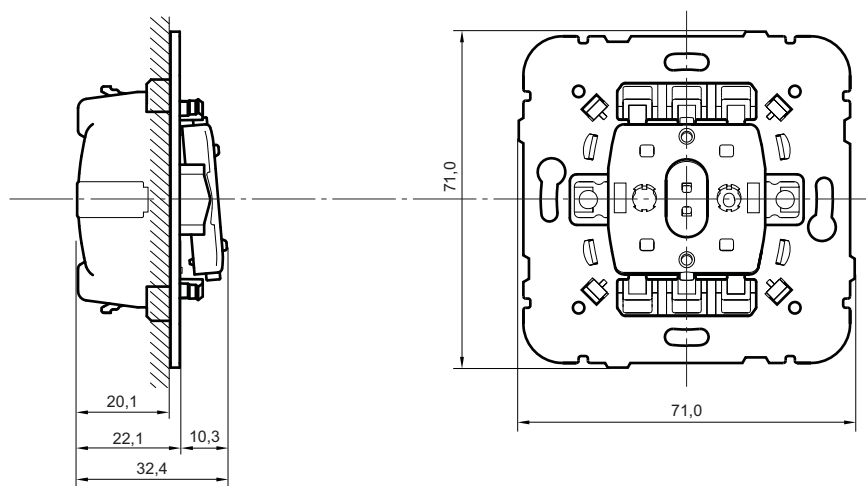




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	■ APOLO 5000 Series
	■ WATERPROOF 48 Series 185
	■ Surrounding Sound System
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MEC 21 SERIES - FLUSH MOUNTING MECHANISMS

■ Mechanism Dimensions (mm):



■ Characteristics:

- Only **One Type of Mechanism** for all the Flush Mounting Devices (LOGUS 90, Sirius 70 and APOLO 5000 Series).
- The **IP44 Kit** for Mechanisms of **Single Rocker** (Ref. 21981) and **Double Rockers** (Ref. 21982) assures the Protection Degree of **IP44** to the mechanisms of the MEC 21 Series.

■ Mechanisms in technical thermoplastic.

■ Control Devices (Switches)

- 10AX - 250V~ - connections without screws terminals.
- 20AX - 250V~ - connections with screws terminals.
- In accordance with the EN 60669-1 Standard.



■ Sockets Outlets

- Earth Socket (Schuko and French Types):
 - 16A - 250V~.
 - Connections with screws or **screwless terminals**.
 - In accordance with the IEC 60884-1 Standard; DIN VDE 0620-1 (Schuko) and NF UC 61-314 (French).
- Earth Socket (British Type):
 - 13A - 250V~.
 - With and without Pilot Lamp.
 - In accordance with the BS 1363-2 Standard.
- Earth Socket (Euro-USA Type):
 - 15A - 127V~/16A - 250V~.
 - In accordance with the ANSI; NEMA ND-6 (Figure 5-15) and IEC 60884-1 Standards.
- Earth Socket (Saudi Type):
 - 15A - 127V~.
 - In accordance with the SASO 2204 Standard.



IP44 PROTECTION for FLUSH MOUNTING DEVICES

IP44 KIT

For all Switch Mechanisms of one or two Rockers

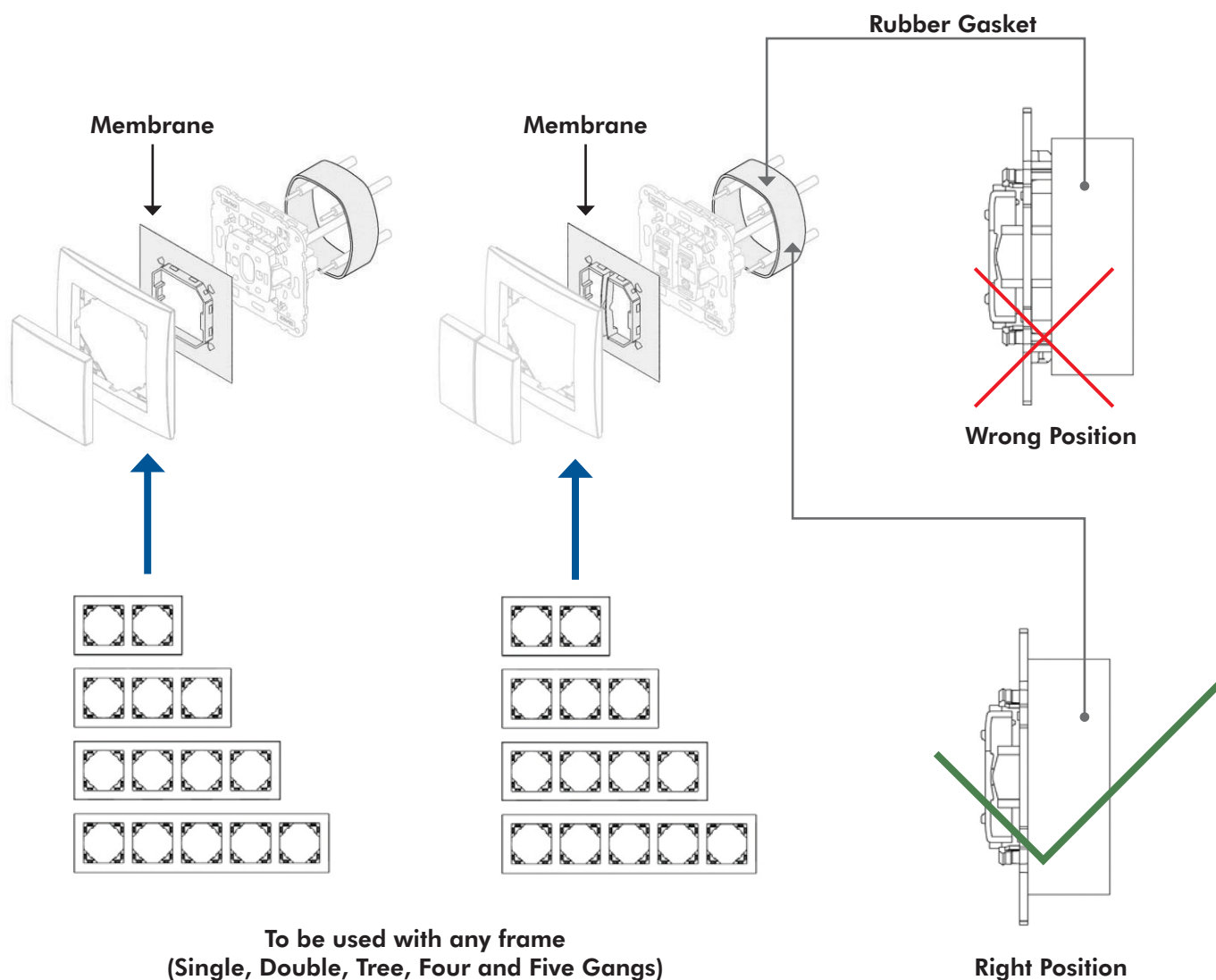
LOGUS⁹⁰

sirius70

APOLO 5000

Single Rocker
Ref. 21981

Double Rockers
Ref. 21982



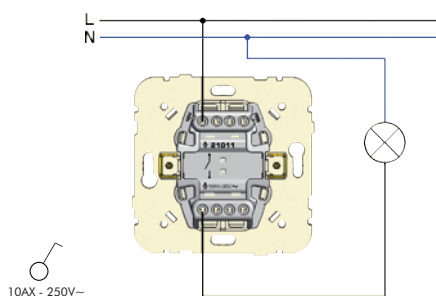
■ Installation Instructions:

1. Put the Rubber Gasket around the Mechanism and make the connections.
2. Attach the Mechanism to the Wall Box.
3. Put the Plastic Membrane over the Mechanism.
4. Finalize the Installation adding the Frame and the Rocker(s).

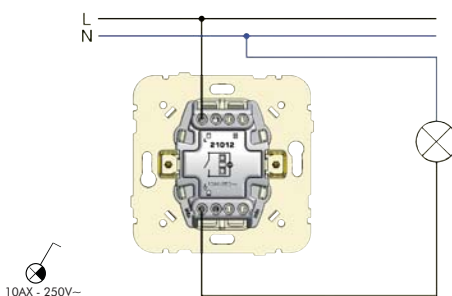
WIRING DIAGRAMS

MECHANISMS USED IN LOGUS 90, SIRIUS 70, APOLO 5000 AND WATERPROOF 48 SERIES

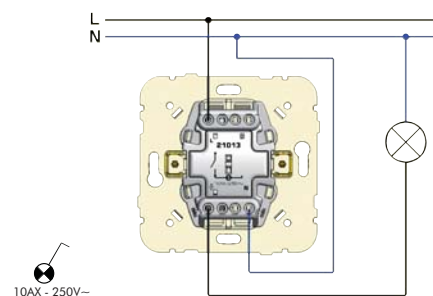
SINGLE POLE SWITCH



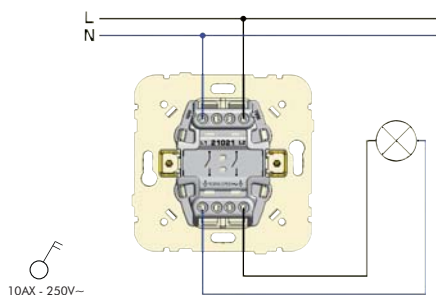
SINGLE POLE SWITCH WITH ORIENTING LIGHT



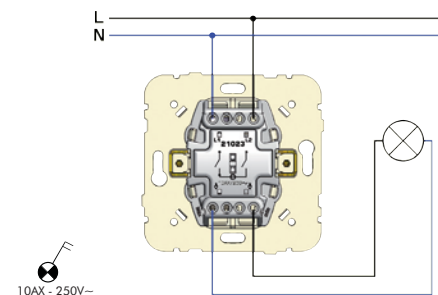
SINGLE POLE SWITCH WITH PILOT LAMP



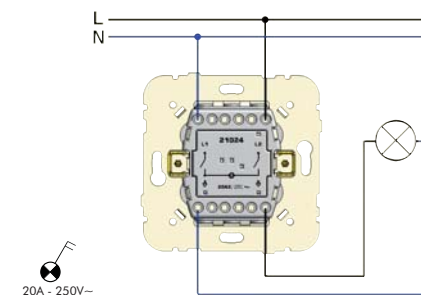
TWO-POLE SWITCH



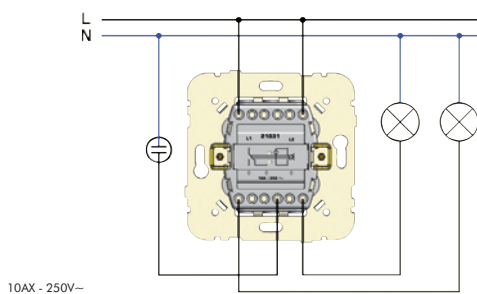
TWO-POLE SWITCH WITH PILOT LAMP



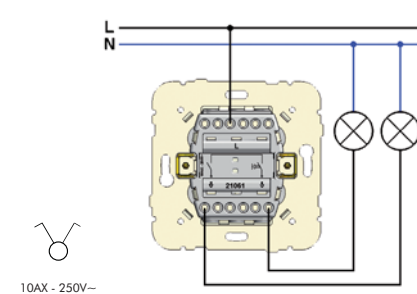
TWO-POLE SWITCH WITH PILOT LAMP 20A



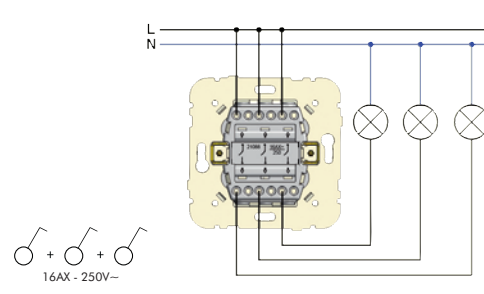
CARD-SYSTEM SWITCH



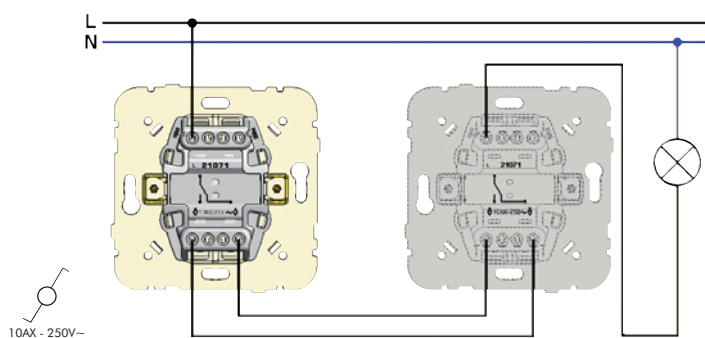
TWO CIRCUITS SWITCH



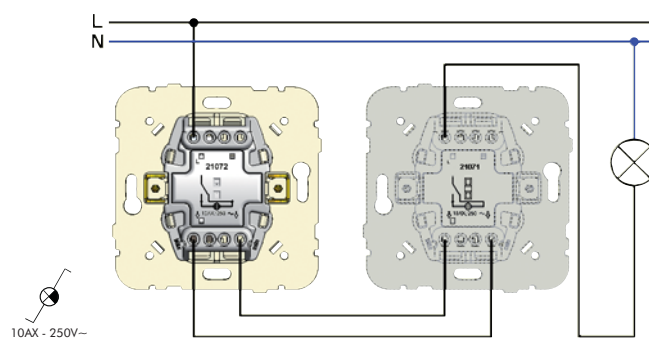
THREE CIRCUITS SWITCH



TWO-WAY SWITCH

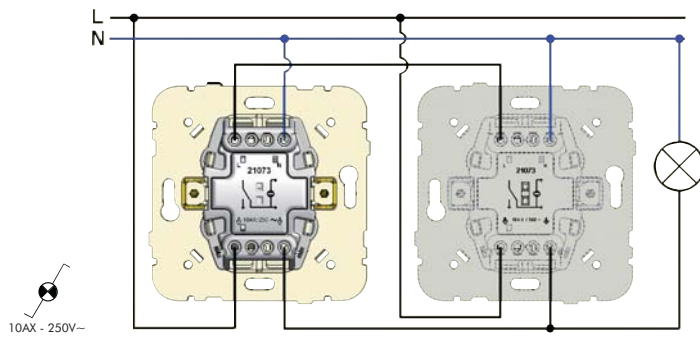


TWO-WAY SWITCH WITH ORIENTING LIGHT

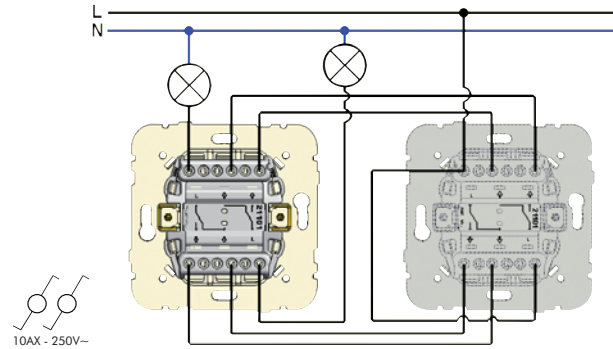


MECHANISMS USED IN LOGUS 90, SIRIUS 70, APOLO 5000 AND WATERPROOF 48 SERIES

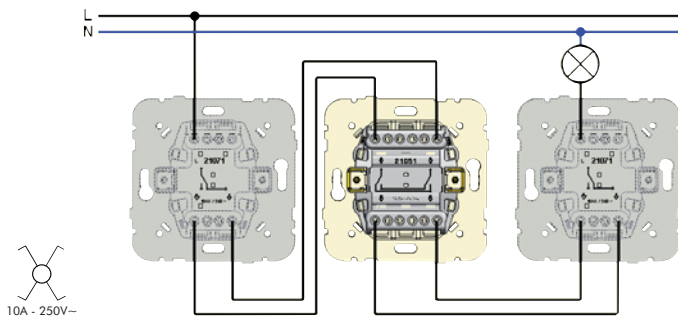
TWO-WAY SWITCH WITH PILOT LAMP



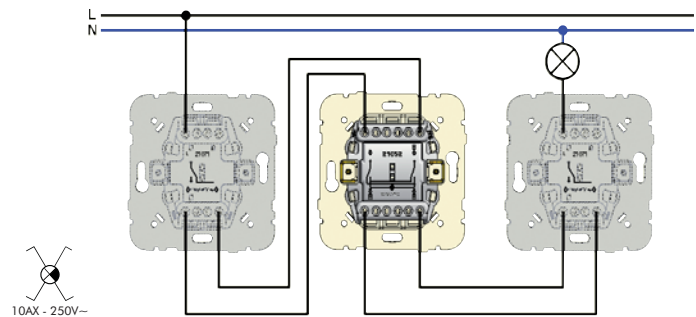
DOUBLE TWO-WAY SWITCH



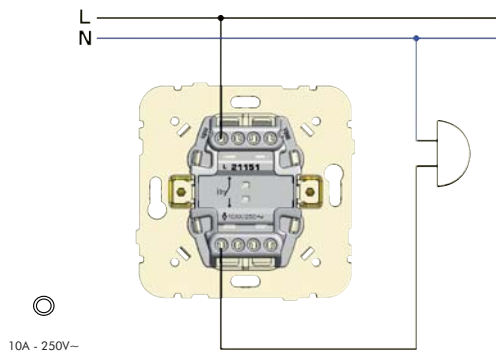
INTERMEDIATE SWITCH



INTERMEDIATE SWITCH WITH ORIENTING LIGHT

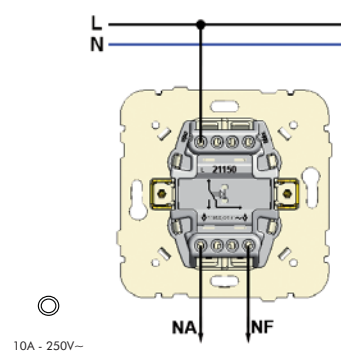


Button PUSH-BUTTON

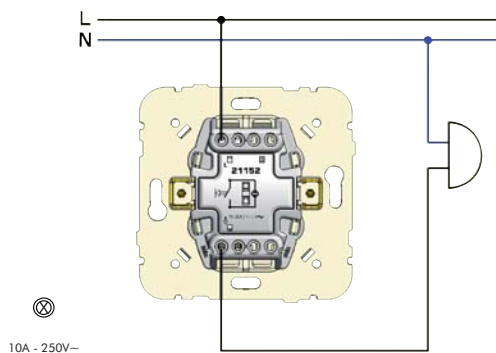


Button PUSH-BUTTON (NO+NC)

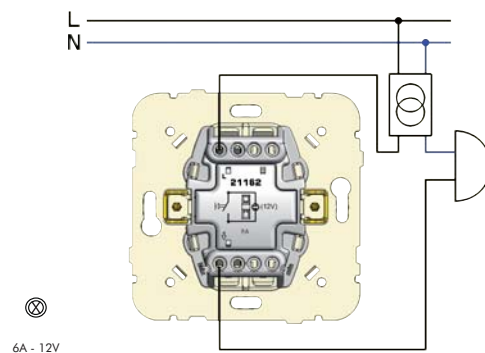
NEW



Button PUSH-BUTTON WITH ORIENTING LIGHT (250V)



Button PUSH-BUTTON WITH ORIENTING LIGHT (12V)

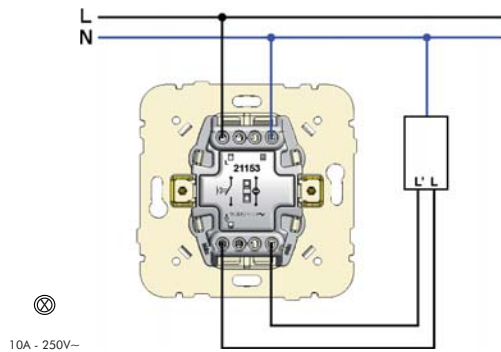


WIRING DIAGRAMS

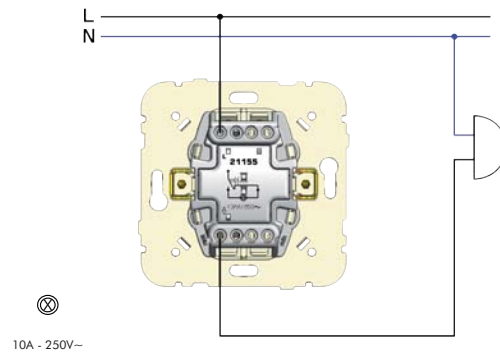
MECHANISMS USED IN LOGUS 90, SIRIUS 70, APOLO 5000 AND WATERPROOF 48 SERIES

**BUTTON PUSH-BUTTON
WITH INDEPENDENT PILOT LAMP**

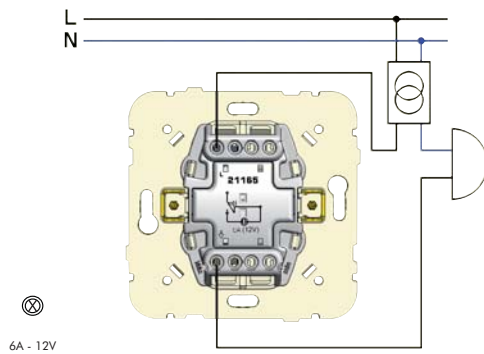
NEW



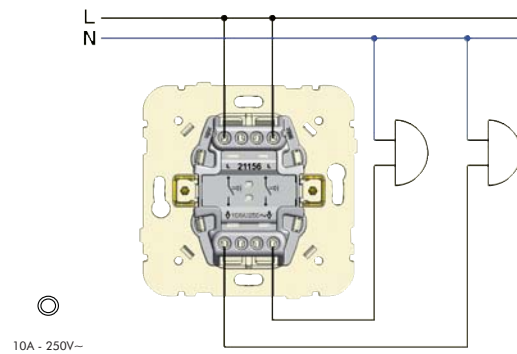
**ROCKER PUSH-BUTTON
WITH IDENTIFICATION (250V)**



**ROCKER PUSH-BUTTON
WITH IDENTIFICATION (12V)**

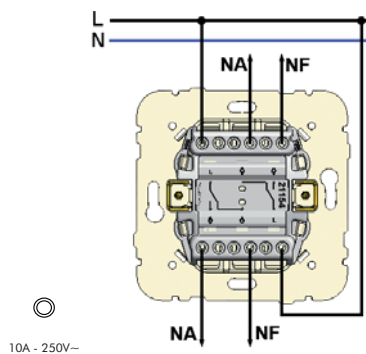


DOUBLE PUSH-BUTTON

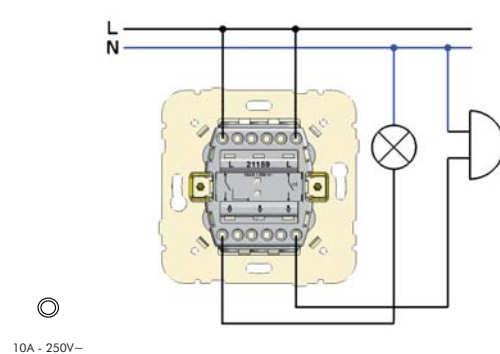


DOUBLE PUSH-BUTTON (2NO+2NC)

