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OPERATING INSTRUCTIONS

Pipe Probes

UNIQ T804

Field Device AME-I
Impedance Measurement



Interface detection, product monitoring, and limit value detection for liquids

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Introduction

These instructions are intended to support users of Aquasant probes with installation, operation, and maintenance. In accordance with the current state of technology and recognized safety regulations, this product is intended for the exclusive use in chemical related plants. The manufacturer accepts no liability for damage caused by unauthorized modifications to the product or opening of the electronics. The relevant accident prevention regulations (APR) and other generally recognized safety, occupational health, and construction regulations must be complied.

Use of the UNIQ T804 pipe probe

Measuring principle

The probe with the AME-I field device monitors smallest changes in impedance in the measuring loop; with a response time of a few milliseconds. Intrinsically safe signal processing signal (analog signal 4-20 mA and 2 relays) is available. The processing of the measurement signal is application- and software-specific.

Impedance measurement principle

The high-resolution measurement electronics of a rod or pipe probe measures the alternating current resistance (sum signal of the dielectric constant and electrical conductivity) as impedance and converts this resistance into a standardized measuring range.

The measured impedance is collected and evaluated by the AME-I measurement electronics. The measured values for this signal range are product-specific and characteristic for different products, such as those encountered in interface measurements of two immiscible liquids.

Area of application

The probe is used specifically for interface detection and/or limit value monitoring in batch processes, as well as for product monitoring of liquids.

Specification overview

- Process connection: Flange DN acc. to EN 1092-1 Form A/B1 / ANSI acc. To ASTM A182
- Process temperature: –20 ... +170 °C (–4 ... +338 °F)
- Process pressure: 500 mbar (a) … 16 bar (a) (-7.25 ... +232 psi)
- International explosion proof certificates

Safety guidelines

This device has been built and tested in accordance with the safety regulations for electronic measuring devices. The proper functioning and operational safety of this device can only be guaranteed during its use, when the generally accepted safety precautions and the device-specific safety instructions as in this operating manual are observed.

These safety instructions do not take into account the fact that:

- Unexpected, random events may occur during installation, operation, and maintenance.
- Compliance with local safety regulations, for which the operating company is responsible, including personnel responsible for installation

The installation and assembly instruction contain basic safety instructions that must be followed during commissioning, operation, and maintenance.

Failure to comply with these instructions may result in:

- Danger to personnel due to electrical, mechanical, and chemical impacts
- Danger to surrounding equipment
- Failure of important functions
- Danger to people and environment in the event of leakage of hazardous substances

This product is an element of the facility and must therefore be integrated into the equipment's safety system.

Authorized personnel

All operations described in this documentation can only be carried out by trained personnel authorized by the plant operator. When working on and with the device, PPE must be worn in accordance with the plant operator's specifications and local regulations. The device is an electronic piece of equipment for use in operating facilities to which only people with electrical training have access.

Personnel must meet the following requirements for their activities (e.g. commissioning or maintenance):

- Trained specialist personnel have qualifications that correspond to their function and activity
- Authorized by the plant operator
- Familiar with national regulations
- Have read and understood the instructions in related manuals and additional documentation
- Follow instructions and general conditions

Further information and notes can be found on page 42 (Maintenance and repair)

Information on cyber security

Protection against cyber attacks is only effective with a well-designed security strategy which is regularly reviewed and kept up to date.
A good strategy includes organizational, technical, digital, process-related, and physical security measures. It should be tailored to the specific risks involved.
The safety features included in this product can only be effective if the product is part of such an overall safety strategy.

Safety signs and symbols

To highlight safety-related or recommended procedures, we have established following safety instructions, each marked with a corresponding pictogram.

Important warnings



Hazardous area symbol
➲ Observe the warning notices to ensure explosion protection



Electrical symbol
➲ Observe the warning notices for hazards involving electrical voltage



Caution Notice
➲ Observe important points



Operation symbol
➲ Observe the operating instructions on the control unit



Maintenance symbol
➲ Maintenance-related information



Manual symbol
➲ Observe the notes and information, reference to documentation

Symbols used



Not recommended, unauthorized action
➲ Observe notes and information, refer to documentation



Permitted function
➲ Processes, parameterizations, connections that are permitted



Caution
➲ Observe instructions



Note additional action needed
➲ Settings, parameters



Device communication USB/APL
➲ Observe notes and information



Installation
➲ Observe notes and information regarding installation



Further steps
➲ Observe instructions and information about further steps

Login



➲ A authorized user must be logged in for parameterization



Tip
➲ Recommendation for further action



Switch
➲ Switch off device, disconnect from power supply



Power supply
➲ Observe instructions and information, refer to documentation

Intended use

The grounded impedance **pipe and rod probes** are used with built-in or separate on-site measurement electronics to measure and detect liquids, foams, and powders.

- AME_COM with intrinsically safe Ex output connected to the AME-I_HMI for use with Aquasant probes of the UNIQ* series and power supply unit (IEC/ATEX RL 2014/34/EU)
- Connect only compatible Aquasant probes
- Improper use of the device can cause hazards
- Only use original Aquasant parts

Warning against misuse

The manufacturer is not liable for damage resulting from improper or unintended use. Deviating from intended operating conditions impair explosion protection and/or the measuring circuit. Proper operation of the device cannot be guaranteed under these conditions.

Installation and commissioning

The pipe or bar probe has been manufactured to be operationally safe according to the state of the art, additionally considers the respective relevant regulations and EC directives. However, if the probe is used improperly or not as intended, it may pose application-related hazards, e.g., product overflow or leakage due to incorrect installation or configuration. Therefore, installation, electrical connection, commissioning, operation, and maintenance of the measuring device can only be carried out by trained personnel authorized by the plant operator. The trained personnel must have read and understood these operating instructions and obey relevant instructions. Modifications and repairs to the device must only be carried out if the operating instructions expressly permit this.

Operational safety

During configuration, testing, and maintenance work at the device, alternative monitoring measures must be taken to ensure operational safety and process reliability.

Potentially hazardous zone



When using the measuring system in potentially explosive areas, relevant national standards and regulations must be observed. The device is issued with a separate Ex documentation, which is an integral part of this documentation. The Ex-related installation instructions, connection values, and safety instructions listed therein must be observed.

Ensure that

- specialist personnel are sufficiently trained.
- measurement and safety requirements relating to the measuring points are observed.
- The probe complies with hazardous zone classification.

Doc: Certificate_Safety Information_UNIQ_impedance_SEV26

Product safety

This field measuring device has been built, tested in accordance with latest technology and good engineering practice. In terms of safety, it has left the factory in perfect condition. It meets general safety and legal requirements.

CE mark

The measuring system complies with the legal requirements of the applicable EC directives. These are listed together with the applicable standards in the corresponding EC declaration of conformity. Aquasant confirms the successful testing of the device by affixing the CE mark.

EU conformity

The device complies with the legal requirements of the applicable EU directives. These are listed together with the applicable standards in the corresponding EU declaration of conformity. Aquasant confirms the successful testing of the device by affixing the CE mark.

RoHS compliance

This product complies with the provisions of Directive 2011/65/EU of the European Parliament and of the European Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) and its respective amendments.

NAMUR recommendations

NAMUR is the association for automation technology in the process industry in Germany. The published NAMUR recommendations are considered standard in field instrumentation. This device meets the requirements of the following NAMUR recommendations:

- NE 21 – Electromagnetic compatibility of equipment
- NE 43 – Standardization of analog 4–20 mA current signals
- NE 53 – Compatibility of field devices and display/operating components
- NE 107 – Self-monitoring and diagnosis of field devices

For further information see www.namur.de.

Functional approvals

Pressure Equipment Directive

The pipe probes are approved in accordance with the Pressure Equipment Directive RL2014/68/EU (PED) Module A2, Cat. 2.
Bar probes, regardless of the maximum permissible pressure, are considered pressure equipment with process connections without pressurized housings and are not subject to the Pressure Equipment Directive.

Ex according to ATEX / IECEx





Control devices with intrinsically safe output, approved for connection of defined probes and detectors in the Ex zone according to SEV26 ATEX and IECEx.

The EC type examination certificate must be observed. It is particularly important to comply with the "special conditions" contained therein. Ex certification according to Directive RL 2014/34/EU

ATEX documentation: PDF download
Certificate_Safety Information_UNIQ_impedance_SEV26

Goods receipt and identification

Goods receipt

Checking incoming goods:

- Are the product label and the delivery note identical?
- Are the parcel and probe intact?
- Does the equipment label match the purchase order?

Please contact Aquasant Messtechnik AG if these conditions are not met.

Identification Device name

Equipment label

The following technical data can be found on the equipment label:

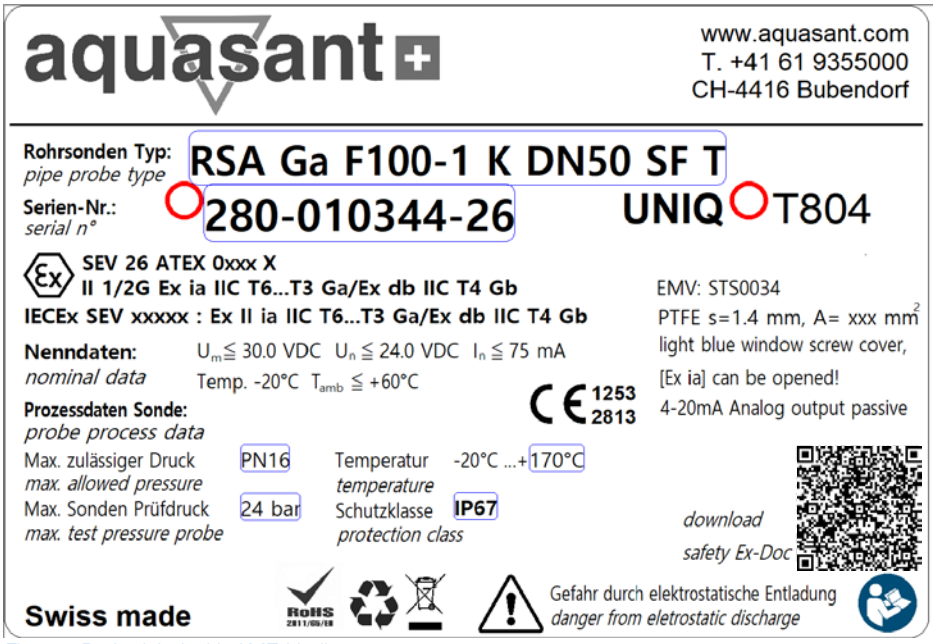


Fig. 1 Probe label with AME-I built

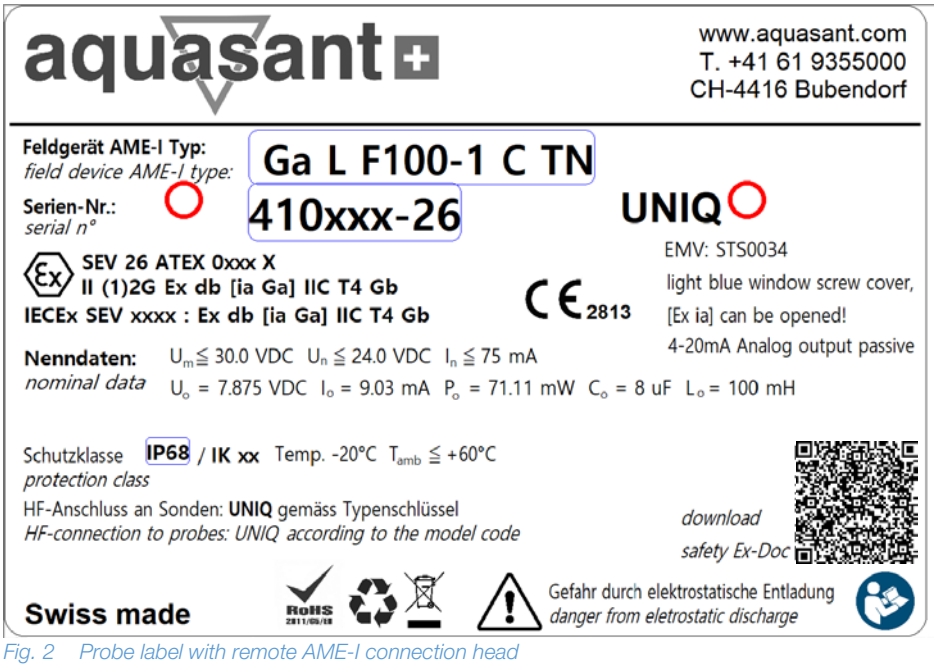


Fig. 2 Probe label with remote AME-I connection head

Product overview

UNIQ-T804 refers to the product group of pipe probes in combination with the field device type: AME-I.
The following options are available for identifying the measuring device:

- Equipment label information
- Probe code with breakdown of device characteristics on the delivery note
- Serial number from equipment label

Device name



The device name is used to identify the alphanumeric type description (see equipment label pipe probes Type: RSA Ga... indicates the exact probe design according to the type code. The Ex-designation is explained in detail in the document: Safety Instructions. Doc: Certificate_Safety Information_UNIQ_impedance_SEV26

Scope of delivery



Please observe the instructions listed under "Goods receipt, transport, storage" regarding unpacking, transport, and storage of the measuring devices!

