

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

- Especially robust design
- Vibration- and shock-resistant
- DNV approval for NS 63 [2 ½"] and 100 [4"] available as an option



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].

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	EN 837-1 ASME B40.100	
	→ For information on the “Selection, installation, handling and operation of pressure gauges”, see technical information IN 00.05.	
Nominal size (NS)	Ø 63 mm [2 ½"] Ø 80 mm [3"] Ø 100 mm [4"]	
Connection location	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	Acrylic glass (PMMA) Laminated safety glass	
Case		
Design	With blow-out device at case circumference, 12 o'clock For scale ranges ≤ 0 ... 16 bar [0 ... 250 psi] with equalising valve to vent and reseal case	
Material	Forged brass	
Surface	Black painted Natural finish Chrome-plated (only for NS 63 [2 ½"] and NS 80 [3"]) Silver painted (only for NS 63 [2 ½"] and NS 80 [3"]) Brass-coloured (only for NS 63 [2 ½"] and NS 80 [3"])	
Ring	Crimp ring, stainless steel	Natural finish (for all nominal sizes)
	Slip-on bezel, steel	Black painted (only for NS 63 [2 ½"] and NS 100 [4"]) Chrome-plated (only for NS 63 [2 ½"] and NS 80 [3"])
	Slip-on bezel, brass	Chrome-plated (only for NS 100 [4"]) Polished (only for NS 100 [4"])
Mounting	Without	
	Surface mounting flange, steel	Black
	Panel mounting flange, steel	Chrome-plated (only for NS 63 [2 ½"] and NS 80 [3"]) Black
	Panel mounting flange, brass	Chrome-plated (only for NS 80 [3"] and NS 100 [4"])
	Triangular profile ring with mounting bracket, steel	Chrome-plated, with clamp Black, with clamp (only for NS 100 [4"])
	Triangular profile ring with mounting bracket, polished stainless steel with clamp (only for NS 63 [2 ½"])	
Case filling ¹⁾	Glycerine ²⁾ Silicone oil	
Movement	Copper alloy	

1) For operating conditions, see table on page 5

2) For low scale ranges the case filling is a glycerine-water mixture

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"]	■ Copper alloy ■ Stainless steel 1.4571 (316Ti) or 1.4404 (316L)
Leak tightness	■ 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)
Temperature error	On deviation from the reference conditions at the measuring system: ≤ ±0.4 % per 10 °C [≤ ±0.4 % per 18 °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

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

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	-

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

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

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	■ bar ■ psi ■ kg/cm² ■ kPa ■ MPa
Dial	
Scale colour	Black
Material	Aluminium
Special scale	■ Without ■ With temperature scale for refrigerant, e.g. for NH₃: R 717 → Other scales or customer-specific dials, e.g. with red mark, circular arcs or circular sectors, on request
Pointer	
Instrument pointer	Aluminium, black
Mark pointer/drag pointer	■ Without ■ Red mark pointer on dial, fixed ■ Red drag pointer on window, adjustable
Pointer stop pin	■ Without ■ At zero point

Process connection		
Standard	EN 837-1 ISO 7 ANSI/B1.20.1	
Size		
EN 837-1	G ⅛ B, male thread G ¼ B, male thread G ½ B, male thread M10 x 1, male thread	
ISO 7	R ⅛, male thread R ¼, male thread R ½, male thread	
ANSI/B1.20.1	⅛ NPT, male thread ¼ NPT, male thread ½ NPT, male thread	
Restrictor	Without Ø 0.3 mm [0.012"], brass Ø 0.5 mm [0.02"], brass	
Material (wetted)		
Process connection	Copper alloy	
Bourdon tube	NS 63 [2 ½"]	Copper alloy
	NS 80 [3"], NS 100 [4"]	Copper alloy Stainless steel 1.4571 (316Ti) or 1.4404 (316L)

→ Other process connections on request

Operating conditions		
Medium temperature		
Instruments with glycerine filling	-20 ... +60 °C [-4 ... +140 °F]	
Unfilled instruments or with silicone oil filling	-40 ... +60 °C [-40 ... +140 °F]	
Ambient temperature		
Instruments with glycerine filling	-20 ... +60 °C [-4 ... +140 °F]	
Unfilled instruments or 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 declaration

