

# Televes®



T.O.X. SERIES

EN TWIN Modulator

Ref. 5806

User manual



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## 1. Technical specifications

### 1.1. TWIN Modulator ref. 5806

Video	Bandwidth	MHz	0,00005 ... 5	Differential phase	°	< 4
	Input level (75 ohm)	Vpp	1	Chroma/luma Delay	ns	< 100
	Modulation depth	%	72,5 ... 90	Chroma/luma Delay	dB	> 52
	Differential gain	%	< 4	Flatness	dB	< +1
Audio	Bandwidth	KHz	0,04 ... 15	S/N ratio	dB	> 45
	Impedance	ohm	10000	Flatness	dB	< ±1
	Pre-emphasis	µs	50	Input level	dBm	>-15 <7
	Deviation (1KHz/1.7Vpp input)		program. (see table)	Distortion (1KHz dev. ± 30KHz)	%	< 1
RF output	Output frequency	MHz	46 ... 862	Return losses	dB	10 (14 typ)
	Impedance	ohm	75	Audio carrier precision	KHz	VHF < 25 UHF < 50
	Output level	dBµV	80 ± 5			
	Regulation margin	dB	> 15	Video carrier stability	KHz	VHF < 15 UHF < 30
	Level stability	dB	± 3			
	Pa/Pv distance		-12, -16 (prog.)	Carrier ratio	MHz	4,5 / 5,5 / 6 / 6,5
	IF frequency	MHz	38,9	Band spurious level 46 ... 862MHz	dBc	55 min. > 60 typ
	Frequency steps	KHz	250 (prog.)			
	C/N (5MHz)	dB	> 56	Through losses (46 - 862 MHz)	dB	< 1.5
General	Power supply	V===	24	Protection index		IP20
	Consumption 24V	mA	300			

The technical characteristics described are defined for a maximum ambient temperature of 45°C (113°F). Forced ventilation is used for higher temperatures.

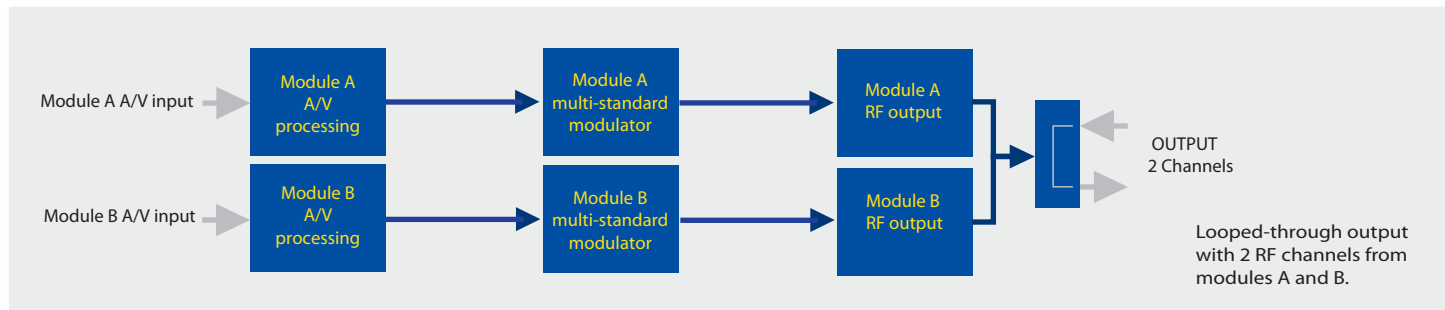
## 1.2. Technical specs. Broadband Amplifiers

Amplifier 5575	Frequency range	MHz	46 ... 862	Connector	type	"F"
	Gain	dB	44 ± 2,5	Powering voltage	Vdc	24
	Regulation margin	dB	20	Consumption at 24 Vdc	mA	450
	Output level (60 dB 42 CH CENELEC)	dBμV	105	Test socket	dB	-30

## 1.3. Technical specs. Power Supply Unit

Power Supply Unit 5629	Mains voltage	Vac/Hz	196 - 264 / 50-60	Total current (max) (output 1 + output 2)	A	5 (24V $\Rightarrow$ )
	Output voltage	Vdc	24	Max. current per output	A	4 (24V $\Rightarrow$ )

## 1.4. TWIN Unit Blocks Diagram

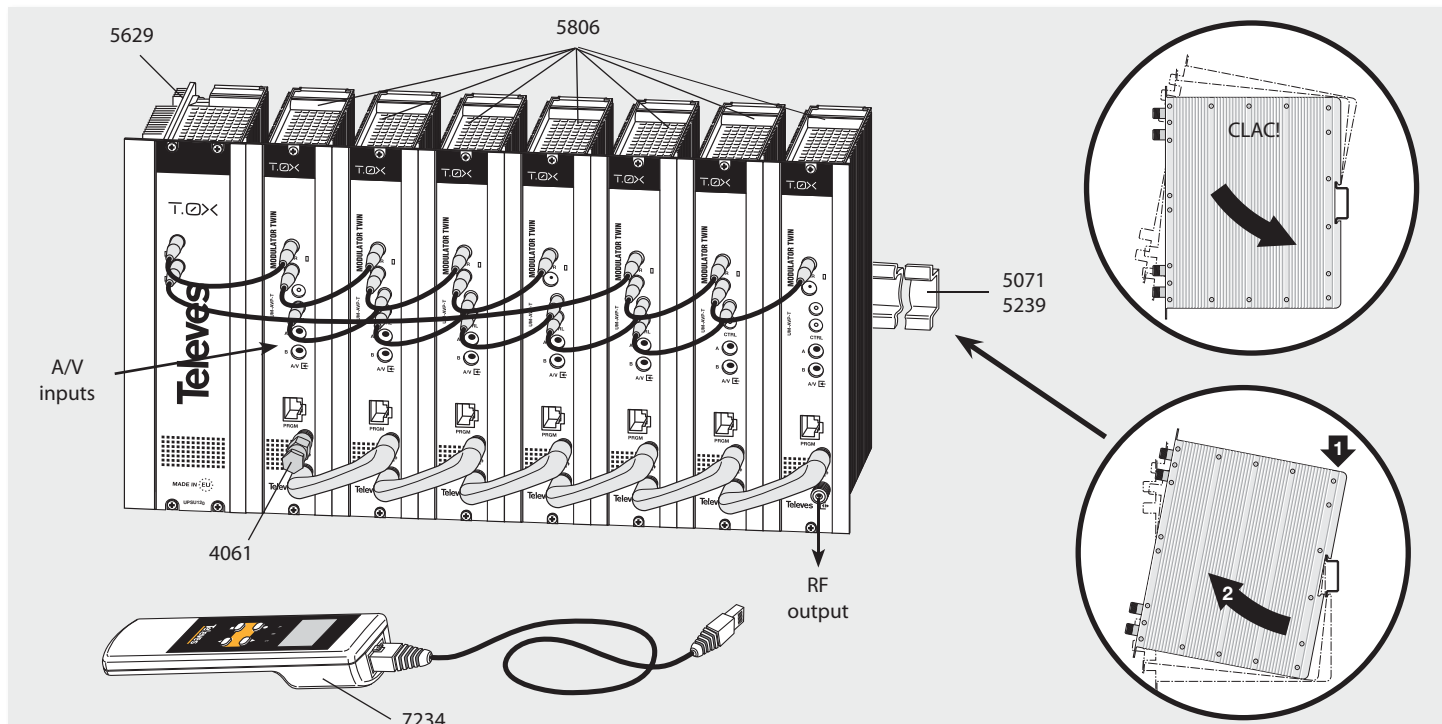


## 2. Description of references

Product Range		Accessories	
5806	TWIN Modulator T-0X	7234	Universal Programmer
5575	Broadband Amplifier 44dB 120dB $\mu$ V T-0X	5071	T03-T05-T-0X Mounting rail (50 cm)
5559	Headend Manager CDC-IP T-0X	5239	T03-T05-T-0X Mounting rail.12 Modules+PSU (56 cm)
555901	Headend Manager CDC-IP GSM T-0X	5301	19" Rack frame
5629	Power supply unit 24VDC/5A T-0X	507202	T-0X Lockable cabinet with Ventilation Unit (7 Modules + PSU)
		4061	75 Ohm DC-Block load
		4058	75 Ohm Load
		422601	T05 to T-0X Power connection lead (40 cm)
		422602	T05 to T-0X Management connection lead (40 cm)
		422603	T-0X Management connection lead (1m)
		5673	Blank plate 50 mm

