arteche

# AUXILIARY RELAYS FOR TRIPPING APPLICATIONS

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

# Moving together

# INDEX

# ANSWER FOR ANY TRIPPING APPLICATION

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

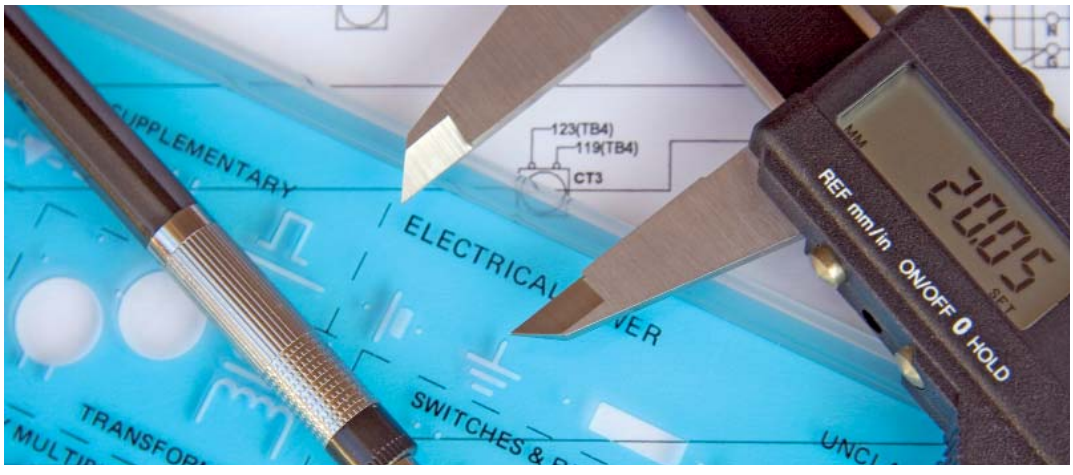
- Interface between protection and control equipments and HV and/or MV circuit breakers, eliminating risks in case of internal failure of the circuit breaker.
- Trip contacts multiplication, to operate directly on the circuit breaker and transmit the corresponding alarms in a minimum time.
- Trip and 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 61812:** Relés de tiempo especificado para aplicaciones industriales.
- **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.
- Possibility to work in environments with relative humidity of 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 or by the magnetic blow out, 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.

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

## 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 and 8 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 sock 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 and 8 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 (opened or closed).

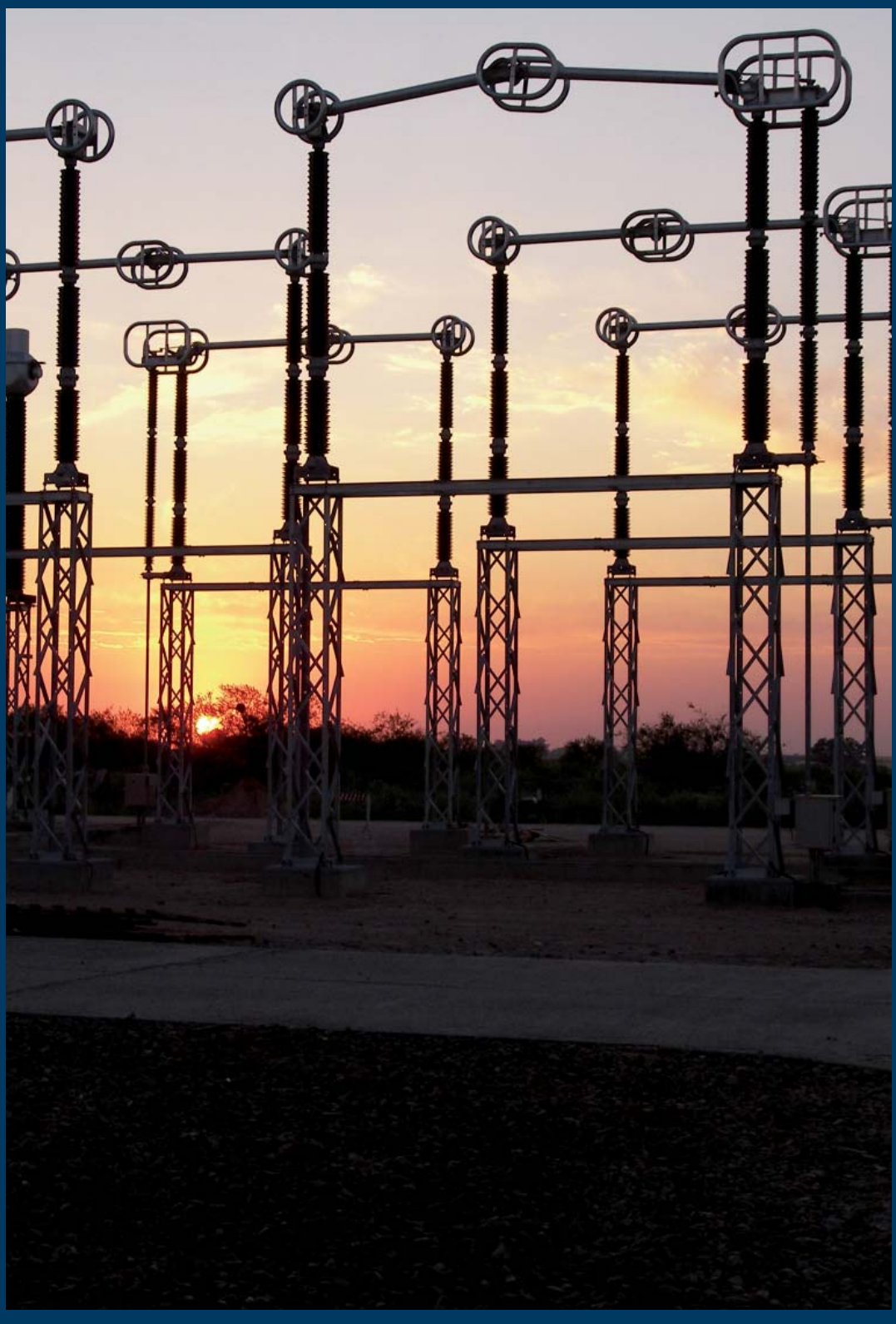
The correct state of the circuit is showed with a green LED on the front plate of the relay. The output contacts change its position if the relay detects a failure in the continuity of the circuit.

