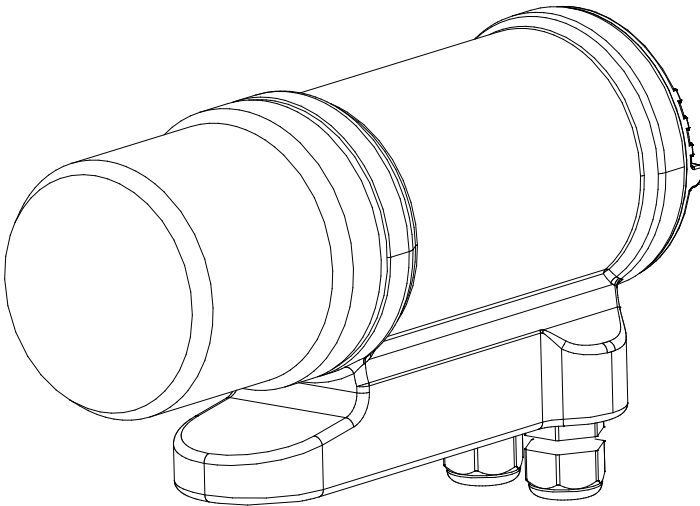


OPERATING AND INSTALLATION MANUAL

CONVERTER

ML4-F1



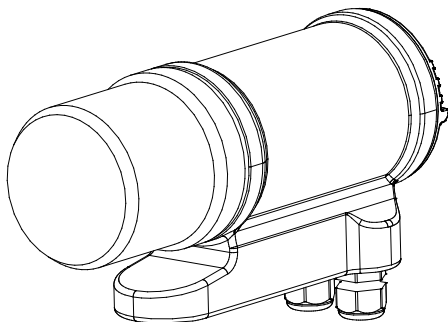
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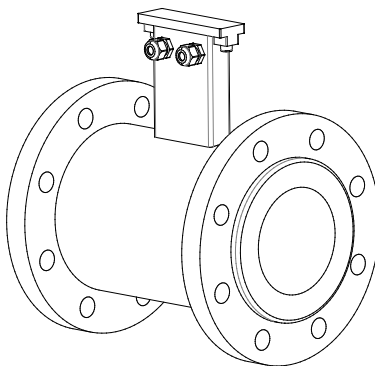
INTRODUCTION

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

The converter is to be used only to be coupled directly with a sensor device to realize a measuring device, flow meter, that is to be used for measuring the flow of conductive liquids in closed pipes with conductivity greater than $5\mu\text{S}/\text{cm}$.



CONVERTER



SENSOR

The reproduction of this manual and any supplied software is strictly forbidden.

SAFETY INFORMATIONS

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.

- 1) Transport the measuring device to the measuring point in the original packaging. Do not remove covers or caps until immediately before installation. In case of cartons 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.
- 2) Disposal of this product or parts of it must be carried out according to the local public or private waste collection service regulations.
- 3) The converter 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).
- 4) The specialists must have read and understood these Operating Instructions and must follow the instructions it contains. The Operating Instructions provide detailed information about the converter. If you are unclear on anything in these Operating Instructions, you must call the ISOIL service department.

- 5) The converter should only be installed after have verified technical data provided in these operating instructions and on the data plate.
- 6) Specialists must take care during installation and use personal protective equipment as provided by any related security plan or risk assessment.
- 7) Never mount or wire the converter while it is connected to the power supply and avoid any liquid contact with the instrument's internal components. To connect remove the terminals from the terminal block.
- 8) Before connecting the power supply check the functionality of the safety equipment.
- 9) Repairs may only be performed if a genuine spare parts kit is available and this repair work is expressly permitted.
- 10) 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).
- 11) To return the product back for service complete and return the meter with form found in the last pages of these 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 converter housing integrity
- The suitable tightness of the sealing elements
- The mechanical fixing of the converter to the pipe or wall stand.

SAFETY CONVENTIONS

DANGER



Warning indicates an action or procedure which, if not performed correctly, can result in injury or a safety hazard. Comply strictly with the instructions and proceed with care.

WARNING



Caution indicates an action or procedure which, if not performed correctly, can result in incorrect operation or destruction of the device. Comply strictly with the instructions.

NOTES



Note indicates an action or procedure which, if not performed correctly, can have an indirect effect on operation or trigger an unexpected response on the part of the device.

TECHNICAL CHARACTERISTICS



ELECTRICAL CHARACTERISTICS

Converter classification: class I, IP 67, installation category (overvoltage) II, rated pollution degree 2.

Power supply versions	Power supply voltage	Max power
LLV	18-30V	10W

- Voltage variations must not exceed $\pm 10\%$ of the nominal one.
- Inputs/outputs are insulated up to 500V
- The output 4-20 mA (optional) is electrically connected



ENVIRONMENTAL USE CONDITIONS

- The converter can be installed inside or outside buildings
- Altitude: from -200 to 2000m (from -656 to 6560 feet)
- Humidity range: 0-100% (IP 67)

AMBIENT TEMPERATURE

	Min. *	Max. ¹
°C	-20	60
°F	-4	140

Consider the ambient temperatures more restrictive between converter and sensor.

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



¹ = For liquid temperature > 60°C , ambient temperature max 40°C

130°C Cip (cleaning in place) is allowed up to 30' (unlimited time if converter switch off)


Data plate

On the data plate there is some technical information:

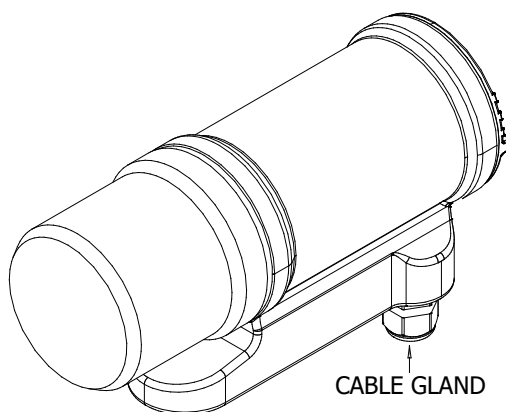
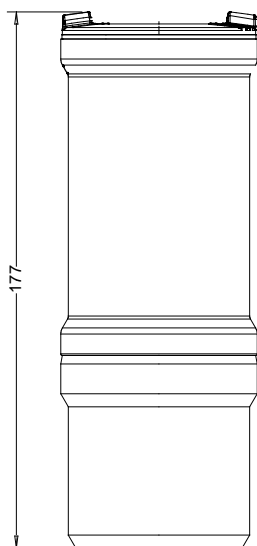
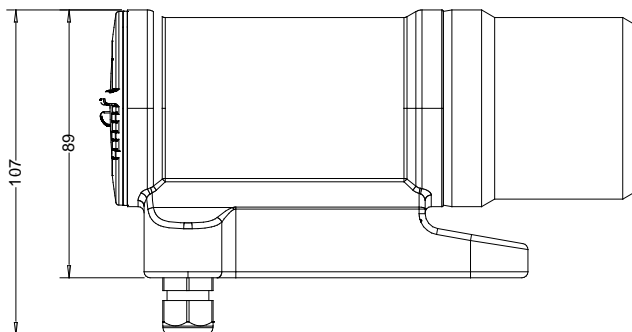
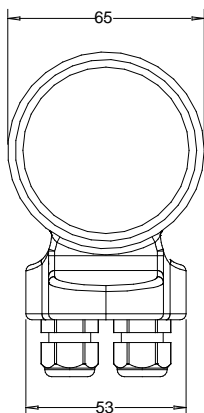
- **Conv. Mod.:** converter Model
- **Conv. s/n:** converter Serial Number
- **P.S.:** power supply
- **Power:** maximum power consumption
- **Sensor Mod.:** serial number of sensor coupled
- **Sens s/n:** serial Number of the sensor
- **DN:** sensor nominal diameter
- **PN:** sensor nominal pressure
- **IP:** Protection grade
- **Fittings:** process connections
- **Lining:** sensor lining
- **Max Temp.:** maximum sensor temperature
- **Electrodes:** sensor electrodes
- **KA:** sensor KA
- **ITEM:** free for user

Conv. Mod.	ML4F-1
Conv.s/n	ConvSerialNumber
P. S.	Power Supply
Power	Power Max
Sensor Mod.	SensModel
Sens s/n	SensSerialNumber
DN	SensDn
PN	SensPn
IP	SensIp
Fittings	SensFitt
Lining	SensLining
Max Temp.	SensTemp
Electrodes	SensElectrodes
KA	SensKA
Item	ITEM



← FLOW DIRECTION →

OVERALL DIMENSIONS

Weight: 2kg

TORQUES

To guarantee the housing's IP degree the following torques are required:

- cable glands: 1.8Nm (in reference conditions)

ELECTRICAL CONNECTIONS

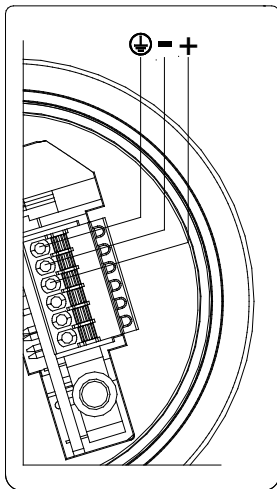


GROUNDING INSTRUCTIONS

ALWAYS ensure that the converter and the sensor are grounded (earthed) correctly. The grounding of the sensor and converter ensures that the equipment and liquid are equipotential.



