

# ISOMAG ™

*The friendly magmeter*

## MS 3810

**PUSH INSERTION SENSOR**



**INSERTION SENSOR FOR "PUSH" INSTALLATION INTO  
PRESSURIZED LINES .**

**DEDICATED SOFTWARE FOR LIQUID SPEED PROFILING**

Warranty conditions are available on this website:  
[www.isomag.eu](http://www.isomag.eu) only in English version

**ISOIL**   
INDUSTRIA  
*The solutions that count*

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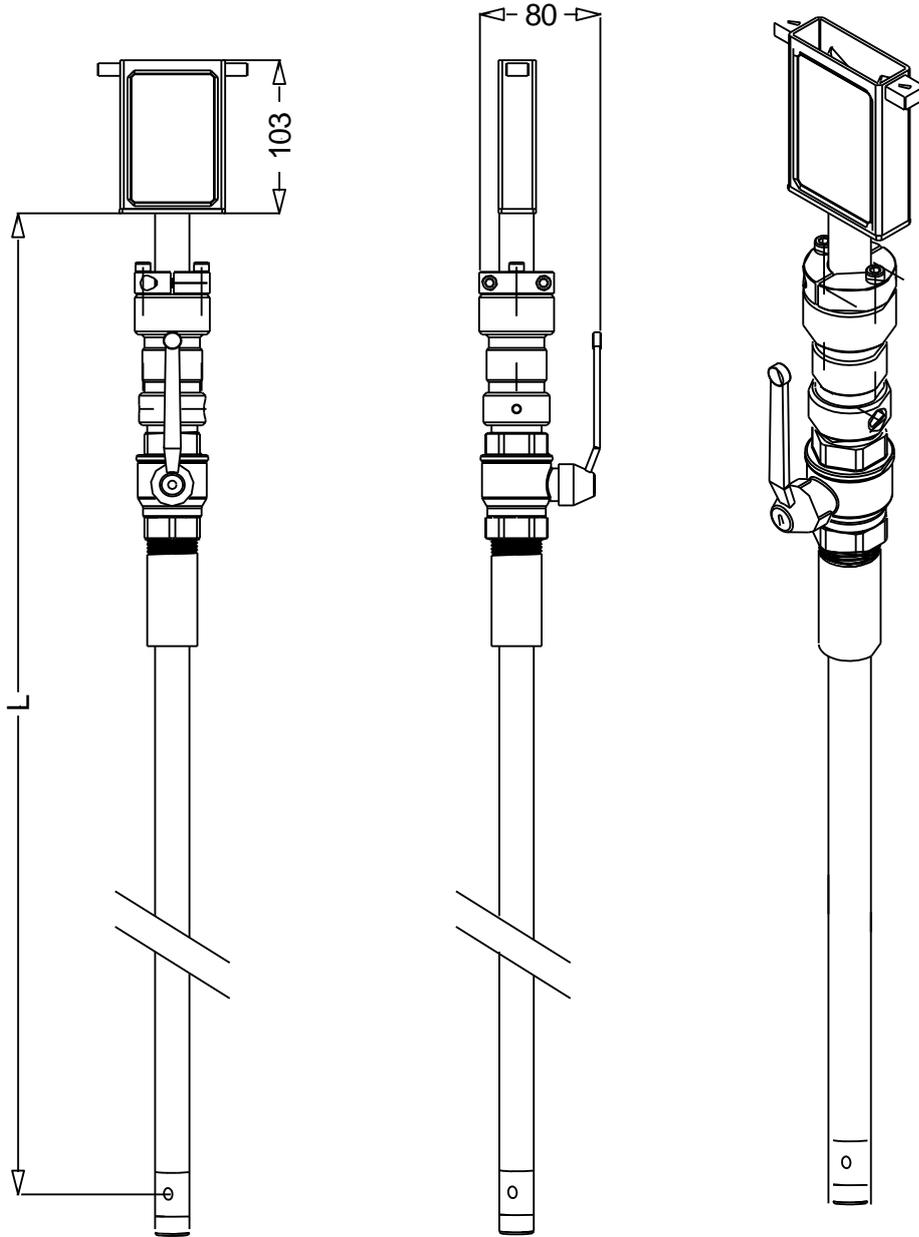
## TECHNICAL DATA

<b>OVERALL FEATURES</b>	
<b>Size for pipe line Ø</b>	<input type="checkbox"/> Size 0 max insertion depth 150 mm <input type="checkbox"/> Size 1 max insertion depth 300 mm <input type="checkbox"/> Size 2 max insertion depth 500 mm <input type="checkbox"/> Size 3 max insertion depth 700 mm <input type="checkbox"/> Size 4 max insertion depth 1000 mm <input type="checkbox"/> Size 5 max insertion depth 2000 mm
<b>Minimum conductivity</b>	<input type="checkbox"/> 5 µS/cm (20 µS/cm for ML145/ML255)
<b>Minimum pipe diameter</b>	<input type="checkbox"/> 80 mm
<b>Humidity Range</b>	<input type="checkbox"/> 0÷100% (IP 67)
<b>Accuracy</b>	<input type="checkbox"/> See table at page 10
<b>CE Certification</b>	<input type="checkbox"/> Yes

<b>STANDARD FEATURES</b>	
<b>Body material</b>	<input type="checkbox"/> Stainless steel AISI 316
<b>Nominal pressure</b>	<input type="checkbox"/> 2500 kPa
<b>Process connection</b>	<input type="checkbox"/> 1" Threaded
<b>Version – protection rating</b>	<input type="checkbox"/> Compact IP67
<b>Connection material</b>	<input type="checkbox"/> Stainless steel AISI 304
<b>Head material</b>	<input type="checkbox"/> PEEK
<b>Gasket material</b>	<input type="checkbox"/> FPM (O-ring)
<b>Liquid temperature</b>	<input type="checkbox"/> 0 °C to 100 °C
<b>Electrodes material</b>	<input type="checkbox"/> Stainless steel AISI 316L

<b>OPTIONAL FEATURES</b> (CHECK FOR MORE DETAILS 'HOW TO ORDER' ON LAST PAGE)	
<b>Size for pipe line Ø</b>	<input type="checkbox"/> Other on request
<b>Body material</b>	<input type="checkbox"/> Others on request
<b>Process connection</b>	<input type="checkbox"/> Others on request
<b>Electrodes material</b>	<input type="checkbox"/> Others on request
<b>Version – protection rating</b>	<input type="checkbox"/> Compact IP 67 <input type="checkbox"/> Separate version (max 20m) – IP 68 <input type="checkbox"/> Separate version (max 500 m), with preamplifier – IP 67 (OPT. IP 68)
<b>Accessories</b>	<input type="checkbox"/> Pressure sensor

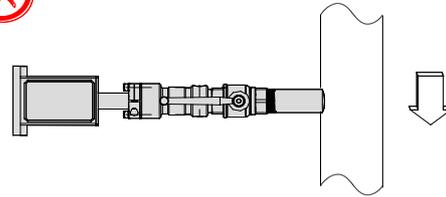
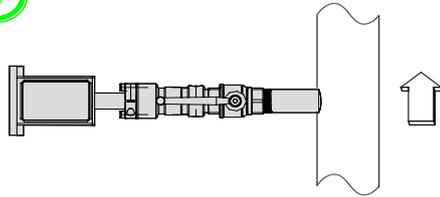
# OVERALL DIMENSIONS



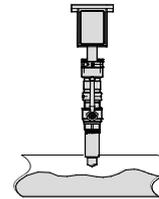
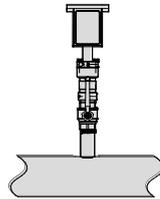
SIZE	MAX DEPTH	L
SIZE 0	150 mm	515
SIZE 1	300 mm	665
SIZE 2	500 mm	865
SIZE 3	700 mm	1065
SIZE 4	1000 mm	1365
SIZE 5	2000 mm	2365

## INSTALLATION RECOMMENDATIONS

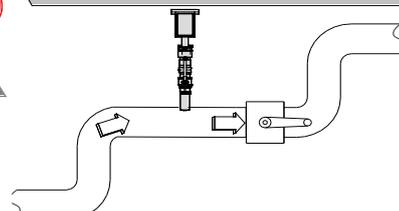
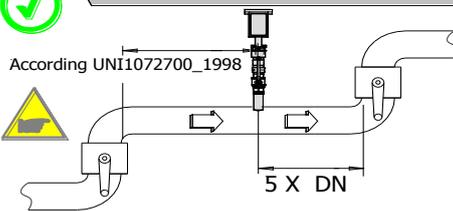
In vertical installations an ascending flow is preferable. For vertical installations with descending flow direction contact the manufacturer



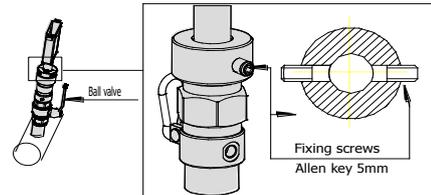
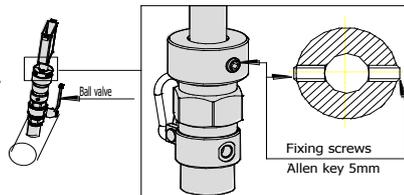
Avoid a partially empty pipe, during operation the pipe must be either completely full of liquid or completely empty



Install the sensor away from bends and hydraulic accessories

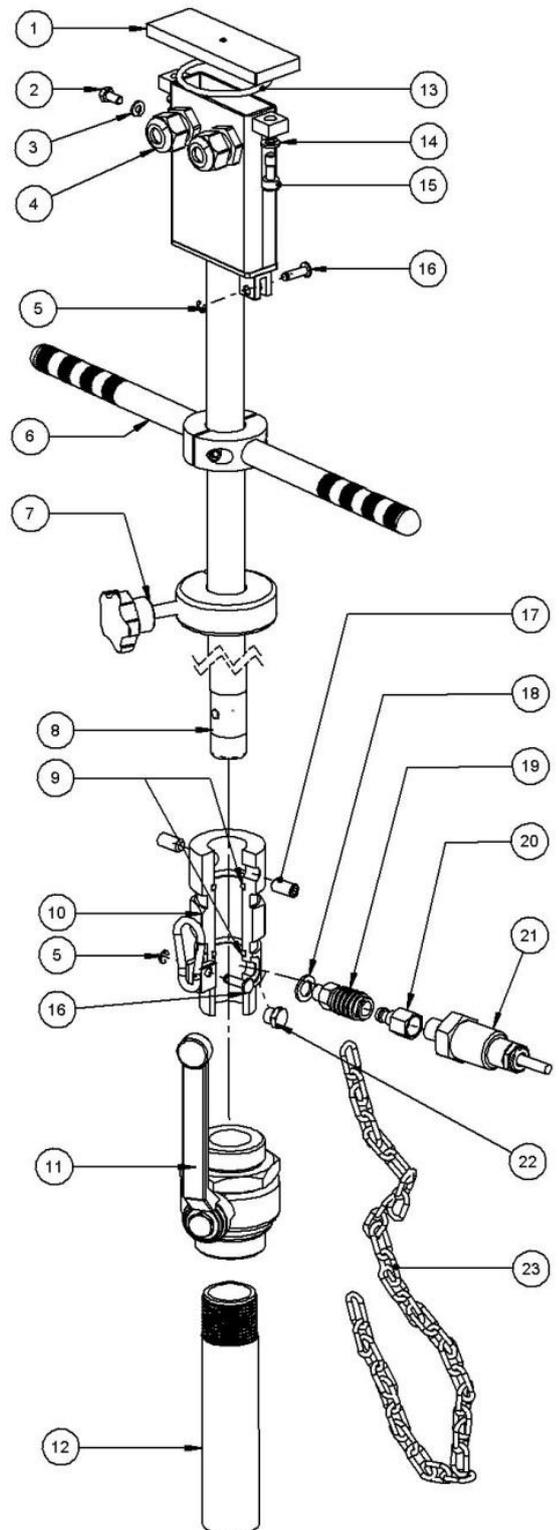


Tighten the two fixing screws before opening the ball valve

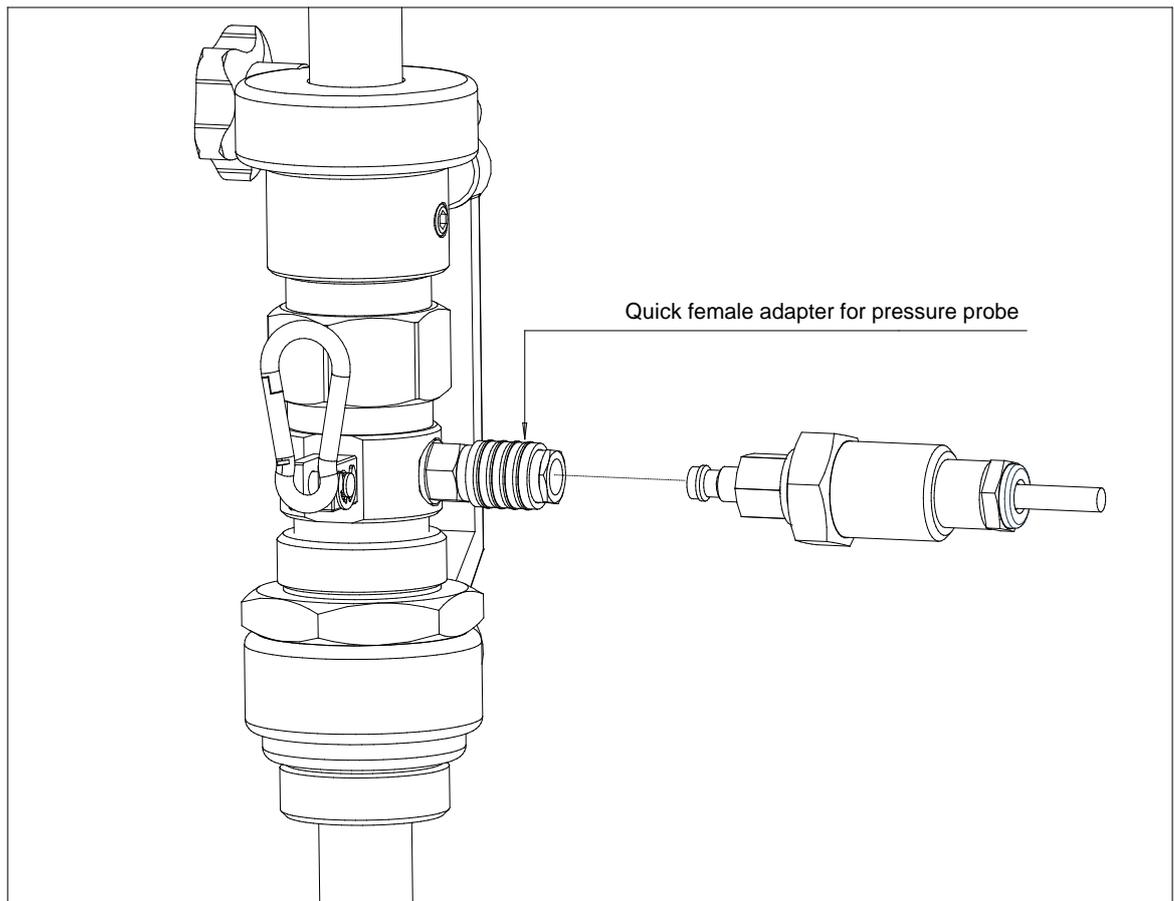


## MS3810: COMPONENTS

POS.	DESCRIPTION	CODE
1	METAL COVER	DE21LXXX05X
		DE21IXXX05X
2	SCREW M5x10	X175VITE
3	GROWER Ø5	XX107ROSE
4	CAP AND CABLE GLAND	---
5	SEGGER 4X9 (RING 4 7434-75)	X2928SEGE
6	HANDLE PUSH	FA211.
7	FIXING KNOB	FA192
8	SENSOR MS3810	---
9	O-RING 4087	XXX75ORIN
10	CYLINDER	DE81IXXX05A
		DE64IXXX05A
11	BALL VALVE	XX169VALV
12	ANKLE WELD	XXX57TRON
13	O-RING 155	XXX61ORIN
14	GROWER Ø6	XXX108ROSE
15	SCREW 6X16 WORKED	DD21IXXX10X
16	PIN FOR INSERT	XX1011PERN
17	GRAB SCREW	X1049GRAN
18	WASHER	---
19	QUICK FEMALE	X1017RACC
20	QUICK MALE	X1144RACC
21	PRESSURE SENSOR	---
22	CUP PRESSURE	X1012TAPP
23	SAFETY CHAIN	---
	SAFETY CHAIN	---

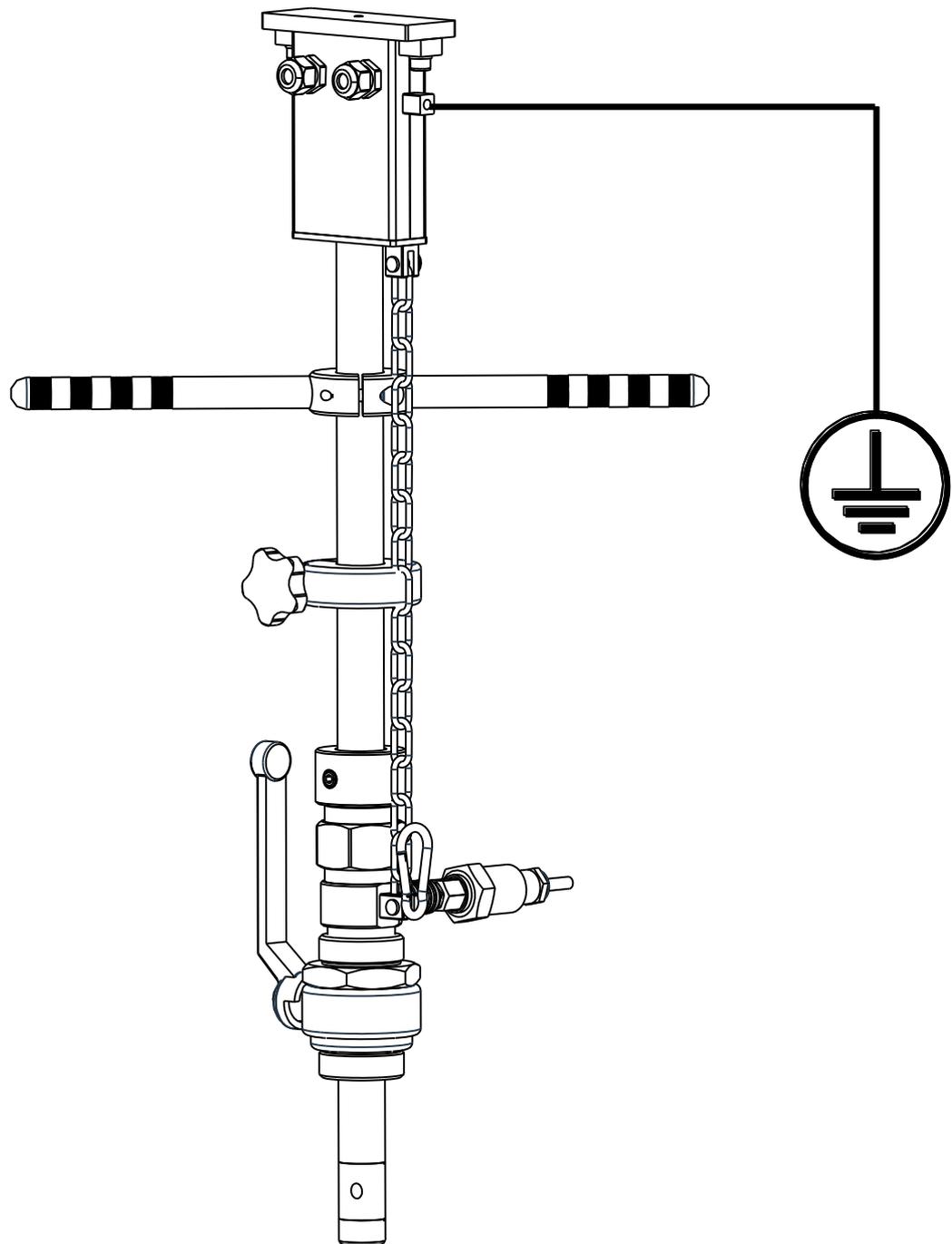


## MS3810 PRESSURE SENSOR INSTALLATION



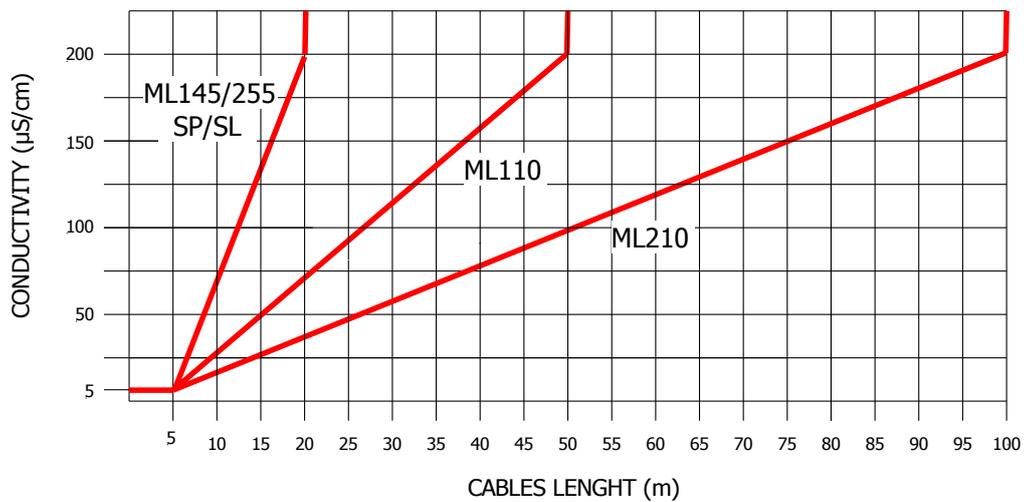
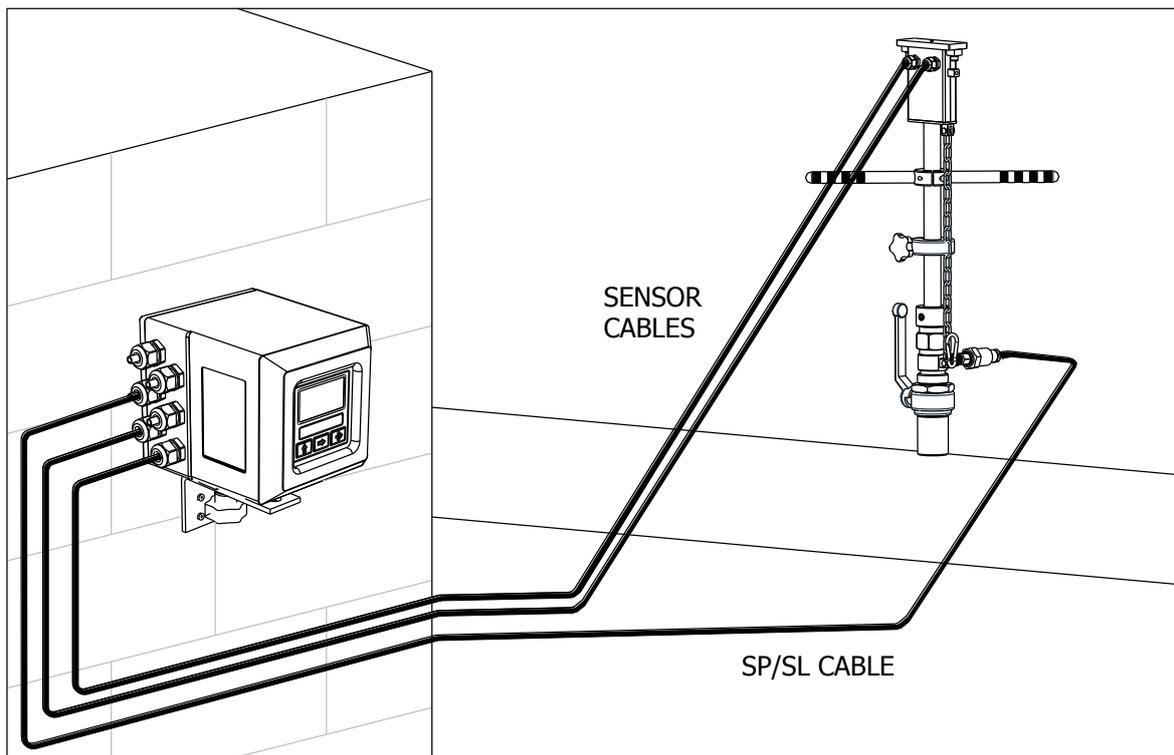
Plug the pressure sensor in to the quick connector.

## SENSOR GROUNDING



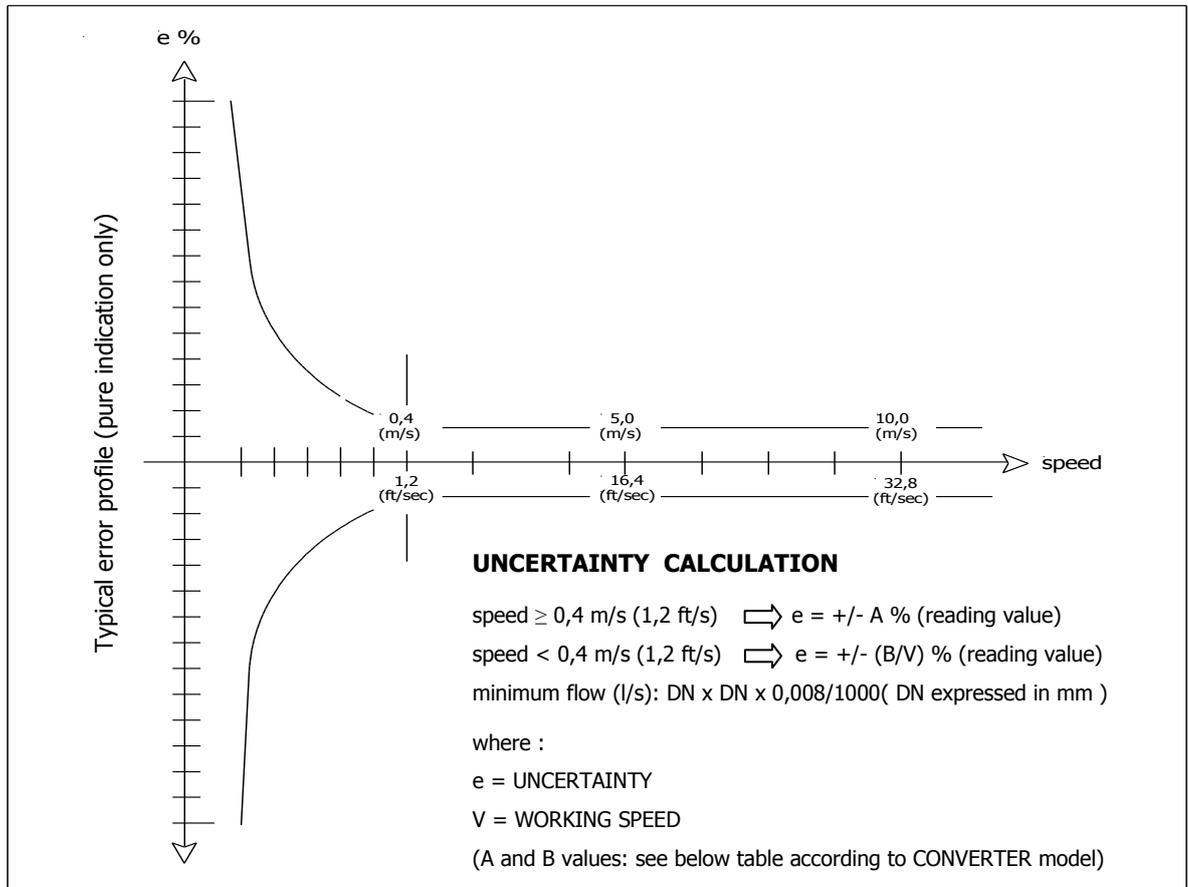
**For the correct operation of the meter the sensor and liquid must be equipotential. ALWAYS connect sensor and converter to the ground.  
For grounding with a cathodic protection pipe, please contact the manufacturer.**

## SEPARATE VERSION

**Notes:**

- It is recommended to install the connection cables away from, or protect against sources of electromagnetic noise.
- The minimum conductivity of the liquid medium to ensure correct functionality of the empty pipe detection is  $20 \mu\text{S/cm}$

## ACCURACY TABLE



### ALL CONVERTERS

A	B (speed m/s)	B (speed ft/s)
<b>2</b>	<b>0,8</b>	<b>2,4</b>

Reference conditions:

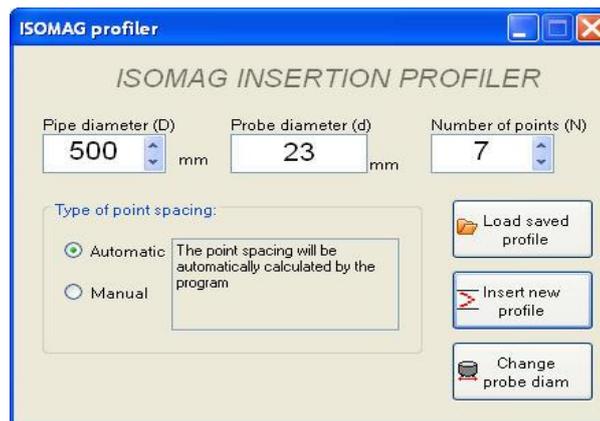
- Constant flow rate during the test
- Pressure: >30 kPa
- Flow condition : fully developed flow profile
- Zero stability +/- 0,005 %
- ID accuracy: mean value better than 1%, IDmin/IDmax>0,98

## PROFILING WITH ISOFLOW PROFILER

Flow Profiler is an application designated to calculate the value of the correction coefficients  $K_i$  and  $K_p$  when the flow profile is not fully developed. This is achieved by measuring the flow velocity at different insertion depths along pipe diameter.

### FUNCTIONING

#### Main page



At program start-up appears the following window that allows the input of the following base parameters used in the profiling computation:

- Diameter of the pipe in which the sensor probe is inserted
- Diameter of the sensor probe (this is usually 23 mm)
- Number of points in which the flow velocity is measured
- Type of point spacing that is correlated to the probe insertion depth at which measures are taken.

Possible choices for the point spacing parameter are:

- Automatic: the point spacing will be automatically calculated by the program
- Manual: the insertion depth of every point will be inserted by the user.



For the program to operate correctly it is necessary to insert at least one point on the pipe axis and to insert the same number of points above and below the center line. The points must be inserted in the insertion depth order.

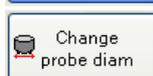
The buttons on the right are used to:



Load a profile previously saved by Profiler program from a text file. The successive window will be automatically opened and filled with the saved data.



Open the form to insert a new profile.



Change the diameter of the insertion sensor probe.

For more details consult the operating manual.

## HOW TO ORDER

Example code	<b>MS 3810</b>	
	<i>Suitable for piping diameter</i>	
<b>0</b>	<b>0</b>	Size 0 max insertion depth 150 mm
	<b>1</b>	Size 1 max insertion depth 300 mm
	<b>2</b>	Size 2 max insertion depth 500 mm
	<b>3</b>	Size 3 max insertion depth 700 mm
	<b>4</b>	Size 4 max insertion depth 1000 mm
	<b>5</b>	Size 5 max insertion depth 2000 mm
	<b>9</b>	TO BE SPECIFY
<b>Sensor and electrodes material / lining / internal gasket</b>		
<b>A</b>	<b>A</b>	Sensor material AISI316, PEEK head, electrodes in AISI316 , gasket in FKM , NECK in SS AISI 304
	<b>Z</b>	Sensor material: to be specified
<b>Accessory for mounting in pressurized pipe line</b>		
<b>1</b>	<b>1</b>	Mounting in pipe without pressure (by the use of the own handles) ; <b>connection 1" UNI 338 ( GAS) AISI304</b>
	<b>2</b>	Accessory kit, suitable for mounting in pressurised line, composed by: 1" hose-coupling (to welding on the pipe ) and 1" ball valve (Bronze material); <b>all connections 1" UNI 338 ( GAS) AISI304</b>
	<b>3</b>	Mounting in pipe without pressure (by the use of the own handles) ; <b>connection 1" NPT AISI304</b>
	<b>4</b>	Accessory kit, suitable for mounting in pressurised line, composed by: 1" hose-coupling (to welding on the pipe ) and 1" ball valve (Bronze material); <b>all connections 1" NPT AISI304</b>
	<b>6</b>	<b>( ONLY FOR ML 255 )</b> Accessory kit, suitable for mounting in pressurised line, composed by: 1" hose-coupling (to welding on the pipe ) and 1" ball valve (Bronze material) <b>1" Uni 338 (GAS) AISI304 + QUICK CONNECTIONS 1/8"</b>
	<b>7</b>	<b>( ONLY FOR ML 255 )</b> Accessory kit, suitable for mounting in pressurised line, composed by: 1" hose-coupling (to welding on the pipe ) and 1" ball valve (Bronze material) <b>1" NPT AISI304 + QUICK CONNECTIONS 1/8"</b>
	<b>8</b>	<b>( ONLY FOR ML 255 )</b> Accessory kit, suitable for mounting in pressurised line, composed by: <b>1" Uni 338 (GAS) AISI304 sleeve connection + QUICK CONNECTIONS 1/8" for pressure sensor</b>
	<b>9</b>	Special connection: to be specified
	<b>Suitable for Pipe Size</b>	
<b>A</b>	<b>A</b>	> 150 mm
	<b>B</b>	< 150 mm
<b>Accuracy</b>		
<b>0</b>	<b>0</b>	Standard ( $V > 0,4 \text{ m/s} = 2\%$ ; $V < 0,4 \text{ m/s} = 0,8/V$ measured ; $V = \text{fluid velocity}$ )
	<b>1</b>	Special (to be define)
<b>Version / Protection rate</b>		
<b>A</b>	<b>A</b>	Compact version , IP67 protection rate
	<b>B</b>	Separate version , remember to <b>add the cables</b> , protection rate IP68 (standing immersion with 1,5 m of head water)
	<b>F</b>	Separate version with N° 2 connectors IP 68 suitable <b>for fast cable connections</b>
	<b>G</b>	Separate version with N° 1 connectors IP 68 suitable <b>for fast cable connections</b>
	<b>M</b>	Compact version , IP67 protection rate , <b>with the possibility to turn the converter of 90°</b>
	<b>N</b>	Separate version in <b>Aluminium</b> , with <b>JB PREAMPLIFIER*</b> (maximum length 500 m.), <b>remember to add the cables</b> ,protection rate IP67
	<b>P</b>	Separate version in <b>AISI 304</b> , with <b>JB PREAMPLIFIER*</b> (maximum length 500 m.), <b>remember to add the cables</b> ,protection rate IP67
	<b>Q</b>	Separate version with N° 1 connectors IP 68 suitable <b>for fast cable connection to JB PREAMPLIFIER*</b> in <b>Aluminium</b> (DEFINE THE CABLE LENGHT MAX 500 m-ADD THE COST )
	<b>R</b>	Separate version with N° 1 connectors IP 68 suitable <b>for fast cable connections to JB PREAMPLIFIER*</b> IN <b>AISI 304</b> (DEFINE THE CABLE LENGHT MAX 500 m-ADD THE COST )



**MS3810-0A1A0A (example of complete code for order)**

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