

Capacitive
Sensors

Capacitive Sensor Selection Guide



Embeddable/Nonembeddable Rectangular				
Housing	5.5 mm	8 mm	10 mm	14 mm
Sensing Range	5 - 10 mm	5 mm	8 mm	10-15 mm
Pages	G17	G17	G19	G19



Embeddable/Nonembeddable Metal Barrel			
Housing	12 mm	18 mm	30 mm
Sensing Range	3 mm	5 mm	10 mm
Pages	G29	G31	G37 - G40

Capacitive Sensor Selection Guide



Embeddable/Nonembeddable Rectangular				
Housing	20 mm	20 mm	40 mm	80 mm
Sensing Range	10-20 mm	10-20 mm	20-30 mm	50 mm
Pages	G21 - G24	G25	G27	G27



Embeddable/Nonembeddable Plastic Barrel					
Housing	12 mm	18 mm	30 mm	34 mm	40
Sensing Range	3-4.5 mm	5-7.5 mm	10-15 mm	15 - 23 mm	20-30 mm
Pages	G29	G33 - G36	G41 - G46	G47 - G50	G49

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Capacitive Sensor Part Number Key

B C 10			K 40 SR			F Z 3 X2			Wiring Option*	Special Option Code*	
Mounting						Number of LEDs					
B = embeddable						(blank) = no LED's					
N = nonembeddable						X = 1 LED					
						X2 = 2 LED's					
Principle of Operation						Voltage Range					
C = capacitive						AC/DC: (No SCP**)					
CC = capacitive (low dielectric targets)						3 = 20-250VAC					
CF = capacitive (noise immune)						DC:					
						4 = 10-65 VDC, polarity protected, pulsed SCP**					
						6 = 10-30 VDC, polarity protected, pulsed SCP					
						**SCP = short-circuit and overload protection					
Rated Operating Distance (mm)						Output					
						N = NPN transistor (current sinking)					
						P = PNP transistor (current sourcing)					
						Z = 2-wire AC					
Housing Style						Output Function					
Barrel - Metal						A = normally open (N.O.)					
M = partial threading, chrome plated brass						F = connection programmable (N.O. or N.C.)					
Barrel - Plastic						R = normally closed (N.C.)					
K = smooth						V = complementary outputs: one N.O., one N.C.					
KT = PVDF, Smooth						Y0 = NAMUR output, requires switching amplifier					
P = full threading						Y1 = NAMUR output, requires switching amplifier					
PT = PVDF, full threading											
S = partial threading											
Rectangular											
Q = metal or plastic, various rectangular styles											
QF = plastic, Polypropylene rectangular style											
Housing Diameter or Height (mm)						Secondary Barrel Modifier					
						SR = straight terminal chamber					

Wiring Options

A) Connectorized Sensor

BC10-M30-AP4X-

H1 1 4 1

Connector Family

B1 = *minifast*®, Metal, Male
B2 = *minifast*®, Plastic, Male
B3 = *microfast*®, Metal, Male
H1 = *eurofast*®, Metal or Plastic, Male
V1 = *picofast*®, Metal, Male

Connector / Sensor Transition

1 = Straight

Factory Code

Example:
1 = Standard
3 = N.C. DC Output on Pin 4 (for US)

Number of Pins

B) Potted Cable

BC 5-S18-AP4X-

7M

Cable Length

Blank = 2 Meter cable
7M = 7 Meter cable

Capacitive

Special Option Codes

BC10-Q14-AP4X2-

/S..

Option Code

Example:
/S250 = No Potentiometer
/S400 = Rear LED's (for Q14 and Q20 only)

Capacitive Sensors

Package Inspection

One of the major benefits of capacitive sensors is their ability to sense through low-dielectric materials. With the sensitivity properly adjusted, these sensors can be used to “see through” an object wall to detect its contents.

From inspecting jars through a cardboard box to sensing ammonia in a vat - capacitive sensors are made for these applications. In addition, capacitive sensors have the ability to sense most materials including wood, plastics, cardboard, glass, grain, all metals and most fluids. The versatility of these sensors can help you save time and run more efficiently.



Grain and Plastic Pellet Detection

The wide sensitivity band of TURCK sensors allows for detection of a variety of granular or powdered materials. Capacitive sensors are widely used to monitor the level of plastic pellets in the hoppers of injection molding machines. TURCK's new BCC and BCF line of sensors are ideal for this application.

TURCK Intrinsically Safe NAMUR sensors are also used in grain elevators to monitor the levels of materials ranging from rice and barley malt to corn and soybeans.



Small Parts Detection

Another great use for capacitive sensors is to detect small items as they come down the assembly line. They can be used to count product or sense proper operation of the line. Choose from many styles with short-circuit and overload protection in AC, DC and Intrinsically Safe NAMUR.

Capacitive Sensors Work Where Others Don't!

TURCK presents... The industry's most extensive line of capacitive sensors

You may know that TURCK has the broadest product offering in inductive sensors, but did you also know that we have the most extensive line of capacitive sensors?

TURCK's Q-Pak™ capacitive sensors are available in packages up to 10 times narrower than conventional barrel-style sensors. Also our PVDF sensors offer incredible resistance to harsh chemical environments found in the semiconductor and chemical industries.

Liquid Level Detection

Capacitive sensors have the ability to "see through" lower dielectric materials, such as plastic or glass, to detect higher dielectric ones. This allows capacitive sensors to detect levels of many types of materials either directly through the wall for plastic tanks, or by utilizing a sight glass or tank well for metal tanks. With TURCK's Intrinsically Safe NAMUR sensors, PVDF models and PTFE® tank wells, even explosive or corrosive materials can be safely sensed.

Wire Break Detection

TURCK capacitive sensors are ideal for sensing wire breakage. Our sensors will detect even the smallest wires of any metal. The long sensing ranges allow the wire to bounce during the process without causing false outputs.

Capacitive Sensors

Sensitivity Adjustments

Many applications require adjusting the sensitivity of the capacitive sensor in order to reliably detect the target material. Although the potentiometer is factory set for an operating distance of 0.7 to 0.8 times the rated operating distance, it can be easily changed.

Most TURCK capacitive sensors are listed as embeddable. By increasing the sensitivity, the embeddable sensor can be changed into a non-embeddable version with enhanced sensing capabilities.



Noise Immunity

Capacitive sensors were originally designed for use in level detection applications in areas that were generally far away from other electrical equipment. As factory automation has become more prevalent throughout industrial markets, these capacitive sensors have gravitated into new environments where electrical noise levels are greatly increased. Electrical noise can be produced by various sources including variable frequency drives, electromechanical motors and standard walkie-talkie devices. These “noisy” environments can have adverse effects on sensing devices causing them to operate improperly and unreliably.

TURCK recognizes this and has developed a new circuit for its capacitive sensors. These new “BCF” sensors incorporate a **unique filter principle**, making them immune to most industrial noise. This principle involves a fixed oscillator frequency combined with a rectifier filter providing superior noise immunity over the competition.

TURCK’s **fixed oscillator** allows the sensor to maintain a constant frequency regardless of sensitivity adjustment. This fixed frequency is high enough to ignore most of the “standard” noise levels seen on plant floors.

Electrical noise is mostly symmetrical which makes it easier to identify and separate from the sensor’s input signal. The TURCK **rectifier filter** is able to block this noise allowing only the “useful” input signal, which is in phase with the oscillator frequency, to pass.

These two innovative electrical techniques give TURCK the best defense against industrial noise. The list of specifications and test results below demonstrates how TURCK meets or exceeds all of the rigid standards established by CE. In fact, the criteria set forth by CE is so stringent that most capacitive sensors offered on the market today cannot pass any or all of these testing requirements. If you have a capacitive sensor application located in a “noisy” environment choose the new “BCF” sensors from TURCK to ensure your process operates smoothly.

Test Type		CE “Product” Standard	CE “Generic” Standard	TURCK “BCF” Noise Immune Capacitive Sensors
Immunity to Electrostatic Discharge (ESD)	IEC 1000-4-2 EN 61000-4-2	4 kV Direct Contact 8 kV Airborne	4 kV Direct Contact 8 kV Airborne	8 kV Direct Contact 30 kV Airborne
Immunity to Radiated Electromagnetic Fields. Radio Frequency Interference (RFI)	IEC 1000-4-3 EN 61000-4-3	3 V/M 80-1000 MHz	10V/M 80-1000 MHz	15 V/M 80-1000 MHz
Immunity to Electrical Fast Transients (Burst-High Voltage)	IEC 1000-4-4 EN 61000-4-4	2000 V	2000 V	3000 V
Immunity to Conducted R.F. Voltage (Line coupled Noise)	IEC 1000-4-6 EN 61000-4-6	Undefined	10 V 150 kHz-80 MHz	>10 V 150 kHz-230 MHz
Immunity to Surges (lightning strike)	IEC 255-5	1kV, 500Ω DC	Undefined	1kV, 500Ω DC 5kV, 500Ω AC

Capacitive Sensors

Applications

- **Liquid Level Control** for both explosive and non-explosive materials.
- **Package Inspection** for product content and/or fill level.
- **Wire-Break Detection** for wire sizes down to .003".
- **Plastic Pellet Detection** in a hopper for injection molding processes.
- **Grain or Food Products Level Detection**; intrinsically safe models available.
- **Small Metal Parts Detection**; greater sensing range than comparable inductive sensors.

