

# Bourdon tube pressure gauge, copper alloy Stainless steel case, case filling Model 113.53, NS 40 [1 ½"], 80 [3"] and 100 [4"]

WIKA data sheet PM 01.08



For further approvals,  
see page 6

## Applications

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

## Special features

- Vibration and shock resistant
- Robust design



Model 113.53.100, lower mount

Configurator



## Description

The liquid-filled model 113.53 mechanical Bourdon tube pressure gauge is constructed with a case from stainless steel and wetted parts from copper alloy.

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. In the event of a failure, overpressure can escape there.

Due to the case filling, the pressure 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.

The cases of the model 113.53 are available in nominal sizes of 40 [1 ½"], 80 [3"] and 100 [4"] and fulfil IP65 ingress protection. With an accuracy of class 2.5, this pressure gauge is suitable for a wide range of applications in industry.

For mounting in control panels, the pressure gauges with a back mount process connection can be fitted with a mounting flange or with a triangular profile ring and mounting bracket.

## 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 40 mm [1 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</li> </ul>	
<b>Window</b>	Polycarbonate	
<b>Case</b>		
Design	NS 40 [1 ½"]	Safety level "S2" per EN 837-1: with blow-out device
	NS 80 [3"], 100 [4"]	Safety level "S1" per EN 837-1: with blow-out device With scale ranges ≤ 0 ... 16 bar [≤ 0 ... 200 psi], the filling plug can be vented and resealed for internal pressure compensation
Material	Stainless steel, natural finish	
<b>Ring</b>	Crimp ring, stainless steel	
<b>Mounting</b>	<ul style="list-style-type: none"> <li>■ Without</li> <li>■ Panel mounting flange, stainless steel <sup>1)</sup></li> <li>■ Triangular profile ring with mounting bracket, stainless steel</li> <li>■ Surface mounting flange, stainless steel <sup>1)</sup></li> </ul>	
<b>Case filling</b>	<ul style="list-style-type: none"> <li>■ Glycerine <sup>2)</sup></li> <li>■ Silicone oil</li> </ul>	
<b>Movement</b>	Copper alloy	

1) Not available for NS 40 [1 ½"]

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

Measuring element	
<b>Type of measuring element</b>	Bourdon tube, C-type or helical type
<b>Material</b>	Copper alloy
<b>Leak tightness</b>	Leakage rate: <math> < 5 \cdot 10^{-3}</math> mbar l/s

Accuracy specifications		
<b>Accuracy class</b>		
NS 40 [1 ½"]	EN 837-1	Class 2.5
	ASME B40.100	±3 %   ±2 %   ±3 % of measuring span (grade B)
NS 80 [3"], 100 [4"]	EN 837-1	<ul style="list-style-type: none"> <li>■ Class 2.5</li> <li>■ Class 1.6</li> </ul>
	ASME B40.100	<ul style="list-style-type: none"> <li>■ ±3 %   ±2 %   ±3 % of measuring span (grade B)</li> <li>■ ±2 %   ±1 %   ±2 % of measuring span (grade A)</li> </ul>
<b>Temperature error</b>	On deviation from the reference conditions at the measuring system: ≤ ±0.4 % per 10 °C [≤ ±0.4 % per 18 °F] of full scale value	
<b>Reference conditions</b>		
Ambient temperature	+20 °C [68 °F]	

## Scale ranges

bar	
0 ... 1	0 ... 60
0 ... 1.6	0 ... 100
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 ... 40	-

kg/cm <sup>2</sup>	
0 ... 1	0 ... 60
0 ... 1.6	0 ... 100
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 ... 40	-

kPa	
0 ... 100	0 ... 6,000
0 ... 200	0 ... 8,000
0 ... 250	0 ... 10,000
0 ... 400	0 ... 16,000
0 ... 600	0 ... 20,000
0 ... 800	0 ... 25,000
0 ... 1,000	0 ... 31,500
0 ... 1,600	0 ... 40,000
0 ... 2,500	0 ... 60,000
0 ... 4,000	-

MPa	
0 ... 0.1	0 ... 6
0 ... 0.16	0 ... 10
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 ... 4	-

