

Ультратонкие логические реле безопасности MINOS

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Ultra Slim Safety Logic Devices

MINOS product line



SAFETY



What is MINOS?

MINOS are ultra slim safety modules for safety applications like:

- Emergency-Stop
- Guard door monitoring
- Light grids and light curtains
- Safe coupling functions

All devices fulfill the normative requirements of the following standards

- EN ISO 13849-1
- IEC 62061
- IEC 61508
- IEC 61511
- EN 50156-1
- EN 746-2

and can therefore be used for applications in manufactory industry and process industry, especially for safe firing.



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MINOS types

We distinguish between two types of MINOS:

MINOS **SL**:

Safety-Modules with safe semiconductor output



MINOS **SD**:

Safety-Modules with safe relay contact



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MINOS product line

MINOS SL

Ultra Slim Safety Semiconductor Logic



EN ISO 13849-1



IEC 62061
IEC 61511
IEC 61508



EN 746 - 2
EN 50156 - 1



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MINOS product line

MINOS SL at a glance:

Technical data:

- In and Out's:
 - ❖ Power Supply - DC 24 V
 - ❖ One or two channel input
 - ❖ Semiconductor auxilliary output - DC 24 V, 100 mA
 - ❖ Safe semiconductor output - DC 24 V, max. 2.5 A
 - ❖ Automatic or monitored reset with feedback loop
- High diagnostics with different front LED's:
 - ❖ Power Supply
 - ❖ Status at input 1 and input 2
 - ❖ Status safe output
 - ❖ Error (cross-circuit, overvoltage, ...)
- Minimal width – 6.2 mm
- Screw terminals or tensil-spring terminals
- Variants with or without test pulses at the safe output



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MINOS SL at a glance:

Variants:

- SL1E and SL2E
SL-Variants with test pulses at the safe output for applications up to PL e / SIL 3

SL1E: With cross circuit detection for e.g. emergency stop buttons
SL2E: Without cross circuit detection for e.g. OSSD outputs of light grids / light curtains
- SL1D and SL2D
SL-Variants without test pulses at the safe output for applications up to PL d / SIL 2

SL1D: With cross circuit detection for e.g. emergency stop buttons
SL2D: Without cross circuit detection for e.g. OSSD outputs of light grids / light curtains
- Every SL-Variant is available with automatic or manual start and with screw terminals or tensil-spring terminals (each type has it's own article number)



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MINOS **SL** at a glance:
Application examples:

- Emergency Stop
- Light grid/curtain
- Guard door monitoring with non contact switches
- Safe area monitoring with rope switches
- Safe contact reinforcement for safe PLC-outputs

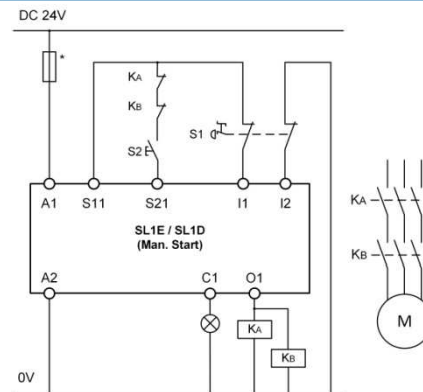


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MINOS **SL** at a glance:
Application examples:

