

## Product Information PF

## FOOD

# Modular Pressure Transmitter PF



## Range of applications

- Pressure measurement in pipes and vessels
- High Temperature applications up to 177 °C (350 °F) permanent

## Application examples

- Sanitary pressure monitoring for breweries, dairies and food & beverage production

## Hygienic design/Process connection

- Hygienic process connection with CLEANadapt
- Versions available to conform to 3-A Standard 74-
- All wetted materials and actuating fill are FDA-conforming
- Sensor completely made of stainless steel
- Complete overview of process connections: see order code
- The Anderson-Negele CLEANadapt system offers a flow-optimized, hygienic and easily sterilizable installation solution for sensors.

## Features

- CIP-/ SIP-cleaning up to 177 °C / 350 °F
- Unique design and fully modular components
- Components may be economically purchased and individually integrated
- Lower inventory cost for critical sensors
- Modules may be stocked and interchanged to meet any need
- Extremely durable at continuous temperatures up to 177 °C / 350 °F
- Easy to operate, adjustments without additional tools
- Self diagnostics ensure that sensor is performing optimally
- Available with absolute and relative measuring cell (vacuum proof)
- Developed to excel in the harshest environments
- Air tight sealing eliminates internal condensation

## Options/Accessories


- Wide offering of standard pressure ranges
- Customer specified ranges available
- Waterproof prefabricated cable for M12 connector

## Measuring principle of the pressure sensor

This unit utilizes an internal piezoelectric transducer to convert the process measurement into a corresponding mV signal. The mV signal then passes through custom linearization and conditioning circuitry. The resulting signal is an industry standard 4...20 mA. This mA signal is factory set over the specified range of the unit.

With relative pressure sensors, the back of the diaphragm is vented, i.e. this sensor measures the gauge pressure and/or vacuum relative to the atmospheric pressure. With an absolute pressure sensor the measurement is relative to a perfect theoretical vacuum. I.e. the signal will vary with the ambient atmospheric air pressure.

## Communication

 4...20 mA

## Pressure sensor PF

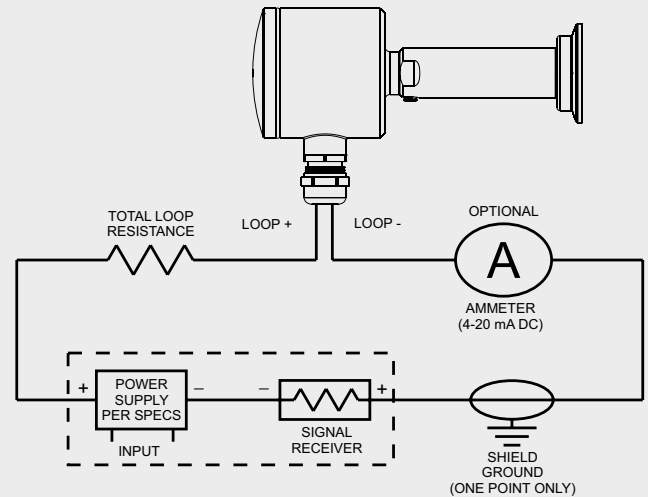
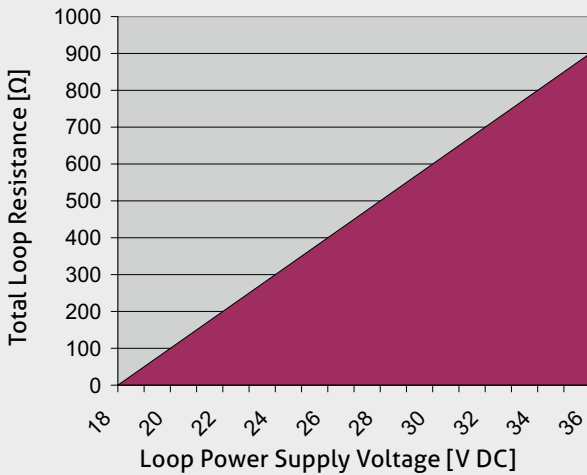



