

# Ultra Slim Safety Logic Devices

## MINOS product line



EN ISO 13849-1



IEC 62061  
IEC 61511  
IEC 61508



EN 746 - 2  
EN 50156 - 1



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## 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 product line

## 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  
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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 product line

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

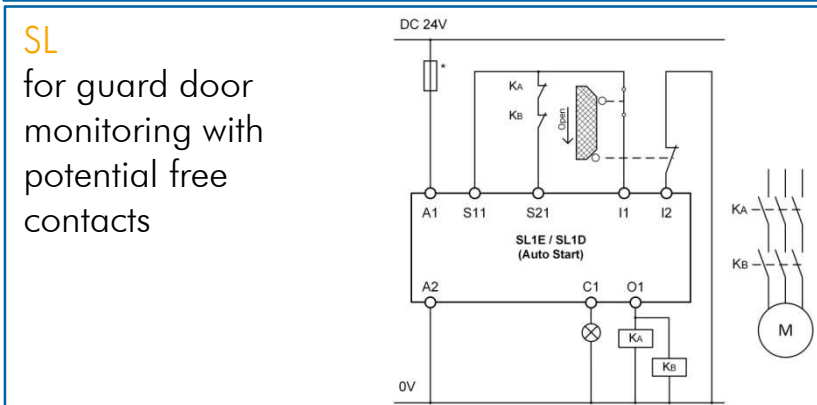
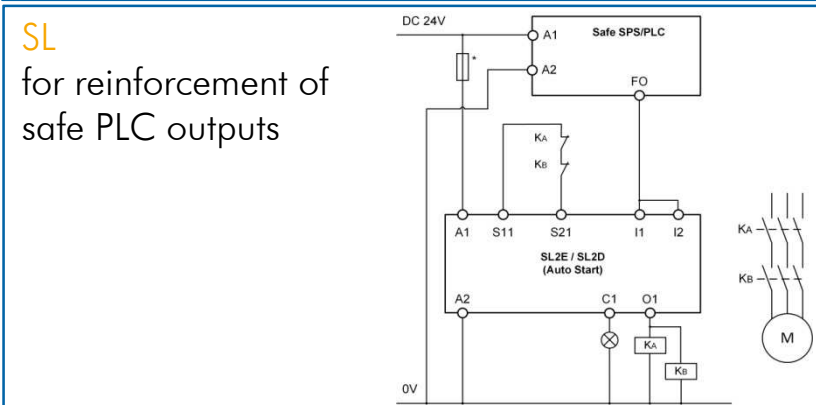
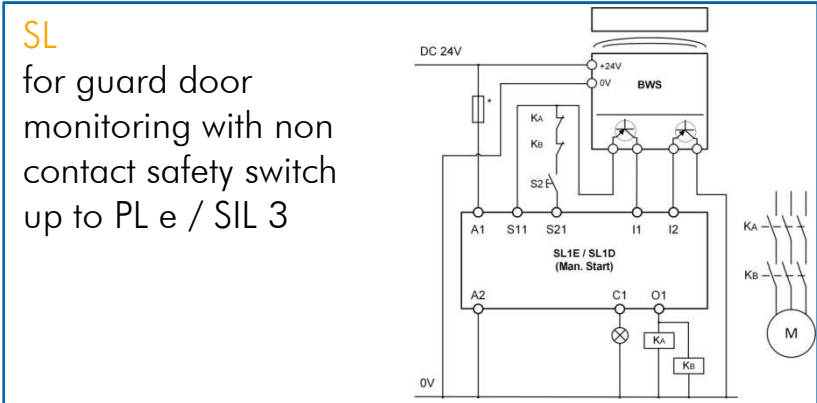
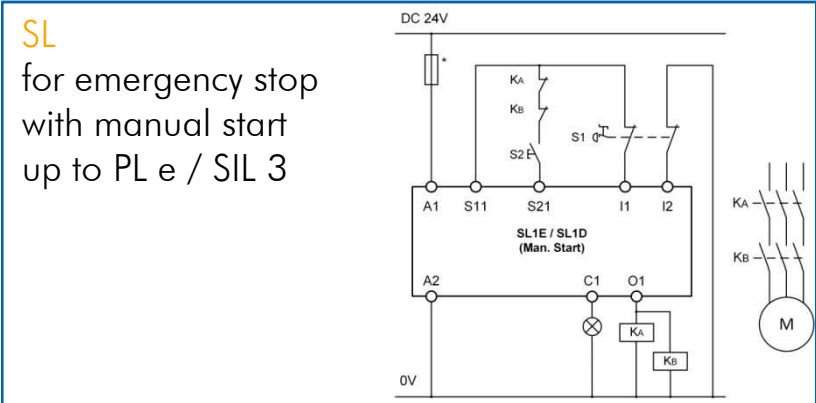
- Emergency Stop
- Light grid/curtain
- Guard door monitoring with non contact switches
- Safe area monitoring with rope switches
- Safe contact reinforcement for safe PLC-outputs