Operating Principle

The active element is formed by two metallic electrodes positioned much like an "opened" capacitor (Figure 1).

Electrodes A and B are placed in a feedback loop of a high frequency oscillator. When no target is present, the sensor's capacitance is low, therefore the oscillation amplitude is small. When a target approaches the face of the sensor, it increases the capacitance. This increase in capacitance results in an increased amplitude of oscillation.

The amplitude of oscillation is measured by an evaluating circuit that generates a signal to turn on or off the output (Figure 2).

Figure 1

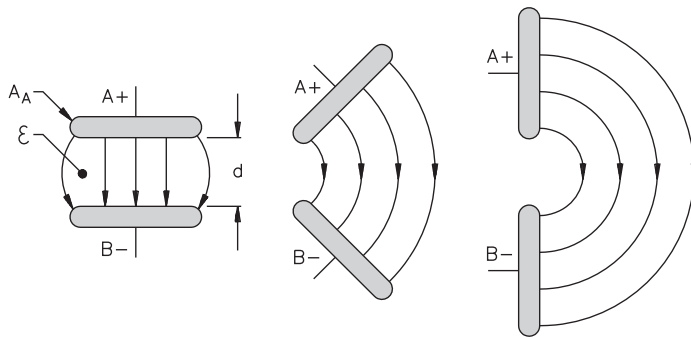
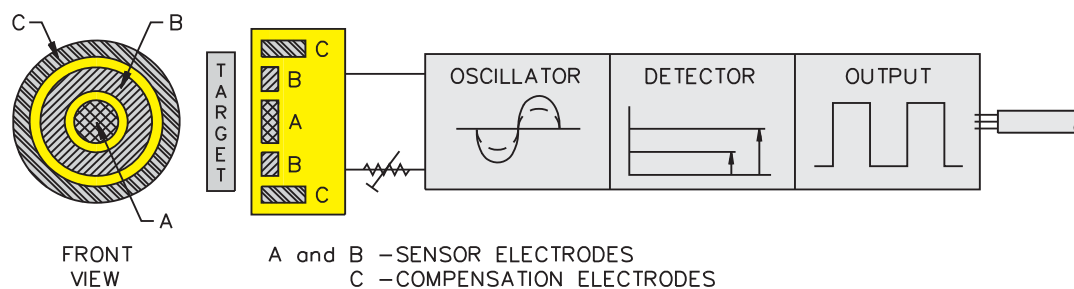


Figure 2



Operating Principle

Capacitance is a function of the surface area of either electrodes (A or B), the distance between the electrodes (d), and the dielectric constant of the material (ϵ) between the electrodes (Figure 1).

$$C = \frac{\epsilon \times A}{d}$$

C = capacitance of sensor
A = surface area of either electrode
d = distance between two electrodes
 ϵ = dielectric constant of material between the electrodes

When a **Conductive Target** enters the sensor's field, it forms a counter electrode to the active face of the sensor, thus decreasing the distance between the electrodes (d) and increasing their average surface area (Figure 3). The capacitance with a metal target present is always greater than the capacitance of the circuit in the absence of the target.

Reduction factors for different metals are not a consideration when using capacitive sensors.

Figure 3

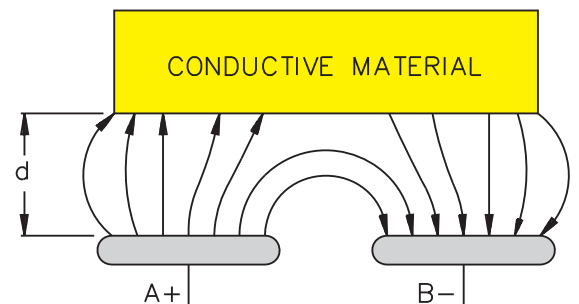
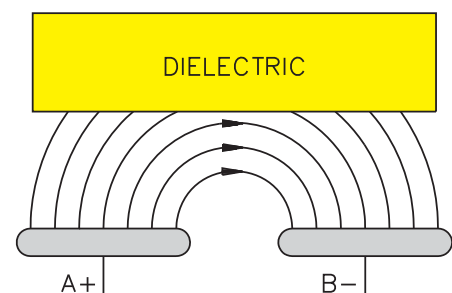


Figure 4



When a **Non-Conductive Target** enters the sensor's field, it acts as an electrical insulator between electrodes A and B (Figure 4).

The dielectric constant of the material (ϵ) is a measure of its insulation properties. All liquids and solids have a greater dielectric constant than air ($\epsilon_{\text{air}} = 1$). Therefore, the capacitance with a non-metallic target present is always greater than the capacitance of the circuit in the absence of the target.

Capacitive Sensors

Sensitivity Adjustment

Capacitive sensors can be adjusted two ways in order to sense a target consistently.

1. **Physical adjustment** - moving the sensor towards or away from the target is the preferred method of adjusting sensitivity when the sensor is not in direct contact with the target. This allows materials to be moved into or out of range while leaving the sensor at the factory setting or after re-calibration to the nominal operating distance S_n .
2. **Adjustment of the potentiometer** - turning the potentiometer in a clockwise direction increases the sensitivity of the sensor. The potentiometer is factory-set for an operating distance of 0.7 to 0.8 S_n to a grounded standard target (Figure 5). It should be adjusted in increments of no greater than a quarter-turn (Figure 6). Increasing the sensitivity results in a greater operating distance to both conductive and non-conductive targets.

Figure 5

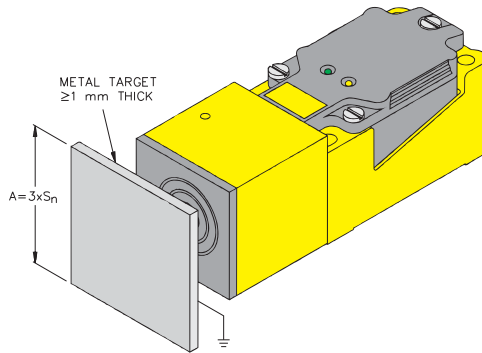
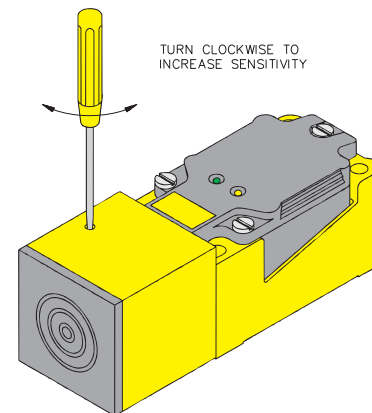


Figure 6



When sensing non-conductive targets, the larger the dielectric constant of a material, the greater the achievable operating distance (Figure 7). Adjusting the potentiometer affects the total curve; for example, if the potentiometer is adjusted for less sensitivity, it will have less operating distance to all materials.

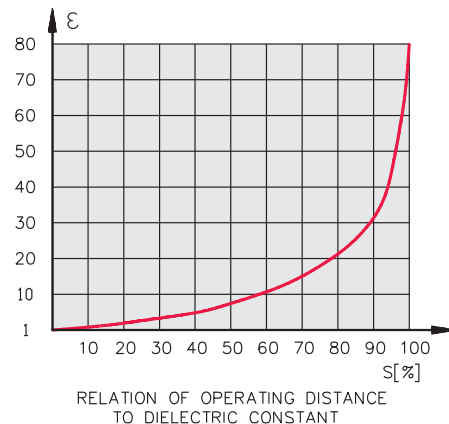
In general terms, the larger the dielectric constant of a material, the greater the achievable operating distance.

When detecting organic materials the sensing distance will depend largely on the water content ($\epsilon_{\text{water}} = 88$).

It should be noted that a large increase in sensitivity will cause the sensor to become nonembeddable, and may result in an unstable switching point that can be influenced by environmental changes such as temperature, humidity, dust, etc.

At adjustments of $S > S_n$, the differential travel (hysteresis) can also increase.

Figure 7



Example Application 1 - Adjustment

Problem:

Can a BC20-K40SR-FZ3X2 be used to sense the presence of ammonia from behind a .125" glass panel?

Solution:

The dielectric constants for these materials can be found on pages 15 and 16.

Dielectric (ϵ_r) of ammonia:	20
Dielectric (ϵ_r) of glass:	10

From Figure 7, $\epsilon_r = 20$ corresponds to 80% Sn; $\epsilon_r = 10$ corresponds to 60% Sn.

Since Sn = 20 mm for a BC20:	S for ammonia = 16 mm
	S for glass = 12 mm

The difference is 4 mm. The glass thickness = .125", or 3.1 mm. This application will work with a 0.9 mm margin. This means that by adjusting the potentiometer there should be a reasonable distinction between the glass and the ammonia as seen by the sensor.

