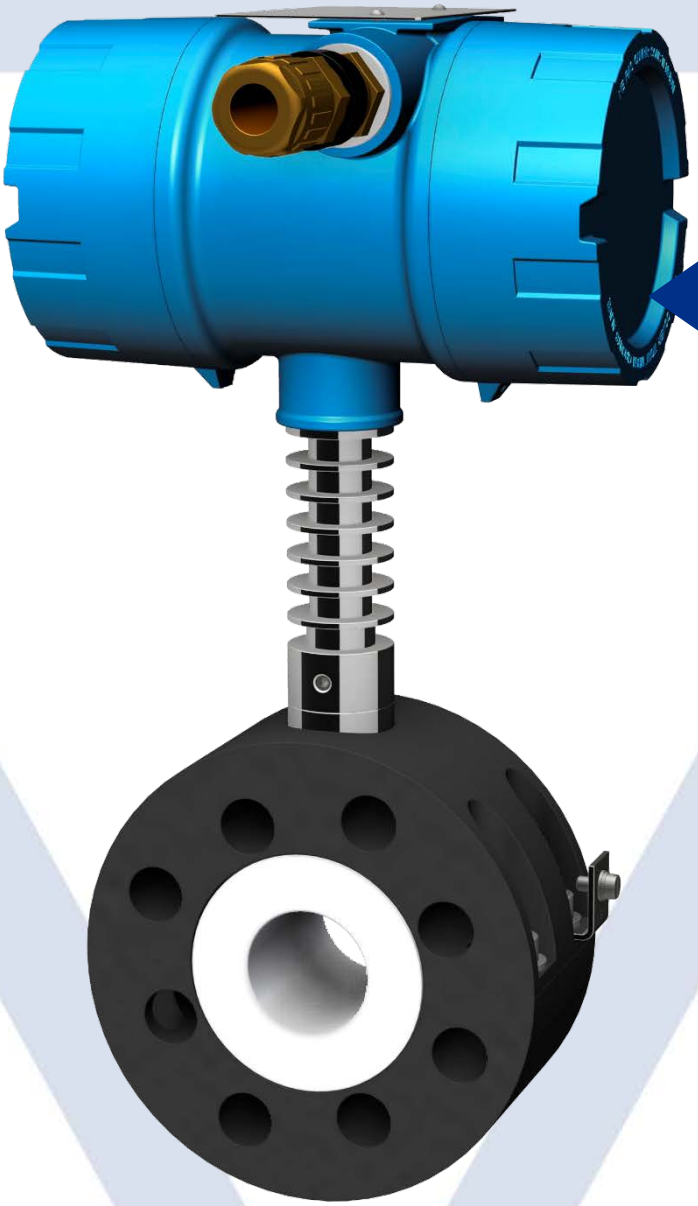
aquasant

TECHNICAL DOCUMENTATION

# Interface pipe probe

## TSS80 DN(ANSI) ... SF T6 K MTI50/0 AGd



- No commissioning, plug & processing
- High-resolution measuring signal
- Pressure independent, stable measuring signal
- No moving parts
- PTFE-core Ex ia IIC
- Process pressure PN16 / 150 lbs
- Process temperature 170 °C
- Insensitive to contamination

## Use

Can be utilized in pipe probes after settling tanks and reactors, in mono and multipurpose plants, from pilot plant to production, as well in tank depots. For liquid/liquid phase separation of organics to aqueous media.

## Application

The pipe probe flanges in the standard version are manufactured as sandwich-structured probe, combined with a PTFE inner body (including the measurement system) and combined with the aluminum housing in hard anodized aluminum with PTFE-inclusion (ALTEF® coating). The TSS80 is applied as interface pipe probe for interface detection, separation, monitoring or as empty signal.

