

**ISOMAG** 

*The friendly magmeter*

**DATA SHEET**

**CS3900**



**CE**

**ISOIL**   
INDUSTRIA



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## ■ TECHNICAL DATA

### **OVERALL FEATURES**

<b>Size for pipe line Ø</b>	<input type="checkbox"/> 10 / 15 / 20 / 25 / 32 / 40 / 50
<b>Minimum conductivity</b>	<input type="checkbox"/> 50 µS/cm
<b>Altitude</b>	<input type="checkbox"/> -200m up to 4000 m
<b>Humidity Range</b>	<input type="checkbox"/> 0÷100% (IP 67)
<b>CE Certification</b>	<input type="checkbox"/> Yes

### **STANDARD FEATURES**

<b>Protection Rate</b>	<input type="checkbox"/> IP 67
<b>Power Supply/Consumption</b>	<input type="checkbox"/> min10 / max30 V  - 1W
<b>Electrical connections</b>	<input type="checkbox"/> 5 pins connector M12X1 complete with plug/2 m of 5 poles cable Already Connected
<b>Full scale value</b>	<input type="checkbox"/> 0,4...10m/s
<b>Protocols</b>	<input type="checkbox"/> MCP
<b>Output</b>	<input type="checkbox"/> N° 1 channel freely programmable OUTPUT for volume pulses/alarms
<b>Data Storage</b>	<input type="checkbox"/> F-ram not volatile
<b>Programming Plug In</b>	<input type="checkbox"/> Mini USB
<b>Temperature measure</b>	<input type="checkbox"/> measure of temperature -10 .. +100 (it can be set as analog out on 4-20 mA)
<b>Bi-Directional</b>	<input type="checkbox"/> Yes
<b>Nominal pressure</b>	<input type="checkbox"/> 1600 kPa
<b>Process connection</b>	<input type="checkbox"/> Threaded end
<b>Version – protection rating</b>	<input type="checkbox"/> Compact IP67
<b>Lining material/gasket</b>	<input type="checkbox"/> Ptfе/FPM
<b>Liquid temperature</b>	<input type="checkbox"/> -10°C ÷ 100°C compact version
<b>Electrodes material</b>	<input type="checkbox"/> Aisi 316

### **OPTIONAL FEATURES**

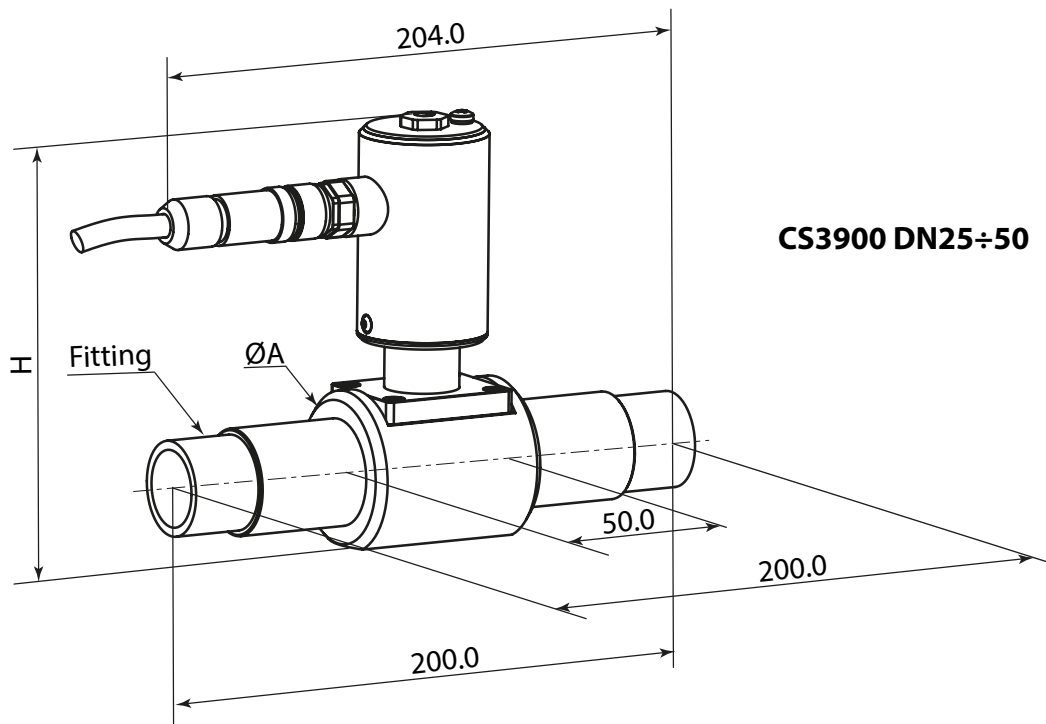
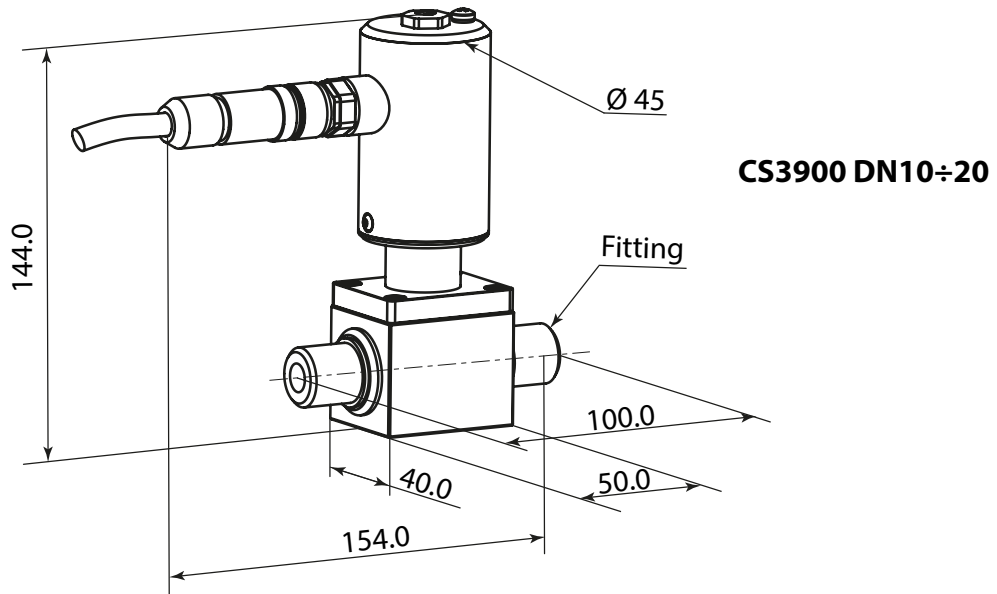
*(CHECK FOR MORE DETAILS 'HOW TO ORDER' ON LAST PAGE)*

