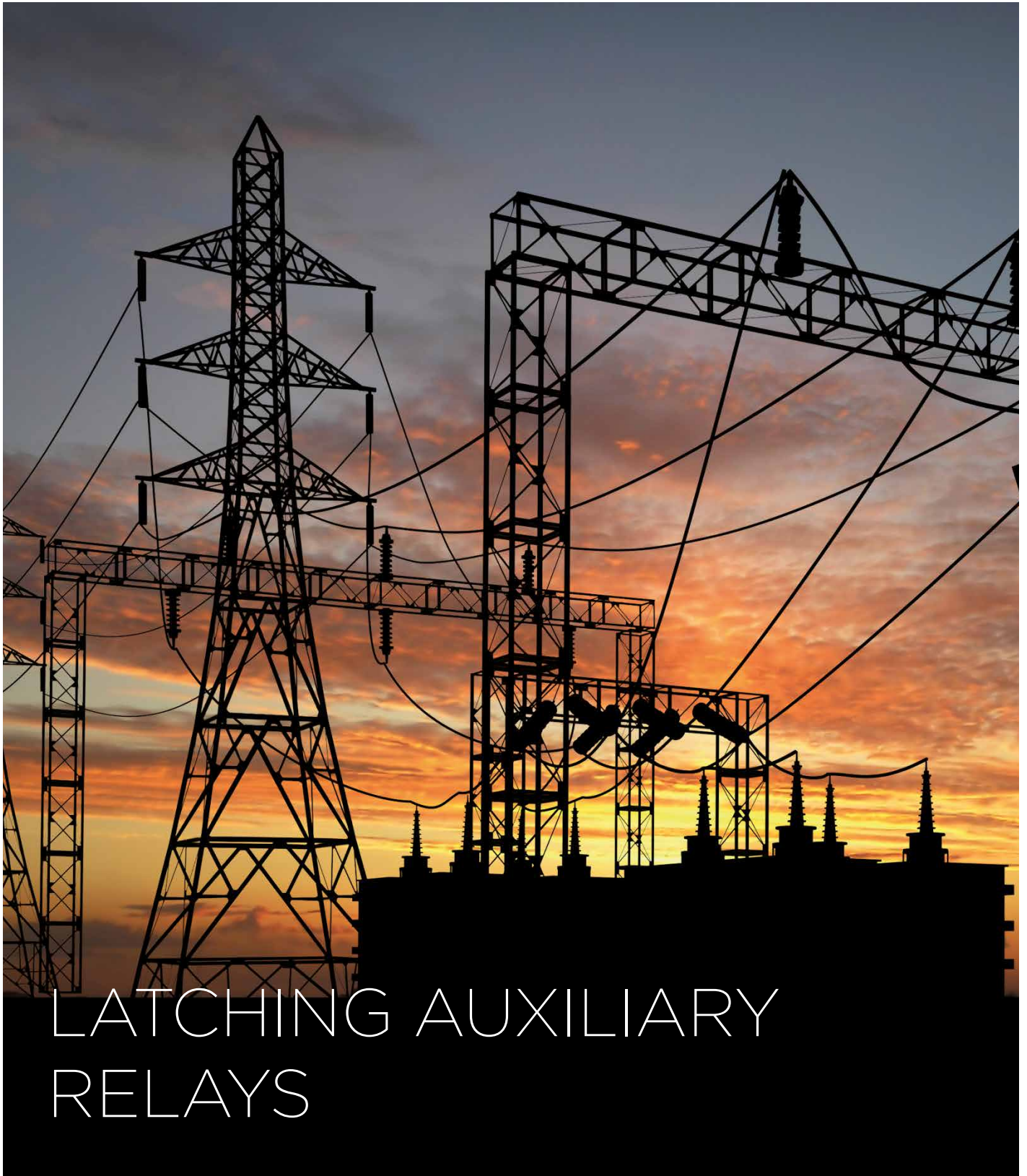


arteche



# LATCHING AUXILIARY RELAYS

This document may be subject to changes. Contact ARTECHE to confirm the characteristics and availability of the products described here.



# Moving together

# INDEX

- 4. › Answers for any application
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- 18. › Pick-up voltage/release voltage-temperature charts
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# ANSWERS FOR ANY APPLICATION

ARTECHE latching relays are relays with 2 stable positions for the output contacts. Depending on which coil is energized, the output contacts will change from one position to another. The design of Arteche relay allows to have no consumption in permanence.

ARTECHE latching relays range is designed to guarantee the best features and complete security even in the hardest working environment.

