Pressure sensor for connection to radio unit Models PEU-20 and PEU-21

For further approvals, see page 7

Configurator

Applications

- Remote monitoring of the process pressure for non-critical applications in combination with model NETRIS®3 radio unit
- Industrial pressure measurement for gases and liquids
- Process industry: oil and gas, chemical and petrochemical industries, water and wastewater, power generation
- Pharmaceutical and hygienic industry, food industry

Special features

- IIoT-capable measuring instrument in combination with radio unit, model NETRIS®3
- Intrinsically safe version Ex i per ATEX, IECEx
- Measuring ranges from 0 … 1 to 0 ... 1,600 bar [0 ... 15 to 0 ... 20,000 psi] as well as vacuum and compound measuring ranges

Pressure sensor for connection to radio unit, model PEU-20

Description

The model PEU-2x in combination with the model NETRIS®3 radio unit is used wherever web-based remote monitoring of the process pressure of liquids and gases is desired. Typical applications include mobile parts of plants or remote measuring locations. The connection to NETRIS®3 allows for cloud-based process and plant monitoring in industrial applications.

Via retrofit, machinery or moving parts can be configured smartly – without having to plan and document cable routing. Particularly when no continuous measurement is needed, cost advantages can be realised.

The pressure sensor enables simple condition monitoring. A temperature indication inside the case, in addition to the pressure value, reveals possible malfunctions due to wear or system faults at an early stage and thus reduces the risk of downtime and damage.

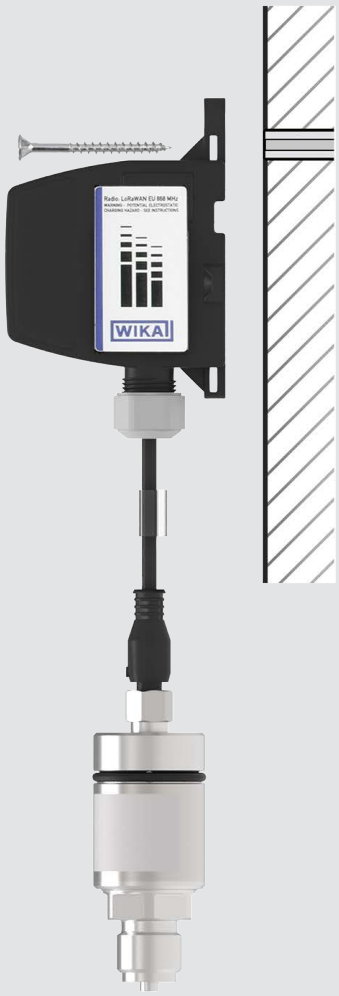
The PEU-2x pressure sensor is part of the WIKA IIoT solution. With this, WIKA offers a holistic solution for your digitalisation strategy.

Data sheets showing similar products:
Bourdon tube pressure gauge for connection to radio unit, model PGU2x.100; see data sheet PV 42.03
Radio unit with LoRaWAN® for WIKA measuring instruments; model NETRIS®3; see data sheet AC 40.03

Installation example

Model PEU-2x with radio unit, model NETRIS®3

Wall mounting of model NETRIS®3



Specifications

Overview of versions	
Model	**Description**
PEU-20	With pressure port
PEU-21	With flush connection

Accuracy specifications	
Accuracy	■ 0.5 % of span ■ 0.25 % of span (≤ 1,000 bar [15,000 psi]) ■ 0.1 % of span (≤ 1,000 bar [15,000 psi]) → 0.1 % of span at < 1.6 bar [23 psi], gauge and bar abs. not possible
Zero point setting	-20 ... 95 % (limited by 0 bar absolute)
Non-repeatability per IEC 62828-2	
Measuring ranges ≤ 1,000 bar [15,000 psi]	≤ 0.1 % of span
Measuring ranges > 1,000 bar [15,000 psi]	≤ 0.5 % of span
Total probable error per IEC 62828-2	Rated temperature range per DIN 16086: -40 ... +80 °C [-104 ... +176 °F]
	Ambient temperature range whose specification limits must not be exceeded.
Long-term stability per IEC 62828-1	
Measuring ranges < 1 bar [15 psi]	Max. 0.35 % of span/year
Measuring ranges ≥ 1 ... < 1.6 bar [≥ 15 ... < 20 psi]	Max. 0.15 % of span/year
Measuring ranges ≥ 1.6 ... ≤ 40 bar [≥ 20 ... ≤ 500 psi]	Max. 0.10 % of span/year
Measuring ranges > 40 bar [> 500 psi]	Max. 0.05 % of span/year
Reference conditions	Per IEC 62828-1

