ISOMAG
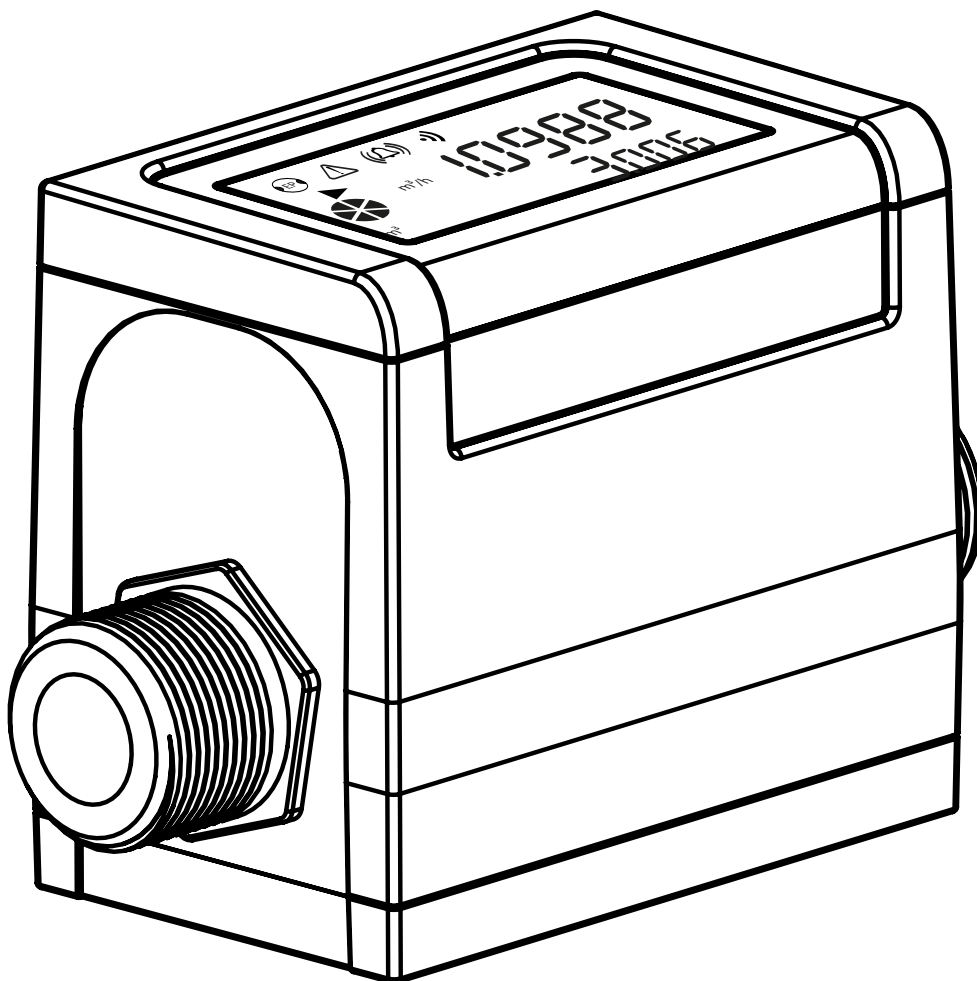
The friendly magmeter

OPERATING AND MAINTENANCE MANUAL

CS8100

CE

ISOIL
INDUSTRIA

Release number: **8100_EN_IT_IS_R0_1.0X** -

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

SAFETY INFORMATION

Any use other than described in this manual affects the protection provided by the manufacturer and compromises the safety of people and the entire measuring system and is, therefore, not permitted. The manufacturer is not liable for damaged caused by improper or non-designated use.

❑ Transport the measuring device to the measuring point in the original packaging. In case of carton packaging it is possible to place one above the other but no more than three cartons. In case of wooden packaging do not place one above the other.

❑ Disposal of this product or parts of it must be carried out according to the local public or private waste collection service regulations.

❑ The electromagnetic flow meter must only be installed, connected 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 follow the instructions it contains. If you are unclear on anything in these Operating Instructions, you must call the ISOIL service. The Operating Instructions provide detailed information about the instrument.

❑ The flow meter should only be installed after having verified technical data provided in this operating instructions and on the data plate.

❑ Specialists must take care during installation and use personal protective equipment as provided by any related security plan about risk assessment.

❑ Never mount or wire CS8100 while it is connected to the power supply and avoid any liquid contact with the instrument's internal components.

❑ Before connecting the power supply check the safety equipment.

❑ Repairs may only be performed if a genuine spare parts kit is available and this repair work is expressly permitted.

❑ For the cleaning of the device use only a damp cloth, and for the maintenance/repairs contact the service center (for details see the last page).

❑ To return the product back for service complete and return the meter with form found on the last pages of this operating instructions.

Before starting up the equipment please verify the following:

❑ Power supply voltage must correspond to that specified on the data plate
❑ Electric connections must be completed as described
❑ Ground (earth) connections must be completed as specified

Verify periodically (every 3-4 months):

❑ The power supply cables integrity, wiring and other connected electrical parts
❑ The housing integrity
❑ The suitable tightness of the sealing elements
❑ The front panel integrity (display and keyboard)
❑ The mechanical fixing of the converter to the pipe or wall stand

SAFETY CONVENTION

DANGER ELECTRIC SHOCK	WARNING	PRECAUTIONS	ATTENTION

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ELECTRIC CHARACTERISTICS

Converter classification: class I, IP67/IP68 for noryl housing, installation category (overvoltage) II, rated pollution degree 2.

Power supply voltage	Power
min10 / max30V ⎓	1W

❑ Voltage variations must not exceed ±10% of the nominal one.
❑ Output insulated up to 500V.
❑ The output 4-20mA max load: 500 Ω (optional) is electrically connected to the ON/OFF outputs and the output power supply (24V ⎓).
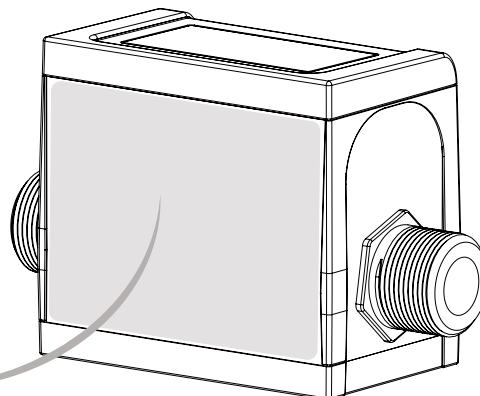
ENVIRONMENTAL USE CONDITIONS

❑ The converter can be installed internally or externally
❑ Altitude: from –200m to 2000m (from -656 to 6560 feet)
❑ Humidity range: 100%

AMBIENT TEMPERATURE	Min*	Max
°C	-10	50
°F	14	122

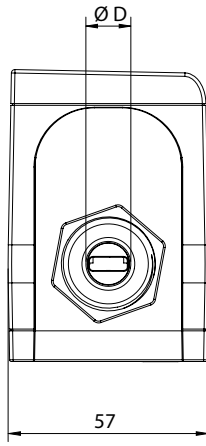| LIQUID TEMPERATURE	Min*	Max
°C	-20	85
°F	-4	185

DATA PLATE

MODEL: Flowmeter model
S/N: Serial number
PW SUPP: Main power supply
MAXPow: Maximun power consumption
Max Flow: l/h
IP: Protection rate
Fittings: Fittings
Press: Pressure (psi)
T AMB: Max Ambient temperature
T LIQ: Liquid temperature
Mat: Lining material

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ISOMAG

OVERALL DIMENSIONS

ØD	FITTINGS
13	1/2" GAS UNI338/NPT
15	3/4" GAS UNI338/NPT

FITTINGS

SOCKET FOR USB ACCESS
(PROGRAMMING PORT)

Ø D

57

29

59

135

93

83

181
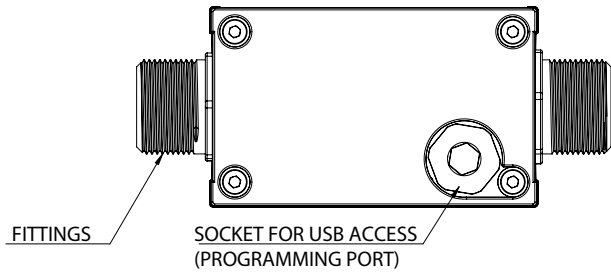
5 POLES PLUG
(available only on connector version)

135

93

83

CABLEGLAND PG7
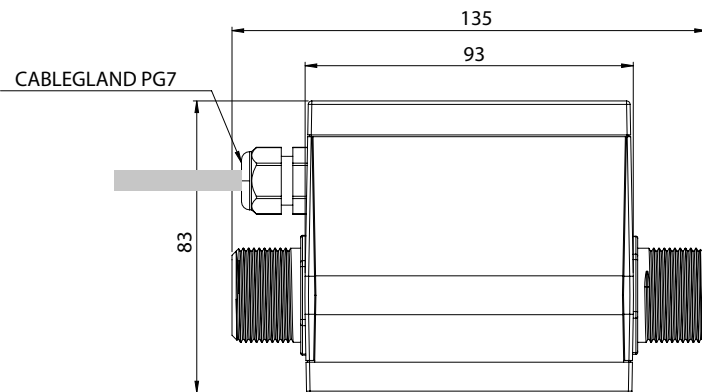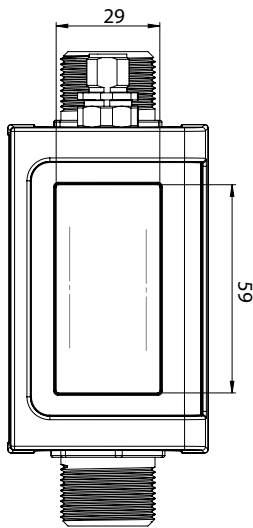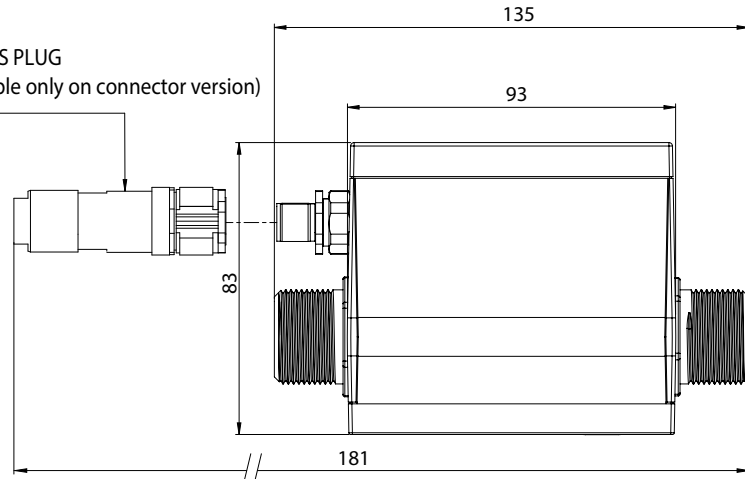
5 POLES CABLE VERSION

2 CABLE METERS
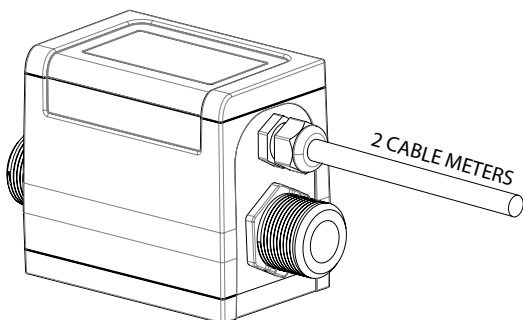
5 POLES CONNECTOR VERSION
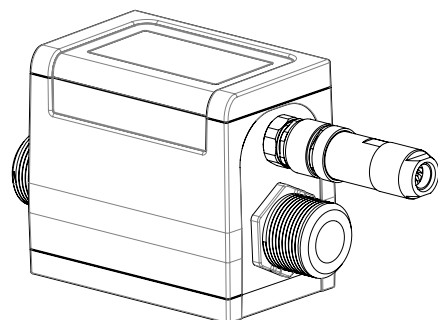
ISOIL INDUSTRIA

8100_EN_IT_IS_R0_1.0X

SHREWDNESS AND PRECAUTIONS

In vertical installations an ascending flow is preferable. For vertical installations with descending flow direction contact the manufacturer
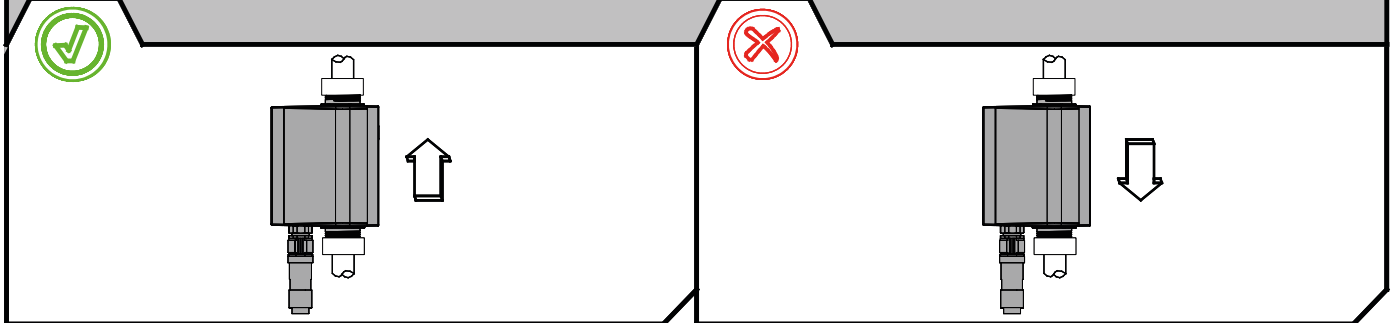
For installations in long pipe lines, please use anti vibration joints

