

# AUXILIARY RELAYS FOR TRIPPING APPLICATIONS

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# Moving together



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### ANSWER FOR ANY TRIPPING APPLICATION

ARTECHE offers a wide range of relays specially designed to be used in circuit breaker tripping applications.

- Interface between protection and control equipments and HV and/or MV circuit breakers, eliminating risks in case of internal failure of the circuit breaker.
- > Trip contacts multiplication, to operate directly on the circuit breaker and transmit the corresponding alarms in a minimum time.
- > Trip and lock-out, with electric or hand reset to avoid accidental closing of circuit breakers associated to power transformers, generators or machines.
- > The surveillance of the trip circuit, guarantees it is in perfect conditions to allow the trip when it is needed.

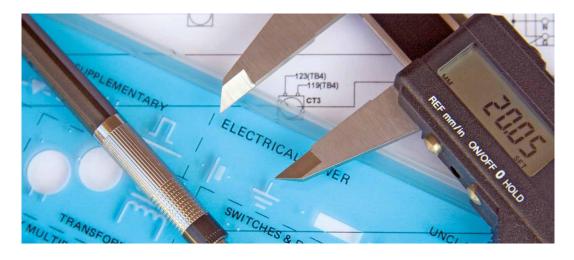


### **TECHNICAL STANDARDS**

#### GENERAL STANDARDS

In addition to the specific applicable standards, ARTECHE auxiliary relays are designed based on the fulfilment of the following standards:

- > IEC 61810: Electromechanical all-or-nothing relays.
- > IEC 60255: Electrical relays. Measuring relays and protection equipment.
- > IEC 61812: Specified time relays for industrial use.
- > IEC 60947: Low-voltage switchgear and controlgear.
- > IEC 61000: Electromagnetic compatibility.





### GENERAL CHARACTERISTICS

Some of the general characteristics of the ARTECHE trip relays are:

- > High isolation level between input and output circuit, which guarantees that a problem in the circuit breaker will not cause irreparable damages on the protection system.
- > Fast operating times, down to 3 ms, minimizing the impact on the total trip time.
- > High breaking capacity, which allows direct operation on highly inductive circuits.
- > Sturdy design, which ensures high reliability.
- > Wide range of auxiliary voltage (Vdc and Vac).
- > Self-cleaning of the contacts.
- > Security contacts according to EN 50205.
- > Easy installation (plug-in relays with different installation possibilities).
- > Designed to work in permanent service, even at high temperature for the whole voltage range.
- > Capable to work under ambients with relative humidity around 100%.
- > Seismic characteristics, allowing their use in installations which can be subject to vibrations, as for example in power stations or in regions with high risk of seism.
- > High protection degree (IP40), with transparent cover, making them appropriate for tropical and saline environments.
- Fulfilment of the most demanding standards: IEC, EN, IEEE, CE and UL mark.
- > No maintenance needed.

In addition, the different number of alternatives that are offered when the equipment is selected, both technically (increase of the breaking capacity by serial contacts, high speed operation of the output contacts, possibility of adding different options to the relay) and in the assembly method (front, rear or flush mounted sockets, with screws or fastons) must be considered.







UL Recognized Component Marks for USA and Canada: The combined UL signs for the USA and Canada are recognized by the authorities of both countries. All auxiliary relays identified with this mark meet the requirements of both countries.



#### **TRIP RELAYS**

Instantaneous trip relays, whose contacts change instantaneously from the rest position to the working position when the coil is energized. The contacts return to the rest position when the coil is no longer energized.

This range includes relays with 2, 4, 8 and 16 contacts, with operating times from 3 ms to 8 ms, depending on the model.

All the relays include a diode in parallel with the coil (see auxiliary relays with overvoltage protection characteristic) and comply with the shock and vibration standards, related to the relays with seismic characteristics.

#### TRIP AND LOCKOUT RELAYS

Trip relays with 2 stable positions for the output contacts. Depending on which coil is energized, the contacts will change from one position to the other. The design of the ARTECHE relays has no consumption in permanence, and prevents both coils from being energized simultaneously.

This range includes relays with 3, 4, 8 and 16 contacts, with operating times below 10 ms, depending on the model, and possibility of manual reset. The position change is made with 2 sets of coils with separated entrances, in BF-3 and BJ-8, and with breaking-flame contacts for each set of coils.

#### TRIP CIRCUIT SUPERVISION RELAYS

For single phase or three phase circuit breakers. Through a small supervision current the whole circuit is supervised, in both positions of the circuit breaker (open or closed).

The correct state of the circuit is showed with a green LED on the front plate of the relay. The output contacts change their position if the relay detects a failure in the continuity of the circuit.

The single phase trip circuit supervision relay can be manufactured with different LED indicator configurations, refers to selection chart for more detailed information

## AUXILIARY SUPPLY CIRCUIT SUPERVISION RELAYS

Auxiliary relay with four changeover contacts, aimed to supervise the failure of trip supply.

Connecting the relay across the trip circuit supply, the equipment is normally energized. Faults will occur when the trip voltage is lost, so the relay drops off in those cases, providing the related signs and alarms. In order to avoid faulty alarms due to instantaneous supply voltage dips, the drop off time of the relay is delayed over 100 ms so those non-permanent failures of trip supply would not be considered.

Auxiliary supply circuit supervision relays can be manufactured with different LED indicator configuration, refers to selection chart for more detailed information



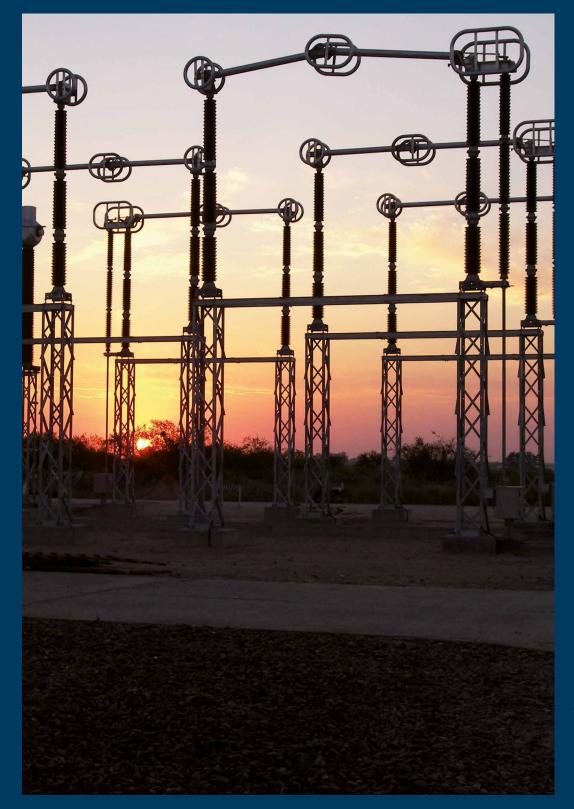








# TRIP RELAYS



 World-class range of auxiliary relays for energy sector, specially designed for the most demanding applications



