
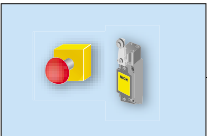




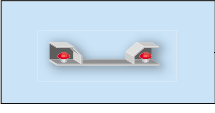

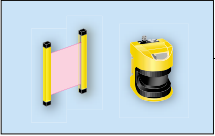

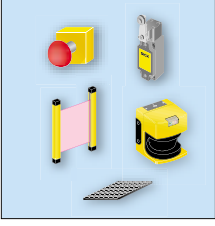






**Safety Relays**  
**UE 10 – UE 48 Series**



## Selection Table

| Main Application  | Mode                 | Features   |  | UE-Unit   |
|---|----------------------|--|---|---|
|                      | Single Channel Input | <br> | $\frac{2}{1}$   | <b>UE 23-2 MF</b>   |
|   |                      |  | $\frac{2}{1}$   | <b>UE 43-2 MF</b>   |
|   | $\frac{3}{1}$        |  | <b>UE 43-3 MF</b>   |   |
|   | $\frac{6}{4}$        |  | <b>UE 43-6 MF</b>   |   |
|   | $\frac{3}{0}$        |  | <b>UE 45-3 S1 2 3</b><br>1 Output<br>up to 3 s Off-Delay                          |   |
|   | $\frac{3}{0}$        |  | <b>UE 45-3 S1 2 30</b><br>1 Output<br>up to 30 s Off-Delay                        |   |
|  1)                | Dual Channel Input   |   | $\frac{3}{0}$   | <b>UE 44-3 SL 2 3</b><br>1 Output<br>up to 3 s On-Delay   |
|   |                      |  | $\frac{3}{0}$   | <b>UE 44-3 SL 2 30</b><br>1 Output<br>up to 30 s On-Delay |
|                    | Dual Channel Input   |   | $\frac{2}{1}$   | <b>UE 42-2 HD</b>   |
|                    | Dual Channel Input   |   | $\frac{3}{1}$   | <b>UE 10-3 OS</b>   |
|                    | Dual Channel Input   |   | $\frac{2}{1}$   | <b>UE 48-2 OS</b>   |
|   |                      |  | $\frac{3}{0}$   | <b>UE 48-3 OS</b>   |
| Expansion unit<br> |                      |  | $\frac{4}{2}$   | <b>UE 10-4 XT</b>   |
|   |                      |  | $\frac{4}{2}$   | <b>UE 11-4 DX</b><br>Off-Delay<br>0.5, 1, 2, 3 s          |

1) Safety switch with mechanical locking

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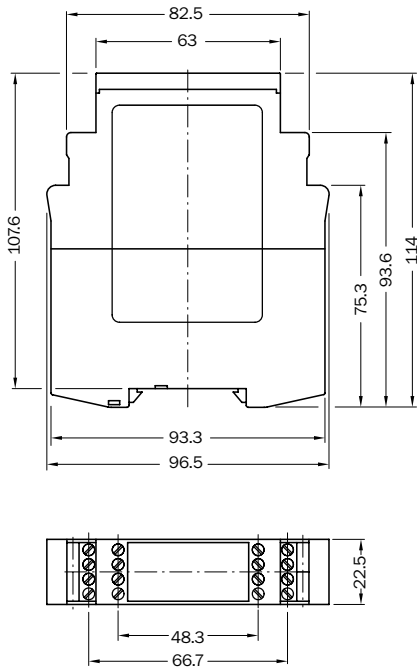
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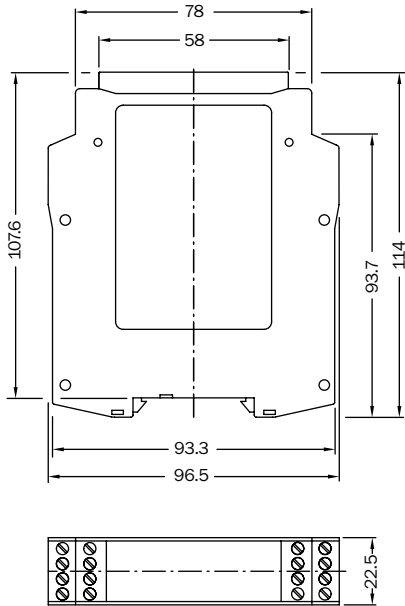
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## Housing A



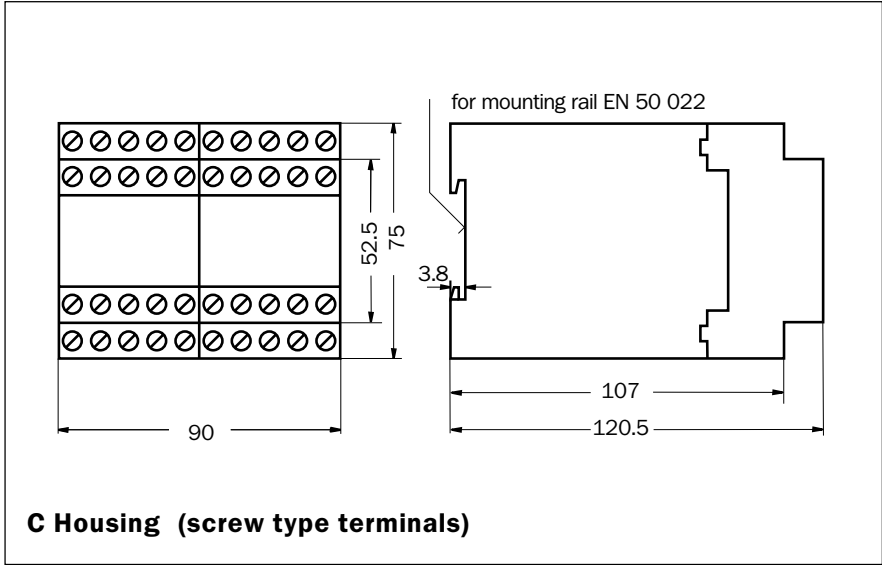
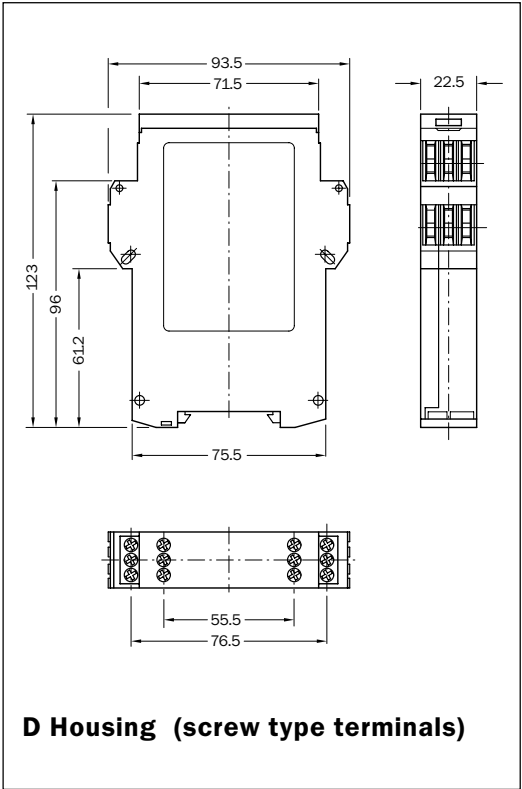
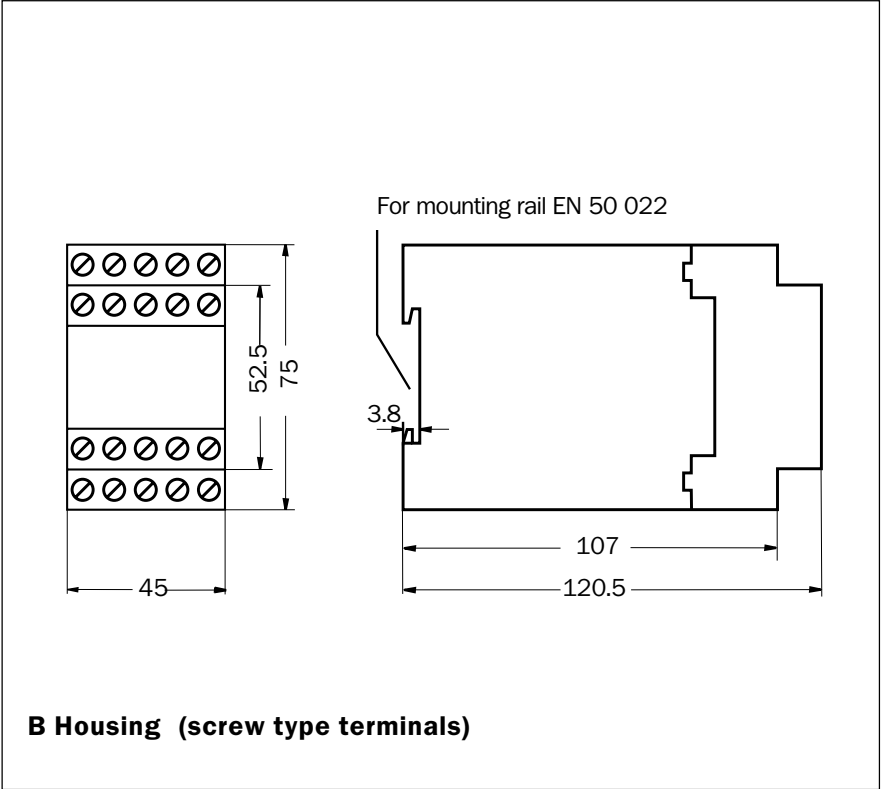
### A.1 Housing (screw type terminals)



### A.2 Housing (removable terminals)

Dimensions in mm

Housing B, C and D

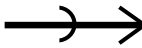



Dimensions in mm


## Technical Explanations


### Symbols

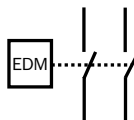
#### Function

 Off-delay

 On-delay


 1 Normally open (NO) input

 1 Normally closed (NC) input

 External device monitoring

#### Reset

 Automatic Reset

 Manual Reset

#### Applications



Safety Switch



Emergency Stop



Safety Laser Scanner



Safety Light Curtain



Safety Mat



Two-hand Controls



Safety Locking Device

# UE 10-3 OS Safety Relay

for opto-electronic protective equipment

## Application

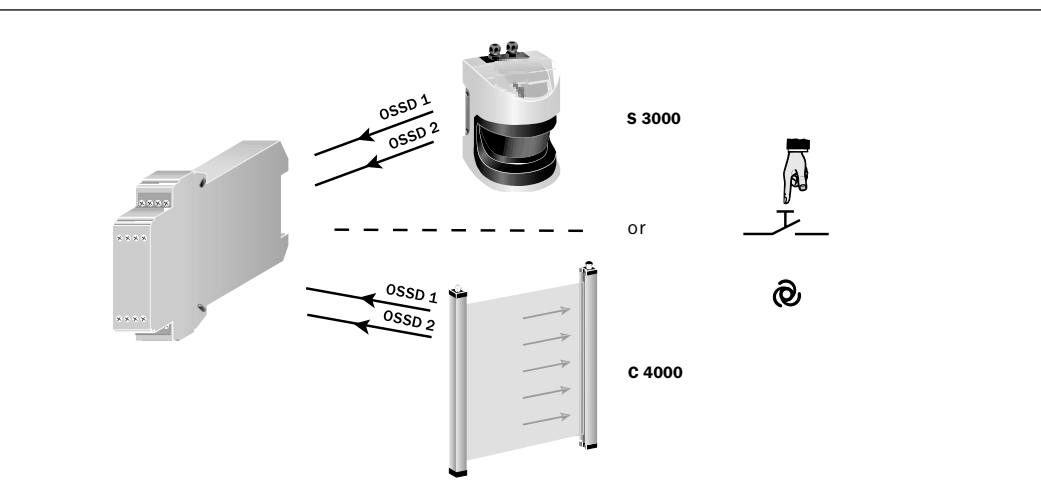
The UE 10-3 OS Safety Relay is a relay module for:

- Electro-Sensitive Protective Equipment (ESPE) with monitored semiconductor outputs, integral external device monitoring (EDM) and Restart Inhibit, such as
  - C 4000
  - C/M 2000
  - MSL
  - S 3000
- Safety systems with monitored semiconductor outputs, integral external device monitoring and Restart Inhibit, such as LSI and LE 20

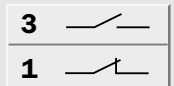
## Features

- Single- or dual-channel control
- NC contact for external device monitoring (EDM)
- Outputs: 3 normally open contacts, 1 normally closed contact
- 2 LEDs for relays K 1 and K 2
- Increase in the number of outputs by way of the expansion units
  - UE 10-4 XT
  - UE 11-4 DX
- Available with removable terminals (key coded)
- "A" Housing (see Page 4), width: 22.5 mm

See Pages 51 and 52 for sample wiring diagrams



|          |                           |
|----------|---------------------------|
| EN 954-1 | Same as protective device |
| EN 61496 | Types 2, 3, 4             |



## Function

If the semiconductor outputs of the installed safety device (e. g. C 4000, S 3000) are energised, then the safety output contacts will close.

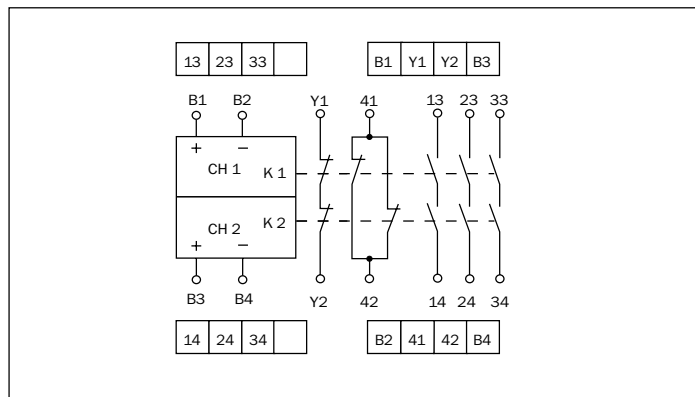
When at least one of the semiconductor outputs of the safety device becomes de-energised, then the output contacts revert back to open circuit status.

If Restart Inhibit is needed, then this is achieved in the safety device, for example C 4000 or S 3000.

### External device monitoring (EDM)

Safety Category 3 or 4 requires monitoring of contactors. This is provided in the connected protective device, for example in the C 4000 or S 3000. The normally closed contact (Y 1 - Y 2) in the UE 10-3 OS unit is, however, a part of this contactor monitoring system.

The UE 10-3 OS **2** unit has screw type terminals.  
 The UE 10-3 OS **3** unit has removable terminals.



Internal Circuitry UE 10-3 OS

Technical Data UE 10-3 OS

|  | min.   | typ.         | max.               |
|--|--|--------------|--------------------|
| <b>General System Data</b>   |  |              |                    |
| Supply voltage to B 1 - B 2, B 3 - B 4                                 |  |              |                    |
| Electrical output circuit > 25 V AC / 60 V DC                          |  | PELV         |                    |
| Electrical output circuit < 25 V AC / 60 V DC                          |  | PELV or SELV |                    |
| <b>Inputs B 1 ... B 4</b>  |  |              |                    |
| Activation time  |  |              | 40 ms              |
| Switch-on voltage  | 15 V   | 24 V         | 30 V               |
| Switch-on current  |  |              | 500 mA             |
| <b>Output circuits (13 - 14, 23 - 24, 33 - 34, 41 - 42, Y 1 - Y 2)</b> |  |              |                    |
| Response time (K 1 / K 2)  |  |              | 20 ms              |
| <b>Relay contacts</b>  | 3 Normally open contacts (NO), safety relevant<br>1 Normally closed contact (NC), not safety relevant<br>1 Normally closed contact (NC), contactor monitoring  |              |                    |
| Contact type   | positively guided  |              |                    |
| Contact material   | Silver alloy; gold-plated  |              |                    |
| Load capacity of contacts  |  |              |                    |
| Switching voltage  | 10 V AC/DC   |              | 230 V AC / 30 V DC |
| Switching current  | 10 mA  |              | 6 A                |
| Total current across all contacts                                      |  |              | 12 A               |
| Application Category to EN 60 947-5-1                                  | AC-15 Ue 230 V AC, I <sub>e</sub> 4 A (360 c/h)<br>AC-15 Ue 230 V AC, I <sub>e</sub> 3 A (3600 c/h)<br>DC-13 Ue 24 V DC, I <sub>e</sub> 4 A (360 c/h)<br>DC-13 Ue 24 V DC, I <sub>e</sub> 2.5 A (3600 c/h) |              |                    |
| Permitted switching frequency  |  |              | 3600 c/h           |
| Service life, mechanical (switching cycles)                            | 1 x 10 <sup>7</sup>  |              |                    |
| Service life, electrical (dependent on the load)                       | 2 x 10 <sup>6</sup>  |              |                    |
| <b>Operating data</b>  | <b>see Page 47</b>   |              |                    |
| <b>Weight</b>  | 0.2 kg   |              |                    |

### Order reference list for UE 10-3 OS

| Type    | Outputs |    | Connections          |                     | Without actual supply voltage | Order No. |
|---------|---------|----|----------------------|---------------------|-------------------------------|-----------|
|         |         |    | Screw type terminals | Removable terminals |                               |           |
| UE 10 - | 3       | OS | 2                    |                     | D0                            | 6 024 917 |
| UE 10 - | 3       | OS |                      | 3                   | D0                            | 6 024 918 |

## UE 10-4 XT and UE 11-4 DX Expansion modules

### Application

The UE 10-4 XT and UE 11-4 DX expansion modules serve to

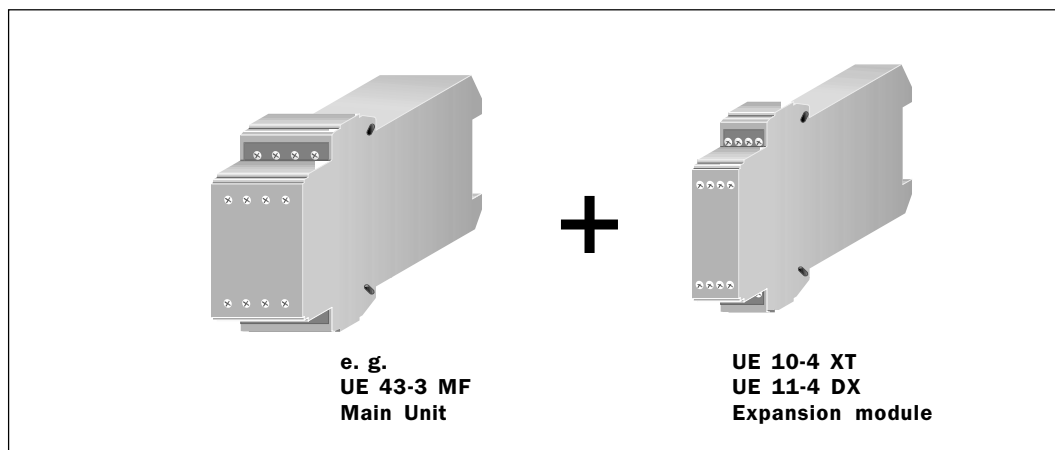
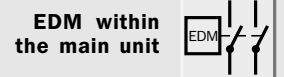
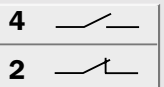
- Increase the number of output contacts of a main unit
- UE 11-4 DX has off-delayed outputs (0.5, 1, 2, 3 sec, depending on model)

### Features

- NC contact for external device monitoring (EDM)
- Outputs: 4 normally open contacts, 2 normally closed contacts
- 2 LEDs for relays K 1 and K 2
- Available with removable terminals (key coded)
- "A" Housing (see Page 4), width: 22.5 mm



EN 954-1 Same as the main unit



## Function

The supply voltage of the expansion module is linked to an output contact of a main unit.

Upon applying the supply voltage to terminals A 1 and A 2, relays K 1 and K 2 are energised (the LEDs for both relays illuminate): The 4 output contacts close, the two normally closed contacts and the EDM (feedback) circuit switch to open circuit status.

When the output contacts of the standard unit opens (e.g. by activation of the Emergency Stop), the relays K 1 and K 2 de-energise: The normally open contacts open, and the two normally closed contacts close.

