

ISOMAG 

The friendly magmeter

DATA SHEET



ML210

CE

ISOIL 
I N D U S T R I A



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TECHNICAL DATA

OVERALL FEATURES

Suitable For	☐ All the ISOMAG sensors
Minimum conductivity	☐ 5 $\mu\text{S}/\text{cm}$
Altitude	☐ -200 m up to 5000 m
Ambient Temperature	☐ -20... +60°C / -4... +140 °F - Aluminium housing ☐ -20... +40°C / -4... +104 °F - Panel mounting housing
Humidity Range	☐ 0÷100% (IP65 -IP 67) ☐ 0-90% (IP40) without condensation, for panel mounting housing (without transparent frontal cover IP 65)

STANDARD FEATURES

Housing materials	☐ Wall/Compact: Painted Aluminium die casting ☐ Panel version: NORYL UL 94 V-0 black
Protection Rate	☐ IP 67 – Aluminium housing ☐ IP65/IP40 – Panel version
Power Supply/Consumption	☐ 100-240 V~ (25VA) – 44-66 Hz
Cable Gland	☐ N° 6 cable gland PG 11
Data Logger	☐ 32 values + 64 alarm events
Full scale value	☐ 0,4...10m/s
Digital Outputs	☐ N° 2 Programmable function (Pulses, alarms) 1250 Hz, 100mA, 40 Vdc
Protocols	☐ ETP
Dig. Input	☐ N°1 , programmable function (Totalizer reset)
Data Storage	☐ Eeprom values storing system in case of power failure
Galvanic Isolation	☐ All the inputs/outputs are galvanically isolated from power supply up to 500 V
Programming Plug In	☐ Protected plug in for the connection to PC or hand terminal
Bi-Directional	☐ Yes
Dual Range	☐ Yes
Diagnostic Funct.	☐ Yes
Empty Pipe Detect.	☐ Yes
Batch Function	☐ Yes
CE Certification	☐ Yes

OPTIONAL FEATURES**(CHECK HOW TO ORDER, AT LAST PAGE, FOR MORE DETAILS)**

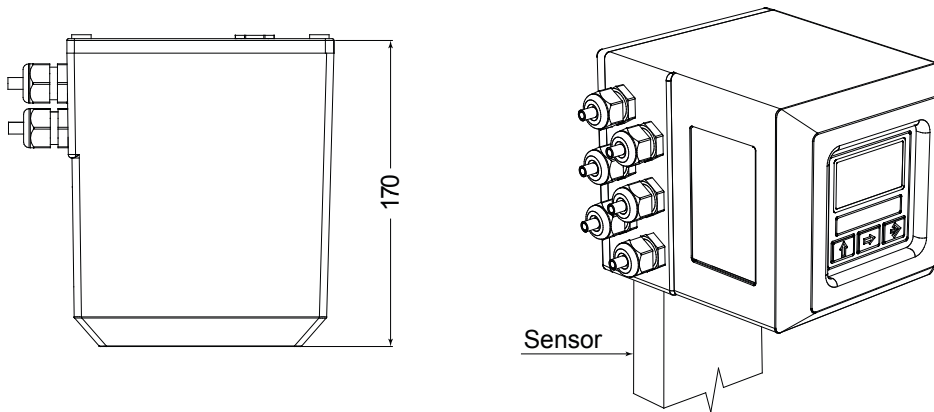
Housing materials	☐ Wall/Compact: AISI304
Version	☐ Compact ☐ Separate
Protection Rate	☐ IP 68
Conn. Sensor Cable	☐ CABLE C015 - C016 for separate version ☐ CABLE C014 for separate version with pre-amplifier
LCD Display	☐ Graphic display 128x64 pixels back light, 3 programming keys
Power Supply/Consumption	☐ 18-45V~ (25 VA) 44-66Hz ☐ 18-45 V (20W); ☐ 10-35V (20W)
Pulses/ Alarm Outputs	☐ N°2 , 1250 Hz, 100mA, 40 Vdc (12,5 KHz Opt.) ☐ Relais
Current Output	☐ N°1 , 0/4...20mA – RL=1000Ω (+1 Opt.)
Communication port	☐ RS 485 ☐ RS232
Protocols	☐ Profibus DP/HART/Modbus
Certification	☐ MI-001 ☐ MI-004

