SmartLevel sensors exceed limits

Simply describing the output of SmartLevel sensors as level sensors for reliable sensing of liquids and conductive media does not do its strengths justice. This is because SmartLevel can do much more – exactly when all other capacitive sensors reach their limit: SmartLevel sensors compensate for moisture, foam and deposits, penetrate wall thicknesses of glass and plastic even over 10 mm, detect aqueous to strongly conductive media, and have a chemically resistant housing made of PTFE. In short: SmartLevel sensors transcend boundaries. This is because they are the solution in applications that, until now, were extremely difficult.

SmartLevel sensors also reduce costs, since they can be installed without adjustment, can be used in most applications without cleaning, and require only minimal design effort (for example, omitting bypass tubes).

In this way, SmartLevel sensors optimize the production process and increase the application security.

SmartLevel sensors take off

Airbus is equipping the restrooms in its 4-engine large-body A380 with a mixer tap. The heart of this exclusive system in the elegant Airbus design are compact SmartLevel capacitive sensors. These enable passengers to conveniently select the desired water temperature with the assistance of an LED indicator. The special attraction: Sensing errors are impossible, since SmartLevel sensors ignore clinging dirt, liquid films and soap foam all on their own. Touching the faucet triggers a switching operation, even if a wet paper towel covers it.

Capacitive Sensors for Level Detection

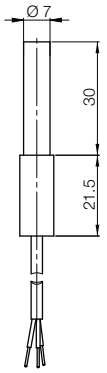
SMART*LEVEL*, cylinder design, DC 3-wire, Ø 7 mm, M18×1

SMART*LEVEL* 15

Size		**Ø 7×52 mm**
Mounting type		Not flush
Rated switching distance s_n		**Fixed adjustment, media-dependent**
PNP, NO	**Ordering code**	**BCS009C**
	Part number	BCS S20TT01-PSLFAG-ET02
PNP, NC	**Ordering code**	**BCS009E**
	Part number	BCS S20TT01-POLFAG-ET02
NPN, NO	**Ordering code**	**BCS009F**
	Part number	BCS S20TT01-NSLFAG-ET02
NPN, NC	**Ordering code**	**BCS009H**
	Part number	BCS S20TT01-NOLFAG-ET02
Supply voltage U_S		10…30 V DC
Voltage drop U_d at I_e		≤ 1.5 V
Rated insulation voltage U_i		75 V DC
Output current max.		50 mA
No-load supply current I_0 max.		≤ 20 mA
Polarity reversal protected/transposition protected/short-circuit protected		No/No/No
Ambient temperature T_a		+5…+100 °C
Switching frequency f		10 Hz
Output function indicator		No
Degree of protection as per IEC 60529		IP 66
Material	Housing	PTFE
	Sensing surface	PTFE
	Cover	PTFE
Connection		2 m PTFE cable, 3×0.2 mm²

Wiring diagrams, see page 971.

Additional cable lengths on request.



