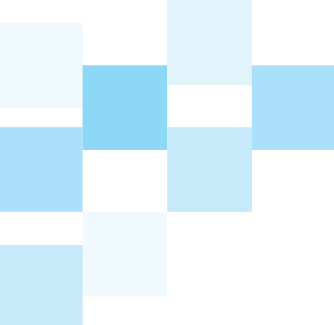




ISOMAG ™

The friendly magmeter

DATA SHEET

MV145



CE

ISOIL 
I N D U S T R I A



INDEX

TECHNICAL DATA	4
OVERALL DIMENSIONS	5
MV145 EXPLODED LAYOUT	12
EXPLODED LAYOUT	14
CONVERTER ACCESS	15
BATTERY POWER SUPPLY	17
ELECTRICAL CONNECTIONS	21
DIGITAL INPUTS	23
DIGITAL OUTPUTS	23
AUXILIARY MODULE ANALOG INPUTS	24
4÷20 MA OUTPUTS	26
MODBUS (RS485)	27
AUXILIARY MODULE DIGITAL INPUTS/ OUTPUTS	28
FUNCTIONS MENU	29
MEASUREMENT SETTINGS	34
MAIN PAGES VISUALIZATION	35
USER INTERFACE	36
DATA LOGGER	37
ACCURACY	38
OIML R49	39
MI-001	42
HOW TO ORDER	45

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

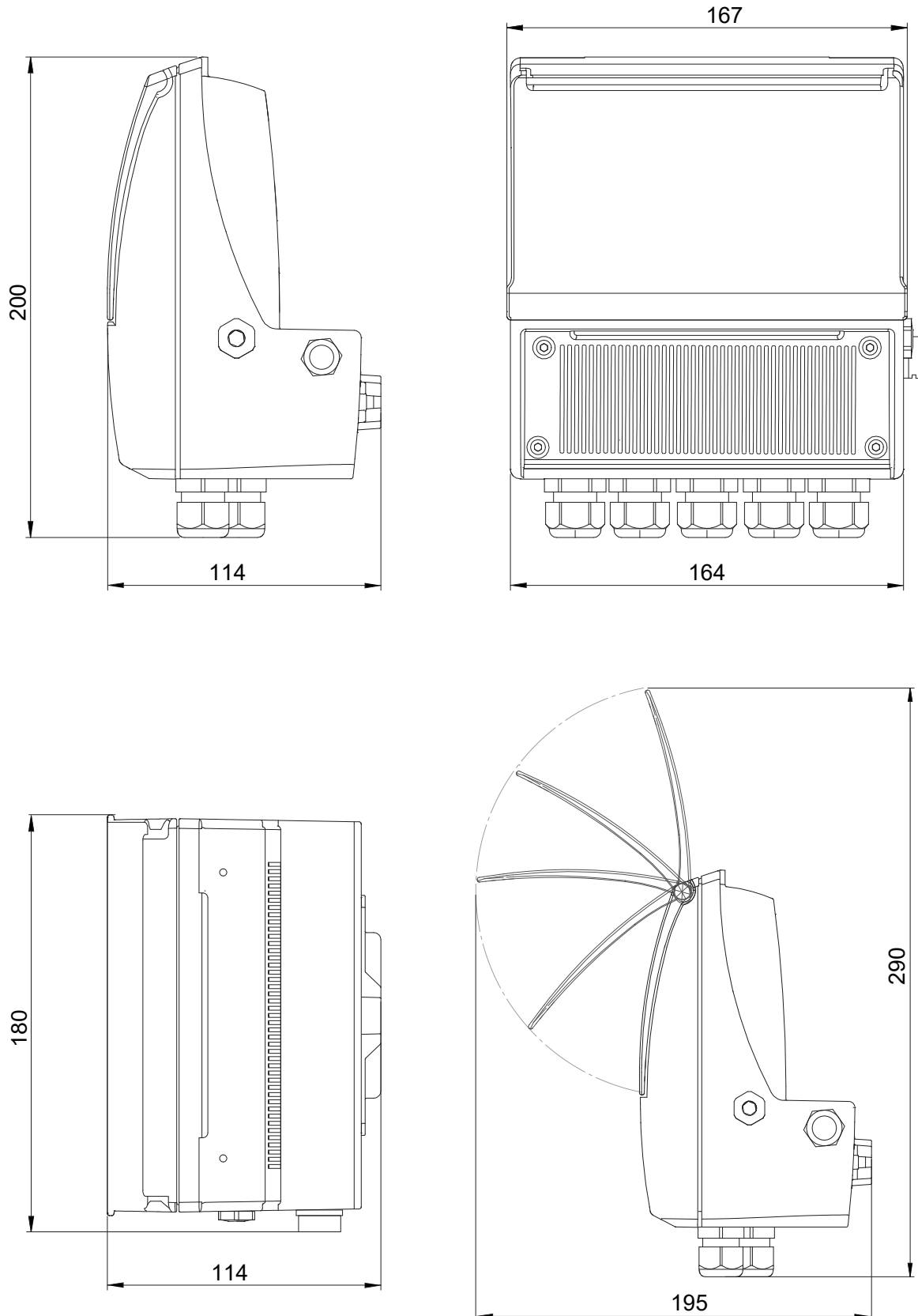
Accuracy (Whole System Converter+Sensor)	☐ See table below
---	--

OVERALL DIMENSIONS

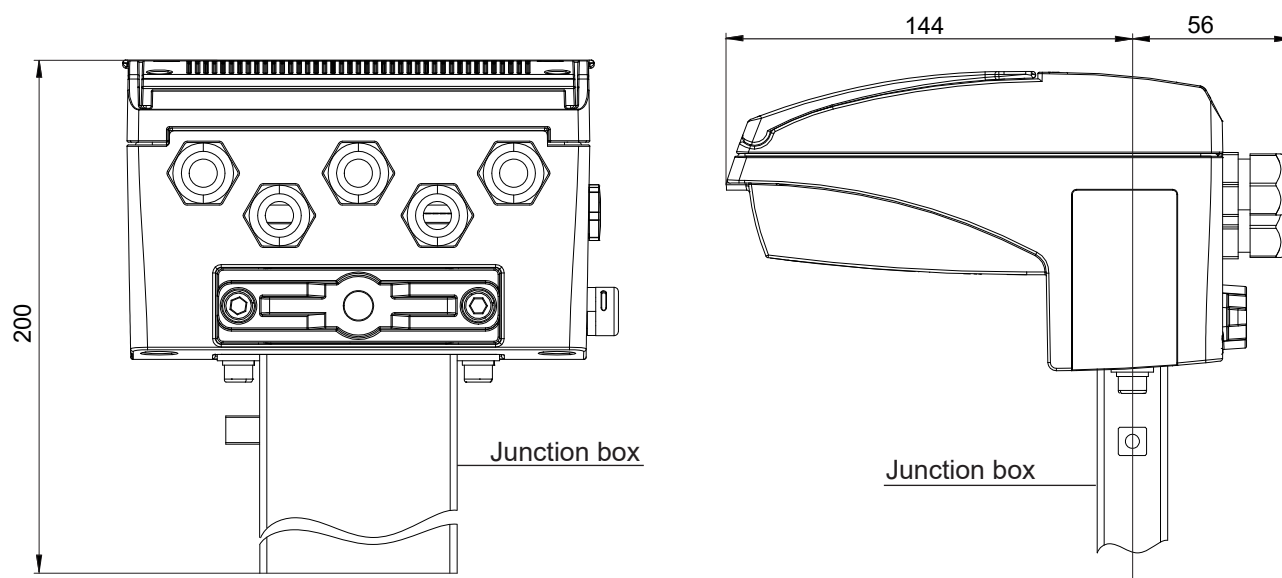
PA6 CASE (IP67)

ALLUMINIUM CASE (IP67-IP68)

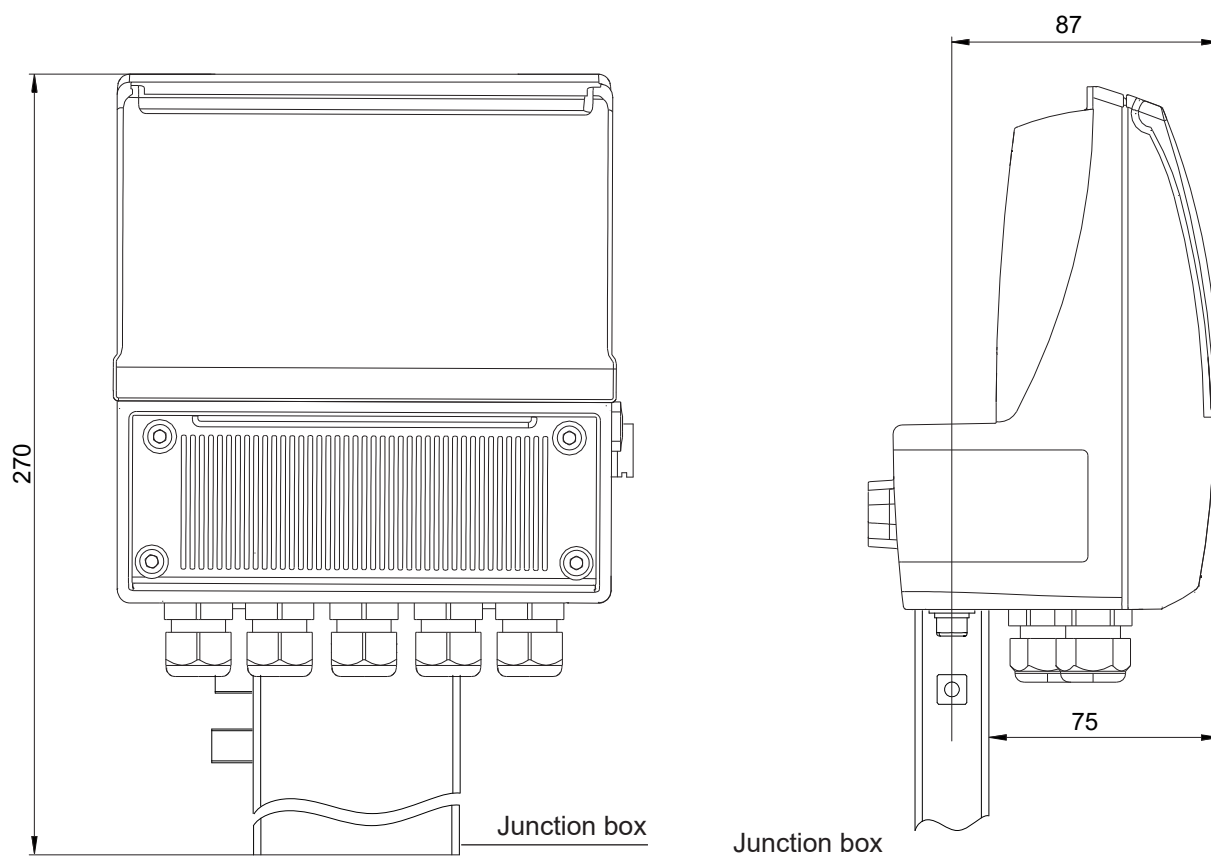
Without battery pack



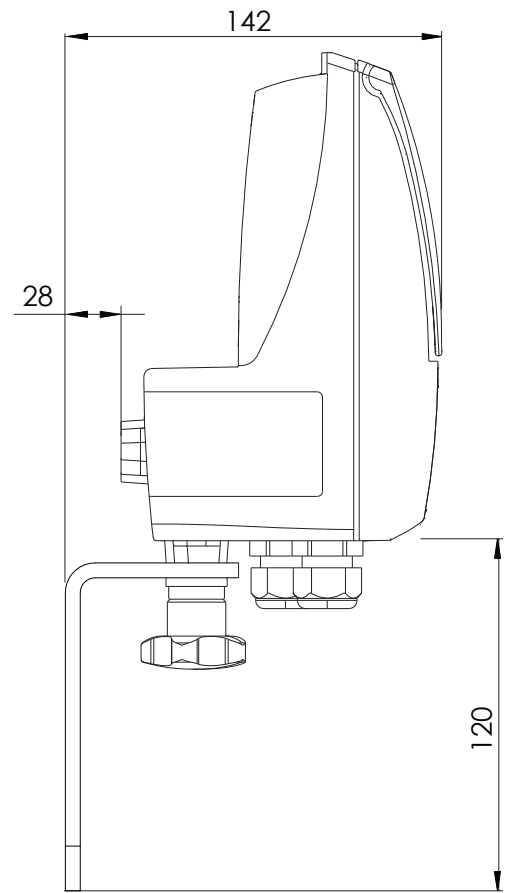
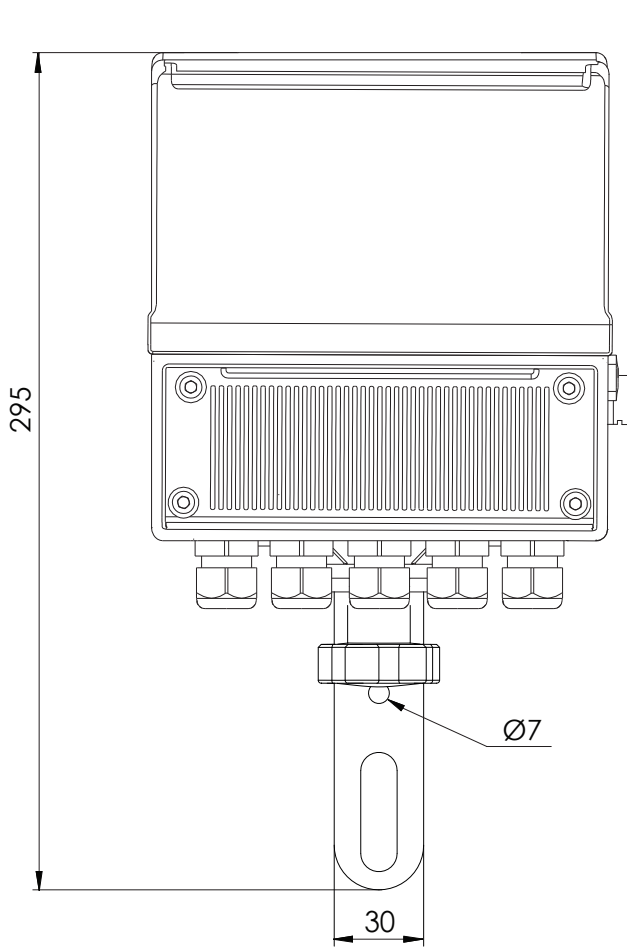
Horizontal compact version



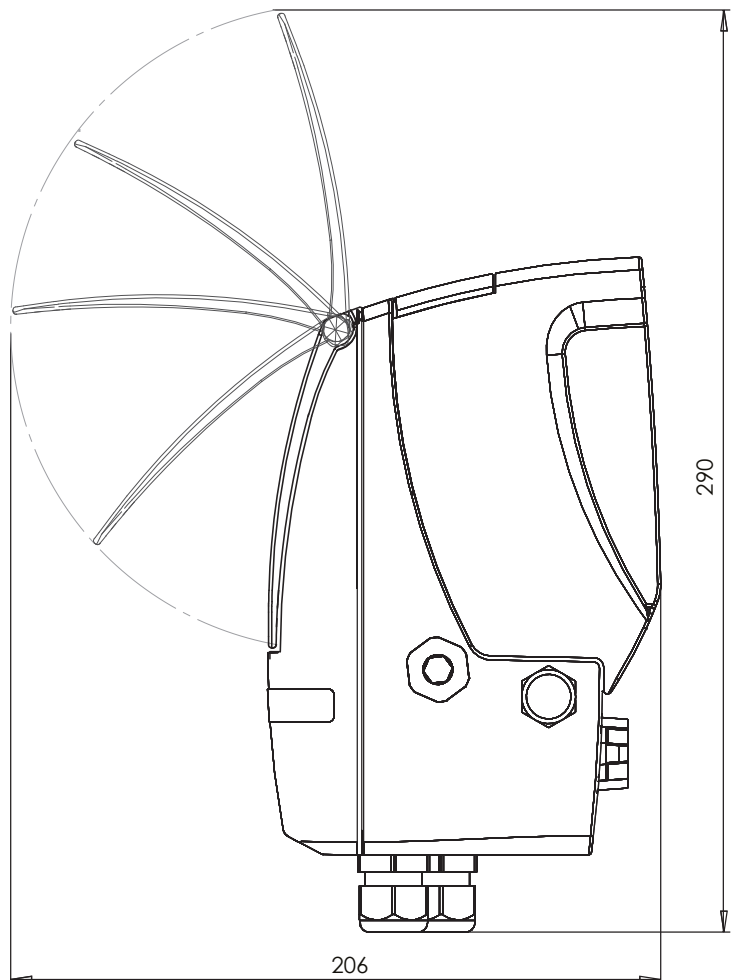
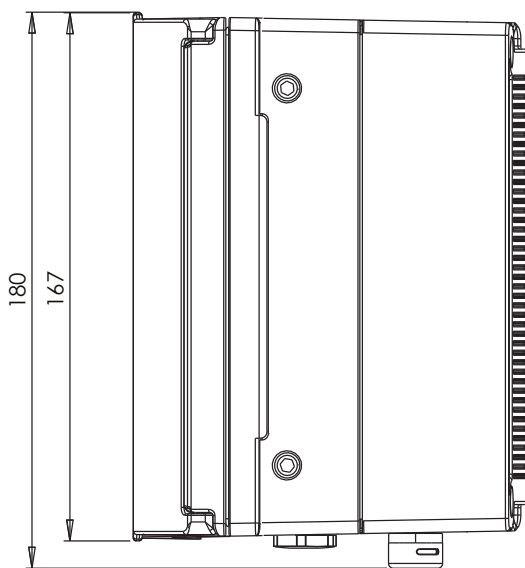
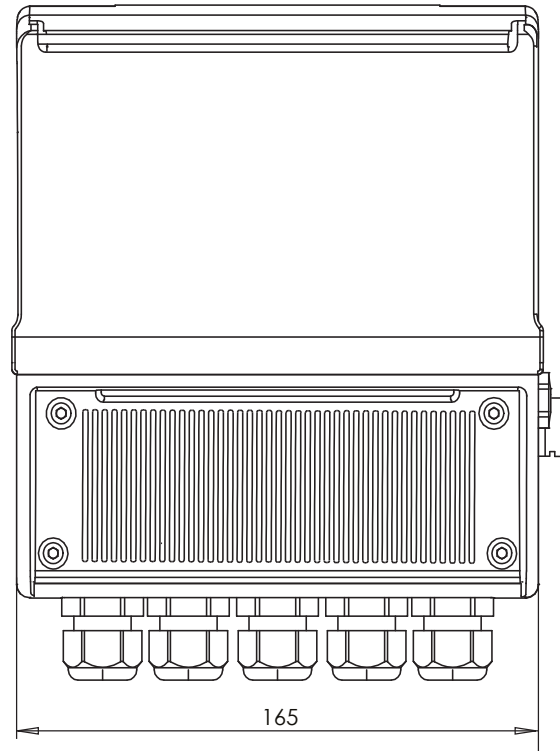
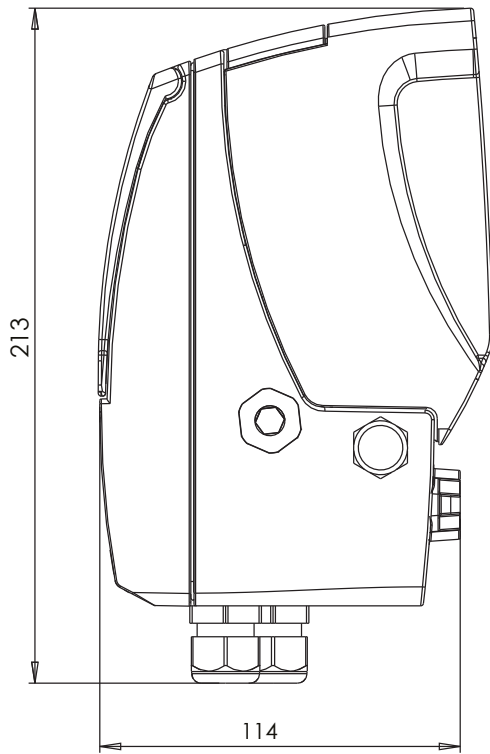
Vertical compact version



