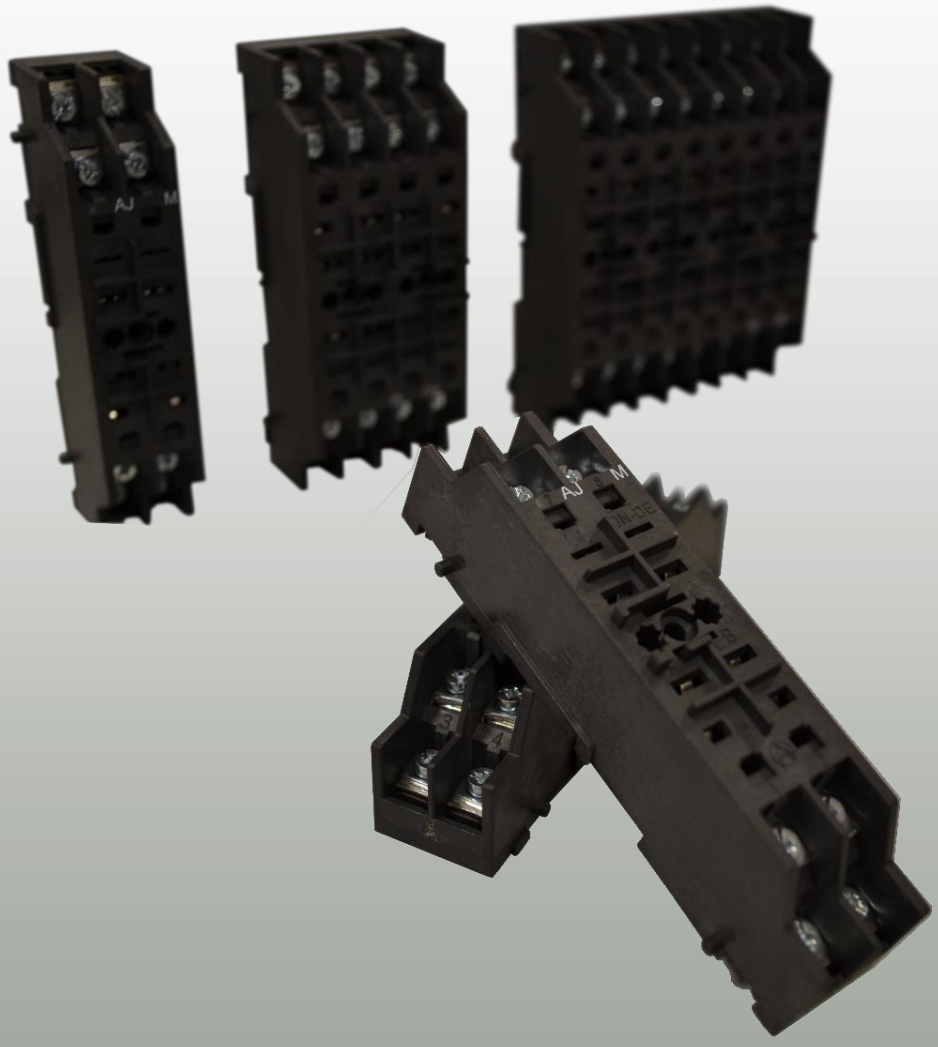
Sockets and accessories for auxiliary relays

User manual



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Chapter 1. Purpose

The purpose of this user manual is to help the user to define, fit and use the sockets for ARTECHE auxiliary relays.

Chapter 2. Acceptance and storage

The sockets have been dispatched in boxes with packaging that guarantees their protection during normal handling for this type of equipment.

If they are not to be installed immediately, it is recommended that they remain in their packaging, perfectly closed and in interior environmental conditions away from pollution, rain, dust, vibration, etc.

If the packaging has been damaged or there is doubt over breakage due to incorrect handling during transport, this must be reported quickly (less than three days) to the carrier, to the relevant insurance company and to the factory.

Also check that the material received matches the data on the order.

Chapter 3. Type description

The sockets are classified according to 4 criteria:

a. Size of relay (D, F, J, I)

b. Installation type (DIN rail or front connection, rear and flush mounting)

c. Type of connections (screw, faston, double faston and clamp)

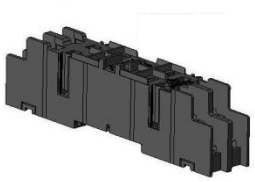
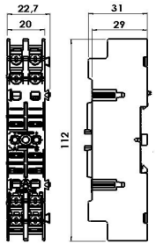
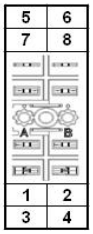
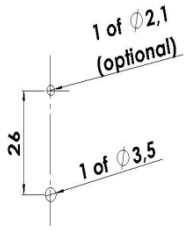
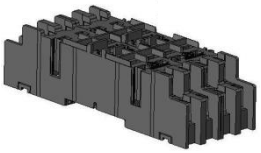
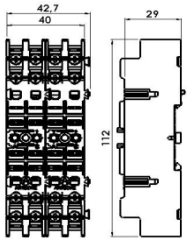
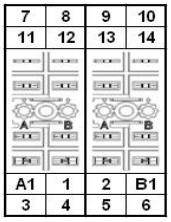
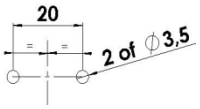
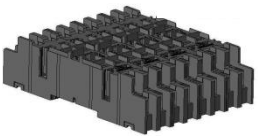
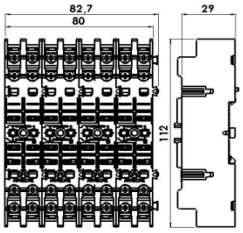
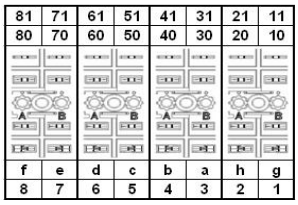
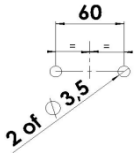
d. Degree of protection (IP 10, IP 20)

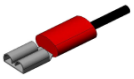
There are currently two families of sockets, those for the updated design developed by ARTECHE in 2005, called "OP" from now on and sockets for the previous design, called “NO OP.”

The following tables show the OP and NO OP sockets in the ARTECHE range classified according to the four criteria described above.

For bases mounted on DIN rails with front connections, there are two options according to the degree of protection for the terminals, called IP 10 and IP 20, according to the degree of protection. In case of cage clamp sockets, rear and/or flush mounting, the degree of protection for the terminals, is fixed.