## AUXILIARY SUPPLY CIRCUIT SUPERVISION RELAYS

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

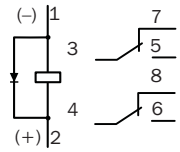
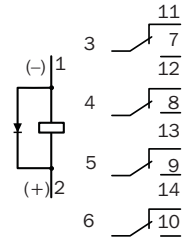
Connecting the relay across the trip circuit supply, the equipment is normally energized. Faults will occur when the trip voltage is lost, so the relay drops off in those cases, providing the related signs and alarms.In order to avoid faulty alarms due to instantaneous supply voltage dips, the drop off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

# TRIP RELAYS



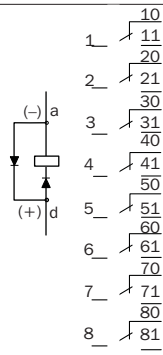
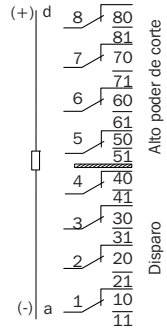
› World-class range of auxiliary relays for energy sector, specially designed for the most demanding applications

# TRIP RELAYS (I)

| Model | RD-2R | RD-2XR | RF-4R | RF-4XR |
|---|---|---|---|---|
| |  |  |  |  |
| Applications | Intended for tripping applications where high demanding requirements in operating time (with tripping time from 8ms to 3 ms) and breaking capacity are needed, that is the case of tripping HV and MV circuit breakers. | | | |
| High burden configuration | not available | | See page 15 for technical details | |
| **Construction characteristics** | | | | |
| Contacts no. | 2 Changeover | | 4 Changeover | |
| Connections |   | |   | |
| Options | With 0P options • LED included • Diode in parallel with the coil included | | | |
| Weight (g) | 125 | | 250 | |
| Dimensions (mm) | 22,5 x 50,4 x 72 | | 42,5 x 50,4 x 72 (F short Type) | |
| **Coil characteristics** | | | | |
| Standard voltages[1] | 24, 48, 110, 125, 220, 250 [4] Vdc /110, 127, 230 Vac (50-60Hz) | 24, 48, 110, 125, 220, 250 Vdc | 24, 48, 110, 125, 220, 250 [4] Vdc / 110, 127, 230 Vac (50-60 Hz) | 24, 48, 110, 125, 220, 250 [4] Vdc |
| Voltage range | +10% -20% $U_N$ | | | |
| Pick-up voltage | See pick-up/release voltage-temperature curves | | | |
| Release voltage | | | | |
| Consumptions In permanence ($U_N$) | 0,95 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<br>Vac: <50 ms | Vdc: <40 ms | Vdc: <40 ms<br>Vac: <50 ms | Vdc: <40 ms |
| **Contacts** | | | | |
| Contact material | AgNi | | | |
| Contacts resistance[2] | ≤30 mΩ | | | |
| Distance between contacts | 1,2 mm | | | |
| Permanent current | 10 A | | | |
| Instantaneous current | 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 | | | |
| Breaking capacity | See breaking capacity curves (Contact configuration type B) | | | |
| Max. breaking capacity | See value for 50.000 operations | | | |
| $U_{max}$ opened contact | 250 Vdc / 400 Vac | | | |
| **Perfomance data** | | | | |
| Mechanical endurance | $10^7$ operations | | | |
| Operating temperature | -10ºC +55ºC | | | |
| Storage temperature | -30ºC +70ºC | | | |
| Max. operating humidity | 93% / +40ºC | | | |
| Operating altitude[3] | <2000 m | | | |

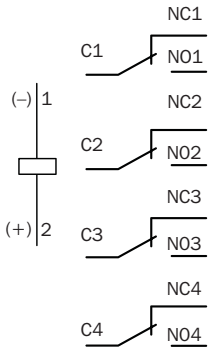
[1] Other voltage upon request
[2] Guarantee data for relays just manufactured
[3] Ask for higher altitudes
[4] Voltage not recognized by UL

# TRIP RELAYS (II)

| Model | RJ-8R | RJ-8XR | RJ-4XR4 |
|---|---|---|---|
| |  |  |  |
| Applications | Intended for tripping applications where high quality requirements in operating time (with models 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 details | See page 15 for technical details | not available |
| **Construction characteristics** | | | |
| Contacts no. | 8 Changeover | | 4 Changeover + 4 Fast Singles-Inversors without break power |
| Connections |   | |   |
| Options | With OP options • LED included • Diode in parallel with the coil included | | |
| Weight (g) | 500 | | 335 |
| Dimensions (mm) | 82,5 x 50,4 x 72 (J short type) | | 42,5 x 50,4 x 82,5 (F short Type) |
| **Coil characteristics** | | | |
| Standard voltages[1] | 24, 48, 110, 125, 220, 250 [4] Vdc/110, 127, 230 Vac (50-60 Hz) | 24, 48, 110, 125, 220, 250[4] Vdc | 110, 125, 220, 250 [4] Vdc |
| Voltage range | +10% -20% $U_N$ | | +15% -20% $U_N$ |
| Pick-up voltage | See pick-up/release voltage-temperature curves | | |
| Release voltage | | | |
| Consumptions In permanence ($U_N$) | 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 1-4: AgNi 10 Contacts 5-8: Ag1000 |
| Contacts resistance[2] | ≤30 mΩ | | |
| Distance between contacts | 1,2 mm | | Contacts 5-8: 1,2 mm |
| Distance between contacts | 10 A | | Contacts 5-8: 15 A Contacts 1-4: 8 A |
| Instantaneous current | 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 | | |
| Breaking capacity | See breaking capacity curves (Contact configuration type B) | | |
| Max. breaking capacity | See value for 50,000 operations | | |
| $U_{max}$ opened contact | 250 Vdc / 400 Vac | | |
| **Perfomance data** | | | |
| Mechanical endurance | $10^7$ operations | | |
| Operating temperature | -10ºC +55ºC | | |
| Storage temperature | -30ºC +70ºC | | |
| Max. operating humidity | 93% / +40ºC | | |
| Operating altitude[3] | <2000 m | | |

