

"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

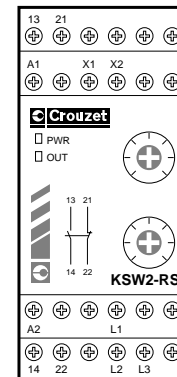
Part number (and voltage)

24 V ~/=	85 100 326
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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

1 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.

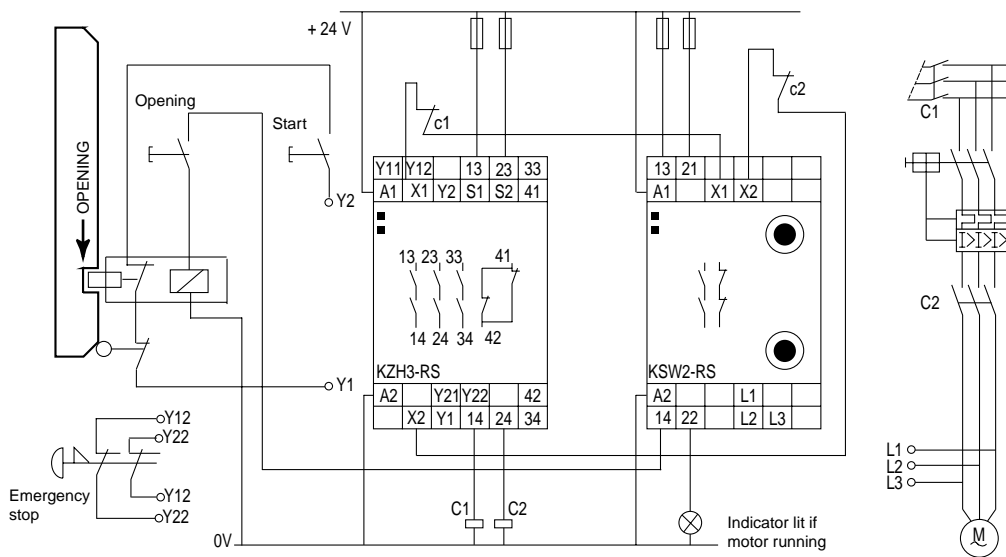
Control devices :

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.

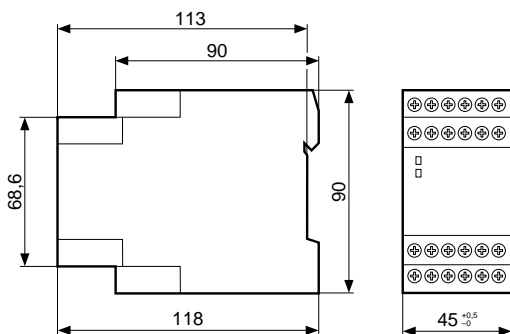
Extending the number of contacts :

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