

BALLUFF

sensors worldwide



BSP Pressure Sensors

Reliable solutions for the automation industry



more added value



BSP Pressure Sensors

Reliable Solutions for
the Automation Industry



With over 50 years of sensor experience, Balluff is a leading global sensor specialist with its own line of connectivity products for every area of factory automation. Balluff is based in Germany and has a tight international network of 54 representatives and subsidiaries.

Balluff stands for comprehensive systems from a single source, continuous innovation, state-of-the-art technology, highest quality and greatest reliability and prides itself on distinctive customer orientation, custom-tailored solutions, fast worldwide service and outstanding application assistance.

High-quality, innovative products and a quality management system certified according to DIN ISO 9001 (EN 2008) form a secure foundation for optimized added value for our customers.

Whether electronic and mechanical sensors, rotary and linear transducers, identification systems or optimized connection technology for high-performance automation, Balluff masters not only the entire technological variety with all of the different operating principles, but also provides technology that fulfills regional quality standards and is suitable for use worldwide. Wherever you are in the world, Balluff technology is never far away. You won't have to look far for you nearest Balluff expert.

Balluff products increase performance, quality and productivity around the world every day. They satisfy prerequisites for meeting demands for greater performance and cost reductions on the global market. Even in the most demanding areas. No matter how stringent your requirements may be, Balluff delivers state-of-the-art solutions.

**Advanced technology,
individual solutions:
high quality for
greater efficiency.**



more added value

- The right product selection for your application
- Outstanding price/performance ratio
- Especially user-friendly

BSP Pressure Sensors

Reliable Solutions for
the Automation Industry

BSP pressure sensors from Balluff were designed for measuring the pressure of gases and liquids. A rotary housing and two-button programming make these sensors flexible to install and easy to operate. The bright LED display provides up-to-date information on the current system pressure.

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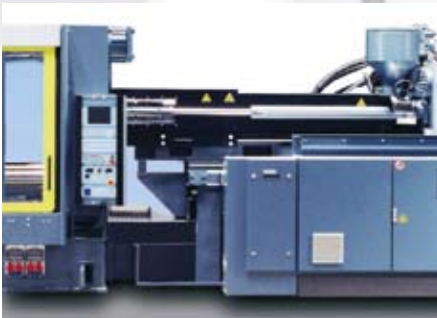


BSP Pressure Sensors

Reliable Solutions for
the Automation Industry

BSP pressure sensors from Balluff guarantee the consistently high quality of your products.

Process technology is becoming more and more important in the factory automation sector. The monitoring of process materials such as cooling lubricant, hydraulic and pneumatic fluids has an important influence on production quality. BSP pressure sensors from Balluff guarantee the consistently high quality of your products.





BSP Pressure Sensors

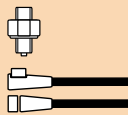
Reliable Solutions for the Automation Industry

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- Save space when positioning the versatile sensor in the switching cabinet – the exceptionally compact sensor has independently rotating display and connection housings.
- View the system pressure at a glance – Balluff pressure sensors have a large, brightly illuminated LED display.
- Clear menu navigation for the quick and easy adjustment of pressure parameters – configure the sensor using 2 buttons in line with VDMA standards.
- Also suitable for harsh industrial applications – Balluff offers high-end versions in a high-quality, hard-wearing stainless steel housing with degree of protection IP 67.
- Reliable operation of your plants even under demanding conditions (pressure peaks) – reliable ceramic measuring cells guarantee long-term stability and durability.
- Simple installation with globally standardized screw fittings – process connection via a G 1/4" internal thread and adapter available in different sizes and versions.
- Find the right sensor for your application – Balluff offers versions with two switching points or with one switching point and one analog output.

Application areas

- Hydraulics
- Pneumatics
- Machine tools
- Plastics technology
- Packaging machines
- Wind turbines
- Off-shore

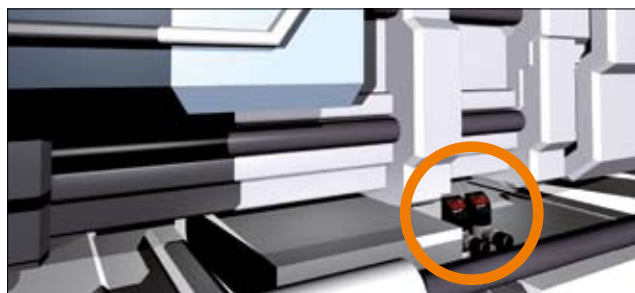
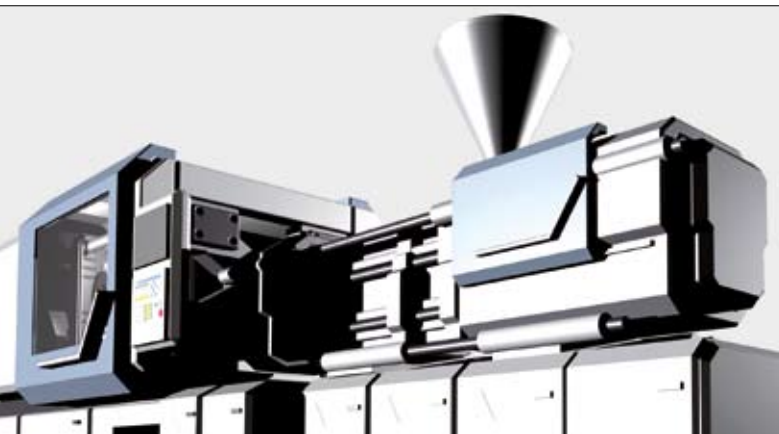


Type	Standard	High-End
From page	14	16
Housing material		
Plastic	■	
Stainless steel		■
Special properties		
Standard temperature range -25...+85 °C	■	■
Increased temperature range -40...+85 °C		■
Display housing rotates 320°	■	■
Connection housing with M12 plug rotates 320°	■	■
Application areas and applications		
Hydraulics	■	■
Pneumatics	■	■
Machine tools	■	■
Plastics technology	■	■
Packaging machines	■	■
Wind turbines		■
Off-shore		■

Multi-talented: BSP Balluff pressure sensors combine the advantages of a display, measuring transducer and pressure switch in a single device.

Holding pressure switchover on injection molding machines

Balluff BSP pressure sensors measure the hydraulic pressure of the screw drive in order to regulate the switchover point between the injection and holding pressure systems. Controlling this parameter with a high degree of precision is a crucial factor in achieving dimensional accuracy and quality of the products manufactured. A BSP pressure sensor with analog output monitors the available hydraulic pressure in order to control the process accurately while achieving a satisfactory degree of repeatability.



Benefits

- Switching point and analog output (0...10 V or 4...20 mA)
- Degree of protection IP 67
- Consistent quality of workpieces

Coolant monitoring on machine tools

The pressure in the coolant supply system must be monitored continually to guarantee the consistently high surface quality of machined workpieces. Balluff BSP pressure sensors can monitor the pressure level and shut down the machine within a few milliseconds if the system pressure exceeds the defined limits.