The scope of delivery consists of:

- Assembled device
- Optional accessories

Supplied documentation:

- VEB-AMEI-UNIQ_Safety-Instruction-SEV26
- Regulatory documentation, unless listed in the operating instructions.

Probe storage and transport

Probe storage

The measuring device must be packed shockproof for storage and transport. The original packaging provides optimum protection for this purpose. Recommended storage temperature is –20 °C to +70 °C.

- Observe recommended storage temperature and humidity
- Store probe in its original packaging

Probe transport to the measuring point

Probe must not be damaged during transport. The following points must be observed:



➲ Safety note: For a device weighing more than 18 kg, observe transport conditions according to IEC 61010.
➲ Transport sensor to the measuring point in its original packaging
➲ Do not lift the probe on the connection head; pay attention to the sensor's center of gravity during transport
➲ Caution: Do not damage the PTFE body. The probe must be held by the outer casing, not by the active PTFE part of the probe!

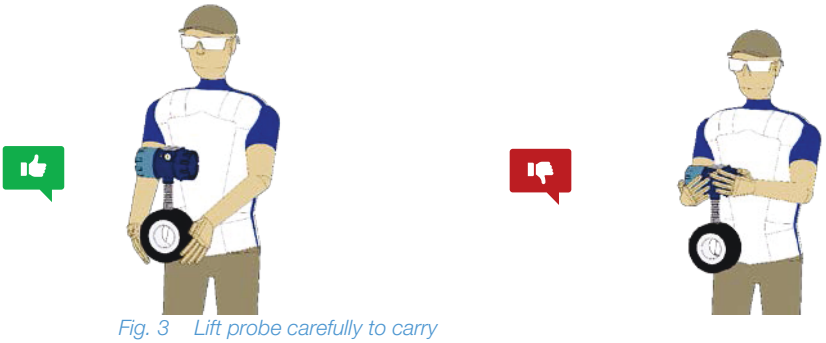


Fig. 3 Lift probe carefully to carry

Installation / Fitting

Installation

Suitable installation position

Depending on the application, an installation position with a minimum gradient of 3% to vertical alignment is recommended. The pipe probe must be guaranteed to run empty!

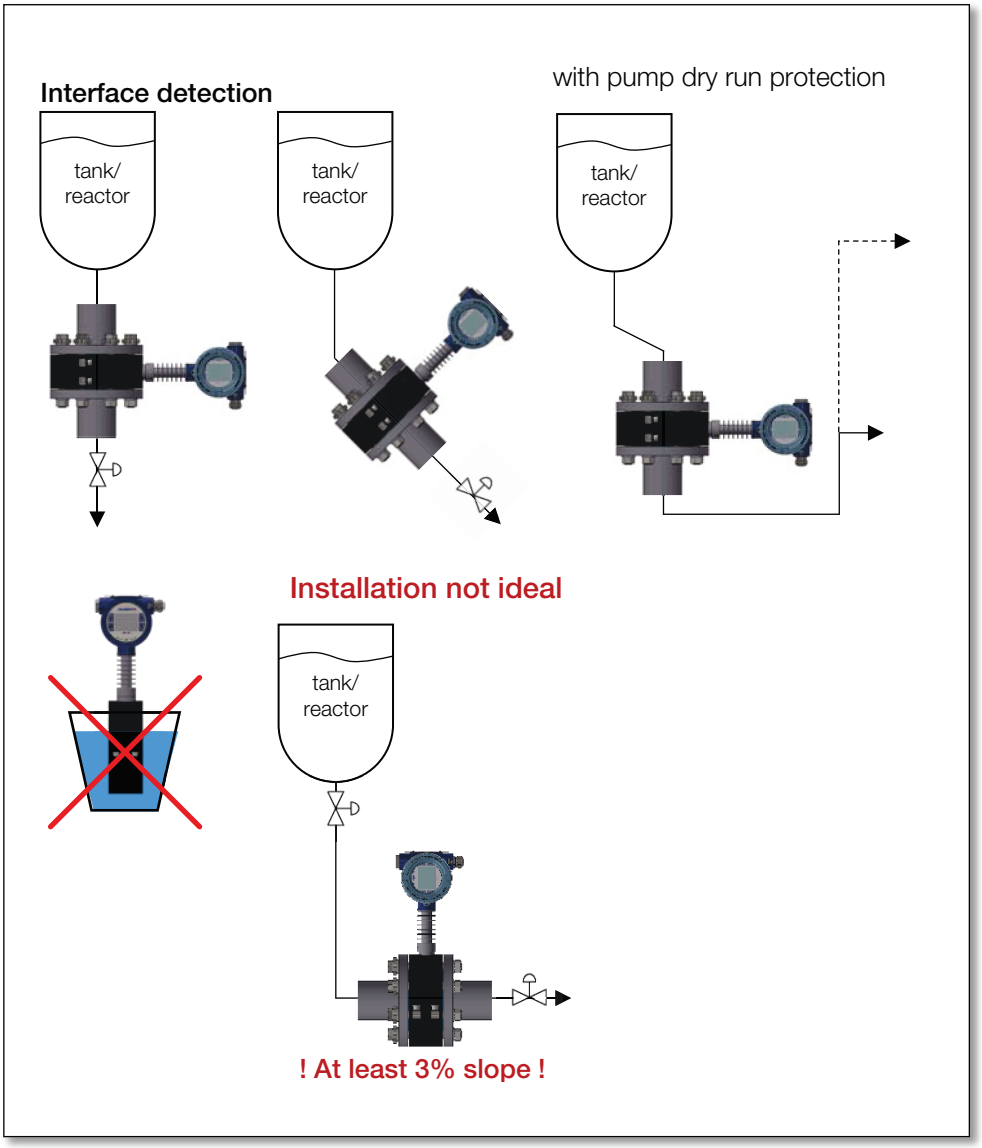


Fig. 4 Pipe probe installation position

Project implementation notes

Implementation instructions

The UNIQ-T804 pipe probes must be protected against moisture and mechanical damage before and during installation.
In the case of a detached connection head only remove the protective cap on the Lemo® connection when the HF cable is being plugged in. The housing covering may only be removed when the connection head with a heat sink for temperatures ≤170°C and/or the connection extension for insulated cables is electrically connected.



Note!

- Pipe probes must not be installed without flat gaskets.
- Pipe probes are installed below the bottom outlet valve and before the shut-off valve.
- Pipe probes should be used preferably without pipe reduction or expansion.

Preparation for installation / assembly

➲ Ensure that flanges and seals are installed whose pressure rating, connection type, and dimensions comply with the application requirements. See probe labeling.
➲ The pipe probes must be protected against moisture before and during installation.
➲ The installation direction is independent of the flow direction.

Caution! Observe flange spacing for different nominal diameters and comply with the sealing specifications described in *Tab. 13 Pipe probe dimensions*

➲ The pipe probe is installed between two smooth PN 16/150 lbs flanges with two seals (1.6 mm each).

For further information see the document:
VEB-AMEI-UNIQ_Safety-Instruction-SEV26.

Mounting



The pipe probe can be supplied with various process connections. The pipe probe is inserted between two smooth weld-on flanges or flared flanges. The distance between the flanges is determined by the probe body width (see *Tab. 13 Pipe probe dimensions*) with the corresponding flat gaskets or special installation protection gaskets for loose flanges. The black probe body is optimally protected against corrosion. Prevent damage to this protective coating.

- Observe internal safety regulations for open tanks
- The pressure test must be carried out with probe installed
- Caution: Probe body is only leak-proof when flanged
- The special conditions in section (17) of the EC type examination certificate must be observed

➲ During installation of the probe into the pipeline, both covers on the connection head must be closed.
➲ Only unpack the probe from the original packaging at the installation site and check them then for damage. Damaged probes must not be installed.

Installation instructions

For pipe probes with XD housing (pressure-resistant), the connection head orientation can be adjusted as desired!
The inner diameter of the inlet pipe must correspond to the inner diameter of the pipe probe.



- Seal types complying with the company's internal installation guidelines must be used.
- Does the probe meet the measurement specifications, such as process temperature/pressure, ambient temperature, measurement range, zone, etc.?
- Installation in pipes according to the nominal diameter.
- Recommended flat gaskets and tightening torques must be applied
- Depending on the application, installation position from vertical to 3% slope
- Installation direction independent of flow direction
- Installation between two smooth flanges type A or B1 according to EN 1092-1 with the appropriate seal type
- Installation between two loose flanges or flange collar is only possible with special installation protection seals
- Caution! Observe the flange distance (FLD) per nominal diameter; the PTFE inner body protrudes 0.5 mm on both sides
- The insulation of the pipe must not enclose the heat sink and/or the connection housing
- Ambient temperature: maximum permissible temperature in the connection head must not exceed +60°C
- For pipe probes exposed to >80°C (140°F), the connection head must be mounted horizontally or facing downwards, fixed in any 360° position with the adjusting screw.
- The pressure test must be carried out with the probe installed; test pressure according to the specifications found on the equipment label.
- Caution! The probe body is only leak-proof when installed. Probe must not be immersed in liquid.

Note

Installation must only be carried out by qualified personnel in accordance with approved common technical rules. When installing a pipe probe, the recommended maximum tightening torque must not be exceeded so that the PTFE probe body cannot be damaged. Excessive tightening will cause deformation of the probe‘s body.

Left: Structure with sandwich seal with grounding tab
Right: Gylon flat gasket screw-centered

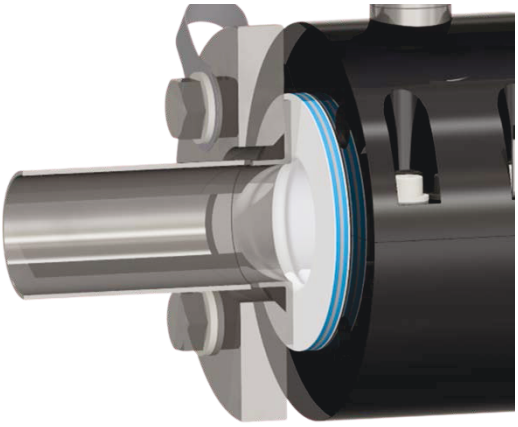


Fig. 5 Protective seal with grounding tab

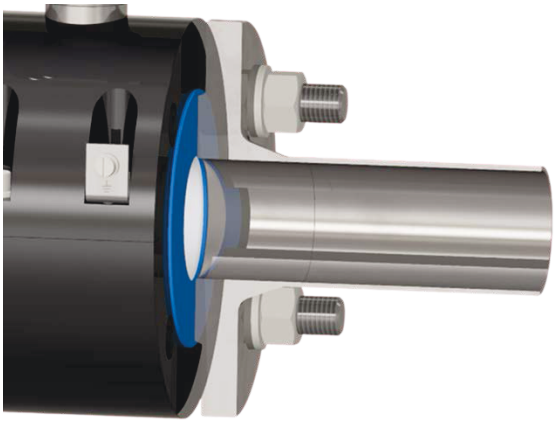


Fig. 6 Gylon seal

Figure 4 shows the ESD-T-E-(DN/ANSI) flange gasket package (spare part) consisting of: PTFE U-cover, Gylon flat gasket screw-centered, support disc with grounding tab, Gylon flat gasket screw-centered, PTFE body closure of the pipe probe
All Gylon seal types and sandwich seal packages can be ordered from Aquasant as spare parts in various nominal sizes.

