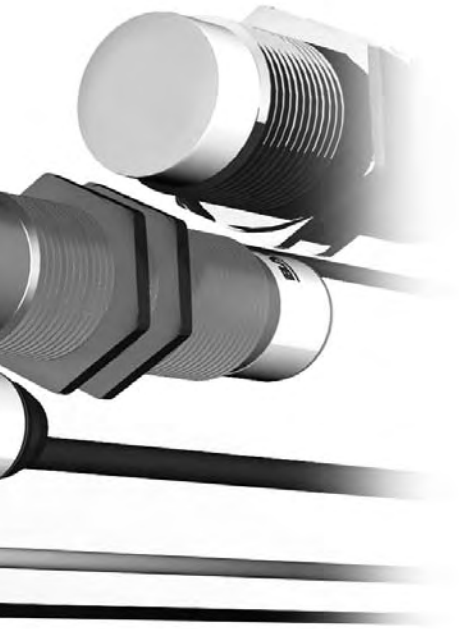
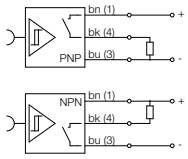
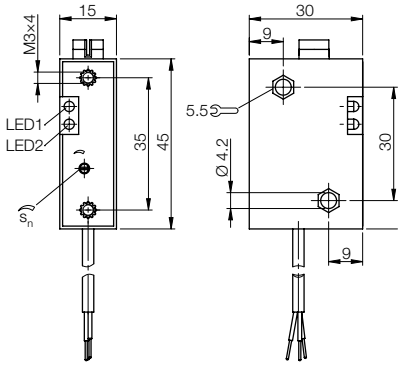


Housing size			**45×30×15 mm**
PNP	Normally open	**Ordering code**	**BAE009E**
		Part number	BAE SA-CS-001-PS
PNP	Normally closed	**Ordering code**	**BAE009F**
		Part number	BAE SA-CS-001-PO
NPN	Normally open	**Ordering code**	**BAE009H**
		Part number	BAE SA-CS-001-NS
NPN	Normally closed	**Ordering code**	**BAE009J**
		Part number	BAE SA-CS-001-NO
Supply voltage U_S			12…35 V DC
Voltage drop U_d at I_e			0.8 V
Rated insulation voltage U_i (protection class)			75 V DC
Output current max.			300 mA
No-load supply current I_0 max.			20 mA
Reverse polarity/short circuit protected			yes/yes
Ambient temperature range T_a			–30…+70 °C
Switching frequency f			100 Hz
Function indicator			yes/yes
Degree of protection per IEC 60529			IP 67
Material		Housing	PC
Wiring			2 m cable PUR 3x0.14 mm²

Wiring configuration





Function overview

LED 1: Switching status indicator
LED 2: Power indicator
Pos. 1: Through-hole Ø 4.2 mm,
hex well both sides
for inserting an M3 nut.

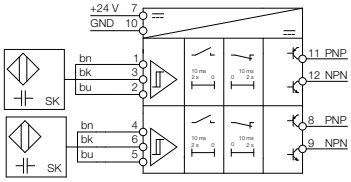
Accessories

Sensor amplifier for two miniature sensors

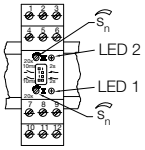
– Two discrete sensor amplifiers in one housing
– Two PNP and NPN transistor outputs
– Selectable N.O./N.C.
– Actuation delay (normally open) selectable 10 ms/2 s
– Turn-off delay (normally closed) selectable 10 ms/2s
– Screw terminal connections
– Switching distance for sensors separately adjustable
– Switching state indicated by two separate LEDs