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

## Vacuum and compound scale ranges

bar	
-1 ... 0	-1 ... +9
-1 ... +0.6	-1 ... +15
-1 ... +1.5	-1 ... +24
-1 ... +3	-1 ... +30
-1 ... +5	-1 ... +40

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

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

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

psi	
-30 inHg ... 0	-30 inHg ... +15

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	Other scales or customer-specific dials, e.g. with red mark, circular arcs or circular sectors, on request
<b>Pointer</b>	
Instrument pointer	Plastic, black
<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> <li>■ M12 x 1.5, male thread</li> <li>■ M20 x 1.5, male thread</li> </ul>
ISO 7	<ul style="list-style-type: none"> <li>■ R 1/8, male thread</li> <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>■ 1/8 NPT, male thread</li> <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 0.5 mm [0.02"], copper alloy</li> <li>■ Ø 0.3 mm [0.012"], copper alloy</li> </ul>
<b>Material (wetted)</b>	
Process connection	Copper alloy
Bourdon tube	Copper alloy

→ Other process connections on request

Operating conditions	
<b>Medium temperature</b>	
Instruments with glycerine filling	-20 ... +100 °C [-4 ... +212 °F]
Instruments with silicone oil filling	-40 ... +100 °C [-40 ... +212 °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>	
Steady	3/4 x full scale value
Fluctuating	2/3 x full scale value
Short time	Full scale value
<b>Ingress protection per IEC/EN 60529</b>	IP65

## Approvals

Logo	Description	Region
	<b>EU declaration of conformity</b>	European Union
	Pressure Equipment Directive PS > 200 bar, module A, pressure accessory	
-	<b>CRN</b> Safety (e.g. electr. safety, overpressure, ...)	Canada

## Optional approvals

Logo	Description	Region
	<b>PAC Kazakhstan</b> Metrology, measurement technology	Kazakhstan
-	<b>PAC Ukraine</b> Metrology, measurement technology	Ukraine
	<b>PAC Uzbekistan</b> Metrology, measurement technology	Uzbekistan
-	<b>PAC China</b> Metrology, measurement technology	China

## Manufacturer's declaration

Logo	Description
-	Pressure Equipment Directive (PED) for maximum allowable pressure $PS \leq 200$ bar
-	Suitability of wetted materials for drinking water in accordance with the European 4MS initiative

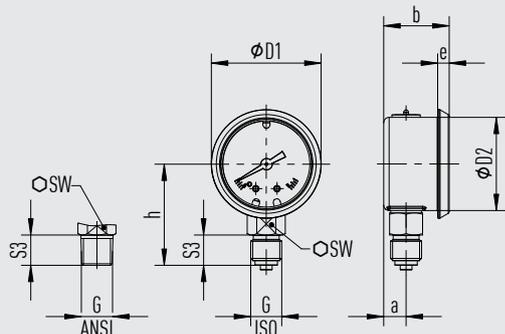
## Certificates

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. indication accuracy)</li> <li>■ PCA calibration certificate, traceable and accredited in accordance with ISO/IEC 17025</li> <li>■ Calibration certificate by a national accreditation body, traceable and accredited in accordance with ISO/IEC 17025 on request</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 40 [1 1/2"], lower mount (radial)



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NS	Weight
NS 40 [1 1/2"]	0.1 kg [0.22 lb]

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

NS	G	Dimensions in mm [in]							
		$h \pm 1 [0.04]$	S3	a	$b \pm 0.5 [0.02]$	e	D1	D2	SW
40 [1 1/2"]	G 1/8 B	40.5 [1.59]	10 [0.39]	9.5 [0.37]	28 [1.1]	5 [0.2]	47 [1.85]	40 [1.57]	14 [0.55]
	G 1/4 B	43.5 [1.71]	13 [0.51]	9.5 [0.37]	28 [1.1]	5 [0.2]	47 [1.85]	40 [1.57]	14 [0.55]
	M10 x 1	41.5 [1.63]	11 [0.43]	9.5 [0.37]	28 [1.1]	5 [0.2]	47 [1.85]	40 [1.57]	14 [0.55]

