

Information on process connections

WIKA data sheet IN 00.14

Applications

- For the definition of the process connections for WIKA pressure measuring instruments

Scope

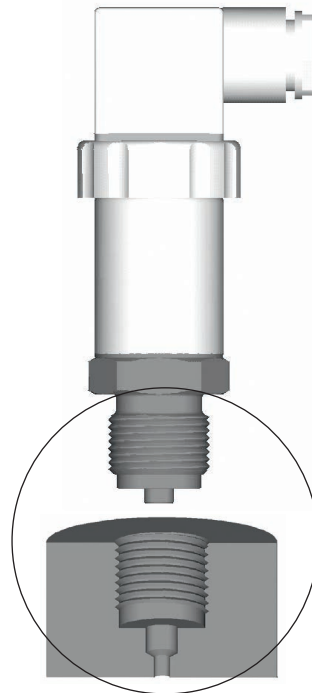
- Pressure sensors
- Electronic pressure switches
- UHP transducer

Contents

- Mounting at the process connection
- Dimensions of the process connections
- Max. measuring ranges and overpressure limits depending on the process connections

Description

WIKA offers pressure measuring instruments with a variety of process connections in order to meet diverse customer-specific application requirements.



Mounting

The following notes relate to process connections with specified geometric and functional features in accordance with technical regulations.

Requirements for the mounting point

The mounting point must meet the following conditions:

- Keep the sealing faces at the pressure sensor and the measuring location clean and free from scratches.
- Remove the protective cap and/or the Mylar or protective foil not until shortly before installation.
- Observe the permissible ambient temperatures. Do not exceed the performance limits of the measuring instrument specified by the manufacturer. Consider possible restrictions on the ambient temperature range due to the mating connectors used.

Mechanical mounting

Carry out the mounting in accordance with the following steps:

1. Prior to commissioning, subject the instrument to a visual inspection.
→ Leaking liquid is indicative of damage.
2. Depressurise the container, pipeline or system.
3. Ensure that the sealing faces are clean and do not show any mechanical damage.
4. Seal the sealing face, see [„Sealing variants“](#).
5. At the mounting point, screw the instrument in hand-tight.
→ Make sure not to cross the threads.
6. For force transmission, use only the defined spanner flats, see [„Spanner flats“](#).
→ The case must not be subjected to mechanical load. Never use the case as a working surface.
7. Tighten the instrument with a torque wrench using the spanner flats.



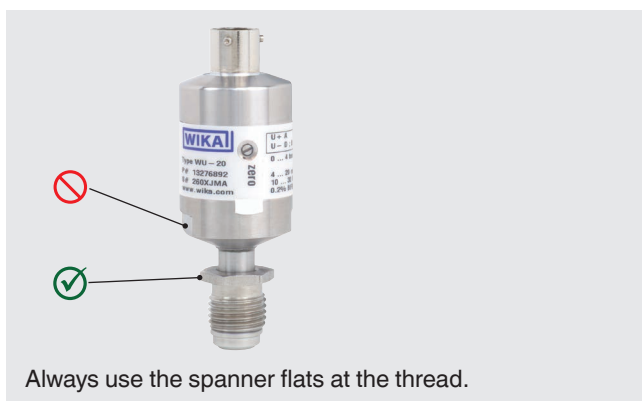
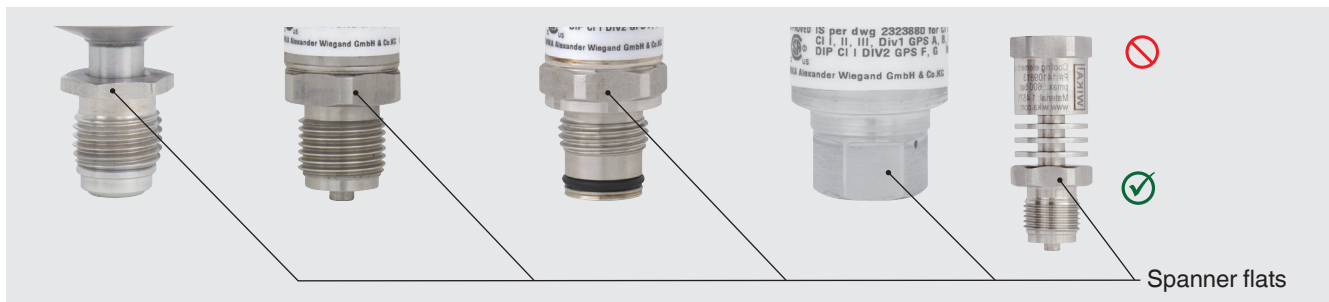
The correct torque depends on the mounting point (e.g. material and shape).