## 3. Mounting

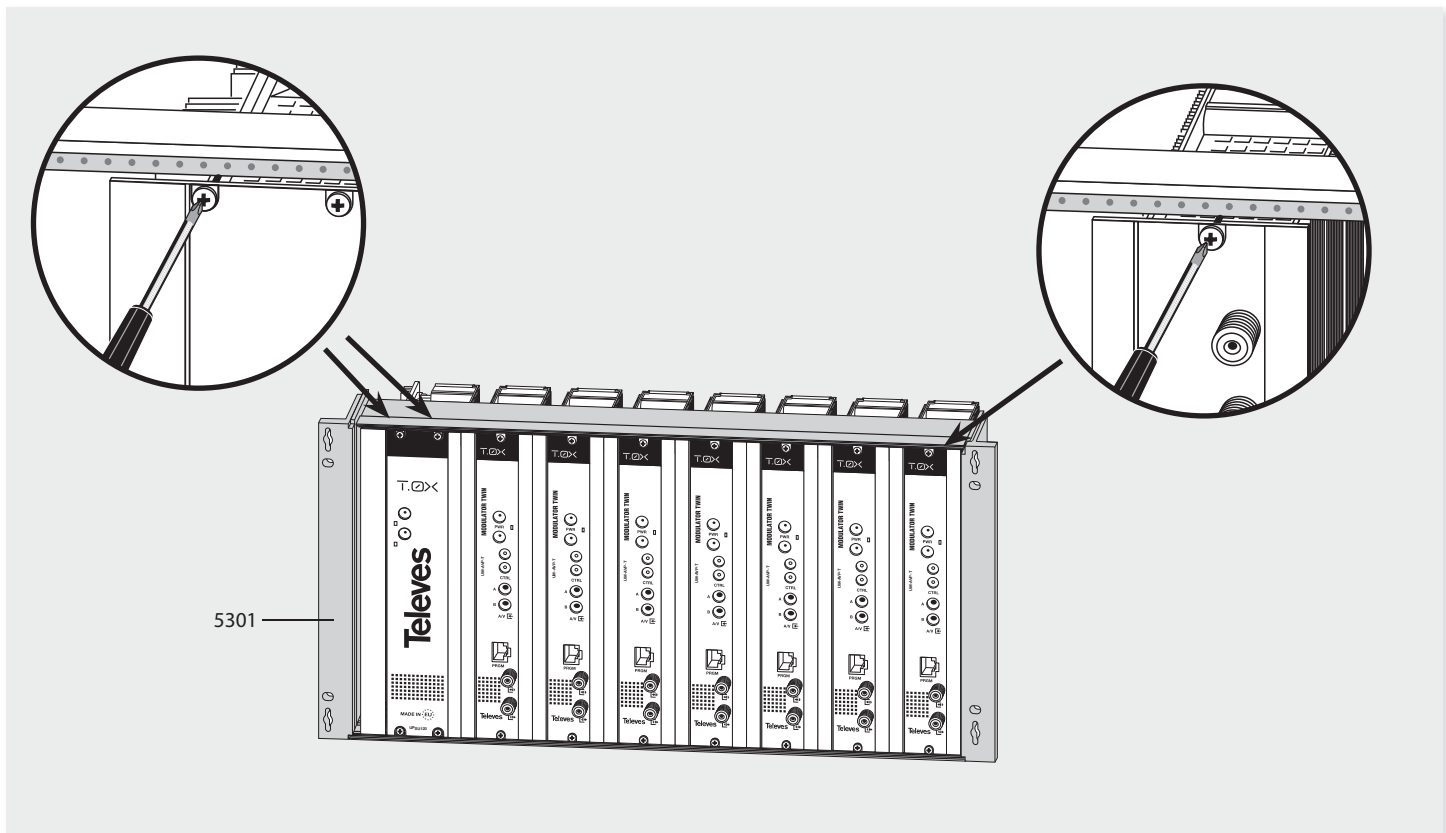
### 3.1. Wall mounting



**NOTE:** The use of both PSU power outputs is recommended to balance the consumption. For example, 4+3 or 3+4

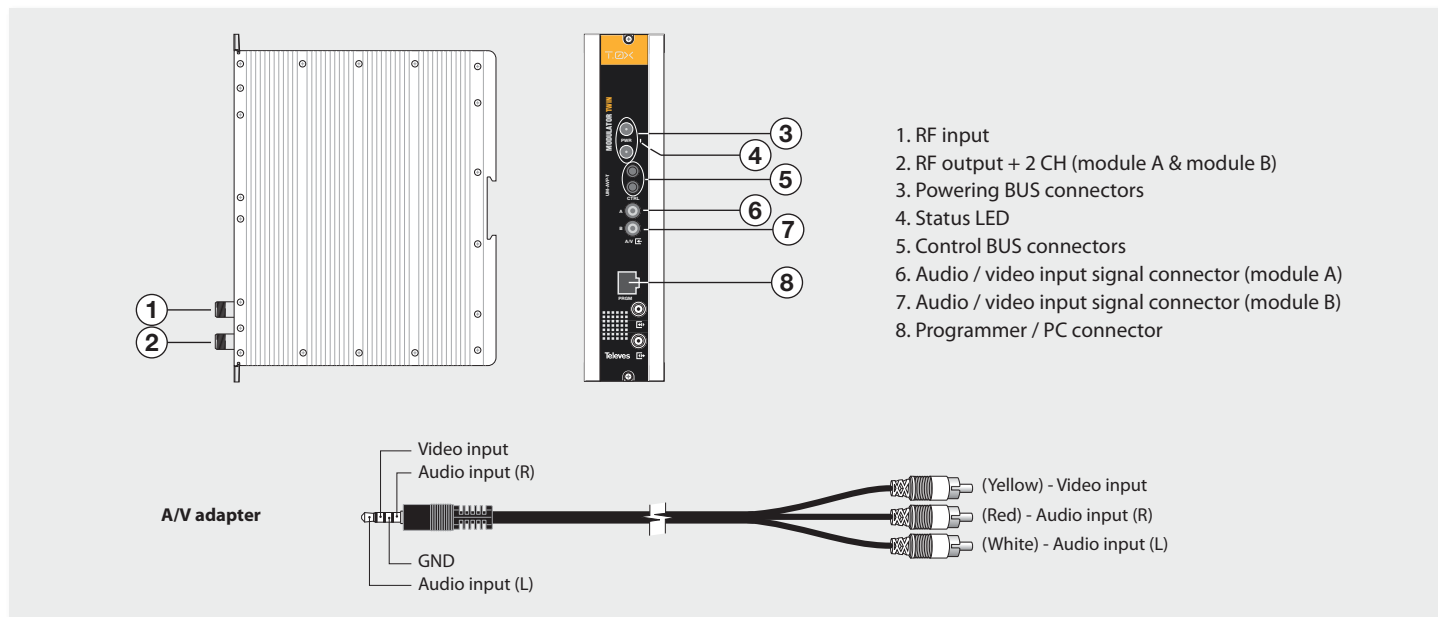


### 3.2. 19" rack frame mounting



## 4. Identification of the system elements

### 4.1. Twin modulator



The TWIN unit features two A/V inputs (modules A and B) which generate two independent output channels.

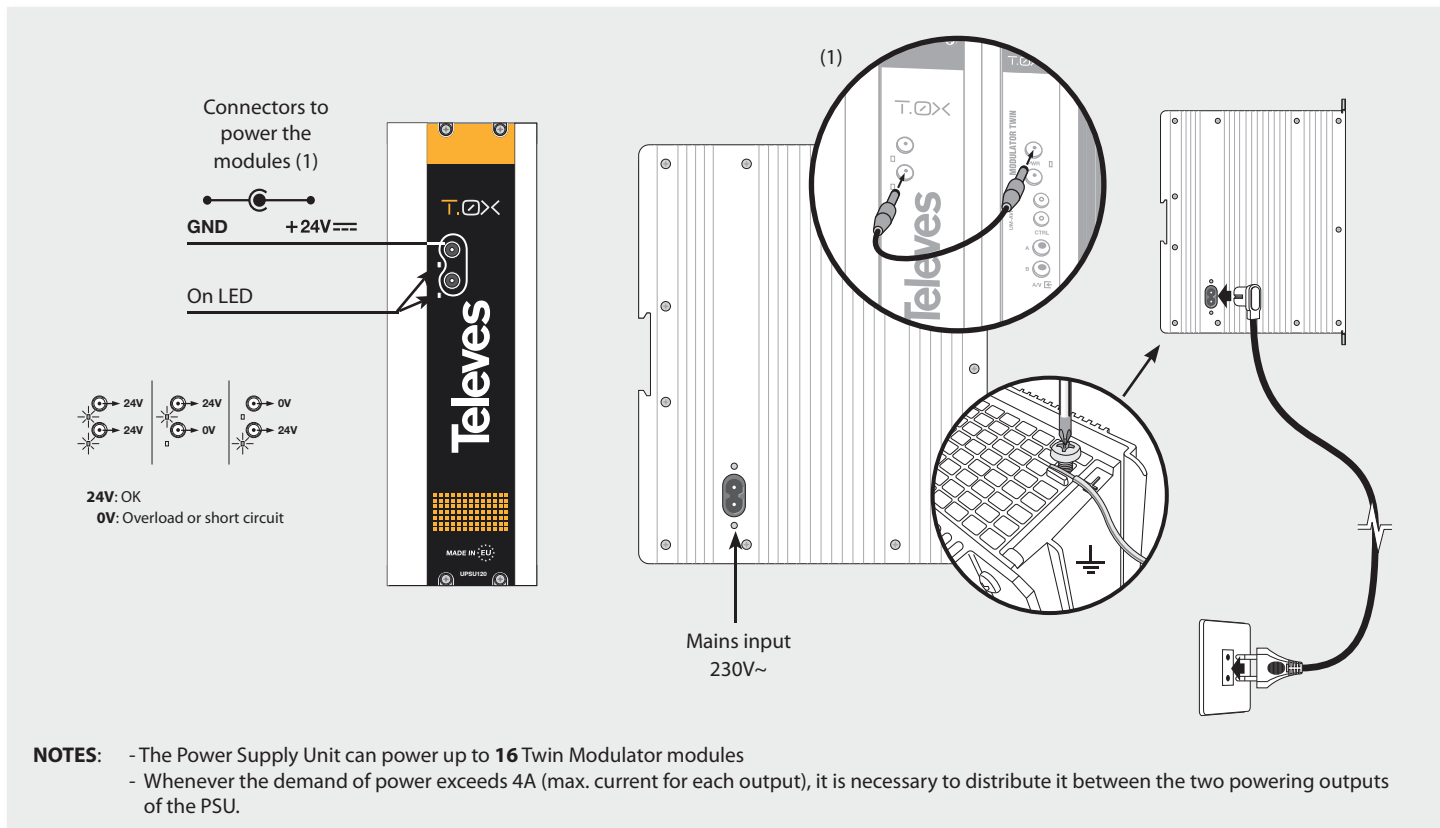
The A/V inputs for each module (A and B) are modulated according to the TV standard in an IF

of 38.9 MHz.