3.1. OP socket with front screw or faston connections (IP20)

SOCKET	DIMENSIONS	INTERNAL CONNECTIONS (Top view)	FIX DRILLING	RELAYS
 DN-DE-IP20 DN-DE2C-IP20 (*)				RD OP DD-10 OP CD
 FN-DE-IP20 FN-DE2C IP20 (*)				RF OP TDF OP VDF10 OP BF CF RBF
 JN-DE-IP20 JN-DE2C IP20 (*)				RJ OP TDJ OP VDJ30 OP RJS4 OP BJ CJ

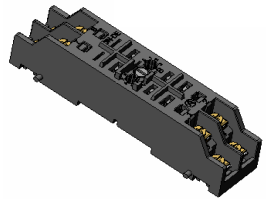
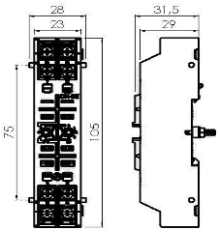
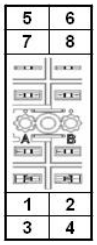
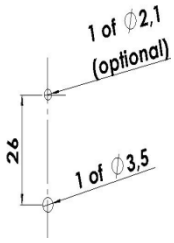
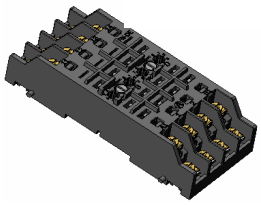
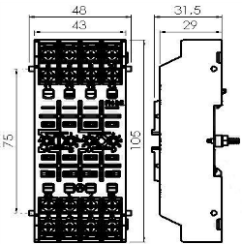
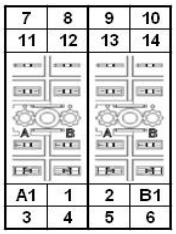
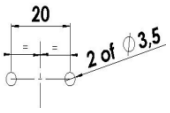
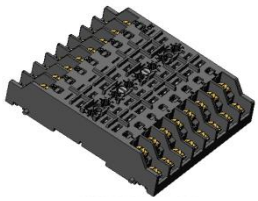
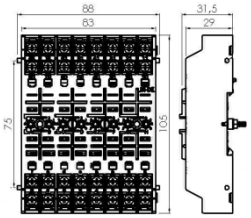
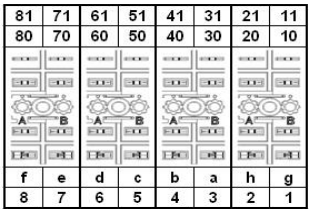
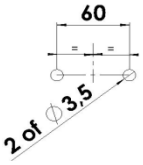
TERMINAL			
TYPE		MAX. WIRE SECTION	QUANTITY
FORK TERMINAL		2,5mm^2	1
LOCKING TERMINAL		2,5mm^2	1
CABLE PIN TERMINAL		2,5mm^2	1
BLADE TERMINAL		2,5mm^2	1
WIRE		0,2 – 2,5mm2	2
DOUBLE FASTON 4,8 x 0,5 (*)		2,5mm^2	2

(*) The double faston terminal can be used only in models marked with an asterisk.

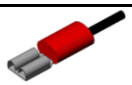
Recommended torque for screwed sockets:

Connection type	Recommended tightening torque	Screwdriver type
Screw	1Nm	Philips
		Pozi
		Flat

3.2. OP socket with front screw or faston connections (IP10)

SOCKET	DIMENSIONS	INTERNAL CONNECTIOS (Top view)	FIX DRILLING	RELAYS
 DN-DE IP10 DN-DE2C IP10 (*)				RD OP DD-10 OP CD
 FN-DE IP10 FN-DE2C IP10 (*)				RF OP TDF OP VDF10 OP BF CF RBF
 JN-DE IP10 JN-DE2C IP10 (*)				RJ OP TDJ OP VDJ30 OP RJS4 OP BJ CJ

TERMINAL			
TYPE		MAX. WIRE SECTION	QUANTITY
ROUND TERMINAL		2,5mm^2	2
FORK TERMINAL		6,0mm^2	2
LOCKING TERMINAL		2,5mm^2	2
CABLE PIN TERMINAL		2,5mm^2	2
BLADE TERMINAL		2,5mm^2	2

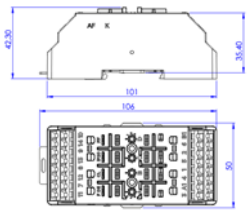
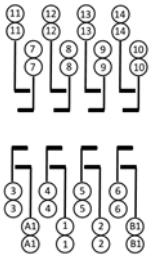
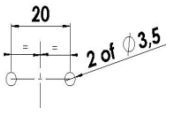
TERMINAL			
WIRE		0,2 – 4,0mm^2	2
DOUBLE FASTON 6,35 x 0,8 (*)		2,5mm^2	2

(*)The double faston terminal can be used only in models marked with an asterisk.

Recommended torque for screwed sockets:

Connection type	Recommended tightening torque	Screwdriver type
Screw	1Nm	Philips
		Pozi
		Flat

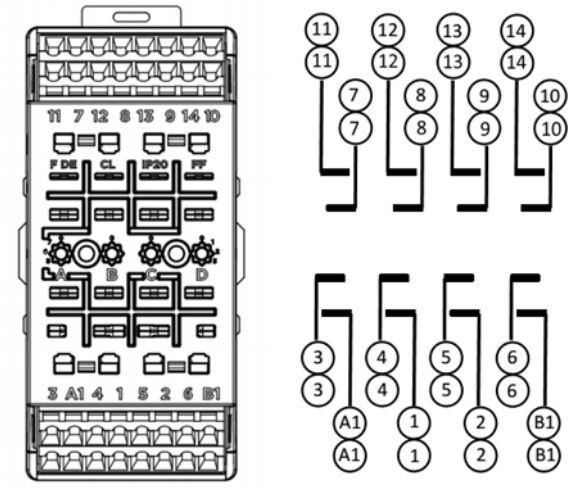
3.3. OP socket with front clamp connections (IP20)

SOCKET	DIMENSIONS	INTERNAL CONNECTIOS (Top view)	FIX DRILLING	RELAYS
F DE CL IP20				RF OP TDF OP VDF10 OP BF CF RBF

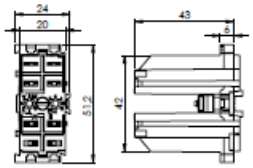
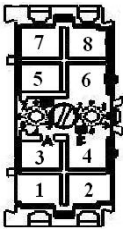
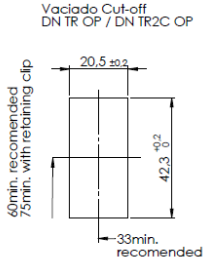
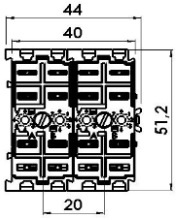
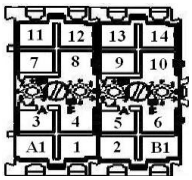
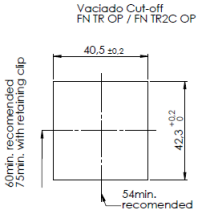
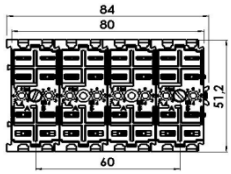
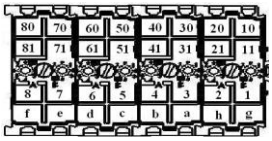
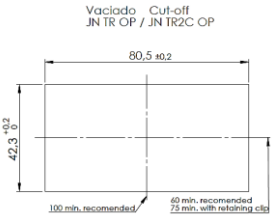
TERMINAL			
TYPE		MAX. WIRE SECTION.	QUANTITY
RIGID (Stripped wire length: 5 – 6mm)		0,08 - 2,5mm^2	1+1
FLEXIBLE (Stripped wire length: 5 – 6mm)		0,08 - 2,5mm^2	1+1
TIP ISOLATE TERMINAL		0,25 - 1,5mm^2	1+1
TIP WITHOUT ISOLATE TERMINAL		0,25 - 2,5mm2	1+1

