

DATA SHEET



ML 155

**Stand alone Converter
for Flow and Pressure Management**

Official Isoil dealer in The Netherlands:

UFM

ISOIL 
I N D U S T R I A

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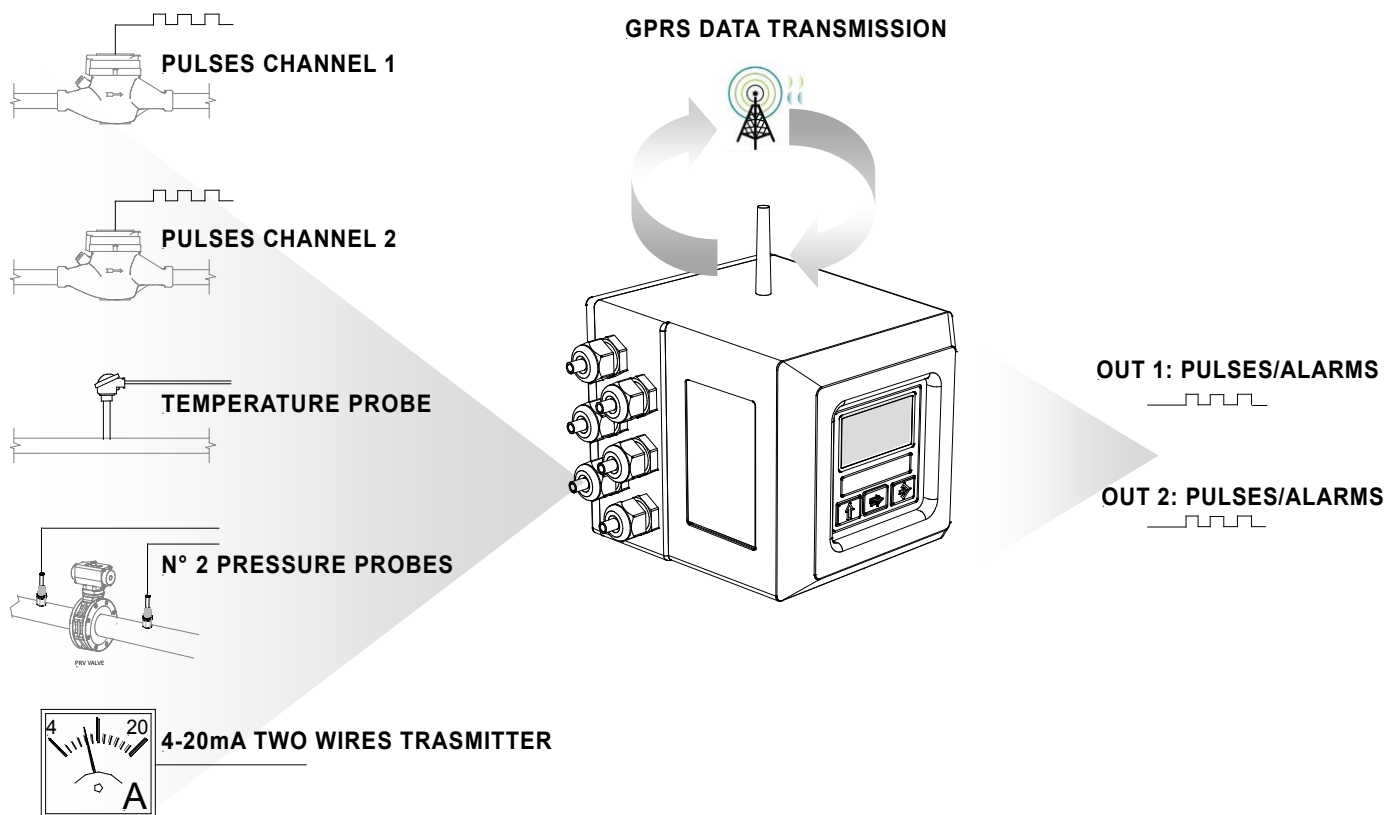
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GENERAL DESCRIPTION

Stand-alone converter for flow and pressure management .

It allow to measure :

- Two flow rate coming from pulses emitter
- One temperature (PT500)
- Two pressure
- 4/20 mA from transmitter (like level transmitter)