<b>Pulses/ Alarm Output</b>	<input type="checkbox"/> N°1 Digital Output
<b>Current Output</b>	<input type="checkbox"/> N°1 , 0/4...20mA – RL=500 Ω
<b>Process connection</b>	<input type="checkbox"/> Others on request
<b>Electrodes material</b>	<input type="checkbox"/> Others on request

### **ACCURACY**

<b>Measurements tolerance (board)</b>	<input type="checkbox"/> Volume = ±0,2% v.l. <input type="checkbox"/> Out 4/20 mA = ± 0,2 % v.l.
<b>Accuracy (whole system)</b>	<input type="checkbox"/> FLOW RATE/VOLUME +/- 1 % r.v. (UP TO 0,5% ON REQUEST) <input type="checkbox"/> TEMPERATURE : +/- 2°C

OVERALL DIMENSIONS



DN	FITTINGS	A	H
10	1/2"	---	---
15	3/4"	---	---
20	1"	---	---
25	1"	56	148
32	1"1/4	56	148
40	1"1/2	62	156
50	2"	69	164

■ EXPLODED LAYOUT

PG9 USB plug

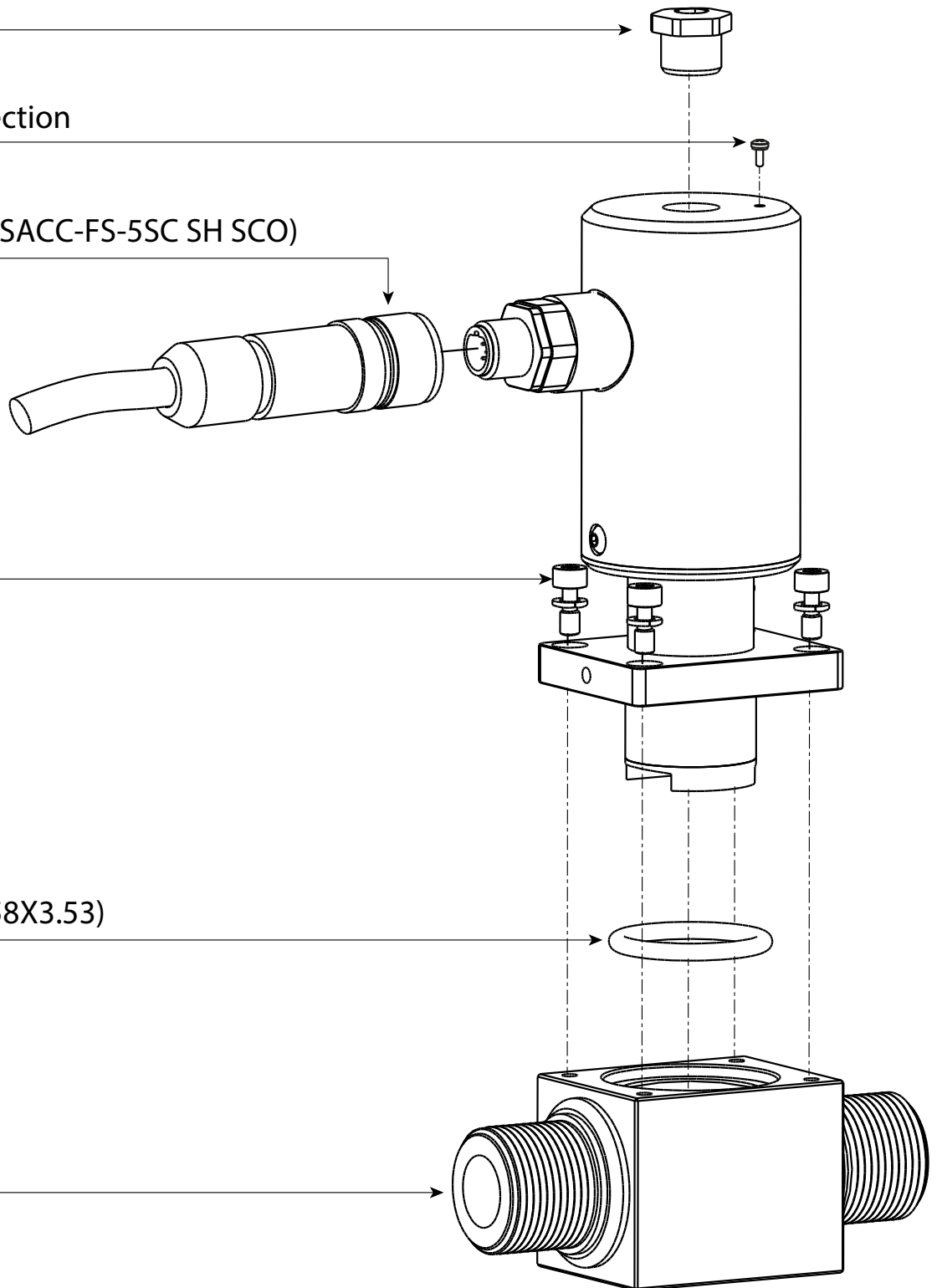
Grounding connection

5-poles plug  
(phoenix contact SACC-FS-5SC SH SCO)

M4 screws

O-Ring 4106 (26.58X3.53)

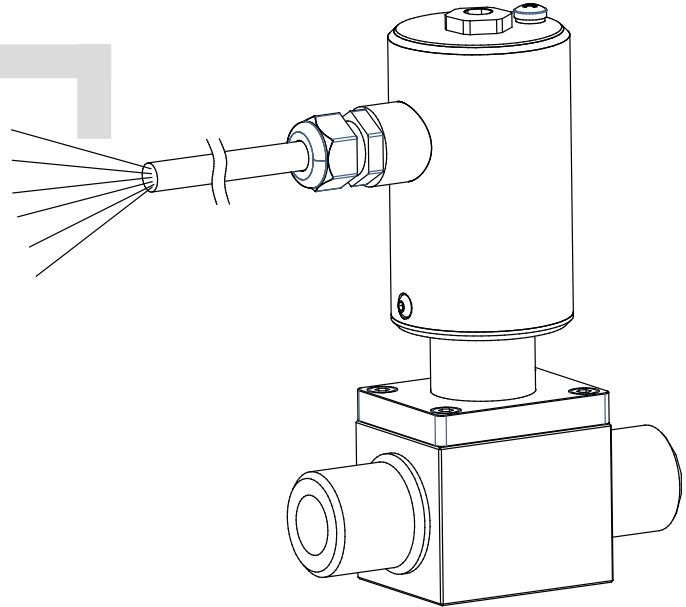
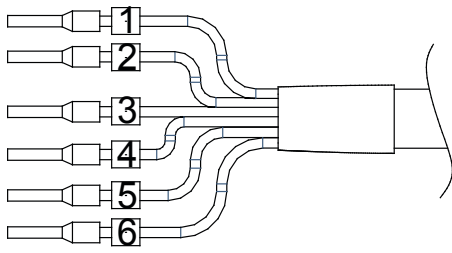
Lined body



