

# PN2099



## Pressure sensor with display

PN-1-1BRER14-MFRKG/US/ IV



### Product characteristics

Number of inputs and outputs	Number of digital outputs: 2; Number of analog outputs: 1					
Measuring range	-1...1 bar	-1000...1000 mbar	-14.5...14.5 psi	-29.5...29.5 inHg	-401...401 inH2O	-100...100 kPa
Process connection	threaded connection G 1/4 Internal thread (DIN EN ISO 1179-2)					

### Application

Special feature	gold-plated contacts					
Measuring element	ceramic-capacitive pressure measuring cell					
Application	for industrial applications					
Media	liquids and gases					
Medium temperature [°C]	-25...80					
Min. burst pressure	30000 mbar	450 psi		3000 kPa		
Pressure rating	10000 mbar	145 psi		1000 kPa		
Vacuum resistance	-1000 mbar			-0.1 MPa		
Type of pressure	relative pressure; vacuum					

### Electrical data

Operating voltage [V]	18...30 DC; (to SELV/PELV)					
Current consumption [mA]	< 35					
Min. insulation resistance [MΩ]	100; (500 V DC)					
Protection class	III					
Reverse polarity protection	yes					
Power-on delay time [s]	0.3					
Integrated watchdog	yes					



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Inputs / outputs						
Number of inputs and outputs	Number of digital outputs: 2; Number of analog outputs: 1					
Outputs						
Total number of outputs	2					
Output signal	switching signal; analog signal; IO-Link; (configurable)					
Electrical design	PNP/NPN					
Number of digital outputs	2					
Output function	normally open / closed; (configurable)					
Max. voltage drop switching output DC [V]	2					
Permanent current rating of switching output DC [mA]	250					
Switching frequency DC [Hz]	< 500					
Number of analog outputs	1					
Analog current output [mA]	4...20; (scalable 1:5)					
Max. load [Ω]	500					
Analog voltage output [V]	0...10; (scalable 1:5)					
Min. load resistance [Ω]	2000					
Short-circuit protection	yes					
Type of short-circuit protection	yes (non-latching)					
Overload protection	yes					
Measuring/setting range						
Measuring range	-1...1 bar	-1000...1000 mbar	-14.5...14.5 psi	-29.5...29.5 inHg	-401...401 inH2O	-100...100 kPa
Analog start point	-1000...600 mbar	-14.5...8.7 psi	-29.5...17.7 inHg	-402...240 inH2O	-100...60 kPa	
Analog end point	-600...1000 mbar	-8.7...14.5 psi	-17.7...29.5 inHg	-240...402 inH2O	-60...100 kPa	
Factory setting / CMPT = 2						
Set point SP	-985...1000 mbar	-14.3...14.5 psi	-29.2...29.5 inHg	-396...402 inH2O	-98.5...100 kPa	
Reset point rP	-995...990 mbar	-14.45...14.4 psi	-29.4...29.3 inHg	-400...398 inH2O	-99.5...99 kPa	
Min. difference between SP and rP	10 mbar	0.15 psi	0.3 inHg	4 inH2O	1 kPa	
In steps of	5 mbar	0.05 psi	0.1 inHg	2 inH2O	0.5 kPa	
Status_B High Resolution / CMPT = 3						
Set point SP	-987...1000 mbar	-14.32...14.5 psi	-29.2...29.5 inHg	-396...401 inH2O	-98.7...100 kPa	
Reset point rP	-996...992 mbar	-14.44...14.38 psi	-29.4...29.3 inHg	-400...398 inH2O	-99.6...99.2 kPa	
Min. difference between SP and rP	9 mbar	0.12 psi	0.3 inHg	4 inH2O	0.9 kPa	
In steps of	1 mbar	0.01 psi	0.1 inHg	1 inH2O	0.1 kPa	
Accuracy / deviations						
Switch point accuracy [% of the span]	< ± 0,4; (Turn down 1:1)					
Repeatability [% of the span]	< ± 0,1; (with temperature fluctuations < 10 K; Turn down 1:1)					
Characteristics deviation [% of the span]	< ± 0,25 (BFSL) / < ± 0,5 (LS); (Turn down 1:1; BFSL = Best Fit Straight Line; LS = limit value setting)					
Hysteresis deviation [% of the span]	< ± 0,1; (Turn down 1:1)					



