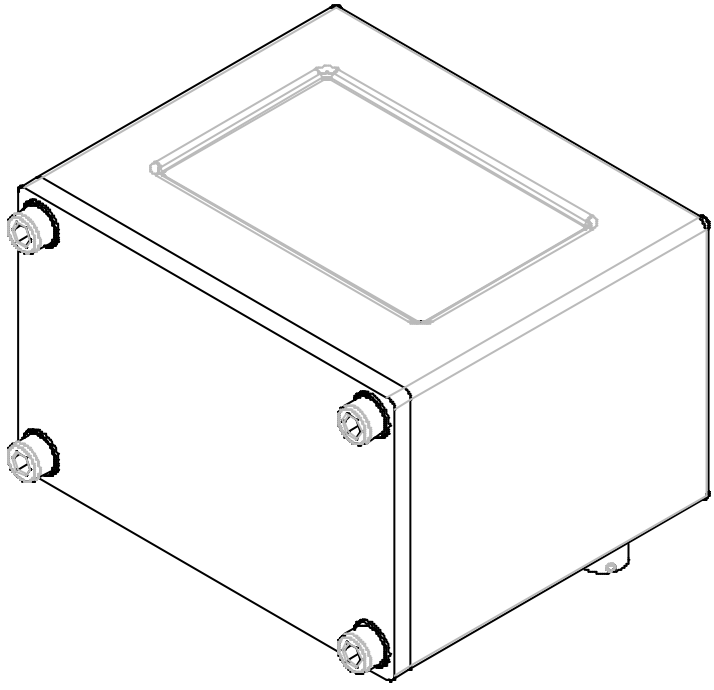
ISOMAG™
THE FRIENDLY MAG METER

OPERATING AND INSTALLATION MANUAL

CONVERTER

ML 252



CE

ISOIL INDUSTRIA
The solutions that count

INDEX

INTRODUCTION

This manual is integral part of the product. Read carefully the instructions contained it since it contains important indications for a safe of use and maintenance.
Technical information and relative products in this manual could undergo modifications without any previous notice.
The flow meter must be used for what it has been built for. The improper use, possible tampering of the instrument or parts of it and substitutions of any not original components, makes the warranty to decay automatically.
The manufacturer is considered responsible only if the instrument in used in his original configuration.
The reproduction of the present manual and of possible software supplied with the instrument it's strictly forbidden

Symbols Used on the manual

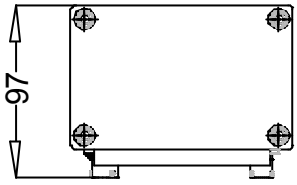
ATTENTION

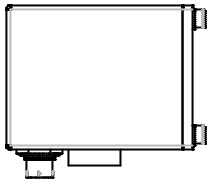
DANGER ELECTRIC SHOCK

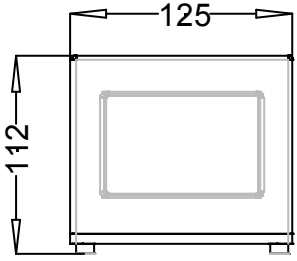
WARNING

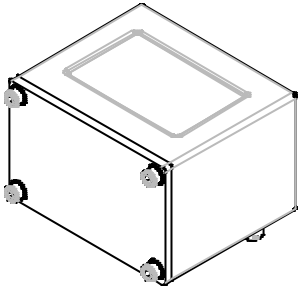
PRECAUTIONS

OVERALL DIMENSIONS









TECHNICAL CHARACTERISTICS

ELECTRIC CHARACTERISTICS

Classification of the instrument: class I, IP 67, category of installation II

Power supply version	Power supply voltage	Power supply frequency	Max power	Max Current
LITIUM BATTERY	3,6 V – 16,5 A/h	-	-	-

INPUT/OUTPUT ISOLATION

- Input/output are insulated up to 500V
- Port RS 232 NON is not insulated

ENVIRONMENTAL CONDITIONS OF USE

- The instrument can be installed inside or outside buildings
- Altitude: from –200 a 6000 m (from -656 to 19685 feet)
- Humidity range: 0÷100% (IP 67)
- Line voltage range: (see table on technical characteristics)

OPERATING TEMPERATURE

CONVERTER			
Ambient Temp.			
Min.		Max	
°C	°F	°C	°F
-10*	-14*	50	122

*** For discontinuous use, the installation of heating resistance is necessary**

MEASURE/ CONSUMPTIONS

The converter can be used in two different modes:

- ❑ with continuous sampling
- ❑ with sampling to preset unit of time.

❑CONTINUOUS SAMPLING (pic.1) (ENERGY SAVING OFF)

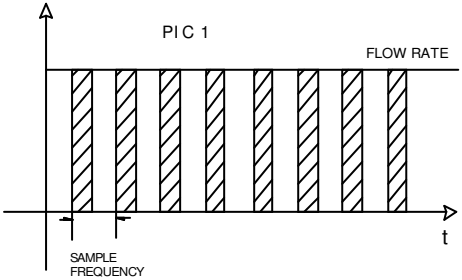
In this mode the converter make the measure in accordance with the classical diagram of the flow meter; the consumption of the system, with any diameter of the sensor is 0,05 W ; **the life of battery is about 1 month (6 with 6 battery)**
The accuracy of the system is definite in those conditions.

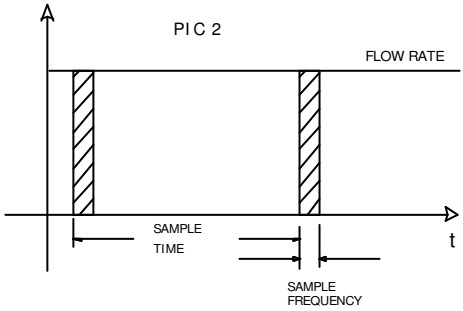
❑SAMPLING TO PRESET UNIT TIME (pic. 2) (ENERGY SAVING ON)

This mode works sampling the range to intervals of preset time (see MEASURE menu, func. 3.5); it allows a great saving of energy

In this conditions the consumptions are:

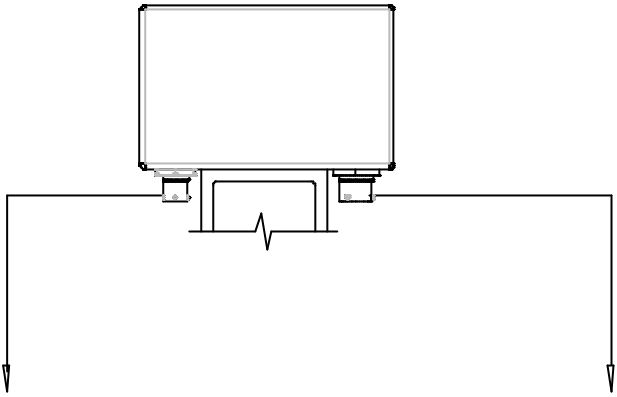
Sampling time (s)	Battery life - n° 1 battery (years)	Battery life – " N " batteries (years)	
1	0,7	0,7 * N	Whatever the results , the maximum time is limited to 10 years
2	1.3	1.3 * N	
5	2.1	2.1 * N	
10	2.7	2.7 * N	
15	3.0	3.0 * N	
>= 30	5	5.0 * N	



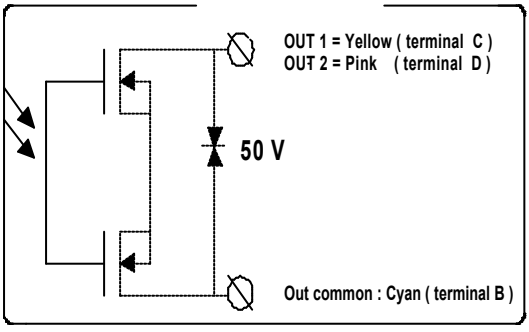


ATTENTION: the consumptions on the table are without optional IF2 cable connected to the converter. This device accelerate the consumption of the batteries even if the instrument is in standby mode**. Recommends to disconnect the IF2 cable from the converter after every his uses or switch off the converter by the dip-switches (see page 9)**

ELECTRICAL CONNECTIONS



4 poles : OUT ON/OFF



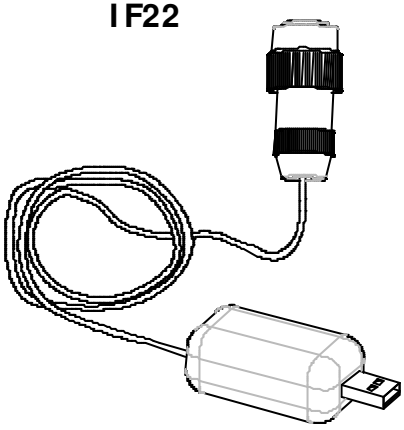
6 poles

- A (ORANGE) : external power supply 8-35 VDC
- B (GREEN) : GROUND
- C (BROWN) : RS232 – TX
- D (VIOLET) : RS232 – RX
- E (BLU) : to IF22 USB interface
- F : not connected

Technical characteristics

- Opto-insulated output (Opto- MOS)
- Maximum switching voltage: 40 Vdc
- Maximum switching current: 100mA
- Maximum Ron = 70 Ohm
- Maximum switching frequency (loadRL=240Ω, VOUT=24Vdc): 32 Hz
- Insulation from other secondary circuits: 500 Vdc

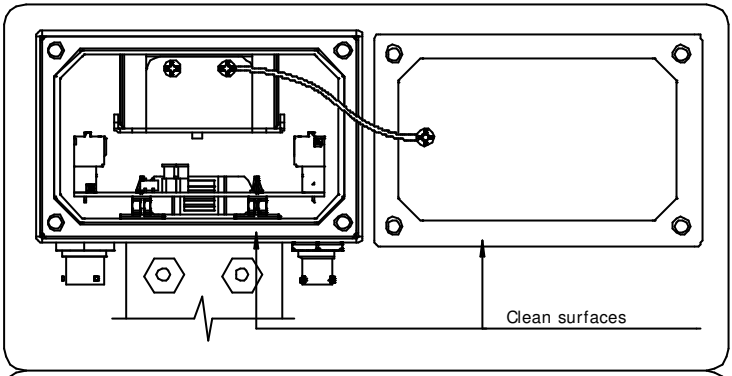
IF22

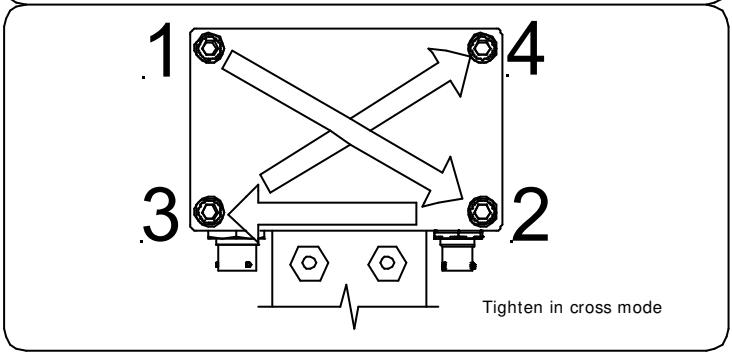


INSTRUMENT START UP AND MAINTENANCE

Before to close the converter verify the following:

- ❑ Sealing surfaces mast be clean
- ❑ Tighten the screw in cross mode up to about 12/13 Nm
- ❑ Repeat the tightening operations after 2/3 minutes





Before to switch on the instrument verify the following:

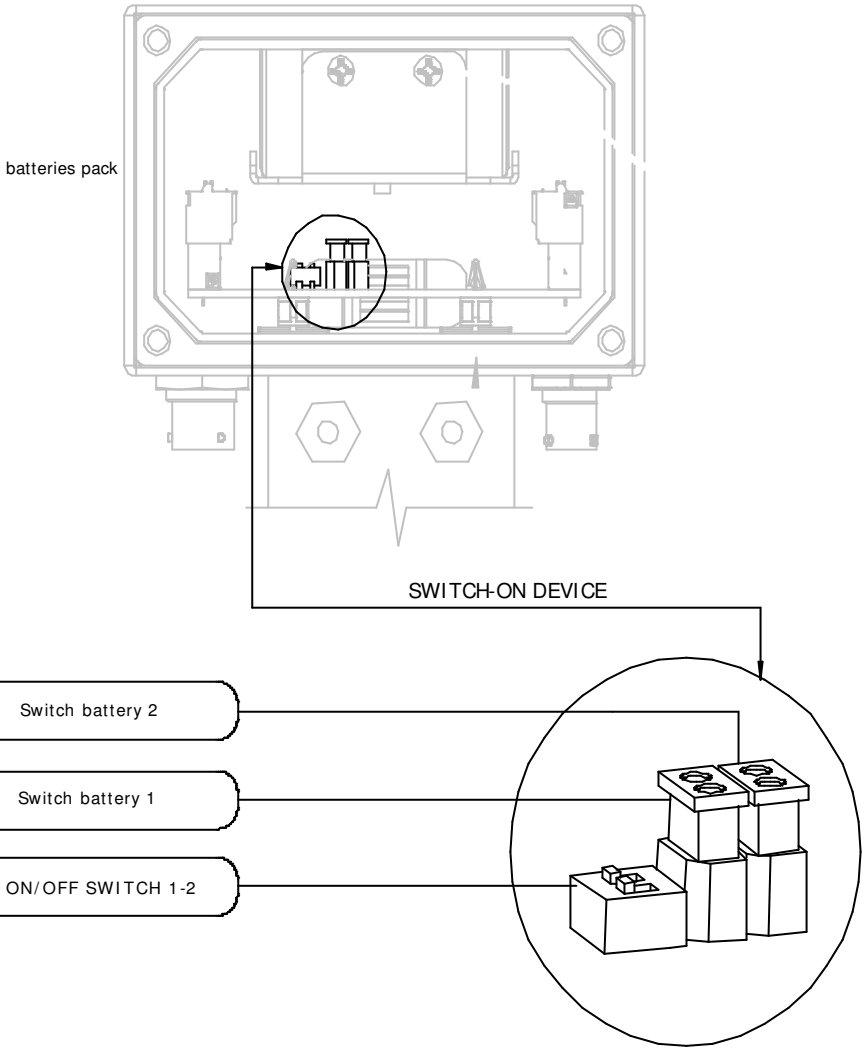
- ❑ Power supply voltage must correspond to that specified in the name plate
- ❑ Electric connections must be done as described at page 8-10
- ❑ Ground connections must be done

Verify periodically:

- ❑ The integrity of the power supply cables, wiring and other electrical parts connected
- ❑ The integrity of the instrument's housing (this must not have bruises or other damages that may compromises the hermetical sealing)
- ❑ The tightening of the sealing elements (cable glands, covers, etc.)
- ❑ The integrity of the front panel (display and keyboard), damages may compromise the sealing
- ❑ The mechanical fixing of the instrument on the pipe or on the wall stand

INSTRUMENT START UP

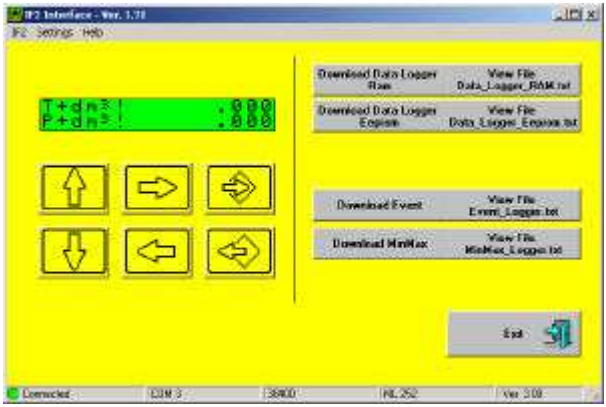
Batteries Power Supply



- Batteries quantity : N° 1 standard (+ N° 1 optional)

USER INTERFACE

ML252 is available only in blind version, therefore the only way to view and set the functions of instrument it's the serial interface IF22



ACCESS CODE

Some functions in the converter are enabled by the access codes. The information of this manual is related to all the functions available with L2 level. All the functions available through higher level are protected and reserved to the service.

Description of the L2 access code

(menu "11 Internal data" pos. 11.1)

- **with code L2 = 00000** (with this code only) you disable the request of code L2
  NOTE: the availability of the functions is related to the selected block
- * **with L2 customised** (freely chosen by the user) you can proceed programming all the functions up to L2 security level, entering its code whenever you enter the Main menu

*** ATTENTION:** take note very carefully of the customised code you have chosen, since there is no way for the user to retrieve it if it is forgotten

FACTORY PRESETTINGS

The converter is delivered with access code L2:

11111

and with the "Quick start menu" enable. Press the key to access to the "Quick start menu" from one of the visualization pages

The "Quick start menu" may be set without entering any access code (see example 1 on page 17).

Alarm ON

Flow rate visualization

* Direct Reverse totalizer

Push to change visualisation

Flow rate and direct reverse totalizer visualization

Push to change visualisation

Speed of fluid

Alternate pages

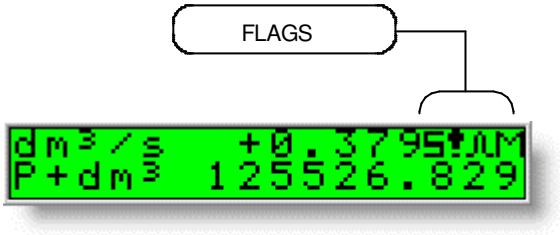
Push for alrms visualization

Data and time

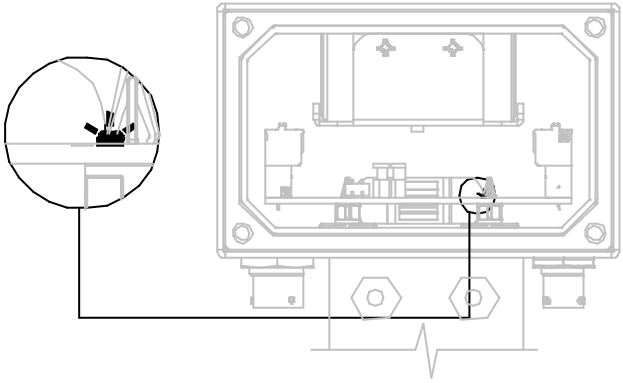
Alarm description

* The maximum number shown from the totalizer is 999999999 independently from the number of selected decimals. Beyond this value the totalise are reset.

