



Capacitive Sensors

Accessories for capacitive sensors

The numerous varieties of capacitive sensors for individual solutions are enhanced by custom matched accessories. Thus there are downstream switching amplifiers for particular flexibility when there is different voltage, so that the sensors can be optimally connected: for 24 V and—if users do not have their own low voltage supply—for 230 V (115 V AC). Precisely matched mounting elements ensure exact positioning right away.



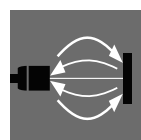


Accessories for Capacitive Sensors

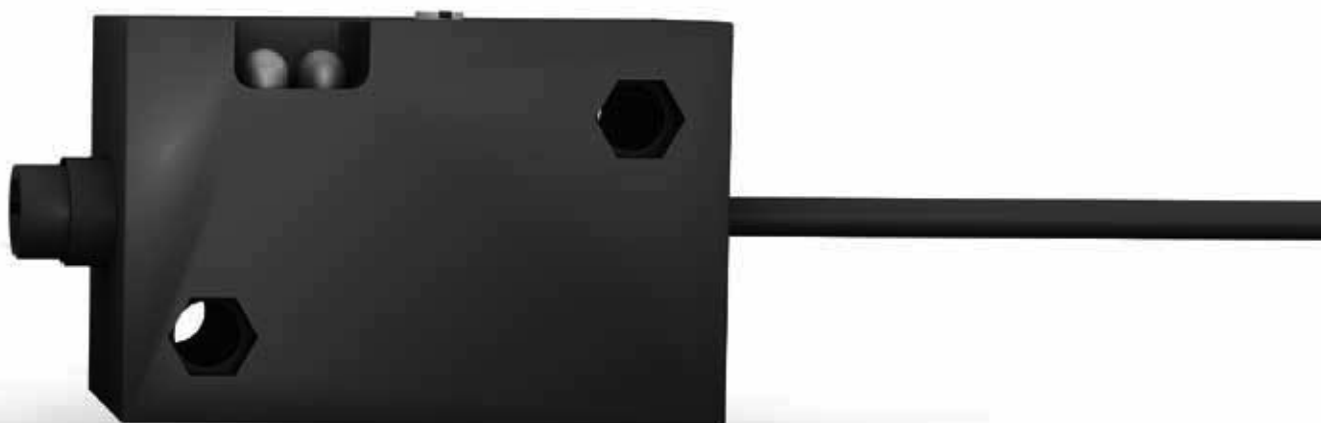
Contents

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Basic information
and definitions
can be found
on **page 934**.



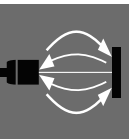


Accessories for Capacitive Sensors

Sensor amplifier for capacitive sensors without an internal amplifier (mini-sensors)



Size	45x30x15 mm	
PNP, NO	Ordering code	BAE009E
	Part number	BAE SA-CS-001-PS
PNP, NC	Ordering code	BAE009F
	Part number	BAE SA-CS-001-PO
NPN, NO	Ordering code	BAE009H
	Part number	BAE SA-CS-001-NS
NPN, NC	Ordering code	BAE009J
	Part number	BAE SA-CS-001-NO
Supply voltage U_S	12...35 V DC	
Voltage drop U_d at I_o	0.8 V	
Rated insulation voltage U_i	75 V DC	
Output current max.	300 mA	
No-load supply current I_o max.	20 mA	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	
Ambient temperature T_a	-30...+70 °C	
Switching frequency f	100 Hz	
Supply voltage/output function indicator	Green LED/Yellow LED	
Degree of protection as per IEC 60529	IP 67	
Material	Housing	PC
Connection	2 m PUR cable 3x0.14 mm ²	



Capacitive
Sensors

Capacitive
Sensors for
Object
Detection

Capacitive
Sensors for
Level
Detection

Capacitive
Sensors with
Special
Properties

Capacitive Sen-
sors for Analog
Distance
Measurement

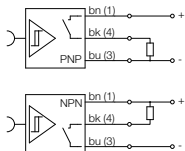
Accessories
for Capacitive
Sensors

**Sensor
Amplifiers**

Sensor
Downstream
Switching
Devices

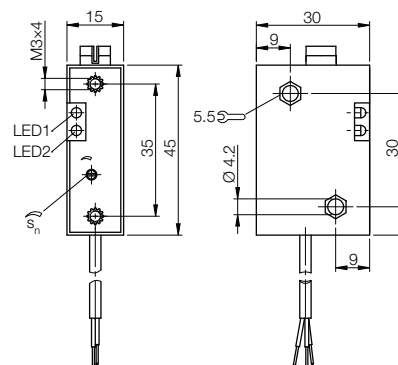
Adapter

Pin assignments



Function overview

- LED 1: Switching state indicator
- LED 2: Indicates supply voltage
- Pos. 1: Through-hole Ø 4.2 mm, hexagonal on both sides for inserting an M3 nut