ACCURACY

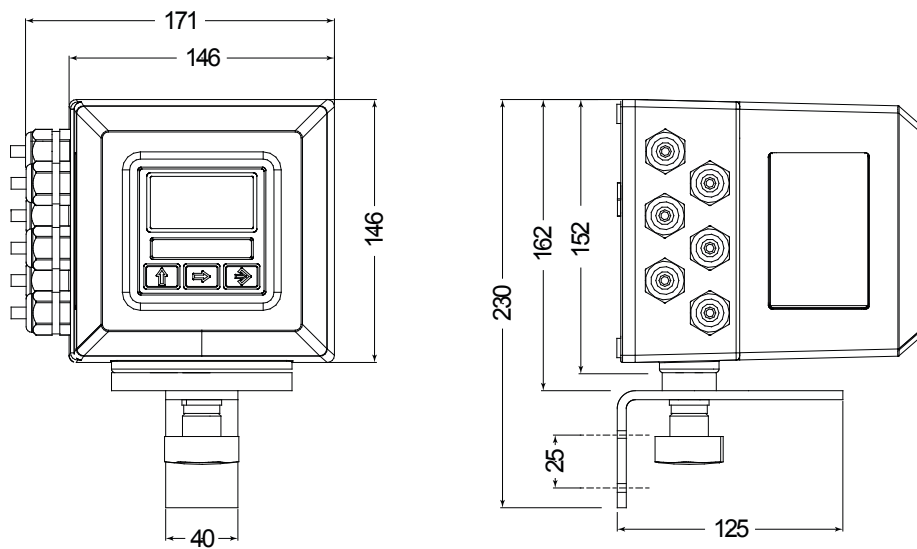
Measurements tolerance	☐ Flow rate (volume) = $\pm 0,05\%$ v.l. ☐ Out 4/20 mA = $\pm 0,08\%$ v.l. ☐ Frequency Out = $\pm 0,08\%$ v.l.
Accuracy (whole system converter+sensor)	☐ See table below

