Heading 7

Chemical Seal Mounting

ARMANO Messtechnik GmbH

- Diaphragm Seals
  - Hygienic Seals
  - Process Seals
  - Precision Seals
- In-line Seals
  - Hygienic Seals
  - Process Seals
  - CIP / SIP Seals

Quality Made in Germany

Chemical Seals

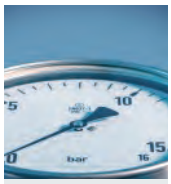
The ARMANO Messtechnik GmbH represents tradition and innovation in the production and distribution of precision pressure and temperature measuring instruments, which have an excellent reputation worldwide – for more than 100 years.

We are continually developing customer-specific solutions for a variety of applications requiring pressure and temperature measuring technology. Their use is manifold and there are always new applications.

In this brochure, you will find our range of diaphragm seals and in-line seals.

Your instrument is not listed here? Jointly, we will find a suitable solution for your application.
Do not hesitate to contact us!

Our Products at a Glance



Mechanical Pressure Measurement

Electronic Pressure Measurement

Chemical Seal Mounting

Calibration Technology

Mechanical Temperature Measurement

Electrical Temperature Measurement

Thermowells & Accessories

Certificates and Approvals

Our company is certified according to the highest quality standards and our product portfolio meets the highest quality demands. We do not only manufacture according to product-specific instrument standards, we also offer versions with special approvals for application areas with specific requirements. The ARMANO Messtechnik GmbH is certified according to DIN EN ISO 9001.

Application

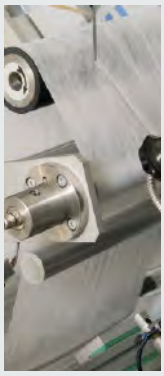
Application Fields of Chemical Seals

Due to their design, pressure measuring instruments often have orifices, shoulders and undercuts. A lot of media might clog the pressure measuring instrument and in food and pharmaceutical applications bacteria and viruses can accumulate.
Aggressive media cause corrosion damage in the pressure measuring instrument. In such cases of application, chemical seals offer a solution. They extend the fields of application of measuring instruments for pressure, vacuum, compound ranges, absolute and differential pressure, i.e. Bourdon tube pressure gauges, pressure switches, transmitters and pressure transducers. Here, pressure ranges of just a few mbar up to 3000 bar and higher can be realised.
Chemical seals can be mounted directly, or via cooling element / capillary line between chemical seal and measuring instrument (see page 14).
Chemical seals consist of a body with process connection and a diaphragm or tube as separating element, which prevents the medium from entering the measuring unit or sensor element.

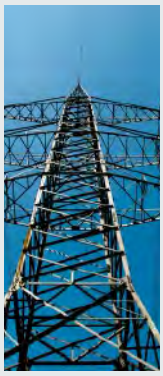
Chemistry & Petrochemistry

Engineering & Plant Construction

Pulp & Paper Industry



Energy



Building Materials Industry

Food, Bio & Pharmaceutical Industry

Sewage Plants & Waste Water Engineering

Chemical Seals are Mounted to the Measuring Instrument ...

- if the **medium must not enter the measuring unit**, e.g. in case of heterogeneous, viscous media, or media that tend to harden or crystallise and thus might clog parts such as pressure inlet port and Bourdon tube.
- if, due to **corrosion resistance,** the wetted parts have to be made of special materials that are not suitable for the construction of elastic elements for pressure measuring instruments.
- if the **medium is toxic or environmentally hazardous** and must not be able to enter the environment or the atmosphere, e.g. in case of leakage of the measuring element due to overload or wear. Chemical seals offer effective additional protection by separating the medium from the measuring element.
- if processes and regulations place particularly **high demands on hygiene**, e.g. in the food / bio / pharmaceutical industries (free of wetted dead spaces, very good cleaning possibilities). ARMANO also offers EHEDG and 3-A certified instruments for these applications.
- if the **ambient temperature at the measuring point or the temperature of the medium is too high for the measuring instrument**. By using a chemical seal with cooling element or capillary line, the measuring instrument can be separated from the temperature.
- if the **installation conditions at the measuring point are unfavourable** or if mechanical vibrations and pulsations should be kept away from the measuring instrument. By using a chemical seal with capillary line it is possible to separate the measuring instrument from the measuring point and mount it at a suitable location.

Construction Types

Connection to the Process

The most commonly used chemical seal types are diaphragm seals and in-line seals.
The diaphragm seal is coupled to the medium, whereas the in-line seal can be inserted into the medium flow.

Diaphragm Seals

Diaphragm seals are available in a variety of flange, process and hygienic fittings. This ensures easy adaption of the diaphragm seals to pipelines and vessel walls by means of T-pieces or tube sockets.
Diaphragm seals are available in a wide range of special materials and coatings, enabling even pressure measurements of highly corrosive media.
Electrochemical finishing (electropolishing) in-house provides ARMANO diaphragm seals with the very high surface qualities that are standard in food / bio / pharmaceutical industries.

In-line Seals

In-line seals are used in the medium flow. The measuring membrane is tubular and offers metrological advantages over diaphragm seals, especially for small tube diameters. Due to their self-draining design and the construction free of dead spaces, in-line seals are particularly appreciated in the food and pharmaceutical industries.
Using the in-house CIP / SIP cleaning system, ARMANO has developed in-line seals that can withstand this demanding cleaning process.
Even extremely small in-line seals with a nominal diameter of up to 10 mm can be manufactured and are applied for particularly high-quality media in the pharmaceutical industry.

