ABB MEASUREMENT & ANALYTICS | OPERATING INSTRUCTION

S26 remote and direct mount seals

Diaphragm seals for 266 pressure transmitters

266DRH with direct mount and remote S26RA seals

Engineered solutions for all applications

Measurement made easy

Introduction

The 2600T family provides comprehensive range of top quality pressure measurement products, specifically designed to meet the widest range of applications ranging from arduous conditions in offshore oil and gas to the laboratory environment of the pharmaceutical industry.

For more information

Further publications for 2600T series pressure products are available for free download from www.abb.com/pressure

1 The Company

We are an established world force in the design and manufacture of measurement products for industrial process control, flow measurement, gas and liquid analysis and environmental applications.

As a part of ABB, a world leader in process automation technology, we offer customers application expertise, service and support worldwide.

We are committed to teamwork, high quality manufacturing, advanced technology and unrivalled service and support.

The quality, accuracy and performance of the Company's products result from over 100 years experience, combined with acontinuous program of innovative design and development to incorporate the latest technology.

Index

2 1 Introduction

2.1 1.1 Instruction manual structure

The present manual provides information for installing the S26 diaphragm-seal-equipped pressure transmitters. Instructions covering all aspects of the transmitters, which are not related to installation of the remote seals, are included in the relevant operating instruction. Please read this manual before working with the product.

In case of additional information needs please contact ABB at the address you find at last pages of this manual or at the web site: http://www.abb.com/pressure.

The products described in the present manual are not intended for use in NUCLEAR-QUALIFIED environments/applications.

2.2 1.2 Models covered by this manual

The present manual can be used for all the diaphragm-seal-equipped pressure transmitters.

3 2 Safety

3.1 2.1 General safety information

The “Safety” section provides an overview of the safety aspects to be observed for operation of the device.

The device has been constructed in accordance with the state of the art and is operationally safe. It has been tested and left the factory in perfect working conditions. The information in the manual, as well as the applicable documentation and certificates, must be observed and followed in order to maintain this condition throughout the period of operation.

Full compliance with the general safety requirements must be observed during operation of the device. In addition to the general information, the individual sections in the manual contain descriptions of processes or procedural instructions with specific safety information.

Only by observing all of the safety information can you reduce to the minimum the risk of hazards for personnel and/or environment. These instructions are intended as an overview and do not contain detailed information on all available models or every conceivable event that may occur during setup, operation, and maintenance work.

For additional information, or in the event of specific problems not covered in detail by these operating instructions, please contact the manufacturer. In addition, ABB declares that the contents of this manual are not part of any prior or existing agreements, commitments, or legal relationships; nor are they intended to amend these.

All obligations of ABB arise from the conditions of the relevant sales agreement, which also contains the solely binding warranty regulations in full. These contractual warranty provisions are neither extended nor limited by the information provided in this manual.

Caution. Only qualified and authorized specialist personnel should be charged with installation, electrical connection, commissioning, and maintenance of the transmitter. Qualified personnel are persons who have experience in installation, electrical wiring connection, commissioning, and operation of the transmitter or similar devices, and hold the necessary qualifications such as:

— Training or instruction, i.e., authorization to operate and maintain devices or systems according to safety engineering standards for electrical circuits, high pressures, and aggressive media

— Training or instruction in accordance with safety engineering standards regarding maintenance and use of adequate safety systems.

For safety reasons, ABB draws your attention to the fact that only sufficiently insulated tools conforming to DIN EN 60900 may be used.

Since the transmitter may form part of a safety chain, we recommend replacing the device immediately if any defects are detected. In case of use in Hazardous Area non sparking tools only must be employed.

In addition, you must observe the relevant safety regulations regarding the installation and operation of electrical systems, and the relevant standards, regulations and guidelines about explosion protection.

Warning. The device can be operated at high levels of pressure and with aggressive media. As a result, serious injury or significant property damage may occur if this device is operated incorrectly.

3.2 2.2 Improper use

It is prohibited to use the device for the following purposes:

— As a climbing aid, e.g., for mounting purposes

— As a support for external loads, e.g., as a support for pipes.

— Adding material, e.g., by painting over the name plate or welding/soldering on parts

— Removing material, e.g., by drilling the housing.

Repairs, alterations, and enhancements, or the installation of replacement parts, are only permissible as far as these are described in the manual. Approval by ABB must be requested for any activities beyond this scope. Repairs performed by ABB-authorized centers are excluded from this.

3.3 2.3 Technical limit values

The device is designed for use exclusively within the values stated on the name plates and within the technical limit values specified on the data sheets.

The following technical limit values must be observed:

— The Maximum Working Pressure may not be exceeded.

— The Maximum ambient operating temperature may not be exceeded.

— The Maximum process temperature may not be exceeded.

— The housing protection type must be observed.

3.4 2.4 Warranty prevision

Using the device in a manner that does not fall within the scope of its intended use, disregarding this manual, using underqualified personnel, or making unauthorized alterations, releases the manufacturer from any liability for any resulting damage. This makes the manufacturer’s warranty null and void.

3.5 2.5 Use of instruction

Danger – <Serious damage to health/risk to life>. This message indicates that an imminent risk is present. Failure to avoid this will result in death or serious injury.

Caution – <Minor injuries>. This message indicates a potentially dangerous situation. Failure to avoid this could result in minor injuries. This may also be used for property damage warnings.

Important. This message indicates indicates operator tips or particularly useful information. It does not indicate a dangerous or damaging situation.

Warning – <Bodily injury>. This message indicates a potentially dangerous situation. Failure to avoid this could result in death or serious injury

Attention – <Property damage>. This message indicates a potentially damaging situation. Failure to avoid this could result in damage to the product or its surrounding area.

3.6 2.6 Operator liability

Prior to using corrosive and abrasive materials for measurement purposes, the operator must check the level of resistance of all parts coming into contact with the materials to be measured.

ABB will gladly support you in selecting the materials, but cannot accept any liability in doing so.

The operators must strictly observe the applicable national regulations with regard to installation, function tests, repairs, and maintenance of electrical devices.

3.7 2.7 Qualified personnel

Installation, commissioning, and maintenance of the device may only be performed by trained specialist personnel who have been authorized by the plant operator. The specialist personnel must have read and understood the manual and comply with its instructions.

3.8 2.8 Returning devices

Use the original packaging or suitably secure shipping package if you need to return the device for repair or recalibration purposes. Fill out the return form (see the end of the document) and include this with the device.

According to EC guidelines and other local laws for hazardous materials, the owner of hazardous waste is responsible for its disposal. The owner must observe the proper regulations for shipping purposes.

All devices sent back to ABB must be free from any hazardous materials (acids, alkalis, solvents, etc.).

3.9 2.9 Disposal

ABB actively promotes environmental awareness and has an operational management system that meets the requirements of DIN EN ISO 9001:2000, EN ISO 14001:2004, and OHSAS 18001. Our products and solutions are intended to have minimum impact on the environment and persons during manufacturing, storage, transport, use and disposal.

This includes the environmentally friendly use of natural resources. ABB conducts an open dialog with the public through its publications.

This product/solution is manufactured from materials that can be reused by specialist recycling companies.

3.10 2.10 Information on WEEE Directive 2002/96/EC (Waste Electrical and Electronic Equipment)

This product or solution is not subject to the WEEE Directive 2002/96/EC or corresponding national laws (e.g., the ElektroG - Electrical and Electronic Equipment Act - in Germany). Dispose of the product/solution directly at a specialist recycling facility; do not use municipal garbage collection points for this purpose.

According to the WEEE Directive 2002/96/EC, only products used in private applications may be disposed of at municipal garbage facilities. Proper disposal prevents negative effects on people and the environment, and supports the reuse of valuable raw materials. ABB can accept and dispose of returns for a fee.

3.11 2.11 Transport and storage

— After unpacking the pressure transmitter, check the device for transport damage.

— Check the packaging material for accessories.

— During intermediate storage or transport, store the pressure transmitter in the original packaging only.

For information on permissible ambient conditions for storage and transport, see “Technical data”. Although there is no limit on the duration of storage, the warranty conditions stipulated on the order acknowledgment from the supplier still apply.

3.12 2.12 Safety information for electrical installation

Electrical connections may only be established by authorized specialist personnel in accordance with the electrical circuit diagrams. The applicable protection type may be affected. Ground the measurement system according to requirements.

3.13 2.13 Safety information for inspection and maintenance

Warning – Risk to persons. There is no EMC protection or protection against accidental contact when the housing cover is open. There are electric circuits within the housing which are dangerous if touched. Therefore, the auxiliary power must be switched off before opening the housing cover.

Warning – Risk to persons The device can be operated at high pressure and with aggressive media. Any process media released may cause severe injuries. Depressurize the pipeline/tank before opening the transmitter connection.

Corrective maintenance work may only be performed by trained personnel.

— Before removing the device, depressurize it and any adjacent lines or containers.

— Check whether hazardous materials have been used as materials to be measured before opening the device. Residual amounts of hazardous substances may still be present in the device and could escape when the device is opened.

— Within the scope of operator responsibility, check the following as part of a regular inspection:

Pressure-bearing walls/lining of the pressure device

Measurement-related function

Leak-tightness

Wear (corrosion)

4 3 Overview

4.1 3.1 Seal system

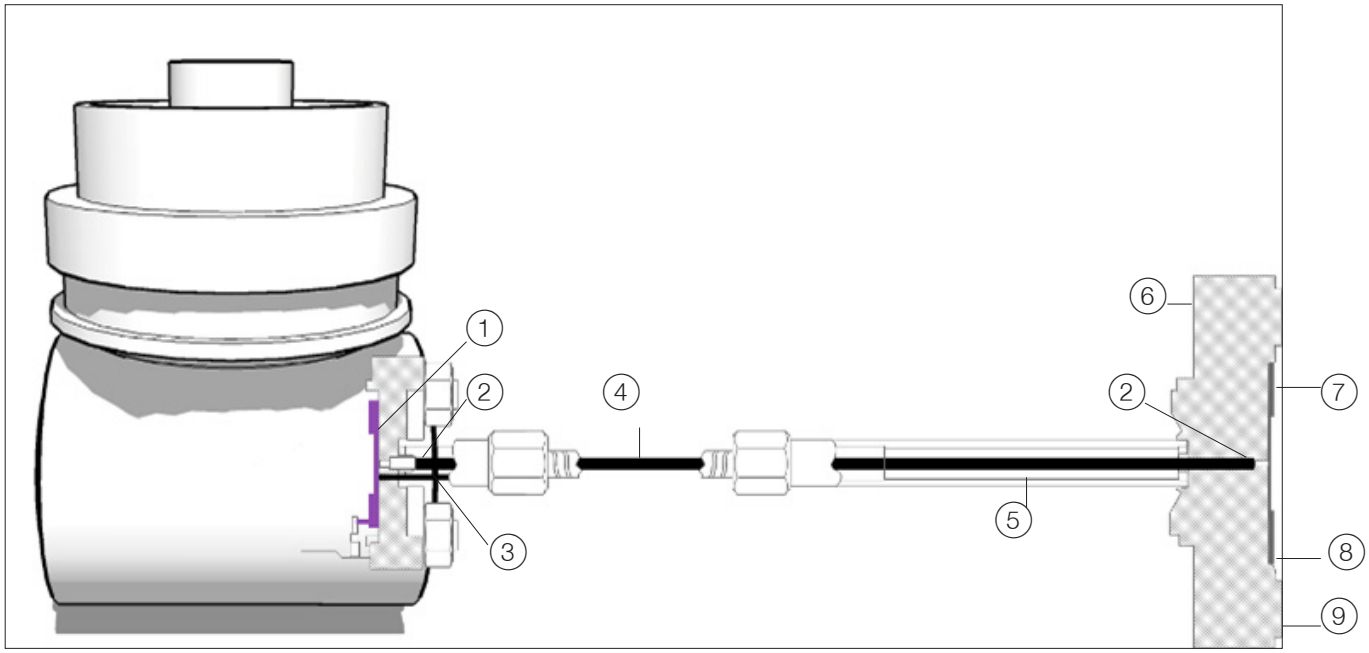
The S26 Series Seal System is a protective device used to isolate transmitters from the process fluid.

When used without diaphragm seals, these transmitters are generally connected to process piping or process vessel by impulse lines. The process fluid leaves its enclosure, fills the impulse lines, and enters the body of the transmitter. For certain applications, it is necessary to prevent the process fluid from leaving its enclosure. The seal system provides a flexible diaphragm seal between the process fluid and a liquid filled capillary tube connected to the body of the transmitter. The diaphragm isolates the process fluid while the filled capillary tube hydraulically transmits the process pressure to the transmitter body.

Some reasons why an isolating seal is required are:

- The process fluid is highly corrosive. Remote seals offer a much wider choice of corrosion resistant materials compared to conventional transmitters.
- The process fluid has solids in suspension or is highly viscous and can clog impulse lines.
- The process fluid can solidify in impulse lines or inside the transmitter body.
- The process fluid is too hazardous to enter the control area where the transmitter is located.
- The process temperature exceeds the recommended maximum or minimum limits for the transmitter.
- The application is interface level or density measurement. Remote seals offer the required constant and equal specific gravity of the pressure transfer fluid on the high and low sides of the transmitter.
- The transmitter body must be located away from the process for easier maintenance.

The S26 series is available in a variety of seal element types. They provide process connection to ANSI, JIS or EN pipe flanges, wedge flow elements, chemical tees, and threaded pipe fittings. Extended diaphragm remote seals are suitable for connection to 2-inch, 3-inch or 4-inch flanged tank nozzles or flanged tees permit the seal diaphragm to be located flush with the inside of a tank or pipe. Sanitary and sanitary aseptic type seals meet the stringent requirements of sanitary food, dairy, pharmaceutical, and Biotech applications. All sanitary seals comply with 3A Sanitary Standard No. 74-02. These remote seal systems feature unique all welded construction (see in Figures 1 and 2). This construction assures reliable operation over a wide range of operating temperatures and pressures. It is especially important in preventing air leakages when the system is operating under vacuum conditions.



1 Transducer isolation diaphragm | 2 Welding capillary | 3 Filling capillary | 4 Capillary tube | 5 Element stem | 6 Element flange | 7 Process diaphragm | 8 Welding | 9 Weld ring / gasket surface

Figure 1: Seai system components

4.2 3.1 Model codes

The S26 Series Seal Systems are available with a variety of remote seal constructions identified as follows:

- S26FA and S26FE: Fixed-flange seals according to ASME and EN standards
- S26RA, S26RE,S26RH and S26RJ: Rotating-flange seals according to ASME, EN, API and JIS standards
- S26MA and S26ME: Off-line flanged seals according to ASME and EN standards
- S26WA and S26WE: Wafer remote seals according to ASME and EN standards
- S26CN: Chemical tee remote seal
- S26JN: In-line seal
- S26KN: Pulp & Paper connection seal
- S26RR: Flanged remote seal – Ring Joint construction
- S26SS: Food and sanitary seal
- S26TT: Off-Line threaded connection seal
- S26UN: Union connection remote seal
- S26PN: Remote seal for Urea service
- S26BN: Button type remote seal
- S26VN: Saddle and socket seal

The S26 Series Seal Systems are used on the following transmitters:

- 266xR / 266xD (where x means “any letter”)

Differential pressure transmitters have one or two remote seals. Single sided differential pressure transmitters have a single remote seal for tank level applications. Gauge and absolute pressure transmitters have a single remote seal. The transmitter and seal system are identified by product code numbers which are stamped on the transmitter nameplate. An example of the product code stamping is as follows:

266DRHGSRRAH	/	S26WAHD5FSM2AASNNN
Transmitter Product Code		Seal System Product Code

The characters which comprise these code numbers identify specific product features. A detailed explanation of the code numbers together with physical and performance specifications for both the transmitter and seal system is provided in the product specification sheets.

5 4 Installation

5.1 4.1 General

The transmitters with remote seals are suitable for use on the following pressure and differential pressure measurement applications:

- FLOW MEASUREMENT
- LIQUID LEVEL MEASUREMENT
- INTERFACE LEVEL MEASUREMENT
- DENSITY MEASUREMENT
- GAUGE PRESSURE MEASUREMENT
- ABSOLUTE PRESSURE MEASUREMENT

Each application has certain unique requirements which influence the selection of the transmitter and seal locations. In general the flow and gauge pressure applications allow the greatest flexibility in selection of a location. Liquid level applications impose restrictions on the relative elevations of the transmitter and seals when the tank operates under vacuum and absolute pressure applications impose similar restrictions when the lower range value is less than atmospheric pressure (nominally 14.7 psia). Transmitters with remote seals measure pressure from two sources: the applied process pressure or differential pressure, and the head pressure developed by the weight of the liquid column in the seal system. The head pressures are a function of transmitter and seal locations as follows:

- Two Seals
  On a DP transmitter with a seal on both the high and low sides, the transmitter measures the head pressure resulting from any difference in elevation between the seals and the output change is directly proportional to the elevation difference. The head pressure has no effect on transmitter output when both seals are at the same elevation. Changing the elevation of the seals relative to the transmitter has no effect as long as the elevation of one seal relative to the other is not changed.
- One Seal
  On a transmitter with one seal, the head pressure from the seal system is measured directly. Any change in the elevation of the seal causes a change in the measured head pressure and the transmitter output changes in direct proportion to the elevation change.

Note. When handling and/or installing the transmitter with remote seal(s), please consider that the minimum bending radius of the capillary system is 10 cm (3.9 in).

For most flow, gauge pressure, and absolute pressure installations the effect of head pressure is relatively minor and can be canceled out by adjusting zero with the transmitter and seals in their installation position while a known process pressure is applied. For liquid level installations, head pressures have a more significant impact on calibration requirements because the nature of the installation requires a substantial difference in elevation between the high and low side seals. See the Liquid Level Measurement Section for more information.

5.2 4.2 Flow measurement

Differential pressure transmitters with two remote seals can be used for both horizontal and vertical flow measurement installations by mean of a Wedge Flow Element. In both horizontal and vertical installations, the transmitter can be placed in any convenient location either above or below the elevation of the seal elements. The high side seal element must be located on the upstream side of the flow restriction. To ensure accurate measurements on liquid flow applications, the flow restriction must be located in a section of the pipe line which remains full under all flow conditions.

- Horizontal Installation
  In a horizontal installation both seal elements are at the same elevation and head pressures resulting from the filling liquid are equal on the high and low side of the transmitter. Thus, the transmitter calibration can be zero based for this installation. If the process contains suspended solids, the seal elements should be located at the top of the pipe to avoid collection of solid material on the seal diaphragm surfaces.
- Vertical installation
  In a vertical installation, the elevation difference between the two seals applies a differential pressure when there is no flow. When the pipe is full at no flow the initial differential is a function of the distance between the seals and the difference in density between the process liquid and the fill liquid.

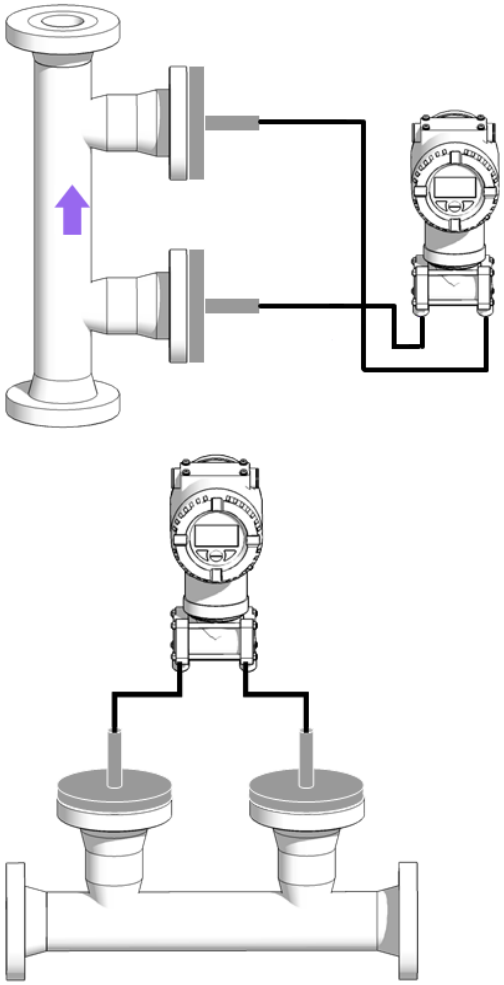


Figure 2: Primary element (Wedge) - vertical and horizontal installations for flow measurements

5.3 4.3 Liquid level measurement

A differential pressure transmitter with either one or two remote seals can be used for liquid level measurement on open tanks, closed tanks operating at pressures above atmospheric and closed tanks operating under vacuum.

Liquid level measurements are based on the height of a process liquid column with respect to predefined measurement reference points on the transmitter. The transmitter has three datum lines as follows:

- Primary Datum Line: located at the center of the seal system connection to the transmitter body.
- High Seal Datum Line: located at the center of the high side seal diaphragm.
- Low Seal Datum line: located at the center of the low side seal diaphragm.

5.3.1 4.3.1 Open Tank Installation

A transmitter with one remote seal can be used for open tank level measurement.

The seal is on the high side of the transmitter, and the seal element must be located near the bottom of the tank so that the high seal datum line is at or below the minimum level. The transmitter can be located either above or below the seal element. The low side of the transmitter must be vented to atmosphere.