Only use the instrument if it is in perfect condition with respect to safety.

Only use original accessories. For accessories, see data sheet for the respective pressure sensor or pressure switch.

Spanner flats

To avoid damage to the instrument, always use the correct spanner flats.

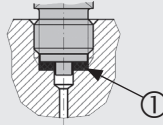


Sealing variants

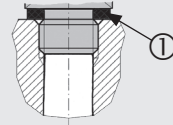
To meet the diverse requirements and operating conditions in different applications, seal the process connections as follows:

Parallel threads

For sealing, use flat gaskets, lens-type sealing rings or WIKA profile sealings at the sealing face ①.



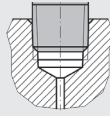
per EN 837



per DIN EN ISO 1179-2
(formerly DIN 3852-E)

Tapered threads

For sealing, the thread is wound with additional sealing material, e.g. PTFE tape.



NPT, R and PT

→ For notes on seals, see WIKA data sheet AC 09.08 at www.wika.com.

Additional notes for special process connections

In certain applications, process connections with special geometric or functional properties are used. This section describes the relevant deviations, technical requirements and notes on the safe and compliant use of such connections.

Cooling element

Cooling elements must not be insulated.

The cooling elements are crucial for regulating the temperature of the pressure measuring instrument. Insulation would impede heat dissipation and could cause the instrument to overheat. This impairs the measurement accuracy and shortens the service life of the pressure measuring instrument.

Flush process connections

Diaphragms must be undamaged.

The diaphragm is the direct interface between the medium and the measuring instrument and is crucial for the following aspects:

- Measurement accuracy: An intact diaphragm ensures correct pressure transmission without errors.
- Prevention of blockages: Especially with viscous, crystalline or abrasive media, an undamaged diaphragm prevents blockages and damage to the pressure port.
- Protection of the measuring instrument: The diaphragm protects the measuring instrument from aggressive or adhesive media.
- Hygiene and cleaning: An undamaged diaphragm makes cleaning easier and prevents contamination, which is particularly important in hygienic applications.

Hygienic process connections

The following notes must be observed when using hygienic process connections:

- Never loosen sealed filling screws on the measuring instrument. Loosening of the filling screws can lead to leakage and contamination.
- For mounting, use the appropriate fastenings. In accordance with the fittings and flange standards, suitable screws, nuts or clamps must be used to ensure a secure and leak-tight connection.
- Only use seals with a sufficiently large inner diameter. The seal must be inserted centrally to prevent contact with the diaphragm, which could lead to measuring deviations.
- Position the welding socket correctly. Position the welding socket so that the bore for leakage detection points downwards. The nozzle must be welded flush with the inner wall of the vessel and ground smooth. The surface roughness of the ground surfaces must be $Ra \leq 0.8 \mu m$.
- Observe the seal manufacturer's instructions. When using soft or PTFE seals, observe the instructions of the seal manufacturer, particularly with regard to tightening torque and load cycles.

UHP process connections

The following notes must be observed when using UHP process connections:

- Complete the weld seam. The weld seam must be fully welded to ensure a secure and leak-tight connection.
- Observe the minimum current and heat input. To avoid damage, ensure that the current and heat input during the welding process are as low as possible.
- Cool the argon flow during the welding process. To improve the quality of the weld seam, cool the flow of argon during welding.
- Perform test welds in advance. Test welds help to prevent welding errors and improve the quality of the weld.
- Clean the connection components. Clean the connection components (such as cable glands, seals and connectors) with pure/filtered gas.



Observe the specifications and notes. Observe the specifications and notes of all components and manufacturers.