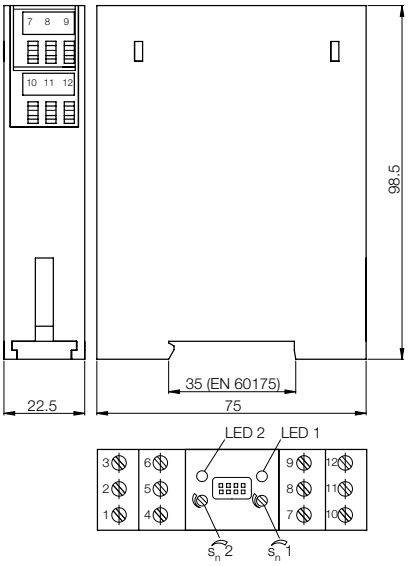
Housing size		**98.5×75×22.5 mm**
Mounting		DIN rail (EN 60751)
PNP/NPN and	**Ordering code**	**BAE009P**
NO/NC selectable	Part number	BAE SA-CS-002-YP
Supply voltage U_S		10…35 V DC
Voltage drop U_d at I_e		0.8 V
Rated insulation voltage U_i (protection class)		75 V DC
Output current max.		300 mA
No-load supply current I_0 max.		15 mA
Reverse polarity/short circuit protected		yes/yes
Ambient temperature range T_a		–30…+70 °C
Switching frequency f		100 Hz
Function indicator		yes/yes
Degree of protection per IEC 60529		IP40 (IP 20 terminal enclosure)
Material	Housing	PC
Wiring		max. 2.5 mm² AWG 14

Wiring configuration



Display





Sensor amplifier with logic
- Connection for two capacitive sensors without internal amplifier
- Two PNP and NPN transistor outputs
- Turn-on delay selectable 10 ms/2s
- Function OR, AND, RS-FF, Min/Max selectable
- Screw terminal connections
- Switching distance for sensors separately adjustable
- Switching state indicated by two separate LEDs

OR function
Output Q active when either one or both sensors are activated.

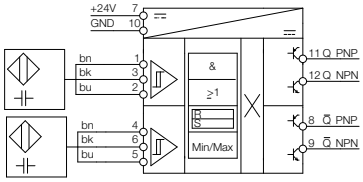
AND function
Output Q active only when both sensors are activated.

RS-FF function
Output Q active when the sensor is first activated on the Set input. This status is retained until the sensor is activated again on the Reset input.

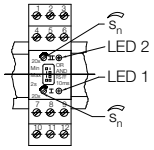
Function min/max
Output Q active when both sensors are activated. The output is only reset when both sensors are deactivated.

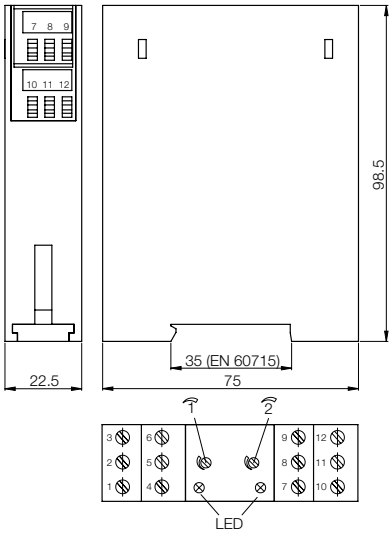
Housing size		**98.5×75×22.5 mm**
Mounting		DIN rail (EN 60751)
PNP/NPN and NO/NC selectable	**Ordering code**	**BAE009R**
	Part number	BAE SA-CS-003-YP
Supply voltage U_S		10…35 V DC
Voltage drop U_d at I_e		0.8 V
Rated insulation voltage U_i (protection class)		75 V DC
Output current max.		300 mA
No-load supply current I_0 max.		25 mA
Reverse polarity/short circuit protected		yes/yes
Ambient temperature range T_a		–30…+70 °C
Switching frequency f		100 Hz
Function indicator		no/yes
Degree of protection per IEC 60529		IP40 (IP 20 terminal enclosure)
Material	Housing	PC
Wiring		max. 2.5 mm² AWG 14

Wiring configuration



Display



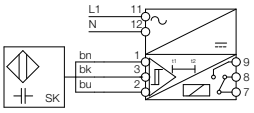


Accessories

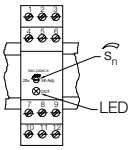
AC powered sensor amplifier for miniature sensors with relay output