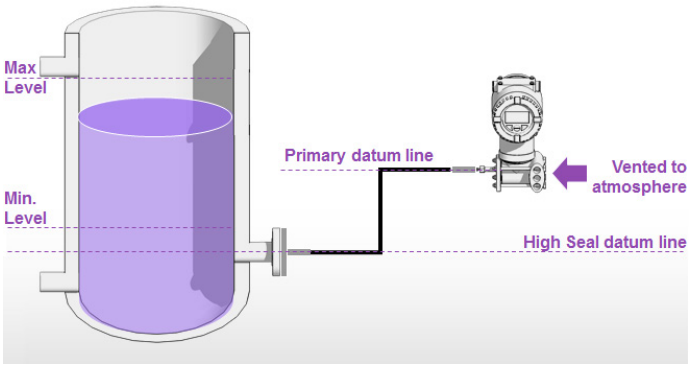


Figure 3: Level measurement of a liquid in an open tank

5.3.2 4.3.2 Closed Tank Installation – Pressure Service – Double Seal

When a transmitter with two remote seals is used to measure level in a pressurized tank, the high pressure side seal element must be located near the bottom of the tank.

The high seal datum line must be at or below the minimum level. The low side seal must be located near the top of the tank, and the low seal datum line must be at or above the maximum level.

The transmitter can be located between the seals, above both seals or below both seals on a pressure service installation.

The preferred location is mid way between the seal elements. This location minimizes the required capillary length, and usually provides the most uniform distribution of ambient temperatures across the capillary length.

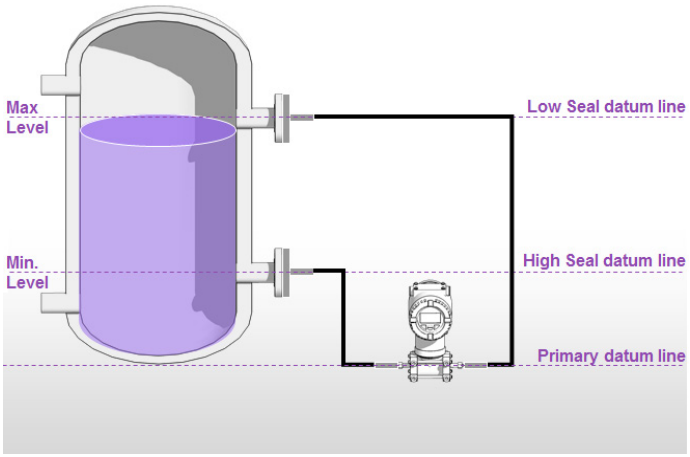


Figure 4: Level measurement of a liquid in a closed tank - vacuum or pressure service

Note. This installation requires a double-seal transmitter. The transmitter must be installed below the minimum level.

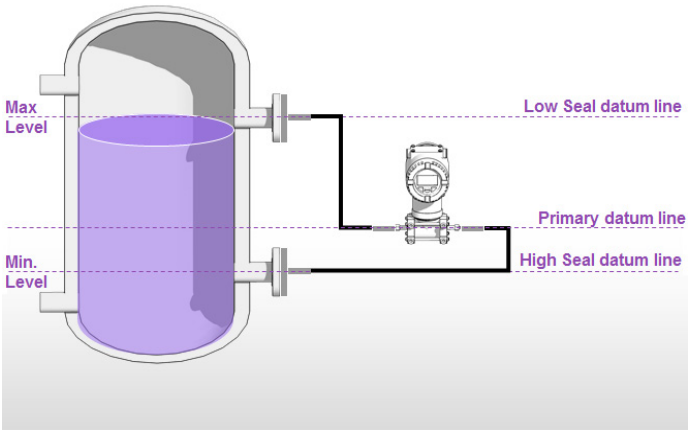


Figure 5: Level measurement of a liquid in a closed tank - pressure service only

Note. This installation requires a double-seal transmitter. The transmitter must be located between the taps of the tank.

5.3.3 4.3.3 Closed Tank Installation – Pressure Service – Single Seal

When a transmitter with one seal is used to measure level in a pressurized tank, a compensating leg must be connected between the vapor space at the top of the tank and the low side of the transmitter.

The remote seal is on the high side of the transmitter, and the seal element must be located near the bottom of the tank so that the high seal datum line is at or below the minimum level.

If the process vapor is not readily condensable, or if the compensating leg is at a higher temperature than the tank interior, a dry leg can be used. A trap installed at the bottom of the leg minimizes the possibility of condensate collecting in the transmitter body.

When the process vapor is condensable, a wet leg is recommended. The wet leg is filled with a suitable liquid to maintain a constant pressure on the low side of the transmitter. This approach avoids the problem of process vapor condensing and collecting in the compensating leg resulting in serious measurement error. The leg can be filled with process liquid or any liquid with a low vapor pressure relative to the process. A filling tee is required at the top of the leg. The wet leg can be avoided if the transmitter can be located near the top of the tank, so that condensate drains back into the tank.

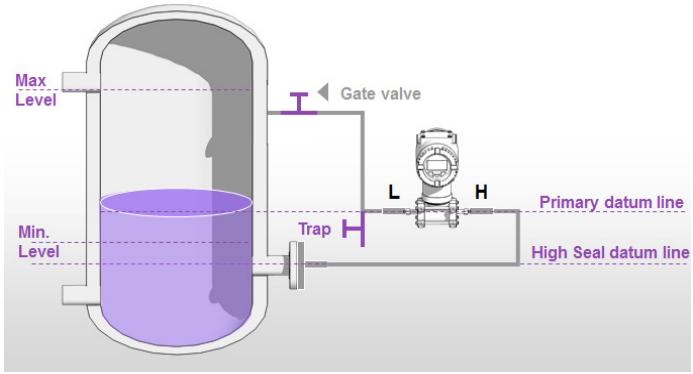


Figure 6: Level measurement of a liquid in a closed tank - pressure service only - condensate trap as option

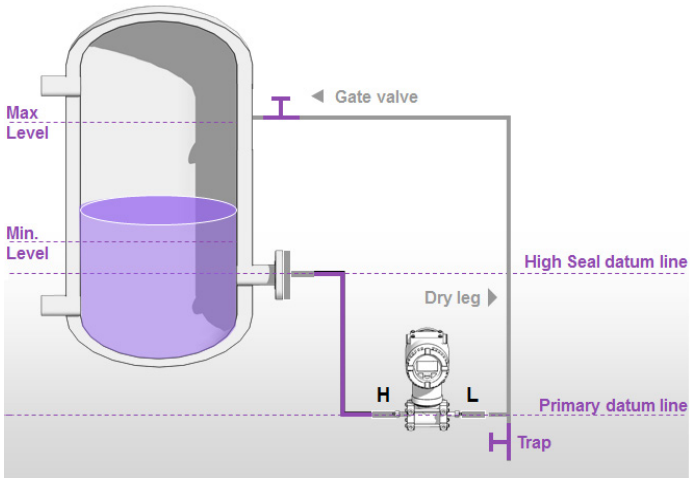


Figure 7: Level measurement of a liquid in a closed tank - vacuum or pressure service - dry leg

5.3.4 4.3.4 Closed Tank Installation – Vacuum Service

When the transmitter is used on a tank in which the operating pressure range includes pressures below atmospheric, it is essential that the transmitter be located below the high-pressure seal datum line. The recommended minimum distance between the primary datum line and the high seal datum line is 1ft (0.3m). Seal element location requirements for vacuum service are the same as for pressure service.

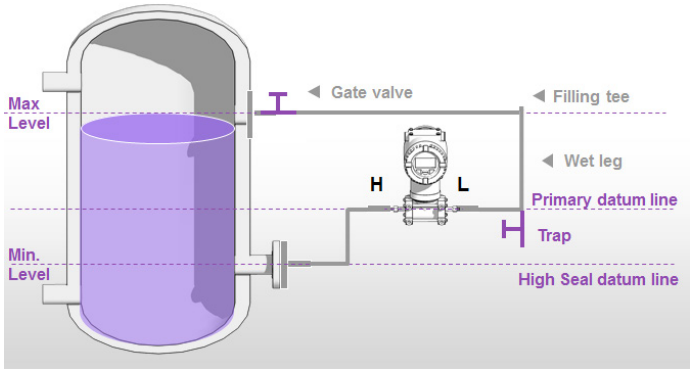


Figure 8: Level measurement of a liquid in a closed tank - pressure service only - wet leg installation

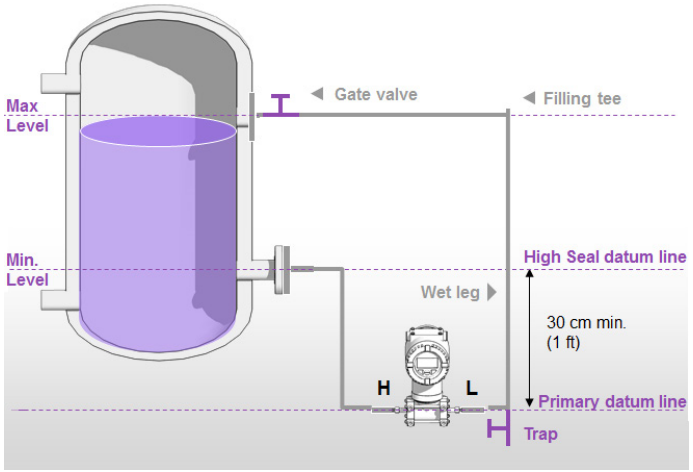


Figure 9: Level measurement of a liquid in a closed tank - vacuum or pressure service - wet leg installation

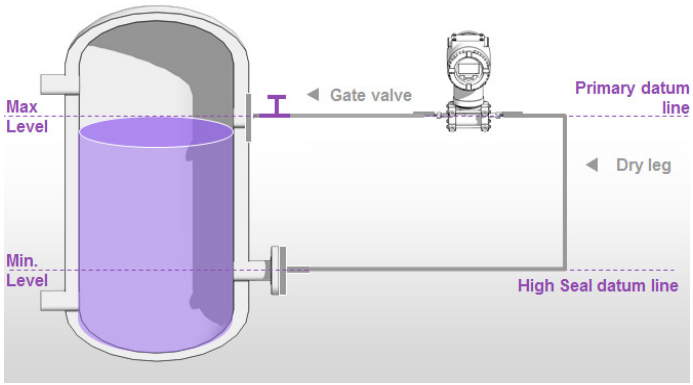


Figure 10: Level measurement of a liquid in a closed tank - vacuum or pressure service - dry leg installation

5.3.5 4.3.5 Calibration Requirements

The location of the high side seal near the bottom of the tank and the low seal near the top of the tank provides increasing transmitter output for increasing liquid level. The actual differential pressure applied to the transmitter is up to maximum value only when the process is at its minimum level due to the elevation difference between the seals. As the tank fills, the process liquid tends to cancel the initial seal system head pressure and the measured differential pressure is therefore at the minimum value when the level reaches its maximum value.

Note also that the maximum differential is applied from the low side because the low seal has the higher elevation.

To accommodate the head pressure conditions imposed by a liquid level installation, the transmitter zero must be adjusted to elevate the output. This cancels the effect of the low side head pressure and provides zero percent output for the minimum level condition. For example, the range values for a level installation might be -120 to -5 inches of water. This indicates that the level change (span) is 115 inches of water; the differential at minimum level is -120 and at maximum level is -5 inches of water.

The minus sign indicates positive differential pressures applied to the low side of the transmitter.

Determination of the span and range values for a specific installation must take into account the level change, elevation difference between the seals, height of the process liquid above the high seal datum line at minimum level, and the specific gravity of the process liquid and the fill liquid in the seal system.

5.4 4.4 Interface level measurement

A differential pressure transmitter with two remote seals can be used to measure interface level. The high side seal element must be located near the bottom of the tank. The high seal datum line must be at or below the lowest interface elevation. The low side seal must be located near the top of the tank, and the low seal datum line must be at or above the highest interface elevation. The minimum level of liquid in the tank must be above the low seal element under all interface conditions. The transmitter can be located between the seals, above both seals or below both seals when the tank is open or operating under positive pressure. The preferred location for 266DLH the transmitter is directly mounted on the bottom connection. This location enables the user to eliminate the capillary and consequently allows a more accurate measurement. If the operating pressure range includes pressures below atmospheric, the transmitter must be located below the high side seal (refer to the vacuum service information in Liquid Level Measurement Section).

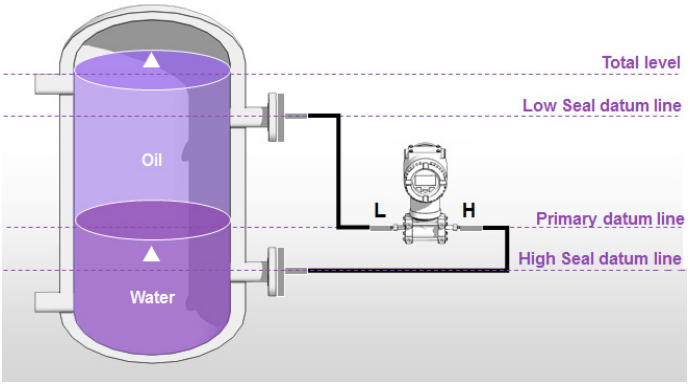


Figure 11: Interface level measurement

Note. Total liquid level must always be above the top transmitter tap. Both the densities must be predetermined and should remain constant for accurate measurement

5.5 4.5 Density measurement

A differential pressure transmitter with two remote seals can be used to measure liquid density or specific gravity.

The high side seal element must be located near the bottom of the tank, and the low side seal must be located near the top of the tank. The minimum level of liquid in the tank must be above the low seal element under all density conditions. The transmitter can be located between the seals, above both seals or below both seals when the tank is open or operating under positive pressure. The preferred location is mid way between the seal elements. This location minimizes the required capillary length, and usually provides the most uniform distribution of ambient temperatures across the capillary length. If the operating pressure range includes pressures below atmospheric, the transmitter must be located below the high side seal (refer to the vacuum service information in Liquid Level Measurement Section).

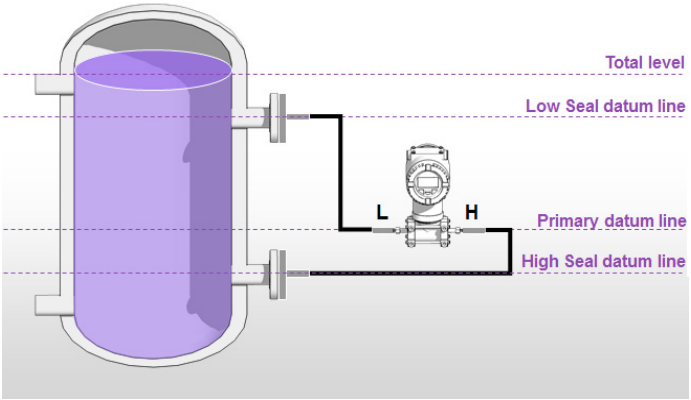


Figure 12: Density or specific gravity measurement

Note. For this kind of measurement, it is essential to minimizes the required capillary length as well as grant a uniform distribution of the ambient temperature.

5.6 4.6 Gauge pressure measurement

A gauge pressure transmitter with a remote seal can be used for measurement of pressure in either a process pipe or tank. Locate the remote seal in the side or top of the pipe to avoid collection of sediment on the seal diaphragm.

5.6.1 4.6.1 Pressure Service

When the operating pressure range has a minimum value above atmospheric pressure (0 psig), the transmitter can be placed in any convenient location, either at the same elevation as the remote seal, above or below the seal.

5.6.2 4.6.2 Vacuum Service

When the operating process pressure range includes pressures below atmospheric, it is essential that the transmitter be located below the elevation of the seal element to ensure that the pressure in the transmitter body is always greater than 0 psia. The recommended minimum distance between the transmitter datum line and the seal datum line is 30cm (1ft).

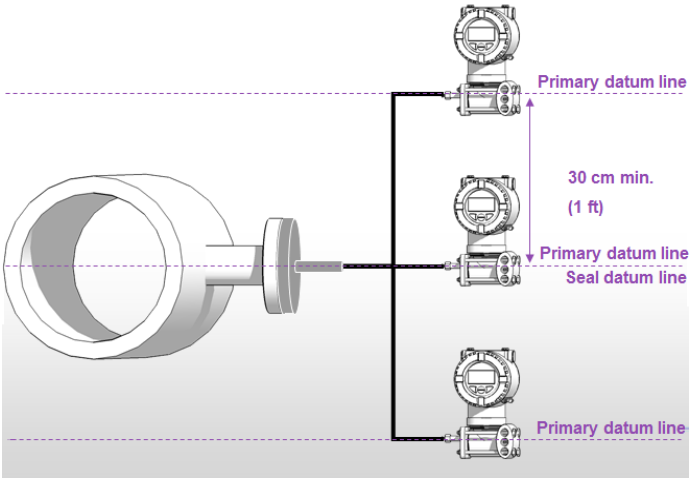


Figure 13: Possible installation for gauge and absolute pressure measurement

Note. The minimum value is to be above the atmospheric pressure (0 psig). Transmitter can be placed in any convenient location.

5.7 4.7 Absolute pressure measurement

An absolute pressure transmitter with a remote seal can be used for measurement of absolute pressure in either a process pipe or tank. Locate the seal element in the side or top of the pipe to avoid collection of sediment on the seal diaphragm. When the operating absolute pressure range has a minimum value above atmospheric pressure (nominally 14.7 psia), the transmitter can be placed in any convenient location, either at the same elevation as the remote seal, above the seal, or below the seal. When the pressure range includes pressures below atmospheric, the transmitter datum line must be below the elevation of the seal element to ensure that the pressure in the transmitter body is always greater than 0 psia. The recommended minimum distance between the transmitter datum line and the seal datum line is 30 cm (1ft).

5.8 4.8 Mounting a diaphragm-seal(s)-equipped transmitter

The transmitter with remote seals can be mounted on a 60 mm (2 in.) horizontal or vertical pipe using the optional pipe mounting bracket available with all 2600T series transmitters. Direct-mount seal transmitters, instead, can be installed without the bracket kit since a mating flange is generally provided.

6 5 Diaphragm seal models

6.1 5.1 Wafer Remote Seal (S26WA and S26WE)

The wafer remote seal is designed to be clamped between two ASME (S26WA) or EN raised face flanges (S26WE). The diaphragm side of the seal faces the process flange and a back-up flange is used on the other side of the seal. The S26WA wafer seals can be used with: ANSI CL150, CL300, CL600, CL900 or CL1500 flanges whereas the S26WE with EN DN 10-40, DN64-160.

For mounting dimensions for the wafer remote seal are listed in this chapter. The required back-up flange can be supplied by the user, or it can be obtained as an option with the seal system. Bolts, nuts, and a flange gasket must be supplied by the user.

Note. In case of DP style transmitter with one remote seal, please refer to “Liquid Level Measurement” Section.

Model S26WA (manufactured according to ASME B16.5) is characterized by a maximum working pressure up to 41.37 MPa (413.7 bar or 6000 psi). Model S26WE (manufactured according to EN 1092-1) can have different pressure limits because of the relevant forms:

— Form B1 up to 40 MPa (400 bar or 5800 psi)

— Form D up to 16 MPa (160 bar or 2320 psi)

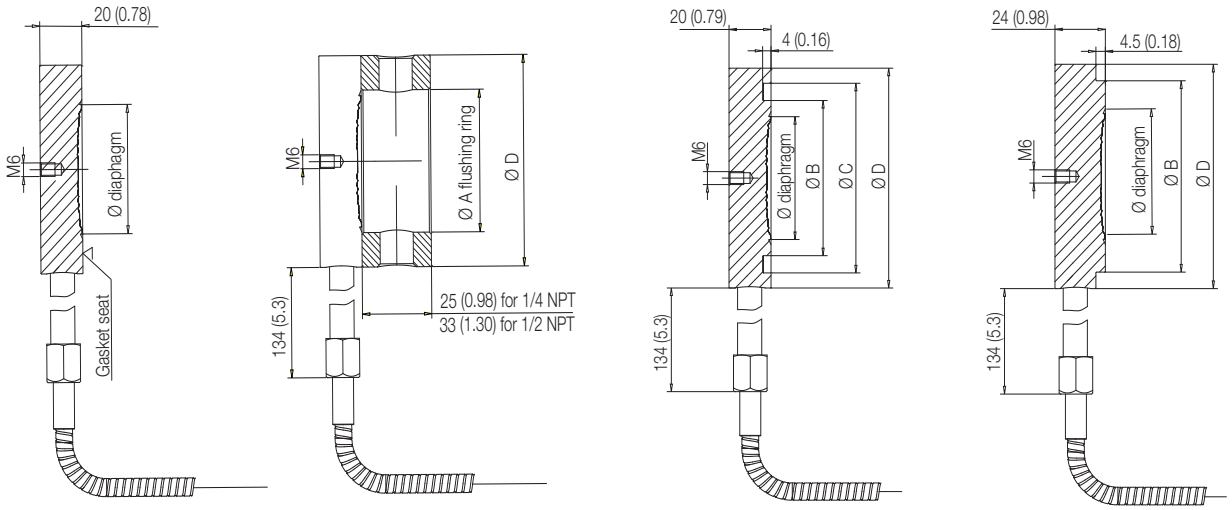
— Form E up to 10 MPa (100 bar or 1450 psi)

Connect the seal element as follows:

1. Remove protective covering from seal.
2. Install a gasket between the flange and the seal surface.
3. Clamp the seal between two flanges (see Figure 12). Be sure that the gasket is properly positioned between the process flange and the seal element gasket surface.
4. Tighten bolts firmly and uniformly in accordance with standard industrial flange bolting practices.

For vacuum service recommendations, temperature limits, gasket finish, temperature effects and configuration, please refer to product datasheet.