Note on VCR®-compatible connections

For VCR®-compatible connections, the union nut/male nut or fitting must be tightened beyond the hand-tight position (depending on the seals used) using a 1/8 or 1/4 turn. Excessive tightening can damage the sealing lips and lead to possible leakage. Do not scratch the sealing lips.

VCR® is a registered trademark of Swagelok

Notes on rework

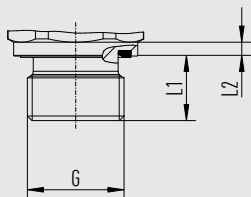
The following rework steps are required for UHP products:

- Set the zero point. A zero point is required; see the operating instructions for the respective instrument.
- Check for leak tightness. Check the UHP connections (threaded connections, welds) for leak tightness using a suitable test (e.g. helium leak test).
- Check the gas flow. Switch the gas flow on and off at least 10 times to remove any particles that may have entered during installation. The flow rate of the gas should correspond to the subsequent process flow.

Dimensions in mm [in]

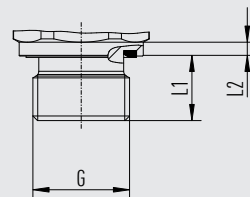
Threaded connections

DIN EN ISO 1179-2



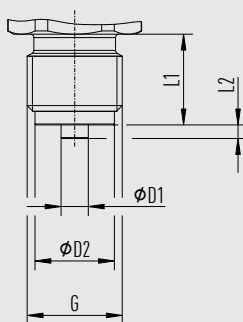
G	L1	L2
G ⅜ A	8 [0.31]	1.5 [0.059]
G ¼ A	12 [0.47]	2 [0.08]
G ½ A	14 [0.55]	3 [0.12]

DIN EN ISO 9974-2



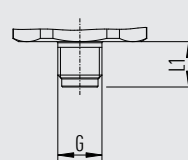
G	L1	L2
M10 x 1.0	8 [0.31]	1.5 [0.059]
M14 x 1.5	12 [0.47]	2 [0.08]

EN 837



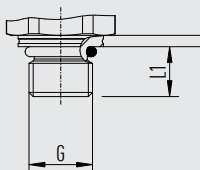
G	L1	L2	D1	D2
G ¼ B	13 [0.51]	2 [0.08]	5 [0.19]	9.5 [0.374]
G ⅝ B	16 [0.63]	3 [0.12]	5.5 [0.22]	13 [0.512]
G ½ B	20 [0.79]	3 [0.12]	6 [0.24]	17.5 [0.689]

EN 837



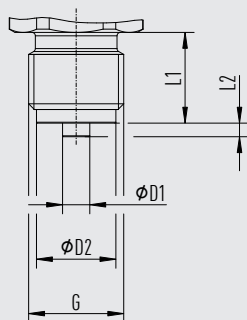
G	L1
G ⅝	10 [0.39]

ISO 6149-2



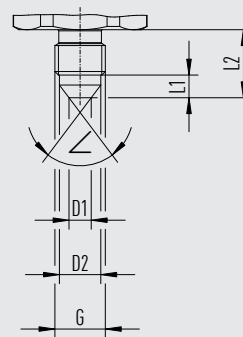
G	L1
M14 x 1.5	11 [0.43]

DIN 16288



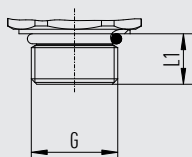
G	L1	L2	D1	D2
M12 x 1.5	13 [0.51]	2 [0.08]	5 [0.19]	9.5 [0.374]
M20 x 1.5	20 [0.79]	3 [0.12]	6 [0.24]	17.5 [0.689]

SAE J514, sealing cone



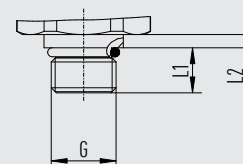
G	L1	L2	D1	D2	∠
7/16-20 UNF-2A	5 [0.2]	15 [0.59]	4.9 [0.193]	9.12 [0.359]	74°

SAE J514, O-ring BOSS



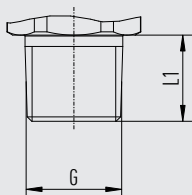
G	L1
3/4-16 UNF-2A, O-ring BOSS	11.13 [0.4382]

