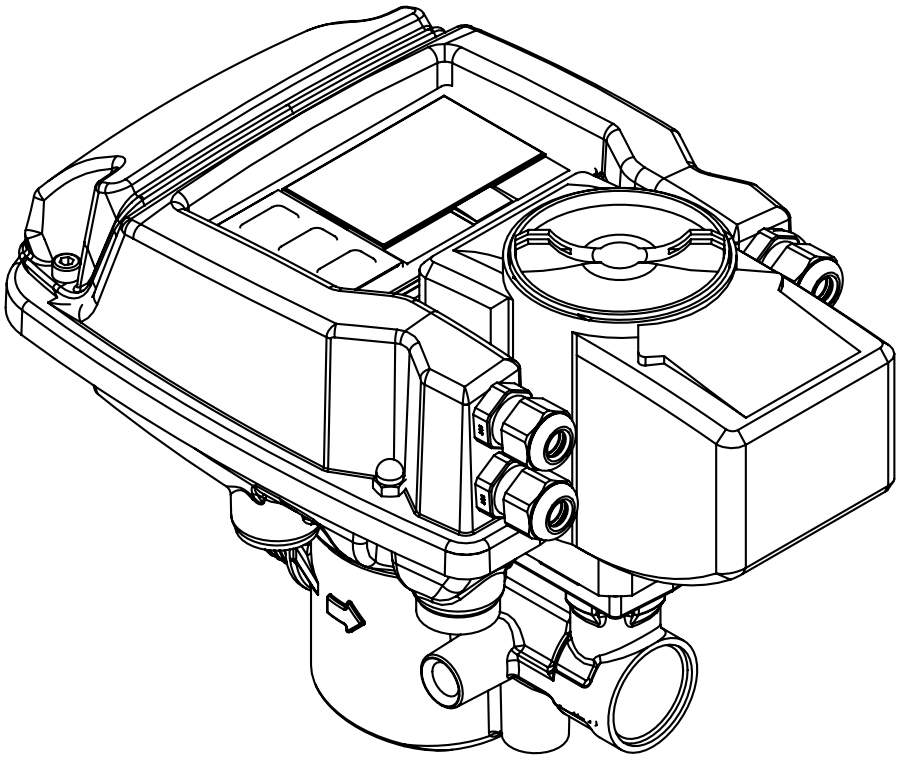
OPERATING AND MAINTENANCE MANUAL

CS611



CE

ISOIL INDUSTRIA

Release number: **MAN_CS611_IT_EN_IS_R02_1.01.XXXX** -

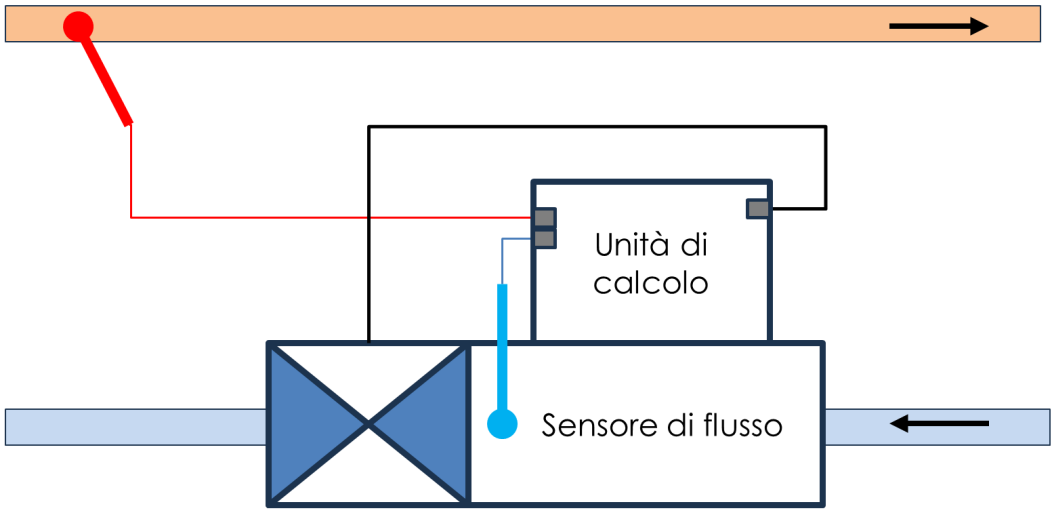
The characters of file name in bolt type indicate the software version which the manual refers to; it is visualized at the instrument start up, or by specific function on DIAGNOSTIC menu.

INDEX:

INTRODUCTION

These operating instructions and description of device functions are provided as part of the supply's scope. They could be modified without prior notice. The improper use, possible tampering of the instrument or parts of it and substitutions of any components not original, makes the warranty automatically void.

The meter CS611-IS is an hybrid counter, in which to the calculator with integrated flow sensor is connected a couple of temperature sensors. The flow sensor incorporates a motorized control valve.



SAFETY INFORMATIONS

The meter must be used for the use for which it was built. The improper use, possible tampering of the instrument, of its parts and substitutions of some non-original components, will automatically void the warranty and also the CE mark, if it's provided with. Installation and use are permitted only to qualified personnel.

- ❑ Transport the measuring device to the measuring point into the original packaging.
- ❑ Disposal of this product, or parts of it, must be carried out according to the local public or private waste collection service regulations.
- ❑ The meter must only be installed, connected, commissioned and maintained by qualified and authorized specialists (e.g. electrical technicians) in full compliance with the instructions in these Operating Instructions, the applicable norms, legal regulations and certificates (depending on the application).
- ❑ The specialists must have read and understood these operating Instructions and must to follow the instructions they contain. The Operating Instructions provide detailed information on the meter. If something in these Operating Instructions isn't clear to you, you can call the ISOIL service department.
- ❑ Repairs can only be performed if a genuine spare parts kit is available and if this repair work is expressly permitted.
- ❑ During assembly, pay attention to possible risks that the installer may incur, therefore use suitable PPE (personal protective equipment), as required by the installer's risk assessment safety plan.
- ❑ Fill the system with the valve in open position

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- In case of display damage, avoid any kind of direct accidental contact and call the service center for possible replacement. Always comply with local regulations regarding the disposal of electrical LCD devices.
- Always make the electrical connections and installation of the instrument in voltage absence, especially if live electrical parts are directly accessible. For a better ease of wiring it should be noted that the terminal covers are removable. Make sure that the internal parts do not come into contact with liquids during wiring so as not to compromise the instrument from a functional and safety point of view.
- Each part of the instrument must be examined or supplied exclusively by the manufacturer or his representative
- The supply voltage must correspond to that specified on the data plate
- To clean the device, use only a cloth, while for maintenance / repairs contact the service center (see the last page).
- For the transport and the yield of the product use (photocopying) the form present at the end of this manual taking care to fill it in all its parts.
- Don't use the valve as far as any part of it as a fixing point.
- Remove any foreign bodies from the pipes and from the valve.
- Provide special dirt separator filters for cleaning hydraulic system.
- Don't cover electronic components and electric actuators with thermal insulating material to prevent overheating
- Don't touch the hot parts without preventive protective measures
- Don't install in systems that require features exceeding those of the product.
- The instrument can't be exposed to corrosive environments
- For remove the instrument from a plant: turn power supply off, remove pressure and let the valve reach ambient temperature

Before the instrument first start verify that:

- The supply voltage corresponds to that one indicated on the data plate.
- The electrical connections are carried out in compliance with the indications in this manual.
- If the instrument is used in a another way than the one specified by the manufacturer, the protection provided by the device may be compromised.

Verify periodically (3-4 months):

- The power supply cables integrity, wiring and other connected electrical parts
- The meter housing integrity
- The front panel integrity (display and keyboard)
- The mechanical fixing of the meter to the wall stand.

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SAFETY CONVENTION

 DANGER ELECTRIC SHOCK	 WARNING	 PRECAUTIONS	 ATTENTION! SEE DOCUMENTATION

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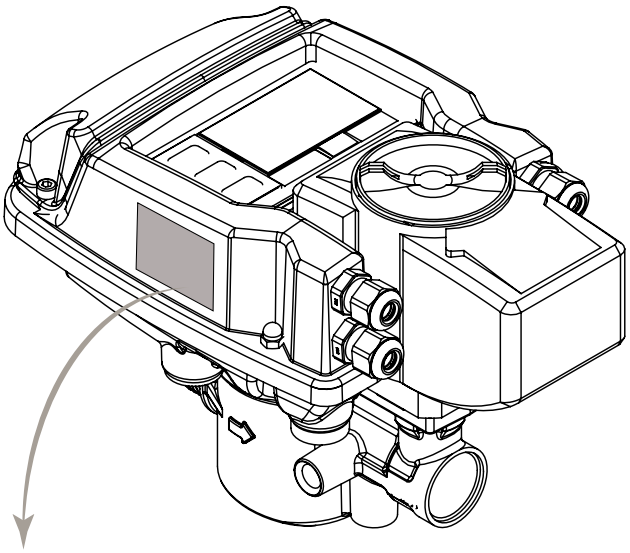
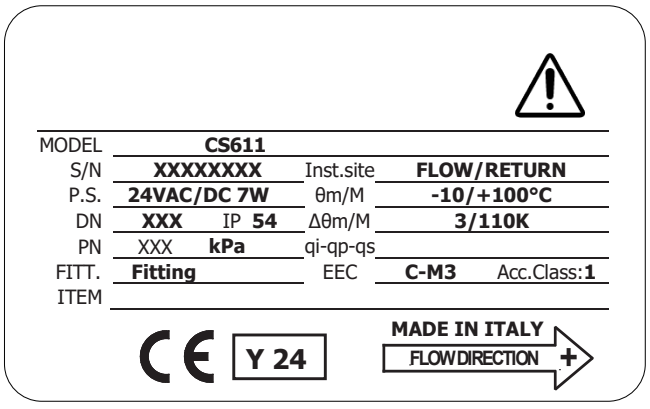
DATA PLATE





ELECTRIC CHARACTERISTIC

Instrument classification: class I,

IP54 (where: 5 = dust protected, limited ingress of dust 4= Protected against water splashed from all directions)

overvoltage category II, rated pollution degree 2.

Power supply voltage	Frequency supply voltage	Min power	Max power
24 AC/DC	50/60 Hz	7W	10W

24 VAC/VDC operating only with safety isolating transformer according EN 61558-2-6

ENVIRONMENTAL USE CONDITIONS

- ❑ The instrument can be installed inside buildings
- ❑ Pressure: 700 ÷ 1200 hPa
- ❑ Humidity range: 0-100% (IP54)

MECHANICAL RESISTANCE

The equipment has a mechanical impact resistance of M3

During the intended application, the tool must not be easily accessible to unauthorized persons or the general public; access to the equipment is limited to occasional operations such as adjustment, programming and maintenance.

TEMPERATURES

OPERATIVE		
	Min	Max
°C	-5	60
°F	23	140

MEASURABLE		
	Min	Max
°C	-10	110
°F	14	212

The operative temperature is the environmental one where the device is installed, while the measurable one is that of the liquid measured.

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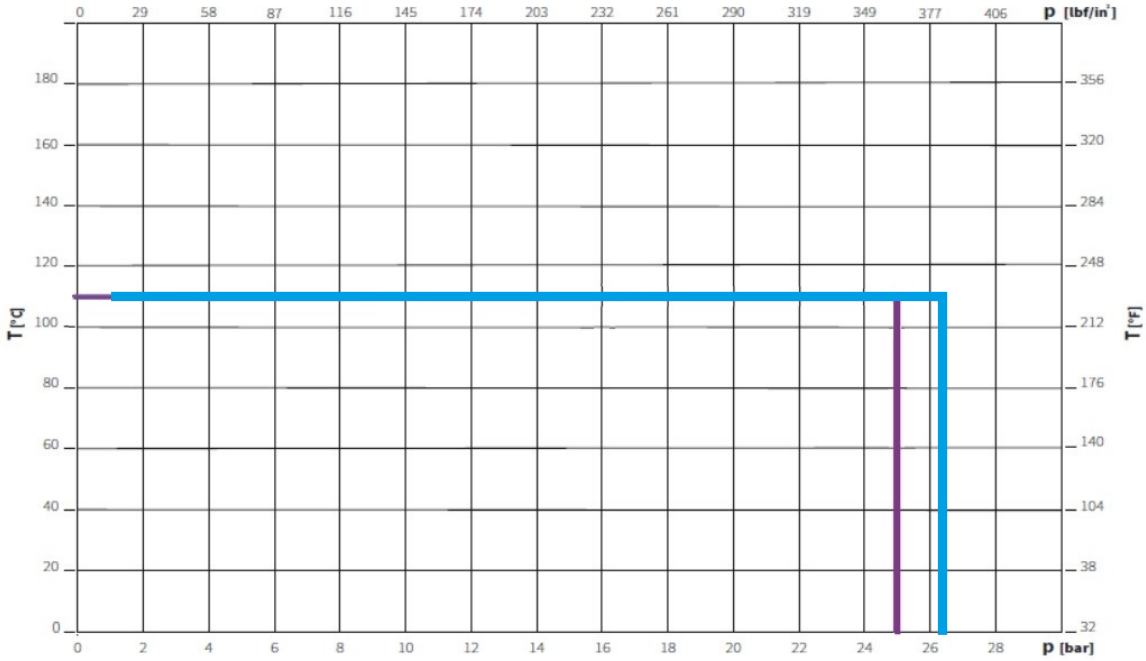
P&T DIAGRAM



HARDWARE CHARACTERISTICS

- ❑ N°1 ON/OFF for pulses/ alarm Output : 1250 Hz, 100mA, 30 Vdc
- ❑ N°1 Programmable digital Input
- ❑ N°1 Programmabile analog Input: 0-10V , 2-10V 0-5V, 1-5V 0-20mA, 4-20mA

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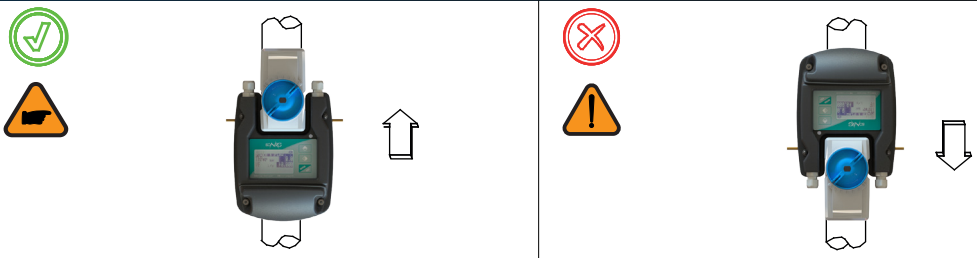
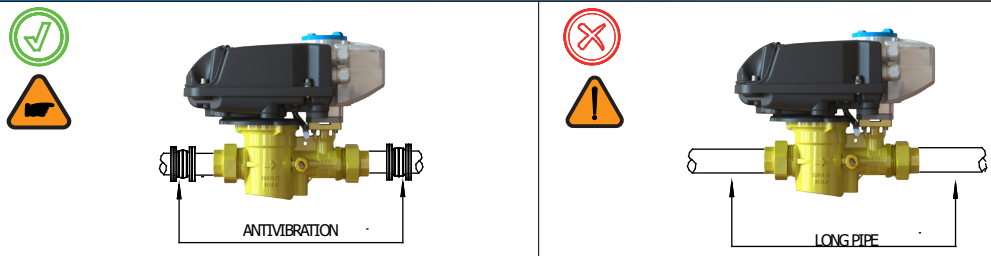
INSTALLATION RECOMMENDATIONS

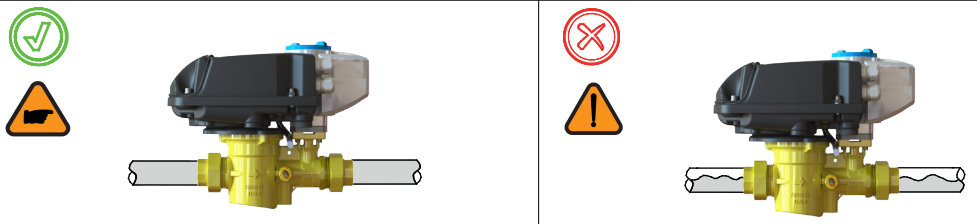
In vertical installations an ascending flow is preferable.
For vertical installations with descending flow direction contact the manufacturer



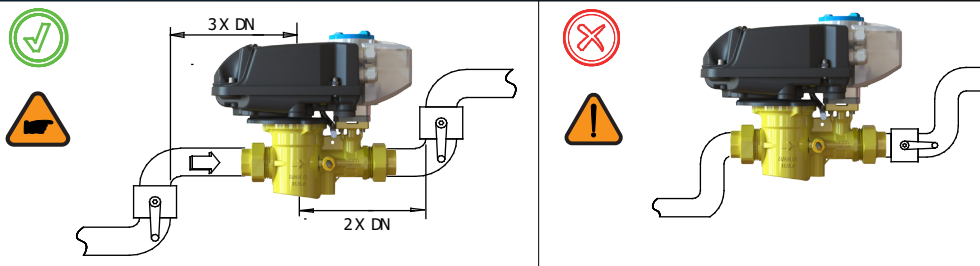
For installations in long pipe lines, please use anti vibration joints



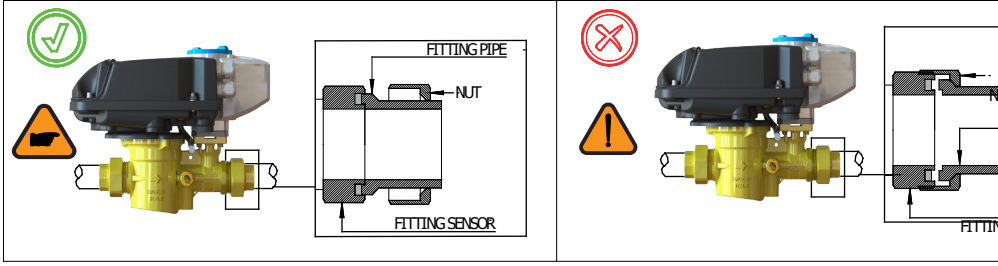
Avoid a partially empty pipe, during operation the pipe must be either completely full of liquid or completely empty



Install the sensor away from bends and hydraulic accessories



Avoid positioning fittings by tigthening the clamps.



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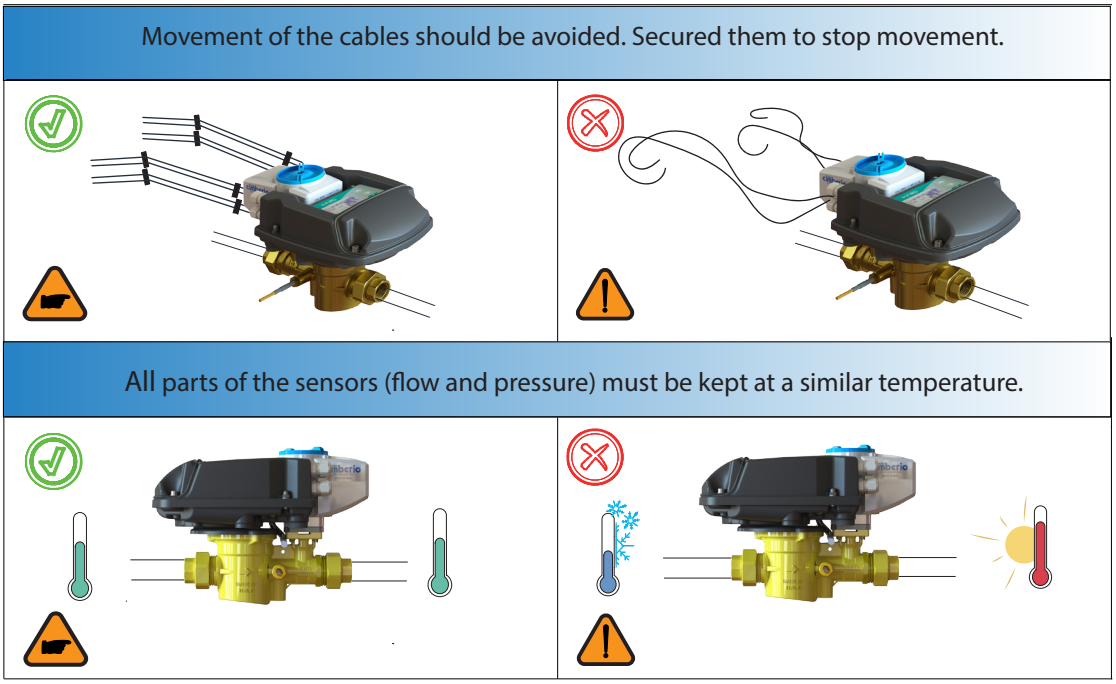

- CS611 can be installed in either horizontal or vertical position. Avoid exposing the valves to constant installation stress caused by an imperfect alignment of pipes or by thermal deformation.
- Install the “partner valve” to the flow side of the heat exchanger (if CS611 is on the return one).
- Screw the temperature probe in the dedicated fitting of partner valve.
- It is recommended that a strainer is installed to protect the devices from dirt coming from the hydraulic system.

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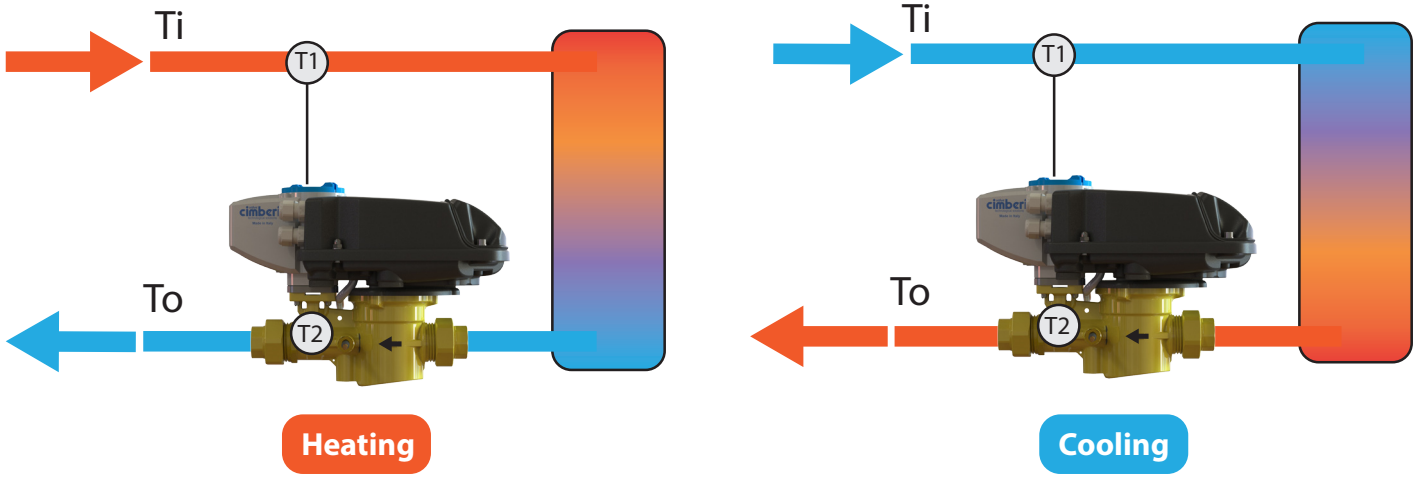
Standard Installation (outlet) : Heating/Cooling

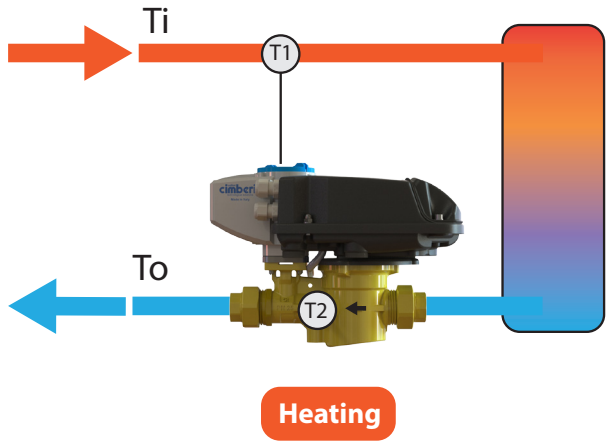
```
MEASURE
+VF m. mode=          H/C
+VF mea.side=          To
-VF m. mode=          OFF
```



- Flow Direction: Positive Only (no energy calculation on negative flow)
- Installation Side: Outlet
- Cooling / Heating: based on dT and TiHC only.