Figure 14: Wafer / Pancake style remote seal



ASME and EN 1092-1 Form B1 smooth and serrated ..... EN 1092-1 Form D EN 1092-1 Form E

Size/Rating	Dimensions mm (in) for S26W					
	diaphragm (dia)		A flushing ring internal dia	B (dia)	C (dia)	D (dia)
	std. thickness	low thickness				
1 1/2 in. ASME B16.5	47 (1.85)	47 (1.85)	52 (2.05)	NA	NA	73 (2.87)
2 in. ASME B16.5	60 (2.36)	58 (2.28)	62 (2.44)	NA	NA	92 (3.62)
3 in. ASME B16.5	89 (3.5)	75 (2.95)	92 (3.62)	NA	NA	127 (5)
DN 40 EN 1092-1 Form B1	47 (1.85)	47 (1.85)	52 (2.05)	NA	NA	88 (3.46)
DN 50 EN 1092-1 Form B1	60 (2.36)	58 (2.28)	62 (2.44)	NA	NA	102 (4.02)
DN 80 EN 1092-1 Form B1	89 (3.5)	75 (2.95)	92 (3.62)	NA	NA	138 (5.43)
DN 40 EN 1092-1 Form D	47 (1.85)	47 (1.85)	NA	60 (2.36)	76 (2.99)	88 (3.46)
DN 50 EN 1092-1 Form D	60 (2.36)	58 (2.28)	NA	72 (2.83)	88 (3.46)	102 (4.02)
DN 80 EN 1092-1 Form D	89 (3.5)	75 (2.95)	NA	105 (4.13)	121 (4.76)	138 (5.43)
DN 40 EN 1092-1 Form E	47 (1.85)	47 (1.85)	NA	75 (2.95)	NA	88 (3.46)
DN 50 EN 1092-1 Form E	60 (2.36)	58 (2.28)	NA	87 (3.42)	NA	102 (4.02)
DN 80 EN 1092-1 Form E	89 (3.5)	75 (2.95)	NA	120 (4.72)	NA	138 (5.43)

6.2 5.2 Chemical Tee Remote Seal (S26CN)

The chemical tee remote seal is designed to connect to a 1630L Wedge Flow Element or to any process fitting with appropriate mating surfaces.

Chemical tee elements cannot be connected to a standard ASME or EN pipe flange.

Please note that the pressure limit for a transmitter with this remote seal is determined by the seal flange. Maximum working pressure for the flange is 2 MPa (20 bar or 290 psi).

The gaskets required to connect the seal are available with the seal element system and can be manufactured either in PTFE or in graphite. Their relevant process temperature limits are listed in the product datasheet.

The eight cap screws required to connect each seal are supplied with the wedge flow element. These gaskets and bolts have been specifically selected to meet the sealing and pressure rating requirements of the chemical tee element. Substitution of these supplied elements with other selected by the user is not recommended.

Note. If the transmitter is a DP with one remote seal for liquid level measurement, refer to Section “Connecting the Low Side Compensating Leg on DP with One Seal” before connecting the seal.

Connect the seal as follows:

1. Remove protective covering from seal.
2. Place the gasket on sealing surface and insert seal into connection opening.
3. Insert 8 cap screws and finger tighten each screw.
4. Following a diagonal sequence, tighten each cap screw to a torque of 12.4 Nm.

If you experience a large Zero shift due to temperature change or erratic output:

1. Take the chemical tee seals and mount them face up several feet above the transmitter.
2. Wait an hour.
3. With your thumbs at the”9 o’clock and 3 o’clock” positions on a single diaphragm, lightly apply thumb pressure alternating right thumb/left thumb. As you press with the right, the left side of the diaphragm should rise evenly.

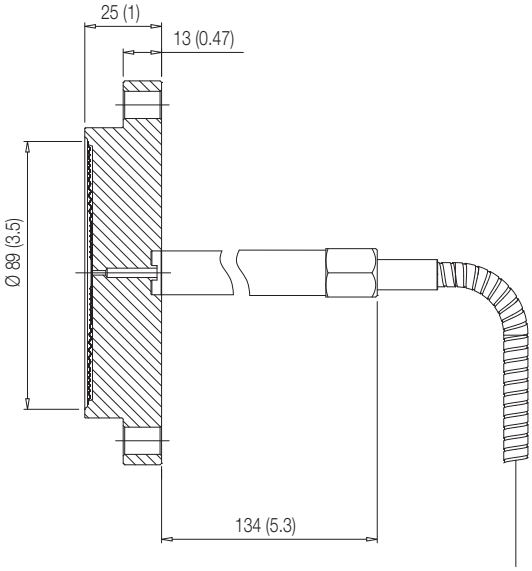
If it does not rise then there is a lack of fill. Replace the seal.

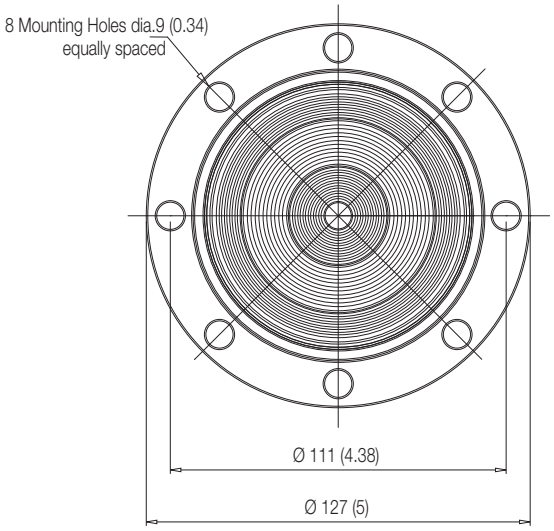
If it rises and then snaps (like an oil can) then the diaphragm has been stressed. Replace the seal.

4. Lightly tap the diaphragms with the flat part of your fingernail. A dull thud is heard when fill is behind the diaphragm.

If there is air present, the sound will be “Tinny”. Replace the seal.

Figure 15: Chemical Tee remote seal





This kind of diaphragm seal has been designed to be connected to ABB Wedge primary element model WRC.

For vacuum service recommendations, process temperature limits, temperature effects and configuration, please refer to product datasheet.

6.3 5.3 Rotating flange diaphragm seals – flush and extended (S26RA, S26RE, S26RH and S26RJ)

The extended and flush diaphragm remote seal is designed to connect to flanged pipe fitting, according to ASME B16.5 (S26RA), EN 1092-1 (S26RE), JIS B 2220 standards (S26RJ) or ISO 10423 (S26RH).

For liquid level measurement installations the seal connects to a flanged tank nozzle, compliant to the relevant standard.

The sealing is provided by a selectable smooth or serrated gasket seat surface finish. The mounting flange is of rotating type and can be supplied on carbon steel or in stainless steel AISI 316.

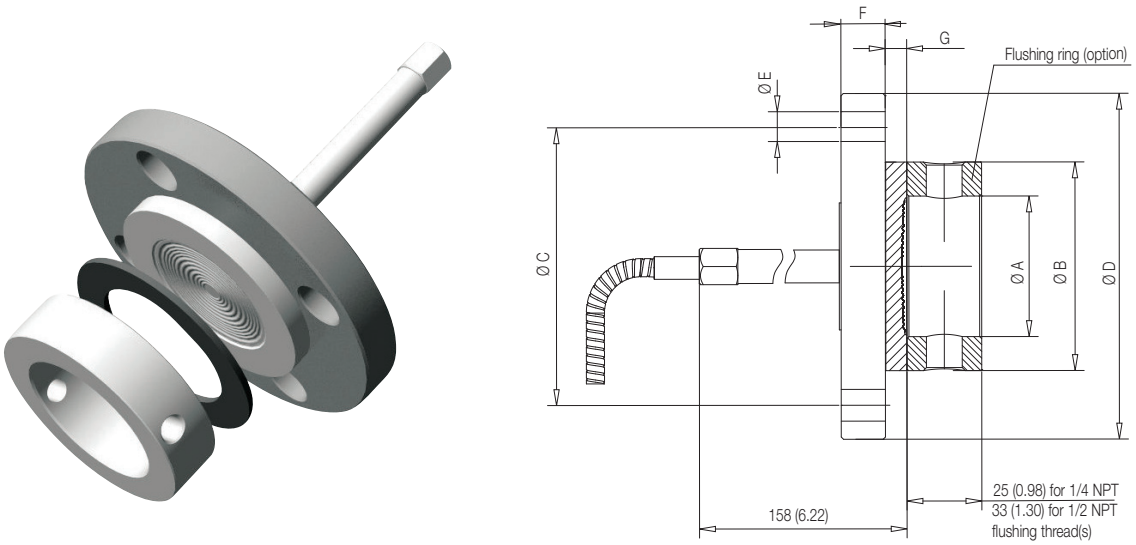


Figure 15: Flush rotating-flange seals (flushing ring as an option)

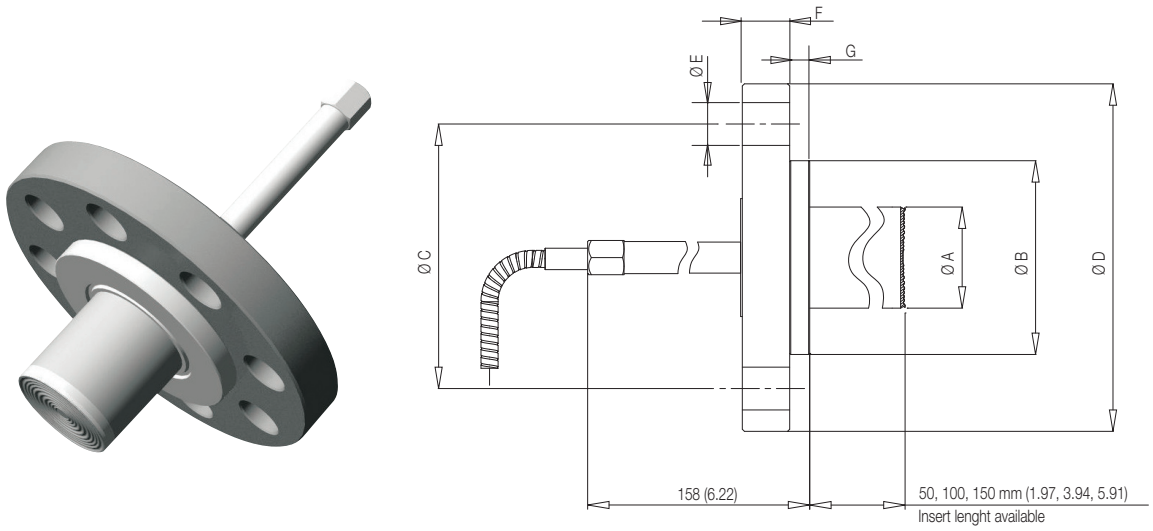


Figure 16: Extended rotating-flange seals

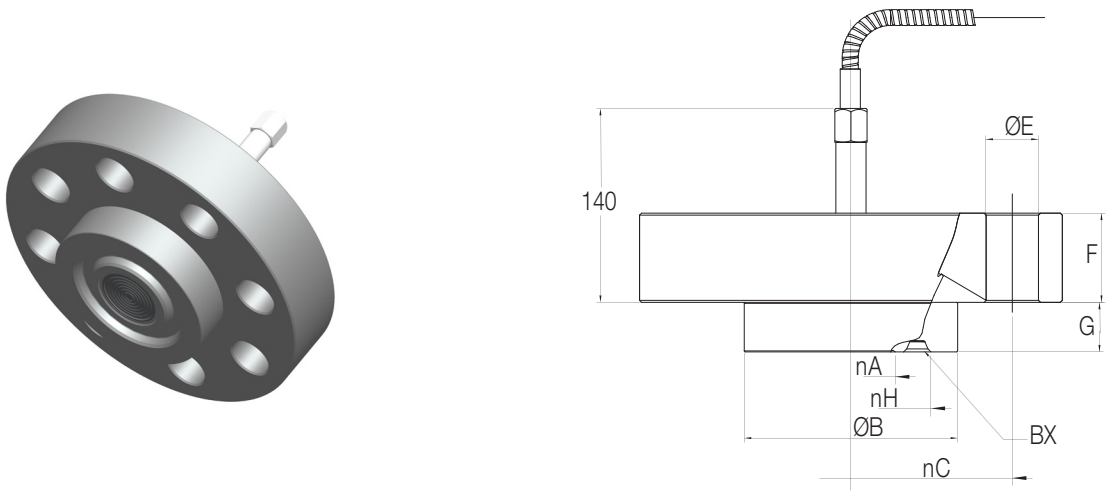


Figure 17: Flush rotating-fange (API) ring-joint construction

Size/Rating	Dimensions mm (in) for S26RA										
	A (dia)				B (dia)	C (dia)	D (dia)	E (dia)	F (Note 1)	G	N° of holes
	extended diaphragm	flush diaphragm std.	flush diaphragm low thick.	flushing ring internal dia							
2 in. ASME CL 150	48 (1.9)	60 (2.36)	58 (2.28)	62 (2.44)	92 (3.62)	120.65 (4.75)	152.4 (6)	19.1 (0.79)	17.5 (0.6)	9.5 (0.37)	4
2 in. ASME CL 300	48 (1.9)	60 (2.36)	58 (2.28)	62 (2.44)	92 (3.62)	127 (5)	165.1 (6.5)	19.1 (0.79)	20.8 (0.8)	9.5 (0.37)	8
2 in. ASME CL 600	NA	60 (2.36)	58 (2.28)	62 (2.44)	92 (3.62)	127 (5)	165.1 (6.5)	19.1 (0.79)	25.4 (1)	9.5 (0.37)	8
2 in. ASME CL 900	NA	60 (2.36)	58 (2.28)	62 (2.44)	92 (3.62)	165 (6.5)	215.9 (8.5)	26 (1.02)	38.1 (1.5)	9.5 (0.37)	8
2 in. ASME CL 1500	NA	60 (2.36)	58 (2.28)	62 (2.44)	92 (3.62)	165 (6.5)	215.9 (8.5)	26 (1.02)	38.1 (1.5)	9.5 (0.37)	8
3 in. ASME CL 150	72 (2.83)	89 (3.5)	75 (2.95)	92 (3.62)	127 (5)	152.4 (6)	190.5 (7.5)	19.1 (0.79)	22.4 (0.88)	9.5 (0.37)	4
3 in. ASME CL 300	72 (2.83)	89 (3.5)	75 (2.95)	92 (3.62)	127 (5)	168.15 (6.62)	209.6 (8.25)	22.4 (0.88)	26.9 (1.1)	9.5 (0.37)	8
3 in. ASME CL 600	NA	89 (3.5)	75 (2.95)	92 (3.62)	127 (5)	168.15 (6.62)	209.6 (8.25)	22.4 (0.88)	31.8 (1.3)	9.5 (0.37)	8
3 in. ASME CL 900	NA	89 (3.5)	75 (2.95)	92 (3.62)	127 (5)	190.5 (7.5)	241 (9.48)	26 (1.02)	38.1 (1.5)	9.5 (0.37)	8
3 in. ASME CL1500	NA	89 (3.5)	75 (2.95)	92 (3.62)	127 (5)	203.2 (8)	266.7 (10.5)	31.75 (1.25)	47.7 (1.88)	9.5 (0.37)	8
4 in. ASME CL 150	94 (3.7)	89 (3.5)	75 (2.95)	92 (3.62)	157.2 (6.2)	190.5 (7.5)	228.6 (9)	19.1 (0.79)	22.4 (0.88)	9.5 (0.37)	8
4 in. ASME CL 300	94 (3.7)	89 (3.5)	75 (2.95)	92 (3.62)	157.2 (6.2)	200.2 (7.88)	254 (10)	22 (0.86)	30.2 (1.19)	9.5 (0.37)	8

Size/Rating	Dimensions mm (in) for S26RE										
	A (dia)				B (dia)	C (dia)	D (dia)	E (dia)	F (Note 2)	G	N° of holes
	extended diaphragm	flush diaphragm std.	flush diaphragm low thick.	flushing ring internal dia							
DN 50 EN PN 16	48 (1.9)	60 (2.36)	58 (2.28)	62 (2.44)	102 (4.02)	125 (4.92)	165 (6.5)	18 (0.71)	15 (0.58)	9.5 (0.37)	4
DN 50 EN PN 40	48 (1.9)	60 (2.36)	58 (2.28)	62 (2.44)	102 (4.02)	125 (4.92)	165 (6.5)	18 (0.71)	18 (0.71)	9.5 (0.37)	4
DN 50 EN PN 63	NA	60 (2.36)	58 (2.28)	62 (2.44)	102 (4.02)	135 (5.31)	180 (7.08)	22 (0.86)	23 (0.9)	9.5 (0.37)	4
DN 50 EN PN 100	NA	60 (2.36)	58 (2.28)	62 (2.44)	102 (4.02)	145 (5.71)	195 (7.67)	26 (1.02)	27 (1.06)	9.5 (0.37)	4
DN 80 EN PN 16	72 (2.83)	89 (3.5)	75 (2.95)	92 (3.62)	138 (5.43)	160 (6.3)	200 (7.87)	18 (0.71)	17 (0.67)	9.5 (0.37)	8
DN 80 EN PN 40	72 (2.83)	89 (3.5)	75 (2.95)	92 (3.62)	138 (5.43)	160 (6.3)	200 (7.87)	18 (0.71)	21 (0.83)	9.5 (0.37)	8
DN 80 EN PN 63	NA	89 (3.5)	75 (2.95)	92 (3.62)	138 (5.43)	170 (6.7)	215 (8.46)	22 (0.86)	25 (0.98)	9.5 (0.37)	8
DN 80 EN PN 100	NA	89 (3.5)	75 (2.95)	92 (3.62)	138 (5.43)	180 (7.08)	230 (9.05)	26 (1.02)	33 (1.3)	9.5 (0.37)	8
DN 100 EN PN 16	94 (3.7)	89 (3.5)	75 (2.95)	92 (3.62)	158 (6.22)	180 (7.08)	220 (8.66)	18 (0.71)	17 (0.67)	9.5 (0.37)	8
DN 100 EN PN 40	94 (3.7)	89 (3.5)	75 (2.95)	92 (3.62)	162 (6.38)	190 (7.48)	235 (9.25)	22 (0.86)	21 (0.83)	9.5 (0.37)	8

Size/Rating	Dimensions mm (in) for S26RJ							
	A (dia) flush diaphragm	B (dia)	C (dia)	D (dia)	E (dia)	F (Note 3)	G	N° of holes
A50 Class 10K	60 (2.36)	96 (3.78)	120 (4.72)	155 (6.1)	19 (0.75)	16 (0.63)	9.5 (0.37)	4
A50 Class 20K	60 (2.36)	96 (3.78)	120 (4.72)	155 (6.1)	19 (0.75)	18 (0.71)	9.5 (0.37)	8
A50 Class 40K	60 (2.36)	104.3 (4.11)	130 (5.12)	165 (6.5)	19 (0.75)	26 (1.02)	9.5 (0.37)	8
A80 Class 10K	89 (3.5)	126 (4.96)	150 (5.91)	185 (7.28)	19 (0.75)	18 (0.71)	9.5 (0.37)	8
A80 Class 20K	89 (3.5)	132 (5.2)	160 (6.3)	200 (7.87)	23 (0.91)	22 (0.87)	9.5 (0.37)	8
A80 Class 40K	89 (3.5)	139.4 (5.49)	170 (6.69)	210 (8.27)	23 (0.91)	32 (1.26)	9.5 (0.37)	8
A100 Class 10K	89 (3.5)	151 (5.94)	175 (6.89)	210 (8.27)	19 (0.75)	18 (0.71)	9.5 (0.37)	8
A100 Class 20K	89 (3.5)	160 (6.3)	185 (7.28)	225 (8.86)	23 (0.91)	24 (0.94	9.5 (0.37)	8

Size/Rating	Dimensions mm (in) for S26RH									
	A (dia)	B (dia)	C (dia)	D (dia)	E (dia)	F	G	H (dia)	BX	N° of holes
1” -13/16	40 (1.57)	105.5 (4.15)	146.1 (5.75)	185 (7.3)	23 (0.9)	42.1 (1.65)	25 (0.98)	77.77 (3.06)	BX 151	8
1” -13/16 API 15000	40 (1.57)	105.5 (4.15)	160.3 (6.31)	210 (8.2)	26 (1.02)	45 (1.77)	25 (0.98)	77.77 (3.06)	BX 151	8
2” 1/16 API 10000	50 (1.96)	112.5 (4.43)	158.8 (6.25)	200 (7.87)	23 (0.9)	44.1 (1.73)	25 (0.98)	86.23 (3.39)	BX 152	8
2” 1/16 API 15000	50 (1.96)	112.5 (4.43)	174.6 (6.87)	220 (8.66)	26 (1.02)	50.8 (2)	25 (0.98)	86.23 (3.39)	BX 152	8

Note 1 - Flange thickness tolerance is +3.0 / -0.0 mm (+0.12 / 0.0 in.).
Note 2 - Flange thickness tolerance is +1.0 / -1.3 mm (+0.04 / 0.05 in.) up to 18 mm or ±1.5 mm (±0.06 in.) from 18 to 50 mm from 18 to 50 mm.
Note 3 - Flange thickness tolerance is +1.5 / -0.0 mm (+0.06 / 0.0 in.) up to Class 20K or +2.0 / -0.0 mm (+0.08 / 0.0 in.) from Class 20K to Class 50K.

6.4 5.4 Rotating flange diaphragm seal - Ring Joint (S26RR)

The flanged flush diaphragm remote seal – ring joint is designed to connect to ASME flanged pipe fitting. On the 1 in. seal the process flange and nuts are supplied by the user. On the 1-1/2 in. and 2 in. seals the process flange, bolts and nuts are supplied by the user. A user-supplied gasket must be installed between the process pipe flange and the lower housing of each seal.