Membrane

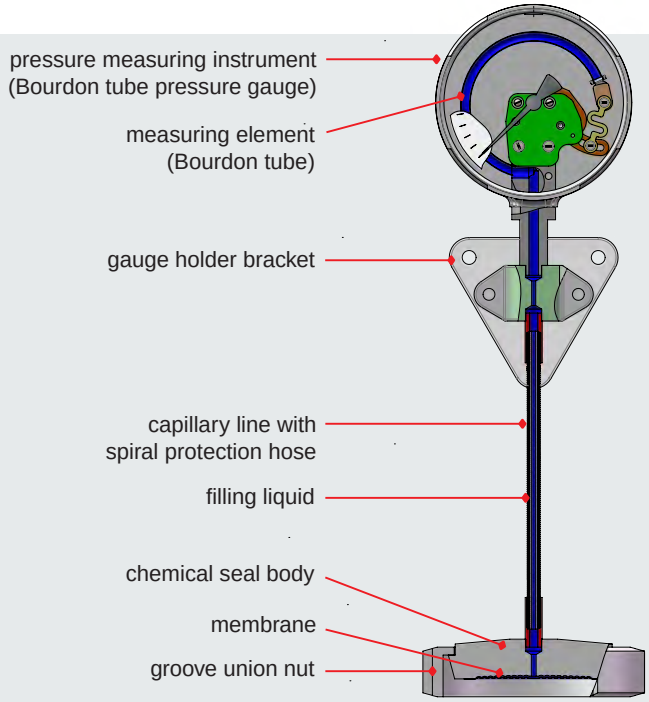
The membrane is an elastic separating element. It can be manufactured from a wide range of materials and, if necessary, provided with a protection foil or coating, thus ensuring that suitable versions are available for almost any medium.

Thickness depending on version:	30 µm to 200 µm
Processing:	mainly laser-welded

The membrane must not be touched improperly. Any contact with hard objects or high-pressure water jets, etc. can cause permanent damage.

Operating Principle of Chemical Seals

The essential part of a chemical seal is the usually welded separating element, which can be a diaphragm, a tube or an immersion shaft tube. This separating element is not a measuring element such as an up to 1 mm thick diaphragm (cf. model overview 3000), which transfers the medium pressure via a fixed connection to an indicating pointer move. It rather serves to keep the medium away from the actual measuring system with the least possible influence on the measuring result. The most common chemical seals are diaphragm seals mounted on Bourdon tube pressure gauges. Thus, the basic operating principles are explained below based on this construction type.



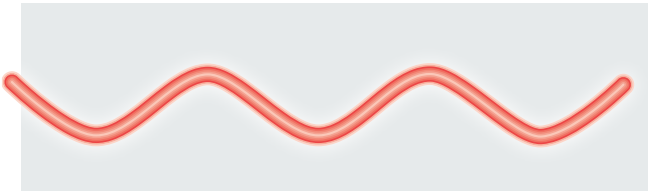
The space between diaphragm and Bourdon tube tip is evacuated, completely filled with a suitable filling liquid and hermetically sealed.
The elastic part of the diaphragm bends inwards under the pressure of the medium and thus displaces the volume in the system. For pressure indication, the diaphragm has to displace at least as much volume as is necessary to deflect the Bourdon tube.
The volume necessary for the maximum pressure indication of the measuring instrument is the required “control volume”.
The volume that the diaphragm can actually displace is the “operating volume”. The operating volume is determined by the thickness, geometry, material and in particular by the diameter of the diaphragm.
If the operating volume is smaller than the required control volume, the combination of this chemical seal with this particular pressure gauge is not applicable.
The operating principle is similar if vacuum is applied, except that the diaphragm of the diaphragm seal bends outwards as the vacuum increases.

The Structure Pattern of the Chemical Seal Separating Membrane

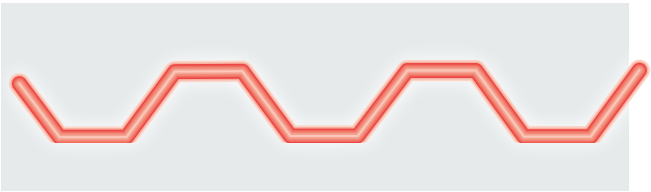
A standard chemical seal separating membrane from ARMANO has a concentric structure pattern that resembles a sine wave. The pattern guarantees that the membrane operates with very small measuring errors. The sinus membrane geometry ensures that the measuring error is as small as possible and that it is linear. Over a wide range, the characteristic curve of the sinus membrane can be described as a linear equation. The sinus membrane geometry is widely used and can be applied easily for pressure measuring instruments with a measuring error of up to 0.5 %.

For precision applications, such as the use of mechanical and electrical process pressure measuring instruments, which often have accuracies <0.5 %, ARMANO has developed the High-Soft Membrane. This new type of membrane can compensate very large volume fluctuations with almost no counteracting force. In comparison to the sinus membrane geometry, here the membrane-related measuring error is smaller by a factor of 100.
ARMANO supplies many standard chemical seals with a high-soft membrane at no extra cost.

Sinus Membrane



High-Soft Membrane



Process-related Influences

If the measuring task cannot be solved with standard pressure measuring instruments, diaphragm seals or in-line seals are applied. The list of influencing factors includes, for example, the aggressiveness of the medium, the excessive temperatures or the required sterility.
A measuring point with chemical seal can only meet the requirements in an optimal way if all influencing factors are known. For your support, ARMANO offers checklists with which a chemical seal measuring point can be easily described. These checklists can be downloaded from the ARMANO website.
The following should be known about the process and the measuring point:

Important Process Parameters ✓

- What kind of medium is to be measured?
- What is the viscosity of the medium?
- What is the aggregate state of the medium?
- What is the process pressure?
- What is the process temperature?
- Is there any pulsation?
- Is there negative pressure / vacuum?

Important Ambient Parameters ✓

- What are the mounting conditions of the measuring instrument?
- Which type of pressure (e.g. vacuum) is measured?
- What is the ambient temperature range?
- Is there any vibration?