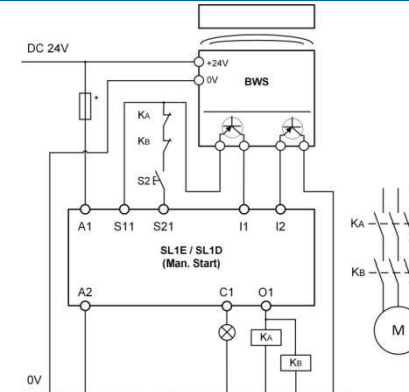
SL

for emergency stop
with manual start
up to PL e / SIL 3



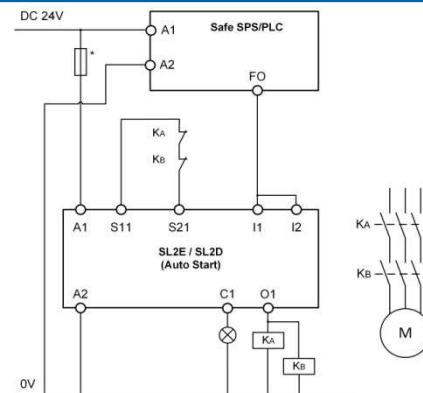
SL

for guard door
monitoring with non
contact safety switch
up to PL e / SIL 3



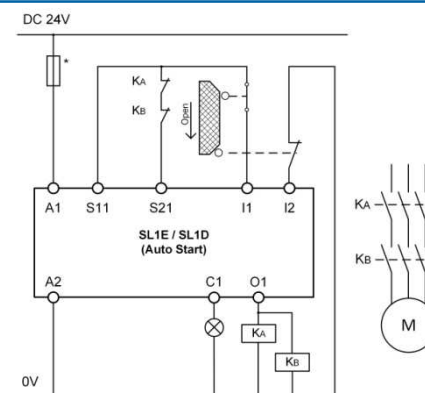
SL

for reinforcement of
safe PLC outputs



SL

for guard door
monitoring with
potential free
contacts



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MINOS product line

MINOS **SL** at a glance:

Your benefits:

- Ultra slim safety module with only 6.2 mm width.
 - Less costs for wiring space
- Predefined configurations for reset- and safety circuit
 - Less time required for wiring
- Safe semiconductor output instead of relay contact
 - Cost effective modules
 - Short reaction times
- No electromechanics
 - Highest safety level without limitation of switching cycles
- Variants with or without test pulses at the safe output
 - SLxD variants for sensitive actors
- Screw or tensil-spring terminals
 - Safe and optimized wiring according to the customer's preference



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MINOS SD

Ultra Slim Safety Relay

Safety Relay SD1E



EN ISO 13849-1



IEC 62061
IEC 61511
IEC 61508



EN 746 - 2
EN 50156 - 1



SAFETY

MINOS product line

MINOS **SD1E** at a glance:

Technical data:

- In and Out's:
 - ❖ Power Supply - DC 24 V
 - ❖ One or two channel input
 - ❖ Semiconductor auxilliary output - DC 24 V, 100 mA
 - ❖ Safe relay contact up to AC 250 V, 6 A
 - ❖ Automatic or monitored reset with feedback loop
- High diagnostics with different front LED's:
 - ❖ Power Supply
 - ❖ Status at input 1 and input 2
 - ❖ Status safe relay contact
- Minimal width – 6.8 mm
- Screw terminals
- Configuration of application and start function at the device via slide switches



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MINOS product line

MINOS **SD1E** at a glance:

Application examples:

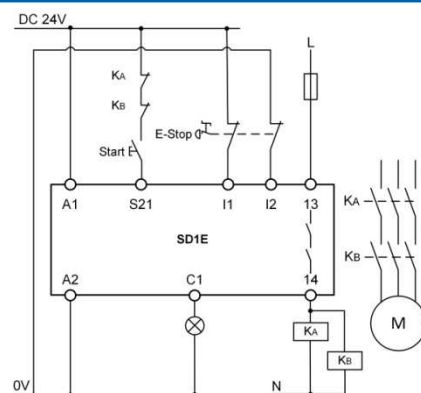
- Emergency Stop
- Light grid/curtain
- Guard door monitoring with non contact switches
- Safe area monitoring with rope switches



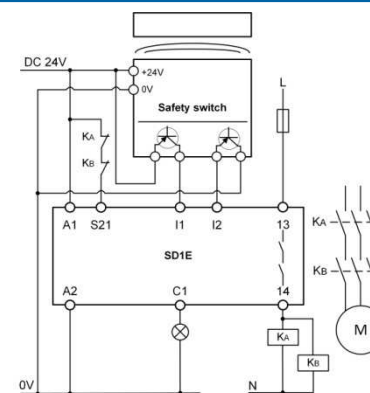
SAFETY

Application examples:

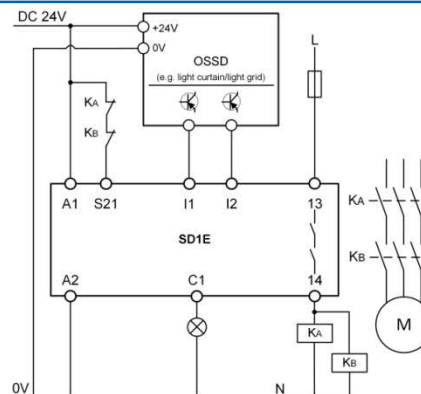
for emergency stop
with manual start
up to PL e / SIL 3



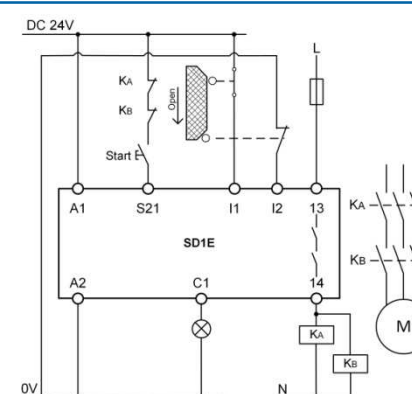
for guard door
monitoring with non
contact safety switch
up to PL e / SIL 3



for light grid / light
curtain applications



for guard door
monitoring with
potential free
contacts



MINOS product line

MINOS **SD1E** at a glance:

