

# Pressure transmitter

## For sanitary applications

### Model SA-11

WIKA data sheet PE 81.80



for further approvals  
see page 13

### Applications

- For gases, compressed air, vapour; liquid, pasty, powdery and crystallising media
- Ultra-pure steam systems for SIP
- Hydrostatic level measurement
- Vacuum monitoring, e.g. vacuum conveyors, pump monitoring
- Food and beverage industry, pharmaceutical industry, biotechnology, sanitary applications

### Special features

- Wide variety of aseptic process connections, for process temperatures up to 150 °C [302 °F]
- Diaphragm seal parts all welded
- Suitable for SIP and CIP
- Ingress protection up to IP68

### Description

The model SA-11 pressure transmitter is designed especially for the requirements of the food and beverage, pharmaceutical and biotechnology industries.

The instrument is particularly suitable for the special conditions of CIP/SIP cleaning processes, such as chemical stability towards cleaning liquids and high temperatures.

The flush diaphragm is directly welded to the process connection. This guarantees a crevice-free joint between the process connection and the measuring cell, additional sealings are not required.

For dead-space free instrumentation, aseptic process connections (clamp, threaded, VARINLINE® and NEUMO®) are available.

The model SA-11 conforms to the 3-A Sanitary Standard and is EHEDG-certified.



Pressure transmitter model SA-11 with TRI-CLAMP® connection

### Construction

A diaphragm made of 1.4435 stainless steel forms a flush separation of the process medium from the pressure transmitter.

The process pressure is transmitted hydrostatically from the diaphragm, via an FDA-approved system fill fluid, to a piezoresistive sensor.

The measuring range covers 0 ... 250 mbar up to 0 ... 25 bar.

The model SA-11 pressure transmitter is powered with a DC voltage of 10 (14) ... 30 V. As output signals, 4 ... 20 mA, 0 ... 20 mA or 0 ... 10 V are available.

A stainless steel case, with an ingress protection of up to IP68, offers a secure protection for external cleaning with splash water and enables its use in high-humidity environments. Through the integrated cooling element, process temperatures of up to 150 °C [302 °F] can be realised.

# Specifications

## Versions

Angular connector

Field case

Circular connector

Cable outlet



## Installation example

Pressure transmitter model SA-11, with circular connector M12 x 1 and grooved union nut DIN 11864-1



The total height of the model SA-11 pressure transmitter includes the electrical connection, the transmitter case and the process connection

Accuracy specifications		
Non-linearity per BFSL (per IEC 61298-2)	≤ 0.2 % of span	
Accuracy <sup>1)</sup>	<ul style="list-style-type: none"> <li>■ ≤ 0.5 % of span</li> <li>■ ≤ 0.25 % of span</li> </ul>	
Mean temperature coefficients at 0 ... 80 °C [32 ... 176 °F]		
Zero point	Measuring range 0 ... 0.6 bar to 0 ... 25 bar	≤ 0.2 % of span / 10 K
	Measuring range 0 ... 0.4 bar	≤ 0.25 % of span / 10 K
	Measuring range 0 ... 0.25 bar	≤ 0.4 % of span / 10 K
Span	≤ 0.2 % of span / 10 K	
Long-term stability (per DIN 16086)	≤ 0.2 % of span/year	
Adjustability of zero point, span	Adjustment is made using potentiometers inside the instrument. Not possible for IP68 cable outlet.	
Non-repeatability (per IEC 61298-2)	≤ 0.1 % of span	
Mounting position influence	Calibrated in vertical mounting position with process connection facing downwards.	

1) Including non-linearity, hysteresis, zero offset and end value deviation (corresponds to measured error per IEC 61298-2), calibrated in vertical mounting position with process connection facing downwards.

