



# DATA SHEET

## MV311



CE





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## ■ SYSTEM DESCRIPTION

MV311 is an energy meter designed for heating, cooling or combined heating/cooling carried by a thermal fluid; typically the thermal fluid is water, though a special features allow to calculate the energy even for water and glycol ethylene or polypropylene at several concentration. The calculator contains all the necessary circuits for calculating energy value according to the standard EN1434; the thermal energy calculation is based on the following calculation :

$$Q = \int_{t_0}^{t_1} q_m \Delta h dt$$

Where:

- Q: amount of heat (energy) transferred or absorbed
- $q_m$ : mass flow rate of the vector fluid /kg s-1
- $\Delta h$ :  $\Delta$  of specific enthalpy between in-let and out-let pipe line /J kg-1
- t: time /s

### FLOW MEASUREMENT

The calculator can calculate the flow rate throughout two channel:

- Analogic: it acquire the 4-20mA signal from a flow meter
- Factorized pulses: it calculate the flow rate throughout factorized pulses coming from the flow meter

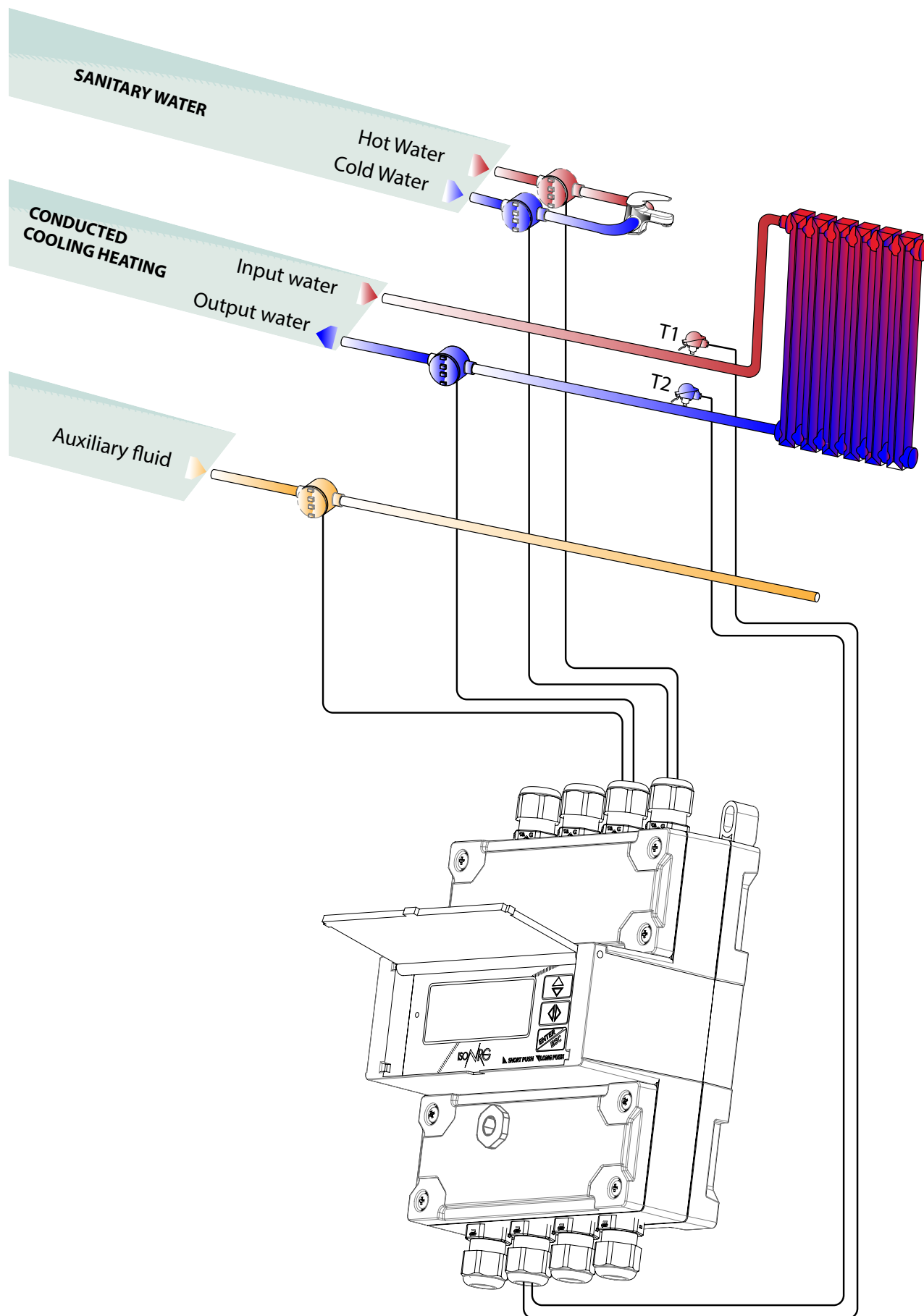
### TEMPERATURE MEASUREMENT

The instrument measures the temperature by RTD (PT type), in a 4-wires configuration; the PT values, can be selected via software; the allowed model are:

- PT100
- PT500
- PT1000

By a highly accurate internal reference system and an appropriate electronic switch network, the temperatures are measured by highly accurate ADC (Analog to Digital Converter).

The diagram below is a schematic of the principle: in addition to the thermal energy meter function, the ML 311 allows to totalize the hot and cold water volume used for service lines; in some cases this solution can be helpful for a quick reference of the measures and the possibility to transfer them to other systems using several fieldbus which the instrument has built-in.



The manufacturer guarantees only English text available on our web site [www.isoill.com](http://www.isoill.com)

## ■ TECHNICAL DATA

### OVERALL FEATURES


<b>Maximum Thermal Power</b>	<input type="checkbox"/> Ps = 99999 GW
<b>Hot/Cold Switching</b>	<input type="checkbox"/> Automatic through assignment of the +/- sign (possibility of congruence control from remote input)
<b>Measure Units Available</b>	<input type="checkbox"/> kW/MJ, W, kW, MW, GW, J, kJ, Wh, MJ, kWh, GJ, MWh, GWh, BTU, kBTU, MBTU, °C, °F, ml, cm <sup>3</sup> , l, dm <sup>3</sup> , dal, hl, m <sup>3</sup> , Ml, in <sup>3</sup> , Gal, IGL, ft <sup>3</sup> , bbl, BBL, hf <sup>3</sup> , KGL, IKG, kf <sup>3</sup> , ttG, Aft, MGL, IMG,
<b>Installation</b>	<input type="checkbox"/> Any orientation - DIN rail
<b>Altitude</b>	<input type="checkbox"/> From -200m to 4000m (from -656 to 13120 feet)
<b>Environmental Temperature</b>	<input type="checkbox"/> +5... +55°C (+41...+131°F)
<b>Temperature Range(Measure)</b>	<input type="checkbox"/> -30... +200 (-22...+392°F)
	<input type="checkbox"/> -15... +150 (+5...+302°F) for MID instrument
<b>Protection Rate</b>	<input type="checkbox"/> IP65