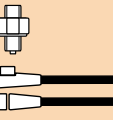
Benefits

- Ceramic measuring cells offer stability in the long term
- Display is easy to read
- Reliable machine operation

BSP Pressure Sensors

Applications

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Central hydraulic unit on wind turbines

Many central systems on a wind turbine such as the pitch control and braking system are operated hydraulically. The high-end version of the BSP measures the actual system pressure reliably, even under harsh ambient conditions. The pump motor can be controlled directly via two programmable switching points to prevent the oil pressure from exceeding the maximum or minimum permitted levels.

Vacuum grippers

Vacuum grippers are used for a wide variety of material handling tasks. The grippers must be able to adapt to different materials and workpieces and operate continuously without error. Balluff BSP pressure sensors designed for vacuum applications are used to monitor the pressure of the vacuum suckers and make sure they grip reliably.



Benefits

- Compact housing
- Simple installation
- Vacuum sensors up to -1 bar relative pressure

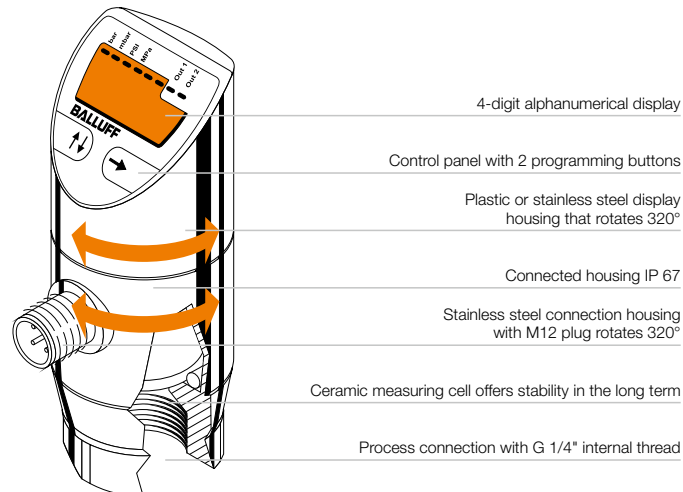


Benefits

- Extended temperature range to -40 °C
- Two programmable switching points
- Increased system availability

Basic Information and Definitions

Sensor design



Principle of operation

Balluff pressure sensors convert the physical pressure variable (force per surface) into an electrical output variable that serves as a pressure indicator. BSP Balluff pressure sensors use a ceramic membrane to perform this conversion process. The electrical signal is amplified and linearized and interfering factors such as temperature are compensated.

Pressure characteristics

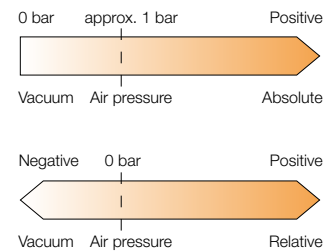
Absolute pressure: the absolute pressure is the pressure in relation to zero pressure (vacuum). The value range of absolute pressure is always positive.

Relative pressure: pressure is usually measured in relation to the relevant atmospheric pressure. Measuring pressures greater than air pressure always produces positive values. Pressures lower than air pressure produce negative values.

Nominal pressure: corresponds to the maximum design pressure.

Cracking pressure: minimum pressure that the pressure sensor must withstand without being destroyed. If this pressure is exceeded, it is certain that pressurized components will burst, the device will begin to leak or internal mechanisms will be destroyed.

Pressure peaks: pressure load pulses that can be several times the measured pressure.



Material characteristics

Incompressible material: changes in the pressure of fluids such as water and hydraulic fluid do not initially have an effect on volume. These materials are classed as incompressible.

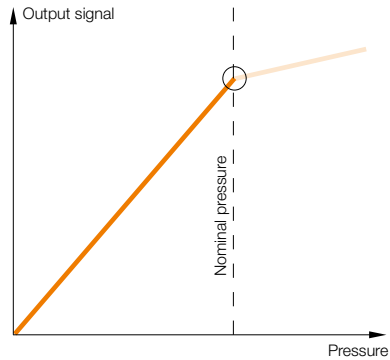
Compressible material: typical compressible materials include gases, which decrease in volume when their pressure increases.

Material temperature: indicates the permitted temperature range of the pressurized material.



Characteristic

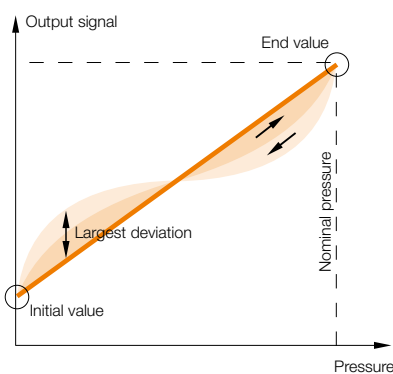
Describes the relationship between the measured and output variable. On pressure sensors, the characteristic indicates how dependent the output signal is on the pressure. In an ideal scenario, the characteristic should be a straight line.



Accuracy

The accuracy indicates how much the actual characteristic can deviate from the ideal characteristic (according to IEC 60770 non-linearity, Hysteresis and repeatability). Accuracy specifications represent a percentage value of the measurement range (FSO) and never include dimensions.

Nominal pressure 50 bar
Accuracy 0.5 %
Max. deviation 0.25 bar



Measuring range

Working range with specific tolerances within which the measured deviation lies.

Full scale end value (FS)

Maximum measuring variable to which a device is adjusted, e.g. 20 mA.

Full scale output (FSO)

The range represents the difference between the upper and lower limit values of the display range. Example: a pressure sensor with a measuring range of 0...6 bar and a corresponding output signal of 4...20 mA has an FSO of 16 mA

Response time

The time between the change in pressure and the change in the switching output status.

Repeatability

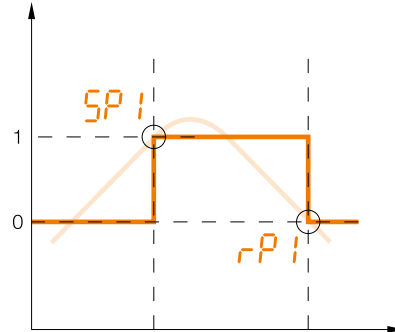
Repeat accuracy of two measurements under standardized conditions.

Basic Information and Definitions

Hysteresis, adjustable

The difference between the switching point (SP) and return point (RP) is known as a hysteresis. On electronic pressure switches, any hysteresis can be selected within the measuring range.

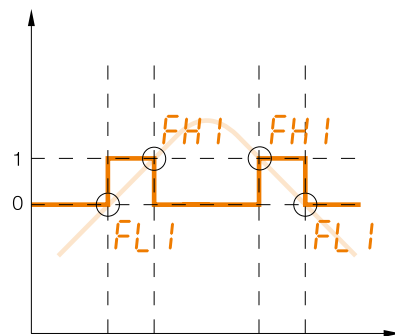
Hysteresis function: the hysteresis keeps the switching status of the outputs stable, even if the system pressure fluctuates either side the setpoint value. The output is activated when the system pressure rises and the relevant switching point (SP) is reached. The output is deactivated when the pressure decreases again and the return point (RP) is reached.



