

Manual

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Inline Turbidity Sensors MoniTurb-C-FS

Combined 12° & 90° scattered light Turbiditymeter

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Transportation Damages!

Please inspect the instrument immediately after receiving for potential shipping damages.

For any claims to the transportation insurance or warranty repair, it is absolutely required to notify transportation damages immediately after receiving the instrument. In case of obvious damages of the outer packaging, the carrier must give a receipt for this damage to make demands for the insurance. In case of a delayed announcement the insurance will not pay for damages and Chemtronic Waltemode GmbH will not assume liability for these damages.



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Copyright

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There are no further reaching warranty claims to take because of the content of existing document.

Non-warranty

Chemtronic Waltemode GmbH takes no responsibility or warranty for technical or editorial mistakes or omissions in this document. The information in this publication will be provided without warranty for their correctness. Chemtronic Waltemode GmbH reserves all rights to make changes to this document without announcement.

Chemtronic Waltemode GmbH is by no means liable for any consequential damages or miscellaneous damages, which occur during the use or storage of the system.

Some countries do not allow the limitation of liability, so that this exclusion is possibly not valid for you.

Warranty conditions

The warranty for this product takes place according to the legal provisions. As place of warranty we explicitly name Chemtronic Waltemode GmbH, Monheim am Rhein, Germany. Chemtronic will charge the additional expenses e.g. travel expenses, overnight cost, etc., in case of warranty service at the customer site.

Consumable parts as well as wearing parts e.g. lamps, gaskets, etc. are not covered by warranty.

Improper use, gross negligence, use of the system outside of the technical specifications, missing or improper maintenance will cause a loss of the warranty claim. Please pay attention to our general terms of contract.

Storage

Please inspect the instrument immediately after receiving for potential shipping damages.

If the instrument has already been unpacked for inspection or testing, or if the instrument has been removed from the process and it is not to be installed or reinstalled for more than 1 day, the following procedure should be observed:

1. If the instrument has been in service, the wetted portion should be thoroughly cleaned (typically with clean water) and then thoroughly dried.
2. In case the original packing material is not available, place the instrument in a sealed heavy plastic bag with a desiccant added to assure clean dry storage.
3. The instrument should then be stored in a protected area until time of installation.

Shipment of the instrument

Please clean the instrument carefully before shipment (e.g. for revision / repair). Please use fixed packaging to protect the instrument against any shipping damages.

If at all possible the original packaging should be used.

Safety instructions

Take notice to the following general safety instructions during use and operation of the system. Ignoring these instructions or special warnings inside of this manual can damage the sensor, cause inaccurate measurements, and possibly result in unsafe installations. Chemtronic Waltemode GmbH will not take any responsibility for consequences arising from ignoring the safety instructions and warnings.

For ALL chemical liquids

Reagents, standards or the measured product may be toxic or otherwise harmful to human health. Observe appropriate precautions when handling and disposing the reagents. Review the appropriate published material safety data sheets regarding the safe handling and disposal of all these products.

Electrical installation

Qualified technical personnel must install the electrical installation of the system.

Hazardous area

DO NOT INSTALL the system in hazardous area without the optional Ex-proof equipment. Operation of non Ex- proof systems in hazardous area will cause a high risk. Please check separate Ex-documents and stickers on the sensor.



Using the system in hazardous areas (Ex Zone I & II) will only be safe, with the installation of the optional special Ex-proof designs including all required certifications.



Maintenance

Always disconnect the instrument from power during maintenance, replacement of components, installation of additional components or any other operations at the open instrument.

Only qualified technical personnel must perform this work.

Operating the instrument with open enclosure

Only qualified technical personnel should operate the instrument when the enclosure is open (e.g. during repair or calibration procedure). Be careful that no moisture enters the enclosure.



Some components inside the instrument are energized with voltages, which can cause lethal shocks in case of contact. Be careful during installation, handling and operation of the instrument.



Improper installation / operation of the system

Warranty is void if the system is installed improperly, handled improperly, used outside of the technical specifications (of the instrument), or damaged by gross negligence.

Principle of Measurement

What does turbidity mean?

Turbidity is an optical impression, which describes the characteristic of a transparent product, to scatter light. A focused light beam will be attenuated and scattered in hazy products, so that this product can become practically opaque in bigger layers.

What causes turbidity?

Turbidity is caused by particles in transparent products. A particle is defined as something with a different refractive index as the carrier product. Some examples of particles are minerals, yeast cells, metals, oil drops in water, milk in water, gas bubbles and aerosoles.

Measurement of turbidity

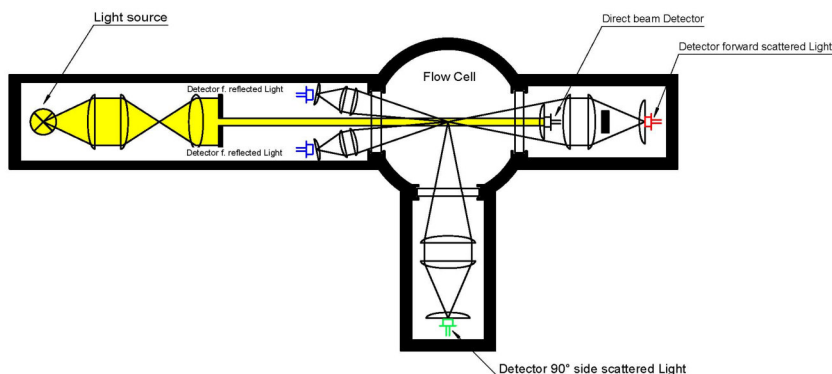
Turbidity is not a clearly defined magnitude like e.g. temperature or pressure.

Turbidity is a subjective impression. For this reason turbidity measurement systems will be typically calibrated by using a comparison's standard such as Formazin or Diatomaceous Earth.

Measuring methods

The most common scattered light turbidity measuring methods are:

- Side scattering (90°) The detector is located in a right angle (90°) to the light beam
- Forward scattering (12°) The position of the detector is 12° shifted to the axis of light beam



An intense collimated beam of light is projected through a sample contained within the sensor. The intensity of this light beam is measured by the direct beam detector, located opposite to the light source. The light, scattered by particles inside the sample is measured by a scatter light detector. Depending by sensor specification, this detector is located 12° and/or 90°, displaced from the beam axis.

The ratio of scattered and direct light signals, compensate for changes in product color, lamp ageing and window coatings. The signals will be processed as followed:

$$\frac{\text{Scattered light signal}}{\text{Direct light signal}} = \text{Turbidity value}$$

The particles inside the liquid flow decrease the intensity of direct light, and increase the intensity of the scattered light, that means the turbidity rises.

Product color, lamp ageing and window coatings decrease the intensity of direct **and** scattered light in same ratio that means the turbidity value stays constant.

Comparison of the different measuring methods

The two different measurement methods (12° forward scattering / 90° side scattering) are not comparable. The deviations of the measuring results are caused by the different particle size distributions in the measured liquid. Both measurement methods respond different, depending by particle size distribution in the sample.

Please take notice:

Make sure that your turbidity meters operate according to the same principle of measurement, if you compare measurement results.

You can compare 90° vs. 90° scattered light turbidity meters, or 12° vs. 12° scattered light turbidity meters.

Never compare turbidity meters with different methods of measurement!

Context between particle size, measurement methods and measurement results

The most common Calibration standard for turbidity is based on Formazin liquid.

When using Formazin as calibration standard, defined Formazin suspensions have to show identical measurement results with all different measurement methods. 12° scattered light turbidimeter, 90° scattered light turbidimeter or absorption turbidimeter have to show equal readings if measuring Formazin suspensions.

During observation of a real sample, such as a filtrated liquid, the different methods will show different measurement results. The measurement results of the 90° side scatter method are typically by factor 3 to 10 above the measurement results of the 12° forward scatter method.

The reason is, that filtrate typically contains a higher amount of small particles compared to the amount of large particles.

The small particles will be overvalued with the 90° method, due to the fact that this method is more affected by the quantity of the particles as by the particle size.

The 12° forward scatter method is more mass related because a small particle creates low scattered light intensity and a large particle creates a high scattered light intensity.

90° method:

small particles and large particles will cause comparable scattered light intensities.

12° method:

small particles create low scattered light intensities;

large particles create high scattered light intensities;

At a particle size of approx. 0.3 µm (Formazin) both methods will create about equal scatter light intensities.

The combination of both measurement results informs about the tendency of the particle size distribution.

If the 90° measuring results are higher compared to the 12° measuring results means that the average particle size is smaller than 0,3 µm.