### STANDARD FEATURES

<b>Housing Material</b>	<input type="checkbox"/> PC/ABS self-extinguishing
<b>Power Supply/Power Consumption</b>	<input type="checkbox"/> 100-240V~ 45-66Hz (5W); 24-36V~ 45-66Hz (5W); 12-48V (5W)
<b>Pulses Outputs</b>	<input type="checkbox"/> N° 2 output 1250Hz, 100mA, 30Vdc
<b>Available Protocols</b>	<input type="checkbox"/> MCP over USB
<b>Digital Input</b>	<input type="checkbox"/> N° 1 multifunction (Reset totalizers, cooling, heating, auxiliary fluid volume)
<b>Analog Input For Flow Meter</b>	<input type="checkbox"/> N°1 4..20mA range for measure fluid flow rate
<b>Pulses Inputs (q max weight function per pulse)</b>	<input type="checkbox"/> N° 4 inputs (frequency max. 1kHz, min. 0.003 Hz):
	<ul style="list-style-type: none"> <li>• Vector Fluid volume</li> <li>• Hot water volume</li> <li>• Cold water volume</li> <li>• Auxiliary fluid volume (or digital input)</li> </ul>
<b>Inputs For Sensor Temperature</b>	<input type="checkbox"/> N° 2 (one for the delivery and one for the return)
<b>Digital Outputs</b>	<input type="checkbox"/> N° 2 programmable for alarms or pulses for energy/volume
<b>Programming Plug In</b>	<input type="checkbox"/> Mini USB type B
<b>Data storage</b>	<input type="checkbox"/> F-RAM: permanent data storage in case of power failure
<b>Galvanic Isolation</b>	<input type="checkbox"/> All the inputs/outputs are galvanically isolated from power supply up to 500 V
<b>Diagnostic Function</b>	<input type="checkbox"/> Yes
<b>CE Certification</b>	<input type="checkbox"/> Yes

### OPTIONAL FEATURES

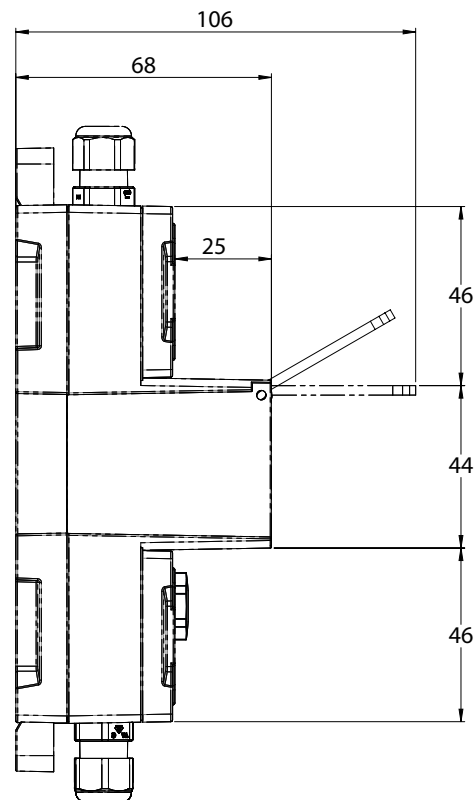
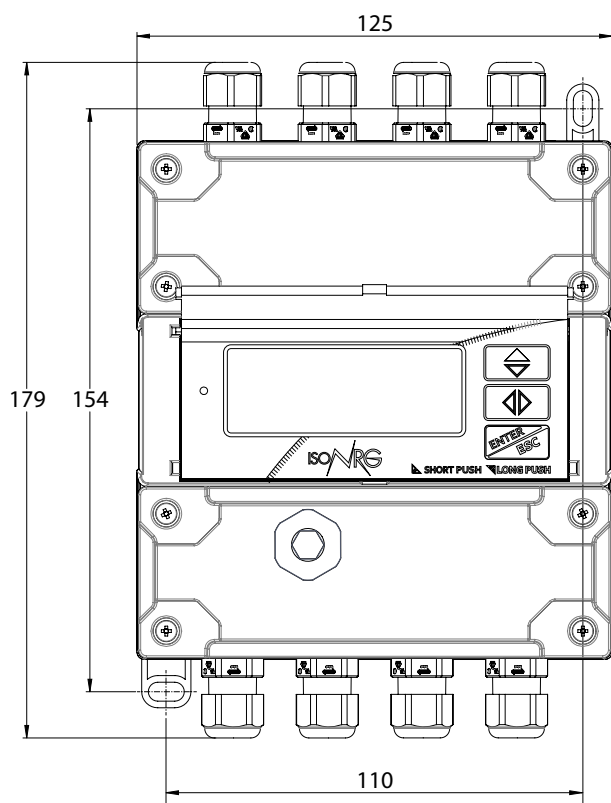
((CHECK FOR MORE DETAILS 'HOW TO ORDER' ON LAST PAGE))

<b>LCD Display</b>	<input type="checkbox"/> Graphic display 128 x 48 pixels back light; characters height 7,2/3,6mm
	<input type="checkbox"/> 3 membrane keys
	<input type="checkbox"/> Led status
<b>Current Output</b>	<input type="checkbox"/> N° 2 0/4...20mA selectable alternatively for flow, power, temperature T1, T2 or delta T
<b>Temperature Sensor</b>	<input type="checkbox"/> Thermal probes PT 100/PT500/PT1000 (2/3/4 wires)
<b>Communication Port</b>	<input type="checkbox"/> RS 485/MBus
<b>Available Protocols</b>	<input type="checkbox"/> Modbus (over RS485)/ BACnet (over RS485)/ M-bus 
<b>Data Storage</b>	<input type="checkbox"/> Data Logger with MicroSD Memory 4 GB
<b>RTC</b>	<input type="checkbox"/> Real Time Clock with Autonomy of 7 days (1 month if Measure Backup battery is installed) in absence of power supply.
<b>Measure Backup</b>	<input type="checkbox"/> Rechargeable Li-ion Battery for Measure Backup operations up to 1 month in absence of power supply (depending on configurations and connections).
<b>MID Certification</b>	<input type="checkbox"/> MI-004

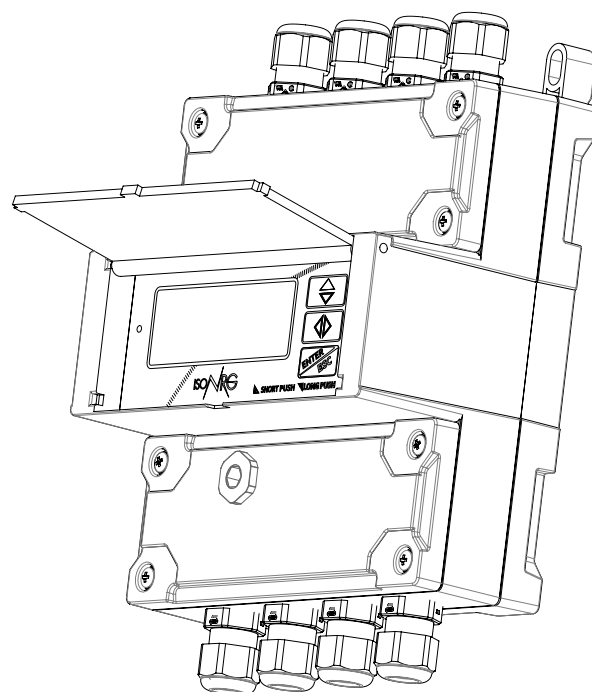
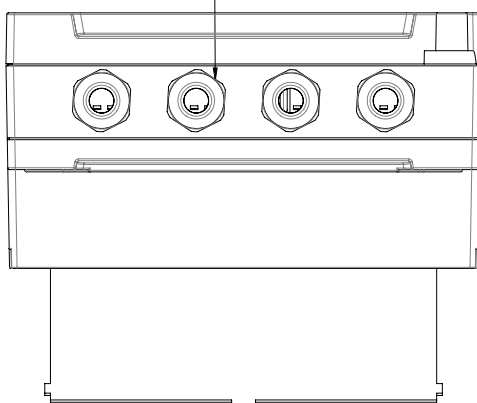
### MEASUREMENT