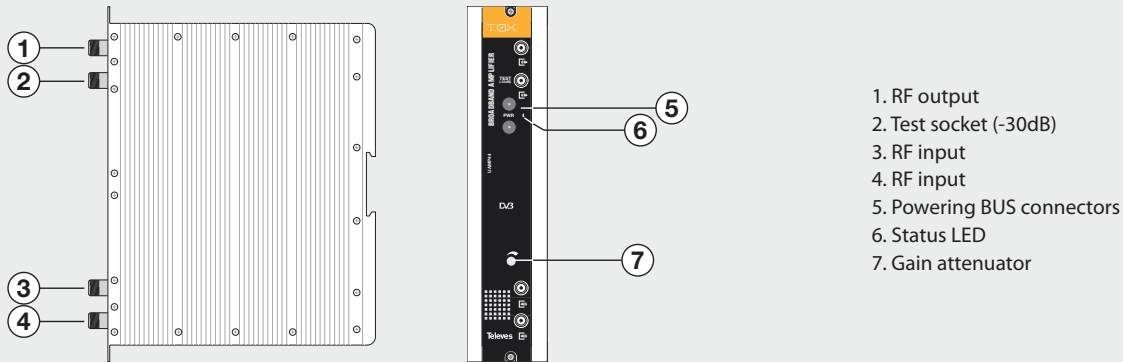
The modulated IF signal is converted to any channel or frequency between 46 and 862 MHz and then, once filtered, it is amplified to achieve the specified output level.

It is also possible to control the unit via a PC as is explained in section 6.

## 4.2. Power supply unit



### 4.3. Broadband amplifier



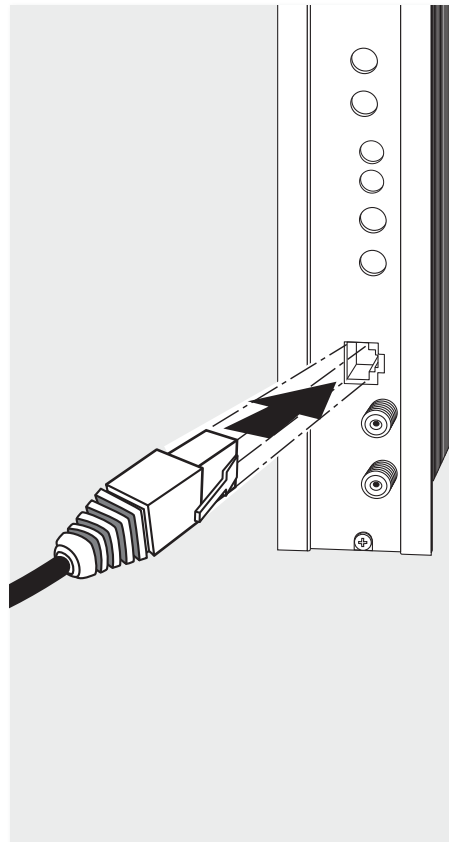
1. RF output
2. Test socket (-30dB)
3. RF input
4. RF input
5. Powering BUS connectors
6. Status LED
7. Gain attenuator

It features two signal input connectors, to allow the mixing of the channels provided by two systems. If only using one of the inputs, it is recommended to load the unused input with a load of 75 ohm, ref 4061.

Output connector and a test socket (-30 dB) are located in the upper part of the front panel.

The amplifier is powered with 24 Vdc by means of a lead which is the same as that used to power the rest of the system's modules.

#### 4.4. Universal Programmer PCT 5.0



The programmer features 4 buttons:

- (short press) - Selection of parameter (positioning of the cursor).
- ▲-▼ Modification of the parameter chosen by the cursor (flashing)
- (short press) - Change menu
- (long press) - Change between Principal and Extended menus
- (long press) - Save changes to memory
- +●+▲ Increases the contrast of the screen.
- +●+▼ Decreases the contrast of the screen.

## 5. - Instructions for use

The unit sends its configured parameters (frequencies/output channels, output levels, audio and video configuration, FW version,...) to the programmer when they are connected each other. Upon initiating the process, the SW version of the programmer will be displayed for a few seconds with the following screen:

```
PCT firmware
version
-----
U: X.XX
```

Next, the programmer's display will show the loaded FW version for a few seconds:

```
Vers. FW.
Ux.xx
Vers. Boot
U:x.xx
```

After this, the main menu is displayed.

### 5.1. Main Menu

From here on, scroll down to see the different submenus by pressing the key **■**: Output Menu, Channel Table Menu, Video Menu, Audio Menu and Audio Mode Menu.

**Note:** *If you wish to change the menu language, the "Language" menu should be accessed before configuring the device. This is done by holding down the **●** key in order to access the Extended menu, pressing the **■** key three times and then pressing **▲** or **▼** to select language. Finally, hold down the **■** key to record changes. For more information, see "Extended Menu => Select Language" section".*

To switch between **A** and **B** modules of the TWIN unit, keep pressed the key **●** until the A/B indication starts to flash in the upper left corner of the display. Then use keys **▲** and **▼** to select the desired module.

### a. Output Menu

Allows to **select the module** to be configured and its **output channel**, both in channel mode and in frequency mode, and indicates the **output level**. The way it is displayed will depend on how the module has been programmed since its last configuration (frequency mode or channel mode). If the device is in **channel mode**, then this menu displays the number and frequency of the output channel's video carrier (which varies upon changing the channel); it also displays digits (00-99) allowing control of the corresponding modulator's output level via the programmer. To select one of the modulators (A or B) of the TWIN unit, press the key **●** once, then the A/B indication will flash. Next, use keys **▲** or **▼** to make the A or B selection.

To change the output channel of the chosen modulator, move through the menu by pressing the parameter selection key **●** until the channel value starts to flash. Then use keys **▲** and **▼** to change it.

For example, if the selected channel is C21 of the CCIR UHF table:

```
A▶OUTPUT
Channel: C21
(471.25 MHz)
Level: 99
```

If the device is configured in **frequency mode**, the output menu will display the channel central frequency that is being programmed. For example:

```
A▶OUTPUT
Frequency:
474.00 MHz
Level 1: 99
```

The frequency value is programmed digit by digit, moving to the next digit by pressing ● (short press), and changing its value by pressing ▲ or ▼. When the cursor is placed over the decimal part, only one of the next four values can be selected:

```
.00 MHz
.25 MHz
.50 MHz
.75 Mhz
```

Finally, by pressing the key ● once more, the digits to control the output level are selected. Use keys ▲ and ▼ to modified its value. Set 99 to obtain the max. oputput level. All the way down up to the value 00 the output level is 15 dB below its maximum.

## b. Channel Tables Menu

Press the ■ key to gain access to the second menu allowing channel table selection that will be used for programming the output channels from the previous menu. Frequency mode selection is also allowed. The 9 possible tables are: *CCIR N.Z. Ind, China Taiwan, Chile M/N, Italy, France, Russia (OIR), Ireland, South Africa, Poland and Australia*. Select one of the modulators (A or B) of the TWIN unit: first, press the key ● once, and second, use keys ▲ and ▼ to select A or B. Next, by pressing the key ● again, the name of the channels table will flash, and then can be modified with ▲ or ▼ keys.

```
A▶CHANNELS
Channel Tab:
CCIR N.Z. Ind
```

## c. Video Menu

Pressing ■ accesses the following menu. In this menu it is possible to configure the **video parameters** and the TV standard (depending on the audio carrier distance relative to that of the video and modulation). Video modulation depth (**VMD**) and audio carrier frequency (**FAud**) values can be modified.

```
A▶VIDEO
UMD: 68.5%
FAud: 5.5MHz
```

Initially, a short press on the parameter selection key ● gives access to the A/B modulator selection menu; then use keys ▲ and ▼ to select A or B. By a short press on the parameter selection key ●, the video modulation (VMD) sub-menu is accessed. Keys ▲ or ▼ allow modification of the video level, whose range of allowed values are indicated below (they are modulation depth values provided that the video signal input level is 1 Vpp). If the modulator is programmed in L norm, the allowed values are: 87%, 89.5%, 91.0% and 93.0%. For any other standard, these values are: 68.5%, 72.0%, 75.5%, 77.0%, 79.0%, 80.0%, 81.0% and 82.5%. Short pressing the parameter selection key ● accesses the audio carrier carrier frequency selection sub-menu (FAud) (norm or standard). To modify the norm or standard, press ▲ or ▼ until the desired value appears, amongst the following:

FAud:	Ac/Vc relative frequency (MHz)
4.5 MHz	4.5 MHz, Standard M/N
5.5 MHz	5.5 MHz, Standard B/G
6.0 MHz	6.0 MHz, Standard I
6.5 MHz	6.5 MHz, Standard D/K
NORM L	6.5 MHz, L Norm

## d. Audio Menu

Pressing **■** accesses the next menu. In this menu, it is possible to configure the modulation **audio parameters**, audio deviation, audio carrier frequency relative to that of the video and audio sub-carrier frequency (5.74 MHz) relative to that of video <sup>(\*)</sup>.

