ISOMAG™

The friendly magmeter

CONVERTER 4/20 mA LOOP POWERED

ML 51

VERY COMPACT CONVERTER POWERED BY 4/20 MA (TWO WIRE) WITH DIGITAL OUTPUT FOR PULSES AND ALARM

Warranty conditions are available on this website:
www.isomag.eu only in English version

ISOIL INDUSTRIA
The solutions that count

INDEX

TECHNICAL DATA

OVERALL FEATURES	
Suitable For	❑ All the ISOMAG sensors up to DN 1000
Minimum conductivity	❑ 5 µS/cm
Altitude	❑ -200 m up to 2000 m
Ambient Temperature	❑ -20... +70°C / -4... +158 °F
Humidity Range	❑ 0÷100% (IP 67)

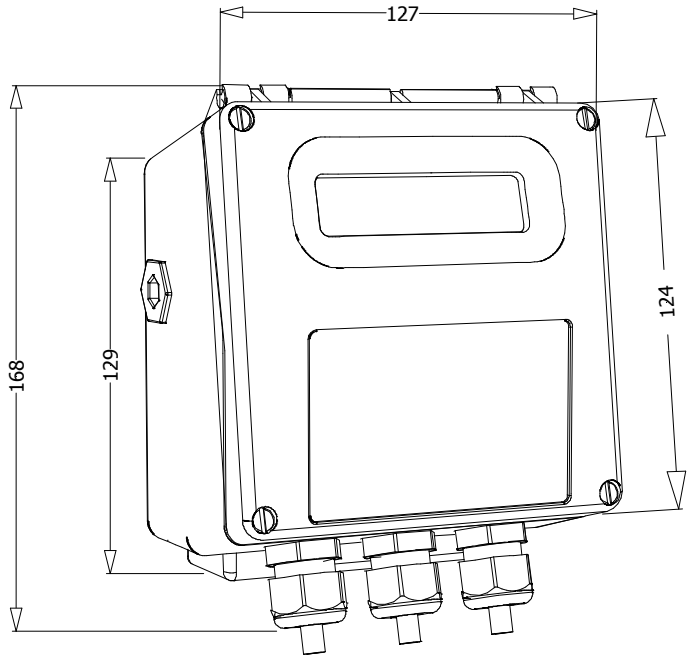
STANDARD FEATURES	
Housing materials	❑ Nylon PA6 with fiber of glass
Version	❑ Compact
Protection Rate	❑ IP 65
Power supply/Consumption	❑ 4/20 mA current loop (18 – 36 V ⎓)/12 V-12 mA (4/20 disable)
Cable gland	❑ N° 3 Cable gland PG 11
Full scale value	❑ 0,4...10m/s
Protocols	❑ ETP
Pulses/frequency outputs	❑ N°1 ,50 Hz, 10mA, 40 VDC
Galvanic Isolation	❑ All the inputs/outputs are galvanically isolated from power supply
Data Storage	❑ Eeprom values storing system in case of power failure
Programming Plug In	❑ Protected plug in for the connection to PC or hand terminal
Bi-Directional	❑ Yes
Diagnostic Funct.	❑ Yes
Empty Pipe Detect.	❑ Yes
CE Certification	❑ Yes

OPTIONAL FEATURES *(CHECK HOW TO ORDER, AT LAST PAGE, FOR MORE DETAILS)*	
Housing materials	❑ Painted aluminium die casting
Protection Rate	❑ IP 67 (Aluminium housing)
LCD Display	❑ Alphanumerical display 16 characters x 2 lines no back light
Keyboard	❑ 3 internal keys

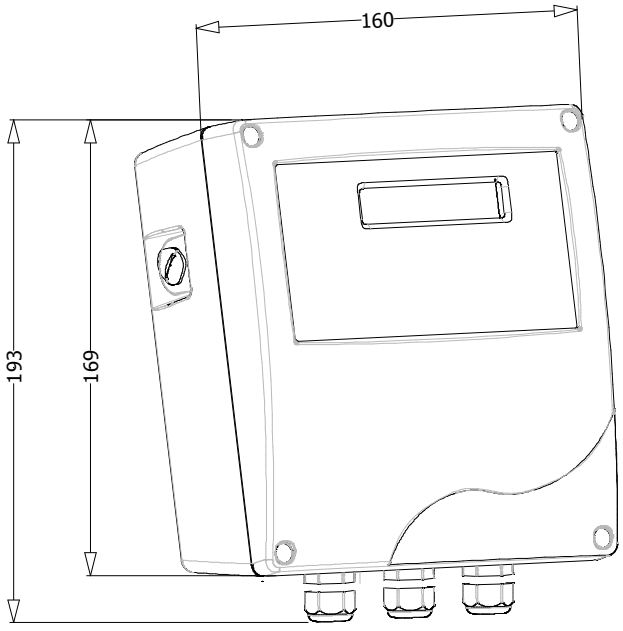
ACCURACY	
Accuracy (whole system converter+sensor)	❑ See table below