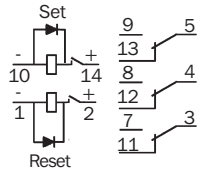
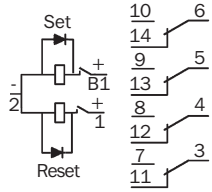
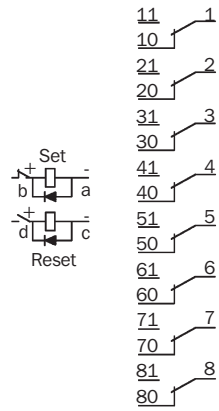
[1] Other voltage upon request
[2] Guarantee data for relays just manufactured
[3] Ask for higher altitudes
[4] Voltage not recognized by UL

# TRIP RELAYS (III)

| Model | RXR-4 |
|---|---|
| |  |
| Applications | Tripping applications with very high speed requirements |
| High burden configuration | not available |
| **Construction characteristics** | |
| Contacts no. | 4 Changeover |
| Connections |   |
| Options | No options available |
| Weight (g) | 126 |
| Dimensions (mm) | 53 x 90 x 58 |
| **Coil characteristics** | |
| Standard voltages[1] | 110, 125, 250 Vdc |
| Voltage range | +10% -20% $U_N$ |
| Pick-up voltage | 40% |
| Release voltage | 28% |
| Consumptions | <3 W |
| **Operating time** | |
| Pick-up time | <3 ms |
| Drop-out time | <3 ms |
| **Contacts** | |
| Contact material | AgNi |
| Permanent current | 8 A |
| Max. making capacity | 15 A during 4s |
| Breaking capacity | See breaking capacity curves |
| $U_{max}$ opened contact | 250 Vdc / 400 Vac |
| **Performance data** | |
| Mechanical endurance | $10^7$ operations |
| Operating temperature | -10ºC +55ºC |
| Storage temperature | -30ºC +70ºC |
| Max. operating humidity | 93% / +40ºC |
| Operating altitude[2] | <2,000 m |

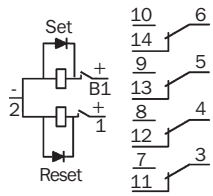
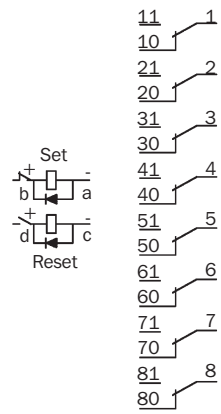
[1] Other voltage upon request
[2] Ask for higher altitudes

# TRIP AND LOCKOUT RELAYS (I)

| Model | BF-3R | BF-4R | BJ-8R |
|---|---|---|---|
| |  |  |  |
| Applications | Intended for trip and lockout applications where high demanding requirements in operating time and breaking capacity are needed. | | |
| High burden configuration | not available | See page 15 for technical details | See page 15 for technical details |
| **Construction characteristics** | | | |
| Contacts no. | 3 Changeover | 4 Changeover | 8 Changeover |
| Connections |  |  |  |
| Options | Options are not available | | |
| Weight (g) | 300 | | 600 |
| Dimensions (mm) | 45 x 45 x 96,5 (F short Type) | | 90 x 50 x 100,5 (J short Type) |
| **Coil characteristics** | | | |
| Standard voltages[1] | 24, 48, 72, 110, 125, 220 Vdc / 63,5, 110, 127, 230 Vac (50-60 Hz) | | |
| Voltage range | +10% -20% $U_N$ | | |
| Pick-up voltage | See pick-up voltage / temperature curves for Latching relays | | |
| Consumptions only in the change-over | 27 W | 23 W | 35,5 W |
| **Operating time** | | | |
| Pick-up time | <10 ms (Vdc) <20 ms (Vac) | | <10 ms (Vdc) <20 ms (Vac) |
| **Contacts** | | | |
| Contact material | AgNi | | |
| Distance between contacts | 1,8 mm | | |
| Permanent current | 10 A | | |
| Instantaneous current | 880 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 | | |
| $U_{max}$ opened contact | 250 Vdc / 400 Vac | | |
| **Performance data** | | | |
| Mechanical endurance | $10^7$ operations | | |
| Operating temperature | -40ºC +70ºC | | |
| Storage temperature | -40ºC +70ºC | | |
| Max. operating humidity | 93% / +40ºC | | |
| Operating altitude[2] | <2000 m | | |

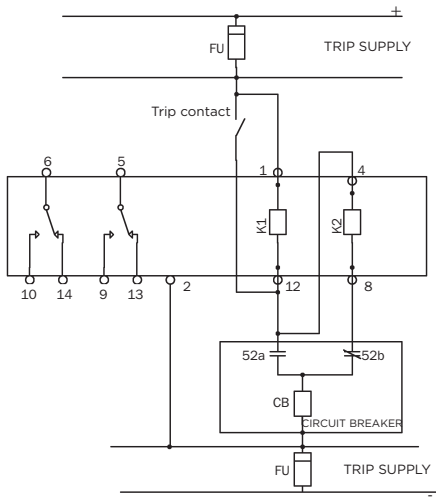
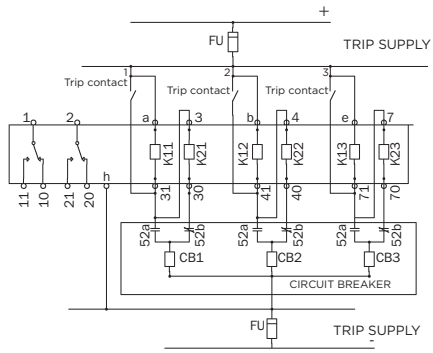
[1] Other voltage upon request
[2] Ask for higher altitudes