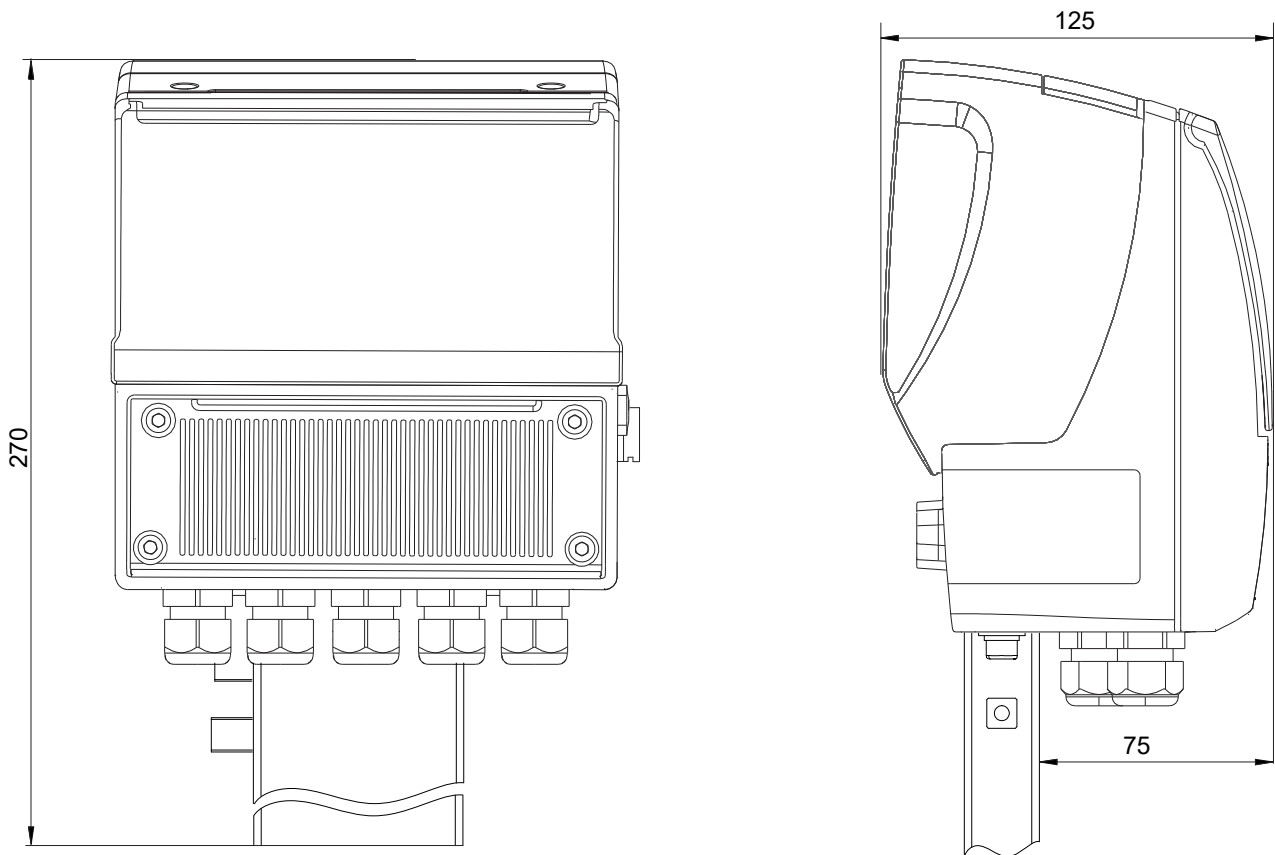
Separate (wall) version



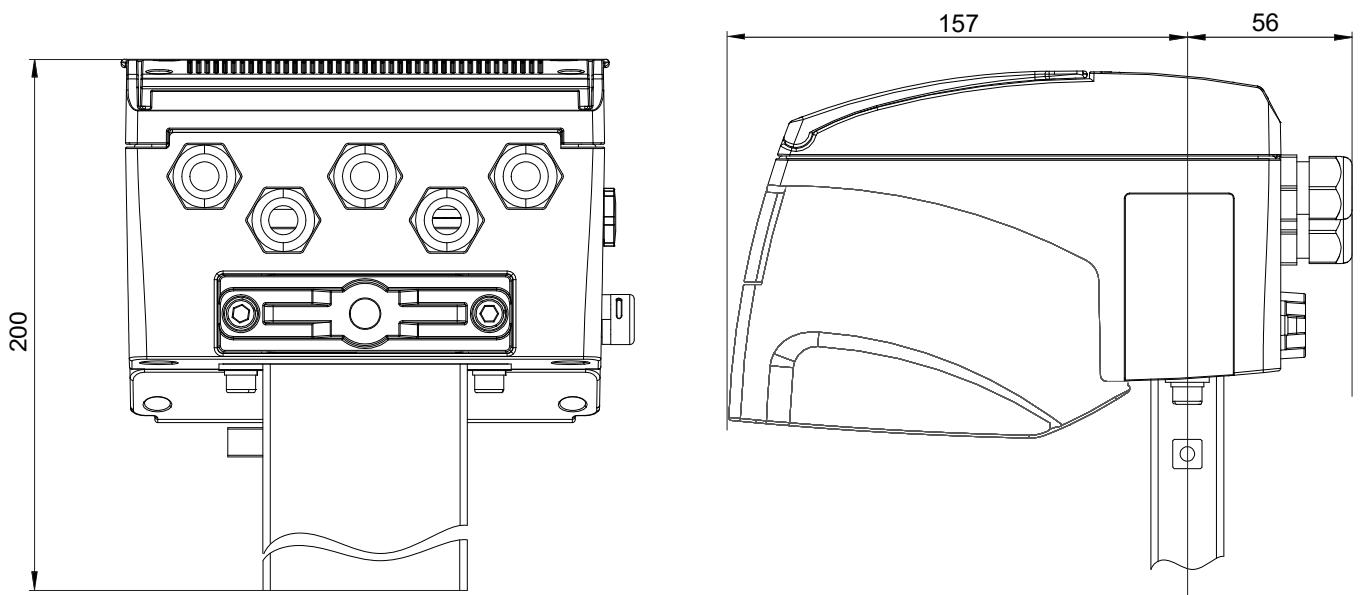
PA6 CASE (IP67)
ALLUMINIUM CASE (IP67-IP68)
With battery pack

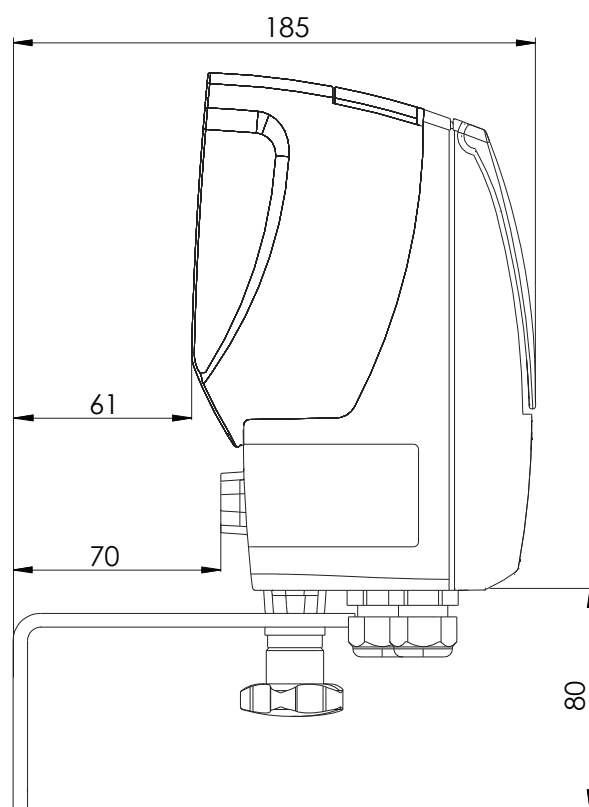
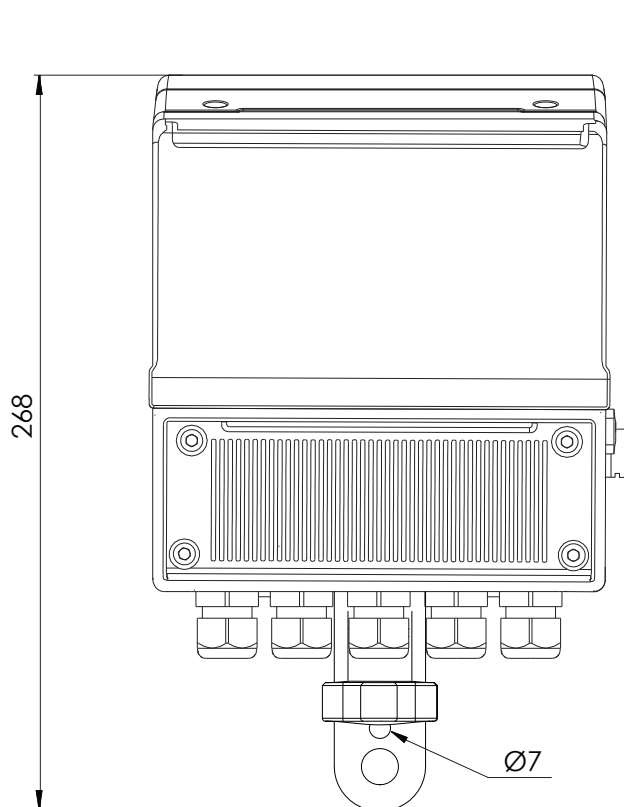


Horizontal compact version

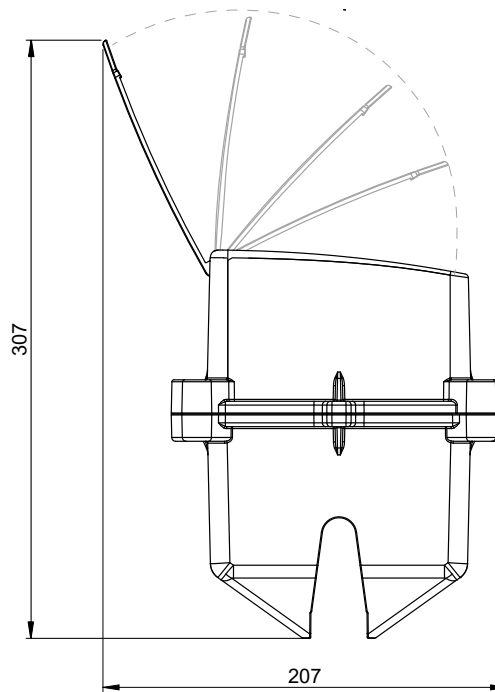
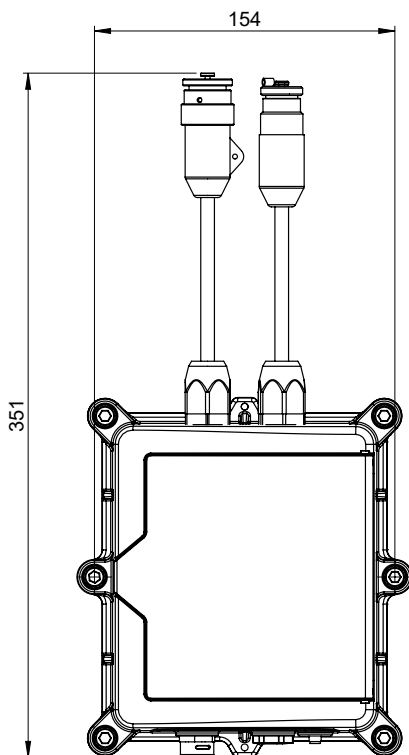
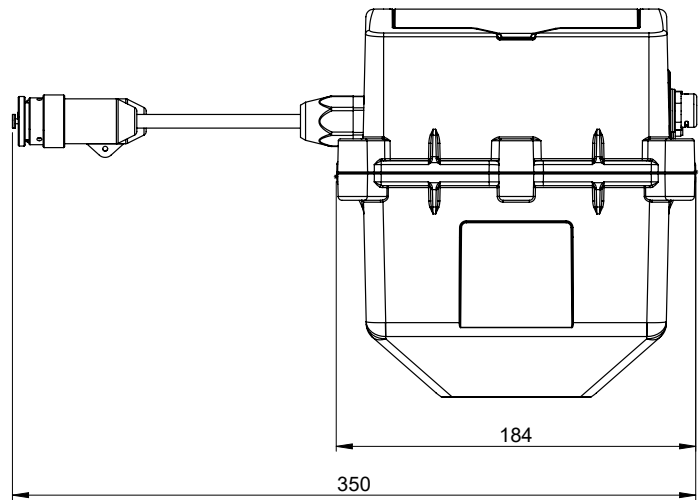
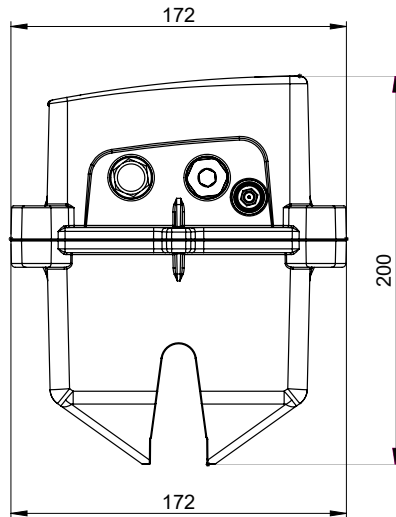


Vertical compact version



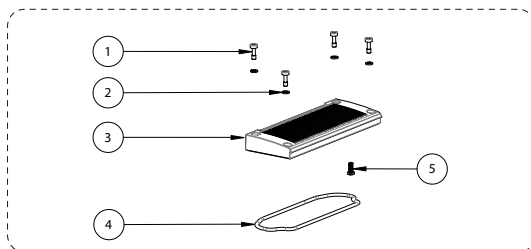
Separate (wall) version

PA6 CASE (IP68)

