

FM700

Transmitter

Datasheet



Benefits

- Volume, velocity and wight measurement in one device
- Compact or remote options available
- Direct sensor configuration
- Battery powered option available
- Low conductivity $>5\mu\text{S}/\text{cm}$
- Inputs for pressure and temperature sensors

DN25 up to DN1000

Temperature Range: -20°C to $+60^{\circ}\text{C}$ (-4°F to 140°F)

Accuracy: 0.4%

Flexible power device

Typical Applications

- Water / wastewater
- Cooling systems
- Water treatment / filtration
- Pump control
- Leveling
- Water consumption
- Leakage detection

Contents

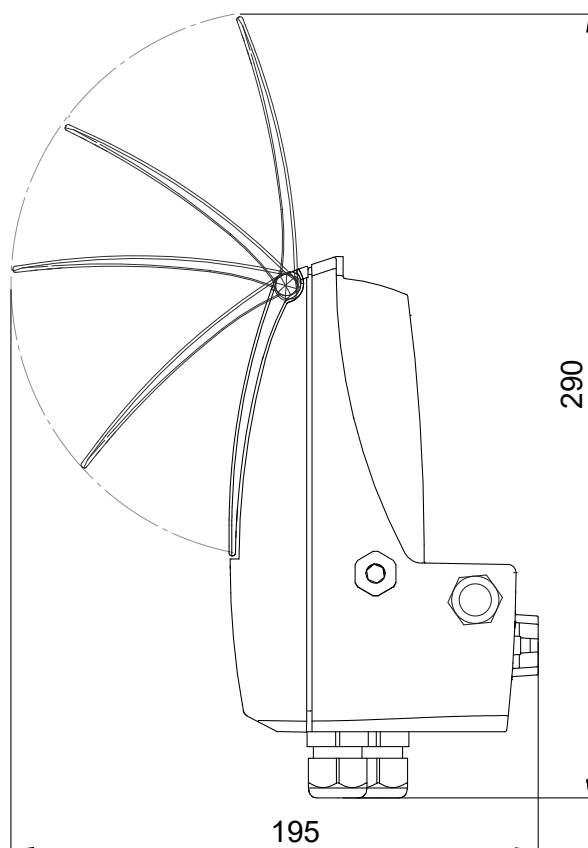
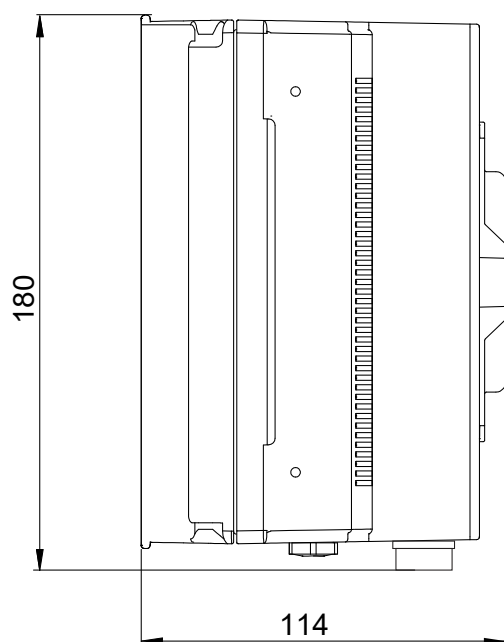
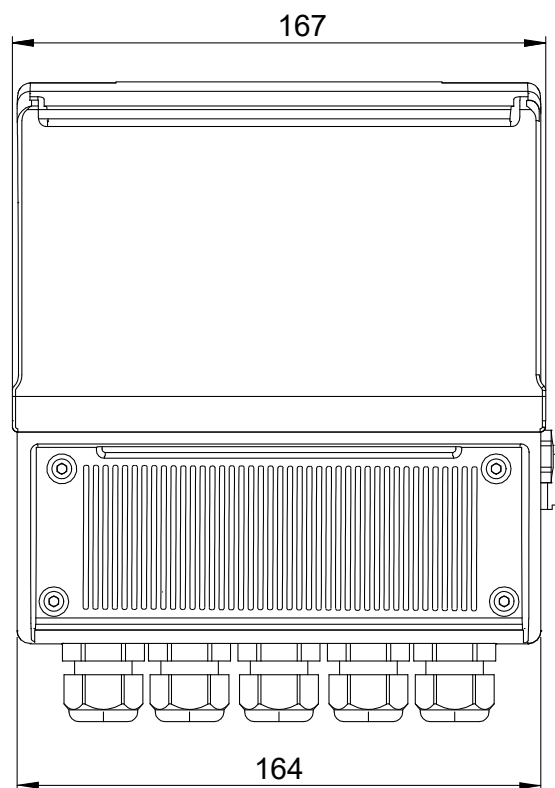
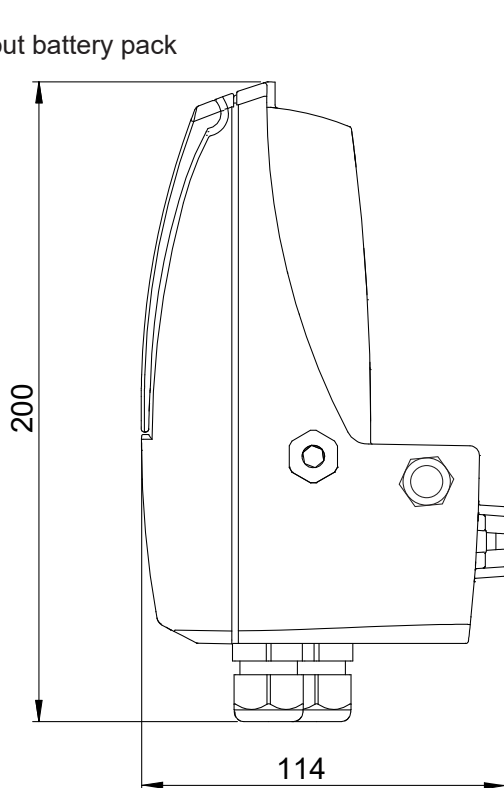
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Technical Data

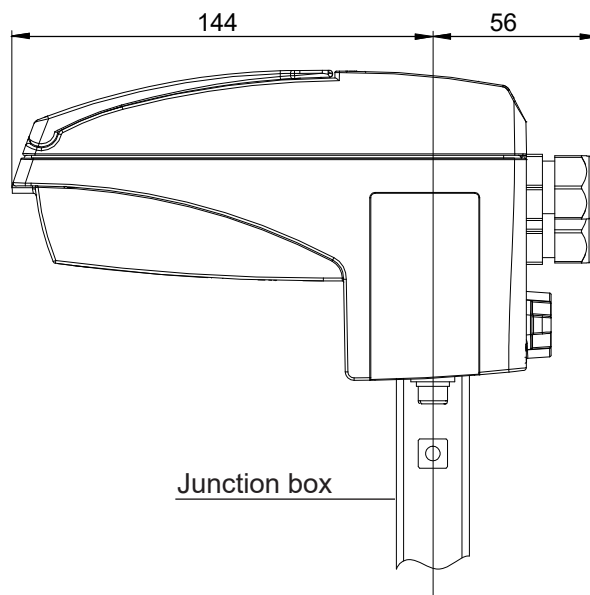
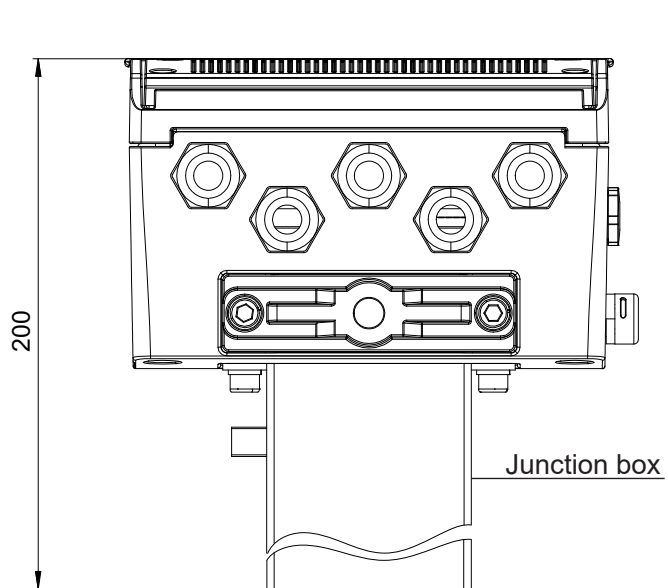
Overall Features	
Suitable For	All FM sensors
Minimum conductivity	5 µS/cm
Altitude	-200 m up to 4000 m (-656 feet up to 13123 feet)
Ambient Temperature	-20 to +60°C (-4°F to +140°F) - Aluminium housing
Humidity Range	0÷100%
Standard Features	
Version	• Compact • Separate
Housing materials	• Painted Aluminium die casting
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)
Bi-Directional	Yes
Diagnostic Function	Yes
Empty Pipe Detection	Yes
CE Certification	Yes
Optional Features (For more details, see 'How to Order' on last page)	
Protection Rate	IP 68
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
Communication Gateway	RS 485
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
Protocols	ModBus RTU (speed range setting bps: 4800 /9600 / 19200/ 22800/ 38400/ 57600)
Accuracy	
Accuracy (Whole System Transmitter+Sensor)	See table below

Overall Dimensions (Compact Version)

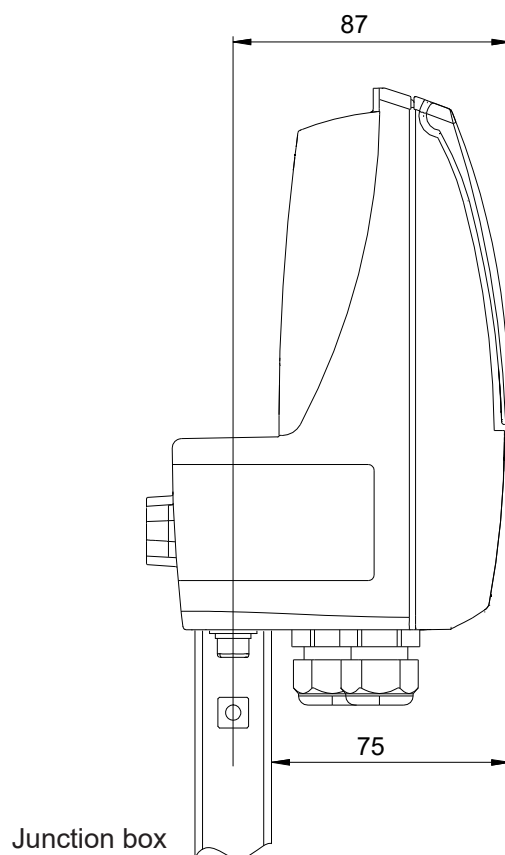
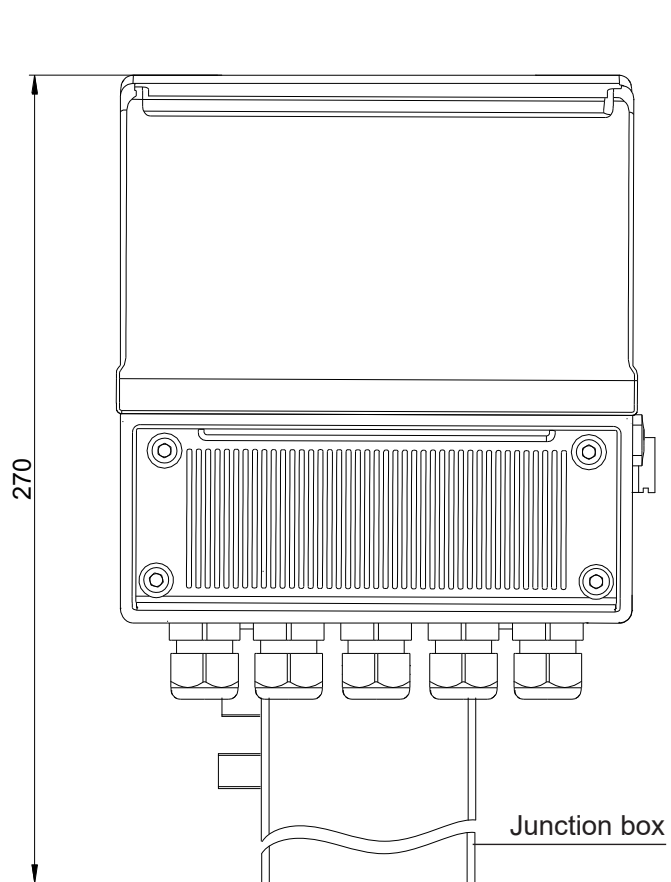
Without battery pack