TORQUES	
<b>PG9 plug</b>	4Nm
<b>5 poles conn./ cablegland PG9</b>	4Nm
<b>M4 screws</b>	3Nm

**ELECTRICAL CONNECTIONS**

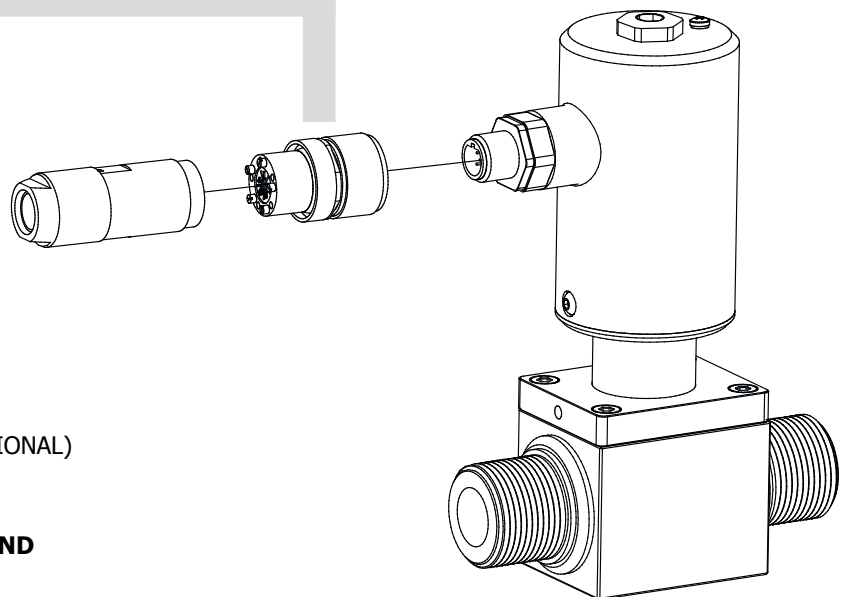
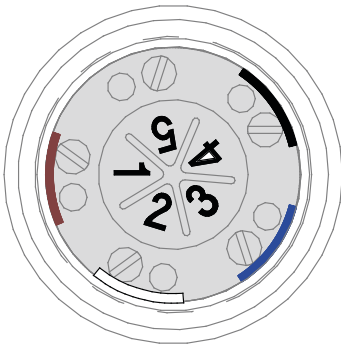
**POWER SUPPLY/OUTPUTS (CONNECTOR)**



- 1 (+) POWER SUPPLY
- 2 (+) OUTPUT 1
- 3 (+) OUTPUT 2 (OPTIONAL)
- 4 (+) 4-20mA max load: 500 Ω OUTPUT (OPTIONAL)
- 5 (-) POWER SUPPLY / OUTPUTS
- 6 (SH) SHIELD

 **PIN 5/6 TO BE CONNECT TO THE GROUND**

**POWER SUPPLY/OUTPUTS (CABLE)**

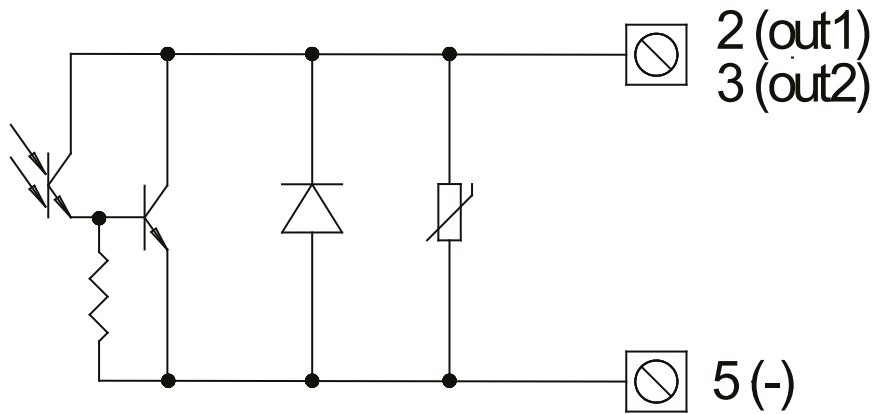


- 1 (+) POWER SUPPLY
- 2 (+) OUTPUT 1
- 3 (+) OUTPUT 2 (OPTIONAL)
- 4 (+) 4-20mA max load: 500 Ω OUTPUT (OPTIONAL)
- 5 (-) POWER SUPPLY / OUTPUTS