Serial-number: TAG-number:

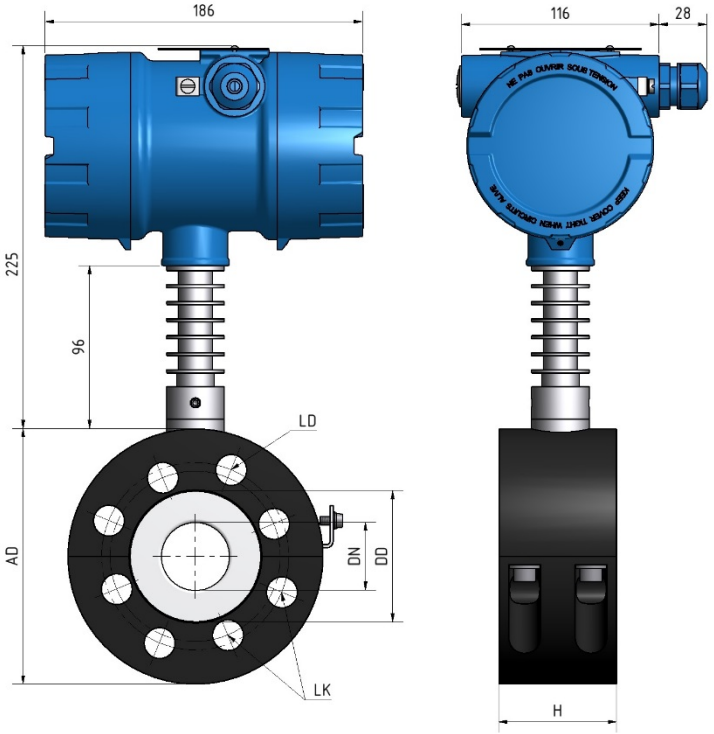
# Model code:

## TSS80 DN(ANSI) .. SF T6 K MTI 50/0 AGd ExG

| | | |
|---|---|---|
| TSS80 | \| | Pipe probe with PTFE measuring electrode in aluminum flange body construction |
| DN | \| | Flange DN 32/40, 50, 80, 100, 150 PN16 \| form A to EN 1092-1<br>ANSI 2, 3, 4" 150lbs ASTM A182, ASME B16,5 RF |
| SF | \| | Process connection on steel flange |
| T6 | \| | Teflon® TFM® 1600 measuring body s = 1.4 mm |
| K | \| | Cooling gills stainless steel (<-20 / >100 max. 170 °C) |
| MTI | \| | Built in measuring electronics device, selected according to process condition MTI 50/0 AEO2 K |
| A | \| | Analog measurement technology for interphase detection, product monitoring, full and empty signal |
| Gd | \| | Measuring electronics – protective housing, 360° rotatable fixed with adjustment screw, outdoor, seawater-proof (Offshore), blue RAL 5007, seal: Silicone, EX/flameproof IP 68, cable gland PM M20 × 1.5, cable clamping range 8-11mm, IP 65 to EN 60529 |
| (F3 | \| | Only for phase separation with media with el. conductivity up to 5000 µS/cm, higher measuring frequency) |

Probe Ex-protection: SEV 09 ATEX 0133 X CE 0036/1254

| | | |
|---|---|---|
| ExG | \| | (Gas-) Ex version (probe/MTI) II 1/2 G Ex ia IIC T6 Ga/Gb |




# Technical data

**emperature range**
20 ... +170 °C medium | –20 ... +60 °C connection head

**leaning temperature** 210 °C max. 10 min pressureless (CIP, SIP)

**ressure** -0.5 bar to max. 16 bar / 150 lbs. standard

**leasuring principle** Impedance

**leasuring range** DK 1.20 ... > 80
**easuring value water** 2800 Imp.

**esolution** < 6 Impulses

**onductivity optimum for organic phase**
TI Standard: 0…200 µS/cm / F3: 0…5000 µS/cm

**asic capacity** Cp: 38 pF / Rp: 2.8 MΩ

**ntegration time** 40-400 ms / 0-3750 Imp

**se in Ex-Zone** II 1/2G Zone 0

**leasuring electrode PTFE-layer thickness** PTFE s = 1.4 mm

**pplication** Interface detection for separation and monitoring

**leasuring electronics** Round plug-in housing MTI 50/0 AEO2K

**rotection** connection head round IP68

**Wiring**
Shielded 2-core cable 0.75 mm² twisted CY/EIG to all evaluation devices mipromex® cable length up to 200 m or max. C= 120 nF / R = 30 Ohm line impedance