To set up the sensor for this application, the sensing face of the sensor should be flush against the sight glass.

1. With no ammonia present (if possible) turn the potentiometer clockwise until the sensor turns on. If the sensor is already on, skip step one.
2. Next, turn the potentiometer counter clockwise until the sensor turns off.
3. Now add the ammonia so that it covers the glass panel.
4. Once again, turn the potentiometer counter clockwise, *counting the number of turns* until the sensor turns off.*
5. Divide the number of turns by two and turn the potentiometer back clockwise that amount.

Using this process will allow for a margin of error in either direction. If this application had called for something other than ammonia, like molasses, that tends to leave buildup behind, step 1 above should be performed *with the buildup present (if possible)*.

* If sensor does not turn off after 10 full turns, turn back the potentiometer clockwise between 3 to 5 turns. Minor adjustments may need to be made to achieve desired setting.

Example Application 2 - Mounting

Problem:

A metal tank containing a water-based solution has a 1" outside diameter sight glass. What sensor and bracket could be used for monitoring the liquid level?

Solution:

The QF 5.5 flat style can be used on non-conductive tubing up to 1.0 inch in diameter with the standard mounting straps provided with the sensor (Figure 8).

Other mounting straps for larger diameters are available upon request (consult factory).

Figure 8



Dielectric Constants of Industrial Products

Material	Dielectric Constant
ABS resin, pellet	1.5 - 2.5
Acetic Acid	4.1
Acetone	19.5
Acetyl bromide	16.5
Acrylic resin	2.7 - 4.5
Air	1.0
Alcohol, industrial	16 - 31
Alcohol, isopropyl	18.3
Ammonia	15 - 25
Aniline	5.5 - 7.8
Aqueous solutions	50 - 80
Asbestos	3.0
Ash (fly)	1.7
Bakelite	3.6
Barley powder	3.0 - 4.0
Benzene	2.3
Benzyl acetate	5
Butane	1.4
Cable sealing compound	2.5
Calcium carbonate	9.1
Carbon Dioxide	1.6
Carbon tetrachloride	2.2
Celluloid	3.0
Cellulose	3.2 - 7.5
Cement	1.5 - 2.1
Cement powder	5 - 10
Cereal	3 - 5
Charcoal	1.2 - 1.8
Chlorine, liquid	2.0
Coke	1.1 - 2.2
Corn	5 - 10
Ebonite	2.7 - 2.9

Material	Dielectric Constant
Epoxy resin	2.5 - 6
Ethanol	24
Ethyl bromide	4.9
Ethylene Chloride	10.5
Ethylene Dichloride	11.0
Ethylene glycol	38.7
Ethylene Oxide	14.0
Ferrous Oxide	14.2
Fired Ash	1.5
Flour	2.5 - 3.0
Formic Acid	59.0
Freon® R22 & 502, liquid	6.1
Gasoline	2.2
Glass	3.1 - 10
Glass, raw material	2.0 - 2.5
Glycerine	47
Hexane	1.9
Hydrochloric Acid	4.6
Hydrogen cyanide	95.4
Hydrogen peroxide	84.2
Ice, -5C	2.85
Ice, -18C	3.16
Isobutylamine	4.5
Lime, shell	1.2
Marble	8.0 - 8.5
Melamine resin	4.7 - 10.2
Methane, liquid	1.7
Methanol	33.6
Mica, white	4.5 - 9.6
Milk, powdered	3.5 - 4
Nitrobenzene	36
Neoprene	6 - 9

Dielectric Constants of Industrial Products

Material	Dielectric Constant
Nylon	4 - 5
Oil, for transformer	2.2 - 2.4
Oil, paraffin	2.2 - 4.8
Oil, peanut	3.0
Oil, petroleum	2.1
Oil, soybean	2.9 - 3.5
Oil, turpentine	2.2
Paint	5 - 8
Paraffin	1.9 - 2.5
Paper	1.6 - 2.6
Paper, hard	4.5
Paper, oil saturated	4.0
Perspex	3.2 - 3.5
Petroleum	2.0 - 2.2
Phenol	9.9 - 15
Phenol resin	4.9
Polyacetal (Delrin®)	3.6
Polyamide (nylon)	2.5
Polycarbonate	2.9
Polyester resin	2.8 - 8.1
Polyethylene	2.3
Polypropylene	2.0 - 2.3
Polystyrene	3.0
Polyvinyl Chloride resin	2.8 - 3.1
Porcelain	4.4 - 7
Press board	2 - 5
Propane, liquid	1.6
Propylene, liquid	11.9
Quartz glass	3.7
Rice, dry	3.5

Material	Dielectric Constant
Rubber	2.5 - 35
Salt	6.0
Sand	3 - 5
Shellac	2.0 - 3.8
Silicon dioxide	4.5
Silicone rubber	3.2 - 9.8
Silicone varnish	2.8 - 3.3
Soybean	2.8
Styrene resin	2.3 - 3.4
Sugar	3.0
Sugar, granulated	1.5 - 2.2
Sulfur	3.4
Sulfuric acid	84
Teflon®, PCTFE	2.3 - 2.8
Teflon, PTFE	2.0
Toluene	2.3
Trichloroethylene	3.4
Urea resin	6.2 - 9.5
Urethane	3.2
Vaseline	2.2 - 2.9
Vinyl Chloride	2.8
Water	48 - 88
Wax	2.4 - 6.5
Wood, dry	2 - 7
Wood, pressed board	2.0 - 2.6
Wood, wet	10 - 30
Xylene	2.4
Zinc Oxide	1.7
Zirconium Oxide	12.5
Zirconium Silicate	5.0

Capacitive Sensors

Temperature and Environmental Conditions

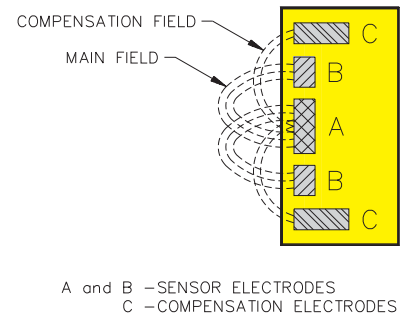
Compensation Electrode

In practice, sensors can be affected by water droplets, humidity, dust, etc., causing false outputs. To combat this effect each TURCK sensor incorporates a compensating electrode (C) which forms part of a negative feedback circuit (Figure 9).

When contaminants are on the sensor face, they affect the sensor's main field, as well as its compensation field. The negative feedback circuit detects the increase in both fields, and can filter out the effects of the contaminants.

When a large target comes into the sensor's main field, the compensation field is not affected, thus the negative feedback circuit can distinguish a difference between the two fields, and the sensor generates an output.

Figure 9

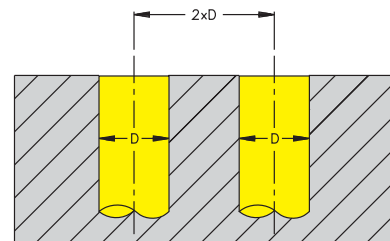


Mounting

Most capacitive sensors manufactured by TURCK are embeddable, which ensures that the electric field is only effective in front of the active face. They are suitable for flush mounting at the factory setting in any material (conductive & nonconductive).

When sensors are flush mounted, the effect on the operating distance is minimal and can be overcome by adjustment of the potentiometer. Minimum separation distances must be observed to avoid the possibility of interference between the two sensors' fields (Figure 10).

Figure 10



Operating Distance (Sensing Range) Considerations

The operating distance (S) of the different models is basically a function of the diameter of the sensing coil. Maximum operating distance is achieved with the use of a standard or larger target. Rated operating distance (S_n) for each model is given in the manual.

Standard Target

An earth-grounded square piece of carbon steel having a thickness of 1 mm (0.04 in) is used as a standard target to determine the following operating tolerances. The length and width of the square is equal to three times the rated operating distance.

Operating Distance = S

The operating distance is the distance at which the target approaching the sensing face along the reference axis causes the output signal to change.

Rated Operating Distance = S_n

The rated operating distance is a conventional quantity used to designate the operating distance. It does not take into account either manufacturing tolerances or variations due to external conditions such as voltage and temperature. (Figure 10)

Effective Operating Distance = S_r $0.9 S_n \leq S_r \leq 1.1 S_n$

The effective operating distance is the operating distance of an individual proximity sensor at a constant rated voltage and 23°C (73°F). It allows for manufacturing tolerances.

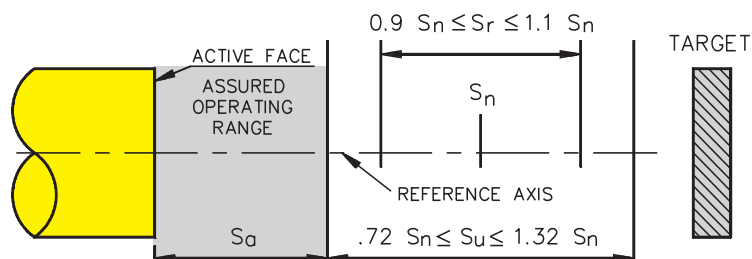
Usable Operating Distance = S_u $0.72 S_n \leq S_u \leq 1.32 S_n$

The usable operating distance is the operating distance of an individual proximity sensor measured over the operating temperature range at 85% to 110% of its rated voltage. It allows for external conditions and for manufacturing tolerances.