Your benefits:

- Ultra slim safety module with only 6.8 mm width
 - Less costs for wiring space
- SD1E with configuration switches on the device
 - Less time for configuration and less warehouse costs
- Safe relay contact
 - Switching loads up to AC 250 V / 6 A galvanically isolated
- Type examined for EN 50156-1 and EN 746-2
 - Certified solution for furnaces and ancillaries



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MINOS product line

MINOS SD

Ultra Slim Safety Relay

Safe Coupling Relay SD1K



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MINOS product line

MINOS **SD1K** at a glance:

Technical data:

- In and Out's:
 - ❖ Control line – DC 24 V
 - ❖ Semiconductor auxilliary output - DC 24 V, 100 mA
 - ❖ Safe relay contact up to AC 250 V, 6 A
 - ❖ Feedback loop
- High diagnostics with different front LED's:
 - ❖ Power Supply
 - ❖ Status safe relay contact
- Minimal width – 6.8 mm
- Screw terminals

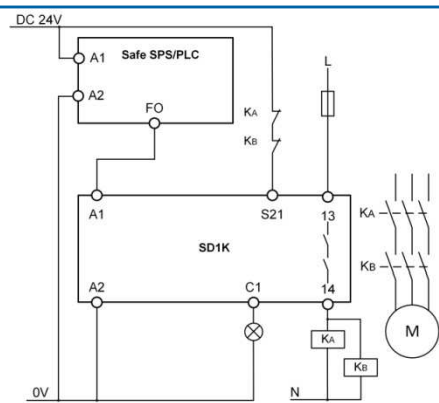


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MINOS **SD1K** at a glance:
Application examples:

SD1K

for safe contact
reinforcement of
safe PLC output
up to PL e / SIL 3



MINOS product line

MINOS **SD1K** at a glance:

Your benefits:

- Ultra slim safety module with only 6.8 mm width
 - Less costs for wiring space
- Safe relay contact
 - Switching loads up to AC 250 V / 6 A, galvanically isolated
- Two channel structure with self-monitoring
 - Less wiring due to no monitoring of the SD1K by the PLC
- Type examined for EN 50156-1 and EN 746-2
 - Certified solution for furnaces and ancillaries



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MINOS product line

The right MINOS for your application!

Facts	Types	SD1E	SD1K	SL1E SL2E	SL1D SL2D
Switching voltage DC 24 V		●	●	●	●
Switching voltage up to 230 V; Galvanically isolated		●	●		
Safe coupling function; Gavanically isolated			●		
Emergency stop applications		●		●	●
Light grid / Light curtain application		●		●	●
Guard door monitoring (OSSD, Potential Free, PNP)		●		●	●
Reinforcement of safe PLC outputs			●	●	●
Furnaces and ancilliary in continuous mode (EN 50156-1, EN 746-2)		●	●	●	●
Cost effective				●	●
Required safety level up to PL e / SIL 3		●	●	●	
Required safety level up to PL d / SIL 2					●

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Ordering informations – MINOS SL:

Type designation				Order No.					
MINOS		SL		4	7	2	8		
Type									
Application									
1 Dual-Channel emergency stop or safety door monitoring with short circuit monitoring									
2 Light curtains, contact amplification, OSSD or single-channel emergency stop									
PL / SILCL				Variant SLxD / SLxE					
D Up to PL d / SILCL 2 No test pulses at the safe output				0 SLxD					
E Up to PL e / SILCL 3 Test pulses at the safe output enable error detection during operation				2 SLxE					
				Application, Start behavior and Terminals					
				0 SL1y with manual start and tensil spring terminals					
				1 SL1y with manual start and screw terminals					
				2 SL1y with automatic start an tensil spring terminals					
				3 SL1y with automatic start and screw terminals					
				4 SL2y with manual start and tensil spring terminals					
				5 SL2y with manual start and screw terminals					
				6 SL2y with automatic start and tensil spring terminals					
				7 SL2y with automatic start and screw terminals					
Example:									
472826: MINOS SL2E with automatic Start and tensil spring terminals									

SAFETY

Ordering informations – MINOS SD:

Type designation				Order No.						
MINOS		SD	1		4	7	2	8		1
Type Application E Safety Relay K Safe Coupling Relay				Variant SD1E / SD1K 4 SD1E 5 SD1K						

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