Window, adjustable

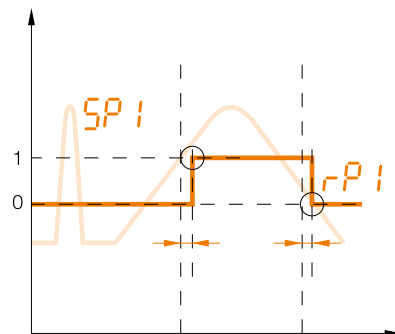
The output function is activated when the measured value falls between the preset switching and return point.

Window function: the range between a defined lower pressure limit and a defined upper limit is known as a window. A switching operation is initiated as soon as the upper or lower limit of the programmed pressure range is exceeded.



Delay times

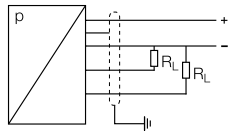
Delay times can reliably filter out undesired pressure peaks that occur momentarily. The status of the switching output does not change immediately after the switching event occurs, but only once a preselected delay time of 0...50 s has elapsed. If the switching event no longer exists by the time the delay has elapsed, the switching output does not change.



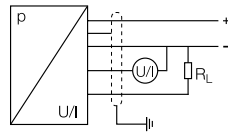


Switching function

4-wire pressure sensors with switching output



4-wire pressure sensors with analog output



Pin assignments

Electrical connections	Pressure sensors with switching output	Pressure sensors with analog output
Supply +	1	1
Supply -	3	3
Signal +		2
Switching output 1	4	4
Switching output 2	2	
Shield	Connector housing	Connector housing

Operating voltage U_B

is the voltage range in which flawless functioning of the sensor is assured. It includes all voltage tolerances and ripple.

Output current max.

is the maximum current with which the output of the sensor may be loaded in continuous operation.

No-load supply current I_0 max.

is the power consumption of the sensor with a maximum operating voltage U_O and with no connected load.

Short-circuit protection and overload protection

All DC sensors feature this protection device. In the event of overload or short-circuit at the output, the output transistor is automatically switched off. As soon as the malfunction has been corrected, the output stage is reset to normal functioning.

Polarity reversal protection

The sensor electronics are protected against possible polarity reversal or interchanging of the connection wires.

Ambient temperature range T_a

The device operates reliably within this temperature range. The ambient temperature range of the device must remain within the range specified on the relevant data sheet and should not exceed the upper or lower range limits.

Temperature drift

When changes in the ambient temperature range cause the switching point to shift.

Switching frequency f max.

is a succession of periodically repeated sensor switching cycles that occur during one second.

Basic Information and Definitions

Materials

Material	Use and characteristics
Plastics	
PA 6.6 polyamide	Good mechanical strength. Temperature resistance.
FKM Fluoroelastomer	Resistant to pressure deformation. Temperature resistance. Good chemical resistance.
PUR Polyurethane	Elastic, abrasion-resistant, impact-resistant. Good resistance to oils, greases, solvents (used for gaskets and cable jackets).
PVC Polyvinylchloride	Good mechanical strength. Chemical resistance (cable).
Metal	
Stainless steel	Excellent corrosion resistance and strength. Quality 1.4301: Standard material for the foods industry.
Other	
Ceramic	Very good strength and chemical resistance. Electrically insulating. Excellent temperature resistance.

Degree of protection

The enclosure ratings IP 20, IP 40, IP 54, IP 64 up to IP 68 are in accordance with IEC 60529. Code letters IP (International Protection) designate protection against shock hazard, ingress of solid foreign bodies, and water, for electrical equipment.

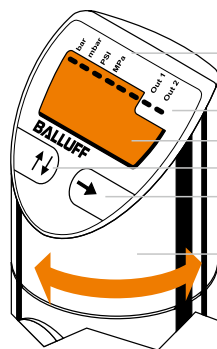
First digit:

- 2 Protection against penetration of solid bodies larger than 12 mm, shielding from fingers and objects
- 4 Protection against penetration of solid bodies larger than 1 mm, shielding from tools and wires
- 5 Protection against harmful dust deposits, complete shock-hazard protection
- 6 Protection against penetration of dust, complete shock-hazard protection

Second digit:

- 0 No special protection
- 4 Protection against water spraying from all directions against the piece of equipment concerned
- 5 Protection against a water jet from a nozzle directed towards the piece of equipment concerned from any direction
- 7 Protection against water, when the piece of equipment concerned (housing) is immersed in water under specified pressure and time conditions
- 8 Protection against water during continuous submersion

Display



Different pressure units can be selected

Function ready/error indicator

Luminous, 4-digit, 7-segment display

Change menus and adjust parameters

Display parameters

Plastic or stainless steel display housing that rotates 320°

Description	ASCII	Description	ASCII
SP:1 Switching point (1)	SP1	Hno: NO with hysteresis function	HNO
rP:1 Return point (1)	RP1	Fno: NO with window function	FNO
SP:2 Switching point (2)	SP2	Hnc: NC with hysteresis function	HNC
rP:2 Return point (2)	RP2	Fnc: NC with window function	HNC
FH:1 Pressure window, upper value (1)	FH1	Uni: Unit selection	Uni
FL:1 Pressure window, lower value (1)	FL1	bar: Unit bar	bar
FH:2 Pressure window, upper value (2)	FH2	MPa: Unit MPa	MPa
FL:2 Pressure window, lower value (2)	FL2	Pa: Unit Pa	Pa
EF:1 Extended function	EF	psi: Unit psi	psi
rES: Reset	RES	Lo: Min. value	LO
dS:1 Switching delay time (1)	dS1	Hi: Max. value	HI
dS:2 Switching delay time (2)	dS2	dR: Diagnostic function	DIA
dR:1 Return delay time (1)	dR1	Err: Error indicator	ERR
dR:2 Return delay time (2)	dR2	di: Display	DIS
ou:1 Output (1)	Ou1	PE: Yes	Yes
ou:2 Output (2)	Ou2	no: No	No



Setting and adjusting parameters

Balluff BSP pressure sensors are easy to configure in line with VDMA standards: **Change menu** – Press the button to switch to programming mode and modify the pressure sensor settings.

Display parameters – Press the button to show the relevant parameter on the display. **Set parameter** – Press the button in any menu to select the relevant value.

Display mode

The current process pressure is displayed here. You can check this parameter directly on location at any time.



Switching point 1

Here you can select the switching point (pressure value) of output 1, which determines when the output status of the sensor changes. The switching point can be set to any value within the measuring range.



Return point 1

Return point 1 is used to select the pressure value that defines when output 1 switches back. The difference between SP 1 (9.05 bar here) and RP 1 (7.05 bar here) produces the hysteresis (2 bar here) of switching output 1.



Switching point 2

For setting output 2. Proceed as described for switching point 1.



Return point 2

For setting output 2. Proceed as described for return point 1.



Extended functions

Additional settings such as switching functions for outputs 1 and 2 can be configured in the "Extended functions" menu.