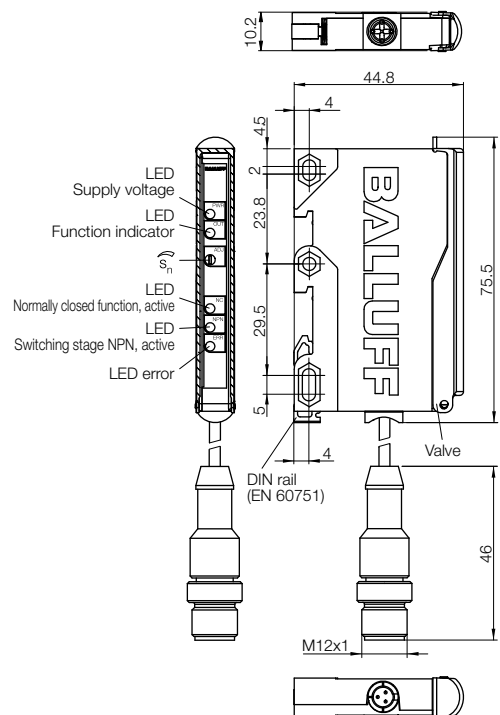
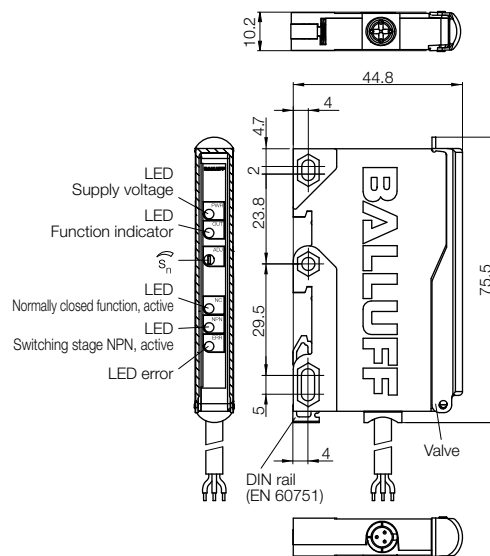


Accessories for Capacitive Sensors

Sensor amplifier for capacitive sensors without an internal amplifier (mini-sensors)

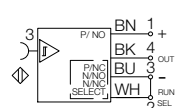


Size	76×45×11 mm	76×45×11 mm	
Installation	Spring or standard rail mounting	Spring or standard rail mounting	
PNP/NPN and NO/NC, can be coded	Ordering code BAE00KH	BAE00L9	
	Part number	BAE SA-CS-025-YP-BP02	BAE SA-CS-025-YP-BP00,3-GS04
Supply voltage U_S	12...30 V DC	12...30 V DC	
Voltage drop U_d at I_o	< 2 V	< 2 V	
Rated insulation voltage U_i	75 V DC	75 V DC	
Output current max.	100 mA	100 mA	
No-load supply current I_o max.	25 mA	25 mA	
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes	Yes/Yes/Yes	
Ambient temperature T_a	-5...+70 °C	-5...+70 °C	
Switching frequency f	100 Hz	100 Hz	
Supply voltage/output function indicator	Green LED/Yellow LED	Green LED/Yellow LED	
Degree of protection as per IEC 60529	IP 40	IP 40	
Material	Housing	PBT, PA	
Connection	2 m PUR cable, 4×0.25 mm ²	0.3 m PUR cable with M12 connector, 4-pin	

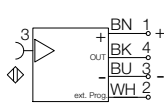


Wiring diagrams

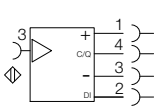
Standard version



Convenience version



IO-Link version



The sensor has a fourth programming cable (white) that can be used to configure the switching stage. The cable is open in configuration mode. This status is displayed by the "ERR" LED by flashing.

After each potential transition of the programming cable from open to U_{Bat} , the switching output configuration is switched forward one variant each time: PNP, NO → PNP, NC → NPN, NO → NPN, NC → PNP, NO, etc.

