E-STOP, Safety gate, Safety light curtain input safety relay

CE RoHS

The inputs of K series E-STOP, safety gate, safety light curtain input safety relays are normally closed contact signals, which are used for emergency braking or the protection of people entering dangerous areas, and widely used in machining and other industries.

- 1oo2 architecture
- With detection of shorts across contacts
- With auto reset and manual reset or monitored manual reset function
- The safety function remains effective in the case of a component failure
- The correct opening and closing of the safety function relays is tested automatically in each on-off cycle

Model

Model	Auto	Manual	Monitored	Output
DSR-K11	■	■		3NO+1NC
DSR-K12			■*	3NO+1NC
DSR-K13	■	■		2NO+2NC
DSR-K14			■*	2NO+2NC

NOTE: Monitored manual reset products are not suitable for safety light curtain applications

Parameters

Power supply	
Voltage range	24V AC/DC
Voltage tolerance	0.85 ~ 1.1
AC frequency	50Hz ~ 60Hz
Power dissipation	≤ 2.2W/24V DC, ≤ 5.4VA/24V AC
Input	
Current consumption	≤ 50mA/24V DC
Cable resistance	≤ 15Ω
Input devices	E-STOP button, Safety gate, PNP safety light curtain
Output	
Signal type	3NO + 1NC or 2NO + 2NC
Contact type	Forced guided
Contact material	$AgSnO_2$+0.2μmAu
Contact loading	AC-15: 5A/230V, DC-13:5A/24V
Contact fuse protection	10A gL/gG(NO), 6A gL/gG(NC)
Times	
Switch-on	Auto: ≤ 300ms, Manual: ≤ 150ms
Release	E-stop: ≤ 30ms, Power failure: ≤ 100ms
Recovery time	E-stop: ≤ 30ms, Power failure: ≤ 100ms
Supply short interruption	20ms

Environmental	
EMC	According to IEC/EN 60947, IEC 61326-3-1, IEC/EN 61000-6-2, IEC/EN 61000-6-4
Rated insulation voltage	250V AC
Rated impulse voltage	6000V(1.2/50μs)
Dielectric strength	1500V AC, 1min
Clearance and creepage	According to IEC 60947-1
Vibration	10Hz ~ 55Hz, 0.35mm
Overvoltage category	III
Pollution degree	2
Protection type	IP20
Ambient temperature	-20°C~ +60°C
Storage temperature	-40°C~ +80°C
Relative humidity	10 %RH ~ 90 %RH(40 ℃)
Atmosphere pressure	80kPa~106kPa
Operating altitude	≤ 2000m
Mechanical	
Mechanical life	10×10^6cycles
Connect type	Screw terminal
Install type	DIN35
Weight	180g

DEGSON Safety Relay

E-STOP, Safety gate, Safety light curtain input safety relay CE RoHS

Safety Values

Performance level	PLe, according to ISO 13849	SIL	SIL3, according to IEC 61508
Category	Cat.4, according to ISO 13849	SIL CL	SIL CL3, according to IEC 62061
DTI	At least 1x per day, according to ISO 13849	HFT	1, according to IEC 62061
PTI (T_M)	20 years, according to ISO 13849	SFF	≥ 99%, according to IEC 62061
DC_{avg}	99%, according to ISO 13849	DC_{avg}/PTI = 20 years	1.29×10^{-5}, according to IEC 62061
$MTTF_D$	164 years, according to ISO 13849	PFH	1.49×10^{-10} 1/h, according to IEC 62061
CCF	68, according to ISO 13849	Stop Category	0, according to IEC 60204

CAUTION!

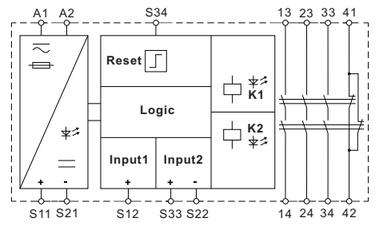
When using the product in accordance with the European Machinery Directive, it has to be checked whether the safety contacts of the relay outputs open correctly. Start the device again or open the safety contacts (switch off output), so that the internal diagnostics can check the correct opening of the safety contacts. Diagnosis test interval shall be tested at least 1× per day.