ANTIVIBRATION

LONG PIPE
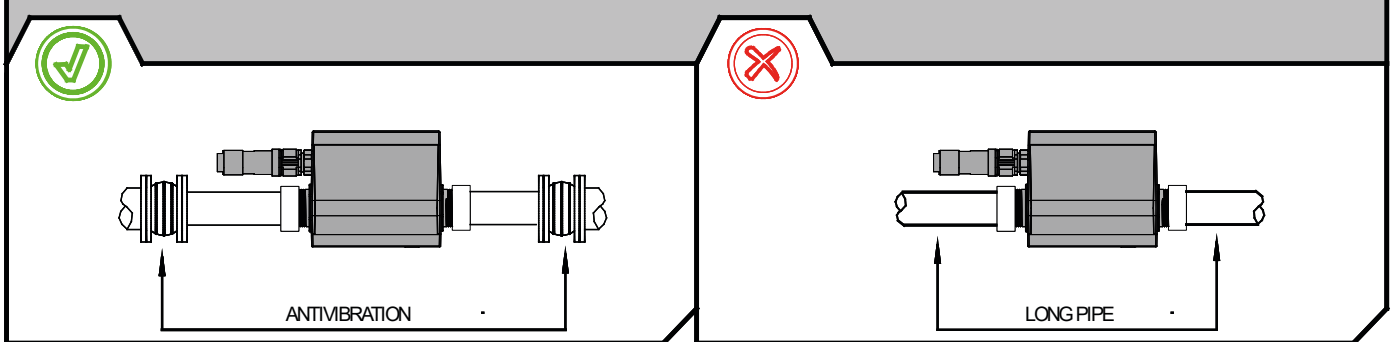
Avoid a partially empty pipe, during operation the pipe must be either completely full of liquid or completely empty
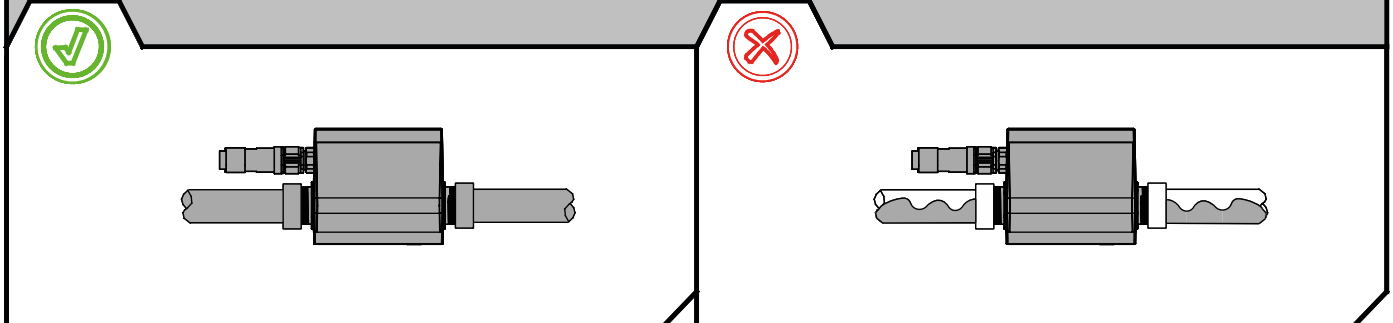
Install the sensor away from bends and hydraulic accessories
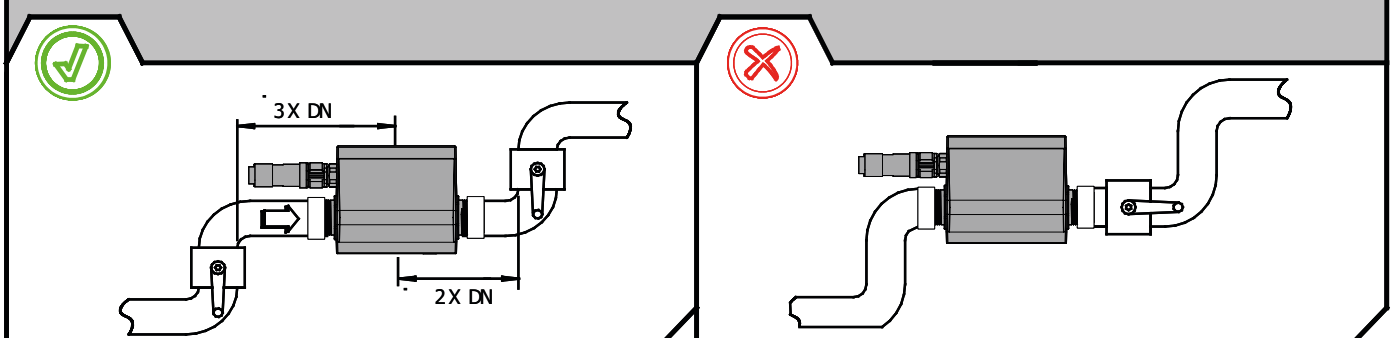
3 X DN

2 X DN
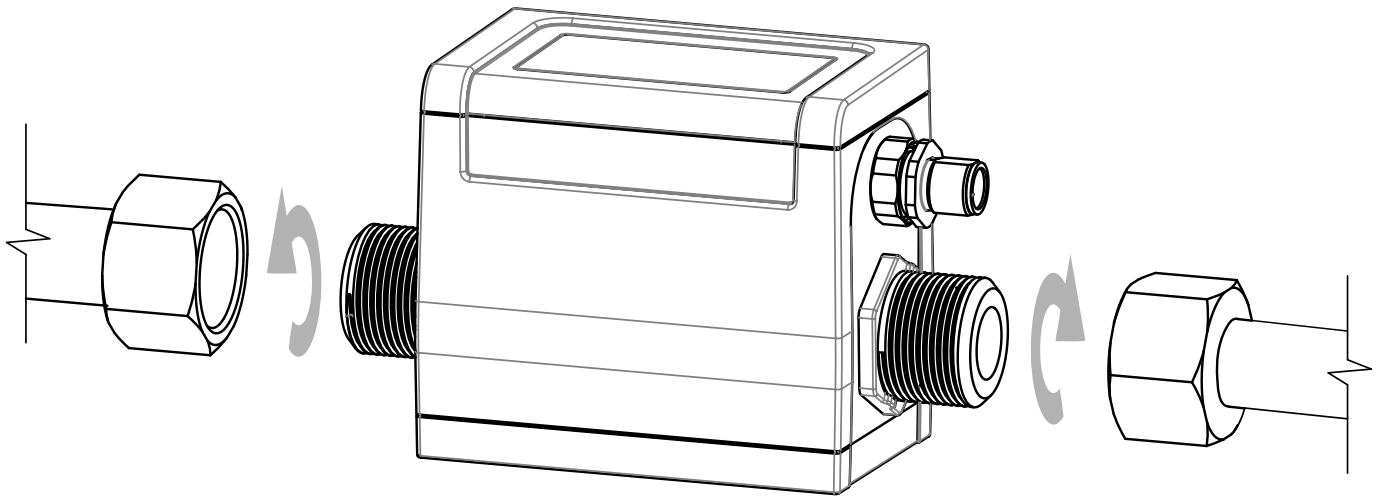
TIGHTENING TORQUE

❑ Tightening torque: **20Nm**

❑ Do not apply tension on the threaded connections when installing the flowmeter in the pipe line

8100_EN_IT_IS_R0_1.0X

ELECTRICAL CONNECTIONS

OUTPUT WITH CONNETCTOR
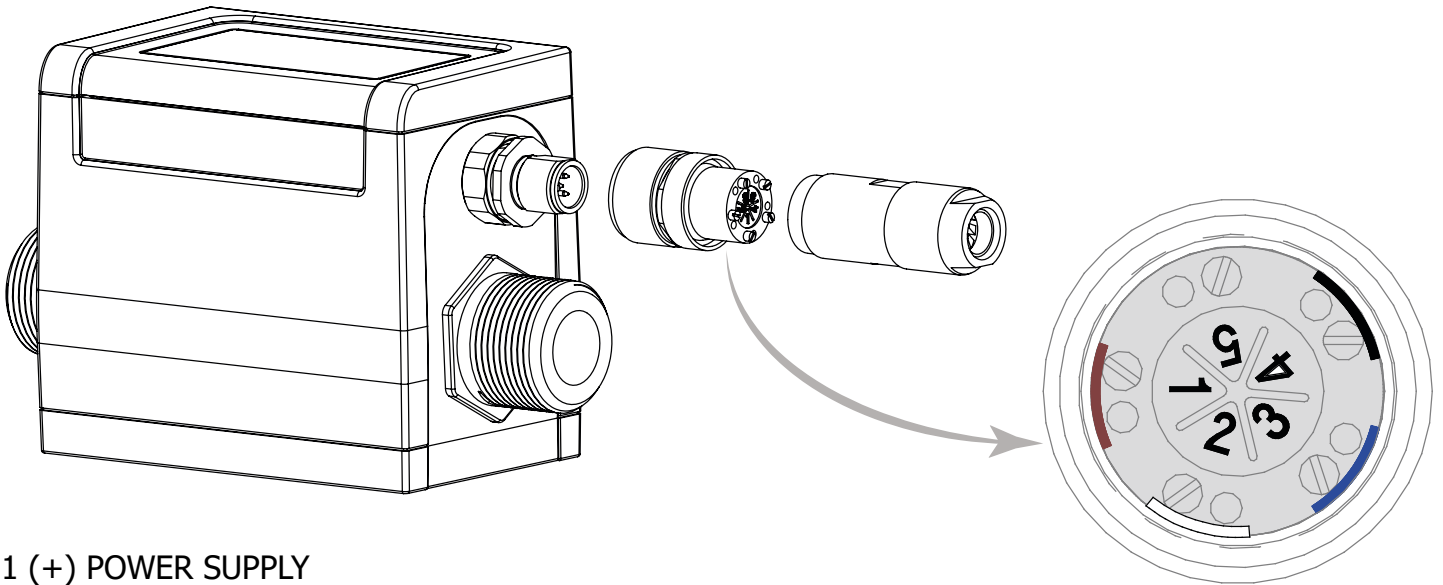
1 (+) POWER SUPPLY

2 (+) OUTPUT 1

3 (+) OUTPUT 2 (OPTIONAL)

4 (+) 4-20mA max load: 500 Ω OUTPUT (OPTIONAL)

5 (-) POWER SUPPLY / OUTPUTS

PIN 5 TO BE CONNECT TO THE GROUND

OUTPUT WITH CABLE
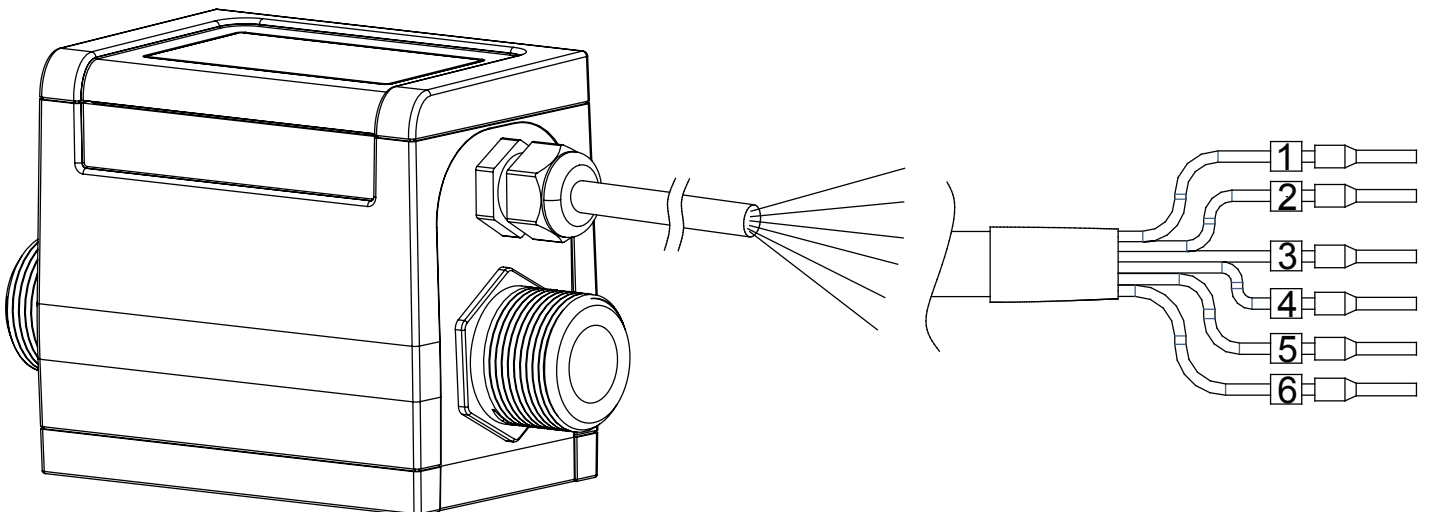
1 (+) POWER SUPPLY

2 (+) OUTPUT 1

3 (+) OUTPUT 2 (OPTIONAL)