Accessories for Capacitive Sensors

Sensor amplifier for capacitive sensors without an internal amplifier (mini-sensors)



Available as of May 2014
Convenience version

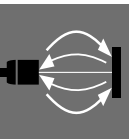


Available as of May 2014
Convenience version



Available as of May 2014
IO-Link

76×45×11 mm	76×45×11 mm	76×45×11 mm
Spring or standard rail mounting	Spring or standard rail mounting	Spring or standard rail mounting
BAE00KJ	BAE00LA	BAE00LC
BAE SA-CS-026-YP-BP02	BAE SA-CS-026-YP-BP00,3-GS04	BAE SA-CS-027-YI-BP00,3-GS04
15...30 V DC	15...30 V DC	18...30 V DC
< 2 V	< 2 V	< 2 V
75 V DC	75 V DC	75 V DC
100 mA	100 mA	100 mA
25 mA	25 mA	25 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
-5...+70 °C	-5...+70 °C	-5...+70 °C
100 Hz	100 Hz	
Green LED/Yellow LED	Green LED/Yellow LED	Green LED/Yellow LED
IP 40	IP 40	IP 40
PBT, PA	PBT, PA	PBT, PA
2 m PUR cable, 4×0.25 mm ²	0.3 m PUR cable with M12 connector, 4-pin	0.3 m PUR cable with M12 connector, 4-pin



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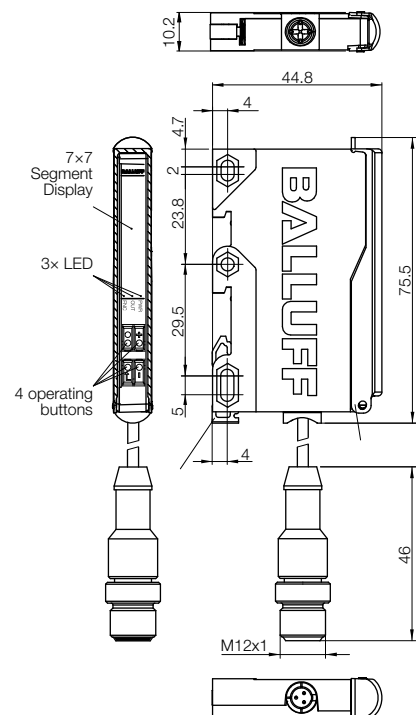
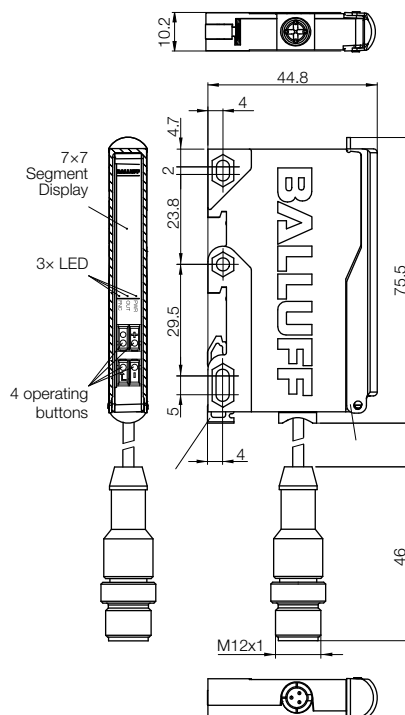
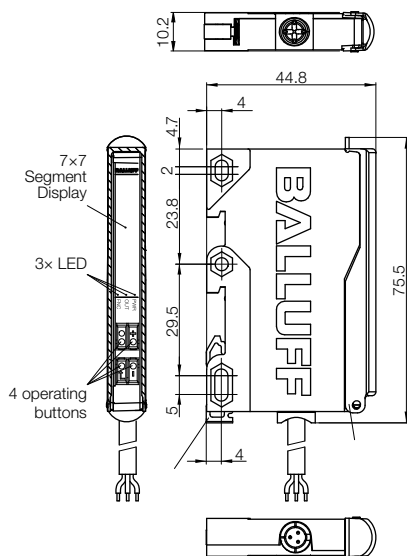
Capacitive Sen-
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Distance
Measurement

Accessories
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**Sensor
Amplifiers**

