

ISOMAG [®]
The friendly magmeter

DATA SHEET
MV145



CE

ISOIL 
I N D U S T R I A



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■ TECHNICAL DATA

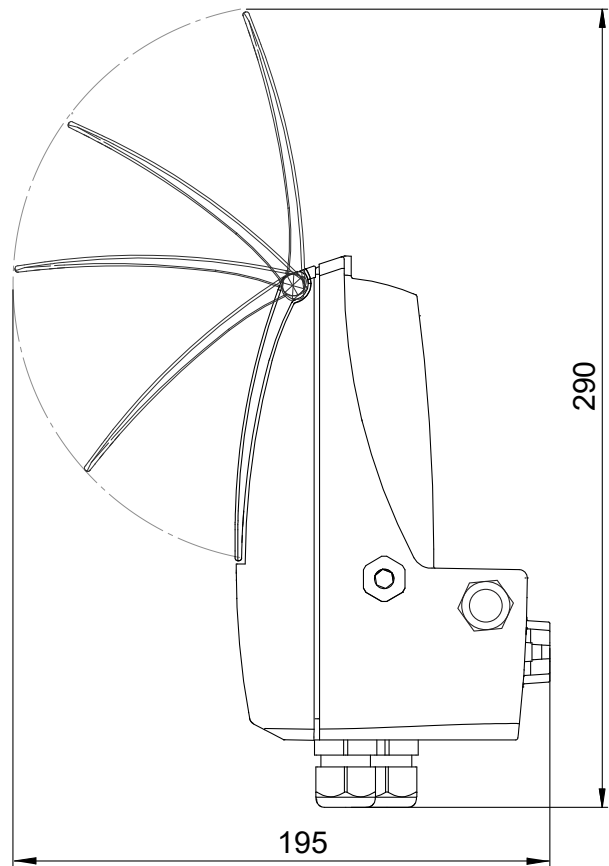
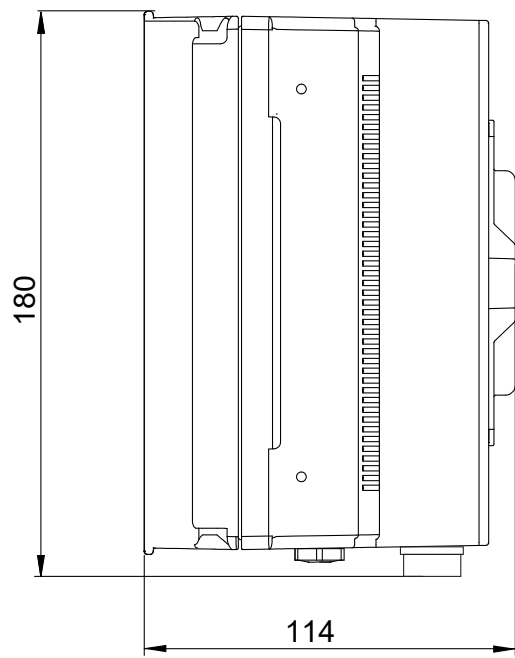
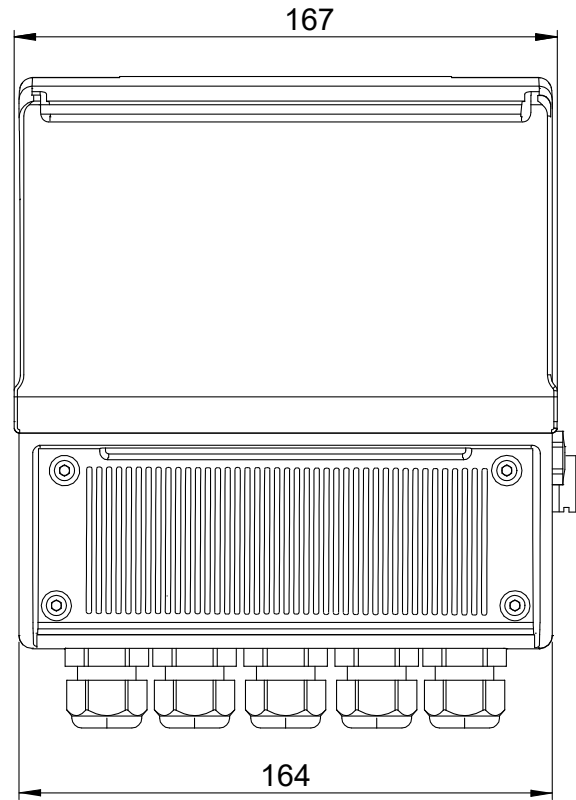
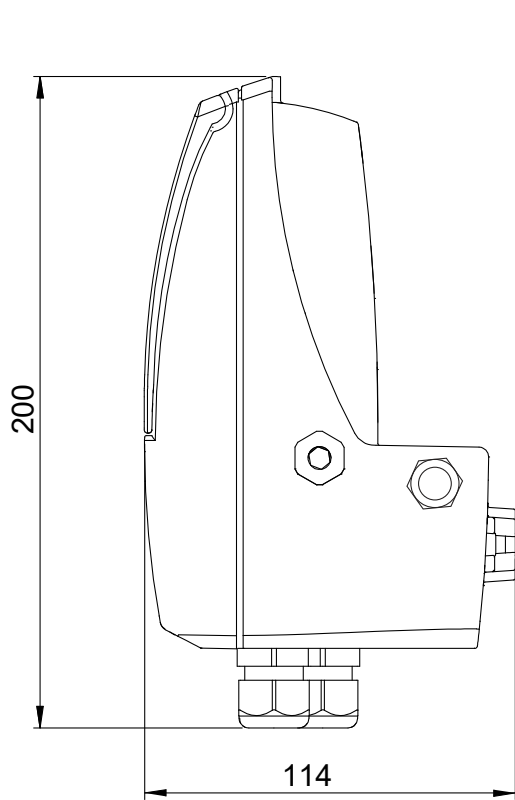
OVERALL FEATURES	
Suitable For	<input type="checkbox"/> All the ISOMAG® sensors
Minimum conductivity	<input type="checkbox"/> 5 µS/cm
Altitude	<input type="checkbox"/> -200 m up to 4000 m
Ambient Temperature	<input type="checkbox"/> -20... +60°C / -4... +140 °F - Aluminium housing <input type="checkbox"/>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

STANDARD FEATURES	
Housing materials	<input type="checkbox"/> Painted Aluminium die casting Or Nylon reinforced with 15% of fiber glass
Protection Rate	<input type="checkbox"/> IP 67
Power Supply/Consumption	<input type="checkbox"/> Network/ Primary Lithium Batteries / Alkaline Batteries (50mW ... 4W)
Cable Gland	<input type="checkbox"/> N° 5 cable gland PG 11
Full scale value	<input type="checkbox"/> 0,4...10m/s
Dig. Input	<input type="checkbox"/> N°1 , programmable function (i.e. Totalizer reset)
Data Storage	<input type="checkbox"/> F-Ram
Galvanic Isolation	<input type="checkbox"/> All analog / digital inputs / outputs are galvanically isolated (500V)
Programming Plug In	<input type="checkbox"/> PC connection via USB (A A / USB MINI B type cable must be used)
Bidirectional	<input type="checkbox"/> Yes
Diagnostic Funct.	<input type="checkbox"/> Yes
Empty Pipe Detect.	<input type="checkbox"/> Yes
CE Certification	<input type="checkbox"/> Yes

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

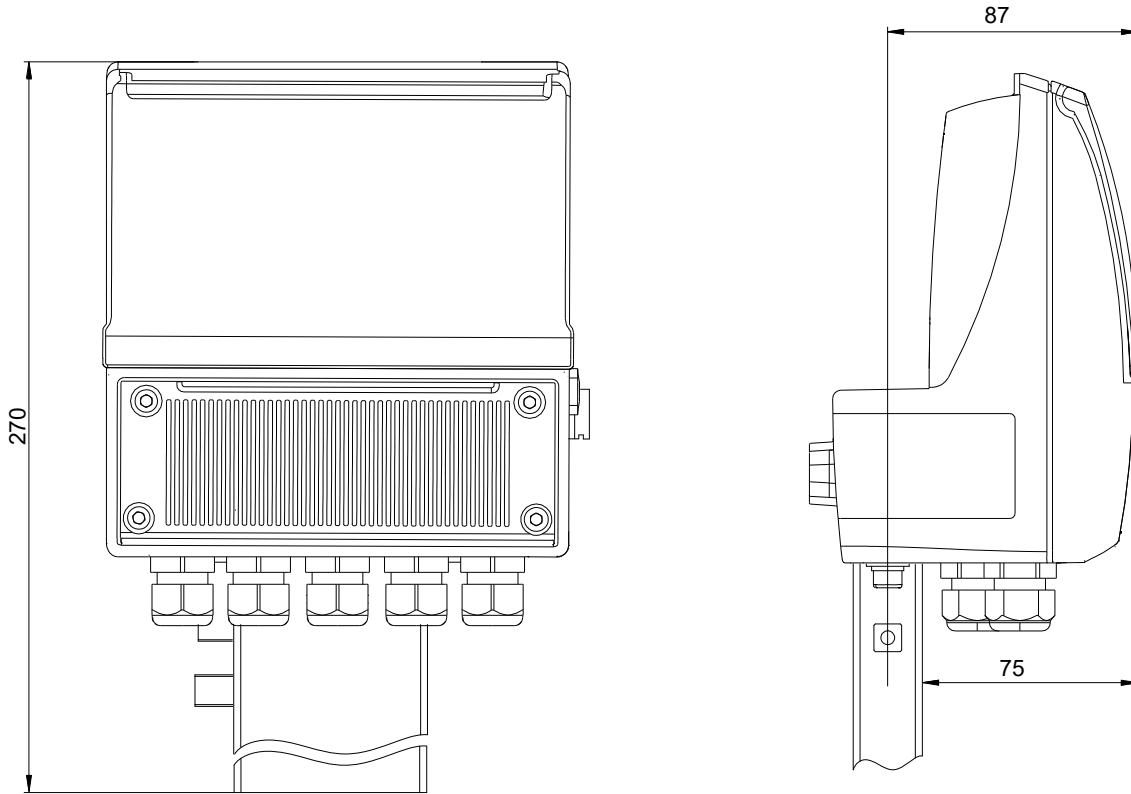
ACCURACY	
Measurements tolerance	<input type="checkbox"/> Flow rate (volume) = ±0,1% v.l. <input type="checkbox"/> Out 4/20 mA = ± 0,2 % v.l. <input type="checkbox"/> Frequency Out = ± 0,2% v.l.
Accuracy (whole system converter+sensor)	<input type="checkbox"/> See table below

OVERALL DIMENSION WITHOUT BATTERY PACK

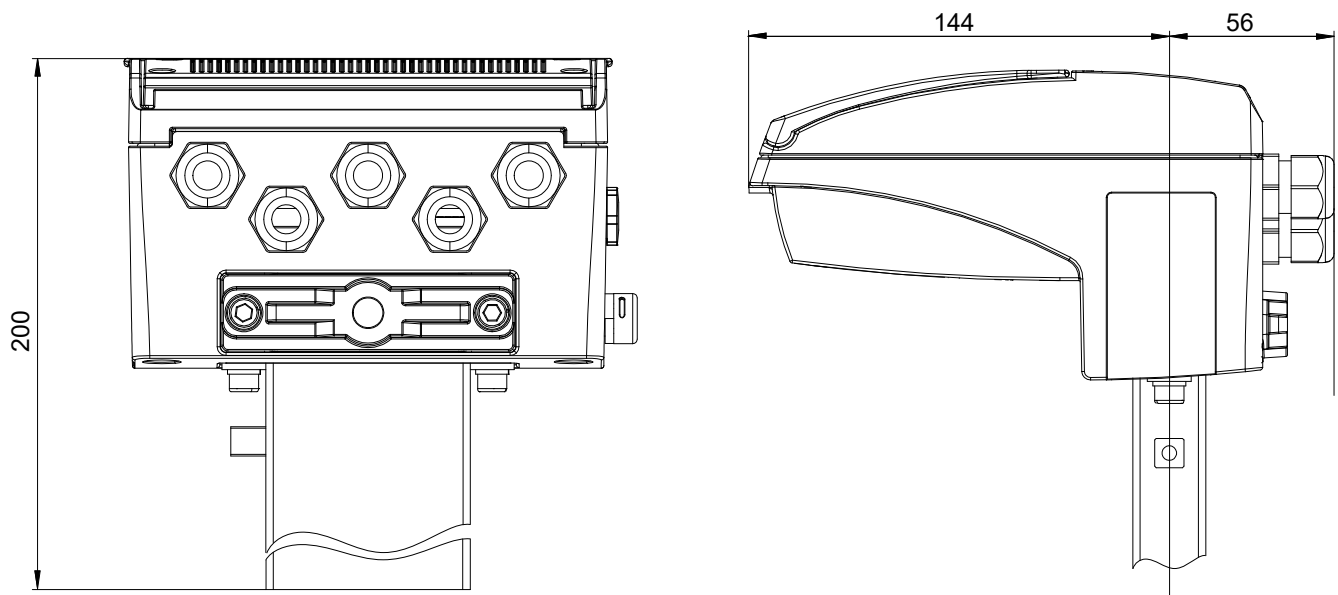


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COMPACT VERSION

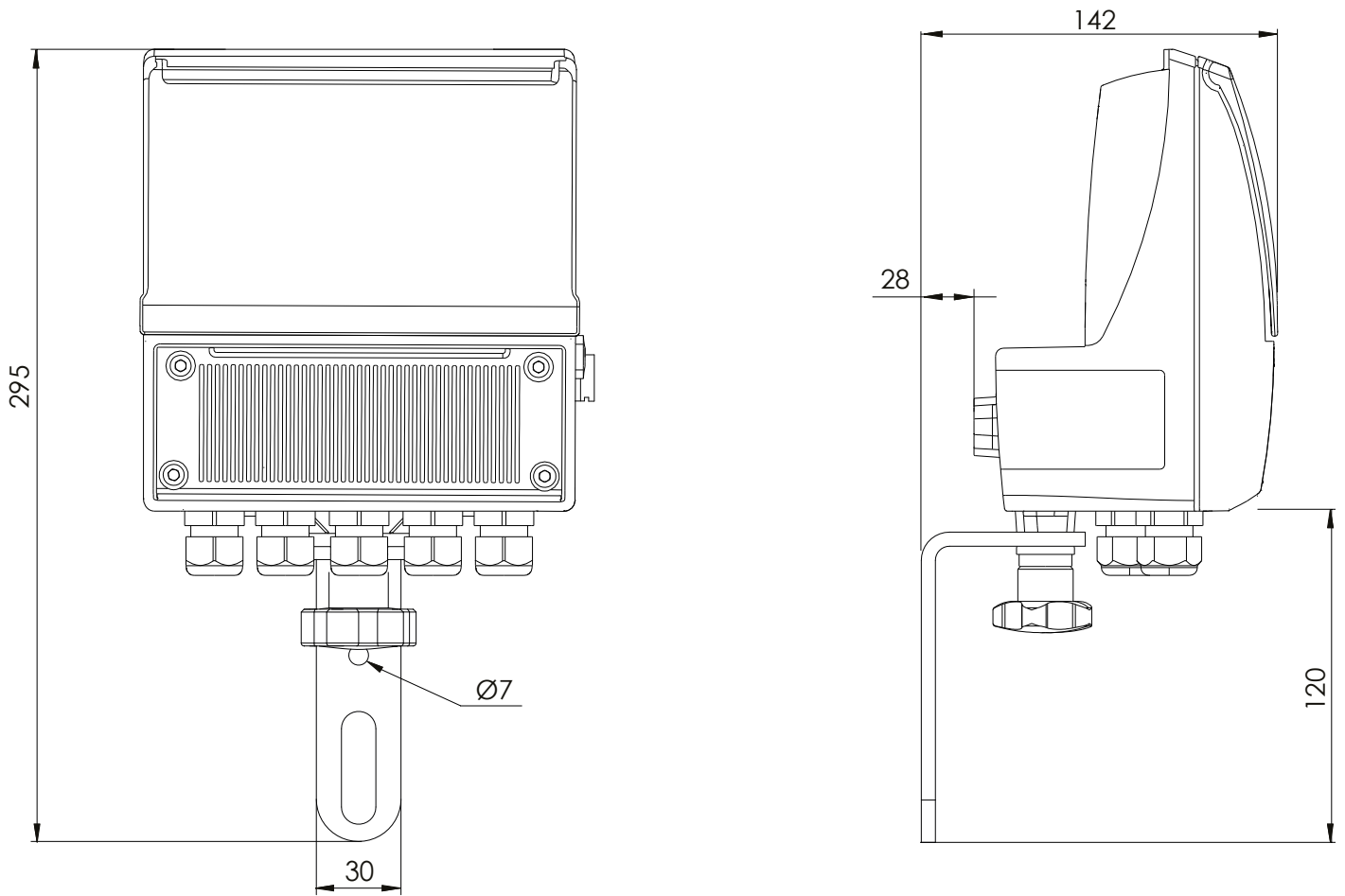


COMPACT VERSION (ROTATED)

