

**Safety Relay
 Series UE 10-3 OS**

1 Safety

The safety category of the UE 10-3 OS is dependant on the category of the basic unit as well as the application itself.

1.1 Safety regulations

- Installation and electrical connection must be carried out solely by technically qualified technicians.
- For use and installation of Safety Switches and for commissioning and routine technical checks, the national and international legislative regulations shall apply, in particular
 - the Directive 98/37/EG on Machinery
 - the Directive 89/655/EWG on the use of operational resources
 - the Low Voltage Directive 73/23/EWG
 - Safety legislation and enactments, plus
 - accident prevention regulations and safety regulations
- Manufacturers and operators of the machine, on which safety devices are used, are responsible for ensuring that all currently applicable safety legislation and safety regulations are defined for them by the Authorities responsible and are heeded and observed.
- The operating instructions are to be heeded and to be archived.
- The examinations and tests are to be carried out by technicians or by persons authorised and commissioned for this purpose in-house, and the results are to be documented in a manner that enables traceability to be effected at any time.
- The operating instructions are to be made available to the operator of the machine on which the safety relay is used. The operator of the machine is to be given induction instructions by a skilled technician.

1.2 Areas of application

The UE 10-3 OS Safety Relay is used exclusively for use with the following SICK basic unit's

- C 4000
- C/M 2000
- MSL
- As well as
- safety devices with monitored semiconductor outputs like LSI and LE 20.

The UE 10-3 OS has no reset interlock or EDM.

1.3 Use in accordance with the regulations

For any other use, and in the event of modifications to the unit, or if the unit has been opened, even as part of assembly and installation, any warranty claims against SICK AG shall become null and void.

1.4 Environmentally correct disposal

Unusable and irreparable units shall always be disposed of in accordance with the applicable waste disposal regulations specific to the country concerned. SICK will be pleased to assist in disposing of units.

2 Product Description

2.1 Construction and operation of the unit

The switching of the two semiconductor outputs of the attached basic unit each control two separate internal relays. The UE 10-3 OS's two normally open contacts serve as safe outputs. The normally closed output is a non-safe output. The feedback contact (Y 1 - Y 2) is monitored by the EDM circuit of the basic unit.

2.2 Indicators

Description	Colour	Function
K 1	Green	Relay K 1 energised
K 2	Green	Relay K 2 energised

3 Assembly

Operation only in the control cabinet!
 The unit is only suitable for installation in control cabinets having a minimum protective type of enclosure to Class IP 54. Fitting of the units is effected by snapping on to a TS 35 (EN 50 022) mounting rail.

4 Electrical Installation

Switch off the system!
 In order to exclude any inadvertent starting up of the system or the creating of an electrical hazard, the system is to be switched off and electrically isolated from any voltage supply.

Protection against electrocution to EN 50 178
 In order to secure protection from electrocution in accordance with EN 50178, the UE 10-3 OS is to be attached through contacts(B 1 - B 4) with a PELV rated power supply(e. g. C 4000).

Instructions

- Inputs B 2 and B 4 are always to be connected to the 0 V potential of the basic unit's power supply.
- To prevent welding of the contacts of the installed relays, an overcurrent protection device with a maximum of 6 A short-circuit protection (Operating Class gG) shall be incorporated in the output circuits (see fig. 2, fuse F 2 / F 3 / F 4).
- If capacitive or inductive loads are connected to the output circuits, a protective circuit (spark suppression) shall be provided. In doing so, it shall be observed that the response times increase depending on the type of protection.
- The wires for the input and output signals shall be routed outside the control cabinet, according to the safety category to be used (EN 954). For example, protected routing, single sheathed cable with screen etc.
- The details given in *Technical Data* must be observed.

4.1 Wiring of connections

B 1	Input circuit 1 "+"
B 2	Input circuit 1 "-"
B 3	Input circuit 2 "+"
B 4	Input circuit 2 "-"
Y 1 - Y 2	EDM for external switching elements
13 - 14	output 1, safe
23 - 24	output 2, safe
33 - 34	output 3, safe
41 - 42	output NC; non-safe

4.2 Operating modes

4.2.1 Single-channel operation

Jumper contacts B 1 and B 3. The basic unit's semiconductor output is connected to B 1. B 2 and B 4 are always to be connected to the 0 V Potential of the basic unit's power supply.