### Gauge pressure, measuring ranges

Measuring range	
bar	psi
0 ... 0.25	0 ... 5
0 ... 0.4	0 ... 10
0 ... 0.6	0 ... 15
0 ... 1	0 ... 30
0 ... 1.6	0 ... 60
0 ... 2.5	0 ... 100
0 ... 4	0 ... 160
0 ... 6	0 ... 200
0 ... 10	0 ... 300
0 ... 16	
0 ... 25	

### Absolute pressure, measuring ranges

Measuring range	
bar abs.	psi abs.
0 ... 1	0 ... 15
0 ... 1.6	0 ... 25
0 ... 2.5	0 ... 50
0 ... 4	0 ... 100
0 ... 6	0 ... 250
0 ... 10	
0 ... 16	

### Vacuum and +/- measuring ranges

Measuring range	
bar	psi
-1 ... 0	-30 inHg ... 0
-1 ... +0.6	-30 inHg ... +30
-1 ... +1	
-1 ... +2	
-1 ... +3	
-1 ... +4	
-1 ... +5	
-1 ... +9	
-1 ... +10	
-1 ... +15	

Other measuring ranges on request.

Further details on: Measuring ranges	
<b>Special measuring ranges</b>	Other measuring ranges on request
<b>Unit</b>	<ul style="list-style-type: none"> <li>■ bar</li> <li>■ psi</li> <li>■ bar abs.</li> <li>■ psi abs.</li> </ul>
<b>Overpressure limit</b>	
Measuring ranges ≤ 6 bar	4 times
Measuring ranges 10 bar and 16 bar	3 times
Measuring range 25 bar	2 times
<b>Vacuum resistance</b>	Vacuum-resistant to -1 bar

Process connection	
Standard	Size
<b>TRI-CLAMP® (DIN 32676)</b> For pipes per DIN 11866 row C or ASME BPE	<ul style="list-style-type: none"> <li>■ DN 1 ½"</li> <li>■ DN 2"</li> </ul>
<b>DIN 32676</b> For pipes per DIN 11866 row A or DIN 11850 row 2	<ul style="list-style-type: none"> <li>■ DN 32</li> <li>■ DN 40</li> <li>■ DN 50</li> </ul>
<b>ISO 2852</b> For pipes per ISO 2037 and BS 4825 part 1	<ul style="list-style-type: none"> <li>■ DN 38</li> <li>■ DN 40</li> <li>■ DN 51</li> </ul>
<b>DIN 11851</b> For pipes per DIN 11850 row 2	<ul style="list-style-type: none"> <li>■ DN 25</li> <li>■ DN 40</li> <li>■ DN 50</li> </ul>
<b>SMS (SMS 1145)</b> For pipes per ISO 1127 row 2 or ISO 2037/1992	<ul style="list-style-type: none"> <li>■ DN 1 ½"</li> <li>■ DN 2"</li> </ul>
<b>IDF (ISO/DIS 2853 and BS 4825 part 4)</b> For pipes per ISO 1127 row 2 or ISO 2037/1992	<ul style="list-style-type: none"> <li>■ DN 1 ½"</li> <li>■ DN 2"</li> </ul>
<b>APV-RJT (BS 4825 part 5)</b> For pipes per BS 4825 part 1 and O.D. tube	<ul style="list-style-type: none"> <li>■ DN 1 ½"</li> <li>■ DN 2"</li> </ul>
<b>VARINLINE®</b> Suitable for installation in VARINLINE® components	<ul style="list-style-type: none"> <li>■ Form F, PN 25</li> <li>■ Form N, PN 25</li> </ul>
<b>DIN 11864-1 form A</b> For pipes per DIN 11866 row A or DIN 11850 row 2	<ul style="list-style-type: none"> <li>■ DN 40</li> <li>■ DN 50</li> </ul>
<b>DIN 11864-2 form A</b> For pipes per DIN 11866 row A or DIN 11850 row 2	<ul style="list-style-type: none"> <li>■ DN 40</li> <li>■ DN 50</li> </ul>
<b>DIN 11864-3 form A</b> For pipes per DIN 11866 row A or DIN 11850 row 2	<ul style="list-style-type: none"> <li>■ DN 40</li> <li>■ DN 50</li> </ul>
<b>NEUMO BioControl®</b> Suitable for installation in BioControl® cases, see data sheet AC 09.14	<ul style="list-style-type: none"> <li>■ Size 50</li> <li>■ Size 65</li> </ul>
<b>NEUMO BioConnect®</b> Flange, form V	<ul style="list-style-type: none"> <li>■ DN 40</li> <li>■ DN 50</li> </ul>
<b>NEUMO BioConnect®</b> Liner and grooved union nut, form V	<ul style="list-style-type: none"> <li>■ DN 40</li> <li>■ DN 50</li> </ul>
<b>DRD flange connection</b>	-