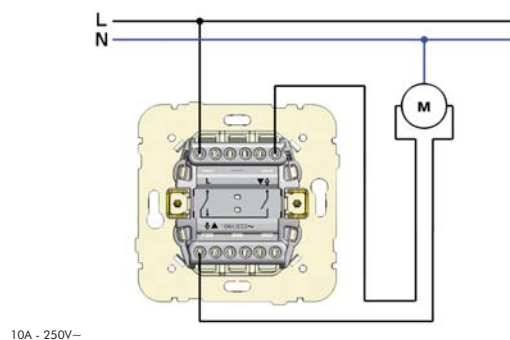
NEW



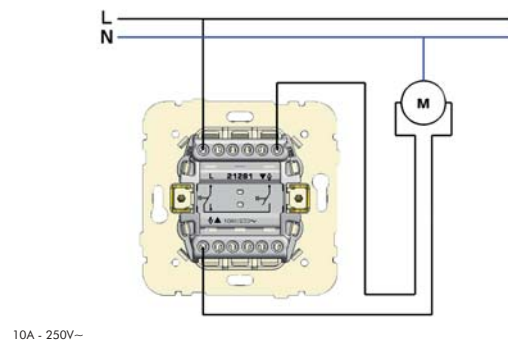
**ROCKER PUSH-BUTTON/
TWO-WAY SWITCH**



**VENETIAN SWITCH
VENETIAN SWITCH WITH MECHANICAL BLOCKAGE**

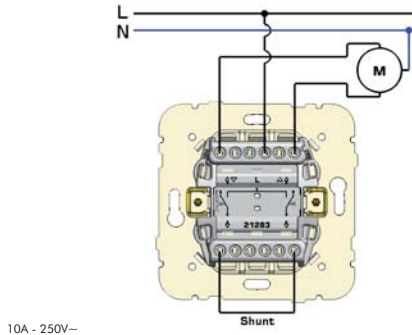


VENETIAN DOUBLE PUSH-BUTTON

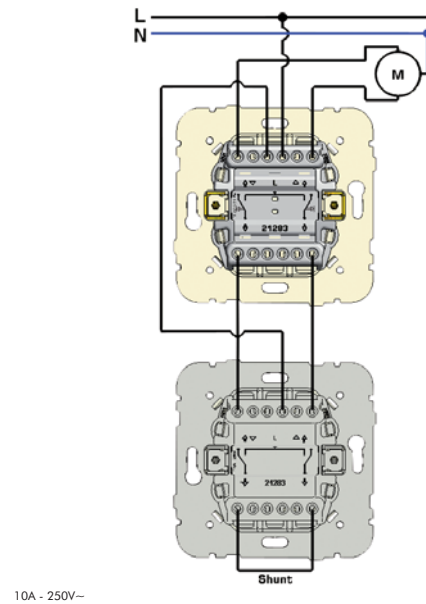


MECHANISMS USED IN LOGUS 90, SIRIUS 70, APOLO 5000 AND WATERPROOF 48 SERIES

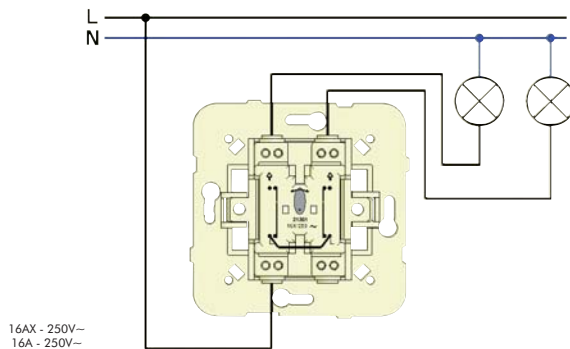
**VENETIAN DOUBLE PUSH-BUTTON FOR MULTIPLE POINT
BLINDS CONTROL** (Control from 1 point)



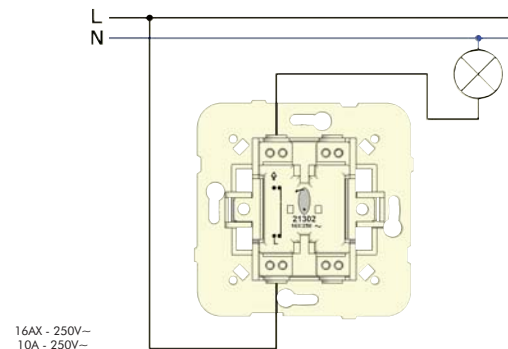
**VENETIAN DOUBLE PUSH-BUTTON FOR MULTIPLE POINT
BLINDS CONTROL** (Control from 2 or several points)



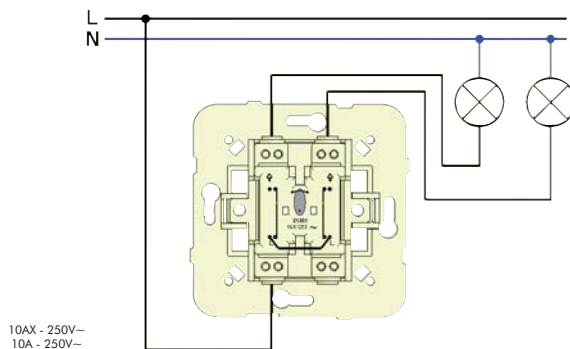
**ROTARY TWO-WAY SWITCH 16A
ROTARY VENETIAN PUSH-BUTTON**



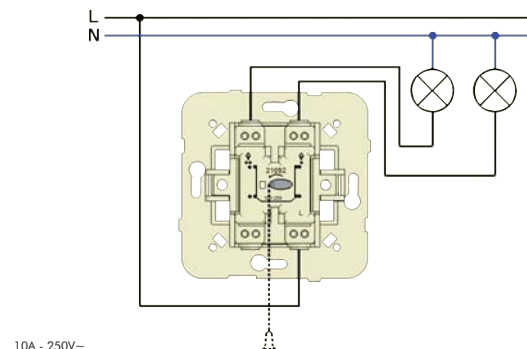
**ROTARY SWITCH 16A
PULL-CORD PUSH-BUTTON 10A**



**KEY-LOCK TWO-WAY SWITCH
KEY-LOCK PUSH-BUTTON**



PULL-CORD TWO-WAY SWITCH



DIGITAL CLOCK SWITCHES

LOGUS⁹⁰

sirius70

APOLO 5000

QUADRO 45



■ **Description:** The Digital Clock Switch is a device designed to control any electrical installation. Includes pulse programming from 1 to 59 seconds and up to 32 block memory spaces. Automatic Winter-Summer official time adjustment.

■ **Operating Instructions:**

- **"C1" Button** - Manual Operation Channel 1, Access and change the Menu Items.
- **"C2" Button** - Manual Operation Channel 2 (model only 2 Channels), Access and change the Menu Items.
- **"OK/Menu" Button** - Access the Menu Items, Confirms the selection.
- **"STANDBY" Button** - Suspension of Programming.
- **"C" Button** - Move back in Menu Items, Permanent override.

■ **Characteristics:**

Characteristics	One Circuit Digital Clock Switch (Ref. 21046/45046 S)	Two Circuits Digital Clock Switch (Ref. 21047/45047 S)
Rated Voltage	230V~ - 50Hz	230V~ - 50Hz
Power Consumption	1W	1W
Breaking Capacity	6A	6A + 6A
Programming Accuracy	1 Sec.	1 Sec.
Operating Accuracy	< 1 Sec./day	< 1 Sec./day
Memory Capacity	32 Blocks	32 Blocks
Output Functions	ON - OFF - Pulse (from 1 to 59 Sec)	ON - OFF - Pulse (from 1 to 59 Sec)
Output Contacts	NO and NC	2NO and 2NC
Blockade Function	✓	✓
Battery Back Up	✓	✓

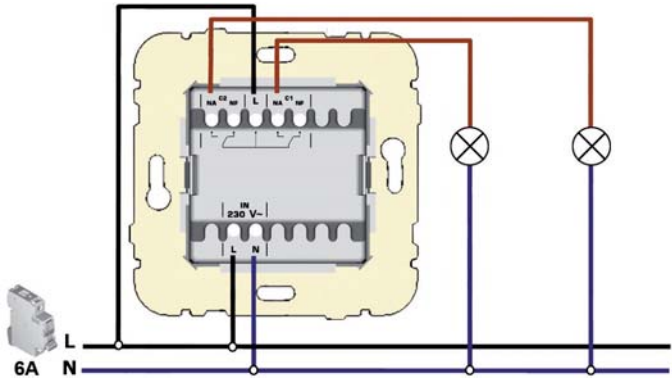
Note:

NO – Normally open.

NC – Normally closed.

■ **Wiring Diagram:**

Ref. 21047 / 45047 S



DIMMER / TWO-WAY SWITCHES

LOGUS⁹⁰

sirius70

APOLO 5000



■ **Description:** Allows to control the luminous intensity of a lamp or a group of lamps.

■ **Operating Instructions:**

- Rotate the potentiometer to adjust the luminous intensity of the lamp(s).
- Push the knob gently to work as a two-way switch.
- Voltage Trailing edge control (Ref. 21212).



■ **Characteristics:**

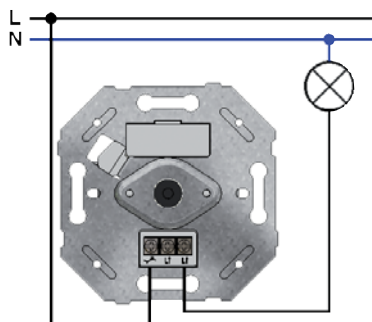
Characteristics	Dimmer / Two-way Switch of 500W (Ref. 21211)	Electronic Dimmer / Two-way Switch of 320W (Ref. 21212)
Maximum Load	500W	320W
Minimum Load	40W	5W
Two-way Switch Function	✓	✓
Minimum Intensity Adjustment	✓	*
Fuse	✓	—
Incandescent Lamps	✓	✓
Halogen Lamps, 230V~	✓	✓
Halogen Lamps with Ferromagnetic Transformer	✓	—
Halogen Lamps with Electronic Transformer	—	✓

Note:

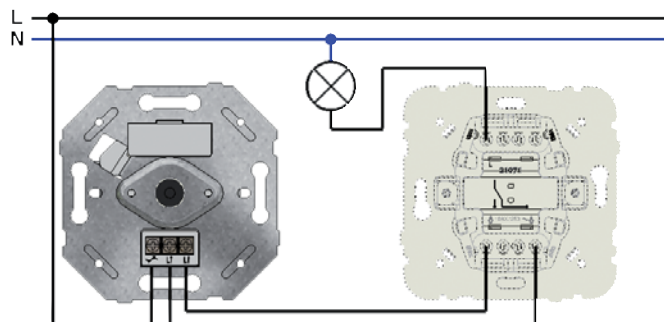
* - Auto Adjust

■ **Wiring Diagram:**

Use as a Dimmer Switch



Use as a Dimmer Switch and a Two-way Switch



MOTION DETECTORS

LOGUS⁹⁰

sirius70

APOLO 5000

QUADRO 45



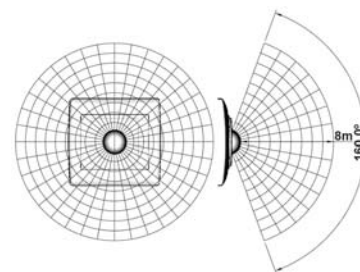
■ **Description:** Controls the connection of electrical circuit according to the detection of motion and the ambient light. **Compatible with any electric load.**

■ **Operating Instructions:**

- Remove the cover of the mechanism to reach the potentiometers of the adjustments of time and sensibility.

Operating Time Regulation

Light Sensibility Regulation



■ **Characteristics:**

Characteristics	Motion Detector of 1000W (Ref. 21401/45401 S)	Motion Detector of 400W (Ref. 21402/45402 S)
Rated Voltage	230V~ - 50/60Hz	230V~ - 50/60Hz
Power Consumption	1W	1W
Maximum Load	1000W	400W
Light Sensibility Regulation	✓	✓
Operating Time Regulation	from 5 Sec. to 5 min.	from 5 Sec. to 5 min.
Range of Detection	8m	8m
Detection Angle	160°	160°
Relay Output	NO and NC	NO and NC

Note:

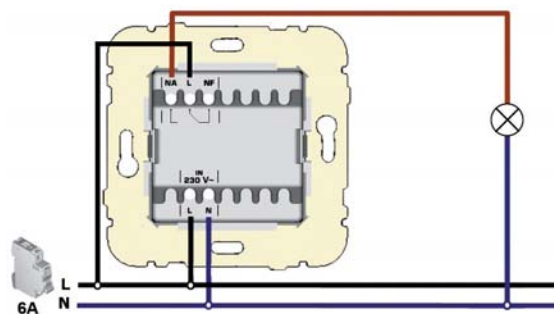
NO – Normally open.

NC – Normally closed.

■ **Wiring Diagram:**

NEW

Motion Detector with Voltage Free Inverter Contact (NO+NC).



TEMPERATURE CONTROLS

LOGUS⁹⁰

sirius70

APOLO 5000

QUADRO 45



PROGRAMMABLE CHRONO-THERMOSTAT

■ **Description:** It allows to control manually or automatically the heating or air conditioning systems according to a daily / weekly schedule and according with pre-programmed temperatures. It is possible to connect a floor temperature sensor and automatically detect its connection.

■ **Operating Instructions:**

- “▼” **Button** – Reduce Values; Menu Items Navigation; Minimum Temperature.
- “▲” **Button** – Increment Values; Menu Items Navigation; Maximum Temperature.
- “C” **Button** – ON/OFF and Stop Action.
- “OK” **Button** – OK and Menu Items.



ROOM THERMOSTAT WITH INFRARED REMOTE CONTROL

■ **Description:** It allows to control the heating or air conditioning systems according to the chosen temperature. It is possible to connect a floor temperature sensor and automatically detect its connection.

■ **Operating Instructions:**

- “▼” **Button** – Temperature Reduction; Reduce Values.
- “▲” **Button** – Temperature Increasing; Increment Values.
- “TIMER” **Button** – ON/OFF and Timer.

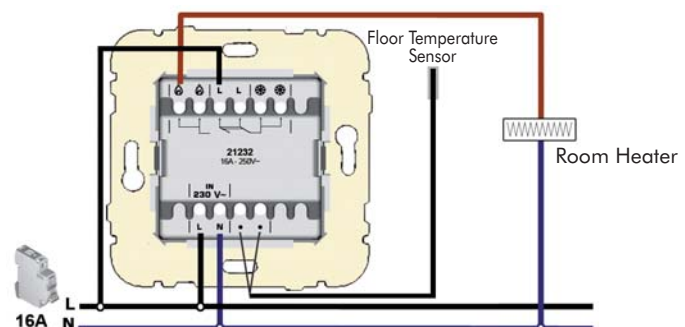
■ **Characteristics:**

Characteristics	Programmable Chrono-Thermostat (Ref. 21232/45232 S)	Room Thermostat with Infrared Remote Control (Ref. 21233/45233 S)
Rated Voltage	230V~ - 50Hz	230V~ - 50Hz
Power Consumption	1W	1W
Breaking Capacity	16A	16A
Adjustable Timer	✓	—
Sensibility	1°C	1°C
Room Temperature Read-out	0 to 35°C	0 to 35°C
Timer	—	15 to 90 min
Programming of the holidays period	✓	—
Infrared Remote Control	—	✓
Voltage Free Contacts	✓	✓
Battery Back up	≈ 3h	≈ 3h

■ **Wiring Diagram:**

NEW

**With Floor Temperature Sensor
detection and reading and 16A
of breaking capacity**



ELECTRICAL BLINDS CONTROL MODULES

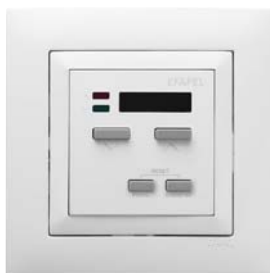
LOGUS⁹⁰

sirius70

APOLO 5000

QUADRO 45

1. BLINDS CONTROL MODULES



GENERAL BLINDS CONTROL MODULE WITH INFRARED REMOTE CONTROL

■ **Description:** This module allows the individual or the general control of a blind or a group of blinds, in manual or automatic way, in accordance with a pre-programmed schedule or with the environmental conditions defined or measured by associated sensors (Wind, Sun, etc). The remote control is possible through an IR transmitter.

■ Operating Instructions:

- “▼” **Button** – Blinds Down / Down Program
- “▲” **Button** – Blinds Up / Up Program
- “PROG” **Button** – Program
- “PROG + STANDBY” **Button** – Delete the existing program
- “STANDBY” **Button** – Stop the existing program



LOCAL BLINDS CONTROL MODULE WITH INFRARED REMOTE CONTROL

■ **Description:** It allows the individual control of a blind. The remote control is possible through an IR transmitter.

■ Operating Instructions:

- “▼” **Button** – Blinds Down / Down Program
- “▲” **Button** – Blinds Up / Up Program

■ Characteristics:

Characteristics	General Blinds Control Module with Infrared Remote Control (Ref. 21311/45311 S)	Local Blinds Control Module with Infrared Remote Control (Ref. 21312/45312 S)
Rated Voltage	230V~ - 50Hz	230V~ - 50Hz
Power Consumption	1W	1W
Maximum Load	6A (1380W, Cosφ = 1)	6A (1380W, Cosφ = 1)
Programming	2 functions (Up and Down)	—
Battery Back up	24h	24h
Functions	Standby	—
Infrared Remote Control	✓	✓

ELECTRICAL BLINDS CONTROL MODULES

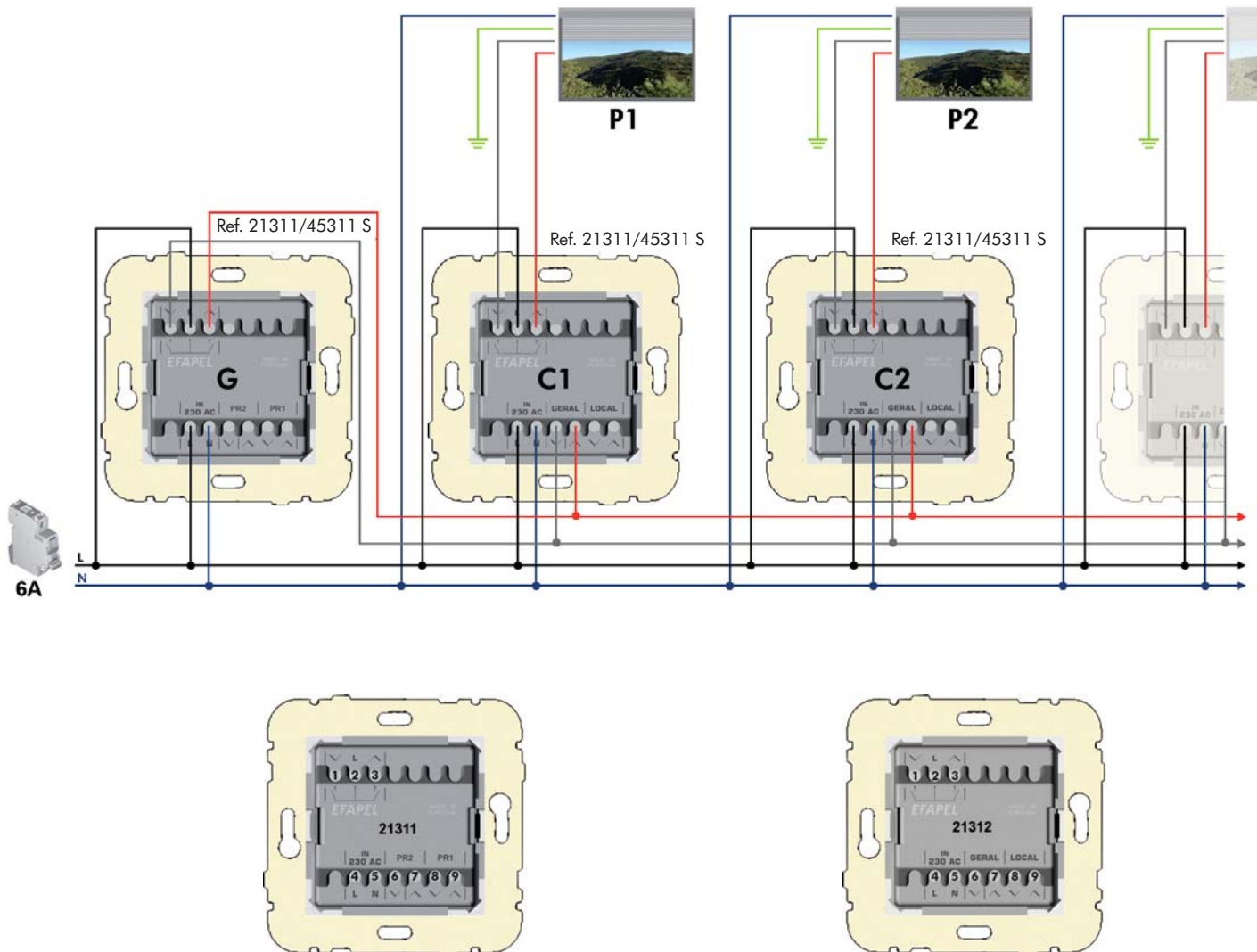
LOGUS⁹⁰

sirius70

APOLLO 5000

QUADRO 45

1.1 Wiring Diagram for a Blinds Centralized Installation by using Blinds Control Modules:



Terminal	FUNCTION - General Blinds Control Module with Infrared Remote Control (Ref. 21311/45311 S)	FUNCTION - Local Blinds Control Module with Infrared Remote Control (Ref. 21312/45312 S)
1	General Output - Down	General Output - Down
2	Blinds Power Supply (line)	Blinds Power Supply (line)
3	General Output - Up	General Output - Up
4	Power Supply (line)	Power Supply (line)
5	Power Supply (neutral)	Power Supply (neutral)
6	Signal input priority 2 (230V~) - Down	Signal input from General Control - Down
7	Signal input priority 2 (230V~) - Up	Signal input from General Control - Up
8	Signal input priority 1 (230V~) - Down	Signal input from the Local Control - Down
9	Signal input priority 1 (230V~) - Up	Signal input from the Local Control - Up

LOGUS⁹⁰

sirius70

APOLO 5000

QUADRO 45



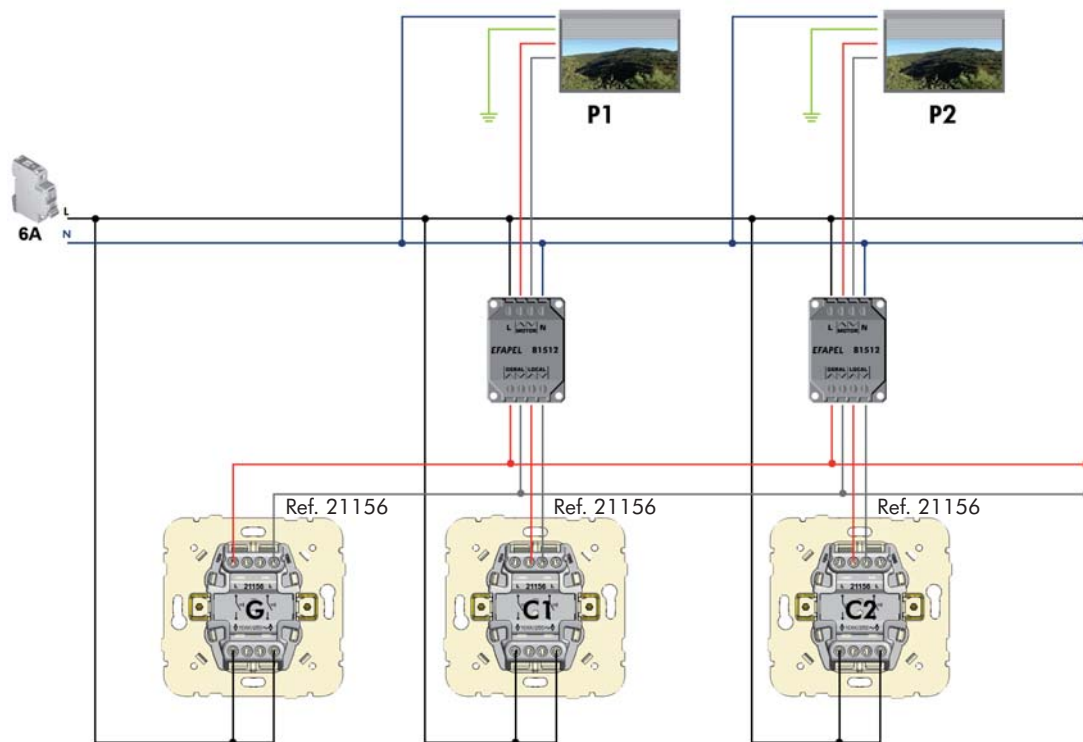
2. AUTOMATIC RELAY FOR BLINDS CONTROL

■ **Description:** It allows the individual and general control of a group of blinds. It could be installed in the standard wall boxes, in the derivation boxes near the blinds or in deep wall boxes and behind the wiring devices installed in the same box.

■ Characteristics:

Rated Voltage	230V~ - 50Hz
Power Consumption	1W
Maximum Load	6A (1380W, $\cos\phi = 1$)
Time of Opening and Closing	90 Sec.
Electrical Blockage	✓
Dimensions	48mm x 36,3mm x 24mm

2.1 Wiring Diagram for a Blinds Centralized Installation by using Automatic Relay for Blinds Control (Ref. 81512):



Note: The protection against two simultaneous orders of open or close applied in the same device or different devices, is guaranteed by the software of the relay.



Terminal	FUNCTION - Automatic Relay for Blinds Control (Ref. 81512)
▼	Output for Motor - Down
▲	Output for Motor - Up
L	Power Supply (Phase)
N	Power Supply (Neutral)
▼	Signal input for the General Control - Down
▲	Signal input for the General Control - Up
▼	Signal input for the Local Control - Down
▲	Signal input for the Local Control - Up

ELECTRICAL BLINDS CONTROL MODULES

LOGUS⁹⁰

sirius70

APOLLO 5000

QUADRO 45

3. RELAY FOR BLINDS CONTROL

■ **Description:** It allows the individual and general control of a group of blinds. It could be installed in the standard wall boxes, in the derivation boxes near the blinds or in deep wall boxes and behind the wiring devices installed in the same box.

