50083-5

# 913 CASCADABLE MULTISWITCHES

16 polarities and terrestrial TV



ML-402

## Description

Cascadable multiswitches for 16 polarities and terrestrial TV with 8, 12 and 16 outputs. The outputs are amplified in the satellite IF band. In the terrestrial band they can be configured to function in either active or passive mode. Need to be powered from each individual receiver so that the switching and amplification of each derived output will function.

## Applications

Medium-sized collective satellite and terrestrial TV installations. It is essential that they be mounted along with end multiswitches, so as to obtain distributions of up to 64 outlets on a single line if they are installed with intermediary amplifiers.

## Characteristics

Shielded metal chassis with plastic supports. F-type connectors. Earth.

## Accessories

9090033 AV-315 Variable attenuator, 5-2400 MHz, 18 dB with DC path.

9090029 PR-310 Preamplifier, 5-2400 MHz, 10 dB with DC path.

9090038 BL-300 Current blocker.

CODE	9130134			9130135		9130136	
MODEL		ML-402		ML-403		ML-404	
TV system		FM-TV / DVB-S / AM-TV / DVB-T					
Connection		F female					
Inputs		17/17					
Tap outputs		8		12		16	
Frequency range	MHz	47-862	950-2150	47-862	950-2150	47-862	950-2150
PASSIVE MODE							
Tap loss	dB±TOL	22 ±2.0	0 ±2.0	24 ±2.0	1 ±2.0	24 ±2.0	1 ±2.0
Output level	dBµV	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
ACTIVE MODE							
Tap loss	dB±TOL	2 ±2.0	0 ±2.0	4 ±2.0	1 ±2.0	4 ±2.0	1 ±2.0
Output level	dBµV	99 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	96 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	96 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
ACTIVE / PASSIVE MODE							
Tap equalization	dB	3	3	2	3	2	3
Throughgt loss	dB±TOL	4.5 ±1.0	2.0 ±1.0	4.5 ±1.0	3.0 ±1.0	4.5 ±1.0	4.0 ±1.0
Rejection between bands	dB	> 25 TV/SAT > 65 SAT/TV					
Isolation between users	dB	> 25 TV > 30 SAT					
Isolation of switching	dB	> 30 SAT/SAT					
Switching the outputs		DiSEqC 2.0 14V---/18V--- 0/22 kHz					
Power supply of the LNB		2050 mA /13 V---					
Output voltage	V---	13 V---					
Consumption from the receiver	mA	42 ±2.0 (14/18V---					
Operating temperature close to equipement	°C	-10..+65					
Room temperature with/without fan	°C	-10..+55/+45					
Protection index		IP 30					
Units per packing		1	5	1	5	1	5
Packing weight	Kg	1.05	5.65	1.05	5.65	1.20	6.40
Packing dimensions	mm	335 x 245 x 55	345 x 290 x 260	335 x 245 x 55	340 x 290 x 260	335 x 245 x 55	340 x 290 x 260

IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-5

IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-5

Data published in compliance with the definitions and measurement methods of the following standards: EN 50083-3, EN 50083-4 and EN 50083-5

# 913 CASCADABLE MULTISWITCHES

16 polarities and terrestrial TV



ML-405

## Description

Cascadable multiswitches for 16 polarities and terrestrial TV with 20, 24 and 32 outputs. The outputs are amplified in the satellite IF band. In the terrestrial band they can be configured to function in either active or passive mode. Need to be powered from each individual receiver so that the switching and amplification of each derived output will function.

## Applications

Medium-sized collective satellite and terrestrial TV installations. It is essential that they be mounted along with end multiswitches, so as to obtain distributions of up to 128 outlets on a single line if they are installed with intermediary amplifiers.

## Characteristics

Shielded metal chassis with plastic supports. F-type connectors. Earth.

## Accessories

9090033 AV-315 Variable attenuator, 5-2400 MHz, 18 dB with DC path.  
9090029 PR-310 Preamplifier, 5-2400 MHz, 10 dB with DC path.  
9090038 BL-300 Current blocker.

CODE		9130137		9130138		9130175	
MODEL		ML-405		ML-406		ML-408	
TV system		FM-TV / DVB-S / AM-TV / DVB-T					
Connection		F female					
Inputs/outputs		17/17					
Tap outputs		20		24		32	
Frequency range	MHz	47-862	950-2150	47-862	950-2150	47-862	950-2150
PASSIVE MODE							
Tap loss	dB±TOL	26 ±2.0	2 ±2.0	26 ±2.0	2 ±2.0	28 ±2.0	5 ±2.0
Output level	dBµV	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	-	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
ACTIVE MODE							
Tap loss	dB±TOL	6 ±2.0	2 ±2.0	6 ±2.0	2 ±2.0	8 ±2.0	5 ±2.0
Output level	dBµV	95 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	95 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)	95 (DIN 45004B)	100 (IMD <sub>3</sub> -35 dB) 90 (IMD <sub>2</sub> -35 dB)
ACTIVE / PASSIVE MODE							
Tap equalization	dB	1	2	1	2	1	2
Rejection between bands	dB	> 25 TV/SAT > 65 SAT/TV					
Isolation between users	dB	> 25 TV > 30 SAT					
Isolation of switching	dB	> 30 SAT/SAT					
Switching the outputs		DiSEqC 2.0 14V $\overline{\text{---}}$ /18V $\overline{\text{---}}$ 0/22 kHz					
Power supply of the LNB		2050 mA /13 V $\overline{\text{---}}$					
Output voltage	V $\overline{\text{---}}$	13 V $\overline{\text{---}}$					
Consumption from the receiver	mA	42 ±2.0 (14/18V $\overline{\text{---}}$ )					
Operating temperature close to equipment	°C	-10..+65					
Room temperature with/without fan	°C	-10..+55/+45					
Protection index		IP 30					
Units per packing		1	5	1	5	1	5
Packing weight	Kg	1.51	8.05	1.65	8.75	1.57	7.9
Packing dimensions	mm	395 x 245 x 55	400 x 290 x 270	395 x 245 x 55	400 x 295 x 270	333 x 315 x 44	335 x 335 x 460

# 913 ACCESSORIES



Satellite dish

9120216	
PF-620	
Units per packaging	1
Packing weight	10,4 Kg
Packing dimensions	1080 x 990 x 225 mm

Offset parabolic antenna with high gain and efficiency, 100x95cm (see page 24).



DiSEqC switch for 16 polarities

9130050	
CN-611	
Units per packaging	36
Packing weight	1,92 Kg
Packing dimensions	220 x 200 x 60 mm

External switch to access the 16 polarities of two stacked multiswitches of 8 polarities. Requires a receiver with DiSEqC control (version 1.0 and higher).



Amplifier

9090029	
PR-310	
Units per packaging	1
Packing weight	0,02 Kg
Packing dimensions	15 x 80 x 100 mm

Remote-fed line amplifier, 10dB, from 47 to 2,150MHz. Used in the inputs of the multiswitch or the amplifier when the signal from the satellite dish is too weak; and in the outputs when the distance to the outlet is excessive (see page 390).



Variable attenuator

9090033	
AV-315	
Units per packaging	1
Packing weight	0,02 Kg
Packing dimensions	15 x 80 x 100 mm

Variable attenuator, 18dB, from 5 to 2,400MHz. Permits the passing of a feed path and of LNB and DiSEqC control signals. Permits reduction of the level of a polarity when it is too strong to prevent interference with the other polarities (see page 391).



IF Splitter

9130059	
DI-213	
Units per packaging	1
Packing weight	0,60 Kg
Packing dimensions	200 x 80 x 40 mm

2 output splitter which covers frequencies up to 2,400 MHz. Permits current path from the input to all its outputs. Used to feed intermediate active multiswitches starting from only one amplifier in the head-end.



IF Splitter

9090060	
DI-413	
Units per packaging	1
Packing weight	0,60 Kg
Packing dimensions	200 x 80 x 40 mm

4 output splitter which covers frequencies up to 2,400 MHz. Permits current path from the input to all its outputs. Used to feed intermediate active multiswitches starting from only one amplifier in the head-end.



Current blocker

9090038	
BL-300	
Units per packaging	1
Packing weight	0,02 Kg
Packing dimensions	15 x 80 x 100 mm

DC Current blocker (5-2400MHz) for 913 series multiswitches, to avoid shortcircuits while supplying power to the switches



9 polarities amplifier

D9130001	
AU-0630	
Units per packaging	1
Packing weight	0,44 Kg
Packing dimensions	158 x 258 x 49 mm

SAT amplifier for 9 polarities, for installations in cascade. Compatible with multiswitches 913-ML and 913-MB.





Tone generators

<b>9090034</b>	
<b>GT-001</b>	
Units per packaging	1
Packing weight	0,053 Kg
Packing dimensions	80 x 25 x 15 mm

22 KHz tone generator, fed by the 12–18V= voltage of the LNB power supply. Enables selection of the high band of a single LNB connected to SAT receiving equipment or to an installation with multiswitches.



Male type F connector

<b>9120039</b>	
<b>CM-004</b>	
Units per packaging	100
Packing weight	0,340 Kg
Packing dimensions	80 x 50 x 15 mm

Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.



Male type F connector

<b>9080023</b>	
<b>MC-302</b>	
Units per packaging	1
Packing weight	0,49 Kg
Packing dimensions	210 x 200 x 60 mm

Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.



F Insulated load

<b>9080019</b>	
<b>RC-110</b>	
Units per packaging	1
Packing weight	0,01 Kg
Packing dimensions	110 x 80 x 15 mm

Insulated load of 75 Ω with F-type male connector, to load all the unused inputs and outputs with 905-ZG/ZP equipment and in the cascable multiswitches of the 913 series, it is necessary to use insulated loads.



F splicers

<b>9080012</b>	
<b>EP-111</b>	
Units per packaging	10
Packing weight	0,06 Kg
Packing dimensions	75 x 50 x 10 mm

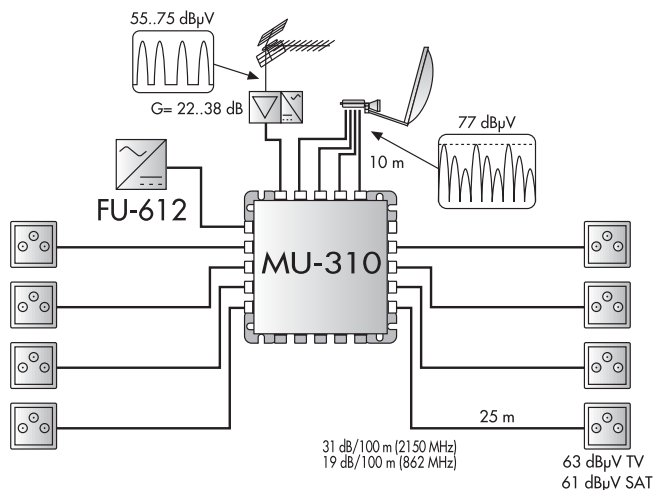
Shielded splicer with two female F connectors which permits the connection of two sections of coaxial cable by means of the splicer and two male F connectors.

# 913

## EXAMPLES OF INSTALLATIONS

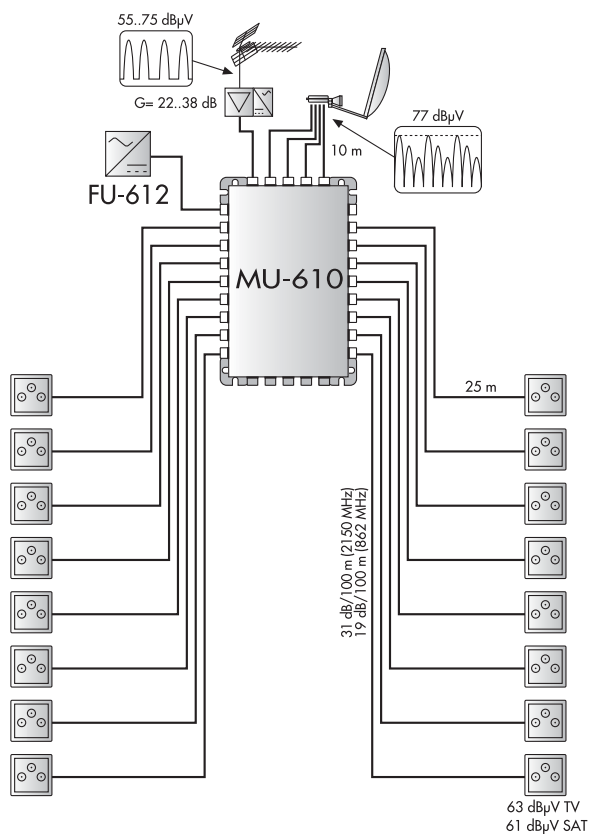
### Installation with 4 SAT polarities and terrestrial TV for 8 apartments

Installation with a multiswitch which distributes the terrestrial and satellite TV to the outlets. The distribution is made on the 5 to 2,150 MHz band, in a star-shaped form. Each outlet of the installation receives the terrestrial TV and any of the satellite polarities, which are selected from the individual satellite receiver.



### Installation with 4 SAT polarities and terrestrial TV for 16 apartments

Installation with multiswitches which distributes the terrestrial and satellite TV to the outlets. The distribution is on the 5 to 2,150 MHz band and is star-shaped in form. Each outlet of the installation receives the terrestrial TV and any of the satellite polarities, which are selected from the individual satellite receiver.

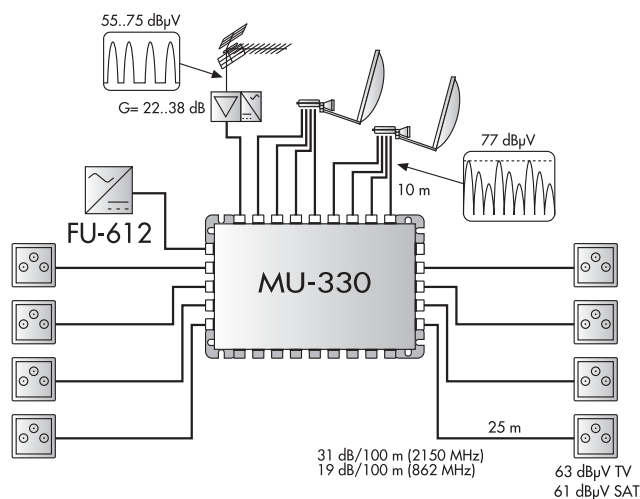




# 913 EXAMPLES OF INSTALLATIONS

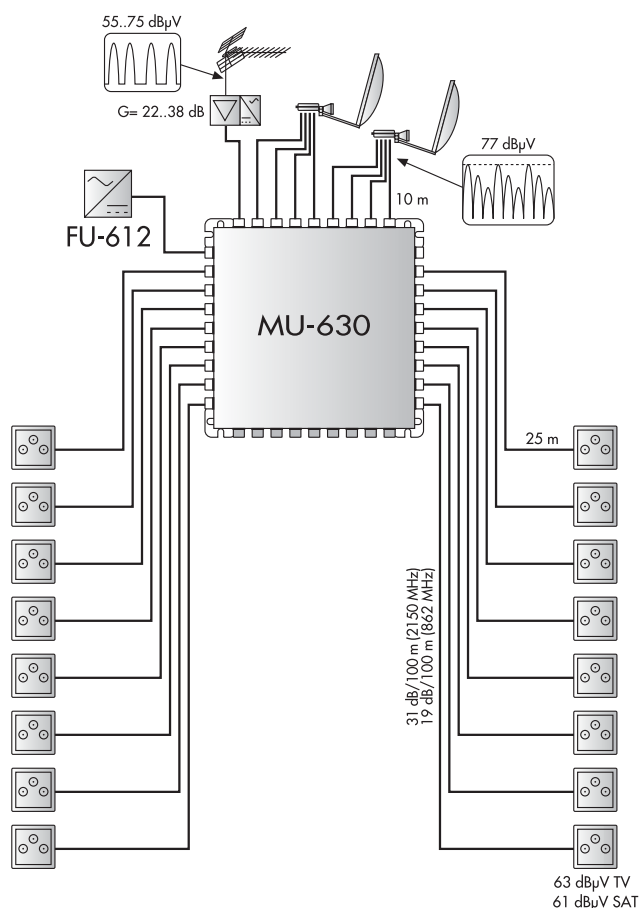
## Installation with 8 SAT polarities and terrestrial TV for 8 apartments

Installation with multiswitches which distributes the terrestrial and satellite TV to the outlets. The distribution is on the 5 to 2,150MHz band and is star-shaped in form. Each outlet of the installation receives the terrestrial TV and any of the satellite polarities, which are selected from the individual satellite receiver.



## Installation with 8 SAT polarities and terrestrial TV for 16 apartments

Installation with multiswitches which distributes the terrestrial and satellite TV to the outlets. The distribution is on the 5 to 2,150MHz band and is star-shaped in form. Each outlet of the installation receives the terrestrial TV and any of the satellite polarities, which are selected from the individual satellite receiver.

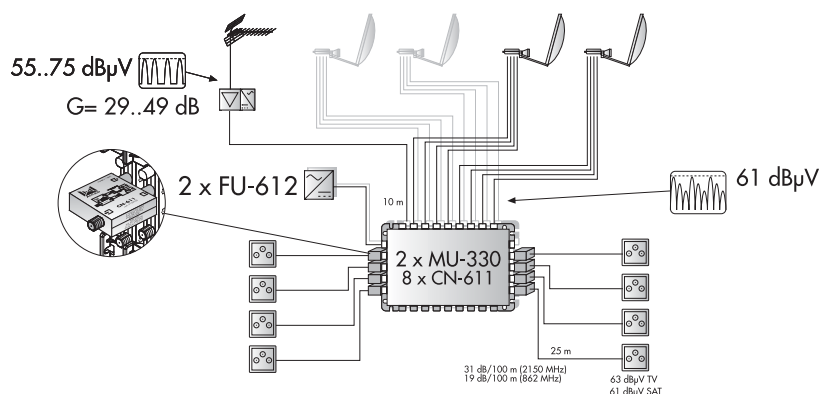


# 913

## EXAMPLES OF INSTALLATIONS

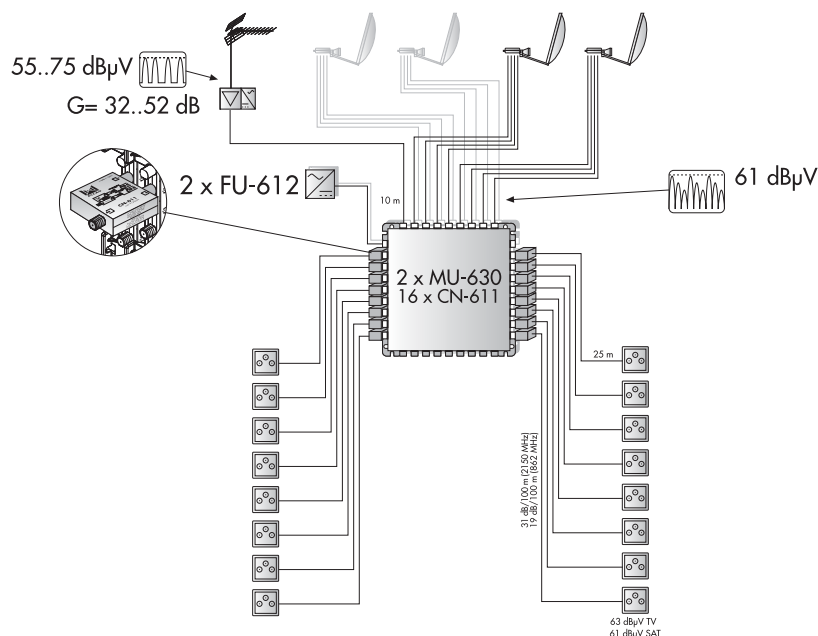
### Installation with 16 SAT polarities and terrestrial TV for 8 apartments

Installation with 2 stacked multiswitches of 8 polarities and an external DiSEqC CN-611 switch for 16 polarities per output. Star-shaped installation which distributes the terrestrial and satellite TV to the outlets, the distribution is made on the 5 to 2,150 MHz band. Each outlet of the installation receives the terrestrial TV and any of the satellite polarities, which are selected from the individual satellite receiver.



### Installation with 16 SAT polarities and terrestrial TV for 16 apartments

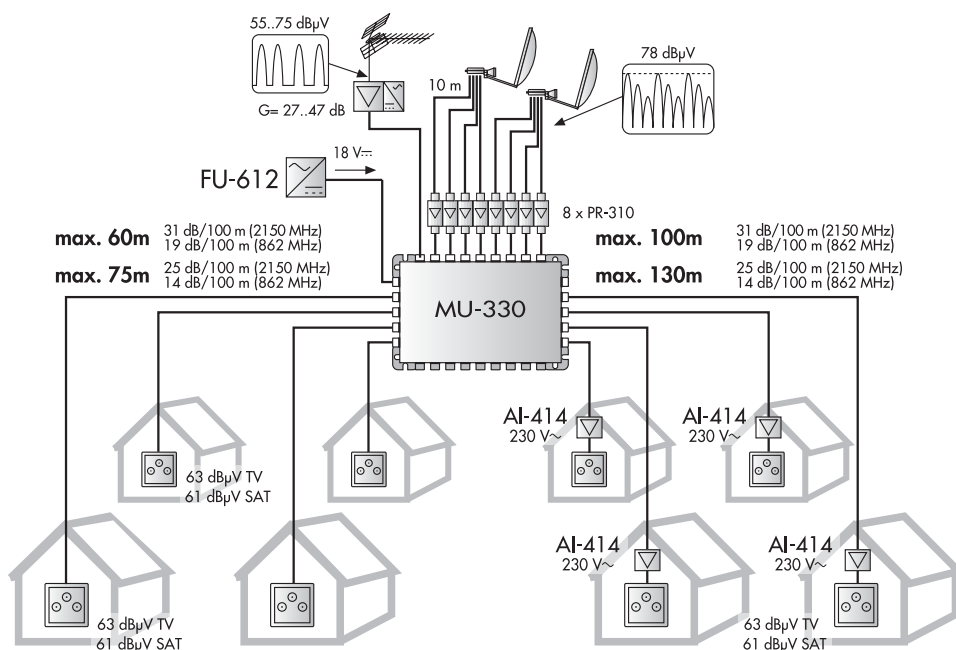
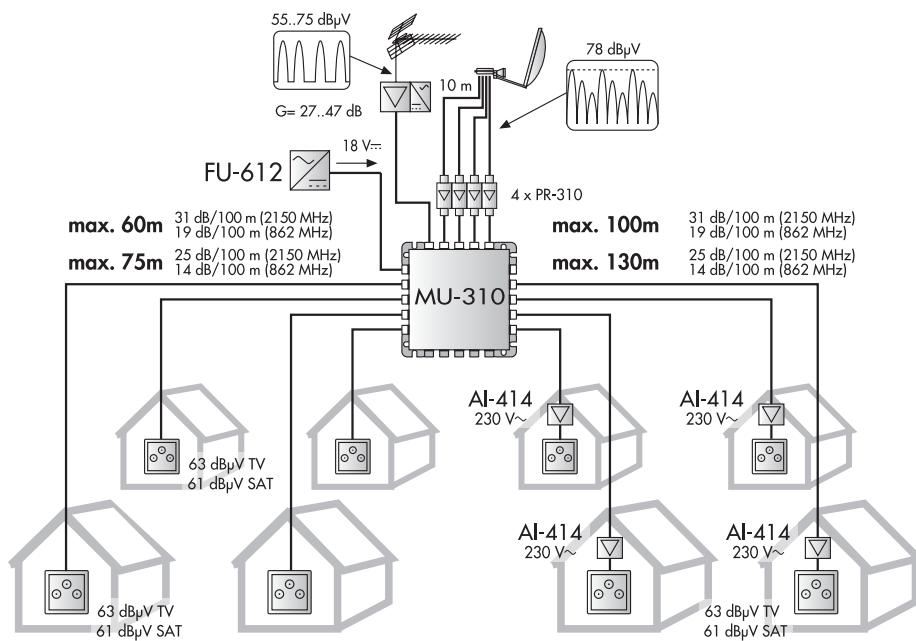
Installation with 2 stacked multiswitches of 8 polarities and an external DiSEqC CN-611 switch for 16 polarities per output. Star-shaped installation which distributes the terrestrial and satellite TV to the outlets, the distribution is made on the 5 to 2,150 MHz band. Each outlet of the installation receives the terrestrial TV and any of the satellite polarities, which are selected from the individual satellite receiver.



# 913 EXAMPLES OF INSTALLATIONS

## Installation with large distance between multiswitch and outlet

Installation with multiswitches in cascade which distribute the terrestrial and satellite TV to the outlets. The distribution is on the 5 to 2,150 MHz band. A SAT amplifier must be used to amplify all the satellite signals. Each outlet of the installation receives the terrestrial TV and any of the satellite polarities, which are selected from the individual satellite receiver.

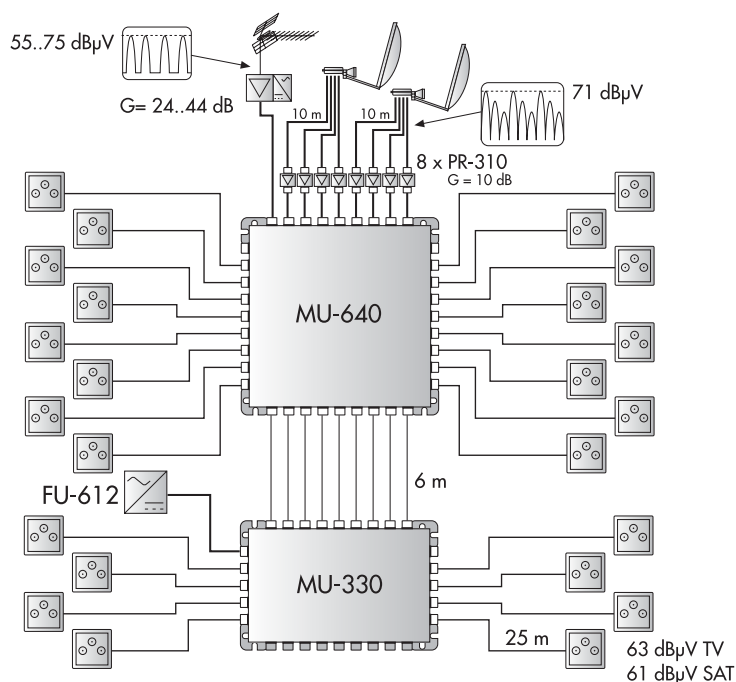


# 913

## EXAMPLES OF INSTALLATIONS

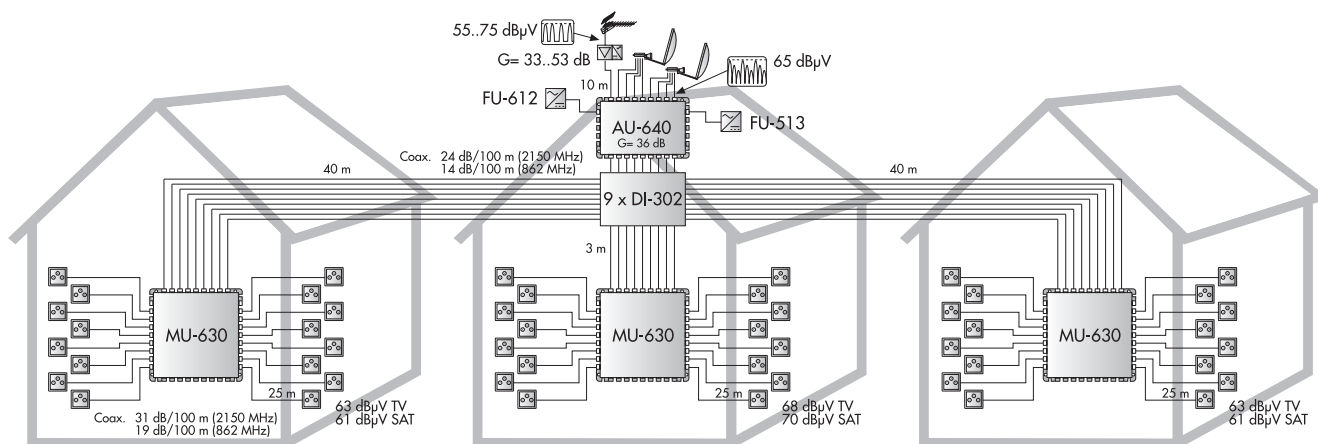
### Installation with 8 SAT polarities and terrestrial TV for 24 apartments

Installation with one multiswitch in cascade which distributes the terrestrial and satellite TV to the outlets. The distribution is on the 5 to 2,150 MHz band. It is necessary to use SAT amplifiers to amplify all the satellite signals. Each outlet of the installation receives the terrestrial TV and any of the satellite polarities, which are selected from the individual satellite receiver.



### Installation with 8 SAT polarities and terrestrial TV for 48 apartments

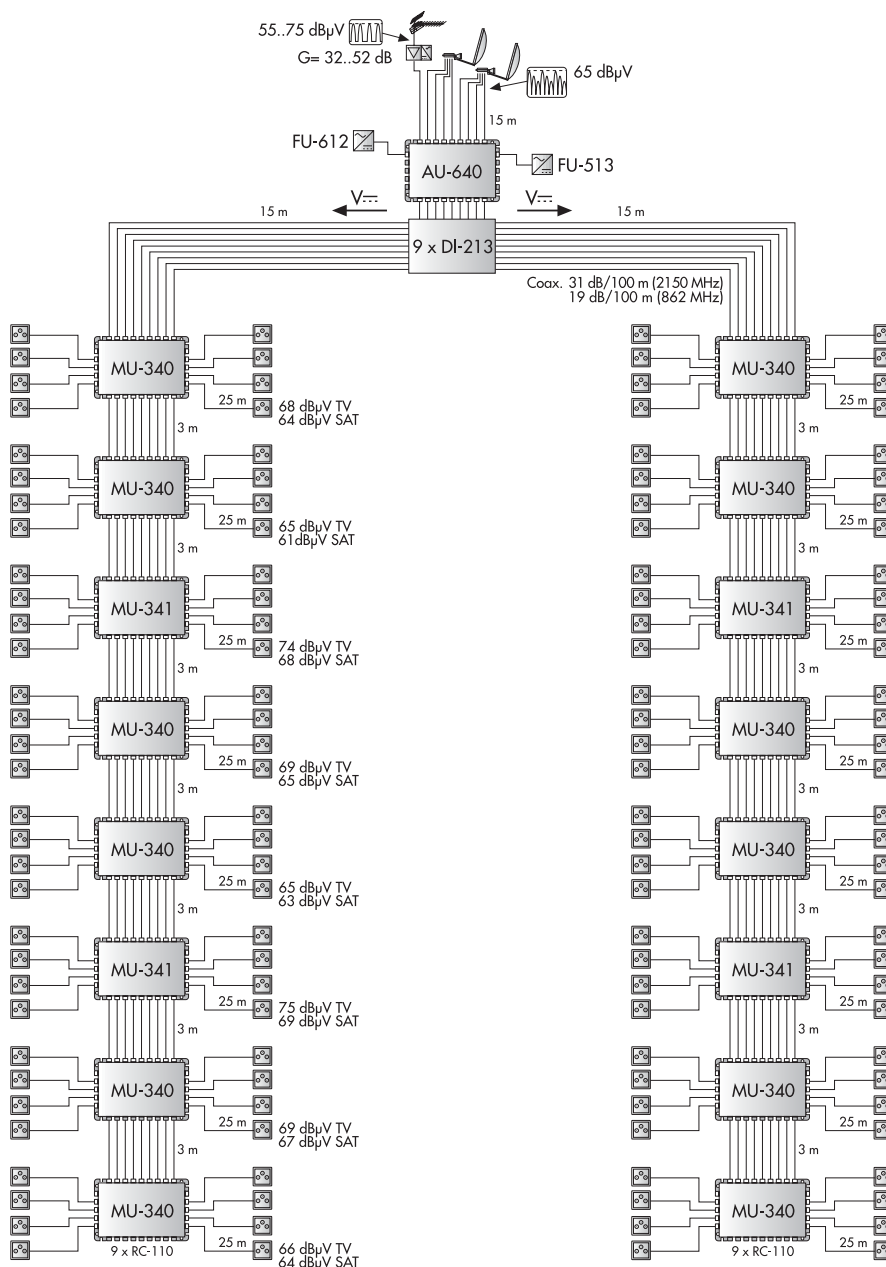
Installation with final multiswitches which distribute the terrestrial and satellite TV for three lines to the outlets. The distribution is on the 5 to 2,150 MHz band. It is necessary to use SAT amplifiers to amplify all the satellite signals. Each outlet of the installation receives the terrestrial TV and any of the satellite polarities, which are selected from the individual satellite receiver.



# 913 EXAMPLES OF INSTALLATIONS

## Installation with 8 SAT polarities and terrestrial TV for 128 apartments

Installation with final multiswitches which distribute the terrestrial and satellite TV for two lines to the outlets. The distribution is on the 5 to 2,150 MHz band. It is necessary to use SAT amplifiers to amplify all the satellite signals. Each outlet of the installation receives the terrestrial TV and any of the satellite polarities, which are selected from the individual satellite receiver.

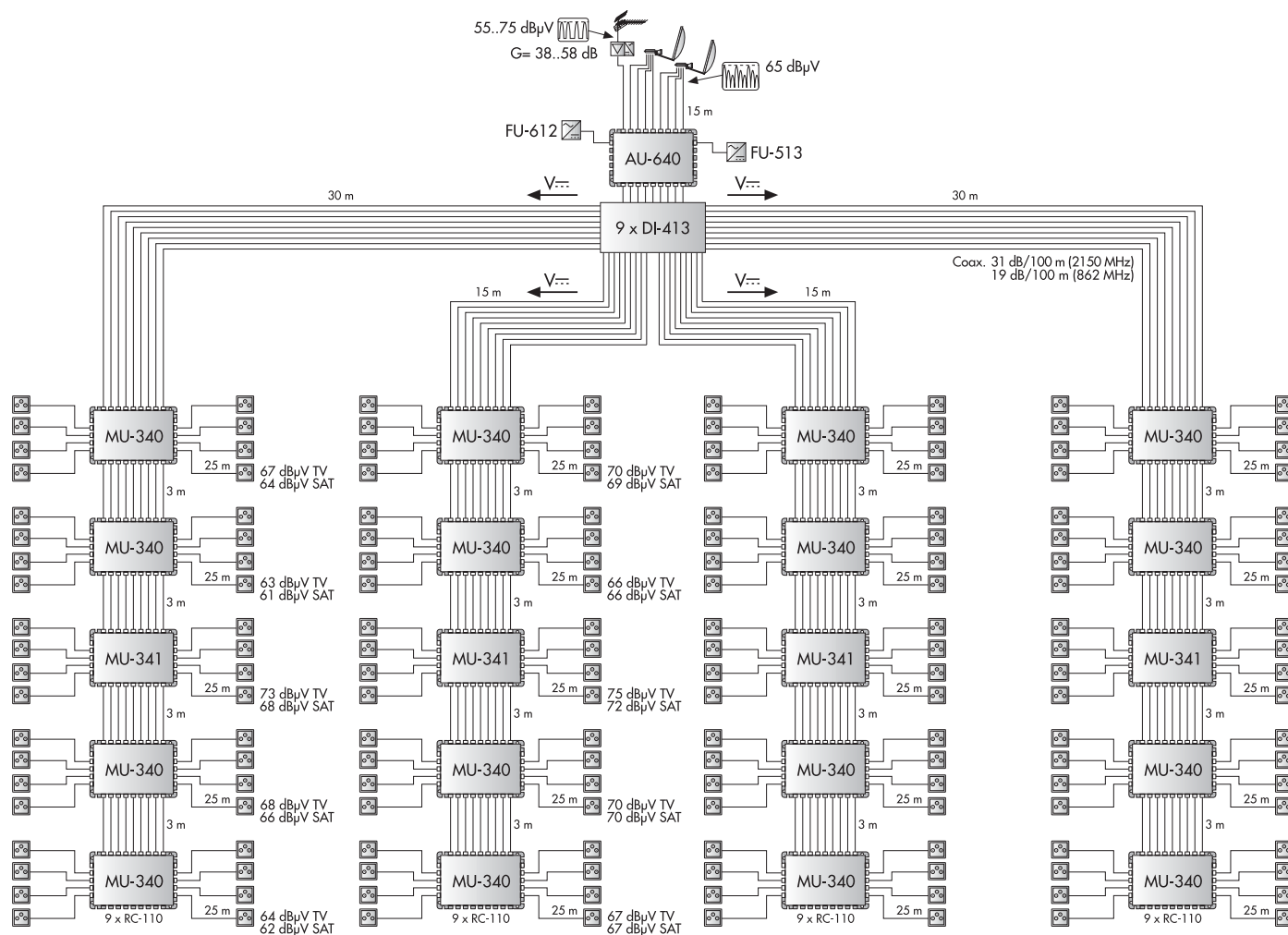


# 913

## EXAMPLES OF INSTALLATIONS

### Installation with 4 SAT polarities and terrestrial TV for 160 apartments

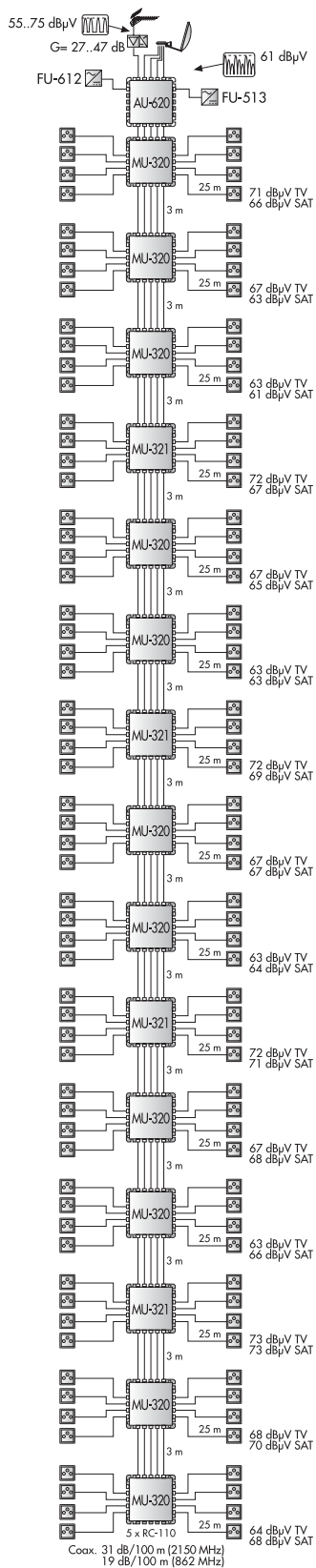
Installation with final multiswitches which distribute the terrestrial and satellite TV for four lines to the outlets. The distribution is on the 5 to 2,150 MHz band. It is necessary to use SAT amplifiers to amplify all the satellite signals. Each outlet of the installation receives the terrestrial TV and any of the satellite polarities, which are selected from the individual satellite receiver.



## EXAMPLES OF INSTALLATIONS

Installation with 4 SAT polarities and terrestrial TV for 120 apartments

Installation with multiswitches in cascade which distribute the terrestrial and satellite TV to the outlets. The distribution is on the 5 to 2,150 MHz band. A SAT amplifier must be used to amplify all the signals from the satellite and active multiswitches to maintain the strength of the signal throughout the cascade. Each outlet of the installation receives the terrestrial TV and any of the satellite polarities, which are selected from the individual satellite receiver.

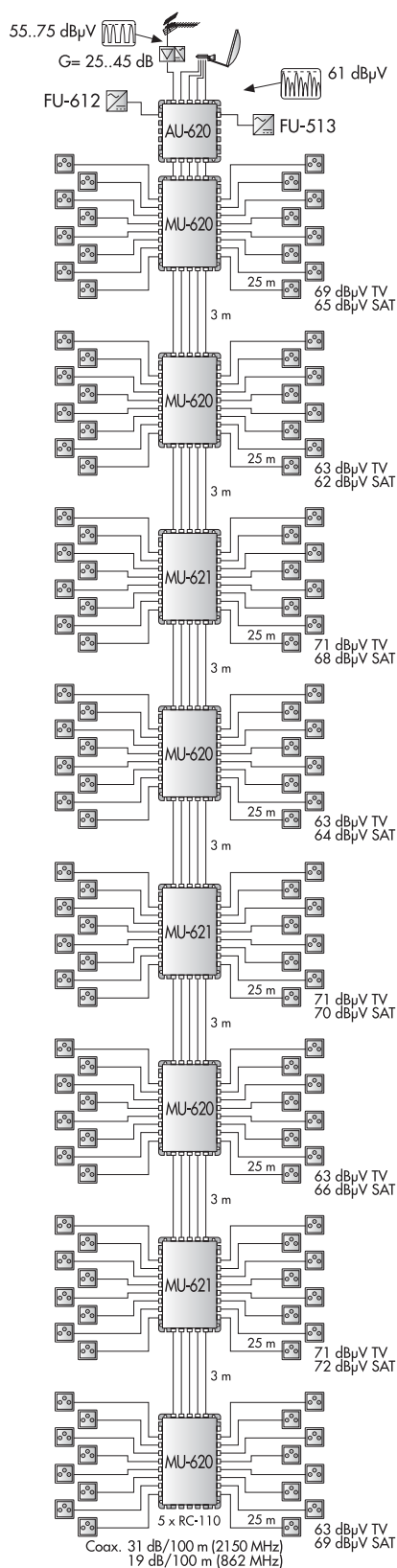


# 913

## EXAMPLES OF INSTALLATIONS

### Installation with 4 SAT polarities and terrestrial TV for 128 apartments

Installation with multiswitches in cascade which distribute the terrestrial and satellite TV to the outlets. The distribution is on the 5 to 2,150 MHz band. A SAT amplifier must be used to amplify all the signals from the satellite and active multiswitches to maintain the strength of the signal throughout the cascade. Each outlet of the installation receives the terrestrial TV and any of the satellite polarities, which are selected from the individual satellite receiver.

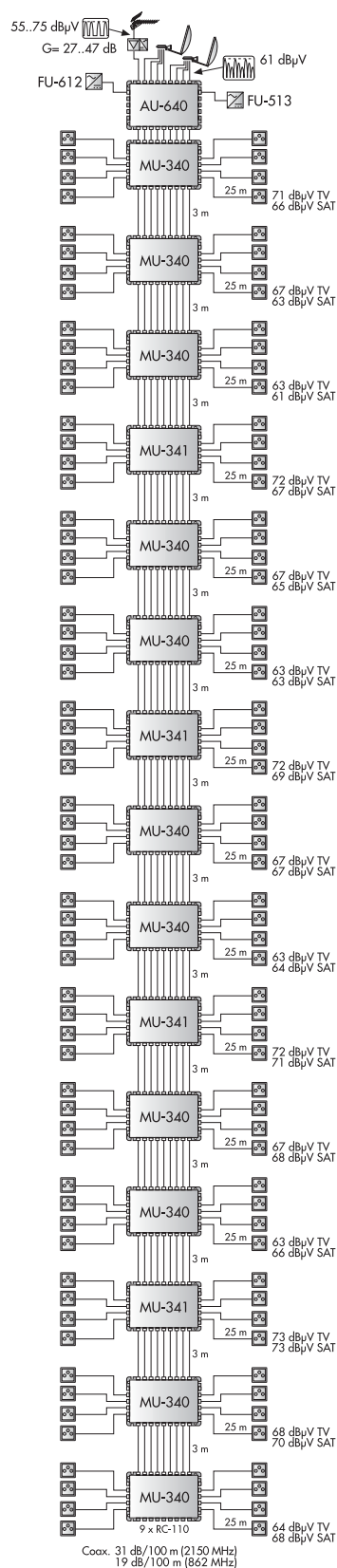




# 913 EXAMPLES OF INSTALLATIONS

## Installation with 8 SAT polarities and terrestrial TV for 120 apartments

Installation with multiswitches in cascade which distribute the terrestrial and satellite TV to the outlets. The distribution is on the 5 to 2,150 MHz band. A SAT amplifier must be used to amplify all the signals from the satellite and active multiswitches to maintain the strength of the signal throughout the cascade. Each outlet of the installation receives the terrestrial TV and any of the satellite polarities, which are selected from the individual satellite receiver.



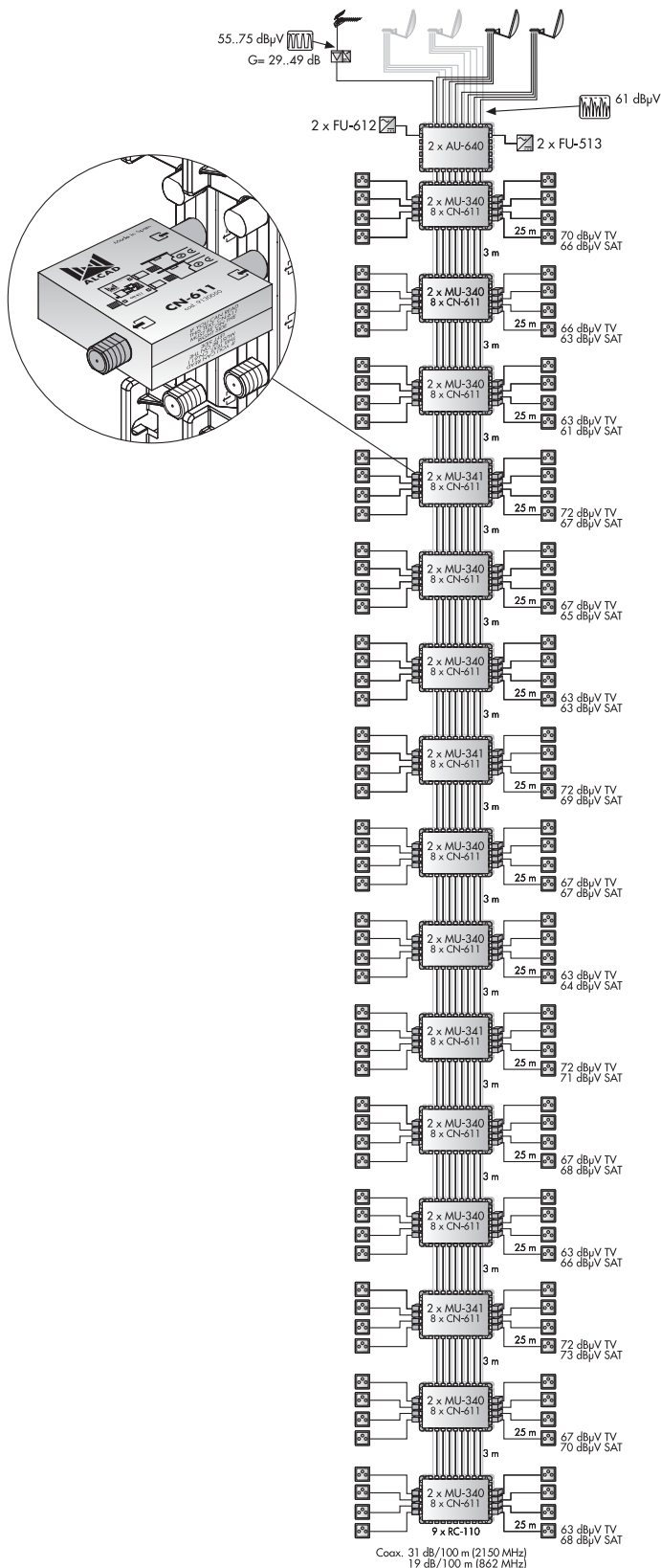
Installation with multiswitches in cascade which distribute the terrestrial and satellite TV to the outlets. The distribution is on the 5 to 2,150 MHz band. A SAT amplifier must be used to amplify all the signals from the satellite and active multiswitches to maintain the strength of the signal throughout the cascade. Each outlet of the installation receives the terrestrial TV and any of the satellite polarities, which are selected from the individual satellite receiver.



## EXAMPLES OF INSTALLATIONS

### Installation with 16 SAT polarities and terrestrial TV for 120 apartments

Installation with stacked multiswitches of 8 polarities and an external DiSeQ CN-611 switch for 16 polarities per output. Installation in cascade which distribute the terrestrial and satellite TV to the outlets. The distribution is on the 5 to 2,150 MHz band. A SAT amplifier must be used to amplify all the signals from the satellite and active multiswitches to maintain the strength of the signal throughout the cascade. Each outlet of the installation receives the terrestrial TV and any of the satellite polarities, which are selected from the individual satellite receiver.

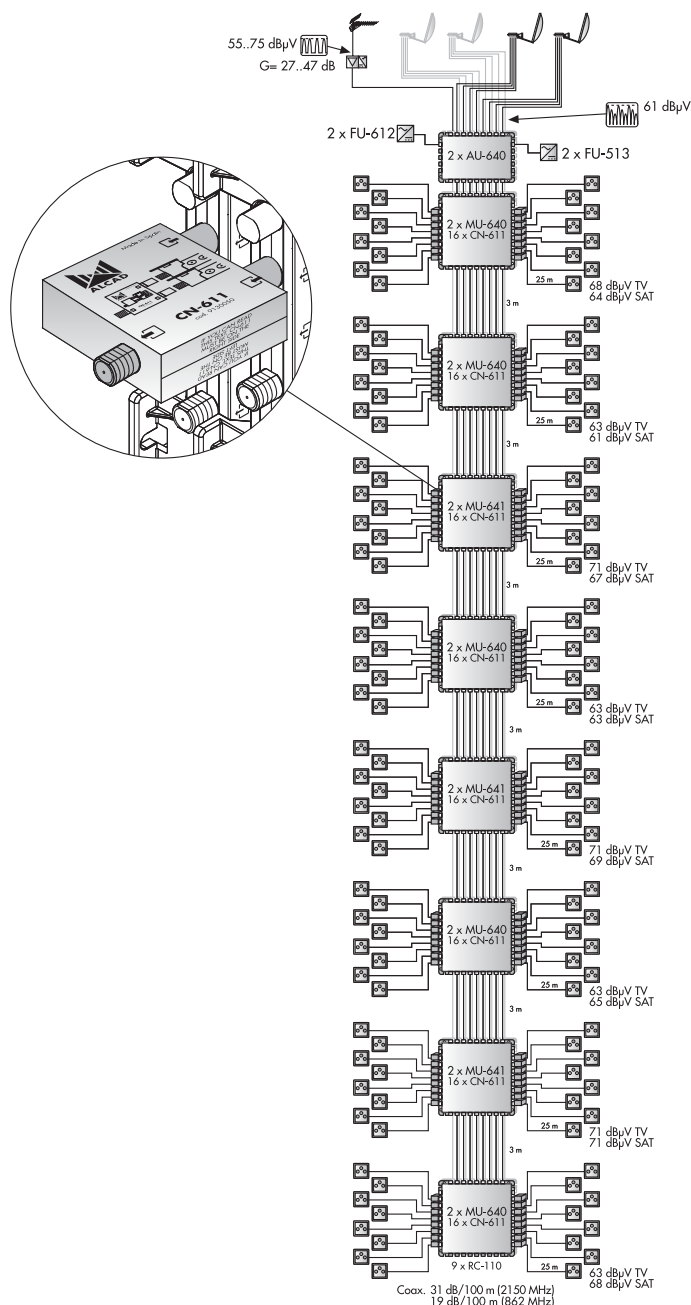


# 913

## EXAMPLES OF INSTALLATIONS

### Installation with 16 SAT polarities and terrestrial TV for 128 apartments

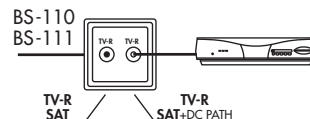
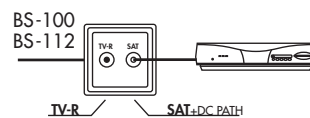
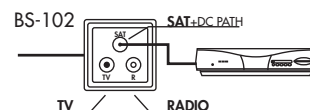
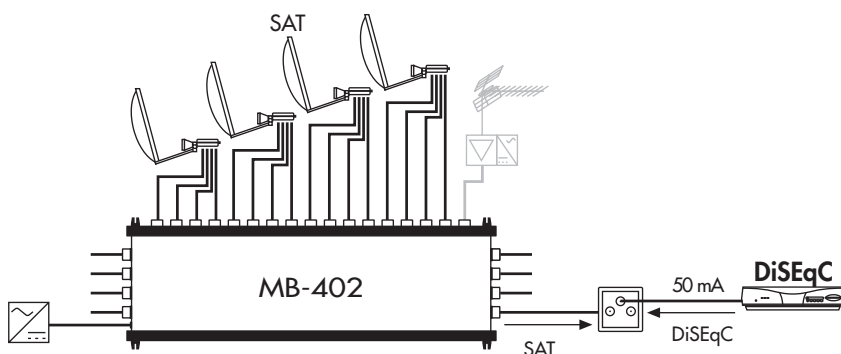
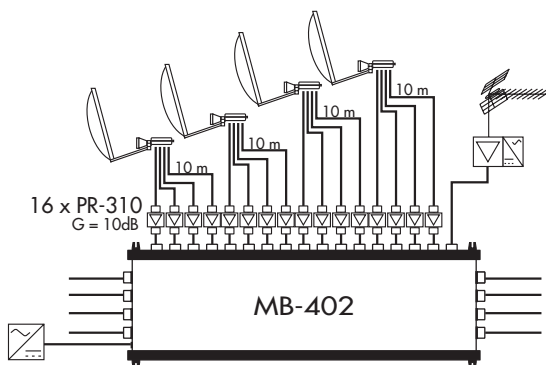
Installation with stacked multiswitches of 8 polarities and an external DiSEqC CN-611 switch for 16 polarities per output. Installation in cascade which distribute the terrestrial and satellite TV to the outlets. The distribution is on the 5 to 2,150 MHz band. A SAT amplifier must be used to amplify all the signals from the satellite and active multiswitches to maintain the strength of the signal throughout the cascade. Each outlet of the installation receives the terrestrial TV and any of the satellite polarities, which are selected from the individual satellite receiver.



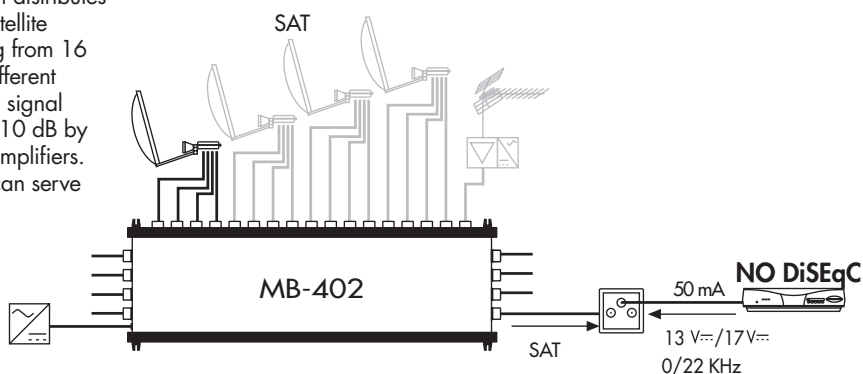
# 913 EXAMPLES OF INSTALLATIONS

## Amplification and switching examples

Installation with a multiswitch, showing the differences between the switches by means of DiSEqC. It provides access to the 16 polarities, and the 13/18 Vdc 0/22 KHz analogue switch, in which it is possible to switch only between the 4 SAT 1 polarities.



Installation with a multiswitch which distributes terrestrial and satellite television coming from 16 polarities of 4 different satellites with the signal preamplified by 10 dB by remote-fed line amplifiers. The multiswitch can serve up to 8 users.