OVERALL DIMENSIONS

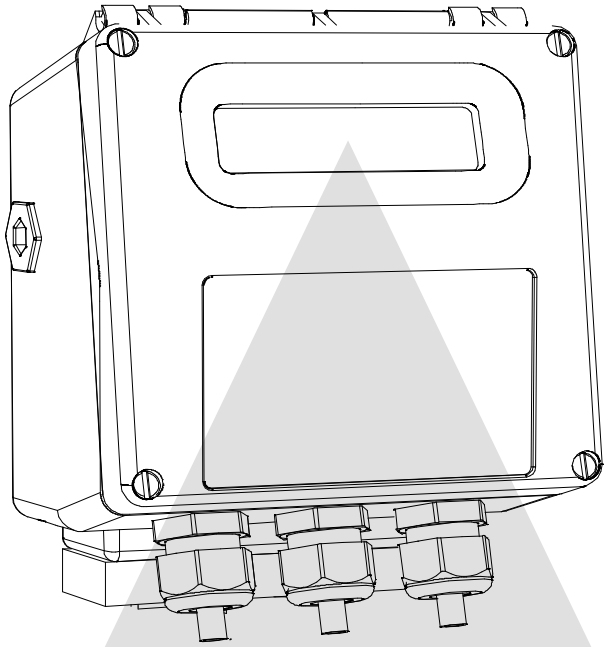
PA6 (NYLON) HOUSING

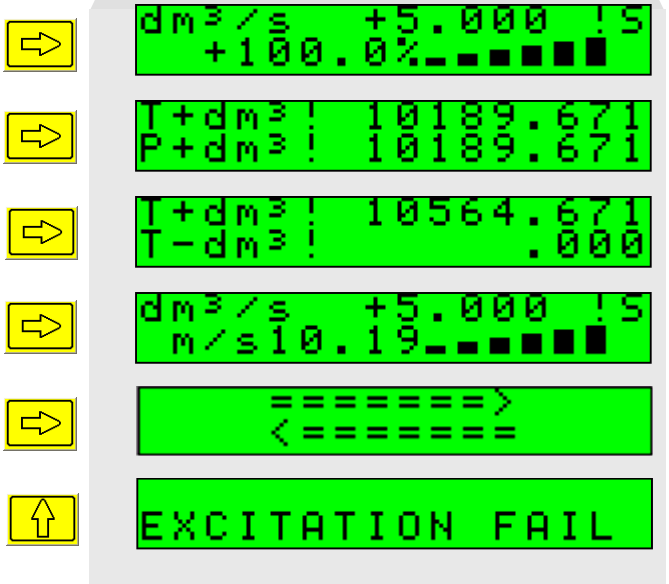


ALUMINIUM HOUSING



VISUALIZATION PAGES (ONLY WITH DISPLAY OPTION)