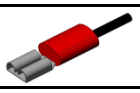
(Recommended tool by clamp connector supplier: flat screwdriver 0,4 x 3,5mm maximum)

ELECTRICAL CONNECTIONS (2 holes on the terminal block for each connection) :



3.4. OP socket with rear screw connections or faston connections (IP10)

BASE	DIMENSIONS	INTERNAL CONNECTIONS (Top view)	FIX DRILLING	IP	RELAYS
				10	RD OP DD-10 OP CD
				10	RF OP TDF OP VDF10 OP BF CF RBF
				10	RJ OP TDJ OP VDJ30 OP RJS4 OP BJ CJ

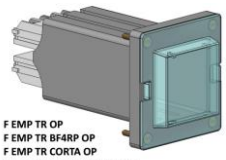
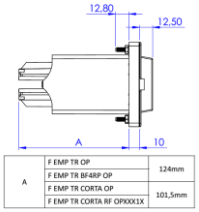
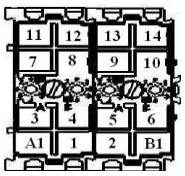
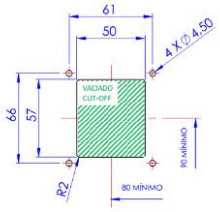
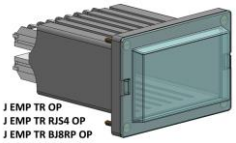
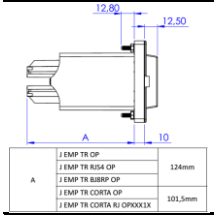
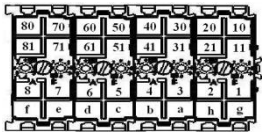
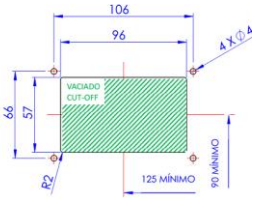
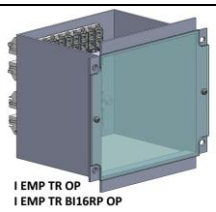
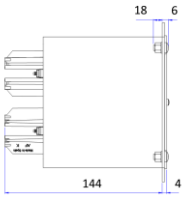
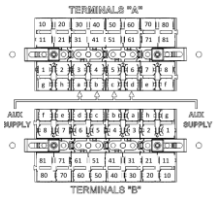
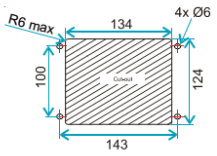
TERMINAL			
TYPE		MAX. WIRE SECTION.	QUANTITY
FORK TERMINAL		2,5mm^2	1
LOCKING TERMINAL		2,5mm^2	2
CABLE PIN TERMINAL		2,5mm^2	2
BLADE TERMINAL		2,5mm^2	2
WIRE		0,2 – 2,5mm^2	2
DOBLE FASTON 4,8 x 0,5 (*)		2,5mm^2	2

(*)The double faston terminal can be used only in models marked with an asterisk.

Recommended torque for screwed sockets:

Connection type	Recommended tightening torque	Screwdriver type
Screw	1Nm	Philips
		Pozi
		Flat

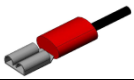
3.5. OP socket with rear flush mounting screw or faston

SOCKET	DIMENSIONS	INTERNAL CONNECTIONS (Top view)	FIX DRILLING	IP	RELAYS
				(**)	**F EMP TR OP:** TDF OP VDF10 OP RBF BF **F EMP TR BF4RP OP** BF4RP **F EMP TR CORTA OP:** RF OP CF **F EMP TR CORTA RF OPXXX1X** RF4 OPXXX1X
				(**)	**J EMP TR OP:** TDJ OP VDJ30 OP BJ CJ **J EMP TR RJS4 OP** RJS4 OP **J EMP TR BJ8RP OP** BJ8RP **J EMP TR CORTA OP:** RJ **J EMP TR CORTA RJ OPXXX1X** RJ8 OPXXX1X
				(**)	I EMP OP BI RI

(**) Protection degree of the OP flush mounting socket with the panel installation:

- F EMP TR OP, F EMP TR CORTA OP, J EMP TR OP y J EMP TR CORTA OP: IP40
- F EMP TR BF4RP OP, F EMP TR CORTA RF OPXXX1X, J EMP TR RJS4 OP, J EMP TR BJ8RP OP y J EMP TR CORTA RJ OPXXX1X: IP30
- I EMP TR OP e I EMP TR BI16RP OP: IP20

TERMINAL			
TYPE		MAX. WIRE SECTION.	QUANTITY
FORK TERMINAL		2,5mm^2	1
LOCKING TERMINAL		2,5mm^2	2
CABLE PIN TERMINAL		2,5mm^2	2
BLADE TERMINAL		2,5mm^2	2

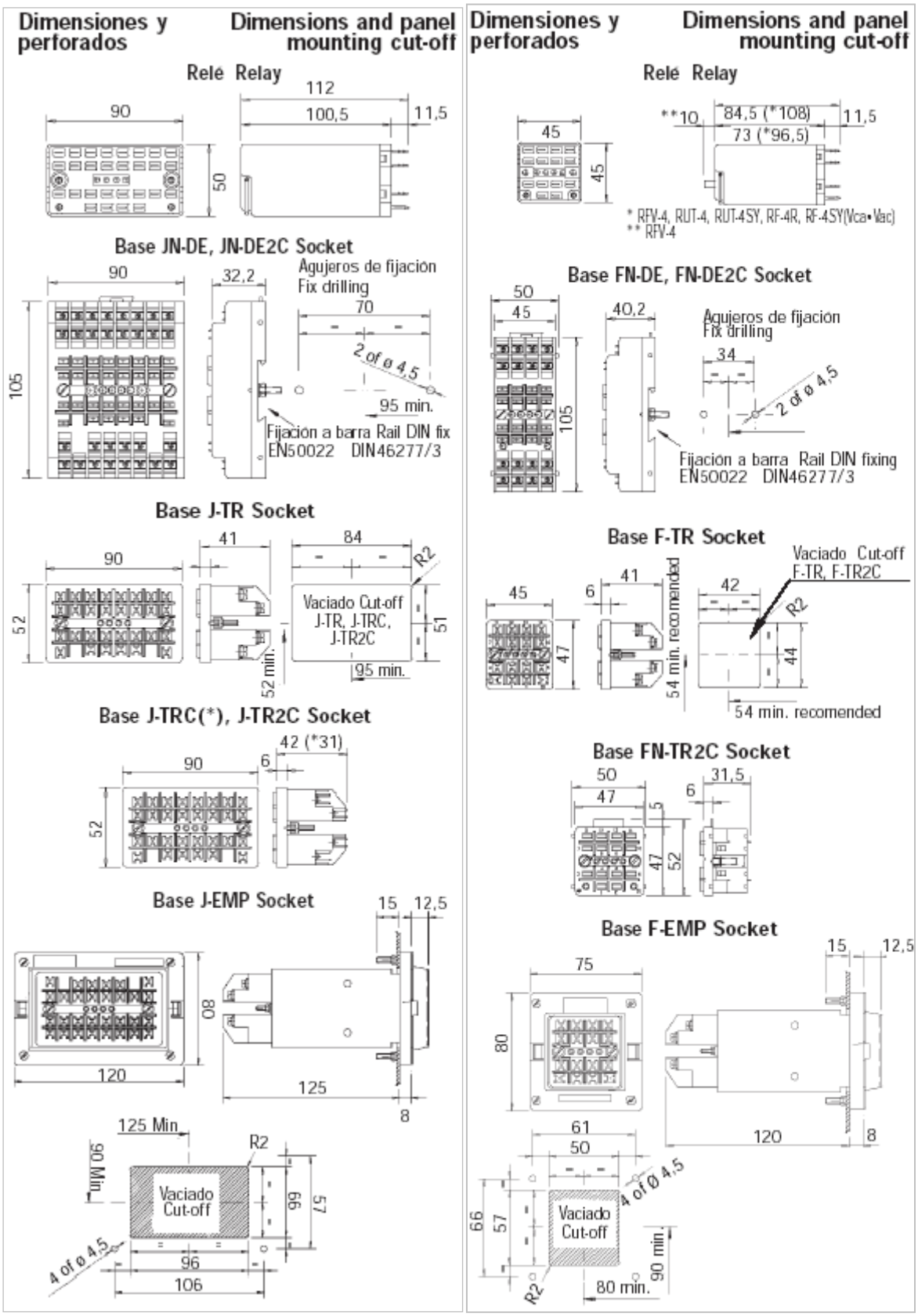
TERMINAL			
WIRE		0,2 – 2,5mm^2	2
DOBLE FASTON 4,8 x 0,5 (*)		2,5mm^2	2