(\*) Only in the case where the main audio carrier is at 5.5MHz.

```

A▶AUDIO
S. Dev.: 7
PictS 1: -16
PictS 2: -18
  
```

Initially, a short press on the parameter selection key **●** gives access to the A/B modulator selection menu; then use keys **▲** and **▼** to select A or B. A short press on the parameter selection key **●** gives access the audio deviation sub-menu (AudDev). Modify the audio deviation value between 0 to 13, by using keys **▲** or **▼**. Values shown in the next table indicate the audio level necessary at the input (for an input signal of 1 KHz) in order to obtain a modulation deviation value of 50 KHz in Dual mode. In other words, if the input signal is 1.7 Vpp at 1 KHz (0 dBm in the audio analyser), we need to program the AudDev menu of the programmer with a value of **6**.

S. Dev.:	Input level audio (dBm)
0	6
1	5
2	4
3	3
4	2
5	1
6	0
7	-1
8	-2
9	-3
10	-4
11	-5
12	-6
13	-7

For an input audio level of 1Vpp for a 1KHz signal (-7,5dBm in the audio analyser), the modulation deviation will depend on the AudDev value programmed as indicated in the following table:

S. Dev.:	Modulation Deviation KHz
0	±11.5
1	±13
2	±14
3	±15
4	±17
5	±19
6	±22
7	±25
8	±28
9	±31

10	±34
11	±37.5
12	±40
13	±45

If the modulator programmer is in L Norm, these values indicate the modulation depth:  $m=100^* \frac{[E_{max}-E_{min}]}{[E_{max}+E_{min}]}$  provided that the input level is 1 Vpp for a 1 KHz signal.

S. Dev.:	L Norm (1Vpp)
0	20%
1	22%
2	24%
3	26%
4	29%
5	32.6%
6	36.7%
7	39.5%
8	45.8%
9	49%
10	54%
11	60%
12	68.5%
13	77%

Short pressing the parameter selection key again **●** accesses the selection sub-menu for audio carrier level relative to that of the video (RelPort) which can be changed by pressing **▲** and **▼**.



The allowed values for the main audio carrier level relative to that of the video are: **-12dB** and **-16dB**.

After pressing the parameter selection key ● (short press) the following sub-menu allows to change the audio sub-carrier level (5.74MHz) relative to that of the video (RelSubC).

The range of values that are allowed for selection are: **-18dB, -20dB, -22dB, -24dB**.

## e. Mode Menu

Pressing ■ accesses the next menu. In this menu, it is possible to configure the modulation output mode, audio mode<sup>(\*)</sup> and test pattern mode parameters.

(\*) Only in the case where the main audio carrier is at 5.5MHz.

```

▶MODE
Audio Mode:
Mono
TestMode OFF
  
```

Initially pressing the parameter selection key (short press) ● allows selection of a desired modulator; then, press ▲ or ▼ to change the modulator that will be configured.

Short pressing the parameter selection key ● accesses the function mode menu (Audio Mode).

Pressing ▲ and ▼ selects between stereo, dual or mono (for separation between 5.5 MHz carriers).

Short pressing the parameter selection key ● accesses the function mode sub-menu (TestMode). Using keys ▲ and ▼ selects between activated (ON) and deactivated (OFF).

In function mode with test pattern deactivated, the output signal is modulated with external audio and video (A/V in). This will be normal functioning mode.

In function mode with test pattern, the output signal consists of an internally generated test signal that shows two vertical bars on a black background, and an audio tone.

## 5.2. Extended Menu

To access extended menus, hold down the ● key for more than three seconds. Menu selection, as well as modification of selected values and saving changes, are made in the same manner as in the main menu.

Once in extended mode, you can move through each menu by short pressing ■.

EN

## a. Configuration Menu

Allows selection of the unit's address for communicating with the Header Control.

```

▶CONFIG
Adr CDC: 001
  
```

The unit's address is programmed number by number, moving to the next digit by pressing ● (short), and modifying its value by pressing ▲ or ▼. The allowed values are between 1 and 254 (0 and 255 values being reserved for other purposes).

## b. Temperature Menu

The following menu provides an indication of the unit's **current temperature** as well as the maximum recorded. The maximum can be reset by pressing the key ●.

```

▶TEMPERATURE
Now:   03
Max:   04
● reset
  
```

The recommended operating margins are as follows:

- Optimum operation : **0-6**
- High temperature: **7-8**
- Excessive temperature: **9-10**

If the maximum recorded is outside the optimal range the installation should be adjusted to try to lower the temperature.

## c. Version Menu

Pressing ■ accesses the following menu. This menu displays information about the current FW version of the the unit (microprocessor, boot).

```

Vers. FW.
Ux.xx
Vers. Boot
U:x.xx
  
```

## d. Language Menu

Pressing the ■ key accesses the next extending menu. This menu allows selection, between Spanish, English and German of the language in which to display the LCD screen text.

The language is changed directly using the keys ▲ and ▼.

```

▶LANGUAGE

English
  
```

## 5.3. Parameters Saving

Once a parameter is modified to the desired value in any menu (normal or extended), to save the settings press ■ for three seconds. The display will show the following indication:

```

Saving
settings and
restarting
...
  
```

Please, do not unplug the programmer until this indication disappears. Then the Output Menu will be displayed with the video frequency (or channel number) of the output channel.

If the configuration parameters are modified but not saved, the previous configuration is retrieved after 30 sec. in other words, the changes are discarded.

## 6. - Controlling the Device

This version of the Twin Modulator allows configuration and monitoring via a PC, both locally and remotely.

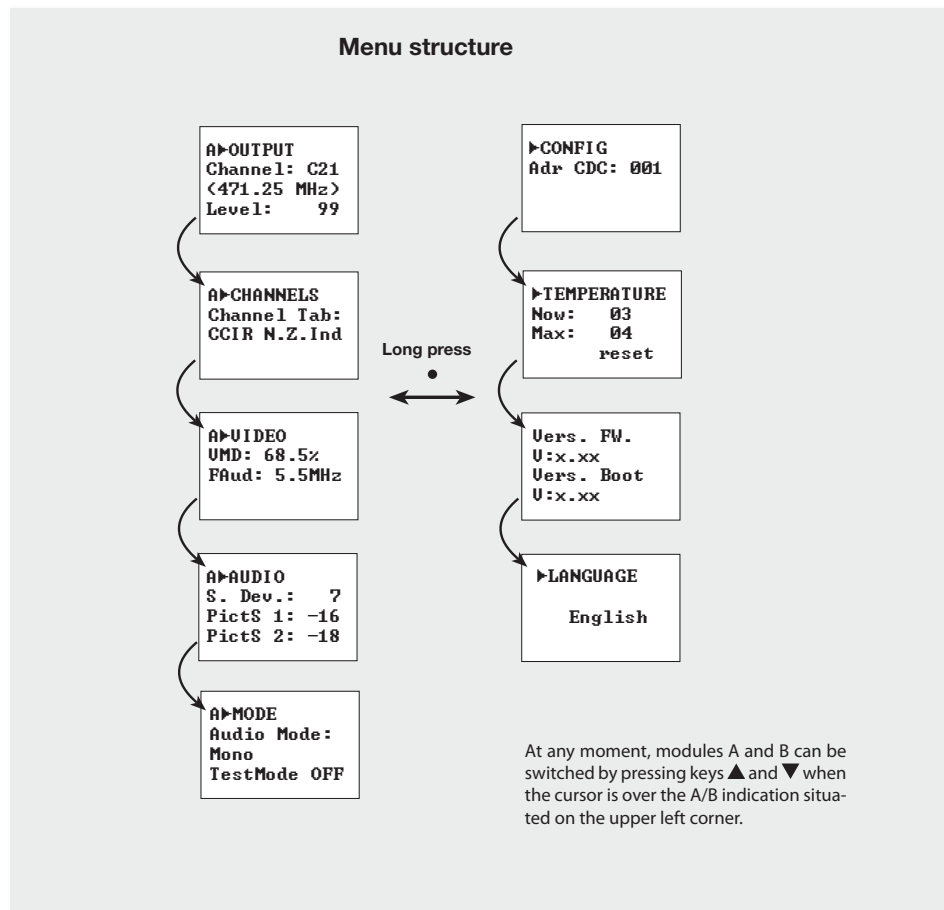
### a. Local control

The “Headend Management” programme (v2.14 or higher) is required, as well as a special cable (provided with the programme) that connects a PC serial port to the Twin Modulator “PRGM” socket. The programme can be used to set up and read all the operating parameters of the device.