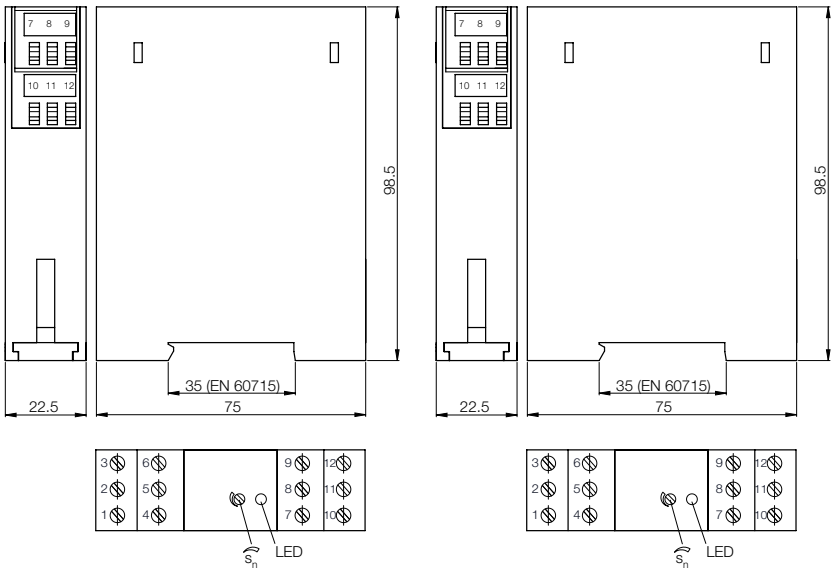
Housing size		**98.5×75×22.5 mm**	**98.5×75×22.5 mm**
Mounting		DIN rail (EN 60751)	DIN rail (EN 60751)
PNP/NPN and	**Ordering code**	**BAE009K**	**BAE009L**
NO/NC selectable	Part number	BAE SA-CS-006-XR	BAE SA-CS-007-XR
Supply voltage U_S		230 V AC	115 V AC
Rated insulation voltage U_i (protection class)		250 V AC	250 V AC
Output current max.		8 A	8 A
No-load supply current I_0 max.		20 mA	20 mA
Reverse polarity/short circuit protected		no/no	no/no
Ambient temperature range T_a		–30…+70 °C	–30…+70 °C
Switching frequency f		10 Hz	10 Hz
Function indicator		no/yes	no/yes
Degree of protection per IEC 60529		IP 20	IP 20
Material	Housing	PC	PC
Wiring		max. 2.5 mm² AWG 14	max. 2.5 mm² AWG 14

Wiring configuration



Display





- Potential free relay output
- Screw terminal connections
- Adjustable switching distance
- Switching state indicated by two separate LEDs

Accessories

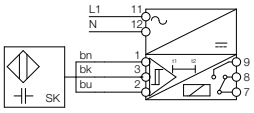
AC powered sensor amplifier for miniature sensor with relay output and delay timer

230 VAC

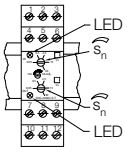
115 VAC

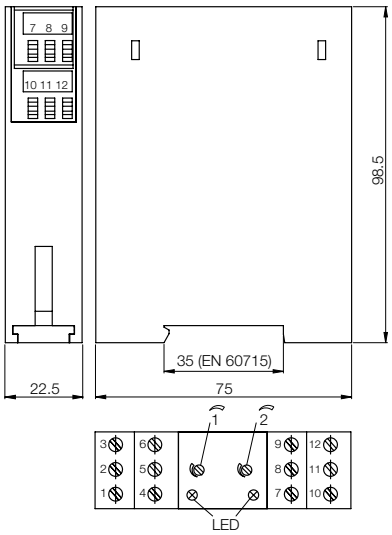
Housing size		**98.5×75×22.5 mm**	**98.5×75×22.5 mm**
Mounting		DIN rail (EN 60751)	DIN rail (EN 60751)
PNP/NPN and NO/NC selectable	**Ordering code**	**BAE009M**	**BAE009N**
	Part number	BAE SA-CS-008-XR	BAE SA-CS-009-XR
Supply voltage U_S		230 V AC	115 V AC
Rated insulation voltage U_i (protection class)		250 V AC	250 V AC
Output current max.		8 A	8 A
No-load supply current I_0 max.		20 mA	20 mA
Reverse polarity/short circuit protected		no/no	no/no
Ambient temperature range T_a		–30…+70 °C	–30…+70 °C
Switching frequency f		10 Hz	10 Hz
Function indicator		no/yes	no/yes
Degree of protection per IEC 60529		IP 20	IP 20
Material	Housing	PC	PC
Wiring		max. 2.5 mm² AWG 14	max. 2.5 mm² AWG 14

