Operating Instructions

for

Turbidity Probe

Model: ATL / ATT-KA

We don’t accept warranty and liability claims neither upon this publication nor in case of improper treatment of the described products.

The document may contain technical inaccuracies and typographical errors. The content will be revised on a regular basis. These changes will be implemented in later versions. The described products can be improved and changed at any time without prior notice.

1. Contents

Manufactured and sold by:

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2. Note

Please read these operating instructions before unpacking and putting the unit into operation. Follow the instructions precisely as described herein.
The instruction manuals on our website www.kobold.com are always for currently manufactured version of our products. Due to technical changes, the instruction manuals available online may not always correspond to the product version you have purchased. If you need an instruction manual that corresponds to the purchased product version, you can request it from us free of charge by email (info.de@kobold.com) in PDF format, specifying the relevant invoice number and serial number. If you wish, the operating instructions can also be sent to you by post in paper form against an applicable postage fee.

The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

When used in machines, the measuring unit should be used only when the machines fulfil the EC-machine guidelines.

as per PED 2014/68/EU
In acc. with Article 4, Paragraph (3), "Sound Engineering Practice", of the PED 2014/68/EU no CE mark.

3. Instrument Inspection

Instruments are inspected before shipping and sent out in perfect condition.
Should damage to a device be visible, we recommend a thorough inspection of the delivery packaging. In case of damage, please inform your parcel service / forwarding agent immediately, since they are responsible for damages during transit.

Scope of delivery:
The standard delivery includes:
- Turbity Probe model: ATL

4. Using the instruction manual

4.1 Validity of the instruction manual

This instruction manual is valid for the following sensors: ATL-F / ATL-N. Abbreviations mean the following sensor options:

- F color sensor (wavelength application specific)
- N near infrared sensor with range of wavelengths 730 – 970 nm

Follow the instruction manual for every operation. If the product is not used as described in this instruction manual, your safety and the product function may be affected.

To keep up reliability of the product, enhance its life cycle, and avoid down times, follow the instructions given in this manual.

Furthermore, please follow the existing accident prevention and environmental protection instructions, as well as recognized technical instructions for safe and professional working.

4.2 Pictograms and signal words

Important information in this instruction manual is marked with the following pictograms:

Danger!
This pictogram indicates immediate danger to life and health of persons.
The text next to the symbol gives information on how to avoid bodily injuries.

If the possible cause of risk can be specified, the corresponding pictogram precedes instructions:

Danger!
Electrical voltage.
This pictogram indicates danger due to electrical voltage.

Attention!
This pictogram indicates information on how to avoid material damage.

Notice!
This pictogram indicates instructional or general advice.

5. Regulation Use

Any use of the Turbidity Probe, model: ATL, which exceeds the manufacturer's specification, may invalidate its warranty. Therefore, any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

The sensor ATL and its variants are to be applied only as absorption sensors for liquids and gases in inline applications according to the technical data.
Use in hazardous locations is prohibited.

Unauthorized constructional changes, additional fittings or rebuildings regarding the sensor are prohibited. The only exceptions are rebuildings into one of the variants listed in the chapter "Validity of the instruction manual". Changes to and interference with the converter program are prohibited as well.

Burying sensor cables underground without protection is prohibited.

6. Operating Principle

6.1 Description of sensors ATL-F / ATL-N

This sensor is a high precision absorption sensor designed for direct installation into pipelines and vessels. It is of compact and robust construction with a measuring segment optimized with respect to flow and sterile requirements. Two different optical path lengths in combination with an extensive range of accessories offer maximum flexibility for adaptation to the process.

Fig. 1 ATL

The following are the main sensor components:

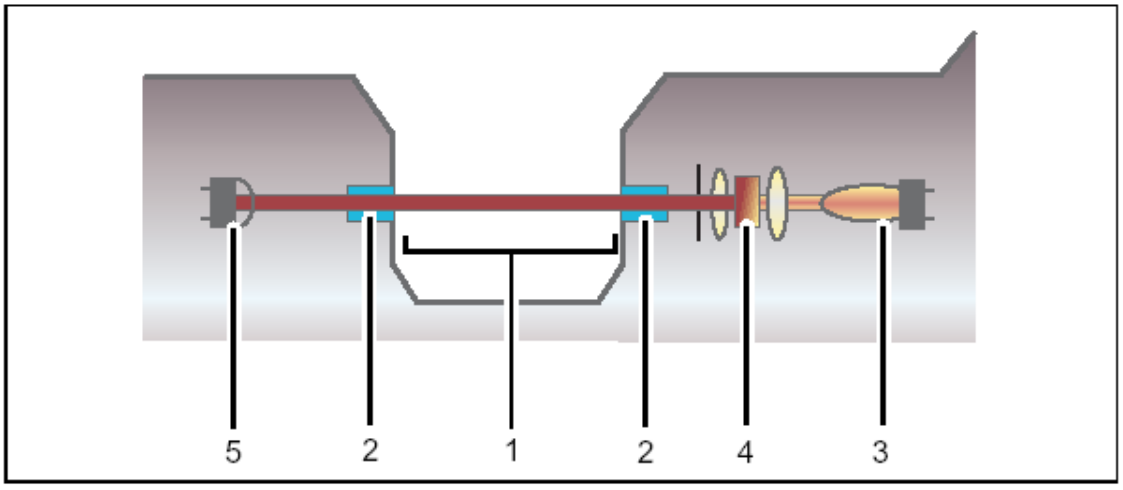

Fig. 2: Schematic ATL

1	Optical path length (OPL)	2	Sapphire window
3	Lamp	4	Optics module with filter
5	Detector		

The process medium is penetrated by a precisely focused, constant light beam. A hermetically sealed silicon photodiode measures intensity of incoming and optically filtered light and supplies the converter with it in form of photocurrent.

Attenuation of light intensity, as a result of absorption and / or scattering of substances in the process medium, is described by the Lambert-Beer Law. It states that the logarithm of the transmission loss is proportional to the concentration of the substance. This is true for dissolved substances and undissolved material. Depending on the particular material properties, concentrations can be detected in ppm as well as in %.

According to this law, the extinction coefficient, defined through ingredient and wavelength, affects the logarithm of the transmission loss, too. Therefore, the choice of wavelength or range of wavelengths is of decisive importance for the measurement and is defined for each measurement type with the help of optical filters.

The third factor of influence in the Lambert-Beer Law is the path length of light passing through the process medium. Equally proportional, the path length, too, is an important aspect with regard to specification of a photometer. The distance to be covered by light is defined through the optical path length (OPL), that is the distance between the windows in the measuring segment of the sensor. The OPL of your sensor is given on its serial number plate.

6.2 Converter for 1-Channel Absorption Probe

The Kobold converter model ATT-K combined with the probe ATL provides continuous inline, real-time measurement and control of concentrations, colour changes or turbidity in a variety of industrial processes.
With four fixed measuring ranges and one variable measuring range, the converter can be set to match your specific process parameters. The 3-digit LED indicator displays the percentage of the selected measuring range.
Two independent setpoints and one mA output are provided by the converter for alarms and real-time process monitoring when wired to the plant‘s process control system. An additional failsafe relay output is built in for remote sensing of lamp or power failure.