FLAG AND LED INTERPRETATION



FLAGS INTERPRETATION	
FLAG	**DESCRIPTION**
M	Alarm max activated
m	Alarm min activated
!	- Interruption coils circuit - Segnal error - Empty pipe
C	Calibration running
B	Poor power batteries



CONVERTER LED INTERPRETATION
Always switch off: not power supply or trouble circuit
Always switch on: firmware not valid
Continuos quickly flash: normal operation in continuoe sampling mode
Slowly flash (2 time each second) : empty pipe condition
Alternate quickly flashes: normal operation in energy saving mode
Flash one time each second and switch off: switch to stand-by mode
ATTENTION: the LED are visible without cover of converter

ACCESS TO THE INSTRUMENT

SHORT PRESSING (< 1 SECOND):
It increases the numeric figure or the parameter selected by the cursor
It goes to the previous subject on the menu
batch start/stop (when enabled)

LONG PRESSING (> 1 SECOND):
It decreases the numeric figure or the parameter selected by the cursor
It goes to the next subject on the menu
Visualizes the remaining charge of the batteries

SHORT PRESSING (< 1 SECOND):
It moves the cursor rightward on the input field
It goes to the following subject of the menu
It change the display of the process data

LONG PRESSING (> 1 SECOND):
It moves the cursor leftward on the input field
It goes to the previous subject on the menu

SHORT PRESSING (< 1 SECOND):
It enter /leaves the selected function
It enables the main menu for the instrument configuration
It cancels the selected function under progress

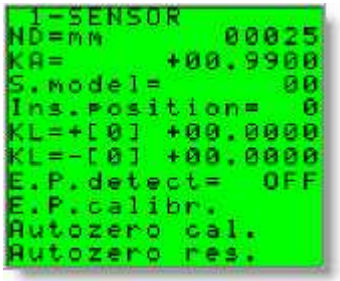
LONG PRESSING (> 1 SECOND):
It leaves the current menu
It enables the totalizer reset request (when enabled)
It confirms the selected function

ML252 Functions

(for detail functions with symbol " "see the manual from page 19)*

Attention: The function in grey colour are visualized on display only with other active functions or with optional modules

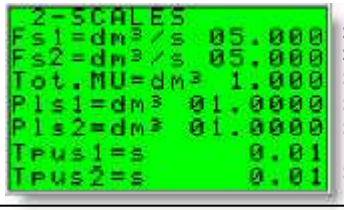
MAIN MENU
1-Sensor



1.1 Insert ND of sensor (0-3000)
1.2 Calibration data of sensor visualized on sensor's label
1.3 Sensors model: Enter the first two characters of the serial number of the sensor
1.4 Position for insertion sensors: 0= 1/8DN, 1= 1/2DN, 2= 7/8DN
1.5 Factory parameter

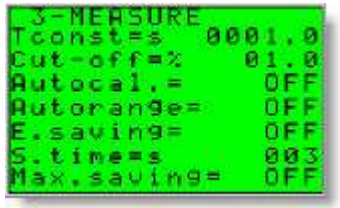
1.6 Enables the empty pipe detection feature
1.7* Enables the automatic calibration procedure of the empty pipe detection
1.8* Enables the automatic zero calibration sy stem
1.9 Reset the preceding function

MAIN MENU
2-Scales



2.1* Full scale value set for range N.1
2.2* Full scale value set for range N.2
2.3* Unit of measure and number of decimal totalizes
2.4* Pulse value on channel 1
2.5* Pulse value on channel 2
2.6* Duration of the pulse generated on channel 1
2.7* Duration of the pulse generated on channel 2

MAIN MENU
3-Measure



3.1* Time constant
3.2 Low flow zero threshold: 0-25% of full scale value
3.3 Enable every hour an internal cycle of calibration. The measure it's stopped for 8-15 sec.
3.4* Automatic change of scale
3.5* Energy saving
3.6 Interval of time among a measure and the other (see page 6)
3.7 Amplifiers switch-off to save more energy

MAIN MENU
4-Alarms

4.1 Maximum value alarm set for direct flow rate
4.2 Maximum value alarm set for reverse flow rate
4.3 Minimum value alarm set for direct flow rate
4.4 Minimum value alarm set for reverse flow rate
4.5 Hysteresis threshold set for the minimum and maximum flow rate alarms
4.6 Empty pipe detection threshold. It's automatically set by the function 1.9

MAIN MENU
6-Outputs

```
6-OUTPUTS
Out1=          IMP1
Out2=           OFF
```

6.1* Output 1 functions
6.2* Output 2 functions

MAIN MENU
7-Communication

```
7-COMMUNICATION
IF2 prot.=      DPP
Address=        000
RS232 bps= 19200
RS232 prot.= DPP
```

7.1 Choice of the communication protocol for the IF2 device
7.2 Address value of converter (range 0 – 255)
7.3 Speed of the RS232 output (possible choices: 2400, 9600, 19200, 38400 bps)
7.4 Choice of the communication protocol for the RS232 port

MAIN MENU
8-Display

```
8-DISPLAY
Language=       EN
T+ reset
P+ reset
T- reset
P- reset
D.time=s       060
Quick start=  OFF
Net total.=   OFF
Currency=     OFF
Curr.decim.=    2
EUR/dm3+ 01.0000
EUR/dm3- 01.0000
```

8.1 Choice of the language: E= English, I=italian, F= French, S= Spanish
8.2* Total direct (positive) flow totalise reset from keyboard
8.3* Partial direct (positive) flow totalise reset from keyboard
8.4* Total reverse (negative) flow totalise reset enable from keyboard
8.5* Partial reverse (negative) flow totalise reset enable from keyboard
8.6 Time for switch off display (shown with function 3.7 enabled)
8.7 Visualization of "Quick start menu"
8.8 Enable the page of net totalizer (difference between direct and reverse)
8.9 Visualizes the values of the partial totalise in the unit of selected currency
8.10 Choice of the numbers of decimals for the visualization currency value: From 0 to 3
8.11* Value of conversion/currency for direct totalizer
8.12* Value of conversion/currency for reverse totalizer

MAIN MENU
9-Data logger

```
9-DATA LOGGER
Acquisition=    ON
Interval=m       1
1992/01/06 23:14
Disp.dyn.data
Display data
Display events
Disp.min/max
Clear dyn.data
Clear data
Clear events
Reset min/max
```