Model		RD-2R	RD-2XR	RF-4R	RF-4XR		
Applications		(with trippin	g time from 8ms to 3 m	h demanding requiremen s) and breaking capacity HV and MV circuit break	are needed,		
High burden configuration		not av	ailable	See page 15 for t	echnical details		
Construction characteristics							
Contacts no.		2 Chan	geover	4 Chang	geover		
Connections		(+) 2 <b>±</b> (-) 1	$3 5 \frac{7}{5}$ $4 \frac{6}{6}$	(+) 2 <b>±</b> (-) 1	$3 - \frac{11}{7}$ $4 - \frac{12}{8}$ $5 - \frac{9}{9}$ $6 - \frac{14}{10}$		
Options		With OP options • LED included • Diode in parallel with the coil included					
Weight (g)		125 250					
Dimensions (mm)		(A) 22,5 x (B) 50,4 x (C) 72 (D type) (A) 42,5 x (B) 50,4 x (C)			(C) 72 (F short type)		
Coil characteristics							
Standard voltages <sup>(1)</sup>		24, 48, 110, 125, 220, 250 Vdc /110, 127, 230 Vac (50-60Hz)	48, 110, 125, 220, 250 Vdc	24, 48, 110, 125, 220, 250 Vdc / 110, 127, 230 Vac (50-60 Hz)	48, 110, 125, 220, 250 Vdc		
Voltage range			+10% -	20% U <sub>N</sub>			
Pick-up voltage		S	e nick-un/release vol	tage-temperature curve	25		
Release voltage							
Average consumption	In permanence ( $U_N$ )	0,95	5 W	1 W			
	Peak • ≤96 Vdc	0,8 A / 20 ms	2,5 A / 20 ms	0,8 A / 20 ms	2,5 A / 20 ms		
	Peak • >96 Vdc	0,3 A / 20 ms	0,8 A / 20 ms	0,3 A / 20 ms	0,8 A / 20 ms		
Operating time							
Pick-up time		<8 ms (<10 ms Vac)	<5,5 ms	<8 ms (<10 ms Vac)	<5,5 ms		
Drop-out time		Vdc: <40 ms Vac: <50 ms	Vdc: <40 ms	Vdc: <40 ms Vac: <50 ms	Vdc: <40 ms		
Contacts							
Contact material			A	gNi			
Contacts resistance <sup>(2)</sup>			≤30	) mΩ			
Distance between contacts			1,2	mm			
Permanent current				) A			
Instantaneous current		30 A du	uring 1 s / 80 A during	200 ms / 200 A during	g 10 ms		
Max. making capacity			40 A / 0,5	s / 110 Vdc			
Breaking capacity		See brea	aking capacity curves	(Contact configuration	type B)		
Max. breaking capacity			See value for 50	0.000 operations			
U <sub>max</sub> opened contact			250 Vdc	/ 400 Vac			
Perfomance data							
Mechanical endurance		10 <sup>7</sup> operations					
Operating temperature		-25°C +70°C					
Storage temperature			-40ºC	C +85ºC			
Max. operating humidity			93% /	′ +40ºC			
Operating altitude <sup>(3)</sup>		<2000 m					



 $^{\scriptscriptstyle{(3)}}$  Ask for higher altitudes

### TRIP RELAYS (II)



g capacity

RJ-8R RJ-8XR Model RJ-4XR4\* Intended for tripping applications where high quality requirements in operating time (with models Applications even tripping in less than 3 ms) and breaking capacity are needed, that is the case of tripping HV and MV circuit breakers. High burden configuration See page 15 for technical See page 15 for technical not available details details Características constructivas 4 Changeover + 4 Fast Singles-Inversors without break power 8 Changeover Contacts no. 10 1\_\_\_\_\_11 <u>10</u> <u>1 11</u> 20 2<u>21</u> 20 <u>- 21</u> <u>30</u> <u>3</u> Trip 30 31 (+) d (+) d‡ 404415055160Connections

		(•) a	$ \begin{array}{c}                                     $	(-) a
Options		With OP options •	LED included • Diode in p	arallel with the coil included
Weight (g)		500	C	335
Dimensions (mm)		(A) 82,5 x (B) 50,4 x (C) 7	2 (J short type)	(A) 82,5 x (B) 50,4 x (C) 72 (J short Type)
Coil characteristics				
Standard voltages <sup>(1)</sup>		24, 48, 110, 125, 220, 250 Vdc/110, 127, 230 Vac (50-60 Hz)	48, 110, 125, 220, 250 Vdc	110, 125, 220, 250 Vdc
Voltage range		+10% -20	0% U <sub>N</sub>	+15% -20% U <sub>N</sub>
Pick-up voltage		Coo miale um (mileo o coolta		85% U <sub>N</sub>
Release voltage		See pick-up/release voltage	ge-temperature curves	65% U <sub>N</sub>
Average consumption	In permanence (U <sub>N</sub> )	1,4 W		6,5 W
	Peak • ≤96 Vdc	0,8 A / 20 ms	2,5 A / 20 ms	25 W / 5 ms
	Peak • >96 Vdc	0,3 A / 20 ms	0,8 A / 20 ms	
Operating time				
Pick-up time		<8 ms Vdc (<10 ms Vac) (Range 24 Vdc <10 ms)	<6,5 ms	Contacts 1-4: <3 ms Contacts 5-8: <20 ms
Drop-out time		Vdc: <40 ms Vac: <50 ms	Vdc: <40 ms	Contacts 1-4: <25 ms Contacts 5-8: <50 ms
Contacts				
Contact material			AgNi	
Contacts resistance <sup>(2)</sup>			≤30 mΩ	
Distance between contacts		1,2 mm	1	Contacts 5-8: 1,2 mm
Permanent current		10 A		Contacts 1-4: 8 A Contacts 5-8: 15 A
Instantaneous current		30 A during 1 s / 80 A during 200	) ms / 200 A during 10 ms	Contacts 5-8: 30 A during 1 s / 80 A during 200 ms / 200 A during 10 ms
Max. making capacity		40 A / 0,5 s /	110 Vdc	Contacts 5-8: 40 A / 0,5 s / 110 Vdc
Breaking capacity		See breaking capacity curves (Cor	ntact configuration type B)	Contacts 5-8: See breaking capacity curves (Contact configuration type B)
Max. breaking capacity		See value for 50,000	0 operations	Contacts 5-8: See value for 50,000 operations
U <sub>max</sub> opened contact			250 Vdc / 400 Va	c
Perfomance data				
Mechanical endurance			10 <sup>7</sup> operations	
Operating temperature		-25ºC +	70ºC	-40°C +55°C
Storage temperature			-40ºC +85ºC	
Max. operating humidity			93% / +40ºC	
Operating altitude(3)			<2000 m	