Standard Installation (outlet) : only heating example

```
MEASURE
+VF m. mode=          HEAT
+VF mea.side=          To
```



- **Flow Direction:** Positive
- **Installation Side:** Outlet
- **Cooling / Heating:**
  1. Heating only on Positive Flow no cooling energy calculation on positi ve flow
  2. exclusion based on dT and TiHC will apply

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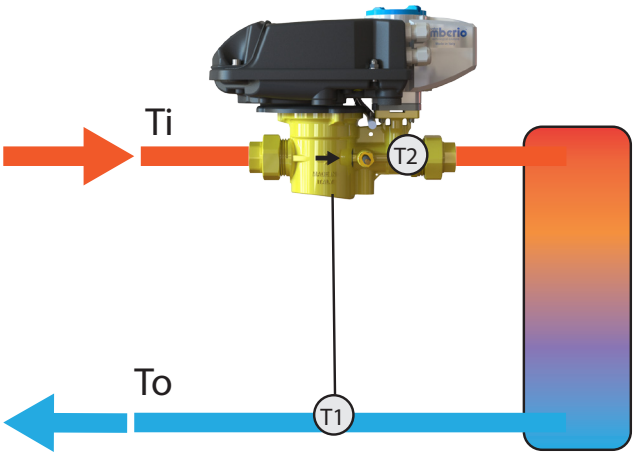
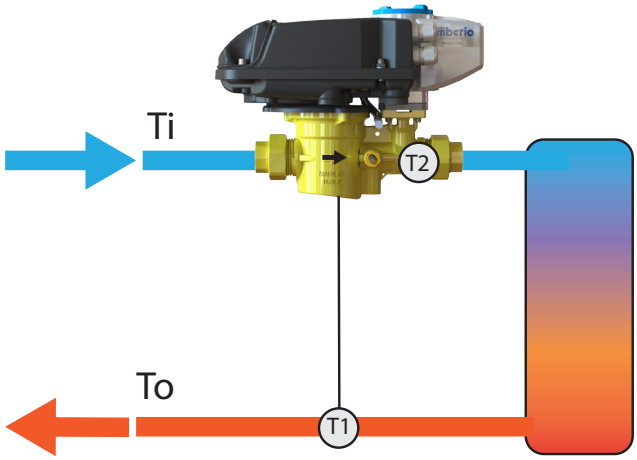
Other Installation (inlet) : Heating/Cooling



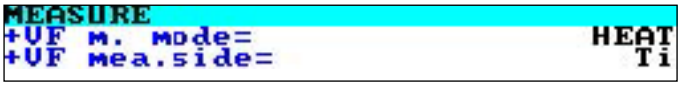
Heating

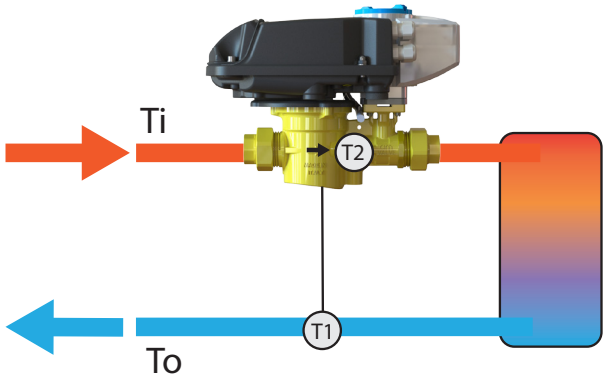


Cooling

- ❑ Flow Direction: Positive Only (no energy calculation on negative flow)
- ❑ Installation Side: Inlet
- ❑ Cooling / Heating: based on dT and TiHC only.

Other Installation (inlet): only Heating example





Heating

- ❑ **Flow Direction:** Positive
- ❑ **Installation Side:** Inlet
- ❑ **Cooling / Heating:**
  1. Heating only on Positive Flow no cooling energy calculation on positive flow
  2. exclusion based on dT and TiHC will apply

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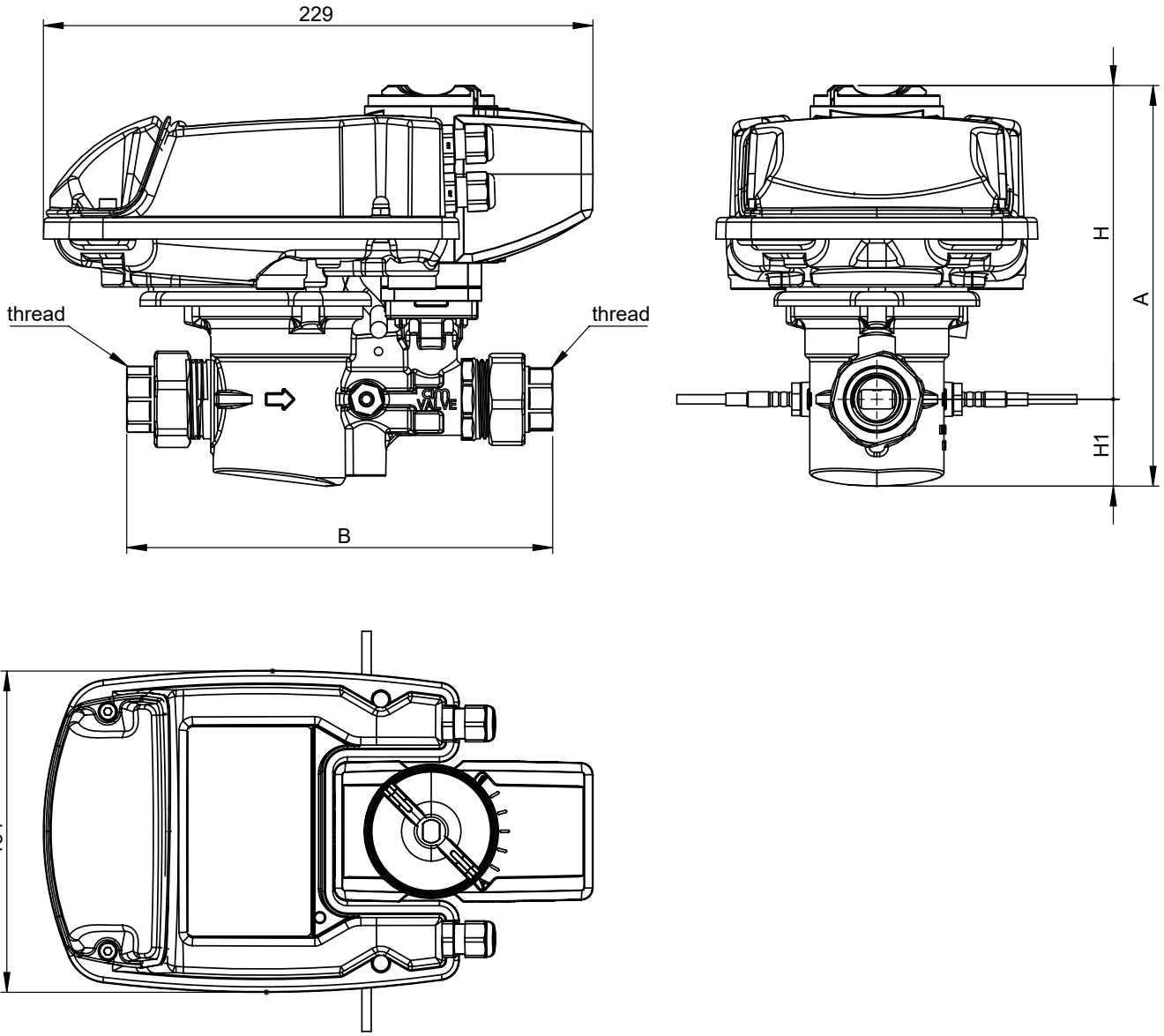
OVERALL DIMENSIONS



Dimensions						
DN	15	20	25	32	40	50
A (mm)	165	165	175	175	190	200
B (mm)	177	182	212	216	271	275
H (mm)	132	132	139	139	151	151
H1 (mm)	36	36	39	39	48	48
thread (inches)	1/2"	3/4"	1"	1"1/4	1"1/2	2"

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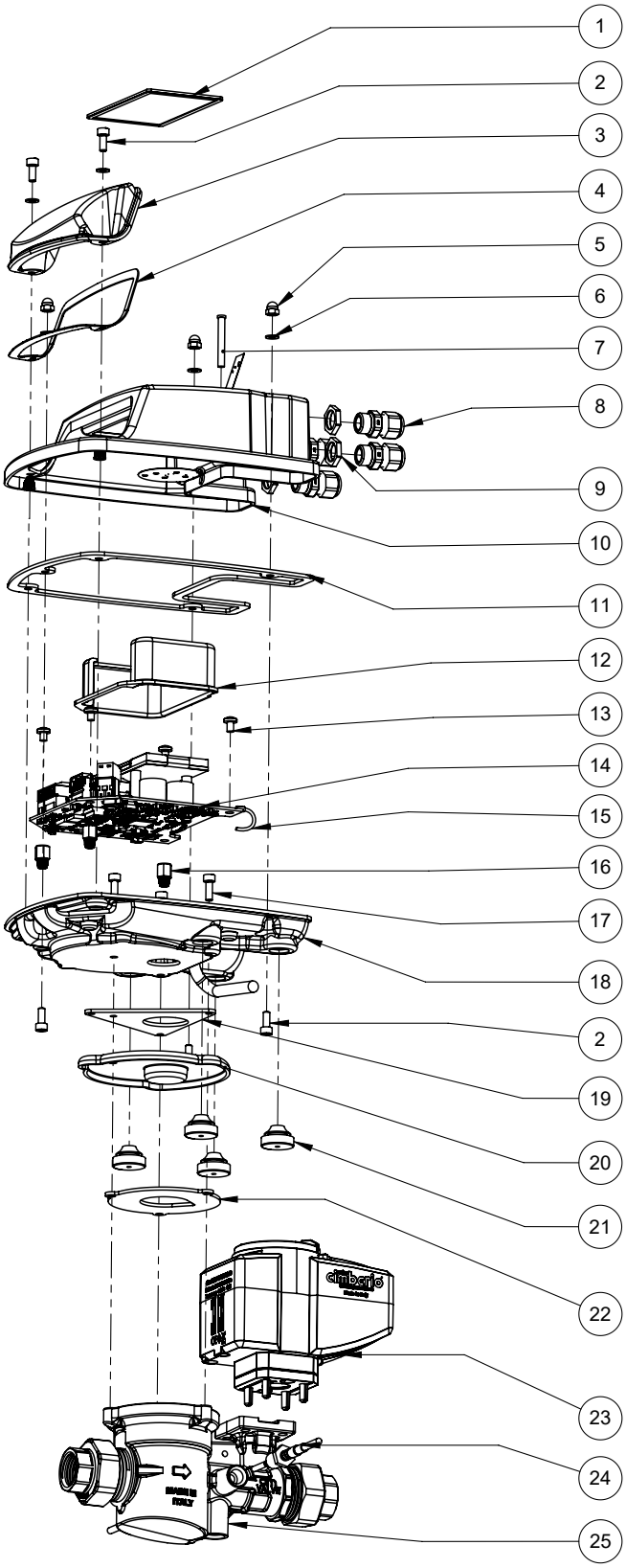
CS611 CONSTRUCTION



POS.	DESCRIPTION	QT.	MATERIAL
1	SCREEN-PRINTED GLASS	1	LEXAN 9030TG+ Biadesivo
2	SCREW M4X10 INOX TCE	8	Acciaio Inox
3	TERMINAL COVER	1	ABS
4	TERMINAL COVER GASKET	1	EPDM espanso P304/B
5	BLIND NUT INOX M4	3	Acciaio inox
6	FLAT GROWER INOX Ø 4	5	Acciaio inox
7	GUIDALED	1	Policarbonato
8	PG7 CABLE GLAND WITH O-RING	4	Poliammide
9	BRASS RING NUT	4	Ottone
10	UPPER SHELL	1	ABS
11	UPPER SHELL GASKET	1	EPDM espanso P304/B
12	INTERNAL BOX	1	ABS
13	SCREWS M4 X 6 TC	4	Inox
14	BOARD	1	Vetronite
15	GROUND CABLE	1	---
16	SPACER MF06 H 4080.5 08	4	Ottone
17	SCREW M4X12 INOX TCE	4	Inox
18	BOTTOM SHELL	1	ABS
19	ADAPTER GASKET	1	EPDM 60 sh tipo 4000
20	ADAPTER	1	ABS
21	CONICAL GLANDS	4	EPDM
22	GASKET DN 15-20 GASKET DN 25-32 GASKET DN 40-50	1	EPDM 60 sh tipo 4000
23	VALVE MOTOR	1	---
24	TEMPERATURE PROBES	2	---
25	BRASS VALVE BODY	1	---

Sensor materials:

- ❑ Lining/ gaskets:PEEK/FPM
- ❑ Electrode: HC276

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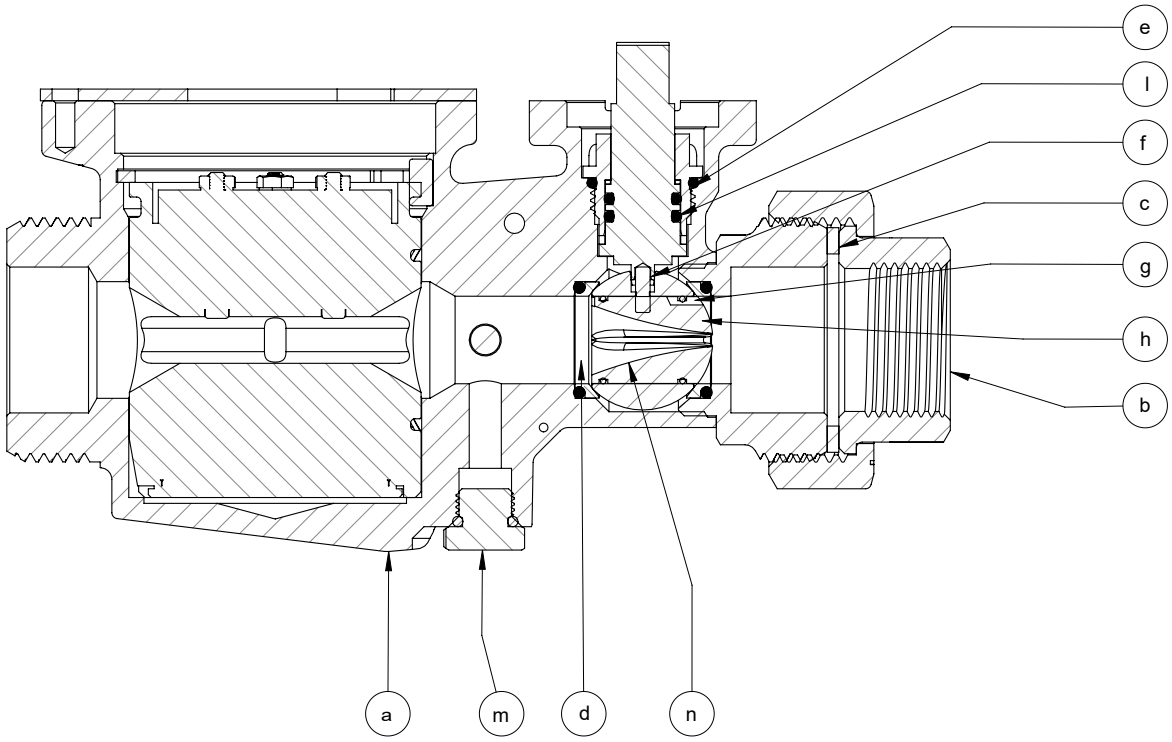
Valve detail



POS.	DESCRIZIONE	QT.	MATERIALE
a	BODY	1	CW511L-DW; T.E.A.+® coating
b	FEMALE-FEMALE TWO-PIECE FITTING	8	CW511L-DW; T.E.A.+® coating
c	SCREWED END	1	CW511L-DW; T.E.A.+® coating
d	BALL	1	CW511L-DW; chrome plating
e	STEM AND CAP	3	CW617N-DW / PTFE /EPDM
h	PIN	5	AISI 304
g	INSERT	1	Rayton R-4
f	O-RING	4	EPDM 70 PEROX
l	BALL GASKET WITH O-RING	4	PTFE EPDM70 PEROX
m	STEM O-RING	1	EPDM 70 PEROX
n	PLUG	1	CW617N-DW

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ENERGY VALVE FEATURES

Main features

- ❑ Two way ball valve made of DZR brass alloy;
- ❑ Ball with flow passage characterized by an accurate flow regulation
- ❑ Three pieces connection ends which allow an easy valve installation
- ❑ Electric motor actuator with stroke indicator and emergency manual operation

Technical features

VALVE	
Max. static working pressure	❑ 25 bar
Max. water, water-glycol temperature	❑ 110 °C
Min. temperature	❑ -10°C
Fluids	❑ Water, water-glycol mixture
Valve body material	❑ EN12165 CW511L-DW
Screwed end material	❑ EN12165 CW511L-DW
Ball material	❑ EN12165 CW511L-DW (from 1/2" to 1"1/4) EN1982 CC770S-DW low lead (from 1/2" to 2")
O-ring	❑ EPDM Perox
Threads	❑ ISO 228

ACTUATOR	
Power supply	❑ 24Vac/dc (5.5VA/5W)
Command signal and feedback	❑ Input=2.10VDC Output=2..10VDC
Actuator	❑ Electro motor
Rotation time (90°)	❑ 60 Sec
Protection	❑ IP54
Working ambient temperature	❑ 0÷50°C
Isolating class	❑ Class III
Connection cable	❑ Cable 4x0.75 mm² L= 300 mm
Torque(max)	❑ 10Nm
Noise level	❑ ≤40dB(A)
Valve connection	❑ ISO 5211 F3 Q9 (quick connection ISO-Click - PATENTED)
Manual release	❑ Press and turn the knob
Dimensions	❑ 108 x 60 x h 96 mm (including ISO flange thickness)
Certifications	❑ CE- EN60730-1:2013

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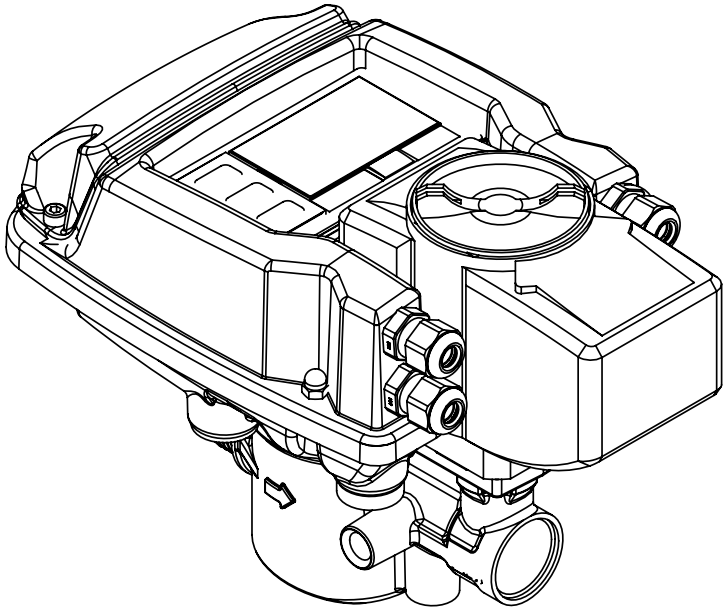
TORQUES



Torques Nm	
Cable glands	1.5

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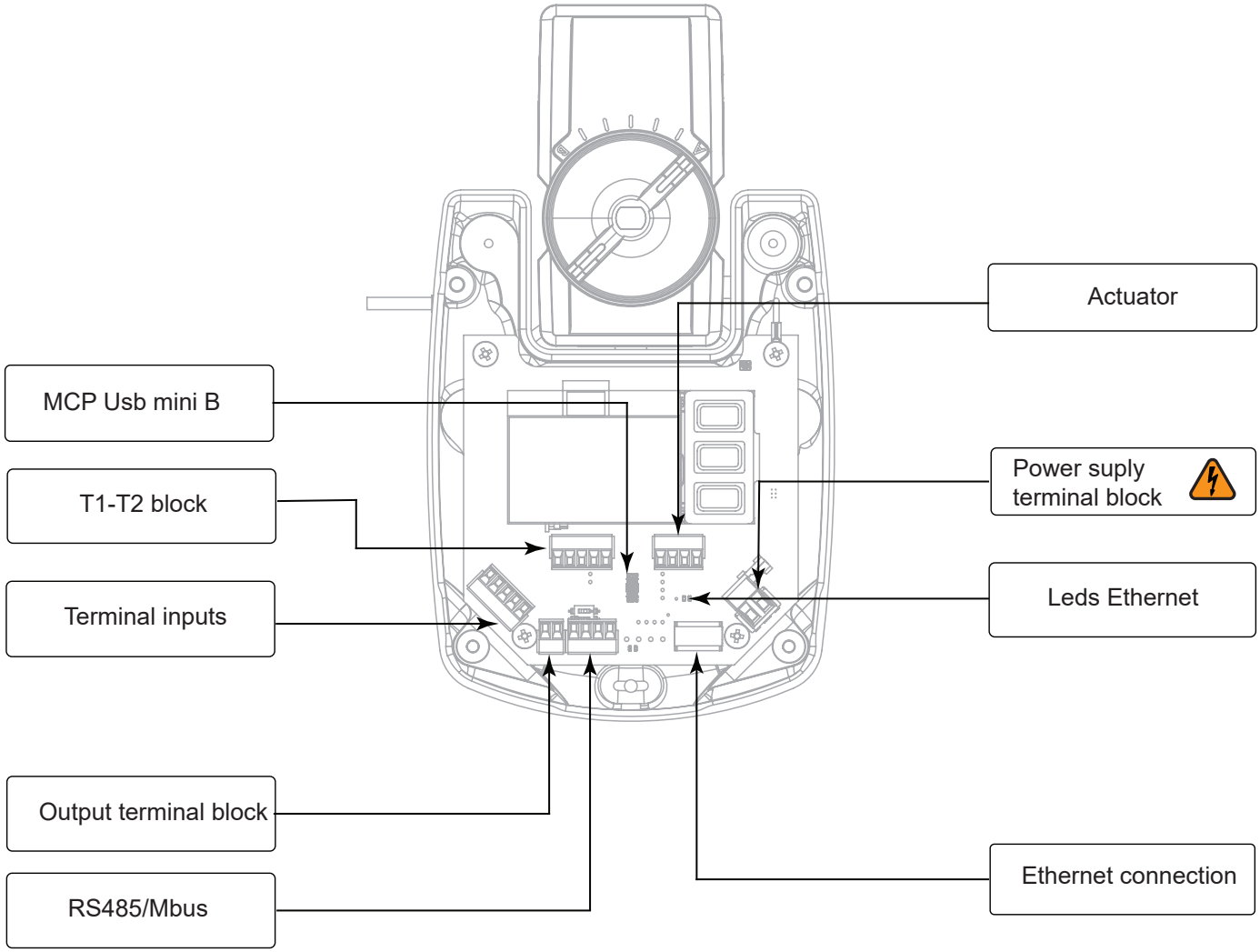
METER TOP VIEW



All signal cables used for the connections must be of a shielded type; the shield must be grounded

CABLE CHARACTERISTICS		
Port name	**Cable shielding**	**Typ. Cable length**
AC mains/DC mains	unshielded	> 3m
RS-485	shielded	> 30 m
Ethernet/LAN	shielded	> 30 m
Temperature probes	unshielded	< 3 m
I/O	shielded	< 30 m

Temperature is measured by a pair of PT thermoresistances (RTD), preferably with 2 wires; the selectable values are: PT100, PT500 and PT1000.

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FRONT LED

COLOR	BLINK	LED STATE MEANING
GREEN	FIXED [1]	Heating mode; Zero flow rate FV o Idle energy storage.
GREEN	BLINK [3]	Heating mode; Detected flow rate FV e Active energy storage.
BLUE	FIXED	Cooling mode; Zero flow rate FV o Idle energy storage.
BLUE	BLINK [3]	Cooling mode; Detected flow rate FV e Active energy storage.
WHITE	FIXED	Hold touch key
WHITE	SHORT BLINK [1 3]	Comunication in progress
RED	FIXED	HP Allarm (High priority)
RED	BLINK. [1]	Generic alarm (Low priority)

1. Alternating with standard color / other operating colors.
2. If the function is active.
3. If the option is active.

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The actual colors used depend on the display menu settings.:

- ❑ **LED Op. mode**= Determines whether the LED color changes depending on the Operating Mode (Heating / Cooling) or not.
  - **OFF** No change (only green, no blue).
  - **SIG** Cambiamento in funzione del segno della potenza rilevato (Verde Riscaldamento, Blu Raffreddamento).
  - **CTR** Cambiamento in funzione del comando impostato (Verde Riscaldamento, Blu Raffreddamento).
- ❑ **LED FV Blink**= Determina se i colore Verde o Blu/Verde lampeggia solo in presenza di portata rilevata del Fluido Vettore e Accumulo Energia attivo o se lampeggia sempre.
- ❑ **LED Comm Blk=** Activates the generation of a short white flash when there is active communication.
  - **OFF** No blink.
  - **MCP** blink only on MCP communication (USB).
  - **BUS** blink only on BUS communication (BACnet, ModBus, M-Bus).
  - **ALL** Blink when there is any communication.

LED ETHERNET

See Ethernet manual

CS611 KEYBOARD

DEVICE KEYS		KEYS MCP	DISPLAY ALARMS [0]	MENU E SUB MENU	CHANGE THE PARAMETERS
	SHORT TOUCH	↑	Scroll the alarms displayed upwards.	Scrolls upwards.	Increment of the numerical digit or of theparameter indicated by the cursor.
	LONG TOUCH	↓	Scroll the alarms displayed downwards.	Scrolls the entries downward.	Decrease of the numerical digit or of the parameter indicated by the cursor.
	SHORT TOUCH	→	Scroll through the screens in the order 0, 1, 2, 3, 4, 5, 6, 7, 8, 0, …	Scrolls the entries downward.	Move to the right of the cursor.
	LONG TOUCH	←	Scroll through the screens in the order 8, 7, 6, 5, 4, 3, 2, 1, 0, 8, …	Flows voices towards the High.	Move to the left of the cursor.
	SHORT TOUCH	Enter	Access the Menus.	Accesses the submenu / accesses the modification of the value or execution of the function.	Move to the left of the cursor.
	LONG TOUCH	Esc/ Del	Inactive.	Exit the Submenu / return to the Work screens.	Cancel the entered / selected value.

MEANING OF FLAGS

NOTE: Icons in the same category (eg Power, MCP connection, ...) are displayed alternatively in the same position.

SIMBOL	DESCRIPTION
BLINK ALARMS	
	HP Alarm (High Priority); in the presence of this alarm the main function of the device does not work!
	Generic Alarm (Low Priority); all other alarms that do not inhibit the main function of the device (see alarm list for details); this alarm may not be present if there is a specific icon for each active alarm.
	Temperature sensor disconnected.
	Temperature sensor(s) resistance error.
	Temperature sensor pilot error T1/T2
	Empty pipe detected
	Not valid signal measured by magnetic sensor; It may also appear in case of empty pipe when the specific function is deactivated.
	Significant disturbance detected by the magnetic sensor; It could be a major electrical disturbance or the passage of large quantities of air.
	Magnetic sensor pilot error

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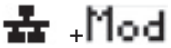
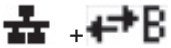
	An Analog Input is disconnected or malfunctioning, the values are invalid for the setting; (see alarm list for details on the input that generated the alarm).
	Overflow or PULSE OUT 1 error
	Overflow value (see alarm list for for details on the measure that generated the alarm: flow rate, power, dT, T1 o T2).
ETHERNET COMMUNICATION	
	Ethernet connected to 10M
	Ethernet connected to 100M.
	Alternating CMODbus-TCP connected..
	MODbus-TCP; communication with CS611 in progress (Generates White LED flash if enabled).
	BACnet-IP alternate; communication error.
	BACnet-IP alternate; recent communication
	BACnet-IP alternate; communication with CS611 in progress (Generates White LED flash if enabled).
	BACnet-IP alternate; communication error.
VARIOUS	
	Blinking Simulation mode activated!!
	Totalizer blocking function (Total or Partial) active.
POWER SUPPLY	
	Main power supply present
	Main power supply error
	Powered by USB (does not charge the battery!).
FIELDBUS COMMUNICATION	
	MODbus-RTU connected and detected
	MODbus-RTU; communication with CS611 in progress (Generates White LED flash if enabled).
	Communication error on FIELDbus, verify settings
MCP CONNECTION	
	MCP Connection active.
	Download MCP file.
	Load MCP file .