# TRIP AND LOCKOUT RELAYS (II)

| Model | BF-4RP | BJ-8RP |
|---|---|---|
| |  |  |
| Applications | Intended for tripping and locking applications where high quality requirements in operating time and breaking capacity are needed, with manual reset. | |
| High burden configuration | See page 15 for technical details | See page 15 for technical details |
| Construction characteristics | | |
| Contacts no. | 4 Changeover | 8 Changeover |
| Connections |   |   |
| Options | Options are not available | |
| Weight (g) | 300 | 600 |
| Dimensions (mm) | 45 x 45 x 96,5 (F short Type) | 90 x 50 x 100,5 (J short Type) |
| Coil characteristics | | |
| Standard voltages[1] | 24, 48, 72, 110, 125, 220 Vdc<br>63,5, 110, 127, 230 Vac (50-60 Hz) | |
| Voltage range | +10% -20% $U_N$ | |
| Pick-up voltage (20ºC) | See pick-up voltage / temperature curves for Latching relays | |
| Consumptions only in the change-over | 23 W | 35,5 W |
| Operating time | | |
| Pick-up time | <10 ms (Vdc) <13 ms (Vac) | <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 type A) | |
| Max. breaking capacity | See value for 50,000 operations | |
| $U_{max}$ opened contact | 250 Vdc / 400 Vac | |
| Performance data | | |
| Mechanical endurance | $10^7$ operations | |
| Operating temperature | -40ºC +70ºC | |
| Storage temperature | -40ºC +70ºC | |
| Max. operating humidity | 93% / +40ºC | |
| Operating altitude[2] | <2000 m | |

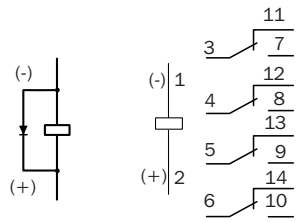
[1] Other voltage upon request
[2] Ask for higher altitudes

# TRIP CIRCUIT SUPERVISION RELAYS

| Model | VDF-10 | VDJ-30 |
|---|---|---|
| |  |  |
| Applications | Trip circuit supervision for single-phase circuit breakers | Trip circuit supervision for three-phase circuit breakers |
| **Construction characteristics** | | |
| Timing Contacts no. | 2 Changeover | 2 Changeover |
| Connections |   |   |
| Options | Options are not available | |
| Weight (g) | 100 | 163 |
| Dimensions (mm) | 42,5 x 50,4 x 96,6 (F short Type) | 82,5 x 50,5 x 96,6 (J short Type) |
| **Coil characteristics** | | |
| Standard voltages[1] | 24/30, 60, 110/125, 220 Vdc, 110/127, 230 Vac (50-60 Hz) | |
| Voltage range | +10% -25% $U_N$ | |
| Pick-up voltage (23º C) | 70% $U_N$ | |
| Release voltage (23º C) | 50% $U_N$ | |
| Consumptions | 3,1 W | 3,63 W |
| **Operating time** | | |
| Drop-out time | >200 ms | |
| **Contacts** | | |
| Contact material | AgNi | |
| Permanent current | 8 A | |
| Instantaneous current | 15 A | |
| Max. making capacity | 15 A during 4 s | |
| Max. breaking capacity | 0,3 A / 110 Vdc | |
| $U_{max}$ opened contact | 250 Vdc / 400 Vac | |
| **Performance data** | | |
| Mechanical endurance | $10^7$ operations | |
| Operating temperature | -10ºC +55ºC | |
| Storage temperature | -30ºC +70ºC | |
| Max. operating humidity | 93% / +40ºC | |
| Operating altitude[2] | <2000 m | |

[1] Other voltage upon request
[2] Ask for higher altitudes

# AUXILIARY SUPPLY SUPERVISION RELAYS

| Model | RUT-4 |
|---|---|
| |  |
| 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 |   |
| Options | Options are not available |
| Weight (g) | 250 |
| Dimensions (mm) | 42,5 x 50,4 x 96,6 (F short Type) |
| **Coil characteristics** | |
| Standard voltages [1] | 24, 48, 72, 110, 125, 220 Vdc |
| Voltage range | +10% -20% $U_N$ |
| Pick-up voltage | See pick-up release voltage-temperature curves for standard relays |
| Release voltage | |
| Consumptions in permanence | 3,9 W |
| **Operating time** | |
| Pick-up time | <20 ms |
| Drop-out time<br>To minimum voltage<br>Maximum | <br>>100 ms<br><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 |
| $U_{max}$ opened contact | 250 Vdc / 400 Vac |
| **Performance data** | |
| Mechanical endurance | $10^7$ operations |
| Operating temperature | -10ºC +55ºC |
| Storage temperature | -30ºC +70ºC |
| Max. operating humidity | 93% / +40ºC |
| Operating altitude[3] | <2000 m |

[1] Other voltage upon request
[2] Guarantee data for relays just manufactured
[3] Ask for higher altitudes

CE

# HIGH / LOW BURDEN CONFIGURATION
## (HIGH SPEED TRIPPING RELAYS ONLY)

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 10μF capacitor charged to 120% of the higher rated voltage for the relay.

For relays with rated voltage of 220 V, the relays will withstand, without operating a discharge into their operate circuits of a 10μF capacitor charged to 100% of the higher rated voltage for the relay, i.e 242 V.

Specifications:

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

## HIGH BURDEN RELAYS CONSUMPTIONS

Instantaneous relays (self reset relays): same consumption as low burden configuration

Latching relays (electric and hand&electric reset): See table below

| | Standard Voltage | 220 Vdc | 125 Vdc | 24 Vdc |
|---|---|---|---|---|
| **Electrical reset and hand and electrical reset relays** | Consumption (only in commutation) | < 150 W (peak) | < 100 W (peak) | < 75 W (peak) |

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# BREAKING CAPACITY

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

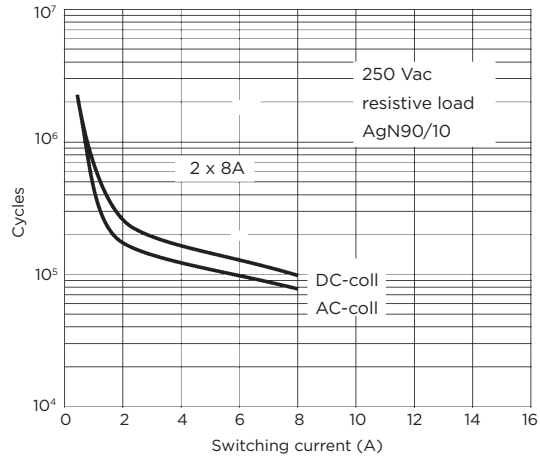
# BREAKING CAPACITY

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 MODEL RXR:




## ELECTRICAL ENDURANCE OTHER MODELS

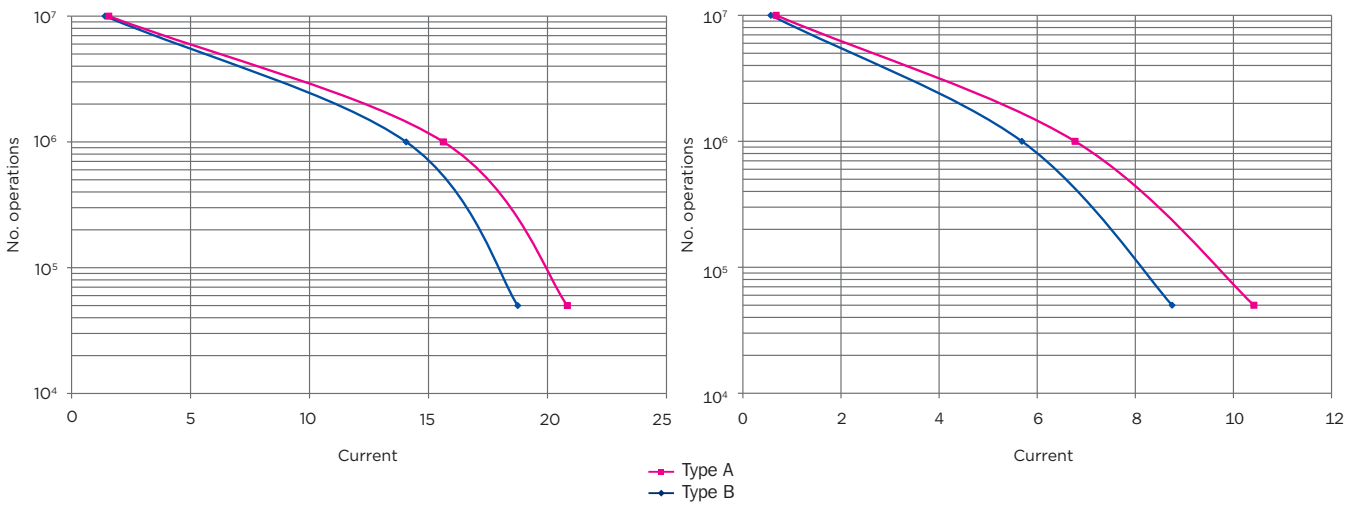
### 24 Vdc voltage
### Different loads configurations.

**Resistive load:**

› L/R= 0 ms.

**Highly inductive load:**

› L/R= 40 ms.

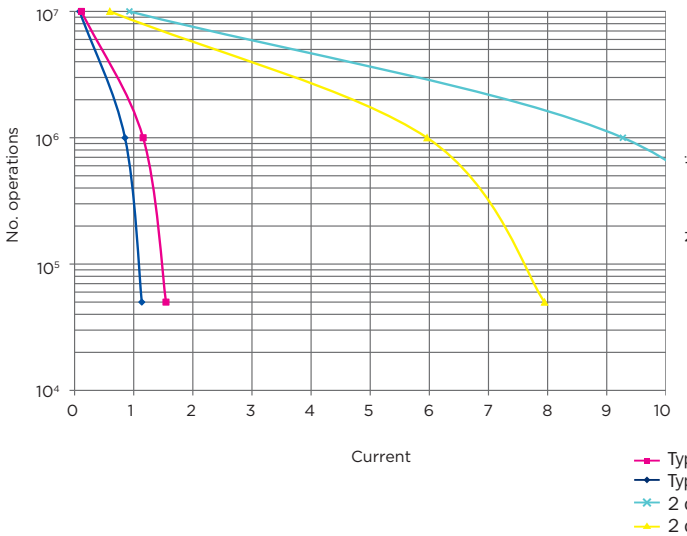



| | | 0 ms | | 20 ms | | 40 ms | |
|---|---|---|---|---|---|---|---|
| Vdc | Contact configuration | P(W) | I(A) | P(W) | I(A) | P(W) | I(A) |
| 24 | Type A | 500 | 20,83 | 370 | 15,42 | 250 | 10,42 |
| | Type B | 450 | 18,75 | 300 | 12,50 | 210 | 8,75 |

# 110 Vdc voltage
## Different loads configurations.

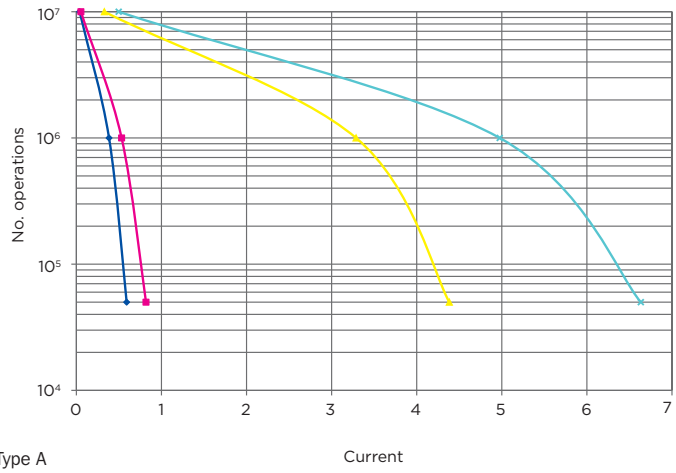
**Resistive load:**

› L/R= 0 ms.




**Highly inductive load:**

› L/R= 40 ms.



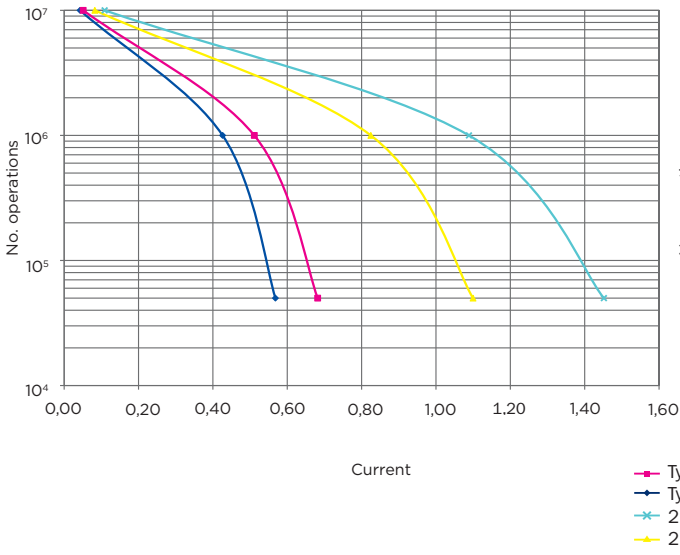

Type A
Type B
2 contacts type A
2 contacts type B

| | | 0 ms | | 20 ms | | 40 ms | |
|---|---|---|---|---|---|---|---|
| Vdc | Contacts configuration | P(W) | I(A) | P(W) | I(A) | P(W) | I(A) |
| 110 | Type A | 170 | 1,55 | 140 | 1,27 | 90 | 0,82 |
| | Type B | 125 | 1,14 | 100 | 0,91 | 65 | 0,59 |
| | 2 contacts type A | 1.360 | 12,36 | 1.106 | 10,05 | 730 | 6,63 |
| | 2 contacts type B | 874 | 7,95 | 742 | 6,74 | 482 | 4,38 |