Assured Operating Range = S_a $0 \leq S_a \leq 0.72 S_n$

The assured actuating range is between 0 and 72% of the rated operating distance. It is the range within which the correct operation of the proximity sensor under specified voltage and temperature ranges is assured. (Figure 11)

Figure 11



TURCK

Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
5.5 mm - Embeddable, Potted-In Cable 	BC 5-QF5.5-AN6X2/S250	S2620120	No Potentiometer	5	5	3-Wire DC NPN
	BC10-QF5.5-AN6X2	S2620121		10	10	
	BC10-QF5.5-AN6X2/S250	S2620119	No Potentiometer	10	10	
	BC10-QF5.5-RN6X2			10	10	
	BC10-QF5.5-RN6X2/S250		No Potentiometer	10	10	
	BC 5-QF5.5-AP6X2/S250	S2620116	No Potentiometer	5	5	3-Wire DC PNP
	BC 5-QF5.5-RP6X2/S250		No Potentiometer	5	5	
	BC10-QF5.5-AP6X2	S2620117		10	10	
	BC10-QF5.5-AP6X2/S250	S2620115	No Potentiometer	10	10	
	BC10-QF5.5-RP6X2		Normally Closed	10	10	
	BC10-QF5.5-RP6X2/S250		No Potentiometer	10	10	
	BC 5-QF5.5-Y1X/S250	S2030000	No Potentiometer	5	5	2-Wire DC NAMUR
5.5 mm - Embeddable, Potted-In Cable, w/Potentiometer Cover 	BC10-QF5.5-AN6X2/S932	S2620137	Covered Pot.	10	10	3-Wire DC NPN
	BC10-QF5.5-RN6X2/S932	S2620140	Covered Pot.	10	10	
	BC10-QF5.5-AP6X2/S932	S2620109	Covered Pot.	10	10	3-Wire DC PNP
	BC10-QF5.5-RP6X2/S932	S2620141	Covered Pot.	10	10	
8 mm - Embeddable, Potted-In Cable 	BC 5-Q08-AN6X2/S250	S2620100	No Potentiometer	5	5	3-Wire DC NPN
	BC 5-Q08-AP6X2/S250	S2620000	No Potentiometer	5	5	3-Wire DC PNP
8 mm - Embeddable, picofast® Connector 	BC 5-Q08-AN6X2-V1131/S250	S2621100	No Potentiometer	5	5	3-Wire DC NPN
	BC 5-Q08-AP6X2-V1131/S250	S2621000	No Potentiometer	5	5	3-Wire DC PNP

"/S250" designates without potentiometer.

"/S932" designates Covered potentiometer.

Level Sensors - Capacitive

Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Material	Face/ Front Cap	Power LED	Output LED	Mating Cord, Cable Length/ Jacket	Wiring Diagram #	Wiring Diagrams
10-30 VDC	100	≤200	-25 to +70	IP67	PP	PP	GN	YE	2M/TPU	1	Diagram 1
	100	≤200	-25 to +70	IP67	PP	PP	GN	YE	2M/TPU	1	
	100	≤200	-25 to +70	IP67	PP	PP	GN	YE	2M/TPU	1	
	100	≤200	-25 to +70	IP67	PP	PP	GN	YE	2M/TPU	5	
	100	≤200	-25 to +70	IP67	PP	PP	GN	YE	2M/TPU	5	
10-30 VDC	100	≤200	-25 to +70	IP67	PP	PP	GN	YE	2M/TPU	2	Diagram 2
	100	≤200	-25 to +70	IP67	PP	PP	GN	YE	2M/TPU	6	
	100	≤200	-25 to +70	IP67	PP	PP	GN	YE	2M/TPU	2	
	100	≤200	-25 to +70	IP67	PP	PP	GN	YE	2M/TPU	2	
	100	≤200	-25 to +70	IP67	PP	PP	GN	YE	2M/TPU	6	
	100	≤200	-25 to +70	IP67	PP	PP	GN	YE	2M/TPU	6	
5-30 VDC	100	Remote	-25 to +70	IP67	PP	PP	N/A	YE	2M/TPU	5	Diagram 3
10-30 VDC	100	≤200	-25 to +70	IP67	PP	PP	GN	YE	2M/TPU	1	
	100	≤200	-25 to +70	IP67	PP	PP	GN	YE	2M/TPU	5	
10-30 VDC	100	≤200	-25 to +70	IP67	PP	PP	GN	YE	2M/TPU	2	
	100	≤200	-25 to +70	IP67	PP	PP	GN	YE	2M/TPU	6	
10-30 VDC	100	≤200	-25 to +70	IP67	Zinc	PA 12	GN	YE	2M/TPU	1	Diagram 4
	100	≤200	-25 to +70	IP67	Zinc	PA 12	GN	YE	2M/TPU	2	
10-30 VDC	100	≤200	-25 to +70	IP67	Zinc	PA 12	GN	YE	2M/TPU	1	Diagram 5
10-30 VDC	100	≤200	-25 to +70	IP67	Zinc	PA 12	GN	YE	2M/TPU	2	
10-30 VDC	100	≤200	-25 to +70	IP67	Zinc	PA 12	GN	YE	PKG 3Z-*	3	Diagram 6
10-30 VDC	100	≤200	-25 to +70	IP67	Zinc	PA 12	GN	YE	PKG 3Z-*	4	

* Length in meters.

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Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
10 mm - Embeddable, Potted-In Cable 	BC 8-Q10-AN6X2/S250	S2621203	No Potentiometer	8	8	3-Wire DC NPN
	BC 8-Q10-AP6X2/S250	S2621200	No Potentiometer	8	8	3-Wire DC PNP
10 mm - Embeddable, <i>picofast</i>® Connector 	BC 8-Q10-AN6X2-V1131/S250	S2621202	No Potentiometer	8	8	3-Wire DC NPN
	BC 8-Q10-AP6X2-V1131/S250	S2621201	No Potentiometer	8	8	3-Wire DC PNP
14 mm - Embeddable, Potted-In Cable 	BC10-Q14-AN4X2	M2530010		10	15	3-Wire DC NPN
	BC10-Q14-AN4X2/S400	M2530005	Rear LED	10	15	
	BC10-Q14-AP4X2	M2530001		10	15	3-Wire DC PNP
	BC10-Q14-AP4X2/S400	M2530003	Rear LED	10	15	
	BC10-Q14-VN4X2	M2530030	Comp. Outputs	10	15	4-Wire DC NPN
	BC10-Q14-VP4X2	M2530020	Comp. Outputs	10	15	4-Wire DC PNP
14 mm - Embeddable, <i>picofast</i> Connector 	BC10-Q14-AN4X2-V1131	M2530011		10	15	3-Wire DC NPN
	BC10-Q14-AN4X2-V1131/S400	M2530006	Rear LED	10	15	
	BC10-Q14-AP4X2-V1131	M2530002		10	15	3-Wire DC PNP
	BC10-Q14-AP4X2-V1131/S400	M2530004	Rear LED	10	15	

"/S250" in part number designates without potentiometer.

"/S400" in part number designates rear LED location on back of sensor opposite front face.

Level Sensors - Capacitive

Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Material	Power LED	Output LED	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-30 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	2M/PVC	1	Diagram 1
10-30 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	2M/PVC	2	Diagram 2
10-30 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	PKG 3M-*	3	Diagram 3
10-30 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	PKG 3M-*	4	Diagram 4
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	2M/PVC	1	Diagram 5
	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	2M/PVC	1	
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	2M/PVC	2	Diagram 6
	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	2M/PVC	2	
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	2M/PVC	5	
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	2M/PVC	6	
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	PKG 3M-*	3	
	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	PKG 3M-*	3	
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	PKG 3M-*	4	
	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	PKG 3M-*	4	

* Length in meters.

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Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
10 mm - Embeddable, eurofast® Connector	BCF10-Q20L60-AP4X-H1141	M2504027	Noise Immune	10	20	3-Wire DC PNP
10 mm - Embeddable, Potted-In Cable	BCF10-Q20L60-AP4X	M2504028	Noise Immune	10	20	3-Wire DC PNP

Level Sensors - Capacitive

Voltage	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Material	Power LED	Output LED	Mating Cord Length/ Jacket	Wiring Diagram #	Wiring Diagrams
10-65 VDC	≤200	-25 to 70	IP67	PBT-GF20-V0	None	YE	RK 4T-*	1	Diagram 1 Diagram 2
10-65 VDC	≤200	-25 to 70	IP67	PBT-GF20-V0	None	YE	2M/PVC	2	

* Length in meters.