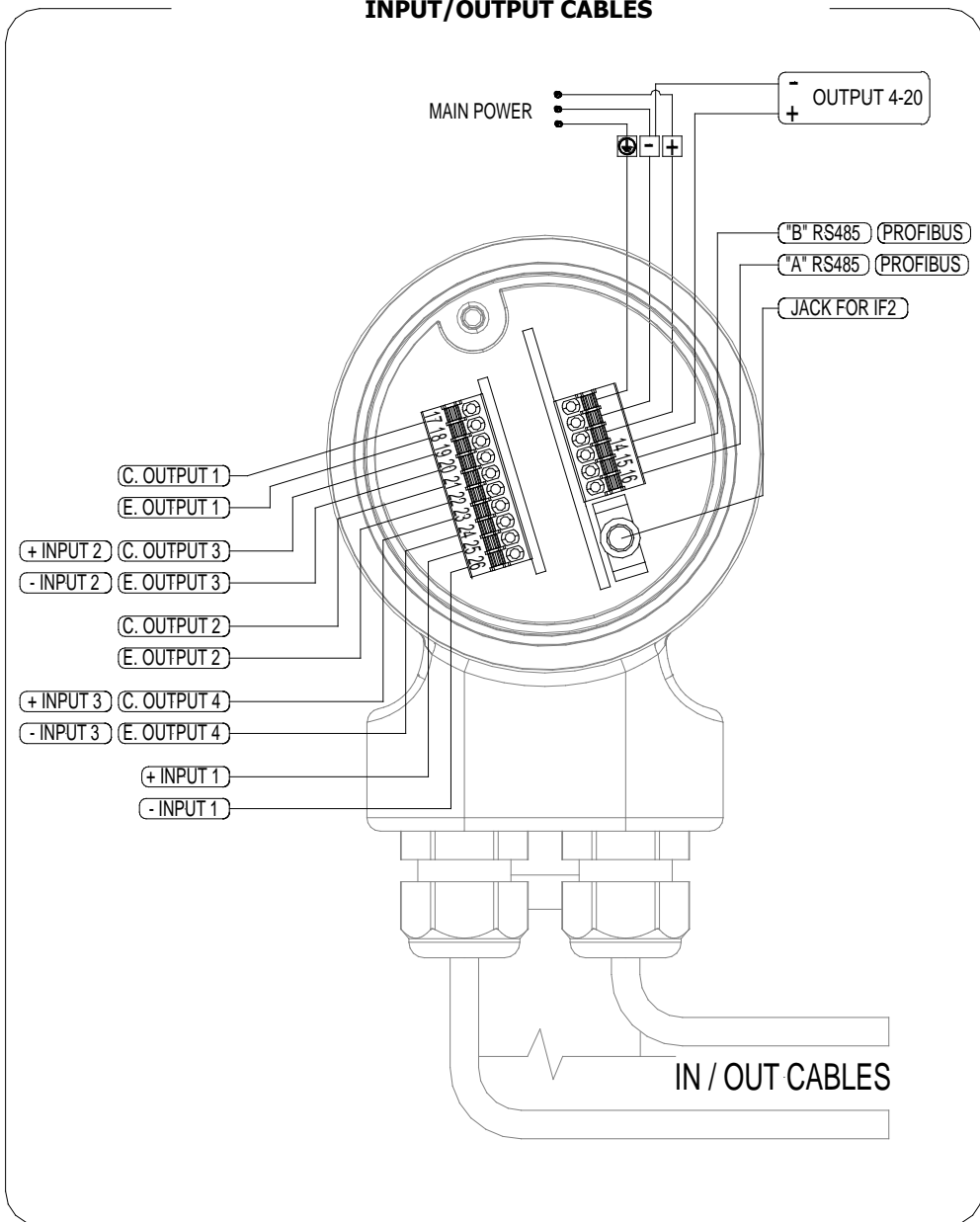
CONVERTER POWER SUPPLY



- ❑ Before connecting the power supply, verify that the mains voltage is within the limits indicated on data plate.
- ❑ **ATTENTION:** the converters on dc power supply line are not protected against the inversions of polarity.
- ❑ For the connections use only approved conductors, with fire-proof properties, whose section varies from 0.25mm² to 2.50mm², based on distance/power; additionally fix the power supply wires with a additional fastening system located close to the terminal.
- ❑ The power supply line must be equipped with an external protection for overload current (fuse or automatic line breaker).
- ❑ Provide in close proximity the converter a circuit breaker easily accessible for the operator and clearly identified; whose symbols must conform to the electrical safety and local electrical requirements.
- ❑ Ensure that the component complies with the requirements of the standard for electrical safety distance.
- ❑ Check chemical compatibility of materials used in the connection security systems in order to minimize electrochemical corrosion.
- ❑ The sensor, hardwired inputs and outputs are connected to the converter through a terminal blocks located inside the converter.
- ❑ To locate terminal blocks loosen the 2 covers, front and back. The terminal block is the hardwire connection of the converter to external equipment, including the sensor.

The following pages give informations on the terminal block numbering, and the respective connecting of the sensor cables, and inputs/outputs.

INPUT/OUTPUT CABLES



NOTE: shielded cables are recommended for inputs and outputs wiring.

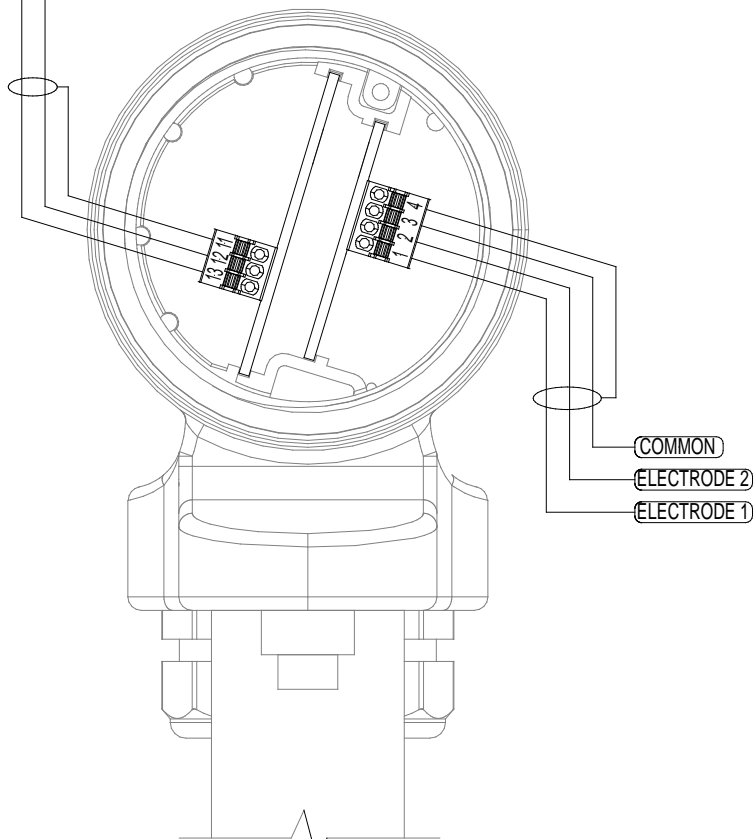
SENSOR CABLES

Dangers voltage:

- 60V^{AC} max
- 250V max commutation coils circuit

COIL 1

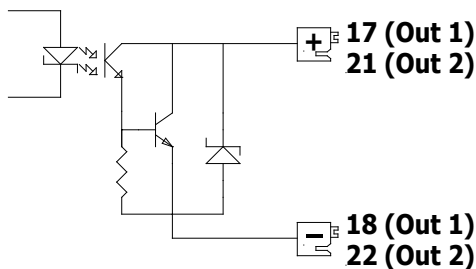
COIL 2



CABLES FROM SENSOR

INPUTS/OUTPUTS

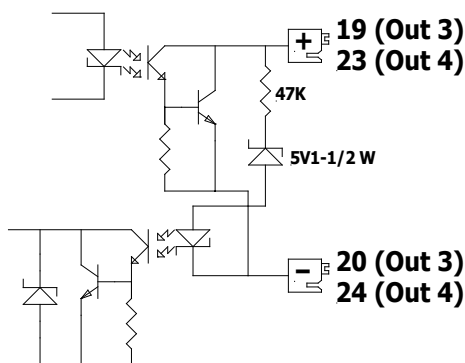
Output 1-2



OUTPUTS technical characteristics

- Max voltage **30V**
- Max load: **100mA @24V**,
- Max frequency: 1250Hz.

Output 3-4/Input 2-3



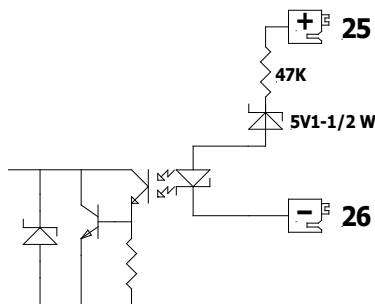
OUTPUTS technical characteristics

- Max voltage **30V**
- Max load: **100mA @24V**,
- Max frequency: 1250Hz.