### External device monitoring (EDM)

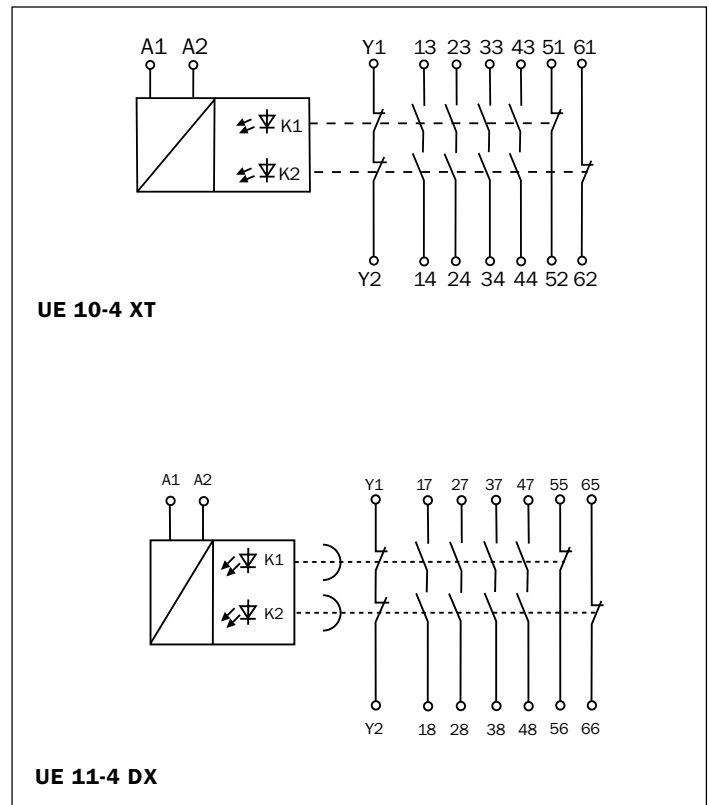
If external device monitoring is implemented in the connected main unit, then the normally closed contacts (Y 1 - Y 2) prevent the resetting of the main unit, when K 1 and/or K 2 do not de-energise.

### The function of the UE 11-4 DX ...

... corresponds to that of the UE 10-4 XT, but the unit also has fixed switch off-delay times of 0.5 sec, 1 sec, 2 sec and 3 sec, depending on the model. They are achieved by means of capacitors, so that even in the event of power supply failure the off-delay runs its full duration in each instance. The delay cannot be prematurely cancelled. Only after the delay periods have expired do the relays K 1 and K 2 return to their neutral rest position.

With the combination of UE 11-4 DX and a main unit, Stop Category 1 (EN 418) can be realised.

Units ... XT **2** and ... DX **2** have screw type terminals,  
Units ... XT **3** and ... DX **3** have removable terminals.



Internal Circuitry of the UE 10-4 XT and UE 11-4 DX

Technical Data UE 10-4 XT and UE 11-4 DX

|   | min.   | typ.                  | max.  |
|---|--|-----------------------|---|
| <b>General System Data</b>  |  |                       |   |
| Supply voltage to A 1 - A 2<br>Electrical output circuit > 25 V AC / 60 V DC<br>Electrical output circuit < 25 V AC / 60 V DC   | PELV<br>PELV or SELV   |                       |   |
| Supply voltage $V_v$ (A 1 - A 2)<br>UE 10-4 XT<br>UE 11-4 DX  | 20.4 V AC/DC<br>20.4 V DC  | 24 V AC/DC<br>24 V DC | 26.4 V AC/DC<br>26.4 V DC                                   |
| Power consumption<br>AC (UE 10-4 XT only)<br>DC UE 10-4 XT / UE 11-4 DX   |  |                       | 2.7 VA<br>1.5 W / 2.0 W                                     |
| Residual ripple in DC mode<br>(within the limits of $V_v$ )   |  |                       | 2.4 $V_{pp}$  |
| Nominal frequency in AC mode (UE 10-4 XT)   | 50 Hz  |                       | 60 Hz   |
| Activation time (after applying the supply voltage)<br>UE 10-4 XT<br>UE 11-4 DX   | 25 ms  | 75 ms                 |   |
| <b>Output circuits</b><br><b>UE 10-4 XT (13 - 14, 23 - 24, 33 - 34, 43 - 44, 51 - 52, 61- 62, Y 1 - Y 2)</b><br><b>UE 11-4 DX (17 - 18, 27 - 28, 37 - 38, 47 - 48, 55 - 56, 65 - 66, Y 1 - Y 2) off-delayed</b> |  |                       |   |
| Response time of UE 10-4 XT (K 1 / K 2)   |  |                       | 40 ms   |
| Switch-off delay time of UE 11-4 DX (depending on type)<br>Influence of the supply voltage<br>Influence of ambient temperature<br>Mean value of error (% + $\pm$ 10 ms)<br>Dispersion (% + $\pm$ 10 ms)         | 0.5, 1, 2 or 3 sec   |                       | 0.5 (%/% $\Delta U_N$ )<br>0.4 (%/K)<br>$\pm$ 20<br>$\pm$ 2 |
| <b>Relay contacts</b>   | 4 Normally open contacts (NO), safety relevant<br>2 Normally closed contacts (NC), not safety relevant<br>1 Normally closed contact (NC), contactor monitoring |                       |   |
| Contact type  | positively guided  |                       |   |
| Contact material  | Silver alloy; gold-plated  |                       |   |
| Load capacity of contacts<br>Switching voltage<br>Switching current<br>Total current across all contacts  | 10 V AC/DC<br>10 mA  |                       | 230 V AC / 30 V DC<br>6 A<br>12 A                           |
| Application Category to EN 60 947-5-1   | AC-15 Ue 230 V AC, $I_e$ 6 A (3600 c/h)<br>DC-13 Ue 24 V DC, $I_e$ 6 A (360 c/h)<br>DC-13 Ue 24 V DC, $I_e$ 3 A (3600 c/h)                                     |                       |   |
| Permitted switching frequency   |  |                       | 3600 c/h  |
| Service life, mechanical (switching cycles)   | 1 x 10 <sup>7</sup>  |                       |   |
| Service life, electrical (dependent upon loading)   | 2 x 10 <sup>6</sup>  |                       |   |
| <b>Operating data</b>   | <b>see Page 47</b>   |                       |   |
| <b>Weight</b>   | 0.2 kg   |                       |   |

## UE 10-4 XT and 11-4 DX Series

### Order reference list for UE 10-4 XT

| Type    | Output |    | Connections          |                     | Supply voltage<br>24 V AC/DC | Order No. |
|---------|--------|----|----------------------|---------------------|------------------------------|-----------|
|         |        |    | Screw type terminals | Removable terminals |                              |           |
| UE 10 - | 4      | XT | 2                    |                     | D2                           | 6 024 919 |
| UE 10 - | 4      | XT |                      | 3                   | D2                           | 6 024 920 |

### Order reference list for UE 11-4 DX (with off-delayed outputs)

| Typ     | Output |    | Connections          |                     | Supply voltage<br>24 V DC | Delay in<br>in secs. | Order No. |
|---------|--------|----|----------------------|---------------------|---------------------------|----------------------|-----------|
|         |        |    | Screw type terminals | Removable terminals |                           |                      |           |
| UE 11 - | 4      | DX | 2                    |                     | D3                        | 0.5                  | 6 024 921 |
| UE 11 - | 4      | DX | 2                    |                     | D3                        | 1                    | 6 024 922 |
| UE 11 - | 4      | DX | 2                    |                     | D3                        | 2                    | 6 024 923 |
| UE 11 - | 4      | DX | 2                    |                     | D3                        | 3                    | 6 024 924 |
| UE 11 - | 4      | DX |                      | 3                   | D3                        | 0.5                  | 6 024 925 |
| UE 11 - | 4      | DX |                      | 3                   | D3                        | 1                    | 6 024 926 |
| UE 11 - | 4      | DX |                      | 3                   | D3                        | 2                    | 6 024 927 |
| UE 11 - | 4      | DX |                      | 3                   | D3                        | 3                    | 6 024 928 |

# UE 23-2 MF Safety Relay

## Manual or Automatic Reset

### Application

The UE 23-2 MF Safety Relay serves as a monitoring module for:

- Emergency Stops (EN 418): for single- or dual-channel use
- Safety Switches (EN 1088): for single- or dual-channel use, e. g. on movable guards

### Features

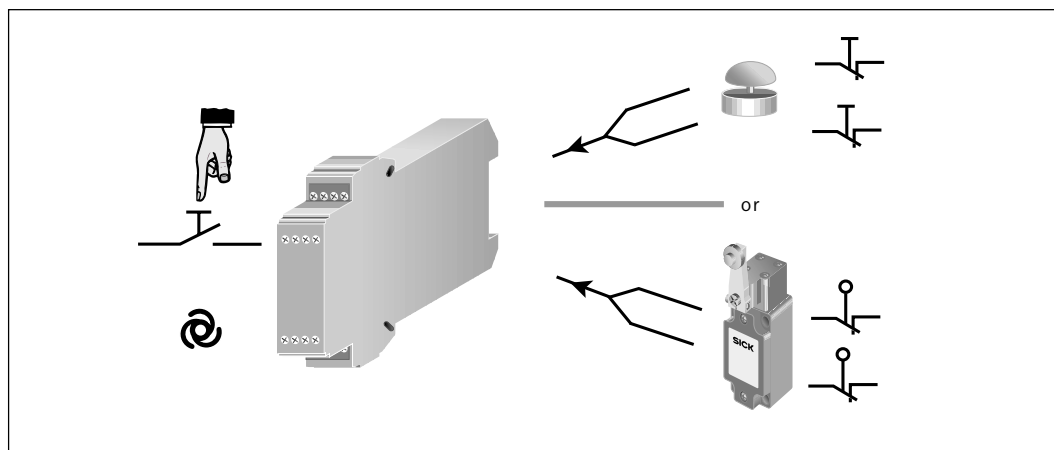
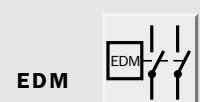
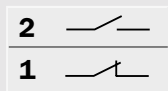
- Single-channel control
- Outputs: 2 normally open contacts, 1 normally closed contact
- 2 LEDs: supply voltage, relays K 1, K 2
- Manual Reset
- Automatic Reset
- Increase in the number of outputs by way of the expansion units UE 10-4 XT, UE 11-4 DX
- External device monitoring (EDM)
- Protection Class 2 to EN 50 178
- "D" Housing (see Page 5), width: 22.5 mm

### See Page 53 for sample wiring diagram

<sup>1)</sup> The wires for the input and output signals shall be routed outside the control cabinet according to the safety category to be used



EN 954-1 Up to Category 4 <sup>1)</sup>



## Function

After applying the supply voltage (LED SUPPLY illuminates), the normally open contacts remain in the open state. If the connected sensor is not activated (i.e. the input circuits are closed), then the normally open contacts close immediately in Automatic Reset (LED "K 1, K 2" illuminate). In the case of Manual Reset, this only occurs after pressing the Reset button.

### External device monitoring (EDM)

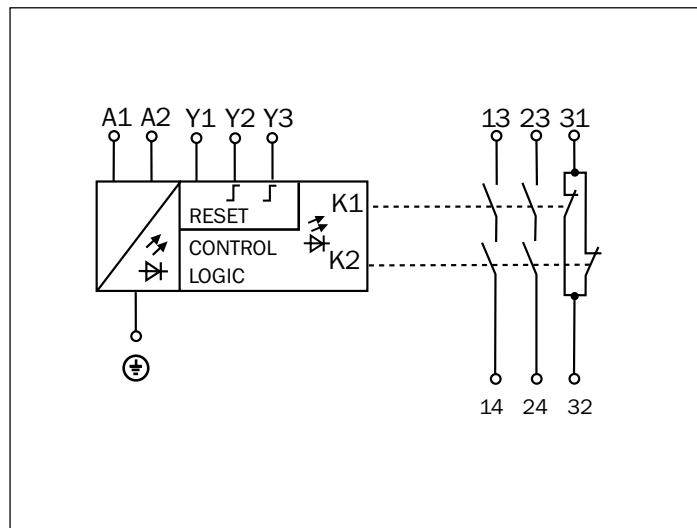
The unit can take over the function of external device monitoring. The contactor monitoring system monitors the external relays through their normally closed contacts.

### Manual Reset

For Manual resetting a pushbutton must be connected to terminals Y 1 and Y 3. This Reset is monitored.

### Automatic Reset

For Automatic resetting, Y 1 - Y 2 must be linked.



Internal Circuitry UE 23-2 MF

Technical Data UE 23-2 MF

|   | min.   | typ.         | max.                |
|---|--|--------------|---------------------|
| <b>General System Data</b>  |  |              |                     |
| Protection Class 2 according to EN 50 178                         | between supply circuit / control circuit / output circuits and between the output circuits mutually  |              |                     |
| Safety Category: EN 954-1   |  |              | 4 <sup>1)</sup>     |
| Stop Category: EN 60 204  | 0  |              |                     |
| <b>Supply voltage/Input circuit V<sub>s</sub> (A 1 - A 2)</b>     |  |              |                     |
| UE 23-2 MF 2 D2   | 20.4 V DC  | 24 V DC      | 26.4 V DC           |
| UE 23-2 MF 2 A4   | 98 V AC  | 115/120 V AC | 132 V AC            |
| UE 23-2 MF 2 A3   | 196 V AC   | 230 V AC     | 253 V AC            |
| Power consumption   |  |              |                     |
| AC  |  |              | 2.7 VA              |
| DC  |  |              | 1.6 W               |
| Residual ripple in DC mode (within the limits of V <sub>s</sub> ) |  |              | 2.4 V <sub>PP</sub> |
| Nominal frequency in AC mode                                      | 50 Hz  |              | 60 Hz               |
| <b>Control voltage (Y 1 - Y 2 - Y 3)</b>                          |  |              |                     |
| Control voltage   |  |              | 40 V DC             |
| Control current   |  |              | 200 mA              |
| Fuse  | PTC resistor   |              |                     |
| Reset time  |  |              |                     |
| Manual (Y 3)  |  |              | 70 ms               |
| Automatic (Y 2)   |  |              | 600 ms              |
| Galvanic separation (only on AC units)                            | yes  |              |                     |
| <b>Output circuits (13 - 14, 23 - 24, 31 - 32)</b>                |  |              |                     |
| Response time (K 1 / K 2)   |  | 30 ms        | 80 ms               |
| <b>Relay contacts</b>   |  |              |                     |
|   | 2 Normally open contacts (NO), safety relevant<br>1 Normally closed contact (NC), not safety relevant  |              |                     |
| Contact type  | positively guided  |              |                     |
| Contact material  | Silver alloy; gold-plated  |              |                     |
| Load capacity of the contacts                                     |  |              |                     |
| Switching voltage   | 10 V AC/DC   |              | 230 V AC / 30 V DC  |
| Switching current   | 10 mA  |              | 6 A                 |
| Total current across all contacts                                 |  |              | 12 A                |
| Category to EN 60 947-5-1   | AC-15 Ue 230 V AC, I <sub>e</sub> 4 A (360 c/h)<br>AC-15 Ue 230 V AC, I <sub>e</sub> 3 A (3600 c/h)<br>DC-13 Ue 24 V DC, I <sub>e</sub> 4 A (360 c/h)<br>DC-13 Ue 24 V DC, I <sub>e</sub> 2,5 A (3600 c/h) |              |                     |
| Permitted switching frequency                                     |  |              | 3600 c/h            |
| Service life, mechanical (switching cycles)                       | 1 x 10 <sup>7</sup>  |              |                     |
| Service life, electrical (dependent upon loading)                 | 2 x 10 <sup>6</sup>  |              |                     |
| <b>Operating data</b>   | <b>see Page 47</b>   |              |                     |
| <b>Weight</b>   | 270 g  |              |                     |

<sup>1)</sup> The wires for the input and output signals shall be routed outside the control cabinet according to the safety category to be used

## Order reference list for UE 23-2 MF

| Type   | Outputs |    | Connections<br>Screw type terminals | Electrical supply |                |          | Part No.  |
|--------|---------|----|-------------------------------------|-------------------|----------------|----------|-----------|
|        |         |    |                                     | 24 V DC           | 115 - 120 V AC | 230 V AC |           |
| UE 23- | 2       | MF | 2                                   | D3                |                |          | 6 026 146 |
| UE 23- | 2       | MF | 2                                   |                   | A4             |          | 6 026 147 |
| UE 23- | 2       | MF | 2                                   |                   |                | A3       | 6 026 148 |

# UE 42-2 HD Safety Relay for two-hand operation Automatic Start

## Application

The UE 42-2 HD safety relay serves as a monitoring module for:

- Two-hand controls with Type III C requirements to EN 574 and to EN 954-1, Category 4
- Two-hand pushbuttons, each with 1 normally open / 1 normally closed contact combinations
- Safety Switches (EN 1088)

## Features

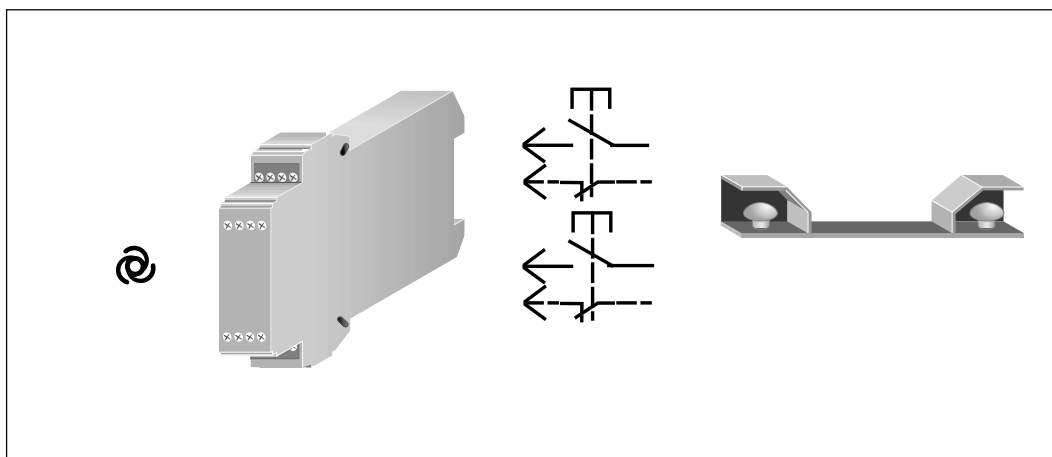
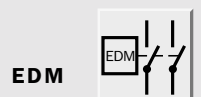
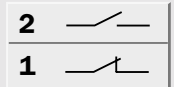
- Dual-channel control
- Outputs: 2 normally open contacts, 1 normally closed contact
- 3 LEDs for supply voltage, relay K 1 and relay K 2
- Automatic Start
- Increase in the number of outputs by way of the expansion unit UE 10-4 XT
- External device monitoring (EDM)
- Available with removable terminals (key coded)
- "A" Housing (see Page 4), width: 22.5 mm

See Page 54 for sample wiring diagrams



EN 954-1  
EN 574

Category 4  
Type III C

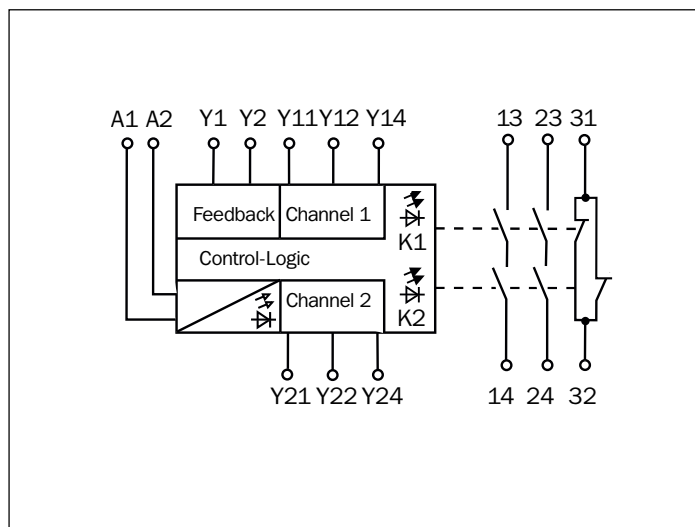


## Function

The UE 42-2 HD unit corresponds to EN 574 Type III C. A prerequisite for the release of the outputs is that the two inputs (e. g. two-hand pushbuttons) are actuated within 0.5 sec.

After applying the supply voltage to the terminals A 1 - A 2 the LED SUPPLY illuminates to indicate that electrical power is present. Pressing the two-hand pushbuttons S 1 and S 2 at the same time (see Page 53 – *Sample wiring diagrams*) closes the two normally open contacts. Releasing even one of the buttons will cause the circuits to adopt the open circuit status.

A renewed attempt to initiate starting is only possible if both Start buttons are set to their nominal start position (for two-hand pushbuttons units: if both have been released) and the normally closed contact is closed.



Internal Circuitry UE 42-2 HD

### External device monitoring (EDM)

The UE 42-2 HD can take over the function of external device monitoring. The normally closed contacts of the external relays are switched in series, connected to the terminals Y 1 - Y 2.