The design, durability and quality of the different alternatives that ARTECHE latching relays can offer (FF range and standard range), make them suitable for high responsibility controls in different areas, highlighting:

## ELECTRICAL UTILITIES:

### Power plants, electrical substations.

- › Position monitoring of circuit breaker and sectionalizer
- › Direct operation on MV / HV (circuit breaker, sectionalizer)
- › Position memory:
  - manual / automatic
  - local / remote
- › Galvanic isolation between the control system and the primary equipment
- › Applications where high speed operation is a must
- › Applications where high breaking capacity is required
- › Tripping and lockout functions
- › Low duty loads control, activate digital inputs. FF range



## RAILWAY SECTOR:

### Electrification, signalling, interlocking and rolling stock.

- › Boarding doors locking
- › Brake circuit command
- › Lighting and air conditioned systems operation
- › Traction system
- › Low duty loads control, activate digital inputs. FF range



## INDUSTRIAL SECTOR:

### Continuous process industries (Petrochemical, concrete, iron industries), water treatment, ...

- › Critical process surveillance
- › Position monitoring circuit breaker and sectionalizer
- › Galvanic isolation between the control and the power systems
- › Low duty loads control, activate digital inputs. FF range
- › Activation of security systems in industrial processes:
  - bloking electrical machines

The great power of the output contacts makes possible direct action on HV and MV switchgear, because their making/breaking capacities, continuous through-current and overvoltage capacity guarantee perfect insulation.

# GENERAL CHARACTERISTICS

The main features of ARTECHE's latching auxiliary relays are the followings:

- › Designed to allow continuous operation even in high temperature ambient, within the whole voltage range.
- › No consumption in permanence.
- › Self-cleaning contacts.
- › High level of electrical insulation between input and output circuits.
- › Availability of extended voltage range (+25/-30%) for high security applications.
- › Capable to operate under low duty loads, activate digital inputs, and operate without any load. FF Range.
- › High speed operation (up to 10 ms).
- › Capable to withstand vibrations and seismic conditions (EN 61373; IEEE 344; IEEE 323; IEEE C37.98 Standards).
- › Sturdy design.
- › Front state indication on the nameplate.
- › High protection degree (IP40), with transparent cover, making them suitable for use in salty and tropical atmospheres.
- › In compliance with the most demanding test standards: IEC, EN, IEEE and bearing the CE mark.
- › Wide range of auxiliary voltage levels (Vdc and Vac).
- › Simplicity of installation (plug-in relays in a wide range of sockets with different installation configurations).
- › Capable to work under ambients with relative humidity around 100%.
- › No need of maintenance after installation.



Large variety of assemblies with frontal and rear connection sockets by screw or fast-on clip.

# TECHNICAL STANDARDS

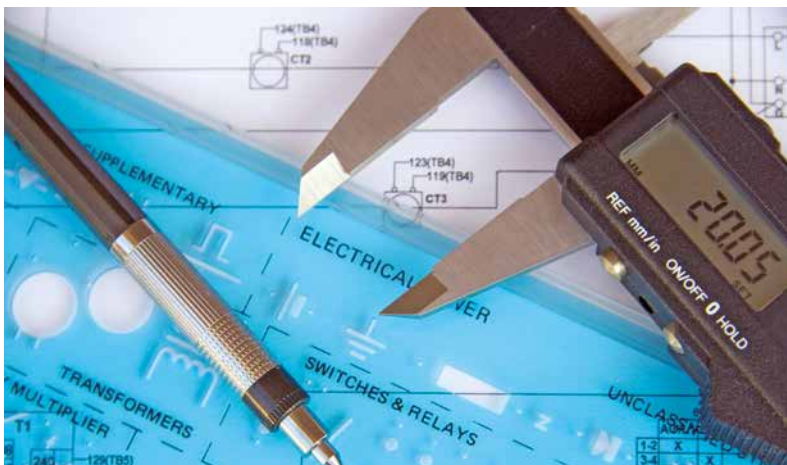
## GENERAL STANDARDS

In addition to the specific applicable standards, ARTECHE latching 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.

## RAILWAY APPLICABLE STANDARDS

- › **EN 60077 Series.** Rolling stock equipment.
  - Part 1: General conditions in service and general terms.
  - Part 2: Electrotechnical components.
- › **EN 50155** (IEC 60571 equivalent). Railway applications - Rolling stock equipment.



E322124

**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.

# RANGE OF PRODUCTS

## General purpose latching relays

The bistable ARTECHE relays with 2 stable positions. These positions are held by a permanent magnet, which prevents intermediate positions, giving a huge security operation. The position change is made with 2 sets of coils with separate entrances in BF3 and BJ8 and with breaking-flame contacts for each set of coils.

Their pick-up time lower than 20 ms and the high breaking capacity of their contacts make them appropriate to be used as an interface between the protection system and the breaker. The main application for these relays is multiply the output contacts in those controls that need to memorize 2 stable positions:

- automatic / manual
- close / open



## Auxiliary trip and lockout relays

ARTECHE offers specific relays intended to be used in tripping and lockout applications, where high quality requirement in operating time (with models that assure the trip ever in less than 10 ms) and breaking capacity are needed.

Front indication on the nameplate, that indicates if the relay has changed the contact position.

All the relays include a diode in parallel with the coil (see bistable relays with overvoltage protection characteristic).

There is also the possibility of a bistable trip and lockout relay with manual reset.



## Latching relays with coil overvoltage protection

ARTECHE's auxiliary relays, either Vdc or Vac, have the possibility of including an element in parallel with the coil (diode or varistance).

These elements aim to prevent the over voltage peak generated by the coil itself and it may affect other equipment installed on the same line.