INPUTS technical characteristics

- Max voltage **30V**
- Min voltage for recognized logical state enables: **18V**
- Entry resistance of the circuit: **47kΩ**

Input 1



INPUTS technical characteristics

- Max voltage **30V**
- Min voltage for recognized logical state enables: **18V**
- Entry resistance of the circuit: **47kΩ**

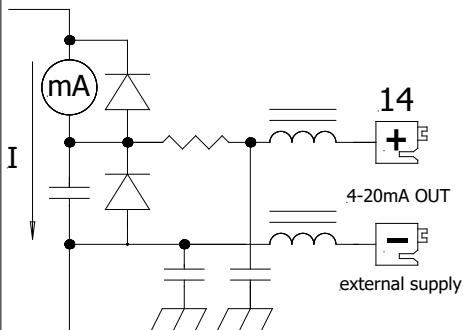


PROTECTIONS

The terminals are protected for the accidental polarity inversion; the output is protected from the extra voltage due to the inductive loads (connections of coils or relay).

OPTIONAL EXPANSION MODULES

Output 4-20mA

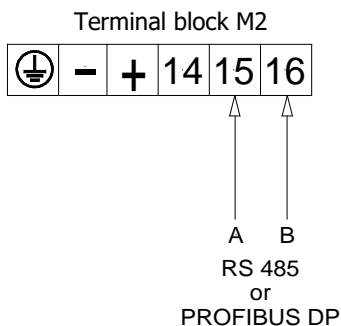


- Power supply **18-30V** $\overline{\text{DC}}$
- Max load resistive to the output: **800 Ω** with 24V $\overline{\text{DC}}$ of power supply
- Minimum load recommended **500 Ω**
- Setting time: **5ms**

ATTENTION: The power supply of 4-20mA is the same of that of entire instruments, therefore is not insulated from it.



MODULE ME35/36 OPTIONAL



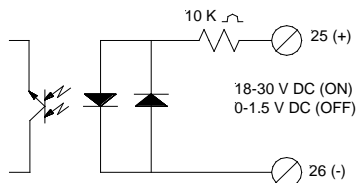
ATTENTION: The power supply of communication module is the same of that of entire instruments, therefore is not insulated from it.



FOR COMMUNICATION MODULE SEE THE SPECIFIC MANUALS

DIGITAL INPUT

Input electric wiring



Speed rate	Tmin
20 Hz	110 ms
50 Hz	45 ms
60 Hz	40 ms
80 Hz	30 ms
150 Hz	15 ms

ATTENTION: where not specified the time T must be \geq to Tmin

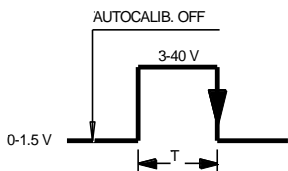
The functions refer to the inputs could be substantially divided in three groups:

1. only assignable functions to the input 1
2. functions that act directly on the inputs independently from the select input
3. only assignable functions to the input 2 and only to the input 3 which they interact between them

Remember that the activation of any functions of batch automatically disable the operation of other. The list of such functions is suitable in the table of the batch function section.

INPUT OPERATION STAGE (GENERIC FUNCTIONS)

Auto-calibration

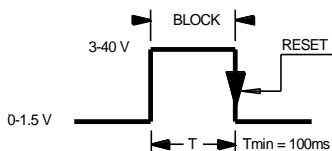


$T_{min} < T < 1 \text{ sec.} = \text{autocalibration}$
 $T > 1 \text{ sec.} = \text{Autozero}$

Necessary conditions for enable the function

- POS. 5.6 ENABLED
- POS. 5.8-9-10 batch functions assign to input 1-2-3 (optional) DISABLED
- POS. 6.1-2-3-4 batch functions assign to output 1-2-3-4 DISABLED

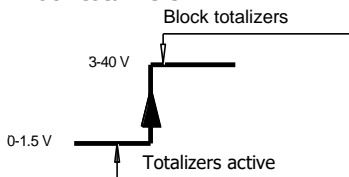
Reset totalizers



Necessary conditions for enable the function

- POS. 5.1-2 ENABLED at least one

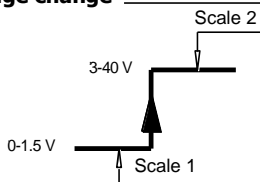
Block totalizers



Necessary conditions for enable the function

- POS. 5.4 ENABLED
- POS. 9.5 (auto-batch) DISABLED
- POS. 9.7 (cons. mode) DISABLED

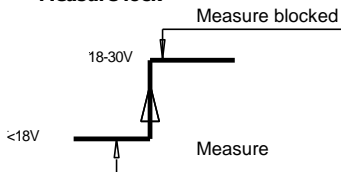
Range change



Necessary conditions for enable the function

- POS. 5.7 ENABLE
- POS. 5.8 (batch on input 1) DISABLED
- POS. 5.9-10 batch functions assign to input 2-3 (optional) DISABLED

Measure lock



Necessary condition for enabling the function

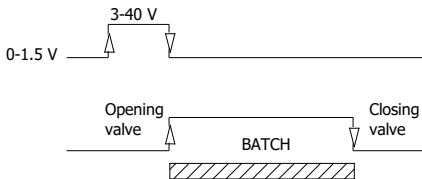
- POS. 5.5 ENABLED (measure lock)



THE FUNCTIONS POINT OUT ABOVE ARE ENABLED ONLY ON INPUT 1

OPERATION STAGE ON INPUT 1 OR 2 OR 3 (BATCH FUNCTION)

Start batch from remote input

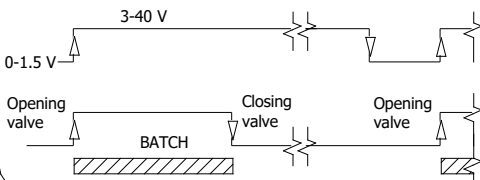


INPUT
OUTPUT

Necessary conditions for enable the function

- POS. 5.8 ENABLE or POS. 5.9 or 5.10 on batch
- POS. 6.1-4 on end batch

Start batch from consent (remote)

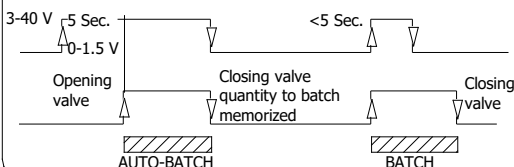


INPUT
OUTPUT

Necessary conditions for enable the function

- POS. 5.8 ENABLE or POS. 5.9 or 5.10 on batch
- POS. 6.1-4 on end batch
- POS. 9.7 (CONSENT MODE) ENABLED

Start batch from remote input with auto-batch enabled

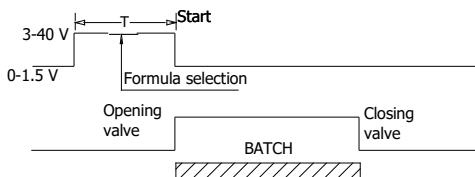


INPUT
OUTPUT

Necessary conditions for enable the function

- POS. 5.8 ENABLE or POS. 5.9 or 5.10 on batch
- POS. 6.1-4 on end batch
- POS. 9.5 (auto-batch) ENABLED
- POS. 9.7 (consent mode) DISABLED

Start batch from remote input with automatic selection of formula 00/03



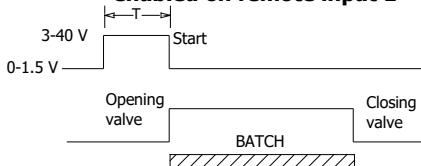
INPUT
OUTPUT

T= 100ms ±50ms for select the formula 00
T= 200ms ±50ms for select the formula 01
T= 300ms ±50ms for select the formula 02
T= 400ms ±50ms for select the formula 03
In case of stop batch from remote input the time of input pulse must be > 50ms

Necessary conditions for enable the function

- POS. 5.8 ENABLE or POS. 5.9 or 5.10 on batch
- POS. 6.1-2 on end batch
- POS. 9.6 (BM auto sel) ENABLED
- POS. 9.7 (consent mode) DISABLED
- POS. 5.8-9 functions assigned to BM SELECT

Start batch from remote input 1 reset p+ enabled on remote input 1



INPUT
OUTPUT

T BETWEEN 1 E 4 = RESET TOTALIZER
T < 1 = START E RESET TOTALIZER

Necessary conditions for enable the function

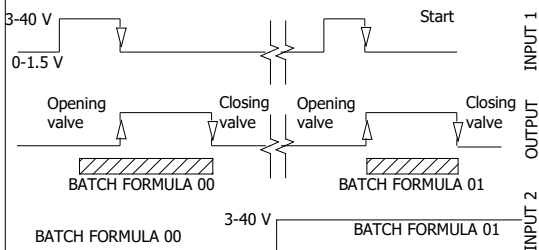
- POS. 5.8 (batch on input 1) ENABLED
- POS. 6.1-2 on AND BATCH
- POS. 5.2 (reset T2) ENABLED



N.B.: THE ACTIVATION OF BATCH FUNCTIONS ON INPUT 2 PREVENTS THE ACTIVATION OF BATCH FUNCTIONS ON INPUT 1

OPERATION STAGE ON INPUT 1 and 2 or 1 and 3 (BATCH FUNCTION)