These seals are available with a flushing connection in the lower housing. The connection provides a 1/4 in. NPT port into the cavity around the seal diaphragm to permit flushing to remove trapped solids, when necessary. The flushing connection also provides a means of checking calibration without disconnecting the element. A gate or ball valve installed in the process line near the seal connection allows the process to be isolated and calibration pressure can then be applied via the flushing connection. Use of a gate or ball type valve avoids restricting the process line during normal operation.

Connect the seal as follows:

1. Install a gasket between the process flange and the seal element gasket surface.
2. Bolt the seal to the process flange.
3. Tighten bolts (nuts on 1 in. seal) firmly and uniformly in accordance with standard industrial flange bolting practices.
4. If the seal has a flushing connection, connect a flushing line with appropriate valving to the 1/4 in. connection.

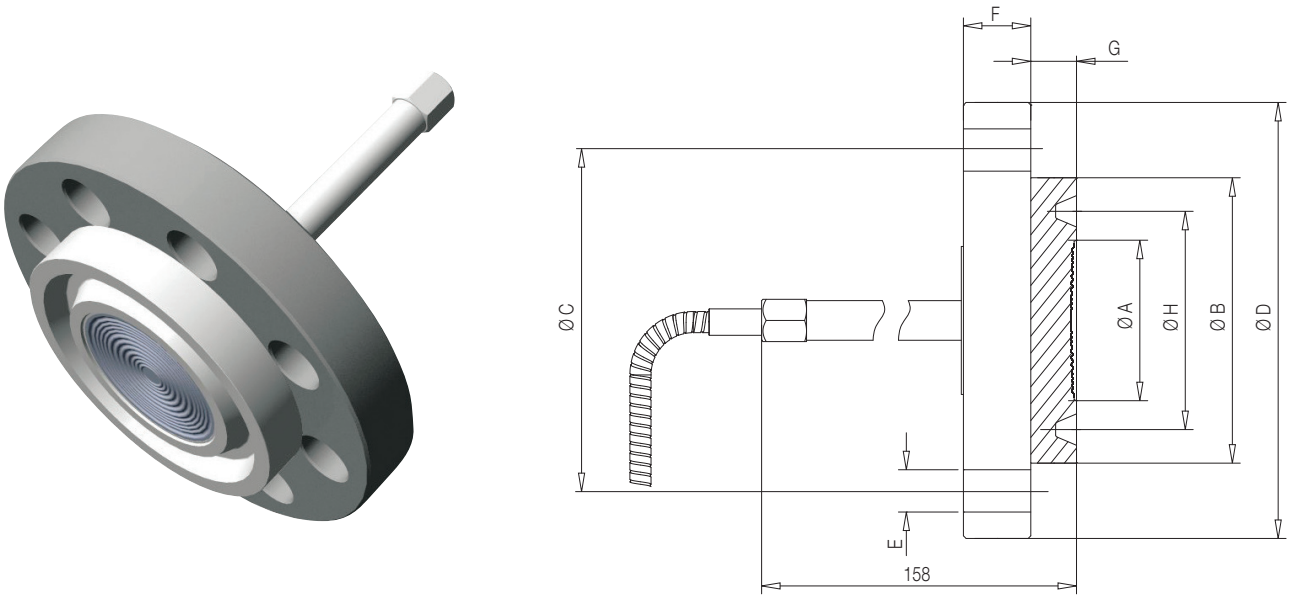


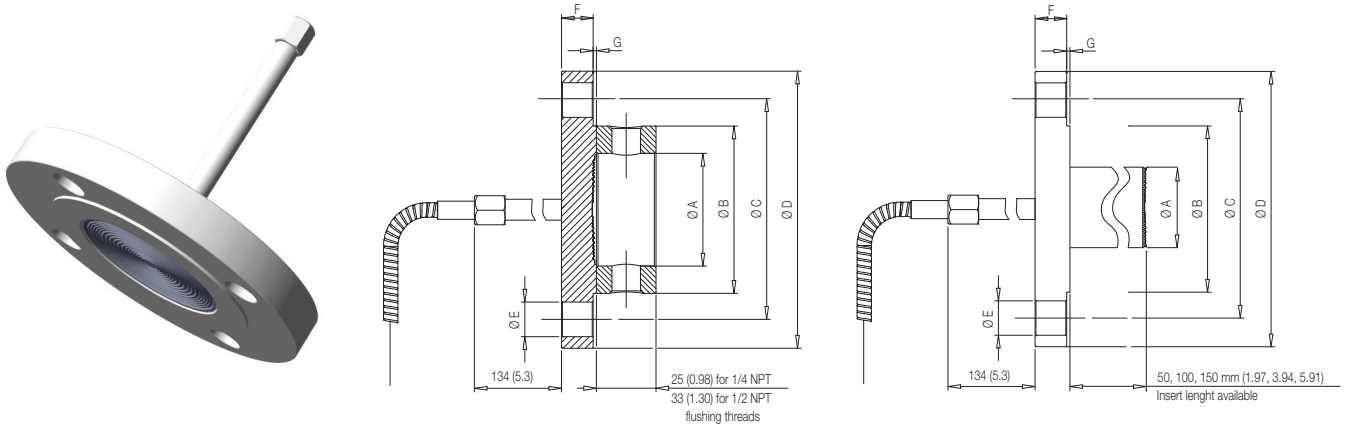
Figure 18: Ring-joint diaphragm seal

Size/Rating	Dimensions mm (in) for S26RR									
	A (dia)	B (dia)	C (dia)	D (dia)	E (dia)	F	G	H (dia)	R	N° of holes
1-1/2 in. ASME CL 150	48 (1.89)	83 (3.27)	98.6 (3.88)	127 (5)	15.75 (0.62)	17.5 (0.69)	17.3 (0.68)	65.1 (2.56)	R19	4
1-1/2 in. ASME CL 300	48 (1.89)	90 (3.54)	114.3 (4.5)	155.5 (6.12)	22.35 (0.88)	20.6 (0.81)	17.3 (0.68)	68.3 (2.69)	R20	4
1-1/2 in. ASME CL 600	48 (1.89)	90 (3.54)	114.3 (4.5)	155.5 (6.12)	22.35 (0.88)	22.4 (0.88)	17.3 (0.68)	68.3 (2.69)	R20	4
1-1/2 in. ASME CL 900/1500	48 (1.89)	92 (3.62)	124 (4.88)	177.8 (7)	28.45 (1.12)	31.8 (1.25)	20.8 (0.82)	68.3 (2.69)	R20	4
1-1/2 in. ASME CL 2500	48 (1.89)	114 (4.49)	146.1 (5.75)	203.2 (8)	31.75 (1.25)	44.5 (1.75)	20.8 (0.82)	82.6 (3.25)	R23	4
2 in. ASME CL 150	60 (2.36)	102 (4.02)	120.65 (4.75)	152.4 (6)	19.05 (0.75)	19.05 (0.75)	17.3 (0.68)	82.6 (3.25)	R22	4
2 in. ASME CL 300	60 (2.36)	108 (4.25)	127 (5)	165.1 (6.5)	19.05 (0.75)	22.35 (0.88)	17.3 (0.68)	82.6 (3.25)	R23	8
2 in. ASME CL 600	60 (2.36)	108 (4.25)	127 (5)	165.1 (6.5)	19.05 (0.75)	25.4 (1)	17.3 (0.68)	82.6 (3.25)	R23	8
2 in. ASME CL 900/1500	60 (2.36)	124 (4.88)	165 (6.5)	215.9 (8.5)	25.4 (1)	38.1 (1.5)	20.8 (0.82)	95.3 (3.75)	R24	8
2 in. ASME CL 2500	60 (2.36)	133 (5.24)	171.5 (6.75)	235 (9.25)	28.45 (1.12)	50.8 (2)	20.8 (0.82)	101.6 (4)	R26	8
3 in. ASME CL 150	89 (3.5)	133 (5.24)	152.4 (6)	190.5 (7.5)	19.05 (0.75)	23.87 (0.94)	17.3 (0.68)	114.3 (4.5)	R29	4
3 in. ASME CL 300	89 (3.5)	146 (5.75)	168.15 (6.62)	209.55 (8.25)	22.35 (0.88)	28.44 (1.12)	17.3 (0.68)	123.8 (4.87)	R31	8
3 in. ASME CL 600	89 (3.5)	146 (5.75)	168.15 (6.62)	209.55 (8.25)	22.35 (0.88)	31.75 (1.25)	17.3 (0.68)	123.8 (4.87)	R31	8
3 in. ASME CL 900	89 (3.5)	155 (6.10)	190.5 (7.5)	241.3 (9.5)	25.4 (1)	38.1 (1.50)	20.8 (0.82)	123.8 (4.87)	R31	8
3 in. ASME CL 1500	89 (3.5)	168 (6.61)	203.2 (8)	266.7 (10.5)	31.75 (1.25)	47.8 (1.88)	20.8 (0.82)	136.5 (5.37)	R35	8
3 in. ASME CL 2500	89 (3.5)	168 (6.61)	228.6 (9)	304.8 (12)	35.05 (1.38)	66.5 (2.62)	20.8 (0.82)	127 (5)	R32	8

For any other detailed information regarding S26RR seal such as pressure limits, vacuum service recommendations, process temperature limits, temperature effects and configuration, please refer to product datasheet.

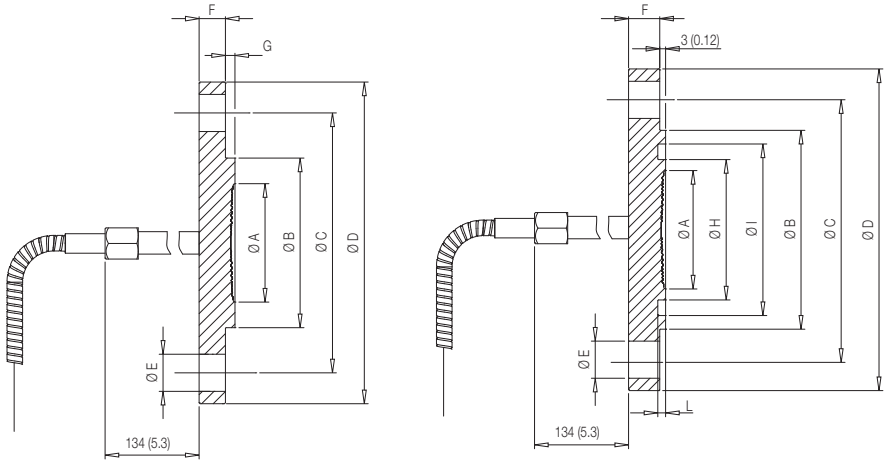
6.5 5.5 Fixed flange diaphragm seals – flush and extended (S26FA, S26FE)

These diaphragm seal are designed to connect to flanged pipe fitting, according to ASME or EN standards. For liquid level measurement installations, the seal connects to a flanged tank nozzle, compliant to relevant standard. The sealing is provided by a selectable gasket seat surface finish. The “fixed” mounting flange is integral with the seal.



ASME and EN 1092-1 smooth and Form B1 (flushing ring as option, only for flush version)

Figure 19: Fixed-flange diaphragm seal



EN 1092-1 Form E..... EN 1092-1 Form D

Size/Rating		Dimensions mm (in) for S26FA									
		A (dia)									N° of holes
	extended diaphragm	flush diaphragm		flushing ring internal dia	B (dia)	C (dia)	D (dia)	E (dia)	F (Note 1)	G	
		std.	low thick.								
2 in. ASME CL 150	48 (1.9)	60 (2.36)	58 (2.28)	62 (2.44)	92 (3.62)	120.65 (4.75)	152.4 (6)	19.1 (0.79)	17.5 (0.6)	2 (0.08)	4
2 in. ASME CL 300	48 (1.9)	60 (2.36)	58 (2.28)	62 (2.44)	92 (3.62)	127 (5)	165.1 (6.5)	19.1 (0.79)	20.8 (0.8)	2 (0.08)	8
2 in. ASME CL 600	48 (1.9)	60 (2.36)	58 (2.28)	62 (2.44)	92 (3.62)	127 (5)	165.1 (6.5)	19.1 (0.79)	25.4 (1)	7 (0.27)	8
3 in. ASME CL 150	72 (2.83)	89 (3.5)	75 (2.95)	92 (3.62)	127 (5)	152.4 (6)	190.5 (7.5)	19.1 (0.79)	22.4 (0.88)	2 (0.08)	4
3 in. ASME CL 300	72 (2.83)	89 (3.5)	75 (2.95)	92 (3.62)	127 (5)	168.15 (6.62)	209.6 (8.25)	22.4 (0.86)	26.9 (1.1)	2 (0.08)	8
3 in. ASME CL 600	72 (2.83)	89 (3.5)	75 (2.95)	92 (3.62)	127 (5)	168.15 (6.62)	209.6 (8.25)	22.4 (0.86)	31.8 (1.3)	7 (0.27)	8
4 in. ASME CL 150	94 (3.7)	89 (3.5)	75 (2.95)	92 (3.62)	157.2 (6.2)	190.5 (7.5)	228.6 (9)	19.1 (0.79)	22.4 (0.88)	2 (0.08)	8

Size/Rating		Dimensions mm (in) for S26FE smooth and Form B1									
		A (dia)									N° of holes
	extended diaphragm	flush diaphragm		flushing ring internal dia	B (dia)	C (dia)	D (dia)	E (dia)	F (Note 2)	G	
		std.	low thick.								
DN 50 EN PN 16	48 (1.9)	60 (2.36)	58 (2.28)	62 (2.44)	102 (4.02)	125 (4.92)	165 (6.5)	18 (0.71)	15 (0.58)	3 (0.12)	4
DN 50 EN PN 40	48 (1.9)	60 (2.36)	58 (2.28)	62 (2.44)	102 (4.02)	125 (4.92)	165 (6.5)	18 (0.71)	18 (0.67)	3 (0.12)	4
DN 50 EN PN 63	48 (1.9)	60 (2.36)	58 (2.28)	62 (2.44)	102 (4.02)	135 (5.31)	180 (7.08)	22 (0.86)	23 (0.9)	3 (0.12)	4
DN 50 EN PN 100	48 (1.9)	60 (2.36)	58 (2.28)	62 (2.44)	102 (4.02)	145 (5.71)	195 (7.67)	26 (1.02)	27 (1.06)	3 (0.12)	4
DN 80 EN PN 16	72 (2.83)	89 (3.5)	75 (2.95)	92 (3.62)	138 (5.43)	160 (6.3)	200 (7.87)	18 (0.71)	17 (0.67)	3 (0.12)	8
DN 80 EN PN 40	72 (2.83)	89 (3.5)	75 (2.95)	92 (3.62)	138 (5.43)	160 (6.3)	200 (7.87)	18 (0.71)	21 (0.83)	3 (0.12)	8
DN 80 EN PN 63	72 (2.83)	89 (3.5)	75 (2.95)	92 (3.62)	138 (5.43)	170 (6.7)	215 (8.46)	22 (0.86)	25 (0.98)	3 (0.12)	8
DN 80 EN PN 100	72 (2.83)	89 (3.5)	75 (2.95)	92 (3.62)	138 (5.43)	180 (7.08)	230 (9.05)	26 (1.02)	33 (1.3)	3 (0.12)	8
DN 100 EN PN 16	94 (3.7)	89 (3.5)	75 (2.95)	92 (3.62)	158 (6.22)	180 (7.08)	220 (8.66)	18 (0.71)	17 (0.67)	3 (0.12)	8

Size/Rating	Dimensions mm (in) for S26FE Form E								
	diaphragm A (dia)		B (dia)	C (dia)	D (dia)	E (dia)	F (Note 2)	G	N° of holes
	std. thickness	low thickness							
DN 50 EN PN 16	60 (2.36)	58 (2.28)	87 (3.42)	125 (4.92)	165 (6.5)	18 (0.71)	13.5 (0.53)	4.5 (0.18)	4
DN 50 EN PN 40	60 (2.36)	58 (2.28)	87 (3.42)	125 (4.92)	165 (6.5)	18 (0.71)	15.5 (0.61)	4.5 (0.18)	4
DN 50 EN PN 63	60 (2.36)	58 (2.28)	87 (3.42)	135 (5.31)	180 (7.08)	22 (0.86)	21.5 (0.85)	4.5 (0.18)	4
DN 50 EN PN 100	60 (2.36)	58 (2.28)	87 (3.42)	145 (5.71)	195 (7.67)	26 (1.02)	25.5 (1)	4.5 (0.18)	4
DN 80 EN PN 16	89 (3.5)	75 (2.95)	120 (4.72)	160 (6.3)	200 (7.87)	18 (0.71)	15.5 (0.61)	4.5 (0.18)	8
DN 80 EN PN 40	89 (3.5)	75 (2.95)	120 (4.72)	160 (6.3)	200 (7.87)	18 (0.71)	19.5 (0.77)	4.5 (0.18)	8
DN 80 EN PN 63	89 (3.5)	75 (2.95)	120 (4.72)	170 (6.7)	215 (8.46)	22 (0.86)	23.5 (0.92)	4.5 (0.18)	8
DN 80 EN PN 100	89 (3.5)	75 (2.95)	120 (4.72)	180 (7.08)	230 (9.05)	26 (1.02)	31.5 (1.24)	4.5 (0.18)	8
DN 100 EN PN 16	89 (3.5)	75 (2.95)	149 (5.87)	180 (7.08)	220 (8.66)	18 (0.71)	15 (0.59)	5 (0.20)	8

Size/Rating	Dimensions mm (in) for S26FE Form D										
	diaphragm A (dia)		B (dia)	C (dia)	D (dia)	E (dia)	F (Note 2)	H (dia)	I (dia)	L	N° of holes
	std. thickness	low thickness									
DN 50 EN PN 16	60 (2.36)	58 (2.28)	102 (4.02)	125 (4.92)	165 (6.5)	18 (0.71)	15 (0.59)	72 (2.83)	88 (3.46)	4 (0.16)	4
DN 50 EN PN 40	60 (2.36)	58 (2.28)	102 (4.02)	125 (4.92)	165 (6.5)	18 (0.71)	18 (0.71)	72 (2.83)	88 (3.46)	4 (0.16)	4
DN 50 EN PN 63	60 (2.36)	58 (2.28)	102 (4.02)	135 (5.31)	180 (7.08)	22 (0.86)	23 (0.91)	72 (2.83)	88 (3.46)	4 (0.16)	4
DN 50 EN PN 100	60 (2.36)	58 (2.28)	102 (4.02)	145 (5.71)	195 (7.67)	26 (1.02)	27 (1.06)	72 (2.83)	88 (3.46)	4 (0.16)	4
DN 80 EN PN 16	89 (3.5)	75 (2.95)	138 (5.43)	160 (6.3)	200 (7.87)	18 (0.71)	17 (0.67)	105 (4.13)	121 (4.76)	4 (0.16)	8
DN 80 EN PN 40	89 (3.5)	75 (2.95)	138 (5.43)	160 (6.3)	200 (7.87)	18 (0.71)	21 (0.83)	105 (4.13)	121 (4.76)	4 (0.16)	8
DN 80 EN PN 63	89 (3.5)	75 (2.95)	138 (5.43)	170 (6.7)	215 (8.46)	22 (0.86)	25 (0.92)	105 (4.13)	121 (4.76)	4 (0.16)	8
DN 80 EN PN 100	89 (3.5)	75 (2.95)	138 (5.43)	180 (7.08)	230 (9.05)	26 (1.02)	33 (1.3)	105 (4.13)	121 (4.76)	4 (0.16)	8
DN 100 EN PN 16	89 (3.5)	75 (2.95)	158 (6.22)	180 (7.08)	220 (8.66)	18 (0.71)	17 (0.67)	128 (5.04)	149 (5.91)	4.5 (0.18)	8

Note 1 - Flange thickness tolerance is +3.0 / -0.0 mm (+0.12 / 0.0 in.).
Note 2 - Flange thickness tolerance is +1.0 / -1.3 mm (+0.04 / 0.05 in.) up to 18 mm or ±1.5 mm (±0.06 in.) from 18 to 50 mm from 18 to 50 mm.

For any other detailed information regarding S26RR seal such as pressure limits, vacuum service recommendations, process temperature limits, temperature effects and configuration, please refer to product datasheet.

6.6 5.6 Off-line Threaded Connection Seal (S26TT)

The off-line threaded remote seal connects directly to a process pipe via the NPT connection in the lower housing. Connections for 1/4, 1/2, 3/4, 1, and 1-1/2 in. process piping are available. In addition to the process connection, mechanical support for the weight of the seal may be required, especially for the 1/4 and 1/2-inch pipe sizes.

These elements are available with a flushing connection in the lower housing. The connection provides a 1/4 in. NPT port into the cavity around the seal diaphragm to permit flushing to remove trapped solids, when necessary. The flushing connection also provides a means of checking calibration without disconnecting the element. A gate or ball valve installed in the process line near the seal element connection allows the process to be isolated and calibration pressure can then be applied via the flushing connection. Use of a gate or ball type valve avoids restricting the process line during normal operation, not a gasket.

Connect the seal element to the process pipe at the NPT connection in the end of the lower housing.

If the element has a flushing connection, connect a flushing line with appropriate valving to the 1/4 in. NPT connection in the side of the lower housing.