Important Cleaning Parameters ✓

- What is the cleaning temperature?
- Which cleaning agent is used?
- Is cleaning or sterilisation carried out with steam?
- Is cleaning carried out with pressurised water?
- Are the measuring devices sterilised or autoclaved?
- Is cleaning carried out in the process (CIP / SIP)?

Are there any certifications required? ✓

- EHEDG, 3-A or FDA in food and pharmaceutical sectors
- NACE MR0175 for the oil production
- NACE MR0103 for oil processing
- GOST approvals for Eastern Europe
- CRN approval for the use of pressure measuring instruments in Canada
- Stamp confirmation certificate according to AD 2000W

Metrological Influences

In addition to process-related factors, there are also metrological factors that must be considered when designing a chemical seal to ensure that the measuring instrument and the mounted chemical seals function as expected. If the metrological influencing factors are well-known, the metrological properties of the chemical seal system can be mathematically calculated in advance.

The following data are required for a chemical seal calculation: ✓

- Medium temperature
- Ambient temperature at the pressure measuring instrument, or the temperature range to be expected
- Instrument-specific factors, such as filling volume and control volume
- Mounting of the pressure measuring instrument to the chemical seal, e.g. length of the capillary line, height differences of the chemical seals for tank measurements
- Depending on the distance between chemical seal and pressure measuring instrument, a response delay occurs, the so-called floating time

Temperature

Depending on version and filling, chemical seals are available for process temperatures from −90 °C to +400 °C.
The standard reference temperature for chemical seal systems with attached measuring instrument is +20 °C.
Deviating ambient or medium temperatures cause a volume change of the filling liquid. This changes the pressure within the system, which causes an additional indication error.
For inquiries and orders, temperatures deviating from +20 °C (min./max. values, if applicable) must be indicated by all means, so that the version and the calibration can be optimised for the operating conditions.

The temperature influences can be reduced by

- suitable filling liquids
- selecting the largest possible diameter of the membrane
- keeping the volume in the system as small as possible
- keeping the measuring instrument away from the temperature by mounting a capillary line or a cooling element between chemical seal and measuring instrument (strongly recommended for temperatures above +100 °C!)

Operating and cleaning temperature

We differentiate between operating temperature (t_A) and cleaning temperature (t_R), especially for instruments for the food/bio/pharmaceutical industries.

- **t_A** is the operating temperature at the membrane (process temperature).
  Our instruments are adjusted for t_A +20 °C as standard. Adjustments for other operating temperatures are optionally available.
- **t_R** is the maximum permissible temperature during cleaning/sterilisation processes (without pressure indication).
  The standard maximum permissible cleaning temperature for our chemical seal series MDM 73… or RDM 763… with vegetable oil filling is +150 °C.
  (There are restrictions for a few types and nominal widths).
  CIP/SIP cleaning is possible for separately approved diaphragm seals. Autoclavable pressure measuring instruments are available as well.

Height Difference (for Instruments with Capillary Line)

If the measuring device and the chemical seal are not on the same reference plane, this difference in height affects the measurement due to the hydrostatic pressure of the liquid column.
When ordering, it is absolutely necessary to specify a height difference to ensure that any resulting measurement error can be compensated by appropriate calibration.
In general, the following applies to chemical seals with capillary line:
If vacuum occurs or can occur, the pressure measuring instrument must be mounted at least 40 cm below the chemical seal!

Floating Time

The indication may be delayed in systems with capillary line. This delay is called floating time and may be intentional for additional damping in certain cases. The floating time is affected by:

- the viscosity of the filling liquid
- the internal diameter of the capillary line
- the length of the capillary line
- the control volume of the measuring instrument

Process Connection

Depending on the industry, certain process connection types have been established, e.g. flanges are generally used by customers in the chemical or petrochemical industry, while so-called clamp connections are frequently requested in the pharmaceutical sector. To support our customers with the selection, we have divided our chemical seals into product families.

Flange connection	**for chemical and petrochemical industries**	**(e.g. data sheets 75..)**	✓
Clamp connection	**for food / bio / pharmaceutical industries**	**(e.g. data sheets 73..)**	✓
Thread connection	**for engineering and plant construction**	**(e.g. data sheets 74..)**	✓

Chemical seals with process connections according to a wide range of standards and in various nominal sizes from our standard product range are available from stock. In addition, we manufacture numerous customer-specific special versions.

Instrument Connection

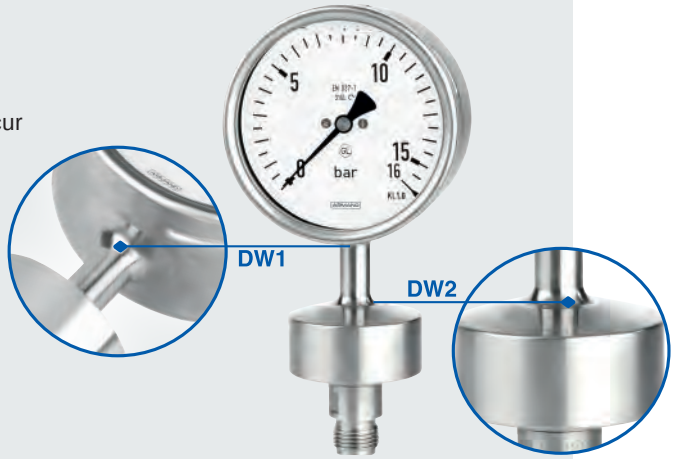
..vd8 ✓

Direct welding of the chemical seal to the measuring instrument has been standard for years and is superior to screwed chemical seals, e.g. for hygienic design diaphragm seals.