\*Not recognized by UL

(3) Ask for higher altitudes

Auxiliary relays | Tripping applications

<sup>(2)</sup> Guarantee data for relays just manufactured

<sup>(1)</sup> Other voltage upon request



<b>FRIP RELAYS</b>	5 (111)		
Model	RI-16R	RXR-4	RF-4UR
	Intended for trip applications where		manuar (C Brateche Instance Instance Instance Instance
Applications	high demanding requirements in operating time and breaking capacity are needed.	Tripping applications with very high speed requirements.	Tripping applications with very high speed requirements.
High burden configuration	See page 15 for technical details	Not available	Not available
Construction characteristics			
Contacts no.	16 Changeover	4 Changeover	4 Changeover
Connections	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$(+) 2 \qquad NC1 \\ (+) 2 \qquad NC2 \\ C2 \qquad NO2 \\ NC3 \\ C3 \qquad NO3 \\ (-) 1 \qquad NC4 \\ C4 \qquad NO4 \\ C4 \qquad NO4 \\ NO4 \\ C4 \qquad NO4 \\$	$ \begin{array}{c} 3 & 7 \\ 2 + & 12 \\ 4 & 8 \\ 1 & 5 & 9 \\ 1 & - & 14 \\ 6 & 10 \end{array} $
Options	<u>عماد معامد محمد المحمد ا محمد المحمد المحمد المحمد المحمد المحمد المحمد المحمد المحمد محمد محمد المحمد المحمد المحمد المحمد المحمد المحم المحمد المحمم محمد محمم محمد محمد محمد محمد محمم مح</u>	No options available	With OP options • LED included • Diode in parallel with the coil included
Weight (g)	1250	126	250
Dimensions (mm)	(A) 120 x (B) 110 x (C) 105	(A) 53 x (B) 90 x (C) 58	(A) 42,5 x (B) 50,4 x (C) 72 (type F short)
Coil characteristics			
Standard voltages <sup>(1)</sup>	48, 110, 125, 220 Vdc	110, 125, 250 Vdc	110, 125, 250 Vdc
Voltage range	+10% -20% U <sub>N</sub>	+10% -20% U <sub>N</sub>	+10% -20% Un
Pick-up voltage	See pick-up/release voltage-	61%	75%
Release voltage	temperature curves	26%	40%
Average consumption	12 W	2,8 W	2 W
Operating time			
Pick-up time	< 10ms	<3 ms	< 3ms
Drop-out time	<50 ms	<4 ms	< 4ms
Contactos			
Contact material	AgNi	AgNi	AgNi
Permanent current	10 A	8 A	8 A
Max. making capacity	40A / 0,5 s / 110 Vdc	15 A during 4s	15 A during 4s
Breaking capacity	ee breaking capacity curves (Contact configuration type A)	See breaking capacity curves	See breaking capacity curves
U <sub>max</sub> opened contact	250 Vdc / 400 Vac	250 Vdc / 400 Vac	250 Vdc / 400 Vac
Performance data			
Mechanical endurance	10 <sup>7</sup> operations	10 <sup>7</sup> operations	10 <sup>7</sup> operations
Operating temperature	-25°C +70°C	-40°C +55°C	-40°C +55°C
Storage temperature	-40°C +85°C	-40°C +85°C	-40°C +85°C
Max. operating humidity	93% / +40°C	93% / +40ºC	93% / +40ºC
Operating altitude <sup>(2)</sup>	<2,000 m	<2,000 m	<2,000 m

<sup>(1)</sup> Other voltage upon request <sup>(2)</sup> Ask for higher altitudes





### TRIP AND LOCKOUT RELAYS (I)

Model	BF-3R	BF-4R	BJ-8R	BI-16R
Applications	Intended for trip	o and lockout applications where time and breaking cap		s in operating
High burden configuration	not available	See page 15 for technical details	See page 15 for technical details	See page 15 for technical details
Construction characteristics				
Contacts no.	3 Changeover	4 Changeover	8 Changeover	16 Changeover
Connections	$\begin{array}{c} \underline{a} \\ \underline{a} \\ \underline{b} \\ \underline{a} \\ \underline{b} \\ \underline{a} \\ \underline{b} \\ \underline{a} \\ \underline{b} \\ $	$\begin{array}{c} a \\ b \\ c \\ c$	$\begin{array}{c} 10\\ 1\\ 1\\ 20\\ 2\\ 21\\ 2\\ 2\\ 21\\ 3\\ 3\\ 3\\ 3\\ 3\\ 3\\ 3\\ 3\\ 3\\ 3\\ 3\\ 4\\ 4\\ 4\\ 4\\ 4\\ 4\\ 4\\ 4\\ 5\\ 5\\ 5\\ 5\\ 5\\ 6\\ 6\\ 6\\ 6\\ 6\\ 6\\ 7\\ 7\\ 7\\ 7\\ 80 \end{array}$	A Terminals 1 - 10 1 - 11 2 - 20 2 - 21 3 - 31 4 - 40 4 - 41 5 - 51 6 - 61 7 - 70 7 - 71 8 - 80 8 - 81 B Terminals 1 - 11 2 - 20 2 - 21 3 - 31 4 - 40 4 - 41 5 - 51 6 - 61 7 - 70 7 - 71 8 - 80 8 - 81 8 - 80

Options		Options are not availab		<u>8</u> <u>81</u> <u>8</u> <u>81</u>
Weight (g)	3	300	600	1250
Dimensions (mm)	(A) 45 x (B) 45 x (	C) 96,5 (F large Type)	(A) 90 x (B) 50 x (C) 100,5 (J large Type)	(A) 120 x (B) 110 x (C) 105
Coil characteristics				
Standard voltages <sup>(1)</sup>	2	4, 48, 72, 110, 125, 220 Vdc	/ 63,5, 110, 127, 230 Vac (50-60 Hz	)
Voltage range		+10	0% -20% U <sub>N</sub>	
Pick-up voltage	:	See pick-up voltage / temp	perature curves for Latching relays	
Average consumptions only in the change-over	17 W	17 W	45 W	90 W
Operating time				
Pick-up time		<10 ms (V	′dc) <20 ms (Vac)	
Contacts				
Contact material			AgNi	
Distance between contacts			1,8 mm	
Permanent current			10 A	
Instantaneous current		80 A during 200	ms / 200 A during 10 ms	
Max. making capacity		40 A /	0,5 s / 110 Vdc	
Breaking capacity	:	See breaking capacity curv	ves (Contact configuration type A)	
Max. breaking capacity		See value fo	r 50.000 operations	
U <sub>max</sub> opened contact		250 V	/dc / 400 Vac	
Performance data				
Mechanical endurance		10 <sup>7</sup> operations		10 <sup>6</sup> operations
Operating temperature		-4	0ºC +70ºC	
Storage temperature		-4	0ºC +85ºC	
Max. operating humidity		93	% / +40°C	
Operating altitude <sup>(2)</sup>		<	<2000 m	

<sup>(1)</sup> Other voltage upon request <sup>(2)</sup> Ask for higher altitudes



Applications

### TRIP AND LOCKOUT RELAYS (II)



Intended for tripping and locking applications where high quality requirements in operating time and breaking capacity are needed, with manual reset.