Measuring ranges, gauge pressure[1)]

bar	
0 ... 1	0 ... 60
0 ... 1.6	0 ... 100
0 ... 2.5	0 ... 160
0 ... 4	0 ... 250
0 ... 6	0 ... 400
0 ... 10	0 ... 600
0 ... 16	0 ... 1000
0 ... 25	0 ... 1600
0 ... 40	-

psi	
0 ... 15	0 ... 5,000
0 ... 30	0 ... 10,000
0 ... 100	0 ... 15,000
0 ... 500	0 ... 20,000
0 ... 1,500	-

1) For measuring ranges > 600 bar [10,000 psi] only the model PEU-20 is available

Measuring ranges, absolute pressure

bar abs.	
0 ... 1	0 ... 10
0 ... 1.6	0 ... 16
0 ... 2.5	0 ... 25
0 ... 4	0 ... 40
0 ... 6	-

psi abs.	
0 ... 15	0 ... 150
0 ... 20	0 ... 200
0 ... 30	0 ... 300
0 ... 50	0 ... 500
0 ... 100	-

Vacuum and compound measuring ranges

bar	
-0.2 ... +0.2	-1 ... 5
-1 ... 0	-1 ... 10
-1 ... 0.6	-1 ... 15
-1 ... 1.5	-1 ... 25
-1 ... 3	-1 ... 40

psi	
-14.5 ... 0	-14.5 ... 300
-14.5 ... 15	-

Other measuring ranges on request.

Further details on: Measuring range	
Units	■ bar ■ psi ■ bar abs. ■ psi abs.
Maximum working pressure	→ Corresponds to the upper measuring range value / measuring range full scale value
Overpressure limit	The overpressure limit is based on the measuring range. Depending on the selected process connection and the seal, restrictions in overpressure limit can result. Use of the instrument in the range between the upper measuring range value / measuring range full scale value and the overpressure limit is not considered normal operation and is only permissible for a short time.
Measuring ranges ≤ 40 bar [500 psi]	3 times
Measuring ranges 40 ... 1,000 bar [500 .... 15,000 psi]	2 times
Measuring range 1,600 bar [20,000 psi]	1.5 times
Vacuum resistance	Yes (not for oxygen applications)

Process connection		
Per standard	**Thread size**	**Possible measuring ranges**
Model PEU-20		
EN 837	G ⅜ B	≤ 0 ... 1,000 bar [0 ... 15,000 psi]
	G ½ B	≤ 0 ... 1,000 bar [0 ... 15,000 psi]
	M20 x 1.5	≤ 0 ... 1,000 bar [0 ... 15,000 psi]
ANSI / ASME B1.20.1	½ NPT	≤ 0 ... 1,000 bar [0 ... 15,000 psi]
	½ NPT, ¼ female thread	≤ 0 ... 1,000 bar [0 ... 15,000 psi]
	¼ NPT	≤ 0 ... 1,000 bar [0 ... 15,000 psi]
-	M16 x 1.5, female thread with sealing cone	≥ 0 ... 100 bar [0 ... 1,500 psi]
	M20 x 1.5, female thread with sealing cone	≥ 0 ... 1,600 bar [0 ... 20,000 psi]
	9/16-18 UNF, female thread F 250-C	≥ 0 ... 100 bar [0 ... 1,500 psi]
Model PEU-21		
-	G ½ B	0 ... 6 to 0 ... 600 bar [0 ... 100 to 0 ... 5,000 psi]
	G 1 B	≤ 0 ... 1.6 bar [0 ... 30 psi]
	G 1 ½ B	≤ 0 ... 1.6 bar [0 ... 30 psi]
	G 1 hygienic [1) 2)]	≤ 0 ... 16 bar [0 ... 100 psi]
	G 1 hygienic with cooling element [2)]	≤ 0 ... 16 bar [0 ... 100 psi]