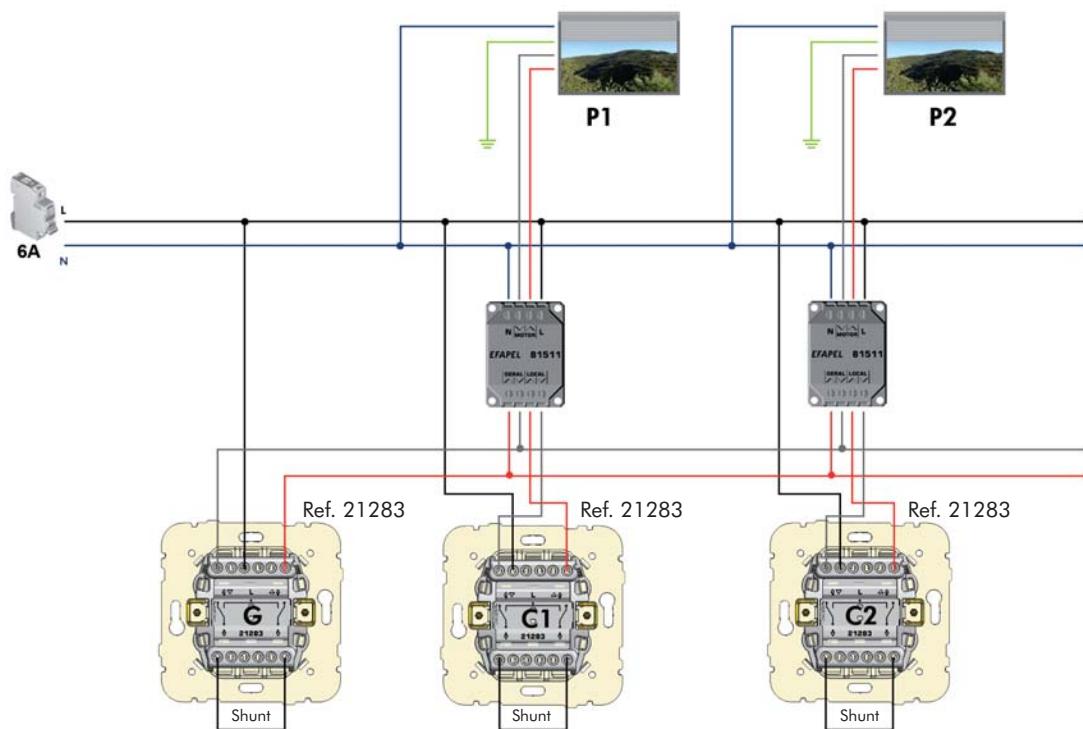
■ Characteristics:

Rated Voltage	230V~ - 50Hz
Power Consumption	1W
Maximum Load	6A (1380W, $\cos\phi = 1$)
Time of Open and Close	—
Electrical Blockage	X*
Dimensions	48mm x 36,3mm x 24mm

Note:

* - The electrical blockage (protection against two simultaneous orders) is guaranteed by the association of the Relay for Blinds Control and the Venetian Double Push-button for multiple Points Blinds Control (Ref. 21283).

2.1 Wiring Diagram for a Blinds Centralized Installation by using Relay for Blinds Control (Ref. 81511):



Notes:

- It is required to hold down the Buttons in order to open / close entirely the blinds.
- The protection against two simultaneous opening and close orders in the same device or different devices is guaranteed by the combination of the mechanism (Ref. 21283) and the relay (Ref. 81511). For this reason, this relay works only with the mentioned mechanism.

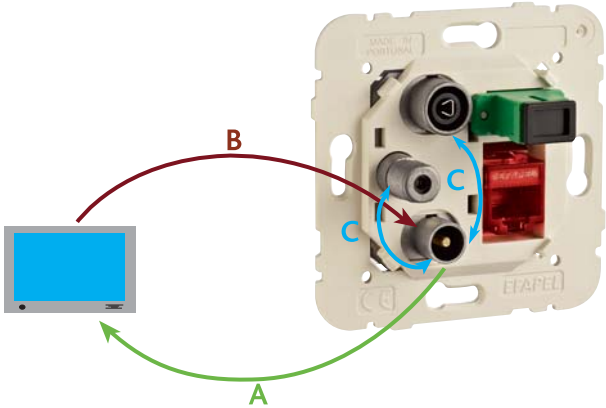


Terminal	FUNCTION - Relay for Blinds Control (Ref. 81511)
▼	Output for Motor - Down
▲	Output for Motor - Up
L	Power Supply (Phase)
N	Power Supply (Neutral)
▼	Signal input for the General Control - Down
▲	Signal input for the General Control - Up
▼	Signal input for the Local Control - Down
▲	Signal input for the Local Control - Up

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APOLO 5000



- A - Insertion Losses
- B - Return Losses
- C - Isolation between Outputs

SOCKETS TYPE:

Type		Ref.	RADIO	TV	SAT	FO SC-APC	RJ45 Cat. 6
STAR CONNECTION		21543					
		21544					
		21545					
		21546					
		21533					
		21534					
		21535					
SERIES CONNECTION		21554					
		21555					
		21564					
		21565					

RADIO, TELEVISION AND SATELLITE SOCKETS

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■ R - TV - SAT Sockets (Impedance of 75 Ohm)

LINEAL	Outputs		Insertion Losses (dB)										Insertion Losses dB	Isolation between Outputs dB	Return Losses dB	DC Current Passage mA (DC)	
	Connector / Outpts		Return	BI	Sub Band	FM	S. Low	BIII /DAB	S. High Hyper	UHF	SAT						
Ref.					4-47 MHz	47-68 MHz	68-80 MHz	84-108 MHz	112-174 MHz	174-230 MHz	230-446 MHz	470-862 MHz	950-2150 MHz	2150-2400 MHz			
Star 21543 21544 21545 21546 45543 S NQ 2b	IEC Male	TV	<1	<1	<1	<1	<1	<1	<1	<1	<1	--	--	--	>20	>18	--
	IEC Female	R	<20	<20	<20	<20	<20	<20	<20	<20	<20	--	--				--
	F Female	SAT	--	--	--	--	--	--	--	--	<3	<3	(SAT-IN) 500mA				
Terminal 21555 45555 S NQ 2b	IEC Male	TV	5±1	5±1	5±1	5±1	5±1	5±1	5±1	5±1	5±1	--	--	--	>12	>18	--
	IEC Female	R	<20	<20	<20	<20	<20	<20	<20	<20	<20	--	--				--
	F Female	SAT	--	--	--	--	--	--	--	--	5±1	5±1	(SAT-IN) 500mA				
Crossover 21565 45565 S NQ 2b	IEC Male	TV	9±1	9±1	9±1	9±1	9±1	9±1	9±1	9±1	9±1	--	--	<3	>12	>18	--
	IEC Female	R	18±1	18±1	18±1	18±1	18±1	18±1	18±1	18±1	18±1	--	--				--
	F Female	SAT	--	--	--	--	--	--	--	--	9±1	9±1	(SAT-IN) 500mA				

■ R - TV Sockets (Impedance of 75 Ohm)

EQUALIZED	Outputs		Insertion Losses (dB)										Insertion Losses dB	Isolation between Outputs dB	Return Losses dB
	Connector / Outpts		Return	BI	Sub Band	FM	S. Low	BIII /DAB	S. High Hyper	UHF	SAT				
			4-47 MHz	47-68 MHz	68-80 MHz	84-108 MHz	112-174 MHz	174-230 MHz	230-446 MHz	470-862 MHz	950-2150 MHz	2150-2400 MHz			
Ref.															
Star 21533 21534 21535 45533 S NQ 2a	IEC Male		<1	<1	<1	--	<1	<1	<1	<1	--	--	--	>20	--
	IEC Female		--	--	--	2±0.3	--	--	--	--	--	--			
Terminal 21554 45554 S NQ 2a	IEC Male		5±1	5±1	5±1	--	5±1	5±1	5±1	5±1	--	--	--	>20	>18
	IEC Female		--	--	--	6±1	--	--	--	--	--	--			
Crossover 21564 45564 S NQ 2a	IEC Male		9±1	9±1	9±1	--	9±1	9±1	9±1	9±1	--	--	1±0.5	>20	>18
	IEC Female		--	--	--	9±1	--	--	--	--	--	--			



SURROUNDING SOUND SYSTEM

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QUADRO 45

1. POWER SUPPLIES

■ **Description:** The Power Supplies are intended to transform the value of network voltage, rectify it and supply the Sound Centrals and Controls Units with a voltage of 15V $\overline{\text{---}}$.

1.1 Power Supply 15V $\overline{\text{---}}$ 30W for DIN Rail Mounting



Characteristics																							
Terminal Pin No. Assignment <table border="1"> <tr> <th>Pin No.</th><th>Assignment</th><th>Pin No.</th><th>Assignment</th></tr> <tr> <td>1</td><td>AC/N</td><td>5,6</td><td>Massa</td></tr> <tr> <td>2</td><td>AC/L</td><td>7</td><td>LED</td></tr> <tr> <td>3,4</td><td>+V</td><td>8</td><td>+VADJ.</td></tr> </table> ADMISSIBLE DIN-RAIL TS35/7.5 OR TS35/15	Pin No.	Assignment	Pin No.	Assignment	1	AC/N	5,6	Massa	2	AC/L	7	LED	3,4	+V	8	+VADJ.	Input	Parameter	Unit	Minimum	Provided	Maximum	Obs.
Pin No.	Assignment	Pin No.	Assignment																				
1	AC/N	5,6	Massa																				
2	AC/L	7	LED																				
3,4	+V	8	+VADJ.																				
Voltage	V~	85	230	264																			
Frequency	Hz	47 ~ 63																					
Rated Current	A	0,48			At 230V~																		
Efficiency	%	83																					
Output	Voltage	V $\overline{\text{---}}$	15																				
	Current	A	2,0			(Max.)																	
	Power	W	30																				
Installation Notes						1. It can be installed in the electrical panel or in a secondary or a floor electrical panel; 2. The pipeline to supply electrical energy to the sound system must be independent of others; 3. Possible to supply energy to 10 Stereo Channel Sound Control Units and 20 Mono Channel Sound Control Units and 1 Module Sound Central Unit.																	

1.2 Power Supply 15V $\overline{\text{---}}$ 12W for Installation in Hollow Ceilings



Characteristics																	
<table border="1"> <thead> <tr> <th>Terminal</th><th>Parameter</th></tr> </thead> <tbody> <tr> <td>L</td><td>230V~ AC Line IN</td></tr> <tr> <td>N</td><td>230V~ AC Neutral IN</td></tr> <tr> <td>2</td><td>15V$\overline{\text{---}}$ (+) Out</td></tr> <tr> <td>4</td><td>Common (-) Out</td></tr> </tbody> </table>	Terminal	Parameter	L	230V~ AC Line IN	N	230V~ AC Neutral IN	2	15V $\overline{\text{---}}$ (+) Out	4	Common (-) Out	Input	Parameter	Unit	Minimum	Provided	Maximum	Obs.
Terminal	Parameter																
L	230V~ AC Line IN																
N	230V~ AC Neutral IN																
2	15V $\overline{\text{---}}$ (+) Out																
4	Common (-) Out																
Voltage	V~	85	230	264													
Frequency	Hz	47 ~ 63															
Rated Current	A	0,174			230V~												
Efficiency	%	85															
Output	Voltage	V $\overline{\text{---}}$	15														
	Current	A	800			(Máx.)											
	Power	W	12														
Installation Notes						1. Fits in the back of the 5" loudspeakers installed in a Flush Mounting Deep Ceiling Box for 5" Loudspeakers (Ref. 75984); 2. The pipeline to supply electrical energy to the sound system must be independent of others; 3. Possible to supply energy to 4 Stereo Channel Sound Control Units and 1 Module Sound Central Unit, or 8 Mono Channel Sound Control Units and 1 Module Sound Central Unit.											

SURROUNDING SOUND SYSTEM

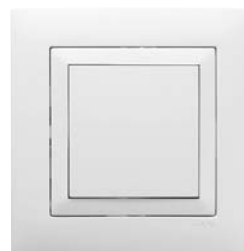
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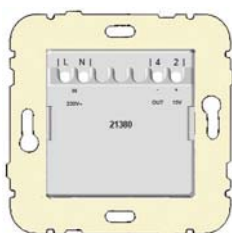
APOLO 5000

QUADRO 45

1.3 Power Supply Module 15V $\sim$ 5W



Characteristics



Terminal	Parameter
L	230V~ AC Line IN
N	230V~ AC Neutral IN
2	15V $\sim$ (+) Out
4	Common (-) Out

	Parameter	Unit	Minimum	Provided	Maximum	Obs.
Input	Voltage	V~	100	230	264	
	Frequency	Hz	47 ~ 63			
	Rated Current	A	0,065			At 230V~
	Efficiency	%	85			
Output	Voltage	V---	15			
	Current	mA	300			(Máx.)
	Power	W	5			
Installation Notes	1. It could be installed in mechanisms boxes* (Ref. 21380) or in cable-trunking adapters of the QUADRO 45 Series (Ref. 45380 S);					
	2. The pipeline to supply electrical energy to the sound system must be independent of others;					
	3. Each Power Supply can feed energy to 1 Stereo or Mono Sound Control.					
	NOTE: * - Use preferable deep mechanism boxes.					

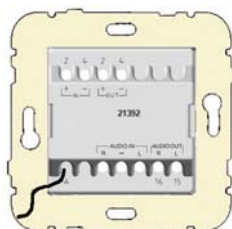
2. MODULAR SOUND CENTRAL UNITS

■ **Description:** The main function of the Modular Sound Central Units is to receive an external source of sound and then transform and send it to the Sound Control Units installed in the entire sound system installation.



2.1 One Stereo Channel Modular Sound Central with FM Tuner

Characteristics



■ **Operating Instructions:**

- ON/OFF** | Turns on and off the Modular Sound Central Unit and interrupts the power to the Sound Control Units. Turns on and off the TIMER (⌚).
- SELECT** | Modular Sound Central Unit Off - Turns the LCD backlight for viewing hours.
Modular Sound Central Unit On - Selects the sound source between the AUX Entry and the FM Tuner.
- ∇ SCAN ^** | Modular Sound Central Unit Off - allows adjustment of the clock with Button ∇ and ^. Modular Sound Central Unit On - allows the automatic and manual search radio stations.
-  | Audio Input through 3,5mm Jack.

Connections		Characteristics					
Terminal	Parameter	Parameter	Un.	Min.	Prov.	Max.	Obs.
IN	+ (2) Power Supply (+) 15V $\sim$	POWER SUPPLY					
	- (4) Common (-)	Voltage	V $\sim$	13,5	15,0	16,5	—
OUT	+ (2) Power Supply of Command 15V $\sim$	Consumption	mA	1,0	—	70	Standby/On
	- (4)	AUDIO (AUX)					
AUDIO IN	R Sound Input Right Channel	Input Sensitivity	Vrms	—	1,0	—	Vout = 1,2V
	- Sound Input Common	Input Impedance	KΩ	—	30,0	—	—
	L Sound Input Left Channel	Frequency Response	Hz	20	—	<20k	-3dB
AUDIO OUT	R Sound Output Right Channel	FM TUNER					
	L Sound Output Left Channel	Output Level FM	Vrms	—	0,7	—	75KHz
A	Antenna	Frequency Range	MHz	87,5	—	108	—

SURROUNDING SOUND SYSTEM

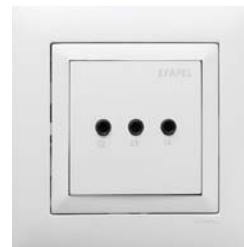
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APOLLO 5000

QUADRO 45

2.2 One Stereo Channel Modular Sound Central Unit and Three Stereo Channel Auxiliary Input Module



Connections			Characteristics					
Terminal	Parameter		Parameter	Un.	Min.	Prov.	Max.	Obs.
IN	+ (2)	Power Supply (+) 15V---	POWER SUPPLY					
	- (4)	Common (-)	Voltage	V---	13,5	15,0	16,5	—
OUT	+ (2)	Power Supply of Command 15V---	Consumption	mA	1,0	—	70	Standby/On
	- (4)		AUDIO INPUTS					
AUDIO OUT	15	Sound Output Left 1 Channel	Input Sensitivity	Vrms	—	1,0	—	Vout = 1,2V
	16	Sound Output Right 1 Channel	Input Impedance	KΩ	—	30,0	—	—
	25	Sound Output Left 2 Channel	Frequency Response	Hz	20	—	<20k	-3dB
	26	Sound Output Right 2 Channel						
	35	Sound Output Left 3 Channel						
	36	Sound Output Right 3 Channel						
	45	Sound Output Left 4 Channel						
	46	Sound Output Right 4 Channel						

■ Operating Instructions:

 | Audio Input through 3,5mm Jack.

3. SOUND CONTROL UNITS

■ **Description:** The Sound Control Units have the main function to receive the audio signal from the Modular Sound Central Units, from its internal tuner or from an external source, amplify it and distribute it to the Loudspeakers.



Characteristics					
PARAMETER	UNITS	MINIMUM	PROVIDED	MAXIMUM	OBSERVATIONS
POWER SUPPLY					
Power Supply	V---	—	12	18	—
Consumption	mA	1,5	60	300	Standby / On / Maximum Power
AUDIO SIGNAL					
Input Sensibility	Vrms	—	2,0	—	—
Input Impedance	KΩ	—	10	—	—
Power Output	W	—	—	1,5 + 1,5	Output Impedance - 32 Ω
Frequency Response	Hz	30	—	>20k	At -3dB
FM TUNER					
Frequency Range	MHz	87,5	—	108	—

SURROUNDING SOUND SYSTEM
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APOLO 5000
4. LOUDSPEAKERS (FLUSH AND SURFACE MOUNTING)


■ **Description:** The Loudspeakers are responsible for receiving the audio signal from the Sound Control Units and turning it into vibrations that are transmitted to the environment, causing the sound.

Characteristics						
PARAMETER	UNITS	MODELS				OBSERVATIONS
Type	Inches	2"	5"	6,5"	5"	1" = 2,54cm
Installation	—	Flush Mounting			Surface Mounting	—
Impedance	Ohm	32	32; 16; 8	32; 16; 8	32; 16; 8	—
Maximum Power	W	10	15	60	30	—
Frequency Response	Hz	450 to 5000	70 to 15000	60 to 20000	80 to 19000	At -6dB

5. STEREO / MONO AMPLIFIER

■ **Description:** The Stereo / Mono Amplifier amplifies the audio signal from a Sound Control Unit when it is necessary more audio power than the supplied by a normal Sound Control Unit.



Characteristics					
PARAMETER	UNITS	MINIMUM	PROVIDED	MAXIMUM	OBSERVATIONS
POWER SUPPLY					
Power Supply	V ₋₋₋	—	16	18	—
Consumption	mA	1,4	50	820	Standby / On / Maximum Power
AUDIO SIGNAL					
Input Sensibility	V _{rms}	—	—	3,5	7V ₋₋₋
Output Impedance	Ω	4Ω + 4Ω Stereo / 8Ω Mono			—
Power Output	W	—	3,6 + 3,6	5 + 5	Stereo
			6,4	8	Mono
Frequency Response	Hz	18	—	33k	At -3dB

SURROUNDING SOUND SYSTEM

6. PRODUCTS SELECTION GUIDE

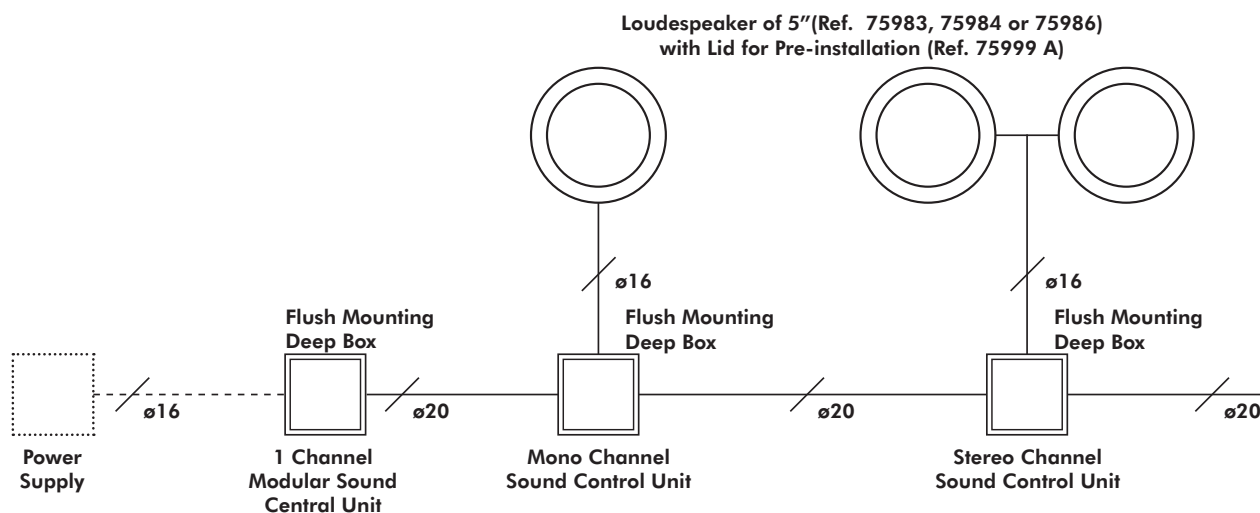
	POWER SUPPLIES											
	Power Supply suitable to the number of Sound Control Units (Ref. 21380 - 1 Sound Control Unit; Ref. 75053 - 4 Stereo Sound Control Units/8 mono; Ref. 75052 - 10 Stereo Control Units/20 mono)											
	ONE CHANNEL INSTALLATION						FOUR CHANNELS INSTALLATION					
	1 Stereo Channel Modular Sound Central Unit (Ref. 21391)				1 Stereo Channel Modular Sound Central Unit with FM Tuner (Ref. 21392)		1 Stereo Channel Modular Sound Central Unit + 3 Stereo Channel Auxiliary Input Module (Ref. 21391 + 21393)				1 Stereo Channel Modular Sound Central Unit with FM Tuner + 3 Stereo Channel Auxiliary Input Module (Ref. 21392 + 21393)	
	STEREO			MONO	STEREO	MONO	STEREO			MONO	STEREO	MONO
Sound Control Units	1 Stereo Channel Sound Control Unit with FM Tuner, Alarm Clock and IR	1 Stereo Channel Sound Control Unit with FM Tuner and Alarm Clock	1 Stereo Channel Sound Control Unit with FM Tuner	1 Mono Channel Sound Control Unit with FM Tuner	1 Stereo Channel	1 Mono Channel	1 Stereo Channel Sound Control Unit with FM Tuner, Alarm Clock and IR + 4 Stereo Channels Selector Module	1 Stereo Channel Sound Control Unit with FM Tuner and Alarm Clock + 4 Stereo Channels Selector Module	1 Stereo Channel Sound Control Unit with FM Tuner + 4 Stereo Channels Selector Module	4 Mono Channels Sound Control Unit with FM Tuner	1 Stereo Channel Sound Control Units + 4 Stereo Channels Selector Module	4 Mono Channels Sound Control Unit
Reference	21370	21379	21377	21373	21372	21371	21370 + 21385	21379 + 21385	21377 + 21385	21378	21372 + 21385	21374
Function												
Independent FM Tunner	✓	✓	✓	✓			✓	✓	✓	✓		
Up and Down automatic Scan	✓	✓	✓	✓			✓	✓	✓	✓		
Manual Scan	✓	✓	✓	✓			✓	✓	✓	✓		
Memory of the last selected radio station	✓	✓	✓	✓			✓	✓	✓	✓		
Visualisation of the radio station	✓	✓					✓	✓				
Auxiliary audio input (MP3)	✓	✓	✓		✓		✓	✓	✓		✓	
Headphones output		✓	✓		✓			✓	✓		✓	
Minimum impedance of 32 Ohm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Volume digital control with 30 positions	✓	✓					✓	✓				
Individual volume	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Volume memory	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
General ON/OFF from the Central Control Unit	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Digital clock with hour in the display	✓	✓					✓	✓				
Alarm clock	✓	✓					✓	✓				
Timer until 90 minutes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Finishings of LOGUS 90 Series	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Finishings of Sirius 70 Series	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Finishings of APOLO 5000 Series	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Finishings of QUADRO 45 Series	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Infrared Remote Control	✓						✓					

For non centralized installation (without Modular Sound Central Unit), please follow the highlight columns .