Output signal		
Signal type	<ul style="list-style-type: none"> <li>■ 4 ... 20 mA, 2-wire</li> <li>■ 0 ... 20 mA, 3-wire</li> <li>■ DC 0 ... 10 V, 3-wire</li> <li>■ DC 0 ... 5 V, 3-wire</li> </ul>	
	Other output signals, e.g. CANopen, on request	
Load in $\Omega$		
4 ... 20 mA, 2-wire	$R_A \leq (U_+ - 10 \text{ V}) / 0.02 \text{ A}$	
0 ... 20 mA, 3-wire	$R_A \leq (U_+ - 3 \text{ V}) / 0.02 \text{ A}$	
DC 0 ... 10 V, 3-wire	$R_A > 10 \text{ k}$	
DC 0 ... 5 V, 3-wire	$R_A > 10 \text{ k}$	
Voltage supply		
Supply voltage	Signal type 4 ... 20 mA, 2-wire	DC 10 ... 30 V
	Signal type 0 ... 20 mA, 3-wire	DC 10 ... 30 V
	Signal type DC 0 ... 10 V, 3-wire	DC 14 ... 30 V
	Signal type DC 0 ... 5 V, 3-wire	DC 10 ... 30 V
Overvoltage protection / dielectric strength <sup>1)</sup>	DC 36 V	
Time response		
Response time (10 ... 90 %)	$\leq 10 \text{ ms}$	

1) NEC class 02 voltage supply (low voltage and low current max. 100 VA even under fault conditions)


Electrical connection	Ingress protection <sup>1)</sup>	Wire cross-section	Cable diameter	Cable length
Angular connector DIN 175301-803 A	IP65	Max. 1.5 mm <sup>2</sup>	6 ... 8 mm	-
Field case	IP67	-	-	-
Circular connector M12 x 1 (4-pin)	IP67	-	-	-
Cable outlet, 1.5 m	IP68	Max. 0.5 mm <sup>2</sup>	6 ... 8 mm	1.5 m


1) The stated ingress protection only applies when plugged in using mating connectors that have the appropriate ingress protection.


Other electrical connections on request


Further details on: Electrical connection	
Short-circuit resistance	S+ vs. U-
Reverse polarity protection	U+ vs. U-
Insulation voltage	DC 500 V with NEC class 02 voltage supply (low voltage and low current max. 100 VA even under fault conditions)

## Pin assignment

Angular connector DIN 175301-803 A			
		2-wire	3-wire
	U+	1	1
	U-	2	2
	S+	-	3

Field case			
		2-wire	3-wire
	U+	1	1
	U-	2	2
	S+	3	3

Circular connector M12 x 1 (4-pin)			
		2-wire	3-wire
	U+	1	1
	U-	3	3
	S+	-	4

Cable outlet			
		2-wire	3-wire
	U+	Brown (BN)	Brown (BN)
	U-	Green (GN)	Green (GN)
	S+	-	White (WH)

Materials	
Wetted parts	Stainless steel 1.4435
Material (wetted)	Stainless steel 1.4571
System fill fluid	<ul style="list-style-type: none"> <li>■ Synthetic oil, KN 77, FDA-compliant, FDA-CFR no. 21CFR178.3750</li> <li>■ Neobee® M-20, KN 59, FDA-compliant, FDA-CFR no. 21CFR174.5</li> </ul>

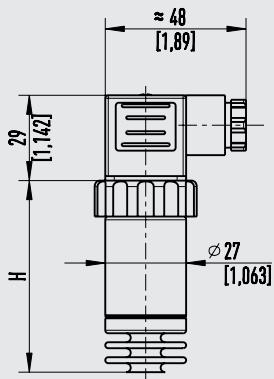
Operating conditions	
<b>Temperature ranges <sup>1)</sup></b>	
Medium temperature	-20 ... +150 °C [-4 ... +302 °F]
Ambient temperature	-20 ... +80 °C [-4 ... +176 °F]
Storage temperature	-40 ... +100 °C [-40 ... +212 °F]
<b>Vibration resistance (per IEC 60068-2-6)</b>	15 g
<b>Shock resistance (per IEC 60068-2-27)</b>	500 g