If the 90° measuring results are lower compared to the 12° measuring results means that average particle size larger as 0,3 µm.

particle size	result 90° scatter light	result 12° scatter
larger 0,3 µm	lower value	higher value
smaller 0,3 µm	higher value	lower value

Typical Measuring units

ppm:	Parts per million	FNU ¹ :	Formazin Nephelometric Unit
FTU:	Formazin Turbidity Unit	mg/l:	Milligram per liter
TEF:	Trübungseinheiten Formazin (German for FTU)	gr/l:	Gram per liter
EBC:	European Brewery Convention	% TS:	Percent total solids
NTU ¹ :	Nephelometric Turbidity Unit		

The dependencies of the different measuring units

1 FTU = 1 TEF = 1 NTU¹ = 1 FNU¹ = 0,25 EBC

¹ Nephelometry describes the method of side scatter turbidity measurements, these units are used at 90° side scatter turbidity meters only.

Based on comparisons measurements, by using a 12° forward measurement system we have found the following dependencies.

1 FTU = 1 TEF = 0,25 EBC = 2,05ppm = 2,05 mg/l = 0,00205 g/l = 0,00000205 % TS

* At a specific particle weight of 1 kg/dm, 1mg/l particles in 1 kg of water will correspond to 1ppm.

Typical ranges

The original design of scatter light turbidimeter was used for the detection of low turbidities. The resolution of these instruments is suited easily in ranges lower as 0.1ppm (approx. 0.05 TEF / FTU / FNU / NTU or approx. 0.01EBC) and better. The maximum range is in ideal case lower than 200ppm, but there are as well systems available with a range of more than 8000ppm.

Measuring Methods

The 12° forward scatter method:

The forward scatter method is typically used at low turbidities and produces nearly mass related measurement results. Main applications are quality control, filtration control, oil in water, etc.

The 90° side scatter method:

The side scatter method is typically as well used at low turbidities. This principle of measurement will produce measurement results related to the number of particles inside the product.

The main application is the observation of small, well distributed particles e.g. beyond a filter. The second typical application is the monitoring of potable water as well as waste water according ISO7027 or according to the US- FDA requirements.

The measurement results of a 90° scatter light system has to be handled with care, due to the fact, that a turbidity caused by many large particles can show a similar measurement result as a turbidity caused by the same quantity of small particles.

The combined 12°/ 90° forward- / side- scatter method:

The 12° measurement method shows higher sensitivity at particles >0.3µm. The 90° measurement method shows higher sensitivity at particles < 0.3µm. The most common application for the combined systems is filtration control. A filter break through is recognized early, with the 12° forward scattered instrument. Just a few larger particles inside the filtrate will raise the 12° measurement value significant.

The 90° side scattered method shows only a small increase of the measurement values in case some large particles pass the filter. A filter break through would be shown very late, due to the fact that the number of particles will not raise significantly in the beginning of a filter break through.

Please take notice:

The combination of forward- and side- scatter turbidity measurement does not replace a particle size analysis, but it can provide a tendency of the particle size distribution.

Installation Guidelines

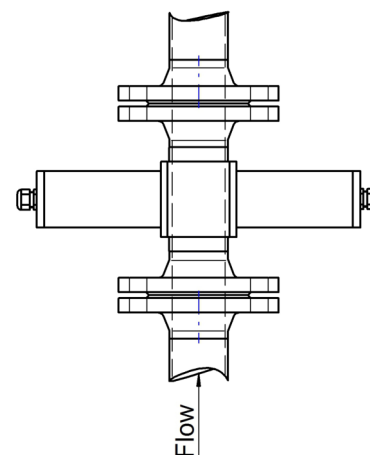


Danger!

Exceeding the specified maximum pressure and / or the specified maximum temperature will cause a very high safety risk. Please read the additional safety instructions before installation and start-up.

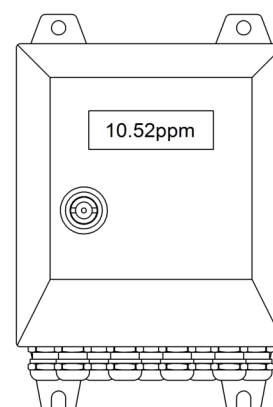
- The sensor is manufactured according to the customer's application (variable line size, flange type, cleaning jets, gasket material etc.).
- It is recommended to run the calibration of the system before installation.
- The location / installation of the sensor should be in a vertical standpipe.
- The process pressure should never exceed the specification of the sensor.
- The process temperature should never exceed the specification of the sensor.
- Avoid air and gas bubbles inside the sensor, they cause disturbances. Air and gas bubbles will cause noise and drift of the measurement signal. (The air bubbles are not expected at pressures upwards of 2bar in aqueous solutions).
- In case the process temperature should fall under the dew point or rise above 85 °C purge the sensor optic housings with dry instrument air (approx. 10 l/h). Condensed water and excessive temperatures can damage the sensor and cause inaccurate measurements.
- Due to potential noise problems we recommend not to extend the sensor cables.
- Due to potential noise problems use original cables and parts only.
- In case the optional cleaning jets are being used, make sure the pressure of the cleaning fluid is at least 50% higher than the process pressure.

Sensor



- Pay attention to the separate manual of the transmitter.
- Transmitter and Sensors are sensitive components, do not drop, handle with care.
- Follow the wiring diagrams (pay attention to sensor / transmitter manuals).
- Please do not use the system in case of any visible mechanical damages!
- The Messenger enclosure fits IP65 / Nema 4x protection class but we recommend installation in a dry / dust free area.
- The ambient temperature for the transmitter must be in a range of -10°C to 50°C (use dry purge air above 40°C approx. 10 l/h).
- The power consumption of the Messenger transmitter is less than 50 VA.
- Transmitter relay ratings for alarms and external devices are 2 A at 48V.
- Do not operate with open enclosure. Exposed electronics will promote the risk of electrical shock and might cause damage to the unit.
- Do not alter cable length. The instrument was calibrated with a specified cable length. Altering cable length can cause unstable signals and void instrument calibration.
- Proper instrument grounding: The instrument must be grounded to avoid electrical shock hazards to personnel and damages to the unit.

Transmitter



Maintenance

Replacement of measurement lamp



Ignoring of the following hints will cause a loss of warranty



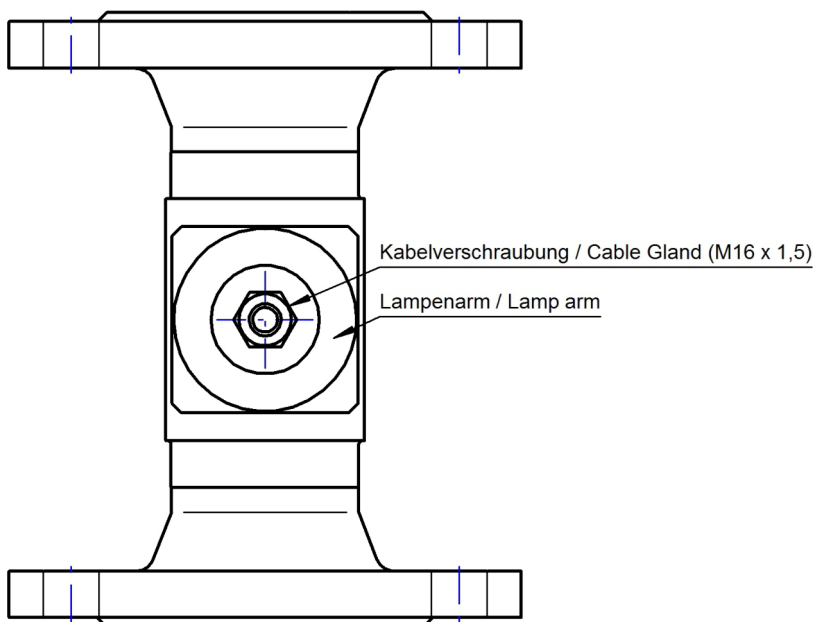
Notice:

- Qualified technical personnel must perform repair and maintenance.
- The sensor must be cleaned and flushed thoroughly, before beginning any work. Depending on customers' application product residues can be very dangerous (aggressive, poisonous).
Please handle the system very careful due to possible leakage etc.
- Avoid pulling and twisting of the lamp cable.
- Avoid applying excessive force during assembling and disassembling of the sensor.
- Screw in all bolts and cable glands stalwart only.
- Please work carefully during the replacement of the measurement lamp.
- The lamp replacement should be done in a dry and clean location, to protect the optical components from dirt.
- Please make sure that no dust or other particles penetrates into the optical assembly.
- Do not touch the lenses.
- In case of dirty component please clean carefully by using fresh water and a cloth (lint-free), dry all components by using instrument air.
- Use suitable tools only.

1. Loosen cable gland to assure that you do not twist the lamp cable.
2. Unscrew the lamp arm (right thread, do not twist lamp cable).
3. Pull the lamp arm carefully backwards.

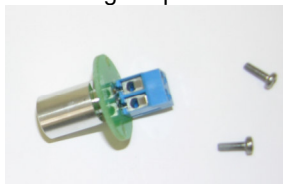
Take notice!

The lamp cable is marked with "lamp".