OVERALL DIMENSION

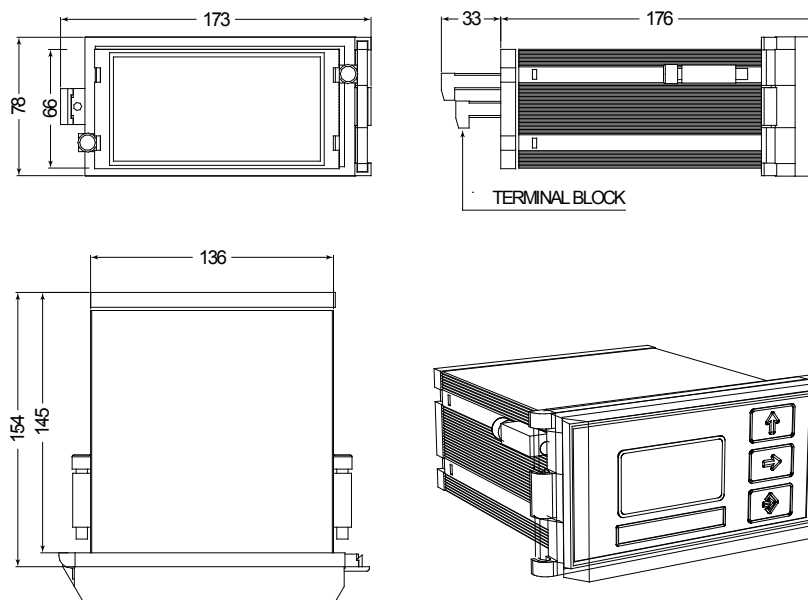
COMPACT VERSION



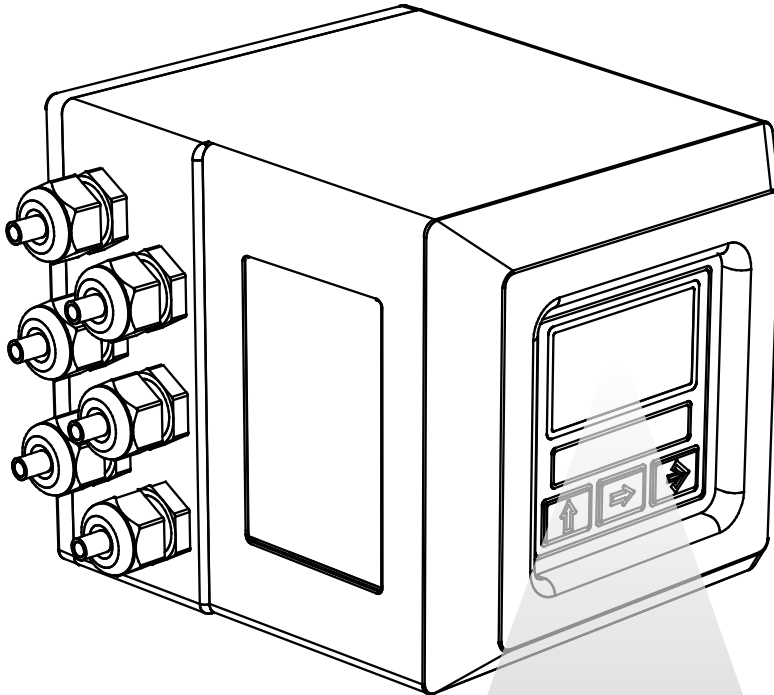
SEPARATE (WALL) VERSION



PANEL VERSION



VISUALIZATION PAGES



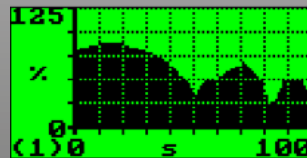
Flowrate and totalizes visualization



Flowrate, speed values and graph



Flowrate value and Full scale % graph



Flowrate graph

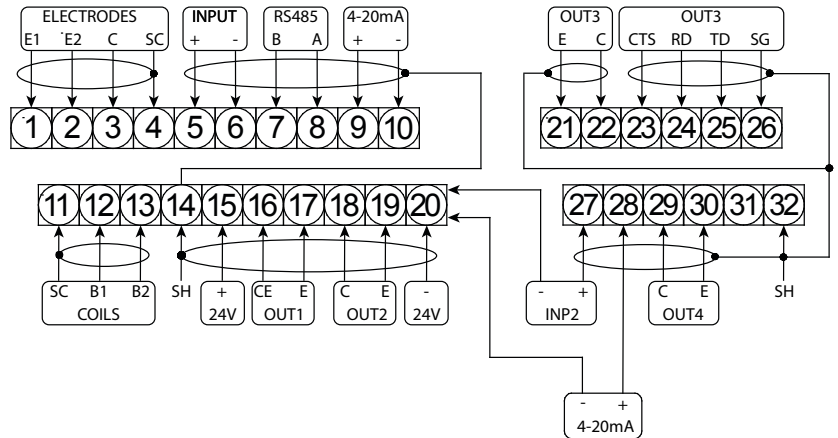
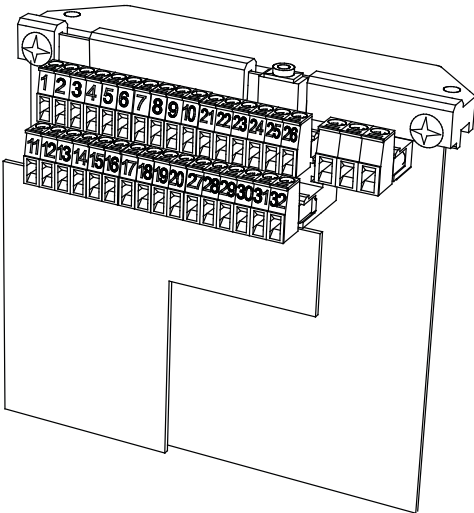


Flowrate value with currency function enabled

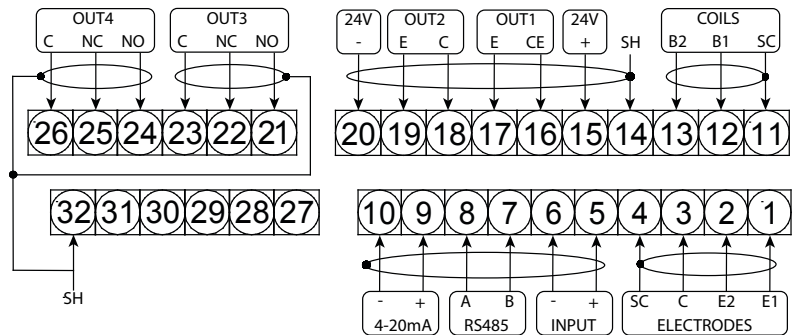
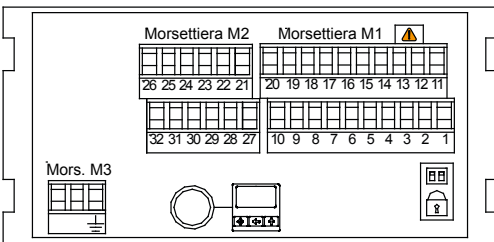
Different visualization possibilities with the simple press of a key