7. Mechanical Connection

7.1 General installation instructions

Before installing the sensor, the weld-in port, an adapter or T-piece has to be installed into the pipeline. In case of installing the weld-in port, distortion has to be corrected after welding! Modify the interior drill hole of 24.7 mm (0.98") to obtain the nominal diameter 25 H7 (25.0-25.021 mm; 0.98-0.99") before installing the sensor!
In the following, different sensor positions are considered (Fig. 3):

1. Avoid vertical installation from top, entrapped gas at top of port is possible, product may adhere to the windows
2. Beveled top installation is recommended, no entrapped gas at top of port, product drains off the windows, easy insertion / removal of sensor, good cleanability
3. Horizontal installation is recommended, no entrapped gas at top of port, product drains off the windows, easy insertion / removal of sensor, good cleanability
4. Beveled bottom installation is possible, product drains off the beveled windows, insertion / removal of sensor impractical, poor cleanability
5. Avoid vertical installation from bottom, product may adhere to the windows, insertion / removal of sensor impractical, extremely poor cleanability due to port sump

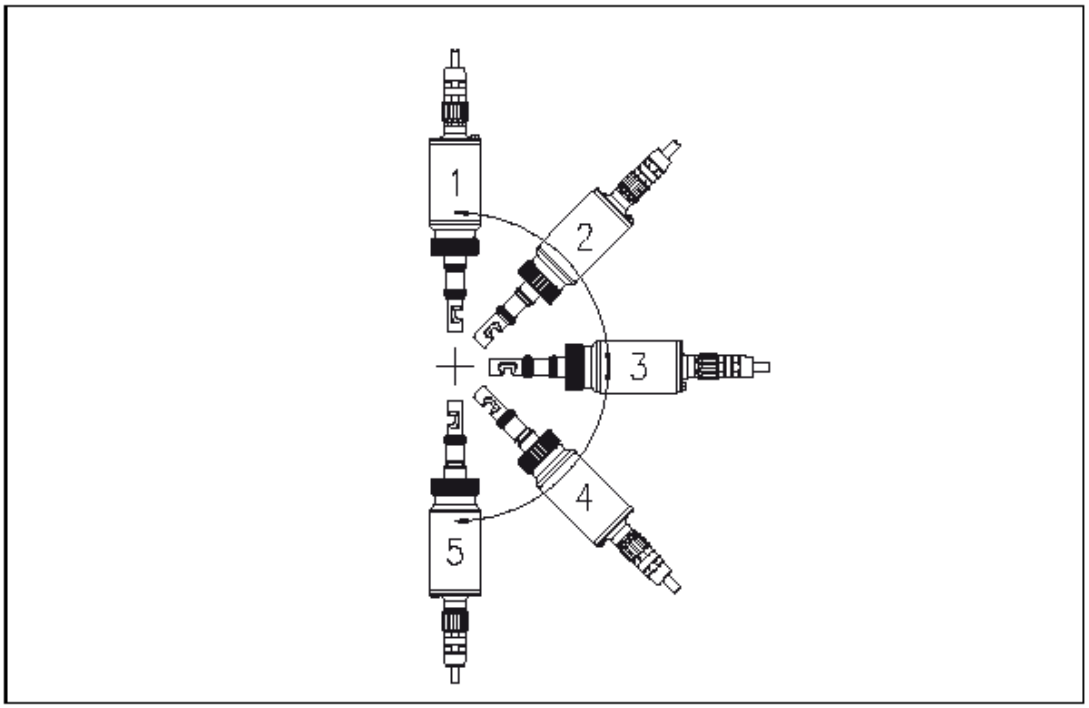

Fig. 3: Sensor positions

- Install sensor in vertical pipelines!
- Orientate port to one side in horizontal pipelines!
- Check seat of swivel nut during installation and maintenance activities.
- Do not exceed 25 bar during any pressure test.
- Always install weld-in port, adapter or T-piece in the pipeline providing optimum flow through the measuring segment. Do not install the named parts immediately behind valves or other flow obstacles.
- Make sure that no extraneous light sources are located near the sensor in order not to distort measuring results.
- Only remove a sealing flange if the pipeline is pressureless, cooled down and empty. The sealing flange is not suitable for safety ports.
- In rare cases seizing of threads may occur. An appropriate lubricant has thus to be used. Apply lubricant as a thin film to the male thread of the port. Appropriate lubricants are given in the spare parts list.

7.2 Installation of the sensor

Tool • none

Assemble the sensor as described below:

Notice!
O-Rings are delivered separately and are not installed at delivery.

1. Check that there is an O-ring for the measuring segment.
2. Depending on the corresponding port length, decide in which groove the O-Ring has to sit. The area below the O-ring will later be inserted into the process medium.
   - Lower groove is correct for 60 mm (2.36") port length.
   - Upper groove is correct for 30 mm (1.18") port length. The measuring segment is further inserted into the process medium.

Notice!
Install only one O-ring. This way, you avoid creation of a hold-up volume or entrapment of process medium at the sensor.

3. Slide the O-ring into the lower or upper groove (see figure below).

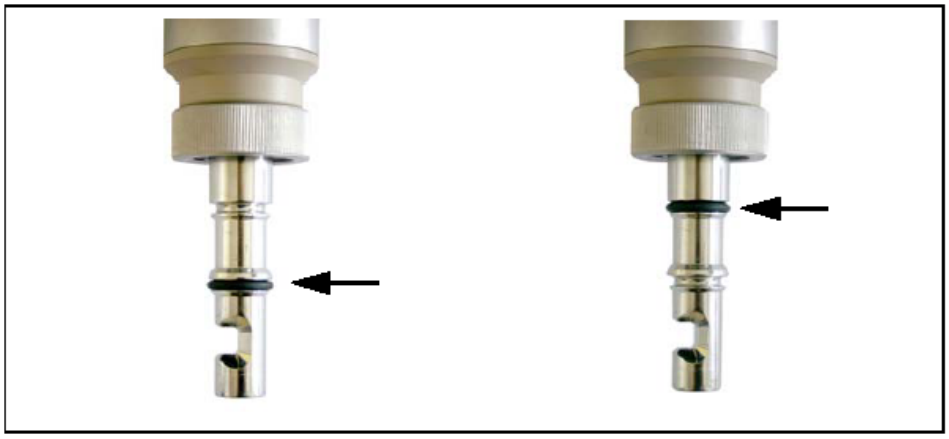

Fig. 4: O-ring in lower groove (left) or in upper groove (right)

4. Orientate sensor outside the pipe. After installation, the measuring segment has to be flown through by process medium and may not point towards the pipe wall.

Attention!
The probe may in no case touch the opposite wall, a 5 mm (0.20") distance is sufficient.
Observe opposite internals!

5. Slide the sensor into the weld-in port, adapter or T-piece.
6. Manually screw-tighten swivel nut.

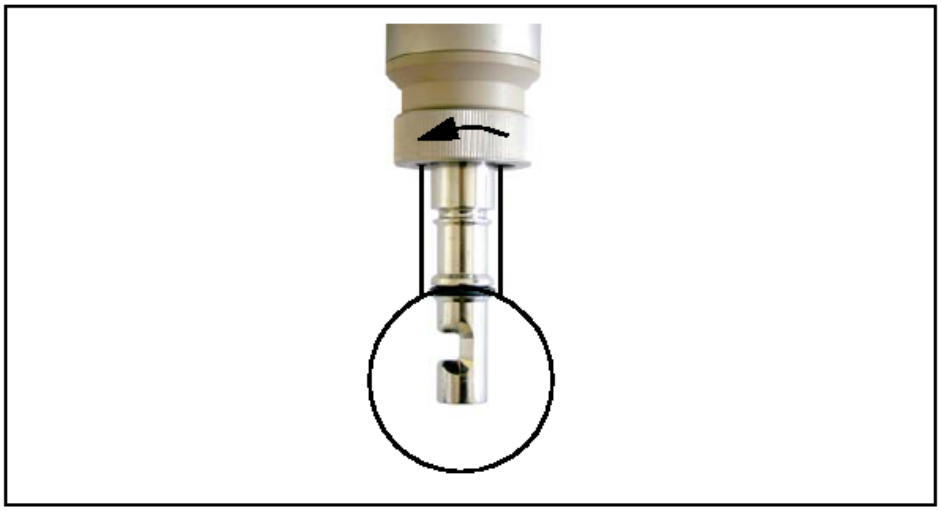

Fig. 5: Tightening swivel nut

7.3 AirPurge

If the temperature of the process medium is too low, the temperature of the air inside the optical housing may fall below the dew point. This leads to condensation on the window surfaces. For this case, the sensor is equipped with airpurge connections on the backplate.