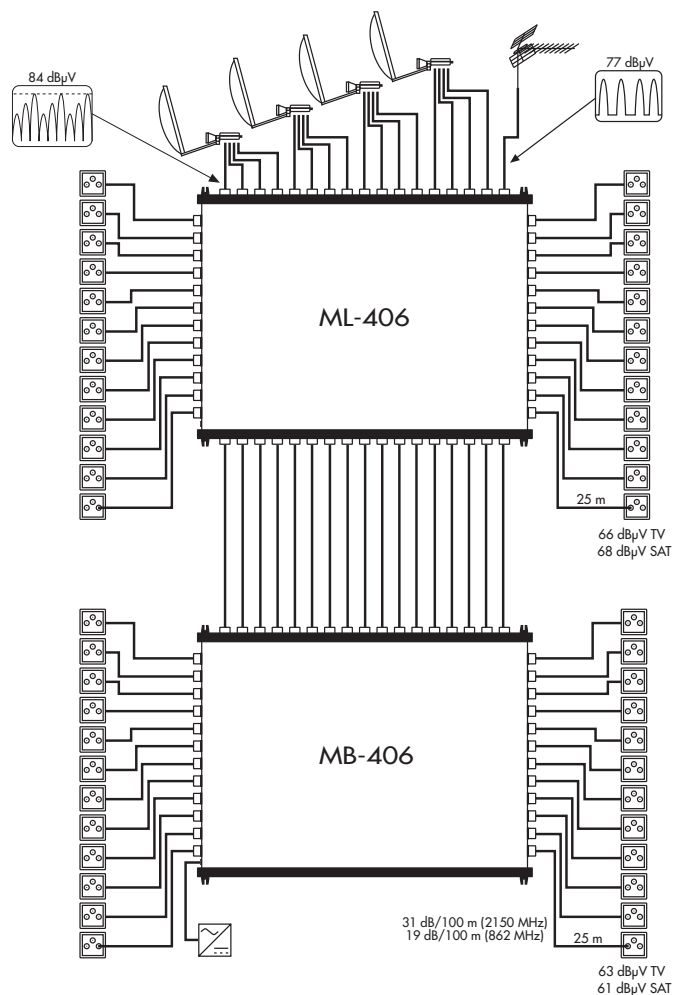


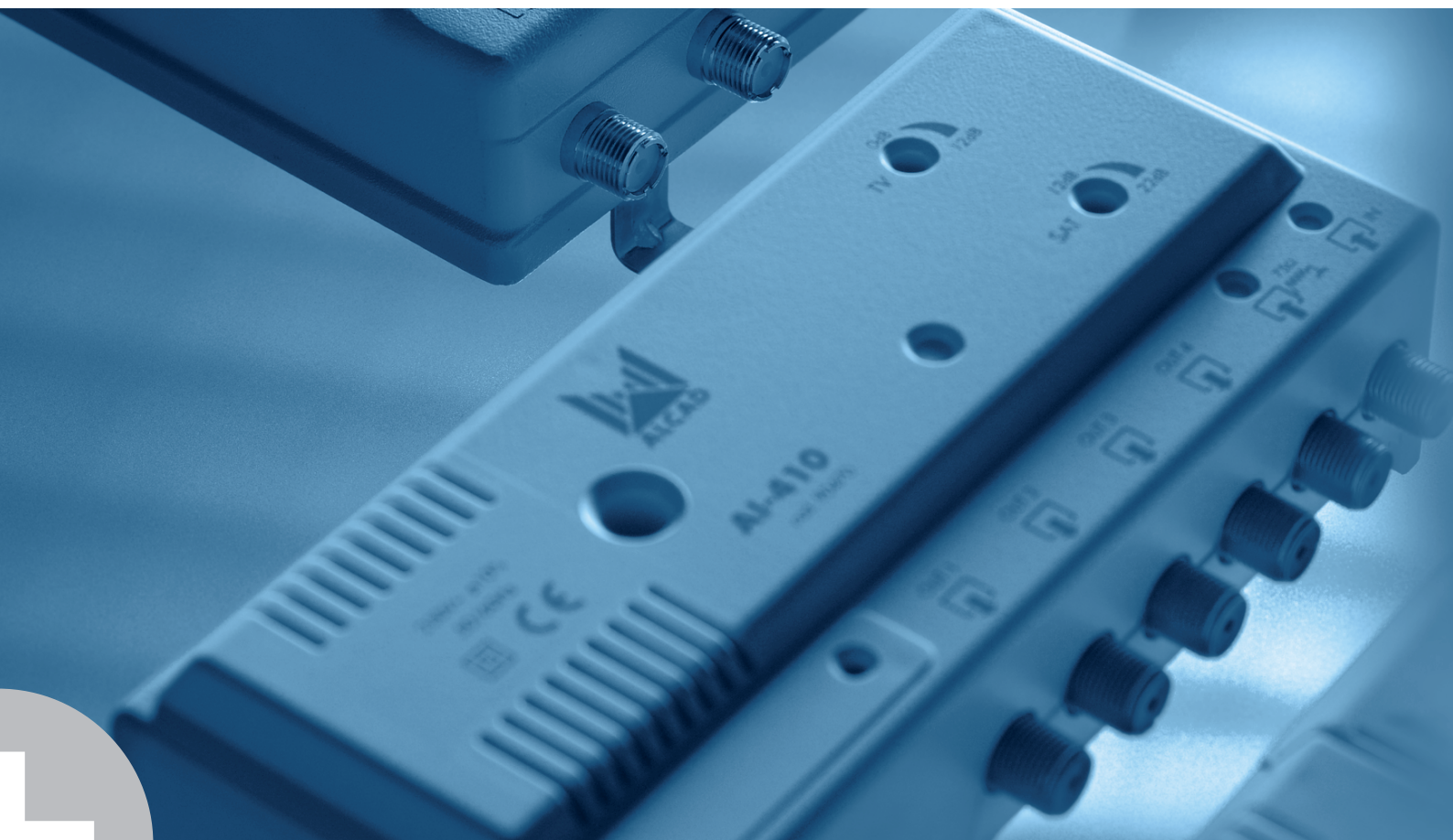
# 913

## EXAMPLES OF INSTALLATIONS

### Installation with 16 SAT polarities and terrestrial TV for 48 apartments

Installation with a cascade multiswitch which distributes terrestrial TV and the signal from the 16 polarities of 4 different satellites to the outlets. The distribution is performed in the 5 to 2,150 MHz band







# Distribution amplifiers

Amplifiers for all the terrestrial and satellite TV bands.  
Distribution amplifiers for long coaxial cable runs and for apartments in order to increase the number of outlets.



# 904 DISTRIBUTION AMPLIFIERS



## Distribution amplifiers - Return path



### Description

Broadband distribution amplifier for terrestrial TV. It has a gain control and variable slope control. It amplifies the return path, and is available in different frequencies according to the model. Fed by a built-in switching power supply. The input and output test point permits the checking and adjustment of the installation without having to disconnect the TV signal.

### Applications

Used as a distribution amplifier in large community installations or cable networks. It can be used as a line amplifier in small cable networks. These installations commonly have long runs of cable which attenuate and unbalance the signal, attenuating those channels with higher frequency more. The distribution amplifiers compensate this loss with the equaliser and amplify the channels adding as little noise as possible.

### Characteristics

Made from zamak and galvanised plate for maximum shielding. Separate housings for the power supply unit and the high frequency circuit. F type connectors, located on the lower part to help with the installation.

### Accessories

- 9120039 CM-004 Male F type connector for Ø6.6 mm coaxial.
- 9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.

CODE		9040016		9040019	
MODEL		DA-701		DA-703	
Frequency range	Band	RP	TV	RP	TV
	MHz	5-30	47-862	5-65	86-862
Gain	dB±TOL	4 ±0,5	34 ±1,0	6 ±0,5	34 ±1,0
Flatness response	dB	±0,5	±0,7	±0,5	±0,7
Gain adjustment	dB	-	20	-	20
Fixed equalization	dB	2.5	3	3.5	3
Adjustable equalization range	dB	-	17	-	16
Input/output test point	dB±TOL	-30 ±0,5	-30 ±2,0	-30 ±0,5	-30 ±2,0
Output level	dBµV	107 DIN 45004B 104 (IMD3 - 60 dB) 90 (IMD2 - 60 dB)	120 DIN 45004B 117 (IMD3 - 60 dB) 110 (IMD2 - 60 dB) 105 (CTB - 60 dB) 110 (CSO - 60 dB) 104 (XMOD - 60 dB)	107 DIN 45004B 104 (IMD3 - 60 dB) 90 (IMD2 - 60 dB)	120 DIN 45004B 117 (IMD3 - 60 dB) 110 (IMD2 - 60 dB) 105 (CTB - 60 dB) 110 (CSO - 60 dB) 104 (XMOD - 60 dB)
Return loss I/O	dB	≥14	≥16 -1.5/octave	≥14	≥16 -1.5/octave
Chroma-luminance delay	ns	<40			
Noise figure	dB	≥7			
Fuse	V~	250			
	W	5			
Mains voltage	V~	230 ±15% 50/60 Hz			
	VA	8			
Operating temperature	°C	-20..+65			
Protection index		IP 50D			
Units per packing		1			
Packing weight	Kg	1.8			
Packing dimensions	mm	220 x 200 x 60			

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> - 60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> - 60 dB: 2 equal carriers, EN 50083-3

CTB - 60 dB: 42 equal carriers, EN 50083-3  
 CSO - 60 dB: 42 equal carriers, EN 50083-3  
 XMOD - 60 dB: 42 equal carriers, EN 50083-3



DA-706

**Description**

Broadband distribution amplifier for terrestrial TV. It has a gain control and variable slope control. It amplifies the terrestrial TV band and the return path up to 20 dB. Fed by a built-in switching power supply. The input and output test point permits the checking and adjustment of the installation without having to disconnect the TV signal.

**Applications**

Used as a distribution amplifier in large community installations or cable networks, that need a big amplification in the return path 5-65 MHz. It can be used as a line amplifier in small cable networks. These installations commonly have long runs of cable which attenuate and unbalance the signal, attenuating those channels with higher frequency more. The distribution amplifiers compensate this loss with the equaliser and amplify the channels adding as little noise as possible.

**Characteristics**

Made from zamak and galvanised plate for maximum shielding. Separate housings for the power supply unit and the high frequency circuit. F type connectors, located on the lower part to help with the installation.

**Accessories**

9120039 CM-004 Male F type connector for Ø6.6 mm coaxial.  
9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.

CODE		9040119	
MODEL		DA-706	
Inputs / outputs		1/1	
Connection		F Female	
Frequency range	Band	RETURN	TV
	Mhz	5-65	86-862
Gain	dB±TOL	20 ±1,0	34 ±1,0
Gain adjust	dB	15	20
Fixed equalization	dB	-	3
Adjustable equalization range	dB	-	16
Output test point	dB	30 ±0,5	30 ±2,0
Output level	dBµV	107 DIN 45004B	120 DIN 45004B
		104 (IMD3-60dB)	117 (IMD3-60dB)
		90 (IMD2-60dB)	115 (IMD2-60dB)
			107 (CTB-60dB)
			108 (CSO-60dB)
			105 (XMOD-60dB)
Return loss I/O	dB	14	16
			-1,5/octave
Noise figure	dB	7	
Mains voltage	V~	230 ±10 50/60 Hz	
	W	3,2	
Fuse	V~	250	
	A	1,6	
Operating temperature	°C	-20...+65	
		IP 50D	
Units per packing		1	
Packing weight	Kg	1.92	
Packing dimensions	mm	220 x 200 x 60	

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
IMD<sub>3</sub> - 60 dB: 2 equal carriers, EN 50083-3  
IMD<sub>2</sub> - 60 dB: 2 equal carriers, EN 50083-3

CTB - 60 dB: 42 equal carriers, EN 50083-3  
CSO - 60 dB: 42 equal carriers, EN 50083-3  
XMOD - 60 dB: 42 equal carriers, EN 50083-3



DA-720

### Description

Broadband distribution amplifier for terrestrial TV. It amplifies the VHF band plus interbands and the UHF band separately. Each band has a gain control and a variable equaliser. As they are independent they facilitate level adjustment. Fed by a built-in power supply.

### Applications

Used as a distribution amplifier in large community installations or cable networks. These installations commonly have long runs of cable which attenuate and unbalance the signal. The channels with higher frequencies attenuate more. The distribution amplifiers compensate this loss with the equaliser and amplify the channels adding as little noise as possible. The separated band amplifiers do not amplify the highest channels of the interband.

### Characteristics

Made from zamak and galvanised plate for maximum shielding. Separate housings for the power supply unit and the high frequency circuit. F type connectors, located on the lower part to help with the installation.

### Accessories

- 9120039 CM-004 Male F type connector for Ø6.6 mm coaxial.
- 9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.
- 9090019 EQ-126 Fixed double equaliser 6/12 dB for terrestrial.

CODE		9040015	
MODEL		DA-720	
Frequency range	Band	VHF	UHF
	MHz	47-422	470-862
Gain	dB±TOL	35 ±1,0	36 ±1,0
Flatness response	dB	±1.0	
Gain adjustment	dB	20	
Fixed equalization	dB	-	4
Adjustable equalization range	dB	17	8
Input/output test point	dB±TOL	-30 ±1,0	
Output level	dBµV	120 DIN 45004B	
		117 (IMD3 - 60 dB)	
		115 (IMD2 - 60 dB)	
		106 (CTB - 60 dB)	
		110 (CSO - 60 dB)	
		102 (XMOD - 60 dB)	
Return loss I/O	dB	10	
Chroma-luminance delay	ns	<30	
Noise figure	dB	7	8
Fuse	V~	250	
	W	1.6	
Mains voltage	V~	230 ±15% 50/60 Hz	
	VA	7	
Operating temperature	°C	-10...+65	
Protection index		IP 50D	
Units per packing		1	
Packing weight	Kg	1.8	
Packing dimensions	mm	220 x 200 x 60	

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> - 60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> - 60 dB: 2 equal carriers, EN 50083-3

CTB - 60 dB: 42 equal carriers, EN 50083-3  
 CSO - 60 dB: 42 equal carriers, EN 50083-3  
 XMOD - 60 dB: 42 equal carriers, EN 50083-3

# 904 DISTRIBUTION AMPLIFIERS

High gain distribution amplifiers



CF-715



CF-115

## Description

Broadband distribution amplifier for terrestrial TV available in different output levels. It amplifies the return path, and is available in different frequencies according to the model. It has a gain control and slope control. Fed by a built-in switching power supply. The input and output test point permits the checking and adjustment of the installation without having to disconnect the TV signal.

## Applications

Used as a distribution amplifier in large community installations or cable networks. It can be used as a line amplifier in small cable networks. These installations commonly have long runs of cable which attenuate and unbalance the signal. The channels with higher frequencies attenuate more. The distribution amplifiers compensate this loss with the equaliser and amplify the channels adding as little noise as possible.

## Characteristics

Made from zamak and galvanised plate for maximum shielding. Separate housings for the power supply unit and the high frequency circuit. F type connectors, located on the lower part to help with the installation.

## Accessories

- 9120039 CM-004 Male F type connector for Ø6.6 mm coaxial.  
 9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.  
 9090019 EQ-126 Fixed double equaliser 6/12 dB for terrestrial.

CODE		9040046		9040042	
MODEL		CF-115		CF-715	
Frequency range	Band	RP	TV	RP	TV
	MHz	5-65	86-862	5-65	86-862
Gain	dB±TOL	10 ±1,0	38 ±2,0	16 ±1,0	47 ±2,0
Gain adjustment	dB	-	20	-	20
Adjustable equalization range	dB	-	18	-	18
Input/output test point	dB±TOL	-28 ±1,0	-30 ±2,0	-28 ±1,0	-30 ±1,0
Output level	dBµV	110 DIN 45004B 107 (IMD3 - 60 dB) 90 (IMD2 - 60 dB)	113 DIN 45004B 110 (IMD3 - 60 dB) 103 (IMD2 - 60 dB) 95 (CTB - 60 dB) 99 (CSO - 60 dB) 95 (XMOD - 60 dB)	110 DIN 45004B 107 (IMD3 - 60 dB) 90 (IMD2 - 60 dB)	120 DIN 45004B 117 (IMD3 - 60 dB) 110 (IMD2 - 60 dB) 103 (CTB - 60 dB) 104 (CSO - 60 dB) 102 (XMOD - 60 dB)
Return loss I/O	dB	≥14	≥10	≥14	≥10
Chroma-luminance delay	ns	<80			
Group delay	ns	<40			
Noise figure	dB	≥ 8.5			
Fuse	V~	250			
	A	1.6			
Mains voltage	V~	230 ±15% 50/60 Hz			
	VA	12			
Operating temperature	°C	-20...+60			
Protection index		IP 50D			
Units per packing		1			
Packing weight	Kg	1.8			
Packing dimensions	mm	220 x 200 x 60			

The CF-115 and CF-715 amplifiers are available with other return path.

DIN 45004B: 3 unequal carriers, IMD<sup>3</sup> at 60 dB  
 IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> -60 dB: 2 equal carriers, EN 50083-3

CTB -60 dB: 42 equal carriers, EN 50083-3  
 CSO -60 dB: 42 equal carriers, EN 50083-3  
 XMOD -60 dB: 42 equal carriers, EN 50083-3



DA-711



DA-713

### Description

Broadband distribution amplifier for terrestrial TV and IF satellite. It amplifies the return path, and is available in different frequencies according to the model. It has a gain control and slope control on each TV and SAT band. Fed by a built-in switching power supply. The input and output test point permits the checking and adjustment of the installation without having to disconnect the TV signal.

### Applications

Used as a distribution amplifier in large terrestrial and IF band SMATV installations. Designed to permit the distribution of the IF band among groups of different buildings or houses from one single SAT head-end.

### Characteristics

Made from zamak and galvanised plate for maximum shielding. Separate housings for the power supply unit and the high frequency circuit. F type connectors, located on the lower part to help with the distribution.

### Accessories

9120039 CM-004 Male F type connector for Ø6.6 mm coaxial.  
9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.

CODE	9040017				9040025		
MODEL		DA-711			DA-713		
Frequency range	Band	RP	TV	SAT	RP	TV	SAT
	MHz	5-30	47-862	930-2150	5-65	86-862	930-2150
Gain	dB±TOL	4 ±0,5	34 ±1,0	41 ±2,5	6 ±0,5	34 ±1,0	41 ±2,5
Flatness response	dB	±0,5	±0,8	±2,0	±0,5	±0,8	±2,0
Gain adjustment	dB	-	20	15	-	20	15
Fixed equalization	dB	2.5	-	1.5 ±1,5	3.5	-	1.5 ±1,5
Adjustable equalization range	dB	-	17	10	-	16	10
Input/output test point	dB±TOL	-30 ±0,5	-30 ±2,0		-30 ±0,5	-30 ±2,0	
Output level	dBµV	107 DIN 45004B 104 (IMD3 - 60 dB) 90 (IMD2 - 60 dB)	120 DIN 45004B 117 (IMD3 - 60 dB) 110 (IMD2 - 60 dB) 105 (CTB - 60 dB) 105 (CSO - 60 dB) 104 (XMOD - 60 dB)	120 (IMD3 - 35 dB) 110 (IMD2 - 35 dB)	107 DIN 45004B 104 (IMD3 - 60 dB) 90 (IMD2 - 60 dB)	120 DIN 45004B 117 (IMD3 - 60 dB) 110 (IMD2 - 60 dB) 105 (CTB - 60 dB) 105 (CSO - 60 dB) 104 (XMOD - 60 dB)	120 (IMD3 - 35 dB) 110 (IMD2 - 35 dB)
Return loss I/O	dB	≥14	≥10	≥9	≥14	≥10	≥9
Chroma-luminance delay	ns	<40					
Noise figure	dB	7		10	7		10
Fuse	V~	250					
	A	1.6					
Mains voltage	V~	230 ±15% 50/60 Hz					
	VA	12					
Operating temperature	°C	-20..+65					
Protection index		IP 50D					
Units per packing		1					
Packing weight	Kg	1.8					
Packing dimensions	mm	220 x 200 x 60					

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
IMD<sub>3</sub> - 60 dB: 2 equal carriers, EN 50083-3  
IMD<sub>3</sub> - 35 dB: 2 equal carriers, EN 50083-3  
IMD<sub>2</sub> - 60 dB: 2 equal carriers, EN 50083-3

IMD<sub>2</sub> - 35 dB: 2 equal carriers, EN 50083-3  
CTB - 60 dB: 42 equal carriers, EN 50083-3  
CSO - 60 dB: 42 equal carriers, EN 50083-3  
XMOD - 60 dB: 42 equal carriers, EN 50083-3



DA-520

### Description

Broadband distribution amplifier for terrestrial TV and satellite IF. One part of the amplifier amplifies the IF signal while rejecting the TV signals. The other part of the amplifier amplifies the TV and IF signals, distributing the TV signal to the two outputs. Includes a gain control on each TV and SAT band, a variable equaliser on the TV band and a switchable equaliser on the SAT band. Fed by a built-in switching power supply.

### Applications

Designed for SMATV installations with double coaxial cable for distribution. The installation is made with a single amplifier for the two distribution cables.

### Characteristics

Made from zamak and galvanised plate for maximum shielding. Separate housings for the power supply unit and the high frequency circuit. F-type connectors, located on the lower part to make installation easier.

### Accessories

9120039 CM-004 Male F type connector for Ø6.6 mm coaxial.  
9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.

CODE		9040065		
MODEL		DA-520		
Inputs / Outputs		2/2		
Frequency range	Band	TV	SAT 1	SAT 2
	MHz	47-862	950-2400	950-2400
Gain	dB±TOL	34 ±2,0	42 ±2,0	42 ±2,0
Flatness response	dB	±0,7	±0,75	±0,75
Gain adjustment	dB	-	15	-
Fixed equalization	dB	3	6	6
Adjustable equalization range	dB	18	7 Switchable	7 Switchable
Output level	dBpV	2x 118 DIN 45004B 2x 115 (IMD3 - 60 dB) 2x 108 (IMD2 - 60 dB) 2x 102 (CTB - 60 dB) 2x 103 (CSO - 60 dB) 2x 102 (XMOD - 60 dB)	120 (IMD3 - 35 dB) 110 (IMD2 - 35 dB)	120 (IMD3 - 35 dB) 110 (IMD2 - 35 dB)
Return loss I/O	dB	≥16 (-1,5dB/octave) ≥12	≥14	≥14
Chroma-luminance delay	ns	<40		
Noise figure	dB	7 ±1,0	10 ±2,0	10 ±2,0
Fuse	V~	250		
	A	1.6		
Mains voltage	V~	230 ±15% 50/60 Hz		
	VA	36		
Operating temperature close to equipment	°C	-10..+65		
Room temperature with/without fan	°C	-10..+55/+45		
Protection index		IP 50D		
Units per packing		1		
Packing weight	Kg	1.95		
Packing dimensions	mm	220 x 200 x 60		

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
IMD<sub>3</sub> - 60 dB: 2 equal carriers, EN 50083-3  
IMD<sub>3</sub> - 35 dB: 2 equal carriers, EN 50083-3  
IMD<sub>2</sub> - 60 dB: 2 equal carriers, EN 50083-3

IMD<sub>2</sub> - 35 dB: 2 equal carriers, EN 50083-3  
CTB - 60 dB: 42 equal carriers, EN 50083-3  
CSO - 60 dB: 42 equal carriers, EN 50083-3  
XMOD - 60 dB: 42 equal carriers, EN 50083-3



# 911 DISTRIBUTION AMPLIFIERS



## Distribution amplifiers – Return path



DAM-504

### Description

Broadband distribution amplifier for terrestrial and cable TV with power supply. It amplifies the terrestrial TV band and the return path separately. It has gain control regulator for each band and fixed equalizer in the TV band.

### Applications

Designed to extend terrestrial and cable TV installations, analog or digital, in community facilities in return path. The signal levels are easily adjusted thanks to two gain controllers. Especially suitable for outdoor installations.

### Characteristics

Robust chassis made of aluminum that provides maximum shielding against interference, and protection in outdoor conditions (IP65). Separate housings for the power supply unit and the high frequency circuit. PG11-F type connectors.

### Accessories

- 9080015 MC-204 Male compression F connector for RG-11 coaxial
- 9080030 MC-304 Male compression F connector for RG-6 coaxial, Ø7.0 mm.
- 9120011 RS-275 F load 75Ω.

CODE		9110000	
MODEL		DAM-504	
Outputs		TV	
	Band	1	
Inputs		1	
Frequency range	Band	RETURN	TV
	MHz	5-42	54-862
Gain	dB±TOL	20 ±1.0	34 ±1.0
Gain adjustment	dB	20	
Fixed equalization	dB	-	2
Adjustable equalization range	dB	-	20
Output test point	dB	30 ±1.0	
Output level	dBµV	120 DIN 45004B	
		117 (IMD <sub>3</sub> - 60 dB)	
		115 (IMD <sub>2</sub> - 60 dB)	
		107 (CTB - 60 dB)	
		108 (CSO - 60 dB)	
		105 (XMOD - 60 dB)	
Return loss I/O	dB	10	≥14 -1.5/octave
Noise figure	dB	≤ 7	
Mains voltage	V---	230 ±10% <sup>(1)</sup> 50/60 Hz	
	W	10	
Fuse	V~	250	
	W	1.6	
Operating temperature	°C	-20..+65	
Protection index		IP 65	
Units per packing		1	
Packing weight	Kg	1.71	
Packing dimensions	mm	255 x 170 x 140	

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> -60 dB: 2 equal carriers, EN 50083-3

CTB -60 dB: 42 equal carriers, EN 50083-3  
 CSO -60 dB: 42 equal carriers, EN 50083-3  
 XMOD -60 dB: 42 equal carriers, EN 50083-3

(1) Consult us for availability at 125 or 240 V~

# 904 APARTMENT AMPLIFIERS

Indoor amplifiers



AI-200



AI-100

## Description

Broadband apartment amplifier for terrestrial TV, with built-in power supply unit. It amplifies the VHF and UHF bands separately and has an independent gain control for each band. It includes two outputs to make the distribution to two or more televisions. The outputs are equal or unbalanced.

## Applications

Designed to enlarge analogue and digital terrestrial TV installations within an apartment or house. It amplifies the TV signal so a distribution with several new outlets can be made from the signal of one TV outlet or from the coaxial cable entering the house. The levels are easily adjusted by means of the two gain controls.

## Characteristics

Made from ABS plastic, with an internal zamak chassis which gives maximum shielding. The power supply unit is insulated from the rest of the high frequency circuit, complying with the safety regulations for the installer and the user. Fixed to the wall by means of the supplied screws and wall-plugs. F type connectors.

## Accessories

- 9120039 CM-004 Male F type connector for Ø6.6 mm coaxial.  
 9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.  
 9120011 RS-275 F load 75 Ω.  
 9060036 FI-243 F connector 2 output splitter.  
 9070037 BM-100 Outlet base.

CODE	9040050				9040053	
MODEL		AI-200		AI-100		
Outputs		2				
Frequency range	Band	VHF	UHF	VHF	UHF	
	MHz	40-318	470-862	40-318	470-862	
Gain	dB±TOL	14 ±1,0	24 ±1,5	14 ±1,0 OUT 1 3 ±1,0 OUT 2	24 ±1,5 OUT 1 11 ±1,5 OUT 2	
Flatness response	dB	±1,0	±1,2	±1,0	±1,2	
Gain adjust	dB	16	12	16	12	
Output level	dBµV	102 DIN 45004B 99 (IMD3 - 60 dB) 88 (IMD2 - 60 dB) 86 (CTB - 60 dB) 82 (CSO - 60 dB) 89 (XMOD - 60 dB)		104/91 DIN 45004B 101/88 (IMD3 - 60 dB) 90/77 (IMD2 - 60 dB) 88/75 (CTB - 60 dB) 90/69 (CSO - 60 dB) 92/77 (XMOD - 60 dB)		
Return loss	dB	10				
Noise figure	dB	<4.5	<3.0	<4.5	<3.5	
Mains voltage	V~	230 ±10% <sup>(1)</sup> 50/60 Hz				
	VA	7				
Operating temperature	°C	-5...+60				
Protection index		IP 20				
Units per packing		1				
Packing weight	Kg	0.4				
Packing dimensions	mm	115 x 102 x 45				

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> -60 dB: 2 equal carriers, EN 50083-3

CTB -60 dB: 42 equal carriers, EN 50083-3  
 CSO -60 dB: 42 equal carriers, EN 50083-3  
 XMOD -60 dB: 42 equal carriers, EN 50083-3

(1) Consult us for availability at 125 or 240 V~



# 904 APARTMENT AMPLIFIERS

Indoor amplifiers



AI-400

## Description

Broadband apartment amplifier for terrestrial TV, with built-in power supply unit. It amplifies the VHF and UHF bands separately and has an independent gain control for each band. It includes four outputs to make the distribution to 4 or more televisions. The outputs are equal or unbalanced.

## Applications

Designed to enlarge analogue and digital terrestrial TV installations within an apartment or house. It amplifies the TV signal so a distribution with several new outlets can be made from the signal of one TV outlet or from the coaxial cable entering the house. The levels are easily adjusted by means of the two gain controls.

## Characteristics

Made from ABS plastic, with an internal zamak chassis which gives maximum shielding. The power supply unit is insulated from the rest of the high frequency circuit, complying with the safety regulations for the installer and the user. Fixed to the wall by means of the supplied screws and wall-plugs. F type connectors.

## Accessories

9120039 CM-004 Male F type connector for Ø6.6 mm coaxial.  
9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.  
9120011 RS-275 F load 75 Ω.  
9070037 BM-100 Outlet base.

CODE		9040063	
MODEL		AI-400	
Outputs		4	
Frequency range	Band	VHF	UHF
	MHz	40-318	470-862
Gain	dB±TOL	20 ±1,0	28 ±2,0
Flatness response	dB	±0,8	±1,8
Gain adjust	dB	16	12
Output level	dBµV	102 DIN 45004B 99 (IMD3 - 60 dB) 86 (IMD2 - 60 dB) 86 (CTB - 60 dB) 81 (CSO - 60 dB) 82 (XMOD - 60 dB)	
Return loss	dB	10	
Return loss I/O	dB	10	
Chorma - luminance delay	ns	<11	
Noise figure	dB	4.2 ±0,2	3.3 ±0,3
Mains voltage	V~	230 ±10% <sup>(1)</sup> 50/60 Hz	
	VA	6	
Operating temperature	°C	-10..+65	
Protection index		IP 20	
Units per packing		1	
Packing weight	Kg	0.58	
Packing dimensions	mm	165 x 100 x 50	

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> -60 dB: 2 equal carriers, EN 50083-3

CTB -60 dB: 42 equal carriers, EN 50083-3  
 CSO -60 dB: 42 equal carriers, EN 50083-3  
 XMOD -60 dB: 42 equal carriers, EN 50083-3

(1) Consult us for availability at 125 or 240 V~

# 904 APARTMENT AMPLIFIERS

## Indoor amplifiers



AI-108

### Description

Broadband apartment amplifier for terrestrial TV, with built-in power supply unit. It amplifies VHF and UHF bands separately. It has a return path compatible with the digital receivers of Dual View I, Digibox and Sky+, as well as an independent gain control for each band. It includes two outputs to make the distribution to two or more televisions.

### Applications

Designed to distribute the signal from a Dual View I, Digibox or Sky+ satellite to all the televisions of an apartment. The return path of the amplifier passes the control signal of the receiver from the IR sensors installed along with each TV to the satellite receiver. The levels are easily adjusted by means of the two gain controls.

### Characteristics

Made from ABS plastic, with an internal zamak chassis which gives maximum shielding. The power supply unit is insulated from the rest of the high frequency circuit, complying with the safety regulations for the installer and the user. Fixed to the wall by means of the supplied screws and wall-plugs. F type connectors. Supplied with the male connectors for a Ø6.8 mm coaxial cable. Does not include the accessory for the transmission of IR signals compatible with the digital receivers.

### Accessories

- 9120039 CM-004 Male F type connector for Ø6.6 mm coaxial.
- 9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.
- 9120011 RS-275 F load 75 Ω.
- 9060055 FI-244 F connector 2 outputs splitter
- 9060036 FI-244 F connector 2 outputs splitter.
- 9070037 BM-100 Outlet base.

CODE		9040062		
MODEL		AI-108		
Outputs		2		
Frequency range	Band	RP	VHF	UHF
	MHz	0-10	40-318	470-862
Gain	dB±TOL	-2 ±0,5	14 ±1,0	24 ±1,5
			3 ±1,0	13 ±1,5
Flatness response	dB	±1,2	±1,0	±1,2
Gain adjust	dB	-	16	12
Output level	dBµV	104/91 DIN 45004B 101/88 (IMD3 - 60 dB) 90/77 (IMD2 - 60 dB) 88/75 (CTB - 60 dB) 90/69 (CSO - 60 dB) 92/77 (XMOD - 60 dB)		
DC path	mA	150		
	V <sub>cc</sub>	9		
Return loss	dB	≥10		
Noise figure	dB	-	4.5 ±1,0	3.0 ±1,0
Mains voltage	V~	230 ±10% 50/60 Hz		
	VA	7		
Operating temperature	°C	-10..+65		
Protection index		IP 20		
Units per packing		1		
Packing weight	Kg	0.4		
Packing dimensions	mm	115 x 102 x 45		

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> -60 dB: 2 equal carriers, EN 50083-3

CTB -60 dB: 42 equal carriers, EN 50083-3  
 CSO -60 dB: 42 equal carriers, EN 50083-3  
 XMOD -60 dB: 42 equal carriers, EN 50083-3

# 904 APARTMENT AMPLIFIERS

Indoor amplifiers with interbands



AI-131

AI-133

## Description

Broadband apartment amplifier for terrestrial TV, with built-in power supply unit. It amplifies the VHF and UHF bands separately and has an independent gain control for each band. It includes two outputs to make the distribution to two or more televisions. The outputs are equal or unbalanced.

## Applications

Designed to enlarge analogue and digital terrestrial TV installations within an apartment or house. It amplifies the TV signal so a distribution with several new outlets can be made from the signal of one TV outlet or from the coaxial cable entering the house. The levels are easily adjusted by means of the two gain controls.

## Characteristics

Made from ABS plastic, with an internal zamak chassis which gives maximum shielding. The power supply unit is insulated from the rest of the high frequency circuit, complying with the safety regulations for the installer and the user. Fixed to the wall by means of the supplied screws and wall-plugs. F type connectors.

## Accessories

9120039 CM-004	Male F type connector for Ø6.6 mm coaxial.
9080023 MC-302	Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.
9120011 RS-275	F load 75 Ω.
9060036 FI-243	F connector 2 output splitter.
9070037 BM-100	Outlet base.

CODE		9040056		9040057	
MODEL		AI-131		AI-133	
Outputs		1			
Frequency range	Band	RP	VHF/UHF	RP	VHF/UHF
	MHz	5-30	47-862	5-65	86-862
Gain	dB±TOL	-2.5 ±0,5	24 ±1,0 OUT 1 10 ±1,0 OUT 2	-2.5 ±0,5	24 ±0,1 OUT 1 10 ±0,1 OUT 2
Flatness response	dB	±1,2	±1,5	±0,5	±1,5
Gain adjust	dB	-	13	-	13
Adjustable equalization range	dB	-	20	-	18
Output level	dBµV	113/99 DIN 45004B 110/96 (IMD3 - 60 dB) 100/85 (IMD2 - 60 dB) 97/83 (CTB - 60 dB) 95/80 (CSO - 60 dB) 97/83 (XMOD - 60 dB)			
Return loss	dB	10			
Noise figure	dB	6 ±1,0			
Mains voltage	V~	230 ±10% <sup>(1)</sup> 50/60 Hz			
	VA	5.5			
Operating temperature	°C	-10..+65			
Protection index		IP 20			
Units per packing		1			
Packing weight	Kg	0.4			
Packing dimensions	mm	115 x 102 x 45			

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> -60 dB: 2 equal carriers, EN 50083-3

CTB -60 dB: 42 equal carriers, EN 50083-3  
 CSO -60 dB: 42 equal carriers, EN 50083-3  
 XMOD -60 dB: 42 equal carriers, EN 50083-3

(1) Consult us for availability at 125 or 240 V~

# 904 APARTMENT AMPLIFIERS

Indoor amplifiers with interbands



## Description

Broadband apartment amplifier for terrestrial TV, with built-in power supply unit. It amplifies the VHF, UHF and interband bands continuously and includes a return path. It has a gain control and two outputs for the distribution to two or more televisions.

## Applications

Designed to enlarge analogue and digital terrestrial TV installations within a house. Especially appropriate as an apartment amplifier in cable TV networks or in community installations where the interband bands are used. It amplifies the TV signal so a new distribution can be made from the signal of one TV outlet or from the coaxial cable entering the house.

## Characteristics

Made from ABS plastic, with an internal zamak chassis which gives maximum shielding. The power supply unit is insulated from the rest of the high frequency circuit. Fixed to the wall by means of the supplied screws and wall-plugs. F type connectors.

## Accessories

- 9120039 CM-004 Male F type connector for Ø6.6 mm coaxial.
- 9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.
- 9120011 RS-275 F load 75 Ω.
- 9060036 FI-243 F connector 2 output splitter.
- 9070043 BM-100 Outlet for cable networks.

CODE		9040051				9040052			
MODEL		AI-221				AI-223			
Outputs		2							
Frequency range	Band	RP	VHF/UHF		RP	VHF/UHF			
	MHz	0-30	47-862		0-65	86-862			
Gain	dB±TOL	-5.5 ±0,5	25 ±1,5		-4.5 ±0,5	25 ±1,5			
Flatness response	dB	±1,2	±1,5		±0,5	±1,5			
Gain adjust	MHz	-	47	862	-	86	862		
	dB	-	20	10	-	15	10		
Output level	dBµV	105 DIN 45004B 102 (IMD3 - 60 dB) 90 (IMD2 - 60 dB) 89 (CTB - 60 dB) 84 (CTB - 60 dB) 90 (CTB - 60 dB)							
Return loss	dB	10							
Noise figure	dB	6							
Mains voltage	V~	230 ±10% <sup>(1)</sup> 50/60 Hz							
	VA	5.5							
Operating temperature	°C	-5..+60							
Protection index		IP 20							
Units per packing		1							
Packing weight	Kg	0.4							
Packing dimensions	mm	115 x 102 x 45							

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> -60 dB: 2 equal carriers, EN 50083-3

CTB -60 dB: 42 equal carriers, EN 50083-3  
 CSO -60 dB: 42 equal carriers, EN 50083-3  
 XMOD -60 dB: 42 equal carriers, EN 50083-3



AI-210

### Description

Broadband apartment amplifier for terrestrial and satellite TV, with built-in power supply unit. It amplifies the terrestrial TV and IF satellite bands separately. It has an independent gain control for each band and a fixed slope on the IF band. Available with two equal outputs.

### Applications

Designed to enlarge analogue and digital terrestrial and satellite TV installations within an apartment or house. It amplifies the TV signal so a distribution with TV-SAT outlets can be made from the signal of one TV outlet or from the coaxial cable entering the house. The levels are easily adjusted by means of the two built-in gain controls.

### Characteristics

Made from ABS plastic, with an internal zamak chassis which gives maximum shielding. The power supply unit is insulated from the rest of the high frequency circuit. Fixed to the wall by means of the supplied screws and wall-plugs. F type connectors.

### Accessories

- 9120039 CM-004 Male F type connector for Ø6.6 mm coaxial.
- 9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.
- 9120011 RS-275 F load 75 Ω.
- 9070073 BS-112 TV-SAT outlet.

CODE		9040071	
MODEL		AI-210	
Outputs		2	
Frequency range	Band	TV	SAT
	MHz	40-862	950-2150
Gain	dB±TOL	16 ±1,0	30 ±1,5
Flatness response	dB	±1,0	±3,0
Gain adjust	dB	15	12
Fixed equalization	dB	-	10
Output level	dBμV	95 DIN 45004B 92 (IMD <sub>3</sub> - 60 dB) 74 (IMD <sub>2</sub> - 60 dB) 79 (CTB - 60 dB) 69 (CSO - 60 dB) 78 (XMOD - 60 dB)	112 (IMD <sub>3</sub> - 35 dB) 85 (IMD <sub>2</sub> - 35 dB)
Isolation between outputs	dB	12	7
Return loss	dB	10	
Chroma - luminance delay	ns	<20	
Noise figure	dB	6	7.5
Mains voltage	V~	230 ±10% <sup>(1)</sup> 50/60Hz	
	%	6.5	
Operating temperature	°C	-5...+60	
Protection index		IP 20	
Units per packing		1	
Packing weight	Kg	0.58	
Packing dimensions	mm	165 x 100 x 50	

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> -60 dB: 2 equal carriers, EN 50083-3

IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-3  
 CTB -60 dB: 42 equal carriers, EN 50083-3  
 CSO -60 dB: 42 equal carriers, EN 50083-3  
 XMOD -60 dB: 42 equal carriers, EN 50083-3

(1) Consult us for availability at 125 or 240 V~

# 904 APARTMENT AMPLIFIERS

Indoor TV-SAT amplifiers



AI-414

## Description

Broadband apartment amplifier for terrestrial and satellite TV for installation with multiswitches, with 4 inputs and built-in power supply unit. It amplifies the terrestrial TV and IF satellite bands separately. It has an independent gain control for each band and a fixed slope on the FI band.

## Applications

Designed to enlarge analogue and digital terrestrial and satellite TV installations within an apartment or house. It amplifies the terrestrial and satellite TV signals from the output of the multiswitch so a distribution with TV-SAT outlets can be made. The levels are easily adjusted by means of the two built-in gain controls.

## Characteristics

Made from ABS plastic, with an internal zamak chassis which gives maximum shielding. The power supply unit is insulated from the rest of the high frequency circuit. Fixed to the wall by means of the supplied screws and wall-plugs. F type connectors.

## Accessories

- 9120039 CM-004 Male F type connector for Ø6.6 mm coaxial.  
 9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.  
 9120011 RS-275 F load 75 Ω.  
 9070073 BS-112 TV-SAT outlet.

CODE		9040075	
MODEL		AI-414	
Outputs		4	
Frequency range	Band	TV	SAT
	MHz	40-862	950-2150
Gain	dB±TOL	12 ±1,0	25 ±1,5
Flatness response	dB	±1,0	±3,0
Gain adjust	MHz	15	12
	dB	-	10
Output level	dBµV	91 DIN 45004B 88 (IMD <sub>3</sub> - 60 dB) 70 (IMD <sub>2</sub> - 60 dB) 75 (CTB - 60 dB) 65 (CSO - 60 dB) 74 (XMOD - 60 dB)	108 (IMD <sub>3</sub> - 35 dB) 81 (IMD <sub>2</sub> - 35 dB)
Isolation between outputs		13	9
Return loss	dB	10	
Chroma - luminance delay	ns	<20	
Noise figure	dB	6	7.5
DC path	V...	14/18	
	mA	400	
	Tone	22 KHz/DiSEqC	
Mains voltage	V~	230 ±10% <sup>(1)</sup> 50/60 Hz	
	VA	6.5	
Operating temperature	°C	-5...+60	
Protection index		IP 20	
Units per packing		1	
Packing weight	Kg	0.58	
Packing dimensions	mm	165 x 100 x 50	

DIN 45004B: 3 unequal carriers, IMD<sub>3</sub> at 60 dB  
 IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>3</sub> -35 dB: 2 equal carriers, EN 50083-3

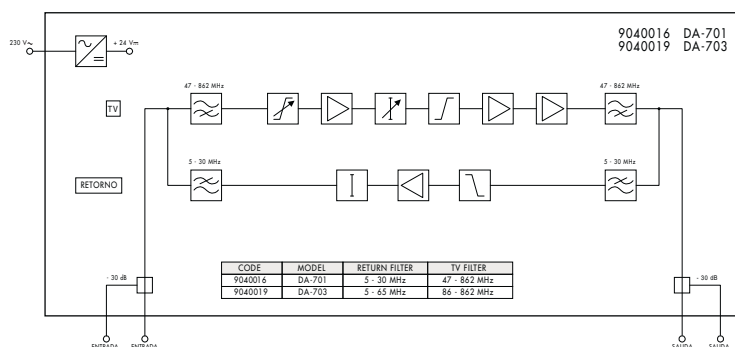
IMD<sub>3</sub> -60 dB: 2 equal carriers, EN 50083-3  
 IMD<sub>2</sub> -35 dB: 2 equal carriers, EN 50083-3  
 CTB -60 dB: 42 equal carriers, EN 50083-3  
 CSO -60 dB: 42 equal carriers, EN 50083-3  
 XMOD -60 dB: 42 equal carriers, EN 50083-3

(1) Consult us for availability at 125 or 240 V~

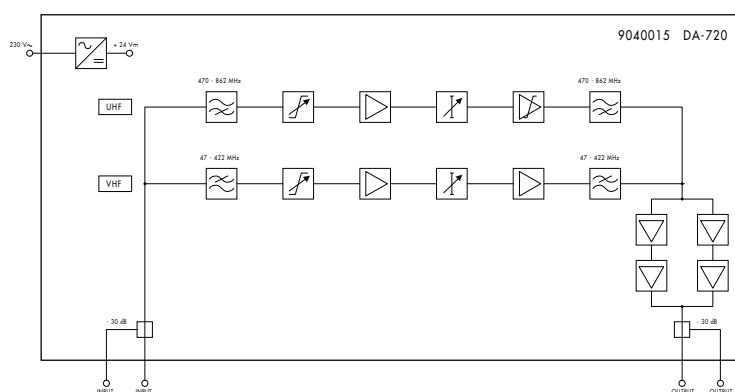
# 904 BLOCKS DIAGRAMS

## Indoor TV-SAT amplifiers

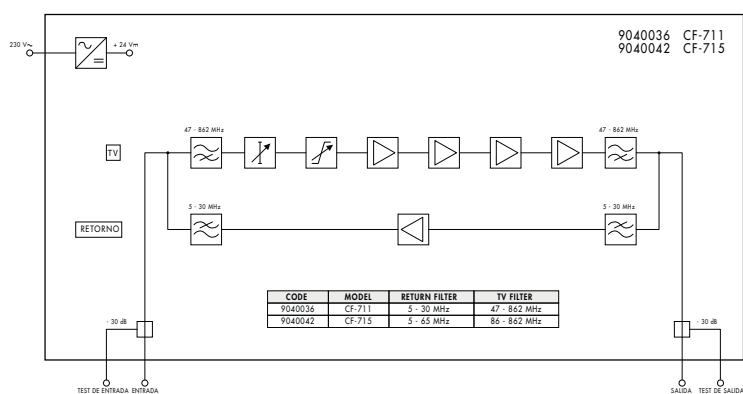
### Distribution amplifiers



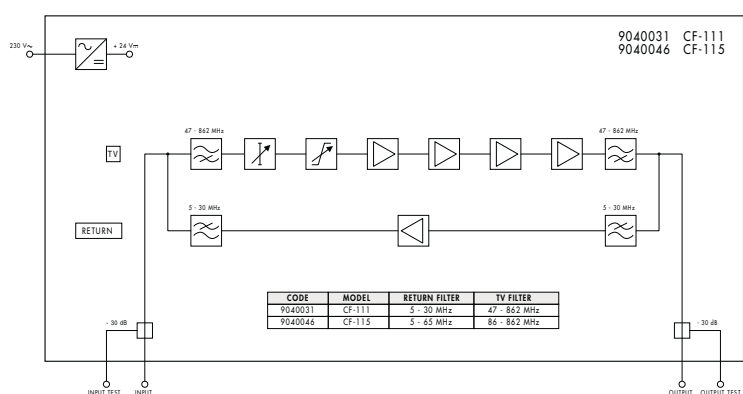
### Split bands distribution amplifiers



### High gain distribution amplifiers

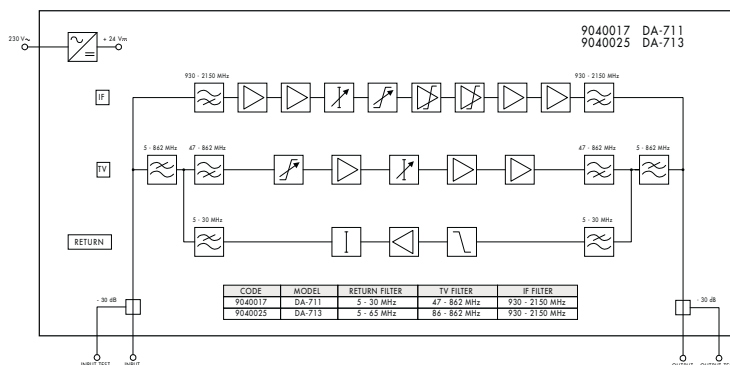


### High gain distribution amplifiers

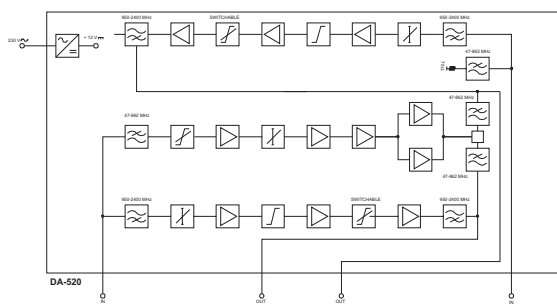


# 904 BLOCKS DIAGRAMS

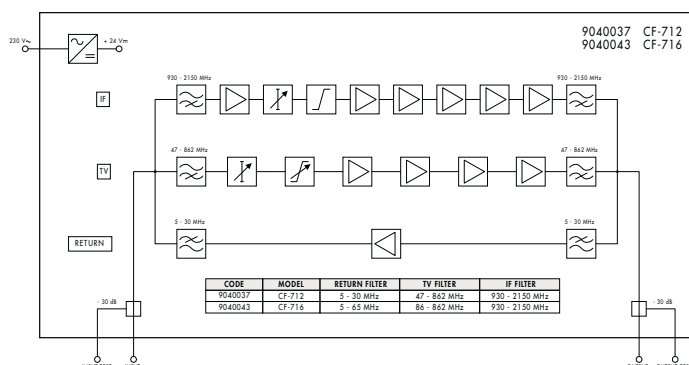
## TV-SAT distribution amplifiers



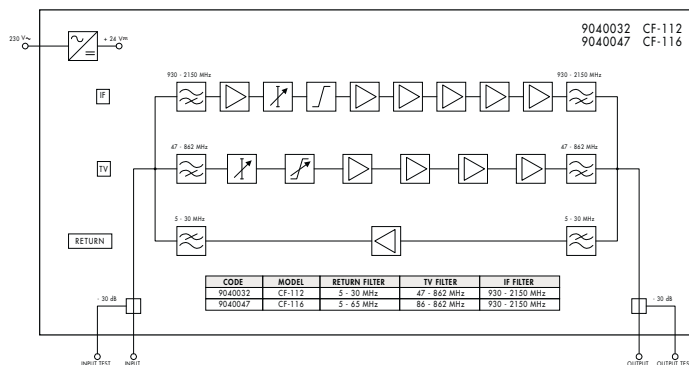
## Double TV-SAT distribution amplifiers



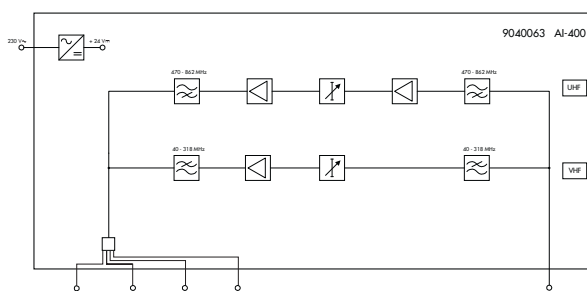
## High gain TV-SAT distribution amplifiers



## High gain TV-SAT distribution amplifiers



## Indoor amplifiers

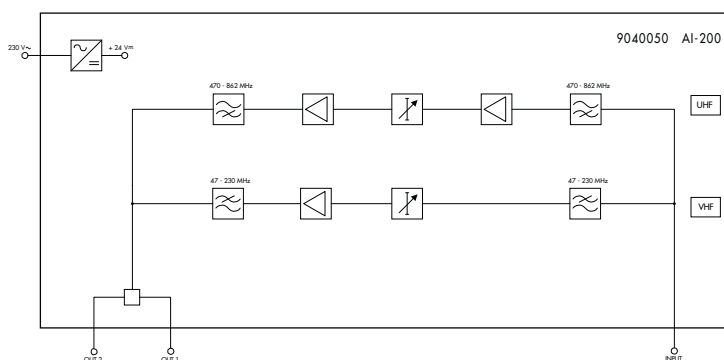




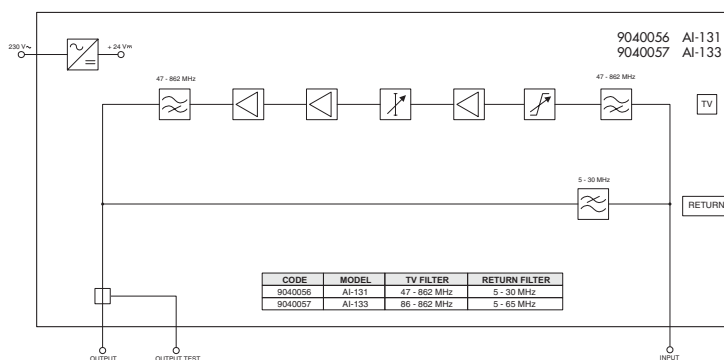
# 904 BLOCKS DIAGRAMS

## Indoor TV-SAT amplifiers

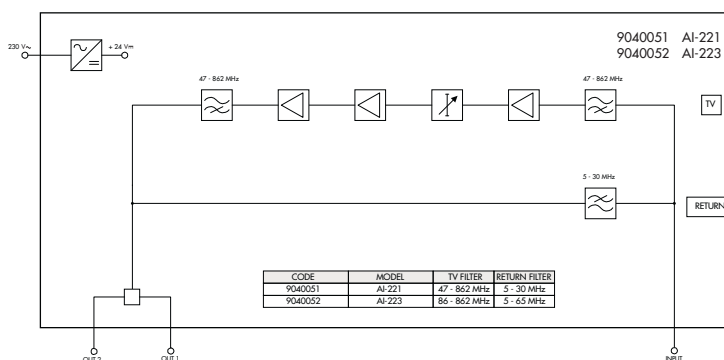
### Indoor amplifiers



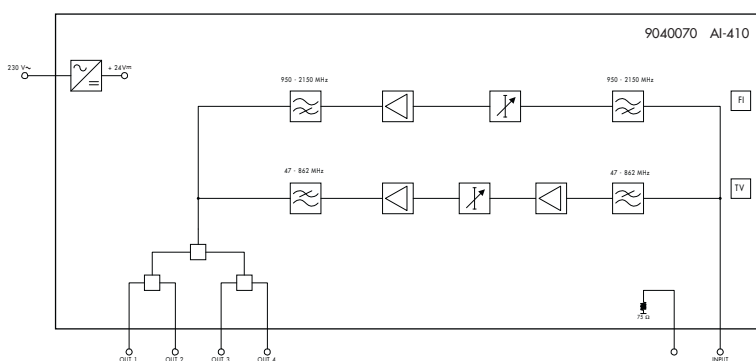
### Indoor amplifiers with interbands



### Indoor amplifiers with interbands



### TV-SAT indoor amplifiers



Community installation of terrestrial TV covering several buildings. The use of distribution amplifiers makes it possible to make a single installation with a common head-end for all the different buildings.




The diagram illustrates a 2x4 antenna array layout for a 47..862 MHz system. The layout is organized into two rows of four antenna units each. Each unit consists of a DA-701 antenna connected to a matching network (FP-211 or FI-243) via a 25m cable. The input signal is 106 dBμV at 47..862 MHz. The output signal is 74 dBμV at 47..862 MHz. The layout also shows a 19dB/100m loss at 862 MHz.

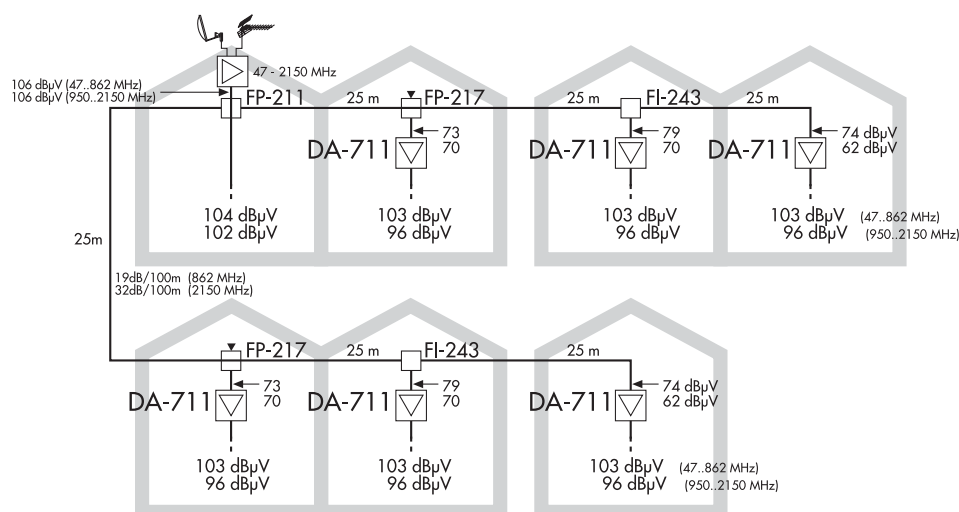
Community installation of terrestrial TV consisting of a group of individual houses. The use of distribution amplifiers in series makes it possible to make a single installation with a common head-end for all the different buildings.

## INSTALLATION EXAMPLES

## Installation in buildings with TV-SAT distribution amplifiers




Community installation of terrestrial TV covering several buildings. The use of distribution amplifiers makes it possible to make a single installation with a common head-end for all the different buildings. The distribution is made on the 5 to 2150 MHz band.