Sealing materials

No.	Seal	Surface pressure [N/mm²]		
		min	recommended	max
1	Gylon Standard Style 3501 brown	20	25	35
2	Gylon Style 3504 blue	10	15	35
3	UCAR 323™	20	28	35
4	ESD-T-E-*	5	10	20

Tab. 1 Surface pressure flat gasket

- The maximum surface pressure values consider temperatures up to 200°C.
- The application limit for PTFE is approx. 50 N/mm², when significant cold flow occurs.
- Our recommended specifications above are 30% below the application limit, which significantly reduces the cold flow effect.

Thread friction coefficient

The coefficient of friction for stainless steel screw connections is between 0.23 and 0.5 without lubrication and between 0.10 and 0.20 with MoS_2 lubrication. Due to the lower tightening torque and reduced tendency to seize up, the specifications refer to lubricated screw connections with an average coefficient of friction of 0.14.

Screw material and dimensions

Due to the preload forces, Aquasant recommends using stainless steel screws of strength class 70–80.

Pipe probe nominal diameter:

DN 32–50	4 M16 screw bolts
DN 80–100	8 M16 screw bolts
DN 150	8 M20 screw bolts
ANSI 2-3"	4 M16 screw bolts / 5/8" x 11G
(ANSI 4"	8 M16 screw bolts / 5/8" x 11G)

Seal type



For connections (flanges, etc.) that do not lie flat on the entire PTFE surface of the pipe probe or for non-flat surfaces (e.g. enameled flanges), protective seals with grounding tabs (seal packages with steel core) must be used. (e.g. PTFE seal with integrated steel disc and Gylon seals 6.5 mm thick). Suitable protective seals with grounding lugs are available from Aquasant.

Sealing surface

RSA DN 32/40		2 x 3150 mm²
RSA DN 50	/ ANSI 2"	2 x 5100 mm²
RSA DN 80	/ ANSI 3"	2 x 6350 mm²
RSA DN 100	/ (ANSI 4")	2 x 8250 mm²
RSR DN150	/ (ANSI 6")	2 x 13000 mm²

Tab. 2 Sealing surfaces

Screw coefficient of friction

The tightening torque is calculated from the preload force, taking the coefficient of friction into account, using the conversion factor from the standard table [SI1.1].

Thread	Friction coefficient	Conversion factor
M16	0.10 0.12 0.14	2.17 2.54 2.92
M18	0.10 0.12 0.14	2.48 2.90 3.32
M20	0.10 0.12 0.14	2.71 3.18 3.65
5/8" x 11G		2.98

Tab. 3 Thread friction coefficient

Formula: Preload force (FV [N]) per screw:
FV [kN] = surface pressure [kN/mm^2] x sealing surface [mm^2] / number of screws
Example TSS 80 DN 50, seal material Gylon blue, minimum surface pressure.
0.01 kN/mm^2 x 5100 mm^2 / 4 = 12.75 kN

Pipe probes with PTFE plating and Gylon flat gaskets

Use disc springs when installing pipe probes.
It is recommended to retighten the fastening screws at regular intervals depending on process temperature and pressure. The recommended torque can be found in *Tab. 4 Seal-dependent tightening torques*.

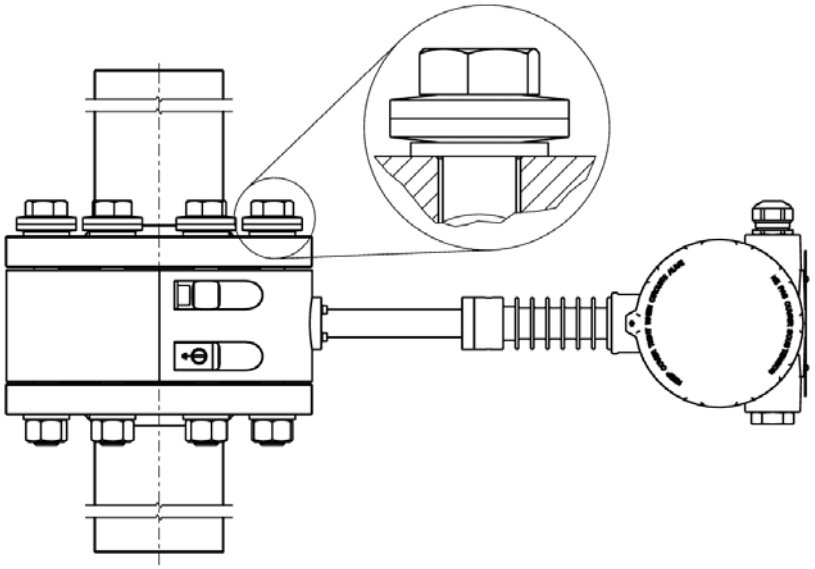


Fig. 7 Pipe probe screw connection

It is recommended to tighten screws in a crisscross pattern and to use anti-seize thread lubricant (to reduce friction and prevent seizing).

Tightening steps: First tighten the screws by hand, then work with reduced torque.

1. First step: approx. (30%-50%) of the final torque
2. Second step: approx. (60%-80%) of the final torque
3. Third step: (100%) of the final torque
4. Final step: Check all screws clockwise with the final torque.
5. Check after 24 hours to offset for any settling of the seal

Tightening torques

Probe type: **RSA Ga DN*** ****RSR Ga DN**	Seal 1 Gylon Standard Style 3501 brown tightening torque [Nm]			Seal 2 Gylon Style 3504 blue tightening torque [Nm]			Gasket 3 UCAR 323™ PTFE with glass fiber fabric anthracite tightening torque [Nm]			Seal 4 **ESD-T-E-*** installation protection seal with grounding tab tightening torque [Nm]		
Nominal diameters	min.	*recommended*	max.	min.	*recommended*	max.	min.	*recommended*	max.	min	*recommended*	max.
DN 32/40 SF	48	***60***	84	48	***60***	84	48	***68***	84	10	**20**	40
DN 50 SF	78	***98***	137	78	***98***	137	78	***110***	137	20	**32**	60
DN 80 SF	48	***60***	84	48	***60***	84	48	***68***	84	10	**20**	40
DN 100 SF	62	***78***	109	62	***78***	109	62	***87***	109	13	**26**	52
**DN150 SF T							102	***144***	180	26	***52***	103
ANSI 2" SF	88	***110***	154	88	***110***	154	88	***124***	154	19	**38**	76
ANSI 3" SF	104	***135***	189	104	***135***	189	104	***151***	189	12	**24**	48
(ANSI 4" SF)	70	***88***	123	70	***88***	123	70	***98***	123	16	**31**	62

Tab. 4 Seal dependent tightening torques

Installation

Caution!

- Do not damage probe insulation during installation!
- When mounting the probe, do not push the housing to move it, as this may damage the housing nipple. First open the grub screw and then align the housing.

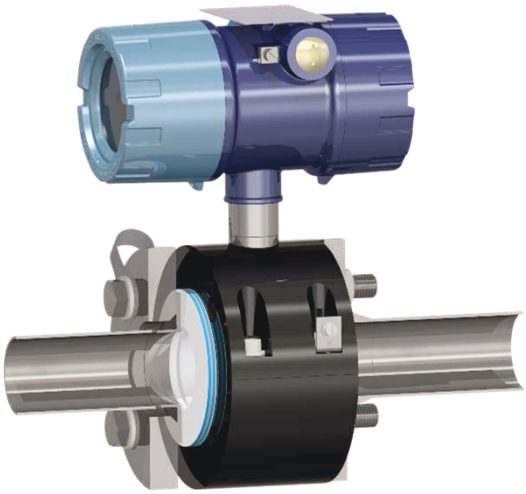


Fig. 8 Pipe probe installation

Sealing probe housing

No humidity must enter the device during mounting work. Housing cover and cable insert openings must always be tightly closed.
The O-ring seal in the housing is coated with a special lubricant before delivery. This allows the cover to close tightly and ensures that the aluminum thread does not seize when tightened. Under no circumstances must mineral oil-based grease be used, because it will destroy the O-ring.

Installation check

After installing the measuring device, perform the following checks:

- Is the probe damaged (visual inspection)?
- Is the process connection tightened according to the correct tightening torque?
- Are the measuring spot number and labeling correct (visual inspection)?
- Is the probe adequately protected against precipitation and direct sunlight?
- Is the heat sink free-standing and not covered with insulation
- Check seals, housing covers, cable glands, and, if applicable, flame paths (for Ex d) for correct fit and integrity.
- Prevention of electrostatic charge in plastics (e.g., suitable grounding, cleaning methods, restriction of wiping movements)

Wiring

Before connecting to the supply voltage the following points must be observed:

- The supply voltage must match the specifications on the product label.
- Switch off the supply voltage before connecting the device
- Connect the equipotential bonding to the probe's ground terminal

Note!

- When using this probe in potentially hazardous atmospheres, the relevant national standards and the information from the safety instructions (Safety Instructions UNIQ-T804) must also be obeyed.
- Only use the specified cable gland.

Connection recommendation

Potential equalization

Attention!
For hazardous applications, the cable shield may be connected to the switch room side and to the designated shield terminal in the connection head. The earth terminal is capacitively coupled to ground.

Connect the equipotential bonding to the outer ground terminal of the housing (Ga) and the pipe probe body.
For further safety instructions refer to the separate documentation for applications in potentially explosive atmospheres.

Electromagnetic compatibility (EMC)

Interference emission according to EN 61326, Class B equipment interference immunity according to EN 61326, Annex A (industrial area) and NAMUR recommendation NE 21 (EMC).

Cable specification

To ensure the type of ignition protection, the AME_COM electronic insert with push-in terminals is connected to the signal cable (with specific properties in accordance with DIN EN 60079-14). For 4-wire devices, a 2x2 twisted, shielded cable must be used (for APL applications, typically cable type A).

We recommend a shielded cable type Li2YCYv(TP) 2x2x0.75 mm², e.g. from LappKabel. For the device to function properly, the cable must meet the following minimum requirements:

- Shielding with copper wire braid
- TP 2-pair twisted, minimum cross-sectional area 0.5 mm²
- Operating capacitance <150 pF/m

For optimum EMC shielding, it is recommended to connect the shielding on both sides when using a shielded installation cable (if potential equalization is available).

- Cables must comply with the requirements of EN 60079-14
- After installation, an initial inspection of the probe and system must be performed in accordance with EN 60079-17.
- Consider the clamping range of the cable glands when selecting cables
- Cables must be flame-retardant in accordance with DIN VDE 0472 Part 804

The wire cross-section depends on the cable length, cable resistance (capacitance for hazardous applications), and permissible voltage drop of 3-5%.

$$wire\ cross\ section\ \ A = \frac{2xLxIxR}{\Delta U}$$

4-wire, 8-wire, 10-wire design

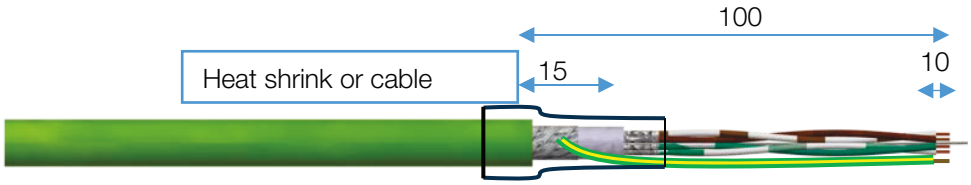


Fig. 9 Cable stripping

Cables in outdoor setting should be protected from weather and sunlight exposure by corrugated tubing.

Installation in the United States and Canada

- Installation in the United States must be performed according to NEC (ANSI/NAFOA70).
- Installation in Canada must be performed according to CEC part 1.

Electrical connections

Once the welding permit has been approved, the ExD connection compartment (dark blue cover) may be opened. If no permit has been issued, the power supply must be interrupted on the switch room side.



Ex ia HMI operating side ExD connection side with left and right cable entry

Fig. 10 Connection head

Cable insert

Connection of supply and signal lines

The use of approved ExD cable glands is mandatory and is the responsibility of the user. If necessary, the M20x1.5 ExD cable gland can be removed and a second ExD cable insert can be used. Cable glands are not included in the scope of delivery.
Unused cable entries must be sealed with certified ExD sealing plugs.