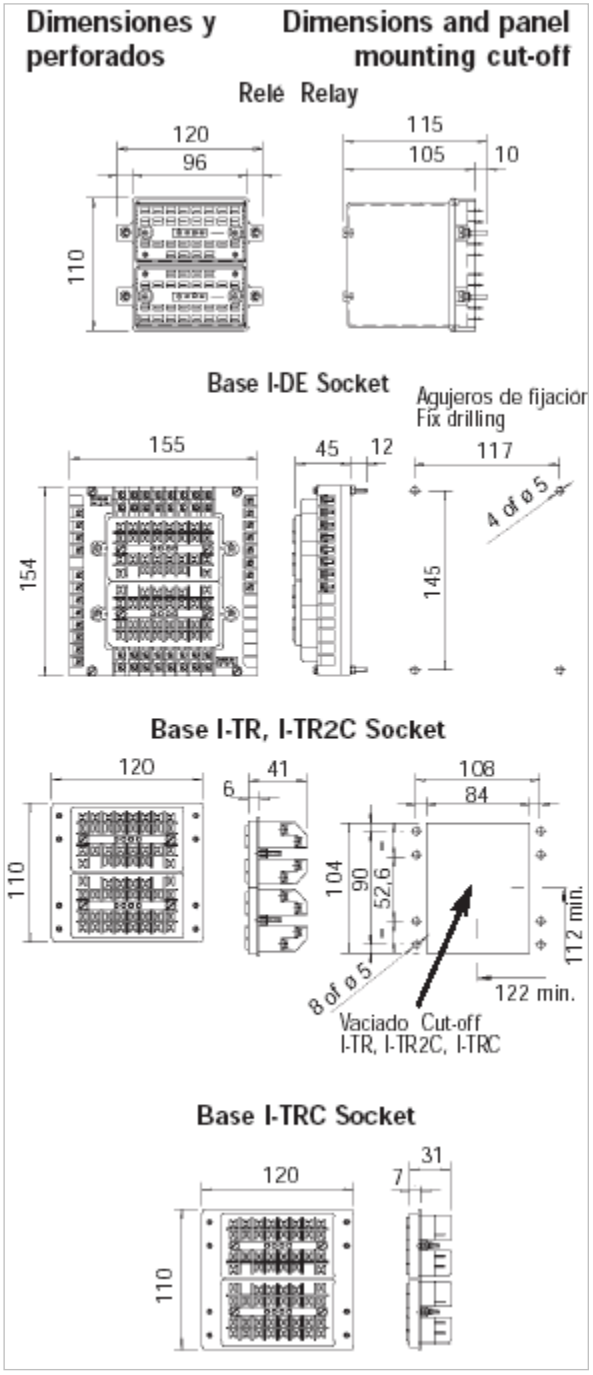
(*)The double faston terminal can be used only in models marked with an asterisk.

Recommended torque for screwed sockets:

Connection type	Recommended tightening torque	Screwdriver type
Screw	1Nm	Philips
		Pozi
		Flat

3.6. “No OP” sockets





Only available I size sockets

Chapter 4. Installation

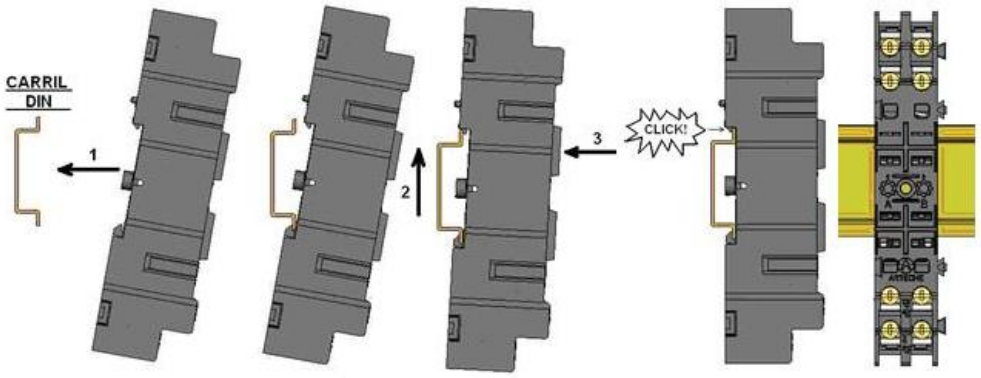
The previous section defined both the sizes of the various types of sockets and the cut-outs for rear and flush mounting sockets and the spacing between fixing holes.

The following gives a series of recommendations for installing the sockets in panels or cabinets.

4.1. Sockets installation on DIN rails

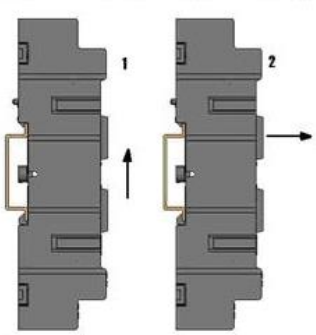
The front sockets are easily mounted on DIN rails, as follows:

1. Insert the lower tabs on the socket on the lower part of the DIN rail as shown in figure below.
2. Fully fit the socket on the lower part of the DIN rail and press lightly and horizontally so that the socket is fixed to the rail by the upper tabs on its rear.