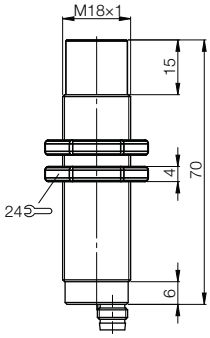

SMART*LEVEL* 15

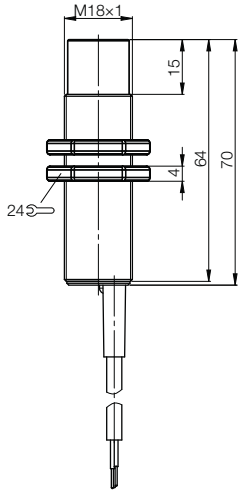

SMART*LEVEL* 15

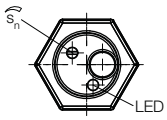
Size		**M18×1**	**M18×1**
Mounting type		Not flush	Not flush
Rated switching distance s_n		**Media-dependent**	**Media-dependent**
PNP, NO	**Ordering code**	**BCS008T**	**BCS007N**
	Part number	BCS M18VVN-PSCFAG-S49G	BCS M18VVI1-PSCFAG-DV02
PNP, NC	**Ordering code**	**BCS008U**	**BCS007P**
	Part number	BCS M18VVN-POCFAG-S49G	BCS M18VVI1-POCFAG-DV02
PNP, NO/NC,can be coded	**Ordering code**		
	Part number		
NPN, NO	**Ordering code**	**BCS008W**	**BCS007R**
	Part number	BCS M18VVN-NSCFAG-S49G	BCS M18VVI1-NSCFAG-DV02
NPN, NC	**Ordering code**	**BCS008Y**	**BCS007T**
	Part number	BCS M18VVN-NOCFAG-S49G	BCS M18VVI1-NOCFAG-DV02
NPN, NO/NC, can be coded	**Ordering code**		
	Part number		
Supply voltage U_S		10…35 V DC	10…35 V DC
Voltage drop U_d at I_e		≤ 1.8 V	≤ 1.8 V
Rated insulation voltage U_i		75 V DC	75 V DC
Output current max.		300 mA	300 mA
No-load supply current I_0 max.		≤ 20 mA	≤ 20 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		–10…+60 °C	–10…+60 °C
Switching frequency f		2 Hz	2 Hz
Output function indicator		Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 64	IP 64
Material	Housing	PVC	PVC
	Sensing surface	PVC	PVC
	Cover	PVC	PVC
Connection		M8 connector, 3-pin	2 m PVC cable, 3×0.25 mm²

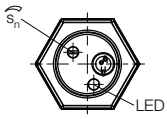
Wiring diagrams, see page 971.

Additional cable lengths on request.









For direct installation in containers: The non-flush mount sensors for level detection M12...M30 in plastic or PTFE housing provide IP 68 protection (at approx. 5 bar) at the sensing face. Sensors in stainless steel housing meet IP 67 at the sensing surface.

Capacitive Sensors for Level Detection
SMART*LEVEL*, cylinder designs, DC 3-wire, M18×1, M30×1.5