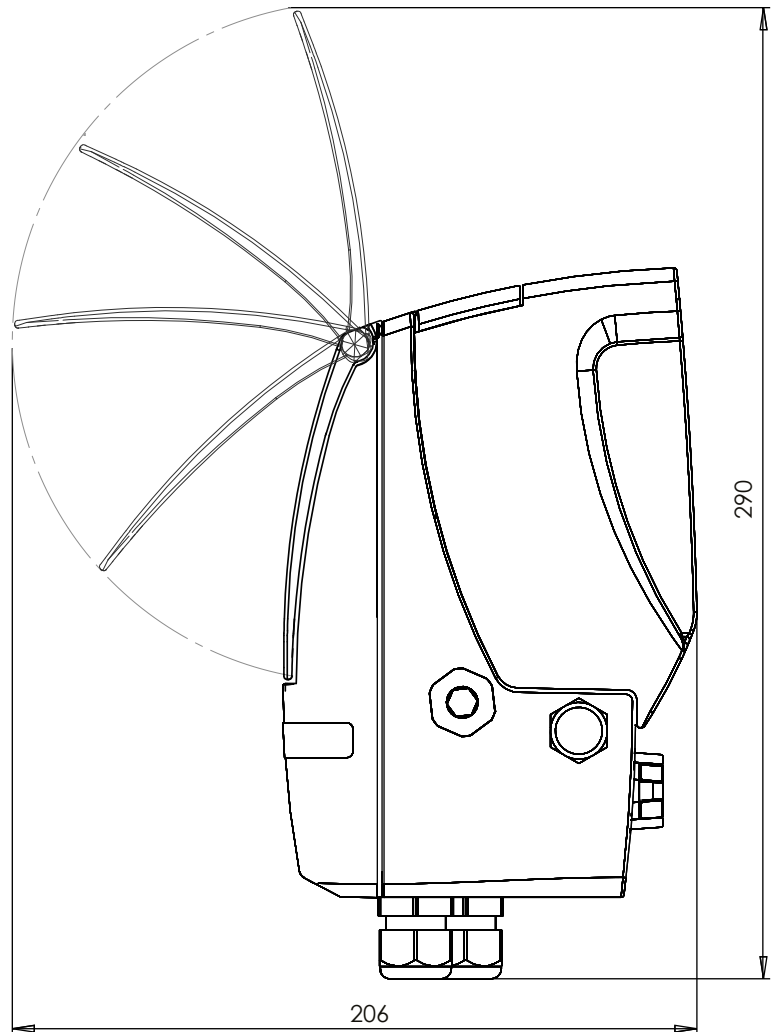
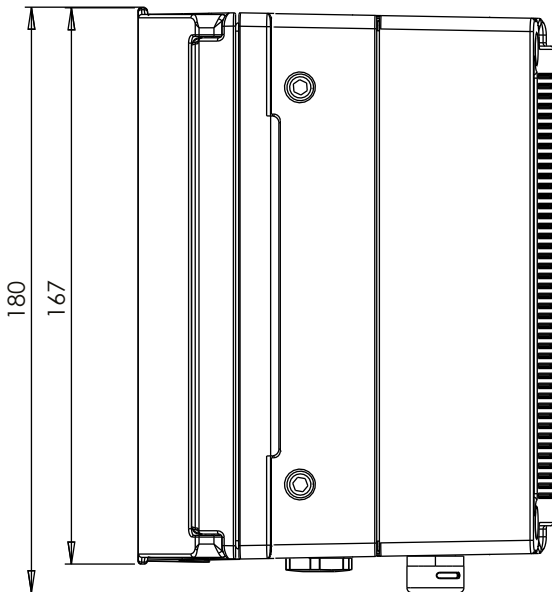
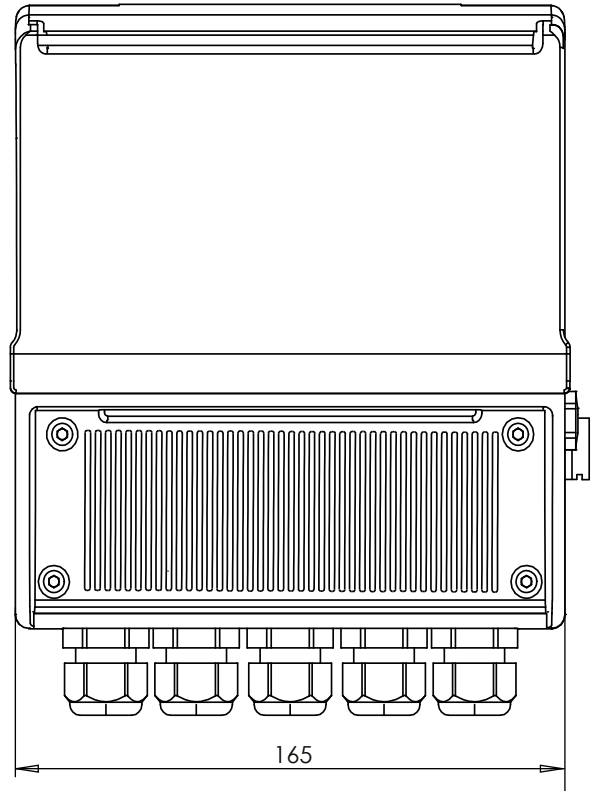
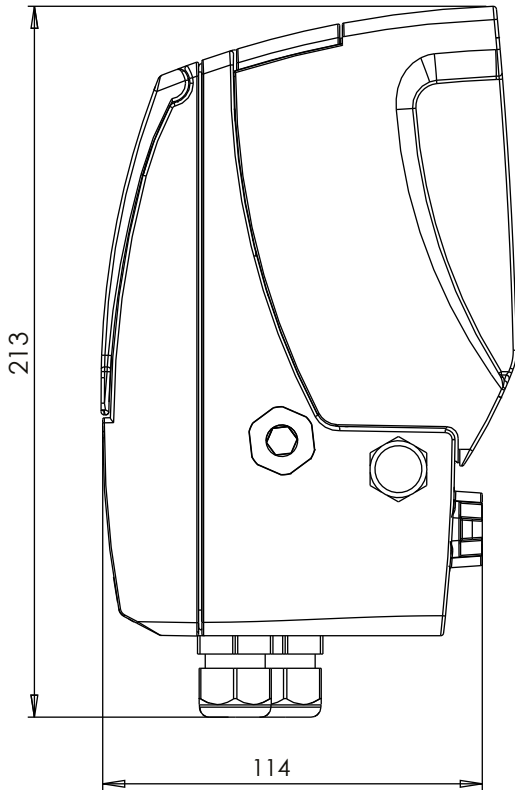