### Automatic start

The UE 42-2 HD has an Automatic start facility.

### Monitoring of simultaneous activation

The pressing of the Start buttons at the same time is monitored. Only when both Start buttons are activated within 0.5 sec do normally open contacts close and the normally closed contact opens.

The UE 42-2 HD **2** unit has screw type terminals.

The UE 42-2 HD **3** unit has removable terminals.

Technical Data UE 42-2 HD

|   | min.  | typ.       | max.                |
|---|---|------------|---------------------|
| <b>General System Data</b>                                  |   |            |                     |
| Supply voltage to A 1 / A 2                                 |   |            |                     |
| Electrical output circuit > 25 V AC / 60 V DC               | PELV  |            |                     |
| Electrical output circuit < 25 V AC / 60 V DC               | PELV or SELV  |            |                     |
| Safety Category: EN 954-1                                   |   |            | 4                   |
| Supply voltage $V_s$ (A 1 / A 2)                            | 20.4 V AC/DC  | 24 V AC/DC | 26.4 V AC/DC        |
| Power consumption   |   |            |                     |
| AC  |   |            | 2.7 VA              |
| DC  |   |            | 1.5 W               |
| Residual ripple in DC mode<br>(within the limits of $V_s$ ) |   |            | 2.4 V <sub>pp</sub> |
| Nominal frequency in AC mode                                | 50 Hz   |            | 60 Hz               |
| <b>Control voltage (Y 11 - Y 21)</b>                        |   |            |                     |
| Control voltage   |   | 24 V DC    |                     |
| Control current   |   | 60 mA      |                     |
| Short-circuit current between Y 11 and A 2                  |   |            | 1000 mA             |
| Fuse  | PTC resistor  |            |                     |
| Galvanic separation between A 1 / A 2 and Y 11 / Y 21       | no  |            |                     |
| <b>Input circuits (Y 12 - Y 14 and Y 22 - Y 23)</b>         |   |            |                     |
| Input current   |   | 60 mA      |                     |
| Reset time  |   |            | 40 ms               |
| Activation time tolerance between the two Start buttons     |   |            | 500 ms              |
| Minimum switch-off time                                     | 250 ms  |            |                     |
| Line resistance at the input circuit                        |   |            | < 70 Ohm            |
| Switch-on time (upon applying the supply voltage)           | 250 ms  |            |                     |
| <b>Output circuits (13 - 14, 23 - 24, 31 - 32)</b>          |   |            |                     |
| Response time (K 1 / K 2)                                   |   |            | 50 ms               |
| <b>Relay contacts</b>                                       | 2 Normally open contacts (NO), safety relevant<br>1 Normally closed contact (NC), not safety relevant   |            |                     |
| Contact type  | positively guided   |            |                     |
| Contact material  | Silver alloy; gold-plated   |            |                     |
| Load capacity of contacts                                   |   |            |                     |
| Switching voltage   | 10 V AC/DC  |            | 230 V AC / 30 V DC  |
| Switching current   | 10 mA   |            | 6 A                 |
| Total current across all contacts                           |   |            | 12 A                |
| Application Category to EN 60 947-5-1                       | AC-15 Ue 230 V AC, I <sub>e</sub> 4 A (360 c/h)<br>AC-15 Ue 230 V AC, I <sub>e</sub> 3 A (3600 c/h)<br>DC-13 Ue 24 V DC, I <sub>e</sub> 4 A (360 c/h)<br>DC-13 Ue 24 V DC, I <sub>e</sub> 2.5 A (3600c/h) |            |                     |
| Permitted switching frequency                               |   |            | 3600 c/h            |
| Service life, mechanical (switching cycles)                 | 1 x 10 <sup>7</sup>   |            |                     |
| Service life, electrical (dependent upon loading)           | 2 x 10 <sup>6</sup>   |            |                     |
| <b>Operating data</b>                                       | <b>see Page 47</b>  |            |                     |
| <b>Weight</b>   | 0.2 kg  |            |                     |

### Order reference list for UE 42-2 HD

| Type   | Outputs |    | Connections          |                     | Electrical supply<br>24 V AC/DC | Part No.  |
|--------|---------|----|----------------------|---------------------|---------------------------------|-----------|
|        |         |    | Screw type terminals | Removable terminals |                                 |           |
| UE 42- | 2       | HD | 2                    |                     | D2                              | 6 024 878 |
| UE 42- | 2       | HD |                      | 3                   | D2                              | 6 024 881 |

# UE 43-2 MF Safety Relay

## Manual or Automatic Reset

### Application

The UE 43-2 MF Safety Relay serves as a monitoring module for:

- Emergency Stops (to EN 418): for single- or dual-channel system use
- Safety Switches (to EN 1088): for single- or dual-channel system use, e. g. movable guards
- Control systems to EN 954-1 (Category 4)

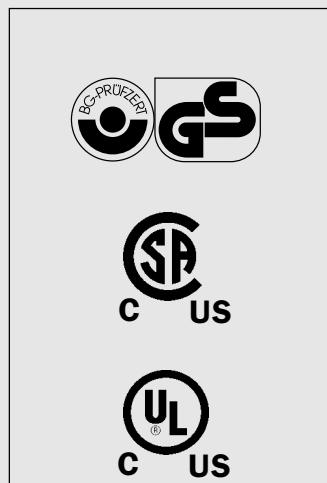
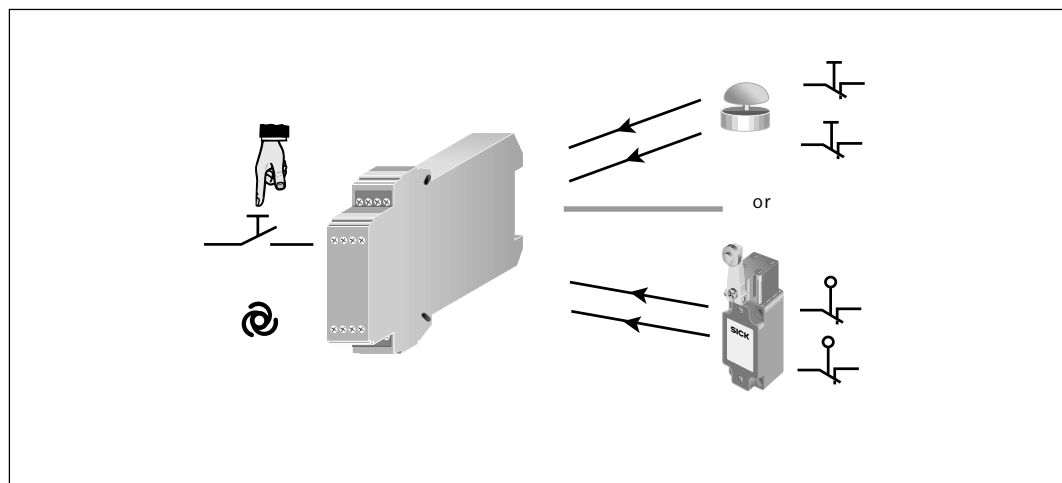
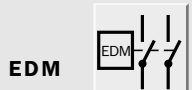
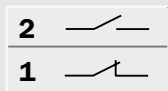
### Features

- Single- or dual-channel control
- Cross circuit detection
- Outputs: 2 normally open contacts, 1 normally closed contacts
- 3 LEDs: for supply voltage, relays K 1 and K 2
- Manual Reset
- Automatic Reset
- Increase in the number of outputs by way of the expansion units UE 10-4 XT, UE 11-4 DX
- External device monitoring (EDM)
- Available with removable terminals (key coded)
- "A" Housing (see Page 4), width: 22.5 mm

See Page 55 for sample wiring diagram



EN 954-1      Category 4



## Function

After applying the supply voltage (LED SUPPLY illuminates), the normally open contacts remain in the opened state. If the connected sensor is not activated (i.e. the input circuits are closed), then the normally open contacts close immediately in Automatic Reset (LED „K 1, K 2“ illuminate). In the case of Manual Reset, this only occurs after pressing and releasing the Reset button. Activation of the sensor (opening of one or both input circuits) effects the opening of the normally open outputs.

### External device monitoring (EDM)

The UE 43-2 MF unit can take over the function of external device monitoring. The contactor monitoring system monitors the external relays by means of their normally closed contacts.

### Manual Reset

For Manual resetting a pushbutton must be connected to terminals S 33 - S 34. Reset is monitored.

### Automatic Reset

For Automatic resetting, S 12 - S 35 must be linked.

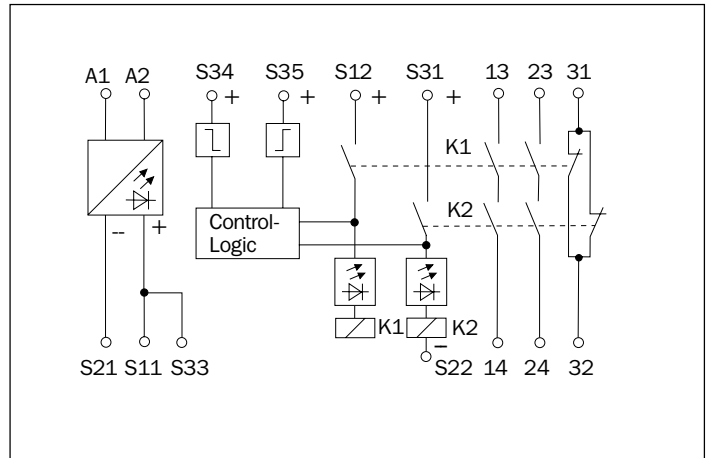
### Cross circuit detection

Cross circuit is detected on dual-channel wired systems if these are wired with opposing polarity.

### Monitoring of synchronisation

Only if input 2 closes by no later than 0.5 sec after input 1 do the output circuits close. If input 2 closes before input 1, the monitoring of synchronisation will not be effected, and the output circuits will close. This monitoring only takes place in Automatic Reset.

The UE 43-2 MF **2** units have screw type terminals.  
The UE 43-2 MF **3** units have removable terminals.



Internal Circuitry UE 43-2 MF

## Technical Data UE 43-2 MF

|   | min.   | typ.       | max.                              |
|---|--|------------|-----------------------------------|
| <b>General System Data</b>  |  |            |                                   |
| Supply voltage to A 1 / A 2<br>Electrical output circuit > 25 V AC / 60 V DC<br>Electrical output circuit < 25 V AC / 60 V DC | PELV<br>PELV or SELV   |            |                                   |
| Safety Category: EN 954-1   |  |            | 4                                 |
| Stop Category: EN 60 204  | 0  |            |                                   |
| Supply voltage $V_s$ (A 1 / A 2)  | 20.4 V AC/DC   | 24 V AC/DC | 26.4 V AC/DC                      |
| Power consumption<br>AC<br>DC   |  |            | 4.6 VA<br>2.1 W                   |
| Residual ripple in DC mode<br>(within the limits of $V_s$ )   |  |            | 2.4 V <sub>pp</sub>               |
| Nominal frequency in AC mode  | 50 Hz  |            | 60 Hz                             |
| <b>Control voltage S 33 / S 11 und S 21</b>   |  |            |                                   |
| Control voltage   | 17.4 V DC  | 22 V DC    |                                   |
| Control current   | 40 mA  |            | 100 mA                            |
| Short-circuit current between S 33 / S 11 and S 21  |  |            | 2000 mA                           |
| Fuse  | PTC resistor   |            |                                   |
| Reaction time by cross connection   |  |            | 3 s                               |
| Activation time upon detection of cross connection  |  |            | 3 s                               |
| Galvanic separation between A 1 / A 2 and S 21, S 11, S 33  | no   |            |                                   |
| <b>Input circuits (S 12, S 31, S 22, S 34, S 35)</b>  |  |            |                                   |
| Input current S 12 und S 31 / S 22  |  | 40 mA      | 100 mA                            |
| Input current S 34 / S 35   |  | 5 mA       | 50 mA                             |
| Reset time<br>Manual (S 34)<br>Automatic (S 35)   | 200 ms   |            | 40 ms<br>500 ms                   |
| Activation time of Reset button   | 50 ms  |            |                                   |
| Line resistance at the input circuit  |  |            | 35 Ohm                            |
| Synchronisation time  |  |            | 500 ms                            |
| <b>Output circuits (13 - 14, 23 - 24, 31 - 32)</b>  |  |            |                                   |
| Response time (K 1 / K 2)   |  |            | 25 ms                             |
| Minimum time outputs will stay off  |  |            | 40 ms                             |
| <b>Relay contacts</b>   | 2 Normally open contacts (NO), safety relevant<br>1 Normally closed contact (NC), not safety relevant  |            |                                   |
| Contact type  | positively guided  |            |                                   |
| Contact material  | Silver alloy; gold-plated  |            |                                   |
| Load capacity of contacts<br>Switching voltage<br>Switching current<br>Total current across all contacts                      | 10 V AC/DC<br>10 mA  |            | 230 V AC / 30 V DC<br>6 A<br>12 A |
| Application Category to EN 60 947-5-1   | AC-15 Ue 230 V AC, I <sub>e</sub> 4 A (360 c/h)<br>AC-15 Ue 230 V AC, I <sub>e</sub> 3 A (3600 c/h)<br>DC-13 Ue 24 V DC, I <sub>e</sub> 4 A (360 c/h)<br>DC-13 Ue 24 V DC, I <sub>e</sub> 2.5 A (3600 c/h) |            |                                   |
| Permitted switching frequency   |  |            | 3600 c/h                          |
| Service life, mechanical (switching cycles)   | 1 x 10 <sup>7</sup>  |            |                                   |
| Service life, electrical (dependent upon loading)   | 1 x 10 <sup>5</sup>  |            |                                   |
| <b>Operating data</b>   | <b>see Page 47</b>   |            |                                   |
| <b>Weight</b>   | 0.2 kg   |            |                                   |

### Order reference list for UE 43- 2 MF

| Type   | Outputs | Connections          |                     | Electrical supply<br>24 V AC/DC | Part No.  |           |
|--------|---------|----------------------|---------------------|---------------------------------|-----------|-----------|
|        |         | Screw type terminals | Removable terminals |                                 |           |           |
| UE 43- | 2       | MF                   | 2                   | D2                              | 6 024 893 |           |
| UE 43- | 2       | MF                   |                     | 3                               | D2        | 6 024 894 |

# UE 43-3 MF Safety Relay

## Manual or Automatic Reset

### Application

The UE 43-3 MF Safety Relay serves as a monitoring module for:

- Emergency Stops (to EN 418): for single- or dual-channel system use
- Safety Switches (to EN 1088): for single- or dual-channel system use, e. g. on movable guards
- Control systems to EN 954-1 (Category 4)

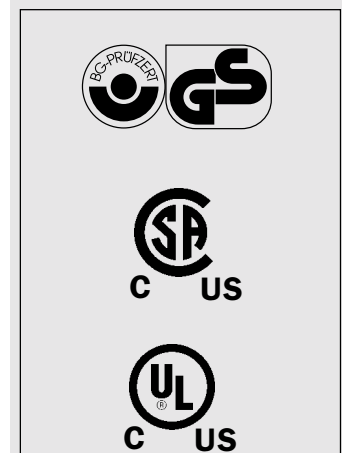
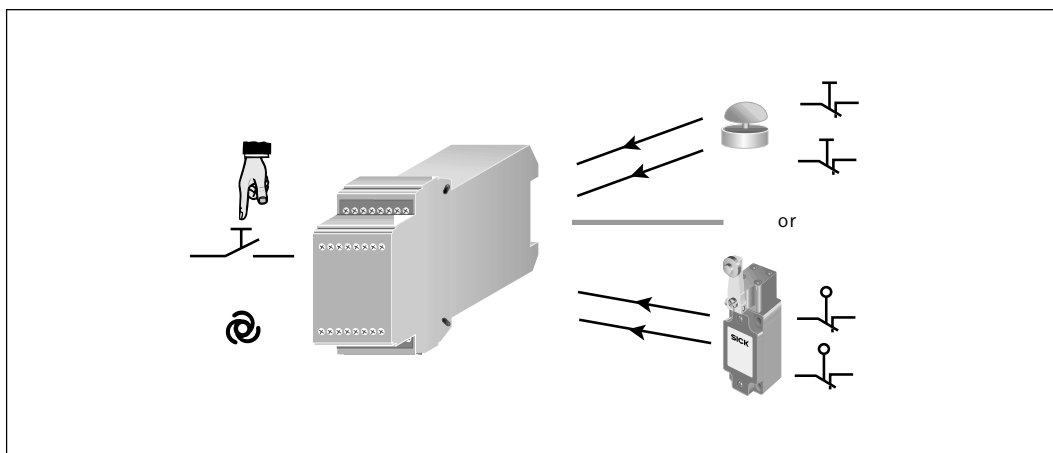
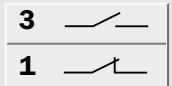
### Features

- Single- or dual-channel control
- Cross circuit detection
- Outputs: 3 normally open contacts, 1 normally closed contact
- 3 LEDs: for supply voltage, relays K 2 and K 3
- Manual Reset
- Automatic Reset
- Increase in the number of outputs by way of the expansion units UE 10-4 XT, UE 11-4 DX
- External device monitoring (EDM)
- "B" Housing (see Page 5), width: 45 mm

See Pages 56 and 57 for sample wiring diagrams



EN 954-1 Category 4



## Function

After applying the supply voltage (LED SUPPLY illuminates) the normally open contacts remain open. If the connected sensor is not activated (i. e. the input circuits are closed), the normally open contacts close immediately in Automatic Reset (LED K 2 and K 3 illuminate). In the case of Manual resetting, this is only effected upon pressing and releasing the Reset button.

Activation of the sensor (opening of one or both input circuits) effects the opening of the normally open contacts (LED K 2 and K 3 off).

### External device monitoring (EDM)

The UE 43-3 MF unit can take over the external device monitoring. The contactor monitoring system monitors the external relays by way of their normally closed contacts.

### Manual Reset

For Manual resetting a pushbutton must be connected to terminals Y 12 and Y 13. Reset is monitored.

### Automatic Reset

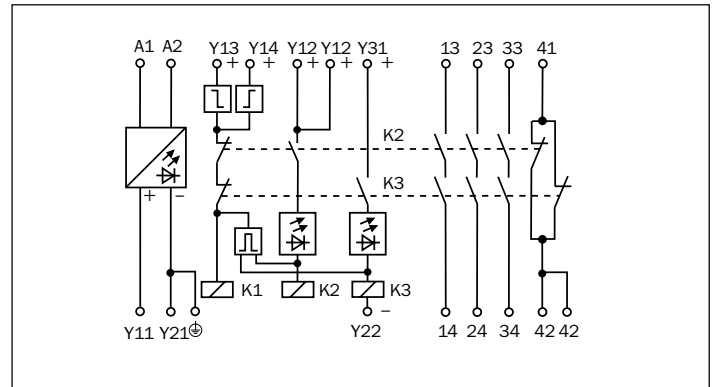
For Automatic resetting Y 12 - Y 14 must be linked.

### Cross circuit detection

Cross circuit is detected on dual-channel wired systems, if these are wired with opposing polarity.

### Monitoring of synchronisation

Only if input 2 closes by no later than 0.5 sec after input 1 do the output circuits close. If input 2 closes before input 1, the monitoring of synchronisation will not be effected, and the output circuits will close. This monitoring only takes place in Automatic Reset.