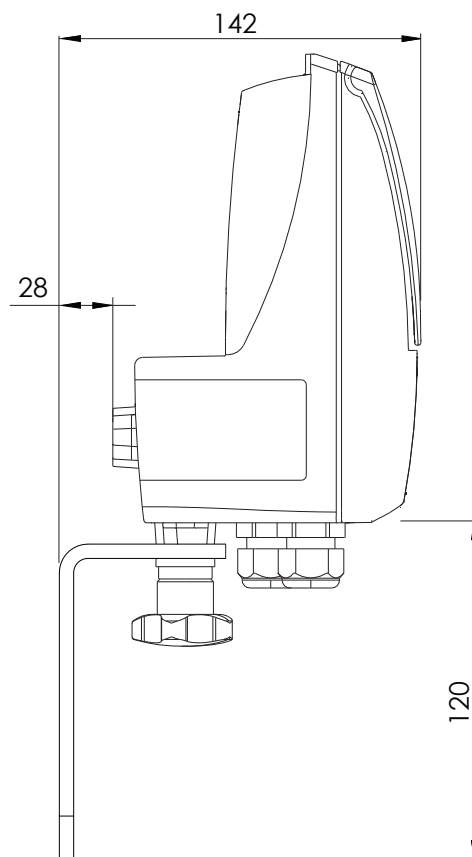
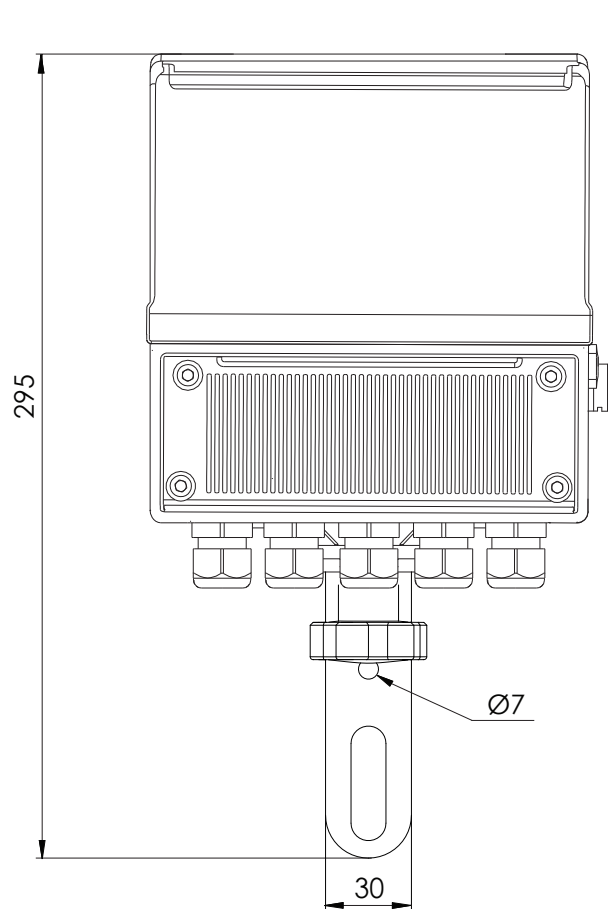
Horizontal compact version



Vertical compact version

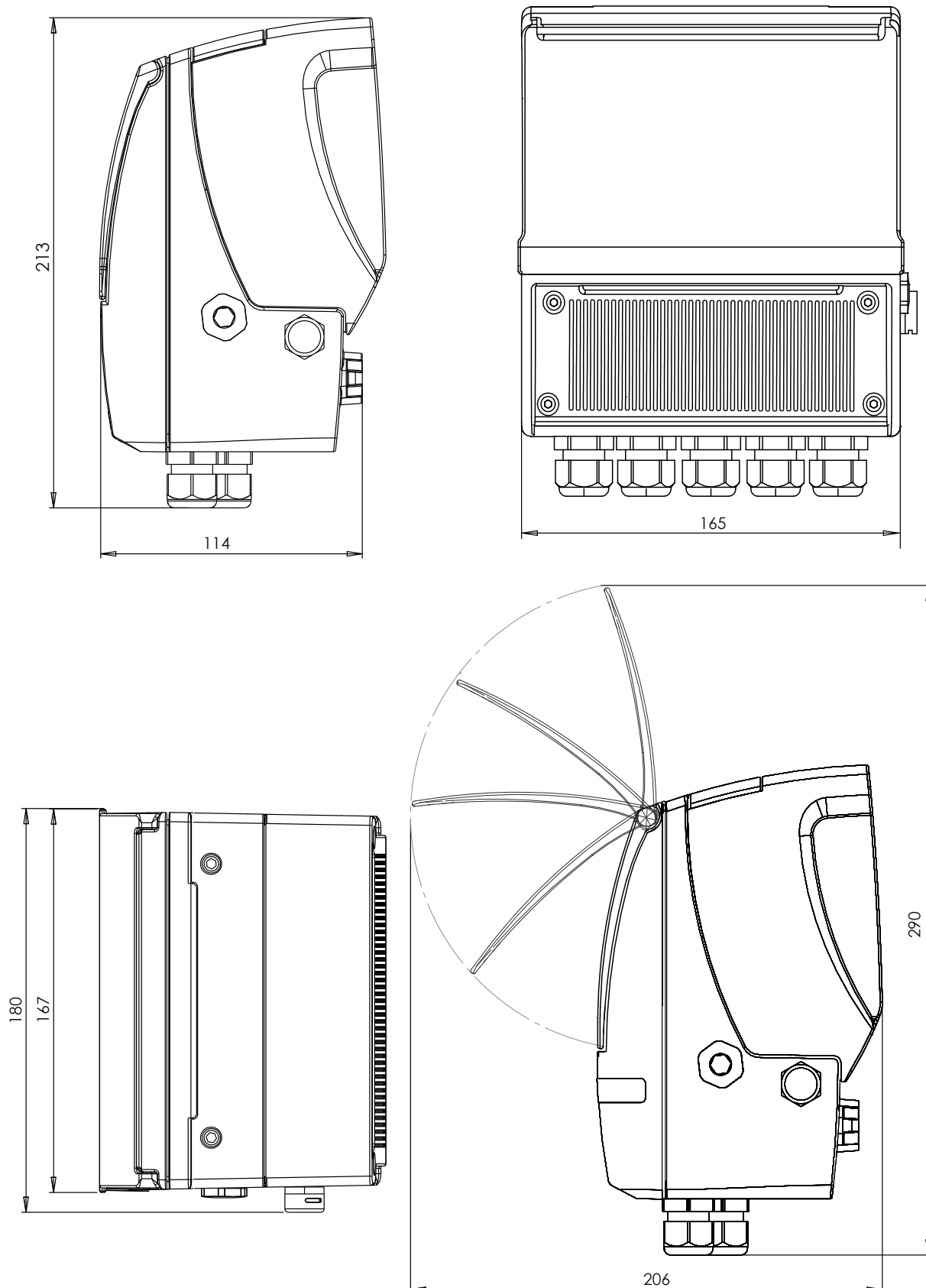


Separate (Wall Version)