BSP Pressure Sensors

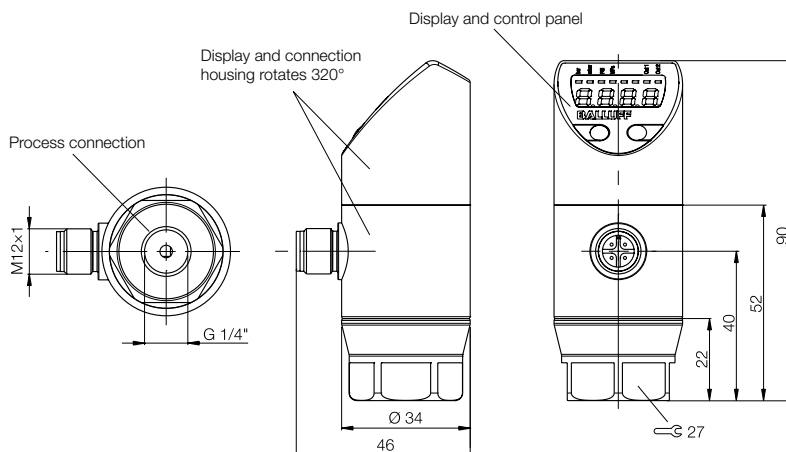
Standard Sensors

Standard Balluff pressure sensors offer an impressive price/performance ratio and are suitable for a wide variety of applications in factory automation. A large display and simple operating concept save time when configuring parameters. These Balluff pressure sensors are versatile and space-saving. The display and electrical output can be rotated independently of the flange. Other features of these sensors include:

- A compact housing design
- A local pressure indicator
- Digital switching outputs
- Analog output signals



Pressure sensors are found in many mechanical engineering applications. Different versions with switching points, an analog output and a variety of pressure ranges mean you are guaranteed to find the right sensor for your application.



Design	Relative nominal pressure	Overload pressure	Cracking pressure \geq	Permitted vacuum
Pressure sensors -1...2 bar	2 bar	4 bar	10 bar	vacuum proof
Pressure sensors -1...10 bar	10 bar	20 bar	35 bar	
Pressure sensors 0...2 bar	2 bar	4 bar	10 bar	
Pressure sensors 0...5 bar	5 bar	10 bar	15 bar	
Pressure sensors 0...10 bar	10 bar	20 bar	35 bar	
Pressure sensors 0...20 bar	20 bar	40 bar	75 bar	
Pressure sensors 0...50 bar	50 bar	100 bar	150 bar	
Pressure sensors 0...100 bar	100 bar	200 bar	250 bar	
Pressure sensors 0...250 bar	250 bar	400 bar	450 bar	
Pressure sensors 0...400 bar	400 bar	650 bar	700 bar	
Pressure sensors 0...600 bar	600 bar	750 bar	800 bar	

-1...2 bar -14.5...29 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
-1...10 bar -14.5...145 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
0...2 bar 0...29 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
0...5 bar 0...73 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
0...10 bar 0...145 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
0...20 bar 0...290 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
0...50 bar 0...725 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
0...100 bar 0...1450 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
0...250 bar 0...3626 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
0...400 bar 0...5802 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
0...600 bar 0...8702 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	

Operating voltage U_B
 Output current max.
 No-load supply current I_0 max.
 Switching frequency f max.
 Accuracy

Temperature error
 Reverse polarity/short-circuit protected
 Ambient/material temperature
 Display/function indicators
 Degree of protection per IEC 60529

Material
 Housing
 Measuring cell
 Seal

Connection
 Connectors
 Process connection

BSP Pressure Sensors

Standard sensors



2 programmable switching points (NO or NC)



1 programmable switching point and analog output 0...10 V DC



1 programmable switching point and analog output 4...20 mA

BSP004F BSP V002-EV002-D00A0B-S4	BSP004J BSP V002-EV002-A00A0B-S4	BSP004L BSP V002-EV002-A02A0B-S4
BSP004N BSP V002-EV002-D01A0B-S4	BSP004R BSP V002-EV002-A01A0B-S4	BSP004U BSP V002-EV002-A03A0B-S4
BSP004H BSP V010-EV002-D00A0B-S4	BSP004K BSP V010-EV002-A00A0B-S4	BSP004M BSP V010-EV002-A02A0B-S4
BSP004P BSP V010-EV002-D01A0B-S4	BSP004T BSP V010-EV002-A01A0B-S4	BSP004W BSP V010-EV002-A03A0B-S4
BSP000F BSP B002-EV002-D00A0B-S4	BSP000T BSP B002-EV002-A00A0B-S4	BSP0014 BSP B002-EV002-A02A0B-S4
BSP003K BSP B002-EV002-D01A0B-S4	BSP003P BSP B002-EV002-A01A0B-S4	BSP003W BSP B002-EV002-A03A0B-S4
BSP000H BSP B005-EV002-D00A0B-S4	BSP000U BSP B005-EV002-A00A0B-S4	BSP0015 BSP B005-EV002-A02A0B-S4
BSP003L BSP B005-EV002-D01A0B-S4	BSP003R BSP B005-EV002-A01A0B-S4	BSP003Y BSP B005-EV002-A03A0B-S4
BSP000J BSP B010-EV002-D00A0B-S4	BSP000W BSP B010-EV002-A00A0B-S4	BSP0016 BSP B010-EV002-A02A0B-S4
BSP001F BSP B010-EV002-D01A0B-S4	BSP001M BSP B010-EV002-A01A0B-S4	BSP001U BSP B010-EV002-A03A0B-S4
BSP000K BSP B020-EV002-D00A0B-S4	BSP000Y BSP B020-EV002-A00A0B-S4	BSP0017 BSP B020-EV002-A02A0B-S4
BSP001H BSP B020-EV002-D01A0B-S4	BSP001N BSP B020-EV002-A01A0B-S4	BSP001W BSP B020-EV002-A03A0B-S4
BSP000L BSP B050-EV002-D00A0B-S4	BSP000Z BSP B050-EV002-A00A0B-S4	BSP0018 BSP B050-EV002-A02A0B-S4
BSP001J BSP B050-EV002-D01A0B-S4	BSP001P BSP B050-EV002-A01A0B-S4	BSP001Y BSP B050-EV002-A03A0B-S4
BSP000M BSP B100-EV002-D00A0B-S4	BSP0010 BSP B100-EV002-A00A0B-S4	BSP0019 BSP B100-EV002-A02A0B-S4
BSP001K BSP B100-EV002-D01A0B-S4	BSP001R BSP B100-EV002-A01A0B-S4	BSP001Z BSP B100-EV002-A03A0B-S4
BSP000N BSP B250-EV002-D00A0B-S4	BSP0011 BSP B250-EV002-A00A0B-S4	BSP001A BSP B250-EV002-A02A0B-S4
BSP001L BSP B250-EV002-D01A0B-S4	BSP001T BSP B250-EV002-A01A0B-S4	BSP0020 BSP B250-EV002-A03A0B-S4
BSP000P BSP B400-EV002-D00A0B-S4	BSP0012 BSP B400-EV002-A00A0B-S4	BSP001C BSP B400-EV002-A02A0B-S4
BSP003M BSP B400-EV002-D01A0B-S4	BSP003T BSP B400-EV002-A01A0B-S4	BSP003Z BSP B400-EV002-A03A0B-S4
BSP000R BSP B600-EV002-D00A0B-S4	BSP0013 BSP B600-EV002-A00A0B-S4	BSP001E BSP B600-EV002-A02A0B-S4
BSP003N BSP B600-EV002-D01A0B-S4	BSP003U BSP B600-EV002-A01A0B-S4	BSP0040 BSP B600-EV002-A03A0B-S4
18...36 V DC 500 mA ≤ 50 mA 200 Hz ≤ ±0.5 % FSO BFSL ≤ ±0.3 % FSO/10 K Yes/yes -25...+85 °C/-25...+125 °C 7 segment display/LED IP 67 (when connected) PA 6.6, stainless steel Ceramic Fluoroelastomer M12 connector, 4-pin G 1/4"	18...36 V DC 500 mA ≤ 50 mA 200 Hz ≤ ±0.5 % FSO BFSL ≤ ±0.3 % FSO/10 K Yes/yes -25...+85 °C/-25...+125 °C 7 segment display/LED IP 67 (when connected) PA 6.6, stainless steel Ceramic Fluoroelastomer M12 connector, 4-pin G 1/4"	18...36 V DC 500 mA ≤ 50 mA 200 Hz ≤ ±0.5 % FSO BFSL ≤ ±0.3 % FSO/10 K Yes/yes -25...+85 °C/-25...+125 °C 7 segment display/LED IP 67 (when connected) PA 6.6, stainless steel Ceramic Fluoroelastomer M12 connector, 4-pin G 1/4"