B_{10d} values for safety-related control system of machinery

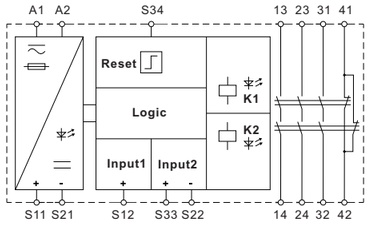
AC-15，Ue = 250V	Cycles
Ie = 5A，1 NO	200000
Ie = 3A，1 NO	230000
Ie = 1A，1 NO	380000
DC-13，Ue = 24V	
Ie = 5A，1 NO	300000
Ie = 2A，1 NO	2000000
Ie = 1A，1 NO	7000000

Confidence level for all B_{10d} values 50%

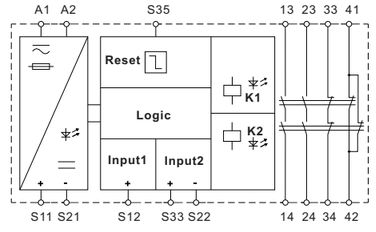
Functional Block Diagram



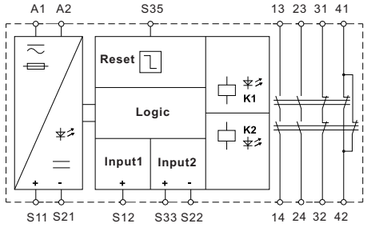
DSR-K11



DSR-K12



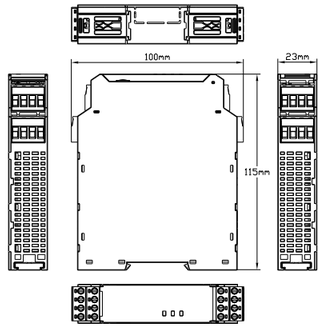
DSR-K13



DSR-K14

Dimension

Width × Height × Depth: 23mm×100mm×115mm



E-STOP, Safety gate input (with delay output) safety relay

CE RoHS

The inputs of K series E-STOP, safety gate input safety relays are normally closed contact signals, which are used for emergency braking or the protection of people entering dangerous areas, and widely used in machining and other industries.

- 1oo2 architecture
- With detection of shorts across contacts
- With auto reset and manual reset or monitored manual reset function
- The safety function remains effective in the case of a component failure
- The correct opening and closing of the safety function relays is tested automatically in each on-off cycle

Model

Model	Auto	Manual	Monitored
DSR-K31	■	■	
DSR-K32			■

Parameters

Power supply	
Voltage range	24V DC
Voltage tolerance	0.85 ~ 1.1
Power dissipation	≤ 3.8W/24V DC
Input	
Current consumption	≤ 50mA/24V DC
Cable resistance	≤ 15Ω
Input devices	E-STOP button, Safety gate
Output	
Signal type	2NO, non-delay + 2NO, d-delay
Contact type	Forced guided
Contact material	$AgSnO_2$
Contact loading	AC-15:3A/230V;DC-13:3A/24V
Contact fuse protection	10A gL/gG(NO)
Times	
Delay time T_{set}	0.1 ~ 80 s, default 10 s
Delay time accuracy	± 15 %
Switch-on	Auto: ≤ 300ms, Manual: ≤ 150ms
Release	E-stop: ≤ 30ms, Power failure: ≤ 100ms
Recovery time	E-stop: ≤ 30ms+T_{set}, Power failure: ≤ 100ms
Supply short interruption	20ms

Environmental	
EMC	According to IEC/EN 60947, IEC 61326-3-1, IEC/EN 61000-6-2, IEC/EN 61000-6-4
Rated insulation voltage	250V AC
Rated impulse voltage	6000V(1.2/50μs)
Dielectric strength	1500V AC, 1min
Clearance and creepage	According to IEC 60947-1
Vibration	10Hz ~ 55Hz, 0.35mm
Overvoltage category	III
Pollution degree	2
Protection type	IP20
Ambient temperature	-20°C~ +60°C
Storage temperature	-40°C~ +80°C
Relative humidity	10 %RH ~ 90 %RH(40 ℃)
Atmosphere pressure	80kPa~106kPa
Operating altitude	≤ 2000m
Mechanical	
Mechanical life	10×10^4cycles
Connect type	Screw terminal
Install type	DIN35
Weight	180g