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Long-term stability [% of the span]	< ± 0,05; (Turn down 1:1; per 6 months)
Temperature coefficient zero point [% of the span / 10 K]	< ± 0,2; (-0...80 °C)
Temperature coefficient span [% of the span / 10 K]	< ± 0,2; (-0...80 °C)
Notes on the accuracy / deviation	switch point accuracy, linearity error under DNV GL: < ± 1%: < ± 1%

### Reaction times

Response time [ms]	< 1.5
Delay time programmable dS, dr [s]	0...50
Damping process value dAP [s]	0...4
Damping for the analog output dAA [s]	0...4
Max. response time analog output [ms]	3

### Software / programming

Parameter setting options	hysteresis / window; normally open / closed; switch-on/ switch-off delay; Damping; Display unit; current/voltage output
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### Interfaces

Communication interface	IO-Link						
Transmission type	COM2 (38,4 kBaud)						
IO-Link revision	1.1						
SDCI standard	IEC 61131-9						
SIO mode	yes						
Required master port class	A; (when pin 2 not connected: B)						
Supported DeviceIDs	<table border="1"> <thead> <tr> <th>Type of operation</th> <th>DeviceID</th> </tr> </thead> <tbody> <tr> <td>Factory setting / CMPT = 2</td> <td>467</td> </tr> <tr> <td>Status_B High Resolution / CMPT = 3</td> <td>983</td> </tr> </tbody> </table>	Type of operation	DeviceID	Factory setting / CMPT = 2	467	Status_B High Resolution / CMPT = 3	983
Type of operation	DeviceID						
Factory setting / CMPT = 2	467						
Status_B High Resolution / CMPT = 3	983						
Note	For further information please see the IODD PDF file at "Downloads"						

#### Factory setting / CMPT = 2

Profiles	Smart Sensor - SSP 0	Generic Profiled Sensor
	Function	Device identification
	Function	Process data variable
	Function	Device diagnosis
Min. process cycle time [ms]	2.3	
IO-Link resolution pressure [mbar]	1	
IO-Link process data (cyclical)	<b>Function</b>	<b>bit length</b>
	pressure	14
	binary switching information	2
IO-Link functions (acyclical)	application specific tag	

#### Status\_B High Resolution / CMPT = 3

Profiles	Smart Sensor - SSP 3.1	Measuring Sensor
	Common - I&D	Identification and Diagnosis
Min. process cycle time [ms]	3	

# PN2099



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IO-Link resolution pressure [mbar]		1
IO-Link process data (cyclical)	<b>Function</b>	<b>bit length</b>
	pressure	16
	device status	4
IO-Link functions (acyclical)	binary switching information	2
		application specific tag

Operating conditions		
Ambient temperature [°C]		-25...80
Storage temperature [°C]		-40...100
Protection		IP 65; IP 67

Tests / approvals		
EMC	DIN EN 61000-6-2	
	DIN EN 61000-6-3	
Shock resistance	DIN EN 60068-2-27	50 g (11 ms)
Vibration resistance	DIN EN 60068-2-6	20 g (10...2000 Hz)
MTTF [years]		138
UL approval	UL approval number	J012
Pressure equipment directive	sound engineering practice; can be used for group 2 fluids; group 1 fluids on request	

Mechanical data		
Weight [g]		237.5
Housing		tubular
Dimensions [mm]		Ø 34 / L = 90.7
Material	stainless steel (1.4404 / 316L); PBT+PC-GF30; PBT-GF20; PC	
Materials (wetted parts)	stainless steel (1.4404 / 316L); Al2O3 (ceramics); FKM	
Min. pressure cycles		100 million
Tightening torque [Nm]	25...35; (recommended tightening torque; Depends on lubrication, seal and pressure rating)	
Process connection	threaded connection G 1/4 Internal thread (DIN EN ISO 1179-2)	
Restrictor element integrated		no (can be retrofitted)

Displays / operating elements		
Display	Display unit	5 x LED, green (mbar, psi, kPa, inH2O, inHg)
	Switching status	2 x LED, yellow
	Measured values	alphanumeric display, red/green 4-digit

Remarks	
Pack quantity	1 pcs.

Electrical connection	
Connector: 1 x M12; coding: A; Contacts: gold-plated	

# PN2099



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### Connection



OUT1	Switching output
	IO-Link
OUT2	Switching output
	analog output
	Core colors :
BK =	black
BN =	brown
BU =	blue
WH =	white