Flow rate value t.u. and %

Totalized values

Direct and reverse totalized

Flow rate and liquid speed

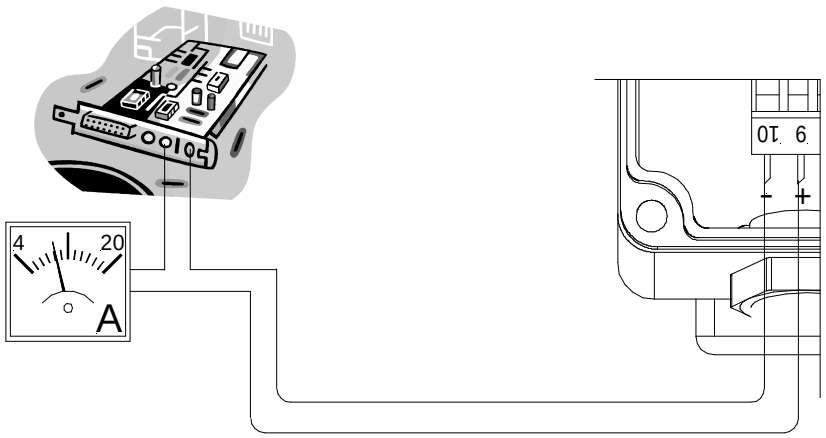
Scrolling visualization

Alarm ON visualization

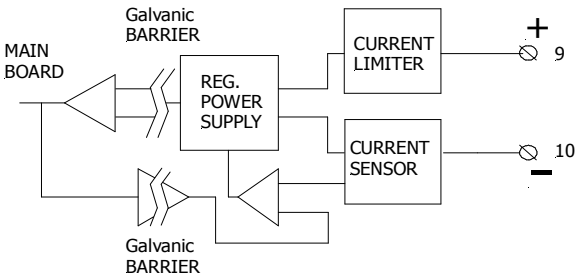
Different visualization possibilities with a simple press of a key

POWER SUPPLY

Scheme of power supply connections



Power supply/Out 4÷20mA : electrical details



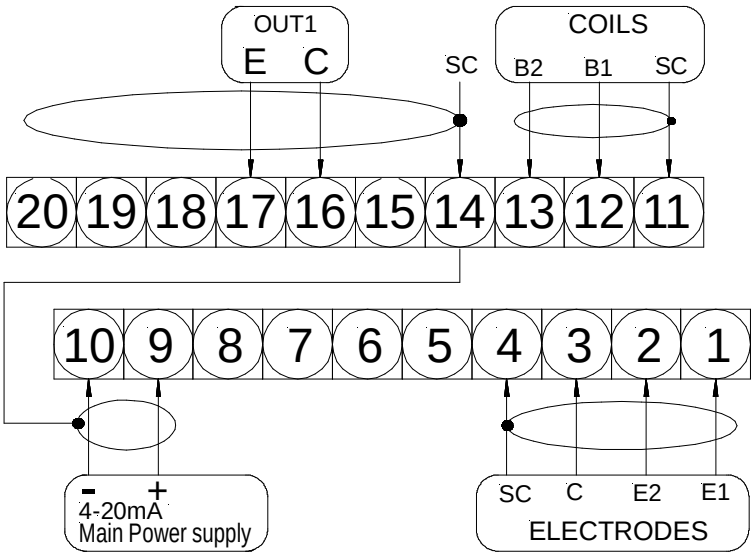
- Working voltage : 18 ÷ 36 Vdc

MAX LOAD TABLE	
Power Supply	R_MAX (ohm)
21.6 (24V-10%)	300
24	400
26.4 (24V+10%)	500
30	680
36	950

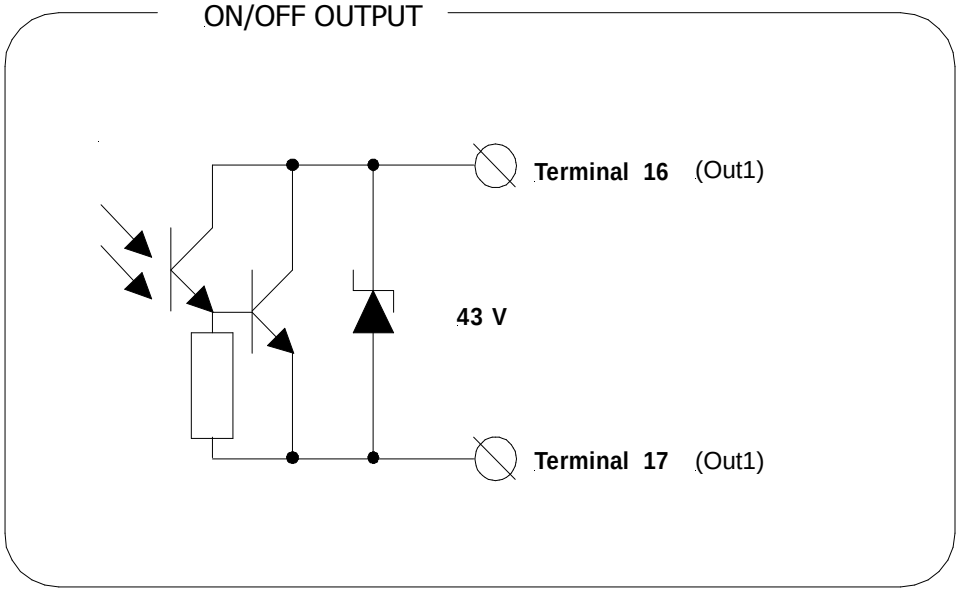
This system allows to use the converter as a transmitter with " 2 wire" method : the measure 4/20 is used also to supply the converter . The MINIMUM value of output current, at "0" FLOW RATE is 4 mA .

