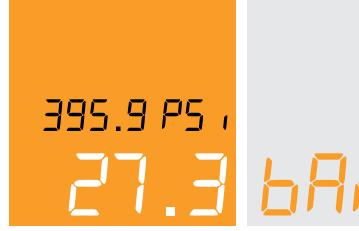




Reliable solutions for the automation industry







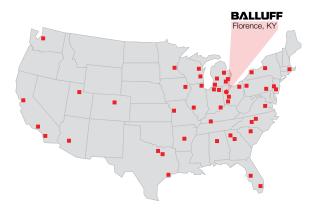
Balluff North America

Florence, Kentucky USA

Balluff's Florence, Kentucky United States headquarters is located just south of Cincinnati, Ohio. Our customers are in industries such as automotive, machine tool, robotics, injection molding, packaging, material handling, and more.

In addition to sales, marketing, and logistic functions, this facility manufactures Micropulse® magnetostrictive linear position sensors and warehouses over 60,000 products.

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The Balluff Global Network

Balluff spans the globe with representation in 56 countries.



BSP pressure sensors from Balluff were designed for measuring the pressure of gases and liquids. By means of a rotatable housing and two buttons for programming, the sensors are flexible to install and easy to operate. The bright LED display makes it possible to read the current system pressure quickly at all times.



BSP Pressure Sensors

10

32

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Industrial Networking and Connectivity - A Selection

For additional products, refer to our catalog: Industrial Networking and Connectivity - A guide to industrial network architectures and sensor connections



For additional products, refer to our brochure: Sensor Positioning System - Award winning flexible system for sensor placement

Basic Information and Definitions



Alphanumerical Directory



WARNING

- Read, understand, and follow warnings and manual.
 Failure to do so could result in serious injury or death.
 NEVER USE AS A SENSING DEVICE FOR PERSONNEL PROTECTION
 Does NOT include self-checking redundancy circuitry required for use in serious leafty, applications.

- required for use in personnel safety applications Does NOT meet OSHA and ANSI standards for point-of-operation devices

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Reliability for Process Technology

BSP Pressure Sensors guarantee a consistently high product quality

Process technology is becoming increasingly more important in factory automation. Monitoring of process media such as cooling lubricants, hydraulic oils, and pneumatic systems has an important influence on the manufacturing quality.

- Save space when positioning the versatile sensor the exceptionally compact sensor has independently rotating display and connection housings.
- View the system pressure at a glance Balluff pressure sensors have a large, bright illuminated LED display.
- Clear menu navigation for the quick and easy adjustment of pressure parameters - configure the sensor using two buttons in line with VDMA standards.
- Also suitable for harsh industrial applications Balluff offers versions in a high-quality, rugged stainless steel housing with IP 67 degree of protection.

Version

Housing material

Applications Hvdraulics **Pneumatics** Machine tools Plastics technology Packaging machines Wind power plants Off-shore Chemical industry

Connection via IO-Link is possible @ Compact versions without a display Standard temperature range -25...+85 °C Extended temperature range -40...+85 °C

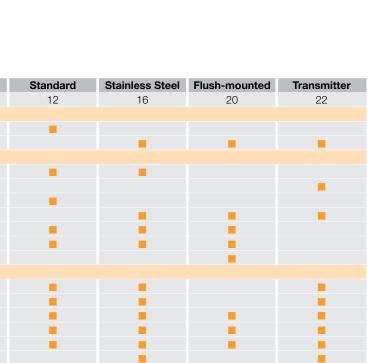
Display housing rotates by 320° M12 connector rotates by 320° Detects pasty and sticky media

Page

Plastic Stainless steel **Special properties**

- connection via a G1/4" 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
- Secure operation for your plant Balluff pressure sensors can be protected from unauthorized access by a password.

meliable operation of your plants even under demanding conditions
(pressure peaks) – reliable ceramic measuring cells with long-term
stability guarantee a long service life.
Simple installation with alphally standardized screw fittings - process









For a Wide Variety of Applications

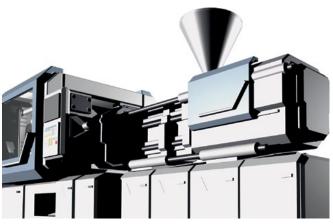
BSP pressure sensors combine the advantages of displays, measuring transducers and pressure switches

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 crucial to achieving the dimensional accuracy and quality of the products manufactured. A pressure sensor BSP with analog output monitors the available hydraulic pressure in order to control the process accurately while achieving a satisfactory degree of reproducibility.

Monitoring of cooling lubricant in machine tools

The pressure in the coolant supply system must be monitored continually to guarantee the consistently high surface quality of machined workpieces. 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

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

Benefits

- Ceramic measuring cells offer stability
- Display is easy to read
- Reliable machine operation



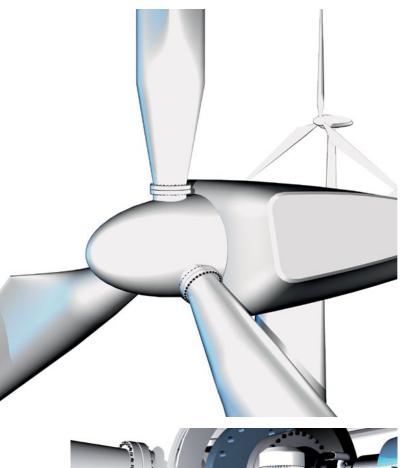


Central hydraulic unit in wind power plants

Many central systems in a wind power plant, such as the pitch control and braking system, are operated hydraulically. The stainless steel 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 or falling below the optimum level.

Vacuum grippers in handling and conveyor systems

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. BSP pressure sensors perform reliably in the vacuum pressure range. They monitor the pressure of the vacuum suction cups and thereby ensure reliable gripping.







Benefits

- Compact design
- Simple startup
- Vacuum sensors up to -1 bar relative pressure

Benefits

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

Pressure Sensors with IO-Link — Right Where the Action Is

Pressure monitoring in production

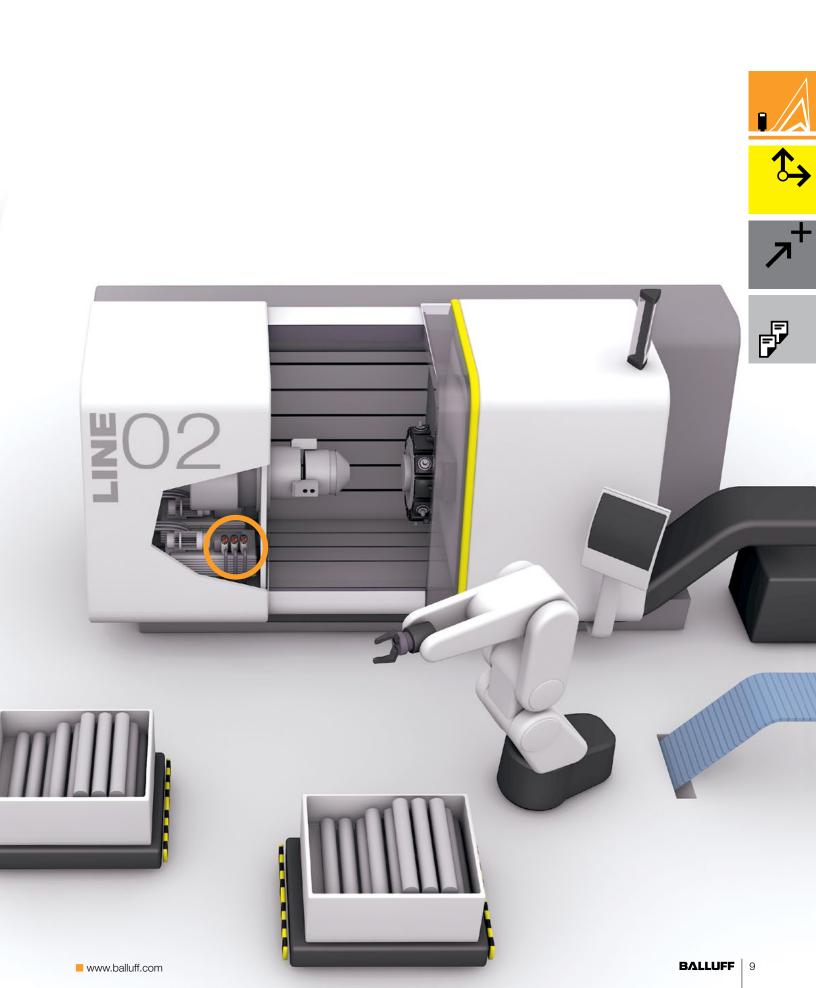
Achieving the best results on a lathe requires a reliable grip on the workpiece and the tool. Pressure sensors for monitoring clamping pressure are used to ensure this function. They are also ideally suited for monitoring process media such as coolants, lubricants, hydraulic fluids and pneumatic components.

IO-Link pressure sensors continuously relay their measured values and data to the controller and let it provide precise readjustment when necessary. IO-Link pressure sensors ensure the highest machine availability. Replacing sensors is possible with simple plug-and-play, since the configuration of the replaced sensor is automatically downloaded from the IO-Link master.

A further benefit

The parameters for IO-Link pressure sensors can be configured using the controller, meaning that they can be installed right where the action is, even at hard-to-reach locations. In the best position for measurements and perfectly matched to the machine design. This ensures quick and precise results. And it saves on costs, since complex mechanical installations of hydraulic lines can be reduced to a minimum.







BSP Pressure Sensors

Balluff pressure sensors monitor pressures of gaseous and fluid media; they can also be used in a variety of ways in factory automation. For this reason, standard and complex applications can be easily solved with them. Moreover, they feature an especially high degree of user-friendliness and an impressive price/performance ratio.



Contents

Standard sensors	12
Standard sensors with IO-Link	14
Stainless steel sensors	16
Stainless steel sensors with IO-Link	18
Flush-mounted stainless steel sensors	20
Transmitters for a wide variety of applications	22
Special pressure sensors	26
Calibration of pressure sensors	27





Basic information and definitions can be found on page 34.





■ www.balluff.com

Standard sensors

Standard pressure sensors are suitable for a wide variety of applications in factory automation. A large display and a simple operating concept in accordance with VDMA saves you time when configuring the sensors. Save space when installing the versatile pressure sensors. The display and electrical output can be rotated independently of the flange.

Additional advantages

- Compact housing design
- Local pressure display
- Digital switching outputs
- Analog output



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

PNP pressure sensors

C€

PNP pressure sensors				
-12 bar (-14.529 psi)	PNP	Ordering code		
	NPN	Ordering code		
-110 bar (-14.5145 psi)	PNP	Ordering code		
	NPN	Ordering code		
02 bar (029 psi)	PNP	Ordering code		
	NPN	Ordering code		
05 bar (073 psi)	PNP	Ordering code		
	NPN	Ordering code		
010 bar (0145 psi)	PNP	Ordering code		
	NPN	Ordering code		
020 bar (0290 psi)	PNP	Ordering code		
	NPN	Ordering code		
050 bar (0725 psi)	PNP	Ordering code		
	NPN	Ordering code		
0100 bar (01450 psi)	PNP	Ordering code		
	NPN	Ordering code		
0250 bar (03626 psi)	PNP	Ordering code		
	NPN	Ordering code		
0400 bar (05802 psi)	PNP	Ordering code		
	NPN	Ordering code		
0600 bar (08702 psi)	PNP	Ordering code		
	NPN	Ordering code		
Supply voltage U _B				
Output current max.				
No-load supply current I ₀ max				
Switching frequency f max.				
Accuracy				
Temperature error				
Polarity reversal protected/sho	ort-circuit pro	otected		
Ambient/media temperature				
Display/function indicators	0500			
Degree of protection per IEC 6				
Material				
	Measuring	g cell		
0	Seal			
Connection	Plug connector			
	Process c	connection		

Wiring diagrams see page 40.