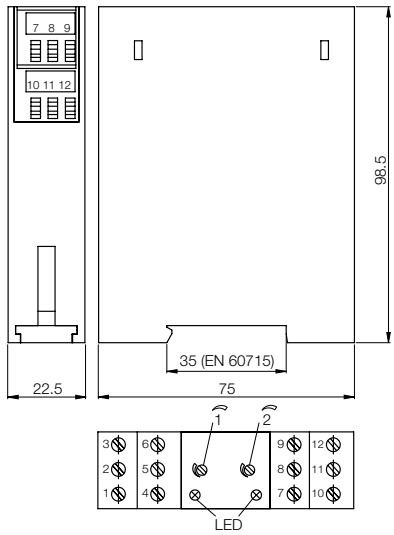
Wiring configuration



Display







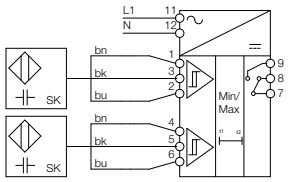
- Potential free relay output
- Adjustable delay timer 50ms...30s
- Screw terminal connections
- Adjustable switching distance
- Switching state indicated by two separate LEDs

Accessories

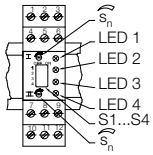
AC powered sensor amplifier for two miniature sensors with relay output and min/max logic controller

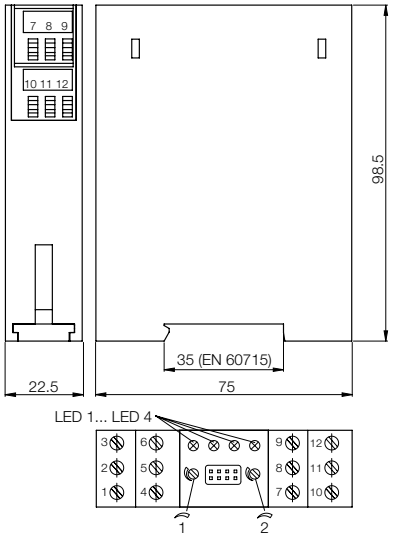
Housing size		**98.5×75×22.5 mm**	**98.5×75×22.5 mm**
Mounting		DIN rail (EN 60751)	DIN rail (EN 60751)
PNP/NPN and	**Ordering code**	**BAE009T**	**BAE009U**
NO/NC selectable	Part number	BAE SA-CS-004-XR	BAE SA-CS-005-XR
Supply voltage U_S		230 V AC	115 V AC
Rated insulation voltage U_i (protection class)		250 V AC	250 V AC
Output current max.		8 A	8 A
No-load supply current I_0 max.		20 mA	40 mA
Reverse polarity/short circuit protected		no/no	no/no
Ambient temperature range T_a		–30…+70 °C	–30…+70 °C
Switching frequency f		5 Hz	5 Hz
Function indicator		no/yes	no/yes
Degree of protection per IEC 60529		IP40 (IP 20 terminal enclosure)	IP40 (IP 20 terminal enclosure)
Material	Housing	PC	PC
Wiring		max. 2.5 mm² AWG 14	max. 2.5 mm² AWG 14