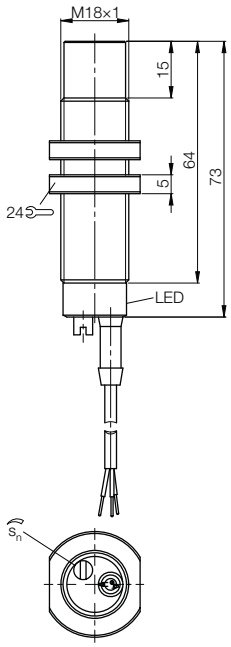

SMART*LEVEL* 15

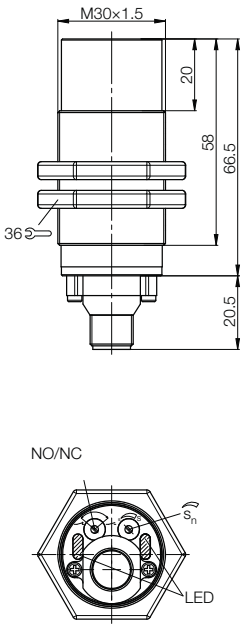

SMART*LEVEL* 15

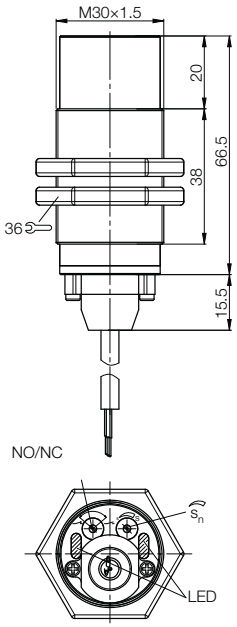

SMART*LEVEL* 15

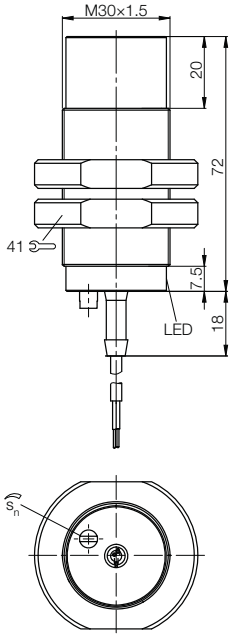

SMART*LEVEL* 15

M18×1	**M30×1.5**	**M30×1.5**	**M30×1.5**
Not flush	Not flush	Not flush	Not flush
Media-dependent	**Media-dependent**	**Media-dependent**	**Media-dependent**
BCS008A			**BCS0086**
BCS M18TTI2-PSCFAG-AT02			BCS M30TTH2-PSCFAG-AT02
BCS008C			**BCS0087**
BCS M18TTI2-POCFAG-AT02			BCS M30TTH2-POCFAG-AT02
	BCS007Y	**BCS007U**	
	BCS M30BBM2-PPCFAG-S04G	BCS M30BBM3-PPCFAG-EP02	
BCS008E			**BCS0088**
BCS M18TTI2-NSCFAG-AT02			BCS M30TTH2-NSCFAG-AT02
BCS008F			**BCS0089**
BCS M18TTI2-NOCFAG-AT02			BCS M30TTH2-NOCFAG-AT02
	BCS007Z	**BCS007W**	
	BCS M30BBM2-NPCFAG-S04G	BCS M30BBM3-NPCFAG-EP02	
10…35 V DC	10…35 V DC	10…35 V DC	10…35 V DC
≤ 1.8 V	≤ 1.8 V	≤ 1.8 V	≤ 1.8 V
75 V DC	75 V DC	75 V DC	75 V DC
300 mA	300 mA	300 mA	300 mA
≤ 20 mA	≤ 20 mA	≤ 20 mA	≤ 20 mA
Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
–10…+60 °C	–10…+60 °C	–10…+60 °C	–10…+60 °C
2 Hz	2 Hz	2 Hz	2 Hz
Red LED	Green LED/Yellow LED	Green LED/Yellow LED	No/Red LED
IP 64	IP 64	IP 64	IP 64
PTFE	PBT	PBT	PTFE
PTFE	PBT	PBT	PTFE
PTFE	PBT, PE	PBT, PE	PTFE
2 m PTFE cable, 3×0.2 mm²	M12 connector, 4-pin, A-coded	2 m PUR cable, 3×0.34 mm²	2 m PTFE cable, 3×0.2 mm²