4 (+) 4-20mA max load: 500 Ω OUTPUT

5 (-) POWER SUPPLY / OUTPUTS

6 (SH) SHIELD

PIN 5-6 TO BE CONNECT TO THE GROUND

OUTPUTS WIRING

DIGITAL OUTPUTS

2 (out1)
3 (out2)

5 (-)
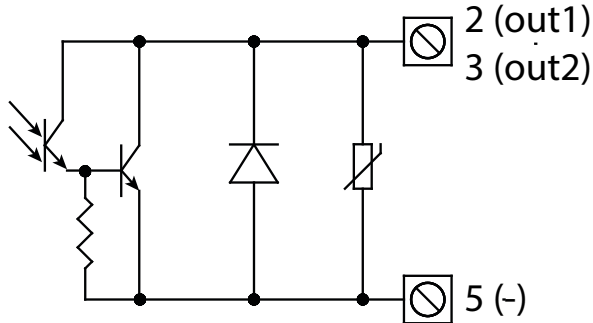
❑ Maximum switching voltage:: 30VDC ⎓

❑ Maximum switching current:: 50mA

ANALOG OUTPUT

+24V INTERNAL

mA

I

4-20mA max load: 500 Ω OUT

4 (+)

5 (-)

24V COMMON
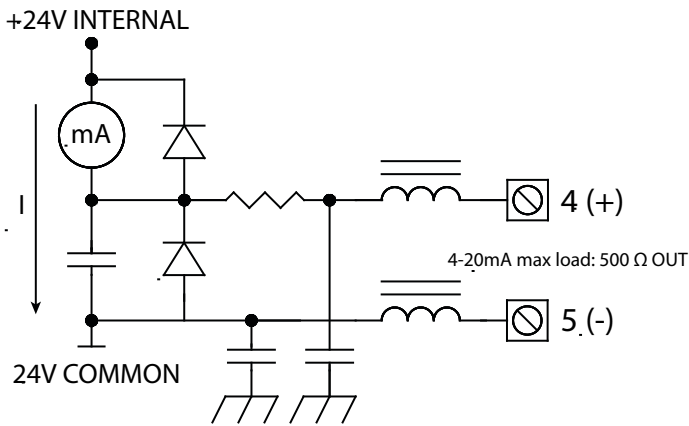
❑ Opto-insulated output

❑ The maximum load depends on the supply voltage and the values are as follows:
1000 ohm @30Vdc
800 ohm   @24Vdc
500 ohm   @18Vdc
300 ohm   @12Vdc

❑ The maximum load depends on the supply voltage and the values are as follows.

8100_EN_IT_IS_R0_1.0X

⚠️ The direct exposure of the converter to the solar rays, could damage the liquid crystal display. The visualization pages can be change according to instrument's setup.
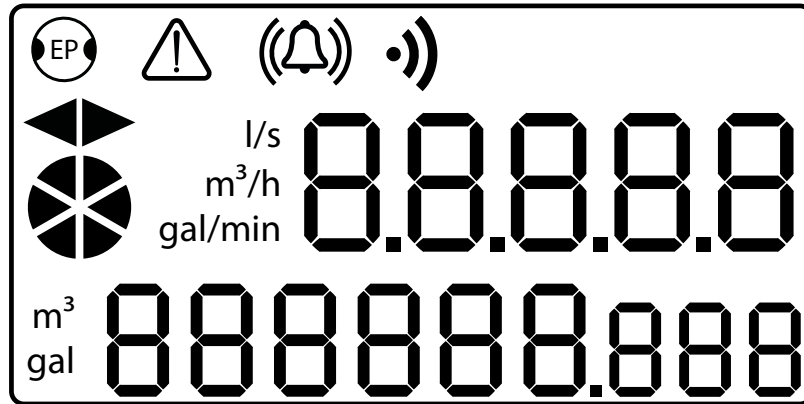
Symbol	Description
EP	EMPTY PIPE WARNING
⚠️	ALARM WARNING
((🔔))	PROCESS ALLARM
•))	DATA TRASMISSION
◀▶	FLOW DIRECTION
❇	ACTIVE FLOW RATE
l/s m³/h gal/min	FLOW RATE MEASURE UNIT
m³ gal	TOTALIZER MEASURE UNIT

USER INTERFACE

You can access the drive configuration menu only by MCP interface for CS8100. It is a software that can be installed on Microsoft Windows® and allows you to set all the functions of the converter and customize the menu. To use the MCP interface, see the user manual .
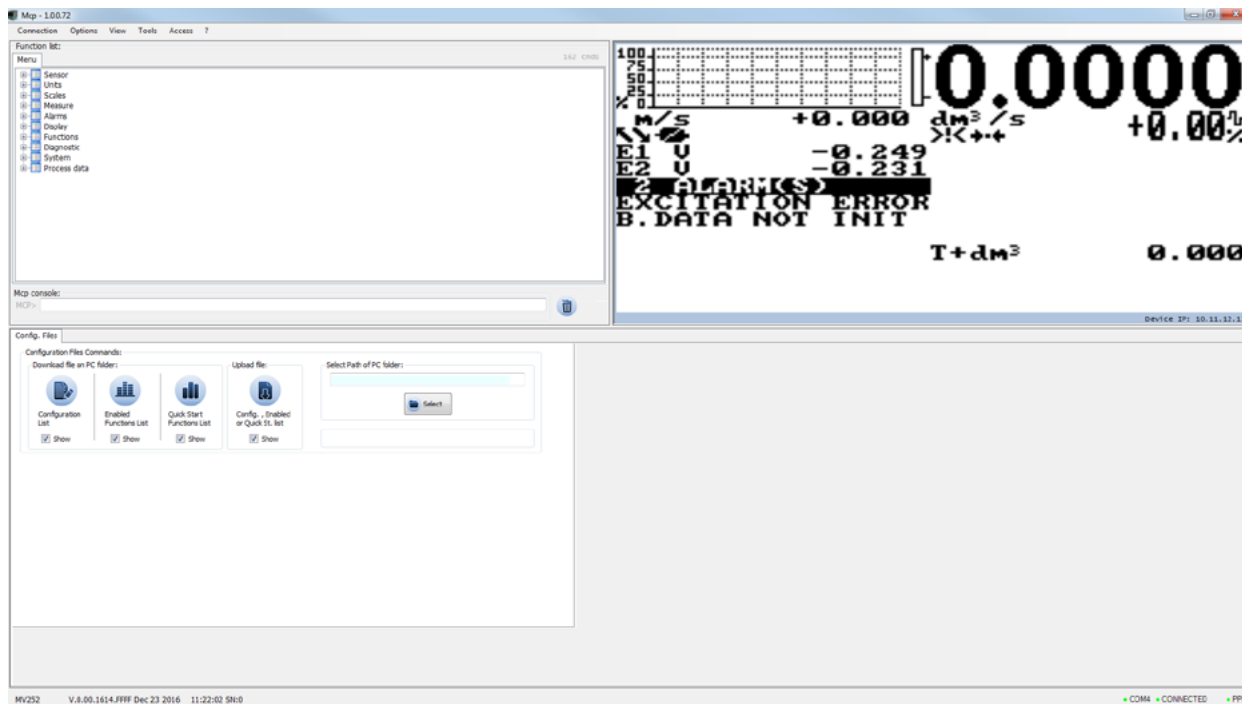
Make the USB connection as shown in the following figure.

8100_EN_IT_IS_R0_1.0X
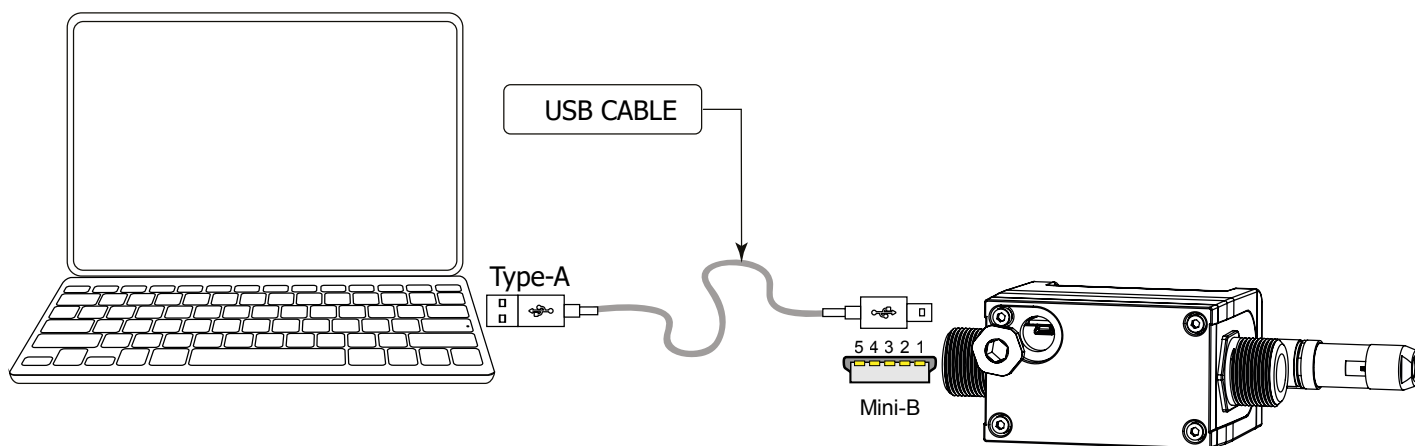
START VISUALIZATION PAGES ON MCP INTERFACE

Electrode 2 resistance

Electrode 1 resistance

Video term. connected

Flow speed

Flow rate graph

Flow rate trend

% full scale

Flow rate value

```
100
 75
 50
 %
 25
  0
 m/s        +0.209
E1 V         -1.261
E2 V         -1.252
NO ALARMS
```

```
0.0164
1/s
 1          +2.06%
P+ m³       11.092
P- m³       13.070
T+ m³       11.092
T- m³       13.070
TN m³       -1.978
PN m³       -1.978
```

Alarms list page

Partial net totalizer

Total net totalizer

Reverse total totalizer

Direct total totalizer

Reverse partial totalizer

Direct partial totalizer

The manufacturer guarantees only English text available on our web site www.isoil.com

MEANING OF FLAGS ON MCP INTERFACE

FLAG	DESCRIPTION
Ø	EMPTY PIPE
	FILE UPLOAD
	FILE DOWNLOAD
▲▼	FLOW RATE SIMULATION (FLASHING)
→·←	CALIBRATION (FLASHING)
>!<	GENERIC ALARM (FLASHING)
!	GENERAL ALARM ONLY ON PHYSICAL DISPLAY (FLASHING)
	SIGNAL ERROR
	EXCITATION ERROR
	MIN FLOW ALARM
	MAX FLOW ALARM
	VIDEO TERMINAL CONNECTED
	FLOW RATE OVERFLOW
⊓1	PULSE 1 OVERFLOW
⊓2	PULSE 2 OVERFLOW

8100_EN_IT_IS_R0_1.0X

FLOW RATE AND TOTALIZER VISUALIZATION
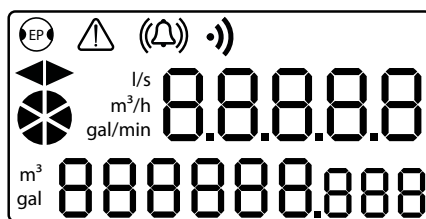
The CS8100 can show a 5 digits display on flow rate field value; this mean the maximum and minimum flow rate values that can be shown on display are:

METRIC		
Measure Units	**Minimum**	**Maximum**
l/s	0.0267	0.6667
m³	2.4000	0.0960

NON METRIC		
Measure Units	**Minimum**	**Maximum**
Gal/m	10.567	00.423

QUICK START MENU

The QUICK START MENU allows to user immediate access to some of the most commonly used functions; through MCP software it possible customize this menu to make it suitable for the specific application.

Access to all functions

See programming functions section
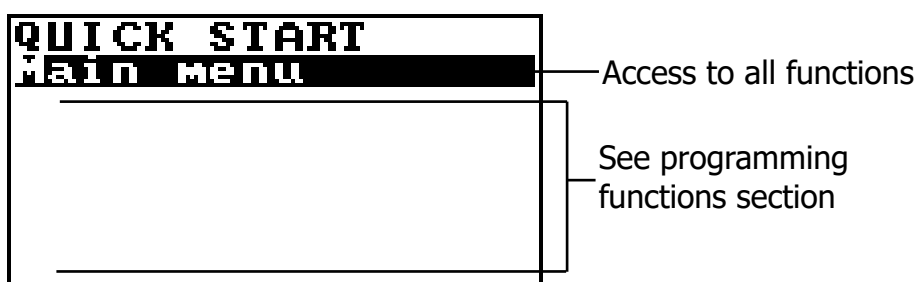
The user has immediate access to the Quick Start menu when the converter is powered up by pressing the Enter key. If access to the quick start menu does not occur, then it could be disabled using the function POS. 9.8 see page 18 .