SURROUNDING SOUND SYSTEM

7. PRE-INSTALLATION

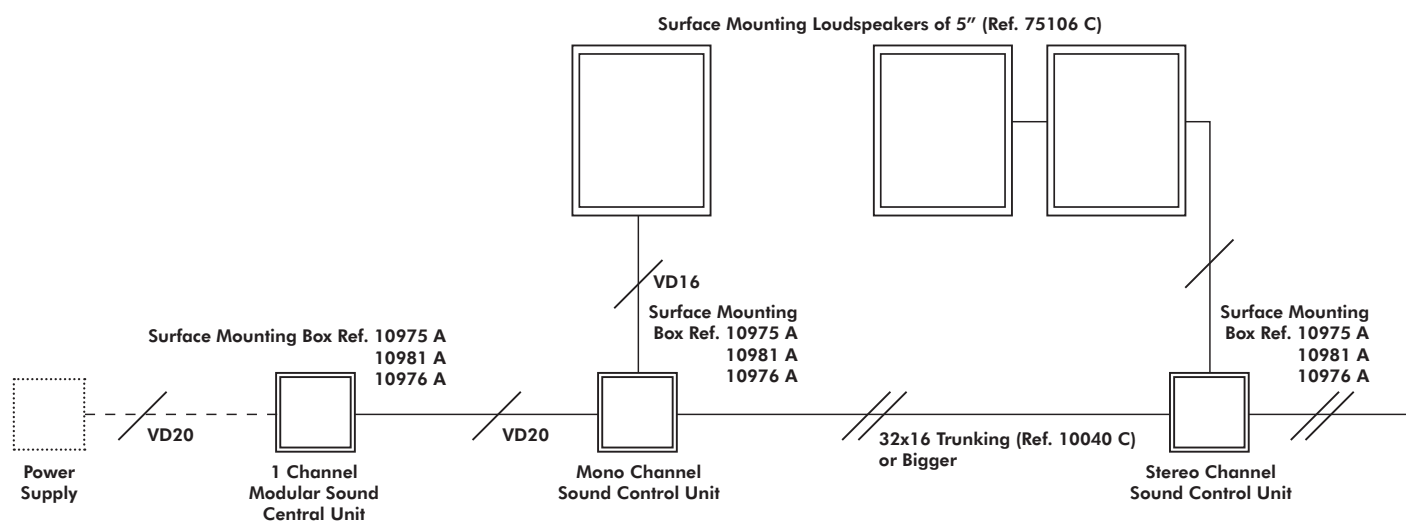
■ **Flush Mounting Pre-installation**



Notes:

- To install the Loudspeakers 5" in hollow ceilings, the diameter of the hole should be **160mm**.
- For Loudspeakers 6,5" the opening should be square and with dimensions of **185mm x 185mm**.

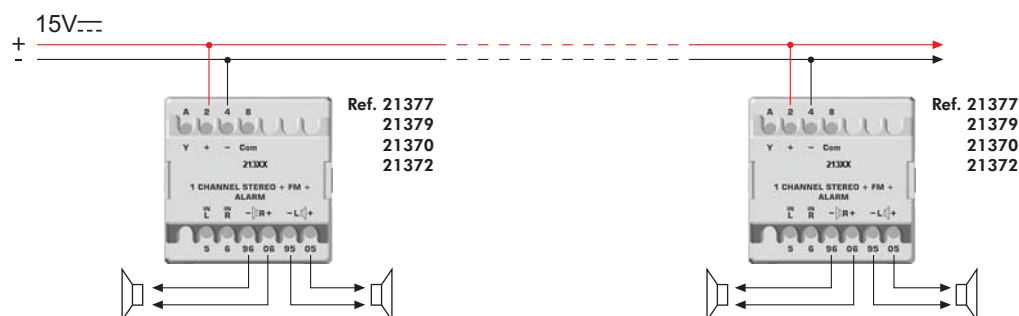
■ **Surface Mounting Pre-installation**



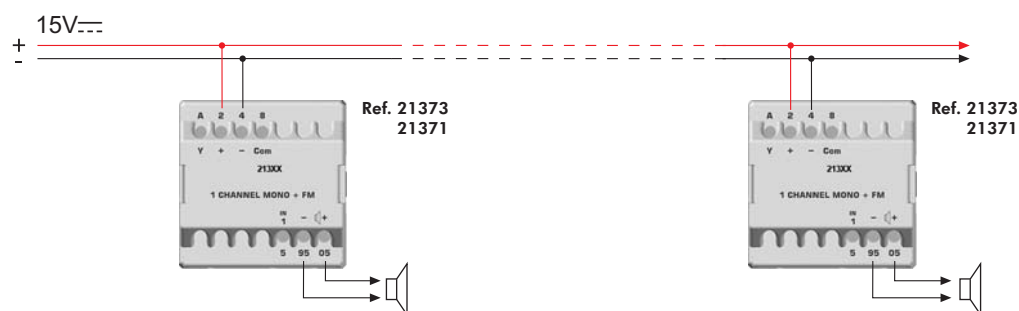
SURROUNDING SOUND SYSTEM

8. NON CENTRALIZED INSTALLATION

■ Stereo Channel Sound Control Units with/without FM Tuner

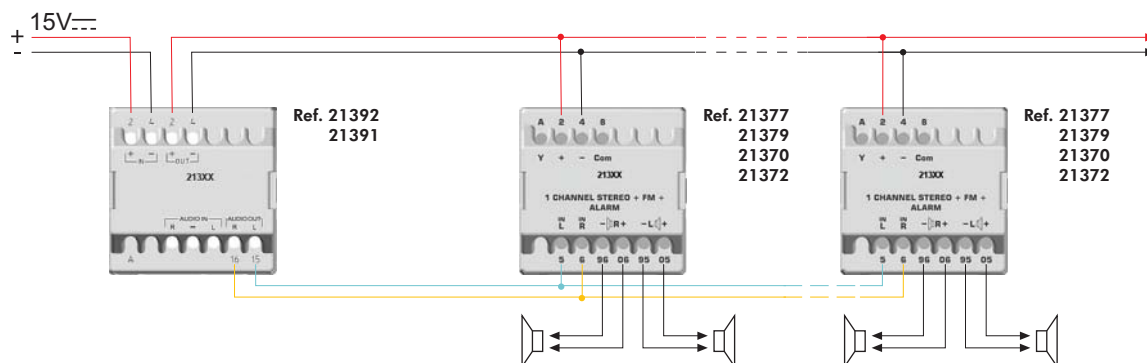


■ Mono Channel Sound Control Units with/without FM Tuner



9. CENTRALIZED INSTALLATION

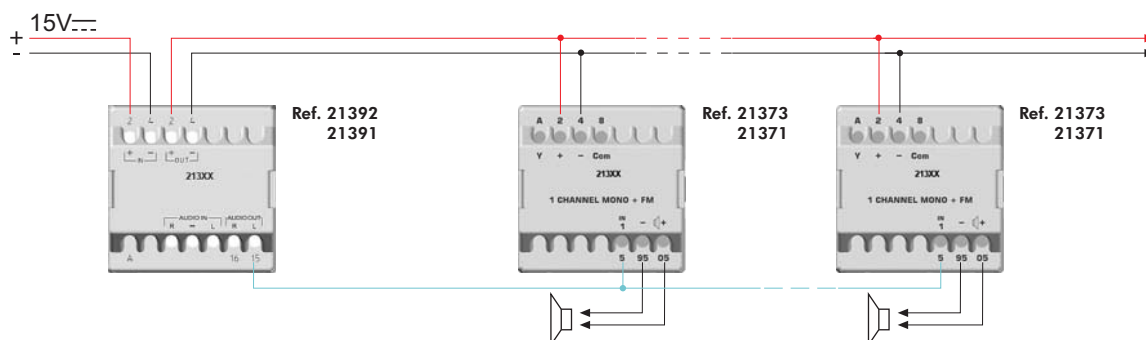
■ 1 Stereo Channel Sound Control Units with/without FM Tuner



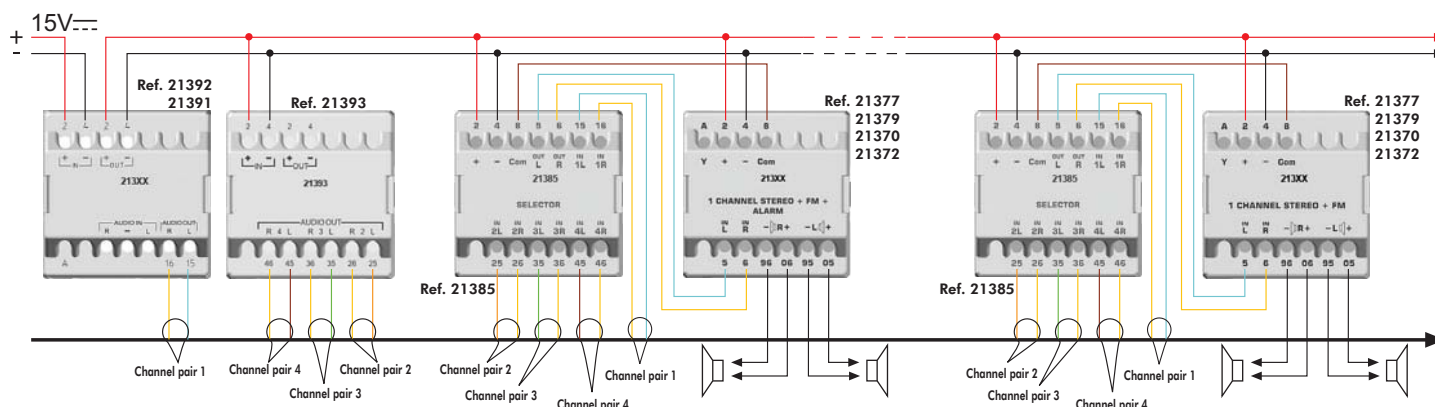
SURROUNDING SOUND SYSTEM

9. CENTRALIZED INSTALLATION (Continuation)

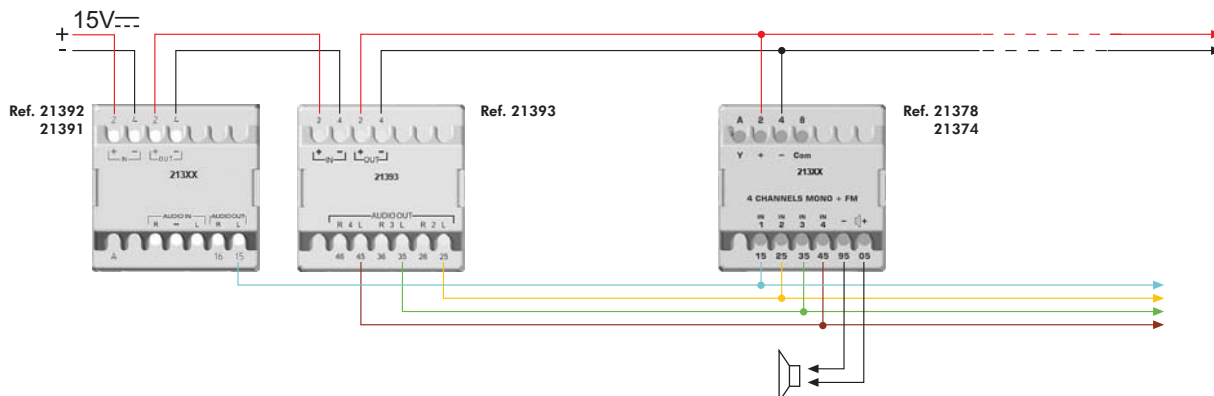
■ **1 Mono Channel Sound Control Units with/without FM Tuner**



■ **4 Stereo Channels Sound Control Units with/without FM Tuner**



■ **4 Mono Channels Sound Control Units with/without FM Tuner**

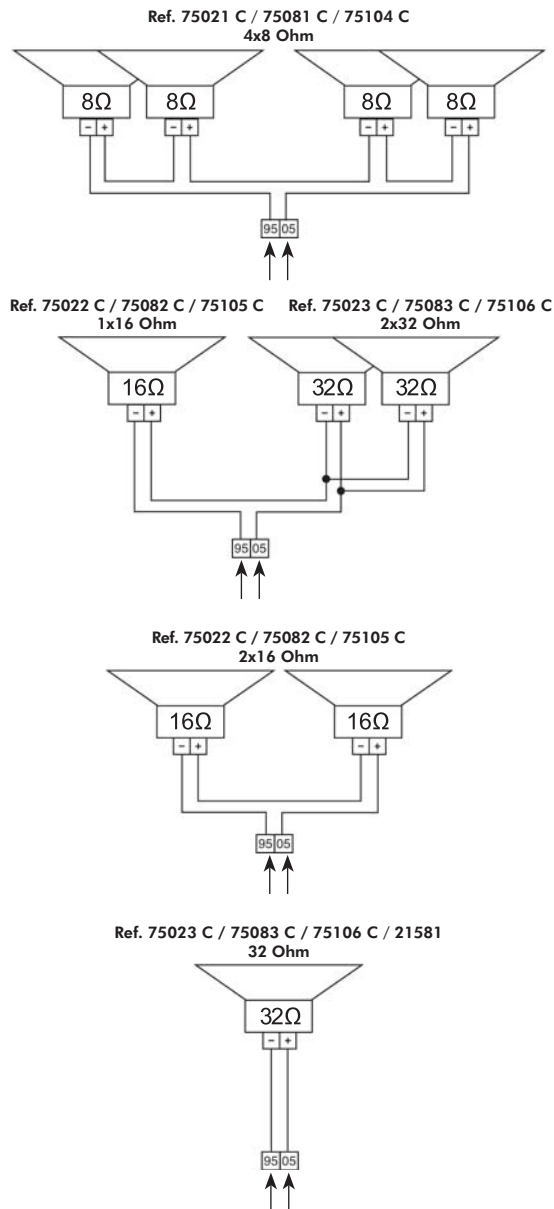


SURROUNDING SOUND SYSTEM

10. SELECTION GUIDE OF LOUDSPEAKERS

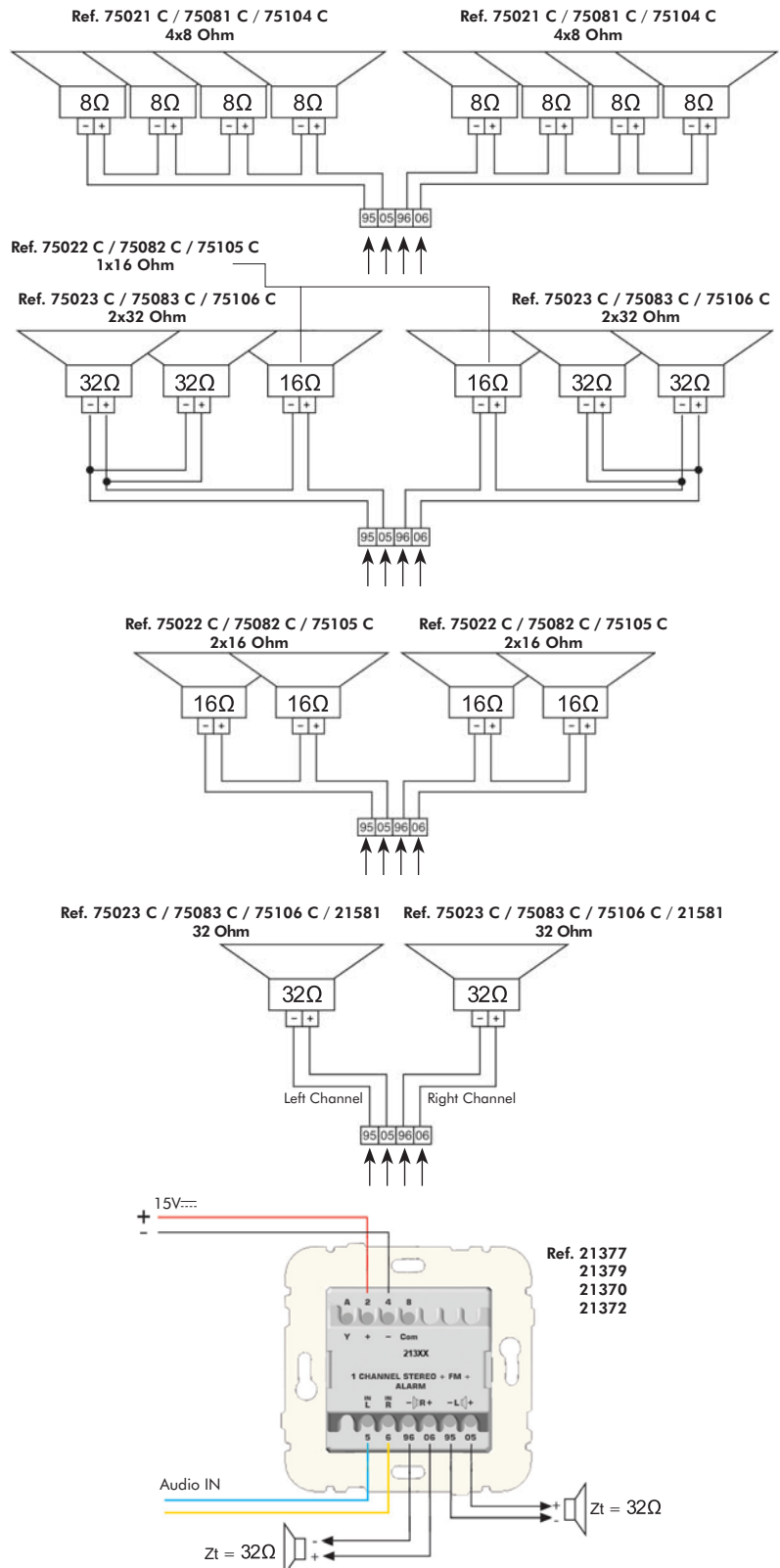
Mono Installation

The total impedance of the serial connection must be equal to 32 Ohm



Stereo Installation

The total impedance of the serial connection per channel must be equal to 32 Ohm



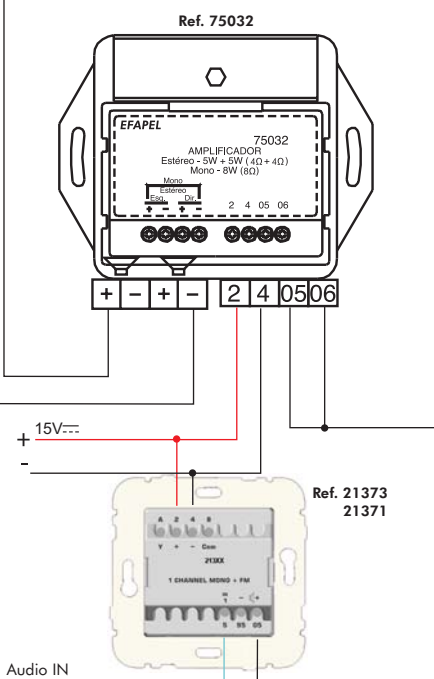
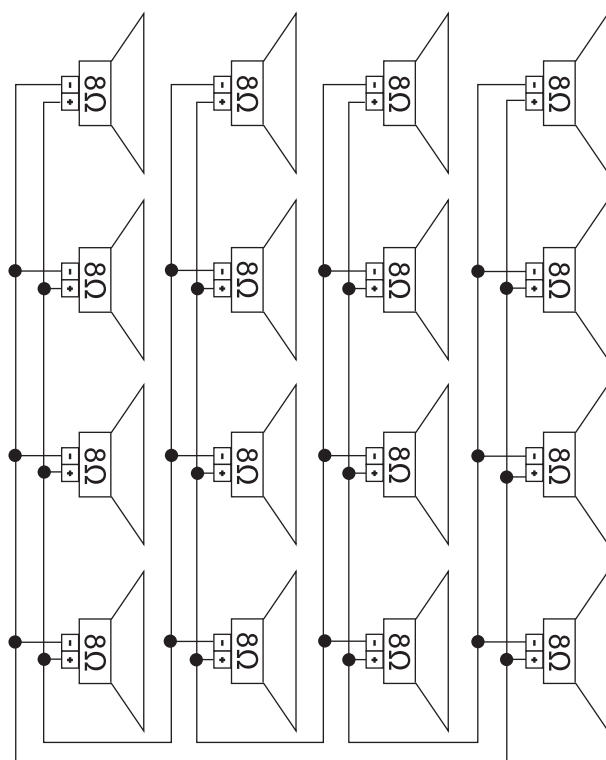
SURROUNDING SOUND SYSTEM

10. SELECTION GUIDE OF LOUDSPEAKERS (Continuation)

**Mono Installation of 16 Loudspeakers
with Stereo/Mono Amplifier**

4 groups in series of 4 Loudspeakers of 8 Ohm in parallel (= 8Ω)

Ref. 75021 C / 75081 C / 75104 C
16x8 Ohm



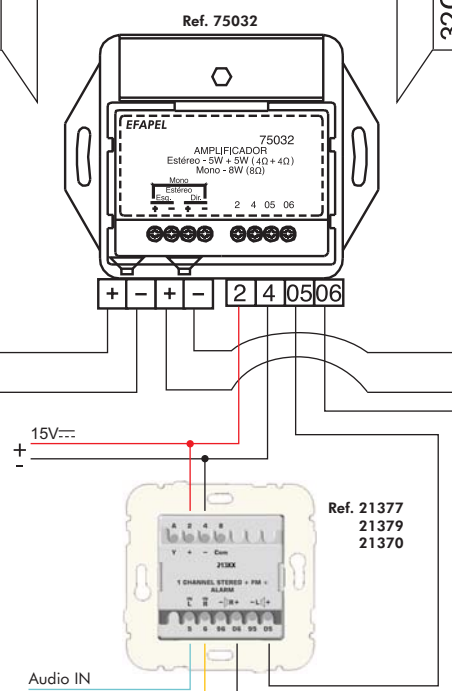
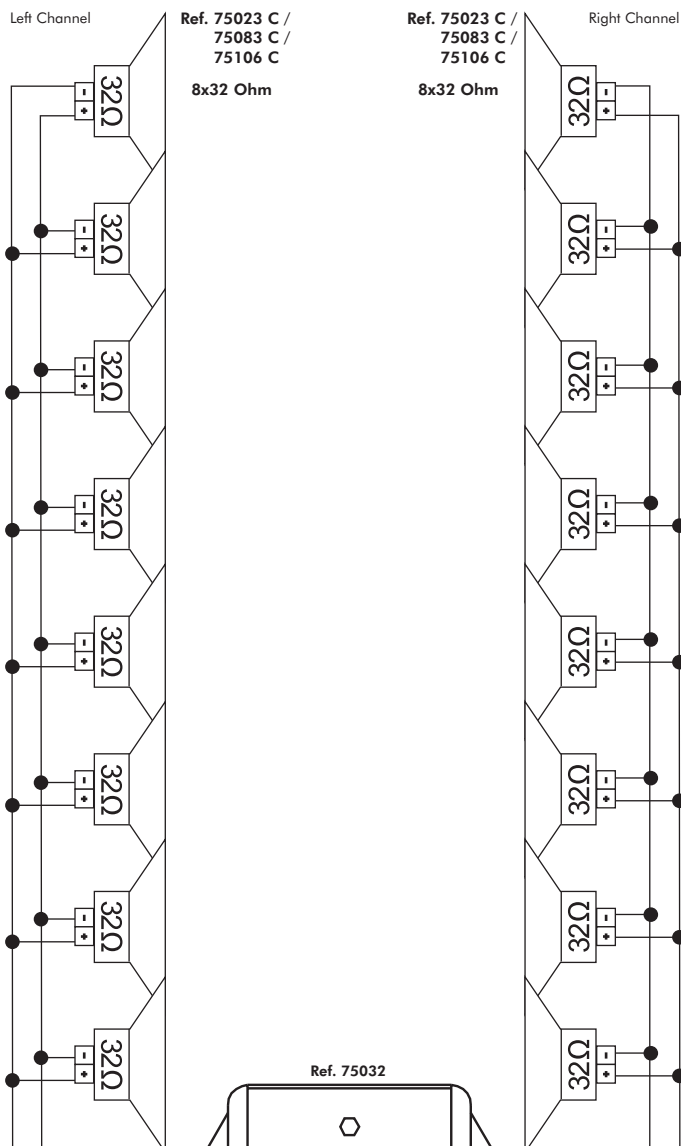
**Stereo Installation of 10 to 16 Loudspeakers
with Stereo/Mono Amplifier**

Left Channel

Ref. 75023 C /
75083 C /
75106 C
8x32 Ohm

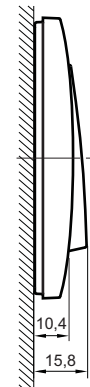
Ref. 75023 C /
75083 C /
75106 C
8x32 Ohm

