

# Bourdon tube pressure gauge, copper alloy Heavy-duty version, case filling Model 213.40, NS 63 [2 ½"], 80 [3"] and 100 [4"]

WIKA data sheet PM 02.06



for further approvals,  
see page 5

## Applications

- For measuring locations with high dynamic pressure loads or vibrations
- For gaseous and liquid media that are not highly viscous or crystallising and will not attack copper alloy parts
- Mining industry
- Hydraulics
- Shipbuilding

## Special features

- Vibration- and shock-resistant
- Especially robust design
- NS 63 [2 ½"] and 100 [4"] with DNV GL approval
- Scale ranges from 0 ... 0.6 to 0 ... 1,000 bar [0 ... 10 to 0 ... 15,000 psi]



Bourdon tube pressure gauge, model 213.40

## Description

The liquid-filled model 213.40 Bourdon tube pressure gauge is constructed with a forged brass case and wetted parts from copper alloy.

Scale ranges from 0 ... 0.6 to 0 ... 1,000 bar [0 ... 10 to 0 ... 15,000 psi] ensure the measuring ranges required for a wide variety of applications.

Due to the case fill fluid, the measuring element and movement are efficiently damped. Therefore, these instruments are particularly suited to measuring locations with high dynamic loads, such as fast load cycles or vibrations.

WIKA manufactures and qualifies the pressure gauge in accordance with the standards EN 837-1 and ASME B40.100. As a safety function, this instrument has a blow-out device with blow-out plug on the top of the case. In the event of a failure, overpressure can escape there.

# Specifications

Basic information	
<b>Standard</b>	<ul style="list-style-type: none"> <li>■ EN 837-1</li> <li>■ ASME B40.100</li> </ul> <p>For information on the "Selection, installation, handling and operation of pressure gauges", see Technical information IN 00.05.</p>
<b>Nominal size (NS)</b>	<ul style="list-style-type: none"> <li>■ Ø 63 mm [2 ½"]</li> <li>■ Ø 80 mm [3"]</li> <li>■ Ø 100 mm [4"]</li> </ul>
<b>Connection location</b>	<ul style="list-style-type: none"> <li>■ Lower mount (radial)</li> <li>■ Centre back mount (only for NS 63 [2 ½"])</li> <li>■ Lower back mount (only for NS 80 [3"] and NS 100 [4"])</li> </ul>
<b>Window</b>	<ul style="list-style-type: none"> <li>■ Acrylic glass (PMMA)</li> <li>■ Laminated safety glass</li> </ul>
<b>Case</b>	
Design	<ul style="list-style-type: none"> <li>■ With compensating valve to vent and reseal case</li> <li>■ With internal pressure compensation (pressure compensation foil)</li> </ul> <p>With blow-out device at case circumference, 12 o'clock</p>
Material	<ul style="list-style-type: none"> <li>■ Forged brass, black painted</li> <li>■ Forged brass, natural finish</li> </ul>
<b>Ring</b>	
NS 63 [2 ½"], NS 80 [3"]	Crimp ring, stainless steel, natural finish
NS 100 [4"]	Crimp ring, stainless steel, polished
<b>Mounting</b>	<ul style="list-style-type: none"> <li>■ Without</li> <li>■ Surface mounting flange, steel, black</li> <li>■ Panel mounting flange, steel, chrome-plated</li> <li>■ Panel mounting flange, steel, black</li> <li>■ Panel mounting flange, brass, chrome-plated</li> <li>■ Triangular profile ring with mounting bracket, steel, chrome-plated, with clamp</li> <li>■ Triangular profile ring with mounting bracket, polished stainless steel, with clamp</li> </ul>
<b>Case filling <sup>1)</sup></b>	<ul style="list-style-type: none"> <li>■ Glycerine or glycerine-water mixture</li> <li>■ Silicone oil</li> </ul>
<b>Movement</b>	Copper alloy