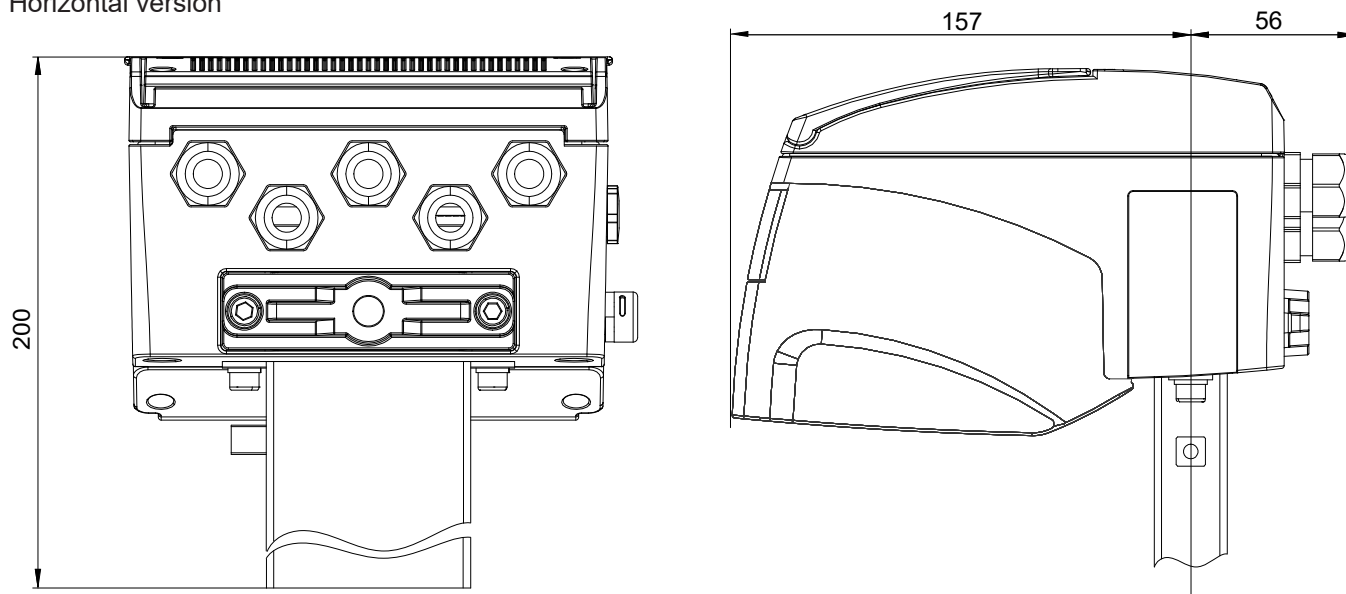
Overall Dimensions

With battery pack

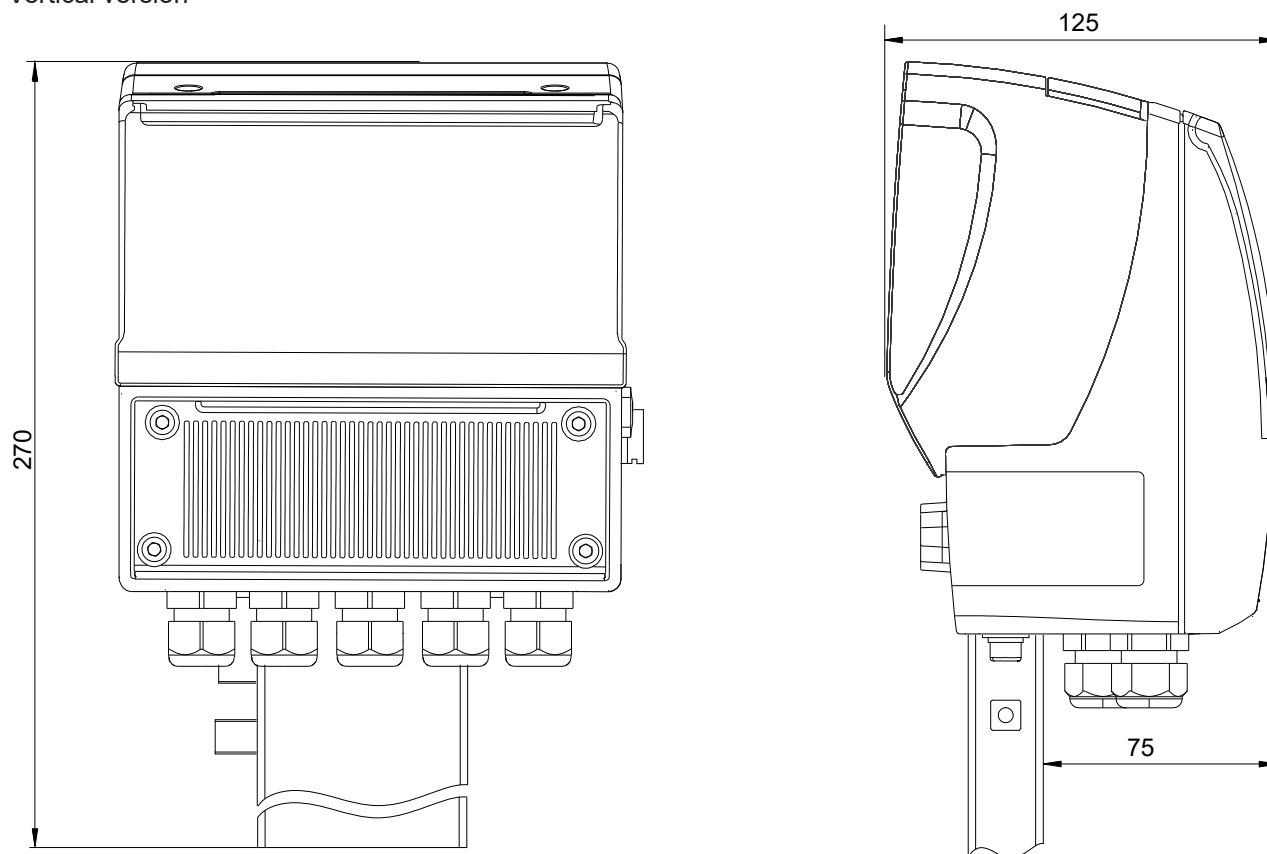


Horizontal Version

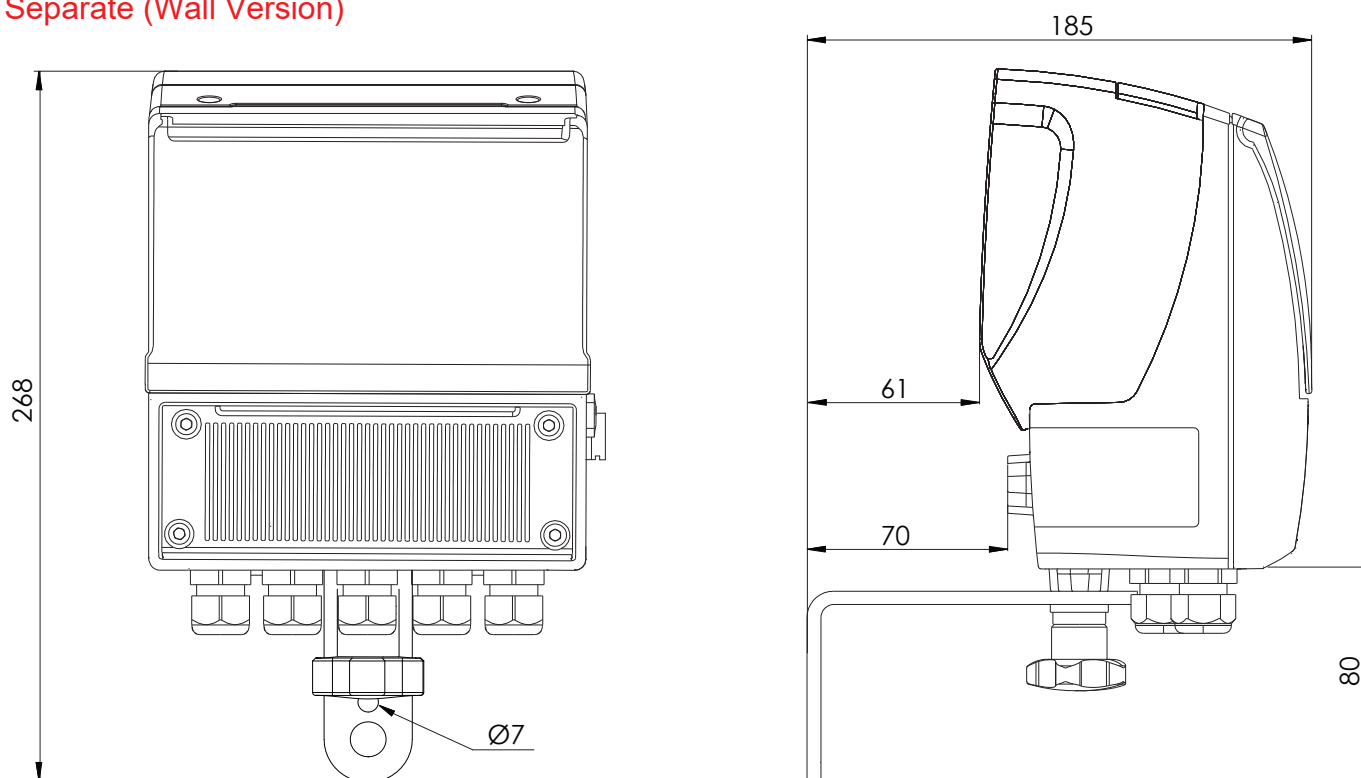
Horizontal version



Vertical version

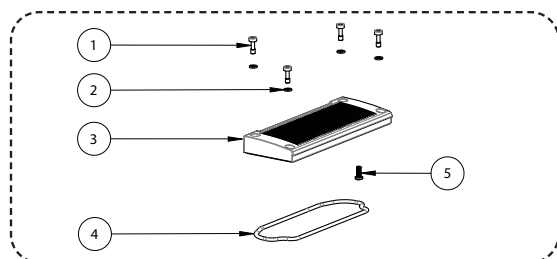


Separate (Wall Version)

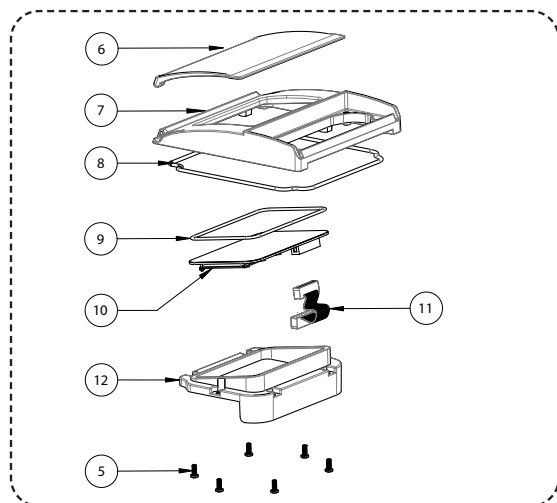


FM700 Exploded Layout

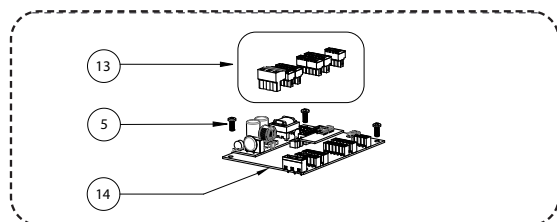
Terminal Block Cover



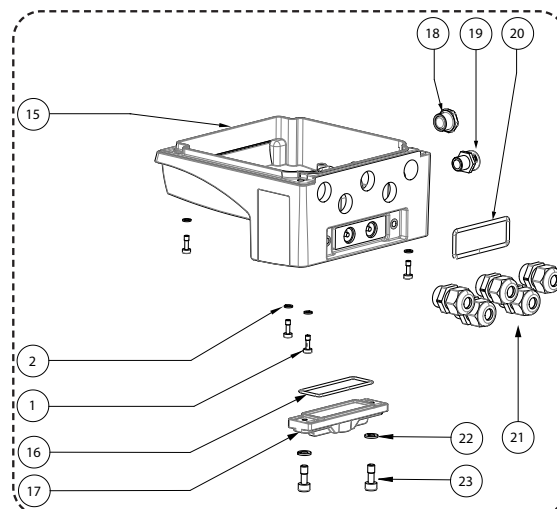
Main Housing Cover



PCB FM700



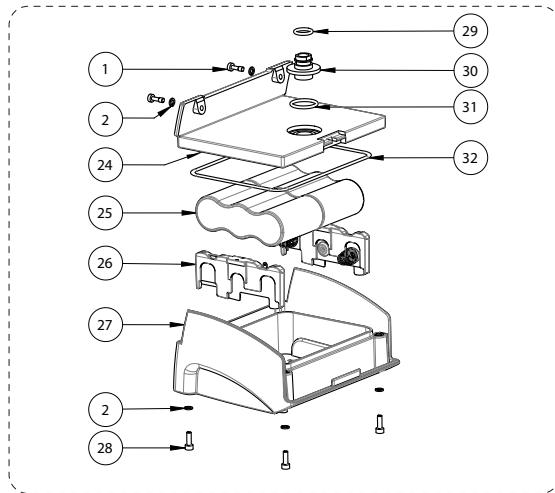
Main Housing



POS.	DESCRIPTION	
	PA6 VERSION	ALLUMINIUM 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	O-RING-4700	
9	O-RING-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 FM700	
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	