TECHNICAL DATA

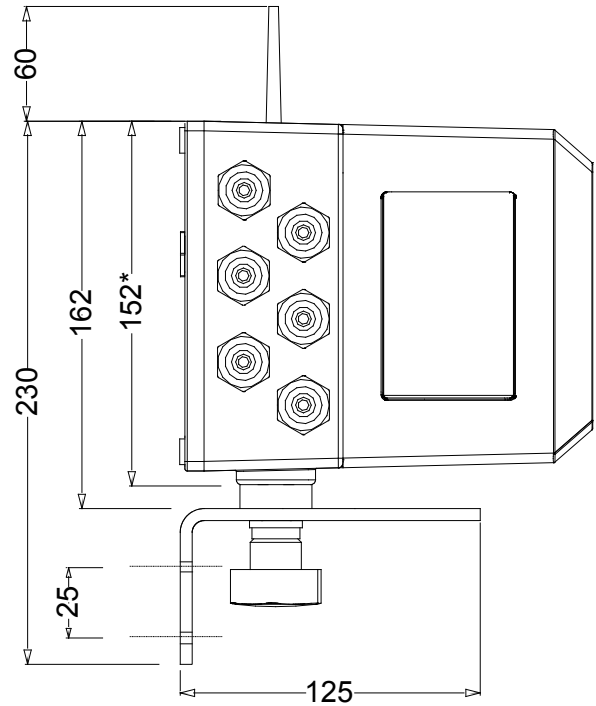
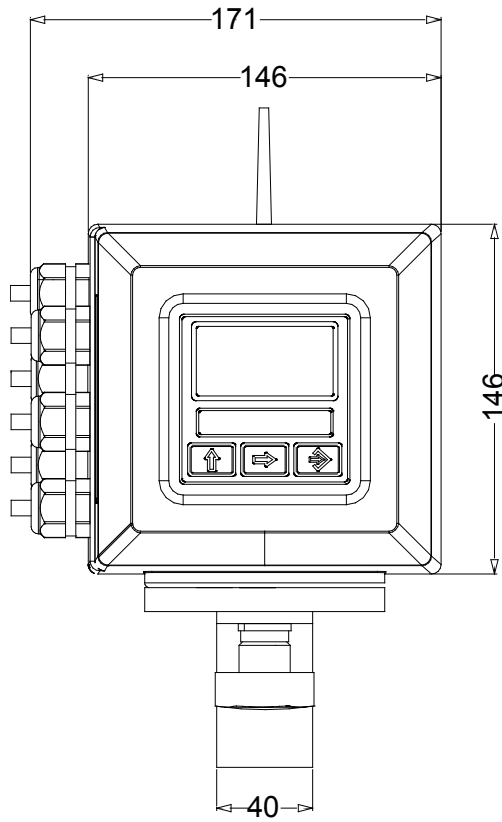
OVERALL FEATURES	
Suitable For	<input type="checkbox"/> Isomag PRESSURE SENSOR-Pulses from Woltman/Turbine/etc.-Temperature Probe- 4-20 mA transmitters
Power consumption	<input type="checkbox"/> MAX : 200 mW (Batteries) , 4 W (Main supply)
Altitude	<input type="checkbox"/> -200 m up to 2000 m
Ambient Temperature	<input type="checkbox"/> -20... +60°C / -4... +140 °F
Humidity Range	<input type="checkbox"/> 0÷100% (IP 67)

STANDARD FEATURES	
Housing materials	<input type="checkbox"/> Painted Aluminium die casting
Protection Rate	<input type="checkbox"/> IP 67
Data Logger	<input type="checkbox"/> MicroSD Memory Card 2 GBytes
Data storage	<input type="checkbox"/> F-Ram
Protocols	<input type="checkbox"/> ETP
Galvanic Isolation	<input type="checkbox"/> All the outputs are galvanically insulated from power supply up to 500 V
Programming Plug In	<input type="checkbox"/> Protected plug in for the connection to PC (IF2X interface)
Diagnostic Functions	<input type="checkbox"/> Yes
Digital Input	<input type="checkbox"/> N°1 for totalizer reset, system wake-up
CE Certification	<input type="checkbox"/> Yes

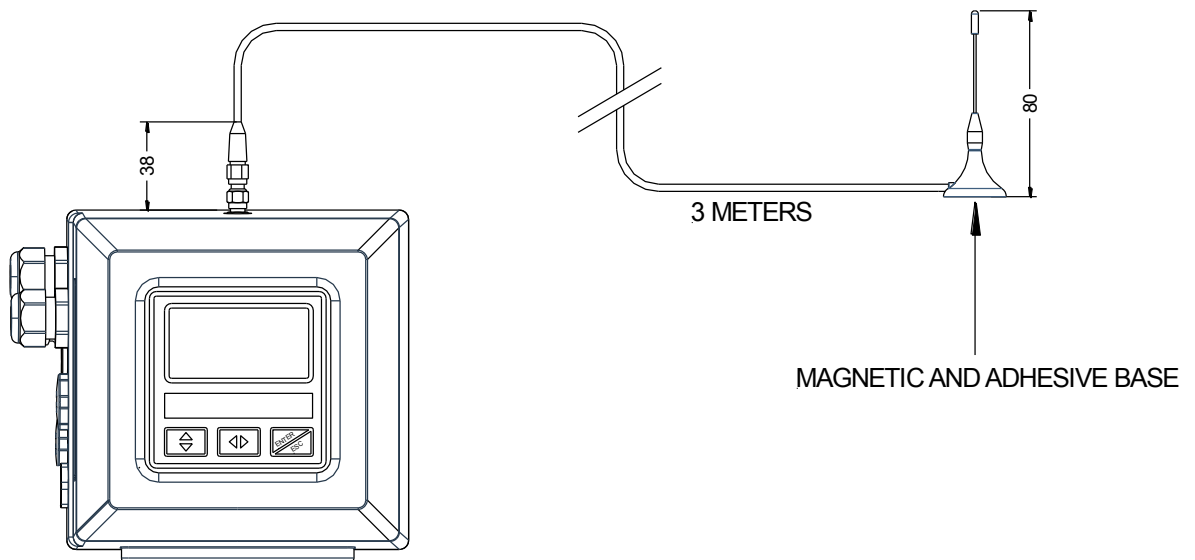
OPTIONAL FEATURES <i>(CHECK HOW TO ORDER, AT LAST PAGE, FOR MORE DETAILS)</i>	
Housing materials	<input type="checkbox"/> AISI304
Protection Rate	<input type="checkbox"/> IP 68
Wires connections	<input type="checkbox"/> IP 68 Connectors
LCD Display	<input type="checkbox"/> Graphic display WSTM 128x64 pixels, 3 membrane keys
Power Supply	<input type="checkbox"/> Mixed System Main Power Supply and Batteries as Backup
Pulses/ Alarm Outputs	<input type="checkbox"/> N°2 , 50 Hz, 100mA, 40 Vdc , N°1 On/Off Input
Additional Modules	<input type="checkbox"/> Communication, GSM /GPRS (SMS/CSD System)
Communication port	<input type="checkbox"/> RS232 (DPP/HTP protocols)
Additional measures	<input type="checkbox"/> UP to 2 Pressure Sensors <input type="checkbox"/> ONE Temperature Sensor <input type="checkbox"/> N°2 Pulses inputs from remote flow sensor (32Hz) Note: for temperature measure Two Wires PT500 must be used ; check last page for possible combinations of the above.