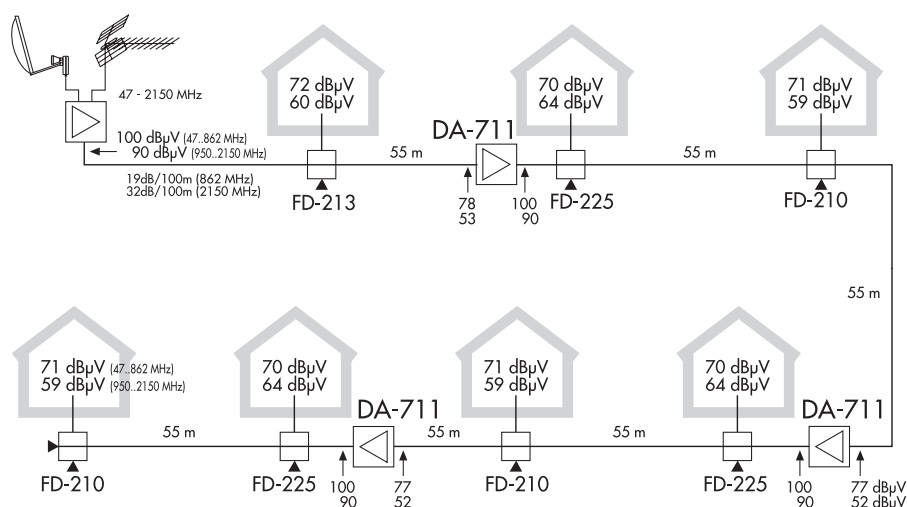
	10 Channels	47..862 MHz
	20 Channels	47..862 MHz
	30 Transponders	950..2150 MHz



## Installation in individual houses with TV-SAT distribution amplifiers

Community installation of terrestrial TV consisting of a group of individual houses. The use of distribution amplifiers in series makes it possible to make a single installation with a common head-end for all the different buildings. The distribution is made on the 5 to 2150 MHz band.

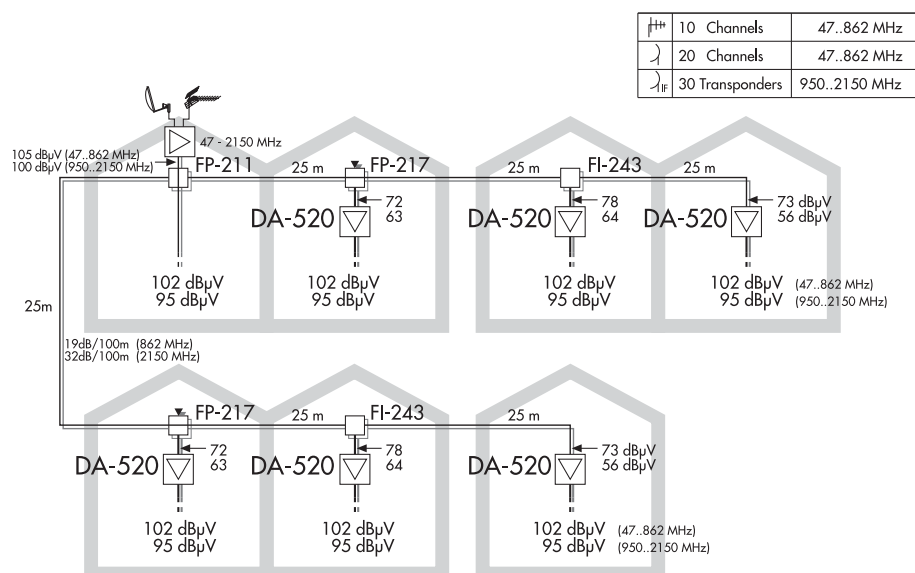
	10 Channels	47..862 MHz
	20 Channels	47..862 MHz
	30 Transponders	950..2150 MHz



# 904 INSTALLATION EXAMPLES

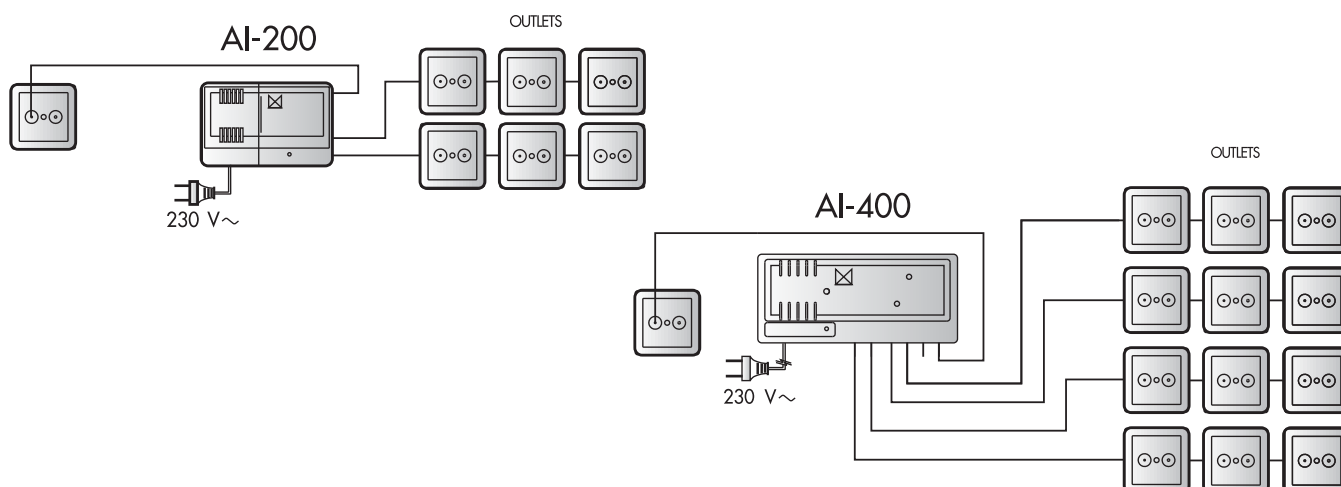
## Installation in buildings with TV-SAT distribution amplifiers

SMATV installation involving several buildings with double distribution. Installation with two coaxial cables in which distribution to the dwellings is carried out with only one coaxial cable. The signal which is distributed to the dwelling is selected by changing the coaxial cable connections in the input. By using double distribution amplifiers, it is possible to perform a single installation with one head-end shared by all the buildings. The distribution takes place in the 5MHz to 2150MHz bands.



### Indoor amplifier

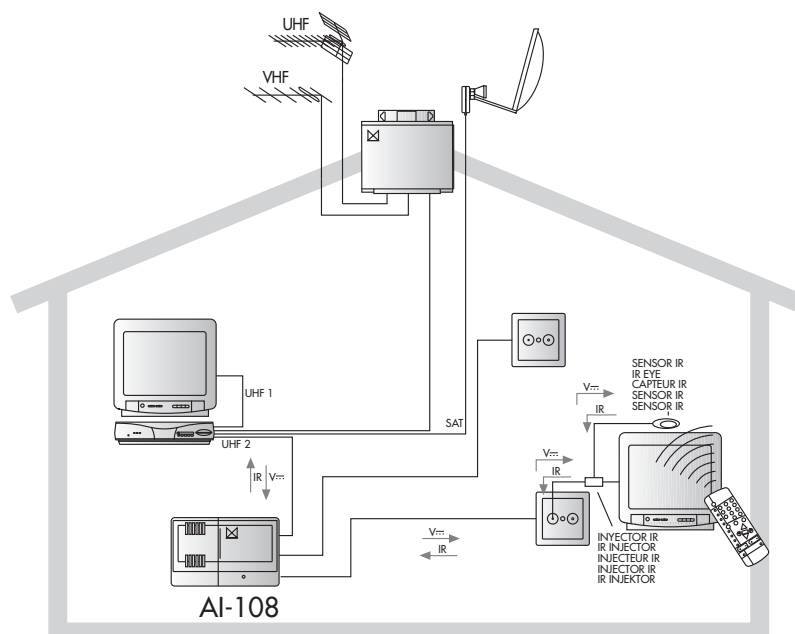
Installation of new outlets in an apartment using an indoor amplifier. The amplifier amplifies the signal which comes from the original outlet of the installation and distributes it to the new outlets.



# 904 INSTALLATION EXAMPLES

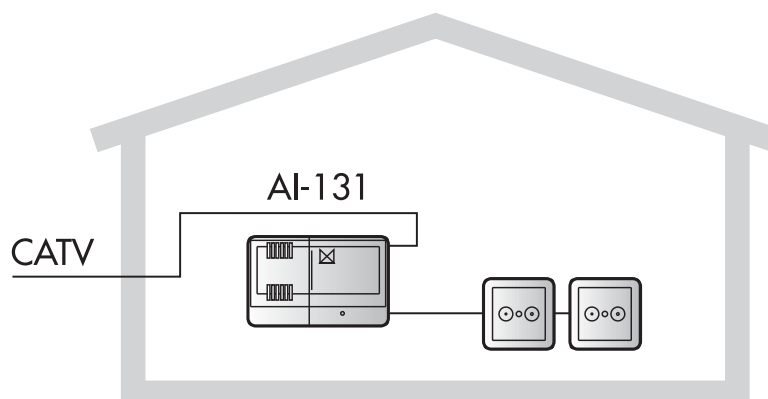
## Indoor amplifier compatible with Dual View I, Digibox or Sky+

Distribution of the signal from the receiver of a Dual View I, Digibox or Sky+ satellite to all the TVs of an apartment. The amplifier amplifies the signal from the satellite receiver. The return path of the amplifier passes the control signal of the receiver from the IR sensors installed along with each TV to the satellite receiver.



## Indoor amplifier for cable network

Installation of an indoor amplifier with interbands and return path in a house connected to a cable network. The amplifier permits the installation of several outlets when the signal levels of the cable network are calculated for the installation of a single outlet.



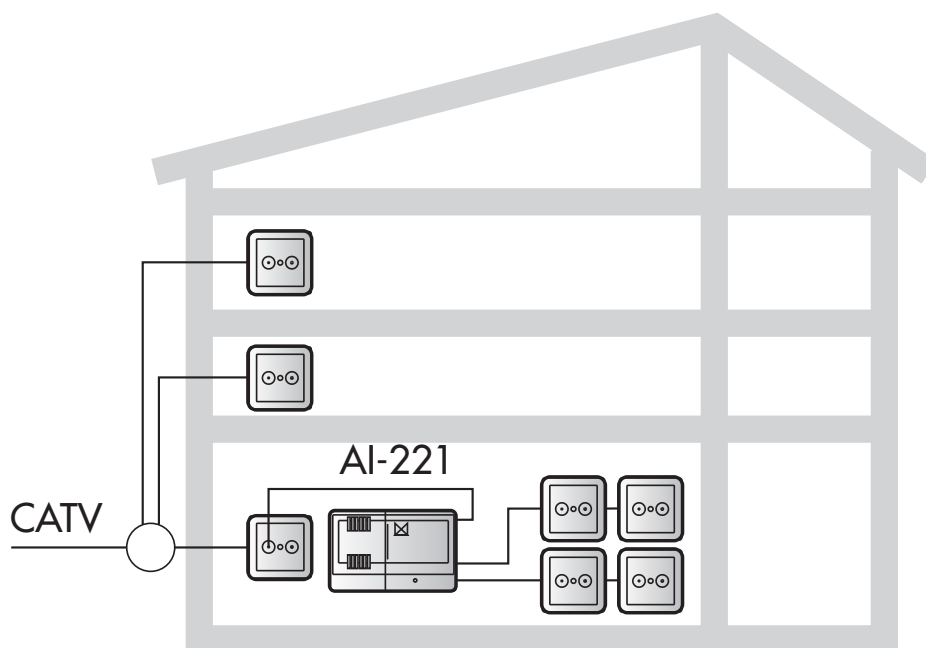
# 904

## INSTALLATION EXAMPLES

CE

### Indoor amplifier for cable network

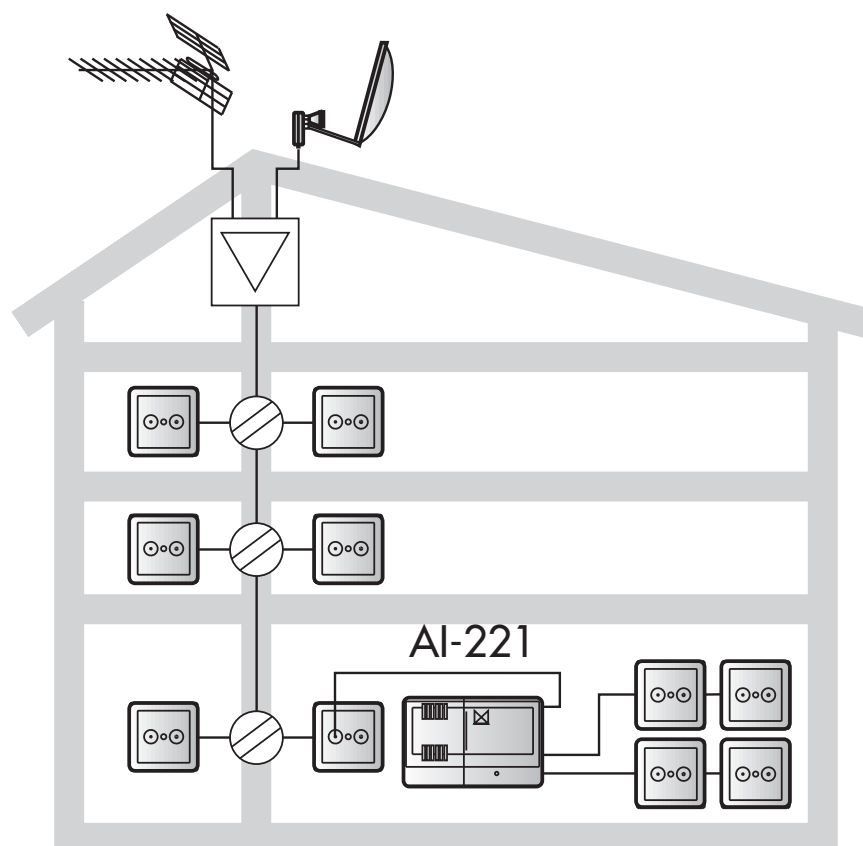
Installation of new outlets in an apartment connected to a cable network using an indoor amplifier with interbands and return path. The amplifier amplifies the signal which comes from the original outlet of the installation and distributes it to the new outlets.



# 904 INSTALLATION EXAMPLES

## Indoor amplifier in an installation with interband channels

Community installations with a great number of satellite channels normally use the channels of the interbands, S channels. The use of an indoor amplifier with interbands is necessary in order to install new outlets in an apartment.

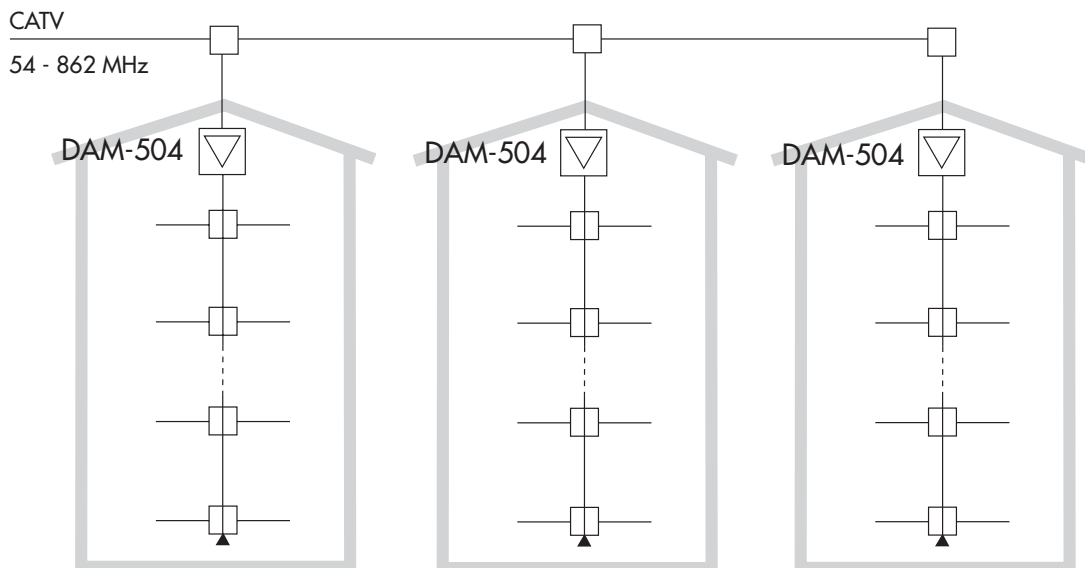


# 904

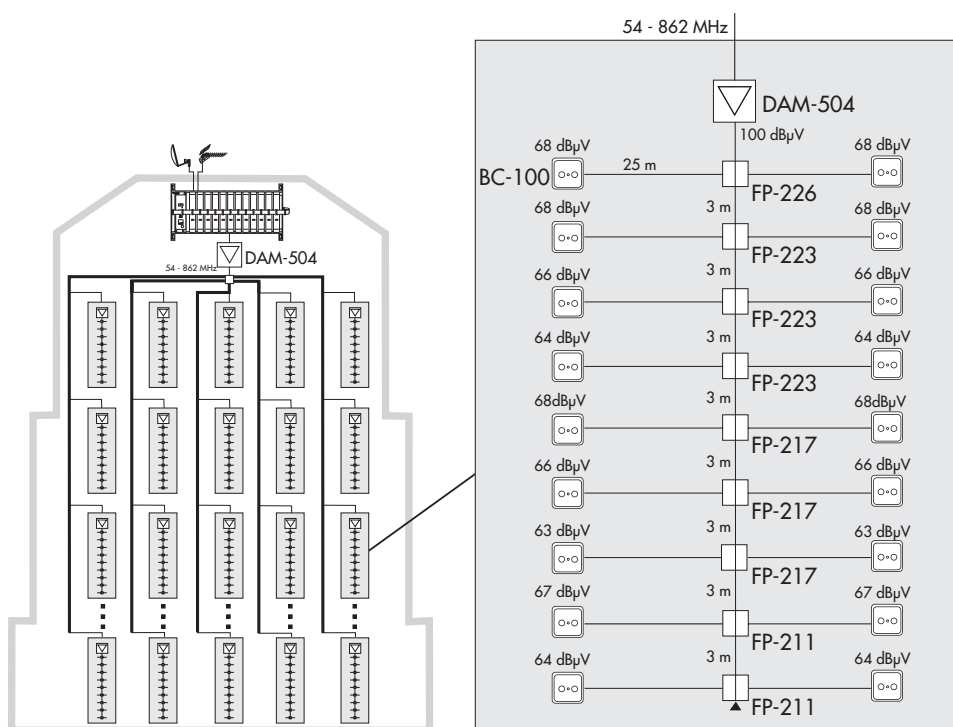
## INSTALLATION EXAMPLES

### TV Distribution amplifier

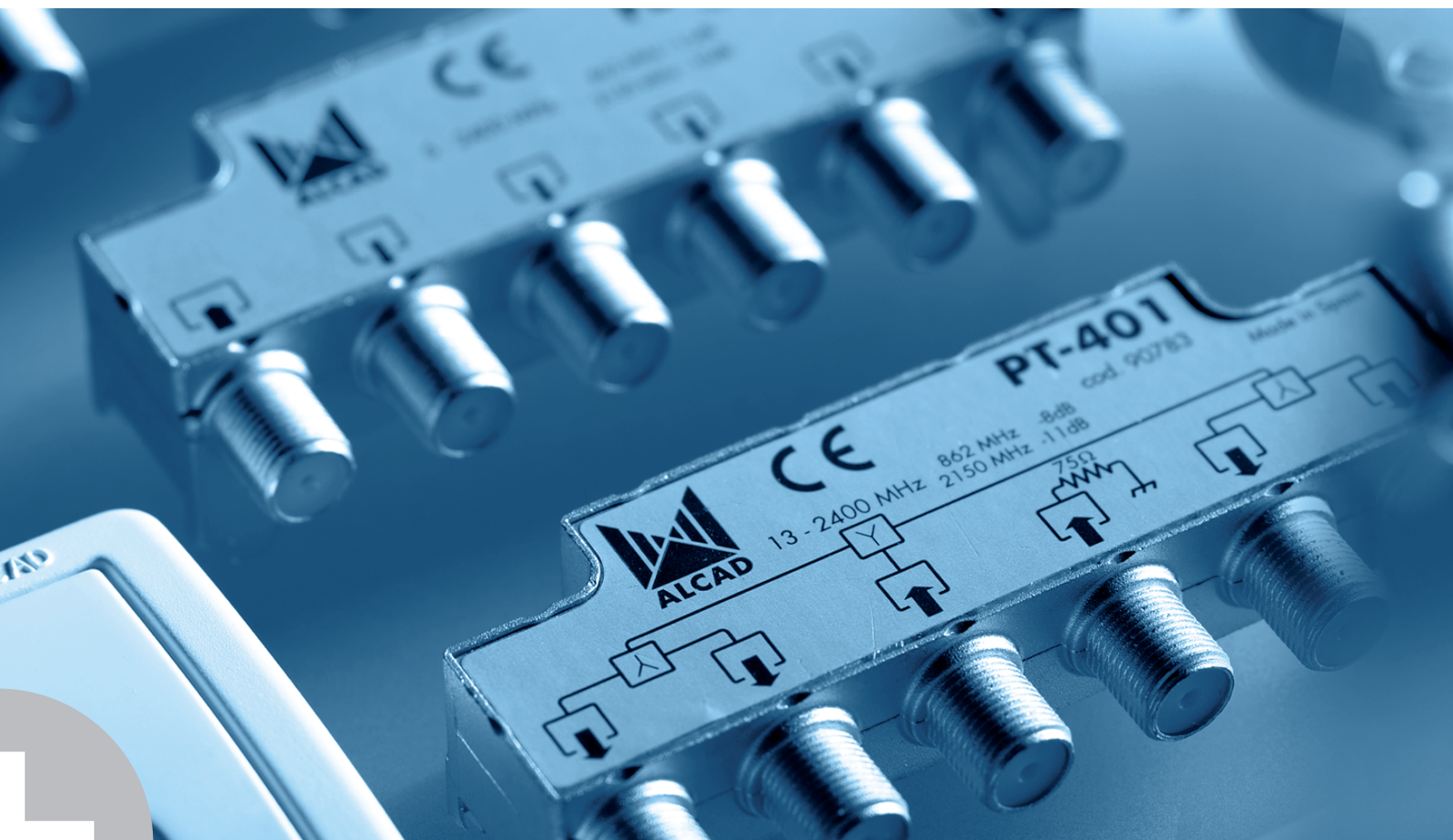
Installation of distribution amplifiers with TV band and return path connected to a cable network.



Installation of distribution amplifiers with TV band and return path connected to a terrestrial TV network, in a large building.









# Distribution elements

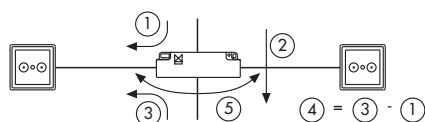
Distribution elements for all the terrestrial and satellite TV bands. They distribute the TV signals from the amplifiers to the houses, maintaining the balance of the signals.



# 906 TAP-OFFS AND SPLITTERS



## Equalised IF tap-offs



### Description

Equalised tap-offs for terrestrial and satellite TV with two tap outputs which cover the 5 to 2,400 MHz frequencies. They distribute part of the input signal to their tap outputs and the main part of the signal continues to the output. The equalisation of the tap outputs compensates the losses of the coaxial cable. Available in different tap-off attenuation values.

### Applications

SMATV installations with a tree-shaped distribution. The tree-shaped distribution reduces the number of distribution elements, and reduces the metres of coaxial cable to be installed, even though the head-end to outlet distances remain constant. For installation in buildings with many floors due to the low through loss of the tap-offs.

### Characteristics

Voltage blockage in the tap-offs. Shielded zamak chassis and metal plate. Connectors on the lower part to facilitate the connections. Reduced dimensions. Fits in a 100 x 100 mm box.

### Accessories

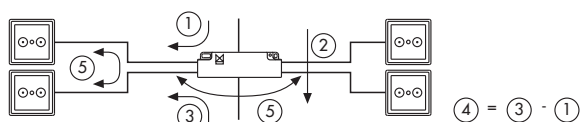
- 9120039 CM-004 Male F type connector for Ø6.6 mm coaxial.
- 9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.
- 9120011 RS-275 F load 75 Ω.
- 9060026 SD-003 Accessory for outdoor mounting.
- 9120027 LF-001 F connector tool.

CODE			9060053	9060033	9060034	9060035
MODEL			FD-210	FD-213	FD-219	FD-225
Connection			F female			
Outputs			2			
Frequency range	MHz		5 - 2400			
Top loss	dB ±1,0	5 - 47 MHz 47 - 230 MHz 470 - 862 MHz 950 - 2150 MHz 2150 - 2400 MHz	26.0 - 24.5 24.5 - 21.5 17.0 - 13.0 12.5 - 8.5 8.5 - 8.0	28.0 28.0 - 25.0 21.5 - 17.5 17.0 - 12.0 12.0 - 11.5	32.0 32.0 - 30.5 27.5 - 24.0 23.0 - 17.5 17.5 - 17.0	36.0 36.0 - 34.5 33.0 - 30.0 30.0 - 26.0 26.0 - 25.5
Flatness response	dB		±1,0			
Through loss	dB ±0,5	5 - 47 MHz 47 - 230 MHz 470 - 862 MHz 950 - 2150 MHz 2150 - 2400 MHz	0.8 0.8 - 1.0 1.2 - 1.7 1.8 - 3.0 3.0 - 3.5	0.6 0.6 - 0.7 0.9 - 1.2 1.2 - 2.0 2.0 - 2.3	0.5 0.5 0.5 - 0.8 0.8 - 1.4 1.4 - 1.6	0.5 0.5 0.5 - 0.6 0.6 - 1.0 1.2
Directivity	dB	5 - 47 MHz 47 - 862 MHz 950 - 2150 MHz 2150 - 2400 MHz	>0 > 0-6 >7 >8	>0 >0-5 > 5-8 >8	>0 >0-5 >5-7 >7	>0 >0-4 >4-7 >8
Isolation	dB	5 - 47 MHz 47 - 862 MHz 950 - 2150 MHz 2150 - 2400 MHz	>45 >32 >28 >26	>50 >40 >30 >28	>60 >55 >45 >38	>60 >60 >45 >40
Return loss	dB	5 - 47 MHz 47 - 862 MHz 950 - 2150 MHz 2150 - 2400 MHz	>18 >18 >13 >13	>17 >15 >15 >13	>18 >18 >15 >15	
Units per packing			6			
Packing weight	Kg		0.45			
Packing dimensions	mm		155 x 95 x 40			

# 906 TAP-OFFS AND SPLITTERS



## Equalised IF tap-offs



### Description

Equalised tap-offs for terrestrial and satellite TV with four tap outputs which cover the 5 to 2,400 MHz frequencies. They distribute part of the input signal to their tap outputs and the main part of the signal continues to the output. The equalisation of the tap outputs compensates the losses of the coaxial cable. Available in different tap-off attenuation values.

### Applications

SMATV installations with a tree-shaped distribution. The tree-shaped distribution reduces the number of distribution elements, and reduces the metres of coaxial cable to be installed, even though the head-end to outlet distances remain constant. For installation in buildings with many floors due to the low through loss of the tap-offs.

### Characteristics

Voltage blockage in the tap-offs. Shielded zamak chassis and metal plate. Connectors on the lower part to facilitate the connections. Reduced dimensions. Fits in a 100x100 mm box.

### Accessories

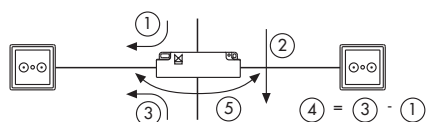
9120039	CM-004	Male F type connector for Ø6.6 mm coaxial.
9080023	MC-302	Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.
9120011	RS-275	F load 75 Ω.
9060026	SD-003	Accessory for outdoor mounting.
9120027	LF-001	F connector tool.

CODE			9060054	9060038	9060039	9060040
MODEL			FD-410	FD-413	FD-419	FD-425
Connection			F female			
Outputs			4			
Frequency range	MHz		5 - 2400			
Top loss	dB ±1,0	5 - 47 MHz 47 - 230 MHz 470 - 862 MHz 950 - 2150 MHz 2150 - 2400 MHz	27.0 - 25.5 25.5 - 22.5 18.8 - 15.0 14.5 - 10.2 10.2 - 9.7	28.0 28.0 - 26.0 22.5 - 18.5 18.0 - 13.5 13.5	33.0 33.0 - 21.0 28.0 - 24.0 23.5 - 18.5 18.5 - 17.5	36.0 36.0 - 34.5 32.5 - 30.0 30.0 - 25.5 25.5 - 25.0
Flatness response	dB		±1,0			
Through loss	dB ±0,5	5 - 47 MHz 47 - 230 MHz 470 - 862 MHz 950 - 2150 MHz 2150 - 2400 MHz	1.5 - 1.7 1.7 - 1.8 2.1 - 2.7 2.9 - 4.7 4.7 - 5.0	1.0 1.0 - 1.3 1.5 - 2.0 2.0 - 3.0 3.0 - 3.5	0.5 0.5 - 0.8 0.9 - 1.0 1.2 - 1.8 1.8 - 2.0	0.5 0.5 - 0.6 0.7 - 0.9 0.9 - 1.3 1.3 - 1.5
Directivity	dB	5 - 47 MHz 47 - 862 MHz 950 - 2150 MHz 2150 - 2400 MHz	>0 >0-6 >6 >7	>0 >0-6 >6 >6		>0 >0-5 >5-7 >7
Isolation	dB	5 - 47 MHz 47 - 862 MHz 950 - 2150 MHz 2150 - 2400 MHz	>45 >35 >30 >30	>50 >40 >32 >32	>60 >55 >45 >40	>60 >60 >45 >40
Return loss	dB	5 - 47 MHz 47 - 862 MHz 950 - 2150 MHz 2150 - 2400 MHz	>15 >15 >13 >13	>15 >16 >16 >16	>17 >18 >17 >15	>18 >18 >17 >16
Units per packing			6			
Packing weight	Kg		0.45			
Packing dimensions	mm		155 x 95 x 40			



# 906 TAP-OFFS AND SPLITTERS

## Flat IF tap-offs



### Description

Tap-offs for terrestrial and satellite TV with two tap outputs which cover the 5 to 2,400 MHz frequencies. They distribute part of the input signal to their tap outputs and the main part of the signal continues to the output. The response of the tap outputs is flat, without equalisation. Available in different tap-off attenuation values.

### Applications

SMATV installations with a tree-shaped distribution. The tree-shaped distribution reduces the number of distribution elements, and reduces the metres of coaxial cable to be installed, even though the head-end to outlet distances remain constant.

### Characteristics

Voltage blockage in the tap-offs. Shielded zamak chassis and metal plate. Connectors on the lower part to facilitate the connections. Reduced dimensions. Fits in a 100x100 mm box.

### Accessories

- 9120039 CM-004 Male F type connector for Ø6.6 mm coaxial.
- 9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.
- 9120011 RS-275 F load 75 Ω.
- 9060026 SD-003 Accessory for outdoor mounting.
- 9120027 LF-001 F connector tool.

CODE			9060031	9060032	9060043	9060044
MODEL			FP-211	FP-217	FP-223	FP-226
Connection			F female			
Outputs			2			
Frequency range	MHz		5 - 2400			
Top loss ①	dB ±2,0	5 - 862 MHz 930 - 2150 MHz 2150 - 2400 MHz	11.0 11.0 12.0	17.0 17.0 18.5	23.0 23.0 24.0	26.0 26.0 26.0
Through loss ②	dB ±0,5	5 - 862 MHz 930 - 2150 MHz 2150 - 2400 MHz	2.5 2.5 - 4.0 4.0 - 4.5	1.8 1.8 - 3.0 3.0 - 3.5	1.6 1.6 - 2.6 2.6 - 3.3	
Directivity ④	dB	5 - 862 MHz 930 - 2150 MHz 2150 - 2400 MHz	>15.0 >5.0 >5.0	>17.0 >5.0 >5.0	>18.0 >5.0 >5.0	
Isolation ⑤	dB	5 - 862 MHz 930 - 2150 MHz 2150 - 2400 MHz	>30.0 >22.0 >20.0	>30.0 >25.0 >25.0	>40.0 >35.0 >35.0	>50.0 >40.0 >40.0
Return loss	dB	5 - 862 MHz 930 - 2150 MHz 2150 - 2400 MHz	>12.0 >12.0 >15.0	>15.0 >15.0 >15.0	>17.0 >15.0 >15.0	
Units per packing			6			
Packing weight	Kg		0.45			
Packing dimensions	mm		155 x 95 x 40			

# 906 TAP-OFFS AND SPLITTERS

## Flat IF tap-offs



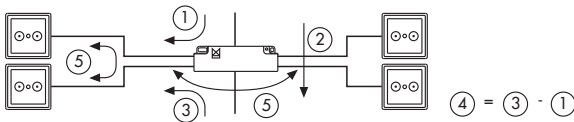
FP-414



FP-420



FP-426



### Description

Tap-offs for terrestrial and satellite TV with four tap outputs which cover the 5 to 2,400 MHz frequencies. They distribute part of the input signal to their tap outputs and the main part of the signal continues to the output. The response of the tap outputs is flat, without equalisation. Available in different tap-off attenuation values.

### Applications

SMATV installations with a tree-shaped distribution. The tree-shaped distribution reduces the number of distribution elements, and reduces the metres of coaxial cable to be installed, even though the head-end to outlet distances remain constant.

### Characteristics

Voltage blockage in the tap-offs. Shielded zamak chassis and metal plate. Connectors on the lower part to facilitate the connections. Reduced dimensions. Fits in a 100x100 mm box.

### Accessories

- 9120039 CM-004 Male F type connector for Ø6.6 mm coaxial.
- 9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.
- 9120011 RS-275 F load 75 Ω.
- 9060026 SD-003 Accessory for outdoor mounting.
- 9120027 LF-001 F connector tool.

CODE		9060046		9060047		9060048	
MODEL			FP-414	FP-420	FP-426		
Connection			F female				
Outputs			4				
Frequency range	MHz		5 - 2400				
Top loss ①	dB ±2,0	5 - 862 MHz 930 - 2150 MHz 2150 - 2400 MHz	14.0 14.0 15.0	20.0 20.0 20.5	26.0 26.0 25.0		
Through loss ②	dB ±0,5	5 - 862 MHz 930 - 2150 MHz 2150 - 2400 MHz	4.5 4.5 - 5.7 5.7 - 6.5	1.2 1.2 - 2.6 2.6 - 3.0	0.8 0.8 - 1.8 1.8 - 2.3		
Directivity ④	dB	5 - 862 MHz 930 - 2150 MHz 2150 - 2400 MHz	>13.0 >10.0 >10.0	>18.0 >10.0 >5.0			
Isolation ⑤	dB	5 - 862 MHz 930 - 2150 MHz 2150 - 2400 MHz	>16.0 >17.0 >20.0	>18.0 >18.0 >22.0	>20.0 >30.0 >30.0		
Return loss	dB	5 - 862 MHz 930 - 2150 MHz 2150 - 2400 MHz	>12.0 >10.0 >14.0	>17.0 >12.0 >12.0			
Units per packing			6				
Packing weight	Kg		0.45				
Packing dimensions	mm		155 x 95 x 40				

# 906 TAP-OFFS AND SPLITTERS

## IF splitters



FI-473



FI-243



FI-253



FI-483

### Description

Splitters for terrestrial and satellite TV which cover frequencies up to 2,400 MHz. They distribute all the input signal in equal parts to their outputs. Models FI-243 and FI-473 are specially designed to work with the return path. The response of the outputs is flat. Available in 2 or 4 outputs and with different isolation values between outputs.

### Applications

SMATV installations with a star-shaped distribution or to distribute the TV signal to the different branch lines in a tree or star-shaped distribution. The different outputs are better isolated with splitters with higher isolation and prevent problems of one area from affecting other areas of the distribution.

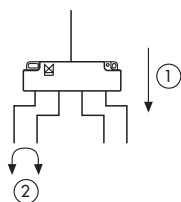
### Characteristics

Voltage blockage in the outputs. Shielded zamak chassis and metal plate. Connectors on the lower part to facilitate the connections. Reduced dimensions. It can be installed in a 100x100 mm box.

### Accessories

9120039	CM-004	Male F type connector for Ø6.6 mm coaxial.
9080023	MC-302	Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.
9120011	RS-275	F load 75 Ω.
9060026	SD-003	Accessory for outdoor mounting.
9060060	SD-100	Accessory for mast and outdoor mounting.
9120027	LF-001	F connector tool.

CODE			9060036	9060037	9060041	9060042
MODEL			FI-243	FI-473	FI-253	FI-483
Connection			F female			
Outputs			2	4	2	4
Frequency range	MHz		5 - 2400			
Splitter loss ①	dB ±1,0	5/13 - 47 MHz	5.0 - 4.0	10.0 - 9.0	5.0 - 4.5	9.5 - 9.5
		47 - 862 MHz	4.0 - 4.0	9.0 - 9.0	4.5 - 4.0	9.5 - 8.0
		950 - 2150	4.0 - 5.5	9.0 - 10.5	4.0 - 4.0	8.0 - 10.5
		2150 - 2400 MHz	5.5 - 6.0	10.5 - 12.0	4.0 - 4.5	10.5 - 12.5
Flatness response	dB		±0,3			
Isolation ②	dB	5/13 - 47 MHz	>20	>26	>13	>14
		47 - 862 MHz	>19	>16	>13	>12
		950 - 2150	>19	>16	>15	>8
		2150 - 2400 MHz	>20	>14	>16	>6
Return loss	dB	5/13 - 47 MHz	>14	>18	>14	>11
		47 - 862 MHz	>16	>12	>15	>11
		950 - 2150	>13	>17	>13	>11
		2150 - 2400 MHz	>19	>14	>16	>9
Units per packing			6			
Packing weight	Kg		0.45			
Packing dimensions	mm		155 x 95 x 40			



# 906 TAP-OFFS AND SPLITTERS

## IF splitters



FI-474



FI-244



FI-254



FI-374



FI-484



FI-594

### Description

Splitters for terrestrial and satellite TV which cover frequencies up to 2,400 MHz. They distribute all the input signal in equal parts among their outputs. They have a DC path through any of their outputs to the input. Available in 2, 3, 4 and 5 outputs and with different decoupling values between outputs.

### Applications

SMATV installations with a star-shaped distribution. They permit the feeding of a preamplifier or of an LNB through any of the outputs. A control voltage can be sent in installations of multiswitches through their outputs.

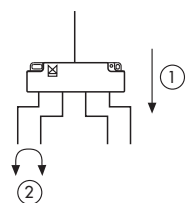
### Characteristics

Protection diodes in all the outputs. Shielded zamak chassis and metal plate. Connectors on the lower part to facilitate the connections. Reduced dimensions. Fits in a 100x100 mm box.

### Accessories

9120039	CM-004	Male F type connector for Ø6.6 mm coaxial.
9080023	MC-302	Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.
9120011	RS-275	F load 75 Ω.
9060026	SD-003	Accessory for outdoor mounting.
9060060	SD-100	Accessory for mast and outdoor mounting.
9120027	LF-001	F connector tool.

CODE			9060055	9060078	9060056	9060079	9060057	9060058	
MODEL			FI-244	FI-374	FI-474	FI-594	FI-254	FI-484	
Connection			F female						
Outputs			2	3	4	5	2	4	
Frequency range	MHz		5 - 2400						
Splitter loss ①	dB ±1,0	5 - 13 MHz	4.5 - 4.5	7.5 - 7.5	10.0 - 10.0	11.0 - 11.0	5.0 - 5.0	14.0 - 9.5	
		13 - 47 MHz	4.5 - 4.0	7.5 - 7.5	10.0 - 8.5	11.0 - 11.5	5.0 - 4.5	9.5 - 9.0	
		47 - 862 MHz	4.0 - 4.5	7.5 - 9.0	8.5 - 9.0	11.5 - 13.0	4.5 - 4.0	9.0 - 8.0	
		950 - 2150 MHz	4.5 - 5.5	9.0 - 10.5	9.0 - 11.0	13.0 - 15.0	4.0 - 4.0	8.0 - 10.0	
		2150 - 2400 MHz	5.5 - 6.5	10.5 - 10.5	11.0 - 13.0	15.0 - 15.0	4.0 - 5.0	10.0 - 13.0	
Flatness response	dB		±0,3						±0,5
Isolation ②	dB	5 - 13 MHz	>18	>20	>26	>20	>9	>14	
		13 - 47 MHz	>18	>20	>26	>20	>12	>14	
		47 - 862 MHz	>20	>21	>15	>22	>13	>12	
		950 - 2150 MHz	>18	>23	>16	>24	>15	>8	
		2150 - 2400 MHz	>18	>21	>15	>23	>14	>6	
Return losses	dB	5 - 13 MHz	>17	>16	>19	>15	>13	-	
		13 - 47 MHz	>17	>16	>19	>15	>14	>11	
		47 - 862 MHz	>15	>11	>13	>11	>15	>12	
		950 - 2150 MHz	>12	>11	>16	>11	>14	>11	
		2150 - 2400 MHz	>15	>11	>10	>12	>9	>8	
DC path	V...		34 max						
	mA		300 max	400 max	300 max	400 max	300 max		
	Tono		22 KHz / DiSEqC						
Units per packing			6						
Packing weight	Kg		0.45						
Packing dimensions	mm		155 x 95 x 40						







DE-201



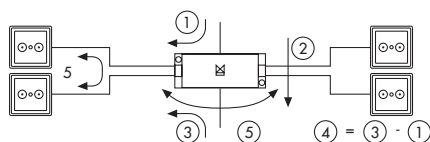
DE-203



DE-205



DE-207



### Description

Tap-offs for terrestrial and satellite TV with two tap outputs, covering the 5MHz to 2,300MHz frequencies. They distribute part of the input signal to their tap outputs while the main part of the signal continues to the output. The response of the tap outputs is flat, without equalisation. Available in different tap-off attenuation values

### Applications

Collective terrestrial and satellite TV installations with an arborescent or tree-shaped distribution. The arborescent distribution reduces the number of distribution elements and the length of coaxial cable to be installed, even though the distances from head-end to outlet remain constant.

### Characteristics

Protection diodes in all the outputs. Shielded zamak chassis and metal plate. Zamak F-type connectors which form part of the tap-off chassis.

### Accessories

9120039	CM-004	Male F type connector for Ø6.6 mm coaxial.
9080023	MC-302	Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.
9120011	RS-275	F load 75 Ω.
9120027	LF-001	F connector tool.

CODE			9060063	9060064	9060065	9060066
MODEL			DE-201	DE-203	DE-205	DE-207
Connection			F female			
Outputs			2			
Frequency range	MHz		5 - 2300			
Top loss	dB ±1,5	5 - 47 MHz	11.0	16.0	20.5	25.0
①		47 - 862 MHz	11.5	15.5	20.0	25.0
		950 - 2150 MHz	13.5	16.5	22.0	27.0
		2150 - 2300 MHz	14.0	17.0	23.0	28.5
Flatness response	dB		±0,3			
Channel flatness response			±0,1			
Through loss	dB ±0,5	5 - 47 MHz	3.0	2.5	1.5	1.5
②		47 - 862 MHz	2.5	2.0	1.5	1.5
		950 - 2150 MHz	4.0	3.5	3.5	3.5
		2150 - 2300 MHz	4.5	3.5	4.0	4.0
Directivity	dB	5 - 47 MHz	>13	>11	>10	>10
④		47 - 862 MHz	>13	>12	>7	>5
		950 - 2150 MHz	>5	>3	>0	>1
		2150 - 2300 MHz	>5	>2	>0	>0
Isolation	dB	5 - 47 MHz	>33	>42	>52	>60
⑤		47 - 862 MHz	>30	>35	>39	>43
		950 - 2150 MHz	>29	>33	>35	>34
		2150 - 2400 MHz	>26	>36	>32	>32
Return loss	dB	5 - 47 MHz	>11	>12	>16	>15
		47 - 862 MHz	>13	>15	>15	>12
		950 - 2150 MHz	>9	>8	>8	>8
		2150 - 2400 MHz	>8	>8	>8	>8
DC path	V...		24 max			
	mA		500 max			
	Tono		22 KHz/DiSEqC			
Protection index			IP 20			
Units per packing			6			
Packing weight	Kg		0.45			
Packing dimensions	mm		155 x 95 x 40			

# 906 TAP-OFFS AND SPLITTERS



Flat IF tap-offs



DE-401



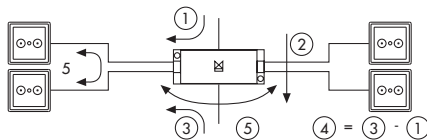
DE-403



DE-405



DE-407



## Description

Tap-offs for terrestrial and satellite TV with four tap outputs, covering the 5MHz to 2,300MHz frequencies. They distribute part of the input signal to their tap outputs while the main part of the signal continues to the output. The response of the tap outputs is flat, without equalisation. Available in different tap-off attenuation values.

## Applications

Collective terrestrial and satellite TV installations with an arborescent or tree-shaped distribution. The arborescent distribution reduces the number of distribution elements and the length of coaxial cable to be installed, even though the distances from head-end to outlet remain constant.

## Characteristics

Protection diodes in all the outputs. Shielded zamak chassis and metal plate. Zamak F-type connectors which form part of the tap-off chassis.

## Accessories

9120039	CM-004	Male F type connector for Ø6.6 mm coaxial.
9080023	MC-302	Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.
9120011	RS-275	F load 75 Ω.
9120027	LF-001	F connector tool.

CODE			9060068	9060069	9060070	9060071
MODEL			DE-401	DE-403	DE-405	DE-407
Connection			F female			
Outputs			4			
Frequency range	MHz		5 - 2300			
Top loss	dB ±1,5	5 - 47 MHz	12.0	15.5	21.0	25.5
①		47 - 862 MHz	12.5	15.5	20.5	25.0
		950 - 2150 MHz	15.0	17.5	22.5	28.5
		2150 - 2300 MHz	16.0	18.0	23.0	30.5
Flatness response	dB		±0,3			
Channel flatness response			±0,1			
Through loss	dB ±0,5	5 - 47 MHz	5.0	2.5	1.5	1.0
②		47 - 862 MHz	4.5	2.5	1.5	1.0
		950 - 2150 MHz	5.5	5.0	1.5	2.5
		2150 - 2300 MHz	6.0	5.5	2.0	3.0
Directivity	dB	5 - 47 MHz	>8	>25	>21	>11
④		47 - 862 MHz	>22	>13	>11	>7
		950 - 2150 MHz	>10	>5	>6	>1
		2150 - 2300 MHz	>7	>5	>5	>0
Isolation	dB	5 - 47 MHz	>20	>18	>16	>15
⑤		47 - 862 MHz	>22	>23	>22	>22
		950 - 2150 MHz	>21	>19	>18	>20
		2150 - 2400 MHz	>21	>21	>18	>19
Return loss	dB	5 - 47 MHz	>10	>10	>10	>12
		47 - 862 MHz	>10	>13	>11	>12
		950 - 2150 MHz	>9	>9	>10	>8
		2150 - 2400 MHz	>8	>9	>9	>7
DC path	V...		24 max			
	mA		500 max			
	Tono		22 KHz/DiSEqC			
Protection index			IP 20			
Units per packing			12			
Packing weight	Kg		1.86			
Packing dimensions	mm		375 x 85 x 67			

# 906 TAP-OFFS AND SPLITTERS



## Flat IF tap-offs



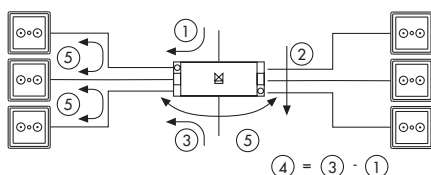
DE-603



DE-605



DE-607



### Description

Tap-offs for terrestrial and satellite TV with six tap outputs, covering the 5MHz to 2,300MHz frequencies. They distribute part of the input signal to their tap outputs while the main part of the signal continues to the output. The response of the tap outputs is flat, without equalisation. Available in different tap-off attenuation values.

### Applications

Collective terrestrial and satellite TV installations with an arborescent or tree-shaped distribution. The arborescent distribution reduces the number of distribution elements and the length of coaxial cable to be installed, even though the distances from head-end to outlet remain constant.

### Characteristics

Protection diodes in all the outputs. Shielded zamak chassis and metal plate. Zamak F-type connectors which form part of the tap-off chassis.

### Accessories

9120039	CM-004	Male F type connector for Ø6.6 mm coaxial.
9080023	MC-302	Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.
9120011	RS-275	F load 75 Ω.
9120027	LF-001	F connector tool.

CODE			9060073	9060074	9060075
MODEL			DE-603	DE-605	DE-607
Connection			F female		
Outputs			6		
Frequency range	MHz		5 - 2300		
Top loss	dB ±1,5	5 - 47 MHz	17.0	21.0	26.0
①		47 - 862 MHz	17.5	21.0	25.0
		950 - 2150 MHz	21.0	24.5	27.5
		2150 - 2300 MHz	21.5	26.5	30.0
Flatness response	dB		±0,3		
Channel flatness response			±0,1		
Through loss	dB ±0,5	5 - 47 MHz	4.0	1.5	1.5
②		47 - 862 MHz	3.5	1.5	1.5
		950 - 2150 MHz	6.0	3.0	3.0
		2150 - 2300 MHz	7.5	3.5	3.5
Directivity	dB	5 - 47 MHz	>14	>12	>16
④		47 - 862 MHz	>14	>10	>7
		950 - 2150 MHz	>0	>0	>0
		2150 - 2300 MHz	>0	>0	>0
Isolation	dB	5 - 47 MHz	>24	>24	>21
⑤		47 - 862 MHz	>22	>24	>20
		950 - 2150 MHz	>20	>20	>21
		2150 - 2400 MHz	>22	>19	>25
Return loss	dB	5 - 47 MHz	>10	>10	>10
		47 - 862 MHz	>10	>10	>11
		950 - 2150 MHz	>7	>8	>9
		2150 - 2400 MHz	>6	>7	>6
DC path	V...		24 max		
	mA		500 max		
	Tono		22 KHz/DiSEqC		
Protection index			IP 20		
Units per packing			12		
Packing weight	Kg		2.88		
Packing dimensions	mm		440 x 155 x 57		

# 906 TAP-OFFS AND SPLITTERS

## IF splitters



DI-602



DI-402



DI-602



DI-302

### Description

Splitters for terrestrial and satellite TV, covering all frequencies from 5MHz to 2,300MHz. They distribute all the input signal in equal parts among their outputs. They have a feed path through any of their outputs to the input. The response of the outputs is flat. Available with 2, 3, 4, 6 or 8 outputs.

### Applications

Individual and collective installations of terrestrial and satellite TV with a star-shaped distribution. They permit power to be fed from a preamplifier or LNB through any of the outputs. In installations with multiswitches, a control voltage can be sent through their outputs.

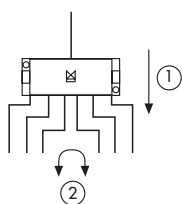
### Characteristics

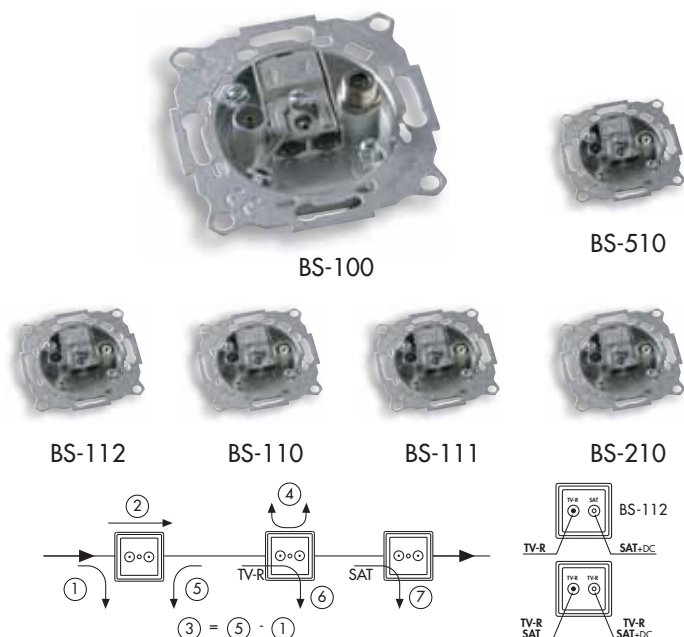
Protection diodes in all the outputs. Shielded zamak chassis and metal plate. Zamak F-type connectors which form part of splitter chassis.

### Accessories

9120039	CM-004	Male F type connector for Ø6.6 mm coaxial.
9080023	MC-302	Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.
9120011	RS-275	F load 75 Ω.
9120027	LF-001	F connector tool.

CODE			9060076	9060096	9060077	9060061	9060062
MODEL			DI-202	DI-302	DI-402	DI-602	DI-802
Connection			F female				
Outputs			2	3	4	6	8
Frequency range	MHz		5 - 2300				
Top loss ①	dB	5 - 47 MHz	4.5	7.5	8.5	10.5	12.5
		47 - 862 MHz	4.5	8.0	8.5	11.5	13.0
		950 - 2150 MHz	6.0	10.5	10.5	15.0	16.5
		2150 - 2300 MHz	6.5	11.0	11.5	16.5	17.5
Flatness response	dB		±0,3				
Channel flatness response			±0,1				
Isolation ②	dB	5 - 47 MHz	>18	>19	>20	>22	>22
		47 - 862 MHz	>20	>20	>23	>23	>22
		950 - 2150 MHz	>18	>20	>20	>20	>20
		2150 - 2400 MHz	>18	>20	>20	>20	>20
Return loss	dB	5 - 47 MHz	>10	>8	>10	>9	>9
		47 - 862 MHz	>10	>10	>13	>10	>9
		950 - 2150 MHz	>10	>10	>12	>10	>10
		2150 - 2400 MHz	>10	>10	>13	>10	>10
DC path	V...		24 max				
	mA		500 max				
	Tono		22 KHz/DiSEqC				
Protection index			IP 20				
Units per packing			12				
Packing weight	Kg		1.45	1.94	1.08	2.42	2.50
Packing dimensions	mm		195 x 115 x 67	180 x 135 x 80	375 x 85 x 67	312 x 122 x 62	





### Description

Outlets for terrestrial and satellite TV with two IEC male and female connectors (except for the BS-100 outlet). They cover frequencies up to 2,400 MHz. They have a DC path from one of their outputs to the input and from the through output in the intermediate outlets to the input.

### Applications

Individual or SMATV installations. Installation as a terminal outlet connected to a tap-off or splitter, or as outlets in series connected to each other. They permit the feeding of a preamplifier or of an LNB through the output. A control voltage can be used in installations with multiswitches.

### Characteristics

Shielded zamak and metal plate chassis. Connection of the coaxial cable by means of screw terminal. Fits in a Ø60 mm box.

### Accessories

- 9070021 EM-201 TV-R/TV-R frontplate for all the models except BS-100 and BS-112 (not supplied with the outlet).
- 9070022 EM-202 TV-R/SAT frontplate for BS-100 and BS-112 (not supplied with the outlet).
- 9120011 RF-075 75 Ω load for screw terminal.
- 9070075 SB-003 Accessory for outdoor mounting.

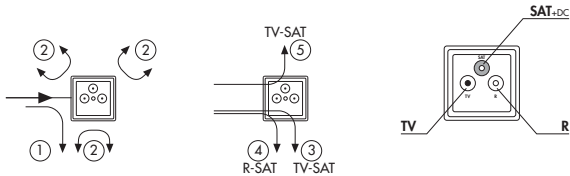
CODE		9070062		9070073		9070068		9070069		9070070		9070071			
MODEL				BS-100		BS-112		BS-110		BS-111		BS-210		BS-510	
Installation				Final								Intermediate			
Connection				Screw terminal and clamp											
Output connectors			C1	IEC male Ø 9.52 mm											
			C2	F female		IEC female Ø 9.52 mm									
Frequency range		MHz	E/S	5 - 2400				5 - 2400							
			C1	5 - 862				5 - 2400							
			C2	930 - 2400				5 - 2400							
Basic loss <div>①</div>		dB ±TOL	FM	0,2 ±0,1				3,7 ±0,3				10,0 ±1,0		14,5 ±0,5	
	TV		1,0 ±0,5				4,0 ±0,5				10,0 ±1,0		14,5 ±1,0		
	SAT		1,2 ±0,6				5,0 ±1,2				12,0 ±2,0		15,0 ±2,0		
Through loss <div>②</div>		dB ±0,5	FM	-								2,5 ±0,5		1,0 ±0,2	
	TV		-								2,5 ±0,7		1,0 ±0,3		
	SAT		-								3,0 ±1,0		2,0 ±1,0		
Directivity <div>③</div>		dB	FM	-								>20.0		>25.5	
	TV		-								>12.0		>13.5		
	SAT		-								>5.0		>5.0		
Isolation <div>④</div>		dB	FM	>45				>20		>15		>45		>13	
	TV		>14				>20		>10		>30		>13		
	SAT		>14				>14		>8		>28		>13		
Selectivity <div>⑥</div> <div>⑦</div>		dB	TV-R	>15				-							
	SAT		>15				-								
Return loss		dB	VR	>25				>16		-		>13		>16	
			FM	>25				>16		>13		>13		>16	
			TV	>14				>16		>12		>12		>16	
			SAT	>10				>9		>9		>12		>16	
DC path		V...		24 max											
		mA		500 max											
		Tono		22 KHz/DiSEqC											
Units per packing				24											
Packing weight		Kg		2.2											
Packing dimensions		mm		305 x 225 x 65											

# 907 OUTLETS

## SAT outlets



BS-102



### Description

Outlets for terrestrial and satellite TV with three male IEC connectors, an IEC female connector and an F-type female connector. They cover frequencies up to 2,300MHz. They allow a feed path via the female F-type connector to the input.