9.1* Automatic data logger enable
9.2* Interval time for the data logging function: 1, 2, 3, 5, 15, 30, 60 minutes
9.3* Date and time set
9.4* Display dynamic data
9.5 Displaying of the data stored in the data logger
9.6 Displaying of the last 64 alarms stored in the data logger
9.7 Visualization function of minimum and maximum peak of flow rate
9.8 Logged dynamic data cancel function
9.9 Logged data cancel function
9.10 Reset all alarm events
9.11 Reset all minimum and maximum peak of flow rate stored

MAIN MENU
10-Diagnostic

10.1* Enable the calibration of the converter
10.2* Converter auto-test
10.3* Flow rate simulation enabling
10.4* Stand-by function

MAIN MENU
11-Internal data

11.1 Level 2 access code enter
11.3 Load factory data pre-set
11.4 Load user data saved
11.5 Save user data
11.6 Visualisation of the total operation hours of the converter (function not editable)
11.7 Ks Coefficient

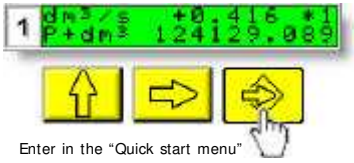
ACCESS TO THE CONFIGURATION MENUES

The access to the configuration menu can take place in two different modes:

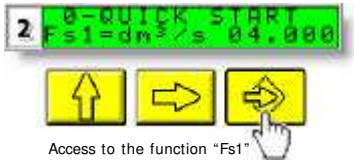
- Through the **"Quick start menu"** where is possible to access directly to some of the principal functions
- Through the **"Main menu"** where is possible to access to all function with access code ≤ 2

Below are brought some examples relating to the change of the value in the function "2.1 Fs1"

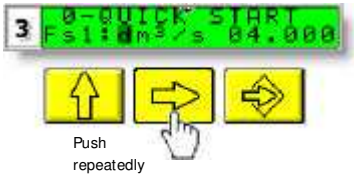
EXAMPLE: modifying the full scale value from 4dm³/s to 5dm³/s. from "Quick start menu"



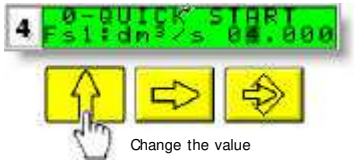
Enter in the "Quick start menu"



Access to the function "Fs1"

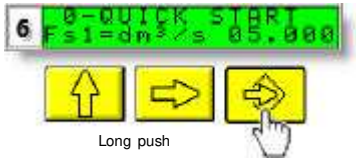


Push repeatedly



Change the value

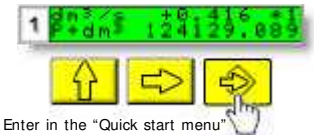
Confirm the new value



Long push

Main page

EXAMPLE: modifying the full scale value from 4dm³/s to 5dm³/s. from "Main Menu" (quick start menu enable)

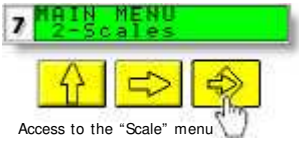


Enter in the "Quick start menu"

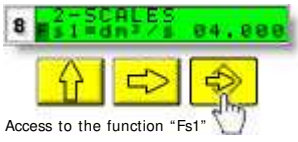
X 3 TIMES

Access to the "Main Menu"

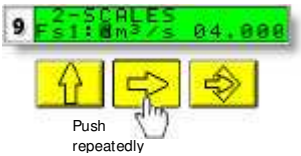
X 5 TIMES



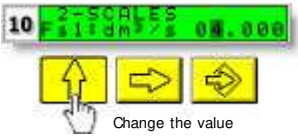
Access to the "Scale" menu



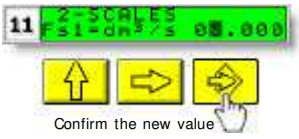
Access to the function "Fs1"



Push repeatedly



Change the value



Confirm the new value

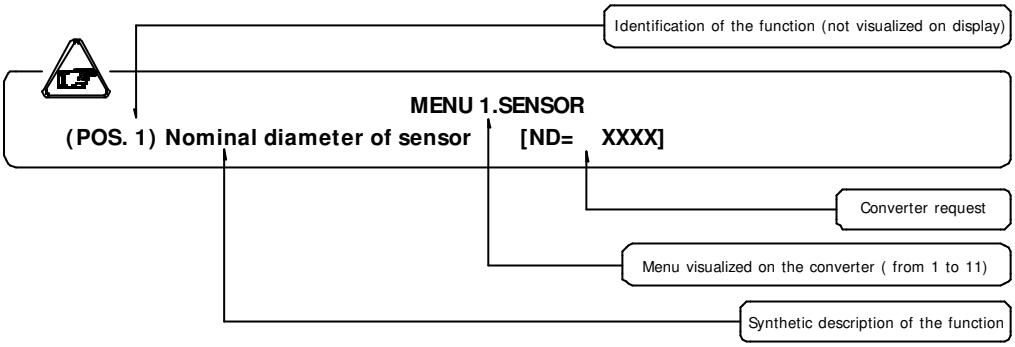
Long push

Long push

Main page

FUNCTIONS DESCRIPTION

(description of the functions with access code< 3)



MENU 1.SENSOR

(POS. 1.7) "empty pipe" calibration **[E.P. CALI BR.]**

This function enables/disables the automatic calibration procedure of the empty pipe detection function. Before enabling this function, the Empty Pipe test should be enabled first as above described. Before performing this function, the sensor has to be completely filled with the liquid so that both the lining and the electrodes are wetted. The sensor has then to be emptied again and then you should press the key : the operation will have to be confirmed by pressing the key or cancelled by pressing the key . By this function the system sets the value of a parameter that could also be manually changed (see function "E.P.thr" menu 4-ALARMS).

(POS. 1.8) "Autozero" calibration **[AUTOZERO CAL.]**

Enables/disables the automatic zero calibration system. It is necessary to perform this function at the first sensor installation or after a long period the sensor has been empty. To perform the sensor it is absolutely necessary the sensor is full of liquid and that the liquid is perfectly staying still. Even very small movement of the liquid may affect the result of this function, and, consequently, the accuracy of the system. Once you are sure the a.m. conditions are fulfilled press for more than one second the key ; will start one counter for 60 s, after that check if the zero is correct , otherwise repeat the operation again. Press to go out the function.