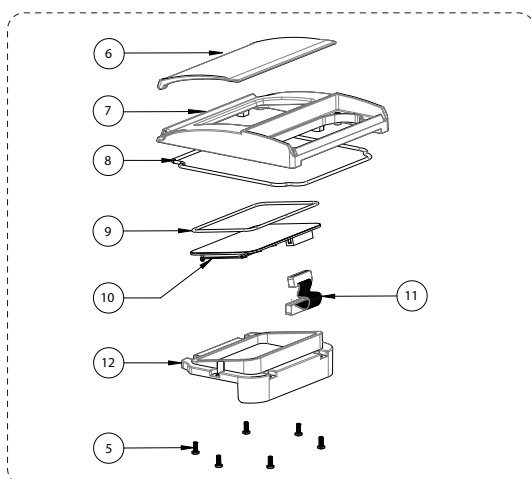


MV145 EXPLODED LAYOUT

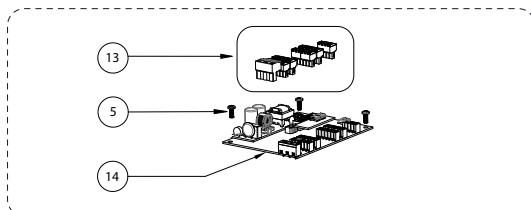
TERMINAL BLOCK COVER



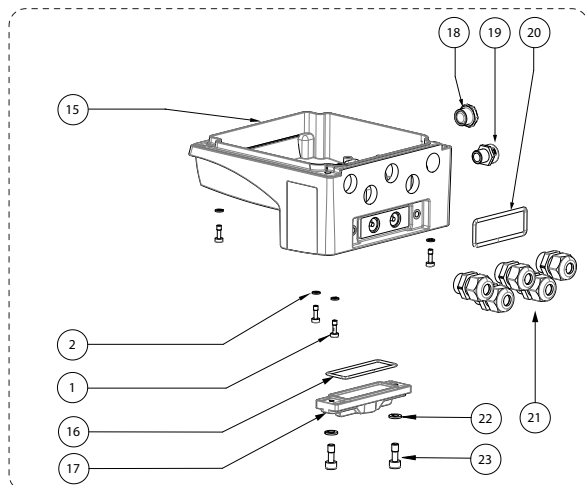
MAIN HOUSING COVER



PCB MV145

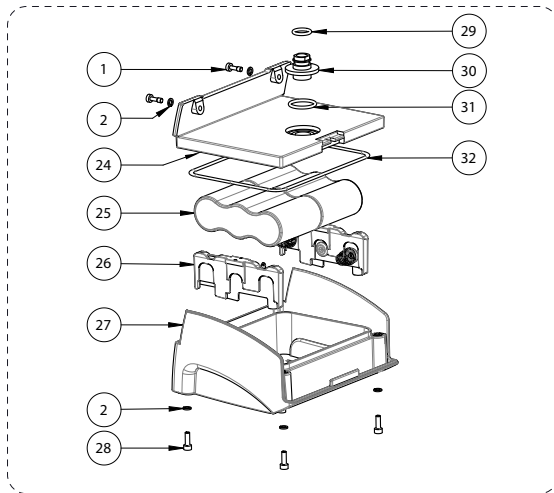


MAIN HOUSING



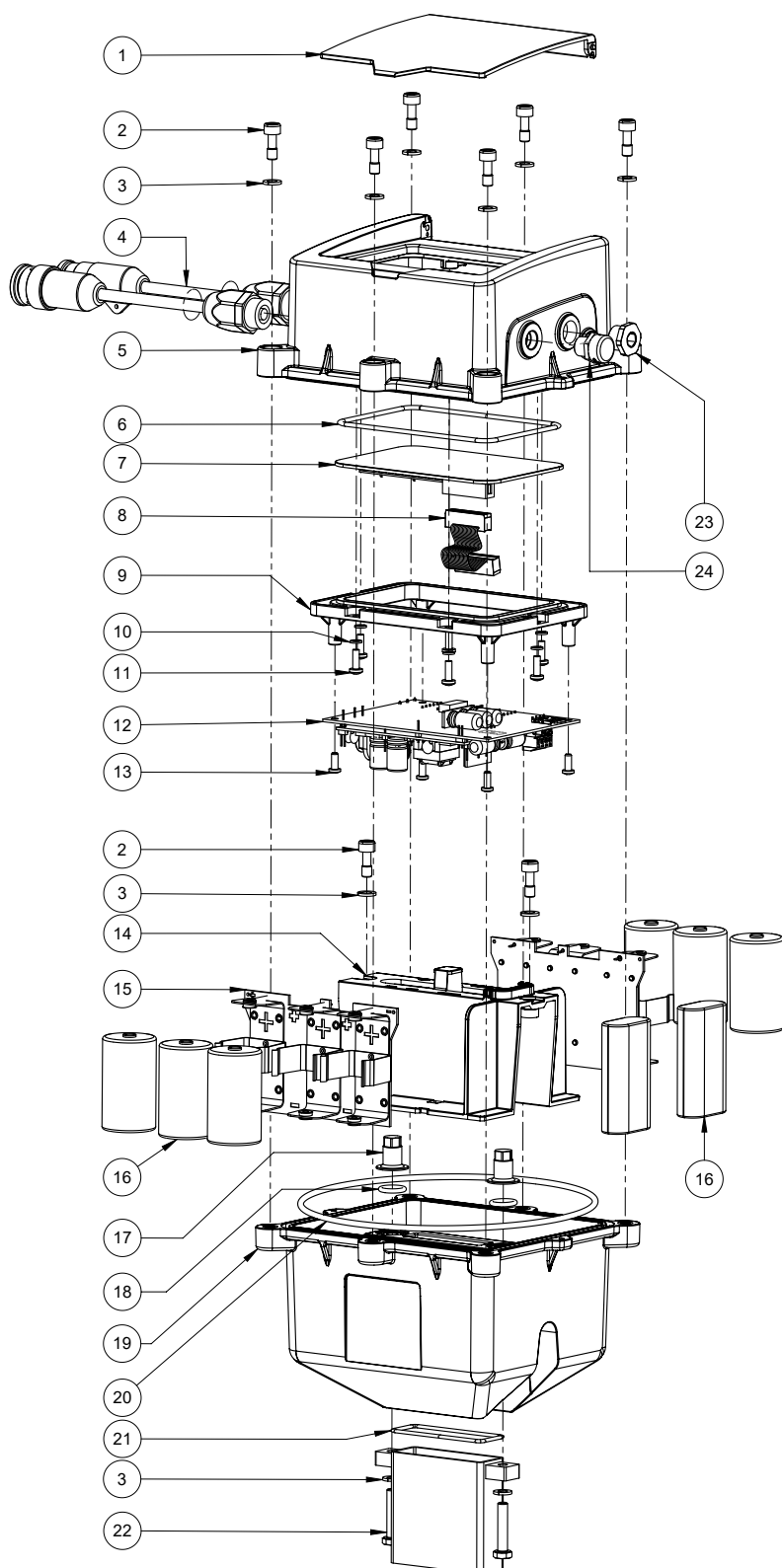
POS.	DESCRIPTION	
	PA6 VERSION	ALUMINIUM VERSION
1	SCREW M4x12	SCREW M5x12
2	GROWER WASHER Ø4	GROWER WASHER Ø5
3	TERMINAL BLOCK COVER	TERMINAL BLOCK COVER
4	O-RING-4400	
5	SELF-TAPPING SCREW 4x10	TRILOBULAR SCREW 4x10
6	PROTECTION COVER	
7	HOUSING COVER	HOUSING COVER
8	ORING-4700	
9	ORING-117x3	
10	DISPLAY	
11	FLAT CABLE	
12	PA6 FIXING DISPLAY FRAME	
13	TERMINAL BLOCK SOLID WIRE: 26-16 AWG / 0.129-1.31 mm ² STRANDED WIRE: 26-16 AWG / 0.129-1.31 mm ² 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 M6x16	

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	

EXPLODED LAYOUT



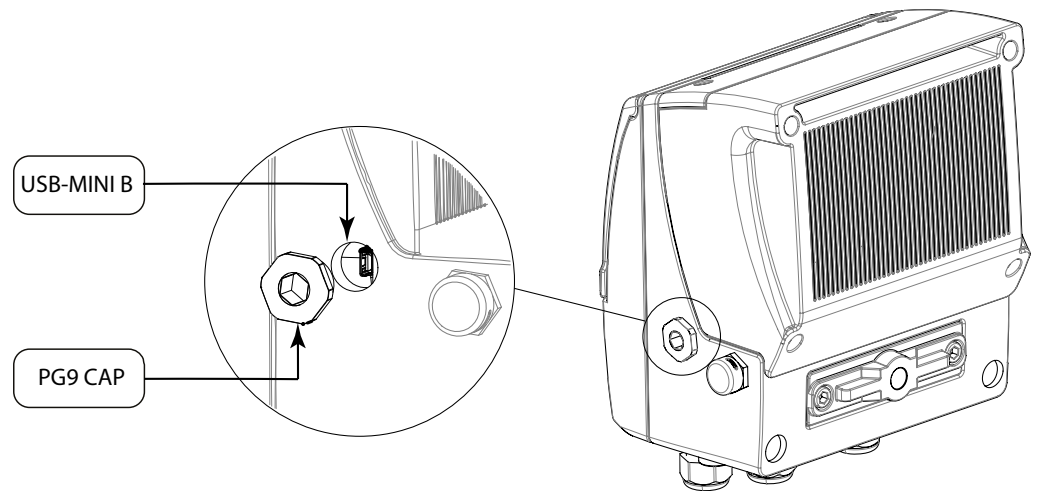
POS.	DESCRIZIONE
1	PROTECTION COVER
2	WORKED SCREW
3	GROWER Ø6
4	WIRED CONNECTORS
5	MAIN COVER
6	O-RING 117X3 (EPDM)
7	DISPLAY
8	FLAT CABLE
9	FRAME DISPLAY
10	GROWER Ø5
11	SCREW M4
12	PCB
13	SELF-TAPPING SCREW
14	BATTERY HOLDER
15	ALKALINE BATTERIES
16	LITHIUM/RECHARGEABLE BATTERIES
17	BLIND NUT
18	O-RING 115 11.91x2.62
19	FRAME
20	O-RING 4700
21	O-RING 155 NBR
22	SCREW M6 X 30
23	PG9 CAP
24	ANTICONDENSATION CAP

CONVERTER ACCESS

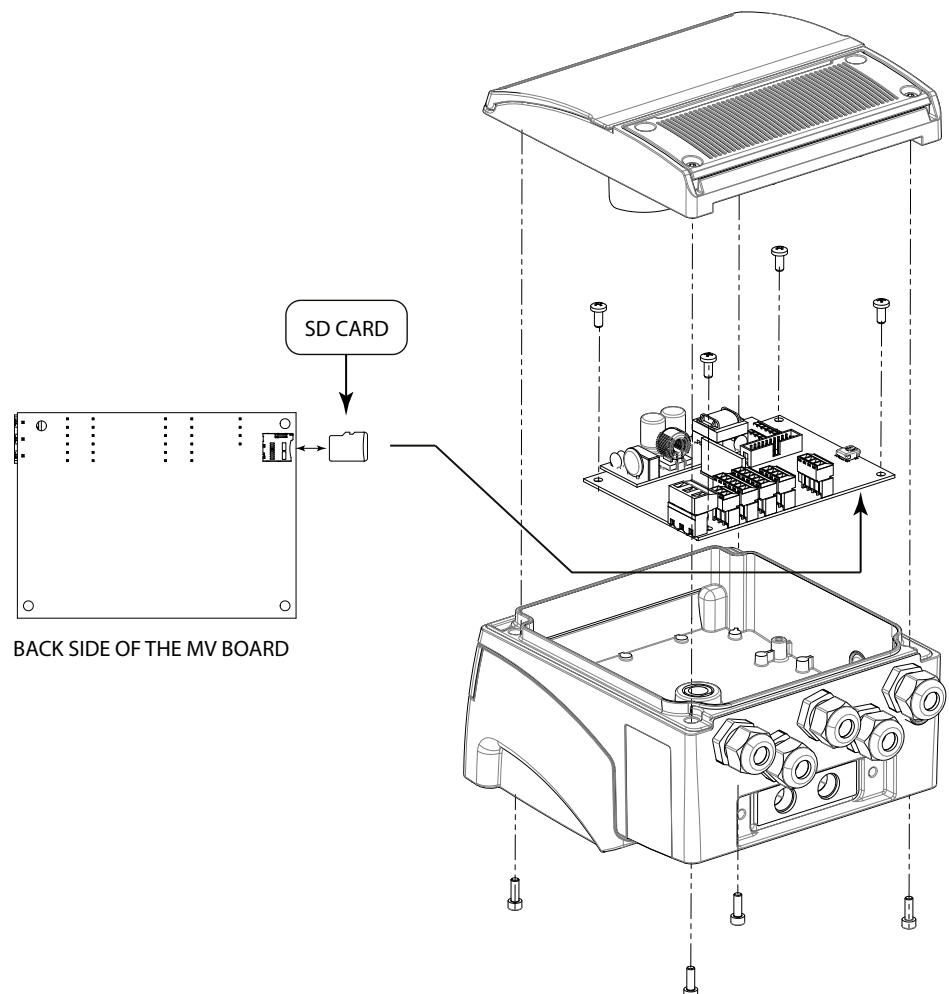
PA6 CASE (IP67)

ALLUMINIUM CASE (IP67-IP68)

USB Connection

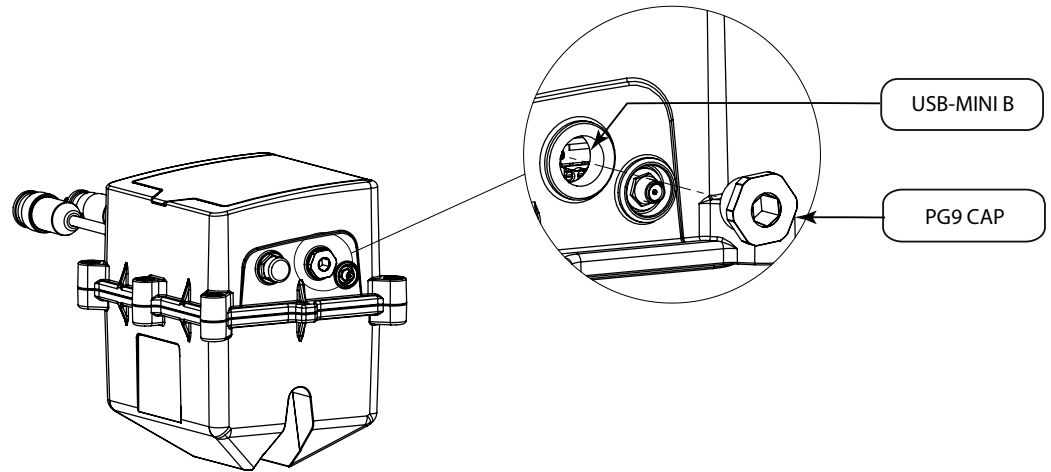


SD card

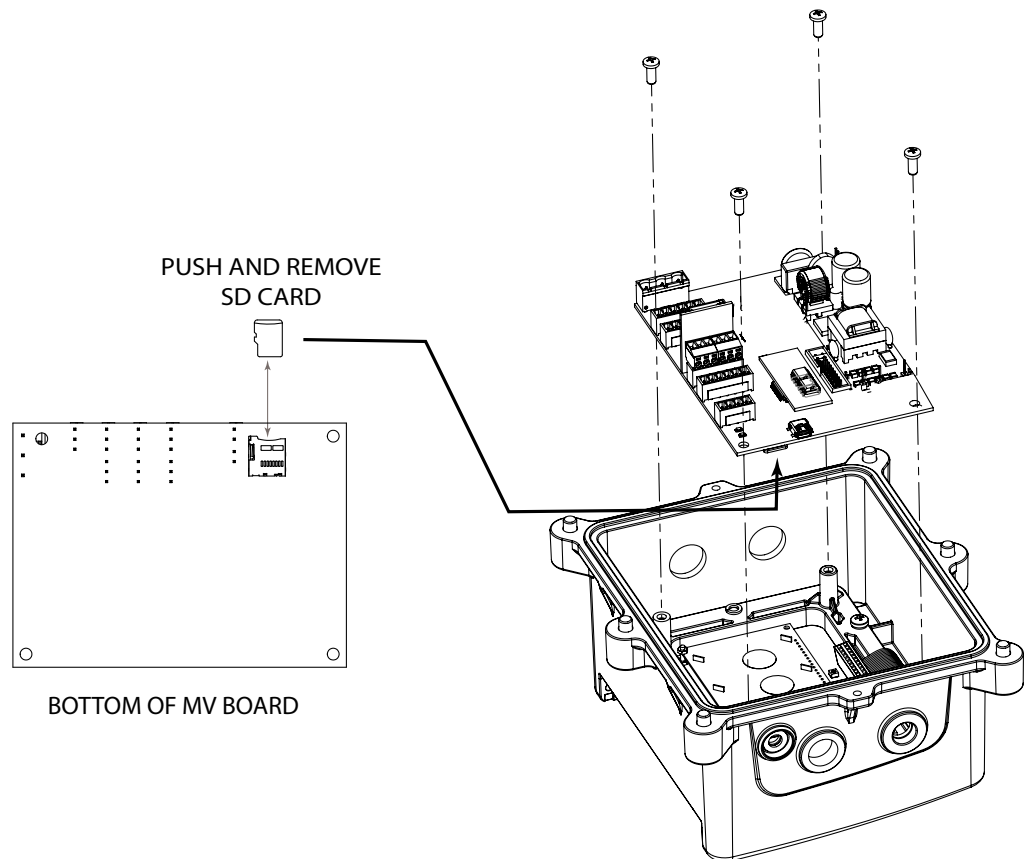


PA6 CASE (IP68)

USB Connection



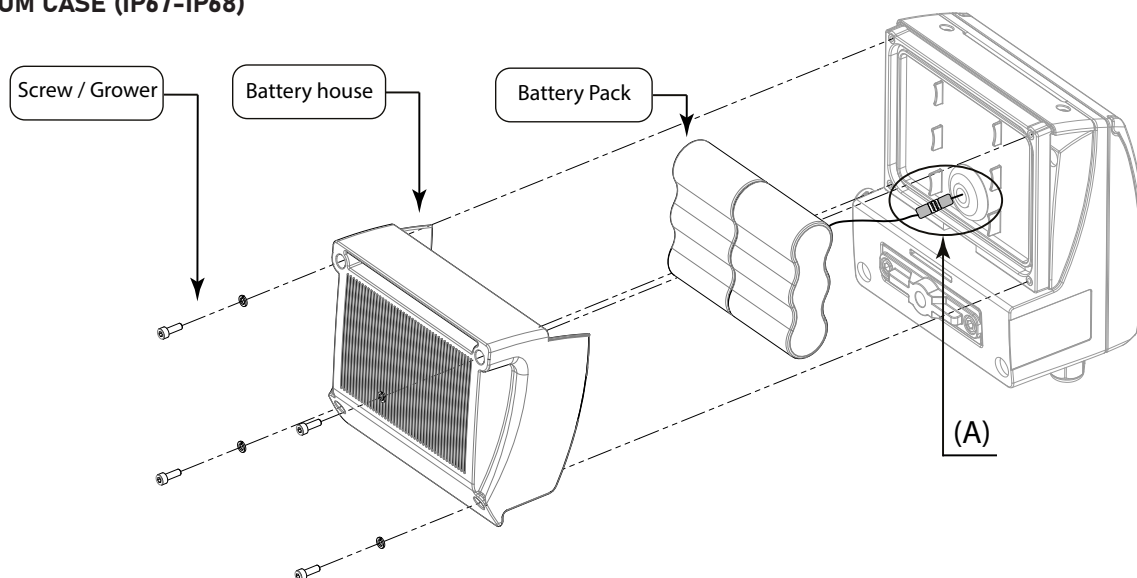
SD card



BATTERY POWER SUPPLY

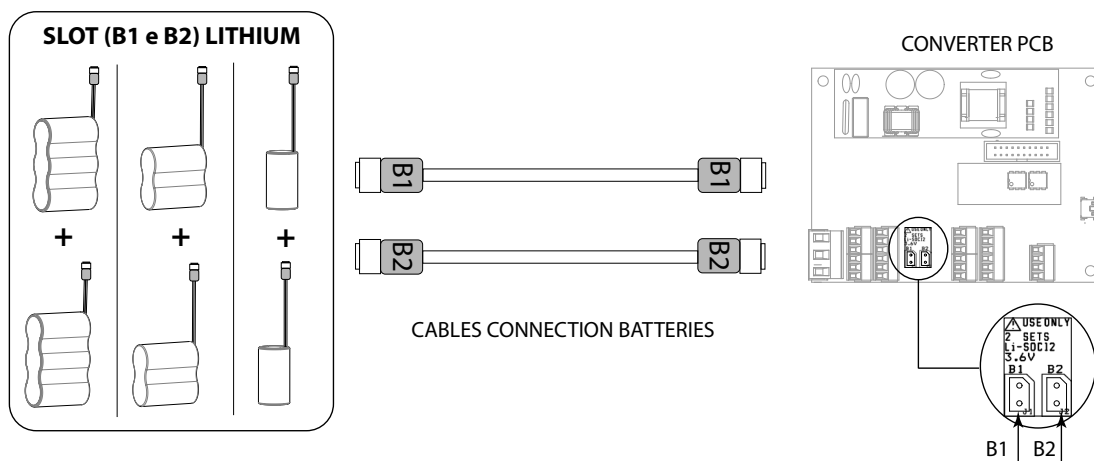
PA6 CASE (IP67)