ACCURACY	
Measurements tolerance	<input type="checkbox"/> Flow rate (volume) = $\pm 0,1\%$ v.l. <input type="checkbox"/> Out 4/20 mA = $\pm 0,5\%$ v.l. <input type="checkbox"/> Frequency Out = $\pm 0,1\%$ v.l.

OVERALL DIMENSIONS

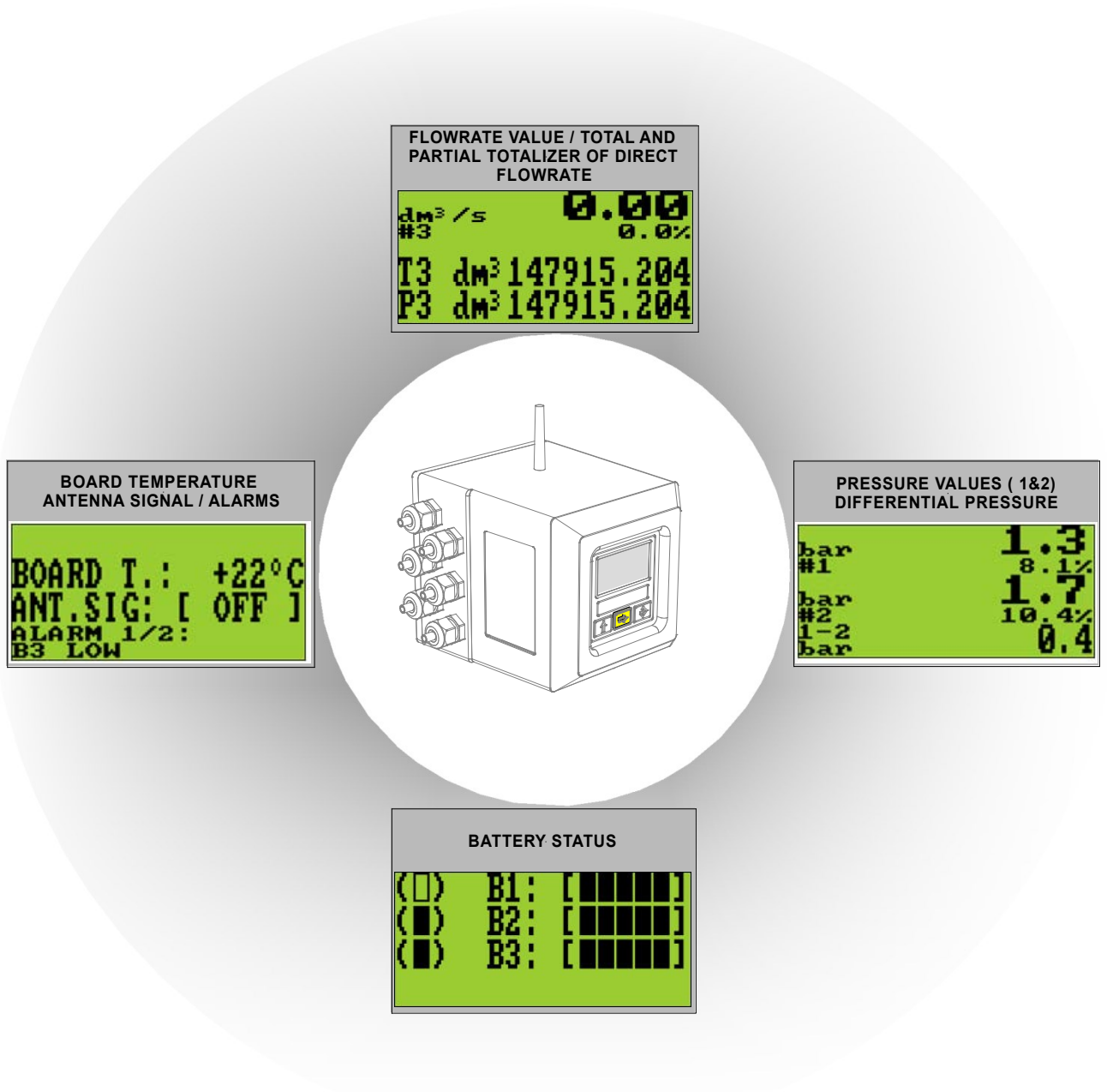


VERSION WITH 3 METERS CABLE ANTENNA



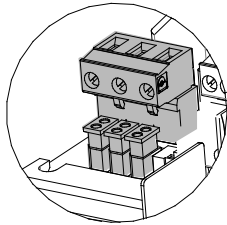
VISUALIZATION PAGES

Different visualisation possibilities with the simple press of a key 

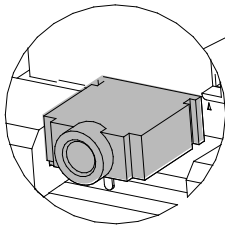


PCB LAYOUT

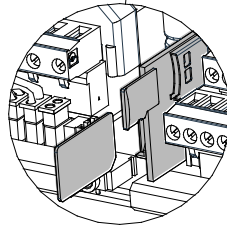
Terminal block M3 (OPT.)
And battery connections