To remove a front socket from a DIN rail:

1. Fully fit the socket on the lower part of the DIN rail as shown in figure below.
2. Pull the socket lightly outwards to remove it from the DIN rail



4.2. Spacing between sockets

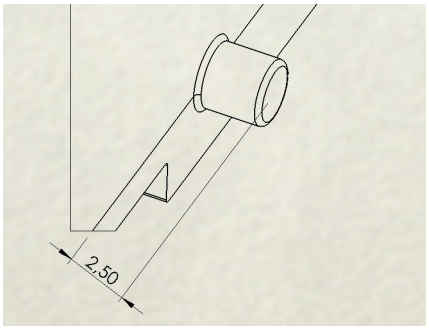
The following section gives the minimum recommended distances between sockets for the correct installation of ARTECHE relays, both the OP version and the rest, to allow their installation and removal and to prevent unnecessary overheating and damage to the useful life of the relays.

The natural position of the relay is considered when the DIN rail is in horizontal position, the socket in vertical position mounted on the rail, and the relay mounted on the socket, with front plate legible facing the user. In case the position of the relay is not the natural one, the used of retaining clips is recommended, in order to avoid that the relay loosens from the socket.

With reference to the vertical installation of the relays, in order to avoid overheating, the distances between sockets and relays will be approximately three times the indicated below.

4.2.1. For OP relays (contactors and impulse relays included):

- On IP10 front connection sockets and clamp IP20 sockets, the width of the socket is similar to the width of the relays. The sockets include 2,50mm distancing bars located at the lateral side of each socket, which guarantee a minimum distance of 5mm when installing two sockets together.



- In IP20 front connection sockets and rear connection sockets, the width of the sockets is smaller than the width of the relays. The relays are, in their three sizes D, F and J, 2,50mm wider than their corresponding socket. Therefore, when installing these sockets, it is necessary to take into account not only the minimum distance of 5 mm between the relays, but also the 1,25mm the relay protrudes from the socket on each side. That means the minimum distance between sockets must be 7,50mm. In this case there is no external element which guarantees this distance, so it must be taken into account by the installer

(mm)	Relay width	Socket width
D	22,50	20
F	42,50	40
J	82,50	80

The distances (mm) between sockets for OP relays are:

Relay size	Front connection sockets		Rear connection sockets
	DE IP10 and DE CL IP20 (guaranteed with distancing bars on the socket)	DE IP20	TR
D	5	7,50	7,50
F	5	7,50	7,50
J	5	7,50	7,50

4.2.2. For latching relays (No OP):

➔ In latching relays the width of the relays is bigger than the width of the sockets. Therefore the distance between sockets will be calculated taking into account the width difference between relays and sockets.

Relay size	Width (mm)	DE IP10 socket	CL IP20 socket	DE IP20 socket	TR socket
F	**Socket**	43	45	40	40
	Relay	45	45	45	45
J	**Socket**	83	-	80	80
	Relay	90	90	90	90

The minimum distance of 5mm is in this case not necessary, as these relays do not have permanent consumption. Only 1,5mm will be added on each side of the relay to ease plug and unplug. The distances are (mm):

Relay size	Front connection sockets			Rear connection sockets
	IP10	IP20	CL IP20	TR
F	5	8	3	8
J	10	13		13

➔ In case of using spring type retaining clips, to ease plug and unplug of the sockets, the distance (mm) between them will be as follows:

Relay size	Front connection sockets			Rear connection sockets
	IP10	IP20	CL IP20	TR
F	11	14	9	14
J	15	18	-	18

4.3. Installation on DIN rail:

Summary of the distances (mm) that should be kept:

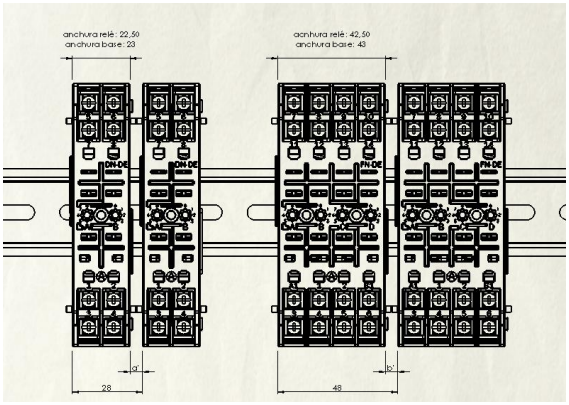
Size	DE IP10 and DE CL IP20 sockets (guaranteed with distancing bars on the socket)		DE IP20 socket		Rear socket	
	OP	Latching	OP	Latching	OP	Latching
D	5	---	7,50	---	7,50	---
F	5	5 (11)	7,50	8 (14)	7,50	8 (14)
J	5	10* (15)	7,50	13 (18)	7,50	13 (18)

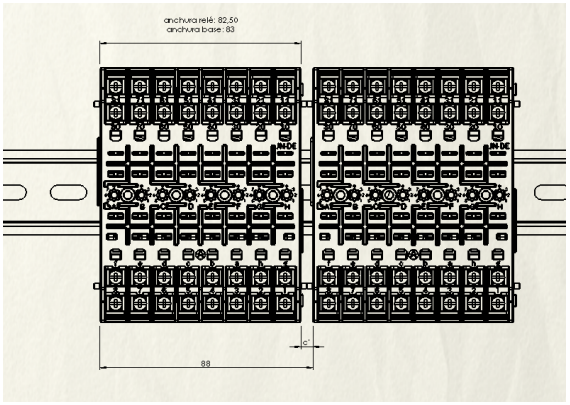
** Not guaranteed with distancing bars.*

Between brackets the distance when using spring type retaining clip

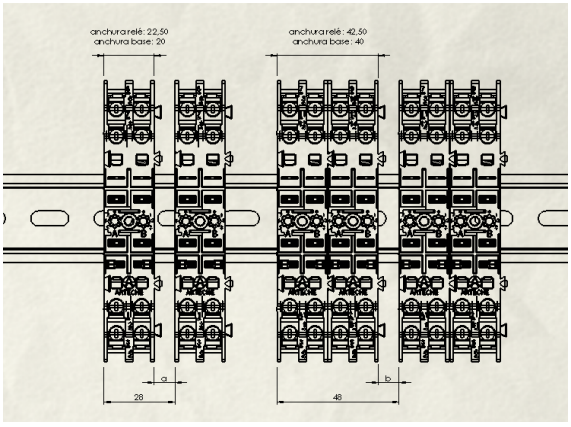
NOTE: In case of using spring type retaining clip (no OP relays), the retaining clip must be mounted on the socket before it is installed.