Tool F Screw ⊖ driver
F wrench 7 mm

At delivery, the drill hole(s) of the air purge connection(s) is / are sealed with O-ring and sealing screws M5 x 6 (DIN 84).

1. Loosen the sealing screw.
2. Check if there is an O-ring on the air purge connection.
3. Install air purge connection (1 in Fig. 14) screwing.
4. Place the air purge hose on the air purge connection (1).

Fig. 6: Airpurge connection on sensor

After connecting the sensor to the power supply and putting it into operation, rinse it as described below:

1. Loosen the cylinder nut (2 in Fig. 6) turning it 2-3 turns anticlockwise.
2. Rinse the optical housing by aerating it with dry, oil and dust free air for approx. 10 minutes at a maximum of 0.5 bar (7.25 psi) gauge pressure.
   If you do not have air purge supply of appropriate quality, feel free to contact us or one of our distributing partners.
3. Reduce air pressure to approx. 0.1 bar (1.45 psi).
4. Retighten the cylinder nut (2). Keep up the gauge pressure. Air consumption in this operational state is minimal.

8. Electrical Connection

8.1 Connection to the converter ATT-KA

For connecting the sensor cables, observe the following basic conditions:

- Bring the sensor cable to the cable entry from underneath.
- Form a loop with the sensor cable close to the cable entry.
- Do not lay sensor cables in ducts of current-carrying lines.
- Observe cable specifications (see technical data).

To lay sensor cables underground without protection is prohibited. For connecting the sensor to the converter, a sensor cable is provided.

Connection to the sensor

Fig. 7: Connector

Tool • not needed

Connection of the sensor cable

1. Loosen the connection cover of the sensor.
2. Loosen the plug cover on the sensor cable.
3. Insert the sensor cable until it audibly locks into place. Only then, the thread grips.
4. Fasten the thread, until it locks into place. The connection is now fastened.

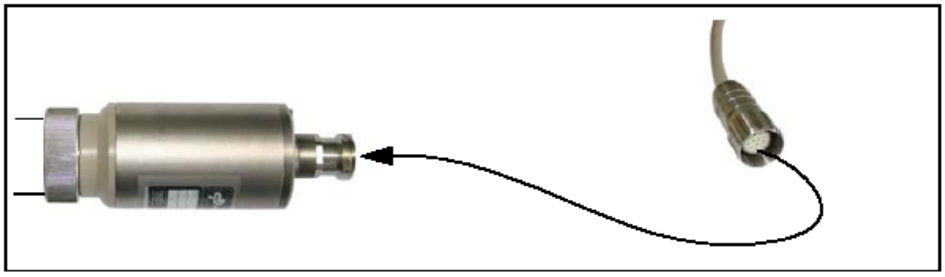

Fig. 8: Connecting sensor cable

Connection to the converter

The following connections are on the back of the converter:

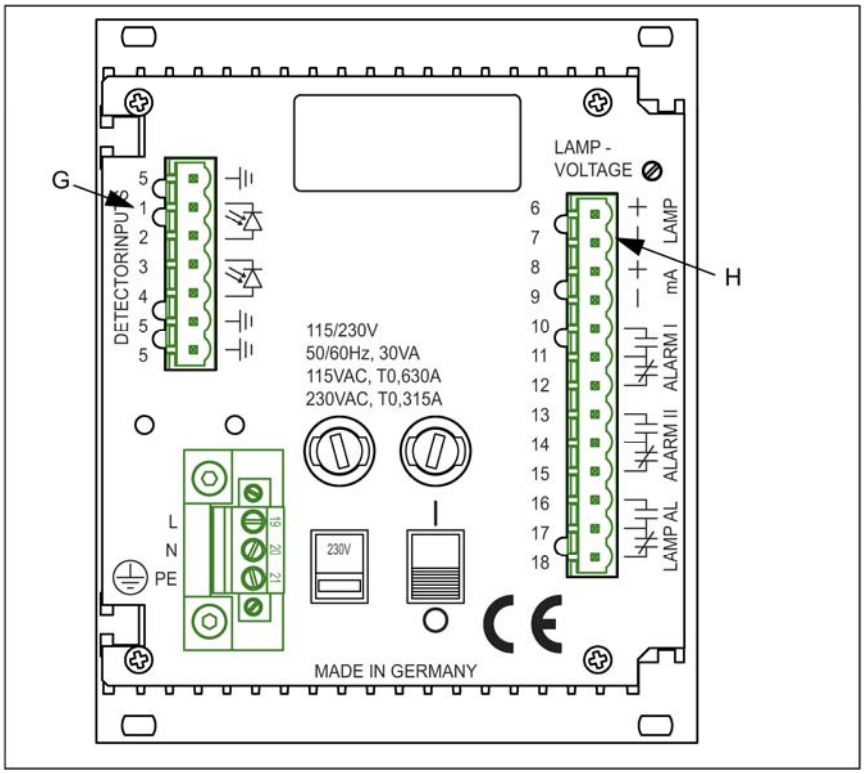

Fig. 9: Detector inputs and lamp outputs of the converter ATT-KA

Letters stand for

- G Detector inputs (5, 1, 2)
- H Lamp outputs (6, 7)

The connections depend on the configuration of your converter and depend on how many sensors you want to connect.

Note!
Stick to the detector inputs and lamp outputs specified in table 2. Thus, danger of mixing inputs and outputs up is minimized.

Number of sensors Sensor type	Detector input connection of the converter	Lamp output	Cable set lengths max.
1 sensor ATL	Detector input (5, 1, 2)	Lamp output (6, 7)	50 m

Table 1: Connections

Tool • Screw driver

To be able to allocate the end splices unequivocally to the terminals of the converter, each end splice is marked with the number of the correct terminal:

Detector cable to sensor

1 = white (A1) 2 = brown (A2) 5 = black (A5)

Lamp cable to sensor

6 = white or blue (6) 7 = brown (7)

Caution!
Lamp voltage must be adjusted to the cable length in order to compensate voltage loss in the cable. Too low lamp voltage can lead to wrong measuring results. Too high lamp voltage reduces the life of the lamp module considerably. In operation the voltage at the lamp is 4.8 VDC.

9. Faults

Among other possibilities, you can detect faults whenever an error message on the converter appears. Try to clear the fault using the following table. Should you have any difficulty clearing the fault, feel free to contact our customer service.