CONVERTER ACCESS CODE

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

Access Level 1-2-3-4-5-6 Freely programmable by user

ACCESS CODE SET : MENU 13 SYSTEM

```
11-Functions
12-Diagnostic
13-System
 SYSTEM
 L1 code=********
 L2 code=********
 L3 code=********
 L4 code=********
 L5 code=********
 L6 code=********
 Restr.access=OFF
 Device IP addr=
 Client IP addr=
 Network mask=
 KT=       1.01218
 KS=       1.00000
 KR=       1.00000
 DAC2 out 4mA cal
 DAC1 4mA=1.02382
 DAC1 20mA= 10050
 FW update
```

```
 SYSTEM
 L1 code=********5
 L2 code=********
 L3 code=********
 L4 code=********
 L5 code=********
 L6 code=********
        0◄►99999999
```

The CODE is Settable by MCP interface.
Depending on the level of access different display functions will be visible. (See section "FUNCTIONS DESCRIPTION" page 20)
These access levels interact with the "Restricted access"

RESTRICTED ACCESS SET : MENU 13 SYSTEM

```
 SYSTEM
 L1 code=********
 L2 code=********
 L3 code=********
 L4 code=********
 L5 code=********
 L6 code=********
 Restr.access=OFF
```

Settable Values
ON
OFF

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

Restict = OFF: It enables to change functions for the selected level and ALL the functions with lower access level.
Example: If the operator has the code of level 3, after having set it, he can change all the functions at level 3 and those at lower levels.

* WARNING: take careful note of the customized code, since there is no way for the user to retrieve or reset it if lost.

Factory preset access codes:

L1: 10000000	**L4: 40000000**
L2: 20000000	**L5: 57291624**
L3: 30000000	**L6: 65940123**

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The following example shows how to change the Full scale by Quick Start menu; the second illustrates how to change the function by the Main menu.

EXAMPLE: modifying the full scale value from 4L/s to 5L/s, from the "Quick start menu"
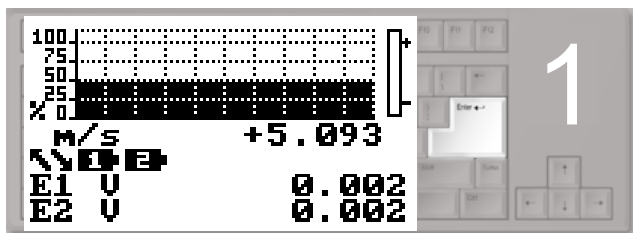
Press enter key to access in the "Quick Start menu"
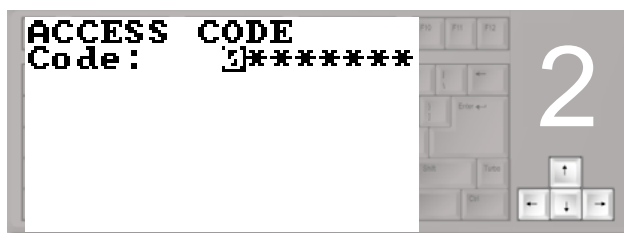
Use the right-left arrow keys to select the character and the up-down arrow key to assign the numeric value of the access code
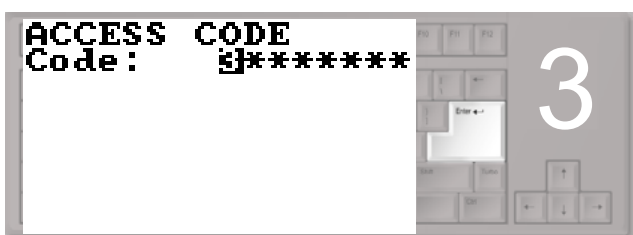
Press the enter key to confirm the access code
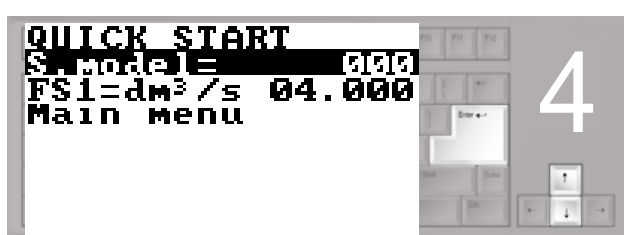
Select the FS1 function with the arrow keys
Press the enter key modify the function
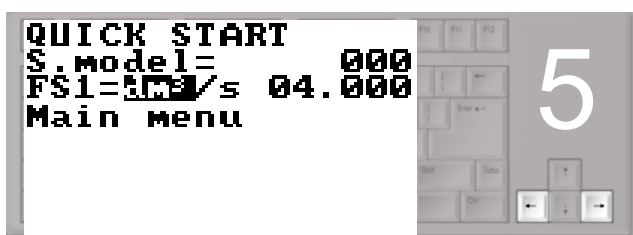
Press the indicated arrow keys to select the character

Press the arrow keys indicated to change the value
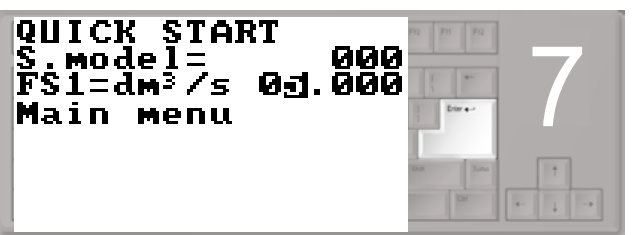
Press the enter button to confirm the changed value

Press the esc key to exit from to the "quick start menu" and return to the main page
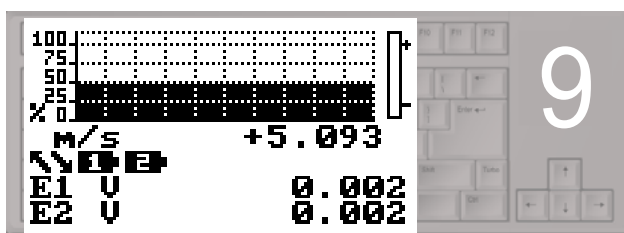
Main Page

8100_EN_IT_IS_R0_1.0X

EXAMPLE: modifying the full scale value from 4l/s to 5l/s, from the "Main Menu" (quick start menu enabled)
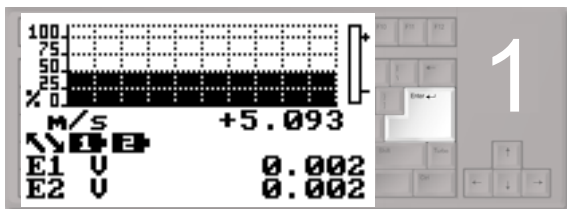
Press enter key to access in the "Quick Start menu"
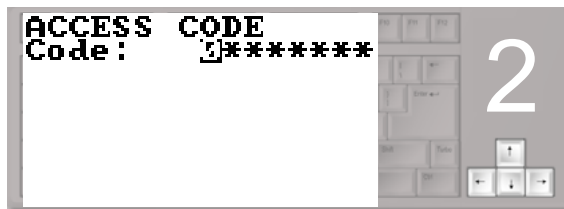
Use the right-left arrow keys to select the character and the up-down arrow key to assign the numeric value of the access code
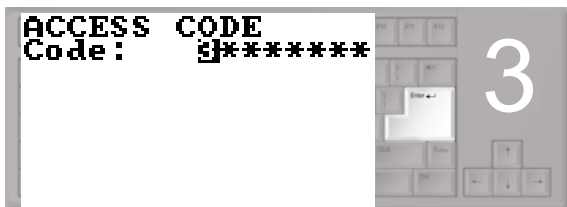
Press the enter key to confirm the access code

Select the Main Menu function with the arrow keys

Press the enter key to access the main menu
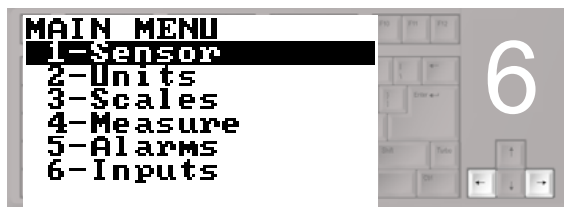
Select menu 3 with the arrow keys
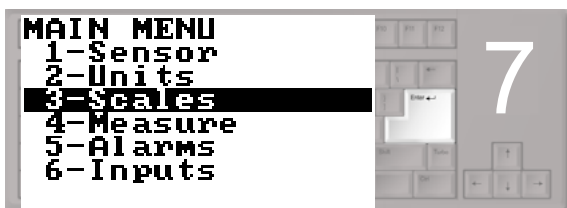
Press the enter key to access menu 3
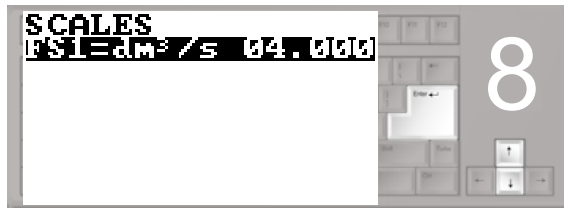
Select the FS1 function with the arrow keys
Press the enter key to confirm
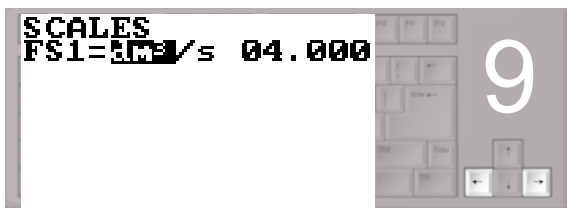
Press the indicated arrow keys to select the character
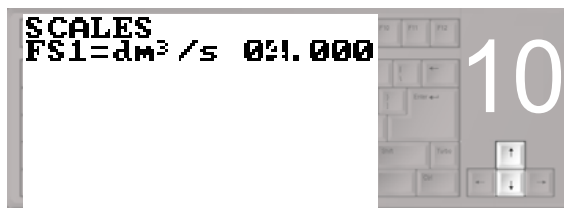
Press the indicated arrow keys to change the value
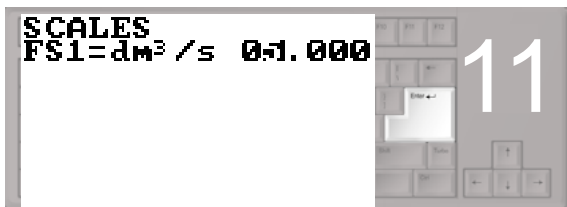
Press the enter key to confirm the changed value
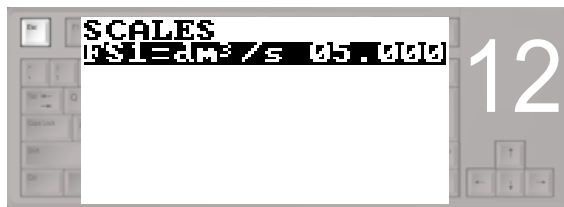
Press the esc key to exit the "quick start menu"
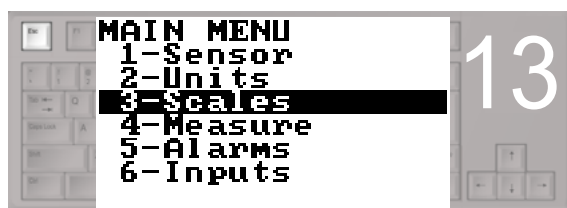
Press the esc key to exit the menu and return to the main page
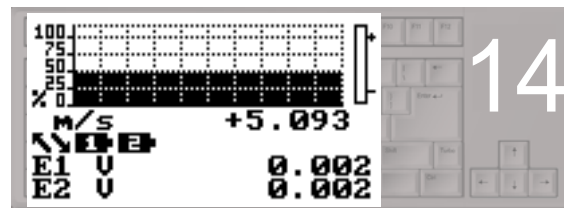
Main Page

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FUNCTIONS MENU

The main menu is selected from the Quick start menu by pressing enter in your key board and entering the access code. Note: Functions in grey here below are displayed only with other functions active, or with optional modules.

```
MAIN MENU
 1-Sensor
SENSOR
S.model=        000
U.type=     METRIC
KA=       +01.3000
KA-=      -04.4904
KZ=       +0000000
KD=       +0000000
KC=        1.00000
C.Curr.=mA 025.0
C.Reg.PB=      005
C.Reg.DK=      010
S.Freq.=Hz      50
E.P.Detect=     ON
Z max=kohm    0500
KL= 00.000000000
S.err.delay= 010
```

1.1	Sensors model: Enter the first two characters of the serial number of the sensor
1.2	Type of measure units for sensor parameter: metric or imperial
1.3	Calibration data of sensor
1.4	Calibration data of sensor for negative flow
1.5	Sensor coefficient KZ (zero point)
1.6	Sensor coefficient KD
1.7	Sensor coefficient KC
1.8	Sensor excitation current
1.9	Current regulator proportional band
1.10	Current regulator derivation constant
1.11	Measure sampling frequency
1.12	Enables the empty pipe detection feature
1.13	Maximum input impedance threshold
1.14	Linearization coefficient
1.15	Signal error delay (n. sample)

```
MAIN MENU
 1-Sensor
 2-Units
UNITS
FR.unit=    METRIC
Pl1 unit=
Pl2 unit=
T+ unit=    METRIC
T+ unit=        m³
P+ unit=    METRIC
P+ unit=        m³
T- unit=    METRIC
T- unit=        m³
P- unit=    METRIC
P- unit=        m³
```