### Applications

Outlets for terrestrial and satellite TV with three male IEC connectors, an IEC female connector and an F-type female connector. They cover frequencies up to 2,300MHz. They allow a feed path via the female F-type connector to the input.

### Characteristics

Shielded zamak and metal plate chassis. Connection of the coaxial cable by means of screw terminal. Includes TV/R/SAT frontplate, surface box and screws for fixing to a wall.

### Accessories

9070021	EM-201	TV-R/TV-R frontplate for all the models except BS-100 and BS-112 (not supplied with the outlet).
9070022	EM-202	TV-R/SAT frontplate for BS-100 and BS-112 (not supplied with the outlet).
9120011	RF-075	75 $\Omega$ load for screw terminal.
9070075	SB-003	Accessory for outdoor mounting.

CODE		9070086	
MODEL		BS-102	
Installation		Final	
Connection		Terminal and clamp	
Output connectors		C1	IEC male $\varnothing$ 9.52 mm
		C2	IEC female $\varnothing$ 9.52 mm
		C3	F female
Frequency range	MHz	I	5 - 2500
		C1	5 -68 / 125 - 862
		C2	87.5 - 108
		C3	950 - 2500
Basic loss (1)	dB $\pm$ TOL	FM	2
		TV	2.7
		SAT	2.3
Isolation (2)	dB	FM	>24.3
		TV	>15
		SAT	>15
Selectivity (3) (4) (5)	dB	FM	>15
		TV	>15
		SAT	>15
Return loss	dB	VR	>7.6
		FM	>10
		TV	>7.6
		SAT	>8.2
DC path	V...		34 max
	mA		500 max
	Tono		22 KHz/DiSEqC
Units per packing		1	
Packing weight		Kg	
Packing dimensions		mm	

# 907 OUTLETS

## SAT outlets for cascades



BS-220



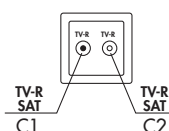
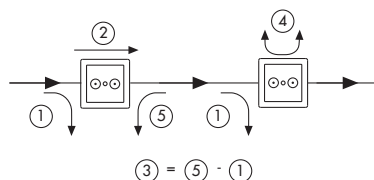
BS-420



BS-620



BS-820



### Description

Outlets for terrestrial and satellite TV with two IEC male and female connectors. They cover frequencies up to 2,400 MHz.

### Applications

SMATV installations. Installation as outlets in series connected to each other. The outlet facilitates the connection of the TV to the distribution and loads the distribution when the TV is not connected.

### Characteristics

Voltage blockage in the output connectors. Shielded zamak and metal plate chassis. Connection of the coaxial cable by means of screw terminal. Fits in a Ø60 mm box.

### Accessories

9070021	EM-201	T TV-R/TV-R frontplate for all the models.
9120011	RF-075	75 Ω load for screw terminal.
9070075	SB-003	Accessory for outdoor mounting.

CODE	9070004			9070005		9070006		9070008	
MODEL			BS-220	BS-420		BS-620		BS-820	
Installation			Final	Intermediate					
Connection			Screw terminal and clamp						
Output connectors		C1	IEC male Ø 9.52 mm						
		C2	IEC female Ø 9.52 mm						
Frequency range	MHz	E/S	5 - 2400						
		C1	5 - 2400						
		C2	5 - 2400						
Basic loss ①	dB ±TOL	FM TV SAT	11,0 ±1,0 11,0 ±1,0 11,5 ±1,5	16,5 ±1,0 16,5 ±1,0 17,5 ±1,5		21,0 ±1,0 21,0 ±1,0 22,5 ±2,0		31,0 ±1,0 31,0 ±1,0 35,0 ±4,5	
Through loss ②	dB ±TOL	FM TV SAT	- - -	0,9 ±0,3 0,9 ±0,3 1,4 ±0,6					
Directivity ③	dB	FM TV SAT	- - -	>10 >10 >10				>10 >10 >5	
Isolation ④	dB	FM TV SAT	>15 >15 >17	>15 >15 >15					
Return loss	dB	FM TV SAT	>24 >24 >14	>15 >15 >14					
Units per packing			24						
Packing weight	Kg		2.2						
Packing dimensions	mm		305 x 225 x 65						



# 907 OUTLETS

## Outlets



BM-100



BM-700



BM-111



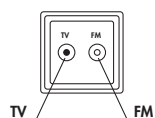
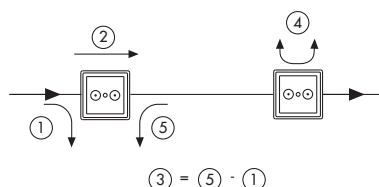
BM-101



BM-200



BM-500



### Description

Outlets for terrestrial TV with two IEC male and female connectors. They cover frequencies up to 862 MHz.

### Applications

Individual or MATV installations. Installation as a terminal outlet connected to a tap-off or splitter, or as outlets in series connected to each other. The outlet facilitates the connection of the TV to the distribution and loads the distribution when the TV is not connected.

### Characteristics

Voltage blockage in the output connectors. Shielded zamak and metal plate chassis. Connection of the coaxial cable by means of screw terminal. Fits in a Ø60 mm box.

### Accessories

9070021	EM-201	T TVR/TV-R frontplate for all the models.
9120011	RF-075	75 Ω load for screw terminal.
9070075	SB-003	Accessory for outdoor mounting.

CODE			9070037	9070039	9070038	9070040	9070041	9070042
MODEL			BM-100	BM-111	BM-101	BM-200	BM-500	BM-700
Installation			Final			Intermediate		
Connection			Screw terminal and clamp					
Output connectors		C1	IEC male Ø 9.52 mm					
		C2	IEC female Ø 9.52 mm					
Frequency range	MHz	I/O	5 - 862			13 - 862	5 - 862	
		C1	5 - 862			13 - 862	5 - 862	
		C2	5 - 862			13 - 862	5 - 862	
Basic loss ①	dB ±TOL	FM	10,0 ±0,7	10,0 ±0,7	6,0 ±0,5	25,0 ±1,5	30,0 ±0,2	34,0 ±2,0
		DAB	10,0 ±1,5	10,0 ±1,5	6,0 ±0,5	25,0 ±1,5	30,0 ±0,2	34,0 ±2,0
		VHF	4,0 ±1,5	1,5 ±1,0	6,0 ±0,5	8,0 ±0,7	11,0 ±1,0	16,0 ±1,0
		UHF	3,0 ±0,5	0,5 ±0,2	5,5 ±0,7	8,0 ±0,7	10,5 ±1,0	15,5 ±1,0
Through loss ②	dB ±TOL	FM	-		6,5 ±0,5	2,0 ±0,3	1,0 ±0,2	0,7 ±0,2
		VHF	-		6,5 ±0,7	2,0 ±0,5	1,1 ±0,3	0,7 ±0,2
		UHF	-		5,5 ±0,7	2,0 ±0,5	1,3 ±0,4	0,9 ±0,3
Directivity ③	dB	FM	-		0	>12	>25	>21
		TV	-		0	>9	>13	
Isolation ④	dB	FM	>14	>9	>5.5	>16	>20	>21
		TV	>14	>9	>5.5	>15	>18	>19
Return loss	dB	FM TV	>18 >10	>12 >12	>6.0 >5.5	>12 >12	>18 >15	>20 >16
Units per packing			24					
Packing weight	Kg		2.2					
Packing dimensions	mm		305 x 225 x 65					





BC-100



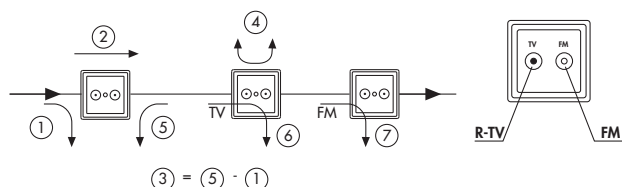
BC-110



BC-200



BC-500



### Description

Outlets for terrestrial TV with two IEC male and female connectors. Radio and TV outputs separated by filters. Designed for use in cable TV networks. They cover frequencies between 5 and 1000 MHz.

### Applications

Cable TV networks requiring the filtering of radio and TV signals at the outlet base. Installation as a terminal outlet connected to a tap-off or splitter or as outlets in series connected to each other. The outlet base facilitates the connection of the TV to the distribution and loads the distribution when the TV is not connected.

### Characteristics

Voltage blockage in the output connectors with a 2 KV insulation. Shielded zamak and metal plate chassis. Connection of the coaxial cable by means of screw terminal. Fits in a Ø60 mm box.

### Accessories

9070020	EM-200	TV/R frontplate (not supplied with the outlet).
9120011	RF-075	75 Ω load for screw terminal.
9070075	SB-003	Accessory for outdoor mounting.

CODE			9070043	9070046	9070044	9070045
MODEL			BC-100	BC-110	BC-200	BC-500
Installation			Final		Intermediate	
Connection			Screw terminal and clamp			
Output connectors		C1	IEC male Ø 9.52 mm			
		C2	IEC female Ø 9.52 mm			
Frequency range	MHz	I/O				
		C1	5 - 68 / 118 - 1000			
		C2	87.5 - 108.0			
Basic loss ①	dB ±TOL	R FM TV	0,3 ±0,1 1,1 ±0,3 0,9 ±0,3	5,0 ±0,5 6,0 ±1,0 5,5 ±0,7	11,0 ±1,0 11,5 ±1,0 10,0 ±1,5	17,0 ±2,0 17,0 ±2,0 15,0 ±2,0
Through loss ②	dB ±TOL	FM VHF UHF	- - -		1,0 ±0,2 1,0 ±0,2 1,4 ±0,4	0,8 ±0,2 0,7 ±0,2 1,0 ±0,3
Directivity ③	dB	FM TV	- -		>25 >13	>21 >12
Isolation ④	dB	FM TV	>18 >16			
Selectivity	dB	FM TV	>10 >18			
Return loss	dB	R	>18			
		FM	>16	>20	>18	>20
		TV	>18			>20
Isolation	KV		-			
Chroma-luminance delay	ns		<10			
Units per packing			24			
Packing weight	Kg		2.2			
Packing dimensions	mm		305 x 225 x 65			

# 907 USER ACCESS POINTS

User access points



PT-401



PT-201

## Description

User access points for terrestrial and satellite TV. They have two inputs and several outputs. One of the inputs remains connected to the outputs while the other input is permanently connected to a 75  $\Omega$  load. They cover the 5 to 2,400 frequencies. Available in 2 or 4 outputs and with different isolation values between outputs.

## Applications

Designed for TV installations with two coaxial cables in which distribution to the dwellings is performed with a single coaxial cable. The signal which is distributed to the dwelling is selected by changing the connections of the coaxial cables at the user access point.

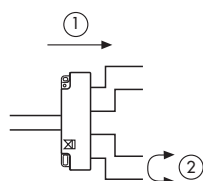
## Characteristics

Voltage blockage in the output connectors. Shielded zamak and metal plate chassis. F type connectors in machined zamak which form part of the chassis. All the connectors are placed on the lower part to facilitate connection. Reduced dimensions.

## Accessories

9120039	CM-004	Male F type connector for $\varnothing 6.6$ mm coaxial cable.
9080023	MC-302	Male F connector to screw onto RG-6 coaxial, $\varnothing 7.0$ mm.
9120011	RF-075	75 $\Omega$ load for screw terminal.
9120027	LF-001	F connector tool

CODE		9070082		9070083	
MODEL			PT-201	PT-401	
Connection			F female		
Outputs	MHz		2	4	
Frequency range	MHz		5 - 2,400		
Splitter loss <div>①</div>	dB ±1,0	5-13 MHz	5.0 - 5.0	14.0 - 9.5	
		13-47 MHz	5.0 - 4.5	9.5 - 9.5	
		47-862 MHz	4.5 - 4.0	9.5 - 8.0	
		950-2150 MHz	4.0 - 4.0	8.0 - 10.5	
		2150-2400 MHz	4.0 - 4.5	10.5 - 12.5	
Flatness response	dB		±0,3	±0,5	
Isolation <div>②</div>	dB	5-13 MHz	>9	>14	
		13-47 MHz	>13	>14	
		47-862 MHz	>13	>12	
		950-2150 MHz	>15	>8	
		2150-2400 MHz	>16	>6	
Return loss	dB	5-13 MHz	>13	-	
		13-47 MHz	>14	>11	
		47-862 MHz	>15	>11	
		950-2150 MHz	>13	>11	
		2150-2400 MHz	>16	>9	
Units per packing			6		
Packing weight	Kg		0.45		
Packing dimensions	mm		155 x 95 x 40		



# 907 USER ACCESS POINTS

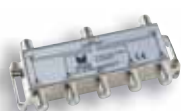
## User access points



PT-800



PT-510



PT-600



PT-210



PT-310



PT-410

### Description

User access points for terrestrial and satellite TV. They have two inputs and several outputs. One of the inputs remains connected to the outputs while the other input is permanently connected to a 75  $\Omega$  load. They cover the 5 to 2,300 frequencies. Specifically designed to work with return path. Available with 6 and 8 outputs.

### Applications

Designed for TV installations with two coaxial cables in which distribution to the houses is performed with a single coaxial cable. The signal which is distributed to the house is selected by changing the connections of the coaxial cables at the user access point.

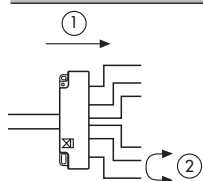
### Characteristics

Voltage blockage in the output connectors. Shielded zamak and metal plate chassis. F type connectors in machined zamak which form part of the chassis. Reduced dimensions.

### Accessories

- 9120039 CM-004 Male F type connector for  $\varnothing 6.6$  mm coaxial cable.
- 9120011 RF-075 75  $\Omega$  load for screw terminal.
- 9120027 LF-001 F connector tool.

CODE			9070101	9070102	9070103	9070104	9070084	9070085
MODEL			PT-210	PT-310	PT-410	PT-510	PT-600	PT-800
Connection			F female					
Outputs	MHz		2	3	4	5	6	8
Frequency range	MHz		5 - 2300					
Tap loss ①	dB $\pm 1,0$	5-13 MHz	3.5	7.5	8.5	11.5	11.5	12.5
		47-862 MHz	4.0	7.0	8.5	11.0	11.0	12.5
		950-2150 MHz	5.5	10.0	10.5	14.5	14.5	16.0
		2150-2300 MHz	6.0	10.5	11.5	15.0	15.5	16.5
Flatness response	dB		$\pm 0,3$					
Channel flatness response	dB		$\pm 0,1$					
Isolation ⑤	dB	5-13 MHz	>16	>19	>20	>26	>26	>22
		47-862 MHz	>28	>23	>29	>26	>25	>25
		950-2150 MHz	>22	>20	>16	>25	>24	>18
		2150-2400 MHz	>20	>25	>18	>27	>27	>17
Return loss	dB	5-13 MHz	>15	>10	>10	>10	>10	>10
		47-862 MHz	>15	>14	>12	>12	>12	>11
		950-2150 MHz	>11	>12	>9	>9	>8	>10
		2150-2400 MHz	>9	>12	>9	>9	>7	>10
Protection index			IP 20					
Units per packing			12	12		12		12
Packing weight	Kg		1.01	1.37		1.98		2.40
Packing dimensions	mm		225 x 70 x 90	250 x 85 x 90		260 x 125 x 75		260 x 125 x 90



# 906/907 ACCESSORIES



SAT outlet

<b>9070105</b>	
<b>BS-113</b>	
Units per packaging	90
Packing weight	9,50 Kg
Packing dimensions	310 x 205 x 250mm

Outlet for terrestrial and satellite TV without brackets, for mounting in flush-mounted box with screws. The electrical characteristics are the same as those of the BS-112 model (see page 340).



Terminal outlet with frontplate

<b>9070087</b>	
<b>BS-101</b>	
Units per packaging	1
Packing weight	0,10 Kg
Packing dimensions	34 x 71 x 71 mm

Terminal filtered outlet with frontplate BS-100 + EM-202.



Mast splitter

<b>9020041</b>	
<b>MM-200</b>	
Units per packaging	24
Packing weight	4,10 Kg
Packing dimensions	310 x 230 x 185mm

2 input multiplexer which can be used as a 2 output terrestrial TV splitter, for mast installation (see page 44).



Male type F connector

<b>9120039</b>	
<b>CM-004</b>	
Units per packaging	100
Packing weight	0,340 Kg
Packing dimensions	80 x 50 x 15 mm

Shielded male F connector to screw onto shielded RG-6 coaxial cable of Ø 6.6mm



Male type F connector

<b>9080023</b>	
<b>MC-302</b>	
Units per packaging	1
Packing weight	0,49 Kg
Packing dimensions	210 x 200 x 60 mm

Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.



F load

<b>9120011</b>	
<b>RS-275</b>	
Units per packaging	10
Packing weight	0,03 Kg
Packing dimensions	80 x 50 x 15 mm

F load of 75  $\Omega$ , to load the unused inputs and outputs

# 906/907 ACCESSORIES



Load for screw terminal

<b>9060050</b>	
<b>RF-075</b>	
Units per packaging	50
Packing weight	0,03 Kg
Packing dimensions	120 x 40 x 10 mm

75  $\Omega$  load for screw terminal to load the unused inputs and outputs.



F connector tool

<b>9120027</b>	
<b>LF-001</b>	
Units per packaging	3
Packing weight	0,05
Packing dimensions	80 x 40 x 20 mm

F connector tool, facilitates the connection of the equipment.



Accessory for outdoor use

<b>9060026</b>	
<b>SD-003</b>	
Units per packaging	4
Packing weight	0,12 Kg
Packing dimensions	280 x 97 x 30 mm

Accessory for outdoor mounting of FD-FP-FI tap-offs or splitters.



F male connector

<b>9120039</b>	
<b>CM-004</b>	
Units per packaging	100
Packing weight	0,340 Kg
Packing dimensions	80 x 50 x 15 mm

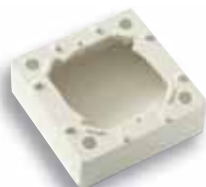
Shielded male F connector to screw onto shielded RG-6 coaxial cable of  $\varnothing$  6.6mm



Accessory for outdoor use

<b>9060060</b>	
<b>SD-100</b>	
Units per packaging	1
Packing weight	0,14 Kg
Packing dimensions	150 x 115 x 50 mm

Accessory for mast and outdoor mounting of FD-FP-FI tap-offs or splitters.



Accessory for surface mounting

<b>9070075</b>	
<b>SB-003</b>	
Units per packaging	24
Packing weight	1,15 Kg
Packing dimensions	255 x 175 x 135 mm

Accessory for mounting outlets on a surface.

# 906/907 ACCESSORIES



Frontplate

<b>9070020</b>	
<b>EM-200</b>	
Units per packaging	24
Packing weight	0,48 Kg
Packing dimensions	190 x 85 x 85 mm

TV/R frontplate for BM-BC outlets.



Frontplate

<b>9070021</b>	
<b>EM-201</b>	
Units per packaging	24
Packing weight	0,48 Kg
Packing dimensions	190 x 85 x 85 mm

TV-R/TV-R frontplate for all the BS outlet models except BS-100 and BS-112.



Frontplate

<b>9070022</b>	
<b>EM-202</b>	
Units per packaging	24
Packing weight	0,48 Kg
Packing dimensions	190 x 85 x 85 mm

TV-R/SAT frontplate for BS-100 and BS-112 outlet bases.



Customised front plate

<b>9070024</b>	
<b>EM-210</b>	
Units per packaging	72
Packing weight	1,44 Kg
Packing dimensions	248 x 185 x 144 mm

TV/R customised front plate for outlet BM and BC.



Customised front plate

<b>9070025</b>	
<b>EM-211</b>	
Units per packaging	72
Packing weight	1,44 Kg
Packing dimensions	248 x 185 x 144 mm

TV-R/TV-R customised front plate for all BS outlet models except BS-100 and BS-112.



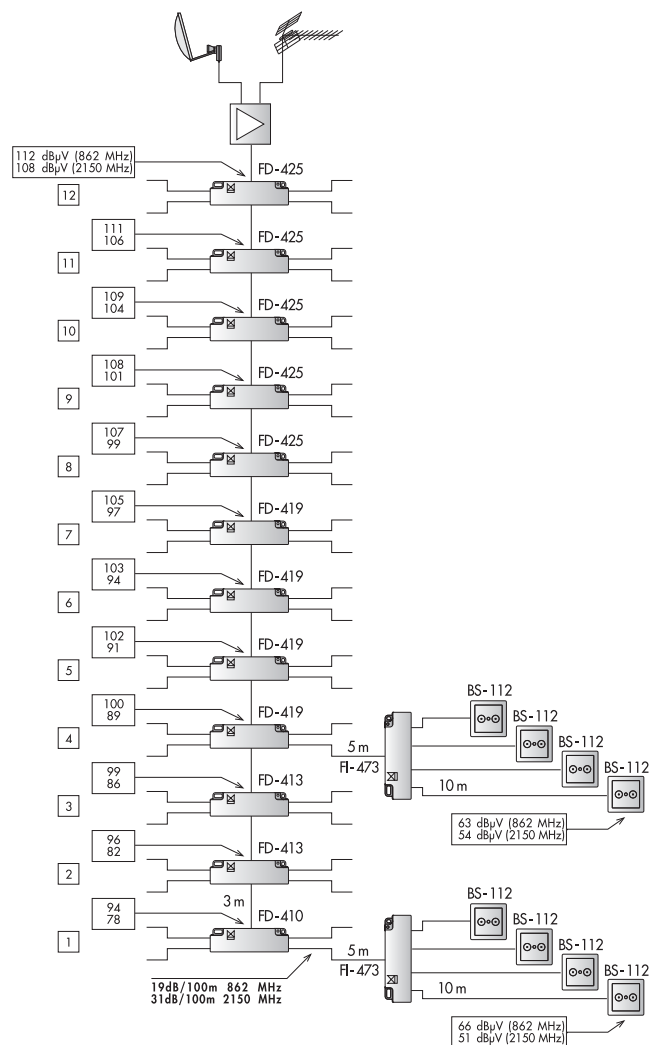
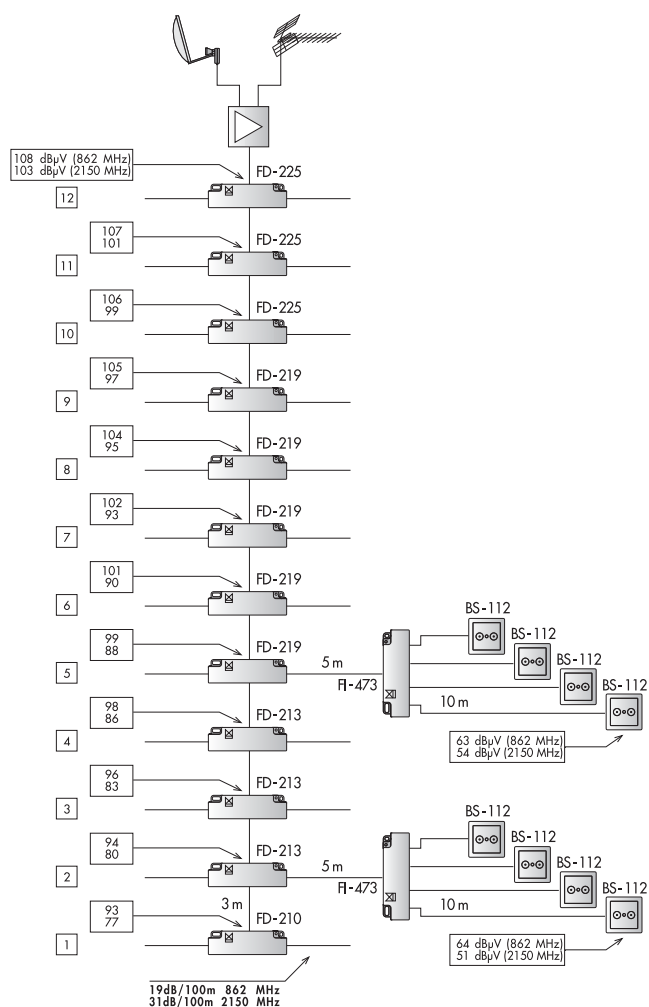
Customised front plate

<b>9070027</b>	
<b>EM-212</b>	
Units per packaging	72
Packing weight	1,44 Kg
Packing dimensions	248 x 185 x 144 mm

TV-R/SAT customised front plate for BS-100 and BS-112 outlet bases.

## SMATV installation with equalised IF tap-offs

Tap-offs with different attenuations are used to compensate the levels at the different outlets. In buildings with fewer floors, the indicated tap-offs are used on the lower floors, and the necessary head-end level will be that which is indicated on the input of the tap-off. The levels are indicated on the weakest outlets.

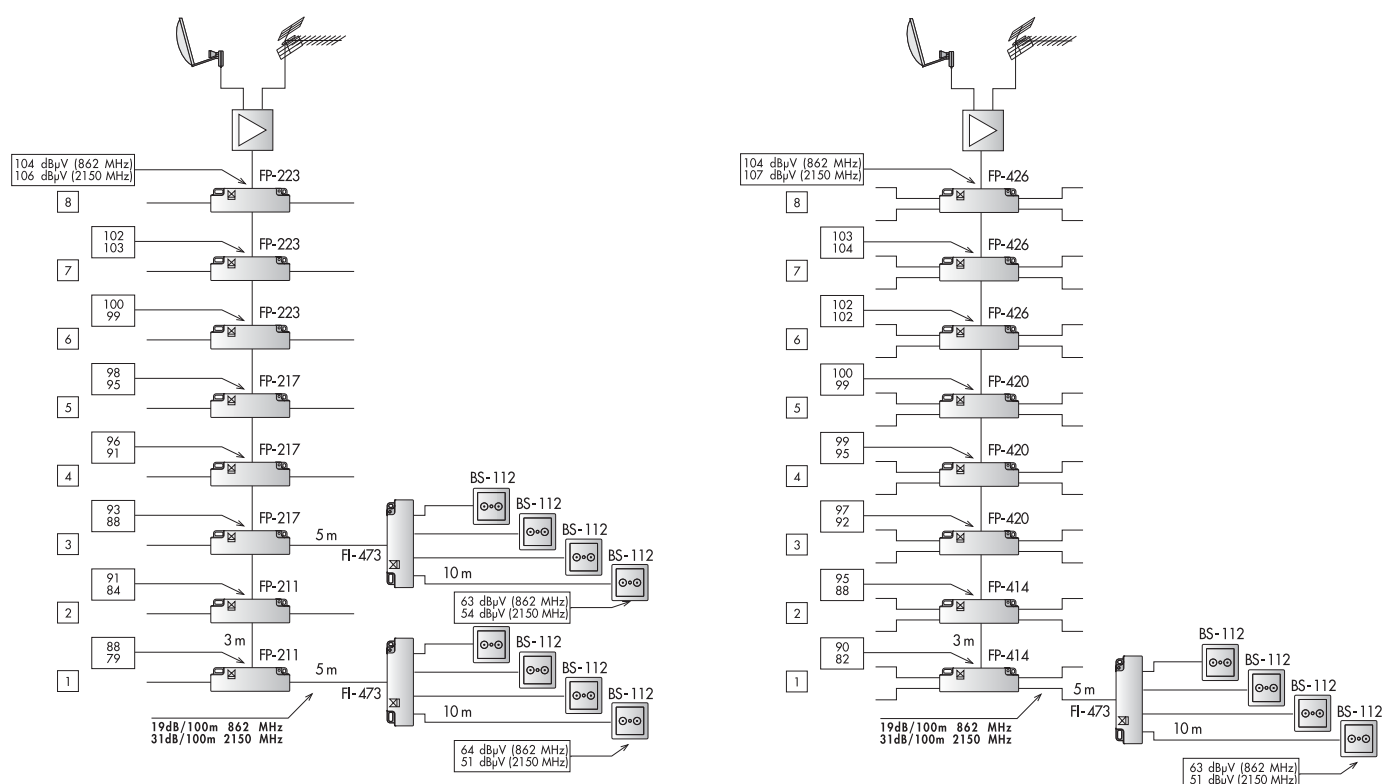


# 906 INSTALLATION EXAMPLES

## SMATV installations with flat IF tap-offs



Tap-offs with different attenuations are used to compensate the levels at the different outlets. In buildings with fewer floors, the indicated tap-offs are used on the lower floors, and the necessary head-end level will be that which is indicated on the input of the tap-off. Compared with the equalised IF tap-offs, these installations require a lower terrestrial TV level but a higher satellite TV level. The levels are indicated on the weakest outlets.

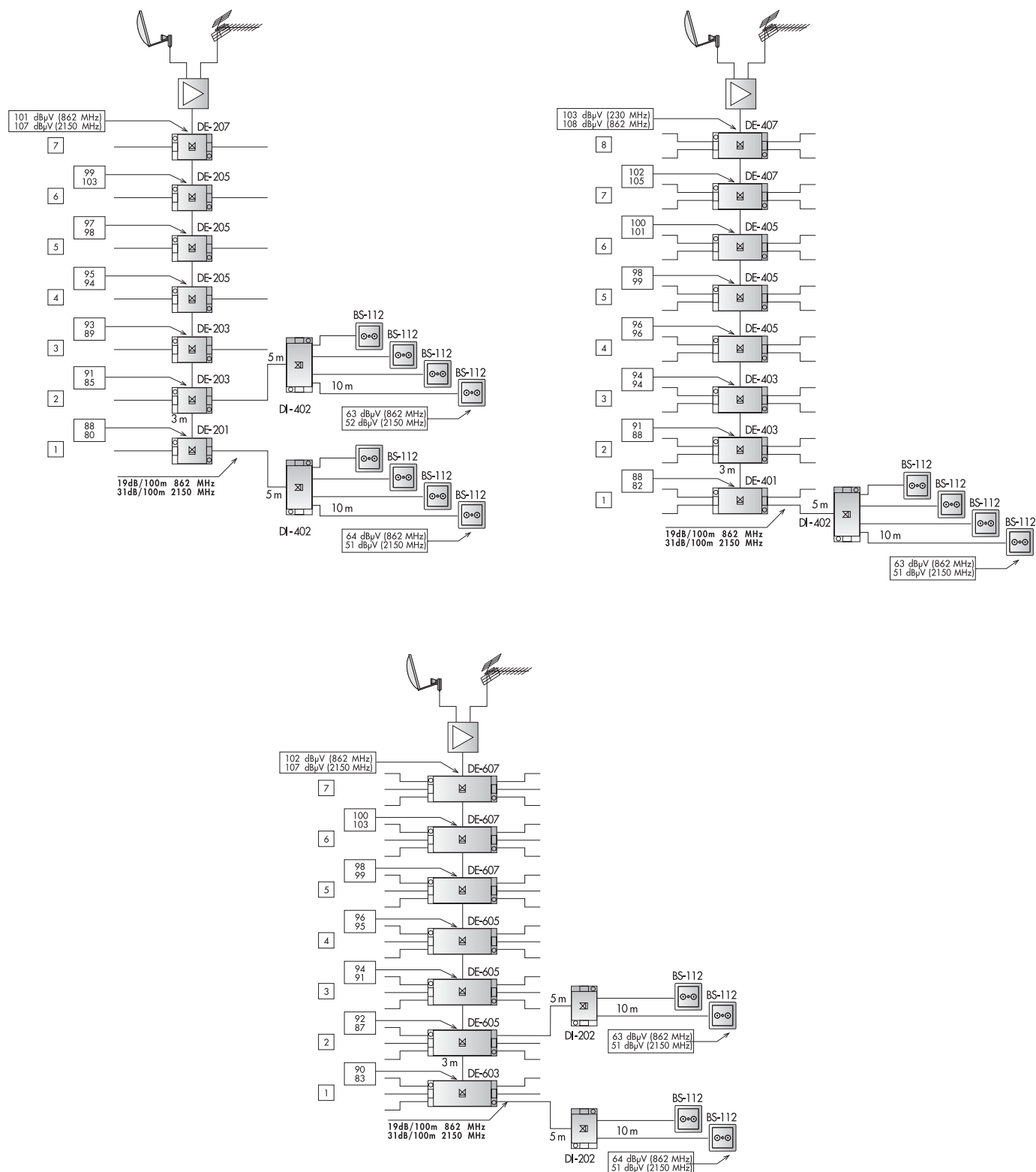




# 906 INSTALLATION EXAMPLES

## SMATV installation with flat IF tap-offs

Tap-offs with different attenuations are used to compensate the levels at the different outlets. In buildings with fewer floors, the indicated tap-offs are used on the lower floors, and the necessary head-end level will be that which is indicated on the input of the tap-off. Compared with the equalised IF tap-offs, these installations require a lower terrestrial TV level but a higher satellite TV level. The levels are indicated on the weakest outlets.

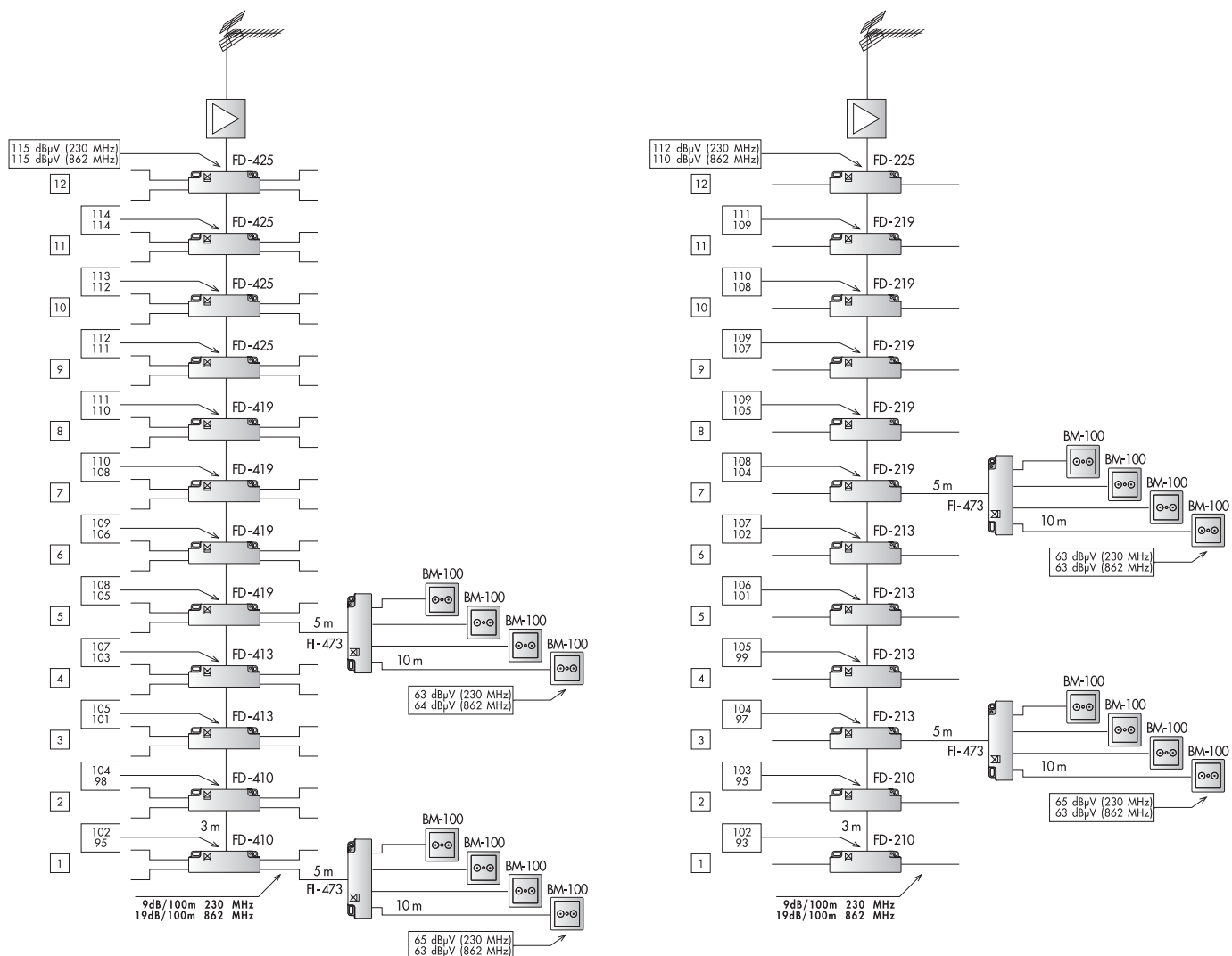


# 906

## INSTALLATION EXAMPLES

### MATV installation with equalised IF tap-offs

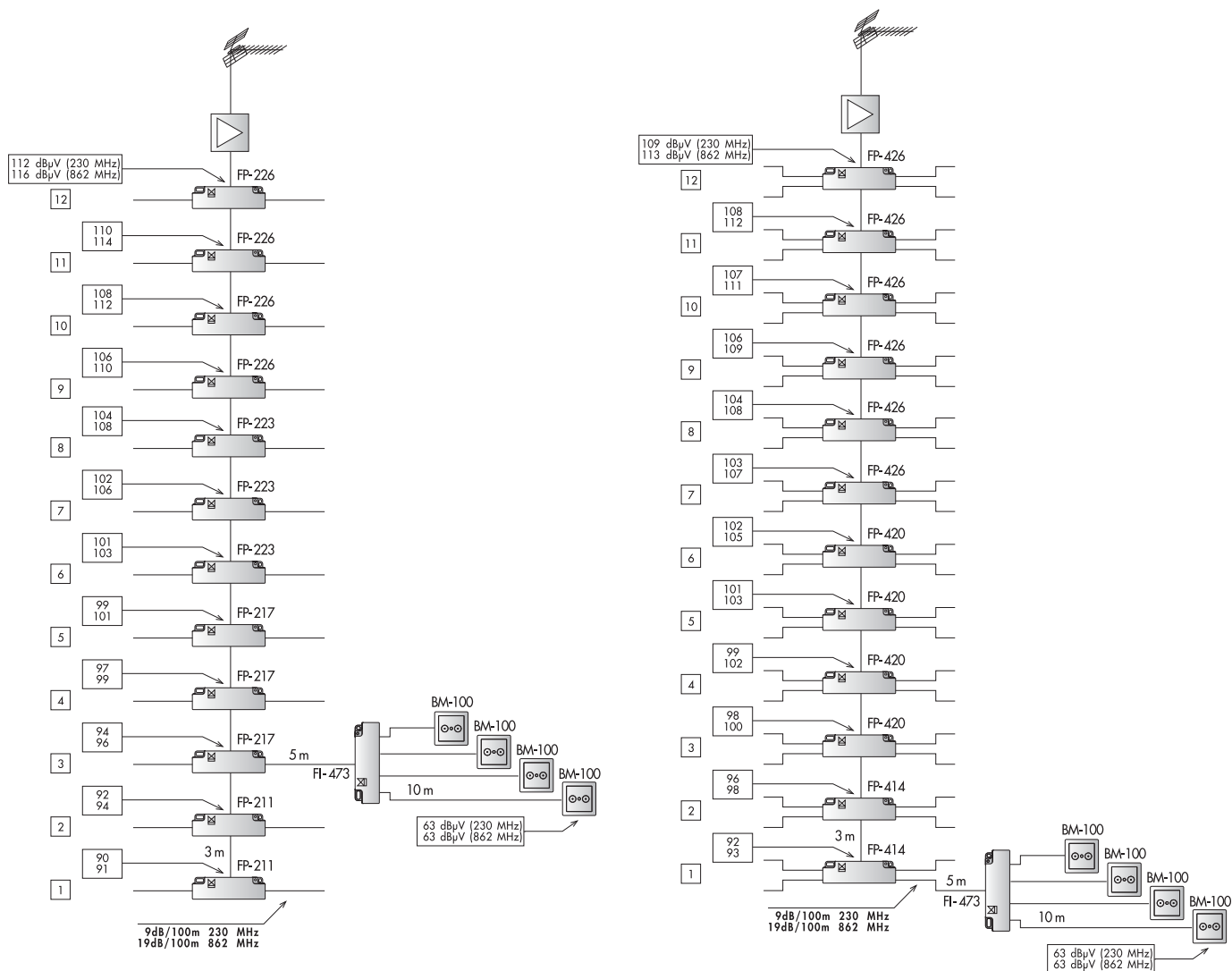
Only the terrestrial TV band is distributed, even though TV-SAT tap-offs and splitters are used. Tap-offs with different attenuations are used to compensate the levels at the different outlets. In buildings with fewer floors, the indicated tap-offs are used on the lower floors, and the necessary head-end level will be that which is indicated on the input of the tap-off. The levels are indicated on the weakest outlets.



# 906 INSTALLATION EXAMPLES

## MATV installation with flat IF tap-offs

Only the terrestrial TV band is distributed, even though TV-SAT tap-offs and splitters are used. Tap-offs with different attenuations are used to compensate the levels at the different outlets. In buildings with fewer floors, the indicated tap-offs are used on the lower floors, and the necessary head-end level will be that which is indicated on the input of the tap-off. The levels are indicated on the weakest outlets.

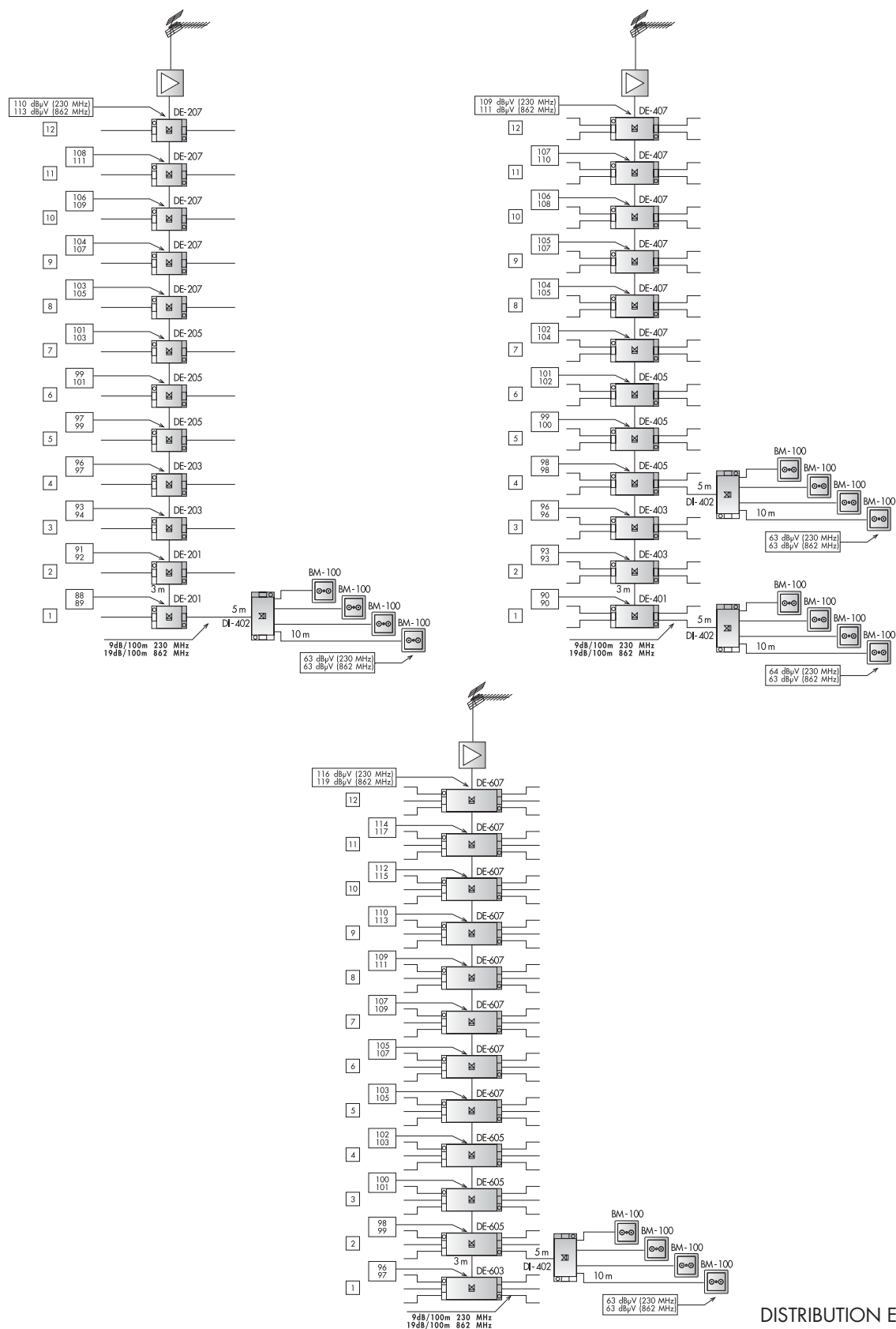


## 906

## INSTALLATION EXAMPLES

## MATV installation with equalised IF tap-offs

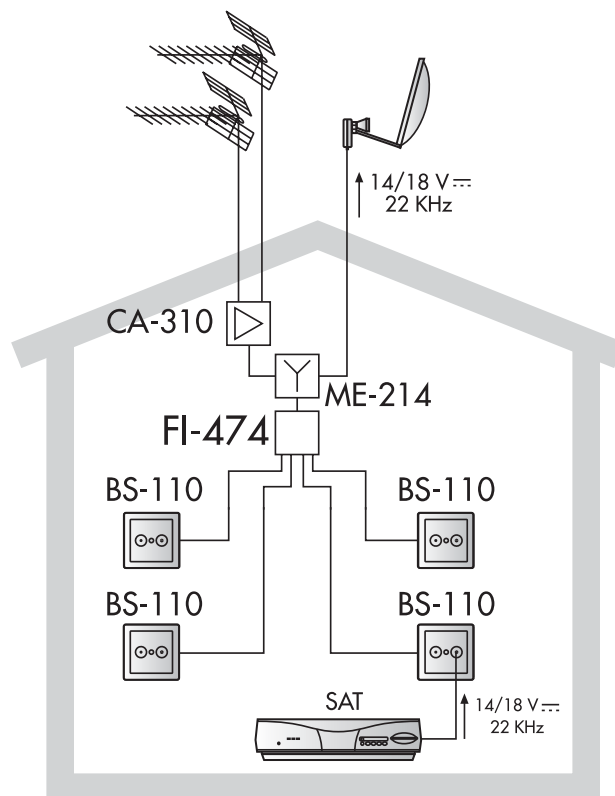
Only the terrestrial TV band is distributed, even though TV-SAT tap-offs and splitters are used. Tap-offs with different attenuations are used to compensate the levels at the different outlets. In buildings with fewer floors, the indicated tap-offs are used on the lower floors, and the necessary head-end level will be that which is indicated on the input of the tap-off. The levels are indicated on the weakest outlets.



# 907 INSTALLATION EXAMPLES

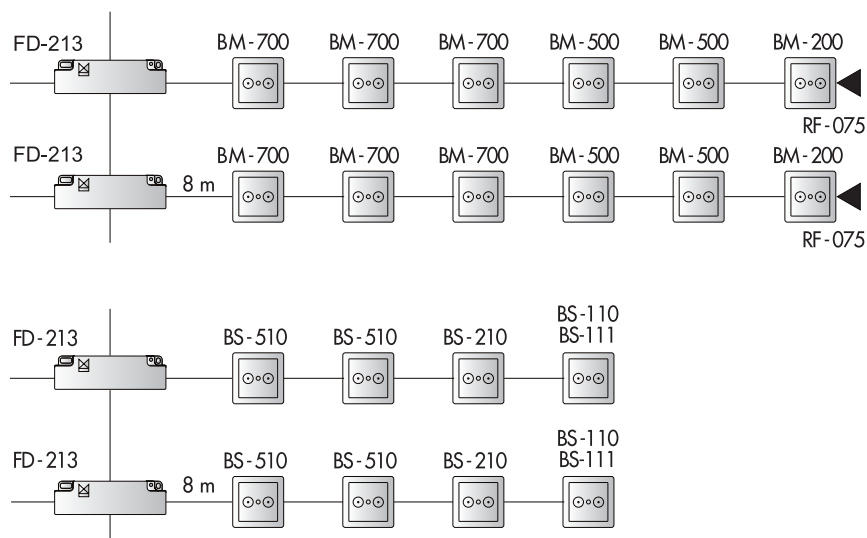
## Individual star-shaped SMATV installation

Individual installation for a single SAT receiver located on any of the outlets of the installation. An IF splitter is used to distribute the signal to all the outlets. The distributor has a DC path which permits the voltage feeding of the LNB. If more than one SAT receiver is installed the control signals of the LNB of the receivers will suffer interference.



## Distribution with outlets in series

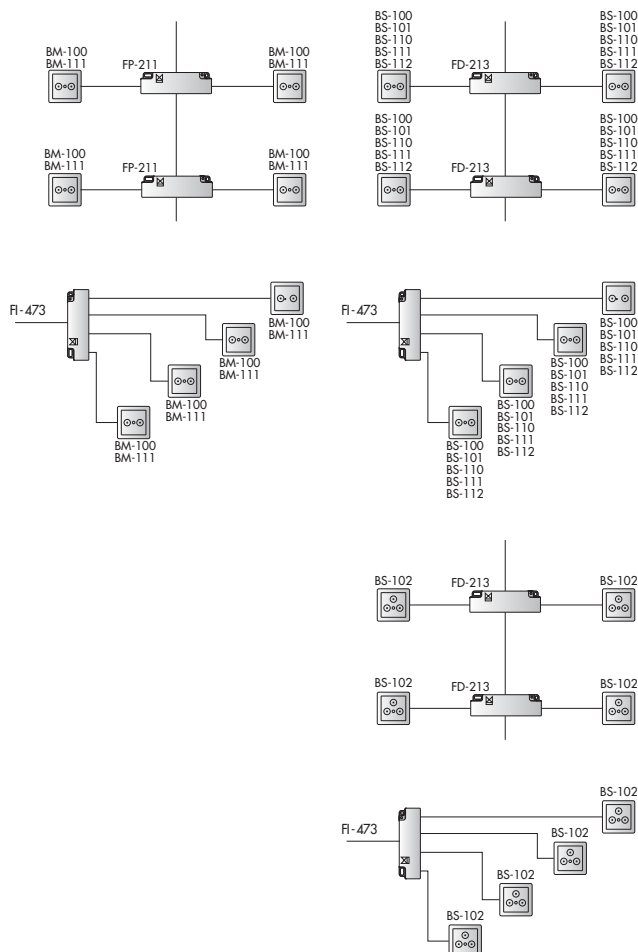
In distributions with outlets in series (outlets in cascade within the same house) several intermediate outlets are used, with input and output, and a terminal outlet.



# 907 INSTALLATION EXAMPLES

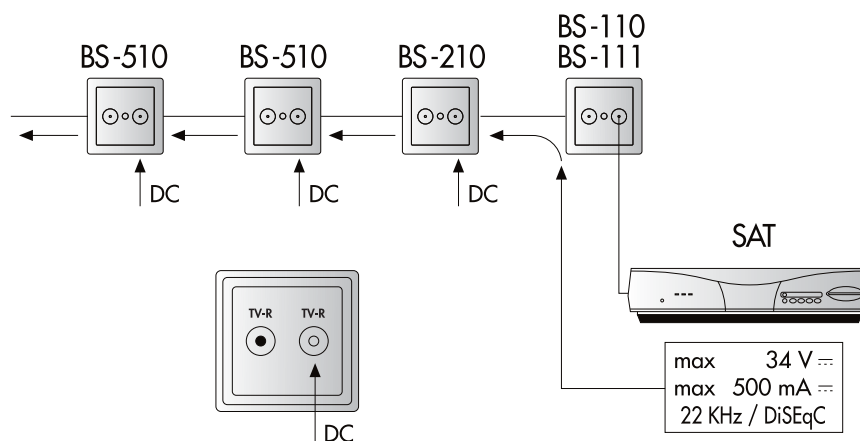
## Distribution with terminal outlets

The terminal outlets must be connected to a tap-off or splitter in order to achieve a high isolation among all the outlets of the installation, preventing problems of one outlet from affecting the rest of the installation.



## DC path in the TV-SAT outlets

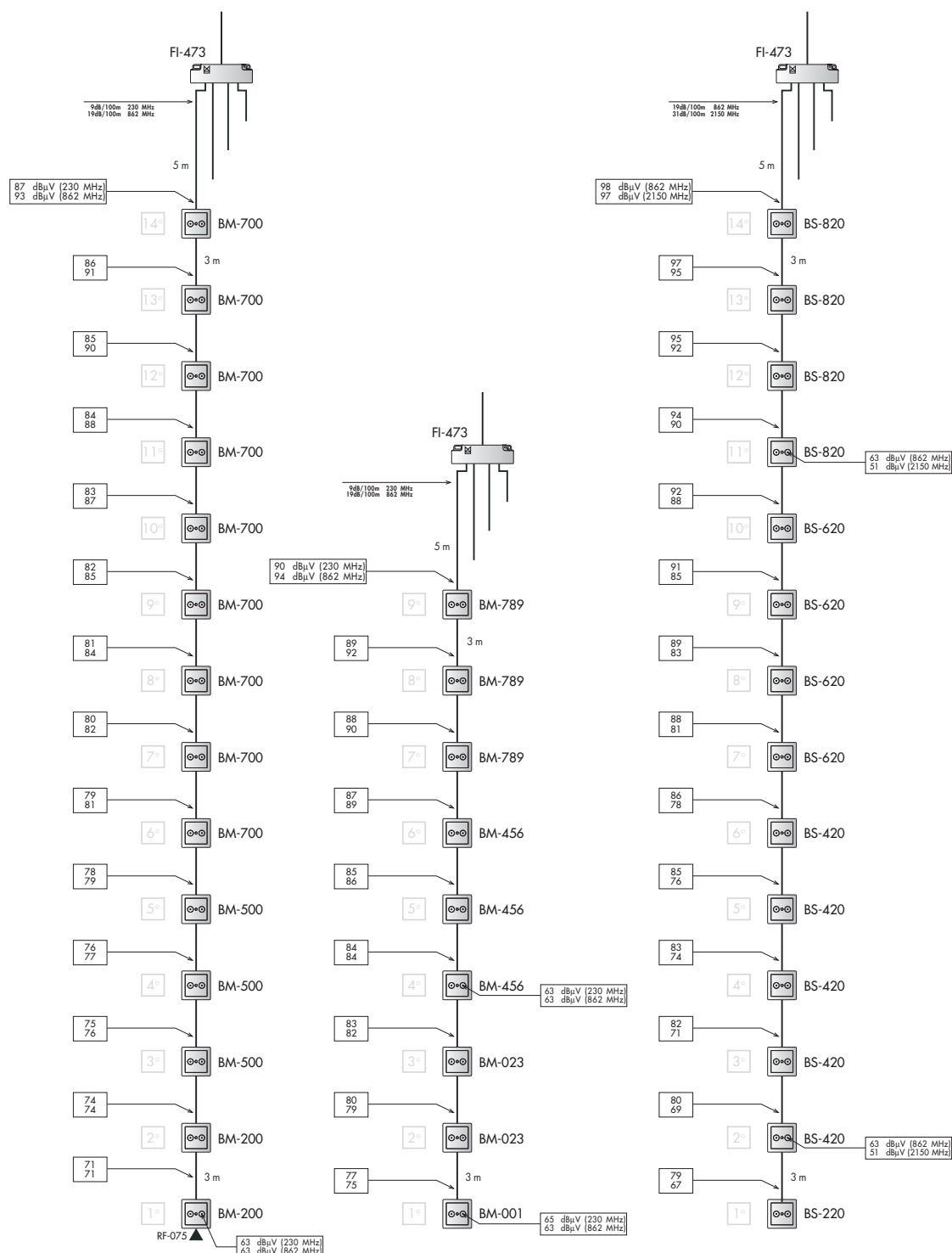
The TV-SAT outlets have a DC path through one of their outputs to the input, and from the through output of the intermediate bases to the input.



