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## Standstill monitoring KSW3-JS Part number 85102331



- Function "Stillstand detection without sensors"
- Independent of rotation direction
- Security with redundancy and feedback circuit
- 3 forcibly guided "NO" security contacts
- 1 forcibly guided "NC" security contact
- 1 "NO" monitoring contact
- 2 semiconductor monitoring outputs
- Performance Level (PL) e, safety category 4 to EN ISO 13849-1
- SIL Claimed Level (SIL CL) 3 to IEC/EN 62061

### Part numbers

Type	Terminals	Voltages	Outputs
85102331 KSW3-JS	Screws	24 VDC	3 NO + 1 NC

### Specifications

#### Operating characteristics

Functions	Standstill detection on motors without sensors
Return loop	Y1, Y2
Failure detection	Broken wire detection in measure circuit
Display of output state by LED	Power supply : PWR (green = operation, red = internal error) Output : OUT (yellow = e.m.f. > U, green flashes = time progression of t, permanent green = output contacts enabled) Error : ERR (flashing codes)

#### Supply

Supply voltage	85 102 331 : 24 VDC
Operating range	± 10 % U
Consumption	3 W

#### Precision

Release delay for detection of running motor	< 100 ms
Standstill time delay	0,2 → 6 adjustable

#### Output specification

Type	Forcibly guided relays (positively driven)
Number of safety circuits	3 NO
Number of data circuits	1 NC
Nominal output voltage	250 VAC max.
Max. thermal current I for each contact	5 A
Maximum power rating	According to AC15 (NO contacts) : 3 A / 230 VAC at 40 °C According to AC15 (NC contacts) : 2 A / 230 VAC at 40 °C According to DC13 (NO contacts) : 2 A / 24 VDC at 40 °C According to DC13 (NC contacts) : 2 A / 24 VDC at 40 °C
Electrical endurance	For 5 A, 230 VAC, cos φ = 0,5 : > 2 x 10 <sup>5</sup> switching cycles
Mechanical life	50 x 10 <sup>6</sup> switching cycles
Maximum rate	1200 switching cycles / h
Protection against short circuits	Max. fuse rating : 4 A gL Line circuit breaker : C 6 A

#### Climatic environment

Operating temperature (°C)	-25 → +60
Storage temperature (°C)	-40 → +75
Altitude	< 2000 m
Climate resistance according to IEC/EN 60068-1	25 / 060 / 04

#### Mechanical environment

Vibration resistance according to IEC/EN 60068-2-6	Amplitude : 0,35 mm Frequency : 10 → 55 Hz
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#### Electromagnetic environment

Immunity to electrostatic discharges acc. IEC/EN 61000-4-2	8 kV (air)
Immunity to radiated, radio-frequency, electromagnetic field acc. IEC/EN 61000-4-3	20 V / m
Immunity to rapid transient bursts acc. to IEC/EN 61000-4-4	2 kV
Immunity to shock waves according to IEC/EN 61000-4-5	Between wires for power supply : 2 kV (AC - U), 1 kV (24 VDC) Between measuring input L1 / L2 / L3 : 2 kV

Immunity to radio frequency in common mode acc. to IEC/EN 61000-4-6	10 V
Interference suppression according to IEC/EN 55011	Limit value class B
<b>Housing</b>	
Material : self-extinguishing (UL94VO)	Thermoplastic with V0 extinction behaviour
Protection (IEC/EN 60529) - Casing	IP40
Protection (IEC/EN 60529) - Term. block	IP20
Mounting	DIN-rail
Weight (g)	400
<b>Safety standards</b>	
Approvals	CE, TÜV, UL/CSA
Environmental directive 2002/95/CE	RoHS
Environmental regulation 1907/2006	Reach
Security data according to EN ISO 13849-1	Performance Level (PL) : e Catégorie : 4
SIL Claimed Level (SIL CL) to IEC/EN 62061	3
Safety Integrity Level (SIL) according to CEI/EN 61508	3
Safety category to EN 954-1	4