Logo	Description
-	Pressure Equipment Directive (PED) for maximum allowable pressure $PS \leq 200$ bar

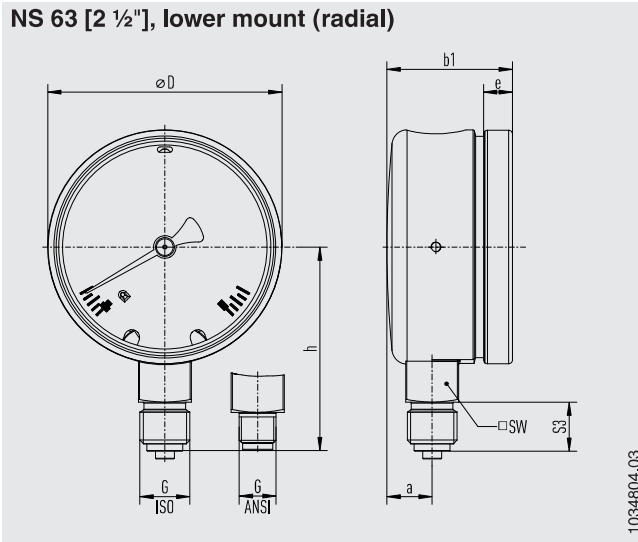
Certificates

Description	
Certificates	■ 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. 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)



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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]						
		$h \pm 1$ [0.04]	S3	e	a	$b_1 \pm 0.5$ [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]

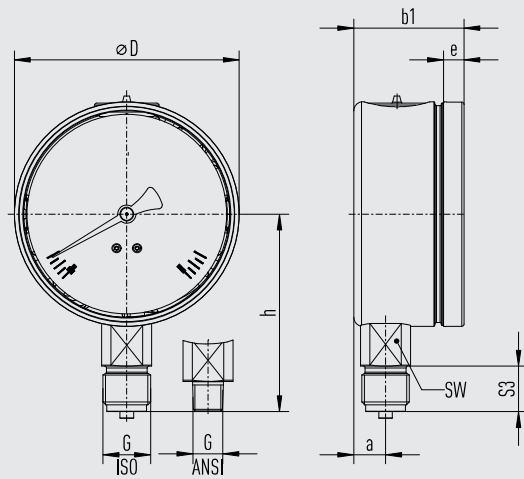
Process connection with thread per ISO 7

NS	G	Dimensions in mm [in]						
		$h \pm 1$ [0.04]	S3	e	a	$b_1 \pm 0.5$ [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	$b_1 \pm 0.5$ [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)



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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	a	e	$b1 \pm 0.5$ [0.02]	D	SW
80 [3"]	G ¼ B	69 [2.72]	13 [0.51]	14 [0.55]	8.8 [0.35]	37.7 [1.48]	79 [3.11]	22 [0.87]
	G ½ B	76 [2.99]	20 [0.79]	14 [0.55]	8.8 [0.35]	37.7 [1.48]	79 [3.11]	22 [0.87]
100 [4"]	G ¼ B	80 [3.15]	13 [0.51]	14 [0.55]	9 [0.35]	48.5 [1.91]	99 [3.9]	22 [0.87]
	G ½ B	87 [3.43]	20 [0.79]	14 [0.55]	9 [0.35]	48.5 [1.91]	99 [3.9]	22 [0.87]

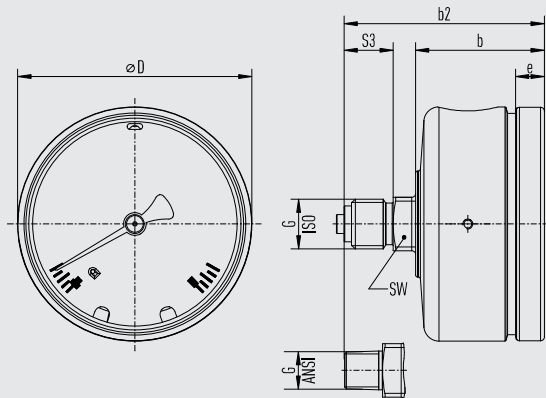
Process connection with thread per ISO 7