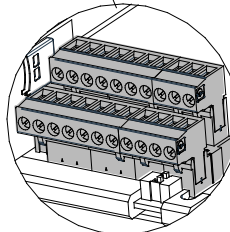
IF2X socket



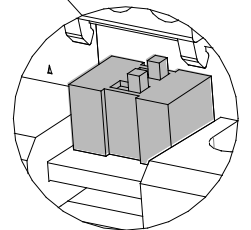
SIM GSM and SD
memory card



Terminal block M1

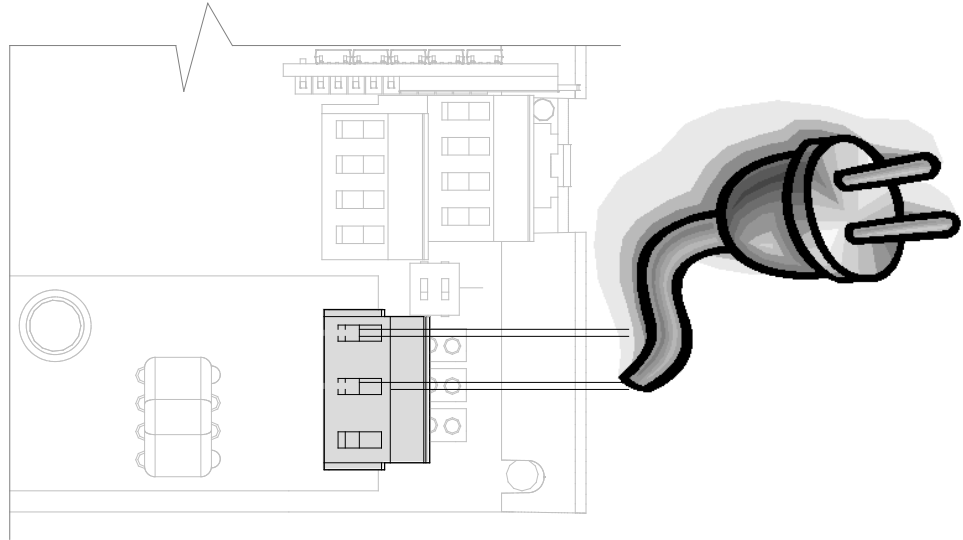


Key pad block



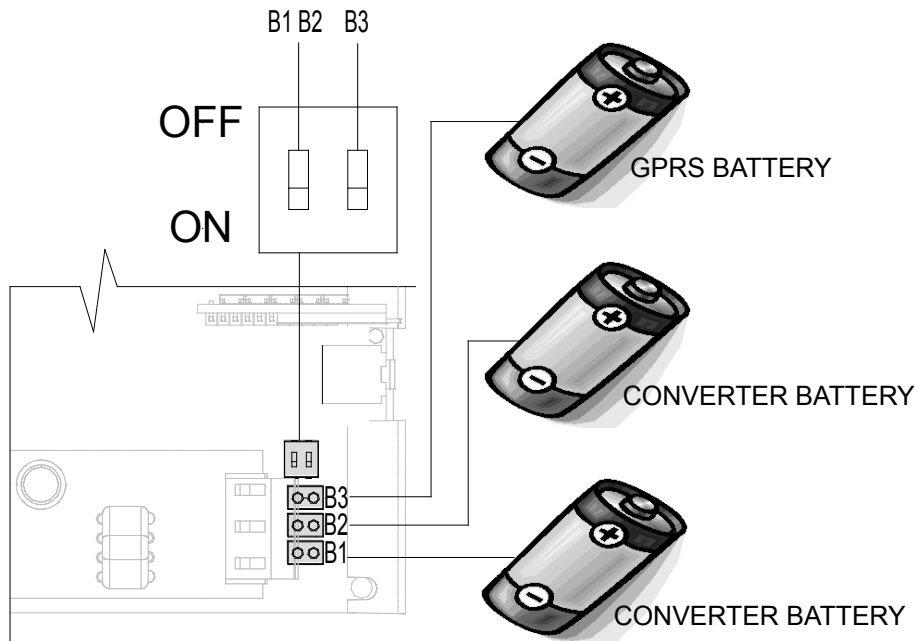
POWER SUPPLY

BY MAIN VOLTAGE



Auto detection of converter power source: batteries are automatically excluded if still main power; it always works at the maximum sampling rate (continuous sampling).