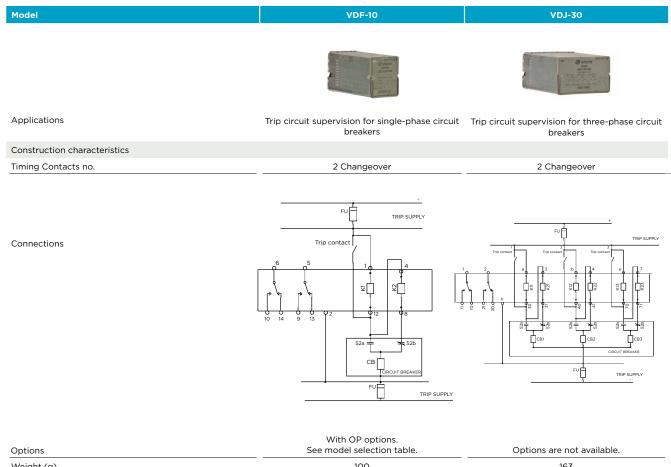
	needed, with manual reset.				
High burden configuration		See page 15 for technic	al details		
Construction characteristics					
Contacts no.	4 Changeover	8 Changeover	16 Changeover		
Connections	$\begin{array}{c} \begin{array}{c} & & & \\ & & \\ & \\ & \\ & \\ & \\ & \\ & \\ $	$\begin{array}{c} 1 \\ 1 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\$	A Terminals       B Terminals $1 - 10$ $1 - 10$ $2 - 21$ $2 - 21$ $3 - 31$ $2 - 21$ $3 - 31$ $40$ $4 - 41$ $3 - 31$ $5 - 51$ $5 - 51$ $6 - 60$ $6 - 61$ $7 - 71$ $7 - 70$ $8 - 81$ $8 - 81$		
Options	Options are	not available			
Weight (g)	300	600	1400		
Dimensions (mm)	(A) 45 x (B) 45 x (C) 96,5 (F large Type)	(A) 90 x (B) 50 x (C) 100,5 (J large Type)	(A) 120 x (B) 110 x (C) 105		
Coil characteristics					
Standard voltages <sup>(1)</sup>	24, 48, 72, 110 63,5, 110, 127, 23	), 125, 220 Vdc 0 Vac (50-60 Hz)	48, 110, 125, 220 Vcc <sup>(3)</sup>		
Voltage range		+10% -20% U <sub>N</sub>			
Pick-up voltage (20°C)		See pick-up voltage / temperature cur	ves for Latching relays		
Average consumptions only in the change-over	17 W	45 W	90W		
Operating time					
Pick-up time	<10 ms (Vdc) <13 ms (Vac)	<10 ms (Vdc) <20 ms (Vac)	<10 ms		
Contacts					
Contact material		AgNi			
Distance between contacts		1,8 mm			
Permanent current		10 A			
Instantaneous current		80 A during 200 ms / 200 A	during 10 ms		
Max. making capacity		40 A / 0,5 s / 110 V	/dc		
Breaking capacity		See breaking capacity curves (Contact	t configuration type A)		
Max. breaking capacity		See value for 50,000 op	perations		
U <sub>max</sub> opened contact		250 Vdc / 400 Va	ac		
Performance data					
Mechanical endurance	10 <sup>7</sup> oper	ations	10 <sup>₅</sup> operations		
Operating temperature		-40ºC +70ºC			
Storage temperature		-40°C +85°C			
Max. operating humidity		93% / +40°C			
Operating altitude <sup>(2)</sup>		<2000 m			

<sup>(1)</sup> Other voltage upon request
 <sup>(2)</sup> Ask for higher altitudes
 <sup>(3)</sup> Vac voltage upon request





# TRIP CIRCUIT SUPERVISION RELAYS



Options	See model selection table.	See model selection table. Options are not available.				
Weight (g)	100	163				
Dimensions (mm)	(A) 42,5 x (B) 50,4 x (C) 96,6 (F large Type)	(A) 82,5 x (B) 50,4 x (C) 96,6 (J large Type)				
Coil characteristics						
Standard voltages <sup>(1)</sup>	24/30, 60, 110/125, 220 Vdc	, 110/127, 230 Vac (50-60 Hz)				
Voltage range	+10% -	-25% U <sub>N</sub>				
Pick-up voltage (23º C)	70'	% U <sub>N</sub>				
Release voltage (23° C)	60	% U <sub>N</sub>				
Consumptions	1,35 W	1,6 W				
Operating time						
Drop-out time	>50	0 ms				
Contacts						
Contact material	A	gNi				
Permanent current	8	3 A				
Instantaneous current	15	5 A				
Max. making capacity	15 A du	uring 4 s				
Max. breaking capacity	0,3 A /	110 Vdc				
U <sub>max</sub> opened contact	250 Vdc	/ 400 Vac				
Performance data						
Mechanical endurance	10 <sup>7</sup> op	erations				
Operating temperature	-40°C	C +55℃				
Storage temperature	-40°C	C +85℃				
Max. operating humidity	93% /	′ +40ºC				
Operating altitude <sup>(2)</sup>	<20	00 m				

<sup>(1)</sup> Other voltage upon request <sup>(2)</sup> Ask for higher altitudes