DW-Line (Double Weld)
In order to meet the special requirements even more effectively, especially in the food / bio / pharmaceutical industries, ARMANO has developed the DW-Line pressure gauges for chemical seal mounting.
In contrast to the classical mounting versions, the DW-Line pressure gauges have special design features that significantly improve the DW-Line chemical seal system.
DW – Double Weld are Bourdon tube pressure gauges, which are welded to the chemical seal. The case of the pressure gauge is welded to the circular connecting piece (DW1) and the circular connecting piece is welded to the chemical seal (DW2). For this purpose, the circular connecting piece has a d8x5 process connection and the chemical seal has a corresponding bore.

Advantages:
- Pressure gauge welded to chemical seal – not screwed
- The filling port is within the pressure gauge – no leakage can occur
- No loss of filling liquid due to temperature change
- Reduced temperature error due to less filling liquid
- Standard front-to-back sizes

DW-Line pressure gauges are available over a wide pressure range and in all common case sizes. DW-Line pressure gauges with nominal case sizes 63 and 100 can be supplied as SDL DW-Line measuring device in combination with the common hygienic connections particularly fast and at a reasonable price.



..vG½ female ✓

Of course, ARMANO also offers classical chemical seals with a G½ or M20x1 female thread connection screwed to the pressure measuring instrument.

Other Connections ✓

Several thread options are available, whereas we do not recommend NPT connections.

Materials

For Each Task the Right Material

In many applications, chemical seals are fitted if the medium must not come into contact with the measuring instrument because the medium causes corrosion in the pressure measuring instrument. In other areas of application, a non-stick coating or a protective barrier against gas diffusion / permeation is necessary.
Depending on the medium, different materials are applied, with our standard material stainless steel 316L being used in a large number of applications. If the requirements concerning the necessary resistance are increasing, we have several further materials that can be applied.

Coatings and foils on the membrane or other wetted parts further enhance the resistance for the application of critical media. Especially regarding media that must be locked against diffusion (permeation)[1], chemical seals offer special protection with the application of additional corresponding coatings.

Basically, the wetted parts of a chemical seal should always be made of a suitable material.
This can be achieved in three ways:

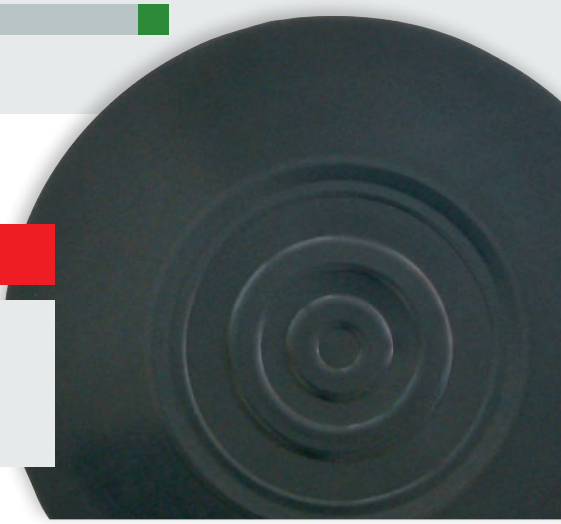
Homogeneous Chemical Seal
Chemical seal body and the membrane are made of one material

Two-phase Chemical Seal
Chemical seal body is made of high-strength material (e.g. 316L) and wetted parts are made of special material

Coated Chemical Seal
Chemical seal body is made of high-strength material and wetted parts are coated

Overview of the Materials

Stainless steel		PTFE (grey)	
Duplex steel		PTFE (black)	
Titanium		PTC	
Tantalum		PFA	
Monel		PFA (rot)	
Inconel		Gold	
Hastelloy		ECTFE (Halar®)	
Nickel		Rubber coating	



The following factors may change the process suitability of the materials incl. membrane, wetted parts and coatings:

- temperature
- pressure
- oxidising environments
- applied sealing materials or seals
- position of installation
- medium composition
- chemical / mechanical medium properties (abrasion)

[1] Permeation is the superordinate term for diffusion. At permeation, the medium (e.g. chemicals) permeates the protective coating of the chemical seal and may damage it. In order to avoid this process, materials offering sufficient protection have to be applied.

Surface Quality

Requirements on the Surface Quality

In addition to the non-stick properties obtained e.g. by PTFE coatings, the surface finish of the wetted parts plays an important role, especially in food / bio / pharmaceutical industries. Here, residue-free cleaning is required and recesses in which bacteria or fungi could grow are to be avoided.
Many hygienic chemical seals from ARMANO have EHEDG and 3-A approvals, which confirm their good cleaning properties and surface quality.
An essential aspect for the protection of food / bio and pharmaceutical products against contamination is the hygienic design of the chemical seals. Roughness values such as Ra 0.8 µm to Ra 0.2 µm (electropolished) serve as quality characteristics. The surface roughness should be smaller than the size of the substances adhering to the surface in order to achieve a direct wetting of the residual dirt with cleaning-active substances during the cleaning phase.

Standard	Electropolished	KCT Process
		

Tightness

Absolutely Leakage-free

Each chemical seal is subjected to a helium leak test up to 10^{-9} mbar l/s after the membrane has been welded in. The complete measuring system is checked again shortly before the filling process. This ensures that all connections of the finished system are absolutely leakage-free, otherwise filling fluid leaks and the pressure measuring system loses its functionality.

Filling Liquids

The selection of the filling liquids is crucial for the operating temperature range of a chemical seal. Both minimum and maximum medium and ambient temperatures must be taken into account when selecting the appropriate filling.

In addition, the filling liquid must be compatible with the medium, especially for media such as oxygen and chlorine, or for devices for food/bio/pharmaceutical industries. This is necessary in the rare case that a membrane is damaged, e.g. due to particles in the medium, and filling liquid enters the medium.

