

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 6

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 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

Configurator



Standard articles



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

1) For operating conditions, see table on page 5

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

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

Accuracy specifications	
Temperature error	On deviation from the reference conditions at the measuring system: $\leq \pm 0.4 \text{ \% per } 10 \text{ }^{\circ}\text{C}$ [$\leq \pm 0.4 \text{ \% per } 18 \text{ }^{\circ}\text{F}$] of full scale value
Reference conditions	
Ambient temperature	+20 °C [+68 °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 ²	
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 compound 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 ²	
-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	
Special scale ranges	→ Other scale ranges on request
Unit	<ul style="list-style-type: none"> ■ bar ■ psi ■ kg/cm² ■ kPa ■ MPa
Dial	
Scale colour	Black
Material	Aluminium
Special scale	<ul style="list-style-type: none"> ■ Without ■ With temperature scale for refrigerant, e.g. for NH₃: R 717 <p>→ Other scales or customer-specific dials, e.g. with red mark, circular arcs or circular sectors, on request</p>
Pointer	
Instrument pointer	Aluminium, black
Mark pointer/drag pointer	<ul style="list-style-type: none"> ■ Without ■ Red mark pointer on dial, fixed ■ Red drag pointer on window, adjustable
Pointer stop pin	<ul style="list-style-type: none"> ■ Without ■ At zero point

Process connection		
Standard	<div><div></div> EN 837-1</div> <div><div></div> ISO 7</div> <div><div></div> ANSI/B1.20.1</div>	
Size		
EN 837-1	<div><div></div> G ⅝ B, male thread</div> <div><div></div> G ¼ B, male thread</div> <div><div></div> G ½ B, male thread</div> <div><div></div> M10 x 1, male thread</div>	
ISO 7	<div><div></div> R ¼, male thread</div> <div><div></div> R ½, male thread</div>	
ANSI/B1.20.1	<div><div></div> ¼ NPT, male thread</div> <div><div></div> ½ NPT, male thread</div>	
Restrictor	<div><div></div> Without</div> <div><div></div> Ø 0.3 mm [0.012"], brass</div> <div><div></div> Ø 0.5 mm [0.02"], brass</div>	
Material (wetted)		
Process connection	Copper alloy	
Bourdon tube	NS 63 [2 ½"]	Copper alloy
	NS 80 [3"], NS 100 [4"]	<div><div></div> Copper alloy</div> <div><div></div> Stainless steel 1.4571 (316Ti) or 1.4404 (316L)</div>




→ Other process connections on request

Operating conditions		
Medium temperature	max. +60 °C [+140 °F]	
Ambient temperature		
Instruments with glycerine filling	-20 ... +60 °C [-4 ... +140 °F]	
Instruments with silicone oil filling	-40 ... +60 °C [-40 ... +140 °F]	
Pressure limitation		
NS 63 [2 ½"], 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
Ingress protection per IEC/EN 60529	IP65	

Approvals

Logo	Description	Country
	EU declaration of conformity Pressure equipment directive PS > 200 bar, module A, pressure accessory	European Union
-	CRN Safety (e.g. electr. safety, overpressure, ...)	Canada

Optional approvals

Logo	Description	Country
	PAC Kazakhstan Metrology, measurement technology	Kazakhstan
-	MChS Permission for commissioning	Kazakhstan
-	PAC Ukraine Metrology, measurement technology	Ukraine
	PAC Uzbekistan Metrology, measurement technology	Uzbekistan
-	PAC China Metrology, measurement technology	China
	DNV Ships, shipbuilding (e.g. offshore)	International

Manufacturer's information and certificates

Logo	Description
-	Pressure equipment directive (PED) for maximum allowable pressure PS ≤ 200 bar