1) For operating conditions, see table on page 5

Measuring element	
<b>Type of measuring element</b>	Bourdon tube, C-type or helical type
<b>Material</b>	
NS 63 [2 ½"]	Copper alloy
NS 80 [3"], NS 100 [4"]	<ul style="list-style-type: none"> <li>■ Copper alloy</li> <li>■ Stainless steel 1.4571 (316Ti) or 1.4404 (316L)</li> </ul>
<b>Leak tightness</b>	<ul style="list-style-type: none"> <li>■ Tested leakage rate: <math>&lt; 5 \cdot 10^{-3}</math> mbar l/s</li> <li>■ Helium tested, leakage rate: <math>&lt; 1 \cdot 10^{-5}</math> mbar l/s</li> </ul>

Accuracy specifications		
<b>Accuracy class</b>		
NS 63 [2 ½"], NS 80 [3"]	■ EN 837-1	Class 1.6
	■ ASME B40.100	$\pm 2\%$   $\pm 1\%$   $\pm 2\%$ of measuring span (grade A)
NS 100 [4"]	■ EN 837-1	Class 1.0
	■ ASME B40.100	$\pm 1\%$ of measuring span (grade 1A)

Accuracy specifications	
Temperature error	On deviation from the reference conditions at the measuring system: $\leq \pm 0.4\%$ per $10\text{ }^{\circ}\text{C}$ [ $\leq \pm 0.4\%$ per $18\text{ }^{\circ}\text{F}$ ] of full scale value
Reference conditions	
Ambient temperature	$+20\text{ }^{\circ}\text{C}$ [ $+68\text{ }^{\circ}\text{F}$ ]

## Scale ranges

bar	
0 ... 0.6	0 ... 60
0 ... 1	0 ... 100
0 ... 1.6	0 ... 140
0 ... 2.5	0 ... 160
0 ... 4	0 ... 200
0 ... 6	0 ... 250
0 ... 10	0 ... 315
0 ... 16	0 ... 400
0 ... 25	0 ... 600
0 ... 30	0 ... 700
0 ... 40	0 ... 1,000

kg/cm <sup>2</sup>	
0 ... 0.6	0 ... 60
0 ... 1	0 ... 100
0 ... 1.6	0 ... 140
0 ... 2.5	0 ... 160
0 ... 4	0 ... 200
0 ... 6	0 ... 250
0 ... 10	0 ... 315
0 ... 16	0 ... 400
0 ... 25	0 ... 600
0 ... 30	0 ... 700
0 ... 40	0 ... 1,000

kPa	
0 ... 60	0 ... 6,000
0 ... 100	0 ... 10,000
0 ... 160	0 ... 14,000
0 ... 250	0 ... 16,000
0 ... 400	0 ... 20,000
0 ... 600	0 ... 25,000
0 ... 1,000	0 ... 31,500
0 ... 1,600	0 ... 40,000
0 ... 2,500	0 ... 60,000
0 ... 3,000	0 ... 70,000
0 ... 4,000	0 ... 100,000

MPa	
0 ... 0.06	0 ... 6
0 ... 0.1	0 ... 10
0 ... 0.16	0 ... 14
0 ... 0.25	0 ... 16
0 ... 0.4	0 ... 20
0 ... 0.6	0 ... 25
0 ... 1	0 ... 31.5
0 ... 1.6	0 ... 40
0 ... 2.5	0 ... 60
0 ... 3	0 ... 70
0 ... 4	0 ... 100

psi	
0 ... 10	0 ... 800
0 ... 15	0 ... 1,000
0 ... 30	0 ... 1,500
0 ... 60	0 ... 2,000
0 ... 100	0 ... 3,000
0 ... 150	0 ... 4,000
0 ... 160	0 ... 5,000
0 ... 200	0 ... 6,000
0 ... 250	0 ... 7,500
0 ... 300	0 ... 10,000
0 ... 400	0 ... 15,000
0 ... 600	

## Vacuum and +/- scale ranges

bar	
-0.6 ... 0	-1 ... +5
-1 ... 0	-1 ... +9
-1 ... +0.6	-1 ... +15
-1 ... +1.5	-1 ... +24
-1 ... +3	-1 ... +30

kg/cm <sup>2</sup>	
-0.6 ... 0	-1 ... +5
-1 ... 0	-1 ... +9
-1 ... +0.6	-1 ... +15
-1 ... +1.5	-1 ... +24
-1 ... +3	-1 ... +30

kPa	
-60 ... 0	-100 ... +500
-100 ... 0	-100 ... +900
-100 ... +60	-100 ... +1,500
-100 ... +150	-100 ... +2,400
-100 ... +300	-100 ... +3,000