# 220 Vdc voltage
## Different loads configurations.

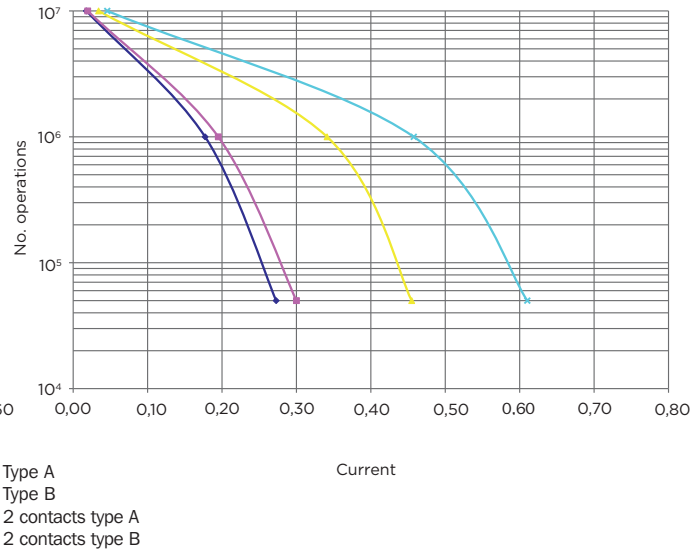
**Resistive load:**

› L/R= 0 ms.




**Highly inductive load:**

› L/R= 40 ms.




Type A
Type B
2 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) |
| 220 | Type A | 150 | 0,68 | 115 | 0,52 | 66 | 0,30 |
| | Type B | 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 two 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.
- Include the magnetic blow-out option: This option is indicated for safety applications (back-up) where the load values are extremely high. The mechanical life of the relay is reduced, but it is able to open very high loads for a certain number of operations.

These values of high breaking capacity are represented in the following table, where the high capacity of the output contacts of ARTECHE's auxiliary relays is proved:

| Equipe | I | V | L/R |
|---|---|---|---|
| With contact configuration Type A + magnetic blow out (OP: 1XXXX) | 5 A | 125 Vdc | 40 ms |
| With contact configuration Type B + magnetic blow out (OP: 1XXXX) | | | |
| 2 contacts type A + magnetic blow out (OP: 1XXXX) | 15 A | 125 Vdc | 40 ms |
| 2 contacts type B + magnetic blow out (OP: 1XXXX) | | | |

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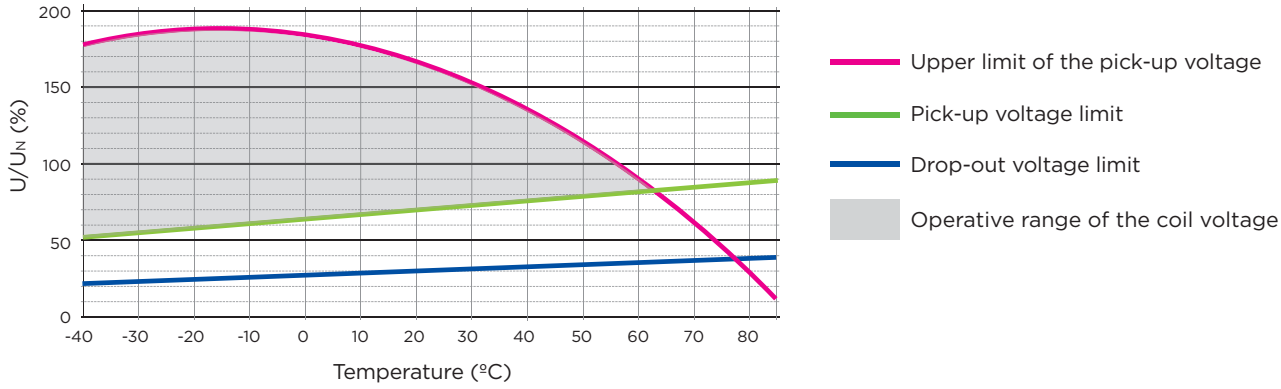
# PICK-UP VOLTAGE/RELEASE VOLTAGE-TEMPERATURE CHARTS