<b>Temperature Measuring Range</b>	<input type="checkbox"/> $\vartheta_{min}$ -15 °C (+5°F), $\vartheta_{max}$ 200°C (392°F)
<b>Delta Temperature (<math>\Delta\vartheta</math>)</b>	<input type="checkbox"/> $\Delta\vartheta$ min 3 °C (37,4°F), $\Delta\vartheta$ max 150 °C (392°F)
	<input type="checkbox"/> $\Delta\vartheta$ min 0,1 °C (32.18°F) $\Delta\vartheta$ max 200 °C (392°F) – instruments without MID certificate
<b>Measurement Accuracy</b>	<input type="checkbox"/> System: $\pm 0,20$ % (0.18 + $\Delta\vartheta$ min/ $\Delta\vartheta$ )

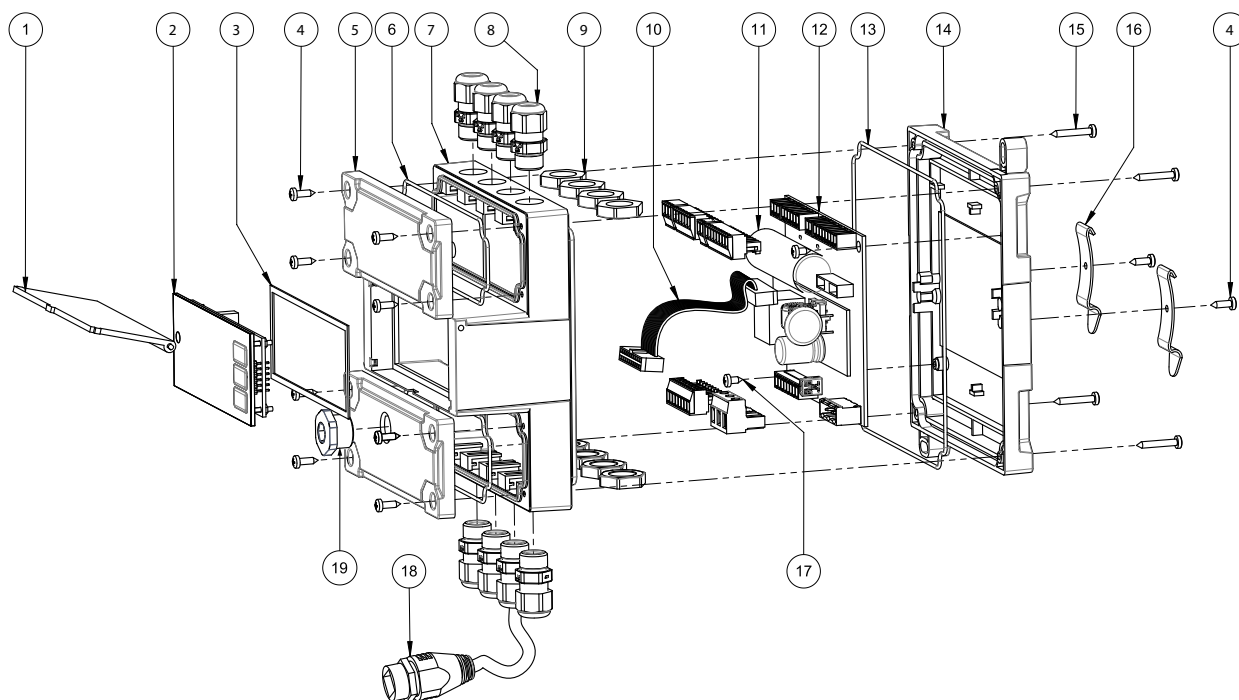
OVERALL DIMENSIONS



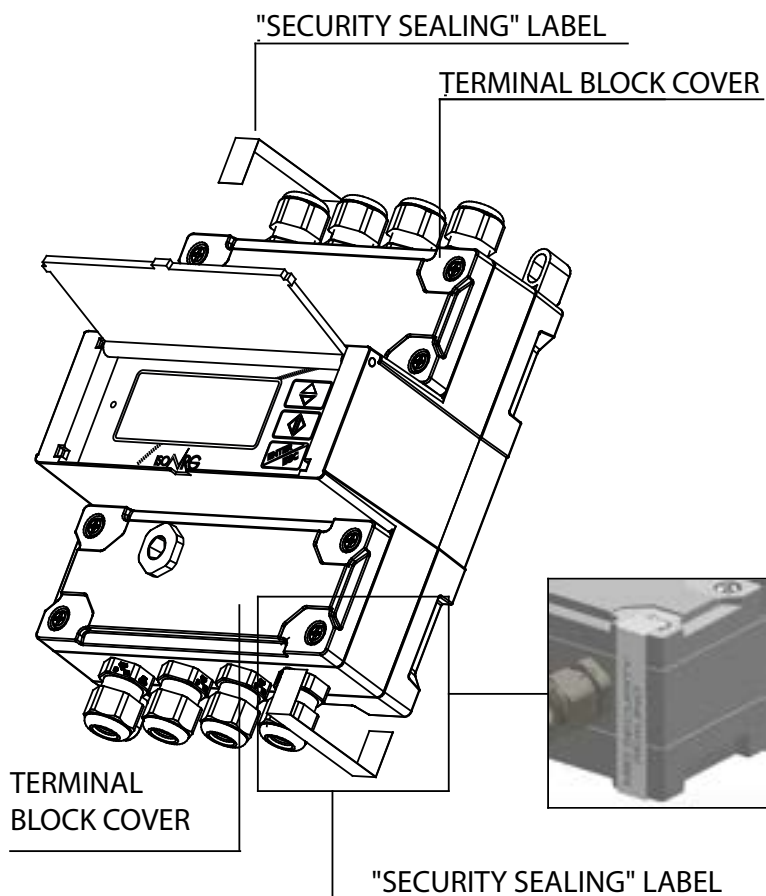
N° 8 Pressacavi PG7



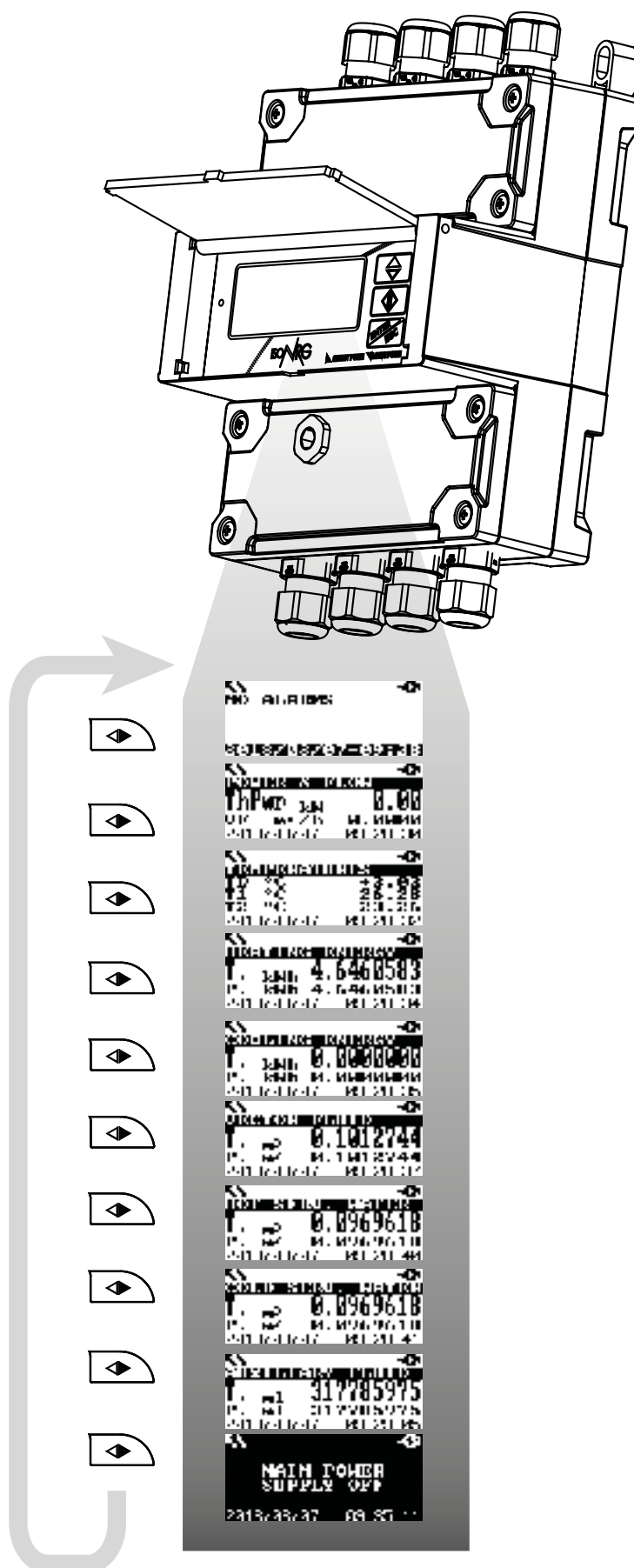
## ■ MV311 CONSTRUCTION



POS.	DESCRIPTION	QT.