Tab. 2: Possible faults and remedies

Possible fault	Possible remarks	Cause	Remedy
Failure of lamp module	• "Lamp failure" LED of converter flashes. • Signal loss	Lamp cable between sensor and converter defective	• Continuity test of lamp cable • Exchange lamp cable for new one.
		Lamp module defective	Exchange lamp module.
Detector failure	-	Detector cable between sensor and converter defective	• Continuity test of detector cable • Exchange detector cable for new one.
		Detector defective	Exchange detector.
Condensate formation	Unrealistic, random measuring results	Humidity gets into optical housing and forms condensation deposits on windows.	Use air purge.
		O-ring missing or defective	Disassemble sensor assemblies and check O-rings, exchange if necessary.
Wrong results	• Results are fluctuating. • Zero point is drifting.	• Sensor body windows are dirty. • Sensor body windows are corroded. • Lamp module near failure, lamp module near the end of its life.	• Clean sensor body window. • Exchange sensor body window for sapphire window. • Exchange lamp module.
Connection error	• No function • No "Lamp failure" LED message	Detector cable between sensor and converter defective	• Continuity test of detector cable • Exchange detector cable for new one.
		Sensor cable incorrectly connected to converter	Check and revise connections.
Measuring range exceeded	↑ – ↑ – ↑ flashing at the converter	Process conditions	• Amplify measuring range. • If the measuring range cannot be amplified, reduce optical path length.
		Wavelength-dependent detector module reduces the dynamic measuring range, optical filters reduce wanted signal.	• Reduce optical path length and / or change measuring wavelength. • Exchange lamp module.
Lower measuring range exceeded	↓ – ↓ – ↓ flashing at the converter	• Zero point was established with dirty or contaminated zero solution. • Zero point for a liquid process stream was adjusted based on air (i.e. empty armature)	Use pure zero solution (DI water or respective solvent for liquid process streams) and re-zero instrument.

Possible fault	Possible remarks	Cause	Remedy
mA-signal (output)	mA-output delivers correct current results if measuring results are low and too low current results if measuring results are high.	Connected load > 600 ohms	• Check resistance of wiring. • Use appropriate mA-input.
	Smaller deviations in the % range	Poor calibration of the receiving mA-input	Compensation by adjusting calibration of the sending mA-output.
mA-signal (input)	Smaller deviations in the % range	Poor calibration of the sending mA-output	Compensation by adjusting calibration of the receiving mA-input.
Converter defective	None of the above mentioned errors can be detected.	-	Send system (converter and sensor) to optek for checking purposes. If necessary, the sensor body can remain in the pipeline so that only the optical arms and the converter have to be sent.

10. Maintenance

10.1 Preventive maintenance

Table 3: Preventive maintenance

Component	Maintenance activity	Maintenance interval	Information
Wetted parts	inspection with regard to leakages	as part of standard installation maintenance	Possible damaged sealing faces of the sensor body can lead to leakages.
Lamp module	exchange	1 - 2 years	Operation of the lamp below its nominal voltage (4.8 V DC instead of 5.0 V DC) enhances lamp life. Strong vibrations, high temperatures or frequent on and off switching of the system can have negative effects on the service life. Statistical service life is 3 years.

Notice!
The used detector is not subjected to measurable aging when used properly.

10.2 Exchange of lamp module

Tool

- Screw driver

1. Switch the converter voltage-free.
2. Loosen the sensor cable from the sensor.
3. Loosen both cylinder nuts connecting the backplate to the housing and carefully remove the backplate

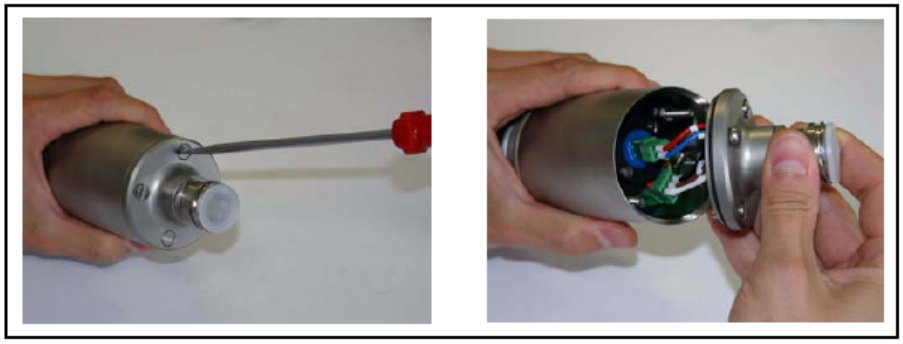

Fig. 10: Loosening cylinder nuts and removing backplate

4. Carefully loosen the lamp and detector connectors.
5. Loosen both screws (1 in the figure below) of the lamp module.

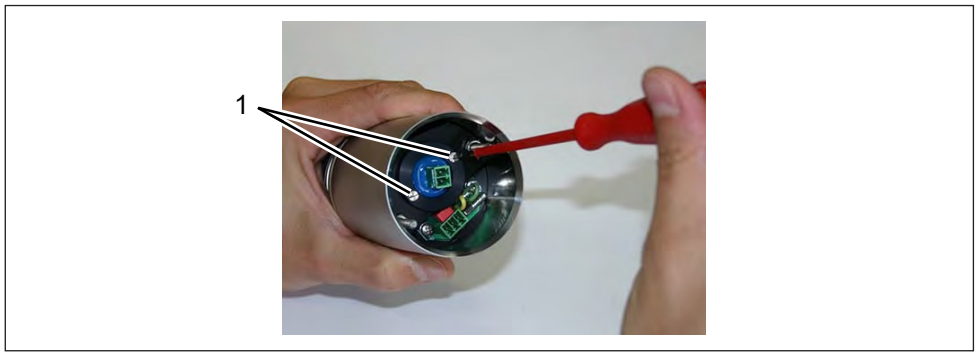

Fig. 11: Screws of lamp module

6. Pull out the lamp module (2).

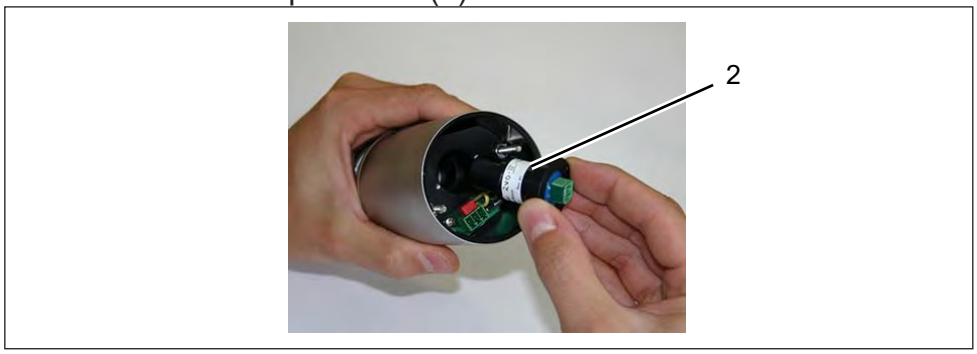

Fig. 12: Pulling out the lamp module

7. Insert the new lamp module into the sensor.
8. Fasten both screws (1). Now, the lamp module is fit in the sensor.

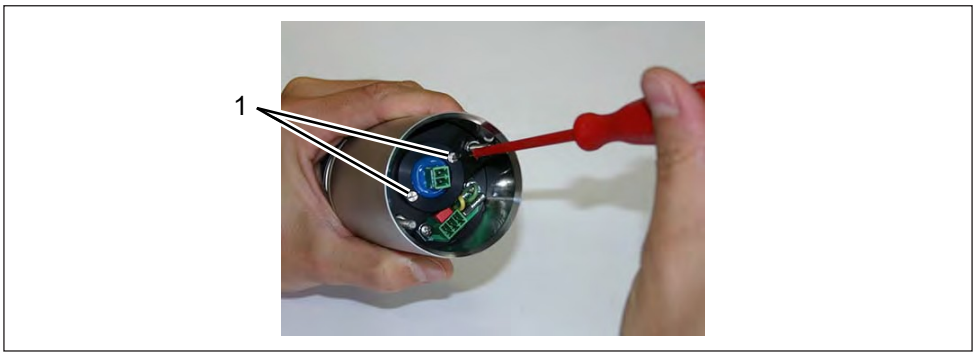

Fig. 13: Screws of lamp module

9. Verify that the O-ring is provided on the backplate. Replace it if necessary.
10. Connect the 2-pin connector to the lamp module and the 3-pin connector to the detector.
11. Place the backplate on the housing, so that the drill holes correspond.
12. Fasten both cylinder nuts.