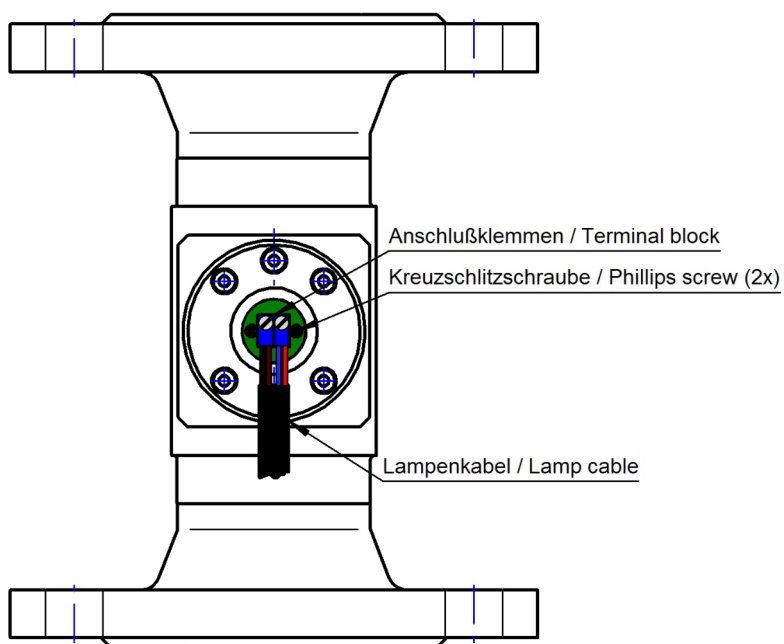


4. Loosen the slotted screws of the terminal block and remove the lamp cable.
5. Unscrew the Phillips screws and pull out the measuring lamp carefully.

Measuring lamp



6. Replace the measuring lamp and reassemble the sensor in reverse order.



Replacement of measurement lamp (sensor with optional flameproof enclosure (ATEX Ex d IIC T6))



Please take notice:

The flameproof- housings may be opened by an expert operator only, if it is closed with hexa-gon socket screws and these screws are not sealed.

The housing must not be opened if only one circuit is under voltage, unless there is no risk of explosion (fire permission).



Ignoring of the following hints will cause a loss of warranty



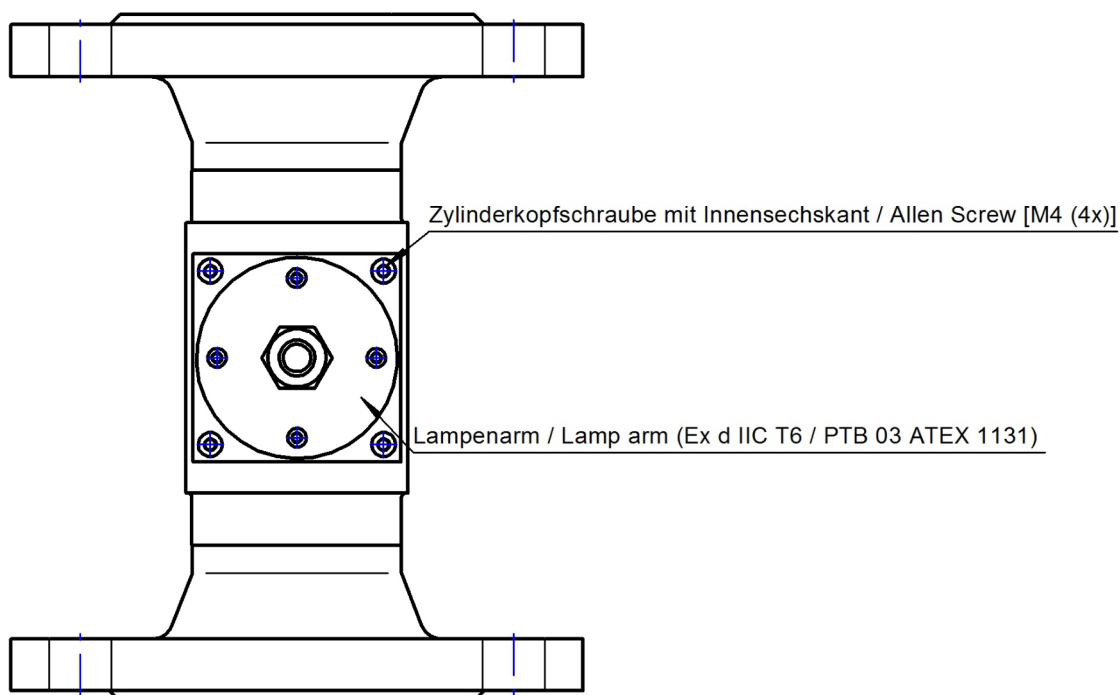
- The sensor must be cleaned and flushed thoroughly, before beginning any work. Depending on customers' application product residues can be very dangerous (aggressive, poisonous).
Please handle the system very careful due to possible leakage etc.
- Avoid pulling and twisting of the lamp cable.
- Avoid applying excessive force during assembling and disassembling of the sensor.
- Screw in all bolts and cable glands stalwart only.
- Please work carefully during the replacement of the measurement lamp.
- The lamp replacement should be done in a dry and clean location, to protect the optical components from dirt.
- Please make sure that no dust or other particles penetrates into the optical assembly.
- Do not touch the lenses.
- In case of dirty component please clean carefully by using fresh water and a cloth (lint-free), dry all components by using instrument air.
- Use suitable tools only.

1. Unscrew the four Allen screws at the mounting flange and remove the lamp arm.

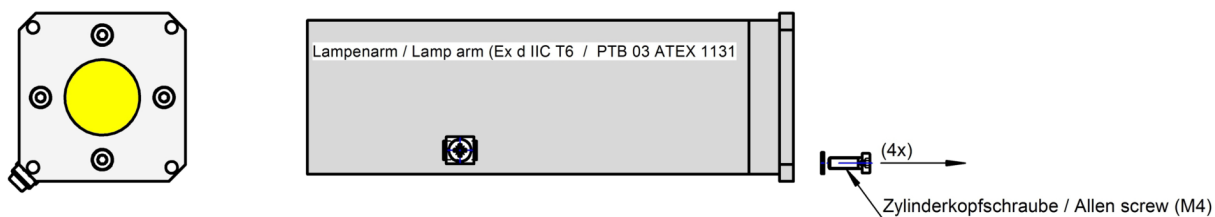
Take care that you do not damage the o-ring seals.

Take notice!

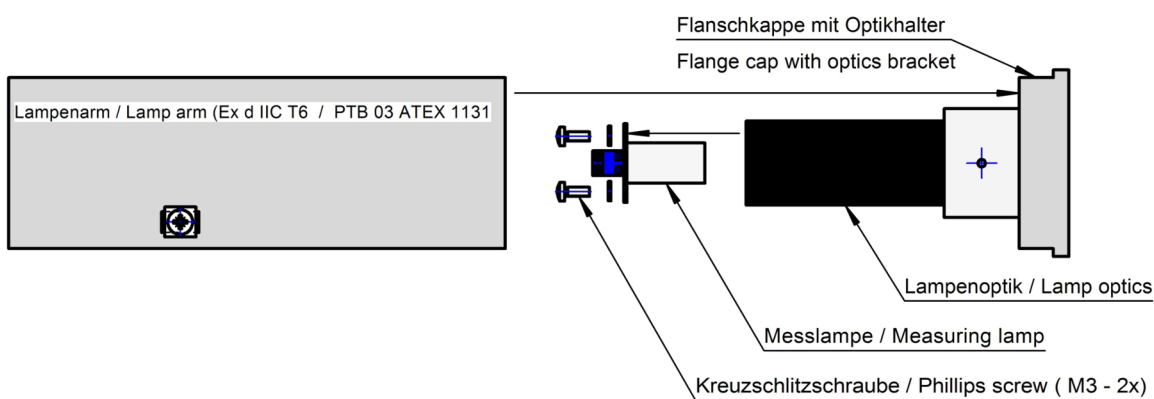
The lamp cable is marked with "lamp".



2. Unscrew the four Allen screws located at the inside of the mounting flange.



4. Pull the flange cap carefully out of the lamp arm.
5. Loosen the slotted screws of the terminal block.
6. Disconnect the wires carefully from terminal block.
7. Unscrew the Phillips screws and pull out the measuring lamp carefully.
8. Replace the measuring lamp and reassemble the sensor in reverse order.



Replacement of gaskets



Ignoring of the following hints will cause a loss of warranty



- The sensor must be cleaned and flushed thoroughly, before beginning any work. Depending on customers' application product residues can be very dangerous (aggressive, poisonous).
Please handle the system very careful due to possible leakage etc.
- Avoid pulling and twisting of the lamp cable.
- Avoid applying excessive force during assembling and disassembling of the sensor.
- Screw in all bolts and cable glands stalwart only.
- Please work carefully during the replacement of the measurement lamp.
- The lamp replacement should be done in a dry and clean location, to protect the optical components from dirt.
- Please make sure that no dust or other particles penetrates into the optical assembly.
- Do not touch the lenses.
- In case of dirty component please clean carefully by using fresh water and a cloth (lint-free), dry all components by using instrument air.
- Use suitable tools only.