# AUXILIARY SUPPLY SUPERVISION RELAYS

Model



Applications		Supervise only the auxiliary supply circuit of the protection equipments, avoiding false alarms due to short-time drop of supply
Construction characteristics		
Timing Contacts no.		4 Changeover
Connections		$ \begin{array}{c}  & 11 \\ 3 & 7 \\ (-) & 1 \\ 4 & 8 \\ (+) & 2 \\ (+) & 2 \\ \end{array} $
Options		With OP options. See model selection table.
Weight (g)		250
Dimensions (mm)		(A) 42,5 x (B) 50,4 x (C) 96,6 (F large Type)
Coil characteristics		
Standard voltages (1)		24, 48, 72, 110, 125, 220 Vdc / 63,5 , 110 , 127 , 230 Vac
Voltage range		+10% -20% U <sub>N</sub>
Pick-up voltage		See pick-up release voltage-temperature
Release voltage		curves for standard relays
Consumptions in permanence		4,5 W
Operating time		
Pick-up time		<20 ms
Drop-out time	To minimum voltage Maximum	>100 ms <400 ms
Contacts		
Contact material		AgNi
Contacts resistance (2)		≤30 mΩ
Distance between contacts		1,8 mm
Permanent current		10 A
Instantaneous current		80 A during 200 ms / 200 A during 10 ms
Max. making capacity		40 A / 0,5 s / 110 Vdc
Breaking capacity		See breaking capacity curves (Contact Configuration Type A)
Max. breaking capacity		See value for 50.000 operations
U <sub>max</sub> opened contact		250 Vdc / 400 Vac
Performance data		
Mechanical endurance		10 <sup>7</sup> operations
Operating temperature		-40°C +55°C
Storage temperature		-40°C +85°C
Max. operating humidity		93% / +40°C
Operating altitude(3)		<2000 m

<sup>(1)</sup> Other voltage upon request
 <sup>(2)</sup> Guarantee data for relays just manufactured
 <sup>(3)</sup> Ask for higher altitudes





### HIGH / LOW BURDEN CONFIGURATION

High Burden configuration:
Fast and extra-fast types
Low Burden configuration:
Ultra-fast, extra-fast and fast types

The standard high speed tripping relays are manufactured with a low burden configuration, considering that the initiating contact is placed close to the tripping relay.

However, and in order to avoid unwanted trip relay operation due to pickup or transients, particularly if the relay operating coil is connected to extensive wiring, ARTECHE tripping relays could be manufactured with a high burden configuration, complying with ESI 48-4 international standard, as EB2 class relays. These EB2 class relays are suitable for use in high security circuit breaker tripping circuits, increasing their immunity to capacitance discharge currents. For relays with rated voltage up to and including the 125 V, the relays will withstand, without operating, a discharge into their operate circuits of a  $10\mu$ F capacitor charged to 120% of the nominal voltage.

For relays with rated voltage of 220 V, the relays will withstand, without operating a discharge into their operate circuits of a  $10\mu$ F capacitor charged to 100% of the nominal voltage.

Specifications:

ESI 48-4 EB1: 1983	Low Burden
ESI 48-4 EB2: 1983	High Burden

#### HIGH BURDEN RELAYS CONSUMPTIONS

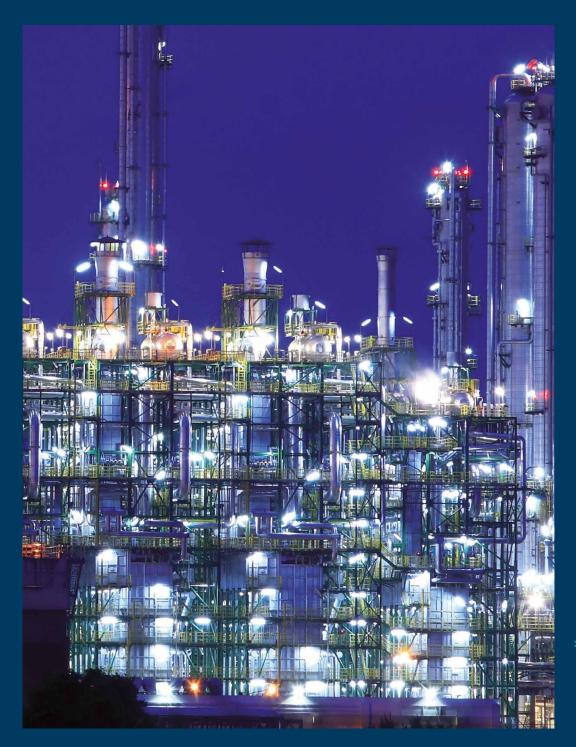
See table below:

Standard Voltage Consumption				
	Model	Peak (< 2ms)	Steady-State	
Instantaneous	RF4R HB		$\leq 4 W$	
	RJ8R HB	≤ 300 W	≤ 6 W	
	RI16R HB		≤ 4 W	
	RF4R (RP) HB		≤ 21 W (Only In commutation)	
Latching Electrical and hand&electric reset	BJ8R (RP) HB	≤ 500 W	≤ 45 W (Only In commutation)	
	BI16R (RP) HB		$\leq$ 90 W (Only In commutation)	





# BREAKING CAPACITY



With devices operating worldwide, also heavy industries like oil & gas sector trust in our relays.



### **BREAKING CAPACITY**

The breaking capacity is a critical parameter on the design and the applications of the relays. Its mechanical life could be considerably reduced, depending on the value of the load (especially with heavy duty loads), the number of operations and the environmental conditions in which the relay is operating.

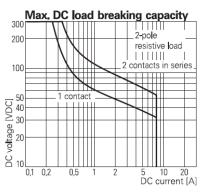
In any configuration, ARTECHE's auxiliary relays have a high breaking capacity values. These limits are showed in the table below, in terms of power and current values. In all the cases, these relays guarantee a right performance during 50,000 operations.

Likewise, the values showed in the following charts have been obtained in standard conditions in the laboratory, and they could be different in real conditions. In any case, the possibility of connecting serial contacts or a bigger distance between contacts makes these values to be considerably increased.

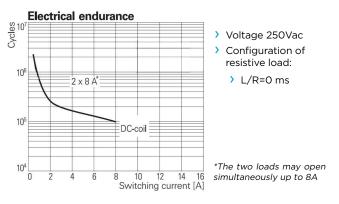
#### ELECTRICAL ENDURANCE OTHER MODELS

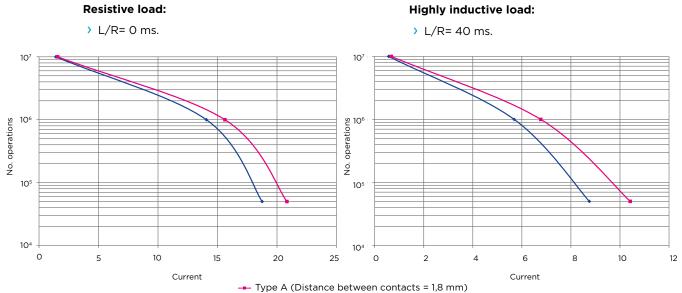
### 24 Vdc voltage Different loads configurations.