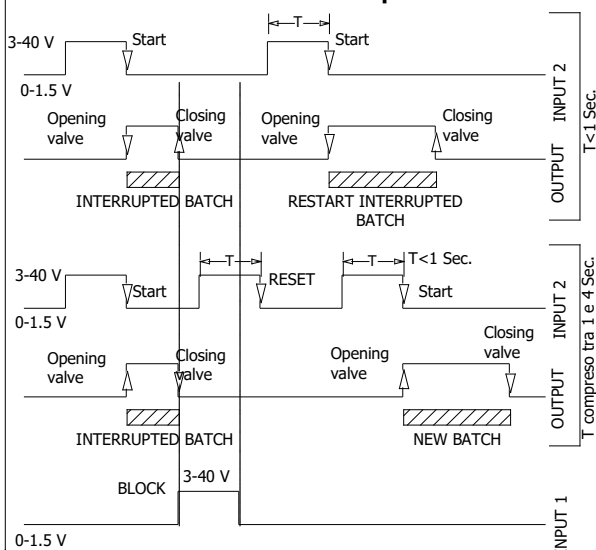
Start batch on remote input 1 stop from output selection formula 00 o 01 from remote input 2



Necessary conditions for enable the function

- POS. 5.8 ENABLED
- POS. 6.1 or 6.3 on END BATCH
- POS. 5.9 or/and 5.10 on BM SELECT

Block totalizer from remote input 1 start batch from remote input 2



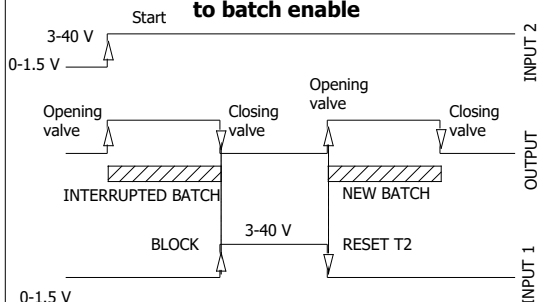
The block of totalizer always determine the interruption of the batch. Exiting again the input 2 or 3 is been able to get 2 results:

- 1) $T < 1\text{Sec}$ = restart interrupted batch
- 2) T between 1 e 4 Sec = reset interrupted batch. N.B.: will be necessary give a new impulse of start to the input 2 ($T < 1\text{Sec}$) for begin a new batch

Necessary conditions for enable the function

- POS. 5.4 (Count lock) ENABLE
- POS. 6.1 or 6.3 on END BATCH
- POS. 5.9 or 5.10 on BATCH
- POS. 5.2 (T2) ENABLE

Block and reset totalizer from remote input 1 start batch from remote input 2 consent mode to batch enable



The block of the totalize always determines the stop of batch. With the function of reset T2 enable on descent front of input 1 comes reset the totalize of the batch in course. therefore the presence of the consent or a new pulse on the input 2 or 3 they will determine the start of a new batch

Necessary conditions for enable the function


- POS. 5.4 (Cout lock) ENABLE
- POS. 5.9 or 5.10 on BATCH
- POS. 9.7 (consent mode) ENABLE
- POS. 5.2 (T2) ENABLE

FLAGS AND LED INTERPRETATION

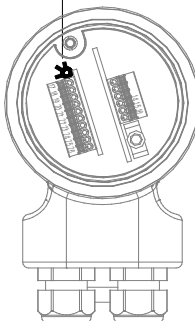
FLAGS



FLAGS INTERPRETATION

FLAG	DESCRIPTION
⬇	Alarm max/min activated
!	- Interruption coils circuit - Signal error - Empty pipe
C	Calibration running
S	Simulation
	Pulse output saturation (reduce TIME PULSE)

LED



LED INTERPRETATION

PERMANENT LIGHT: initialization

FLASHING LIGHT (1 sec.): normal function

FLASHING LIGHT (<1 SEC.): alarm on

The LED signals the real alarm status only if the display visualizes one of the visualization pages

FLOW RATE VISUALIZATION

The instrument can show a 5 digit character display for flow rate units; this mean the maximum flow rate value that can be represented on the display is **99999** (no matter the positioning of the decimal point). The minimum is **0.0025**.

The representable measure unit depends from sensor flow rate and diameter; the permitted units are those, set the instrument full scale value, allow to be represented with a numerical field which the maximum value do not exceed **99999**.

Example for DN 300:

- Full scale value: 3m/s
- **PERMITTED** measure unit (example): l/s (216.00); m³/h (777.60); m³/s (0.2160)
- **NOT PERMITTED** measure unit (example): l/h (777600)..

ACCESS CODES

Functions in the converter main menu are enabled by the access codes. The information in this manual are related to all the functions available with the 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 = 000000** (only with this code) you can disable the L2 code request
 - * **with L2 customized** (freely chosen by the user) you can program all the functions up to L2 security level, entering the code whenever you need enter the Main menu.
- * **ATTENTION:** 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

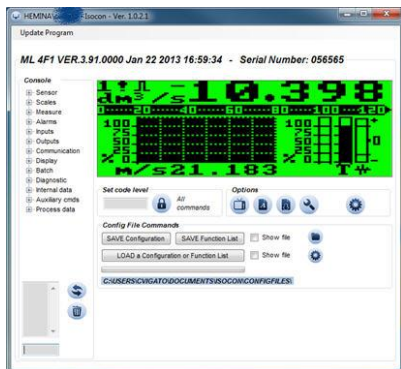
The converter is delivered with the default L2 (level 2) access code:

111111

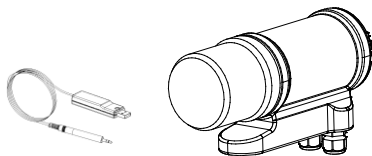
ACCESS TO THE CONFIGURATION MENU

The converter configuration menu can be accessed **ONLY** using **ISOCON** interface (**cable and software needed**).

ISOCON INTERFACE



Isocon is a Windows® software that allows to set all the converter functions and personalize the menu (IF2 is required), see suitable manual for details.



THE CONFIGURATION MENU

Functions can be accessed in two different ways:

- ❑ The **Quick start menu** makes direct access possible to a range of principal functions for setting the scale reading and display characteristics of the sensor.

```

0-QUICK START
Fs1=dm³ /s 4.0000
Fs2=dm³ /s 4.0000
MU .tot=dm³ 1.000
Imp1=dm³ 1.00000
Imp2=dm³ 1.00000
Ipull1=ms 0050.00
Ipull2=ms 0050.00
  
```

Quick start menu can be enabled by function 8.4 (menu display)

Factory pre-setting: QUICK START MENU=ON

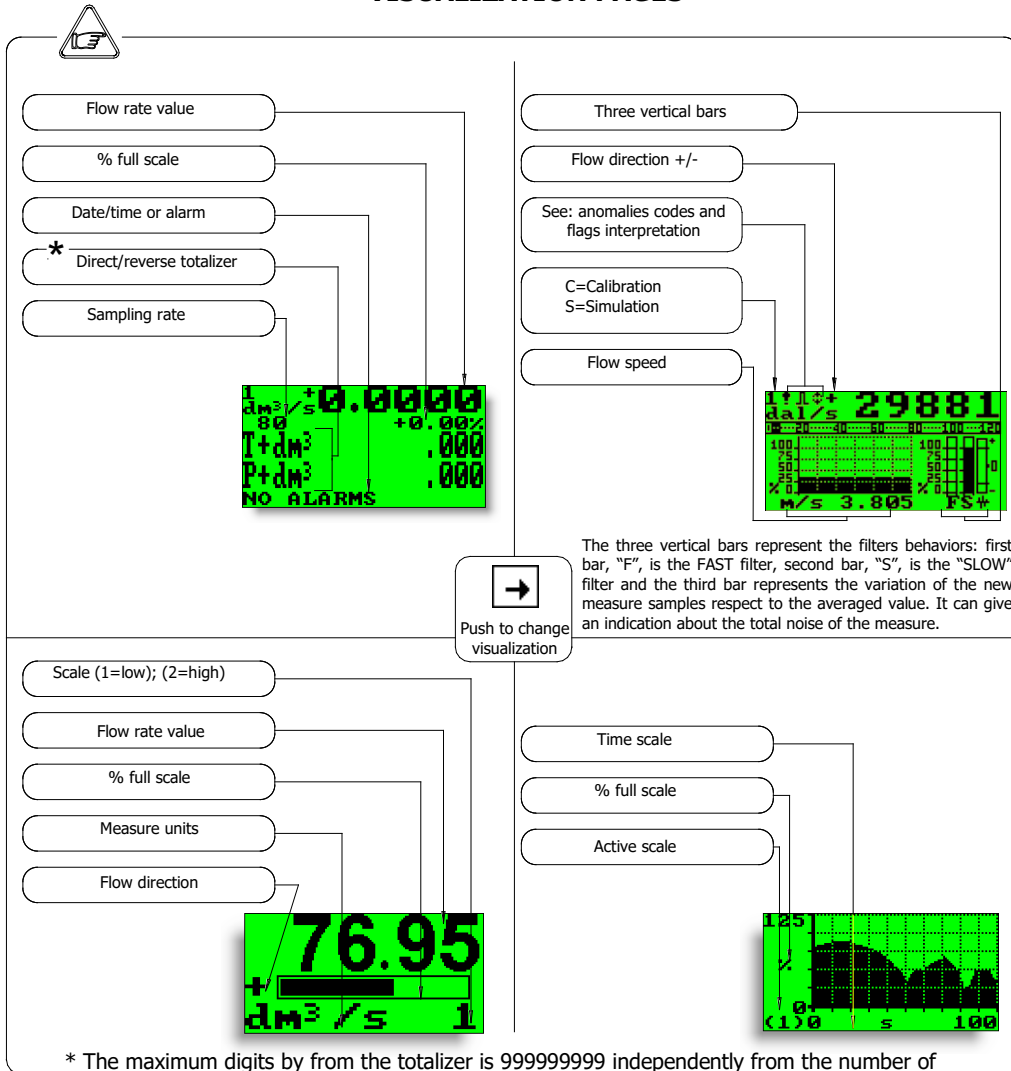
- ❑ Through the **Main menu** it is possible to access functions with the access code level 2. These control the sensor's monitoring, data processing, input/output as well further options.

```

MAIN MENU
1-Sensor
2-Scales
3-Measure
4-Alarms
5-Inputs
6-Outputs
  