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SEPARATE (WALL) VERSION

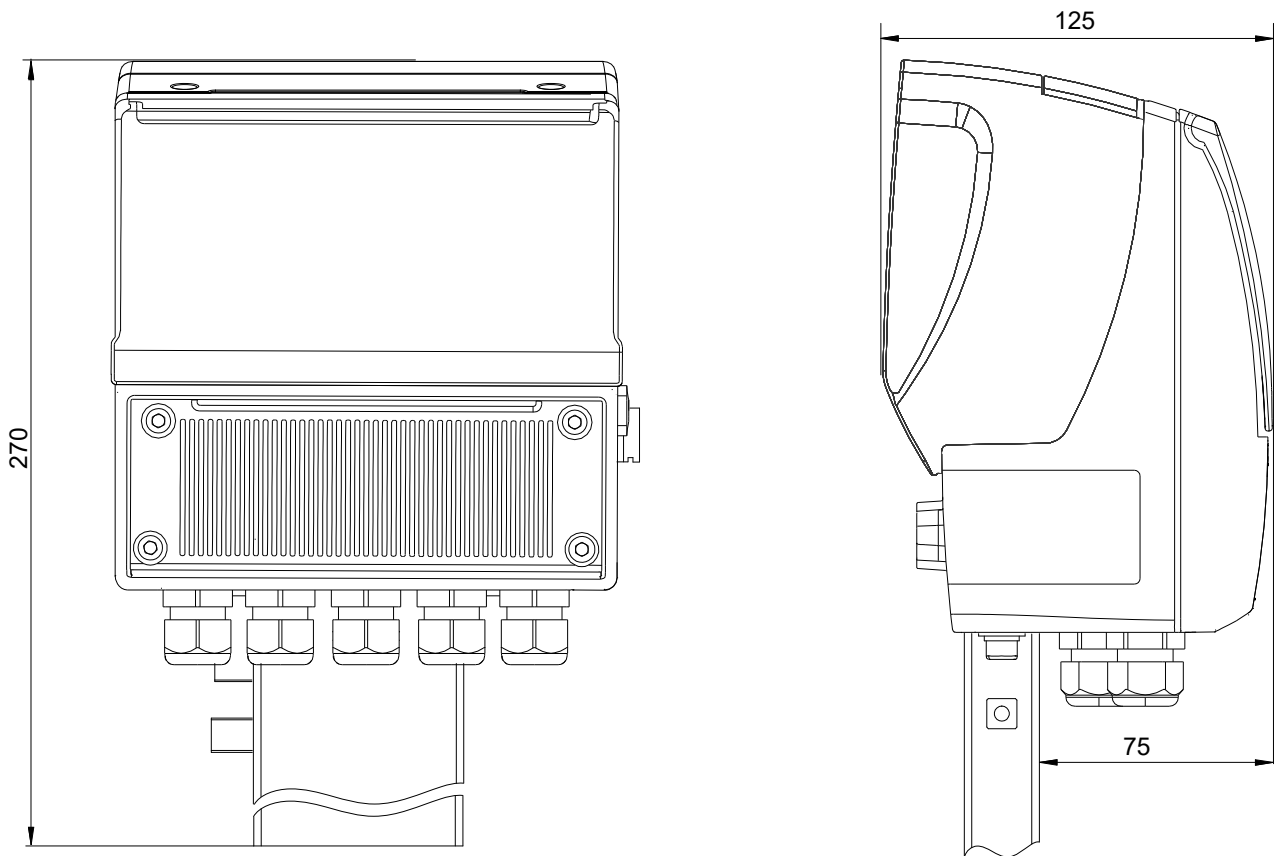


OVERALL DIMENSION WITH BATTERY PACK

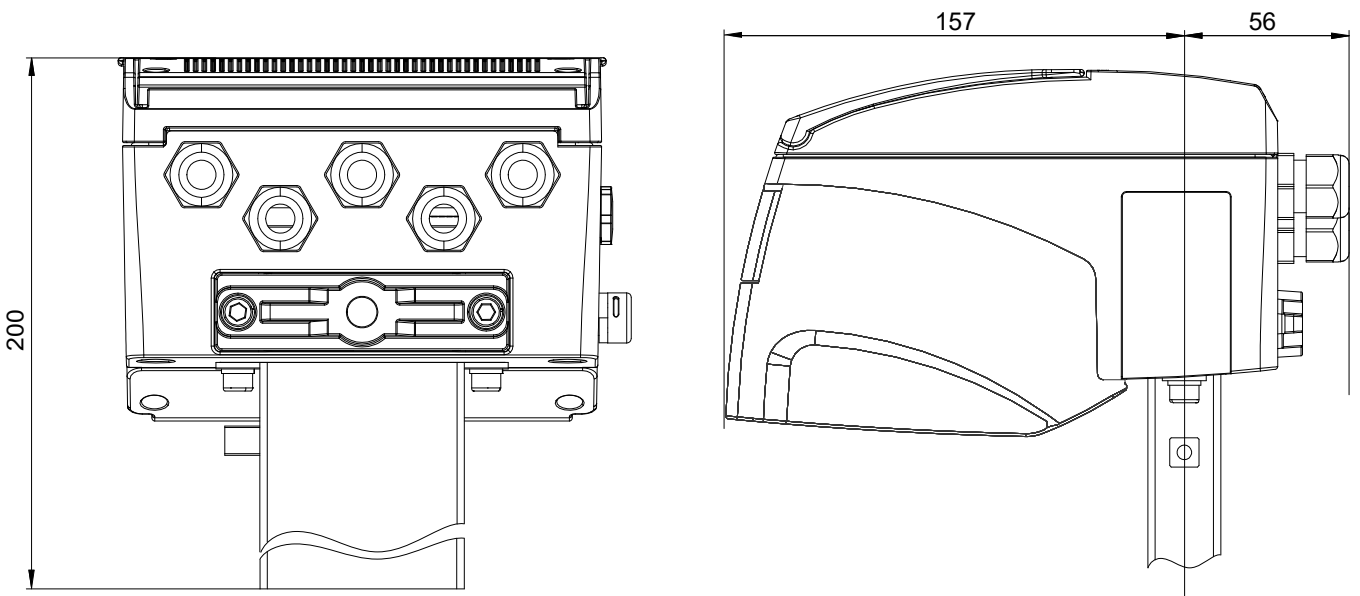


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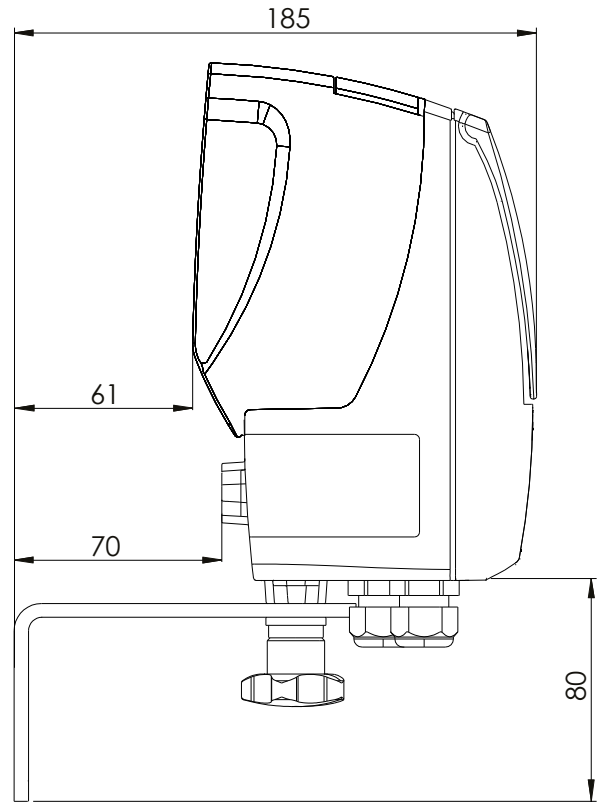
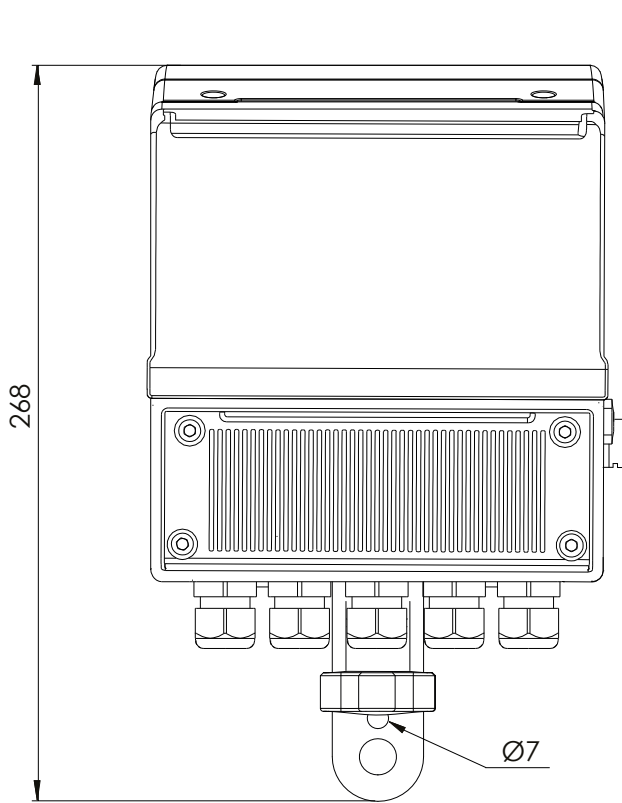
COMPACT VERSION



COMPACT VERSION (ROTATED)



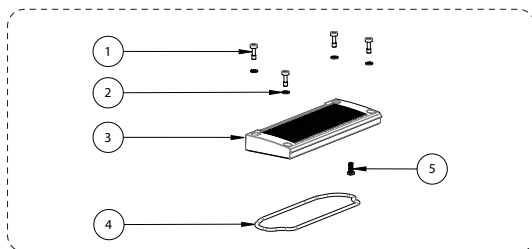
SEPARATE (WALL) VERSION



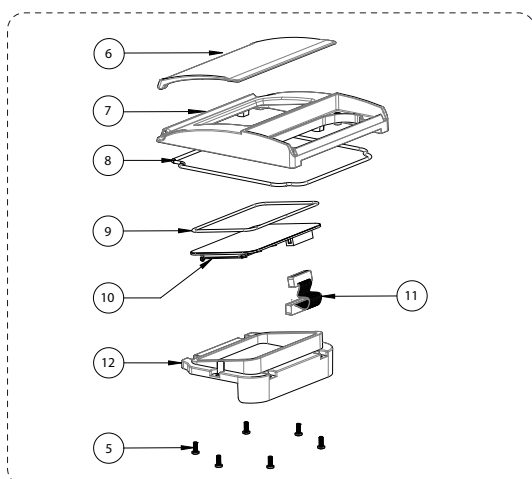
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MV145 EXPLODED LAYOUT

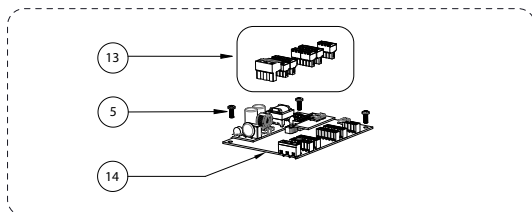
TERMINAL BLOCK COVER



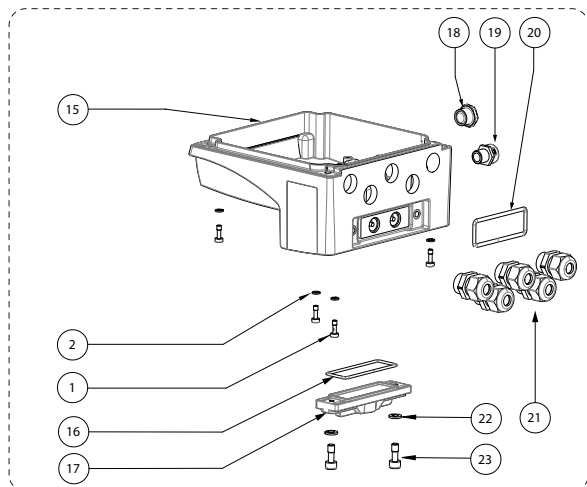
MAIN HOUSING COVER



PCB MV145

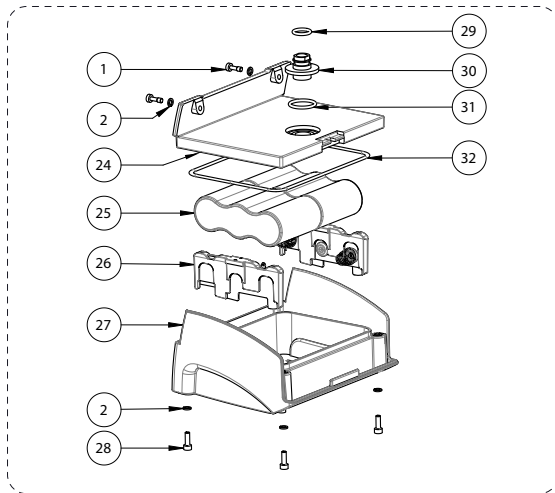


MAIN HOUSING



POS.	DESCRIPTION	
	PA6 VERSION	ALUMINIUM VERSION
1	SCREW M4x12	SCREW M5x12
2	GROWER Ø4	GROWER Ø5
3	TERMINAL BLOCK COVER	TERMINAL BLOCK COVER
4	O-RING-4400	
5	SELF-TAPPING SCREW 4x10	TRILOBO 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	PA6 MAIN HOUSING	ALUMINIUM MAIN HOUSING
16	O-RING-155	
17	PA6 VERSION CAP	
18	PG9 CAP	
19	ANTICONDENSE CAP	
20	O-RING-155	
21	PG11 CABLE GLAND CABLE DIAMETER: Ø5-Ø10mm	
22	GROWER Ø6	
23	SCREW M6x16	

BATTERIES HOUSING

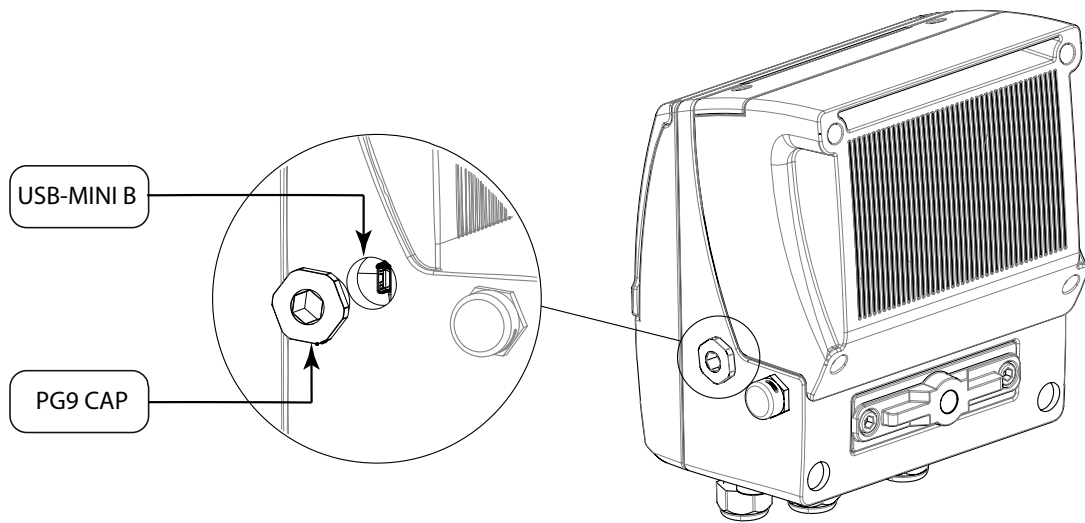


POS.	DESCRIPTION	
	<i>PA6 VERSION</i>	<i>ALUMINIUM VERSION</i>
24	PA6 BATTERY HOUSE COVER	
25	LITHIUM OR ALKALINE BATTERY	
26	CONTACTS FRAME FOR ALKALINE BATTERY	
27	PA6 BATTERY HOUSE	
28	SCREW M4X12	
29	O-RING 3050	
30	SEAL BUSH	
31	O-RING 3081	
32	O-RING 4575	

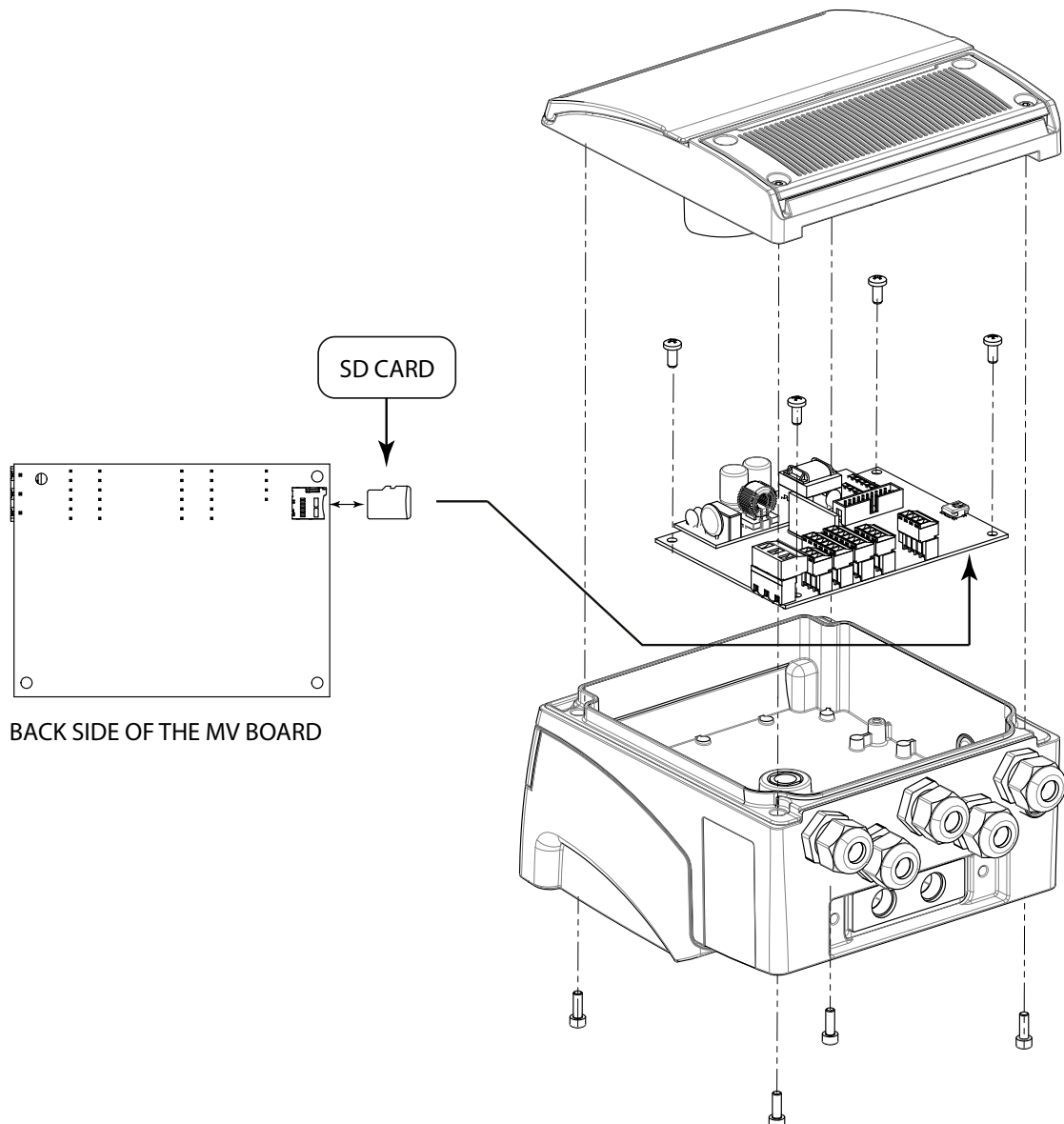
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CONVERTER ACCESS