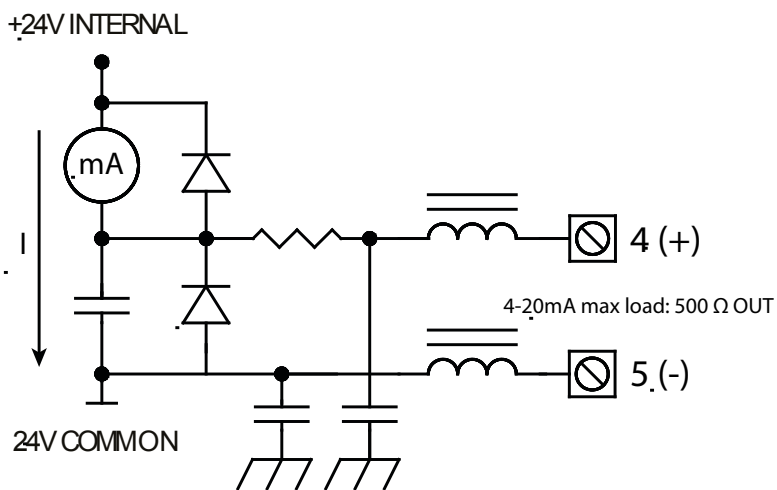
 **PIN 5 TO BE CONNECT TO THE GROUND**



■ **OUTPUTS: SCHEMATICS**



**DIGITAL OUTPUTS**

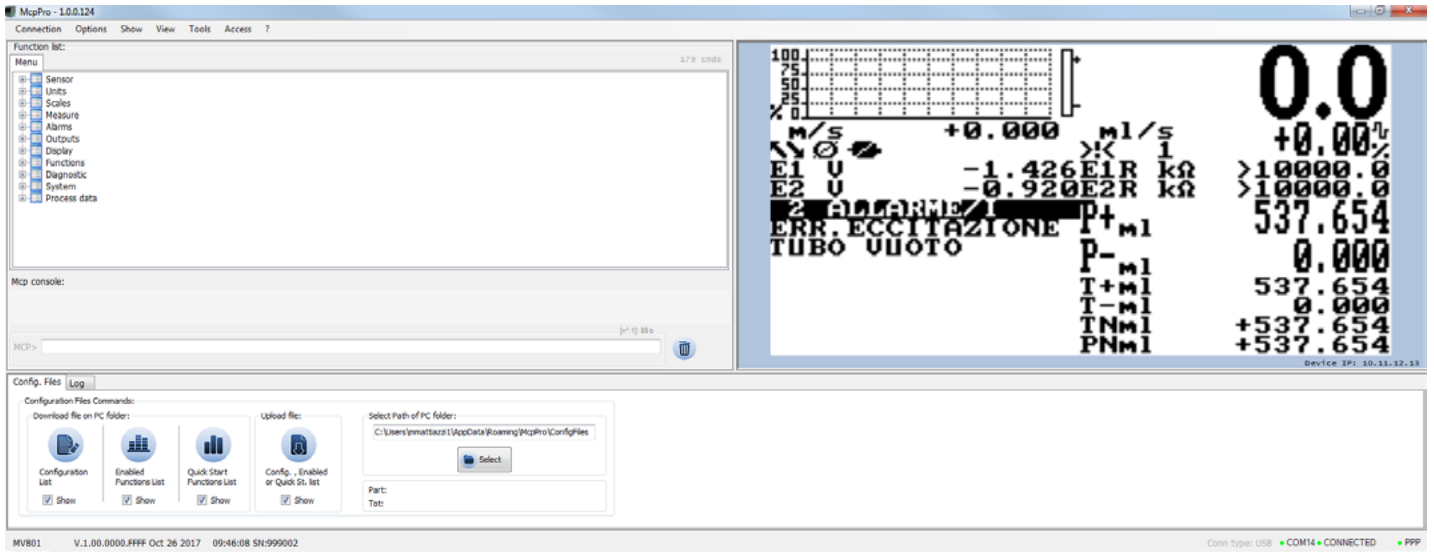


**ANALOG OUTPUT**

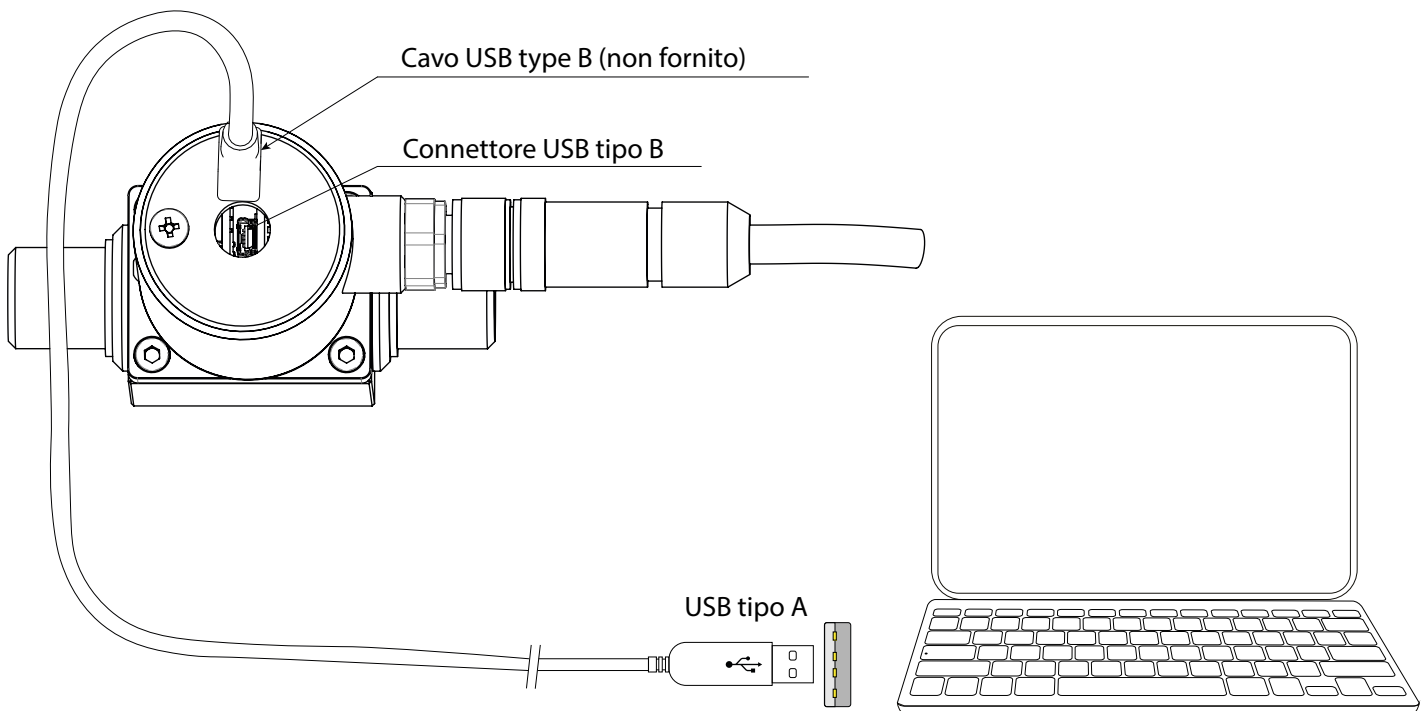
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## USER INTERFACE

CS3900 can be programmed by MCP interface (USB cable is required see below)



Make the USB connection as shown in the following picture.



PROGRAMMING FUNCTIONS

```

MAIN MENU
1-Sensor
2-SENSOR
3-S: model= 000
4-Lining= UNSPEC.
5-S. type= F. BORE
6-U. type= METRICHE
7-Diam.=mm 25
8-KA= +00.7771
9-KA= 01.0000
10-KZ= +00000000
11-KD= +000000
12-Ins. position= 0
13-KP dynamic= OFF
14-Ki= +01.8727
15-Kp= +01.0000
16-KC= 1.000000
17-C. Curr.=mA 025.0
18-C. Reg. PB= 010
19-C. Reg. DK= 025
20-S. Freq.=Hz 10
21-E. P. Detect= ON
22-R max=kohm 0500
23-S. err. delay= 010
24-Sens. verify= OFF
Zero point cal.
KL=00 -000000001
    
```

- 1.1 Sensors model: Enter the first two characters of the serial number of the sensor
- 1.2 Flow sensor lining material type
- 1.3 Type of sensor: fullbore or insertion