# 907 INSTALLATION EXAMPLES

## Distribution with outlets in cascade

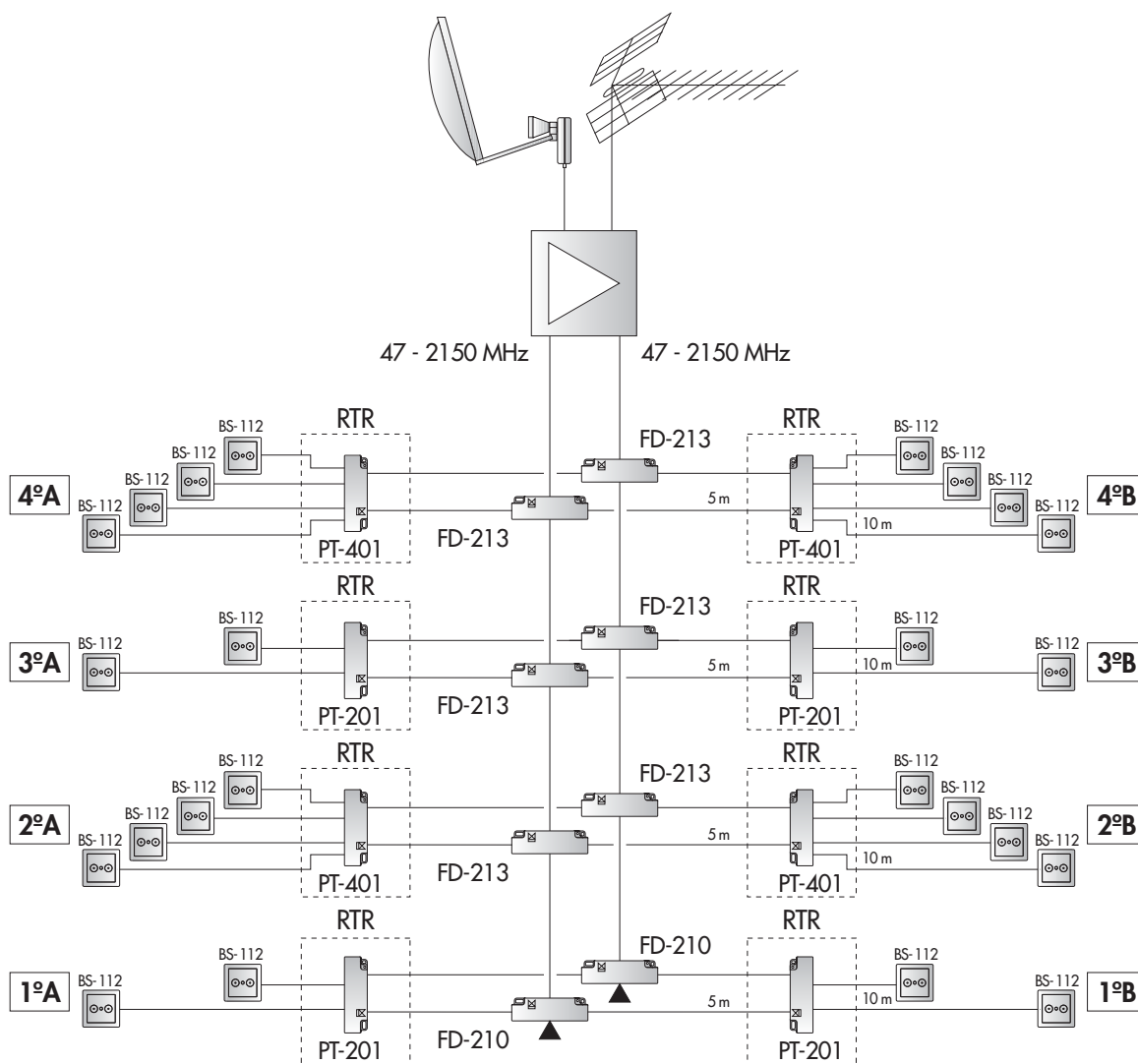
In distributions with outlet bases in cascade several intermediate outlet bases are used, with input and output, and a terminal outlet. This type of installation is not recommended due to the difficulties it causes for the maintenance of the installation, it is not always possible to access one of the houses to check the installation.



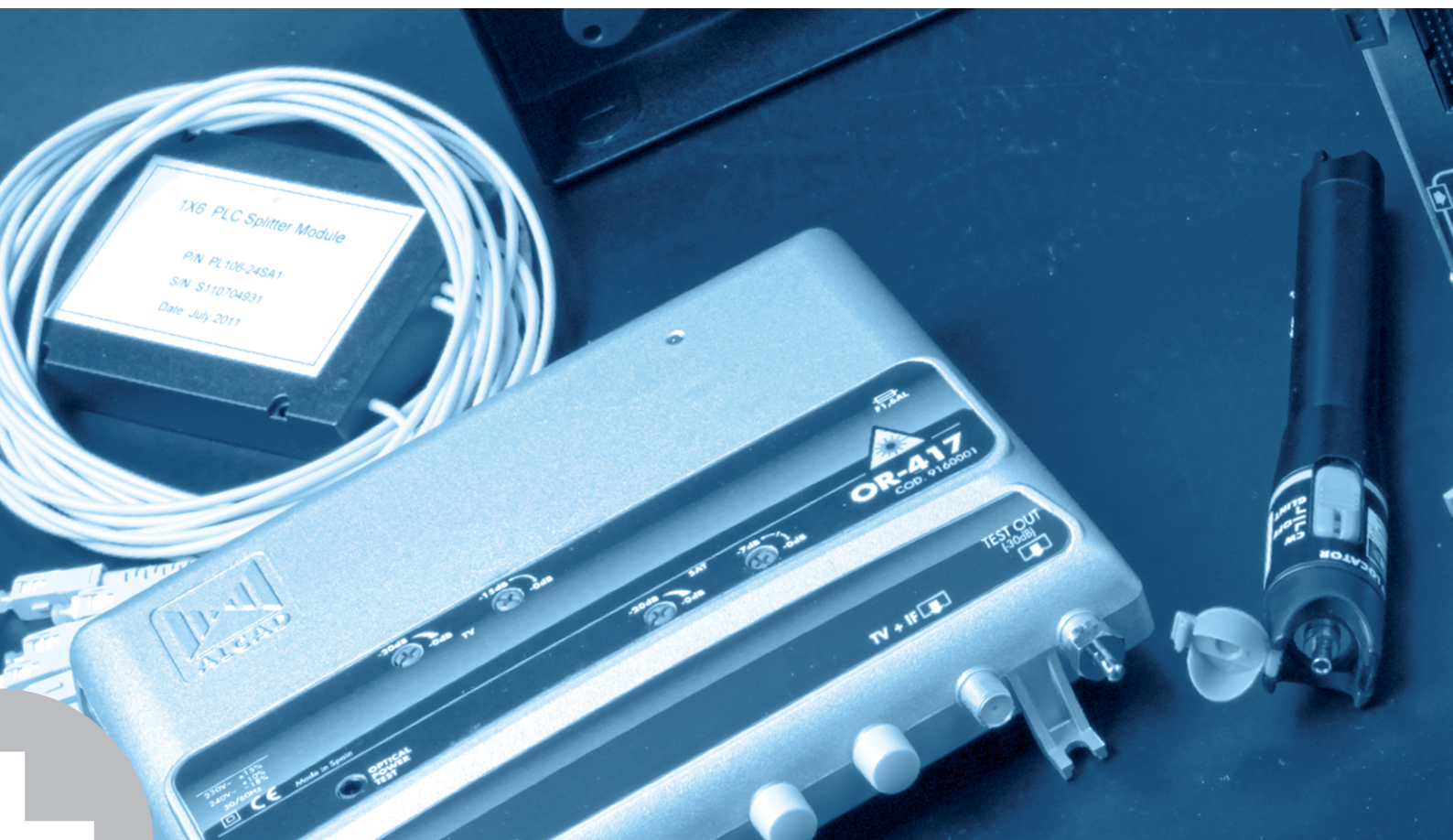
# 907 INSTALLATION EXAMPLES

## Double coax installation with user access points

SMATV installation with double coaxial cable for distribution. Installation with two coaxial cables in which distribution to the dwellings is carried out with only one coaxial cable. The signal which is distributed to the dwelling is selected by changing the coaxial cable connections at the user access point. User access points have a distributor with several outputs.









## Fibre optic

Optical transmitter and receiver equipments for analogue and digital TV signals, terrestrial and satellite. Connection and distribution Fibre optic accessories and elements.



### Description

Optical transmitter and receiver equipments, for analogue and digital TV signals, terrestrial and satellite. The transmitter equipment receives the TV signals via coaxial cable, and transmits them via single-mode optical fibre. And the receiver equipment receives the TV signals via single-mode optical fibre, transmits them via coaxial cable.

### Applications

Large-scale collective terrestrial and satellite TV installations in which, due to the topology of the installation, the distribution is not possible using coaxial cable.

### Characteristics

F-type connectors for the input of the TV signals in the terrestrial band and the satellite IF band. Female SC/APC connector for optical fibre.

### Accessories

See page 367.

## 916

## OPTICAL TRANSMITTER EQUIPMENT 916-OT



RF-OF transceiver



OT-402

**Description**

Optical transmitter for analogue and digital TV signals, terrestrial and satellite. The equipment receives the TV signals in the terrestrial and satellite bands in IF via coaxial cable, and transmits them via single-mode optical fibre with a wavelength ( $\lambda$ ) of 1310 nm, by means of Class 1 laser.

**Applications**

Large-scale collective terrestrial and satellite TV installations in which, due to the topology of the installation, the distribution is not possible using coaxial cable. The optical modulation is easily adjustable with two independent controls of the OMI for terrestrial and satellite TV.

**Characteristics**

Modular equipment. Zamak chassis with metallic side panels. F-type connectors for the input of the TV signals in the terrestrial band and the satellite IF band. Female SC/APC connector for optical fibre.

**Accessories**

9160006	OAT-106	Optical attenuator, 6 dB SC/APC.
9160010	OPC-101	Single-mode optical fibre patchcord, 1m, SC/APC.
9160011	OPC-103	Single-mode optical fibre patchcord, 3m, SC/APC.
9120039	CM-004	Male F type connector for Ø6.6 mm coaxial cable.
9080023	MC-302	Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.
9120011	RS-275	F load 75Ω.

CODE		9160000			
MODEL		OT-402			
HF inputs					
Connection		F female			
Frequency range	Band	TV		SAT	
	MHz	46-862		950-2150	
Input level	dB $\mu$ V	72..87			
Flatness	dB	$\pm 0,7$		$\pm 1,0$	
Return loss	dB	$>12$		$>10$	
Input impedance	$\Omega$	75			
Test input	dB $\pm$ TOL	0 $\pm 1,0$			
HF connectors		75			
Optical output					
Optical output power	mW	4 (6 dBm)			
Wavelength	nm	1310			
Return loss	dB	$>50$			
Optical connector		SC/APC 8°			
Power supply	V $\overline{--}$	+3,3	+5,2	+12	+24
	mA	0	120	500	0
Units per packing		1			
Packing weight	Kg	1,4			
Packing dimensions	mm	270 x 170 x 38			



OR-417

**Description**

Optical receiver for analogue and digital TV signals, terrestrial and satellite. The equipment receives the terrestrial and satellite TV signals via single-mode optical fibre with a wavelength ( $\lambda$ ) of 1310 nm and transmits them by means of a single coaxial cable to the terrestrial and IF band. Equipped with an indicator light to show the input levels of the optical signal. Each band has a gain control and a variable equaliser. As they are independent they facilitate level adjustment. Fed by a built-in power supply.

**Applications**

Large-scale collective terrestrial and satellite TV installations in which, due to their topology, it is not possible to perform the distribution using coaxial cable. The receivers act as distribution or head-end devices in those points from which the signal will be distributed via coaxial cable.

**Characteristics**

Manufactured in zamak with a galvanized cover to obtain maximum shielding. Separate housings for the power supply unit and the high frequency circuit. F-type connectors for the input of the TV signals in the terrestrial band and the satellite IF band. Female SC/APC connector for fibre optic.

**Accessories**

9160006	OAT-106	Optical attenuator, 6 dB SC/APC.
9160010	OPC-101	Single-mode optical fibre patchcord, 1m, SC/APC.
9160011	OPC-103	Single-mode optical fibre patchcord, 3m, SC/APC.
9120039	CM-004	Male F type connector for Ø6.6 mm coaxial cable.
9080023	MC-302	Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.
9120011	RS-275	F load 75Ω.

CODE		9160001	
MODEL		OR-417	
Optical input			
Optical input level range	dBm	-10..+1	
Wavelength	nm	1310..1550	
Return loss	dB	>50	
Optical connector		SC/APC 8°	
HF output			
Number of RF outputs		1	
Frequency range	Band	TV	SAT
	MHz	46-862	950-2150
Output level	dBμV	119 (DIN 4500B)	120 (IMD3 -35dB)
Gain control	dB	15	
Flatness	dB	±1,5	±2,0
Slope control	dB	15	7 Switchable
Carrier to noise ratio	dB	52	36
Return loss	dB	>12	>10
Input impedance	Ω	75	
Test input	dB ±TOL	-30 ±1,0	
HF connectors		F	
Power supply	V	230 ±20%	50/60 Hz
		240 +15% -20%	
	W	15	
Units per packing		1	
Packing weight	Kg	1,92	
Packing dimensions	mm	220 x 200 x 60	



# 912 OPTICAL TRANSMITTER EQUIPMENT 916-OT



## Power Supply units



FA-310



FA-312

### Description

Switching power supply, which permits the installation of an amplifier and up to 6 modules on the support frame. Power supply with a flat cable of 20 lines for different feed voltages.

### Applications

Required for feeding the modules of the equipment.

### Characteristics

Protected against power surges, overloads and short-circuits. Zamak chassis with side grills to facilitate proper ventilation. Supplied with power cable.

CODE		9120046				9120168			
MODEL		FA-310				FA-312			
Output voltage	V $\cdots$	+3.3	+5.2	+12.0	+24	+3.3	+5.2	+12.0	+24
	mA	5500	2500	1500	500	10000	5000	1500	500
Peak to peak ripple voltage	mV	>50				100			
Mains voltage	V $\sim$	230 $\pm$ 20% 50/60 Hz		240 $\begin{smallmatrix} +15\% \text{ 50/60 Hz} \\ -20\% \text{ 50/60 Hz} \end{smallmatrix}$		90..264 $\text{ 50/60 Hz}$			
	W	72				85			
Operating temp. close to equipment	$^{\circ}\text{C}$	-10..+65							
Room tmperature with/without fan	$^{\circ}\text{C}$	-10..+55/+45							
Protection index		IP 20C							
Units per packaging		1							
Packing weight	Kg	1.43				1.65			
Packing dimensions	mm	270 x 165 x 60							

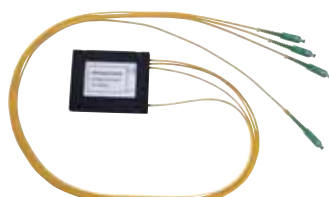
See table on page 454 for more information.

# 916 DISTRIBUTION ELEMENTS FOR FIBRE OPTIC 916-OS

## Optical Splitters



OS-002



OS-003



OS-004



OS-008

### Description

Optical fibre splitters with 2, 3, 4 and 8 outputs. The optical signal is distributed equally to all the outputs. The input and the outputs are separated and clearly identified.

### Applications

Collective terrestrial and satellite TV installations where it is necessary to distribute the signal to several points via optical fibre.

### Characteristics

Manufactured in ABS plastic. They incorporate the lengths of single-mode optical fibre cable, 1m long and 3mm across. Male SC/APC connectors.

### Accessories

- 9160012 OWB-001 Wall box with 4 SC/APC single-mode simplex ports (max: 6 ports)
- 9160013 OWB-002 Wall box with 9 SC/APC single-mode simplex ports (max: 12 ports)
- 9160008 OAD-101 SC/APC simplex optical adaptor.

CODE		9160002	9160003	9160004	9160005
MODEL		OS-002	OS-003	OS-004	OS-008
Outputs		2	3	4	8
Connection		SC/APC 8°			
Wavelength $\lambda$	nm	1310 - 1550			
Insertion loss		< 3,7	< 5,5	< 7,2	< 10,4
Return loss	dB	50			
Units per packing		1			
Packing weight	Kg	0,195	0,200	0,205	0,235
Packing dimensions	mm	380 x 197 x 40			

# 916

## ACCESSORIES FOR FIBRE OPTIC

### Elements for Rack 19"



Distribution tray with 24 SC/APC connectors for 19" cabinet. Manufactured in cold-rolled steel. Guides for easy extraction.

Optical patch panel, 24 ports simplex SC/APC singlemode for Rack 19"

CODE		9160014
MODEL		ODP-003
Number of ports		24
Adaptor		SC/APC female
Insertion loss	dB	$\leq 0,2 \pm 0,1$
Return loss	dB	$> 60$
Material		Rolled steel
Assembly		19" Rack, 1U
Operating temperature	°C	-20..+40
Units per packaging		1
Packing weight	Kg	2,93
Packing dimensions	mm	515 x 280 x 50



Wall support for three 19" trays. Manufactured in galvanised steel. Plugs included for fixing to a wall.

Wall support of galvanized steel for rack 19"

CODE		9300057
MODEL		RWS-003
Format		19"
Height		3U
Material		Galvanized steel
Thickness	mm	2
Units per packaging		1
Packing weight	Kg	1,07
Packing dimensions	mm	485 x 280 x 141



# 916

## ACCESORIES FOR FIBRE OPTIC

### Wallboxes



Wallboxes, SC/APC

Wall box with 4 or 9 SC/APC single-mode simplex ports (6 or 12 ports max.). Manufactured in cold-rolled steel. Included are accessories for classifying and identifying the fibres inside.

CODE	9160012	9160013
MODEL	OWB-001	OWB-002
Connection	SC/APC 8° female	
Nº of connections	6 max	12 max
Dimensions	mm 180 x 40 x 178	310 x 50 x 230
Units per packaging	1	1
Packing weight	Kg 1,125	2,260
Packing dimensions	mm 245 x 110 x 230	360 x 110 x 295



Optical distribution cabinet

Wall cabinets for segregating optical fibre cable with 24 and 72 fibres. Included are accessories for classifying and identifying the fibres inside.

CODE	9160016	9160017
MODEL	OWB-004	OWB-005
Connection	SC/APC 8° female	
Nº of connections	24 max	72 max
Dimensions	mm 430 x 380 x 70	450 x 415 x 160
Units per packaging	1	1
Packing weight	Kg 4.02	12.56
Packing dimensions	mm 445 x 400 x 70	470 x 427 x 180



Optical distribution box

Wall boxes which can accommodate splices or handle the distribution of optical fibres. Manufactured in storm-resistant plastic with IP65 protection rating. Included are accessories for classifying and identifying the fibres inside.

CODE	9160015	9160026	9160030
MODEL	OWB-003	OWB-006	OWB-008
Connection	SC/APC 8° female		
Nº of connections	4 max	24 max	12 max
Dimensions	mm 230 x 205 x 60	320 x 260 x 90	210 x 175 x 40
Units per packaging	1	1	1
Packing weight	Kg 1,125	2,260	0.47
Packing dimensions	mm 245 x 110 x 230	360 x 110 x 295	212 x 180 x 50



Optical distribution box

Wall box for the distribution of up to 8 optical fibres for surface canalizations. Manufactured in storm-resistant plastic with IP65 protection rating. Included are accessories for classifying and identifying the fibres inside.

CODE	9160029
MODEL	OWB-007
Connection	-
Nº of connections	8 max
Dimensions	mm 220 x 170 x 80
Units per packaging	1
Packing weight	Kg 0.70
Packing dimensions	mm 240 x 200 x 95

# 916

## ACCESSORIES FOR FIBRE OPTIC

### Distribution elements



Optical attenuator with 6dB loss. Male SC/APC to female SC/APC connection.

Optical attenuator, 6 dB SC/APC 1240 a 1600 nm

CODE	9160006	
MODEL		OAT-106
Connection		SC/APC 8° female
Attenuation	dB	6
Units per packaging		1
Packing weight	Kg	0.015
Packing dimensions	mm	90 x 60



Optical adapter: female SC/APC to female SC/APC. Enables the connection of two optical fibres with male SC/APC connectors.

Optical adaptor SC/APC simplex

CODE	9160008	
MODEL		OAD-101
Connection		SC/APC
Attenuation	dB	6
Units per packaging		1
Packing weight	Kg	0.010
Packing dimensions	mm	90 x 60



Mechanical SC/APC optical connector. Enables the connection of single-mode 900 µm optical fibre without assembly tools.

Mechanical SC/APC connector for F.O., 900 µm

CODE	9160028	
MODEL		OCN-000
Connector type		SC
Polish type		APC
Fibre type		Single-mode
Insertion loss	dB	≤ 0.4 (Typ.)
Reflection	dB	50
Operating Temp.	°C	- 40 ~ + 70
Units per packaging		1
Packing weight	Kg	0.01
Packing dimensions	mm	110 x 110 x 5



Universal mechanical optical fibre splicer. Enables splicing of 250 µm to 900 µm optical fibres without a fusion splicer.

Mechanical splice for FO, universal 250 to 900 µm

CODE	9160007	
MODEL		OSP-001
Ø Fibre	µm	250-900
Units per packaging		1
Packing weight	Kg	0,010
Packing dimensions	mm	90 x 60



SC/ACP single-mode optical fibre pigtail, 2m long x 900 µm.

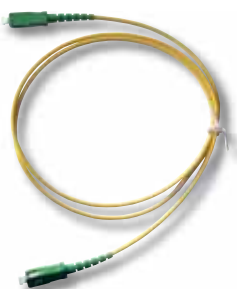
Pigtail, singlemode SC/APC 2 m

CODE	9160009	
MODEL		OPT-102
Connection		SC/APC 8° male
Fibre type		singlemode
Dimensions (length/Ø)	mm	2000/0,9
Units per packaging		1
Packing weight	Kg	0,010
Packing dimensions	mm	170 x 260

# 916

## ACCESSORIES FOR FIBRE OPTIC

### Distribution elements



Single-mode optical fibre patchcord, 1m and 3m long x 3mm across. SC/APC connectors.

Patchcord, singlemode SC/APC

CODE		9160010	9160011
MODEL		OPC-101	OPC-103
Connection		SC/APC 8° male	
Fibre type		singlemode	
Dimensions (length/Ø)	mm	1000/3	3000/3
Units per packaging		1	1
Packing weight	Kg	0.020	0.030
Packing dimensions	mm	175 x 260	



Termination box for 2 optical fibres with 2 SC/APC optical adapters.

Optical Fibre termination box

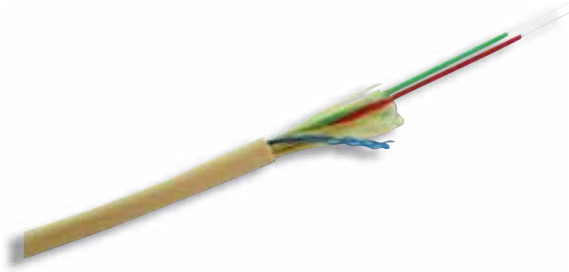
CODE		9160018
MODEL		OTB-000
Number of ports		2
Adaptor		SC/APC female
Insertion loss	dB	≤ 0,2 ±0,1
Return loss	dB	> 60
Material		Fire retardant ABS plastic
Operating Temp.	°C	-20..+40
Units per packaging		1
Packing weight	Kg	0,06
Packing dimensions	mm	85 x 85 x 35

# 916 OPTICAL FIBRE CABLES

## Tight buffered fibres

### Description

Cable with 2 single-mode optical fibres adjusted for indoors, G.657A2 type. LSZH sheathing. Single-tube cable which protects the 2 optical fibres. Protection against pulling and twisting thanks to its inner nylon guide and to its inner lining of aramide yarn.

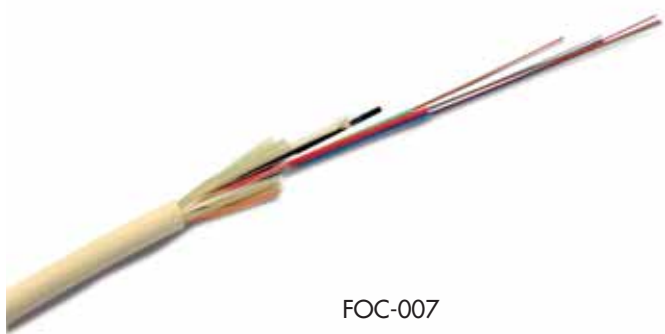


FOC-000

CODE		9160020
MODEL		FOC-000
Fibre type		Tight-buffered single-mode
Number of fibres		2
Tight-buffered fibre	mmØ	0.9
External cover diameter		3.8 ± 0.2
External cover		Ivory white, LSZH
Strength members		Aramid yarns
Tensile strength permanent/Inst.	N	350 / 500
Crush strength	N/100 mm	800
Minimum bending radius	mm	18
Operating temperature	°C	-10...+60
Cable weight	Kg/Km	14
Standards		UIT-T G.657A2, EN 187000, IEC 60793, IEC 60794
Units per packaging		500
Packing weight	Kg	7.7
Packing dimensions	mm	345 x 345 x 195

# 916 OPTICAL FIBRE CABLES

## Loose tube fibres



### Description

Cable with 24 and 48 loose single-mode optical fibres for indoors, G.657A2 type. LSZH sheathing. Multi-tube cable which protects the fibres in groups of 6. Protection against pulling and twisting thanks to its inner lining of aramide yarn.

CODE		9160023	9160025
MODEL		FOC-005	FOC-007
Fibre type		Loose tube single-mode	
Number of fibres		24	48
Number of Fibres per tube		6	8
Number of tubes/ Number of actives tubes		6 / 4	6 / 6
External cover diameter	mmØ	7.8 ± 0.2	
External cover material		LSZH thermoplastic	
External cover colour		Ivory white	
Strength members		Aramid yarns	
Tensile strength permanent/Inst.	N	1000	
Crush strength	N/100 mm	1000	
Minimum bending radius	mm	78 ± 0.2	
Operating temperature	°C	-30 .. +70	
Cable weight	Kg/Km	58	60
Standards		UIT-T G.657A2, EN 187000, EN 50265, EN 50267, EN 61034	
Units per packaging		500	
Packing weight	Kg	34.60	36.80
Packing dimensions	mm	595 x 595 x 385	605 x 605 x 390

# 916 OPTICAL FIBRE CABLES

## Loose tube fibres - outdoor

### Description

Cable with 4 loose single-mode optical fibres for exterior. LSZH sheathing. Single-tube cable which protects the 4 fibres. Protection against pulling and twisting thanks to its inner reinforcement of corrugated steel.

CODE		9160021
MODEL		FOC-201
Fibre type		Loose tube single-mode
Number of fibres		4
Armour		Corrugated steel
External cover material		Linear low density polyethylene
External cover diameter	mmØ	9.6 ± 0.3
External cover colour		Black
Strength members		Fibreglass water-bloquing
Tensile strength permanent/Inst.	N	1500 / 2700
Crush strength	N/100 mm	2000
Minimum bending radius	mm	192
Operating temperature	°C	-40 .. +70
Cable weight	Kg/Km	88
Standards		EN 187000 CEI 60794
Units per packaging		500
Packing weight	Kg	51
Packing dimensions	mm	650 x 650



Optical power meter

9180002	
OEQ-000	
Units per packaging	1
Packing weight	1.690 Kg
Packing dimensions	320 x 360 x 165 mm

Optical power measurement kit, consisting of a visual locator of faults in optical continuity, a laser light source and an optical power meter for the 1310/1490/1550 nm wavelengths. (See page 414).



Fibre optic fusion splicing kit

9180003	
OEQ-100	
Units per packaging	1
Packing weight	8.430 Kg
Packing dimensions	525 x 360 x 305 mm

Optical fibre fusion kit, consisting of an optical fusion splicer with core alignment, and a precision optical fibre stripper and cutter. (See page 420).



Fibre optic splicing kit

9180004	
OEQ-200	
Units per packaging	1
Packing weight	2.100 Kg
Packing dimensions	330 x 270 x 185mm

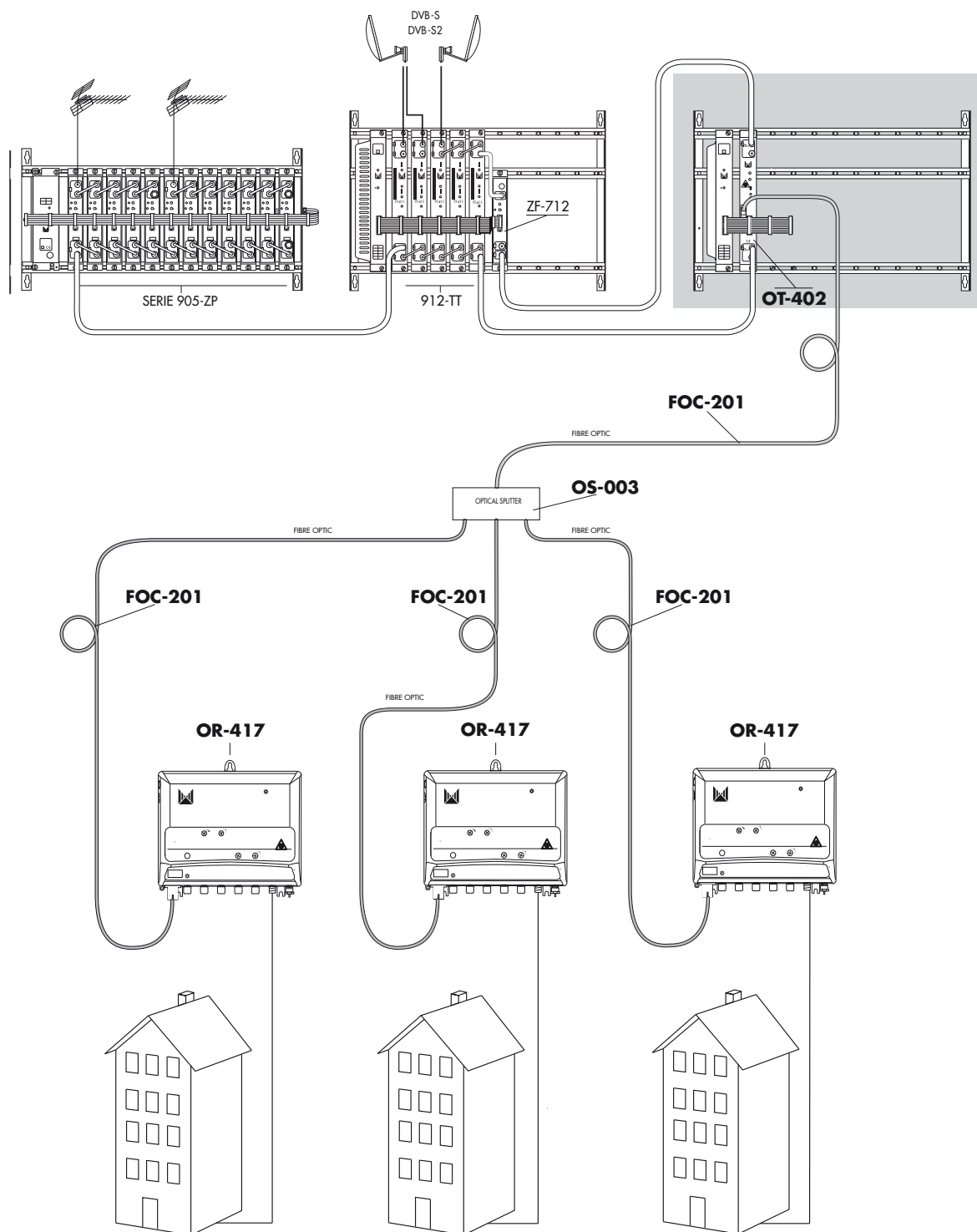
Optical fibre connectorisation kit, which includes all the elements necessary for making mechanical connections of optical fibre on site without requiring fusion. (See page 421).

# 916

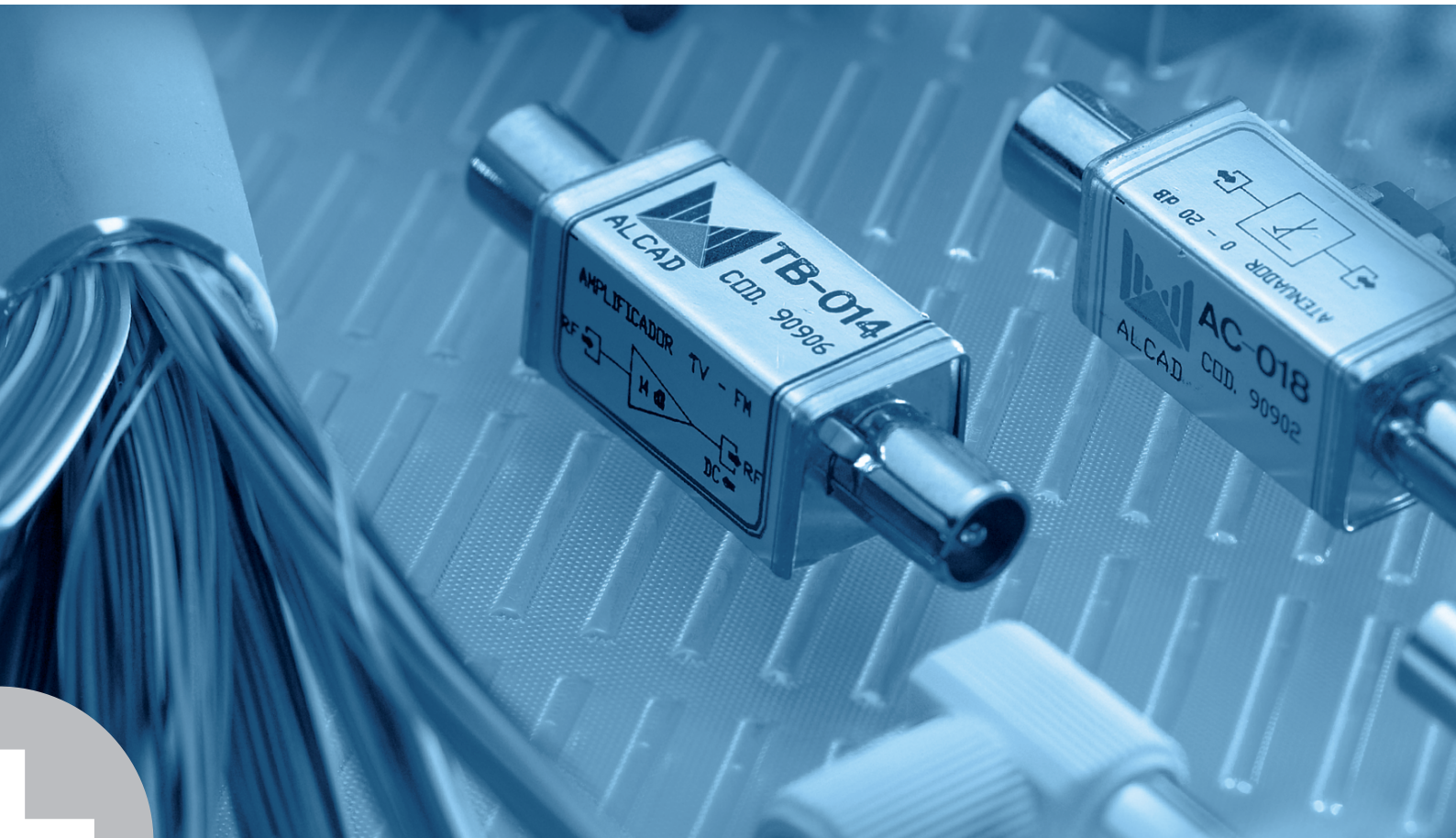
## INSTALLATION EXAMPLES

### Installation of TV+SAT distribution via fibre optic

Distribution of 17 terrestrial TV channels and 1 satellite polarity via fibre optic to three different places. The installation is compound by one optical transmitter OT-402, one optical splitter with three outputs OS-003 and three optical receivers OR-417. The optical transmitter OT-402 receives the TV signal via coaxial cable and transmits it via fibre optic. The optical receiver OR-417 receives the TV signal via fibre optic and transmits it via coaxial cable.









# Structured cabling and telephony **networks**

Equipment necessary for  
performing structured wiring  
installations using UTP cable  
and telephone installations using  
twisted-pair cable.

# 930 STRUCTURED CABLING AND TELEPHONY NETWORKS

## Elements for rack 19"



TDP-102

Distribution tray with 24 RJ45 connectors for 19" cabinet. Manufactured in cold-rolled steel. Guides for easy extraction.

Patch panel 24 ports RJ45 category 6

CODE	9300056	
MODEL	TDP-102	
Number of ports		24
Connector		Female RJ45, IDC compatible with 110&Krone
Standard		Category 6
Compatible cables		4 pairs, unshielded cable AWG 22 - 26
Wiring scheme		T568A/T568B
Assembly		19" Rack, 1U
Units per packing		1
Packing weight	Kg	0,55
Packing dimensions	mm	505 x 50 x 40



RWS-003

Wall support for three 19" trays. Manufactured in galvanised steel. Plugs included for fixing to a wall.

Wall support of galvanized steel of 19"

CODE	9300057	
MODEL	RWS-003	
Format		19"
Height		3U Height
Material		Galvanized steel
Thickness	mm	2
Units per packing		1
Packing weight	Kg	1,07
Packing dimensions	mm	485 x 280 x 141

# 930 STRUCTURED CABLING AND TELEPHONY NETWORKS

## Distribution elements



TTB-101

Termination box, for 1 female RJ45 CAT 6 connector. The conectorisation on UTP cable is made using HT-001 tool.

### Termination box

CODE	9300058	
MODEL		TTB-101
Number of ports		1
Connector		Female RJ45, IDC compatible with 110&Krone
Standard		Category 6
Compatible cables		4 pairs, unshielded cable AWG 22 - 26
Wiring scheme		T568A/T568B
Units per packaging		1
Packing weight	Kg	0,04
Packing dimensions	mm	155 x 105 x 30



TPS-006

Passive multiplexer of 1 input, male RJ45 connector with patchcord of 0.5 m, and 6 outputs, female RJ45 connectors.

### Passive Splitter

CODE	9300068	
MODEL		TPS-006
Outputs		6
Output connector		RJ-45 female
Input patchcord	mm	500
Input connector		RJ-45 male
Cascadable		Yes
Units per packaging		1
Packing weight	Kg	0,19
Packing dimensions	mm	150 x 80 x 25



TOU-101

Outlets with 1 or 2 female RJ45 connectors, with white plastic frontplate. Each connector is protected by shutters for unused.

### Flush-mounted outlet

CODE	9300063		9300064
MODEL		TOU-101	TOU-102
Number of ports		1	2
Connector		Female RJ45, IDC compatible with 110&Krone	
Standard		Category 6	
Compatible cables		4 pairs, unshielded cable AWG 22 - 26	
Wiring scheme		T568A/T568B	
Units per packaging		1	
Packing weight	Kg	0,51	0,60
Packing dimensions	mm	315 x 230 x 65	

# 930 STRUCTURED CABLING AND TELEPHONY NETWORKS

## Accesories



TPC-101 / 103

Patchcords for structured wiring with male RJ45 connectors, 1m and 3m long.

UTP patch cord

CODE		9300059	9300060
MODEL		TPC-101	TPC-103
Connector		2 x RJ45 male	
Standard		Category 6	
Cable type		4 pairs, unshielded cable AWG 22 - 26	
Wiring scheme		T568A/T568B	
Length	m	1	3
Units per packing		1	
Packing weight	Kg	0,40	0,94
Packing dimensions	mm	160 x 135 x 20	



TCN-100

Male RJ45 connector for UTP Category 6 cable. Each of the connectors is attached using the HT-100 crimping tool.

RJ45 connector

CODE		9300061	
MODEL		TCN-100	
Connector		Male RJ45	
Standard		Category 6	
Compatible cables		4 pairs, unshielded cable AWG 22 - 26	
Wiring scheme		T568A/T568B	
Units per packing		1	100
Packing weight	Kg	0,01	0,16
Packing dimensions	mm	22 x 11 x 8	170 x 120 x 30



TCN-110

Female RJ45 connector for UTP Category 6 cable. Each of the connectors is attached using the HT-001 crimping tool.

RJ45 female connector

CODE		9300062	
MODEL		TCN-110	
Connector		Female RJ45, IDC compatible with 110&Krone - Keystone	
Standard		Category 6	
Compatible cables		4 pairs, unshielded cable AWG 22 - 26	
Wiring scheme		T568A/T568B	
Units per packing		1	25
Packing weight	Kg	0,01	0,35
Packing dimensions	mm	32 x 20 x 20	180 x 145 x 75



# 930 STRUCTURED CABLING AND TELEPHONY NETWORKS

## UTP Cable



TCA-100

**Description**

UTP Category 6 cable, with central pair separator, and with external LSZH (low smoke zero halogen) sheathing.

**Applications**

Installations of structured wiring.

**Characteristics**

Supplied in coils of 305m.

CODE		9300065
MODEL		TCA-100
Type of cable		UTP Category 6
Internal conductor	Mat	Solid bare CU
	mmØ	0,54 (23 AWG)
Insulation	Mat	HDPE
	mmØ	0,22
Assembly		4 pairs with central cross filler of PL
Cover	Mat	Blue/LSZH
	mmØ	6,20
Standards		EN 50288-6-1, EN 50173-1, ANSI/TIA-568-C.2 IEC 60332-1-2, UL Certification
Units per packaging		305
Packing weight	Kg	13,97
Packing dimensions	mm	370 x 360 x 260

### RJ45 ports tester



9180000	
TME-000	
Units per packaging	1
Packing weight	0,131 Kg
Packing dimensions	120 x 70 x 36 mm

UTP cable tester with female RJ45 connectors. Can test the correct connectorisation of UTP cables, indicating: crossed cable, direct cable, open circuit, and short circuit. (See page 418).

### Category 6 cable network certifier



9180001	
TME-100	
Units per packaging	1
Packing weight	4,400 Kg
Packing dimensions	600 x 350 x 400 mm

UTP structured wiring networks certifier for categories 3, 4, 5, 5e and 6A. (See page 416).

### Crimping tool



9300066	
HT-100	
Units per packaging	1
Packing weight	0,358 Kg
Packing dimensions	275 x 125 x 28 mm

Crimping tool for male RJ45 connectors onto UTP cable.

### Impact punch down and cuts tool



9300067	
HT-001	
Units per packaging	1
Packing weight	0,170 Kg
Packing dimensions	225 x 95 x 30 mm

Impact tool for embedding telephone cable pairs into supports and structured cable into RJ45 female connectors. The connection is made by moving deck.

### Connection modules



9300000	
RE-000	
Units per packaging	10
Packing weight	0,50 Kg
Packing dimensions	255 x 111 x 45 mm

Connection module for 10 telephone pairs. The HT-000 tool must be used to connect the pairs.

### Connection modules



9300001	
RE-500	
Units per packaging	15
Packing weight	0,45 Kg
Packing dimensions	230 x 140 x 32 mm

Connection module for 5 telephone pairs. The HT-000 tool must be used to connect the pairs.

# 930 TELEPHONY NETWORK



Connection modules with support

<b>9300002</b>	
<b>RE-510</b>	
Units per packaging	15
Packing weight	0,45 Kg
Packing dimensions	230 x 140 x 32 mm

Connection module for 5 telephone pairs with support.



Multiple supports

<b>9300020</b>	
<b>SO-000</b>	
Units per packaging	50
Packing weight	13,50 Kg
Packing dimensions	650 x 310 x 250 mm

Metal support for 10 connection modules RE-000 of 10 pairs.



Single supports

<b>9300024</b>	
<b>SO-011</b>	
Units per packaging	20
Packing weight	13,50 Kg
Packing dimensions	227 x 50 x 120 mm

Metal support for one RE-000 connection module of 10 pairs.



Single supports

<b>9300021</b>	
<b>SO-511</b>	
Units per packaging	120
Packing weight	2,40 Kg
Packing dimensions	227 x 180 x 125 mm

Metal support for 1 connection module RE-000 of 5 pairs.



Card-holders – 10 pairs

<b>9300010</b>	
<b>TR-000</b>	
Units per packaging	50
Packing weight	0,50 Kg
Packing dimensions	250 x 200 x 25 mm

Pair identification card-holder, for connection modules RE-000 of 10 pairs.



Card-holders – 5 pairs

<b>9300011</b>	
<b>TR-500</b>	
Units per packaging	50
Packing weight	0,25 Kg
Packing dimensions	170 x 130 x 25 mm

Pair identification card-holder, for connection modules RE-500 of 5 pairs.



Card-holders – 5 pairs

<b>9300012</b>	
<b>TR-501</b>	
Units per packaging	50
Packing weight	0,05 Kg
Packing dimensions	170 x 130 x 25 mm

Pair identification card-holder, for RE-000 connection modules of 5 pairs with RE-510 supports.



# 930 TELEPHONY NETWORK



User access point

<b>9300041</b>	
<b>PP-000</b>	
Units per packaging	1
Packing weight	0,07 Kg
Packing dimensions	80 x 80 x 28 mm

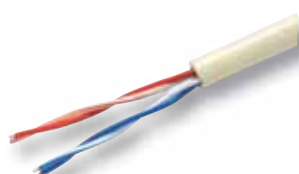
User access point for basic telephony which permits the verification of the telephony installation.



Subscriber cables – 1 pair

<b>9300050</b>	
<b>TC-100</b>	
Units per packaging	250
Packing weight	10,0 Kg
Packing dimensions	260 x 260 x 100 mm

Subscriber telephony cable, one pair. Supplied in a 250 m coil.



Subscriber cables – 2 pairs

<b>9300051</b>	
<b>TC-200</b>	
Units per packaging	250
Packing weight	15,0 Kg
Packing dimensions	260 x 260 x 100 mm

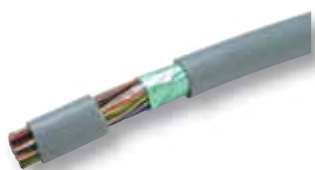
Subscriber telephony cable, two pairs. Supplied in a 250 m coil.



Multipair cables – 25 pairs

<b>9300052</b>	
<b>TC-400</b>	
Units per packaging	100
Packing weight	15,0 Kg
Packing dimensions	510 x 510 x 320 mm

Multipair telephony cable, 25 pairs. Supplied in a 100 m coil.



Multipair cables – 50 pairs

<b>9300053</b>	
<b>TC-500</b>	
Units per packaging	100
Packing weight	40,0 Kg
Packing dimensions	510 x 510 x 320 mm

Multipair telephony cable, 50 pairs. Supplied in a 100 m coil.



Multipair cables – 75 pairs

<b>9300054</b>	
<b>TC-600</b>	
Units per packaging	100
Packing weight	40,0 Kg
Packing dimensions	753 x 753 x 380 mm

Multipair telephony cable, of 75 pairs. Supplied in a 100 m coil.



Multipair cables – 100 pairs

<b>9300055</b>	
<b>TC-700</b>	
Units per packaging	100
Packing weight	50,0 Kg
Packing dimensions	753 x 753 x 380 mm

Multipair telephony cable, of 100 pairs. Supplied in a 100 m coil.

# 930 TELEPHONY NETWORK



Multipair cables – 100 pairs

9300065	
TCA-100	
Units per packaging	305
Packing weight	13,97 Kg
Packing dimensions	370 x 360 x 260 mm

UTP Cable Cat. 6 (See page 381)



Connection tools

9300040	
HT-000	
Units per packaging	1
Packing weight	0,12 Kg
Packing dimensions	205 x 54 x 37 mm

Connection tool for connection modules. Permits the connections of the pairs to the module by pressure.



Test point plugs

9300030	
CJ-000	
Units per packaging	1
Packing weight	0,05 Kg
Packing dimensions	180 x 20 x 20 mm

Test point plug for taking readings of a pair of the telephony installation. Permits the independent reading of both sides of the installation.



Disconnection plugs

9300031	
CJ-010	
Units per packaging	1
Packing weight	0,01 Kg
Packing dimensions	37 x 9 x 6 mm

Disconnection plug, introduced in the connection module permitting the disconnection of one of the pairs of the installation.



Crimping tool

9300066	
HT-100	
Units per packaging	1
Packing weight	0,358 Kg
Packing dimensions	275 x 125 x 28 mm

Crimping tool for male RJ45 connectors onto UTP cable.



Impact punch down and cuts tool

9300067	
HT-001	
Units per packaging	1
Packing weight	0,170 Kg
Packing dimensions	225 x 95 x 30 mm

Impact tool for embedding telephone cable pairs into supports and structured cable into RJ45 female connectors. The connection is made by moving deck.

# 930 INSTALLATION EXAMPLES

## Colour tables for multipair cables



25-pair cable

9300052
TC-400

25-pair cable, with pairs intertwined in accordance with the colour coding shown below.



50-pair cable

9300053
TC-500

Cable with 2 sheaths of 25 pairs, each of which is marked with a colour band as follows: the first in white and blue; the second in white and orange; the third in white and green; the fourth in white and brown. Pairs are intertwined in accordance with the colour coding shown below.



75-pair cable

9300054
TC-600

Cable with 3 sheaths of 25 pairs, each of which is marked with a colour band as follows: the first in white and blue; the second in white and orange; the third in white and green; the fourth in white and brown. Pairs are intertwined in accordance with the colour coding shown below.



100-pair cable

9300055
TC-700

Cable with 4 sheaths of 25 pairs, each of which is marked with a colour band as follows: the first in white and blue; the second in white and orange; the third in white and green; and the fourth in white and brown. Pairs are intertwined in accordance with the colour coding shown below.

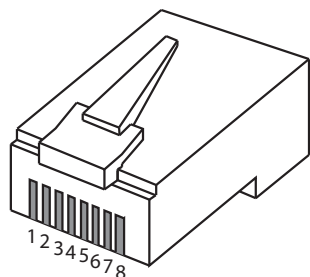
Pair 1			White	Blue	Pair 14			Black	Brown
2			White	Orange	15			Black	Grey
3			White	Green	16			Yellow	Blue
4			White	Brown	17			Yellow	Orange
5			White	Grey	18			Yellow	Green
6			Red	Blue	19			Yellow	Brown
7			Red	Orange	20			Yellow	Grey
8			Red	Green	21			Violet	Blue
9			Red	Brown	22			Violet	Orange
10			Red	Grey	23			Violet	Green
11			Black	Blue	24			Violet	Brown
12			Black	Orange	25			Violet	Grey
13			Black	Green	Pair pilot			White	Black

# 930 INSTALLATION EXAMPLES

Colour table for UTP cables and pinout for RJ-45 Connectors

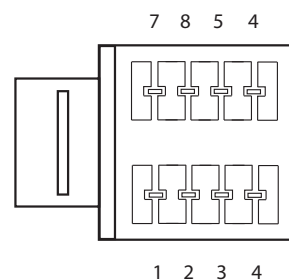
T568-A				T568-B			
White / green	1				1	White / orange	
Green	2				2	Orange	
White / orange	3				3	White / green	
Blue	4				4	Blue	
White / blue	5				5	White / blue	
Orange	6				6	Green	
White / brown	7				7	White / brown	
Brown	8				8	Brown	

RJ-45 Male 9300061 TCN-100 connector



Note: To crimping this connector use the crimping tool HT-100

RJ-45 Female 9300062 TCN-110 connector



Note: To connect this connector use the impact tool HT-001







# Accessories

Accessories to enhance the quality of the installation. Coaxial cables, connectors, and loads to join the distribution elements and amplifiers. Telephony elements of connection and distribution for telephone installations.

**Description**

Broadband remote-feeding preamplifiers for terrestrial and satellite TV. Have built-in gain control. Available in different amplification and pass bands. They are powered by the output connector, via the coaxial cable, or through a Faston power connector at 24Vdc, depending on the model.

**Applications**

They are used at the output of the antennas to amplify terrestrial or satellite antenna signals which are too weak. They are installed at the output of the distribution elements when the distance to the TV outlet is great.

**Characteristics**

Shielded zamak chassis, with female input and output F connectors.

**Accessories**

- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial.  
 9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.  
 9080030 MC-304 Male F-type connector for crimping onto Ø7.0 mm coaxial cable.

CODE		9090028	9090044	9090029
MODEL		PR-200	PR-201	PR-310
Connection		F Female		
Frequency range	Band	UHF		TV / SAT
	MHz	470 - 862		5 - 2400
Gain	dB	14		10
Flatness response	dB $\pm$ TOL	$\pm 0,6$ $\pm 0,1$ (8 MHz)		$\pm 0,6$ $\pm 0,1$ (8 MHz) TV $\pm 0,2$ (36 MHz) SAT
Output level	dB $\mu$ V	100 DIN 45004B 97 (IMD3 - 60 dB)		102 DIN 45004B TV 99 (IMD3 - 60 dB) TV 81 (IMD2 - 60 dB) TV 109 (IMD3 - 35 dB) SAT 101 (IMD2 - 35 dB) SAT
Through loss	dB	>10		
Noise figure	ns	<1		
Noise figure	dB	4		
Power supply	V $\cdots$	24 Remote feed	24 With faston	13 / 18 Remote feed
	mA	16		12 / 32
DC path	mA			500 mA
Operating temperature	°C	-10...+65		
Protection index		IP 20		
Units per packing		1		
Packing weight	Kg	0.02		
Packing dimensions	mm	15 x 80 x 100		

DIN 45004B: 3 unequal carriers, IMD3 at 60 dB  
 IMD3 - 66 dB: 3 unequal carriers, EN 50083-5  
 IMD2 - 60 dB: 2 equal carriers, EN 50083-5

# 909 ACCESSORIES

## Attenuators



AV-315



AV-305



AV-206

### Description

Fixed and variable attenuators for terrestrial and satellite TV. The variable attenuators are equipped with an attenuation control. Available in different attenuation and pass bands according to the model. All models have a constant impedance of 75  $\Omega$ .

### Applications

Used to attenuate signals which are too strong. Installed at the input of equipment when the antenna level is excessive, or at the output when the output level of the equipment is excessive. Installed at the output of an outlet with excess signal, permitting a reduction in the level of signal that the television receives.

### Characteristics

Shielded zamak chassis, with female input and output F connectors.

### Accessories

- 9120039 CM-004 Male F connector for  $\varnothing 6.6$  mm coaxial.  
9080023 MC-302 Male F connector to screw onto RG-6 coaxial,  $\varnothing 7.0$  mm.

CODE		9090032	9090031	9090033
MODEL		AV-206	AV-305	AV-315
Connection		F female		
Frequency range	Band	TV	SAT	TV / SAT
	MHz	5 - 862	950-2400	5 - 2400
Fixed attenuation	dB $\pm$ TOL	4 $\pm 0,2$	1 $\pm 0,5$	3 $\pm 0,5$ TV 4 $\pm 1,0$ SAT
Variable attenuation	dB $\pm$ TOL	18 $\pm 2,0$	-	18 $\pm 2,0$
Flatness response	dB	$\pm 1,5$ $\pm 0,1$ (7/8 MHz) TV $\pm 0,1$ (36 MHz) SAT	$\pm 1,0$ $\pm 0,1$ (7/8 MHz) TV $\pm 0,1$ (36 MHz) SAT	
Rejection	dB	>30	-	
Return loss I/O	dB	>10		
Chroma-luminance delay	ns	<1		
DC path	mA	-		500
	Tono	-		22 KHz / DiSEqC
Operating temperature	$^{\circ}\text{C}$	-10...+65		
Room temperature with/without fan	$^{\circ}\text{C}$	-10...+55/+45		
Protection index		IP 20		
Units per packing		1		
Packing weight	Kg	0.02		
Packing dimensions	mm	15 x 80 x 100		





RB-609



RB-619

### Description

Rejection filters for head-end, suppressing interfering mobile telephone signals: LTE, GSM and TETRA. Incorporates DC path to allow power to be supplied to a preamplifier.

### Applications

Suitable for collective terrestrial TV installations which are affected by the transmission of LTE mobile telephone signals in the 790-862 MHz band, and by GSM and TETRA transmissions in the 870-960 MHz band. The filters suppress interfering signals before amplification of the TV signals at the head-end of the installation, or between the outlet and the television so as to prevent interference from mobile devices, thereby obtaining a rejection in the LTE band of up to -60dB.

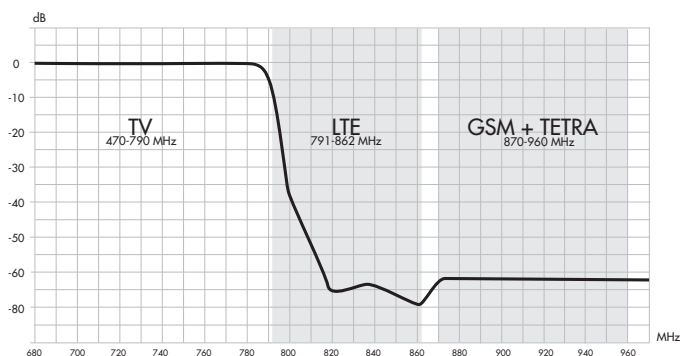
### Characteristics

Shielded zamak chassis, metal-plated, with F-type connectors. Connectors situated at the bottom to facilitate connections. Its compact design means it can be installed in a 100 x 100 mm box.

### Accessories

- 9120039 CM-004 Male F connector for Ø6.6 mm coaxial.
- 9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.
- 9080030 MC-304 Male F-type connector for crimping onto Ø7.0 mm coaxial cable.

CODE		9090041	9090042
MODEL		RB-609	RB-619
Connection		F Female	
Inputs		1	
Frequency range	Band	FM/DAB/TV	
	MHz	0 - 790	
Insertion Loss	dB ±TOL	1 ±2	
LTE band rejection 791-862 MHz	dB	60	
GSM-TETRA band rejection 870-960 MHz	dB	60	
DC path	V <sub>DC</sub>	+24	
	mA	300	
Operating temperature	°C	-10...+65	
Protection index		IP 53	
Units per packing		6	8
Packing weight	Kg	0,60	
Packing dimensions	mm	200 x 80 x 40	



# 909 ACCESSORIES

## Filters



RB-208



RB-008



FR-423

### Description

Band or channel rejection filters for terrestrial TV. The channel rejection filters reject a single channel in the working band of the filter. The installer can adjust the rejected channel by means of a frequency control.