Process connection		
Per standard	**Thread size**	**Possible measuring ranges**
TRI-CLAMP®	DN 1½ with cooling element for 150 °C [302 °F]	≤ 0 ... 40 bar [0 ... 500 psi]
	DN 2 with cooling element for 150 °C [302 °F]	≤ 0 ... 40 bar [0 ... 500 psi]
Clamp DIN 32676	DN 40 with cooling element for 150 °C [302 °F]	≤ 0 ... 40 bar [0 ... 500 psi]
	DN 50 with cooling element for 150 °C [302 °F]	≤ 0 ... 40 bar [0 ... 500 psi]
Grooved union nut DIN 11851 with conical coupling	DN 25 with cooling element for 150 °C [302 °F]	≤ 0 ... 40 bar [0 ... 500 psi]
	DN 40 with cooling element for 150 °C [302 °F]	≤ 0 ... 25 bar [0 ... 500 psi]
	DN 50 with cooling element for 150 °C [302 °F]	≤ 0 ... 25 bar [0 ... 500 psi]
NEUMO BioConnect®	DN 40 form V with cooling element for 150 °C [302 °F]	≤ 0 ... 16 bar [0 ... 500 psi]
VARINLINE®	Form N with cooling element for 150 °C [302 °F], DN 40 ... 50	≤ 0 ... 16 bar [0 ... 500 psi]
	Form F with cooling element for 150 °C [302 °F], DN 25	≤ 0 ... 16 bar [0 ... 500 psi]

1) Also available as high-temperature version to 150 °C [302 °F] with extended EPDM or FKM seal.
2) Suitable WIKA adapter system model 910.61; see data sheet AC 09.20

Details must be tested separately in the respective application. The specified values for the overpressure limit serve only as a rough orientation. The values depend on the temperature, the seal used, the selected torque, the type and material of the mating thread and the prevailing operating conditions.

Digital interface	
Signal type	Unified WIKA Interface (UWI)
Digital signal resolution	< 0.01 % of measuring span
Connection type	Plug connection for NETRIS®3 M12 connector

Material		
Materials (wetted)		
PEU-20		
≤ 40 bar [500 psi]	All process connections	Stainless steel 1.4404 / 316L Sensor: stainless steel 1.4404 / 316L
> 40 bar [500 psi]	All process connections	Process connection: stainless steel 1.4404 / 316L Sensor: Elgiloy® 2.4711
> 1,000 bar [15,000 psi]	All process connections	Process connection: stainless steel 1.4534 / 904L Sensor: stainless steel 1.4534 / 904L
PEU-21		
All measuring ranges	All process connections	Process connection: stainless steel 1.4435 / 316L Diaphragm: stainless steel 1.4435 / 316L
	■ G ½ ■ G 1	Process connection: Hastelloy® HC276 / 2.4819 Diaphragm: Hastelloy HC276 / 2.4819
	■ G ½ ■ G 1	Process connection: gold-plated Diaphragm: gold-plated 1)
Seal	■ NBR ■ EPDM ■ FKM	
	→ For PEU-21 with G-thread up to max. +105 °C [221 °F]	

Material		
Surface roughness with hygienic connections	■ Unpolished surface R_a ≤ 0.5 µm ■ Polished surface R_a ≤ 0.38 µm	
Pressure transmission medium		
PEU-20	Measuring range ≤ 40 bar [500 psi]	Synthetic oil
	Measuring range > 40 bar [500 psi]	Dry measuring cell
PEU-21	All measuring ranges	■ Synthetic oil ■ NEOBEE M-20 FDA

1) Accuracy 0.1 % not available for gold-plated sensors.

All connections are NACE-compatible (MR0103 and MR0175). No NACE with measuring ranges > 1,000 bar [15,000 psi], see table „Process connection“.

Version for special media		
Food	FDA-listed, food-compatible system fill fluid	
Oil- and grease-free	Per G93:2019 level D (< 220 mg/m²)	
Oxygen, oil- and grease-free	■ Per G93:2019 level D (< 220 mg/m²) ■ Particle < 1,000 µm	
Hydrogen	Measuring ranges	≥ 100 bar [1,450 psi]
	Material (wetted)	316L and Elgiloy (2.4711)
	With the measurement of hydrogen, preferably, a gold-plated diaphragm should be used. If this is not technically possible, a higher long-term drift should be expected. Use with pressures ≥1,000 bar [≥14,500 psi] is not permissible.	

