ISOMAG

The friendly magmeter

DATA SHEET

MV 800

Official Isoil dealer in The Netherlands:

UFM Ultrasonic Flow Management

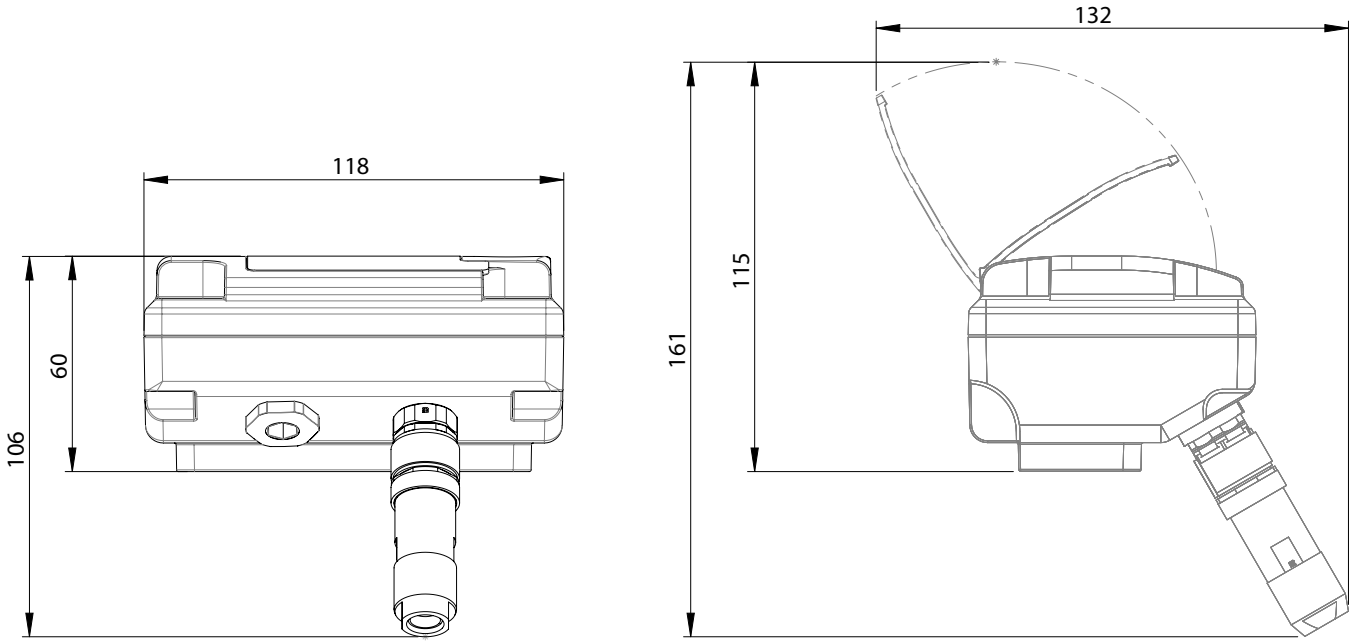
ISOIL INDUSTRIA

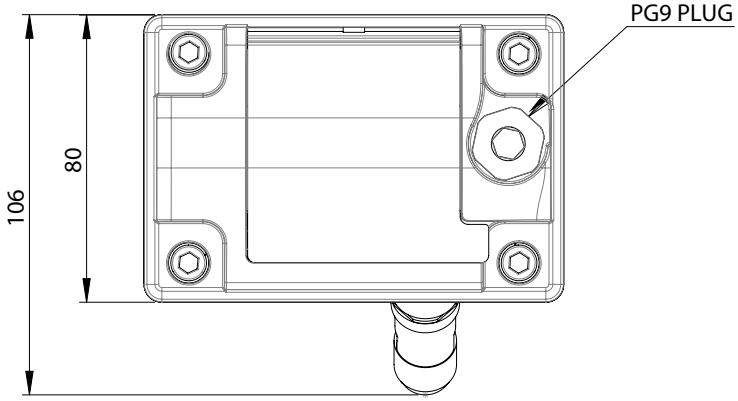
INDEX

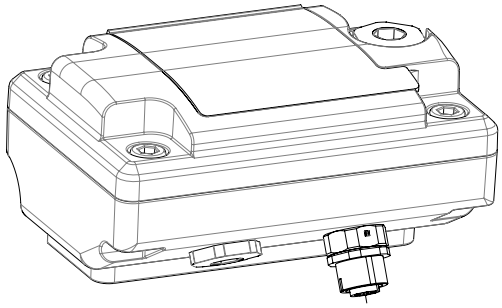
TECHNICAL DATA

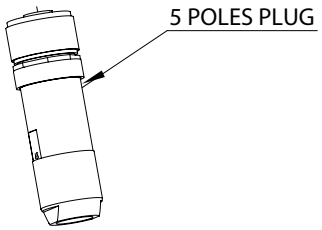
OVERALL FEATURES	
Suitable For	❑ All ISOMAG® sensors (MS1000-2500 up to ND 400)
Minimum conductivity	❑ 20 µS/cm
Altitude	❑ -200 m up to 2000 m
Ambient Temperature	❑ -20... +60°C / -4... +140 °F
Humidity Range	❑ 0÷100% (IP 67)
STANDARD FEATURES	
Housing materials	❑ Painted Aluminium die casting (Cover in PA6 with Display)
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
Programming Plug In	❑ Protected plug in for the connection to PC
Bidirectional	❑ Yes
CE Certification	❑ 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	❑ MI-001 ❑ MI-004
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