Standard
Sensors
High-End
Sensors

BSP Pressure Sensors

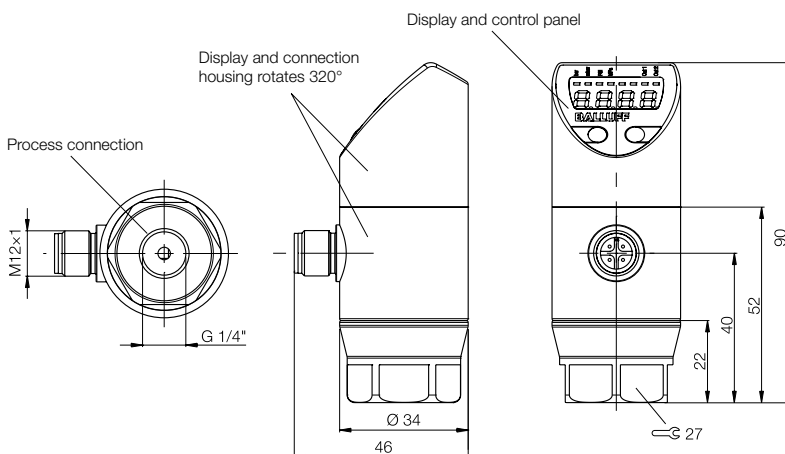
High-End Sensors

Balluff pressure sensors for high-end applications were designed for demanding requirements and extended temperature ranges. The high-end pressure sensor is ideal for harsh environments. The compact housing is manufactured entirely from hard-wearing stainless steel. Parameters are configured quickly and easily in line with VDMA standards. High-end applications include:

- Wind turbines
- Off-shore
- Refrigeration and air-conditioning systems



The high-end version of the Balluff BSP is enclosed in a two-way rotary housing for easier installation. Position the cable outlet as shown in the machine layout and turn the display in your viewing direction.



Design	Relative nominal pressure	Overload pressure	Cracking pressure \geq	Permitted vacuum
Pressure sensors -1...2 bar	2 bar	4 bar	10 bar	vacuum proof
Pressure sensors -1...10 bar	10 bar	20 bar	35 bar	
Pressure sensors 0...2 bar	2 bar	4 bar	10 bar	
Pressure sensors 0...5 bar	5 bar	10 bar	15 bar	
Pressure sensors 0...10 bar	10 bar	20 bar	35 bar	
Pressure sensors 0...20 bar	20 bar	40 bar	75 bar	
Pressure sensors 0...50 bar	50 bar	100 bar	150 bar	
Pressure sensors 0...100 bar	100 bar	200 bar	250 bar	
Pressure sensors 0...250 bar	250 bar	400 bar	450 bar	
Pressure sensors 0...400 bar	400 bar	650 bar	700 bar	
Pressure sensors 0...600 bar	600 bar	750 bar	800 bar	

-1...2 bar -14.5...29 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
-1...10 bar -14.5...145 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
0...2 bar 0...29 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
0...5 bar 0...73 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
0...10 bar 0...145 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
0...20 bar 0...290 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
0...50 bar 0...725 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
0...100 bar 0...1450 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
0...250 bar 0...3626 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
0...400 bar 0...5802 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	
0...600 bar 0...8702 psi	PNP	Ordering code	
		Part number	
	NPN	Ordering code	
		Part number	

Operating voltage U_B
 Output current max.
 No-load supply current I_0 max.
 Switching frequency f max.
 Accuracy

Temperature error
 Reverse polarity/short-circuit protected
 Ambient/material temperature
 Display/function indicators
 Degree of protection per IEC 60529

Material
 Housing
 Measuring cell
 Seal

Connection
 Connectors
 Process connection

BSP Pressure Sensors

High-End Sensors



2 programmable switching points (NO or NC)