NS	G	Dimensions in mm [in]						
		$h \pm 1$ [0.04]	S3	a	e	$b1 \pm 0.5$ [0.02]	D	SW
80 [3"]	R ¼	69 [2.72]	13 [0.51]	14 [0.55]	8.8 [0.35]	37.7 [1.48]	79 [3.11]	22 [0.87]
	R ½	75 [2.95]	19 [0.75]	14 [0.55]	8.8 [0.35]	37.7 [1.48]	79 [3.11]	22 [0.87]
100 [4"]	R ¼	80 [3.15]	13 [0.51]	14 [0.55]	9 [0.35]	48.5 [1.91]	99 [3.9]	22 [0.87]
	R ½	86 [3.39]	19 [0.75]	14 [0.55]	9 [0.35]	48.5 [1.91]	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	a	e	$b1 \pm 0.5$ [0.02]	D	SW
80 [3"]	¼ NPT	69 [2.72]	13 [0.51]	14 [0.55]	8.8 [0.35]	37.7 [1.48]	79 [3.11]	22 [0.87]
	½ NPT	75 [2.95]	19 [0.75]	14 [0.55]	8.8 [0.35]	37.7 [1.48]	79 [3.11]	22 [0.87]
100 [4"]	¼ NPT	80 [3.15]	13 [0.51]	14 [0.55]	9 [0.35]	48.5 [1.91]	99 [3.9]	22 [0.87]
	½ NPT	86 [3.39]	19 [0.75]	14 [0.55]	9 [0.35]	48.5 [1.91]	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 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]

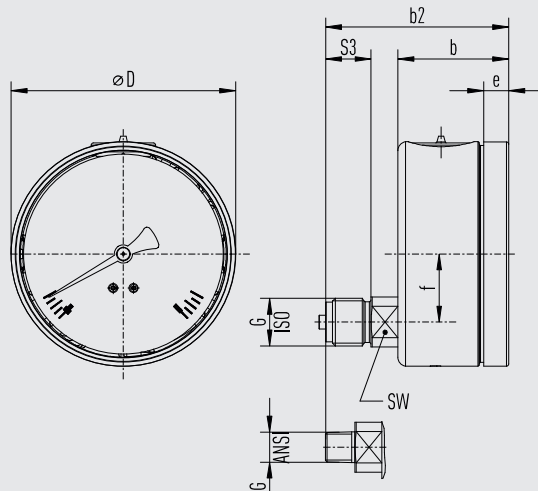
Process connection with thread per ISO 7

NS	G	Dimensions in mm [in]					
		b2 ±0.5 [0.02]	b ±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 ±0.5 [0.02]	b ±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	68.7 [2.7]	37.7 [1.48]	20 [0.79]	8.8 [0.35]	79 [3.11]	22 [0.87]
100 [4"]	G ¼ B	73.6 [2.9]	48.8 [1.92]	13 [0.51]	11 [0.43]	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