The interval to replace the gaskets depends by the specific application.

The replacement cycle depends on process pressure, process temperature, sealing material and product characteristics. In worst case (high temperature, high pressure, aggressive medium) the gaskets must be replaced every month. Under normal conditions the gaskets should be replaced every year. The maximum lifetime in easy applications can go up to 2 years.

We strictly recommend that the customer establishes a maintenance interval based on local conditions.

If you have any questions or if you require more information contact Chemtronic Waltemode GmbH.

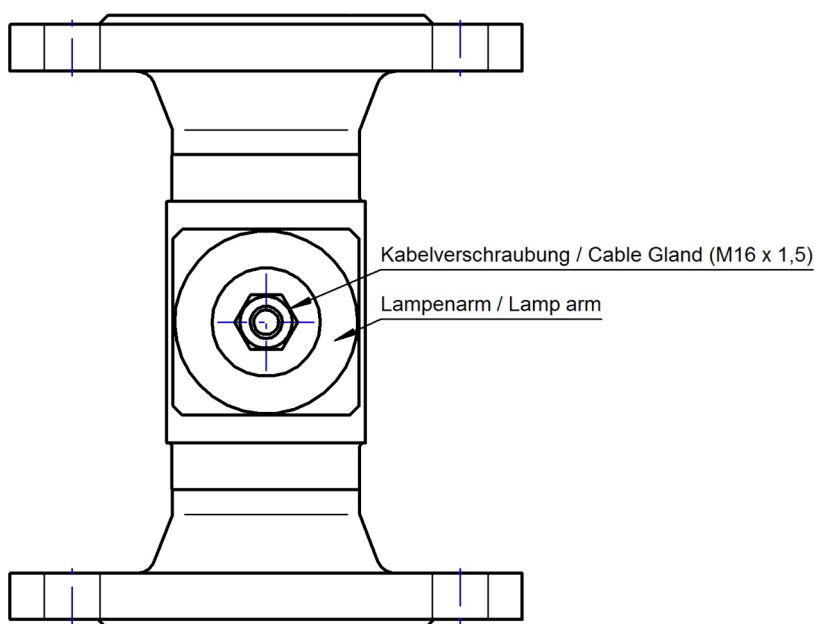


Please take notice!

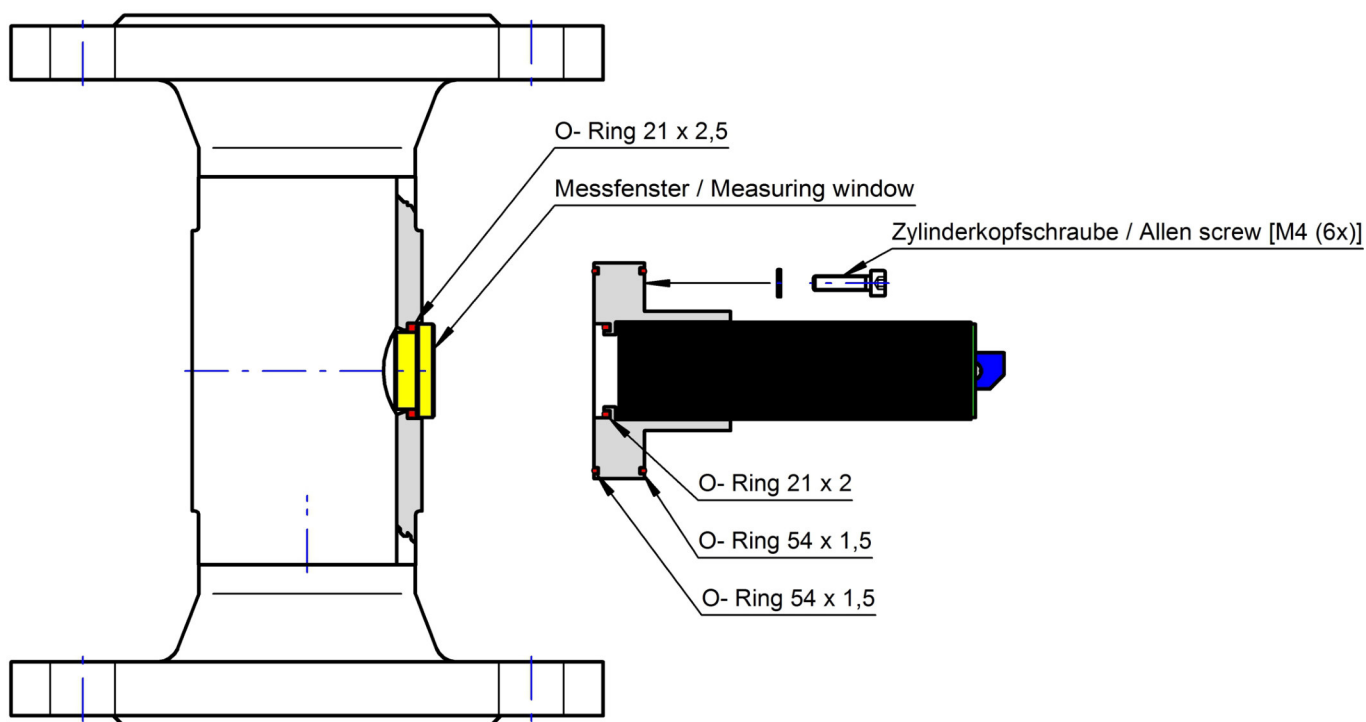
Make sure that the measuring cell is empty and not pressurized, before beginning of work.



1. Loosen the cable gland to assure that you do not twist the cables.
2. Unscrew the measuring arms (right thread, do not twist cables).
3. Pull the lamp arm carefully backwards.



4. Unscrew the six Allen screws and remove the window bracket carefully.



5. Remove the measuring windows and the o-ring seals and replace them if necessary.
6. Reassemble the sensor in reverse order.

Replacement of gaskets (sensor with optional flameproof enclosure (ATEX Ex d IIC T6))



Ignoring of the following hints will cause a loss of warranty



- The sensor must be cleaned and flushed thoroughly, before beginning any work. Depending on customers' application product residues can be very dangerous (aggressive, poisonous). Please handle the system very careful due to possible leakage etc.
- Avoid pulling and twisting of the lamp cable.
- Avoid applying excessive force during assembling and disassembling of the sensor.
- Screw in all bolts and cable glands stalwart only.
- Please work carefully during the replacement of the measurement lamp.
- The lamp replacement should be done in a dry and clean location, to protect the optical components from dirt.
- Please make sure that no dust or other particles penetrates into the optical assembly.
- Do not touch the lenses.
- In case of dirty component please clean carefully by using fresh water and a cloth (lint-free), dry all components by using instrument air.
- Use suitable tools only.

The interval to replace the gaskets depends by the specific application.

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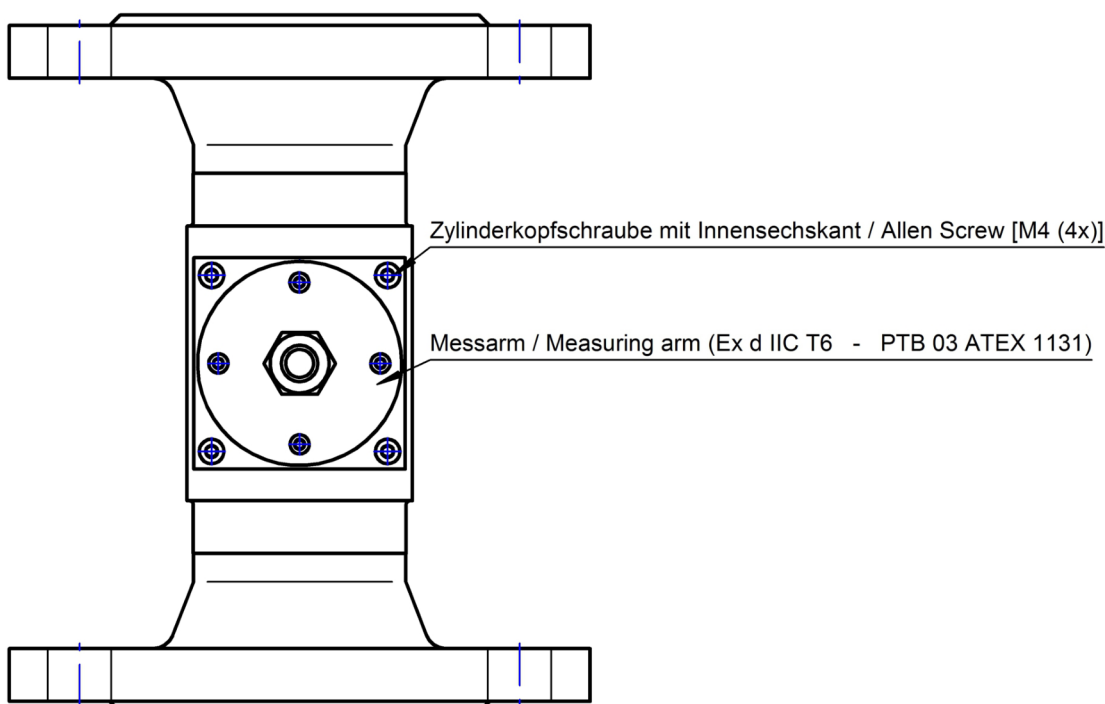


Please take notice!