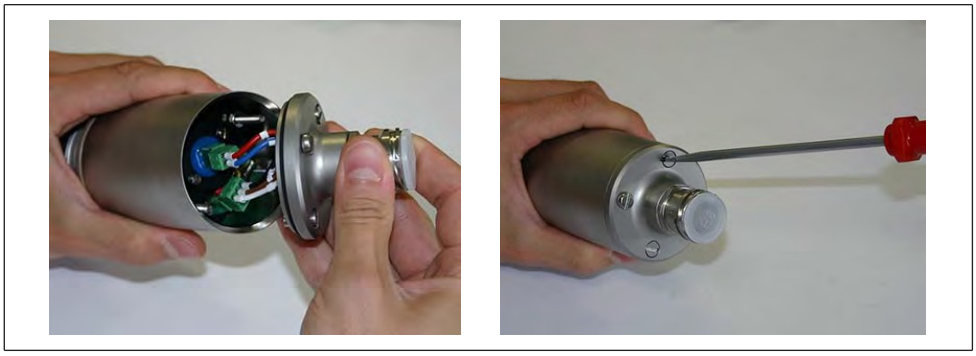

Fig. 14: Placing backplate and fastening cylinder nuts

13. Re-connect the sensor cable.
14. Switch on the measuring system.
15. Follow the instructions given in chapter 10.3, page 20

10.3 Return to operation after the exchange of lamp module

Before return to operation of the entire measuring system, undertake the following activities:

1. Switch on the converter.
2. Wait for approx. 15 minutes, until the converter has reached the working temperature.
3. Check the system's zero-point (see instruction manual of the converter).
4. Document your settings using the form (see instruction manual of the converter).
5. Check the measuring results with regard to plausibility.
6. If the settings and measuring results are correct, enable measuring.

11. Technical Information

11.1 Sensor ATL

Measuring principle:	absorption
Measuring range:	sensor spezific 0 - 1 CU for ATL-F Freely selectable 0 – 3 CU for ATL-N
Permitted process temperature TS:	permanent: 0...90 °C, (32...194 °F) peak (60 min/day): 0...°C, (32...212 °F)
Ambient temperature:	operation: 0...40 °C, (+32...104 °F) transportation: -20...70 °C, (-4...158 °F)
Pressure rating:	PN10 (test pressure PT 15 bar)
Permitted pressure PS:	10 mbar - 10 bar with TS 0 °C / +90 °C

Permitted pressure at elevated temperature:

TS (°C)	< 90	100
PS (bar)	10	8

Material:	
Wetted parts:	stainless steel 1.4435 (SS 316 L)
Surface:	electro-polished Ra < 0.8 µm (standard)
Window:	saphire (without gasket)
Housing:	stainless steel 1.4571 (SS 316 Ti)
Adapter:	stainless steel 1.4435 (SS 316L)
Port gasket:	O-Ring Ø 18.64 x 3.53 mm

Gasket material:	application specific, selection by end user Permitted: EPDM (FDA), silicone (FDA), Kalrez® 6375, Chemraz® (FDA), others on request
Port connection:	for ports AS25-GS60 (similar to Ingold ports) diameter: 25 mm (Ø 25 H7) nominal length: 60 und 30 mm thread: G1 1/4“ ISO 228/1
Insertion depth maximal:	OPL + 35 mm with port length 60 mm
Opt. Path length (OPL):	5 or 10 mm
AirPurge:	connection M5 available as standard
Light source:	incandescent tungsten lamp: 5.0 V DC, 775 mA
Wave length:	430 nm for ATL-F 730 – 970 nm for ATL-N
Detector:	silicone photodiode, hermetically sealed
Cable connection:	probe cable ASx6-TT, end splice on both sides probe cable ASx6-SCT, with stainless steel plug and socket 2, 3, 5, 10, 15, 20, … 45 or 50 m (7, 10, 16, 33, 49, 66,…148 or 164 ft.)
Weight:	probe: approx. 2.0 – 2.5 kg, depending on version cable set: approx. 1.5 kg / 10 m
Protection:	IP65
Certificates:	ISO 9001:2000, PED, CE, HP0

11.2 Converter ATT-KA

Mesuring range:	0-1 CU, 0-2 CU, 0-3 CU, 0-4 CU, variable 0-0.5...4 CU (factory set 0-0.5 CU)
Resolution:	< ±0.5 % of respective measuring range
Repeatability:	< ±1% of respective measuring range
Linearity:	specific to application, < ±2% of respective measuring range
Response time:	1 second
Ambient temperature	
Operation:	0...50 °C (32...122 °F), no direct light
Transport:	-20...+70 °C (-4...+158 °F)
Housing:	19" version for rack mounting, 3HE / 21 TE dimensions 106 x 116 x 190 mm (W x H x D) weight 2.0 kg
Display:	digital, 3-digits
Alarm output:	2 independant adjustable SPDT contacts
Failsafe:	1 contact to alarm in case of lamp or system failure (ative)
Cable length:	combined with ATL max. 50 m (max. 164 ft.)
Output:	0/4 – 20 mA (galvanically isolated)
Load:	max. 500 Ω
Power supply:	115 / 230 V_{AC} selectable or 24 $V_{AC/DC}$
Power consumption:	30 VA
Protection:	front IP40 / rear IP20 when mounting in optional available field housing higher protection is possible
Certificates:	CE, GS

12. Order Codes

Order codes sensor (example: **ATL- F E A**)

Model	Wavelength	Gasket	Optical path length
ATL-*	**F** = 430 nm **N** = 730 - 970 nm (NIR)	**E** = EPDM (FDA) **I** = silicone (FDA) **K** = Kalrez® 6375 **C** = Chemraz® (FDA) **X**** = other material on request	**A** = OPL 5 mm **B** = OPL 10 mm

* The connection cable between probe and converter and between the adapter hast to be separately ordered as accessories

** Please specify material when ordering

Order codes adapter (example: **ATL-Z T50**)

Model	Adapter	
	Connection	Size
ATL-Z	**T50** = Tri Clamp® 2" **V50** = Varivent® d=68 mm **S90** = weld in port 90°, cone **S9K** = weld in port 90°, short **S15** = weld in port 15°	
	R1 = T-piece with tube, acc. to DIN 11850 **R2** = T-piece with tube OD, acc. to BS 4825	**9** = DN50 / 2" **0** = DN65 / 2 1/2" **B** = DN80 / 3" **C** = DN100 / 4" **D** = DN125 / 5" **E** = DN150 / 6"

Order codes accesories

Model	Description
ATL-ZK-10 **ATL-ZK-20** **ATL-ZK-30** **ATL-ZK-40** **ATL-ZK-50**	connection cable between sensor ATL and evaluation electronics ATT-K Length available in steps of 5 m
ATL-ZF	sealing flange for probe connection

Order codes converter (example: **ATT-K A E C 1**)

Model	Measuring principle	Housing	Unit	Power supply
ATT-K*	A = absorption	E = panel mounting F = field housing	C = CU	1 = 115 / 230 V_{AC} switchable 2 = 24 $V_{AC/DC}$

*The connection cable between probe and converter hast to be ordered as accessories

13. Dimensions

13.1 Accessories Weld-in port ATL-ZS...

The ATL sensor is designed for port connections (similar to Ingold Port) with a 25H7 inside diameter, a nominal length of 60 mm (2.36") and a G1-1/4" ISO 228/1 connection thread. The ATL-ZS90 port is prepared in a way that the straight (0°) ATL-ZS9K port as well as the angular (15°) ATL-ZS15 port are easy to realize at the site. The port may as well be welded in at an angle smaller than 15°, because it is provided with the corresponding cone. The three weld-in ports are available as accessories.