## Pressure sensor PF



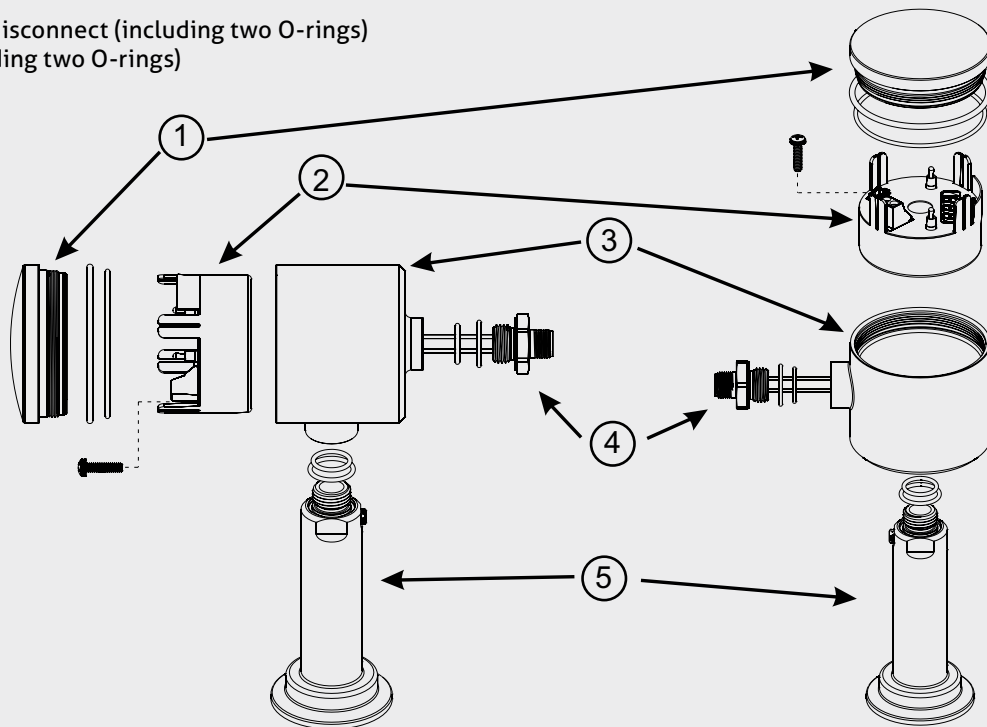
Specification		
<b>Measuring range URL [bar]</b>	Relative	0...2 / 3 / 4 / 6 / 7 / 10 / 20 / 35 / 70 -1...1 / 2.5 / 3 / 4 / 7
<b>Measuring range URL [psi]</b>	Absolute	0...2 / 3 / 4 / 6 / 7 / 10 / 20 / 35
	Relative	0...30 / 50 / 60 / 99 / 100 / 150 / 160 / 200 / 300 / 500 / 1000 30 mmHg/0, 30 mmHg/0...15 / 30 / 60 / 100 / 200
	Absolute	0...30 / 50 / 60 / 100 / 150 / 160 / 200 / 300 / 500
<b>Turndown</b>	max. 10:1	of upper range value (see also measurement accuracy)
<b>Overpressure strength</b>	Factor	1.5 x nominal pressure of measuring element up to 35 bar/500 psi 1.1 x nominal pressure of measuring element 70 bar / 1000 psi
<b>Measurement accuracy</b>	Turndown to 5:1 Turndown over 5:1 Repeatability Long-term stability	≤ 0.10 % in calibrated measuring range ≤ 0.15 % in calibrated measuring range 0.05 % 0.2 % URL every 2 years
<b>Temperature effect</b>	Process Ambient	< 12.5 mbar / 10 °C (0.1 psi / 10 °F) typical < 12.5 mbar / 10 °C (0.1 psi / 10 °F) typical
<b>Temperature range</b>	Process Ambient	-18...177 °C (0...350 °F) at ambient temp. up to 60 °C (140 °F) -18...165 °C (0...330 °F) at ambient temp. up to 71 °C (160 °F) 0...71 °C (32...169 °F)
<b>Response time</b>		< 0.1 seconds
<b>Sample rate</b>		< 0.05 seconds
<b>Materials</b>	Connection head Metal cover Plastic cover Threaded connector Wetted parts Diaphragm Diaphragm seal/oil filling	Stainless steel, AISI 304 (1.4301), $R_a \leq 0.8 \mu\text{m}$ (32 microinch) Stainless steel, AISI 304 (1.4301), $R_a \leq 0.8 \mu\text{m}$ (32 microinch) Polycarbonate Stainless steel, AISI 304 (1.4301), $R_a \leq 0.8 \mu\text{m}$ (32 microinch) Stainless steel, AISI 316L, $R_a \leq 0.64 \mu\text{m}$ (25 microinch) Stainless steel, AISI 316L, $R_a \leq 0.64 \mu\text{m}$ (25 microinch) Medical white oil / mineral oil / paraffin oil FDA approval number 21CFR172.878, 21CFR178.3620, 21CFR573.680 Neobee M20 (optional)
<b>Process connection</b>		G1" hygienic, CPM fitting, IDF 38 mm / 51 mm (female), Tri-Clamp 3/4" ...2"
<b>Electric connection</b>	Cable gland Plug-in connection	M16x1.5 M12 plug, 5-pin, 1.4305 (option)
<b>Protection class</b>		IP 67 (with cable fitting) / NEMA 4X IP 69 K (with plug-in connection)
<b>Auxiliary voltage</b>		18...36 V DC
<b>Output</b>	Current loop	analog 4...20 mA
<b>Burden</b>		see separate graph on page 3
<b>Tightening torque</b>	For assembly all PFS components	27 Nm (20 ft-lbs)
<b>Weight</b>		approx. 780 g