Our chemical seals are filled with silicone oil as standard. Chemical seals for food/bio/pharmaceutical industries (MDM 73.., RDM 763..) are filled with vegetable oil.

Filling Liquid		Permissible Medium Temperatures[1]		Density g/cm³ at 20 °C	Dynamic Viscosity kg/m x s at 20 °C	Coefficient of Compressibility 1/bar x 10^{-5}	Coefficient of Volume Expansion 1/°C	Specifics
External Name	Ordering Code	Vacuum[2]	Pressure					
General Applications								
Silicone oil	FA1	–	−20 / +200 °C	0.97	0.337	10.1	0.00 092	
Silicone oil	FA2	−90 / +80 °C	−90 / +120 °C	0.92	0.004	9.3	0.00 113	
Silicone oil	FA5	−40 / +180 °C	−40 / +400 °C	0.96	0.048	9.8	0.00 100	
Silicone oil	FA6	−40 / +180 °C	−40 / +300 °C	0.96	0.048	10.1	0.00 100	
Food/Bio/Pharmaceutical Applications								
Vegetable oil	FN1	−10 / +200 °C	−10 / +300 °C	0.91	0.063	6.5	0.00 082	
White oil (paraffin oil)	FN2	−10 / +150 °C	−10 / +300 °C	0.87	0.066	8.5	0.00 087	FDA, silicone-free
Glycerin	FN3	–	10 – 200 °C	1.26	1.410	2.2	0.00 050	FDA, for O_2 up to 60 °C/25 bar
Glycerin/ water	FN4	–	−10 / +120 °C	1.23	0.150	2.5	0.00 050	
Neobee®	FN7	−10 / +130 °C	−20 / +200 °C	0.92	0.0111	8.6	0.00 086	FDA
Oxygen Applications, Chlorine Applications, etc.								
Halocarbon	FO1	−40 / +80 °C	−40 / +175 °C	1.85	0.012	8.3	0.00 079	for O_2 (up to 60 °C/160 bar) and chlorine

[1] deviations only via development department
[2] also valid for compound ranges

Accessories

SpR

Version	flushing ring for diaphragm seals
Data sheet	7.7001

Flushing rings for flange and cellular ("pancake") type diaphragm seals can be mounted between process connection and chemical seal if media residues or cloggings at the chemical seal connection are to be expected.
The two lateral flushing bores allow for purging of accumulated particles in front of the diaphragm and for ventilation of the pressure chamber.

KElRv

Version	cooling element
Data sheet	7.7002

We recommend decoupling the measuring instruments for medium temperatures from 100 °C. Depending on the instrument model, the temperature limit may also be lower.
Cooling elements can be applied for medium temperatures up to +300 °C. For medium temperatures higher than +250 °C, a capillary line is required.

FLv / FL

Version	capillary lines
Data sheet	7.7003

Capillary lines with chemical seal are not only used to separate a measuring instrument from the measuring point due to high temperatures, but also to install it at a suitable place in case of unfavourable installation conditions at the measuring point or if the instrument is to be mounted in a control room away from the process line.
Furthermore, capillary lines help to keep disruptive mechanical vibrations and/or pulsations away from the pressure measuring instrument.
A mounting device for the measuring instrument is required for systems with capillary line, e.g. gauge holder brackets, rear flanges or front flanges for pressure gauges.
Never use the capillary line of a chemical seal to carry or move the instrument! The welding joints should be stressed as little as possible. Above all, do not bend a capillary line. This would increase the floating time or leakages might occur, causing the system to lose its functional capability.
We supply capillary lines:

- made of stainless steel
- bending radius min. 150 mm
- with spiral protection hose made of stainless steel
- length 0.5 – 10 m, in 0.5 m increments
- maximum length also depends on medium and ambient temperatures, pressure range and chemical seal type, details upon request
- options e.g.: spiral protection hose with PE cover, deviating capillary line lengths

Adapt FS

Version	flame arrester flame penetration protection with ATEX approval
Data sheet	11001

Within the meaning of the ATEX Directive 2014/34/EU, our chemical seals are components and can therefore be mounted in explosion-hazardous areas (zones 1 and 2) without any further conformity assessment procedures.
For mounting to zone 0, the chemical seals have to be equipped with a type-approved protection system, our flame arrester Adapt FS.

Process Connection Pieces

For chemical seals with connections for food and aseptic applications MDM 73.. and RDM 763.., upon request we can also supply:

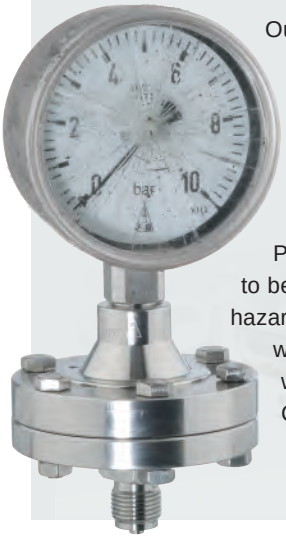
- welded connection pieces flush or with thread
- sealings
- clamps
- union nuts

Service

Mounting of Components from other Manufacturers

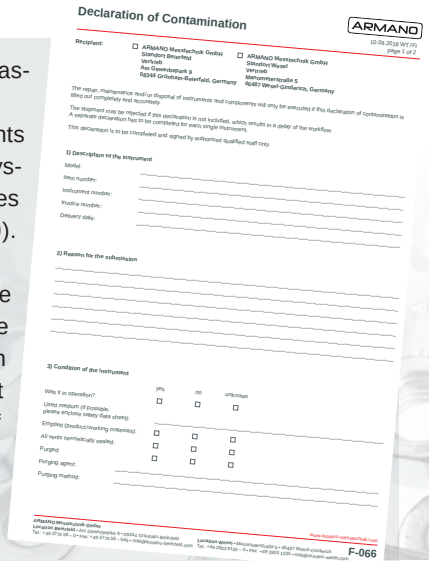
Upon request, we can also mount measuring instruments from other manufacturers, provided that they are suitable. Technical data sheets and operating instructions for the external device as well as information on the required control volume are indispensable and must be provided on request or when sending in the device.