**Connection to evaluation unit** mipromex® MIQ / MAT / MLS

**Article-n°** 02.29.11.0000 xxxx

| Nominal diameter | OD | DN | LD drill hole | LK | DD | Installation H | Weight |
|---|---|---|---|---|---|---|---|
| DN 32/40 | 150 | 32/40 | 8 x ø 18 | 100/110 | 77 | 70 | |
| DN 50 | 165 | 50 | 4 x ø 18 | 125 | 97 | 92 | |
| DN 80 | 200 | 80 | 8 x ø 18 | 160 | 123 | 74 | |
| DN 100 | 220 | 100 | 8 x ø 18 | 180 | 146 | 74 | |
| ANSI 2" | 152.4 | 50 | 4 x ø 19.1 | 120.7 | 97 | 92 | |
| ANSI 3" | 190.5 | 80 | 4 x ø 19.1 | 152.4 | 123 | 74 | |
| ANSI 4" | 228.6 | 100 | 8x19.1 | 190.5 | 146 | 74 | |

Connection to MTI-unit:
Length x Width x Depth
125 x 80 x 57 mm
Extension:
Insulation thickness max. 100 mm

# Technical data on-site MTI measuring electronics

### Design type
Plug-in electronics with square stainless cover in the protective housing, with HF-connection; IP 20

### Installation
Protection housing with mounting holes, plug-in electronics pluggable, fixed with 2 screws M4x8

### Performance
Linear conversion of an impedance range into a normed digital measurement signal

### Use / Display
One-time compensation of basic capacity of the RF cable and uncovered dry probe, LED display for quick adjustment

### Dimensions electronics
Round model diameter x height ø 85 x 51 mm

### Weight electronics
140 g

### Ex-power supply / connection wiring
Shielded two-wire connection 0.75 mm2 twisted CY/EIG to all evaluation devices mipromex® cable length up to 200 m or max. C= 120 nF / R = 30 Ohm line impedance

### Transfer signal
Impulse parcel, superimposed on the supply current

### Measuring voltage / current
U ~ 14.5 V  I ~ 13.5 mA

### Nominal data of the supply voltage
Rate data **Ex ia IIC** only for connection to mipromex®-or *TI*K-units
Circuit with the following maximum output values
$U_i \leq$ 18.9 V  $I_i \leq$ 49 mA
$P_i \leq$ 231 mW
$C_i =$ 60 nF  $L_i =$ 0 mH
For ignition protection type flameproof enclosure and intrinsic safety, **Ex d ia** IIC only for connection to mipromex® Typ M** **** *

Circuit with the following maximum output values
U ≤ 19.3 V  I ≤ 75 mA

### Ambient temperature
–20 …+60 °C

### Storage temperature
–30 …+80 °C, ideal +20 °C

### Measuring range
10 / 20 / 50 / 100 / 200 / 300 respective 0 up to max. 3750 impulses, special ranges available. The resolution range depends on the probe dimension and is product specific.

### Resolution
Max. 0.003 pF/impulses

### Norm range for pipe probe with remote MTI housing
Type TSS80 .../100/200/300
55 pF, type MTI 30/, 50/(0 - 16) basic adjustment range depending on probe and RF cable length, determined by the manufacturer

### Basic adjustment range
MTI .../. 0 to 16, 0 to 500 pF

### Measurement frequency
~ 500 kHz

### Linearity
Deviation < 0,1 % (without probe)

### Hysteresis
1 measured impulse

### Temperature influence 5 – 45 °C
Type MTI .../.A analog: < ± 3 measuring impulses

### Certification
Gas II 1/2G Ex ia Gb IIC T6
Dust II 1/2D Ex iaD 20/21 IP65 T85°C
II 1/2G Ex d ia IIC T6
RL 2014/34/EU
Inspection report n°: 08-IK-0395.01 with extension 1
Unit can be supplied without Ex-protection

### Intrinsically save Ex-connection:
Measuring electronics MTI ... in a protective housing or tube probe type TSS80
EMC-tested, STS 024 report n° 990102WS corresponds to EN 1127-1 : 20011
EN 61000-6-2 2005 EN 6100-6-4 : 2007
EN 60079-0 : 2012 EN 60079-11 : 2012

# Function

The impedance changes as a function of the dielectric constant and the el. conductivity of the organic and aqueous media, measured in a partially filled, horizontally installed pipe probes. The measured impedance at the measuring electronics MTI is transformed directly into a normed digital sum signal and transmitted as a pulse train to the mipromex®.