```

Examples in the next pages show how to change the Full scale by Quick Start menu and

VISUALIZATION PAGES



QUICK START MENU

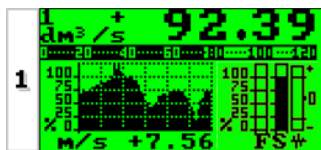
The user has immediate access to the Quick Start menu when the converter is powered up by pressing the key **Enter**. If access to the quick start menu does not occur, then it has been disabled through the function 8.4

```
0-QUICK START
Fs1=dm3/s 5.0000
Fs2=dm3/s 5.0000
MU.tot=dm3 1.000
Imp1=dm3 1.00000
Imp2=dm3 1.00000
Tpul1=ms 0050.00
Tpul2=ms 0050.00
Damping= OFF
Language= EN
Main menu
```

See function menu section

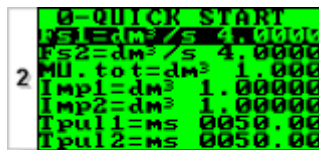
Access to all functions

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



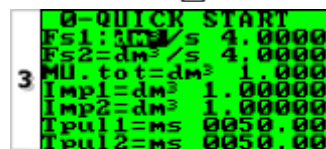
ent

Enter in the Quick start menu



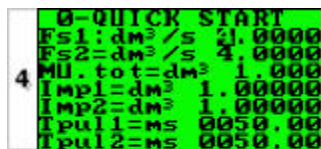
ent

Access to the function "Fs1"



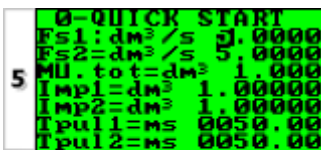
→

Push repeatedly



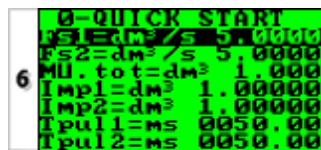
↑

Change the value

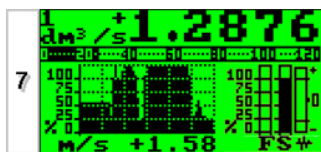


ent

Confirm the new value

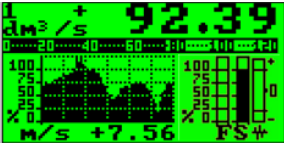
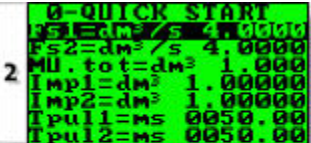





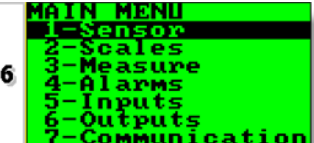
esc

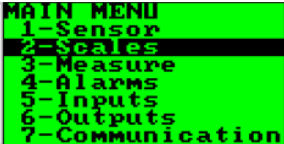

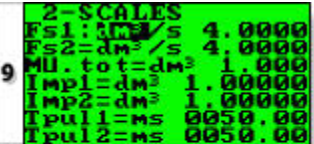



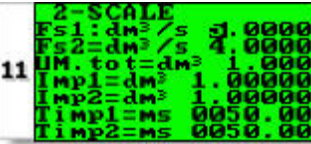

Main page



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

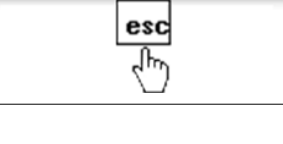
1   

2   

3   

4   

5  

6 

Enter in the Quick start menu

Move the cursor down to Main menu

Access to the Main Menu

X 6 TIMES

Confirm the keycode

Access to the Scale menu

Access to the function "Fs1"

Push repeatedly

Change the value

Confirm the new value

Main page

PROGRAMMING FUNCTIONS

(functions with access code < 3, those with symbol "*" see next section)

Functions in grey colour are visualized on display only with other active functions or with optional modules

```

MAIN MENU
1-Sensor
1-SENSOR
ND=mm 00025
KA=mm +01.0000
S model= 014
Ri= 1.0000
Rp= 1.0000
E.P.detect= OFF
E.cleaning= OFF
E.p.thr.= 200
Autozero cal.
    
```

- 1.1 Insert the Nominal Diameter of the sensor (0-3000mm)
- 1.2 Calibration data of sensor visualized on sensor label
- 1.3 Sensor model: enter the first two characters of the sensor serial number
- 1.4 Factory parameters
- 1.5 Enables the empty pipe detection feature
- 1.6* Electrodes cleaning
- 1.7* Value of empty pipe sensibility detection
- 1.8* Enables the automatic zero calibration system

```

MAIN MENU
1-Sensor
2-Scales
2-SCALES
FS1=dm³/s 5.0000
FS2=dm³/s 0.1920
MU1ot.=dm³ 1.0000
Imp1=dm³ 1.000000
Imp2=dm³ 1.000000
Tpul1=ms 0050.00
Tpul2=ms 0050.00
Sg=kg/dm³ 01.0000
    
```

- 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 output 1
- 2.5* Pulse value on output 2
- 2.6* Duration of the pulse generated on output 1
- 2.7* Duration of the pulse generated on output 2
- 2.8 Specific gravity set in kg/dm³ (enable only if FS1 or FS2 are weigh/time)

```

MAIN MENU
1-Sensor
2-Scales
3-Measure
3-MEASURE
Damping= OFF
Cut-off=% 10.0
Start thr=% 00.0
Autocal.= OFF
Autorange= OFF
    
```

- 3.1* Measure filter
- 3.2 Low flow zero threshold: 0-25% of full scale value
- 3.3 Only for service purposes
- 3.4 Enable every hour an internal cycle of calibration. The measure is stopped for 8-15 sec.
- 3.5* Automatic change of scale

```

MAIN MENU
1-Sensor
2-Scales
3-Measure
4-ALARMS
Max thr+=% 000
Max thr-=% 000
Min thr+=% 000
Min thr-=% 000
Hyst.=% 03
mA v.fault=% 000
Timeout=s 00.0
    
```

- 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* Current output value in case of failure
- 4.7* Batch safety timer

```

MAIN MENU
1-Sensor
2-Scales
3-Measure
4-ALARMS
5-INPUTS
I1 reset= OFF
I2 reset= ON
Puls. reset= OFF
Count lock= OFF
Meas. lock= ON
Calibration= OFF
Range change= OFF
Batch= ON
Inp.2= OFF
Inp.3= OFF
    
```

- 5.1* Total direct (positive) flow totalizer reset enable
- 5.2* Partial direct (positive) flow totalizer reset enable
- 5.3 Reset totalizer of pulse from digital input (see page 13)
- 5.4 Totalizer counting lock command (see page 13)
- 5.5* Block measures command
- 5.6* Autozero calibration external command
- 5.7 Range change external command (see pos. 3.5)
- 5.8 Batch start/stop external command (see batch functions)
- 5.9* Functions assigned to input 2 (automatically disabled if OUT3 is enabled)
- 5.10* Functions assigned to input 3 (automatically disabled if OUT4 is enabled)

Functions assigned on input 1


```

6-Outputs
6-OUTPUTS
Out1= #1 IMP+
Out2= #1 SIGN
Out3= #1 OFF
Out4= #2 IMP+
Out1 mA=4:22

```

- 6.1* Output 1 functions
- 6.2* Output 2 functions
- 6.3* Output 2 functions
- 6.4* Output 4 functions
- 6.5* Choice of the function and the range of current output n.1

```

6-Outputs
7-Communication
IF2 pr.= DPP
Address= 000
Speed= 38400
A.delay=ms 0

```

- 7.1 Choice of the communication protocol for the IF2 device
- 7.2 Address value of the converter
- 7.3 Speed of the RS485 output (possible choices: 4800, 9600, 19200, 38400 bps)
- 7.4 Instrument answer delay

```

6-Outputs
7-Communication
8-Display
8-DISPLAY
Language= EN
Totaliz.= T+/T-
D.rate=Hz 10
Quick start= OFF
T1 reset
T2 reset

```

- 8.1 Choice of the language: EN= English, IT=italian, FR= French, SP= Spanish
- 8.2 Display totalizer mode
- 8.3 Updating frequency on the display: 1-2-5-10 Hz
- 8.4 Quick start menu visualization
- 8.5* Volume totalizer 1 reset
- 8.6* Volume totalizer 2 reset

Menu 9 visualized only IF batch is active

```

9-BATCH
N.samples= 000
Hyst.=% 010
U.com=dm² 00.000
U.pre=dm² 00.000
Auto batch= OFF
BM auto sel= OFF
Cons.mode= OFF

```

- 9.1* Number of batch cycles to be done to define the value of compensation.
- 9.2* % limit of compensation threshold
- 9.3* Compensation value
- 9.4* Prebatch value
- 9.5* Auto-batch
- 9.6* Automatic selection of batch formula
- 9.7* Static consent of batch

```

MAIN MENU
10-DIAGNOSTIC
Calibration
Self test
Simulation= OFF
STAND-BY
Firmware rev.