1) Also meets EN 50178, tab. 7, operation (C) 4K4H, storage (D) 1K4, transport (E) 2K3

# Dimensions in mm [in]

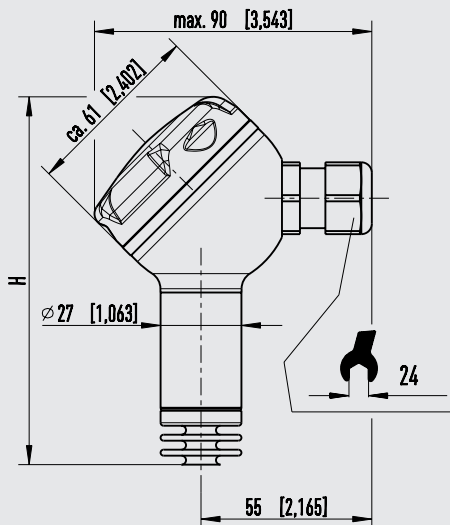
Angular connector DIN 175301-803 A

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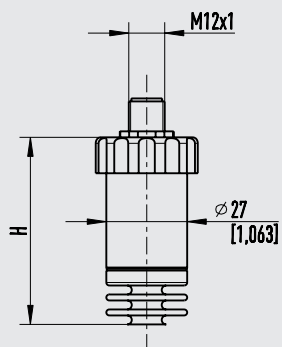
Field case

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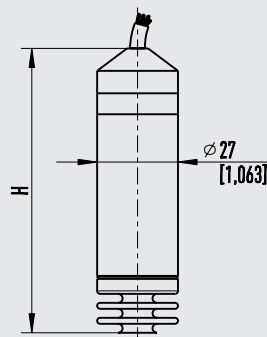
Circular connector M12 x 1

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Cable outlet

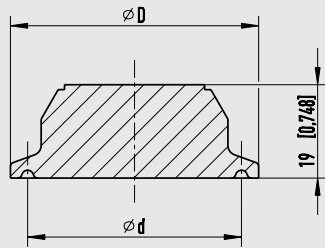
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Version	H	
	With accuracy 0.5 %	With accuracy 0.25 %
Angular connector	64 [2.52]	84 [3.31]
Field case	123 [4.84]	138.5 [5.45]
M12 x 1	64 [2.52]	84 [3.31]
Cable outlet	79.5 [3.13]	95 [3.74]

## Process connections

Clamp connection (clamp)



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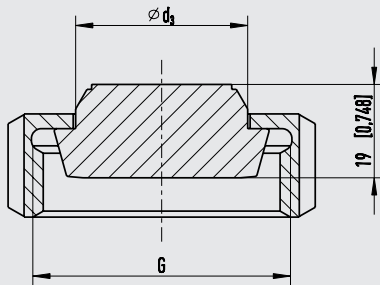


EHEDG-compliant only in combination with a Kalrez stainless steel gasket from Dupont de Nemours or with a T-ring seal from Combifit International B.V.

Standard	Size	Dimensions in mm [in]	
		D	d
<b>TRI-CLAMP® 1)</b> (DIN 32676) For pipes per DIN 11866 row C or ASME BPE	1 ½"	50.5	43.5
	2"	64	56.6
<b>DIN 32676</b> For pipes per DIN 11866 row A or DIN 11850 row 2	DN 32	50.5	43.5
	DN 40	50.5	43.5
	DN 50	64	56.6
<b>ISO 2852</b> For pipes per ISO 2037 and BS 4825 part 1	DN 33.7	50.5	43.5
	DN 38	50.5	43.5
	DN 40	64	56.6
	DN 51	64	56.6

1) TRI-CLAMP® is a trademark of the company Alfa Laval AB SE

Grooved union nut DIN 11851



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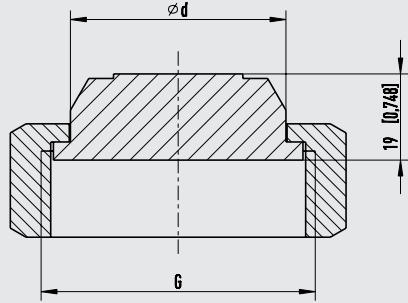
3-A-compliant only in combination with profile sealing from SKS Komponenten BV or Kieselmann GmbH.