Operating conditions		
Medium temperature limit	→ See „Safety-related characteristic values (Ex)“	
	Oxygen application	-20 ... +60 °C [-4 ... +140 °F]
	Hydrogen application	Max. 30 °C [86 °F]
Medium temperature limit due to sealing material (only for model PEU-21)		
NBR	-20 ... +105 °C [-4 ... +221 °F]	
FKM	-20 ... +105 °C [-4 ... +221 °F]	
FKM	-20 ... +150 °C [-4 ... +302 °F] 1)	
EPDM	-40 ... +105 °C [-40 ... +221 °F]	
EPDM	-40 ... +150 °C [-40 ... +302 °F] 2)	
Ambient temperature limit	-40 ... +80 °C [-40 ... +176 °F] 2)	
Storage temperature limit	-40 ... +80 °C [-40 ... +176 °F]	
Relative humidity per IEC 62828-1	50 ... 70 % relative humidity (non-condensing)	
Vibration resistance per DNVGL-CG-0339		
For instruments without cooling element	4g (5 ... 100 Hz)	
For instruments with cooling element	0.7g (5...100 Hz)	
Shock resistance per IEC 60068-2-27		
For instruments without cooling element	100g [6 ms]	
For instruments without cooling element	50g [6 ms]	
For instruments with measuring range 1,000 bar [15,000 psi]	20g [6 ms]	
Mounting position	Vertical, diaphragm points downward	
Ingress protection per IEC 60529	IP66/67	
	The ingress protection only applies with a correct plug connection with model NETRIS®3	

1) Process connection with cooling element
2) Instrument with angular connector or circular connector: -30 ... +80 °C [-22 ... +176 °F]

Approvals

Logo	Description	Region
CE	**EU declaration of conformity**	European Union
	ATEX directive Hazardous areas - Ex i Zone 0 gas — II 1G Ex ia IIC T6...T1 Ga - Ex i Zone 1 mounting to zone 0 gas — II 1/2G Ex ia IIC T6...T1 Ga/Gb - Ex i Zone 1 gas — II 2G Ex ia IIC T6...T1 Gb - Ex i Zone 20 dust — II 1D Ex ia IIC T135°C Da - Ex i Zone 21 mounting to zone 20 dust — II 1/2D Ex ia IIC T135 °C Da/Db - Ex i Zone 21 dust — II 2D Ex ia IIC T135°C Db	
	EMC Directive EN 61326 emission (group 1, class A) and immunity (industrial environment)	
	Pressure Equipment Directive (pressure accessory, module A)	
	RoHS directive	
IEC IECEx	**IECEx** Hazardous areas - Ex i Zone 0 gas — Ex ia IIC T6...T1 Ga - Ex i Zone 1 mounting to zone 0 gas — Ex ia IIC T6...T1 Ga/Gb - Ex i Zone 1 gas — Ex ia IIC T6...T1 Gb - Ex i Zone 20 dust — Ex ia IIC T135°C Da - Ex i Zone 21 mounting to zone 20 dust — Ex ia IIC T135 °C Da/Db - Ex i Zone 21 dust — Ex ia IIC T135°C Db	International
EHEDG	**EHEDG** Hygienic Equipment Design (only for PEU-21)	European Union

Manufacturer's declaration

Logo	Description
-	Manufacturer's declaration regarding EU regulation 1935/2004 EC
-	Manufacturer's declaration GB 4806.1-2016 China National Food Safety Standard – Good Manufacturing Practice GB 31603-2015 (GMP)

Certificates

Description	
Certificates	■ Without ■ 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, material proof, measurement accuracy) ■ 3.1 inspection certificate per EN 10204 (e.g. material proof for wetted metal parts)
Calibration	■ Without ■ 3.1 inspection certificate per EN 10204 (factory calibration) ■ DAkkS calibration certificate (traceable and accredited in accordance with ISO/IEC 17025)
Recommended calibration interval	1 year (dependent on conditions of use)

→ For approvals and certificates, see website

Safety-related characteristic values (Ex)

Safety-related characteristic values (Ex)	
Electrical parameters of the intrinsically safe voltage supply	
Max. input voltage U_i	DC 6.7 V
Max. input current for gas applications I_i	250 mA
Max. input power P_i	300 mW
Effective internal capacitance C_i	4.4 nF