- 1.4 Type of measure units for sensor parameter: metric or imperial
- 1.5 Insert ND of sensor (0-2500)
- 1.6 Calibration data of sensor
- 1.7 Calibration data of sensor
- 1.8 Sensor coefficient KZ (zero point)
- 1.9 Sensor coefficient KD
- 1.10 Insertion position
- 1.11 KP dynamic coefficient for insertion
- 1.12 Sensor coefficient Ki
- 1.13 Sensor coefficient Kp
- 1.14 Sensor coefficient KC
- 1.15 Sensor excitation current
- 1.16 Current regulator proportional band
- 1.17 Current regulator derivation constant
- 1.18 Measure sampling frequency
- 1.19 Enables the empty pipe detection feature
- 1.20 Empty pipe detection threshold
- 1.21 Signal error delay (n. sample)
- 1.22 Automatic sensor verify enable
- 1.23 Pipe hydraulic zero calibration
- 1.24 Linearization coefficient

```

MAIN MENU
1-Sensor
2-Units
3-UNITS
4-DIAM.= MM
5-FR. unit= METRIC
6-Pl1 unit= METRIC
7-Pl2 unit= METRIC
8-T+ unit= METRIC
9-T+ unit= g
10-T+ D.P.= 3
11-P+ unit= METRIC
12-P+ unit= g
13-P+ D.P.= 3
14-T- unit= METRIC
15-T- unit= g
16-T- D.P.= 3
17-P- unit= METRIC
18-P- unit= g
19-P- D.P.= 3
20-Temp. unit= °C
21-Mass units= ON
22-Sg=kg/dm³ 1.0000
    
```