FM700 Exploded Layout

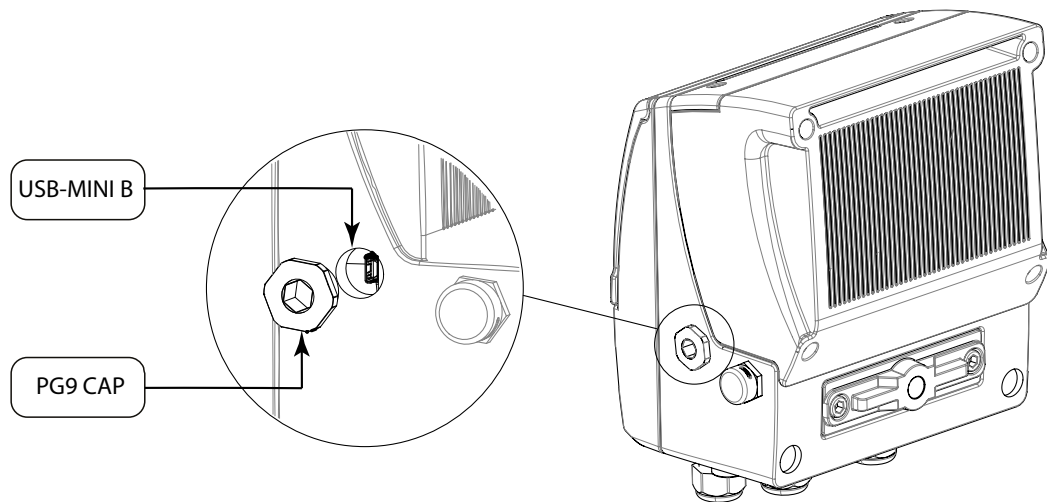
Batteries Housing



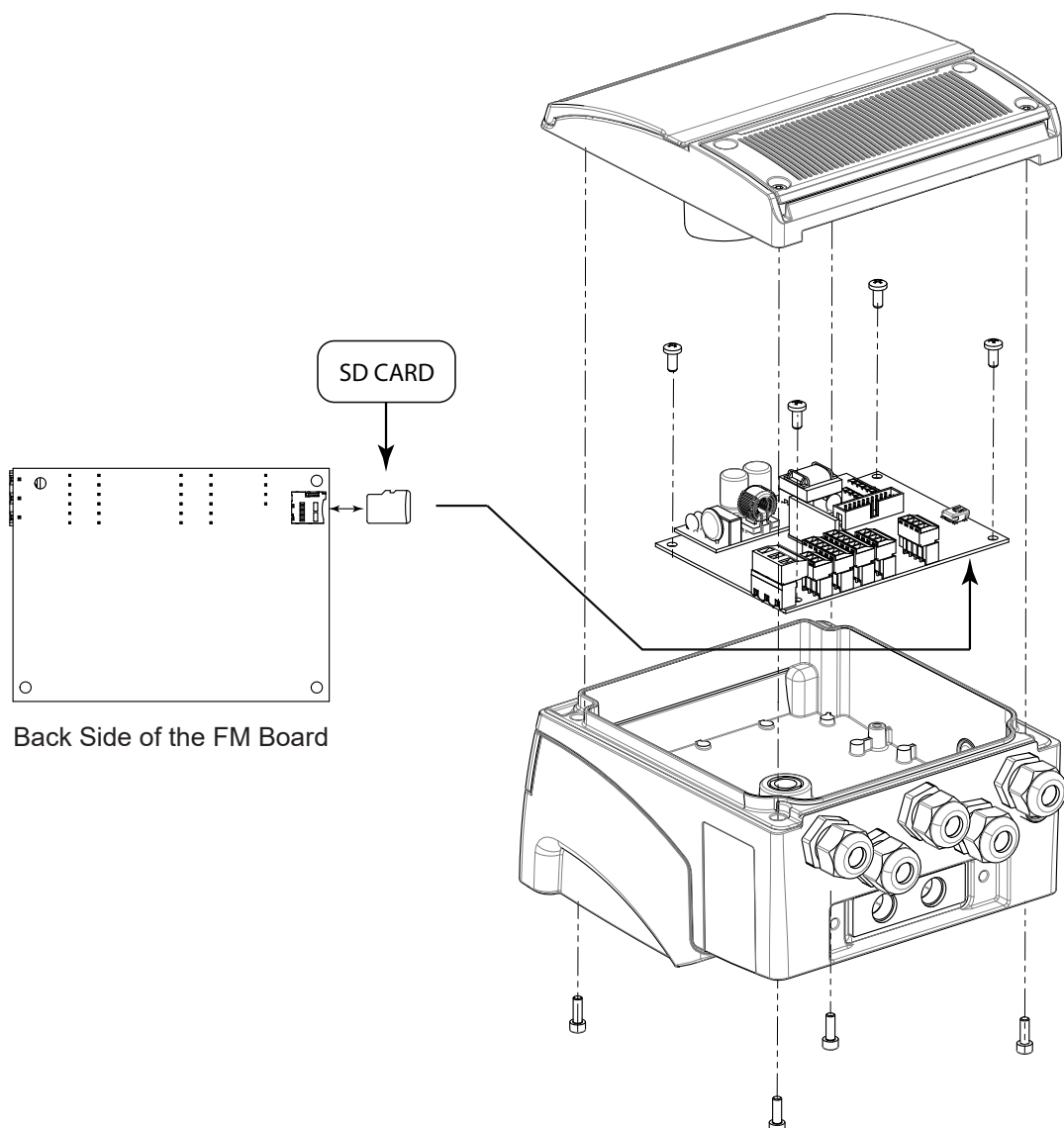
POS.	DESCRIPTION	
	PA6 VERSION	ALLUMINIUM VERSION
24	PA6 Battery House Cover	
25	Lithium or Alkaline Battery	
26	Contacts Frame for Alkaline Battery	
27	PA6 Battery House	
28	Screw M4x10	
29	O-RING3050	
30	Seal Bush	
31	O-RING3081	

Converter Access

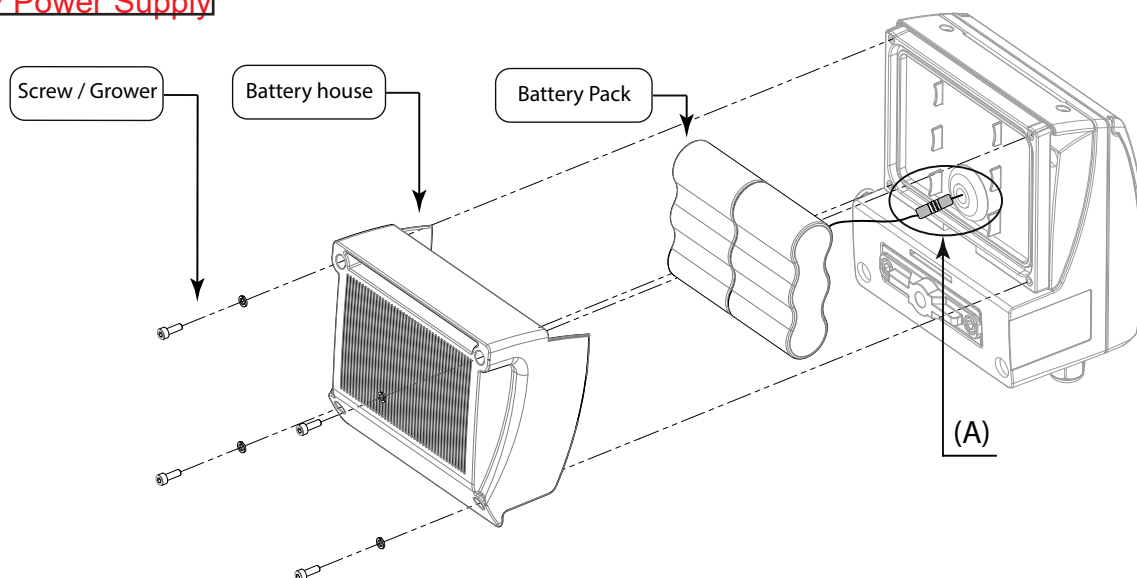
USB Connection



SD Card

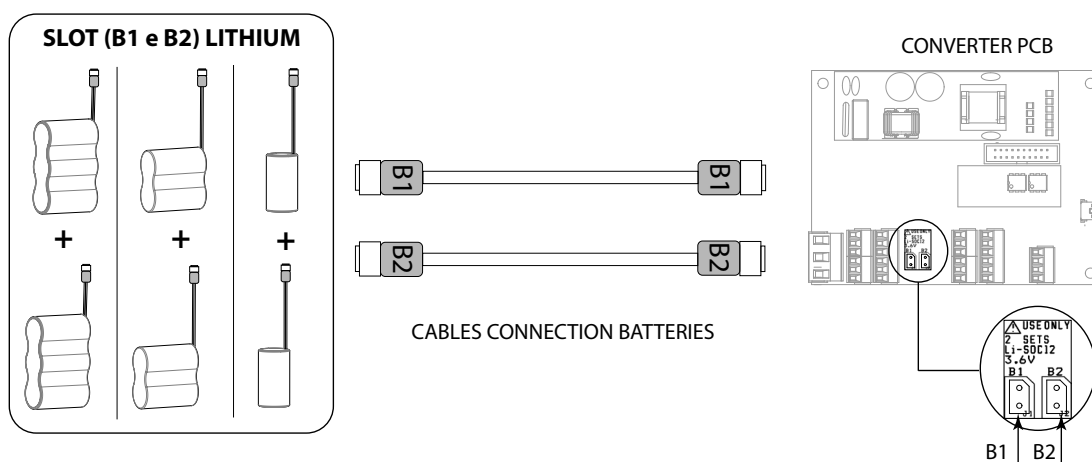


Battery Power Supply

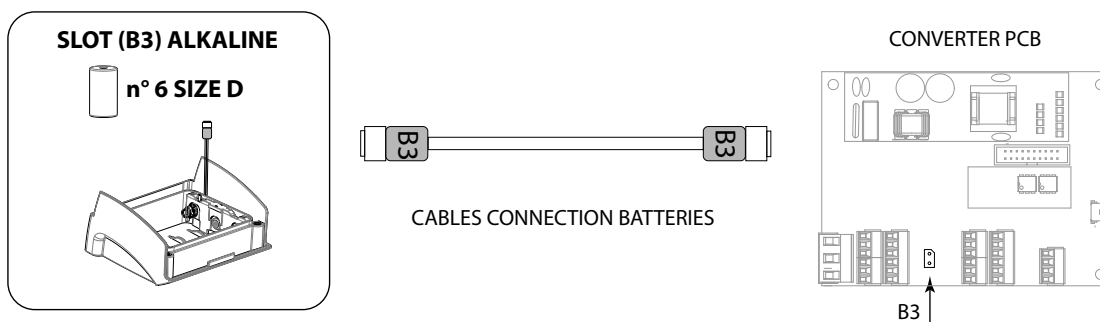


DETAIL (A) BATTERY CONNECTIONS CONVERTER PCB

LITHIUM BATTERIES



ALKALINE BATTERIES

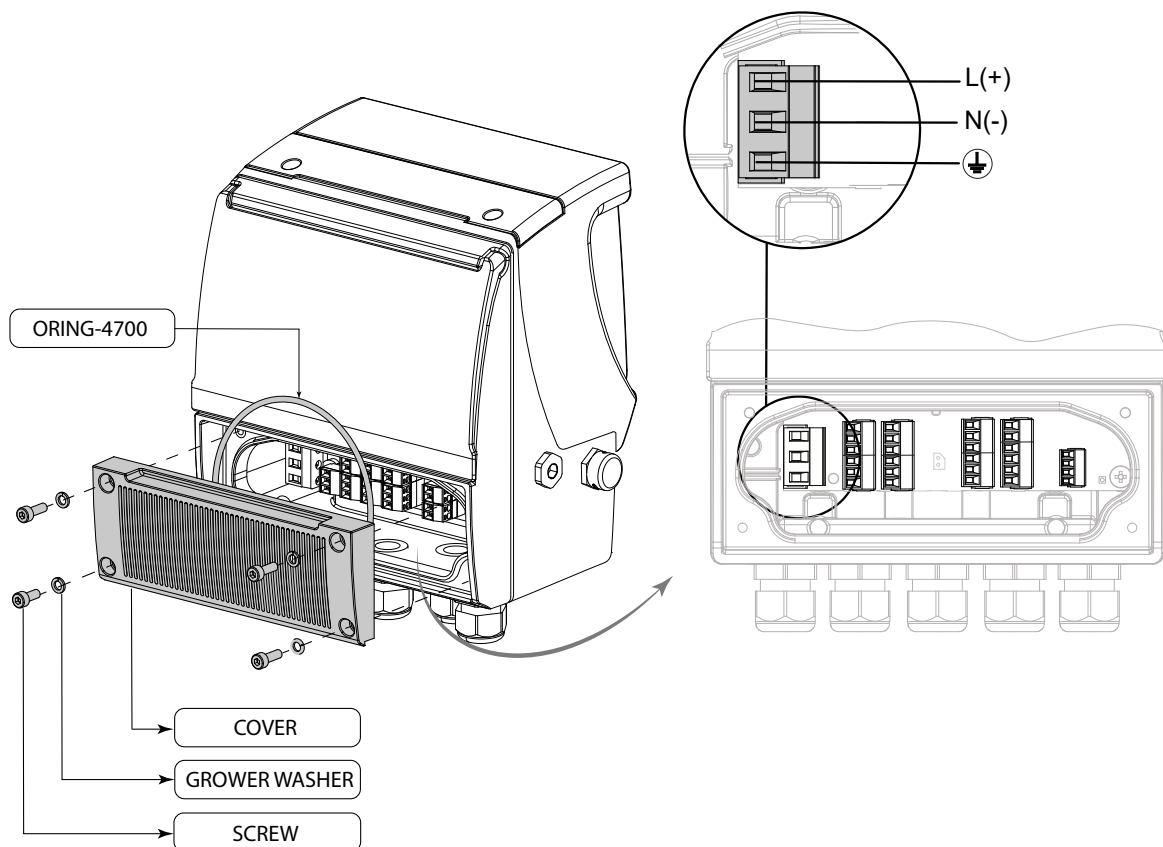


The maximum number of batteries allowed in the various configurations is 6 size D batteries