# Mounting directions

- Installation position of a 3 % slope to vertical, depending on the application (see mounting directions for TSS)
- Installation independent of the flow direction
- Installation between two smooth flanges or flared, loose flanges only with special installation protection gaskets
- Caution! Note flange to flange distance for different nominal widths, the PTFE core protrudes on both sides by 0.2 mm
- Additional flat gaskets "Gylon" protect the PTFE-core (with appropriate tightening torque)
- Internal installation guidelines always have to be followed and suitable sealing types used.
- Observe internal safety regulations for open tanks
- Installation in pipes with appropriate nominal diameter with flat gasket and tightening torques (see mounting directions for TSS80)
- The pipe insulation must not enclose the cooling rod
- Ambient temperature: max. allowed temperature in the connection head must not exceed +60 °C, if pipe probe is insulated and measuring electronics is remote installed
- The connection electronics MTI must be mounted at pipe temperatures of >60 °C horizontal or downwards and with the adjustment screw fixed in any 360° position.
- Pressure tests have to be conducted with mounted probe
- Caution! Probe body is only leak-proof when flanged in.

# Disassembly instructions

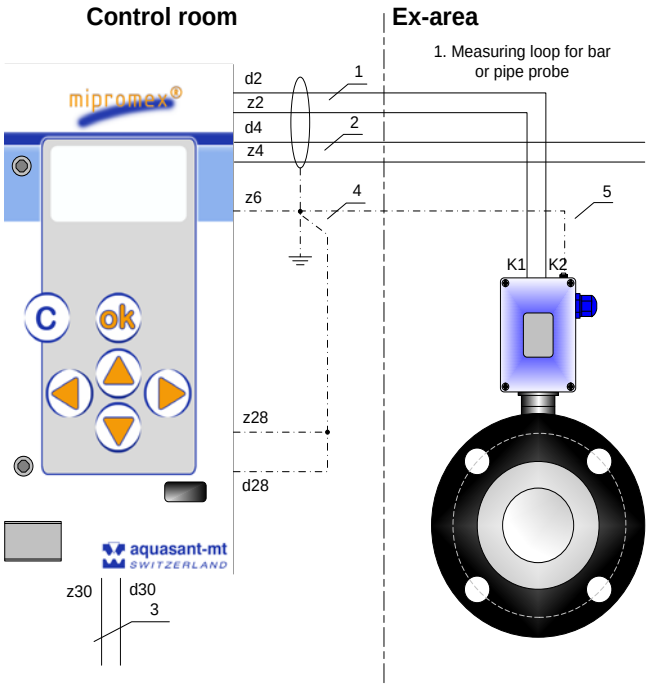
- Empty tank and flush with nitrogen or water according to operating instructions (observe internal safety regulations)
- Disconnect electrical connections. Dismount probe, lift at the flange. Careful, residual liquid may leak out
- Data sheets for personal security purpose need to be added with repair shipments to aquasant.

# Electrical directions

- Wiring must comply with the circuit and grounding diagram.
- Connections to MTI clamps 1/2, protected against polarity reversal, suitable for wire cross section 0.2 – 1.5 $mm^2$
- The connecting cable has to suit the demands at the measuring circle.
- MTI-housing lid in [Ex ia] zone can be opened under live-line working.
- Output signal of mipromex® is a pulse modulated signal $U_0$ ≤18.9 V

# Basic circuit diagram

Probe connection to evaluation unit mipromex®
Connection diagram MRM2 Monorack DIN housing




# Certificates

Explosion protection (ATEX)
EC-type examination SEV 09 ATEX 0133 X
- Ex certification according to the directive 2014/34 EU
- Confidential test report no: 08-IK-0395.01

CE-Mark
The probe fulfills the legal requirements according to the EC directives. CE 1254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