ELECTRICAL CONNECTIONS

TERMINAL BLOCK



STANDARD ON/OFF OUTPUT



FUNCTIONS

MAIN MENU
1-Sensor

1-SENSOR	
ND=mm	00025
KA=	+01.0000
Sens.type=	00
Ins.position=	0
KL=+[0]	+00.0000
KL=-[0]	+00.0000
E.P.detect=	OFF
E.P.calibr.	
Autozero cal.	
Autozero res.	

1.1 Insert ND of sensor (0-1000)
1.2 Calibration data of sensor visualized on sensor's label
1.3 Type of sensor: 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 system
1.9 Reset the preceding function

MAIN MENU
2-Scales

2-SCALES	
Fs1=dm³/s	05.000
Fs2=dm³/s	05.000
Tot.MU=dm³	1.000
Pls =dm³	01.0000
Tpls =ms	0050.00

2.1* Full scale 1 value
2.2* Full scale 2 value
2.3* Unit of measure and number of decimal totalizes
2.4* Pulse value
2.5* Duration of the pulse

MAIN MENU
3-Measure

3-MEASURE	
Tconst=s	0002.0
Skip thr=%	025
Peak thr=%	125
Cut-off=%	07.0
Autocal.=	OFF
Autorange=	OFF

3.1* Time constant
3.2* Acceleration threshold
3.3* Anomalous signal pick cut off threshold
3.4 Low flow zero threshold: 0-25% of full scale value
3.5 Enable every hour an internal cycle of calibration. The measure it's stopped for 8-15 sec.
3.6 Automatic change of scale

MAIN MENU
4-Alarms

4-ALARMS	
Max thr+=%	000
Max thr-=%	000
Min thr+=%	000
Min thr-=%	000
Hyst.=%	03
E.P.thr.=	075
mA v.fault=%	113

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
4.7* Current output value in case of failure

MAIN MENU
5-Inputs

5-INPUTS	
T+ reset=	OFF
P+ reset=	OFF
T- reset=	OFF
P- reset=	OFF
Count lock=	OFF
Calibration=	OFF
Range change=	ON

5.1* Total direct (positive) flow totalise reset enable
5.2* Partial direct (positive) flow totalise reset enable
5.3* Total reverse (negative) flow totalise reset enable
5.4* Partial reverse (negative) flow totalise reset enable
5.5 Totalise counting lock command
5.6* Autozero calibration external command
5.7 Range change external command

```
MAIN MENU
 6-Outputs
```

```
 6-OUTPUTS
Out1=          OFF
Out mA=         ON
Out mA=4_22
```

6.1* Output functions
6.2 Enable 4÷20 output
6.3* Field for 4/20 mA out

```
MAIN MENU
 7-Communication
```

```
 7-COMMUNICATION
IF2 prot.=     DPP
IF2 supply=    OFF
```

6.1* Output functions
6.2 Enable 4÷20 output

```
MAIN MENU
 8-Display
```

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

8.1 Choice of the language: En= English, It=italian, Fr= French, Sp= Spanish
8.2* Total direct (positive) flow totalise reset
8.3* Partial direct (positive) flow totalise reset
8.4* Total reverse (negative) flow totalise reset
8.5* Partial reverse (negative) flow totalise reset
8.6 Quick start menu visualization
8.7 Enable the page of net totalizer (difference between direct and reverse. see page 11)
8.8 Visualizes the values of the partial totalise in the unit of selected currency
8.9 Choice of the numbers of decimals for the visualization currency value: From 0 to 3
8.10* Value of conversion/currency for direct totalizer
8.11* Value of conversion/currency for reverse totalizer

```
MAIN MENU
10-Diagnostic
```

```
10-DIAGNOSTIC
Calibration
Self test
Simulation=   OFF
```

10.1* Enable the calibration of the converter
10.2* Converter autotest
10.3* Flow rate simulation enabling