Internal Circuitry UE 43-3 MF

Technical Data UE 43-3 MF

|   | min.  | typ.   | max.   |
|---|---|--|--|
| <b>General System Data</b>  |   |  |  |
| Supply voltage to A 1 / A 2 for DC Units<br>Electrical output circuit > 25 V AC / 60 V DC<br>Electrical output circuit < 25 V AC / 60 V DC<br>Voltage supply to A 1 / A 2 on AC units | PELV<br>PELV <b>or</b> SELV<br>Use of earth conductor terminal  |  |  |
| Safety Category: EN 954-1   |   |  | 4  |
| Stop Category: EN 60 204  | 0   |  |  |
| Supply voltage $V_s$<br>UE 43-3 MF 2 D3<br>UE 43-3 MF 2 A0<br>UE 43-3 MF 2 A1<br>UE 43-3 MF 2 A2<br>UE 43-3 MF 2 A3   | 20.4 V DC<br>20.4 V AC<br>97.75 V AC<br>102.0 V AC<br>195.5 V AC  | 24 V DC<br>24 V AC<br>115 V AC<br>120 V AC<br>230 V AC | 26.4 V DC<br>26.4 V AC<br>126.5 V AC<br>132.0 V AC<br>253.0 V AC |
| Power consumption<br>AC<br>DC   |   | 2.5 W / 3.2 VA<br>1.0 W                                |  |
| Residual ripple in DC mode<br>(within the limits of $V_s$ )   |   |  | 2.4 V <sub>pp</sub>  |
| Nominal frequency in AC mode  | 50 Hz   |  | 60 Hz  |
| <b>Control voltage Y 11 and Y 21</b>  |   |  |  |
| Control voltage   |   | 24 V DC  |  |
| Control current   |   | 40 mA  |  |
| Short circuit current between Y 11 and A 2  |   |  | 1000 mA  |
| Fuse<br>AC units<br>DC units  | short circuit resistant transformer<br>PTC resistor   |  |  |
| Reaction time by cross connection   |   |  | 3 s  |
| Galvanic separation between A 1/A 2 and Y 11 - Y 21 - PE  | only on AC units  |  |  |
| <b>Input circuits (Y 12 and Y 31 - Y 22)</b>  |   |  |  |
| Input current at Y 12 and Y 31  |   |  | 15 mA  |
| Input current at Y 13 and Y 14 (reset circuit)  |   |  | 40 mA  |
| Reset time<br>Manual (Y 13)<br>Automatic (Y 14)   |   | 150 ms<br>0.8 s  | 250 ms<br>1.2 s  |
| Synchronisation time  |   |  | 500 ms   |
| Line resistance at the input circuit  |   |  | < 70 Ohm   |
| Input time upon applying supply voltage   | 100 ms  |  |  |
| <b>Output circuits (13 - 14, 23 - 24, 33 - 34, 41 - 42)</b>   |   |  |  |
| Response time (K2/K3)   |   |  | 50 ms  |
| <b>Relay contacts</b>   | 3 Normally open contacts (NO), safety relevant<br>1 Normally closed contact (NC), not safety relevant   |  |  |
| Contact type  | positively guided   |  |  |
| Contact material  | Silver alloy; gold-plated   |  |  |
| Load capacity of contacts<br>Switching voltage<br>Switching current<br>Total current across all contacts  | 10 V AC/DC<br>10 mA   |  | 230 V AC / 30 V DC<br>6 A<br>18 A                                |
| Application Category to EN 60 947-5-1   | AC-15 Ue 230 V AC, I <sub>e</sub> 6 A (3600 c/h)<br>DC-13 Ue 24 V DC, I <sub>e</sub> 6 A (360 c/h)<br>DC-13 Ue 24 V DC, I <sub>e</sub> 3 A (3600 c/h) |  |  |
| Permitted switching frequency   |   |  | 3600 c/h   |
| Service life, mechanical (switching cycles)   | 1 x 10 <sup>7</sup>   |  |  |
| Service life, electrical (dependent upon loading)   | 2 x 10 <sup>6</sup>   |  |  |
| <b>Operating data</b>   | <b>see Page 47</b>  |  |  |
| <b>Weight</b><br>AC unit<br>DC unit   | 0.36 kg<br>0.30 kg  |  |  |

## Order reference list for UE 43-3 MF

| Type   | Outputs |    | Connections<br>Screw type terminals | Electrical supply |         |          |          |          | Part No.  |
|--------|---------|----|-------------------------------------|-------------------|---------|----------|----------|----------|-----------|
|        |         |    |                                     | 24 V DC           | 24 V AC | 115 V AC | 120 V AC | 230 V AC |           |
| UE 43- | 3       | MF | 2                                   | D3                |         |          |          |          | 6 024 897 |
| UE 43- | 3       | MF | 2                                   |                   | A0      |          |          |          | 6 024 898 |
| UE 43- | 3       | MF | 2                                   |                   |         | A1       |          |          | 6 024 899 |
| UE 43- | 3       | MF | 2                                   |                   |         |          | A2       |          | 6 024 900 |
| UE 43- | 3       | MF | 2                                   |                   |         |          |          | A3       | 6 024 901 |

# UE 43-6 MF Safety Relay

## Manual or Automatic Reset

### Application

The UE 43-6 MF Safety Relay serves as a monitoring module for:

- Emergency Stops (to EN 418): for single- or dual-channel system use
- Safety Switches (to EN 1088): for single- or dual-channel system use, e. g. on movable guards
- Control systems to EN 954-1 (Category 4)

### Features

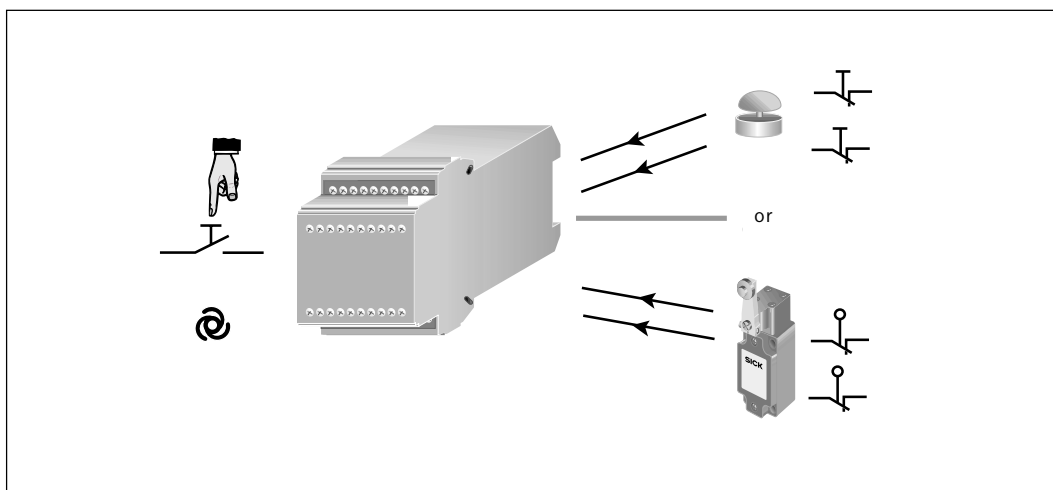
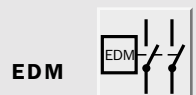
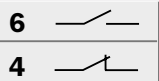
- Single- or dual-channel control
- Cross circuit detection
- Outputs: 6 normally open contacts, 4 normally closed contacts
- 6 LEDs: for supply voltage, CH 1, CH 2, relays K 1, K 2 and "K 3 RESET"
- Manual Reset
- Automatic Reset
- Increase in the number of outputs by way of the expansion units UE 10-4 XT, UE 11-4 DX
- External device monitoring (EDM)
- "C" Housing (see Page 5), width: 90 mm

See Page 58 for sample wiring diagram



Available as of 2004

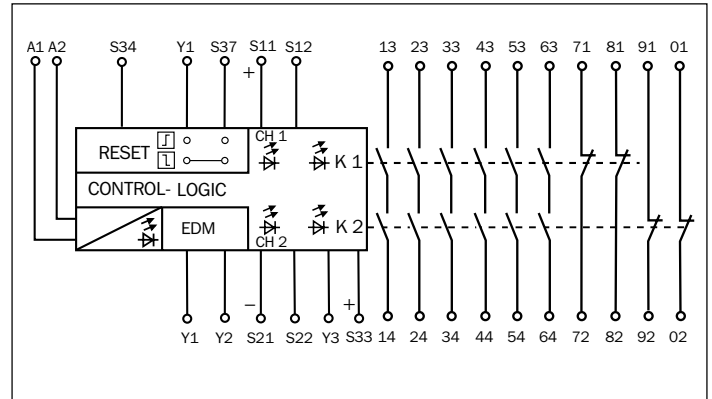
EN 954-1 Category 4



## Function

After applying the supply voltage (LED SUPPLY illuminates), the normally open contacts remain open. If the connected sensor is not activated, the LEDs CH 1 and CH 2 illuminate. In the case of Automatic resetting, the normally open contacts close immediately (LED K 1 and K 2 illuminate). With Manual resetting the normally open contacts only close upon pressing and releasing the Reset button.

The activation of the sensor (opening of one or both input circuits) effects the opening of the normally open contacts (LED K 1 and K 2 off).



Internal Circuitry UE 43-6 MF

### External device monitoring (EDM)

The UE 43-6 MF unit can take over the external device monitoring. The contactor monitoring system monitors the external relays by way of their normally closed contacts.

### Manual Reset

For Manual Reset a pushbutton is to be connected to the terminals S 33 - S 34 and a link connected between S 12 and Y 3 and between Y 1 and S 37. This Reset is monitored.

### Automatic Reset

For Automatic Reset S 12 - S 34 and Y 3 - S 33 must be linked.

### Cross circuit detection

Cross circuit is detected on dual-channel wired systems, if these are wired with opposing polarity.

### Monitoring of synchronisation

Only if input 2 closes by no later than 0.5 sec after input 1 do the output circuits close. If input 2 closes before input 1, the monitoring of synchronisation will not be effected, and the output circuits will close. This monitoring only takes place in Automatic Reset.

**Technical Data UE 43-6 MF (provisional)**

|  | min.   | typ.                            | max.                                  |
|--|--|---------------------------------|---------------------------------------|
| <b>General System Data</b>   |  |                                 |                                       |
| Supply voltage to A 1 / A 2 for DC units<br>Electrical output circuit > 25 V AC / 60 V DC<br>Electrical output circuit < 25 V AC / 60 V DC | PELV<br>PELV or SELV   |                                 |                                       |
| Voltage supply to A 1 / A 2 for AC unit  | Use earth conductor terminal   |                                 |                                       |
| Safety Category: EN 954-1  |  |                                 | 4                                     |
| Stop Category: EN 60 204   | 0  |                                 |                                       |
| Supply voltage $V_s$ (A 1 / A 2)<br>UE 43-6 MF 2 D 3<br>UE 43-6 MF 2 A 2<br>UE 43-6 MF 2 A 3   | 20.4 V DC<br>102.0 V AC<br>195.5 V AC  | 24 V DC<br>120 V AC<br>230 V AC | 26.4 V DC<br>132.0 V AC<br>253.0 V AC |
| Power consumption<br>AC<br>DC  |  | 4.2 W / 4.5 VA<br>2.4 W         |                                       |
| Residual ripple in DC mode<br>(within the limits of $V_r$ )  |  |                                 | 2.4 V <sub>pp</sub>                   |
| Nominal frequency in AC mode   | 50 Hz  |                                 | 60 Hz                                 |
| <b>Control voltage S 11 and S 21</b>   |  |                                 |                                       |
| Control voltage  |  | 24 V DC                         |                                       |
| Control current  |  | 40 mA                           |                                       |
| Short circuit current (between Y 11 and A 2)   |  |                                 | 1000 mA                               |
| Fuse<br>AC units<br>DC units   | short circuit resistant transformer<br>PTC resistor  |                                 |                                       |
| Reaction time by cross connection (DC unit)  |  |                                 | 3 s                                   |
| Galvanic separation<br>between A 1 - 2 and Y 11 - Y 21 - PE  | only on AC units   |                                 |                                       |
| <b>Input circuits (S 12 - S 22 and Y 3 - S 22)</b>   |  |                                 |                                       |
| Input current  |  |                                 | 40 mA                                 |
| Reset time<br>Manual<br>Automatic  |  |                                 | 350 ms<br>500 ms                      |
| Synchronisation time   |  |                                 | 500 ms                                |
| Line resistance at the input circuit   |  |                                 | 85 Ohm                                |
| Switch-on time upon applying the supply voltage (AC units)   | 100 ms   |                                 |                                       |
| <b>Output circuits<br/>(13 - 14, 23 - 24, 33 - 34, 43 - 44, 53 - 54, 63 - 64, 71 - 72, 81 - 82, 91 - 92, 01 - 02)</b>                      |  |                                 |                                       |
| Response time (K 1 / K 2)  |  |                                 | 60 ms                                 |
| <b>Relay contacts</b>  | 6 Normally open contacts (NO), safety relevant<br>4 Normally closed contacts (NC), not safety relevant |                                 |                                       |
| Contact type   | positively guided  |                                 |                                       |
| Contact material   | Silver alloy; gold-plated  |                                 |                                       |
| Load capacity of contacts<br>Switching voltage<br>Switching current<br>Total current across all contacts                                   | 10 V AC/DC<br>10 mA  |                                 | 230 V AC / 30 V DC<br>6 A<br>24 A     |
| Application Category to EN 60 947-5-1  | AC-15 Ue 230 V AC, I <sub>e</sub> 3 A (3600 c/h)<br>DC-13 Ue 24 V DC, I <sub>e</sub> 2 A (3600 c/h)    |                                 |                                       |
| Permitted switching frequency  |  |                                 | 3600 c/h                              |
| Service life, mechanical (switching cycles)  | 1 × 10 <sup>7</sup>  |                                 |                                       |
| Service life, electrical (dependent upon loading)  | 2 × 10 <sup>6</sup>  |                                 |                                       |
| <b>Operating data</b>  | <b>see Page 47</b>   |                                 |                                       |
| <b>Weight</b>  | 0.8 kg   |                                 |                                       |

## Order reference list for UE 43-6 MF

| Type   | Outputs |    | Connections<br>Screw type terminals | Electrical supply |          |          | Part No.  |
|--------|---------|----|-------------------------------------|-------------------|----------|----------|-----------|
|        |         |    |                                     | 24 V DC           | 120 V AC | 230 V AC |           |
| UE 43- | 6       | MF | 2                                   | D3                |          |          | 6 024 902 |
| UE 43- | 6       | MF | 2                                   |                   | A2       |          | 6 024 905 |
| UE 43- | 6       | MF | 2                                   |                   |          | A3       | 6 024 906 |

# UE 44-3 SL Safety Relay with additional on-delay

## Application

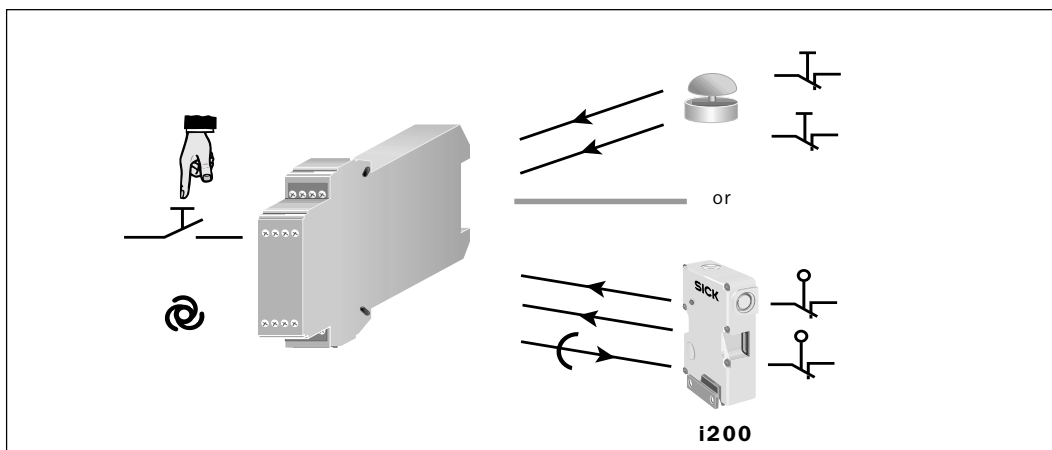
The UE 44-3 SL Safety Relay serves as a monitoring module for:

- Emergency Stops (to EN 418): for single- or dual-channel system use
- Safety Switches (to EN 1088): for single- or dual-channel system use, e. g. on movable guards
- Safety Switches with mechanical locking (e. g. i200)
- Control systems to EN 954-1 (Category 4)

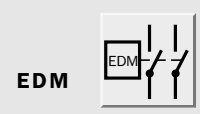
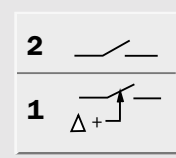
## Features

- Single- or dual-channel control
- Cross circuit detection
- Outputs: 2 normally open contacts, 1 normally open contact with on-delay, adjustable from 0.15 ... 3 sec or 1.5 ... 30 sec
- 3 LEDs: for supply voltage, relays K 1 / K 2 (without delay) and relays K 3 / K 4 (on-delayed)
- Manual Reset
- Automatic Reset
- Increase in the number of outputs by way of the expansion units UE 10-4 XT, UE 11-4 DX
- External device monitoring (EDM)
- Available with removable terminals (key coded)
- "A" Housing (see Page 4), width: 22.5 mm

## See Page 59 for sample wiring diagram



EN 954-1      Category 4



## Function

After applying the supply voltage (LED SUPPLY illuminates), the normally open contacts (13 - 14 / 23 - 24) remain open. After completion of the on-delay set on the relay, the delay circuit (37 - 38) closes, and the LED K 3 / K 4 illuminates. If the connected sensor is not activated (i. e. the input circuits are closed), the normally open contacts (13 - 14 / 23 - 24) close immediately during Automatic Reset, the LED K 1 / K 2 illuminates, and the delay circuit (37 - 38) opens (LED K 3 / K 4 off). In the case of Manual Reset, this only occurs after pressing and releasing the Reset button.

The activation of the sensor (opening of one or both input circuits) effects the opening of both normally open contacts (13 - 14 / 23 - 24), with LEDs K 1 / K 2 being off, and a time delayed closing of the third circuit (37 - 38), with LED K 3 / K 4 illuminating.

### External device monitoring (EDM)

The unit can take over external device monitoring. The contactor monitoring system monitors the external relays by way of their normally closed contacts.

### Manual Reset

For Manual resetting, a pushbutton is to be connected between 24 V DC supply and terminal S 34. This Reset is monitored. For applications with mechanical locking safety switches, only channel 2 must be closed during Manual Reset (see page 59)

### Automatic Reset

For Automatic resetting S 12 - S 35 must be linked. For applications with mechanical locking safety switches, only channel 1 must be closed during Automatic Reset.

### Cross circuit detection

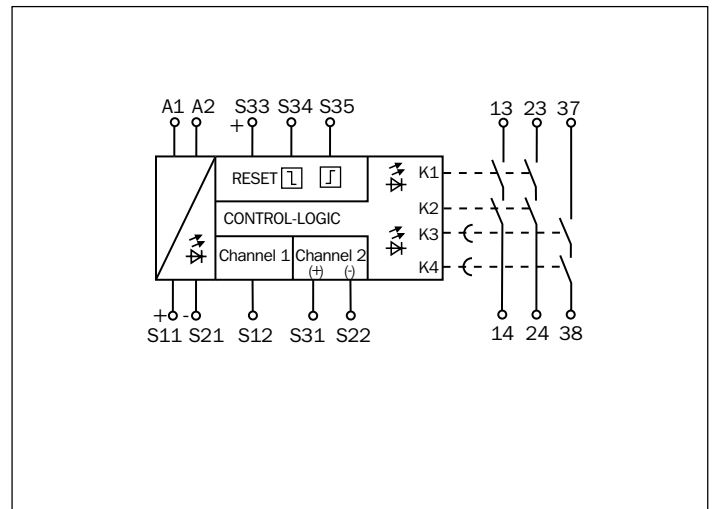
Cross circuit is detected on dual-channel wired systems, if these are wired with opposing polarity.

### Monitoring of synchronisation

Only if input 2 closes by no later than 0.5 sec after input 1 do the output circuits close. If input 2 closes before input 1, the monitoring of synchronisation will not be effected, and the output circuits will close. This monitoring only takes place in Automatic Reset.

The UE 44-3 SL **2** unit has screw type terminals.

The UE 44-3 SL **3** unit has removable terminals.