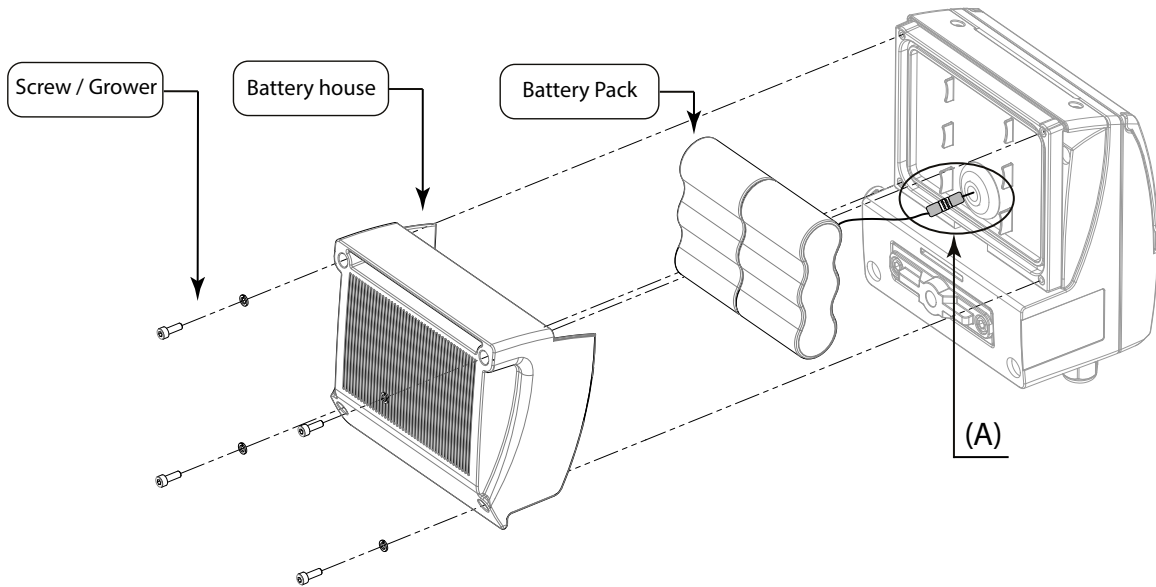
USB CONNECTION



SD CARD

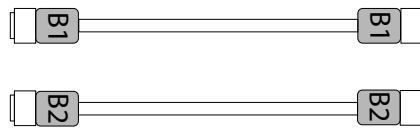
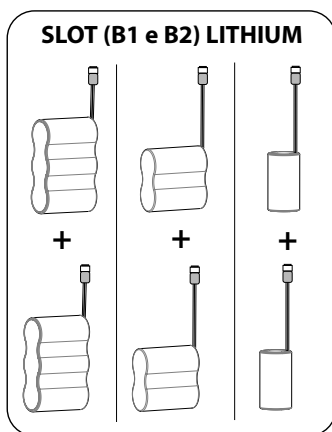


CONFIGURATION BATTERY

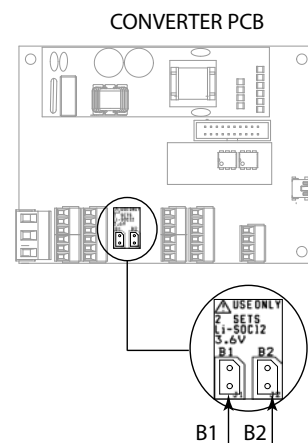


DETAIL (A) BATTERY CONNECTIONS CONVERTER PCB

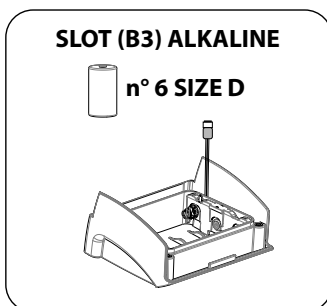
LITHIUM BATTERIES



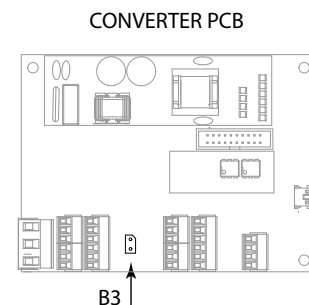
CABLES CONNECTION BATTERIES



ALKALINE BATTERIES

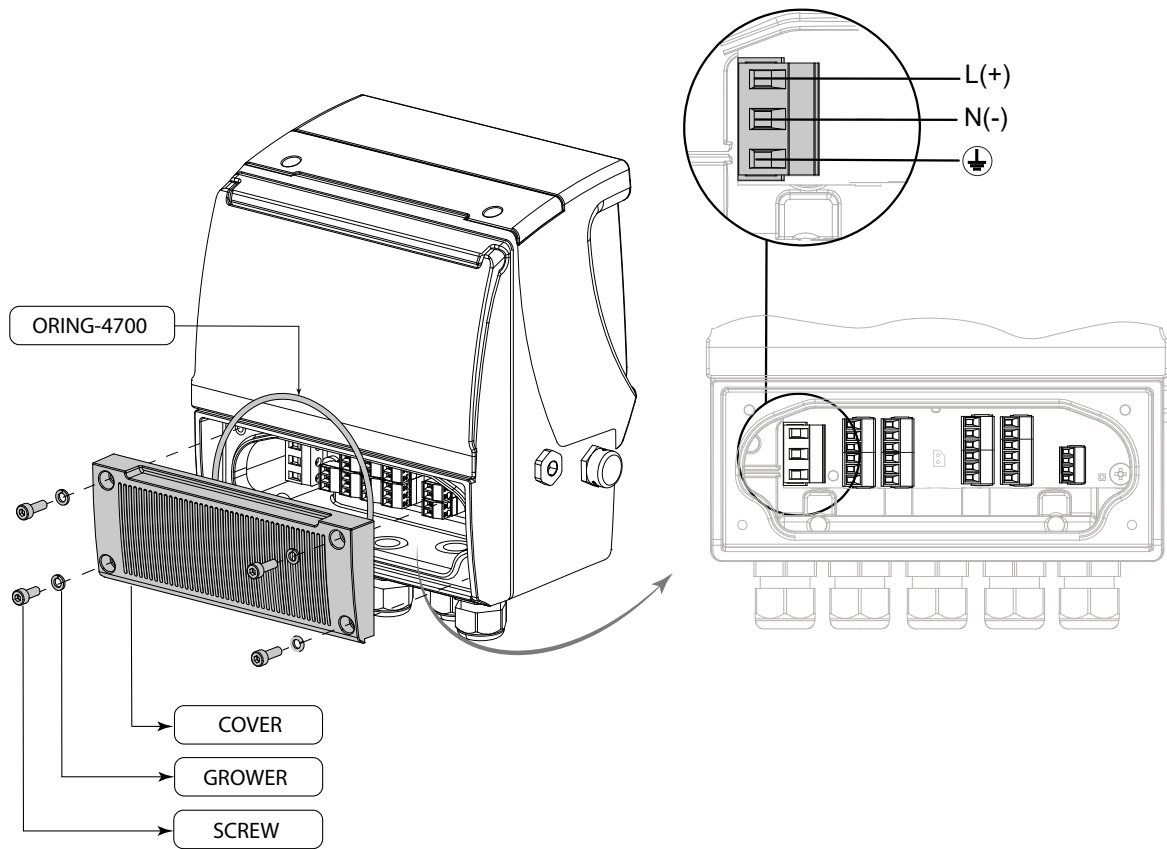


CABLES CONNECTION BATTERIES



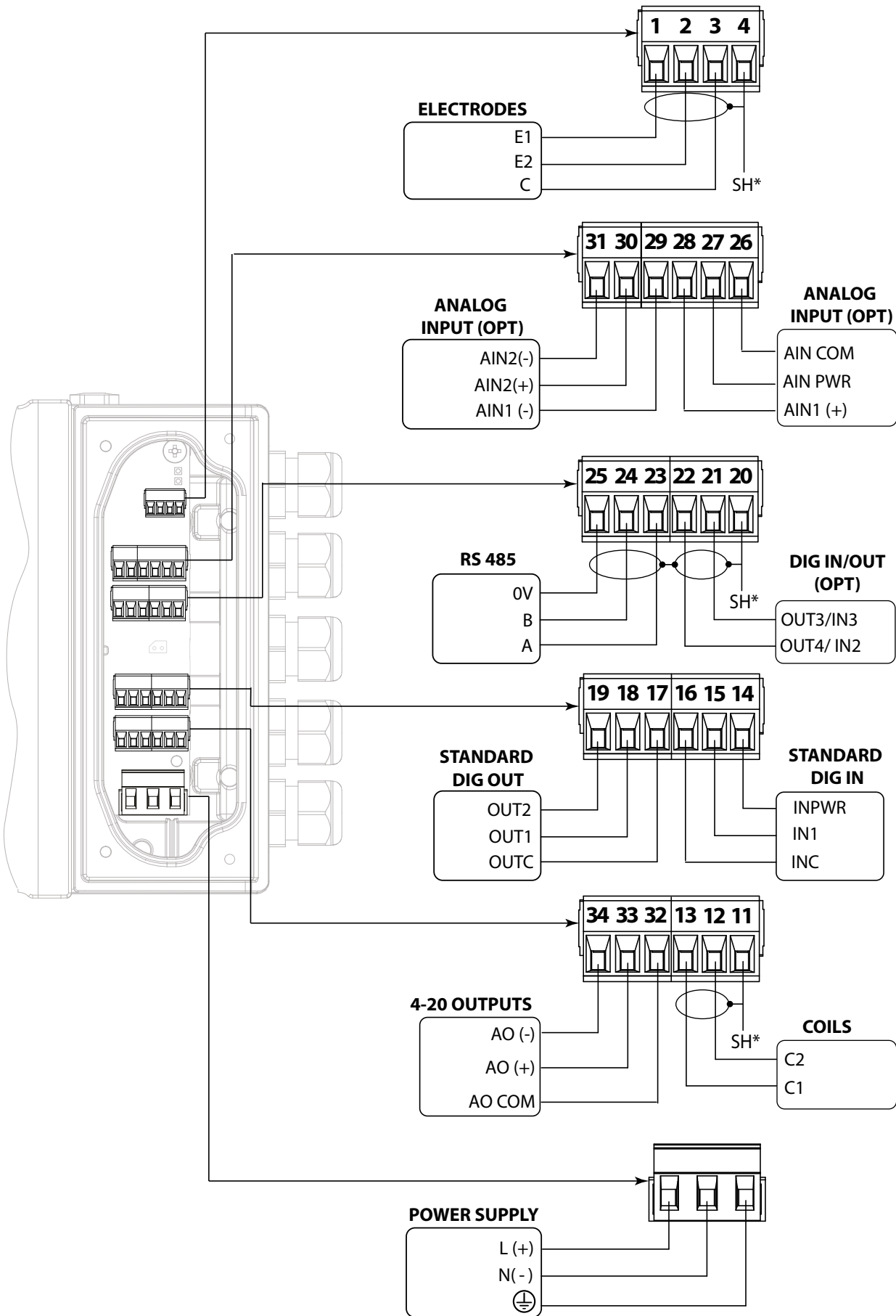
- The maximum number of batteries allowed in the various configurations is 6 size D batteries
- Alkaline batteries can also be purchased separately from third parties
- Lithium batteries are supplied exclusively by the manufacturer and can not be purchased separately from third parties. Furthermore,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

POWER SUPPLY FROM MAIN LINE



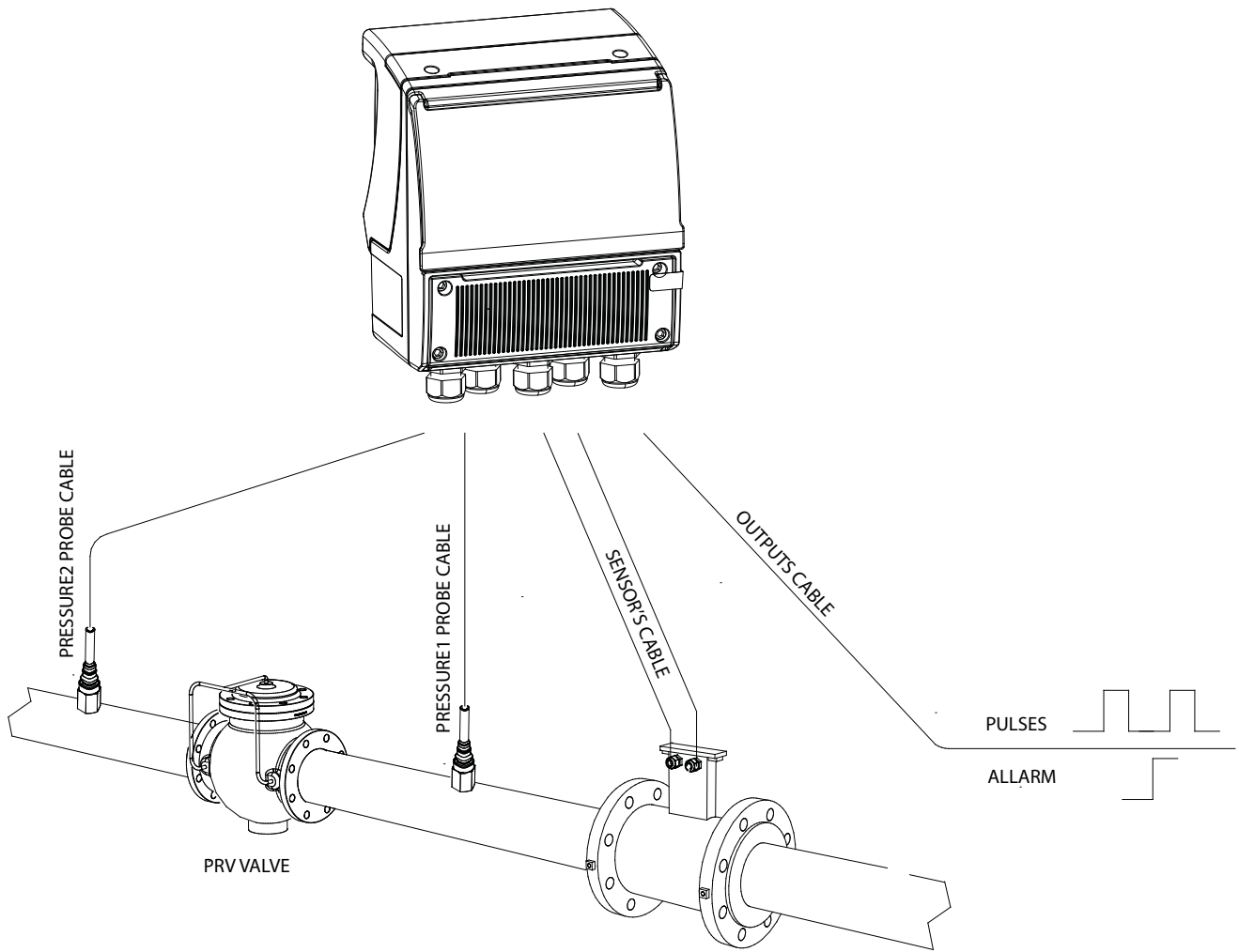
- The connections are made with approved cables with flame retardant properties, whose section varies from 0.25mm^2 to 2.50mm^2 , based on distance / power.
- The wiring can be checked by unscrewing the 4 screws on the terminal cover.
- When the lid is raised, the terminal block is visible. The terminal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