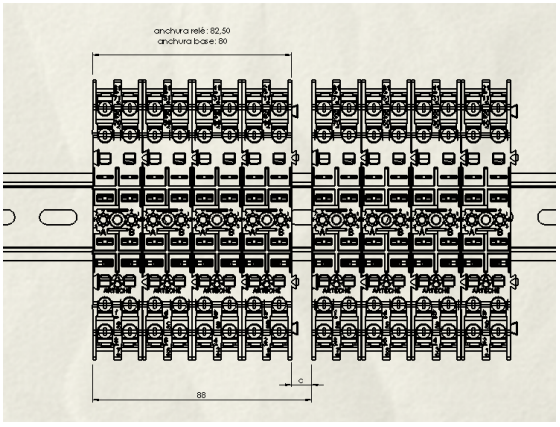
IP10 and CL IP20



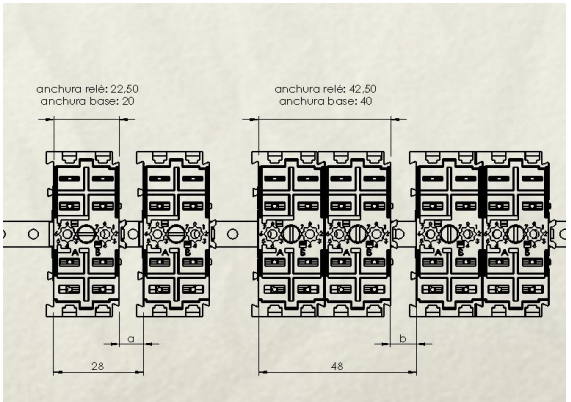


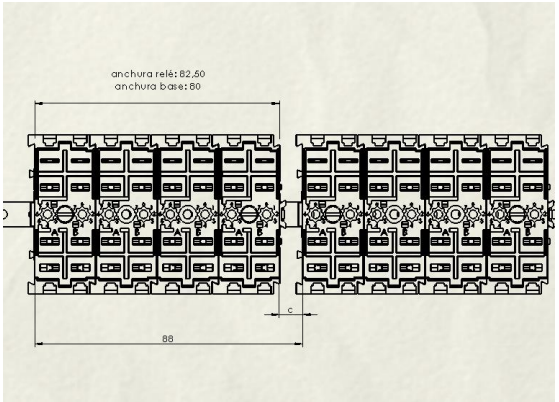
IP20





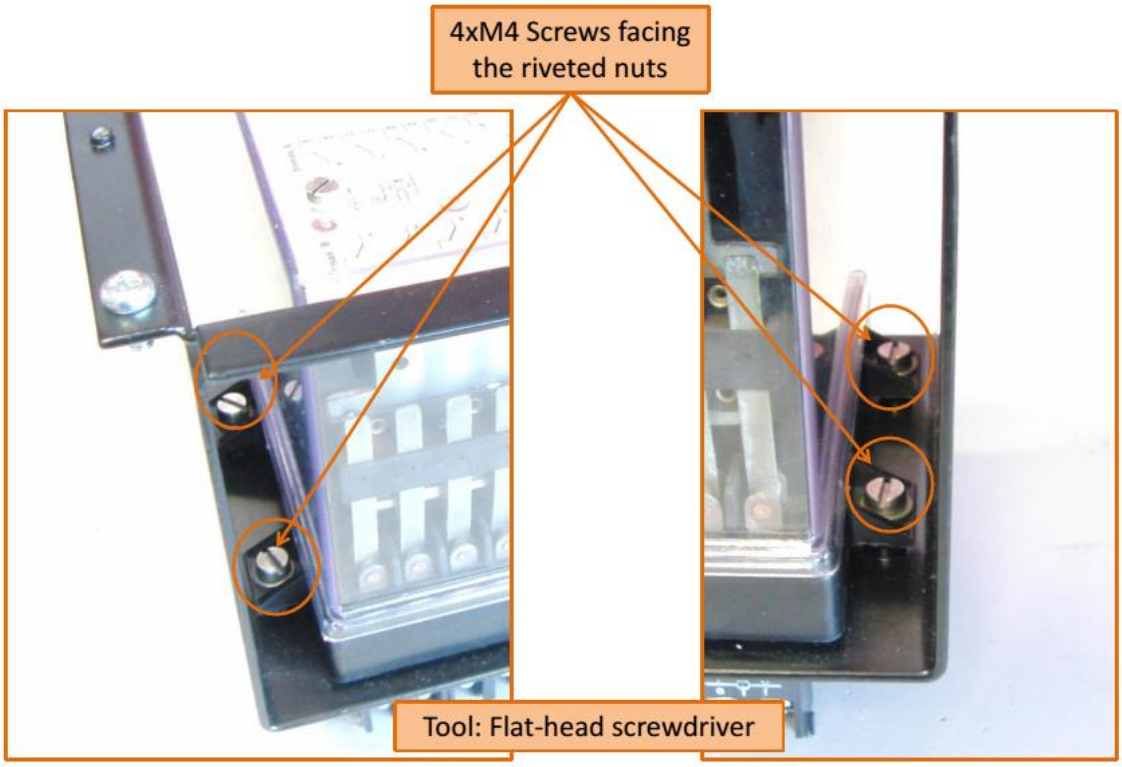
TR



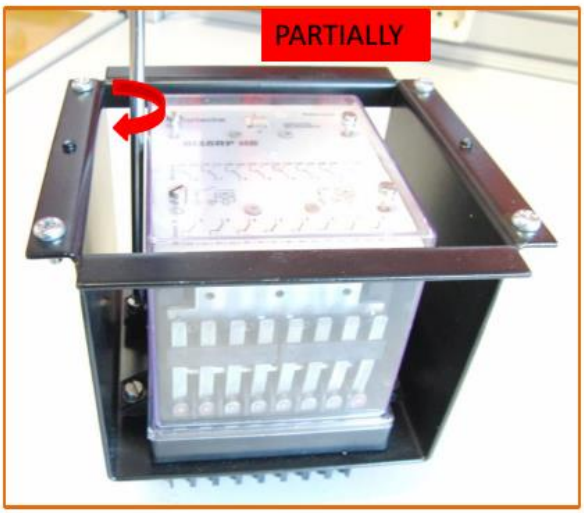


4.4. Installation I size relay in a flush mounting socket:

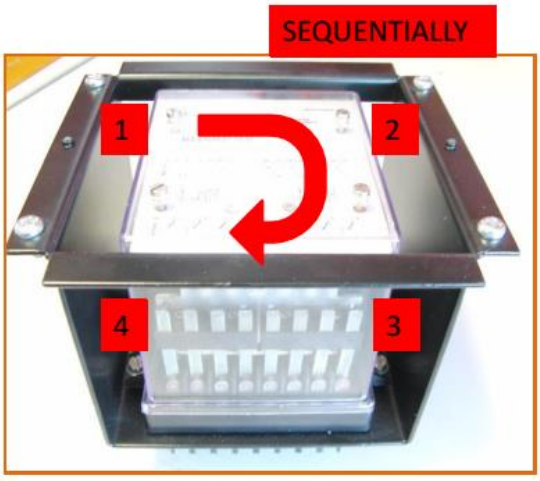
4.4.1. Relay positioning



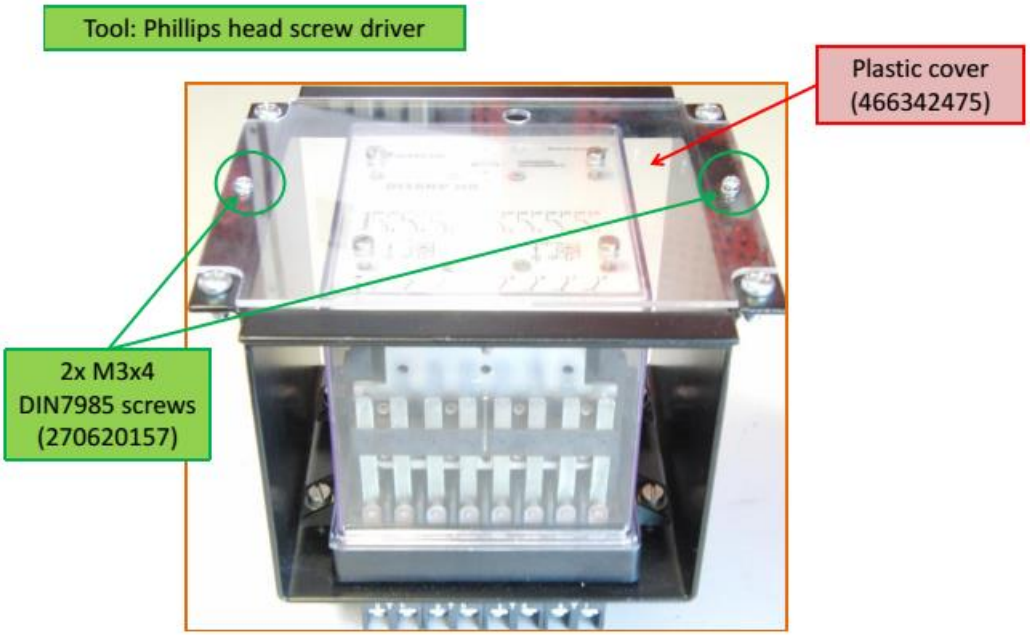
4.4.2. Relay connection



4 screws to be fastened sequentially and partially, connecting the relay little by little

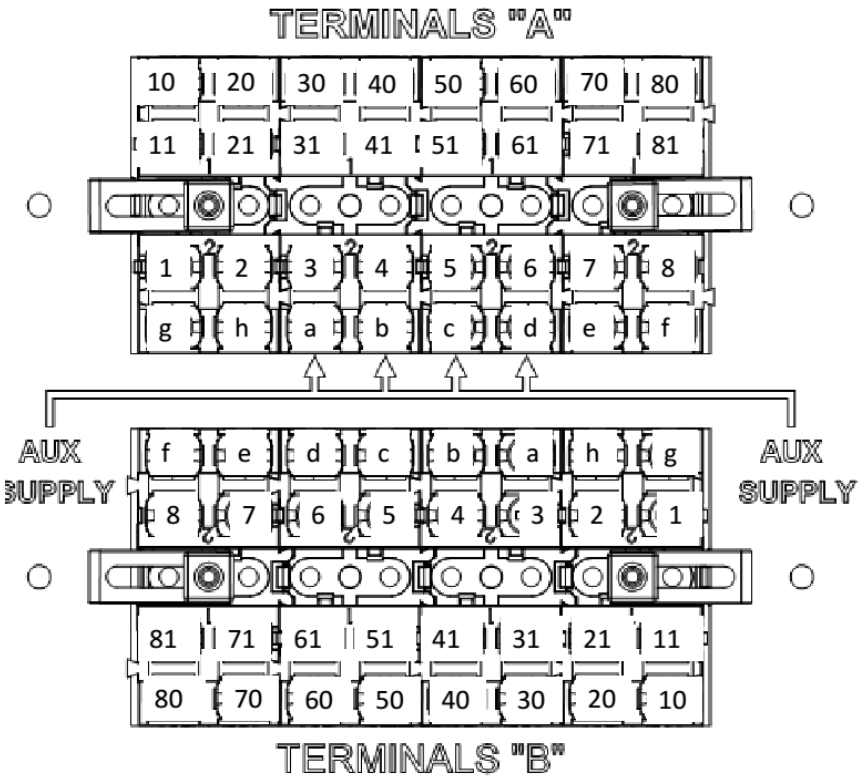


4.4.3. Cover fixation



4.4.4. Cable connections

(Information provided printed on each socket)



Chapter 5. Retaining clips

The design of the new OP sockets allows both OP relays and the rest (NO OP) to be plugged into them, except for the D size sockets.

If retaining clip is needed, their definition will depend on the combination of relay and socket.

Type	OP Socket	OP Relay
E0	Universal	Universal (RD OP; RF OP; RJ OP; TDF OP; VDF OP; VDJ OP; RJS OP; RUT OP; CD; CF; CJ; RBF)