# TECHNICAL FEATURES PER MODEL



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



# GENERAL PURPOSE LATCHING RELAYS

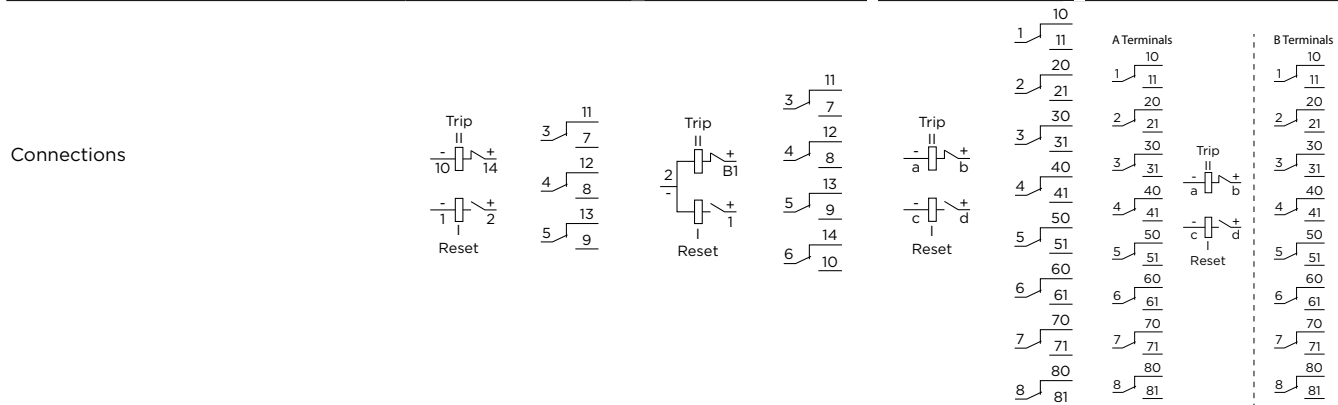
Model	BF-3	BF-4	BJ-8	BI-16
-------	------	------	------	-------



Applications Relays with two stable positions. Required when the position memory (open-close, automatic-manual, local-remote...) is needed.

### Construction characteristics

Contacts no.	3 Changeover	4 Changeover	8 Changeover	16 Changeover
--------------	--------------	--------------	--------------	---------------



Options Options are not available

Weight (g)	300	600	1400
------------	-----	-----	------

Dimensions (mm)	45 x 45 x 96,5 (F large Type)	90 x 50 x 100,5 (J large Type)	120 x 110 x 105
-----------------	-------------------------------	--------------------------------	-----------------

### Coil characteristics

Standard voltages <sup>(1)</sup>	24, 48, 72, 110, 125, 220 Vdc / 63,5, 110, 127, 230 Vac (50-60 Hz)	24, 48, 72, 110, 125, 220 Vcc/Vca (50/60 Hz)
----------------------------------	--	--

Voltage range	+25% -30% U <sub>N</sub>	+10% -20% U <sub>n</sub>
---------------	--------------------------	--------------------------

Pick-up voltage See pick-up voltage / temperature curves for Latching relays

Average consumptions only in the change-over	6 W	12 W	24 W
--	-----	------	------

### Operating time

Pick-up time	<20 ms
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### Contacts

Contact material	AgNi
------------------	------

Distance between contacts	1,8 mm
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Permanent current	10 A
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Instantaneous current	80 A during 200 ms / 200 A during 10 ms	80 A during 200 ms / 150 A during 10 ms
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Max. making capacity	40 A / 0,5 s / 110 Vdc
----------------------	------------------------

Breaking capacity See breaking capacity curves (Contact configuration)

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 +70°C
-----------------------	-------------

Storage temperature	-40°C +85°C
---------------------	-------------

Max. operating humidity	93% / +40°C
-------------------------	-------------

Operating altitude <sup>(2)</sup>	<2000 m
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<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 and lockout applications where high demanding requirements in operating time and breaking capacity are needed.			
Construction characteristics				
Contacts no.	3 Changeover	4 Changeover	8 Changeover	16 Changeover
Connections				
Options	Options are not available			
Weight (g)	300		600	1250
Dimensions (mm)	45 x 45 x 96,5 (F large Type)		90 x 50 x 100,5 (J large Type)	120 x 110 x 105
Coil characteristics				
Standard voltages <sup>(1)</sup>	24, 48, 72, 110, 125, 220 Vdc / 63,5, 110, 127, 230 Vac (50-60 Hz)			
Voltage range	+10% -20% U <sub>N</sub>			
Pick-up voltage	See pick-up voltage / temperature curves for Latching relays			
Average consumptions only in the change-over	17 W	17 W	30 W	90 W
Operating time				
Pick-up time	<10 ms (Vdc) <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 curves (Contact configuration)			
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		10 <sup>6</sup> operations	
Operating temperature	-40°C +70°C			
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