Design	Relative nomina	al pressure	Overload pres	ssure	Burst pressur	e≥	Permitted vacuum
-12 bar	29 psi	2 bar	58 psi	4 bar	145 psi	10 bar	
-110 bar	145 psi	10 bar	290 psi	20 bar	508 psi	35 bar	
02 bar	29 psi	2 bar	58 psi	4 bar	145 psi	10 bar	
05 bar	73 psi	5 bar	145 psi	10 bar	218 psi	15 bar	₹
010 bar	145 psi	10 bar	290 psi	20 bar	508 psi	35 bar	proof
020 bar	290 psi	20 bar	580 psi	40 bar	1088 psi	75 bar	
050 bar	725 psi	50 bar	1450 psi	100 bar	2176 psi	150 bar	vacuum
0100 bar	1450 psi	100 bar	2900 psi	200 bar	3626 psi	250 bar	8
0250 bar	3626 psi	250 bar	5802 psi	400 bar	6527 psi	450 bar	
0400 bar	5802 psi	400 bar	9428 psi	650 bar	10153 psi	700 bar	
0600 bar	8702 psi	600 bar	10878 psi	750 bar	11603 psi	800 bar	

Standard sensors



Two programmable switching points (NO or NC)



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



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



3SP	
ressure	
Sensors	

00113013
Standard
sensors

Standard sensors with IO-Link Stainless steel sensors

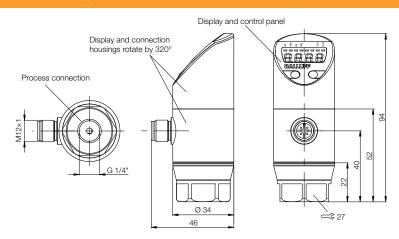
Stainless steel sensors with IO-Link Flush-

Flushmounted stainless steel sensors Pressure

transmitters Special pressure sensors Calibration

BSP004F BSP004N BSP004R BSP004U BSP005C+ BSP005H+ BSP005J+ BSP005J- BSP004P BSP004T BSP004W BSP004W BSP003F BSP003H BSP003H BSP0014 BSP003B BSP003H BSP000U BSP0015 BSP003L BSP003H BSP003Y BSP003Y BSP001F BSP001M BSP0016 BSP001F BSP001F BSP001M BSP001U BSP001F BSP001F BSP001M BSP001T BSP001T BSP001H BSP001D BSP001F BSP001T BSP001B BSP001B BSP001B BSP001B	(NO or NC)	analog output 010 V DC	analog output 420 mA
BSP004H BSP005C* BSP005H* BSP005J* BSP004W BSP005F* BSP004P BSP004T BSP004W BSP005F* BSP004F* BSP004W BSP005F* BSP000F* BSP000T BSP0014 BSP003K BSP003F* BSP003W BSP003D* BSP003W BSP000H BSP000U BSP0015 BSP003L BSP000U BSP0015 BSP0015 BSP0015 BSP0015 BSP0015 BSP0015 BSP001F* BSP001M BSP001F* BSP001M BSP001F* BSP001M BSP001F* BSP001M BSP001F* BS	BSP004F	BSP004J	BSP004L
BSP005C* BSP004P BSP000T BSP0014 BSP000F BSP000T BSP0014 BSP003K BSP003P BSP003W BSP003L BSP003B BSP003Y BSP003L BSP003R BSP003Y BSP001B BSP001B BSP0016 BSP001F BSP000W BSP0016 BSP001F BSP001W BSP001T BSP001B BSP001T BSP001T BSP001B BSP001W BSP001W BSP001J BSP001P BSP001Y BSP001B BSP001P BSP001P BSP001B BSP001P BSP001P BSP001B BSP001P BSP001P BSP001B BSP001B BSP001P BSP001B BSP001B BSP001B BSP001B <	BSP004N	BSP004R	BSP004U
BSP004P BSP000T BSP0014 BSP000T BSP0014 BSP000SK BSP003P BSP003W BSP003W BSP003K BSP003P BSP003W BSP003H BSP003H BSP003H BSP003H BSP000U BSP0015 BSP000U BSP0016 BSP0016 BSP001F BSP001M BSP001H BSP003H BSP003H BSP003H BSP003H BSP003H BSP003H BSP001H BSP003H BSP001H BSP003H BSP001H BSP003H BS	BSP004H	BSP004K	BSP004M
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BSP003K BSP000U BSP000T BSP003L BSP003R BSP003Y BSP000J BSP000W BSP0016 BSP001F BSP001M BSP001U BSP001F BSP001M BSP001U BSP001H BSP001N BSP001V BSP001H BSP001N BSP001W BSP001J BSP001P BSP0018 BSP001J BSP001P BSP0019 BSP001B BSP001P BSP001P BSP001F BSP001B BSP001P BSP001B BSP001B BSP001B BSP001C BSP001A BSP001A BSP001B BSP001A BSP001A BSP001B BSP001B BSP001C BSP001B BSP001C BSP001C BSP003M BSP001B BSP001B BSP003N BSP001B BSP001B BSP003N BSP001B BSP001B BSP003N BSP001B BSP001B BSP004B BSP004B BSP004B BSP005B SSO mA <td< th=""><th>BSP004P</th><th>BSP004T</th><th>BSP004W</th></td<>	BSP004P	BSP004T	BSP004W
BSP000H BSP003R BSP003Y BSP00J BSP00W BSP0016 BSP00IF BSP00IM BSP001U BSP00K BSP00Y BSP001T BSP001H BSP00IN BSP001F BSP001B BSP001B BSP001B BSP001J BSP001P BSP001Y BSP005E* BSP001B BSP001P BSP001K BSP001B BSP001B BSP001A BSP001B BSP001A BSP001B BSP001A BSP001A BSP001L BSP001T BSP001C BSP003M BSP001B BSP001C BSP003M BSP001B BSP001B BSP003M BSP001B BSP001B BSP003M BSP003B B	BSP000F	BSP000T	BSP0014
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BSP000J BSP001F BSP001M BSP001U BSP000K BSP000Y BSP001T BSP001H BSP001N BSP001W BSP001L BSP001P BSP0018 BSP001J BSP001P BSP001Y BSP000M BSP0010 BSP0019 BSP001K BSP001R BSP001Z BSP001L BSP001T BSP001A BSP001L BSP001T BSP0020 BSP003M BSP0012 BSP001C BSP003M BSP003T BSP003Z BSP001B BSP001B BSP001E BSP003N BSP003U BSP004D 1836 V DC 1836 V DC 1836 V DC 500 mA ≤ 00 mA ≤ 50 mA < ± 0.5 % FSO BFSL ≤ ± 0.5 % FSO BFSL ≤ ± 0.5 % FSO BFSL ≤ ± 0.5 % FSO BFSL ≤ ± 0.5 % FSO BFSL ≤ ± 0.5 % FSO BFSL ≤ ± 0.3 % FSO/10 K ≤ ± 0.3 % FSO/10 K < ± 0.3 % FSO/10 K Yes/Yes Yes/Yes Yes/Yes Yes/Yes -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C <th>BSP000H</th> <th>BSP000U</th> <th>BSP0015</th>	BSP000H	BSP000U	BSP0015
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BSP000K BSP001N BSP001W BSP001H BSP000Z BSP001W BSP001J BSP001P BSP001Y BSP000M BSP0010 BSP0019 BSP001K BSP001R BSP0019 BSP001K BSP0011 BSP001A BSP001L BSP0011 BSP001C BSP003M BSP0012 BSP001C BSP003M BSP003T BSP003Z BSP003B BSP0013 BSP001E BSP003M BSP003B BSP004D 1836 V DC 1836 V DC 1836 V DC 500 mA ≤ 50 mA ≤ 50 mA 200 Hz 200 Hz 200 Hz ≤ ±0.3 % FSO BFSL ≤ ±0.5 % FSO BFSL ≤ ±0.5 % FSO BFSL ≤ ±0.3 % FSO/10 K ≤ ±0.3 % FSO/10 K ≤ ±0.3 % FSO/10 K Yes/Yes Yes/Yes Yes/Yes -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C 7-segment display/LED 7-segment display/LED 7-segment display/LED IP 67 (when screwed into place) IP 67 (when screw	BSP000J	BSP000W	BSP0016
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BSP001K BSP001R BSP001Z BSP000N BSP0011 BSP001A BSP005F* BSP001T BSP0020 BSP001L BSP0012 BSP001C BSP003M BSP003T BSP003Z BSP003N BSP0013 BSP001E BSP003N BSP003U BSP0040 1836 V DC 1836 V DC 1836 V DC 500 mA 500 mA 500 mA ≤ 50 mA ≤ 50 mA ≤ 50 mA 200 Hz 200 Hz 200 Hz ≤ ±0.5 % FSO BFSL ≤ ±0.5 % FSO BFSL ≤ ±0.3 % FSO/10 K Yes/Yes Yes/Yes Yes/Yes -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C 7-segment display/LED 7-segment display/LED IP 67 (when screwed into place) IP 67 (when screwed into place) IP 67 (when screwed into place) IP 67 (when screwed into place) PA 6.6 and stainless steel Ceramic Ceramic Ceramic Fluoroelastomer Fluoroelastomer Fluoroelastomer M12 connector, 4-pin M12	BSP001J	BSP001P	BSP001Y
BSP001K BSP001R BSP001A BSP005F* BSP0011 BSP001A BSP001L BSP001T BSP0020 BSP003M BSP0012 BSP001C BSP003M BSP003T BSP003Z BSP000R BSP0013 BSP001E BSP003N BSP003U BSP0040 1836 V DC 1836 V DC 1836 V DC 500 mA 500 mA 500 mA ≤ 50 mA ≤ 50 mA ≤ 50 mA 200 Hz 200 Hz 200 Hz ≤ ±0.5 % FSO BFSL ≤ ±0.5 % FSO BFSL ≤ ±0.5 % FSO BFSL ≤ ±0.3 % FSO/10 K ≤ ±0.3 % FSO/10 K ≤ ±0.3 % FSO/10 K Yes/Yes Yes/Yes Yes/Yes -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C 7-segment display/LED IP 67 (when screwed into place) IP 67 (when screwed into place) IP 67 (when screwed into place) PA 6.6 and stainless steel PA 6.6 and stainless steel PA 6.6 and stainless steel Ceramic Ceramic Ceramic Fluoroelastomer Fluoroelastomer Fluoroelastom	BSP000M	BSP0010	BSP0019
BSP000N BSP0011 BSP001A BSP001L BSP001T BSP0020 BSP001P BSP0012 BSP001C BSP003M BSP003T BSP003Z BSP000R BSP0013 BSP001E BSP003N BSP003U BSP0040 1836 V DC 1836 V DC 1836 V DC 500 mA 500 mA 500 mA ≤ 50 mA ≤ 50 mA ≤ 50 mA 200 Hz 200 Hz 200 Hz ≤ ±0.5 % FSO BFSL ≤ ±0.5 % FSO BFSL ≤ ±0.5 % FSO BFSL ≤ ±0.3 % FSO/10 K ≤ ±0.3 % FSO/10 K ≤ ±0.3 % FSO/10 K Yes/Yes Yes/Yes Yes/Yes -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C 7-segment display/LED 7-segment display/LED 7-segment display/LED IP 67 (when screwed into place) IP 67 (when screwed into place) IP 67 (when screwed into place) PA 6.6 and stainless steel PA 6.6 and stainless steel PA 6.6 and stainless steel Ceramic Ceramic Ceramic Fluoroelastomer	BSP005E*		
BSP001L BSP001T BSP0020 BSP000P BSP0012 BSP001C BSP03M BSP003T BSP003Z BSP001B BSP001B BSP001E BSP003N BSP003U BSP004D 1836 V DC 1836 V DC 1836 V DC 500 mA 500 mA 500 mA ≤ 50 mA ≤ 50 mA ≤ 50 mA 200 Hz 200 Hz 200 Hz ≤ ±0.5 % FSO BFSL ≤ ±0.5 % FSO BFSL ≤ ±0.5 % FSO BFSL ≤ ±0.3 % FSO/10 K ≤ ±0.3 % FSO/10 K ≤ ±0.3 % FSO/10 K Yes/Yes Yes/Yes Yes/Yes -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C 7-segment display/LED 7-segment display/LED 7-segment display/LED IP 67 (when screwed into place) IP 67 (when screwed into place) IP 67 (when screwed into place) PA 6.6 and stainless steel PA 6.6 and stainless steel PA 6.6 and stainless steel PA 6.6 and stainless steel PA 6.6 and stainless steel Ceramic Ceramic Ceramic Ceramic Ceramic Fluoroelastomer Fluoroelastomer Fluoroelastomer Fluoroelastomer <th>BSP001K</th> <th>BSP001R</th> <th>BSP001Z</th>	BSP001K	BSP001R	BSP001Z
BSP001L BSP001P BSP0012 BSP001C BSP003M BSP003T BSP003Z BSP003E BSP000R BSP0013 BSP001E BSP003N BSP003U BSP0040 1836 V DC 1836 V DC 500 mA 500 mA 500 mA ≤ 50 mA ≤ 50 mA ≤ 50 mA 200 Hz 200 Hz 200 Hz ≤ ±0.5 % FSO BFSL ≤ ±0.5 % FSO BFSL ≤ ±0.5 % FSO BFSL ≤ ±0.3 % FSO/10 K Yes/Yes Yes/Yes -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C -25+125 °C 7-segment display/LED 7-segment display/LED 7-segment display/LED IP 67 (when screwed into place) IP 67 (when screwed into place) IP 67 (when screwed into place) PA 6.6 and stainless steel PA 6.6 and stainless steel PA 6.6 and stainless steel Ceramic Ceramic Ceramic Fluoroelastomer Fluoroelastomer Fluoroelastomer M12 connector, 4-pin M12 connector, 4-pin	BSP000N	BSP0011	BSP001A
BSP000P BSP003T BSP003Z BSP000R BSP0013 BSP001E BSP003N BSP003U BSP0040 1836 V DC 1836 V DC 1836 V DC 500 mA 500 mA 500 mA ≤ 50 mA ≤ 50 mA ≤ 50 mA 200 Hz 200 Hz 200 Hz ≤ ± 0.5 % FSO BFSL ≤ ± 0.5 % FSO BFSL ≤ ± 0.5 % FSO BFSL ≤ ± 0.3 % FSO/10 K ≤ ± 0.3 % FSO/10 K ≤ ± 0.3 % FSO/10 K Yes/Yes Yes/Yes Yes/Yes -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C 7-segment display/LED 7-segment display/LED IP 67 (when screwed into place) IP 67 (when screwed into place) IP 67 (when screwed into place) IP 67 (when screwed into place) PA 6.6 and stainless steel PA 6.6 and stainless steel PA 6.6 and stainless steel Ceramic Ceramic Ceramic Fluoroelastomer Fluoroelastomer Fluoroelastomer M12 connector, 4-pin M12 connector, 4-pin M12 connector, 4-pin	BSP005F*		
BSP003M BSP0013 BSP001E BSP003N BSP003U BSP0040 1836 V DC 1836 V DC 1836 V DC 500 mA 500 mA 500 mA ≤ 50 mA ≤ 50 mA ≤ 50 mA 200 Hz 200 Hz 200 Hz ≤ ± 0.5 % FSO BFSL ≤ ± 0.5 % FSO BFSL ≤ ± 0.5 % FSO BFSL ≤ ± 0.3 % FSO/10 K ≤ ± 0.3 % FSO/10 K ≤ ± 0.3 % FSO/10 K Yes/Yes Yes/Yes Yes/Yes -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C -25+125 °C 7-segment display/LED 7-segment display/LED 7-segment display/LED IP 67 (when screwed into place) IP 67 (when screwed into place) IP 67 (when screwed into place) PA 6.6 and stainless steel PA 6.6 and stainless steel PA 6.6 and stainless steel Ceramic Ceramic Ceramic Fluoroelastomer Fluoroelastomer Fluoroelastomer M12 connector, 4-pin M12 connector, 4-pin M12 connector, 4-pin	BSP001L	BSP001T	BSP0020
BSP000R BSP003U BSP0040 1836 V DC 1836 V DC 1836 V DC 500 mA 500 mA 500 mA ≤ 50 mA ≤ 50 mA ≤ 50 mA 200 Hz 200 Hz 200 Hz ≤ ±0.5 % FSO BFSL ≤ ±0.5 % FSO BFSL ≤ ±0.5 % FSO BFSL ≤ ±0.3 % FSO/10 K ≤ ±0.3 % FSO/10 K ≤ ±0.3 % FSO/10 K Yes/Yes Yes/Yes Yes/Yes -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C 7-segment display/LED 7-segment display/LED T-segment display/LED IP 67 (when screwed into place) IP 67 (when screwed into place) IP 67 (when screwed into place) PA 6.6 and stainless steel PA 6.6 and stainless steel PA 6.6 and stainless steel Ceramic Ceramic Ceramic Fluoroelastomer Fluoroelastomer Fluoroelastomer M12 connector, 4-pin M12 connector, 4-pin M12 connector, 4-pin	BSP000P	BSP0012	BSP001C
BSP003N BSP003U BSP0040 1836 V DC 1836 V DC 500 mA 500 mA 500 mA ≤ 50 mA ≤ 50 mA ≤ 50 mA 200 Hz 200 Hz 200 Hz ≤ ±0.5 % FSO BFSL ≤ ±0.5 % FSO BFSL ≤ ±0.5 % FSO BFSL ≤ ±0.3 % FSO/10 K ≤ ±0.3 % FSO/10 K ≤ ±0.3 % FSO/10 K Yes/Yes Yes/Yes Yes/Yes -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C 7-segment display/LED 7-segment display/LED 7-segment display/LED IP 67 (when screwed into place) IP 67 (when screwed into place) IP 67 (when screwed into place) PA 6.6 and stainless steel PA 6.6 and stainless steel PA 6.6 and stainless steel Ceramic Ceramic Ceramic Fluoroelastomer Fluoroelastomer Fluoroelastomer M12 connector, 4-pin M12 connector, 4-pin M12 connector, 4-pin	BSP003M	BSP003T	BSP003Z
1836 V DC 1836 V DC 500 mA 500 mA ≤ 50 mA ≤ 50 mA 200 Hz 200 Hz ≤ ±0.5 % FSO BFSL ≤ ±0.5 % FSO BFSL ≤ ±0.3 % FSO/10 K ≤ ±0.3 % FSO/10 K Yes/Yes Yes/Yes -25+85 °C/-25+125 °C -25+85 °C/-25+125 °C 7-segment display/LED 7-segment display/LED IP 67 (when screwed into place) IP 67 (when screwed into place) IP 6.6 and stainless steel PA 6.6 and stainless steel Ceramic Ceramic Fluoroelastomer Fluoroelastomer M12 connector, 4-pin M12 connector, 4-pin	BSP000R	BSP0013	BSP001E
500 mA	BSP003N	BSP003U	BSP0040
$ \le 50 \text{ mA} $ $ \le 50 \text{ mA} $ $ \le 50 \text{ mA} $ $ \ge 200 \text{ Hz} $ $ \ge \pm 0.5 \% \text{ FSO BFSL} $ $ \le \pm 0.5 \% \text{ FSO BFSL} $ $ \le \pm 0.3 \% \text{ FSO/10 K} $ $ \le \pm 0.3 \% \text{ FSO/10 K} $ $ \le \pm 0.3 \% \text{ FSO/10 K} $ $ \times 200 \text{ FSO/10 K} $ $ \times 2$	1836 V DC	1836 V DC	1836 V DC
200 Hz			
$ \leq \pm 0.5 \% \text{ FSO BFSL} $ $ \leq \pm 0.5 \% \text{ FSO BFSL} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% \text{ FSO/10 K} $ $ \leq \pm 0.3 \% FSO/1$			
Yes/YesYes/YesYes/Yes-25+85 °C/-25+125 °C-25+85 °C/-25+125 °C7-segment display/LED7-segment display/LED7-segment display/LEDIP 67 (when screwed into place)IP 67 (when screwed into place)IP 67 (when screwed into place)PA 6.6 and stainless steelPA 6.6 and stainless steelPA 6.6 and stainless steelCeramicCeramicCeramicFluoroelastomerFluoroelastomerFluoroelastomerM12 connector, 4-pinM12 connector, 4-pinM12 connector, 4-pin			
-25+85 °C/-25+125 °C 7-segment display/LED 7-segment display/LED 7-segment display/LED 7-segment display/LED 7-segment display/LED 7-segment display/LED 1P 67 (when screwed into place) PA 6.6 and stainless steel PA 6.6 and stainless steel Ceramic Fluoroelastomer Fluoroelastomer M12 connector, 4-pin P-25+85 °C/-25+125 °C 7-segment display/LED 1P 67 (when screwed into place) PA 6.6 and stainless steel			
7-segment display/LED 1P 67 (when screwed into place) PA 6.6 and stainless steel PA 6.6 and stainless steel Ceramic Ceramic Fluoroelastomer Fluoroelastomer M12 connector, 4-pin M12 connector, 4-pin 7-segment display/LED 7-segment display/LED 1P 67 (when screwed into place) PA 6.6 and stainless steel	100,100	100/100	100,100
IP 67 (when screwed into place)IP 67 (when screwed into place)IP 67 (when screwed into place)PA 6.6 and stainless steelPA 6.6 and stainless steelPA 6.6 and stainless steelCeramicCeramicCeramicFluoroelastomerFluoroelastomerFluoroelastomerM12 connector, 4-pinM12 connector, 4-pinM12 connector, 4-pin			
PA 6.6 and stainless steel Ceramic Ceramic Fluoroelastomer M12 connector, 4-pin PA 6.6 and stainless steel PA 6.6 and stainless steel Ceramic Fluoroelastomer M12 connector, 4-pin PA 6.6 and stainless steel Ceramic Fluoroelastomer M12 connector, 4-pin M12 connector, 4-pin			
CeramicCeramicCeramicFluoroelastomerFluoroelastomerFluoroelastomerM12 connector, 4-pinM12 connector, 4-pinM12 connector, 4-pin	. ,	` ' '	1 /
Fluoroelastomer Fluoroelastomer Fluoroelastomer Fluoroelastomer M12 connector, 4-pin M12 connector, 4-pin M12 connector, 4-pin			
M12 connector, 4-pin M12 connector, 4-pin M12 connector, 4-pin			
Internal thread G¼" per DIN EN 3852 Internal thread G¼" per DIN EN 3852 Internal thread G¼" per DIN EN 3852	·		
	Internal thread G¼" per DIN EN 3852	Internal thread G1/4" per DIN EN 3852	Internal thread G1/4" per DIN EN 3852