E41	DN DE IP	RD OP, CD
E40	FN DE IP	RF OP, CF
E43	FN DE IP	TDF OP; VDF OP; RUT OP, RBF
E42	FN TR OP	RF OP, CF
E44	FN TR OP	TDF OP; VDF OP; RUT OP; RBF
E45	JN DE IP	RJ OP, CJ
E47	JN DE IP	TDJ OP; VDJ OP
E46	JN TR OP	RJ OP, CJ
E48	JN TR OP	TDJ OP; VDJ OP

Type	OP Socket	No OP Relay
E30	FN DE IP	RF (except RF4SY for VCA, RF4R, RFV and RUT)
E31	FN DE IP	BF; RFV; VDF; TF; TF-FT; RUT; RF-4R, RF-4SY for VAC
E20	FN TR OP	RF (except RF-4SY for VAC, RF4R, RFV and RUT)
E21	FN TR OP	BF; RFV; VDF; TF; TF-FT; RUT; RF4R, RF4SY for VAC
E28	JN DE IP	RJ for VDC (except RJ8R)
E29	JN DE IP	BJ; UJ; IJ; TJ; RJ for VAC, RJ8R
E26	JN TR OP	RJ for VDC (except RJ8R)
E27	JN TR OP	BJ; UJ; IJ; TJ; RJ for VAC, RJ8R

Type	No OP Socket	OP Relay
E24	FN DE	RF OP, CF
E25	FN DE	VDF OP; TDF OP; RUT OP, RBF

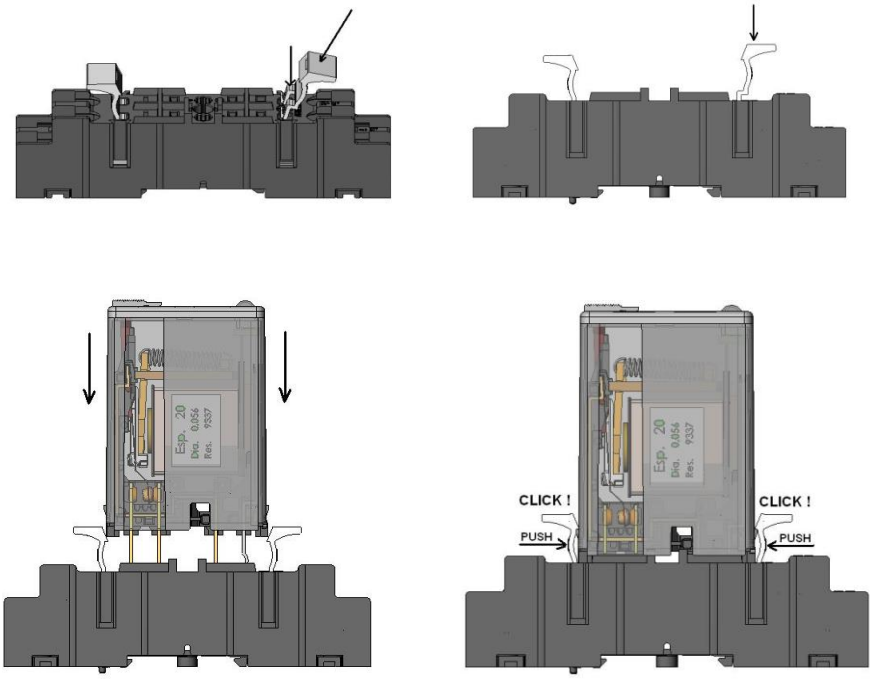
Type	No OP Socket	OP Relay
E22	F TR	RF OP, CF
E23	F TR	VDF OP; TDF OP; RUT OP, RBF
E34	JN-DE	RJ OP, CJ
E35	JN-DE	TDJ OP
E32	J-TR	RJ OP, CJ
E33	J-TR	TDJ OP