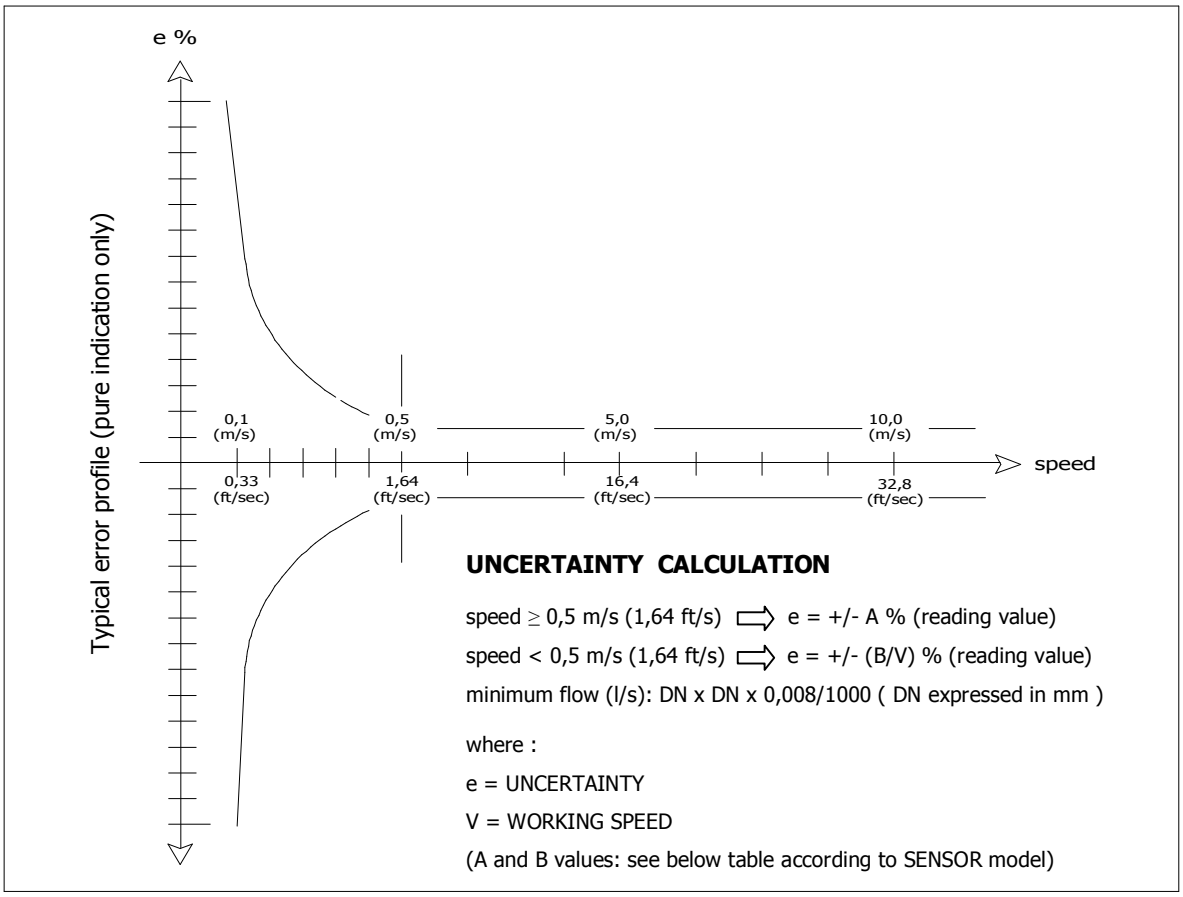
```
MENU PRINCIPALE
11-Dati interni
```

```
11-INTERNAL DATA
L2 keycode=00000
Load fact.pres.
Load user pres.
Save user pres.
Hours=      000031
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 Visualisation of the total operation hours of the converter (function not editable)
11.7 Ks Coefficient

Note : all page number references are to the operating manual .

ACCURACY TABLE



FULL BORE SENSORS

MS501/MS1000/MS2500			MS5000		
A	B(m/s)	B(ft/s)	A	B(m/s)	B(ft/s)
0,5	0,25	0,82	2,0	1,0	3,28

INSERTION SENSORS

See MS 3770 / MS 3800 DATA SHEET

Reference conditions :

- Constant flow rate during the test
- Pressure: >30 Kpa
- Flow condition : fully developed flow profile
- Zero stability +/- 0,005 %

HOW TO ORDER

CODE EXAMPLE	Display	
A	A	Blind execution (without display and programming keys)
	B	Complete with 2 line back light display (each of 16 characters) and 3 programming keys **ATTENTION : THIS OPTION IS AVAILABLE ONLY FOR CONVERTER COUPLED WITH FULL BORE SENSORS**
Housing material / Protection rate		
1	1	Nylon PA6 with fiber of glass / IP 65
	2	Painted aluminum die casting, protection rate IP67
Version		
A	A	Compact version with sensor MS.... (liquid maximum temperature 100 °C)

ML51-A1A (Complete code example for order)

The manufacturer reserves the right to make design improvements without notice.

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