1 programmable switching point and analog output 0...10 V DC



1 programmable switching point and analog output 4...20 mA

BSP004Y BSP V002-EV003-D00A0B-S4	BSP0050 BSP V002-EV003-A00A0B-S4	BSP0052 BSP V002-EV003-A02A0B-S4
BSP0054 BSP V002-EV003-D01A0B-S4	BSP0056 BSP V002-EV003-A01A0B-S4	BSP0058 BSP V002-EV003-A03A0B-S4
BSP004Z BSP V010-EV003-D00A0B-S4	BSP0051 BSP V010-EV003-A00A0B-S4	BSP0053 BSP V010-EV003-A02A0B-S4
BSP0055 BSP V010-EV003-D01A0B-S4	BSP0057 BSP V010-EV003-A01A0B-S4	BSP0059 BSP V010-EV003-A03A0B-S4
BSP0021 BSP B002-EV003-D00A0B-S4	BSP002A BSP B002-EV003-A00A0B-S4	BSP002N BSP B002-EV003-A02A0B-S4
BSP0041 BSP B002-EV003-D01A0B-S4	BSP0045 BSP B002-EV003-A01A0B-S4	BSP0049 BSP B002-EV003-A03A0B-S4
BSP0022 BSP B005-EV003-D00A0B-S4	BSP002C BSP B005-EV003-A00A0B-S4	BSP002P BSP B005-EV003-A02A0B-S4
BSP0042 BSP B005-EV003-D01A0B-S4	BSP0046 BSP B005-EV003-A01A0B-S4	BSP004A BSP B005-EV003-A03A0B-S4
BSP0023 BSP B010-EV003-D00A0B-S4	BSP002E BSP B010-EV003-A00A0B-S4	BSP002R BSP B010-EV003-A02A0B-S4
BSP0031 BSP B010-EV003-D01A0B-S4	BSP0036 BSP B010-EV003-A01A0B-S4	BSP003C BSP B010-EV003-A03A0B-S4
BSP0024 BSP B020-EV003-D00A0B-S4	BSP002F BSP B020-EV003-A00A0B-S4	BSP002T BSP B020-EV003-A02A0B-S4
BSP0032 BSP B020-EV003-D01A0B-S4	BSP0037 BSP B020-EV003-A01A0B-S4	BSP003E BSP B020-EV003-A03A0B-S4
BSP0025 BSP B050-EV003-D00A0B-S4	BSP002H BSP B050-EV003-A00A0B-S4	BSP002U BSP B050-EV003-A02A0B-S4
BSP0033 BSP B050-EV003-D01A0B-S4	BSP0038 BSP B050-EV003-A01A0B-S4	BSP003F BSP B050-EV003-A03A0B-S4
BSP0026 BSP B100-EV003-D00A0B-S4	BSP002J BSP B100-EV003-A00A0B-S4	BSP002W BSP B100-EV003-A02A0B-S4
BSP0034 BSP B100-EV003-D01A0B-S4	BSP0039 BSP B100-EV003-A01A0B-S4	BSP003H BSP B100-EV003-A03A0B-S4
BSP0027 BSP B250-EV003-D00A0B-S4	BSP002K BSP B250-EV003-A00A0B-S4	BSP002Y BSP B250-EV003-A02A0B-S4
BSP0035 BSP B250-EV003-D01A0B-S4	BSP003A BSP B250-EV003-A01A0B-S4	BSP003J BSP B250-EV003-A03A0B-S4
BSP0028 BSP B400-EV003-D00A0B-S4	BSP002L BSP B400-EV003-A00A0B-S4	BSP002Z BSP B400-EV003-A02A0B-S4
BSP0043 BSP B400-EV003-D01A0B-S4	BSP0047 BSP B400-EV003-A01A0B-S4	BSP004C BSP B400-EV003-A03A0B-S4
BSP0029 BSP B600-EV003-D00A0B-S4	BSP002M BSP B600-EV003-A00A0B-S4	BSP0030 BSP B600-EV003-A02A0B-S4
BSP0044 BSP B600-EV003-D01A0B-S4	BSP0048 BSP B600-EV003-A01A0B-S4	BSP004E BSP B600-EV003-A03A0B-S4
18...36 V DC 500 mA ≤ 50 mA 200 Hz ≤ ±0.5 % FSO BFSL ≤ ±0.3 % FSO/10 K Yes/yes -40...+85 °C/-40...+125 °C 7 segment display/LED IP 67 (when connected) Stainless steel Ceramic Fluoroelastomer M12 connector, 4-pin G 1/4"	18...36 V DC 500 mA ≤ 50 mA 200 Hz ≤ ±0.5 % FSO BFSL ≤ ±0.3 % FSO/10 K Yes/yes -40...+85 °C/-40...+125 °C 7 segment display/LED IP 67 (when connected) Stainless steel Ceramic Fluoroelastomer M12 connector, 4-pin G 1/4"	18...36 V DC 500 mA ≤ 50 mA 200 Hz ≤ ±0.5 % FSO BFSL ≤ ±0.3 % FSO/10 K Yes/yes -40...+85 °C/-40...+125 °C 7 segment display/LED IP 67 (when connected) Stainless steel Ceramic Fluoroelastomer M12 connector, 4-pin G 1/4"



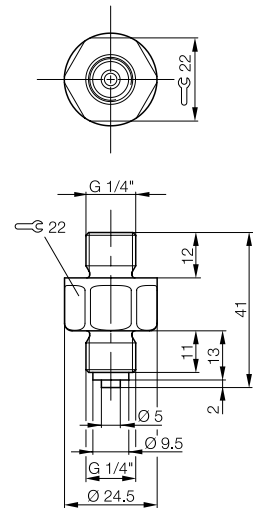
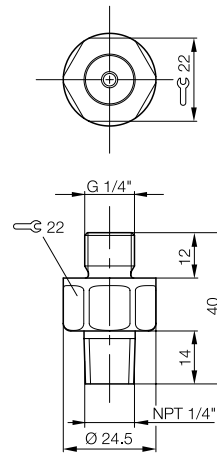
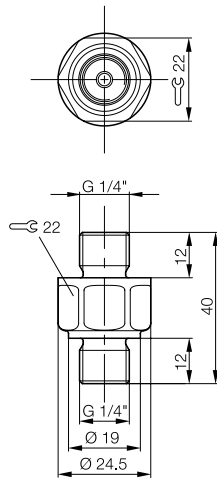
Standard Sensors
High-End Sensors

Accessories

Adapters



Description	Adapter G 1/4"	Adapter NPT 1/4"	Adapter G 1/4"
Version			for attachment to pressure gauge
Ordering code	BAM01KP	BAM01KT	BAM01KR
Part number	BAM AD-SP-008-1G4/1G4-4	BAM AD-SP-008-1G4/1N4-4	BAM AD-SP-008-1G4/1G4-4-EN837
Housing material	Stainless steel	Stainless steel	Stainless steel
Sensor end connection	G 1/4"	G 1/4"	G 1/4"
Process end connection	G 1/4"	NPT 1/4"	G 1/4" for attachment to pressure gauge as per EN 837



Balluff BSP pressure sensors can be adapted to different process connections using adapters available as an optional extra.

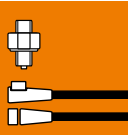
Adapters for other process connections are available on request.

Accessories

Connectors



ECOLAB

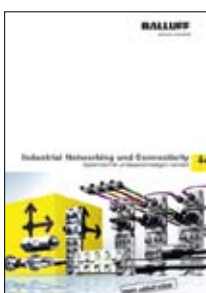
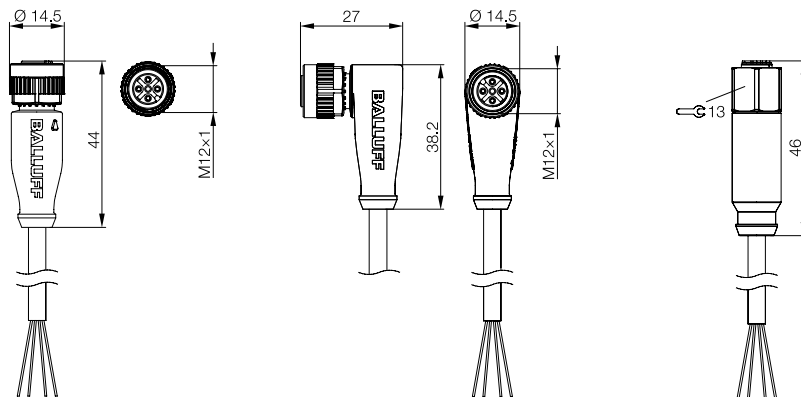


Adapters
Connectors

Version	Connection cable for standard pressure sensors	Connection cable for standard pressure sensors	Connection cable for high-end pressure sensors
Type	Straight female	Right-angle female	Straight female
Connector diagram and wiring	<p>PIN 1: brown PIN 2: white PIN 3: blue PIN 4: black</p>	<p>PIN 1: brown PIN 2: white PIN 3: blue PIN 4: black</p>	<p>PIN 1: brown PIN 2: white PIN 3: blue PIN 4: black</p>
Max. operating voltage U_0	250 V DC	250 V DC	32 V AC/DC
Cable	Molded	Molded	Assembled
No. of wires x conductor cross-section	4x0.34 mm ²	4x0.34 mm ²	4x0.34 mm ²
Degree of protection per IEC 60529	IP 68	IP 68	IP 68/IP 69K
Ambient temperature T_a	PUR: -25...+80 °C PVC: -5...+80 °C	-25...+80 °C -5...+80 °C	-40...+85 °C (momentarily +105 °C)

