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FM300

Sensor

Datasheet

Benefits

- Compact design for space saving equipment
- Simpli ied electronic
- 4...20mA output
- Pulse- / Frequency- / Alarm output
- with or without display
- Stainless steel housing

Typical Applications

- Agriculture
- Water treatment
- Industrial water treatment
- Cleaning
- Cooling

Measuring Range: up to DN 400
Temperature Range: -20°C – 60°C (-4°F – 140°F)
Accuracy: +/- 1 %

Version 2026/02
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Contents

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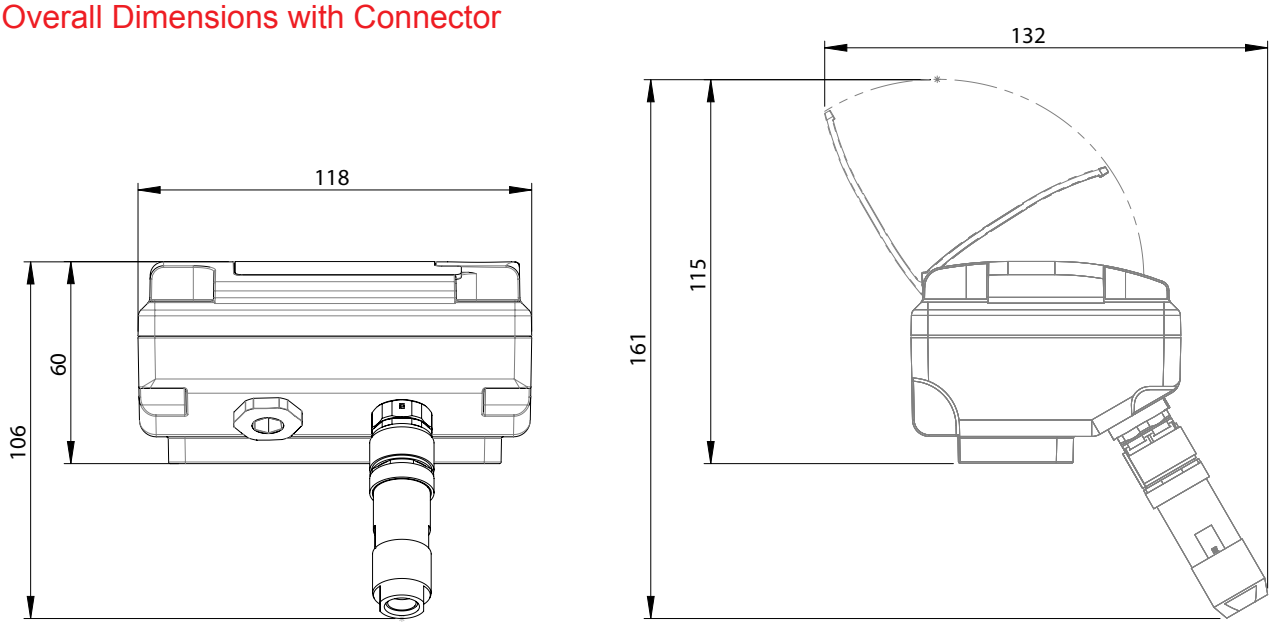
Overall features	
Suitable For	All FM Transducer (FM130, FM150 up to DN400, FM170 all DN)
Minimum conductivity	20 µS/cm
Altitude	-200 m up to 2000 m
Ambient Temperature	-20… +60°C / -4… +140 °F
Humidity Range	0÷100% (IP 67)

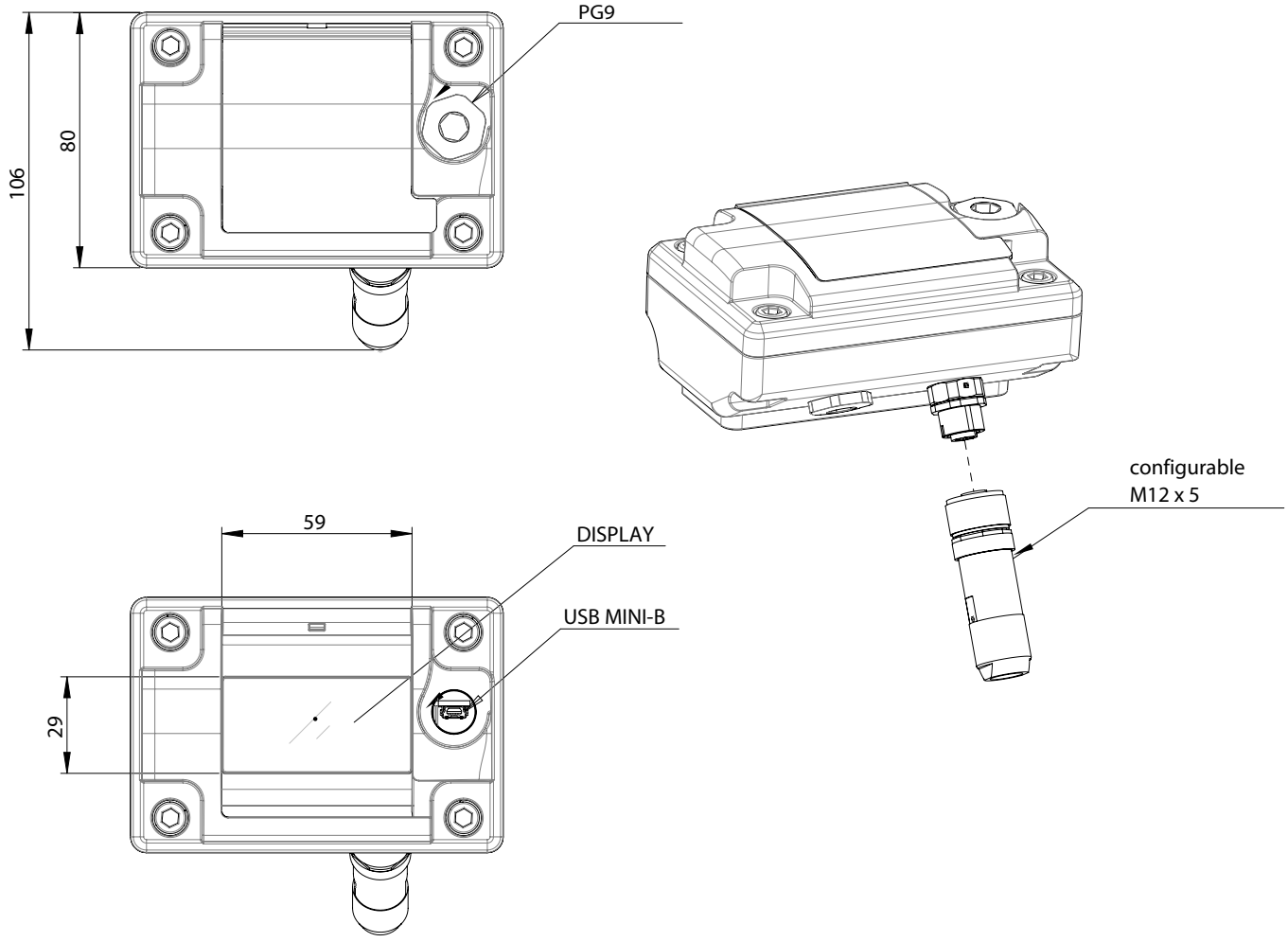
Standard features	
Housing materials	Painted Aluminium die casting
Protection Rate	IP 67
Power Supply/Consumption	min10 / max30 V ⎓ - 1W
Electrical connections	5 pins connector M12X1 complete of plug/Cable
Full scale value	0,4…10m/s
Protocols	MCP protocol Via USB Interface
Digital Input/Outputs	N° 1 channel OUTPUT for volume pulses/alarms
Data Storage	Eeprom values storing system in case of power failure
Bidirectional	Protected plug in for the connection to PC
CE Certification	Yes
Humidity Range	Yes

Optional features (check how to order, at last page, for more details)	
Protection Rate	IP 68
Display	Display LCD Custom dimensions 60 x 40 mm
Housing materials	Housing in AISI 304 JB RAW/POLISHED (Cover in PA6 woth Display)
Outputs: Pulses/Frequence/Alarms	N° 1 channel OUTPUT for volume pulses/alarms
Current Output	N°1 , 0/4…20mA – RL= 500 Ohm (according to main power supply)
MID Certifications	

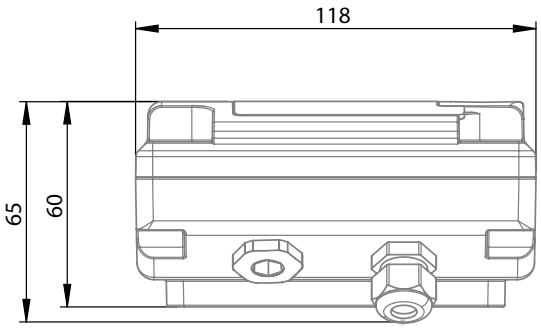
Accuracy	
Measurements tolerance (board)	Volume = ±0,2% v.l. Out 4/20 mA = ± 0,2 % v.l.
Accuracy (whole system converter+sensor)	See table below

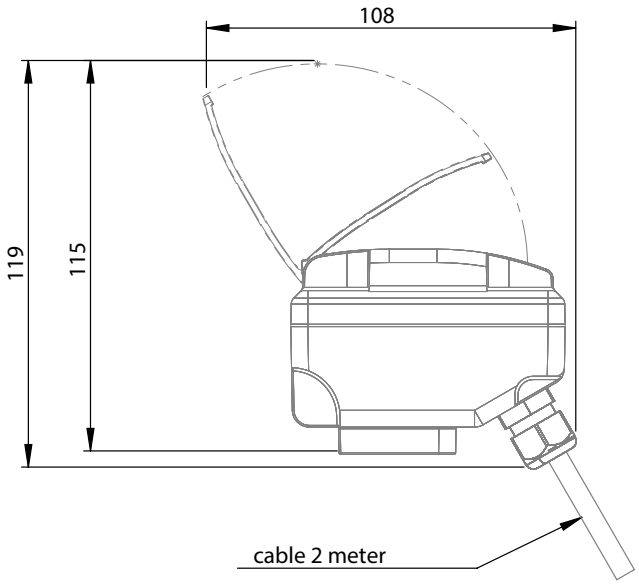
Overall Dimensions with Connector

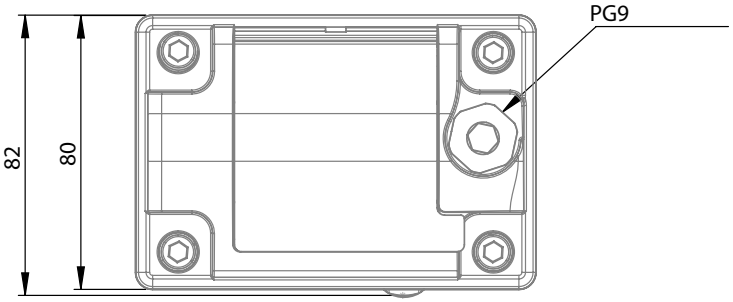


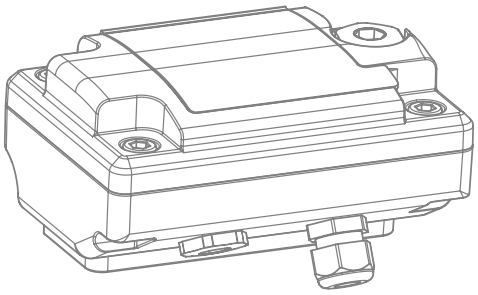


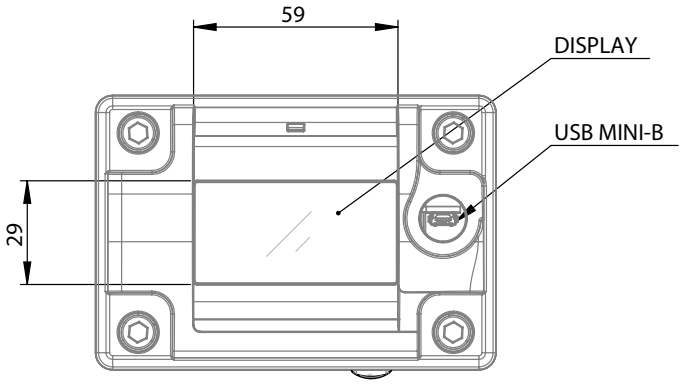
Overall Dimensions with Cable Gland



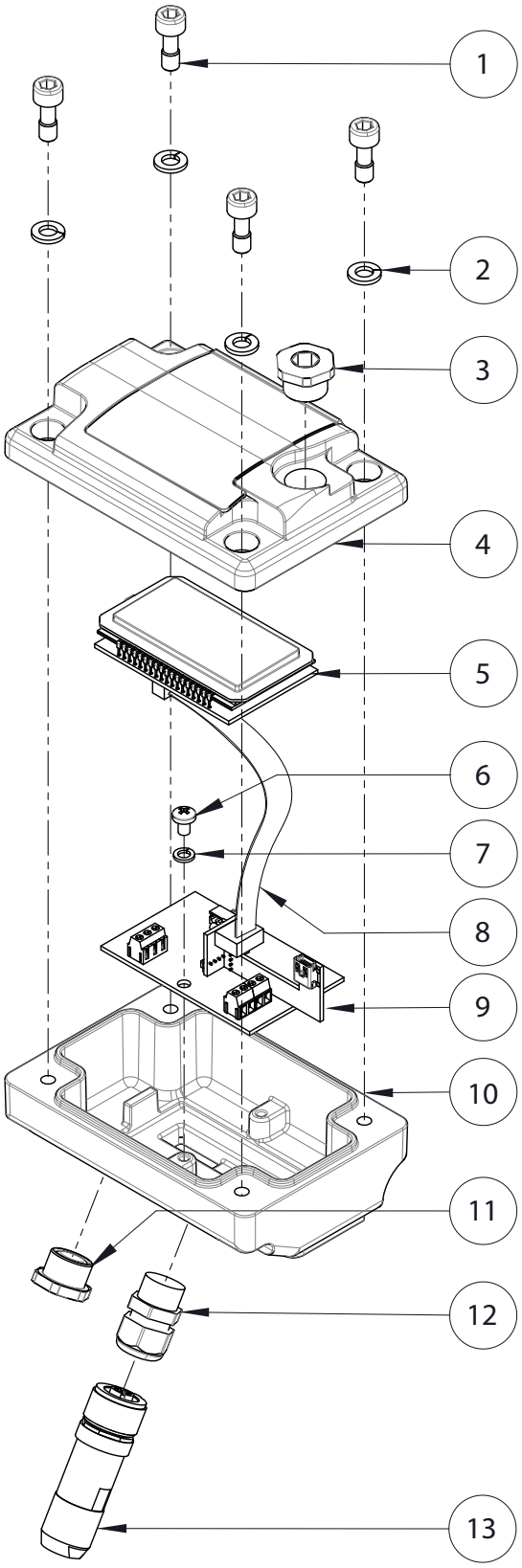








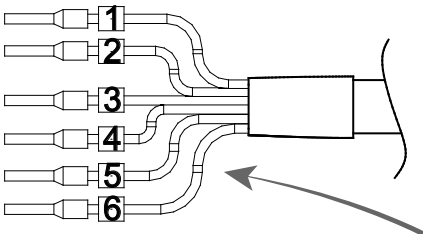
FM300 Layout

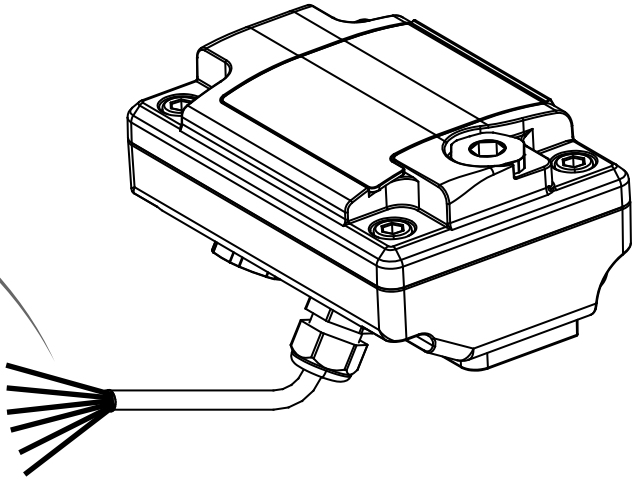


POS.	DESCRIPTION
1	SCREWS M6x16
2	GROWERS Ø6
3	PG9 PLUG
4	COVER PA06
5	DISPLAY
6	SCREWS M4X6 TC
7	GROWERS Ø 4
8	FLAT CABLE
9	FM300 PCB
10	HOUSING IN AISI 304 JB RAW OR POLISCHED
11	PG9 PLUG
12	CABLE GLANDS
13	5 POLES CONNECTOR COMPLETE OF PLUG

Electrical Connections

Version with cable

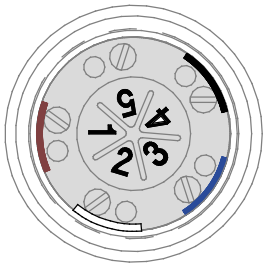


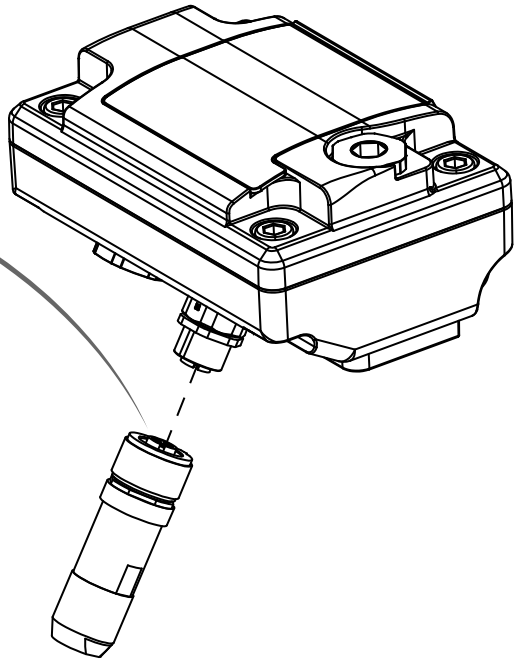


1 (+) POWER SUPPLY
2 (+) OUTPUT 1
3 (+) OUTPUT 2 (OPTIONAL)
4 (+) 4-20mA max load: 500 Ω OUTPUT (OPTIONAL)
5 (-) POWER SUPPLY / OUTPUTS
6 SHIELD (CONNECT TO GROUND)

PIN 5-6 TO BE CONNECT TO THE GROUND

Version with connector



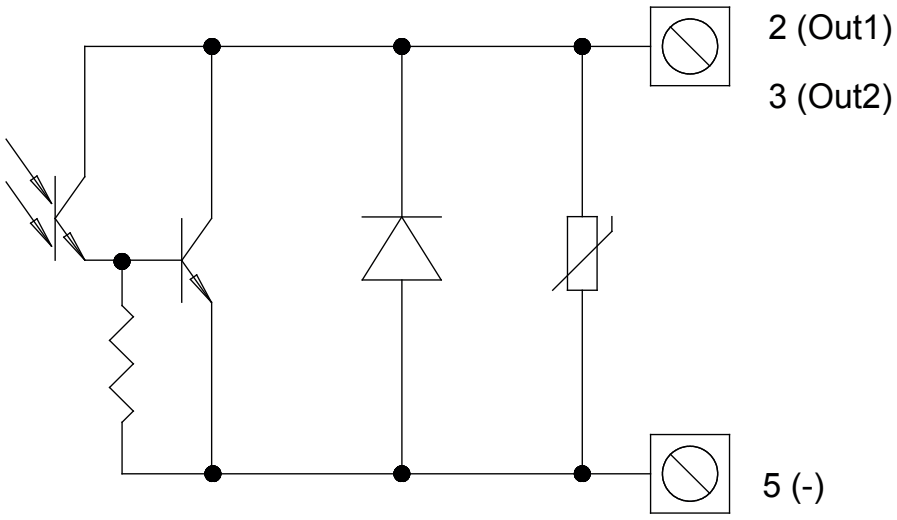


1 (+) POWER SUPPLY
2 (+) OUTPUT 1
3 (+) OUTPUT 2 (OPTIONAL)
4 (+) 4-20mA max load: 500 Ω OUTPUT (OPTIONAL)
5 (-) POWER SUPPLY / OUTPUTS

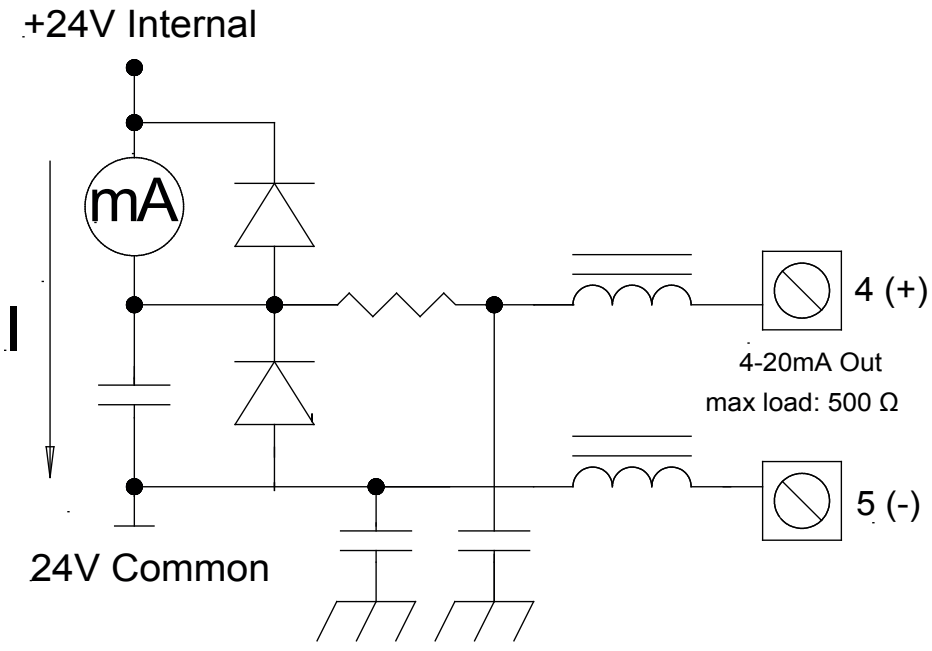
PIN 5 TO BE CONNECT TO THE GROUND

Outputs: Digital/Analog

Digital Outputs

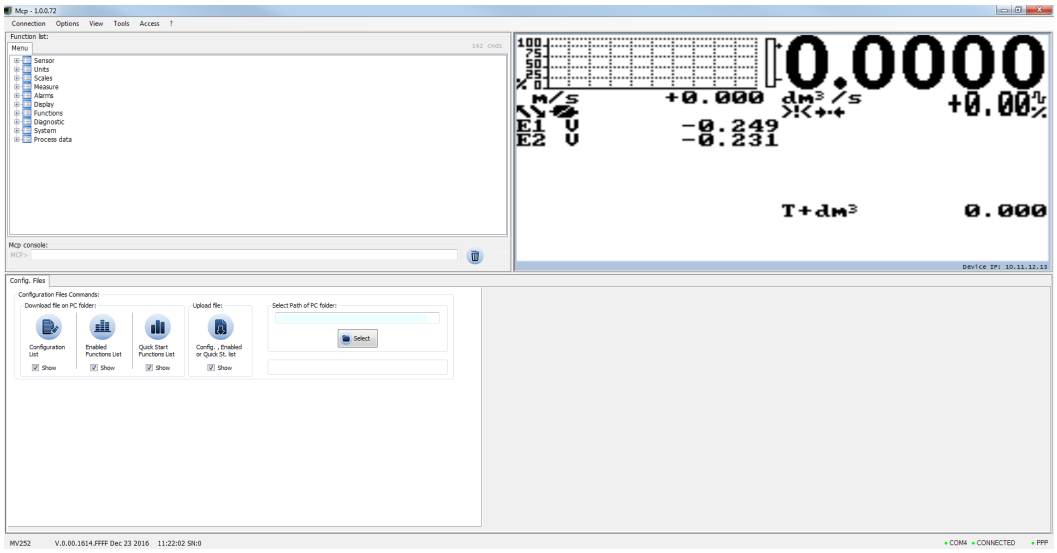


Analog Outputs

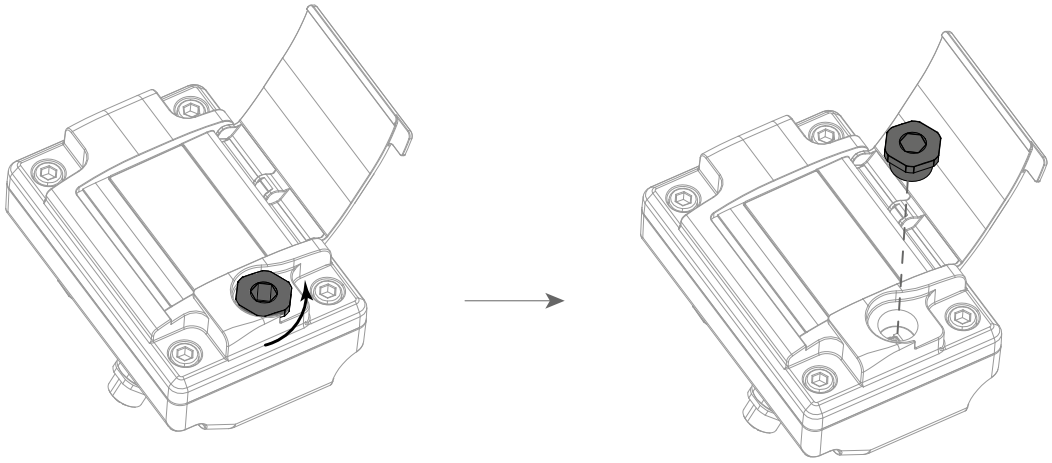


User Interface

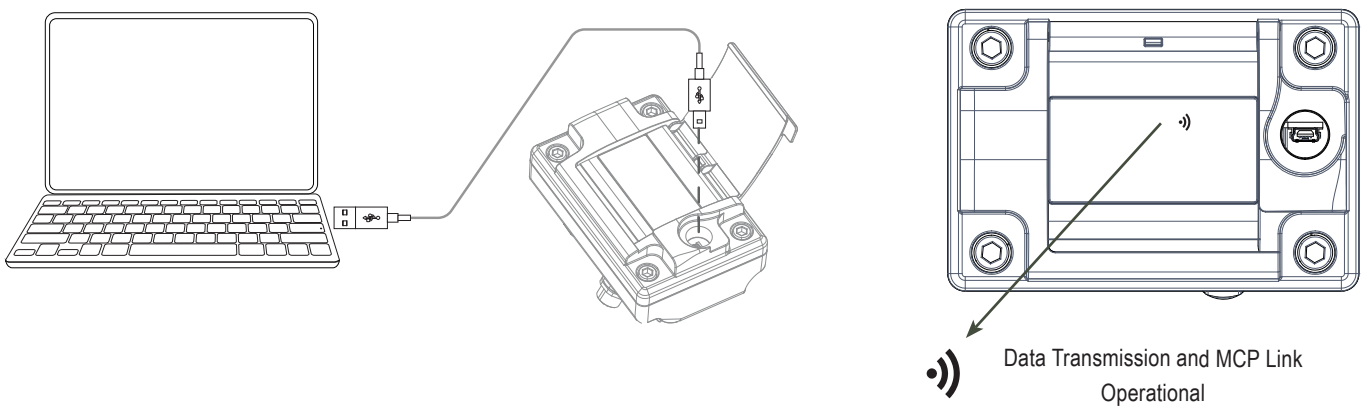
MCP is a Windows® software that allows to set all the converter functions and personalize the menu. To use MCP interface consult the relevant user manual.



To connect the converter to the computer, connect the USB cable as shown below.
Remove the PG9 PLUG.



Connect USB cable type mini B. Verify connection by symbol on display.



Display Visualization

EP — Empty Pipe Warning

Alarm Warning

Process Alarm

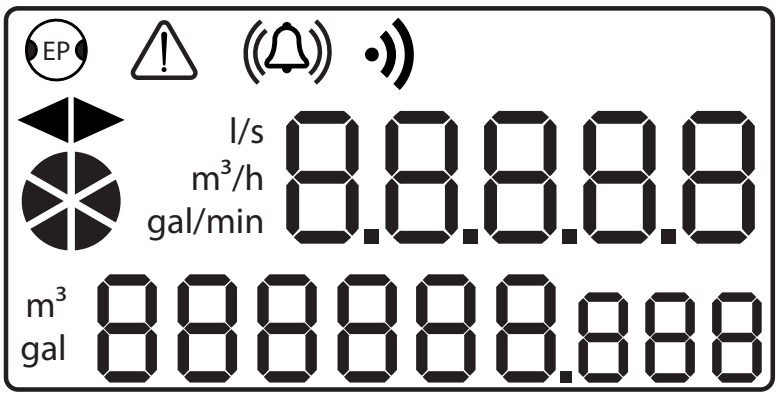
Data Transmission

Flow Direction

Active Flow Rate

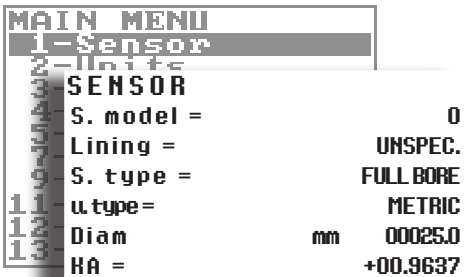
l/s
m^3/h
gal/min — Flow Rate Measure Unit

m^3
gal — Totalizer Meausre Unit



Menu Functions

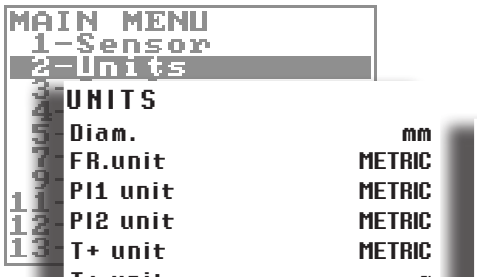
Sensor



SENSOR		
S. model =		0
Lining =		UNSPEC.
S. type =		FULL BORE
u.type=		METRIC
Diam	mm	00025.0
KA =		+00.9637
KA- =		-04.4904
KZ =		+0000000
KD=		+0000000
Ins. position=		0
KP DinaWmic=		OFF
Ki=		01.8727
Kp=		01.0000
KC=		1.00000
C.curr =		025.0
C.Reg.PB=		004
C.Reg.DK=		008
S. Freq.= Hz		50
E.P Detect=		ON
R max= kohm		0500
S. err. delay=		010
Sens. verify=		OFF
KL =		00.000000000
Zero point cal.		

1.1	Sensors model: Enter the first two characters of the serial number of the sensor
1.2	Flow sensor lining material type
1.3	Type of sensor: fullbore or insertion
1.4	Type of measure units for sensor parameter: metric or imperial
1.5	Insert ND of sensor (0-2500)
1.6	Calibration data of sensor visualized on sensor's label
1.7	Calibration data of sensor for negative flow
1.8	Sensor coefficient KZ (zero point)
1.9	Sensor coefficient KD
1.10	Insertion position
1.11	KP dynamic, coefficient for insertion
1.12	Sensor coefficient Ki
1.13	Sensor coefficient Kp
1.14	Sensor coefficient KC
1.15	CW volume total. decimal point position
1.16	Current regulator proportional band
1.17	Current regulator derivation constant
1.18	Measure sampling frequency
1.19	Enables the empty pipe detection feature
1.20	Empty pipe detection threshold
1.21	Signal error delay (n. sample)
1.22	Automatic sensor verify enable
1.23	Pipe hydraulic zero calibration
1.24	Linearization coefficient

Units



UNITS	
Diam.	mm
FR.unit	METRIC
PI1 unit	METRIC
PI2 unit	METRIC
T+ unit	METRIC
T+ unit	g
P+ unit	METRIC
P+ unit	g
T- unit	METRIC
T- unit	g
P- unit	METRIC
P- unit	g
Temp.unit	°C
Mass units	ON
Sg=kg/dm3	1.0000

2.1	Nominal diameter measure unit
2.2	Flowrate type measure unit: metric or not metric
2.3	Pulse 1 type measure unit: metric or not metric
2.4	Pulse 2 type measure unit: metric or not metric
2.5	Total direct totalizer measure unit type: metric or not metric
2.6	Total direct totalizer measure unit
2.7	Partial direct totalizer measure unit type: metric or not metric
2.8	Partial direct totalizer measure unit
2.9	Total reverse totalizer measure unit type: metric or not metric
2.10	Total reverse totalizer measure unit
2.11	Partial reverse totalizer measure unit type: metric or not metric
2.12	Partial reverse totalizer measure unit
2.13	Temperature measure unit
2.14	Enable/disable the selection of mass units on full scale set
2.15	Specific gravity coefficient

The physical display provides the following units of measurement: l/s, m^3/h, gal/mln, m^3, gal. Other units available at menus, selectable by MCP interface, they will not be displayed on the physical display, but will only display their numeric values.

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Menu Functions

Scales

```
MAIN MENU
 1-Sensor
 2-Units
 3-Scales
 4-Measure
```

```
SCALES
FS1 g/s        4908.7
FS2 g/s        4908.7
Pls1=g         1000.00
Tpls1=ms       0050.0
Pls2=g         1000.00
Tpls2=g        0050.0
Frq1=Hz        1000.00
Frq2=Hz        1000.00
```

3.1	Full scale flow rate 1
3.2	Full scale flow rate 2
3.3	Pulse value on channel 1
3.4	Duration of the pulse generated on channel 1
3.5	Pulse value on channel 2
3.6	Duration of the pulse generated on channel 2
3.7	Full scale frequency for channel 1 (0.1Hz-1000.0Hz)
3.8	Full scale frequency for channel 2 (0.1Hz-1000.0Hz)

Measures

```
MAIN MENU
 1-Sensor
 2-Units
 3-Scales
 4-Measure
 5-Alarms
 7-Outputs
```

```
MEASURES
Damping        SMART
Cut-off= %     00.1
DT Min.        ON
Autorange      ON
```

4.1	Measure filter
4.2	Low flow zero threshold: 0-25% of full scale value
4.3	Automatic calibration verify
4.4	Automatic change of measurement range

Alarms

```
MAIN MENU
 1-Sensor
 2-Units
 3-Scales
 4-Measure
 5-Alarms
 7-Outputs
```

```
ALARMS
Max+ = dm3/s   OFF
Max- = dm3/s   OFF
Min+= dm3/s    OFF
Min-= dm3/s    OFF
Hysterisis=%   03
mA v.alarm=%   000
Hz v.alarm=%   000
```

5.1	Maximum value alarm set for direct flow rate
5.2	Maximum value alarm set for reverse flow rate
5.3	Minimum value alarm set for direct flow rate
5.4	Minimum value alarm set for reverse flow rate
5.5	Hysteresis threshold set for the minimum and maximum flow rate alarms
5.6	Current output value in case of failure
5.7	Frequency output value in case of alarms

Outputs

```
MAIN MENU
 1-Sensor
 2-Units
 3-Scales
 4-Measure
 5-Alarms
 7-Outputs
```

```
OUTPUTS
Out1           PULSES+
Out2           PULSES-
Out mA1        4_22 +/-
A1S            4.9087
```

7.1	Output 1 functions
7.2	Output 2 functions
7.3	Choice of the function and the range of current output n.1
7.4	Full Scale value for analog out1

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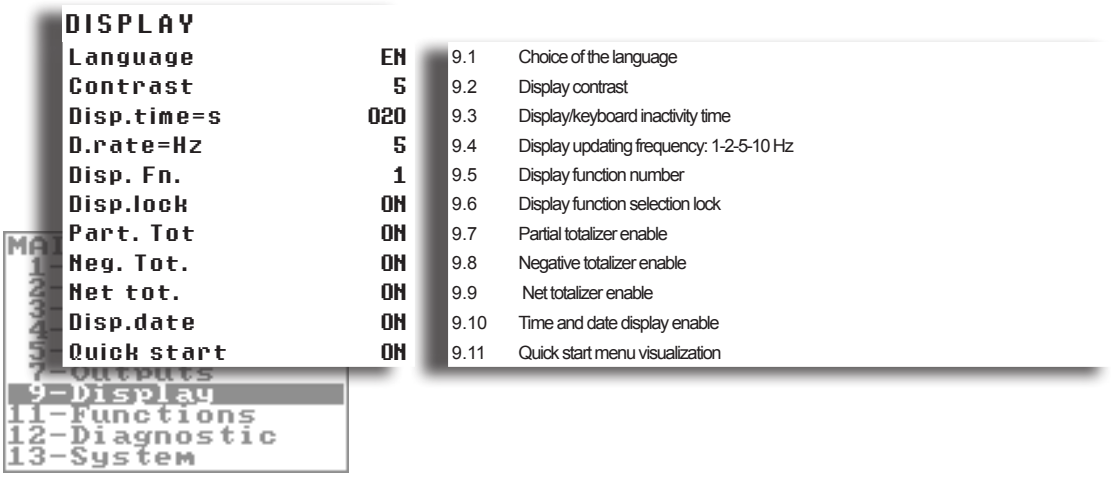
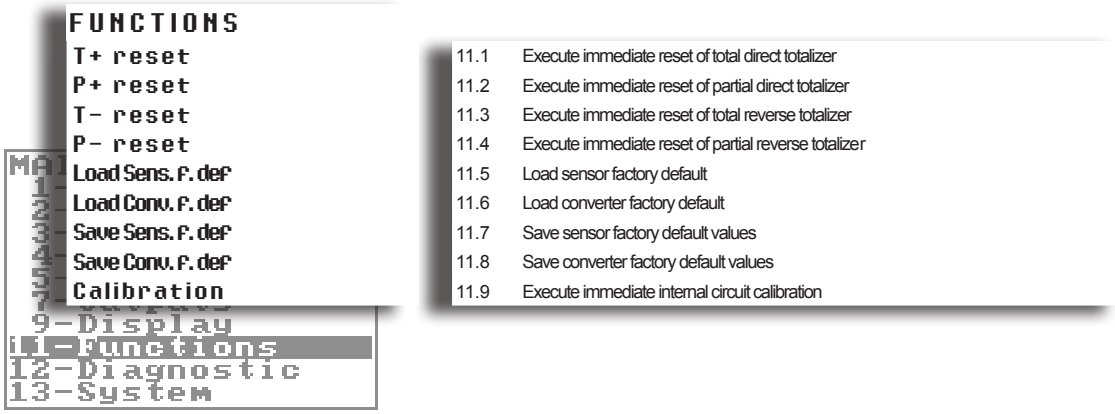
Menu Functions

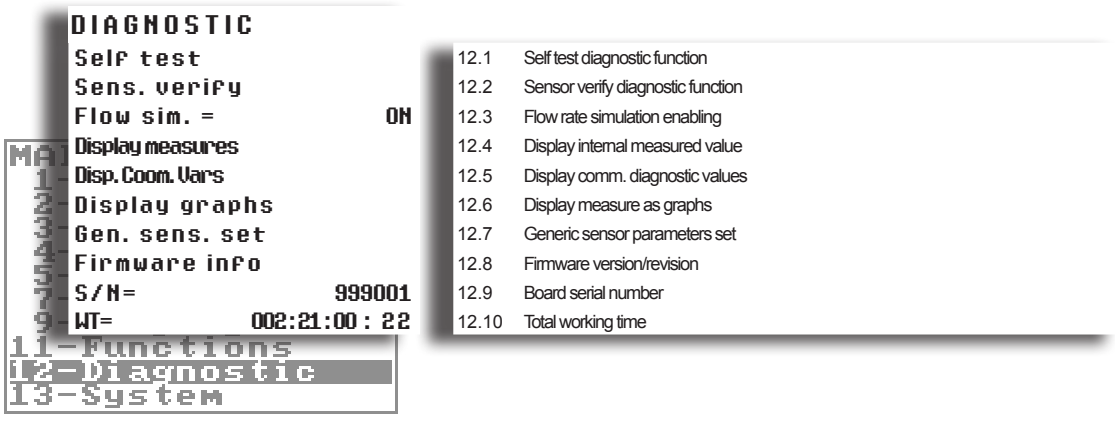
Display



Functions

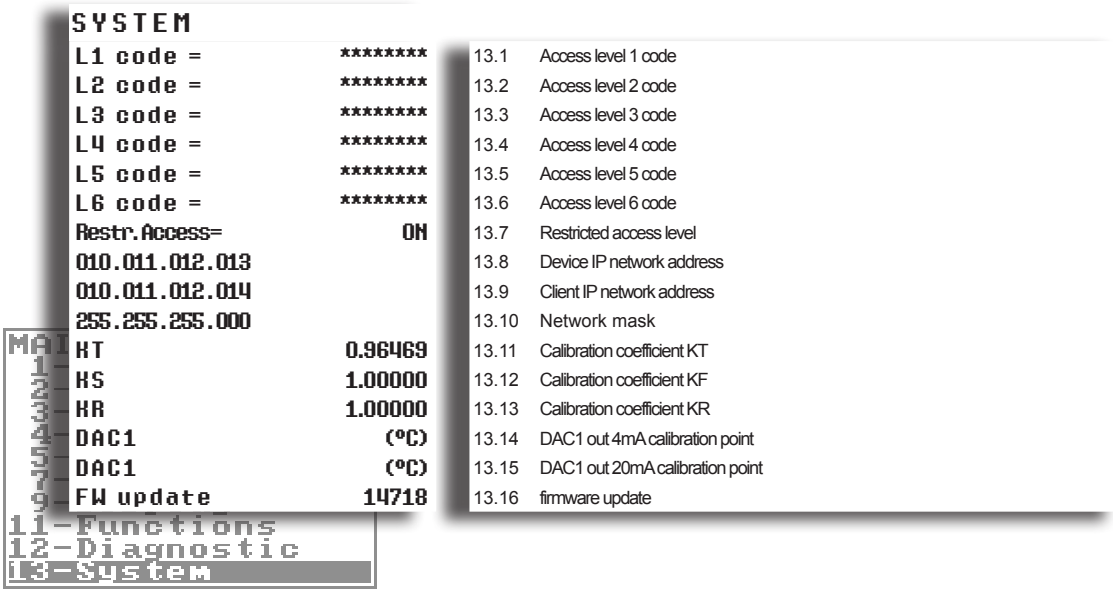


Diagnostic

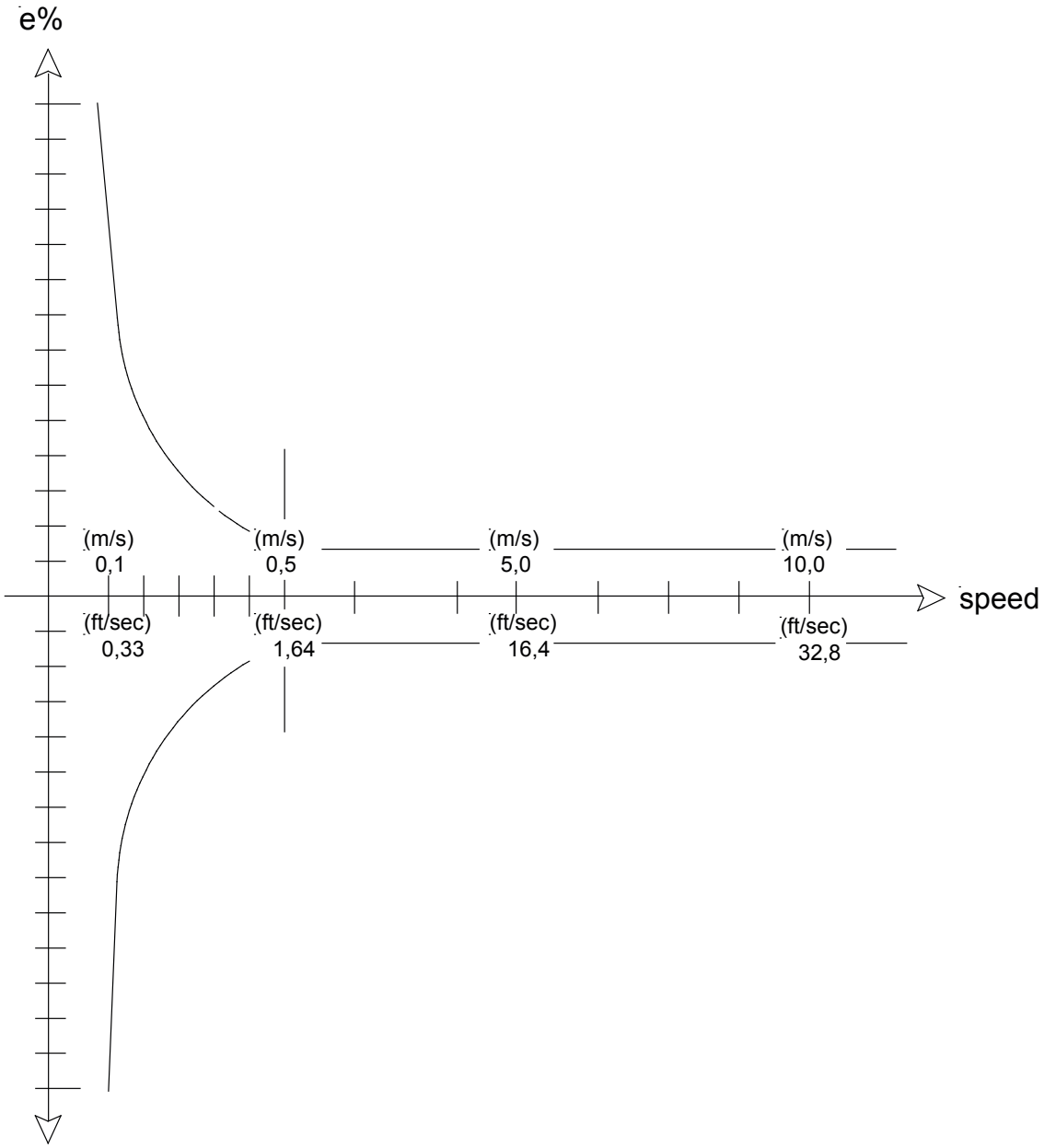


Menu Functions

System



Accuracy Table



FM130 / FM150		
A	B(m/s)	B(ft/s)
0,5	0,25	0,82

Reference conditions below and as per internal testing procedures:

Constant flow rate during the test
Pressure: >30 Kpa
Flow condition : fully developed flow profile
Zero stability +/- 0,005 %

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How to Order

CODE EXAMPLE	CODE/DESCRIPTION	
FM300		
A	A	A FM300 - Blind, N°1 freely programmable digital OUT
	B	B FM300 - Complete of DISPLAY LCD and N°1 freely programmable digital OUT (mandatory for MI001)
Housing Material/Protection Rate		
0	1	Housing in AISI304 JB RAW (with PA6 plastic cover for version with display) - IP67
	2	Housing in AISI304 JB POLISHED (with PA6 plastic cover for version with display) - IP67
	4	Housing in AISI304 RAW-IP68 (ONLY ELECTRICAL CONNECTIONS B and BLIND VERSION)
	5	Housing in AISI304 POLISHED-IP68 (ONLY ELECTRICAL CONNECTIONS B and BLIND VERSION)
Digital Output		
A	A	without Additional Digital Out
	B	n° 1 additional digital out
Analog Output		
0	0	Without Analog Out
	1	With Analog Out
Electrical Connections		
A	A	5 poles connector complete of plug
	B	2 meters of N° 5 poles cable ALREADY CONNECTED
Special Features		
0	0	None
MID Approval		
A	A	None

Example of complete to order → FM300-A0A0A0A