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Adapter



Accessories for Capacitive Sensors

Sensor amplifier for two capacitive sensors without internal amplifier

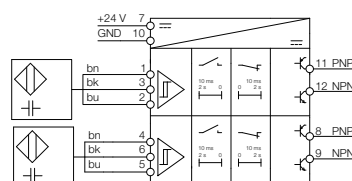
Technical details

- Two separate sensor amplifiers in one housing
- Connection for two capacitive sensors without internal amplifier
- PNP and NPN transistor output
- Function normally open/normally closed can be switched
- Actuation delay (normally open) selectable 10 ms/2 s
- Turn-off delay (normally closed) selectable 10 ms/2 s
- Clamping terminal
- Switching distance for sensors separately adjustable
- Switching status indicated by two separate LEDs

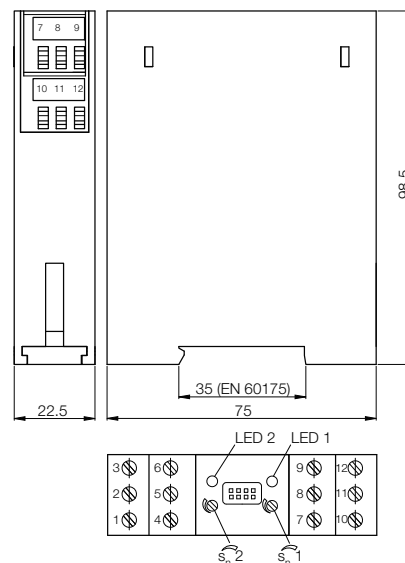
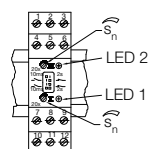


Size	98.5×75×22.5 mm
Mounting type	DIN rail (EN 60751)
PNP/NPN and NO/NC, can be coded	Ordering code BAE009P
	Part number BAE SA-CS-002-YP
Supply voltage U_S	10...35 V DC
Voltage drop U_d at I_o	0.8 V
Rated insulation voltage U_i	75 V DC
Output current max.	300 mA
No-load supply current I_o max.	15 mA
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes
Ambient temperature T_a	-30...+70 °C
Switching frequency f	100 Hz
Output function indicator	Yellow LED
Degree of protection as per IEC 60529	IP 40 (IP 20 at terminal box)
Material	Housing
Connection	Max. 2.5 mm ² AWG 14

Pin assignments



Display



Accessories for Capacitive Sensors

Sensor amplifier with logic for two capacitive sensors without internal amplifier

Sensor amplifier with logic

- Connection for two capacitive sensors without internal amplifier
- Two outputs each PNP/NPN for Q and Q
- Pick-up delay selectable 10 ms/2 s
- Function OR, AND, RS-FF, min/max selectable
- Clamping terminal
- Switching distance for sensors separately adjustable
- Switching status indicated by two separate LEDs

OR function

Output Q active when one or both sensors are damped.

AND function

Output Q active only when both sensors are damped.

RS-FF function

Output Q active when the sensor is first damped on the Set input. This status is retained until the sensor is damped on the Reset input.

Function min/max

Output Q active when both sensors are damped. The output is only reset when both sensors are undamped.



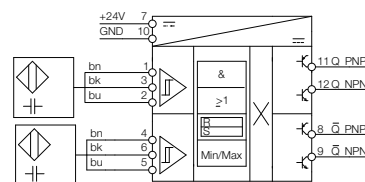
Size	98.5×75×22.5 mm
Mounting type	DIN rail (EN 60751)
PNP/NPN and NO/NC, can be coded	Ordering code BAE009R
	Part number BAE SA-CS-003-YP
Supply voltage U_S	10...35 V DC
Voltage drop U_d at I_o	0.8 V
Rated insulation voltage U_i	75 V DC
Output current max.	300 mA
No-load supply current I_o max.	25 mA
Polarity reversal protected/transposition protected/short-circuit protected	Yes/Yes/Yes
Ambient temperature T_a	-30...+70 °C
Switching frequency f	100 Hz
Output function indicator	Yellow LED
Degree of protection as per IEC 60529	IP 40 (IP 20 at terminal box)
Material	Housing PC
Connection	Max. 2.5 mm ² AWG 14