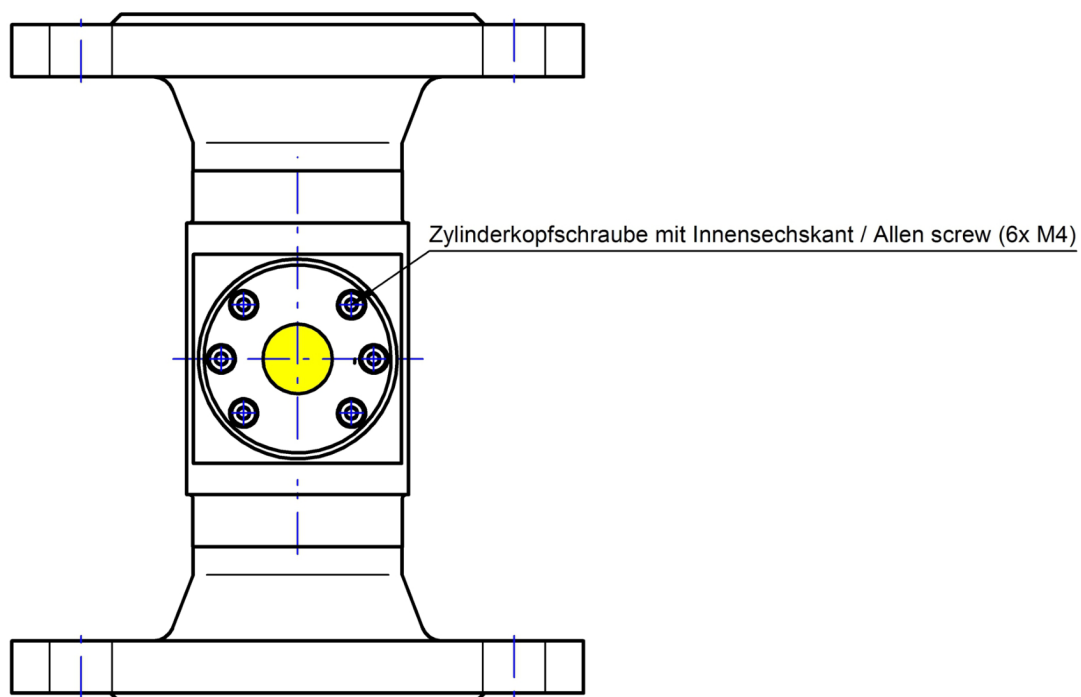
Make sure that the measuring cell is empty and not pressurized, before beginning of work.



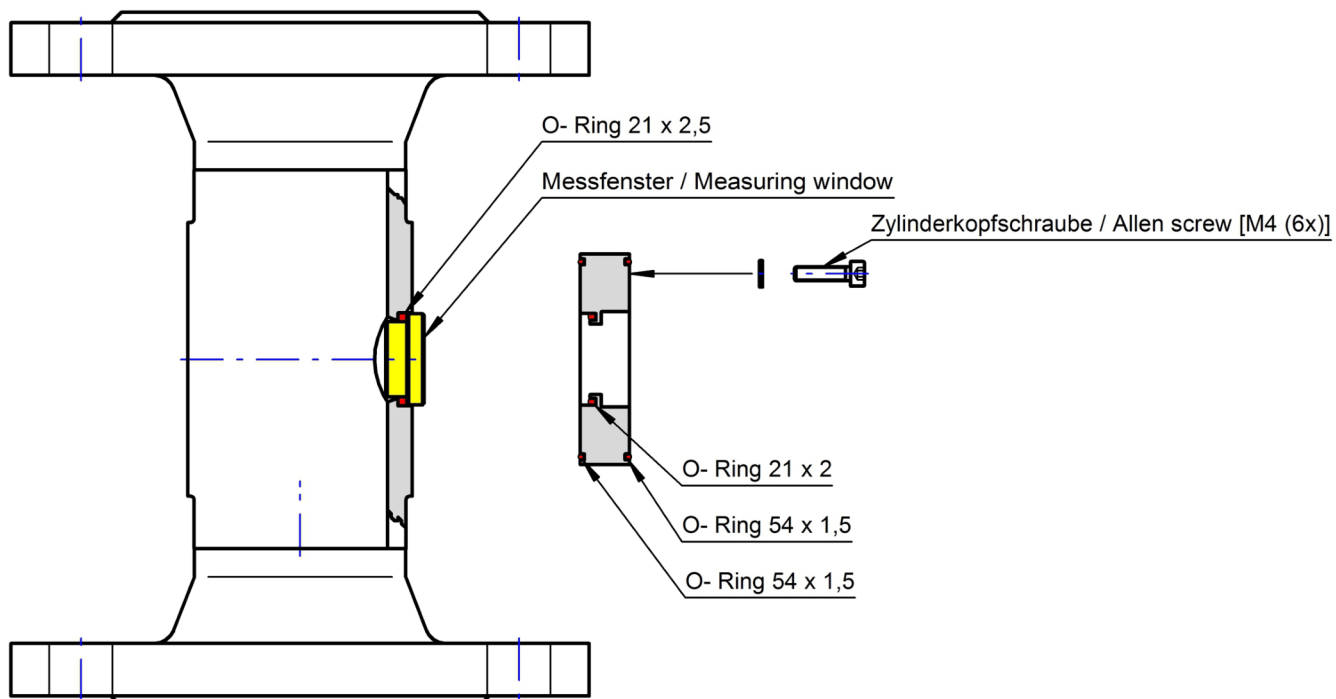
1. Loosen the four Allen screws at the mounting flanges and remove the measuring arms.
2. Place the measuring arms aside carefully.



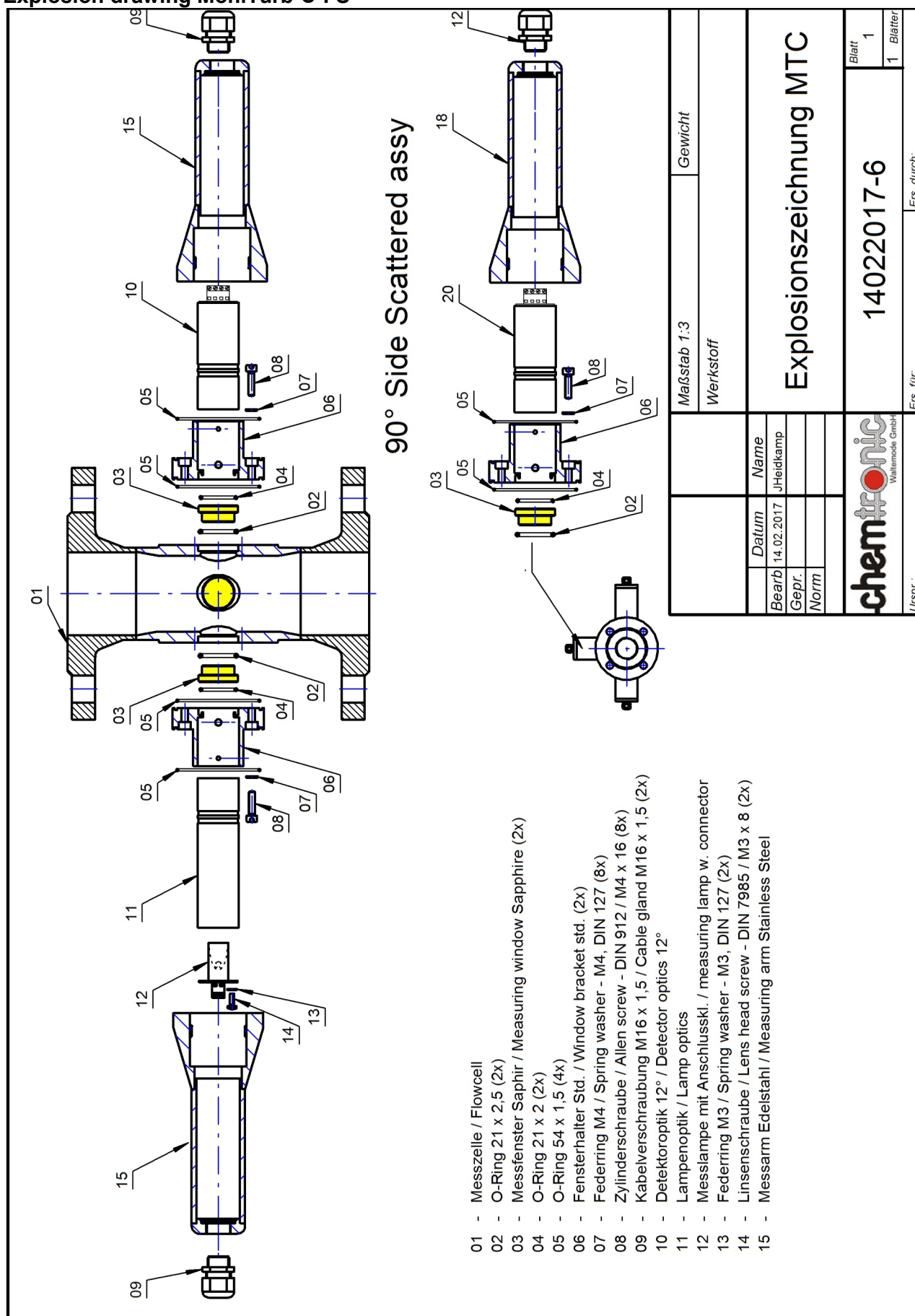
3. Loosen the six Allen screws at the window bracket.