Right Channel

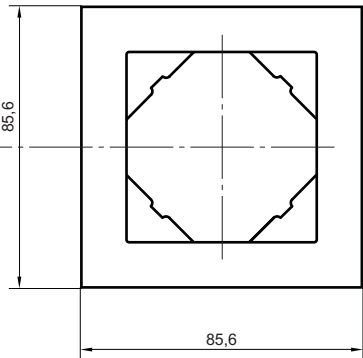


FRAMES DIMENSIONS (mm) - BASE AND AQUARELLA

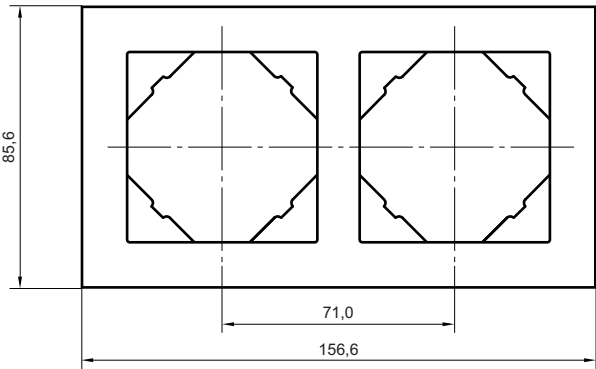
FRAME
+
ROCKER



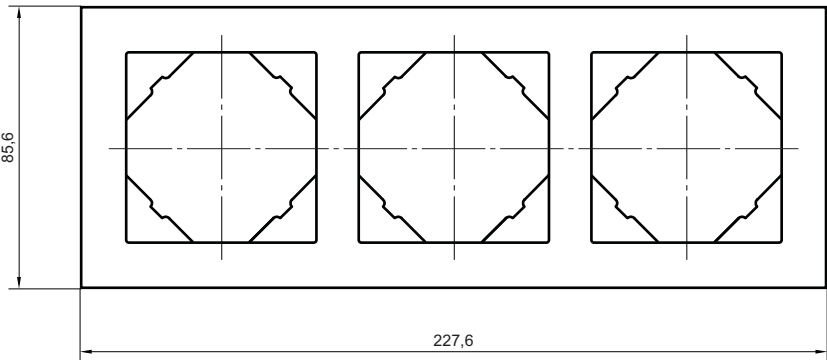
SINGLE



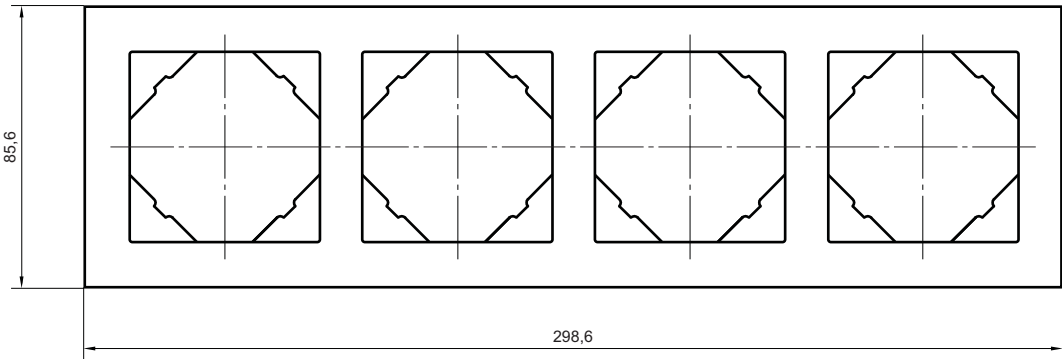
DOUBLE



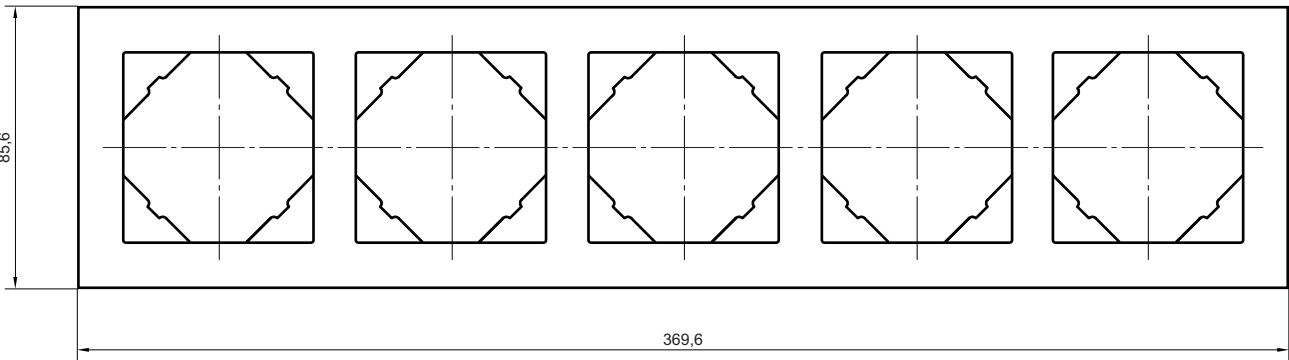
TRIPLE



FOUR-GANG

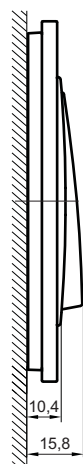


FIVE-GANG

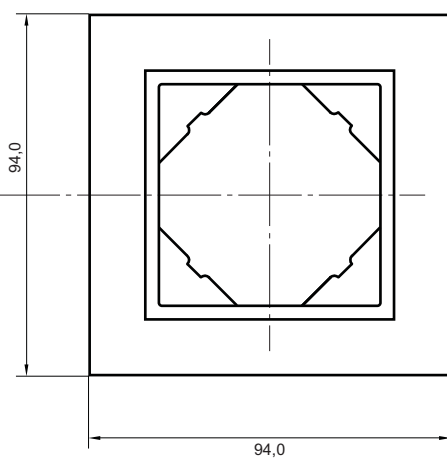


FRAMES DIMENSIONS (mm) - CRYSTAL, METALLO, ARBORE AND PETRA

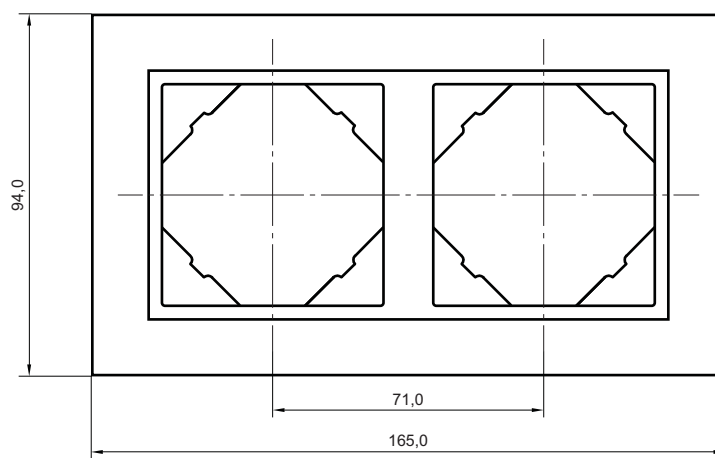
FRAME
+
ROCKER



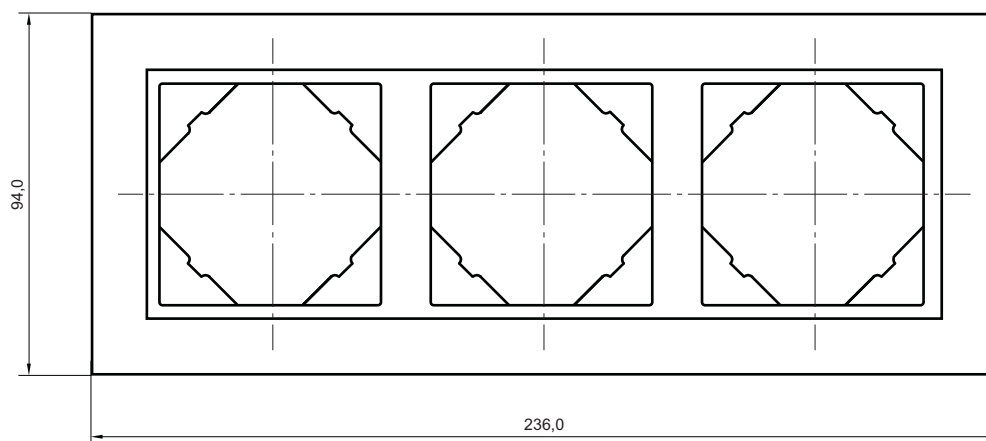
SINGLE



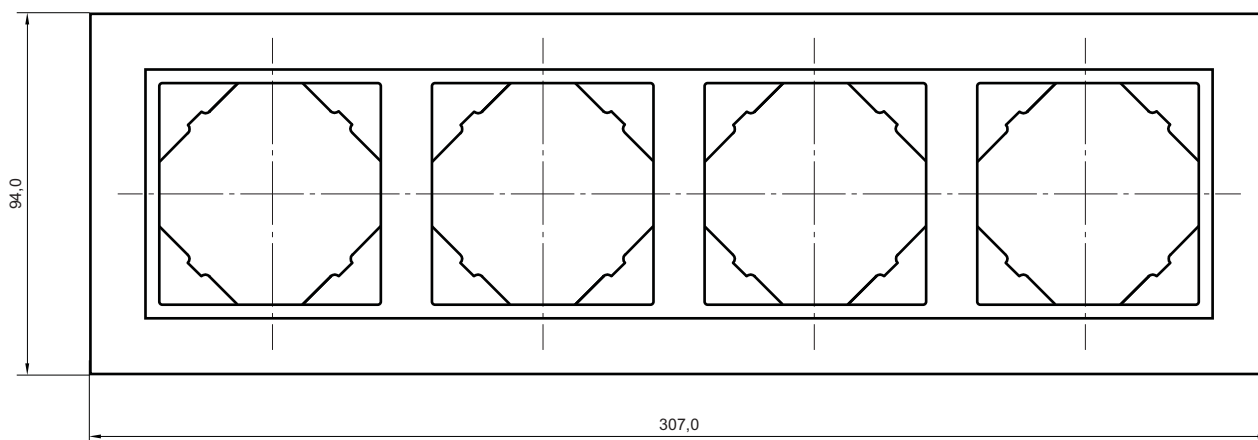
DOUBLE



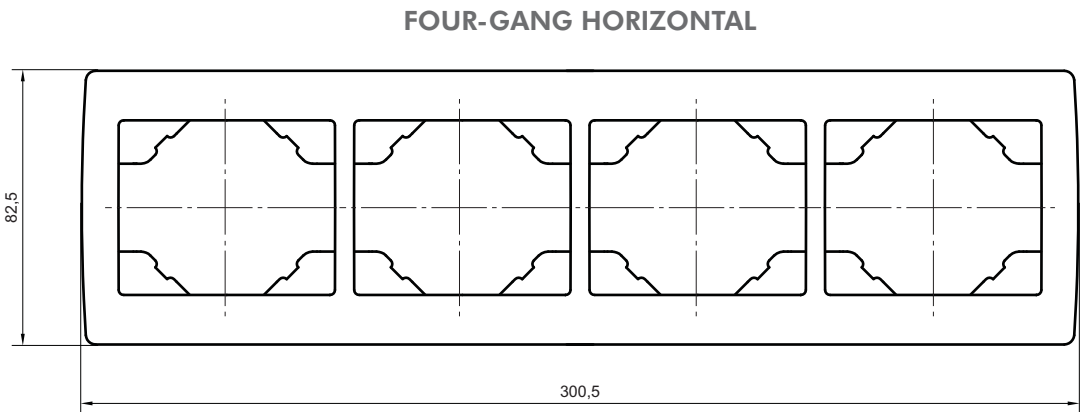
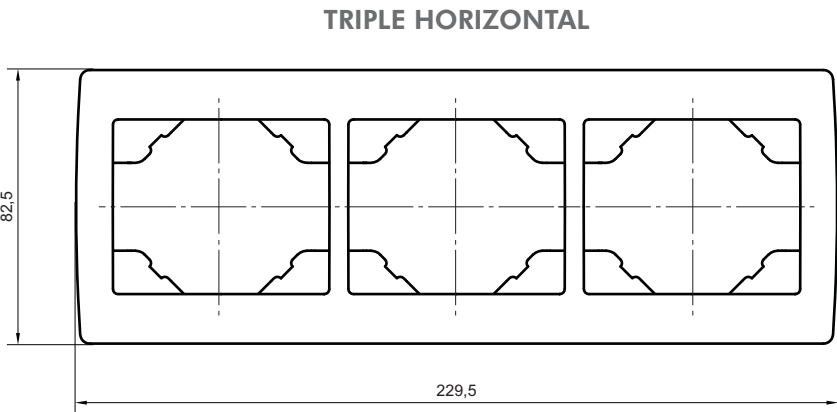
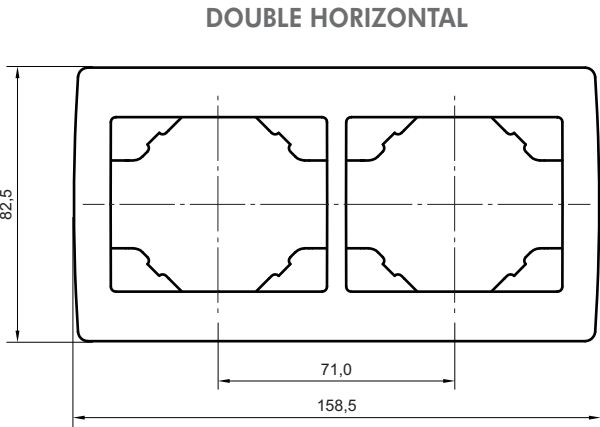
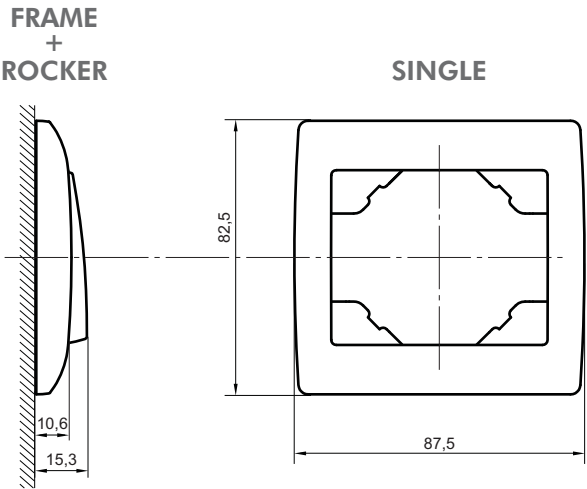
TRIPLE



FOUR-GANG

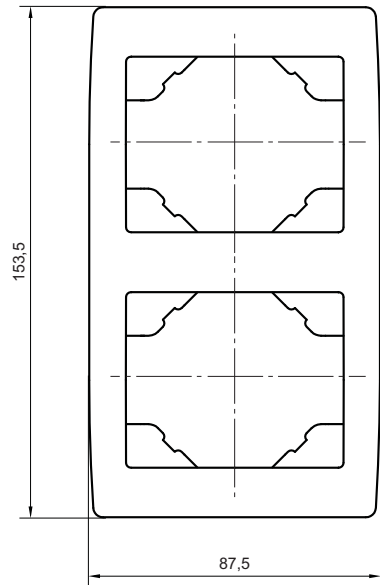


FRAMES DIMENSIONS (mm)

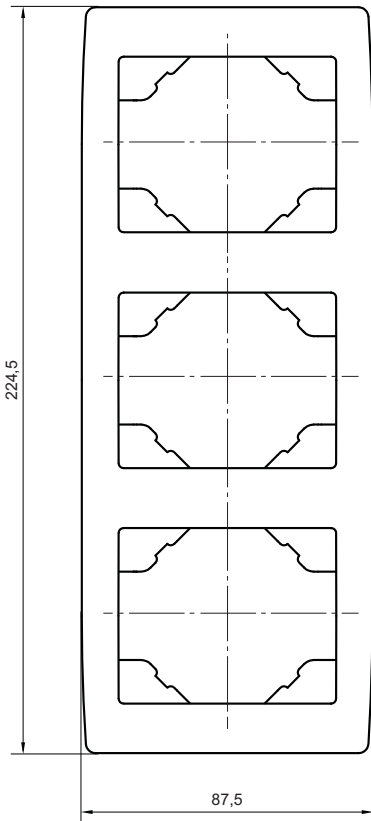


FRAMES DIMENSIONS (mm)

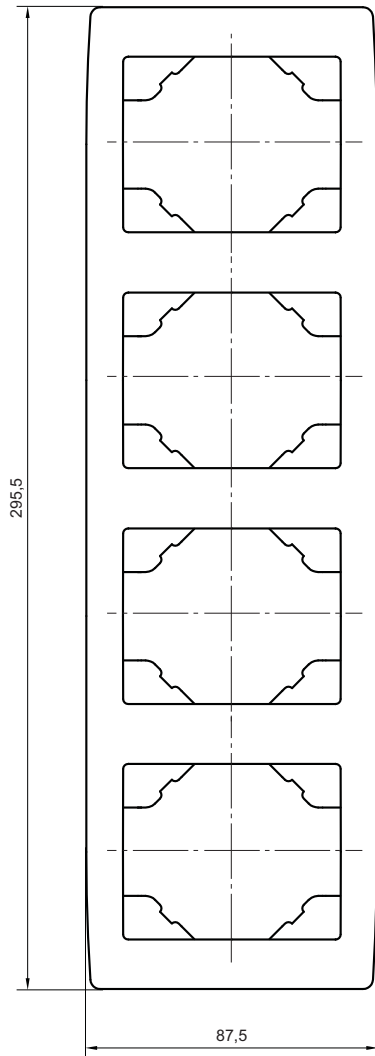
DOUBLE VERTICAL



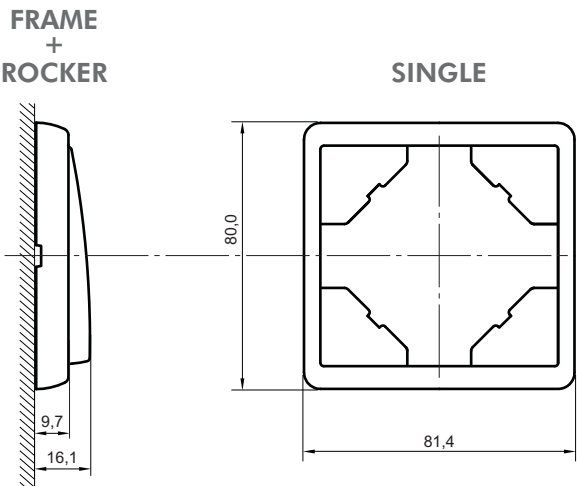
TRIPLE VERTICAL



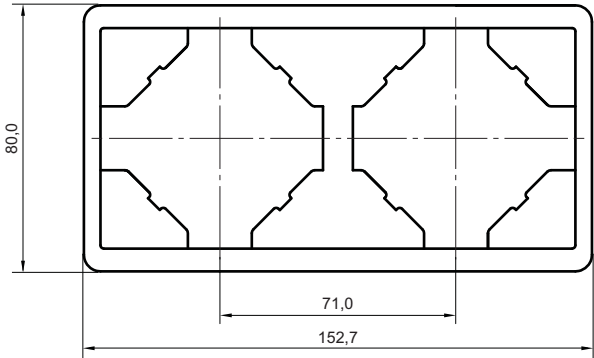
FOUR-GANG VERTICAL



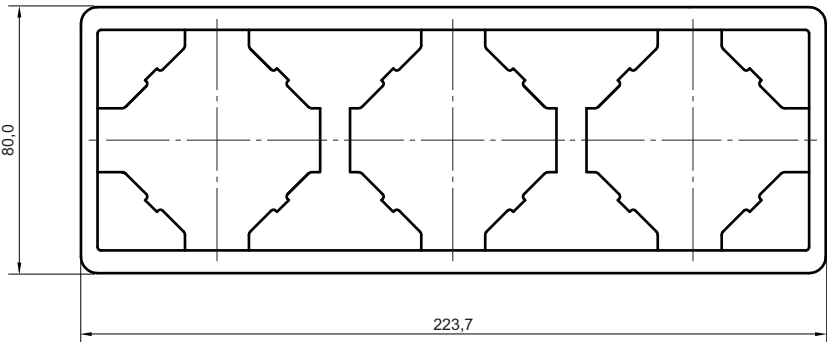
FRAMES DIMENSIONS (mm)



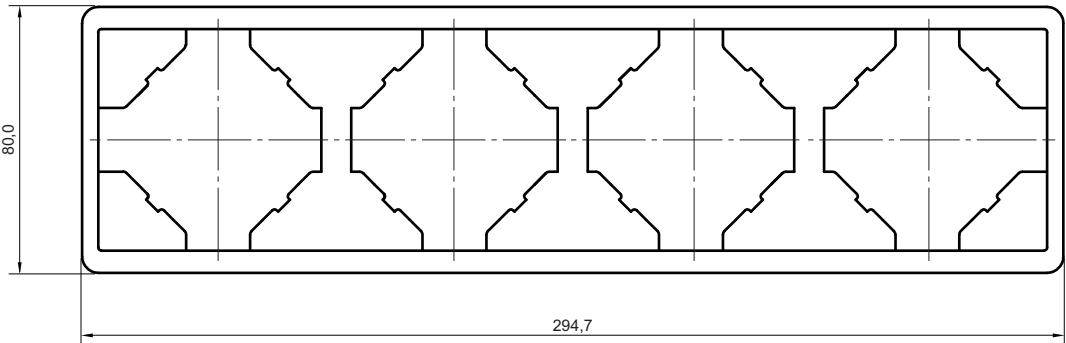
DOUBLE HORIZONTAL



TRIPLE HORIZONTAL

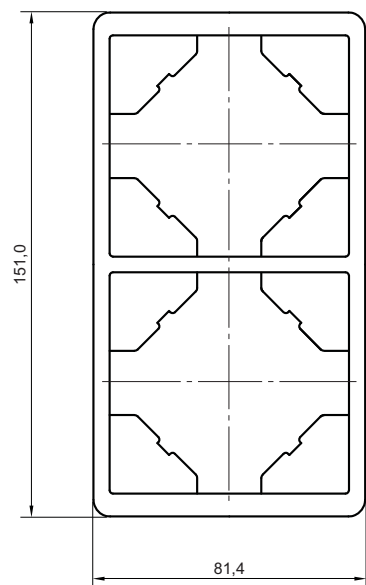


FOUR-GANG HORIZONTAL

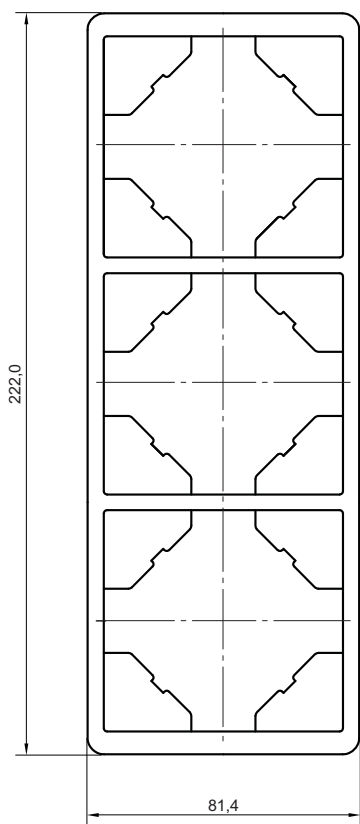


FRAMES DIMENSIONS (mm)

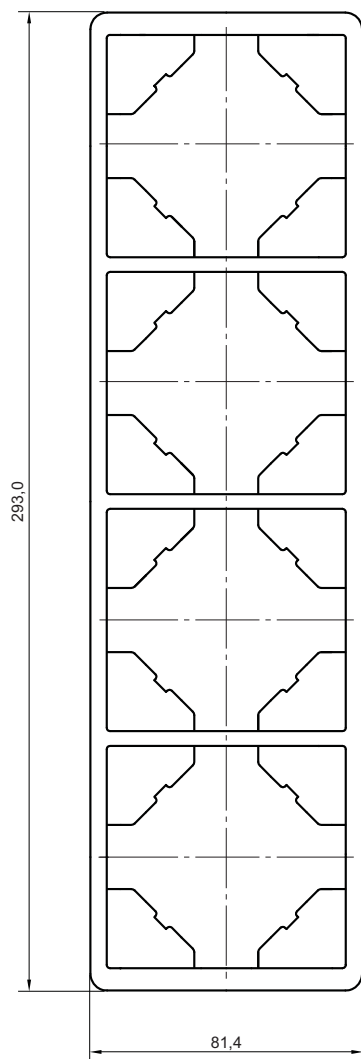
DOUBLE VERTICAL



TRIPLE VERTICAL



FOUR-GANG VERTICAL



1. CHARACTERISTICS

- Products in technical thermoplastic.