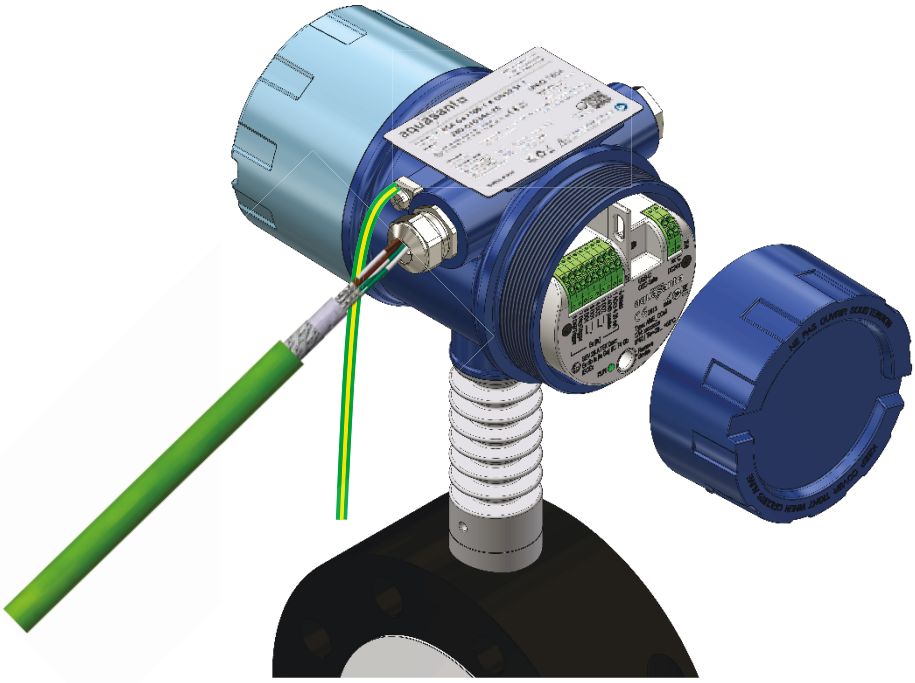
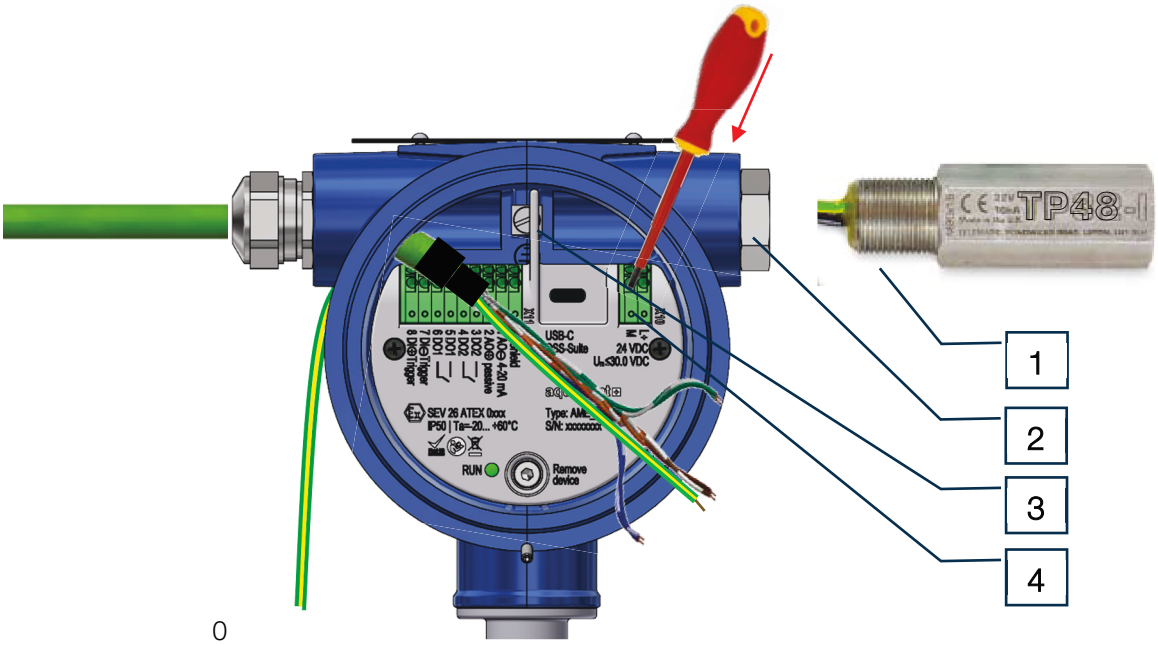


Fig. 11 Cable insert into ExD enclosure

- ➲ Connect the equipotential bonding cable to the ground points of the probe (min. 4 mm²)
- ➲ Remove cover; loosen M3 locking pin, loosen the lid
- ➲ Install the appropriate ExD cable gland according to manufacturer's installation instructions
- ➲ Insert prepared stripped ExD signal cable
- ➲ Tighten the ExD cable gland according to instructions



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Fig. 12 Cable connection to terminals

❶ Lightning protection TP48/4 | ❷ Blind screw M20x1.5 | ❸ Grounding screw housing for lightning protection grounding conductor | ❹ Connection terminals

Conductor connection to double push-in terminals

Nominal cross-section: 1.5 mm² | Stripping length: 10 mm | Material: PA green

Connection conductor	Conductor cross-section
Rigid or flexible	0.2 … 1.5 mm²
Flexible with wire ferrule	0.5 … 1.5 mm²
2-conductor in wire ferrule	0.5 … 0.5 mm²
AWG	24 ... 16

Tab. 5 Cable strands

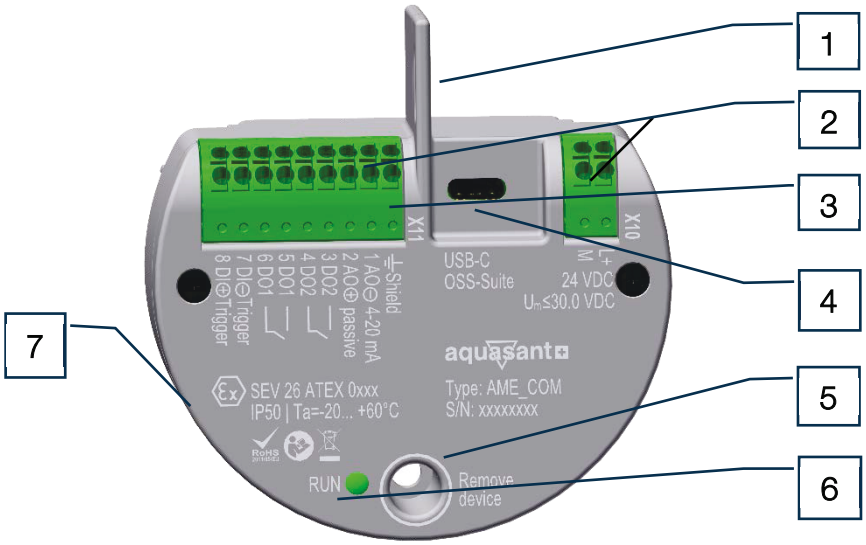


Fig. 13 AME_COM unit

❶ Partition wall Ex-ia | ExD with cable entry
❷ Double-deck connection terminals X10/X11 Push-In no.: L+/M, 1-8
❸ Terminal cable shield
❹ USB-C connection (maintenance with OSS-Suite)
❺ AME_COM unit with hexagonal screw M4x15 (size 3) to open the housing, tightening torque max. 5 Nm
❻ LED Run indicator flashing = OK / lit = fault
❼ Rear: Spring strip for 20-pin plug-in strip in ExD feed-through, plugged in

Terminal assignment

Ex	Function		Strand	Terminal
ExD	24C DC power supply, polarity independent Feed strands through hole in partition wall		blue	X10. L+
			blue/white	X10. M
	Grounding for cable shield		shield	
	AO 4-20mA current output passive	- +	brown/white brown	X11.1 X11.2
	DO Relay 2 Empty signal	NO COM		X11.3 X11.4
	DO Relay 1 Interface layer detection	NO COM		X11.5 X11.6
	DI External trigger input Start ID (ID: interface detection)	- +		X11.7 X11.8

Tab. 6 Terminal connection

The 24VDC power supply can be inserted separately with an ExD cable on the right-side.

Ensuring electrical safety:

- ➲ Do not disconnect the protective conductor connection
- ➲ Disconnect the device from power before disconnecting the protective conductor

4-wire block diagram 4-20 mA, switching output

Minimum functional design in ExD with 4-20 mA current output and 24 DC power supply.

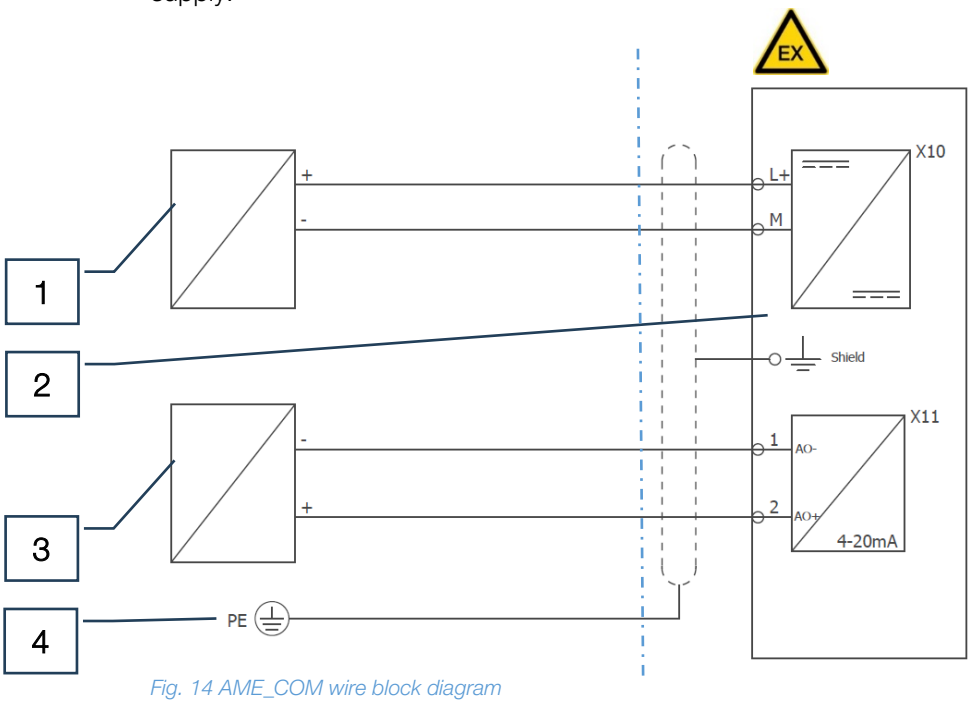


Fig. 14 AME_COM wire block diagram

❶ Power supply 24 VDC supply | ❷ Field device AME_COM unit in ExD connection head
❸ Active isolation barrier 4-20 mA or via PLC | ❹ Cable shield connected on both sides

8-wire block diagram 4-20 mA, relay switch output

Advanced functional design with relay for interface detection, empty signal with Zener barrier, and 4-20 mA current output with separate 24 DC power cable.