*Internal thread 1/4" NPT



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Standard pressure sensors with IO-Link can be positioned in the machine right where the action is from a process technology standpoint. That is because the accessibility of the sensors loses its significance through IO-Link. Process monitoring, configuration and error analysis of the IO-Link devices now take place in the controller and this way processes are optimized. Signal delays and distortions are eliminated reliably. Digital transmission of data also ensures high signal quality.

- Reduced downtimes:
 Simple sensor replacement with plug-and-play
- Maximum flexibility:System conversion during ongoing operation
- Simple commissioning: Complete parameter sets can be duplicated using IO-Link
- In-process diagnostics: Process data and errors are reported directly to the controller via IO-Link



PNP pressure sensors			CE	
-12 bar (-14.529 psi)	PNP	Ordering code		
	NPN	Ordering code		
-110 bar (-14.5145 psi)	PNP	Ordering code		
	NPN	Ordering code		
02 bar (029 psi)	PNP	Ordering code		
	NPN	Ordering code		
05 bar (073 psi)	PNP	Ordering code		
	NPN	Ordering code		
010 bar (0145 psi)	PNP	Ordering code		
	NPN	Ordering code		
020 bar (0290 psi)	PNP	Ordering code		
	NPN	Ordering code		
050 bar (0725 psi)	PNP	Ordering code		
	NPN	Ordering code		
0100 bar (01450 psi)	PNP	Ordering code		
	NPN	Ordering code		
0250 bar (03626 psi)	PNP	Ordering code		
	NPN	Ordering code		
0400 bar (05802 psi)	PNP	Ordering code		
	NPN	Ordering code		
0600 bar (08702 psi)	PNP	Ordering code		
	NPN	Ordering code		
Supply voltage U _B				
Output current max.				
No-load supply current I ₀ max				
Switching frequency f max.				
Accuracy				
Temperature error				
Polarity reversal protected/short-circuit protected				
Ambient/media temperature				
Display/function indicators				
Degree of protection per IEC 6				
Material	Housing			
	Measuring	g cell		
	Seal			
Connection	Plug conn			
	Process of	connection		

Wiring diagrams see page 40.