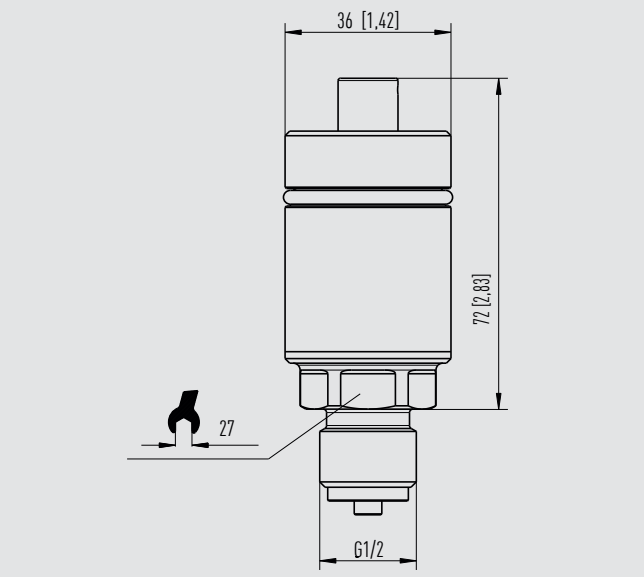
Safety-related characteristic values (Ex)	
Effective internal inductance L_i	Negligible
Max. output voltage U_o [1]	DC 6.7 V
Max. output current I_o [1]	400 mA
Temperature range	→ Applies for temperature classes T1 ... T4 and max. surface temperature T135 for dust Ex atmosphere
Ambient temperature	-40 ... +80 °C [-40 ... +176 °F]
Medium temperature [2]	-40 ... +80 °C [-40 ... +176 °F] → For increased medium temperatures, see table „Further specifications on: Safety-related characteristic values (Ex)“.

1) Short-term due to capacitor discharge, time constant 5xT < 25 ms
2) Medium temperatures depend on the process connection, the seal and the characteristic values for explosion protection. Medium temperatures above 80 °C [176 °F] are only possible with flush process connections.

The model PEU-2x is intended for use with the intrinsically safe, battery-operated model NETRIS®3 radio unit with ignition protection type “ia” .

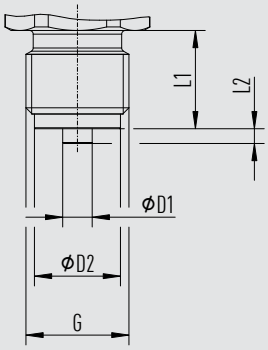
Further specifications on: Safety-related characteristic values (Ex)		
Temperature class	**Max. medium temperature**	**Ambient temperature**
Without cooling element		
T4	120 °C [248 °F]	-40 ≤ Ta ≤ +30 °C [-40 ≤ Ta ≤ +86 °F]
T4	105 °C [221 °F]	-40 ≤ Ta ≤ +40 °C [-40 ≤ Ta ≤ +104 °F]
T4	85 °C [185 °F]	-40 ≤ Ta ≤ +80 °C [-40 ≤ Ta ≤ +176 °F]
T5	85 °C [185 °F]	-40 ≤ Ta ≤ +80 °C [-40 ≤ Ta ≤ +176 °F]
T6	70 °C [158 °F]	-40 ≤ Ta ≤ +70 °C [-40 ≤ Ta ≤ +158 °F]
With cooling element		
T3	150 °C [302 °F]	-40 ≤ Ta ≤ +40 °C [-40 ≤ Ta ≤ +104 °F]
T4	120 °C [248 °F]	-40 ≤ Ta ≤ +50 °C [-40 ≤ Ta ≤ +122 °F]
T4	105 °C [221 °F]	-40 ≤ Ta ≤ +50 °C [-40 ≤ Ta ≤ +122 °F]
T4	85 °C [185 °F]	-40 ≤ Ta ≤ +80 °C [-40 ≤ Ta ≤ +176 °F]
T5	85 °C [185 °F]	-40 ≤ Ta ≤ +80 °C [-40 ≤ Ta ≤ +176 °F]
T6	70 °C [158 °F]	-40 ≤ Ta ≤ +70 °C [-40 ≤ Ta ≤ +158 °F]

Dimensions in mm [in]