### Applications

Band rejection filters are used to eliminate a frequency band which produces interference in the TV installation. Channel rejection filters are used to eliminate a channel which produces interference, normally because its level is excessive.

### Characteristics

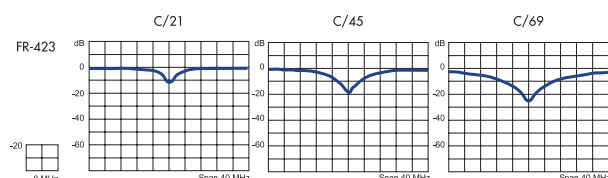
Shielded zamak chassis. Female input and output F connectors.

### Accessories

9120039 CM-004 Male F connector for Ø6.6mm coaxial.

9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.

CODE	9090023			9090022		9090026
MODEL		RB-008		RB-208		FR-423
Connection		F female				
Frequency range	Band	CB	VHF / UHF	FM	VHF / UHF	UHF
	MHz	0 - 30	41 - 862	87.5 - 108.0	41 - 862	470 - 862
Band rejection	dB	>40	-	>40	-	-
Channel rejection	dB					18 ±6,0
Insertion loss	dB	-	0,3 ±0,2	-	0,3 ±0,2	0,5 ±0,2
Flatness response	dB	-	±0,3 ±0,1 (7/8 MHz)	-	±0,3 ±0,1 (7/8 MHz)	±0,3 ±0,1 (8 MHz)
Return loss I/O	dB	>10				
Chroma-luminance delay	ns	<1				
DC path	mA	-		500		
Operating temperature	°C	-10..+65				
Room temperature with/without fan	°C	-10..+55/+45				
Protection index		IP 20				
Units per packing		1				
Packing weight	Kg	0.02				
Packing dimensions	mm	15 x 80 x 100				



# 912 ACCESSORIES

## Filtered multiplexers for head-ends



MF-201



MF-202



MF-205

### Description

Multiplexers with two inputs which combine the head-end equipment outputs. Each input of the multiplexers has a low or high pass filter for a group of channels.

### Applications

Used to combine the output channels of the modulators or of satellite receivers in installations with a great number of channels. The multiplexers by channel groups make it possible to combine the different channels of the equipment, maintaining a high carrier to noise ratio. By combining the seven available filters, a system of mixing channels is obtained using band pass filters with 8 groups of 11 channels. See the application example on page 153.

### Characteristics

Shielded zamak chassis with F type connectors. Supplied in a multiple pack.

### Accessories

9120039 CM-004 Male F type connector for Ø6.6 mm coaxial cable.

9080023 MC-302 Male F type connector for Ø7.0 mm coaxial cable.

CODE		9120090		9120091		9120092	
MODEL		MF-201		MF-202		MF-205	
Number of inputs				2			
Frequency range	MHz	47-244	251-430	470-662	678-862	47-430	470-862
	Channel	2-S12	S14-S36	21-44	47-69	2-S36	21-69
Insertion loss	dB±TOL	2.0 ±0,5	2.5 ±0,5	2.0 ±0,5	3.0 ±1,0	1.5 ±1,0	1.5 ±1,0
Selectivity	dB	>6 (7 MHz)		>6 (16 MHz)		>6 (40 MHz)	
		>20 (49 MHz)		>20 (112 MHz)		>20 (104 MHz)	
Flatness response	dB			±0,5			
Return loss	dB			>10			
Connectors				F female			
Operating temperature	°C			-10...+65			
Protection index				IP 43			
Units per packing				6			
Packing weight	Kg			0.45			
Packing dimensions	mm			155 x 95 x 40			

# 912 ACCESSORIES

## Equalizers



EQ-186

### Description

Fixed equalisers for terrestrial TV. Each product includes two equalisers which can be used independently or in series.

### Applications

Used as a complement to a distribution amplifier to give a greater equalisation before amplifying it, especially after long runs of cable. These long distances of cable unbalance the signal, attenuating more the channels of higher frequencies. The equalisers compensate these problems.

### Characteristics

Shielded zamak and metal plate chassis with F connectors. Connectors on the lower part to facilitate connections. Reduced dimensions. Fits in a 100x100 mm box.

### Accessories

9120039 CM-004 Male F type connector for Ø6.6 mm coaxial.  
9080023 MC-302 Male F connector to screw onto RG-6 coaxial, Ø7.0 mm.

CODE			9090018	
MODEL			EQ-186	
Connection			F female	
Number of equalisers			2	
Equalisers			18	6
Frequency range	MHz		5 - 862	
Through loss	dB ±0,2	5 MHz	18.3	8.0
		50 MHz	15.8	7.5
		230 MHz	10.0	5.3
		470 MHz	5.0	3.5
		862 MHz	0.6	0.5
Return loss	dB	5 MHz	>21	>20
		50 MHz	>20	>21
		230 MHz	>19	>27
		470 MHz	>18	>18
		862 MHz	>12	>25
Flatness response	dB		0.8	0.4
Chroma-luminance delay	ns		<1	
Protection index			IP 43	
Units per packing			6	
Packing weight	Kg		0.45	
Packing dimensions	mm		155 x 95 x 40	



GSM rejection filter

<b>9040029</b>	
<b>FL-100</b>	
Units per packaging	6
Packing weight	0,45 Kg
Packing dimensions	155 x 95 x 40 mm

Rejection filter for interfering signals from GSM mobile telephony, caused by mobile antenna installations to individual and MATV installations. (See page 95).



Current blocker

<b>9090038</b>	
<b>BL-300</b>	
Units per packaging	1
Packing weight	0,020 Kg
Packing dimensions	150 x 20 x 100 mm

DC blocker. Shielded zamak chassis, with female input and output F-type connectors.



Tone generator

<b>9090034</b>	
<b>GT-001</b>	
Units per packaging	1
Packing weight	0,020 Kg
Packing dimensions	15 x 80 x 10 mm

22 KHz tone generator, fed by the 12 – 18 V $\approx$  voltage of the LNB power supply. Enables selection of the high band of a single LNB connected to SAT receiving equipment or to an installation with multiswitches.



Voltage injector

<b>9050002</b>	
<b>IM-123</b>	
Units per packaging	1
Packing weight	0,02 Kg
Packing dimensions	80 x 45 x 20 mm

Power injector, 24Vdc. Is fed by a Faston connector. Shielded zamak chassis, with female input and output F-type connectors.



0-20 dB Attenuator

<b>9090002</b>	
<b>AC-018</b>	
Units per packaging	1
Packing weight	0,020 Kg
Packing dimensions	80 x 45 x 20 mm

Variable attenuator, 1-23dB. Shielded zamak chassis, with female input and output F-type connectors.

# 908 ACCESSORIES

## Connectors, loads and splicers



Distributor

9090016	
DV-102	
Units per packaging	1
Packing weight	0,02 Kg
Packing dimensions	80 x 45 x 25 mm

### Splitters and multiplexers

Two output splitter to connect on the output of a video, DVD or satellite receiver. It can be used as a multiplexer of two inputs. Female IEC connector to connect to the equipment and male IEC output.



Multiplexer

9090006	
MD-104	
Units per packaging	1
Packing weight	0,02 Kg
Packing dimensions	80 x 45 x 25 mm

Two input multiplexer to connect to the input of a video. It can be used as a two input splitter. Female IEC input connector and male IEC output connector to connect to the equipment.



Shielded male IEC connector

9080006	
MC-001	
Units per packaging	10
Packing weight	0,10 Kg
Packing dimensions	100 x 90 x 35 mm

Shielded Ø9.52mm male IEC connector, frequency range of 5 to 2,400 MHz. Shielding of 70dB between 5 and 862MHz, and of 60dB between 950 and 2,400MHz. Avoids feedback in head-end equipment.



Shielded female IEC connector

9080007	
HC-001	
Units per packaging	10
Packing weight	0,11 Kg
Packing dimensions	100 x 90 x 35 mm

Shielded Ø9.52mm female IEC connector, frequency range of 5 to 2,400 MHz. Shielding of 70dB between 5 and 862MHz, and of 60dB between 950 and 2,400MHz.



Shielded male IEC connector

9080024	
MC-004	
Units per packaging	20
Packing weight	0,200 Kg
Packing dimensions	100 x 100 x 20 mm

Shielded male Ø9.52mm IEC connector to be crimped on to Ø7.0mm coaxial cable. Avoids feedback in head-end equipment.



Male IEC connector

9080000	
MC-095	
Units per packaging	50
Packing weight	0,44 Kg
Packing dimensions	130 x 130 x 50 mm

Shielded Ø9.52 mm male IEC connector.



Female IEC connector

9080001	
HC-095	
Units per packaging	50
Packing weight	0,46 Kg
Packing dimensions	130 x 130 x 50 mm

Curved, shielded Ø9.52 mm female IEC connector.

# 908 ACCESSORIES

## Connectors, loads and splicers



Shielded male IEC connector

9080025	
MC-000	
Units per packaging	10
Packing weight	0,350 Kg
Packing dimensions	150 x 100 x 20 mm

Shielded Ø9.52mm right-angle IEC male connector. Avoids feedback in head-end equipment.



Shielded male IEC connector

9080029	
HC-000	
Units per packaging	10
Packing weight	0,350 Kg
Packing dimensions	150 x 100 x 20 mm

Shielded Ø9.52mm right-angle IEC female connector.



Male IEC connector

9080010	
RM-095	
Units per packaging	25
Packing weight	0,20 Kg
Packing dimensions	105 x 105 x 35 mm

Straight, shielded Ø9.52 mm male IEC connector.



Female IEC connector

9080011	
RH-095	
Units per packaging	25
Packing weight	0,21 Kg
Packing dimensions	105 x 105 x 35 mm

Straight, shielded Ø9.52 mm male IEC connector.



Male type F connector

9120039	
CM-004	
Units per packaging	100
Packing weight	0,340 Kg
Packing dimensions	130 x 100 x 20 mm

Shielded male F connector to screw onto shielded RG-6 coaxial cable of Ø 6.5mm to Ø 6.8mm.



Male type F connector

9080023	
MC-302	
Units per packaging	10
Packing weight	0,04 Kg
Packing dimensions	80 x 50 x 15 mm

Shielded male F-type connector to screw onto RG-6 coaxial cable of Ø6.9mm - 7.2mm.



High-speed male F connector

9080008	
MC-101	
Units per packaging	10
Packing weight	0,05 Kg
Packing dimensions	10 x 80 x 100 mm

Shielded high-speed male F connector, to screw onto RG-6 coaxial cable of Ø6.5 to Ø7.1mm and to press onto female F connector.



Male F connector

9080014	
MC-104	
Units per packaging	10
Packing weight	0,03 Kg
Packing dimensions	80 x 50 x 15 mm

Male F connector to crimp on RG-6 coaxial, Ø 7.0 mm.



# 908 ACCESSORIES

## Connectors, loads and splicers



Male F connector

<b>9080015</b>	
<b>MC-204</b>	
Units per packaging	10
Packing weight	0,05 Kg
Packing dimensions	10 x 80 x 100 mm

Shielded male F-type compression connector for RG-11 coaxial cable of Ø10.0mm to Ø10.4mm. The connector is inserted in the coaxial cable using the HE-100 assembly tool and is pressed onto the cable using the HE-201 crimping tool.



Male F connector

<b>9080030</b>	
<b>MC-304</b>	
Units per packaging	100
Packing weight	1,05 Kg
Packing dimensions	210 150 x 30 mm

Shielded male F-type compression connector for RG-6 coaxial cable of Ø6.9 to Ø7.2 mm. The connector is inserted in the coaxial cable using the HE-100 assembly tool and is pressed onto the cable using the HE-201 crimping tool.



Male F connector

<b>9080033</b>	
<b>MC-202</b>	
Units per packaging	1
Packing weight	0,010 Kg
Packing dimensions	29 x 12 x 12 mm

Shielded male F-type connector for screwing on to RG-11 coaxial cable of Ø10.0 to Ø10.4 mm. The connector is inserted in the coaxial cable using the HE-100 assembly tool.



IEC load

<b>9050004</b>	
<b>RM-075</b>	
Units per packaging	1
Packing weight	0,01 Kg
Packing dimensions	110 x 80 x 15 mm

75 Ω load with shielded Ø9.52 mm male IEC connector. The loads are used to close the unused outputs, avoiding the formation of standing waves which affect the levels of the channels.



F load

<b>9120011</b>	
<b>RS-275</b>	
Units per packaging	1
Packing weight	0,01 Kg
Packing dimensions	20 x 12 x 12 mm

75 Ω load with shielded male F connector. The loads are used to close the unused outputs, avoiding the formation of standing waves which affect the levels of the channels.



F load

<b>9080031</b>	
<b>RC-100</b>	
Units per packaging	1
Packing weight	0,02 Kg
Packing dimensions	26 x 16 x 16

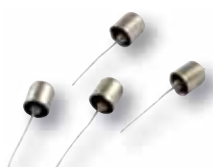
75 Ω load with male F-type connector, shielded and tamperproof. The loads are placed using the HE-101 assembly tool.



F Insulated load

<b>9080019</b>	
<b>RC-110</b>	
Units per packaging	1
Packing weight	0,01 Kg
Packing dimensions	110 x 80 x 15 mm

Insulated load of 75 Ω with F-type male connector, to load all the unused inputs and outputs with 905-ZG/ZP equipment and in the cascable multiswitches of the 913 series, it is necessary to use insulated loads.



Screw terminal load

<b>9060050</b>	
<b>RF-075</b>	
Units per packaging	50
Packing weight	0,03 Kg
Packing dimensions	120 x 40 x 10 mm

75 Ω load for screw terminal. The loads are used to close the unused outputs, avoiding the formation of standing waves which affect the levels of the channels.



# 908 ACCESSORIES

## Connectors, loads and splicers



Splicer, male fast F-type

9080026	
EP-311	
Units per packaging	100
Packing weight	0,049 Kg
Packing dimensions	110 x 130 x 50 mm

Shielded splicer with two male F connectors. Connected by pushing into the female F connector. Enables cascable multiswitches to be connected to each other without the use of coaxial cable.



IEC adapter, Ø9.52mm, male / female F

9080027	
EP-414	
Units per packaging	10
Packing weight	0,057 Kg
Packing dimensions	90 x 70 x 10 mm

Permits the connection of a coaxial cable with a male F connector to equipment with a female IEC connector.



F splicers

9080012	
EP-111	
Units per packaging	10
Packing weight	0,06 Kg
Packing dimensions	75 x 50 x 10 mm

Shielded splicer with two female F connectors which permits the connection of two sections of coaxial cable by means of the splicer and two male F connectors.



Female to female IEC Ø9.52 mm adaptor

9080013	
EP-212	
Units per packaging	10
Packing weight	0,07 Kg
Packing dimensions	80 x 80 x 10 mm

The adaptor is used to connect a coaxial cable with a male IEC Ø9.52mm connector to equipment whose IEC connector is also male. It can also be used to splice two coaxial cables with male IEC connectors.



Male to male Ø9.52 mm IEC adaptor

9080020	
EP-313	
Units per packaging	10
Packing weight	0,05 Kg
Packing dimensions	80 x 80 x 10 mm

The adaptor is used to connect a coaxial cable with a female Ø9.52mm IEC connector to the female connector of a TV outlet. It is also used to splice two coaxial cables with female IEC connectors.



Splicers for coaxial cable

9080004	
EM-101	
Units per packaging	25
Packing weight	0,19 Kg
Packing dimensions	105 x 105 x 35 mm

Splicer for coaxial cable. Connection by means of screw terminal permitting the connection of two sections of coaxial cable.

# 910 COAXIAL CABLES

## Coaxial cables CU-AL-AL

CE-753

CE-743

CE-170

CE-754



### Description

Coaxial cable with physically expanded dielectric. Flame-retardant. Conforms to norm EN 50117.

### Applications

Used to transmit the TV signal on the terrestrial band or on the IF satellite band.

### Characteristics

Supplied in coils of 100 m and packed in a carton box.

CODE			9100021	9100056	9100013	9100058
MODEL			CE-753	CE-743	CE-170	CE-754
Internal conductor	Mat		CU			CSS
	mmø		1.13			1.02
Dielectric	Mat		PEE Physical			
	mmø		4.85			4.70
Shielding	Mat		AL - PL - AL			
Mesh	Mat		AL			
Cover	Mat		PVC white	PE black	PVC white	
	mmø		6,95			6,70
Attenuation / 100m	dB	50 MHz	4.7			6.3
		470 MHz	12.8			12.9
		862 MHz	18.1			16.2
		2150 MHz	30.3			31.1
Return loss	dB	5-470 MHz	>23			
		470-2150 MHz	>20			
Resistance to DC current	Ω/Km		50			50
Minimum bending radius	mm		35			
Characteristic impedance	Ω		75 ±3,0			
Units per packing			100			
Packing weight	Kg		4.36			3.86
Packing dimensions	mm		310 x 310 x 90			290 x 290 x 70

CU - Copper  
 AL - Aluminium  
 PL - Polyester  
 PEE - Expanded polyethylene  
 PVC - Polychloride  
 PE - Polyethylene

# 910 COAXIAL CABLES

Coaxial cables Cu-Cu-Cu

## Description

Coaxial cable with physically expanded dielectric and copper insulation. Flame-retardant. Conforms to norm EN 50117.

## Applications

Used to transmit the TV signal on the terrestrial band or on the IF satellite band.

## Characteristics

Supplied in coils of 100 m and packed in a carton box.



FI-250

FI-240

CODE		9100014		9100055	
MODEL			FI-250	FI-240	
Internal conductor	Mat		CU		
	mmø		1.15		
Dielectric	Mat		PEE Physical		
	mmø		5.00		
Shielding	Mat		CU		
Mesh	Mat		CU		
Cover	Mat		PVC white	PE black	
	mmø		6.80		
Attenuation / 100m	dB	50 MHz	3.9		
		470 MHz	12.2		
		862 MHz	17.2		
		2150 MHz	28.4		
Return loss	dB	5-470 MHz	>23		
		470-2150 MHz	>20		
Resistance to DC current	Ω/Km		34		
Minimum bending radius	mm		35		
Characteristic impedance	Ω		75 ±3,0		
Units per packing			100		
Packing weight	Kg		5.0		
Packing dimensions	mm		335 x 335 x 100		

# 910 COAXIAL CABLES

## RG-11 Cables

CL-201

CL-200



### Description

RG-11 coaxial cable with physically expanded dielectric. Flame-retardant. Conforms to norm EN 50117.

### Applications

Used to transmit the TV signal in the terrestrial band or in the satellite IF band in distributions requiring substantial lengths of cable.

### Characteristics

Supplied in coils of 250 m and packed in a carton box.

CODE		9100057		9100016	
MODEL			CL-201	CL-200	
Internal conductor	Mat		CU		
	mmø		1.63		
Dielectric	Mat		PEE Physical		
	mmø		7.20		
Shielding	Mat		CU	AL	
Mesh	Mat		CU	AL	
Cover	Mat		PE black		
	mmø		10		
Attenuation / 100m	dB	50 MHz	2.7	3.0	
		470 MHz	7.6	8.7	
		862 MHz	11.0	12.6	
		2150 MHz	20.0	21.5	
Return loss	dB	5-470 MHz 470-2150 MHz	>23 >20		
Resistance to DC current	Ω/Km		34	37	
Minimum bending radius	mm		35		
Characteristic impedance	Ω		75 ±3,0		
Units per packing			250	200	
Packing weight	Kg			15.0	
Packing dimensions	mm		400 x 400 x 370	450 x 450 x 300	

# 910 COAXIAL CABLES

Coaxial cables

CE-750

CE-741

CE-850



## Description

Coaxial cable with physically expanded dielectric. Flame-retardant. Complies with the UNE-EN 50117 standard.

## Applications

Used to transmit the TV signal on the terrestrial band or on the IF satellite band.

## Characteristics

Supplied in coils of 500 metres.

CODE		9100017	9100019	9100018
MODEL		CE-750	CE-741	CE-850
Equivalent model		CE-752	CE-740	CE-170
Units per packing		500	500	500
Packing weight	Kg	23.50	23.50	21.75
Packing dimensions	mm	400 x 400 x 360	400 x 400 x 360	400 x 400 x 360

## Accessories



### Staples

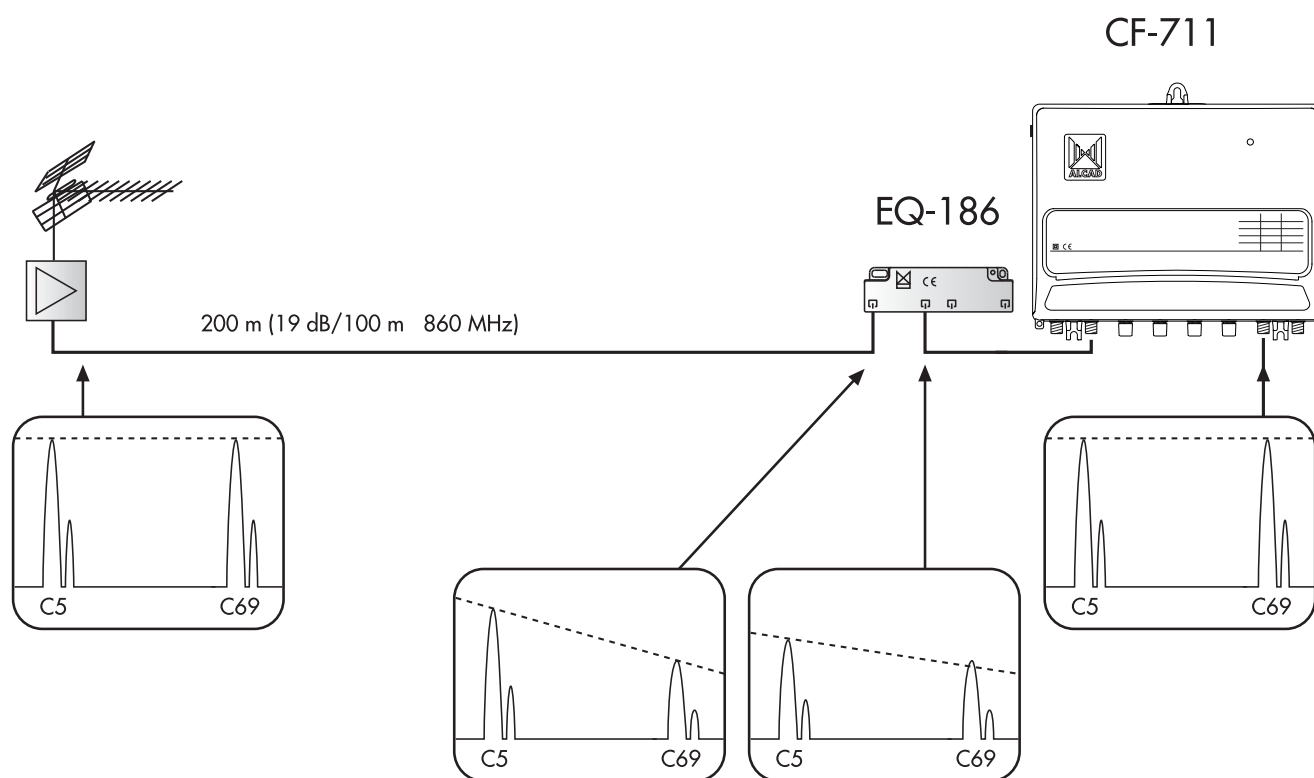
9100050	
GC-007	
Units per packaging	100
Packing weight	0,15 Kg
Packing dimensions	120 x 120 x 45 mm

Staples for the coaxial cable of Ø6 to Ø7 mm. With a tempered steel nail.

# 909 INSTALLATION EXAMPLES

## Equaliser as a complement of an amplifier

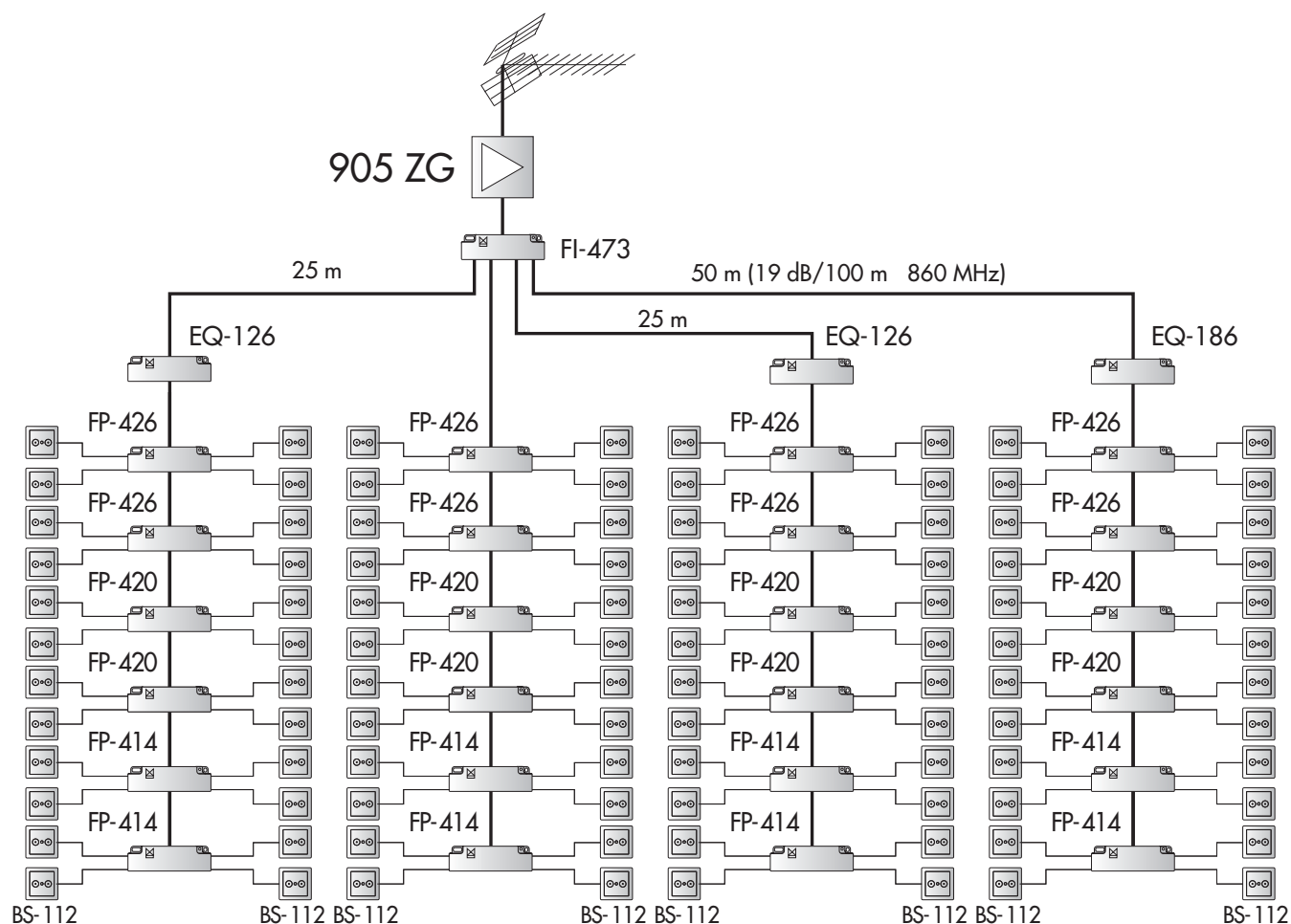
An additional equaliser may be necessary to the one which is already incorporated in the distribution amplifiers in community installations with long cable runs.



# 909 INSTALLATION EXAMPLES

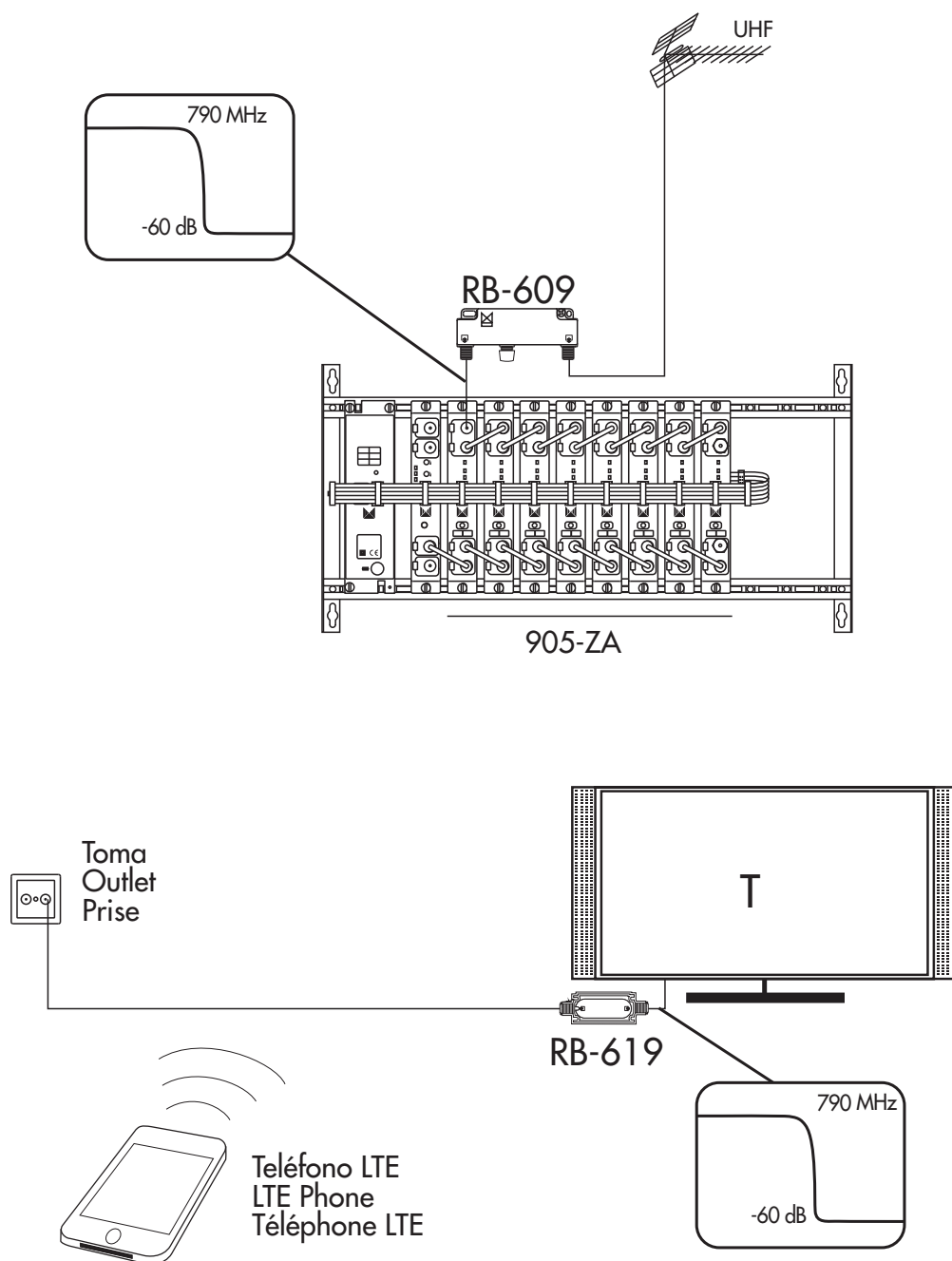
## Equaliser in MATV installations

It is advisable to equalise the signal in order to obtain a more balanced distribution in community installations with long cable runs. Excessive levels of the VHF channels can be avoided in this way.



# 909 INSTALLATION EXAMPLES

## Connection Diagram









# Measurement equipment and tools

Measurement equipment and tools  
for TV, fibre optic, structured cabling  
networks and telephony installations.

# 918 MEASUREMENT EQUIPMENT

## TV Field strength meter



FSM-530

### Description

Field strength meter for satellite and terrestrial TV. ALCAD's FSM field strength meters are equipped with a graphic interface which is particularly user-friendly thanks to its quick-click controls and its touch-sensitive rotary button.

### Applications

Measurement and analysis of terrestrial and satellite TV installations, providing the necessary measurements for digital DVB-T/H, DVB-T2, DVB-S and DVB-S2 signals, as well as analogue measurement in PAL, SECAM and NTSC. Graphic interface showing measurements and satellite dish pointing. Superfast spectrum analysis. Viewing of TV programmes in HD (MPEG-4 H.264). Allows channels to be loaded via its Ethernet and USB ports and saved.

### Characteristics

7" TFT panoramic colour screen. Battery with autonomy of 4 hours. Waterproof and water-resistant front. Its size and weight make it easy to handle and transport. Protective cover against bumps and dirt.

CODE		9180005			
MODEL		FSM-530			
RF input					
Terrestrial frequency range	MHz	45-865			
Satellite frequency range	MHz	950..2,150			
Resolution	KHz	25			
Tuning mode		Channel / Frequency			
Search mode		Manual / Automatic			
Standards		B, G, D, K, I, L, M, N, FM, PAL, SECAM, NTSC, DVB-T/H, DVB-T2, DVB-S, DVB-S2, DSS			
Impedance	Ω	75			
Connection		F male with F-F , F-BNC adapters			
Remote supply	V~	5	13	18	24
	mA	500	500	500	300
LNB supply		13-18V /0-22Khz /DiSEqC 1.2			
Dynamic level range	dBμV	20..120 (terrestrial) - 30..110 (sat)			
Analog measurements					
Terrestrial band		Signal level, Carrier to noise (C/N), video/audio ratio			
Satellite band		Signal level, C/N			
Digital measurements					
DVB-T/H		Signal level, C/N, MER, VBER, CBER, UNC, echoes analyzer and constellation			
DVB-T2		Signal level, C/N, MER, LDPC, BCH, FER, echoes analyzer and constellation			
DVB-S		Signal level, C/N, MER, VBER, CBER, UNC and constellation diagram			
DVB-S2		Signal level, C/N, MER, LDPC, BCH, PER and constellation			



FSM-530

CODE		9180005
MODEL		FSM-530
<b>Spectrum</b>		
Ultra fast analysis mode	ms	100 (terrestrial) - 350 (sat)
Span	MHz	5.. full
Display graphics		60 dB (10dB/div)
Attenuation		0..50dB automatic
<b>Display</b>		
Display type		16/9 LCD 7" color W-VGA
Analogic mode		Pal, Secam, NTSC
Digital mode		SD (MPEG-2), HD (MPEG-4)
Audio		Analógico, MPEG-1, MPEG-2, Dolby® Digital, Dolby® Digital Plus
Connection		RCA female connector for input and output video, right audio and left audio signals
<b>Other specifications</b>		
Keyboards and cursor		Tactile membrane
Ports		LAN RJ-45, USB, mini USB
Data storage		Non volatil memory, USB pendrive (optional)
<b>General features</b>		
Power supply		110/230Vac - 15V -5A adapter
Battery		LiOn 70W
Autonomy		3H typ.
Charging time		1 Hour for 80% capacity
Operatin temperature range	°C	-5.. 45
Units per packing		1
Packing weight	Kg	3,38
Packing dimensions	mm	300 x 250 x 200

# 918 MEASUREMENT EQUIPMENT



## TV Field strength meter



FSM-630

### Description

Field strength meter for terrestrial, satellite and cable TV. ALCAD's FSM field strength meters are equipped with a graphic interface which is particularly user-friendly thanks to its quick-click controls and its touch-sensitive rotary button.

### Applications

Measurement and analysis of terrestrial, satellite and cable TV installations, providing the necessary measurements for digital DVB-T/H, DVB-T2, DVB-S, DVB-S2 and DVB-C signals, as well as analogue measurement in PAL, SECAM and NTSC. Graphic interface showing measurements and satellite dish pointing. Superfast spectrum analysis. Viewing of TV programmes in HD (MPEG-4 H.264). Allows channels to be loaded via its Ethernet and USB ports and saved.

### Characteristics

7" TFT panoramic colour screen. Battery with autonomy of 4 hours. Waterproof and water-resistant front. Its size and weight make it easy to handle and transport. Protective cover against bumps and dirt.

CODE		9180006			
MODEL		FSM-630			
RF input					
Terrestrial frequency range	MHz	45-865			
Satellite frequency range	MHz	950..2,150			
Resolution	KHz	25			
Tuning mode		Channel / Frequency			
Search mode		Manual / Automatic			
Standards		B, G, D, K, I, L, M, N, FM, PAL, SECAM, NTSC, DVB-T/H, DVB-T2, DVB-S, DVB-S2, DSS, DBV-C			
Impedance	Ω	75			
Connection		F male with F-F , F-BNC adapters			
Remote supply	V~	5	13	18	24
	mA	500	500	500	300
LNB supply		13-18V /0-22Khz /DiSEqC 1.2			
Dynamic level range	dBμV	20..120 (terrestrial) - 30..110 (sat)			
Analog measurements					
Terrestrial band		Signal level, Carrier to noise (C/N), video/audio ratio			
Satellite band		Signal level, C/N			
Digital measurements					
DVB-T/H		Signal level, C/N, MER, VBER, CBER, UNC, echoes analyzer and constellation			
DVB-T2		Signal level, C/N, MER, LDPC, BCH, FER, echoes analyzer and constellation			
DVB-S		Signal level, C/N, MER, VBER, CBER, UNC and constellation diagram			
DVB-S2		Signal level, C/N, MER, LDPC, BCH, PER and constellation			
DVB-C		Signal level, C/N, MER, BER, UNC			
Spectrum					
Ultra fast analysis mode	ms	100 (terrestrial) - 350 (sat)			
Span	MHz	5.. full			
Display graphics		60 dB (10dB/div)			
Attenuation		0..50dB automatic			



FSM-630

<b>CODE</b>		9180006
<b>MODEL</b>		FSM-630
<b>Display</b>		
Display type		16/9 LCD 7" color W-VGA
Analogic mode		Pal, Secam, NTSC
Digital mode		SD (MPEG-2), HD (MPEG-4)
Audio		Analógico, MPEG-1, MPEG-2, Dolby® Digital, Dolby® Digital Plus
Connection		RCA female connector for input and output video, right audio and left audio signals
<b>Other specifications</b>		
Keyboards and cursor		Tactile membrane
Ports		LAN RJ-45, USB, mini USB
Data storage		Non volatil memory, USB pendrive (optional)
Conditional access		CAM Viaccess included
<b>General features</b>		
Power supply		110/230Vac - 15V -5A adapter
Battery		LiOn 70W
Autonomy		3H typ.
Charging time		1 Hour for 80% capacity
Operatin temperature range	°C	-5.. 45
Units per packing		1
Packing weight	Kg	3,38
Packing dimensions	mm	300 x 250 x 200



# 918 MEASUREMENT EQUIPMENT



## Optical power measurement kit



OEQ-000

### Description

Optical power measurement kit, consisting of a visual optical continuity fault locator, a laser light source and an optical power meter.

### Applications

Measurement and verification of optical fibre installations. The triple laser light source transmits on the 1310/1490/1550 nm wavelengths. The optical power meter saves past measurements in its internal memory, greatly simplifying the collection and analysis of data throughout an installation. The optical continuity fault locator provides the installer with a tool which quickly reveals the correct point-by-point installation of the fibres, identifying fibres already installed and checking for breakages in the optical fibres.

### Characteristics

Powered by AA batteries or direct connection to the mains. The external power supply unit can be used to recharge Ni-MH AA batteries. The laser transmitter and the optical power meter are equipped with SC/APC connectors.

CODE		9180002
MODEL		OEQ-000
<b>Optical power meter specifications</b>		
<b>Measurement at 1310 nm</b>		
Pass band	nm	1260.. 1360
Measurement rang	dBm	+10.. 35
Max. permitted input level	dBm	+15 max
Isolation of 1490/1550nm bands resolving	dB	>40
<b>Measurement at 1490 nm</b>		
Pass band	nm	1480.. 1550
Measurement rang	dBm	+10.. 50
Max. permitted input level	dBm	+15 max
Isolation of 1310nm band	dB	>40
Isolation of 1550nm band	dB	>40
<b>Measurement at 1550 nm</b>		
Pass band	nm	1530.. 1570
Measurement rang	dBm	+25.. 45
Max. permitted input level	dBm	+30
Isolation of 1310nm band	dB	>40
Isolation of 1490nm band	dB	>40
<b>Other specifications</b>		
Optical connector interchangeable		SC/PC
Intrinsic uncertainty	dB	0.5
Linearity	dB	0.1
Pass through insertion loss	dB	<1.5



OEQ-000

CODE		9180002
MODEL		OEQ-000
Thershold sets		Yes
Data memory		Yes
Extension interface		USB
Batteries		Size AA x 3
Battery operating time		>30 hours
Operating temperature	°C	-10.. +60
Storage and transport temperatures	°C	-10.. +70
<b>Triple wavelength laser source specifications</b>		
Stability	dB	$\pm 0.05$ (1hour) / $\pm 0.1$ (8hour)
Output power	dBm	> -6 (at 1310/1490/1550/1625nm)
Modulation	dBm	> -10 (at 1300/850 nm)
	Hz	270, 1000, 2000
Conectivity		SC/APC configurable
Auto switch-off		10 minutes
Battery life		>16 hours
Storage and transport temperatures	°C	-20.. +60
Operating temperatures	°C	-10.. +50
Power supply		Size AA x 3
Units per packing		1
Packing weight	Kg	1.69
Packing dimensions	mm	320 x 230 x 165





TME-100

## Description

Structured cabling networks UTP / FTP analyzer, consisting of a main measurement unit and a remote unit.

## Applications

Completing the certification of structured cabling UTP / FTP installations, Category 3, 4, 5, 5e and 6. Provides instructions for checking the premises structured cabling measures. To store and manage the data of an installation by performing full reports of each installation. Voice intercom between the main unit and the remote.

## Characteristics

Colour screen. Li-ion batteries with autonomy of 12 hours. Robust design for use under field conditions. RJ45 female connector.

CODE		9180001
MODEL		TME-100
Cable types		
Shielded and unshielded twisted pair LAN cabling (STP, FTP, SSTP, and UTP)		TIA Category 3, 4, 5, 5e, and 6A: 100Ω ISO/IEC Class C and D: 100Ω and 120Ω ISO/IEC Class E, Class EA, Class F and Class FA: 100Ω
Standard link interface adapters		
Cat 6A/Class EA permanent link adapters		Plug type: shielded Cat 6A centered 8-pin modular plug (RJ45) Plug life: > 8000 insertions Tests supported: shielded and unshielded cable, TIA Cat 3, 4, 5, 5e, and 6 and ISO/IEC Class C, D and EA permanent link
Cat 6/Class E channel adapters		Plug type: shielded 8-pin modular socket (RJ45) Plug life: > 10,000 insertions Tests supported: shielded and unshielded cable, TIA Cat 3, 4, 5, 5e, 6, and 6A and ISO/IEC Class C, D, EA channels
Test standards		
TIA		Category 3 and Category 5e per TIA/EIA-568B Category 5 (1000BASE-T) per TIA TSB-95 Category 6 per TIA/EIA-568B.2-1 (Addendum #1 to TIA/EIA-568B.2) Category 6A per TIA/EIA-568B.2-10
ISO/IEC		11801 Class C, D and E 11801-2000 Class C, D and E, 11801 Amd 1 Class EA channel; Amd 2 Class EA permanent link 11801 Class F (DTX-1800 only)
EN		50173 Class C, D, E 50173 Class F (DTX-1800 only)
ANSI		TP-PMD
IEEE 802.3		10BASE-T, 100BASE-TX, 1000BASE-T, 10GBASE-T
IEEE 802.5		(STP cabling, IBM Type 1, 150 Ω ) Token Ring, 4 Mbps and 16 Mbps
General specifications		
Speed of autotest		Full 2-way Autotest of Category 6 Twisted-Pair links: 9seconds or less Full 2-way Autotest of ISO/IEC Class F links: 25 seconds



TME-100

CODE	9180001
MODEL	TME-100
Supported test parameters	Wire Map, Length, Propagation Delay, Delay Skew, DC Loop Resistance, Insertion Loss (Attenuation), Return Loss (RL), RL @ Remote, NEXT, NEXT @ Remote, Attenuation-to-Crosstalk Ratio, ACR-N @ Remote, ARC from the far end (ACR-F) formerly named ELFEXT, ACR-F @ Remote, Power Sum, NEXT (PS NEXT), PSNEXT @ Remote, Power Sum ACR-N, PSACR @ Remote, Power Sum ACR-F (PS ACR-F) and PS ACR-F @ Remote.
Cable tone generator	Generates tones that can be detected by a tone probe such as a Fluke Networks IntelliTone™ probe. The tones are generated on all pairs. Frequency range of tones: 440 Hz to 831 Hz
Display	3.7 in (9.4 cm) diagonal, 240 dots wide by 320 dots high, passive color, transmissive LCD with backlight.
Input protection	Protected against continuous telco voltages and 100 mA over-current. Occasional ISDN over-voltages will not cause damage
Case	High impact plastic with shock absorbing overmold
Dimensions	Main unit and Smart Remote: 8.5 in x 4.4 in x 2.4 in (21.6 cm x 11.2 cm x 6 cm), nominal
Weight	2.4 lb (1.1 kg), nominal (without adapter or module)
<b>Power</b>	
Main unit and remote	Lithium-ion battery pack, 7.4 V, 4000 mAh
Typical battery life	12 to 14 hours
Charge time* (with tester off)	4 hours (below 40° C)
AC adapter/charger, USA version	Linear power supply; Input 108 V ac to 132 V ac, 60 Hz ; Output 15 V dc, 1.2 A
AC adapter/charger, international version	Switching power supply; Input 90 V ac to 264 V ac, 47 to 63 Hz; Output 15 V dc, 1.2 A (isolated output)
Memory backup power in main unit	Lithium battery
Typical life of lithium battery	5 years
Languages supported	English, French, German, Spanish, Portuguese, Italian, Japanese, and Simplified Chinese
Operating temperature	0°.. 45° C
Units per packing	1
Packing weight	4.400Kg
Packing dimensions	600 x 350 x 400mm



TME-000

## Description

Structured cabling UTP/FTP tester, consisting of a main unit and a remote unit.

## Applications

Checking the correct connectorisation of UTP/FTP cables. By light and sound signals indicating whether the cable is crossed, cable is direct, open or short circuit.

## Characteristics

Made from in two plastic pieces. Female RJ45 connector. Powered by A23 batteries.

CODE		9180000
MODEL		TME-000
Connectors		RJ45 female
Indication mode		Led and acoustic signal
Operating mode		Auto / step by step
Test function		Straight, short ,crossover, and open
Battery		GP23AE (12V alkaline battery included)
Units per packing		1
Packing weight	Kg	0.131
Packing dimensions	mm	120 x 70 x 36

# 912 TOOLS

## Programming tool



PS-011

### Description

Wireless programmer for all programmable devices manufactured by ALCAD.

### Applications

Configuration of installations composed of any programmable devices manufactured by ALCAD. Saves and manages such configurations, storing all the parameters of each installation in memory. Generates and sends NIT tables. Can be easily updated via USB memory stick or SD card in order to add new features. It is possible to add new programmable product series and to remove old ones. Management of files saved in memory. Two-way infrared communication (IrDA and IR).

### Characteristics

3.4" TFT colour screen. Internal memory and memory expansion slots for USB sticks and SD cards. Powered by two AA batteries or connection via an adaptor to the electric mains.

CODE		9120144
MODEL		PS-011
Communication		IrDA / IR
Interface ports		USB / SD slot
Internal memory	Mb	64
Display		3,4" colour TFT
Firmware		Upgradeable by USB and SD slot
Language		Spanish, English, French
File management	dB	Yes
Battery		Size AA x 2 (Ni-MH 1.2V/2500mA rechargeable)
Power supply adaptor input	V~	100.. 240
	mA	30
Power supply adaptor output	V---	5
	mA	1200
Units per packing		1
Packing weight	Kg	0.49
Packing dimensions	mm	220 x 200 x 60

# 918 TOOLS

## Fibre optic fusion splicing kit



OEQ-100

### Description

Optical fibre fusion kit, consisting of an optical fusion splicer with core alignment, and a precision optical fibre cutter and stripper.

### Applications

Splicing single-mode and multimode optical fibre on site in 8 seconds. The splicer gives a reading of the optical losses during splicing. The 5" screen allows the user to see the automatic alignment of the fibre in real time. Incorporates a feature for heat-shrinking a splice protector in 40 seconds. Allows data from up to 8,000 fusions to be recorded in internal memory. The precision cutter and stripper prepare the fibres before fusion so that losses are minimised during the process.

### Characteristics

Long-lasting internal battery. Lightweight compact design for easy handling on site. Reversible monitor with control panel on both sides.

CODE		9180003
MODEL		OEQ-100
Type of fibres accepted		SM, MM, DS, NZ-DS, EDF
Cladding diameter	µm	100...150
Coating diameter	µm	100...1000
Fibre cleaved length	mm	8 ~ 22 (standard)
Fibre Alignment		Core alignment
Splicing mode		Auto & Manual
Average splice loss	dB	0,02 (SM) / 0,01 (MM) / 0,04 (DS) / 0,04 (NZDS)
Return loss	dB	60
Electrodes lifetime		> 2500 splices
Protection sleeve length	mm	20, 40, 60
Tension test	N	2.0 (standard)
Language		Spanish, English, French, Chinese, Korean, Russian
Interface		RS232 interface & video output
Internal Battery		12 V / 10000 mAh, up to 200 splices and heats
Power supply AC adaptor		85 ~ 260
Environment conditions		- 25 ~ + 50 °C (operation temperature), 0 ~ 95 %RH (humidity), 0 ~ 5000 m (altitude)
Storage conditions		- 40 ~ + 80 °C (temperature), 0 ~ 95 %RH (humidity)
Fiber splicer weight	Kg	3,3
Fiber splicer dimensions	mm	170 x 170 x 140
Units per packing		1
Packing weight	Kg	8,43
Packing dimensions	mm	525 x 360 x 305

# 918 TOOLS



## Fibre optic splicing kit



### Tools

9180004	
OEQ-200	
Units per packaging	1
Packing weight	2.100 Kg
Packing dimensions	330 x 270 x 185mm

### Description

Optical fibre connectorisation kit containing everything necessary to make mechanical SC/APC connectors and perform mechanical optical fibre splices on site.

### Applications

Making mechanical connectors and splices of single-mode optical fibres on site without having to use a fusion splicer. The various elements which make up the kit allow the user to cut, strip and clean the fibres so that the connectorisations can be made quickly and efficiently.

### Characteristics

The kit consists of:

- a precision optical fibre cutter
- an optical fibre stripper
- 5 SC/APC mechanical connectors with plastic holder for assembly
- 5 mechanical splices
- an assembly tool for mechanical splices
- a spool of cleaning tape for SC/APC connectors
- hand wipes saturated in isopropyl alcohol
- a bottle of high-grade isopropyl alcohol with dispenser
- 5 cleaning sticks for fibre adapters
- an optical fibre ferrule pen-cleaner
- a carrying bag.



F connector tool

9120027	
LF-001	
Units per packaging	3
Packing weight	0,05 Kg
Packing dimensions	80 x 40 x 20 mm

Assembly key for F type connectors, facilitates the connection of male F connectors to the different equipment.



Ø10 mm cable stripper

9080021	
HE-001	
Units per packaging	1
Packing weight	0,060 Kg
Packing dimensions	185 x 120 x 25 mm

Stripping tool for RG-11 coaxial cable, Ø10.1 mm.



Ø7mm cable stripper

9080017	
HE-000	
Units per packaging	10
Packing weight	0,060 Kg
Packing dimensions	185 x 120 x 25 mm

Tool for stripping Ø6.5mm - Ø7.1mm coaxial cable.



Ø7mm cable stripper

9080028	
HE-002	
Units per packaging	10
Packing weight	0,030 Kg
Packing dimensions	120 x 26 x 26 mm

Tool for stripping Ø6.5mm – 7.2mm coaxial cable. Does not require blade adjustment. Allows cables for terminals to be stripped with ease.



Compression tool

9080022	
HE-201	
Units per packaging	1
Packing weight	0,570 Kg
Packing dimensions	220 x 80 x 55 mm

Tool for compressing MC-204 compressing.



Crimping tool

9080016	
HE-200	
Units per packaging	1
Packing weight	0,600 Kg
Packing dimensions	130 x 80 x 20 Kg

Crimping tool for MC-104 connectors.



Assembly tool

9080018	
HE-100	
Units per packaging	1
Packing weight	0,080 Kg
Packing dimensions	140 x 30 x 30 mm

Tool for assembling male F-type connector.

## 930 TOOLS



Crimping tool

9300066	
HT-100	
Units per packaging	1
Packing weight	0,358 Kg
Packing dimensions	275 x 125 x 28 mm

Crimping tool for male RJ45 connectors onto UTP cable.



Impact punch down and cuts tool

9300067	
HT-001	
Units per packaging	1
Packing weight	0,170 Kg
Packing dimensions	225 x 95 x 30 mm

Impact tool for embedding telephone cable pairs into supports and structured cable into RJ45 female connectors. The connection is made by moving deck.



Connection tools

9300040	
HT-000	
Units per packaging	1
Packing weight	0,12 Kg
Packing dimensions	205 x 54 x 37 mm

Connection tool for connection modules. Permits the connections of the pairs to the module by pressure.



Test point plugs

9300030	
CJ-000	
Units per packaging	1
Packing weight	0,05 Kg
Packing dimensions	180 x 20 x 20 mm

Test point plug for taking readings of a pair of the telephony installation. Permits the independent reading of both sides of the installation.



Tools

9300032	
HE-101	
Units per packaging	1
Packing weight	0.080 Kg
Packing dimensions	115 x 25 x 25mm

Assembly tool for RC-100, shielded and tamperproof F type loads.







# Home electronics

Home electronics equipment which improve the quality and comfort in audiovisual installations. Wireless video surveillance systems. Modulators for domestic installations.



# 951 STANDALONE DIGITAL MODULATORS



## HDMI to DVB-T Compact modulators



DMH-141

### Description

Digital modulator designed to generate a digital terrestrial TV channel in DVB-T from one HDMI signal or from one A/V signal. Can be programmed using built-in keyboard and display.

	CODE	MODEL	UNITS PER PACKING	PACKING WEIGHT	PACKING DIMENSIONS
Digital modulator	9510070	DMH-141	1	1.073 Kg	203 x 182 x 150 mm

More information on page 177

# 951 STANDALONE DIGITAL MODULATORS



## A/V to DVB-T Compact modulators



DM-141

### Description

Digital modulator designed to generate a digital terrestrial TV channel in DVB-T from one A/V signal. Can be programmed using built-in keyboard and display.

	CODE	MODEL	UNITS PER PACKING	PACKING WEIGHT	PACKING DIMENSIONS
Digital modulator	9510069	DM-141	1	0.900 Kg	203 x 182 x 150 mm

More information on page 178



DMH-341

### Description

Digital modulator designed to generate a digital terrestrial TV channel in DVB-C from one HDMI signal or from one A/V signal. Can be programmed using built-in keyboard and display.

	CODE	MODEL	UNITS PER PACKING	PACKING WEIGHT	PACKING DIMENSIONS
Digital modulator	9510071	DMH-341	1	1.073 Kg	203 x 182 x 150 mm

More information on page 179

# 951 VIDEO TRANSMISSION



Video transmitter by radio



## Description

Audio, video and remote control transmission system. The transmission is carried out via radio, without cables. The kit consists of a transmitter and receiver.

## Applications

Used in the TV installations within a house in which it is not possible to install a coaxial cable and permits the changing of the channel from any point in the house, using the remote control of the corresponding device.

## Characteristics

Transmission of the remote control via radio, on the 2.4 GHz band. This band is free of the habitual interference of the other bands.

	CODE	MODEL	UNITS PER PACKING	PACKING WEIGHT	PACKING DIMENSIONS
Video Transmitter kit	9510029	RV-001	12	24,0 Kg	540 x 415 x 240 mm
Video receiver	9510059	RV-011	12	12.0 Kg	540 x 415 x 240 mm

# 951 INFRARED IR TRANSMISSION



IR transmitter by radio



## Description

Remote control transmission system via radio without cables. The kit consists of a transmitter and receiver. The system can be complemented with additional transmitters.

## Applications

Used in the TV installations within a house to control equipment installed in another room. Transmits the orders of the remote control to any point in the house.

## Accessories

9510062 IR-211 Additional IR transmitter.

	CODE	MODEL	UNITS PER PACKING	PACKING WEIGHT	PACKING DIMENSIONS
IR transmitter kit	9510060	IR-201	12	7,20 Kg	530 x 340 x 250 mm
IR by radio transmitter	9510062	IR-211	12	3,60 Kg	530 x 340 x 250 mm

# 951 MODULATORS

## Compact modulators



See specifications on pages 179 and 180.