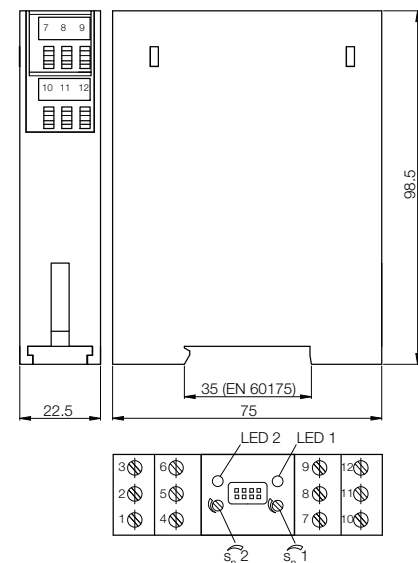
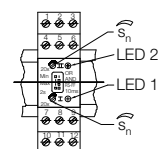
Capacitive Sensors

Capacitive Sensors for Object Detection

Pin assignments



Display



Capacitive Sensors for Level Detection

Capacitive Sensors with Special Properties

Capacitive Sensors for Analog Distance Measurement

Accessories for Capacitive Sensors

Sensor Amplifiers

Sensor Downstream Switching Devices Adapter

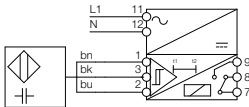
Accessories for Capacitive Sensors

Sensor amplifier for one capacitive sensor without internal amplifier

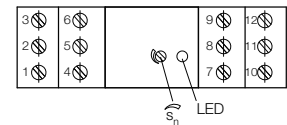
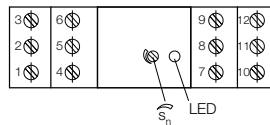
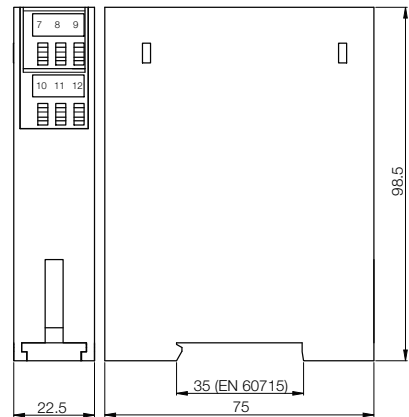
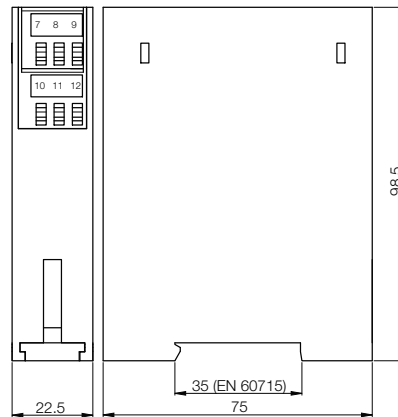
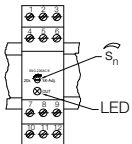


Size	98.5×75×22.5 mm	98.5×75×22.5 mm
Mounting type	DIN rail (EN 60751)	DIN rail (EN 60751)
PNP/NPN and NO/NC, can be coded	Ordering code BAE009K	BAE009L
Part number	BAE SA-CS-006-XR	BAE SA-CS-007-XR
Supply voltage U_s	230 V AC	115 V AC
Rated insulation voltage U_i (protection class)	250 V AC (II)	250 V AC (II)
Output current max.	8 A	8 A
No-load supply current I_0 max.	20 mA	20 mA
Polarity reversal protected/transposition protected/short-circuit protected	Floating relay	Floating relay
Ambient temperature T_a	-30...+70 °C	-30...+70 °C
Switching frequency f	10 Hz	10 Hz
Output function indicator	Yellow LED	Yellow LED
Degree of protection as per IEC 60529	IP 20	IP 20
Material	PC	PC
Housing		
Connection	Max. 2.5 mm ² AWG 14	Max. 2.5 mm ² AWG 14

Pin assignments



Display

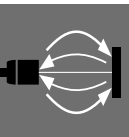


Accessories for Capacitive Sensors

Sensor amplifier with Min/Max level control for two capacitive sensors without internal amplifier



Size	98.5×75×22.5 mm		98.5×75×22.5 mm
Mounting type	DIN rail (EN 60751)		DIN rail (EN 60751)
PNP/NPN and NO/NC, can be coded	Ordering code	BAE009T	BAE009U
	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 (II)		250 V AC (II)
Output current max.	8 A		8 A
No-load supply current I_0 max.	20 mA		40 mA
Polarity reversal protected/transposition protected/short-circuit protected	Floating relay		Floating relay
Ambient temperature T_a	-30...+70 °C		-30...+70 °C
Switching frequency f	5 Hz		5 Hz
Output function indicator	Yellow LED		Yellow LED
Degree of protection as per IEC 60529	IP 40 (IP 20 at terminal box)		IP 40 (IP 20 at terminal box)
Material	Housing	PC	PC
Connection	Max. 2.5 mm² AWG 14		Max. 2.5 mm² AWG 14