ELECTRICAL CONNECTIONS

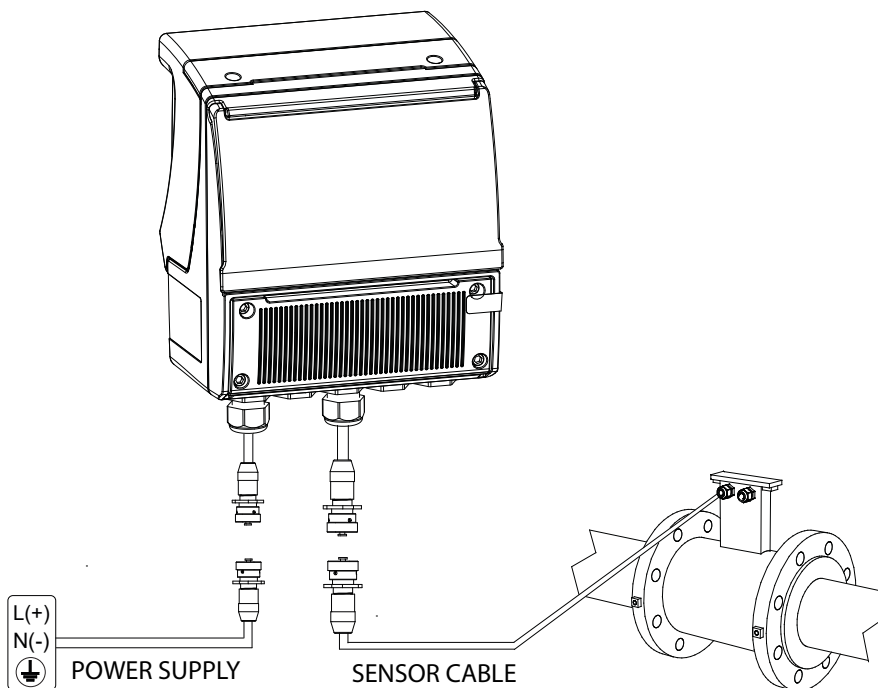


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PRESSURE / TEMPERATURE PROBES

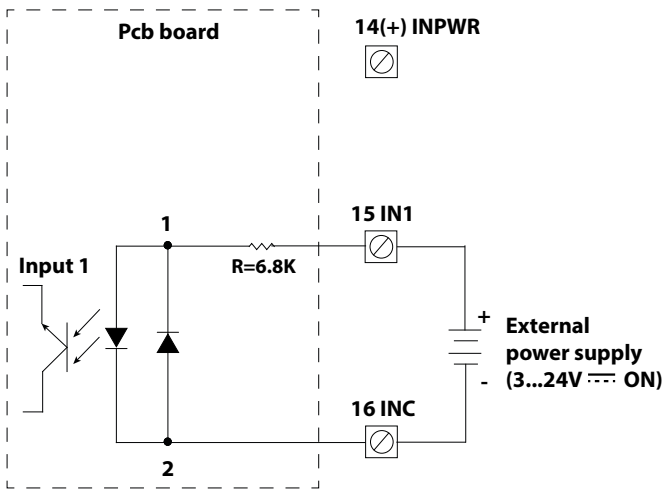


IP68 CONNECTION (EXAMPLE INSTALLATION)

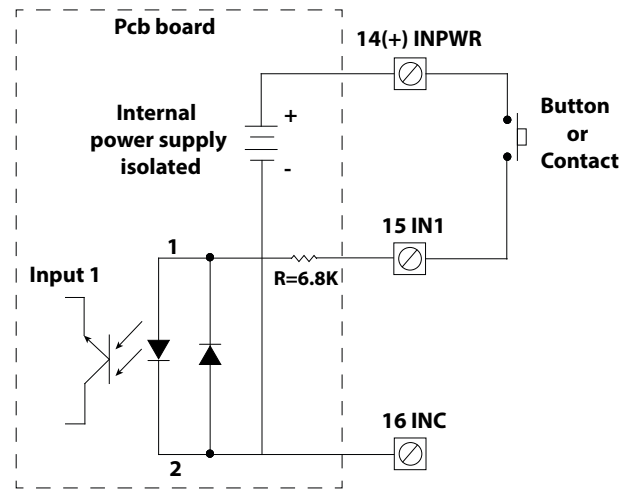


DIGITAL INPUT

ON/OFF INPUT (EXTERNAL POWER SUPPLY)

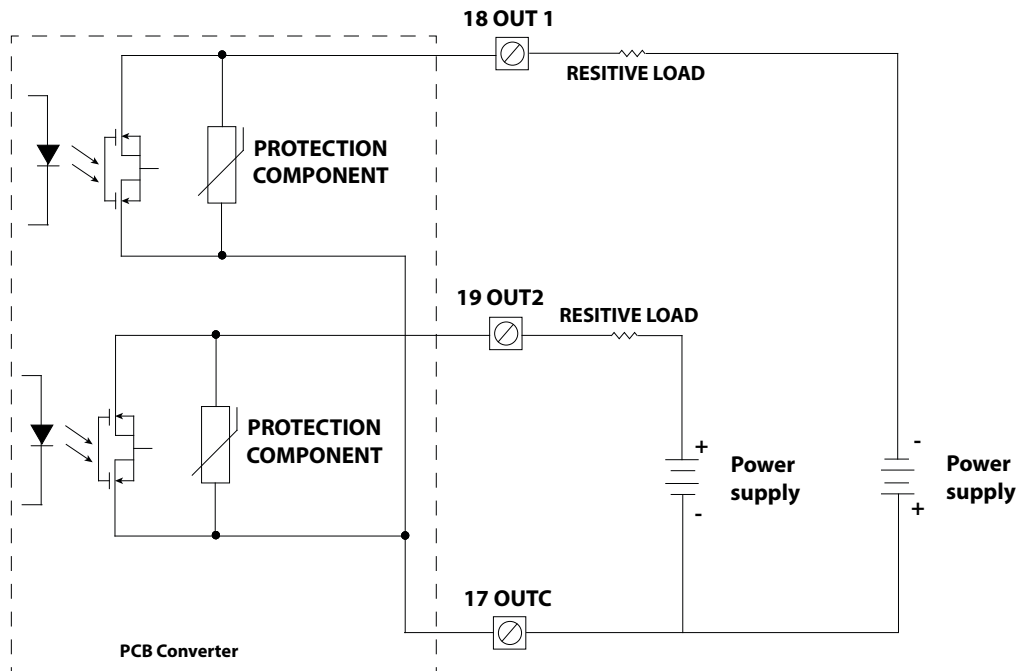


ON/OFF INPUT (INTERNAL POWER SUPPLY)



DIGITAL OUTPUTS

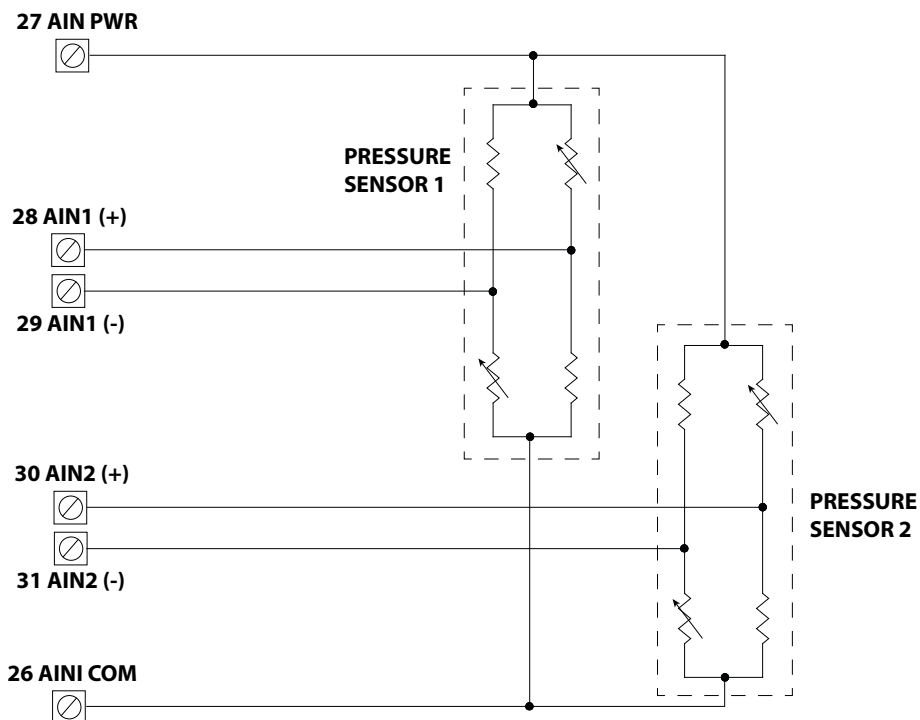
NOTE: the outputs are NOT polarized, so you can adopt schemes for connection to positive or common negative, as in the following electrical scheme.



AUXILIARY MODULE ANALOG INPUTS

NOTE: Two different types of sensors can be connected, for example a pressure sensor connected to input 1 and a temperature sensor connected to input 2, or contrary.

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.

27 AIN PWR

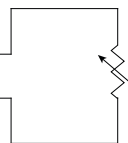


SENSOR TEMPERATURE 1
(PT100/PT500/PT1000)

28 AIN1 (+)



29 AIN1 (-)

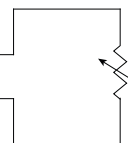


SENSOR TEMPERATURE 2
(PT100/PT500/PT1000)

30 AIN2 (+)



31 AIN2 (-)



26 AINI COM



4-20 OUTPUTS

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

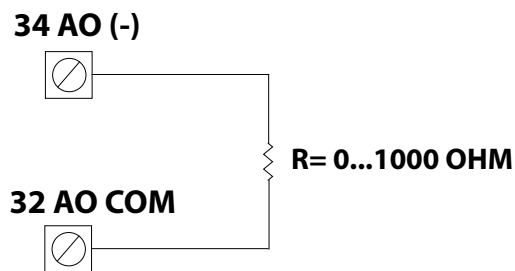
Passive mode: power is supplied from an external source.

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

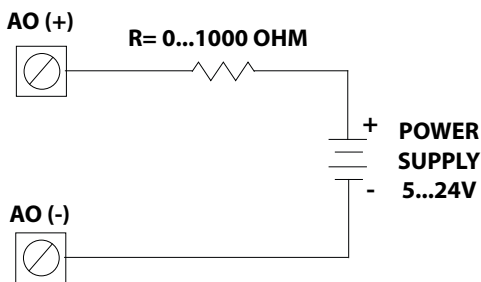
Active mode: power is supplied from the board power supply (if fitted).

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

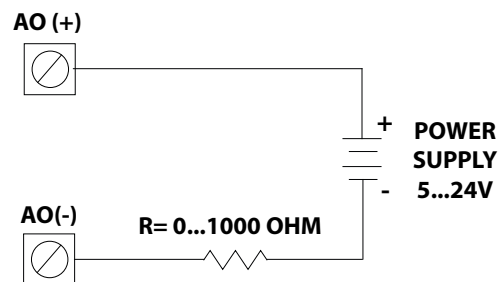
ACTIVE CONNECTION



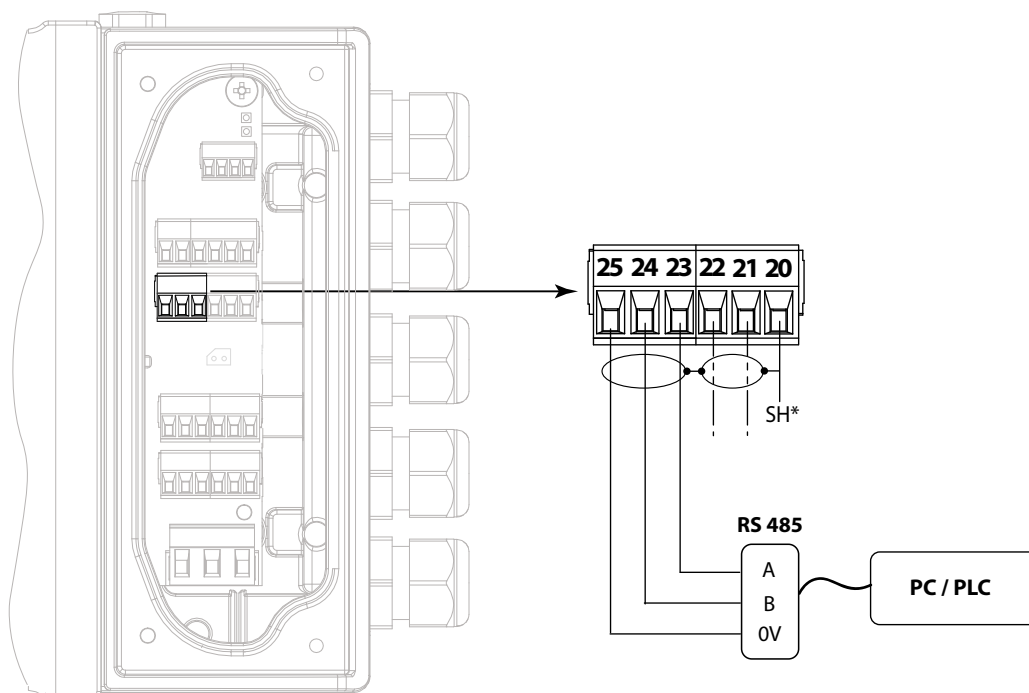
PASSIVE CONNECTION 1



PASSIVE CONNECTION 2



MODBUS (RS485)



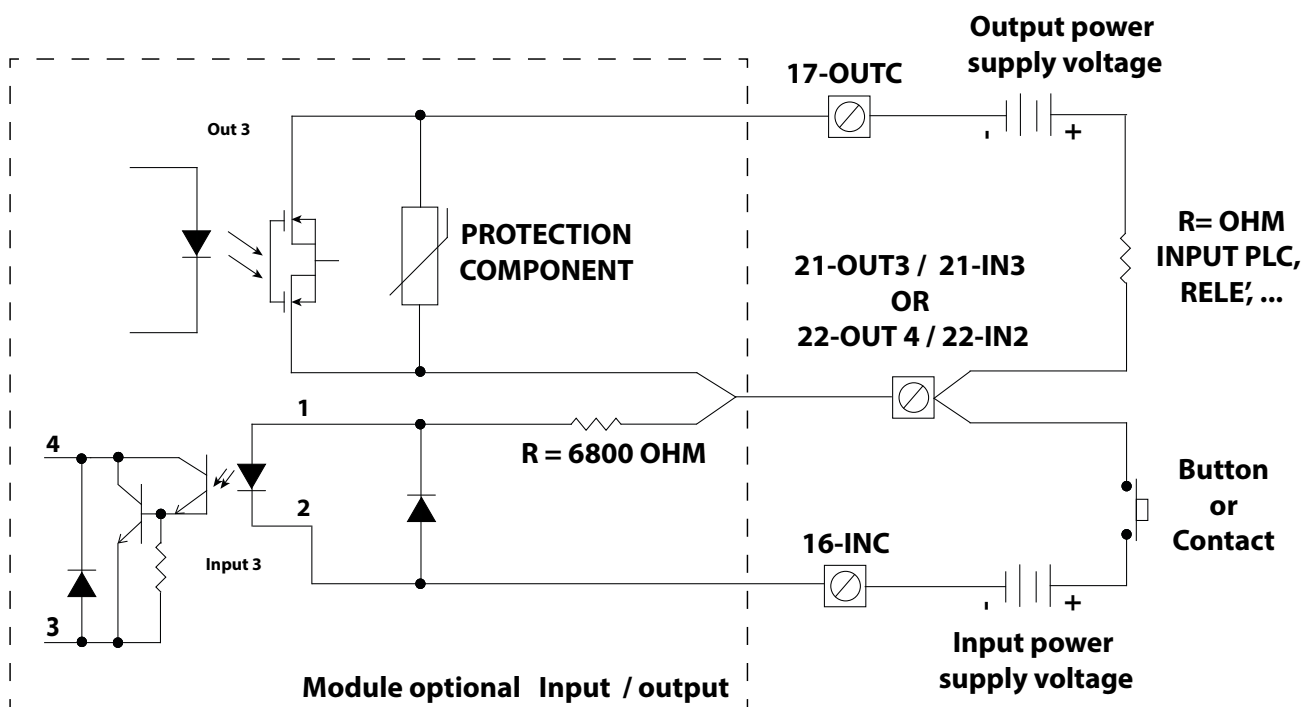
AUXILIARY MODULE DIGITAL INPUTS/ OUTPUTS

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).