2.1	Flowrate type measure unit: metric or imperial
2.2	Pulse 1 type measure unit: metric or imperial
2.3	Pulse 2 type measure unit: metric or imperial
2.4	Total direct totalizer measure unit type: metric or imperial
2.5	Total direct totalizer measure unit
2.6	Partial direct totalizer measure unit type: metric or imperial
2.7	Partial direct totalizer measure unit
2.8	Total reverse totalizer measure unit type: metric or imperial
2.9	Total reverse totalizer measure unit
2.10	Partial reverse totalizer measure unit type: metric or imperial
2.11	Partial reverse totalizer measure unit

The physical display provides the following units of measurement: l/s, m^3/h, gal/mln, m^3, gal. Other units available at menus, selectable by MCP interface, they will not be displayed on the physical display, but will only display their numeric values.

```
MAIN MENU
 1-Sensor
 2-Units
 3-Scales
SCALES
FS1=   l/s 0.8000
Frq1=H      1000.0
Frq2=H      1000.0
Pls1=    m³0.00100
Tpls1=ms    0050.0
Pls2=    m³0.00100
Tpls2=ms    0050.0
```

3.1	Full scale flow rate 1
3.2	Full scale frequency for channel 1 (0.1Hz-1000.0Hz)
3.3	Full scale frequency for channel 2 (0.1Hz-1000.0Hz)
3.4	Pulse value on channel 1
3.5	Duration of the pulse generated on channel 1
3.6	Pulse value on channel 2
3.7	Duration of the pulse generated on channel 2

```
MAIN MENU
 1-Sensor
 2-Units
 3-Scales
 4-Measure
```
```
MEASURE
Damping=      OFF
Cut-off=%   00.0
Cal.verify=   OFF
```
4.1   Measure filter
4.2   Low flow zero threshold: 0-25% of full scale value
4.3   Automatic calibration verify

```
MAIN MENU
 1-Sensor
 2-Units
 3-Scales
 4-Measure
 5-Alarms
```
```
ALARMS
Max.thr+=%    000
Max.thr-=%    000
Min.thr+=%    000
Min.thr-=%    000
Hysteresis=%   03
mA v.alarm=%  010
Hz v.alarm=%  125
```
5.1   Maximum value alarm set for direct flow rate
5.2   Maximum value alarm set for reverse flow rate
5.3   Minimum value alarm set for direct flow rate
5.4   Minimum value alarm set for reverse flow rate
5.5   Hysteresis threshold set for the minimum and maximum flow rate alarms
5.6   Current output value in case of failure
5.7   Frequency output value in case of alarms

```
OUTPUT:
Out1=         OFF
Out2=         OFF
Out mA 4_22 +/-
A1S=   l/s 0.8000


 7-Outputs
```
7.1   Output 1 functions
7.2   Output 2 functions
7.3   Choice of the function and the range of current on output
7.4   Full Scale value for analog out

```
 9-Display
 DISPLAY
 Language=      EN
 Contrast=       5
 D.rate=Hz      10
 D.item=        P+
 Part.tot.=    OFF
 Neg.tot.=     OFF
 Net.tot.=     OFF
 Quick start=  OFF
```
9.1   Choice of the language
9.2   Display contrast
9.3   Display updating frequency: 1-2-5-10 Hz
9.4   Display item choice
9.5   Partial totalizer enable
9.6   Negative totalizer enable
9.7   Net totalizer enable
9.8   Quick start menu visualization

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```
11-Functions
1 FUNCTIONS
1 T+ reset
  P+ reset
  T- reset
  P- reset
  Load Sens.f.def
  Load Conv.f.def
  Save Sens.f.def
  Save Conv.f.def
  Calibration
```

11.1	Execute immediate reset of total direct totalizer
11.2	Execute immediate reset of partial direct totalizer
11.3	Execute immediate reset of total reverse totalizer
11.4	Execute immediate reset of partial reverse totalizer
11.5	Load sensor factory default
11.6	Load converter factory default
11.7	Save sensor factory default values
11.8	Save converter factory default values
11.9	Execute immediate internal circuit calibration

```
9-Display
11-Functions
12-Diagnostic
1 DIAGNOSTIC
  Self test
  Display test
  Flow sim.=    OFF
  Display measures
  Disp.comm.vars
  Display graphs
  Firmware info
  S/N=      999004
  WT=0011:17:57:51
```

12.1	Self test diagnostic function
12.2	Function tests physical display
12.3	Flow rate simulation enabling
12.4	Display internal measured value
12.5	Display comm. diagnostic values
12.6	Display measure as graphs
12.7	Firmware version/revision
12.8	Board serial number
12.9	Total working time