4. Remove the measuring windows and the o-ring seals and replace them if necessary.
5. Reassemble the sensor in reverse order.



Explosion drawing MoniTurb-C-FS



Explosion drawing MoniTurb-C-FS (Version for hazardous area ATEX / Ex d IIC T6)

90° Side Scattered assy

	Maßstab 1:4	Gewicht
	Werkstoff	

Explosionszeichnung MTC		
		Blatt 1
14022017-3		
Urspr.: chemtronic Waltermode GmbH	Ers. für:	Ers. durch:

01 - Messzelle / Flowcell 02 - O-Ring 21 x 2,5 (2x) 03 - Messfenster Saphir / Measuring window Sapphire (2x) 04 - O-Ring 21 x 2 (2x) 05 - O-Ring 54 x 1,5 (4x) 06 - Fensterhalter Ex / Window bracket Ex (2x) 07 - Federring M4 / Spring washer - M4, DIN 127 (8x) 08 - Zylinderschraube / Allen screw - DIN 912 / M4 x 16 (8x) 09 - Zylinderschraube / Allen screw - DIN 912 / M4 x 12 (8x) 10 - Bertscheibe Ex- Gehäuse / Explosion diaphragm of Ex- enclosure (2x) 11 - Ex- Gehäuse - Messarm / Ex- Measuring arm {ATEX, Ex d IIC T6} (2x) 12 - Verschlusskappe Ex- Gehäuse / Locking cap Ex- enclosure {ATEX, Ex d IIC T6} (2x) 13 - Federring M3 / Spring washer M3, DIN 127 (2x) 14 - Zylinderschraube / Allen screw - DIN 912 / M3 x 12 (8x) 15 - O-Ring 17 x 2 (2x) 16 - Ex- Kabelverschraubung 3/4" NPT / Ex- Cable gland 3/4" NPT (2x) 17 - Detektoroptik 12° / Detector optics 12° 18 - Lampenoptik / Lamp optics 19 - Messlampe mit Anschlusskl. / measuring lamp w. connector 20 - Linsenschraube / Lens head screw - DIN 7985 / M3 x 8 (2x) 21 - Detektoroptik 90° / Detector optics 90°	
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Spare Part List MoniTurb-C-FS

Chemtronic Waltemode GmbH Tel.: +49 - (0)2173/57007
 Fax: +49 - (0)2173/56007
 Niederstr. 14 E-mail: info@chemtronic-gmbh.de
 40789 Monheim Home: www.chemtronic-gmbh.de

Ersatzteilpreisliste / Price list spare-parts

Pos.	Qty required	Article-No.	Article-Description	Price per piece	Price total
001	1	S-0000-0102-00	Stückliste MoniTurb-C-FS	0,00 €	0,00 €
002	3	C208-6000-VI	O-Ring (MTC • FKM • 21x2,5)	22,00 €	66,00 €
003	3	C208-6000-KA	O-Ring (MTC • FFKM • 21x2,5)	112,00 €	336,00 €
004	3	2200-1100-SA	Messfenster / measuring window (OPL45- Saphir 11mm) - (22 , 45, MTC)	267,00 €	801,00 €
005	3	2200-1400-SA	Messfenster / measuring window (OPL40- Saphir 14,0mm) - (22 , 45, MTC)	290,00 €	870,00 €
006	3	2200-1900-SA	Messfenster / measuring window (OPL30- Saphir 22,0mm) - (22 , 45, MTC)	315,00 €	945,00 €
007	2	2200-2400-SA	Messfenster / measuring window (OPL20- Saphir 24,0mm) - (22 , 45, MTC)	325,00 €	650,00 €
008	3	2200-2900-SA	Messfenster / measuring window (OPL10- Saphir 29,0mm) - (22 , 45, MTC)	340,00 €	1.020,00 €
009	3	2200-3150-SA	Messfenster / measuring window (OPL5- Saphir 31,5mm) - (22 , 45, MTC)	360,00 €	1.080,00 €
010	3	2200-3300-SA	Messfenster / measuring window (OPL2- Saphir 33mm) - (22 , 45, MTC)	390,00 €	1.170,00 €
011	3	C208-6001-VI	O-Ring (MTC • FKM • 22x2)	19,00 €	57,00 €
012	3	C208-6001-KA	O-Ring (MTC • FFKM • 22x2)	102,00 €	306,00 €
013	6	C208-6006-VI	O-Ring (MTC • FKM • 54x1,5)	23,00 €	138,00 €
014	3	D650-0004-00	Fensterhalter Std. / Window bracket std. (MTC)	245,00 €	735,00 €
015	3	D650-0011-00	Fensterhalter Ex / Window bracket Ex (MTC)	225,00 €	675,00 €
016	3	D650-0001-00	Messarm Edelstahl / Measuring arm SS (MTC)	390,00 €	1.170,00 €
017	1	C608-1001-10	Ex-Arm Lampe o. Optik / Ex-arm lamp w/o optics (MT/MS - Ex d IIC T6)	835,00 €	835,00 €
018	2	C608-1001-12	Ex-Arm Detek. o. Optik / Ex-arm detec. w/o optics (MT/M - Ex d IIC T6)	835,00 €	1.670,00 €
019	3	D650-0003-00	Verschlusskappe Messarm / Locking cap (MTC)	120,00 €	360,00 €
020	3	C208-6005-VI	O-Ring (MTC • FKM • 52x1,5)	23,00 €	69,00 €
021	3	C305-1038-00	Kabelverschraubung VA/Cable gland 316SS (M16x1,5)	35,00 €	105,00 €
022	3	C305-1039-00	Kabelverschraubung Polyamid/Cable gland Polyamid (M16x1,5)	8,00 €	24,00 €
023	3	C305-1044-00	Kabelverschraubung-Ex VA/Cable gland-Ex 316SS (3/4" NPT)	35,00 €	105,00 €
024	1	2001-0504-50	Baugruppe 12° Detektoroptik / Kit 12° detector optic (MTC-F & MTC-FS)	690,00 €	690,00 €
025	1	2001-0505-50	Baugruppe 90° Detektoroptik 90° detector optic (MTC-S & MTC-FS)	780,00 €	780,00 €
026	1	2001-0503-50	Baugruppe Lampenoptik / Kit lamp optic (MTC-F & MTC-FS)	980,00 €	980,00 €
027	1	C604-1001-00	Detektorkabel / detector cable - (MT, MS) per 1m	9,00 €	9,00 €
028	1	C604-1002-00	Lampenkabel / lamp cable - (MT, MS) per 1m	9,00 €	9,00 €
029	1	C402-1001-11	Messlampe / measuring lamp - (MT1, MS1) incl. holder + board	125,00 €	125,00 €
030	2	C305-1002-00	Luftanschluss 90°/Connector air purge 90°	21,00 €	42,00 €
031	1	2001-1000-01	Verschraubung Reinigungsdüse (1/4" MNPT • MT, MS)	55,00 €	55,00 €
032	1	C608-1002-00	Reinigungs-sonde, 120mm lang / Cleanig probe 120mm length (MT, MS)	430,00 €	430,00 €

Please take notice: Minimum order EUR 100,00

Bitte beachten Sie: Mindestbestellsumme EUR 100,00

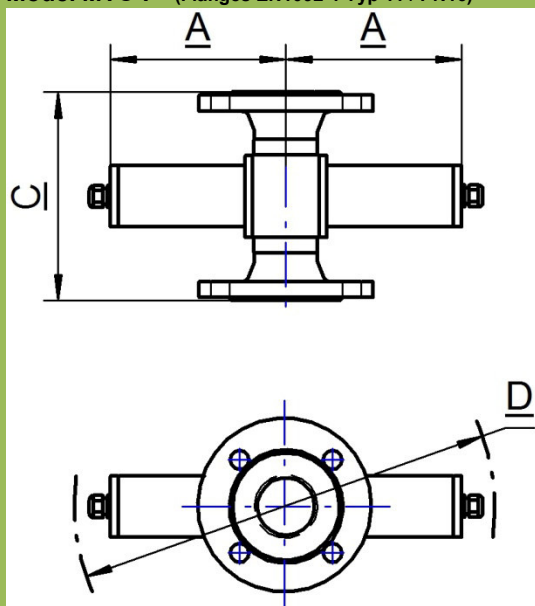
Die Liste enthält die gängigsten Ersatzteile für nicht gelistete Teile kontaktieren Sie Chemtronic / This list contains the most common spare parts, for non listed parts contact Chemtronic.