### Principles

<b>EN ISO 13849-1:</b>		
Category:	4	
PL:	e	
MTTF <sub>d</sub> :	93	a (years)
DC <sub>avg</sub> :	99,0	%
d <sub>op</sub> :	365	d/a (days/year)
h <sub>op</sub> :	24	h/d (hours/day)
t <sub>cycle</sub> :	28,8E+03	s/cycle
	≅ 1	/8 h (hours)

<b>IEC/EN 62061 IEC/EN 61508:</b>		
SIL CL:	3	IEC/EN 62061
SIL	3	IEC/EN 61508
HFT <sup>*)</sup> :	1	
DC <sub>avg</sub> :	99,0	%
SFF	99,7	%
PFH <sub>D</sub> :	4,10E-10	h <sup>-1</sup>
*) HFT = Hardware failure tolerance		

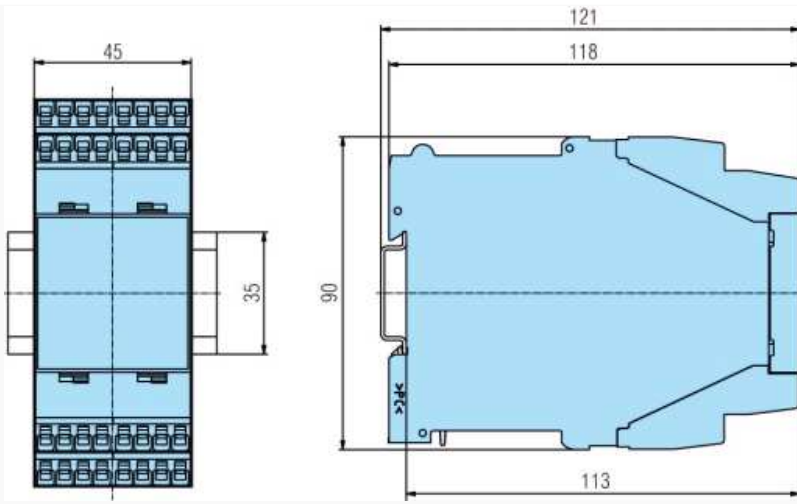
### Dimensions (mm)



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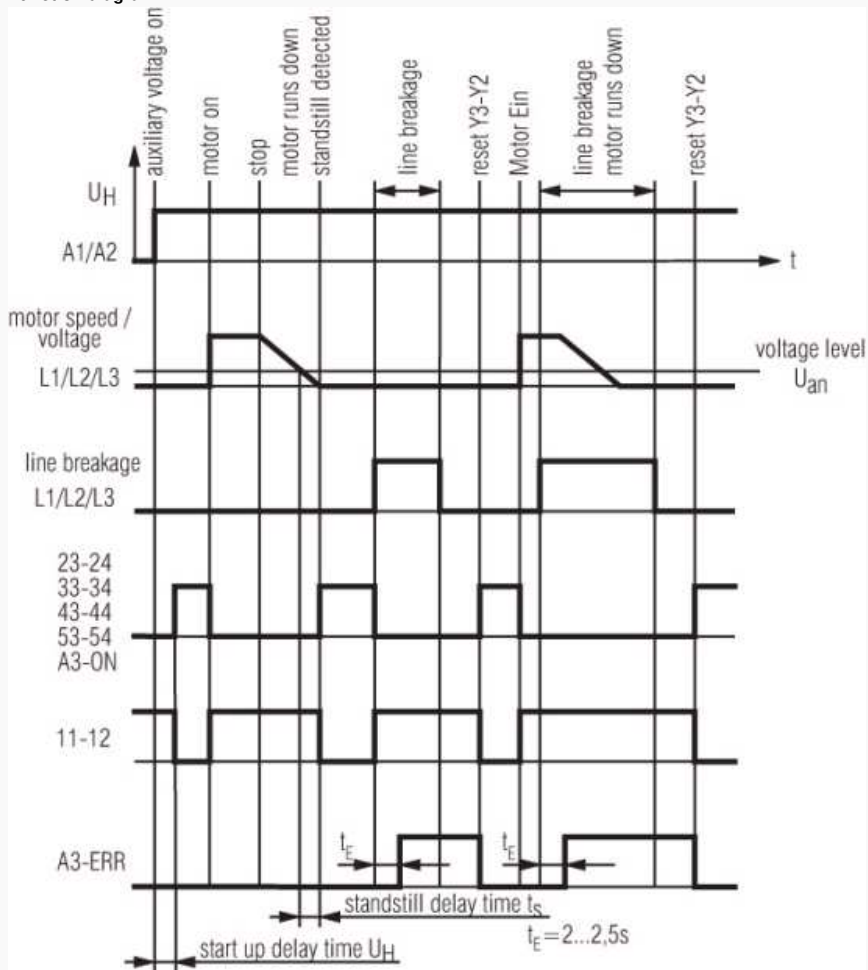
#### Screw terminals