Capacitive Sensors for Level Detection

SMART*LEVEL*, cylinder designs, DC 3-wire, M12×1, G¼", NPT¼" MicroLevel

SMART*LEVEL* 15

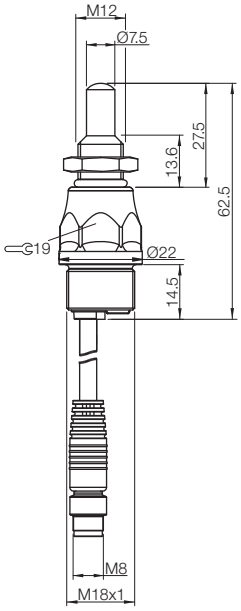
SMART*LEVEL* 15

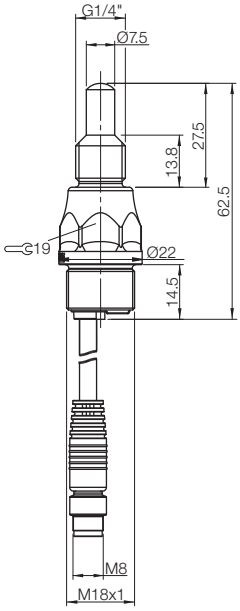
Size			**M12×1**	**G¼"**
Mounting type			Not flush	Not flush
Rated switching distance s_n			**Level adjustable**	**Level adjustable**
PNP/NPN and NO/NC user selectable	**Ordering code**			
	Part number			
PNP, NO	**Ordering code**		**BCS0105**	**BCS0109**
	Part number		BCS S44KK01-PSCFAG-EP00,3-GS49	BCS S44KK02-PSCFAG-EP00,3-GS49
PNP, NC	**Ordering code**		**BCS0106**	**BCS010A**
	Part number		BCS S44KK01-POCFAG-EP00,3-GS49	BCS S44KK02-POCFAG-EP00,3-GS49
NPN, NO	**Ordering code**		**BCS0107**	**BCS010C**
	Part number		BCS S44KK01-NSCFAG-EP00,3-GS49	BCS S44KK02-NSCFAG-EP00,3-GS49
NPN, NC	**Ordering code**		**BCS0108**	**BCS010E**
	Part number		BCS S44KK01-NOCFAG-EP00,3-GS49	BCS S44KK02-NOCFAG-EP00,3-GS49
Supply voltage U_S			10…30 V DC	10…30 V DC
Voltage drop U_d at I_e			≤ 2 V	≤ 2 V
Rated insulation voltage U_i			75 V DC	75 V DC
Output current max.			50 mA	50 mA
No-load supply current I_0 max.			≤ 11 mA	≤ 11 mA
Polarity reversal protected/transposition protected/short-circuit protected			Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a			–5…+105 °C (sensing surface)	–5…+105 °C (sensing surface)
Switching frequency f			10 Hz	10 Hz
Supply voltage/output function indicator			Green LED/Yellow LED	Green LED/Yellow LED
Degree of protection as per IEC 60529			IP 67 (sensing surface: IP 68)	IP 67 (sensing surface: IP 68)
Material	Housing		PEEK	PEEK
	Sensing surface		PEEK	PEEK
	Cover		PA 12	PA 12
Connection			0.3 m PUR cable with M8 connector, 3-pin	0.3 m PUR cable with M8 connector, 3-pin

Wiring diagrams, see page 971.

Additional cable lengths on request.

Reverse mounting in a tube of any desired length for fashioning "point-switching" rod sensors. The sealing can be done with an O-ring or with a flat seal.