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Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
20 mm - Embeddable, Potted-In Cable 	BC20-Q20-AN4X2	M2530110		20	30	3-Wire DC NPN
	BC20-Q20-AN4X2/S400	M2530104	Rear LED	20	30	
	BC20-Q20-AP4X2	M2530100		20	30	3-Wire DC PNP
	BC20-Q20-AP4X2/S400	M2530102	Rear LED	20	30	
	BC20-Q20-VP4X2/S400	M2530122	Comp. Outputs Rear LED	20	30	4-Wire DC PNP
	BC20-Q20-AZ3X2	M4352000		20	30	2-Wire AC
	BC20-Q20-AZ3X2/S400	M2310005	Rear LED	20	30	

"/S400" in part number designates rear LEDs, located on back of sensor opposite of sensing face.

Level Sensors - Capacitive

Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Material	Power LED	Output LED	CableLength /Jacket	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	2M/PVC	1	Diagram 1 Diagram 2 Diagram 3 Diagram 4
	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	2M/PVC	1	
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	2M/PVC	2	
	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	2M/PVC	2	
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	2M/PVC	3	
20-250 VAC	20	≤500	-25 to +70	IP67	PBT-GF30-V0	GN	YE	2M/PVC	4	
	20	≤500	-25 to +70	IP67	PBT-GF30-V0	GN	YE	2M/PVC	4	

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Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
20 mm - Embeddable, eurofast® Connector 	BC20-Q20-AN4X2-H1141	M2530111		20	30	3-Wire DC NPN
	BC20-Q20-AN4X2-H1141/S400	M2530105	Rear LED	20	30	
	BC20-Q20-AP4X2-H1141	M2530101		20	30	3-Wire DC PNP
	BC20-Q20-AP4X2-H1141/S400	M2530103	Rear LED	20	30	
	BC20-Q20-VN4X2-H1141	M2530131	Comp. Outputs	20	30	4-Wire DC NPN
	BC20-Q20-VN4X2-H1141/S400	M2530124	Comp. Outputs Rear LED	20	30	
	BC20-Q20-VP4X2-H1141	M2530121	Comp. Outputs	20	30	4-Wire DC PNP
	BC20-Q20-VP4X2-H1141/S400	M2530123	Comp. Outputs Rear LED	20	30	

"/S400" in part number designates rear LEDs, located on back of sensor opposite of sensing face.

Level Sensors - Capacitive

Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Material	Power LED	Output LED	Mating Cord	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	RK 4T-*	1	Diagram 1
	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	RK 4T-*	1	
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	RK 4T-*	2	Diagram 2
	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	RK 4T-*	2	
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	RK 4.4T-*	3	Diagram 3
	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	RK 4.4T-*	3	
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	RK 4.4T-*	4	Diagram 4
	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	RK 4.4T-*	4	

* Length in meters.

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Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
40 mm - Embeddable, Terminal Chamber	BC20-CP40-VN4X2	M2515700	Comp. Outputs	20	30	4-Wire DC NPN
	BC20-CP40-VP4X2	M2515600	Comp. Outputs	20	30	4-Wire DC PNP
	BC20-CP40-FZ3X2	M2311500	Prog. Outputs	20	30	2-Wire AC
80 mm - Nonembeddable, Terminal Chamber	NC50-CP80-VN4X2	M2580112	Comp. Outputs	NA	50	4-Wire DC NPN
	NC50-CP80-VP4X2	M2580212	Comp. Outputs	NA	50	4-Wire DC PNP
	NC50-CP80-FZ3X2	M2310610	Prog. Outputs	NA	50	2-Wire AC

Level Sensors - Capacitive

Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Material	Power LED	Output LED	Mating Cordset	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	----	1	Diagram 1
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	----	2	Diagram 2
20-250 VAC	20	≤500	-25 to +70	IP67	PBT-GF30-V0	GN	YE	----	3	Diagram 3
10-65 VDC	200	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	----	1	Diagram 3
10-65 VDC	200	≤200	-25 to +70	IP67	PBT-GF30-V0	GN	YE	----	2	Diagram 3
20-250 VAC	20	≤500	-25 to +70	IP67	PBT-GF30-V0	GN	YE	----	3	Diagram 3

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Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
12 mm - Embeddable, eurofast® Connector 	BC 3-M12-AN6X-0.2M-RS 4T	M2601190		3	3	3-Wire DC NPN
	BC 3-M12-AP6X-0.2M-RS 4T	M2601091		3	3	3-Wire DC PNP
12 mm - Embeddable, Potted-In Cable 	BC 3-M12-AN6X	M2601100		3	3	3-Wire DC NPN
	BC 3-M12-AP6X	M2601000		3	3	3-Wire DC PNP
12 mm - Embeddable, eurofast Connector 	BC 3-S12-AN6X-0.2M-RS 4T	M2601390		3	4.5	3-Wire DC NPN
	BC 3-S12-AP6X-0.2M-RS 4T	M2601291		3	4.5	3-Wire DC PNP
12 mm - Embeddable, Potted-In Cable 	BC 3-S12-AN6X	M2601300		3	4.5	3-Wire DC NPN
	BC 3-S12-AP6X	M2601200		3	4.5	3-Wire DC PNP
	BC 3-S12-AP6X/S100	M2601201	High Temp. 100°C	3	4.5	

Level Sensors - Capacitive

Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Material	Face Material	End Cap	Power LED	Output LED	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-30 VDC	100	≤200	-25 to +70	IP67	CPB	ABS	PA	N/A	YE	RK 4T-*	1	Diagram 1
10-30 VDC	100	≤200	-25 to +70	IP67	CPB	ABS	PA	N/A	YE	RK 4T-*	2	Diagram 2
10-30 VDC	100	≤200	-25 to +70	IP67	CPB	ABS	PA	N/A	YE	2M/PVC	3	Diagram 3
10-30 VDC	100	≤200	-25 to +70	IP67	CPB	ABS	PA	N/A	YE	2M/PVC	4	Diagram 4
10-30 VDC	100	≤200	-25 to +70	IP67	PA 12-GF30	PA	N/A	YE	RK 4T-*	1		
10-30 VDC	100	≤200	-25 to +70	IP67	PA 12-GF30	PA	N/A	YE	RK 4T-*	2		
10-30 VDC	200	≤200	-25 to +70	IP67	PA 12-GF30	PA	N/A	YE	2M/PVC	3		
10-30 VDC	100	≤200	-25 to +70	IP67	PA 12-GF30	PA	N/A	YE	2M/PVC	4		
	100	≤200	-25 to +100	IP67	PA 12-GF30	PA	N/A	YE	2M/PVC	4		

* Length in meters..

Capacitive

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Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Embeddable Range (mm)	Nonembed. Range (mm)	Output
18 mm - Embeddable, eurofast® Connector 	BC 5-M18-AN4X-0.2M-RS 4T	M2504091	5	5	3-Wire DC NPN
	BC 5-M18-AP4X-0.2M-RS 4T	M2504090	5	5	3-Wire DC PNP
18 mm - Embeddable, microfast® Connector 	BC 5-M18-AZ3X-0.2M-SB 3T	M2305090	5	5	2-Wire AC
18 mm - Embeddable, Potted-In Cable 	BC 5-M18-AN4X	M2504002	5	5	3-Wire DC NPN
	BC 5-M18-AP4X	M2504001	5	5	3-Wire DC PNP
	BC 5-M18-AZ3X	M2305000	5	5	2-Wire AC

Level Sensors - Capacitive

Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Material	Face Material	End Cap	Power LED	Output LED	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP67	CPB	PBT-G30-V0	PUR	N/A	YE	RK 4T-*	1	Diagram 1
10-65 VDC	100	≤200	-25 to +70	IP67	CPB	PBT-G30-V0	PUR	N/A	YE	RK 4T-*	2	Diagram 2
20-250 AC	20	≤500	-25 to +70	IP67	CPB	PBT-G30-V0	PUR	N/A	YE	KB 3T-*	5	Diagram 3
20-250 AC	20	≤500	-25 to +70	IP67	CPB	PBT-G30-V0	PUR	N/A	YE	KB 3T-*	5	Diagram 4
10-65 VDC	100	≤200	-25 to +70	IP67	CPB	PBT-G30-V0	PUR	N/A	YE	2M/PVC	3	Diagram 5
10-65 VDC	100	≤200	-25 to +70	IP67	CPB	PBT-G30-V0	PUR	N/A	YE	2M/PVC	4	Diagram 6
20-250 VAC	20	≤500	-25 to +70	IP67	CPB	PBT-G30-V0	PUR	N/A	YE	2M/PVC	6	Diagram 6

* Length in meters.