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

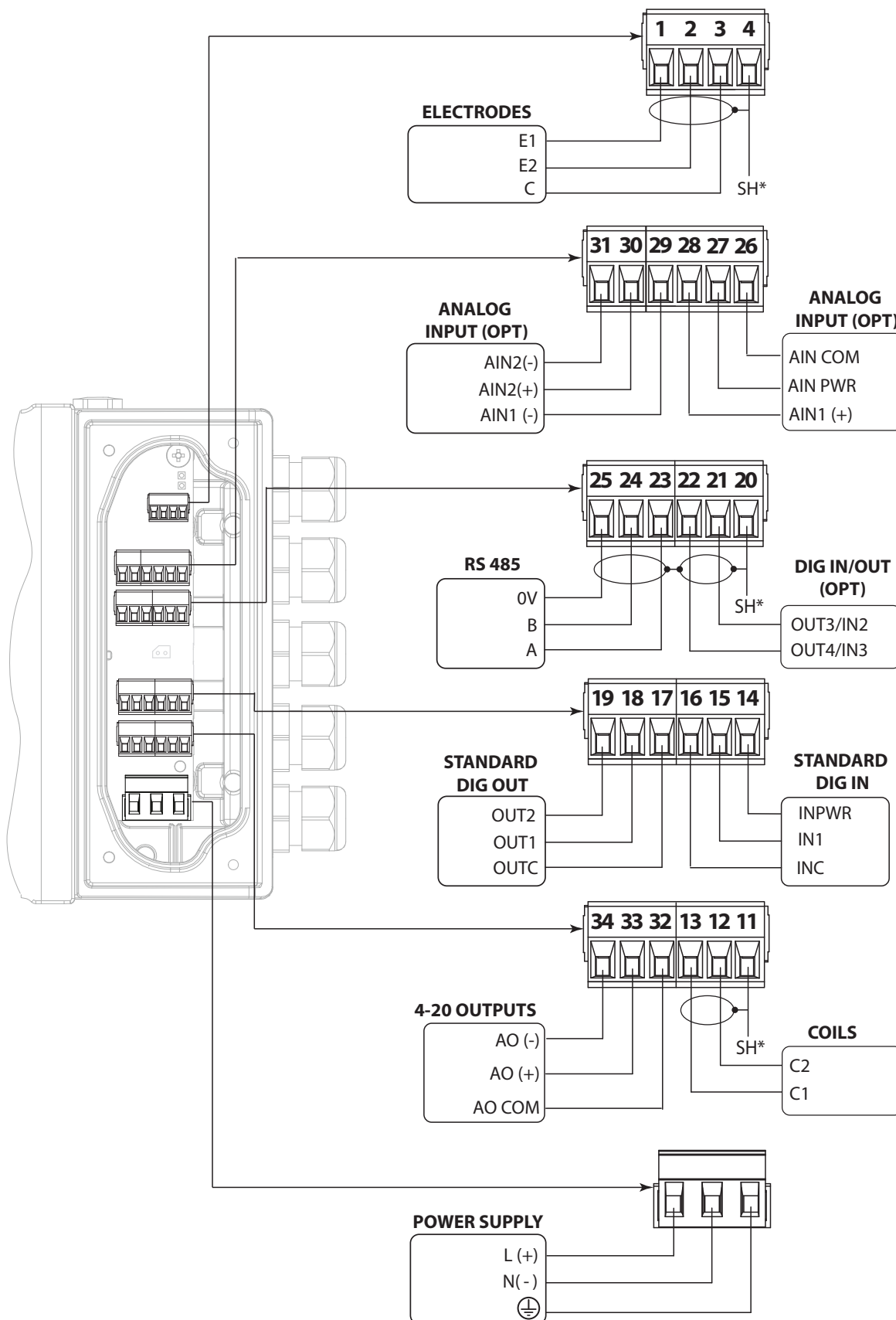


The connections are made with approved cables with flame retardant properties, whose section varies from 0.25 mm² to 2.50 mm², based on distance / power.

The wiring can be checked by unscrewing the 4 screws on the terminal cover.

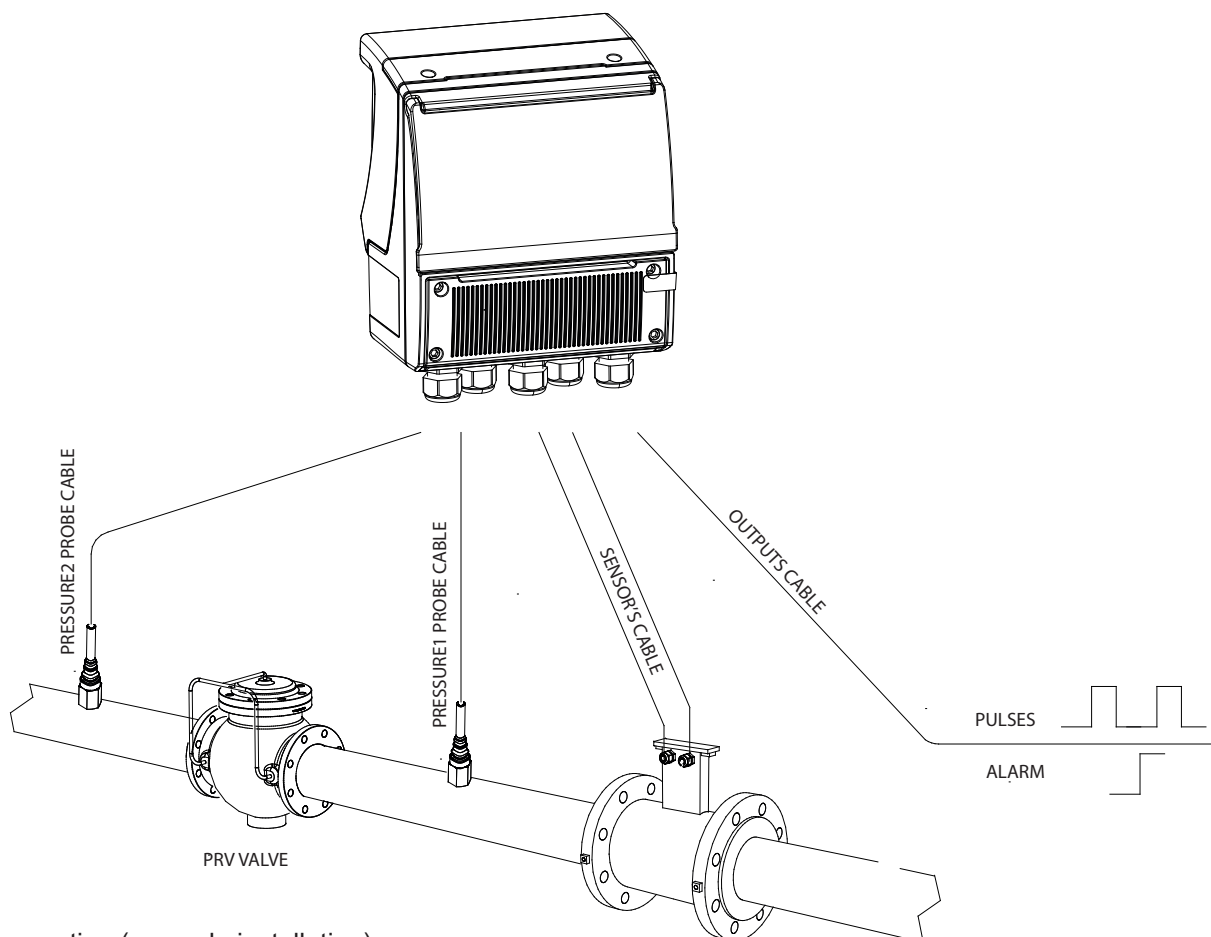
When the lid is raised, the terminal block is visible. The terminal block shows the wired connection of the converter to external devices, sensor included.

Electrical Connections

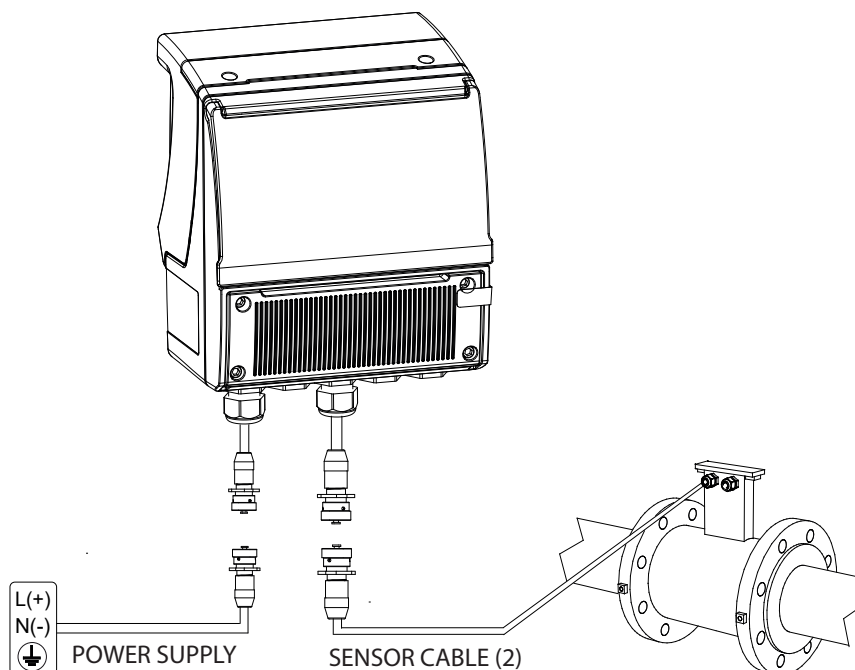


Functions Menu

Pressure and temperature probes

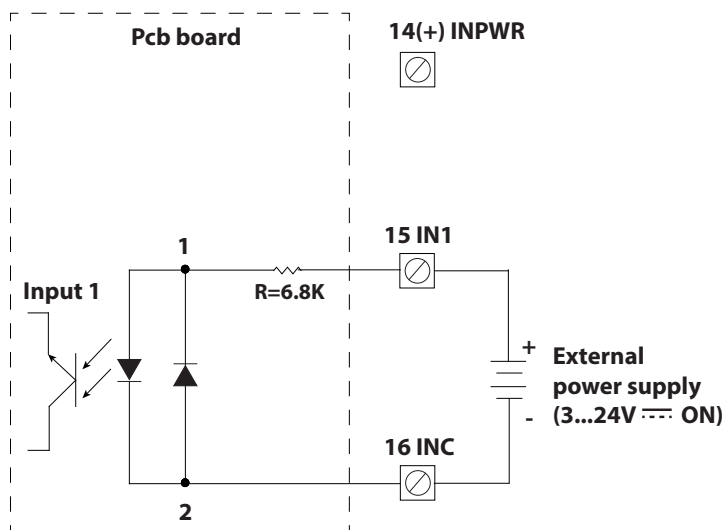


IP68 connection (example installation)



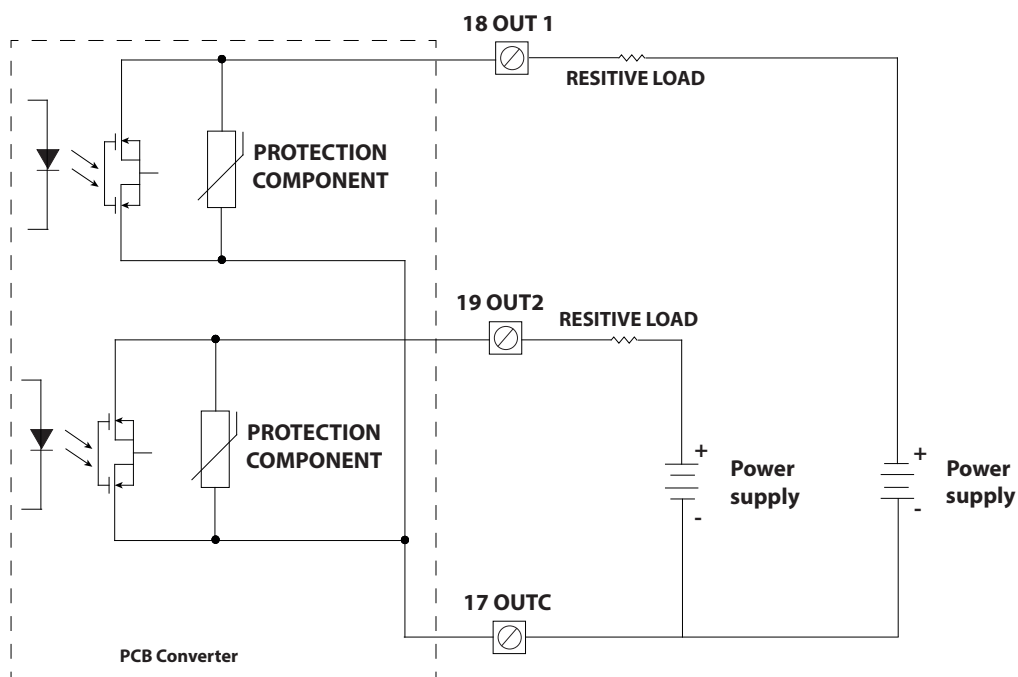
Digital Inputs

On / Off Input (External power supply)