```

- 10.1* Enable the calibration of the converter
- 10.2* Converter autotest
- 10.3* Flow rate simulation enabling
- 10.4 Stand-by of converter to reduce the consumption during service operation
- 10.5 Firmware revision/version

```

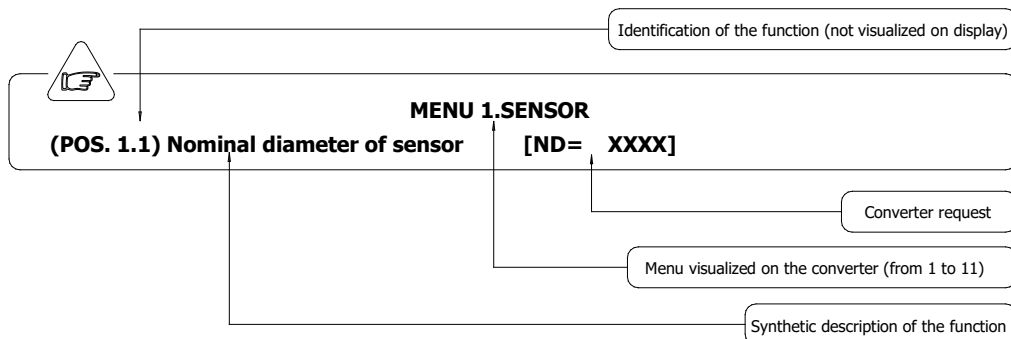
MAIN MENU
1-Sensor
11-INTERNAL DATA
L2 keycode=*****
Load fact.pres.
Load user pres.
Save user data
Ign.cal.err= OFF
KS= +1.0000

```

- 11.1 Level 2 access code enter
- 11.2 Load factory data pre-set
- 11.3 Load user data saved
- 11.4 Save user data
- 11.5 Ignore the calibration error during the switch on test
- 11.6 Ks coefficient (only for service purposes)

FUNCTIONS DESCRIPTION

(description of the functions with access code < 3)



The following pages give a description of the most important functions and how they can be changed or enabled/disabled by the user.

MENU 1 - SENSOR

(POS. 1.6) Electrodes cleaning

[E. cleaning=MIN]

Selectable options: OFF, minimum, average and maximum. It is not recommended the use of this function (let OFF) when the liquid has a conductivity less than 100µS/cm.

(POS. 1.7) Empty pipe threshold

[E.p. thr.=XXX]

This value represents the threshold of measure block to zero in empty pipe condition; the span function is 20-250. Since the sensibility of empty pipe detection could be changed by the liquid conductivity, ground connections, type of lining, in case of needed it is possible to adjust manually the preset threshold. It is recommended to check periodically its proper functioning. Value increasing means sensibility decreasing.

(POS. 1.8) Autozero calibration

[Autozero cal.]

This function activates the zero calibration automatic system. To perform this operation, it is necessary for the sensor to be full of liquid, and the liquid be perfectly still. Even minimal movement of the liquid may affect the result, and consequently, the accuracy of the system. Once you are sure the above conditions have been fulfilled (and the percentage flow rate value is stable) press the key \downarrow and automatically activates the zeroing procedure, after which it is necessary to check that the percentage value showed goes to zero, repeat the operation otherwise. When the value is stable at zero, then press the key **Enter**.

MENU 2 - SCALES

(POS. 2.1-2) Full scale n° 1-2

[FS1-2=dm³/SX.XXXX]

The full scale is used to indicate to the maximum meter's flow rate; a volume per time is required. The full scale should be chosen carefully as it's parameters are used for several other parameters. 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 dm³ and 1 kg. The converter accepts any kind of combination of units of measure satisfying both the following conditions:

1. Numeric field value ≤ 99999
2. $\frac{1}{25} f_{s_{max}} \leq \text{numeric field value} \leq f_{s_{max}}$.

Where $f_{s_{max}}$ 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:

cm³	Cubic centimetre
ml	Millilitre
l	Liter
dm³	Cubic decimeter
dal	Decalitre
hl	Hectolitre
m³	Cubic metre

in³	Cubic inch
Gal	American gallon
GAL	British gallon
ft³	Cubic foot
Bbl	Standard barrel
BBL	Oil barrel
yd³	Cubic yard
kgl	KAmerican gallon
KGL	KBritish gallon

G	Gram
Kg	Kilogram
T	Ton

Oz	Ounce
Lb	Pound
Ton	short tons

When a mass unit of measure is set, the specific gravity function is automatically enabled by the system. The units of measure of time may be chosen among the values: **s**=second, **m**=minute, **h**=hour, **d**=day.

(POS. 2.3) Measure unit and number decimal totalizers **[MU.tot:dm³X.XXX]**

Setting the unit of measure and number of decimals for visualized the totalizers or the volumes to batch. For set the unit of measure, position the cursor on field of the actual unit of measure; to set the type of unit, position the cursor on the blank space between the unit of measure and the numeric value; to set the number of decimal totalizers position the cursor on numeric field and choose one of the possible combinations: 1000-01.00-001.0-00001.

(POS. 2.4-5) Pulse value output 1-2 and unit of measure of tot. **[Imp1-2=dm³X.XXXXX]**

Setting of the pulse volume corresponding to output 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. 2.6-7) Pulse duration on output 1-2 **[Tpul1-2=msXXXX.XX]**

Setting of the duration of the pulse generated on output 1-2. Its 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 go down to 0.04 milliseconds.

ATTENTION: since the instrument cannot detect which type of device it is connected to, it is up to the user to verify the set pulse duration is compatible with the external device processing such pulses. If, for example, an electro-mechanical pulse counter is connected, then two kind of problems may occur: if the pulse is too long than the coil may burn or, if it is too short, the counter may not be able to count and eventually even cause the damaging of the output itself.

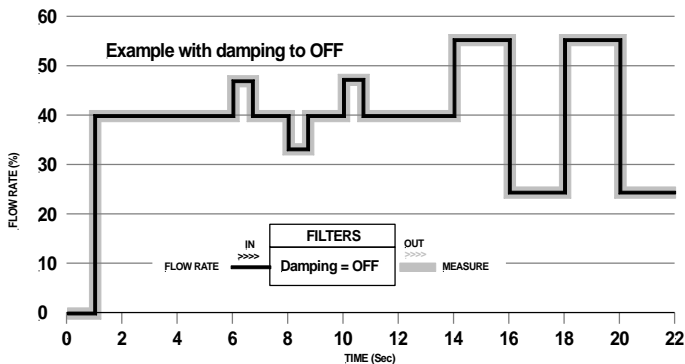
MENU 3 - MEASURE

(POS. 3.1) Damping

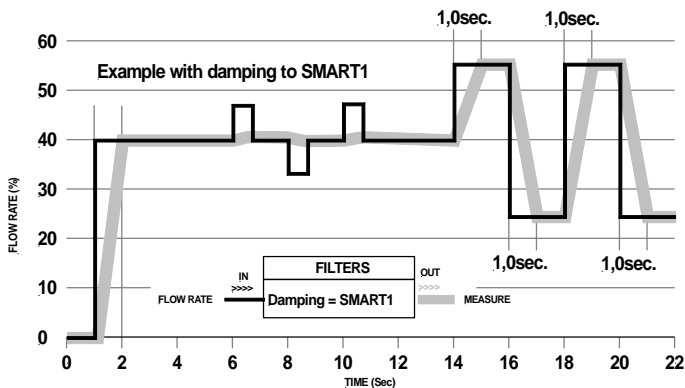
[Damping=OFF/SMARTX /(time)]

This section of the manual is extremely important. The correct filter settings ensures a proper response of the instrument to the measured flow rate. The available dampening filter values range between no damping (damping=OFF) and maximum damping based of 1000 seconds (Damping=1000).

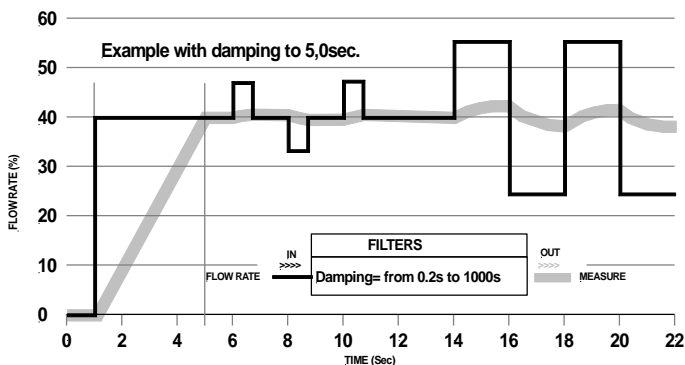
The three diagrams below demonstrate the instrument behavior with different dampening settings with flow rate changes in the range of 1-100%.



Damping function(OFF). the meter follows the trend of fast changes in flow



Damping (Smart 1,2,4):these settings effect a predefined filter dampening of the noise and sudden change in flow rate on the rise.



Damping mode based on time (fro 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. 3.5) 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 range N.2 (Fs2) if enabled is bigger than N.1 (Fs1). 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. **Note:** the autorange does not allow using the range change external command (pos. 5.6).