Curves

Function diagram

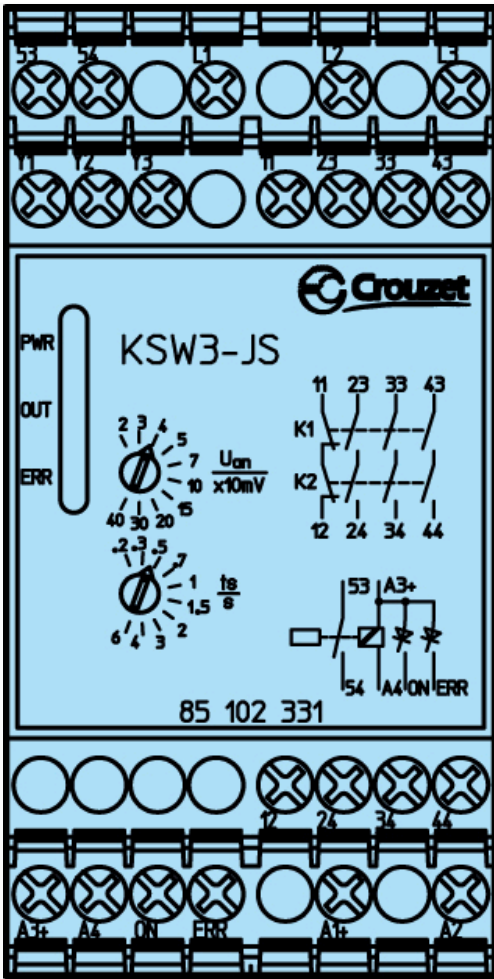


Connections



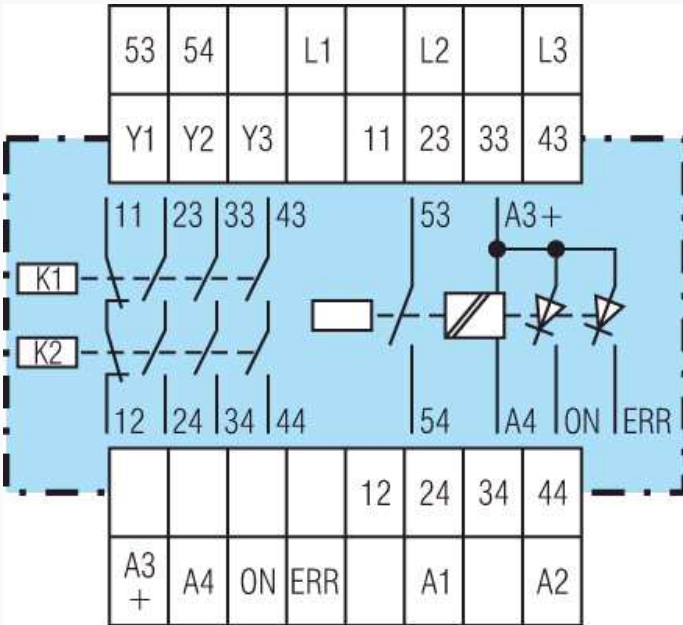
Connections

Front face drawing



**Connections**

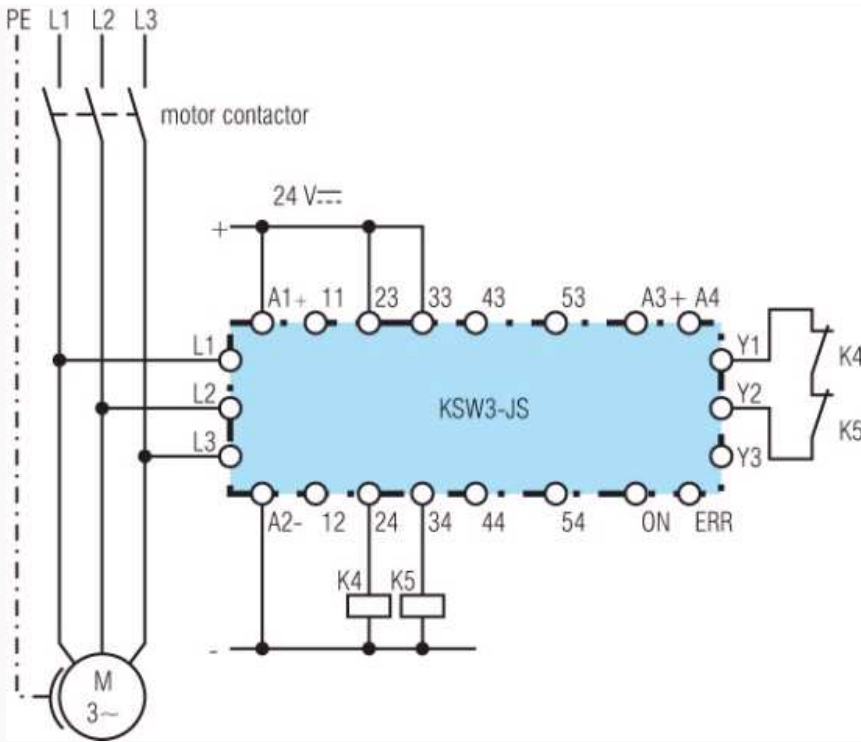
**Contacts**



L1, L2, L3 : Connection to monitored motor 11, 12 : Safety circuit output (forcibly guided NC contact) 23, 24, 33, 34, 43, 44 : Safety circuit outputs (forcibly guided NO contacts) 53, 54 : Monitoring output (NO contact) Y1, Y2 : Connection of feedback circuit (for external contactors) Y2, Y3 : Manual reset for external faults A1+, A2 : Auxiliary supply (UH) A3+, A4 : Supply for semiconductor outputs ON : Semiconductor output indicated state of safety contacts ERR : Semiconductor output indicates failures