1	PROTECTION GLASS	1
2	MV311 DISPLAY	1
3	ADHESIVE GASKET	1
4	SELF-TAPPING SCREW 2.9X9,5	10
5	TERMINAL BLOCK COVER	1
6	O-RING TERMINAL BLOCK COVER	2
7	MAIN HOUSING	2
8	CABLE GLAND PG7 COMPLETE WITH O-RING	8
9	CABLE GLAND RING PG7	8
10	FLAT CABLE 20 VIE	1
11	MV311 BATTERY	1
12	MV311 PCB	1
13	O-RING BACK COVER	1
14	REAR COVER	4
15	SELF-TAPPING SCREW 2.9X19	2
16	DIN RAIL CONNECTIONS	2
17	SELF-TAPPING SCREW 2.9X6.5	1
18	OPTIONAL ETHERNET CONNECTOR (P.O.E. ON ORDER).	1
19	PG9 CAP	1



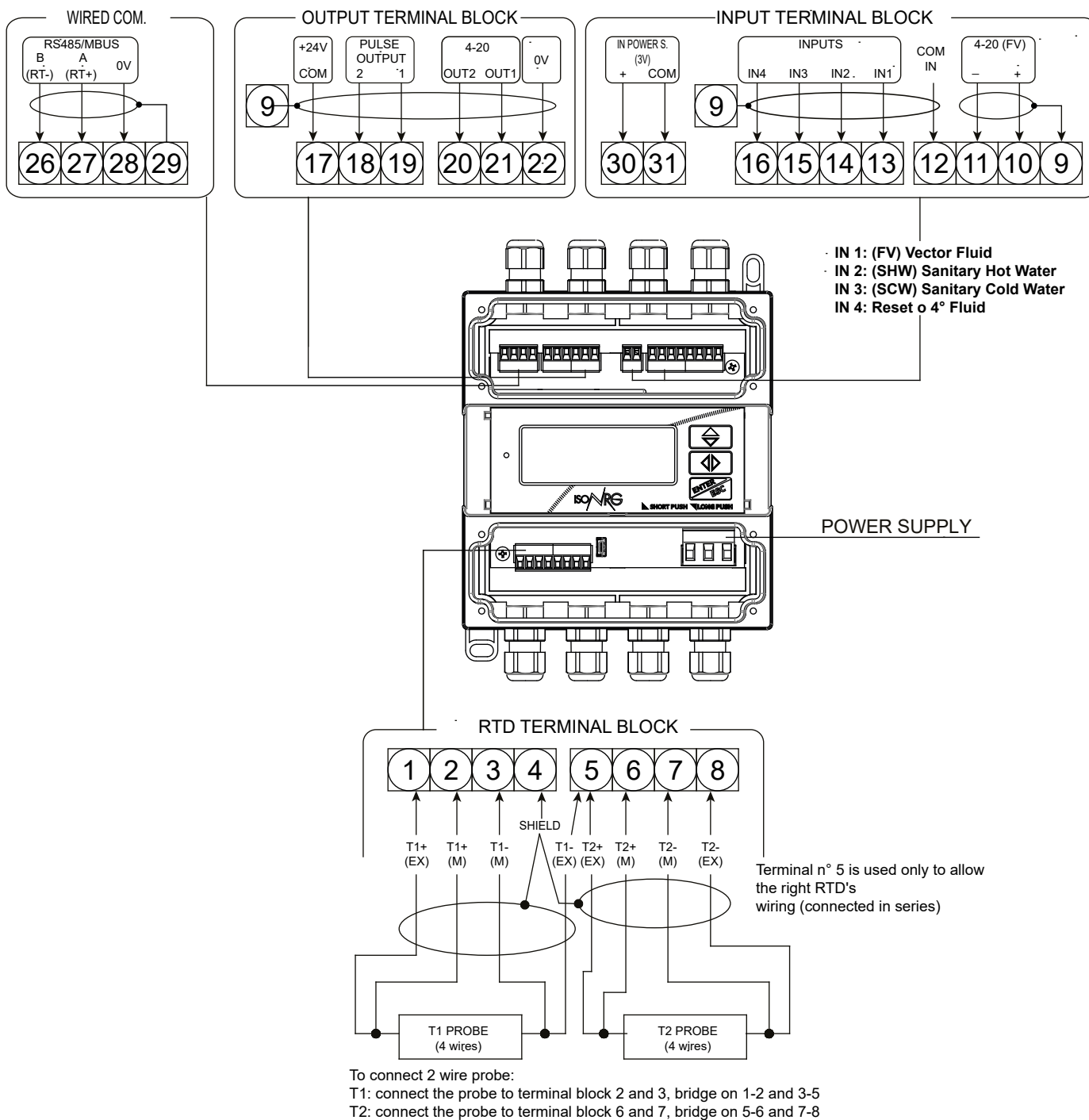
## ■ VISUALIZATION PAGE



**Different visualization possibilities by simply pressing of a key.**



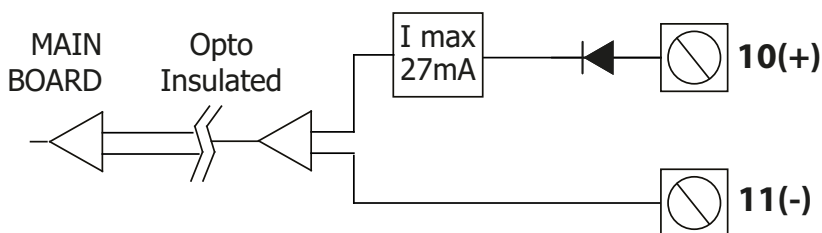
## ELECTRICAL CONNECTIONS



Cable gland PG7: Allowed diameter cables 3-6.5 mm.