Site of Company: 40213 Düsseldorf, Amtsgericht Düsseldorf, HRB 45293

Dimensional Drawings MoniTurb-C Series

Dimensional Drawing with Flanges acc. EN1092-1

Model MTC-F (Flanges EN1092-1 Typ 11 / PN16)



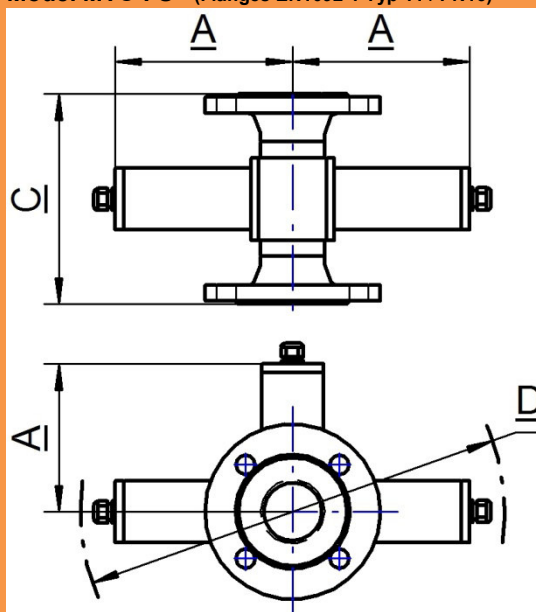
Version for installation in safe Area

	A	C	D
DN25	191	228	444
DN32	191	232	444
DN40	191	238	444
DN50	191	198	444
DN65	201	198	464
DN80	208	208	478
DN100	219	212	500
DN125	233	218	528

Version for installation in hazardous Area

	A	C	D
DN25	246	228	602
DN32	246	232	602
DN40	246	238	602
DN50	246	198	602
DN65	256	198	622
DN80	263	208	636
DN100	274	212	658
DN125	288	218	686

Model MTC-FS (Flanges EN1092-1 Typ 11 / PN16)



Version for installation in safe Area

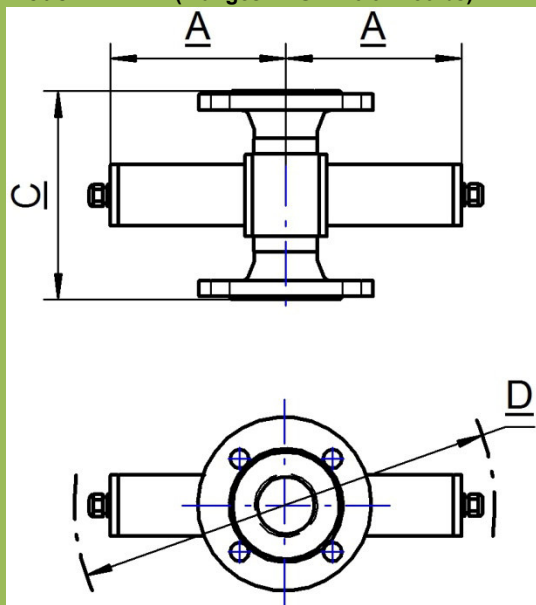
	A	C	D
DN25	191	228	444
DN32	191	232	444
DN40	191	238	444
DN50	191	198	444
DN65	201	198	464
DN80	208	208	478
DN100	219	212	500
DN125	233	218	528

Version for installation in hazardous Area

	A	C	D
DN25	246	228	602
DN32	246	232	602
DN40	246	238	602
DN50	246	198	602
DN65	256	198	622
DN80	263	208	636
DN100	274	212	658
DN125	288	218	686

Dimensional Drawing with Flanges acc. ANSI B16.5 – 150lbs

Model MTC-F (Flanges ANSI B16.5 / 150lbs)



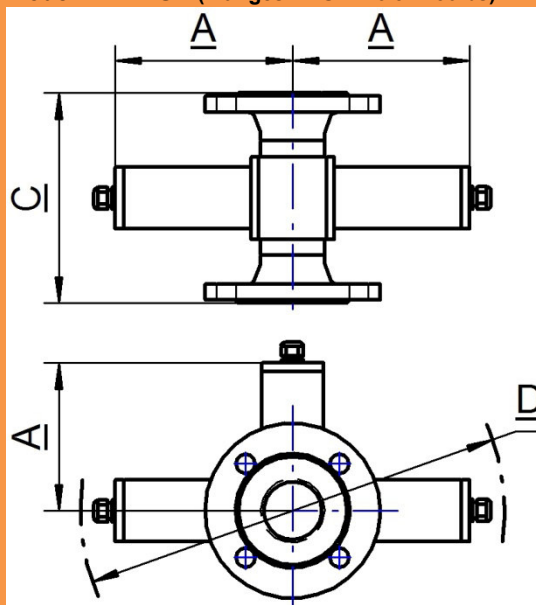
Version for installation in safe Area

	A	C	D
1"	191	259,2	444
1 1/4"	191	262,4	444
1 1/2"	191	272	444
2"	191	235	444
2 1/2"	201	247,8	464
3"	208	247,2	478
4"	219	260,4	500
5"	233	285,8	528

Version for installation in hazardous Area

	A	C	D
1"	246	259,2	602
1 1/4"	246	262,4	602
1 1/2"	246	272	602
2"	246	235	602
2 1/2"	256	247,8	622
3"	263	247,2	636
4"	274	260,4	658
5"	288	285,8	686

Model MTC-FS (Flanges ANSI B16.5 / 150lbs)



Version for installation in safe Area

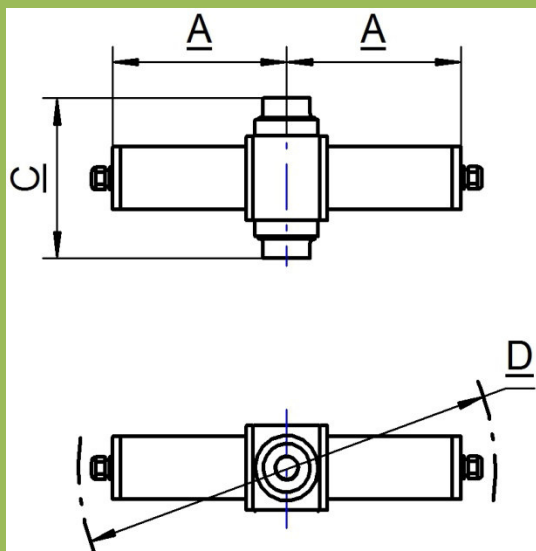
	A	C	D
1"	191	259,2	444
1 1/4"	191	262,4	444
1 1/2"	191	272	444
2"	191	235	444
2 1/2"	201	247,8	464
3"	208	247,2	478
4"	219	260,4	500
5"	233	285,8	528

Version for installation in hazardous Area

	A	C	D
1"	246	259,2	602
1 1/4"	246	262,4	602
1 1/2"	246	272	602
2"	246	235	602
2 1/2"	256	247,8	622
3"	263	247,2	636
4"	274	260,4	658
5"	288	285,2	686

Dimensional Drawing with NPT- Threads

Model MTC-F (NPT Fittings)



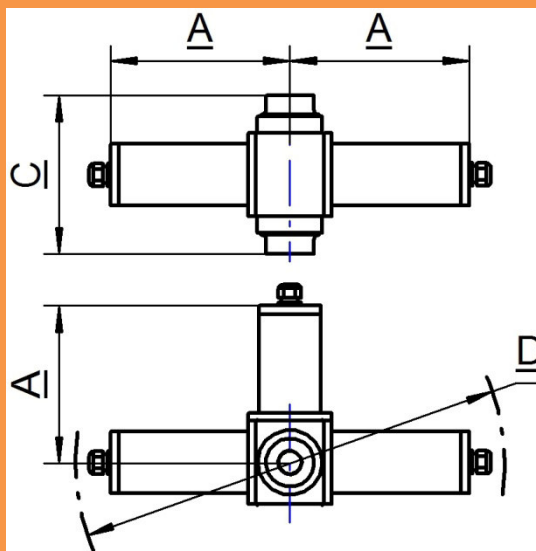
Version for installation in safe Area

	A		C	D
1/4"	191		148	444
1/2"	191		148	444
3/4"	191		148	444
1"	191		148	444
1 1/4"	191		148	444
1 1/2"	191		148	444

Version for installation in hazardous Area

	A		C	D
1/4"	246		148	602
1/2"	246		148	602
3/4"	246		148	602
1"	246		148	602
1 1/4"	246		148	602
1 1/2"	246		148	602

Model MTC-FS (NPT Fittings)