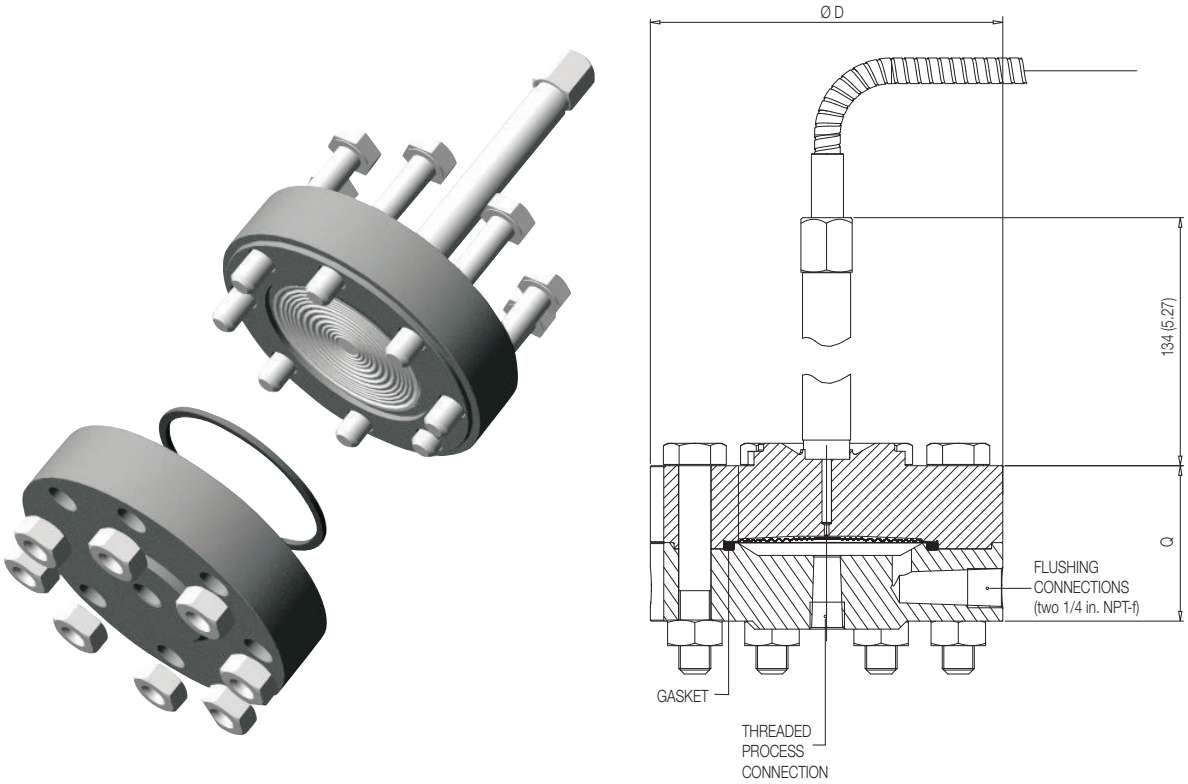


Figure 20: Off-line threaded connection diaphragm seal

Size (thread)	Dimensions mm (in) for S26T	
	D (dia)	Q
1/4 in. NPT	109.2 (4.3)	53.3 (2.1)
1/2 in. NPT	109.2 (4.3)	53.3 (2.1)
3/4 in. NPT	109.2 (4.3)	63.5 (2.5)
1 in. NPT	109.2 (4.3)	63.5 (2.5)
1 1/2 in. NPT	109.2 (4.3)	63.5 (2.5)

S26TT can be supplied with different kinds of bolts: stainless steel AISI 316, carbon steel or alloy steel (NACE compliant)

For any other detailed information regarding S26TT seals such as pressure limits, vacuum service recommendations, process temperature limits, temperature effects and configuration, please refer to product datasheet.

6.7 5.7 Off-Line Flanged Connection Remote Seal (S26MA, S26ME)

Available with ASME (S26MA) and EN (S26ME) flanged process connection, the Off-line model matches small process connections. Recommended for clean process fluid measurements.

These elements are available with a flushing connection in the lower housing, selectable on request.

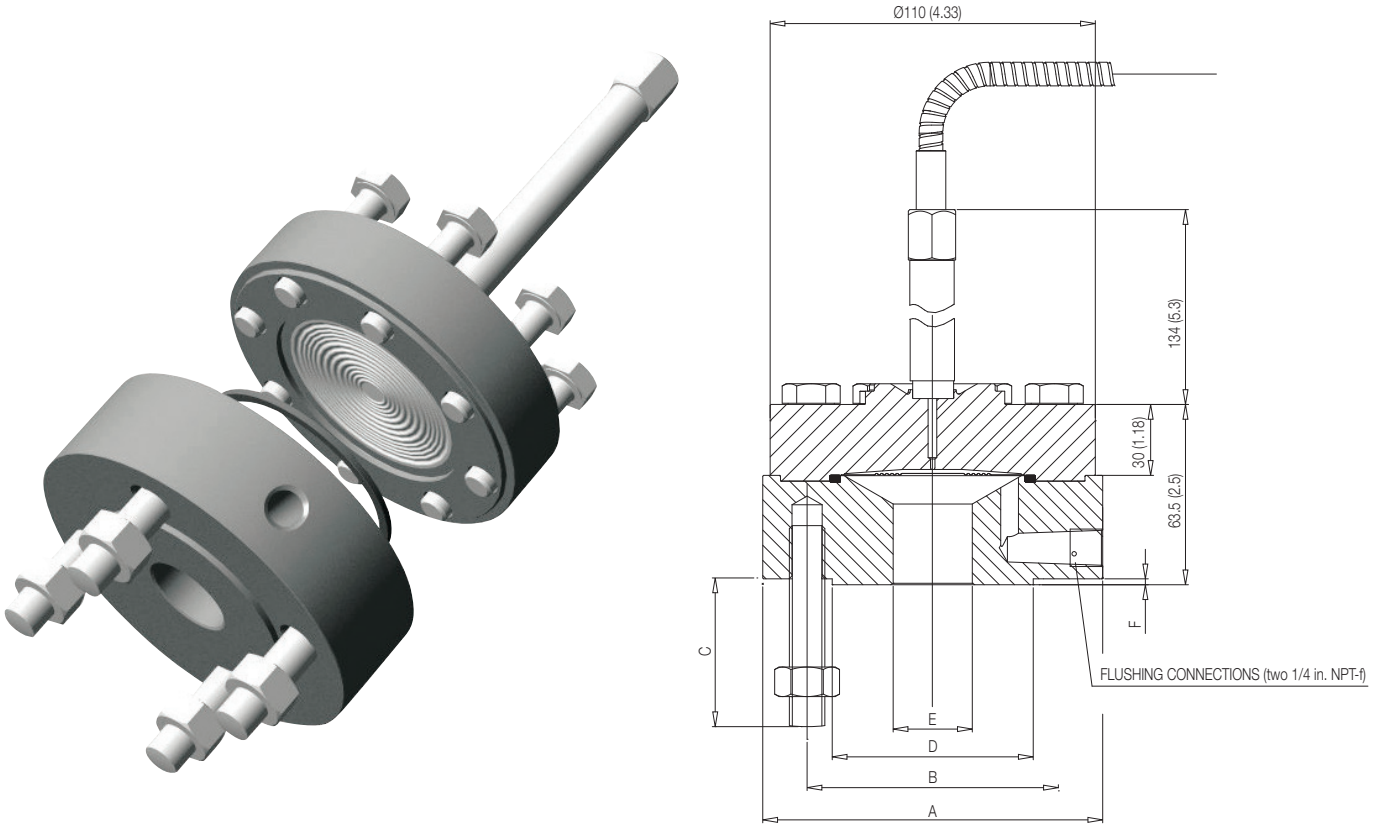


Figure 21: Off-line flanged diaphragm seal

Size/Rating	Dimensions mm (in) for S26MA and S26ME						
	A (dia)	B (dia)	C (4 studs)		D (dia)	E (dia)	F
			Length	Thread			
1/2 in. ASME CL 150	110 (4.33)	60.5 (2.38)	39 (1.53)	1/2in – 13 UNC	35.1 (1.38)	15.8 (0.62)	1.6 (0.06)
1/2 in. ASME CL 300	110 (4.33)	66.5 (2.62)	39 (1.53)	1/2in – 13 UNC	35.1 (1.38)	15.8 (0.62)	1.6 (0.06)
1 in. ASME CL 150	110 (4.33)	79.4 (3.12)	39 (1.53)	1/2in – 13 UNC	50.8 (2)	26.7 (1.05)	1.6 (0.06)
1 in. ASME CL 300	124 (4.88)	88.9 (3.5)	51 (2)	5/8in – 11 UNC	50.8 (2)	26.7 (1.05)	1.6 (0.06)
1 1/2 in. ASME CL 150	127 (5)	98.4 (3.87)	39 (1.53)	1/2in – 13 UNC	73 (2.87)	41 (1.61)	1.6 (0.06)
1 1/2 in. ASME CL 300	155 (6.1)	114.3 (4.5)	57 (2.24)	3/4in – 10 UNC	73 (2.87)	41 (1.61)	1.6 (0.06)
DN 25 PN 16-40	115 (4.52)	85 (3.34)	42 (1.65)	M12	68 (2.67)	28.5 (1.12)	2 (0.08)
DN 40 PN 16-40	150 (5.9)	110 (4.33)	48 (1.89)	M16	88 (3.46)	43.1 (1.69)	3 (0.12)

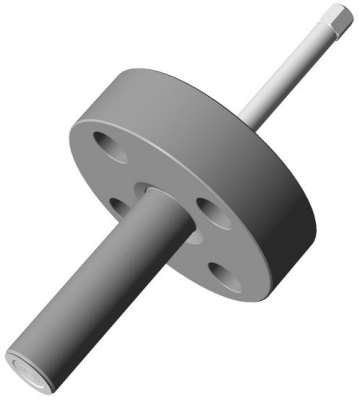
Note. This diaphragm seal features two flushing connections.

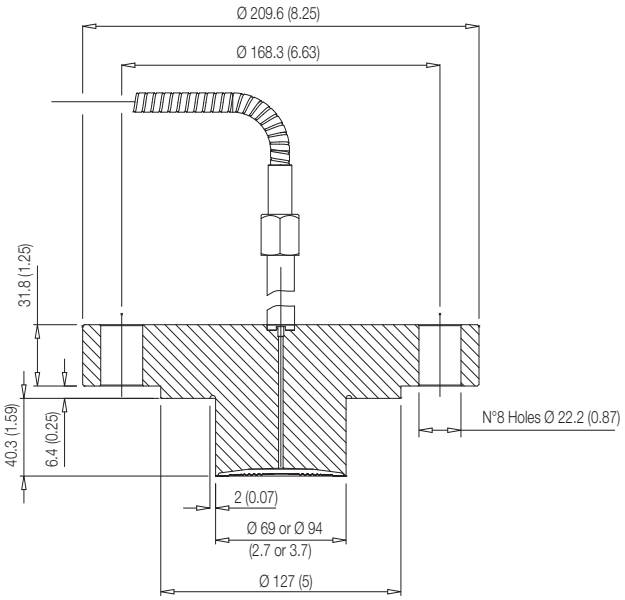
For any other detailed information regarding S26Mx seals such as pressure limits, vacuum service recommendations, process temperature limits, bolts, gasket seat finishing, temperature effects and configuration, please refer to product datasheet.

6.8 5.8 Remote Seal for Urea Service (S26PN)

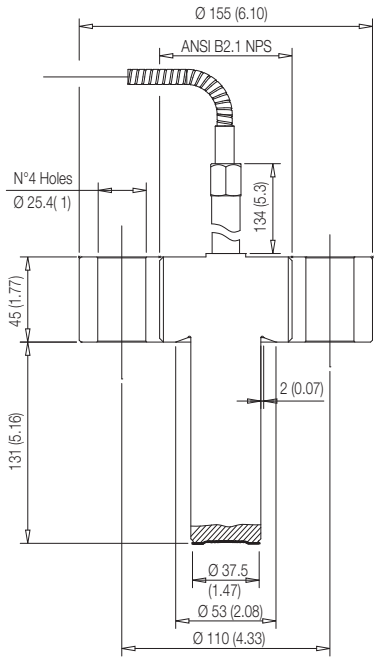
This specialized remote seal is manufactured from materials which match the aggressively corrosive conditions when Urea is present in the process.

The urea grade wetted materials ensure stable performances even in high temperature / high vacuum conditions.





2 1/2 in.urea service seal Flange ASME 600, 3 in.



1 1/2 in.urea service seal Flange ASME 2500, 2 in.

Figure 22: Urea service extended seals with ASME flange

For any other detailed information regarding S26PN seal such as pressure limits, vacuum service recommendations, process temperature limits, bolts, temperature effects and configuration, please refer to product datasheet.

6.9 5.9 Button Type remote seal (S26BN)

This remote seal is designed to connect to a process via the NPT threaded connection or to match pipe fitting with an interface suitable for the provided mating flange. The button seals, thanks to their accurate design, are projected to carry out accurate measurements with medium/high calibrated span (2 MPa - 20 bar - 290 psi approx or greater).

The button type remote seal is to be used only for gauge pressure.

This type of connection is especially suitable for plastic and resins production processes.

For any other detailed information regarding S26BN seals such as pressure limits, vacuum service recommendations, process temperature limits, temperature effects and configuration, please refer to product datasheet.

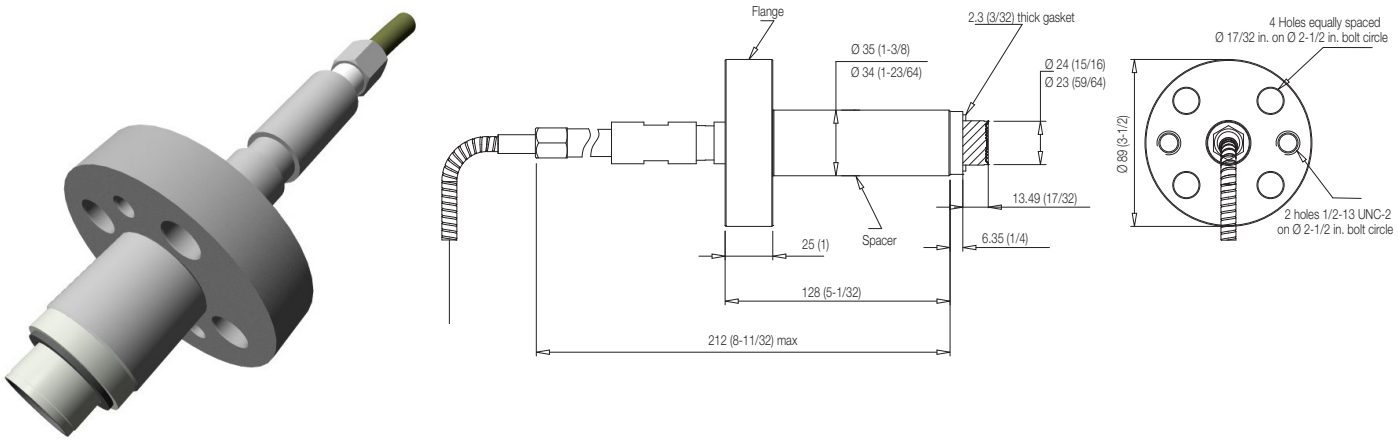


Figure 23: 3-1/4 in. flange extended – type 91

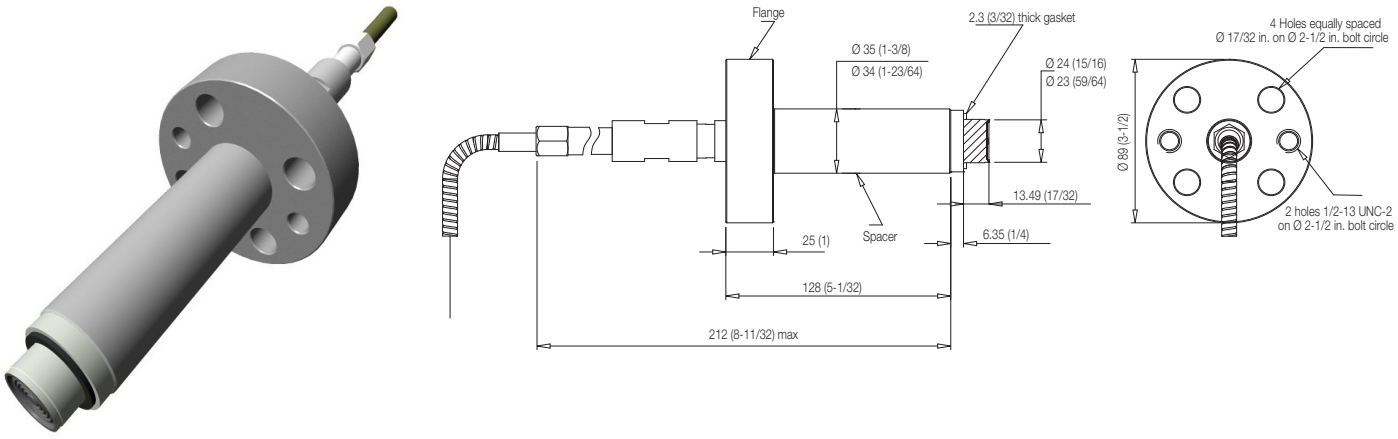


Figure 24: 3-1/4 in. flange extended – type 91 modified

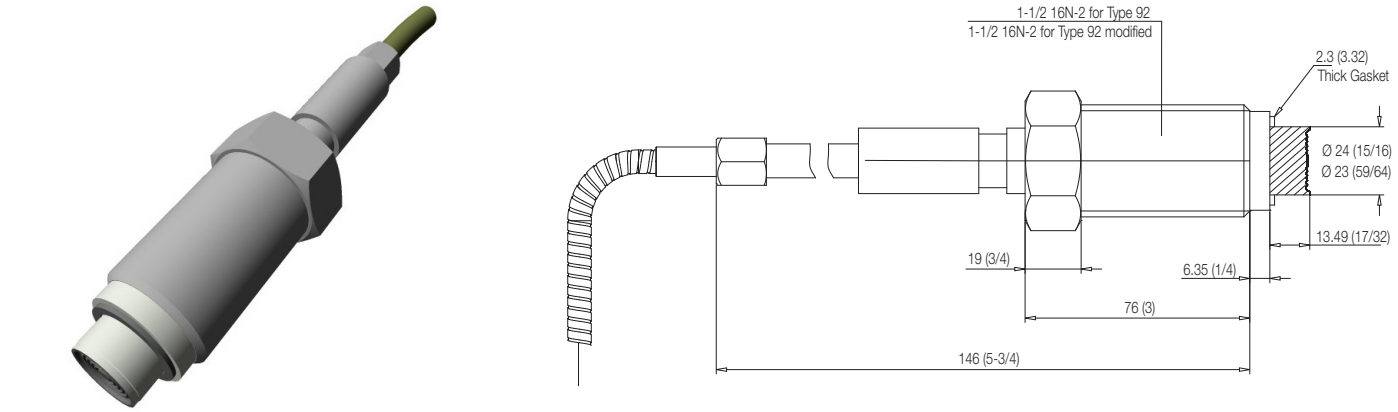


Figure 25: 1-1/2 in. threaded union type 92 or 92 modified

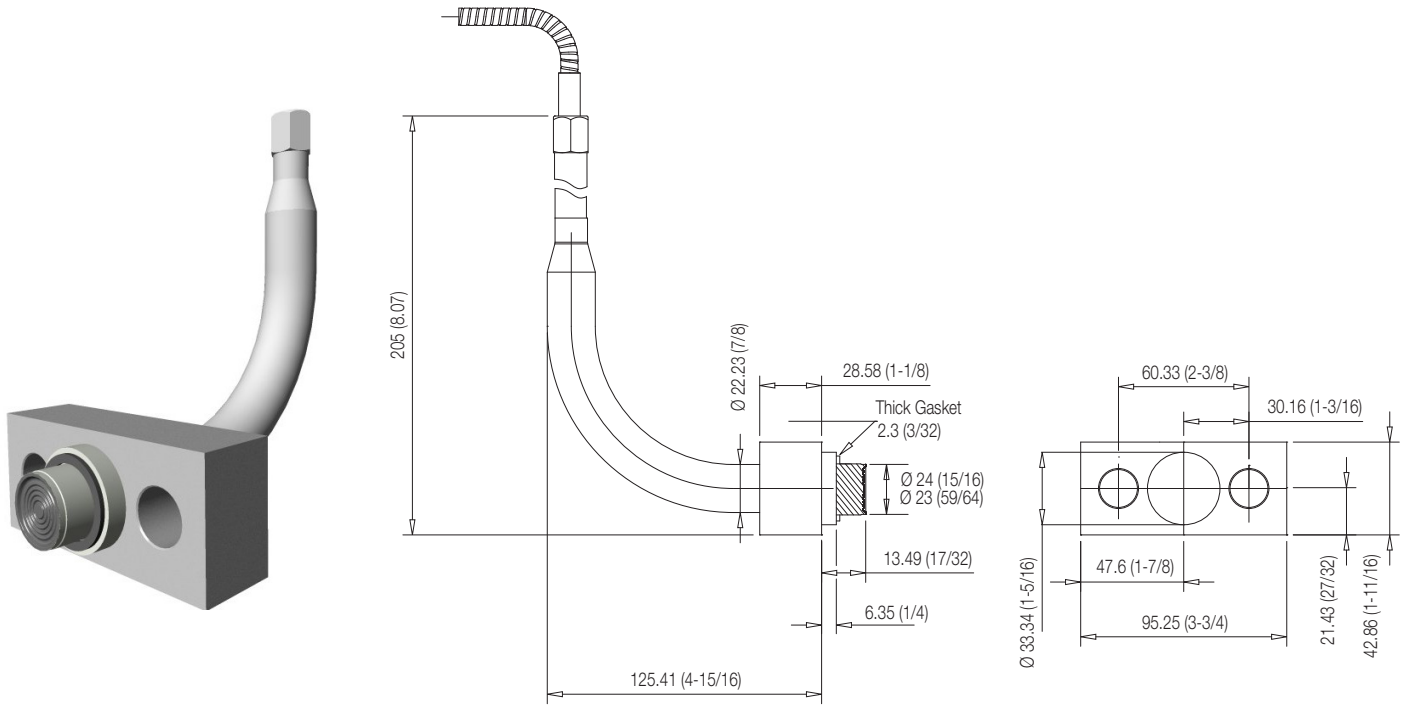


Figure 26: Bracket – type 89

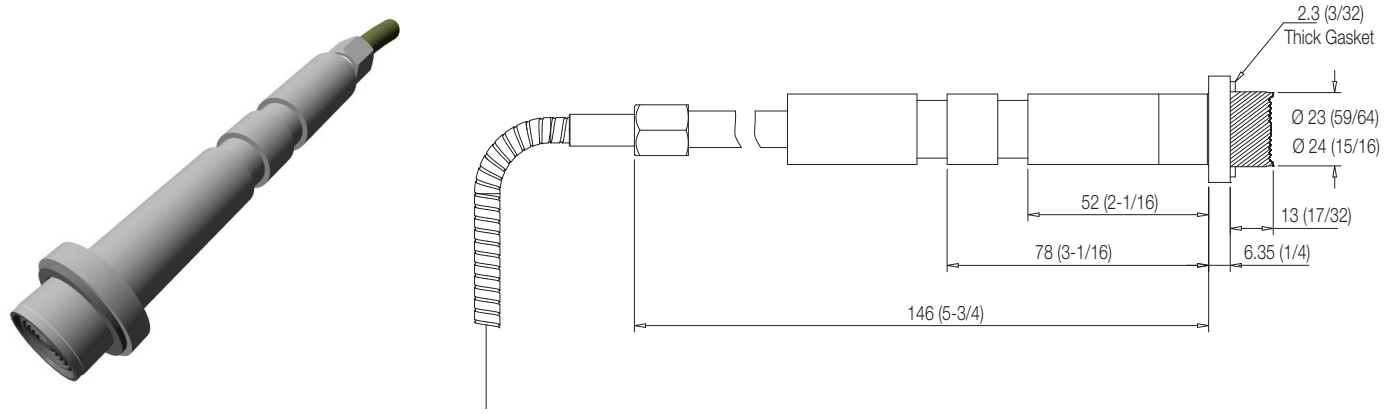


Figure 27: Universal – type 90

6.10 5.10 Union Connection remote seals (S26UN)

The union connection remote seals are used exclusively for pressure measurement. The seal is available without a weld bushing, with an optional weld bushing, or with an optional chemical tee flange. An O-ring is used to seal the process connection.