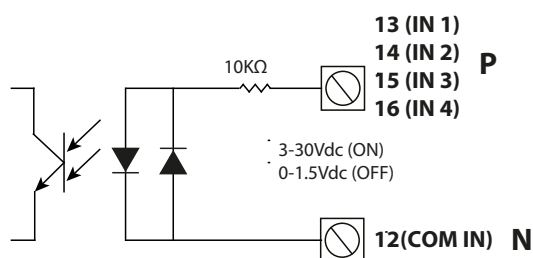
## INPUTS/OUTPUTS

### 4-20mA INPUT

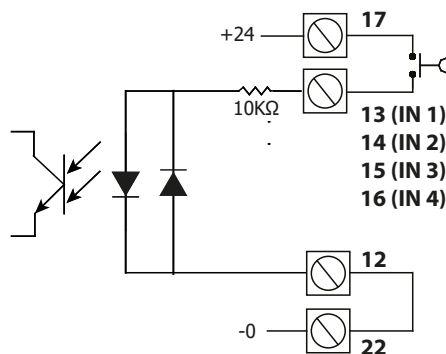


### CONNECTIONS WITH POLARITY 'TYPE P'

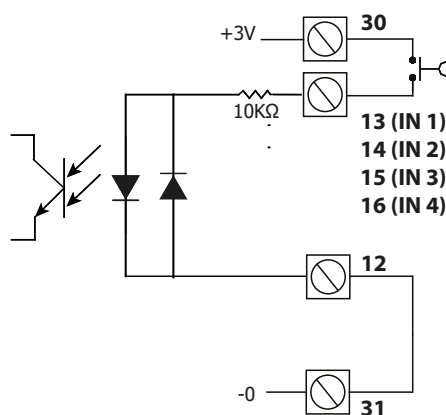
#### ISOLATED DIGITAL INPUT WITH EXTERNAL POWER SUPPLY



#### ISOLATED DIGITAL INPUT WITH + 24V INTERNAL POWER SUPPLY

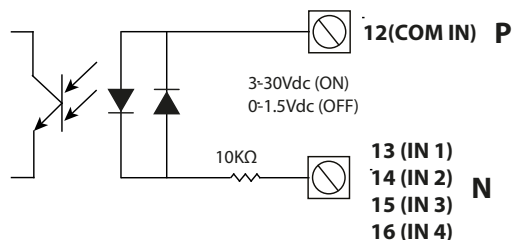


#### NOT ISOLATED DIGITAL INPUT WITH INTERNAL BATTERY POWER SUPPLY

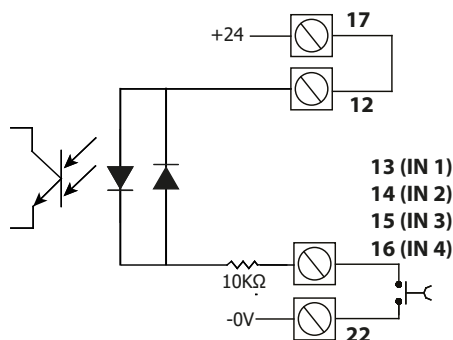


## CONNECTIONS WITH POLARITY 'TYPE "N"'

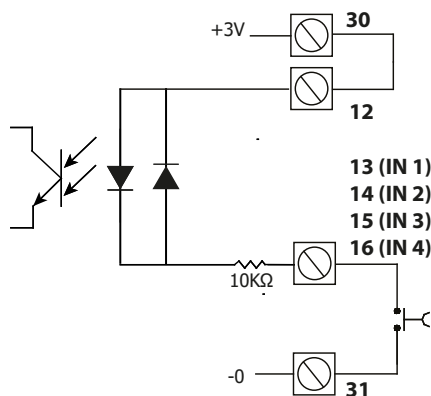
### ISOLATED DIGITAL INPUT WITH EXTERNAL POWER SUPPLY



### DIGITAL INPUT WITH + 24V INTERNAL POWER SUPPLY

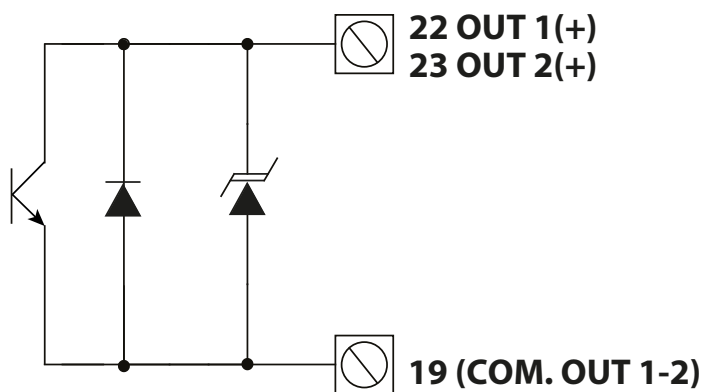


### NOT ISOLATED DIGITAL INPUT WITH INTERNAL BATTERY POWER SUPPLY

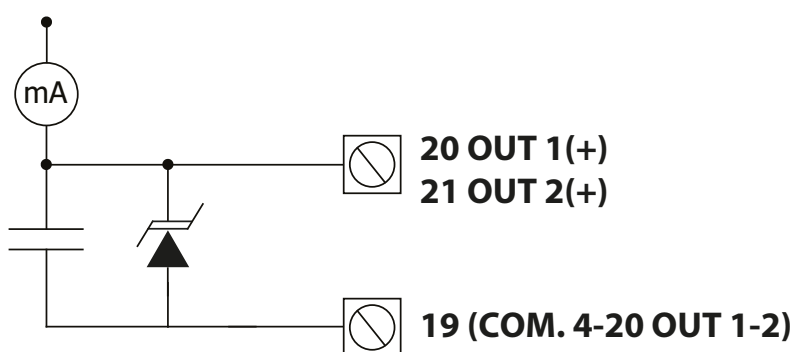


## OUTPUT CONNECTIONS

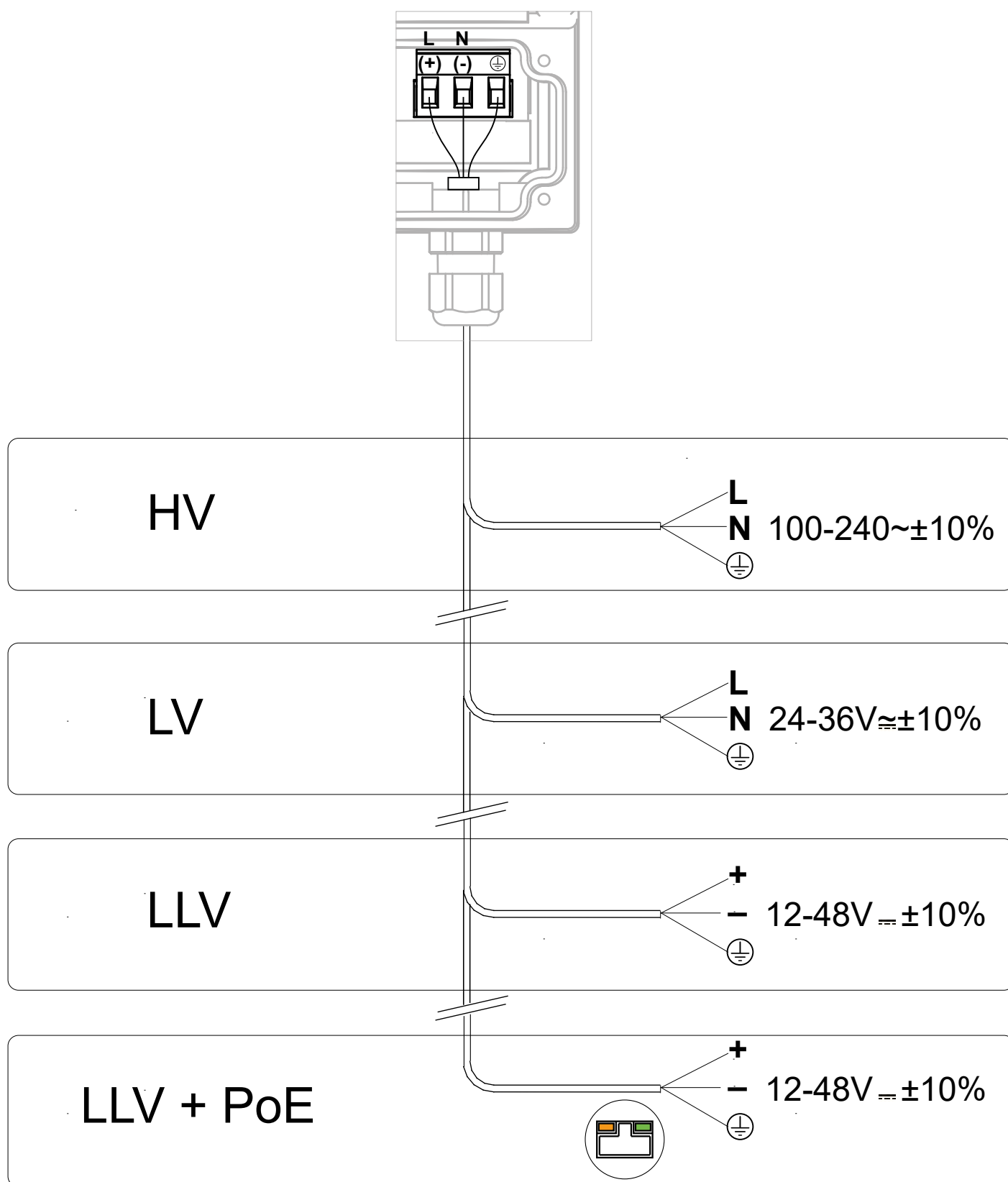
### OUTPUT ON/OFF 1250HZ



### OUTPUT 4-20mA



## POWER SUPPLIES



If the PoE power supply version, to guarantee the isolation required by the IEEE for ethernet, the external power supply (optional) must have minimum 1500Vac insulation with respect to earth and to every other connection

**The options above are also available with a rechargeable backup battery**

## FUNCTION MENU

MAIN MENU  
1-Units

```

UNITS
FR.unit= METRIC
Temper. unit= °C
Energy unit= J
D.P. Energy= 0
VFv unit= METRIC
VFv unit= I
VFv D.P.= 0
HWv unit= METRIC
HWv unit= I
HWv D.P.= 0
CWv unit= METRIC
CWv unit= I
CWv D.P.= 0
AXv unit= METRIC
AXv unit= I
AXv D.P.= 0
IP1 unit= METRIC
IP2 unit= METRIC
IP3 unit= METRIC
IP4 unit= METRIC
    
```

- 1.1 Flow rate unit of measure type
- 1.2 Temperature unit of measure
- 1.3 Energy totalizer unit of measure
- 1.4 Energy totalizer Decimal point position
- 1.5 VF volume totalizer unit of measure type
- 1.6 VF volume totalizer unit of measureV
- 1.7 VF volume total. decimal point position