Internal Circuitry UE 44-3 SL

Technical Data UE 44-3 SL

|   | min.  | typ.    | max.                |
|---|---|---------|---------------------|
| <b>General System Data</b>                                  |   |         |                     |
| Supply voltage to A 1 / A 2 for DC units                    |   |         |                     |
| Electrical output circuit > 25 V AC / 60 V DC               | PELV  |         |                     |
| Electrical output circuit < 25 V AC / 60 V DC               | PELV or SELV  |         |                     |
| Safety Category: EN 954-1                                   |   |         | 4                   |
| Stop Category: EN 60 204                                    | 0   |         |                     |
| Supply voltage $V_s$  | 20.4 V DC   | 24 V DC | 26.4 V DC           |
| Power consumption   |   | 1.8 W   |                     |
| Residual ripple in DC mode<br>(within the limits of $V_s$ ) |   |         | 2.4 V <sub>PP</sub> |
| <b>Control voltage S 11 - S 33 und S 21</b>                 |   |         |                     |
| Control voltage   |   | 22 V DC |                     |
| Control current   |   | 60 mA   |                     |
| Electrical short circuit between S 11 and A 2               |   |         | 2200 mA             |
| Fuse  | PTC resistor  |         |                     |
| Reaction time by cross connection                           |   |         | 2 s                 |
| Galvanic separation<br>between A 1 / A 2 and S 11 - S 21    | no  |         |                     |
| <b>Input circuits (S 12 and S 31)</b>                       |   |         |                     |
| Input current at S 12 and S 31                              |   | 25 mA   | 100 mA              |
| Input current at S 34 / S 35 (reset circuit)                |   | 40 mA   | 50 mA               |
| Reset time  |   |         |                     |
| Manual (S 34)   |   |         | 30 ms               |
| Automatic (S 35)  |   |         | 750 ms              |
| Synchronisation time  |   |         | 500 ms              |
| Activation time of Reset button                             | 250 ms  |         |                     |
| Line resistance at the input circuit                        |   |         | < 85 Ohm            |
| <b>Output circuits (13 - 14, 23 - 24, 37 - 38)</b>          |   |         |                     |
| Response time (K 1 / K 2)                                   |   |         | 25 ms               |
| On-Delay time (K 3 / K 4)                                   |   |         |                     |
| UE 44-3 SL xD3 <b>3</b>                                     | 0.15 s  |         | 3 s                 |
| UE 44-3 SL xD3 <b>30</b>                                    | 1.5 s   |         | 30 s                |
| <b>Relay contacts</b>                                       |   |         |                     |
|   | 2 Normally open contacts (NO), Safety Cat. 4  |         |                     |
|   | 1 Normally open contact (NO), on-delayed, Safety Cat. 3   |         |                     |
| Contact type  | positively guided   |         |                     |
| Contact material  | Silver alloy; gold-plated   |         |                     |
| Load capacity of contacts                                   |   |         |                     |
| Switching voltage   | 10 V AC/DC  |         | 230 V AC / 30 V DC  |
| Switching current   | 10 mA   |         | 6 A                 |
| Total current across all contacts                           |   |         | 12 A                |
| Application Category to EN 60 947-5-1                       | AC-15 Ue 230 V AC, I <sub>e</sub> 4 A (3600 c/h)<br>DC-13 Ue 24 V DC, I <sub>e</sub> 5 A (360 c/h)<br>DC-13 Ue 24 V DC, I <sub>e</sub> 3 A (3600 c/h) |         |                     |
| Permitted switching frequency                               |   |         | 3600 c/h            |
| Service life, mechanical (switching cycles)                 | 5 x 10 <sup>6</sup>   |         |                     |
| Service life, electrical (dependent upon loading)           | 2 x 10 <sup>6</sup>   |         |                     |
| <b>Operating data</b>                                       |   |         |                     |
|   | see Page 47   |         |                     |
| <b>Weight</b>   |   |         |                     |
|   | 0.2 kg  |         |                     |

### Order reference list for UE 44-3 SL

| Type   | Outputs | Connections          |                     | Electrical supply<br>24 V DC | Delay in sec. | Part No.  |
|--------|---------|----------------------|---------------------|------------------------------|---------------|-----------|
|        |         | Screw type terminals | Removable terminals |                              |               |           |
| UE 44- | 3       | SL                   | 2                   | D3                           | 3             | 6 024 907 |
| UE 44- | 3       | SL                   |                     | D3                           | 3             | 6 024 908 |
| UE 44- | 3       | SL                   | 2                   | D3                           | 30            | 6 024 909 |
| UE 44- | 3       | SL                   |                     | D3                           | 30            | 6 024 910 |

# UE 45-3 S1 Safety Relay with additional off-delay

## Application

The UE 45-3 S1 serves as a monitoring module for:

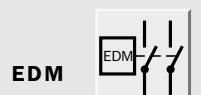
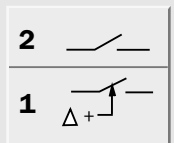
- Emergency Stops (to EN 418): for single- or dual-channel system use
- Safety Switches (to EN 1088): for single- or dual-channel system use, e. g. on movable guards
- Control systems to EN 954-1 (Category 4)

## Features

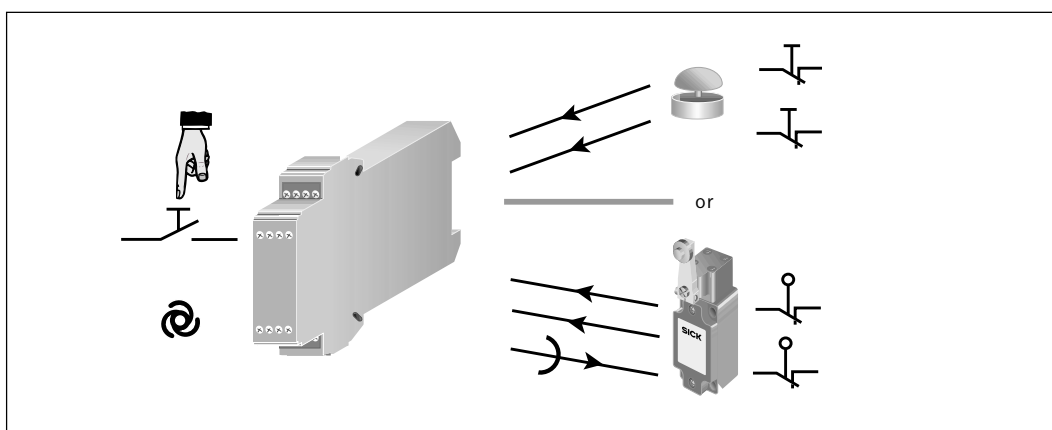
- Single- or dual-channel control
- Cross circuit detection
- Outputs: 2 normally open contacts, 1 normally open contact with off-delay, adjustable from 0.15 ... 3 sec or 1.5 ... 30 sec
- 3 LEDs: for supply voltage, relays K 1 / K 2 (without delay) and relays K 3 / K 4 (off-delayed)
- Manual Reset
- Automatic Reset
- Increase in the number of outputs by way of the expansion units UE 10-4 XT, UE 11-4 DX
- External device monitoring (EDM)
- Available with removable terminals (key coded)
- "A" Housing (see Page 4), width: 22.5 mm



EN 954-1 Category 4  
EN 60 204-1 Stop Category 0/1



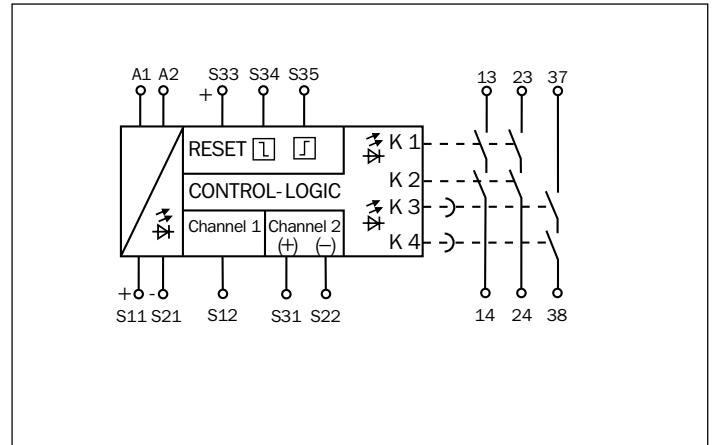
See Page 60 for sample wiring diagram



## Function

After applying the supply voltage (LED SUPPLY illuminates), the normally open contacts remain open. If the connected sensor is not activated (i. e. the input circuits are closed), the normally open contacts close immediately during Automatic resetting, LED K 1 / K 2 and K 3 / K 4 illuminate. In the case of Manual resetting, this only occurs after pressing and releasing the Reset button.

The activation of the sensor (opening of one or both input circuits) effects the opening of both normally open contacts (13 - 14 / 23 - 24) immediately, and a time delayed closing of the third circuit (37 - 38), with LED K 1 / K 2 immediately going off and K 3 / K 4 going off later.



Internal Circuitry UE 45-3 S1

### External device monitoring (EDM)

The unit can take over external device monitoring. The contactor monitoring system monitors the external relays by way of their normally closed contacts.

### Manual Reset

For Manual resetting, a pushbutton must be connected to terminals S 33 - S 34. This Reset is monitored.

### Automatic Reset

For Automatic resetting S 33 - S 35 must be linked.

### Cross circuit detection

Cross circuit is detected on dual-channel wired systems, if these are wired with opposing polarity.

### Monitoring of synchronisation

Only if input 2 closes by no later than 0.5 sec after input 1 do the output circuits close. If input 2 closes before input 1, the monitoring of synchronisation will not be effected, and the output circuits will close. This monitoring only takes place in Automatic Reset.

The UE 45-3 S1 **2** unit has screw type terminals.  
The UE 45-3 S1 **3** unit has removable terminals.

**Technical Data UE 45-3 S1**

|   | min.  | typ.    | max.                              |
|---|---|---------|-----------------------------------|
| <b>General System Data</b>  |   |         |                                   |
| Supply voltage to A 1 / A 2<br>Electrical output circuit > 25 V AC / 60 V DC<br>Electrical output circuit < 25 V AC / 60 V DC | PELV<br>PELV <b>or</b> SELV   |         |                                   |
| Safety Category: EN 954-1   |   |         | 4                                 |
| Stop Category: EN 60 204  | 0/1   |         |                                   |
| Supply voltage $V_s$  | 20.4 V DC   | 24 V DC | 26.4 V DC                         |
| Power consumption   |   | 2.6 W   |                                   |
| Residual ripple in DC mode<br>(within the limits of $V_s$ )   |   |         | 2.4 V <sub>pp</sub>               |
| <b>Control voltage S 11 / S 33 and S 21</b>   |   |         |                                   |
| Control voltage   |   | 24 V DC |                                   |
| Control current   |   | 60 mA   |                                   |
| Electrical short circuit between S 11 and A 2   |   |         | 2200 mA                           |
| Fuse  | PTC resistor  |         |                                   |
| Reaction time by cross connection   |   |         | 2 s                               |
| Galvanic separation<br>between A 1 / A 2 and S 11 / S 21  | no  |         |                                   |
| <b>Input circuits (S 12 and S 31)</b>   |   |         |                                   |
| Input current at S 12 and S 31  |   | 25 mA   | 100 mA                            |
| Input current at S 34 / S 35 (reset circuit)  |   | 40 mA   | 50 mA                             |
| Reset time<br>Manual (S 34)<br>Automatic (S 35)   |   |         | 30 ms<br>600 ms                   |
| Synchronisation time  |   |         | 500 ms                            |
| Activation time for Reset button  | 200 ms  |         |                                   |
| Line resistance at the input circuit  |   |         | < 85 Ohm                          |
| <b>Output circuits (13 - 14, 23 - 24, 37 - 38)</b>  |   |         |                                   |
| Response time (K 1 / K 2)   |   |         | 25 ms                             |
| Off-delay time (K 3 / K 4)<br>UE 45-3 S1 xD3 <b>3</b><br>UE 45-3 S1 xD3 <b>30</b>   | 0.15 s<br>1.5 s   |         | 3 s<br>30 s                       |
| <b>Relay contacts</b>   | 2 Normally open contacts (NO), Safety Cat. 4<br>1 Normally open contact (NO), off-delayed, Safety Cat. 3  |         |                                   |
| Contact type  | positively guided   |         |                                   |
| Contact material  | Silver alloy; gold-plated   |         |                                   |
| Load capacity of contacts<br>Switching voltage<br>Switching current<br>Total current across all contacts                      | 10 V AC/DC<br>10 mA   |         | 230 V AC / 30 V DC<br>6 A<br>12 A |
| Application Category to EN 60 947-5-1   | AC-15 Ue 230 V AC, I <sub>e</sub> 4 A (3600 c/h)<br>DC-13 Ue 24 V DC, I <sub>e</sub> 5 A (360 c/h)<br>DC-13 Ue 24 V DC, I <sub>e</sub> 3 A (3600 c/h) |         |                                   |
| Permitted switching frequency   |   |         | 3600 c/h                          |
| Service life, mechanical (switching cycles)   | 5 x 10 <sup>6</sup>   |         |                                   |
| Service life, electrical (dependent upon loading)   | 2 x 10 <sup>6</sup>   |         |                                   |
| <b>Operating data</b>   | <b>see Page 47</b>  |         |                                   |
| <b>Weight</b>   | 0.2 kg  |         |                                   |

### Order reference list for UE 45-3 S1

| Type   | Outputs |    | Connections          |                     | Electrical supply<br>24 V DC | Delay in sec. | Part No.  |
|--------|---------|----|----------------------|---------------------|------------------------------|---------------|-----------|
|        |         |    | Screw type terminals | Removable terminals |                              |               |           |
| UE 45- | 3       | S1 | 2                    |                     | D3                           | 3             | 6 024 911 |
| UE 45- | 3       | S1 |                      | 3                   | D3                           | 3             | 6 024 912 |
| UE 45- | 3       | S1 | 2                    |                     | D3                           | 30            | 6 024 913 |
| UE 45- | 3       | S1 |                      | 3                   | D3                           | 30            | 6 024 914 |

# UE 48-2 OS and UE 48-3 OS Safety Relay

## Automatic or Manual Reset

### Application

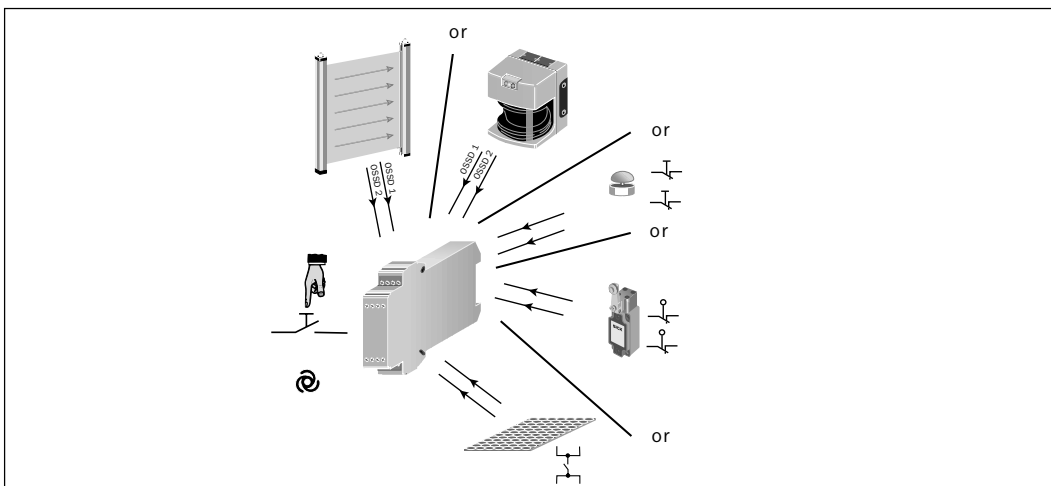
The UE 48 Safety Relays serve as a monitoring module for:

- Emergency Stops (to EN 418): for single- or dual-channel system use
- Safety Switches (to EN 1088): for single- or dual-channel system use, e. g. on movable guards
- Safety Mats in accordance with DIN EN 1760 using 4-wire technology
- Electro-sensitive protective equipment (ESPE) employing monitored semiconductor outputs (OSSD), such as FGS, PLS, C 2000, M 2000, C 4000, S 3000, LSI, MSL
- Control systems to EN 954-1 (Category 4)

### Features

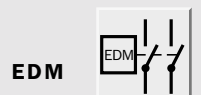
- Single- or dual-channel control
- Cross circuit detection
- Outputs  
 UE 48-2 OS: 2 normally open contacts, 1 normally closed contact  
 UE 48-3 OS: 3 normally open contacts
- 3 LEDs: for supply voltage, relays K 1 and K 2
- Manual or Automatic Reset
- Increase in the number of outputs by way of the expansion units  
 UE 10-4 XT, UE 11-4 DX
- External device monitoring (EDM)
- Available with removable terminals (key coded)
- "A" Housing (See Page 4), width: 22.5 mm

### See Pages 61 and 62 for sample wiring diagrams



**UE 48-3 OS available as of 2004**

EN 954-1 Category 4  
 EN 61 496 Types 2, 3, 4



## Function

After applying the supply voltage (LED SUPPLY illuminates), the normally open contacts remain open. If the connected sensor is not activated or the protective field of the connected electro-sensitive protective equipment (ESPE) is not broken (i. e. the input circuits are closed), then the normally open contacts close immediately in Automatic Reset, LED K 1 and K 2 illuminate. In the case of Manual resetting, this only occurs after pressing and releasing the Reset button.

The activation of the sensor or incursion into the protective field of the non-contact safety device (open state of one of the two input circuits) effects the opening of the normally open contacts (LED K 1 and K 2 off).

### External device monitoring (EDM)

The unit can take over external device monitoring. The contactor monitoring system monitors the external relays by way of their normally closed contacts.

### Manual Reset

For Manual resetting, a pushbutton must be connected to terminals S 33 - S 34. This Reset is monitored.

### Automatic Reset

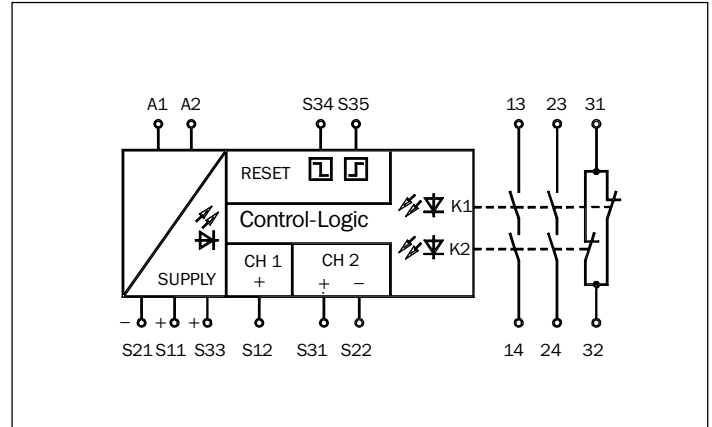
For ESPE's: S 33 - S 35 must be linked; for applications with potential free contacts on the input circuit S 12 - S 35 must be linked.

### Cross circuit detection

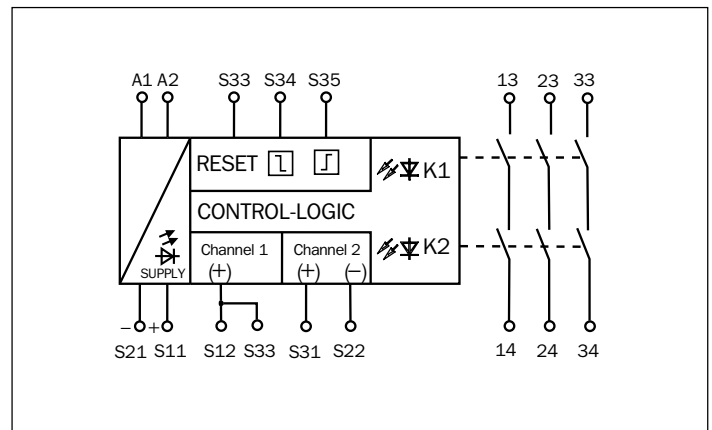
Cross circuit is detected on dual-channel wired systems, if these are wired with opposing polarity.

The UE 48-2 OS **2** and UE 48-3 OS **2** units have screw type terminals.

The UE 48-2 OS **3** and UE 48-3 OS **3** units have removable terminals.