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

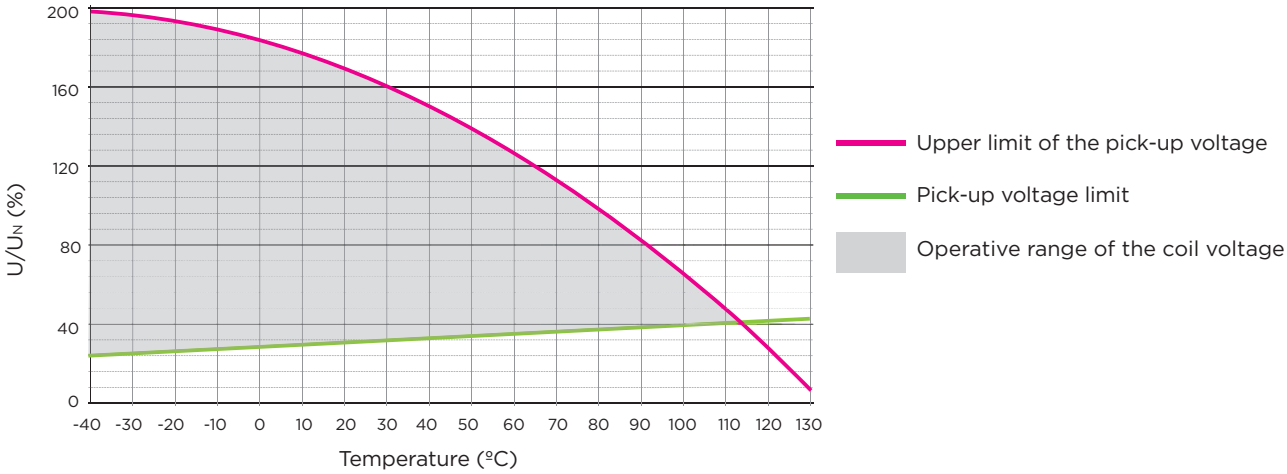
## TRIPPING RELAYS

**Operative range against ambient temperature.**



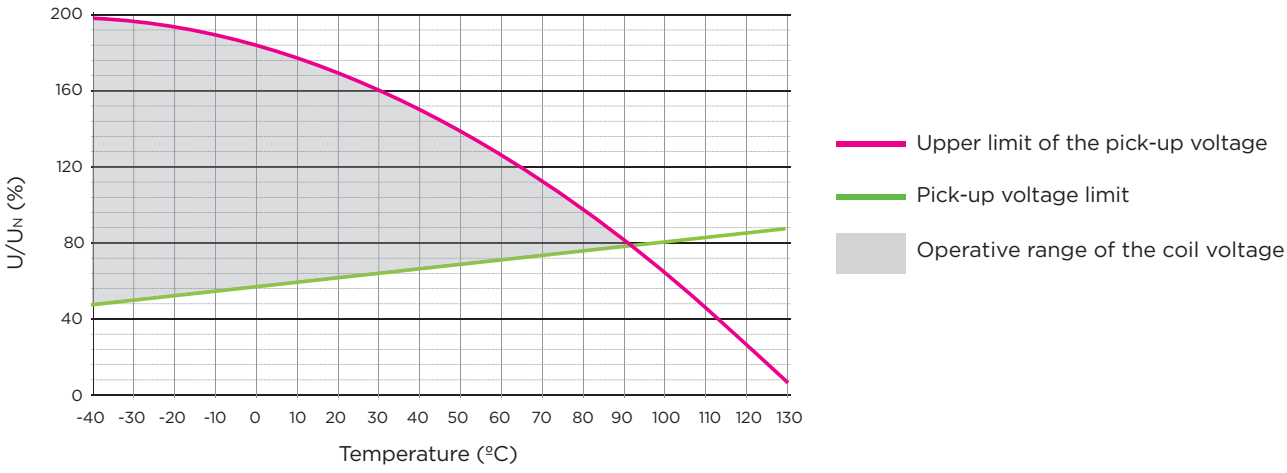

## TRIP AND LOCKOUT RELAY

**Operative range against ambient temperature.**




## TRIP AND LOCKOUT RELAYS WITH RESET PUSH BUTTON

**Operative range against ambient temperature.**



# MODEL SELECTION

| TRIP | Type | Range | Aux. Supply | | Options | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | OP | | | | |
| **Relay type** | | | | | | | | |
| 2 contacts relay | RD-2R | | | | 1 | | | |
| 2 contacts relay | RD-2XR | | | | 1 | | | |
| 4 contacts relay | RF-4R | | | | 1 | | | |
| 4 contacts relay | RF-4XR | | | | 1 | | | |
| 8 contacts relay | RJ-8R | | | | 1 | | | |
| 8 contacts relay | RJ-8XR | | | | 1 | | | |
| Ultra-fast (only Vdc) | RJ-4XR4 | | | | 1 | 0 | 0 | 0 |
| Ultra-fast (only Vdc) | RXR-4 | | | | 1 | - | - | - |
| **Range** | | | | | | | | |
| High Burden | | HB | | | | | | |
| Low burden | | - | | | | | | |
| **Aux. Supply Vdc o Vac** | | | | | | | | |
| Indicate voltage level and if it is VDC or VAC (ex: 24 VDC) | | | | | | | | |
| **Options** | | | | | | | | |
| High breaking capacity (magnetic arc blow-out) | No | | | 0 | | | | |
| | Yes | | | 1 | | | | |
| Front LED | No | | | | 0 | | | |
| | Yes | | | | 1 | | | |
| Mechanical contact position indicator | No | | | | | 0 | | |
| | Yes | | | | | 1 | | |
| Trip flag | No | | | | | | 0 | |
| | Yes | | | | | | 1 | |
| Push to test button | No | | | | | | | 0 |
| | Yes | | | | | | | 1 |

Restrictions

## Trip and lockout

| Relay type | Type | Range | Aux. Supply |
|---|---|---|---|
| 3 contacts relay | BF-3R | - | |
| 4 contacts relay | BF-4R | | |
| 4 contacts relay | BF-4RP | | |
| 8 contacts relay | BJ-8R | | |
| 8 contacts relay | BJ-8R | | |

| Range | |
|---|---|
| High Burden | HB |
| Low burden | - |

| Aux. Supply Vdc o Vac | |
|---|---|
| Indicate voltage level and if it is VDC or VAC (ex: 24 VDC) | |

## Trip circuit supervision

| Relay type | Type | Aux. Supply |
|---|---|---|
| One phase | VDF-10 OP | |
| Three phase | VDJ-30 OP | |

| Aux. Supply Vdc o Vac | |
|---|---|
| Indicate voltage level and if it is VDC or VAC (ex: 24 VDC) | |

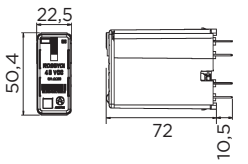
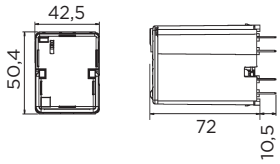
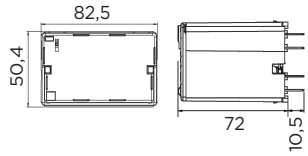
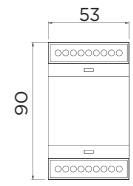
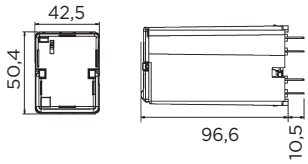
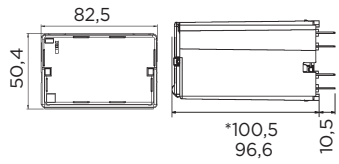
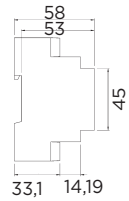
## Auxiliary supply circuit supervision

| Relay type | Type | Aux. Supply |
|---|---|---|
| One phase | RUT-4 OP | |

| Aux. Supply Vdc o Vac | |
|---|---|
| Indicate voltage level and if it is VDC or VAC (ex: 24 VDC) | |