ELECTRICAL CONNECTIONS

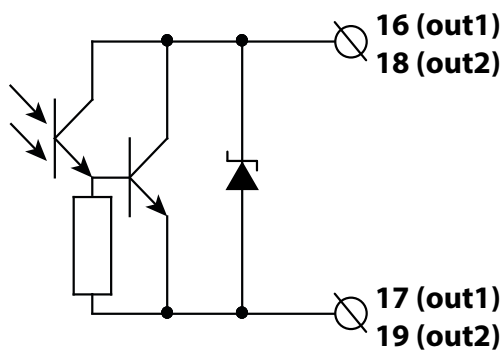
TERMINAL BLOCK: COMPACT/SEPARATE VERSION



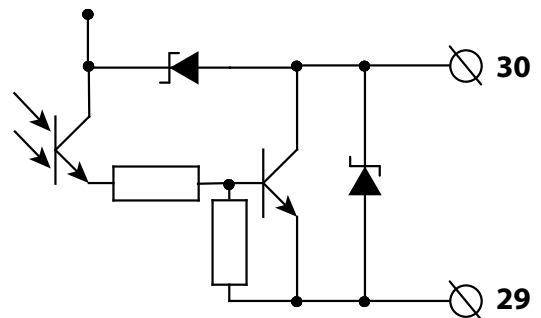
TERMINAL BLOCK: PANEL MOUNTING VERSION



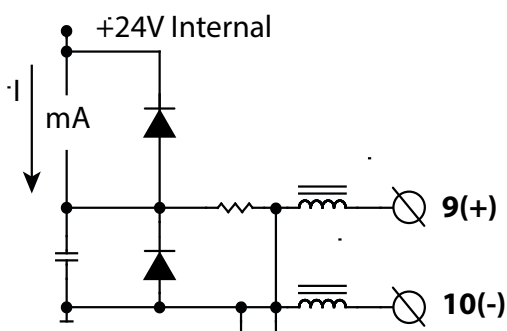
ON/OFF STANDARD OUTPUT



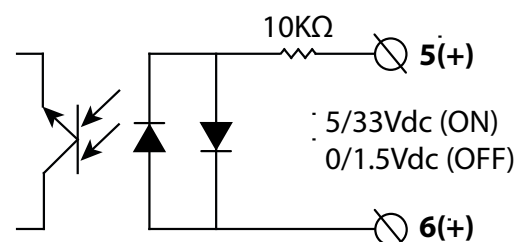
ON/OFF HIGH FREQUENCY OUTPUT



4/20 mA OUTPUT



ON/OFF INPUT



```

MAIN MENU
1-Sensor
1-SENSOR
ND=mm      10000
KA=        +01.0000
Sens.type=  014
Ins.position= 1
Ki=        1.0015
Kp=        0.8865
Cable len.=m 000
E.P.detect=  ON
E.cleaning=  OFF
E.p.thr.=   250
Autozero cal.

```

- 1.1 Insert sensor ND (0-3000mm)
- 1.2 Sensor calibration data, visualized on sensor's label
- 1.3 Type of sensor: Enter the first two characters of the sensor serial number
- 1.4 Position for insertion sensors: 0=1/8DN, 1=1/2DN, 2=7/8DN
- 1.5 Factory parameters automatically calculated (ONLY for insertion sensors)
- 1.6 Length of the cable connecting the sensor to the converter
- 1.7 Enables the empty pipe detection feature
- 1.8* Electrodes cleaning
- 1.9* Value of empty pipe sensibility detection
- 1.10* Enables the automatic procedure of zero calibration

```

MAIN MENU
1-Sensor
2-Scales
2-SCALES
Fs1=dm³/s  5.0000
Fs2=dm³/s  8.1920
Tot.MU=dm³  1.000
Pls1=dm³    1.00000
Pls2=dm³    1.00000
Tpls1=ms    0050.00
Tpls2=ms    0050.00
Frq1=Hz     1000.00
Frq2=Hz     1000.00
Mass units=  ON
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 place
- 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
- 2.8 Full scale freq. for channel 1 (0.1Hz-1000.0Hz) (0.1Hz-10000Hz with opt. module)
- 2.9 Full scale freq. for channel 2 (0.1Hz-1000.0Hz) (0.1Hz-10000Hz with opt. module)
- 2.10 Enable/disable the selection of mass units on full scale set
- 2.11 Specific gravity set in kg/dm³

```

MAIN MENU
1-Sensor
2-Scales
3-Measure
3-MEASURE
Damping=    OFF
Cut-off=%   00.7
Autocal.=   OFF
Autorange=  OFF

```

- 3.1* Measure filter
- 3.2 Low flow cut off threshold: 0-25% of full scale value
- 3.3 Enable every hour an internal cycle of calibration. Measurement stopped for 8-15 sec.
- 3.4* Automatic change of measurement range

```

MAIN MENU
1-Sensor
2-Scales
3-Measure
4-ALARMS
4-ALARMS
Max thr+=%  000
Max thr-=%  000
Min thr+=%  000
Min thr-=%  000
Hyst.=%     03
mA v.fault=% 000
Hz v.fault=% 125
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* Frequency output value in case of failure
- 4.8* Batch safety timer

```

3-Measure
4-ALARMS
5-INPUTS
5-INPUTS
T+ reset=   ON
P+ reset=   ON
T- reset=   OFF
P- reset=   ON
Puls.reset= OFF
Count lock= ON
Meas.lock=  OFF
Calibration= OFF
Range change= OFF
Batch=      ON
Inp.2=      OFF

```

- 5.1* Total direct (positive) flow totalizers reset enable
- 5.2* Partial direct (positive) flow totalizers reset enable
- 5.3* Total reverse (negative) flow totalizers reset enable
- 5.4* Partial reverse (negative) flow totalizers reset enable
- 5.5 Reset totalizers of pulse from digital input (see page 14)
- 5.6 Totalizers counting lock command (see page 14)
- 5.7* Block measures command
- 5.8* Autozero calibration external command
- 5.9 Range change external command (see function 3.5)
- 5.10 Batch start/stop external command (see batch functions)
- 5.11* Functions assigned to input 2

```

4-Alarms
5-Inputs
6-Outputs
6-OUTPUTS
Out1= #1 IMP+
Out2= SIGN
Out3= OFF
Out4= #2 IMP+
Out mA1=4÷22
Out mA2=4÷22

```

- 6.1* Output 1 functions
- 6.2* Output 2 functions
- 6.3* Output 3 functions
- 6.4* Output 4 functions
- 6.5* Choice of the function and the range of current output n.1
- 6.6* Choice of the function and the range of current output n.2

```

6-Outputs
7-Communication
7-COMMUNICATION
IF2 pr.= DPP
RS232 pr.= DPP
RS485 bps= 19200
RS232 bps= 19200
Printer= OFF
Print batch= OFF
Print data= OFF
Print events=OFF
A.delay=ms 20
Parity= NONE
Address= 000
Rem.addr.= 000
Remote u.conn.