Design	Relative nomina	l pressure	Overload pres	ssure	Burst pressur	e ≥	Permitted vacuum
-12 bar	29 psi	2 bar	58 psi	4 bar	145 psi	10 bar	
-110 bar	145 psi	10 bar	290 psi	20 bar	508 psi	35 bar	
02 bar	29 psi	2 bar	58 psi	4 bar	145 psi	10 bar	
05 bar	73 psi	5 bar	145 psi	10 bar	218 psi	15 bar	ð,
010 bar	145 psi	10 bar	290 psi	20 bar	508 psi	35 bar	proof
020 bar	290 psi	20 bar	580 psi	40 bar	1088 psi	75 bar	Ę
050 bar	725 psi	50 bar	1450 psi	100 bar	2176 psi	150 bar	vacuum
0100 bar	1450 psi	100 bar	2900 psi	200 bar	3626 psi	250 bar	8
0250 bar	3626 psi	250 bar	5802 psi	400 bar	6527 psi	450 bar	
0400 bar	5802 psi	400 bar	9428 psi	650 bar	10153 psi	700 bar	
0600 bar	8702 psi	600 bar	10878 psi	750 bar	11603 psi	800 bar	

Standard sensors with IO-Link



IO-Link Two programmable switching points (NO or NC)



IO-Link One programmable switching point and analog output 0...10 V DC



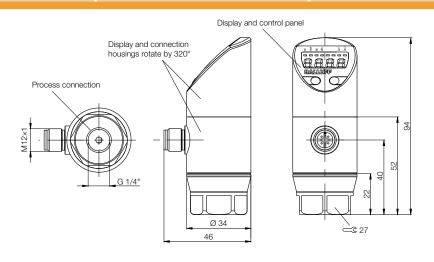
IO-Link One programmable switching point and



Sensors
Standard sensors
Standard sensors with IO-Link
Stainless steel sensors
Stainless steel sensors with IO-Link
Flush- mounted stainless steel sensors

Pressure transmitters Special pressure sensors Calibration

(NO or NC)	analog output 010 V DC	analog output 420 mA
BSP0086	BSP008L	BSP0091
BSP009U	BSP00C2	BSP009E
BSP0087	BSP008M	BSP0092
BSP009W	BSP00C3	BSP009F
BSP0088	BSP008N	BSP0093
BSP009Y	BSP00C4	BSP009H
BSP0089	BSP008P	BSP0094
BSP009Z	BSP00C5	BSP009J
BSP008A	BSP008R	BSP0095
BSP00A0	BSP00C6	BSP009K
BSP008C	BSP008T	BSP0096
BSP00A1	BSP00C7	BSP009L
BSP008E	BSP008U	BSP0097
BSP00A2	BSP00C8	BSP009M
BSP008F	BSP008W	BSP0098
BSP00A3	BSP00C9	BSP009N
BSP008H	BSP008Y	BSP0099
BSP00A4	BSP00CA	BSP009P
BSP008J	BSP008Z	BSP009A
BSP00A5	BSP00CC	BSP009R
BSP008K	BSP0090	BSP009C
BSP00A6	BSP00CE	BSP009T
1836 V DC	1836 V DC	1836 V DC
500 mA	500 mA	500 mA
≤ 50 mA	≤ 50 mA	≤ 50 mA
200 Hz	200 Hz	200 Hz
≤ ±0.5 % FSO BFSL	≤±0.5 % FSO BFSL	≤ ±0.5 % FSO BFSL
≤ ±0.3 % FSO/10 K	≤ ±0.3 % FSO/10 K	≤ ±0.3 % FSO/10 K
Yes/Yes	Yes/Yes	Yes/Yes
-25+85 °C/-25+125 °C	−25+85 °C/−25+125 °C	−25+85 °C/−25+125 °C
7-segment display/LED	7-segment display/LED	7-segment display/LED
IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)
PA 6.6 and stainless steel	PA 6.6 and stainless steel	PA 6.6 and stainless steel
Ceramic	Ceramic	Ceramic
Fluoroelastomer	Fluoroelastomer	Fluoroelastomer
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin
Internal thread G1/4" per DIN EN 3852	Internal thread G1/4" per DIN EN 3852	Internal thread G1/4" per DIN EN 3852



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Stainless Steel Sensors

Balluff pressure sensors with stainless steel housings are designed for the demanding requirements of extended temperature ranges and harsh environments. Parameters are configured quickly and easily in conformance with VDMA standards. Features of these sensors include:

- Extended temperature range
- Complete stainless steel housing
- Digital switching outputs
- Analog output



The stainless steel version of the BSP pressure sensors 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.

PNP pr	essure	sensors
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CF

PNP pressure sensors						
-12 bar (-14.529 psi)	PNP	Ordering code				
	NPN	Ordering code				
-110 bar (-14.5145 psi)	PNP	Ordering code				
	NPN	Ordering code				
02 bar (029 psi)	PNP	Ordering code				
	NPN	Ordering code				
05 bar (073 psi)	PNP	Ordering code				
	NPN	Ordering code				
010 bar (0145 psi)	PNP	Ordering code				
	NPN	Ordering code				
020 bar (0290 psi)	PNP	Ordering code				
	NPN	Ordering code				
050 bar (0725 psi)	PNP	Ordering code				
	NPN	Ordering code				
0100 bar (01450 psi)	PNP	Ordering code				
	NPN	Ordering code				
0250 bar (03626 psi)	PNP	Ordering code				
	NPN	Ordering code				
0400 bar (05802 psi)	PNP	Ordering code				
	NPN	Ordering code				
0600 bar (08702 psi)	PNP	Ordering code				
	NPN	Ordering code				
Supply voltage U _S						
Output current max.						
No-load supply current I ₀ max.						
Switching frequency f max.						
Accuracy						
Temperature error						
Polarity reversal protected/sho	rt-circuit pr	otected				
Ambient/media temperature						
Display/function indicators						
Degree of protection per IEC 6						
Material	Housing	n				
Measuring cell						
0	Seal					
Connection	Connection Plug connector					
	Process c	connection				

Wiring diagrams see page 40.

Design	Relative nomina	Relative nominal pressure Over		Overload pressure		e ≥	Permitted vacuum
-12 bar	29 psi	2 bar	58 psi	4 bar	145 psi	10 bar	
-110 bar	145 psi	10 bar	290 psi	20 bar	508 psi	35 bar	
02 bar	29 psi	2 bar	58 psi	4 bar	145 psi	10 bar	
05 bar	73 psi	5 bar	145 psi	10 bar	218 psi	15 bar	₹
010 bar	145 psi	10 bar	290 psi	20 bar	508 psi	35 bar	proof
020 bar	290 psi	20 bar	580 psi	40 bar	1088 psi	75 bar	Ę
050 bar	725 psi	50 bar	1450 psi	100 bar	2176 psi	150 bar	vacuum
0100 bar	1450 psi	100 bar	2900 psi	200 bar	3626 psi	250 bar	8
0250 bar	3626 psi	250 bar	5802 psi	400 bar	6527 psi	450 bar	
0400 bar	5802 psi	400 bar	9428 psi	650 bar	10153 psi	700 bar	
0600 bar	8702 psi	600 bar	10878 psi	750 bar	11603 psi	800 bar	

Stainless Steel Sensors



Two programmable switching points (NO or NC)



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

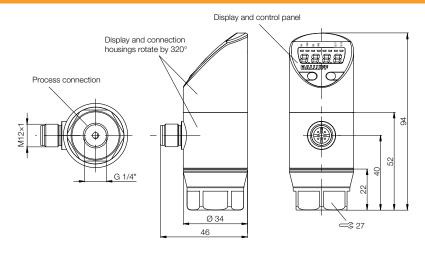


One programmable switching point and

BSP
Pressure
Sensors
Standard sensors
Standard sensors with IO-Link
Stainless stee sensors
Stainless steel sensors with IO-Link
Flush- mounted stainless steel sensors
Pressure transmitters
Special pressure sensors

Calibration

(NO or NC)	analog output 010 V DC	analog output 420 mA
BSP004Y	BSP0050	BSP0052
BSP0054	BSP0056	BSP0058
BSP004Z	BSP0051	BSP0053
BSP0055	BSP0057	BSP0059
BSP0021	BSP002A	BSP002N
BSP0041	BSP0045	BSP0049
BSP0022	BSP002C	BSP002P
BSP0042	BSP0046	BSP004A
BSP0023	BSP002E	BSP002R
BSP0031	BSP0036	BSP003C
BSP0024	BSP002F	BSP002T
BSP0032	BSP0037	BSP003E
BSP0025	BSP002H	BSP002U
BSP0033	BSP0038	BSP003F
BSP0026	BSP002J	BSP002W
BSP0034	BSP0039	BSP003H
BSP0027	BSP002K	BSP002Y
BSP0035	BSP003A	BSP003J
BSP0028	BSP002L	BSP002Z
BSP0043	BSP0047	BSP004C
BSP0029	BSP002M	BSP0030
BSP0044	BSP0048	BSP004E
1836 V DC	1836 V DC	1836 V DC
500 mA	500 mA	500 mA
≤ 50 mA	≤ 50 mA	≤ 50 mA
200 Hz	200 Hz	200 Hz
≤ ±0.5 % FSO BFSL	≤ ±0.5 % FSO BFSL	≤ ±0.5 % FSO BFSL
≤ ±0.3 % FSO/10 K	≤ ±0.3 % FSO/10 K	≤ ±0.3 % FSO/10 K
Yes/Yes	Yes/Yes	Yes/Yes
-40+85 °C/-40+125 °C	-40+85 °C/-40+125 °C	-40+85 °C/-40+125 °C
7-segment display/LED	7-segment display/LED	7-segment display/LED
IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)
Stainless steel	Stainless steel	Stainless steel
Ceramic	Ceramic	Ceramic
Fluoroelastomer	Fluoroelastomer	Fluoroelastomer
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin
Internal thread G1/4" per DIN EN 3852	Internal thread G1/4" per DIN EN 3852	Internal thread G1/4" per DIN EN 3852



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Stainless Steel Sensors with IO-Link



Stainless steel pressure sensors with IO-Link monitor cooling lubricant, hydraulic fluids and pneumatic systems. Using IO-Link, you continuously relay your measured values and data to the controller. You initiate the exact readjustment and thereby provide for the highest machine availability. IO-Link pressure sensors enable quick, error-free sensor replacement and prompt commissioning. Downtimes are significantly reduced since the parameters of a replaced IO-Link sensor are automatically transmitted from the IO-Link master to the new sensor. Commissioning processes, format changes or recipe changes are processed centrally via the controller's functional components. This saves time and reduces the potential for errors to a minimum.



-12 bar (-14.529 psi) PNP Ordering code NPN Ordering code NP	PNP pressure sensors			C€	
NPN	•	DND	0.1.2		
-110 bar (-14.5145 psi) O2 bar (029 psi) O5 bar (029 psi) O5 bar (073 psi) O5 bar (073 psi) O5 bar (073 psi) O5 bar (0145 psi) O6 bar (0145 psi) O6 bar (0145 psi) O7 bar (0145 psi) O10 bar (0145 psi) O10 bar (0145 psi) O10 bar (0145 psi) O10 bar (0290 psi) O10 bar (0125 psi) O10 bar (0125 psi) O10 bar (01450 psi) Ordering code NPN	-12 bar (-14.529 psi)		•		
NPN Ordering code 02 bar (029 psi) PNP Ordering code 05 bar (073 psi) PNP Ordering code 010 bar (0145 psi) PNP Ordering code 020 bar (0290 psi) PNP Ordering code 020 bar (0290 psi) PNP Ordering code 050 bar (0725 psi) PNP Ordering code 050 bar (01450 psi) PNP Ordering code 0100 bar (01450 psi) PNP Ordering code 0250 bar (03626 psi) PNP Ordering code 0250 bar (03626 psi) PNP Ordering code 0400 bar (03620 psi) PNP Ordering code 0400 bar (08702 psi) PNP Ordering code 0600 bar (08702 psi) PNP Ordering code 0601 bar (08702 psi) PNP Ordering code 0602 bar (08702 psi) PNP Ordering code 0603 bar (08702 psi) PNP Ordering code 0604 bar (08702 psi) PNP Ordering code 0605 bar (08702 psi) PNP Ordering code 0607 bar (08702 psi) PNP Ordering code 0608 bar (08702 psi) PNP Ordering code 0609 bar (08702 psi) PNP Ordering code 0600 bar (0870	4 40 1 (445 445 1)		•		
02 bar (029 psi) PNP	-110 bar (-14.5145 psi)				
NPN Ordering code O5 bar (073 psi) PNP Ordering code NPN Ordering code O10 bar (0145 psi) PNP Ordering code NPN Ordering code					
05 bar (073 psi) PNP	02 bar (029 psi)				
NPN			•		
010 bar (0145 psi) PNP (NPN) Ordering code 020 bar (0290 psi) PNP (NPN) Ordering code 050 bar (0725 psi) PNP (NPN) Ordering code 0100 bar (01450 psi) PNP (NPN) Ordering code 0250 bar (03626 psi) PNP (NPN) Ordering code 0400 bar (03626 psi) PNP (NPN) Ordering code 0400 bar (03702 psi) PNP (NPN) Ordering code 0600 bar (03702 psi) PNP (NPN) Ordering code 0400 bar (03702 psi) PNP (NPN) Ordering code	05 bar (073 psi)				
NPN Ordering code			•		
O20 bar (0290 psi) PNP Ordering code NPN O	010 bar (0145 psi)		•		
NPN Ordering code O50 bar (0725 psi) PNP Ordering code NPN					
O50 bar (0725 psi) PNP Ordering code NPN O	020 bar (0290 psi)				
O100 bar (01450 psi) PNP Ordering code NPN			•		
O100 bar (01450 psi) PNP Ordering code NPN	050 bar (0725 psi)				
NPN Ordering code O250 bar (03626 psi) PNP Ordering code NPN Ordering code NP					
O250 bar (03626 psi) PNP Ordering code NPN	0100 bar (01450 psi)	PNP			
O400 bar (05802 psi) O400 bar (05802 psi) PNP Ordering code NPN Orderi		NPN	Ordering code		
O400 bar (05802 psi) PNP Ordering code NPN Ordering code PNP Ordering code NPN Ordering code	0250 bar (03626 psi)	PNP	Ordering code		
O600 bar (08702 psi) NPN Ordering code PNP Ordering code NPN Ordering code Supply voltage U _B Output current max. No-load supply current I ₀ max. Switching frequency f max. Accuracy Temperature error Polarity reversal protected/short-circuit protected Ambient/media temperature Display/function indicators Degree of protection per IEC 60529 Material Housing Measuring cell Seal Connection Plug connector		NPN	Ordering code		
O600 bar (08702 psi) PNP Ordering code NPN Ordering code Supply voltage U _B Output current max. No-load supply current I ₀ max. Switching frequency f max. Accuracy Temperature error Polarity reversal protected/short-circuit protected Ambient/media temperature Display/function indicators Degree of protection per IEC 60529 Material Housing Measuring cell Seal Connection Plug connector	0400 bar (05802 psi)	PNP	Ordering code		
Supply voltage U _B Output current max. No-load supply current I ₀ max. Switching frequency f max. Accuracy Temperature error Polarity reversal protected/short-circuit protected Ambient/media temperature Display/function indicators Degree of protection per IEC 60529 Material Housing Measuring cell Seal Connection Plug connector		NPN	Ordering code		
Supply voltage U _B Output current max. No-load supply current I ₀ max. Switching frequency f max. Accuracy Temperature error Polarity reversal protected/short-circuit protected Ambient/media temperature Display/function indicators Degree of protection per IEC 60529 Material Housing Measuring cell Seal Connection Plug connector	0600 bar (08702 psi)	PNP	Ordering code		
Output current max. No-load supply current I ₀ max. Switching frequency f max. Accuracy Temperature error Polarity reversal protected/short-circuit protected Ambient/media temperature Display/function indicators Degree of protection per IEC 60529 Material Housing Measuring cell Seal Connection Plug connector		NPN	Ordering code		
No-load supply current I ₀ max. Switching frequency f max. Accuracy Temperature error Polarity reversal protected/short-circuit protected Ambient/media temperature Display/function indicators Degree of protection per IEC 60529 Material Housing Measuring cell Seal Connection Plug connector	Supply voltage U _B				
Switching frequency f max. Accuracy Temperature error Polarity reversal protected/short-circuit protected Ambient/media temperature Display/function indicators Degree of protection per IEC 60529 Material Housing Measuring cell Seal Connection Plug connector	Output current max.				
Accuracy Temperature error Polarity reversal protected/short-circuit protected Ambient/media temperature Display/function indicators Degree of protection per IEC 60529 Material Housing Measuring cell Seal Connection Plug connector	No-load supply current I ₀ max.				
Temperature error Polarity reversal protected/short-circuit protected Ambient/media temperature Display/function indicators Degree of protection per IEC 60529 Material Housing Measuring cell Seal Connection Plug connector	Switching frequency f max.				
Polarity reversal protected/short-circuit protected Ambient/media temperature Display/function indicators Degree of protection per IEC 60529 Material Housing Measuring cell Seal Connection Plug connector	Accuracy				
Ambient/media temperature Display/function indicators Degree of protection per IEC 60529 Material Housing Measuring cell Seal Connection Plug connector	Temperature error				
Display/function indicators Degree of protection per IEC 60529 Material Housing Measuring cell Seal Connection Plug connector	Polarity reversal protected/sho	t-circuit pro	otected		
Degree of protection per IEC 60529 Material Housing Measuring cell Seal Connection Plug connector	Ambient/media temperature				
Material Housing Measuring cell Seal Connection Plug connector	Display/function indicators				
Measuring cell Seal Connection Plug connector	Degree of protection per IEC 6	0529			
Seal Connection Plug connector	Material	Housing			
Seal Connection Plug connector		Measuring	g cell		
1.09 00					
Process connection	Connection	Plug conn	ector		
		Process of	onnection		