SAE J514, O-ring BOSS



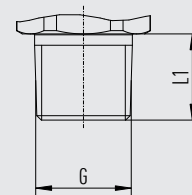
G	L1	L2
7/16-20 UNF-2A, O-ring BOSS	9.14 [0.3598]	2.92 [0.1149]
9/16-18 UNF-2A, O-ring BOSS	9.93 [0.3909]	2.92 [0.1149]

ANSI/ASME B1.20.1



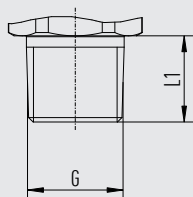
G	L1
1/8 NPT	10 [0.39]
1/4 NPT	13 [0.51]
1/2 NPT	19 [0.75]

KS B 0222



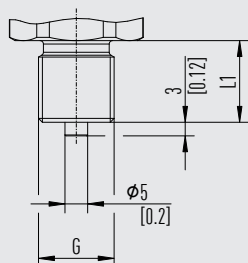
G	L1
PT 1/4	13 [0.51]
PT 3/8	15 [0.59]
PT 1/2	19 [0.75]

ISO 7



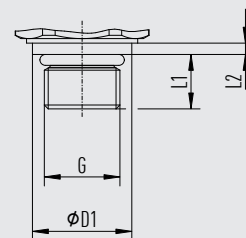
G	L1
R ¼	13 [0.51]
R ⅜	15 [0.59]
R ½	19 [0.75]

JIS B 7505-76



G	L
G ¼ B	16 [0.63]

JIS B 2351-1

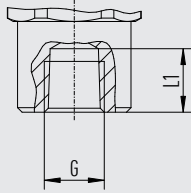


G	D1	L1	L2
G ¼ FORM O with collar	19 [0.75]	10 [0.39] ¹⁾	2 [0.08]
G ⅜ FORM O with collar	21.9 [0.962] ¹⁾	12 [0.47]	2.5 [0.098]

1) Not in accordance with standard

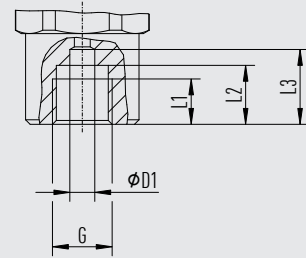
Connections with female thread

ANSI/ASME B1.20.1



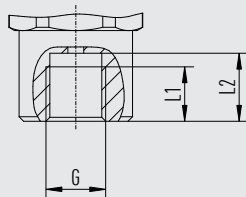
G	L1
1/4 NPT	14 [0.55]

EN 837



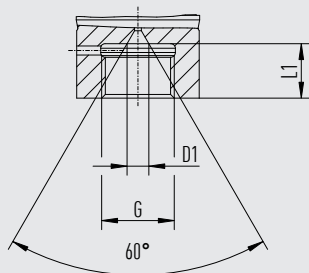
G	L1	L2	L3	D1
G 1/4	10 [0.39]	13 [0.51]	16.5 [0.65]	5.5 [0.217]

ISO 8434-1



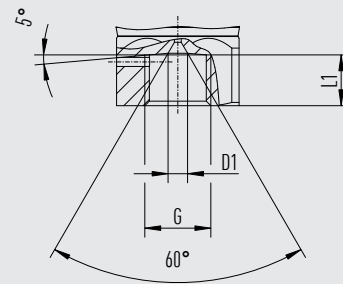
G	L1	L2
G 1/4 (compatible with bite-type fittings)	12 [0.47]	15 [0.59]

Metric threads



G	L1	D1
M16 x 1.5, with sealing cone	12 [0.47]	4.8 [0.189]
M20 x 1.5, with sealing cone	15 [0.59]	4.8 [0.189]

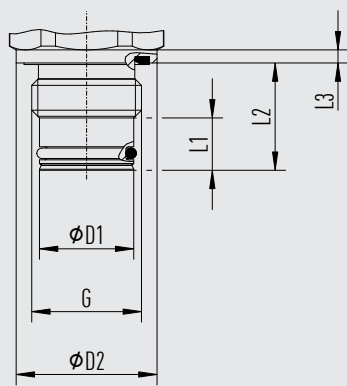
UNF thread



G	L1	D1
9/16-18 UNF-2B (F250-C)	11.2 [0.441]	4.3 [0.169]