MPa	
-0.06 ... 0	-0.1 ... +0.5
-0.1 ... 0	-0.1 ... +0.9
-0.1 ... +0.06	-0.1 ... +1.5
-0.1 ... +0.15	-0.1 ... +2.4
-0.1 ... +0.3	-0.1 ... +3

psi	
-15 inHg ... 0	-30 inHg ... +100
-30 inHg ... 0	-30 inHg ... +160
-30 inHg ... +15	-30 inHg ... +200
-30 inHg ... +30	-30 inHg ... +300
-30 inHg ... +60	

Other scale ranges on request


Further details on: Scale ranges	
<b>Special scale ranges</b>	Other scale ranges on request
<b>Unit</b>	<ul style="list-style-type: none"> <li>■ bar</li> <li>■ psi</li> <li>■ kg/cm<sup>2</sup></li> <li>■ kPa</li> <li>■ MPa</li> </ul>
<b>Dial</b>	
Scale colour	Black
Material	Aluminium
Special scale	<ul style="list-style-type: none"> <li>■ Without</li> <li>■ With temperature scale for refrigerant, e.g. for NH<sub>3</sub>: R 717</li> </ul> <p>Other scales or customer-specific dials, e.g. with red mark, circular arcs or circular sectors, on request</p>
<b>Pointer</b>	
Instrument pointer	Aluminium, black
Mark pointer/drag pointer	<ul style="list-style-type: none"> <li>■ Without</li> <li>■ Red mark pointer on dial, fixed</li> <li>■ Red drag pointer on window, adjustable</li> </ul>
<b>Pointer stop pin</b>	<ul style="list-style-type: none"> <li>■ Without</li> <li>■ At zero point</li> </ul>

Process connection		
<b>Standard</b>	<ul style="list-style-type: none"> <li>■ EN 837-1</li> <li>■ ISO 7</li> <li>■ ANSI/B1.20.1</li> </ul>	
<b>Size</b>		
EN 837-1	<ul style="list-style-type: none"> <li>■ G 1/8 B, male thread</li> <li>■ G 1/4 B, male thread</li> <li>■ G 1/2 B, male thread</li> <li>■ M10 x 1, male thread</li> </ul>	
ISO 7	<ul style="list-style-type: none"> <li>■ R 1/4, male thread</li> <li>■ R 1/2, male thread</li> </ul>	
ANSI/B1.20.1	<ul style="list-style-type: none"> <li>■ 1/4 NPT, male thread</li> <li>■ 1/2 NPT, male thread</li> </ul>	
<b>Restrictor</b>	<ul style="list-style-type: none"> <li>■ Without</li> <li>■ Ø 0.3 mm [0.012"], brass</li> <li>■ Ø 0.5 mm [0.02"], brass</li> </ul>	
<b>Material (wetted)</b>		
Process connection	Copper alloy	
Bourdon tube	NS 63 [2 1/2"]	Copper alloy
	NS 80 [3"], NS 100 [4"]	<ul style="list-style-type: none"> <li>■ Copper alloy</li> <li>■ Stainless steel 1.4571 (316Ti) or 1.4404 (316L)</li> </ul>





Other process connections on request

Operating conditions		
<b>Medium temperature</b>	max. +60 °C [+140 °F]	
<b>Ambient temperature</b>		
Instruments with glycerine filling	-20 ... +60 °C [-4 ... +140 °F]	
Instruments with silicone oil filling	-40 ... +60 °C [-40 ... +140 °F]	
<b>Pressure limitation</b>		
NS 63 [2 1/2"], NS 80 [3"]	Steady	3/4 x full scale value
	Fluctuating	2/3 x full scale value
	Short time	Full scale value
NS 100 [4"]	Steady	Full scale value
	Fluctuating	0.9 x full scale value
	Short time	1.3 x full scale value
<b>Ingress protection per IEC/EN 60529</b>	IP65	