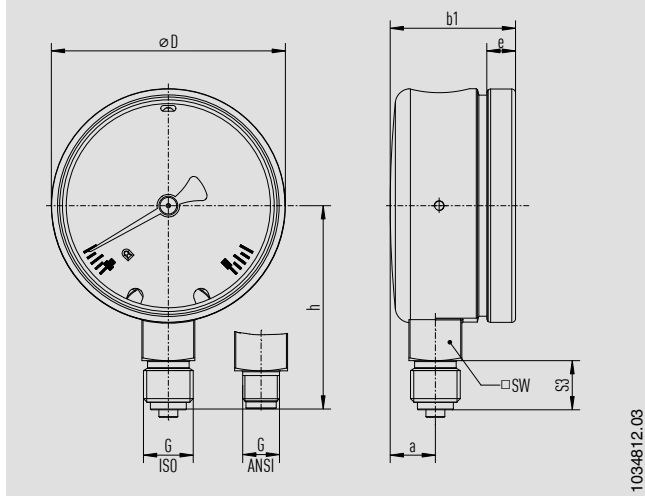
Certificates (option)

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

→ For approvals and certificates, see website

Dimensions in mm [in]

NS 63 [2 ½"], lower mount (radial)



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]						
		$h \pm 1$ [0.04]	S3	e	a	$b1 \pm 0.5$ [0.02]	D	SW
63 [2 ½"]	G ½ 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 ¼ 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]

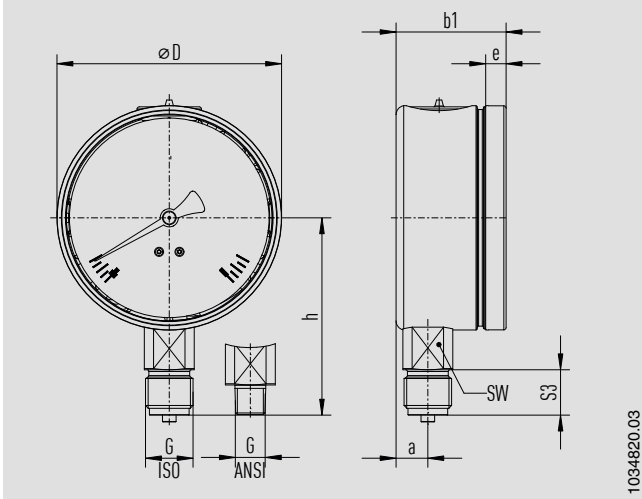
Process connection with thread per ISO 7

NS	G	Dimensions in mm [in]						
		$h \pm 1$ [0.04]	S3	e	a	$b1 \pm 0.5$ [0.02]	D	SW
63 [2 ½"]	R ½	51 [2.01]	10 [0.39]	7.6 [0.3]	12 [0.47]	34.5 [1.36]	62 [2.44]	14 [0.55]
	R ¼	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 ½"]	½ NPT	51 [2.01]	10 [0.39]	7.6 [0.3]	12 [0.47]	34.5 [1.36]	62 [2.44]	14 [0.55]
	¼ 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]

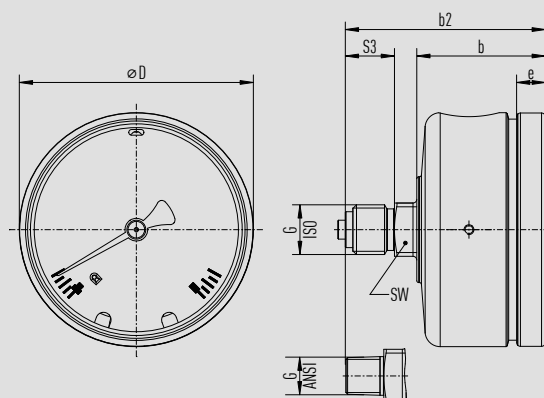
Process connection with thread per ISO 7

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]					
		$b2 \pm 0.5$ [0.02]	$b \pm 0.5$ [0.02]	S3	e	D	SW
63 [2 ½"]	G ½ 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]