ALLUMINIUM CASE (IP67-IP68)

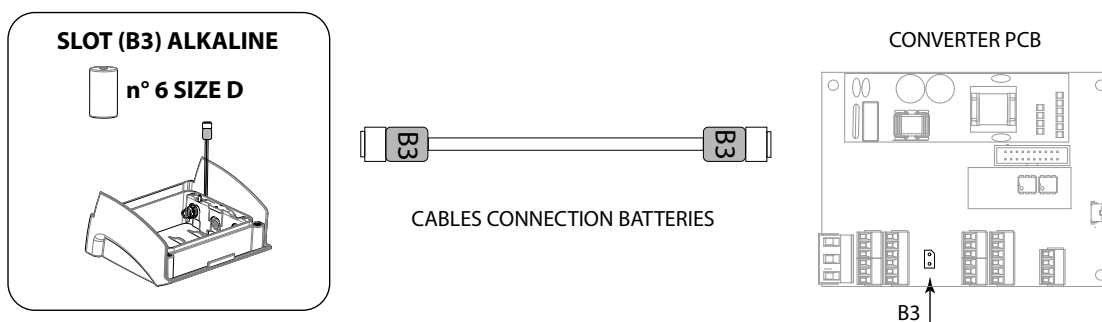


DETAIL (A) BATTERY CONNECTIONS CONVERTER PCB

LITHIUM BATTERIES

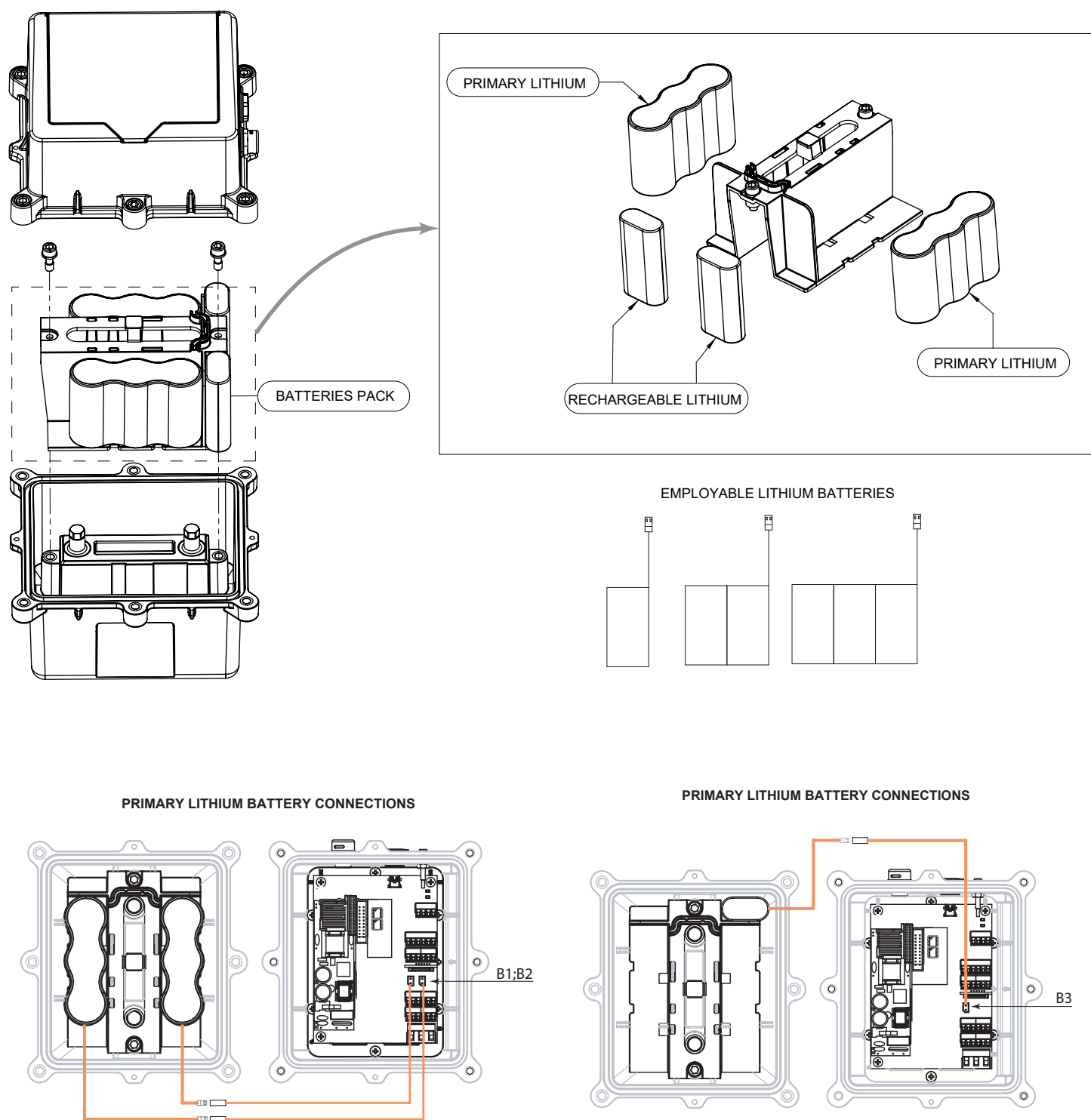


ALKALINE BATTERIES



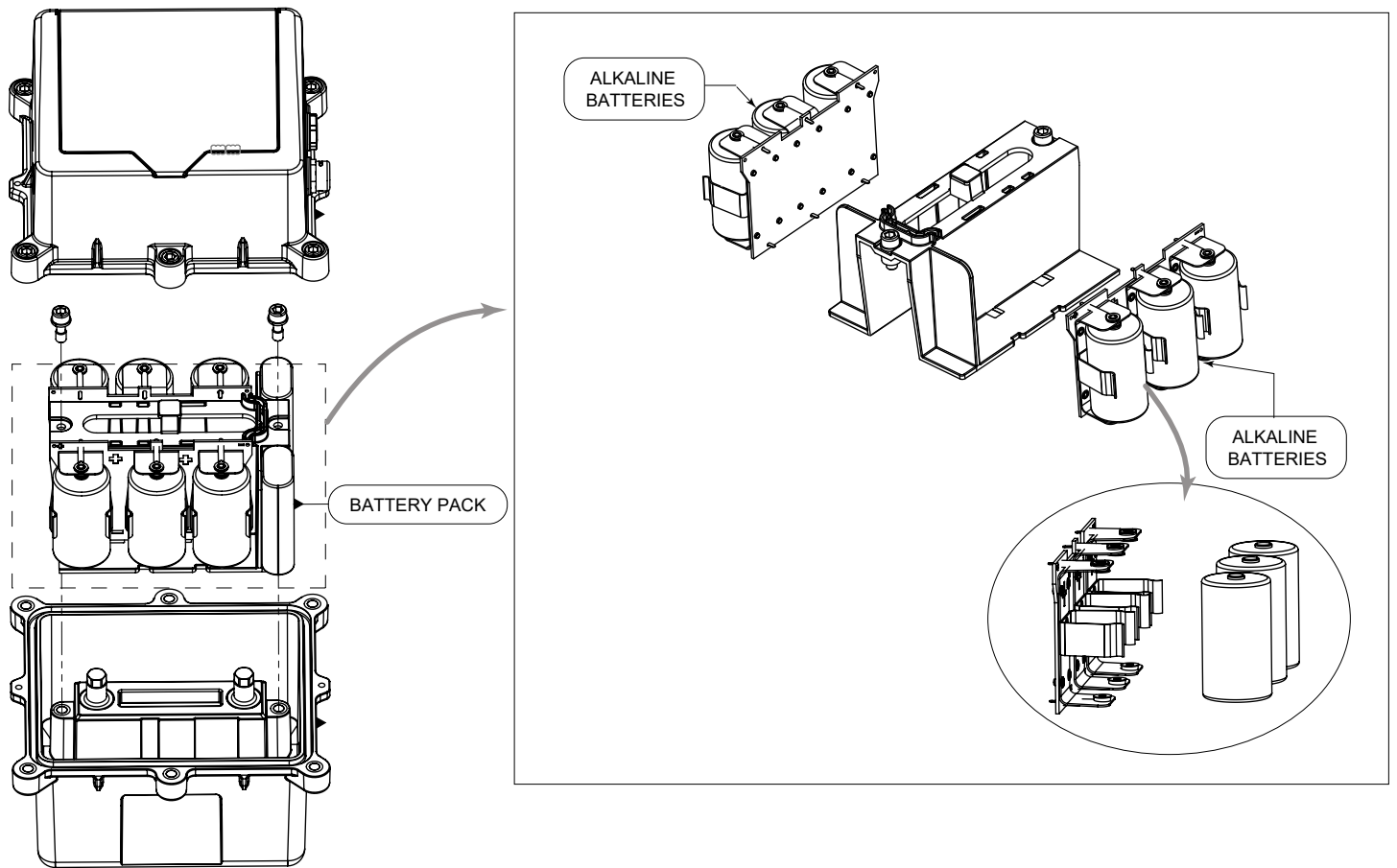
- ☐ The maximum number of batteries allowed in the various configurations is 6 size D batteries
- ☐ Alkaline batteries can also be purchased separately from third parties
- ☐ Lithium batteries are supplied exclusively by the manufacturer and can not be purchased separately from third parties. Furthermore, 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.

PA6 CASE (IP68) - LITHIUM BATTERIES

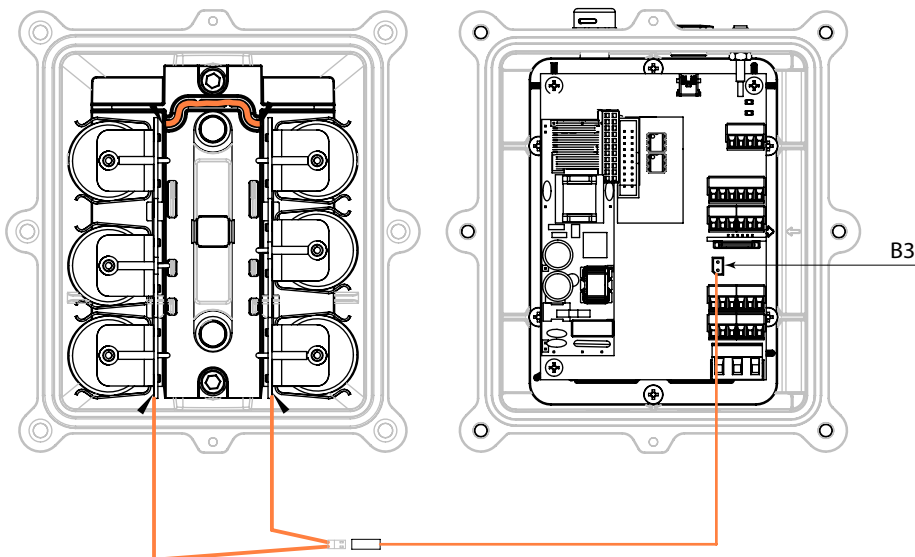


- ❑ The maximum number of batteries allowed in the various configurations is 6 size D batteries
- ❑ Lithium batteries are supplied exclusively by the manufacturer and can not be purchased separately from third parties. Furthermore, they are subject to special transport regulations based on the "Dangerous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

PA6 CASE (IP68) - ALKALINE BATTERIES



ALKALINE BATTERIES CONNECTION

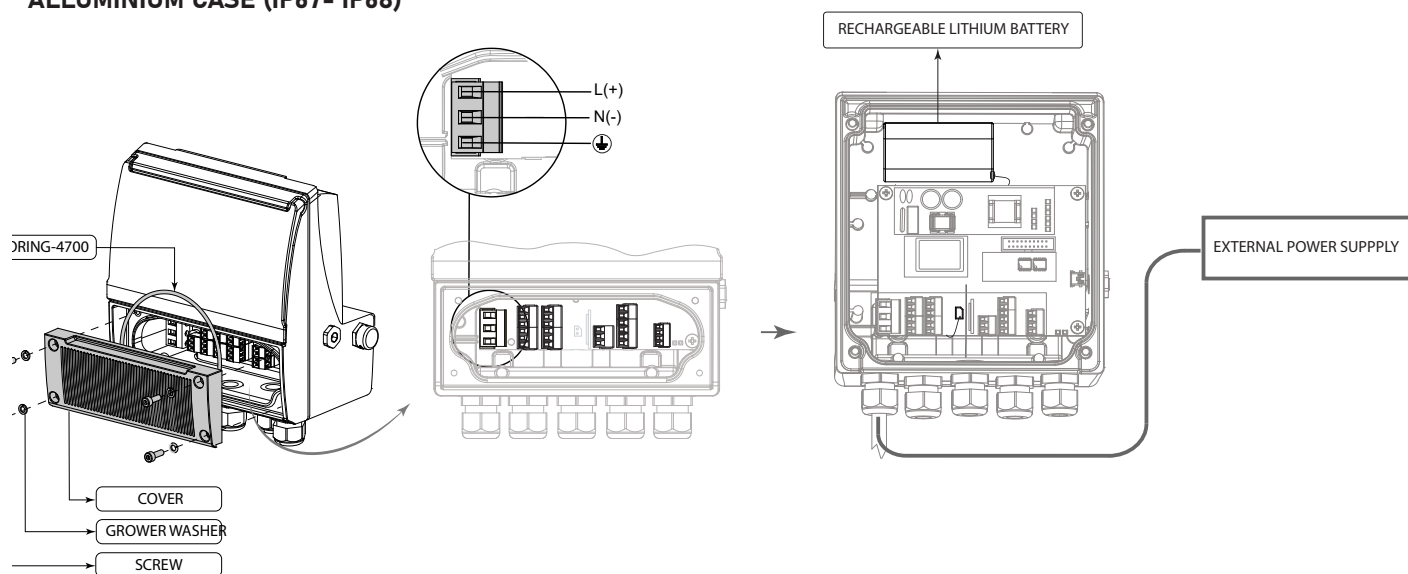


- Alkaline batteries can also be purchased separately from third parties.