The O-ring material can be silicone rubber for temperatures up to 177°C (350°F) or PTFE for temperatures up to 204°C (400°F).

Note. The operating temperature limit for the seal can be lower than the O-ring temperature limit because of fill fluid limitations (refer to the fill fluid parameter table in the Specification Sheet). Connect the seal as described in the applicable following section.

6.10.1 Seal without Weld Bushing

The seal without a weld bushing must be connected to a user supplied fitting having mating surface dimensions as shown in the figure. Connect the seal as follows:

1. Lubricate the sealing O-ring with Silicone gasket grease.
2. Mount the O-ring on the end of the seal.
3. Insert seal into mating fitting and tighten the union connection nut to press the O-ring against the fitting surface.

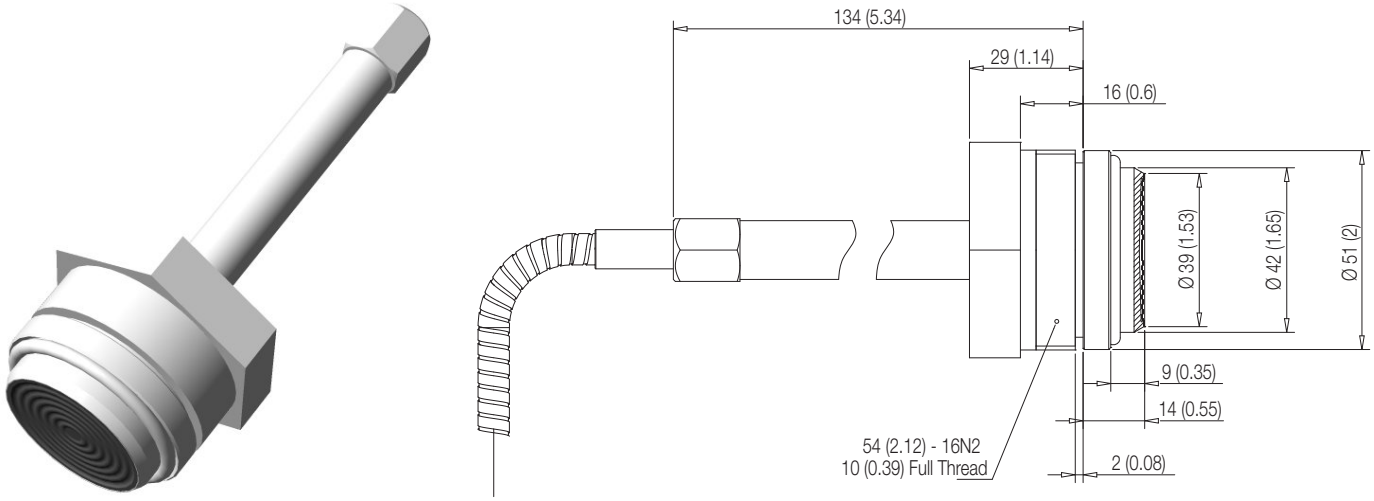


Figure 28: Union connection remote seal – basic version

6.10.2 Seal with Weld Bushing

The remote seal with a weld bushing includes a bushing which provides the mating surface for the seal element. The bushing must be welded to the process piping or vessel before installing the seal. Use the following procedure:

1. Weld bushing to pipe or vessel in accordance with standard industrial practices.
2. Remove protective covering from seal.
3. Lubricate the sealing O-ring with silicone gasket grease.
4. Mount the O-ring on the end of the element.
5. Insert element into mating fitting and tighten the union connection nut to press the O-ring against the fitting surface.

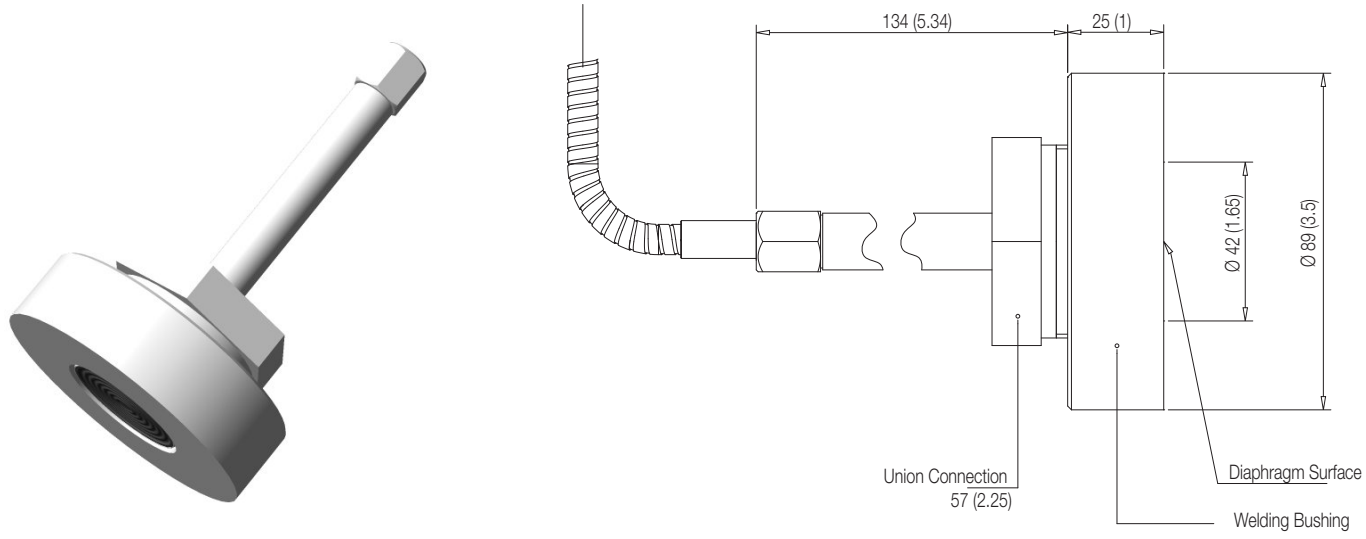


Figure 29: Union connection remote seal with weld bushing

6.10.3 Seal with Chemical Tee flange

The union connection seal with a chemical tee flange is designed to connect to any process fitting which accepts a chemical tee seal element (refer to Chemical Tee Seal for more information). The union seal connects to the chemical tee flange which serves as an adapter to permit connection of the union seal to a chemical tee type fitting.

In addition to the O-ring required on the remote seal, this option requires a gasket to seal the chemical tee flange at its connection to the process fitting. This gasket is included when the chemical tee flange option is specified. The gasket material is PTFE with silica filler and the maximum operating temperature is 204°C (400°F). Note that the seal operating temperature limit can be lower than this gasket temperature limit if the remote seal O-ring is silicone rubber with a 177°C (350°F) rating, or if the fill fluid has a lower temperature limit (refer to the fill fluid parameter table in the Specification Sheet). The eight cap screws required to connect the flange are supplied with the mating process fitting. The gasket and bolts have been specifically selected to meet the sealing and pressure rating requirements of the chemical tee flange.

Substitution of user supplied bolts and gaskets is not recommended.

Connect the seal element using the following procedure:

1. Connect the chemical tee flange as follows:

   Place the gasket on the flange sealing surface and insert flange into the process fitting.

   Insert 8 cap screws and finger tighten each screw.

   Following a diagonal sequence, tighten each cap screw to a torque of 12.4 Nm (110 inch-lbs).

2. Connect the union seal to the chemical tee flange as follows:

   Remove protective covering from seal.

   Lubricate the sealing O-ring with Silicone gasket grease.

   Mount the O-ring on the end of the seal.

   Insert the seal into the chemical tee flange and tighten the union connection nut to seal the O-ring against its mating surface.

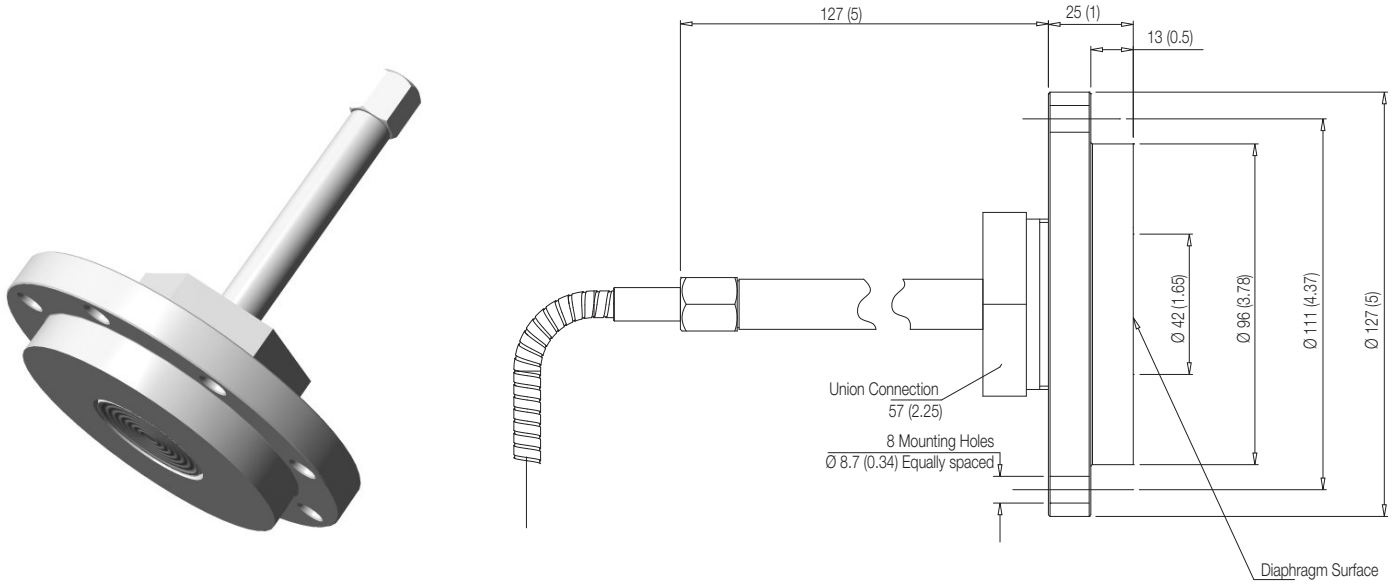


Figure 30: Union connection remote seal with Chemical Tee flange

Note. The pressure limit for a transmitter with this seal is determined by the chemical tee flange. Maximum working pressure for the flange is 2000 KPa (300 psi).

For any other detailed information regarding S26UN seals such as pressure limits, vacuum service recommendations, process temperature limits, temperature effects and configuration, please refer to product datasheet.

6.11 5.11 Food and Sanitary seal (S26SS)

Sanitary diaphragm seals have been specifically developed for food, sanitary, chemical and pharmaceutical applications, complying with the stringent 3-A requirements.

Available with different process fittings (Triclamp, Cherry Burrell, Union Nut and Sanitary), this model highlights ABB's commitment to satisfy users needs approaching even the most demanding processes successfully.

6.11.1 Cherry Burrell Aseptic

The sanitary aseptic remote seal is designed to connect to a 4in sanitary fitting: either an aseptic tank spud or a 4in Cherry Burrell aseptic ferrule. The tank spud, gaskets and V-band clamp are available option with the seal element.

Note. The tank spud or ferrule required for connection of this seal element must be welded to the process vessel prior to connecting the element, following recommended welding and pressure testing procedure. Weld the Cherry Burrell ferrule to the process vessel in accordance with manufacturers' recommendations.

Connect the sanitary aseptic seal to the tank spud or ferrule as follows:

1. Remove protective covering from seal.
2. Install two O-rings on the periphery of the seal and an O-ring under each steam connection fitting.
3. Insert the seal into the tank spud or ferrule and place the steam connection cap against the back of the element.
4. Position the clamp ring as shown and tighten to seal the O-rings against the spud.
5. Connect the inlet and outlet steam lines to the 1/8. NPT steam connections in the cap. Steam temperature must not exceed 149°C (300°F); pressure must not exceed 358.5 KPa (52psi).

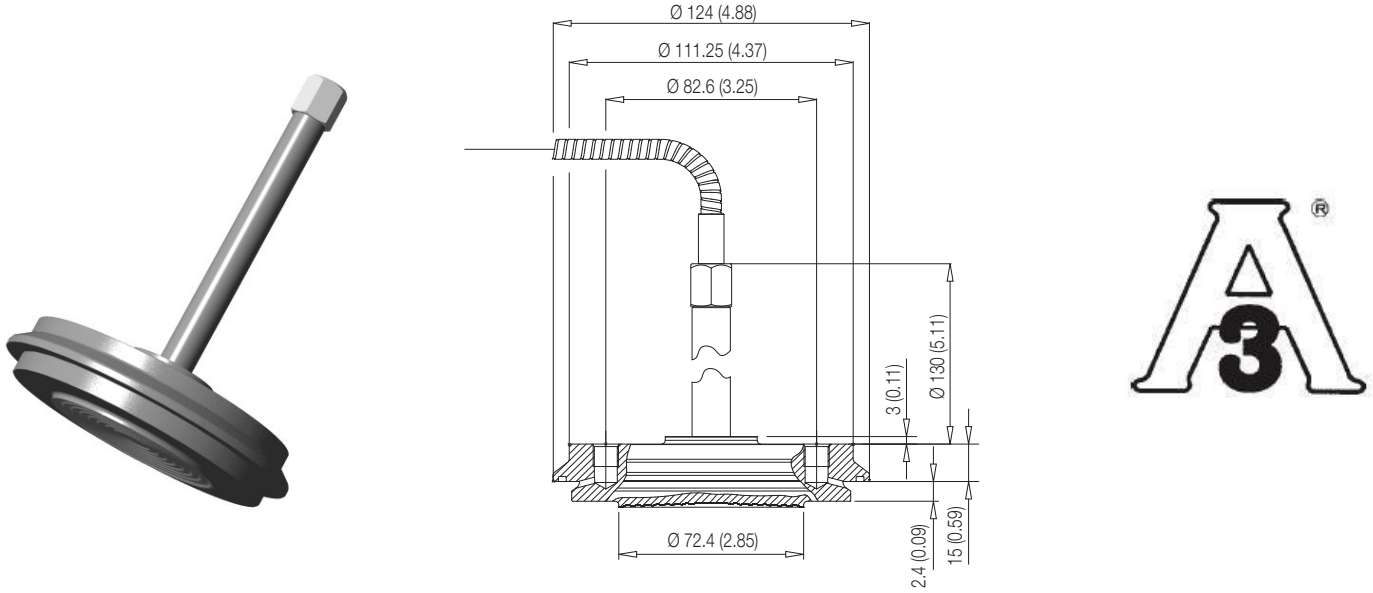


Figure 31: 4 in. Cherry Burrell Aseptic

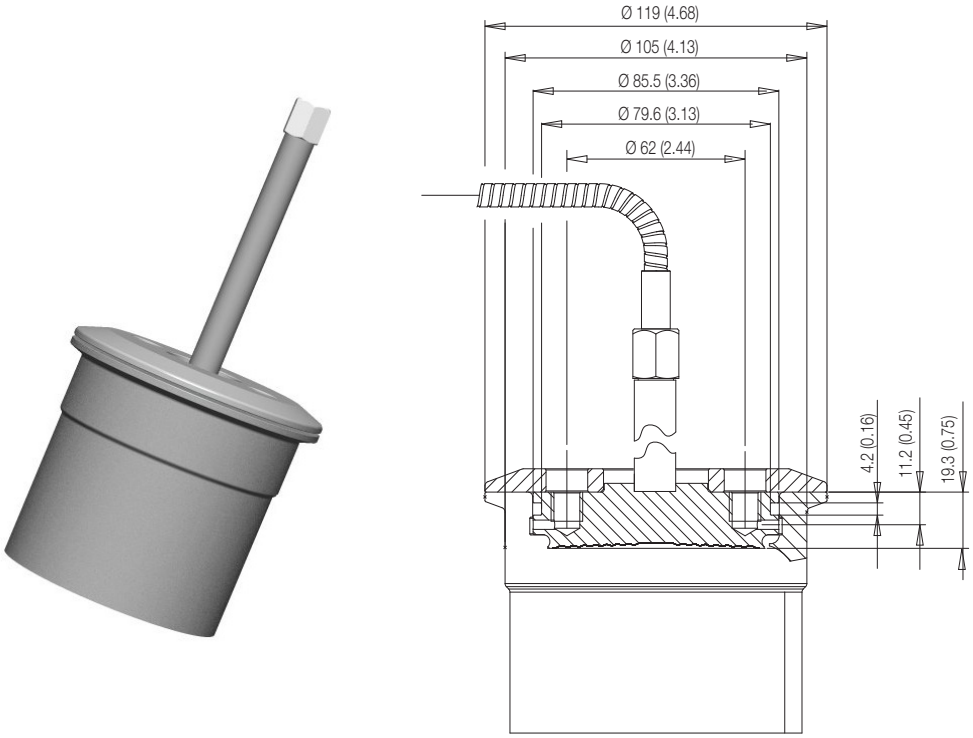


Figure 32: 4 in. Aseptic flanged connection

6.11.2 Sanitary Seal with flush diaphragm

The sanitary remote seal with flush diaphragm is designed to connect to a 4-inch sanitary tank spud.

The tank spud and process O-ring, made of Buna or Viton, are available with the seal.

Connect the seal as follows:

1. Remove protective covering from seal and install the process O-ring.
2. Insert the seal into the tank spud.
3. Position the clamp ring as shown and tighten to seal the O-ring against the spud.

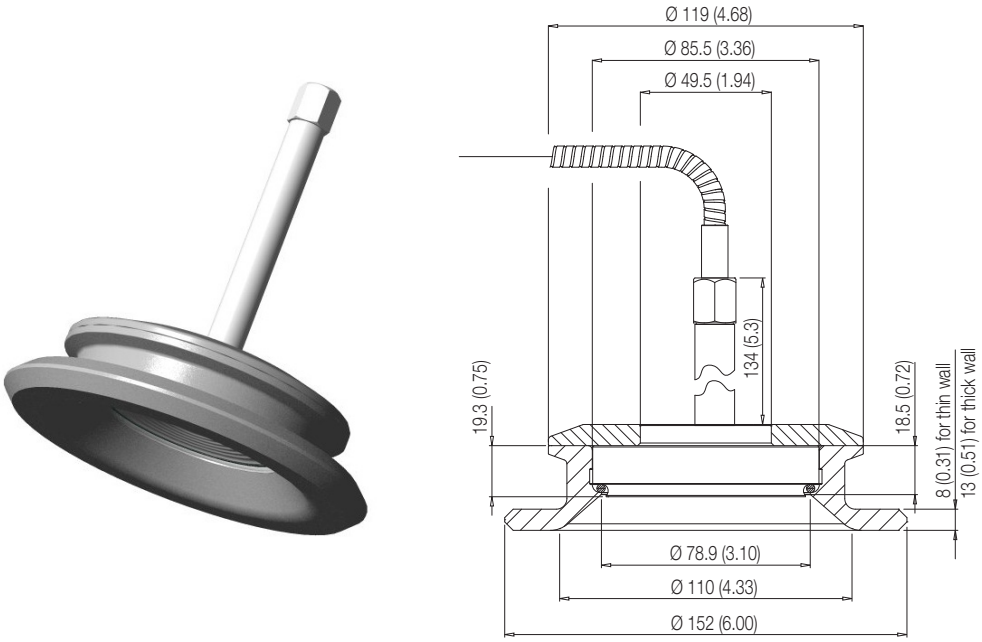


Figure 33: Sanitary seal with flush diaphragm

6.11.3 Sanitary seal with extended diaphragm

The sanitary remote seal with extended diaphragm is designed to connect to a 4-inch sanitary tank spud with an extended neck (2, 4 or 6 inches). The tank spud, an Ethylene Propylene process O-ring and V-Band clamp ring are available with the seal.