## Burden



## Exploded view of functional components

- 1: Cap (including two O-rings)
- 2: Puck
- 3: Enclosure
- 4: M12 Quick disconnect (including two O-rings)
- 5: Stem (including two O-rings)



## Note on 3-A Sanitary Standard 74-



Information on installation according to 3-A standard is available on our website:  
[www.anderson-negele.com/3A74.pdf](http://www.anderson-negele.com/3A74.pdf)

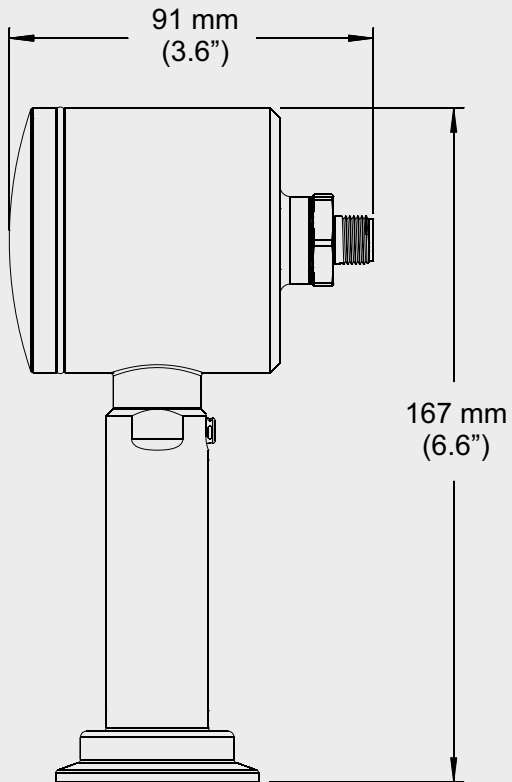
Click on the PDF icon to download the document.

## Intended use

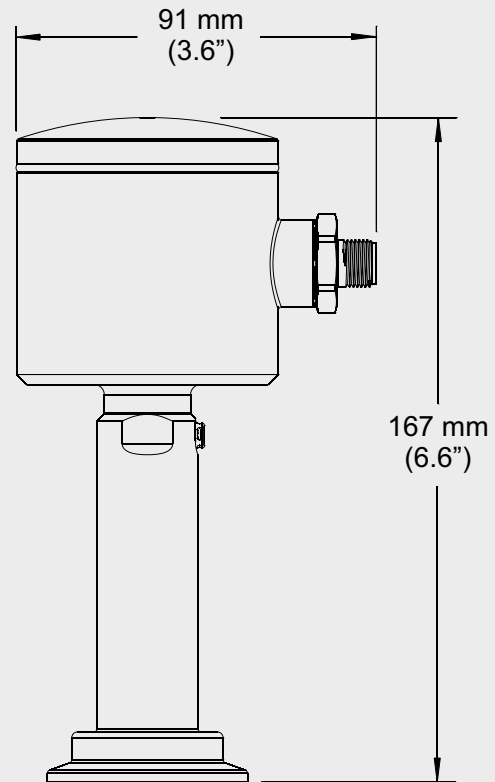


- Not suitable for applications in explosive areas.
- Not suitable for applications in safety-relevant equipment (SIL).

