

# PN2169



## Pressure sensor with display

PN-+,5BRER14-MFRKG/US/ IV



Product characteristics	
Number of inputs and outputs	Number of digital outputs: 2; Number of analog outputs: 1
Measuring range	-0.5...0.5 bar    -500...500 mbar    -7.26...7.26 psi    -201...201 inH <sub>2</sub> O    -50...50 kPa
Process connection	threaded connection G 1/4 Internal thread
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	-0.5...0.5 bar   -500...500 mbar   -7.26...7.26 psi   -201...201 inH2O   -50...50 kPa
Analog start point	-500...300 mbar   -7.26...4.36 psi   -201...120 inH2O   -50...30 kPa
Analog end point	-300...500 mbar   -4.36...7.26 psi   -120...201 inH2O   -30...50 kPa
Factory setting / CMPT = 2	
Set point SP	-494...500 mbar   -7.16...7.26 psi   -198...201 inH2O   -49.4...50 kPa
Reset point rP	-498...496 mbar   -7.22...7.2 psi   -200...199 inH2O   -49.8...49.6 kPa
Min. difference between SP and rP	6 mbar   0.06 psi   2 inH2O   0.6 kPa
In steps of	2 mbar   0.02 psi   1 inH2O   0.2 kPa
Status_B High Resolution / CMPT = 3	
Set point SP	-494...500 mbar   -7.16...7.25 psi   -198...201 inH2O   -49.4...50 kPa
Reset point rP	-498...496 mbar   -7.22...7.19 psi   -200...199 inH2O   -49.8...49.6 kPa
Min. difference between SP and rP	5 mbar   0.06 psi   2 inH2O   0.5 kPa
In steps of	1 mbar   0.01 psi   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)
Long-term stability	< ± 0,05; (Turn down 1:1; per 6 months)

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[% of the span]	
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>468</td> </tr> <tr> <td>Status_B High Resolution / CMPT = 3</td> <td>984</td> </tr> </tbody> </table>	Type of operation	DeviceID	Factory setting / CMPT = 2	468	Status_B High Resolution / CMPT = 3	984
Type of operation	DeviceID						
Factory setting / CMPT = 2	468						
Status_B High Resolution / CMPT = 3	984						
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	
IO-Link resolution pressure [mbar]	0.5	

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IO-Link process data (cyclical)	Function	bit length
	pressure	16
	device status	4
	binary switching information	2
IO-Link functions (acyclical)	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]	238.5
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
Restrictor element integrated		no (can be retrofitted)

Displays / operating elements		
Display	Display unit	4 x LED, green (mbar, kPa, psi, inH2O)
	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



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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