■ MENU FUNCTIONS

MAIN MENU	
1 - Sensor	
SENSOR	
S.model	000
Lining	UNSPEC.
S.type	FULLBORE
U.type	METRIC
Diam.	00700
KA	+00.9637
KA-	-04.4904
KZ	-0018852
KD	+00.4014
Ins.position	0
KP dynamic	OFF
Ki	+01.0000
Kp	+01.0000
KC	1.00000
C.Curr.	mA025.0
S.time1	ms03
Reg.C.T	stp 005
C.R.time	ms03
E.P.Detect	ON
Z max	Kohm0500
S.err.delay	010
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	
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.	1,107/MCPI
AIN2 m.u.	1,107/MCPI

- 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

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```

MAIN MENU
1 -Sensor
2 -Units
3 -Scales
4 -Measure
5 -Alarms
6 -Diagnosis
7 -Help
8 -Factory
9 -Factory
10 -Factory
11 -Factory
12 -Diagnosis
13 -System
    
```

```

SCALES
FS1          dm3/s500
Pls1         dm3 0.15
Tpls1        (ms)
Pls2         dm30.15
Tpls2        15*(ms)
IAN1         1,107MCP
IAN2         1,107MCP
    
```

- 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

```

MAIN MENU
1 -Sensor
2 -Units
3 -Scales
4 -Measure
5 -Alarms
6 -Diagnosis
7 -Help
8 -Factory
9 -Factory
10 -Factory
11 -Factory
12 -Diagnosis
13 -Sistema
    
```

```

MEASURE
M.Prof.      SMART1
Filt.bypass  ON
Cut-off      00.0(%)
LP Cycle sim. ON
Cal.verify   ON
H.imm.inp.   ON
    
```

- 4.1 Measure power profile
- 4.2 Measure filter bypass
- 4.3 Measure cut-off threshold
- 4.4 Low power m.cycle simulation
- 4.5 Automatic calibration verify
- 4.6 High immunity inputs

```

MAIN MENU
1 -Sensor
2 -Units
3 -Scales
4 -Measure
5 -Alarms
6 -Diagnosis
7 -Help
8 -Factory
9 -Factory
10 -Factory
11 -Factory
12 -Diagnosis
13 -Sistema
    
```

```

ALARMS
Max+         dm3/s
Max-         dm3/s
Min+         dm3/s
Min-         dm3/s
A1Mx        ( )
A1Mn        ( )
A2Mx        ( )
A2Mn        ( )
Hysteresis   %
V.all HZ     %
    
```

- 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 MAX alarm threshold for analog input 1
- 5.6 MIN alarm threshold for analog input 1
- 5.7 MAX alarm threshold for analog input 2
- 5.8 MIN alarm threshold for analog input 2
- 5.9 Hysteresis on alarm thresholds
- 5.10 Output frequency value in alarm

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```

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

```

```

7
8 INPUTS
9 T+ reset OFF 6.1
10 P+ reset OFF 6.2
11 T- reset OFF 6.3
12 P- reset OFF 6.4
13 Count lock OFF 6.5
Meas.lock OFF 6.6
Calibration external command 6.7
Sys.v.detect ON 6.8
D.In2 SYS.MDL 6.9
D.In3 OFF 6.10
D.in p.sup. ON 6.11

```

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 Aux.digital inputs power supply

```

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

```

```

8 OUTPUTS
9 Out1 F.R.SIGN 7.1
10 Out1 inv. ON 7.2
11 Out1 pls. ON 7.3
12 Out2 ANLMM/MN 7.4
13 Out2 inv. ON 7.5
Out2 pls. ON 7.6
Out3 MAX.AL+ 7.7
Out3 inv. ON 7.8
Out3 pls. ON 7.9
Out4 MAX.AL+ 7.10
Out4 inv. ON 7.11
Out4 pls. ON 7.12
Out mA1 4-20 7.13
A1S dm3/s 7.14

```

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-Communications

```

```

9 COMMUNICATION
10 Dev. Addr. 001 8.1
11 Speed bps22800 8.2
12 Parity NO 8.3
13 Delay ms 00 8.4
C.timeout 2 8.5

```

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)

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```

MAIN MENU
1 -Sensor
2 -Units
3 -Scales
4 -Measure
5 -Alarms
6 -Inputs
7 -Outputs
8 -Communications
9 -Display
    
```

```

1 1
1 1
1 1
1 1
DISPLAY
Language           EN
Disp.time          s
Disp.Fn.           1
Disp.lock          OFF
Part.tot.          ON
Neg.tot.           ON
Net tot.           ON
Disp.date          ON
Quick start        OFF
    
```

9.1 Choice of the language
 9.2 Display/keyboard inactivity time
 9.3 Display function number
 9.4 Display function selection lock
 9.5 Partial totalizer enable
 9.6 Negative totalizer enable
 9.7 Net totalizer enable
 9.8 Time and date display enable
 9.9 Quick start menu visualization

```

MAIN MENU
1 -Sensor
2 -Units
3 -Scales
4 -Measure
5 -Alarms
6 -Inputs
7 -Outputs
8 -Communications
9 -Display
10 -Data logger
    
```

```

1 1
1 1
1 1
DATA LOGGER
D.logger en.       ON
Meas.units         ON
Field separ.       ;
Decim.separ.       .
Interv.            00:01:00
Log T+             OFF
Log P+             OFF
Log T-             OFF
Log P-             OFF
Log TN             OFF
Log PNI            OFF
Log Q(UM)          OFF
Log Q(Z)           OFF
Log AL.EU          OFF
Log ADM            OFF
Log STR            OFF
Log BTS            OFF
Log IBV            OFF
Log EDC            OFF
Log EAC            OFF
Log EIZ            OFF
Log SCU            OFF
    
```

10.1 Data logger enabling
 10.2 Measure unit recording enable
 10.3 Field separator character
 10.4 Decimal separator character
 10.5 Sampling interval
 10.6 Totalizer Total Positive Enable T+
 10.7 Totalizer Partial Positive Enable P+
 10.8 Totalizer Total Negative Enable T-
 10.9 Totalizer Partial Net Enable P-
 10.10 Totalizer Total Net Enable
 10.11 Totalizer Partial Net Enable
 10.12 Flow rate in Technical Units Enable
 10.13 Flow rate in PerCentage Enable
 10.14 ALarm Events Enable
 10.15 ADDitional Measures Enable
 10.16 Sensor Test Results Enable
 10.17 Board TemperatureS Enable
 10.18 Internal Board Voltages
 10.19 Electrodes DC Voltages Enable
 10.20 Electrodes AC voltages Enable
 10.21 Electrodes Source Impedance Enable
 10.22 Sensor Coils Values Enable

```

FUNCTION
T+ reset           ON
P+ reset           ON
T- reset           ;
P- reset           .
Load Sens.F.def    00:01:00
Load Conv.F.def    OFF
Save Sens.F.def    OFF
Save Conv.F.def    OFF
Calibration        OFF
    
```

11.1 Volume Totalizer Total Positive Reset
 11.2 Volume Totalizer Partial Positive Reset
 11.3 Volume Totalizer Total Negative Reset
 11.4 Volume Totalizer Partial Negative Reset
 11.5 Load Factory Default Sensor Data
 11.6 Load Factory Default Converter Data
 11.7 Save Factory Default Sensor Data
 11.8 Save Factory Default Converter Data
 11.9 Calibration Immediate Command

```

11 -Functions
12 -Diagnostic
13 -System
    
```

DIAGNOSTIC	
Self test	
Display test	
Sens.verify	
Flow sim.	OFF
Display measures	
Disp.comm.vars	
Display graphs	
SD card info	
Firmware info	
S/N	000000
WT	000:00:00:00
TC	0000000000
12 - Diagnostica	
13 - Sistema	

- 12.1 Auto test Immediate Command
- 12.2 Execute dit pattern display test
- 12.3 Sensor Verify Command
- 12.4 Measure Simulation Enable
- 12.5 Diagnostic Measure Values
- 12.6 Diagnostic Communication Values
- 12.7 Oscilloscope function
- 12.8 SD memory Status
- 12.9 Model and Software Version
- 12.10 Serial Number
- 12.11 Total Working Time
- 12.12 Total Measure Cycles

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	011.012.012
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	
13 - System	

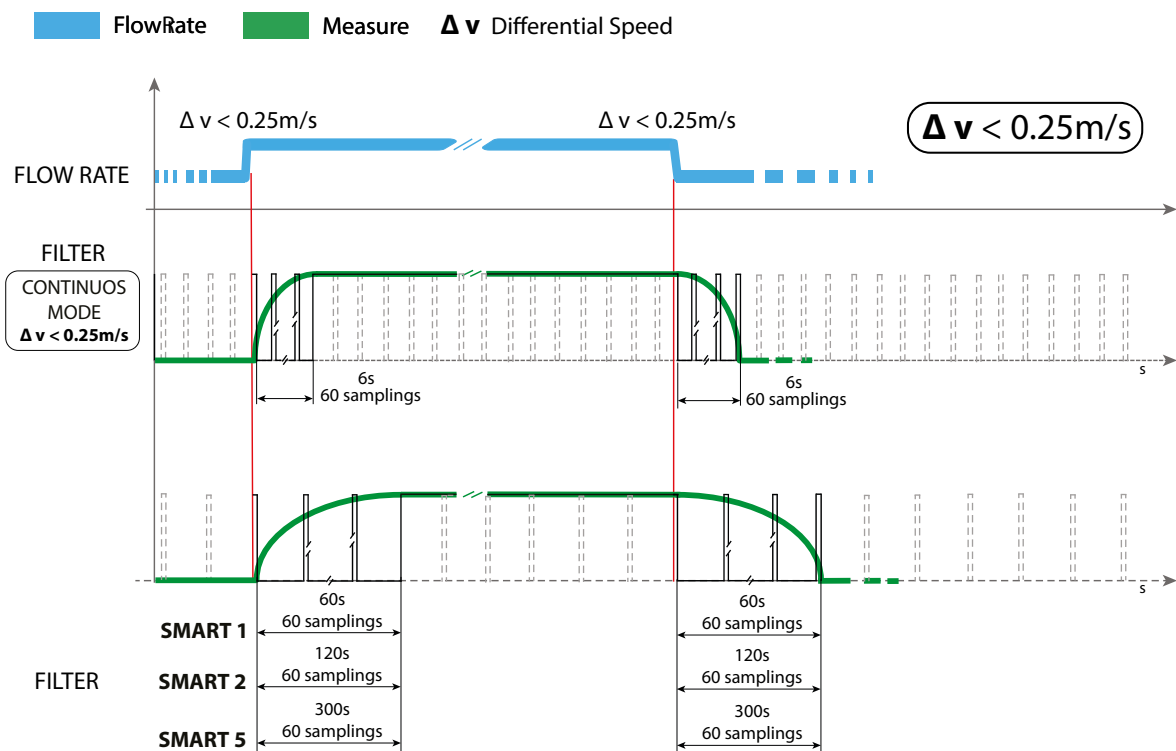
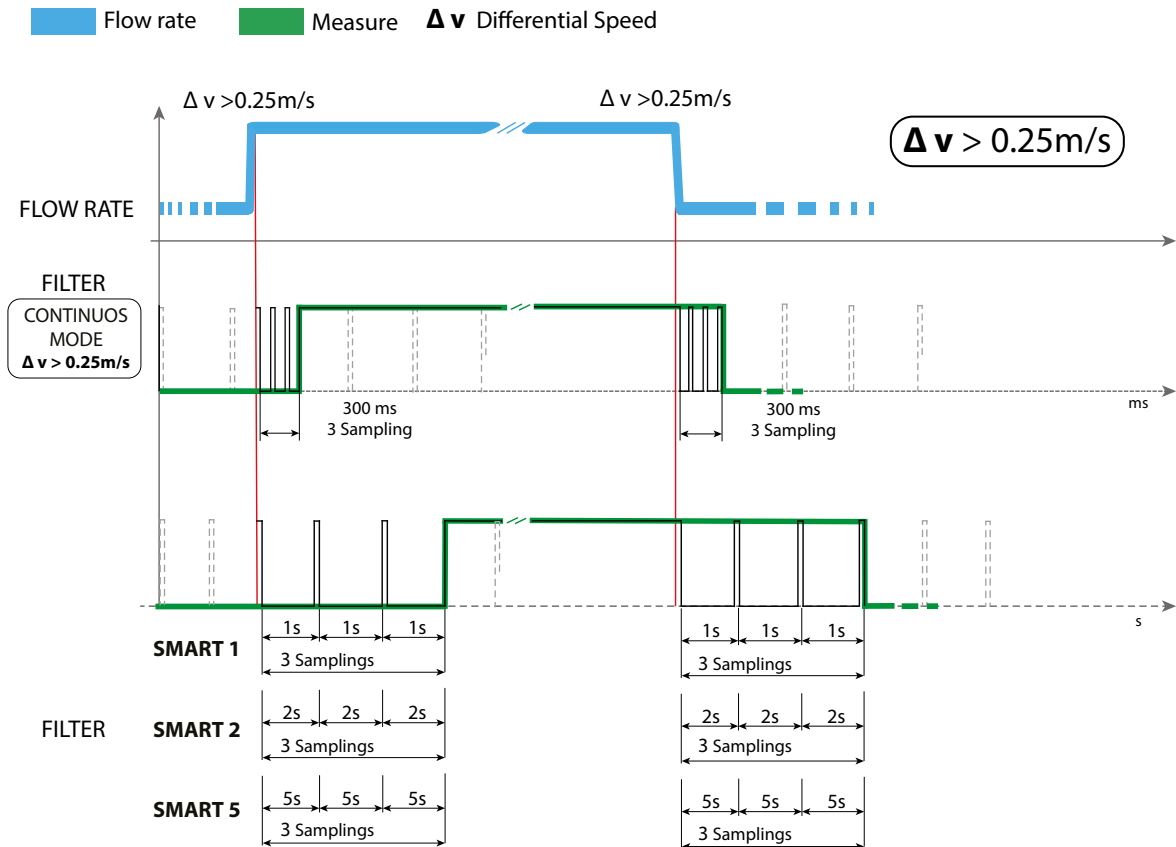
- 13.1 Daylight Saving Time Enable
- 13.2 Time Zone
- 13.3 Date and Time
- 13.4 Level 1 Access Code
- 13.5 Level 2 Access Code
- 13.6 Level 3 Access Code
- 13.7 Level 4 Access Code
- 13.8 Level 5 Access Code
- 13.9 Level 6 Access Code
- 13.10 ReStricted Access Rule Enable
- 13.11 Device IP Address
- 13.12 Client IP Address
- 13.13 NETwork Madk
- 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