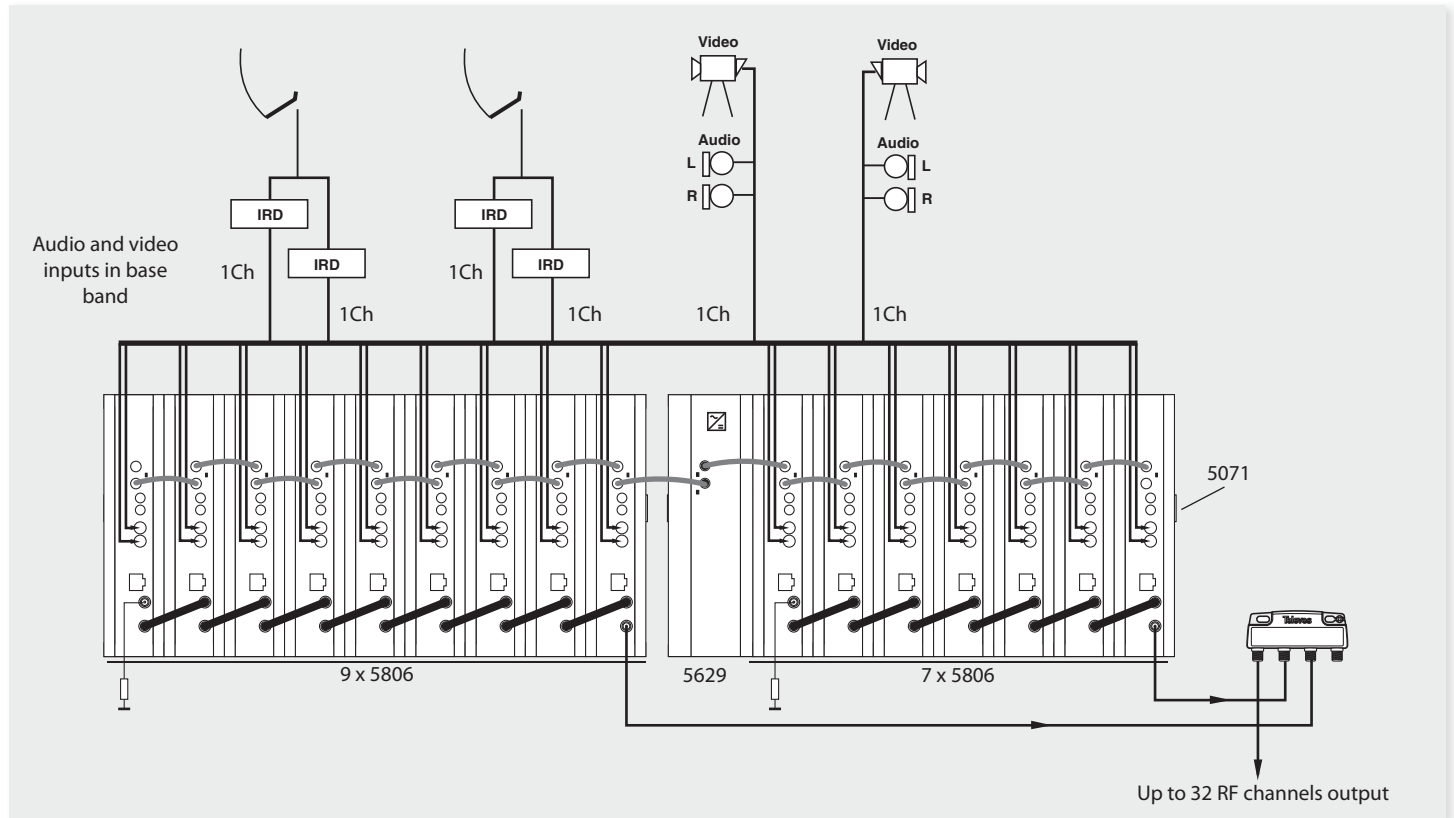
### b. Remote control

It is necessary to have a Headend Control module (ref. 5559 or 555901) that includes the programme mentioned above, and the corresponding modem connected to a phone line.

Once the communication with the headend control has been established, all the controllable devices that have been installed in the headend can be accessed. In this case it is essential that each element be programmed with a different device address between 1 and 254.



## 7. Application example

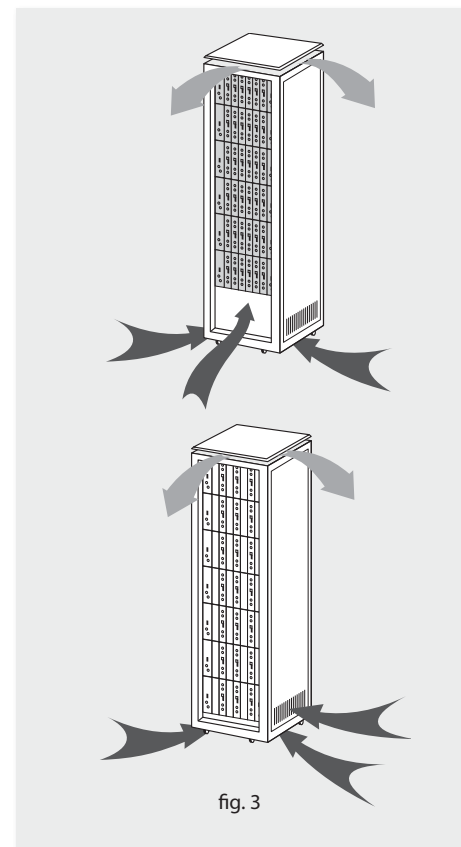
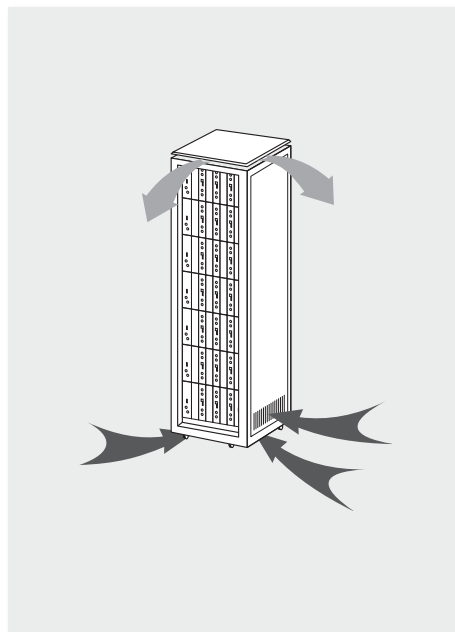
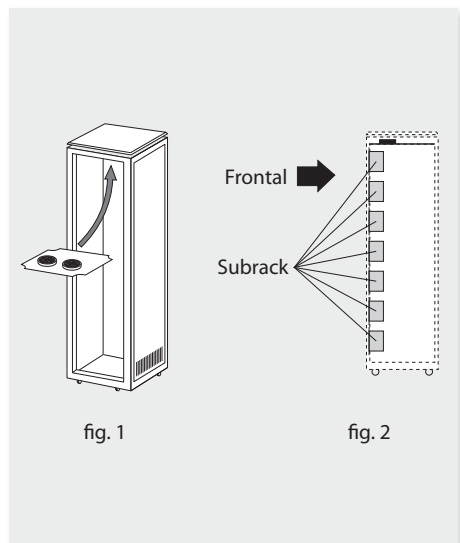


## 8. Norms for rack mounting (max. 49 TWIN MODULATOR - 7 subracks with 5 units in height - 8,7")

### 8.1. Installation of the rack with ventilation facilities

To facilitate the renewal and circulation of the air inside the rack, to reduce the temperature of the units and thus improving their characteristics, it is advisable to place 2 ventilation units of 25W, particularly when the rack with the Twin Modulator is located in warm places, with temperatures higher than 45°C.

These ventilators will be installed on a tray that is fixed inside the cabinet (fig. 1 & 2). This way, the ventilators will force the fresh air entering from the base of the cabinet, to circulate between the modules and be expelled through a gap on top of the cabinet (3-5 cm approx.). See fig. 3.



It is very important that this process operates correctly, therefore the following must be observed:

- Do not open the side doors, as this would cause the ventilators to extract the air from the outside rather than the air inside of the rack.
- Do not place objects close to the rack that may block the entry and exit openings for the air.
- If the rack is not complete, the subracks must be placed from the top downwards without leaving any gaps in between, fig. 4.