Wiring diagrams see page 40.

Design	Relative nomina	Relative nominal pressure Over		Overload pressure		e ≥	Permitted vacuum
-12 bar	29 psi	2 bar	58 psi	4 bar	145 psi	10 bar	
-110 bar	145 psi	10 bar	290 psi	20 bar	508 psi	35 bar	
02 bar	29 psi	2 bar	58 psi	4 bar	145 psi	10 bar	
05 bar	73 psi	5 bar	145 psi	10 bar	218 psi	15 bar	₹
010 bar	145 psi	10 bar	290 psi	20 bar	508 psi	35 bar	proof
020 bar	290 psi	20 bar	580 psi	40 bar	1088 psi	75 bar	Ę
050 bar	725 psi	50 bar	1450 psi	100 bar	2176 psi	150 bar	vacuum
0100 bar	1450 psi	100 bar	2900 psi	200 bar	3626 psi	250 bar	8
0250 bar	3626 psi	250 bar	5802 psi	400 bar	6527 psi	450 bar	
0400 bar	5802 psi	400 bar	9428 psi	650 bar	10153 psi	700 bar	
0600 bar	8702 psi	600 bar	10878 psi	750 bar	11603 psi	800 bar	

Stainless Steel Sensors with IO-Link



Two programmable switching points



♦ 10-LinkOne programmable switching point and analog output 0...10 V DC



One programmable switching point and analog output 4, 20 m/s



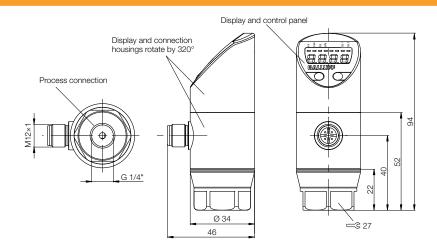
Pressure Sensors
Standard sensors
Standard sensors with IO-Link

WILLI TO LITTIC
Stainless steel
sensors
Stainless stee

sensors with IO-Link Flushmounted stainless steel sensors Pressure transmitters

transmitters Special pressure sensors Calibration

(NO or NC)	analog output 010 V DC	analog output 420 mA
BSP00CF	BSP00AM	BSP00A7
BSP00CW	BSP00E8	BSP00EN
BSP00CH	BSP00AN	BSP00A8
BSP00CY	BSP00E9	BSP00EP
BSP00CJ	BSP00AP	BSP00A9
BSP00CZ	BSP00EA	BSP00ER
BSP00CK	BSP00AR	BSP00AA
BSP00E0	BSP00EC	BSP00ET
BSP00CL	BSP00AT	BSP00AC
BSP00E1	BSP00EE	BSP00EU
BSP00CM	BSP00AU	BSP00AE
BSP00E2	BSP00EF	BSP00EW
BSP00CN	BSP00AW	BSP00AF
BSP00E3	BSP00EH	BSP00EY
BSP00CP	BSP00AY	BSP00AH
BSP00E4	BSP00EJ	BSP00EZ
BSP00CR	BSP00AZ	BSP00AJ
BSP00E5	BSP00EK	BSP00F0
BSP00CT	BSP00C0	BSP00AK
BSP00E6	BSP00EL	BSP00F1
BSP00CU	BSP00C1	BSP00AL
BSP00E7	BSP00EM	BSP00F2
1836 V DC	1836 V DC	1836 V DC
500 mA	500 mA	500 mA
≤ 50 mA	≤ 50 mA	≤ 50 mA
200 Hz	200 Hz	200 Hz
≤±0.5 % FSO BFSL	≤±0.5 % FSO BFSL	≤ ±0.5 % FSO BFSL
≤ ±0.3 % FSO/10 K	≤ ±0.3 % FSO/10 K	≤ ±0.3 % FSO/10 K
Yes/Yes	Yes/Yes	Yes/Yes
-40+85 °C/-40+125 °C	-40+85 °C/-40+125 °C	-40+85 °C/-40+125 °C
7-segment display/LED	7-segment display/LED	7-segment display/LED
IP 67 (when screwed into place)	IP 67 (when screwed into place)	IP 67 (when screwed into place)
Stainless steel	Stainless steel	Stainless steel
Ceramic	Ceramic	Ceramic
Fluoroelastomer	Fluoroelastomer	Fluoroelastomer
M12 connector, 4-pin	M12 connector, 4-pin	M12 connector, 4-pin
Internal thread G1/4" per DIN EN 3852	Internal thread G1/4" per DIN EN 3852	Internal thread G1/4" per DIN EN 3852



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Flush-mounted Stainless Steel Sensors

Flush-mounted BSP pressure sensors are ideally suited for pressure measurement in viscous, paste-like, crystallizing or solids-containing media. This makes them suitable for pressure measurement of adhesives, greases, sealants or often changing media. With their flush-mounted, welded stainless steel membrane, they have no dead spaces and can be easily cleaned.

Benefits

- Completely free of dead space
- No gaskets or offsets in the process
- Flush-mounted, welded stainless steel membrane
- Easy to clean



The connection to your process is made via a $G\frac{1}{2}$ " external thread in accordance with DIN EN 3852. Other process connections, such as TriClamp, Varivent, etc., are available on request.



PNP pressure sensors

(€

-12 bar (-14.529 psi)	PNP	Ordering code
	NPN	Ordering code
-110 bar (-14.5145 psi)	PNP	Ordering code
	NPN	Ordering code
02 bar (029 psi)	PNP	Ordering code
	NPN	Ordering code
05 bar (073 psi)	PNP	Ordering code
	NPN	Ordering code
010 bar (0145 psi)	PNP	Ordering code
	NPN	Ordering code
020 bar (0290 psi)	PNP	Ordering code
	NPN	Ordering code
050 bar (0725 psi)	PNP	Ordering code
	NPN	Ordering code
0100 bar (01450 psi)	PNP	Ordering code
	NPN	Ordering code
0250 bar (03626 psi)	PNP	Ordering code
	NPN	Ordering code
0400 bar (05802 psi)	PNP	Ordering code
	NPN	Ordering code
Supply voltage U _B		
Output current max.		

Output current max.

No-load supply current I_0 max.

Switching frequency f max.

Accuracy

Temperature error

Polarity reversal protected/short-circuit protected

Ambient/media temperature

Display/function indicators

Degree of protection per IEC 60529

Material Housing

Measuring cell Seal

Connection Plug connector

Process connection

Wiring diagrams see page 40.

Design	Relative nomina	l pressure	Overload pres	ssure	Burst pressur	e≥	Permitted vacuum
-12 bar	29 psi	2 bar	145 psi	10 bar	217 psi	15 bar	
-110 bar	145 psi	10 bar	580 psi	40 bar	725 psi	50 bar	
02 bar	29 psi	2 bar	145 psi	10 bar	217 psi	15 bar	
05 bar	73 psi	5 bar	580 psi	40 bar	725 psi	50 bar	proof
010 bar	145 psi	10 bar	580 psi	40 bar	725 psi	50 bar	
020 bar	290 psi	20 bar	1160 psi	80 bar	1740 psi	120 bar	vacuum
050 bar	725 psi	50 bar	1450 psi	100 bar	2176 psi	150 bar	/acı
0100 bar	1450 psi	100 bar	2900 psi	200 bar	4350 psi	300 bar	
0250 bar	3626 psi	250 bar	5802 psi	400 bar	10875 psi	750 bar	
0400 bar	5802 psi	400 bar	9428 psi	600 bar	14500 psi	1000 bar	

Flush-mounted Stainless Steel Sensors



M12 connector, 4-pin

G1/2" per DIN EN 3852

Two programmable switching points (NO or NC)



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



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



BSP Pressure Sensors

Standard

Standard sensors with IO-Link

Stainless steel sensors

Stainless steel sensors with IO-Link

Flushmounted stainless steel sensors

Pressure transmitters Special

pressure sensors Calibration

BSP005M BSP006F **BSP0062** BSP006W BSP007N **BSP0078** BSP005N BSP006H **BSP0063** BSP006Y BSP007P BSP0079 BSP005P BSP006J **BSP0064** BSP006Z BSP007R BSP007A BSP005R BSP006K **BSP0065** BSP0070 BSP007T BSP007C BSP005T BSP006L **BSP0066** BSP0071 BSP007U BSP007E BSP005U BSP006M BSP0067 BSP0072 BSP007W BSP007F BSP005W BSP006N **BSP0068** BSP0073 BSP007Y BSP007H BSP005Y BSP006P **BSP0069** BSP0074 BSP007Z BSP007J BSP005Z BSP006R BSP006A **BSP0075 BSP0080** BSP007K **BSP0060** BSP006T BSP006C **BSP0076** BSP0081 BSP007L 18...36 V DC 18...36 V DC 18...36 V DC 500 mA 500 mA 500 mA ≤ 50 mA ≤ 50 mA ≤ 50 mA 200 Hz 200 Hz 200 Hz ≤ ±0.5 % FSO BFSL ≤ ±0.5 % FSO BFSL ≤ ±0.5 % FSO BFSL ≤ ±0.3 % FSO/10 K ≤ ±0.3 % FSO/10 K ≤ ±0.3 % FSO/10 K Yes/Yes Yes/Yes Yes/Yes -40...+85 °C/-40...+125 °C -40...+85 °C/-40...+125 °C -40...+85 °C/-40...+125 °C 7-segment display/LED 7-segment display/LED 7-segment display/LED IP 67 (when screwed into place) IP 67 (when screwed into place) IP 67 (when screwed into place) Stainless steel Stainless steel Stainless steel Ceramic Ceramic Ceramic Fluoroelastomer Fluoroelastomer Fluoroelastomer

V	ariants	up t	o 50	bar

M12 connector, 4-pin

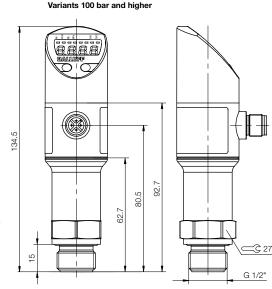
G1/2" per DIN EN 3852

Display and control panel Display and connection housings rotate by 320° Process connection 44.7 Ø 34 G 1/2"

Variants 100 bar and higher

M12 connector, 4-pin

G1/2" per DIN EN 3852



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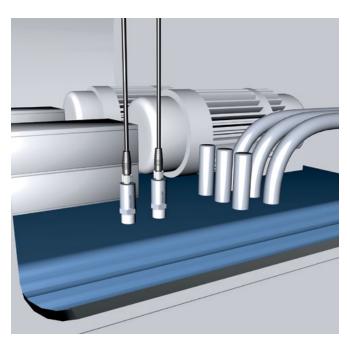
21

Pressure transmitters Voltage output 0...10 V DC

Compact pressure transmitters stand for continuously reliable pressure measurement. They are compact and installed right where the action is. Balluff pressure transmitters feature an impressive price/performance ratio and solve a wide variety of tasks in factory automation.