DEGSON

Safety Relay

E-STOP, Safety gate input (with delay output) safety relay

CE RoHS

Safety Values

Performance level	PLe, according to ISO 13849[1]; PLd, according to ISO 13849[2]	SIL	SIL3, according to IEC 61508
Category	Cat.4, according to ISO 13849[1]; Cat.3, according to ISO 13849[2]	SIL CL	SIL CL3, according to IEC 62061
DTI	At least 1x per day, according to ISO 13849[1] at least 1x per three months, according to ISO 13849[2]	HFT	1, according to IEC 62061
		SFF	≥ 99%, according to IEC 62061
PTI (T_M)	20 years, according to ISO 13849	DC_{avg}/PTI = 20 years	1.29×10^{-5}, according to IEC 62061 [1] 1.53×10^{-5}, according to IEC 62061 [1] 1.59×10^{-5}, according to IEC 62061 [2]
DC_{avg}	99%, according to ISO 13849[1]; 90%, according to ISO 13849[2]		
$MTTF_D$	164 years, according to ISO 13849[1] 161 years, according to ISO 13849[2]	PFH	1.49×10^{-10}1/h, according to IEC 62061[1] 1.77×10^{-10}1/h, according to IEC 62061[1] 1.85×10^{-10}1/h, according to IEC 62061[2]
CCF	68, according to ISO 13849	Stop Category	0, according to IEC 60204[1]; 0, according to IEC 60204[2]

NOTE： 1))For non-delay contacts: 13/14 ， 23/24 2) For de-delay contacts: 37/38 ， 47/48

CAUTION!

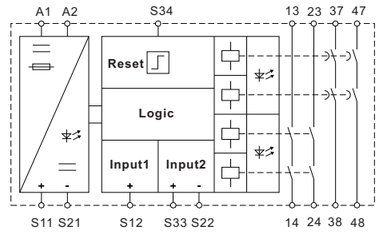
When using the product in accordance with the European Machinery Directive, it has to be checked whether the safety contacts of the relay outputs open correctly. Start the device again or open the safety contacts (switch off output), so that the internal diagnostics can check the correct opening of the safety contacts.
Diagnosis test interval: Non-delay channel shall be tested at least 1× per day; Delay channel shall be tested at least 1× per three months.

B_{10d} values for safety-related control system of machinery

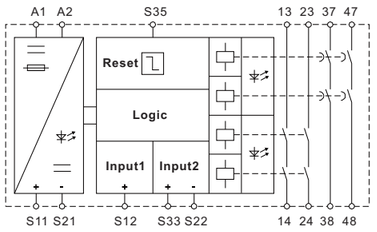
AC-15 ， Ue = 250V	Cycles
Ie = 3A ， 1 NO	400000
Ie = 1A ， 1 NO	200000
DC-13 ， Ue = 24V	
Ie = 3A ， 1 NO	450000
Ie = 1A ， 1 NO	2000000
Ie = 0.75A ， 1 NO	2000000

Confidence level for all B_{10d} values 50%

Functional Block Diagram



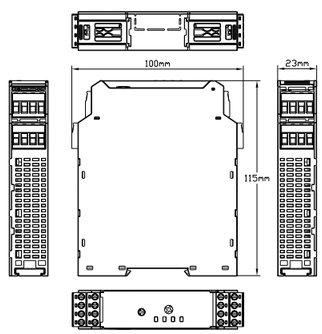
DSR-K31



DSR-K32

Dimension

Width × Height × Depth: 23mm×100mm×115mm



DO signal input safety relay

CE RoHS

K series DO signal input safety relay applies mechanical interlock conforming to EN 50205 standard to realize multiple safety outputs. Up to 5A functional current and reliable diagnosis. It can be used for safety related applications of SIL3 and SC3 in accordance with IEC 61508 standard, and ESD in SIS.