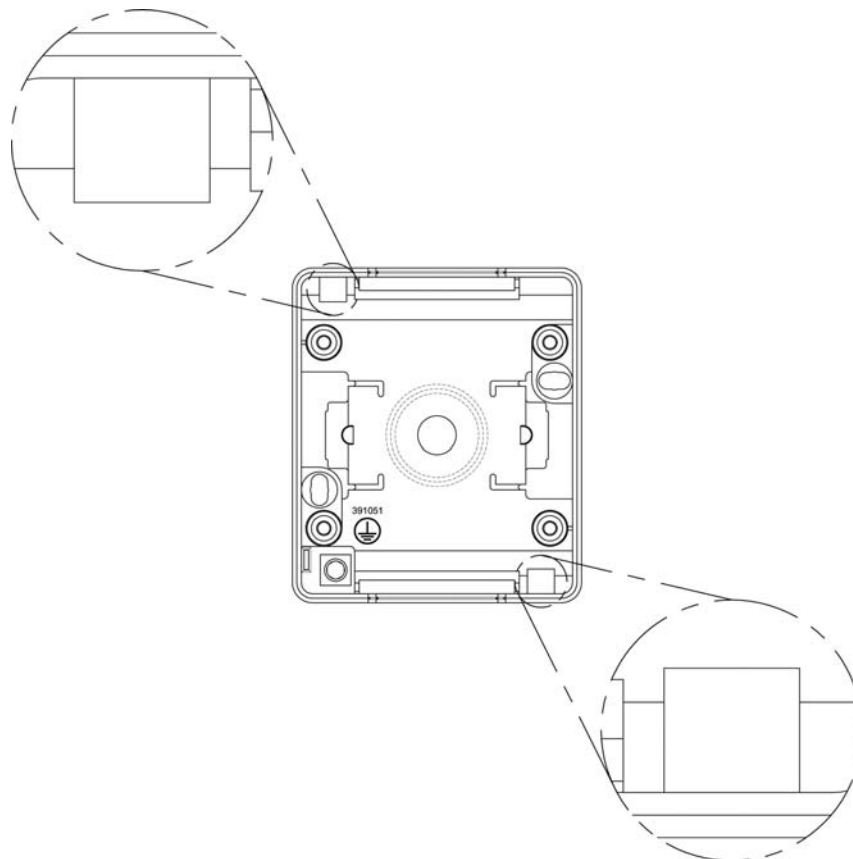
IP65

- Available colors:
 - Grey (RAL 7035)
 - White (RAL 9003)

IK07

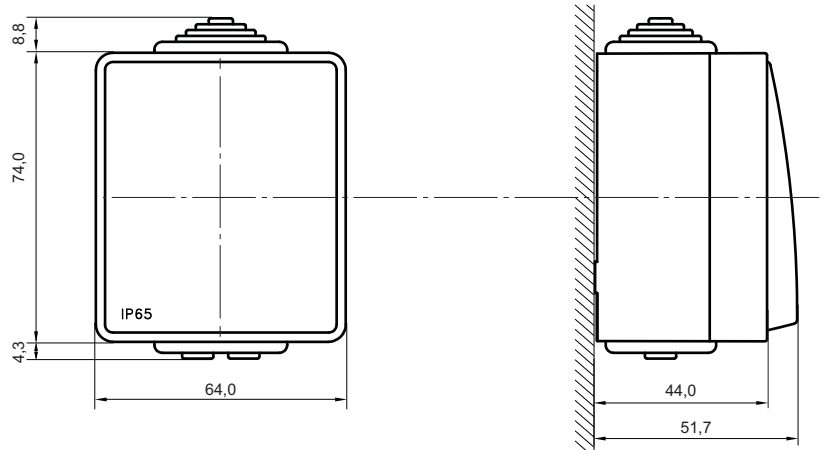
- **Draining Holes:**

All the products of the **Waterproof 48 Series** have two pre-drilled draining holes. Depending on the mounting position of the product, the draining hole pointing to the lower part of the base must be open.

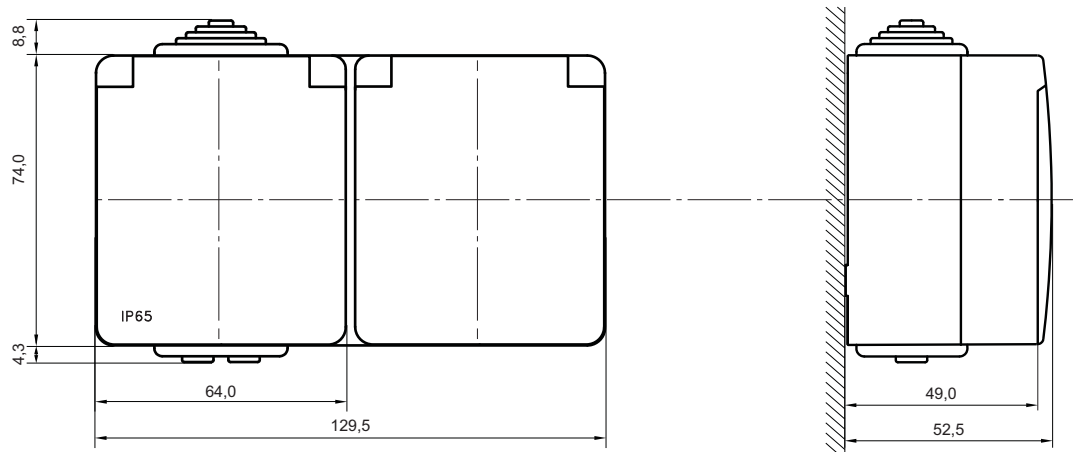


2. DIMENSIONS (mm)

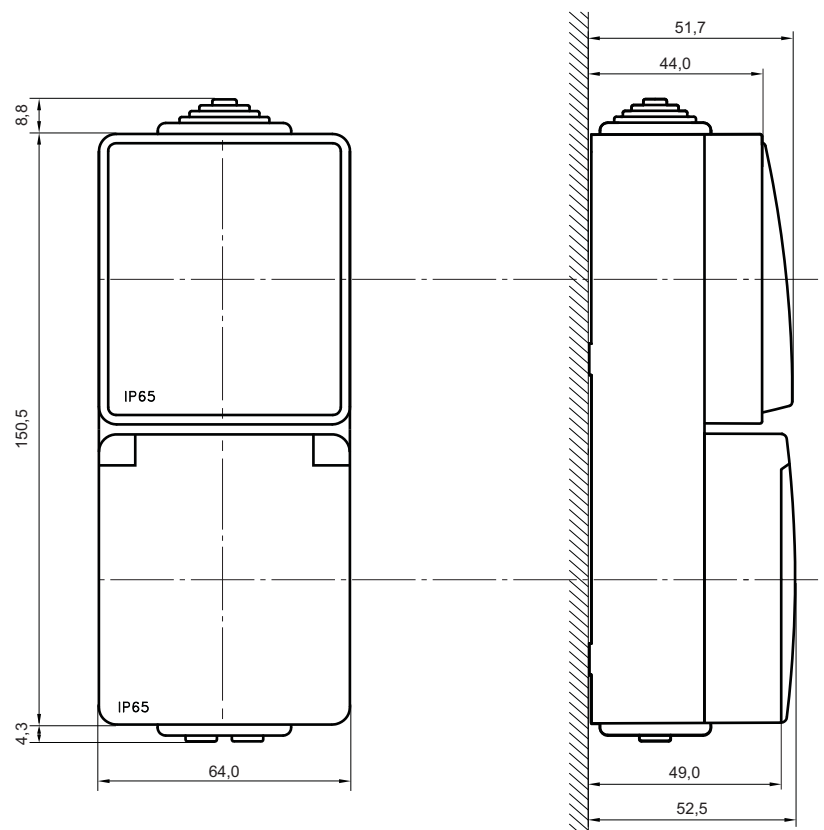
SINGLE



DOUBLE HORIZONTAL

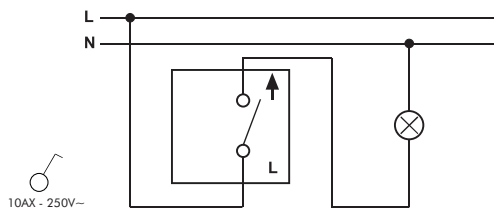


DOUBLE VERTICAL

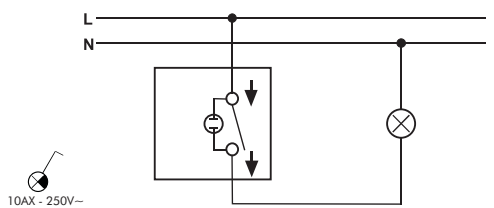


WIRING DIAGRAMS OF 2600, 3700 AND 47 SERIES

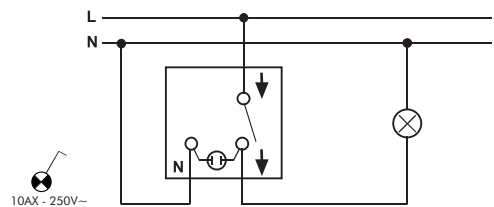
SINGLE POLE SWITCH



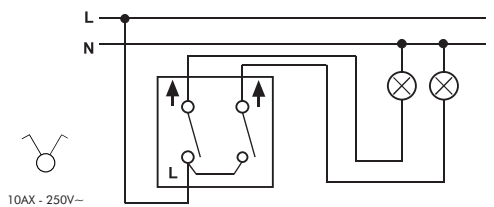
SINGLE POLE SWITCH WITH ORIENTING LIGHT



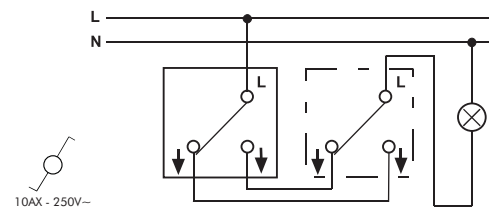
SINGLE POLE SWITCH WITH PILOT LAMP



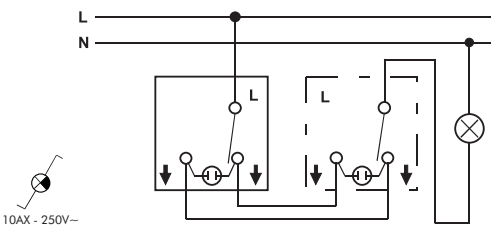
TWO CIRCUITS SWITCH



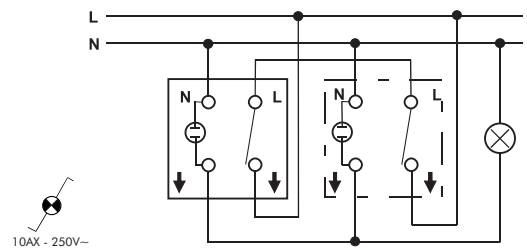
TWO-WAY SWITCH



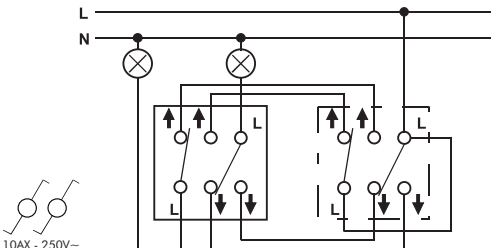
TWO-WAY SWITCH WITH ORIENTING LIGHT



TWO-WAY SWITCH WITH PILOT LAMP

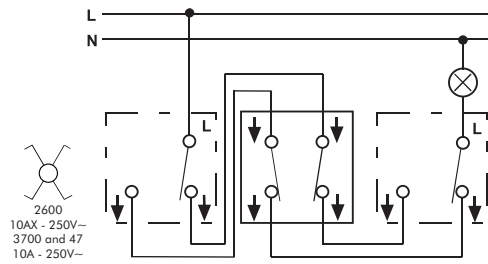


DOUBLE TWO-WAY SWITCH

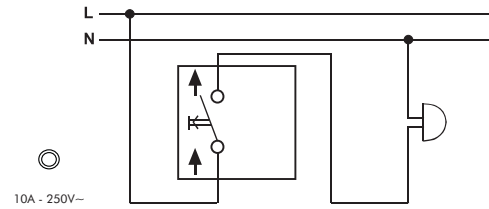


WIRING DIAGRAMS OF 2600, 3700 AND 47 SERIES

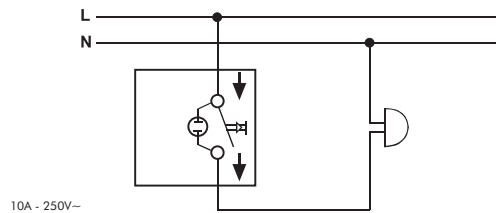
INTERMEDIATE SWITCH



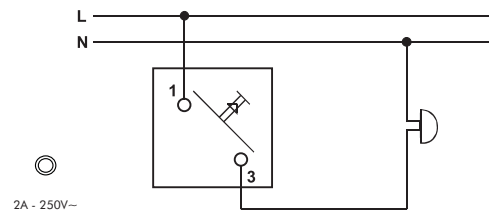
Button PUSH-BUTTON SWITCH



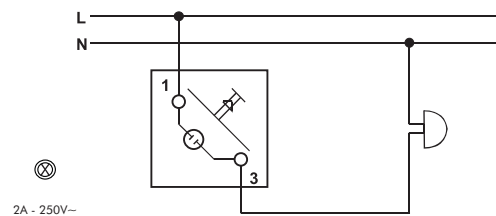
Button PUSH-BUTTON SWITCH WITH ORIENTING LIGHT



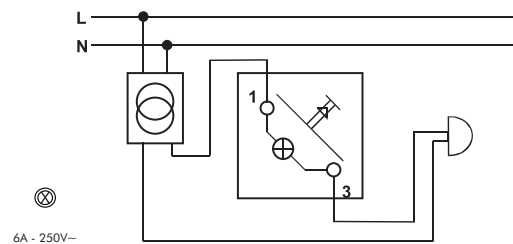
PUSH-BUTTON SWITCH



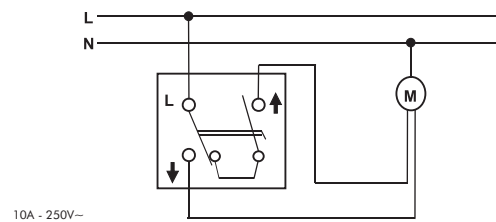
PUSH-BUTTON SWITCH WITH ORIENTING LIGHT (250V)



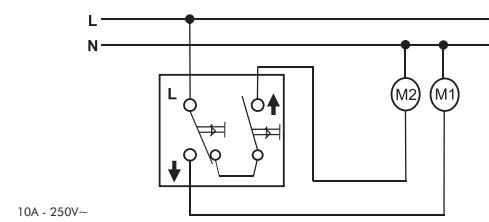
PUSH-BUTTON SWITCH WITH ORIENTING LIGHT (12V)



VENETIAN SWITCH

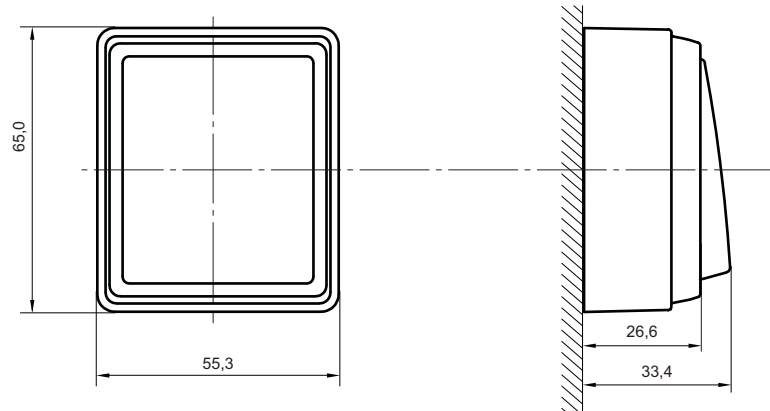


VENETIAN DOUBLE PUSH-BUTTON SWITCH

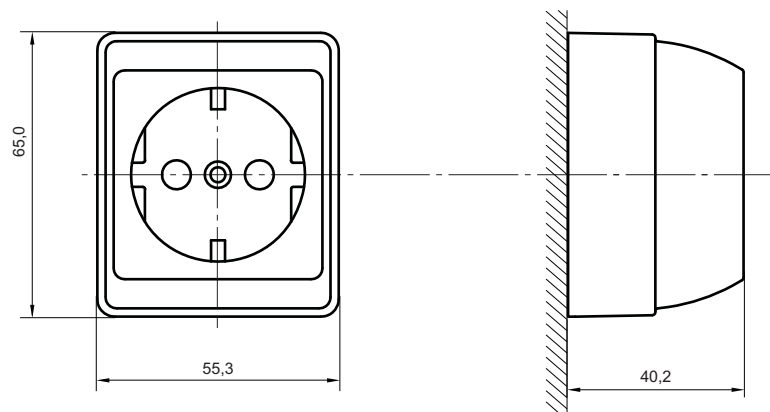


DIMENSIONS (mm)

SWITCHES



ENERGY SOCKETS



■ Characteristics:

- Products in technical thermoplastic.
- Applied in Surface Mounting Electrical Installations and with the 10 Series Cable-trunkings for Electrical and Telecommunications Installations.
- Available colors:
 - **White (RAL 9003)**, the same used in the EFAPEL Cable-trunkings Series.

RADIO, TELEVISION AND SATELLITE SOCKETS

3700 Series

47 Series

■ R TV - SAT Sockets (Impedance of 75 Ohm)

LINEAL	Outputs		Insertion Losses (dB)								Insertion Losses dB	Isolation between Outputs dB	Return Losses dB	DC Current Passage mA (DC)
	Male	R TV	Return	BI	FM	VHF	UHF	Dig. TV	SAT					
Ref.	Female	SAT	4-47 MHz	47-68 MHz	87-108 MHz	118-470 MHz	470-822 MHz	822-862 MHz	950-2150 MHz	2150-2400 MHz				
Terminal 37550 47550	IEC Male		1	1	1	1	2	3	--	--	--	--	--	--
	IEC Female		--	--	--	--	--	--	6	6	--	--	--	500mA

■ R - TV Sockets (Impedance of 75 Ohm)

EQUALIZED	Outputs		Insertion Losses (dB)								Insertion Losses dB	Isolation between Outputs dB	Return Losses dB	DC Current Passage mA (DC)
	Male	TV	Return	BI	FM	VHF	UHF	Dig. TV	SAT					
Ref.	Female	R	4-47 MHz	47-68 MHz	87-108 MHz	118-470 MHz	470-822 MHz	822-862 MHz	950-2150 MHz	2150-2400 MHz				
Terminal 37531 47531	IEC Male		0.5	0.5	--	0.5	0.5	0.5	--	--	--	--	--	--
	IEC Female		--	--	1	--	--	--	--	--	--	--	--	--
Crossover 37532 47532	IEC Male		6.0	6.0	--	6.0	6.0	6.0	--	--	2.0	--	--	--
	IEC Female		--	--	6.0	--	--	--	--	--	2.0	--	--	--

DVI - DATA, VOICE AND IMAGE

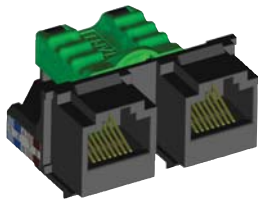
1. RJ45 UTP CONNECTORS



Ref. 21978
RJ45 Cat. 6 UTP Connector (250 MHz)



Ref. 21975
RJ45 Cat. 5e UTP Connector (100 MHz)



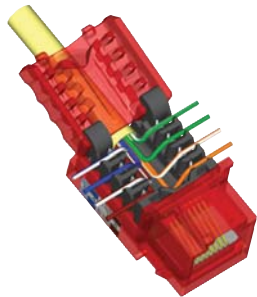
Ref. 21980
Double RJ45 Cat. 5e UTP Connector
(1 input, 2 outputs)

IDC Terminals	EIA/TIA 568 A		EIA/TIA 568 B	
	Pair	Wire Color	Pair	Wire Color
Pin 5	1	White/Blue	1	White/Blue
Pin 4		Blue		Blue
Pin 1	3	White/Green	2	White/Orange
Pin 2		Green		Orange
Pin 3	2	White/Orange	3	White/Green
Pin 6		Orange		Green
Pin 7	4	White/Brown	4	White/Brown
Pin 8		Brown		Brown

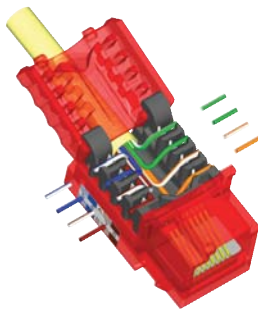
■ Characteristics:

- Reduced size.
- Quick assembly.
- Tool-free connection (connectors with self-peeling contacts).
- Robust and secure connection through an effective crimping and insulation system of the cables.
- Easy identification of the type of connector (Cat. 6 - Red and Cat. 5e - Green).
- Universal Keystone clamping system.
- Identification of contacts by double color code (EIA/TIA 568 A and 568 B).

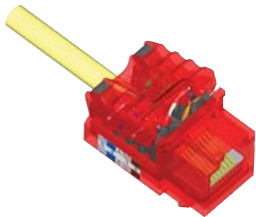
■ Assembly Sequence:



- Introduce the cable.
- Separate the pairs.
- Put the cables in the terminals.



- Cut the excess of cables.



- Close the lid and press until it is fixed to the base.

DVI - DATA, VOICE AND IMAGE

2. RJ45 STP CONNECTORS

**Ref. 21985**

RJ45 Cat. 5e STP Connector (100 MHz)

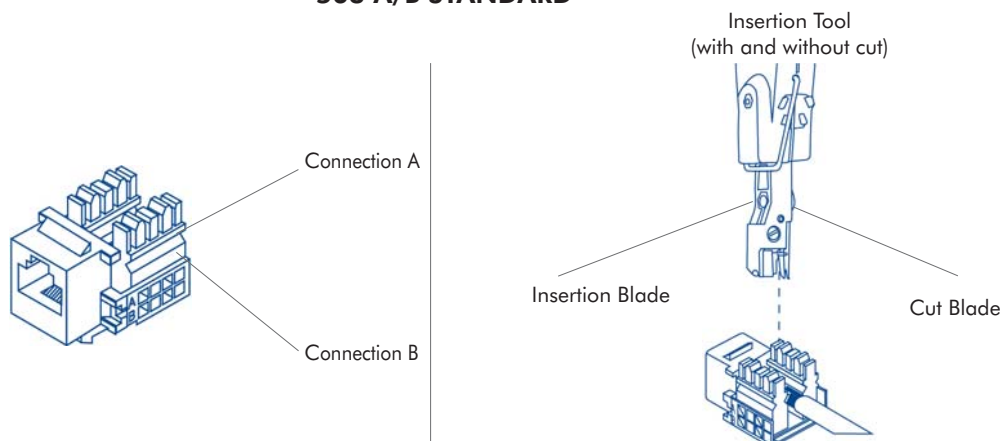
**Ref. 21988**

RJ45 Cat. 6 STP Connector (250 MHz)

■ **Characteristics:**

- Reduced size.
- Assembly with the Insertion Tool.
- Shielded with a metal cover.
- Universal Keystone clamping system.

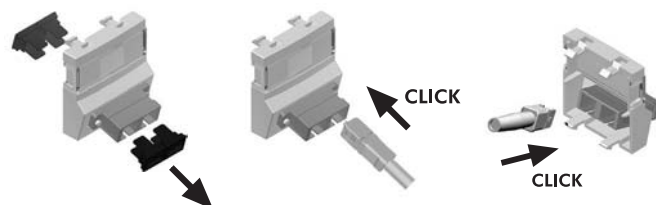
568 A/B STANDARD



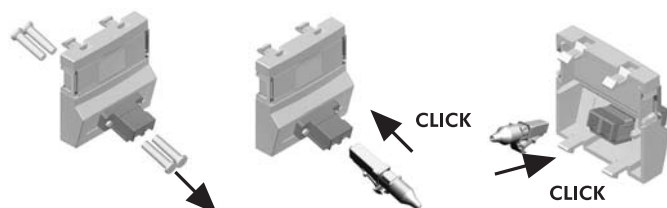
Note: In order to maintain the same category along the installation it must be used the same categories in the equipments or the same color code EIA/TIA 568 (A or B).