## Approvals

Logo	Description	Country
	<b>EU declaration of conformity</b> Pressure equipment directive PS > 200 bar, module A, pressure accessory	European Union
-	<b>CRN</b> Safety (e.g. electr. safety, overpressure, ...) For scale ranges ≤ 1,000 bar	Canada

### Optional approvals

Logo	Description	Country
	<b>PAC Russia</b> Metrology, measurement technology	Russia
	<b>PAC Kazakhstan</b> Metrology, measurement technology	Kazakhstan
-	<b>MChS</b> Permission for commissioning	Kazakhstan
	<b>PAC Belarus</b> Metrology, measurement technology	Belarus
-	<b>PAC Ukraine</b> Metrology, measurement technology	Ukraine
-	<b>CPA</b> Metrology, measurement technology	China
	<b>DNV GL</b> Ships, shipbuilding (e.g. offshore)	International

## Manufacturer's information and certificates

Logo	Description
-	Pressure equipment directive (PED) for maximum allowable pressure PS ≤ 200 bar
-	Suitability of wetted materials for drinking water in accordance with the European 4MS initiative

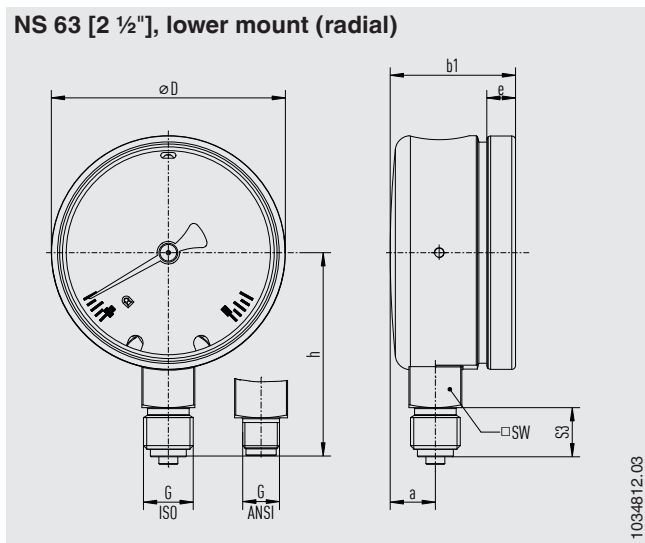
## Certificates (option)

Certificates	
<b>Certificates</b>	<ul style="list-style-type: none"> <li>■ 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, indication accuracy)</li> <li>■ 3.1 inspection certificate per EN 10204 (e.g. material proof for wetted metal parts, indication accuracy)</li> </ul>
<b>Recommended calibration interval</b>	1 year (dependent on conditions of use)

→ For approvals and certificates, see website

## Dimensions in mm [in]

### NS 63 [2 1/2"], lower mount (radial)



NS	Weight
63 [2 1/2"]	0.36 kg [0.79 lb]

### Process connection with thread per EN 837-1

NS	G	Dimensions in mm [in]						
		$h \pm 1$ [0.04]	S3	e	a	$b1 \pm 0.5$ [0.02]	D	SW
63 [2 1/2"]	G 1/8 B	51 [2.01]	10 [0.39]	7.6 [0.3]	12 [0.47]	34.5 [1.36]	62 [2.44]	14 [0.55]
	G 1/4 B	53.8 [2.12]	13 [0.51]	7.6 [0.3]	12 [0.47]	34.5 [1.36]	62 [2.44]	14 [0.55]
	M10 x 1	51 [2.01]	10 [0.39]	7.6 [0.3]	12 [0.47]	34.5 [1.36]	62 [2.44]	14 [0.55]