4.2.2 Dual-channel operation

The two semiconductor outputs of the basic unit are to be attach to B 1 and B 3. B 2 and B 4 are always to be connected to the 0 V Potential of the basic unit's power supply.

5 Commissioning

The normally open output contact's logic opposes the signal and feedback contacts. With the closing of these normally open outs, the signal and feedback contacts open.

Monitor the danger zone!

Prior to commissioning, it must be ensured that nobody is in the danger zone. The safety regulations and test instructions as described above are to be heeded. The following functional tests / checks are to be carried out during commissioning:

5.1 Function test

When the semiconductor outputs of the basic unit are active, the output contacts close. When the outputs are deactivated, the output contacts open.

5.2 Regular inspection / testing of the safety equipment by trained technical personnel

Following major modification work to the machine or the safety equipment, the system is to be examined in accordance with the safety regulations given above.

6 Maintenance

In operation, the UE 10-3 OS Safety Relay is maintenance-free.

7 Technical Data

Refer to Table

8 Ordering Data

Version	Type	Order No.
screw terminals	UE 10-3 OS 2 D0	6 024 917
removable plug-in block terminals	UE 10-3 OS 3 D0	6 024 918

9 Examples of Circuits

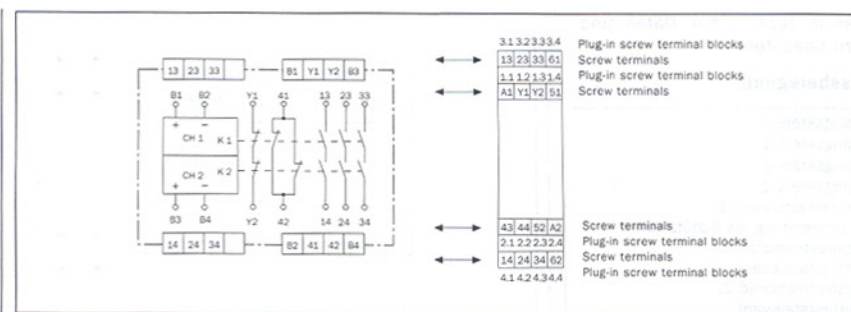


Fig. 1: Internal wiring UE 10-3 OS

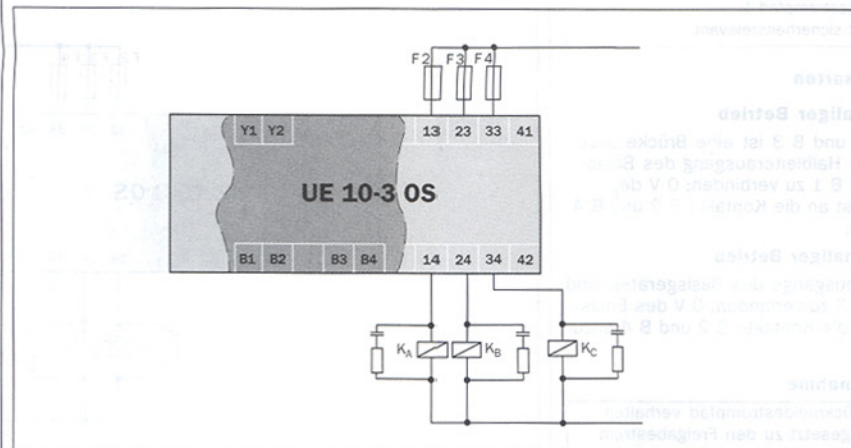


Fig. 2: Basic wiring UE 10-3 OS

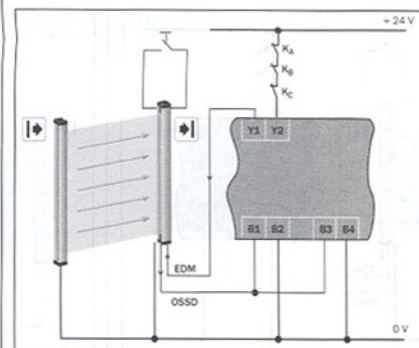


Fig. 3: Example for a single-channel light curtain type 2 with manual reset, external device monitoring (EDM)