3. COUPLERS FOR FIBRE OPTIC CONNECTORS

SC-APC



LC

**NEW**

CLASSIFICATION OF CABLE-TRUNKINGS - EN 50085-2-1 Standard - Section 6

10 Series - Cable-trunkings for Electrical and Telecommunications Installations

Section 6	Classification	Miniature and Floor Cable-trunkings		Distribution Cable-trunkings
6.2	Resistance to the impact during the installation and application	12x7	0,5 J	2 J
		110x20	1 J	
		16x10 / 20x12,5 / 32x16 / 40x12,5 / 40x16 / 60x16 / 75x20	2 J	
6.3	Minimum Storage and Transport Temperature	-25°C		-25°C
6.3	Minimum Installation and Application Temperature	-5°C		-5°C
6.3	Maximum Installation Temperature	60°C		60°C
6.4	Resistance to flame propagation	Non-flame propagating		Non-flame propagating
6.5	Electrical continuity characteristic	Without Electrical continuity		Without Electrical continuity
6.6	Electrical Insulation	With electrical insulating		With electrical insulating
6.7	Protection degree provided by enclosure	IP44		IP44
6.8	Protection against corrosive or polluting substances	Medium protection outside and inside		Medium protection outside and inside
6.9	Access system and retention of the cover	The cover can only be opened with a tool		The cover can only be opened with a tool
6.10	Electrically protective separation	With and without internal protective partition (divider)		With internal protective partition (divider)
6.101	Intended installation positions	Surface mounted on wall and/or on the ceiling		Surface mounted on wall and/or on the ceiling
6.102	Prevention of contact between liquids and insulated conductors and live parts in case of mounted in a skirting position and on wet-treatment of floor	Not declared		Not declared
6.103	Type	Type 3 (Installation)		Type 3 (Installation)
	Rated Voltage	500V		500V



RoHS - All the Cable-trunkings and the respective Accessories manufactured by EFAPEL fulfil the specifications of the RoHS 2002/95/CE Directive that restricts the use of certain hazardous substances like lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ether (PBDE).

CLASSIFICATION OF CABLE-TRUNKINGS - EN 50085-2-1 Standard - Section

16 Series - Distribution Modular Cable-trunkings

13 Series - Trunkings for the Protection of Cables and Pipes

Section 6	Classification	16 Series - Distribution Modular Cable-trunkings	13 Series - Trunkings for the Protection of Cables and Pipes
6.2	Resistance to the impact during the installation and application	5 J	5 J
6.3	Minimum Storage and Transport Temperature	-25°C	-25°C
6.3	Minimum Installation and Application Temperature	-5°C	-5°C
6.3	Maximum Installation Temperature	60°C	60°C
6.4	Resistance to flame propagation	Non-flame propagating	Non-flame propagating
6.5	Electrical continuity characteristic	Without Electrical continuity	Without Electrical continuity
6.6	Electrical Insulation	With electrical insulating	With electrical insulating
6.7	Protection degree provided by enclosure	IP44	IP44
6.8	Protection against corrosive or polluting substances	Medium protection outside and inside	Medium protection outside and inside
6.9	Access system and retention of the cover	The cover can only be opened with a tool	The cover can only be opened with a tool
6.10	Electrically protective separation	With internal protective partition (divider)	Without internal protective partition (divider)
6.101	Intended installation positions	Surface mounted on wall and/or on the ceiling	Surface mounted on wall and/or on the ceiling
6.102	Prevention of contact between liquids and insulated conductors and live parts in case of mounted in a skirting position and on wet-treatment of floor	Not declared	Not declared
6.103	Type	Type 3	Type 2
	Rated Voltage	500V~	500V~



RoHS - All the Cable-trunkings and the respective Accessories manufactured by EFAPEL fulfil the specifications of the RoHS 2002/95/CE Directive that restricts the use of certain hazardous substances like lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ether (PBDE).



PROTECTION INDEX (IK) OF CABLE-TRUNKINGS - EN 50102 Standard

10 Series - Cable-trunkings for Electrical and Telecommunications Installations

Ref.	Outside Dimensions (mm)	Protection against the Mechanical Schoks IK
Miniature Cable-trunkings		
10010 CBR	12x7	IK05
10020 CBR	16x10	IK07
10030 CBR	20x12,5	IK07
10040 CBR	32x16	IK07
10050 CBR	40x12,5	IK07
10060 CBR	40x16	IK07
10070 CBR	60x16	IK07
10140 CBR	75x20	IK07
Skirt Cable-trunkings		
10100 CBR	110x20	IK05
Distribution Cable-trunkings		
10080 CBR	110x34	IK08
10090 CCZ	110x50	IK08

16 Series - Distribution Modular Cable-trunkings

Ref.	Outside Dimensions (mm)	Protection against the Mechanical Schoks IK
16010 CBR	75x50	IK08
16020 CBR	90x50	IK08
16030 CBR	155x50	IK08
16040 CBR	185x50	IK08
16050 CBR	90x65	IK08
16060 CBR	185x65	IK08

13 Series - Trunkings for the Protection of Cables and Pipes

Ref.	Outside Dimensions (mm)	Protection against the Mechanical Schoks IK
13010 CBR	25x30	IK08
13020 CBR	40x40	IK08
13030 CBR	60x40	IK08
13040 CBR	60x60	IK08
13050 CBR	80x40	IK08
13060 CBR	80x60	IK08
13070 CBR	100x40	IK08
13080 CBR	100x60	IK08

TABLES of CABLES and CRITERIA for CABLE-TRUNKINGS SELECTION

Table of Cables

■ Energy Cables

Diameter and Section Table of some common use cables.
(The dimensions may vary according to the manufacturer.)

■ Data and Telephone Cables

Diameter and Section Table of some common use data cable, UTP, STP, FTP and Coaxial type.
(The dimensions may vary according to the manufacturer.)

Type of Cable	Nominal Section (mm)	Diameter (mm)	Section (mm ²)	Type of Cable	Diameter (mm)	Section (mm ²)
H05 VV-F	2x0,75	7,6	58	4 Pairs UTP Cat. 5e Cable	6,2	37,5
H05 VV-F	2x1	8,0	64	4 Pairs FTP Cat. 5e Cable	6,9	47,2
H05 VV-F	2x1,5	9,0	81	4 Pairs UTP Cat. 6 Cable	7,6	57
H05 VV-F	2x2,5	11,0	121	4 Pairs FTP Cat. 6 Cable	8,3	68
H05 VV-F	3 G 0,75	8,0	64	RG 59 Coaxial Cable	6,2	38,4
H05 VV-F	3 G 1	8,4	71	RG 58 Coaxial Cable	5	25
H05 VV-F	3 G 1,5	9,8	96	RG 11 Coaxial Cable	10,5	110,3
H05 VV-F	3 G 2,5	12,0	144	RG 8 Coaxial Cable	10,3	106,1
H07 V-U	1x1,5	2,8	7,84	RG 7 Coaxial Cable	8,1	65,6
H07 V-U	1x2,5	3,4	11,56	RG 6 Coaxial Cable	7	49
H07 V-U	1x4	3,8	14,44	TVHV 1x2x0,5 Cable	4,3	18,5
H07 V-U	1x6	4,4	19,36	TVHV 2x2x0,5 Cable	5,0	25
H07 V-K	1x1,5	3,5	12	TVHV 3x2x0,5 Cable	5,7	32,5
H07 V-K	1x2,5	4,2	18	TVHV 6x2x0,5 Cable	6,5	42,3
H07 V-K	1x4	4,8	23	TVHV 10x2x0,5 Cable	7,8	60,8
H07 V-K	1x6	6,3	40	TVHV 15x2x0,5 Cable	8,7	75,7
H07 V-K	1x10	7,6	58	TVHV 20x2x0,5 Cable	9,7	94,1
VV-0,6/1 KV	3x16+10	20,7	428	TVHV 30x2x0,5 Cable	12,0	144
VV-0,6/1 KV	3x25+16	23,0	529	TVHV 40x2x0,5 Cable	13,5	182,3
VV-0,6/1 KV	3x35+16	25,0	625	TVHV 50x2x0,5 Cable	15,0	225
VV-0,6/1 KV	4 G 1,5	11,4	130	TVHV 100x2x0,5 Cable	20,0	400

Criteria for Cable-trunkings Selection

Examples for common installations:

Cables to be Installed

Type of Cable	Quantity (Q)	Nominal Section (S)	Outside Diameter (d) (mm)	Unitary Section (Su) (Su= dxd)	Total Section (St) (mm ²) (SuxQ)
H07 V-U	20	1x4	3,8	14,44	288,8
H07 V-U	15	1x6	4,4	19,36	290,4
H07 V-U	10	1x2,5	3,4	11,56	115,6
H07 V-U	10	1x4	3,8	14,44	144,4
Cable Total Section (St)					839,2mm²
Minimum Trunkings Section = Cables Total Section (St) x K = 839,2 x 1,4 =					1174,88mm²

Typical K values to ensure better ventilation, crossings and possible augmentations:

K = Filling Coefficient

K = 1,4 for Low Voltage, Power Cable

K = 1,3 for Data and Telephone Cables

K = 1,2 for Tubes

It is possible to choose one of the following EFAPEL's cable-trunkings:

Cable-trunkings			
Ref.	Description	Internal Section (mm ²)	Available Section (mm ²)
10080 CBR	110x34 Trunking	3111,2	2222
13030 CBR	60x40 Trunking	1973,7	1410
16020 CBR	90x50 Trunking	3956	2826

MODULAR PROTECTIONS AND DEVICES FOR ELECTRICAL PANELS

The products of the MODUS 55 Series are designed and manufactured in accordance with European and International Standards that rule these type of products:

- **EN 60898 - IEC 60898:** "Circuit Breakers for Overcurrent Protection for household and similar installations"
- **EN 61008 - IEC 61008:** "Residual Current operated Circuit Breakers without integral Overcurrent Protection for household and similar uses"
- **EN 61643-1:** "Low-voltage Surge Protective Devices - Part 1: Surge Protective Devices Connected to Low-voltage Power Distribution Systems"
- **EN 60947-3 - IEC 60947-3:** "Low-voltage Switchgear and Controlgear - Part 3: Switches, Disconnectors, Switch-disconnectors and Fuse-combination Units"

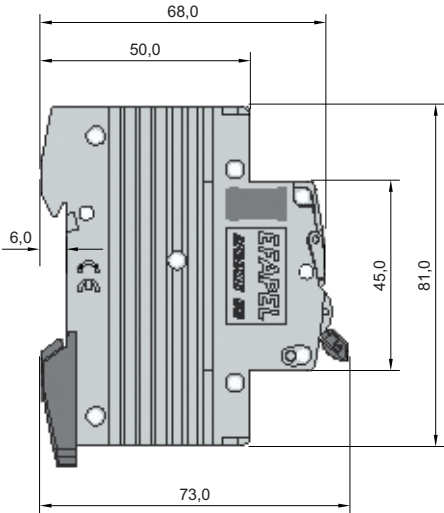
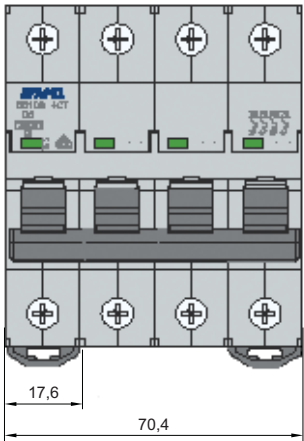


1. MINIATURE CIRCUITS BREAKERS (MCBs)

■ Characteristics:

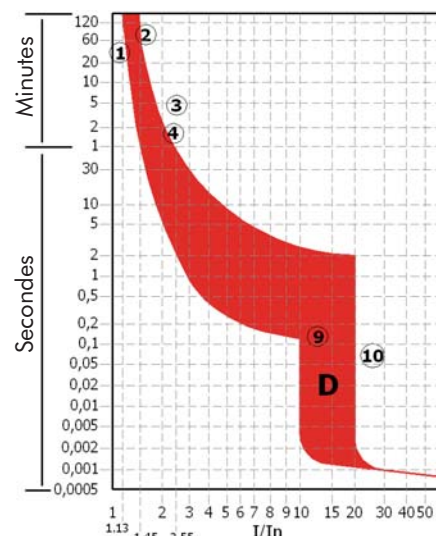
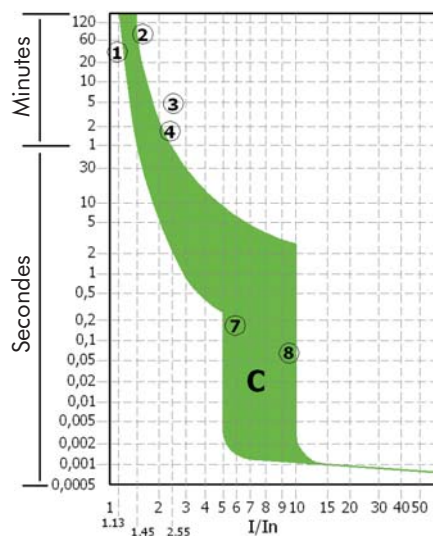
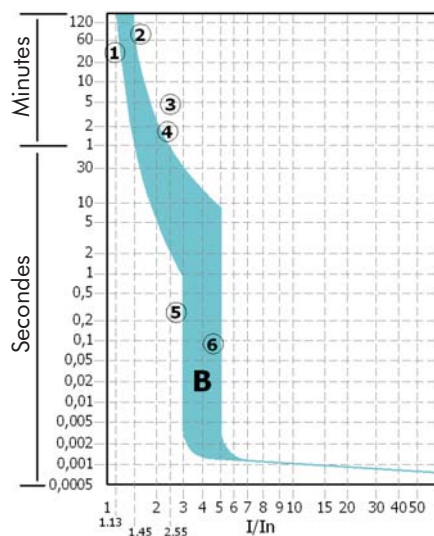
Characteristics	Range						
Type	PLUS	SUPER			ULTRA		
Rated Voltage	230/400V~	230/400V~			230/400V~		
Breaking Capacity	4,5kA	6kA			10kA		
Tripping Curve	C	C	B	D	C	B	D
Rated Current	6 to 63A	1 to 63A	1 to 63A	1 to 63A	1 to 63A	1 to 63A	1 to 63A
Energy Limitation Class	3	3			3		
Isolation Voltage	660V~						
Protection Index	IP20						
Certification	SEMKO						

■ Dimensions (mm):



MODULAR PROTECTIONS AND DEVICES FOR ELECTRICAL PANELS

■ Tripping Curves:



■ Operating Time when Operating in Overload:

Current	Operating time	Zone
1,13 In	$t \geq 1$ hour	①
1,45 In	$t < 1$ hour	②
2,55 In	$I_n \leq 32A \Rightarrow t < 60\text{sec.}$	③
	$I_n > 32A \Rightarrow t < 120\text{sec.}$	④

■ Operating Time when Operating in Short-circuit:

Tripping Characteristics	Current	Operating Time	Zone	Use
B	3 In	$t \geq 0,1\text{sec.}$	⑤	Protection of electrical circuits with resistive loads.
	5 In	$t < 0,1\text{sec.}$	⑥	
C	5 In	$t \geq 0,1\text{sec.}$	⑦	Protection of general purpose electrical circuits.
	10 In	$t < 0,1\text{sec.}$	⑧	
D	10 In	$t \geq 0,1\text{sec.}$	⑨	Protection of electrical circuits with loads that produce high transient currents.
	20 In	$t < 0,1\text{sec.}$	⑩	

MODULAR PROTECTIONS AND DEVICES FOR ELECTRICAL PANELS

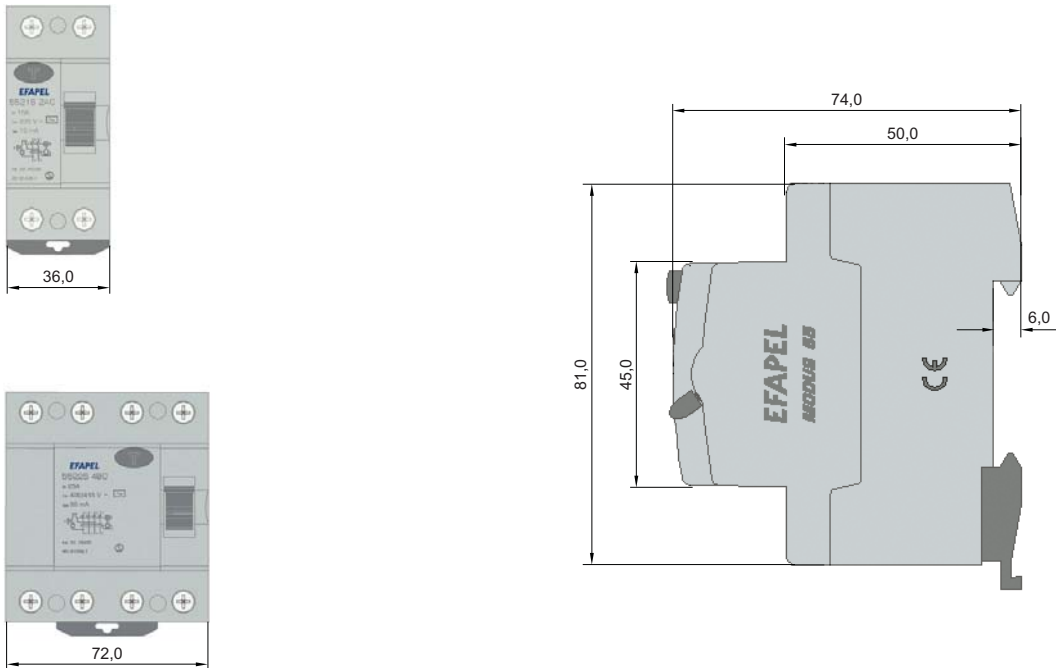
2. RESIDUAL CURRENT CIRCUIT BREAKERS (RCCBs)

■ Characteristics:

Characteristics	DIF Range	
Number of Poles	2	4
Rated Voltage	230V~	400V~
Type	A and AC Classes	A and AC Classes
Sensibility	10, 30, 300 and 500mA	30, 300 and 500mA
Rated Current	16, 25, 40 and 63A	25, 40 and 63A
Breaking Capacity	10 In for In ≤ 50A 630A for In = 63A	
Isolation Voltage	660V~	
Protection Index	IP20	
Certification	SEMKO	

-  **Transient Protection** - The Residual Current Circuit Breakers DIF Type are protected against nuisance tripping caused by transient leakage currents (lightning, capacitive loads).
-  **AC Class** - General purpose, protects the environment in the presence of leakage of current with a purely sinusoidal waveform.
-  **A Class** - For facilities with equipment such as rectifiers, triacs, etc., causing a leakage of current with DC current components, undetectable by the AC Class devices.

■ Dimensions (mm):



MODULAR PROTECTIONS AND DEVICES FOR ELECTRICAL PANELS

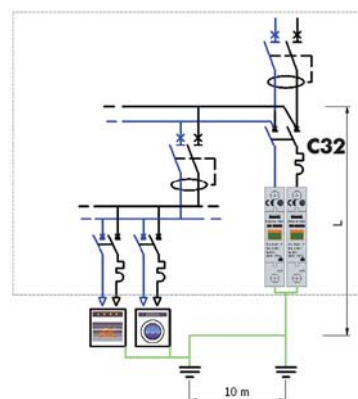
3. OVER-VOLTAGE AND SURGE PROTECTION DEVICES - IEC 61643-1 STANDARD (SPDs)

■ Characteristics:

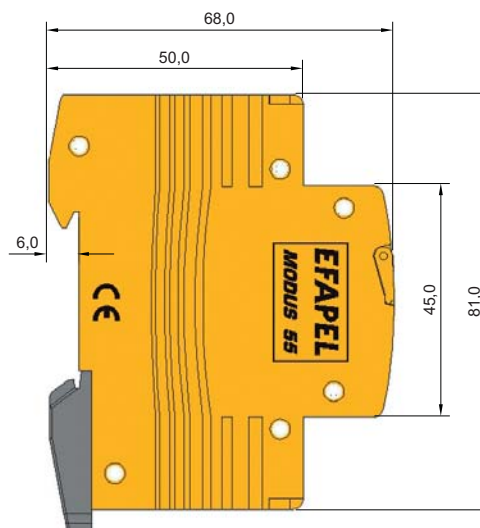
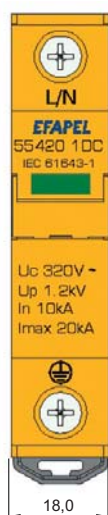
Characteristics	References			
	55410 1DC	55420 1DC	55440 1DC	55460 1DC
Un - Rated Voltage (cov)	230V~	230V~	230V~	380V~
Uc - Maximum Continuous Operating Voltage	320V~	320V~	320V~	420V~
Up - Protection Level (8/20 μ seg)	1,0kVp	1,2kVp	1,5kVp	2,0kVp
In - Rated Discharge Current (8/20 μ seg)	5kA	10kA	20kA	30kA
I _{max} - Maximum Discharge Current (8/20 μ seg)	10kA	20kA	40kA	60kA
Tr - Response Time	< 25ns			
T - Operating Temperature	-40°C to +80°C			
P - Number of Poles	1			
Protection Index	IP20			
Terminal's Capacity	1x50mm ² or 2x20mm ²			
Colour of the Body	Red	Orange	Grey	Brown

■ Rules for the installation of Over-voltage and Surge Protection Devices

- The correct operation and performance of the SPDs are assured when the ground installation is made in accordance with the official electrical codes, rules and prescriptions determined by the government or by the official entities.
- The total length of the connection cables to the SPDs (L) must be as short as possible (<0,5m).
- It must be avoided to make derivations in the circuit of the SPDs. With currents up to 50A, the derivations must be made over the same terminals of the SPDs (terminal's connection capacity: 2 x 20mm² cross section cables).
- The circuit where the SPDs are connected must be protected against overloads and short circuits. It is recommended the use of a MCBs of 32 A - C Curve (C32).
- If the installation has different protection levels against over voltages, it is recommended that the length of the cable that connect the main SPDs with a secondary SPDs is greter than 1m, in order to avoid the simultaneous conduction of both devices.



■ Dimensions (mm):



MODULAR PROTECTIONS AND DEVICES FOR ELECTRICAL PANELS

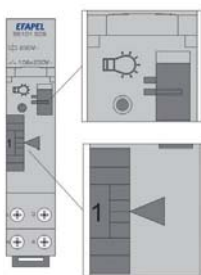
4. STAIRCASES TIME-DELAY SWITCH

■ **Description:** It allows the manually connecting and automatically disconnecting of a lighting installation after a programmed time-delay. The activation is made by the use of standard or luminous push-buttons (Max 50 mA).

■ **Characteristics:**

Characteristics	
Rated Voltage	230V~ - 50/60Hz
Rated Current	10A
Time Adjustment	45sec. to 7min.
Size	1 Mód. DIN
Operating Temperature Range	-10°C to 60°C
Protection Index	IP20
Insulation Class	Class II
Maximum stand-by current of Push-Buttons	50mA

■ **Operating Instructions:**



– Manual Control

⬤ Always ON

⬤ Automatic Operation

– Automatic Control

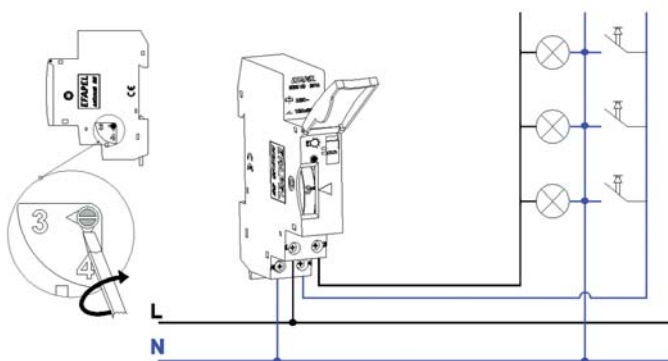
– Time Adjustment: turn the knob until it points to the desired value of time.

– The staircases time-delay switch is provided with the command circuit closed (the light will turn on when is connected for the first time) and the first interruption will happen after finalized the first timing cycle.

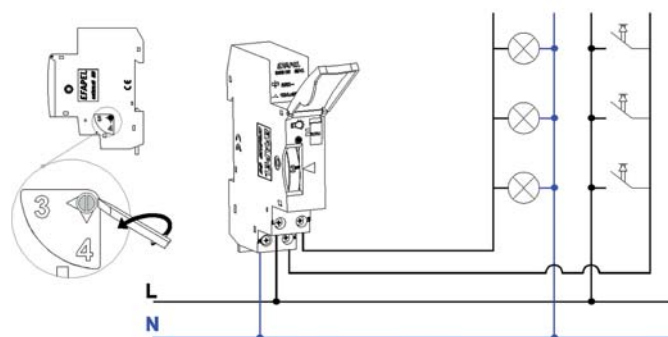
■ **Installation:** DIN track, in electrical panels.

■ **Wiring Diagrams:**

a) With 3 wires



b) With 4 wires



MODULAR PROTECTIONS AND DEVICES FOR ELECTRICAL PANELS

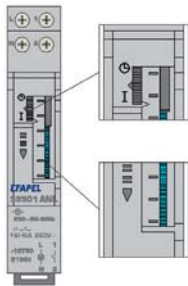
5. ANALOGUE DAILY CLOCK SWITCH OF 1 CHANNEL

■ **Description:** It allows to control the operation of an electric installation or an equipment according with a daily program. The minimum time of a program is 15 minutes.

