Series 21C

Piezoresistive pressure transmitters in a compact design with ratiometric output signal

Features

- Compensated over the entire temperature range
- Ratiometric voltage output of 0,5…4,5 V
- Mechanically and electrically robust
- Hermetically sealed electronics
- Robust stainless steel housing
- High long term stability

Technology

- Insulated and encapsulated piezoresistive pressure sensor chip
- Chip-in-oil technology (CiO)
- Mathematical modelling
- Fully welded design with no internal seals

Typical applications

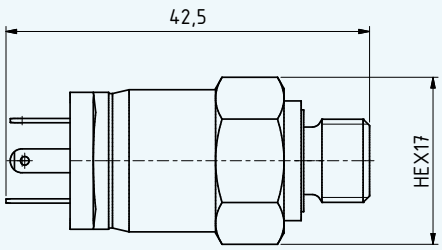
- Cooling and air-conditioning technology
- Pneumatics
- Hydraulics
- Automotive
- Pump technology

Accuracy
±0,25 %FS

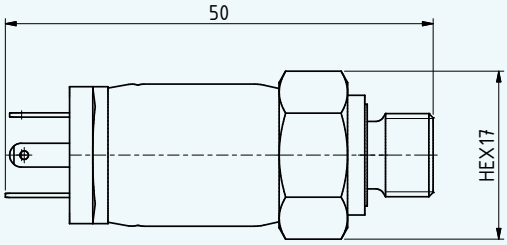
Total error band
± 1,5 %FS @-20…85 °C

Pressure ranges
0…2,5 to 0…160 bar

Series 21C 0…2,5 to 0…60 bar



Series 21C 0…100 to 0…160 bar



Series 21C – Specifications

Standard pressure ranges

Relative pressure PR	Relative pressure PR	Proof pressure
0…2,5	-1…2,5	9
0…4	-1…4	12
0…6	-1…6	18
0…10	-1…10	30
0…16	-1…16	48
0…25	-1…25	75
bar rel.		bar
Reference pressure at atmospheric pressure		Based on reference pressure

Absolute pressure PAA	Absolute pressure PA	Proof pressure
0…2,5		9
0…4	0…4	12
0…6	0…6	18
0…10	0…10	30
0…16	0…16	48
0…25	0…25	75
0…40	0…40	120
0…60	0…60	180
0…100	0…100	300
0…160	0…160	
bar abs.	bar	bar
Reference pressure at 0 bar abs. (vacuum)	Reference pressure at 1 bar abs.	Based on reference pressure

Performance

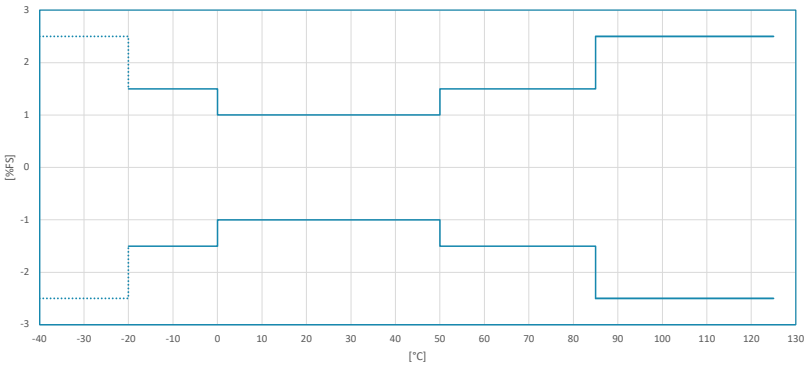
Pressure

Accuracy	≤ ± 0,25 %FS	Non-linearity (best fit straight line, BFSL), pressure hysteresis, non-repeatability
Total error band (-20…85 °C)	≤ ± 1,5 %FS	Maximum deviation within the compensated pressure and temperature range.
Compensated temperature range	-20…85 °C	
Long term stability	≤ ± 0,3 %FS	Per year under reference conditions.
Position dependency	≤ ± 1,5 mbar	Calibrated in vertical installation position with pressure connection facing downwards.