# TRIP AND LOCKOUT RELAYS (II)

Model	BF-4RP	BJ-8RP	BI-16RP
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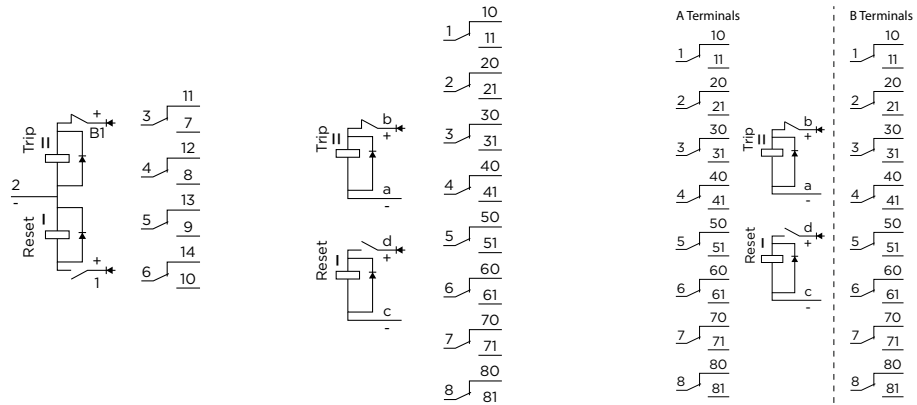


**Applications** Intended for tripping and locking applications where high quality requirements in operating time and breaking capacity are needed, with manual reset.

### Construction characteristics

Contacts no.	4 Changeover	8 Changeover	16 Changeover
--------------	--------------	--------------	---------------

### Connections



### Options

Options are not available

Weight (g)	300	600	1400
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Dimensions (mm)	45 x 45 x 96,5 (F large Type)	90 x 50 x 100,5 (J large Type)	(A) 120 x (B) 110 x (C) 105
-----------------	----------------------------------	-----------------------------------	-----------------------------

### Coil characteristics

Standard voltages <sup>(1)</sup>	24, 48, 72, 110, 125, 220 Vdc 63,5, 110, 127, 230 Vac (50-60 Hz)	110, 125, 220 Vcc
----------------------------------	---	-------------------

Voltage range	+10% -20% U <sub>N</sub>
---------------	--------------------------

Pick-up voltage (20°C)	See pick-up voltage / temperature curves for Latching relays
------------------------	--

Average consumptions only in the change-over	17 W	30 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 Vdc
----------------------	------------------------

Breaking capacity	See breaking capacity curves (Contact configuration)
-------------------	--

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	10 <sup>6</sup> operations
----------------------	----------------------------	----------------------------

Operating temperature	-40°C +70°C
-----------------------	-------------

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

# LATCHING RELAYS WITH COIL OVERVOLTAGE PROTECTION

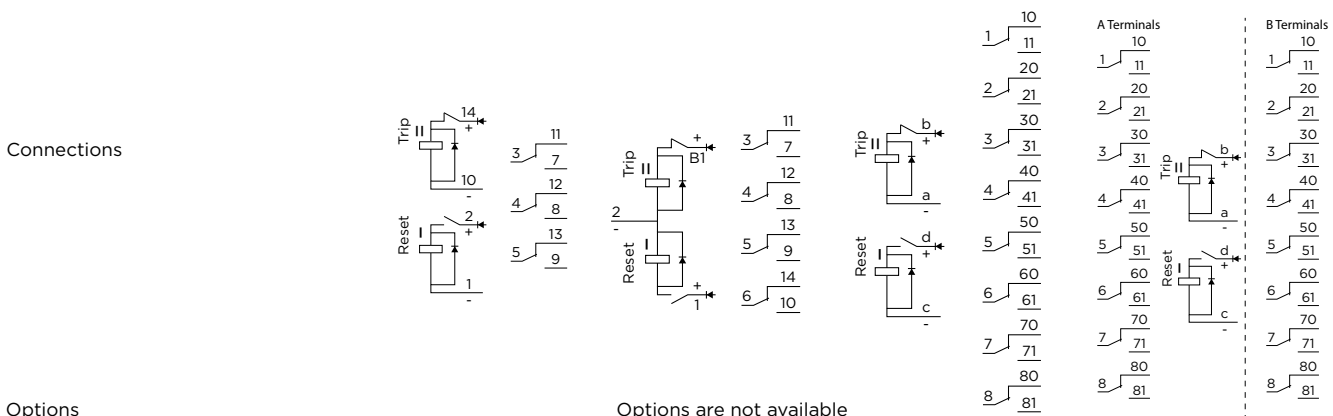
Model	BF-3BB	BF-4BB	BJ-8BB	BI-16BB
-------	--------	--------	--------	---------



Applications Intended to protect the contact of the equipment that feeds the coil in our relay.

Construction characteristics

Contacts no.	3 Changeover	4 Changeover	8 Changeover	16 Changeover
--------------	--------------	--------------	--------------	---------------



Options Options are not available

Weight (g)	300	600	1400
Dimensions (mm)	45 x 45 x 96,5 (F large Type)	90 x 50 x 100,5 (J large Type)	120 x 110 x 105

Coil characteristics

Standard voltages <sup>(1)</sup>	24, 48, 72, 110, 125, 220 Vdc <sup>(3)</sup>	24, 48, 72, 110, 125, 220 Vcc/Vca (50/60 Hz)	
Voltage range	+25% -30% U <sub>N</sub>	+10% -20% U <sub>n</sub>	
Pick-up voltage	See pick-up voltage / temperature curves for Latching relays		
Average consumptions only in the change-over	6 W	12 W	24 W