## MAX. BREAKING CAPACITY ULTRA-FAST TYPE (Tripping contact):



## ELECTRICAL ENDURANCE ULTRA-FAST TYPE (Tripping contact):





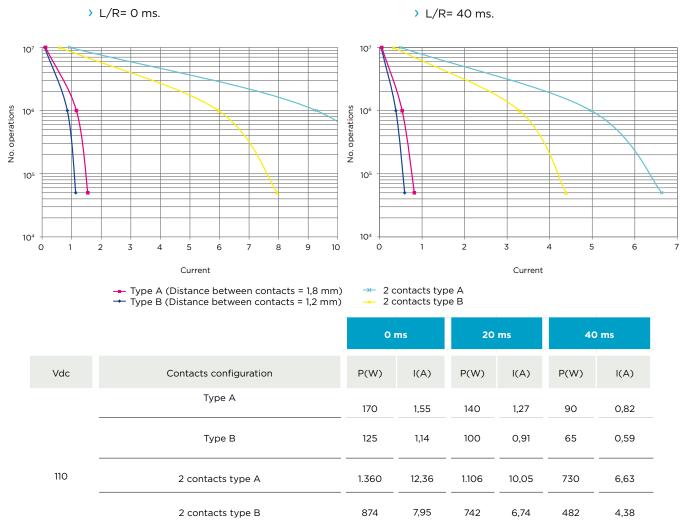
→ Type B (Distance between contacts = 1,0 mm)

		0 ms 20 ms		40 ms			
Vdc	Contact configuration	P(W)	I(A)	P(W)	I(A)	P(W)	I(A)
24	Туре А	500	20,83	370	15,42	250	10,42
24	Туре В	450	18,75	300	12,50	210	8,75



### 110 Vdc voltage Different loads configurations.

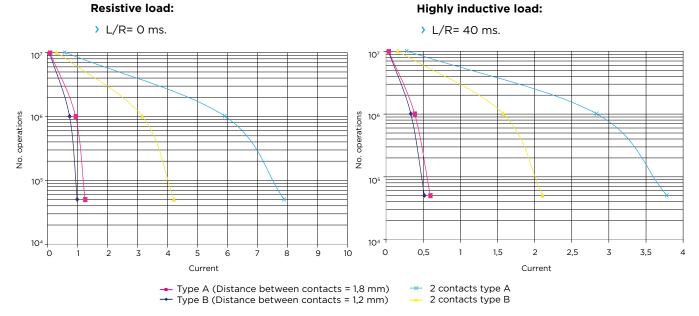
#### **Resistive load:**



Highly inductive load:

### 125 Vdc voltage Different loads configurations.

#### **Resistive load:**





		O r	ns	20	ms	40	ms
Vdc	Contacts configuration	P(W)	I(A)	P(W)	I(A)	P(W)	I(A)
	Туре А	158	1,26	120	0,96	75	0,60
125	Туре В	125	1	96	0,77	65	0,52
	2 contacts type A	987,5	7,90	733,809	5,87	472,972	3,78
	2 contacts type B	528,547	4,23	395,983	3,17	263,827	2,11

### 220 Vdc voltage Different loads configurations.

**Resistive load:** Highly inductive load: > L/R= 0 ms. > L/R= 40 ms. 107 10<sup>7</sup> No. operations <sub>9</sub>01 106 No. operations 10⁵ 10⁵ 104 104 0,00 0,20 0,40 0,60 0,80 1,00 1,20 1,40 1,60 0,00 0,10 0,20 0,30 0,40 0,50 0,60 0,70 0,80 Current Current

Type A (Distance between contacts = 1,8 mm)
 Type B (Distance between contacts = 1,2 mm)

ounon

<sup>2</sup> contacts type A
2 contacts type B

		0 ms		20	ms	40	ms	
Vdc	Contacts configuration	P(W)	I(A)	P(W)	I(A)	P(W)	I(A)	
	Туре А	150	0,68	115	0,52	66	0,30	
220	Туре В	125	0,57	104	0,47	60	0,27	
	2 contacts type A	319	1,45	234	1,06	134	0,61	
	2 contacts type B	242	1,10	177	0,81	100	0,45	



## HOW TO SELECT THE CURVE OF MY RELAY

These charts show the breaking capacity values, either for resistive and highly inductive loads, in three voltage values of reference (ask for other voltage values). The charts show four different curves:

- > Type A: Breaking capacity of the relays with distance between contacts = 1.8 mm.
- > Type B: Breaking capacity of the relays with distance between contacts = 1.2 mm.
- > 2 contacts type A: Breaking capacity for relays with serial contacts, and distance between contacts=1.8 mm.
- > 2 contacts type B: Breaking capacity for relays with serial contacts, and distance between contacts=1.2 mm.

The distance between contacts is shown in the tables of technical data.

## HOW THE BREAKING CAPACITY CAN BE INCREASED

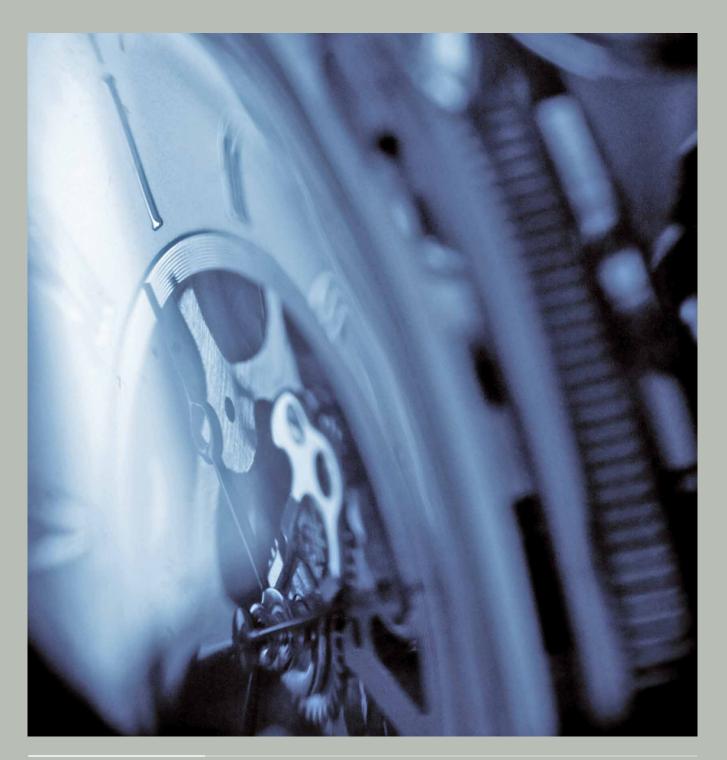
ARTECHE's auxiliary relays are power relays, designed specially to have a high breaking capacity. Thus, there are applications where the loads are so high that it is necessary to even increase the breaking capacity, keeping the reliability of the contacts of the auxiliary relays.