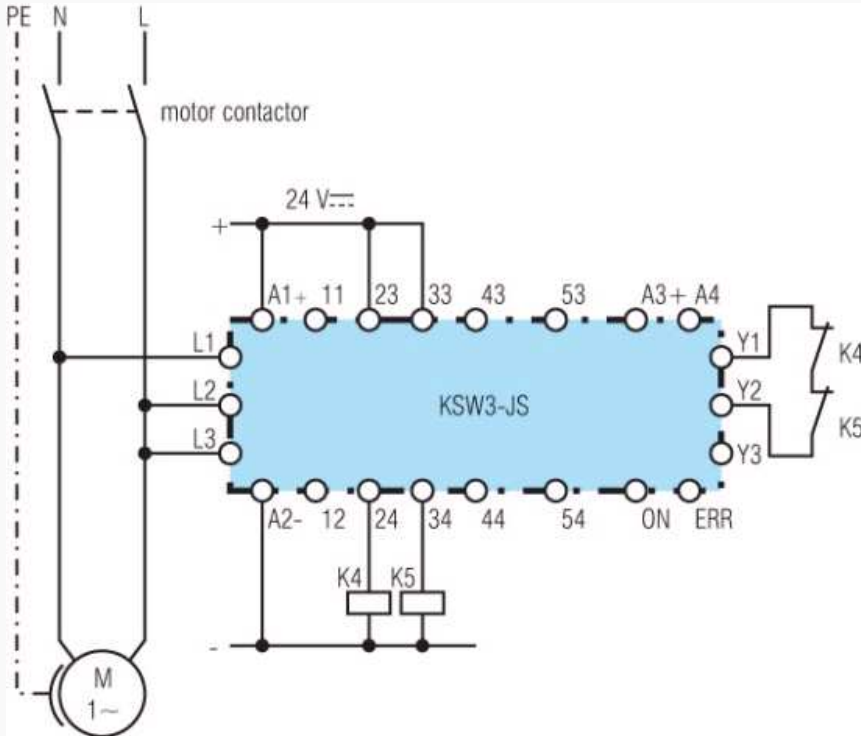
**Applications**

**With 3-phase motor**



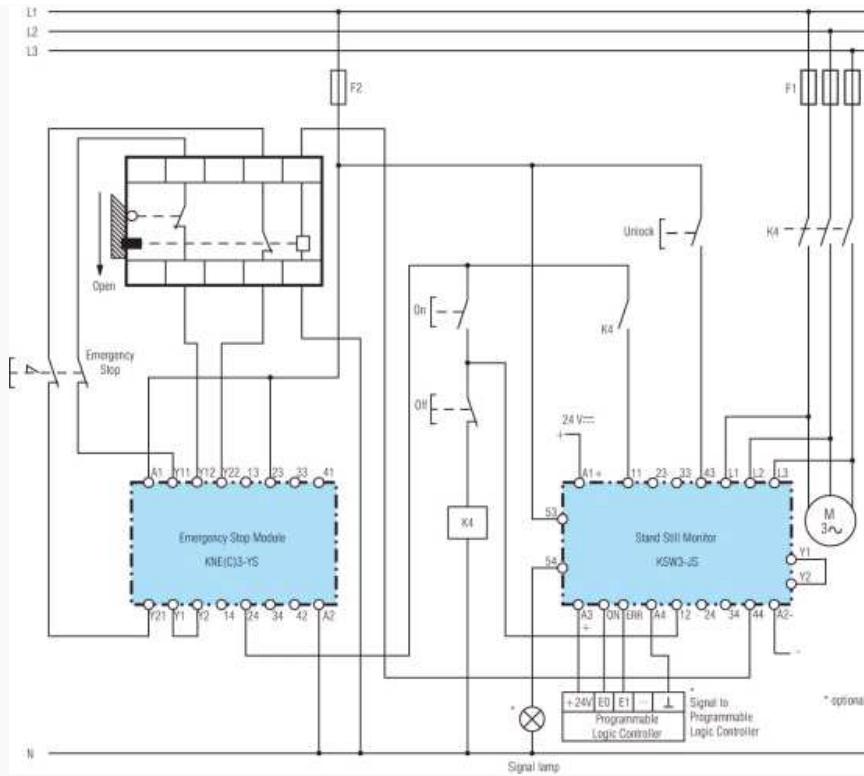
**Applications**

With single-phase motor



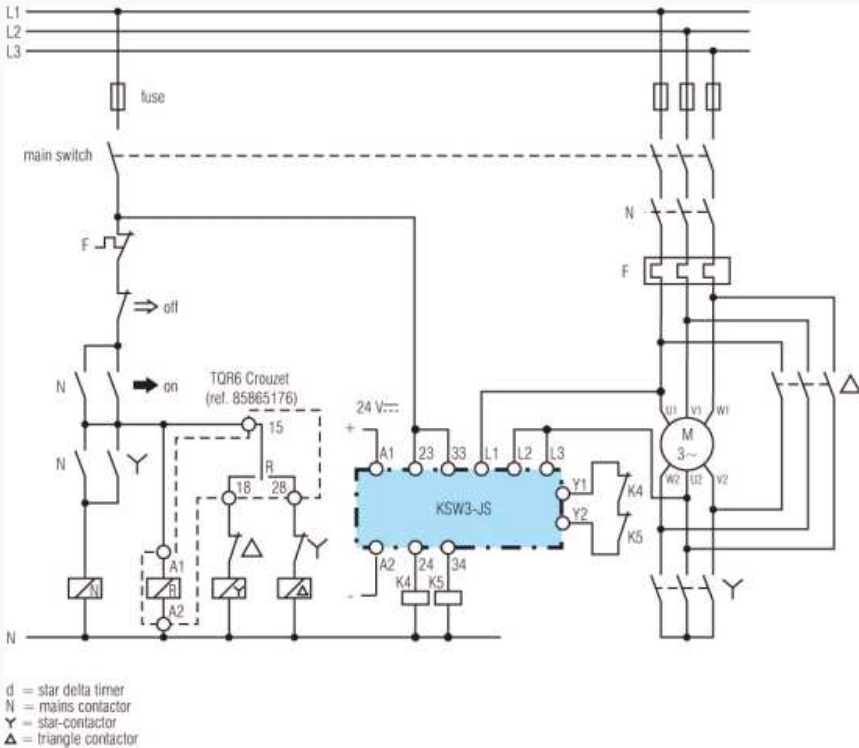
**Applications**

Typical connection combination with E-stop



**Applications**

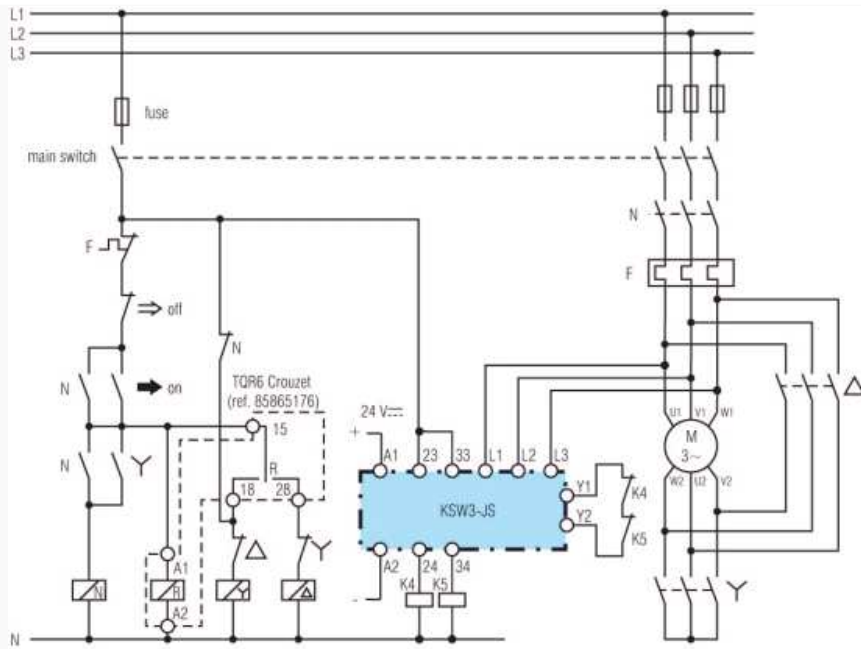
**Typical connection combination with star delta timer**



2-phase connection

**Applications**

**Typical connection combination with star delta timer**



- d = star delta timer
- N = mains contactor
- Y = star-contactor
- Δ = triangle contactor

With "3-phase" connection of KSW3-JS, the star contactor (Y) has to be closed after the motor is switched off to detect standstill. If this is not the case the failure signal "broken wire" blocks the output contacts in off position.

3-phase connection