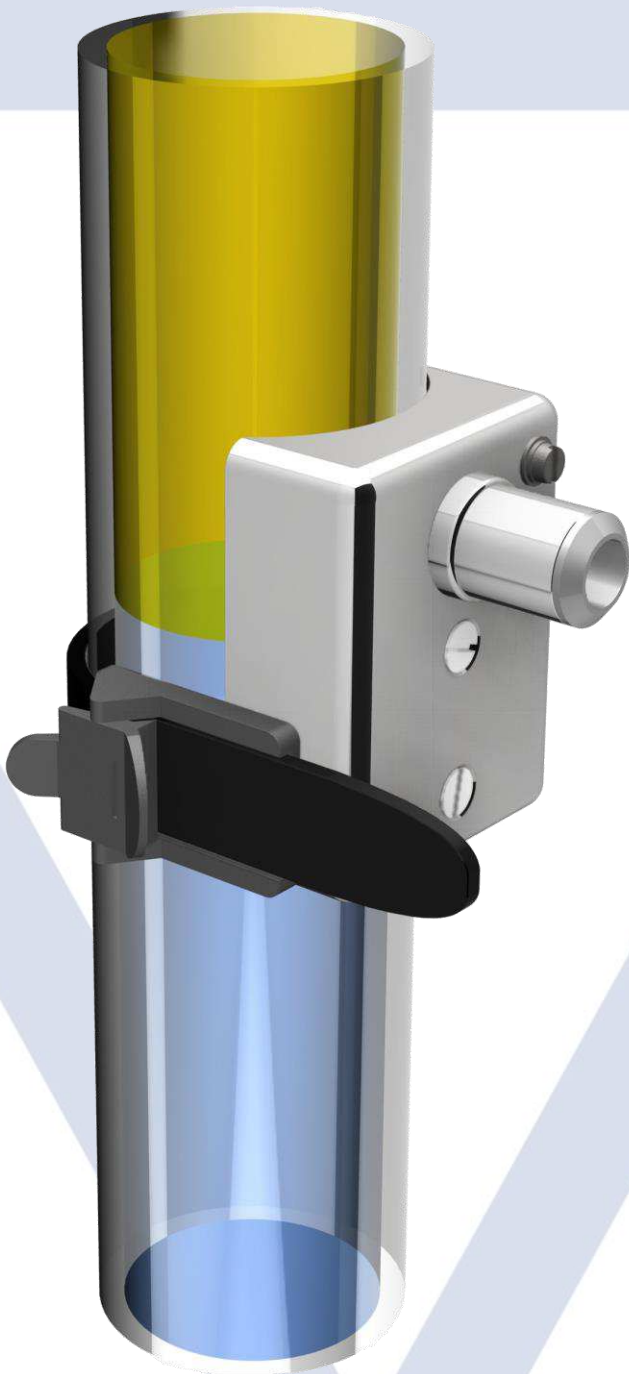




# Interface clamp probe

FR(G)L 80/60 SE R U EF(ES) GR60 ExG



- Mounted on glass pipe
- High-resolution measuring signal
- Protection class IP30
- Process temperature 170 °C
- Lemo-connection for HF-cable

## Use

Recommended to install at glass reactors of multipurpose plants, separators and continuous settling tanks in labs, pilot plants or production. For liquid/liquid interface separation of organic to aqueous media.

## Application

The clamp probe used for interface detection is manufactured in stainless steel combined with the stainless-steel measuring electrode and bar reference electrode. The to be measured media must have constant electrical properties. If the dielectrical constant or the el. conductivity changes, a product compensated measuring system has to be used.



Serial number:

TAG number:

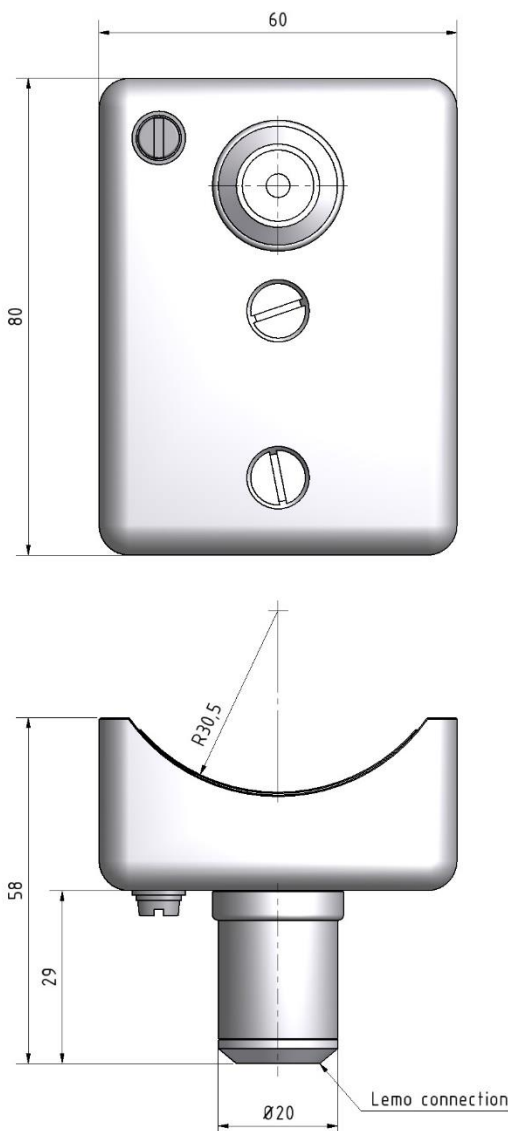
## Model code:

FR(G)L 80/60 SE R TN EFES GR60 ExG

F	Flat, clamp probe, IP code: IP30
R(G)	Measuring electrode stainless steel, glass pipe in contact with media with $\varnothing$ 60 mm, s = 5 mm $\pm$ 0.5mm (customer specific)
L	Lemo-connection for remote measuring electronics in protective housing
L	Outer dimensions: Length x Width x Depth 80 x 60 x 29 mm (R=30.5)
EL	Measuring probe length 68 mm (located internal)
SE	Disk electrode
R	Probe material stainless steel 316L
U	Universal: Interface level and detection, fill level, limit value full/empty
EF	Flange reference electrode
(ES)	Bar reference = stirrer shaft with probe mass connected! (at customer's site)
GR	Glass pipe $\varnothing$ 60 mm, $\pm$ 1 mm; mounted with ratchet system

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

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



## Technical data

Temperature range -20 ... +100 °C media

Cleaning Wipe with organic solvents, pressureless

Pressure Atmospheric

Measuring principle Impedance

Measuring range DC 1.4 ... 80 / 0 - 1555 Imp

Resolution Up to < 1 mm

El. conductivity optimum of the organic phase

MTI standard: 0 ... 5000  $\mu$ S/cm (constant)

Basic capacity Cp: 21.8 pF / Rp: 1.8 M $\Omega$  (at glass pipe)

Integration time 40 - 400 ms / 0 - 3750 Imp

Use Ex-zone II 1/2G Zone 1

Application Continuous interface detection, level-, switch

Measuring electronics Housing square: MTI 50/4 AGK0 K

Connection: Probe to measuring electronics

HF cable hb 1 m UHF/Lemo

### Wiring

From MTI shielded 2-core cable 0.75 mm<sup>2</sup> 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 / MIL / MAT / MLS

Article n° 02.29.12.1781

## 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 insertable, 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

Square version height x width x length 57 x 80 x 175 mm

### Weight electronics

140 g

### Ex-power supply / connection wiring

Shielded two-wire connection 0.75 mm<sup>2</sup> 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® type M\*\* \*\*\*\* \* - or \*TI\*K-units

Circuit with the following maximum output values

$U_i \leq 18,9 \text{ V}$   $I_i \leq 49 \text{ mA}$

$P_i \leq 231 \text{ mW}$

$C_i = 60 \text{ nF}$   $L_i = 0 \text{ mH}$



### 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 dimensions and is product specific.

### Resolution

Max. 0.003 pF/impulses

### Norm range for pipe probe with remote MTI housing

Type STK .../100/200/300

55 pF, type MTI 30/, 50/(0 - 16) basic adjustment range depending on probe and HF-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 impulse

### 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 safe Ex-connection:

Measuring electronics MTI ... In a protective housing or bar probe type S\*\*, K\*\*, F\*\*

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



## Measuring system

The measuring loop consists of a probe with remote on-site electronics MTI and the evaluation unit mipromex® in a non Ex-zone. The cable length for an Ex ia application is max. 200 m.

## Function

The impedance changes as a function of the dielectric constant and the el. conductivity of the organic and aqueous media, as well as depending on the immersion depth of the active measuring electrode. The detected 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 laterally to the glass pipe (outside), fixed with ratchet system, without liquid in the glass pipe!
- Measuring electronics setting: With a number 2 screw driver set the trimmer to a measuring value of 60 – 100 impulses (mipromex® signal-setting menu point: 3.1.3, zero point, accepted with keystroke)
- Caution! During installation the probe needs to be handled truly carefully.
- Internal installation guidelines always have to be followed

## Disassembly instructions

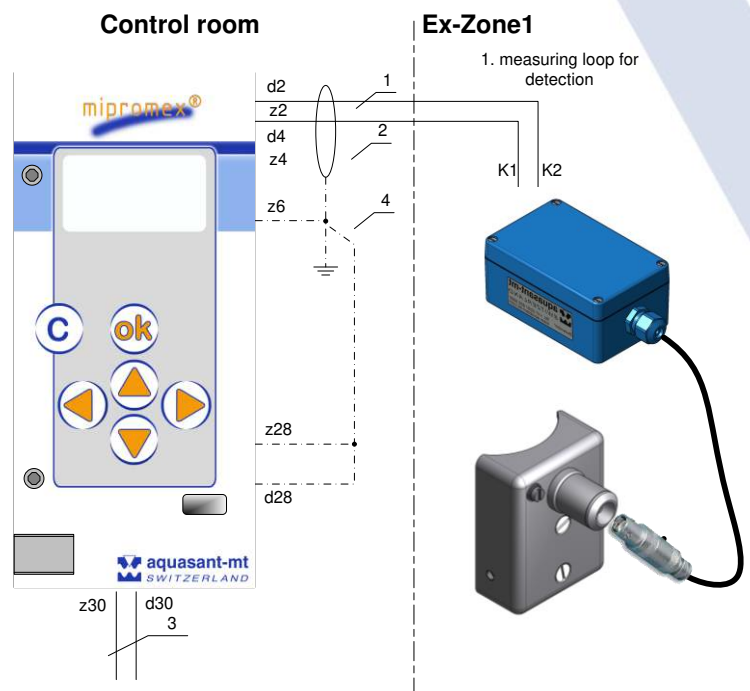
- System does not have to be empty (observe internal safety regulations)
- Disconnect electrical connections. Dismount probe: Open ratchet system

## 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<sup>2</sup>
- 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  $U_0 \leq 18.9 \text{ V}$

## 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 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