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Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
18 mm - Embeddable, eurofast® Connector 	BC 5-S18-AN4X-0.2M-RS 4T	M2503192		5	7.5	3-Wire DC NPN
	BC 5-S18-AN4X-H1141/S250	M2503108	No Potentiometer	5	7.5	
	BCF 5-S18-AN4X-0.2M-RS 4T	M2503089	Noise Immune	5	7.5	
	BC 5-S18-AP4X-0.2M-RS 4T	M2503492		5	7.5	3-Wire DC PNP
	BC 5-S18-AP4X-H1141/S250	M2503602	No Potentiometer	5	7.5	
	BCF 5-S18-AP4X-0.2M-RS 4T	M2503099	Noise Immune	5	7.5	
18 mm - Embeddable, eurofast Connector 	BC 5-S185-AN4X-0.3M-RS 4T	M2503590	Chemical Resistant	5	7.5	3-Wire DC NPN
	BC 5-S185-AP4X-0.2M-RS 4T	M2503591	Chemical Resistant	5	7.5	3-Wire DC PNP
18 mm - Embeddable, microfast® Connector 	BC 5-S18-AZ3X-0.2M-SB 3T	M2305590		5	7.5	2-Wire AC

"/S250" in part number designates without potentiometer.

Level Sensors - Capacitive

Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Material	End Cap	Power LED	Output LED	Mating Cordset	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP67	PA 12-GF30	PUR	N/A	YE	RK 4T-*	1	Diagram 1
	100	≤200	-25 to +70	IP67	PA 12-GF30	PUR	N/A	YE	RK 4T-*	1	
	100	≤200	-25 to +70	IP67	PA 12-GF30	PUR	N/A	YE	RK 4T-*	1	
10-65 VDC	100	≤200	-25 to +70	IP67	PA 12-GF30	PUR	N/A	YE	RK 4T-*	2	Diagram 2
	100	≤200	-25 to +70	IP67	PA 12-GF30	PUR	N/A	YE	RK 4T-*	2	
	100	≤200	-25 to +70	IP67	PA 12-GF30	PUR	N/A	YE	RK 4T-*	2	
10-65 VDC	100	≤200	-25 to +70	IP67	PVDF	PUR	N/A	YE	RK 4T-*	1	Diagram 3
10-65 VDC	100	≤200	-25 to +70	IP67	PVDF	PUR	N/A	YE	RK 4T-*	2	
20-250 VAC	20	≤500	-25 to +70	IP67	PA12-GF30	PUR	N/A	YE	KB 3T-*	3	

* Length in meters.

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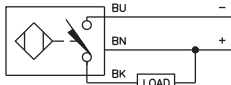
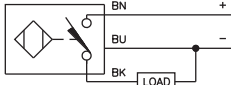
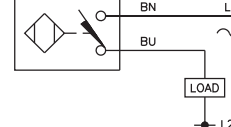
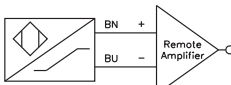
Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
18 mm - Embeddable, Potted-In Cable 	BC 5-S18-AN4X	M2503100		5	7.5	3-Wire DC NPN
	BCF 5-S18-AN4X	M2503012	Noise Immune	5	7.5	
	BC 5-S18-AP4X	M2503000		5	7.5	3-Wire DC PNP
	BCF 5-S18-AP4X	M2503011	Noise Immune	5	7.5	
	BCF 5-S18-AP4X/S90	M2503014	Noise Immune	5	7.5	
	BC 5-S18-AZ3X	M2305500		5	7.5	2-Wire AC
18 mm - Embeddable, Potted-In Cable 	BC 5-S185-AN4X	M2503550	Chemical Resistant	5	7.5	3-Wire DC NPN
	BC 5-S185-AN4X/S100	M2503551	High Temp. 100°C	5	7.5	
	BC 5-S185-AP4X	M2503500	Chemical Resistant	5	7.5	3-Wire DC PNP
	BC 5-S185-AP4X/S100	M2503502	High Temp. 100°C	5	7.5	
18 mm - Embeddable, Potted-In Cable 	BC 5-S18-Y1X	M2006000		5	7.5	2-Wire DC NAMUR

"/S100" in part number designates high temperature sensor.

Level Sensors - Capacitive

Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Material	End Cap	Power LED	Output LED	Cable Length/ Material	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP67	PA 12-GF30	PUR	N/A	YE	2M/PVC	1	Diagram 1  Diagram 2  Diagram 3  Diagram 4 
	100	≤200	-25 to +70	IP67	PA 12-GF30	PUR	N/A	YE	2M/PVC	1	
10-65 VDC	100	≤200	-25 to +70	IP67	PA 12-GF30	PUR	N/A	YE	2M/PVC	2	
	100	≤200	-25 to +70	IP67	PA 12-GF30	PUR	N/A	YE	2M/PVC	2	
	100	≤200	-25 to +70	IP67	PA 12-GF30	PUR	N/A	YE	2M/PUR	2	
20-250 VAC	20	≤500	-25 to +70	IP67	PA 12-GF30	PUR	N/A	YE	2M/PVC	3	
10-65 VDC	100	≤200	-25 to +70	IP67	PVDF	PUR	N/A	YE	2M/PVC	1	
	100	≤200	-25 to +100	IP67	PVDF	PUR	N/A	YE	2M/PVC	1	
10-65 VDC	100	≤200	-25 to +70	IP67	PVDF	PUR	N/A	YE	2M/PVC	2	
	100	≤200	-25 to +100	IP67	PVDF	PUR	N/A	YE	2M/PVC	2	
5-30 VDC	100	Remote	-25 to +70	IP67	PA 12-GF30	PUR	N/A	YE	2M/PVC	4	

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Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
30 mm - Embeddable, eurofast® Connector 	BC10-M30K-AN4X-H1141	M2503030		10	10	3-Wire DC NPN
	BC10-M30K-AP4X-H1141	M2503026		10	10	3-Wire DC PNP
	BC10-M30K-VN4X-H1141	M2503033	Comp. Outputs	10	10	4-Wire DC NPN
	BC10-M30K-VP4X-H1141	M2503035	Comp. Outputs	10	10	4-Wire DC PNP
30 mm - Embeddable, microfast® Connector 	BC10-M30K-AZ3X-B3131	M2503034		10	10	2-Wire AC N.O.
	BC10-M30K-RZ3X-B3131	M2503023		10	10	2-Wire AC N.C.

Level Sensors - Capacitive

Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Material	Face Material	End Cap	Power LED	Output LED	Mating Cordset	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	RK 4T-*	1	Diagram 1
10-65 VDC	100	≤200	-25 to +70	IP67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	RK 4T-*	2	Diagram 2
10-65 VDC	100	≤200	-25 to +70	IP67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	RK 4.4T-*	3	Diagram 3
10-65 VDC	100	≤200	-25 to +70	IP67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	RK 4.4T-*	4	Diagram 4
20-250 AC	20	≤500	-25 to +70	IP67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	KB 3T-*	5	Diagram 5
20-250 AC	20	≤500	-25 to +70	IP67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	KB 3T-*	6	Diagram 6

* Length in meters.

Capacitive

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Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
30 mm - Embeddable, Potted-In Cable 	BC10-M30K-VN4X	M2503024	Comp. Outputs	10	10	4-Wire DC NPN
	BC10-M30K-VP4X	M2503022	Comp. Outputs	10	10	4-Wire DC PNP
	BC10-M30K-AZ3X	M2503031		10	10	2-Wire AC N.O.
	BC10-M30K-RZ3X	M2503025		10	10	2-Wire AC N.C.

Level Sensors - Capacitive

Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Material	Face Material	End Cap Material	Power LED	Output LED	Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	1	Diagram 1
10-65 VDC	100	≤200	-25 to +70	IP67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	2	Diagram 2
20-250 VAC	20	≤500	-25 to +70	IP67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	3	Diagram 3
20-250 VAC	20	≤500	-25 to +70	IP67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	4	Diagram 4

* Length in meters.

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Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
30 mm - Embeddable, eurofast® Connector 	BCC10-S30-AP4X-H1141	M2503038	Low Dielectric Targets	10	10	3-Wire DC PNP
	BCC10-S30-RP4X-H1143	M1542562	Low Dielectric Targets	10	10	3-Wire DC PNP N.C.
	BC10-S30-VN4X-H1141	M2506010	Comp. Outputs	10	15	4-Wire DC NPN
	BCF10-S30-VN4X-H1141	M2506016	Noise Immune	10	15	
	BC10-S30-VP4X-H1141	M2506100	Comp. Outputs	10	15	4-Wire DC PNP
	BCC10-S30-VP4X-H1141	M2503043	Low Dielectric Targets	10	10	
	BCF10-S30-VP4X-H1141	M2506117	Noise Immune	10	15	
30 mm - Embeddable, microfast® Connector 	BC10-S30-AZ3X-B3131	M2310710		10	15	2-Wire AC N.O.
	BCF10-S30-AZ3X-B3131	M2506012	Noise Immune	10	15	
	BC10-S30-RZ3X-B3131	M2310810		10	15	2-Wire AC N.C.
	BCF10-S30-RZ3X-B3131	M2506014	Noise Immune	10	15	