```
11-Functions
12-Diagnostic
13-System
  SYSTEM
  L1 code=********
  L2 code=********
  L3 code=********
  L4 code=********
  L5 code=********
  L6 code=********
  Restr.access=OFF
  Device IP addr=
  Client IP addr=
  Network mask=
  KT=       1.01218
  KS=       1.00000
  KR=       1.00000
  DAC2 out 4mA cal
  DAC1 4mA=1.02382
  DAC1 20mA= 10050
  FW update
```

13.1	Access level 1 code
13.2	Access level 2 code
13.3	Access level 3 code
13.4	Access level 4 code
13.5	Access level 5 code
13.6	Access level 6 code
13.7	Restricted access level
13.8	Device IP network address
13.9	Client IP network address
13.10	Network mask
13.11	Calibration coefficient KT
13.12	Calibration coefficient KF
13.13	Calibration coefficient KR
13.14	Cal DAC 4mA analog output 2
13.15	DAC1 out 4mA calibration point
13.16	DAC1 out 20mA calibration point
13.17	firmware update

FUNCTIONS DESCRIPTION

Find bellow a description of the menu rows.

Menu visualized on the converter (from 1 to 13)

MENU 1 - SENSOR

(POS. 1.1) *Sensor Model*   **[S. model xxx]**   *AL4*   **[SMODL]**

Access level

MCP command

Convert request1

Synthetic description of the function
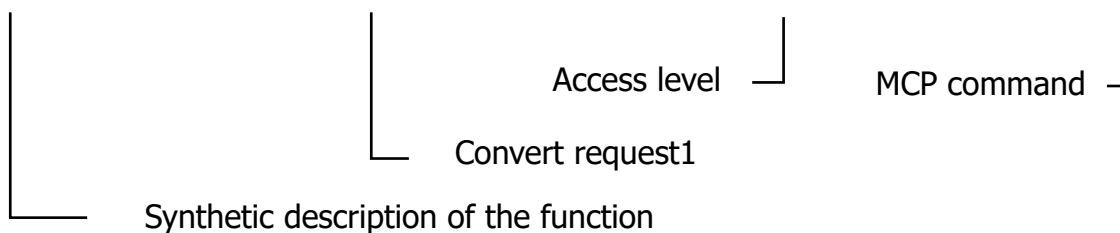
The following picture describes where to find the name of the MCP functions in MCP-software. More info see MCP manual.

Line editor for the insertion and execution of MCP commands.

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(POS. 1.1) *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. 1.2) *Unit type*   [U.type= METRIC]   *AL4*   [SUTYP]

Select type of measure unit of sensor's parameter. Values metric or imperial (inch).

(POS. 1.3) *KA*   [KA= +/- xx.xxx]   *AL4*   [CFFKA]

KA factor: coefficient of calibration

(POS. 1.4) *KA -*   [KA= - xx.xxx]   *AL4*   [CFKAN]

KA factor: calibration coefficient for negative flow. This function is showed only if at least 1 negative KL value is set.

(POS. 1.5) *KZ*   [KZ= +/- xxxxx]   *AL4*   [CFFKZ]

Calibration Factor. KZ is located on the sensor label

(POS. 1.6) *KD*   [KC= +/- xx.xxx]   *AL4*   [CFFKC]

Calibration Factor.

(POS. 1.7) *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. 1.8) *Coils Ex.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. 1.9) *C. Reg. PB*   [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. 1.10) *C. Reg. DK*   [C.Reg. DK = xxx]   *AL4*   [CRDER]

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

(POS. 1.11) *S. Freq.*   [S.Freq.= Hz xx]   *AL4*   [SFREQ]

Measure sampling frequency. This function is activated if the sensor model is NOT present on the sensors table standard parameters

(POS. 1.12) *Empty Pipe Detection*   [E.P.Detect= ON]   *AL4*   [EPDEN]

Enables the empty pipe detection function. This function is useful to keep the meter lock to zero when the pipe become empty.

(POS. 1.13) *Empty pipe detec thr.*   [Z max= xxx]   *AL4*   [EPDTH]

Threshold to determine empty pipe detection. This function is enabled only if the function 1.11 Empty Pipe Detection is ON.

(POS. 1.14) *Coefficient KL*   **[KL=XX +/- XXXXXXXX]**   *AL4*   **[SETKL]**

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

(POS. 1.15) *Signal error delay*   **[S.err.delay=m   xxx]**   *AL4*   **[SEALT]**

Delay before generating error. This function is useful to prevent unexpected lock to zero of measure caused by sporadic events (empty pipe, excitation error, signal error)

MENU 1 - SENSOR: ONLY MCP FUNCTIONS

Coefficient KZ   **[MCP ONLY]**   *AL4*   **[SETKZ]**

Instrument setting coefficient.

MENU 2 - UNITS

WARNING: The totalizer value is updated and changed depending on the setting of unit value.
The scale change may cause accuracy loss depending of rounding up. For example, if T +=0,234 liters with 3 decimals, it become T +=0.001 m³ losing 0.234 liters in rounding up.

(POS. 2.1) *Flow rate unit of m. type*   [FR unit= METRIC]   *AL2*   [FRMUT]

Flow rate type measure unit. Select metric or not metric (Imperial units)

(POS. 2.2) *Pulse 1 unit of m. type*   [PL1 unit= METRIC]   *AL2*   [PL1UT]

This function is active with POS.7.1-7.2 see page 18 enable.
This function changes the choice of measure unit POS.3.4 see page 17
Pulse 1 type measure unit: metric or not metric (Imperial units).

(POS. 2.3) *Pulse 2 unit of m. type*   [PL2 unit= METRIC]   *AL2*   [PL2UT]

This function is active with POS.7.1-7.2 see page 18 enable.
This function changes the choice of measure unit POS.3.6 see page 17
Pulse 2 type measure unit: metric or not metric Imperial units).

(POS. 2.4) *Totalizer direct unit of m. type*   [T+ unit= METRIC]   *AL2*   [TTPUT]

Setting total direct totalizer measure unit type: metric or not metric Imperial units).
This function changes the values measure unit on POS.2.5 see page 17

(POS. 2.5) *Totalizer direct unit of measure*   [T+ unit= m³]   *AL2*   [TTPUM]

Setting total direct totalizer measure unit.
This function visualized on visualization pages.

(POS. 2.6) Total. *Part. drect unit of m. type*   [P+ unit= METRIC]   *AL2*   [TPPUT]

This function is active with POS.9.5 see page 18 enable.
Setting partial direct totalizer measure unit type: metric or not metric (Imperial units).
This function changes the values measure unit on POS.2.7 see page 17 .
It is visualized on visualization pages.

(POS. 2.7) Total. *Part. direct unit of measure*   [P+ unit= m³]   *AL2*   [TPPUM]

Setting partial direct totalizer measure unit.
This function visualized on visualization pages.

(POS. 2.8) Total. *T reverse unit of m. type*   [T- unit= METRIC]   *AL2*   [TTNUT]

This function is active with POS.9.6 see page 18, enabled.
Setting total reverse totalizer measure unit type: metric or not metric (Imperial units).
This function changes the values measure unit on POS.2.9 see page 17.
It is visualized on visualization pages.

(POS. 2.9) *Total. T reverse unit of meas.*   [T- unit= m³]   *AL2*   [TTNUM]

Setting total reverse totalizer measure unit.
This function visualized on visualization pages.

(POS. 2.10)Total. *Part. reverse unit of m. type*   **[P- unit= METRIC]**   *AL2*   **[TPNUT]**

This function is active with POS.9.5 see page 18, enable.
Setting partial reverse totalizer measure unit type: metric or not metric (Imperial units).
This function changes the values measure unit on POS.2.11 see page 17
It is visualized on visualization pages.

(POS. 2.11)Total. *Part. reverse unit of meas.*   **[P- unit= m³]**   *AL2*   **[TPNUM]**

Setting partial reverse totalizer measure unit.
This function visualized on visualization pages.

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(POS. 3.1) *Flow Rate Full Scale 1*   **[FS1= l/s xxxx.x]**   *AL2*   **[FRFS1]**

The full scale is used to indicate to the maximum meter's flow rate. The full scale should be chosen carefully as it's parameters are used for several other parameters.There are two fields to fill in order to set this parameter, from left to right: 1) measure unit, 2) numeric value. The selection is made by positioning the cursor on the field to modify. To change the type unit of measure (metric, Imperial units) see POS.2.1 see page 17. The following tables shown the units of measure available and the conversion factor by comparison with 1dm3 and 1kg. The converter accepts any kind of combination of units of measure satisfying both the following conditions:

❑ Numeric field value (see "Flow rate and totalizer Visualization" page 13)
❑ 1/25 fsmax ≤ numeric field value ≤ fsmax.

METRIC	
l	Liter
m³	Cubic meter

NOT METRIC	
Gal	American gallon

(POS. 3.2-3.3)Output full scale freq.1-2   [Frq1-2= x.xxxxx]   *AL2*   [OU1FF-OU2FF]

Frq1 and Frq2 are activated with POS.7.1-7.2 enabled and set to the value freq+/-/+-. Setting duration of the pulse generated on channel 1 and 2.

(POS. 3.4-3.6)Output *Pulse 1-2*   **[Pls1-2= dm³   x.xxxxx]   *AL2*   [OP1PV-OP2PV]**

Pls1 and Pls2 is active with POS.7.1-7.2 see page 18, enable and setting pulse value on channel 1 and channel 2. This function allows the user to set a signal (a pulse) to be given from the converter when a defined amount of liquid has passed through the sensor. To set the parameter, complete the 2 fields, from left to right: 1)measure unit, 2) numeric value. The selection is performed by positioning the cursor in the field to be modified. To change the unit type (metric, No metric) see POS.2.2-2.3 see page 17. Only those units described above are available to be selected.

(POS. 3.5-3.7) *Output1-2 Pulse Time*   **[Tpls1-2= ms x.xxxxx]   *AL2*   [OP1PT OP2PT]**

Tpls1 and Tpls2 is active with POS.7.1-7.2 see page 18 enable. Setting duration of the pulse generated on channel 1 and 2.
With the liquid volume to generate the pulse value (POS.3.4-3.6) set by the user. The user must set the corresponding duration of the pulse to be outputed. This value is expressed in milliseconds and has to be between 0.4 and 9999.99. When the high frequency output is present, then the minimum value can type of device is connected to the converter, the user must verify that the set pulse duration is compatible with the external device processing such pulses. If, for example, an electro-mechanical pulse counter is connected, a minimum pulse time of 0.04 milliseconds can be set.
ATTENTION: The converter can not detect problems that may occur; firstly, the pulse is too long the coils may burn out, secondly, if the pulse is too short, the counter may not be able to function, causing damage of the output.

MENU 4 - MEASURE

(POS. 4.1) *Damping*	[Damping=OFF/SMART/(TIME)]	*AL3*	[MFDMP]

This section of manual is extremely important because the correct setting of the filters allows to obtain a proper response of the instrument to the measured flow rate and the specific requirements of use; as a general rule, consider that, starting from Damping = OFF (no filter applied to the measure), successive values, introduce increasing damping. The following diagrams show the instrument's response to changes in flow rate from 0 to 100%, using the different settings of the damping function.

The SMART is an adaptive filter that adapts automatically to most of the processes (recommended value), making the response of the meter very ready to fast changes of flow and at the same time extremely precise and stable for slow variations. It may be convenient to use a constant damping filter time, where there is a pulsating flow (for example generated by peristaltic pumps). With longer times you get a mean value stable, while with short times the measure will closely follow the flow pulses, but consequently more unstable. NOTE: If the rechargeable battery is active, the damping could be set only in "SMART".

Example with damping to OFF
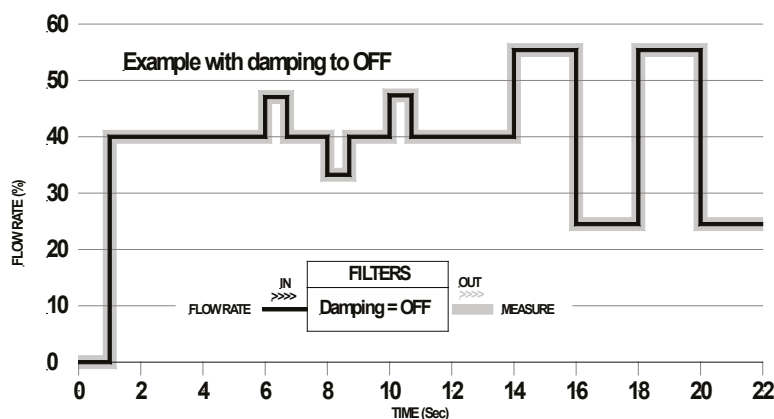
Damping function(OFF). the meter follows the trend of fast changes in flow.

Example with damping to 5,0sec.
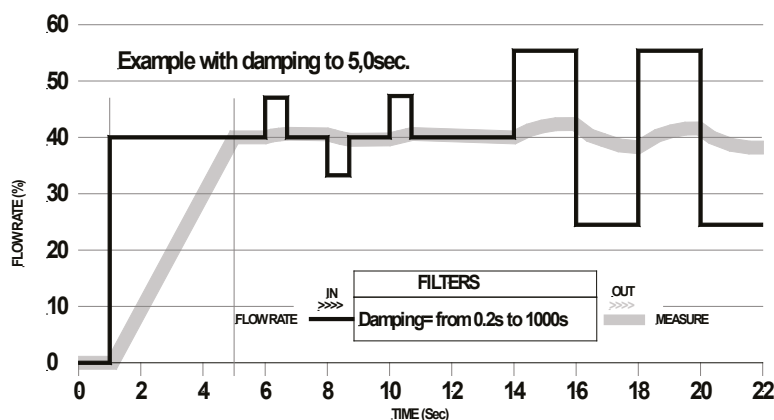
Damping mode based on time (from 0.2s to 1000s) The measure is averaged over a number of samples determined by the value assigned to the dampening function. When the damping parameter is expressed in seconds, the filter works damping the measurement noise and sudden change of flow rate. Increasing the parameter of damping increases the stability of the measurement.

(POS. 4.2) *Cut-off threshold*	**[Cut-off=% xxx]**	*AL3*	**[MFCUT]**

Setting the low flow cutoff threshold. This function is useful to avoid that flows close to zero, due to the electrical noises from tiny movements of liquid (due for example to vibrations of the pipe) which cause an increasing of the totalizers. The allowed range for this function is 0-25% of full scale set. For most applications a value between 0.5 and 1% is recommended.

(POS. 4.3) *Calibration verify*	**[Cal.verify=ON]**	*AL3*	**[ACAVE]**

This function enables an automatic verification of board's coefficients. As the converter performs continuously a large number of tests, we recommend to use this function only in presence of wide range of temperature. Instead it is NOT recommended to use it when the instrument is used in metering applications (batch).

MENU 4 - MEASURE: ONLY MCP FUNCTIONS

Measure Filter Cut-off Threshold 2	**[MCP ONLY]**	*AL3*	**[MFCT2]**

Setting the low flow cutoff threshold, it is similar to the function in 4.2. The value of this function is NOT visible on diplay but only with MCP command.

High immunity inputs	**[MCP ONLY]**	*AL4*	**[HIINP]**

The HIINP function (INPut High Immunity filter) introduces a hardware filter to be used ONLY IN CASE OF ABSOLUTE NECESSITY, when the measure is absolutely unstable or it is NOT possible to make the measure, and every possible attempt to reduce or eliminate the noise do not give a positive result, with particular attention of instrument ground connection. When this function is activated (HIINP = ON) the measure will be influenced by an unavoidable error estimated around 1%.

Dynamic sample analysis	**[MCP ONLY]**	*AL4*	**[DINSA]**

Reserved to the service

Dynamic sample time	**[MCP ONLY]**	*AL4*	**[DYNST]**

Reserved to the service

MENU 5 - ALARMS

(POS. 5.1) *Maximum direct flow rate threshold*   **[Max. thr+=% XXX]**   *AL3* **[FRAXP]**

Maximum value alarm set for direct flow rate set. When the flow rate value exceeds such a threshold, then an alarm message is generated. The value of this parameter is expressed as percentage of the full scale value and may be set from 0 to 125%. Setting this parameter to zero disables the alarm generation.

(POS. 5.2) *Maximum reverse flow rate threshold*   **[Max. thr-=% XXX]**   *AL3* **[FRAXN]**

Maximum value alarm set for reverse flow rate set. When the flow rate value exceeds such a threshold, then an alarm message is generated. The value of this parameter is expressed as percentage of the full scale value and may be set from 0 to 125%. Setting this parameter to zero disables the alarm generation.

(POS. 5.3) *Minimum direct flow rate threshold*   **[Min. thr+=% XXX]**   *AL3* **[FRANP]**

Minimum value alarm set for reverse flow rate set. When the flow rate value falls below such a threshold, then an alarm message is generated. The value of this parameter is expressed as percentage of the full scale value and may be set from 0 to 125%. Setting this parameter to zero disables the alarm generation.

(POS. 5.4) *Minimum reverse flow rate threshold*   **[Min. thr-=% XXX]**   *AL3* **[FRANN]**

Minimum alue alarm set for reverse flow rate set. When the flow rate value falls below such a threshold, then an alarm message is generated. The value of this parameter is expressed as percentage of the full scale value and may be set from 0 to 125%. TSetting this parameter to zero disables the alarm generation.

(POS. 5.5) *Hysteresis*   **[Hysteresis=% XX]**   *AL3* **[ATHYS]**

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

(POS. 5.6) *Current output value in case of failure*   **[mA V.alarm =% XXX]**   *AL3* **[OCACV]**

The output current signal can be specified by the user in case of failure of either, empty pipe, coils interrupted, or ADC error. The signal current is set as a percentage (0 to 125%) of the 0/4-20mA current. 125% corresponds to 24mA and does not depend on the selected range (0-20/4-20mA).

The NAMUR NE43 recommendation asks for a alarms signalling value for the current output lower than 3.6mA (<18%) or bigger than 21mA (>105%). It would then be preferable to set the value of this function at the 10%, so that the current value in case of the a.m. cases would be 2 mA, allowing the following diagnostics:

current < 2mA - 5%: line interrupted, power supply failure or faulty converter;

2mA -5% * current * 2mA + 5%: hardware alarm;

4mA * current * 20mA: normal working range;

20mA < current * 22mA: out of range, measure above 100% f.s.

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(POS. 5.7) *Frequency output value in case of failure*   **[Hz V.alarm=%XXX]**   *AL3*   **[OFACV]**

This function is active with POS. 7.1-7.2 enable to (FREQ.+, FREQ.-, FREQ.±)

To set the frequency value assigned to the on/off output in one or more of the following failure cases:
Empty pipe; Coils interrupted ; ADC error

Allowable range is from 0 to 125% of the frequency full scale value. Although there are no specific rules regulating cases such as these, it would be convenient to use the failure information as follows:
0% Hz * frequency * 100% f.s.: normal working range;
100% f.s. < frequency * 110% f.s.: overflow, measure above the 100% of the f.s.;
115% f.s. * frequency * 125% f.s.: hardware alarm condition.

MENU 7 - OUTPUTS

| (POS. 7.1) *Output 1 function selection* | [Out1=XXXXXX] | *AL3* [OUT1F] |

Function choice corresponding to digital Output 1. The functions are listed in the table below.

| (POS. 7.2) *Output 2 function selection* | [Out2=XXXXXX] | *AL3* [OUT2F] |

Function choice corresponding to digital Output 2. The functions are listed in the table below.

FUNCTIONS FOR OUTPUTS 1 AND 2

- ❑ **OFF:** DISABLE
- ❑ **MAX AL. +:** MAX DIRECT FLOW RATE OUTPUT (ENERGIZED = AL. OFF)
- ❑ **MIN AL. +:** MIN DIRECT FLOW RATE OUTPUT (ENERGIZED = AL. OFF)
- ❑ **MAX/MIN+:** MAX/MIN DIRECT FLOW RATE OUTPUT (ENERGIZED = AL. OFF)
- ❑ **MAX AL.-:** MAX INVERSE FLOW RATE OUTPUT (ENERGIZED = AL. OFF)
- ❑ **MIN AL.-:** MIN INVERSE FLOW RATE OUTPUT (ENERGIZED = AL. OFF)
- ❑ **MAX/MIN-:** MAX/MIN REVERSE FLOW RATE OUTPUT (ENERGIZED = AL. OFF)
- ❑ **MAX/MIN+/-:** MAX/MIN DIRECT / REVERSE FLOW RATE OUTPUT (ENERGIZED = AL. OFF)
- ❑ **P.EMPTY:** EMPTY PIPE ALLARM OUTPUT (ENERGIZED = AL. OFF)
- ❑ **HARDW.AL.:** SUM OF ALL ALARMS "energized interrupted " AND "error input signal "
- ❑ **OVERFLOW:** OUT OF RANGE ALLARM OUTPUT (ENERGIZED = FLOWRATE OK)
- ❑ **ALL ALARMS:** SUM OF ALL ALARMS POSSIBLE
- ❑ **EXT. COMM:** OUTPUT MAY TAKE A STATE EMPLOYEE FROM AN EXTERNAL CONTROL (MCP)
- ❑ **F.R. SIGN:** FLOW DIRECTION (ENERGIZED WHEN FLOW IS NEGATIVE)
- ❑ **SCALE:** INDICATION SCALE
- ❑ **FREQ.+:** FREQUENCY POSITIVE FLOWRATE
- ❑ **FREQ.-:** FREQUENCY NEGATIVE FLOWRATE
- ❑ **FREQ.+/-:** FREQUENCY POSITIVE/NEGATIVE FLOWRATE
- ❑ **PULSES.+:** PULSE POSITIVE FLOW RATE
- ❑ **PULSES.-:** PULSE NEGATIVE FLOW RATE
- ❑ **PULSES+/-:** PULSE NEGATIVE/POSITIVE FLOW RATE

| (POS. 7.3) *Current output option and range* | [Out mA=X_XX XXX] | *AL3* [AO1CF][AO2CF] |

This function sets the current output 1 and 2. This function is optional and will not appear unless the option has been requested. There are three fields to modify for this function:

Scale zero: 4 or 0mA

Full scale: 20 or 22mA

Field: + = positive, - = negative, blank = both, -0+ = central zero scale

The values corresponding to the scale points are shown in the following chart:

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CURRENT VALUES IN mA ASSOCIATE TO THE % FULL SCALE VALUE					
POSSIBLE FIELD	**REVERSE FLOW VALUE**		**ZERO**	**DIRECT FLOW VALUE**	
	≤-110%	-100%	0%	+100%	≥+110%
Out.mA = 0 ÷ 20 +	0	0	0	20	20
Out.mA = 0 ÷ 22 +	0	0	0	20	22
Out.mA = 4 ÷ 20 +	4	4	4	20	20
*Out.mA = 4 ÷ 22 +	4	4	4	20	22
Out.mA = 0 ÷ 20 -	20	20	0	0	0
Out.mA = 0 ÷ 22 -	22	20	0	0	0
Out.mA = 4 ÷ 20 -	20	20	4	4	4
Out.mA = 4 ÷ 22 -	22	20	4	4	4
Out.mA = 0 ÷ 20	20	20	0	20	20
Out.mA = 0 ÷ 22	22	20	0	20	22
Out.mA = 4 ÷ 20	20	20	4	20	20
Out.mA = 4 ÷ 22	22	20	4	20	22
Out.mA = 0 ÷ 20 −0+	0	0	10	20	20
Out.mA = 0 ÷ 22 −0+	0	1	11	21	22
**Out.mA = 4 ÷ 20 −0+	4	4	12	20	20
Out.mA = 4 ÷ 22 −0+	4	4.8	12.8	21	22

In hardware alarm conditions "HARDW AL." (interrupted coils, empty pipe, measure error) the current value is programmed by the function "mA v.fault" (pos. 4.4) and it is expressed as percentage of a fixed current range, where: 0% = 0mA and 110% = 22mA.

* Example 1: out 4-22 +   ** Example 2: out 4-20 −0+
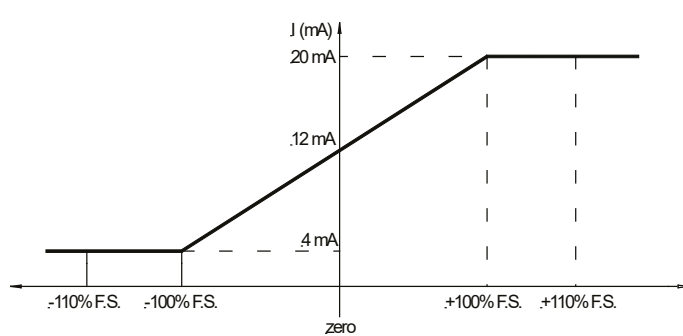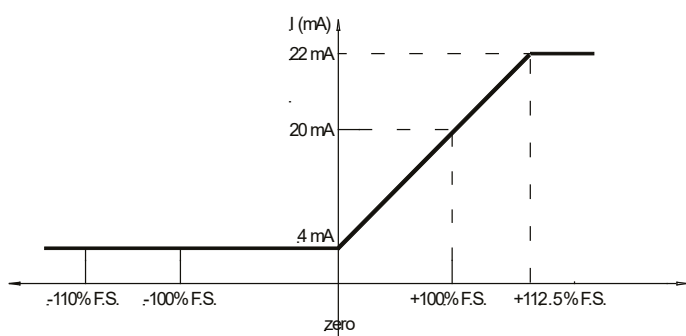
(POS. 7.4) Analog Output1 full scale   [A1S= dm/s x.xxxx]   *AL3* [AO1FS]

It allows to set the full scale value for analog output 1 **independently** from the main scale of the instrument.

(POS. 9.1) *Language for all msn*   [Language=   ITA/EN]   *AL1*   [LLANG]

Choice of the language. There are 2 languages available: **EN** = english, **IT** = Italian.

(POS. 9.2) *Display Contrast*   [Contrast=   x]   *AL1*   [DCNTR]

Display contrast set. The contrast can change according to the room temperature. The allowed range is from 0 to 9.

(POS. 9.3) *Display refresh Frequency*   [D.rate=Hz   xx]   *AL1*   [DISRF]

Frequency of the display data update. This parameter effects only the display layout and not the response time of the meter itself. The possible choices are: 1/2/5/10 Hz.

(POS. 9.4) *Display item*   [D. item=   x]   *AL2*   [DCNTR]

Second raw display item choiche

(POS. 9.5) *Partial totalizer*   [Part. tot=   ON]   *AL2*   [PTOTE]

This function enables the display of partial totalizer in visualization pages

(POS. 9.6) *Negative totalizer*   [Neg. tot=   ON]   *AL2*   [NEGTE]

This function enables the display of negative totalizer in visualization pages

(POS. 9.7) *Quick start menu*   [Quick start=   ON]   *AL2*   [QSTME]

This function enables the quick start menu.

MENU 11 - FUNCTION

The following functions are activated by first pressing the "ENTER" and then the "ESC" when the screen appears "confirm" to start the function.

(POS. 11.1) *Total direct totalizer reset*   **[T+ RESET= ON]**   *AL3*   **[VTTPR]**

Reset total direct totalizer for direct flow rate (+)

(POS. 11.2) *Partial direct totalizer reset*   **[P+ RESET= ON]**   *AL3*   **[VTPPR]**

Reset total partial totalizer for direct flow rate (+)

(POS. 11.3) *Total reverse totalizer reset*   **[T- RESET= ON]**   *AL3*   **[VTTNR]**

Reset total reverse totalizer for direct flow rate (-)

(POS. 11.4) *Partial reverse totalizer reset*   **[P- RESET= ON]**   *AL2*   **[VTPNR]**

Reset partial reverse totalizer for direct flow rate (-)

(POS. 11.5) *Load factory default sensor*   **[Load sens.f.def= ON]**   *AL3*   **[LFDSD]**

This function resets the parameters of the sensor factory default. To Load the saved files see function (11.7).

(POS. 11.6) *Load factory default converter*   **[Load conv.f.def= ON]**   *AL3*   **[LFDCD]**

This function resets the parameters of the converter factory default. o Load the saved files see function (11.8).

(POS. 11.7) *Save sensor factory default*   **[Save sens.f.def= ON]**   *AL6*   **[SFDSD]**

This function save the parameters of the sensor factory default.

(POS. 11.8) *Save convert factory default*   **[Save conv.f.def= ON]**   *AL6*   **[SFDCD]**

This function save the parameters as factory default

(POS. 11.9) *Calibration Immediate*   **[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 delete the operation.
If the sensor table is valid, the calibration is performed also when one of the following paramenter has been change:

1. SENSOR DIAMETER -> Menu Sensor1
2. SENSOR MODEL -> Menu Sensor1
3. Exc. CURRENT -> Menu Sensor1
4. S. Freq. -> Menu Sensor1

To check the calibration status, active or inactive, type the command MCP Calic? and check as follows:

CALIC = 1 calibration in progress
CALIC = 0 calibration terminated

(POS. 12.1) *Self Test Diagnostic*   **[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. 12.2) *Test display*   **[Test display]**   *AL1*   NO MCP COMMAND

This function allows to do a physical test the graphic display. During this operation, 4 sequences are displayed to test the correct functioning of the device.

(POS. 12.3) *Flow rate simulation*   **[Flow sim=ON]**   *AL3*   **[MSIEN]**

Flow rate simulation enabling. With this function it is possible to generate an internal signal that simulates the flow rate, allowing the outputs and all the connected instruments test. After enabling it, a '▲▼' appears in the top left of the screen and the flow rate simulation can be:

set: by pushing the key Enter from one of visualization pages, to set the required % flow rate (Fl.rate=%) and the same key to confirm the value;

finished: by pushing the key Enter from visualization pages and then by long pushing the same key.

(POS. 12.4) *Diagnostic measures*   **[Display measures]**   *AL5*   **DMVLS**

This Function shows the values of the various internal parameters as listed below :