MENU 2.SCALES

(POS. 2.1-2.2) Full scale n° 1-2 **[FS1-2= *dm³/ S* X.XXXX]**

Full scale value set for range N.1-2. There are four fields to fill in order to set this parameter, from left to right: 1) volume unit of measure, 2) type of unit, 3) time unit of measure and 4) numeric value. The selection is made by positioning the cursor on the field to modify. To change the type of unit of measure (metric, British or American, mass or volume) the cursor has to be positioned on the symbol "/" (field N. 2). When the nominal diameter is set to zero it is possible to modify only the numeric field, since the unit of measure stays at m/sec. The following tables show the units of measure available and the conversion factor by comparison with 1 dm^3 and 1 kg. The converter accepts any kind of combination of units of measure satisfying both the following conditions:

- Numeric field value ≤ 99999
- $^1/_{25}$ fs_{max} ≤ numeric field value ≤ fs_{max}.

where fs_{max} is the maximum full scale value corresponding to the sensor, equal to a 10 m/sec liquid speed. The units of measure are shown as appear on the display. The British and American units are diversified by using capital and small characters.

Available units of mass and volume

cm^3	Cubic centimetre
ml	Millilitre
l	Litre
dm^3	Cubic decimetre
dal	Decalitre
hl	Hectolitre
m^3	Cubic metre

in^3	Cubic inch
Gal	American gallon
GAL	British gallon
ft^3	Cubic foot
Bbl	Standard barrel
BBL	Oil barrel
yd^3	Cubic yard
kgl	KAmerican gallon
KGL	KBritish gallon

Oz	Ounce
Lb	Pound
Ton	short tons

G	Gram
Kg	Kilogram
T	Ton

When a mass unit of measure is set, the specific gravity function is automatically enabled by the system. Please, note that the temperature heavily affects the mass measure and therefore with certain liquids this may cause significant measure errors. The units of measure of time may be chosen among the following values: **s** = second, **m** = minute, **h** = hour, **d** = day.

(POS. 2.3) Unit of measure and number of decimal totaliz. [tot. UM.:dm^3 X.XXX]

Setting the unit of measure and number of decimals for visualized the totalizer

For set the unit of measure , position the cursor on field of the actual unit of measure; For set the type of unit, position the cursor on the blank space between the unit of measure and the numeric value; For set the number of decimal totaliz . position the cursor on numeric field and choose one of the possible combinations: 1000-01.00-001.0-00001.

(POS. 2.4-2.5) Pulse value channel 1 and unit of totaliz . [IMP1-2= dm^3 X.XXXXX]

Setting of the pulse volume corresponding to channel 1-2 and of the totalizers measure units. There are three fields to fill in to set this parameter, from left to right: 1) measure unit, 2) unit type and 3) numeric value. The selection is performed by positioning the cursor on the field to be modified. To change the unit type (metric, British or American, mass or volume) just position the cursor on the blank space between the measure unit and the numeric value. When the nominal diameter is set to zero it is possible to modify only the numeric field since the measure unit stays at meter (m) or feet (ft). The possible measure units are those above described

(POS. 2.6-2.7) Pulse duration channel 1 [TPUL1-2= msXXXX.XX]

Setting of the duration of the pulse generated on channel 1. Its value is expressed in milliseconds and has to be between 0.4 and 9999.99.

(POS.2.8-2.9) Minimum/ maximum value for input 4÷20mA [I.IS= *bar* ± XXX.XX]

Setting the minimum/maximum value for external device with 4÷20mA output. There are four fields to fill in to set this parameter, from left to right: 1) unit of measure, 2) type of unit of measure and 3) sign, 4) numeric value. The selection is performed positioning the cursor on the field to modify. To change the type of unit of measure (pressure, temperature or percentage of f.s) just position the cursor on the blank space between the unit of measure and the numeric value. This functions is active only with additional module.

MENU 3. - MEASURE

(POS. 3.1) Time constant [T. COST= sXXXX.X]

Time constant set. This parameter affects the integrating filter making the instrument response quicker or slower, depend to the set value. A higher value corresponds to a more stable but slower measure, a smaller value the opposite. The most common values are from 1 to 5 seconds. The value of this parameter has to be within the range from 0 (integral filter disabled) to 6000.0 seconds. The following diagram shows the response of the instrument for a flow rate variation from 0 to 100% within the T time constant period.

(POS. 3.4) Automatic scale change enable [AUTORANGE= ON/ OFF]

Enables the automatic change of scale. The meter may have two different working ranges in order to suit to the variable process conditions. In order to get the best results out of this function it is important that range N.2 is bigger than N.1. When the flow rate increases and reaches the 100% of the full scale 1, then the meter automatically switches to scale 2. When the flow rate decreases again reaching a value on scale 2 equal to the 90% of full scale N.1, then the active scale is 1

again. Allowed values for this parameter: ON / OFF. **N.B.:** the autorange doesn't allow using the manual change of range (see pos. 5.8)

(POS. 3.5) Energy saving enable **[E.SAVING= ON/ OFF]**

Enable automatic energy saving function. This function IF ON, ENABLES THE OPERATION OF THE METER IN ACCORDANCE WITH INTERVALS OF FIXED TIME WITH THE FOLLOWING FUNCTION; if OFF the measure is continuous at 10 Hz of frequency. Allowed values for this parameter: ON/OFF

MENU 6. OUTPUT

(POS. 6.1-6.2) Function corresponding to on/ off output 1-2 **[OUT 1-2= XXXXXX]**

Choice of the function corresponding to digital Output 1-2. The functions are listed in the table below