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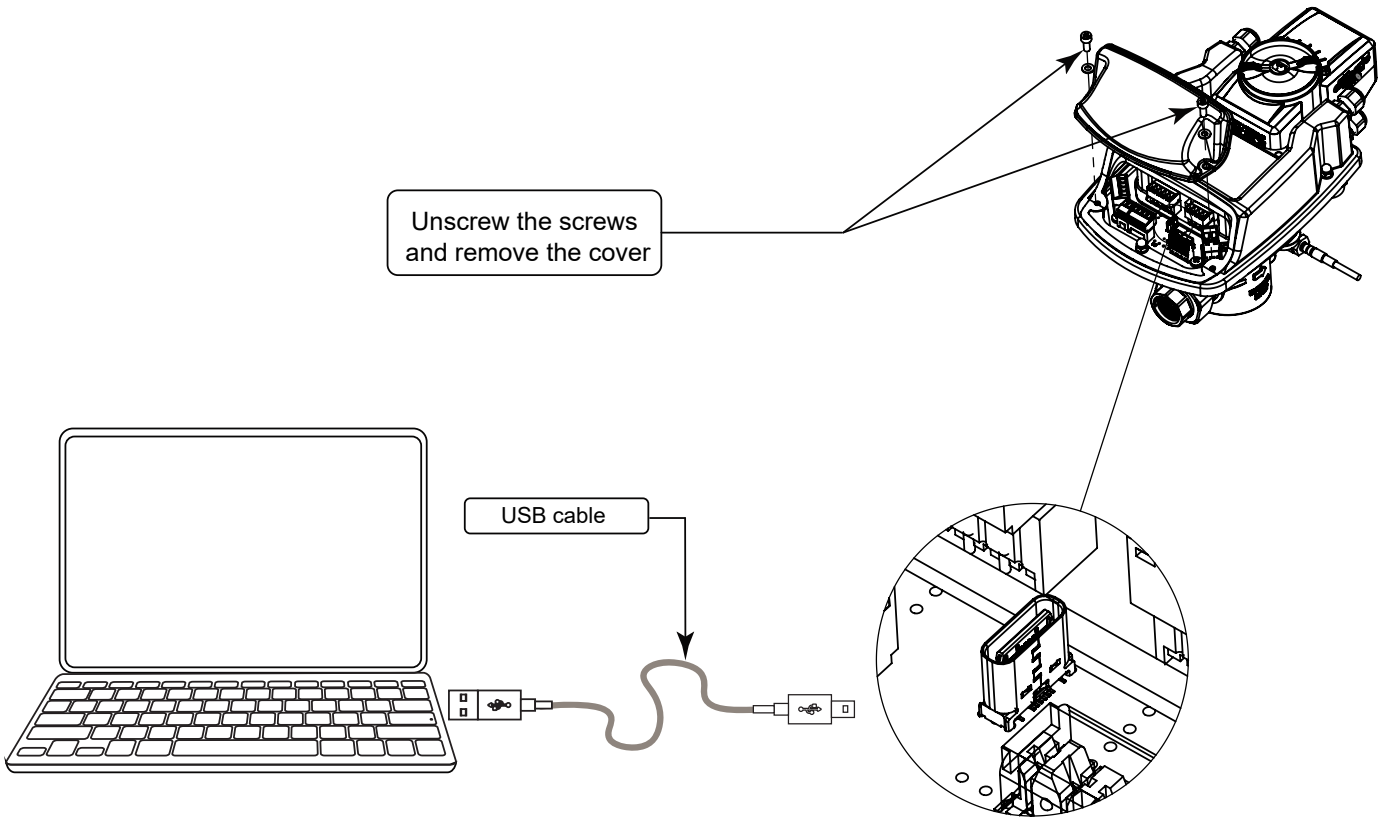
CONNECTION WITH MCP INTERFACE

MCP is a Windows® software that allows you to set all the functions of the converter and to customize the menu. To use the MCP interface, refer to the relative manual.



The physical connection between the PC and the computer is made using the USB cable not supplied with the converter.

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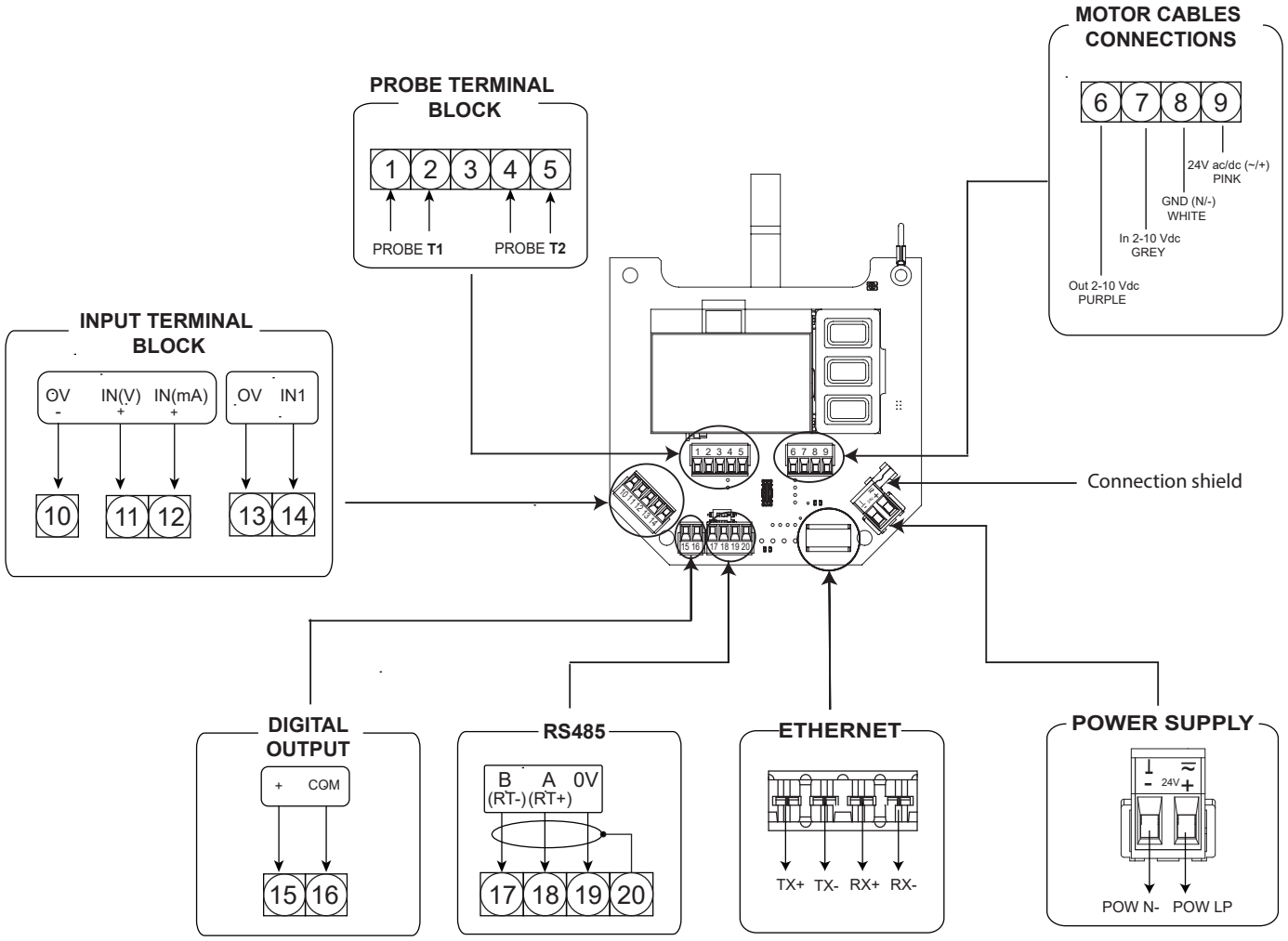
ELECTRICAL CONNECTIONS : OVERVIEW

ATTENTION: the separate cables are adjacent to all the cables of the other wires, furthermore secure the cables with an additional fixing system placed near the terminal.

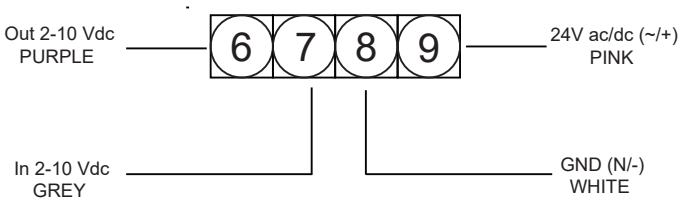


Cable gland PG7: Allowed diameter cables 3-6.5 mm.

RS485 TERMINATION SWITCH

This mechanical switch is present on the RS485 board only if it is installed. For more details, refer to the communication manual.

MOTOR CABLE TERMINATION BLOCK



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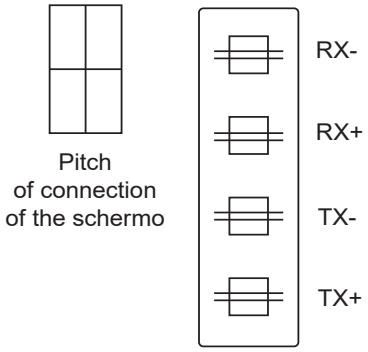
ETHERNET CONNECTION

Ethernet output is insulated

CONNECTOR	TIA568A	TIA568B	RJ45
RX-	orange	green	6
RX+	white/orange	white/green	3
TX-	green	orange	2
TX+	white/green	white/orange	1

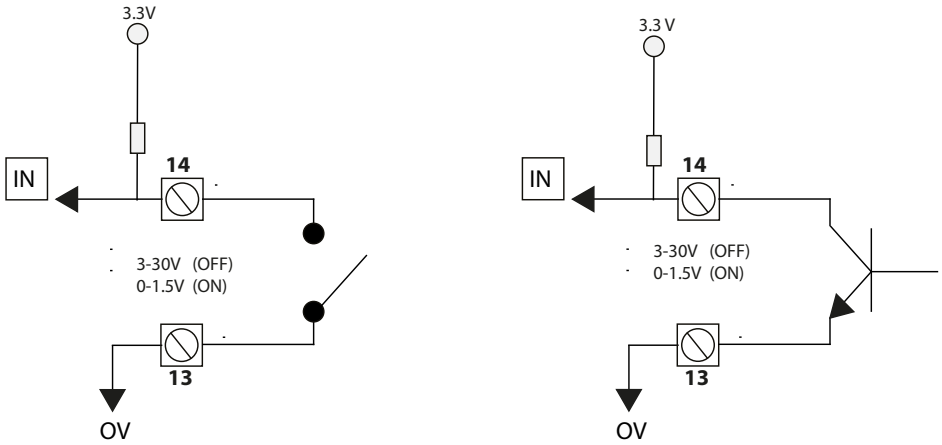


N.B: Recommended cable Cat5 Ethernet cable (SF/UTP) Siemens 6XV1840-2AH10, PVC sheath

CONNECTOR	6XV1840	RJ45
RX-	Blue	6
RX+	White	3
TX-	Orange	2
TX+	Yellow	1

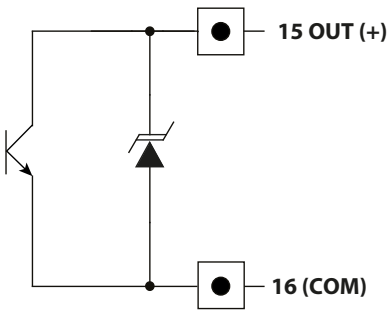
DIGITAL INPUT

Digital input is not insulated



DIGITAL OUTPUT

Digital output is insulated



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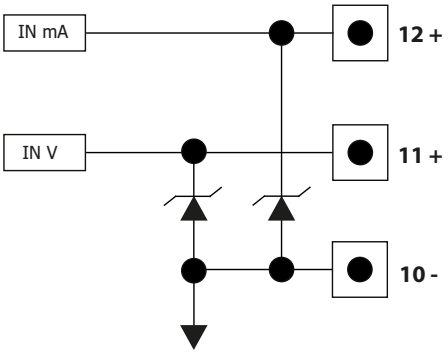
ANALOG INPUT

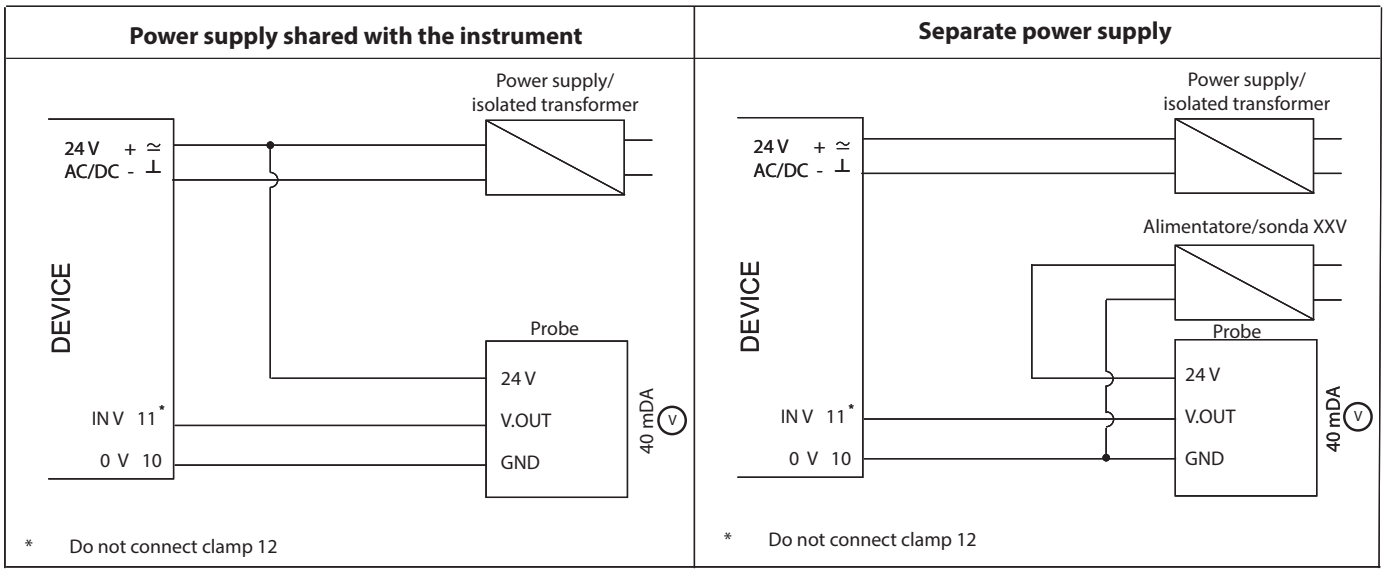
Analog input is not insulated



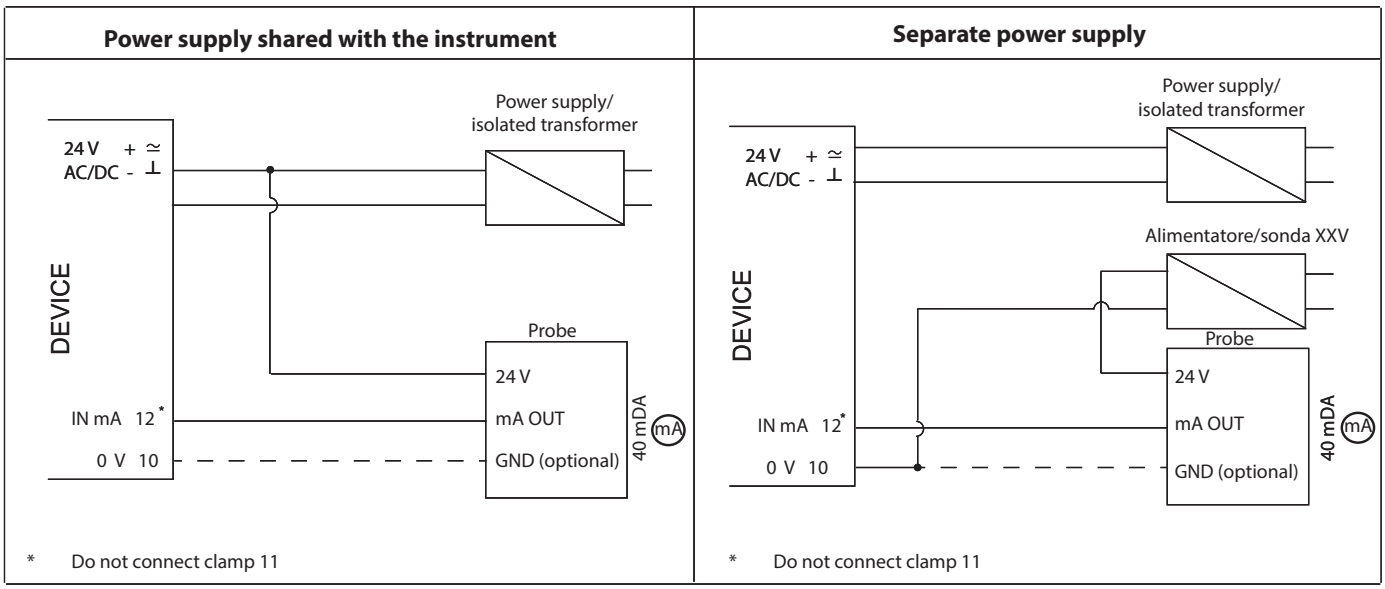
Inputs to be used alternatively, connect only one!

Analog Input connection examples:

VOLTAGE INPUT



CURRENT INPUT



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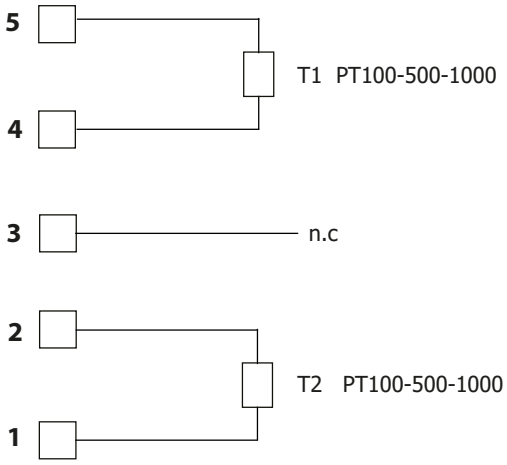
TEMPERATURE



Temperature probe description

Temperature sensors PT are platinum resistance used for temperature measurement in closed pipe systems.

The operating principle is based on change of electric resistance of sensing element proportionally to change of temperature of the measured medium.

Resistance dependence on temperature of medium, depending on the Pt-designation is according to EN 60751.

Direct mounting without additional immersion wells is recommended to achieve optimum thermal coupling with the measurement medium in the heating system.

Furthermore, make sure that the installation point is deep enough to prevent damage to the tip of the probe when screwing in.

The temperature probe must be installed in the pipeline so that a sufficient immersion depth is guaranteed. During installation, the connecting cable must not be shortened or extended as this would impair compliance with the accuracy (for two-wire technology).

The connecting cable must not be laid alongside or wrapped around hot pipes because the line resistance and its temperature dependence are considered in the measurement result for

temperature probes using two-wire technology.

NOTE: one temperature sensor is screwed to the CS611 directly.

The probe of the second temperature sensor shall be connected to the partner valve during installation.

Both temperature sensors are connected to electronic board during product assembly.

Temperature probes main features:

Couple of temperature sensors PT500 pair-calibrated	❑ 0°C ... 150°C
Temperature measurement range	❑ 3°C ... 100°C
Temperature difference measurement range	❑ 150°C
Maximum admissible temperature of medium	❑ B according to EN 60751
Tolerance class	❑ 3m, 5m
Temperature sensor cable length	❑ Not shielded, 2 x 0,5mm^2
Cable type for 2-wire connection	❑ Connected permanently
Response time	❑ <10 s
Total resistance of signal leads	❑ 0,22 Ohm - for wire length 3m ❑ 0,36 Ohm - for wire length 5m
Ambient	❑ Ambient temperature +5°C... +55°C ❑ Mechanical ambient class M1 ❑ Electromagnetic environment class

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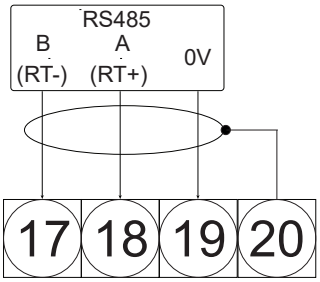
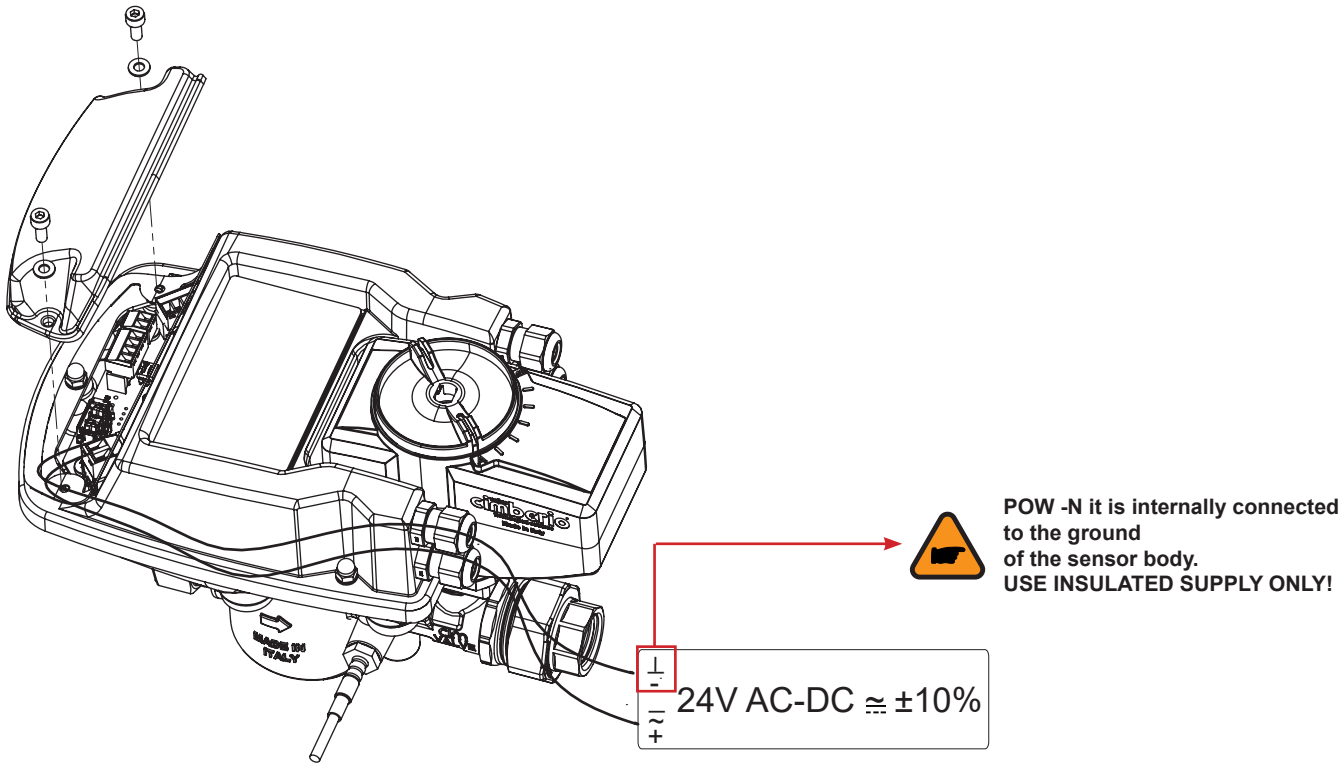
RS485

The output RS485 is insulated



POWER SUPPLY



24 VAC/VDC operating only with safety isolating transformer according EN 61558-2-6

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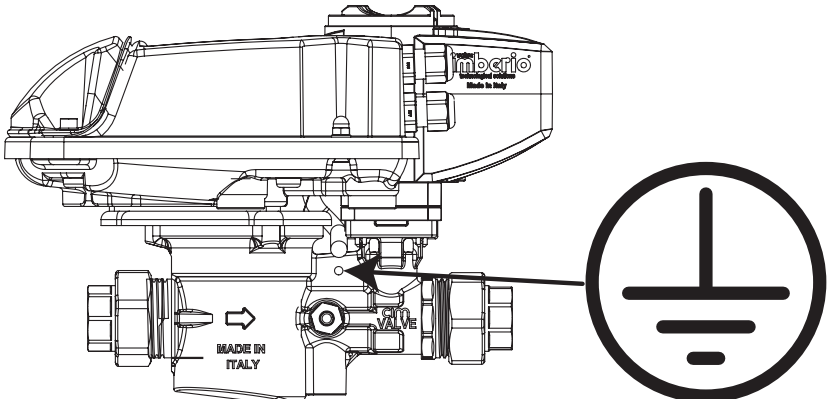
GROUNDING



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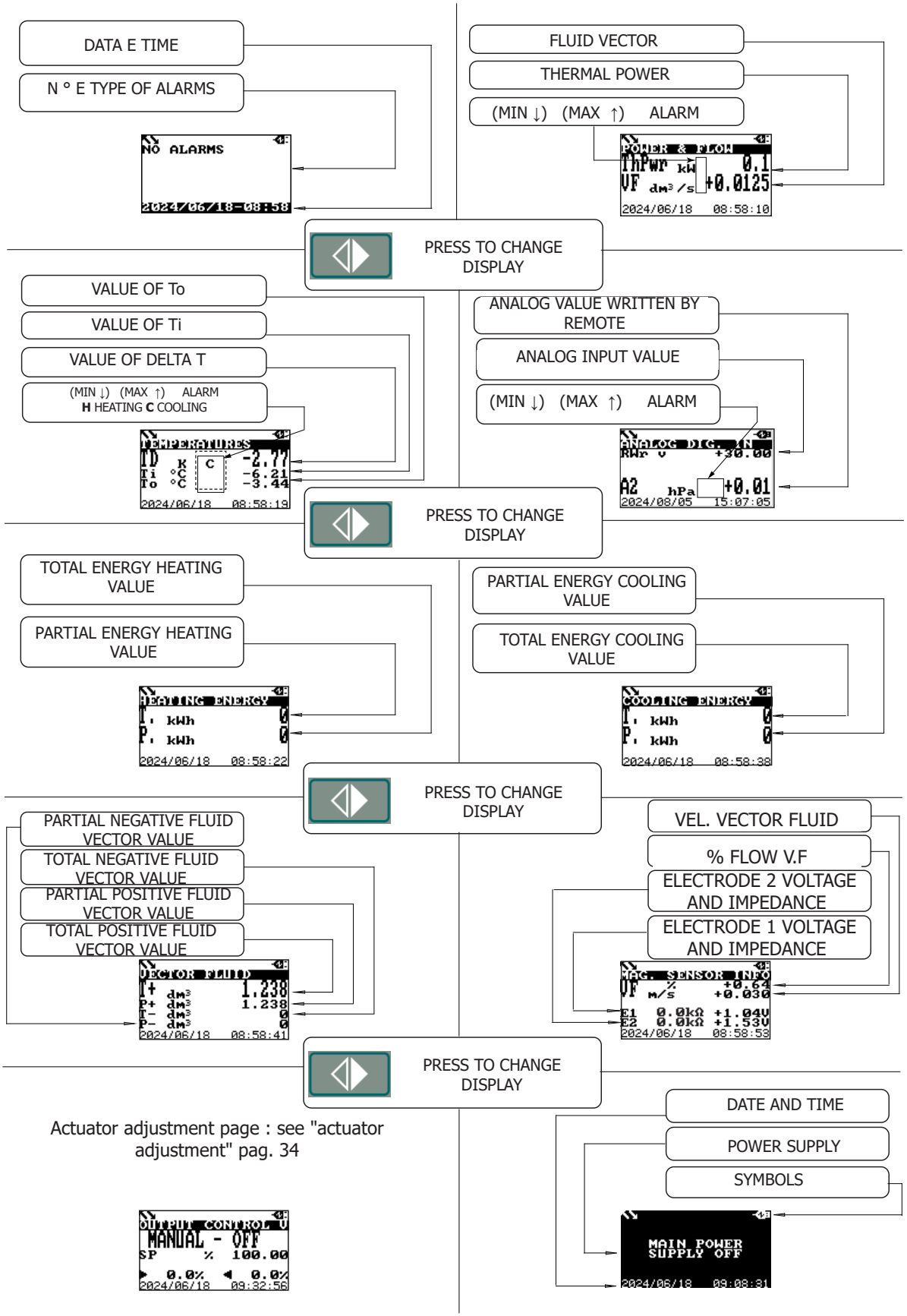
VISUALISATION PAGES

The direct exposure of the meter to the solar rays, could damage the liquid crystal display.