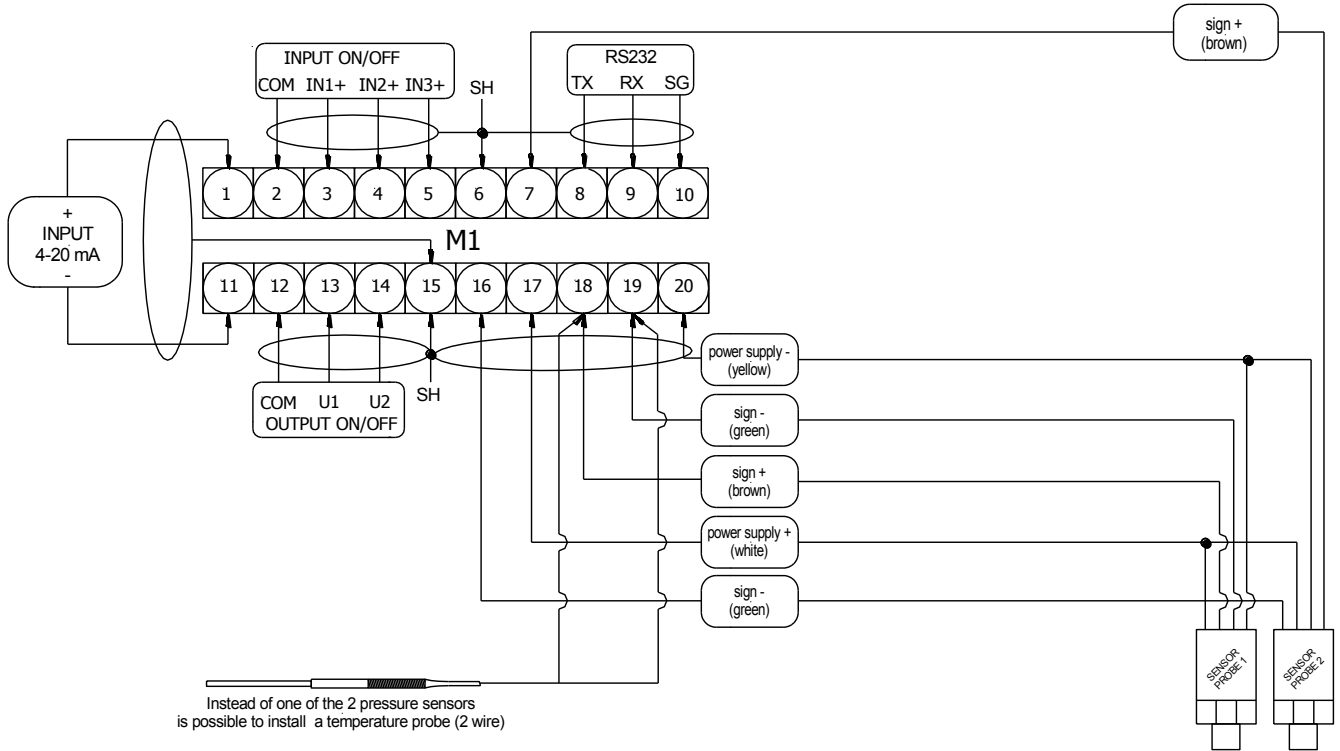
BY BATTERIES



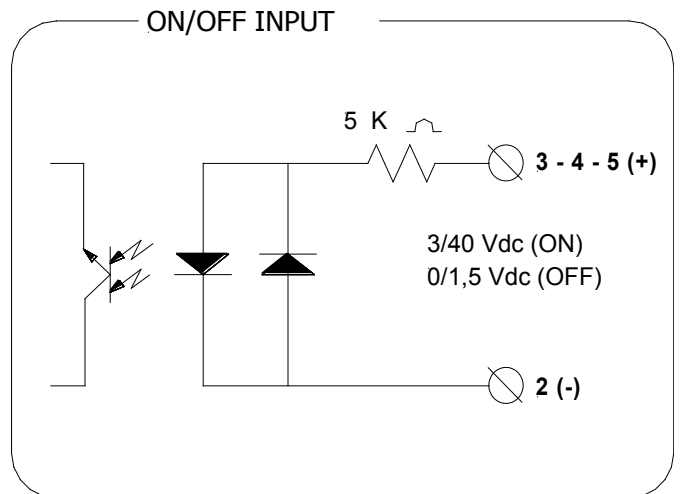
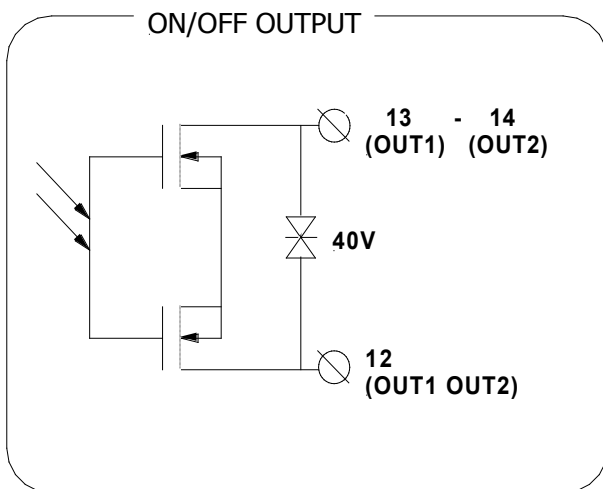
Note : Lithium batteries are subject to special transportation regulations according to "Regulation of Dangerous Goods, UN3090 and UN 3091". Special documentation is required to observe these regulations. This may influence both, transportation time and costs.

ELECTRICAL CONNECTIONS

TERMINAL BLOCK



DIGITAL INPUT / OUTPUT



FUNCTION'S LIST

MAIN MENU		
1-Scales		
1-SCALES		
Fs1=dm ³ /s	5.00000	1.1* Full scale 1 value (ON/OFF input)
Fs2=dm ³ /s	100.000	1.2* Full scale 2 value (ON/OFF input)
Fs3=dm ³ /s	100.000	1.3* Full scale 3 value (4-20mA input)
Fs.ps=bar	10.00	1.4 Full scale value set for pressure measure
Temp.u.meas.=	°C	1.5 Unit of measure of temperature
Tot1MU=dm ³	00001	1.6* Unit of measure and number of decimal totalizer 1
Tot2MU=dm ³	00001	1.7* Unit of measure and number of decimal totalizer 2
Tot3MU=dm ³	00001	1.8* Unit of measure and number of decimal totalizer 3
Ips1=dm ³	1.00000	1.9* Pulse value on input 1
Ips2=dm ³	2.00000	1.10*Pulse value on input 2
Pls1=dm ³	3.00000	1.11*Pulse value on output 1
Pls2=dm ³	4.00000	1.12*Pulse value on output 2
TPs1=ms	0010.0	1.13*Pulse duration on input 1
TPs2=ms	0020.0	1.14*Pulse duration on input 2

MAIN MENU		
1-Scales		
2-Measure		
2-MEASURE		
Cut-off=%	00.0	2.1 Low flow zero threshold: 0-25% of full scale value
Interv=s	10	2.2 Interval time between 2 measure
In1 avg.mode=	ON	2.3 Enable average mode input 1
Max.per.1=s	0060	2.4 Maximum period for input 1
In2 avg.mode=	ON	2.5 Enable average mode input 2
Max.per.2=s	0060	2.6 Maximum period for input 2
Analog in=	Q3	2.7 Analog input for flow rate or level