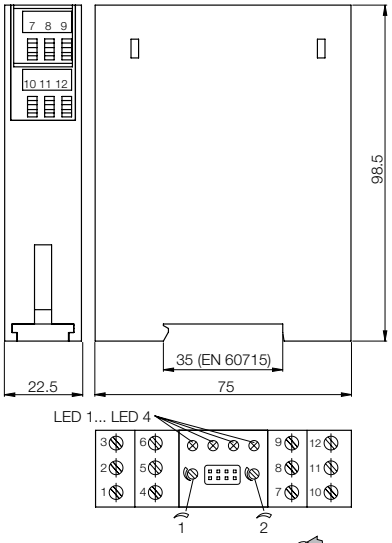
Wiring configuration



Display







Function

When both sensors are deactivated, the relay turns on – “LED” empty“ lights up (contact 7/9 closed).
If the Min sensor activates, the “LED fill” lights up. When both sensors are activated, the relay turnsoff – “LED full” lights up (contact 7/9 open).

Note:

If the Max sensor is activated, the “LED empty” lights up. The relay does not switch on until both sensors are deactivating again.

DIP switch functions

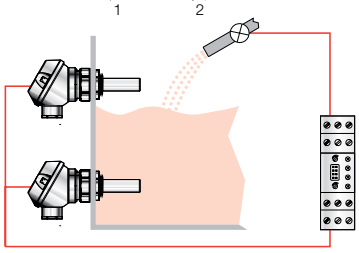
S1 – Time delay Max-Sensor (off: approx. 0.2 s; on: approx. 5 s)
S2 – Time delay Min-Sensor (off: approx. 0.2 s; on: approx. 5 s)
S3 – Power-on-Setup (off: fill; on: empty)
S4 – Output (relay inverse)

Function indicators

A – Full
B – Fill
C – Empty
D – Empty

Sensor adjustment

Max-Sensor: Pot I
Min-Sensor: Pot II



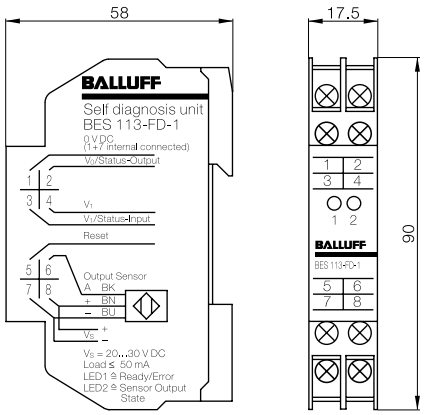
Diagnostics

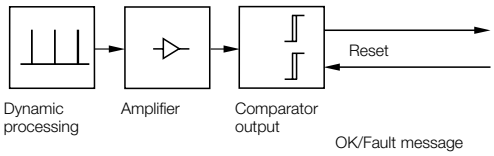
The BES 113-FD-1 function diagnostics unit monitors a proximity switch with dynamic function diagnostics including its cable. A logic circuit polls the sensor signals for the presence of test pulses and also monitors for proper function of the processor. For the machine controller it emits a High level signal on the "Status/Output" line when there is no fault and a Low signal when a fault is present. LEDs indicate the switching state of the sensor.

Recurring faults are stored by the device. They must be reset using a reset function (Low signal on 5).

If the BES 113-FD-1 is used as a single unit, terminals VI (3 and 4) must be jumpered together.

Description		**Function diagnostics unit** with electronic output
Use		for function diagnostic sensors
Ordering code		**BAE006W**
Part number		BES 113-FD-1
Supply voltage U_S		20...30 V DC
No-load current		approx. 20 mA
Output voltage U_0	low	0...(0.1×U_S) when the sensor or diagnostics unit has a fault)
(referenced to 0 V)	high	(0.5×U_S)...U_S when malfunctioning
Output current max.		50 mA
Ambient temperature range T_a		0...+60 °C
LED 1 green		„Ready/Error“ – in a faultless state the LED is on bright. When there is a fault the LED illuminates dimly).
LED 2 yellow		„Sensor Output State“ indicates the switching state of the sensor.
Degree of protection per IEC 60529		Housing IP 40, terminals IP 20
Housing attachment		Rail mount per DIN EN 50022-35
max. conductor cross-section		2×2.5 mm²