- 1.8 HW volume totalizer unit of measure type
- 1.9 HW volume totalizer unit of measure
- 1.10 HW volume total, decimal point position
- 1.11 CW volume totalizer unit of measure type
- 1.12 CW volume totalizer unit of measure
- 1.13 CW volume total. decimal point position
- 1.14 AUX volume totalizer unit of measure type
- 1.15 AUX volume totalizer unit of measure
- 1.16 AUX volume total. decimal point position
- 1.17 In Pulse 1 unit of measure type
- 1.18 In Pulse 2 unit of measure type
- 1.19 In Pulse 3 unit of measure type
- 1.20 In Pulse 4 unit of measure type
- 1.21 Out Pulse 2 unit of measure type

MAIN MENU  
1-Units  
2-Scales

```

SCALES
FR= m³/h 2.9000
TPwr= kW 132.10
Ipl1= ml 1000.0
Ipl2= ml 1000.0
Ipl3= ml 1000.0
Ipl4= ml 1000.0
Op11= J 1.0000
Op12= J 1.0000
Top1= ms 0010.0
Top2= ms 0010.0
Start S. I= °C+000
Full S. I= °C+200
F.S. ΔTemp= °F 3.6
PresT1= kPa 1013
PresT2= kPa 1013
    
```

- 2.1 Full scale flow rate value
- 2.2 Full scale thermal power value
- 2.3 Channel 1 IN pulse volume value
- 2.4 Channel 2 IN pulse volume value
- 2.5 Channel 3 IN pulse volume value
- 2.6 Channel 4 IN pulse volume value
- 2.7 Channel 1 OUT pulse energy value
- 2.8 Channel 2 OUT pulse volume value
- 2.9 Channel 1 OUT pulse time value
- 2.10 Channel 2 OUT pulse time value
- 2.11 Start scale temperature (Min)
- 2.12 Full scale temperature (Max)
- 2.13 Full scale temperature Delta
- 2.14 Pressure at T1 point
- 2.15 Pressure at T2 point

MAIN MENU  
1-Units  
2-Scales  
3-Measure

```

MEASURE
Sens.Type= PT500
UFF C.O.= %
DT Min.= °F 01.0
T1HC enable= ON
T1HC= °C+025.0
UF Meas. side=T2
UF F.r. src=PLS1
Aux Vol. En.= ON
UF F.r. pls= FRQ
Max Tme In1=s005
Max Pls In1=1000
Max Pls In2=1000
Max Pls In3=1000
Max Pls In4=1000
E. Ctrl type=AUT
K-factor= OFF
Glyc. type= ETHY
Concentr. %= 0
M. Prof.= STD
LP S.Freq.= Hz1.0
LP Cycle sim=OFF
    
```