MENU 4 - ALARMS**(POS. 4.6) Current output value in case of failure****[mA v.fault =% XXX]**

Setting of the value the 4-20mA current output has to be in one of the following cases:
empty pipe; coils interrupted; ADC error

The allowed range is from 0 to 120% of the 0-20 mA scale, 120% 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 2mA, allowing the following diagnostics:

1. current < 2 mA - 5%: line interrupted, power supply failure or faulty converter;
2. 2mA -5% ≤ current ≤ 2mA + 5%: hardware alarm;
3. 4mA ≤ current ≤ 20mA: normal working range;
4. 20mA < current ≤ 22mA: out of range, measure above 100% f.s.

N.B.: To set this parameter to zero corresponds to disable the alarm

(POS. 4.7) Batch safety timer**[Timeout=s XX.X]**

With this function is possible to set a maximum time for the batch; over this time will generate an alarm.

This function is useful when you need control one or both of the followings condition:

- batch valve open and flow rate is zero
- batch valve closed and flow rate different to zero

When this alarm is activated, they are aborted the batch operation and the power supply of the valve. The values of function are from 0 to 25.5 seconds and is active only if one or more of the batch functions are enable.

MENU 5 - INPUTS**(POS. 5.1-2) Modify/reset totalizer enable****[T1-2 reset=ON/OFF]**

When one of this function is enabled, the related totalizer may be reset through the on/off input.

(POS. 5.5) "Block measures" command block measures enable**[Meas. lock=ON/OFF]**

When this function is active (ON), applying a voltage on the on input terminals, the measurement is stopped, the meter will display zero flow.

(POS. 5.6) Autozero calibration external command enable**[Calibration=ON/OFF]**

When this function is active, applying a voltage on the on/off input terminals the meter performs a autozero calibration cycle. ATTENTION: if the voltage pulse is less 1 sec., the meter performs a calibration cycle for compensate possible thermal drifts. If the voltage pulse is more 1 sec, the meter performs a zero calibration of measure. This function enables/disables the automatic zero calibration system. 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.

(POS. 5.9-10) Functions assigned to input 2-3**[INP.2-3=XXXXXX]**

Choice of the function to associate the input 2 The functions are listed in the table below.

FUNCTIONS FOR INPUTS 2-3**OFF:** DISABLE**BATCH:** START/STOP BATCH**BM SELECT:** STATIC SELECTION OF FORMULA**VALV. OPEN:** OPEN VALVE COMMAND**STAND-BY:** STAND-BY COMMAND (see function 10.4)

MENU 6 - OUTPUTS

(POS. 6.1-4) Function corresponding to on/off output 1-2-3-4**[OUT1=XXXXXX]**

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

FUNCTIONS FOR OUTPUTS 1, 2, 3, 4

OFF: DISABLED

PLS+: PULSE FOR POSITIVE FLOW RATE (**ONLY OUTPUT 1-2**)PLS-: PULSE FOR NEGATIVE FLOW RATE (**ONLY OUTPUT 1-2**)PLS: PULSE FOR POSITIVE AND NEGATIVE FLOW RATE (**ONLY OUTPUT 1-2**)

SIGN: FLOW DIRECTION OUTPUT (ENERGIZED = -)

RANGE: RANGE INDICATION OUTPUT (ENERGIZED = SCALE 2)

MAX AL+: MAX DIRECT FLOW RATE OUTPUT(ENERGIZED = AL. OFF)

MAX AL-: MAX REVERSE FLOW RATE OUTPUT(ENERGIZED = AL. OFF)

MAX AL: MAX DIRECT/REVERSE FLOW RATE OUTPUT(ENERGIZED = AL. OFF)

MIN AL+: MIN DIRECT FLOW RATE OUTPUT(ENERGIZED = AL. OFF)

MIN AL-: MIN REVERSE FLOW RATE OUTPUT(ENERGIZED = AL. OFF)

MIN AL: MIN DIRECT/REVERSE FLOW RATE OUTPUT(ENERGIZED = AL. OFF)

MAX+MIN±: MAX AND MIN FLOW RATE ALARM OUTPUT (ENERGIZED = AL. OFF)

P.EMPTY: EMPTY PIPE ALARM OUTPUT (ENERGIZED = FULL PIPE)

OVERFLOW.: OUT OF RANGE ALARM OUTPUT (ENERGIZED = FLOW RATE OK)

HARDW AL.: CUMULATIVE ALARM OUTPUT interrupt coils, empty pipe, measure error (ENERGIZED = NO ALARMS)

EXT. COMM.: ONLY AVAILABLE WITH DATA LOGGER MODULE

BATCH AL: BATCH ALARM

BATCH SYN.: AT THE END OF BATCH THE OUTPUT CHANGE STATUS

END BATCH.: END BATCH OUTPUT (ENERGIZED =BATCH IN PROGRESS)

PREBATCH.: PREBATCH OUTPUT (ENERGIZED = PREBATCH IN PROGRESS)

(POS. 6.5) Function and the range of current output n.1**[OUT.mA1=X÷XX+]**

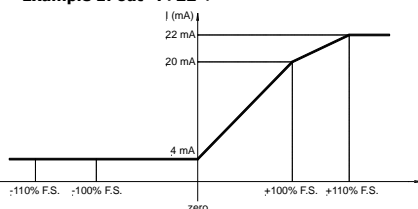
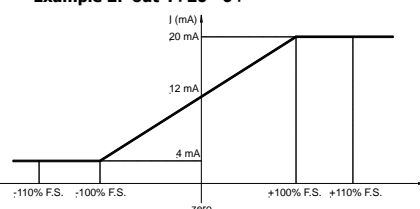
Choice of the function and the range of current output N.1. There are three fields to modify for this function:

- Scale zero: **4** or **0** mA; Full scale: **20** or **22** mA
- Field: **+** = positive, **-** = negative, blank = both, **-0+** = central zero scale

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

POSSIBLE FIELD	CURRENT VALUES IN mA ASSOCIATE TO THE % VALUE OF FULL SCALE				
	REVERSE FLOW VALUE		ZERO	DIRECT FLOW VALUE	
	≤ -110%	-100%	0%	+100%	≥+110%
OutmA = 0 ÷ 20 +	0	0	0	20	20
OutmA = 0 ÷ 22 +	0	0	0	20	22
OutmA = 4 ÷ 20 +	4	4	4	20	20
* OutmA = 4 ÷ 22 +	4	4	4	20	22
OutmA = 0 ÷ 20 -	20	20	0	0	0
OutmA = 0 ÷ 22 -	22	20	0	0	0
OutmA = 4 ÷ 20 -	20	20	4	4	4
OutmA = 4 ÷ 22 -	22	20	4	4	4
OutmA = 0 ÷ 20	20	20	0	20	20
OutmA = 0 ÷ 22	22	20	0	20	22
OutmA = 4 ÷ 20	20	20	4	20	20
OutmA = 4 ÷ 22	22	20	4	20	22
OutmA = 0 ÷ 20 -0+	0	0	10	20	20
OutmA = 0 ÷ 22 -0+	0	1	11	21	22
** OutmA = 4 ÷ 20 -0+	4	4	12	20	20
OutmA = 4 ÷ 22 -0+	4	4.8	12.8	20.8	22

In hardware alarm conditions "HW ALARM" (interrupted coils, empty pipe, measure error) the current value is programmed by the function "mA v. fault" (pos. 4.6) and it is expressed as percentage of a fixed current range, where: 0% = 0mA e 110% = 22mA.

*** Example 1: out 4÷22 +****** Example 2: out 4÷20 -0+**

MENU 8 - DISPLAY**(POS. 8.5-6) Totalizer 1-2 reset****[T1/2 reset]**

These functions are activated pressing the key **Enter** during the function visualization. When "EXECUTE?" is required, press **Esc/Del/Canc** to proceed; or any other key to delete the operation.

MENU 9 - BATCH**Visualized only with batch active (output on batch and/or pos. 5.8 enable or pos. 5.9 on batch)****(POS. 9.1) Number of batch samples****[N.SAMPLES=XXX]**

Number of batch cycles to be done to define the value of compensation. This function allows to automatically determine the average value for automatic compensation of system delay (pos. 9.3). Set to ZERO this function for manually introduction of the compensation value.

(POS. 9.2) % limit of compensation**[HYST.=%XXX]**

This value defines the percentage of maximum difference between the compensation value set (pos. 9.3) and the average compensation value defined with the function 9.1. Over this threshold the new compensation value will be automatically set (if Number of batch samples is different from zero)

(POS. 9.3) Compensation value**[V.COM.=XX.XXX]**

This value, expressed in the same selected volume unit of measure, is the result of the difference between the batch value set and the quantity of product really supplied due to the system delays: closing valves, stop pumps, stop motors, etc. Attention: if you need to set manually the value of compensation, preset to ZERO the Number of batch samples (pos. 9.1)

(POS. 9.4) Prebatch value**[V.PRE.=XX.XXX]**

set the volume of liquid at which you want to enable the pre-batch. When the pre-batch volume "V Pre" is reached the output (if enabled) is de-activated. This value is constant for all quantities to be batched and must be set in current volume unit of measure. The pre-batch function is useful when you need fast and accurate fillings.