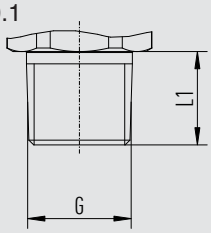
Process connections for model PEU-20

EN 837



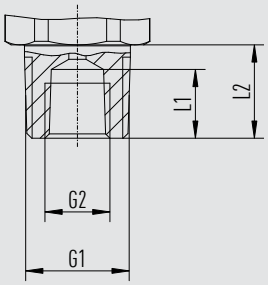
G	L1	L2	D1	D2
G ⅜ B	16 [0.63]	3 [0.12]	5.5 [0.22]	13 [0.512]
G ½ B	20 [0.79]	3 [0.12]	6 [0.24]	17.5 [0.689]
M20 x 1.5	20 [0.79]	3 [0.12]	6 [0.24]	17.5 [0.689]

ANSI/ASME B1.20.1



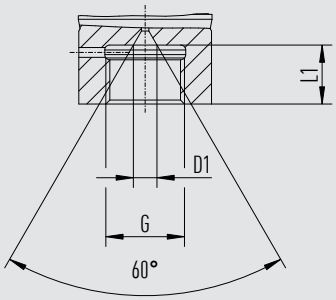
G	L1
¼ NPT	13 [0.51]
½ NPT	19 [0.75]

ANSI/ASME B1.20.1



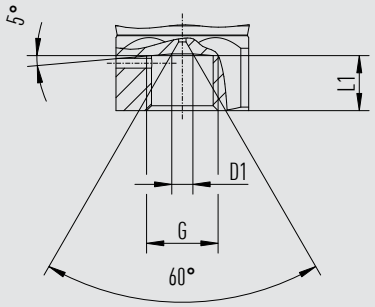
G1	G2	L1	L2
½ NPT, male	1/4 NPT, female	14 [0.55]	19 [0.75]

High-pressure connection



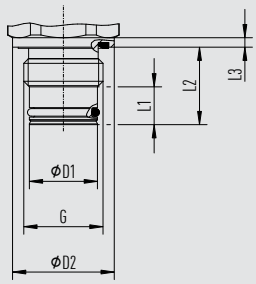
G	L1	D1
M16 x 1.5 female	12 [0.47]	4.8 [0.19]
M20 x 1.5 female	15 [0.59]	4.8 [0.19]

High-pressure connection



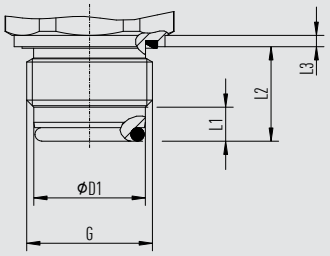
G	L1	D1
9/16-18 UNF female F 250-C	11.2 [0.44]	4.3 [0.17]

Process connections for model PEU-21

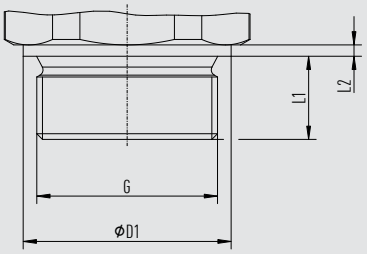


G	L1	L2	L3	D1	D2
G ½ B	10 [0.39]	20.5 [0.807]	3 [0.12]	18 [0.71]	26.9 [1.059]
G 1 B	9 [0.35]	25 [0.98]	2.5 [0.098]	30 [1.18]	40 [1.595]

Hygienic

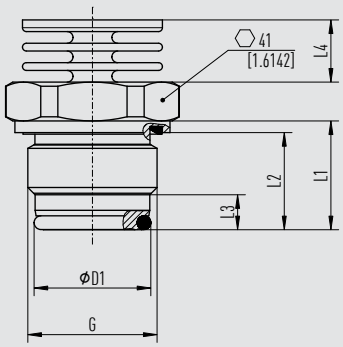


G	L1	L2	L3	D1
G 1	9 [0.35]	25 [0.98]	3 [0.12]	29.5 [1.16]



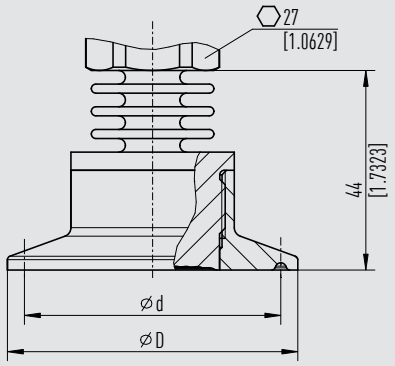
G	L1	L2	D1
G 1 ½ B	22 [0.87]	3 [0.12]	55 [2.17]