EHEDG-compliant only in combination with ASEPTO-STAR k-flex upgrade sealing from Kieselmann GmbH

Standard	Size	Dimensions in mm [in]	
		G	d <sub>3</sub>
<b>DIN 11851</b> For pipes per DIN 11850 row 2	DN 25	Rd 52 x 1/6	44
	DN 40	Rd 65 x 1/6	48
	DN 50	Rd 78 x 1/6	61



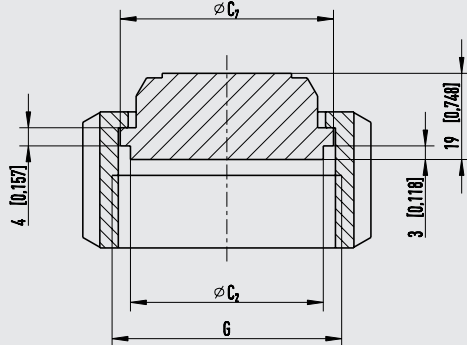
Grooved union nut SMS



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Standard	Size	Dimensions in mm [in]	
		G	d <sub>3</sub>
SMS (SMS 1145) For pipes per ISO 1127 row 2 or ISO 2037/1992	1 1/2"	Rd 60 x 1/6	47.5
	2"	Rd 70 x 1/6	60

Grooved union nut IDF

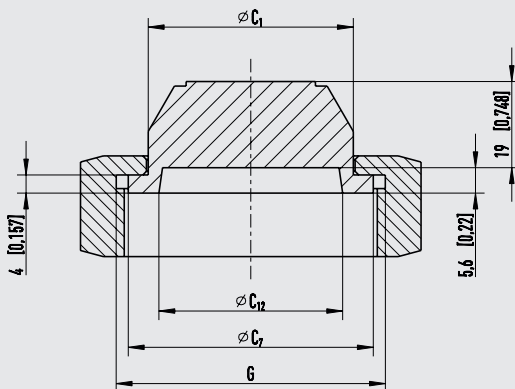


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3-A-compliant only in combination with a sealing with support ring per ISO 2853

Standard	Size	Dimensions in mm [in]		
		G	C <sub>2</sub>	C <sub>7</sub>
IDF (ISO/DIS 2853 and BS 4825 part 4) For pipes per ISO 1127 row 2 or ISO 2037/1992	1 1/2"	IDF 1.5	42.5	47
	2"	IDF 2	56	60.5

Grooved union nut APV-RJT

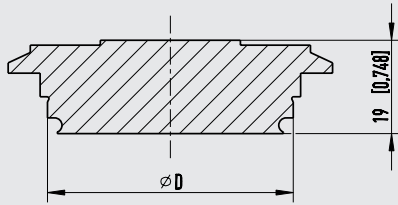


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Standard	Size	Dimensions in mm [in]			
		G	C <sub>1</sub>	C <sub>7</sub>	C <sub>12</sub>
APV-RJT (BS 4825 part 5) For pipes per BS 4825 part 1 and O.D. tube	1 1/2"	2 5/16" x 8	45.2	54	40.5
	2"	2 7/8" x 8	57.7	66.6	53.2

VARINLINE®

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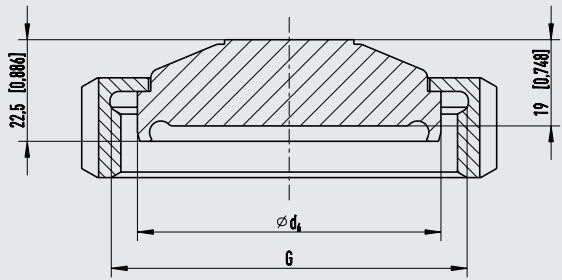
Size	Dimensions in mm [in]
	D
VARINLINE® form F, PN 25	50
VARINLINE® form N, PN 25	68