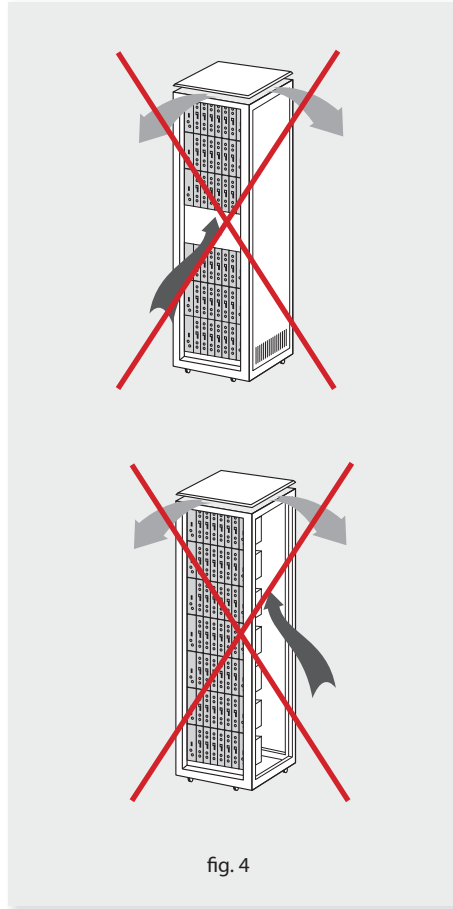
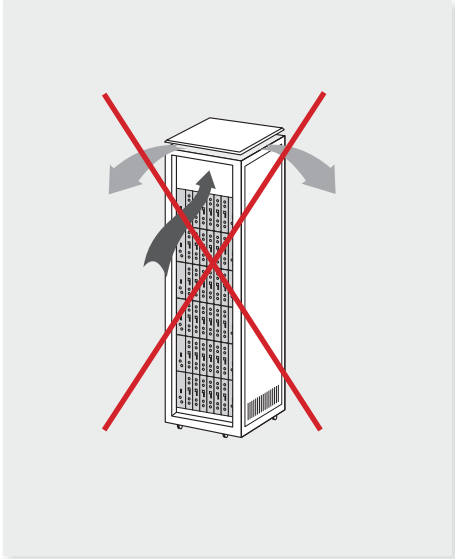


fig. 4

## 8.2. Installation of the rack without ventilation facilities

To install the units in racks without installation facilities, and when the rack is located in a place with a temperature of around 45°C, it is advisable to place the rack completely open, in other words, do not use the side doors. This is to facilitate the ventilation of the units, fig. 5.

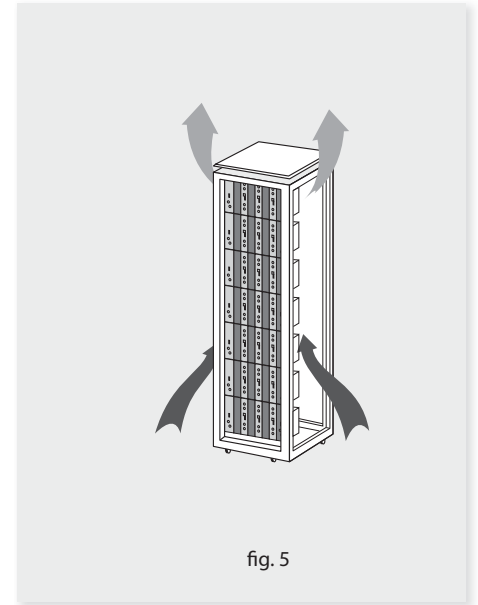


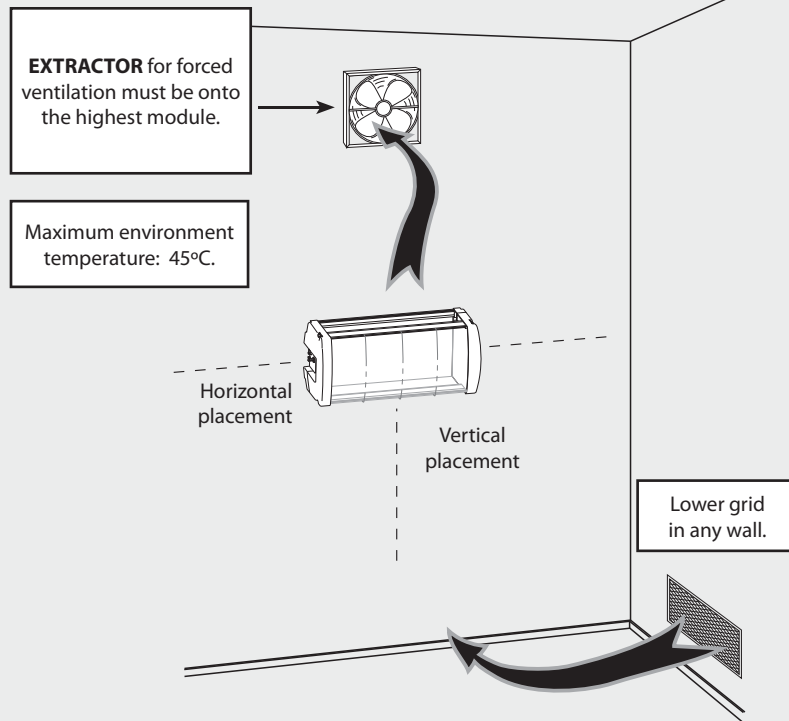
fig. 5

## 9. Norms for cabinet mounting

### IMPORTANT

The scheme of recommended ventilation is the one in the figure in any case of cabinet placement (horizontal or vertical).

The maximum temperature permitted surrounding the highest cabinet is 45°C in both ways of placement, horizontal or vertical way.

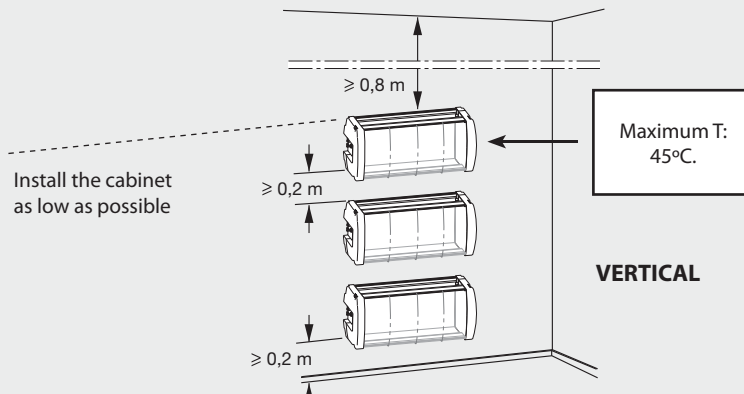
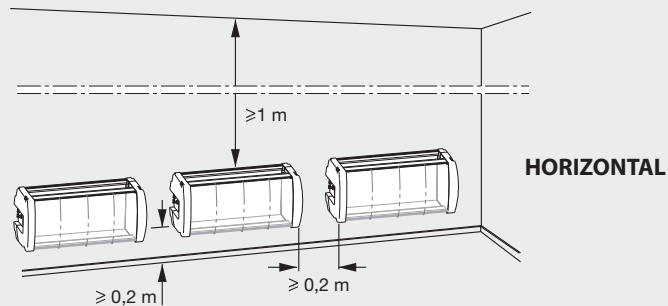


**IMPORTANT**

Horizontal placement of the cabinets is strongly recommended, placing them as near to the floor as possible.

If the horizontal placement is impossible, then vertical placement is allowed.

Respect the recommended minimum distances in the attached schemes.