Operating time

Pick-up time	<20 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	80 A during 200 ms / 150 A during 10 ms
Max. making capacity	40 A / 0,5 s / 110 Vdc	
Breaking capacity	See breaking capacity curves (Contact configuration)	
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 +70°C
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 voltages upon request



# BREAKING CAPACITY



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

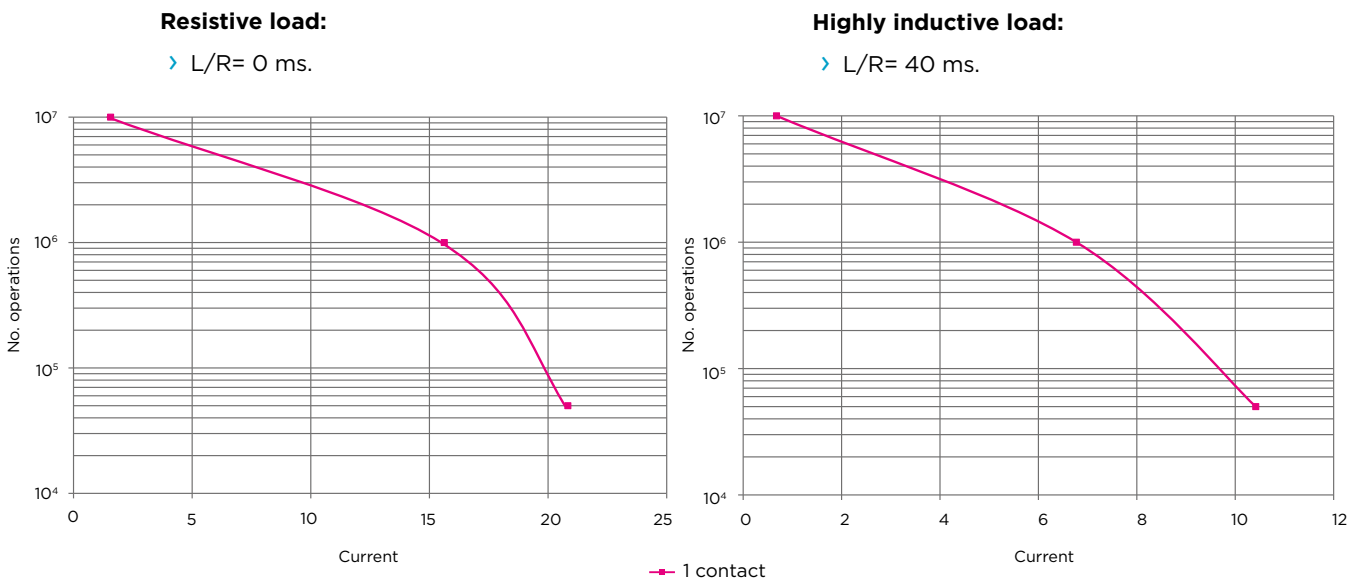
# BREAKING CAPACITY

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.

## 24 Vdc voltage Different loads configurations.



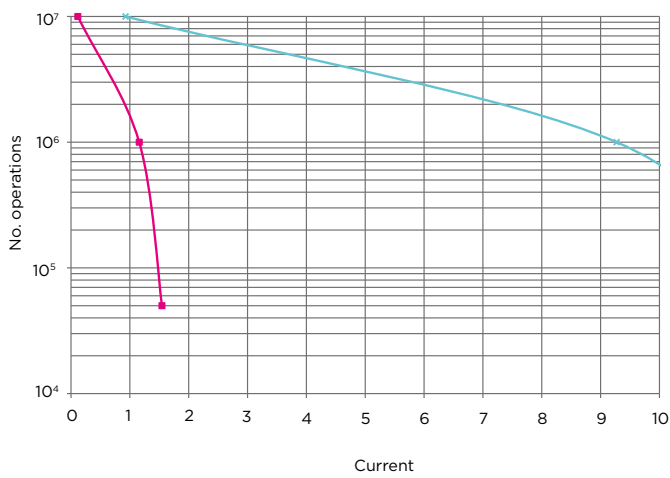
Vdc	Contact configuration	0 ms		20 ms		40 ms	
		P(W)	I(A)	P(W)	I(A)	P(W)	I(A)
24	1 contact	500	20,83	370	15,42	250	10,42

(\*) Ask for data and curve of serial contacts

## 110 Vdc voltage Different loads configurations.

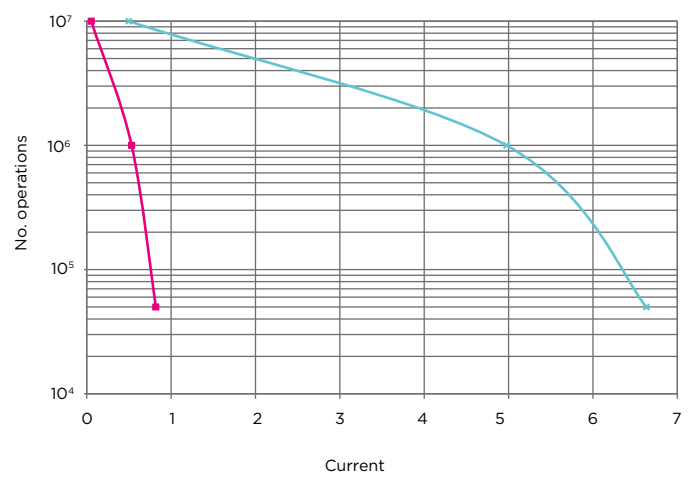
### Resistive load:

> L/R= 0 ms.