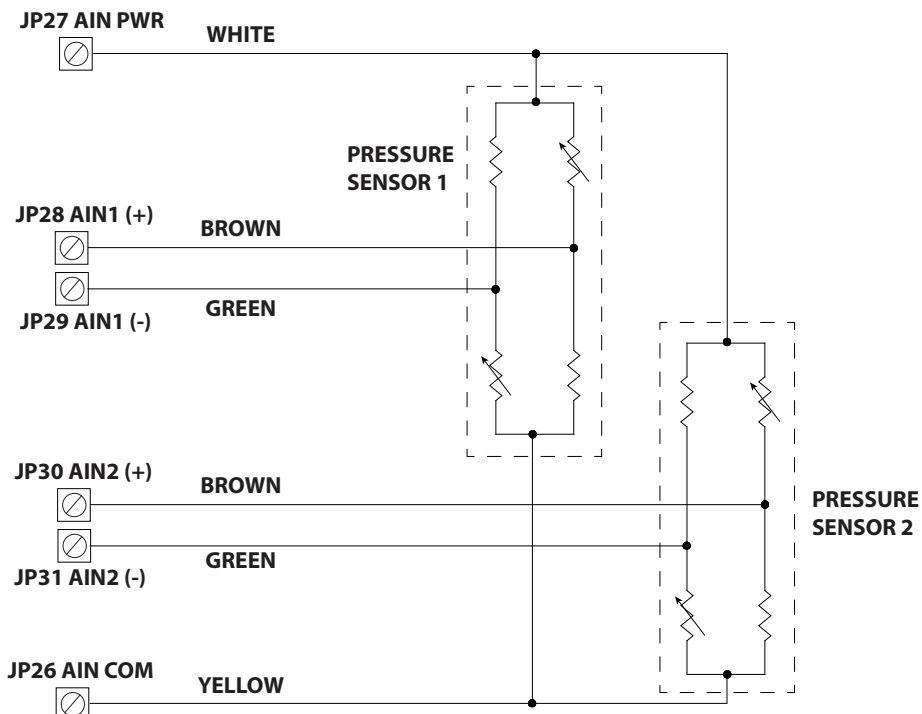
Digital Outputs

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



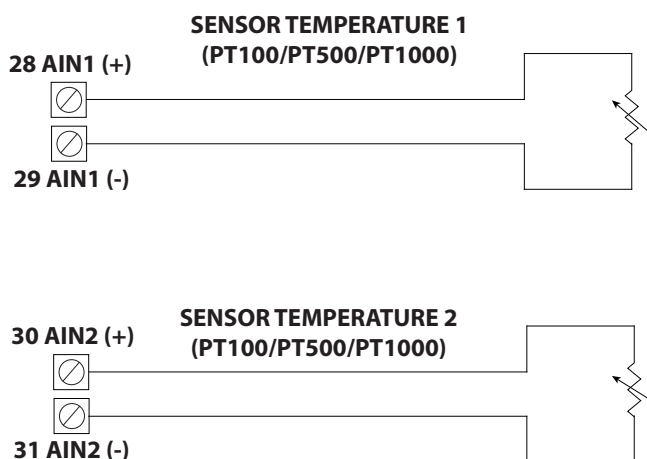
Auxiliary Module Analog Inputs

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.

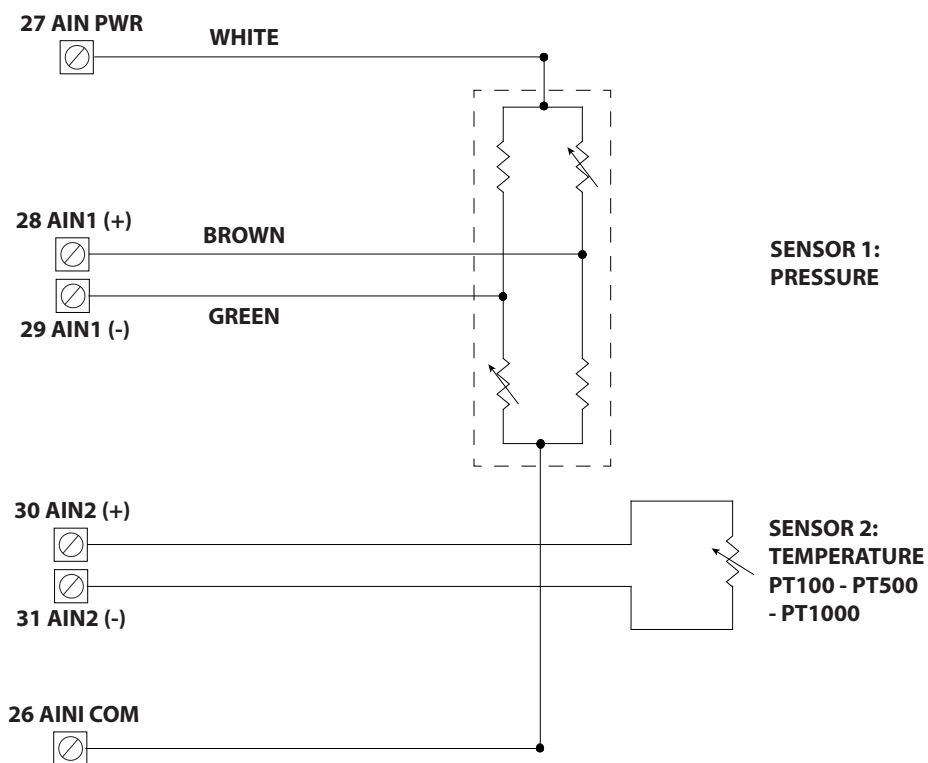


Auxiliary Module Analog Inputs

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):

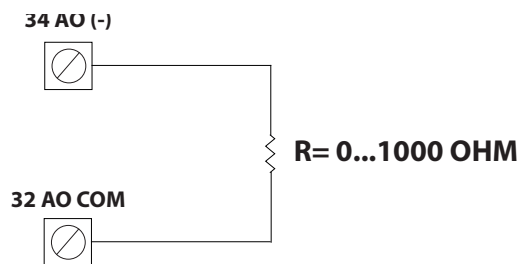
Passive mode: power is supplied from an external source.

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

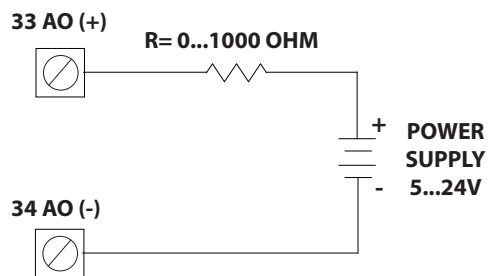
Active mode: power is supplied from the board power supply (if fitted).

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

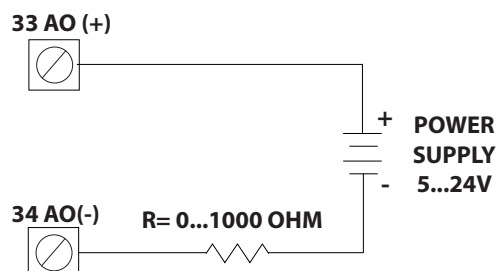
Active Connection



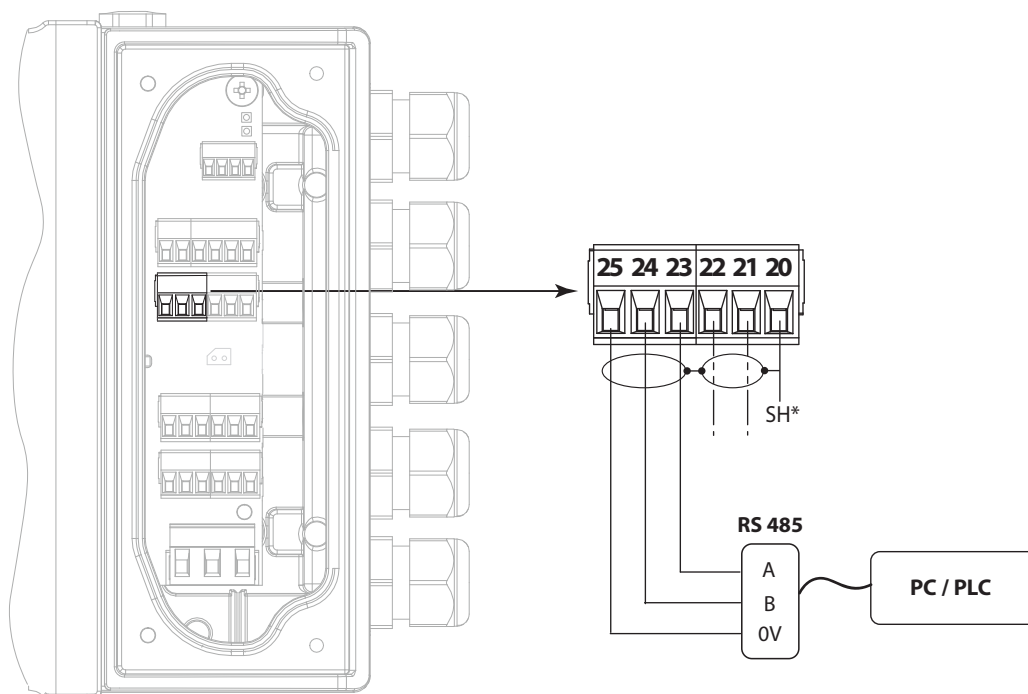
Passive Connection 1



Passive Connection 2



Modbus (rs485)



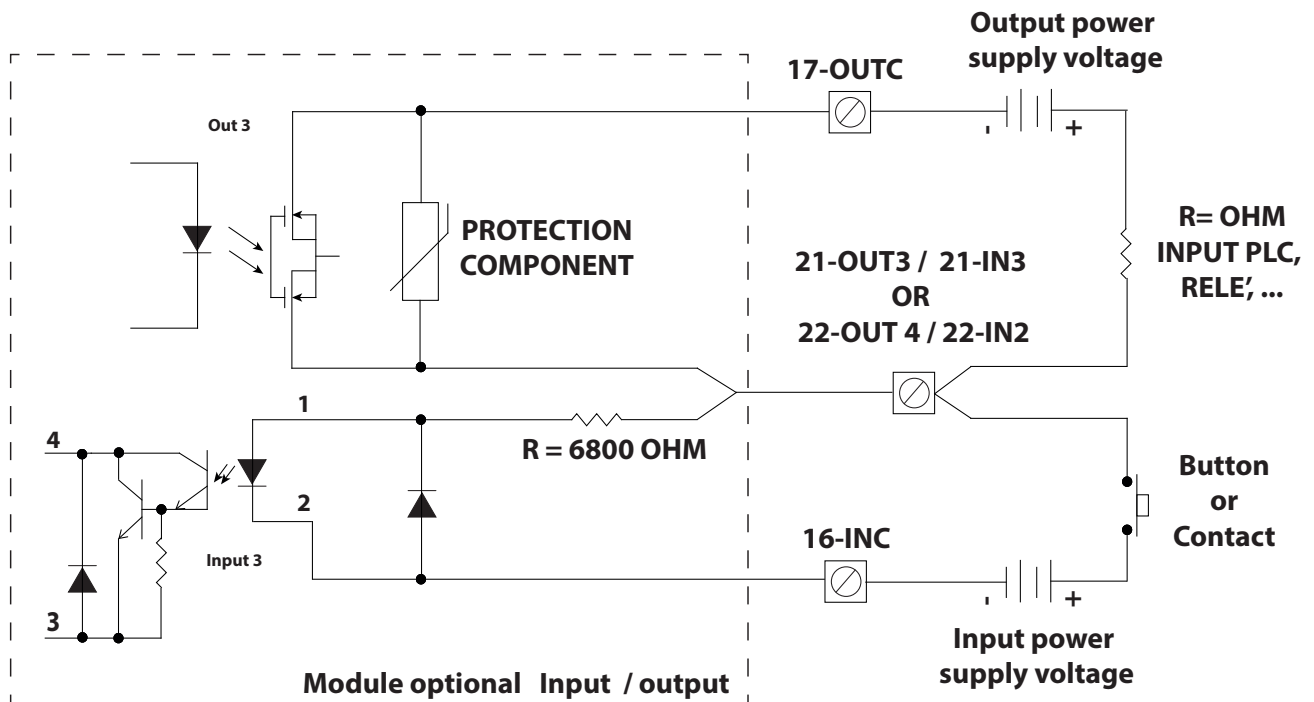
Auxiliary Module Digital Inputs/Output

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			
4	SENSOR		
5	S.model	0	1.1 Sensors model: Enter the first two characters of the serial number of the sensor
6	Lining	UNSPEC.	1.2 Flow sensor lining material type
7	S.type	FULLBORE	1.3 Type of sensor: fullbore or insertion
8	U.type	METRIC	1.4 Type of measure units for sensor parameter: metric or imperial
9	Diam.	00700	1.5 Sensor's nominal/real diameter DN (0-2500)
10	HA	+00.9637	1.6 Sensor coefficient KZ (zero point)
11	HA-	-44904	1.7 Calibration data of sensor for negative flow
12	HZ	-18852	1.8 Sensor coefficient KZ (zero point)
13	HD	+00.4014	1.9 Sensor coefficient KD
	Ins.position	0	1.10 Insertion position
	HP dynamic	OFF	1.11 KP dynamic, coefficient for insertion
	Hi	10000	1.12 Sensor coefficient Ki
	Hp	10000	1.13 Sensor coefficient Kp
	HC	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.DH	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	Hohm 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
	HL	00. +000000	1.23 Linearization coefficient
	Zero point cal.		1.24 Pipe hydraulic zero calibration