```

- 7.1 Choice of the communication protocol for the IF2 device
- 7.2 Choice of the communication protocol for the RS232 port
- 7.3 Speed of the RS485 output (possible choices: 4800, 9600, 19200, 38400 bps)
- 7.4 Speed of the RS232 output (possible choices: 4800, 9600, 19200, 38400 bps)
- 7.5 Print function enable (optional)
- 7.6 Print of the performed batch
- 7.7 Print of the data process on regular intervals
- 7.8 Print of events
- 7.9 Instrument answer delay
- 7.10 RS485 parity
- 7.11 Address value of converter (range 0 - 255)
- 7.12 Address of a further converter connected like a terminal
- 7.13 Start remote connection to the terminal. Connection interrupted after 10sec. of inactivity

```

8-DISPLAY
Language= EN
D.rate=Hz 1
Contrast= 7
P.totaliz.= ON
Date/time= OFF
Quick start= OFF
Net total.= OFF
Currency= ON
Curr.decim.= 2
EUR/dm³+ 1.00000
EUR/dm³- 1.00000
Reset video= OFF
T+ reset
P+ reset
T- reset
P- reset

```

- 8.1 Choice of the language: EN= English, IT=italian, FR= French, SP= Spanish, DE=German
- 8.2 Display updating frequency: 1-2-5-10 Hz
- 8.3* Display contrast
- 8.4 Partial totalizer visualization (with batch enable the function is always on)
- 8.5 Date and time visualization with data logger enable
- 8.6 Quick start menu visualization
- 8.7 Enable the page of net totalizer (difference between direct and reverse)
- 8.8 Visualizes the values of the partial totalizers 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
- 8.12 Reset processor of the display (useful in case of particular badly operations of the display)
- 8.13* Total direct (positive) flow totalizer reset
- 8.14* Partial direct (positive) flow totalizer reset
- 8.15* Total reverse (negative) flow totalizer reset
- 8.16* Partial reverse (negative) flow totalizer reset

```

8-Display
9-Data logger
10-Diagnostic
11-Internal data

```

```

9-DATA LOGGER
1992/05/10 15:03
Acquisition= ON
Interval=h 24
Display data
Display events
Disp.min/max
Clear data
Clear events
Reset min/max

```

- 9.1* Date and time set
- 9.2 Automatic data logger enable
- 9.3 Interval time for the data logging function: 1, 2, 3, 6, 8, 12, 24, 48 hours
- 9.4 Displaying of the data stored in the data logger
- 9.5 Displaying of the last 64 alarms stored in the data logger
- 9.6 Visualization function of minimum and maximum peak of flow rate
- 9.7 Logged data cancel function
- 9.8 Reset all alarm events
- 9.9 Reset all minimum and maximum peak of flow rate stored

```

9-Data logger
10-Diagnostic
11-Internal data

```

MENU PRINCIPALE

10-DIAGNOSI
Calibrazione
Autotest
Simulatore= OFF
Firmware rev.

- 10.1* Calibration of the converter
- 10.2* Autotest converter
- 10.3* Flow rate simulation enabling
- 10.4 Firmware revision/version

6-Uscite
7-Comunicazione
8-Display
9-Data logger

10-Diagnosi
11-Dati interni

MENU PRINCIPALE

11-DATI INTERNI
Codice L2= 00000
Carica d.fabbr.
Carica d.utente
Salva d.utente
Ign.err.cal= 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)