Capacitive Sensors for Level Detection

SMART*LEVEL*, cylinder designs, DC 3-wire, M12×1, G¼", NPT¼" MicroLevel

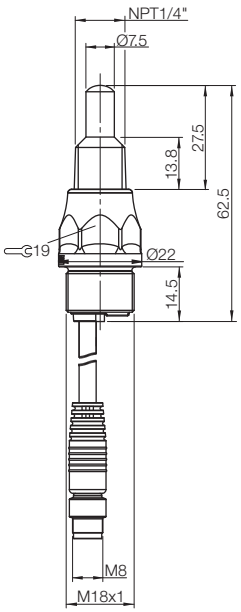
SMART*LEVEL* 15

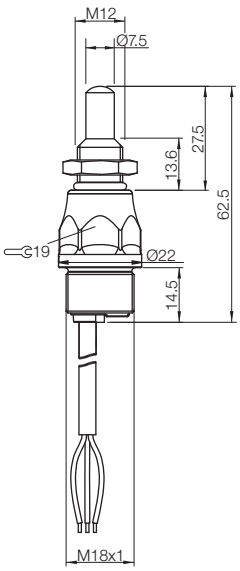
SMART*LEVEL* 15

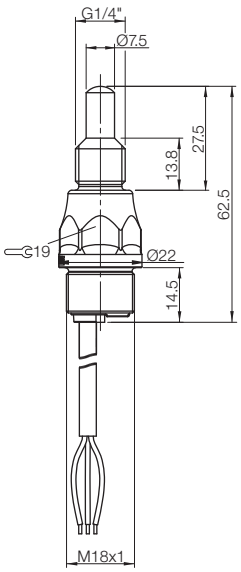
SMART*LEVEL* 15

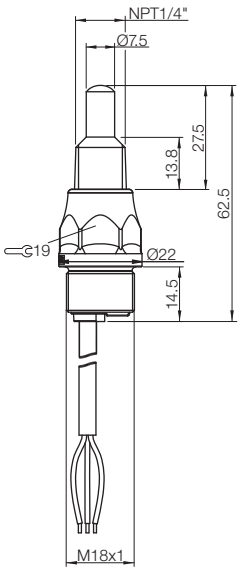
SMART*LEVEL* 15

NPT¼"	**M12×1**	**G¼"**	**NPT¼"**
Not flush	Not flush	Not flush	Not flush
Level adjustable	**Level adjustable**	**Level adjustable**	**Level adjustable**
	BCS010L	**BCS010M**	**BCS010N**
	BCS S44KK01-GPCFAG-EP02	BCS S44KK02-GPCFAG-EP02	BCS S44KK03-GPCFAG-EP02
BCS010F			
BCS S44KK03-PSCFAG-EP00,3-GS49			
BCS010H			
BCS S44KK03-POCFAG-EP00,3-GS49			
BCS010J			
BCS S44KK03-NSCFAG-EP00,3-GS49			
BCS010K			
BCS S44KK03-NOCFAG-EP00,3-GS49			
10…30 V DC	10…30 V DC	10…30 V DC	10…30 V DC
≤ 2 V	≤ 2 V	≤ 2 V	≤ 2 V
75 V DC	75 V DC	75 V DC	75 V DC
50 mA	50 mA	50 mA	50 mA
≤ 11 mA	≤ 11 mA	≤ 11 mA	≤ 11 mA
Yes/Yes/Yes	No/No/Yes	No/No/Yes	No/No/Yes
–5…+105 °C (sensing surface)	–5…+105 °C (sensing surface)	–5…+105 °C (sensing surface)	–5…+105 °C (sensing surface)
10 Hz	10 Hz	10 Hz	10 Hz
Green LED/Yellow LED	Green LED/Yellow LED	Green LED/Yellow LED	Green LED/Yellow LED
IP 67 (sensing surface: IP 68)	IP 67 (sensing surface: IP 68)	IP 67 (sensing surface: IP 68)	IP 67 (sensing surface: IP 68)
PEEK	PEEK	PEEK	PEEK
PEEK	PEEK	PEEK	PEEK
PA 12	PA 12	PA 12	PA 12
0.3 m PUR cable with M8 connector, 3-pin	2 m PUR cable, 3×0.34 mm²	2 m PUR cable, 3×0.34 mm²	2 m PUR cable, 3×0.34 mm²









Capacitive Sensors for Level Detection
SMART*LEVEL*, disk designs, DC 3-wire, Ø 50 mm

The ideal SmartLevel fill-level indicator is always put to good use when finding solutions for applications is more difficult, whether in the semiconductor industry, in special purpose machine manufacturing, in the food and packaging industries, or in industrial cleaning technology. SmartLevel 15 is suitable for conductive media. SmartLevel 50 is best used for highly conductive media.

Wafer processing (semiconductor industry)
During wafer processing, SmartLevel monitors the overflow of hydrochloric acid through a container wall, so that it can come into contact with condensate containing salt. The highly conductive deposit of the condensate does not, however, impede it.

Cold deformation (oil spraying system in special machine design)
Likewise, the SmartLevel ignores highly conductive graphite deposits when it reliably measures the level of an oil-graphite mixture through the wall of a plastic container in special machine construction. Through this, it is ensured that the mixture can be continuously sprayed on metal plates, in order to better be able to bend it during cold deformation.

Filling bottles of body lotion (packaging industry)
The SmartLevel is suited for querying conductive, paste-type media which can cause heavier deposits. Therefore, it is ideally used during filling of bottles of body lotion. Through a 10 mm-thick inspection glass, it monitors their fill level in stainless steel containers with absolute reliability and, through its external positioning, also reduces the effort for cleaning.