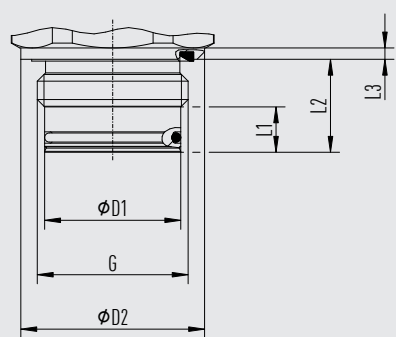
Flush threaded connections

G ½ B flush



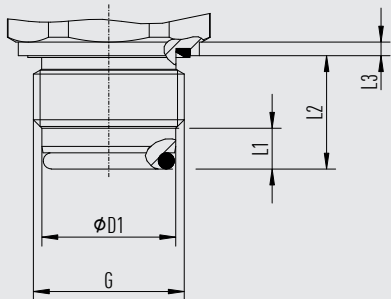
G	L1	L2	L3	D1	D2
G ½ B	10 [0.39]	20.5 [0.807]	3 [0.12]	18 [0.71]	26.9 [1.059]

G 1 B flush



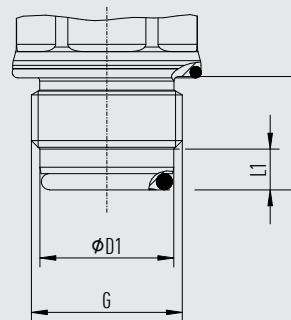
G	L1	L2	L3	D1	D2
G 1 B	10 [0.39]	20.5 [0.807]	2.5 [0.098]	30 [1.18]	40.5 [1.595]

G 1 B hygienic



G	L1	L2	L3	D1
G 1 B	9 [0.35]	25 [0.98]	3 [0.12]	29.5 [1.161]

G 1 B hygienic 3A

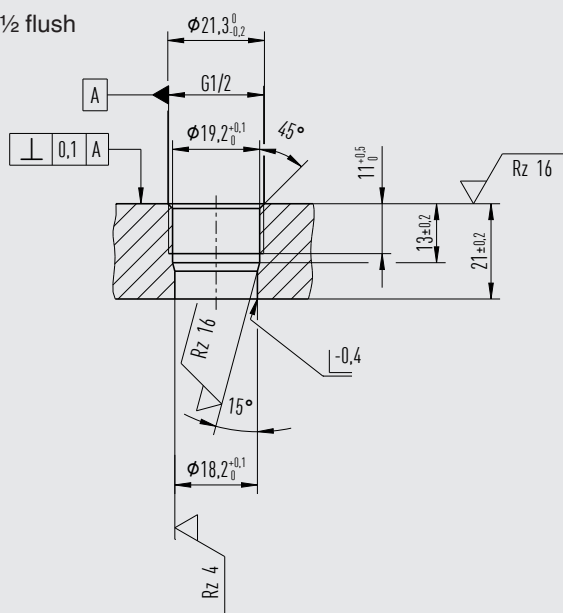


G	L1	D1
G 1 B	9 [0.35]	29.5 [1.161]

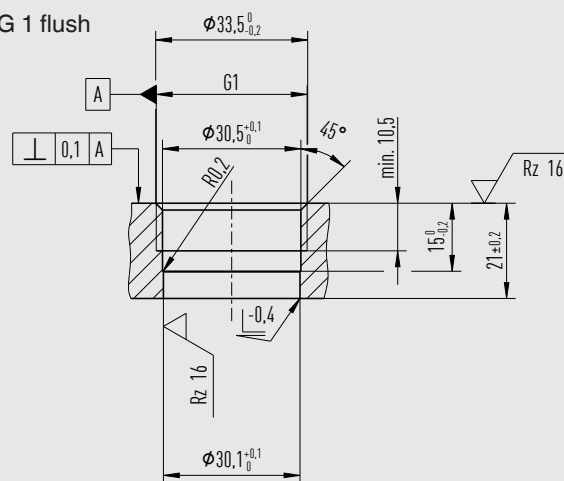
Tapped holes in mm

Tapped holes are only shown for WIKA-specific threads. For all other tapped holes, observe the applicable standards.

