

"KSW2-RS" safety relay (45 mm)

- "Zero speed monitoring" function for a single or 3-phase motor
- Detection of actual stopping by measuring remanent voltages
- "CE" conforming product / BG approved
- Safety via redundancy and self-checking
- Wiring integrity check
- Galvanic isolation
- 1 "N/O" safety contact with linked contacts - 6 A / 250 V~
- 1 "N/C" safety contact with linked contacts - 6 A / 250 V~
- Separate return loop
- Can be used to obtain level 4 according to NF.EN 954-1



Technical characteristics

Power supply

| | |
|----------------------|--|
| Power supply voltage | ~ 24 V 50/60 Hz = 24 V max. ripple 10% |
| Operating range | -15% / +10% of Un for ~ -15% / +15% of Un for = |
| On/off indication | 1 power supply voltage LED |

Accuracy

| | |
|------------------------------|------------------------------|
| Reset time | 3 s (self-test) |
| Setting for channels 1 and 2 | From 20 mV to 500 mV +/- 15% |
| Synchronisation difference | < 3 s |
| Hysteresis | 40% +/- 50% |

Output specification

| | |
|--------------------------------|---|
| Type | Volt-free outputs |
| No. of safety circuits | 1 "N/O" + 1 "N/C" AgSnO ₂ contact |
| Breaking capacity | 1500 VA resistive |
| Max. current breaking capacity | 6.82 A |
| Max. voltage breaking capacity | 440 V~ |
| Electrical life | 10 ⁵ operations at 1500 VA resistive 5.10 ⁵ operations at 500 VA resistive |
| Mechanical life | 10 ⁷ operations |

Operation and use

| | |
|------------------------|-----------------------------------|
| Max. absorbed power | AC 1.6 VA / DC 2 W |
| On/off indication | 1 internal relay status LED |
| Operating temperature | 0°C to +50°C acc. to IEC 68-2-14 |
| Storage temperature | -20°C to +70°C acc. to IEC 68-1/2 |
| Internal voltage | 24 V= |
| Dielectric strength | 2.95 kV according to IEC 664-1 |
| Resistance to tracking | Material group III |

EMC immunity according to EN 50082-2

| | |
|---------------------------------------|--|
| Rapid transients | 2 kV directly acc. to IEC 1000.4.4 2 kV when coupled |
| Radiated electromagnetic field | 30 V/m Level X acc. to IEC 1000.4.3 80 MHz to 1 GHz / 900 MHz (ENV 50140/204) |
| Electrostatic discharges | 15 kV in the air acc. to IEC 1000.4.2 |
| Shock waves | Level 3 according to IEC 1000.4.5 Common mode 2 kV for 24 V= and 24 V~ |
| Radio frequencies in common mode | 30 V rms Level X acc. to IEC 1000.4.6 150 kHz to 80 MHz (ENV 50141) according to IEC 1000.4.11 |
| Drop-out / short breaks / microbreaks | Un-30% for 10 ms every 1 s Un-60% for 100 ms every 1 s according to IEC 61496-1/97 Un-100% for 10 ms every 100 ms* |

* the device operates normally

** the device has not failed dangerously

Casing

| | |
|----------------------|---|
| Material | Polycarbonate Self-extinguishing - UL94 class VO |
| Degree of protection | Casing : IP40 Terminal : IP20 |
| Terminal capacity | 2 X 1.5 mm ² multicore with ferrule 2 X 2.5 mm ² solid conductor |
| Weight | 410 g |

Type

KSW2-RS

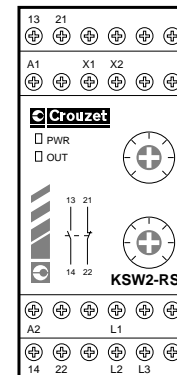
Part number (and voltage)

| | |
|----------|------------|
| 24 V ~/= | 85 100 326 |
|----------|------------|

Conformity

| | |
|---|--------------|
| European "Machinery" Directive 89/392/EEC | ● |
| French Decree 92/765-766-768 | ● |
| European "Usage" Directive 89/655/EEC | ● |
| French Decree 93-40 / 93-41 | ● |
| IEC 61496-1 | ● |
| IEC 664-1 | ● |
| EN 50081-2 | ● |
| EN 50082-2 | ● |
| EN 60204-1 | ● |
| EN 292-1 and 2 | ● |
| EN 954-1 | ● Category 4 |
| EN 418 | ● |
| EN 1088 | ● |
| UL 508 | ● UL |
| C22-2 No. 14-M91 | ● (C) UL |
| GS-ET-20 | ● BG |