### Highly inductive load:

> L/R= 40 ms.



— 1 contact  
— 2 contacts

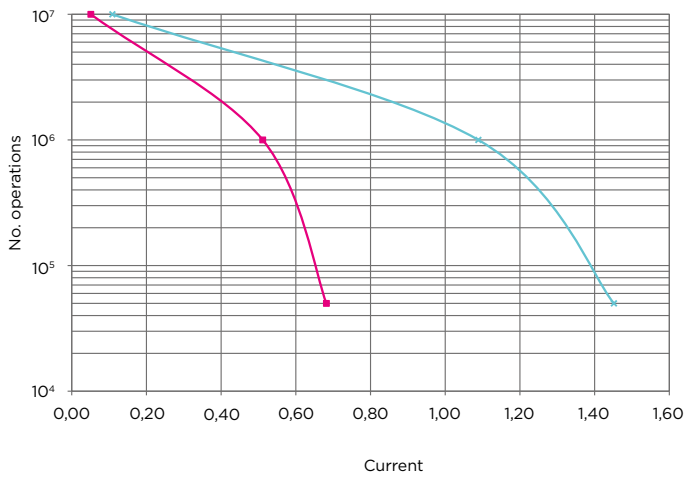
Vdc	Contact configuration	0 ms		20 ms		40 ms	
		P(W)	I(A)	P(W)	I(A)	P(W)	I(A)
110	1 contact	170	1,55	140	1,27	90	0,82
	2 contacts	1,360	12,36	1,106	10,05	730	6,63

## 220 Vdc voltage

Different loads configurations.

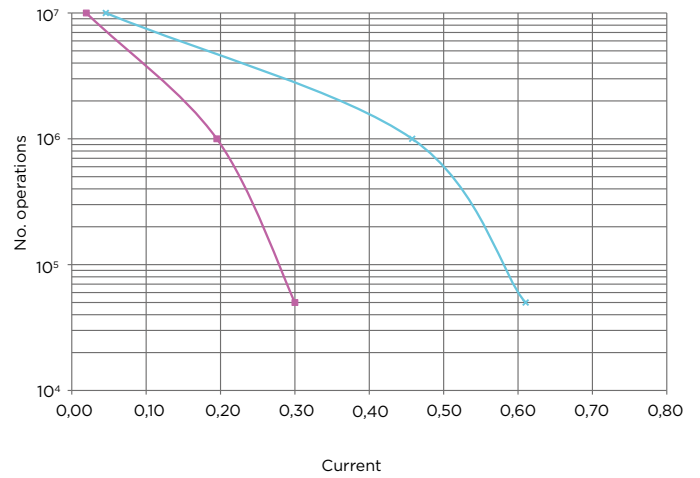
### Resistive load:

› L/R= 0 ms.



### Highly inductive load:

› L/R= 40 ms.



— 1 contact  
— 2 contacts

Vdc	Contact configuration	0 ms		20 ms		40 ms	
		P(W)	I(A)	P(W)	I(A)	P(W)	I(A)
220	1 contact	150	0,68	115	0,52	66	0,30
	2 contacts	319	1,45	234	1,06	134	0,61



## 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 two different curves:

- › 1 contact: Breaking capacity of the relays with distance between contacts = 1.8 mm.
- › 2 contacts: Breaking capacity for relays with serial contacts, and distance between contacts=1.8 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.

Thus, ARTECHE relays have the following alternatives and recommendations:

- › Possibility of external connection of equipment (serial contacts) getting an important increase of breaking capacity in these equipment is shown, guaranteeing the right performance during a high number of operations.