Applications

- Machine tools
- Hydraulics and pneumatics
- Pumps and compressors



Voltage output 0...10 V DC

(€

-12 bar (-14.529 psi)	Ordering code	
-110 bar (-14.5145 psi)	Ordering code	
02 bar (029 psi)	Ordering code	
05 bar (073 psi)	Ordering code	
010 bar (0145 psi)	Ordering code	
020 bar (0290 psi)	Ordering code	
050 bar (0725 psi)	Ordering code	
0100 bar (01450 psi)	Ordering code	
0250 bar (03626 psi)	Ordering code	
0400 bar (05802 psi)	Ordering code	
0600 bar (08702 psi)	Ordering code	
Supply voltage U _B		
No-load supply current I ₀ max.		
Accuracy		
Temperature error		
Polarity reversal protected/short-circuit pro	tected	
Ambient/media temperature		
Degree of protection per IEC 60529		
Load cycles		
Material	Housing	
	Measuring cell	
	Seal	
Connection	Plug connector	

Process connection

Wiring diagrams see page 40.

Design	Relative nominal pressure Over		Overload pres	ssure	Burst pressur	e≥	Permitted vacuum
-12 bar	29 psi	2 bar	58 psi	4 bar	145 psi	10 bar	
-110 bar	145 psi	10 bar	290 psi	20 bar	508 psi	35 bar	
02 bar	29 psi	2 bar	58 psi	4 bar	145 psi	10 bar	
05 bar	73 psi	5 bar	145 psi	10 bar	218 psi	15 bar	₹
010 bar	145 psi	10 bar	290 psi	20 bar	508 psi	35 bar	proof
020 bar	290 psi	20 bar	580 psi	40 bar	1015 psi	70 bar	
050 bar	725 psi	50 bar	1450 psi	100 bar	2176 psi	150 bar	vacuum
0100 bar	1450 psi	100 bar	2900 psi	200 bar	4350 psi	300 bar	8
0250 bar	3626 psi	250 bar	5802 psi	400 bar	10875 psi	750 bar	
0400 bar	5802 psi	400 bar	9428 psi	1200 bar	21750 psi	1500 bar	
0600 bar	8702 psi	600 bar	10878 psi	1200 bar	21750 psi	1500 bar	

Pressure transmitters Voltage output 0...10 V DC









BSP00KN BSP00KP

BSP00KR BSP00KT

BSP00KU

BSP00KW

BSP00KY

BSP00KZ

BSP00L0 BSP00L1

≤ 20 mA

Yes/Yes

> 100 mil. Stainless steel Ceramic Fluoroelastomer

10...30 V DC

≤ ±0.5 % FSO BFSL

≤ ±0.3 % FSO/10 K

M12 connector, 4-pin G1/2" per DIN EN 3852

-40...+85 °C/-40...+125 °C

IP 67 (when screwed into place)

BSP Pressure Sensors
Standard sensors
Standard sensors with IO-Link
Stainless steel sensors
Stainless steel sensors with IO-Link
Flush- mounted stainless steel sensors
Pressure transmitters
Special pressure sensors
Calibration

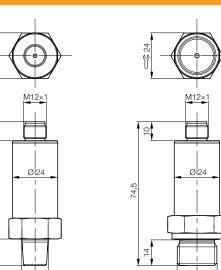
23

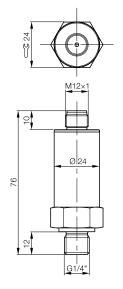


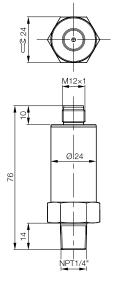
BSP00JE
BSP00JF
BSP00JH
BSP00JJ
BSP00JK
BSP00JL
BSP00JM
BSP00JN
BSP00JP
BSP00JR
BSP00JT
1030 V DC
≤ 20 mA
≤ ±0.5 % FSO BFSL
≤ ±0.5% FSO/10 K
Yes/Yes
-40+85 °C/-40+125 °C
IP 67 (when screwed into place
> 100 mil.
Stainless steel
Ceramic
Fluoroelastomer
M12 connector, 4-pin
G¼" per DIN EN 3852

BSP00JU
BSP00JW
BSP00JY
BSP00JZ
BSP00K0
BSP00K1
BSP00K2
BSP00K3
BSP00K4
BSP00K5
BSP00K6
1030 V DC
≤ 20 mA
≤ ±0.5 % FSO BFSL
≤ ±0.3 % FSO/10 K
Yes/Yes
-40+85 °C/-40+125 °C
IP 67 (when screwed into place
> 100 mil.
Stainless steel
Ceramic
Fluoroelastomer

В	SP00K7
В	SP00K8
В	SP00K9
В	SP00KA
В	SP00KC
В	SP00KE
В	SP00KF
В	SP00KH
В	SP00KJ
В	SP00KK
В	SP00KL
10	030 V DC
≤	20 mA
≤	±0.5 % FSO BFSL
≤	±0.3 % FSO/10 K
	es/Yes
	40+85 °C/-40+125 °C
IF	P 67 (when screwed into place
>	100 mil.
S	tainless steel
C	eramic
	luoroelastomer
N	112 connector, 4-pin
R	1/4"

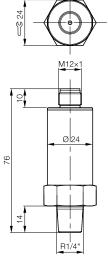


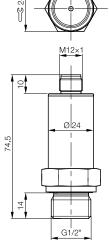




M12 connector, 4-pin

NPT1/4"





Pressure transmitters Current output 4...20 mA

BSP pressure transmitters provide a rugged stainless steel housing, reliable measurement technology and a large temperature range from –40 to 125 °C. This enables reliable operation and a long service life. Choose between eleven different pressure ranges, voltage or current output and various process connections for the appropriate sensor.

Benefits

- Extended temperature range
- Rugged metal housing
- Large product selection





Current output 4...20 mA

(€

-12 bar (-14.529 psi)	Ordering code	
-110 bar (-14.5145 psi)	Ordering code	
02 bar (029 psi)	Ordering code	
05 bar (073 psi)	Ordering code	
010 bar (0145 psi)	Ordering code	
020 bar (0290 psi)	Ordering code	
050 bar (0725 psi)	Ordering code	
0100 bar (01450 psi)	Ordering code	
0250 bar (03626 psi)	Ordering code	
0400 bar (05802 psi)	Ordering code	
0600 bar (08702 psi)	Ordering code	
Supply voltage U _B		
No-load supply current I ₀ max.		
Accuracy		
Temperature error		
Polarity reversal protected/short-circuit pro	tected	
Ambient/media temperature		
Degree of protection per IEC 60529		
Load cycles		
Material	Housing	

Measuring cell

Plug connector Process connection

Seal

Wiring diagrams see page 40.

Connection

Design	Relative nomina	al pressure	Overload pres	ssure	Burst pressure ≥		Permitted vacuum
-12 bar	29 psi	2 bar	58 psi	4 bar	145 psi	10 bar	
-110 bar	145 psi	10 bar	290 psi	20 bar	508 psi	35 bar	
02 bar	29 psi	2 bar	58 psi	4 bar	145 psi	10 bar	
05 bar	73 psi	5 bar	145 psi	10 bar	218 psi	15 bar	Jo
010 bar	145 psi	10 bar	290 psi	20 bar	508 psi	35 bar	proof
020 bar	290 psi	20 bar	580 psi	40 bar	1015 psi	70 bar	
050 bar	725 psi	50 bar	1450 psi	100 bar	2176 psi	150 bar	vacuum
0100 bar	1450 psi	100 bar	2900 psi	200 bar	4350 psi	300 bar	8
0250 bar	3626 psi	250 bar	5802 psi	400 bar	10875 psi	700 bar	
0400 bar	5802 psi	400 bar	17400 psi	1200 bar	21750 psi	1500 bar	
0600 bar	8702 psi	600 bar	17400 psi	1200 bar	21750 psi	1500 bar	

Pressure transmitters Current output 4...20 mA





BSP00H7



BSP00HM

BSP00HN

BSP00HP

BSP00HR BSP00HT

BSP00HU

BSP00HW

BSP00HY

BSP00HZ

BSP00J0 BSP00J1

8...32 V DC ≤ 25 mA

Yes/Yes

> 100 mil. Stainless steel Ceramic

R1/4"

Fluoroelastomer

M12 connector, 4-pin

≤ ±0.5 % FSO BFSL ≤ ±0.3 % FSO/10 K

-40...+85 °C/-40...+125 °C

IP 67 (when screwed into place)



G½"
BSP00J2
BSP00J3
BSP00J4
BSP00J5
BSP00J6
BSP00J7
BSP00J8
BSP00FT
BSP00J9
BSP00JA
BSP00JC
832 V DC
≤ 25 mA
≤ ±0.5 % FSO BFSL
≤ ±0.3 % FSO/10 K
Yes/Yes
-40+85 °C/-40+125 °C
IP 67 (when screwed into place)
> 100 mil.
Stainless steel

Pressure Sensors

Standard

Standard

sensors

Flushmounted stainless steel

sensors Pressure transmitters

Special

pressure sensors

Calibration

25

sensors with IO-Link

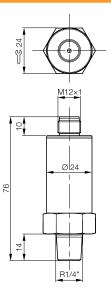
Stainless steel

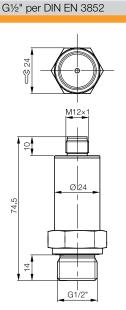
Stainless steel sensors with IO-Link



BSP00FW
BSP00FY
BSP00FZ
BSP00H0
BSP00H1
BSP00H2
BSP00H3
BSP00H4
BSP00H5
BSP00F3
BSP00H6
832 V DC
≤ 25 mA
≤ ±0.5 % FSO BFSL
≤ ±0.5% FSO/10 K
Yes/Yes
–40+85 °C/–40+125 °C
IP 67 (when screwed into place
> 100 mil.
Stainless steel
Ceramic
Fluoroelastomer
M12 connector, 4-pin

DOI 00111
BSP00H8
BSP00H9
BSP00HA
BSP00HC
BSP00HE
BSP00HF
BSP00HH
BSP00HJ
BSP00HK
BSP00HL
832 V DC
≤ 25 mA
≤ ±0.5 % FSO BFSL
≤ ±0.3 % FSO/10 K
Yes/Yes
-40+85 °C/-40+125 °C
IP 67 (when screwed into place
> 100 mil.
Stainless steel
Ceramic
Fluoroelastomer

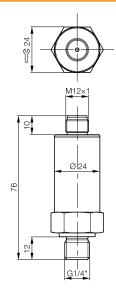




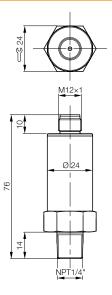
Ceramic

Fluoroelastomer

M12 connector, 4-pin



G1/4" per DIN EN 3852



M12 connector, 4-pin

NPT1/4"

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Special Pressure Sensors

Individual, fully customized products

If desired, we will adapt catalog products individually to your requirements. Our spectrum ranges from preassembly to engineering services to simple housing modifications. We do this completely according to your specifications. This enables the best solutions for your application.