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MEASURE / SAMPLE FREQUENCY

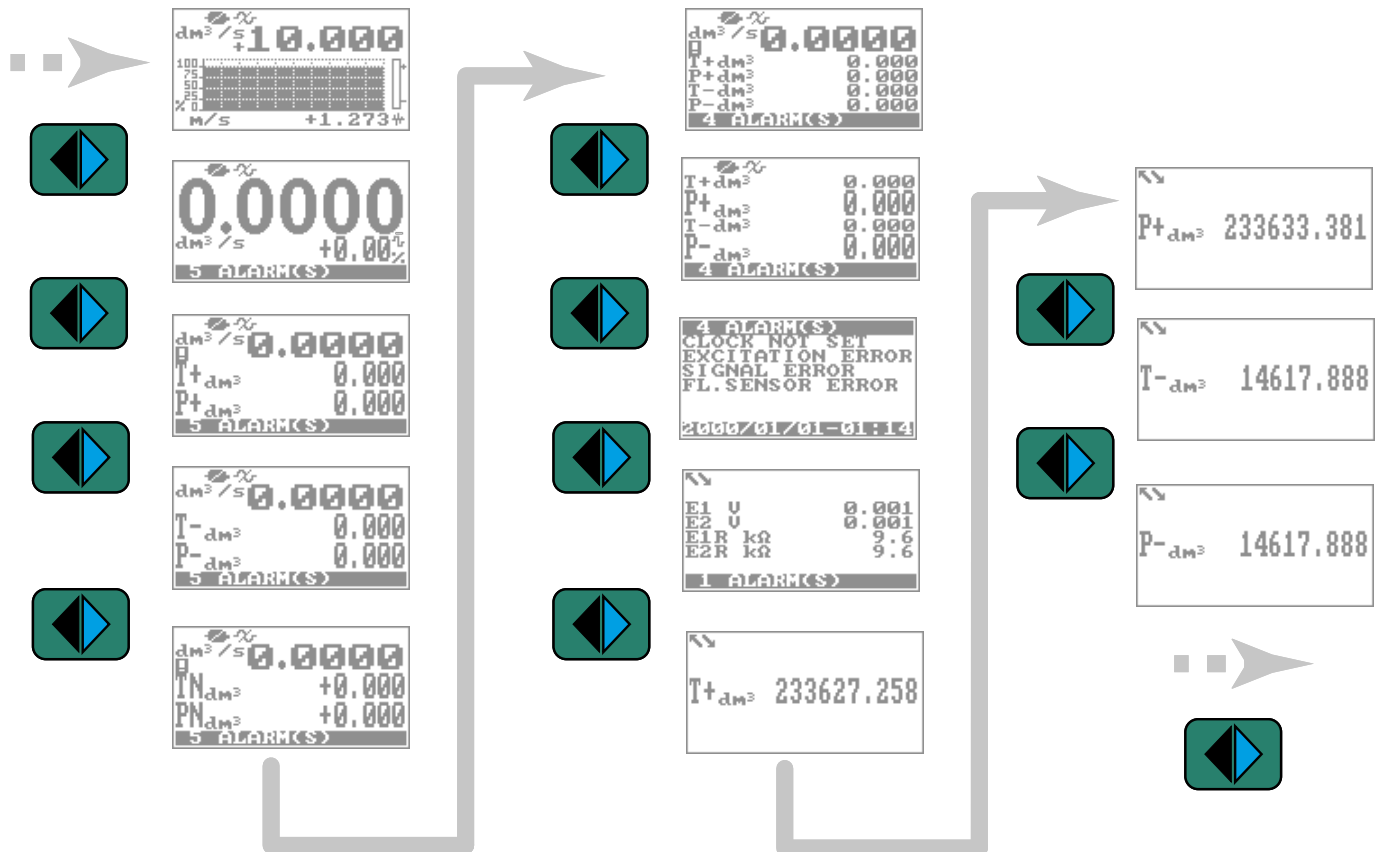
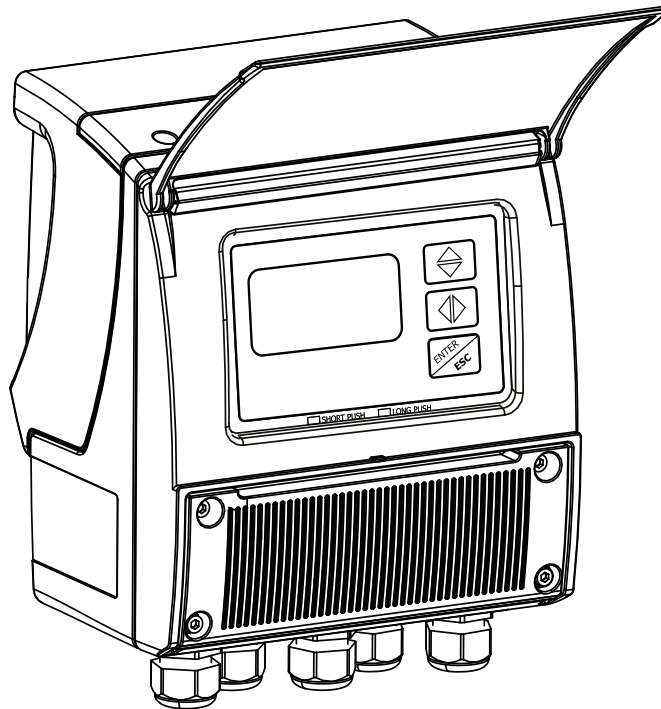
MV145 can be programmed to acquire the measurement in four different ways:

- SMART1: sampling at 1 second
- SMART2: sampling at 2 second
- SMART5: sampling at 5 seconds
- CONT. PWR: Continuous power sampling less than 1 second.



MAIN PAGES VISUALIZATION

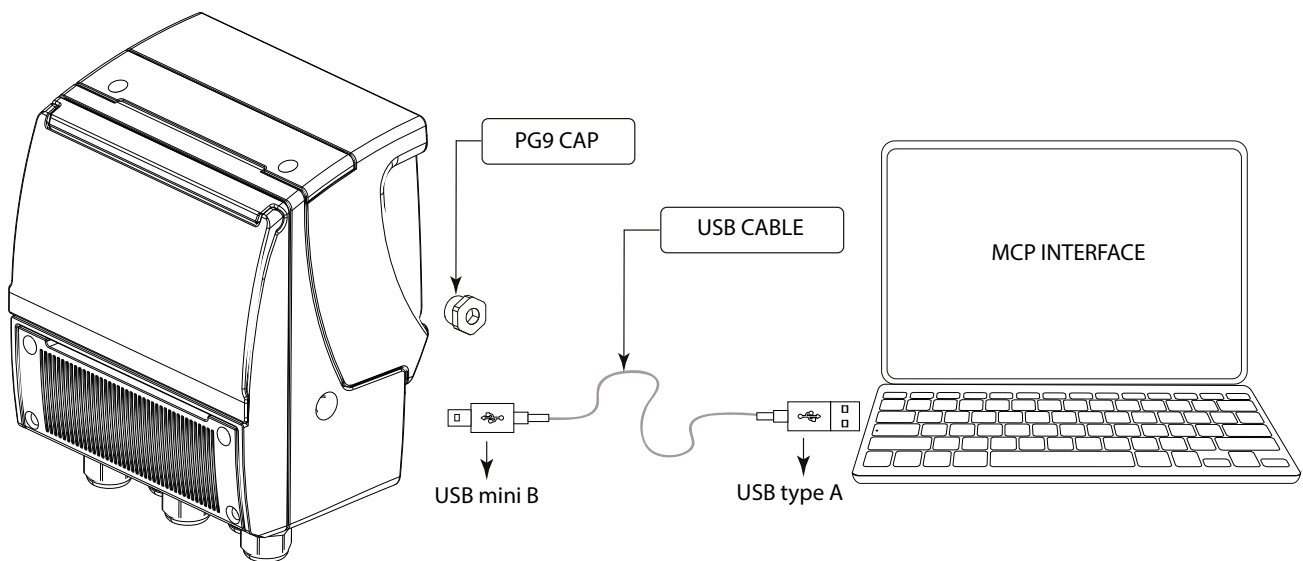
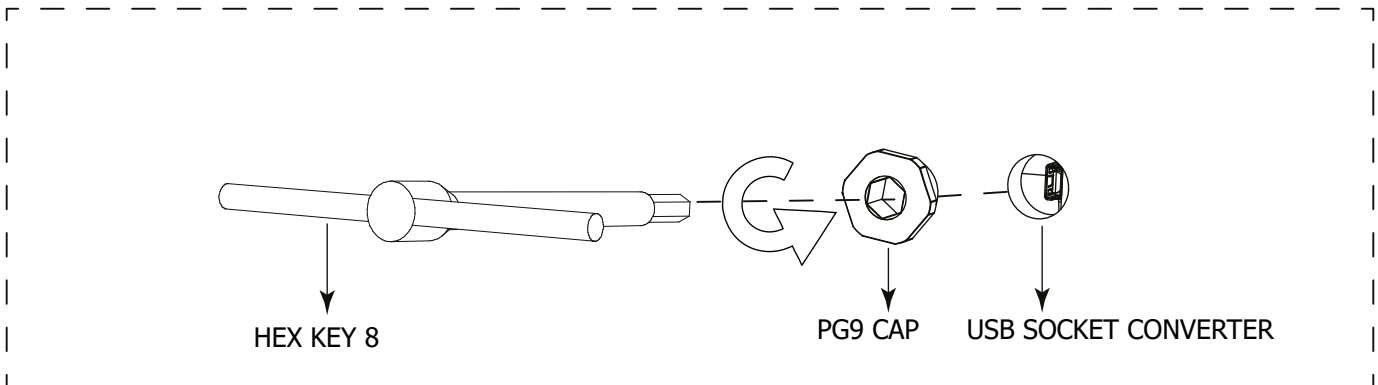
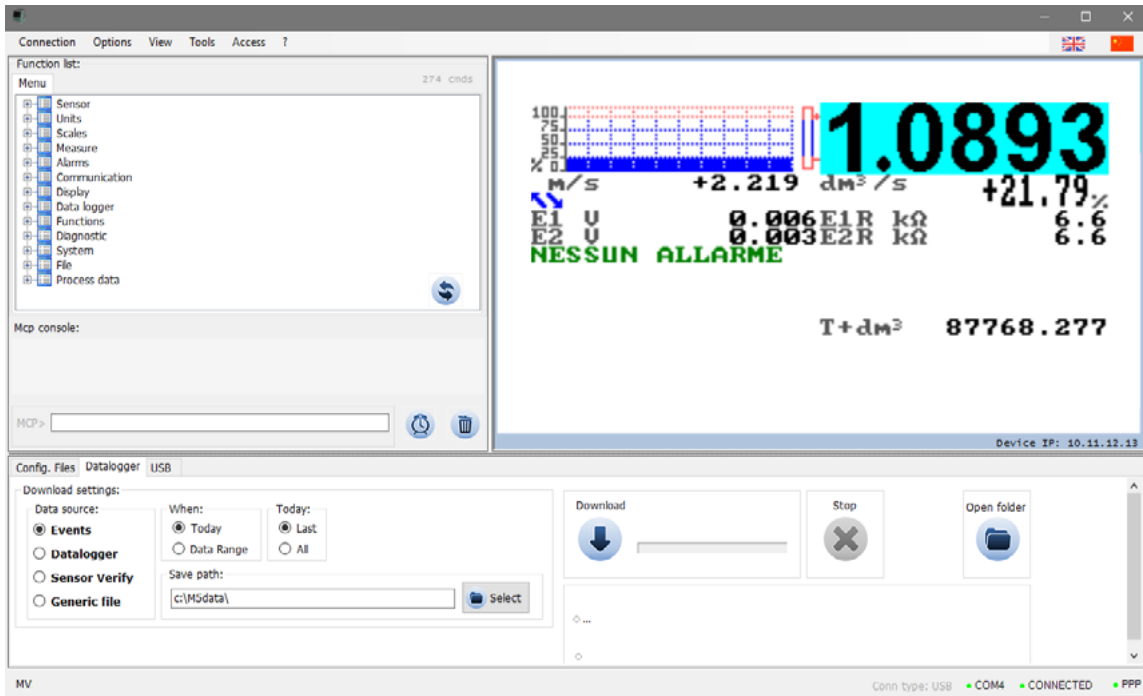
Possible views by simply pressing the button



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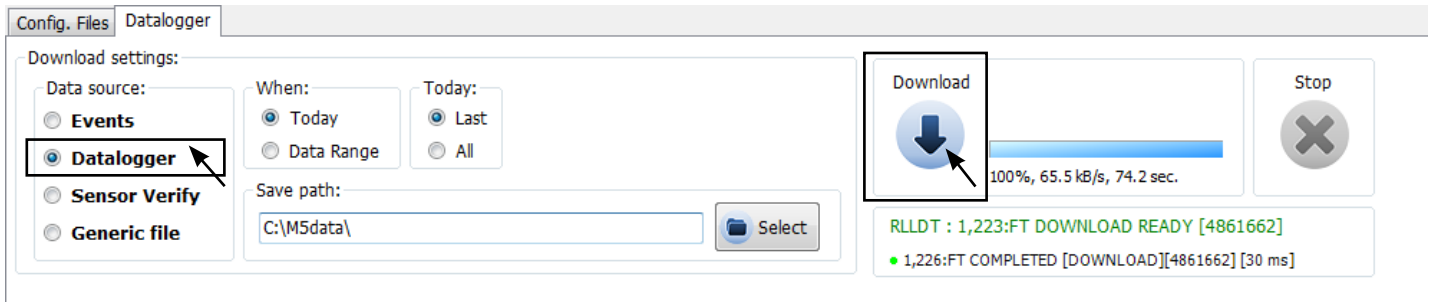
USER INTERFACE

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.