Suitable VARINLINE® component	EHEDG-compliant	
	Form F	Form N
Case	No	Yes
Type T case connecting flange	Yes	Yes
Type T-S case connecting flange	No	No
Type U case connecting flange	No	No
Type U-S case connecting flange	No	No
Type P tank connection flange	Yes	Yes

EHEDG-compliant only in combination with an EPDM O-ring

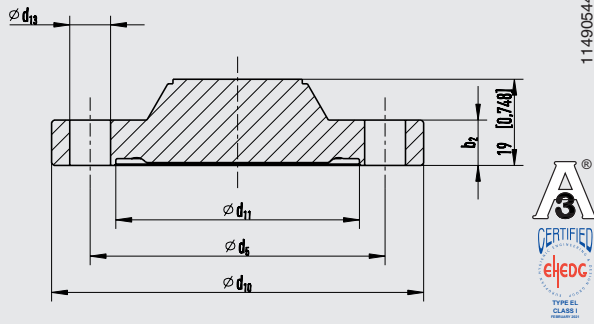
Grooved union nut DIN 11864-1

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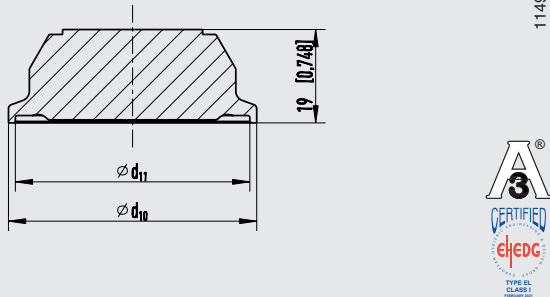
Standard	Size	Dimensions in mm [in]	
		G	d <sub>6</sub>
DIN 11864-1 form A For pipes per DIN 11866 row A or DIN 11850 row 2	DN 40	Rd 65 x 1/6	54.9
	DN 50	Rd 78 x 1/6	66.9

Flange connection DIN 11864-2



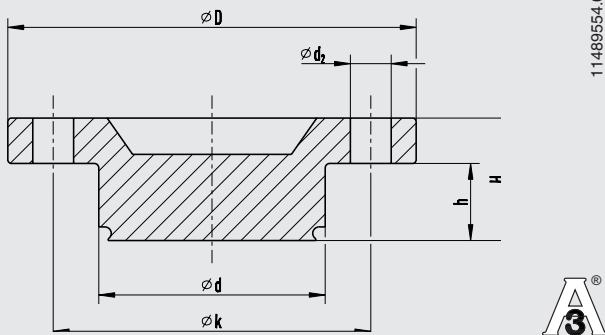
Standard	Size	Dimensions in mm [in]				
		d <sub>5</sub>	d <sub>10</sub>	d <sub>11</sub>	d <sub>13</sub>	b <sub>2</sub>
<b>DIN 11864-2 form A</b> For pipes per DIN 11866 row A or DIN 11850 row 2	DN 40	65	82	53.7	4 x 9	10
	DN 50	77	94	65.7	4 x 9	10

Clamp connection (clamp) DIN 11864-3



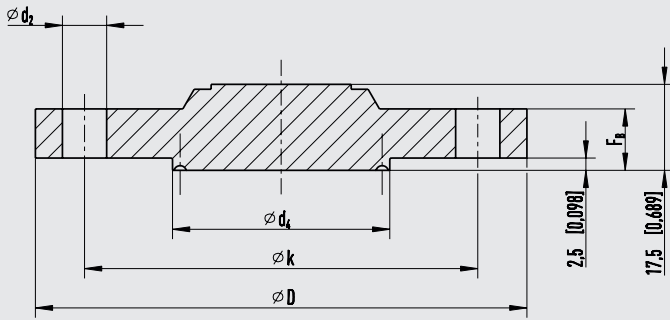
Standard	Size	Dimensions in mm [in]	
		d <sub>10</sub>	d <sub>11</sub>
<b>DIN 11864-3 form A</b> For pipes per DIN 11866 row A or DIN 11850 row 2	DN 40	64	53.7
	DN 50	77.5	65.7