Cable material	Color	Length	Ordering code	Part number	
PUR	Black	2 m	BCC032F	BCC032Y	
			BCC M415-0000-1A-003-PX0434-020	BCC M425-0000-1A-003-PX0434-020	
PUR	Black	5 m	BCC032H	BCC032Z	
			BCC M415-0000-1A-003-PX0434-050	BCC M425-0000-1A-003-PX0434-050	
PUR	Black	10 m	BCC032J	BCC0330	
			BCC M415-0000-1A-003-PX0434-100	BCC M425-0000-1A-003-PX0434-100	
PVC	Gray	2 m	BCC0367	BCC036N	BCC02FE
			BCC M415-0000-1A-003-VX8434-020	BCC M425-0000-1A-003-VX8434-020	BKS-S260-3-02
PVC	Gray	5 m	BCC0368	BCC036P	BCC02FF
			BCC M415-0000-1A-003-VX8434-050	BCC M425-0000-1A-003-VX8434-050	BKS-S260-3-05
PVC	Gray	10 m	BCC0369	BCC036R	
			BCC M415-0000-1A-003-VX8434-100	BCC M425-0000-1A-003-VX8434-100	

Other cable materials, colors and lengths on request.



More about our cables and connectivity products can be found in our brochures or online at: www.balluff.com



Alphanumerical Directory



Sorted by Part number

Part number	Ordering code	Page	Part number	Ordering code	Page
BAM AD-SP-008-1G4/1G4-4	BAM01KP	18	BSP B050-EV003-D01A0B-S4	BSP0033	17
BAM AD-SP-008-1G4/1G4-4-EN837	BAM01KR	18	BSP B100-EV002-A00A0B-S4	BSP0010	15
BAM AD-SP-008-1G4/1N4-4	BAM01KT	18	BSP B100-EV002-A01A0B-S4	BSP001R	15
BCC M415-0000-1A-003-PX0434-020	BCC032F	19	BSP B100-EV002-A02A0B-S4	BSP0019	15
BCC M415-0000-1A-003-PX0434-050	BCC032H	19	BSP B100-EV002-A03A0B-S4	BSP001Z	15
BCC M415-0000-1A-003-PX0434-100	BCC032J	19	BSP B100-EV002-D00A0B-S4	BSP000M	15
BCC M415-0000-1A-003-VX8434-020	BCC0367	19	BSP B100-EV002-D01A0B-S4	BSP001K	15
BCC M415-0000-1A-003-VX8434-050	BCC0368	19	BSP B100-EV003-A00A0B-S4	BSP002J	17
BCC M415-0000-1A-003-VX8434-100	BCC0369	19	BSP B100-EV003-A01A0B-S4	BSP0039	17
BCC M425-0000-1A-003-PX0434-020	BCC032Y	19	BSP B100-EV003-A02A0B-S4	BSP002W	17
BCC M425-0000-1A-003-PX0434-050	BCC032Z	19	BSP B100-EV003-A03A0B-S4	BSP003H	17
BCC M425-0000-1A-003-PX0434-100	BCC0330	19	BSP B100-EV003-D00A0B-S4	BSP0026	17
BCC M425-0000-1A-003-VX8434-020	BCC036N	19	BSP B100-EV003-D01A0B-S4	BSP0034	17
BCC M425-0000-1A-003-VX8434-050	BCC036P	19	BSP B250-EV002-A00A0B-S4	BSP0011	15
BCC M425-0000-1A-003-VX8434-100	BCC036R	19	BSP B250-EV002-A01A0B-S4	BSP001T	15
BKS-S260-3-02	BCC02FE	19	BSP B250-EV002-A02A0B-S4	BSP001A	15
BKS-S260-3-05	BCC02FF	19	BSP B250-EV002-A03A0B-S4	BSP0020	15
BSP B002-EV002-A00A0B-S4	BSP000T	15	BSP B250-EV002-D00A0B-S4	BSP000N	15
BSP B002-EV002-A01A0B-S4	BSP003P	15	BSP B250-EV002-D01A0B-S4	BSP001L	15
BSP B002-EV002-A02A0B-S4	BSP0014	15	BSP B250-EV003-A00A0B-S4	BSP002K	17
BSP B002-EV002-A03A0B-S4	BSP003W	15	BSP B250-EV003-A01A0B-S4	BSP003A	17
BSP B002-EV002-D00A0B-S4	BSP000F	15	BSP B250-EV003-A02A0B-S4	BSP002Y	17
BSP B002-EV002-D01A0B-S4	BSP003K	15	BSP B250-EV003-A03A0B-S4	BSP003J	17
BSP B002-EV003-A00A0B-S4	BSP002A	17	BSP B250-EV003-D00A0B-S4	BSP0027	17
BSP B002-EV003-A01A0B-S4	BSP0045	17	BSP B250-EV003-D01A0B-S4	BSP0035	17
BSP B002-EV003-A02A0B-S4	BSP002N	17	BSP B400-EV002-A00A0B-S4	BSP0012	15
BSP B002-EV003-A03A0B-S4	BSP0049	17	BSP B400-EV002-A01A0B-S4	BSP003T	15
BSP B002-EV003-D00A0B-S4	BSP0021	17	BSP B400-EV002-A02A0B-S4	BSP001C	15
BSP B002-EV003-D01A0B-S4	BSP0041	17	BSP B400-EV002-A03A0B-S4	BSP003Z	15
BSP B005-EV002-A00A0B-S4	BSP000U	15	BSP B400-EV002-D00A0B-S4	BSP000P	15
BSP B005-EV002-A01A0B-S4	BSP003R	15	BSP B400-EV002-D01A0B-S4	BSP003M	15
BSP B005-EV002-A02A0B-S4	BSP0015	15	BSP B400-EV003-A00A0B-S4	BSP002L	17
BSP B005-EV002-A03A0B-S4	BSP003Y	15	BSP B400-EV003-A01A0B-S4	BSP0047	17
BSP B005-EV002-D00A0B-S4	BSP000H	15	BSP B400-EV003-A02A0B-S4	BSP002Z	17
BSP B005-EV002-D01A0B-S4	BSP003L	15	BSP B400-EV003-A03A0B-S4	BSP004C	17
BSP B005-EV003-A00A0B-S4	BSP002C	17	BSP B400-EV003-D00A0B-S4	BSP0028	17
BSP B005-EV003-A01A0B-S4	BSP0046	17	BSP B400-EV003-D01A0B-S4	BSP0043	17
BSP B005-EV003-A02A0B-S4	BSP002P	17	BSP B600-EV002-A00A0B-S4	BSP0013	15
BSP B005-EV003-A03A0B-S4	BSP004A	17	BSP B600-EV002-A01A0B-S4	BSP003U	15
BSP B005-EV003-D00A0B-S4	BSP0022	17	BSP B600-EV002-A02A0B-S4	BSP001E	15
BSP B005-EV003-D01A0B-S4	BSP0042	17	BSP B600-EV002-A03A0B-S4	BSP0040	15
BSP B010-EV002-A00A0B-S4	BSP000W	15	BSP B600-EV002-D00A0B-S4	BSP000R	15
BSP B010-EV002-A01A0B-S4	BSP001M	15	BSP B600-EV002-D01A0B-S4	BSP003N	15
BSP B010-EV002-A02A0B-S4	BSP0016	15	BSP B600-EV003-A00A0B-S4	BSP002M	17
BSP B010-EV002-A03A0B-S4	BSP001U	15	BSP B600-EV003-A01A0B-S4	BSP0048	17
BSP B010-EV003-A00A0B-S4	BSP000J	15	BSP B600-EV003-A02A0B-S4	BSP0030	17
BSP B010-EV003-A01A0B-S4	BSP001F	15	BSP B600-EV003-A03A0B-S4	BSP004E	17
BSP B010-EV003-A02A0B-S4	BSP002E	17	BSP B600-EV003-D00A0B-S4	BSP0029	17
BSP B010-EV003-A03A0B-S4	BSP0036	17	BSP B600-EV003-D01A0B-S4	BSP0044	17
BSP B010-EV003-D00A0B-S4	BSP002R	17	BSP V002-EV002-A00A0B-S4	BSP004J	15
BSP B010-EV003-D01A0B-S4	BSP003C	17	BSP V002-EV002-A01A0B-S4	BSP004R	15
BSP B010-EV003-D02A0B-S4	BSP0023	17	BSP V002-EV002-A02A0B-S4	BSP004L	15
BSP B010-EV003-D03A0B-S4	BSP0031	17	BSP V002-EV002-A03A0B-S4	BSP004U	15
BSP B020-EV002-A00A0B-S4	BSP000Y	15	BSP V002-EV002-D00A0B-S4	BSP004F	15
BSP B020-EV002-A01A0B-S4	BSP001N	15	BSP V002-EV002-D01A0B-S4	BSP004N	15
BSP B020-EV002-A02A0B-S4	BSP0017	15	BSP V002-EV003-A00A0B-S4	BSP0050	17
BSP B020-EV002-A03A0B-S4	BSP001W	15	BSP V002-EV003-A01A0B-S4	BSP0056	17
BSP B020-EV002-D00A0B-S4	BSP000K	15	BSP V002-EV003-A02A0B-S4	BSP0052	17
BSP B020-EV002-D01A0B-S4	BSP001H	15	BSP V002-EV003-A03A0B-S4	BSP0058	17
BSP B020-EV003-A00A0B-S4	BSP002F	17	BSP V002-EV003-D00A0B-S4	BSP004Y	17
BSP B020-EV003-A01A0B-S4	BSP0037	17	BSP V002-EV003-D01A0B-S4	BSP0054	17
BSP B020-EV003-A02A0B-S4	BSP002T	17	BSP V010-EV002-A00A0B-S4	BSP004K	15
BSP B020-EV003-A03A0B-S4	BSP003E	17	BSP V010-EV002-A01A0B-S4	BSP004T	15
BSP B020-EV003-D00A0B-S4	BSP0024	17	BSP V010-EV002-A02A0B-S4	BSP004M	15
BSP B020-EV003-D01A0B-S4	BSP0032	17	BSP V010-EV002-A03A0B-S4	BSP004W	15
BSP B050-EV002-A00A0B-S4	BSP000Z	15	BSP V010-EV002-D00A0B-S4	BSP004H	15
BSP B050-EV002-A01A0B-S4	BSP001P	15	BSP V010-EV002-D01A0B-S4	BSP004P	15
BSP B050-EV002-A02A0B-S4	BSP0018	15	BSP V010-EV003-A00A0B-S4	BSP0051	17
BSP B050-EV002-A03A0B-S4	BSP001Y	15	BSP V010-EV003-A01A0B-S4	BSP0057	17
BSP B050-EV002-D00A0B-S4	BSP000L	15	BSP V010-EV003-A02A0B-S4	BSP0053	17
BSP B050-EV002-D01A0B-S4	BSP001J	15	BSP V010-EV003-A03A0B-S4	BSP0059	17
BSP B050-EV003-A00A0B-S4	BSP002H	17	BSP V010-EV003-D00A0B-S4	BSP004Z	17
BSP B050-EV003-A01A0B-S4	BSP0038	17	BSP V010-EV003-D01A0B-S4	BSP0055	17
BSP B050-EV003-A02A0B-S4	BSP002U	17			
BSP B050-EV003-A03A0B-S4	BSP003F	17			
BSP B050-EV003-D00A0B-S4	BSP0025	17			