POWER SUPPLY - POWER SUPPLY FROM THE ELECTRICAL GRID

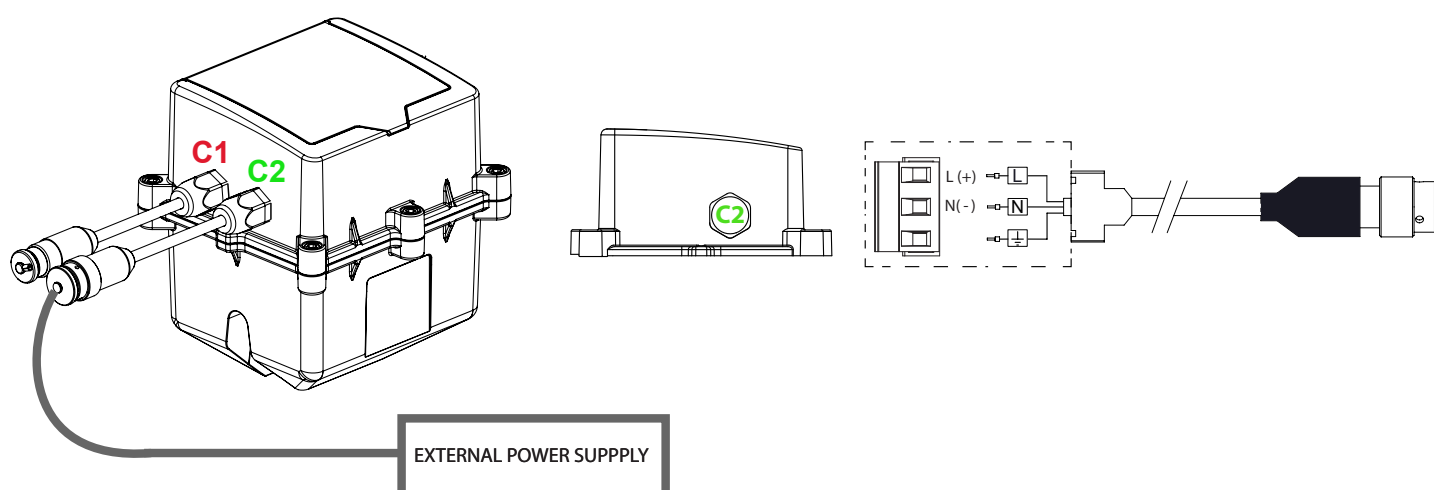
PA6 CASE (IP67)

ALLUMINIUM CASE (IP67- IP68)



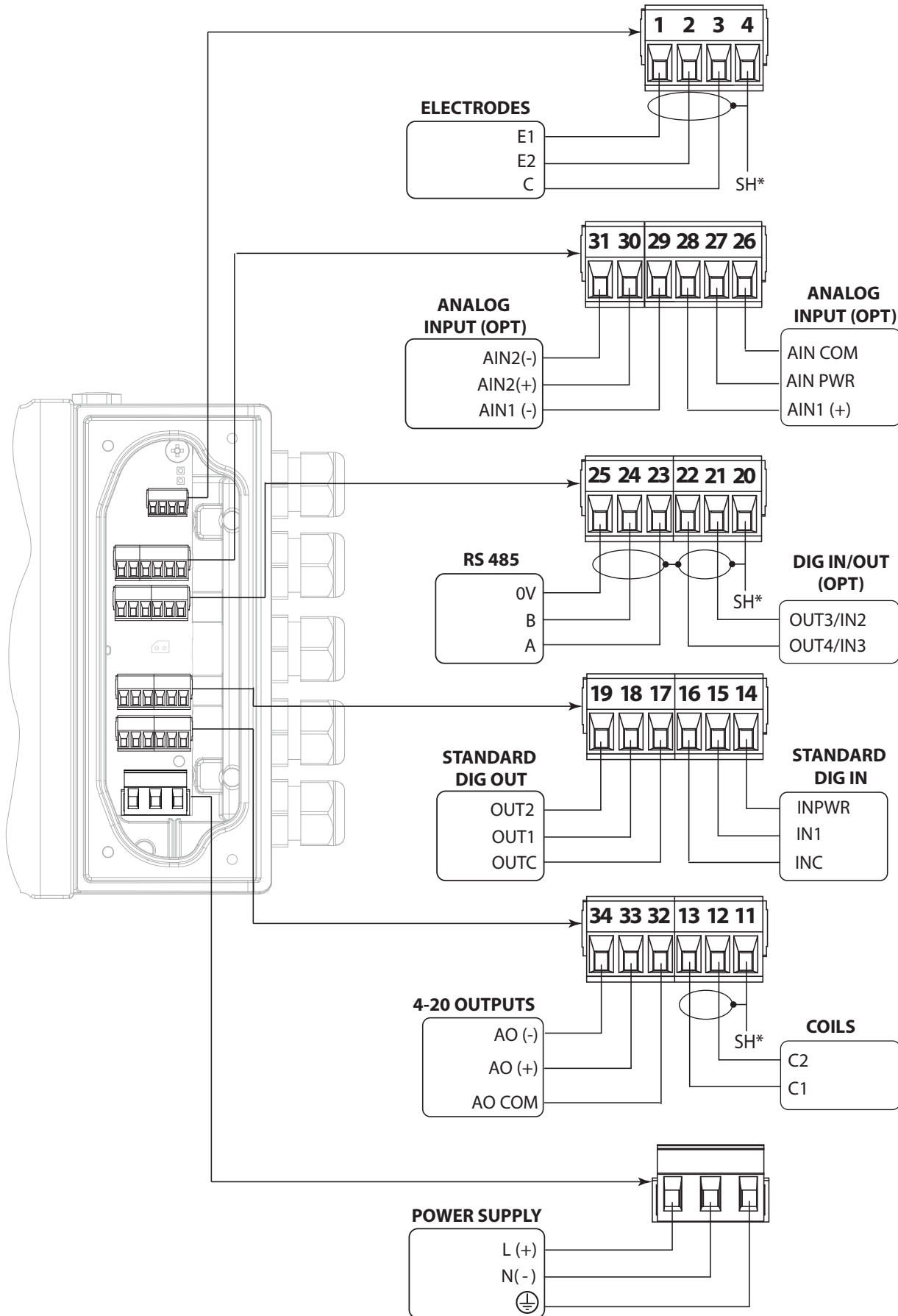
- ☐ The mains-powered converter is not supplied with the external battery housing.
- ☐ The connections are made with approved cables with flame retardant properties, whose section varies from 0.25mm² to 2.50 mm², based on distance / power.
- ☐ The wiring can be checked by unscrewing the 4 screws on the 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, sensor included.
- ☐ The rechargeable battery is always present inside the converter with mains power supply.

PA6 CASE (IP68)

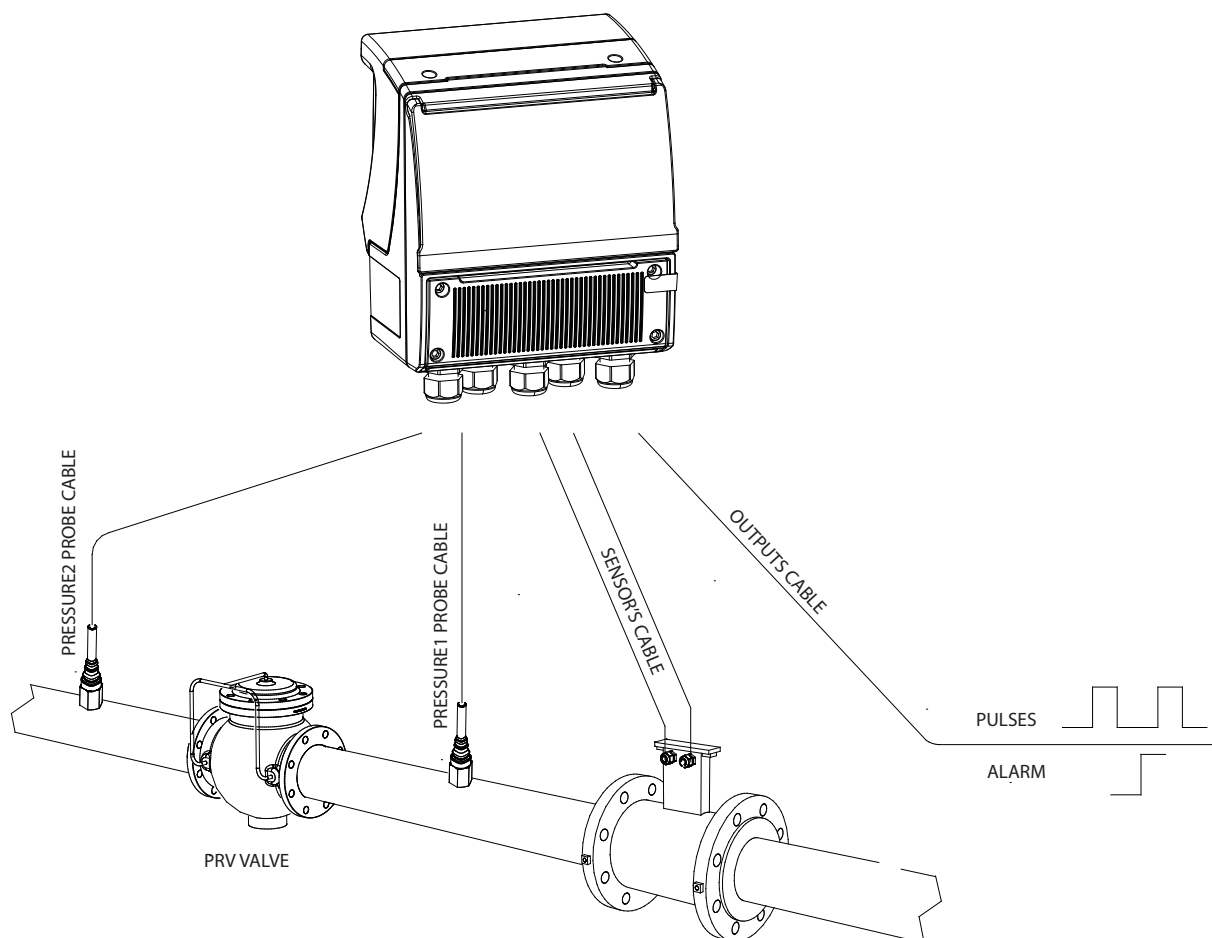


- ☐ Maximum capacity: 2 connectors
- ☐ Power configuration: The external power option occupies one bay, reducing the availability for other connections to a single unit.
- ☐ Supply: The power connector is supplied factory pre-wired.

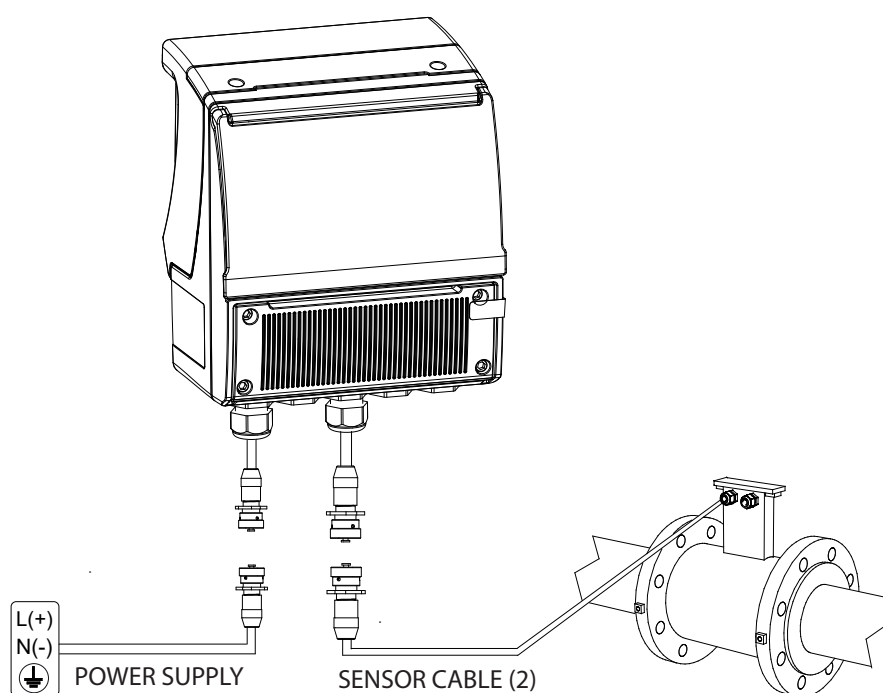
ELECTRICAL CONNECTIONS



Pressure and temperature probes

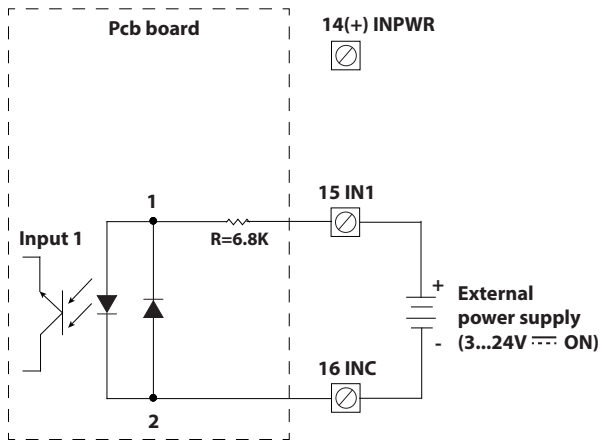


IP68 connection (example installation)



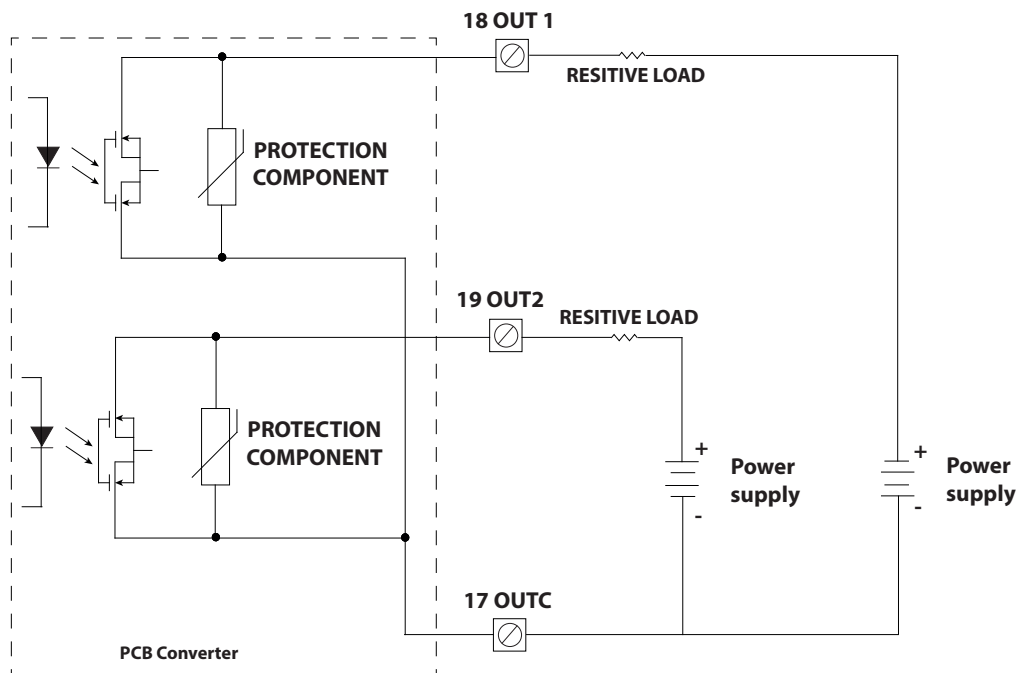
DIGITAL INPUTS

On / Off Input (External power supply)



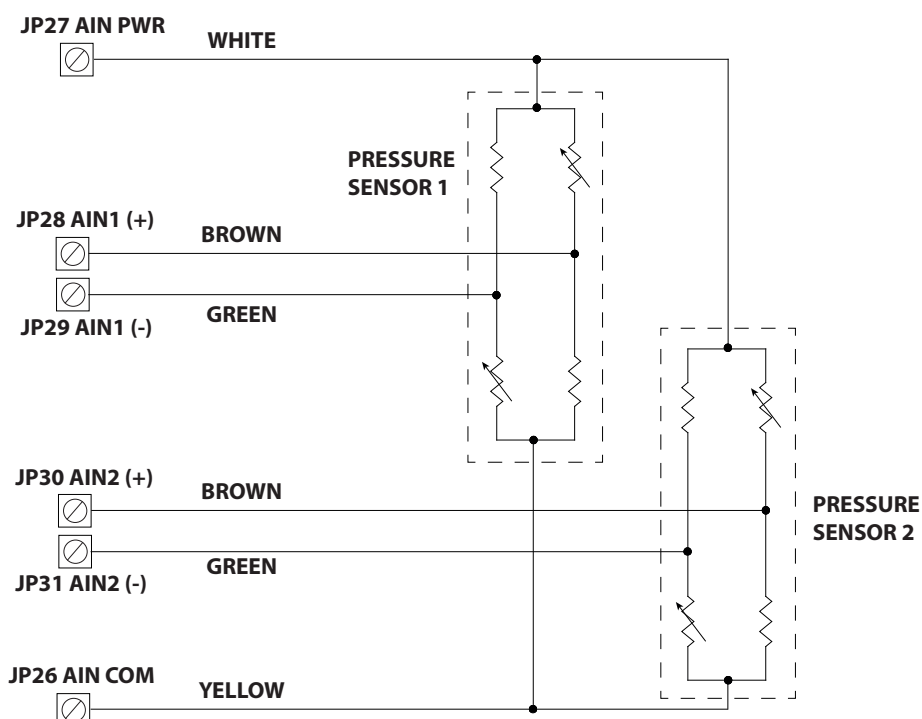
DIGITAL OUTPUTS

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



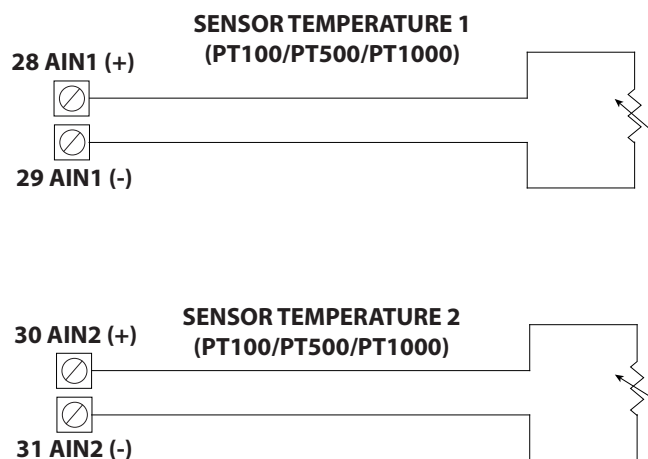
AUXILIARY MODULE ANALOG INPUTS

Connection of pressure sensors



Connection of temperature sensors

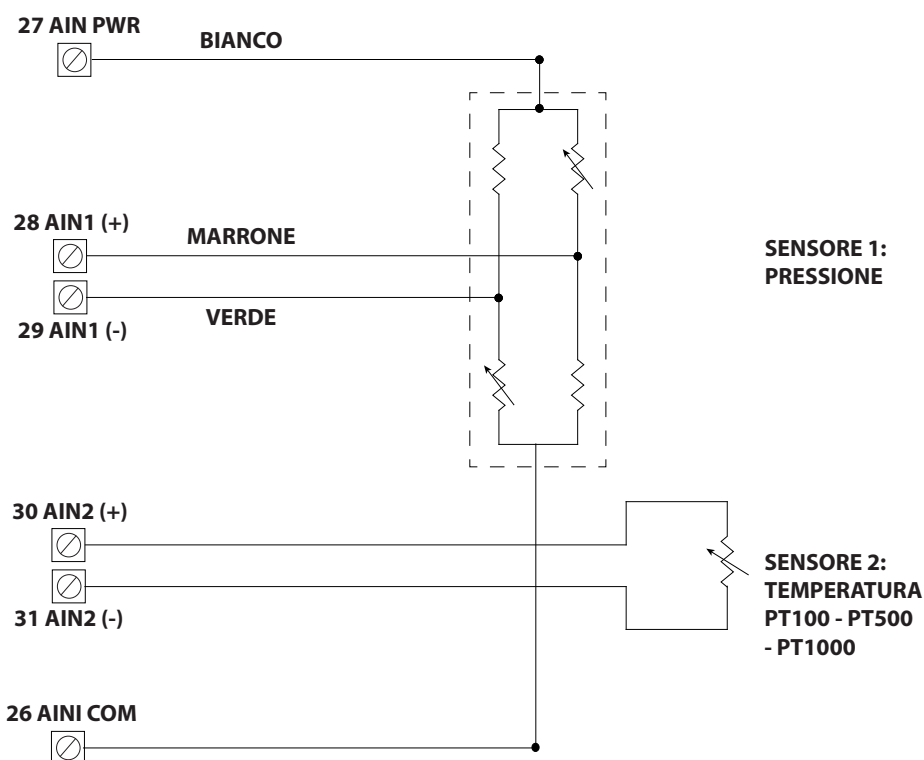
There is no compensation of cable resistance, we recommend the use of PT500 or PT1000 sensors if the cable length is more than one meter. The recognition of the sensor type (PT100 / 500/1000) is automatic.