The maximum number that can be represented by the totalizers is (9) 999999999 regardless of the number of decimals selected. When this value is reached, the counters are reset.

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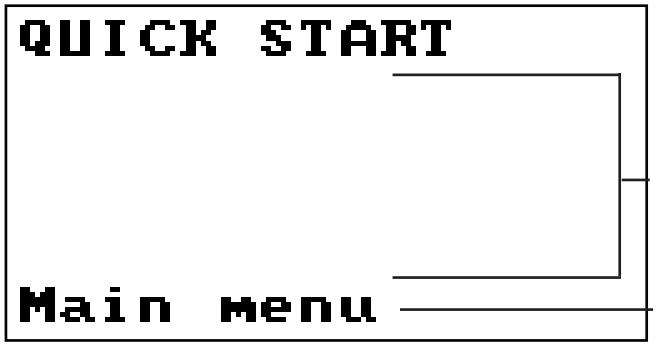
QUICK START MENU

The QUICK START MENU allows the immediate access to the frequently used functions.
When enabled, It's possible to access to "Quick start menu" in two different ways:

Access to the quick start menu from the visualizzation pages

- ❑ Function "10.12" pag. 41 set on DIR
- ❑ Press enter from the visualization pages



The number of functions visible in this section is in relation to the functions chosen for the QS menu.

Access to all functions

Access to the quick start menu from the main menu

- ❑ Function "10.2" pag. 41 set on MENU
- ❑ Press enter from the visualization pages

- ❑ In the main menu press enter on "Quick start"

The "Quick start menu" can be activated via function "10.12" pag. 41 (display menu); the loaded functions are displayed and editable according to the access level entered. The "Main Menu" function allows access to all functions in relation to the access code entered

To make the "Quick start menu" suitable for the specific application, it is possible to customize it through the MCP software

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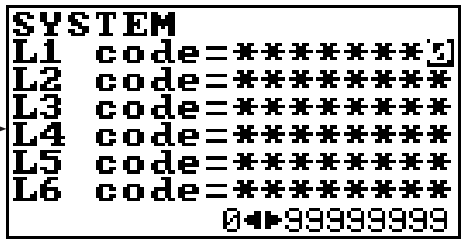
ACCESS CODES

The access to the instrument programming is regulated by six access levels logically grouped.
Every level is protected by a different code.

Access Level 1-2-3-4 Freely programmable by user

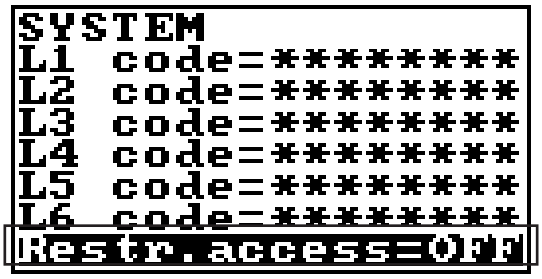
Access Code Set : Menu 12 System

SYSTEM	
RTC enable	OFF
Dayl.saving	OFF
Time zone	(h)
Date/time	00
L1 code	10000000
L2 code	20000000
L3 code	30000000
L4 code	40000000
L5 code	57291624
L6 code	0
Restr.access	OFF
TC	0
Device IP addr	10.011.012.013
Client IP addr	10.011.012.012
Network mask	255.255.255.254
KS	100.000
KR	100.000
T1-T2 BALANCE	
T1 OFFS.	(°C)
T2 OFFS.	(°C)
Stand-by	
OS Save & Lock	
FW update	



The CODE is Settable by keyboard or MCP interface.
Depending on the access level, different display functions will be visible.
These access levels interact with the "Restricted access"

Restricted Access Set : Menu 12 System



Settable Values
ON
OFF

Restrict = ON: Access permitted only to functions provided for a specific level;
Example: If the operator has the access level 3 code, after having set it, he can change only the level 3 access functions.

Restict = OFF: It enables to change for the selected level functions and ALL the lower access level functions.

Example: If the operator has the level 3 code, after having set it, he can change all the functions at level 3 and the lower levels ones.

*** WARNING:** take note carefully of the customized code, because there is no way for the user to retrieve or reset it if he lost it. Factory preset access codes:

- **L1: 10000000**
- **L2: 20000000**
- **L3: 30000000**
- **L4: 40000000**

code **00000000** allows access to level 0 functions only

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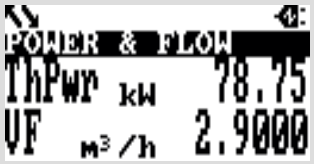
ACCESS TO CONFIGURATION MENU

You can acces to the configuration menus in two different ways:

- ❑ through the “Quick Start Menu” where you can access some of the main functions;
- ❑ through the “Main Menu” where it is possible to access all the functions allowed by the assigned level code.

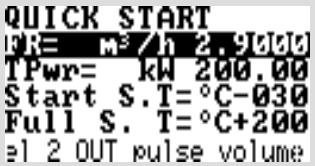
Below there are some examples of value change in the “Fs” function.
EXAMPLE: change the full scale value from 2.9m³ / h to 3m³ / h, from the “Quick start menu” in DIR mode

1



Access the “Quick start menu”

2

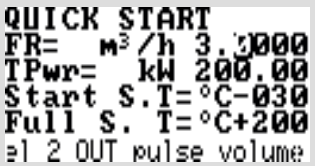


Access the “FR” function

3

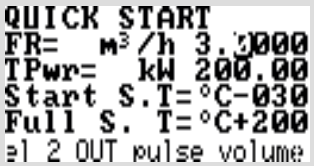
Press repeatedly 4 times

4



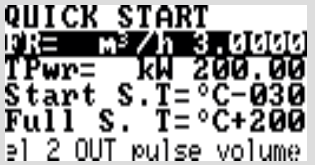
Change the value

5



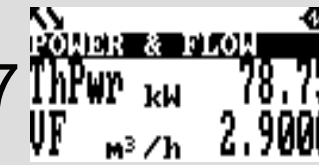
Confirm the change

6



Press Esc or wait for the timeout

7



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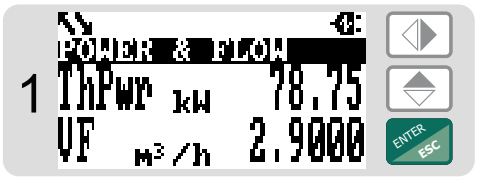
EXAMPLE: change the value of the full scale from 2.9m³ / h to 3m³ / h, from the “Main menu” (Quick start menu not enabled)

1

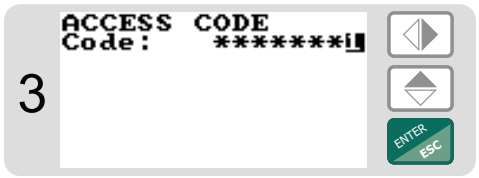


Access the “Quick start menu”

2

X 8 VOLTE

3



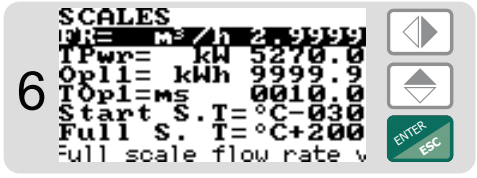
4

Select “scales” menu

5

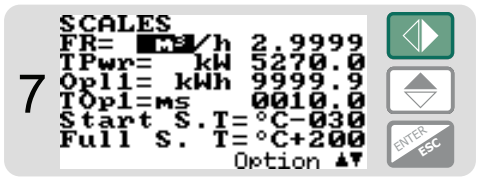
Enter to “scale“ menu

6



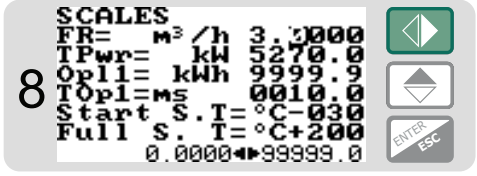
modify the value

7



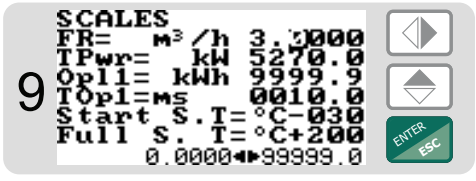
press repeatedly

8



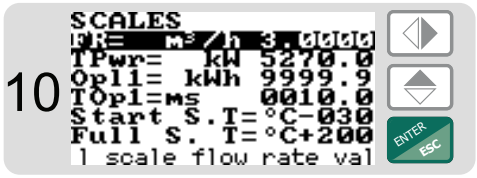
modify the value

9



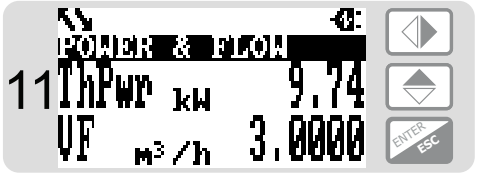
confirm the modification

10



long press the ESC button

11



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ACTUATOR ADJUSTMENT

The specific resources for CS611 control and actuator adjustment are:

RESOURCE	DESCRIPTION	MCP COMMAND	POS.
Analog Output 0	Actuator adjustment with command 0-10 V or **2-10 V** *(configurable function)*	AO0CF	"8.2" pag. 40
Analog Input 0	Reading of actuator position through 0-10 V or **2-10 V** signal *(configurable function)*	AI0CF	"7.13" pag. 40
Analog Input 2	Optional function use for: ❑ Position or adjustment control by configurable analog signal *or* ❑ For adjustment on an external measure read via configurable analog signal and scaled appropriately	AI2CF ORSPS AI2SS AI2FS	"7.14" pag. 40 "1.17" pag. 38 "4.11" pag. 39 "4.12" pag. 39
Digital Input 1	Enabling of regulaton of the adjustment from external digital signal *(optional function)*	ORENS	"1.19" pag. 38

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Automatic actuator adjustment

The main functionality is the **auomatic regulation with P.I actuator control**, in closed loop with proportional and integrative control; The regulation is possible through the function "1.2" pag. 38 on each of these channels:

- ❑ **Ch 1** - Vector fluid flowrate
- ❑ **Ch 2** - Thermal Power (absolute)
- ❑ **Ch 3** - Temperature differenc dT (absolute)
- ❑ **Ch 4** - Temperature Ti (inlet)
- ❑ **Ch 5** - Temperature To (outlet)
- ❑ **Ch 6** - External measure (Analog input 2, scaled)
- ❑ **Ch 7** - External value (set remotely via communication protocol)*

** This regulation channel is different, the measure to be adjusted is not independently acquired by the instrument but is received by one of the communication channels; the external device must constantly update this value (within the TimeOut of 30 seconds), otherwise the adjustment will stop and the corresponding alarm will appear.*

Set point value setting

The setting of "set point" value è specific for each channel and It is in the same technical unit selected for the instrument, see function "1.3" pag. 38.

Alternatively, the adjustment SetPoint or Manual position value can be decided using the appropriately configured Analog Input 2, activating function "1.17" pag. 38.

Regulation loop setting

For each channel there are 2 sets of settings available for regulation loop: one for "Heating" mode , see function "1.5" pag. 38 and one for "Cooling" mode, see function "1.6" pag. 38

La modalità heating/cooling mode is automatically determined by the instrument.

Each setting set consisting of:

- **Polarity:**

  "+": Increasing the control signal increases the measured value in the channel.

  "-": Increasing the control signal decreases the measured value in the channel.

- **Gain Integrative Coefficient:** encreasing this value the system reach morer quicker the desired value; high values lead to overshooting the "Set Point"; by overshooting, the system will begin to oscillate around the set-point.

- **Gain Proportional Coefficient:** by increasing this value the system becomes more responsive to changes; by exceeding it the system may become unstable.

In a system with thermal control and "standard" flow control, the polarity should be set as follows:

CHANNEL N.	CHANNEL DESCR.	HEATING	COOLING
1	Flowrate	+	+
2	Power (absolute)	+	+
3	dT (assoluto)	-	-
4	Ti	normally not adjustable	
5	To	+	-
6	A In 2	It depends on the size read	
7	Remote	It depends on the size read	

REGULATION LIMITS

The following limitations apply to the adjustment:

- **Dead-Band:** of the selected channel, valore percentuale; all'interno della Dead-Band il controllore arresta la regolazione in modo da limitare i movimenti non necessari dell'attuatore.

- **Position:** Position limitation minimum (see function "1.15" a pagina 38) and maximum (see function "1.14" pag. 38), set (priority 4), referred to the actuator control scale. Percentage values.

- **Vector fluid flow rate:** Position limitation minimum (see function "1.6" pag. 38) and maximum (see function "1.5" pag. 38 settable (priority 5), referred to the range scale of the sensor.

- **Temperature difference (dT):** Minimum dT limitation* (see function "1.8" pag. 38) and maximum (see function "1.7" pag. 38) absolute, settable (priority 6), reffered to the device dT scale.

ATTENTION! Activating the limitation of minimum dT (see function "1.8" pag. 38) you must also activate the Minimum Flow Limitation (see function "1.6" pag. 38) and/or the minimum position limitation (see function "1.10" pag. 38) to maintain a minimum circulation of the Vector Fluid; **if this is not done, in the absence of dT, the controller will reach full closure and will no longer be able to detect further changes in dT !**

Note: The application of minimum dT limit (see function "1.8" pag. 38) occurs with a programmable delay (see function "1.9" pag. 38); this delay has the function to exclude the limitation on the minimum dT, allowing the system to NOT reduce the flow rate to comply to the minimum dT in the case when dT is "temporarily" ZERO or very low. This delay starts in one of these conditions:

- Enabling or activating the control loop.
- Transition Presence of Flow Rate from Null Flow Rate
- Turning on the device.

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Manual control

Manual control of actuator positioning is possible through the selection of the "manual" channel (see function "1.2" pag. 38); The set-point "manual" mode (see function "1.4" pag. 38 - priority 2) is indipendent from the regulation loop one, in this way is possible to switch from the adjustment channel to "manual" and vice-versa, without having to re-set the two set-points. Alternatively, the adjustment SetPoint or Manual position value can be decided using the appropriately configured Analog Input 2, activating the function "1.17" pag. 38

Activation/deactivation

The activation/deactivation of the Adjustment Loop (or manual control) can be controlled through the relevant setting (see function "1.1" pag. 38) modificabile tramite display / interfaccia MCP / protocollo di comunicazione, oppure, se selezionata la funzione "1.11" pag. 38, tramite l'ingresso digitale IN_1. Whe the regulation loop is disabled, the actuator output is set to the value "not active" (see function "1.8" pag. 38), which also has priority 1 over Manual control.

Security position

In the case of "priority" alarm (See alarm "HP_ALARMS", chapter "ALARM MESSAGES (CAUSES AND ACTIONS TO BE TAKEN)" pag. 75) it's possibile to activate the function "1.12" pag. 38 which triggers the forcing of the actuator position and its value (priority 3).

Command priority

PRIORITY	VALUE FUNCTION	MCP COMMAND	CONDITIONAL FUNCTION	MCP COMMAND	DESCRIPTION
High 1	POS: "1.8" pag. 38	ORTDN	"1.1" pag. 38, IN_1	ORCEN	Not active regulation
2	POS: "1.4" pag. 38	ORMSP	"1.2" pag. 38	ORCCS	Manual command
3	POS: "1.13" pag. 38	ORDSV	"1.12" pag. 38	ORSDB	In priority alert
4	POS: "1.15" pag. 38, POS:"1.9" pag. 38	ORMNV ORDND	-		Actuator positioning limitation
5	POS: "1.5" pag. 38, POS: "1.6" pag. 38	ORFRX ORFRN	-		Flowrate limitation.
6 Low	POS: "1.7" pag. 38, POS:"1.8" pag. 38*	ORTDX ORTDN	-		dT limitation

* with programmable delay see function "1.9" pag. 38 .

Alarms

- **Of regulation loop:** It's possible to set a max error (see function "1.14" pag. 38) within set-point and measured value For regulation loop; up to this limit an alarm is generated.
- **Of positioning:** For actuators that provide position feedback., It's possible to set a maximum error (see function "1.15" pag. 38) between the command and the actual position read; up to this limit is generated an alarm.

Both alarms seen above, have a common timeout settable (see function "1.16" pag. 38) which allows the system to reach the set-point and position, before generating the relevant alarms.

- **Of positioning:** In case the channel N° 6 (remote) is selected fot the regulation, but the value, but the value from remote was not updated within the 30-second timeout; in this case an alarm is still generated.

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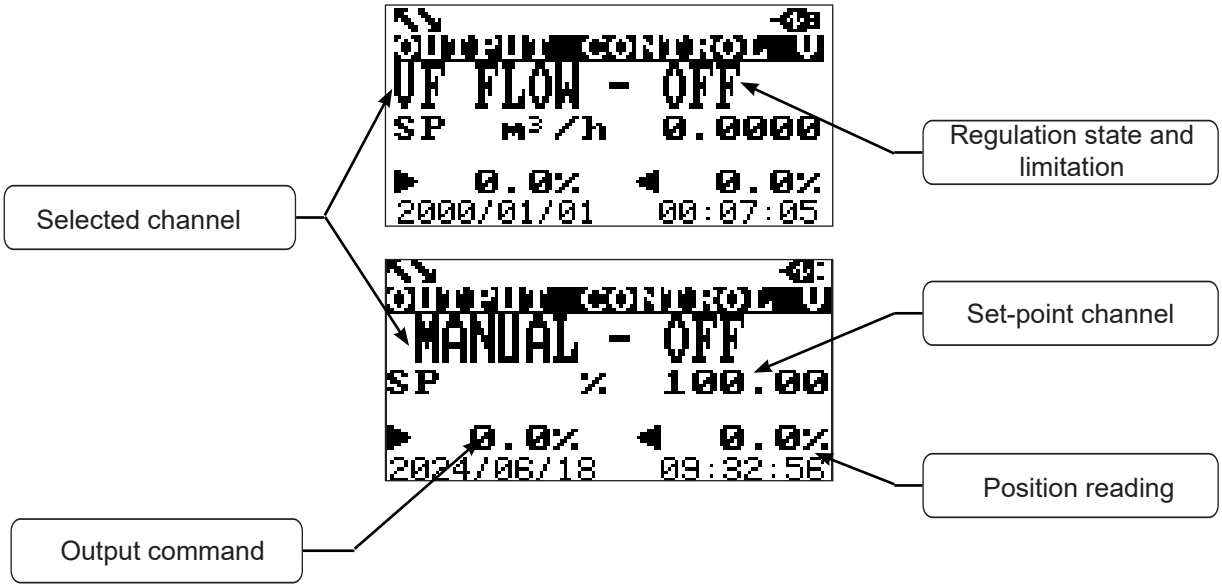
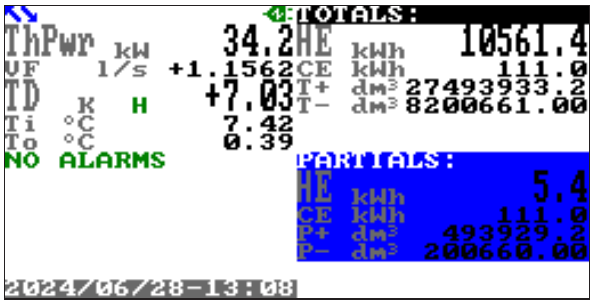
Physical display visualitation



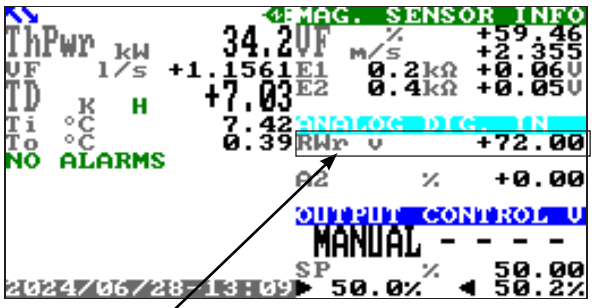
Display virtual visualitation

To the virtual display is added another visualitation page of the instrument, in which the data related to the output regulation are substituted for those of the totalizers; To reach this page, use the right and left keys of te keyboard

Schermata 1



Schermata 2



Analogic value written by remote

* When a valid value is received remotely via one of the communication protocols, its display is activated in the analog screen

Regulation state and limitation

Regulation state	Limitation icon	DESCRIPTION
OFF		Adjustment Disabled by Command
NO POWER		Adjustment Disabled for Power Failure
---		Manual Position Command
ALARM		Position command from Alarm
ON		In adjustment on the selected channel
ON		Under Maximum Flow Limitation
ON		In Minimum Flow Limitation
ON		In limitation of dT Maximum
ON		In limitation of dT Minimum
ON		The channel selected for adjustment/limitation does not have a valid value

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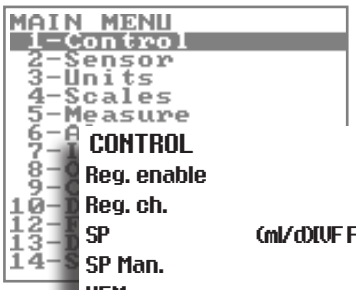
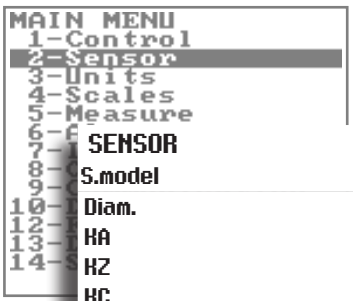
FUNCTION MENU

CONTROL



Reg. enable	OFF	1.1	Enable output regulation
Reg. ch.	MANUAL	1.2	Channel selection for output regulation
SP	(ml/d)(VF FLOW),0.0000	1.3	Setpoint value for channel output reg.
SP Man.	(%)	1.4	Setpoint for output in manual mode
VFM	OFF	1.5	VF Max. flow rate limit
VFm	OFF	1.6	VF min. flow rate limit
TD Max	OFF	1.7	Max. temperature diff. limit
TD min	OFF	1.8	min. temperature diff. limit
TD min. dly	(s)	1.9	Enable min. temp. diff. limit delay
HK	VF FLOW,+1010	1.10	Heating ch. koefficients for out. reg.
CK	VF FLOW,+1010	1.11	Cooling ch. koefficients for out. reg.
Dead-Band	(%)	1.12	Setpoint deadband for channel output reg.
Disabled SP	(%)	1.13	Disabled setpoint value
Out Max Lim	(%)	1.14	Output max value limit
Out Min Lim	(%)	1.15	Output min value limit
SetP. source	SET	1.16	SetPoint source for output regulation
Enab. source	SET	1.17	Enable source for output regulation
Out.en.in-al	OFF	1.18	Enable in-alarm setpoint for out. control
Out.in-a SP	(%)	1.19	In-alarm setpoint value for out.control
Loop error	(%)	1.20	Max loop reg. error for output (0=OFF)
Pos. error	(%)	1.21	Max positioning error for out.c. (0=OFF)
Reg.timeout	(s)	1.22	Regulation and posit. timeouts for out