Total error band

The graph opposite shows the maximum deviation across the entire medium temperature range (-20…125 °C, optional: -40…125 °C) for the Series 21C.

Within the compensated pressure and temperature range, the total error has a maximum value of 1,0 %FS (0…50 °C), 1,5 %FS (-20…85 °C), or 2,5 %FS (-40…125 °C).



Series 21C – Specifications

Electrical data

Connectivity	3-wire
Analog interface	0,5…4,5 V ratiometric
Voltage supply	5 VDC, ± 0,5 V
Power consumption	< 8 mA

Start-up time (power supply ON)	< 5 ms (0…99 %)
Overvoltage protection and reverse polarity protection	± 33 VDC
GND case insulation	> 100 MΩ @ 500 VDC

Analog interface

Load resistance	> 5 kΩ
Limiting frequency	≥ 800 Hz

Electrical connection

Plug	Round plug	M12 x 1	DIN EN 61076-2-101, A-coded, 4-pin
	Valve plug	Form CI (9,4 mm)	DIN EN 175301-803 CI (formerly mPm-393)
	Packard plug	Metri Pack Series 150 P2S, 3-pin	
Cable	ø 3,3 mm, PUR sheath	3-pin	
Standard cable lengths	1 m, 2 m		

CE-conformity as per 2014/30/EU (EMC)	EN IEC 61326-1 / EN IEC 61326-2-3 / EN IEC 61000-6-1 / EN IEC 61000-6-2 / EN IEC 61000-6-3 / EN IEC 61000-6-4

Mechanical data

Materials in contact with media

Pressure connection	Stainless steel AISI 316L
Pressure transducer diaphragm	Stainless steel AISI 316L
Pressure transducer seal (internal)	None
Pressure connection seal (external)	FKM (75 Shore, -20…200 °C)

Other materials

Pressure transducer oil filling	Silicone oil

Further details

Pressure connection	G1/4 male	See Dimensions and variants
	G1/8 male	
	M10x1	
	7/16-20UNF female	
	7/16-20UNF male	
Diameter × length	ø 16,6 mm × approx. 57 mm	
Weight	approx. 40 g	

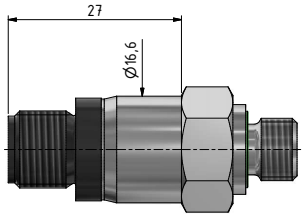
Series 21C – Specifications

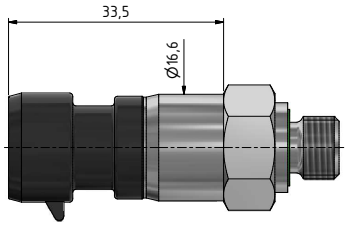
Environmental conditions

Medium temperature range	-20…125 °C	Optional: -40…125 °C	Icing not permitted.
Ambient temperature range	-20…85 °C	Optional: -40…85 °C	
Storage temperature range	-20…85 °C	Optional: -40…85 °C	
Protection	IP67	Round plug, M12 x 1	For relative pressure IP54
	IP67	Packard plug	For relative pressure IP54
	IP65	Valve plug, Form CI (9,4 mm)	For relative pressure, use a cable with integrated capillary.
	IP67	Cable	For relative pressure IP54
Notes	• Degrees of protection are valid with the corresponding mating plug. • The design implementation of the ventilation for relative pressure versions can be found in the respective technical drawing.		
Vibration resistance	10 g, 10…2000 Hz, ±10 mm	IEC 60068-2-6	
Shock resistance	50 g, 6 ms	IEC 60068-2-27	
Load cycles @ RT (20…25 °C)	> 10 m. pressure cycles	0…100 %FS	