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):

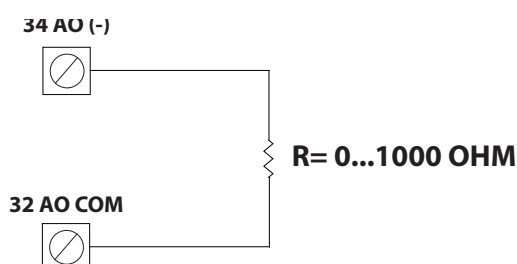
Passive mode: power is supplied from an external source.

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

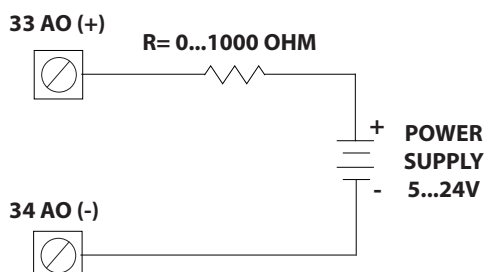
Active mode: power is supplied from the board power supply (if fitted).

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

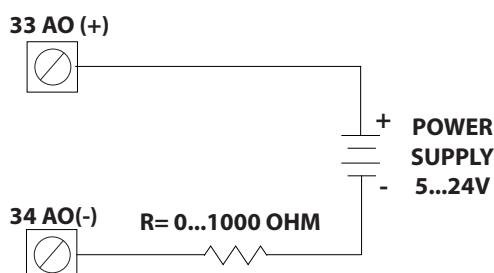
Active Connection



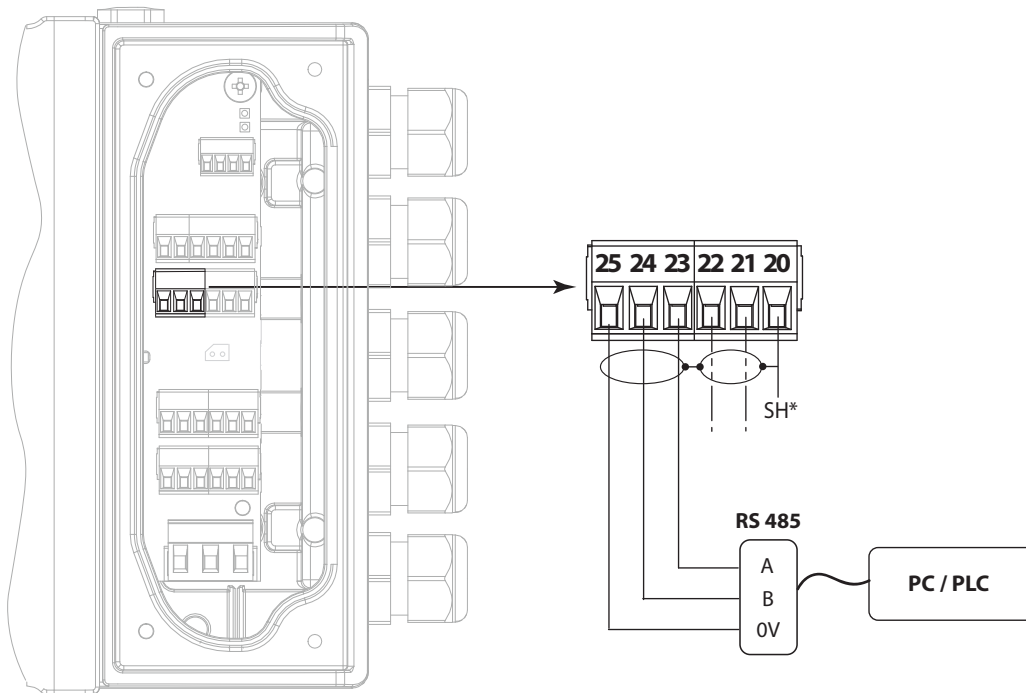
Passive Connection 1



Passive Connection 2



MODBUS (RS485)



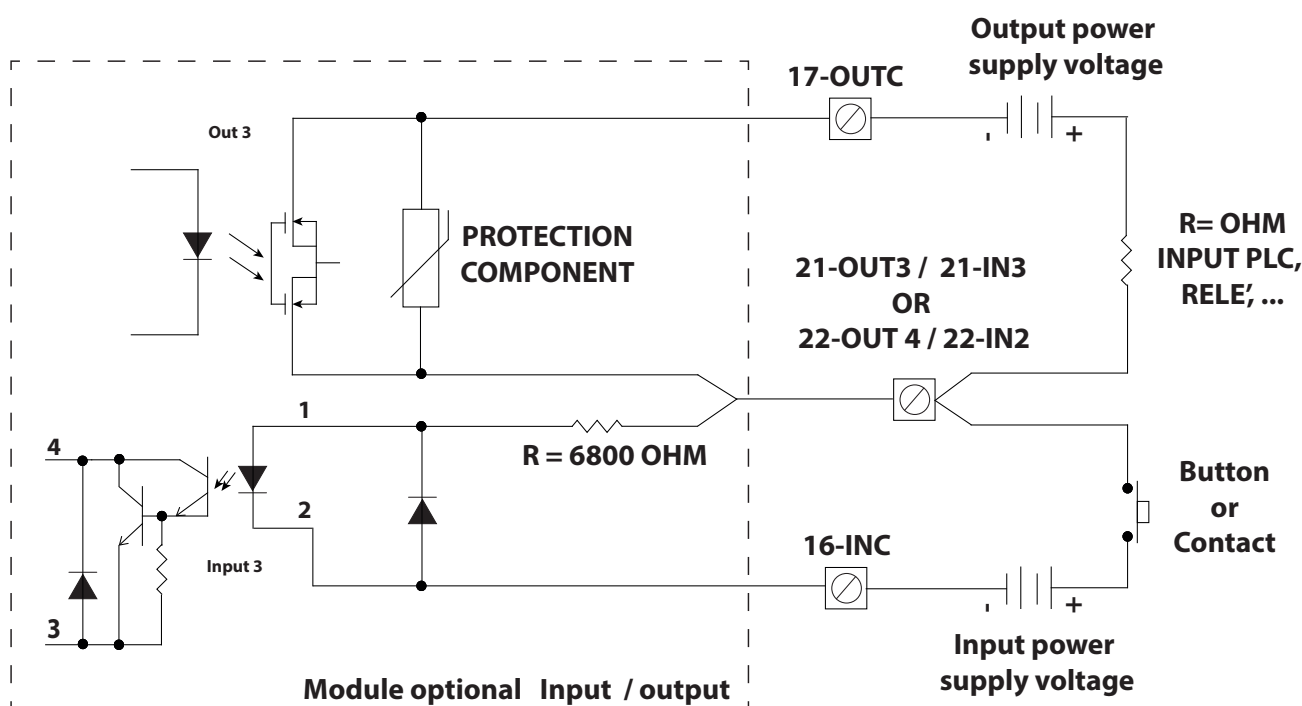
AUXILIARY MODULE DIGITAL INPUTS/ OUTPUTS

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

MAIN MENU	
1-Sensor	
2-Units	
3-Scales	
4-Settings	
5-About	
6-Factory	
7-Reset	
8-Exit	
9-Back	
10-Home	
11-Exit	
12-Exit	
13-Exit	

SENSOR

S.model	0
Lining	UNSPEC.
S.type	FULLBORE
U.type	METRIC
Diam.	00700
KA	+00.9637
KA-	-44904
KZ	-18852
KD	+00.4014
Ins.position	0
KP dynamic	OFF
Ki	10000
Kp	10000
KC	100000
C.Curr.	mA025.0
C.Reg. PB	ms03
C.Reg.DH	stp 005
C.R.time	ms03
E.P.Detect	ON
Z max	Hohm 0500
S.err.delay	10
Sens.verify	OFF
KL	00. +000000
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 Sensor's nominal/real diameter DN (0-2500)
- 1.6 Sensor coefficient KZ (zero point)
- 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 Sensor excitation current
- 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 Linearization coefficient
- 1.24 Pipe hydraulic zero calibration

MAIN MENU	
1-Sensor	
2-Units	
3-Scales	
4-Settings	
5-About	
6-Factory	
7-Reset	
8-Exit	
9-Back	
10-Home	
11-Exit	
12-Exit	
13-Exit	

UNITS

Diam.	mm
S.cable	m
FR.unit	METRIC
Pls1 u.	METRIC
Pls2 u.	METRIC
T+ unit	METRIC
T+ unit	(m3)
T+ D.P.	4
P+ unit	METRIC
P+ unit	(m3)
P+ D.P.	4
T- unit	METRIC
T- unit	(m3)
T- D.P.	4
P- unit	METRIC
P- unit	(m3)
P- D.P.	4
Temp.unit	°C
Mass units	ON
Sg	(kg/dm3)
AIN1 m.u.	1.107MCPI
AIN2 m.u.	1.107MCPI

- 2.1 Nominal diameter measure unit
- 2.2 Cable length on separate version
- 2.3 Flow rate type measure unit: metric or imperial
- 2.4 Pulse 1 type measure unit: metric or not metric
- 2.5 Pulse 2 type measure unit: metric or not metric
- 2.6 Total direct totalizer measure unit type: metric or imperial
- 2.7 Total direct totalizer measure unit
- 2.8 Total direct totalizer decimal point position
- 2.9 Partial direct totalizer measure unit type: metric or not metric
- 2.10 Partial direct totalizer measure unit
- 2.11 Partial direct totalizer decimal point position
- 2.12 Total reverse totalizer measure unit type: metric or not metric
- 2.13 Total reverse totalizer measure unit
- 2.14 Total reverse totalizer decimal point position
- 2.15 Partial reverse totalizer measure unit type: metric or not metric
- 2.16 Partial reverse totalizer measure unit
- 2.17 Partial reverse totalizer decimal point position
- 2.18 Temperature measure
- 2.19 Enable/disable the selection of mass units on full scale set
- 2.20 Specific gravity coefficient
- 2.21 Unit of measurement for analogue input 1
- 2.22 Unit of measurement for analogue input 2

UNITS

SCALES

MAIN MENU	
1-Sensor	
2-Units	
3-Scales	
4-Measure	
5-Alarms	
6-Inputs	

SCALES

FS1	dm ³ /s 5.00
Pls1	dm ³ 0.15
Tpls1	(ms)
Pls2	dm ³ 0.15
Tpls2	15*(ms)
AIN1	1,107 MCPI
AIN2	1,107 MCPI

3.1	Full scale flow rate 1
3.2	Full scale flow rate 2
3.3	Duration of the pulse generated on channel 1
3.4	Pulse value on channel 2
3.5	Duration of the pulse generated on channel 2
3.6	Analog input scale 1
3.7	Analog input scale 2

MEASURE

MAIN MENU	
1-Sensor	
2-Units	
3-Scales	
4-Measure	
5-Alarms	
6-Inputs	

MEASURE

Filt.bypass	ON
Cut-off	00.0(%)
Cal.verify	ON
H.imm.inp.	ON

4.1	Measure filter bypass
4.2	Measure cut-off threshold
4.3	Automatic calibration verify
4.4	High immunity inputs

ALARMS

MAIN MENU	
1-Sensor	
2-Units	
3-Scales	
4-Measure	
5-Alarms	
6-Inputs	

ALARMS

Max+	dm ³ /s	OFF
Max-	dm ³ /s	OFF
Min+	dm ³ /s	OFF
Min-	dm ³ /s	OFF
Qhyst		XXXXX
A1Mx		()
A1Mn		()
A1H	HPa	0.00
A2Mx		()
A2Mn		()
A2H	HPa	0.00

5.1	Max.pos.flow r. alarm threshold MAX+
5.2	Max.neg.flow r. alarm threshold MAX-
5.3	Min.pos.flow r. alarm threshold MIN+
5.4	Min.neg.flow r. alarm threshold MIN-
5.5	Hysteresis on f.rate alarm threshold
5.6	MAX alarm threshold for analog input 1
5.7	MIN alarm threshold for analog input 1
5.8	AIN1 MIN alarm threshold
5.9	MAX alarm threshold for analog input 2
5.10	MIN alarm threshold for analog input 2
5.11	Hysteresis on a. in.2 al. thr

INPUTS

```

MAIN MENU
1-Sensor
2-Units
3-Scales
4-Measure
5-Alarms
6-Inputs
7-Outputs
8-Communication
9-Display
10-Data logger
11-Functions
12-Diagnostic
13-System
    
```

```

10-Inputs
11-Outputs
12-Communication
13-System

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.VOL.
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          ANAL.MV/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
    
```

```

MAIN MENU
1-Sensor
2-Units
3-Scales
4-Measure
5-Alarms
6-Inputs
7-Outputs
8-Communication
9-Display
10-Data logger
11-Functions
12-Diagnostic
13-System
    
```

COMMUNIC.

COMMUNICATIONS

```

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

```

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

```

MAIN MENU
1-Sensor
2-Units
3-Scales
4-Measure
5-Alarms
6-Inputs
7-Outputs
8-Communication
9-Display
10-Data logger
11-Functions
12-Diagnostic
13-System
    
```

DISPLAY

DISPLAY		
Language	EN	9.1 Language for all messages
Disp.time	s	9.2 Display/keyboard inactivity time
D.rate		9.3 Display refresh rate
Disp.Fn.	1	9.4 Display function number
Disp.lock	OFF	9.5 Display function selection lock
Part.tot.	ON	9.6 Partial totalizers enable
Neg.tot.	ON	9.7 Negative totalizers enable
Net tot.	ON	9.8 Net totalizers enable
Disp.date	ON	9.9 Time and date display enable
Quick start	OFF	9.10 Quick start menu enable

MAIN	
1	
2	
3	
4	
5	
6	
7	
8	Communication
9	Display
10	Data logger
11	Functions
12	Diagnostic
13	System

DATA LOGGER

DATA LOGGER		
D.logger en.	ON	10.1 Data logger enabling
Meas.units	ON	10.2 Measure unit recording enable
Field separ.	;	10.3 Field separator character
Decim.separ.	.	10.4 Decimal separator character
Interv.	0:01:00	10.5 Sampling interval
Log T+	OFF	10.6 Totalizer Total Positive Enable T+
Log P+	OFF	10.7 Totalizer Partial Positive Enable P+
Log T-	OFF	10.8 Totalizer Total Negative Enable T-
Log P-	OFF	10.9 Totalizer Partial Net Enable P-
Log TN	OFF	10.10 Totalizer Total Net Enable
Log PN	OFF	10.11 Totalizer Partial Net Enable
Log Q(UM)	OFF	10.12 Flow rate in Technical Units Enable
Log Q(%)	OFF	10.13 Flow rate in Percentage Enable
Log AL.EV	OFF	10.14 Alarm Events Enable
Log ADM	OFF	10.15 Additional Measures Enable
Log STR	OFF	10.16 Sensor Test Results Enable
Log BTS	OFF	10.17 Board TemperatureS Enable
Log IBV	OFF	10.18 Internal Board Voltages
Log EDC	OFF	10.19 Electrodes DC Voltages Enable
Log EAC	OFF	10.20 Electrodes AC voltages Enable
Log EIZ	OFF	10.21 Electrodes Source Impedance Enable
Log SCU	OFF	10.22 Sensor Coils Values Enable

MAIN	
1	
2	
3	
4	
5	
6	
7	
8	Communication
9	Display
10	Data logger
11	Functions
12	Diagnostic
13	System

FUNCTION

FUNCTION		
T+ reset	ON	11.1 Volume Totalizer Total Positive Reset
P+ reset	ON	11.2 Volume Totalizer Partial Positive Reset
T- reset	;	11.3 Volume Totalizer Total Negative Reset
P- reset	.	11.4 Volume Totalizer Partial Negative Reset
Load Sens.F.def	0:01:00	11.5 Load Factory Default Sensor Data
Load Conv.F.def	OFF	11.6 Load Factory Default Converter Data
Save Sens.F.def	OFF	11.7 Save Factory Default Sensor Data
Save Conv.F.def	OFF	11.8 Save Factory Default Converter Data
Calibration	OFF	11.9 CALibration Immediate Command

MAIN	
1	
2	
3	
4	
5	
6	
7	
8	Communication
9	Display
10	Data logger
11	Functions
12	Diagnostic
13	System

DIAGNOSTIC

DIAGNOSTIC

Self test	
Display test	
Sens.verify	
Flow sim.	OFF
Diag.sys.val.	
Display measures	
Disp.comm.vars	
Display graphs	
SD card info	
Firmware info	0
S/N	000:00:00:00
WT	0
TC	

```

MAIN
1-Start
2-Stop
3-Run
4-Menu
5-Back
6-Exit
7-Inputs
8-Outputs
9-Communication
10-Data logger
11-Functions
12-Diagnostic
13-System