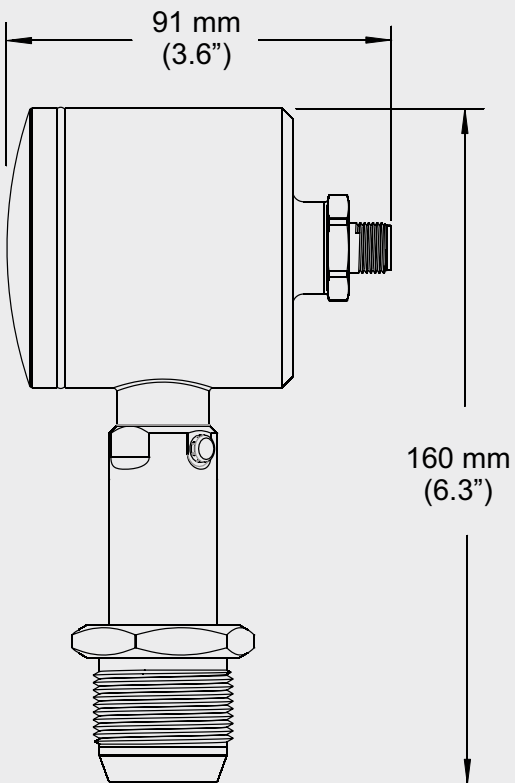
Dimensional drawing horizontal orientation



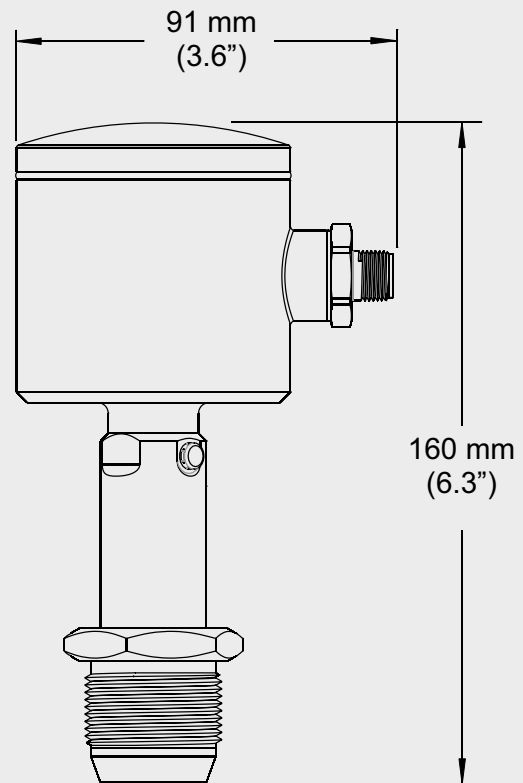
Dimensional drawing vertical orientation



Dimensional drawing CLEANadapt horizontal orientation



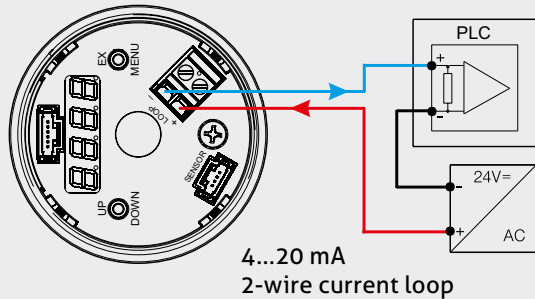
Dimensional drawing CLEANadapt vertical orientation

**Mechanical connection/installation**

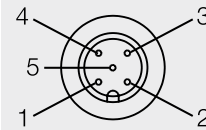
Pay attention to the maximum tightening torque of 20 Nm if using Negele CLEANadapt system!