```
VCPU:V          5.01   LFN_COM:V      0.000
VPS:V           5.41   LFN_DIF:V      0.000
VUSB:V          4.53   HFN_ADC:mV     0.000
+AVCC:V        +10.1   LFN_ADC:mV     0.001
-AVCC:V         -9.9   MEAS_NB:           0
VBATT:V        0.000   CAL_I:mV      16.503
IBATT:A        0.000   CAL_U:mV     530.778
VIN1:V        -8.071   CAL_G:        32.1622
VIN2:V        -8.065   CAL_O:mA      -0.055
VIN_C:V       -8.068   CAL_C:mA      -0.055
VIN_D:V       -0.006   CAL_R0:      1.00000
C_C:mA         25.00   CAL_R1:      1.00000
C_U:V            5.0   CAL_R2:      1.00000
C_VPK:V          5.5   CAL_R3:      1.00000
C_R:Ω          201.9   SYS_F:MHz   50.0512
C_PWR:W        0.126   CURR_K:      0.00000
C_T:°C            -    PROC1:%         46.4
C_RT:ms         0.00   PROC2:%          7.3
C_LK:mA        0.000   PROC3:%          3.8
C_ST:              1   PROC4:%         29.8
S.VER.RSLT:     0000   PROC5:%         12.6
E1R:kΩ           0.0   CPU_T:°C     +33.12
E2R:kΩ           0.0
```

(POS. 12.5) *Disp, comm. Diagnostic values*   **[Disp. comm. vars]**   *AL5*   **DCVLS**

Create a list of diagnostic values on the instrument communication.