(POS. 9.5) Enable/disable auto-batch function**[AUTO BATCH=ON/OFF]**

Applying a voltage on the on/off input terminals for more than 5 second the valve controlled by the meter stands open while the voltage is applied on the input. When the product has reached the desired volume/level, removing the voltage from the input, the meter closes the valve and memorizes the supplied product volume in the current memory batch (see "BATCH FUNCTIONS"); the value obtained with this procedure will be the volume supplied in every following batch. In order to modify this value, repeat the operations above. This procedure set the safety timer at a value 1.25 times greater than the time used to reach the batched quantity; after that the counter will be reset.

(POS. 9.6) Automatic selection of batch formula**[BM AUTO SEL=ON/OFF]**

The function allows the automatic selection of the first 4 formulas depending on the duration of the pulse of the batch start (see section Input operation stage). This function is active only if the function cons. mode (pos. 9.7) has not enabled. Besides, activating this function, the automatic compensation of the batch volume is also excluded (the value of the parameter "N.samples" (pos. 9.1) will be automatically set to zero). However the manual compensation is possible introducing the opportune value on the parameter "V.com" (pos. 9.3)

(POS. 9.7) Static consent of batch**[CONS. MODE=ON/OFF]**

The function enable the dosing start and stop using a static signal, instead of an impulsive, applied to the input (see Digital input section), this signal will have to stand applied all through the batch. The function automatically disables functions BM AUTO SEL (pos. 9.6) and AUTO BATCH (pos. 9.5).

MENU 10 - DIAGNOSTIC

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

Enable the calibration of the meter. The activation of this function happens pressing the key **Enter** during the function visualization. Will be visualized the following question: "EXECUTE?" press the key **Esc/Del/Canc** to proceed. Press any other key to delete the operation

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

Meter autotest 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: "EXECUTE?" push the key **Esc/Del/Canc**. 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 on the device.

(POS. 10.3) Flow rate simulation**[SIMULATION=ON/OFF]**

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 '**S**' 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 the key **Esc/Del/Canc**.

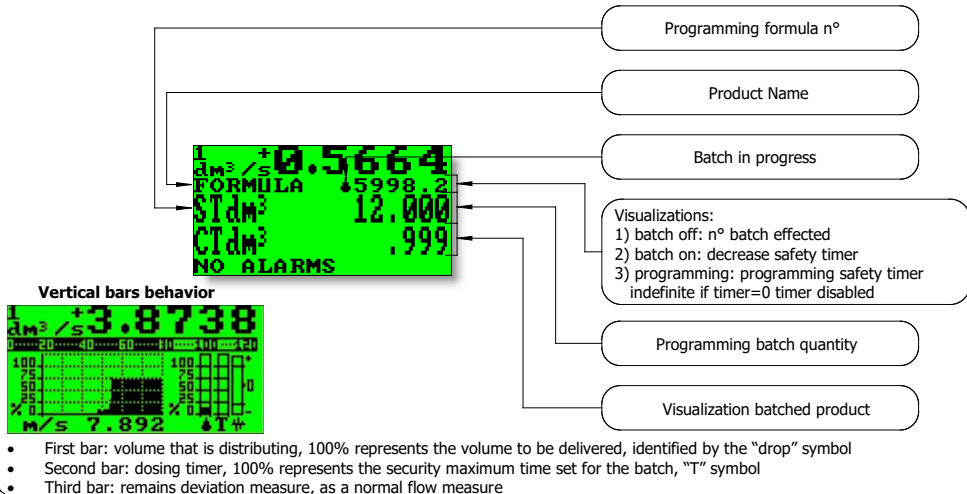
BATCH FUNCTION

ENABLE BATCH

Enable one of the following functions to enable and program the batch on the converter:

- POS. 5.8-9-10: START/STOP batch from input
 - POS. 6.1-2-3-4: assign one of the functions to one of two output
- Some examples of operation of such functions are visualized from page 14

VISUALIZATION PAGE WITH BATCH FUNCTION ENABLE



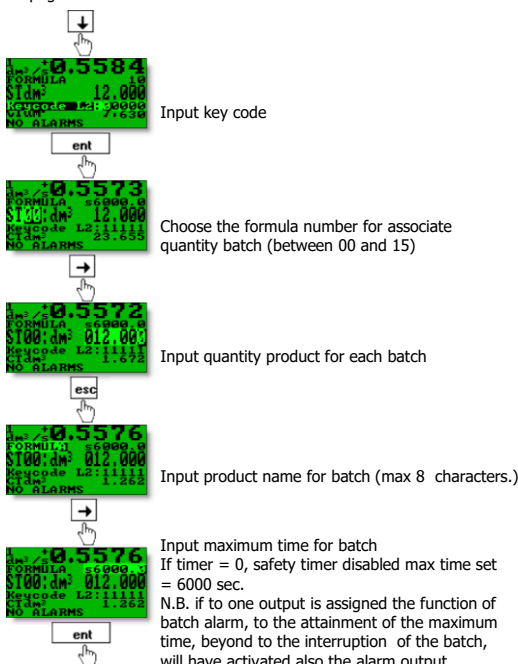
PROGRAMMING BATCH

For each formula you can associate:

- Product quantity
- Product name
- Maximum time for batch (safety time for each formula)


After activating the batch function from visualization page, proceed as in the aside example.

From the visualization pages




START STOP BATCH



START: it is possible activate the start of batch in two different way:

- from remote input:** assigning the functions of start/stop batch to the input 1 (POS. 5.8) or input 2-3 (POS. 5.9-10) and using the input/s like visualized from page 14.
- from keyboard:** pressing of the key 
N.B.: the start of batch from keyboard is always on the descent front (release of the key) and is not available with the function of batch consent (POS. 9.7)

STOP: the stop of batch can be due to three events:

- keyboard or remote input** (manual stop): pressing of the key 
- end of batch:** in this case the stop of batch will have activated from a output signal to the attainment of the batch quantity
- maximum time of batch:** if a maximum batch time has been set and this is exceeded, the batch in progress is stopped independently from the batched quantity

Notes:

- during the batch the symbol of the active batch  and the name of the formula are visualized on video.**
- When the batch outputs are enable, pushing the key , the outputs will remain energized till the key is released. On the display, in place of the CT and ST totalises the following messages will appear:

!! VALVE !!
!! OPENED !!

IMPORTANT NOTES

Cross of relation between functions assigned to the input and automatic settings of IN/OUT:

		POS 9.5	POS 9.6	POS 5.4	POS 9.1	POS 3.6-5.6	POS 5.5	POS 5.8	POS 5.9	POS 5.10
		AUTO BATCH	BM AUTO SEL	COUNT LOCK	N. SAMPLES	AUTO RANGE CHANGE OR FROM INPUT	CALIBRATION	INPUT 1 (BATCH)	INPUT 2	INPUT 3
POS 9.5	AUTO BATCH			* DISABLE						
POS 9.6	BM AUTO SEL				** DISABLE					
POS 9.7	CONS. MODE	DISABLE	DISABLE	* DISABLE						
POS 5.8	INPUT 1 ON BATCH					DISABLE	DISABLE			
POS 5.9	INPUT 2 ON BATCH					DISABLE	DISABLE	DISABLE		
POS 5.10	INPUT 3 ON BATCH					DISABLE	DISABLE	DISABLE	DISABLE	
POS 6.1-2-3-4	OUTPUT 1-2-3-4 ON BATCH FUNCTIONS			DISABLE		DISABLE	DISABLE			
POS 6.3-4	OUTPUT 3-4 ON ANY FUNCTION								DISABLE	DISABLE
POS 5.9-10	INPUT 2-3 ON BM SELECT		DISABLE		** DISABLE					

* IF INPUT 1 USED
** SET VALUE TO ZERO

To optimize the performances of the meter used as a batch instrument (batch time < 5s), it is recommended to set it as prompt as possible according to the plant requirements, choosing the **batching setup** for the automatic parameter optimization of the quick start menu. It is also recommended to deactivate the function 3.1, Damping.

ALARMS

Causes and actions to be taken

Messages	ANOMALIES	ACTION TO TAKE
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 calibration procedure
BATCH ALARM	Batch interrupted for the followings condition: <ul style="list-style-type: none"> <input type="checkbox"/> Timer batch expired before the end of the batch <input type="checkbox"/> Batch valve open and flow rate to zero for a time longer to the safety timer set <input type="checkbox"/> batch valve closed and flow rate different from zero for a time longer to the safety timer set 	Verify: <ul style="list-style-type: none"> <input type="checkbox"/> presetting <input type="checkbox"/> system condition
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, the grounding connections of the devices or the possible presence of noise sources
EXCITATION FAIL	The coils or the cable connecting the sensor are interrupted	Check the connecting cables to the sensor
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 suitable in the label.	Verify that the power supply is that suitable on label

Anomalies codes

CODES	ANOMALIE DESCRIPTIONS	ACTION TO TAKE
0001	problem with watch-dog circuit	ADDRESS TO SERVICE
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

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.

ADDRESSES

Isoil Industria spa

Head office

20092 Cinisello Balsamo (MI) Italy

27, via F.lli Gracchi

Phone +39-02-66027.1

Fax +39-02-6123202

E-mail: sales@isoil.it

Web: www.isoil.com

Service

Isoil Industria spa

20092 Cinisello Balsamo (MI) Italy

27, via F.lli Gracchi

Phone +39-02-66027.1

Fax +39-02-6123202

E-mail: isomagservice@isoil.it