- 3.1 Temperature sensor type
- 3.2 Vector fluid flow cut-off threshold
- 3.3 Temperature delta cut-off threshold
- 3.4 T1 Heating-Cooling threshold enable
- 3.5 T1 Heating-Cooling threshold value
- 3.6 Vector fluid measurement side
- 3.7 Vector Fluid flow rate source
- 3.8 Aux Volume input enable
- 3.9 Vector Fluid f. rate pulse type
- 3.10 Max Time Period for Input
- 3.11 Max Pulses second for Input 1
- 3.12 Max Pulses second for Input 2
- 3.13 Max Pulses second for Input 3
- 3.14 Max Pulses second for Input 4
- 3.15 Energy counter control type enable
- 3.16 Enable Table of Kfactor Coeff.
- 3.17 Kfactor Coeff. Substance Type
- 3.18 Kfactor Substance Concentration
- 3.19 Measure acquisition profile
- 3.20 Low power sampling frequency
- 3.21 Low power m.cycle simulation

```

MAIN MENU
1-Units
2-Scales
3-Measure
4-alarms

```

```

ALARMS
FM= m3/h 0.9001 4.1
Fm= m3/h 0.9001 4.2
Pwr M= kW 100.00 4.3
Pwr m= kW 100.00 4.4
DT Max= °F 100.0 4.5
DT Min= °F 100.0 4.6
T1 Max= °C+200.0 4.7
T1 Min= °C+200.0 4.8
T2 Max= °C+200.0 4.9
T2 Min= °C+200.0 4.10
Hysteresis=%00.0 4.11
OC Fault=MA 00.0 4.12

```

4.1 VF Max. flow rate alarm threshold  
4.2 VF min. flow rate alarm threshold  
4.3 Max. thermal power alarm threshold  
4.4 Min. thermal power alarm threshold  
4.5 Max. temperature delta alarm threshold  
4.6 Min. temperature delta alarm threshold  
4.7 Max. temperature alarm threshold  
4.8 Min. temperature alarm threshold  
4.9 Max. temperature alarm threshold  
4.10 Min. temperature alarm threshold  
4.11 Hysteresis on alarm thresholds  
4.12 Out.Current Alarm Condition Val.

```

MAIN MENU
1-Units
2-Scales
3-Measure
4-alarms
5-Inputs

```

```

INPUTS
UFv P. reset= ON 5.1
HWv P. reset= ON 5.2
CWv P. reset= ON 5.3
AXv P. reset= ON 5.4
HEv P. reset= ON 5.5
CEv P. reset= ON 5.6
P.Count lock=OFF 5.7
UFv T. reset= ON 5.8
HWv T. reset= ON 5.9
CWv T. reset= ON 5.10
AXv T. reset= ON 5.11
HEv T. reset= ON 5.12
CEv T. reset= ON 5.13
T.Count lock=OFF 5.14

```

5.1 Vector fluid vol. part. reset input en.  
5.2 Hot water vol. partial reset input en.  
5.3 Cold water vol. partial reset input en.  
5.4 Aux fluid vol. partial reset input en.  
5.5 Heating energy partial reset input en.  
5.6 Cooling energy partial reset input en.  
5.7 Partial counters lock input enable  
5.8 Vector fluid vol. total reset input en.  
5.9 Hot water vol. total reset input en.  
5.10 Cold water vol. total reset input en.  
5.11 Aux fluid vol. total reset input en.  
5.12 Heating energy total reset input en.  
5.13 Cooling energy total reset input en.  
5.14 Total counters lock input enable

```

MAIN MENU
1-Units
2-Scales
3-Measure
4-alarms
5-Inputs
6-Outputs

```

```

OUTPUTS
D.Out1= AIN ERR. 6.1
D.Out2= DT m+M 6.2
A.Out1= DT 6.3
A.Out2= DT 6.4
A.Out1=mA 4_20 6.5
A.Out2=mA 4_20 6.6

```

6.1 Digital Out 1 function selection  
6.2 Digital Out 2 function selection  
6.3 Analog Out 1 function selection  
6.4 Analog Out 2 function selection  
6.5 Analog Out 1 current range sel.  
6.6 Analog Out 2 current range sel.

```


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

```

```

8 COMMUNICATION
9 BACnet= MSTP
10 Modbus= RTU
11 M-bus= ON
12 Dev. Address=003
Com.Speed=115200
Parity= NO 1SB
Ans. Delay=ms 00
ETH DHCP en.=
ETH dev IP addr.
ETH network mask
ETH gateway add.
ETH DNS address=
Bnet max mst=127
Bnet ONr=0000033
MU311_Name
MU311_descript.
MU311_location
Bnet pw=*****
Bnet W.E.= ALL
Mbus ID=00000001
Mbus Dev.T.=AUTO

```

7.1 BACnet Communication Protocol 

7.2 Modbus Communication Protocol

7.3 MeterBus Communication Protocol

7.4 Device Communication Address

7.5 Communication Speed

7.6 Communication Parity Bits

7.7 Communication Answer Delay

7.8 Ethernet DHCP enable

7.9 Ethernet device IP address

7.10 Ethernet network mask

7.11 Ethernet gateway address

7.12 Ethernet DNS address

7.13 BACnet max master

7.14 BACnet Object Instance Number

7.15 BACnet Device Object Name

7.16 BACnet Device Object Description

7.17 BACnet Device Object Location

7.18 BACnet Device Managem. Password

7.19 BACnet Device Object Write Enable

7.20 MeTerbus Identifier number

7.21 Meterbus Device TYPE

```

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

```

```

9 DISPLAY
10 Language= EN
11 Contrast= 5
12 Disp.time=s 030
Disp. F.Num.= 1
Disp. P.Lock=OFF
Disp. A.Scroll=000
Disp.date= MAIN
LED Op. Mode=SIG
LED VF Blink= ON
LED HW Blink= ON
LED CW Blink= ON
LED Comm.Blk=ALL
Quick start= OFF

```

8.1 Language for all messages

8.2 Display contrast adjustment

8.3 Display/keyboard inactivity time

8.4 Display page function number

8.5 Display lock page number

8.6 Display auto-scroll pages bits (0=disab.)

8.7 Time and date display enable

8.8 LED Operating Mode color switch

8.9 LED Vector Fluid blink enable

8.10 LED Hot Water blink enable

8.11 LED Cold Water blink enable

8.12 LED Communication blink enable

8.13 Quick start menu enable

```

DATA LOGGER
D.logger en.= ON
Meas. units= ON
Field separat.=;
Decimal separ.=.
Interv.=00:01:00
Tot. volume= ON
Par. volume= ON
Tot. energy= ON
Par. energy= ON
Temperatur.= ON
Therm. power= ON
U.F. flow r.= ON
Log ALARM Nr= ON
Log TempS D.= ON
Log Board T.= ON
Log Int.B.UC= ON

```

9.1 Data logger sampling enable

9.2 Measure units recording enable

9.3 Field separator character

9.4 Decimal separator character

9.5 Sampling interval

9.6 Enable log of volume total totalizer

9.7 Enable log of volume partial totalizer

9.8 Enable log of energy total totalizer

9.9 Enable log of energy partial totalizer

9.10 Enable log of temperatures

9.11 Enable log of thermal power

9.12 Enable log of vector fluid flow rate

9.13 Alarm events number logging enable

9.14 Temperature sensor's data logging enable

9.15 Board temperatures logging enable

9.16 Internal board voltages & curr. log.enable

```

9-Data logger
10-Functions
11-Diagnostic
12-System

```



```

FUNCTIONS
UFv P. reset
HWv P. reset
CWv P. reset
AXv P. reset
HEv P. reset
CEv P. reset
UFv T. reset
HWv T. reset
CWv T. reset
AXv T. reset
HEv T. reset
CEv T. reset
Load Dev. Fact.
Save Dev. Fact.
Acknow. Fact. Warn