Brining pretzels (food industry)
SmartLevel also finds use directly in foaming media. For example, in the stainless steel container of a system in which pretzels are sprayed with caustic soda lye. In doing so, it controls the minimum-maximum fill level of the caustic soda lye with absolute reliability.

Cleaning metal parts (industrial cleaning technology)
SmartLevel controls the fill level of a supply tank for cleaning metal parts, because it can compensate for foam, grease and swarf. Water spray and temperatures up to 105 °C do not impede it. In addition, its PTFE sleeve protects it from aggressive media.

c UL us LISTED CE

Size		
Mounting type		
Rated switching distance s_n		
PNP, NO	**Ordering code**	
	Part number	
PNP, NC	**Ordering code**	
	Part number	
PNP, NO/NC,can be coded	**Ordering code**	
	Part number	
NPN, NO	**Ordering code**	
	Part number	
NPN, NC	**Ordering code**	
	Part number	
NPN, NO/NC, can be coded	**Ordering code**	
	Part number	
Supply voltage U_S		
Voltage drop U_d at I_e		
Rated insulation voltage U_i		
Output current max.		
No-load supply current I_0 max.		
Polarity reversal protected/transposition protected/short-circuit protected		
Ambient temperature T_a		
Switching frequency f		
Output function indicator		
Degree of protection as per IEC 60529		
Material	Housing	
	Sensing surface	
	Cover	
Connection		

Wiring diagrams, see page 971.

Additional cable lengths on request.

Capacitive Sensors for Level Detection
SMART*LEVEL*, disk designs, DC 3-wire, Ø 50 mm