```

12.1	Auto test Immediate Command
12.2	Execute bit pattern test display
12.3	Sensor Verify Command
12.4	Measure Simulation Enable
12.5	Diagnostic system values
12.6	Diagnostic Measure Values
12.7	Diagnostic Communication Values
12.8	Display measures as graphs
12.9	SD memory Status
12.10	Model and Software Version
12.11	Serial Number
12.12	Total Working Time
12.13	Total Measure Cycles

SYSTEM

SYSTEM

Dayl.saving	ON
Time zone	+00.00
Date/time	///00:00:00
L1 code	XXXXXXXX
L2 code	XXXXXXXX
L3 code	XXXXXXXX
L4 code	XXXXXXXX
L5 code	XXXXXXXX
L6 code	XXXXXXXX
Restr.access	OFF
Device IP addr	63015504
Client IP addr	11012012
Network mask	255.255.254
KT	0.97882
KS	100.000
KR	100.000
DAC1 4mA	2460
DAC1 20mA	11050
AIN1 SS	0
AIN1 FS	20000
AIN2 SS	0
AIN2 FS	20000
Stand-by	
FW update	

```

MAIN
1-Start
2-Stop
3-Run
4-Menu
5-Back
6-Exit
7-Inputs
8-Outputs
9-Communication
10-Data logger
11-Functions
12-Diagnostic
13-System

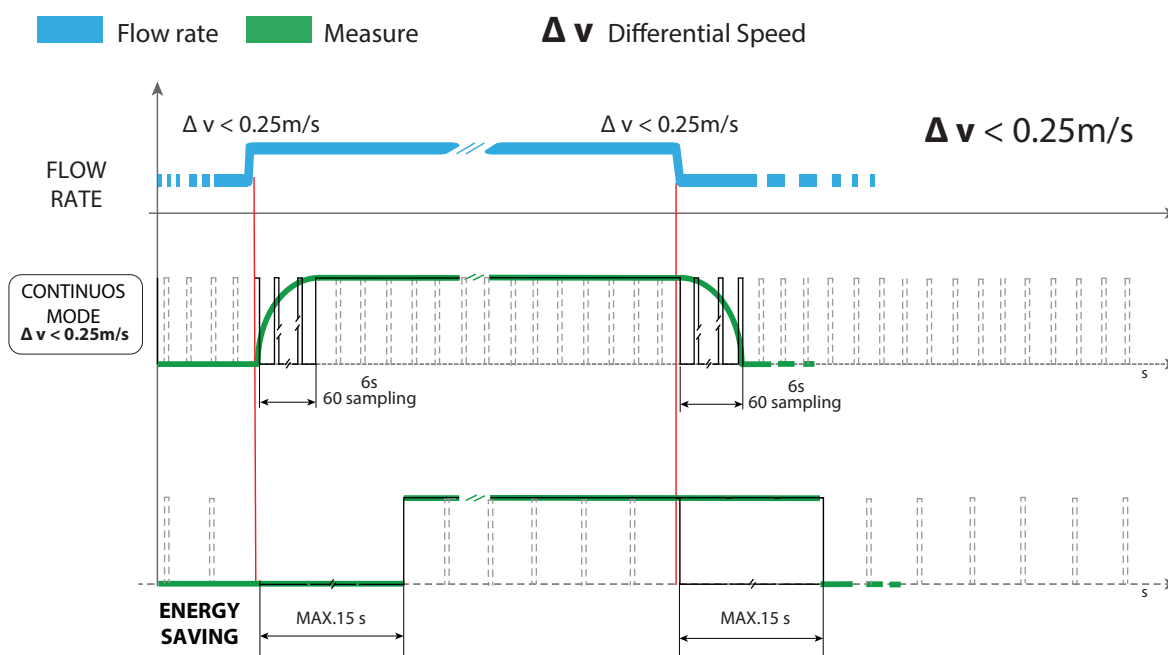
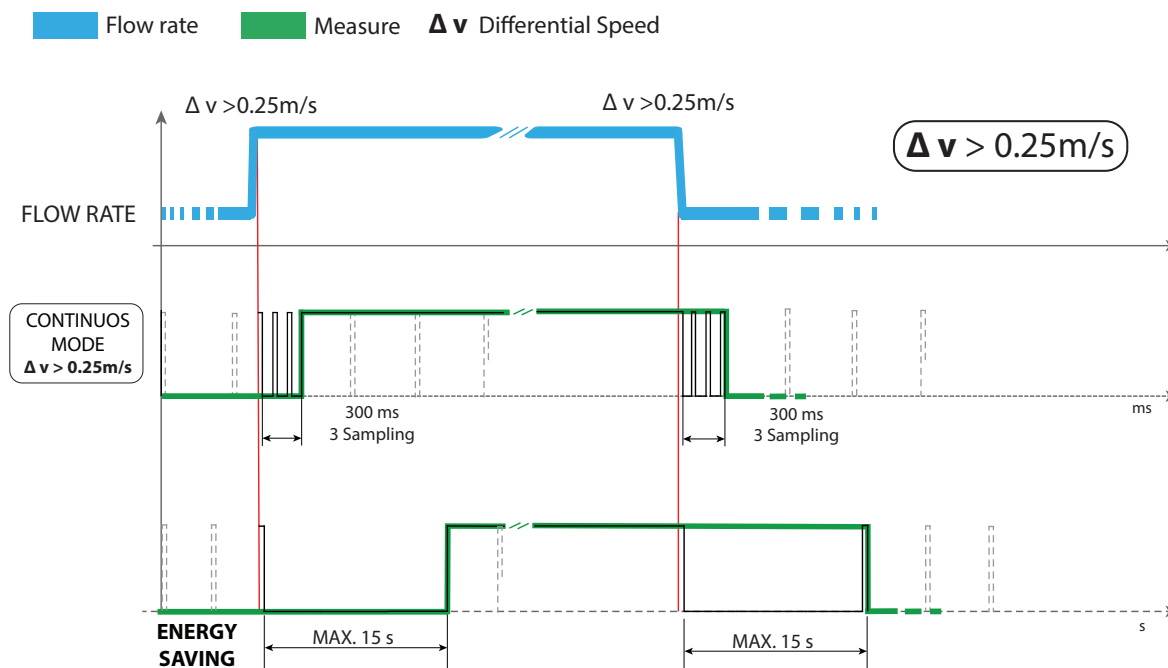
```

13.1	Daylight Saving Time Enable
13.2	Time zone
13.3	Date and Time
13.4	Level 1 Access CoDe
13.5	Level 2 Access CoDe
13.6	Level 3 Access CoDe
13.7	Level 4 Access CoDe
13.8	Level 5 Access CoDe
13.9	Level 6 Access CoDe
13.10	ReStricted Access Rule Enable
13.11	Device IP Address
13.12	Client IP Address
13.13	Network MaSk
13.14	Coefficient KT
13.15	Coefficient KS
13.16	Coefficient KR
13.17	Current output 1 Calibration Point 1
13.18	Current output 1 Calibration Point 2
13.19	Analog input 1 Calibration Point 1
13.20	Analog input 1 Calibration Point 2
13.21	Analog input 2 Calibration Point 1
13.22	Analog input 2 Calibration Point 2
13.23	System Standby
13.24	Firmware update

MEASUREMENT SETTINGS

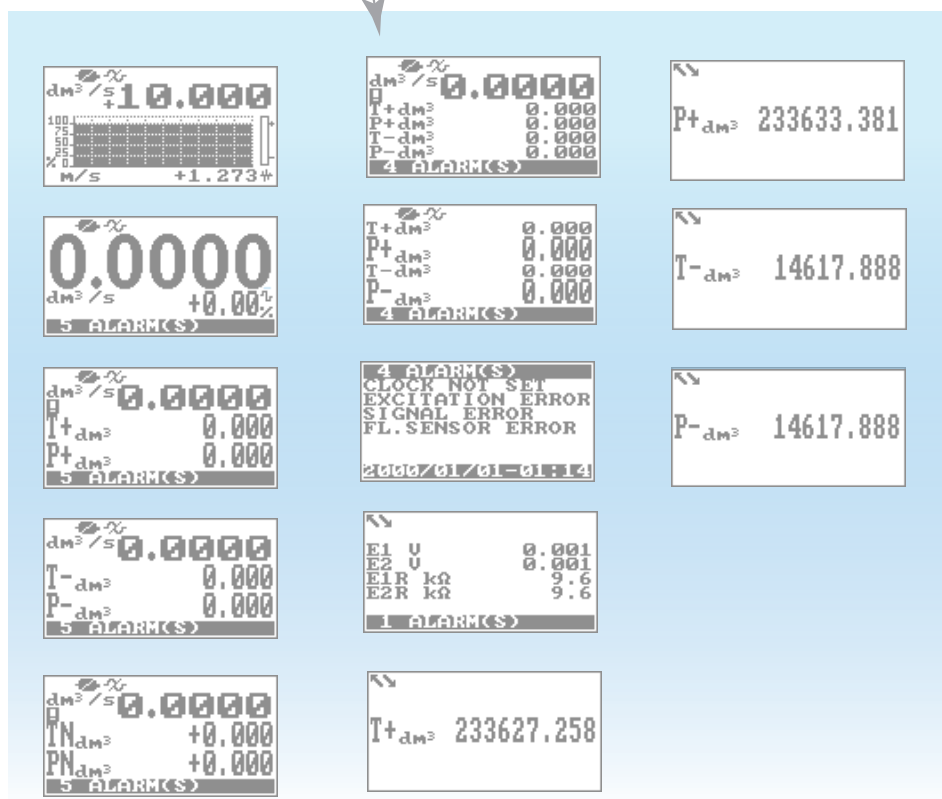
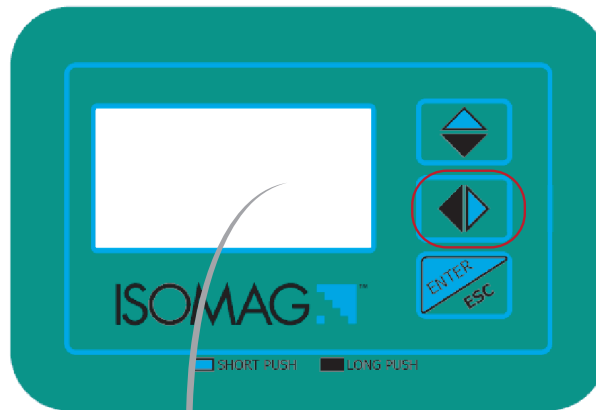
MV145 can be programmed to acquire the measurement in two different ways:

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



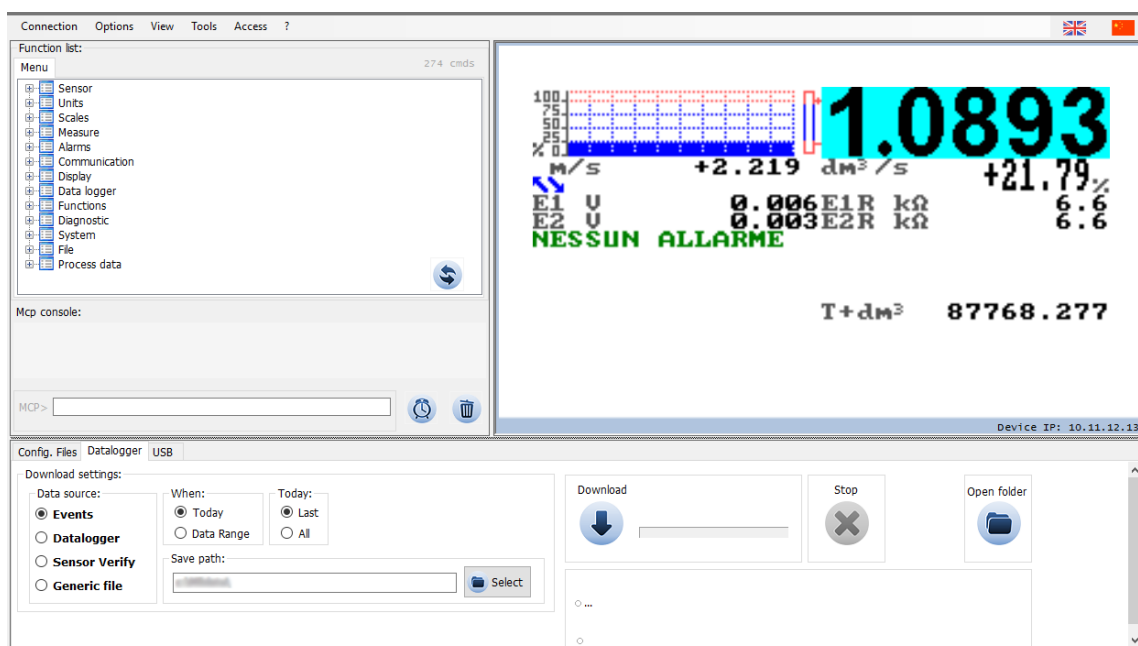
MAIN PAGES VISUALIZATION

Possible views by simply pressing the button

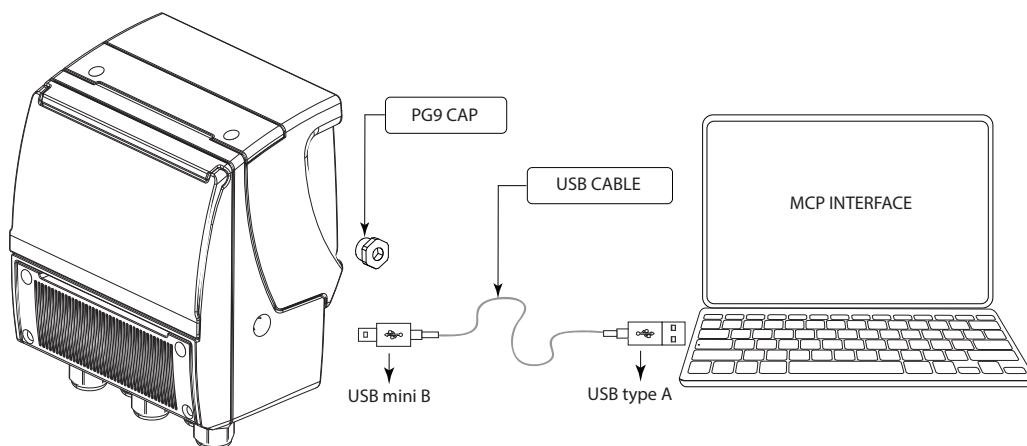


USER INTERFACE

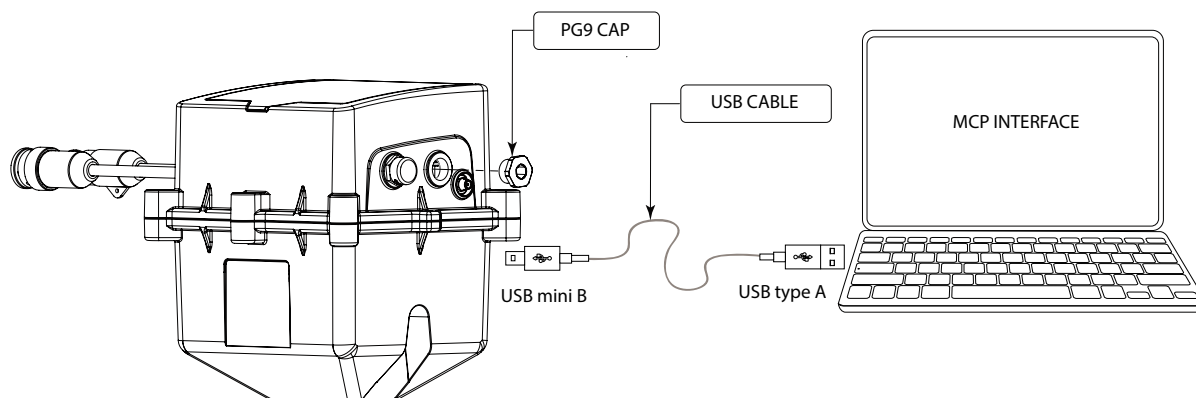
Besides the keyboard, the converter can be programmed by MCP INTERFACE: a real time interface between converter and PC.



PA6 CASE (IP67) ALLUMINIUM CASE (IP67- IP68)



PA6 CASE (IP68)



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.