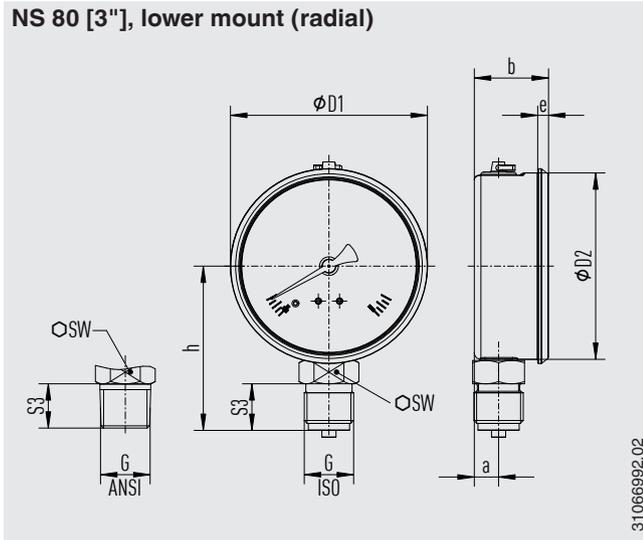
### Process connection with thread per ISO 7

NS	G	Dimensions in mm [in]							
		$h \pm 1 [0.04]$	S3	a	$b \pm 0.5 [0.02]$	e	D1	D2	SW
40 [1 1/2"]	R 1/8	40.5 [1.59]	10 [0.39]	9.5 [0.37]	28 [1.1]	5 [0.2]	47 [1.85]	40 [1.57]	14 [0.55]
	R 1/4	43.5 [1.71]	13 [0.51]	9.5 [0.37]	28 [1.1]	5 [0.2]	47 [1.85]	40 [1.57]	14 [0.55]

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

NS	G	Dimensions in mm [in]							
		$h \pm 1 [0.04]$	S3	a	$b \pm 0.5 [0.02]$	e	D1	D2	SW
40 [1 1/2"]	1/8 NPT	40.5 [1.59]	10 [0.39]	9.5 [0.37]	28 [1.1]	5 [0.2]	47 [1.85]	40 [1.57]	14 [0.55]
	1/4 NPT	43.5 [1.71]	13 [0.51]	9.5 [0.37]	28 [1.1]	5 [0.2]	47 [1.85]	40 [1.57]	14 [0.55]

### NS 80 [3"], lower mount (radial)



NS	Weight
NS 80 [3"]	0.3 kg [0.66 lb]

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

NS	G	Dimensions in mm [in]							
		$h \pm 1 [0.04]$	S3	a	$b \pm 0.5 [0.02]$	e	D1	D2	SW
80 [3"]	G ¼ B	67.5 [2.66]	17 [0.67]	10.5 [0.41]	31.5 [1.24]	4.5 [0.18]	83.5 [3.29]	80 [3.15]	22 [0.87]
	G ½ B	70.5 [2.78]	20 [0.79]	10.5 [0.41]	31.5 [1.24]	4.5 [0.18]	83.5 [3.29]	80 [3.15]	22 [0.87]
	M20 x 1.5	70.5 [2.78]	20 [0.79]	10.5 [0.41]	31.5 [1.24]	4.5 [0.18]	83.5 [3.29]	80 [3.15]	22 [0.87]

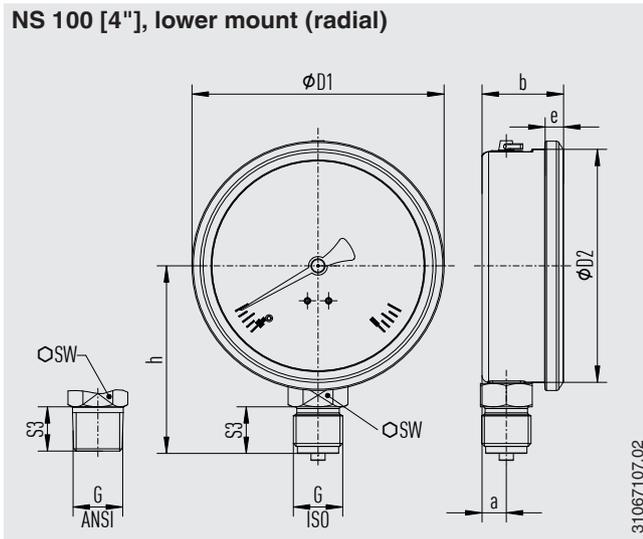
### Process connection with thread per ISO 7