Repair Service



Our service includes the calibration, adjustment and repair of measuring instruments (including those from other manufacturers). Please note, however, that repairs of measuring instruments with chemical seal are relatively costly. Therefore, these systems should always be handled with special care, cf. the notes on the capillary line (page 14) and on the diaphragm (page 10).

Prior to sending in an instrument for repair, all wetted parts have to be cleaned thoroughly. This applies especially to media that are hazardous to health. Always enclose a declaration of contamination with the repair order. PDF versions for printing can be found at www.armano-messtechnik.com (Downloads / Declaration of Contamination).



Declaration of Contamination

ARMANO

10.09.2018 WY/PI
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Recipient:

☐ ARMANO Messtechnik GmbH
Standort Bruchsal
Verbach
Am Gewerbepark 9
76344 Gröbbach-Reichfeld, Germany

☐ ARMANO Messtechnik GmbH
Standort Wesel
Verbach
Mathildenstraße 5
46487 Wesel-Gindertzo, Germany

The repair, maintenance and/or disposal of instruments and components will only be executed if this declaration of contamination is filled out completely and accurately.

The shipment may be rejected if this declaration is not included, which results in a delay of the workflow.
A separate declaration has to be completed for each single instrument.

This declaration is to be checked and signed by authorised qualified staff only.

1) Description of the instrument

Model:

Item number:

Instrument number:

Invoice number:

Delivery date:

2) Reason for the submission

3) Condition of the instrument

	yes	no	unknown
Was it in operation?	☐	☐	☐
Used medium (if possible, please enclose safety data sheet):			
Emptied (product/working materials):	☐	☐	☐
All teeth hermetically sealed:	☐	☐	☐
Purged:	☐	☐	☐
Purging agent:			
Purging method:			

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Tel.: +49 0281 9520 – 0 • Fax: +49 0281 9520 • info@armano-wesel.com

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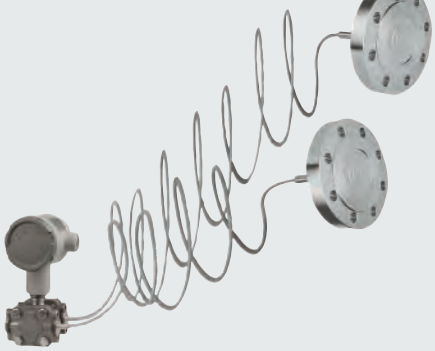
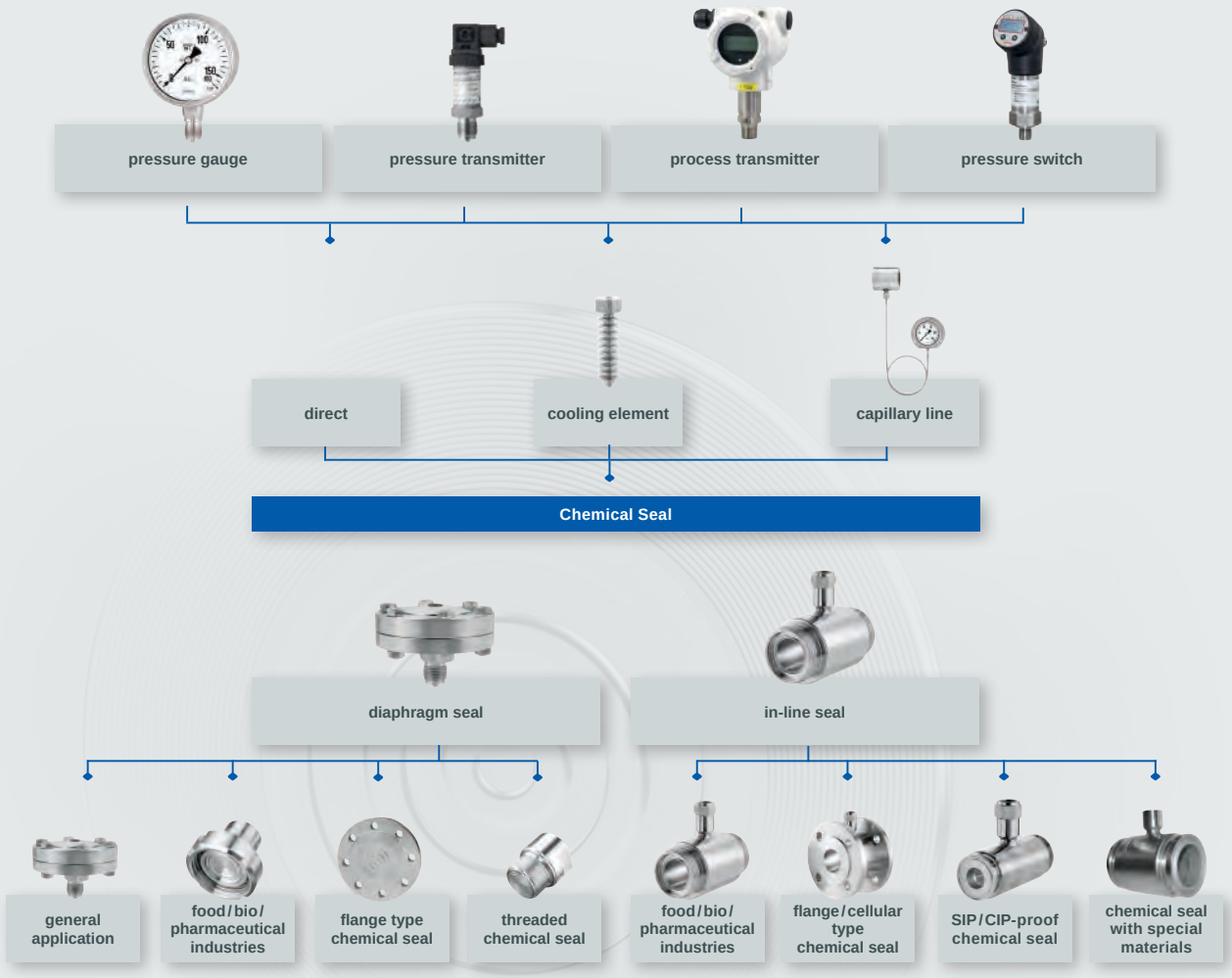
Special Versions