## A. Channels table

Tabl. 1	Tabl. 2		Tabl. 3		Tabl. 4		Tabl. 5		Tabl. 6		Tabl. 7		Tabl. 8		Tabl. 9		Tabl. 10		
CCIR	China/Taiwan		Chile		Italy		France		OIR channels		Ireland		South Africa		Poland (OIR)		Australia		
C02	48,25	1	49,75	1	55,25	A	53,75	F01	47,75	R01	49,75	1	45,75	2	53,75	S01	111,25	0	46,25
C03	55,25	2	57,75	2	61,25	B	62,25	L02	55,75	R02	59,25	2	53,75	3	61,75	S02	119,25	1	57,25
C04	62,25	3	65,75	3	67,25	C	82,25	L03	60,5	R03	77,25	3	61,75	4	175,25	S03	127,25	2	64,25
L01	69,25	4	77,25	4	77,25	S01	105,25	L04	63,75	R04	85,25	5	175,25	5	183,25	S04	135,25	3	86,25
L02	76,25	5	85,25	5	83,25	S02	112,25	S01	105,25	R05	93,25	6	183,25	6	191,25	S05	143,25	4	95,25
L03	83,25	6	168,25	6	175,25	S03	119,25	S02	112,25	S01	111,25	7	191,25	7	199,25	S06	151,25	5	102,25
S01	105,25	7	176,25	7	181,25	S04	126,25	S03	119,25	S02	119,25	8	199,25	8	207,25	S07	159,25	S02	112,25
S02	112,25	8	184,25	8	187,25	S05	133,25	S04	126,25	S03	127,25	9	207,25	9	215,25	S08	167,25	S03	119,25
S03	119,25	9	192,25	9	193,25	S06	140,25	S05	133,25	S04	135,25	10	215,25	10	223,25	K06	175,25	S04	126,25
S04	126,25	10	200,25	10	199,25	S07	147,25	S06	140,25	S05	143,25	11	223,25	11	231,25	K07	183,25	S05	133,25
S05	133,25	11	208,25	11	205,25	S08	154,25	S07	147,25	S06	151,25	C21	471,25	12	239,25	K08	191,25	5A	138,25
S06	140,25	12	216,25	12	211,25	S09	161,25	S08	154,25	S07	159,25	C22	479,25	13	247,43	K09	199,25	S06	140,25
S07	147,25	C21	471,25	21	471,25	S10	168,25	S09	161,25	S08	167,25	C23	487,25	C21	471,25	K10	207,25	S07	147,25
S08	154,25	C22	479,25	22	477,25	D	175,25	S10	168,25	R06	175,25	C24	495,25	C22	479,25	K11	215,25	S08	154,25
S09	161,25	C23	487,25	23	483,25	E	183,75	L05	176	R07	183,25	C25	503,25	C23	487,25	K12	223,25	S09	161,25
S10	168,25	C24	495,25	24	489,25	F	192,25	L06	184	R08	191,25	C26	511,25	C24	495,25	S09	231,25	S10	168,25
C05	175,25	C25	503,25	25	495,25	G	201,25	L07	192	R09	199,25	C27	519,25	C25	503,25	S10	239,25	6	175,25
C06	182,25	C26	511,25	26	501,25	H	210,25	L08	200	R10	207,25	C28	527,25	C26	511,25	S11	247,25	7	182,25
C07	189,25	C27	519,25	27	507,25	H1	217,25	L09	208	R11	215,25	C29	535,25	C27	519,25	S12	255,25	8	189,25
C08	196,25	C28	527,25	28	513,25	H2	224,25	L10	216	R12	223,25	C30	543,25	C28	527,25	S13	263,25	9	196,25
C09	203,25	C29	535,25	29	519,25	S11	231,25	S11	231,25	S11	231,25	C31	551,25	C29	535,25	S14	271,25	9A	203,25
C10	210,25	C30	543,25	30	525,25	S12	238,25	S12	238,25	S12	239,25	C32	559,25	C30	543,25	S15	279,25	10-o	209,25
C11	217,25	C31	551,25	31	531,25	S13	245,25	S13	245,25	S13	247,25	C33	567,25	C31	551,25	S16	287,25	10	210,25
C12	224,25	C32	559,25	32	537,25	S14	252,25	S14	252,25	S14	255,25	C34	575,25	C32	559,25	S17	295,25	11-o	216,25
S11	231,25	C33	567,25	33	543,25	S15	259,25	S15	259,25	S15	263,25	C35	583,25	C33	567,25	S18	303,25	11	217,25
S12	238,25	C34	575,25	34	549,25	S16	266,25	S16	266,25	S16	271,25	C36	591,25	C34	575,25	S19	311,25	12	224,25
S13	245,25	C35	583,25	35	555,25	S17	273,25	S17	273,25	S17	279,25	C37	599,25	C35	583,25	S20	319,25	S11	231,25
S14	252,25	C36	591,25	36	561,25	S18	280,25	S18	280,25	S18	287,25	C38	607,25	C36	591,25	S21	327,25	S12	238,25
S15	259,25	C37	599,25	37	567,25	S19	287,25	S19	287,25	S19	295,25	C39	615,25	C37	599,25	S22	335,25	S13	245,25
S16	266,25	C38	607,25	38	573,25	S20	294,25	S20	294,25	S20	303,25	C40	623,25	C38	607,25	S23	343,25	S14	252,25
S17	273,25	C39	615,25	39	579,25	S21	303,25	S21	303,25	S21	311,25	C41	631,25	C39	615,25	S24	351,25	S15	259,25
S18	280,25	C40	623,25	40	585,25	S22	311,25	S22	311,25	S22	319,25	C42	639,25	C40	623,25	S25	359,25	S16	266,25
S19	287,25	C41	631,25	41	591,25	S23	319,25	S23	319,25	S23	327,25	C43	647,25	C41	631,25	S26	367,25	S17	273,25
S20	294,25	C42	639,25	42	597,25	S24	327,25	S24	327,25	S24	335,25	C44	655,25	C42	639,25	S27	375,25	S18	280,25
S21	303,25	C43	647,25	43	603,25	S25	335,25	S25	335,25	S25	343,25	C45	663,25	C43	647,25	S28	383,25	S19	287,25

S22	311,25	C44	655,25	44	609,25	S26	343,25	S26	343,25	S26	351,25	C46	671,25	C44	655,25	S29	391,25	S20	294,25
S23	319,25	C45	663,25	45	615,25	S27	351,25	S27	351,25	S27	359,25	C47	679,25	C45	663,25	S30	399,25	S21	303,25
S24	327,25	C46	671,25	46	621,25	S28	359,25	S28	359,25	S28	367,25	C48	687,25	C46	671,25	S31	407,25	S22	310,25
S25	335,25	C47	679,25	47	627,25	S29	367,25	S29	367,25	S29	375,25	C49	695,25	C47	679,25	S32	415,25	S23	317,25
S26	343,25	C48	687,25	48	633,25	S30	375,25	S30	375,25	S30	383,25	C50	703,25	C48	687,25	S33	423,25	S24	324,25
S27	351,25	C49	695,25	49	639,25	S31	383,25	S31	383,25	S31	391,25	C51	711,25	C49	695,25	S34	431,25	S25	331,25
S28	359,25	C50	703,25	50	645,25	S32	391,25	S32	391,25	S32	399,25	C52	719,25	C50	703,25	S35	439,25	S26	338,25
S29	367,25	C51	711,25	51	651,25	S33	399,25	S33	399,25	S33	407,25	C53	727,25	C51	711,25	S36	447,25	S27	345,25
S30	375,25	C52	719,25	52	657,25	S34	407,25	S34	407,25	S34	415,25	C54	735,25	C52	719,25	S37	455,25	S28	352,25
S31	383,25	C53	727,25	53	663,25	S35	415,25	S35	415,25	S35	423,25	C55	743,25	C53	727,25	S38	463,25	S29	359,25
S32	391,25	C54	735,25	54	669,25	S36	423,25	S36	423,25	S36	431,25	C56	751,25	C54	735,25	C21	471,25	S30	366,25
S33	399,25	C55	743,25	55	675,25	S37	431,25	S37	431,25	S37	439,25	C57	759,25	C55	743,25	C22	479,25	S31	373,25
S34	407,25	C56	751,25	56	681,25	S38	439,25	S38	439,25	S38	447,25	C58	767,25	C56	751,25	C23	487,25	S32	380,25
S35	415,25	C57	759,25	57	687,25	S39	447,25	S39	447,25	S39	455,25	C59	775,25	C57	759,25	C24	495,25	S33	387,25
S36	423,25	C58	767,25	58	693,25	S40	455,25	S40	455,25	S40	463,25	C60	783,25	C58	767,25	C25	503,25	S34	394,25
S37	431,25	C59	775,25	59	699,25	S41	463,25	S41	463,25	C21	471,25	C61	791,25	C59	775,25	C26	511,25	S35	401,25
S38	439,25	C60	783,25	60	705,25	C21	471,25	C21	471,25	C22	479,25	C62	799,25	C60	783,25	C27	519,25	S36	408,25
S39	447,25	C61	791,25	61	711,25	C22	479,25	C22	479,25	C23	487,25	C63	807,25	C61	791,25	C28	527,25	S37	415,25
S40	455,25	C62	799,25	62	717,25	C23	487,25	C23	487,25	C24	495,25	C64	815,25	C62	799,25	C29	535,25	S38	422,25
S41	463,25	C63	807,25	63	723,25	C24	495,25	C24	495,25	C25	503,25	C65	823,25	C63	807,25	C30	543,25	S39	429,25
C21	471,25	C64	815,25	64	729,25	C25	503,25	C25	503,25	C26	511,25	C66	831,25	C64	815,25	C31	551,25	S40	436,25
C22	479,25	C65	823,25	65	735,25	C26	511,25	C26	511,25	C27	519,25	C67	839,25	C65	823,25	C32	559,25	S41	443,25
C23	487,25	C66	831,25	66	741,25	C27	519,25	C27	519,25	C28	527,25	C68	847,25	C66	831,25	C33	567,25	S42	450,25
C24	495,25	C67	839,25	67	747,25	C28	527,25	C28	527,25	C29	535,25	C69	855,25	C67	839,25	C34	575,25	S43	457,25
C25	503,25	C68	847,25	68	753,25	C29	535,25	C29	535,25	C30	543,25			C68	847,25	C35	583,25	S44	464,25
C26	511,25	C69	855,25	69	759,25	C30	543,25	C30	543,25	C31	551,25			C69	855,25	C36	591,25	S45	471,25
C27	519,25			70	765,25	C31	551,25	C31	551,25	C32	559,25					C37	599,25	H21	478,25
C28	527,25			71	771,25	C32	559,25	C32	559,25	C33	567,25					C38	607,25	H22	485,25
C29	535,25			72	777,25	C33	567,25	C33	567,25	C34	575,25					C39	615,25	H23	492,25
C30	543,25			73	783,25	C34	575,25	C34	575,25	C35	583,25					C40	623,25	H24	499,25
C31	551,25			74	789,25	C35	583,25	C35	583,25	C36	591,25					C41	631,25	H25	506,25
C32	559,25			75	795,25	C36	591,25	C36	591,25	C37	599,25					C42	639,25	H26	513,25
C33	567,25			76	801,25	C37	599,25	C37	599,25	C38	607,25					C43	647,25	H27	520,25
C34	575,25			77	807,25	C38	607,25	C38	607,25	C39	615,25					C44	655,25	H28	527,25
C35	583,25			78	813,25	C39	615,25	C39	615,25	C40	623,25					C45	663,25	H29	534,25
C36	591,25			79	819,25	C40	623,25	C40	623,25	C41	631,25					C46	671,25	H30	541,25
C37	599,25			80	825,25	C41	631,25	C41	631,25	C42	639,25					C47	679,25	H31	548,25
C38	607,25			81	831,25	C42	639,25	C42	639,25	C43	647,25					C48	687,25	H32	555,25
C39	615,25			82	837,25	C43	647,25	C43	647,25	C44	655,25					C49	695,25	H33	562,25
C40	623,25			83	843,25	C44	655,25	C44	655,25	C45	663,25					C50	703,25	H34	569,25
C41	631,25			84	849,25	C45	663,25	C45	663,25	C46	671,25					C51	711,25	H35	576,25