MAIN MENU		
1-Scales		
2-Measure		
3-alarms		
3-ALARMS		
Al.maxQ1=%	000	3.1 Maximum value alarm set for flow rate input 1
Al.minQ1=%	000	3.2 Minimum value alarm set for flow rate input 1
Al.maxQ2=%	000	3.3 Maximum value alarm set for flow rate input 2
Al.minQ2=%	000	3.4 Minimum value alarm set for flow rate input 2
Al.maxQ3=%	000	3.5 Maximum value alarm set for flow rate input 3
Al.minQ3=%	000	3.6 Minimum value alarm set for flow rate input 3
Al.maxP1=%	000	3.7 Maximum value alarm set for pressure 1
Al.minP1=%	000	3.8 Minimum value alarm set for pressure 1
Al.maxP2=%	000	3.9 Maximum value alarm set for pressure 2
Al.minP2=%	000	3.10 Minimum value alarm set for pressure 2
Al.maxDP=%	000	3.11 Maximum value alarm set for differential pressure
Al.minDP=%	000	3.12 Minimum value alarm set for differential pressure
Hyst.=%	03	3.13 Hysteresis threshold set for the minimum and maximum flow rate alarms

MAIN MENU		
1-Scales		
2-Measure		
3-alarms		
4-Inputs		
4-INPUTS		
In1=	PULSES	4.1* Digital input 1 mode
In2=	PULSES	4.2* Digital input 2 mode
TI1 reset=	OFF	4.3* Total flow totaliser 1 reset enable
TI2 reset=	ON	4.4* Partial flow totaliser 1 reset enable
TI3 reset=	ON	4.5* Total flow totaliser 2 reset enable
TI2 reset=	OFF	4.6* Partial flow totaliser 2 reset enable
TI3 reset=	ON	4.7* Total flow totaliser 3 reset enable
TI3 reset=	OFF	4.8* Partial flow totaliser 3 reset enable
Integr.chk=	OFF	4.9 Integrity check enable
Wake-up=	OFF	4.10* Auto-switch on command

MAIN MENU		
1-Scales		
2-Measure		
3-alarms		
4-Inputs		
5-Outputs		
5-OUTPUTS		
Out1=	PLS1	5.1* Output 1
Out2=	PLS3	5.5* Output 2
IPwr src=	ON	5.6 Power supply of pressure probes

```

MAIN MENU
1-Scales
2-Measure
3-Alarms
4-Inputs
5-Outputs
5-OUTPUTS
Out1= DIRECT. DR.
Out1= HOURLY
T.ON =00d00h00m
T.OFF =00d00h00m
Out2= PLS3
Pwr src= ON

```

- 5.1* Output 1 set on DIRECT. DR. function
- 5.2 Frequency of output drive
- 5.3 Interval time of output switch on
- 5.4 Interval time of output switch off

The function DIRECT. DR. can be assigned to all outputs

```

4-Inputs
5-Outputs
6-Communication
6-COMMUNICATION
IF2 prot.= DPP
RS232 prot.= DPP
Address= 101
RS232 bps= 38400
Min. ant. s.= % 10
Send DL= mail
Send DL= PERIODIC
Send DL= HOURLY
Time =00d00h59m
Send PD= OFF
Send AL= mail
T.min AL =00m00s
Chk SMS= OFF
Ck mail= OFF
Clock s= OFF
Send events= OFF
Roaming= OFF
Send DL
Send events
Send config.
Clock s
Ck mail
Chk SMS

```

- 6.1 Choice of the IF2 communication protocol
- 6.2 Choice of the RS232 communication protocol
- 6.3 Address RS232 port
- 6.4 RS232 port speed
- 6.5 Minimum antenna signal strength to send e-mail*
- 6.6 Choice of how to send data logger*
- 6.7 Choice of when send data logger*
- 6.8 Interval of data logger sending if 6.7 is set on "PERIODIC"*
- 6.9 Interval of sending DATA LOGGER*
- 6.10 Enables send Process data*
- 6.11 Enables send Alarm*
- 6.12 Minimum time to send Alarm*
- 6.13 Enables check INCOMING SMS*
- 6.14 Enables check INCOMING E-MAIL*
- 6.15 Enables clock synchronization with a specified server via the HTTP protocol*
- 6.16 Enables send EVENTS*
- 6.17 Roaming enable*
- 6.18 Send Data Logger, instant command*
- 6.19 Send EVENTS, instant command*
- 6.20 Send configuration through e-mail immediately*
- 6.21 Clock synchronization, immediately, with a specified server via the HTTP protocol*
- 6.22 Check INCOMING E-MAIL, instant command*
- 6.23 Check INCOMING SMS, instant command*

* (Communication function group only) = see wireless specific manual supplied for more details

```

5-Outputs
6-Communication
7-Display
7-DISPLAY
Language= EN
D.time=s 020
Quick start= OFF
Disp.lock= OFF
IT1 reset
IP1 reset
IT2 reset
IP2 reset
IT3 reset
IP3 reset

```

- 7.1 Choice of the language: EN= English, IT=Italian, FR= French, SP= Spanish
- 7.2 Time for switch off display
- 7.3 Visualization of "Quick start menu"
- 7.4 Lock of DISPLAY in ONE SPECIFIC visualization page
- 7.5* Total flow totalizer 1 reset from keyboard
- 7.6* Partial flow totalizer 1 reset from keyboard
- 7.7* Total flow totalizer 2 reset from keyboard
- 7.8* Partial flow totalizer 2 reset from keyboard
- 7.9* Total flow totalizer 3 reset from keyboard
- 7.10* Partial flow totalizer 3 reset from keyboard