FUNCTION FOR OUTPUT 1, 2,3

- OFF: DISABLED
- PLS: PULSE FOR POSITIVE AND NEGATIVE FLOW RATE
- PLS-: PULSE FOR NEGATIVE FLOW RATE
- PLS+ : PULSE FOR POSITIVE FLOW RATE
- EXT. COMM.: ONLY AVAILABLE WITH DATA LOGGER MODULE
- HARDW AL: CUMULATIVE ALARM OUT interrupt coils, empty pipe, meas. error (ENERG. = NO ALARMS)
- OVERFLOW.: OUT OF RANGE ALARM OUTPUT (ENERGISED = FLOW RATE OK)
- EMPTY PIPE: EMPTY PIPE ALARM OUTPUT (ENERGISED = FULL PIPE)
- MAX+ MIN±: MAX AND MIN FLOW RATE ALARM OUTPUT (ENERGISED = AL. OFF)
- MIN AL±: MIN DIRECT/REVERSE FLOW RATE OUTPUT(ENERGISED = AL. OFF)
- MIN AL-: MIN REVERSE FLOW RATE OUTPUT(ENERGISED = AL. OFF)
- MIN AL+: MIN DIRECT FLOW RATE OUTPUT(ENERGISED = AL. OFF)
- MAX AL: MAX DIRECT/REVERSE FLOW RATE OUTPUT(ENERGISED = AL. OFF)
- MAX AL-: MAX REVERSE FLOW RATE OUTPUT (ENERGISED = AL. OFF)
- MAX AL+: MAX DIRECT FLOW RATE OUTPUT (ENERGISED = AL. OFF)
- RANGE: RANGE INDICATION OUTPUT (ENERGISED = SCALE 2)
- SIGN: FLOW DIRECTION OUTPUT (ENERGISED = -)

MENU 8.DISPLAY

(POS. 8.2-8.3-8.4-8.5) Reset totalizer **[T/ P+ / - RESET= ON/ OFF]**

Reset of totalizer by key board;

N.B.: The reset of the totaliz . may be done from the function listed upon pushing the key [◆]. and the key [◆]. The reset of partial totalizer /currency may be done also from the visualization pages at page 12 like this . Push the key [◆] Set the L2 CODE if request and then push the key [◆] . At the question "RESET TOTALIZ.?". Push the key [◆] to proceed with the zeroing. Push any other key to cancel this operation.

(POS. 8.9) Enable conversion currency **[CURRENCY = ON/ OFF]**

This function visualizes the values of the partial totalizators converts in the unite of selected currency.

(POS. 8.10) Decimal currency **[CURR DECIM = X]**

This function allows the choice of the numbers of decimals to use for the visualization of the numerical value converted in the currency. The allows values are from 0 to 3. The function is active only if the currency function is enable

(POS. 8.11-8.12) Conversion factor for flow rate totalizers **[EUR/ dm^3 + = X]**

Set the value of conversion/currency for totalizers. There are three fields for this parameter, from left to right:1) monetary token, 2) default/personalized monetary token, 3) conversion coefficient. For the selection setting the cursor over the field to modify. The mode set of monetary token could be two:

- choice of one of the 7 predetermined monetary tokens (standard ISO 4217-REV81):
  EUR = Eur, USD = USA dollar, CAD = Canadian dollar, AUD = Australian dollar, GPB = English pound, CHF = Swissfranc, JPY = Japanese yen.

MENU 9.DATA LOGGER

(POS. 9.1) Automatic data logging enable **[ACQUISITION = ON/ OFF]**

Enable data logging; 8192 values in packets with flow rate, partial volumes + and - , input 4/20mA or pressure, date and time of record.

(POS. 9.2) Data logging time interval set **[INTERV.(h)= X]**

Sampling time interval for the data logging function and their printing. The allowed values are: 1, 1, 2, 3, 5, 15, 30, 60 minutes **(only for Eeprom data logger)**

(POS. 9.3) Date and time set **[= DD/ MM/ YY hh:mm]**

Date and time set. If the real time clock optional module is present, then the time setting is kept also when the power supply is off, otherwise it is frozen till the power supply is back. For example, if the power supply has been off for one hour, when switched on the instrument will be one hour late. The calendar is valid till year 2091.

N.B.: Date and time are visualized only if data logger is ON.

(POS. 9.4) Logged data display in RAM **[DISP. DYN DATA]**

Displaying of the data stored in the RAM memory of data logger. This values are the last 512 sample (shift register): min time. 1 s, or to intervals according to the sampling time (example: 1 sampling every 15 s); is possible scroll down the data stored.

MENU 10. DIAGNOSTIC

(POS. 10.1) Meter "calibration" **[CALIBRATION]**

Enable the calibration of the meter. With this function the measure doesn't interrupted but start a cycle calibration of the input circuit of the converter.

The activation of this function happens pressing the key during the visualization of the function.

Will be visualized the following question: " EXECUTE?" press the key to proceed . Press any other key to delete the operation

(POS. 10.2) "Autotest" function enable **[SELF TEST]**

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 , at the question: "EXECUTE?" push the key for start autotest, or any other key for delete operation. The result of the test is shown on the display. At the end of operation will have visualized one of visualization page. This function is automatically performed when switching the device on.

(POS. 10.3) Flow rate simulation **[SIMULATION]**

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, the flow rate simulation can be:

set: by pushing for more 1 second the key from one of four visualization pages

started: by pushing the key after set it

finished: by pushing for more 1 second the key from visualization pages and then pushing for more 1 second the key .

N.B.: the enable of flow rate simulation disable the contrast regulation.

(POS. 10.4) Stand-by of meter **[STAND-BY]**

Enable the stand-by of the meter. To activate this function, after select it, press the key and at the request "Execute?" press the key to activate the stand-by of the instrument, any other key to delete the operation. To reactivate the instrument is enough press any key of the keyboard. The consumption of the instrument in stand by is about 50 µA

NOTE : we recommend to enable this function when the meter will be off for long term.

MENU 11.INTERNAL DATA

(POS. 11.1) Level 2 access code set **[L2 KEYCODE= XXXXX]**

Level 2 access code enter. This code is programmable by the user within the range 00001 - 65535. Setting such a value at 22222 the access code for levels lower than level 3 is disabled. (see pag. 18)

(POS. 11.2) Block level **[BLOCK LEVEL = X]**

Block level function can be set from 0 to 3. Every level enables and disables specific functions (see pag. 23).

N.B.: the block levels are enabled only if the dip-switches on the back of converter are on

(POS. 11.3) Factory pre-set data loading **[LOAD FACT PRES.]**

Re-set the default factory data. Any previous programming is cancelled getting back to the manufacturer's standard values

(POS. 11.4) User pre-settings loading **[LOAD USER PRES.]**

This function recalls the values saved from the user.

(POS. 11.5) User pre-settings saving **[LOAD USER PRES.]**

This function saves the current programming as user pre-settings.