Benefits

- Quick and transparent feasibility check
- Solution for your application
- Customized products secure your competitive advantage
- Highest feasibility without compromises

Resistant to hydrochloric acid - an example from the real world

The standard version of BSP pressure sensors is ideally suited for use in a steel plant. For example, for monitoring the coolant in a rolling stand or the pressure in hydraulic drives. From -25 to 125 °C. With the wide variety of pressure ranges and output signals you can handle almost any task.

Ideal for the steel industry, the pressure sensors have an acid-resistant process connection made from PVDF and can reliably monitor cleaning processes during surface finishing.



Pressure ranges		-150 bar
Supply voltage U _B		1836 V DC
Switching frequency f max.		200 Hz
Accuracy		≤ ±0.5 % FSO BFSL
Temperature error		≤ ±0.3 % FSO/10 K
Ambient/media	temperature	-25+85 °C/-25+125 °C
Degree of prote	ection per IEC 60529	IP 67 (when screwed into place)
Material	Housing	PA 6.6 and stainless steel
	Measuring cell	Ceramic
	Seal	Fluoroelastomer
	Process connection	PVDF
Connection	Plug connector	M12 connector, 4-pin
	Process connection	G½" per DIN EN 3852



With an acid-resistant process connection made from PVDF, the sensor can even be used in adverse conditions such as those experienced during surface finishing for steel production.

Calibration of Pressure Sensors

Send us your pressure sensors for inspection. And build upon our manufacturing expertise.

Regular calibration of pressure sensors is becoming increasingly important for legal, technical and quality assurance-related reasons.

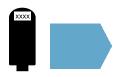
As a manufacturer, we offer professional support. For instance, we inspect and calibrate your pressure sensors directly at our plant. Once per year—to maintain quality standards.

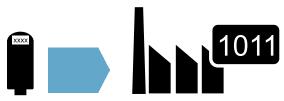
You receive a bilingual certificate of the factory calibration for measuring ranges from -1 to 600 bar for your records. Take advantage of our manufacturing expertise and stay on the safe side.

Benefits

- Calibration directly at the manufacturer
- 6-point factory calibration
- Uniform, high process quality

Order with BSS CAL









Pressure Sensors

Standard sensors Standard

sensors with IO-Link Stainless steel

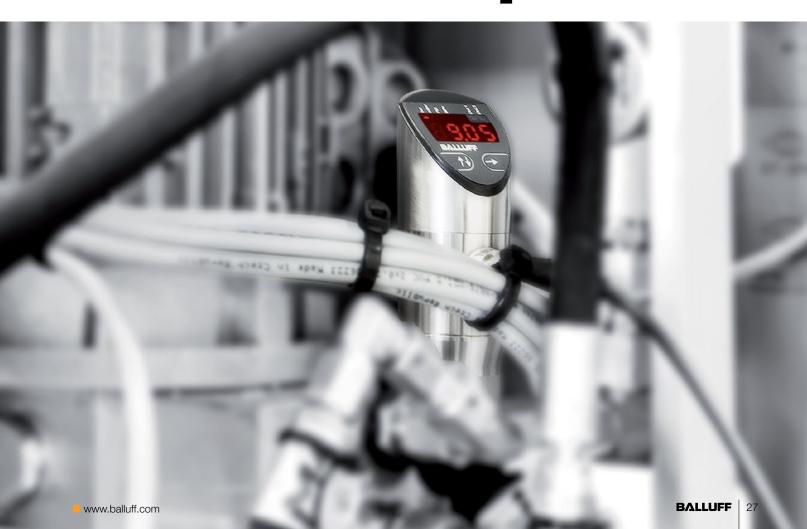
sensors Stainless steel sensors with IO-Link

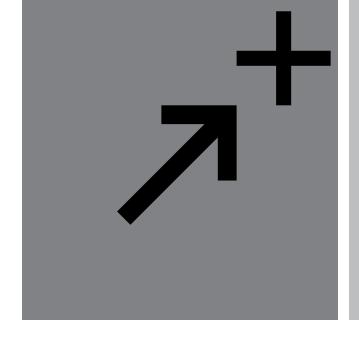
Flushmounted stainless steel sensors

Pressure transmitters

Special pressure sensors

Calibration





Accessories

Accessories - A Selection

Fitting accessories are the optimal peripherals for sensors. We provide reliable products for time and cost-saving integration into your automation system and for reliable operation. We have put together a selection for you from our comprehensive product line.



Accessories – A Selection

Contents

Connectors Adapters and fasteners 30

32







Basic information and definitions can be found on **page 38.**



Accessories — A Selection

M12 female straight and right-angle, 4-pin



Max. supply voltage AC U _B	
Max. supply voltage DC U _B	
Cable	
Number of wires × cross-section	
Degree of protection per IEC 60529	
Ambient temperature T _a static/moving	PUR
	PUR shielded

Connector diagram and wiring

Use

Cable material		Color	Length	
PUR (Black	2 m	
PUR ()	Black	5 m	
PUR ()	Black	10 m	
PUR shielded)	Black	2 m	
PUR shielded)	Black	5 m	
PUR shielded)	Black	10 m	

Other cable materials, colors and lengths on request.

Connectors without LED are suitable for PNP and NPN switching functions.

NPN versions on request.



You will find many additional products in our total product line: "Industrial Networking and Connectivity – A guide to industrial network architectures and sensor connections",

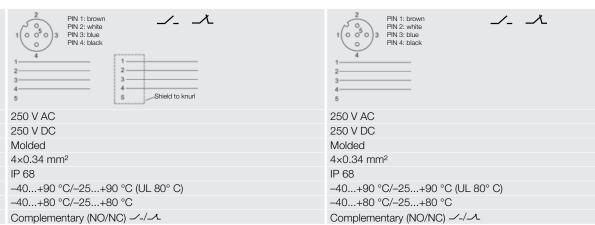
or online at: www.balluff.com

Accessories — A Selection

M12 female straight and right-angle, 4-pin



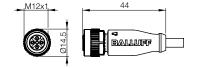


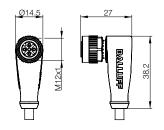




Accessories -A Selection Connectors Adapters and fasteners

Ordering code	Ordering code
BCC032F	BCC032Y
BCC032H	BCC032Z
BCC032J	BCC0330
BCC032K	BCC0331
BCC032L	BCC0332
BCC032M	BCC0333





Accessories – A Selection

Adapters and fasteners



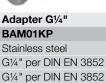
Description

Ordering code

Housing material

Connection
Sensor-side

Process-side



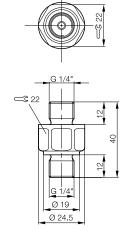


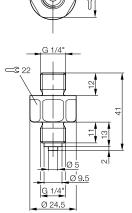
Manometer screw connection per DIN EN 837

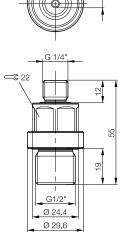
Adapter G¼"
BAM01KR
Stainless steel
G¼" per DIN EN 3852
G¼" per DIN EN 837



Adapter G½"
BAM01UJ
Stainless steel
G¼" per DIN EN 3852
G½" per DIN EN 3852









BSP pressure sensors can be adapted to different process connections using adapters. **Other adapters on request.**

Accessories – A Selection

Adapters and fasteners



Adapter M20×1.5 BAM0209 Stainless steel G¼" per DIN EN 3852

M20×1.5



Adapter R1/4" BAM01RP Stainless steel G1/4" per DIN EN 3852 R1/4"



Adapter NPT1/4" BAM01KT Stainless steel G¼" per DIN EN 3852 NPT1/4"



Adapter NPT1/4" BAM01TR Stainless steel G1/4" per DIN EN 3852 Internal thread NPT1/4"

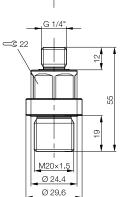




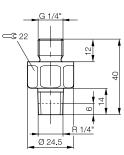


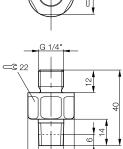
Accessories -A Selection Connectors Adapters and fasteners



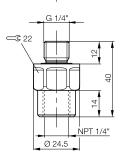








Ø 24.5

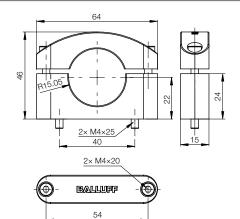


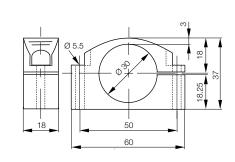


		-	
	4		9
ш	1		
-		1	
		-	



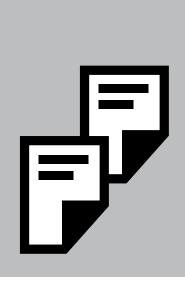
Wall mount for BSP pressure sensors	Wall mount for BSP pressure sensors
Two-piece retaining clip, metal	One-piece retaining clip, plastic
BAM01U0	BAM0110
Anodized aluminum	PA 6.6 (fiberglass reinforced)
	Two-piece retaining clip, metal BAM01U0



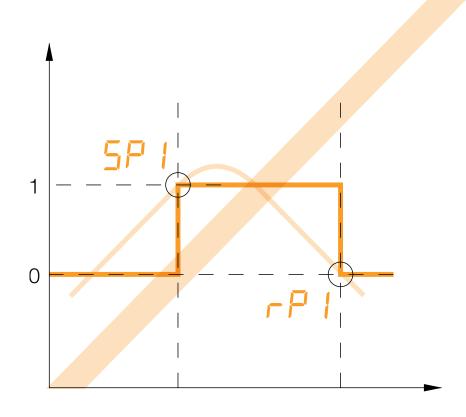


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Basic Information and Definitions



Basic Information and Definitions

Contents

Quality and environmental management	36
Specific basic information for pressure sensors	37
Electrical properties	40
Mechanical properties	41
Configuring and adjusting concore	12



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Basic Information and Definitions

Quality and environmental management

Quality management system per DIN EN ISO 9001:2008

Balluff companies	
Balluff GmbH	Germany
Balluff SIE Sensorik GmbH	Germany
Balluff Controles Elétricos Ltda.	Brazil
Balluff Sensors (Chengdu) Co., Ltd.	China
Balluff Ltd.	Great Britain
Balluff Automation S.R.L.	Italy
Balluff Canada Inc.	Canada
Balluff de México S.A. de C.V.	Mexico
Balluff GmbH	Austria
Balluff Sp. z o.o.	Poland
Balluff Hy-Tech AG	Switzerland
Balluff Sensortechnik AG	Switzerland
Balluff S.L.	Spain
Balluff CZ, s.r.o	Czech Republic
Balluff Elektronika Kft.	Hungary
Balluff Inc.	USA



Environmental management system per DIN EN ISO 14001:2009

Balluff companies	
Balluff GmbH	Germany
Balluff Sensors (Chengdu) Co., Ltd.	China
Balluff Elektronika KFT	Hungary

Testing laboratory

The Balluff testing laboratory operates in accordance with ISO/IEC 17025 and is accredited by the German Accreditation Body (DAkks) for testing electromagnetic compatibility (EMC).



Balluff products comply with EU directives

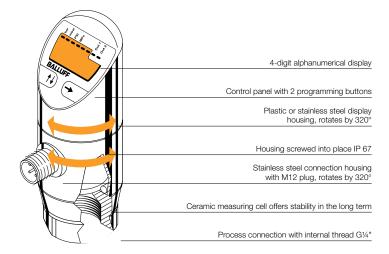
Products that require labeling are subject to a conformity evaluation process according to the EU directive and the product is labeled with the CE marking. Balluff products fall under the following EU directive:



2004/108/EC	EMC directive
2006/95/EC	Low Voltage Directive valid for
	products with supply voltage
	≥ 75 V DC/≥ 50 V AC

Specific basic information for pressure sensors

Sensor design



Function principle

Balluff pressure sensors convert the physical pressure variable (force per surface) into an electrical output variable that serves as a pressure indicator. This conversion is made with a ceramic membrane. 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.

0 bar

approx. 1 bar

Vacuum Air pressure

Vacuum Air pressure

Negative 0 bar

Positive

Absolute

Positive

Relative

Relative pressure: Pressure is usually measured in relation to the actual atmospheric pressure. For pressures greater than the air pressure, positive values are obtained for the measurements. For pressures less than the air pressure, negative values.

Nominal pressure: This corresponds to the maximum design pressure.

Burst pressure: Minimum pressure that the pressure sensor must withstand without being destroyed. If this pressure is exceeded, expect pressurized components to crack, the device to leak, or internal mechanisms to 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: This indicates the permitted temperature range of the pressurized material.