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MINOS SL at a glance:  
 Application examples:



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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



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## 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

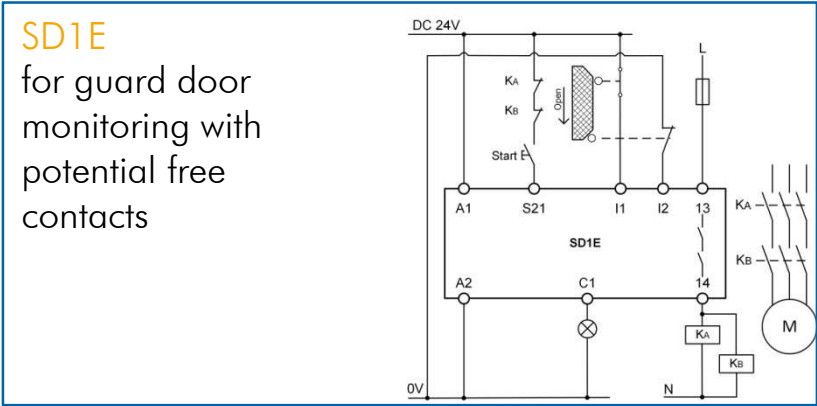
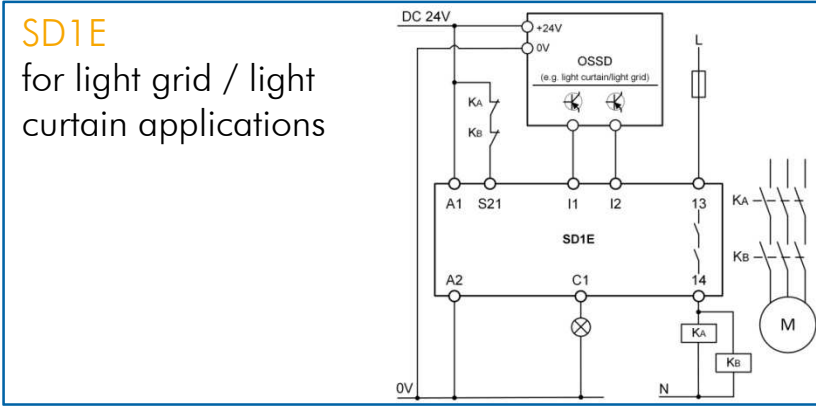
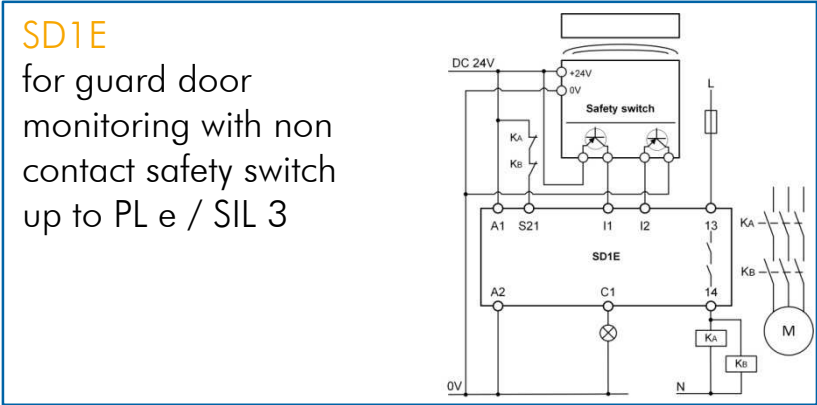
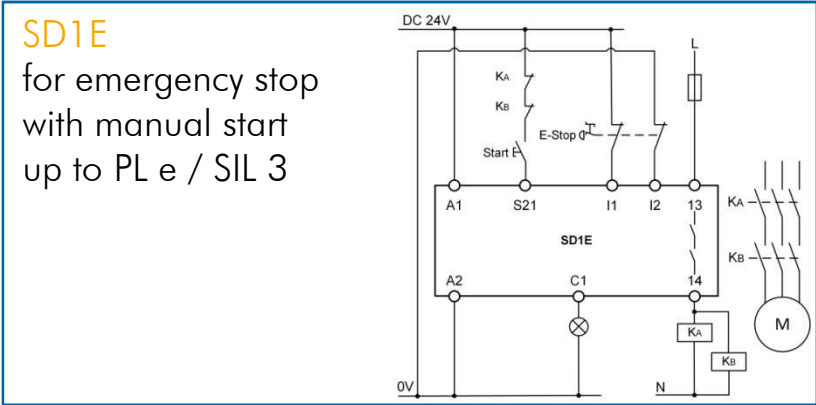
MINOS **SD1E** at a glance:  
Application examples:

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



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MINOS SD1E at a glance:  
 Application examples:



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## 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 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

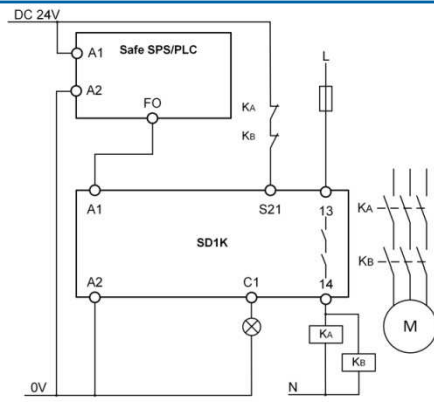


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MINOS **SD1K** at a glance:  
Application examples:

**SD1K**  
for safe contact  
reinforcement of  
safe PLC output  
up to PL e / SIL 3



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## 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:

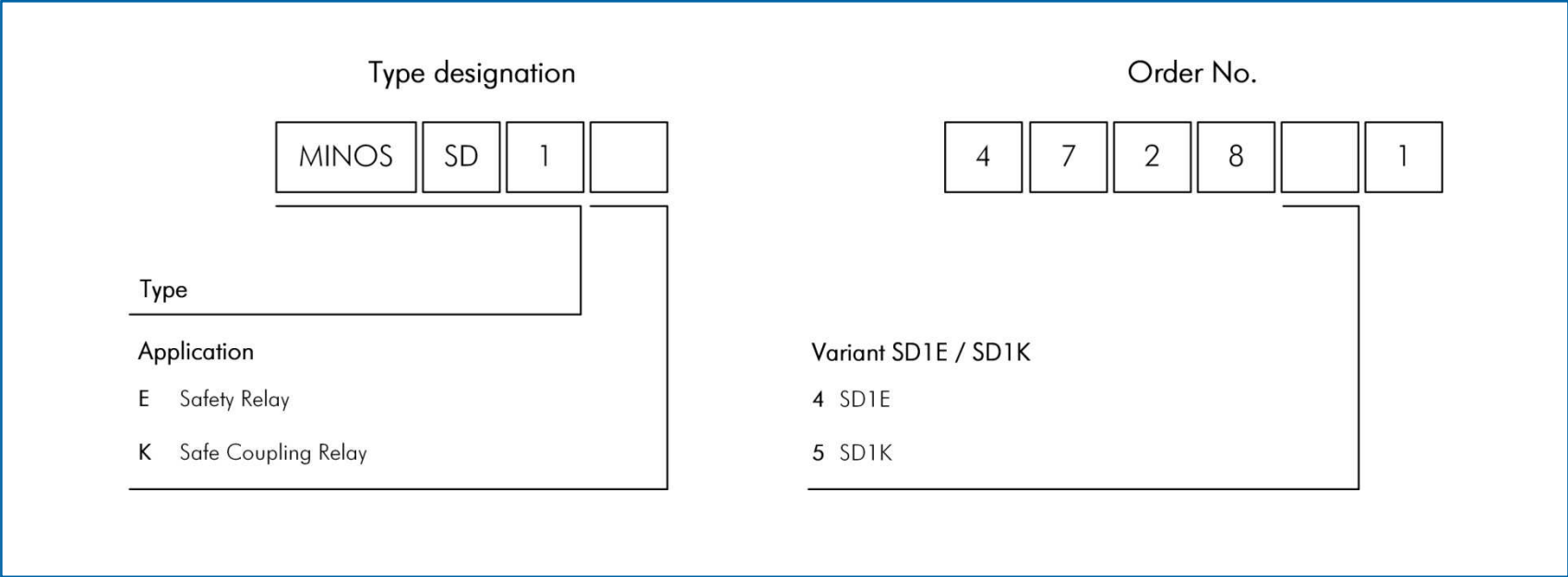
Type designation				Order No.						
MINOS		SL			4	7	2	8		
<b>Type</b> <b>Application</b> 1 Dual-Channel emergency stop or safety door monitoring with short circuit monitoring 2 Light curtains, contact amplification, OSSD or single-channel emergency stop				<b>Variant SLxD / SLxE</b> 0 SLxD 2 SLxE						
<b>PL / SILCL</b> D Up to PL d / SILCL 2 No test pulses at the safe output E Up to PL e / SILCL 3 Test pulses at the safe output enable error detection during operation				<b>Application, Start behavior and Terminals</b> 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										

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## Ordering informations – MINOS SD:



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