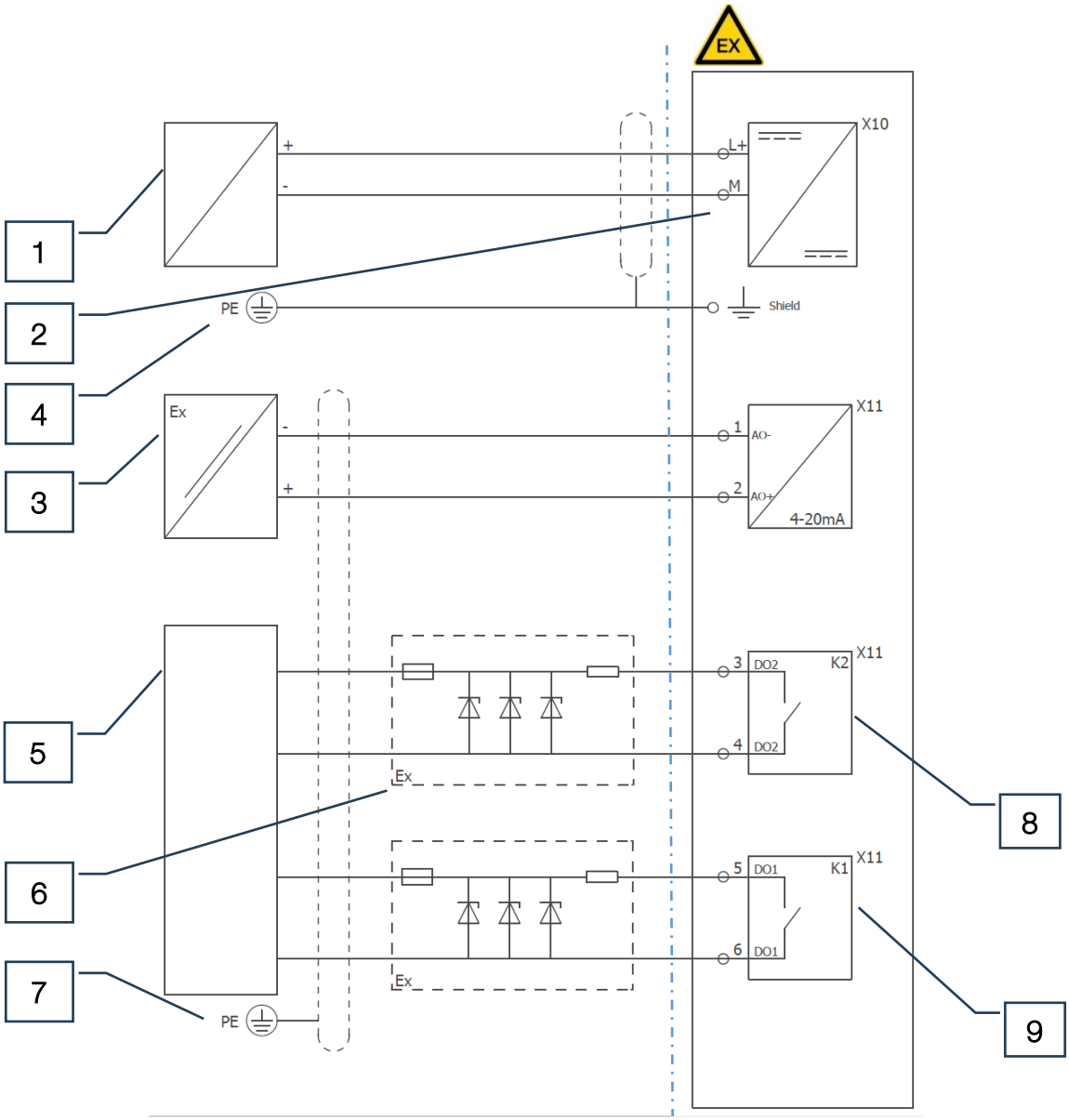


Fig. 15 AME_COM 8-wire block diagram

❶ Power supply 24 VDC |❷ AME_COM unit in ExD connection head |❸ Cable shield connected on both sides |❹ Active Ex isolation barrier 4-20 mA |❺ PLC process control system digital input |❻ Ex Zener barrier |❼ Ex ia cable shield connected on one side in the control cabinet |❽ Relay output to PLC; limit value empty detector |❾ Relay output to PLC; interface detected

10-wire block diagram 4-20 mA, relay switching output with trigger ID start

ExD connection, fully functional design with trigger input for automatic interface detection, relay for interface detection (ID start), empty signal and 4-20 mA current output with 24 DC power supply.

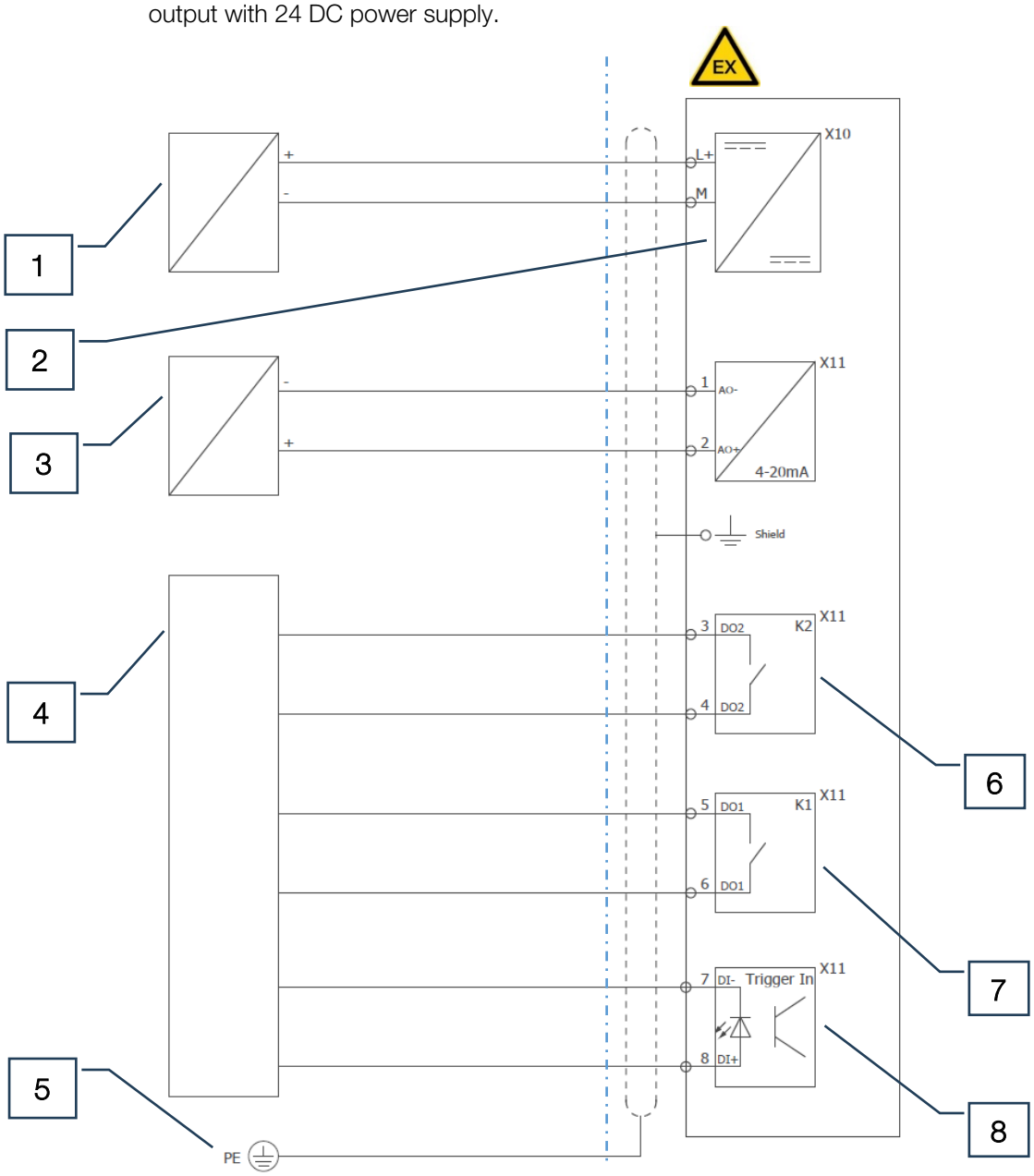


Fig. 16 AME_COM 10-wire block diagram

❶ Power supply 24 VDC | ❷ AME_COM unit in ExD connection head | ❸ Active isolation barrier 4-20 mA or PLC |❹ PLC process control system digital input | ❺ Cable shield connected on both sides | ❻ Relay output to PLC; empty indicator limit value | ❼ Relay output to PLC; interface detected | ❽ ID trigger input from PLC digital output

USB-C interface



The USB-C connection is used for maintenance with the Operating-Support-System (OSS)-suite for parameterization, data backup, and firmware update. For this purpose, the power supply can be disconnected and used via USB (5VDC / 500mA).
WebApp: https://aquasant-oss.ch



Caution: A welding permit is required to open the cover on the ExD side if energized.



For more information on how to use the software tool for the AME field device, please refer to the OSS-Suite user manual.



To update the firmware of the AME_COM field device processor, the terminal electronics can be removed from the housing and operated in a safe zone (in non-Ex zone or in Ex zone with appropriate precautions) with a 5 V USB power supply.

Supply voltage 24VDC

- 14.4 ... 30 VDC (in non-hazardous areas)
- 14.4 ... 30 VDC (in hazardous areas) Terminals X11 1/2
- 14.4 ... 30 VDC (in hazardous areas) Terminals X10 L+/M $U_m \leq 30.0$ VDC



Overvoltage Category (OVC): I
The field device is designed for connection to overvoltage category I. In hazardous areas, it may only be connected to circuits that are powered by a safe isolation (SELV/PELV power supply in accordance with surge category III) to ensurethat the maximum voltage Um = 30 VDC is not exceeded at any time.

If terminals X10 L+/M 24VDC are powered the device is operational, even if the 4-20 mA power supply is not connected. The field device does not function, if only the 4-20 mA power supply is connected.

Galvanic isolation

All outputs/inputs in the circuit are galvanically isolated from each other. The USB-C service interface is excluded.

Power consumption

4-wire

Auxiliary power 24V	Power consumption		
12-30 VDC	max 1.2 W	$U_m \leq 30.0$ VDC	
24VDC, 4-20 mA	max 0.7 W		

Tab. 7 Power consumption

Current consumption

Current output 4-20 mA terminal: X11 1(-) | 2(+) 24 VDC

Nominal current	3.5 … 22 mA, starting current of AME-I
Measuring signal	3.8 … 20.5 mA
Failure signal (Namur NE43)	3.5 … 22 mA configurable
Threshold failure signal	Lower current range: 0 ≤ IA ≤ 3.7 mA Upper current range: 20.8 … 22 mA

Tab. 8 Current output



For the PLC the failure signal should be present for at least 4 seconds before it is recognized as such.

24 VDC power supply AME_COM with AME-I_HMI terminal: X10 M |L+ 24 VDC Exd

Nominal current	50 mA
Starting current	600 mA

Tab. 9 Current consumption 24 VDC power supply

Failure signal

Information concerning the failure signal is displayed as following depending on the interface:

- Current output
- Error behavior selectable (according to NAMUR recommendation NE 43):
  Minimum alarm: 3.5 mA; maximum alarm (= factory setting): 22 mA
- Error behavior with freely configurable value: 3.5...22 mA
- Plain text display
- Status signal (according to NAMUR recommendation NE 107)

Trigger input

For automatic adaptive interface detection, the start/stop command is transmitted via the trigger input using the rising or falling edge.
Terminal X11 7(-) | 8(+) 24VDC

Limit value relay

The two limit value (GW) Ex relays (NO) are used for interface detection (ID) and empty signal. These are controlled by FLS. The relays can be tested in the software under menu item 4.6.3.
ID: Terminals X11 5 | 6 COM | NO
GW: Terminals X11 3 | 4 COM | NO
Max load 200 VDC/AC | 0.5 A | 10 W

Power failure



- All data, logs, and configurations remain intact
- Error messages with time logs are stored in the processor flash

Parameter data can be saved externally via the USB-C interface using the WebApp: OSS-suite.

Surge protection

Field devices which are used outdoors for flammable liquids require surge protection in accordance with DIN EN 60079-14, test standard 60060-1 (10kA) must use → surge protection module.
These are preferably used at the connection head with the external surge protection module for 4-wire transmitters, e.g. MTL TP48/4. The conductors are routed parallel to the power supply into double-deck terminals 7-10. The ground conductor is connected to the housing base.

Connection check

After finalizing the wiring of the measuring device, carry out the following checks:

- The terminal assignment is correct
- Check cable and wire entries: Suitable Ex-approved cable glands, not damaged, correctly tightened, seals intact.
- Ensure that intrinsically safe circuits are clearly marked and separated from non-intrinsically safe circuits
- Compare the cable type used (shielding, insulation, temperature range) with the system documentation.
- Check the continuity and effectiveness of the equipotential bonding (equipotential bonding bar, ground wire to the sensor, especially for metal enclosures).
- Housing cover screwed in all the way and secured
- If auxiliary power is available: The device is ready for operation
  Is the green LED on the AME_COM connection board flashing or lit
  The display starts up on the Ex ia side (light blue cover)

Performance characteristics

Reference conditions

Room temperature = 22°C ±5°C
Air pressure = standard sea level 1013 mbar (a) ±20 mbar
Humidity = 60% ±15%
PTFE layer thickness of pipe probe in batch process: 2 mm
εr of liquid 1 = 80 water, electrical conductivity >10'000 µS/cm
εr of liquid 2 = 2.4 oil, electrical conductivity <1 µS/cm

Accuracy (adaptive interface detection)

Data under reference conditions: DIN EN IEC 61298-2 / DIN EN IEC 60770-1; percentage values relative to the measurement range.