# PICK-UP VOLTAGE/RELEASE VOLTAGE-TEMPERATURE CHARTS

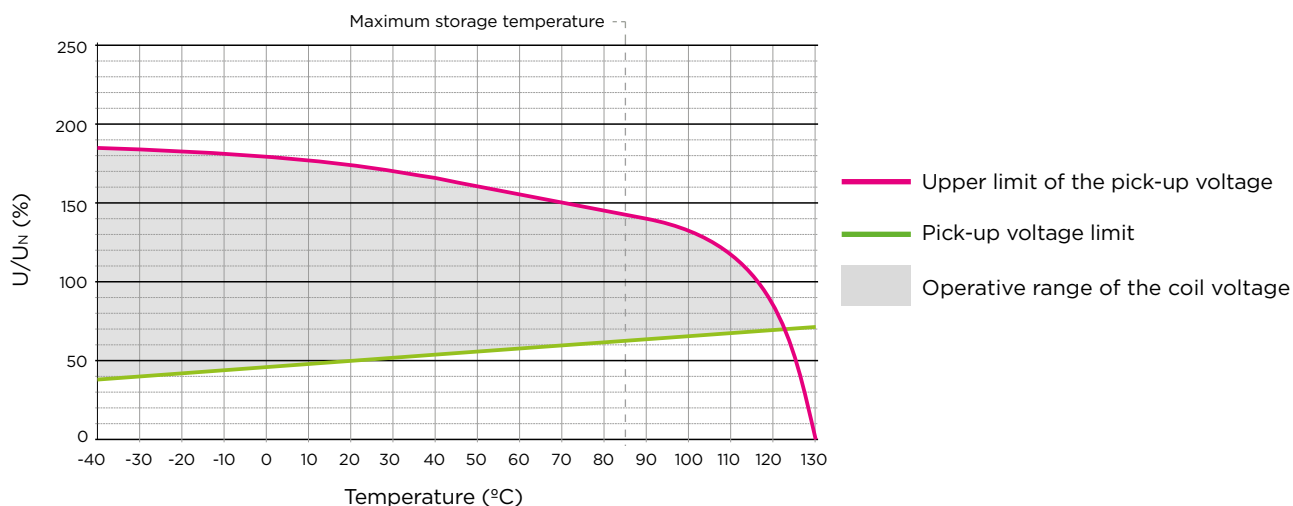


Variability of operative voltage range against temperature for the latching auxiliary relays.

General purpose latching relays and relays with coil overvoltage protection.

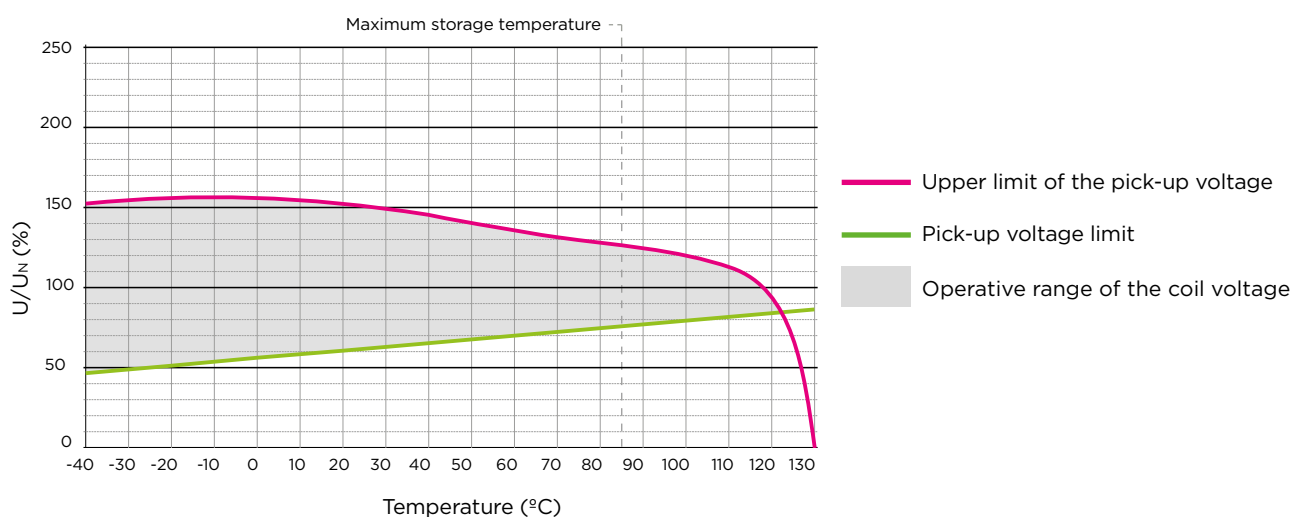
## GENERAL PURPOSE RELAYS

### Operative range against ambient temperature.



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

### Operative range against ambient temperature.



# MODELS SELECTION

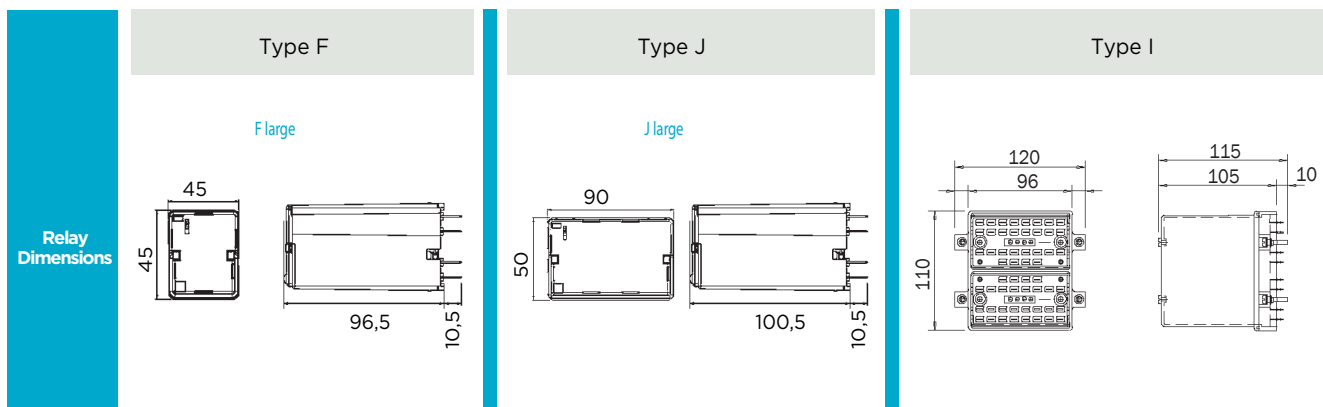
Latching	Type	Range	Range FF*	Aux. Supply Vdc or Vac.
<b>Model Selection</b> ▶▶				
<b>General purpose range</b>				
3 contacts relay	BF-3			
4 contacts relay	BF-4			
8 contacts relay	BJ-8			
16 contacts relay	BI-16			
<b>Options</b>				
Diode in parallel with the coil (only Vdc)		BB		
Fast acting trip and lock out relay (electrical reset only)		R		
Fast acting trip and lock out relay (electrical and manual reset)**		RP		
<b>Range FF</b>				
Rolling stock applications or low duty loads***	No		-	
	Yes		FF	
<b>Aux. Supply Vdc or Vac</b>				
Indicate voltage level and if it is VDC or VAC (ex: 24 VDC)				