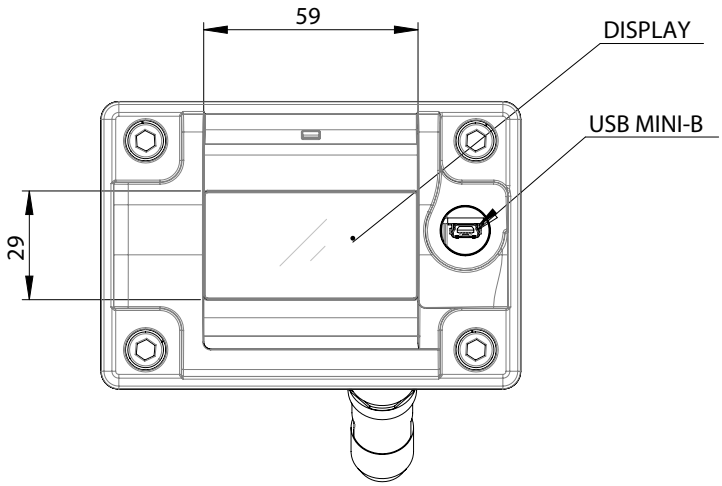
OVERALL DIMENSIONS WITH CONNECTOR



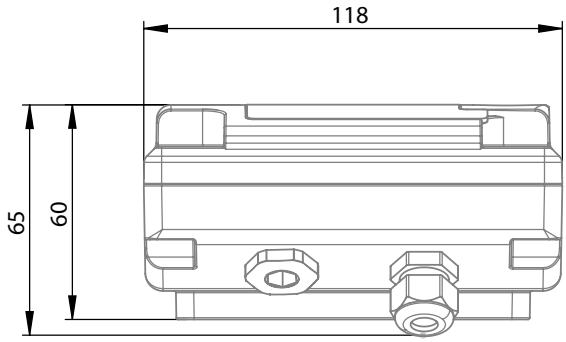


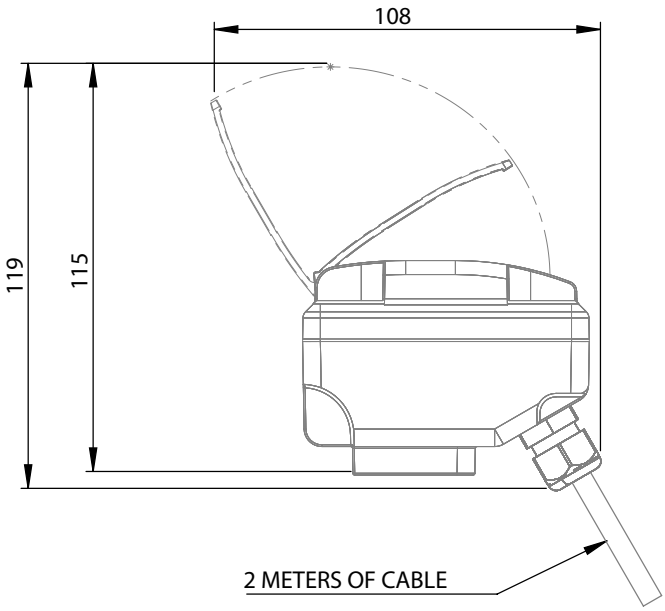


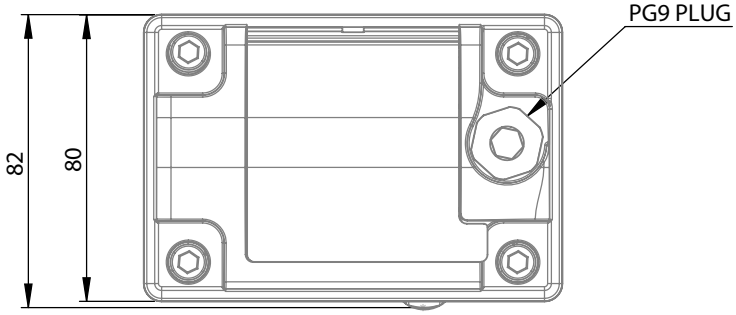


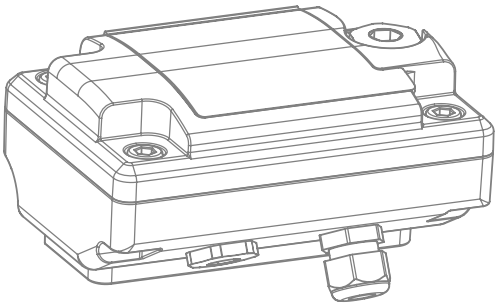


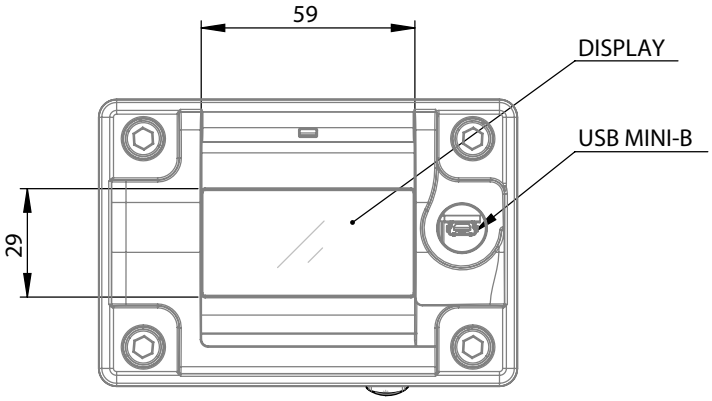
OVERALL DIMENSIONS WITH CABLE GLAND



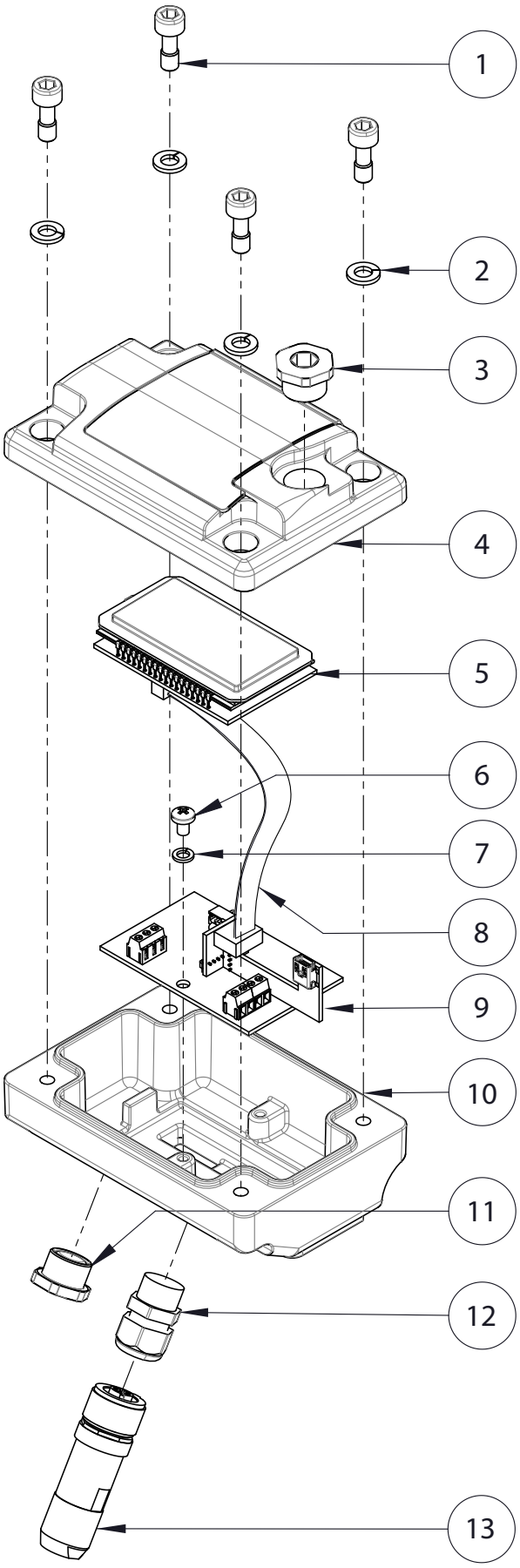








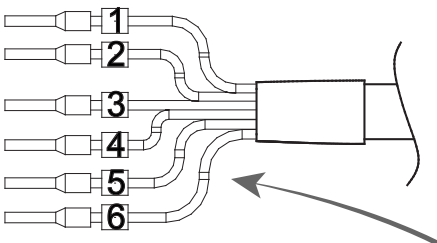
MV800 LAYOUT

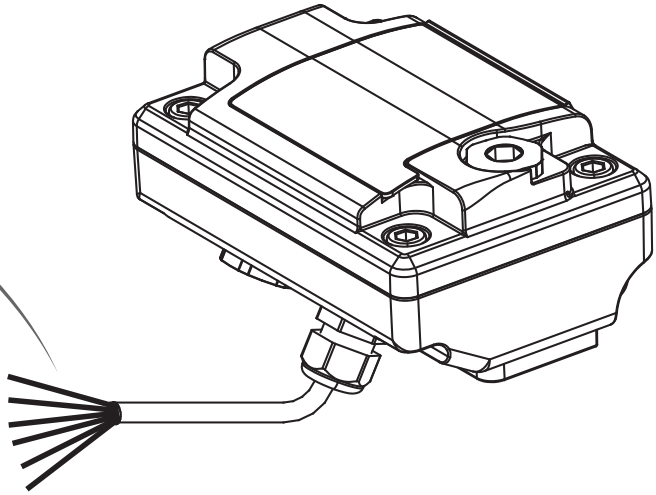


POS.	DESCRIPTION
1	SCREWS M6x16
2	GROWERS Ø6
3	PG9 PLUG
4	COVER PA06
5	DISPLAY
6	SCREWS M4X6 TC
7	GROWERS Ø 4
8	FLAT CABLE
9	MV800 PCB
10	HOUSING IN PA06/AISI 304 JB RAW OR POLISCHED
11	PG9 PLUG
12	CABLE GLANDS
13	5 POLES CONNECTOR COMPLETE OF PLUG

ELECTRICAL CONNECTIONS

Version with cable

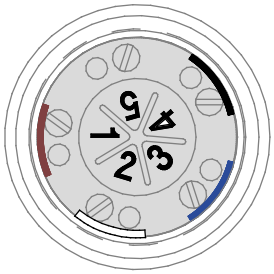


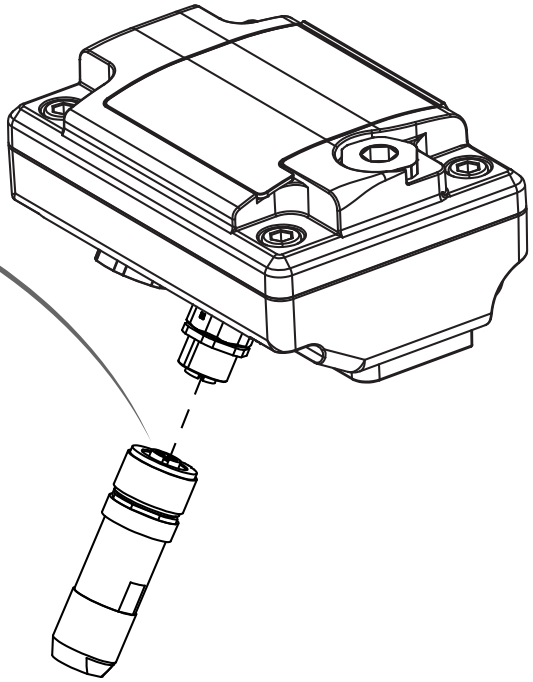


1 (+) POWER SUPPLY
2 (+) OUTPUT 1
3 (+) OUTPUT 2 (OPTIONAL)
4 (+) 4-20mA max load: 500 Ω OUTPUT (OPTIONAL)
5 (-) POWER SUPPLY / OUTPUTS
6 SHIELD (CONNECT TO GROUND)

PIN 5-6 TO BE CONNECT TO THE GROUND

Version with connector



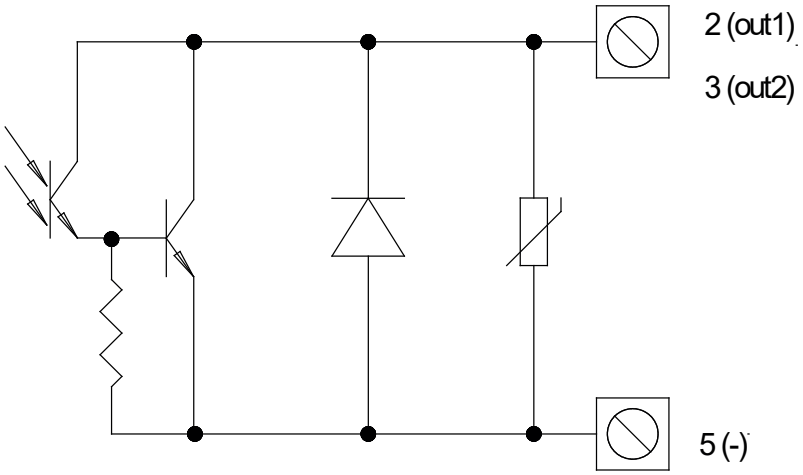


1 (+) POWER SUPPLY
2 (+) OUTPUT 1
3 (+) OUTPUT 2 (OPTIONAL)
4 (+) 4-20mA max load: 500 Ω OUTPUT (OPTIONAL)
5 (-) POWER SUPPLY / OUTPUTS

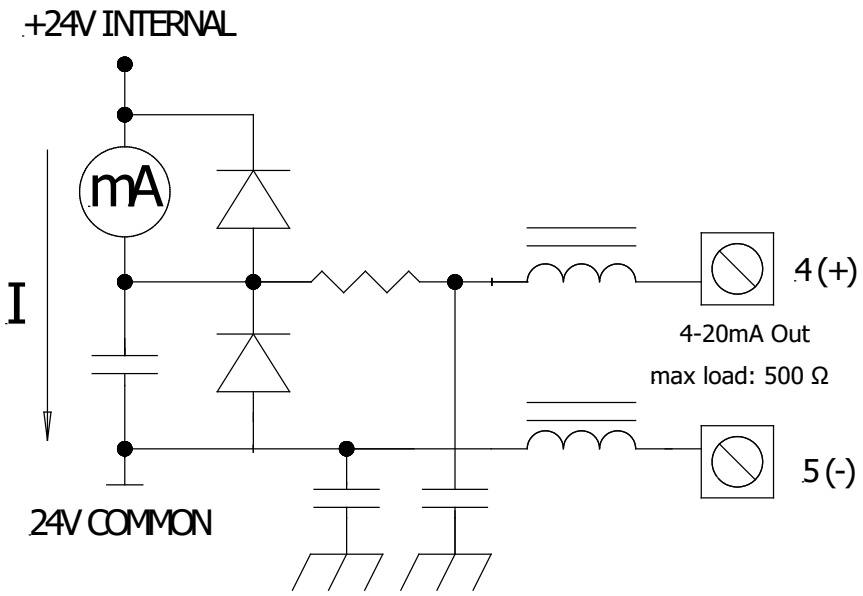
PIN 5 TO BE CONNECT TO THE GROUND

OUTPUTS: DIGITAL /ANALOG

Digital Outputs

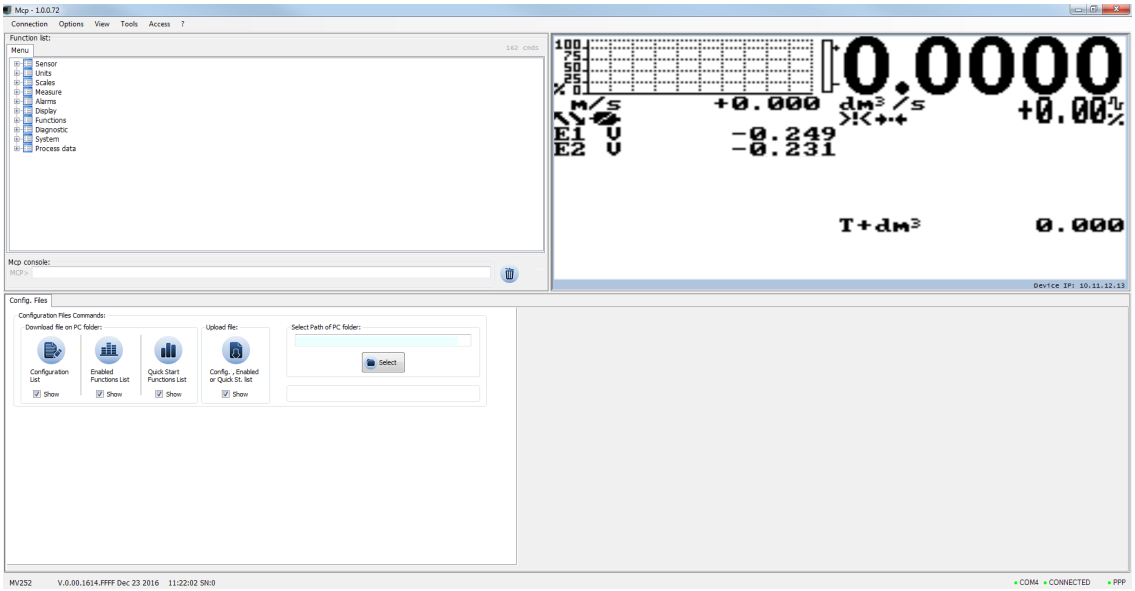


Analog Outputs



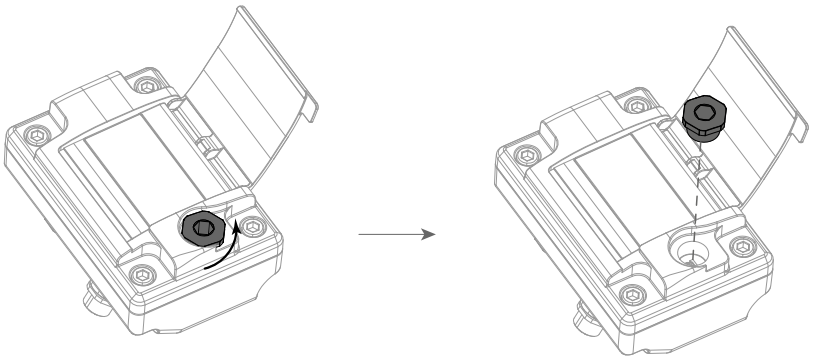
USER INTERFACE

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.

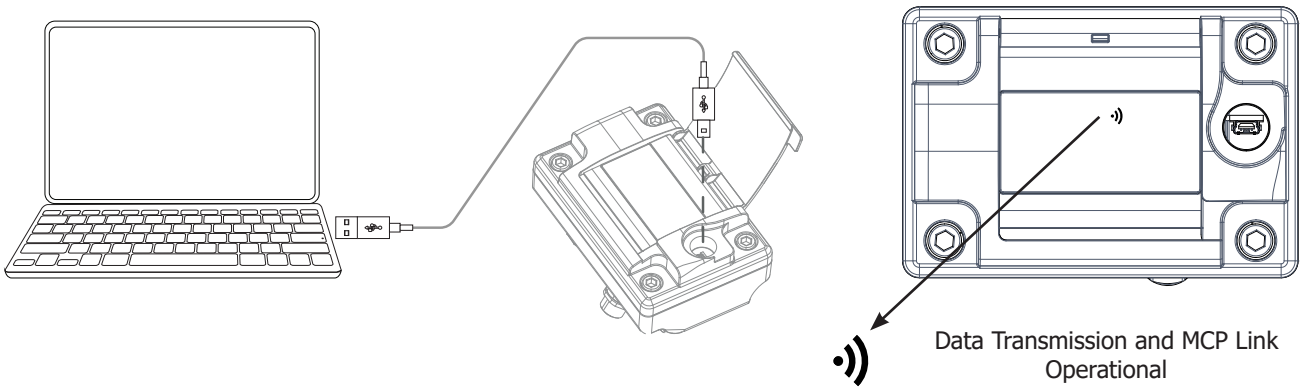


To connect the converter to the computer, connect the USB cable as shown below.

Remove the PG9 PLUG.



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



DISPLAY VISUALIZATION

EMPTY PIPE WARNING

ALARM WARNING

PROCESS ALARM

DATA TRANSMISSION

FLOW DIRECTION

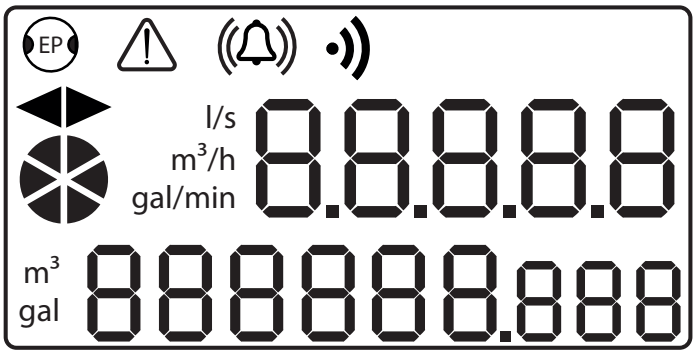
ACTIVE FLOW RATE

l/s
m^3/h
gal/min

FLOW RATE MEASURE UNIT

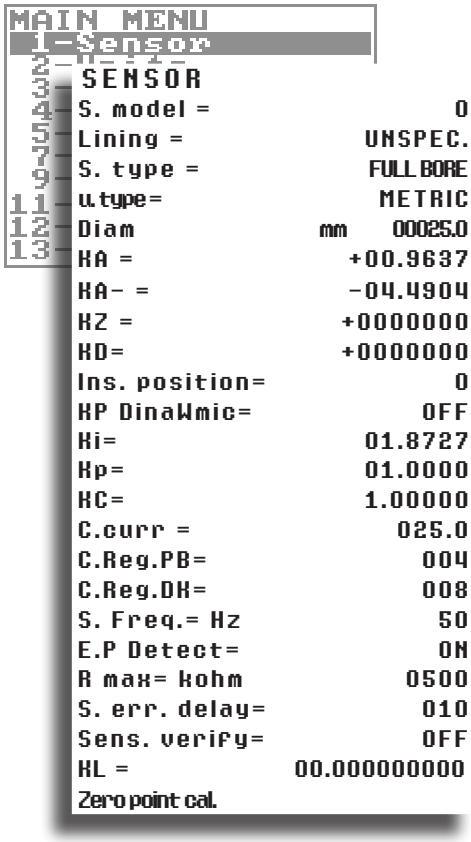
m^3
gal

TOTALIZER MEASURE UNIT



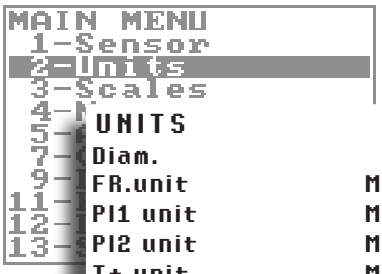
MENU FUNCTIONS

SENSOR



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

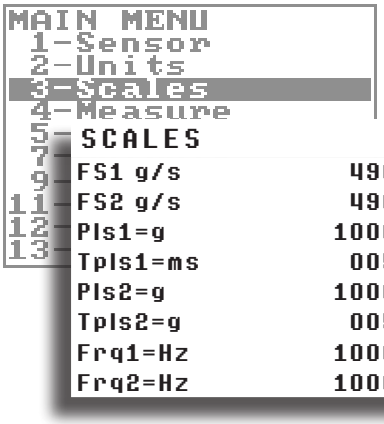
UNITS



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

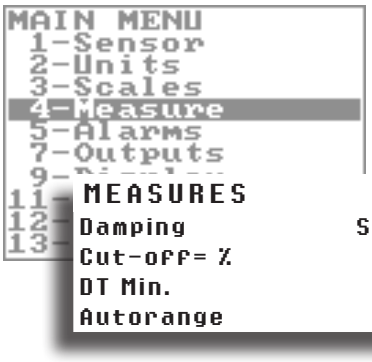
The physical display provides the following units of measurement: l/s, m^3/h, gal/mln, m^3, gal. Other units available at menus, selectable by MCP interface, they will not be displayed on the physical display, but will only display their numeric values.

SCALES



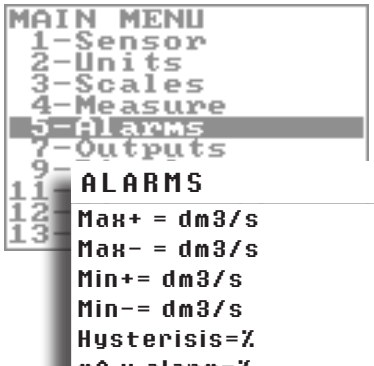
3.1	Full scale flow rate 1
3.2	Full scale flow rate 2
3.3	Pulse value on channel 1
3.4	Duration of the pulse generated on channel 1
3.5	Pulse value on channel 2
3.6	Duration of the pulse generated on channel 2
3.7	Full scale frequency for channel 1 (0.1Hz-1000.0Hz)
3.8	Full scale frequency for channel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

MEASURES



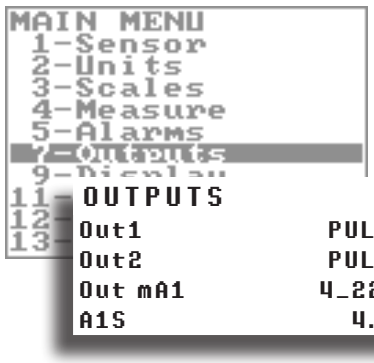
4.1	Measure filter
4.2	Low flow zero threshold: 0-25% of full scale value
4.3	Automatic calibration verify
4.4	Automatic change of measurement range

ALARMS



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

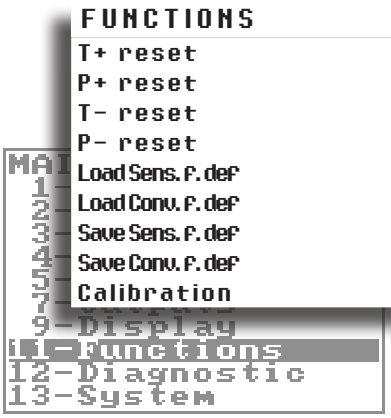


7.1	Output 1 functions
7.2	Output 2 functions
7.3	Choice of the function and the range of current output n.1
7.4	Full Scale value for analog out1

DISPLAY

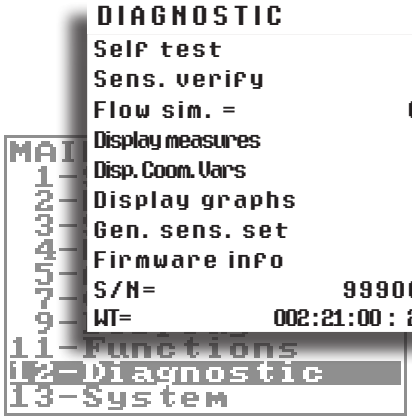
9.1	Choice of the language
9.2	Display contrast
9.3	Display/keyboard inactivity time
9.4	Display updating frequency: 1-2-5-10 Hz
9.5	Display function number
9.6	Display function selection lock
9.7	Partial totalizer enable
9.8	Negative totalizer enable
9.9	Net totalizer enable
9.10	Time and date display enable
9.11	Quick start menu visualization

FUNCTIONS



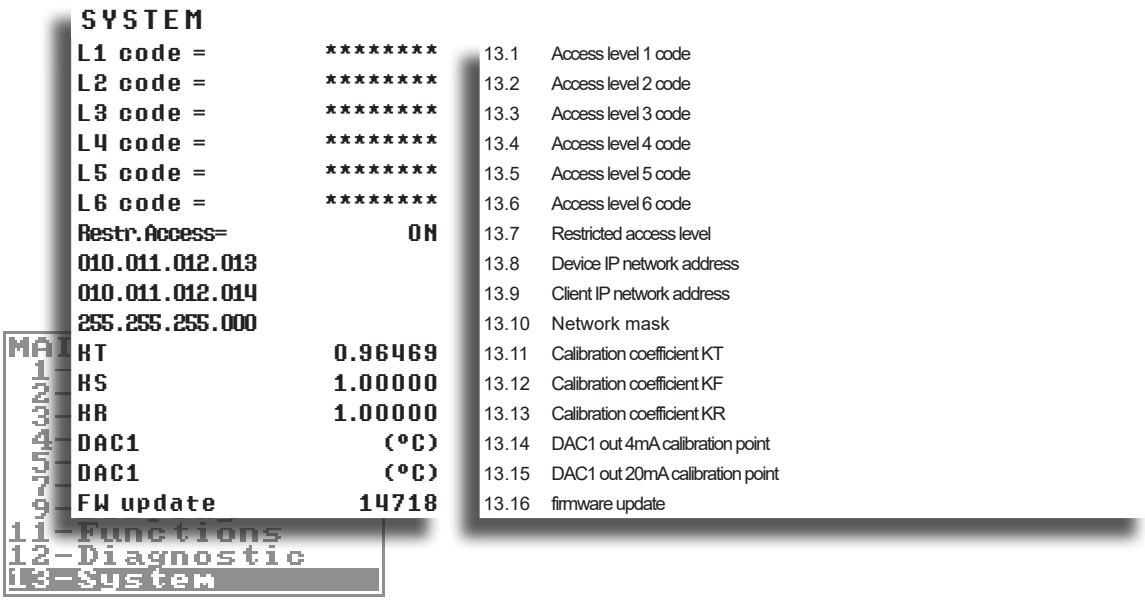
11.1	Execute immediate reset of total direct totalizer
11.2	Execute immediate reset of partial direct totalizer
11.3	Execute immediate reset of total reverse totalizer
11.4	Execute immediate reset of partial reverse totalizer
11.5	Load sensor factory default
11.6	Load converter factory default
11.7	Save sensor factory default values
11.8	Save converter factory default values
11.9	Execute immediate internal circuit calibration

DIAGNOSTIC

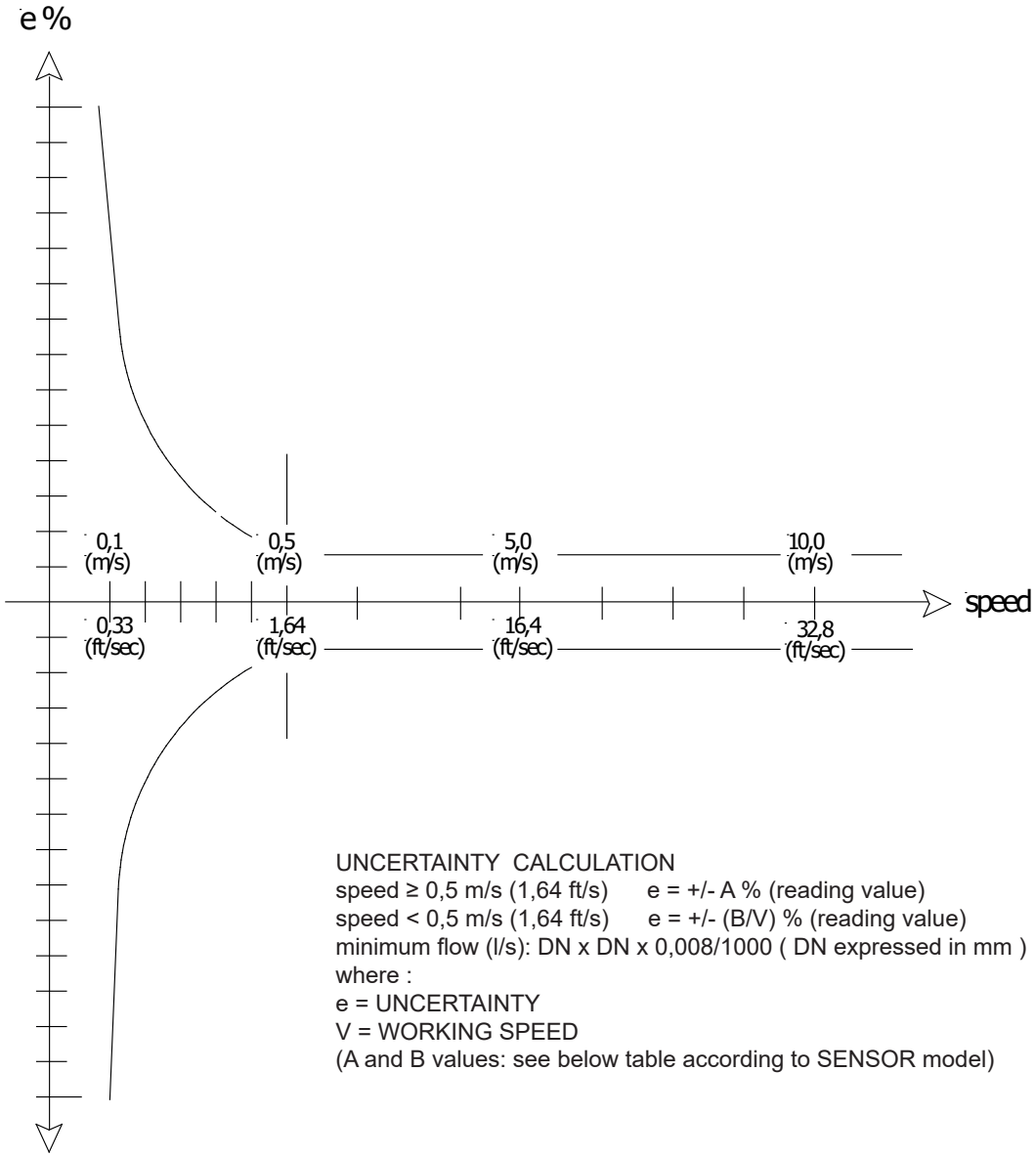


12.1	Self test diagnostic function
12.2	Sensor verify diagnostic function
12.3	Flow rate simulation enabling
12.4	Display internal measured value
12.5	Display comm. diagnostic values
12.6	Display measure as graphs
12.7	Generic sensor parameters set
12.8	Firmware version/revision
12.9	Board serial number
12.10	Total working time

SYSTEM


SYSTEM
L1 code = ********
L2 code = ********
L3 code = ********
L4 code = ********
L5 code = ********
L6 code = ********
Restr.Access= ON
010.011.012.013
010.011.012.014
255.255.255.000
KT 0.96469
KS 1.00000
KR 1.00000
DAC1 (°C)
DAC1 (°C)
FW update 14718
11-Functions
12-Diagnostic
13-System
13.1 Access level 1 code
13.2 Access level 2 code
13.3 Access level 3 code
13.4 Access level 4 code
13.5 Access level 5 code
13.6 Access level 6 code
13.7 Restricted access level
13.8 Device IP network address
13.9 Client IP network address
13.10 Network mask
13.11 Calibration coefficient KT
13.12 Calibration coefficient KF
13.13 Calibration coefficient KR
13.14 DAC1 out 4mA calibration point
13.15 DAC1 out 20mA calibration point
13.16 firmware update

ACCURACY TABLE



UNCERTAINTY CALCULATION
speed ≥ 0,5 m/s (1,64 ft/s) e = +/- A % (reading value)
speed < 0,5 m/s (1,64 ft/s) e = +/- (B/V) % (reading value)
minimum flow (l/s): DN x DN x 0,008/1000 (DN expressed in mm)
where :
e = UNCERTAINTY
V = WORKING SPEED
(A and B values: see below table according to SENSOR model)

MS1000/MS2500		
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 %

MI-001 OIML R49 CLASS1: MV800

The **MS2500** sensor's diameters listed below, coupled with **MV800**, are certified according to European Directive 2014/32/EU category MI-001 (OIML R49)

SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0,26	0,16	100
32	1 ¼	25	0,40	0,25	
40	1 ½	40	0,64	0,4	
50	2	63	1,01	0,63	
65	2 ½	100	1,60	1	
80	3	160	2,56	1,6	
100	4	250	4,00	2,5	
125	5	400	6,40	4	
150	6	630	10,08	6,3	

SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0,102	0,064	250
32	1 ¼	25	0,16	0,1	
40	1 ½	40	0,256	0,16	
50	2	63	0,403	0,252	
65	2 ½	100	0,64	0,4	
80	3	160	1,024	0,64	
100	4	250	1,6	1	
125	5	400	2,56	1,6	
150	6	630	4,032	2,52	

MI-001 OIML R49 CLASS2: MV800

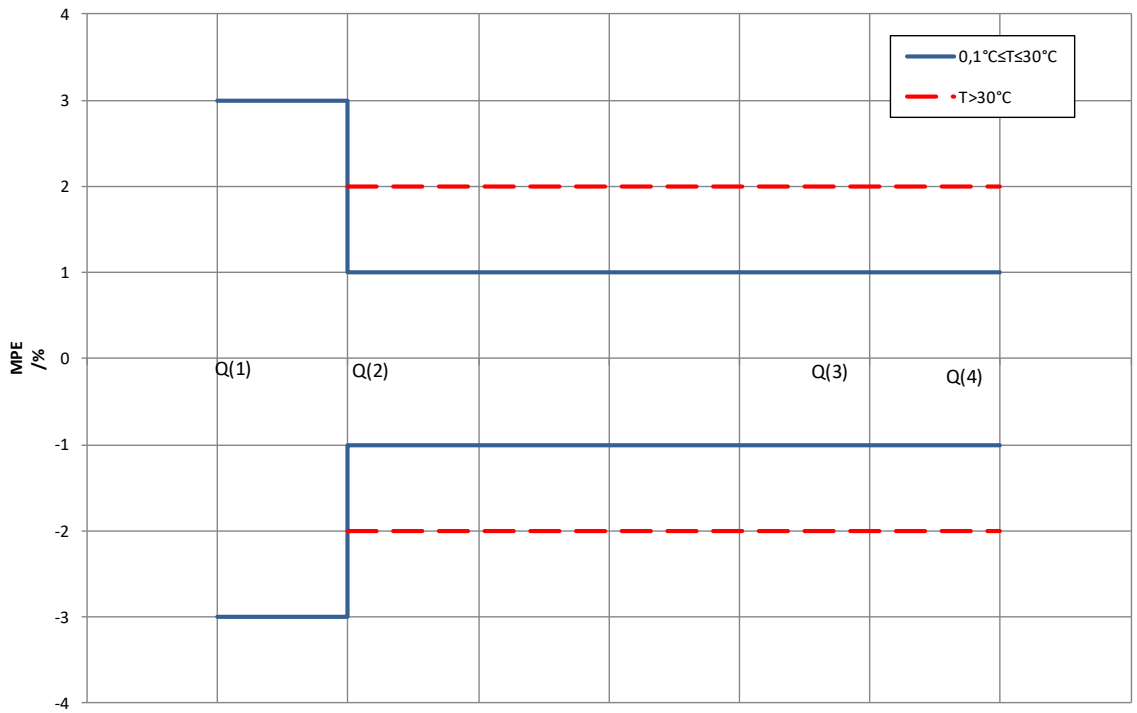
The **MS2500** sensor's diameters listed below, coupled with **MV800**, are certified according to European Directive 2014/32/EU category MI-001 (OIML R49)

SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0,16	0,1	160
32	1 ¼	25	0,25	0,16	
40	1 ½	40	0,4	0,25	
50	2	63	0,63	0,39	
65	2 ½	100	1	0,63	
80	3	160	1,6	1	
100	4	250	2,5	1,6	
125	5	400	4	2,5	
150	6	630	6,3	3,9	
200	8	630	6,3	3,9	
250	10	630	6,3	3,9	

SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0,064	0,04	400
32	1 ¼	25	0,1	0,06	
40	1 ½	40	0,16	0,1	
50	2	63	0,252	0,16	
65	2 ½	100	0,4	0,25	
80	3	160	0,64	0,4	
100	4	250	1	0,63	
125	5	400	1,6	1	
150	6	630	2,5	1,6	

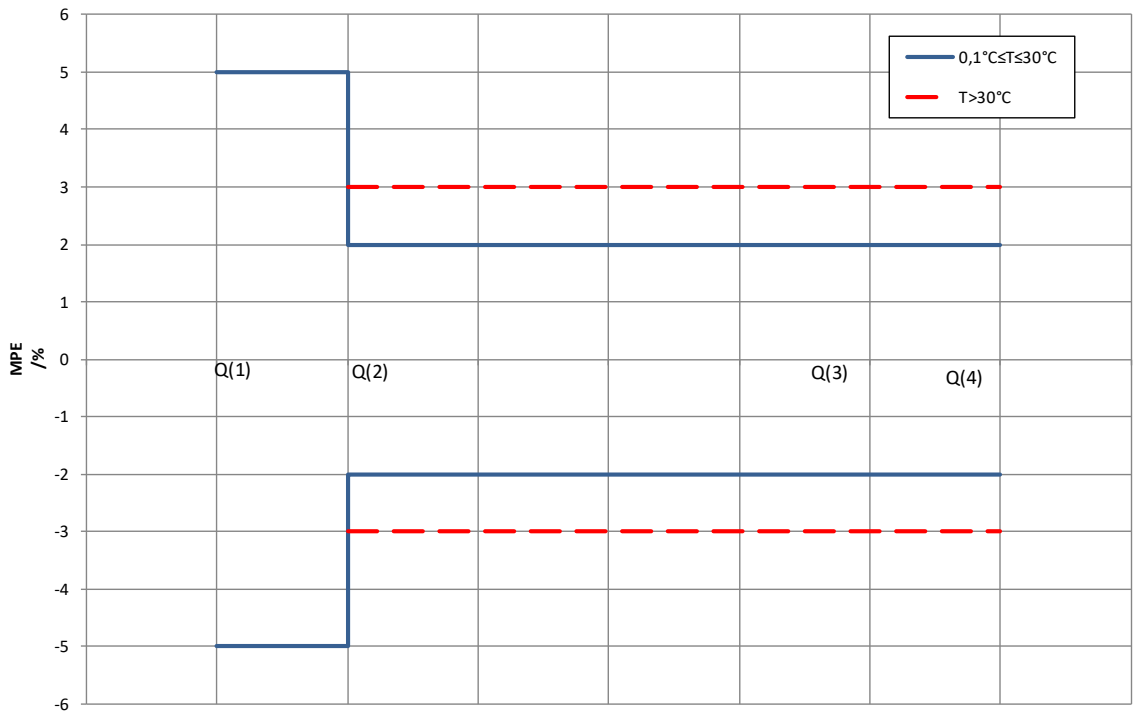
MPE - MI 001 - OIML R49 ACCURACY CLASS 1

(OIML R 49-1:2013 (E) - ISO4064-1:2017)



MPE - MI 001 - OIML R49 ACCURACY CLASS 2

(OIML R 49-1:2013 (E) - ISO4064-1:2017)



MI-004 CLASS1: MV800

The **MS2500** sensor's diameters listed below, coupled with **MV800**,are certified according to European Directive 2014/32/EU category MI-004

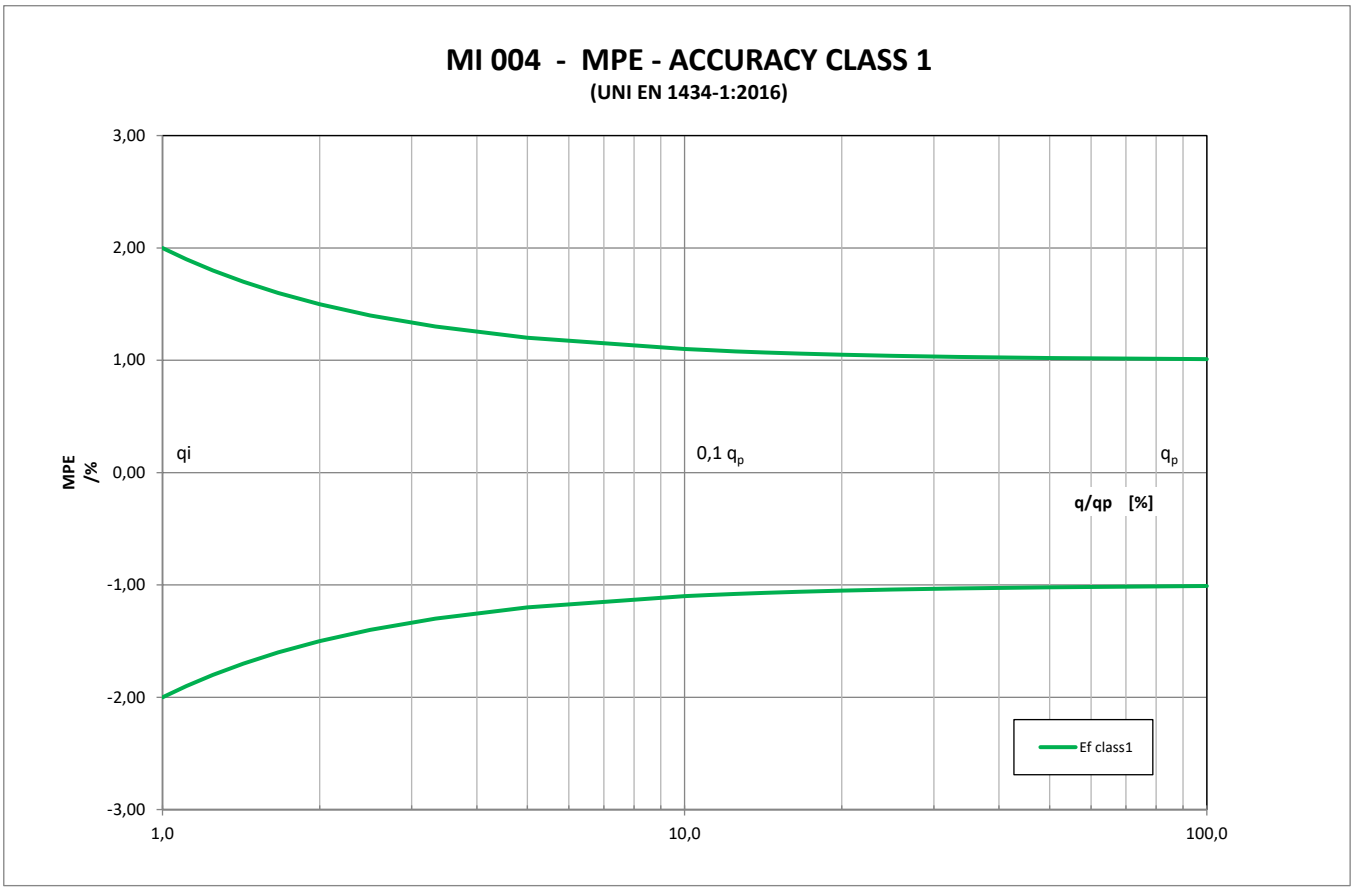
SIZE		$q_{p\ (10m/s)}$	q_s	0,1 q_p	q_i	MC
mm	inch	m3/h				q_p/q_i
25	1	16	16	1,6	0,16	100
32	1 ¼	25	25	2,5	0,25	
40	1 ½	40	40	4	0,40	
50	2	63	63	6,3	0,63	
65	2 ½	100	100	10	1,00	
80	3	160	160	16	1,60	
100	4	250	250	25	2,50	
125	5	400	400	40	4,0	
150	6	630	630	63	6,3	
200	8	1000	1000	100	10	
250	20	160	1600*	160	16	80
300	31	250	2500*	250	25	
350	31	250	2500*	250	25	
400	50	400	4000*	400	40	

SIZE		$q_{p\ (10m/s)}$	q_s	0,1 q_p	q_i	MC
mm	inch	m3/h				q_p/q_i
25	1	10	16	1	0,2	50
32	1 ¼	16	25	1,6	0,32	
40	1 ½	25	40	2,5	0,5	
50	2	40	63	4	0,8	
65	2 ½	63	100	6,3	1,26	
80	3	100	160	10	2	
100	4	160	250	16	3,2	
125	5	250	400	25	5	
150	6	400	630	40	8	
200	8	630	1000	63	12,6	
250	10	1000	1600	100	20	
300	12	1600*	2500	160	32	
350	14	2500*	2500	250	50	
400	16	2500*	4000	250	50	

SIZE		$q_{p\ (10m/s)}$	q_s	0,1 q_p	q_i	MC
mm	inch	m3/h				q_p/q_i
25	1	10	16	1	0,4	25
32	1 ¼	16	25	1,6	0,64	
40	1 ½	25	40	2,5	1	
50	2	40	63	4	1,6	
65	2 ½	63	100	6,3	2,52	
80	3	100	160	10	4	
100	4	160	250	16	6,4	
125	5	250	400	25	10	
150	6	400	630	40	16	
200	8	630	1000	63	25,2	
250	10	1000	1600	100	40	
300	12	1600*	2500	160	64	
350	14	2500*	2500	250	100	
400	16	2500*	4000	250	100	

SIZE		$q_{p\ (10m/s)}$	q_s	0,1 q_p	q_i	MC
mm	inch	m3/h				q_p/q_i
25	1	10	16	1	1	10
32	1 ¼	16	25	1,6	1,6	
40	1 ½	25	40	2,5	2,5	
50	2	40	63	4	4	
65	2 ½	63	100	6,3	6,3	
80	3	100	160	10	10	
100	4	160	250	16	16	
125	5	250	400	25	25	
150	6	400	630	40	40	
200	8	630	1000	63	63	
250	10	1000	1600	100	100	
300	12	1600*	2500	160	160	
350	14	2500*	2500	250	250	
400	16	2500*	4000	250	250	

(*) : Reduced flowrates to the test rig limits


MI 004 - MPE - ACCURACY CLASS 1
(UNI EN 1434-1:2016)
3,00
2,00
1,00
0,00
-1,00
-2,00
-3,00
MPE /%
qi
0,1 qp
qp
q/qp [%]
Ef class1
1,0
10,0
100,0

HOW TO ORDER

CODE EXAMPLE	CODE / DESCRIPTION	
	MV 800	
A	A	MV800 - Blind, N°1 freely programmable digital OUT
	B	MV800 - Complete of DISPLAY LCD and N°1 freely programmable digital OUT (mandatory for MI001)
	Housing material / Protection rate	
0	0	Housing in painted Alluminum (with PA6 plastic cover for version with display) - IP67
	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
	3	Housing in painted Alluminum-IP68 (ONLY ELECTRICAL CONNECTIONS B and BLIND VERSION)
	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
	B	MI-001/OIMLR49-CLASS 1
	C	MI-001/OIMLR49-CLASS 2
	D	MI-004-CLASS 1

Example of complete code to order → **MV800-A0A0A0A**

Due to the constant technical development and improvement of its products, the manufacturer reserves the right to make changes and/or modify the information contained in this document without prior notice.

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