SENSOR



S.model	47	2.1	Sensor's model
Diam.	(mm)	2.2	Sensor's nominal/real diameter
KA	10.000	2.3	Sensor's coefficient KA
KZ	0	2.4	Sensor's coefficient KZ
KC		2.5	Sensor's coefficient KC
C.Curr.	(mA)	2.6	Sensor's excitation current
C.Reg.PB	50	2.7	Current regulator Prop.Band
C.Reg.DK	50	2.8	Current regulator Deriv.Const.
E.P.Detect	ON	2.9	Empty pipe detection
R max	(kohm)	2.10	Maximum input resistance
KL	+1950002	2.11	Coefficient KL values

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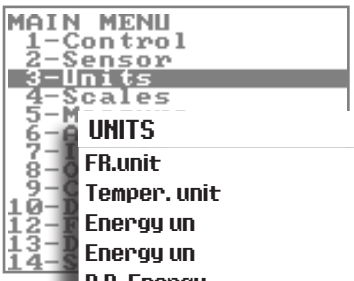
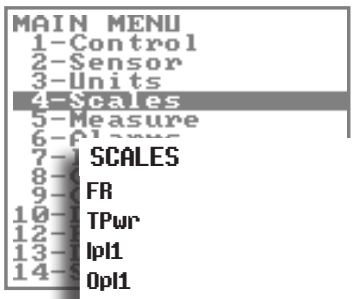
UNITS



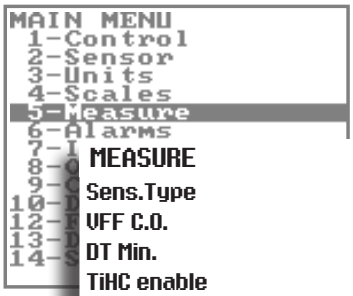
UNITS			
FR.unit	METRIC	3.1	Flow rate unit of measure type
Temper. unit	°C	3.2	Temperature unit of measure
Energy un	METRIC	3.3	Energy totalizer unit of measure type
Energy un	(kWh)	3.4	Energy totalizer unit of measure
D.P. Energy	0	3.5	Energy totalizer Decimal point position
T+ unit	METRIC	3.6	Positive totalizer unit of measure type
T+ unit	(dm3)	3.7	Positive totalizer unit of measure
T+ D.P.	3	3.8	Positive totalizer decimal point position
T- unit	METRIC	3.9	Negative totalizer unit of measure type
T- unit	(dm3)	3.10	Negative totalizer unit of measure
T- D.P.	0	3.11	Negative totalizer decimal point position
AXi unit	MET.V.	3.12	AUX input totalizer unit of measure type
AXi unit	(ml)	3.13	AUX input totalizer unit of measure
AXi D.P.	0	3.14	AUX input total. decimal point position
IP1 unit	MET.V.	3.15	In Pulse 1 unit of measure type
OP1 unit	METRIC	3.16	Out Pulse 1 unit of measure type
AnIn2 Unit	%	3.17	Analog In2 Unit of Measure

SCALES



SCALES			
FR	ml/d,99999	4.1	Full scale flow rate value
TPwr	W,1.0000	4.2	Full scale thermal power value
Ipl1	ml,1000.0	4.3	Channel 1 IN pulse volume value
Opl1	J,1.0000	4.4	Channel 1 OUT pulse energy value
TOp1	(ms)	4.5	Channel 1 OUT pulse time value
Start S.T	(°C)	4.6	Start scale temperature (Min)
Full S. T	(°C)	4.7	Full scale temperature (Max)
F.S.DTemp	(K)	4.8	Full scale temperature Delta
PresTi	(kPa)	4.9	Pressure at Ti point
PresTo	(kPa)	4.10	Pressure at To point
SI2	(hPa)	4.11	Start scale analog input 2 (Min)
FI2	(hPa)	4.12	Full scale analog input 2 (Max
S.s. rwv	0	4.13	Start scale remotely written value (Min)
F.s. rwv	1.000.000	4.14	Full scale remotely written value (Max)

MEASURE



MEASURE			
Sens.Type	PT100	5.1	Temperature sensor type
VFF C.O.	(%)	5.2	Vector fluid flow cut-off threshold
DT Min.	(K)	5.3	Temperature delta cut-off threshold
TiHC enable	OFF	5.4	Ti Heating-Cooling threshold enable
TiHC	(°C)	5.5	Ti Heating-Cooling threshold value
+VF m.mode	H/C	5.6	Positive vector flow measurement mode
+VF mea. side	To	5.7	Positive vector flow measurement side
-VF m. mode	OFF	5.8	Negative vector flow measurement mode
-VF mea. side	Ti	5.9	Negative vector flow measurement side
E. Ctrl type	AUT	5.10	Energy counter control type enable
K-Factor	OFF	5.11	Enable Table of Kfactor Coeff.
Subst. type	ETGAPnNAS	5.12	Kfactor Substance Type
Subst.Conc.	%	5.13	Kfactor Substance Concentration
M.Prof.	FAST	5.14	Measure acquisition profile

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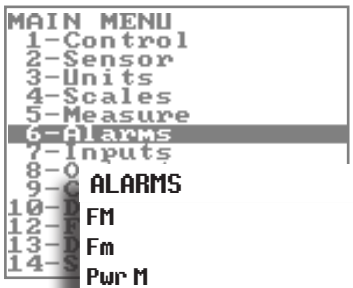
ALARMS



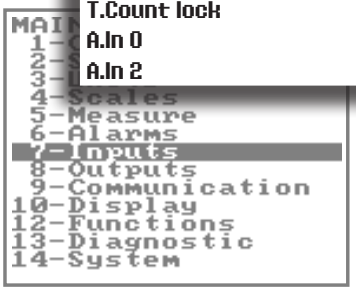
ALARMS

FM	OFF	6.1	VF Max. flow rate alarm threshold
Fm	OFF	6.2	VF min. flow rate alarm threshold
Pwr M	OFF	6.3	Max. thermal power alarm threshold
Pwr m	OFF	6.4	min. thermal power alarm threshold
DT max	OFF	6.5	Max. temperature delta alarm threshold
DT min	OFF	6.6	Min. temperature delta alarm threshold
Ti Max	OFF	6.7	Max. temperature alarm threshold
Ti min	OFF	6.8	min. temperature alarm threshold
To Max	OFF	6.9	Max. temperature alarm threshold
To min	OFF	6.10	min. temperature alarm threshold
A2M	OFF	6.11	Analog In.2 Max. alarm threshold
A2m	OFF	6.12	Analog In.2 min. alarm threshold
Hysteresis	(%)	6.13	Hysteresis on alarm thresholds
OV Fault	(V)	6.14	Out.Voltage Alarm Condition Value

INPUTS

INPUT

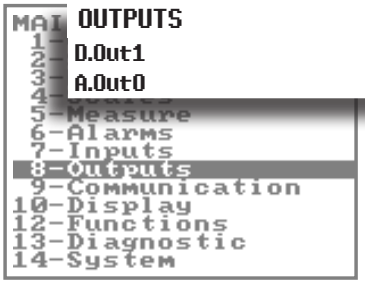
P+ reset	OFF	7.1	Positive partial tot. reset input enable
P- reset	OFF	7.2	Negative partial tot. reset input enable
AuX P. reset	OFF	7.3	Aux partial tot. reset input enable
HEv P. reset	OFF	7.4	Heating energy partial reset input en.
CEv P. reset	OFF	7.5	Cooling energy partial reset input en.
P.Count lock	OFF	7.6	Partial counters lock input enable
T+ reset	OFF	7.7	Positive total tot. reset input enable
T- reset	OFF	7.8	Negative total tot. reset input enable
AuX T. reset	OFF	7.9	Aux total tot. reset input enable
HEv T. reset	OFF	7.10	Heating energy total reset input en.
CEv T. reset	OFF	7.11	Cooling energy total reset input en.
T.Count lock	OFF	7.12	Total counters lock input enable
A.In 0	0_10 V	7.13	Analog In 0 range selection
A.In 2	OFF	7.14	Analog In 2 type & range selection



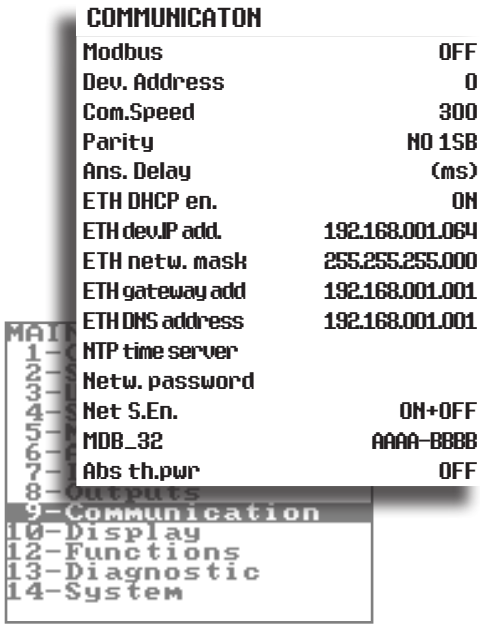
OUTPUTS

OUTPUTS

D.Out1	OFF	8.1	Digital Out 1 function selection
A.Out0	0,0	8.2	Analog Out 0 voltage range sel.

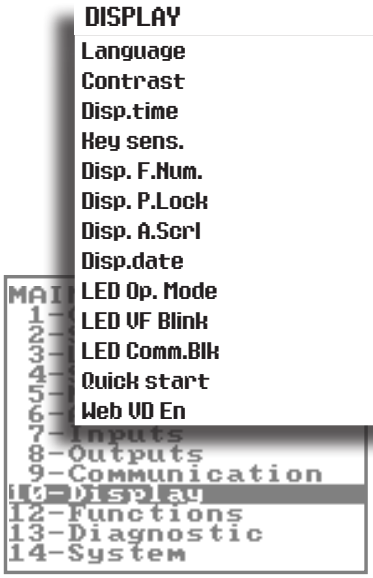


COMMUN.



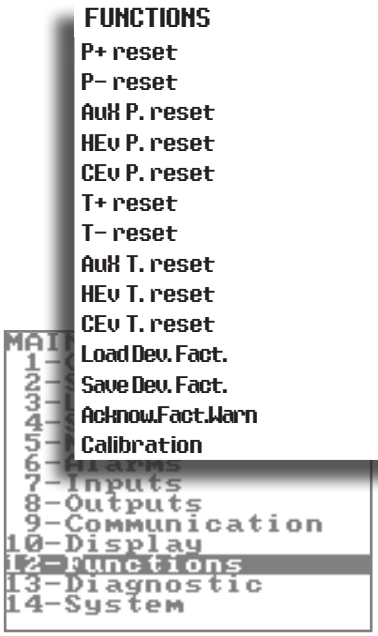
9.1	Modbus Communication Protocol
9.2	Device Communication Address
9.3	Communication Speed
9.4	Communication Parity Bits
9.5	Communication Answer Delay
9.6	Ethernet DHCP enable
9.7	Ethernet device IP address
9.8	Ethernet network mask
9.9	Ethernet gateway address
9.10	Ethernet DNS address
9.11	NTP time server name / address
9.12	Network access password (web
9.13	Network security (SSL-TLS) enable
9.14	Modbus 32 bits registers order
9.15	Use absolute th.power value on com. prot.

DISPLAY



10.1	Language for all messages
10.2	Display contrast adjustment
10.3	Display/keyboard inactivity time
10.4	Keyboard sensitivity
10.5	Display page function number
10.6	Display lock page number
10.7	Display auto-scroll pages bits (0=disab.)
10.8	Time and date display enable
10.9	LED Operating Mode color switch
10.10	LED Vector Fluid blink enable
10.11	LED Communication blink enable
10.12	Quick start menu enable
10.13	Virtual display web interface enable

FUNCTIONS



12.1	Positive partial tot. reset function
12.2	Negative partial tot. reset function
12.3	Aux partial tot. reset function
12.4	Heating energy partial reset function
12.5	Cooling energy Partial reset function
12.6	Positive total tot. reset function
12.7	Negative total tot. reset function
12.8	Aux total tot. reset function
12.9	Heating energy total reset function
12.10	Cooling energy total reset function
12.11	Load device factory default values
12.12	Save device factory default values
12.13	Acknowledge factory data warning message
12.14	Internal circuit calibration

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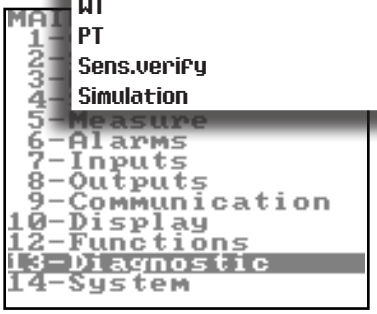
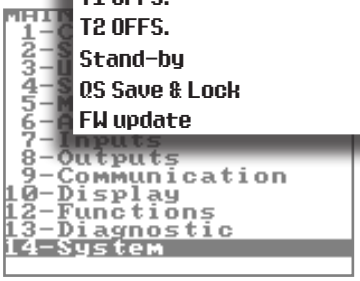
DIAGNOSTIC

DIAGNOSTIC			
Reboot-Self_Test		13.1	Reboot and execute self test diag. funct.
Firmware info	17	13.2	Firmware version information
Fluid table info	32	13.3	Quick Setup information
Mag.s.table info	27	13.4	Display diagnostic system values
Quick Setup info		13.5	FieldBus comm.diagnostic values
Storage mem.info	8192KB MF	13.6	Display comm.diagnostic values
Disp. sys.values		13.7	Display internal measured values
Ethernet info.		13.8	Board serial number (read only)
F.Bus comm.diag.		13.9	Total working time (read only)
Disp.comm.vars		13.10	Partial counters / L.T.S. life time
Display measures		13.11	Sens.verify diagnostic function
S/N	6	13.12	Flow & Temp. simulation function
WT	0000	13.13	Board serial number (read only)
PT	0000	13.14	Total working time (read only)
Sens.verify	0	13.15	Partial counters / L.T.S. life time
Simulation	OFF	13.16	Flow & Temp. simulation function



SYSTEM

SYSTEM			
RTC enable	OFF	14.1	Date/Time (Real Time Clock) enable
Dayl.saving	OFF	14.2	Daylight saving time change
Time zone	(h)	14.3	Localized time zone
Date/time	00	14.4	System date and time
L1 code	10000000	14.5	Access level 1 code
L2 code	20000000	14.6	Access level 2 code
L3 code	30000000	14.7	Access level 3 code
L4 code	40000000	14.8	Access level 4 code
L5 code	57291624	14.9	Access level 5 code
L6 code	0	14.10	Access level 6 code
Restr.access	OFF	14.11	Restricted access level
TC	0	14.12	Total measure cycles
Device IP addr	10.011.012.013	14.13	Device IP network address
Client IP addr	10.011.012.012	14.14	Client IP network address
Network mask	255.255.255.254	14.15	Network mask
KS	100.00	14.16	Calibration coefficient KS
KR	100.00	14.17	Calibration coefficient KR
T1-T2 BALANCE		14.18	Temperature T1 - T2 calibration balance
T1 OFFS.	(°C)	14.19	Temperature T1 calibration offset
T2 OFFS.	(°C)	14.20	Temperature T2 calibration offset
Stand-by		14.21	System stand-by mode activation (poweroff)
QS Save & Lock		14.22	Quick setup save and lock editing
FW update		14.23	Firmware update



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FUNCTIONS DESCRIPTION

Here below is shown the explanation of how the menu files are described.

Menu visualized on the converter (from 1 to 13)

MENU 1 - CONTROL

(POS. 1.1) Output Regulation Control ENable	**[Reg. enable]**	***AL1***	**[ORCEN]**

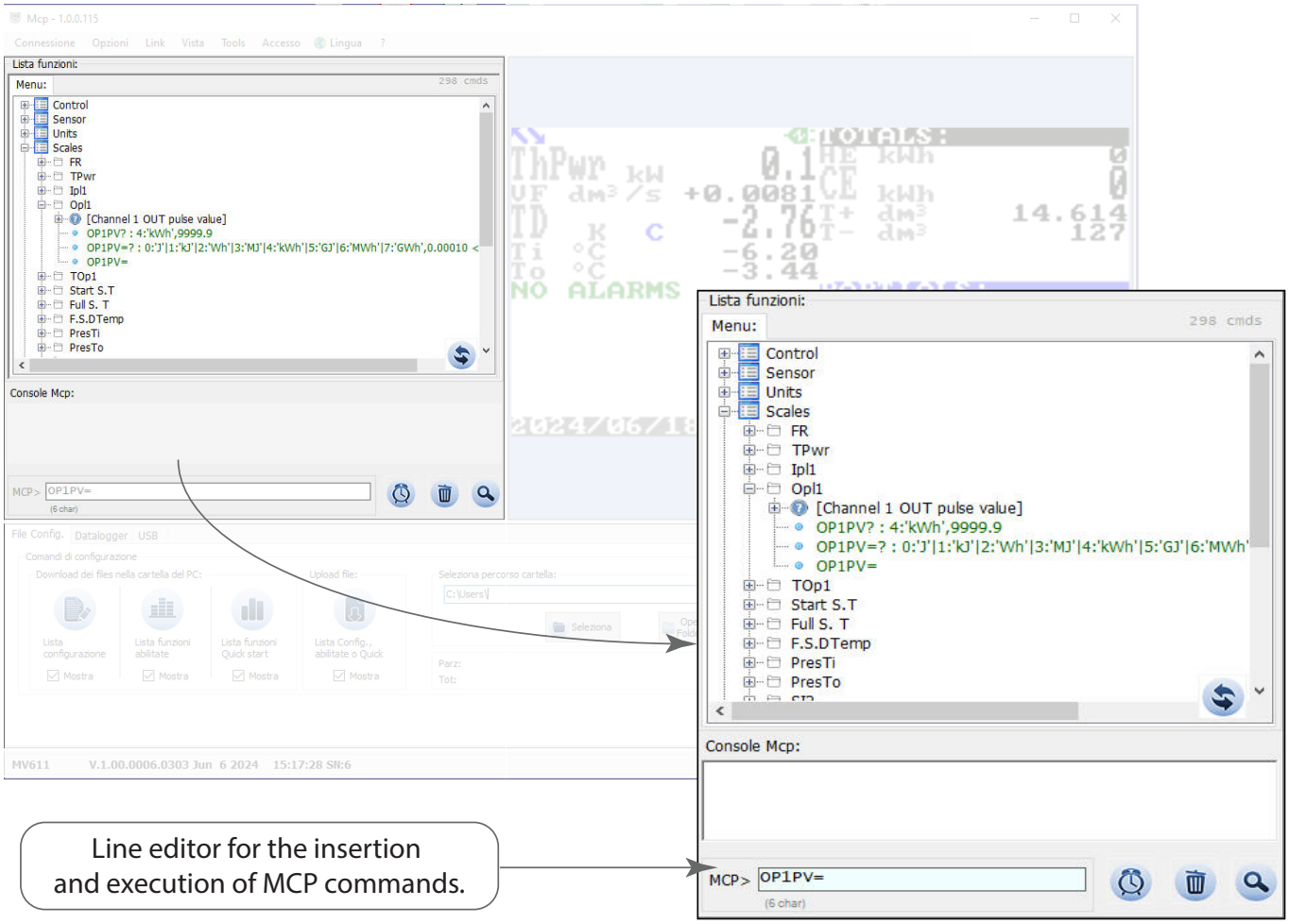
Access level

MCP command

Function name as shown on converter display

MCP comand acronym

The following picture describes where you can find the MCP functions name in the MCP-software.
For more informations, see MCP manual.



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MENU 1 - CONTROL

(POS. 1.1) Output Regulation Control ENable	[Reg. enable]	AL1	[ORCEN]

This function activates regulation on the selected channel; including the “manual” channel.

This function is not visible on the display if enabling is commanded by the IN-1 input.

(POS. 1.2) Output Regulation Control Channel Selection	[Reg. ch.]	AL1	[ORCCS]

This function selects the channel on which to make the adjustment.

Available options:

0. MANUAL*
1. VF FLOWTi
2. T.POWER
3. DT
4. Ti
5. To
6. AN.IN2**
7. REM.WR***

* The Manual channel does not make any adjustments but sets the relative independent % set-point.

** Channel AI2 will not be selectable if not present and appropriately configured for the measurement.

*** The data is loaded via communication protocol

(POS. 1.3) Output Regulation Control Setpoint Value	[SP]	AL1	[ORCSV]

Set-point relating to the selected channel, in the "technical unit" set for the system; when the "manual" channel is set, this set-point on the display cannot be set (the "manual" mode uses an independent % set-point).

The setting limits for the channels are the Min and Max extremes relative to the full scale of the channel itself.

(POS. 1.4) Output Regulation Manual Setpoint Percent	[SP Man.]	AL1	[ORMSP]

Independent % set-point for “manual” mode (priority 2)

(POS. 1.5) Output Regulation Flow Rate maX	[VFM]	AL2	[ORFRX]

Values window for limiting the maximum flow rate obtained when the regulation loop is active (with the exception of the “manual” channel); if during regulation the flow rate value goes outside an "active" limit, the regulator will use the flow rate regulation parameters to bring it back within the exceeded limit. To deactivate this limitation, set the value “0” (= OFF).

Note: The flow rate setting value will not be limited but will not be reached if out of limits.

(POS. 1.6) Output Regulation Flow Rate miN	[VFm]	AL2	[ORFRN]

Range of Values for the MINIMUM flow rate limitation obtained when the control loop is active (except for the "manual" channel); if during the regulation the flow rate value il valore di portata will come out of an "active" limit, the regulator will use the parameters of flowrate regulation to bring it back within the exceeded limit.

To disable this limitation, set the value “0” (= OFF).

Note: range setting value will not be limited but will not be reached if out of limits.

(POS. 1.7) Output Regulation Temperature Delta maX	[TD Max]	AL2	[ORTDX]

Maximum value for the dT limitation obtained when the control loop is active (except for the "manual" channel); if during control the value of dT goes out of an "active" limit, the controller will use the parameters of the dT control to bring it back within the exceeded limit. To disable this limitation, set the value "0" (= OFF). **Note:** The dT setting value will not be limited but will not be reached if out of bounds.

ATTENTION! Activating the limitation of minimum dT (see function "1.8" pag. 38) you must also activate the Minimum Flow Limitation (see function "1.6" pag. 38) and/or the minimum position limitation (see function "1.10" pag. 38) to maintain a minimum circulation of the Vector Fluid; **if this is not done, in the absence of dT, the controller will reach full closure and will no longer be able to detect further changes in dT!**

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(POS. 1.8) Output Regulation Temperature Delta miN	[TD min]	AL2	[ORTDN]

Minimum value for the dT limitation obtained when the control loop is active (except for the "manual" channel); if during control the value of dT goes out of an "active" limit, the controller will use the parameters of the dT control to bring it back within the exceeded limit. To disable this limitation, set the value "0" (= OFF). **Note:** The dT setting value will not be limited but will not be reached if out of limits.

ATTENTION! Activating the limitation of minimum dT (see function "1.8" pag. 38) you must also activate the Minimum Flow Limitation (see function "1.6" pag. 38) and/or the minimum position limitation (see function "1.10" pag. 38) to maintain a minimum circulation of the Vector Fluid; **if this is not done, in the absence of dT, the controller will reach full closure and will no longer be able to detect further changes in dT!**

(POS. 1.9) Output Regulation temperature Delta miN enable Delay	[TD min. dly]	AL2	[ORDND]

Delay on dT minimum limit application (see function "1.6" pag. 38); this delay "temporarily" excludes the limitation on the minimum dT under the following conditions:

- ❑ Enabling or activating the control loop.
- ❑ Transition Presence of Flow Rate from Null Flow Rate
- ❑ Turning on the device.

(POS. 1.10) Output Regulation Heating Koefficients List	[HK]	AL2	[ORHKL]

Coefficient for the heating regulation loop.
The Coefficient is made up of the sign representing the polarity of the Loop, 2 digits (00-99) for the Integrative gain and 2 digits (00-99) for the proportional gain.

On the display it is possible to modify only the coefficients of the selected channel and the function will not be accessible if the "manual" channel is selected.
From MCP it is possible to modify the coefficients of the selected channel (by inserting just one) or all 5 coefficients (by inserting them separated by commas); the function will always be accessible even if the "manual" channel is selected.
From MODbus it is possible to modify the coefficients of all 7 coefficients; the function will always be accessible even if the "manual" channel is selected.

(POS. 1.11) Output Regulation Cooling Koefficients List	[CK]	AL2	[ORCKL]

Coefficient for the cooling regulation loop.
The Coefficient is made up of the sign representing the polarity of the Loop, 2 digits (00-99) for the Integrative gain and 2 digits (00-99) for the proportional gain.

On the display it is possible to modify only the coefficients of the selected channel and the function will not be accessible if the "manual" channel is selected.
From MCP it is possible to modify the coefficients of the selected channel (by inserting just one) or all 5 coefficients (by inserting them separated by commas); the function will always be accessible even if the "manual" channel is selected.
From MODbus it is possible to modify the coefficients of all 7 coefficients; the function will always be accessible even if the "manual" channel is selected.

(POS. 1.12) Output Regulation control Setpoint DeadBand	[Dead-Band]	AL2	[ORSDB]

% Error Band between Set-point and relative measured value, on the selected channel, for the regulation loop, within which no regulation takes place and the control output remains at a fixed value.

This function prevents unnecessary movements by reducing wear on the mechanics; very high values of this parameter generate consequent hysteresis in the value reached. Note: The actuator can also have its own intrinsic deadband. Set “0” to deactivate this function.

(POS. 1.13) Output Regulation DiSabled Value	[Disabled SP]	AL2	[ORDSV]

% value that the control output assumes when the regulation loop is disabled by the relevant function or input (priority 1)

(POS. 1.14) Output Regulation MaX Value	[Out Max Lim]	AL2	[ORMXV]

Window of Maximum % values that the control output can assume when the control loop is enabled (with the exception of the "manual" channel) (priority 4).