```
PPP_STATUS:    NETW   E_IP_HDR5:         3
MCPI_S: ESTABLISH     E_IP_HDR6:         0
RxCNT:      1477149   E_IP_HDR7:         0
TxCNT:      6515456   E_IP_HDR8:         0
E_SR_LINK:        0   E_IP_HDR9:         0
E_PAKTLEN:        0   E_TCPHDR1:         0
E_NETLAYR:        0   E_TCPHDR2:         0
E_TSPLAYR:        0   E_UDPHDR1:         0
E_ARPHDR1:        0   E_UDPHDR2:         0
E_ARPHDR2:        0   E_UDPHDR3:        92
E_IP_HDR1:        0   E_ICMPHDR:         0
E_IP_HDR2:        0
E_IP_HDR3:        0
```

(POS. 12.6) Display graphs [Display graphs] *AL5* NO MCP COMMAND

This function displays graphs of input Z, C. current, C. Volt, C.Load, Input 1, Input 2, Input1-Input 2, Analog to Digital Converter.
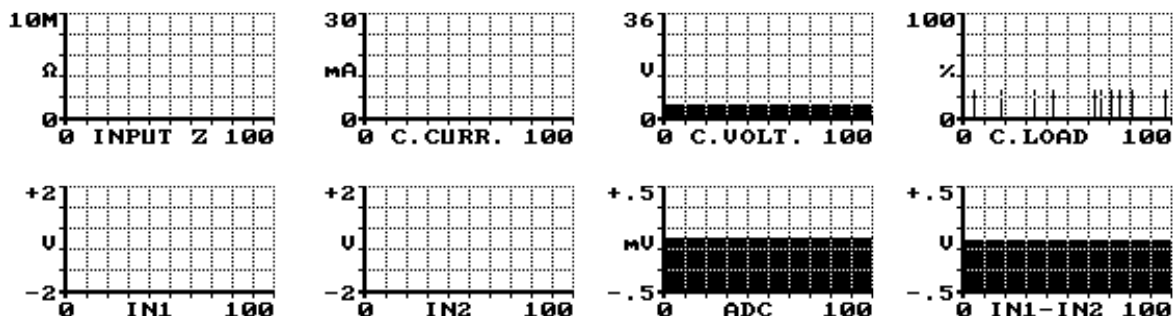
(POS. 12.7) *Firmware info* [Firmware info] *AL0* MODSV

Firmware info version/revision

(POS. 12.8) *Board Serial Number* [S/N= xxxxxx] *AL0* [SRNUM?]

View Board serial number. (read only)

(POS. 12.9) *Working Time* [WT= xxxx: xx: xx: xx] *AL0* [TWKTM?]

View Total working time instrument. (read only)

MENU 12 - MEASURE: ONLY MCP FUNCTIONS

Diagnostic function [MCP ONLY] *AL3* [DIAGF]

Factory reserved function. The value of this function is NOT visible on diplay but only with MCP command.

Coil courrent mean real value [MCP ONLY] *AL3* [CCMRV]

Factory reserved function. The value of this function is NOT visible on diplay but only with MCP command.

(POS. 13.1-2-3-4-5-6) Access level n° code	[Ln xxxxxxxx]	---	[L1ACD]->[L6ACD]

This function enables or disables, for each access level code, the main menu functions.
Each level unlocks the functionality of the lower level. (Function "13.7   Restricted access level")
L1 code= ******** Access level value code 1   L4 code= ******** Access level value code 4
L2 code= ******** Access level value code 2   L5 code= ******** Access level value code 5
L3 code= ******** Access level value code 3   L6 code= ******** Access level value code 6

(POS. 13.7) Restricted access level	[Restr. access= ON]	*AL6*	[RSARE]

Enable Or disable access level code. If active displays only the functions related to the level entered access.

IP ADDRESS SETTING (13.11-12-13)

(POS. 13.8)Device IP address	[XXX.XXX.XXX.XXX]	*AL3*	[DIPAD]

Device IP network edress

(POS. 13.9) Client IP address	[XXX.XXX.XXX.XXX]	*AL3*	[CIPAD]

Client IP network adress

(POS. 13.10) Network mask	[XXX.XXX.XXX.XXX]	*AL3*	[NETMS]

Network mask.

Caution: Changes to the functions of the points 13.11-13.12-13.13 are enabled after the drive device restart (see function 12.1 Self test for restart converter).

PC/SERVER

DEVICE IP ADDRESS   CLIENT IP ADDRESS
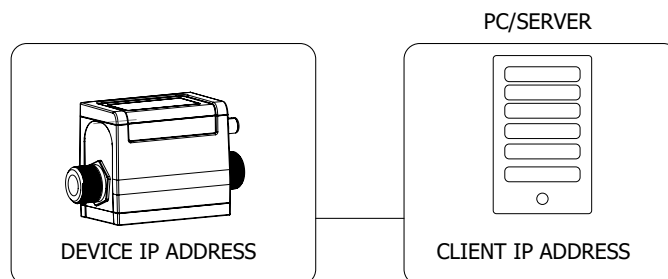
(POS. 13.11) Coefficient KT	[KF=X.XXXXX]	*AL6*	[CFFKT]

Gain correction coefficient (calculated automatically)

(POS. 13.12) Coefficient KS	[KF=X.XXXXX]	*AL5*	[CFFKS]

Correction coefficient constant instrumental

(POS. 13.13) Coefficient KR	[KR=X.XXXXX]	*AL5*	[CFFKR]

Correction coefficient constant instrumental

DIGITAL ANALOG CONVERTER (Correction Parameters)(13.17-18-19-20)
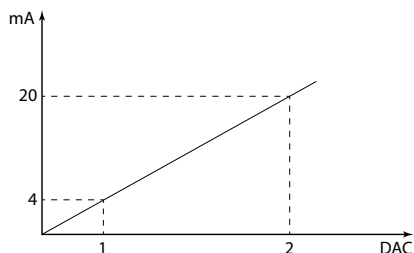
The diagram shows how the DAC 4-20mA max load: 500 Ω parameters are setup. The DAC1 value corresponds to 4 mA corresponding to a zero flow rate, while the value of 20mA corresponds to a 100% of the flow rate.

(POS. 13.14) DAC2 4mA	[DAC2 4mA =XXXXX]	*AL5*	[C1CP1]

DAC1 out 4mA calibration point. (current output2)

(POS. 13.15) DAC1 4mA	[DAC1 4mA =XXXXX]	*AL5*	[C1CP1]

DAC1 out 4mA calibration point. (current output1 calibration point 1)

(POS. 13.16) DAC1 20mA	[DAC1 20mA=XXXXX]	*AL5*	[C1CP2]

DAC1 out 20mA calibration point. (current output1 calibration point 2)

(POS. 13.17) Firmware Update	[FW update]	*AL4*	[FWUPD]

Enable firmware update. The firmware can be upload to the SD card (name.file).
MCP interface is activated by the command FWUPD = name.file

MENU 13 - SYSTEM: ONLY MCP FUNCTIONS

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

Device Unique Identity key

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

Device hardware configuration

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

Device hardware code

Calibr. Exec. status Memory	[MCP ONLY]	*AL6*	[CALXM]

Calibration Execution status Memory. This function checks the instrument's internal calibration status.
CALXM=1 valid calibration in execution.
CALXM=0 invalid calibration (If the function is zero, start the calibration function [MCP command CALIC])

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

Select the function code

Quick Start FuNction Selection	[MCP ONLY]	*AL6*	[QSFNS]

Select function for quick start menu

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

Select ALL function converter for quick start menu.

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

List enable status of functions

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

Input the right access code

Exemple set quick start menù function for mcp.
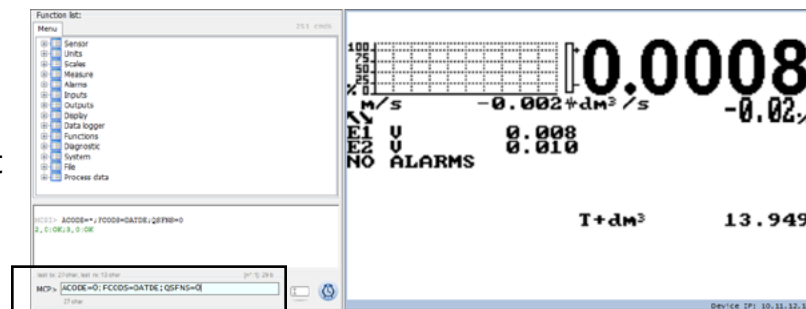
ACODE=0; FCODS=[MCP COMMAND]; QSFNS=1

Access Code   INSERT MCP Command of the function to be activated in the QS menu.

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

Terminate the PPP data link

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

Quit the MCPI connection

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

View list of all available converter functions.

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

View compact list of all available converter functions.

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

Select menu for functions list

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

Configuration parameter list. The list with the status / values of the converter parameter.

Volume Totalizer Total Positive Set	**[MCP ONLY]**	*AL4*	**[VTTPS]**
Totaliz.T+ value set			
Volume Totalizer Partial Positive Set	**[MCP ONLY]**	*AL4*	**[VTPPS]**
Totaliz.P+ value set			
Volume Totalizer Total Negative Set	**[MCP ONLY]**	*AL4*	**[VTTNS]**
Totaliz.T- value set			
Volume Totalizer Partial Negative Set	**[MCP ONLY]**	*AL4*	**[VTPNS]**
Totaliz.P- value set			
Volume Total Positive Overflow Set	**[MCP ONLY]**	*AL4*	**[VTPOS]**
Totaliz.T+ overflow value set			
Volume Partial Positive Overflow Set	**[MCP ONLY]**	*AL4*	**[VPPOS]**
Totaliz.P+ overflow value set			
Volume Total Negative Overflow Set	**[MCP ONLY]**	*AL4*	**[VTNOS]**
Totaliz.T- overflow value set			
Volume Partial Negative Overflow Set	**[MCP ONLY]**	*AL4*	**[VPNOS]**
Totaliz.P- overflow value set			
CPU MaX.recorded temperature	**[MCP ONLY]**	*AL6*	**[CPUMX]**
CPU max.recorded temperature			
CPU MiN.recorded temperature	**[MCP ONLY]**	*AL6*	**[CPUMN]**
CPU min.recorded temperature			
Calibration OFset Register 0	**[MCP ONLY]**	*AL6*	**[COFR0]**
Calibration offset register 0			
Calibration GAin Register 0	**[MCP ONLY]**	*AL6*	**[CGAR0]**
Calibration gain register 0			
Calibration GAin Register C	**[MCP ONLY]**	*AL6*	**[CGARC]**
Calibration gain register C			

OUTput 1 Set	**[MCP ONLY]**	*AL0*	**[OUT1S]**
Set value for digital output 1

OUTput 2 Set	**[MCP ONLY]**	*AL0*	**[OUT2S]**
Set value for digital output 2

Flow Rate Full Scale in chosen Units	**[MCP ONLY]**	*AL0*	**[FRFSU]**
F.rate f.scale in chosen units

Flow Rate Value PerCentage	**[MCP ONLY]**	*AL0*	**[FRVPC]**
Flow rate value in percentage

Flow Rate Value Percentage without cut-off	**[MCP ONLY]**	*AL0*	**[FRVPX]**
F.rate in perc.without cut-off

Flow Rate Value Binary without cut-off	**[MCP ONLY]**	*AL0*	**[FRVBX]**
F.rate in binary.without cut-off

Flow Rate Value Technical Unit	**[MCP ONLY]**	*AL0*	**[FRVTU]**
F.rate value in unit of measure

Volume Totalizer Total Positive Value	**[MCP ONLY]**	*AL0*	**[VTTPV]**
Totaliz.T+ read value

Volume Totalizer Partial Positive Value	**[MCP ONLY]**	*AL0*	**[VTPPV]**
Totaliz.P+ read value

Volume Totalizer Total Negative Value	**[MCP ONLY]**	*AL0*	**[VTTNV]**
Totaliz.T- read value

Volume Totalizer Partial Negative Value	**[MCP ONLY]**	*AL0*	**[VTPNV]**
Totaliz.P- read value

Volume Totalizer Total Positive Overflow	**[MCP ONLY]**	*AL0*	**[VTTPO]**
Totaliz.T+ number of overflows

Volume Totalizer Partial Positive Overflow	**[MCP ONLY]**	*AL0*	**[VTPPO]**
Totaliz.P+ number of overflows

Volume Totalizer Total Negative Overflow	**[MCP ONLY]**	*AL0*	**[VTTNO]**
Totaliz.T- number of overflows

Volume Totalizer Partial Negative Overflow	**[MCP ONLY]**	*AL0*	**[VTPNO]**
Totaliz.P- number of overflows

CPU temperature	**[MCP ONLY]**	*AL0*	**[CPUTP]**
CPU temperature			
LiQuid VELocity	**[MCP ONLY]**	*AL0*	**[LQVEL]**
Liquid velocity			
AVeraGe process data Samples Number	**[MCP ONLY]**	*AL0*	**[AVGSN]**
N.of samples for averaged values			
ALARM status	**[MCP ONLY]**	*AL0*	**[ALARM]**
Active alarm(s) status			
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			
SEQuence NumBer	**[MCP ONLY]**	*AL0*	**[SEQNB]**
Sequence number			
Sensor Table Version	**[MCP ONLY]**	*AL0*	**[SEQNB]**
Displays the load sensor table in the converter			

ALARM MESSAGES (CAUSES AND ACTIONS TO BE TAKEN)

MESSAGGIO	CAUSE	ACTION TO TAKE
NO ALARMS	All works regularly	---
[000] SYSTEM RESTART	---	---
[001] SYSTEM RESTART	Internal PS Fail	Contact the service
[005] F-RAM ERROR	Error writing / reading Flash-RAM	Contact the service
[006] EXCITATION ERROR	The excitation of the sensor coils resulting from cable is interrupted	Check the connecting cables to the sensor.
[007] SIGNAL ERROR	The measure is strongly effected by external noise or the cable connecting the converter to the sensor is broken.	Check the status of the cables connecting the sensor, the grounding connections of the devices and the possible presence of noise sources.
[008] PIPE EMPTY	The measuring pipe is empty or the detection system has not been properly calibrated.	Check whether the pipe is empty or repeat the empty pipe calibration procedure.
[009] FLOW>MAX+	The flow rate is higher than the maximum positive threshold set.	Check the maximum positive flow rate threshold set and the process conditions.
[010] FLOW>MAX-	The flow rate is higher than the maximum negative threshold set.	Check the maximum negative flow rate threshold set and the process conditions.
[011] FLOW<MIN+	The flow rate is lower than the minimum positive threshold set.	Check the minimum positive flow rate threshold set and the process conditions.
[012] FLOW<MIN-	The flow rate is lower than the minimum negative threshold set.	Check the minimum negative flow rate threshold set and the process conditions.
[013] FLOW>FULL SCALE+	The flow rate is higher than the full scale positive value set on the instrument.	Check the full scale positive value set on the instrument and the process conditions.
[014] FLOW>FULL SCALE-	The flow rate is higher than the full scale negative value set on the instrument.	Check the full scale negative value set on the instrument and the process conditions.
[015] PULSE1>RANGE	The pulse generation output 1 of the device is saturated and cannot generate the sufficient number of impulses.	Set a bigger unit of volume or, if the connected counting device allows it, reduce the pulse duration value.
[016] PULSE2>RANGE	The pulse generation output 2 of the device is saturated and cannot generate the sufficient number of impulses.	Set a bigger unit of volume or, if the connected counting device allows it, reduce the pulse duration value.
[017] CALIBR.ERROR	Calibration Error	Contact the service
[018] SYSTEM FREQ.ERR	System Freq. Error	Contact the service
[019] B.DATA NOT INIT	Uninitialized data system	Contact the service
[020] FL.SENSOR ERROR	Flow rate sensor error	Contact the service

MANUAL REVIEWS

REVIEW	DATE	DESCRIPTION
8100_EN_IT_R0_1.00.0	22/12/2017	First edition

8100_EN_IT_IS_R0_1.0X

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.

ISOIL INDUSTRIA S.p.A.

HEAD OFFICE	SERVICE
Via Fratelli Gracchi, 27 20092 Cinisello Balsamo (MI) Tel +39 02 66027.1 Fax +39 02 6123202 vendite@isoil.it	isomagservice@isoil.it

If you want to find the complete list of our distributors access at the following link:
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