The accuracy measurement was performed using an UNIQ-T804 DN50.

	10 Measurements	Variation
Accuracy (measurement range)		
Accuracy (interface detection)	30 impulse	5 impulse
Reproducibility		

Tab. 10 Accuracy

For details on accuracy refer to the corresponding probe system-log for the specific probe supplied.

Resolution

Resolution of the 4-20 mA current output and local display

	Current output	Local display
Digital	0.5 mm	1 mm
Analog	0.5µA	0.01 mA

Tab 11 Resolution

Response time

The response time depends on the maximum measured value of the product.

Measuring length	DK εr	Measurement rate	Response time
≤ 1 m	80	xx	xx
≤ 1 m	2	xx	xx

Tab. 12 Response time

Influence of ambient temperature

The measurements are carried out in accordance with DIN EN IEC 61298-3 / DIN EN IEC 60770-1

- digital (APL): average TK = 0.6 mm/10 K

For devices with a remote probe, there is an additional offset error of ±0.3 mm/10K (±0.01 in/10K) per 1 m (3.3 ft) of remote cable length.

- analog (current output): XXX
- Zero point (4 mA): average TK = 0.02%/10 K
- Span (20 mA): average TK = 0.05%/10 K

Ambient conditions

Ambient temperature

Field device:	-20 to +80 °C (-20 to +176 °F)
HMI module display:	-20 to +60 °C (-20 to +158°F)
HF cable probe detached:	-30 to +170 °C

If the HMI-module is exposed to temperatures above 60°C, its service life may be shortened.

When using the probe outdoors avoid direct sunlight

- Use of weather protection hoods and roofs recommended (accessories)
- Relative humidity <80%, non-condensing

To ensure effective prevention of ignition sources from hot surfaces in accordance with EN 1127-1, the operator must restrict the permissible gas temperature classes according to the actual process temperature.



Depending on the maximum process temperature T_{medium}, a mandatory temperature class classification is determined for the sensor range. Please refer to the table in the *safety instruction manual.*

Insulation of the pipe

The probe must be insulated in such a way that the heat sink is exposed and not covered by insulation material.

A maximum of 33 mm of insulation may be applied to the standard pipe probe with heat sink.

Pipe probes as KS version (with extension of the heat sink) can be insulated up to a maximum of 125 mm.

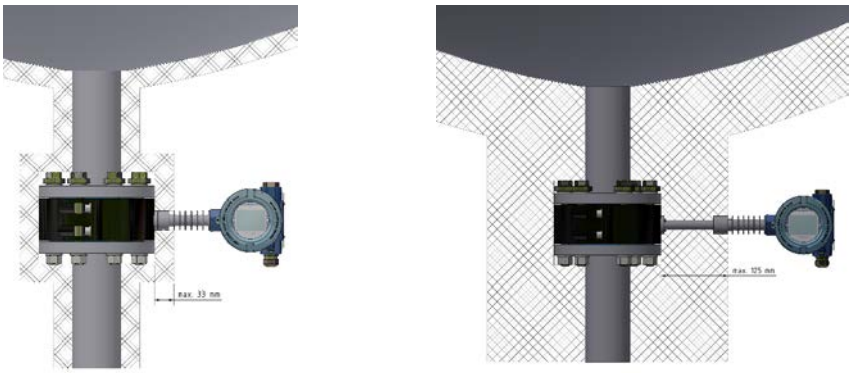


Fig. 17 Pipe insulation

Protection class

Tested as installed probe with sealed housing:

- IP68, NEMA6P (24 hours at 1.83 m under water)
- With open housing: IP50, NEMA1

Vibration resistance

DIN EN 60068-2-64 / IEC 60068-2-64: 20 … 2000 Hz, 1 (m/s2) 2/Hz

Cleaning of the probe

Contamination or deposits may form on the probe. Insulating contamination has a minor effect on the measurement. Diffusion of product into the PTFE can lead to zero-point shifts.
The PTFE probe can be cleaned with a damp cotton cloth (using solvent). Under no circumstances should the PTFE be scraped, brushed, or scratched.

Structural set-up

Connection head housing

❶ Ex ia display electronics side, cover with vision panel (light blue)
silicone VMQ O-ring, thread with graphite grease
❷ Ground terminal A4
❸ Laser-engraved type plate A2
❹ Cable insert 2x M20x15 threaded insert in ExD space
❺ ExD connection electronics side, cover (dark blue)
silicone VMQ O-ring, thread with graphite grease
❻ Housing XD-ID100win10 aluminum powder-coated
❼ Cover lock, internal hexagon M3 A4
❽ M6x8 anti-twist protection for connection head A2

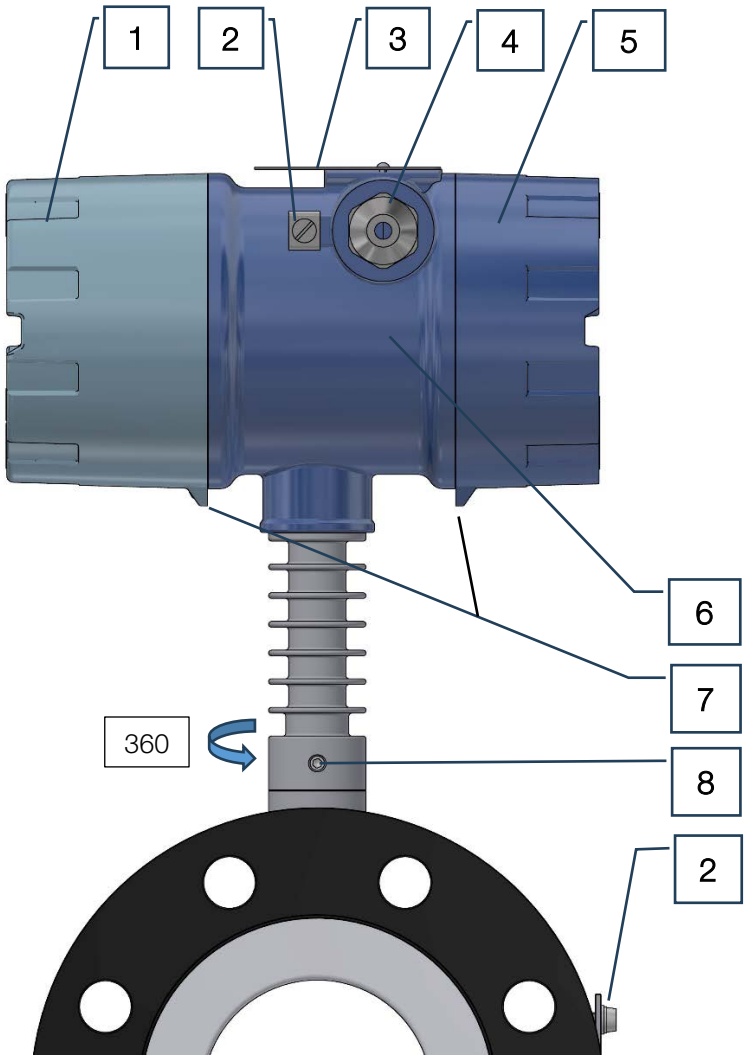


Fig. 18 Pipe probe materialization

Adjust connection head

By loosening the M6x8 grub screw (No. 8), the connection head can be rotated by 360° and set up accordingly. After alignment, it is essential to retighten the fixing screw 8 with a maximum torque of 10 Nm.

AME_COM and AME-I_HMI electronic modules

The AME_COM module serves as a connection board, processor board with firmware, and communication processing.
The AME-I_HMI module is responsible for impedance measurement and visualization of the measurement data. Both units can be addressed during a software update via the USB-C interface. In the event of malfunction, the AME units can be replaced independently of each other. If the AME_COM module needs to be replaced, the saved parameters can be reloaded using the software tool or a new commissioning can be carried out.
In the ExD connection head the AME_COM and AME-I_HMI module electronic inserts are independent of each other.

HMI display Ex ia	ExD feed-through	COM connection Exd

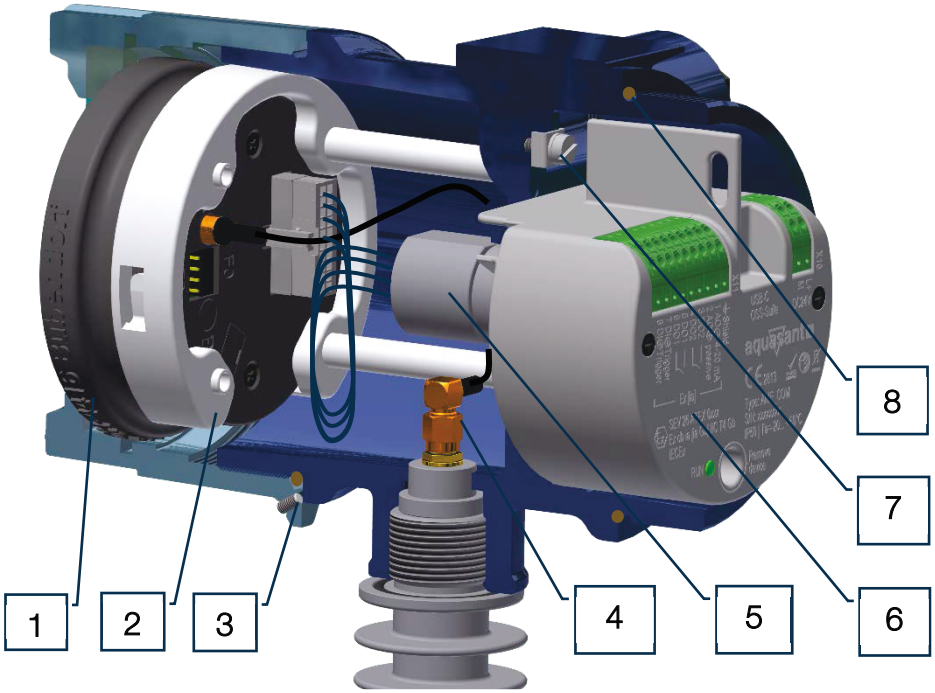


Fig. 19 Electronic inserts in housing

❶ AME-I_HMI module; display with measurement electronics (spare part)
❷ Grid hoof holder for HMI module
❸ Cover lock, internal hex M3 A4
❹ HF probe connection with SMA connection HF cable, screwed (spare part)
❺ ExD feed-through with 20-pin plug to AME-I_HMI module
❻ AME_COM module connection and communication processor (spare part)
Plugged into ExD feed-through with spring strip
❼ Ground connection exclusively for TP48/3 lightning protection ground wire
❽ Cover O-ring silicone VMQ

Dimensions connection head

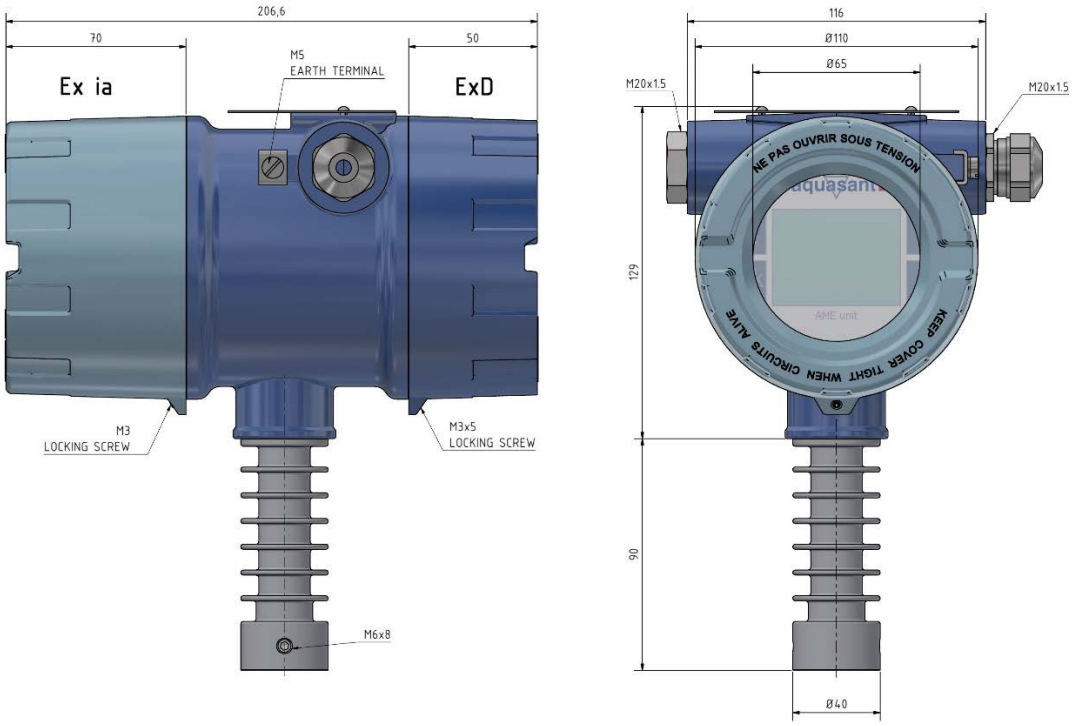


Fig. 20 Housing dimensions

Pressure-encapsulated housing (type XD-ID100win10) completely mounted on heat sink.