Numerous customer solutions are available for almost all models. Thus, only a few examples are specified below.
Further possibilities can be found in the data sheets or other technical documents of the respective models.
Further individual special configurations are available upon request.
No matter what requirements and needs your application has, together with our technicians we will find an ideal solution for you – please contact us!



Combination Matrix with Measuring Instruments



Diaphragm Seals

General Applications

The three-part design (attachment flange, upper part and lower part) allows the combination of different materials and the selection of various process connections (male thread or flange connections), thus providing a wide range of applications. The diaphragm is welded to the upper part.

All-rounder With Particularly Good Metrological Properties

MDM 7210v	
Process connection	male thread or flange
Nominal pressure	PN 40, optional PN 100
Material	stainless steel 316L (others see page 11)
Instrument connection	vd8 vG ½ female
Data sheet	7210

Compact Metal Sealed up to 400 °C

MDM 7210.L	
Process connection	male thread
Nominal pressure	PN 100, optional PN 250
Material	stainless steel 316L (others see page 11)
Instrument connection	vd8 vG ½ female
Data sheet	7210.L

For High-pressure Applications up to 250 bar

MDM 7211v	
Process connection	male thread or flange
Nominal pressure	PN 250
Material	stainless steel 316L (others see page 11)
Instrument connection	vd8 vG ½ female
Data sheet	7211

For High Pressure up to 600 bar Metal Sealed Suitable for High Temperatures

MDM 7280v	
Process connection	female thread
Nominal pressure	PN 600
Material	stainless steel 316L (others see page 11)
Instrument connection	vd8 vG ½ female
Data sheet	7280

Diaphragm Seals

For Food / Bio / Pharmaceutical Industries

Diaphragm seals of the type series 73.. are particularly suitable for food / bio / pharmaceutical industries. These chemical seals can withstand cleaning temperatures up to max. 150 °C and maintain roughness values of Ra 0.8 µm, thus ensuring a hygienic, aseptic design between medium and chemical seal.

For Hygienic Applications

MDM 73.. MDM 73..v	
Process connection	DIN 11 851, APV RJT, ISO 2853 (IDF), SMS, DS 722 DRD, Clamp ISO 2852, DIN 32 676, Tri-Clamp
Nominal pressure	PN 10 – 40
Material	stainless steel 316L (others see page 11)
Instrument connection	vd8 vG ½ female
Data sheet	7300

Aseptic In-line

MDM 73.. MDM 73..v	
Process connection	SÜDMO (W 500 D), Ingoldstutzen, APV-In-Line, NEUMO BioControl®, Varivent® (for Varinline® case)
Nominal pressure	PN 16 – 60
Material	stainless steel 316L
Instrument connection	vd8 vG ½ female
Data sheet	7301

Aseptic Screw Fitting According to DIN EN 11 864

MDM 73.. MDM 73..v	
Process connection	DIN 11 864-1 DIN 11 864-2 DIN 11 864-3
Nominal pressure	PN 16 – 40
Material	stainless steel 316L (others see page 11)
Instrument connection	vd8 vG ½ female
Data sheet	7302

Neumo BioConnect®

MDM 73.. MDM 73..v	
Process connection	NEUMO BioConnect®
Nominal pressure	PN 10 – 16
Material	stainless steel 316L (others see page 11)
Instrument connection	vd8 vG ½ female
Data sheet	7303

Diaphragm Seals

Flange Type Seals according to DIN EN, ASME and JIS

Diaphragm seals of the type series 75.. are suitable for aggressive, contaminated and hot media. Numerous common pressure gauges of our supply programme can be equipped with these chemical seals, but also pressure switches, pressure transmitters and pressure transducers. The diaphragm is welded free of dead space to the process side of the chemical seal.

High Spec DTM and ASME Flanges

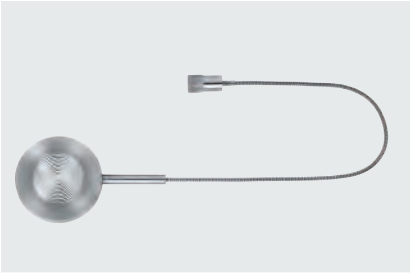
MDM 7510v MDM 7520v	
Process connection	flange according to DIN EN or ASME
Nominal pressure	PN 10 – 400 Class 150 – 2500
Material	stainless steel 316L (1.4404) (others see page 11)
Instrument connection	vd8 vG ½ female
Data sheet	7500

Flanges for Small Tube Diameters

MDM 7511v MDM 7521v	
Process connection	flange according to DIN EN or ASME
Nominal pressure	PN 10 – 40 Class 150 – 300
Material	stainless steel 316L (1.4404) (others see page 11)
Instrument connection	vd8 vG ½ female
Data sheet	7501

Flanges with Extension Tube

MDM 7515v MDM 7525v	
Process connection	flange according to DIN EN or ASME
Nominal pressure	PN 10 – 40 Class 150 – 300
Material	stainless steel 316L (1.4404) (others see page 11)
Instrument connection	vd8 vG ½ female
Data sheet	7502



Cellular Type Seal

MDM 7550 – 7565	
Process connection	intermediate flange acc. to DIN EN or ASME
Nominal pressure	PN 16 – 400 Class 150 – 2500
Material	stainless steel 316L (1.4404) (others see page 11)
Instrument connection	capillary line with G ½ female
Data sheet	7505

Diaphragm Seals

Thread Connection

Diaphragm seals of the type series 74.. with thread connection are universally usable and are primarily used in engineering and plant construction.