Menu Item	Description
6-Communication	
7-Display	
8-Data logger	
1 8-DATA LOGGER	
2011/08/05 11:14	8.1* Date and time set
T.zone=h +00.0	8.2 Set of Time Zone (Against GMT -12 to +12 hours)
Acquisition= ON	8.3* Automatic data logger enable
Comp.mode= OFF	8.4 Data formatted like ML250 (see ML250 manual)
Double int.= ON	8.5 Choice of single (off) or double (on) logging interval
int.1 =00h00m01s	8.6 Interval time 1 for the data logging function
int.2 =00h00m01s	8.7 Interval time 2 for the data logging function
int.2 = HOURLY	8.8 Interval period 2 for the data logging function
T.ON =00d00h00m	8.9 Interval 2 start logging time
T.OFF =00d00h00m	8.10 Interval 2 stop logging time
Log TT1= OFF	8.11 Enables the logging of total totalizer 1
Log TP1= OFF	8.12 Enables the logging of partial totalizer 1
Log Q1= OFF	8.13 Enables the logging of flow rate 1
Log TT2= OFF	8.14 Enables the logging of total totalizer 2
Log TP2= OFF	8.15 Enables the logging of partial totalizer 2
Log Q2= OFF	8.16 Enables the logging of flow rate 2
Log TT3= OFF	8.17 Enables the logging of total totalizer 3
Log TP3= OFF	8.18 Enables the logging of partial totalizer 3
Log Q3/LV= OFF	8.19 Enables the logging of flow rate/level input 3
Log P1= ON	8.20 Enables the logging of pressure 1
Log P2= OFF	8.21 Enables the logging of pressure 2
Log TEMP= OFF	8.22 Enables the logging of temperature
M.units= ON	8.23 Enables the sending of measure units (technical units)
% values= OFF	8.24 Enables the sending of measure units (%)
Separator= ;	8.25 Symbol used as separator on CSV files

Menu Item	Description
7-Display	
8-Data logger	
9-Diagnostic	
1 9-DIAGNOSTIC	
Self test	9.1* Converter auto-test
Simulation= OFF	9.2* Flow rate simulation enabling
Stand-by	9.3* Stand-by function
Gprs test	9.4 Test of GPRS connections
Read SDC info	9.5 SD card status/info
Firmware rev.	9.6 Firmware revision/version

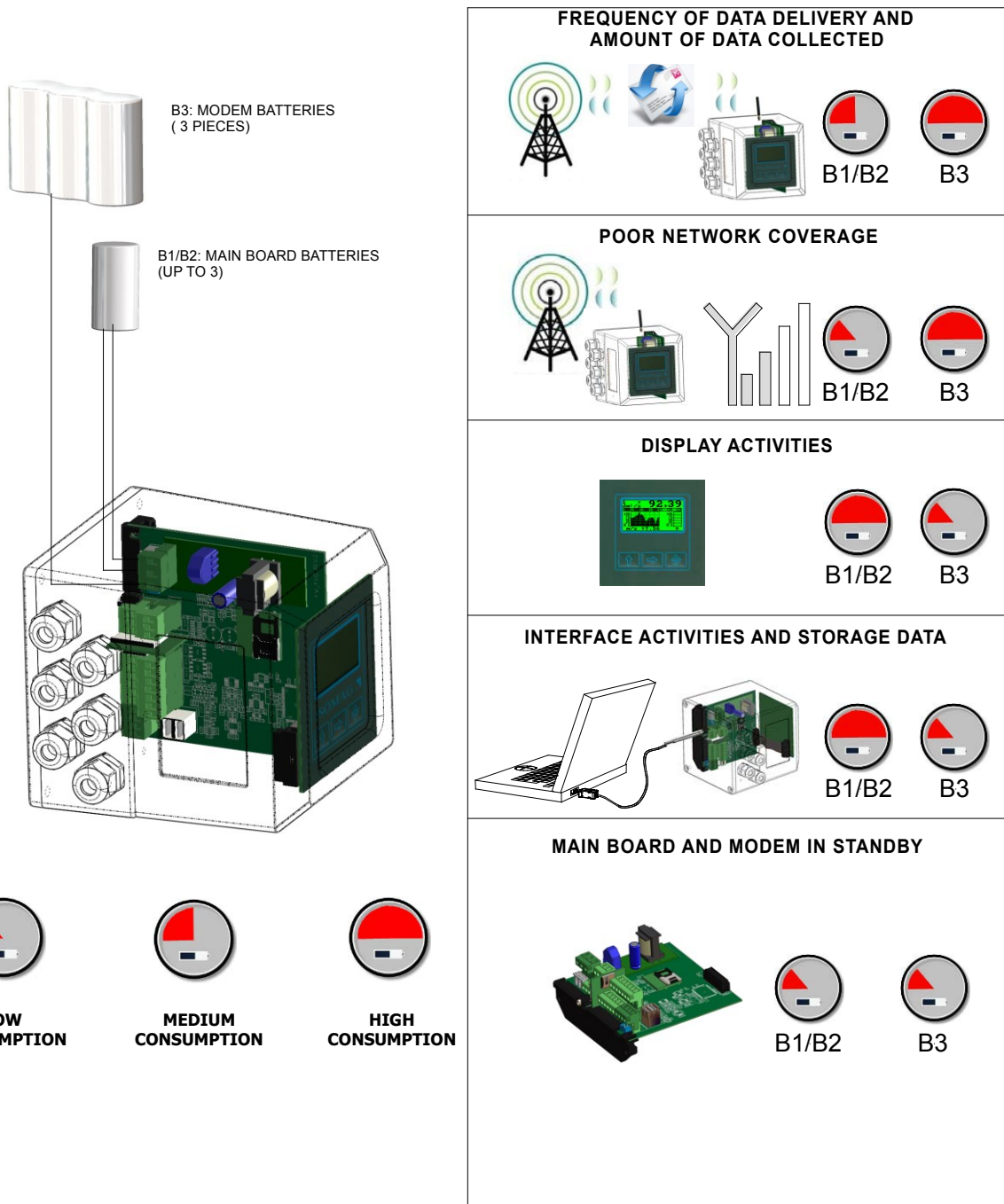
Menu Item	Description
8-Data logger	
9-Diagnostic	
10-INTERNAL DATA	
L2 code= *****	10.1 Level 2 access code enter
Load fact.pres.	10.2 Load factory data pre-set
Load user pres.	10.3 Load user data pre-set
Save user pres.	10.4 Save user data pre-set

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

BATTERIES CONSUMPTION

The batteries consumption depends from the setting of the followings elements: main board, sampling interval (measure profile), sensor diameter, modem wireless link condition, frequency of data delivery, amount of data collected, interface activities (display/modem activities).