Type	No OP Socket	No OP Relay
E1	FN-DE (front screw connection) FN-DE2C (front double clip connections)	RF (except RF4SY for VAC, RFV and RUT)
E2	FN-DE (front screw connection) FN-DE2C (front double clip connections)	BF, RFV, VDF, TF, TF-FT, TDF RUT, RF4SY for VAC
E4	JN-DE (front screw connection) JN-DE2C (front double clip connections)	RJ for VDC (except RJ8R)
E5	JN-DE (front screw connection) JN-DE2C (front double clip connections)	BJ, UJ, IJ, RJ for VAC, RJ8R
E6	DN-DE (front screw connection)	RD
E7	F-DE (rear screw connection) FN-DE2C (rear double clip connections)	RF except RF4SY for VAC, RJ8R
E8	F-TR (rear screw connection) FN-TR2C (rear double clip connections)	BF, RFV, VDF, TF, TF-FT, TDF RUT, RF4R, RF4SY for VAC
E10	J-TR (rear screw connection) J-TRC (rear screw connection) JN-DE2C (rear double clip connections)	RJ for VDC (except RJ8R)
E11	J-TR (rear screw connection) J-TRC (rear screw connection) J-TR2C (rear double clip connections)	BJ, UJ, IJ, RJ for VAC, RJ8R
E12	D-TR (rear screw connection) DN-TRC(rear clip connections)	RD

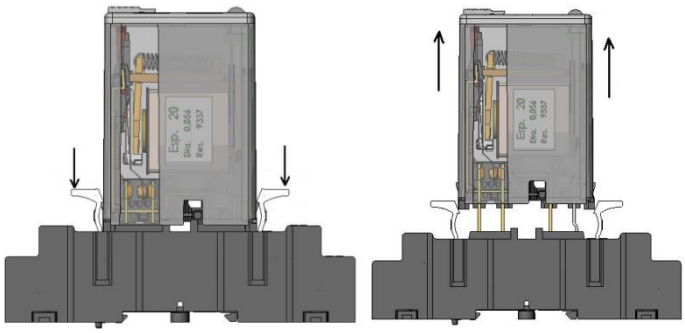
To fit the E0 universal retaining clip:

- → Insert the retaining clips in the housing in the socket as shown in the following figure.
- → Fully fit the retaining clip against the socket on the lower part of the DIN rail with a light vertical pressure.
- → Insert the relay.

➔ Press on the retaining clip in the area marked PUSH at right angles to the relay until it clips onto the cover (a click is heard).

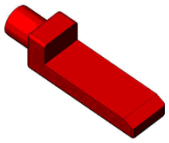


To remove the relay, release the retaining clip by pressing lightly on it as shown in the following figure.

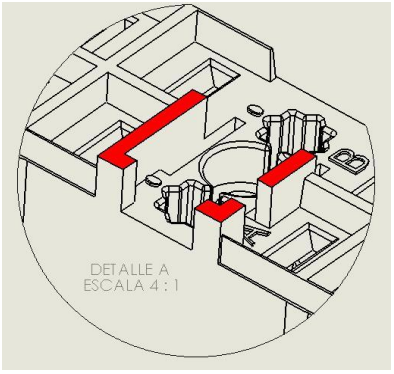


Chapter 6. Security pins

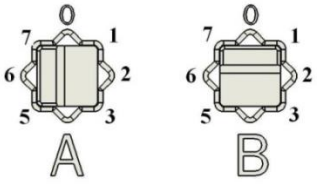
Security pins may be fitted to the OP sockets to be used with OP relays (instantaneous relays RD, RF and RJ, time-lag relays TDF and TDJ, trip circuit supervision relays VDF and VDJ). These security pins are not suitable to be used with “No OP” relays (latching relays BF and BJ, supply circuit supervision relays RUT) or with “No OP” sockets.



These security pins are placed in the sockets and in the relays to allow the client/user to code the relays and sockets to avoid errors when replacing relays already installed so that only a correct relay model can be connected (e.g., RF-4 OP00001 for 125 VDC).



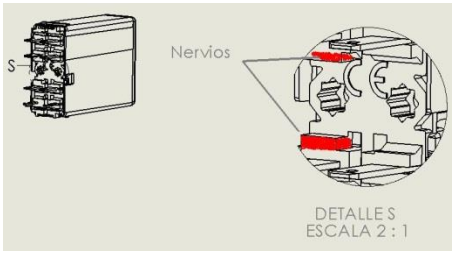
The sockets have star-shaped sockets as shown in the following figure which allow a large number of combinations bases.



Depending on the socket model, they allow a large number of combinations:

- D sockets 64 combinations (2 pins).
- F sockets: 4096 combinations (4 pins).
- J sockets: 4096^2 combinations (8 pins)

The sockets also have nerves (shown in red in the figures above and below) that prevent the erroneous fitting of the relay, ensuring that each relay terminal is connected to its proper socket terminal:



Chapter 7. Tests

Electrical security test: **IEC 60255-27**

- Dielectric test: 2 KV. 50Hz. 1min
- Surge withstand: 5 KV., 0,5 J., 1,2/50 μs
- Insulation: 500 VDC. > 100MOhm

Mechanical safety tests:

- Connection capacity and thread maximum torque: **IEC 60999-1**
- Cable extraction force: **IEC 60999-1**

Environmental tests:

- Thermal shock: **IEC 60068-2**, +70ºC / -25ºC / 5 cycles of 3h+3h
- Damp heat: **IEC 60068-2**, 40ºC / 93%RH / 4 days
- Sinusoidal vibrations: **EN 60068-2-6**: Fc
- Shock: **EN 60068-2-27**: Ea, 5Hz - 8 Hz: 3,5mm de amplitude. 8Hz - 150 Hz: 1g
- Bump test: **EN 60068-2-29**: Eb, 15 g / 11 ms
- Seismic qualification: IEEE 344-2004, IEEE C37.98-1987, ZPA 5
- Free fall test: **EN 60068-2-32**: procedure 1, 1.000mm / 2 falls from each X, Y and Z position

Thermal test:

- Temperature rise at rated voltage: **EN 61810-7**, 55ºC / 10A / 3h

Functional tests:

- Resistance of paints to solvents: **IEC 61810-1**
- Engaging and separating forces (basic test procedures and measurement methods): **EN 60512-13-1**
- Degrees of protection provided by enclosures (IP code): **EN 60529**

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