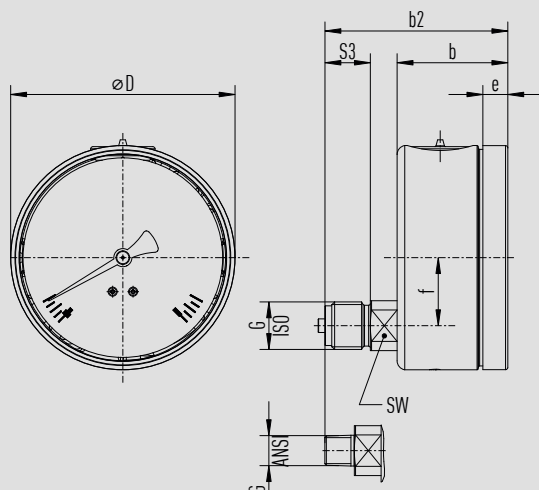
Process connection with thread per ISO 7

NS	G	Dimensions in mm [in]					
		$b2 \pm 0.5$ [0.02]	$b \pm 0.5$ [0.02]	S3	e	D	SW
63 [2 ½"]	R ½	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]					
		$b2 \pm 0.5$ [0.02]	$b \pm 0.5$ [0.02]	S3	e	D	SW
63 [2 ½"]	½ 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 ±0.5 [0.02]	b ±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

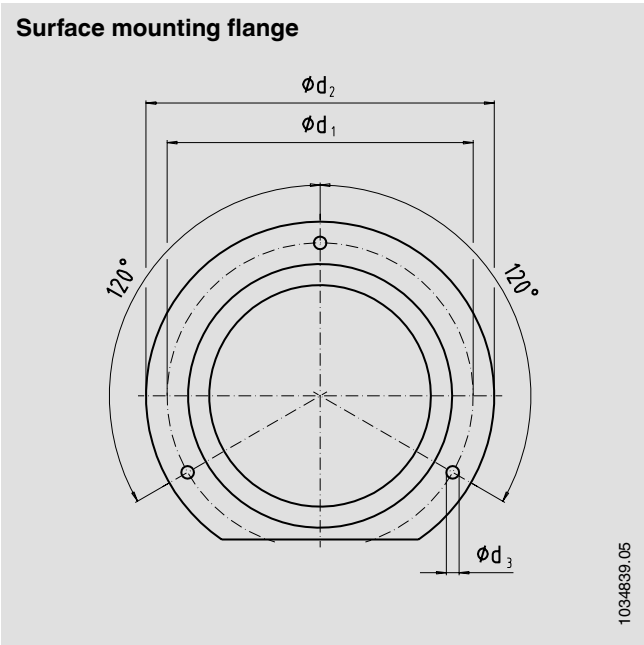
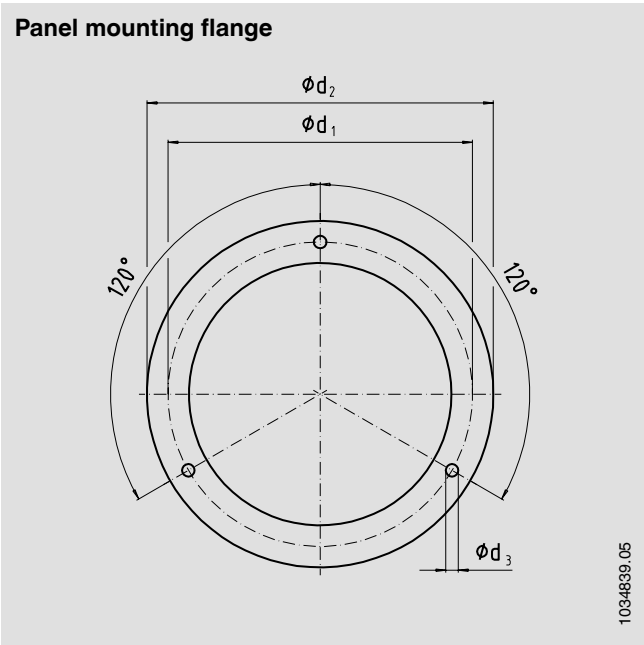
NS	G	Dimensions in mm [in]					
		b2 ±0.5 [0.02]	b ±0.5 [0.02]	S3	e	D	SW
80 [3"]	R ¼	61.7 [2.43]	37.7 [1.48]	13 [0.51]	8.8 [0.35]	79 [3.11]	22 [0.87]
	R ½	67.7 [2.67]	48.8 [1.92]	19 [0.75]	11 [0.43]	79 [3.11]	22 [0.87]
100 [4"]	R ¼	73.6 [2.9]	37.7 [1.48]	13 [0.51]	8.8 [0.35]	99 [3.9]	22 [0.87]
	R ½	79.6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