### Description

TV modulator with mono audio, which generates an analogue TV channel from the audio and video signals. The generated channel is mixed with the rest of the channels of the TV installation. Available in different bands, with different standards and channel tables.

### Applications

It modulates the audio and video signal of a satellite receiver, DVD, video or surveillance camera, in order to distribute it in the TV installation of the house. The audio and video signals are obtained from the scart connector of the video.

### Characteristics

The output channel can be selected by means of switches. Essential features of this equipment are the high carrier to noise ratio together with a very reduced spurious level in the band. Modulation in VSB vestigial side band. F type connector and RCA connector for audio/video.

### Accessories

9510066 CR-101 A/V input cable

	CODE	MODEL	UNITS PER PACKING	PACKING WEIGHT	PACKING DIMENSIONS
Modulator BIII/BS norma B-D-I	9510064	MD-310	1	0,4 Kg	115 x 102 x 45 mm
Modulator UHF norma G-K-I-L	9510065	MD-410	1	0,4 Kg	115 x 102 x 45 mm
Modulator wideband BG stereo	9510067	MD-531	1	0,58 Kg	165 x 100 x 50 mm

# 951 OTHER PRODUCTS

## Indoor antenna



### Description

Indoor antenna with built-in amplifier which covers the VHF (telescopic V-shaped antenna) and UHF bands (dipole type antenna). Weak signals can be received with this antenna.

### Applications

TV reception in places where there is no TV installation, such as camping sites or in cars or caravans. TV reception of channels that are not distributed by the TV installation in the building – in this case the indoor antenna mixes the channels it receives with the channels of the outlet of the installation.

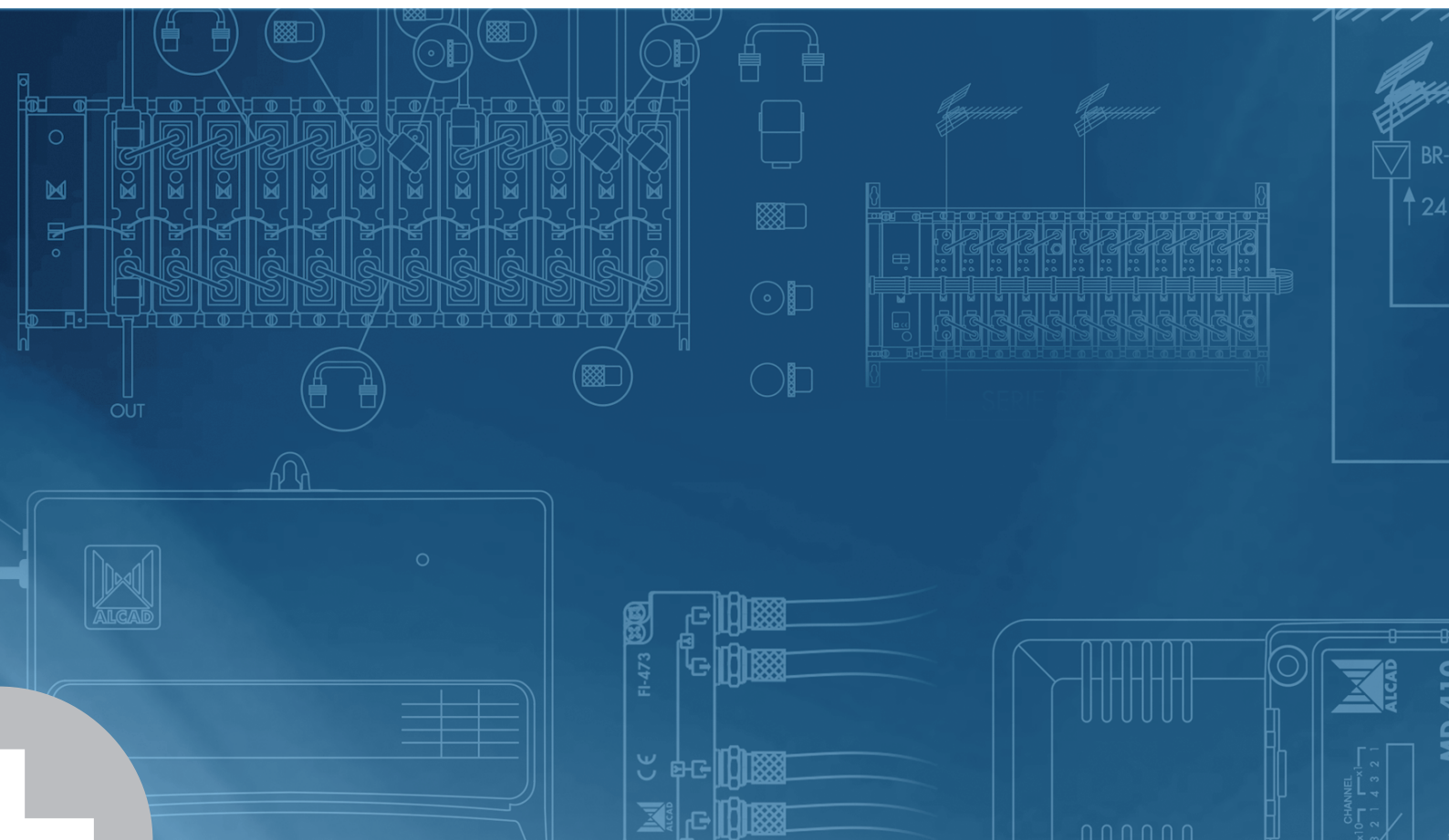
### Characteristics

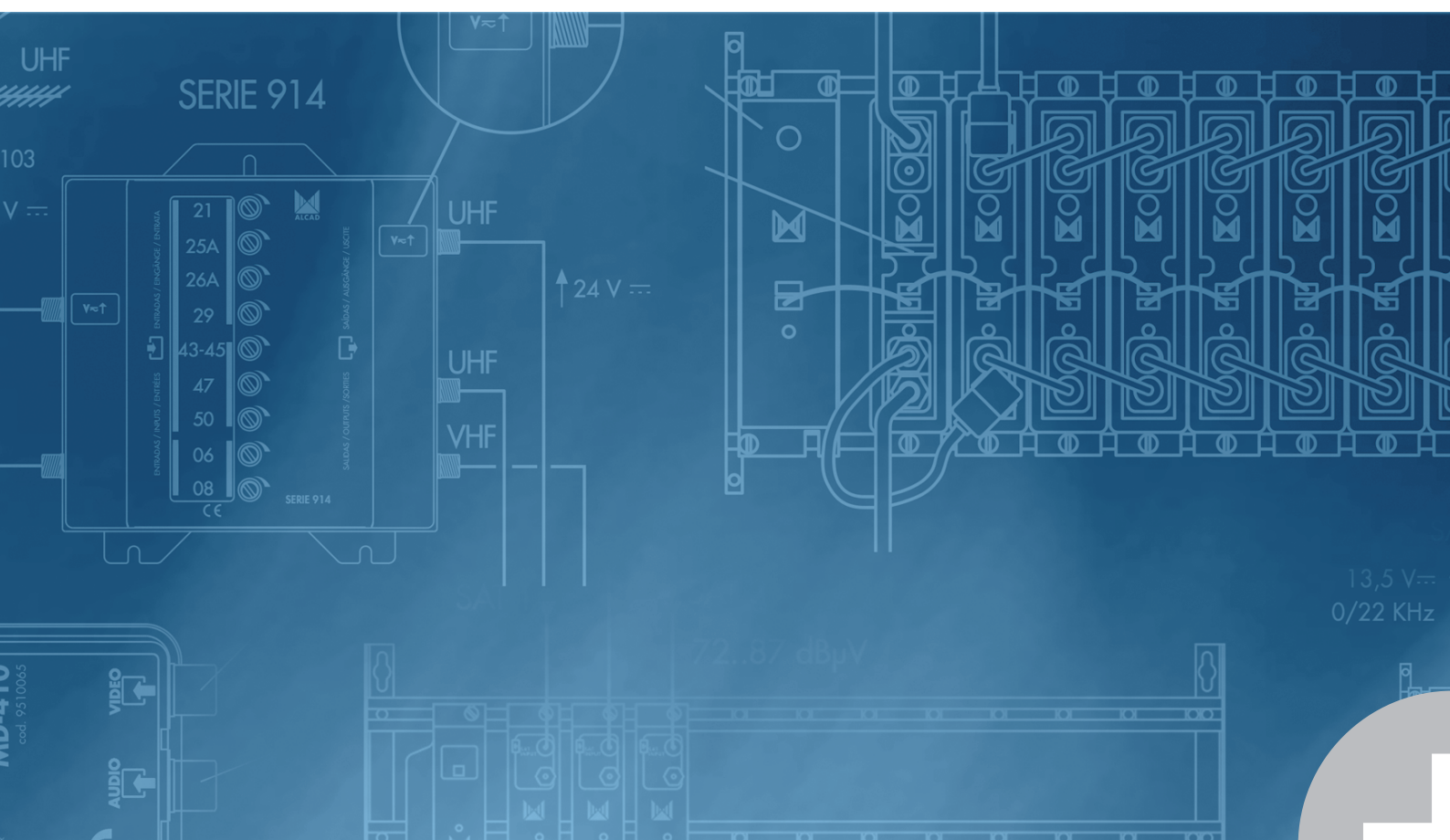
Built-in amplifier with gain control. Multiplexer for the installation's TV signal. Mains power supply (230 V~) or battery (12 V~) for vehicles or outdoor use.

	CODE	MODEL	UNITS PER PACKING	PACKING WEIGHT	PACKING DIMENSIONS
Indoor antennas	9510011	IA-001	10	12,0 Kg	670 x 615 x 540 mm









# Technical annex

Technical annex with norms and conditions of measurement of the information in this catalogue. TV standard tables and identification of channels.



# NORMS

The High Frequency products presented in this catalogue (Chapters 1 to 10) comply with the European norms regulating products “for cable distribution networks for television signals, audio signals and interactive signals.”

EN 60065	Safety requirements
EN 50083-1	Safety requirements
EN 50083-2	Electromagnetic compatibility

Alcad certifies the compliance of these norms by the “Declaration of Conformity” which is included in the instruction pages. The CE marking on the products, packaging, instruction pages or catalogues guarantees this compliance. Additional country standardisation is therefore unnecessary in the countries of the European Union, given that the CE marking is the only requirement required for the commercialisation and installation of our equipment. In addition, the specifications, measurement methods and publication of information regarding these products fully comply with the following non-obligatory norms:

EN 50083-3	Active broadband equipment for coaxial distribution networks
EN 50083-4	Passive broadband equipment for coaxial distribution networks
EN 50083-5	Head-end equipment
EN 50083-7	System requirements
EN 50083-8	Electromagnetic compatibility for systems

These norms facilitate the work of the installer by making the products adapt to the systems where they will be installed and publishing the necessary documentation so the installer can comply with the European norms with regards to installations.

The Home Electronic products presented in this catalogue (Chapter 11) comply with the European norms demanded of products of “Consumer Electronics for the Home”.

EN 60065	Safety requirements
EN 50081-1	Electromagnetic compatibility

## TECHNICAL INFORMATION

### General Information

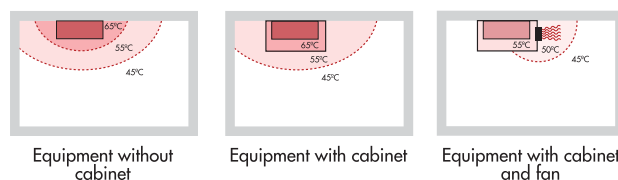
#### Impedance

The impedance of the RF inputs and outputs of the products is  $75\ \Omega$ , except where indicated differently.

#### Temperature of the equipment and environmental temperature

The temperature of the equipment is the temperature of the air surrounding the equipment at a distance of less than 1 cm and is the temperature which should be tested to determine whether a piece of equipment is correctly installed. Operating equipment outside its recommended temperature range may result in damage to the equipment. Unless indicated otherwise, this temperature range is from  $-10\ ^\circ\text{C}$  to  $+65\ ^\circ\text{C}$  for equipment installed outdoors or indoors. It is shown on datasheets as the operating temperature or as the temperature in close proximity to the equipment.

The environmental temperature is the temperature of the air at a distance of more than 1 m from the equipment or from the cabinet in which the equipment is installed. If the equipment is installed in a cabinet with a ventilator, the maximum allowable environmental temperature will be the maximum allowable temperature of the equipment minus  $20\ ^\circ\text{C}$ . If the equipment is not installed in a cabinet or is installed in a cabinet without a ventilator, the maximum allowable environmental temperature will be the maximum allowable temperature of the equipment minus  $10\ ^\circ\text{C}$ , unless indicated otherwise.



#### Mains voltage

The necessary mains voltage to feed the equipment conforms to the IEC 38 / UNE 21301:1991 norm for a voltage of 230 Vac  $\pm 6\%$  /  $\pm 10\%$ , or with improved margins according to those indicated in the product information.

#### Antenna wind resistance

The resistance to wind of the antennas is specified according to the norm EN 50083-1 for a wind pressure of  $800\ \text{N/m}^2$  ( $120\ \text{km/h}$ ). For antennas installed at a height greater than 20m a corrective coefficient of 1.375 should be applied which corresponds to a wind pressure of  $1.100\ \text{N/m}^2$  ( $150\ \text{km/h}$ ).

#### Antenna gain

The gain of the non-isotropic antennas is indicated in dB (dBd) with regards to the gain of a dipole antenna of  $l/2$ . The gain of the isotropic antennas (omnidirectionals) is indicated in dBi with regards to the gain of an isotropic antenna, this measurement is 2 dB greater than the former.

# TECHNICAL INFORMATION

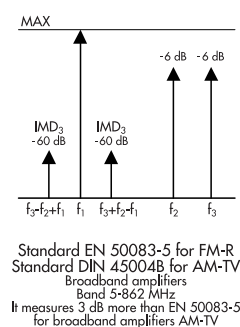
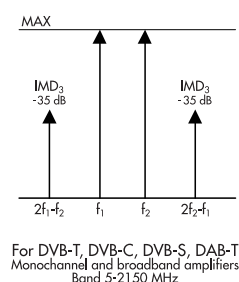
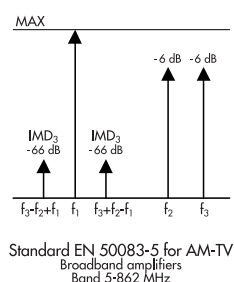
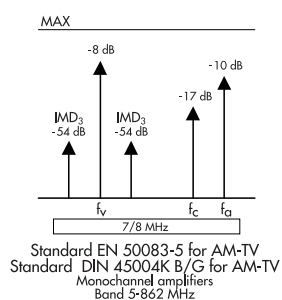
## Amplifiers

The maximum output levels of the active products are specified according to the EN 50083-4 norm for head-end equipment and according to the EN 50083-3 norm for amplifiers of distribution or cascadable. The levels for broadband amplifiers are also specified according to the DIN 45004B norms as are the levels for monochannel amplifiers in norm DIN 45004K.

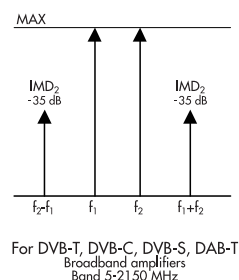
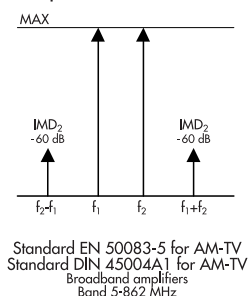
The following methods of measurement also specify the maximum levels which maintain 2nd or 3rd intermodulation order ( $IMD_2$  or  $IMD_3$ ) under a maximum level.

## Head-end amplifiers

### Output level in terms of the 3rd order intermodulation ( $IMD_3$ )

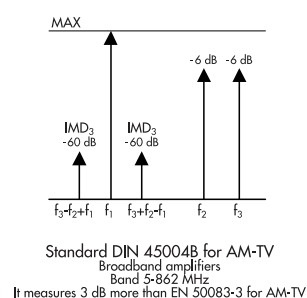
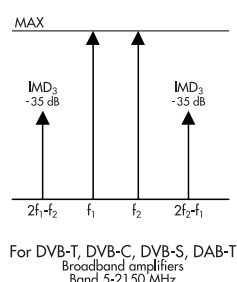
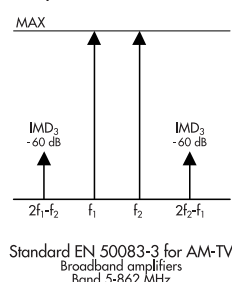


### Output level in terms of the 2nd order intermodulation ( $IMD_2$ )

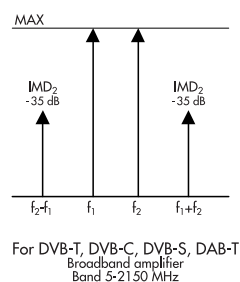
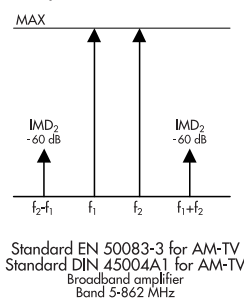


## Distribution and cascable amplifiers

### Output level in terms of the 3rd order intermodulation ( $IMD_3$ )




### Output level in terms of the 2nd order intermodulation ( $IMD_2$ )



## OUTPUT LEVEL EQUIVALENCES

### Table of equivalences

There are different forms of expressing the maximum output level of amplifiers in terms of the method of measurement that is applied. In practice, this can make it difficult for the installer to know if a product fulfils the full specifications of a certain project. The use of this table allows you to obtain the maximum output level of an amplifier according to the most frequently used methods of measurement using the maximum output level measured with a different method.



		DIN 45004K	EN 50083-3	DIN V VDE 0855	UTE C90-124	
		3 carriers IMD <sub>3</sub> α - 54 dB	2 carriers IMD <sub>3</sub> α - 35 dB	2 carriers IMD <sub>3</sub> α - 35 dB	2 carriers IMD <sub>3</sub> α - 46 dB	3 carriers IMD <sub>3</sub> α - 42 dB
DIN 45004K	3 carriers IMD <sub>3</sub> α - 54 dB	+0.0	-	-	-	-11.5
EN 50083-3	2 carriers IMD <sub>3</sub> α - 35 dB	-	+0.0	+0.0	-5.5	-6.5
DIN V VDE 0855 Part 12	2 carriers IMD <sub>3</sub> α - 35 dB	-	+0.0	+0.0	-5.5	-6.5
	2 carriers IMD <sub>3</sub> α - 46 dB	-	+5.5	+5.5	+0.0	-1.0
UTE C90-124	3 carriers IMD <sub>3</sub> α - 42 dB	+11.5	+6.5	+6.5	+1.0	+0.0
	2 carriers IMD <sub>3</sub> α - 52 dB	-	+8.5	+8.5	+3.0	+2.0
UTE C90-120	3 carriers IMD <sub>3</sub> α - 46 dB	-12.5	+8.5	+8.5	+3.0	+2.0
	2 carriers IMD <sub>3</sub> α - 54 dB	-	+9.5	+9.5	+4.0	+3.0
DIN 45004B	3 carriers IMD <sub>3</sub> α - 60 dB	-	+9.5	+9.5	+4.0	+3.0
UTE C90-125	3 carriers IMD <sub>3</sub> α - 52 dB	+16.5	+11.5	+11.5	+6.0	+5.0
EN 50083-3	2 carriers IMD <sub>3</sub> α - 60 dB	-	+12.5	+12.5	+7.0	+6.0
	3 carriers IMD <sub>3</sub> α - 60 dB	-	+15.5	+15.5	+10.0	+9.0
EN 50083-3	42 carriers CTB α - 60 dB	-	+23.5	+23.5	+21.0	+20.0

# OUTPUT LEVEL EQUIVALENCES

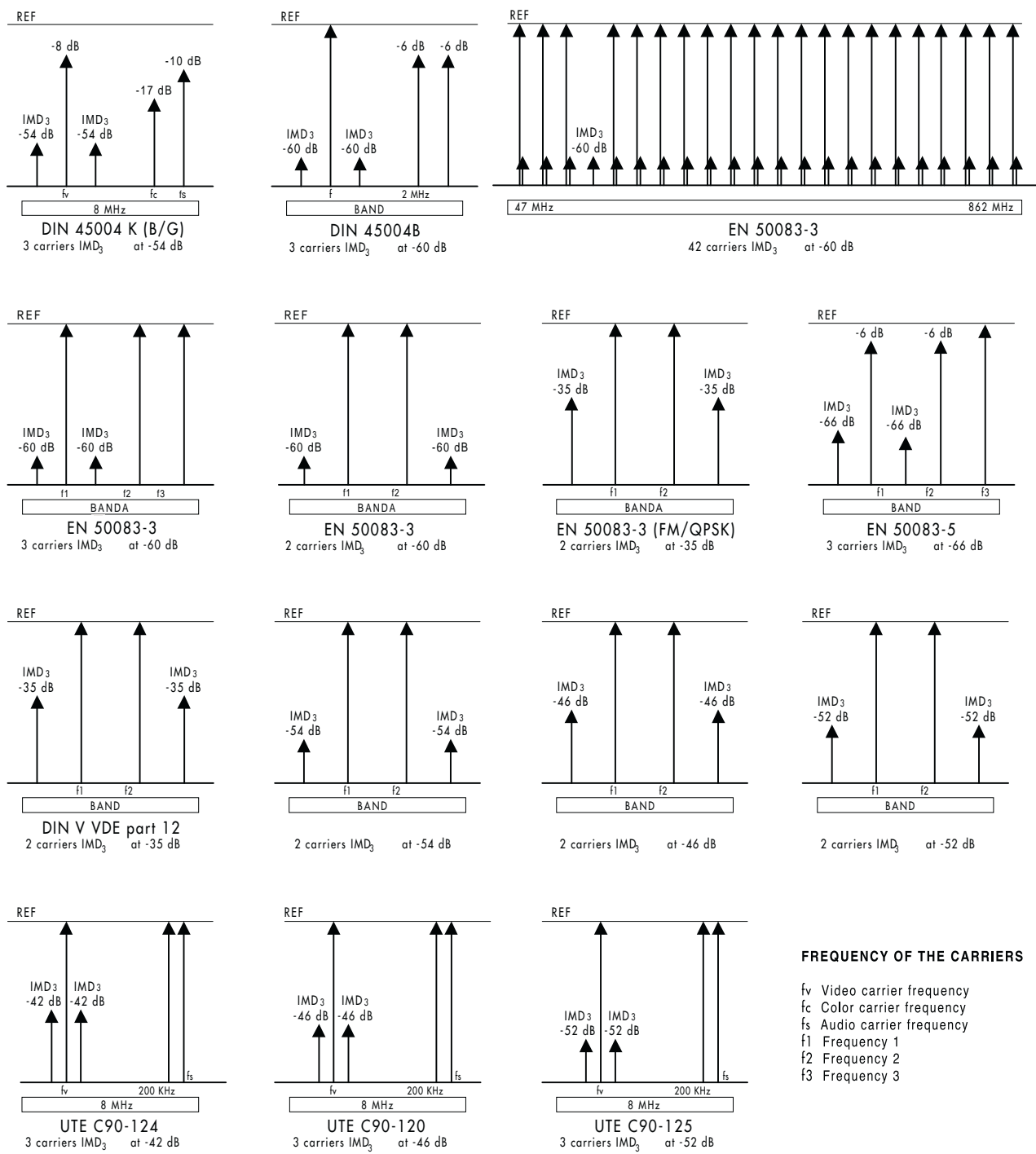
## Table of equivalences

UTE C90-120		DIN 45004B		UTE C90-125	EN 50083-3	
2 carriers IMD <sub>3</sub> α - 52 dB	3 carriers IMD <sub>3</sub> α - 46 dB	2 carriers IMD <sub>3</sub> α - 54 dB	3 carriers IMD <sub>3</sub> α - 60 dB	3 carriers IMD <sub>3</sub> α - 52 dB	2 carriers IMD <sub>3</sub> α - 60 dB	3 carriers IMD <sub>3</sub> α - 60 dB
-	-12.5	-	-	-16.5	-	-
-8.5	-8.5	-9.5	-9.5	-11.5	-12.5	-15.5
-8.5	-8.5	-9.5	-9.5	-11.5	-12.5	-15.5
-3.0	-3.0	-4.0	-4.0	-6.0	-7.0	-10.0
-2.0	-2.0	-3.0	-3.0	-5.0	-6.0	-9.0
+0.0	+0.0	-1.0	-1.0	-3.0	-4.0	-7.0
+0.0	+0.0	-1.0	-1.0	-3.0	-4.0	-7.0
+1.0	+1.0	+0.0	+0.0	-2.0	-3.0	-6.0
+1.0	+1.0	+0.0	+0.0	-2.0	-3.0	-6.0
+3.0	+3.0	+2.0	+2.0	+0.0	-1.0	-4.0
+4.0	+4.0	+3.0	+3.0	+1.0	+0.0	-3.0
+7.0	+7.0	+6.0	+6.0	+4.0	+3.0	+0.0
+18.0	+18.0	+17.0	+17.0	+15.0	+14.0	+11.0

# OUTPUT LEVEL EQUIVALENCES

## Measurement methods

The maximum levels which maintain 2nd or 3rd order intermodulations under a maximum level are specified in these methods of measurement.



## BROADBAND SYSTEMS

### Calculating the operating level of the amplifiers

The reduction of the maximum output level of the amplifier in terms of the number of channels and of the number of amplifiers in series should be taken into account in analogue terrestrial TV installations with broadband amplifiers. By applying these reductions to the maximum output level according to norm DIN 45004B the level of intermodulations can be maintained at 54dB weaker than that of the channels which is undetectable in the TV. This reduction in the output level should be applied to all the amplifiers of the line.

$N_{\text{omax}}$  Maximum operating level  
 $N_{\text{max}}$  Maximum output level DIN 45004B  
 $R_1$  Reduction by number of channels  
 $R_2$  Reduction by number of amplifiers in series

$$N_{\text{tmax}} = N_{\text{max}} - R_1 - R_2$$

#### $R_1$

CHANNELS	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Reduction	0	2.5	3.5	4.5	5	5.5	6	6.5	7	7.5	8	8	8.5	8.5	9	9

#### $R_2$

AMPLIFIERS	1	2	3	4	5	6
Reduction	0	3	4.5	6	7	7.5

Example: The following reductions in level should be applied in an installation designed for the distribution of up to 15 channels and with three broadband amplifiers in series, with a maximum output level of 120 dB $\mu$ V DIN 45004B:

$R_1 = 8.5 \text{ dB}$   
 $R_2 = 4.5 \text{ dB}$

$$N_{\text{omax}} = 120 - 8.5 - 4.5 = 107 \text{ dB}\mu\text{V}$$

The intermodulations will not be visible if the output level of the three amplifiers is adjusted to 107 dB $\mu$ V DIN 45004B.

Note: It is possible to calculate the reduction values with the following formulas instead of using the reduction tables.

$n$  Number of channels  
 $m$  Number of amplifiers in series

$$R_1 = 7.5 \cdot \log(n-1)$$

$$R_2 = 10 \cdot \log(m)$$

# BROADBAND SYSTEMS

## Correction of the output level in terms of the number of channels

There are different forms of expressing the maximum output level of amplifiers in terms of the method of measurement that is applied. To use an amplifier in a particular installation we need to know the maximum output level for a determined number of channels, maintaining the intermodulations at a level that will be undetectable on the TV. In the case of channels with AM or QAM modulation, the intermodulations should be 54 dB weaker than the channels, and in the case of FM or QPSK modulations, the intermodulations should be 35 dB weaker. The following table allows you to determine the maximum output level with a specific number of channels starting with the maximum output level according to the most frequently used methods of measurement.

		2 channels	5 channels	10 channels	15 channels	20 channels	30 channels
EN 50083-3	2 carriers $IMD_3$ $\alpha$ - 35 dB	-0.0	-4.5	-7.0	-8.5	-9.5	-11.0
DIN V VDE 0855 part12	2 carriers $IMD_3$ $\alpha$ - 35 dB	-0.0	-4.5	-7.0	-8.5	-9.5	-11.0
	2 carriers $IMD_3$ $\alpha$ - 46 dB	-4.0	-8.5	-11.0	-12.5	-13.5	-15.0
UTE C90-124	3 carriers $IMD_3$ $\alpha$ - 42 dB	-3.0	-7.5	-10.0	-11.5	-12.5	-14.0
	2 carriers $IMD_3$ $\alpha$ - 52 dB	-1.0	-5.5	-8.0	-9.5	-10.5	-12.0
UTE C90-120	3 carriers $IMD_3$ $\alpha$ - 46 dB	-1.0	-5.5	-8.0	-9.5	-10.5	-12.0
	2 carriers $IMD_3$ $\alpha$ - 54 dB	-0.0	-4.5	-7.0	-8.5	-9.5	-11.0
DIN 45004B	3 carriers $IMD_3$ $\alpha$ - 60 dB	-0.0	-4.5	-7.0	-8.5	-9.5	-11.0
UTE C90-125	3 carriers $IMD_3$ $\alpha$ - 52 dB	+2.0	-2.5	-5.0	-6.5	-7.5	-9.0
EN 50083-3	2 carriers $IMD_3$ $\alpha$ - 60 dB	+3.0	-1.5	-4.0	-5.5	-6.5	-8.0
	3 carriers $IMD_3$ $\alpha$ - 60 dB	+6.0	+1.5	-1.0	-2.5	-3.5	-5.0
EN 50083-3	42 carriers CTB $\alpha$ -60 dB	+19.0	+13.0	+9.5	+7.5	+6.5	+4.5

Example: Calculate the maximum output level of an amplifier with 30 FM or QPSK channels whose maximum output level is 120 dB $\mu$ V according to norm EN-50083-3 ( $IMD_3$  - 35 dB).

$$120 \text{ dB}\mu\text{V (EN 50083-3)} - 11.0 \text{ dB} = 109.0 \text{ dB}\mu\text{V (30 channels FM or QPSK with } IMD_3 \text{ at -35 dB)}$$

Example: Calculate the maximum output level of an amplifier with 20 AM or QAM channels whose maximum output level is 109 dB $\mu$ V according to norm UTE C90-125.

$$109 \text{ dB}\mu\text{V (UTE C90-125)} - 7.5 \text{ dB} = 99.5 \text{ dB}\mu\text{V (20 channels AM or QAM with } IMD_3 \text{ at -54 dB)}$$

## BROADBAND SYSTEMS

### Correction of the output level in terms of the number of channels

42 channels	50 channels	60 channels	77 channels	90 channels	APPLICATION
-12.0	-12.5	-13.5	-14.0	-14.5	FM / QPSK $\text{IMD}_3$ - 35 dB
-12.0	-12.5	-13.5	-14.0	-14.5	FM / QPSK $\text{IMD}_3$ - 35 dB
-16.0	-16.5	-17.5	-18.0	-18.5	AM / QAM $\text{IMD}_3$ - 54 dB
-15.0	-15.5	-16.5	-17.0	-17.5	AM / QAM $\text{IMD}_3$ - 54 dB
-13.0	-13.5	-14.5	-15.0	-15.5	AM / QAM $\text{IMD}_3$ - 54 dB
-13.0	-13.5	-14.5	-15.0	-15.5	AM / QAM $\text{IMD}_3$ - 54 dB
-12.0	-12.5	-13.5	-14.0	-14.5	AM / QAM $\text{IMD}_3$ - 54 dB
-12.0	-12.5	-13.5	-14.0	-14.5	AM / QAM $\text{IMD}_3$ - 54 dB
-10.0	-10.5	-11.5	-12.0	-12.5	AM / QAM $\text{IMD}_3$ - 54 dB
-9.0	-9.5	-10.5	-11.0	-11.5	AM / QAM $\text{IMD}_3$ - 54 dB
-6.0	-6.5	-7.5	-8.0	-8.5	AM / QAM $\text{IMD}_3$ - 54 dB
+3.0	+2.0	+1.5	+0.5	-0.5	AM / QAM $\text{IMD}_3$ - 54 dB



# TV NORMS

## Terrestrial TV standards

Main technical specifications of the different standards of analogue TV and of the norm DVB-T for digital TV in its two variants 2K and 8K.

STANDARD		B	D	G	H	I	K	K1	L	M	N	
Number of channels		25								30	25	
Number of lines		625								525	625	
Channel bandwidth	MHz	7	8							6		
Video bandwidth	MHz	5	6	5		5.5	6			4.2		
Video-audio separation	MHz	+5.5	+6.5	+5.5		+6	+6.5			+4.5		
Vestigial side band	MHz	0.75			1.25		0.75	1.25		0.75		
Video modulation		Negative								Positive	Negative	
Audio modulation		FM								AM	FM	

DVB-T		Mode 2K	Mode 8K
Number of carriers (N')		1,706	6,818
Carriers modulation		QPSK. 16 QAM or 64 QAM	
Useful symbol duration (Ts)	ms	224	896
Security interval	ms	Ts/4. Ts/8 o Ts/32	
Carrier bandwidth (1/Ts)	Hz	4,464	1,116
Multiplex bandwidth	MHz	7,62	7,61

## TV STANDARDS

### TV standards by country

Standards of analogue TV used on the VHF and UHF band of the different countries in the world. Due to the difficulties in compiling this information and to the variations which these standards are continuously subjected to, this information should be used as a guide only. We recommend that the official authorities of each country be consulted in order to confirm the standards in present use.

PAL 4.433 MHz	STANDARD		PAL 4.433 MHz	STANDARD		NTSC 3.579 MHz	STANDARD		SECAM 4 MHz	STANDARD	
	VHF	UHF		VHF	UHF		VHF	UHF		VHF	UHF
AFGANISTAN	D	-	PORTUGAL	B	G	BERMUDAS	M	-	CONGO	K1	K1
ALBANIA	B	G	QATAR	B	G	BOLIVIA	M	-	CZECH. REP.	D	K
ALGERIA	B	G	ROMANIA	D	K	CANADA	M	-	FRANCE	L	L
ANGOLA	I	-	SINGAPORE	B	G	CHILE	M	M	GABON	K1	K1
AUSTRALIA	B	B	SOUTH AFRICA	I	I	COLOMBIA	M	M	GERMANY	B	G
AUSTRIA	B	G	SPAIN	B	G	COSTA RICA	M	M	GREECE	B	G
BAHREIN	B	G	SRI LANKA	B	-	CUBA	M	M	GUADALOUPE	K1	-
BANGLADESH	B	-	SUDAN	B	-	DOMINICAN REP.	M	M	GUIANA (FR.)	K1	-
BELGIUM	B	H	SWAZILAND	B	G	ECUADOR	M	M	GUIANA (REP.)	K1	-
CAMEROON	B	G	SWEDEN	B	G	EL SALVADOR	M	M	HUNGARY	D	K
CHINA	D	D	SWITZERLAND	B	G	GREENLAND	M	M	IRAN	B	G
CYPRUS	B	G	TANZANIA	I	I	GUAM	M	-	IRAQ	B	-
EGYPT	B	G	THAILAND	B	G	GUATEMALA	M	M	IVORY COAST	K1	-
DENMARK	B	G	TURKEY	B	G	HAITI	M	-	SECAM 4 MHz		
FINLAND	B	G	UGANDA	B	G	HONDURAS	M	-			
GERMANY	B	G	UNITED ARAB. EM.	B	G	JAMAICA	N	-	AFGHANISTAN	D	-
GHANA	B	G	UNITED KINGDOM	-	I	JAPAN	M	M	IVORY COAST	D	K
HONG KONG	-	I	YEMEN (ARAB. REP.)	B	-	KOREA (SOUTH)	M	-	LEBANON	K1	-
ICELAND	B	G	YUGOSLAVIA	B	G	MEXICO	M	M	LIBYA	B	-
INDIA	B	-	ZAMBIA	B	G	NETH. ANTILLES	M	-	LUXEMBOURG	B	G
INDONESIA	B	-	ZANZIBAR	I	I	NICARAGUA	M	M	MADAGASCAR	B	G/L
IRELAND	I	I	ZIMBAWE	B	G	PANAMA	M	M	MARTINIQUE	K1	K1
ISRAEL	B	G	PAL 3.575 MHz			PERU	M	M	MAURITIUS	K1	-
ITALY	B	G				PHILIPPINES	M	M	MONACO	B	-
JORDAN	B	G	BRAZIL	M	M	PUERTO RICO	M	M	MOROCCO	L	L/G
KENYA	B	G	PAL 3.582 MHz			SAMOA	M	-	NEW CALEDONIA	B	G
KUWAIT	B	G				SURINAM	M	-	POLAND	K1	-
LIBERIA	B	-	PAL 3.582 MHz			TAIWAN	M	-	RUSSIA	D	K
LUXEMBOURG	B	G/L				TRINIDAD	M	-	SAUDI ARABIA	B	G
MALAYSIA	B	G	ARGENTINA	N	N	USA	M	M	SENEGAL	K1	K1
MALTA	B	-	PARAGUAY	N	N	VENEZUELA	M	-	SYRIA	B	G
NETHERLANDS	B	G	URUGUAY	N	-	YEMEN (DEM. REP.)	B	-	TOGO	K1	-
NEW ZEALAND	B	G	NTSC 3.579 MHz			SECAM 4 MHz			TUNISIA	B	G
NIGERIA	B	I							ZAIRE	K1	K1
NORWAY	B	G	BAHAMAS	M	-	BENIN	K1	K1			
OMAN	B	G	BARBADOS	M	-	BULGARIA	D	K			
PAKISTAN	B	G									

# TV STANDARDS

## Channel identification

To avoid the existing confusion among channels of different standards, Alcad asks that orders of monochannel amplifiers (905-ZG and 905 ZP) be made according to the following specifications, concerning the identification of the channel and the model to be used in relation to the channel.

		ZG-611			ZG-4XX	
		ZP-611			ZP-4XX	
STANDARD		BI	Interband	BIII	Interband	UHF
B/G	CCIR	C/02..04	C/S01..S10	C/05..12	C/S11..S41	C/21..69
B/G	ITALY	C/A..C	C/S01..S10	C/D..H, H1, H2	C/S11..S41	C/21..69
B/G	NEW ZELAND	C/Z01..Z03	C/S01..S10	C/Z04..Z11	C/S11..S41	C/21..69
B/G	MOROCCO	-	C/S01..S10	C/M04..M10	C/S11..S41	C/21..69
B	AUSTRALIA	C/A00..A05 C/A05A	C/AS01..AS10	C/A06..A12 C/A09A C/A10N, A11N	C/AS11..AS41	-
L	FRANCE	C/L02..L04	C/LS01..LS07	C/L05..L10 C/LS08..LS13	C/LS14..LS41	C/L21..L69
K1	DOM TOM	C/K01..K03	-	C/K04..K09	-	-
D/K	OIRT	C/R01..R05	C/RS01..RS08	C/R06..R12	C/RS11..RS18 C/RS20..RS41	C/L21..L69
D/K	POLAND	C/R01..R05	C/PS01..PS08	C/R06..R12	C/PS09..PS38	C/L21..L69
D/K	ZCECH REP.	C/R01..R05	-	C/R06..R12	-	C/L21..L69
I	UK	-	-	-	-	C/21..69
I	UK (SM8)	C/U02..U04	C/IS01..IS10	C/U04..U12	C/IS11..IS18 C/IS21..IS41	C/21..69
I	IRELAND	C/IA..IC	C/IS01..IS10	C/ID..IJ	C/IS11..IS18 C/IS21..IS41	C/21..69
I	SOUTH AFRICA	C/IA..IC	C/IS01..IS10	C/I04..I13	C/IS14..IS18 C/IS21..IS41	C/21..69
FREQUENCIES MHz		42,00 - 144,00	94,00 - 174,75	174,00 - 258,18	222,75 - 470,00	470,00 - 862,00

ZG-4XX	ZP-4XX
ZG-412	ZP-412
ZG-413	ZP-413
ZG-414	ZP-414
ZG-431	ZP-431

## TV STANDARDS

### Channel identification

#### Adjustment and change of channel groups

The amplifiers of the 905-ZG and 905-ZP range are manufactured and adjusted according to the following groups:

BAND	GROUP	FREQUENCES	CHANNELS B/G CCIR
MONOCHANNEL AMPLIFIERS			
VHF	A0	42,00 - 53,00 MHz	-
VHF	A	46,00 - 70,00 MHz	C/02..04
VHF	B	68,00 - 108,00 MHz	-
VHF	C	102,00 - 135,00 MHz	C/S01..S04
VHF	D	132,00 - 177,00 MHz	C/S05..S10
VHF	E	174,00 - 215,00 MHz	C/05..09
VHF	F	208,00 - 238,00 MHz	C/09..S11
VHF	G	237,00 - 272,00 MHz	C/S12..S16
VHF	H	272,00 - 318,00 MHz	C/S17..S22
VHF	I	318,00 - 358,00 MHz	C/S23..S27
VHF	J	358,00 - 414,00 MHz	C/S28..S34
VHF	K	414,00 - 470,00 MHz	C/S35..S41
UHF	A	470,00 - 550,00 MHz	C/21..30
UHF	B	550,00 - 638,00 MHz	C/31..41
UHF	D	638,00 - 742,00 MHz	C/42..54
UHF	C	742,00 - 862,00 MHz	C/55..69
MULTICHANNEL AMPLIFIERS			
UHF	A1	470,00 - 510,00 MHz	C/21..25
UHF	A2	510,00 - 568,00 MHz	C/26..32
UHF	A3	566,00 - 666,00 MHz	C/33..44
UHF	A4	662,00 - 758,00 MHz	C/45..56
UHF	A5	757,00 - 862,00 MHz	C/57..69

# CHANNEL TABLES

## B/G standard – CCIR channels

VHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
2	42.25	53.75	47.00 - 54.00
3	55.25	60.75	54.00 - 61.00
4	62.25	67.75	61.00 - 68.00
S1	105.25	110.75	104.00 - 111.00
S2	112.25	117.75	111.00 - 118.00
S3	119.25	124.75	118.00 - 125.00
S4	126.25	131.75	125.00 - 132.00
S5	133.25	138.75	132.00 - 139.00
S6	140.25	145.75	139.00 - 146.00
S7	147.25	152.75	146.00 - 153.00
S8	154.25	159.75	153.00 - 160.00
S9	161.25	166.75	160.00 - 167.00
S10	168.25	173.75	167.00 - 174.00
5	175.25	180.75	174.00 - 181.00
6	182.25	187.75	181.00 - 188.00
7	189.25	194.75	188.00 - 195.00
8	196.25	201.75	195.00 - 202.00
9	203.25	208.75	202.00 - 209.00
10	210.25	215.75	209.00 - 216.00
11	217.25	222.75	216.00 - 223.00
12	224.25	229.75	223.00 - 230.00
S11	231.25	236.75	230.00 - 237.00
S12	238.25	243.75	237.00 - 244.00
S13	245.25	250.75	244.00 - 251.00
S14	252.25	257.75	251.00 - 258.00
S15	259.25	264.75	258.00 - 265.00
S16	266.25	271.75	265.00 - 272.00
S17	273.25	278.75	272.00 - 279.00
S18	280.25	285.75	279.00 - 286.00
S19	287.25	292.75	286.00 - 293.00
S20	294.25	299.75	293.00 - 300.00
S21	303.25	308.75	302.00 - 310.00
S22	311.25	316.75	310.00 - 318.00
S23	319.25	324.75	318.00 - 326.00
S24	327.25	332.75	326.00 - 334.00
S25	335.25	340.75	334.00 - 342.00
S26	343.25	348.75	342.00 - 350.00
S27	351.25	356.75	350.00 - 358.00
S28	359.25	364.75	358.00 - 366.00
S29	367.25	372.75	366.00 - 374.00
S30	375.25	380.75	374.00 - 382.00
S31	383.25	388.75	382.00 - 390.00
S32	391.25	396.75	390.00 - 398.00
S33	399.25	404.75	398.00 - 406.00
S34	407.25	412.75	406.00 - 414.00
S35	415.25	420.75	414.00 - 422.00
S36	423.25	428.75	422.00 - 430.00
S37	431.25	436.75	430.00 - 438.00
S38	439.25	444.75	438.00 - 446.00
S39	447.25	452.75	446.00 - 454.00
S40	455.25	460.75	454.00 - 462.00
S41	463.25	468.75	462.00 - 470.00

UHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
21	471.25	476.25	470.00 - 478.00
22	479.25	484.75	478.00 - 486.00
23	487.25	492.75	486.00 - 494.00
24	495.25	500.75	494.00 - 502.00
25	503.25	508.75	502.00 - 510.00
26	511.25	516.75	510.00 - 518.00
27	519.25	524.75	518.00 - 526.00
28	527.25	532.75	526.00 - 534.00
29	535.25	540.75	534.00 - 542.00
30	543.25	548.75	542.00 - 550.00
31	551.25	556.75	550.00 - 558.00
32	559.25	564.75	558.00 - 566.00
33	567.25	572.75	566.00 - 574.00
34	575.25	580.75	574.00 - 582.00
35	583.25	588.75	582.00 - 590.00
36	591.25	596.75	590.00 - 598.00
37	599.25	604.75	598.00 - 606.00
38	607.25	612.75	606.00 - 614.00
39	615.25	620.75	614.00 - 622.00
40	623.25	628.75	622.00 - 630.00
41	631.25	636.75	630.00 - 638.00
42	639.25	644.75	638.00 - 646.00
43	647.25	652.75	646.00 - 654.00
44	655.25	660.75	654.00 - 662.00
45	663.25	668.75	662.00 - 670.00
46	671.25	676.75	670.00 - 678.00
47	679.25	684.75	678.00 - 686.00
48	687.25	692.75	686.00 - 694.00
49	695.25	700.75	694.00 - 702.00
50	703.25	708.75	702.00 - 710.00
51	711.25	716.75	710.00 - 718.00
52	719.25	724.75	718.00 - 726.00
53	727.25	732.75	726.00 - 734.00
54	735.25	740.75	734.00 - 742.00
55	743.25	748.75	742.00 - 750.00
56	751.25	756.75	750.00 - 758.00
57	759.25	764.75	758.00 - 766.00
58	767.25	772.75	766.00 - 774.00
59	775.25	780.75	774.00 - 782.00
60	783.25	788.75	782.00 - 790.00
61	791.25	796.75	790.00 - 798.00
62	799.25	804.75	798.00 - 806.00
63	807.25	812.75	806.00 - 814.00
64	815.25	820.75	814.00 - 822.00
65	823.25	828.75	822.00 - 830.00
66	831.25	836.75	830.00 - 838.00
67	839.25	844.75	838.00 - 846.00
68	847.25	852.75	846.00 - 854.00
69	855.25	860.75	854.00 - 862.00

# CHANNEL TABLES

B/G standard – Italy

VHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
A	53.75	59.25	52.50 - 59.50
B	62.25	67.75	61.00 - 68.00
C	82.25	87.75	81.00 - 88.00
S1	105.25	110.75	104.00 - 111.00
S2	112.25	117.75	111.00 - 118.00
S3	119.25	124.75	118.00 - 125.00
S4	126.25	131.75	125.00 - 132.00
S5	133.25	138.75	132.00 - 139.00
S6	140.25	145.75	139.00 - 146.00
S7	147.25	152.75	146.00 - 153.00
S8	154.25	159.75	153.00 - 160.00
S9	161.25	166.75	160.00 - 167.00
S10	168.25	173.75	167.00 - 174.00
D	175.25	180.75	174.00 - 181.00
E	183.75	189.25	182.50 - 189.50
F	192.25	197.75	191.00 - 198.00
G	201.25	206.75	200.00 - 207.00
H	210.25	215.75	209.00 - 216.00
H1	217.25	222.75	216.00 - 223.00
H2	224.25	229.75	223.00 - 230.00
S11	231.25	236.75	230.00 - 237.00
S12	238.25	243.75	237.00 - 244.00
S13	245.25	250.75	244.00 - 251.00
S14	252.25	257.75	251.00 - 258.00
S15	259.25	264.75	258.00 - 265.00
S16	266.25	271.75	265.00 - 272.00
S17	273.25	278.75	272.00 - 279.00
S18	280.25	285.75	279.00 - 286.00
S19	287.25	292.75	286.00 - 293.00
S20	294.25	299.75	293.00 - 300.00
S21	303.25	308.75	302.00 - 310.00
S22	311.25	316.75	310.00 - 318.00
S23	319.25	324.75	318.00 - 326.00
S24	327.25	332.75	326.00 - 334.00
S25	335.25	340.75	334.00 - 342.00
S26	343.25	348.75	342.00 - 350.00
S27	351.25	356.75	350.00 - 358.00
S28	359.25	364.75	358.00 - 366.00
S29	367.25	372.75	366.00 - 374.00
S30	375.25	380.75	374.00 - 382.00
S31	383.25	388.75	382.00 - 390.00
S32	391.25	396.75	390.00 - 398.00
S33	399.25	404.75	398.00 - 406.00
S34	407.25	412.75	406.00 - 414.00
S35	415.25	420.75	414.00 - 422.00
S36	423.25	428.75	422.00 - 430.00
S37	431.25	436.75	430.00 - 438.00
S38	439.25	444.75	438.00 - 446.00
S39	447.25	452.75	446.00 - 454.00
S40	455.25	460.75	454.00 - 462.00
S41	463.25	468.75	462.00 - 470.00

UHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
21	471.25	476.25	470.00 - 478.00
22	479.25	484.75	478.00 - 486.00
23	487.25	492.75	486.00 - 494.00
24	495.25	500.75	494.00 - 502.00
25	503.25	508.75	502.00 - 510.00
26	511.25	516.75	510.00 - 518.00
27	519.25	524.75	518.00 - 526.00
28	527.25	532.75	526.00 - 534.00
29	535.25	540.75	534.00 - 542.00
30	543.25	548.75	542.00 - 550.00
31	551.25	556.75	550.00 - 558.00
32	559.25	564.75	558.00 - 566.00
33	567.25	572.75	566.00 - 574.00
34	575.25	580.75	574.00 - 582.00
35	583.25	588.75	582.00 - 590.00
36	591.25	596.75	590.00 - 598.00
37	599.25	604.75	598.00 - 606.00
38	607.25	612.75	606.00 - 614.00
39	615.25	620.75	614.00 - 622.00
40	623.25	628.75	622.00 - 630.00
41	631.25	636.75	630.00 - 638.00
42	639.25	644.75	638.00 - 646.00
43	647.25	652.75	646.00 - 654.00
44	655.25	660.75	654.00 - 662.00
45	663.25	668.75	662.00 - 670.00
46	671.25	676.75	670.00 - 678.00
47	679.25	684.75	678.00 - 686.00
48	687.25	692.75	686.00 - 694.00
49	695.25	700.75	694.00 - 702.00
50	703.25	708.75	702.00 - 710.00
51	711.25	716.75	710.00 - 718.00
52	719.25	724.75	718.00 - 726.00
53	727.25	732.75	726.00 - 734.00
54	735.25	740.75	734.00 - 742.00
55	743.25	748.75	742.00 - 750.00
56	751.25	756.75	750.00 - 758.00
57	759.25	764.75	758.00 - 766.00
58	767.25	772.75	766.00 - 774.00
59	775.25	780.75	774.00 - 782.00
60	783.25	788.75	782.00 - 790.00
61	791.25	796.75	790.00 - 798.00
62	799.25	804.75	798.00 - 806.00
63	807.25	812.75	806.00 - 814.00
64	815.25	820.75	814.00 - 822.00
65	823.25	828.75	822.00 - 830.00
66	831.25	836.75	830.00 - 838.00
67	839.25	844.75	838.00 - 846.00
68	847.25	852.75	846.00 - 854.00
69	855.25	860.75	854.00 - 862.00

# CHANNEL TABLES

B/G standard – New Zealand

VHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
1	45.25	50.75	44.00 - 51.00
2	55.25	60.75	54.00 - 61.00
3	62.25	67.75	61.00 - 68.00
S1	105.25	110.75	104.00 - 111.00
S2	112.25	117.75	111.00 - 118.00
S3	119.25	124.75	118.00 - 125.00
S4	126.25	131.75	125.00 - 132.00
S5	133.25	138.75	132.00 - 139.00
S6	140.25	145.75	139.00 - 146.00
S7	147.25	152.75	146.00 - 153.00
S8	154.25	159.75	153.00 - 160.00
S9	161.25	166.75	160.00 - 167.00
S10	168.25	173.75	167.00 - 174.00
4	175.25	180.75	174.00 - 181.00
5	182.25	187.75	181.00 - 188.00
6	189.25	194.75	188.00 - 195.00
7	196.25	201.75	195.00 - 202.00
8	203.25	208.75	202.00 - 209.00
9	210.25	215.75	209.00 - 216.00
10	217.25	225.75	216.00 - 223.00
11	224.25	229.75	223.00 - 230.00
S11	231.25	236.75	230.00 - 237.00
S12	238.25	243.75	237.00 - 244.00
S13	245.25	250.75	244.00 - 251.00
S14	252.25	257.75	251.00 - 258.00
S15	259.25	264.75	258.00 - 265.00
S16	266.25	271.75	265.00 - 272.00
S17	273.25	278.75	272.00 - 279.00
S18	280.25	285.75	279.00 - 286.00
S19	287.25	292.75	286.00 - 293.00
S20	294.25	299.75	293.00 - 300.00
S21	303.25	308.75	302.00 - 310.00
S22	311.25	316.75	310.00 - 318.00
S23	319.25	324.75	318.00 - 326.00
S24	327.25	332.75	326.00 - 334.00
S25	335.25	340.75	334.00 - 342.00
S26	343.25	348.75	342.00 - 350.00
S27	351.25	356.75	350.00 - 358.00
S28	359.25	364.75	358.00 - 366.00
S29	367.25	372.75	366.00 - 374.00
S30	375.25	380.75	374.00 - 382.00
S31	383.25	388.75	382.00 - 390.00
S32	391.25	396.75	390.00 - 398.00
S33	399.25	404.75	398.00 - 406.00
S34	407.25	412.75	406.00 - 414.00
S35	415.25	420.75	414.00 - 422.00
S36	423.25	428.75	422.00 - 430.00
S37	431.25	436.75	430.00 - 438.00
S38	439.25	444.75	438.00 - 446.00
S39	447.25	452.75	446.00 - 454.00
S40	455.25	460.75	454.00 - 462.00
S41	463.25	468.75	462.00 - 470.00

UHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
21	471.25	476.25	470.00 - 478.00
22	479.25	484.75	478.00 - 486.00
23	487.25	492.75	486.00 - 494.00
24	495.25	500.75	494.00 - 502.00
25	503.25	508.75	502.00 - 510.00
26	511.25	516.75	510.00 - 518.00
27	519.25	524.75	518.00 - 526.00
28	527.25	532.75	526.00 - 534.00
29	535.25	540.75	534.00 - 542.00
30	543.25	548.75	542.00 - 550.00
31	551.25	556.75	550.00 - 558.00
32	559.25	564.75	558.00 - 566.00
33	567.25	572.75	566.00 - 574.00
34	575.25	580.75	574.00 - 582.00
35	583.25	588.75	582.00 - 590.00
36	591.25	596.75	590.00 - 598.00
37	599.25	604.75	598.00 - 606.00
38	607.25	612.75	606.00 - 614.00
39	615.25	620.75	614.00 - 622.00
40	623.25	628.75	622.00 - 630.00
41	631.25	636.75	630.00 - 638.00
42	639.25	644.75	638.00 - 646.00
43	647.25	652.75	646.00 - 654.00
44	655.25	660.75	654.00 - 662.00
45	663.25	668.75	662.00 - 670.00
46	671.25	676.75	670.00 - 678.00
47	679.25	684.75	678.00 - 686.00
48	687.25	692.75	686.00 - 694.00
49	695.25	700.75	694.00 - 702.00
50	703.25	708.75	702.00 - 710.00
51	711.25	716.75	710.00 - 718.00
52	719.25	724.75	718.00 - 726.00
53	727.25	732.75	726.00 - 734.00
54	735.25	740.75	734.00 - 742.00
55	743.25	748.75	742.00 - 750.00
56	751.25	756.75	750.00 - 758.00
57	759.25	764.75	758.00 - 766.00
58	767.25	772.75	766.00 - 774.00
59	775.25	780.75	774.00 - 782.00
60	783.25	788.75	782.00 - 790.00
61	791.25	796.75	790.00 - 798.00
62	799.25	804.75	798.00 - 806.00
63	807.25	812.75	806.00 - 814.00
64	815.25	820.75	814.00 - 822.00
65	823.25	828.75	822.00 - 830.00
66	831.25	836.75	830.00 - 838.00
67	839.25	844.75	838.00 - 846.00
68	847.25	852.75	846.00 - 854.00
69	855.25	860.75	854.00 - 862.00