```

- 10.1 Vector fluid vol. part. reset function
- 10.2 Hot water vol. partial reset function
- 10.3 Cold water vol. partial reset function
- 10.4 Aux fluid vol. partial reset function
- 10.5 Heating energy partial reset function
- 10.6 Cooling energy Partial reset function
- 10.7 Vector fluid vol. total reset function
- 10.8 Hot water vol. total reset function
- 10.9 Cold water vol. total reset function
- 10.10 Aux fluid vol. total reset function
- 10.11 Heating energy total reset function
- 10.12 Cooling energy total reset function
- 10.13 Load device factory default values
- 10.14 Save device factory default values
- 10.15 Acknowledge factory data warning message

```

10-Statistics
11-Diagnostic
12-System

```

```

DIAGNOSTIC
Reboot-Self_Test
Firmware info
SD card info
Battery info
Ethernet info.
F.Bus comm.diag.
Disp.comm.vars
Display measures
S/N= 000002
WT=0000:00:00:00
BW=0000:00:00:00
PT=0000:00:00:00
Display test
Simulation= ON

```

- 11.1 Reboot exec. self test diag. funct.
- 11.2 Firmware version information
- 11.3 SD card status information
- 11.4 Battery information
- 11.5 Ethernet information
- 11.6 FieldBus comm.diag. values
- 11.7 Display comm.diagnostic values
- 11.8 Diagnostic Measure ValueS
- 11.9 Board serial number (read only)
- 11.10 Total working time (read only)
- 11.11 Battery working time (read only)
- 11.12 Partial counters / L.T.S. life time
- 11.13 Display verification
- 11.14 Flow & Temp. sim. function

```

11-Diagnostic
12-System

```

```

SYSTEM
RTC enable= ON
Dayl.saving= ON
Time zone=+01.00
2018/01/30-11:11
L1 code=*****
L2 code=*****
L3 code=*****
L4 code=*****
L5 code=*****
L6 code=*****
Restr.access=OFF
TC= 2473904
010.011.012.013
010.011.012.012
255.255.255.254
T1-T2 BALANCE
T1 OFFS.= °C+0.00
T2 OFFS.= °C+0.00
ADC 4mA= 00559
ADC 20mA= 02830
DAC1 4mA= 03459
DAC1 20mA= 14767
DAC2 4mA= 03484
DAC2 20mA= 14780
Stand-by
FW update

```

- 12.1 Date/Time (Real Time Clock) enable
- 12.2 Daylight saving time change
- 12.3 Localized time zone
- 12.4 System date and time
- 12.5 Access level 1 code
- 12.6 Access level 2 code
- 12.7 Access level 3 code
- 12.8 Access level 4 code
- 12.9 Access level 5 code
- 12.10 Access level 6 code
- 12.11 Restricted access level
- 12.12 Total measure cycles
- 12.13 Device IP network address
- 12.14 Client IP network address
- 12.15 Network mask
- 12.16 Temperature T1 - T2 calibration balance
- 12.17 Temperature T1 calibration offset
- 12.18 Temperature T2 calibration offset
- 12.19 ADC in 4mA calibration point
- 12.20 ADC in 20mA calibration point
- 12.21 DAC1 out 4mA calibration point
- 12.22 DAC1 out 20mA calibration point
- 12.23 DAC2 out 4mA calibration point
- 12.24 DAC2 out 20mA calibration point
- 12.25 System stand-by mode activation (poweroff)
- 12.26 Firmware update

```

11-Diagnostic
12-System

```

## ■ HOW TO ORDER

CODE EXAMPLE	Certification	
0	0	WITHOUT MID-004
	M	CE M CERTIFICATION: MID-004
B	<b>Display</b>	
	A	Blind version (without display)
	B	Graphic display 128 x 48 pixels with back light, 3 keys and RGB status LED.
2	<b>Housing material / Protection rate</b>	
	1	Without Housing
	2	PC/ABS housing sealable
A	<b>Flow Rate Source (Thermal Fluid)</b>	
	A	Pulses
	B	4/20 mA
	C	Pulses - 4/20 mA selectable by the customer, option NOT valid for MID instrument
1	<b>Power supply</b>	
	1	Power Supply : 100 ... 240 VAC 44/66 Hz
	2	Power Supply : 24 ... 36 VAC/VDC 0...44/66 Hz
	3	Power Supply : 12...48 VDC
	4	Power Supply : 12...48 VDC + P.o.E. (Power Over Ethernet - Ethernet port is required)
A	<b>Analogue output</b>	
	A	Without Analog Out
	B	n° 1 Programmable Analogue output 0/4...20/22 mA
	C	n° 2 Programmable Analogue outputs 0/4...20/22 mA
0	<b>Digital Output</b>	
	0	Without Digital Output
	1	With n° 2 Programmable Digital Outputs (Transistor)
A	<b>Communication Gateway</b>	
	A	Without Gateway
	B	RS485 port
	C	Mbus
	D	Ethernet port
	E	RS485 + Ethernet port
	F	Mbus + Ethernet port
G	Others	
0	<b>Protocols</b>	
	0	Without Protocol
	1	Modbus (RTU over RS485/ IP over Ethernet) - Modbus Protocol requires RS485 and/or Ethernet Gateway
	2	Bacnet (MS-TP over RS485/IP over Ethernet) - BACnet Protocol requires RS485 and/or Ethernet Gateway
	3	BACnet MS-TP/Modbus RTU - selectable by the customer - (over RS485)
	4	Mbus (M-bus Protocol requires Mbus Gateway)
	5	Mbus + Modbus IP (Mbus Protocol requires Mbus Gateway)
	6	Mbus + BACnet IP (Mbus Protocol requires Mbus Gateway)
	7	Modbus RTU/IP + BACnet MS-TC/IP
8	Mbus + Modbus IP + BACnet IP (Mbus Protocol requires M-bus Gateway)	
	9	Others

<b>B</b>	<b>Thermal Probe</b>	
	<b>A</b>	Without PT, selectable by the customer (default PT100)
	<b>B</b>	PT 100
	<b>C</b>	PT 500
	<b>D</b>	PT 1000
<b>0</b>	<b>RTC - Measure BackUp - Data Logger</b>	
	<b>0</b>	Without RTC - Measure BackUp - Data Logger
	<b>1</b>	RTC - With Autonomy of 7 days ( No measure back-up)
	<b>2</b>	RTC + Measure Back-Up With Autonomy up to 1 Month
	<b>3</b>	RTC - With Autonomy of 7 days + Data Logger with MicroSD Memory 4 GB ( No measure back-up)
<b>4</b>	RTC + Measure BackUp (With Autonomy up to 1 Month)+ Data Logger with MicroSD Memory 4 GB	
<b>A</b>	<b>Special Features</b>	
	<b>A</b>	NONE



**MV311-0B2A1A0A0B0A** (Complete code example for order)

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