Connect the seal as follows:

1. Weld the tank spud into the process vessel. Be sure to orient the spud so that the drain hole is at the lowest point.
2. Remove protective covering from seal and Install the O-ring.
3. Insert the seal into the tank spud.
4. Position the clamp ring over the joint between the seal and spud and tighten the clamp.

Note. The tank spud required for connection of this seal element must be welded to the process vessel prior to connecting the seal, following a recommended welding and pressure testing procedure.

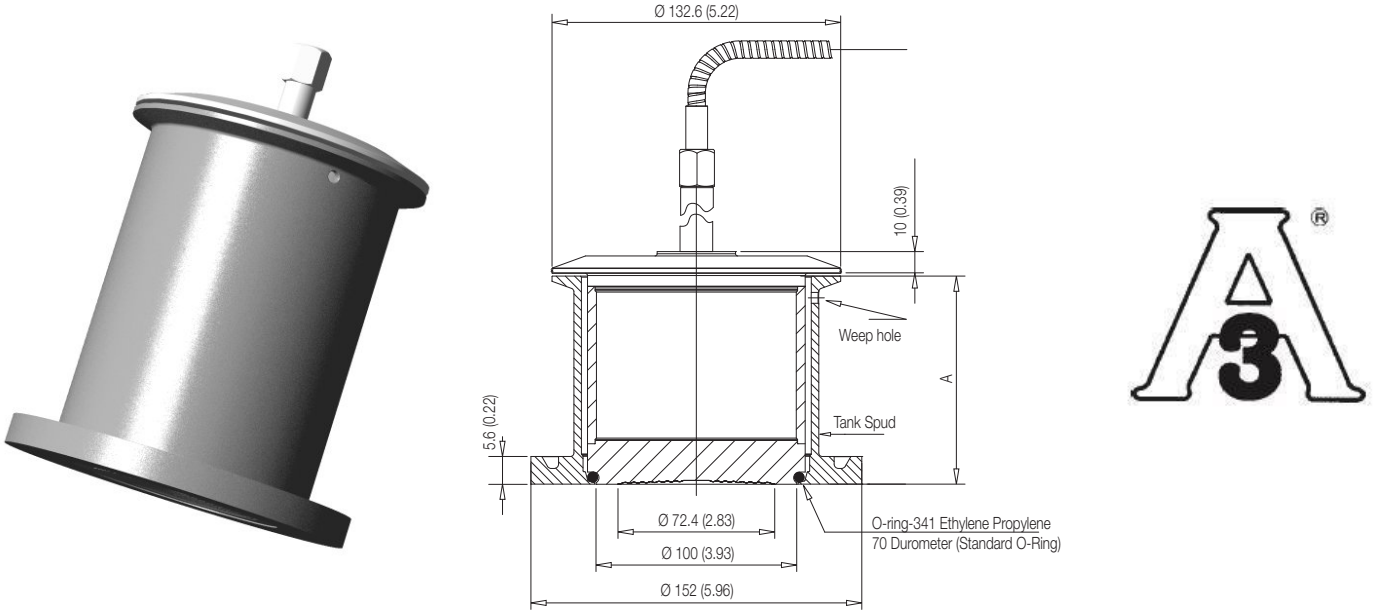
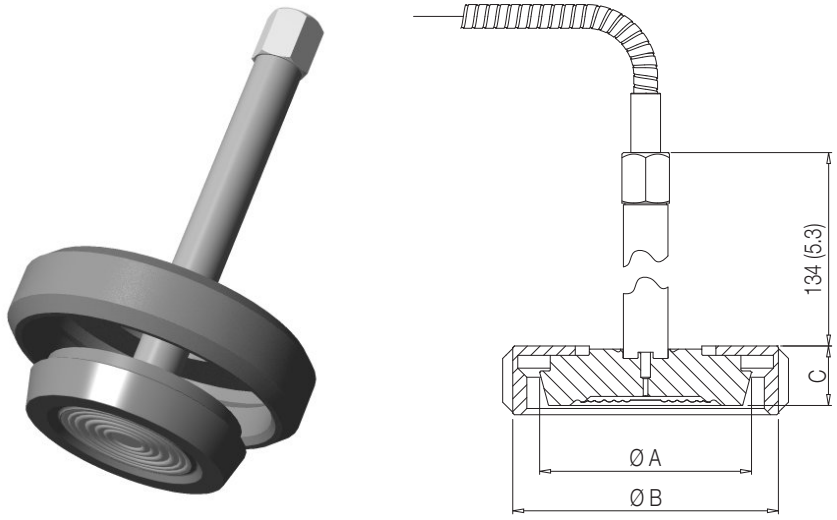


Figure 34: Sanitary seal with extended diaphragm

6.11.4 Union Nut and Triclamp remote seal

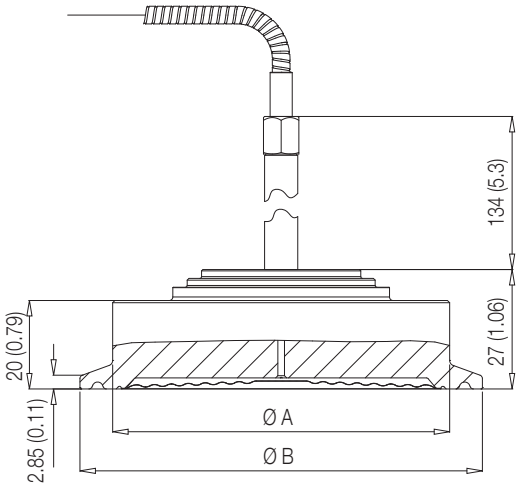
The Union Nut and Triclamp seals are designed for connection by Union Nut according to DIN 11851 - F50 or F80 and 2in, 3in, 4in Triclamp sanitary fittings. A variety of gaskets and clamp rings for the seals are available.

Note. This kind of diaphragm seal does not comply with the stringent 3A standard requirements. Therefore, it is not covered by the relevant certification.



Size	Dimensions mm (in) for S26SS Union Nut to DIN 11851			
	A (dia)	B (Rd)	C (dia)	D
F50	42 (1.65)	78 (3.07)	92 (3.62)	22 (0.87)
F80	72 (2.83)	110 (4.33)	127 (5)	29 (1.14)

Figure 35: Union Nut sanitary seal



Size	Dimensions mm (in) for S26SS Triclamp	
	A (dia)	B (dia)
2 in.	56.3 (2.2)	64 (2.5)
3 in.	83 (3.26)	91 (3.58)
4 in.	110.3 (4.34)	119 (4.68)

Figure 36: Triclamp sanitary seal

6.11.5 Cherry Burrell seal

The Cherry Burrell seals are designed for connection to 2in, 3in or 4in Cherry Burrell I-Line sanitary fittings. A 4in. V-band clamp is optionally available for the 4in. variant.

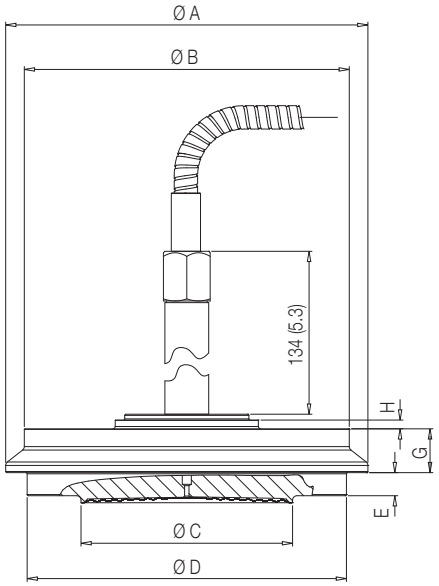


Figure 37: Cherry Burrell sanitary seal

Size	Dimensions mm (in) for S26S Cherry Burrell							
	A (dia)	B (dia)	C (dia)	D (dia)	E	F	G	H
2 in.	67 (2.64)	56 (2.2)	42 (1.65)	57 (2.24)	3.2 (0.13)	6.5 (0.26)	12.5 (0.49)	3 (0.12)
3 in.	98.4 (3.87)	81 (3.19)	72.42 (2.85)	83.8 (3.3)	2.4 (0.09)	7.9 (0.31)	15 (0.59)	3 (0.12)
4 in.	124 (4.88)	111.25 (4.38)	72.42 (2.85)	109.3 (4.3)	2.4 (0.09)	7.9 (0.31)	15 (0.59)	3 (0.12)

6.11.6 Beverage bolted seal

This seal has been designed to be suited for specific applications in beverage processes. The sanitary bolted seal is available only for gauge and absolute transmitters with direct-mount seal construction. Spud process fitting is available on request.

Note. This kind of diaphragm seal does not comply with the stringent 3A standard requirements. Therefore, it is not covered by the relevant certification.

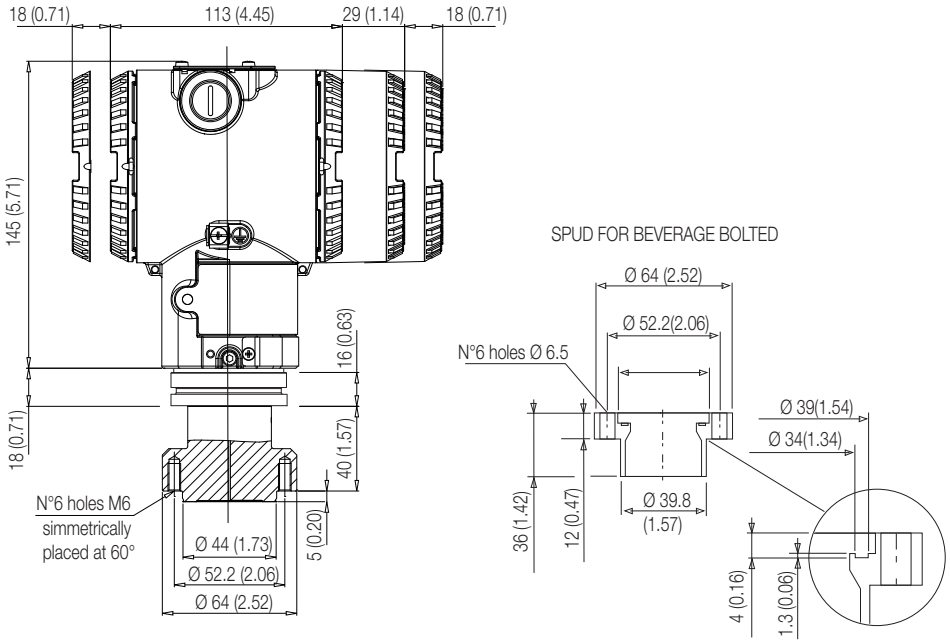


Figure 38: Beverage bolted seal on 266HDH and 266NDH

6.11.7 3-A requirements

All sanitary S26SS remote diaphragm seals and other associated direct mount sanitary diaphragm seals must be mounted in such a way as to allow for drainage of all process fluids. Tank spud fittings must be mounted with the leak detection hole located at the bottom for proper drainage by gravity. Sanitary applications must be performed so that all welding surface are smooth in order to prevent dirt from lodging inside surface irregularities.

3-A seals are equipped with a specific label (see below) indicating the temperature range and gasket characteristics.

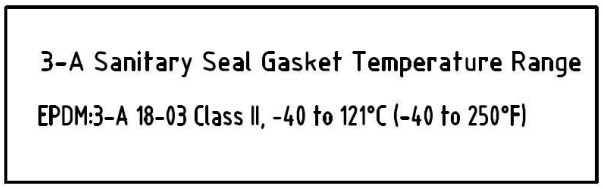
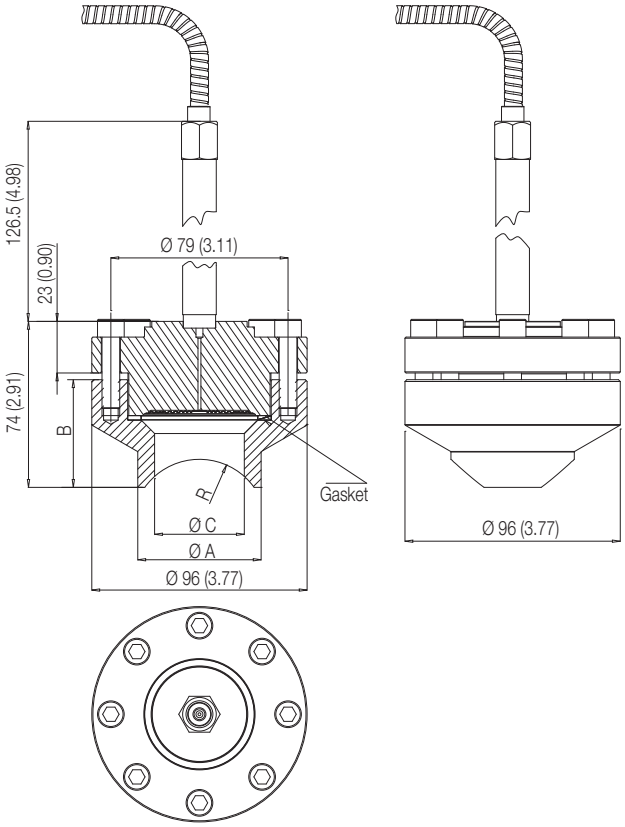


Figure 39: Adhesive label for 3-A certified S26SS seals

For any other detailed information regarding S26SS seals such as pressure limits, vacuum service recommendations, process temperature limits, temperature effects and configuration, please refer to product datasheet.

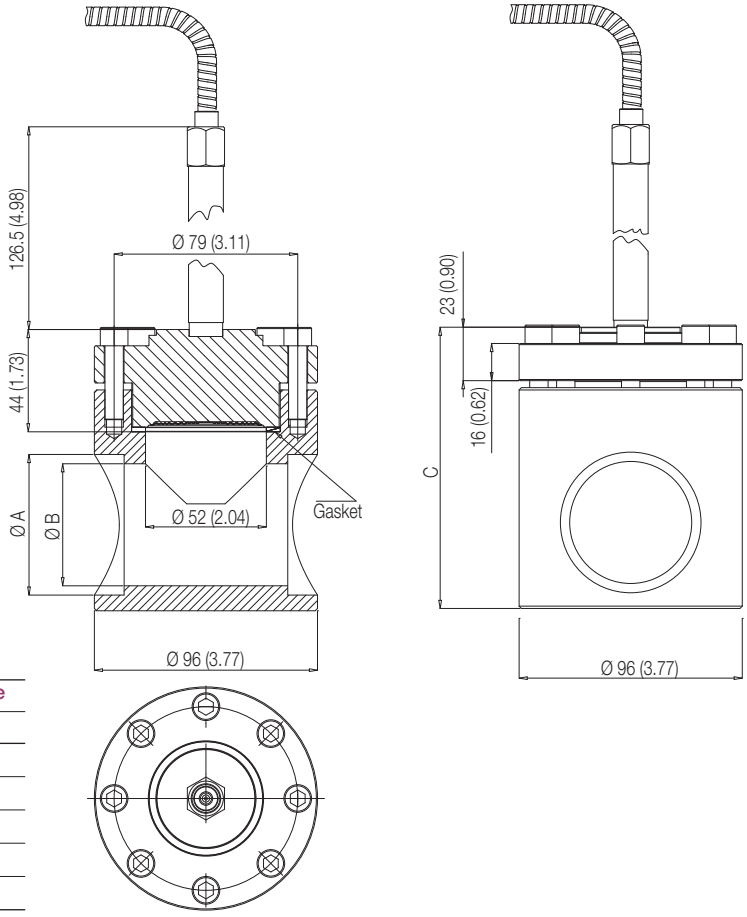
6.12 5.12 Saddle and Socket diaphragm seal (S26VN)

The saddle and socket seal are the best solution when the diaphragm needs to be as closest as possible to the process media. These are typically installed by welding to the process pipes with fluid at high viscosity. Saddle and socket process connection fittings are available as option selection, available only in AISI 316 L ss.



Fitting connection Size	Dimensions mm (in) for S26VN- saddle type			
	A (dia)	B	C (dia)	R
Saddle 2 in.	55 (2.17)	48 (1.89)	40 (1.57)	30
Saddle 2 1/2 in.	76 (3.0)	45 (1.77)	52 (2.05)	45
Saddle 3 in.	76 (3.0)	45 (1.77)	50 (1.97)	45
Saddle 4 in.	76 (3.0)	41 (1.61)	50 (1.97)	57
Saddle 5 in.	76 (3.0)	40 (1.57)	50 (1.97)	70
Saddle 6 in.	76 (3.0)	36 (1.42)	50 (1.97)	85

Figure 39: Saddle type seal

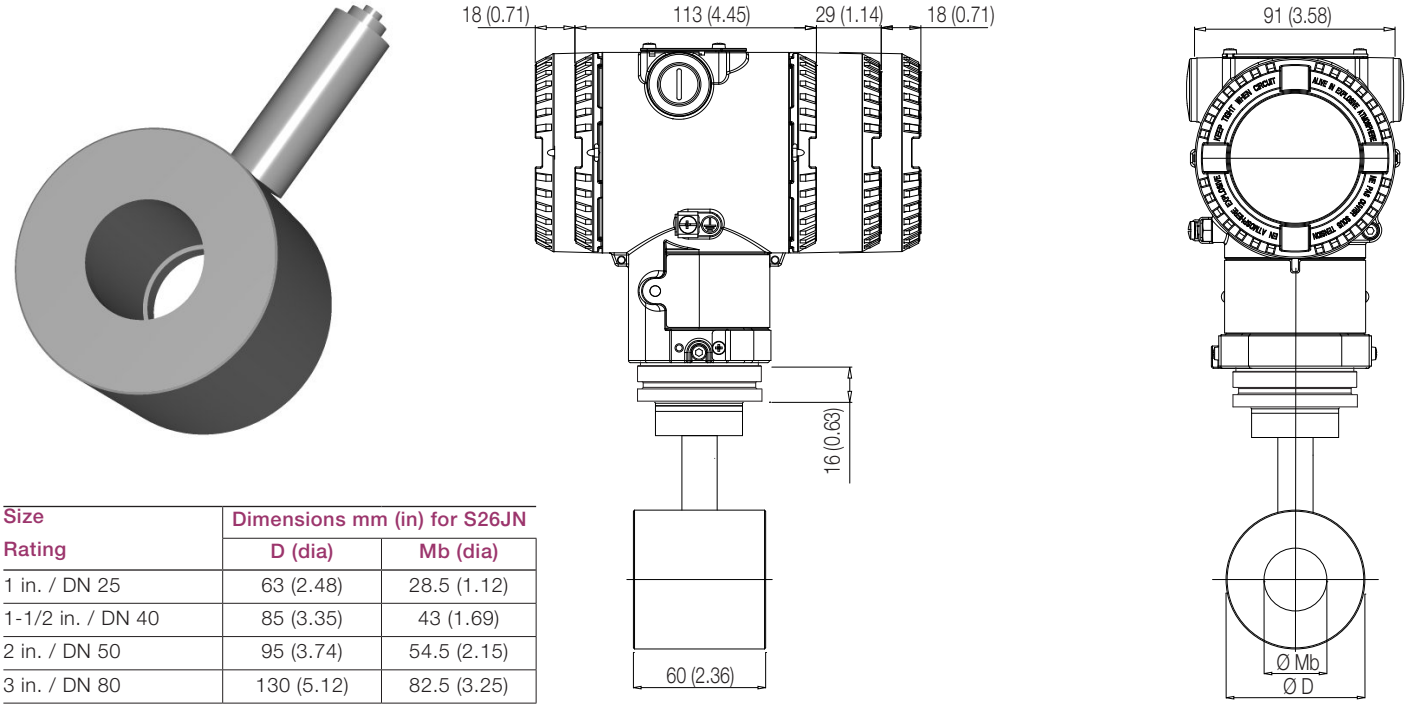


Fitting connection Size	Dimensions mm (in) for S26VN- socket type		
	A (dia)	B	C
Socket 1/2 in.	21.8 (0.86)	15.9 (0.63)	86 (3.39)
Socket 3/4 in.	27 (1.06)	21.2 (0.83)	96 (3.78)
Socket 1 in.	33.6 (1.32)	26.8 (1.06)	101 (3.98)
Socket 1 1/2 in.	48.5 (1.91)	41 (1.61)	121 (4.76)
Socket 2 in.	60.5 (2.38)	52.5 (2.07)	121 (4.76)

Figure 40: Socket type seal

6.13 5.13 In-line diaphragm seal (S26JN)

In line seals are suitable for measuring the pressure of fluids in pipes. The pressure measuring diaphragm forms the pipe wall making this type of seal suitable for measuring the pressure of flowing fluids particularly those that are highly viscous or contain solids. This particular diaphragm seal is available only on direct-mount gauge and absolute pressure transmitters.



Size Rating	Dimensions mm (in) for S26JN	
	D (dia)	Mb (dia)
1 in. / DN 25	63 (2.48)	28.5 (1.12)
1-1/2 in. / DN 40	85 (3.35)	43 (1.69)
2 in. / DN 50	95 (3.74)	54.5 (2.15)
3 in. / DN 80	130 (5.12)	82.5 (3.25)

Figure 41: In-line diaphragm seal

6.14 5.14 Pulp and Paper diaphragm seals (S26KN)

Models 266HDH, 266NDH, 266GDH and 266ADH integrate a direct mount seal on the positive side, having the negative side reference at atmospheric or vacuum pressure, respectively for gauge or absolute measurements.