Internal Circuitry UE 48-2 OS



Internal Circuitry UE 48-3 OS

Technical Data UE 48

|   | min.   | typ.       | max.                              |
|---|--|------------|-----------------------------------|
| <b>General System Data</b>  |  |            |                                   |
| Supply voltage to A 1 / A 2<br>Electrical output circuit > 25 V AC / 60 V DC<br>Electrical output circuit < 25 V AC / 60 V DC | PELV<br>PELV or SELV   |            |                                   |
| Safety Category: EN 954-1   |  |            | 4                                 |
| Stop Category: EN 60 204  | 0  |            |                                   |
| Supply voltage $V_s$ (A 1 / A 2)  | 20.4 V AC/DC   | 24 V AC/DC | 26.4 V AC/DC                      |
| Power consumption<br>AC Mode<br>DC Mode   |  |            | 4.6 VA<br>2.1 W                   |
| Residual ripple in DC mode<br>(within the limits of $V_s$ )   |  |            | 2.4 V <sub>pp</sub>               |
| Nominal frequency in AC mode  | 50 Hz  |            | 60 Hz                             |
| <b>Control voltage S 33 / S 11 and S 21</b>   |  |            |                                   |
| Control voltage   | 17.4 V DC  | 22 V DC    |                                   |
| Control current   | 40 mA  |            | 100 mA                            |
| Electrical short circuit between S 33 / S 11 and S 21)  |  |            | 300 mA                            |
| Fuse  | Electronic Fuse  |            |                                   |
| Reaction time by cross connection   |  |            | 50 ms                             |
| Switch-on time after cross connection detection   |  |            | 50 ms                             |
| Galvanic separation<br>between A 1 / A 2 and S 21, S 11, S 33   | no   |            |                                   |
| <b>Input circuits (S 12, S 31, S 22, S 34, S 35)</b>  |  |            |                                   |
| Input voltage (S 12 and S 31)<br>HIGH<br>LOW  | 17.4 V DC<br>-3 V DC   |            | 26.4 V DC<br>+5 V DC              |
| Input current at S 12 and S 31 / S 22   |  | 40 mA      | 100 mA                            |
| Input current at S 34 / S 35  |  | 5 mA       | 50 mA                             |
| Reset time<br>Manual (S 33 / S 34)<br>Automatic (ESPE: S 33 / S 35; potential free: S 12 / S 35)                              |  |            | 40 ms<br>80 ms                    |
| Activation time for Reset button  | 50 ms  |            |                                   |
| Minimum switch-off time / minimum switch-on time  | 7 ms   |            |                                   |
| Permitted test pulse time / Test frequency  |  |            | 1000 $\mu$ s / 10 s <sup>-1</sup> |
| Line resistance at the input circuit  |  |            | 35 Ohm                            |
| Synchronisation time  | 70 ms  |            |                                   |
| <b>Output circuits (13 - 14, 23 - 24, 31 - 32 / 33 - 34)</b>  |  |            |                                   |
| Response time (K 1 / K 2)   |  |            | 25 ms                             |
| Minimum switch-off time   | 70 ms  |            | 130 ms                            |
| <b>Relay contacts UE 48-2 OS</b>  | 2 Normally open contacts (NO), safety relevant<br>1 Normally closed contact (NC), not safety relevant  |            |                                   |
| <b>Relay contacts UE 48-3 OS</b>  | 3 Normally open contacts (NO), safety relevant   |            |                                   |
| Contact type  | positively guided  |            |                                   |
| Contact material  | Silver alloy; gold-plated  |            |                                   |
| Load capacity of contacts<br>Switching voltage<br>Switching current<br>Total current across all contacts                      | 10 V AC/DC<br>10 mA  |            | 230 V AC / 30 V DC<br>6 A<br>12 A |
| Application Category to EN 60 947-5-1   | AC-15 Ue 230 V AC, I <sub>e</sub> 4 A (360 c/h)<br>AC-15 Ue 230 V AC, I <sub>e</sub> 3 A (3600 c/h)<br>DC-13 Ue 24 V DC, I <sub>e</sub> 4 A (360 c/h)<br>DC-13 Ue 24 V DC, I <sub>e</sub> 2.5 A (3600 c/h) |            |                                   |
| Permitted switching frequency   |  |            | 3600 c/h                          |
| Service life, mechanical (switching cycles)   | 1 x 10 <sup>7</sup>  |            |                                   |
| Service life, electrical (dependent upon loading)   | 2 x 10 <sup>6</sup>  |            |                                   |
| <b>Operating data</b>   | <b>see Page 47</b>   |            |                                   |
| <b>Weight</b>   | 0.2 kg   |            |                                   |

## Order reference list for UE 48

| Type    | Outputs |    | Connections          |                     | Electrical supply<br>24 V AC/DC | Part No.  |
|---------|---------|----|----------------------|---------------------|---------------------------------|-----------|
|         |         |    | Screw type terminals | Removable terminals |                                 |           |
| UE 48 - | 2       | OS | 2                    |                     | D2                              | 6 024 915 |
| UE 48 - | 2       | OS |                      | 3                   | D2                              | 6 024 916 |
| UE 48 - | 3       | OS | 2                    |                     | D2                              | 6 025 089 |
| UE 48 - | 3       | OS |                      | 3                   | D2                              | 6 025 097 |

Common Technical Specifications

|   | min.                 | typ. | max.                 |
|---|----------------------|------|----------------------|
| Surge voltage rating (V <sub>Imp.</sub> )                                 |                      |      | 4 kV                 |
| Excess Voltage Category   |                      |      | III                  |
| Contamination rating of the unit (EN 50 178)                              |                      |      |                      |
| external  |                      |      | 3                    |
| internal  |                      |      | 2                    |
| Voltage rating  |                      |      | 300 V AC             |
| Test voltage V <sub>eff</sub> (50 Hz) EN 60 439-1                         |                      |      | 2.0 kV               |
| Protection type   |                      |      |                      |
| Housing   | IP 40                |      |                      |
| Terminals   | IP 20                |      |                      |
| Radio interference  | DIN EN 61 000-6-4    |      |                      |
| <b>UE 10-4 XT, UE 11-4 DX, UE 42-2 HD, UE 44-3 SL and UE 45-3 S1 only</b> | EN 60 947-1 02/99    |      |                      |
| Screening against interference  | DIN EN 61 000-6-2    |      |                      |
| <b>UE 10-4 XT, UE 11-4 DX, UE 42-2 HD, UE 44-3 SL and UE 45-3 S1 only</b> | EN 60 947-1 02/99    |      |                      |
| Ambient operating temp.   | -25 °C               |      | +55 °C               |
| Storage temperature   | -25 °C               |      | +75 °C               |
| Cross sections of electrical conductors                                   |                      |      |                      |
| single strand wire (2 x, identical cross section)                         | 0.14 mm <sup>2</sup> |      | 0.75 mm <sup>2</sup> |
| single strand wire (1 x)  | 0.14 mm <sup>2</sup> |      | 2.5 mm <sup>2</sup>  |
| fine stranded wire with terminal crimps (2 x, identical cross section)    | 0.25 mm <sup>2</sup> |      | 0.5 mm <sup>2</sup>  |
| fine stranded wire with terminal crimps (1 x)                             | 0.25 mm <sup>2</sup> |      | 2.5 mm <sup>2</sup>  |
| <b>UE 43-3 MF and UE 43-6 MF only</b>                                     |                      |      |                      |
| single strand wire (2 x, identical cross section)                         | 0.75 mm <sup>2</sup> |      | 2.5 mm <sup>2</sup>  |
| single strand wire (1 x)  | 0.75 mm <sup>2</sup> |      | 2.5 mm <sup>2</sup>  |
| fine stranded wire with terminal crimps (2 x, identical cross section)    | 0.5 mm <sup>2</sup>  |      | 1.5 mm <sup>2</sup>  |
| fine stranded wire with terminal crimps (1 x)                             | 0.5 mm <sup>2</sup>  |      | 1.5 mm <sup>2</sup>  |

### Glossary

|  |  |
|--|--|
| <b>Activation time of Reset button</b>                         | Time in which a Reset button must be pressed, in order to ensure the resetting of the safety relay.  |
| <b>Minimum switch-off time (Inputs)</b>                        | The minimum time the inputs need to stay off in order for the unit to recognise an off signal. Times under this value may not be recognised as an off signal.  |
| <b>Minimum switch-off time (Outputs)</b>                       | The unit specific minimum time the outputs must stay off. This insures that the internal relays can fall back to their rest state.   |
| <b>Minimum switch-on time</b>                                  | The minimum time the inputs need to be HIGH before a Restart can be enabled.   |
| <b>Monitoring of simultaneous activation (UE 42-2 HD only)</b> | The simultaneous pressing of the Start buttons is monitored, and is specified for two-hand control systems. Only when both safety input signals change their state within 0.5 sec will the output contacts be switched.  |
| <b>Off-delay time</b>  | Time by which the switching off of the output contacts is delayed. This time is either fixed or adjustable depending on module type.   |
| <b>On-delay time</b>   | Time by which the switching on of the output contacts is delayed. For safety relays having an on-delay, the time settings are adjustable.  |
| <b>Reset time</b>  | Time period between the activation of the Reset and when the output contacts switch on.<br>The time starts: <ul style="list-style-type: none"><li>- during Manual Reset with the release of the Reset button</li><li>- during Automatic Reset with the closing of the input circuits (e. g. closing of the door).</li></ul>                |
| <b>Response time</b>   | The time between the activation of the inputs (e. g. E Stop is pressed), and the switching off of the outputs.   |
| <b>Switch-on time</b>  | Time, which the safety device needs after applying the supply voltage in order to be ready for operation.  |
| <b>Synchronisation time</b>                                    | Switching of the input circuits within a fixed time span is monitored. Only if input 2 closes by no later than 0.5 sec after input 1 do the output circuits close. If input 2 closes before input 1, the monitoring of synchronisation will not take place, and the output circuits will close. This monitoring occurs in Automatic Reset. |

Application Overview

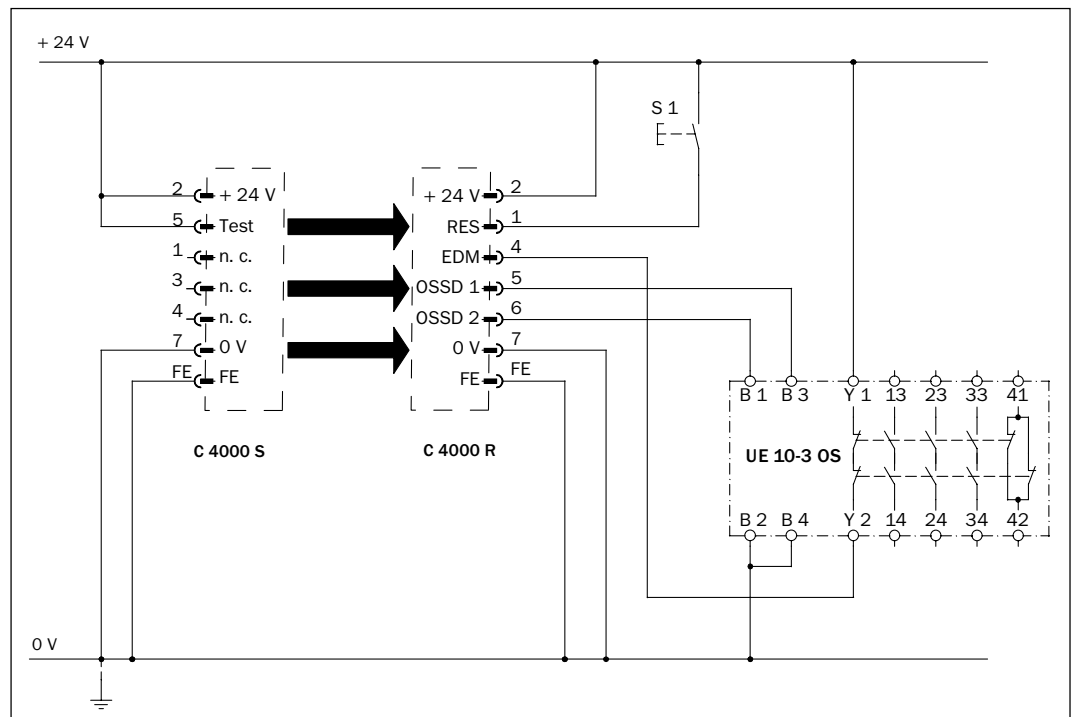
|                   | General notes               |               |                  | Applications            |                         |   |   |   | Outputs                     |                               |          |                   | Features                      |                             |                         |                 |                          | Housing width (mm) |   |                                    |
|-------------------|-----------------------------|---------------|------------------|-------------------------|-------------------------|---|---|---|-----------------------------|-------------------------------|----------|-------------------|-------------------------------|-----------------------------|-------------------------|-----------------|--------------------------|--------------------|---|------------------------------------|
|                   | Safety Category to EN 954-1 | Standard unit | Expansion module | Emergency Stop (EN 418) | Safety Switch (EN 1088) | Two-hand control systems (Typ III C / EN 574) | Safety mats (only available in 4-wire technology) | Electro-Sensitive Protective Equipment (ESPE) | Normally open contacts (NO) | Normally closed contacts (NC) | On-delay | Off-delay         | Single-channel control system | Dual-channel control system | Cross circuit detection | Automatic Reset | Manual Reset (monitored) |                    | Monitoring of simultaneous activation (0.5 s) | Synchronisation monitoring (0.5 s) |
| <b>UE 42-2 HD</b> | 4                           | ■             |                  |                         | ■                       | ■   |   |   | 2                           | 1                             |          |                   |                               | ■                           | ■                       |                 | ■                        |                    |   | 22.5                               |
| <b>UE 23-2 MF</b> | 4 <sup>1)</sup>             | ■             |                  | ■                       | ■                       |   |   |   | 2                           | 1                             |          |                   | ■                             |                             |                         | ■               | ■                        |                    |   | 22.5                               |
| <b>UE 43-2 MF</b> | 4                           | ■             |                  | ■                       | ■                       |   |   |   | 2                           | 1                             |          |                   | ■                             | ■                           | ■                       | ■               | ■                        |                    | ■   | 22.5                               |
| <b>UE 43-3 MF</b> | 4                           | ■             |                  | ■                       | ■                       |   |   |   | 3                           | 1                             |          |                   | ■                             | ■                           | ■                       | ■               | ■                        |                    | ■   | 45                                 |
| <b>UE 43-6 MF</b> | 4                           | ■             |                  | ■                       | ■                       |   |   |   | 6                           | 4                             |          |                   | ■                             | ■                           | ■                       | ■               | ■                        |                    | ■   | 90                                 |
| <b>UE 10-3 OS</b> | 2 <sup>2)</sup>             | ■             |                  |                         |                         |   |   | ■   | 3                           | 1                             |          |                   | ■                             | ■                           |                         |                 |                          |                    |   | 22.5                               |
| <b>UE 48-2 OS</b> | 4                           | ■             |                  | ■                       | ■                       |   | ■   | ■   | 2                           | 1                             |          |                   | ■                             | ■                           | ■                       | ■               | ■                        |                    |   | 22.5                               |
| <b>UE 48-3 OS</b> | 4                           | ■             |                  | ■                       | ■                       |   | ■   | ■   | 3                           | 0                             |          |                   | ■                             | ■                           | ■                       | ■               | ■                        |                    |   | 22.5                               |
| <b>UE 44-3 SL</b> | 4                           | ■             |                  | ■                       | ■                       |   |   |   | 2                           |                               | ■        |                   | ■                             | ■                           | ■                       | ■               | ■                        |                    | ■   | 22.5                               |
| <b>UE 45-3 S1</b> | 4                           | ■             |                  | ■                       | ■                       |   |   |   | 2                           |                               |          | ■                 | ■                             | ■                           | ■                       | ■               | ■                        |                    | ■   | 22.5                               |
| <b>UE 10-4 XT</b> | 3 <sup>3)</sup>             |               | ■                |                         |                         |   |   |   | 4                           | 2                             |          |                   |                               |                             |                         |                 |                          |                    |   | 22.5                               |
| <b>UE 11-4 DX</b> | 3 <sup>3)</sup>             |               | ■                |                         |                         |   |   |   |                             |                               |          | 4/2 <sup>4)</sup> |                               |                             |                         |                 |                          |                    |   | 22.5                               |

1) The wires for the input and output signals shall be routed outside the control cabinet according to the safety category to be used  
 2) Same as protective device  
 3) Same as the main unit  
 4) 4 normally open contacts / 2 normally closed contacts with off-delay function

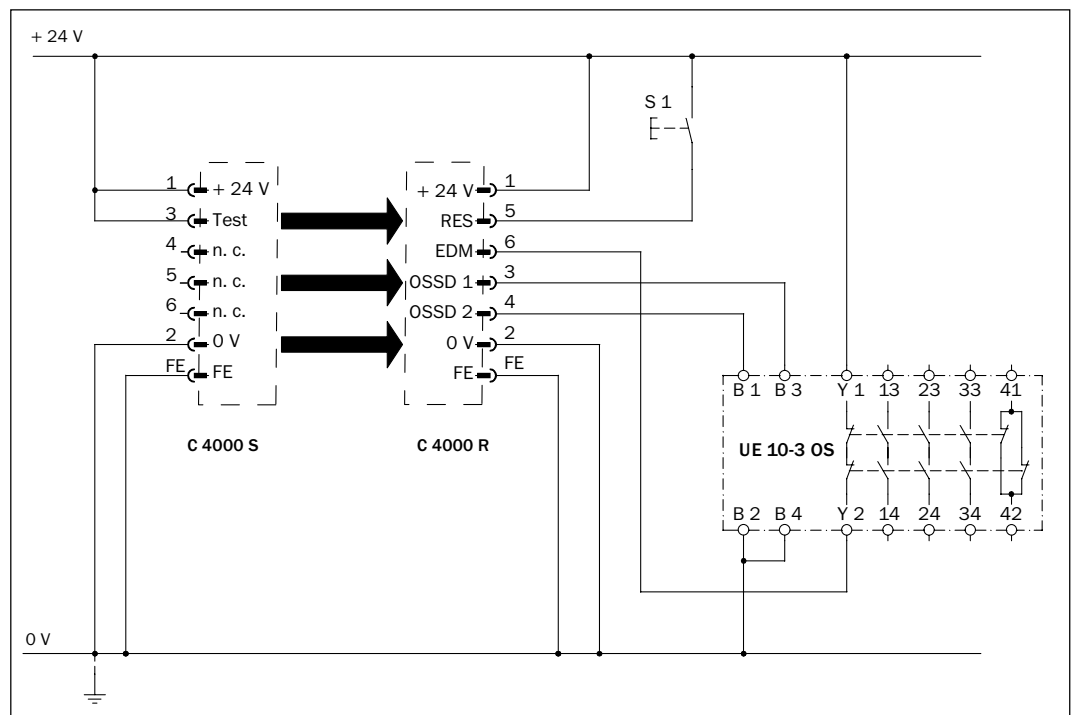
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Sample wiring diagrams UE 10-3 OS

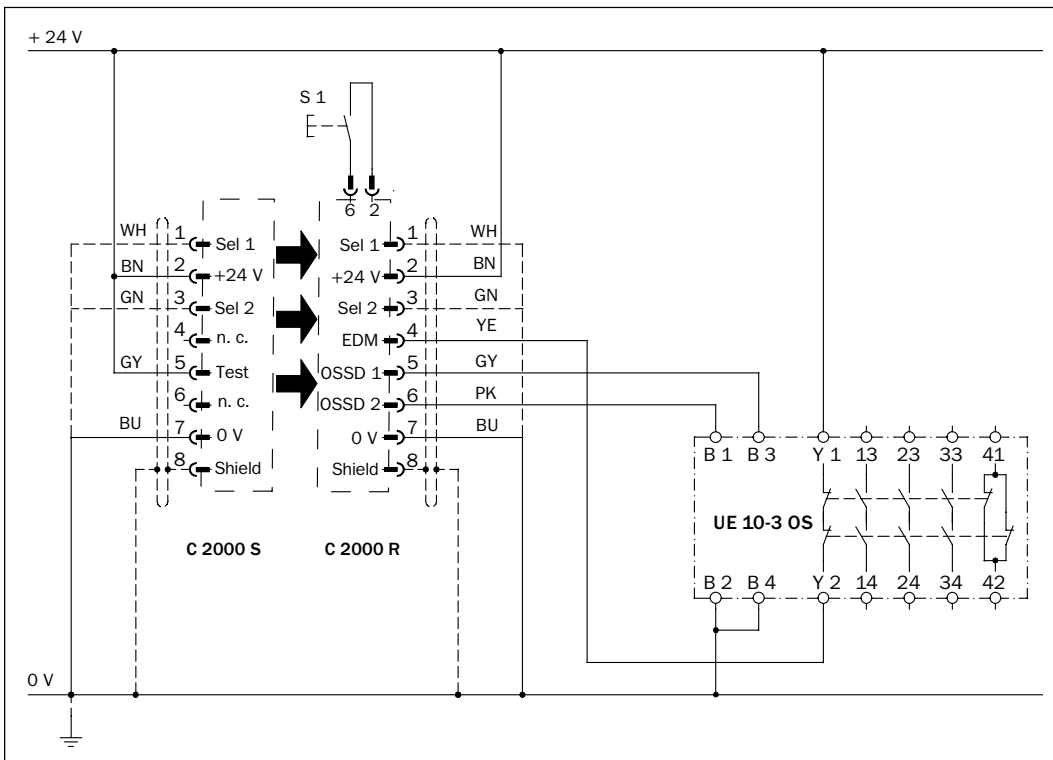


C 4000 Micro connected to UE 10-3 OS Safety Relay, with Manual Reset and external device monitoring (active)