Recommendations to increase breaking capacity:

- > Connect contacts in series. The breaking capacity is increased considerably, guaranteeing the right performance during a high number of operations. See curves for two contacts.
- > Use ARTECHE range of contactors. See ARTECHE contactors catalogue for more detailed information.



# PICK-UP VOLTAGE/RELEASE VOLTAGE-TEMPERATURE CHARTS

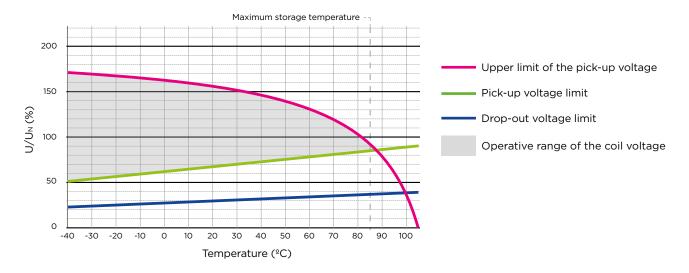




Variability of operative voltage range against temperature for the instantaneous auxiliary relays.

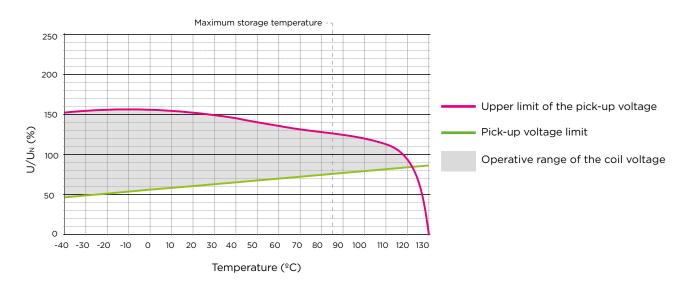
#### TRIPPING RELAYS

#### Operative range against ambient temperature.



## TRIP AND LOCKOUT RELAYS AND TRIP AND LOCKOUT RELAYS WITH RESET PUSH BUTTON

#### Operative range against ambient temperature.





### MODEL SELECTION

RIP	Туре	Range	Aux. Supply				Options			
Model Selection				OP						
Relay type										
2 contacts relay	RD-2R	_*			0*	 1	0	0		0
2 contacts relay	RD-2XR	_*			0*	1	0	0		0
4 contacts relay	RF-4R				0*	1	0	0		0
4 contacts relay	RF-4XR				0*	1	0	0		0
8 contacts relay					0*	1	0	0		0
8 contacts relay	RJ-8XR				0*	1	0	0		0
16 contacts relay					0*	 1*/2***	0*	0*		0*
Ultra-fast (only Vdc)		_*			0*	 1*	0*	0*		0*
Ultra-fast (only Vdc)		_*			_*	 _*	_*	_*		_*
Ultra-fast (only Vdc)		_*			_*	 _*	_*	_*		_*
	RF-40R	_			-	 -	 -	 -		-
Range										
High Burden		НВ								
Low burden (all by default)		-								
Rolling stock applications or lo	w	FF								
duty loads or guided contacts	**									
Aux. Supply										
Vdc or Vac Indicate voltage level and if it	ic									
VDC or VAC	15									
(ex: 24 VDC)										
Options										
					0					
	No					0				
Front LED	Yes					1				
	165									
	No						0			
Mechanical contact position indicator						 				
	Yes						1			
	No							0		
Trip flag						 			-	
	Yes							1	J	
	No							 		0
Push to test button										
	To Push the cor	ntacts								1

#### \*Mandatory option

\*\* For more information refer to railway application brochure

\*\*\* Option only available for HB models with 48 and 125 Vdc rated voltage. Red LED for trip signaling.



Trip and lockout	Туре	Range	Aux. Supply
Model Selection			
Relay type			
3 contacts relay	BF-3R	-	
4 contacts relay	BF-4R		
4 contacts relay	BF-4RP		
8 contacts relay	BJ-8R		
8 contacts relay	BJ-8RP		
16 contacts relay	BI-16R		
16 contacts relay	BI-16RP		
Range			
High Burden		НВ	
Low burden (all by default)		-	



Aux. Supply - Vdc or Vac

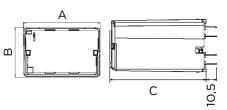
Indicate voltage level and if it is VDC or VAC (ex: 24 VDC)

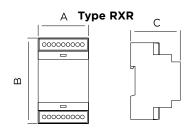
Trip circuit supervision	Туре	LED Indicator configuration	Aux. Supply
Model Selection			
		-	
Relay type			
One phase	VDF-10		
Three phase	VDJ-30		
One phase relay LED Indicators configurator			
Correct operation of the VDF-10 OP is shown via an illuminated green LED (in the bottom left)		OP.	
Correct operation of the VDF-10 OP is shown via an illuminated red LED (in the bottom left)		OP.1	
Correct operation of the VDF-10 OP is shown via an illuminated green LED (in the bottom left) in case of loss of continuity a red LED is illuminated in the upper left		OP.2	
Aux. Supply- Vdc or Vac			
Indicate voltage level and if it is VDC or VAC (ex: 24 VDC)			

Auxiliary supply circuit supervision	Туре	LED Indicator configuration	Aux. Supply
Model Selection			
Relay type			
One phase	RUT-4		
One phase relay Indicators.Options			
Correct operation of the RUT-4 OP is shown via an illuminated green LED (in the bottom left)		OP.	
Correct operation of the RUT-4 OP is shown via an illuminated green LED (in the bottom left) in case of voltage lack a red LED is illuminated in the upper left		OP.2	
Aux. Supply- Vdc or Vac			
Indicate voltage level and if it is VDC or VAC (ex: 24 VDC)			-

## DIMENSIONS OF THE RELAYS

> Dimensions: A x B x C





Size and weight vary depending on the model. Please refer to datasheet for detailed info.