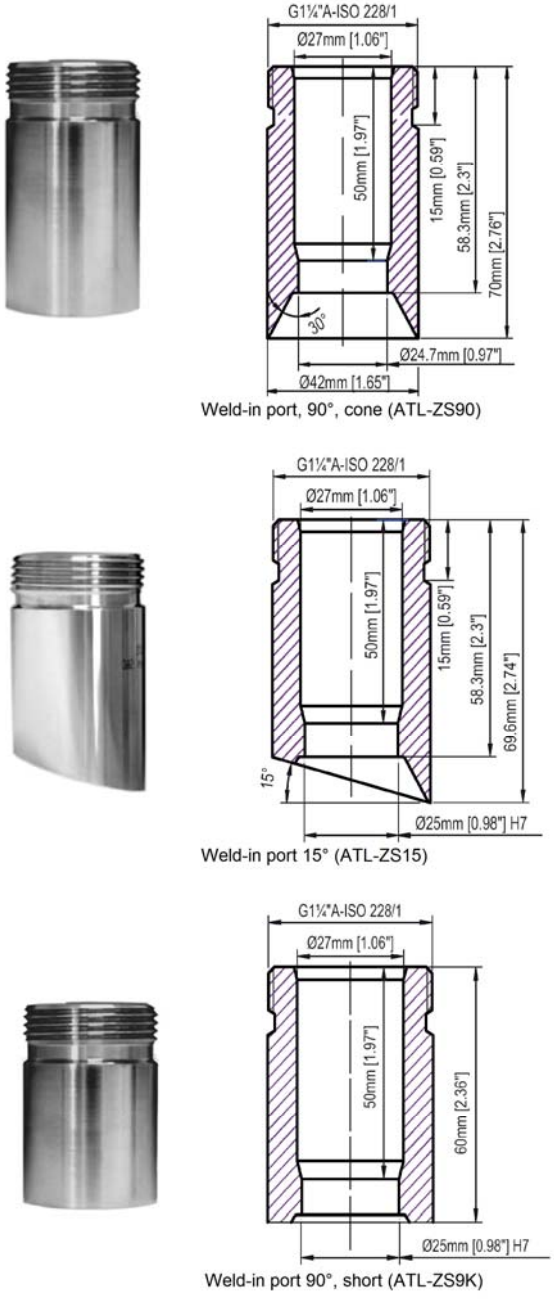

Fig. 15: Weld-in ports

Notice!

After welding, distortion at the weld-in port has to be corrected! Modify the interior drill hole of Ø 24.7 mm to obtain the nominal diameter Ø 25 H7 (Ø 25.0 - Ø 25.021 mm) before installing the probe!

13.2 Accessories Varivent® adapter port ATL-ZV50

The adapter allows sensor installation with Varivent® inline housings. The adapter may be installed on all housings instead of a closing plate Ø 68 mm (2.68").
The adapter made of high-quality bulk material 1.4435 (SS 316 L) combines Varivent inline housings with the AS25-G60 weld-in port.

Varivent® hinged clamp (TU no. 701-075), nut M6 (TU no. 912-035) and gasket Ø 60x3, EPDM FDA (TU no. 930-144) are parts included in the Varivent inline housing scope of supply. As standard, the adapter is delivered without these parts.

The sensor is inserted into the pipeline to a different degree depending on the applied optical path length and the variant:

Tab.: 4 Varivent® adapter ATL-ZV50

OPL [mm]	**ATL insertion depth max. [mm]**
5	40
10	45

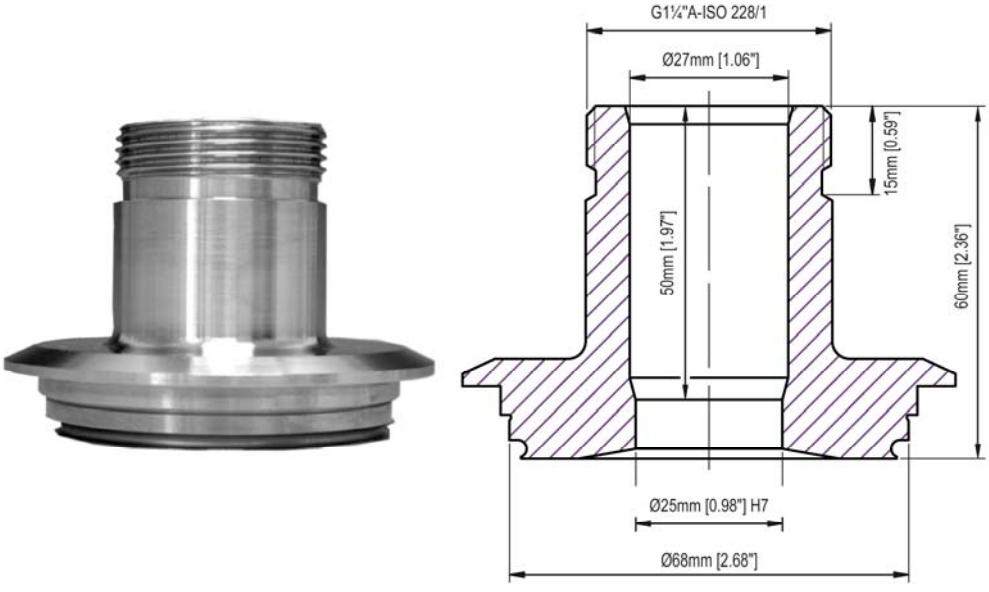

Fig. 16: Varivent® adapter ATL-ZV50

13.3 Accessories adapter Tri-Clamp® 2" ATL-ZT50

The adapter allows sensor installation with T-pieces with clamp 2.0" acc. ISO 2852-1993 or clamp 2.0" TC-L14AM7 (Tri-Clover®).
The adapter made of high-quality bulk material 1.4435 (SS 316 L) combines Clamp technology with the ATL-ZT50 weld-in port.

As standard, the adapter is delivered without hinged clamp and gasket.