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(POS. 1.15) Output Regulation MiN Value	[Out Min Lim]	AL2	[ORMNV]

Window of Maximum % values that the control output can assume when the control loop is enabled (with the exception of the "manual" channel) (priority 4).

(POS. 1.16) Output Regulation SetPoint Source	[SetP. source]	AL2	[ORSPS]

Selection of "command SetPoint" source for regulation loop and manual position between:

- ❑ Settings from function (display, MCP or communication protocol)
- ❑ Input AN-2
- ❑ **NOTE:** This function isn't avaiable if the input AN-2 isn't avaiable or isn't configured.

(POS. 1.17) Output Regulation ENable Source	[Enab. source]	AL2	[ORENS]

This function allows the selection of the control loop "enabling" source between:

- ❑ Setting by Function (display, MCP or protocol)
- ❑ IN-1 input

NOTE: This function is not available if the IN-1 input is not available or is used with other functionality.

(POS. 1.18) Output Regulation In Alarm Enable set value	[Out.en.in-al]	AL3	[ORIAE]

Enabling of the forcing of output command in case of device “HP_ALARMS” alarm.

(POS. 1.19) Output Regulation In Alarm Value	[Out.in-a SP]	AL3	[ORIAV]

% value of output command forcing in case of device “HP_ALARMS” alarm, if enabled; this command has priority 3

(POS. 1.20) Output Regulation Loop max ErroR	[Loop error]	AL3	[ORLER]

Maximum % error allowed between Set-point and related measured value, on the selected channel, for the regulation loop; beyond this value, after the timeout, the alarm will be generated.

Set “0” to disable this alarm.

(POS. 1.21) Output Regulation Positioning ErroR	[Pos. error]	AL3	[ORPER]

Maximum % error allowed between output command and relative measured position; beyond this value, after the timeout, the alarm will be generated.

Set “0” to disable this alarm.

(POS. 1.22) Output Regulation Control TimeOuts	[Reg.timeout]	AL3	[ORCTO]

Delay before generating the alarms seen above

MENU 2 - SENSOR

(POS. 2.1) Sensor MODeL	[S.model= xxx]	AL4	[SMODL]

Enter the first two characters of the serial number of the sensor as on the sensor label.

(POS. 2.2) Sensor DIameter Unit of Measure	[Diam.= mm]	AL2	[SDIUM]

Select the nominal diameter of the sensor. ND is written on the sensor label.

(POS. 2.3) CoeFFicient KA	[KA= + xx.xxx]	AL4	[CFFKA]

KA factor: gain calibration coefficient

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(POS. 2.4) CoeFFicient KZ	[KZ= +/- xxxxx]	AL4	[CFFKZ]

Calibration Factor of sensor zero.

(POS. 2.5) CoeFFicient KC	[KC= +/- xx.xxx]	AL4	[CFFKC]

Calibration Factor. This function is activated if the sensor model is NOT present on the sensors table standard parameters

(POS. 2.6) Coils EXCitation Current	[C.Curr.= mA xxx.x]	AL4	[CEXCC]

Excitation coils current. This function is activated if the sensor model is NOT present on the sensors table standard parameters

(POS. 2.7) Current Regulator PRop. Band	[C.Reg.PB=xxx]	AL4	[CRPRB]

Current regulator parameter. This function is activated if the sensor model is NOT present on the sensors table standard parameters

(POS. 2.8) Coils Regulator DERivative constant	[C.Reg. DK = xxx]	AL4	[CRDER]

Derivative constant adjustment current.This function appears only if the sensor is not in the standard sensor table parameters.

(POS. 2.9) Empty Pipe Detection ENable	[E.P.Detect= ON]	AL3	[EPDEN]

Enables the empty pipe detection function. This function is useful to keep the meter lock to zero when the pipe become empty; at the same time, the measurement of the impedance of the electrodes is also activated

(POS. 2.10) Empty Pipe Detection THreshold	[R max= Kohm xxxx]	AL4	[EPDTH]

Maximum resistance value at the inputs (electrodes) determine the empty pipe condition. This feature is enabled only if the "2.9" pag. 38 Empty Pipe Detection is ON.

(POS. 2.11) SET KL values	[KL=XX +/- XXXXXXXXX]	AL4	[SETKL]

Flow Linearization coefficient, reserved to the service. This command is only showed if SMODL = 000.

MENU 2 - SENSOR: ONLY MCP FUNCTIONS

Sensor TYPE	MCP ONLY	AL4	[STYPE]

Reserved

SET TK values	MCP ONLY	AL4	[SETTK]

Temperature linearization coefficient

Sensor SPecial FeaTures	MCP ONLY	AL6	[SSPFT]

Reserved

MENU 3 - UNITS

(POS. 3.1) Flow Rate Unit of Meas.Type	[FR.unit]	AL2	[FRMUT]

Flow measurement unit. Select metric or non-metric units (British and American units)

(POS. 3.2) TeMPerature Unit of Measure	[Temper. unit]	AL2	[TMPUM]

Measurement unit temperature ° C and ° F.

(POS. 3.3) Totalizer Total Energy Unit of measure Type	[Energy unit]	AL2	[TTEUT]

Unit of measure type: metric or not metric

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(POS. 3.4) Totalizer Total Energy Unit of Measure	[Energy unit]	AL2	[TTEUM]

Setting the unit of measurement to display the totalizers of the thermal energy;

METRIC units of measure available are:

J, joule (= Watt·second)

kJ, kilojoule (= 1.000 Joule)

Wh, wattora (= 3.600 Joule)

MJ, megajoule (= 1.000.000 Joule)

kWh, kilowattora (= 1.000 Wattora)

GJ, gigajoule (= 1.000.000.000 Joule)

MWh, megawattora (=1.000.000 Wattora)

GWh, gigawattora (= 1.000.000.000 Wattora)

NOT METRIC units of measure available are:

BTU, British Thermal Unit (= 1055,0559 Joule)

kBT, kilo British Thermal Unit (= 1.000 BTU; = 1055055,9 Joule)

MBT, Mega British Thermal Unit (= 1.000.000 BTU; = 1055055900 Joule)

To change the unit of measurement, move the cursor to the area where the unit of measurement is displayed.

(POS. 3.5) Totalizer Total Energy Decimal Point position	[D.P. Energy]	AL2	[TTEDP]

To change the number of decimals used, position yourself on the relative numerical fields and choose one of the possible values: 1/2/3/4/5/6/7.

(POS. 3.6) Totalizer Total Positive Unit of measure Type	[T+ unit= METRIC]	AL2	[TTPUT]

This function sets the type of unit of measurement of the partial totalizer: metric or non-metric (English and American units).

(POS. 3.7) Totalizer Total Positive Unit of Measure	[T+ unit=ml]	AL2	[TTPUM]

This function sets the unit of measurement for the total total totalizer. The choice of its values depends on the choice of the unit of measurement of the function "3.6" pag. 39

(POS. 3.8) Totalizer Total Positive Decimal Point position	[T+ D.P.=0]	AL2	[TTPDP]

Setting partial direct totalizer decimal point position. Example: P+D.P.= 3 visualized value P+dm³ 0.000 / P+D.P.= 2 visualized value P+dm³ 0.00

(POS. 3.9) Totalizer Total Negative Unit of measure Type	[T- unit= METRIC]	AL2	[TTNUT]

This function sets the type of unit of measurement of the total inverse totalizer: metric or non-metric (English and American units).

(POS. 3.10) Totalizer Total Negative Unit of Measure	[T- unit=ml]	AL2	[TTNUM]

This function sets the unit of measurement for the total inverse totalizer. The choice of its values depends on the choice of the unit of measurement of the function "3.9" pag. 39

(POS. 3.11) Totalizer Total Negative Decimal Point position	[T- D.P.=0]	AL2	[TTNDP]

Setting total reverse totalizer decimal point position. Example: T- D.P.= 3 visualized value T- dm³ 0.000; T- D.P.= 2 visualized value T- dm³ 0.00.

(POS. 3.12) Totalizer Total auX Unit of measure Type	[AXi unit= METRIC]	AL2	[TTXUT]

Reserved

(POS. 3.13) Totalizer Total auX Unit of Measure	[AXi unit=ml]	AL2	[TTXUM]

Reserved

(POS. 3.14) Totalizer Total auX Decimal Point position	[AXi D.P.=0]	AL2	[TTXDP]

Reserved

(POS. 3.15) Pulse In 1 Unit of measure Type	[IP1 unit= MET.V]	AL2	[PI1UT]

Reserved

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(POS. 3.16) Pulse Out 1 Unit of measure Type	[OP1 unit= METRIC]	AL2	[PO1UT]

Pulse output 1 unit of measure type

(POS. 3.17) Analog In2 Unit of Measure	[AnIn2 Unit=%]	AL2	[AI2UM]

Analog input 2 unit of measure. Free field (max. 5 characters)

MENU 4 - SCALE

(POS. 4.1) Flow Rate Full Scale Value	[FR]	AL2	[FRFSV]

Full scale value of fluid flow vector. There are three input fields, from left to right: 1) unit of measure, 2) unit of time and 3) numerical values. The selection is made by positioning the cursor over the field to be modified. The calculator supports English and American volume units as well as metric units; the type of unit is selectable via the POS. 1.1, the instrument is delivered by default set in metric units. The calculator accepts all combinations of units of measurement with numerical field value ≤ 99999. The available units of measure are:

METRIC UNIT	
cm³	cubic centimeter
ml	milliliter
dm³	cubic decimeter
dal	decaliter
hl	hectoliter
m³	cubic meter

ENGLISH OR AMERICAN UNITS	
in³	cubic inch
Gal	american gallon
IGL	british gallon (imperial)
ft³	cubic foot
bbl	standard barrel
BBL	oil barrel
KGL	KAmerican gallon
IKG	KBritish gallon (imperial)
aft	Acre feet
MGL	MAmerican gallon
IMG	MBritish gallon (imperial)

The time units can be selected from the following values: s = second, m = minute, h = hour, d = day.

The full scale value affects the alarm thresholds, which are calculated as a function of this value (see Alarms menu). Furthermore, the position of the decimal point can be changed in the function itself by selecting the point and moving the up / down arrow keys to change its position.

(POS. 4.2) Thermal Power Full Scale Value	[TPwr]	AL2	[TPFSV]

Full scale value of thermal power. With this function the full scale value of the thermal power is established; the units are available:

- ❑ W, watt
- ❑ kW, kilowatt (= 1.000 Watt)
- ❑ MW, megawatt (= 1.000.000 Watt)
- ❑ GW, gigawatt (= 1.000.000.000 Watt)

The numeric field can be freely set both as numerical value and as position of the decimal point. **ATTENTION:** values that are too small or too large may cause errors in the representation of data (excessive or not significant number of digits). For the preparation see previous function. Furthermore, the position of the decimal point can be changed in the function itself by selecting the point and moving the up / down arrow keys to change its position.

(POS. 4.3) InPut 1 Pulse Value	[Ipl1]	AL2	[IP1PV]

Reserved

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(POS. 4.4) OutPut 1 Pulse Value	[Opl1]	AL2	[OP1PV]

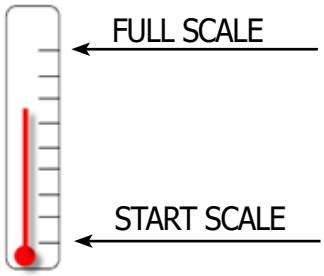
Setting the pulse energy for output 1 and the unit of measurement of the totalizers. There are two input fields for this parameter, from left to right: 1) unit of measure, 2) numerical value. The selection is made by positioning the cursor over the field to be modified. The position of the decimal point can be modified in the function itself by selecting the point and moving the up / down arrow keys to change its position. Units are those seen at the function "3.4" pag. 39.

(POS. 4.5) OutPut 1 Pulse Time	[Top1]	AL2	[OP1PT]

Duration of the single output energy pulse in milliseconds; note: consequently the maximum frequency obtainable at the output depends on this value. The selection is made by positioning the cursor over the field to be modified. The duration of the single output energy pulse in milliseconds; note: the maximum output frequency depends on this value.

(POS. 4.6) Temperature T1 and T2 Start Scale	[Start S.T]	AL2	[T12SS]

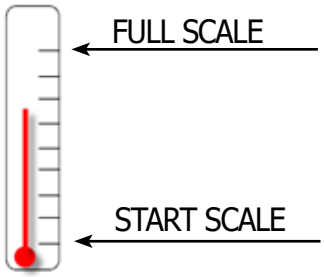
Start of temperature scale (Min) and full scale (max) of temperatures To and Ti; in these fields you change both the unit of measurement (° C / ° F, which is valid for all the temperatures as set at the function "3.2" pag. 39) that the sign +/-.



This scale is also used as a scale for the 0 / 4-20mA output when this is associated with one of the temperatures T1 or T2.

(POS. 4.7) Temperature T1 and T2 Full Scale	[Full S.T]	AL2	[T12FS]

Full scale temperature (Max) and Full scale (min) of temperatures To and Ti; in these fields you change both the unit of measurement (° C / ° F, which is valid for all the temperatures as set at the function "3.2" pag. 39) that the sign +/-.



This scale is also used as a scale for the 0 / 4-20mA output when this is associated with one of the temperatures T1 or T2.

(POS. 4.8) Temperature DelTa Full Scale	[F.S.DTemp]	AL2	[TDTFS]

Delta T full scale; being the ΔT = Ti - To, if Consequently the Scala Fund set here it is to be intended both positive and negative (the sign can not be set); in this field the unit of measurement (°C / °F, which applies to all temperatures as set at the funtion "3.2" pag. 39) is also changed.

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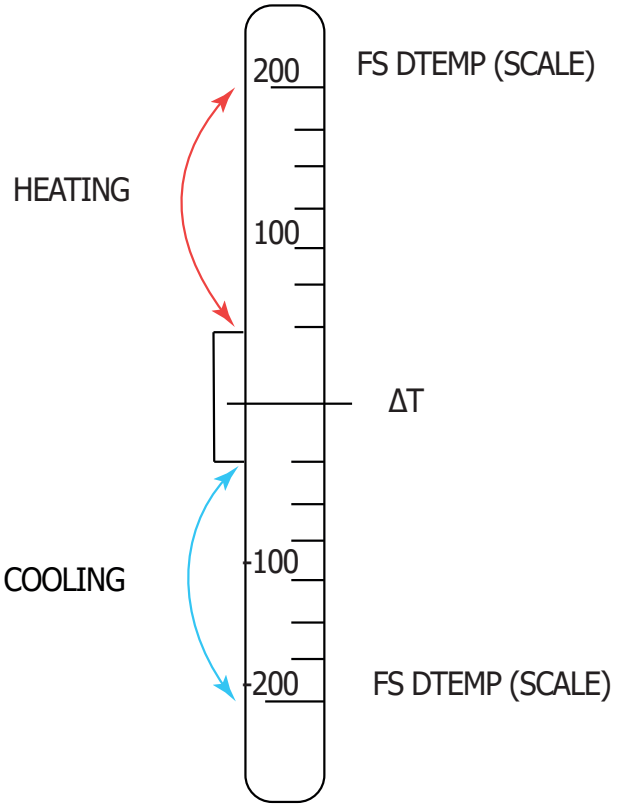

This scale is also used as a scale for the 0 / 4-20mA output when this is associated with the ΔT.

(POS. 4.9) Pressure At Ti Point	**[PresTi]**	**AL2**	**[PATIP]**

This function allows to set the pressure value in bar at the point where the temperature transducer Ti (Inlet) is inserted. This value increases the accuracy of the water density calculation; The permissible values range from 0 to 4000 kPa (which corresponds to 0-40 bar).

(POS. 4.10) Pressure At To Point	**[PresTo]**	**AL2**	**[PATOP]**

This function allows to set the pressure value in bar at the point where the temperature transducer To (Outlet) is inserted. This value increases the accuracy of the water density calculation; The permissible values range from 0 to 4000 kPa (which corresponds to 0-40 bar).

(POS. 4.11) Analog In2 Start Scale value	**[SI2]**	**AL2**	**[PAT1P]**

Scale start value for scaling the Measure done via Analog Input 2.

(POS. 4.12) Analog In2 Full Scale value	**[FI2]**	**AL2**	**[AI2FS]**

Full scale value for scaling the measure done via Analog Input 2.

(POS. 4.13) Remotely Written Value Start Scale	**[S.s. rwv]**	**AL2**	**[RWVSS]**

Scale start value for the measure remotely written (communication protocol).

(POS. 4.14) Remotely Written Value Full Scale	**[F.s. rwv]**	**AL2**	**[RWVFS]**

Full scale value for the measure remotely written (communication protocol).

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MENU 5 - MEASURE

(POS. 5.1) TeMPerature Sensor Type	[Sens.Type]	AL3	[TMPST]

Temperature sensor type: PT 100, PT500, PT1000.0.

(POS. 5.2) Measure vector fluid Flow CUt-off Threshold	[VFF C.O.]	AL3	[MFCUT]

Threshold in % with respect to the full scale of the carrier fluid flow rate below which the flow rate is set to zero. This function is useful to avoid that near-zero flow rates, due to electrical disturbances or miniscule movements of the flow rate on the analogue input, can determine the increase of the totalizers.

(POS. 5.3) Temperature Delta CUt-off Threshold	[DT Min.]	AL3	[TDCUT]

This function is similar to the cut-off threshold: when the difference between temperature Ti and To (delta T) goes below the set value, delta T will be set to zero. This function is used to avoid the thermal energy accounting when the system operating conditions aren't in the usual application area . The minimum vale for MID version is 3°K (5.4°F).

(POS. 5.4) Temperature Ti HC threshold Enable	[TiHC enable]	AL3	[TIHCE]

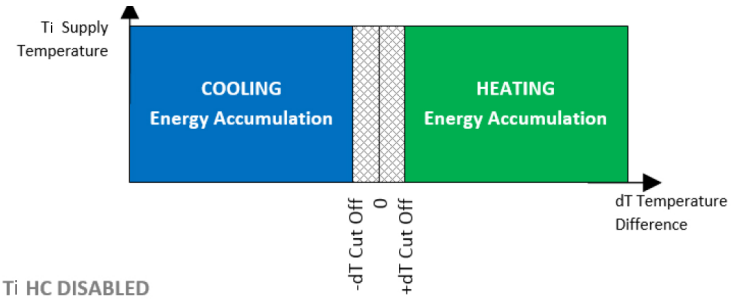
Enable Ti heating cooling threshold. See the referenced scheme below.

(POS. 5.5) Temperature tI HC threshold Value	[TiHC]	AL3	[TIHCV]

Threshold value Ti heating cooling. See the reference scheme below.

REFERENCE DIAGRAM FUNCTIONS POS.5.4 / POS.5.5:

CS611 uses dT to discriminate heating (dT Positive) and cooling (dT Negative); when the temperature is lower than the set point, the power is zero. The parameter TiHC POS. "5.4" pag. 39 is disabled as shown in the diagram.

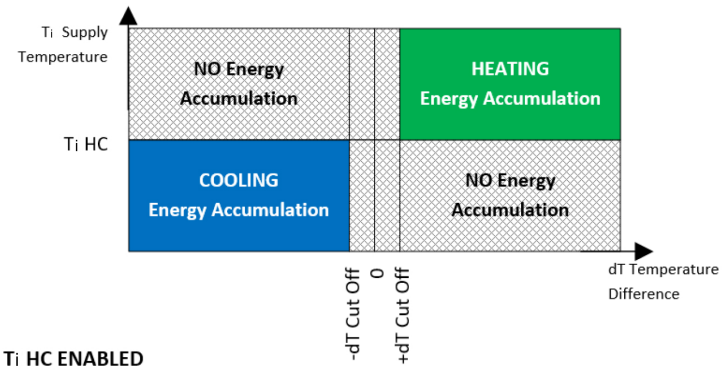


Ti HC DISABLED

In compliance with EN 1434 it is possible to set a parameter "Optional cold flow temperature threshold" when the parameter T1HC POS. "5.4" pag. 39 is enabled, it allows the discrimination between Heating / Cooling which must be accumulated to Energy and undesirable temperature differences that do not have to be accumulated; maintaining the same previous mechanism for heating / cooling, TiHC allows the H / C switch and energy storage only when:

- Ti <TiHC in cooling conditions.
- Ti> TiHC in heating conditions.

In other conditions, the accumulation of energy is not allowed and the vector fluid flow LED does not flash despite the presence of flow.



Ti HC ENABLED

NOTE: The H / C status of the Ti threshold is indicated close to the Ti temperature on Display exactly as the H / C determination is indicated near the DT temperature.

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(POS. 5.6) Positive Vector Fluid Measure Mode	[+VF m.mode]	AL3	[PVFCM]

Positive vector fluid flow measurement mode

- ❑ 1: HEAT: heating measurement only
- ❑ 2: COOL: cooling measurement only
- ❑ 3: H/C: heating/ cooling measurement

(POS. 5.7) Positive Vector Fluid Measure Side	[+VF mea. side]	AL3	[PVFCS]

Positive vector fluid flow measurement side

- ❑ 0: To: CS611 mounted on outlet side
- ❑ 1: Ti: CS611 mounted on inlet side

(POS. 5.8) Negative Vector Fluid Measure Mode	[-VF m. mode]	AL3	[NVFCM]

Negative vector fluid flow measurement mode. Not be used for CS611.

(POS. 5.9) NegativeVector Fluid Measure Side	[-VF mea. side]	AL3	[NVFCS]

Negative vector flow measurement side. Not be used for CS611.

(POS. 5.10) energy ConTRoL Type enable	[E. Ctrl type]	AL3	[CTRLT]

Energy counter control type enable

(POS. 5.11) Enable Functions for Table of Kfactor Coefficients	[K-factor]	AL2	[EFTKC]

Enable coefficient factor K table. If the heat transfer liquid is water with additives, select the function (ON).

(POS. 5.12) Substance Type for Kfactor Table Coefficients	[Subst. type]	AL2	[STKTC]

Select the substance code; only on the Virtual Display or from MCP commands it is possible to view an alphanumeric memonic of the

selected substance.

MCPI> STKTC?

100:'ETG Afn N A5'

MCPI> STKTC=?

100:'ETG Afn N A5'|101:'ETG Afn SHT A5'|200:'PPG Tfr L A5'|201:'PPG Tfr LS A5'

(POS. 5.13) Substance Concentration for Kfactor Table Coefficients	[Subst.Conc]	AL2	[SCKTC]

NOTE: not all concentrations are selectable; for some substances the concentration is not selectable.

MCPI> SCKTC?

020:'%' MCPI> SCKTC=?

20 040 (%)

(POS. 5.14) Measure PROFile	[Prof.M.]	AL3	[MPROF]

Setting the measurement acquisition profile between:

OFF

FAST = "reactive" acquisition, useful when temperature/flow rate changes need to be detected quickly.

STD = Standard acquisition (default).

SLOW = Slow acquisition, useful when there are disturbances or perturbations in temperatures/flow rates.

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MENU 6 - ALARMS

(POS. 6.1) Flow Rate Alarm maX Positive	[FM]	AL3	[FRAXP]

Maximum value set for maximum flow alarm F.V.

When the flow value of the carrier fluid exceeds this threshold, the corresponding alarm message is generated. The value of this parameter is expressed in technical units and is limited by the set vector full scale value (POS "4.1" pag. 39) and the minimum alarm. Set this parameter to zero to disable this alarm, OFF will appear.

(POS. 6.2) Flow Rate Alarm miN Positive	[Fm]	AL3	[FRANP]

Minimum value set for minimum flow alarm F.V.

When the flow value of the carrier fluid falls below this threshold, the corresponding alarm message is generated. The value of this parameter is expressed in technical units and is limited by the maximum alarm value. Set this parameter to zero to disable this alarm, OFF will appear.

(POS. 6.3) thermal PoWer Alarm MaX	[Pwr M]	AL3	[PWAMX]

Maximum value set for maximum thermal power alarm.

When the thermal power value exceeds this threshold, the relative alarm message is generated. The value of this parameter is expressed in technical units and is limited by the set value of the set heat output (POS "4.2" pag. 39) and the minimum alarm. Set this parameter to zero to disable this alarm, OFF will appear.

(POS. 6.4) thermal PoWer Alarm MiN	[Pwr m]	AL3	[PWAMN]

Minimum value set for the minimum thermal power alarm.

When the thermal power value falls below this threshold, the corresponding alarm message is generated. The value of this parameter is expressed in technical units and is limited by the maximum alarm value. Set this parameter to zero to disable this alarm, OFF will appear.

(POS. 6.5) Temperature Delta Alarm MaX	[DT max]	AL3	[TDAMX]

Maximum value set for the maximum temperature difference alarm DT.

When the temperature difference value (in absolute value) exceeds this threshold, the relative alarm message is generated. The value of this parameter is expressed in technical units and is limited by the value of the full scale difference in set temperature (POS "4.8" pag. 39) and by the minimum alarm.

Set this parameter to zero to disable this alarm, OFF will appear.

(POS. 6.6) Temperature Delta Alarm MiN	[DT min]	AL3	[TDAMN]

Minimum value set for the minimum temperature difference alarm DT.

When the temperature difference value (in absolute value) falls below this threshold, the corresponding alarm message is generated. The value of this parameter is expressed in technical units and is limited by the maximum alarm value. Set this parameter to zero to disable this alarm, OFF will appear.