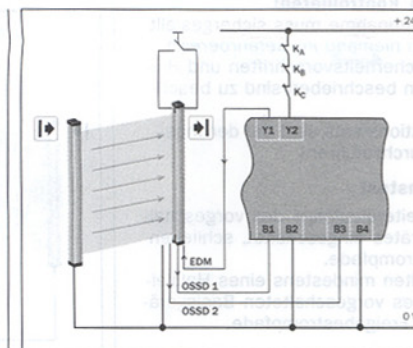
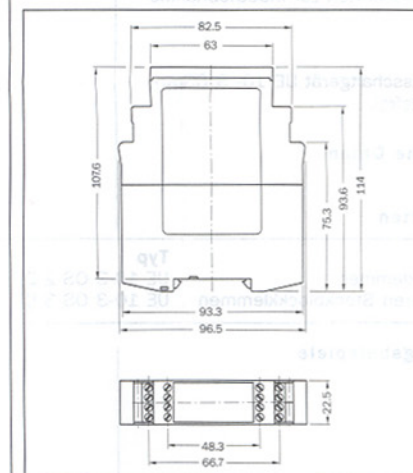


Fig. 4: Example for a dual-channel light curtain type 4 with manual reset, external device monitoring (EDM)



Technical Data UE 10-3 OS

	min.	typ.	max.
General System Data			
Protection (EN 50 178)	Contact protection to VDE 0106 Part 100		
Voltage supply to B 1 - B 2, B 3 - B 4	PELV to B 1 - B 2 / B 3 - B 4		
Output circuit > 25 V AC / 60 V DC	PELV or SELV to B 1 - B 2 / B 3 - B 4		
Output circuit < 25 V AC / 60 V DC	PELV or SELV to B 1 - B 2 / B 3 - B 4		
Response time K 1 / K 2	16 ms		20 ms
Input circuits B 1 ... B 4			
Activation time			40 ms
Input Voltage	15 V	24 V	30 V
Switch on current			500 mA
Total power consumption	2.2 W		
Output circuits (13 - 14, 23 - 24, 33 - 34, 41 - 42, Y 1 - Y 2)			
Relay contacts	3 Output circuits (NO), safe 1 Signal circuit (NC), non-safe 1 Feedback contact (NC)		
Contact type	positively guided		
Contact material	silver alloy; gold plated		
Load capability of contacts			
Switching voltage output circuits / signal circuits	10 V AC/DC		230 V AC / 30 V DC
Switching voltage feedback contact	10 V DC		24 V DC
Switching current output circuits	10 mA		6 A
Switching current signal circuits	10 mA		2 A
Switching current feedback contact	10 mA		0.1 A
Total current			12 A
Application category to EN 60 947-5-1: 1991			
	AC-15 Ue 230 V AC, I _n 3 A (3600 c/h)		
	DC-13 Ue 24 V DC, I _n 3 A (360 c/h)		
	DC-13 Ue 24 V DC, I _n 2.5 A (3600 c/h)		
Permitted switching frequency			3600 c/h
Service life, mechanical (switch clearance tolerances)	1 x 10 ⁷		
Electrical service life	2 x 10 ⁶		
Operational data			
Measured transient/surge voltage (U _{imp})	4 kV		
Overload voltage category	III		
Contamination rating of the unit (EN 50 178)			
external	3		
internal	2		
Measured voltage	300 V AC		
Test voltage U _{gr} (50 Hz) EN 60 439-1	2.0 kV		
Type of protective enclosure			
Housing	IP 40		
Terminals	IP 20		
Interference emission to	EN 60 947-1 02/99		
Noise attenuation to	EN 60 947-1 02/99		
Ambient operating temperature	- 25 °C		+ 55 °C
Storage temperature	- 25 °C		+ 75 °C
Cross-section of connections			
Solid core wire (2x, identical cross-section)	0.14 mm ²		0.75 mm ²
Solid core wire (1x)	0.14 mm ²		2.5 mm ²
Fine multi-stranded flex with terminal sleeves (2x, identical cross-section)	0.25 mm ²		0.5 mm ²
Fine multi-stranded flex with terminal sleeves (1x)	0.25 mm ²		2.5 mm ²
Weight	0.2 kg		