NEUMO BioControl®



Standard	Size	Dimensions in mm [in]					
		d	d <sub>2</sub>	D	k	h	H
<b>NEUMO BioControl®</b> Suitable for installation in NEUMO BioControl® case, see data sheet AC 09.14	Size 50	50	4x9	90	70	17	27
	Size 65	68	4x11	120	95	17	27

NEUMO BioConnect®

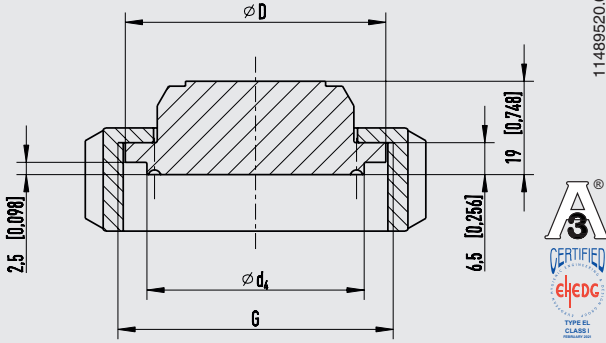


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Standard	Size	Dimensions in mm [in]				
		$d_2$	$d_4$	D	k	$F_B$
NEUMO BioConnect® Flange, form V	DN 40	4 x 9	44.2	100	80	10
	DN 50	4 x 9	56.2	110	90	12

NEUMO BioConnect®

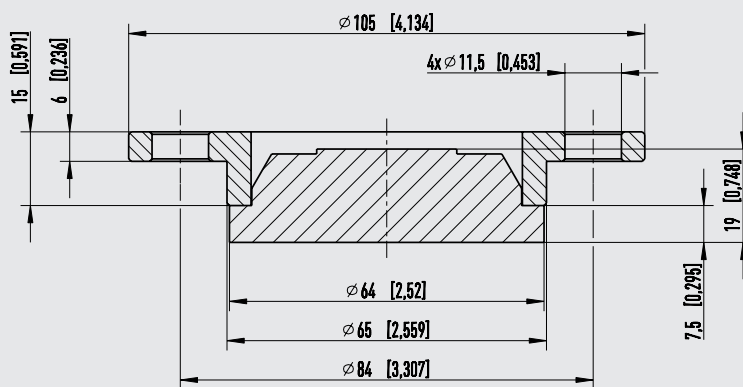


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Standard	Size	Dimensions in mm [in]		
		G	$d_4$	D
NEUMO BioConnect® Liner and grooved union nut, form V	DN 40	M56 x 2	44.2	53
	DN 50	M68 x 2	56.2	65

DRD flange connection



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3-A-compliant in self-draining mounting position, see data sheet DS 99.39, bottom of page 2

Other process connections on request

## Approvals







### Approvals included in the scope of delivery

Logo	Description	Country
	<b>EU declaration of conformity</b> EMC directive EN 61326 emission (group 1, class B) and immunity (industrial application) RoHS directive	European Union
	<b>CSA</b> Safety (e.g. electr. safety, overpressure, ...)	Canada
	<b>3-A <sup>1)</sup></b> Sanitary Standard This instrument is 3-A marked, based on a third party verification for conformance to the 3-A standard.	USA
	<b>EHEDG <sup>2)</sup></b> Hygienic Equipment Design	European Union
-	<b>CRN</b> Safety (e.g. electr. safety, overpressure, ...)	Canada

1) 3-A conformity only in connection with the marked process connections marked

2) EHEDG conformity only in connection with the marked process connections

### Optional approvals

Logo	Description	Country
	<b>EAC</b> EMC directive	Eurasian Economic Community
	<b>GOST</b> Metrology, measurement technology	Russia
	<b>KazInMetr</b> Metrology, measurement technology	Kazakhstan
-	<b>MTSCHS</b> Permission for commissioning	Kazakhstan
	<b>BelGIM</b> Metrology, measurement technology	Belarus
	<b>UkrSEPRO</b> Metrology, measurement technology	Ukraine
	<b>Uzstandard</b> Metrology, measurement technology	Uzbekistan