Level Sensors - Capacitive

Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Material	End Cap Material	Power LED	Output LED	Mating Cordset	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP67	PA12-GF30	PA 66-GF25-V0	N/A	YE	RK 4T-*	5	Diagram 1
10-65 VDC	100	≤200	-25 to +70	IP67	PA12-GF30	PA 66-GF25-V0	N/A	YE	RK 4T-*	6	Diagram 2
10-65 VDC	100	≤200	-25 to +70	IP67	PA12-GF30	PA 66-GF25-V0	N/A	YE	RK 4.4T-*	1	Diagram 3
	100	≤200	-25 to +70	IP67	PA12-GF30	PA 66-GF25-V0	N/A	YE	RK 4.4T-*	1	
10-65 VDC	100	≤200	-25 to +70	IP67	PA12-GF30	PA 66-GF25-V0	N/A	YE	RK 4.4T-*	2	Diagram 4
	100	≤200	-25 to +70	IP67	PA12-GF30	PA 66-GF25-V0	N/A	YE	RK 4.4T-*	2	
	100	≤200	-25 to +70	IP67	PA12-GF30	PA 66-GF25-V0	N/A	YE	RK 4.4T-*	2	
20-250 VAC	20	≤500	-25 to +70	IP67	PA12-GF30	PA 66-GF25-V0	N/A	YE	KB 3T-*	3	Diagram 5
	20	≤500	-25 to +70	IP67	PA12-GF30	PA 66-GF25-V0	N/A	YE	KB 3T-*	3	
20-250 VAC	20	≤500	-25 to +70	IP67	PA12-GF30	PA 66-GF25-V0	N/A	YE	KB 3T-*	4	Diagram 6
	20	≤500	-25 to +70	IP67	PA12-GF30	PA 66-GF25-V0	N/A	YE	KB 3T-*	4	

* Length in meters.

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Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
30 mm - Embeddable, Potted-In Cable 	BCC10-S30-AP4X	M2503037	Low Dielectric Targets	10		3-Wire DC PNP
	BC10-S30-VN4X	M2506000	Comp. Outputs	10	15	4-Wire DC NPN
	BCF10-S30-VN4X	M2506011	Noise Immune	10	15	4-Wire DC NPN
	BC10-S30-VP4X	M2506110	Comp. Outputs	10	15	4-Wire DC PNP
	BCF10-S30-VP4X	M2506111	Noise Immune	10	15	4-Wire DC PNP
	BC10-S30-AZ3X	M2310700		10	15	2-Wire AC
	BCF10-S30-AZ3X	M2506015	Noise Immune	10	15	2-Wire AC
30 mm - Embeddable, Potted-In Cable 	BC10-PT30-VN4X2	M2507020	Chemical Resistant	10	15	4-Wire DC NPN
	BC10-PT30-VP4X2	M2507010	Chemical Resistant	10	15	4-Wire DC PNP
	BC10-PT30-AZ3X	M2350001	Chemical Resistant	10	15	2-Wire AC
	BC10-PT30-Y0X	M2020000	Chemical Resistant	10	15	2-Wire DC NAMUR
30 mm - Embeddable, Terminal Chamber 	BC10-P30SR-VN4X2	M2505100	Comp. Outputs	10	15	4-Wire DC NPN
	BC10-P30SR-VP4X2	M2505000	Comp. Outputs	10	15	4-Wire DC PNP
	BC10-P30SR-VP4X2/S359-2M	M2505001	Comp. Outputs	10	15	4-Wire DC PNP

"/S359" designates Capacitive sensor with external potentiometer located on 2 meter cable.

Level Sensors - Capacitive

Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Material	End Cap Material	Power LED	Output LED	Cable Length/ Material	Wiring Diagram #	Wiring Diagrams
10-30 VDC	100	≤200	-25 to +70	IP67	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	7	Diagram 1
10-65 VDC	100	≤200	-25 to +70	IP67	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	1	Diagram 2
	100	≤200	-25 to +70	IP67	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	1	
10-65 VDC	100	≤200	-25 to +70	IP67	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	2	Diagram 3
	100	≤200	-25 to +70	IP67	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	2	
20-250 VAC	20	≤500	-25 to +70	IP67	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	3	Diagram 4
5-30 VDC	100	N/A	-25 to +70	IP67	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	4	
	100	≤200	-25 to +70	IP67	PVDF	PVDF	GN	YE	2M/PVDF	1	Diagram 5
10-65 VDC	100	≤200	-25 to +70	IP67	PVDF	PVDF	GN	YE	2M/PVDF	2	
20-250 VAC	20	≤500	-25 to +70	IP67	PVDF	PVDF	N/A	YE	2M/PVDF	3	Diagram 6
5-30 VDC	100	Remote	-25 to +70	IP67	PVDF	PVDF	N/A	YE	2M/PVDF	4	
10-65 VDC	100	≤200	-25 to +70	IP67	ABS	ABS	GN	YE	- - - -	5	Diagram 7
10-65 VDC	100	≤200	-25 to +70	IP67	ABS	ABS	GN	YE	- - - -	6	
	100	≤200	-25 to +70	IP67	ABS	ABS	GN	YE	- - - -	6	

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Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
30 mm - Embeddable, eurofast® Connector 	BC10-P30SR-VN4X2-H1141	M2505192	Comp. Outputs	10	15	4-Wire DC NPN
	BC10-P30SR-VP4X2-H1141	M2505094	Comp. Outputs	10	15	4-Wire DC PNP
30 mm - Embeddable, microfast® Connector 	BC10-P30SR-FZ3X2-B3131	M2310491	Comp. Outputs	10	15	2-Wire AC
30 mm - Embeddable, minifast® Connector 	BC10-P30SR-VN4X2-B1141	M2505191	Comp. Outputs	10	15	4-Wire DC NPN
	BC10-P30SR-VN4X2-B2141	M2505193	Comp. Outputs	10	15	
	BC10-P30SR-VP4X2-B1141	M2505092	Comp. Outputs	10	15	4-Wire DC PNP
	BC10-P30SR-VP4X2-B2141	M2505093	Comp. Outputs	10	15	
	BC10-P30SR-FZ3X2-B1131	M2310490	Comp. Outputs	10	15	2-Wire AC
	BC10-P30SR-FZ3X2-B2131	M2310493	Comp. Outputs	10	15	

Level Sensors - Capacitive

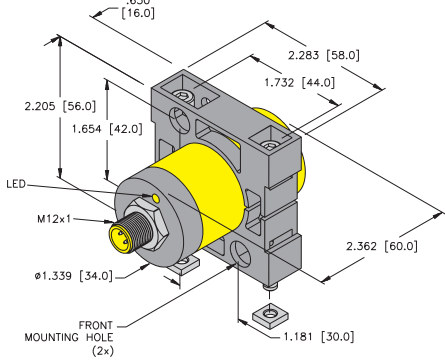
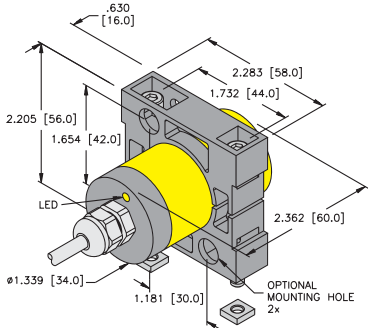
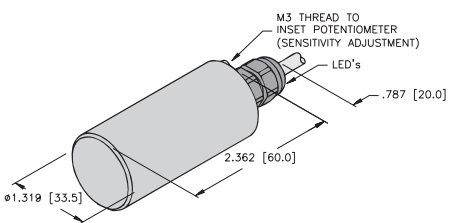
Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Materials	End Cap Materials	Power LED	Output LED	Mating Cordset	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP67	ABS	ABS	GN	YE	RK 4.4T-*	1	Diagram 1
10-65 VDC	100	≤200	-25 to +70	IP67	ABS	ABS	GN	YE	RK 4.4T-*	2	Diagram 2
20-250 AC	200	≤500	-25 to +70	IP67	ABS	ABS	GN	YE	KB 3T-*	3	Diagram 3
10-65 VDC	100	≤200	-25 to +70	IP67	ABS	ABS	GN	YE	RKM 40-*M	4	Diagram 4
	100	≤200	-25 to +70	IP67	ABS	ABS	GN	YE	RK 40-*M	4	
10-65 VDC	100	≤200	-25 to +70	IP67	ABS	ABS	GN	YE	RKM 40-*M	5	Diagram 5
	100	≤200	-25 to +70	IP67	ABS	ABS	GN	YE	RK 40-*M	5	
20-250 AC	20	≤500	-25 to +70	IP67	ABS	ABS	GN	YE	RKM 30-*M	6	Diagram 6
	20	≤500	-25 to +70	IP67	ABS	ABS	GN	YE	RK 30-*M	6	