### **RETAINING CLIPS**

RETAINING CLIPS	OP SOCKET	RELATED PLUGGED RELAY						
EO	Universal (D and F sized sockets require 2 units ; J sized sockets require 4 units)	RD; RF; RJ; TDF; TDJ; VDF; VDJ Universal (Bag of 20 units) Universal (Bag of 100 units)						
E41	DN-DE IP, DN-DE 2C IP	RD OP						
E50	DN-TR OP, DN-TR 2C OP	RD OP						
E40	FN-DE IP, FN-DE 2C IP	RF OP						
E43	FN-DE IP, FN-DE 2C IP	TDF OP; VDF OP; RUT						
E42	FN-TR OP, FN-TR 2C OP	RF OP						
E44	FN-TR OP, FN-TR 2C OP	TDF OP; VDF OP; RUT						
E31	FN-DE IP, FN-DE 2C IP	BF						
E21	FN-TR OP, FN-TR 2C OP	BF						
E45	JN-DE IP, JN-DE 2C IP	RJ OP						
E47	JN-DE IP, JN-DE 2C IP	TDJ OP; VDJ OP						
E46	JN-TR OP, JN-TR 2C OP	RJ OP						
E48	JN-TR OP, JN-TR 2C OP	TDJ OP; VDJ OP						
E29	JN-DE IP, JN-DE 2C IP	BJ; UJ						
E27	JN-TR OP, JN-TR 2C OP	BJ; UJ						
OTHER ACCESSORIES								
Security pins	for RD; RF; RJ; TDF; TDJ; VDF; VDJ	relays (bag of 100 units)						





#### > E\*\* retaining clips

### SOCKETS, DIMENSIONS AND CUT-OUT

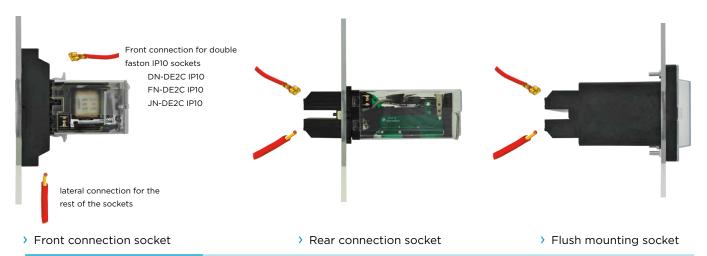
Sockets		Acce		
Relay	Туре	Screw	Double faston	Weight (g)
	IP10 Front connection	DN-DE IP10	DN-DE2C IP10	60
D	IP20 Front connection	DN-DE IP20	DN-DE2C IP20	60
	IP10 Rear connection	DN-TR OP	DN-TR2C OP	50
	IP10 Front connection	FN-DE IP10	FN-DE2C IP10	110
	IP20 Front connection	FN-DE IP20	FN-DE2C IP20	110
F	IP10 Rear connection	FN-TR OP	FN-TR2C OP	90
F	IP10 Flush mounting (short)	F-EMP SHORT OP		300
	IP10 Flush mounting	F-EMP OP		300
	IP10 Front connection	JN-DE IP10	JN-DE2C IP10	225
	IP20 Front connection	JN-DE IP20	JN-DE2C IP20	225
	IP10 Rear connection	JN-TR OP	JN-TR2C OP	180
J	IP10 Flush mounting (short)	J-EMP SHORT OP		400
	IP10 Flush mounting	J-EMP OP		400
	IP10 Front connection	I-DE		1000
I	IP10 Rear connection	I-TR	I-TR2C	500
	IP10 Flush mounting	I-EMP		500

#### Accessories

Retaining clips

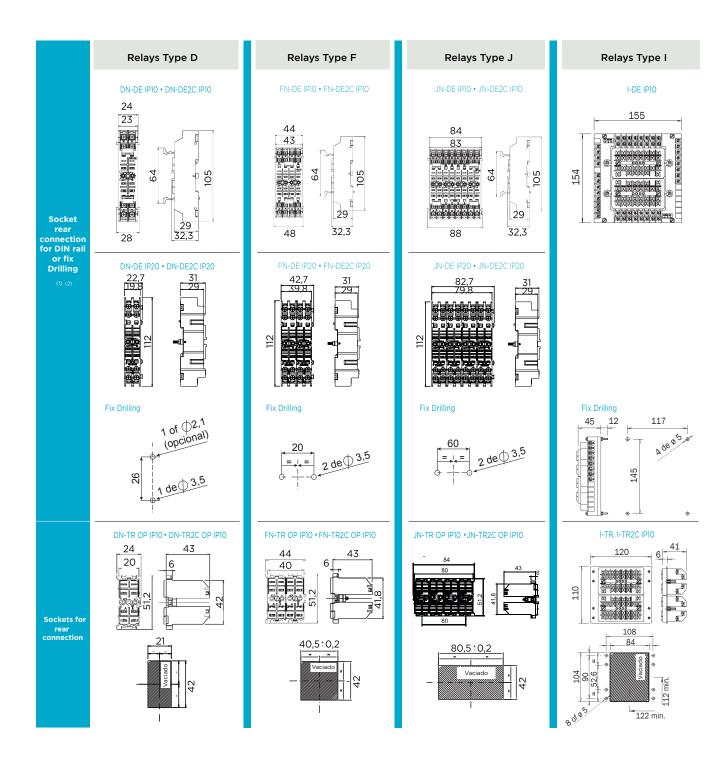
Function signs on the extraction ring

Security pins



Auxiliary relays | Tripping applications

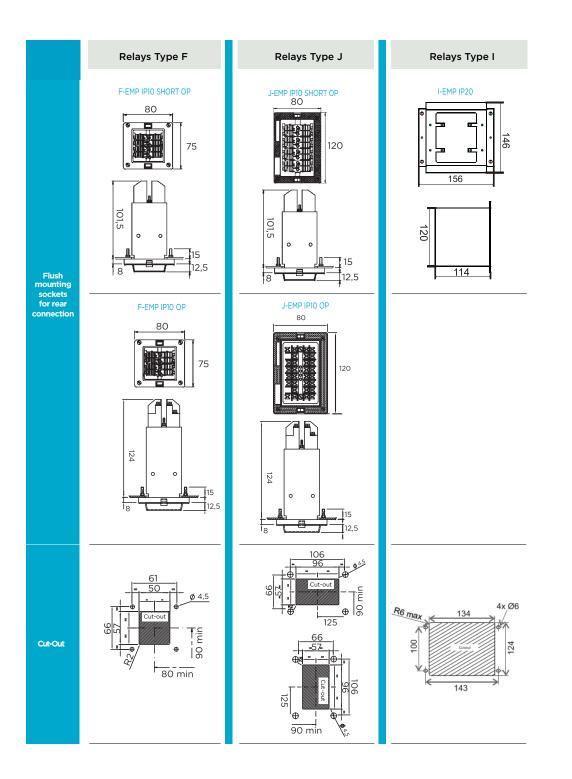




 $^{(\mathrm{l})}$  DIN rail according to EN50022  $\,$  DIN46277/3  $\,$ 

(2) Minimum distance between sockets will depend on type of relay and sockets. Please request sockets user manual for more detailed information.









Updates: ARTECHE\_CT\_Tripping-relays\_EN Version: 2.20