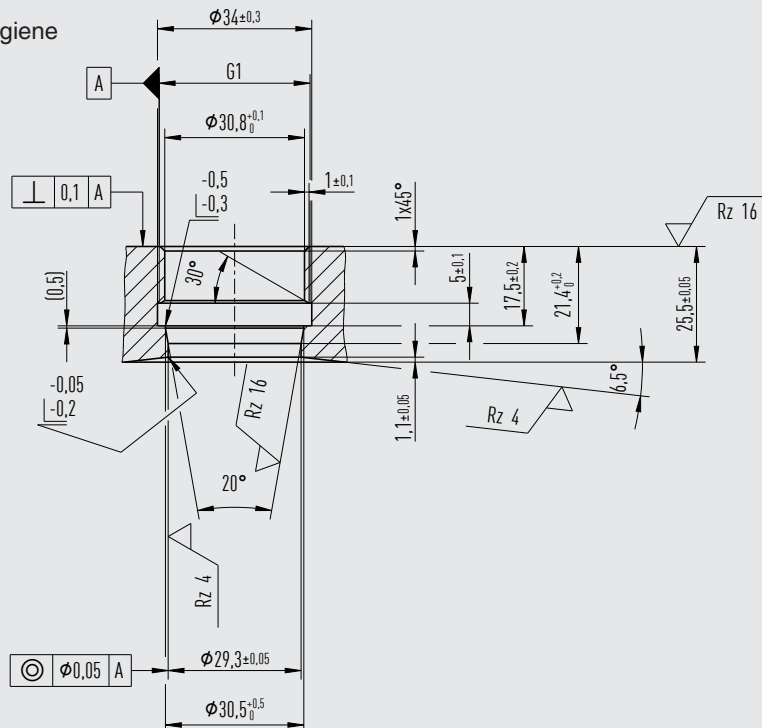
G 1/2 flush



G 1 flush

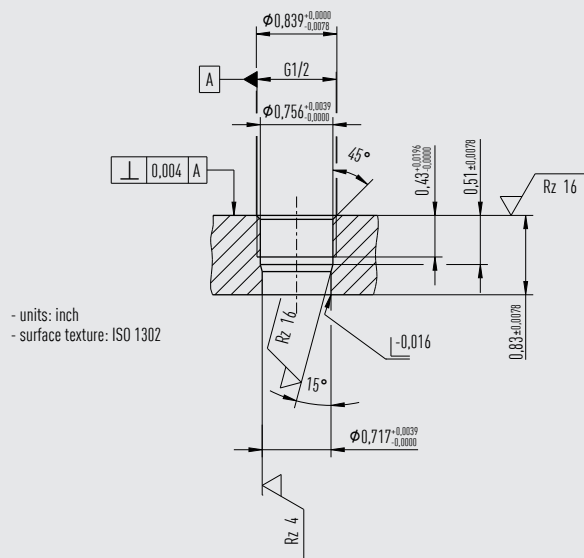


G 1 flush hygiene

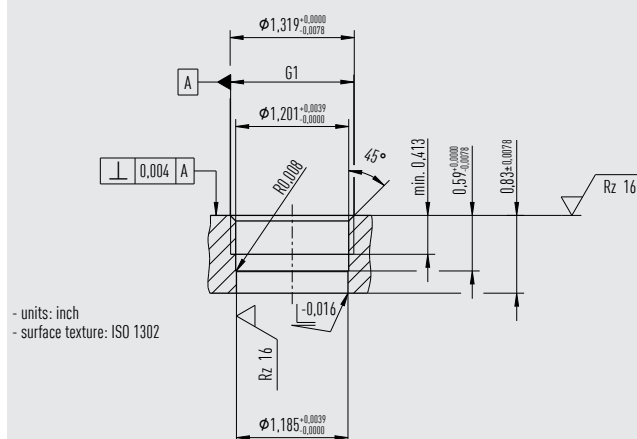


Tapped holes in inch

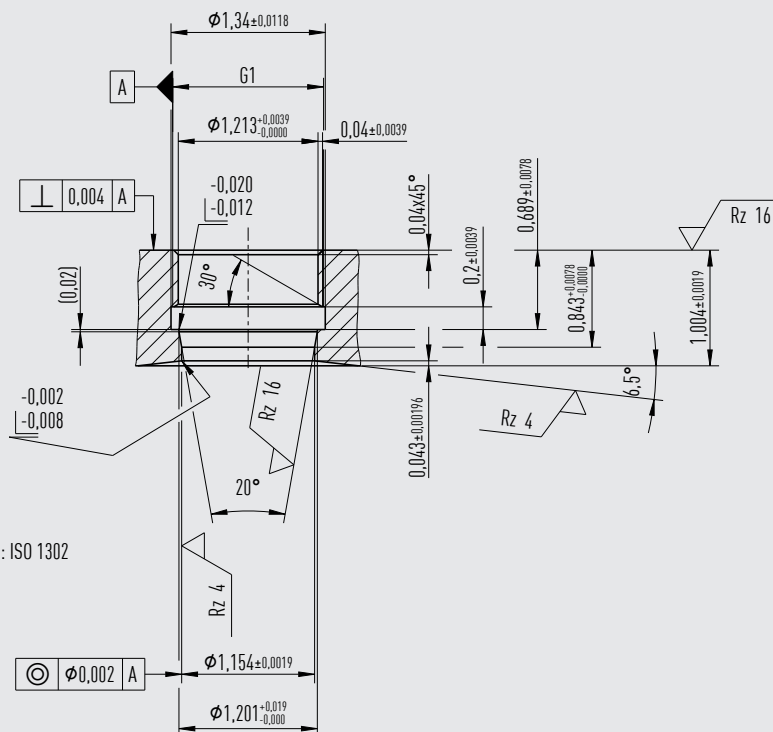
G 1/2 flash



G 1 flash



G 1 flush hygiene



Max. measuring ranges and overpressure limits depending on the process connections

Thread size	Seal	Max. measuring range in bar [psi]	Overpressure limit in bar [psi]
EN 837			
G 3/8 B, male	WIKA seal ¹⁾	1,035 [15,000]	1,480 [21,500]
G 1/8 B, male	WIKA seal ¹⁾	400 [5,800]	572 [8,200]
G 1/4 B, male	WIKA seal ¹⁾	1,035 [15,000]	1,480 [21,500]
G 1/4, female	WIKA seal ¹⁾	1,035 [15,000]	1,480 [21,500]
G 1/2 B, male	WIKA seal ¹⁾	1,035 [15,000]	1,480 [21,500]
G 1/2 B, male ³⁾	Without (from ≥ 1,000 bar ⁴⁾)	1,600 [23,200]	2,288 [33,185]
DIN EN ISO 1179-2			
G 1/8 A, male	Elastomer seal ²⁾	250 [3,600]	358 [3,700]
G 1/4 A, male	Elastomer seal ²⁾	600 [8,700]	858 [12,400]
G 1/4 A, male	Elastomer seal (item no. 14045531)	1,035 [15,000]	1,480 [21,500]
G 1/2 A, male	Elastomer seal ²⁾	600 [8,700]	858 [12,400]
DIN EN ISO 9974-2			
M10 x 1.0, male	Elastomer seal ²⁾	250 [3,600]	358 [3,700]
M14 x 1.5, male	Elastomer seal ²⁾	600 [8,700]	858 [12,400]
ANSI/ASME B1.20.1			
1/8 NPT, male	Self-sealing	400 [5,800]	572 [8,300]