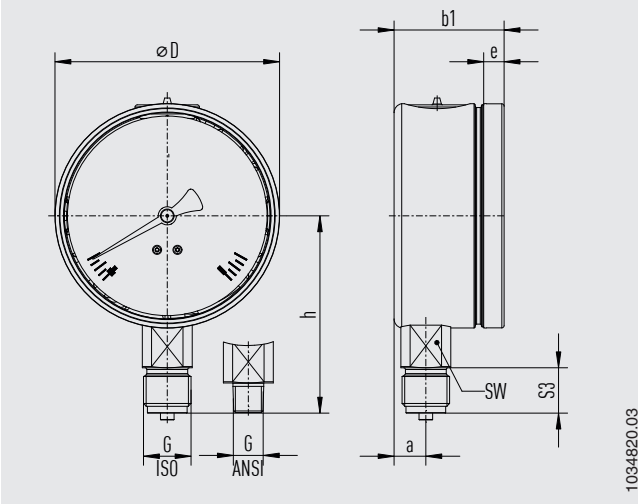
### Process connection with thread per ISO 7

NS	G	Dimensions in mm [in]						
		$h \pm 1$ [0.04]	S3	e	a	$b1 \pm 0.5$ [0.02]	D	SW
63 [2 1/2"]	R 1/8	51 [2.01]	10 [0.39]	7.6 [0.3]	12 [0.47]	34.5 [1.36]	62 [2.44]	14 [0.55]
	R 1/4	53.8 [2.12]	13 [0.51]	7.6 [0.3]	12 [0.47]	34.5 [1.36]	62 [2.44]	14 [0.55]

### Process connection with thread per ANSI/B1.20.1

NS	G	Dimensions in mm [in]						
		$h \pm 1$ [0.04]	S3	e	a	$b1 \pm 0.5$ [0.02]	D	SW
63 [2 1/2"]	1/8 NPT	51 [2.01]	10 [0.39]	7.6 [0.3]	12 [0.47]	34.5 [1.36]	62 [2.44]	14 [0.55]
	1/4 NPT	53.8 [2.12]	13 [0.51]	7.6 [0.3]	12 [0.47]	34.5 [1.36]	62 [2.44]	14 [0.55]

**NS 80 [3"] and NS 100 [4"], lower mount (radial)**



NS	Weight
80 [3"]	0.8 kg [1.75 lb]
100 [4"]	1.13 kg [2.5 lb]

**Process connection with thread per EN 837-1**

NS	G	Dimensions in mm [in]						
		$h \pm 1$ [0.04]	S3	e	a	$b1 \pm 0.5$ [0.02]	D	SW
80 [3"]	G ¼ B	69 [2.72]	13 [0.51]	14 [0.55]	8.5 [0.33]	38.5 [1.52]	79 [3.11]	22 [0.87]
	G ½ B	76 [2.99]	20 [0.79]	14 [0.55]	8.5 [0.33]	38.5 [1.52]	79 [3.11]	22 [0.87]
100 [4"]	G ¼ B	80 [3.15]	13 [0.51]	14 [0.55]	8.1 [0.32]	46.2 [1.82]	99 [3.9]	22 [0.87]
	G ½ B	87 [3.43]	20 [0.79]	14 [0.55]	8.1 [0.32]	46.2 [1.82]	99 [3.9]	22 [0.87]

**Process connection with thread per ISO 7**

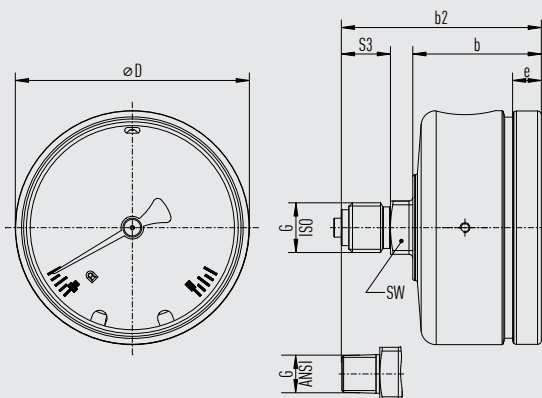
NS	G	Dimensions in mm [in]						
		$h \pm 1$ [0.04]	S3	e	a	$b1 \pm 0.5$ [0.02]	D	SW
80 [3"]	R ¼	76 [2.99]	13 [0.51]	14 [0.55]	8.5 [0.33]	38.5 [1.52]	79 [3.11]	22 [0.87]
	R ½	86 [3.39]	19 [0.75]	14 [0.55]	8.5 [0.33]	38.5 [1.52]	79 [3.11]	22 [0.87]
100 [4"]	R ¼	76 [2.99]	13 [0.51]	14 [0.55]	8.1 [0.32]	46.2 [1.82]	99 [3.9]	22 [0.87]
	R ½	86 [3.39]	19 [0.75]	14 [0.55]	8.1 [0.32]	46.2 [1.82]	99 [3.9]	22 [0.87]