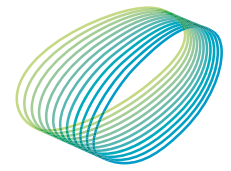
\* Indicate just if FF range is required.

\*\* Unavailable for 3 contacts.

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

# DIMENSIONS OF THE RELAYS





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Arteche has more than 100 customer service technical points, an expert engineers network close to you everywhere

# RETAINING CLIPS

RETAINING CLIPS	OP SOCKET	RELATED PLUGGED RELAY
E0	Universal (D and F sized sockets require 2 units ; J sized sockets require 4 units)	RD; RF; RJ; TDF; TDJ; VDF; VDJ
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
E42	FN-TR OP, FN-TR 2C OP	RF OP
E44	FN-TR OP, FN-TR 2C OP	TDF OP; VDF OP
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)



> E0 retaining clips

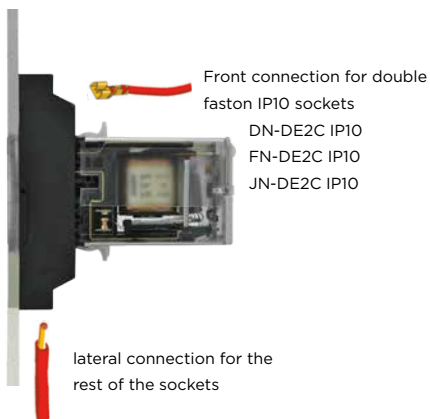


> E\*\* retaining clips

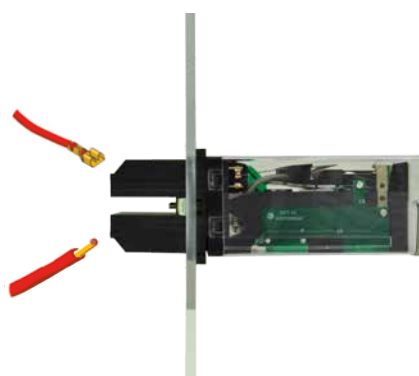
# SOCKETS, DIMENSIONS AND CUT-OUT

Sockets		Options		Weight (g)
Relay	Type	Screw	Faston	
BF	IP10 Front connection	FN-DE IP10	FN-DE2C IP10	110
	IP20 Front connection	FN-DE IP20	FN-DE2C IP20	110
	IP10 Rear connection	FN-TR OP	FN-TR2C OP	90
	IP10 Flush mounting	F-EMP OP		300
BJ	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
	IP10 Flush mounting	J-EMP OP		400
BI	IP10 Front connection	I-DE		1000
	IP10 Rear connection	I-TR	I-TR2C	500
	IP10 Flush mounting	I-EMP		500

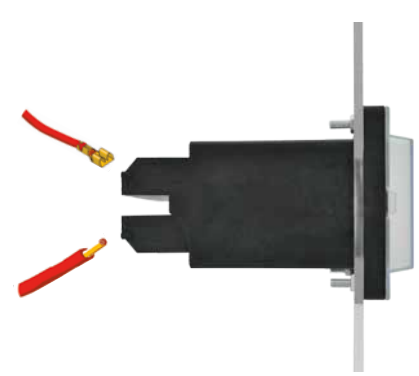
Accessories
Retaining clips
Function signs on the extraction ring



> Front connection socket



> Rear connection socket



> Flush mounting socket

	Relays type F	Relays type J	Relays type I
Sockets for DIN rail (1) (2)	<p>FN-DE IP10 • FN-DE2C IP10</p>	<p>JN-DE IP10 • JN-DE2C IP10</p>	<p>I-DE IP10</p>
	<p>FN-DE IP20 • FN-DE2C IP20</p> <p>Fix Drilling</p>	<p>JN-DE IP20 • JN-DE2C IP20</p> <p>Fix Drilling</p>	<p>Fix Drilling</p>
Sockets for rear connection	<p>FN-TR OP IP10 • FN-TR2C OP IP10</p>	<p>JN-TR OP IP10 • JN-TR2C OP IP10</p>	<p>I-TR, I-TR2C IP10</p>
	<p>F-EMP OP IP10</p>	<p>J-EMP OP IP10</p>	<p>I-EMP IP10</p>
Cut-out			

(1) 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.



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Updates: ARTECHE\_CT\_LATCHING-RELAYS\_EN  
Version: 1.7