# CHANNEL TABLES

## B/G standard – Morocco channels

VHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
1	45.25	50.75	44.00 - 51.00
2	55.25	60.75	54.00 - 61.00
3	62.25	67.75	61.00 - 68.00
S1	105.25	110.75	104.00 - 111.00
S2	112.25	117.75	111.00 - 118.00
S3	119.25	124.75	118.00 - 125.00
S4	126.25	131.75	125.00 - 132.00
S5	133.25	138.75	132.00 - 139.00
S6	140.25	145.75	139.00 - 146.00
S7	147.25	152.75	146.00 - 153.00
S8	154.25	159.75	153.00 - 160.00
S9	161.25	166.75	160.00 - 167.00
S10	168.25	173.75	167.00 - 174.00
4	175.25	180.75	174.00 - 181.00
5	182.25	187.75	181.00 - 188.00
6	189.25	194.75	188.00 - 195.00
7	196.25	201.75	195.00 - 202.00
8	203.25	208.75	202.00 - 209.00
9	210.25	215.75	209.00 - 216.00
10	217.25	225.75	216.00 - 223.00
11	224.25	229.75	223.00 - 230.00
S11	231.25	236.75	230.00 - 237.00
S12	238.25	243.75	237.00 - 244.00
S13	245.25	250.75	244.00 - 251.00
S14	252.25	257.75	251.00 - 258.00
S15	259.25	264.75	258.00 - 265.00
S16	266.25	271.75	265.00 - 272.00
S17	273.25	278.75	272.00 - 279.00
S18	280.25	285.75	279.00 - 286.00
S19	287.25	292.75	286.00 - 293.00
S20	294.25	299.75	293.00 - 300.00
S21	303.25	308.75	302.00 - 310.00
S22	311.25	316.75	310.00 - 318.00
S23	319.25	324.75	318.00 - 326.00
S24	327.25	332.75	326.00 - 334.00
S25	335.25	340.75	334.00 - 342.00
S26	343.25	348.75	342.00 - 350.00
S27	351.25	356.75	350.00 - 358.00
S28	359.25	364.75	358.00 - 366.00
S29	367.25	372.75	366.00 - 374.00
S30	375.25	380.75	374.00 - 382.00
S31	383.25	388.75	382.00 - 390.00
S32	391.25	396.75	390.00 - 398.00
S33	399.25	404.75	398.00 - 406.00
S34	407.25	412.75	406.00 - 414.00
S35	415.25	420.75	414.00 - 422.00
S36	423.25	428.75	422.00 - 430.00
S37	431.25	436.75	430.00 - 438.00
S38	439.25	444.75	438.00 - 446.00
S39	447.25	452.75	446.00 - 454.00
S40	455.25	460.75	454.00 - 462.00
S41	463.25	468.75	462.00 - 470.00

UHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
21	471.25	476.25	470.00 - 478.00
22	479.25	484.75	478.00 - 486.00
23	487.25	492.75	486.00 - 494.00
24	495.25	500.75	494.00 - 502.00
25	503.25	508.75	502.00 - 510.00
26	511.25	516.75	510.00 - 518.00
27	519.25	524.75	518.00 - 526.00
28	527.25	532.75	526.00 - 534.00
29	535.25	540.75	534.00 - 542.00
30	543.25	548.75	542.00 - 550.00
31	551.25	556.75	550.00 - 558.00
32	559.25	564.75	558.00 - 566.00
33	567.25	572.75	566.00 - 574.00
34	575.25	580.75	574.00 - 582.00
35	583.25	588.75	582.00 - 590.00
36	591.25	596.75	590.00 - 598.00
37	599.25	604.75	598.00 - 606.00
38	607.25	612.75	606.00 - 614.00
39	615.25	620.75	614.00 - 622.00
40	623.25	628.75	622.00 - 630.00
41	631.25	636.75	630.00 - 638.00
42	639.25	644.75	638.00 - 646.00
43	647.25	652.75	646.00 - 654.00
44	655.25	660.75	654.00 - 662.00
45	663.25	668.75	662.00 - 670.00
46	671.25	676.75	670.00 - 678.00
47	679.25	684.75	678.00 - 686.00
48	687.25	692.75	686.00 - 694.00
49	695.25	700.75	694.00 - 702.00
50	703.25	708.75	702.00 - 710.00
51	711.25	716.75	710.00 - 718.00
52	719.25	724.75	718.00 - 726.00
53	727.25	732.75	726.00 - 734.00
54	735.25	740.75	734.00 - 742.00
55	743.25	748.75	742.00 - 750.00
56	751.25	756.75	750.00 - 758.00
57	759.25	764.75	758.00 - 766.00
58	767.25	772.75	766.00 - 774.00
59	775.25	780.75	774.00 - 782.00
60	783.25	788.75	782.00 - 790.00
61	791.25	796.75	790.00 - 798.00
62	799.25	804.75	798.00 - 806.00
63	807.25	812.75	806.00 - 814.00
64	815.25	820.75	814.00 - 822.00
65	823.25	828.75	822.00 - 830.00
66	831.25	836.75	830.00 - 838.00
67	839.25	844.75	838.00 - 846.00
68	847.25	852.75	846.00 - 854.00
69	855.25	860.75	854.00 - 862.00



# CHANNEL TABLES

## L standard – France

VHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
2	55.75	49.25	49.00 - 57.00
3	60.50	54.00	53.75 - 61.75
4	63.75	57.25	57.00 - 65.00
S1	120.00	126.50	118.75 - 126.75
S2	128.00	134.50	126.75 - 134.75
S3	136.00	142.50	134.75 - 142.75
S4	144.00	150.50	142.75 - 150.75
S5	152.00	158.50	150.75 - 158.75
S6	160.00	166.50	158.75 - 166.75
S7	168.00	174.50	166.75 - 174.75
S8	176.00	182.50	174.75 - 182.75
S9	184.00	190.50	182.75 - 190.75
S10	192.00	198.50	190.75 - 198.75
5	176.00	182.50	174.75 - 182.75
6	184.00	190.50	182.75 - 190.75
7	192.00	198.50	190.75 - 198.75
8	200.00	206.50	198.75 - 206.75
9	208.00	214.50	206.75 - 214.75
10	216.00	222.50	214.75 - 222.75
S11	200.00	206.50	198.75 - 206.75
S12	208.00	214.50	206.75 - 214.75
S13	216.00	222.50	214.75 - 222.75
S14	224.00	230.50	222.75 - 230.75
S15	232.00	238.50	230.75 - 238.75
S16	240.00	246.50	238.75 - 246.75
S17	248.00	254.50	246.75 - 254.75
S18	256.00	262.50	254.75 - 262.75
S19	264.00	270.50	262.75 - 270.75
S20	272.00	278.50	270.75 - 278.75
S21	280.00	286.50	278.75 - 286.75
S22	288.00	294.50	286.75 - 294.75
S23	296.00	302.50	294.75 - 302.75
S24	303.25	309.75	302.00 - 310.00
S25	311.25	317.75	310.00 - 318.00
S26	319.25	325.75	318.00 - 326.00
S27	327.25	333.75	326.00 - 334.00
S28	335.25	341.75	334.00 - 342.00
S29	343.25	349.75	342.00 - 350.00
S30	351.25	357.75	350.00 - 358.00
S31	359.25	365.75	358.00 - 366.00
S32	367.25	373.75	366.00 - 374.00
S33	375.25	381.75	374.00 - 382.00
S34	383.25	389.75	382.00 - 390.00
S35	391.25	397.75	390.00 - 398.00
S36	399.25	405.75	398.00 - 406.00
S37	407.25	413.75	406.00 - 414.00
S38	415.25	421.75	414.00 - 422.00
S39	423.25	429.75	422.00 - 430.00
S40	431.25	437.75	430.00 - 438.00
S41	439.25	445.75	438.00 - 446.00

UHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
21	471.25	477.75	470.00 - 478.00
22	479.25	485.75	478.00 - 486.00
23	487.25	493.75	486.00 - 494.00
24	495.25	501.75	494.00 - 502.00
25	503.25	509.75	502.00 - 510.00
26	511.25	517.75	510.00 - 518.00
27	519.25	525.75	518.00 - 526.00
28	527.25	533.75	526.00 - 534.00
29	535.25	541.75	534.00 - 542.00
30	543.25	549.75	542.00 - 550.00
31	551.25	557.75	550.00 - 558.00
32	519.25	565.75	558.00 - 566.00
33	567.25	573.75	566.00 - 574.00
34	575.25	581.75	574.00 - 582.00
35	583.25	589.75	582.00 - 590.00
36	591.25	597.75	590.00 - 598.00
37	599.25	605.75	598.00 - 606.00
38	607.25	613.75	606.00 - 614.00
39	615.25	621.75	614.00 - 622.00
40	623.25	629.75	622.00 - 630.00
41	631.25	637.75	630.00 - 638.00
42	639.25	645.75	638.00 - 646.00
43	647.25	653.75	646.00 - 654.00
44	655.25	661.75	654.00 - 662.00
45	663.25	669.75	662.00 - 670.00
46	671.25	677.75	670.00 - 678.00
47	679.25	685.75	678.00 - 686.00
48	687.25	693.75	686.00 - 694.00
49	695.25	701.75	694.00 - 702.00
50	703.25	709.75	702.00 - 710.00
51	711.25	717.75	710.00 - 718.00
52	719.25	725.75	718.00 - 726.00
53	727.25	733.75	726.00 - 734.00
54	735.25	741.75	734.00 - 742.00
55	743.25	749.75	742.00 - 750.00
56	751.25	757.75	750.00 - 758.00
57	759.25	765.75	758.00 - 766.00
58	767.25	773.75	766.00 - 774.00
59	775.25	781.75	774.00 - 782.00
60	783.25	789.75	782.00 - 790.00
61	791.25	797.75	790.00 - 798.00
62	799.25	805.75	798.00 - 806.00
63	807.25	813.75	806.00 - 814.00
64	815.25	821.75	814.00 - 822.00
65	823.25	829.75	822.00 - 830.00
66	831.25	837.75	830.00 - 838.00
67	839.25	845.75	838.00 - 846.00
68	847.25	853.75	846.00 - 854.00
69	855.25	861.75	854.00 - 862.00

# CHANNEL TABLES

## I standard – Ireland

VHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
A	45.75	51.75	44.50 - 52.50
B	53.75	59.75	52.50 - 60.50
C	61.75	67.75	60.50 - 68.50
S1	95.25	101.25	94.00 - 102.00
S2	103.25	109.25	102.00 - 110.00
S3	111.25	117.25	110.00 - 118.00
S4	119.25	125.25	118.00 - 126.00
S5	127.25	133.25	126.00 - 134.00
S6	135.25	141.25	134.00 - 142.00
S7	143.25	149.25	142.00 - 150.00
S8	151.25	157.25	150.00 - 158.00
S9	159.25	165.25	158.00 - 166.00
S10	167.25	173.25	166.00 - 174.00
D	175.25	181.25	174.00 - 182.00
E	183.25	189.25	182.00 - 190.00
F	191.25	197.25	190.00 - 198.00
G	199.25	205.25	198.00 - 206.00
H	207.25	213.25	206.00 - 214.00
I	215.25	221.25	214.00 - 222.00
J	223.25	229.25	222.00 - 230.00
S11	239.25	245.25	238.00 - 246.00
S12	247.25	253.25	246.00 - 254.00
S13	255.25	261.25	254.00 - 262.00
S14	263.25	269.25	262.00 - 270.00
S15	271.25	277.25	270.00 - 278.00
S16	279.25	285.25	278.00 - 286.00
S17	287.25	293.25	286.00 - 294.00
S18	295.25	301.25	294.00 - 302.00
S21	303.25	309.25	302.00 - 310.00
S22	311.25	317.25	310.00 - 318.00
S23	319.25	325.25	318.00 - 326.00
S24	327.25	333.25	326.00 - 334.00
S25	335.25	341.25	334.00 - 342.00
S26	343.25	349.25	342.00 - 350.00
S27	351.25	357.25	350.00 - 358.00
S28	359.25	365.25	358.00 - 366.00
S29	367.25	373.25	366.00 - 374.00
S30	375.25	381.25	374.00 - 382.00
S31	383.25	389.25	382.00 - 390.00
S32	391.25	397.25	390.00 - 398.00
S33	399.25	405.25	398.00 - 406.00
S34	407.25	413.25	406.00 - 414.00
S35	415.25	421.25	414.00 - 422.00
S36	423.25	429.25	422.00 - 430.00
S37	431.25	437.25	430.00 - 438.00
S38	439.25	445.25	438.00 - 446.00
S39	447.25	453.25	446.00 - 454.00
S40	455.25	461.25	454.00 - 462.00
S41	463.25	469.25	462.00 - 470.00

UHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
21	471.25	477.25	470.00 - 478.00
22	479.25	485.25	478.00 - 486.00
23	487.25	493.25	486.00 - 494.00
24	495.25	501.25	494.00 - 502.00
25	503.25	509.25	502.00 - 510.00
26	511.25	517.25	510.00 - 518.00
27	519.25	525.25	518.00 - 526.00
28	527.25	533.25	526.00 - 534.00
29	535.25	541.25	534.00 - 542.00
30	543.25	549.25	542.00 - 550.00
31	551.25	557.25	550.00 - 558.00
32	559.25	565.25	558.00 - 566.00
33	567.25	573.25	566.00 - 574.00
34	575.25	581.25	574.00 - 582.00
35	583.25	589.25	582.00 - 590.00
36	591.25	597.25	590.00 - 598.00
37	599.25	605.25	598.00 - 606.00
38	607.25	613.25	606.00 - 614.00
39	615.25	621.25	614.00 - 622.00
40	623.25	629.25	622.00 - 630.00
41	631.25	637.25	630.00 - 638.00
42	639.25	645.25	638.00 - 646.00
43	647.25	653.25	646.00 - 654.00
44	655.25	661.25	654.00 - 662.00
45	663.25	669.25	662.00 - 670.00
46	671.25	677.25	670.00 - 678.00
47	679.25	685.25	678.00 - 686.00
48	687.25	693.25	686.00 - 694.00
49	695.25	701.25	694.00 - 702.00
50	703.25	709.25	702.00 - 710.00
51	711.25	717.25	710.00 - 718.00
52	719.25	725.25	718.00 - 726.00
53	727.25	733.25	726.00 - 734.00
54	735.25	741.25	734.00 - 742.00
55	743.25	749.25	742.00 - 750.00
56	751.25	757.25	750.00 - 758.00
57	759.25	765.25	758.00 - 766.00
58	767.25	773.25	766.00 - 774.00
59	775.25	781.25	774.00 - 782.00
60	783.25	789.25	782.00 - 790.00
61	791.25	797.25	790.00 - 798.00
62	799.25	805.25	798.00 - 806.00
63	807.25	813.25	806.00 - 814.00
64	815.25	821.25	814.00 - 822.00
65	823.25	829.25	822.00 - 830.00
66	831.25	837.25	830.00 - 838.00
67	839.25	845.25	838.00 - 846.00
68	847.25	853.25	846.00 - 854.00
69	855.25	861.25	854.00 - 862.00

# CHANNEL TABLES

## I standard – England

This table of channels has been completed with VHF channels corresponding to cable TV frequency tables. The original table of channels for England does not have VHF channels.

VHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
2	47.25	53.25	46.00 - 54.00
3	55.25	61.25	54.00 - 62.00
4	63.25	69.25	62.00 - 70.00
S1	95.25	101.25	94.00 - 102.00
S2	103.25	109.25	102.00 - 110.00
S3	111.25	117.25	110.00 - 118.00
S4	119.25	125.25	118.00 - 126.00
S5	127.25	133.25	126.00 - 134.00
S6	135.25	141.25	134.00 - 142.00
S7	143.25	149.25	142.00 - 150.00
S8	151.25	157.25	150.00 - 158.00
S9	159.25	165.25	158.00 - 166.00
S10	167.25	173.25	166.00 - 174.00
5	175.25	181.25	174.00 - 182.00
6	183.25	189.25	182.00 - 190.00
7	191.25	197.25	190.00 - 198.00
8	199.25	205.25	198.00 - 206.00
9	207.25	213.25	206.00 - 214.00
10	215.25	221.25	214.00 - 222.00
11	223.25	229.25	222.00 - 230.00
12	231.25	237.25	230.00 - 238.00
S11	239.25	245.25	238.00 - 246.00
S12	247.25	253.25	246.00 - 254.00
S13	255.25	261.25	254.00 - 262.00
S14	263.25	269.25	262.00 - 270.00
S15	271.25	277.25	270.00 - 278.00
S16	279.25	285.25	278.00 - 286.00
S17	287.25	293.25	286.00 - 294.00
S18	295.25	301.25	294.00 - 302.00
S21	303.25	309.25	302.00 - 310.00
S22	311.25	317.25	310.00 - 318.00
S23	319.25	325.25	318.00 - 326.00
S24	327.25	333.25	326.00 - 334.00
S25	335.25	341.25	334.00 - 342.00
S26	343.25	349.25	342.00 - 350.00
S27	351.25	357.25	350.00 - 358.00
S28	359.25	365.25	358.00 - 366.00
S29	367.25	373.25	366.00 - 374.00
S30	375.25	381.25	374.00 - 382.00
S31	383.25	389.25	382.00 - 390.00
S32	391.25	397.25	390.00 - 398.00
S33	399.25	405.25	398.00 - 406.00
S34	407.25	413.25	406.00 - 414.00
S35	415.25	421.25	414.00 - 422.00
S36	423.25	429.25	422.00 - 430.00
S37	431.25	437.25	430.00 - 438.00
S38	439.25	445.25	438.00 - 446.00
S39	447.25	453.25	446.00 - 454.00
S40	455.25	461.25	454.00 - 462.00
S41	463.25	469.25	462.00 - 470.00

UHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
21	471.25	477.25	470.00 - 478.00
22	479.25	485.25	478.00 - 486.00
23	487.25	493.25	486.00 - 494.00
24	495.25	501.25	494.00 - 502.00
25	503.25	509.25	502.00 - 510.00
26	511.25	517.25	510.00 - 518.00
27	519.25	525.25	518.00 - 526.00
28	527.25	533.25	526.00 - 534.00
29	535.25	541.25	534.00 - 542.00
30	543.25	549.25	542.00 - 550.00
31	551.25	557.25	550.00 - 558.00
32	559.25	565.25	558.00 - 566.00
33	567.25	573.25	566.00 - 574.00
34	575.25	581.25	574.00 - 582.00
35	583.25	589.25	582.00 - 590.00
36	591.25	597.25	590.00 - 598.00
37	599.25	605.25	598.00 - 606.00
38	607.25	613.25	606.00 - 614.00
39	615.25	621.25	614.00 - 622.00
40	623.25	629.25	622.00 - 630.00
41	631.25	637.25	630.00 - 638.00
42	639.25	645.25	638.00 - 646.00
43	647.25	653.25	646.00 - 654.00
44	655.25	661.25	654.00 - 662.00
45	663.25	669.25	662.00 - 670.00
46	671.25	677.25	670.00 - 678.00
47	679.25	685.25	678.00 - 686.00
48	687.25	693.25	686.00 - 694.00
49	695.25	701.25	694.00 - 702.00
50	703.25	709.25	702.00 - 710.00
51	711.25	717.25	710.00 - 718.00
52	719.25	725.25	718.00 - 726.00
53	727.25	733.25	726.00 - 734.00
54	735.25	741.25	734.00 - 742.00
55	743.25	749.25	742.00 - 750.00
56	751.25	757.25	750.00 - 758.00
57	759.25	765.25	758.00 - 766.00
58	767.25	773.25	766.00 - 774.00
59	775.25	781.25	774.00 - 782.00
60	783.25	789.25	782.00 - 790.00
61	791.25	797.25	790.00 - 798.00
62	799.25	805.25	798.00 - 806.00
63	807.25	813.25	806.00 - 814.00
64	815.25	821.25	814.00 - 822.00
65	823.25	829.25	822.00 - 830.00
66	831.25	837.25	830.00 - 838.00
67	839.25	845.25	838.00 - 846.00
68	847.25	853.25	846.00 - 854.00
69	855.25	861.25	854.00 - 862.00

# CHANNEL TABLES

## I standard – South Africa

VHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
A	45.75	51.75	44.50 - 52.50
B	53.75	59.75	52.50 - 60.50
C	61.75	67.75	60.50 - 68.50
S1	95.25	101.25	94.00 - 102.00
S2	103.25	109.25	102.00 - 110.00
S3	111.25	117.25	110.00 - 118.00
S4	119.25	125.25	118.00 - 126.00
S5	127.25	133.25	126.00 - 134.00
S6	135.25	141.25	134.00 - 142.00
S7	143.25	149.25	142.00 - 150.00
S8	151.25	157.25	150.00 - 158.00
S9	159.25	165.25	158.00 - 166.00
S10	167.25	173.25	166.00 - 174.00
4	175.25	181.25	174.00 - 182.00
5	183.25	189.25	182.00 - 190.00
6	191.25	197.25	190.00 - 198.00
7	199.25	205.25	198.00 - 206.00
8	207.25	213.25	206.00 - 214.00
9	215.25	221.25	214.00 - 222.00
10	223.25	229.25	222.00 - 230.00
11	231.25	237.25	230.00 - 238.00
12	239.25	245.25	238.00 - 246.00
13	247.43	253.43	246.18 - 254.18
S14	263.25	269.25	262.00 - 270.00
S15	271.25	277.25	270.00 - 278.00
S16	279.25	285.25	278.00 - 286.00
S17	287.25	293.25	286.00 - 294.00
S18	295.25	301.25	294.00 - 302.00
S21	303.25	309.25	302.00 - 310.00
S22	311.25	317.25	310.00 - 318.00
S23	319.25	325.25	318.00 - 326.00
S24	327.25	333.25	326.00 - 334.00
S25	335.25	341.25	334.00 - 342.00
S26	343.25	349.25	342.00 - 350.00
S27	351.25	357.25	350.00 - 358.00
S28	359.25	365.25	358.00 - 366.00
S29	367.25	373.25	366.00 - 374.00
S30	375.25	381.25	374.00 - 382.00
S31	383.25	389.25	382.00 - 390.00
S32	391.25	397.25	390.00 - 398.00
S33	399.25	405.25	398.00 - 406.00
S34	407.25	413.25	406.00 - 414.00
S35	415.25	421.25	414.00 - 422.00
S36	423.25	429.25	422.00 - 430.00
S37	431.25	437.25	430.00 - 438.00
S38	439.25	445.25	438.00 - 446.00
S39	447.25	453.25	446.00 - 454.00
S40	455.25	461.25	454.00 - 462.00
S41	463.25	469.25	462.00 - 470.00

UHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
21	471.25	477.25	470.00 - 478.00
22	479.25	485.25	478.00 - 486.00
23	487.25	493.25	486.00 - 494.00
24	495.25	501.25	494.00 - 502.00
25	503.25	509.25	502.00 - 510.00
26	511.25	517.25	510.00 - 518.00
27	519.25	525.25	518.00 - 526.00
28	527.25	533.25	526.00 - 534.00
29	535.25	541.25	534.00 - 542.00
30	543.25	549.25	542.00 - 550.00
31	551.25	557.25	550.00 - 558.00
32	559.25	565.25	558.00 - 566.00
33	567.25	573.25	566.00 - 574.00
34	575.25	581.25	574.00 - 582.00
35	583.25	589.25	582.00 - 590.00
36	591.25	597.25	590.00 - 598.00
37	599.25	605.25	598.00 - 606.00
38	607.25	613.25	606.00 - 614.00
39	615.25	621.25	614.00 - 622.00
40	623.25	629.25	622.00 - 630.00
41	631.25	637.25	630.00 - 638.00
42	639.25	645.25	638.00 - 646.00
43	647.25	653.25	646.00 - 654.00
44	655.25	661.25	654.00 - 662.00
45	663.25	669.25	662.00 - 670.00
46	671.25	677.25	670.00 - 678.00
47	679.25	685.25	678.00 - 686.00
48	687.25	693.25	686.00 - 694.00
49	695.25	701.25	694.00 - 702.00
50	703.25	709.25	702.00 - 710.00
51	711.25	717.25	710.00 - 718.00
52	719.25	725.25	718.00 - 726.00
53	727.25	733.25	726.00 - 734.00
54	735.25	741.25	734.00 - 742.00
55	743.25	749.25	742.00 - 750.00
56	751.25	757.25	750.00 - 758.00
57	759.25	765.25	758.00 - 766.00
58	767.25	773.25	766.00 - 774.00
59	775.25	781.25	774.00 - 782.00
60	783.25	789.25	782.00 - 790.00
61	791.25	797.25	790.00 - 798.00
62	799.25	805.25	798.00 - 806.00
63	807.25	813.25	806.00 - 814.00
64	815.25	821.25	814.00 - 822.00
65	823.25	829.25	822.00 - 830.00
66	831.25	837.25	830.00 - 838.00
67	839.25	845.25	838.00 - 846.00
68	847.25	853.25	846.00 - 854.00
69	855.25	861.25	854.00 - 862.00

# CHANNEL TABLES

K1 standard – DOM-TOM France

VHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
1	43.25	49.75	42.00 - 50.00
2	52.25	58.75	51.00 - 59.00
3	60.25	66.75	59.00 - 67.00
4	175.25	181.75	174.00 - 182.00
5	183.25	189.75	182.00 - 190.00
6	191.25	197.75	190.00 - 198.00
7	199.25	205.75	198.00 - 206.00
8	207.25	213.75	206.00 - 214.00
9	215.25	221.75	214.00 - 222.00

UHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
21	471.25	477.75	470.00 - 478.00
22	479.25	485.75	478.00 - 486.00
23	487.25	493.75	486.00 - 494.00
24	495.25	501.75	494.00 - 502.00
25	503.25	509.75	502.00 - 510.00
26	511.25	517.75	510.00 - 518.00
27	519.25	525.75	518.00 - 526.00
28	527.25	533.75	526.00 - 534.00
29	535.25	541.75	534.00 - 542.00
30	543.25	549.75	542.00 - 550.00
31	551.25	557.75	550.00 - 558.00
32	559.25	565.75	558.00 - 566.00
33	567.25	573.75	566.00 - 574.00
34	575.25	581.75	574.00 - 582.00
35	583.25	589.75	582.00 - 590.00
36	591.25	597.75	590.00 - 598.00
37	599.25	605.75	598.00 - 606.00
38	607.25	613.75	606.00 - 614.00
39	615.25	621.75	614.00 - 622.00
40	623.25	629.75	622.00 - 630.00
41	631.25	637.75	630.00 - 638.00
42	639.25	645.75	638.00 - 646.00
43	647.25	653.75	646.00 - 654.00
44	655.25	661.75	654.00 - 662.00
45	663.25	669.75	662.00 - 670.00
46	671.25	677.75	670.00 - 678.00
47	679.25	685.75	678.00 - 686.00
48	687.25	693.75	686.00 - 694.00
49	695.25	701.75	694.00 - 702.00
50	703.25	709.75	702.00 - 710.00
51	711.25	717.75	710.00 - 718.00
52	719.25	725.75	718.00 - 726.00
53	727.25	733.75	726.00 - 734.00
54	735.25	741.75	734.00 - 742.00
55	743.25	749.75	742.00 - 750.00
56	751.25	757.75	750.00 - 758.00
57	759.25	765.75	758.00 - 766.00
58	767.25	773.75	766.00 - 774.00
59	775.25	781.75	774.00 - 782.00
60	783.25	789.75	782.00 - 790.00
61	791.25	797.75	790.00 - 798.00
62	799.25	805.75	798.00 - 806.00
63	807.25	813.75	806.00 - 814.00
64	815.25	821.75	814.00 - 822.00
65	823.25	829.75	822.00 - 830.00
66	831.25	837.75	830.00 - 838.00
67	839.25	845.75	838.00 - 846.00
68	847.25	853.75	846.00 - 854.00
69	855.25	861.75	854.00 - 862.00

# CHANNEL TABLES

## D/K standard – OIRT Channels

VHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
1	49.75	56.25	48.50 - 56.50
2	59.25	65.75	58.00 - 66.00
3	77.25	83.75	76.00 - 84.00
4	85.25	91.75	84.00 - 92.00
5	93.25	99.75	92.00 - 100.00
S1	111.25	117.75	110.00 - 118.00
S2	119.25	125.75	118.00 - 126.00
S3	127.25	133.75	126.00 - 134.00
S4	135.25	141.75	134.00 - 142.00
S5	143.25	149.75	142.00 - 150.00
S6	151.25	157.75	150.00 - 158.00
S7	159.25	165.75	158.00 - 166.00
S8	167.25	173.75	166.00 - 174.00
6	175.25	181.75	174.00 - 182.00
7	183.25	189.75	182.00 - 190.00
8	191.25	197.75	190.00 - 198.00
9	199.25	205.75	198.00 - 206.00
10	207.25	213.75	206.00 - 214.00
11	215.25	221.75	214.00 - 222.00
12	223.25	229.75	222.00 - 230.00
S11	231.25	237.75	230.00 - 238.00
S12	239.25	245.75	238.00 - 246.00
S13	247.25	253.75	246.00 - 254.00
S14	255.25	261.75	254.00 - 262.00
S15	263.25	269.75	262.00 - 270.00
S16	271.25	277.75	270.00 - 278.00
S17	279.25	285.75	278.00 - 286.00
S18	287.25	293.75	286.00 - 294.00
S20	295.25	301.75	294.00 - 302.00
S21	303.25	309.75	302.00 - 310.00
S22	311.25	317.75	310.00 - 318.00
S23	319.25	325.75	318.00 - 326.00
S24	327.25	333.75	326.00 - 334.00
S25	335.25	341.75	334.00 - 342.00
S26	343.25	349.75	342.00 - 350.00
S27	351.25	357.75	350.00 - 358.00
S28	359.25	365.75	358.00 - 366.00
S29	367.25	373.75	366.00 - 374.00
S30	375.25	381.75	374.00 - 382.00
S31	383.25	389.75	382.00 - 390.00
S32	391.25	397.75	390.00 - 398.00
S33	399.25	405.75	398.00 - 406.00
S34	407.25	413.75	406.00 - 414.00
S35	415.25	421.75	414.00 - 422.00
S36	423.25	429.75	422.00 - 430.00
S37	431.25	437.75	430.00 - 438.00
S38	439.25	445.75	438.00 - 446.00
S39	447.25	453.75	446.00 - 454.00
S40	455.25	461.75	454.00 - 462.00
S41	463.25	469.75	462.00 - 470.00

UHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
21	471.25	477.25	470.00 - 478.00
22	479.25	485.75	478.00 - 486.00
23	487.25	493.75	486.00 - 494.00
24	495.25	501.75	494.00 - 502.00
25	503.25	509.75	502.00 - 510.00
26	511.25	517.75	510.00 - 518.00
27	519.25	525.75	518.00 - 526.00
28	527.25	533.75	526.00 - 534.00
29	535.25	541.75	534.00 - 542.00
30	543.25	549.75	542.00 - 550.00
31	551.25	557.75	550.00 - 558.00
32	559.25	565.75	558.00 - 566.00
33	567.25	573.75	566.00 - 574.00
34	575.25	581.75	574.00 - 582.00
35	583.25	589.75	582.00 - 590.00
36	591.25	597.75	590.00 - 598.00
37	599.25	605.75	598.00 - 606.00
38	607.25	613.75	606.00 - 614.00
39	615.25	621.75	614.00 - 622.00
40	623.25	629.75	622.00 - 630.00
41	631.25	637.75	630.00 - 638.00
42	639.25	645.75	638.00 - 646.00
43	647.25	653.75	646.00 - 654.00
44	655.25	661.75	654.00 - 662.00
45	663.25	669.75	662.00 - 670.00
46	671.25	677.75	670.00 - 678.00
47	679.25	685.75	678.00 - 686.00
48	687.25	693.75	686.00 - 694.00
49	695.25	701.75	694.00 - 702.00
50	703.25	709.75	702.00 - 710.00
51	711.25	717.75	710.00 - 718.00
52	719.25	725.75	718.00 - 726.00
53	727.25	733.75	726.00 - 734.00
54	735.25	741.75	734.00 - 742.00
55	743.25	749.75	742.00 - 750.00
56	751.25	757.75	750.00 - 758.00
57	759.25	765.75	758.00 - 766.00
58	767.25	773.75	766.00 - 774.00
59	775.25	781.75	774.00 - 782.00
60	783.25	789.75	782.00 - 790.00
61	791.25	797.75	790.00 - 798.00
62	799.25	805.75	798.00 - 806.00
63	807.25	813.75	806.00 - 814.00
64	815.25	821.75	814.00 - 822.00
65	823.25	829.75	822.00 - 830.00
66	831.25	837.75	830.00 - 838.00
67	839.25	845.75	838.00 - 846.00
68	847.25	853.75	846.00 - 854.00
69	855.25	861.75	854.00 - 862.00

# CHANNEL TABLES

D/K standard – Poland

VHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
1	49.75	56.25	48.50 - 56.50
2	59.25	65.75	58.00 - 66.00
3	77.25	83.75	76.00 - 84.00
4	85.25	91.75	84.00 - 92.00
5	93.25	99.75	92.00 - 100.00
S1	111.25	117.75	110.00 - 118.00
S2	119.25	125.75	118.00 - 126.00
S3	127.25	133.75	126.00 - 134.00
S4	135.25	141.75	134.00 - 142.00
S5	143.25	149.75	142.00 - 150.00
S6	151.25	157.75	150.00 - 158.00
S7	159.25	165.75	158.00 - 166.00
S8	167.25	173.75	166.00 - 174.00
6	175.25	181.75	174.00 - 182.00
7	183.25	189.75	182.00 - 190.00
8	191.25	197.75	190.00 - 198.00
9	199.25	205.75	198.00 - 206.00
10	207.25	213.75	206.00 - 214.00
11	215.25	221.75	214.00 - 222.00
12	223.25	229.75	222.00 - 230.00
S9	231.25	237.75	230.00 - 238.00
S10	239.25	245.75	238.00 - 246.00
S11	247.25	253.75	246.00 - 254.00
S12	255.25	261.75	254.00 - 262.00
S13	263.25	269.75	262.00 - 270.00
S14	271.25	277.75	270.00 - 278.00
S15	279.25	285.75	278.00 - 286.00
S16	287.25	293.75	286.00 - 294.00
S17	295.25	301.75	294.00 - 302.00
S18	303.25	309.75	302.00 - 310.00
S19	311.25	317.75	310.00 - 318.00
S20	319.25	325.75	318.00 - 326.00
S21	327.25	333.75	326.00 - 334.00
S22	335.25	341.75	334.00 - 342.00
S23	343.25	349.75	342.00 - 350.00
S24	351.25	357.75	350.00 - 358.00
S25	359.25	365.75	358.00 - 366.00
S26	367.25	373.75	366.00 - 374.00
S27	375.25	381.75	374.00 - 382.00
S28	383.25	389.75	382.00 - 390.00
S29	391.25	397.75	390.00 - 398.00
S30	399.25	405.75	398.00 - 406.00
S31	407.25	413.75	406.00 - 414.00
S32	415.25	421.75	414.00 - 422.00
S33	423.25	429.75	422.00 - 430.00
S34	431.25	437.75	430.00 - 438.00
S35	439.25	445.75	438.00 - 446.00
S36	447.25	453.75	446.00 - 454.00
S37	455.25	461.75	454.00 - 462.00
S38	463.25	469.75	462.00 - 470.00

UHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
21	471.25	477.75	470.00 - 478.00
22	479.25	485.75	478.00 - 486.00
23	487.25	493.75	486.00 - 494.00
24	495.25	501.75	494.00 - 502.00
25	503.25	509.75	502.00 - 510.00
26	511.25	517.75	510.00 - 518.00
27	519.25	525.75	518.00 - 526.00
28	527.25	533.75	526.00 - 534.00
29	535.25	541.75	534.00 - 542.00
30	543.25	549.75	542.00 - 550.00
31	551.25	557.75	550.00 - 558.00
32	559.25	565.75	558.00 - 566.00
33	567.25	573.75	566.00 - 574.00
34	575.25	581.75	574.00 - 582.00
35	583.25	589.75	582.00 - 590.00
36	591.25	597.75	590.00 - 598.00
37	599.25	605.75	598.00 - 606.00
38	607.25	613.75	606.00 - 614.00
39	615.25	621.75	614.00 - 622.00
40	623.25	629.75	622.00 - 630.00
41	631.25	637.75	630.00 - 638.00
42	639.25	645.75	638.00 - 646.00
43	647.25	653.75	646.00 - 654.00
44	655.25	661.75	654.00 - 662.00
45	663.25	669.75	662.00 - 670.00
46	671.25	677.75	670.00 - 678.00
47	679.25	685.75	678.00 - 686.00
48	687.25	693.75	686.00 - 694.00
49	695.25	701.75	694.00 - 702.00
50	703.25	709.75	702.00 - 710.00
51	711.25	717.75	710.00 - 718.00
52	719.25	725.75	718.00 - 726.00
53	727.25	733.75	726.00 - 734.00
54	735.25	741.75	734.00 - 742.00
55	743.25	749.75	742.00 - 750.00
56	751.25	757.75	750.00 - 758.00
57	759.25	765.75	758.00 - 766.00
58	767.25	773.75	766.00 - 774.00
59	775.25	781.75	774.00 - 782.00
60	783.25	789.75	782.00 - 790.00
61	791.25	797.75	790.00 - 798.00
62	799.25	805.75	798.00 - 806.00
63	807.25	813.75	806.00 - 814.00
64	815.25	821.75	814.00 - 822.00
65	823.25	829.75	822.00 - 830.00
66	831.25	837.75	830.00 - 838.00
67	839.25	845.75	838.00 - 846.00
68	847.25	853.75	846.00 - 854.00
69	855.25	861.75	854.00 - 862.00



## CHANNEL TABLES

## B/B standard – Australia

VHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
0	46,25	51,75	45,00 - 52,00
1	57,25	62,75	56,00 - 63,00
2	64,25	69,75	63,00 - 70,00
2A	71,25	76,75	70,00 - 77,00
2B	78,25	83,75	77,00 - 84,00
3	86,25	91,75	85,00 - 92,00
4	95,25	100,75	94,00 - 101,00
5	102,25	107,75	101,00 - 108,00
5A	138,25	143,75	137,00 - 144,00
S1	105,25	110,75	104,00 - 111,00
S2	112,25	117,75	111,00 - 118,00
S3	119,25	124,75	118,00 - 125,00
S4	126,25	131,75	125,00 - 132,00
S5	133,25	138,75	132,00 - 139,00
S6	140,25	145,75	139,00 - 146,00
S7	147,25	152,75	146,00 - 153,00
S8	154,25	159,75	153,00 - 160,00
S9	161,25	166,75	160,00 - 167,00
S10	168,25	173,75	167,00 - 174,00
6	175,25	180,75	174,00 - 181,00
7	182,25	187,75	181,00 - 188,00
8	189,25	194,75	188,00 - 195,00
9	196,25	201,75	195,00 - 202,00
9A	203,25	208,75	202,00 - 209,00
10O	209,25	214,75	208,00 - 215,00
10	210,25	215,75	209,00 - 216,00
11O	216,25	221,75	215,00 - 222,00
11	217,25	222,75	216,00 - 223,00
12	224,25	229,75	223,00 - 230,00
S11	231,25	236,75	230,00 - 237,00
S12	238,25	243,75	237,00 - 244,00
S13	245,25	250,75	244,00 - 251,00
S14	252,25	257,75	251,00 - 258,00
S15	259,25	264,75	258,00 - 265,00
S16	266,25	271,75	265,00 - 272,00
S17	273,25	278,75	272,00 - 279,00
S18	280,25	285,75	279,00 - 286,00
S19	287,25	292,75	286,00 - 293,00
S20	294,25	299,75	293,00 - 300,00
S21	303,25	308,75	302,00 - 309,00
S22	310,25	315,75	309,00 - 316,00
S23	317,25	322,75	316,00 - 323,00
S24	324,25	329,75	323,00 - 330,00
S25	331,25	336,75	330,00 - 337,00
S26	338,25	343,75	337,00 - 344,00
S27	345,25	350,75	344,00 - 351,00
S28	352,25	357,75	351,00 - 358,00
S29	359,25	364,75	358,00 - 365,00
S30	366,25	371,75	365,00 - 372,00
S31	373,25	378,75	372,00 - 379,00
S32	380,25	385,75	379,00 - 386,00
S33	387,25	392,75	386,00 - 393,00
S34	394,25	399,75	393,00 - 400,00
S35	401,25	406,75	400,00 - 407,00
S36	408,25	413,75	407,00 - 414,00
S37	415,25	420,75	414,00 - 421,00
S38	422,25	427,75	421,00 - 428,00
S39	429,25	434,75	428,00 - 435,00
S40	436,25	441,75	435,00 - 442,00
S41	443,25	448,75	442,00 - 449,00

UHF			
CHANNEL	VIDEO	AUDIO	RANGE
	MHz	MHz	MHz
20	471,25	476,75	470,00 - 477,00
21	478,25	483,75	477,00 - 484,00
22	485,25	490,75	484,00 - 491,00
23	492,25	497,75	491,00 - 498,00
24	499,25	504,75	498,00 - 505,00
25	506,25	511,75	505,00 - 512,00
26	513,25	518,75	512,00 - 519,00
27	520,25	525,75	519,00 - 526,00
28	527,25	532,75	526,00 - 533,00
29	534,25	539,75	533,00 - 540,00
30	541,25	546,75	540,00 - 547,00
31	548,25	553,75	547,00 - 554,00
32	555,25	560,75	554,00 - 561,00
33	562,25	567,75	561,00 - 568,00
34	569,25	574,75	568,00 - 575,00
35	576,25	581,75	575,00 - 582,00
36	583,25	588,75	582,00 - 589,00
37	590,25	595,75	589,00 - 596,00
38	597,25	602,75	596,00 - 603,00
39	604,25	609,75	603,00 - 610,00
40	611,25	616,75	610,00 - 617,00
41	618,25	623,75	617,00 - 624,00
42	625,25	630,75	624,00 - 631,00
43	632,25	637,75	631,00 - 638,00
44	639,25	644,75	638,00 - 645,00
45	646,25	651,75	645,00 - 652,00
46	653,25	658,75	652,00 - 659,00
47	660,25	665,75	659,00 - 666,00
48	667,25	672,75	666,00 - 673,00
49	674,25	679,75	673,00 - 680,00
50	681,25	686,75	680,00 - 687,00
51	688,25	693,75	687,00 - 694,00
52	695,25	700,75	694,00 - 701,00
53	702,25	707,75	701,00 - 708,00
54	709,25	714,75	708,00 - 715,00
55	716,25	721,75	715,00 - 722,00
56	723,25	728,75	722,00 - 729,00
57	730,25	735,75	729,00 - 736,00
58	737,25	742,75	736,00 - 743,00
59	744,25	749,75	743,00 - 750,00
60	751,25	756,75	750,00 - 757,00
61	758,25	763,75	757,00 - 764,00
62	765,25	770,75	764,00 - 771,00
63	772,25	777,75	771,00 - 778,00
64	779,25	784,75	778,00 - 785,00
65	786,25	791,75	785,00 - 792,00
66	793,25	798,75	792,00 - 799,00
67	800,25	805,75	799,00 - 806,00
68	807,25	812,75	806,00 - 813,00
69	814,25	819,75	813,00 - 820,00
70	821,25	826,75	820,00 - 827,00
71	828,25	833,75	827,00 - 834,00
72	835,25	840,75	834,00 - 841,00
73	842,25	847,75	841,00 - 848,00
74	849,25	854,75	848,00 - 855,00
75	856,25	861,75	855,00 - 862,00

There will not be any new services on the C/3-5A channels.  
The C/10-11 channels of old services will be adjusted with 1 MHz less.  
The C/20-27 channels will only be used as modulators.



## CONSUMPTION TABLE

Number of modules per power supply unit

FA-312					
	Max mod.	PA-720	ZF-712	LNB	CAM
TT-411	5	1	0	2	5
TT-401	5	1	0	2	0
TT-311	6	1	0	2	6
TT-211	6	1	0	2	6
TT-201	8	1	0	2	0
TT-111	6	1	0	2	6
TT-101	8	1	0	2	0
DM-102	6	1	0	0	0
DM-302	6	1	0	0	0
TQ-533	6	1	0	2	6
TQ-532	7	1	0	2	0
TQ-521	8	1	0	2	0
PC-525	12	1	0	0	0
RG-101	10	1	0	0	0
UC-233	8	0	1	1	0
UC-222	8	0	1	2	0
UC-221	8	0	1	2	0
OT-402	3	0	0	0	0
MS-551	13	1	0	0	0
MS-545	13	1	0	0	0
TP-589	8	1	0	2	8
TP-579	8	1	0	2	0
TP-569	9	1	0	2	9
TP-559	9	1	0	2	0
TO-569	9	1	0	0	9
TO-559	11	1	0	0	0

FA-310				
Max mod.	PA-720	ZF-712	LNB	CAM
3	1	0	2	3
3	1	0	2	0
4	1	0	2	4
4	1	0	2	4
4	1	0	2	0
3	1	0	2	3
4	1	0	2	0
3	1	0	0	0
3	1	0	0	0
4	1	0	2	4
5	1	0	2	0
6	1	0	2	0
10	1	0	0	0
6	1	0	0	0
8	0	1	1	0
8	0	1	2	0
8	0	1	2	0
3	0	0	0	0
12	1	0	0	0
10	1	0	0	0
4	1	0	2	4
7	1	0	2	0
5	1	0	2	5
8	1	0	2	0
5	1	0	0	5
8	1	0	0	0

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D9130001	AU-0630	285
9000005	FM-200	19
9000036	BU-454	14
9000039	BU-289	14
9000040	FM-102	19
9000042	BU-269	14
9000043	BU-569	14
9000044	MX-045	13
9000045	MX-075	13
9000046	BU-119	15
9000057	AP-369	16
9000058	GA-454	21
9000059	GA-569	21
9000060	BT-756	18
9000063	BT-751	18
9000065	GA-269	21
9000070	BT-451	18
9000071	BT-151	20
9000077	BU-115	15
9000080	GA-751	21
9000081	BU-260	17
9000082	BU-266	10
9000083	BU-456	10
9000084	BU-116	11
9000085	MX-046	9
9000086	GA-266	21
9000088	MX-076	9
9000089	BU-566	10
9000090	GA-566	21
9000097	GA-456	21
9000185	NEO-085	12
9000186	NEO-086	8
9000195	NEO-095	12
9000196	NEO-096	8
9010008	BR-401	23
9010009	BR-411	23
9010012	BR-441	23
9010013	BR-421	22
9010014	BR-431	22

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9010015	BR-451	22
9020016	FR-413	50
9020017	MM-303	45
9020018	MM-208	44
9020040	MM-207	44
9020041	MM-200	44 - 347
9020042	MM-307	45
9020043	MM-406	46
9020044	MM-407	46
9020045	MM-214	47
9020047	FR-015	49
9020048	FR-619	48
9030008	AM-105	58
9030011	AM-115	70
9030012	BO-205	64
9030013	BO-206	64
9030015	AM-903	59
9030016	AM-205	59
9030017	AM-206	59
9030023	AM-319	70
9030024	AM-305	60
9030029	AM-306	60
9030030	AM-301	57
9030031	AM-407	61
9030032	AM-406	61
9030041	BO-305	64
9030042	BO-306	64
9030043	BO-105	64
9030046	BO-406	64
9030047	BO-407	64
9030048	AM-309	62
9030051	AM-315	70
9030052	AM-316	70
9030076	AM-416	70
9030078	AM-216	70
9030086	AL-100	66
9030087	AL-105	67
9030089	AM-215	70
9030099	AM-417	70

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9030103	AL-110	66
9030119	AL-125	67
9030122	AM-930	68
9030130	AM-107	63
9030131	BO-107	64
9030134	AL-130	66
9030135	AL-205	67
9030136	AM-515	69
9030140	AM-910	71
9030141	AM-145	56
9030142	AM-246	56
9030144	AM-140	55
9030145	AM-242	55
9030147	AM-155	70
9030148	AM-256	70
9030149	AM-356	70
9030150	AM-150	70
9030151	AM-252	70
9030152	AM-352	70
9030153	AM-346	56
9030155	AM-342	55
9030157	BO-140	65
9030158	BO-242	65
9030159	BO-342	65
9030160	BO-145	65
9030161	BO-246	65
9030162	BO-346	65
9030163	AM-165	52
9030164	AM-266	52
9030165	AM-160	51
9030166	AM-262	51
9030167	BO-165	65
9030168	BO-266	65
9030169	BO-160	65
9030170	BO-262	65
9030171	AM-366	52
9030172	AM-362	51
9030173	BO-366	65
9030174	BO-362	65
9030175	AM-270	53
9030176	AM-274	54

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9030177	AM-374	54
9030178	AM-173	53
9040003	CA-730	92
9040006	CA-510	93
9040011	CA-311	82
9040014	CA-310	82
9040015	DA-720	306
9040016	DA-701	304
9040017	DA-711	308
9040019	DA-703	304
9040025	DA-713	308
9040029	FL-100	95 - 154 - 396
9040033	CF-511	85
9040034	CF-512	85
9040035	CF-513	93
9040039	CA-312	83
9040042	CF-715	307
9040046	CF-115	307
9040050	AI-200	311
9040051	AI-221	315
9040052	AI-223	315
9040053	AI-100	311
9040056	AI-131	314
9040057	AI-133	314
9040058	CA-313	83
9040060	CA-210	82
9040061	CA-215	94
9040062	AI-108	313
9040063	AI-400	312
9040064	CA-511	84
9040065	DA-520	309
9040071	AI-210	316
9040073	CA-220	87
9040075	AI-414	317
9040077	CA-720	90 - 91
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9040103	CA-710	86
9040116	CA-340	80
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9040119	DA-706	305
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9050004	RM-075	399
9050022	ZG-431	135
9050023	ZG-412	136
9050024	ZG-413	136
9050026	ZG-414	136
9050035	ZG-211	138
9050037	ZG-901	137
9050043	VE-500	152 - 156 - 186 - 245
9050073	ZG-902	137
9050074	ZG-611	134 - 138
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9050092	ZP-431	143
9050093	ZP-412	144
9050094	ZP-413	144
9050096	ZP-414	144
9050097	ZP-211	146
9050098	ZP-611	142 - 146
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9050100	SP-126	153
9050102	PZ-010	155
9050104	LT-107	156
9050106	ZG-212	138
9050108	ZP-212	146
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9050119	PZ-020	155
9050120	LT-102	156
9050121	LT-112	156
9050122	ZA-431	128 - 129
9050124	CP-126	153
9050125	SP-128	153
9050126	ZA-411	126 - 127
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9050129	PA-320	130 - 131
9050132	ZP-901	145
9050133	ZP-902	145

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9050139	ZA-331	128 - 129
9050146	PC-525	114 - 115
9050147	TO-559	106 - 107
9050148	IP-102	155
9050155	TO-569	108 - 109
9050159	RG-101	120 - 121
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9060031	FP-211	332
9060032	FP-217	332
9060033	FD-213	330
9060034	FD-219	330
9060035	FD-225	330
9060036	FI-243	334
9060037	FI-473	334
9060038	FD-413	331
9060039	FD-419	331
9060040	FD-425	331
9060041	FI-253	334
9060042	FI-483	334
9060043	FP-223	332
9060044	FP-226	332
9060046	FP-414	333
9060047	FP-420	333
9060048	FP-426	333
9060050	RF-075	348 - 399
9060053	FD-210	330
9060054	FD-410	331
9060055	FI-244	335
9060056	FI-474	335
9060057	FI-254	335
9060058	FI-484	335
9060060	SD-100	348
9060061	DI-602	339
9060062	DI-802	339
9060063	DE-201	336
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9060065	DE-205	336
9060066	DE-207	336
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9060070	DE-405	337
9060071	DE-407	337
9060073	DE-603	338
9060074	DE-605	338
9060075	DE-607	338
9060076	DI-202	339
9060077	DI-402	339
9060078	FI-374	335
9060079	FI-594	335
9060096	DI-302	339
9070004	BS-220	342
9070005	BS-420	342
9070006	BS-620	342
9070008	BS-820	342
9070020	EM-200	349
9070021	EM-201	349
9070022	EM-202	349
9070024	EM-210	349
9070025	EM-211	349
9070027	EM-212	349
9070037	BM-100	343
9070038	BM-101	343
9070039	BM-111	343
9070040	BM-200	343
9070041	BM-500	343
9070042	BM-700	343
9070043	BC-100	344
9070044	BC-200	344
9070045	BC-500	344
9070046	BC-110	344
9070062	BS-100	340
9070068	BS-110	340
9070069	BS-111	340
9070070	BS-210	340
9070071	BS-510	340
9070073	BS-112	340
9070075	SB-003	348
9070082	PT-201	345
9070083	PT-401	345

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9070084	PT-600	346
9070085	PT-800	346
9070086	BS-102	341
9070087	BS-101	347
9070101	PT-210	346
9070102	PT-310	346
9070103	PT-410	346
9070104	PT-510	346
9070105	BS-113	347
9080000	MC-095	397
9080001	HC-095	397
9080004	EM-101	400
9080006	MC-001	155
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9080007	HC-001	397
9080008	MC-101	398
9080010	RM-095	398
9080011	RH-095	398
9080012	EP-111	286 - 400
9080013	EP-212	400
9080014	MC-104	398
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9080016	HE-200	422
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9080030	MC-304	399
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9090006	MD-104	397
9090016	DV-102	397
9090018	EQ-186	395
9090022	RB-208	393
9090023	RB-008	393
9090026	FR-423	393
9090028	PR-200	152 - 154 - 390
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9090031	AV-305	391
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9090034	GT-001	286 - 396
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9090042	RB-619	392
9090043	IM-123	154
9090044	PR-201	154 - 390
9090060	DI-413	285
9100013	CE-170	401
9100014	FI-250	402
9100016	CL-200	403
9100017	CE-750	404
9100018	CE-850	404
9100019	CE-741	404
9100021	CE-753	401
9100055	FI-240	402
9100056	CE-743	401
9100057	CL-201	403
9100058	CE-754	401
9110000	DAM-504	310
9120011	RS-275	151 - 186 - 244 - 347 - 399
9120027	LF-001	348 - 422
9120030	PF-230	27
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9120039	CM-004	151 - 154 - 186 - 244 - 286 - 347 - 348 - 398
9120046	FA-310	111 - 117 - 123 - 170 - 175 - 207 - 219 - 231 - 237 - 365
9120051	LA-001	245
9120064	PU-101	151 - 186 - 244
9120079	CD-011	185
9120090	MF-201	176 - 394
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9120093	PA-720	110 - 116 - 122 - 169 - 174 - 206 - 218 - 230
9120094	CD-113	185
9120098	CD-003	185
9120100	IP-001	150 - 155 - 184 - 243
9120102	LA-100	152 - 245
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9120106	MS-551	172
9120107	MS-541	173
9120109	MS-543	173
9120110	MS-544	173
9120122	PF-431	26
9120124	LA-102	245
9120126	CB-400	182 - 240
9120128	TP-569	224 - 225
9120129	TP-559	222 - 223
9120130	SP-226	150 - 184 - 243
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9120138	MS-545	173
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9120145	TT-201	196 - 197
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9120159	PF-222	28
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9120161	PF-423	25
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9120168	FA-312	111 - 117 - 123 - 170 - 175 - 207 - 219 - 231 - 237 - 365
9120181	SK-100	184 - 242
9120182	SK-001	242
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9120185	SK-004	242
9120187	SM-010	239
9120188	SK-005	242
9120189	TT-311	200 - 201
9120191	TQ-533	212 - 213
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9120194	DM-102	167
9120196	TP-579	226 - 227
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9120198	UE-403	29
9120199	LA-103	245
9120200	TT-401	202 - 203
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9120205	UE-300	29
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9120210	DM-302	168
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9130071	MB-204	271
9130072	MB-205	272
9130073	MB-206	272
9130079	MB-302	273
9130080	MB-303	273
9130081	MB-304	273
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9130089	MB-402	275
9130090	MB-403	275
9130091	MB-404	275
9130092	MB-405	276
9130093	MB-406	276
9130094	ML-202	279
9130095	ML-203	279
9130096	ML-204	279
9130097	ML-205	280
9130098	ML-206	280
9130114	ML-302	281
9130115	ML-303	281
9130116	ML-304	281
9130117	ML-305	282
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9130145	MB-103	269
9130146	MB-104	269
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9130148	MB-106	270
9130149	ML-102	277
9130150	ML-103	277
9130151	ML-104	277
9130152	ML-105	278
9130153	ML-106	278
9130159	ML-108	278
9130160	MB-108	270
9130168	AU-621	267
9130169	AU-641	267
9130170	MB-208	272
9130171	ML-208	280
9130172	MB-308	274
9130173	ML-308	282
9130174	MB-408	276
9130175	ML-408	284
9140000	FE-009	78
9140001	FE-008	78
9140002	FE-007	78
9140003	FE-006	78
9140004	FE-005	78
9140005	FE-019	79
9140006	FE-018	79
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9140009	FE-015	79
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9300001	RE-500	382
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9300010	TR-000	383
9300011	TR-500	383
9300012	TR-501	383
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9300064	TOU-102	379
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9980009	PI-101	37
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9980013	BB-001	37
9980014	TE-014	35
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9980051	TI-025	30
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9980053	BF-003	30
9980055	BE-001	30
9980056	GM-040	34
9980057	GM-050	34
9980058	AC-014	35
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9980065	RS-500	33
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9980102	MT-411	31
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9980109	FJ-303	36
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