Special software to calculate the consumption is available; here below a simple scheme to evaluate the different "weight" consumption's of each element.



BATTERIES LIFE

Power tool software



Power tool is a software which allows to evaluate the converter battery life. The estimation is done with an easy guided procedure

HOW TO ORDER

CODE		DISPLAY
B	A	Blind execution (without display and programming keys)
	B	Graphic LCD WSTN 128 x 64, 8 line each of 16 characters and 3 programming keys
HOUSING MATERIAL / PROTECTION RATE		
0	0	Painted aluminium die casting , protection rate IP 67
	1	AISI304 Stainless Steel housing, protection rate IP67 (DISPLAY NOT ROTABLE)
	2	Painted aluminium die casting IP 68 1,5 meters under water
VERSION		
B	B	Separate version for wall mounting, complete with mounting accessories in Aluminium (painted RAL6028)
	D	Separate version for wall mounting, complete with mounting accessories in AISI304
POWER SUPPLY		
1	0	n° 1 LITHIUM BATTERY - WITHOUT UNIVERSAL POWER SUPPLY
	1	n° 1 LITHIUM BATTERY - WITH UNIVERSAL POWER SUPPLY
	2	n° 4 LITHIUM BATTERY (1 + 1 OF 3 ELEMENTS PACK NECESSARY FOR GPRS) - WITH UNIVERSAL POWER SUPPLY
	4	n° 6 LITHIUM BATTERY (N° 2 X 3 ELEMENTS PACK) - WITHOUT UNIVERSAL POWER SUPPLY
	5	N° 3 LITHIUM BATTERY (N° 1 OF 3 ELEMENTS PACK) - WITHOUT UNIVERSAL POWER SUPPLY
	6	n° 4 LITHIUM BATTERY (1 + 1 OF 3 ELEMENTS PACK NECESSARY FOR GPRS) - WITHOUT UNIVERSAL POWER SUPPLY
	7	WITHOUT BATTERY WITH UNIVERSAL POWER SUPPLY
	8	WITHOUT BATTERY WITHOUT UNIVERSAL POWER SUPPLY
	9	n° 6 LITHIUM BATTERY (N° 2 X 3 ELEMENTS PACK) - WITH UNIVERSAL POWER SUPPLY
	a	n° 2 LITHIUM BATTERY (1+1) - WITHOUT UNIVERSAL POWER SUPPLY
	b	n° 5 LITHIUM BATTERY (1+1 +1 OF 3 ELEMENTS PACK) - WITHOUT UNIVERSAL POWER SUPPLY
INPUT		
B	B	N° 1 Pressure probe (to be specified the pressure span) for REMOTE PROBE VERSION (ADD THE PRICE, SEE "XXACCREV00GEN-PRESSURE GAUGE" OF PRICE LIST)
	C	N° 1 Pressure probe (to be specified the pressure span) complete of 1/8" QUICK CONNECTOR FOR RUBBER TUBE MOUNTED ON CONVERTER HOUSING
	D	n° 2 Pulses input (Max 32 Hz) from passive contact
	E	OPTION C + D
	F	OPTION B+D (ADD THE PRESSURE PROBE PRICE, SEE "XXACCREV00GEN-PRESSURE GAUGE" OF PRICE LIST)
	G	N° 2 Pressure probe (to be specified the pressure span) for REMOTE PROBE VERSION (ADD THE PRICE, SEE "XXACCREV00GEN-PRESSURE GAUGE" OF PRICE LIST)
	H	OPTION G + D
	I	N° 1 Sensor Temperature (2 Wire - PT500)
	L	N° 1 Sensor Temperature (2 Wire - PT500) + N° 1 Pressure probe (to be specified the pressure span) for REMOTE PROBE VERSION (ADD THE PRICE, SEE "XXACCREV00GEN-PRESSURE GAUGE" OF PRICE LIST)
	M	4/20 mA input for LEVEL/FLOW RATE (TWO-WIRE, PASSIVE)
	N	Options B + M
	O	Options D + M
	P	Options D + G complete of n° 4 connettori IP 68 + 4 IP68 Connector PLUG
	R	Options B + D complete of n° 3 connettori IP 68 + 3 IP68 Connector PLUG
S	n° 1 input for CPM (to be ordered separately)	
ADDITIONAL MODULE		
1	1	NONE
	3	N° 2 on/off out (max 50 Hz - max 100 mA)
	4	Port RS232
	5	GPRS module (COMPLETE OF : ETP ; FLOWIZ SERVICE) WITH ANTENNA ON THE HOUSING
	7	GPRS module (COMPLETE OF : ETP ; FLOWIZ SERVICE) WITH 3 METERS CABLE LENGT OF MAGNETIC ANTENNA (NECESSARY WITH IP 68 VERSION)
	8	Options 3 + 4 (DIGITAL IN/OUT + RS 232)
	e	GPRS module (COMPLETE OF : ETP ; FLOWIZ SERVICE) WITH ANTENNA ON THE HOUSING + 2 on/off OUT
	f	GPRS module(COMPLETE OF : ETP ; FLOWIZ SERVICE) WITH 3 METERS CABLE LENGT OF MAGNETIC ANTENNA(NECESSARY WITH IP 68 VERSION) + 2 on/off OUT
g	N° 2 on/off out (max 50 Hz - max 100 mA) complete of n° 1 IP 68 connector (male + female)	
SPECIAL FEATURES		
A	A	NONE
	B	WITH ANTICONDENSE CAP
	E	N° 1 IP 68 CONNECTOR FOR IF22 INTERFACE



ML155-B0B1B1A (Complete code, example for order)

Due to the constant technical development and improvement of its products, the manufacturer reserves the right to make changes and/or modify the information contained in this document without prior notice.