Basic Information and Definitions

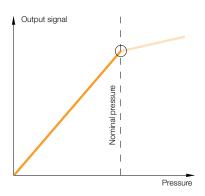
Quality and environmental management Specific basic information for pressure sensors Electrical properties Mechanical

properties
Mechanical
properties
Configuring and
adjusting sensor

Specific basic information for pressure sensors

Characteristic

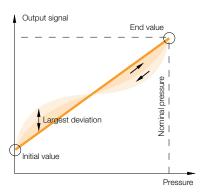
This describes the relationship between the measured and output variable. With pressure sensors, this indicates how dependent the output signal is on the pressure. In an ideal scenario, the characteristic should be a straight line.



Accuracy

The accuracy indicates how much the actual characteristic can deviate from the ideal characteristic (according to IEC 60770 nonlinearity, hysteresis and reproducibility). 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.

Reproducibility

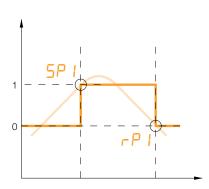
Repeat accuracy of two measurements under standardized conditions.

Specific basic information for pressure sensors

Hysteresis, adjustable

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

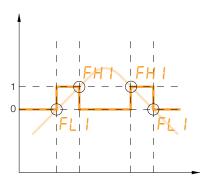
Hysteresis function: The hysteresis keeps the switching status of the outputs stable, even if the system pressure fluctuates around the setpoint value. The output is activated when the system pressure rises and the relevant switching point (SP) is reached. The output is deactivated when the pressure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



Window, adjustable

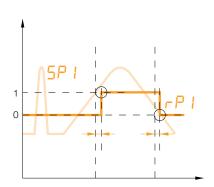
The output function is activated when the measured value falls between the preset switching and return point.

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.



Basic Information and Definitions

Quality and environmental management

Specific basic information for pressure sensors

Electrical properties Mechanical properties Configuring and adjusting sensor

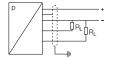
39

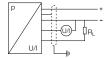
Electrical properties

Switching function

4-wire pressure sensors with switching output

4-wire pressure sensors with analog output





Pin assignments

Electrical	Pressure sensors	Pressure sensors
connections	with switching output	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

Supply voltage $U_{\rm B}$

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

Output current max.

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

No-load supply current I₀ max.

This is the intrinsic current consumption of the sensor at maximum supply voltage U_S with no switched 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 Ta

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

Temperature drift

Shift of the switching point caused by a change in the ambient temperature.

Switching frequency f max.

This is a succession of periodically repeating sensor switching cycles that occur during a specified time interval (1 second).

Mechanical properties

Materials

Material	Use and characteristics
Plastics	
PA 6.6	Good mechanical strength.
Polyamide	Temperature resistance.
FKM	Resistant to pressure deformation. Temperature resistance.
Fluoroelastomer	Good chemical resistance.
PUR	Elastic, abrasion-resistant, impact-resistant. Good resistance to
Polyurethane	oils, greases, solvents (used for gaskets and cable jackets).
TROGAMID®	Very good strength and chemical resistance. UV-resistant and
	continuously transparent. High dynamic resistance.
Metal	
Stainless steel	Excellent corrosion resistance and strength.
	Quality 304: Standard material for the foods industry.
Al	Standard aluminum for cut shaping. Can be anodized.
Wrought aluminum alloy	Used for housings and mounting components.
Other	
Ceramic	Very good strength and chemical resistance.
	Electrically insulating. Excellent temperature resistance.

Degree of protection

The degrees of protection are given according to IEC 60529. Code letters IP (International Protection) designate protection for electrical equipment against shock hazard, ingress of solid foreign bodies and water

First digit:

- 2 Protection against penetration of solid bodies larger than12 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 equipment
- 5 Protection against a water jet from a nozzle striking the device from any direction
- 7 Protection against water when the device (housing) is temporarily immersed
- 8 Protection against water during prolonged immersion



Basic Information and Definitions

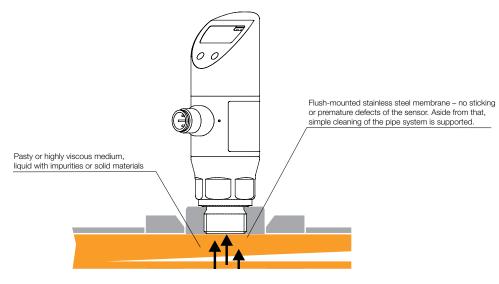
Quality and environmental management Specific basic information for pressure sensors

Electrical properties Mechanical properties

Configuring and adjusting sensors

Flush-mounted pressure sensors

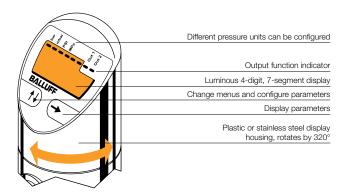
With the flush-mounted, welded stainless steel membrane, the sensors have no dead spaces and are particularly easy to clean. They are ideally suited for pressure measurement in viscous, pastelike, crystallizing or solids-containing media. A G½" external thread according to DIN EN 3852 serves as process connection.



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Configuring and adjusting sensors

Display



	Description	ASCII	
5P 1	Switching point (1)	SP1	Hnc
rP I	Return point (1)	RP1	Fnc
SP 2	Switching point (2)	SP2	Un i
rP 2	Return point (2)	RP2	ЬЯr
FH I	Pressure window, upper value (1)	FH1	TP8
FL I	Pressure window, lower value (1)	FL1	PR
FH 2	Pressure window, upper value (2)	FH2	P5 i
FL 2	Pressure window, lower value (2)	FL2	FL iF
EF	Extended function	EF	Lo
rES	Reset	RES	H i
d5 I	Switching delay time (1)	dS1	SEEC
d5 2	Switching delay time (2)	dS2	dap
dr I	Return delay time (1)	dR1	codE
dr 2	Return delay time (2)	dR2	d iA
oU I	Output (1)	Ou1	Err
6U 2	Output (2)	Ou2	d (5
Hno	NO with hysteresis function	HNO	9E5
Fno	NO with window function	FNO	no

	Description	ASCII
	NC with hysteresis function	HNC
	NC with window function	HNC
	Unit selection	Uni
	Unit bar	bar
	Unit MPa	MPa
	Unit Pa	Pa
	Unit psi	psi
9	Turn display	Flip
	Min. value	LO
	Max. value	HI
)	Zero point adjustment	SETO
	Measured value damping	dAP
	Access protection	Code
	Diagnostic function	DIA
	Error indicator	ERR
	Display	DIS
	Yes	Yes
	No	No

IO-Link

IO-Link is a worldwide standardized IO technology in accordance with IEC 61131-9 for communicating from the controller to the lowest level of the automation system. The interface can be used universally and is a fieldbus-independent point-to-point connection that operates using an unshielded industrial cable.



Benefits of the digital communications standard

- Easy to install
- Need-based maintenance
- Efficient operation
- Highest machine availability

SIO mode

Balluff pressure sensors with IO-Link support both SIO mode and IO-Link mode.

SIO mode (Standard IO mode):

In SIO mode, the sensor operates with the standard output signals. This way one digital output and one more digital output or an analog output are always available.

IO-Link mode (communication mode):

If the sensor operates subordinate to an IO-Link master, then the pressure sensor switches to IO-Link communication mode. The process data length of the pressure sensor is 16 bits. The switching statuses of the two switching outputs (BCD1 and BCD2) are transmitted in the process data, as well as the current measured value.

15 Bit	142	1	0
Signed bit	Measured	BCD2/	BCD1/
	value	Output 2	Output 1

Configuring and adjusting sensors

Configuring and adjusting sensors

Balluff pressure sensors BSP are easy to configure in line with VDMA standards: **Change menus** – Press the button to switch to programming mode and modify the pressure sensor settings. **Display parameter** – Press the Dutton to show the relevant parameter on the display. **Set parameter** – Press the **W** 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



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.



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Information

Quality and environmental

management

Specific basic

information for

Electrical

properties

Mechanical properties

Configuring and adjusting

pressure sensors

Return point 1

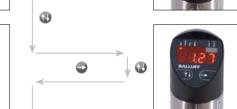
Return point 1 is used to select the pressure value that defines when output 1 switches back. The difference between SP 1 (9.05 bar) and rP 1 (7.05 bar) produces the hysteresis (2 bar) of switching output 1.



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.



- Hysteresis function
- Unit selection
- Min./max. value - Access protection
- Turn display
- Zero point adjustment
- Measured value damping



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Alphanumeric Directory Sorted by part number



Sorted by part number

BAM AD-SP-008-164/104-4-EN837 BAM AD-SP-008-164/1N4-4 BAM AD-SP-008-1064/1N4-4 BAM AD-SP-008-1064/1N4-4 BAM AD-SP-008-1064/1N4-4 BAM AD-SP-008-1064/1N4-4 BAM AD-SP-008-1064/1N4-4 BAM AD-SP-008-106-106-106-106-106-106-106-106-106-106	Part number	Ordering code	Page
BAM AD-SP-008-164/164-4 BAM AD-SP-008-164/164-4-EN837 BAM AD-SP-008-164/1R4-4 BAM AD-SP-008-164/1R4-4 BAM AD-SP-008-164/1R4-4 BAM AD-SP-008-164/1R4-4 BAM AD-SP-008-164/1R4-4 BAM AD-SP-008-164/1R4-4 BAM AD-SP-008-164/M20X1.5-4 BAM AD-SP-008-164/M20X1.5-4 BAM AD-SP-008-164/M20X1.5-4 BAM AD-SP-008-164/M20X1.5-4 BAM AD-SP-011-164/1N4-4 BAM DS-P-008-164/M20X1.5-4 BAM AD-SP-008-164/M20X1.5-4 BAM AD-SP-011-164/1N4-4 BAM MC-XA-017-D30.0-1 BCC MC-MC-MC-MC-MC-MC-MC-MC-MC-MC-MC-MC-MC-M	BAM		
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BSP B002-DV004-A06A1A-S4 BSP00FZ 25 BSP B002-EV002-A00A0B-S4 BSP000T 13 BSP B002-EV002-A01A0B-S4 BSP008N 15 BSP B002-EV002-A01S1B-S4 BSP003P 13 BSP B002-EV002-A01S1B-S4 BSP003P 13 BSP B002-EV002-A01S1B-S4 BSP0093 15 BSP B002-EV002-A03A0B-S4 BSP0093 15 BSP B002-EV002-A03S1B-S4 BSP009H 15 BSP B002-EV002-D00AB-S4 BSP009H 15 BSP B002-EV002-D00AB-S4 BSP0014 13 BSP B002-EV002-D00AB-S4 BSP003K 13 BSP B002-EV002-D01AB-S4 BSP003K 13 BSP B002-EV002-D01S1B-S4 BSP003K 13 BSP B002-EV003-A00AB-S4 BSP003K 13 BSP B002-EV003-A00AB-S4 BSP002A 17 BSP B002-EV003-A0A0AB-S4 BSP002A 17 BSP B002-EV003-A01AB-S4 BSP00AP 19 BSP B002-EV003-A01S1B-S4 BSP00AP 19 BSP B002-EV003-A02AB-S4 BSP00AP 19 BSP B002-EV003-A0	BSP		
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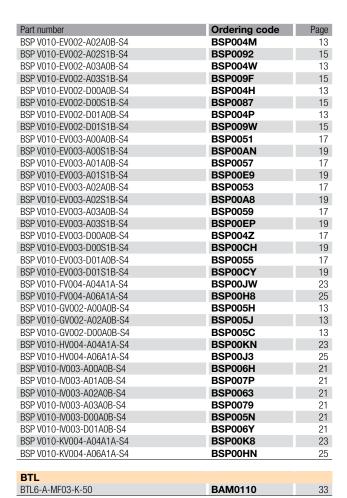
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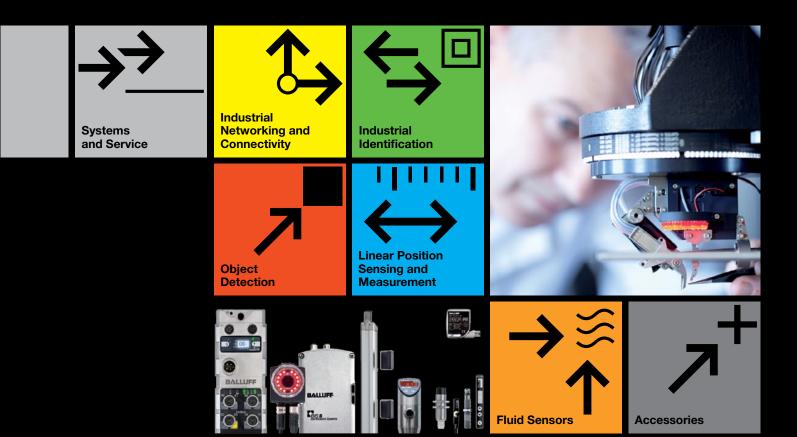
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