Hygienic



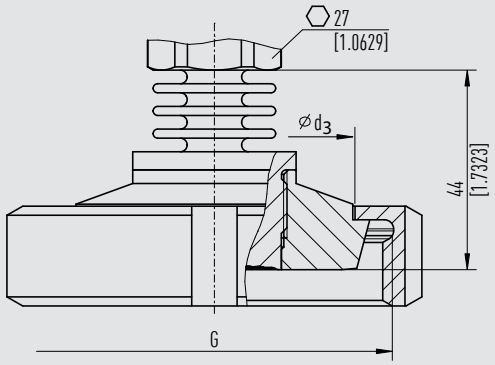
G	L1	L2	L3	L4	D1
G 1	28 [1.10]	25 [0.98]	9 [0.35]	15.5 [0.61]	29.5 [1.161]

Clamp connection DIN 32676
TRI-CLAMP® 1)



DN	ØD	Ød
DN 1 ½	50.5 [1.99]	43.5 [1.71]
DN 2	64 [2.52]	56.6 [2.23]
DN 40	50.5 [1.99]	43.5 [1.71]
DN 50	64 [2.52]	56.6 [2.23]

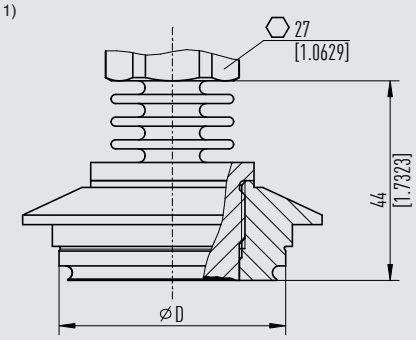
Grooved union nut DIN 11851
with conical coupling, for pipes per DIN 11850



DN	G	Ød3
DN 25	Rd 52 x 1/6	35 [1.37]
DN 40	Rd 65 x 1/6	44 [1.73]
DN 50	Rd 78 x 1/6	61 [2.40]

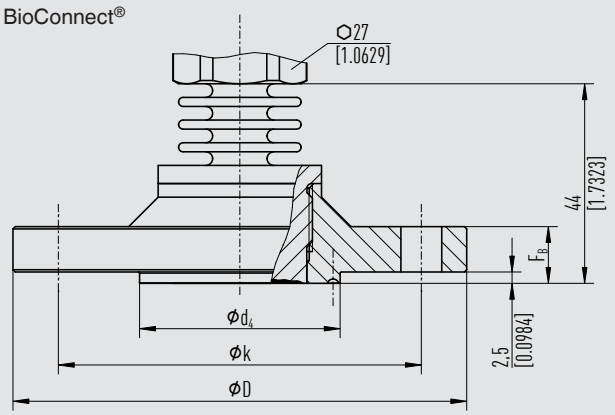
1) Process connections per ASME BPE

VARINLINE® 1)



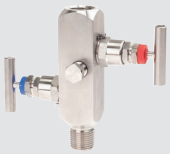
Form	ØD
Form F	50 [1.97]
Form N	68 [2.68]

BioConnect®



DN	Ød4	ØD	Øk	FB
DN 40	44.2 [1.74]	100 [3.94]	80 [3.15]	10 [0.39]

Accessories

	Model	Description	Order number
	**NETRIS®3**	Radio unit with LoRaWAN® for WIKA measuring instruments For applications in hazardous areas → See data sheet AC 40.03	-
	-	Welding socket for process connection G ½ flush	1192299
		Welding socket for process connection G 1 flush	1192264
		Welding socket for process connection G 1 ½ flush	2158982
		Welding socket for process connection G 1 hygienic flush	14070973
	**IV20, IV21**	Block-and-bleed valve → See data sheet AC 09.19	-

BioConnect® is a registered trademark of the company NEUMO.
VARINLINE® is a registered trademark of GEA Tuchenhagen GmbH.

Ordering information

Model / Ex zone / Unit / Pressure type / Measuring range / Process connection / Seal / Wetted parts / Accuracy / Certificates

Configurator

WIKA Alexander Wiegand SE & Co. KG
Alexander-Wiegand-Straße 30
63911 Klingenberg/Germany
Tel. +49 9372 132-0
info@wika.de
www.wika.com