8-Display
9-Data logger

10-Diagnosi
11-Dati interni

MENU 12: BATCH FUNCTION

MENU PRINCIPALE

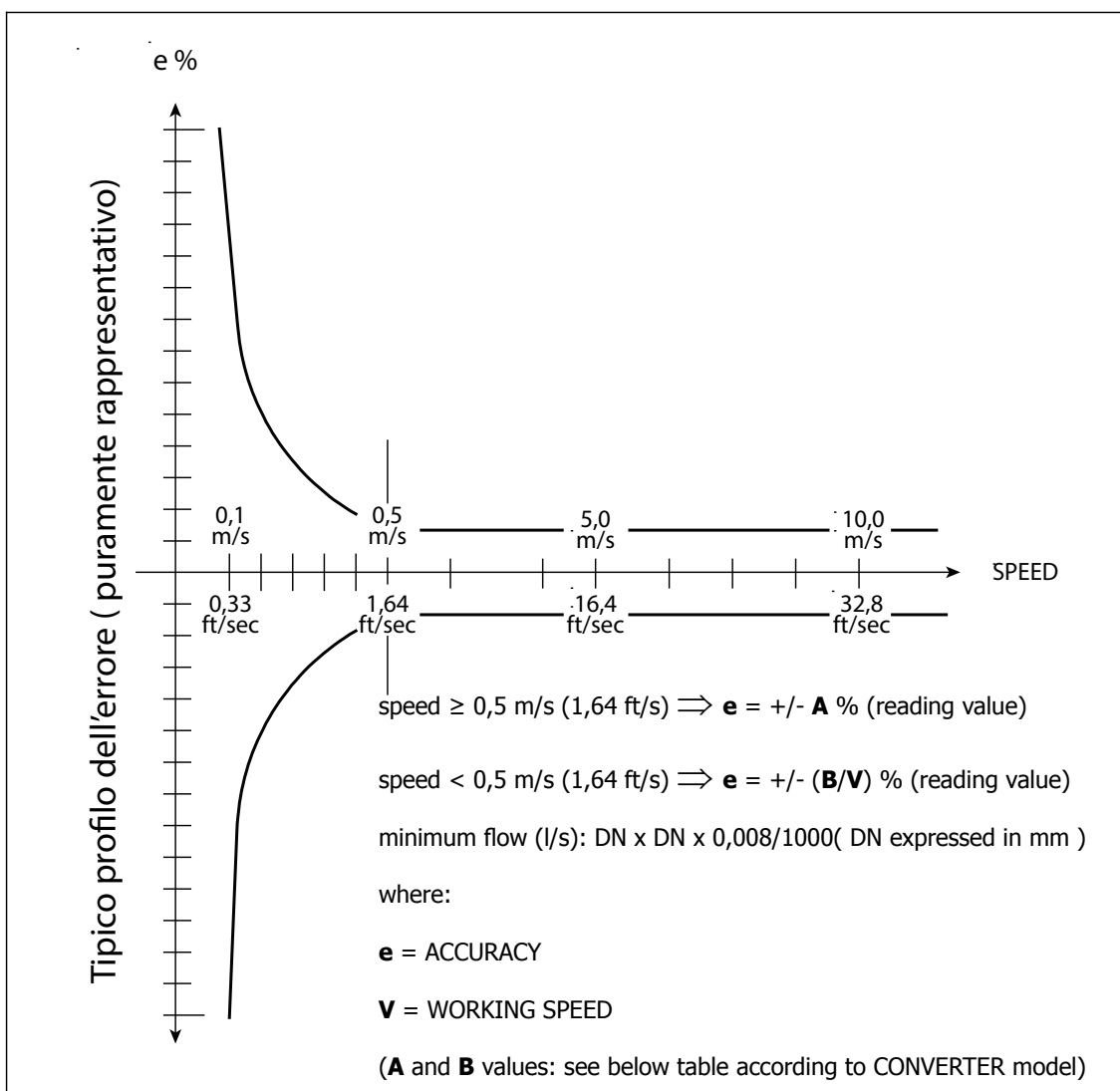
12-DOSAGGIO
N.medie= 000
Diff.max=% 010
V.com=dm³ 00.000
V.pre=dm³ 00.000
Dos.autom.= OFF
Sel.aut.MD= OFF
Modo cons.= OFF

- 12.1* Number of batch cycles to define the value of compensation. Value 0=OFF
- 12.2* % limit of compensation threshold
- 12.3* Compensation value
- 12.4* Prebatch value
- 12.5* Auto-batch
- 12.6* Automatic selection of batch formula
- 12.7* Static consent of batch

9-Data logger
10-Diagnosi
11-Dati interni

12-Dosaggio

TABELLA DELLE PRECISIONI



FULLBORE SENSOR

MS501/MS1000/MS2410/MS2500			MS 600			MS5000		
A	B(m/s)	B(ft/s)	A	B(m/s)	B(ft/s)	A	B(m/s)	B(ft/s)
0,2	0,1	0,33	0,4	0,2	0,66	2	1	3,28

INSERTION SENSORS

See sensors DATA SHEET

Reference conditions below and as per internal testing procedures:

- ☐ Constant flow rate during the test
- ☐ Pressure: >30 Kpa
- ☐ Flow condition : fully developed flow profile
- ☐ Zero stability $\pm 0,005 \%$

ML210/MS2500: MI-001 DETAILS

The sensor's diameters listed below, coupled with ML210, ML110 and 255 are certified according to European Directive 2004/22CE category MI-001 (OIML R49)

SENSOR SIZE	mm	25	32	40	50	65	80	100	125	150	200	250
	inch	1	1 ¼	1 ½	2	2 ½	3	4	5	6	8	10
Q1	m ³ /h	0.100	0.156	0.250	0.394	0.625	1.00	1.56	2.50	3.94	6.25	
Q2	m ³ /h	0.16	0.25	0.40	0.63	1.0	1.6	2.5	4.0	6.3	10	
Q3	m³/h	16.0	25.0	40.0	63.0	100.0	160.0	250.0	400.0	630.0	1000	1600
Q4	m ³ /h	20	31.3	50	78.8	125	200	312.5	500	787.5	1250	2000
R	Q3/Q1	160 (ML210-ML110)										
R	Q3/Q1	from 100 up to 400 (ML255)										

MI-001 ALLOWABLE RANGE

- Q3 allowed range:

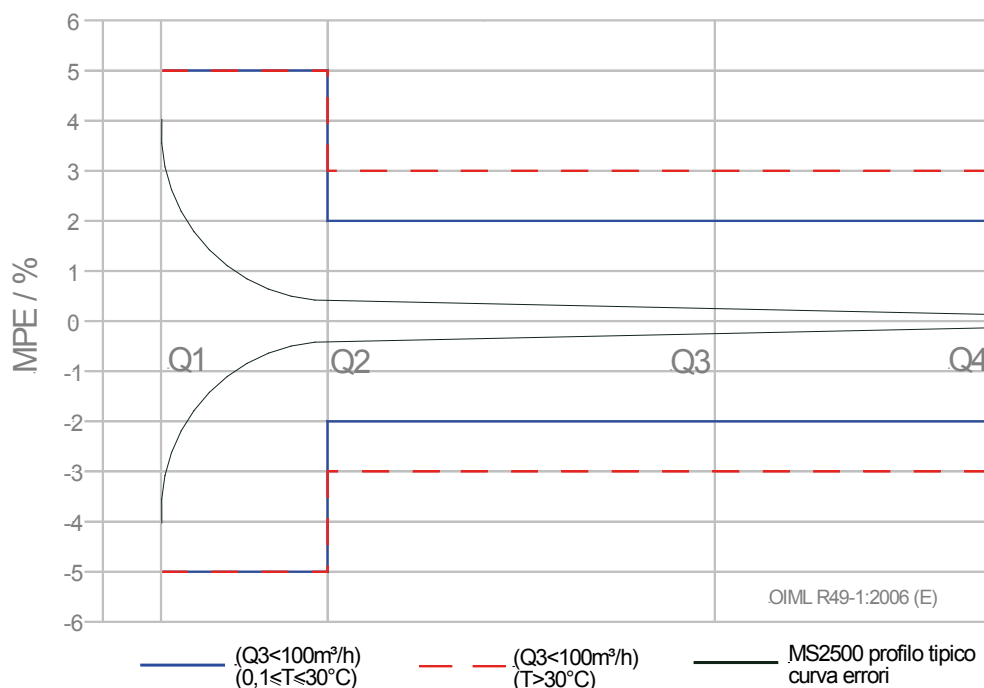
/m ³ h ⁻¹	/dm ³ s ⁻¹	/m ³ h ⁻¹	/dm ³ s ⁻¹	/m ³ h ⁻¹	/dm ³ s ⁻¹	/m ³ h ⁻¹	/dm ³ s ⁻¹	/m ³ h ⁻¹	/dm ³ s ⁻¹
1	0,278	1,6	0,444	2,5	0,694	4	1,111	6,3	1,750
10	2,778	16	4,444	25	6,944	40	11,11	63	17,50
100	27,78	160	44,44	250	69,44	400	111,1	630	175,0
1000	277,8	1600	444,4	2500	694,4	4000	1111	6300	1750

- R (= Q3/Q1) allowed range

10	12,5	16	20	25	31,5	40	50	63	80
100	125	160	200	250	315	400	500	630	800

- Q2/Q1=1,6
- Q4/Q3=1,25

OIML R49 ACCURACY CLASS 2 (MAXIMUM PERMISSIBLE ERROR)



ML210/MS2500: MI-004 DETAILS

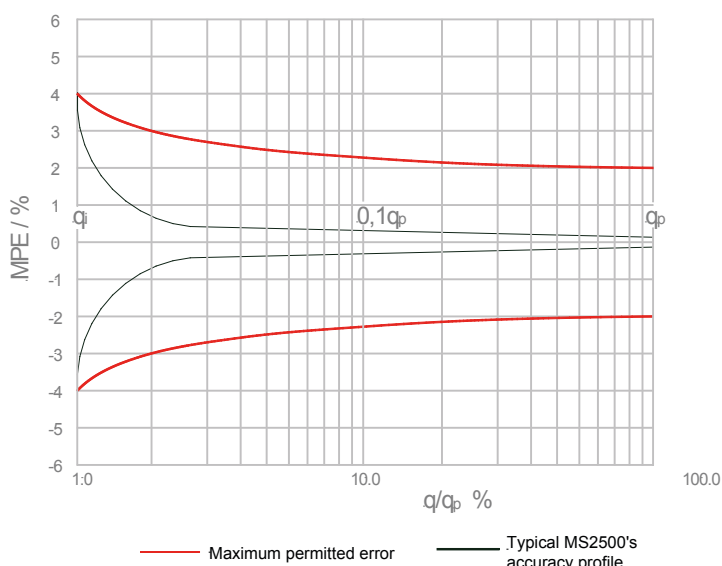
The sensor's diameters listed below, coupled with ML210 and ML110 , are certified according to European Directive 2004/22CE category MI-004

Sensor ND	mm	25	32	40	50	65	80	100	125	150	200
	inch	1	1 ¼	1 ½	2	2 ½	3	4	5	6	8
q_i	m ³ /h	0.16	0.25	0.40	0.63	1.0	1.6	2.5	4.0	6.3	10
0,1 q_p	m ³ /h	1.6	2.5	4.0	6.3	10	16	25	40	63	100
q_p (10m/s)	m ³ /h	16	25	40	63	100	160	250	400	630	1000
q_p/q_i		100	100	100	100	100	100	100	100	100	100

Sensor ND	mm	25	32	40	50	65	80	100	125	150	200
	inch	1	1 ¼	1 ½	2	2 ½	3	4	5	6	8
q_i	m ³ /h	0.20	0.32	0.50	0.80	1.26	2.0	3.2	5.0	8.0	12.6
0,1 q_p	m ³ /h	1.0	1.6	2.5	4.0	6.3	10	16	25	40	63
q_p (5m/s)	m ³ /h	10	16	25	40	63	100	160	250	400	630
q_p/q_i		50	50	50	50	50	50	50	50	50	100