Version for installation in safe Area

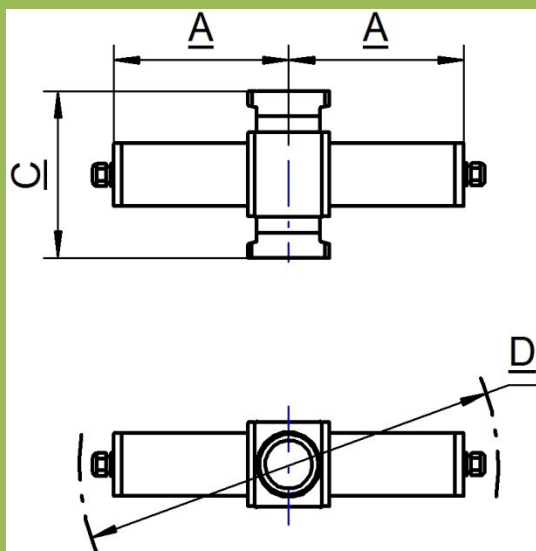
	A		C	D
1/4"	191		148	444
1/2"	191		148	444
3/4"	191		148	444
1"	191		148	444
1 1/4"	191		148	444
1 1/2"	191		148	444

Version for installation in hazardous Area

	A		C	D
1/4"	246		148	602
1/2"	246		148	602
3/4"	246		148	602
1"	246		148	602
1 1/4"	246		148	602
1 1/2"	246		148	602

Dimensional Drawing with Milk fittings [DIN11851])

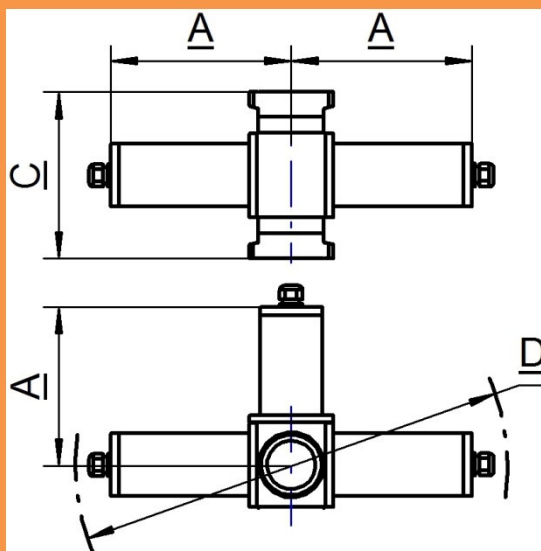
Model MTC-F (Milk Fittings DIN11851)



Version for installation in safe Area

	A		C	D
DN25	191		192	444
DN32	191		192	444
DN40	191		192	444
DN50	191		154	444
DN65	201		158	464
DN80	208		158	478
DN100	219		168	500
DN125	233		o. R.	528

Model MTC-FS (Milk Fittings DIN11851)

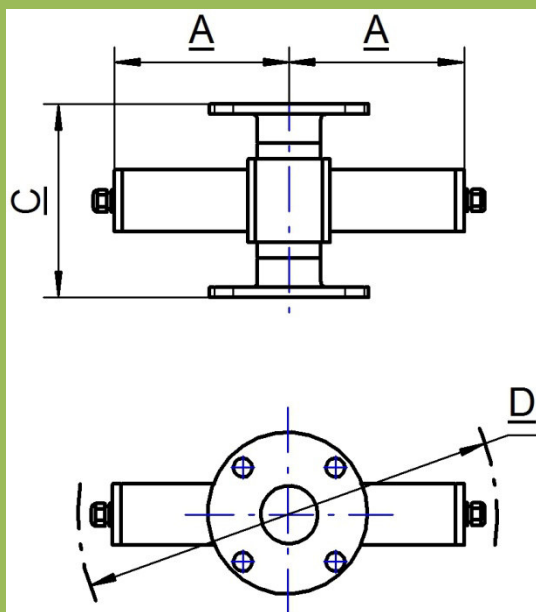


Version for installation in safe Area

	A		C	D
DN25	191		192	444
DN32	191		192	444
DN40	191		192	444
DN50	191		154	444
DN65	201		158	464
DN80	208		158	478
DN100	219		168	500
DN125	233		o. R.	528

Dimensional Drawing with Sanitary fanges flat - APV FG1

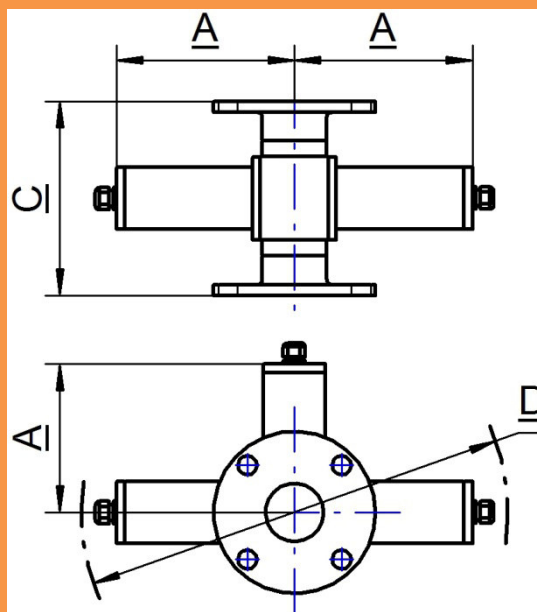
Model MTC-F (APV Sanitary Flanges FG1 / PN10)



Version for installation in safe Area

	A		C	D
DN25	191		196	444
DN40	191		196	444
DN50	191		156	444
DN65	201		156	464
DN80	208		156	478
DN100	219		156	500
DN125	233		162	528

Model MTC-FS (APV Sanitary Flanges FG1 / PN10)



Version for installation in safe Area

	A		C	D
DN25	191		196	444
DN40	191		196	444
DN50	191		156	444
DN65	201		156	464
DN80	208		156	478
DN100	219		156	500
DN125	233		162	528

Tolerances for all Dimensons: +/- 2mm

Technical Data / Data Sheet MoniTurb-C-FS

Turbidity Sensor Model MoniTurb-C-FS (MTC-FS)



Image similar

- Principle of measurement: 12° & 90° scattered light
- Low maintenance / long service life
- Optimized flow cell for simplified maintenance & cleaning
- Calibration- / maintenance interval 24 months (depending by application)
- Measuring lamp, gas filled (λ 380 - 1100nm), life time approx. 2 years
- Protection class: All parts are at least IP65 / Nema 4x rated
- Flow cell material: stainless steel 1.4404 (optional titanium, PTFE, ...)
- Sight glass material: Sapphire (optional Borosilicate, Plexiglas, ...)
- Gasket material: FKM (optional FFKM, EPDM, silicone, ...)
- Process connections: DIN flanges, ANSI flanges, NPT,
- Span of measuring ranges: 0-0.5mg/l to 0-8000mg/l (DE)
- For use in hazardous area Ex- Zone I & Ex- Zone II (ATEX- Ex d IIC / T6)
- Optional air purge
- Cleaning: Cleaning in place / optional cleaning jets

Description:

The turbidity sensor model MoniTurb-C-FS uses the principles of 12° forward- and 90° side scattered light to detect particles in liquids. The transmitter model Messenger is required to use this sensor. The system has been designed for continuous operation with long life time. The measuring results of the 12° system are not affected by particle size. The 90° system shows a high sensitivity for small particles ($< 0.3 \mu\text{m}$). Comparing both measurement values will allow conclusion of particle size distribution inside the liquid. The sensors can be installed into almost any type of pipe. Process connection, gasket material, etc. will be application specific. A ratio measurement of direct- / scatter light assure highly reliable and repeatable measurement results. Inaccuracies caused by product colour, lamp ageing or window coating will be compensated. Calibration can be done in multiple ranges and measurement units like EBC, ppm, mg/l, etc. Optional cleaning jets will allow a cleaning of the sapphire windows in determined intervals.

Applications:

- Filtration control
- Product quality
- Water / Waste water

Operational areas:

- Chemical industry
- Petrochemical industry
- Power plants
- Brew & Beverage

Technical Data:

Line size:	DN 25 – DN 125 / ½" - 5"	Measurement range:	typical 0–1ppm, 0–500ppm
Process pressure:	PN16 / ANSI class 150	Reproducibility:	$\pm 1 \%$ of current range
Process temperature:	-5°C up to 140°C (ice free)	Detector system:	Silica diodes
Sensor material:	1.4404 / 316L (other on request)	Cleaning:	optional cleaning jet probe
Sight glass material:	Sapphire (other on request)	Sterilization:	CIP (cleaning in place)
Gasket material:	application specific	optional hazardous area:	ATEX Zone I or Zone II
Protection class:	IP65 / NEMA 4X		