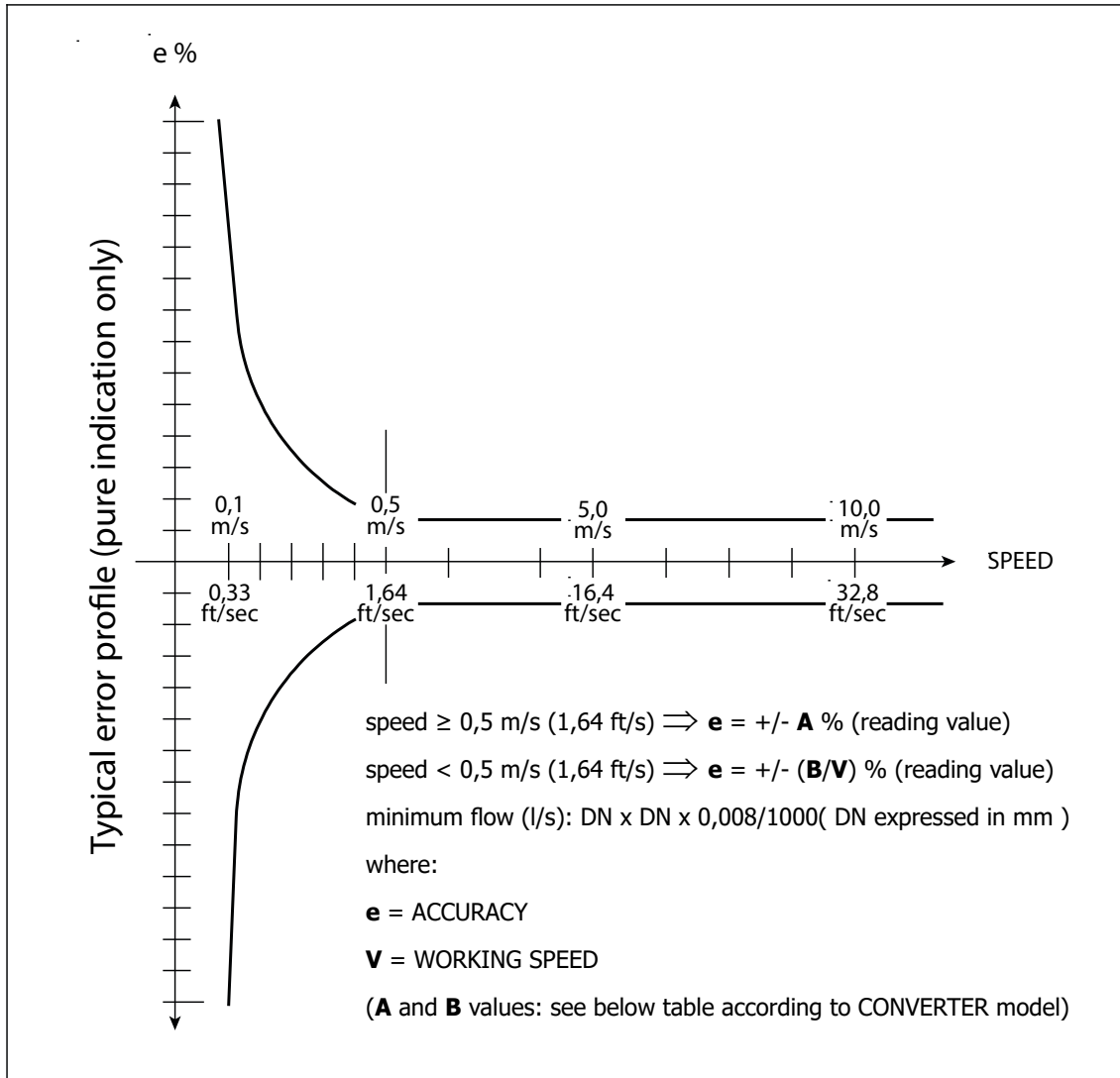


Note: to record correctly the data, the date and time shall be properly set.

Example of extrapolation of the data logger file:

N°Record. View progressively the number of registered records.	A
Date. The recording date viewing for each record.	B DATE
Hours. Time recording viewing for each record.	C HRS
Total positive totalizer value. Form Fields when the send flag is active on the totalizer T+.	D T+ VAL
Partial positive totalizer value. Form Fields when the send flag is active on the totalizer P-.	E P- VAL
Total negative totalizer value. Form Fields when the send flag is active on the totalizer T-.	F T- VAL
Partial negative totalizer value. Form Fields when the send flag is active on the totalizer P-.	G P- VAL
Total net totalizer value. Form Fields when the send flag is active on the totalizer TN.	H TN VAL
Partial net totalizer value. Form Fields when the send flag is active on the totalizer PN	I PN VAL
Flow rate. Form Fields present when the send flag is on the flow in units of measurement.	J FLOW VAL
Flow rate %. Form fields present when the flag of alarm recording is active (only N ° of present total alarms)	K FLOW% VAL
N ° active alarms. Form fields present when the flag of alarm recording is active (only N ° of present total alarms)	L ALARMS VAL
Loss of current measured during insulation test. Available value when recording the sensor test data is active.	M LOSS VAL
Time rise A. Available value when recording the sensor test data is active.	N TRISEA VAL
Time rise B. Available value when recording the sensor test data is active.	O TRISEB VAL
Sensor test error code. Available value when recording the sensor test data is active.	P ERROR VAL

■ ACCURACY



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■ FULLBORE SENSOR

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

* = 0,2 (special)

** = 0,1(m/s) ; 0,33(ft/s) - special

■ INSERTION SENSORS

See sensors 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 %

■ MI-001 OIML R49 CLASS 2: MV145

The MS2500 sensor's diameters listed below, coupled with MV145 comply with the European directive:
DIRECTIVE 2014/32/EU (MID) ANNEX III (MI-001) AND 2015/13/EU- OIML R49

SENSOR SIZE	mm	25	32	40	50	65	80	100	125	150	200
	inch	1	1 ¼	1 ½	2	2 ½	3	4	5	6	8
Q1	m ³ /h	0.100	0.160	0.250	0.390	0.630	1.000	1.560	2.500	3.940	6.250
Q2	m ³ /h	0.160	0.250	0.400	0.630	1.000	1.600	2.500	4.000	6.300	10.000
Q3	m³/h	16.0	25.0	40.0	63.0	100.0	160.0	250.0	400.0	630.0	1000
R	Q3/Q1	160									

SENSOR SIZE	mm	250	300	350	400	450	500	600	700	800	900	1000
	inch	10	12	14	16	18	20	24	28	32	36	42
Q1	m ³ /h	10.000	25.00	25.00	40.00	40.00	63.00	100.0	100.0	160.0	160.0	250.0
Q2	m ³ /h	16.00	40.00	40.00	64.00	64.00	100.8	160.0	160.0	256.0	256.0	400.0
Q3	m³/h	1600***	2500**	2500**	4000**	4000**	6300	10000	10000	16000*	16000*	25000*
R	Q3/Q1	100										

■ MI-001 OIML R49 CLASS1: MV145

The MS2500 sensor's diameters listed below, coupled with MV145 comply with the European directive:
DIRECTIVE 2014/32/EU (MID) ANNEX III (MI-001) AND 2015/13/EU- OIML R49

SENSOR SIZE	mm	25	32	40	50	65	80	100	125	150	200
	inch	1	1 ¼	1 ½	2	2 ½	3	4	5	6	8
Q1	m ³ /h	0.160	0.250	0.400	0.630	1.000	1.600	2.500	4.000	6.300	10.000
Q2	m ³ /h	0.256	0.400	0.640	1.008	1.600	2.560	4.000	6.400	10.080	16.000
Q3	m³/h	16.0	25.0	40.0	63.0	100.0	160.0	250.0	400.0	630.0	1000
R	Q3/Q1	100									

SENSOR SIZE	mm	250	300	350	400	450	500	600	700	800	900	1000
	inch	10	12	14	16	18	20	24	28	32	36	42
Q1	m ³ /h	20.000	31.25	31.25	50.00	50.00	78.75	125.0	125.0	200.0	200.0	312.5
Q2	m ³ /h	32.000	50.00	50.00	80.00	80.00	126.8	200.0	200.0	320.0	320.0	500.0
Q3	m³/h	1600***	2500**	2500**	4000**	4000**	6300	10000	10000	16000*	16000*	25000*
R	Q3/Q1	80										

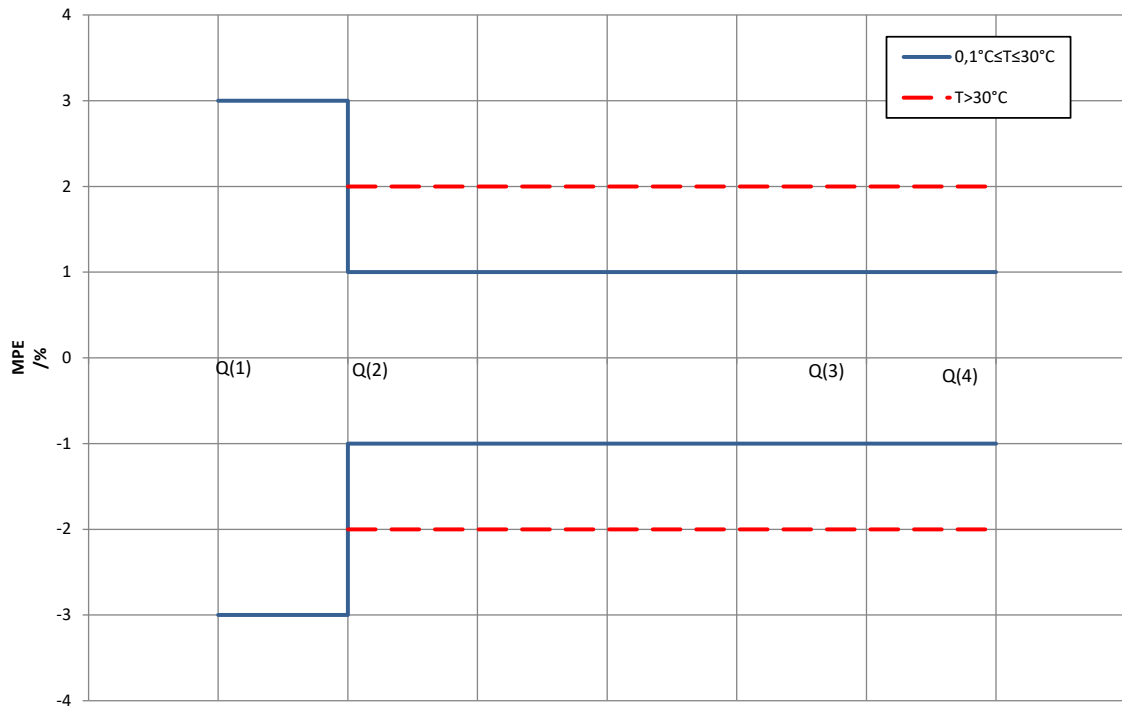
(*) : Calibration flowrate 14000 m³/h - as for max rig flowrate L8

(**) : Calibration flowrate 1400 m³/h - as for max test rig flowrate L7

(***) Calibration flowrate 1100 m³/h - as for max test rig flowrate L6

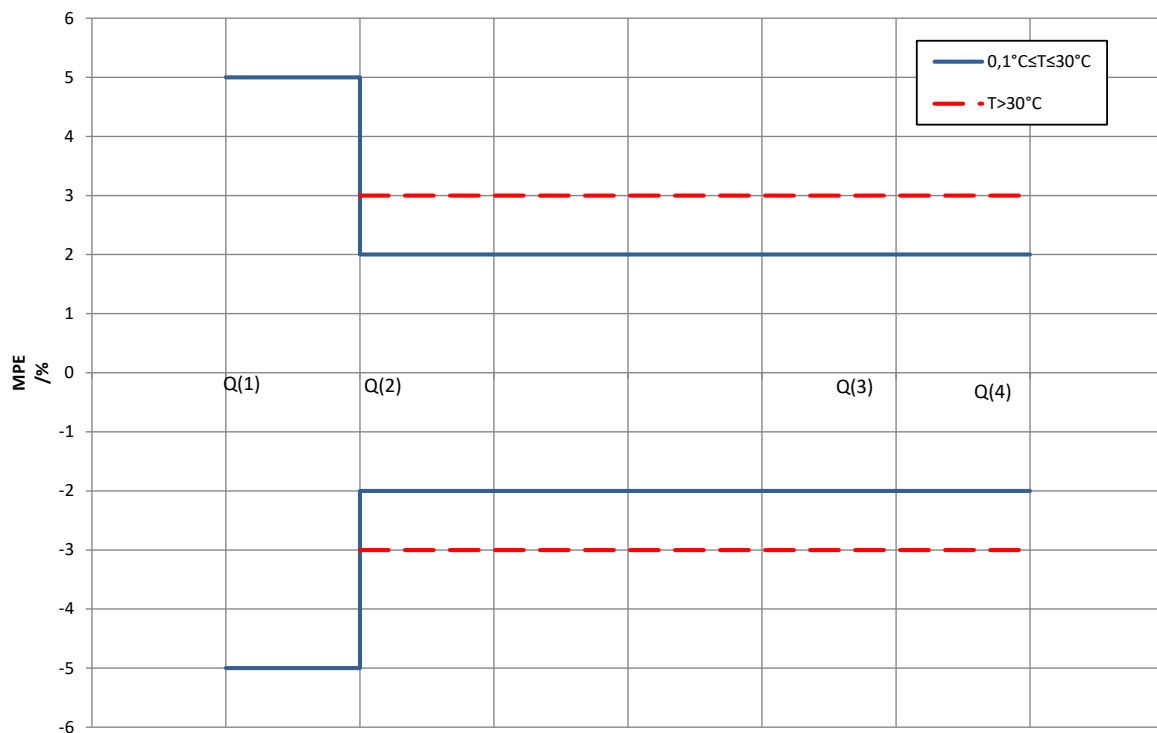
MPE - OIML R49 ACCURACY CLASS 1

(OIML R 49-1:2013 (E) - ISO4064-1:2014)



MPE - MI 001 - OIML R49 ACCURACY CLASS 2

(OIML R 49-1:2013 (E) - ISO4064-1:2014)



■ HOW TO ORDER

CODE EXAMPLE	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-matrix points 128 x 64, 8 line/16 characters and 3 programming keys (mandatory for MI001)
Housing material		
0	0	Nylon PA6 with fiber glass, (IP67 only)
	1	Painted aluminium die casting
Version / Protection rate		
A	A	Compact version with sensor MS - IP67
	B	Separate version for wall monting, 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 with sensor MS - 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...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
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
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	NO CONNECTORS
	B	POWER SUPPLY (n° 1 connector)
	C	SEPARATE VERSION (n° 2 connectors)
	D	POWER SUPPLY (n° 1 connector)+ SEPARATE VERSION (n° 2 connectors)
Connectors for INPUTS/OUTPUTS (Maximum 5 connectors including connectors for Power Supply and cables from sensor) (other combinations on request)		
0	0	NO CONNECTORS
	1	n.1 Pressure or n.1 Temperature (n.1 connector)
	2	n.2 Pressure or n.2 Temperature (n. 2 connector)
	3	n.2 Digital Outputs - n.1 Digital Input (n.1 connector)
	4	n.2 Digital Outputs - n.1 Digital Input + RS485 (n.1 connector)
	5	n.2 Digital Outputs - n.1 Digital Input (n.1 connector) + n.1 Pressure or n.1 Temperature (n.1 connector)
	6	n.2 Digital Outputs + n.1 Output 4-20 mA (n.1 connector)
	7	n.2 Digital Outputs (n.1 connector) n.1 Output 4-20 mA + RS485 (n.1 connector)
MID APPROVAL		
A	A	NONE
	B	MI-001/OIMLR49-CLASS 1
	C	MI-001/OIMLR49-CLASS 2



MV145-B0A0A0A0A0A0A (Complete code example for order)

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If you want to find the complete list of our distributors access at the following link:
http://www.isoil.com/u_vendita.asp



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