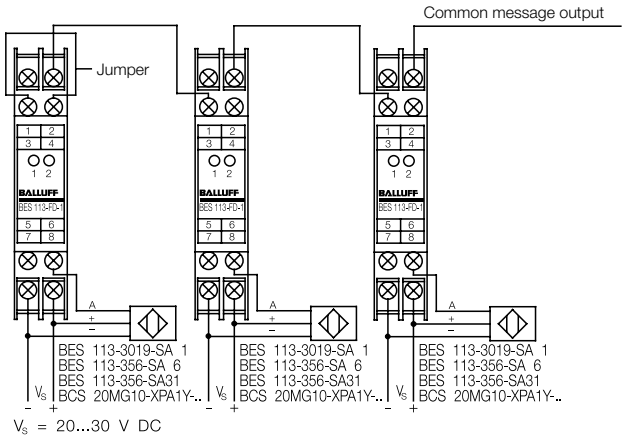


Cascading

When cascading several BES 113-FD-1 the output (2) must be connected to the input (3) of the amplifier. The jumper between VI is not needed except for the first device.

When there is a malfunction, the message appears on the last device. The defective sensor is indicated by the first weakly illuminated LED in the cascade.

Small and space-saving, the BES 113-FD-1 can be mounted in a DIN rail per DIN EN 50022-35.



Accessories

AC powered sensor controller with relay output and timer delay

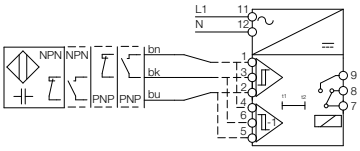
230 VAC

115 VAC

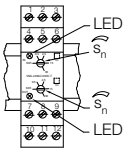
Housing size		**98.5×75×22.5 mm**	**98.5×75×22.5 mm**
Mounting		DIN rail (EN 60751)	DIN rail (EN 60751)
Potential-free changeover contact	**Ordering code**	**BAE009W**	**BAE009Y**
	Part number	BAE SA-XE-010-XR	BAE SA-XE-011-XR
Supply voltage U_S		230 V AC	115 V AC
Output current max.		8 A	8 A
No-load supply current I_0 max.		20 mA	40 mA
Ambient temperature range T_a		–30…+70 °C	–30…+70 °C
Switching frequency f		10 Hz	10 Hz
Function indicator		no/yes	no/yes
Degree of protection per IEC 60529		IP 20	IP 20
Material	Housing	PC	PC
Wiring		Screw terminals	Screw terminals

Not suitable for devices with push-pull output (e.g. BCS S4...)

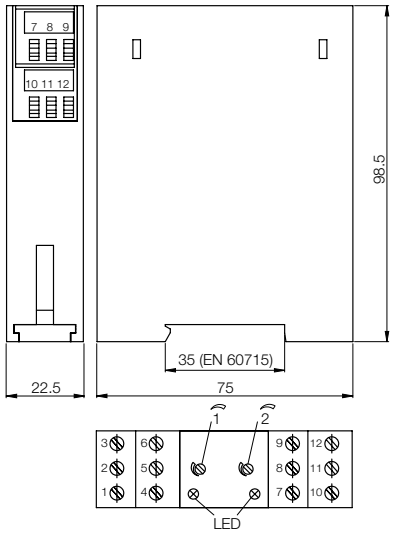
Wiring configuration

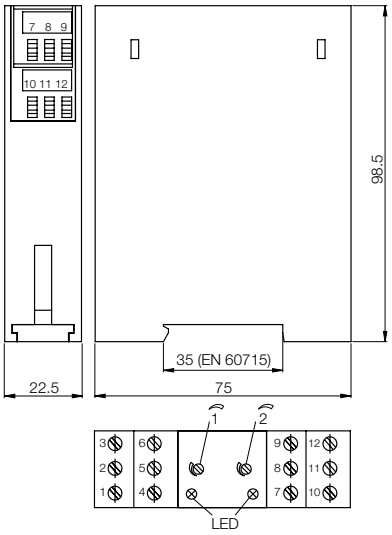


Display



– Actuation delay selectable 50ms..30s S1
– Turn-off delay selectable 50ms..30s S2