■ **Characteristics:**

Characteristics	
Rated Voltage	230V~ - 50/60Hz
Rated Current	16A
Battery Back-up Time	100h
Precision	1 sec./day
Programming Time (Max/Min)	24h/15min
Size	1 Mod. DIN
Power Consumption	0,5W
Operating Temperature Range	-10°C to +50°C
Protection Index	IP20
Insulation Class	Class II

■ **Operating Instructions:**

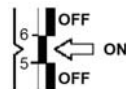


– Manual Control: 2 Positions

⌚ - Automatic Operation

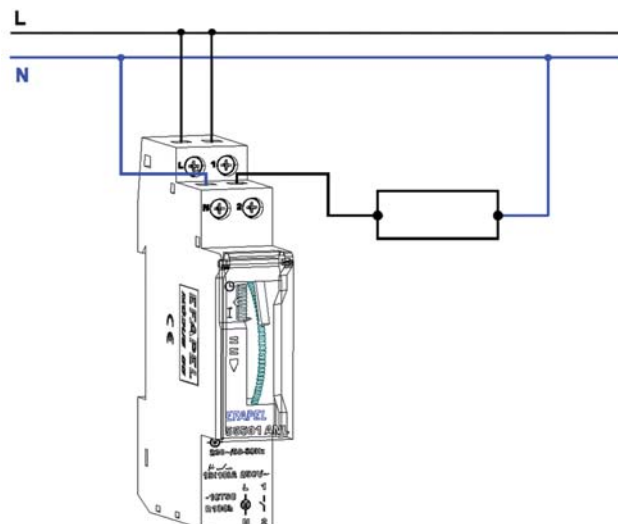
I - Always ON

– Programming: Shift to the left all the cams corresponding to the time periods needed for the operation.



■ **Installation:** DIN track, in electrical panels.

■ **Wiring Diagram:**



MODULAR PROTECTIONS AND DEVICES FOR ELECTRICAL PANELS

6. DIGITAL DAILY/WEEKLY CLOCK SWITCH OF 1 CHANNEL

■ **Description:** It allows to control the operation of an electric installation or an equipment according with a daily or a weekly program. It can memorize the programs with a maximum capacity of 32 Blocks. The output functions are ON, OFF and Impulse from 1 to 59 seconds. It produces the automatic adjustment of the time in Summer and Winter. Is possible to program a Stand By period.

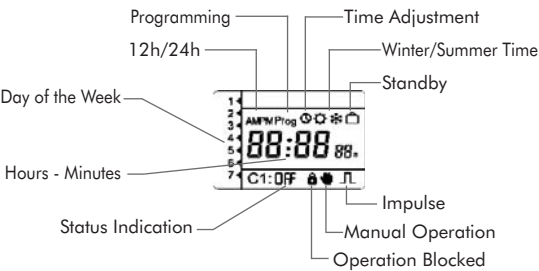
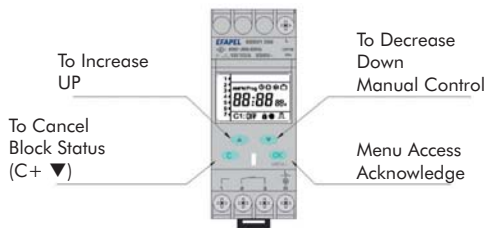
■ **Characteristics:**

Characteristics	
Rated Voltage	230V~ - 50/60Hz
Rated Current	16A
Battery Back-up Time	100h
Precision	1sec./day
Memory Capacity	32 Blocks
Output Functions	ON, OFF and Impulse (1 to 59sec.)
Size	2 Mod. DIN
Power Consumption	1W
Operating Temperature Range	-10°C to +50°C
Protection Index	IP20
Insulation Class	Class II
Output Type	NO and NC

■ **Recommended Maximum Loads:**

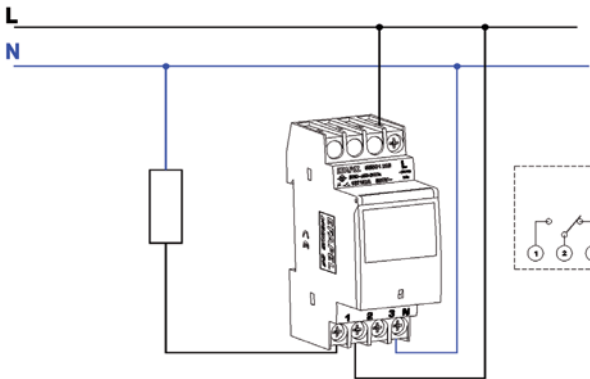
- Incandescent Lamps: 300W
- Fluorescent Lamps: 1200W
- Halogen Lamps MBT: 1000VA (with Transformer)
- Halogen Lamps 230V~: 2500W
- Energy Saving Lamps: 200W

■ **Operating Instructions:**



■ **Installation:** DIN track, in electrical panels.

■ **Wiring Diagram:**



MODULAR PROTECTIONS AND DEVICES FOR ELECTRICAL PANELS

7. CONTACTOR 2 POLE

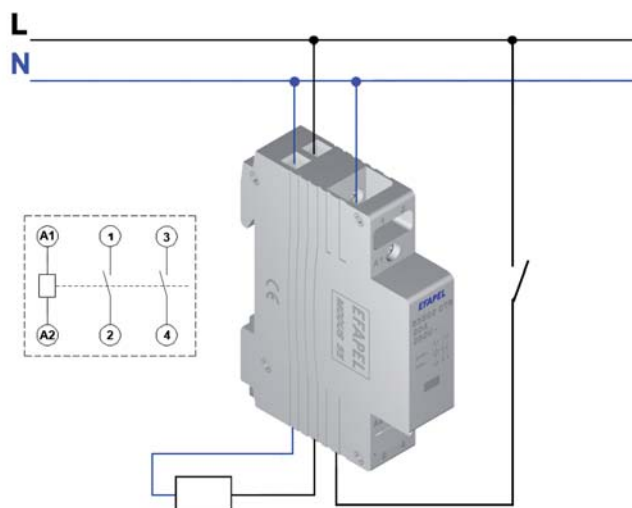
■ **Description:** It allows to control a specific load that needs a High Rated Current through a command that has a low breaking capacity, creating a separation of the high power circuit from the command circuit.

■ **Characteristics:**

Characteristics	
Rated Voltage	230V~
Rated Current	20A
Frequency	50/60Hz
Control Voltage	230V~
Size	1 Mod. DIN
Output Contact	2NA
Operating Temperature Range	-10°C to +50°C
Protection Index	IP20
Insulation Class	Class II

■ **Installation:** DIN track, in electrical panels.

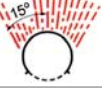
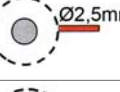
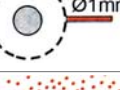
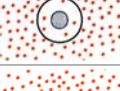
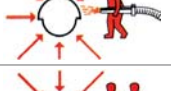
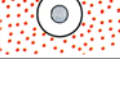
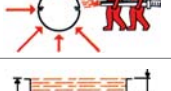
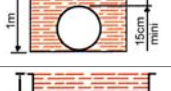
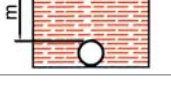
■ **Wiring Diagram:**



PROTECTION INDEX

1. Protection index against the penetration of solid objects and against the water (IP)

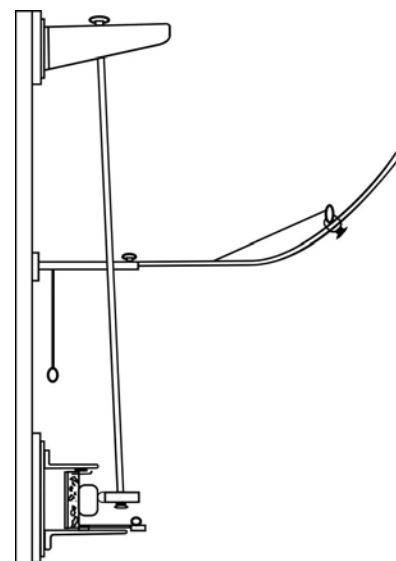
Protection degree of the enclosures of the electrical equipments in accordance with the **EN 60529** and **IEC 60529** Standards.

1st digit (Protection against solid bodies)			2nd digit (Protection against water)		
IP		Test	IP		Test
0	No protection.		0	No protection.	
1	Protected against solid objects whose diameter is greater than or equal to 50mm.		1	Protected against drops of water falling vertically.	
2	Protected against solid objects whose diameter is greater than or equal to 12,5mm.		2	Protected against drops of water falling vertically with the covering inclined, at most, at 15°.	
3	Protected against solid objects whose diameter is greater than or equal to 2,5mm.		3	Protected against rain up to 60° from the vertical.	
4	Protected against solid objects whose diameter is greater than or equal to 1mm.		4	Protected against priming.	
5	Protected against dust.		5	Protected against jets of water from all directions.	
6	Dustproof.		6	Protected against strong jets of water similar to a sea wave.	
			7	Protected against the effects of temporary immersion between 15cm to 1m.	
			8	Protected against the effects of constant immersion in water under pressure.	

2. Protection index against the mechanical shocks (IK)

Protection degree of the enclosures of the electrical equipments in accordance with the **EN 50102** Standard.

IK	Energy of impact Joule	Used Mass Kg
00	0	0
01	0,15	0,2
02	0,20	0,2
03	0,35	0,2
04	0,50	0,2
05	0,70	0,2
06	1	0,5
07	2	0,5
08	5	1,7
09	10	5
10	20	5



PRODUCT CERTIFICATIONS

The mark, when placed on a product, guarantees its conformity with all the applicable standards, and guarantees that the product was produced by a manufacturer who has an manufacturing production control system.



CERTIF

Product Certification (Portugal)



Verband Deutscher Elektrotechniker

Product Certification (Germany)



AFNOR - LCIE

Laboratoire Central des Industries Électriques (France)



KEMA Quality B. V.

Product Certification (The Netherlands)



SGS Bergium N. V. - CEBEC

Product Certification (Belgium)



Underwriters Laboratories

Product Certification (EUA)



INTERTEK ETL SEMKO

Product Certification (Sweden)



GOSSTANDART RUSSIA

Product Certification (Russia)



UKRSEPRO

Product Certification (Ukraine)

MARK OF CONFORMITY TO THE EUROPEAN COMMUNITY DIRECTIVES APPLIABLE TO THE PRODUCT



MANUFACTURER

The CE mark, as established by 2006/95/CE (Low Voltage) and 2004/108/CE (Electromagnetic Compatibility) Directives, shows that the manufacturer fulfils the duties required relating to equipment compliance with the applicable Directives of the European Community Council. All the currently commercialised EFAPEL products are under CE mark, except for:

- 16A (250V) Sockets;
- Music Sockets;
- 12V Switches;
- Plastic Fittings.



PRODUCT CERTIFICATIONS



10 Series				13 Series		16 Series		MEC 21
10010 C	10048 A	10089	10962 A	13010 C	13074 A	16010 C	16054 A	21011
10010 F	10050 C	10090 C	10963 A	13012 A	13075 A	16011 A	16055 A	21012
10011 A	10050 F	10091 A	10964 A	13013 A	13076 A	16012 A	16056 A	21013
10012 A	10051 A	10092 A	10965 A	13014 A	13080 C	16013 A	16060 C	21021
10013 A	10052 A	10093 A	10966 A	13015 A	13082 A	16014 A	16061 A	21023
10014 A	10053 A	10094 A	10967 A	13016 A	13083 A	16015 A	16062 A	21031
10015 A	10054 A	10095 A	10968 A	13020 C	13084 A	16016 A	16063 A	21051
10016 A	10055 A	10096 A	10972 A	13022 A	13085 A	16020 C	16064 A	21052
10017 A	10056 A	10098 A	10975 A	13023 A	13086 A	16021 A	16065 A	21061
10018 A	10057 A	10099	10976 A	13024 A		16022 A	16066 A	21065
10020 C	10058 A	10100 C	10981 A	13025 A		16023 A	16971 A	21071
10020 F	10060 C	10101 A	10984 A	13026 A		16024 A	16972 A	21072
10021 A	10060 F	10102 A	10985 A	13030 C		16025 A		21073
10022 A	10061 A	10104 A	10986 A	13032 A		16026 A		21075
10023 A	10062 A	10105 A	10987 A	13033 A		16030 C		21088
10024 A	10063 A	10106 A	10988 A	13034 A		16031 A		21091
10025 A	10064 A	10107 A	10989 A	13035 A		16032 A		21092
10026 A	10065 A	10108 A	10991 A	13036 A		16033 A		21101
10027 A	10066 A	10109 A	10993 A	13040 C		16034 A		21103
10028 A	10067 A	10140 C	10998 A	13042 A		16035 A		21110
10030 C	10068 A	10141 A		13043 A		16026 A		21111
10030 F	10070 C	10142 A		13044 A		16030 C		21121
10031 A	10071 A	10143 A		13045 A		16031 A		21130
10032 A	10072 A	10144 A		13046 A		16032 A		21131
10033 A	10073 A	10145 A		13050 C		16033 A		21151
10034 A	10074 A	10146 A		13052 A		16034 A		21152
10035 A	10075 A	10147 A		13053 A		16035 A		21155
10036 A	10076 A	10148 A		13054 A		16036 A		21173
10037 A	10077 A	10149 A		13055 A		16040 C		21174
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21012	37012 C	48012 C
21013	37013 C	48013 C
21021	37051 C	48051 C
21023	37061 C	48052 C
21051	37071 C	48061 C
21052	37072 C	48071 C
21061	37073 C	48072 C
21071	37101 C	48073 C
21072	37112 C	48101 C
21073	37122 C	48112 C
21101	37151 C	48151 C
21110	37157 C	48152 C
21111	37158 C	48281 C
21121	37290 C	48283 C
21151		48290 C
21152		
21155		
21281	QUADRO 45	
21283	45112 S	
21290		
21291		
	47 Series	
	47011 S	
	47012 S	
	47013 S	
	47051 S	
	47061 S	
	47071 S	
	47072 S	
	47073 S	
	47101 S	
	47151 S	
	47281 S	
	47290 S	



MEC 21	47 Series
21011	47011 S
21012	47012 S
21013	47013 S
21021	47051 S
21023	47052 S
21051	47061 S
21052	47071 S
21061	47072 S
21071	47073 S
21072	47101 S
21073	47131 S
21091	47132 S
21092	47151 S
21101	47152 S
21130	47155 S
21131	47281 S
21151	47290 S
21152	
21155	
21281	APOLO 5000
21283	
21290	50183 C
21291	50184 C
	50343 C
	50344 C
	Sirius 70
	70183 C
	70184 C
	LOGUS 90
	90183 C
	90184 C
	90343 C
	90344 C



MEC 21	47 Series
21011	47011 S
21012	47012 S
21013	47013 S
21021	47051 S
21023	47052 S
21051	47061 S
21052	47071 S
21061	47072 S
21071	47073 S
21072	47101 S
21073	47112 S
21101	47151 S
21110	47152 S
21111	47155 S
21151	47281 S
21152	47290 S
21155	
21281	
21283	
21290	WATERPROOF 48
21291	
	48011 C
	48012 C
	48013 C
	48051 C
	48052 C
	48061 C
	48071 C
	48072 C
	48073 C
	48101 C
	48112 C
	48151 C
	48152 C
	48281 C
	48283 C
	48290 C



MEC 21

MODUS 55

21975
21978
21980

55101 1BS	55102 3BU	55103 6CS	55106 2DS	55110 3DU	55116 5CP
55101 1BU	55102 3CS	55104 1BS	55106 2DU	55110 4BS	55116 6BS
55101 1CS	55102 3CU	55104 1BU	55106 3BS	55110 4BU	55116 6CS
55101 1CU	55102 3DS	55104 1CS	55106 3BU	55110 4CP	55120 1BS
55101 1DS	55102 3DU	55104 1CU	55106 3CP	55110 4CS	55120 1BU
55101 1DU	55102 4BS	55104 1DS	55106 3CS	55110 4CU	55120 1CP
55101 2BS	55102 4BU	55104 1DU	55106 3CU	55110 4DS	55120 1CS
55101 2BU	55102 4CS	55104 2BS	55106 3DS	55110 4DU	55120 1CU
55101 2CS	55102 4CU	55104 2BU	55106 3DU	55110 5CP	55120 1DS
55101 2CU	55102 4DS	55104 2CS	55106 4BS	55110 6BS	55120 1DU
55101 2DS	55102 4DU	55104 2CU	55106 4BU	55110 6CS	55120 2BS
55101 2DU	55102 5CP	55104 2DS	55106 4CP	55116 1BS	55120 2BU
55101 3BS	55102 6BS	55104 2DU	55106 4CS	55116 1BU	55120 2CP
55101 3BU	55102 6CS	55104 3BS	55106 4CU	55116 1CP	55120 2CS
55101 3CS	55103 1BS	55104 3BU	55106 4DS	55116 1CS	55120 2CU
55101 3CU	55103 1BU	55104 3CS	55106 4DU	55116 1CU	55120 2DS
55101 3DS	55103 1CS	55104 3CU	55106 5CP	55116 1DS	55120 2DU
55101 3DU	55103 1CU	55104 3DS	55106 6BS	55116 1DU	55120 3BS
55101 4BS	55103 1DS	55104 3DU	55106 6CS	55116 2BS	55120 3BU
55101 4BU	55103 1DU	55104 4BS	55110 1BS	55116 2BU	55120 3CP
55101 4CS	55103 2BS	55104 4BU	55110 1BU	55116 2CP	55120 3CS
55101 4CU	55103 2BU	55104 4CS	55110 1CP	55116 2CS	55120 3CU
55101 4DS	55103 2CS	55104 4CU	55110 1CS	55116 2CU	55120 3DS
55101 4DU	55103 2CU	55104 4DS	55110 1CU	55116 2DS	55120 3DU
55101 6BS	55103 2DS	55104 4DU	55110 1DS	55116 2DU	55120 4BS
55101 6CS	55103 2DU	55104 6BS	55110 1DU	55116 3BS	55120 4BU
55102 1BS	55103 3BS	55104 6CS	55110 2BS	55116 3BU	55120 4CP
55102 1BU	55103 3BU	55106 1BS	55110 2BU	55116 3CP	55120 4CS
55102 1CS	55103 3CS	55106 1BU	55110 2CP	55116 3CS	55120 4CU
55102 1CU	55103 3CU	55106 1CP	55110 2CS	55116 3CU	55120 4DS
55102 1DS	55103 3DS	55106 1CS	55110 2CU	55116 3DS	55120 4DU
55102 1DU	55103 3DU	55106 1CU	55110 2DS	55116 3DU	55120 5CP
55102 2BS	55103 4BS	55106 1DS	55110 2DU	55116 4BS	55120 6BS
55102 2BU	55103 4BU	55106 1DU	55110 3BS	55116 4BU	55120 6CS
55102 2CS	55103 4CS	55106 2BS	55110 3BU	55116 4CP	55125 1BS
55102 2CU	55103 4CU	55106 2BU	55110 3CP	55116 4CS	55125 1BU
55102 2DS	55103 4DS	55106 2CP	55110 3CS	55116 4CU	55125 1CP
55102 2DU	55103 4DU	55106 2CS	55110 3CU	55116 4DS	55125 1CS
55102 3BS	55103 6BS	55106 2CU	55110 3DS	55116 4DU	55125 1CU



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55125 1DU	55132 3BS	55140 4BU	55150 6CS	55225 2DC
55125 2BS	55132 3BU	55140 4CP	55163 1BS	55225 2EC
55125 2BU	55132 3CP	55140 4CS	55163 1BU	55225 4BA
55125 2CP	55132 3CS	55140 4CU	55163 1CP	55225 4BC
55125 2CS	55132 3CU	55140 4DS	55163 1CS	55225 4DA
55125 2CU	55132 3DS	55140 4DU	55163 1CU	55225 4DC
55125 2DS	55132 3DU	55140 6BS	55163 1DS	55225 4EC
55125 2DU	55132 4BS	55140 6CP	55163 1DU	55240 2BA
55125 3BS	55132 4BU	55140 6CS	55163 2BS	55240 2BC
55125 3BU	55132 4CP	55150 1BS	55163 2BU	55240 2DA
55125 3CP	55132 4CS	55150 1BU	55163 2CP	55240 2DC
55125 3CS	55132 4CU	55150 1CP	55163 2CS	55240 2EC
55125 3CU	55132 4DS	55150 1CS	55163 2CU	55240 4BA
55125 3DS	55132 4DU	55150 1CU	55163 2DS	55240 4BC
55125 3DU	55132 5CP	55150 1DS	55163 2DU	55240 4DA
55125 4BS	55132 6BS	55150 1DU	55163 3BS	55240 4DC
55125 4BU	55132 6CS	55150 2BS	55163 3BU	55240 4EC
55125 4CP	55140 1BS	55150 2BU	55163 3CP	55263 2BA
55125 4CS	55140 1BU	55150 2CP	55163 3CS	55263 2BC
55125 4CU	55140 1CP	55150 2CS	55163 3CU	55263 2DA
55125 4DS	55140 1CS	55150 2CU	55163 3DS	55263 2DC
55125 4DU	55140 1CU	55150 2DS	55163 3DU	55263 2EC
55125 5CP	55140 1DS	55150 2DU	55163 4BS	55263 4BA
55125 6BS	55140 1DU	55150 3BS	55163 4BU	55263 4BC
55125 6CS	55140 2BS	55150 3BU	55163 4CP	55263 4DA
55132 1BS	55140 2BU	55150 3CP	55163 4CS	55263 4DC
55132 1BU	55140 2CP	55150 3CS	55163 4CU	55263 4EC
55132 1CP	55140 2CS	55150 3CU	55163 4DS	
55132 1CS	55140 2CU	55150 3DS	55163 4DU	
55132 1CU	55140 2DS	55150 3DU	55163 6BS	
55132 1DS	55140 2DU	55150 4BS	55163 6CP	
55132 1DU	55140 3BS	55150 4BU	55163 6CS	
55132 2BS	55140 3BU	55150 4CP	55216 2AC	
55132 2BU	55140 3CP	55150 4CS	55216 2BA	
55132 2CP	55140 3CS	55150 4CU	55216 2BC	
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MADE IN Portugal

- Present **in the electrical market for more than 30 years**, EFAPEL is a company founded in 1978 by local investors and by exclusively **Portuguese capitals**.
- Our working team and force has almost **300 collaborators** who work in **3 modern industrial plants** with a **total manufacturing area of 18.750 m²**.
- We are **certified** in accordance with the:
 - NP EN ISO 9001 Standards (Quality Management System),
 - NP EN ISO 14001 Standards (Environmental Management System) and
 - OHSAS 18001/NP 4397 Standards (Occupational Health and Safety Management System).
- **We develop and manufacture** high quality products to be used in **low voltage electrical installations**.
- Our **Team of the Research, Development and Innovation Department** (RDI Department), exclusively dedicate its job and efforts to the research and development of products and solutions that match the needs and requests of our Customers, by keeping in mind always the following three basic directives:
 - Good Quality/Price Ratio;
 - Easy and Quick Installation;
 - Safe and Comfort for the User.
- Our goal is to offer to our Customers a complete range of products that allows them to project and build a complete electrical installation with EFAPEL products.

Where We Are

- We are located in the **beautiful villa of Serpins**, which is 30 Km away from the important city of Coimbra.



Our Compromises...

With our Customers

From the beginning, our company policy is based on three essentials pillars:

- **The Product:** By developing and manufacturing high Quality products that match the needs and expectations of our Customers;
- **The Service:** By serving our Customers in the most effective and quick way;
- **The Best Quality/Price Ratio:** By obtaining solutions and services which are the best platform to make good business.

With the Quality and Safety of our Products

- All our products are **developed, manufactured** and **tested** in strict accordance with all the related standards. They also respond to the requirements of each country for which they are destined.
- **We guarantee** the **Quality** and the **Safety** of our products from developing to their use by ensuring a **constant supervision** over the Production Processes and a **rigorous Internal Quality Control**.

With the Environment and the Future



- With the intention of promoting the good environmental practices within the overall Community, we encourage our Colleagues, Suppliers and Customers to implement our daily good environmental practices in their day-by-day.
- All the environmental factors and conflicts are systematically identified, controlled and measured in order to guarantee the continuous improvement of EFAPEL environmental behavior and performance.



- The thermoplastic material used in EFAPEL products is 100% recyclable.



- All the carton packages of products, samples, deliveries, etc.; are 100% recyclable.



- We assure the final treatment of the carton packages by a legal contract with the national specialized company – “Ponto Verde”.



- We assure the final treatment of the electrical products under the RoHS 2002/95/CE Directive, by a legal contract with the national specialized company - ERP Portugal.