1/4 NPT, male	Self-sealing	1,035 [15,000]	1,480 [21,500]
1/4 NPT, female	Self-sealing	1,035 [15,000]	1,480 [21,500]
1/2 NPT, male	Self-sealing	1,035 [15,000]	1,480 [21,500]
1/2 NPT, male ³⁾	Self-sealing	1,600 [23,200]	2,288 [33,185]
ISO 7			
R 3/8, male	WIKA seal ¹⁾	1,035 [15,000]	1,480 [21,500]
R 1/4, male	WIKA seal ¹⁾	1,035 [15,000]	1,480 [21,500]
R 1/2, male	WIKA seal ¹⁾	1,035 [15,000]	1,480 [21,500]
SAE J514			
3/4-16 UNF-2A SAE J514 O-ring BOSS	Elastomer seal ²⁾	600 [8,700]	858 [12,400]
7/16-20 UNF-2A SAE J514 O-ring BOSS	Elastomer seal ²⁾	600 [8,700]	858 [12,400]
7/16-20 UNF-2A SAE J514 74°	Self-sealing	800 [11,600]	1,144 [16,600]
9/16-18 UNF-2A SAE J514 O-ring BOSS	Elastomer seal ²⁾	600 [8,700]	858 [12,400]
JIS B2351-1			
G 3/8, male, form O with collar	Elastomer seal ²⁾	600 [8,700]	858 [12,400]
G 1/4 x 10, male, form O with collar	Elastomer seal ²⁾	600 [8,700]	858 [12,400]
DIN 16288			
M20 x 1.5, male	WIKA seal ¹⁾	1,035 [15,000]	1,480 [21,500]
M20 x 1.5, male ³⁾	Without (from ≥ 1000 bar ⁴⁾)	1,600 [23,200]	2,288 [33,185]
DIN 16288 (similar to EN 837)			
M12 x 1.5, male (similar to EN 837)	WIKA seal ¹⁾	1,035 [15,000]	1,480 [21,500]
M12 x 1.5, male (similar to EN 837) ³⁾	Without (from ≥ 1000 bar ⁴⁾)	1,600 [23,200]	2,288 [33,185]
JIS B7505-76			
G 1/4 B, male	WIKA seal ¹⁾	1,035 [15,000]	1,480 [21,500]
ISO 6149-2			