NS	G	Dimensions in mm [in]							
		$h \pm 1 [0.04]$	S3	a	$b \pm 0.5 [0.02]$	e	D1	D2	SW
80 [3"]	R ¼	67.5 [2.66]	17 [0.67]	10.5 [0.41]	31.5 [1.24]	4.5 [0.18]	83.5 [3.29]	80 [3.15]	22 [0.87]
	R ½	69.5 [2.74]	19 [0.75]	10.5 [0.41]	31.5 [1.24]	4.5 [0.18]	83.5 [3.29]	80 [3.15]	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	$b \pm 0.5 [0.02]$	e	D1	D2	SW
80 [3"]	¼ NPT	67.5 [2.66]	17 [0.67]	10.5 [0.41]	31.5 [1.24]	4.5 [0.18]	83.5 [3.29]	80 [3.15]	22 [0.87]
	½ NPT	69.5 [2.74]	19 [0.75]	10.5 [0.41]	31.5 [1.24]	4.5 [0.18]	83.5 [3.29]	80 [3.15]	22 [0.87]

### NS 100 [4"], lower mount (radial)



NS	Weight
NS 100 [4"]	0.5 kg [1.1 lb]

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

NS	G	Dimensions in mm [in]							
		$h \pm 1$ [0.04]	S3	a	$b \pm 0.5$ [0.02]	e	D1	D2	SW
100 [4"]	G ¼ B	77.5 [3.05]	17 [0.67]	10.5 [0.41]	34.5 [1.36]	8 [0.31]	107 [4.21]	100 [3.94]	22 [0.87]
	G ½ B	80.5 [3.17]	20 [0.79]	10.5 [0.41]	34.5 [1.36]	8 [0.31]	107 [4.21]	100 [3.94]	22 [0.87]
	M20 x 1.5	80.5 [3.17]	20 [0.79]	10.5 [0.41]	34.5 [1.36]	8 [0.31]	107 [4.21]	100 [3.94]	22 [0.87]

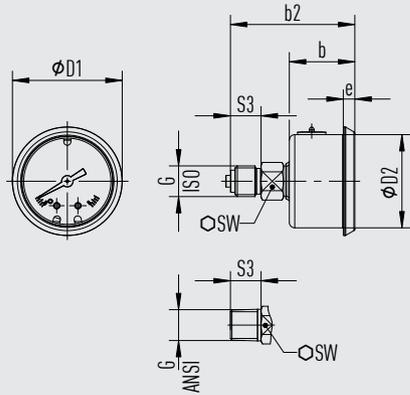
### Process connection with thread per ISO 7

NS	G	Dimensions in mm [in]							
		$h \pm 1$ [0.04]	S3	a	$b \pm 0.5$ [0.02]	e	D1	D2	SW
100 [4"]	R ¼	77.5 [3.05]	17 [0.67]	10.5 [0.41]	34.5 [1.36]	8 [0.31]	107 [4.21]	100 [3.94]	22 [0.87]
	R ½	79.5 [3.13]	19 [0.75]	10.5 [0.41]	34.5 [1.36]	8 [0.31]	107 [4.21]	100 [3.94]	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	$b \pm 0.5$ [0.02]	e	D1	D2	SW
100 [4"]	¼ NPT	77.5 [3.05]	17 [0.67]	10.5 [0.41]	34.5 [1.36]	8 [0.31]	107 [4.21]	100 [3.94]	22 [0.87]
	½ NPT	79.5 [3.13]	19 [0.75]	10.5 [0.41]	34.5 [1.36]	8 [0.31]	107 [4.21]	100 [3.94]	22 [0.87]