Pipe probe dimensions

Pipe | Connection flange acc. to EN 1092-1 / ASTM A182, ASME B16.5							**weld neck flange**	**lap joint flange with stub end or lining** *PTFE/enamelled*
Nominal diameters	**OD**	**(DN) ID**	**HD**	**BC**	**GD**	**H**	**H1**	**H2**
DN 32/40	150	40	8 x ø 18	100/110	77	70	73.2	83.6
DN32/40/35	150	35	8 x ø 18	100/110	77	74	77.2	87.6
DN 50	165	50	4 x ø 18	125	97	92	95.2	105.6
DN 50/45	165	45	4 x ø 18	125	97	96	99.2	109.6
DN 80	200	80	8 x ø 18	160	123	74	77.2	87.6
DN 80/75	200	75	8 x ø 18	160	123	78	81.2	91.6
DN 100	220	100	8 x ø 18	180	146	74	77.2	87.6
DN 100/95	220	95	8 x ø 18	180	146	78	81.2	91.6
ANSI 2"	152.4	50	4 x ø 19.1	120.7	97	92	95.2	105.6
ANSI 2"/45	152.4	45	4 x ø 19.1	120.7	97	96	99.2	109.6
ANSI 3"	190.5	80	4 x ø 19.1	152.4	123	74	77.2	87.6
ANSI 3"/75	190.5	75	4 x ø 19.1	152.4	123	78	81.2	91.6
ANSI 4"	228.6	100	8 x ø 22.4	190.5	146	74	77.2	87.6
ANSI 4"/95	228.6	95	8 x ø 22.4	190.5	146	78	81.2	91.6

Tab. 13 Pipe probe dimensions

OD = Outer diameter | DN ID = Inner diameter | HD = Hole diameter | BC = Bore circle | GD = Gasket diameter | H = Probe height (width) | H1 = Installation height, including flat gasket | H2 = Installation height, including protective gaskets and grounding tab

Display alignment Ex ia side

The light blue cover may be removed at any time during operation, even when the device is live; the HMI unit is intrinsically safe [Ex ia].



Fig. 21 AME-I_HMI display alignment

The HMI display can be rotated 180° to the left or right. The 45° grid holds the electronics housing securely in its fixture. The display can be removed from the fixture without tools.
Be careful when inserting the display into the housing! Pay attention to the spiral cable guide.

AME-I_HMI unit

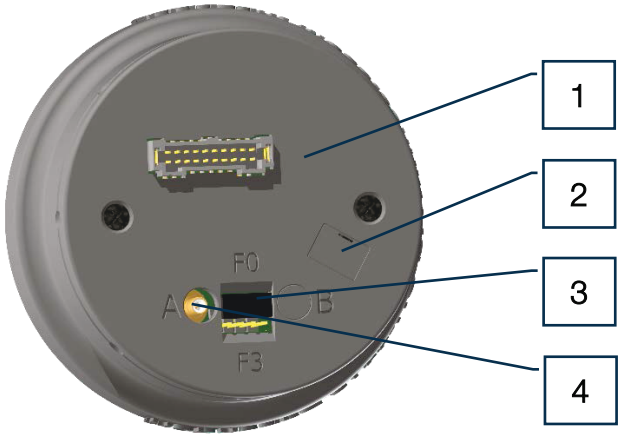


Fig. 22 AME-I_HMI display connections

❶ 20-pin communication connector between COM and HMI
❷ Optional external temperature measurement
❸ Jumper F0/F3 measurement frequency changeover
❹ SMA connector socket HF probe connection A measurement / B reference (optional)

Display with impedance measurement print: Ex protection Ex ia | Protection class IP 20 | PA housing

Replacing the HMI/COM unit

If an HMI or COM unit is defective, it can be replaced.

Replacing the HMI unit (Ex ia side):

The AME-I_HMI consists of the display and the measurement circuit board. The rear is connected to the AME_COM unit via a 20-pin connector for power supply and communication via the ExD feed-through. The plugged-in HF cable, which is screwed onto the measurement electrode connector, is plugged into the HMI unit.

- ➲ De-energize the device
- ➲ Carefully pull the HMI unit out of the housing
- ➲ Pull the HF cable with SMA connector out of the rear of the HMI
- ➲ Hold the white 20-pin connector on the side to pull it out. **Caution!** Unlatch the center clip first, then pull.
- ➲ Insert new HMI unit and connect
  New commissioning is not required!

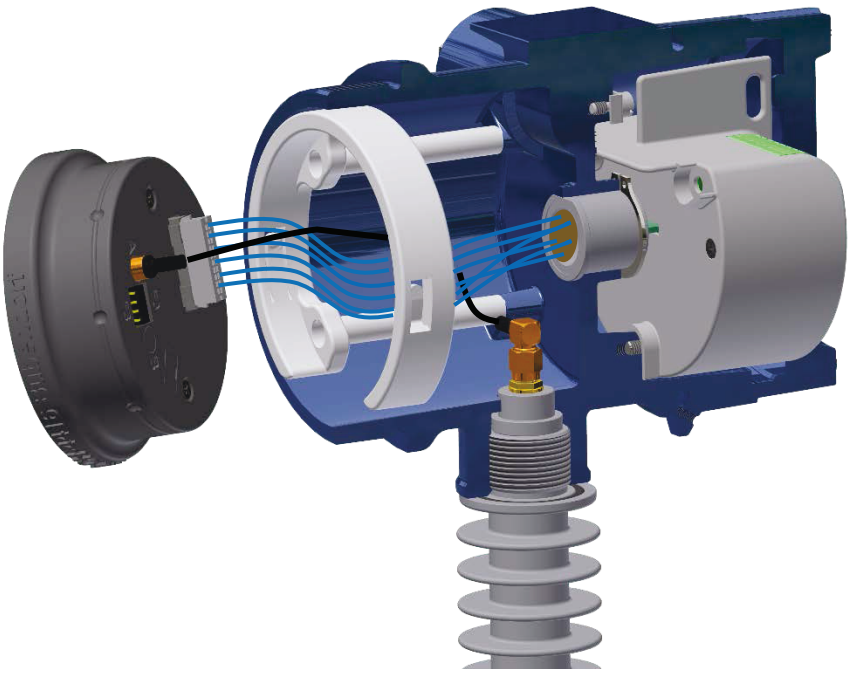


Fig. 23 AME-I_HMI/COM unit connected to ExD head

Changing the COM unit (Ex d side):

- ➲ De-energize the device
- ➲ To open cover, loosen the locking screw
- ➲ Remove all cables from the green terminals. Caution: Do not remove the grounding
- ➲ Loosen the 3 mm hexagon screw; carefully pull the unit straight out (overcome resistance)
- ➲ Insert the new COM unit and connect
  Caution: A new commissioning is required!

Connection head ExD side AME-COM

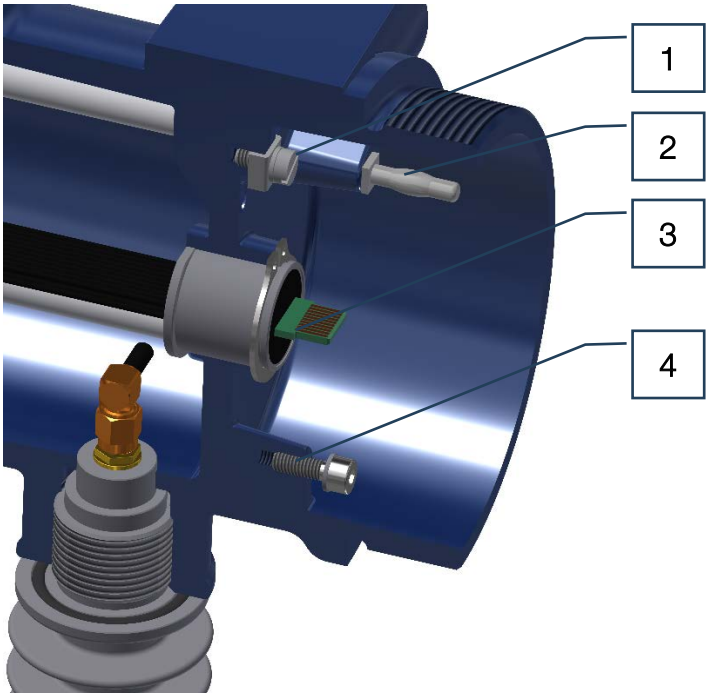


Fig. 24 Connection head ExD side

❶ Ground connection, exclusively for TP48/3 Lightning protection ground wire
❷ Guide pin ø4mm cluster plug, ground connection to AME_COM unit
❸ Plug print in ExD feed-through; contact to spring strip socket in AME_COM
❹ Internal hexagon screw M4x15 (size 3) for loosening the AME_COM housing, tightening torque max. 5 Nm

Caution: The ExD feedthrough must not be removed or replaced. In case of malfunction or defect, return device for repair.

Required tools

Tools required for installation, assembly, and electrical connection are not included in the scope of delivery. Use suitable, functional, and safe tools.
To open the housing cover: 2 mm hex key; for cable connection terminals: slotted screwdriver no. 0; for ground connection: slotted screwdriver no. 4; for twist protection connection head/heat sink: 3 mm hex key.

Connection head remote with HMI

Optionally, the entire connection head can be detached from the pipe probe using a Lemo®-HF cable. The maximum length of the HF cable is 1 m. Accessories: Connection head holder.

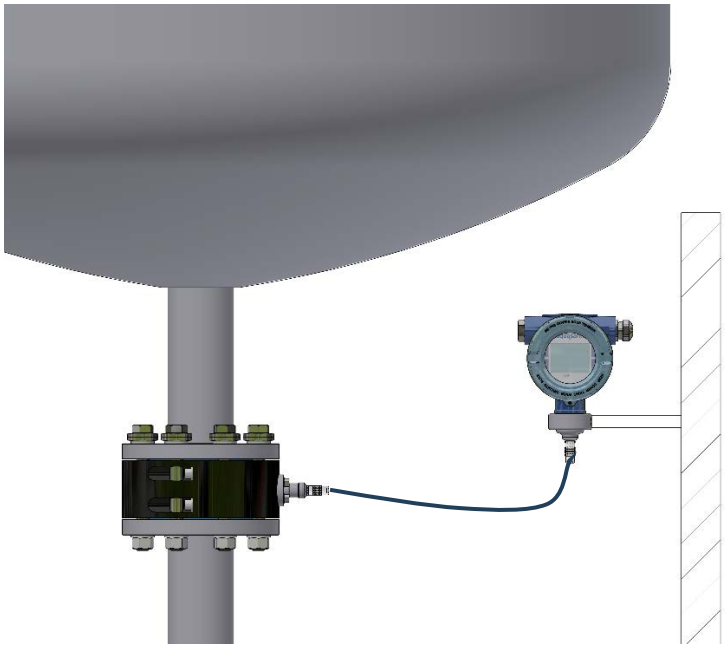


Fig. 25 ExD housing offset with HF cable

Weight

The respective weight of individual components must be added to obtain the total weight.