NOTES ON THE FUNCTIONS 6.5-6.6 TEMPERATURE DIFFERENCE

DT VALUE

Considering that DT = Ti - To, where Ti and To are the measures of the inlet and outlet temperatures respectively, we can have two DT values from the system:

- ❑ POSITIVE means that the system is in heating mode.
- ❑ NEGATIVE means that the system is cooling.
- ❑ The full scale of the DT refers to the DT measured in absolute value; also the alarms, minimum and maximum, refer to the DT in absolute value:

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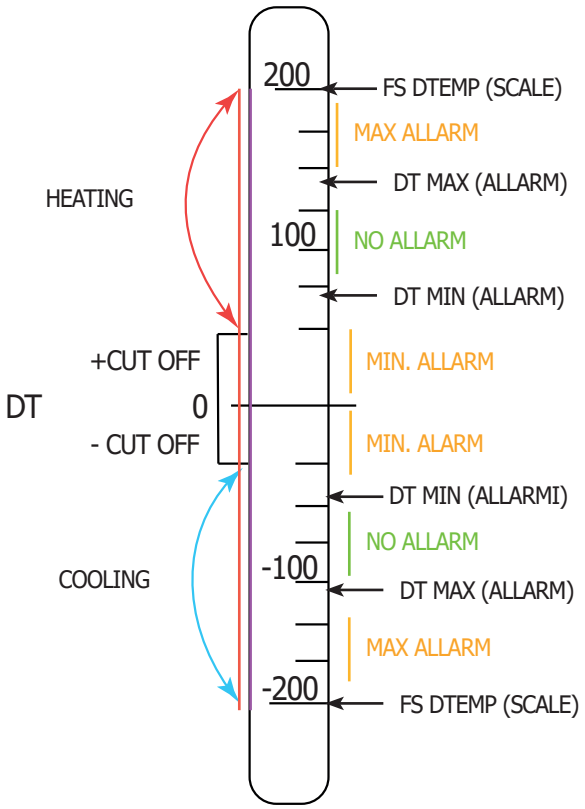
- the maximum alarm threshold should therefore be considered as a value greater than the maximum positive DT or lower than the maximum negative DT
- the minimum alarm threshold goes in the same way as a lower value at the minimum positive DT is greater than the minimum negative DT.

The following diagram summarizes these conditions relating to the temperature difference:



(POS. 6.7) Temperature Ti Alarm MaX	**[Ti Max]**	**AL3**	**[TIAMX]**

Maximum value set for maximum temperature alarms Ti. When the temperature value exceeds this threshold, the corresponding alarm message is generated. The value of this parameter is expressed in technical units and is limited by the full scale value of the set temperature (POS."4.7" pag. 39) and by the minimum alarm. Set this parameter to zero to disable this alarm, OFF will appear.

(POS. 6.8) Temperature Ti Alarm MiN	**[Ti min]**	**AL3**	**[TIAMN]**

Minimum value set for minimum temperature alarms Ti. When the temperature value falls below this threshold, the corresponding alarm message is generated. The value of this parameter is expressed in technical units and is limited by the temperature start value (POS "4.6" pag. 39) from the maximum alarm. Set this parameter to zero to disable this alarm, OFF will appear.

(POS. 6.9) Temperature To Alarm MaX	**[To Max]**	**AL3**	**[TOAMX]**

Maximum value set for maximum temperature alarms To. When the temperature value exceeds this threshold, the corresponding alarm message is generated. The value of this parameter is expressed in technical units and is limited by the full scale value of the set temperature (POS."4.7" pag. 39) and by the minimum alarm. Set this parameter to zero to disable this alarm, OFF will appear.

(POS. 6.10) Temperature To Alarm MiN	**[T2 min]**	**AL3**	**[TOAMN]**

Minimum value set for minimum temperature alarms To. When the temperature value falls below this threshold, the corresponding alarm message is generated. The value of this parameter is expressed in technical units and is limited by the temperature start value (POS "4.6" pag. 39) from the maximum alarm. Set this parameter to zero to disable this alarm, OFF will appear.

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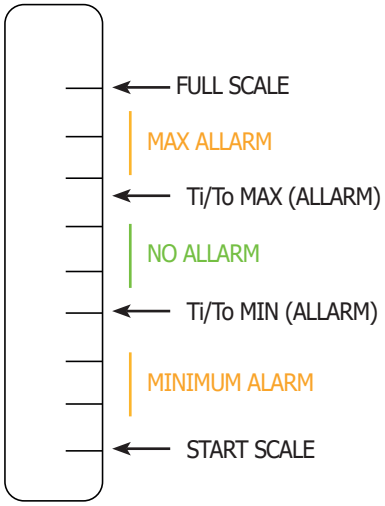
NOTES ABOUT THE FUNCTIONS: 6.7-6.8-6.9-6.10

The following are the conditions for using the minimum and maximum temperature thresholds for the alarms for the Ti and To values.



(POS. 6.11) Analog in2 Alarm MaX	**[A2M]**	**AL3**	**[A2AMX]**

Analog Input.2 Maximum alarm threshold

(POS. 6.12) Analog in2 Alarm MiN	**[A2m]**	**AL3**	**[A2AMN]**

Analog Input 2 minimum alarm threshold

(POS. 6.13) Alarm Thresholds HYSteresis	**[Hysteresis]**	**AL3**	**[ATHYS]**

Hysteresis threshold set for minimum and maximum flow alarms. The value of this parameter is expressed as a percentage of the full scale value and can be set from 0 to 25%.

(POS. 6.14) Output Voltage Alarm Condition Value	**[OV Fault]**	**AL3**	**[OVACV]**

Output.voltage Alarm Condition Value

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MENU 7 - INPUTS

(POS. 7.1) Volume Totalizer Partial Positive reset input Enable	**[P+ reset]**	**AL3**	**[VTPPE]**

Positive partial totalizer reset function

(POS. 7.2) Volume Totalizer Partial Negative reset input Enable	**[P- reset]**	**AL3**	**[VTPNE]**

Negative partial totalizer reset function

(POS. 7.3) auX Totalizer Partial reset Input Enabl	**[AuX P. reset]**	**AL3**	**[XTPIE]**

reserved

(POS. 7.4) Heat. energy partial reset input en	**[HEv P. reset]**	**AL3**	**[AHEPE]**

Enabling the partial zeroing of energy input Heating; this function enables the counter to be reset even by communication protocol. In the MID version the partial contactors cannot be reset because they are Long Term Storage contactors.

(POS. 7.5) Cool. energy partial reset input en.	**[CEv P. reset]**	**AL3**	**[ACEPE]**

Enabling the partial energy zero setting input Cooling; this function enables the counter to be reset even by communication protocol. In the MID version the partial contactors cannot be reset because they are Long Term Storage contactors.

(POS. 7.6) Partial counters lock input enable	**[P.Count lock]**	**AL3**	**[PCLIE]**

Enable partial counter block input. If the function is set to ON, when IN4 becomes high, all the partial and total totalizers will no longer advance even if pulses continue to arrive at the respective inputs. In the MID version the partial contactor block cannot be reset as long-term storage contactors.

(POS. 7.7) Volume Totalizer Total Positive reset Enable	**[T+ reset]**	**AL3**	**[VTTPE]**

Reset total positive totalizer for direct flow rate (+)

(POS. 7.8) Volume Totalizer Total Negative reset Enable	**[T- reset]**	**AL3**	**[VTTNE]**

Reset total negative totalizer for direct flow rate (-)

(POS. 7.9) auX Totalizer Total reset Input Enable	**[AuX T. reset]**	**AL3**	**[XTTIE]**

Reserved

(POS. 7.10) Heating energy total reset input en.	**[HEv T. reset]**	**AL3**	**[AHETE]**

Enabling of total energy zeroing input Heating; this function enables the counter to be reset even by communication protocol.

(POS. 7.11) Cool. energy total reset input en.	**[CEv T. reset]**	**AL3**	**[ACETE]**

Enabling of total energy zeroing input Cooling; this function enables the counter to be reset even by communication protocol.

(POS. 7.12) Total counters lock input enable	**[T.Count lock]**	**AL3**	**[TCLIE]**

Enable total counter block input. By applying a voltage to the input terminals, the increment of the totalizers is interrupted.

(POS. 7.13) Analog Input 0 ConFiguration	**[A.In 0]**	**AL3**	**[AI0CF]**

Selection of the range for the analog input for reading the actuator position between 0-10V and 2-10V.

(POS. 7.14) Analog Input 2 ConFiguration	**[A.In 2]**	**AL3**	**[AI2CF]**

Selection of the range for the analog input2. Possible range: OFF/0_10 V / 2_10 V /0_5 V / 1_5 V / 0_20mA / 4_20mA

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MENU 8 - OUTPUTS

(POS. 8.1) OUTput 1 Function	[D.Out1]	AL3	[OUT1F]

Function for selection to be associated with digital output 1. The functions are listed in the following table.

- **OFF**: DISABLED
- **GEN.ALARM.:** GENERAL ALARM (EXCITED = ALL OFF); Any alarm present.
- **HP ALARM.:** HIGH PRIORITY ALARM (EXCITED = ALL OFF); Only alarms that interrupt the operation of the instrument.
- **H/C DET.:** TYPE OF DETECTED OPERATION (DE-EXCITED = HEATING, EXCITED = COOLING); Change according to the actual sign of Power / Delta T
- **H/C SET:** FUNCTION TYPE SET (DE-EXCITED = HEATING, EXCITED = COOLING);
- **FV FL. m+M:** ALL. MIN / MAX FLOW RETURN VECTOR (EXCITED = ALL OFF)
- **T PWR m+M:** ALL. MIN / MAX THERMAL POWER (EXCITED = ALL OFF)
- **DT m+M:** ALL. MIN / MAX DELTA T (EXCITED = ALL OFF)
- **Ti m+M:** ALL. MIN / MAX TEMPERATURE Ti (EXCITED = ALL OFF)
- **To m+M:** ALL. MIN / MAX TEMPERATURE To (EXCITED = ALL OFF)
- **T.S ERROR.:** TEMPERATURE SENSOR ERROR (EXCITED = SENS.TEMP. OK)
- **EMPT.PIPE:** EMPTY PIPE ERROR
- **F.S ERR.:** MAG FLOW SENSOR ERROR
- **O.C ERR.:** OUTPUT CONTROL ERROR
- **T.NRG PLS:** THERMAL ENERGY SCALED PULSES
- **VF.V PLS:** VECTOR FLUID SCALED PULSES

(POS. 8.2) Analog Output 0 ConFiguration	[A.Out0]	AL3	[AO0CF]

Selection of the variable to be assigned to analogue output 1 see analogue output table.

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MENU 9 – COMMUNICATION

(POS. 9.1) ModBus Communication PRotocol	**[Modbus]**	**AL3**	**[MBCPR]**

Modbus communication protocol

(POS. 9.2) DeVice communication ADdRess	**[Dev. Address]**	**AL3**	**[DVADR]**

Device communication address

(POS. 9.3) COMmunication SPeed	**[Com.Speed]**	**AL3**	**[COMSP]**

Communication's Speed

(POS. 9.4) COMmunication PaRity	**[Parity]**	**AL3**	**[COMPR]**

Communication's Parity bit.

(POS. 9.5) communication ANSwer DeLay	**[Ans. Delay]**	**AL3**	**[ANSDL]**

Communication response delay

(POS. 9.6) ETHernet DHcp enable	**[ETH DHCP en.]**	**AL3**	**[ETHDH]**

DHCP ethernet enablement. After changing the ON / OFF status it is necessary to restart the device with the command mcp [ATSIC] present in the diagnostic menu.

(POS. 9.7) ETHernet device IP address	**[ETH dev IP addr.]**	**AL3**	**[ETHIP]**

Ethernet device IP address

(POS. 9.8) ETHernet Network Mask	**[ETH network mask]**	**AL3**	**[ETHNM]**

Ethernet network mask

(POS. 9.9) ETHernet GateWay address	**[ETH gateway add.]**	**AL3**	**[ETHGW]**

Ethernet gateway address

(POS. 9.10) ETHernet DNs address	**[ETH DNS address]**	**AL3**	**[ETHDN]**

Ethernet DNS address

(POS. 9.11) TiMe SeRVer name	**[NTP time server]**	**AL3**	**[TMSRV]**

NTP time server name / address

(POS. 9.12) Network Access PassWorD	**[Network password]**	**AL3**	**[NAPWD]**

Network access password

(POS. 9.13) NeTwork Secure Socket Layer	**[Net S.En.]**	**AL3**	**[NTSSL]**

Ethernet DNS address

- ❑ OFF: not encrypted access only (encrypted access is not possible)
- ❑ ON: encrypted access only (unencrypted access is not possible)
- ❑ ON+OFF: Access possible in both encrypted and unencrypted mode

(POS. 9.14) ModBus 32 registers Order	**[MDB_32]**	**AL3**	**[MB32O]**

Modbus 32 bits registers order

(POS. 9.15) Absolute Value Power Protocols Enable	**[Abs th.pwr]**	**AL3**	**[AVPPE]**

Use absolute th.power value on communication protocol

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MENU 9- COMMUNICATION: FUNCTIONS ACTIVABLE MCP ONLY

ETHernet Mac address High	**[MCP ONLY]**	**AL5**	**[ETHMH]**

Ethernet MAC address 3 Higher HEX bytes

ETHernet Mac address Low	**[MCP ONLY]**	**AL5**	**[ETHML]**

Ethernet MAC address 3 Lower HEX bytes

Remote energy ConTRol Type	**[MCP ONLY]**	**AL5**	**[RCTRT]**

Remote energy counter control type. Value set by communication protocol.

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MENU 10 - DISPLAY

(POS. 10.1) Layout LANGuage	**[Language]**	**AL1**	**[LLANG]**

Language change. The following languages are available:

- ❑ EN = English

(POS. 10.2) Display CoNTRast	**[Contrast]**	**AL1**	**[DCNTR]**

Display contrast contrast set. Contrast may vary depending on the ambient temperature. The allowed range is from 0 to 9.

(POS. 10.3) KeyBoard TiMeout Time	**[Disp.time]**	**AL1**	**[KBTMT]**

This function sets display / keyboard inactivity.

The set values are between 020 and 255 seconds.

(POS. 10.4) KeyBoard SeNSitivity	**[Key sens.%]**	**AL2**	**[KBSNS]**

Setting of touch keyboard sensivity

(POS. 10.5) DISplay Function Number	**[Disp. F.Num.]**	**AL2**	**[DISFN]**

Display page number function. This function sets the page display to make it visible when the display is started. For each display page is associated a number corresponding to the position.

0 = Main / ALARMS, 1 = POWER AND FLOW, 2 = TEMPERATURES, 3 = ANALOG DIG IN,

4 = HEATING ENERGY, 5 = COOLING, 6 = VECTOR FLUID, 7 = MAG.SENSOR INFO,
8 = OUTPUT CONTROL.

(POS. 10.6) Display function LOcK Enable	**[Disp. P.Lock]**	**AL2**	**[DLOKE]**

Page number block displayed.

This function blocks scrolling of the displayed pages selected by the function "10.5" pag. 41 setting.

(POS. 10.7) Display AutoScroll Page Bits	**[Disp. A.Scrl]**	**AL2**	**[DASPB]**

This function sets the automatic scrolling of the selected screens.

If selected, the Main / ALARMS screen will be scrolled only if there is at least one alarm present. Setting “0” scrolling is disabled.

(POS. 10.8) Date And Time Display Enable	**[Disp.date]**	**AL2**	**[DATDE]**

Date and time visualization can be hidden (OFF), visualisation only on the Main / ALARMS (MAIN) screen or on all pages (ALL), reducing the font size of a parameter.

(POS. 10.9) LED operating MoDe color switch	**[LED Op. Mode]**	**AL2**	**[LEDMD]**

Set the main LED color change:

OFF = Color change off, the main color of the LED will be Green.

SIG = Color change dependent on the “sign” of Power (and DT); Green with positive sign (in heating), Blue with negative sign (in cooling).

CTR = Color change dependent on the actual “control” of the type; the colors Green (Heating) and Blue (Cooling) will therefore depend on the setting of the POS.3.13 function and, relatively, also on the Input 4 or the setting via the communication protocol

(POS. 10.10) LED 1st accumulator blink Enable	**[LED VF Blink]**	**AL2**	**[LED1E]**

Sets the flashing of the LED related to the flow rate of the Vector Fluid:

ON = The color of the Green or Blue LED (see previous setting) will flash only when there is a flow rate otherwise it will remain on steady.

OFF = The color of the Green or Blue led (see previous setting) will flash regardless of the presence of flow.

(POS. 10.11) LED coMmunication blink Enable	**[LED Comm.Blk]**	**AL2**	**[LEDME]**

Set the flashing of the LED related to communication:

ALL = The color of the white LED flashes in the presence of any communication, otherwise it remains off.

BUS = The color of the white LED flashes when there is communication with the selected fieldbus, otherwise it remains off.

MCP = The color of the white LED flashes when there is communication with MCP, otherwise it remains off.

OFF = The color of the white LED remains off.

(POS. 10.12) Quick STart Menu Enable	**[Quick start]**	**AL2**	**[QSTME]**

This function enables the quick start menu to be displayed.

OFF: Quick start menu disabled

DIR: Quick start menu enabled, access from visualization pages

MENU: Quick start menu enabled, access from Main menu

(POS. 10.13) Virtual Display Web Interface Enable	**[Web VD En]**	**AL2**	**[VDWIE]**

This function enables the quick start menu to be displayed.

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MENU 12 - FUNCTION

(POS. 12.1) Volume Totalizer Partial Positive Reset	**[P+ reset]**	**AL3**	**[VTPPR]**

Reset total partial totalizer for direct flow rate (+)

(POS. 12.2) Volume Totalizer Partial Negative Reset	**[P- reset]**	**AL3**	**[VTPNR]**

Reset partial negative totalizer for direct flow rate (-)

(POS. 12.3) auX Totalizer Partial Reset Function	**[AuX P. reset]**	**AL3**	**[XTPRF]**

Reserved

(POS. 12.4) HEv P. reset	**[HEv P. reset]**	**AL3**	**[TPRHV]**

Partial heat energy reset function. In the MID version the partial totalizers cannot be reset because they are Long Term Storage totalizers.

(POS. 12.5) CEv P. reset	**[CEv P. reset]**	**AL3**	**[TPRCV]**

Partial zero cooling energy function. In the MID version the partial totalizers cannot be reset because they are Long Term Storage totalizers.

(POS. 12.6) Volume Totalizer Total Positive Reset	**[T+ reset]**	**AL3**	**[VTTPR]**

Reset total positive totalizer for direct flow rate (+)

(POS. 12.7) Volume Totalizer Total Negative Reset	**[T- reset]**	**AL3**	**[VTTNR]**

Reset total negative totalizer for direct flow rate (-)

(POS. 12.8) auX Totalizer Total Reset Function	**[AuX T. reset]**	**AL3**	**[XTTRF]**

Reserved

(POS. 12.9) Totalizer Total Reset Heating energy Value	**[HEv T. reset]**	**AL3**	**[TTRHV]**

Total heating energy reset function

(POS. 12.10) Totalizer Total Reset Cooling energy Value	**[CEv T. reset]**	**AL3**	**[TTRCV]**

Function clears. total cooling energy

(POS. 12.11) Load Factory Default Calculator device Data	**[Load Dev. Fact.]**	**AL3**	**[LFDCD]**

This function resets the parameters of the converter factory default

(POS. 12.12) Save Factory Default Calculator device Data	**[Save Dev. Fact.]**	**AL6**	**[SFDCD]**

This function save the parameters of the sensor factory default

(POS. 12.13) AcknoWledge Factory Data Alarms	**[Acknow.Fact.Warn]**	**AL3**	**[AWFDA]**

Should the settings of the device be lost, the factory settings will be automatically recharged and the corresponding alarm will be displayed; use this function to eliminate the alarm while keeping current factory data in use.

(POS. 12.14) CALibration Immediate Command	**[Calibration]**	**AL5**	**[CALIC]**

Perform manually a board's calibration. Press Enter and the message " EXECUTE?" will be visualized on the display then press long the key Enter to proceed. Press any other key to cancel the operation.

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MENU 13 - DIAGNOSTIC

(POS. 13.1) AutoTeSt Immediate Command	[Reboot-Self_Test]	AL3	[ATSIC]

Meter auto-test function. This function stops the normal functions of the meter and performs a complete test cycle on the measure input circuits and on the excitation generator. To activate this function, after select it, push key Enter, at the question: “CONFIRM EXEC.?” Long Push the same key to start auto-test, or any other key for delete operation. At the end of operation the converter will revert to one of the initial visualization pages. This function is automatically performed when switching on the device. This function restarts the converter.

(POS. 13.2) MODel and Software Version	[Firmware info]	AL0	[MODSV]

This function displays the latest firmware version of the device.

```
V.1.05.0002.0002
11:23:08
```

The model of the converter is shown, the firmware version is the date and time of the last update.The last 2+2 numbers refer to the fluid and sensor tables.

(POS. 13.3) Fluid TABle Version	[Fluid table info]	ALL	[FTABV]

Fluid table version information

(POS. 13.4) Mag sensor TABle Version	[Mag.s.table info]	ALL	[MTABV]

Mag. sensor table version information

(POS. 13.5) Quick sEtup INFormation	[Quick Setup info]	AL0	[QEINF]

Quick Setup information.

(POS. 13.6) Status of Data memory STorAge	[Storage mem.info]	ALL	[SDSTA]

This function shows the status of the data memory

(POS. 13.7) Diagnostic System VaLueS	[Disp.sys.values]	ALL	[DSVLS]

System diagnostic information

(POS. 13.8) ETHernet communication Information Data	[Ethernet info]	ALL	[ETHID]

Ethernet information data

(POS. 13.9) FieldBus Communication Diagnostic Values	[F.Bus comm.diag.]	ALL	[FBCDV]

FieldBus communication diagnostics.

(POS. 13.10) Diagnostic Communication VaLueS	[Disp.comm.vars]	AL5	[DCVLS]

This function shows the values of various internal parameters specific to MCP communication (diagnostic purpose reserved for the service).

```
PPPlink:      00 NETW  E_IP_HDR3:    0
MCP_TCP:        ESTAB.  E_IP_HDR4:    0
FTR_TCP:        CLOSED  E_IP_HDR5:    0
RxCNT[0]:  500359865  E_IP_HDR6:    0
TxCNT[0]: 1143692041  E_IP_HDR7:    0
RxERR[0]:          0  E_IP_HDR8:   62
E_PAKTLEN:         0  E_IP_HDR9:    0
E_BFOVRUN:         0  E_TCPHDR1:    0
E_TSPLAYR:         0  E_TCPHDR2:    0
E_BFOVERR:         0  E_UDPHDR1:    0
E_TSPLAYR:         0  E_UDPHDR2:    0
E_IP_HDR1:         0  E_UDPHDR3:    0
E_IP_HDR2:         0  E_ICMPHDR:    0
```

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Following are the states for the PPP link and MCPI to connect the device.

PPP link status:

“UNDT” = undetermined

“DEAD” = dead, link down, persistent condition

“LCP” = LCP phase, transition condition

“AUTH” = Authentication phase, transition condition

“IPCP” = IP and DNS addressess assign phase, transition condition

“NETW” = network established (normal persistent condition when the link is UP)

“TERM” = link termination request, transition condition

MCPI link status:

“CLOSED” = socket closed

“ACCEPT” = socket awaiting for new connection

“ESTABLISH” = link established

“CLS_WAIT” = waiting for closure

“LAST_ACK” = lask ACK sent

“FIN_WAIT” = (see TCP/IP RFC documentation)

“TIME_WAIT” = (see TCP/IP RFC documentation)

(POS. 13.10) Diagnostic Measure VaLueS	**[Display measure]**	**AL5**	**[DMVLS]**

Diagnostic Measure VaLueS. Display internal measured values.

(POS. 13.11) SeRial NUMber	**[S/N]**	**AL0**	**[SRNUM]**

Board serial number (read only)

(POS. 13.12) Total WorKing TiMe	**[WT]**	**AL0**	**[TWKTM]**

Total work time (read only)

(POS. 13.13) ParTial Counters TiMe	**[PT]**	**AL0**	**[PTCTM]**

NOT-MID devices, the operating time (counted as the total work time see function 10.10) which has elapsed since the last reset of at least one of the partial counters.

The partial counters can be reset using the relative functions (if enabled) from MCP commands, from input 4 or from the communication protocol. The new partial time totalizer “PTCTM” is reset to zero when at least one partial counter is reset.

MID devices, the operating time (counted as the total working time see function 10.10) which has elapsed since the last copy of the total counters in the partial counters ==> Long Term Storage function; in this way you can see how long ago the stored copy of the Long Term Storage counters is referenced.

All the total counters are copied to the Partial Counters (which become counters of Long Term Storge) whenever the total working time see function 10.10 is a multiple of 30 exact days; at the same time the new partial time totalizer “PTCTM” is reset, allowing to evaluate, to how long ago, the copy of the counters is referred.

(POS. 13.14) Sensor VERify Command	**[Sens.verify]**	**AL0**	**[SVERC]**

This function performs a manual sensor verification

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(POS. 13.15) Measure SIMulation ENable	**[Simulation]**	**AL3**	**[MSIEN]**

Simulation Function PV Flow, Valve and Temperatures. When the simulation is active, the flashing  flag appears in the display.

To set the simulation parameters, press Enter from one of the display pages and then set the parameters of:

- ❑ % full scale
- ❑ Ti
- ❑ To
- ❑ Reg
- ❑ Main menu

To stop the simulation, select the function> END OF SIMULATION.

Diagnostic menu 13: FUNCTIONS ACTIVABLE MCP ONLY

OscilloSCOPe function	**[MCP ONLY]**	**AL5**	**[OSCOP]**

Reserved

DIAGnostic Function	**[MCP ONLY]**	**AL6**	**[DIAGF]**

Set diagnostic function

eNeRGy Calculation Values	**[MCP ONLY]**	**AL6**	**[NRGCV]**

Energy calculation values

KFactor Table Coefficients Read	**[MCP ONLY]**	**AL6**	**[KFTCR]**

Reading of table coefficients

Storage Memory Log Diagnostic Info	**[MCP ONLY]**	**AL6**	**[SMLDI]**

Diagnostic info of logs storage memory

Coil Current Mean Real Value	**[MCP ONLY]**	**AL6**	**[CCMRV]**

Real mean value of coils current

MENU 14 - SYSTEM

(POS. 14.1) RTC ENable	**[RTC enable]**	**AL2**	**[RTCEN]**

Date/Time (Real Time Clock) enable.

(POS. 14.2) DaYlight Saving Time Enable	**[Dayl.saving]**	**AL2**	**[DYSTE]**

Daylight saving time change

(POS. 14.3) Time ZONE	**[Time ZONE]**	**AL0**	**[TZONE]**

Set the difference between GMT and the local time where the instrument is installed.