Sorted by ordering code

Ordering code	Part number	Page	Ordering code	Part number	Page
BAM01KP	BAM AD-SP-008-1G4/1G4-4	18	BSP002M	BSP B600-EV003-A00A0B-S4	17
BAM01KR	BAM AD-SP-008-1G4/1G4-4-EN837	18	BSP002N	BSP B002-EV003-A02A0B-S4	17
BAM01KT	BAM AD-SP-008-1G4/1N4-4	18	BSP002P	BSP B005-EV003-A02A0B-S4	17
BCC02FE	BKS-S260-3-02	19	BSP002R	BSP B010-EV003-A02A0B-S4	17
BCC02FF	BKS-S260-3-05	19	BSP002T	BSP B020-EV003-A02A0B-S4	17
BCC032F	BCC M415-0000-1A-003-PX0434-020	19	BSP002U	BSP B050-EV003-A02A0B-S4	17
BCC032H	BCC M415-0000-1A-003-PX0434-050	19	BSP002W	BSP B100-EV003-A02A0B-S4	17
BCC032J	BCC M415-0000-1A-003-PX0434-100	19	BSP002Y	BSP B250-EV003-A02A0B-S4	17
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BSP002L	BSP B400-EV003-A00A0B-S4	17			

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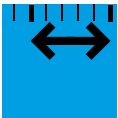
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Object Detection

Inductive sensors BES, cylinder sensors BMF, magnetic field sensors BMF, capacitive sensors BCS for object detection, ultrasonic sensors BUS for object detection, photoelectric sensors BOS, fiber optic devices BFB, fiber optics BFO, angle sensors BWL, through-beam fork sensors BGL, optical window sensors BOW, light grids BLG, contrast sensors BKT, luminescence sensors BLT, color sensors BFS, mechanical and inductive single and multiple position switches BNS



Linear Position Sensing

Micropulse® transducers BTL, magnetic linear encoder system BML, incremental encoders BDG, absolute encoders BRG, inductive displacement system BIW, inductive positioning system BIP, inductive distance sensors BAW, magnetoinductive distance sensors BIL, capacitive distance sensors BCW, photoelectric distance sensors BOD, ultrasonic sensors BUS for analog distance measurement



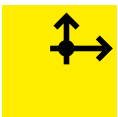
Fluid Sensors

Pressure sensors BSP, capacitive sensors BCS for level detection



Industrial Identification

Industrial RFID systems BIS, vision sensors BVS



Industrial Networking and Connectivity

Connectors and connection cables BCC, valve connectors BCC, passive splitter boxes BPI, active splitter boxes BNI, IO-Link, bus systems (Profibus, Profinet, CC-Link, DeviceNet, EtherNet), inductive couplers BIC, wireless systems BWT, power supplies BAE, electrical devices BAE



Accessories

Brackets and mountings, assembly system BMS

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