Units

MAIN MENU			
1	Sensor		
2	Units		
3	Scales		
4	UNITS		
5	Diam.	mm	2.1 Nominal diameter measure unit
6	S.cable	m	2.2 Cable length on separate version
7	FR.unit	METRIC	2.3 Flow rate type measure unit: metric or imperial
8	Pls1 u.	METRIC	2.4 Pulse 1 type measure unit: metric or not metric
9	Pls2 u.	METRIC	2.5 Pulse 2 type measure unit: metric or not metric
10	T+ unit	METRIC	2.6 Total direct totalizer measure unit type: metric or imperial
11	T+ unit	(m3)	2.7 Total direct totalizer measure unit
12	T+ D.P.	4	2.8 Total direct totalizer decimal point position
13	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.	1,107mCPI	2.21 Unit of measurement for analogue input 1
	AIN2 m.u.	1,107mCPI	2.22 Unit of measurement for analogue input 2

Functions Menu

Scales

MAIN MENU		
1	Sensor	
2	Units	
3	Scales	
4	Measure	
5	Alarms	
6	Inputs	
7	System	
SCALES		
7	FS1	dm3/s 5.00
8	Pls1	dm3 0.15
9	Tpls1	(ms)
10	Pls2	dm3 0.15
11	Tpls2	15*(ms)
12	AIN1	1.107 MCP1
13	AIN2	1.107 MCP1

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	
7	System	
MEASURE		
8	Filt.bypass	ON
9	Cut-off	00.0(%)
10	Cal.verify	ON
11	H.imm.inp.	ON
12		
13	System	

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	
7	System	
ALARMS		
8	Max+	dm3/s OFF
9	Max-	dm3/s OFF
10	Min+	dm3/s OFF
11	Min-	dm3/s OFF
12	Qhyst	XXXXXX
13	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

Functions Menu

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
    
```

```

INPUTS
10-T+ reset      OFF
11-P+ reset      OFF
12-T- reset      OFF
13-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

```

Out1      F.R.SIGN
Out1 inv.  ON
Out1 pls.  ON
Out2      AN1 MH/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
    
```

Outputs

COMMUNICATIONS

```

MAIN MENU
1-Dev. Addr.      1
2-Speed          bps22800
3-Parity         NO
4-Delay          ms 00
5-C.timeout      2
6-Outputs
7-Communication
8-Display
9-Data logger
10-Functions
11-Diagnostic
12-System
    
```

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)

Communic.

Functions Menu

Display

DISPLAY	
1- Language	EN
2- Disp.time	S
3- D.rate	
4- Disp.Fn.	1
5- Disp.lock	OFF
6- Part.tot.	ON
7- Neg.tot.	ON
8- Net tot.	ON
9- Disp.date	ON
10- Quick start	OFF
8- Communication	
9- Display	
10- Data logger	
11- Functions	
12- Diagnostic	
13- System	

9.1	Language for all messages
9.2	Display/keyboard inactivity time
9.3	Display refresh rate
9.4	Display function number
9.5	Display function selection lock
9.6	Partial totalizers enable
9.7	Negative totalizers enable
9.8	Net totalizers enable
9.9	Time and date display enable
9.10	Quick start menu enable

Data logger

DATA LOGGER	
1- D.logger en.	ON
2- Meas.units	ON
3- Field separ.	;
4- Decim.separ.	.
5- Interv.	0:01:00
6- Log T+	OFF
7- Log P+	OFF
8- Log T-	OFF
9- Log P-	OFF
10- Log TH	OFF
11- Log PHI	OFF
12- Log Q(UM)	OFF
13- Log Q(%)	OFF
14- Log AL.EV	OFF
15- Log ADM	OFF
16- Log STR	OFF
17- Log BTS	OFF
18- Log IBV	OFF
19- Log EDC	OFF
20- Log EAC	OFF
21- Log EIZ	OFF
22- Log SCU	OFF
9- Display	
10- Data logger	
11- Functions	
12- Diagnostic	
13- System	

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

Functions

FUNCTION	
1- T+ reset	ON
2- P+ reset	ON
3- T- reset	;
4- P- reset	.
5- Load Sens.F.def	0:01:00
6- Load Conv.F.def	OFF
7- Save Sens.F.def	OFF
8- Save Conv.F.def	OFF
9- Calibration	OFF
10- Data logger	
11- Functions	
12- Diagnostic	
13- System	

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

Functions Menu

Diagnostics

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	00000000
WT	0
TC	

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
HT	0.97882
HS	100.000
HR	100.000
DAC1 4mA	2460
DAC1 20mA	11050
AIN1 SS	0
AIN1 FS	20000
AIN2 SS	0
AIN2 FS	20000
Stand-by	
FW update	

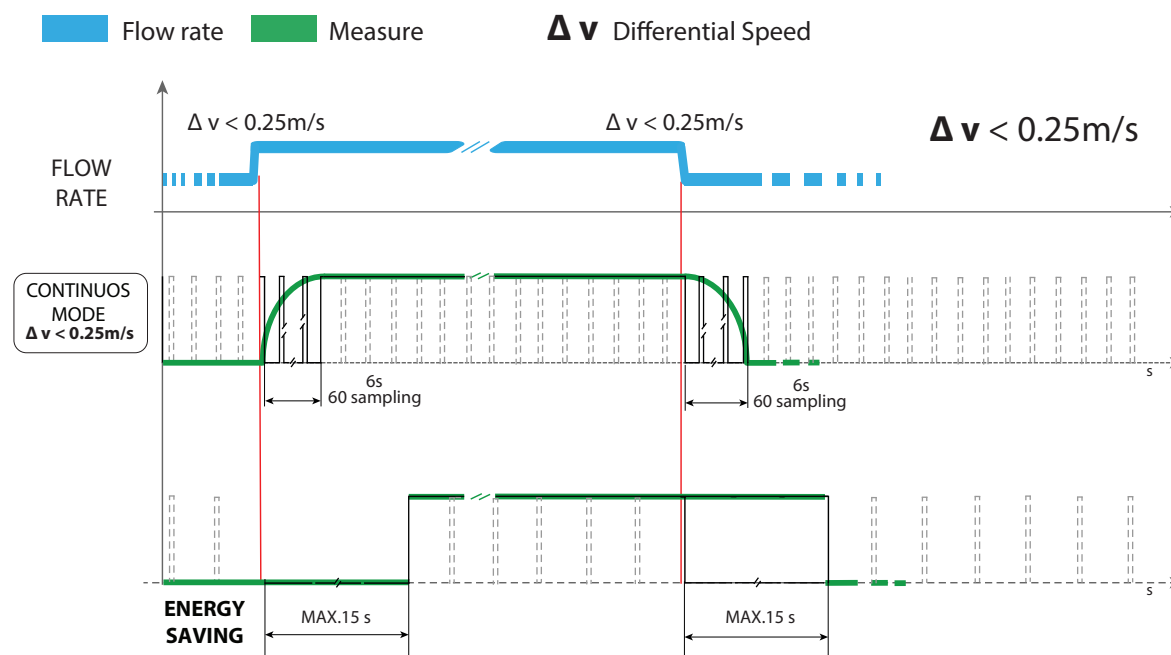
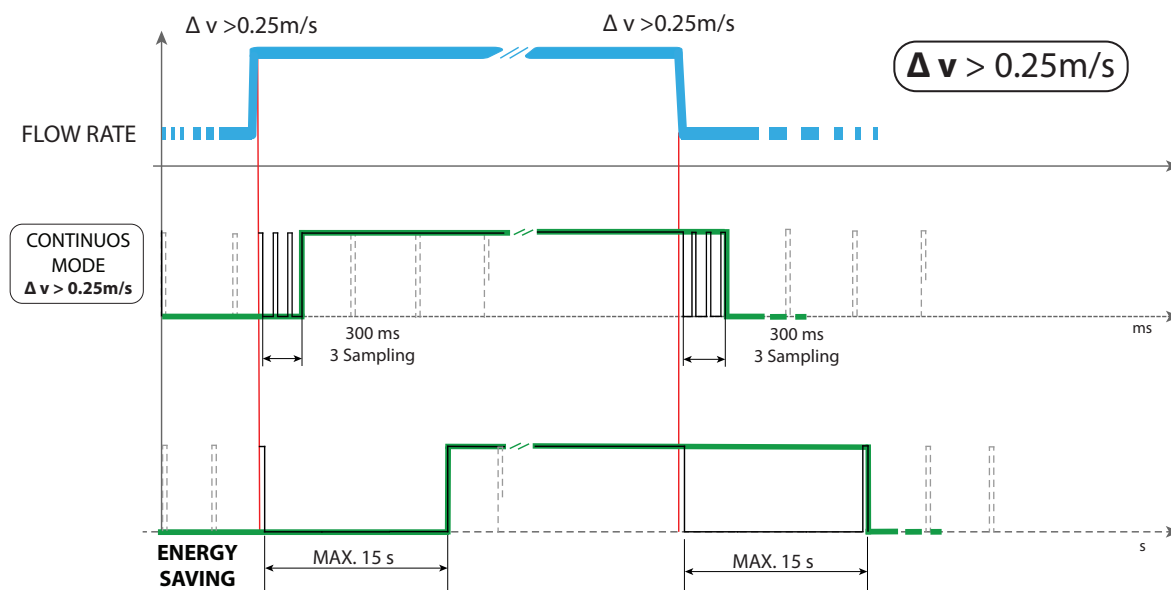
12-Diagnostic
13-System

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

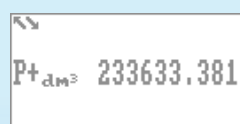
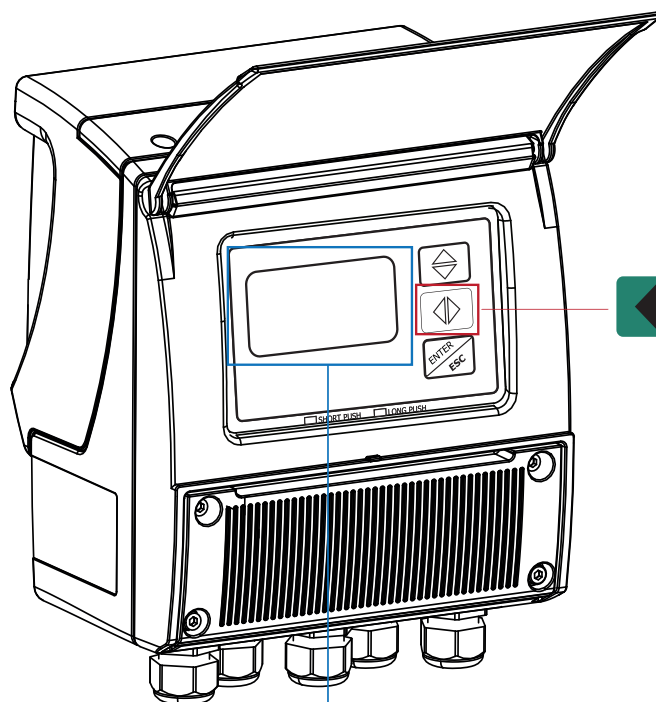
FM700 can be programmed to acquire the measurement in two different ways:

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



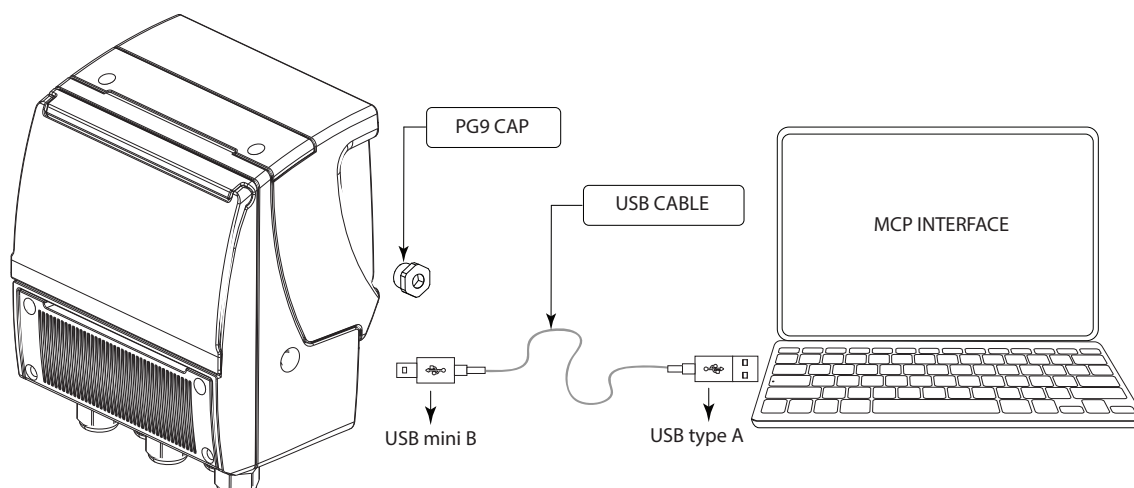
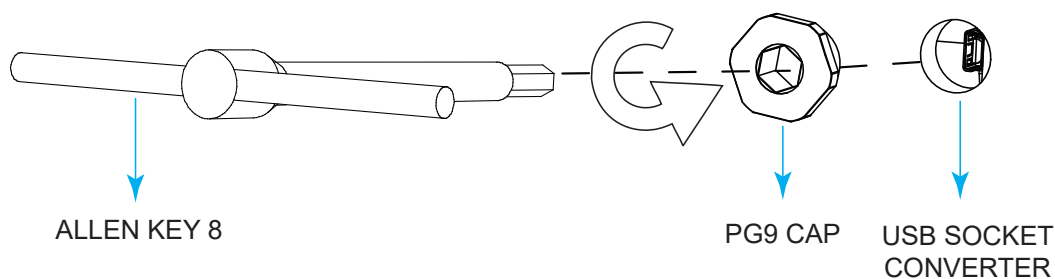
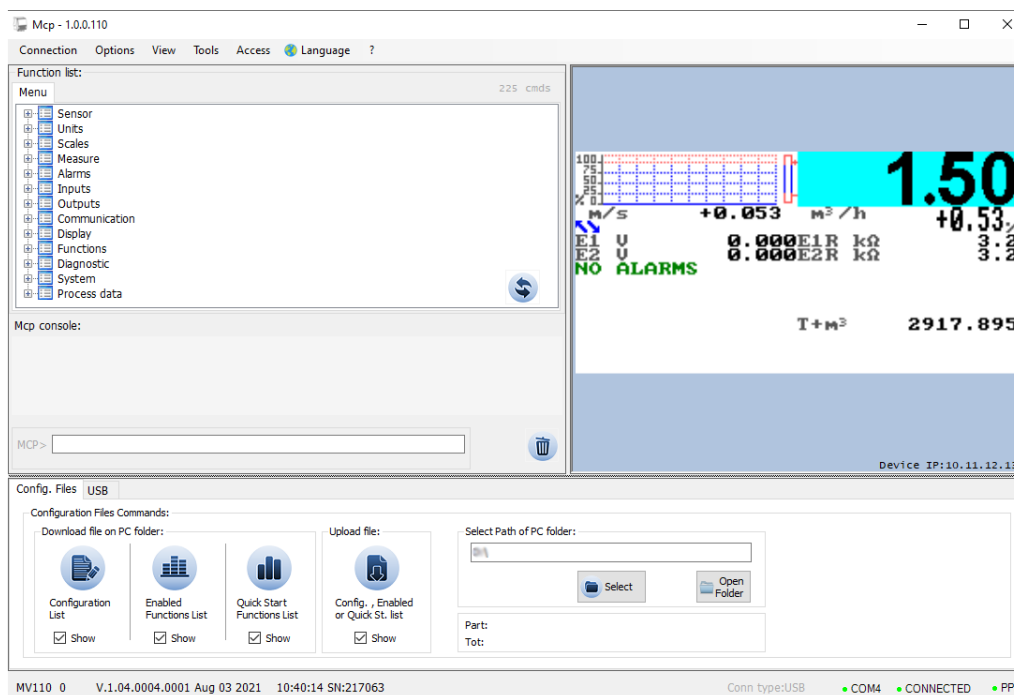
Main Pages Visualization

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.



Datalogger

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.

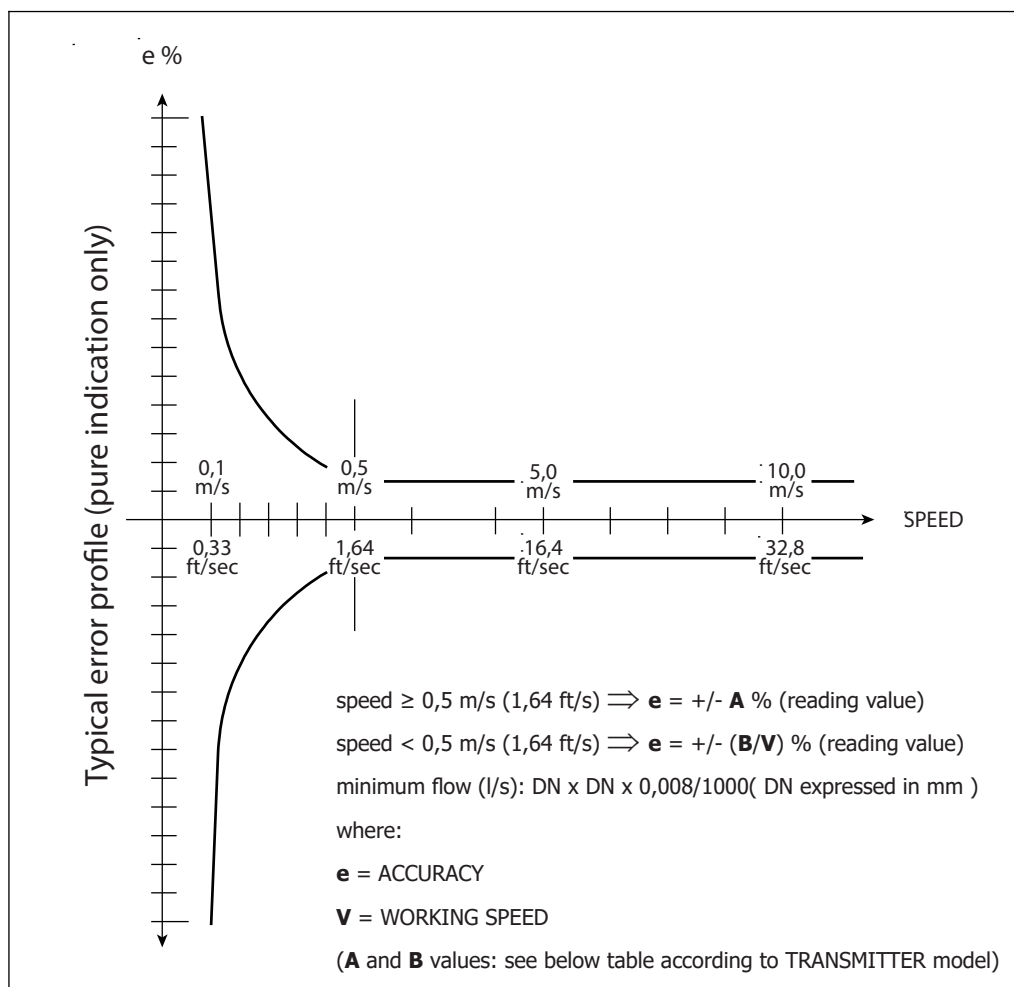
The screenshot shows the 'Datalogger' tab in a software interface. On the left, under 'Download settings:', there are four radio buttons: 'Events', 'Datalogger' (which is selected and highlighted with a red box), 'Sensor Verify', and 'Generic file'. To the right of these are 'When:' and 'Today:' sections with radio buttons for 'Today', 'Data Range', 'Last', and 'All'. Below these is a 'Save path:' field with a 'Select' button. On the right side of the interface, there is a 'Download' button (a blue circle with a white downward arrow) also highlighted with a red box. Next to it is a progress bar showing '100%' and '65.5 kB/s, 74.2 sec.'. To the right of the progress bar is a 'Stop' button (a grey circle with a white 'X'). Below the progress bar, there is a green status message: 'RLDIT : 1,223:FT DOWNLOAD READY [4861662]' and a green dot followed by '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. The recording date viewing for each record.	2 n° DATE
Hours. Time recording viewing for each record.	3 n° ORA
Total positive totalizer value. Form Fields when the send flag is active on the totalizer T+.	4 n° U.M. T+ dn3 0
Partial positive totalizer value. Form Fields when the send flag is active on the totalizer P-.	5 n° U.M. P- dn3 0
Total negative totalizer value. Form Fields when the send flag is active on the totalizer T-.	6 n° U.M. T- dn3 0
Partial negative totalizer value. Form Fields when the send flag is active on the totalizer P-.	7 n° U.M. P- dn3 0
Total net totalizer value. Form Fields when the send flag is active on the totalizer TN.	8 n° U.M. TN dn3 0
Partial net totalizer value. Form Fields when the send flag is active on the totalizer PN	9 n° U.M. PN dn3 0
Flow rate. Form Fields present when the send flag is on the flow in units of measurement.	10 n° U.M. FLOWRATE dn36 0
Flow rate %. Form fields present when the flag of alarm recording is active (only N ° of present total alarms)	11 n° % FLOWRATE-U.M. dn3 0
N ° active alarms. Form fields present when the flag of alarm recording is active (only N ° of present total alarms)	12 n° AL NACTIVEALARM dn3 0
Loss of current measured during insulation test. Available value when recording the sensor test data is active.	13 n° mA LCPIT dn3 0
Time rise A. Available value when recording the sensor test data is active.	14 n° ms TOLIMB A dn3 0
Time rise B. Available value when recording the sensor test data is active.	15 n° ms TOLIMB B dn3 0
Sensor test error code. Available value when recording the sensor test data is active.	16 n° XX AB dn3 0

Accuracy



Full Bore Sensor

FM130/FM150/FM170		
A	B(m/s)	B(ft/s)
0,4*	0,20	0.66

* = 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: > 0.3 bar (4.35 psi)
- Flow condition : fully developed flow profile
- Zero stability $\pm 0,005$ %

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 (mandatory for MI001)
Housing material		
1	1	Painted aluminum die casting
Version / Protection rate		
A	A	Compact version with sensor FM.... - 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...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)
Analogue Input/Output		
0	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		
A	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 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) + Meter Data (Real Time Transmitter & Sensor Data on SD Memory)
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)
	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	NONE
	1	n.1 PRESSURE or n.1 TEMPERATURE (n.1 connector)
	2	n.2 PRESSURES or n.2 TEMPERATURES (n.2 connectors)
	3	n.2 DIGITAL OUTPUT - n.1 DIGITAL INPUT (n.1 connector)
	4	n.2 DIGITAL OUTPUT - n.1 DIGITAL INPUT + RS485 (n.1 connector)
	5	n.2 DIGITAL OUTPUT - n.1 DIGITAL INPUT (n.1 connector) + n.1 PRESSURE or n. 1 TEMPERATURE (n.1 connector)
	6	n.2 DIGITAL OUTPUT + n.1 OUTPUT 4-20 mA (n.1 connector)
	7	n.2 DIGITAL OUTPUT (n. 1 connector) + n.1 OUTPUT 4-20 mA + RS485 (n.1 connector)
	8	n.1 RS485 (n.1 connector)
	9	n.1 RS485 (n.1 connector) n.1 Pressure or n.1 Temperature (n.1 connector)
	a	N° 4 ON/OFF output (max 50 Hz - max 100 mA) - (n.1 connector)
	b	n.1 PRESSURE (n.1 connector) + n.2 DIGITAL OUTPUT (n. 1 connector) + n.1 OUTPUT 4-20 mA + RS485 (n.1 connector)
	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 connector)
	e	1 PRESSURE (n.1 connector) + uscita 4/20 mA + 2 uscite ON/OFF + Ingresso ON/OFF + porta RS485 (n.1 connector)
MID Approval		
A	A	NONE

Complete code
example for order



FM700-A0A1A0A0A0A0