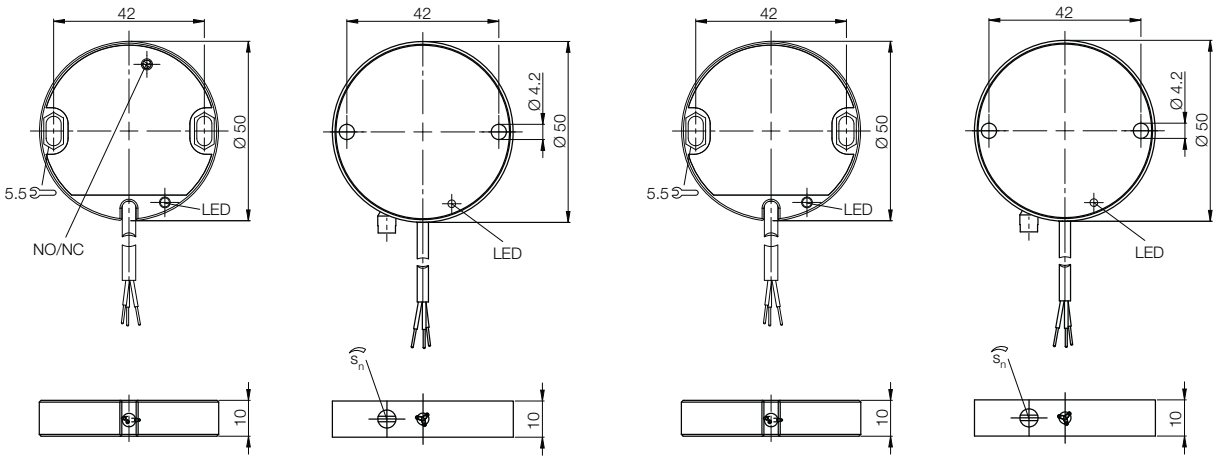
SMART*LEVEL* 15

SMART*LEVEL* 15

SMART*LEVEL* 50

SMART*LEVEL* 50

	Ø 50×10 mm	**Ø 50×10 mm**	**Ø 50×10 mm**	**Ø 50×10 mm**
	Flush	Flush	Flush	Flush
	Media-dependent	**Media-dependent**	**Media-dependent**	**Media-dependent**
		BCS0080	**BCS00CK**	**BCS00UW**
		BCS D50TT05-PSCFAC-ET02	BCS D50OO06-PSFSC-EV02	BCS D50TT06-PSCFSC-ET02
		BCS0081	**BCS00CM**	**BCS00UY**
		BCS D50TT05-POCFAC-ET02	BCS D50OO06-POFSC-EV02	BCS D50TT06-POCFSC-ET02
	BCS0084			
	BCS D50OO04-PPCFAC-EV02			
		BCS0082	**BCS00HE**	**BCS00W0**
		BCS D50TT05-NSCFAC-ET02	BCS D50OO06-NSFSC-EV02	BCS D50TT06-NSCFSC-ET02
		BCS0083	**BCS00C1**	**BCS00UZ**
		BCS D50TT05-NOCFAC-ET02	BCS D50OO06-NOFSC-EV02	BCS D50TT06-NOCFSC-ET02
	BCS0085			
	BCS D50OO04-NPCFAC-EV02			
	10…35 V DC	10…35 V DC	10…30 V DC	10…30 V DC
	≤ 1.8 V	≤ 1.8 V	≤ 1.8 V	≤ 1.8 V
	75 V DC	75 V DC	75 V DC	75 V DC
	300 mA	300 mA	300 mA	300 mA
	≤ 20 mA	≤ 20 mA	≤ 10 mA	≤ 10 mA
	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes	Yes/Yes/Yes
	–10…+60 °C	–10…+60 °C	–10…+60 °C	–10…+60 °C
	2 Hz	2 Hz	2 Hz	2 Hz
	Yellow LED	Red LED	Yellow LED	Red LED
	IP 67	IP 67	IP 67	IP 67
	POM	PTFE	POM	PTFE
	POM	PTFE	POM	PTFE
	POM	PTFE	POM	PTFE
	2 m PVC cable, 3×0.25 mm²	2 m PTFE cable, 3×0.2 mm²	2 m PVC cable, 3×0.25 mm²	2 m PTFE cable, 3×0.2 mm²



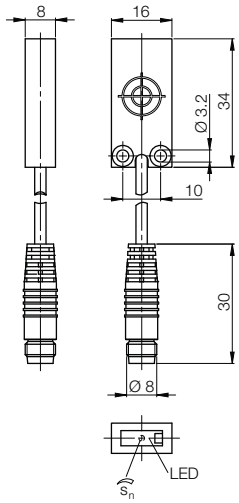
SMART*LEVEL* 15

SMART*LEVEL* 15

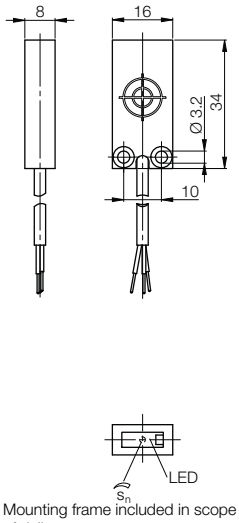
Size		**16×34×8 mm** MicroBox	**16×34×8 mm** MicroBox
Mounting type		Flush	Flush
Rated switching distance s_n		**Media-dependent**	**Media-dependent**
PNP, NO	**Ordering code**	**BCS008M**	**BCS008H**
	Part number	BCS R08RR01-PSMFAC-EP00,2-GS49	BCS R08RR01-PSMFAC-EP02
PNP, NC	**Ordering code**	**BCS008N**	**BCS008J**
	Part number	BCS R08RR01-POMFAC-EP00,2-GS49	BCS R08RR01-POMFAC-EP02
NPN, NO	**Ordering code**	**BCS008P**	**BCS008K**
	Part number	BCS R08RR01-NSMFAC-EP00,2-GS49	BCS R08RR01-NSMFAC-EP02
NPN, NC	**Ordering code**	**BCS008R**	**BCS008L**
	Part number	BCS R08RR01-NOMFAC-EP00,2-GS49	BCS R08RR01-NOMFAC-EP02
Supply voltage U_S		12…30 V DC	12…30 V DC
Voltage drop U_d at I_e		≤ 1.5 V	≤ 1.5 V
Rated insulation voltage U_i		75 V DC	75 V DC
Output current max.		50 mA	50 mA
No-load supply current I_0 max.		≤ 10 mA	≤ 10 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	Yes/Yes/Yes
Ambient temperature T_a		–30…+70 °C	–30…+70 °C
Switching frequency f		2 Hz	2 Hz
Output function indicator		Yellow LED	Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67
Material	Housing	PP	PP
	Sensing surface	PP	PP
	Cover	PP	PP
Connection		0.2 m PUR cable, 3×0.14 mm² with M8 connector, 3-pin	2 m PUR cable, 3×0.14 mm²