- 2.1 Nominal diameter measure unit
- 2.2 Flowrate type measure unit: metric or imperial
- 2.3 Pulse 1 type measure unit: metric or not metric
- 2.4 Pulse 2 type measure unit: metric or not metric
- 2.5 Total direct totalizer measure unit type: metric or imperial
- 2.6 Total direct totalizer measure unit
- 2.7 Total direct totalizer decimal point position
- 2.8 Partial direct totalizer measure unit type: metric or not metric
- 2.9 Partial direct totalizer measure unit
- 2.10 Partial direct totalizer decimal point position
- 2.11 Total reverse totalizer measure unit type: metric or not metric
- 2.12 Total reverse totalizer measure unit
- 2.13 Total reverse totalizer decimal point position
- 2.14 Partial reverse totalizer measure unit type: metric or not metric
- 2.15 Partial reverse totalizer measure unit
- 2.16 Partial reverse totalizer decimal point position
- 2.17 Temperature measure unit
- 2.18 Enable/disable the selection of mass units on full scale set
- 2.19 Specific gravity coefficient

```

MAIN MENU
1-Sensor
2-Units
3-Scales
4-SCALES
5-FS1= g/s 4908.7
6-FS2= g/s 4908.7
7-Pls1= 1000.00
8-Tpls1gms 1000.00
9-Frq1=Hz 0050.0
10-Pls2= 1000.00
11-Tpls2=ms 1000.00
12-Frq2=Hz 0050.0
    
```

- 3.1 Full scale flow rate 1
- 3.2 Full scale flow rate 2
- 3.3 Pulse value on channel 1
- 3.4 Duration of the pulse generated on channel 1
- 3.5 Full scale frequency for channel 1 (0.1Hz-1000.0Hz)
- 3.6 Duration of the pulse generated on channel 2
- 3.7 Pulse value on channel 2
- 3.8 Full scale frequency for channel 2 (0.1Hz-1000.0Hz)

```

MAIN MENU
1-Sensor
2-Units
3-Scales
4-Measure
5-MEASURE
6-Damping= SMART
7-Cut-off=% 00.00
8-Cal. verify= ON
9-Autorange= ON
    
```

- 4.1 Measure filter
- 4.2 Low flow zero threshold: 0-25% of full scale value
- 4.3 Automatic calibration verify
- 4.4 Automatic change of measurement range

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```

MAIN MENU
1-Sensor
2-Units
3-Scales
4-Measure
5-Alarms

```

```

ALARMS
1 Max.thr+=% 000
11 Max.thr-=% 000
13 Min.thr+=% 000
Min.thr-=% 000
Hysteresis=% 03
mA v.alarm=% 010
Hz v.alarm=% 125

```

- 5.1 Maximum value alarm set for direct flow rate
- 5.2 Maximum value alarm set for reverse flow rate
- 5.3 Minimum value alarm set for direct flow rate
- 5.4 Minimum value alarm set for reverse flow rate
- 5.5 Hysteresis threshold set for the minimum and maximum flow rate alarms
- 5.6 Current output value in case of failure
- 5.7 Frequency output value in case of alarms

```

MAIN MENU
1-Sensor
2-Units
3-Scales
4-Measure
5-Alarms
7-Outputs

```

```

OUTPUTS
1 Out1= FREQ.-
12 Out2= PULSES+/-
13 Out mA1=4_22 -0+
AIS= g/s 4908.7

```

- 7.1 Output 1 functions
- 7.2 Output 2 functions
- 7.3 Choice of the function and the range of current output
- 7.4 Full Scale value for analog out