C42	639,25			85	855,25	C46	671,25	C46	671,25	C47	679,25					C52	719,25	H36	583,25
C43	647,25			86	861,25	C47	679,25	C47	679,25	C48	687,25					C53	727,25	H37	590,25
C44	655,25					C48	687,25	C48	687,25	C49	695,25					C54	735,25	H38	597,25
C45	663,25					C49	695,25	C49	695,25	C50	703,25					C55	743,25	H39	604,25
C46	671,25					C50	703,25	C50	703,25	C51	711,25					C56	751,25	H40	611,25
C47	679,25					C51	711,25	C51	711,25	C52	719,25					C57	759,25	H41	618,25
C48	687,25					C52	719,25	C52	719,25	C53	727,25					C58	767,25	H42	625,25
C49	695,25					C53	727,25	C53	727,25	C54	735,25					C59	775,25	H43	632,25
C50	703,25					C54	735,25	C54	735,25	C55	743,25					C60	783,25	H44	639,25
C51	711,25					C55	743,25	C55	743,25	C56	751,25					C61	791,25	H45	646,25
C52	719,25					C56	751,25	C56	751,25	C57	759,25					C62	799,25	H46	653,25
C53	727,25					C57	759,25	C57	759,25	C58	767,25					C63	807,25	H47	660,25
C54	735,25					C58	767,25	C58	767,25	C59	775,25					C64	815,25	H48	667,25
C55	743,25					C59	775,25	C59	775,25	C60	783,25					C65	823,25	H49	674,25
C56	751,25					C60	783,25	C60	783,25	C61	791,25					C66	831,25	H50	681,25
C57	759,25					C61	791,25	C61	791,25	C62	799,25					C67	839,25	H51	688,25
C58	767,25					C62	799,25	C62	799,25	C63	807,25					C68	847,25	H52	695,25
C59	775,25					C63	807,25	C63	807,25	C64	815,25					C69	855,25	H53	702,25
C60	783,25					C64	815,25	C64	815,25	C65	823,25							H54	709,25
C61	791,25					C65	823,25	C65	823,25	C66	831,25							H55	716,25
C62	799,25					C66	831,25	C66	831,25	C67	839,25							H56	723,25
C63	807,25					C67	839,25	C67	839,25	C68	847,25							H57	730,25
C64	815,25					C68	847,25	C68	847,25	C69	855,25							H58	737,25
C65	823,25					C69	855,25	C69	855,25									H59	744,25
C66	831,25																	H60	751,25
C67	839,25																	H61	758,25
C68	847,25																	H62	765,25
C69	855,25																	H63	772,25
																		H64	779,25
																		H65	786,25
																		H66	793,25
																		H67	800,25
																		H68	807,25
																		H69	814,25
																		H70	821,25
																		H71	828,25
																		H72	835,25
																		H73	842,25
																		H74	849,25
																		H75	856,25

## Guarantee

Televes S.A. offers a two year guarantee, beginning from the date of purchase for countries in the EU. For countries that are not part of the EU, the legal guarantee that is in force at the time of purchase is applied. Keep the purchase invoice to determine this date.

During the guarantee period, Televes S.A. complies with the guarantee by repairing or substituting the faulty equipment.

The harm produced by improper usage, wear and tear, manipulation by a third party, catastrophes or any other cause beyond the control of Televes S.A. is not included in the guarantee.

# Televes

## DECLARATION OF CONFORMITY N° 110531171411

DECLARACIÓN DE CONFORMIDAD  
DECLARAZIONE DI CONFORMITÀ  
DECLARATION DE CONFORMITE  
DICHIARAZIONE DI CONFORMITÀ  
DECLARAZIONE DE CONFORMITÀ  
DECLARATIE DE CONFORMITATE  
KONFORMITÄTSERKLÄRUNG  
CONFORMITEITSVERKLARING  
YASTAVUSE SERTIFIKAT

KONFORMITÄTSERKLÄRUNG  
ΔΙΣΤΟΙΧΙΣΤΙΚΟ ΕΥΡΩΜΟΦΟΡΩΣ  
PÖRSÄLÄRYKÖN OIKOUPUNNIN KÄYTTÖ  
VAATIMUSTENMUKAISUUSVAKUUTUS  
ATTI TITRES DE LA RUCIA  
ДЕКЛАРАЦИЯ СООТВЕТСТВИЯ  
MUGGIFELJÄNGÖN OYLAJAMOGAT  
BEKKEFTELSE  
ДЕКЛАРАЦИЯ ВІДПОВІДНОСТІ

Manufacturer / Fabricante / Fabricante / Fabricant / Fabricante / Fabrikant / Käsittelevä / Tilverkare / Valmistaja / Producent / Gaminatjas /  
Hasonnaneja / Productor / Gyártó / Fabrikant / Produsent / Fabrikant / Биродавец / Valmistaja:

Televes S.A.  
Rua Benéfica de Conxo, 17 - 15706 - Santiago de Compostela - Spain

Declare under our own responsibility the conformity of the product / Declaro bajo su exclusiva responsabilidad la conformidad del producto / Declaro sub ma exclusiva responsabilitate a conformitatii de produs / Declare sous notre propre responsabilité la conformité de ce produit / Dichiaro sotto la mia esclusiva responsabilità la conformità del prodotto / Wir übernehmen die Verantwortung für die Konformität des Produktes / Διασφαλίζω με δική μου ευθύνη την συμμόρφωση του προϊόντος / Vastavusse on vastavõetavaks ainult selle tootja eest vastutades / Vakuutame yksikomaan omalla vastuullisuudella oman vastavõetavaks / Объявляю под нашей ответственностью zgodność wyrobu / Deklarujiame suvo atsakomybe, kad produktas yra atitinkamas / Zase stvni e namoi svooi obovinnosti osobno o obovinnosti proizvođača / Declaram pe propria raspundere ca produsul este în conformitate cu cerințele esențiale și celulele prevederi aplicabile / Saji feltöltésigazokra kijelentők, hogy a termék megfelel / Ekliever under vores eget ansvar overensstemmelse for produktet / Ekliever under vårt eget ansvar överensstemmelse for produktet / Wij nemen de verantwoordelijkheid voor de conformiteit van het product / Zanesem z odgovornost proizvođača svojih izdelkov / Кінцевий текст застерег:

Reference / Referencia / Référence / Articolo / Artikelnummer / Nijazony / Referens / Referens / Numer Katalogy / Produkto numeris /  
Арысны / Referinta / Ternektsiya / Varenamer / Varenamer / Artikelnummer / Арысны / Вид:

5806XX

Description / Descripción / Description / Description / Description / Beschreibung / Description / Kausas / Opis / Produkto aprašas / Omscause /  
Descriere / Leirni / Beskrivelse / Beskrivelse / Beschrijving / Onac / Kijelodus:

TWIN MODULATOR T0X

Trademark / Marca / Marca / Marque / Handelsmarke / Märgis / Varemärke / Tavaramärki / Marka / Prekes ženklas / Tapatosa marka / Marca /  
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Me ty atpūtinājot / Dalgt pilnāde betinmelser / Seuraavien määräysten / Zgodno z uvoznimi / Atitinka veiklosimas / Требуванням / In conformitate cu / Ai uldohi kiverimelise / Med bestemmelserne / In overensstemming met / ειδικότητα του κατασκευαστή / In conformance with the requirements of / Con las especificaciones de / Avec les conditions de / Con i requisiti di / Die Voraussetzungen erfüllen /  
Me ty atpūtinājot / Dalgt pilnāde betinmelser / Seuraavien määräysten / Zgodno z uvoznimi / Atitinka veiklosimas / Требуванням / In conformitate cu / Ai uldohi kiverimelise / Med bestemmelserne / In overensstemming met / ειδικότητα του κατασκευαστή:

- Low Voltage Directive 2006 / 95 / EC.

- EMC Directive 2004 / 108 / EC.

Following standard(s) / Con las normas / Selon les normes / Con las normas / Folgende Anforderung / Ανάλογοι έγγραφα / Føljende standard / Seuraavien standardien / Zastosoavni nastavljajuych norm / Føljende standard / Cielosavni standard / Respecto unicas normas / In conformitate cu / Ai uldohi kiverimelise / Med bestemmelserne / In overensstemming met / ειδικότητα του κατασκευαστή / Føljende standard / Folgende standard / Folgende richtlijnen en normen / Насамыяс стандарты / Føljende standard / Føljende standard:

EN 60728-11:2005, EN 5083-2:2006

Santiago de Compostela, 31/5/2011



José L. Fernández Carrero  
Technical Director

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