Capacitive Sensors

Capacitive Sensors for Object Detection

Capacitive Sensors for Level Detection

Capacitive Sensors with Special Properties

Capacitive Sensors for Analog Distance Measurement

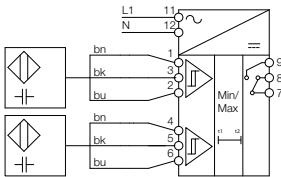
Accessories for Capacitive Sensors

Sensor Amplifiers

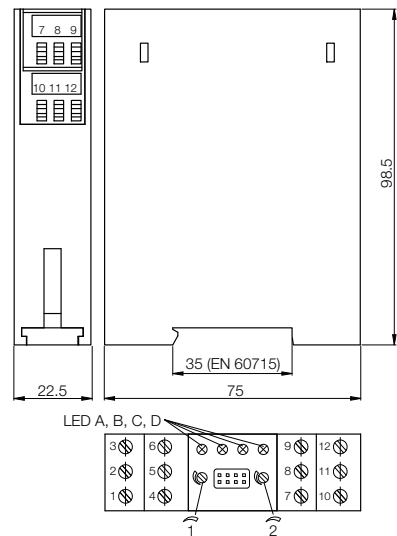
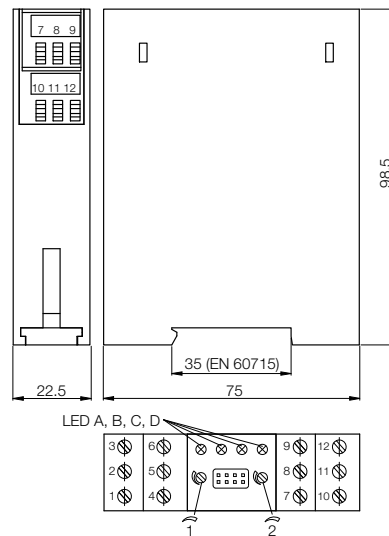
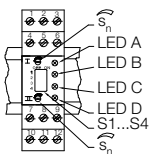
Sensor Downstream Switching Devices

Adapter

Pin assignments



Display



Function

When both sensors are undamped, the relay turns on—the "empty" LED lights up (contacts 7/9 are closed). If the Min sensor is damped, the "fill" LED lights up. When both sensors are damped, the relay turns off—the "full" LED lights up (contacts 7/9 are opened). If the Max sensor is undamped, the "empty" LED lights up. The relay does not turn on until both sensors are again undamped. Other functions are selectable using the mini dip switches.

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 (inverse relay)

Function indicators

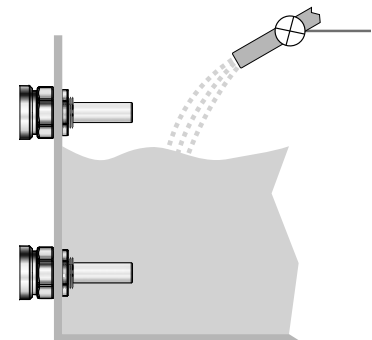
- A – Full
- B – Fill
- C – Empty
- D – Empty

Sensor adjustment

- Max sensor: Potentiometer I
- Min sensor: Potentiometer II

Applications

- Min and Max level control
- Input for connecting two capacitive sensors for level sensing, adjustable separately using two potentiometers
- Switch-on delay for Min and Max sensor can be selected separately



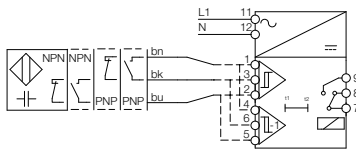
Accessories for Capacitive Sensors

Downstream sensor amplifiers with timer function and potential-free changeover contact for one capacitive sensor