The integral seal is available in 1in and 1-1/2in diaphragm sizes specifically designed for pulp & paper industry applications, providing a flush diaphragm to the process; this solution ensures the measure reliability avoiding all problems of crystallization/ polymerization, typical of pulps having viscosity as in the paper mill.

IMPORTANT. Use of proper procedures and fixtures avoid the risks of personal injury or plant damage.
The recommended minimum radius of curvature of the tank is 0.91 m (3 feet).
Allowed fill fluids are Silicone Oil DC200™ and mineral oil Marcol 82™.

6.14.1 1 in. and 1-1/2 in. size with 1 in. and 1-1/2 in. NPT threaded connection

This particular process connection can withstand a maximum working pressure of 345bar (5000psi). The wetted parts are available in AISI 316L, Hastelloy C276™ and Diaflex (anti-abrasion diaphragm treatment).

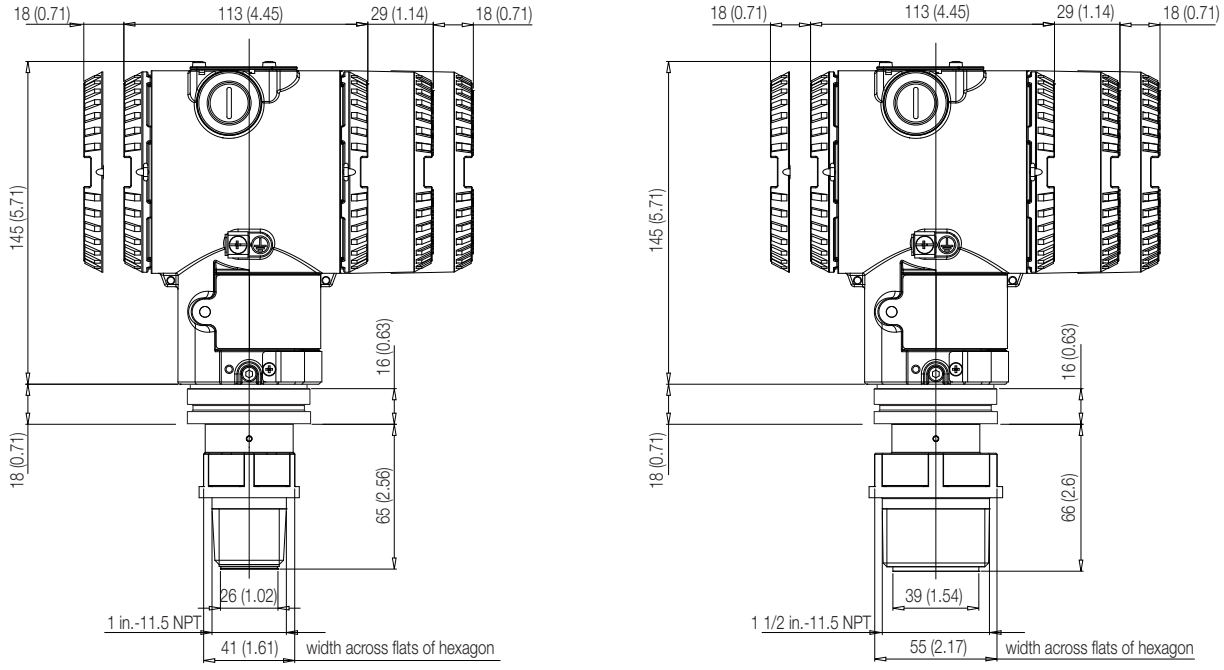


Figure 42: S26KN with NPT threaded connectionl

6.14.2 1 in. and 1-1/2 in. size with G 1 in. B and G 1-1/2 in. B threaded connection

This particular process connection can withstand a maximum working pressure of 600bar (8700psi). The wetted parts are available in AISI 316L, Hastelloy C276™ and Diaflex (anti-abrasion diaphragm treatment).

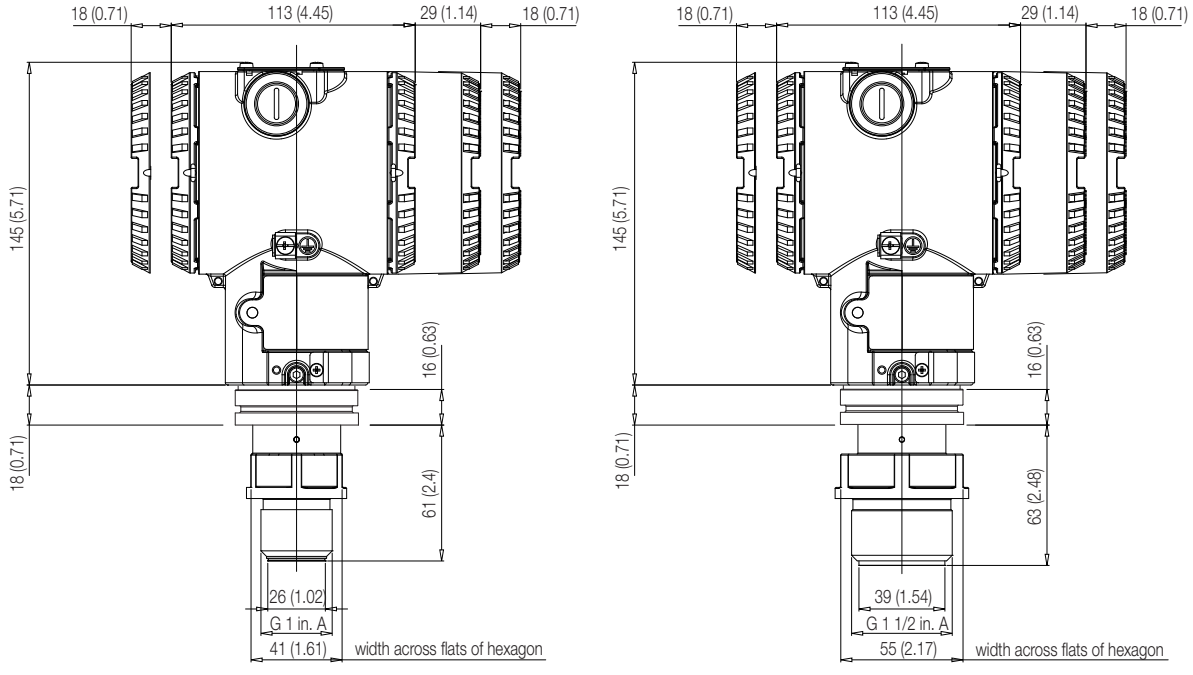


Figure 43: S26KN with GAS threaded connection

6.14.3 1 in. and 1-1/2 in. size to spud with 1 or 2 screw(s) fixing

Consider that this kind of pulp and paper sealing with gasket seal can withstand a maximum working pressure of:

— 30bar (435psi) in case of 1 screw fixing

— 50bar (725psi) in case of 2 screws fixing

The wetted parts are available in AISI 316L, Hastelloy C276™ and Diaflex (anti-abrasion diaphragm treatment).

While installing, please use the appropriate Viton™ gasket.

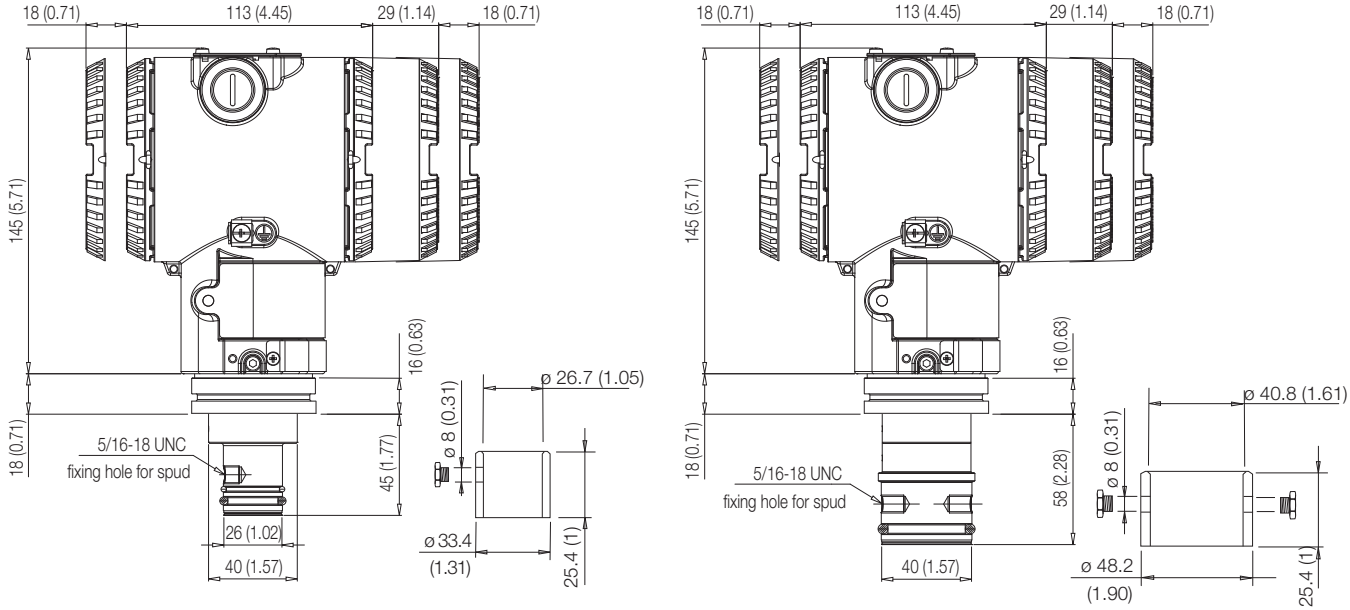


Figure 44: S26KN with spuds and fixing screws

6.14.4 1 in. G with ball valve connection

This special connection allows easy instrument mounting on ball valves which are easy to install and repair. They offer user the opportunity of avoiding complete plant shutdown. This process connection can withstand a maximum working pressure of 40bar (580psi). The wetted parts are available only in Hastelloy C276™.

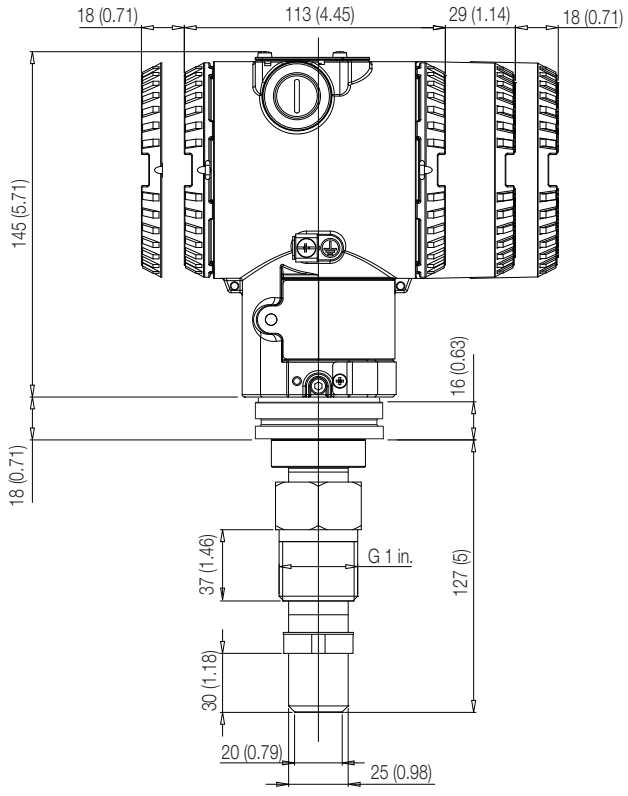


Figure 45: S26KN with ball valve connection

6.14.5 1-1/2 in. sealing connection to threaded spud (M44 x1.5)

Consider that this particular process connection can withstand a maximum working pressure of 50bar (725psi).

While installing, please use the appropriate PTFE gasket.

The wetted parts are available in AISI 316L, Hastelloy C276™ and Diaflex (anti-abrasion diaphragm treatment).

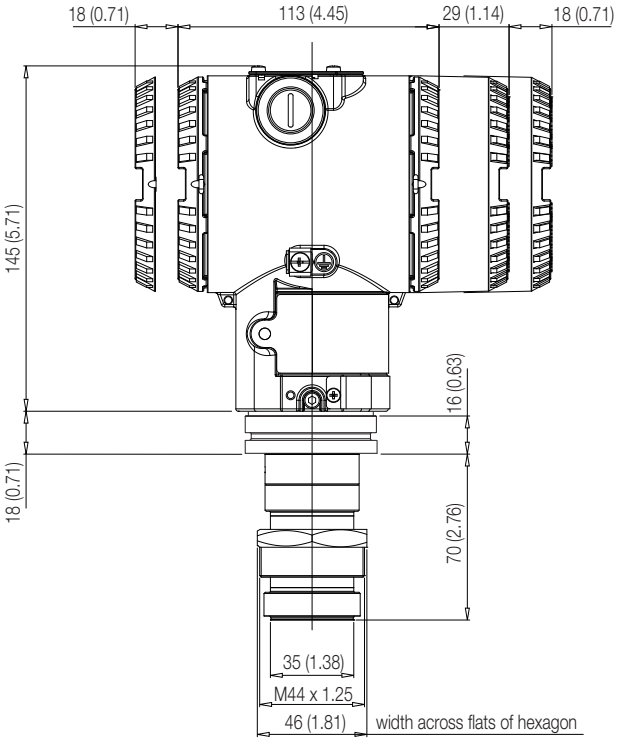


Figure 46: S26KN with M44 x 1.5 trheaded spud connection

6.14.6 5.15 Welding procedure for sanitary and Pulp&Paper spuds

1. Using appropriate size hole saw, cut a hole in the process vessel to accept the spud. The hole should couple with the spud perfectly.
2. Remove the weld spud from the transmitter and secondly the PTFE gasket from the weld spud (if any).
3. Position the weld spud in the vessel hole and start welding. For this important phase, please look at and follow the welding sequence (see figure below).
4. Cool each section properly before proceeding to the next section.
5. Use between 100 and 150 amps. and adjust the amperage, if needed, for spud penetration.
6. After the weld spud has cooled, install the PTFE gasket into the weld spud. Ensure the gasket is properly positioned within the weld spud; improper placement can cause a process leak.
7. Position the transmitter into the spud and engage the threads. Rotate the transmitter and thread it completely.
8. Tighten the transmitter or, if in case of pulp and paper cylindrical spud, install the needed bolt(s).

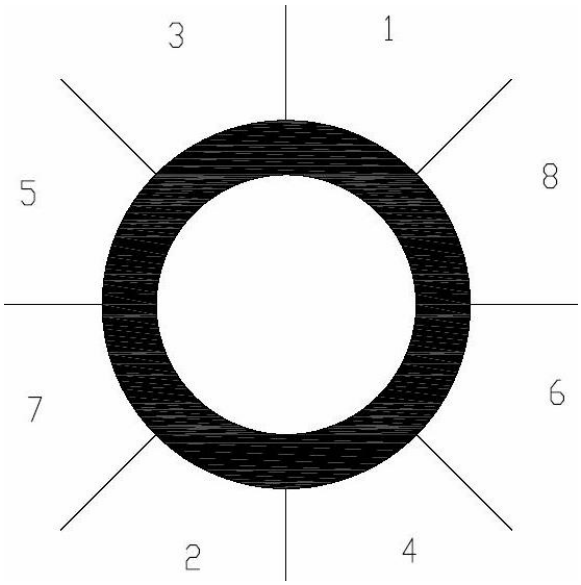


Figure 47: Welding sequence for spuds

IMPORTANT.

Users should install spuds carefully.

Please follow the notes below:

- Position inside gasket (if any) perfectly in order to avoid process leaks.
- Improper installation may result in spud distortion.
- Excessive heat will distort the spud.
- Allow adequate cooling between welding and the following operations.
- Weld the spud properly on tank or vessel walls in order to avoid personal injury or plant damage.

6.14.7 5.16 Sanitary spuds (3-A recommendations)

Use of proper procedures and fixtures permits the flanges to be welded to the maximum wall thickness.

The recommended minimum radius of curvature of the tank is 0.91 m (3 feet).

The spud has to be welded so that the welding surface remains smooth and without irregularities where dirt can lodge. The spud leak detection hole has to be positioned at the bottom of the spud.

For sanitary spud welding procedure, please refer to the following figure.

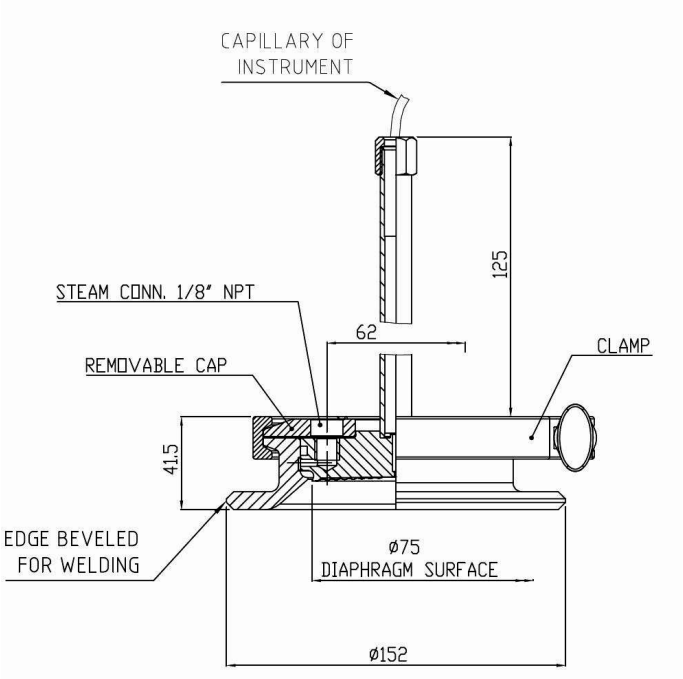


Figure 48: Sanitary spud and welding point

7 6 Connecting low side compensation leg on a DP transmitter with one seal.

Differential pressure transmitters with a single remote seal element are used for liquid level installations. The seal element is connected using the procedure applicable to the type of seal element. The connection requirements for the low side depends on whether the tank is open to atmosphere or closed (pressurized or evacuated). Make the low side connection as described below.

7.1 6.1 Open Tank Instillation

The low side of the transmitter must be vented to atmosphere for open tank installations. Be sure there are no plastic shipping plugs or other restrictions in the low side flange ports. Connect the seal element using the procedure applicable to the element type. Refer to the Connecting the Remote Seals section.

7.2 6.2 Closed Tank Installation

Before connecting the seal element to the tank fitting, determine whether a wet or dry compensating leg is required on the low side of the transmitter. Refer to the Locating the Transmitter and Remote Seals section.

The transmitter is shipped with the vent/drain plug located near the top of the low side flange. In this position the valve permits venting of entrapped gas (normally air) when a wet (liquid filled) compensating leg is required. If a dry leg is required, remove the bolts and rotate the low-side flange 180° so that the vent/drain screw is positioned at the bottom of the flange to permit draining of condensate from the primary cavity. Re-tighten the bolts to a torque of 20 ft-lb.

After properly locating the vent/drain screw, connect the low side to the compensating leg, and connect the seal element using the procedure applicable to the element type. Refer to the Connecting the Remote Seals section.

8 Products and customer support

8.1 ABB's portfolio for valve automation:

– Continuous electrical actuators and pneumatic actuators
– Electro-pneumatic, pneumatic, and digital positioners
– I/P signal converters

8.2 ABB's pressure measurement:

– Absolute, gauge and differential pressure transmitters
– IEC 61508 SIL2/3 certified pressure transmitters and switches
– Multivariable transmitters
– Interface level/density transmitters
– Pressure measurement remote seals
– Pressure measurement accessories
– Pneumatic pressure transmitters

8.3 ABB's temperature measurement:

– Universal temperature sensors
– High-temperature sensors
– Temperature sensors for sanitary applications
– Mineral isolated temperature sensors
– Thermowells
– Temperature transmitters
– IEC 61508 SIL2/3 certified temperature sensors and transmitters

8.4 ABB's portfolio of recorders and controllers:

– Process controllers and indicators
– Videographic recorders
– Paper chart recorders
– Field mountable indicators and controllers

8.5 ABB's portfolio of level measurement:

– Magnetic level gauges
– Magnetostrictive and guided wave radar level transmitters
– Laser and scanner level transmitters
– Ultrasonic, capacitance and vibrating fork level transmitters and switches
– Rotating paddle and thermal dispersion level switches
– IEC 61508 SIL2/3 certified level transmitters

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– Electromagnetic flowmeters
– Mass flowmeters
– Turbine flowmeters
– Wedge flow elements

8.7 ABB's portfolio of device management:

– Fieldbus and wireless solutions
– Scalable asset & device management
– Asset vision software
– Mobility handhelds

8.8 Customer support

We provide a comprehensive after sales service via a Worldwide Service Organization.

Contact one of the following offices for details on your nearest Service and Repair Centre.

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Via Statale 113,
22016 Lenno (Co) – Italy
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Fax: +1 905 6812810

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Faridabad - 121 001, Haryana – India
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Fax: +91 129 2440622

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Shanghai 201319 - P.R. China
Tel: +86 21 6105 6666
Fax +86 21 6105 6677

8.9 Client Warranty

Prior to installation, the equipment referred to in this manual must be stored in a clean, dry environment, in accordance with the Company's published specification. Periodic checks must be made on the equipment's condition. In the event of a failure under warranty, the following documentation must be provided as substantiation:

— A listing evidencing process operation and alarm logs at time of failure.

— Copies of all storage, installation, operating and maintenance records relating to the alleged faulty unit.

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