(POS. 11.6) Operation time **[HOURS= XXXXXX]**

This function allows the visualisation of the total operation hours of the converter

(POS. 11.7) Set KS **[KS= ± X.XXXX]**

Set KS. These parameters give the possibility to change the calibration of the instrument without change the values of plate (KA)

(POS. 11.8) Ignore calibration error **[Ign.cal.err= ON/ OFF.]**

This function if ON , ignore the calibration error during the switch on test. Default setting OFF, the converter give alarm if present during the initial test.

Alarm message, causes and action to be taken

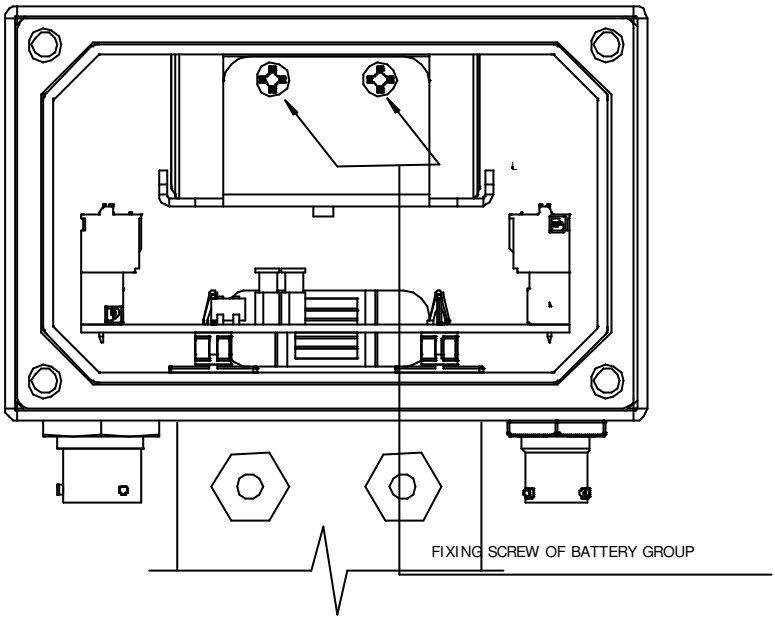
Messagge	Cause	Action
NO ALARMS	All works regularly	-----
MAX ALARM	The flow rate is higher than the maximum threshold set	Check the maximum flow rate threshold set and the process conditions
MIN ALARM	The flow rate is lower than the minimum threshold set	Check the minimum flow rate threshold set and the process conditions
FLOW RATE > FS	The flow rate is higher than the full scale value set on the instrument	Check the full scale value set on the instrument and the process conditions
PULSE/ FREQ> FS	The pulse generation output 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
EMPTY PIPE	The measuring pipe is empty or the detection system has not been properly calibrated	Check whether the pipe is empty or perform again the empty pipe function calibration procedure
INPUT NOISY	The measure is strongly effected by external noise or the cable connected the converter to the sensor is broken	Check the status of the cables connecting the sensor to the converter, the grounding connections of the devices or the possible presence of strong and anomalous noise sources
EXCITATION FAIL	The coils or the cable connecting the sensor to the converter are interrupted	Check the status of the cables connecting the sensor to the converter
CURR. LOOP OPEN	The 0/4...20mA output on board or the optional one are not correctly closed on a valid load	Verify the load is applied to the output (max 1000 ohm). To disable the alarm,set the “mA VAL.FAULT” value (menu alarm) to 0.
P.SUPPLY FAIL	Power supply different from that indicated on the label.	Verify that the power supply is that indicated on the label
BATTERY LOW	Low voltage on battery (battery exhausted)	Replace The Battery

Anomalies codes

CODICE	ANOMALIES DESCRIPTION	ACTION
0001	problem with watch-dog circuit	ADDRESS TO SERVICE Check the status of the cables connecting the sensor to the converter, the grounding connections of the devices or the possible presence of strong and anomalous noise sources
0002	wrong configuration work data in eeprom	
0004	wrong configuration safety data in eeprom	
0008	defective eeprom	
0010	defective keyboard (one or more key are pushed during the test)	
0020	Power supply voltage (+3.3) is out of range	
0040	Power supply voltage (+13) is too low (<10V)	
0080	Power supply voltage (+13) it’s too high (>14V)	
0200	timeout calibration input (input circuit is broken)	
0400	Input stage gaining is out of range	
0800	Interruption on the coils circuit	Check the status of the cables connecting the sensor to the converter
0C00	Cumulative alarm 0800 + 0400	see single code
0001	problem with watch-dog circuit	ADDRESSING TO SERVICE
1000	Low voltage on battery (battery exhausted)	Replace the battery

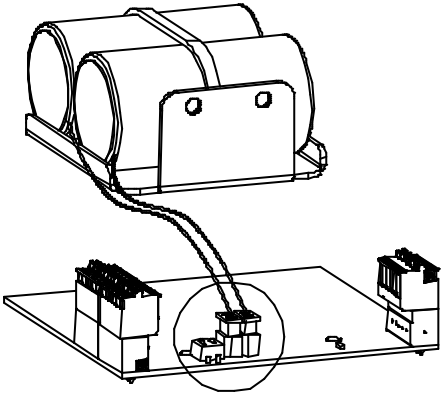
BATTERY SUBSTITUTION

Pic. 1



Pic. 2

BATTERY CONNECTORS



- verify the absence of power supply
- set in stand-by the instrument (menu 10)
- extracts the battery group unscrewing the fixing screw suitable in Pic. 1
- unthread the battery connector
- insert the battery connector as suitable in Pic. 2
- fix the battery group in the converter

EXHAUSTED BATTERIES MUST BE DISPOSED-OF IN ACCORDANCE WITH LOCAL REGULATIONS

252_EN_IS_1_3_00.doc

The last three character of file name , identify the sw version , which the manual is refer . the sw version is visualized during switch on of converter

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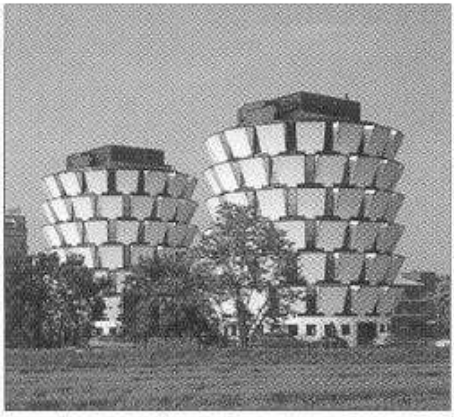

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