```

MAIN MENU
1-Sensor
2-Units
3-Scales
4-Measure
5-Alarms
7-Outputs
9-Display

```

```

DISPLAY
11 Language= GB
12 D.rate=Hz 1
13 Part.tot.= ON
Neg.tot.= ON
Net tot.= ON
Quick start= ON

```

- 9.1 Choice of the language
- 9.2 Display updating frequency: 1-2-5-10 Hz
- 9.3 Partial totalizer enable
- 9.4 Negative totalizer enable
- 9.5 Net totalizer enable
- 9.6 Quick start menu visualization

```

FUNCTIONS
11.1 T+ reset
11.2 P+ reset
11.3 T- reset
11.4 P- reset
11.5 Load Sens.f.def
11.6 Load Conv.f.def
11.7 Save Sens.f.def
11.8 Save Conv.f.def
11.9 Calibration

```

- 11.1 Execute immediate reset of total direct totalizer
- 11.2 Execute immediate reset of partial direct totalizer
- 11.3 Execute immediate reset of total reverse totalizer
- 11.4 Execute immediate reset of partial reverse totalizer
- 11.5 Load sensor factory default
- 11.6 Load converter factory default
- 11.7 Save sensor factory default values
- 11.8 Save converter factory default values
- 11.9 Execute immediate internal circuit calibration

```

11-Functions
12-Diagnostic
13-System

```

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```

DIAGNOSTIC
Self test
Sens.verify
Flow sim.= OFF
Display measures
Disp.comm.vars
Display graphs
Firmware info
S/N=
WT=
11
12-Diagnostic
13-System
    
```

- 12.1 Self test diagnostic function
- 12.2 Sensor verify diagnostic function
- 12.3 Flow rate simulation enabling
- 12.4 Display internal measured value
- 12.5 Display comm. diagnostic values
- 12.6 Display measure as graphs
- 12.7 Firmware version/revision
- 12.8 Board serial number
- 12.9 Total working time

```

SYSTEM
L1 code=*****
L2 code=*****
L3 code=*****
L4 code=*****
L5 code=*****
L6 code=*****
Restr.access=OFF
Device IP addr=
Client IP addr=
Network mask=
KT= 1.00000
KS= 1.00000
KR= 1.00000
DAC1 4mA= 02460
DAC1 20mA= 11050
FW update
11
12
13-System
    
```

- 13.1 Access level 1 code
- 13.2 Access level 2 code
- 13.3 Access level 3 code
- 13.4 Access level 4 code
- 13.5 Access level 5 code
- 13.6 Access level 6 code
- 13.7 Restricted access level
- 13.8 Device IP network address
- 13.9 Client IP network address
- 13.10 Network mask
- 13.11 Calibration coefficient KT
- 13.12 Calibration coefficient KF
- 13.13 Calibration coefficient KR
- 13.14 DAC1 out 4mA calibration point
- 13.15 DAC1 out 20mA calibration point
- 13.16 firmware update

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## ■ HOW TO ORDER

Example code	<b>CS 3900</b>	
	<i>DN</i>	
1	1	10 mm ( thread 1/2")
	2	15 mm ( thread 3/4")
	3	20 mm ( thread 1")
	4	25 mm ( thread 1")
	5	32 mm ( thread 1"1/4)
	6	40 mm ( thread 1"1/2)
	7	50 mm ( thread 2")
<b>Sensor and electrodes material / lining / internal gasket</b>		
A	A	Materials : PTFE coated Steel body, Sensor body in AISI304 (head in PTFE), electrodes in AISI316 , gasket in FKM
	B	Materials : PTFE coated SS AISI 304 body (UP to 1"), Sensor body in AISI304 (head in PTFE), electrodes in AISI316 , gasket in FKM
	Z	Sensor material: to be specified
<b>Connection type</b>		
0	0	UNI 338 (GAS)Thread Male
	1	NPT-Thread Male
	9	Special connection
<b>Analog Output</b>		
A	A	MV801 ( Complete of n° 1 Freely programmable digital out) Electrical Connections : 5 poles connectors
	B	MV801 ( Complete of n° 1 Freely programmable digital out) Electrical Connections: 2 meters of N° 5 poles cable ALREADY CONNECTED
<b>Digital Output</b>		
0	0	without Analog Out
	1	with Analog Out
<b>Electrical Connections</b>		
A	A	without Additional Digital Out
	B	n° 1 additional digital out

 **CS3900-1A0A0A** (Complete code example for order)

## ISOIL INDUSTRIA S.p.A.

HEAD OFFICE	SERVICE
Via Fratelli Gracchi, 27 20092 Cinisello Balsamo (MI) Tel +39 02 66027.1 Fax +39 02 6123202 vendite@isoil.it	isomagservice@isoil.it

If you want to find the complete list of our distributors access at the following link:  
[http://www.isoil.com/u\\_vendita.asp](http://www.isoil.com/u_vendita.asp)



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