**NS 40 [1 1/2"], centre back mount**



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NS	Weight
NS 40 [1 1/2"]	0.1 kg [0.22 lb]

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

NS	G	Dimensions in mm [in]						
		$b2 \pm 1 [0.04]$	$b \pm 0.5 [0.02]$	e	S3	D1	D2	SW
40 [1 1/2"]	G 1/8 B	50 [1.97]	28 [1.1]	5 [0.19]	10 [0.39]	47 [1.85]	40 [1.57]	14 [0.55]
	G 1/4 B	53 [2.08]	28 [1.1]	5 [0.19]	13 [0.51]	47 [1.85]	40 [1.57]	14 [0.55]
	M10 x 1	51 [2.01]	28 [1.1]	5 [0.19]	11 [0.43]	47 [1.85]	40 [1.57]	14 [0.55]

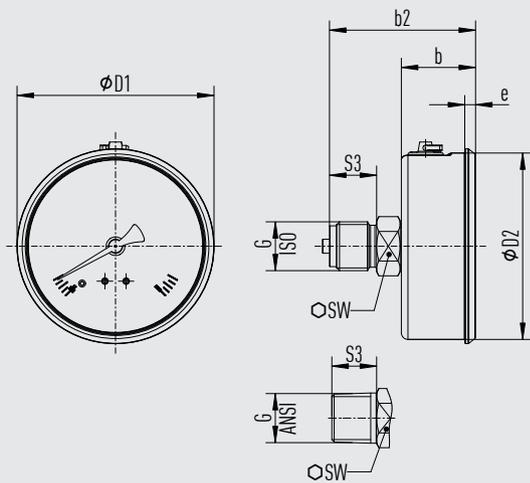
**Process connection with thread per ISO 7**

NS	G	Dimensions in mm [in]						
		$b2 \pm 1 [0.04]$	$b \pm 0.5 [0.02]$	e	S3	D1	D2	SW
40 [1 1/2"]	R 1/8	50 [1.97]	28 [1.1]	5 [0.19]	10 [0.39]	47 [1.85]	40 [1.57]	14 [0.55]
	R 1/4	53 [2.08]	28 [1.1]	5 [0.19]	13 [0.51]	47 [1.85]	40 [1.57]	14 [0.55]

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

NS	G	Dimensions in mm [in]						
		$b2 \pm 1 [0.04]$	$b \pm 0.5 [0.02]$	e	S3	D1	D2	SW
40 [1 1/2"]	1/8 NPT	50 [1.97]	28 [1.1]	5 [0.19]	10 [0.39]	47 [1.85]	40 [1.57]	14 [0.55]
	1/4 NPT	53 [2.08]	28 [1.1]	5 [0.19]	13 [0.51]	47 [1.85]	40 [1.57]	14 [0.55]

**NS 80 [3"], centre back mount**



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NS	Weight
NS 80 [3"]	0.3 kg [0.66 lb]

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

NS	G	Dimensions in mm [in]						
		$b2 \pm 1 [0.04]$	$b \pm 0.5 [0.02]$	e	S3	D1	D2	SW
80 [3"]	G ¼ B	59 [2.32]	31.5 [1.24]	4.5 [0.18]	17 [0.67]	83.5 [3.29]	80 [3.15]	22 [0.87]
	G ½ B	62 [2.44]	31.5 [1.24]	4.5 [0.18]	20 [0.79]	83.5 [3.29]	80 [3.15]	22 [0.87]
	M20 x 1.5	62 [2.44]	31.5 [1.24]	4.5 [0.18]	20 [0.79]	83.5 [3.29]	80 [3.15]	22 [0.87]