## Electrical connection with cable gland



## Electrical connection with M12-plug



## Configuration M12-plug

- 1: + supply +24 V DC
- 2: - output 4...20 mA
- 3: not connected
- 4: not connected
- 5: not connected

## Maintenance error codes

Error code	Category	Customer action
No visible code, 3.8 mA output	Communication	Check Stem ribbon cable connection to puck, power cycle
E100	Incompatible Range	1. Reset Error 2. Reconfigure puck to a range compatible with the stem 3. power cycle
E101	Incompatible Range/ range changed	1. Reset Error 2. Reconfigure puck to a range compatible with the stem 3. power cycle
E300	Stem Data Corruption	Replace Stem
E301	Stem Data Corruption	Replace Stem
E302	Stem Data Corruption	Replace Stem
E304	Stem Data Corruption	Replace Stem
E405	Puck Data Corruption	Replace Puck
E406	Puck Data Corruption	Replace Puck
E407	Puck Data Corruption	Replace Puck
E500	Communication	Check Stem ribbon cable connection to puck, power cycle
E501	Stem Data Corruption	Replace Stem
E502	Stem Data Corruption	Replace Stem
E503	Stem Data Corruption	Replace Stem
E504	Stem Data Corruption	Replace Stem
E505	Insufficient loop voltage	Check if loop voltage is at least 18 V, provide correct voltage then power cycle
E600	Puck Data Corruption	Replace Puck
E602	Stem Configuration Error	Reset Error and power cycle and if error is persistent replace Stem
E603	Stem Configuration Error	Reset Error and power cycle and if error is persistent replace Stem
E700	Internal System Failure	Reset Error and power cycle and if error is persistent replace puck
E701	Internal System Failure	Reset Error and power cycle and if error is persistent replace puck
E702	Internal System Failure	Reset Error and power cycle and if error is persistent replace puck

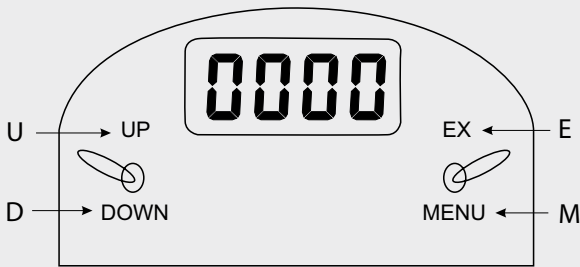


### Modular sensor principle

The "MPF" pressure sensor has a modular design. It can be purchased in separate components and assembled as required by the customer. It is also available as a fully assembled sensor. In both cases, the user can check or change the following settings.

The components and sensors are delivered according to the specifications (ranges and units) stated on the type label. These values can be checked and changed by the user in the following menu. This is accomplished using two operating buttons (with a total of 4 actuation possibilities) and a 4-digit segment display.

#### View of electronics with open cover



#### Explanation of symbols used in menu structure

E	Tip on button "E" for short time
E <sub>L</sub>	Hold button "E" for minimum 2 seconds
M	Tip on button "M" for short time
M <sub>L</sub>	Hold button "M" for minimum 2 seconds
U	Tip on button "U" for short time
U <sub>L</sub>	Hold button "U" for minimum 2 seconds
D	Tip on button "D" for short time
D <sub>L</sub>	Hold button "D" for minimum 2 seconds

#### Configuration submenu "damping output" call up see page 7

Damping	Delay [ms]
0	100
1	1000
2	2000
3	3000
4	4000
5	5000
6	6000
7	7000
8	8000
9	9000
10	10000

#### Starting sequence

Power on device		LED-test all segments and points lighted
		Revision number is displayed
		Pressure unit e. g. BAR or PSI for relative version
		Upper range value e. g. 12.0 BAR
		Self-test, display differs acc. to „Display VALUE“
	<b>Basic menu / RUN MODE</b>	