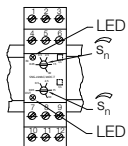


Size	98.5×75×22.5 mm	98.5×75×22.5 mm
Mounting type	DIN rail (EN 60751)	DIN rail (EN 60751)
Potential-free changeover contact	Ordering code Part number	Ordering code Part number
	BAE009W BAE SA-XE-010-XR	BAE009Y BAE SA-XE-011-XR
Supply voltage U_S	230 V AC	115 V AC
Rated insulation voltage U_i (protection class)	250 V AC (II)	250 V AC (II)
Output current max.	8 A	8 A
No-load supply current I_0 max.	20 mA	40 mA
Ambient temperature T_a	-30...+70 °C	-30...+70 °C
Switching frequency f	10 Hz	10 Hz
Pick-up delay	0.05...30 s	0.05...30 s
Release delay	0.05...30 s	0.05...30 s
Output function indicator	Yellow LED	Yellow LED
Degree of protection as per IEC 60529	IP 20	IP 20
Material	Housing	Housing
	PC	PC
Connection	Screw terminals	Screw terminals

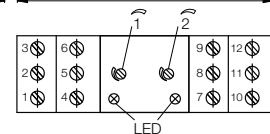
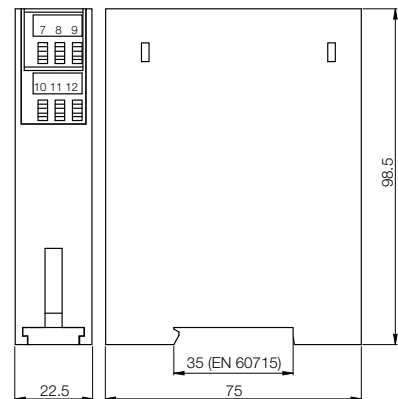
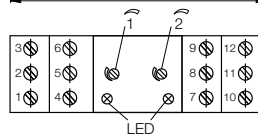
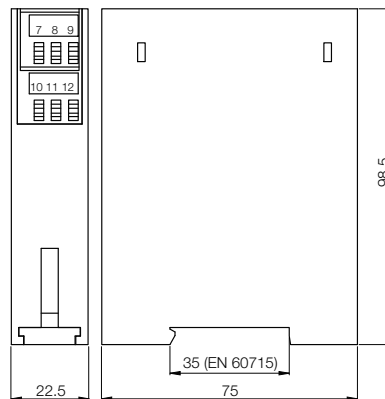
Pin assignments



Display

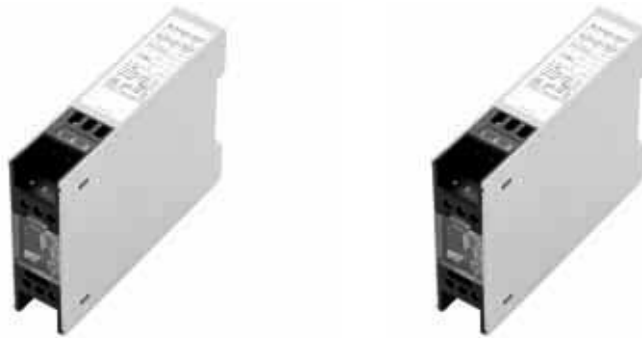


Not suitable for devices with an output stage that can be coded (e.g. BCS S4...)

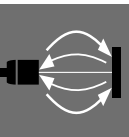


Accessories for Capacitive Sensors

Downstream sensor amplifiers with Min/Max level control and potential-free changeover contact for two capacitive sensors



Size	98.5×75×22.5 mm	98.5×75×22.5 mm
Mounting type	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
Rated insulation voltage U_i (protection class)	250 V AC (II)	250 V AC (II)
Output current max.	8 A	8 A
No-load supply current I_0 max.	20 mA	40 mA
Ambient temperature T_a	-30...+70 °C	-30...+70 °C
Switching frequency f	5 Hz	5 Hz
Output function indicator	Yellow LED	Yellow LED
Degree of protection as per IEC 60529	IP 20	IP 20
Material	Housing	PC
Connection	Screw terminals	Screw terminals



Capacitive Sensors

Capacitive Sensors for Object Detection

Capacitive Sensors for Level Detection

Capacitive Sensors with Special Properties

Capacitive Sensors for Analog Distance Measurement

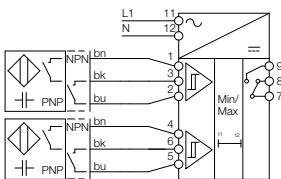
Accessories for Capacitive Sensors

Sensor Amplifiers

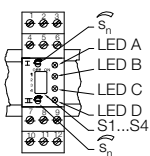
Sensor Downstream Switching Devices

Adapter

Pin assignments



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Not suitable for devices with an output stage that can be coded (e.g. BCS S4...)