Accessories

AC powered sensor controller with relay output and min/max logic

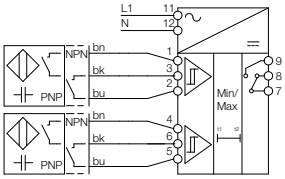
230 VAC

115 VAC

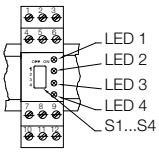
Housing size		**98.5×75×22.5 mm**	**98.5×75×22.5 mm**
Mounting		DIN rail (EN 60751)	DIN rail (EN 60751)
Potential-free changeover contact	**Ordering code**	**BAE009Z**	**BAE00A0**
	Part number	BAE SA-XE-012-XR	BAE SA-XE-013-XR
Supply voltage U_S		230 V AC	115 V AC
Output current max.		8 A	8 A
No-load supply current I_0 max.		20 mA	40 mA
Ambient temperature range T_a		–30…+70 °C	–30…+70 °C
Switching frequency f		5 Hz	5 Hz
Function indicator		no/yes	no/yes
Degree of protection per IEC 60529		IP 20	IP 20
Material	Housing	PC	PC
Wiring		Screw terminals	Screw terminals

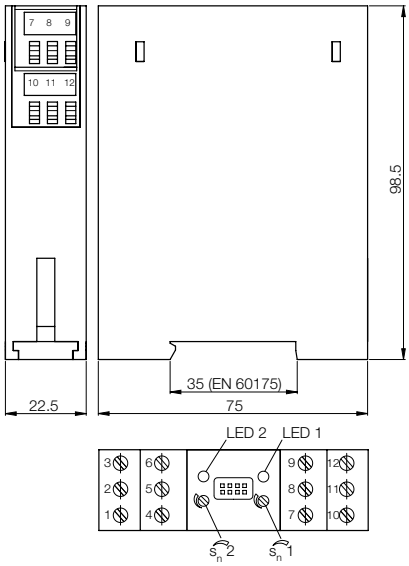
Not suitable for devices with XDC output (e.g. BCS S4...)

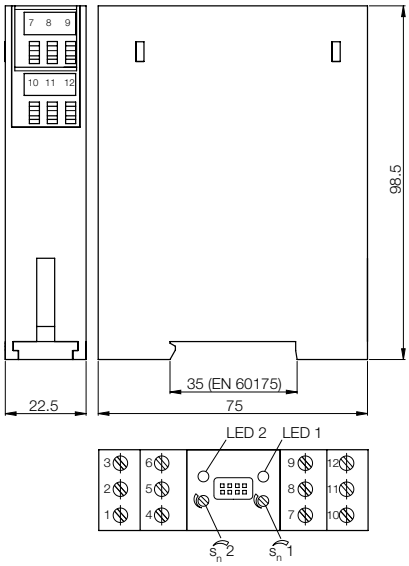
Wiring configuration



Display







Function

When both sensors are deactivated, the relay turns on – “LED” empty lights up (contact 7/9 closed).
If the Min sensor activates, the “LED fill” lights up. When both sensors are activated, the relay turnsoff – “LED full” lights up (contact 7/9 open).

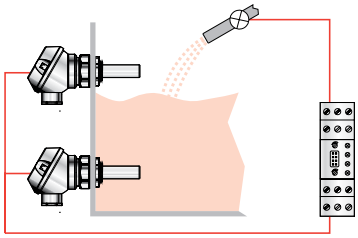
Note: If the Max sensor is activated, the “LED empty” lights up. The relay does not switch on until both sensors are deactivating again.

DIP switch functions

S1 – Time delay Max-Sensor (off: approx. 0.2 s; on: approx. 5 s)
S2 – Time delay Min-Sensor (off: approx. 0.2 s; on: approx. 5 s)
S3 – Power-on-Setup (off: fill; on: empty)
S4 – Output (relay inverse)

Function indicators

A – Full
B – Fill
C – Empty
D – Empty



Applications

– Min- and Max level control
– Input for connecting two miniature capacitive sensors for level sensing, adjustable separately using two potentiometers
– DC short circuit protected
– Turn-on delay for Min- and Max sensor selectable independently