Display of submenu/settings				
Mode / Basic menu	LED Indicator	Button/switch	Submenu operating level	Setting
		Select: U or D	Select: U or D	
<b>RUN MODE</b>	Display actual current or pressure value or error code if an error occurred		<ul style="list-style-type: none"> <li>· Clear error</li> <li>· One touch zero (zero adjustment)</li> <li>· Display pressure or current value</li> </ul>	
			Clear error	
			"One Touch Zero"	
			Display pressure value for 2 seconds (PVAL) if display "current" (CVAL) is selected.	
<b>SENSOR CONFIG MODE</b>				
<b>Display VALUE</b>			Toggle display CVAL / PVAL Actual current value (mA) <b>CVAL</b> Actual pressure value BAR / PSI <b>PVAL</b>	
<b>Units</b>			Toggle unit <b>PSI 9</b> PSI relative / <b>BAR 9</b> BAR relative <b>PSI A</b> PSI absolute / <b>BAR A</b> BAR absolute	
<b>Output</b>			Assignment of current value at output to measuring range 4...20 -> 4 mA = measuring range min 20 mA = max measuring range 20...4 -> 20 mA = measuring range min 4 mA = max measuring range	
<b>PRESSURE RANGE LRV: Lower range value</b>			Display of present setting e.g. "50"	Change value, at <b>GRE</b> changing is not possible (vacuum range).
<b>PRESSURE RANGE URV: Upper range value</b>			Display of present setting e.g. "50"	Change value, use <b>U</b> or <b>D</b> to set desired value. At <b>SET</b> the units BAR / PSI were changed.
<b>Output Damping</b>			Display of present setting e.g. "0...10"	Change value, see table on page 6.
<b>Factory configuration reset</b>			Display "n0"	Change to "YES" -> Reset to factory setting
<b>CALIBRATION MODE</b>				

**Cleaning/Maintenance**

- In case of using pressure washers, don't point nozzle directly to electrical connections!

**Reshipment**

- Sensors shall be clean and must not be contaminated with dangerous media! Note the advice for cleaning!
- Use suitable transport packaging only to avoid damage of the equipment!

**Note on CE**

- Applicable directives:  
Electromagnetic Compatibility Directive 2014/30/EU
- Compliance with the applicable EU directives is identified by the CE label on the product.
- The operating company is responsible for complying with the guidelines applicable to the entire installation.

**Transport/Storage**

- No outdoor storage
- Dry and dust free
- Not exposed to corrosive media
- Protected against solar radiation
- Avoiding mechanical shock and vibration
- Storage temperature -55...90 °C (-67...194 °F)
- Relative humidity max. 98 %

**Standards and guidelines**

- You have to comply with applicable regulations and directives.

**Disposal**

- Electrical devices should not be disposed of with household trash. They must be recycled in accordance with national laws and regulations.
- Take the device directly to a specialized recycling company and do not use municipal collection points.

**Possible presettings of the measurement range**

Order number PSI		Suitable for sensor type (see Order number)		Order number BAR		Suitable for sensor type (see Order number)	
		A (absolute)	C (relative)			A (absolute)	C (relative)
025	30Hg/0		x	251	-1...1		x
028	30Hg/0/15		x	286	-1...2.5		x
029	30Hg/0/30		x	217	-1...3		x
031	30Hg/0/60		x	056	-1...4		x
032	30Hg/0/100		x	304	-1...7		x
314	30Hg/0/200		x	057	0...2	x	x
066	0...30	x		235	0...3	x	x
068	0...50	x	x	192	0...4	x	x
069	0...60	x	x	060	0...6	x	x
070	0...99	x	x	309	0...7	x	x
071	0...100	x	x	061	0...10	x	x
073	0...150	x	x	065	0...20	x	x
074	0...160	x	x	224	0...35	x	x
075	0...200	x	x	206	0...70		x
077	0...300	x	x				
081	0...500	x	x				
084	0...1000	x	x				
000	(Field calibration)						
999	(Factory setting acc. to customer specifications)						



## Order code of fully assembled sensor

PF Modular pressure sensor, food

S1 Sensor neck, food and beverages

## Maximum upper range value

966 30 psi / 2 bar  
 971 100 psi / 7 bar  
 981 500 psi / 35 bar  
 984 1000 psi / 70 bar