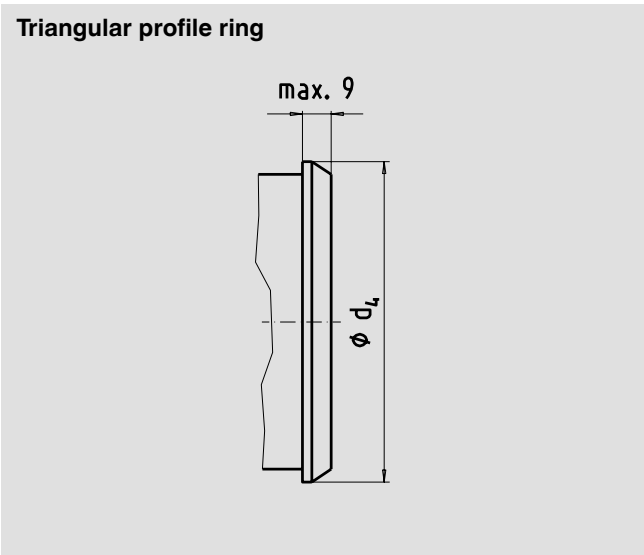
NS	G	Dimensions in mm [in]					
		b2 ±0.5 [0.02]	b ±0.5 [0.02]	S3	e	D	SW
80 [3"]	¼ NPT	61.7 [2.43]	37.7 [1.48]	13 [0.51]	8.8 [0.35]	79 [3.11]	22 [0.87]
	½ NPT	67.7 [2.67]	48.8 [1.92]	19 [0.75]	11 [0.43]	79 [3.11]	22 [0.87]
100 [4"]	¼ NPT	73.6 [2.9]	37.7 [1.48]	13 [0.51]	8.8 [0.35]	99 [3.9]	22 [0.87]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

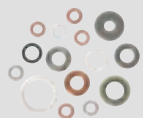









NS	Dimensions in mm [in]			
	Recommended panel cutout	d1	d2	d3
63 [2 ½"]	67 ±0.3 [2.64 ±0.01]	75 [2.95]	85 [3.35]	3.6 [0.14]
80 [3"]	84 ±0.3 [3.31 ±0.01]	95 [3.74]	110 [4.33]	4.8 [0.19]
100 [4"]	104 ±0.5 [4.09 ±0.02]	116 [4.57]	132 [5.2]	4.8 [0.19]



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

Accessories and spare parts

Model		Description
	910.17	Seals → See data sheet AC 09.08
	910.15	Syphons → See data sheet AC 09.06
	910.13	Overpressure protector → See data sheet AC 09.04
	IV1	Needle valve and multiport needle valve → See data sheet AC 09.22
	IV2	Block-and-bleed valve → See data sheet AC 09.19
	IVM	Monoflange, process and instrument version → See data sheet AC 09.17
	BV	Ball valve, process and instrument version → See data sheet AC 09.28
	IBF2, IBF3	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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