Sensor ND	mm	25	32	40	50	65	80	100	125	150	200
	inch	1	1 ¼	1 ½	2	2 ½	3	4	5	6	8
q_i	m ³ /h	0.16	0.25	0.40	0.64	1.0	1.6	2.52	4.0	6.4	10
0,1 q_p	m ³ /h	0.40	0.63	1.0	1.6	2.5	4.0	6.3	10	16	25
q_p (2,5m/s)	m ³ /h	4.0	6.3	10	16	25	40	63	100	160	250
q_p/q_i		25	25	25	25	25	25	25	25	25	100

Sensor ND	mm	25	32	40	50	65	80	100	125	150	200
	inch	1	1 ¼	1 ½	2	2 ½	3	4	5	6	8
q_i	m ³ /h	0.16	0.25	0.40	0.63	1.0	1.6	2.5	4.0	6.3	10
0,1 q_p	m ³ /h	0.16	0.25	0.40	0.63	1.0	1.6	2.5	4.0	6.3	10
q_p (1,0m/s)	m ³ /h	1.6	2.5	4.0	6.3	10	16	25	40	63	100
q_p/q_i		10	10	10	10	10	10	10	10	10	10



HOW TO ORDER

CODE EXAMPLE	Display	
A	A	WITHOUT DISPLAY (BLIND EXECUTION)
	B	Graphic LCD WSTN- GREEN -back light display, point matrix 128 x 64, 8 line each of 16 characters and 3 keys
	C	Graphic LCD WSTN- WHITE -back light display, point matrix 128 x 64, 8 line each of 16 characters and 3 keys
Housing material / Protection rate		
0	0	Painted aluminum die casting, protection rate IP67
	1	AISI304 Stainless Steel housing, protection rate IP67 (DISPLAY NOT ROTABLE)
	2	NORYL UL 94 V-0 black (ONLY "F" VERSION) IP 40
	3	NORYL UL 94 V-0 BLACK (ONLY "F" VERSION)+TRANSPARENT FRONTAL COVER IP 65
	4	Painted aluminum die casting , protection rate IPXX , preset for CUSTOMER CABLE GLAND (Total Dim. Max available 105 x 52 mm)
	9	Painted aluminum die casting, protection rate IP68 (special version CONTACT THE FACTORY)
Version		
A	A	Compact version with sensor MS.... (liquid maximum temperature 100 °C)
	B	Separate version (CABLE C015-C016 OR C014 with preamp.) for wall mounting, complete with mounting accessories in Aluminum (painted RAL6028)
	D	Separate version (CABLE C015-C016 OR C014 with preamp.) for wall mounting, complete with mounting accessories in AISI304
	F	Separate version (CABLE C015-C016 OR C014 with preamp.) for FRONT PANEL mounting according DIN 43700(72x144) complete with mounting accessories; AVAILABLE ONLY FOR HOUSING MATERIALS OPTIONS 2 AND 3 (SEE ABOVE)
Power supply		
1	1	Power supply : 100 ... 240 V 44-66 Hz
	2	Power supply : 15...45 VAC-DC / 44-66 Hz
	3	Power supply : 12 ... 35 V dc
	9	Power supply : other
Analogue output		
A	A	Without Analogue output
	B	Analogue output 0/4...20/22 mA
Serial Interface		
1	1	Without RS485 Serial Interface
	2	RS485 Serial Interface
	3	Modbus protocol over RS 485 interface
Additional module		
A	A	Without additional module
	C	ME200; n. 2 additional ON / OFF programmable output + 1 ON/OFF INPUT
	D	ME201; n. 2 additional ON / OFF programmable output (one of them at 10 KHz frequency)+ 1 ON/OFF INPUT
	E	ME202; additional 0/4...20 mA + n.2 ON / OFF programmable output + 1 ON/OFF INPUT
	F	ME203; n. 1 RS232 serial interface + n.2 additional ON / OFF programmable output + 1 ON/OFF INPUT
	G	ME204; n. 1 RS232 serial interface + additional 0/4...20 mA + n.2 ON / OFF program. output + 1 ON/OFF INPUT
	P	ME205; n. 2 relè output (each with 1 NO contact + 1 NC contact, 2A - 60 Vca, 60W 125 VA)
	T	ME207; n. 2 relè output (each with 1 NO contact + 1 NC contact, 2A - 250 Vca, 60W 125 VA)
	H	ME 100 ; Profibus DP communication module (NOT POSSIBLE IF HOUSING MATERIAL 2 AND 3)
	1	BlueTooth INTERFACE
	2	ME101 - HART PROTOCOL OUT (NOT POSSIBLE IF HOUSING MATERIAL 2 AND 3) Hart certified.
	Z	Other

Special Features		
0	0	NONE
	1	WITH ANTICONDENSE CAP
	2	n° 4 CABLE GLAND 1/2" NPT - IP68 - Nickel plated brass CODE 1.609.1200.70 (CABLE 6 - 12 mm)
	3	PAINT RAL9005 (BLACK)



ML210-A0A1A1A0 (Complete code example for order)

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

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