## Sensor type

A Absolute  
 C Relative, vacuum-proof

## Process connection (Ⓐ: 3-A compliant)

160 Flexible thread G1", hygienic CLEANadapt  
 182 Fixed thread G1" hygienic CLEANadapt  
 059 1½" NPT  
 002 ¾" Tri-Clamp Ⓐ  
 003 1" Tri-Clamp Ⓐ  
 004 1½" Tri-Clamp Ⓐ  
 005 2" Tri-Clamp Ⓐ  
 123 CPM fitting Ⓐ  
 129 IDF 38 mm female  
 131 IDF 51 mm female

## Actuating fill

1 Medical-grade white oil/FDA-approved  
 5 Neobee® M-20

## Material membrane

A Stainless steel 316L

00 Fixed character

A Fixed character

## Enclosure

E2A SS head with measuring electronics and plastic cover  
 E3A SS head with measuring electronics and stainless steel cover

## Unit of measure

P PSI  
 B BAR

## Measuring range

XXX See measuring range table, page 8

0 Fixed character

## Electrical connection

A M12 connector  
 C Cable fitting

## Enclosure orientation

1 Vertical  
 2 Horizontal

## Certificates

A No certificate  
 B 3.1 Material and 2.1 Certificate  
 C 3.1 Material and accuracy  
 D 2.1 Certificate

64 Fixed character



PF S1 966 C 160 1 A 00 A E2A P 068 0 A 1 A 64

## Order number of measuring electronics without stainless steel enclosure

E1A Measuring electronics without stainless steel enclosure

## Unit of measure

- P PSI
- B BAR
- 0 Field calibrated

## Measuring range

- 000 Without preset of measuring range
- XXX See measuring range table, page 8

- 0 Fixed character

## Electrical connection

- 0 Measuring electronics only

## Enclosure orientation

- 0 Measuring electronics only

## Certificates

- A No certificate
- D 2.1 Certificate

- 64 Fixed character



E1A P 066 0 0 0 A 64

## Order number of measuring electronics with stainless steel enclosure

E2A Measuring electronics with stainless steel enclosure and plastic cover

E3A Measuring electronics with stainless steel enclosure and stainless steel cover

## Unit of measure

- P PSI
- B BAR

## Measuring range

- 000 Without preset of measuring range
- XXX See measuring range table, page 8

- 0 Fixed character

## Electrical connection

- A M12 connector
- C Cable fitting

## Enclosure orientation

- 1 Vertical
- 2 Horizontal

## Certificates

- A No certificate
- D 2.1 Certificate

- 64 Fixed character



E2A P 066 0 A 1 A 64

Order code of sensor neck

S1 Sensor neck, food and beverages

Maximum measuring range end value

- 966 30 psi / 2 bar
- 971 100 psi / 7 bar
- 981 500 psi / 35 bar
- 984 1000 psi / 70 bar

Sensor type

- A Absolute
- C Relative, vacuum-proof

Process connection (Ⓐ: 3-A compliant)

- 160 Flexible thread G1", hygienic CLEANadapt
- 182 Fixed thread G1" hygienic CLEANadapt
- 059 1½" NPT
- 002 ¾" Tri-Clamp Ⓐ
- 003 1" Tri-Clamp Ⓐ
- 004 1½" Tri-Clamp Ⓐ
- 005 2" Tri-Clamp Ⓐ
- 123 CPM fitting Ⓐ
- 129 IDF 38 mm female
- 131 IDF 51 mm female

Actuating fill

- 1 Medical white oil / mineral oil
- 5 Neobee® M-20

Material membrane








- A Stainless steel 316L
- 00 Fixed character

Certificates

- A No certificate
- B 3.1 Material and 2.1 Certificate



S1 966 A 160 1 A 00 A

Order number of individual components		
Figure	Part	Order number
	Electronics	See order number of measuring electronics without a stainless steel housing on page 10
	Wire cover	56741B0064
	Enclosure w/o cap	56327S0064
	Stainless steel cap with seal	5632900001
	Plastic cap with seal	5632800001
	M12 connector	SP56726A0002
	Cable gland M16x1.5	SP5633100000
	O-ring kit (6 rings for complete sensor)	563300001