Connections



Key

| | |
|-------|-----------------------------------|
| A1-A2 | : Power supply |
| X1-X2 | : Return loop |
| L1-L2 | : Input channel 1 (motor winding) |
| L2-L3 | : Input channel 2 (motor winding) |
| 13-14 | : "N/O" safety contacts |
| 21-22 | : "N/C" safety contacts |

To order, specify :

Standard products



Part number

Example : KSW2-RS safety relay : 85 100 326

Self-test :

When terminals A1-A2 are powered up, a test sequence is initiated : the output relays (terminals 13-14 and 21-22) are energised for 1.5 s then separate for 1.5 s. If no fault is detected, the relays reattach. This test checks :

- failure of the output contacts (terminals 13-14 and 21-22)
- breaking of one of the phases (L1, L2 or L3)
- the validity of the return loop (X1-X2)
- the failure of an internal component

Safety function :

When an electric motor rotates while no longer supplied with power, it behaves like a generator, supplying voltage (called remanent) to the terminals of its windings. This voltage varies according to several parameters : speed of rotation, the motor characteristics, remanent magnetisation, inertia of the mechanical assembly. The KSW2-RS measures this voltage and interprets it so that the doors and mobile guards can only be opened once the motor has actually stopped.

Setting :

Both channels are set on the front of the KSW2-RS using two potentiometers. This mitigates the effects of any imbalance between the windings or remanent voltages. Setting is within a range of 20 mV to 500 mV in order to adapt a threshold to a slow or zero speed, which is not dangerous for the operator.

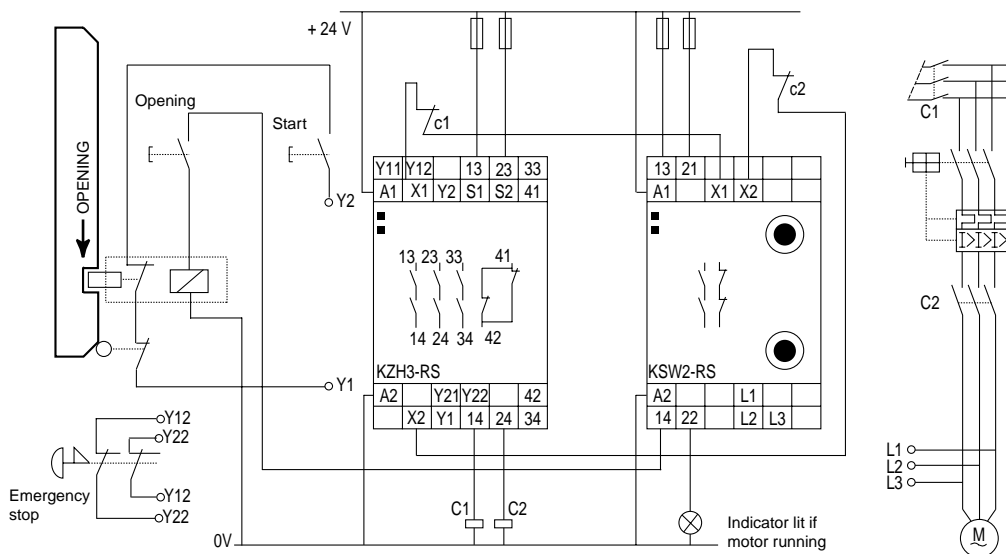
Control devices :

The KSW2-RS has one "N/O" (13-14) and one "N/C" (21-22) safety contact. One or more control devices may be wired up to the breaking capacity of the safety contacts : 1500 VA.

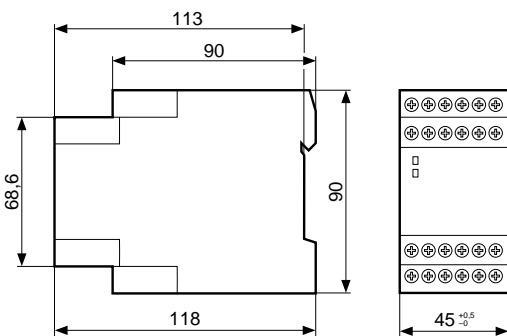
Extending the number of contacts :

The number of contacts of the KSW2-XS can be extended and the breaking capacity thus increased. To do this, use the KZE3-XS (see page 11/20).

Examples of use



Dimensions



Mounting - Removing see page 11/7