### Manufacturer's information and certificates

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




### Certificates (option)

Certificates	
<b>Certificates</b>	<ul style="list-style-type: none"> <li>■ 2.2 test report per EN 10204               <ul style="list-style-type: none"> <li>- State-of-the-art manufacturing, material proof, indication accuracy</li> <li>- FDA conformity of the system fill fluid</li> <li>- 3-A conformity of the diaphragm seal, based on a third party verification</li> </ul> </li> <li>■ 3.1 inspection certificate per EN 10204               <ul style="list-style-type: none"> <li>- Material proof, wetted metal parts</li> <li>- Indication accuracy</li> </ul> </li> <li>■ Others on request</li> </ul>

→ Approvals and certificates, see website

## Accessories

### Instruments for on-site calibration

Model	Description
	<p><b>CPG-KITP</b> Pneumatic service kit, accuracy 0.1 % FS (0.05 % FS or 0.025 % FS also available)</p> <ul style="list-style-type: none"> <li>■ Model CPG1500 precision digital pressure gauge</li> <li>■ Model CPP30 pneumatic hand test pump, pressure generation -0.95 ... +35 bar</li> <li>■ Adapter set</li> <li>■ Service case</li> </ul> <p>→ see data sheet CT 93.01</p>
	<p><b>CPH7000</b> Portable process calibrator, accuracy 0.025 % FS</p> <ul style="list-style-type: none"> <li>■ Model CPH7000 process calibrator, integrated manual pressure generation -0.85 ... +25 bar</li> <li>■ Power supply unit</li> <li>■ Service case</li> </ul> <p>→ see data sheet CT 15.51</p>
	<p><b>CPH7650</b> Portable pressure calibrator, accuracy 0.025 % FS</p> <ul style="list-style-type: none"> <li>■ Model CPH7650 pressure calibrator, integrated electrical pressure generation -0.85 ... +20 bar</li> <li>■ Test cables</li> <li>■ Battery charger</li> </ul> <p>→ see data sheet CT 17.02</p>

FS = Full span = end of measuring range - start of measuring range

### Calibration adapter

Description	Order number
Calibration adapter TRI-CLAMP®, 1 ½"	11563206
Calibration adapter TRI-CLAMP®, 2"	14332415

Other calibration adapters on request

## WIKA-Cal calibration software

### Easy and fast creation of a high-quality calibration certificate

The WIKA-Cal calibration software is used for generating calibration certificates or logger protocols for pressure measuring instruments and is available as a demo version for a cost-free download.

A template helps the user and guides him through the creation process of a document.

In order to switch from the demo version to a full version of the respective template, a USB stick with the template must be purchased.

The pre-installed demo version automatically changes to the selected full version when the USB stick is inserted and remains available as long as the USB stick is connected to the computer.



- Creation of calibration certificates for mechanical and electronic pressure measuring instruments
- A calibration assistant guides you through the calibration
- Automatic generation of the calibration steps
- Generation of 3.1 certificates per DIN EN 10204
- Creation of logger protocols
- User-friendly interface
- Languages: German, English, Italian and more due with software updates

For further information see data sheet CT 95.10

Calibration certificates can be created with the Cal-Template and logger protocols can be created with the Log-Template.



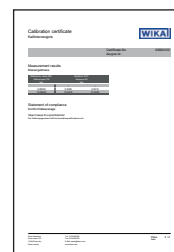
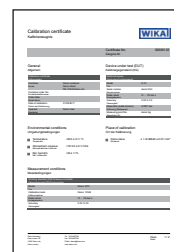
#### Cal Demo

Generation of calibration certificates limited to 2 measuring points, with automatic initiation of pressures via a pressure controller.



#### Cal Light

Generation of calibration certificates with no limitations on measuring points, without automatic initiation of pressures via a pressure controller.



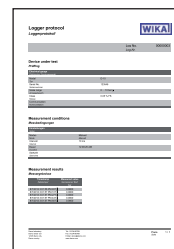
#### Log Demo

Creation of data logger test reports, limited to 5 measured values.



#### Log

Creation of data logger test reports without limiting the measured values.



## Ordering information

Model / Output signal / Measuring range / Process connection / Electrical connection / Certificates / Options

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