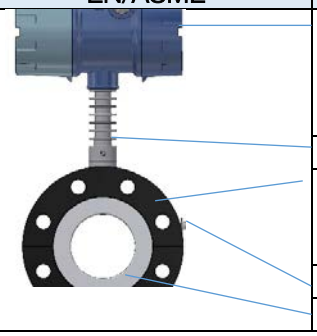
Pipe probe body

DN 32/40	2.7 kg (xx lb)		
DN 50	4.5 kg (xx lb)	ANSI 2"	4.5 kg (xx lb)
DN 80	4.6 kg (xx lb)	ANSI 3"	4.6 kg (xx lb)
DN 100	5.5 kg (xx lb)	ANSI 4"	5.5 kg (xx lb)

Tab. 14 Pipe probe weight

Housing Ga
Total weight connection head with electronics and heat sink 1.5 kg
Housing Gs
Total weight connection head with electronics and heat sink 4.8 kg

Pipe probe materials

UNIQ T804		
Flange EN/ASME		Material
	1	Copper-free aluminum, seawater-resistant titanium-zirconium coating, 120µm paint finish SUP (Class C5-I according to DIN EN ISO 12944)
	2	316L (1.4404)
	3	Hard anodized aluminum body with PTFE embedment (ALTEF®) 40 µm, corrosion resistant
	4	316L (1.4404)
	5	PTFE

Tab. 15 Pipe probe materialization

Caution: Damage to the powder-coated surface of the connection head or the hard-anodized aluminum probe body can lead to corrosion spots.

Operation

Operating concept

The menu structure for customer-specific applications is user-friendly. The system is pre-configured for plug & process. Minimal parameters are required for the initial commissioning. To set these parameters, the user must be logged in.
Each time the field device is switched on (powered up), the language selection appears, which must be selected and confirmed. The next step prompts you to perform the initial startup. This can be executed with [yes] or skipped with [no]. If the initial startup has already been done, it will be skipped after a restart (power interruption). If the language mask is not entered within 15 minutes, the device will return to the main measurement display 1.

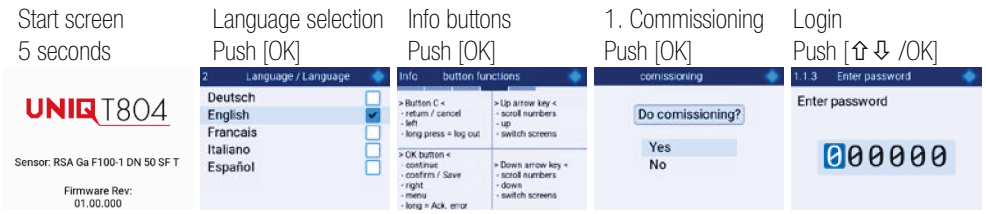


Fig. 26 Sensor HMI startup, Initial activation

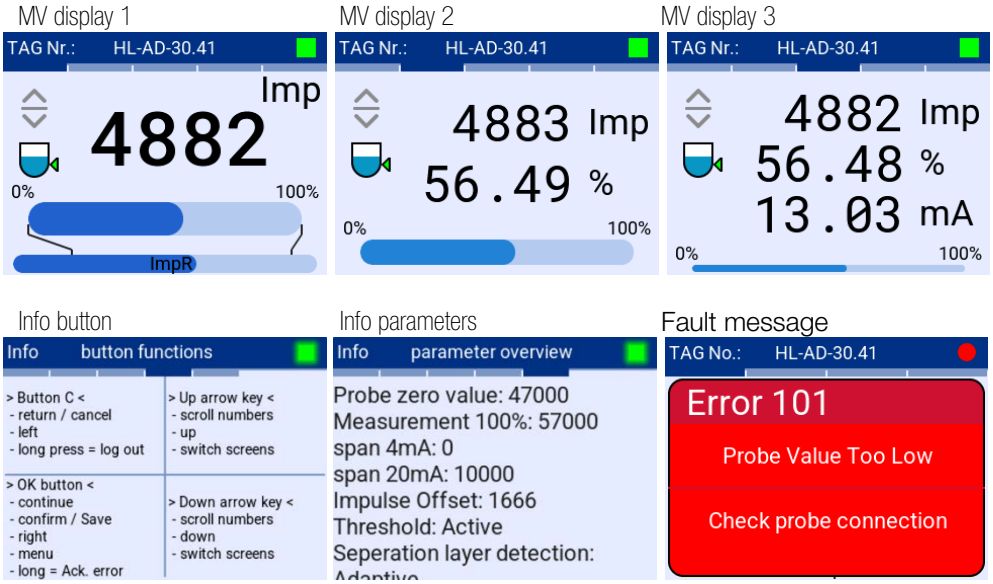
- Initial startup menu procedure; plug & process technology
- Operation by 4 buttons with function description on display
- Diagnostics according to Namur NE107
- Password-protected admin level
- Operating languages: EN, DE, FR, IT, ES; prompt when device starts
- Variable measured value display with parameter information
- 4 – 20 mA spread with analog visualization
- 4 - 20 mA according to Namur 43, evaluation adjustable



Fig. 27 Operation AME-I_HMI display

HMI five display modes

Three displays show the measured value and two information screens are selected using ⇧⇩button. Press the C button to exit from the info parameter overview.



Display description

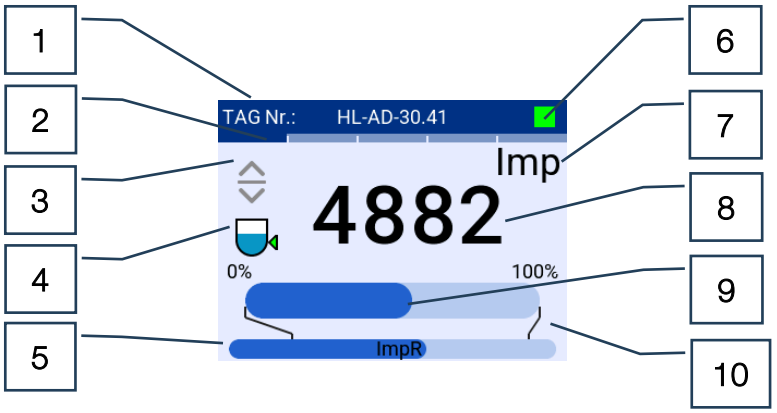


Fig. 29 HMI operation display modes

❶ TAG number display of the measuring point (configurable)
❷ Position display of the five visualizations
❸ Symbol for interface detection via trigger input (if activated)
❹ Relay setpoints: Full/Empty/Interface detected
❺ Analog display of raw measured value
❻ Device status display according to NAMUR 107 green/yellow/orange/red/blue
❼ Measured value unit [Imp = pulses, mA, %...]
❽ Current measured value
❾ Analog display 4-20 mA / 0 ...100% spread of the analog signal
❿ Spread display for raw measured value in pulses [ImpR]

The operation of the menu structure is described in detail in the separate document software operating instructions.

Help with hardware malfunctions

When troubleshooting, section 2 / 3.5 must be observed. Spare parts must be ordered indicating all information found on the equipment label. Only original parts from the manufacturer Aquasant may be installed.

Malfunctions

Malfunctions are generally visualized in the functional HMI via the status icons at the top right of the display in accordance with Namur 107. Error messages are displayed in full text and can be confirmed with the OK button.

Type of malfunction	AME	Fault description	Action
Power supply	COM HMI	Green LED dark, display dark	No power or <12VDC Check terminals X10 L+/M
	COM	Green LED lit	Communication or processor malfunction COM unit defective => replace
	HMI	Display dark	Check connector behind HMI Display defective => replace
	COM	4-20 mA currency output to PLC faulty 0 mA	- Check voltage at cables and terminals X11 1/2 - Check power supply or power isolator - COM current output is passive, must be actively supplied via PLC or power supply isolator
	COM	4-20 mA current output to PLC incorrect values	Check cable resistance Check voltage from power isolator
Hardware	HMI	Probe not connected	Check HF cable connection behind HMI
	HMI	Measured value below minimum	Check HF cable connection behind HMI or, if the connection head is detached, check probe HF cable
	Status display on screen according to NAMUR 107		
HMI		Green light	Device diagnostics is active, device is operating correctly
		Blue light Blue flashing Maintenance	Device start Device is in maintenance mode, e.g., initial startup or user is logged in
		Yellow flashing Minor error	The device is operating outside the permissible range
		Orange light	Function check - temporary invalid signal
		Red light Major error	Invalid signal due to a fault or malfunction of the sensor/device

Tab. 16 NAMUR 107 error messages

Further software error messages are described in detail in the ID (interface detection) software operating instructions.

Maintenance and Upkeep

Maintenance



Basically a pipe probe does not require any maintenance. However, an annual inspection of the probe can be scheduled. During this inspection, the max. measured value and 0 point of the pipe probe, relay outputs, and current output are checked.

The pipe probe must not be immersed in a medium. The probe body is only tight when installed!

Servicing

Service involves checking the installed pipe probe for leaks and checking the bolts for torque. If the pipe probe is removed, the PTFE electrode body should be checked for deformation. If a bulge has formed on the outside, the pipe probe must be sent in for repair.

Disassembly



When dismantling the probe, the company's internal safety regulations and installation guidelines, explosion protection legislation (ATEX), the Ex standards EN/IEC 60079 series, as well as the operational risk assessment and maintenance rules must be observed.



- EN / IEC 60079-14 “Explosive atmospheres – Part 14: Project planning, selection and installation of equipment and initial testing of electrical installations”
- EN / IEC 60079-17 "Testing and maintenance of electrical installations in potentially explosive atmospheres”
- Standard descriptions emphasize that changes (e.g., removal of a probe) may only be carried out by qualified personnel and must be documented on how explosion protection is maintained. Re-testing may be necessary.
- TRBS 1201 Part 1 describes the testing of systems in potentially hazardous areas and demands that maintenance and modifications (including replacement/removal of devices) be planned in such a way that the explosion safety of the entire system is maintained.



- Before removal, check the zone plan, explosion protection document, and device certificate; after removal, update the documentation (e.g. list of Ex devices, circuit diagrams, test reports).
- The procedure must be regulated in the operating instructions/permit to work; if necessary, inerting of the reactor, release measurement, suitability of tools.
- Empty the container and flush with nitrogen or water in accordance with operating instructions
- De-energize the probe on the switch room side.
- Open the cover on the ExD side and check that it is de-energized. Caution: External voltage on trigger and relay outputs!
- Disconnect electrical connections. Open cable glands and unplug cables. Only disconnect the probe grounding after removing the probe.
- Remove the probe, lifting it by the flange
  Caution: Residual liquid may escape
- When returning items for repair, the safety data sheet must be enclosed for personnel protection.
  https://doc.aquasant.com/installation/declaration of cleanliness.pdf

Liability and warranty claims

Notes

Do not put back a defective device into operation. In the event of impact damage, damage caused by dropping, or other damage, contact your Aquasant sales representative immediately and return the device for repair or follow-up inspection. Liability and warranty claims are excluded in the event of improper handling of the pipe probes, such as:

- Opening the probe screw connection
- Mechanical impact on the probe body and PTFE inner body
- Impact and drop damage
- Improper installation and electrical connections
- Immersing probe body into liquid!
- Use of unsuitable mounting materials such as seals, mounting screws, etc.
- Repairs by third parties
- Connection to non-compliant third-party devices
- Improper operation regarding specifications such as pressure, temperature, and medium

This list is not exhaustive.

Pressure safety function

The pipe probe **does not** have a pressure safety function**.** A pressure safety device may be required on the system side.

Test pressure of the pipe probes

Installed in the pipeline DN* PN16 with max. 24 bar; ANSI* 150 lbs with max. 30 bar. Higher pressures can deform the PTFE inner body!

Disposal WEEE Directive



The Waste Electrical and Electronic Equipment (WEEE) Directive, which came into force on February 13, 2003, must be complied with. The WEEE logo (see left), which is displayed either on the product itself or on its packaging, indicates that this product must not be disposed of with normal household waste. For further information regarding the disposal of waste electrical and electronic equipment, recycling, and collection points, please contact your local authority or Aquasant or its representative.

OPERATING INSTRUCTIONS

Amendment index

Version	Date	Description
1.00	10.2026	First edition FW 1.00

Manual Nr.: [US-EN] VEI-Pipeprobe-UNIQ-T804-Assembly-Instructions-Manual
Version: 261029/1
Modification: We reserve the right to make technical and editorial changes to the descriptions, information, and illustrations in this manual
Reference: The German version of the operating instruction serves as the reference and legal basis for all other translations
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