Flush-mounted

MDM 7410v	
Process connection	male thread G½B to G2B
Nominal pressure	PN 600
Material	stainless steel 316L (others see page 11)
Instrument connection	vd8 G½ female
Data sheet	7400

Flush-mounted Tapered Version

MDM 7420v	
Process connection	male thread ½" NPT to 2" NPT
Nominal pressure	PN 600
Material	stainless steel 316L (others see page 11)
Instrument connection	vd8 G½ female
Data sheet	7400

Flush-mounted for Chemical Seals with Union Nut

MDM 7450v	
Process connection	hexagon union nut G1 to G2
Nominal pressure	PN 600
Material	stainless steel 316L (others see page 11)
Instrument connection	vd8 G½ female
Data sheet	7400

Welded Up To 600 bar

MDM 7910v / MDM 7980v	
Process connection	G½B ½" NPT
Nominal pressure	PN 250 PN 600
Material	stainless steel 316L (others see page 11)
Instrument connection	vd8 vG½ female
Filling liquid	silicone oil
Data sheet	7935

Fully Welded Up To 1000 bar

MDM 7952v	
Process connection	high pressure connection M16x1.5 female optional: ½" or ¼" NPT
Nominal pressure	PN 1000
Material	stainless steel 316L (others see page 11)
Instrument connection	vG½ female
Filling liquid	glycerin
Data sheet	7952

In-line Seals

For Food / Bio / Pharmaceutical Industries

For Hygienic Applications

MDM 763..v	
Process connection	DIN 11 851, APV RJT, ISO 2853 (IDF), SMS Clamp ISO 2852, DIN 32 676, Tri-Clamp
Nominal pressure	PN 10 – 40
Material	stainless steel 316L (others see page 11)
Instrument connection	vd8 vG ½ female
Data sheet	7630

With Aseptic Connection

MDM 763..v	
Process connection	DIN 11864-1 DIN 11864-2 DIN 11864-3 Neumo BioConnect®
Nominal pressure	PN 10 – 40
Material	stainless steel 316L (others see page 11)
Instrument connection	vd8 vG ½ female
Data sheet	7630

The in-line seal models RDM 763.. with hygienic connections for food / bio / pharmaceutical industries are directly integrated into the process line.
This enables an excellent hygienic design of production facilities and provides ideal prerequisites for smooth production flows.

Industrial Applications

The in-line seal models RDM 7690 to 7695.1 with flange and cellular type connection are directly integrated into the process line.
This provides ideal prerequisites for smooth production flows.

Flange Type

MDM 7690.1v acc. to DIN EN MDM 7695.1v acc. to ASME	
Process connection	flange according to DIN EN or ASME
Nominal pressure	PN 10 – 40 Class 150 – 300
Material	stainless steel 316L (others see page 11)
Instrument connection	vd8 vG ½ female
Data sheet	7600

Cellular Type

MDM 7690v acc. to DIN EN MDM 7695v acc. to ASME	
Process connection	cellular type according to DIN EN or ASME
Nominal pressure	PN 10 – 400 Class 150 – 2500
Material	stainless steel 316L (others see page 11)
Instrument connection	vd8 vG ½ female
Data sheet	7600

Chemical Seals

For Special Applications

Medium Resistant as Plastic Version

MDM 7190

Specifics	screws 1.4301 cover caps PE
Process connection	G ¼ female or G ½ female
Nominal pressure	PN 10 at 20 °C
Material	upper part PP diaphragm EPDM / PTFE lower part PVC-U, PP, PVDF
Instrument connection	G ¼ female or G ½ female
Filling liquid	Glysantin®
Data sheet	7190

For Pulp and Paper Industries

MDM 7590v

Specifics	connection to the measuring instrument: screwed, via capillary line, quadrant pipe 90° or with vibration damper
Process connection	DN 48 tube length 15 mm
Nominal pressure	PN 40
Material	stainless steel 316L (others see page 11)
Instrument connection	vd8
Filling liquid	silicone oil
Data sheet	7590

For Ermeto Fitting

RDM 7680

Specifics	with cutting ring fitting metal sealing
Process connection	Ermeto fitting M 18x1.5
Nominal pressure	PN 250
Material	stainless steel 1.4404 (316L)
Instrument connection	vd8 vG ½ female
Filling liquid	silicone oil
Data sheet	7680

For Homogenising Machines

MDM 7390v

Specifics	attachment block flange stainless steel 316L
Process connection	homogeniser connection
Nominal pressure	PN 600
Material	stainless steel 1.4435 (others see page 11)
Instrument connection	vd8
Data sheet	7390

Capsule Seal

TDM 7710

Specifics	immersion shaft tube length 90 mm
Process connection	union nut G 1 female
Nominal pressure	PN 600
Material	stainless steel (316L)
Instrument connection	⅜ female
Filling liquid	glycerin
Data sheet	7710

Speed Line e.g. Clamp

RCh / RChG – 3 vDW

Specifics	pressure gauge (case / connection piece welded)
Process connection	depending on the type
Nominal size	63, 100, 160
Material	depending on the type
Instrument connection	vd8
Case filling	with / without
Data sheet	1201.7 / 1211.7