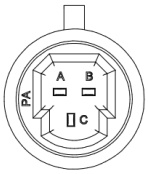
Series 21C – Dimensions and variants

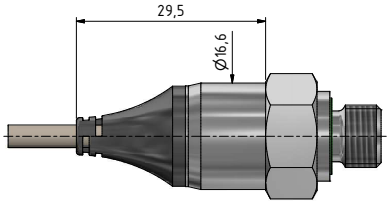
Electrical connections

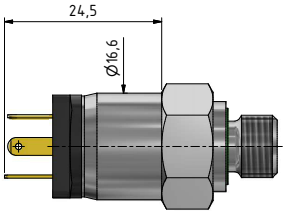


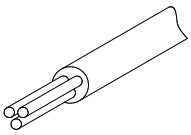


Round plug	3-wire	
M12 × 1	0,5…4,5 V ratiom.	
	1	+Vs
	2	n.c.
	3	GND
	4	+OUT

Packard plug	3-wire	
	0,5…4,5 V ratiom.	
	A	GND
	B	+Vs
	C	+OUT



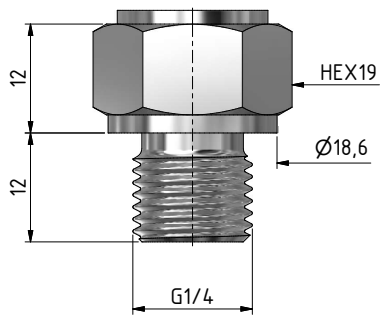
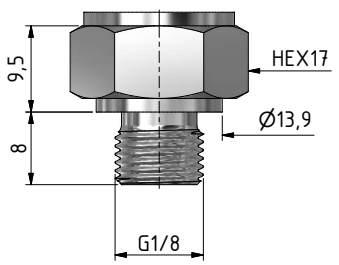
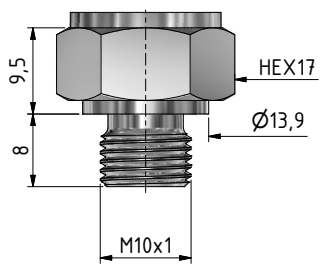


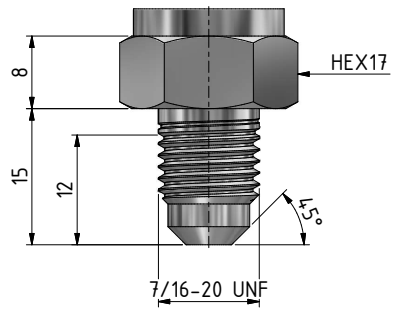
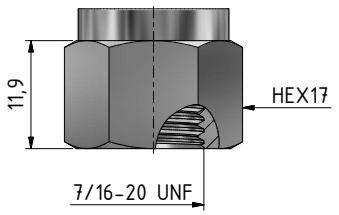
Cable gland	3-wire	
Cable ø 3,3	0,5…4,5 V ratiom.	
	WH	+OUT
	GN	GND
	BN	+Vs

Valve plug	3-wire	
Form CI (9,4 mm)	0,5…4,5 V ratiom.	
	1	GND
	2	+OUT
	3	+Vs
	4	n.c.

Series 21C – Dimensions and variants

Available pressure connections

G1/4 male	G1/8 male	M10x1
		
DIN EN ISO 1179-2	DIN EN ISO 1179-2	DIN EN ISO 1179-2

7/16-20UNF male	7/16-20UNF female
	
ANSI/ASME B1.1, pressure ranges restricted	ANSI/ASME B1.1

Customised configurations on request

- Other electrical connections
- O-rings made of other materials
- Other oil filling types for pressure transducers
- Modifications to customer-specific options

Examples of similar products

- Series 21Y: Piezoresistive pressure transmitters in a compact design with analog 4…20 mA output signal
- Series 23SY: Piezoresistive pressure transmitters for increased requirements and pressure ranges from 0,1 bar and analog output signal
- Pressure transmitter modules: Pressure transducer with electronics (e.g. series 7LC / 9LC or 20PC / 20C / 20SC with thread) for integration in one's own systems

Series 21C – Variants and accessories

Scope of delivery

Mating plug to valve plug form CI

Accessories

Mating plug to round plug, M12 x 1
• Angled socket, cable 2 m PN 602015.0018 • Female connector, cable 2 m PN 602015.0017 • Female connector, cable 5 m PN 602015.0035