**Process connection with thread per ANSI/B1.20.1**

NS	G	Dimensions in mm [in]						
		$h \pm 1$ [0.04]	S3	e	a	$b1 \pm 0.5$ [0.02]	D	SW
80 [3"]	¼ NPT	76 [2.99]	13 [0.51]	14 [0.55]	8.5 [0.33]	38.5 [1.52]	79 [3.11]	22 [0.87]
	½ NPT	86 [3.39]	19 [0.75]	14 [0.55]	8.5 [0.33]	38.5 [1.52]	79 [3.11]	22 [0.87]
100 [4"]	¼ NPT	76 [2.99]	13 [0.51]	14 [0.55]	8.1 [0.32]	46.2 [1.82]	99 [3.9]	22 [0.87]
	½ NPT	86 [3.39]	19 [0.75]	14 [0.55]	8.1 [0.32]	46.2 [1.82]	99 [3.9]	22 [0.87]



**NS 63 [2 ½"], centre back mount**



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NS	Weight
63 [2 ½"]	0.36 kg [0.79 lb]

**Process connection with thread per EN 837-1**

NS	G	Dimensions in mm [in]					
		b2 ±0.5 [0.02]	b ±0.5 [0.02]	S3	e	D	SW
63 [2 ½"]	G ⅝ B	49.9 [1.97]	34 [1.34]	10 [0.39]	7.6 [0.3]	62 [2.44]	14 [0.55]
	G ¼ B	52.9 [2.08]	34 [1.34]	13 [0.51]	7.6 [0.3]	62 [2.44]	14 [0.55]
	M10 x 1	49.9 [1.97]	34 [1.34]	10 [0.39]	7.6 [0.3]	62 [2.44]	14 [0.55]

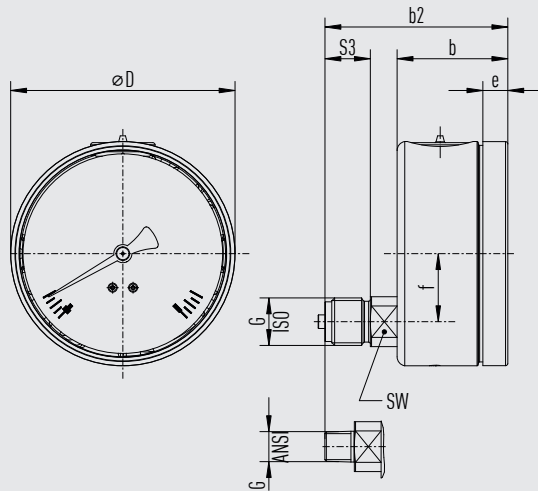
**Process connection with thread per ISO 7**

NS	G	Dimensions in mm [in]					
		b2 ±0.5 [0.02]	b ±0.5 [0.02]	S3	e	D	SW
63 [2 ½"]	R ⅝	49.9 [1.97]	34 [1.34]	10 [0.39]	7.6 [0.3]	62 [2.44]	14 [0.55]
	R ¼	52.9 [2.08]	34 [1.34]	13 [0.51]	7.6 [0.3]	62 [2.44]	14 [0.55]

**Process connection with thread per ANSI/B1.20.1**

NS	G	Dimensions in mm [in]					
		b2 ±0.5 [0.02]	b ±0.5 [0.02]	S3	e	D	SW
63 [2 ½"]	⅝ NPT	49.9 [1.97]	34 [1.34]	10 [0.39]	7.6 [0.3]	62 [2.44]	14 [0.55]
	¼ NPT	52.9 [2.08]	34 [1.34]	13 [0.51]	7.6 [0.3]	62 [2.44]	14 [0.55]