- 1oo2 architecture
- Relay contact output for de-energized to safe function
- System loop dete ction support
- Built-in test pulse filter function
- The correct opening and closing of the safety function relays is tested automatically in each on-off cycle

Model

Model	Input	Output
DSR-K71	Safety switch, DO signal	3NO+1NC
DSR-K72	Safety switch, DO signal	2NO+2NC

Parameters

Power supply	
Power supply type	Loop supply
Voltage range	20 ~ 30 V DC (Typ.24 V)
Power dissipation	≤2.2 W/24V DC
Input	
Current consumption	≤ 90mA
Test pulse width	≤3ms
Test pulse period	100ms
Cable resistance	≤ 15Ω
Input devices	Safety switch, DO signal
Output	
Signal type	3NO + 1NC or 2NO + 2NC
Contact type	Forced guided
Contact material	$AgSnO_2$+0.2μmAu
Contact loading	AC-15: 5A/230V, DC-13:5A/24V
Contact fuse protection	10A gL/gG(NO), 6A gL/gG(NC)
Times	
Switch-on	≤200ms
Release	≤50ms
Switching frequency	≤4Hz

Environmental	
EMC	According to IEC/EN 60947, IEC 61326-3-1, IEC/EN 61000-6-2, IEC/EN 61000-6-4
Rated insulation voltage	250V AC
Rated impulse voltage	6000V(1.2/50μs)
Dielectric strength	1500V AC, 1min
Clearance and creepage	According to IEC 60947-1
Vibration	10Hz ~ 55Hz, 0.35mm
Overvoltage category	III
Pollution degree	2
Protection type	IP20
Ambient temperature	-20°C~ +60°C
Storage temperature	-40°C~ +80°C
Relative humidity	10 %RH ~ 90 %RH(40 ℃)
Atmosphere pressure	80kPa~106kPa
Operating altitude	≤ 2000m
Mechanical	
Mechanical life	10×10^6cycles
Connect type	Screw terminal
Install type	DIN35
Weight	180g

DEGSON
Safety Relay

DO signal input safety relay

CE RoHS

Safety Values

Performance level	PLe, according to ISO 13849	SIL	SIL3, according to IEC 61508
Category	Cat.4, according to ISO 13849	SIL CL	SIL CL3, according to IEC 62061
DTI	At least 1x per day, according to ISO 13849; At least 1x per year, according to ISO 61508	HFT	1, according to IEC 62061
PTI (T_M)	20 years, according to ISO 13849	SFF	≥ 99%, according to IEC 62061
DC_{avg}	99%, according to ISO 13849	DC_{avg}/PTI = 20 years	1.29×10^{-5}, according to IEC 62061
$MTTF_D$	164 years, according to ISO 13849	PFH	1.49×10^{-10} 1/h, according to IEC 62061
CCF	68, according to ISO 13849	Stop Category	0, according to IEC 60204

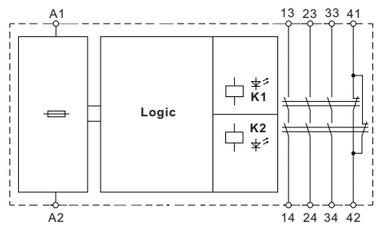
CAUTION!
Diagnosis test interval shall be tested at least Times 1× per day.

B_{10d} values for safety-related control system of machinery

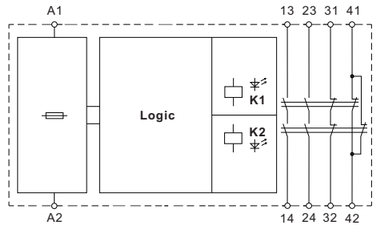
AC-15，Ue = 250V	Cycles
Ie = 5A，1 NO	200000
Ie = 3A，1 NO	230000
Ie = 1A，1 NO	380000
DC-13，Ue = 24V	
Ie = 5A，1 NO	300000
Ie = 2A，1 NO	2000000
Ie = 1A，1 NO	7000000

Confidence level for all B_{10d} values 50%

Functional Block Diagram



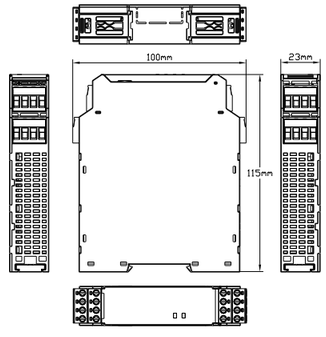
DSR-K71



DSR-K72

Dimension

Width × Height × Depth: 23mm×100mm×115mm



Two-hand control safety relay

CE RoHS

K series two-hand control safety relays are used to ensure that the operator's hands are kept away from the dangerous area and avoid injury during the hazardous movement. Used in mechanical presses or safety circuits with safety requirements.