Wiring diagrams, see page 971.

Additional cable lengths on request.



Mounting frame included in scope of delivery



Mounting frame included in scope of delivery

Capacitive Sensors for Level Detection

SMARTLEVEL, block design, DC 3-wire, 40×40×10 mm Uniflat

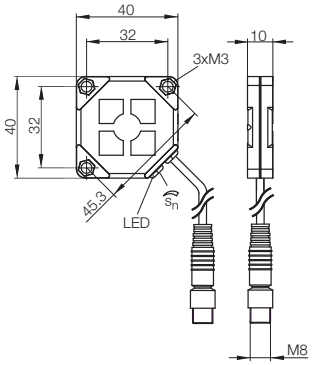
SMARTLEVEL 15

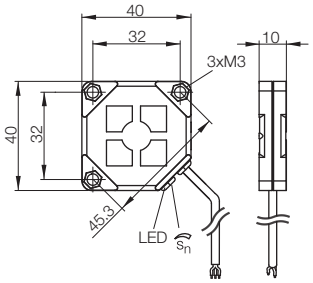
SMARTLEVEL 15

Size		**40×40×10 mm** Uniflat	**40×40×10 mm** Uniflat
Mounting type		Flush	Flush
Rated switching distance s_n		**Media-dependent**	**Media-dependent**
PNP/NPN and NO/NC, can be coded	**Ordering code**		**BCS00TP**
	Part number		BCS Q40BBAA-GPCFAC-EP02
PNP, NO	**Ordering code**	**BCS00U8**	
	Part number	BCS Q40BBAA-PSCFAC-EP00,3-GS49	
PNP, NC	**Ordering code**	**BCS00U7**	
	Part number	BCS Q40BBAA-POCFAC-EP00,3-GS49	
Supply voltage U_S		10...30 V DC	10...30 V DC
Voltage drop U_d at I_e		≤ 2.5 V	≤ 2.5 V
Rated insulation voltage U_i		75 V DC	75 V DC
Output current max.		100 mA	100 mA
No-load supply current I_0 max.		≤ 11 mA	≤ 11 mA
Polarity reversal protected/transposition protected/short-circuit protected		Yes/Yes/Yes	No/No/Yes
Ambient temperature T_a		–5...+85 °C	–5...+85 °C
Switching frequency f		10 Hz	10 Hz
Supply voltage/output function indicator		Green LED/Yellow LED	Green LED/Yellow LED
Degree of protection as per IEC 60529		IP 67	IP 67
Material	Housing	PBT	PBT
	Sensing surface	PBT	PBT
	Cover	PBT	PBT
Connection		0.3 m PUR cable with M8 connector, 3-pin	2 m PUR cable, 3×0.14 mm²

Wiring diagrams, see page 971.

Additional cable lengths on request.





The new capacitive SmartLevel sensors in the Uniflat design detect conductive media through non-metallic container walls with a thickness up to 10 mm extremely reliably.
Their installation is quick and easy. This is because they can be screwed on or attached to bypass tubes with cable ties. Their connection is made using a 2 m cable or a short pigtail line and an M8 plug.
The codable output function provides PNP or NPN and normally open or normally closed functionality.

SmartLevel
- Suppress foam and deposits
- Adjustment-free installation
- Are easy to install on tubes with cable ties
- Regular cleaning can be omitted