Function

When both sensors are undamped, the relay turns on—the "empty" LED lights up (contacts 7/9 are closed). If the Min sensor is damped, the "fill" LED lights up. When both sensors are damped, the relay turns off—the "full" LED lights up (contacts 7/9 are opened). If the Max sensor is undamped, the "empty" LED lights up. The relay does not turn on until both sensors are again undamped. Other functions are selectable using the mini dip switches.

Dip switch functions

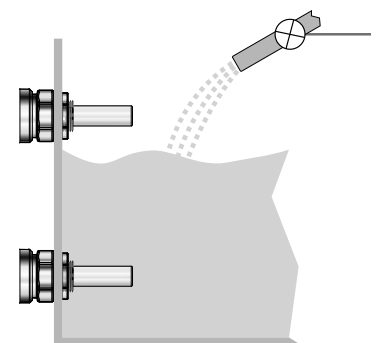
S1 – Time delay Max sensor (off: approx. 0.2 s; on: approx. 5 s)
S2 – Time delay Min sensor (off: approx. 0.2 s; on: approx. 5 s)
S3 – Power-on setup (off: fill; on: empty)
S4 – Output (inverse relay)

Function indicators

A – Full
B – Fill
C – Empty
D – Empty

Applications

- Min and Max level control
- Automatic PNP and NPN input voltage for connecting two normally open sensors
- DC short-circuit protected
- Switch-on delay for Min and Max sensor can be selected separately

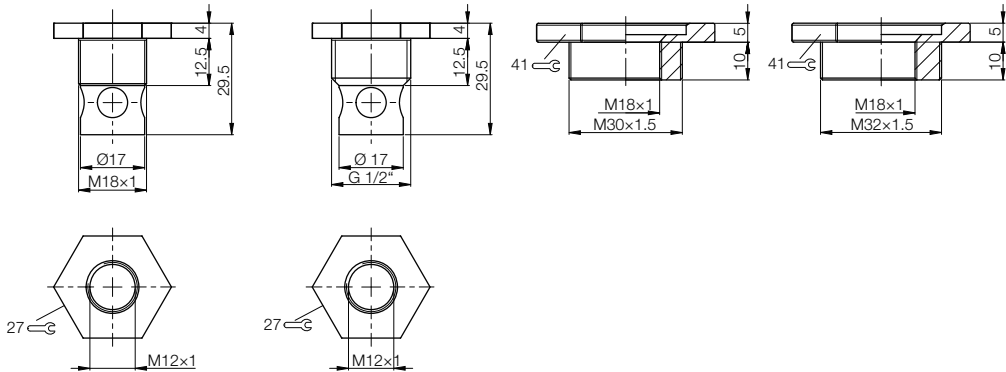


Accessories for Capacitive Sensors

Adapter



Description	Adapter for Micro-Level M12 to M18	Adapter for Micro-Level M12 to G 1/2"	Adapter for BCS S01/2/3 M18 to M30	Adapter for BCS S01/2/3 M18 to M32	
Ordering code	BAM018J	BAM018K	BAM018E	BAM018F	
Part number	BAM AD-XA-002-M12/M18-4	BAM AD-XA-002-M12/G1/2"-4	BAM AD-XA-001-M18/M30-4	BAM AD-XA-001-M18/M32x1,5-4	
Material	Stainless steel	Stainless steel	Stainless steel	Stainless steel	
Ambient temperature T _a					
Connection					

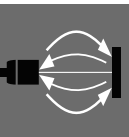


Accessories for Capacitive Sensors

Adapter



Adapter for BCS S01/2/3 M18 to R 1"	Adapter for BCS S01/2/3 M16 to M12	Cable adapter for capacitive mini-sensors	Cable adapter for capacitive mini-sensors	Cable adapter for capacitive mini-sensors
BAM018H	BCC04JT	BCC04JU	BCC04JY	BCC04JZ
BAM AD-XA-001-M18/R1"-4	BCC M454-0000-2A-RM004-020	BCC Z001-002	BCC Z002-030	BCC Z002-080
Stainless steel	MS-Ni/PA -30...+70 °C 0.2 m PVC cable, 3x0.25 mm²	0.2 m PUR cable	3 m PUR cable	8 m PUR cable



Capacitive
Sensors

Capacitive
Sensors for
Object
Detection

Capacitive
Sensors for
Level
Detection

Capacitive
Sensors with
Special
Properties

Capacitive Sen-
sors for Analog
Distance
Measurement

Accessories
for Capacitive
Sensors

Sensor
Amplifiers

Sensor
Downstream
Switching
Devices

Adapter