**NS 80 [3"] and NS 100 [4"], lower back mount**



NS	Weight
80 [3"]	0.8 kg [1.75 lb]
100 [4"]	1.13 kg [2.5 lb]

**Process connection with thread per EN 837-1**

NS	G	Dimensions in mm [in]					
		$b2 \pm 0.5$ [0.02]	$b \pm 0.5$ [0.02]	S3	e	D	SW
80 [3"]	G ¼ B	61.7 [2.43]	37.7 [1.48]	13 [0.51]	8.8 [0.35]	79 [3.11]	22 [0.87]
	G ½ B	73.6 [2.9]	48.8 [1.92]	20 [0.79]	11 [0.43]	79 [3.11]	22 [0.87]
100 [4"]	G ¼ B	68.7 [2.7]	37.7 [1.48]	13 [0.51]	8.8 [0.35]	99 [3.9]	22 [0.87]
	G ½ B	80.6 [3.17]	48.8 [1.92]	20 [0.79]	11 [0.43]	99 [3.9]	22 [0.87]

**Process connection with thread per ISO 7**

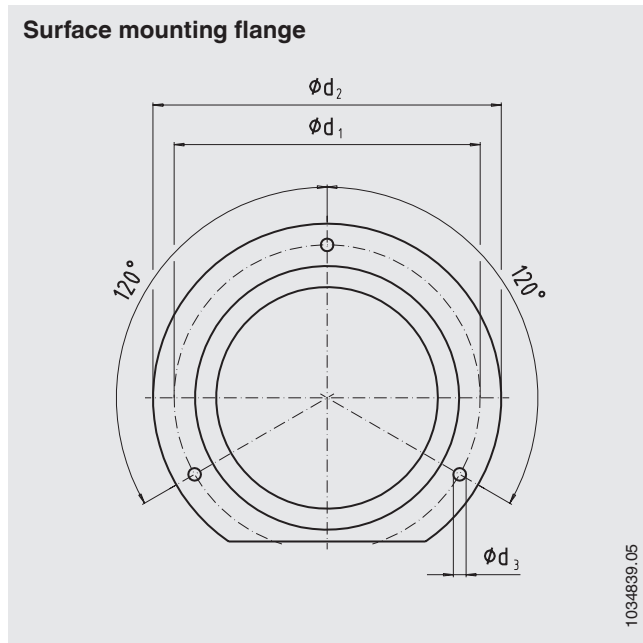
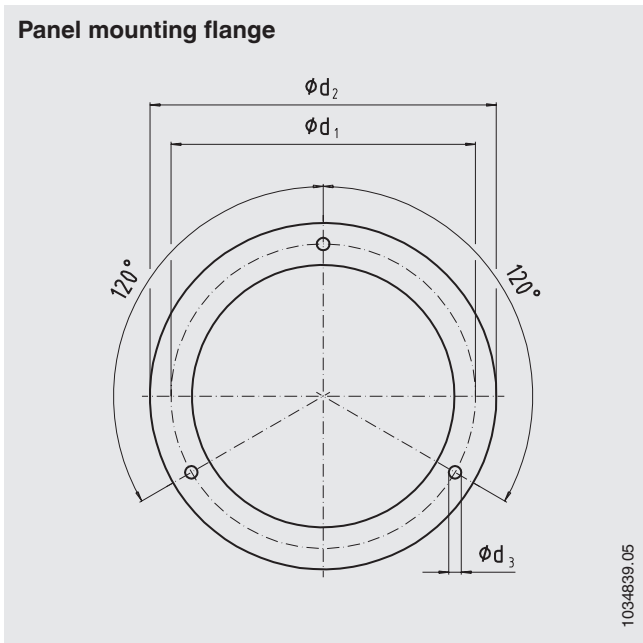
NS	G	Dimensions in mm [in]					
		$b2 \pm 0.5$ [0.02]	$b \pm 0.5$ [0.02]	S3	e	D	SW
80 [3"]	R ¼	61.7 [2.43]	37.7 [1.48]	13 [0.51]	8.8 [0.35]	79 [3.11]	22 [0.87]
	R ½	67.7 [2.67]	48.8 [1.92]	19 [0.75]	11 [0.43]	79 [3.11]	22 [0.87]
100 [4"]	R ¼	73.6 [2.9]	37.7 [1.48]	13 [0.51]	8.8 [0.35]	99 [3.9]	22 [0.87]
	R ½	79.6 [2.13]	48.8 [1.92]	19 [0.75]	11 [0.43]	99 [3.9]	22 [0.87]