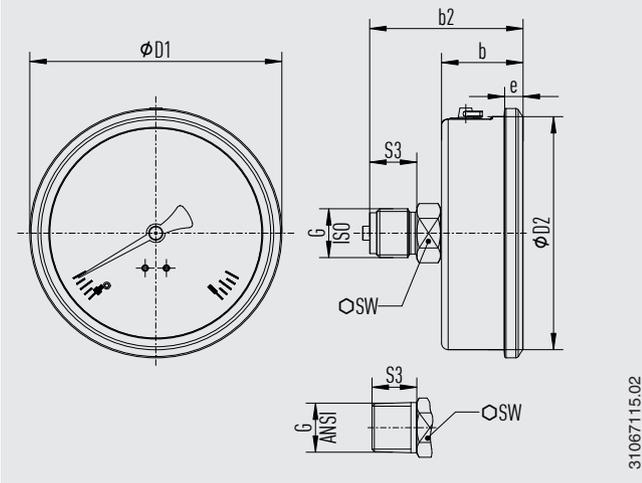
**Process connection with thread per ISO 7**

NS	G	Dimensions in mm [in]						
		$b2 \pm 1 [0.04]$	$b \pm 0.5 [0.02]$	e	S3	D1	D2	SW
80 [3"]	R ¼	59 [2.32]	31.5 [1.24]	4.5 [0.18]	17 [0.67]	83.5 [3.29]	80 [3.15]	22 [0.87]
	R ½	61 [2.4]	31.5 [1.24]	4.5 [0.18]	19 [0.75]	83.5 [3.29]	80 [3.15]	22 [0.87]

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

NS	G	Dimensions in mm [in]						
		$b2 \pm 1 [0.04]$	$b \pm 0.5 [0.02]$	e	S3	D1	D2	SW
80 [3"]	¼ NPT	59 [2.32]	31.5 [1.24]	4.5 [0.18]	17 [0.67]	83.5 [3.29]	80 [3.15]	22 [0.87]
	½ NPT	61 [2.4]	31.5 [1.24]	4.5 [0.18]	19 [0.75]	83.5 [3.29]	80 [3.15]	22 [0.87]

NS 100 [4"], centre back mount



NS	Weight
NS 100 [4"]	0.5 kg [1.1 lb]

Process connection with thread per EN 837-1

NS	G	Dimensions in mm [in]						
		$b2 \pm 1$ [0.04]	$b \pm 0.5$ [0.02]	e	S3	D1	D2	SW
100 [4"]	G ¼ B	62 [2.44]	34.5 [1.36]	8 [0.31]	17 [0.67]	107 [4.21]	100 [3.94]	22 [0.87]
	G ½ B	65 [2.56]	34.5 [1.36]	8 [0.31]	20 [0.79]	107 [4.21]	100 [3.94]	22 [0.87]
	M20 x 1.5	65 [2.56]	34.5 [1.36]	8 [0.31]	20 [0.79]	107 [4.21]	100 [3.94]	22 [0.87]

Process connection with thread per ISO 7

NS	G	Dimensions in mm [in]						
		$b2 \pm 1$ [0.04]	$b \pm 0.5$ [0.02]	e	S3	D1	D2	SW
100 [4"]	R ¼	62 [2.44]	34.5 [1.36]	8 [0.31]	17 [0.67]	107 [4.21]	100 [3.94]	22 [0.87]
	R ½	64 [2.52]	34.5 [1.36]	8 [0.31]	19 [0.75]	107 [4.21]	100 [3.94]	22 [0.87]

Process connection with thread per ANSI/B1.20.1

NS	G	Dimensions in mm [in]						
		$b2 \pm 1$ [0.04]	$b \pm 0.5$ [0.02]	e	S3	D1	D2	SW
100 [4"]	¼ NPT	62 [2.44]	34.5 [1.36]	8 [0.31]	17 [0.67]	107 [4.21]	100 [3.94]	22 [0.87]
	½ NPT	64 [2.52]	34.5 [1.36]	8 [0.31]	19 [0.75]	107 [4.21]	100 [3.94]	22 [0.87]

## Accessories and spare parts

Model	Description	
	<b>910.33</b> Adhesive label set for red and green circular arcs → See data sheet AC 08.03	
	Order number NG 100 [4"]	14238945
	<b>910.17</b> Seals → 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>IV1</b> Needle valve and multiport needle valve → See data sheet AC 09.22	
	<b>IV2</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	

### Ordering information

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

Configurator



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