The sensor is inserted into the pipeline to a different degree depending on the applied optical path length (OPL):

Tab. 5: Adapter Tri-Clamp® 2" ATL-ZT50

OPL [mm]	**ATL insertion depth max. [mm]**
5	40
10	45

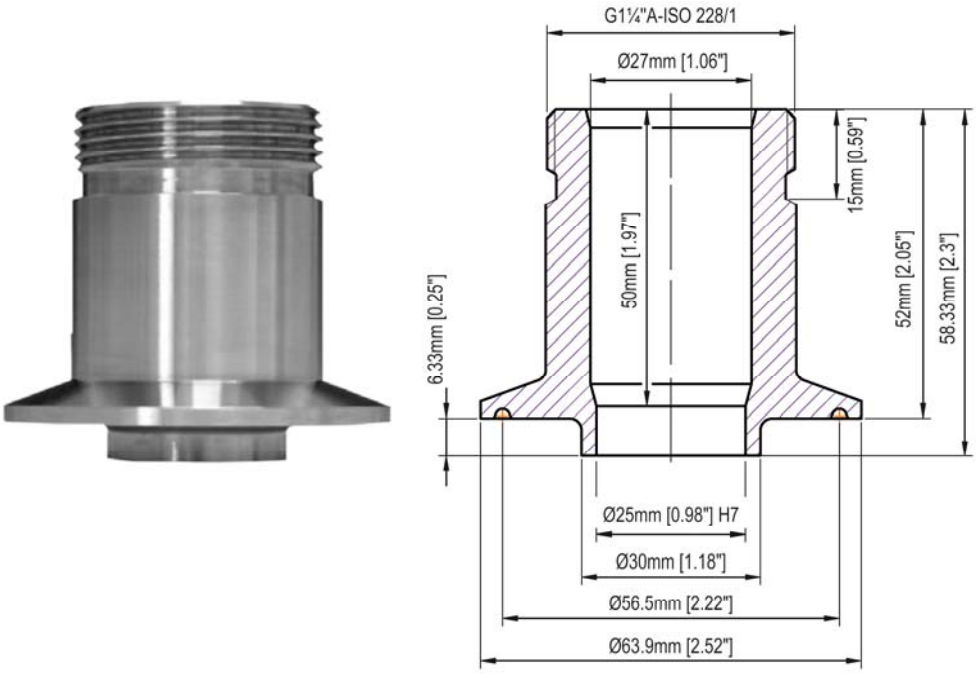

Abb. 17: adapter Tri-Clamp 2" ATL-ZT50

13.4 Accessories Adapter T-piece for pipe DIN 11850 or with pipe OD acc. BS4825 (ATL-ZR...)

T-pieces for pipelines according to DIN 11850 are tubing within the meaning of the PED for liquids and gases of fluid group 1 and 2.

Tab. 6: T-pieces for pipelines acc. to DIN 11850 or with pipe OD

Material:	T-piece made entirely of stainless steel 1.4435 (SS 316 L)
Line sizes:	DN 50 - DN 150 (2.0" - 6.0")
Process connection:	pipe acc. to DIN 11850
Port connection:	for port AS25-GS60 (similar to Ingold port), Ø 25 mm, nominal length 60 mm, thread G1 1/4" ISO 228/1
Admissible pressure PS:	acc. to DIN 11850: 10 mbar - 16 bar for TS -40 °C / +120 °C with pipe OD: 10 mbar - 20 bar for TS -40 °C / +120 °C

Admissible pressure at increased temperature:

ATL-ZR1

TS [°C]	≤ 120	150	200
PS [bar]	16	14	13

ATL-ZR2

TS [°C]	≤ 120	150	200
PS [bar]	20	18	16

Tab. 7: Dimensions and max. OPL of the probe with T-piece with pipe acc. to DIN 11850

Line size	Length L [mm]	Pipe size diameter Ø x S [mm]	Inside diameter D [mm]	Height H [mm]	Depth H1 [mm]	Maximum OPL [mm]	Model
DN 50	150	53.0 x 1.5	50.0	94.5	120	20	ATL-ZR19
DN 65	150	70.0 x 2.0	66.0	103.0	136	20	ATL-ZR10
DN 80	150	85.0 x 2.0	81.0	110.5	151	40	ATL-ZR1B
DN 100	250	104.0 x 2.0	100.0	120.0	170	40	ATL-ZR1C
DN 125	250	129.0 x 2.0	125.0	132.5	195	40	ATL-ZR1D
DN 150	250	154.0 x 2.0	150.0	145.0	220	40	ATL-ZR1E

Tab. 8: Dimensions and max. OPL of the probe for T-piece with pipe OD acc. BS4825

Line size	Length L [mm]	Pipe size diameter Ø x S [mm]	Inside diameter D [mm]	Height H [mm]	Depth H1 [mm]	Maximum OPL [mm]	Model
2.0“	150	50.8 x 1.65	47.5	93.5	117	20	ATL-ZR29
2,5“	150	63.5 x 1.65	60.2	100.0	130	20	ATL-ZR20
3,0“	150	76.2 x 1.65	72.9	106.0	142	40	ATL-ZR2B
4,0“	250	101.6 x 2.1	97.4	118.5	167	40	ATL-ZR2C
5,0“	250	127.0 x 2.1	122.8	131.5	193	40	ATL-ZR2D
6,0“	250	152.4 x 2.8	146.8	144.0	217	40	ATL-ZR2E

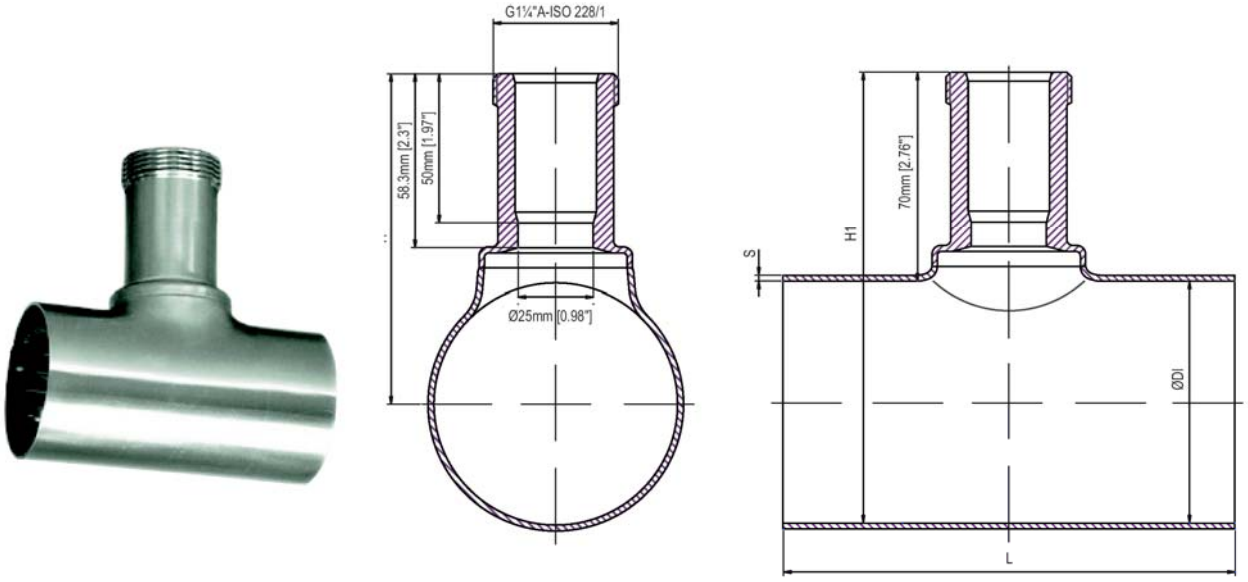

Fig. 18: T-piece with pipe DIN 11850 or with pipe OD

13.5 Accessories sealing flange for sensor connection (ATL-ZF)

The sealing flange is of the same contour as the sensor and may be used to close the port for maintenance activities.
The sealing flange is designed for the straight ATL-ZS90 weld-in port and the 15° ATL-ZS15 weld-in port and may as well be used for other and shorter weld-in ports as the second groove for the O-ring is located 30 mm (1.18 ") higher. Both grooves are designed for O-rings Ø 18.64 x 3.53 mm. The swivel nut is designed for short threads G1-1/4" ISO 228/1.