**Process connection with thread per ANSI/B1.20.1**

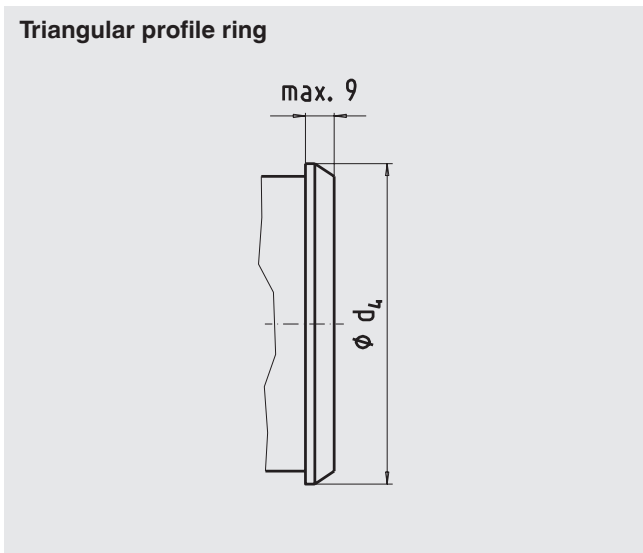
NS	G	Dimensions in mm [in]					
		$b2 \pm 0.5$ [0.02]	$b \pm 0.5$ [0.02]	S3	e	D	SW
80 [3"]	¼ NPT	61.7 [2.43]	37.7 [1.48]	13 [0.51]	8.8 [0.35]	79 [3.11]	22 [0.87]
	½ NPT	67.7 [2.67]	48.8 [1.92]	19 [0.75]	11 [0.43]	79 [3.11]	22 [0.87]
100 [4"]	¼ NPT	73.6 [2.9]	37.7 [1.48]	13 [0.51]	8.8 [0.35]	99 [3.9]	22 [0.87]
	½ NPT	79.6 [2.13]	48.8 [1.92]	19 [0.75]	11 [0.43]	99 [3.9]	22 [0.87]

## Accessories

### Dimensions in mm [in]





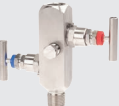





NS	Dimensions in mm [in]			
	Recommended panel cutout	d1	d2	d3
63 [2 ½"]	67 ±0.3 [2.64 ±0.01]	75 [2.95]	85 [3.35]	3.6 [0.14]
80 [3"]	84 ±0.3 [3.31 ±0.01]	95 [3.74]	110 [4.33]	4.8 [0.19]
100 [4"]	104 ±0.5 [4.09 ±0.02]	116 [4.57]	132 [5.2]	4.8 [0.19]



NS	Dimensions in mm [in]	
	Recommended panel cutout	d4
63 [2 ½"]	64,5 ±0,5 [2,54 ±0,02]	68 [2,68]
NS 80 [3"]	82 ±1 [3,23 ±0,04]	87 [3,43]
NS 100 [4"]	102 ±1 [4,02 ±0,04]	107 [4,21]

## Accessories and spare parts

Model	Description
	<b>910.17</b> Sealings → See data sheet AC 09.08
	<b>910.15</b> Syphons → See data sheet AC 09.06
	<b>910.13</b> Overpressure protector → See data sheet AC 09.04
	<b>IV10, IV11</b> Needle valve and multiport valve → See data sheet AC 09.22
	<b>IV20, IV21</b> Block-and-bleed valve → See data sheet AC 09.19
	<b>IVM</b> Monoflange, process and instrument version → See data sheet AC 09.17
	<b>BV</b> Ball valve, process and instrument version → See data sheet AC 09.28
	<b>IBF2, IBF3</b> Monoblock with flange connection → See data sheet AC 09.25

### Ordering information

Model / Nominal size / Scale range / Process connection / Connection location / Options

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