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(POS. 14.4) Date and TIME	**[Date and TIME]**	**AL2**	**[DTIME]**

Set to system date and time

(POS. 14.5-14.10) Level n° Access CoDe	**[LN XXXXXXXX]**	**AL1**	**[L1ACD]-> [L6ACD]**

This function enables or disables the main menu functions for each access level code.
Each level unlocks the functionality of the lower level if the POS function 14.10 is enabled.

L1 code= ******** Access level 1 code
L2 code= ******** Access level 2 code
L3 code= ******** Access level 3 code
L4 code= ******** Access level 4 code
L5 code= ******** Access level 5 code
L6 code= ******** Access level 6 code

(POS. 14.11) ReStricted Access Rule Enable	**[Restr.access]**	**AL6**	**[RSARE]**

Access level limited to the functions for which the access code is known.

(POS. 14.12) Total Measure CYCles	**[TC]**	**AL6**	**[TMCYC]**

Total measure cycles

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SETTINGS IP ADDRESS INTERFACE MCP (14.13 - 14.14- 14.15)

Attention: The changes made to functions 14.13 / 14.14 / 14.15 are activated after the instrument is restarted (start the function "13.1" pag. 42 Auto Test to restart the converter).

(POS. 14.13) ppp Device IP ADdress	**[Device IP addr]**	**AL3**	**[DIPAD]**

Device IP network address

(POS. 14.14) ppp Client IP ADdress	**[Client IP addr]**	**AL3**	**[CIPAD]**

Client IP network address

(POS. 14.15) ppp NETwork MaSk	**[Network mask]**	**AL3**	**[NETMS]**

Network mask

(POS. 14.16) CoeFFicient KS	**[KS]**	**AL3**	**[CFFKS]**

Constant instrumental calibration coefficient

(POS. 14.17) CoeFFicient KR	**[KR]**	**AL3**	**[CFFKR]**

Calibration coefficient

(POS. 14.16) temperature T1_2 Calibration Balance	**[T1-T2 BALANCE]**	**AL4**	**[T12CB]**

Calibration temp. T1 - T2. This function is used to calculate the compensation value between the two temperature probes; to use the function, place both temperature probes in the same liquid to bring them to the same temperature. The temperature difference is compensated by automatically setting the following temperature offsets for T1 and T2. The calculation is performed only if Delta T <± 2.55

(POS. 14.17) temperature T1 Calibration OffSet	**[T1 OFFS.]**	**AL5**	**[T1COS]**

Temperature T1 Calibration OffSet

(POS. 14.18) temperature T2 Calibration OffSet	**[T2 OFFS.]**	**AL5**	**[T2COS]**

Temperature T2 Calibration OffSet

(POS. 14.19) System STanDBY	**[Stand-by]**	**AL3**	**[SSTBY]**

Stand-by mode (power off). This function activates the drive stand-by mode. Function for battery powered instruments.

(POS. 14.20) Quick sEtup Save and Lock Editing	**[QS Save & Lock]**	**AL3**	**[QESLE]**

Quick setup save and lock editing

(POS. 14.21) FirmWare UPDate	**[FW update]**	**AL4**	**[FWUPD]**

This function updates the instrument firmware. The firmware can be loaded into the SD card (name.file). Via the MCP interface the FWUPD = name.file command is activated for the firmware upload.

MENU 14- SYSTEM: FUNCTIONS ACTIVATED MCP ONLY

Unique Identity KEY	**[MCP ONLY]**	**AL0**	**[UIKEY]**

Unique identification code of the device.

HardWare SET	**[MCP ONLY]**	**AL0**	**[HWSET]**

Device hardware configuration

HardWare CODe	**[MCP ONLY]**	**AL0**	**[HWCOD]**

Device hardware code

FirmWare CRC	**[MCP ONLY]**	**AL6**	**[FWCRC]**

System protection firmware CRC

CALibration eXecution status Memor	**[MCP ONLY]**	**AL6**	**[CALXM]**

Calibration execution status memory

RTC Adjustment Coefficient	**[MCP ONLY]**	**AL2**	**[RTCAC]**

This function is used for correcting the internal clock. To set the instrument time with the MCP program, press the button.

Function CODe Selection	**[MCP ONLY]**	**AL0**	**[FCODS]**

Select the function code

Select function enable status	**[MCP ONLY]**	**AL0**	**[FNESS]**

Select function enable status

Select status enable of all the functions	**[MCP ONLY]**	**AL6**	**[AFNSS]**

Select the enabling status of all functions

Select status enable of all the functions	**[MCP ONLY]**	**AL6**	**[AFNSS]**

Select the enabling status of all functions

Function enable Status LiST	**[MCP ONLY]**	**AL6**	**[FSLST]**

List enable status of functions

Quick Start All Functions Selection	**[MCP ONLY]**	**AL0**	**[QSAFS]**

Select ALL functions for quick start menu

Quick start function Status LiST	**[MCP ONLY]**	**AL6**	**[QSLST]**

List quick start group functions

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Quick SeTUP FuNction Selection	**[MCP ONLY]**	**AL6**	**[QEFNS]**

Select fun.for quick setup menu

Quick Start All Functions Selection	**[MCP ONLY]**	**AL6**	**[QEAFS]**

Select ALL functions for quick setup menu

Quick start function Status LiST	**[MCP ONLY]**	**AL6**	**[QESLS]**

List quick setup group functions

Quick sEtup FuNction Selection	**[MCP ONLY]**	**AL2**	**[QEEEN]**

Quick setup menu edit and execute enable

Quick SeTUP FuNction Selection	**[MCP ONLY]**	**AL6**	**[QEFNS]**

Select fun.for quick setup menu

Quick Start All Functions Selection	**[MCP ONLY]**	**AL6**	**[QEAFS]**

Select ALL functions for quick setup menu

Quick start function Status LiST	**[MCP ONLY]**	**AL6**	**[QESLS]**

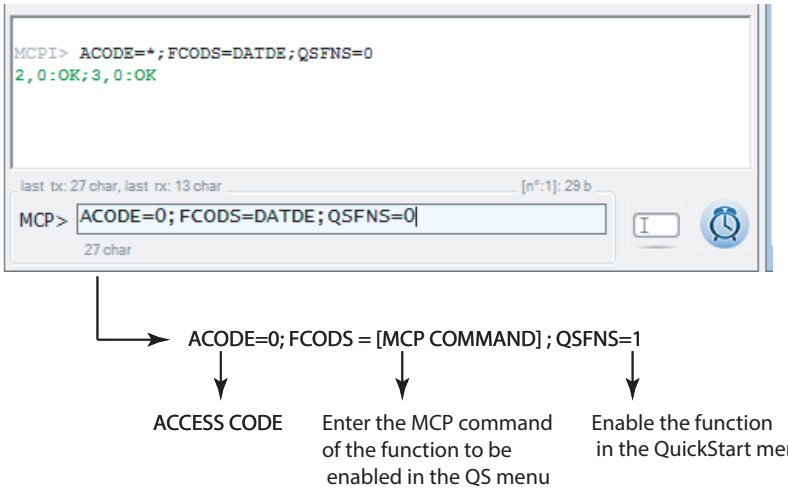
List quick setup group functions

Quick sEtup FuNction Selection	**[MCP ONLY]**	**AL2**	**[QEEEN]**

Quick setup menu edit and execute enable

Access CODE	**[MCP ONLY]**	**AL0**	**[ACODE]**

Entering the access code through the MCP console.



LINK Terminate	**[MCP ONLY]**	**AL0**	**[LTERM]**

Terminate the PPP data connection link.

MCPI session QUIT	**[MCP ONLY]**	**AL0**	**[MQUIT]**

Quit the MCPI connection

Functions LIST	**[MCP ONLY]**	**AL0**	**[FLIST]**

View the list of available converter features.

Functions LISt Compact	**[MCP ONLY]**	**AL0**	**[FLISC]**

View the list of functions of the converter in a compact version.

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Hidden Functions LiST	**[MCP ONLY]**	**AL0**	**[HFLST]**

View the list of hidden function

Functions Menu SELection	**[MCP ONLY]**	**AL0**	**[FMSEL]**

Select menu for functions list

ConFiguration LiST	**[MCP ONLY]**	**AL0**	**[CFLST]**

Parameter list configuration, A list with the status / value of the drive parameters is displayed.

Volume Totalizer Partial Positive value Set	**[MCP ONLY]**	**AL4**	**[VTPPS]**

Positive partial totalizer value set

Volume Totalizer Partial Negative value Set	**[MCP ONLY]**	***AL4***	**[VTPNS]**

Negative partial totalizer value set

auX Totalizer Partial Value Set	**[MCP ONLY]**	**AL4**	**[XTPVS]**

Reserved

Totalizer Partial Set Heating energy value Set	**[MCP ONLY]**	**AL4**	**[TPSHV]**

Heating energy totalizer partial set

Totalizer Partial Set Cooling energy value Set	**[MCP ONLY]**	**AL4**	**[TPSCV]**

Cooling energy totalizer partial set

Volume Totalizer Total Positive Value set	**[MCP ONLY]**	**AL4**	**[VTTPS]**

Positive volume total totalizer value set

Volume Totalizer Total Negative Value set	**[MCP ONLY]**	**AL4**	**[VTTNS]**

Negative volume total totalizer value set

auX Totalizer Total Value Set	**[MCP ONLY]**	**AL4**	**[XTTVS]**

Reserved

Totalizer Total Set Heating energy Value set	**[MCP ONLY]**	**AL4**	**[TTSHV]**

Heating energy totalizer total set

Totalizer Total Set Cooling energy Value set	**[MCP ONLY]**	**AL4**	**[TTSCV]**

Cooling energy total totalizer set

Volume Total Positive Overflow value Set	**[MCP ONLY]**	**AL4**	**[VTPOS]**

Positive volume totalizer overflow value set

Volume Total Negative Overflow value Set	**[MCP ONLY]**	**AL4**	**[VTNOS]**

Negative volume totalizer overflow value set

auX Total Overflow Value Set	**[MCP ONLY]**	**AL4**	**[XTOVS]**

Reserved

Totalizer Total Set Heating energy Overflow value	**[MCP ONLY]**	**AL4**	**[TTSHO]**

Heating energy overflow value set

Totalizer Total Set Cooling energy Overflow value	**[MCP ONLY]**	**AL4**	**[TTSCO]**

Cooling energy overflow value set

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Quick sEtup Saving TiMe	**[MCP ONLY]**	**AL0**	**[QESTM]**

Quick setup saving time (read only)

Quick sEtup Total Heating Energy value	**[MCP ONLY]**	**AL0**	**[QETHE]**

Quick setup total heating energy (read only)

Quick sEtup Total Cooling Energy value	**[MCP ONLY]**	**AL0**	**[QETCE]**

Quick setup total cooling energy (read only)

DeVicE MaX.recorded temperature	**[MCP ONLY]**	**AL6**	**[DVEMX]**

Max temperature DEVICE recorded

DeVicE MiN.recorded temperature	**[MCP ONLY]**	**AL6**	**[DVEMN]**

Min temperature DEVICE recorded

CPU MaX.recorded temperature	**[MCP ONLY]**	**AL6**	**[CPUMX]**

Max temperature CPU recorded

CPU MiN.recorded temperature	**[MCP ONLY]**	**AL6**	**[CPUMN]**

Min temperature CPU recorded

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MENU 14 - FILE (ONLY MCP FUNCTIONS)

File Transfer ABoRt	**[MCP ONLY]**	**AL2**	**[FTABR]**

Abort the current File Transfer

File Transfer STAte	**[MCP ONLY]**	**AL0**	**[FTSTA]**

Show the File Transfer state

Read Last EVenTs	**[MCP ONLY]**	**AL2**	**[RLEVT]**

Read the latest system events

Read All EVenTs	**[MCP ONLY]**	**AL2**	**[RAEVT]**

Read all current system events

Read Last Logged DaTa	**[MCP ONLY]**	**AL2**	**[RLLDT]**

Read the latest logged data

Read All Logged DaTa	**[MCP ONLY]**	**AL2**	**[RALDT]**

Read all logged data

File SEND	**[MCP ONLY]**	**AL2**	**[FSEND]**

Set file name for read operation

File ReCeiVE	**[MCP ONLY]**	**AL5**	**[FRCVE]**

Set file name for write operation

File ReCeive APpend mode	**[MCP ONLY]**	**AL5**	**[FRCAP]**

Set file name for write-append

File OFFSet position	**[MCP ONLY]**	**AL2**	**[FOFFS]**

Set file offset position

ConFiGuration file WRite	**[MCP ONLY]**	**AL2**	**[CFGWR]**

Save the configuration on a file

ConFiGuration file ReaD	**[MCP ONLY]**	**AL2**	**[CFGRD]**

Read the configuration from file

FuNCtion list file WRite	**[MCP ONLY]**	**AL2**	**[FNCWR]**

Save the function list on a file

MENU 15 - DATI PROCESSO (FUNZIONI ATTIVABILI SOLO CON MCP)

Digital INput 1 Status	**[MCP ONLY]**	**AL0**	**[DIN1S]**

Digital input 1 status read

Flow Rate Value PerCentage	**[MCP ONLY]**	**AL0**	**[FRVPC]**

VF Flow rate value in percentage

Flow Rate Value Percentage without cut-off	**[MCP ONLY]**	**AL0**	**[FRVPX]**

VF Flow rate in perc. without cut-off

KL TeST	**[MCP ONLY]**	**AL0**	**[KLTST]**

KL test

TK TeST	**[MCP ONLY]**	**AL0**	**[TKTST]**

TK test

Flow Rate Value Technical Unit	**[MCP ONLY]**	**AL0**	**[FRVTU]**

VF Flow rate value in unit of measure

Thermal Power Value PerCentage	**[MCP ONLY]**	**AL0**	**[TPVPC]**

Thermal power value in percentage

Thermal Power Value Technical Unit	**[MCP ONLY]**	**AL0**	**[TPVTU]**

Thermal power value in unit of measure

TeMPerature Inlet Value	**[MCP ONLY]**	**AL0**	**[TMPIV]**

Ti value in unit of measur

TeMPerature Outlet Value	**[MCP ONLY]**	**AL0**	**[TMPOV]**

To value in unit of measure

TeMPerature Delta Value	**[MCP ONLY]**	**AL0**	**[TMPDV]**

Temperature Delta value in unit of measure

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Heating ENergy totalizer Total Value	**[MCP ONLY]**	**AL0**	**[HENTV]**

Energy Heating Total Totalizer read value

Heating ENergy totalizer Partial Value	**[MCP ONLY]**	**AL0**	**[HENPV]**

Energy Heating Partial Totalizer read val.

Cooling ENergy totalizer Total Value	**[MCP ONLY]**	**AL0**	**[CENTV]**

Energy Cooling Total Totalizer read value

Cooling ENergy totalizer Partial Value	**[MCP ONLY]**	**AL0**	**[CENPV]**

Energy Cooling Partial Totalizer read val.

Volume Totalizer Total Positive Value	**[MCP ONLY]**	**AL0**	**[VTTPV]**

Positive total totalizer read value

Volume Totalizer Partial Positive Value	**[MCP ONLY]**	**AL0**	**[VTPPV]**

Positive partial totalizer read value

Volume Totalizer Total Negative Value	**[MCP ONLY]**	**AL0**	**[VTTNV]**

Negative total totalizer read value

Volume Totalizer Partial Negative Value	**[MCP ONLY]**	**AL0**	**[VTPNV]**

Negative partial totalizer read value

auX Totalizer Total ValuE	**[MCP ONLY]**	**AL0**	**[XTTVE]**

Reserved

auX Totalizer Partial ValuE	**[MCP ONLY]**	**AL0**	**[XTPVE]**

Reserved

Heating ENergy totalizer Total Overflow	**[MCP ONLY]**	**AL0**	**[HENTO]**

Energy Heating Total Totalizer overflow value

Cooling ENergy totalizer Total Overflow	**[MCP ONLY]**	**AL0**	**[CENTO]**

Energy Cooling Total Totalizer overflows value

Volume Totalizer Total Positive Overflow	**[MCP ONLY]**	**AL0**	**[VTTPO]**

Positive volume total totalizer overflows value

Volume Totalizer Total Negative Overflow	**[MCP ONLY]**	**AL0**	**[VTTNO]**

Negative volume total totalizer overflows number

auX Totalizer Total Overflow Value	**[MCP ONLY]**	**AL0**	**[XTTOV]**

Reserved

Totalizers UnlocKed Counting Time	**[MCP ONLY]**	**AL0**	**[TUKCT]**

Totalizers Unlocked counting time read

Sensor TeMPeratures	**[MCP ONLY]**	**AL0**	**[STMPS]**

Sensor temperature

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CPU TemPerature	**[MCP ONLY]**	**AL0**	**[CPUTP]**
CPU temperature			
LiQuid VELocity	**[MCP ONLY]**	**AL0**	**[LQVEL]**
Liquid velocity			
Main PoWeR Status	**[MCP ONLY]**	**AL0**	**[MPWRS]**
Status of main power supply			
INput RESistance	**[MCP ONLY]**	**AL0**	**[INRES]**
Equivalent Input resistance			
INput VoLtageS	**[MCP ONLY]**	**AL0**	**[INVLS]**
Electrodes input voltages			
Analog Input 0 Process Value	**[MCP ONLY]**	**AL0**	**[AI0PV]**
Analog input 0 value			
Analog Input 0 Process Prc	**[MCP ONLY]**	**AL0**	**[AI0PP]**
Analog input 0 percent			
Analog Input 0 Process Adc	**[MCP ONLY]**	**AL0**	**[AI0PA]**
Analog input 0 ADC			
Analog Input 2 Process Value	**[MCP ONLY]**	**AL0**	**[AI2PV]**
Analog input 2 value			
Analog Input 2 Process Prc	**[MCP ONLY]**	**AL0**	**[AI2PP]**
Analog input 2 percent			
Analog Input 2 Process Adc	**[MCP ONLY]**	**AL0**	**[AI2PA]**
Analog input 2 ADC			
FReQency Output 1 value	**[MCP ONLY]**	**AL0**	**[FRQO1]**
Frequency output 1 value			
PuLseS Output 1 value	**[MCP ONLY]**	**AL0**	**[PLSO1]**
Pulses output 1 value			
Output Regulation Limitation StatuS	**[MCP ONLY]**	**AL0**	**[ORLSS]**

Output regulation limitation status:
0 = No limitation activated
1 = Max flowrate limitation activated
2 = Min flowrate limitation activated
3 = Max difference of temperature limitation activated
4 = Min difference of temperature limitation activated

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Output Regulation Command Prc Value	**[MCP ONLY]**	**AL0**	**[ORCPV]**

Output regulation command value

Output Regulation Read Prc Value	**[MCP ONLY]**	**AL0**	**[ORRPV]**

Output regulation read value

Remotely WRitten Analog Value	**[MCP ONLY]**	**AL0**	**[RWRAV]**

Remotely written analog value

Remotely WRitten Analog Prc	**[MCP ONLY]**	**AL0**	**[RWRAP]**

Remotely written analog value for the regulation on N° 7 channel; respectively:

• Nominal value with the scaling provided by the functions "4.13" pag. 39 and "4.14" pag. 39.

• Percentage Value 0-100%.

ALARM status	**[MCP ONLY]**	**AL0**	**[ALARM]**

Active alarm(s) status

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ALARM MESSAGES (CAUSES AND ACTIONS TO BE TAKEN)

MESSAGE	CAUSES	ACTION TO TAKE
NO ALARMS	All works regularly	---
HP_ALARMS (In the presence of one of these errors, the main function of the device is not operational)		
[00] B.DATA NOT INIT	Uninitialized data system	Contact the service
[01] DYN. DATA LOST	Dynamic data (counters, …) reset	
[02] HW DATA LOST	Hardware configuration reset to Default values.	
[04] CFG DATA LOST	Settings configurations reset to default values	
[05] COMM DATA LOST	Communication configuration reset to default values	
[06] SYS.PROT.FAULT	MID device protection error	
[07] INTERNAL PS FAIL	Internal power supply error	Check quality and values of provided power supply.
[08] PS VOLTAGE FAIL	Power supply voltage error.	Contact the service
[09] RTD DISCONNECTED	Temperature sensor/sersors disconnected	Check sensors/cables connections.
[10] RTD EXCIT. ERROR	Wrong temperature sensor excitation current	Check the sensor type set. Check the connections Contact the service
[11] RESIST.1 ERROR	Wrong temperature sensor T1	Check the set sensor type
[12] RESIST.2 ERROR	Wrong temperature sensor T2	
[13] COIL EXC. ERROR	Error excitation magnetc sensor	Contact the service
[14] SIGNAL ERROR	Invalid signal detected by magnetic sensor	Check the sensor grounding and noises presence; This alarm can appear also in presece of empty pipe when the specific function in disabled.
[15] EMPTY PIPE	Empty pipe detected	Check that there is no air in the pipe, Check the function setting
[17] VF SELECT. ERROR	The substance mnemotic code selected or its concentration aren't present/avaiable on the tabel loaded into the device.	Select another substance/ concentration
GENERIC ALARMS		
[21] FACTORY HW DATA	Hardware configuration reset to factory values.	Confirm the reading of the warning using the XXXXX function and change the customized parameters from the factory settings, if necessary.
[23] FACTORY CFG DATA	Settings configurations reset to factory values	
[24] FACTORY COM DATA	Communication configuration reset to factory values	
[25] EVENT LOG. ERROR	Events Log saving error	Contact the service
[26] DATA LOG. ERROR	Data Log saving error	
[27] FACT. DATA ERROR	Factory data error	Try to save again the factory data. Contact the service
[29] STORAGE FAILURE	Saving memory Log not found or unreadable.	Contact the service
[32] CLOCK NOT SET	System clock not set.	Set the system clock by the converter menu System (see also MCP function DTIME).
[33] MAG. SEL. ERROR	Magnetic sensor selection error; the model and/or DN aren't in the table	Select correct model and DN or upload the sensors table

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MESSAGE	CAUSES	ACTION TO TAKE
[34] MAG. TEMP. ERROR	Magnetic temperature sensor error (if compensation is used).	Contact the service
[35] AN IN 0 ERROR	Voltage or current error on analog. input 0	Check the input setting.
[37] AN IN 2 ERROR	Voltage or current error on analog. input 0	Check the connection and the signal.
[38] T.DELTA OVERFLOW	Delta T measure overflow	Check the scale setting
[39] TEMP.T1 OVERFLOW	Temp. T1.measure overflow	
[40] TEMP.T2 OVERFLOW	Temp. T2.measure overflow	
[41] VF FLOW OVERFLOW	Vector fluid flow rate overflow	
[42] T.POWER OVERFLOW	Thermal power calculation overflow	
[43] POWER SIGN INC.	The power sign (Heating / Cooling.) is inconsistent with the energy totalizer selection (Local / Remote) of energy totalizer	Select the corrected counter (Heating / Cooling) or set the corresponding function on Automatic.
[45] PULSE_OUT1>RANGE	Output 1 pulse overflow	Check the setting of scales and pulses output parameters.
[46] VF TEMPER. WARN.	Warning: The measured temperature is out of the recommended range for the vector fluid substance selected	Select another substace or change the working temperature
[47] LOOP REG.MAX.ERR	The set-point is not reachable in time.	• Check that the setting is physically reachable in the connected system, • Check there are no external causes that don't allow the set point to be reached, •Check the coefficent of regulation and their polarity • Increase the maximum acceptable error, • Encrease the timeout, • Disable the alarm
	Adjustment on Channel 7 (remote) is not possible because the value is out of date	Constantly update (30-second timeout) the remote value, or select another channel.
[48] OUT REG. POS.ERR	The position is not reachable in time.	• Check that the valve is not blocked check the coefficent of regulation and their polarity • Increase the maximum acceptable error, • Encrease the timeout, • Disable the alarm
[50] TEMPER. T2 LIMIT	Alarm threshold Temp. T2 reached.	Check the value from the relevant set threshold and the process conditions.
[51] TEMPER. T1 LIMIT	Alarm threshold Temp. T1 reached.	
[52] DELTA T LIMIT	Alarm threshold deltaT reached.	
[53] V.F. FLOW LIMIT	Alarm threshold Vector fluid flow rate reached.	
[54] TH. POWER LIMIT	Alarm threshold Thermal power reached.	
[55] AN.INPUT2 LIMIT	Alarm threshold Analog Input 2 reached.	
[63] CONF. INCOMPLETE	Quick Setup configuration not completed	Complete and save the configuration

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ERROR CODES CONVERTER

The codes are in hexadecimal format, the meaning is given for each bit. Multiple simultaneous error combinations (multiple active bits) are possible which will then give combined numerical codes.

CODE	DESCRIPTION OF ANOMALIES	REMEDIES
00000002	Generic data memory error.	Contact the service if the problem persists or generates other errors.
00000004	Error of dynamic copies of the totalizers.	The totalizers have been reset; contact the service.
00000008	Current Hardware configuration data is not valid	The system will automatically load the Factory version.
00000010	The data of the Factory Hardware configuration are also not valid.	Contact the service.
00000080	Configuration data Invalid current settings and / or communication.	The system will automatically load the relative version of the Factory.
00000100	The configuration and / or factory communication configuration data are also not valid	Contact the service.
00000400	SD card not present or unreadable.	Contact the service; Check or replace the SD card.
00020000	Firmware update error.	The FirmWare update was not performed; verify the cause in the LOG.
00040000	Error loading data after Firmware update.	Check the LOG and contact the service.
00080000	Device protection error	Contact the service

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At the end of its lifetime, this product shall be disposed of in full compliance with the environmental regulations of the state in which it is located.

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MANUAL REVIEWS

REVIEW	DATE	DESCRIPTION
MAN_CS611_IT_EN_IS_R00_1.00.XXXX	23/01/2024	First edition
MAN_CS611_IT_EN_IS_R01_1.01.XXXX	05/08/2024	Firmware update
MAN_CS611_IT_EN_IS_R02_1.01.XXXX	04/12/2024	Added section about analog Input connection examples and updated description of some functions

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