- 1oo2 architecture
- With detection of shorts across contacts
- With auto reset and manual reset or monitored manual reset function
- The safety function remains effective in the case of a component failure
- The correct opening and closing of the safety function relays is tested automatically in each on-off cycle

Model

Model	Auto	Manual	Monitored
DSR-K73	■	■	3NO+1NC
DSR-K74	■	■	2NO+2NC

Parameters

Power supply	
Voltage range	24V DC
Voltage tolerance	0.85 ~ 1.1
Power dissipation	≤ 2.2W/24V DC
Input	
Current consumption	≤ 50 mA/24V DC
Cable resistance	≤ 15Ω
Input devices	Two-hand modules (according to EN574,Type IIIC)
Output	
Signal type	3NO + 1NC or 2NO + 2NC
Contact type	Forced guided
Contact material	$AgSnO_2$+0.2μmAu
Contact loading	AC-15: 5A/230V, DC-13:5A/24V
Contact fuse protection	10A gL/gG(NO), 6A gL/gG(NC)
Times	
Switch-on	Auto: ≤ 300ms, Manual: ≤ 150ms
Release	E-stop: ≤ 30ms, Power failure: ≤ 100ms
Recovery time	E-stop: ≤ 30ms, Power failure: ≤ 100ms
Supply short interruption	20ms

Environmental	
EMC	According to IEC/EN 60947, IEC 61326-3-1, IEC/EN 61000-6-2, IEC/EN 61000-6-4
Rated insulation voltage	250V AC
Rated impulse voltage	6000V(1.2/50μs)
Dielectric strength	1500V AC, 1min
Clearance and creepage	According to IEC 60947-1
Vibration	10Hz ~ 55Hz, 0.35mm
Overvoltage category	III
Pollution degree	2
Protection type	IP20
Ambient temperature	-20°C~ +60°C
Storage temperature	-40°C~ +80°C
Relative humidity	10 %RH ~ 90 %RH(40 ℃)
Atmosphere pressure	80kPa~106kPa
Operating altitude	≤ 2000m
Mechanical	
Mechanical life	10×10^6cycles
Connect type	Screw terminal
Install type	DIN35
Weight	180g

DEGSON
Safety Relay

Two-hand control safety relay

CE RoHS

Safety Values

Performance level	PLe, according to ISO 13849	SIL	SIL3, according to IEC 61508
Category	Cat.4, according to ISO 13849	SIL CL	SIL CL3, according to IEC 62061
DTI	At least 1x per day, according to ISO 13849	HFT	1, according to IEC 62061
PTI (T_M)	20 years, according to ISO 13849	SFF	≥ 99%, according to IEC 62061
DC_{avg}	99%, according to ISO 13849	DC_{avg}/PTI = 20 years	1.29×10^{-5}, according to IEC 62061
$MTTF_D$	164 years, according to ISO 13849	PFH	1.49×10^{-10} 1/h, according to IEC 62061
CCF	68, according to ISO 13849	Stop Category	0, according to IEC 60204

CAUTION!

When using the product in accordance with the European Machinery Directive, it has to be checked whether the safety contacts of the relay outputs open correctly. Start the device again or open the safety contacts (switch off output), so that the internal diagnostics can check the correct opening of the safety contacts. Diagnosis test interval shall be tested at least 1× per day.

B_{10d} values for safety-related control system of machinery

AC-15，Ue = 250V	Cycles
Ie = 5A，1 NO	200000
Ie = 3A，1 NO	230000
Ie = 1A，1 NO	380000
DC-13，Ue = 24V	
Ie = 5A，1 NO	300000
Ie = 2A，1 NO	2000000
Ie = 1A，1 NO	7000000

Confidence level for all B_{10d} values 50%

Functional Block Diagram

DSR-K73

DSR-K74

Dimension

Width × Height × Depth: 23mm×100mm×115mm