Capacitive

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Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
34 mm - Embeddable, eurofast® Connector 	BC15-K34-AN4X-H1141	M2502125		15	23	3-Wire DC NPN
	BC15-K34-AP4X-H1141	M2502126		15	23	3-Wire DC PNP
34 mm - Embeddable, Potted-In Cable 	BC15-K34-VN4X	M2502127	Comp. Outputs	15	23	4-Wire DC NPN
	BC15-K34-VP4X	M2502124	Comp. Outputs	15	23	4-Wire DC PNP
	BC15-K34-AZ3X	M2310008		15	23	2-Wire AC
	BCF15-K34-AZ3X	M2502136	Noise Immune	15	23	
34 mm - Nonembeddable, Potted-In Cable 	NC20-KT34-VN4X2	M2550100	Chemical Resistant Comp. Output	N/A	20	4-Wire DC NPN
	NC20-KT34-VP4X2	M2550300	Chemical Resistant Comp. Output	N/A	20	4-Wire DC PNP

Level Sensors - Capacitive

Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Material	End Cap Material	Power LED	Output LED	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	ABS	N/A	YE	RK 4T-*	1	Diagram 1
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	ABS	N/A	YE	RK 4T-*	2	Diagram 2
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	ABS	N/A	YE	2M/PVC	3	Diagram 3
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	ABS	N/A	YE	2M/PVC	4	Diagram 4
20-250 VAC	20	≤500	-25 to +70	IP67	PBT-GF30-V0	ABS	N/A	YE	2M/PVC	5	Diagram 5
	20	≤500	-25 to +70	IP67	PBT-GF30-V0	ABS	N/A	YE	2M/PVC	5	
10-65 VDC	200	≤200	-25 to +70	IP67	PVDF	PVDF	GN	YE	2M/PVDF	3	
10-65 VDC	200	≤200	-25 to +70	IP67	PVDF	PVDF	GN	YE	2M/PVDF	4	

* Length in meters.

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Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
34 mm - Embeddable, Terminal Chamber 	BC15-K34SR-VN4X2	M2502128	Comp. Outputs	15	23	4-Wire DC NPN
	BC15-K34SR-VP4X2	M2502129	Comp. Outputs	15	23	4-Wire DC PNP
	BC15-K34SR-FZ3X2	M2310009	Prog. Outputs	15	23	2-Wire AC
40 mm - Embeddable, Terminal Chamber 	BC20-K40SR-VN4X2	M2510100	Comp. Outputs	20	30	4-Wire DC NPN
	BC20-K40SR-VP4X2	M2510000	Comp. Outputs	20	30	4-Wire DC PNP
	BC20-K40SR-FZ3X2	M2310300	Prog. Outputs	20	30	2-Wire AC

Level Sensors - Capacitive

Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Material	End Cap Material	Power LED	Output LED	Mating Cordset	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	ABS	GN	YE	- - - -	1	Diagram 1
10-65 VDC	100	≤200	-25 to +70	IP67	PBT-GF30-V0	ABS	GN	YE	- - - -	2	Diagram 2
20-250 VAC	20	≤500	-25 to +70	IP67	PBT-GF30-V0	ABS	GN	YE	- - - -	3	Diagram 3
10-65 VDC	100	≤200	-25 to +70	IP67	ABS	ABS	GN	YE	- - - -	1	
10-65 VDC	100	≤200	-25 to +70	IP67	ABS	ABS	GN	YE	- - - -	2	
20-250 VAC	20	≤500	-25 to +70	IP67	ABS	ABS	GN	YE	- - - -	3	

Capacitive

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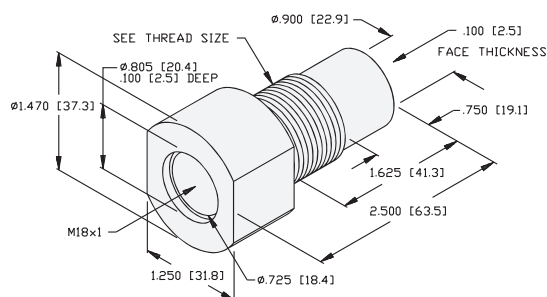
Level Sensors - Capacitive

Tank Wells

Part Number	ID Number	Material	Thread Size	Drill Size	Application
TWD-18S	A5055	Delrin	3/4-14 NPT	⁵⁹ / ₆₄	18 mm threaded capacitive sensors for liquid level sensing
TWT-18S	A5050	PTFE	3/4-14 NPT	⁵⁹ / ₆₄	18 mm threaded capacitive sensors for liquid level sensing
TWD-18S-1NPT	A5057	Delrin	1-11½ NPT	1- ⁵ / ₃₂	18 mm threaded capacitive sensors for liquid level sensing
TWT-18S-1NPT	A5056	PTFE	1-11½ NPT	1- ⁵ / ₃₂	18 mm threaded capacitive sensors for liquid level sensing

Pressure Rating: 150 psi
Inches [mm]

TWD-18..
TWT-18..

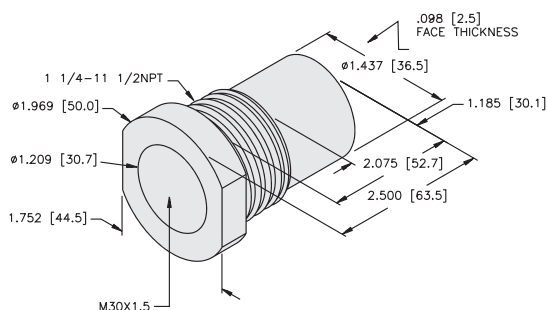
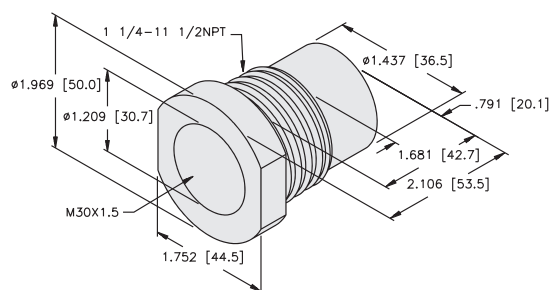


Part Number	ID Number	Material	Thread Size	Drill Size	Application
TWT-30S-SHORT	A5062	PTFE	1¼-11½ NPT	1½	30 mm threaded capacitive sensors for liquid level sensing
TWD-30S-SHORT	A5063	Delrin	1¼-11½ NPT	1½	30 mm threaded capacitive sensors for liquid level sensing

Pressure Rating: 150 psi
Inches [mm]

TWD-30S-SHORT
TWT-30S-SHORT

TWD-30S..
TWT-30S..

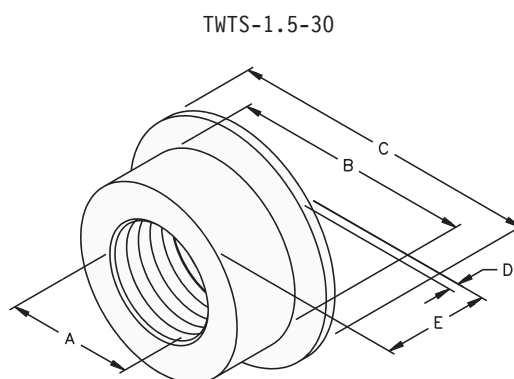


Level Sensors - Capacitive

Sight Glass Mounts

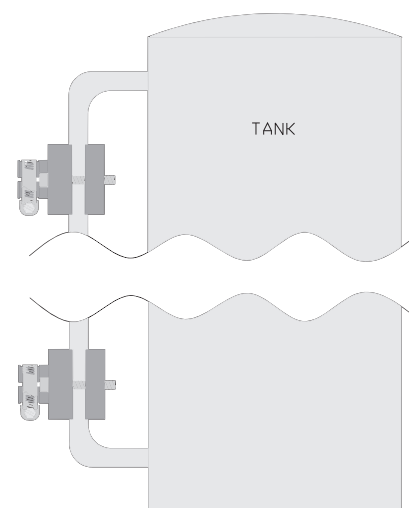
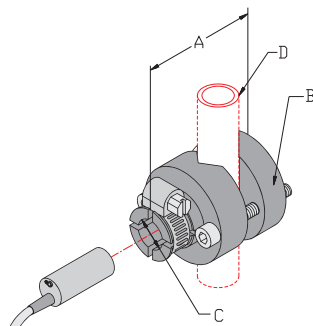
Part Number	ID Number	Dimensions			
		A	B	C	D
TWTS-1.5-30	A5077	M30x1.5	1.500 [38.1]	1.984 [50.4]	1.000 [25.4]
TWTS-2-30	A5076	M30x2.0	2.008 [51.0]	2.520 [64.0]	1.000 [25.4]

Material: PTFE
Inches [mm]



Part Number	ID Number	Dimensions			
		A	B	C	D
TSG-12	A2500	1.75 [44.5]	1.25 [31.8]	12 mm (threaded or non-threaded)	0.37-0.81 [9.40-20.6]
TSG-18	A2501	1.90 [48.3]	1.48 [37.5]	18 mm (threaded or non-threaded)	0.63-1.12 [16.0-28.4]
TSG-30	A2502	3.45 [87.6]	2.00 [50.8]	30 mm (threaded or non-threaded)	1.00-1.75 [25.4-44.5]

Material: Delrin
Inches [mm]



Capacitive

Notes: