ISOMAG™

The friendly magmeter

DATA SHEET

MV145

Official Isoil dealer in The Netherlands:

UFM

ISOIL INDUSTRIA

INDEX

TECHNICAL DATA

OVERALL FEATURES	
Suitable For	❑ All the ISOMAG® sensors
Minimum conductivity	❑ 5 µS/cm
Altitude	❑ -200 m up to 4000 m
Ambient Temperature	❑ -20... +60°C / -4... +140 °F - Aluminium housing ❑ -10... +50°C / -4... +104 °F - Reinforced Nylon
Humidity Range	❑ 0÷100%

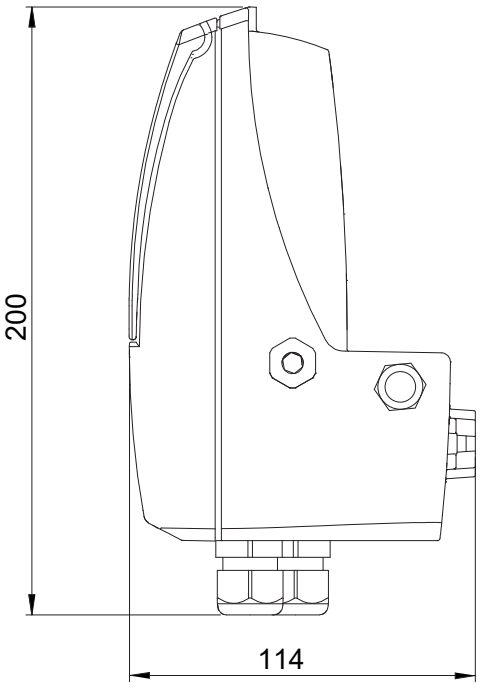
STANDARD FEATURES	
Version	❑ Compact ❑ Separate
Housing materials	❑ Painted Aluminium die casting Or Nylon reinforced with 15% of fiber glass
Protection Rate	❑ IP 67
Power Supply/Consumption	❑ Network/ Primary Lithium Batteries / Alkaline Batteries (50mW ... 4W)
Cable Gland	❑ N° 5 cable gland PG 11
Full scale value	❑ 0,4...10m/s
Dig. Input	❑ N°1 , programmable function (i.e. Totalizer reset)
Data Storage	❑ F-Ram
Galvanic Insulation	❑ Digital inputs/outputs are galvanically insulated, output 4-20mA and RS485 port are not insulated.
Programming Plug In	❑ PC connection via USB (A / USB MINI B type cable must be used)
Bidirectional	❑ Yes
Diagnostic Funct.	❑ Yes
Empty Pipe Detect.	❑ Yes
CE Certification	❑ Yes

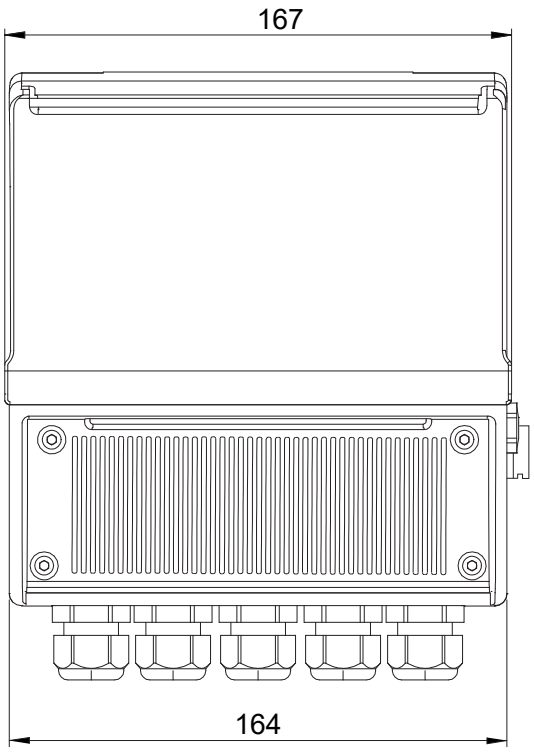
OPTIONAL FEATURES (CHECK HOW TO ORDER, AT LAST PAGE, FOR MORE DETAILS)	
Protection Rate	❑ IP 68 (Aluminium)
Conn. Sensor Cable	❑ CABLE C015-C016
LCD Display	❑ 128x64 pixel backlit graphic display (Main power version only), with 3 keys for programming
Outputs: **Pulses/ Alarm**	❑ N°2...4 DIGITAL OUTPUT, Max 50 Hz, 100mA, 30 V (AC/DC) ❑ N°1...3 DIGITAL INPUT
Analog Output	❑ N ° 1 Analog Output 4 ... 20 mA
Data logger	❑ MicroSD Memory 4 GB : Data Logger + RTC (Real Time Clock) ❑ MicroSD Memory 4 GB : Data Logger + RTC (Real Time Clock) + BIV (Built In Verificator) ❑ MicroSD Memory 4 GB : Data Logger + RTC (Real Time Clock) + Meter Data (Real Time Converter & Sensor Data on SD Memory) ❑ MicroSD Memory 4 GB : Data Logger + RTC (Real Time Clock) + BIV + Meter Data
Communication Gateway	❑ RS 485
Data Logger	❑ MicroSD Memory Card 4...32 GBytes
Protocols	❑ ModBus RTU (speed range setting bps: 4800 /9600 / 19200/ 22800/ 38400/ 57600)
MID Certifications	❑ MI-001

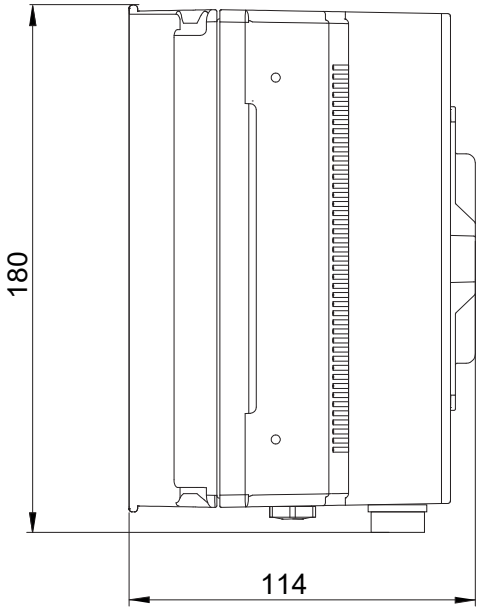
ACCURACY	
Accuracy (Whole System Converter+Sensor)	❑ See table below

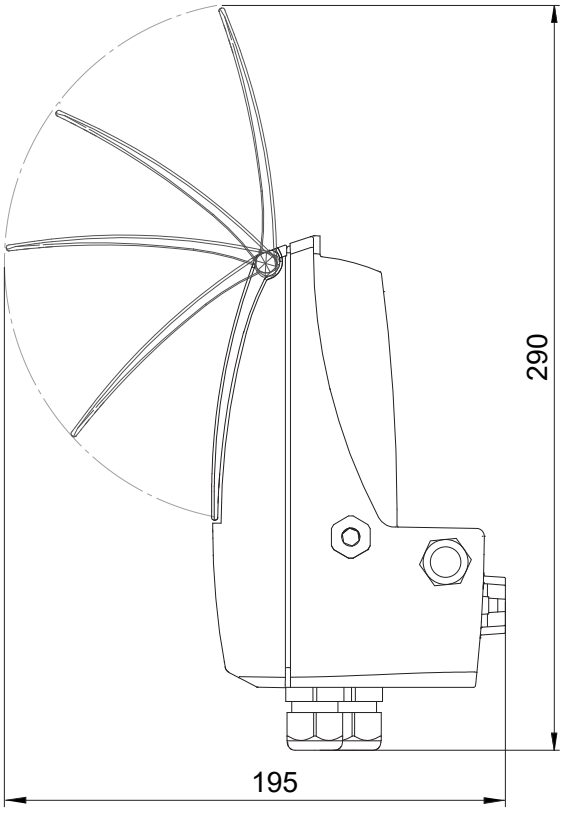
OVERALL DIMENSIONS

Without battery pack

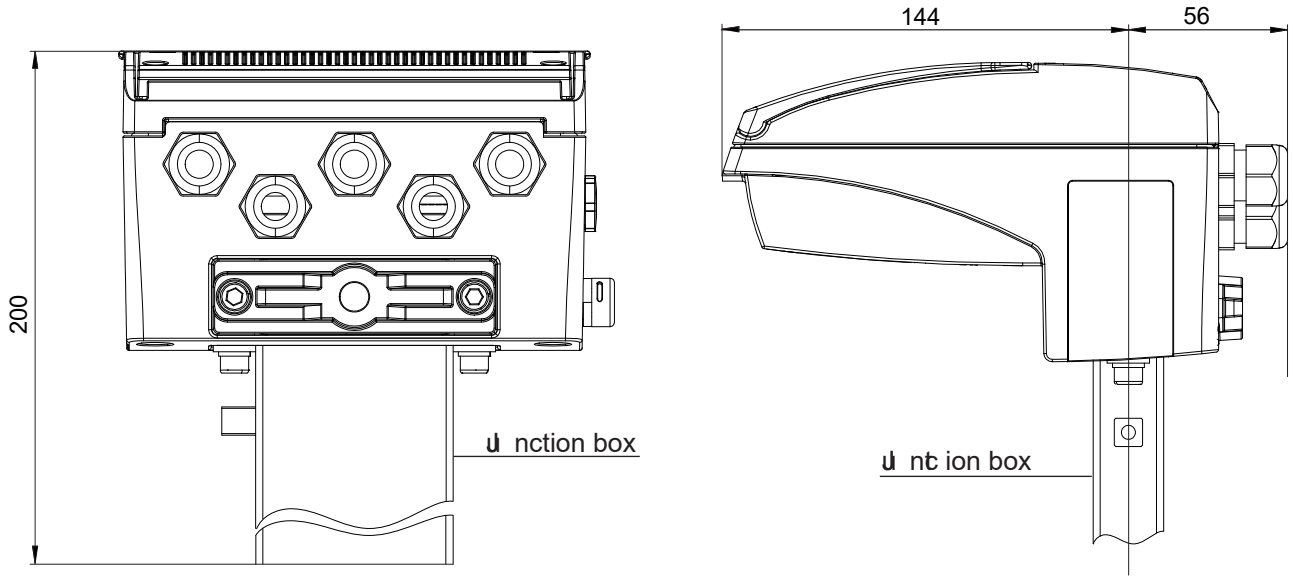




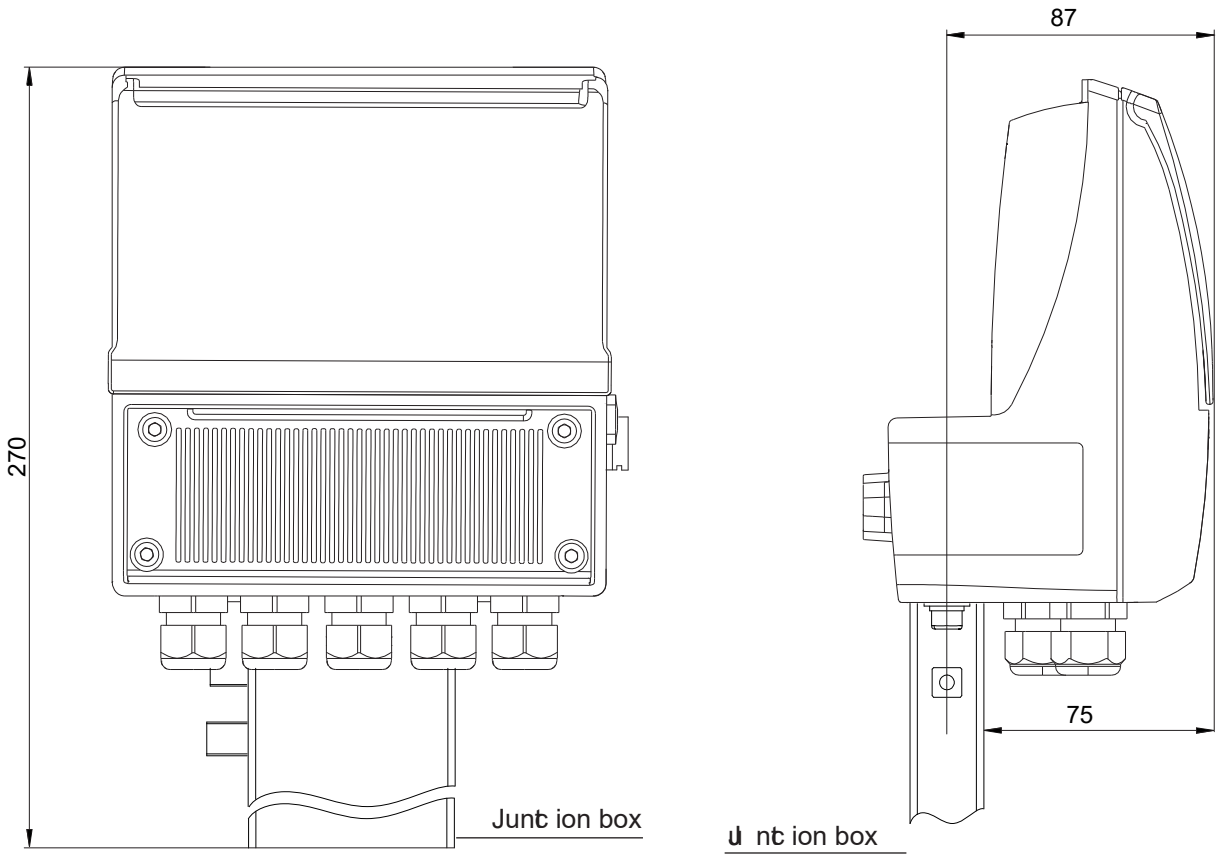




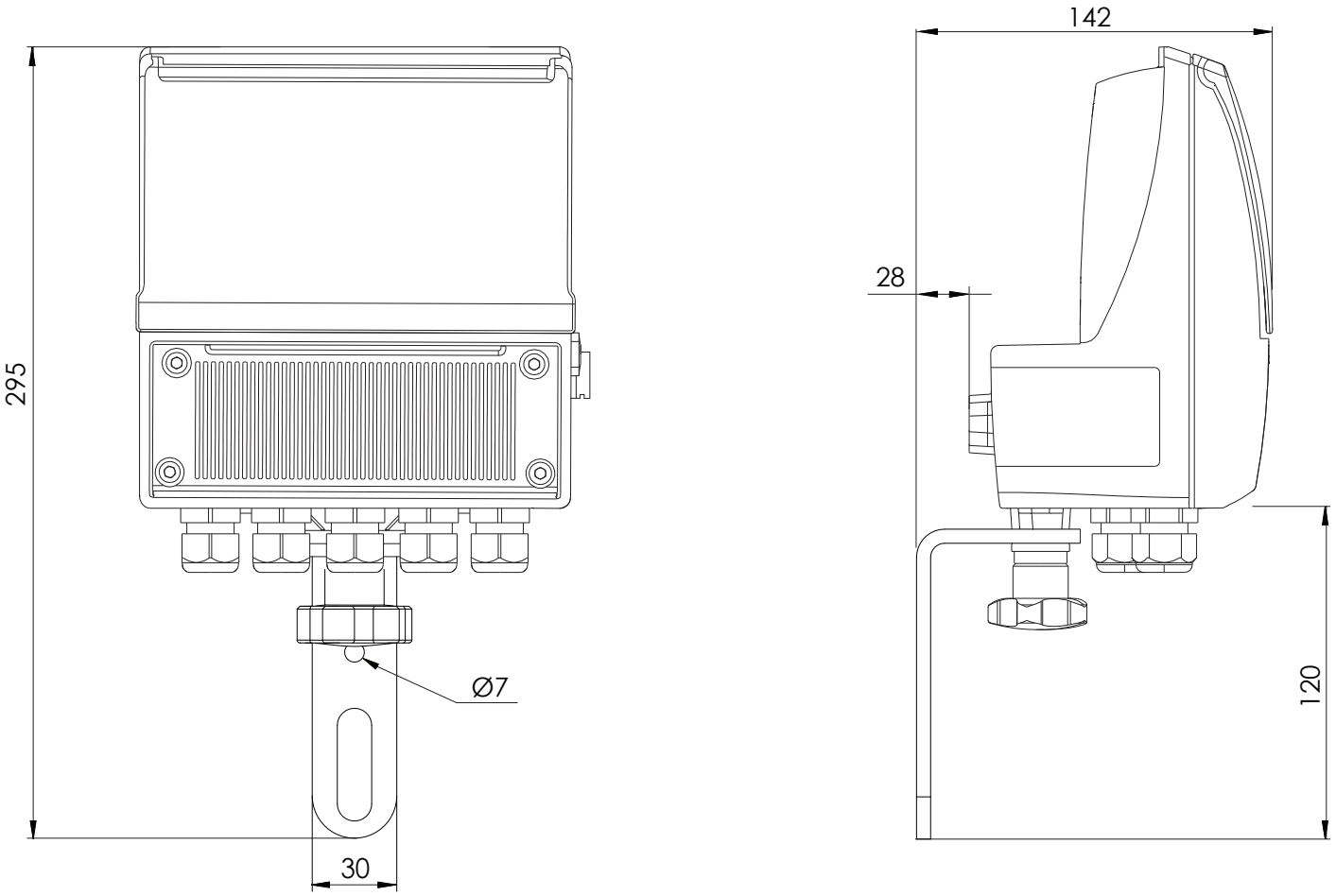
Orrizontal compact version



Vertical compact version

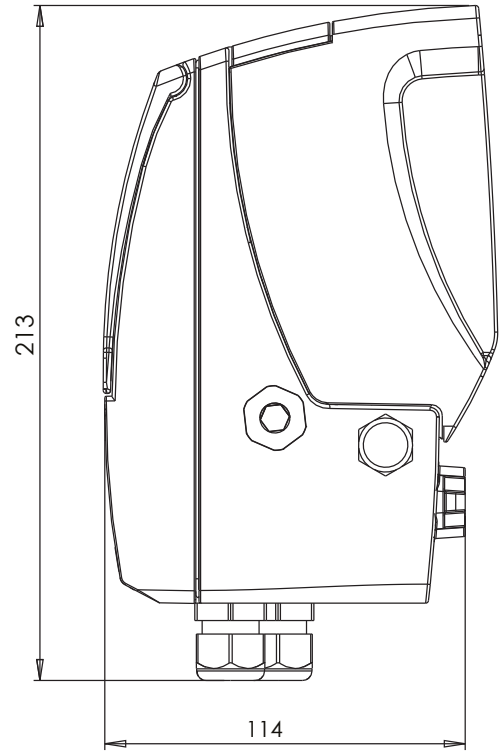


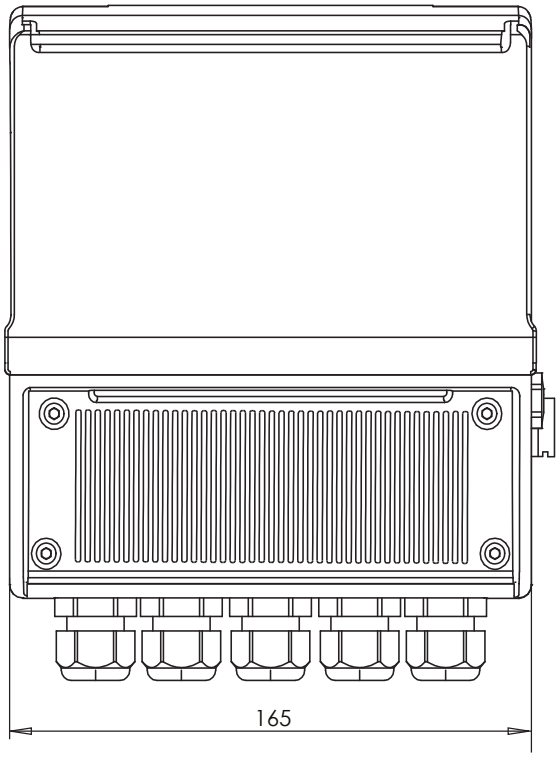
Separate (wall) version

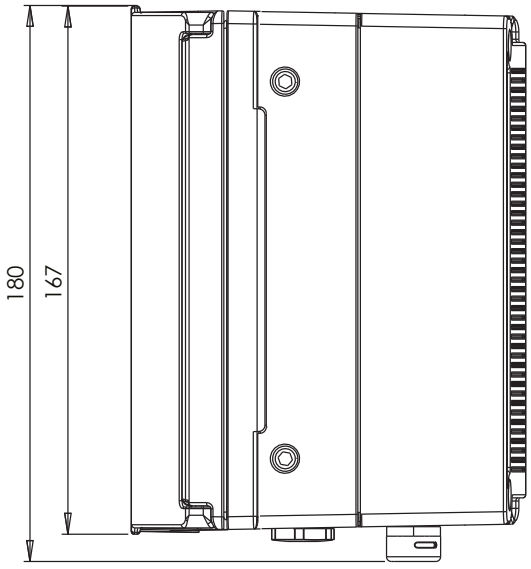


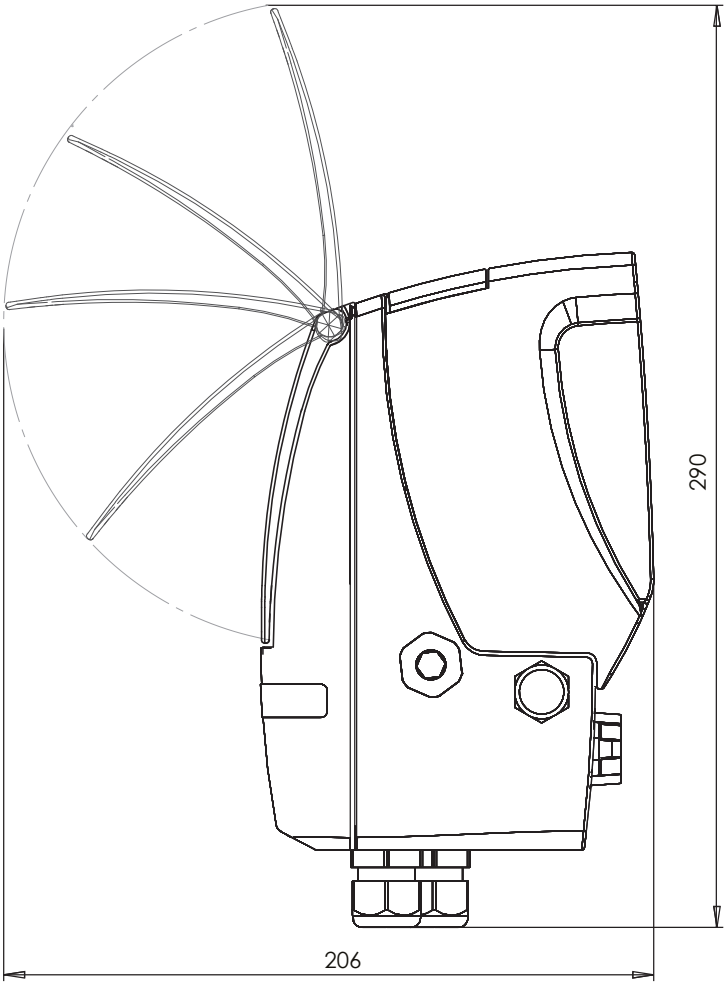
OVERALL DIMENSIONS

With battery pack

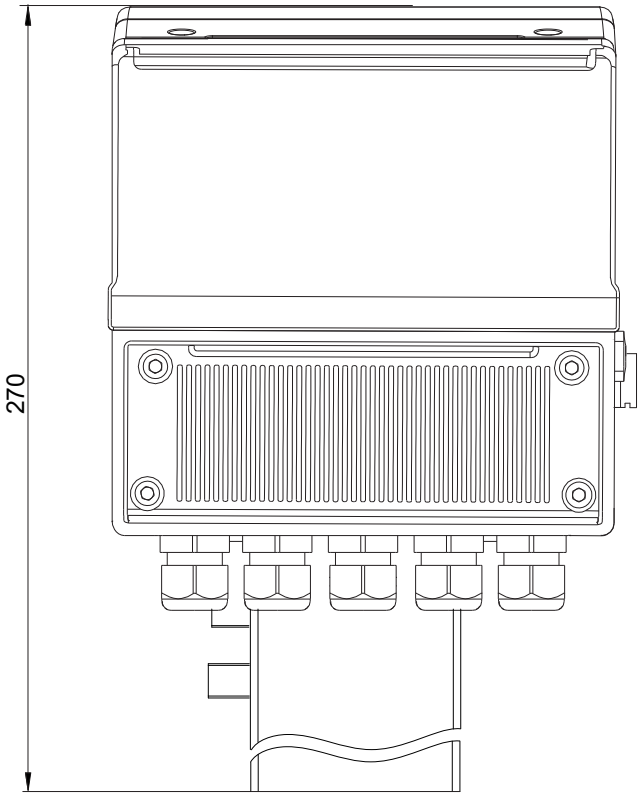


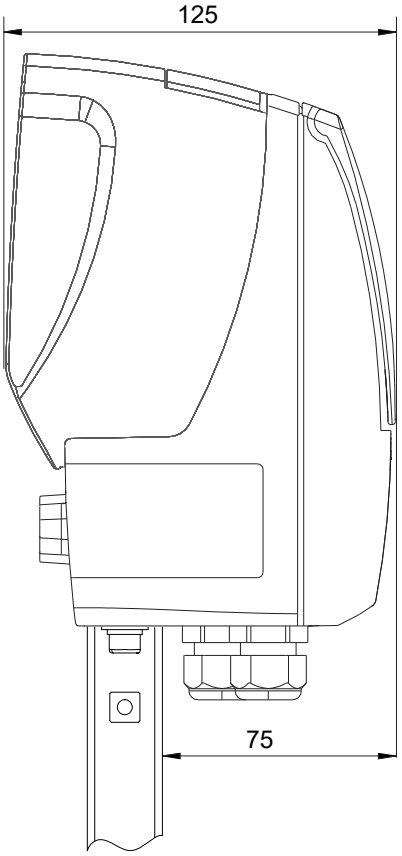




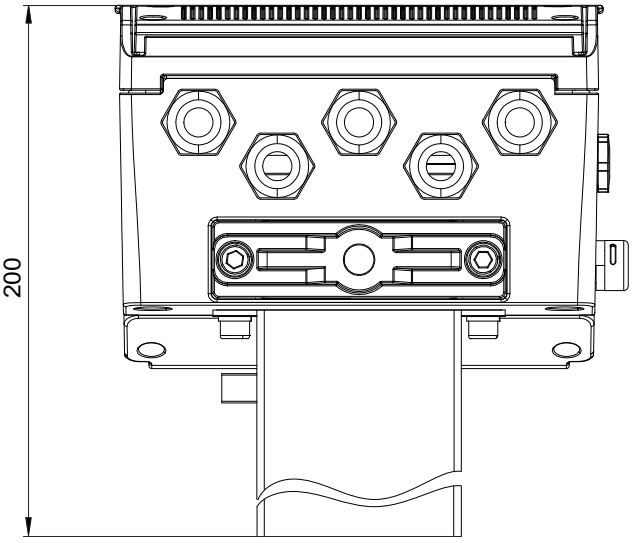


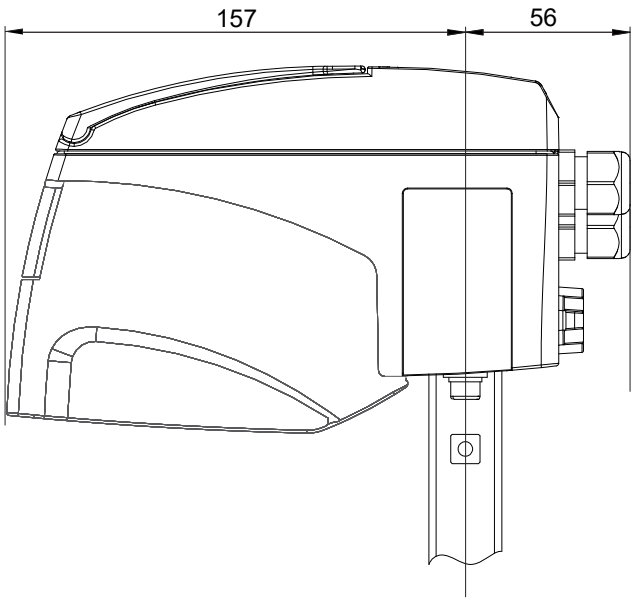
Orrizontal compact version



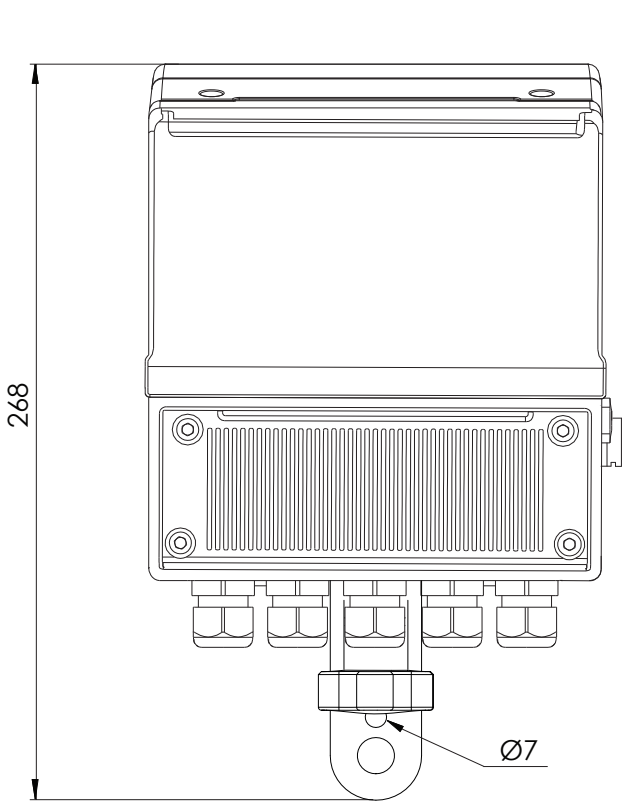


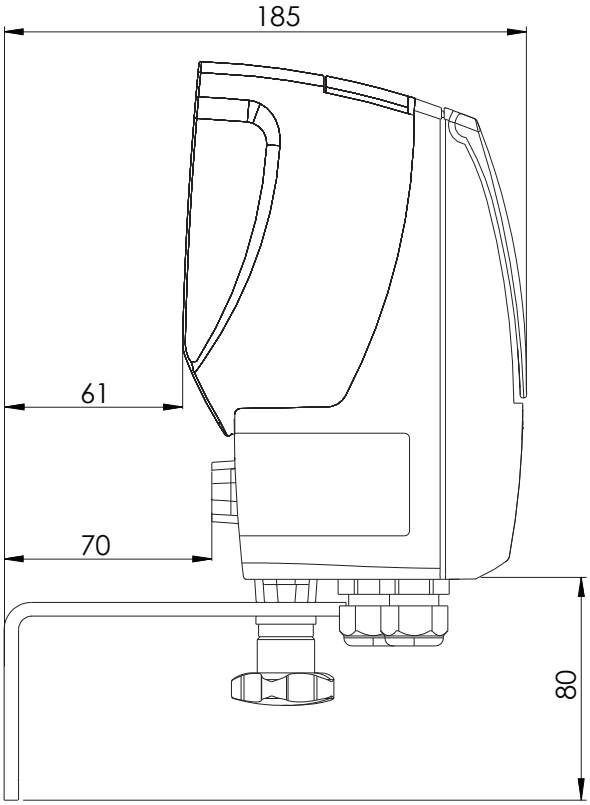
Vertical compact version





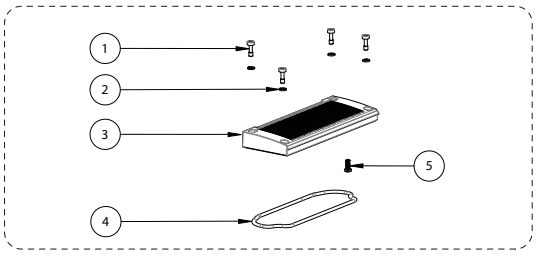
Separate (wall) version



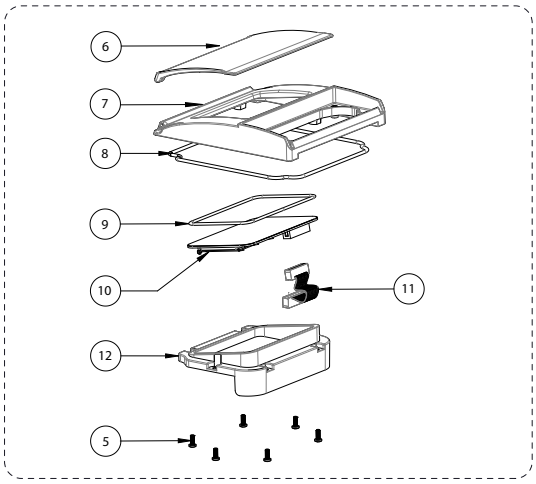


MV145 EXPLODED LAYOUT

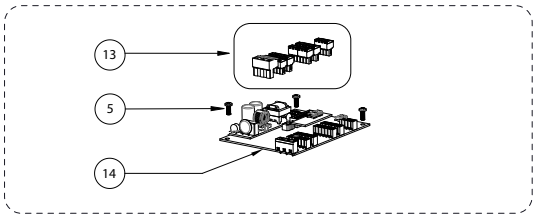
TERMINAL BLOCK COVER



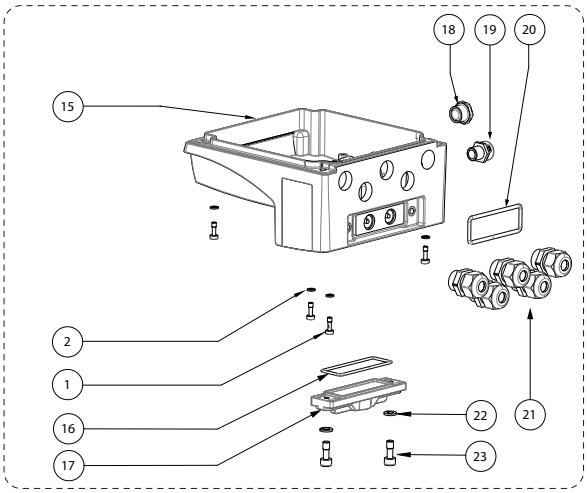
MAIN HOUSING COVER



PCB MV145

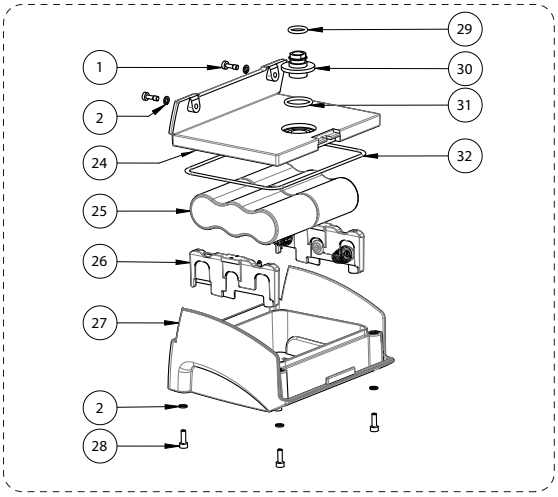


MAIN HOUSING



POS.	DESCRIPTION	
	PA6 VERSION	ALUMINIUM VERSION
1	SCREW M4x 2	SCREW M5x12
2	GROWER WASHER Ø4	GROWER WASHER Ø5
3	TERMINAL BLOCK COVER	TERMINAL BLOCK COVER
4	O-RING-4400	
5	SELF-TAPPING SCREW 4x 0	TRILOBULAR SCREW 4x 0
6	PROTECTION COVER	
7	HOUSING COVER	HOUSING COVER
8	ORING-4700	
9	ORING-1178	
10	DISPLAY	
11	FLAT CABLE	
12	PA6 FIXING DISPLAY FRAME	
13	TERMINAL BLOCK SOLID WIRE: 26-16 AWG / 0.129-1.31 mm² STRANDED WIRE: 26-16 AWG / 0.129-1.31 mm² TORQUE: 3.0 Lb.In / 0.34 Nm	
14	PCB MV145	
15	MAIN HOUSING	MAIN HOUSING
16	O-RING-155	
17	PA6 VERSION CAP	
18	PG9 CAP	
19	PRESSURE COMPENSATION PLUG	
20	O-RING-155	
21	PG11 CABLE GLAND CABLE DIAMETER: Ø5-Ø10mm	
22	GROWER WASHER Ø6	
23	SCREW M6x 6	

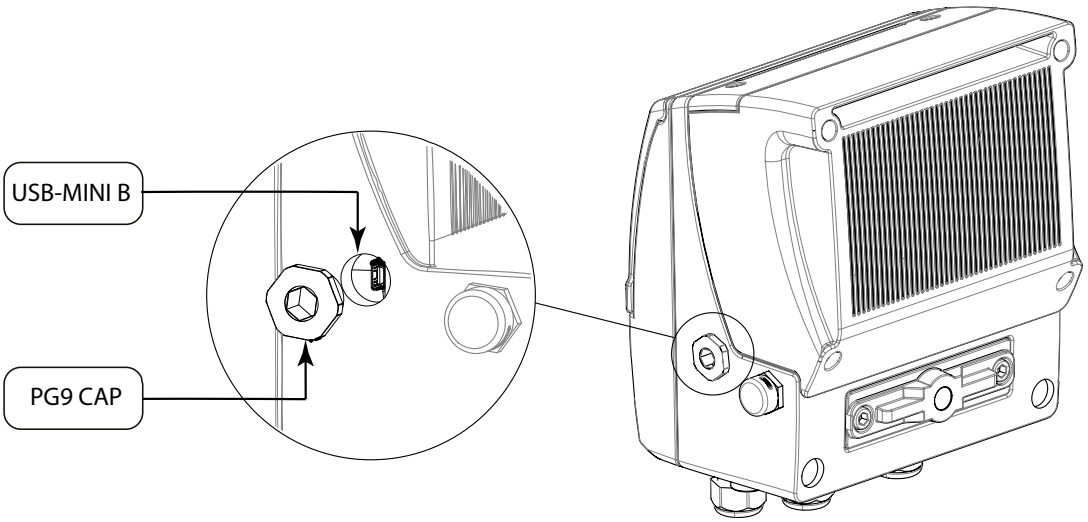
BATTERIES HOUSING



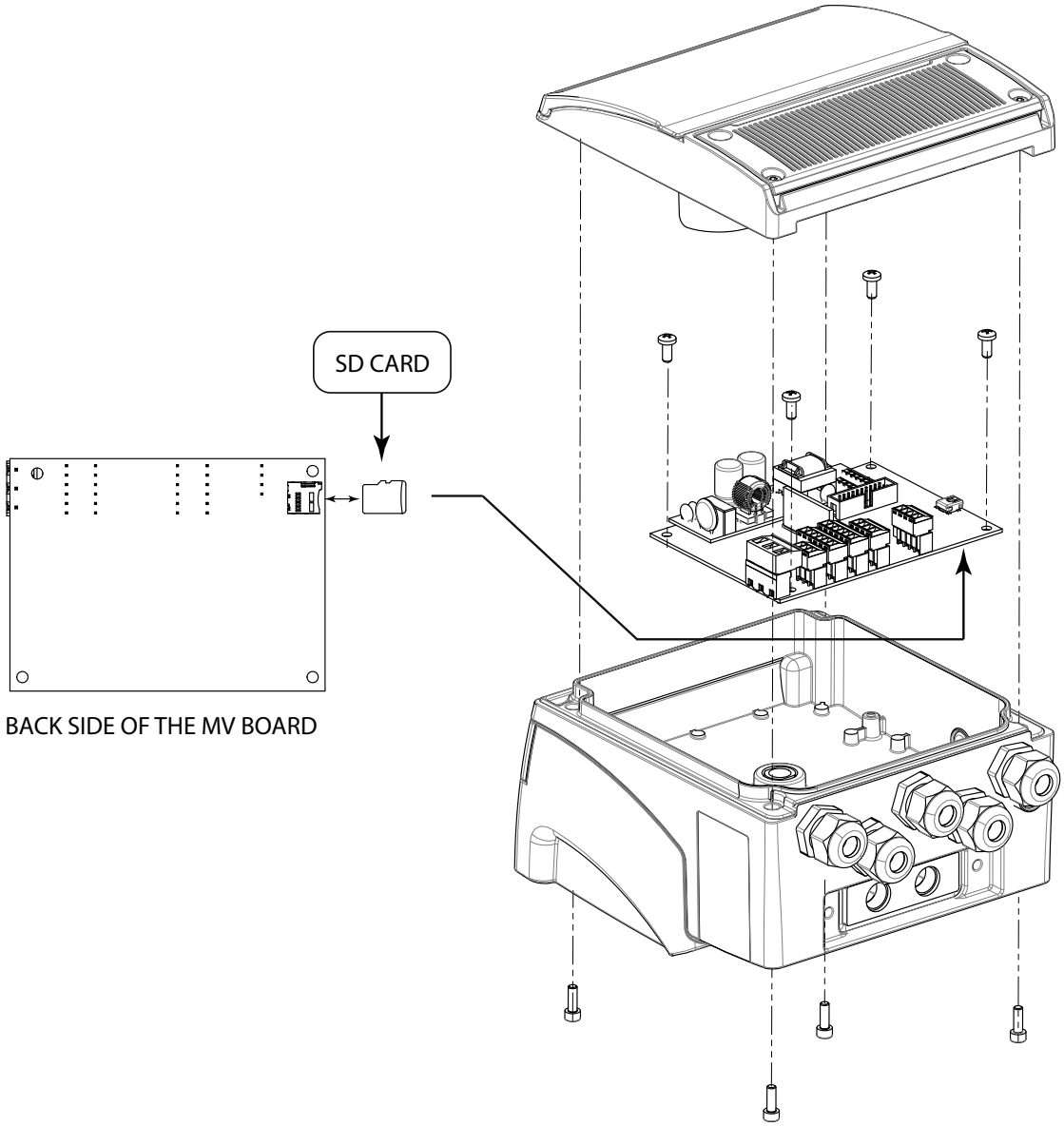
POS.	DESCRIPTION	
	PA6 VERSION	ALUMINIUM VERSION
24	PA6 BATTERY HOUSE COVER	
25	LITHIUM OR ALKALINE BATTERY	
26	CONTACTS FRAME FOR ALKALINE BATTERY	
27	PA6 BATTERY HOUSE	
28	SCREW M4X12	
29	O-RING 3050	
30	SEAL BUSH	
31	O-RING 3081	
32	O-RING 4575	

CONVERTER ACCESS

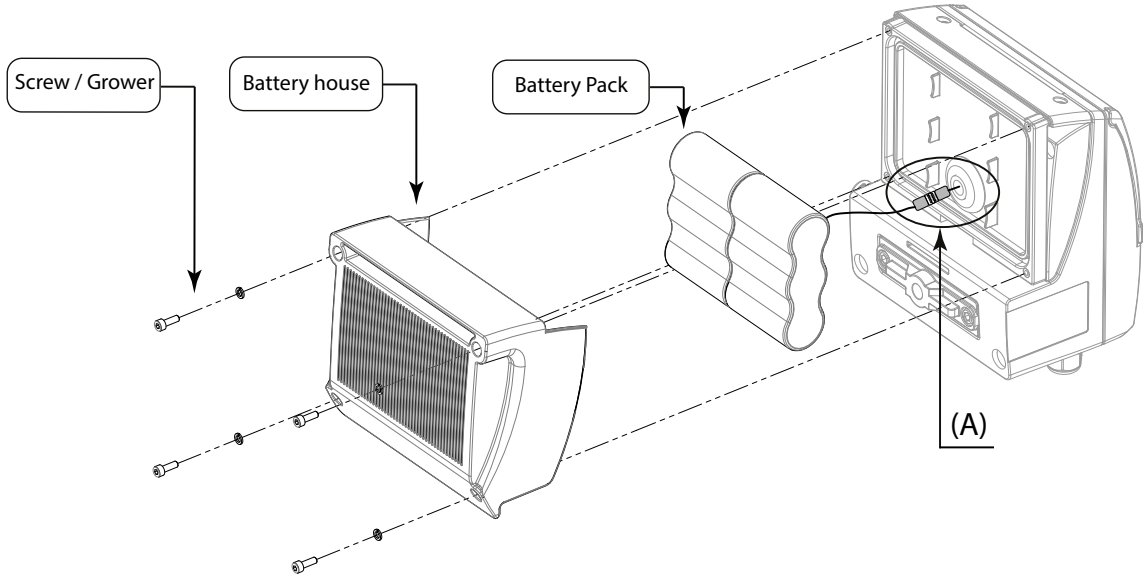
USB Connection



SD Card

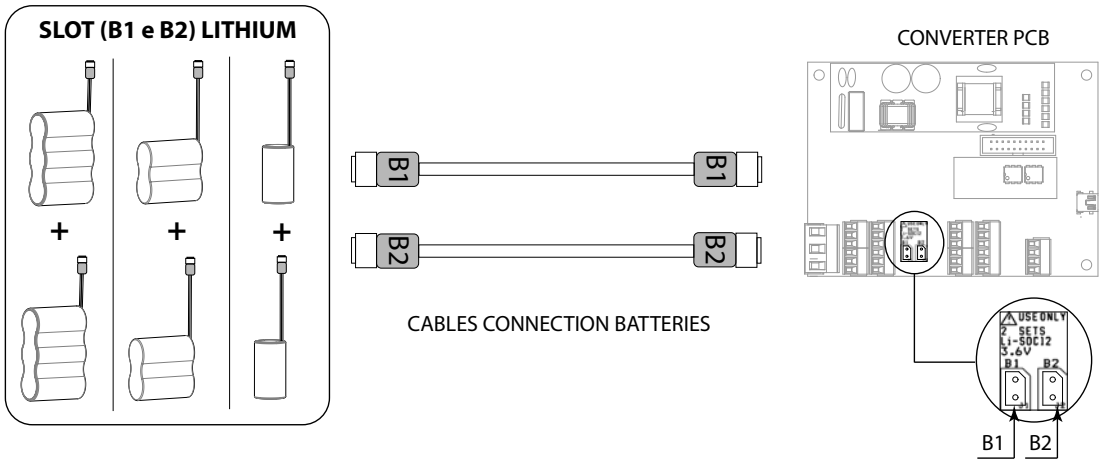


BATTERY POWER SUPPLY

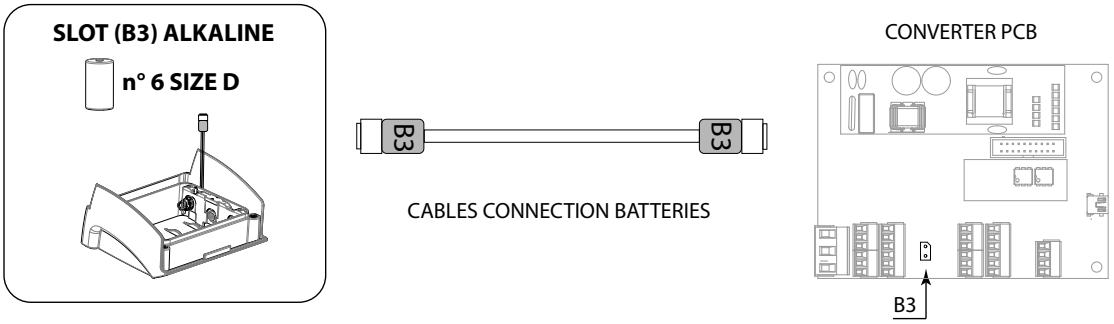


DETAIL (A) BATTERY CONNECTIONS CONVERTER PCB

LITHIUM BATTERIES

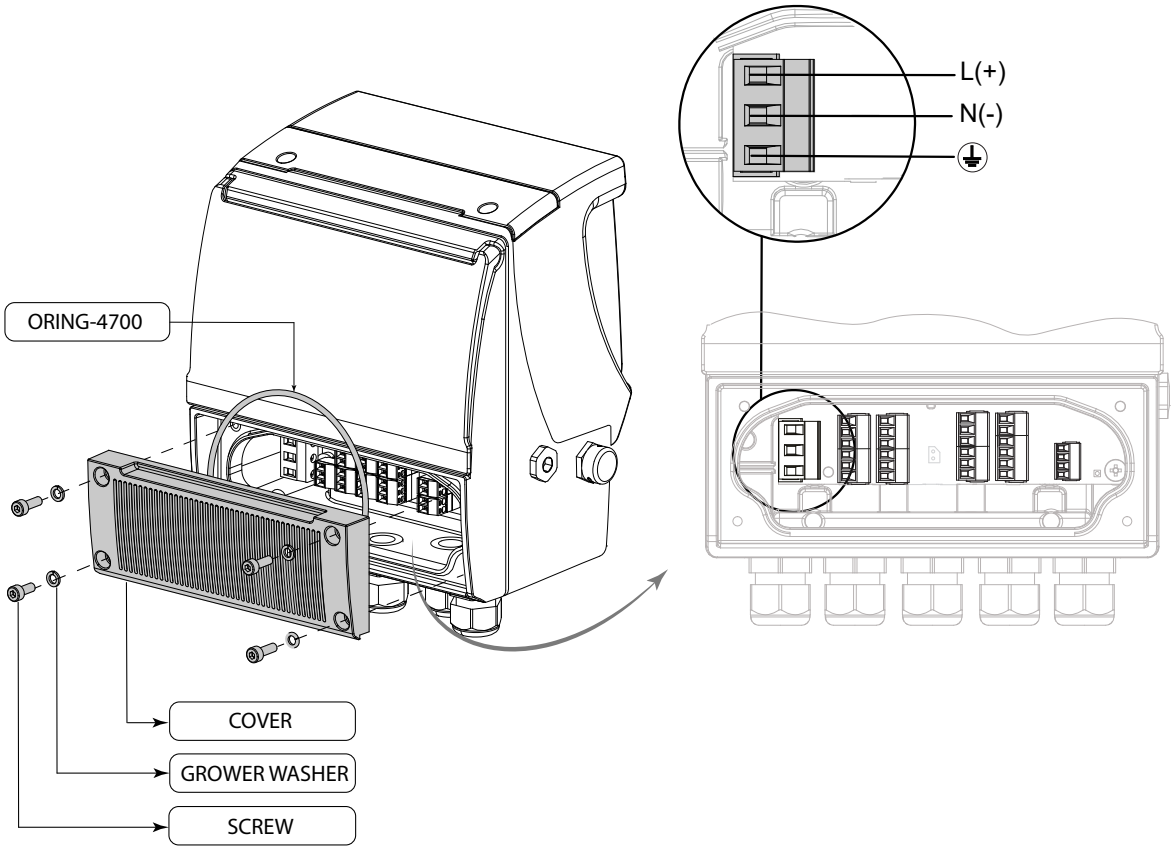


ALKALINE BATTERIES



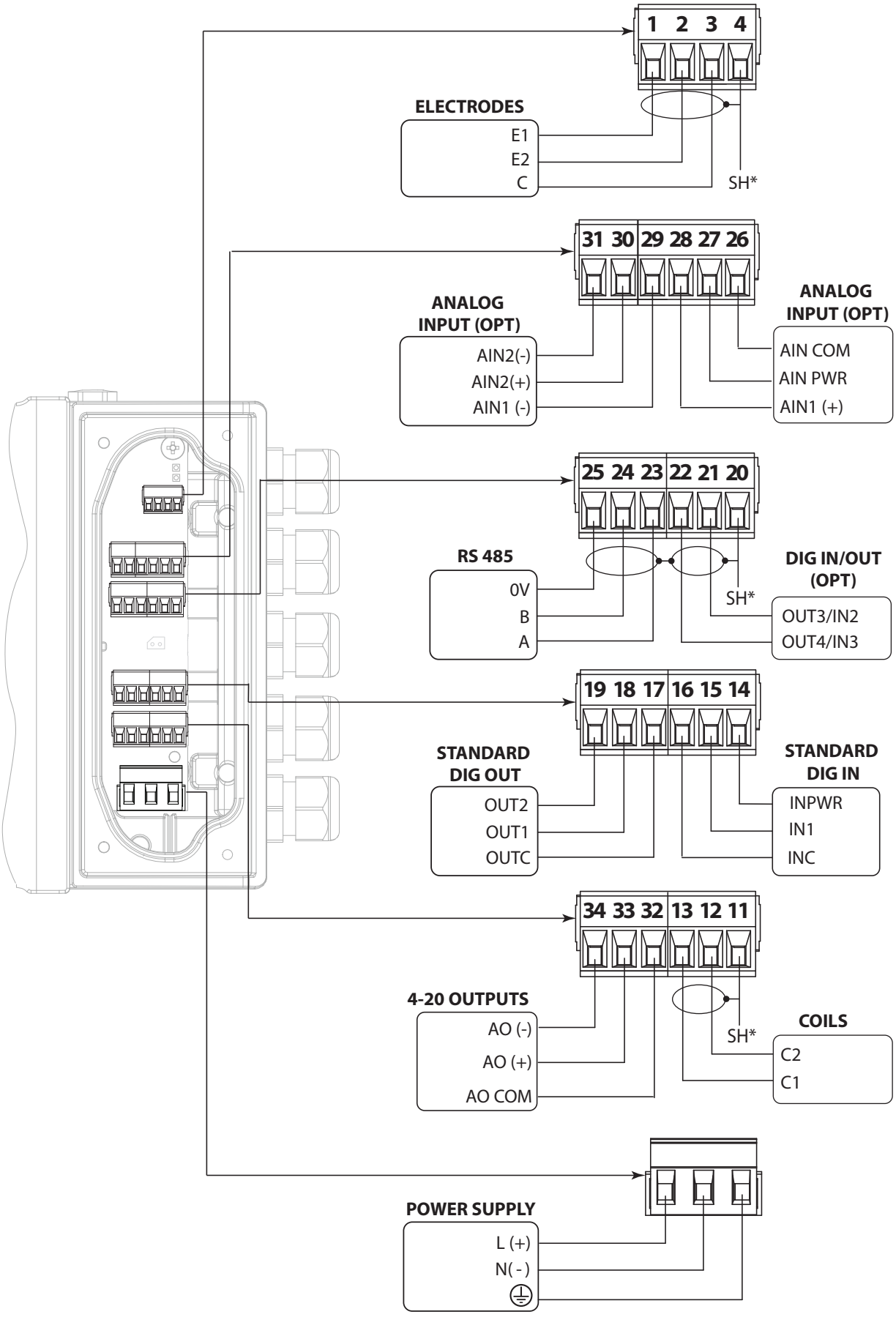
- The maximum number of batteries allowed in the various configurations is 6 size D batteries
- Alkaline batteries can also be purchased separately from third parties
- Lithium batteries are supplied exclusively by the manufacturer and can not be purchased separately from third parties Furthermore, they are subject to special transport regulations based on the “Dangerous Goods Regulations, UN3090 and UN 3091”. Special documentation is required to observe the regulations.

MAIN POWER SUPPLY



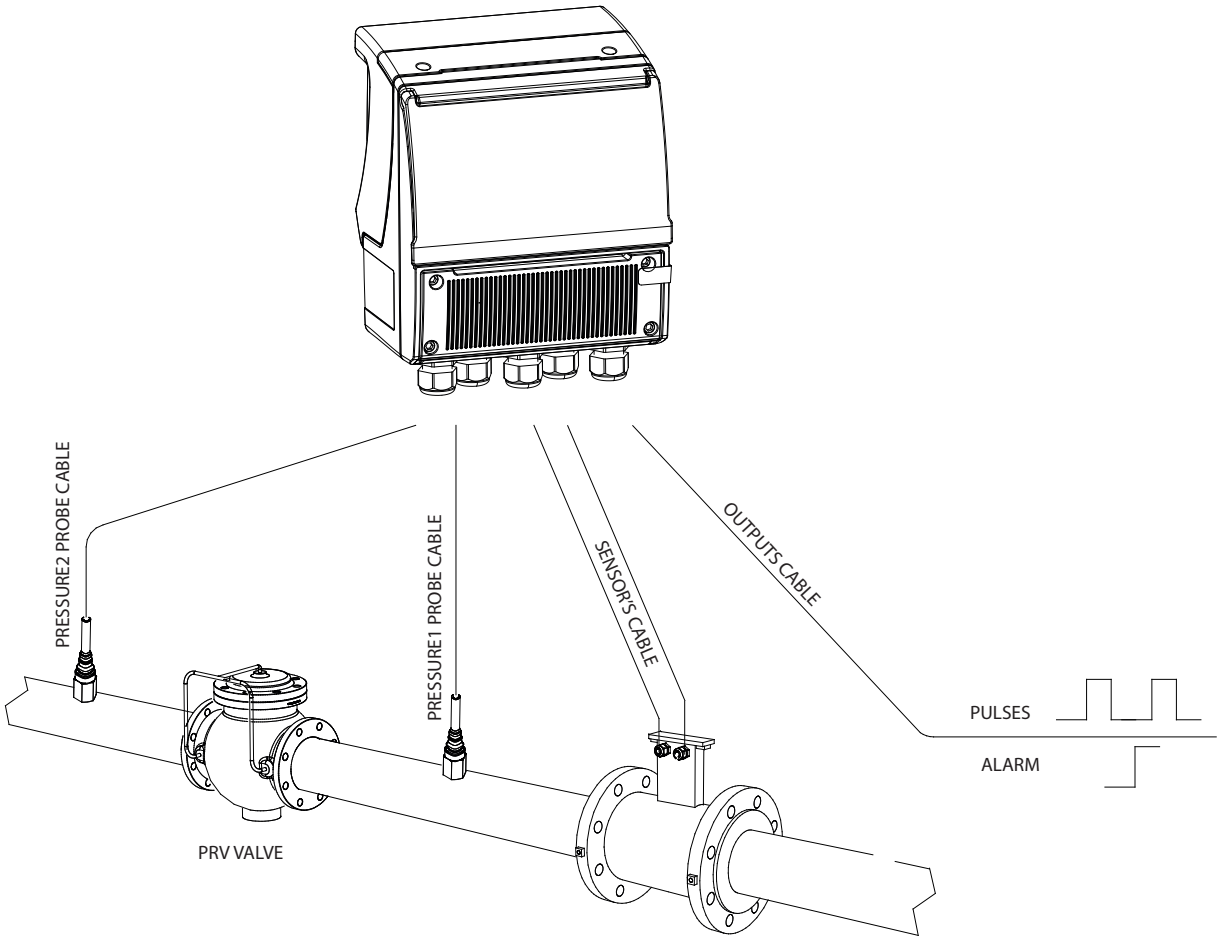
- The connections are made with approved cables with flame retardant properties, whose section varies from 0.25 mm^2 to 2.50 mm^2, based on distance / power.
- The wiring can be checked by unscrewing the 4 screws on the terminal cover.
- When the lid is raised, the terminal block is visible. The terminal block shows the wired connection of the converter to external devices as non included.

ELECTRICAL CONNECTIONS

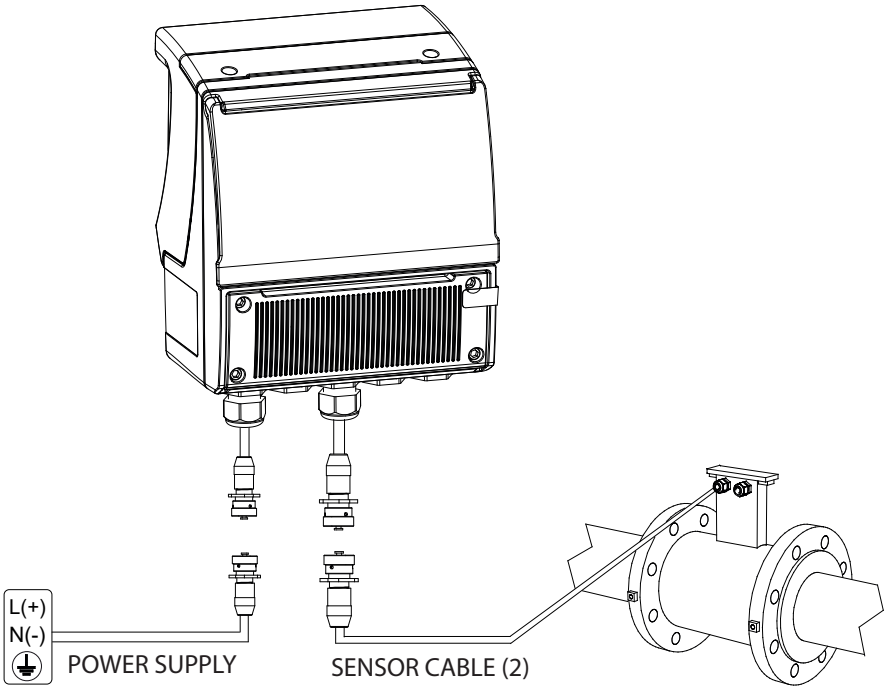


FUNCTIONS MENU

Pressure and temperature probes

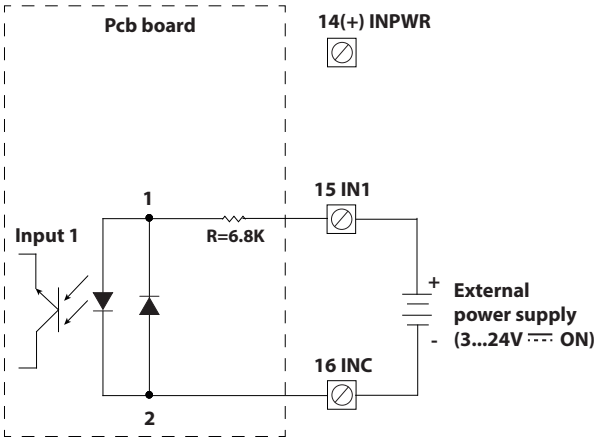


IP68 connection (example installation)



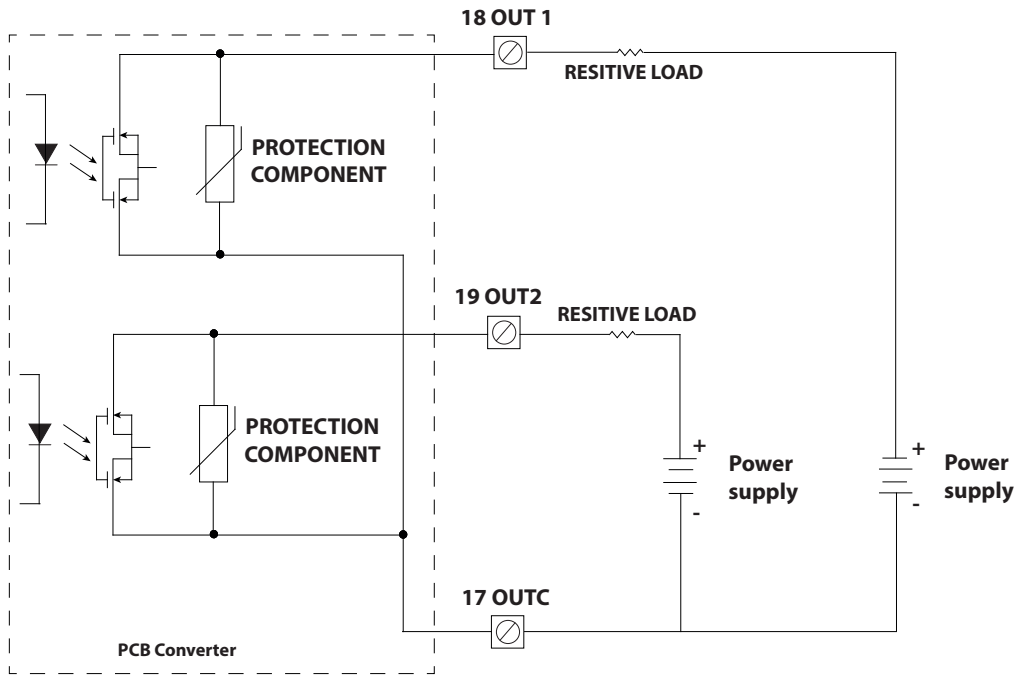
DIGITAL INPUTS

On / Off Input (External power supply)



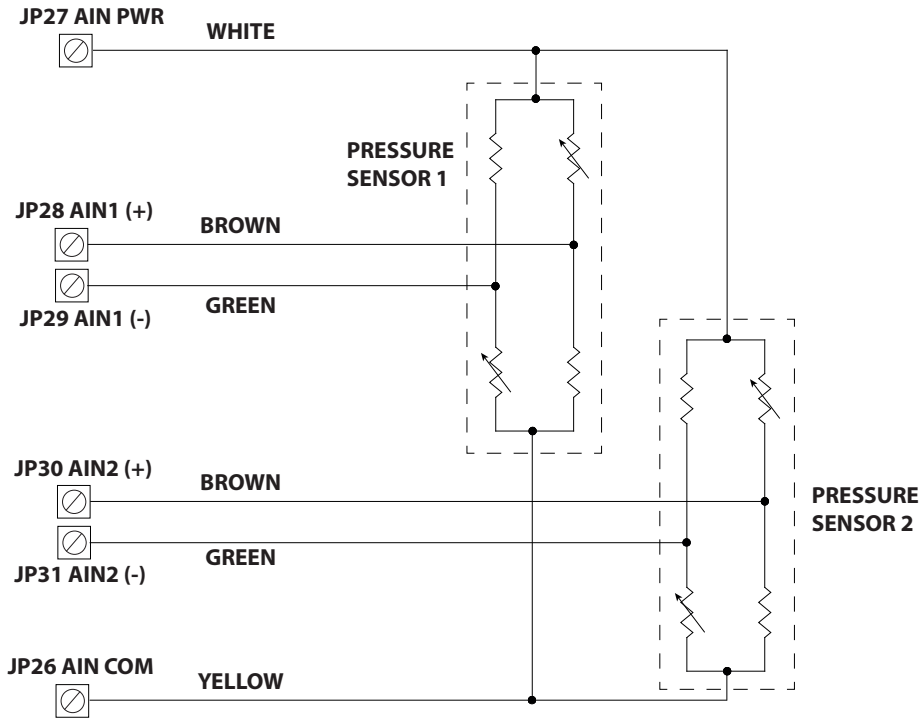
DIGITAL OUTPUTS

NOTE: the outputs are NOT polarized, so you can adopt schemes for connection to positive or common negative, as in the following electrical scheme.



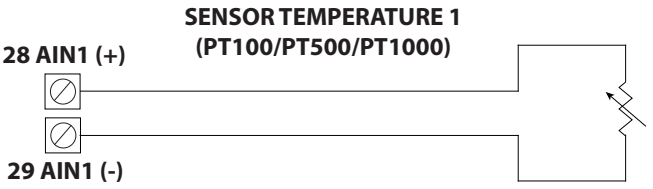
AUXILIARY MODULE ANALOG INPUTS

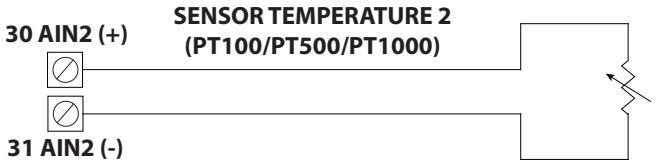
Connection of pressure sensors



Connection of temperature sensors

There is no compensation of cable resistance, we recommend the use of PT500 or PT1000 sensors if the cable length is more than one meter. The recognition of the sensor type (PT100 / 500/1000) is automatic

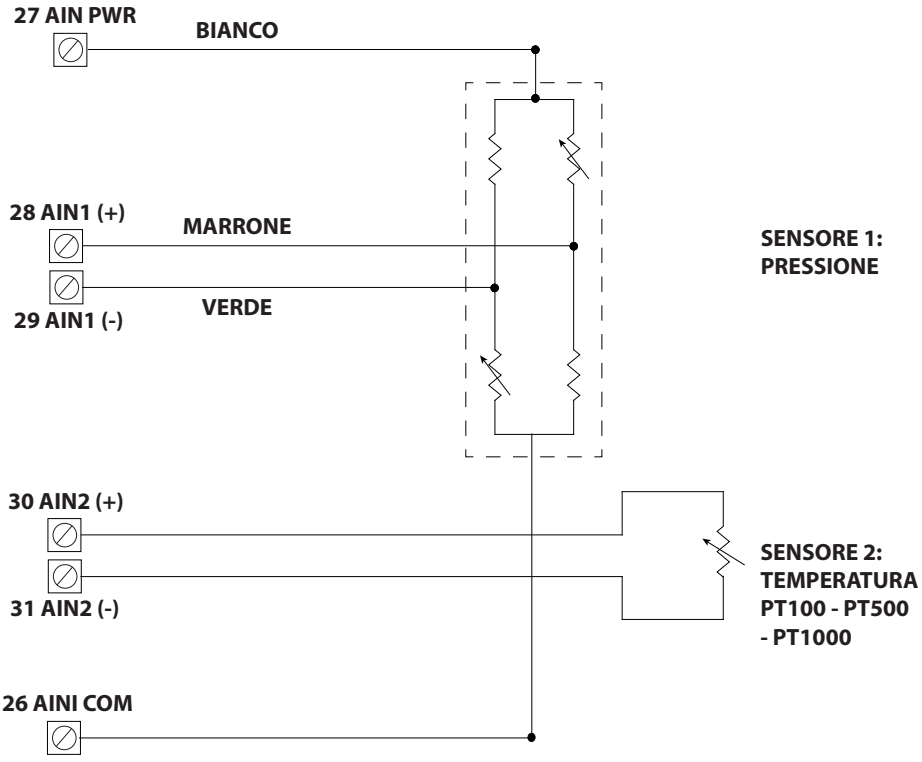




Connection of a pressure/ temperature sensor

Two different types of sensors can be connected, a pressure sensor and a temperature sensor.

For the temperature sensor, because there is no compensation of cable resistance, we recommend the use of PT500 or PT1000 sensors if the cable length is more than one meter. The recognition of the sensor type (PT100 / 500/1000) is automatic



N.B: the pressure sensor MUST BE connected to input 1 and the temperature sensor MUST BE connected to Input 2!

4÷20 MA OUTPUTS

Digital input / output terminal block of the add-on module. (22-OUT4 22-IN2, 21-OUT3 21-IN3, GND):

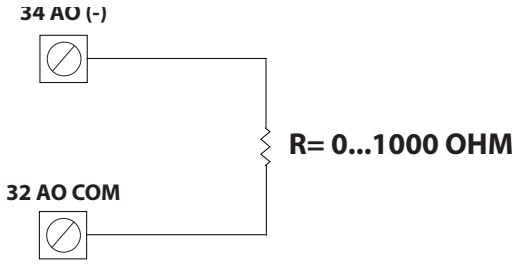
Passive mode: power is supplied from an external source .

- ❑ Connect the POSITIVE of the external source to the AO + terminal
- ❑ Connect the LOAD to the AO- terminal

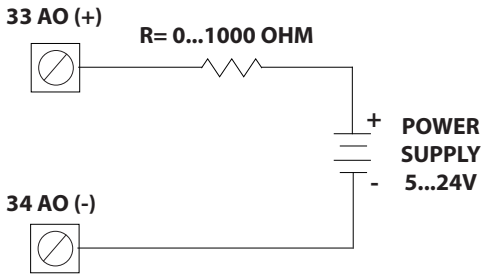
Active mode: power is supplied from the board power supply (if fitted).

- ❑ Connect the LOAD to the AO- terminal
- ❑ Connect the RETURN to the AOC terminal.

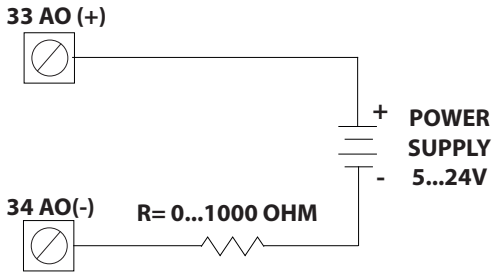
Active Connection



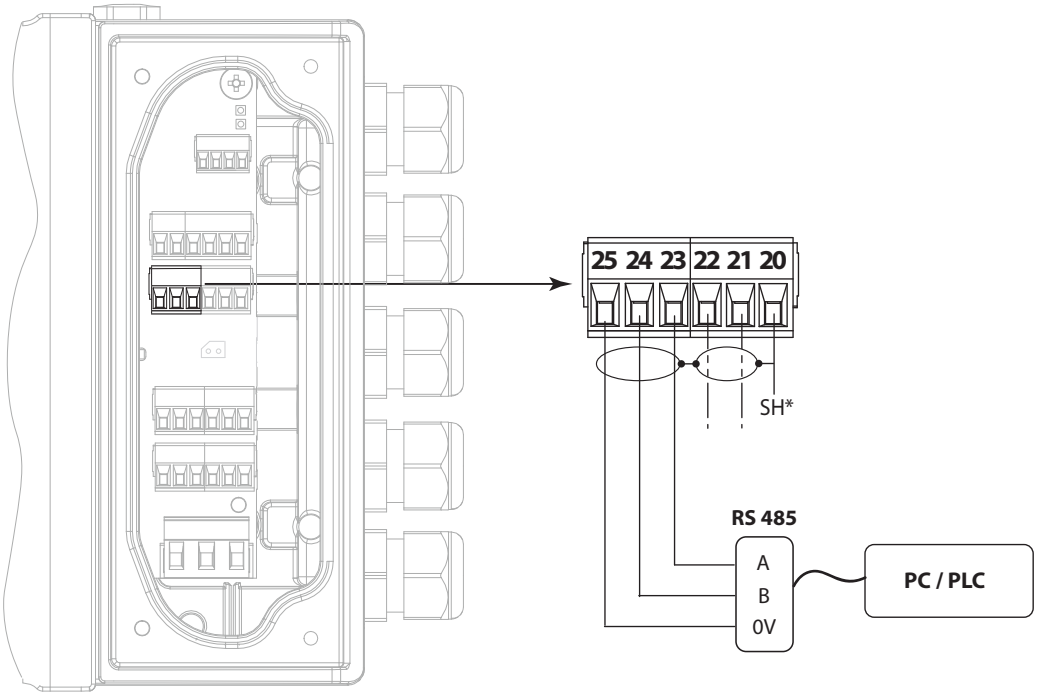
Passive Connection 1



Passive Connection 2



MODBUS (RS485)



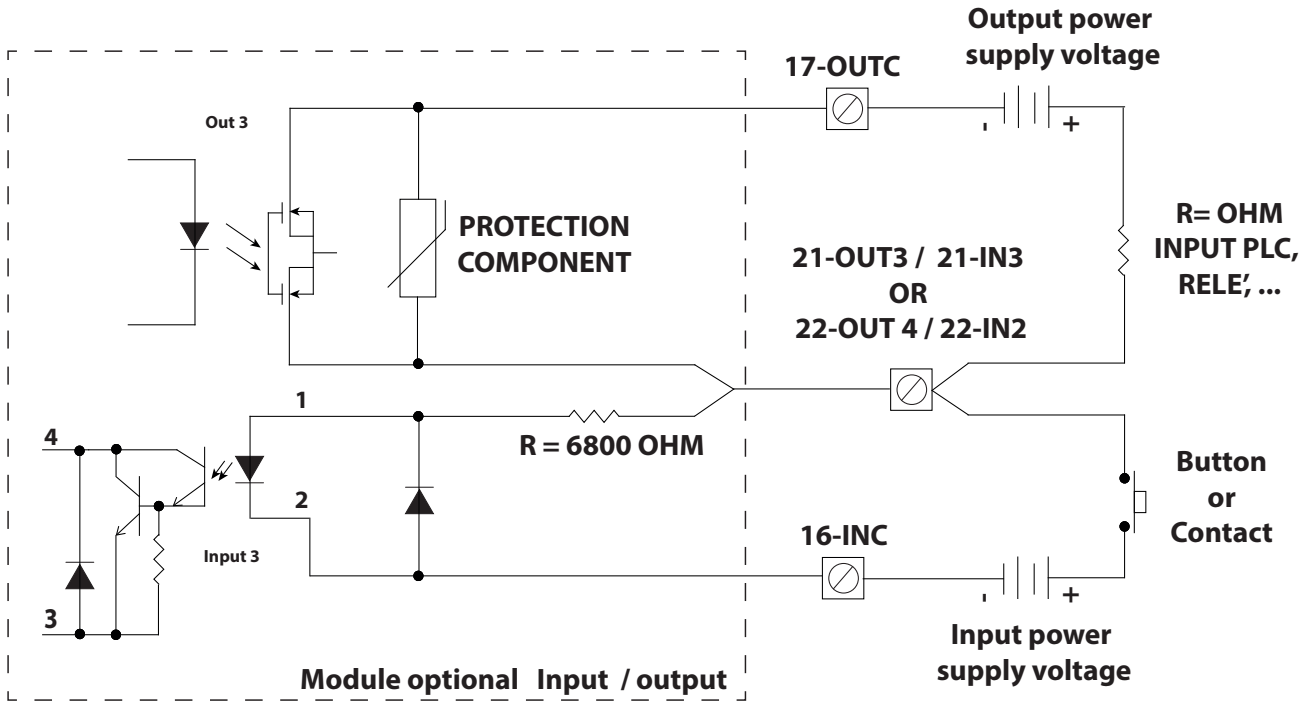
AUXILIARY MODULE DIGITAL INPUTS/ OUTPUS

Digital inputs / outputs terminal block of the add-on module (22-OUT4 22-IN2, 21-OUT3 21-IN3, GND):

- 21-OUT3 21-IN3: digital output OUT 3 / digital input INPUT 3
- 22-OUT4 22-IN2: digital output OUT 4 / digital input INPUT 2
- GND: terminal connected to the protective earth (chassis) for connecting cable screens

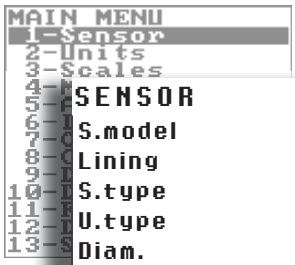
NOTE:

- The digital outputs OUT4 and OUT3 use the 17-OUTC terminal as common.
- The digital inputs IN2 and IN3 use the 16-INC terminal as common.
- The digital output OUT4 and the digital input IN2 as well as the digital output OUT3 and the digital input IN3 share the same terminal but have different common, so the input and output circuits can be realized independently on the other hand, as indicated in the following diagram for OUT3 / IN3 (OUT4 / IN2 are equivalent).



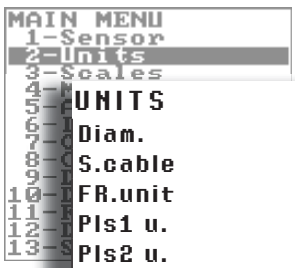
FUNCTIONS MENU

SENSOR



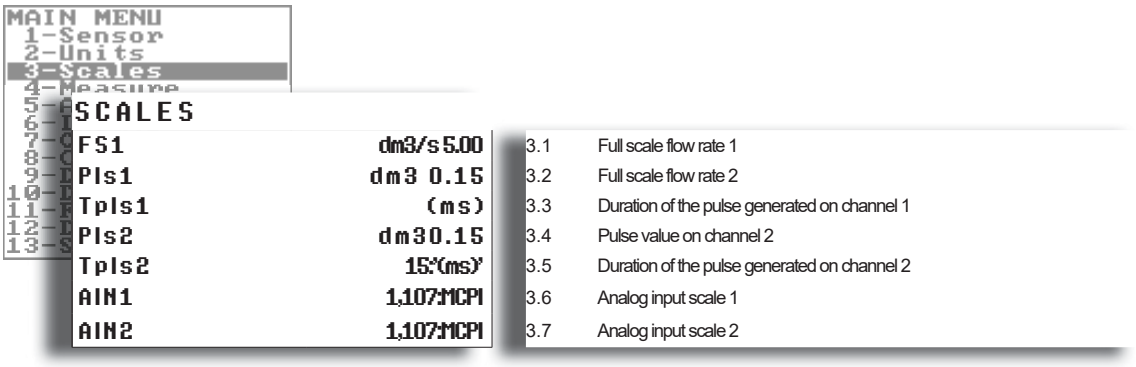
SENSOR			
S.model	0	1.1	Sensors model: Enter the first two characters of the serial number of the sensor
Lining	UNSPEC.	1.2	Flow sensor lining material type
S.type	FULLBORE	1.3	Type of sensor: fullbore or insertion
U.type	METRIC	1.4	Type of measure units for sensor parameter: metric or imperial
Diam.	00700	1.5	Sensor's nominal/real diameter DN (0-2500)
KA	+00.9637	1.6	Sensor coefficient KZ (zero point)
KA-	-44904	1.7	Calibration data of sensor for negative flow
KZ	-18852	1.8	Sensor coefficient KZ (zero point)
KD	+00.4014	1.9	Sensor coefficient KD
Ins.position	0	1.10	Insertion position
KP dynamic	OFF	1.11	KP dynamic, coefficient for insertion
Ki	10000	1.12	Sensor coefficient Ki
Kp	10000	1.13	Sensor coefficient Kp
KC	100000	1.14	Sensor coefficient KC
C.Curr.	mA025.0	1.15	Sensor excitation current
C.Reg. PB	ms03	1.16	Current regulator proportional band
C.Reg.DK	stp 005	1.17	Current regulator derivation constant
C.R.time	ms03	1.18	Measure sampling frequency
E.P.Detect	ON	1.19	Enables the empty pipe detection feature
Z max	Kohm 0500	1.20	Empty pipe detection threshold
S.err.delay	10	1.21	Signal error delay (n. sample)
Sens.verify	OFF	1.22	Automatic sensor verify enable
KL	00.+000000	1.23	Linearization coefficient
Zero point cal.		1.24	Pipe hydraulic zero calibration

UNITS

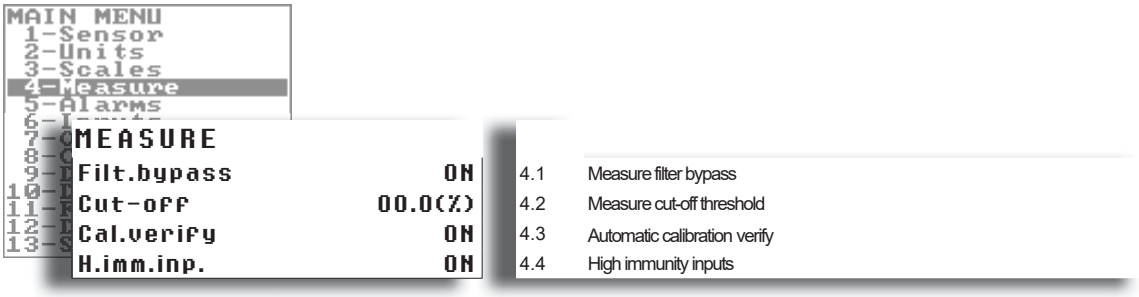


UNITS			
Diam.	mm	2.1	Nominal diameter measure unit
S.cable	m	2.2	Cable length on separate version
FR.unit	METRIC	2.3	Flow rate type measure unit: metric or imperial
Pls1 u.	METRIC	2.4	Pulse 1 type measure unit: metric or not metric
Pls2 u.	METRIC	2.5	Pulse 2 type measure unit: metric or not metric
T+ unit	METRIC	2.6	Total direct totalizer measure unit type: metric or imperial
T+ unit	(m3)	2.7	Total direct totalizer measure unit
T+ D.P.	4	2.8	Total direct totalizer decimal point position
P+ unit	METRIC	2.9	Partial direct totalizer measure unit type: metric or not metric
P+ unit	(m3)	2.10	Partial direct totalizer measure unit
P+ D.P.	4	2.11	Partial direct totalizer decimal point position
T- unit	METRIC	2.12	Total reverse totalizer measure unit type: metric or not metric
T- unit	(m3)	2.13	Total reverse totalizer measure unit
T- D.P.	4	2.14	Total reverse totalizer decimal point position
P- unit	METRIC	2.15	Partial reverse totalizer measure unit type: metric or not metric
P- unit	(m3)	2.16	Partial reverse totalizer measure unit
P- D.P.	4	2.17	Partial reverse totalizer decimal point position
Temp.unit	°C	2.18	Temperature measure
Mass units	ON	2.19	Enable/disable the selection of mass units on full scale set
Sg	(kg/dm3)	2.20	Specific gravity coefficient
AIN1 m.u.	1,107:MCPI	2.21	Unit of measurement for analogue input 1
AIN2 m.u.	1,107:MCPI	2.22	Unit of measurement for analogue input 2

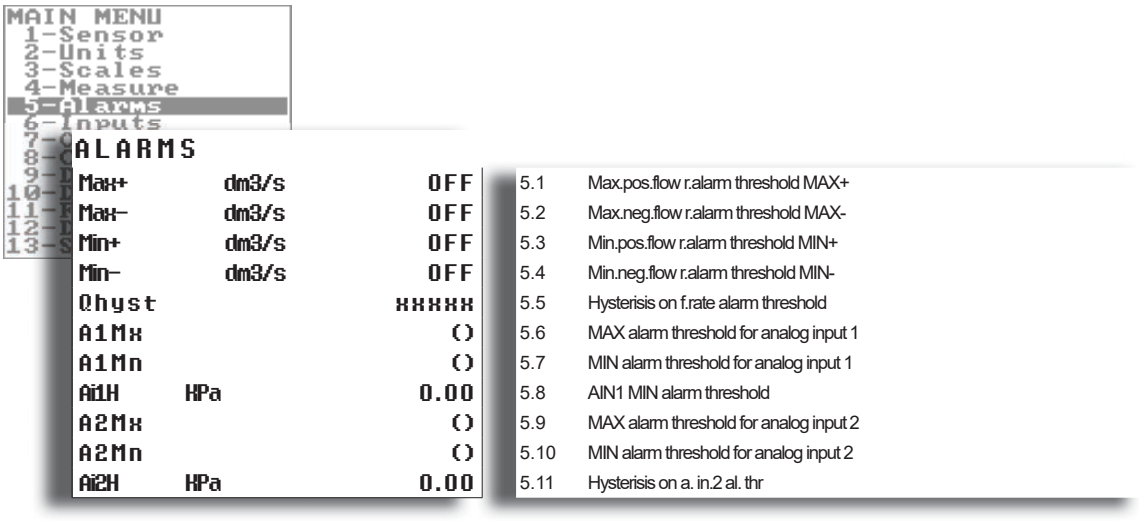
SCALES



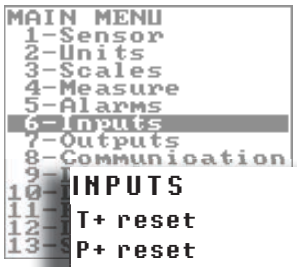
MEASURE



ALARMS



INPUTS



INPUTS	
T+ reset	OFF
P+ reset	OFF
T- reset	OFF
P- reset	OFF
Count lock	OFF
Meas.lock	OFF
Calibration	OFF
Sys.v.detect	ON
D.In2	SYS.VIOL.
D.In3	OFF
D.in p.sup	ON

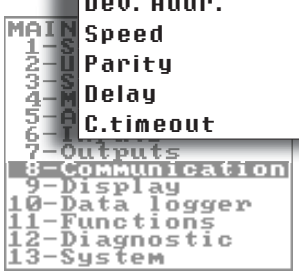
6.1	Total direct (positive) flow totalizer reset enable
6.2	Partial direct (positive) flow totalizer reset enable
6.3	Total reverse (negative) flow totalizer reset enable
6.4	Partial reverse (negative) flow totalizer reset enable
6.5	Totalizer counting lock command
6.6	Measure zero lock command
6.7	Calibration external command
6.8	System violation detect
6.9	Digital input 2 function
6.10	Digital input 3 function
6.11	Digital auxiliary input power supply.

OUTPUTS

OUTPUTS	
Out1	F.R.SIGN
Out1 inv.	ON
Out1 pls.	ON
Out2	AN1 MX/MN
Out2 inv.	ON
Out2 pls.	ON
Out3	MAX.AL+
Out3 inv.	ON
Out3 pls.	ON
Out4	MAX.AL+
Out4 inv.	ON
Out4 pls.	ON
Out mA1	Apr-20
A1S	dm3/s

7.1	Output 1 function selection
7.2	Output 1 inverted status
7.3	Output 1 pulsed status
7.4	Output 2 function selection
7.5	Output 2 inverted status
7.6	Output 2 pulsed status
7.7	Output 3 function selection
7.8	Output 3 inverted status
7.9	Output 3 pulsed status
7.10	Output 4 function selection
7.11	Output 4 inverted status
7.12	Output 4 pulsed status
7.13	Analog current output 1 range
7.14	Full scale value for analog out1

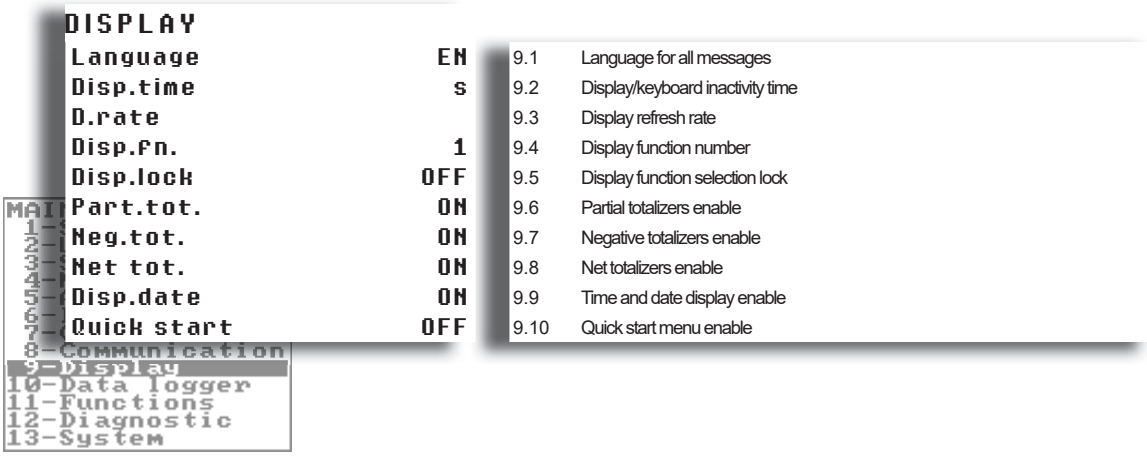
COMMUNIC.



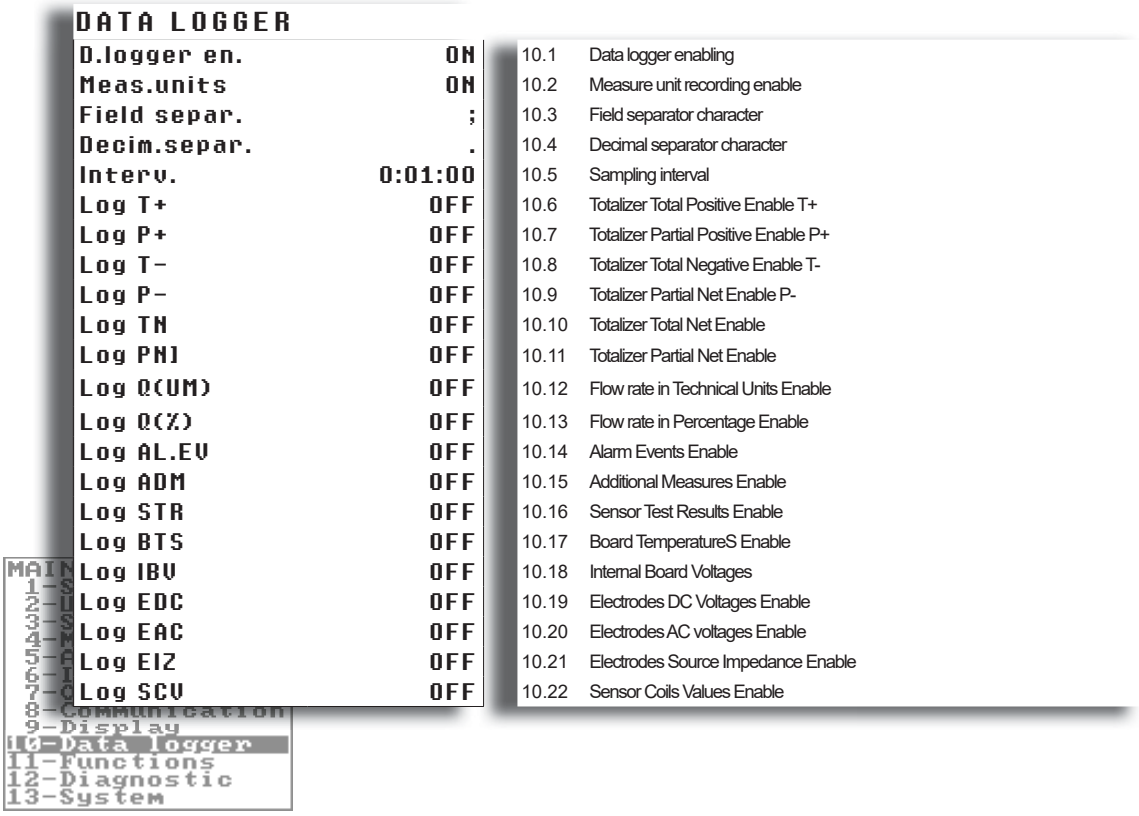
COMMUNICATIONS	
Dev. Addr.	1
Speed	bps22800
Parity	NO
Delay	ms 00
C.timeout	2

8.1	Device comunication address number
8.2	MODBUS link speed
8.3	MODBUS link parity
8.4	MODBUS reply delay
8.5	Max.delay between chars (frame)

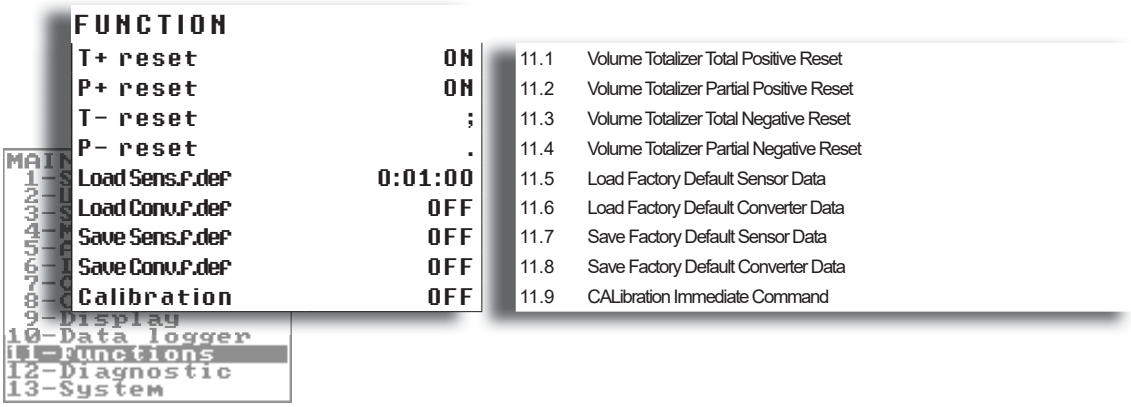
DISPLAY



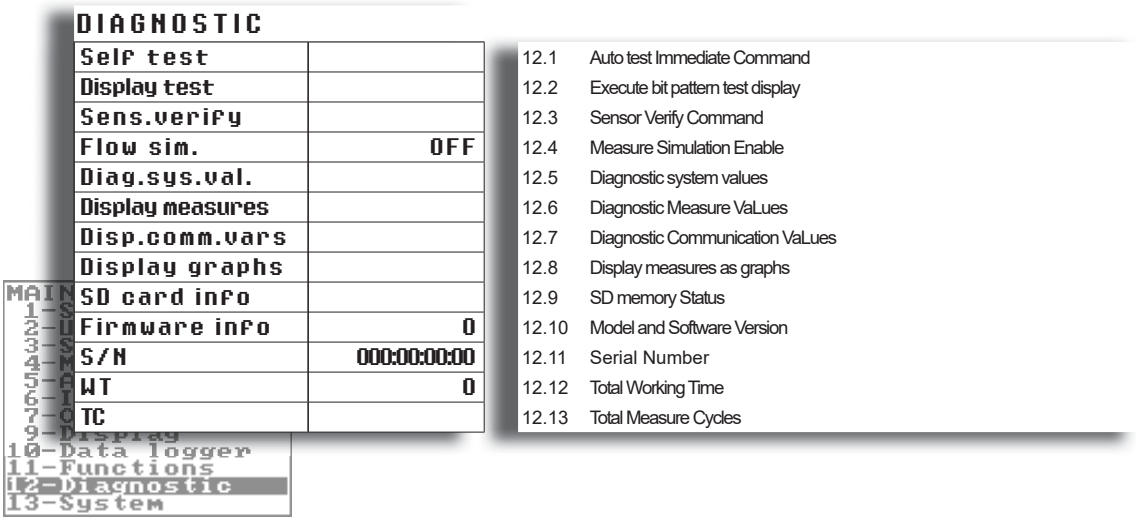
DATA LOGGER



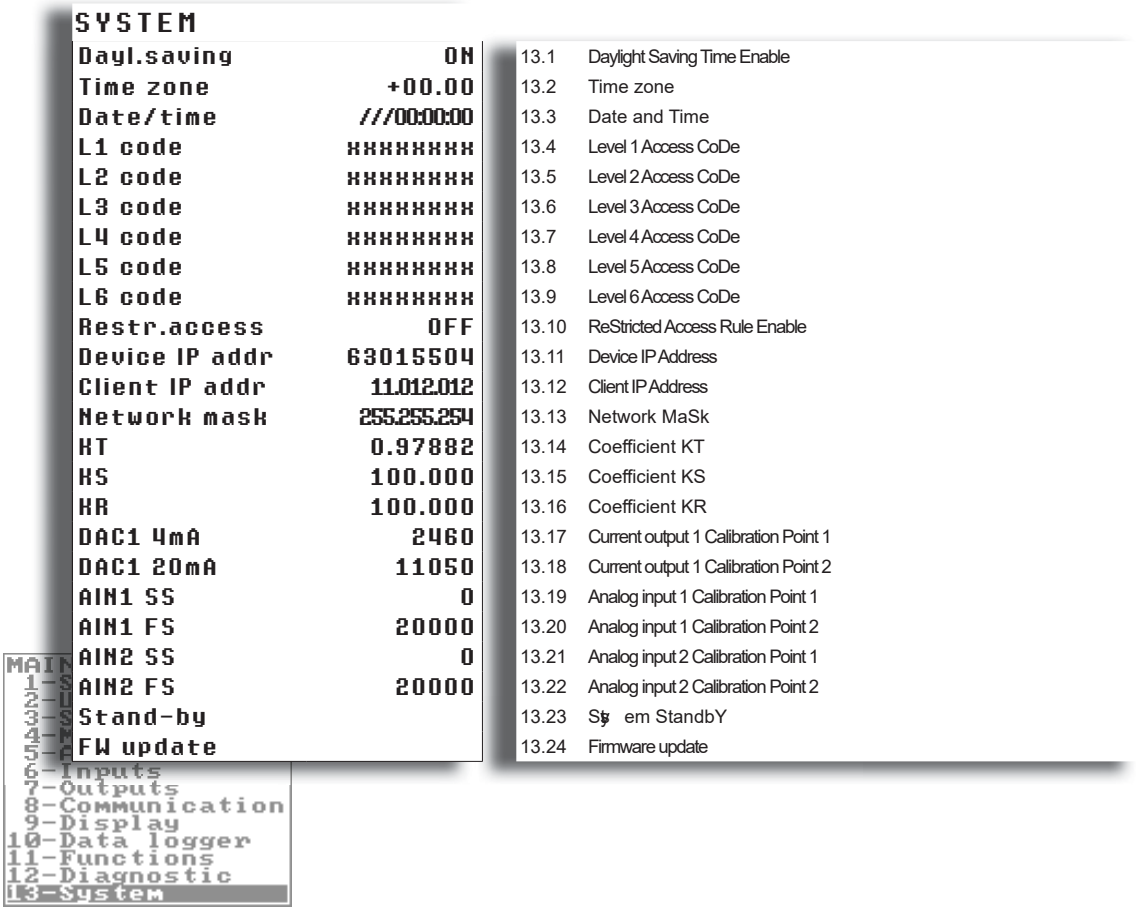
FUNCTION



DIAGNOSTIC



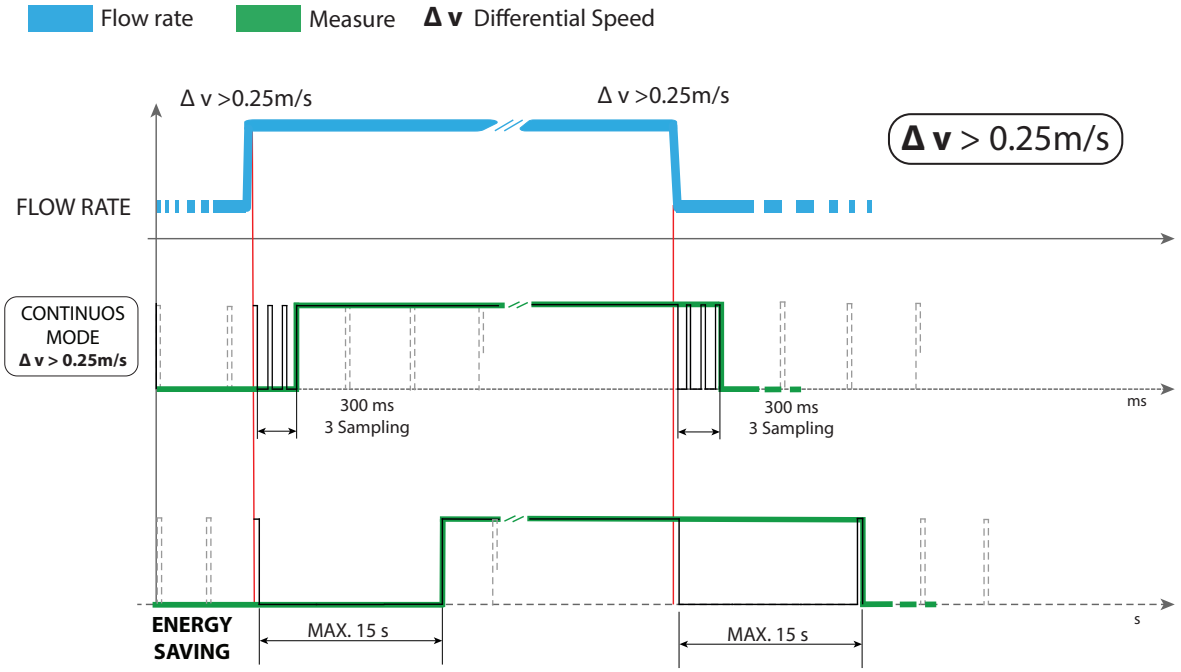
SYSTEM

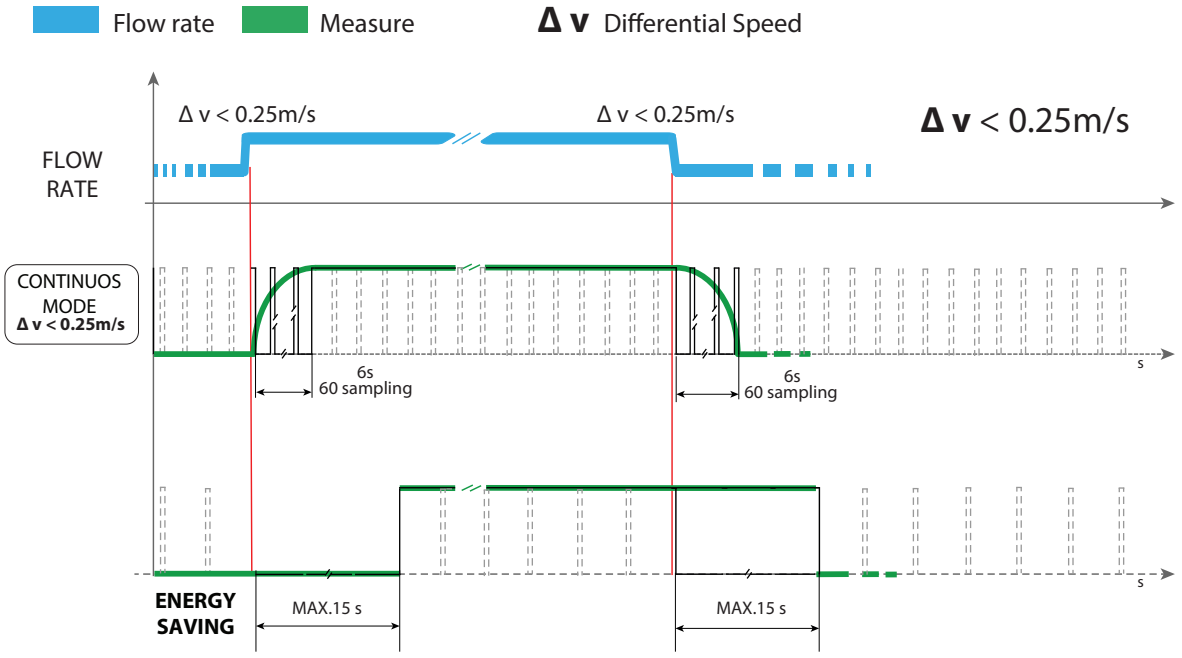


MEASUREMENT SETTINGS

MV145 can be programmed to acquire the measurement in two different ways:

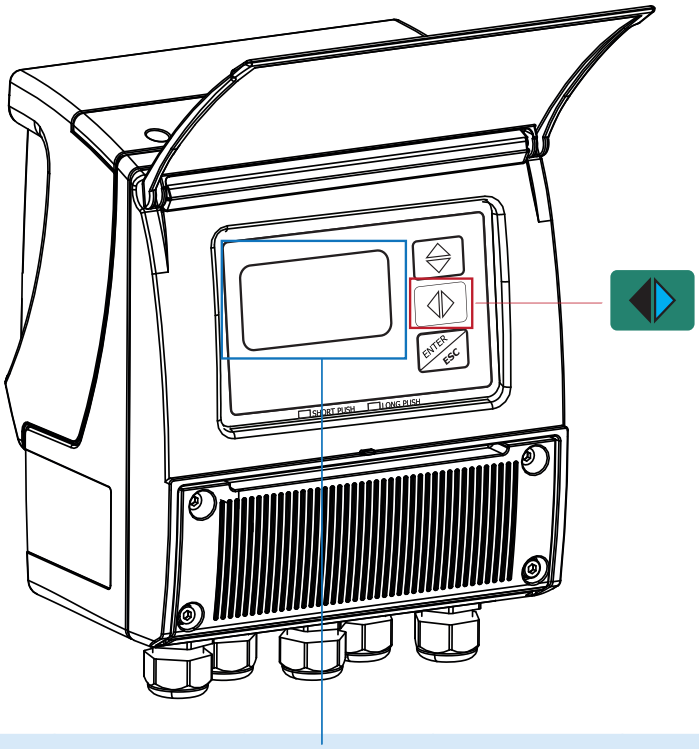
- ENERGY SAVING MODE: Sampling every 15 s.
- CONT. PWR: Continuous power sampling.

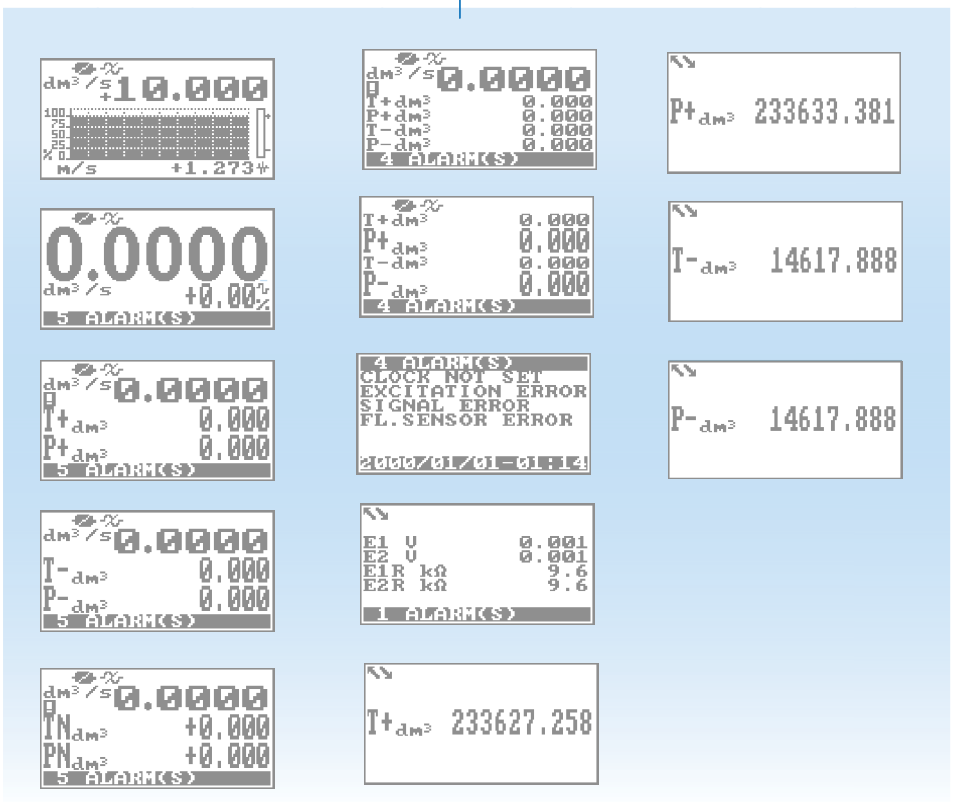




MAIN PAGES VISUALIZATION

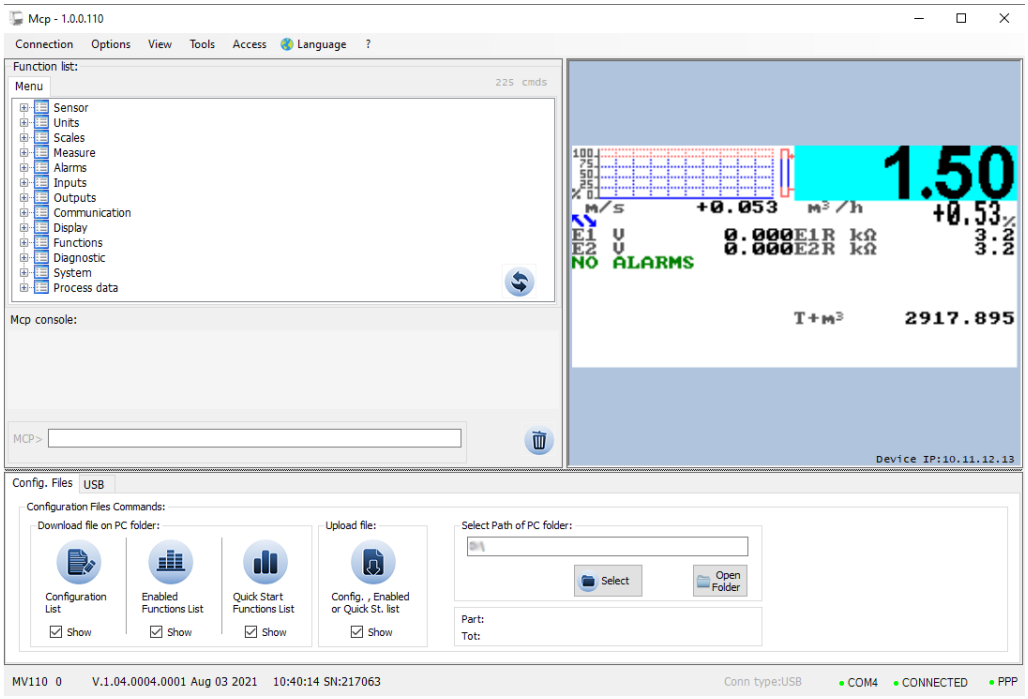
Possible views by simply pressing the button 

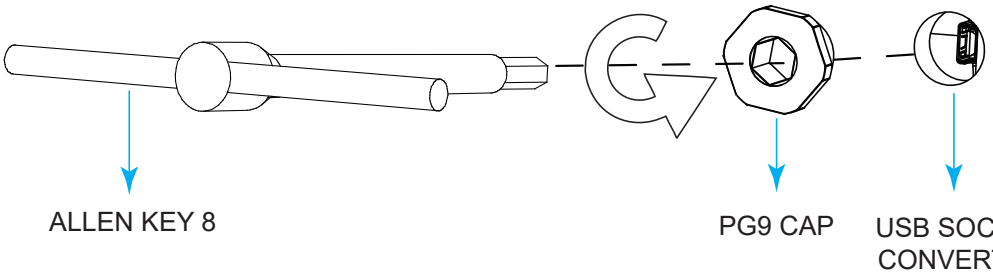


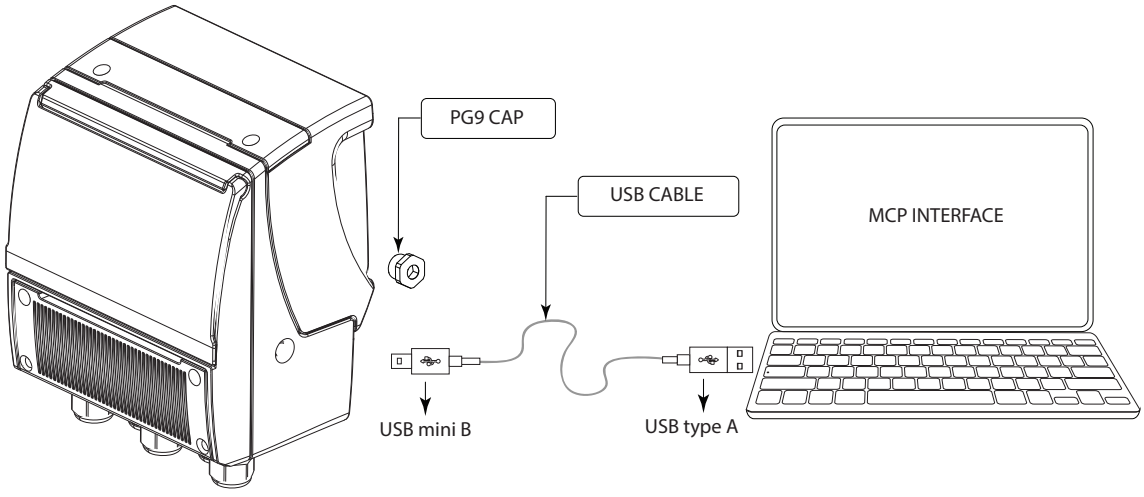


USER INTERFACE

Besides the keyboard, the converter can be programmed by MCP INTERFACE: a real time interface between converter and PC.

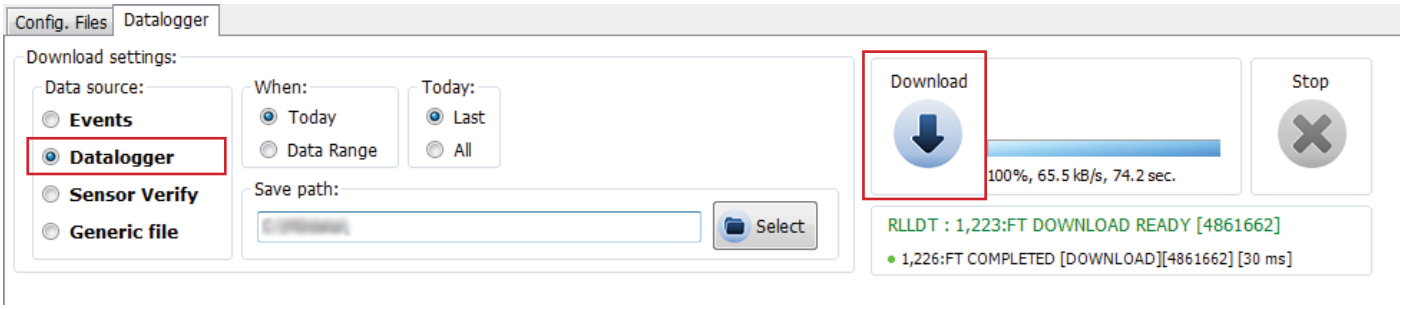






DATA LOGGER

Data is stored on micro SD card; the recorded data or the events can be easily downloaded by the MCP INTERFACE, pressing the relevant key as shown below.

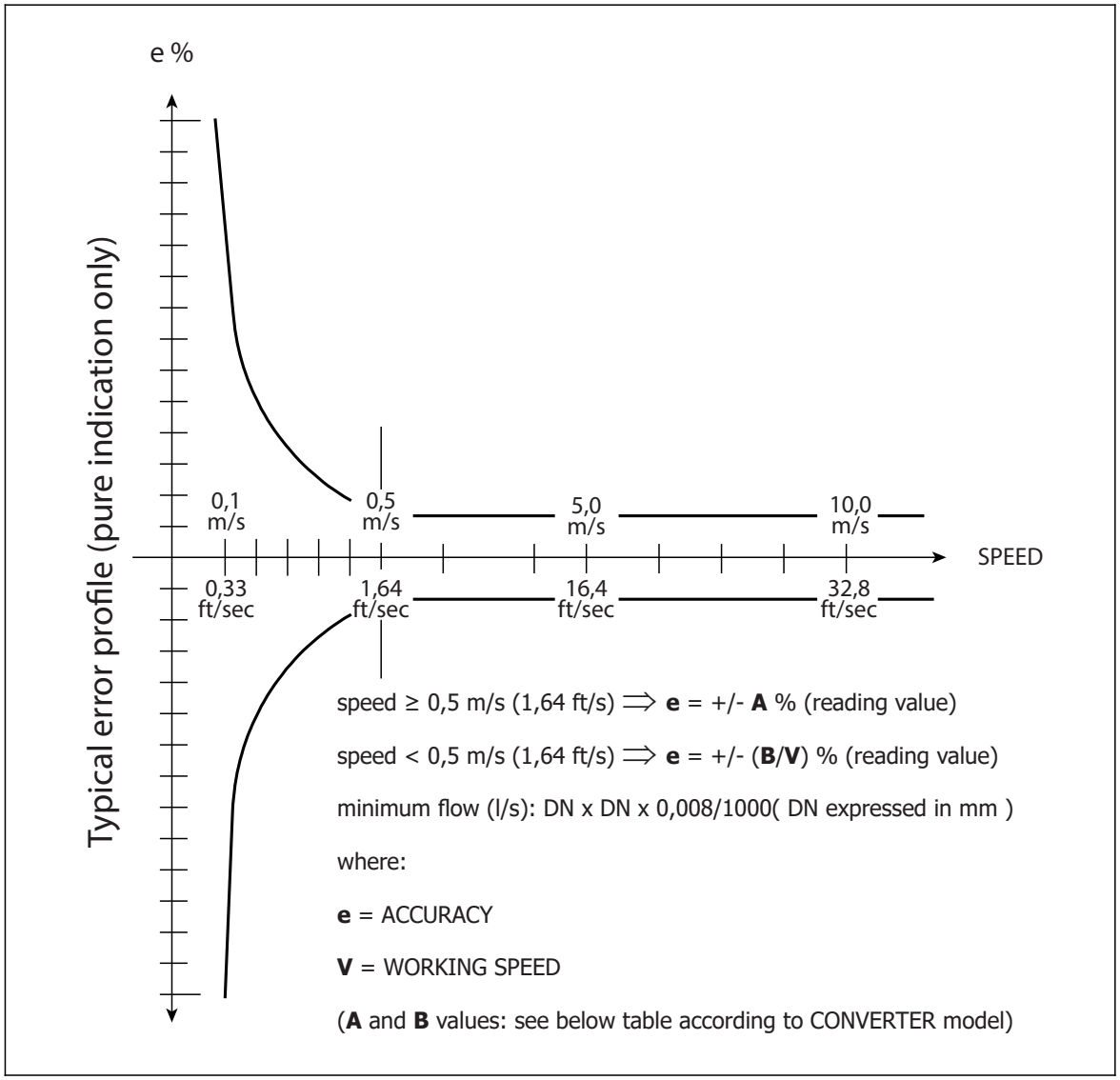


Note: to record correctly the data, the date and time shall be properly set.

Example of extrapolation of the data logger file:

N°Record. View progressively the number of registered records.
Date. The recording date viewing for each record.
Hours. Time recording viewing for each record.
Total positive totalizer value. Form Fields when the send flag is active on the totalizer T+.
Partial positive totalizer value. Form Fields when the send flag is active on the totalizer P-.
Total negative totalizer value. Form Fields when the send flag is active on the totalizer T-.
Partial negative totalizer value. Form Fields when the send flag is active on the totalizer P-.
Total net totalizer value. Form Fields when the send flag is active on the totalizer TN.
Partial net totalizer value. Form Fields when the send flag is active on the totalizer PN
Flow rate. Form Fields present when the send flag is on the flow in units of measurement.
Flow rate %. Form fields present when the flag of alarm recording is active (only N ° of present total alarms)
N ° active alarms. Form fields present when the flag of alarm recording is active (only N ° of present total alarms)
Loss of current measured during insulation test. Available value when recording the sensor test data is active.
Time rise A. Available value when recording the sensor test data is active.
Time rise B. Available value when recording the sensor test data is active.
Sensor test error code. Available value when recording the sensor test data is active.

ACCURACY



Fullbore Sensor

MS501/MS600/MS1000/MS2410/MS2500			MS5000		
A	B(m/s)	B(ft/s)	A	B(m/s)	B(ft/s)
0,4*	0,20	0,66	2	1	3,28

* = 0,25 (special velocity > 1 m/s)

Insertion sensor

See Sensor DATA SHEET.

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 %

OIML R49

The s nsor **MS2500** diameters below, coupled with **MV145** are certified in accordance with OIML R49:2013

CLASS 1

SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0.10	0.064	
32	1 ¼	25	0.16	0.10	
40	1 ½	40	0.26	0.16	
50	2	63	0.40	0.25	
65	2 ½	100	0.64	0.40	
80	3	160	1.0	0.64	
100	4	250	1.6	1.0	
125	5	400	2.6	1.6	
150	6	630	4.0	2.5	250
200	8	1000	6.4	4.0	
250	10	1600	10	6.4	
300	12	2500	16	10	
350	14	2500	16	10	
400	16	4000	26	16	
450	18	4000	26	16	
500	20	6300	40	25	
600	24	10000	64	40	

SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0.26	0.16	
32	1 ¼	25	0.4	0.25	
40	1 ½	40	0.64	0.4	
50	2	63	1.01	0.63	
65	2 ½	100	1.6	1	
80	3	160	2.6	1.6	
100	4	250	4	2.5	
125	5	400	6.4	4	
150	6	630	10.1	6.3	100
200	8	1000	16	10	
250	10	1600	26	16	
300	12	2500	40	25	
350	14	2500	40	25	
400	16	4000	64	40	
450	18	4000	64	40	
500	20	6300	101	63	
600	24	10000	160	100	

SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0.32	0.2	
32	1 ¼	25	0.5	0.31	
40	1 ½	40	0.8	0.5	
50	2	63	1.3	0.79	
65	2 ½	100	2	1.25	
80	3	160	3.2	2	
100	4	250	5	3.13	
125	5	400	8	5	
150	6	630	13	7.88	80
200	8	1000	20	12.5	
250	10	1600	32	20	
300	12	2500	50	31.25	
350	14	2500	50	31.25	
400	16	4000	80	50	
450	18	4000	80	50	
500	20	6300	126	78.75	
600	24	10000	200	125	

CLASS 2

SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0.064	0.040	400
32	1 ¼	25	0.10	0.063	
40	1 ½	40	0.16	0.10	
50	2	63	0.25	0.16	
65	2 ½	100	0.40	0.25	
80	3	160	0.64	0.40	
100	4	250	1.0	0.63	
125	5	400	1.6	1.0	
150	6	630	2.5	1.6	
200	8	1000	4.0	2.5	
250	10	1600	6.4	4.0	
300	12	2500	10	6.3	
350	14	2500	10	6.3	
400	16	4000	16	10	
450	18	4000	16	10	
500	20	6300	25	16	
600	24	10000	40	25	
650	26	10000	40	25	
700	28	10000	64	40	250
750	30	10000	64	40	
800	32	16000	160	100	160
900	36	16000	160	100	
1000	42	16000	256	160	100
1200	48	16000	320	200	80
1400	56	16000	320	200	
1600	64	16000	320	200	
1800	72	16000	640	400	40
2000	80	16000	640	400	

SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0.10	0.064	250
32	1 ¼	25	0.16	0.10	
40	1 ½	40	0.26	0.16	
50	2	63	0.40	0.25	
65	2 ½	100	0.64	0.40	
80	3	160	1.0	0.64	
100	4	250	1.6	1.0	
125	5	400	2.6	1.6	
150	6	630	4.0	2.5	
200	8	1000	6.4	4.0	
250	10	1600	10	6.4	
300	12	2500	16	10	
350	14	2500	16	10	
400	16	4000	26	16	
450	18	4000	26	16	
500	20	6300	40	25	
600	24	10000	64	40	
650	26	10000	64	40	
700	28	10000	64	40	
750	30	10000	64	40	
800	32	16000	160	100	160
900	36	16000	160	100	
1000	42	16000	256	160	100
1200	48	16000	320	200	80
1400	56	16000	320	200	
1600	64	16000	320	200	
1800	72	16000	640	400	40
2000	80	16000	640	400	

CLASS 2

SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0.16	0.10	160
32	1 ¼	25	0.25	0.16	
40	1 ½	40	0.40	0.25	
50	2	63	0.63	0.40	
65	2 ½	100	1.0	0.63	
80	3	160	1.6	1.0	
100	4	250	2.5	1.6	
125	5	400	4.0	2.5	
150	6	630	6.3	4.0	
200	8	1000	10	6.3	
250	10	1600	16	10	
300	12	2500	25	16	
350	14	2500	25	16	
400	16	4000	40	25	
450	18	4000	40	25	
500	20	6300	63	40	
600	24	10000	100	63	
650	26	10000	100	63	
700	28	10000	100	63	
750	30	10000	160	100	
800	32	16000	160	100	
900	36	16000	160	100	
1000	42	16000	250	160	100
1200	48	16000	320	200	80
1400	56	16000	320	200	
1600	64	16000	320	200	
1800	72	16000	640	400	40
2000	80	16000	640	400	

MI-001

The **MS2500** diameters below, coupled with **MV145** are certified in accordance with European directive 2014/32/EU category MI-001

SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0.064	0.040	400
32	1 ¼	25	0.10	0.063	
40	1 ½	40	0.16	0.10	
50	2	63	0.25	0.16	
65	2 ½	100	0.40	0.25	
80	3	160	0.64	0.40	
100	4	250	1.0	0.63	
125	5	400	1.6	1.0	
150	6	630	2.5	1.6	
200	8	1000	4.0	2.5	
250	10	1600	6.4	4.0	
300	12	2500	10	6.3	
350	14	2500	10	6.3	
400	16	4000	16	10	
450	18	4000	16	10	
500	20	6300	25	16	
600	24	10000	40	25	
650	26	10000	40	25	
700	28	10000	64	40	250
750	30	10000	64	40	
800	32	16000	160	100	160
900	36	16000	160	100	
1000	42	16000	256	160	100
1200	48	16000	320	200	80
1400	56	16000	320	200	
1600	64	16000	320	200	
1800	72	16000	640	400	40
2000	80	16000	640	400	

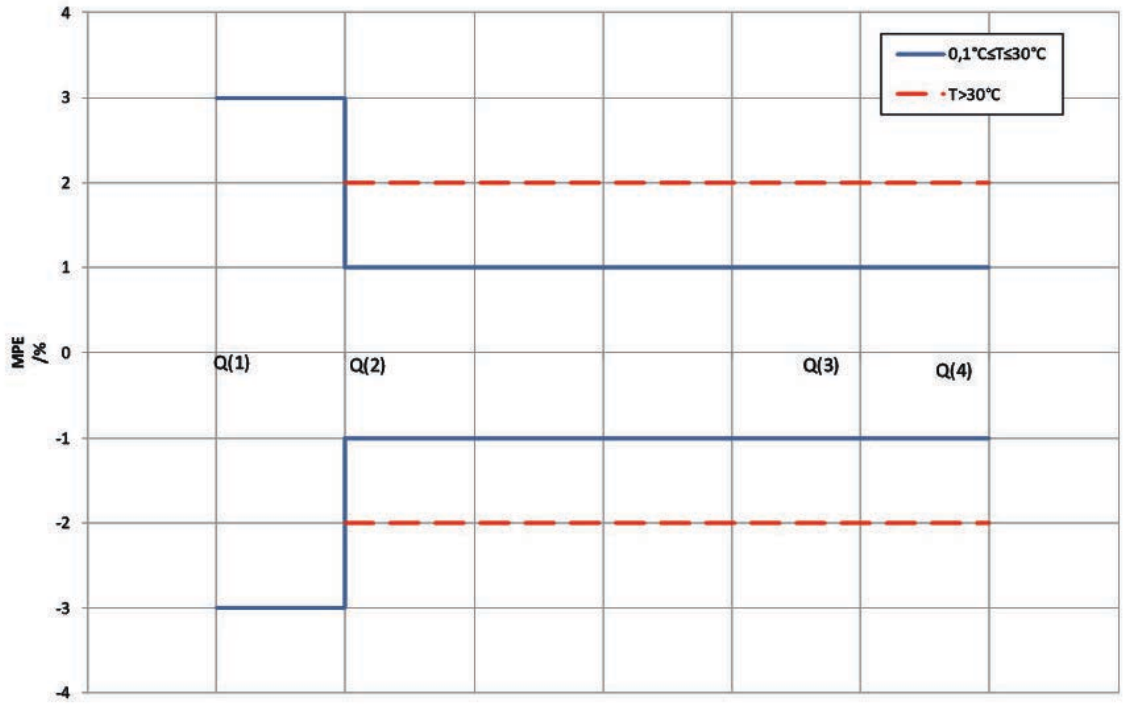
SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0.10	0.064	250
32	1 ¼	25	0.16	0.10	
40	1 ½	40	0.26	0.16	
50	2	63	0.40	0.25	
65	2 ½	100	0.64	0.40	
80	3	160	1.0	0.64	
100	4	250	1.6	1.0	
125	5	400	2.6	1.6	
150	6	630	4.0	2.5	
200	8	1000	6.4	4.0	
250	10	1600	10	6.4	
300	12	2500	16	10	
350	14	2500	16	10	
400	16	4000	26	16	
450	18	4000	26	16	
500	20	6300	40	25	
600	24	10000	64	40	
650	26	10000	64	40	
700	28	10000	64	40	
750	30	10000	64	40	
800	32	16000	160	100	160
900	36	16000	160	100	
1000	42	16000	256	160	100
1200	48	16000	320	200	80
1400	56	16000	320	200	
1600	64	16000	320	200	
1800	72	16000	640	400	40
2000	80	16000	640	400	

The sensor **MS2500** diameters below, coupled with **MV145** are certified in accordance with European directive 2014/32/EU category MI-001

SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0.16	0.10	
32	1 ¼	25	0.25	0.16	
40	1 ½	40	0.40	0.25	
50	2	63	0.63	0.40	
65	2 ½	100	1.0	0.63	
80	3	160	1.6	1.0	
100	4	250	2.5	1.6	
125	5	400	4.0	2.5	
150	6	630	6.3	4.0	
200	8	1000	10	6.3	
250	10	1600	16	10	
300	12	2500	25	16	**160**
350	14	2500	25	16	
400	16	4000	40	25	
450	18	4000	40	25	
500	20	6300	63	40	
600	24	10000	100	63	
650	26	10000	100	63	
700	28	10000	100	63	
750	30	10000	160	100	
800	32	16000	160	100	
900	36	16000	160	100	
1000	42	16000	250	160	**100**
1200	48	16000	320	200	
1400	56	16000	320	200	**80**
1600	64	16000	320	200	
1800	72	16000	640	400	**40**
2000	80	16000	640	400	

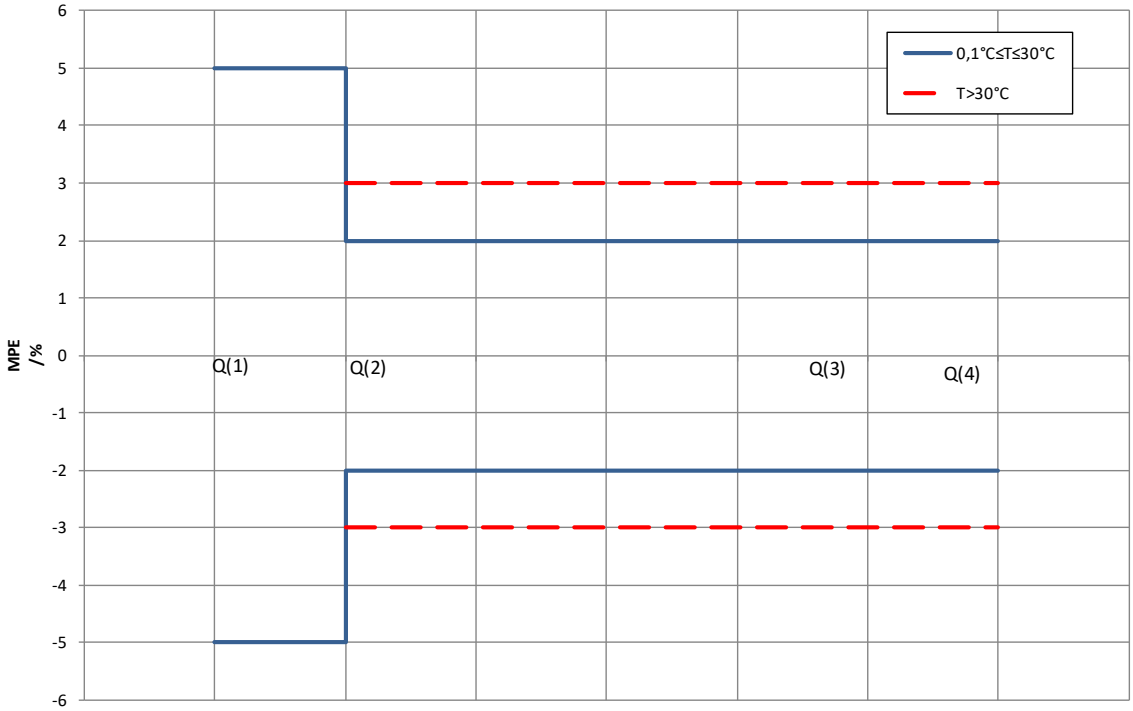
MPE - OIML R49 ACCURACY CLASS 1

(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)



HOW TO ORDER

CODE\ EXAMPLE		CODE\DESCRIPTION
Display		
B	A	Blind version (without display and programming keys, USB cable type A / USB Mini B is Required for programming)
	B	Graphic LCD WSTN - B/W - back light display, dot matrix 128 x 64, 8 line/16 characters and 3 programming keys (REQUIRED FOR MID MI-001/OIML)
Housing material		
0	0	Nylon PA6 with fiber glass (IP67 only)
	1	Painted aluminum die casting
Version / Protection rate		
A	A	Compact version with sensor MS.... - IP67
	B	Separate version for wall mounting, complete with aluminium mounting accessories (use C015/C016 cable MAX LENGTH 20 m) - IP67
	C	Compact version with display visible from the top - IP67
	D	Compact version - IP68 1,5 meters - ONLY aluminium housing
	E	Compact version with display visible from the top - IP68 1,5 meters - ONLY aluminium housing
	F	Separate version for wall mounting (use C015/C016 cable MAX LENGTH 20 m) - IP68 1,5 meters - ONLY aluminium housing
Main Power supply		
0	0	Without Main Power Supply
	1	Power supply : 100 ... 240 VAC- 45/66 Hz
	2	Power supply : 12÷24 VDC
Batteries		
A	A	2 Lithium thionyl chloride batteries (n° 1 on slot 1 - n° 1 on slot 2)
	B	4 Lithium thionyl chloride batteries (n° 2 on slot 1 - n° 2 on slot 2)
	C	6 Lithium thionyl chloride batteries (n° 3 on slot 1 - n° 3 on slot 2)
	D	6 Alkaline or NiMh batteries SIZE D (on slot 3)
	E	Board set for Lithium (slot 1-2) (Batteries NOT Supplied)
	F	Board set for Alkaline (slot 3) (Batteries NOT Supplied)
Analog Input/Output		
A	0	Without Analog Input/Output
	1	N° 1 Input for n° 1 pressure sensor (pressure sensor to be ordered separately)
	2	N° 2 Inputs for n° 2 pressure sensors (pressure sensors to be ordered separately)
	3	N° 1 Input for n° 1 PT 100/500/1000 THERMAL PROBE (probe to be ordered separately)
	4	N° 2 Inputs for n° 2 PT 100/500/1000 THERMAL PROBE (probes to be ordered separately)
	5	N° 1 Analog Output (4/20 mA) - Active or Passive (by wiring) if the Main Power is SELECTED ; ONLY PASSIVE if powered by BATTERIES
	6	Option 1 + 5
	7	Option 2 + 5
	8	Option 3 + 5
	9	Option 4 + 5
	a	Option 1 + 3
Digital Input/Output		
0	A	Without Digital Input/Output
	B	N° 2 ON/OFF output (max 50 Hz - max 100 mA) + N° 1 ON/OFF input
	C	N° 4 ON/OFF output (max 50 Hz - max 100 mA) + N° 3 ON/OFF input
	D	N° 4 ON/OFF output (max 50 Hz - max 100 mA) + N° 3 ON/OFF input + Potted Cable

Communication Gateway		
0	0	Without Gateway
	1	RS485 NOT ins lated - Modbus
	2	Others
Data Logger		
A	A	MicroSD Memory 4 GB : Data Logger + RTC (Real Time Clock)
	B	MicroSD Memory 4 GB : Data Logger + RTC (Real Time Clock) + BIV (Built In Verificator)
	C	MicroSD Memory 4 GB : Data Logger + RTC (Real Time Clock) + Meter Data (Real Time Converter & Sensor Data on SD Memory)
	D	MicroSD Memory 4 GB : Data Logger + RTC (Real Time Clock) + BIV + Meter Data
Special Features		
0	0	None
	1	WITH ANTICONDENSE CAP
	2	N° 5 per M20 x 1,5 (ONLY IP 67 version)
Connectors for POWER SUPPLY and CABLES FROM SENSOR (Separate Version) (Maximum 5 connectors including IN/OUT connectors)		
A	A	NONE
	B	POWER SUPPLY (n.1 o nnet or)
	C	SEPARATE VERSION (n. 2 connet ors)
	D	POWER SUPPLY (n.1 o nnet or) + SEPARATE VERSION (n.2 o nnet ors)
Connectors for INPUTS/OUTPUTS (Maximum 5 connectors including connectors for Power Supply and cables from sensor) (other combinations on request)		
0	0	NONE
	1	n.1 PRESSURE or n.1 TEMPERATURE (n.1 o nnet or)
	2	n.2 PRESSURES or n.2 TEMPERATURES (n.2 o nnet ors)
	3	n.2 DIGITAL OUTPUT - n.1 DIGITAL INPUT (n.1 o nnet or)
	4	n.2 DIGITAL OUTPUT - n.1 DIGITAL INPUT + RS485 (n.1 o nnet or)
	5	n.2 DIGITAL OUTPUT - n.1 DIGITAL INPUT (n.1 o nnet or) + n.1 PRESSURE or n. 1 TEMPERATURE (n.1 o nnet or)
	6	n.2 DIGITAL OUTPUT + n.1 OUTPUT 4-20 mA (n.1 o nnet or)
	7	n.2 DIGITAL OUTPUT (n. 1 connet or) + n.1 OUTPUT 4-20 mA + RS485 (n.1 o nnet or)
	8	n.1 RS485 (n.1 o nnet or)
	9	n.1 RS485 (n.1 o nnet or) n.1 Pres re or n.1 Temperature (n.1 o nnet or)
	a	N° 4 ON/OFF output (max 50 Hz - max 100 mA) - (n.1 connector)
	b	n.1 PRESSURE (n.1 o nnector) + n.2 DIGITAL OUTPUT (n. 1 o nnet or) + n.1 OUTPUT 4-20 mA + RS485 (n.1 o nnet or)
	c	n.2 DIGITAL OUTPUTS +N° 1 ON/OFF input (n° 1 connector) + 1 OUTPUT 4-20 mA + RS485 (n° 1 connector)
	d	n.2 DIGITAL OUTPUT - n.1 DIGITAL INPUT +n° 1 OUT 4/20 mA (n.1 connector) + n.1 PRESSURE (n.1 o nnet or)
	e	1 PRESSURE (n.1 connector) + uscita 4/20 mA + 2 uscite ON/OFF + Ingresso ON/OFF + porta RS485 (n.1 o nnet or)
MID APPROVAL		
A	A	NONE
	B	MI-001 CLASS 2
	C	OIML-R49 CLASS 1
	D	OIML-R49 CLASS 2

Complete code example for order → **MV145-B0A0A0A0A0A**

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 notice.

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