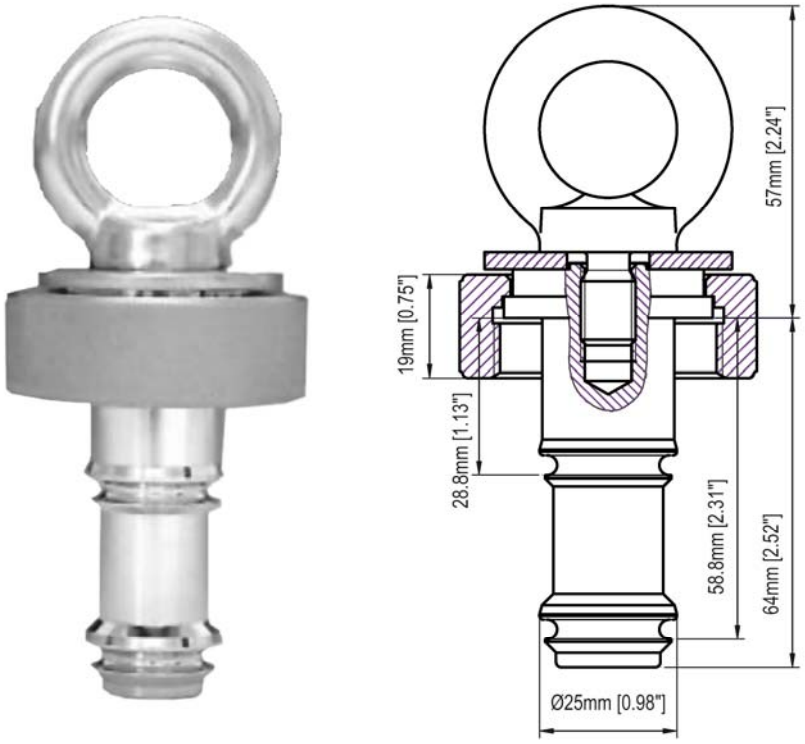

Fig. 19: Sealing flange ATL-ZF

14. Attachment

14.1 Exploded view sensor ATL-F / ATL-N

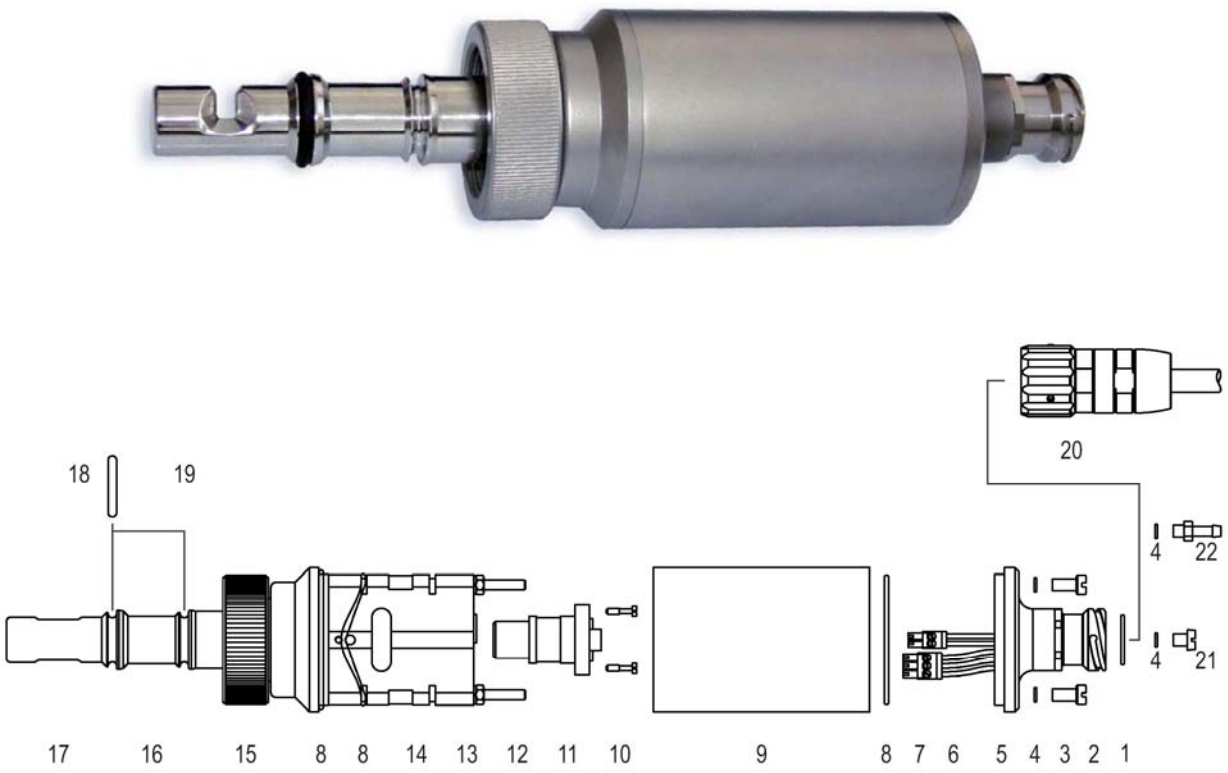

Fig. 20: Foto and exploded view ATL-F / ATL-N

Tab. 9: Explanations of the exploded view

1	O-ring 18.0 x 1.5, Viton®	2	Probe socket AS16
3	2 cylinder nuts M4, 1.4571 (316Ti)	4	O-ring 4.00 x 1.00, Viton®
5	Backplate OH 02	6	Phoenix connector 2-pin (lamp)
7	Phoenix connector 3-pin (detector)	8	O-ring 50.52 x 1.78, Viton®
9	Housing OH02	10	2 collar screws M2.5 x 10.8 (slot)
11	lamp module ATL	12	2 threaded rods M4 x 87 DIN 976 A2
13	Connection detector	14	Lamp holder ATL
15	Swivel nut 35 G1-1/4" H19	16	Probe body ATL polished
17	Measuring segment ATL, variable OPL	18	Option: O-ring 18.64 x 3.53, EPDM, lower groove
19	Option: O-ring 18.64 x 3.53, EPDM, upper groove	20	Probe cable ATL
21	Screw M5 x 6 DIN 84 A4	22	Purge connection M5, Ms/Ni

15. EU Declaration of Conformance

We, KOBOLD Messring GmbH, Hofheim-Ts, Germany, declare under our sole responsibility that the product:

Turbitidy Probe **Model: ATL-...**

to which this declaration relates is in conformity with the standards noted below:

EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements

EN 61326-2-3:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements - Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning

EN 61010-1:2010 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements

EN 61326-2-5:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-5: Particular requirements - Test configurations, operational conditions and performance criteria for field devices with field bus interfaces according to IEC 61784-1

EN 50581:2012 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Also, the following EC guidelines are fulfilled:

2014/30/EU **EMC Directive**
2014/35/EU **Low Voltage Directive**
2011/65/EU **RoHS** (category 9)

Hofheim, 10. Oct. 2017

H. Peters
General Manager

M. Wenzel
Proxy Holder