# DIMENSIONS OF THE RELAYS

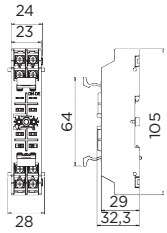
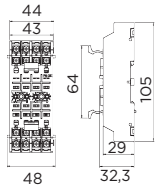
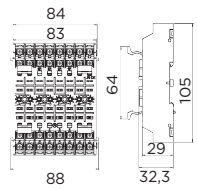
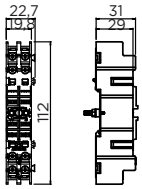
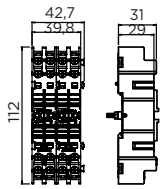
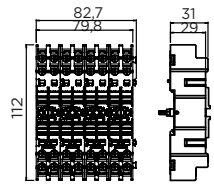
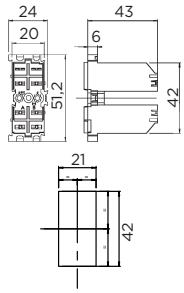
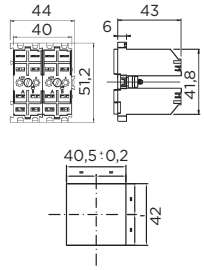
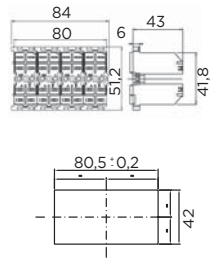
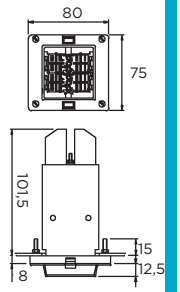
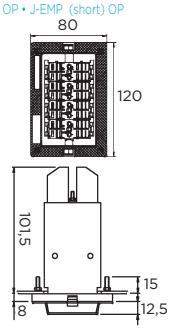
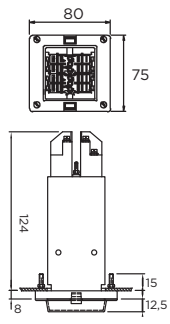
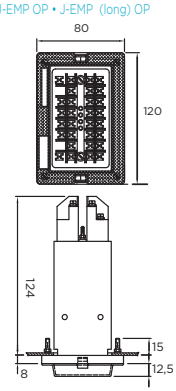
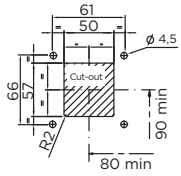
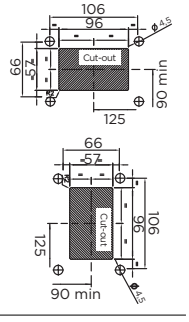
**Relay dimensions**

| Type D | Type F | Type J | Type RXR |
|---|---|---|---|
|  | F Short<br>  | J Short<br>  |  |
| | F Long<br>  | J Long<br>  <br>*depending on the model |  |

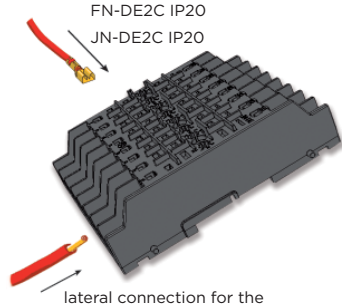
# SOCKETS: DIMENSIONS AND CUT-OUT

| Sockets | | Accessories | | | |
|---|---|---|---|---|---|
| Relay | Type | Screw | Faston | Double faston | Weight (g) |
| D | TIP10 Front connection | DN-DE IP10 | | DN-DE2C IP10 | 60 |
| | IP20 Front connection | DN-DE IP20 | | DN-DE2C IP20 | 60 |
| | Rear connection | DN-TR OP | | DN-TR2C OP | 50 |
| F | IP10 Front connection | FN-DE IP10 | | FN-DE2C IP10 | 110 |
| | IP20 Front connection | FN-DE IP20 | | FN-DE2C IP20 | 110 |
| | IP20 Rear connection | FN-TR OP | | FN-TR2C OP | 90 |
| | IP20 Flush mounting | F-EMP OP | | | 300 |
| J | IP10 Front connection | JN-DE IP10 | | JN-DE2C IP10 | 225 |
| | IP20 Front connection | JN-DE IP20 | | JN-DE2C IP20 | 225 |
| | IP20 Rear connection | JN-TR OP | | JN-TR2C OP | 180 |
| | IP20 Flush mounting | J-EMP OP | | | 400 |

| Accessories |
|---|
| Retaining clips |
| Function signs on the extraction ring |
| Security pins |

| | Relays type D | Relays type F | Relays type J |
|---|---|---|---|
| **Sockets for DIN rail** (1) (2) | DN-DE IP10 • DN-DE2C IP10<br>  <br> | FN-DE IP10 • FN-DE2C IP10<br>  <br> | JN-DE IP10 • JN-DE2C IP10<br>  <br> |
| | DN-DE IP20 • DN-DE2C IP20<br>  <br> | FN-DE IP20 • FN-DE2C IP20<br>  <br> | JN-DE IP20 • JN-DE2C IP20<br>  <br> |
| **Sockets for rear connection** | DN-TR OP • DN-TR2C OP<br>  <br> | FN-TR OP • FN-TR2C OP<br>  <br> | JN-TR OP • JN-TR2C OP<br>  <br> |
| **Sockets for flush mounting** | | F-EMP OP • F-EMP (short) OP<br>  <br> | J-EMP OP • J-EMP (short) OP<br>  <br> |
| | | F-EMP OP • F-EMP (long) OP<br>  <br> | J-EMP OP • J-EMP (long) OP<br>  <br> |
| **Cut-out** | |  <br> |  <br> |

Front connection for double faston IP20 sockets
DN-DE2C IP20
FN-DE2C IP20
JN-DE2C IP20



lateral connection for the rest of the sockets

(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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