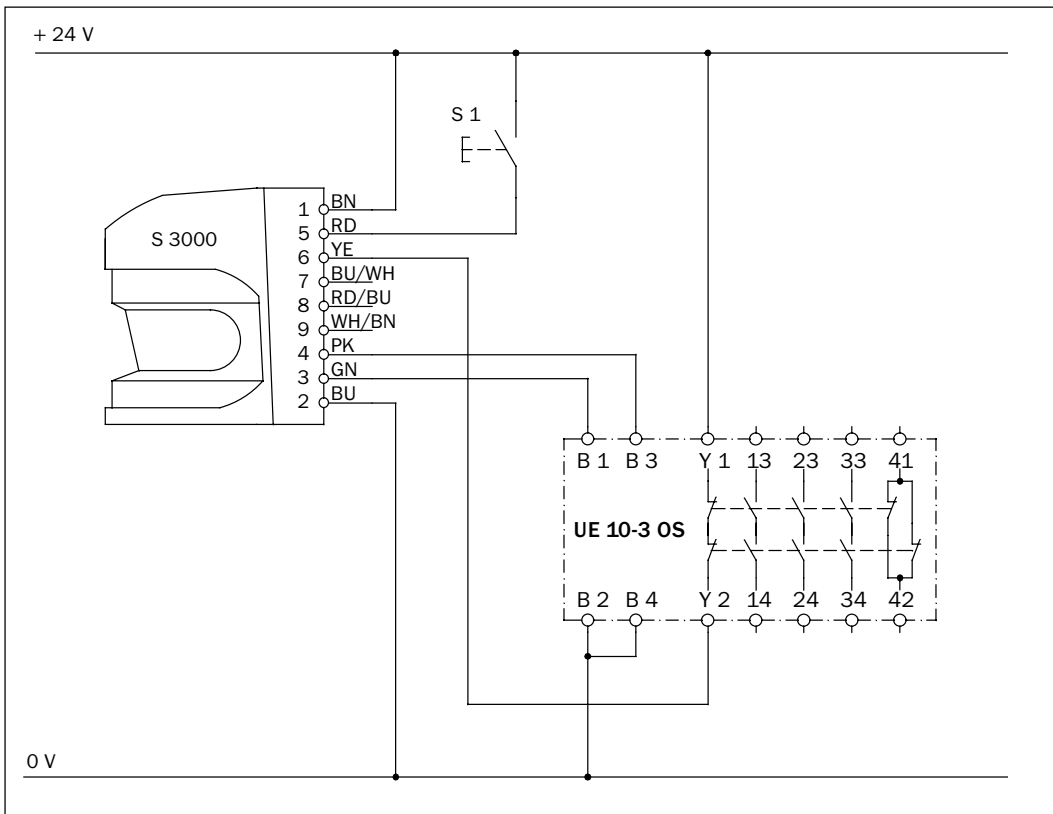


C 4000 Standard/Advanced connected to UE 10-3 OS Safety Relay, with Manual Reset and external device monitoring (active)

## Sample wiring diagrams UE 10-3 OS

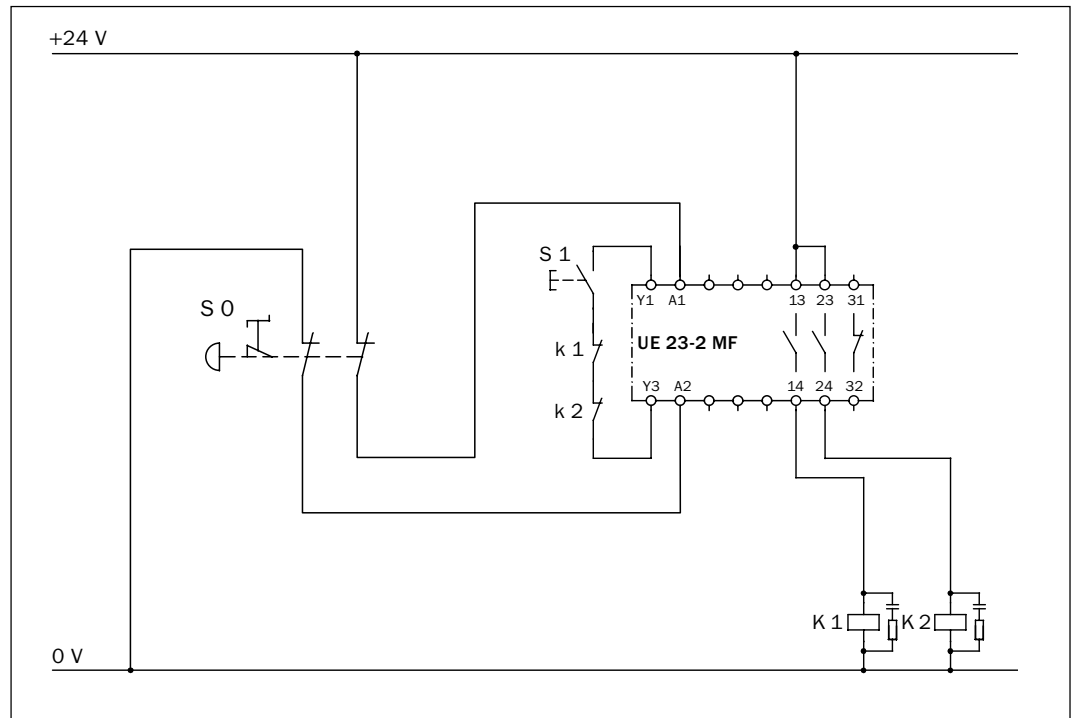


C 2000 Advanced to UE 10-3 OS Safety Relay,  
with Manual Reset and external device monitoring (active)



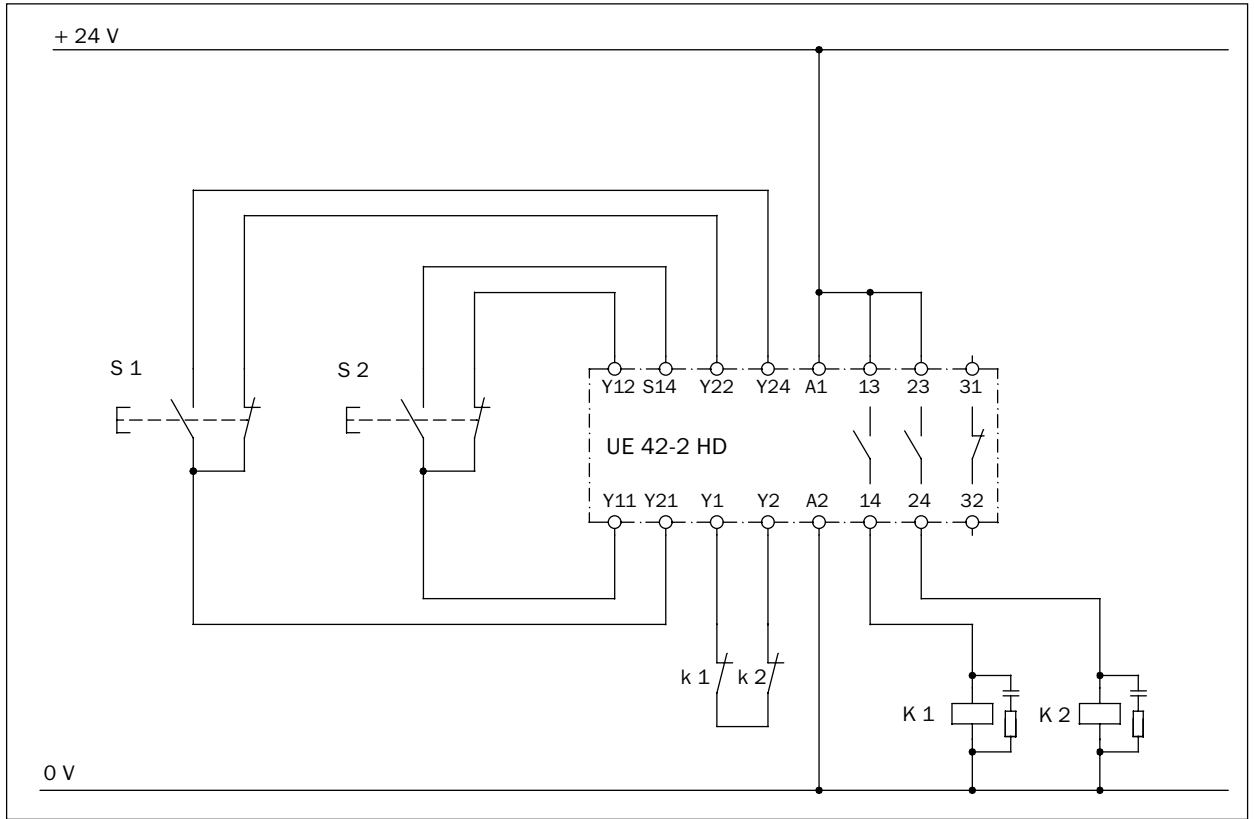
S 3000 Standard to UE 10-3 OS Safety Relay,  
with Manual Reset and external device monitoring (active)

Sample wiring diagram UE 23-2 MF

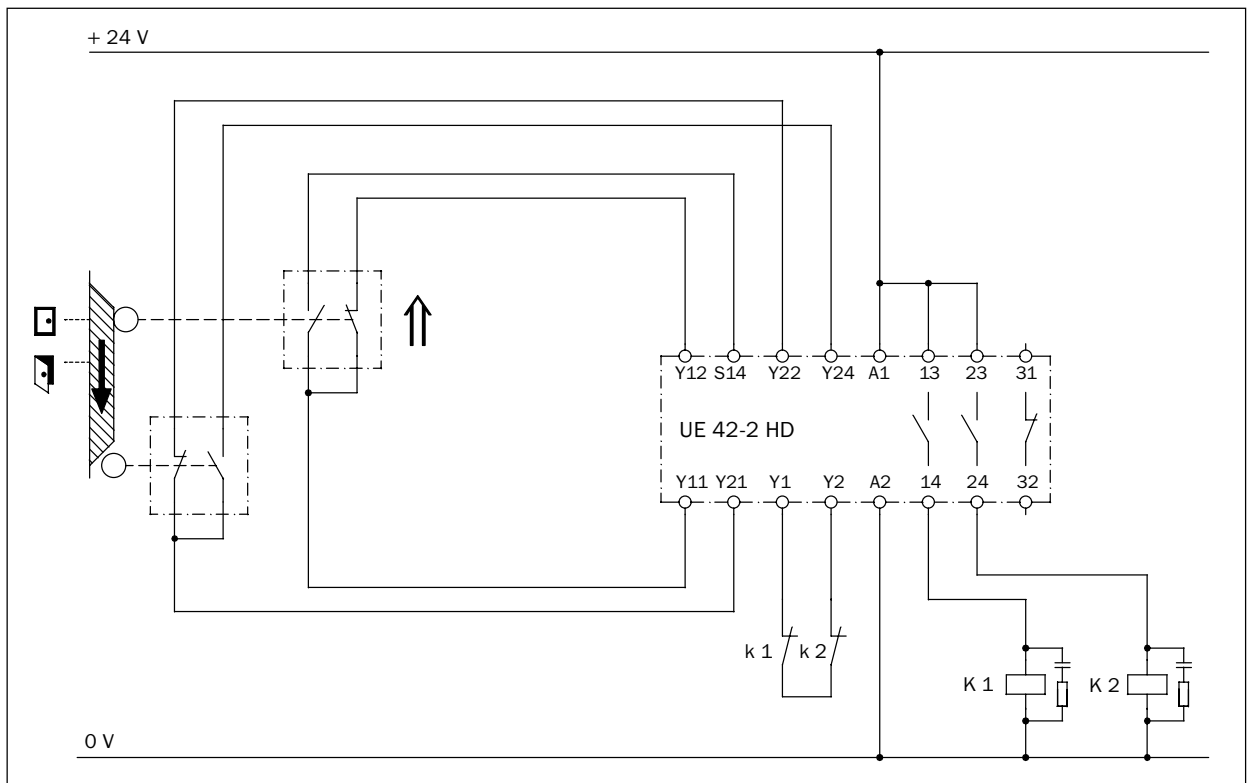


Emergency Stop to UE 23-2 MF Safety Relay,  
with Manual Reset and external device monitoring (EDM)

## Sample wiring diagrams UE 42-2 HD

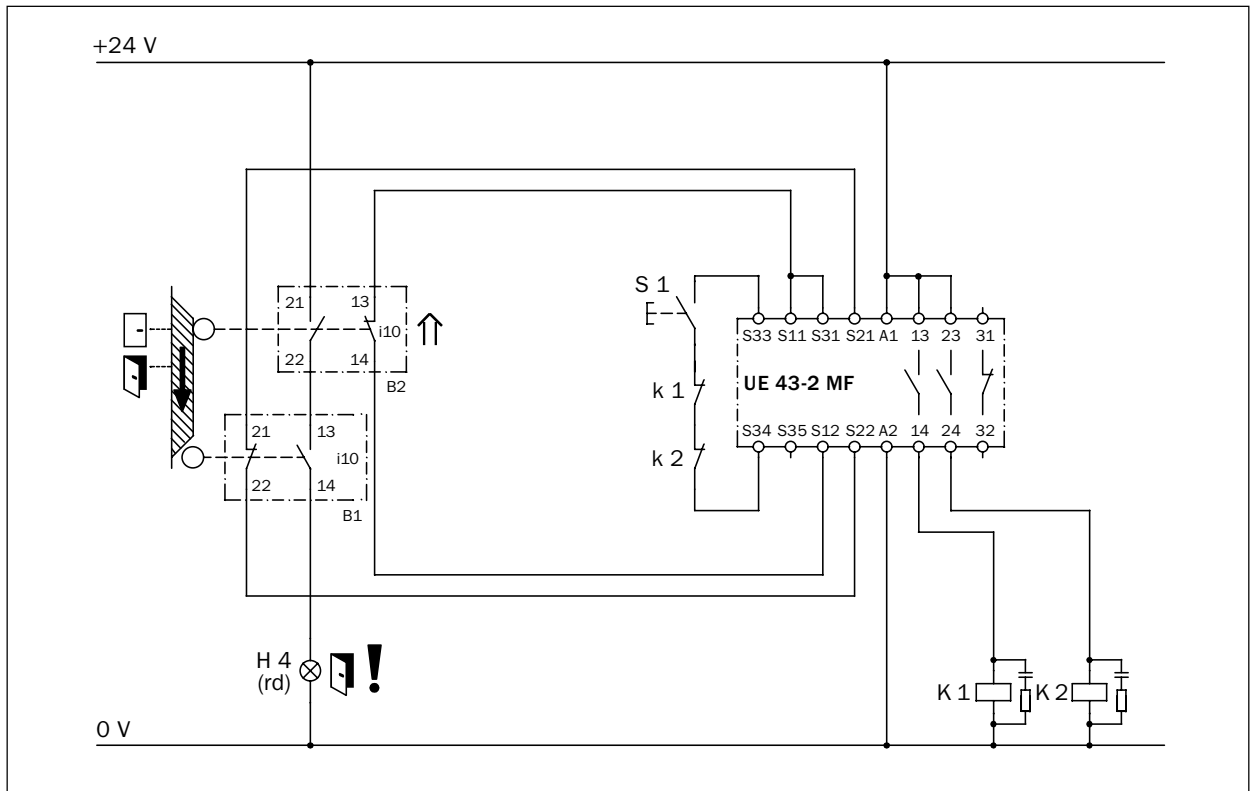


Two-hand control with UE 42-2 HD Safety Relay, dual-channel system, with automatic start and external device monitoring (EDM)



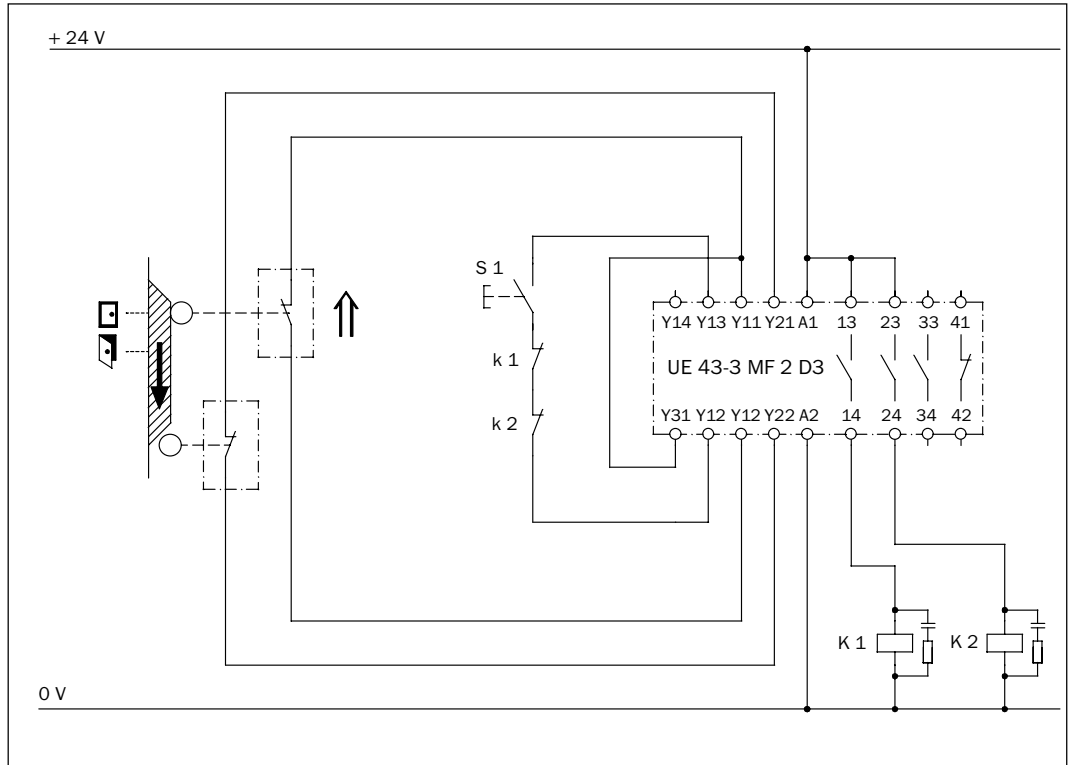
Two Safety Switches connected to UE 42-2 HD Safety Relay, dual-channel system, with Automatic Reset and external device monitoring (EDM)

Sample wiring diagram UE 43-2 MF

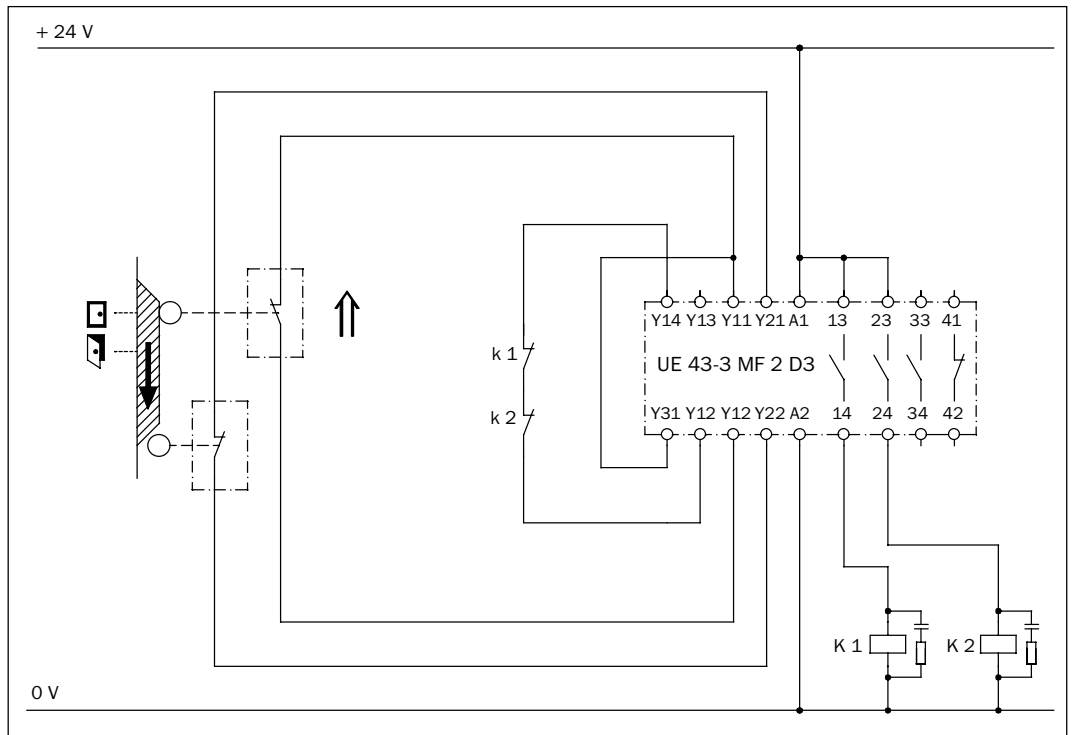


Two Safety Switches i 10 to UE 43-2 MF Safety Relay,  
dual-channel control system, with Manual Reset and external device monitoring (EDM)