Thread size	Seal	Max. measuring range in bar [psi]	Overpressure limit in bar [psi]
M14 x 1.5	Elastomer seal ²⁾	600 [8,700]	858 [12,400]
ISO 8434-1			
G 1/4, female (compatible with bite-type fittings)	Without ⁴⁾	1,035 [15,000]	1,480 [21,500]
KS B 0222			
PT 3/8, male	self-sealing	1,035 [15,000]	1,480 [21,500]
PT 1/4, male	self-sealing	1,035 [15,000]	1,480 [21,500]
PT 1/2, male	self-sealing	1,035 [15,000]	1,480 [21,500]
Without			
G 1/2, flush	NBR, up to 120 °C	600 [8,700]	1,200 [17,400]
G 1/2, flush	FKM, up to 100 °C	420 [6,100]	600 [8,700]
G 1/2, flush	EPDM, up to 150 °C	280 [4,100]	400 [5,800]
G 1/2, flush	FFKM, up to 150 °C	600 [8,700]	1,200 [17,400]
M16 x 1.5 female with sealing cone	Without ⁴⁾	7,000 [101,500]	8,000 [116,000]
M20 x 1.5 female with sealing cone	Without ⁴⁾	15,000 [217,600]	16,000 [232,100]
9/16-18 UNF, female F250-C	Without ⁴⁾	7,000 [101,500]	8,000 [116,000]
G 1 B hygienic 3A	Elastomer seal ²⁾	Not required ⁵⁾	Not required ⁵⁾
G 1 B hygienic	Elastomer seal ²⁾	Not required ⁵⁾	Not required ⁵⁾
G 1 B, flush	Elastomer seal ²⁾	Not required ⁵⁾	Not required ⁵⁾

1) Per DS AC 09.08 (materials only Cu and 1.4571)

2) Per section "Spare parts" of the respective DS

3) Process connection from CrNiMo steel 1.4542

4) The information on the maximum measuring range and overpressure limit refers to the process connection.

Depending on the selected process connection and the seal, restrictions in overpressure limit can result.

5) It is not necessary to specify the maximum measuring range and overpressure limit, as the thread is only used for significantly lower measuring ranges.

Details must be tested separately in the respective application. The specified values for the overpressure limit serve only as a rough orientation. The values depend on the temperature, the seal used, the selected torque, the type and the material of the mating thread and the prevailing operating conditions.

→ Other customised process connections on request

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The specifications given in this document represent the state of the art at the time of publishing.
We reserve the right to make modifications to the specifications and materials.



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