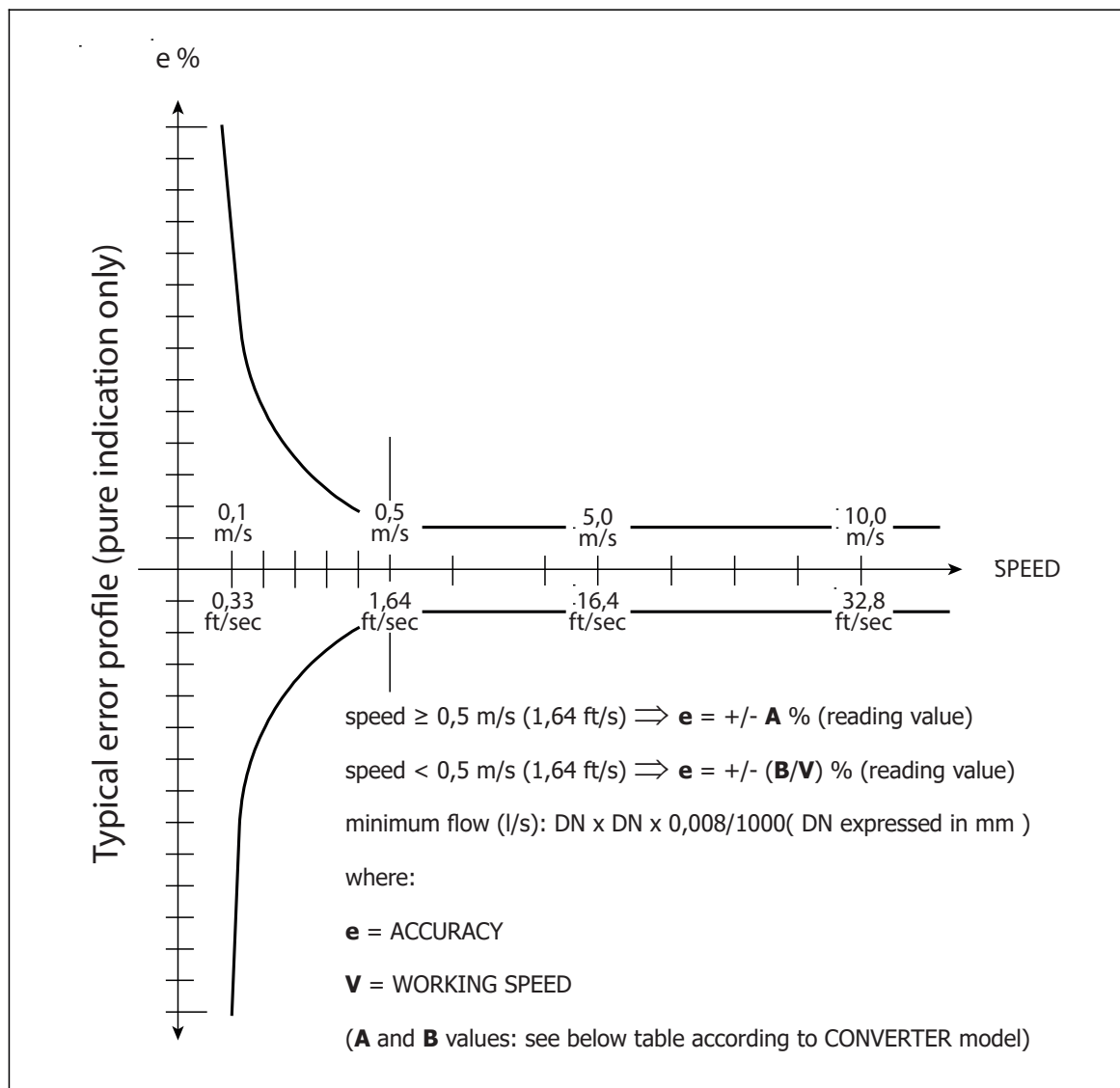
The screenshot shows the 'Datalogger' tab in the software interface. On the left, under 'Download settings:', there are three radio buttons: 'Events', 'Datalogger' (which is selected and highlighted with a red box), 'Sensor Verify', and 'Generic file'. To the right, there are two groups of radio buttons: 'When:' with 'Today' and 'Data Range', and 'Today:' with 'Last' and 'All'. Below these is a 'Save path:' field with a 'Select' button. On the right side, there is a large 'Download' button with a downward arrow icon, a progress bar showing '100%, 65.5 kB/s, 74.2 sec.', and a 'Stop' button with a red X icon. Below the progress bar, there is a green status message: 'RLDIT : 1,223:FT DOWNLOAD READY [4861662]' and a green completion message: '1,226:FT COMPLETED [DOWNLOAD][4861662] [30 ms]'.

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.	1	NRECORD	DATE	ORA	U.M.	T+	U.M.	P+	U.M.	T-	U.M.	P-	U.M.	TN	U.M.	PN	U.M.	Flow	U.M.	Flow%	U.M.	N°	U.M.	Loss	U.M.	Time	U.M.	Time	U.M.	Sensor	U.M.
Date. The recording date viewing for each record.	2	r*	ddmmyy	00:00:00	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	%	%	%	AL	0	dm3	ms	ms	ms	ms	XX	0	
Hours. Time recording viewing for each record.	3	r*	ddmmyy	00:00:00	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	%	%	%	AL	0	dm3	ms	ms	ms	ms	XX	0	
Total positive totalizer value. Form Fields when the send flag is active on the totalizer T+.	4	r*	ddmmyy	00:00:00	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	%	%	%	AL	0	dm3	ms	ms	ms	ms	XX	0	
Partial positive totalizer value. Form Fields when the send flag is active on the totalizer P+.	5	r*	ddmmyy	00:00:00	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	%	%	%	AL	0	dm3	ms	ms	ms	ms	XX	0	
Total negative totalizer value. Form Fields when the send flag is active on the totalizer T-.	6	r*	ddmmyy	00:00:00	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	%	%	%	AL	0	dm3	ms	ms	ms	ms	XX	0	
Partial negative totalizer value. Form Fields when the send flag is active on the totalizer P-.	7	r*	ddmmyy	00:00:00	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	%	%	%	AL	0	dm3	ms	ms	ms	ms	XX	0	
Total net totalizer value. Form Fields when the send flag is active on the totalizer TN.	8	r*	ddmmyy	00:00:00	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	%	%	%	AL	0	dm3	ms	ms	ms	ms	XX	0	
Partial net totalizer value. Form Fields when the send flag is active on the totalizer PN.	9	r*	ddmmyy	00:00:00	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	%	%	%	AL	0	dm3	ms	ms	ms	ms	XX	0	
Flow rate. Form Fields present when the send flag is on the flow in units of measurement.	10	r*	ddmmyy	00:00:00	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	%	%	%	AL	0	dm3	ms	ms	ms	ms	XX	0	
Flow rate %. Form fields present when the flag of alarm recording is active (only N ° of present total alarms)	11	r*	ddmmyy	00:00:00	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	%	%	%	AL	0	dm3	ms	ms	ms	ms	XX	0	
N ° active alarms. Form fields present when the flag of alarm recording is active (only N ° of present total alarms)	12	r*	ddmmyy	00:00:00	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	%	%	%	AL	0	dm3	ms	ms	ms	ms	XX	0	
Loss of current measured during insulation test. Available value when recording the sensor test data is active.	13	r*	ddmmyy	00:00:00	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	%	%	%	AL	0	dm3	ms	ms	ms	ms	XX	0	
Time rise A. Available value when recording the sensor test data is active.	14	r*	ddmmyy	00:00:00	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	%	%	%	AL	0	dm3	ms	ms	ms	ms	XX	0	
Time rise B. Available value when recording the sensor test data is active.	15	r*	ddmmyy	00:00:00	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	%	%	%	AL	0	dm3	ms	ms	ms	ms	XX	0	
Sensor test error code. Available value when recording the sensor test data is active.	16	r*	ddmmyy	00:00:00	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	dm3	0	%	%	%	AL	0	dm3	ms	ms	ms	ms	XX	0	

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 $\pm 0,005 \%$

OIML R49

The sensor **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	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	

SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0.26	0.16	100
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	
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	80
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	
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	250
650	26	10000	40	25	
700	28	10000	64	40	160
750	30	10000	64	40	
800	32	16000	160	100	100
900	36	16000	160	100	
1000	42	16000	256	160	80
1200	48	16000	320	200	
1400	56	16000	320	200	
1600	64	16000	320	200	40
1800	72	16000	640	400	
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	160
650	26	10000	64	40	
700	28	10000	64	40	100
750	30	10000	64	40	
800	32	16000	160	100	80
900	36	16000	160	100	
1000	42	16000	256	160	40
1200	48	16000	320	200	
1400	56	16000	320	200	
1600	64	16000	320	200	40
1800	72	16000	640	400	
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	40
1800	72	16000	640	400	
2000	80	16000	640	400	

MI-001

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	0.064	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	250
650	26	10000	40	25	
700	28	10000	64	40	160
750	30	10000	64	40	
800	32	16000	160	100	100
900	36	16000	160	100	
1000	42	16000	256	160	80
1200	48	16000	320	200	
1400	56	16000	320	200	
1600	64	16000	320	200	40
1800	72	16000	640	400	
2000	80	16000	640	400	

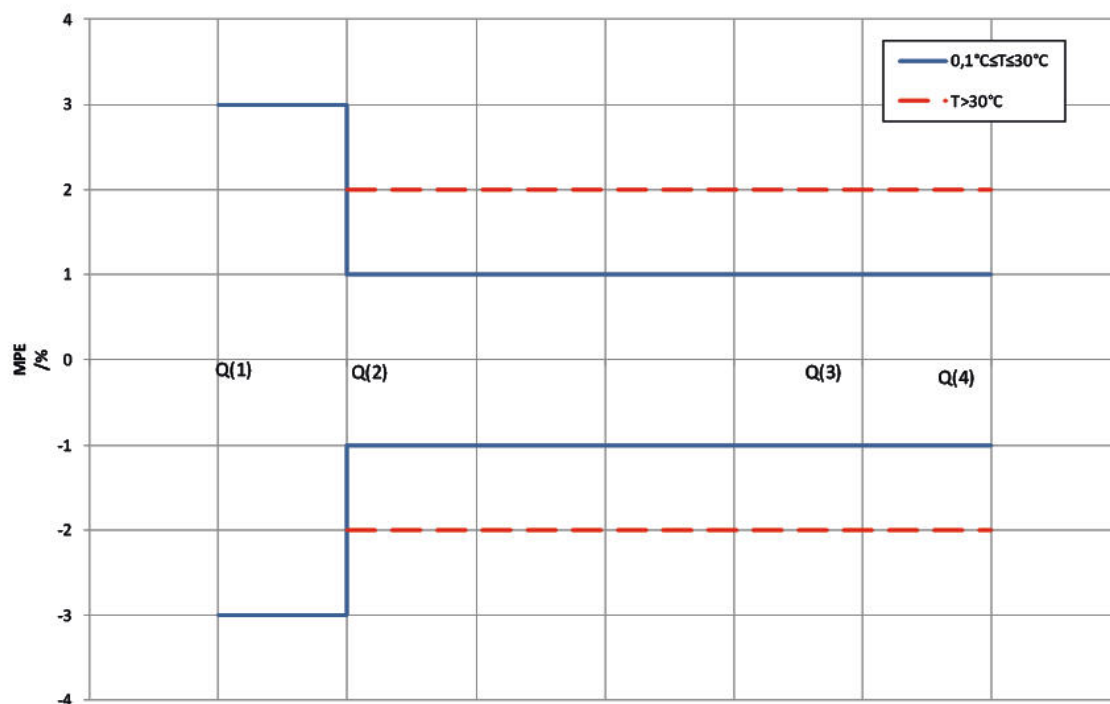
SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0.10	0.064	250
32	1 ¼	25	0.16	0.10	
40	1 ½	40	0.26	0.16	
50	2	63	0.40	0.25	
65	2 ½	100	0.64	0.40	
80	3	160	1.0	0.64	
100	4	250	1.6	1.0	
125	5	400	2.6	1.6	
150	6	630	4.0	2.5	
200	8	1000	6.4	4.0	
250	10	1600	10	6.4	
300	12	2500	16	10	
350	14	2500	16	10	
400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

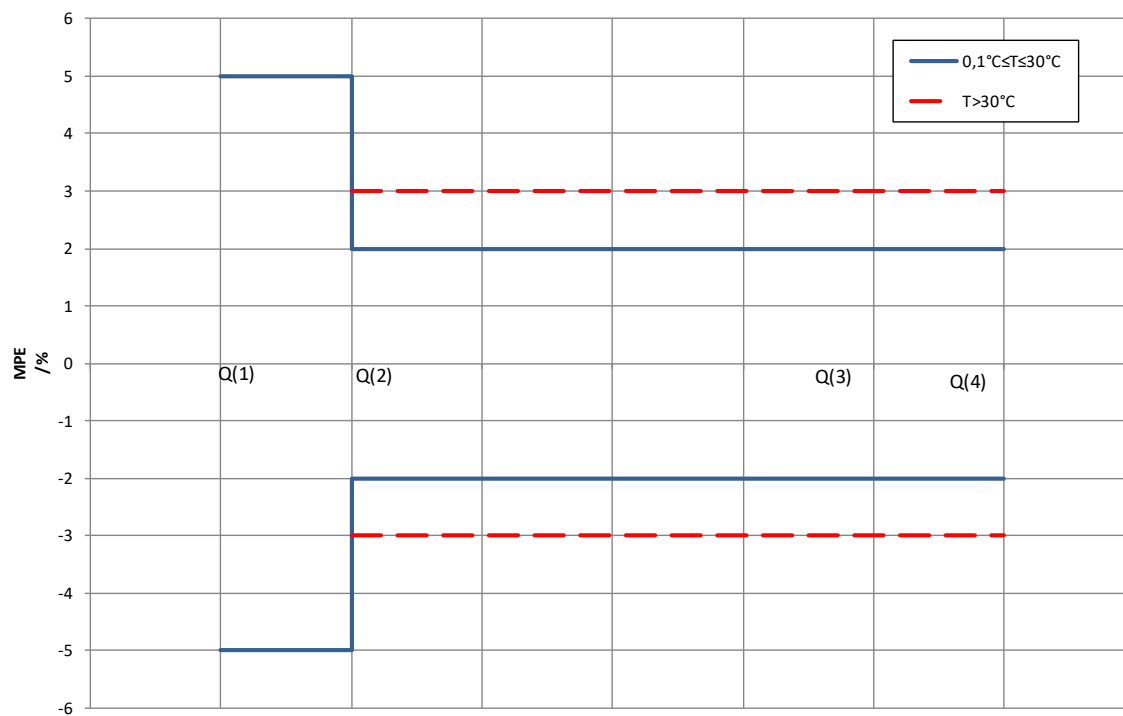
MPE - OIML R49 ACCURACY CLASS 1

(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, point 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
	1	Painted aluminum die casting
Version / Protection rate		
A	A	Compact version 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 - for aluminium housing [up to 5 MIL connectors]
	E	Compact version with display visible from the top - IP68 1,5 meters - ONLY aluminium housing [up to 5 MIL connectors]
	F	Separate version for wall mounting, complete with aluminium mounting accessories (use C015/C016 cable MAX LENGTH 20 m) - IP68 - for aluminium housing [up to 5 MIL connectors]
	G	Compact version with display visible from the top - IP68 - ONLY for Nylon PA6 housing [up to 2 MIL connectors]
Main Power supply		
0	0	Without Main Power Supply
	1	Power supply : 100 ... 240 VAC- 45/66 Hz
	2	Power supply : 12...48 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
	E	N° 2 ON/OFF output (max 50 Hz - max 100 mA)
	F	N° 4 ON/OFF output (max 50 Hz - max 100 mA)
Communication Gateway		
0	0	Without Gateway
	1	RS485 NOT insulated - 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
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 connector) [with "Version / Protection rate" option "G" only 1 connector available for I/O modules]
	C	SEPARATE VERSION (n. 2 connectors) [Not available for "Version / Protection rate" option "G"]
	D	POWER SUPPLY (n.1 connector) + SEPARATE VERSION (n.2 connectors) [Not available for "Version / Protection rate" option "G"]
Connectors for INPUTS/OUTPUTS (Maximum 5 connectors including connectors for Power Supply and cables from sensor) (other combinations on request)		
0	0	No Connectors for I/O modules
	1	TOT n.1 Connectors Connector 1: n.1 pressure/temperature
	2	TOT n.2 Connectors Connector 1: n.1 pressure/temperature Connector 2: n.1 pressure/temperature [Not available for "Version / Protection rate" option "G" + "Connectors for POWER SUPPLY and SEPARATE VERSION CABLES " option "B"]
	3	TOT n.1 Connectors Connector 1: n.2 digital OUT + n.1 Digital IN
	4	TOT n.1 Connectors Connector 1: n.2 digital OUT + n.1 Digital IN + RS485
	5	TOT n.2 Connectors Connector 1: n.1 pressure/temperature Connector 2: n.2 digital OUT + n.1 Digital IN [Not available for "Version / Protection rate" option "G" + "Connectors for POWER SUPPLY and SEPARATE VERSION CABLES " option "B"]
	6	TOT n.1 Connectors Connector 1: n.2 digital OUT + n.1 analog OUT
	7	TOT n.2 Connectors Connector 1: n.2 digital OUT Connector 2: n.1 analog OUT + RS485 [Not available for "Version / Protection rate" option "G" + "Connectors for POWER SUPPLY and SEPARATE VERSION CABLES " option "B"]
	8	TOT n.1 Connectors Connector 1: RS485
	9	TOT n.2 Connectors Connector 1: n.1 pressure/temperature Connector 2: RS485 [Not available for "Version / Protection rate" option "G" + "Connectors for POWER SUPPLY and SEPARATE VERSION CABLES " option "B"]
	a	TOT n.1 Connectors Connector 1: n.4 digital OUT
	b	TOT n.3 Connectors Connector 1: n.1 pressure/temperature Connector 2: n.2 digital OUT Connector 3: n.1 analog OUT + RS485 [Not available for "Version / Protection rate" option A/B/C/D/E/F + "Connectors for POWER SUPPLY and SEPARATE VERSION CABLES " option "D" and "Version / Protection rate" option "G"]
	c	TOT n.2 Connectors Connector 1: n.2 digital OUT + n.1 Digital IN Connector 2: n.1 analog OUT + RS485 [Not available for "Version / Protection rate" option "G" + "Connectors for POWER SUPPLY and SEPARATE VERSION CABLES " option "B"]

0	d	TOT n.3 Connectors Connector 1: n.1 pressure/temperature Connector 2: n.2 digital OUT + n.1 Digital IN Connector 3: n.1 analog OUT [Not available for "Version / Protection rate" option "G" + "Connectors for POWER SUPPLY and SEPARATE VERSION CABLES " option "B"]
	e	TOT n.2 Connectors Connector 1: n.1 pressure/temperature Connector 2: n.2 digital OUT + n.1 Digital IN + n.1 analog OUT + RS485 [Not available for "Version / Protection rate" option "G" + "Connectors for POWER SUPPLY and SEPARATE VERSION CABLES " option "B"]
	f	TOT n.2 Connectors Connector 1: n.1 pressure Connector 2: n.2 digital OUT + n.1 Digital IN + RS485 [Not available for "Version / Protection rate" option "G" + "Connectors for POWER SUPPLY and SEPARATE VERSION CABLES " option "B"]
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-B0A0A0A0A0A0A

ISOIL INDUSTRIA S.p.A.

HEAD OFFICE	SERVICE
Via Fratelli Gracchi, 27 20092 Cinisello Balsamo (MI) Tel +39 02 66027.1 sales@isoil.it	service@isoil.it

If you want to find the complete list of our distributors access at the following link:
<http://www.isoil.it/en>



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.