Sample wiring diagrams UE 43-3 MF

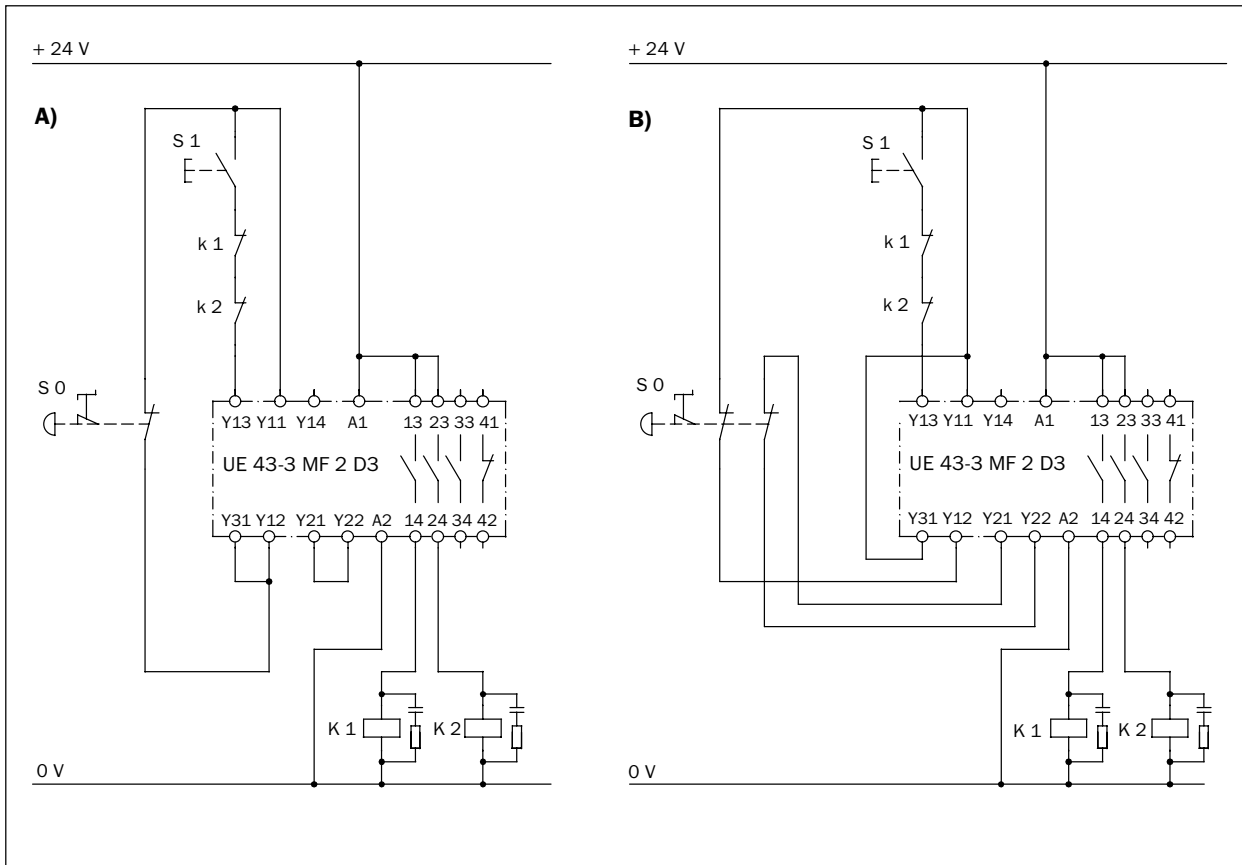


Two Safety Switches to UE 43-3 MF Safety Relay, dual-channel system, with Manual Reset and external device monitoring (EDM)



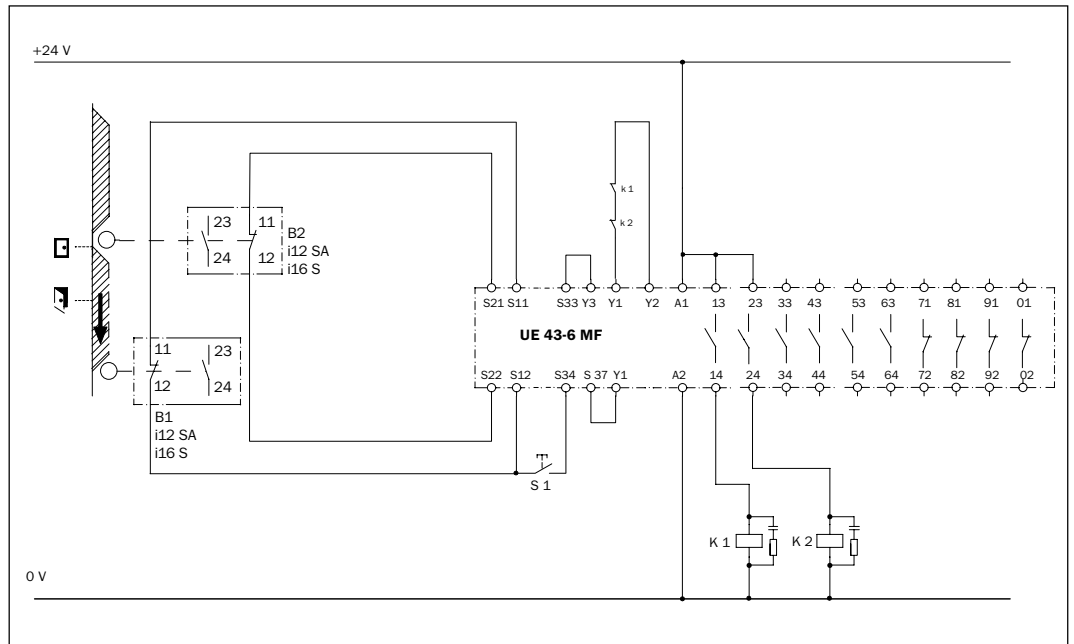
Two Safety Switches to UE 43-3 MF Safety Relay, dual-channel system, with Automatic Reset and external device monitoring (EDM)

Sample wiring diagrams UE 43-3 MF



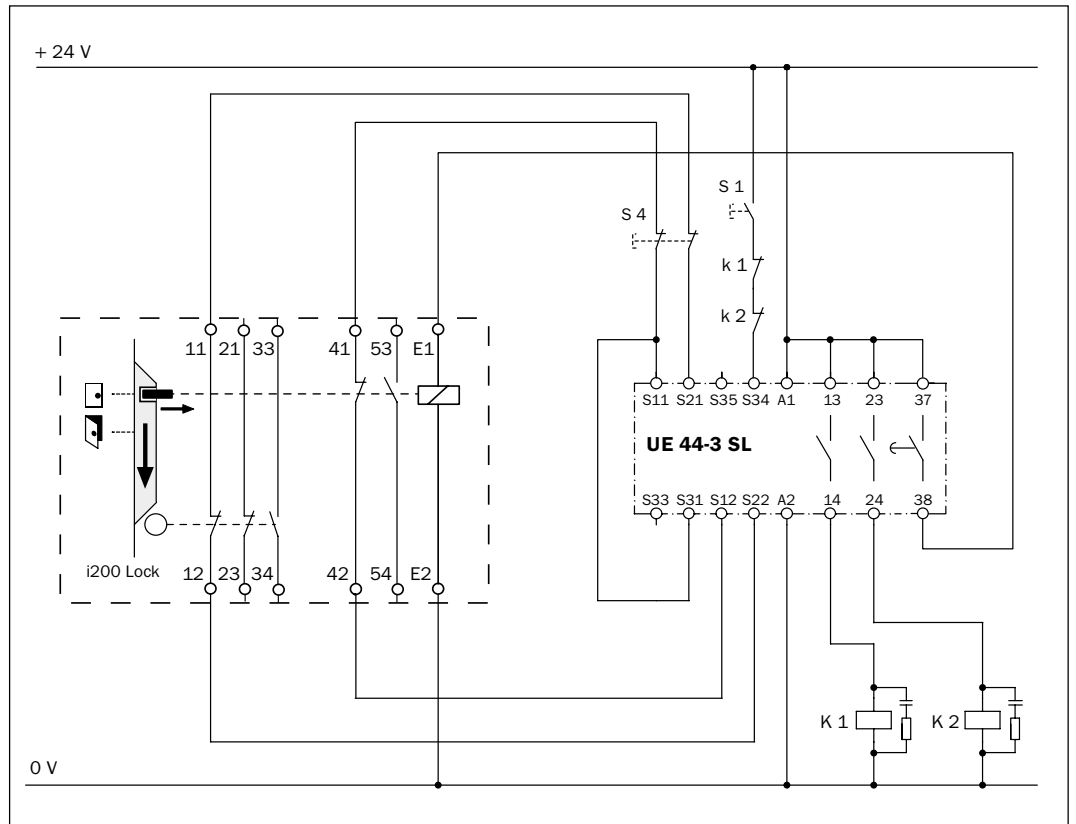
Emergency Stop Switch connected to UE 43-3 MF 2 D3 Safety Relay, with Manual Reset and external device monitoring. **A)** single-channel system, **B)** dual-channel system

## Sample wiring diagram UE 43-6 MF



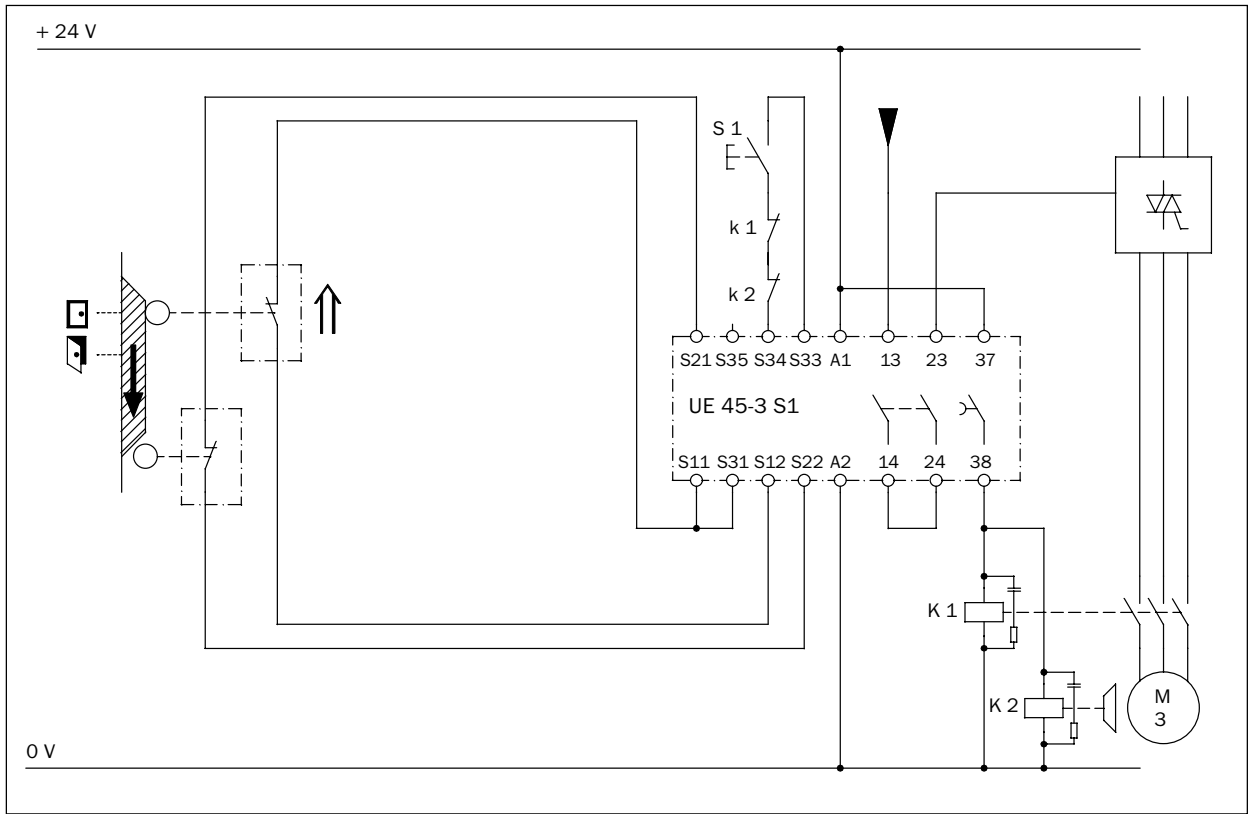
Two Safety Switches to UE 43-6 MF Safety Relay, dual-channel system, with Manual Reset and external device monitoring (EDM)

Sample wiring diagram UE 44-3 SL



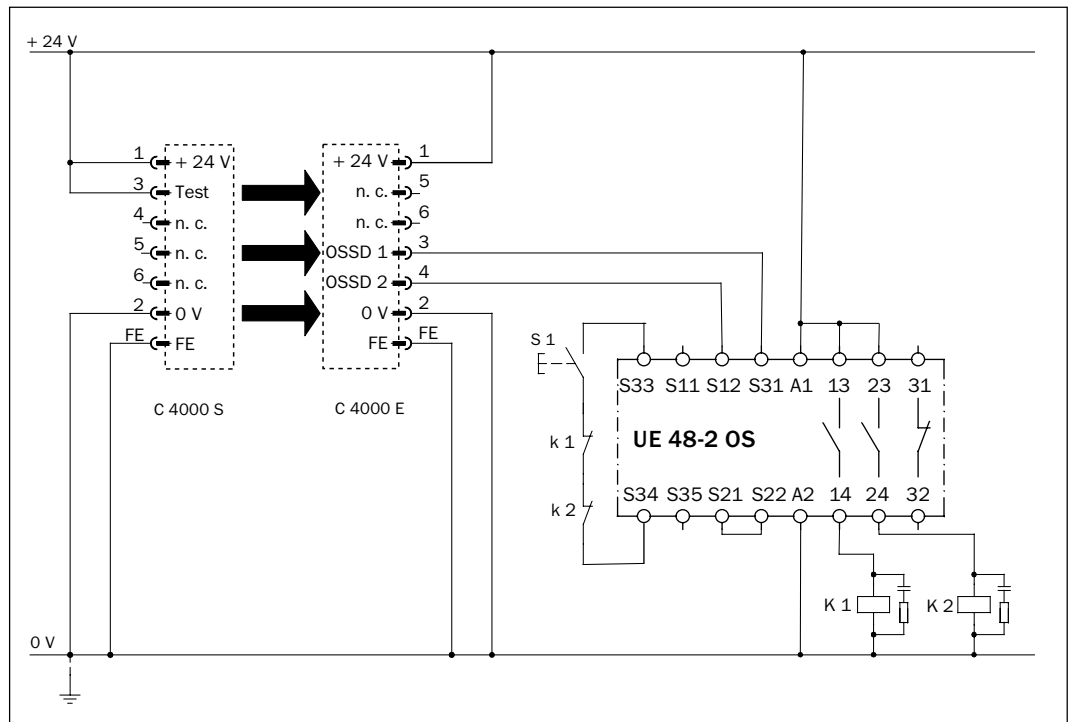
i200 Lock Safety switch (with mechanical locking) connected to UE 44-3 SL Safety Relay, with Manual Reset and external device monitoring (EDM)

Sample wiring diagram UE 45-3 S1

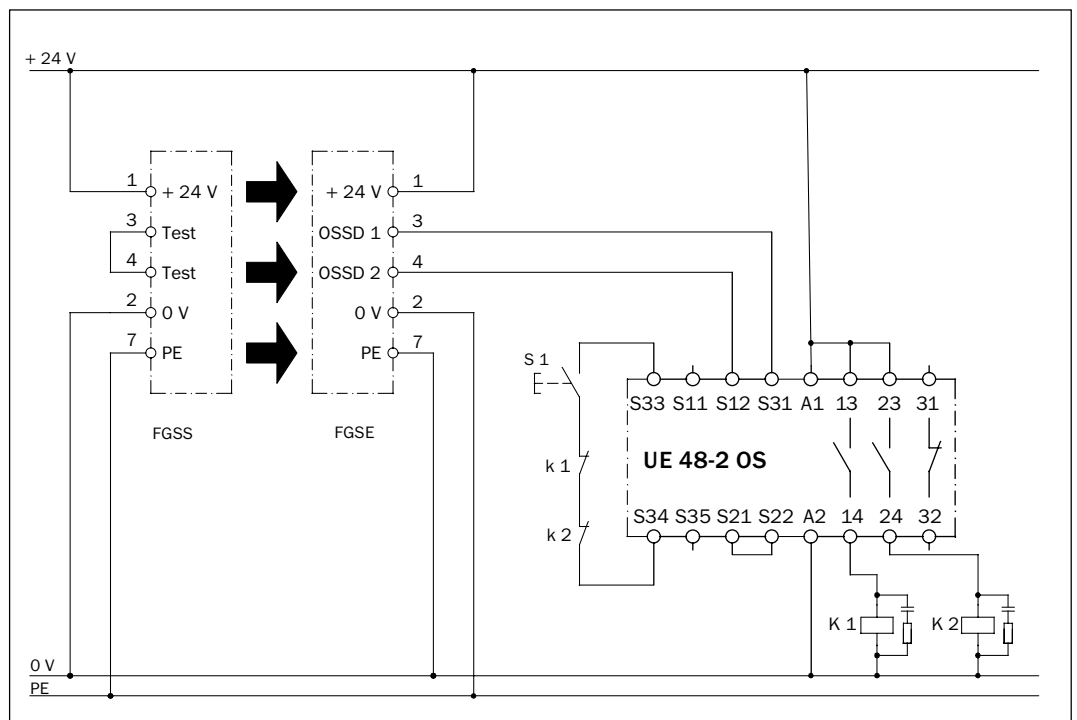


Two Safety Switches connected to UE 45-3 S1 Safety Relay, dual-channel system, with Manual Reset and external device monitoring (EDM)

Sample wiring diagrams UE 48-2 OS

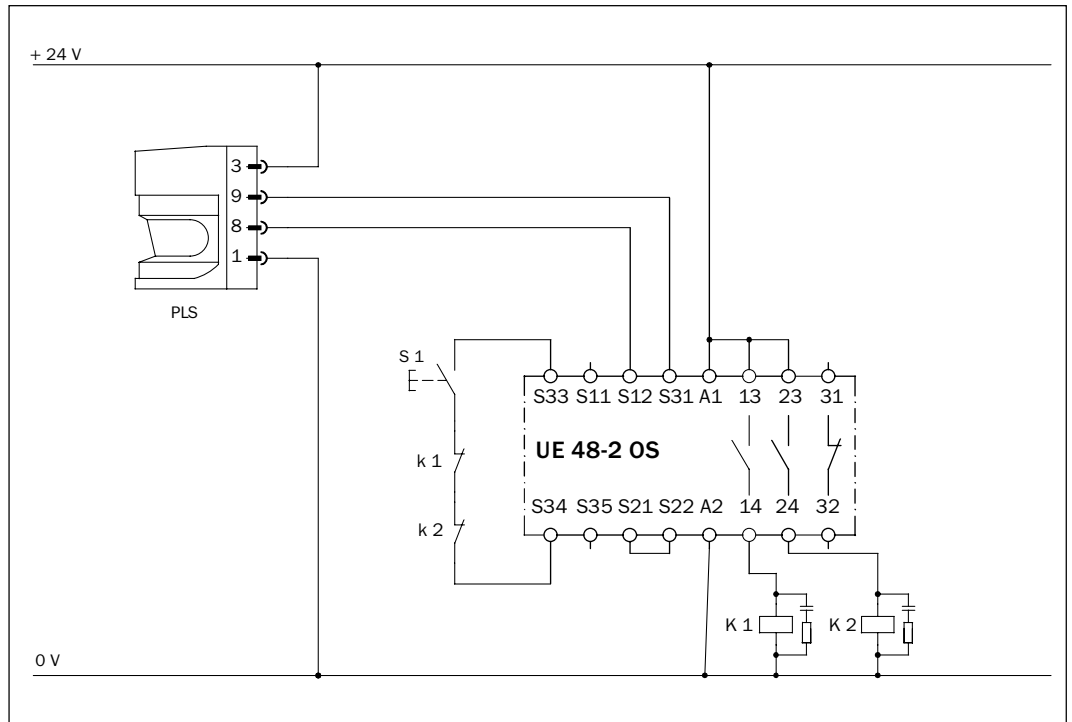


C 4000 Basic to UE 48-2 OS Safety Relay,  
with Manual Reset and external device monitoring (EDM)



FGS connected to UE 48-2 OS Safety Relay,  
with Manual Reset and external device monitoring (EDM)

## Sample wiring diagrams UE 48-2 OS



PLS connected to UE 48-2 OS Safety Relay,  
with Manual Reset and external device monitoring (EDM)



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