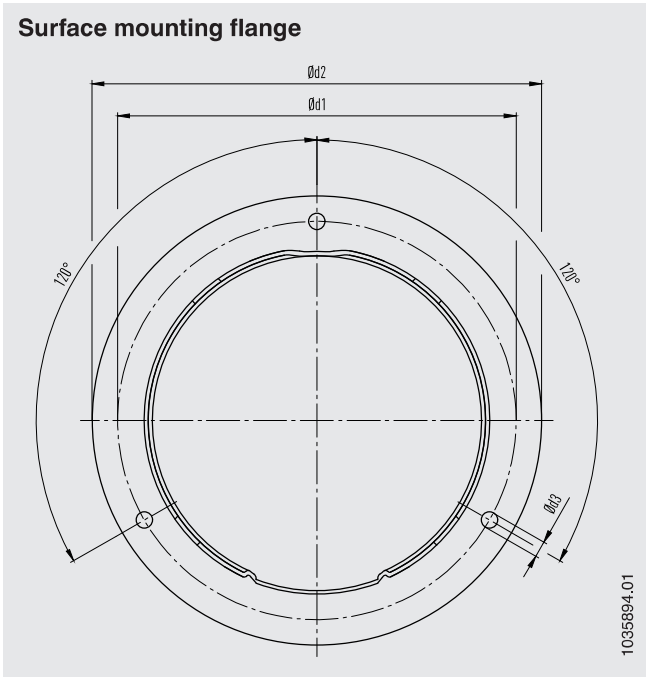
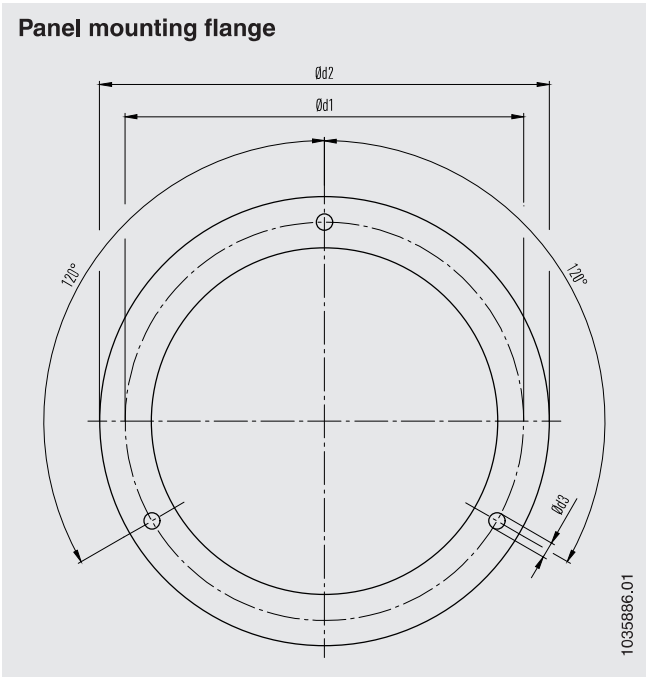
NS	G	Dimensions in mm [in]					
		b2 ±0.5 [0.02]	b ±0.5 [0.02]	S3	e	D	SW
80 [3"]	R ¼	61.7 [2.43]	37.7 [1.48]	13 [0.51]	8.8 [0.35]	79 [3.11]	22 [0.87]
	R ½	67.7 [2.67]	37.7 [1.48]	19 [0.75]	8.8 [0.35]	79 [3.11]	22 [0.87]
100 [4"]	R ¼	73.6 [2.9]	48.8 [1.92]	13 [0.51]	11 [0.43]	99 [3.9]	22 [0.87]
	R ½	79.6 [3.13]	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

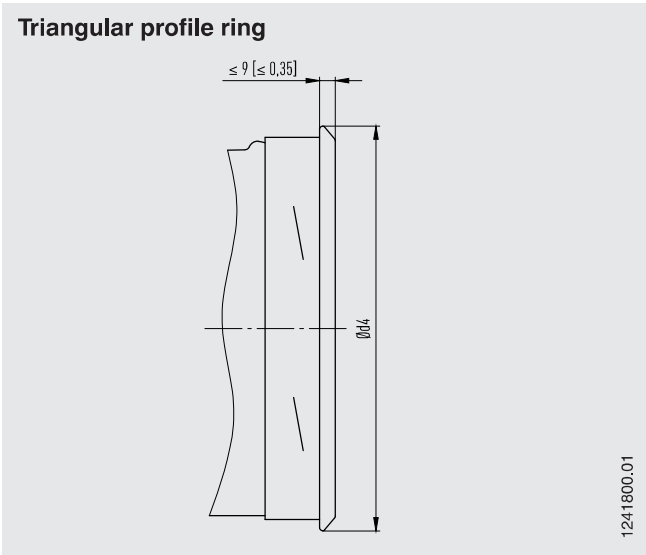
NS	G	Dimensions in mm [in]					
		b2 ±0.5 [0.02]	b ±0.5 [0.02]	S3	e	D	SW
80 [3"]	¼ NPT	61.7 [2.43]	37.7 [1.48]	13 [0.51]	8.8 [0.35]	79 [3.11]	22 [0.87]
	½ NPT	67.7 [2.67]	37.7 [1.48]	19 [0.75]	8.8 [0.35]	79 [3.11]	22 [0.87]
100 [4"]	¼ NPT	73.6 [2.9]	48.8 [1.92]	13 [0.51]	11 [0.43]	99 [3.9]	22 [0.87]
	½ NPT	79.6 [3.13]	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]	117 [4.61]	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]	≤ 108 [≤ 4.25]

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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