



**ISOMAG** 

*The friendly magmeter*

## **DATA SHEET**



**CS3795**

**CE**

**ISOIL**   
I N D U S T R I A



## INDEX

|                                  |           |
|----------------------------------|-----------|
| <b>OVERALL FEATURES</b>          | <b>2</b>  |
| <b>STANDARD FEATURES</b>         | <b>2</b>  |
| <b>OPTIONAL FEATURES</b>         | <b>2</b>  |
| <b>ACCURACY</b>                  | <b>2</b>  |
| <b>TECHNICAL DATA</b>            | <b>2</b>  |
| <b>OVERALL DIMENSIONS</b>        | <b>3</b>  |
| <b>EXPLODED LAYOUT</b>           | <b>4</b>  |
| <b>ELECTRICAL CONNECTIONS</b>    | <b>5</b>  |
| <b>INPUT/OUTPUTS (CONNECTOR)</b> | <b>5</b>  |
| <b>INPUT/OUTPUTS (CABLE)</b>     | <b>5</b>  |
| <b>INPUT/OUTPUTS: SCHEMATICS</b> | <b>6</b>  |
| <b>USER INTERFACE</b>            | <b>7</b>  |
| <b>ACCURACY TABLE</b>            | <b>8</b>  |
| <b>PROGRAMMING FUNCTIONS</b>     | <b>9</b>  |
| <b>HOW TO ORDER</b>              | <b>13</b> |





## ■ TECHNICAL DATA

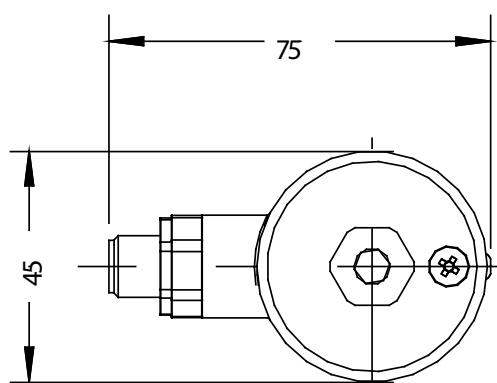
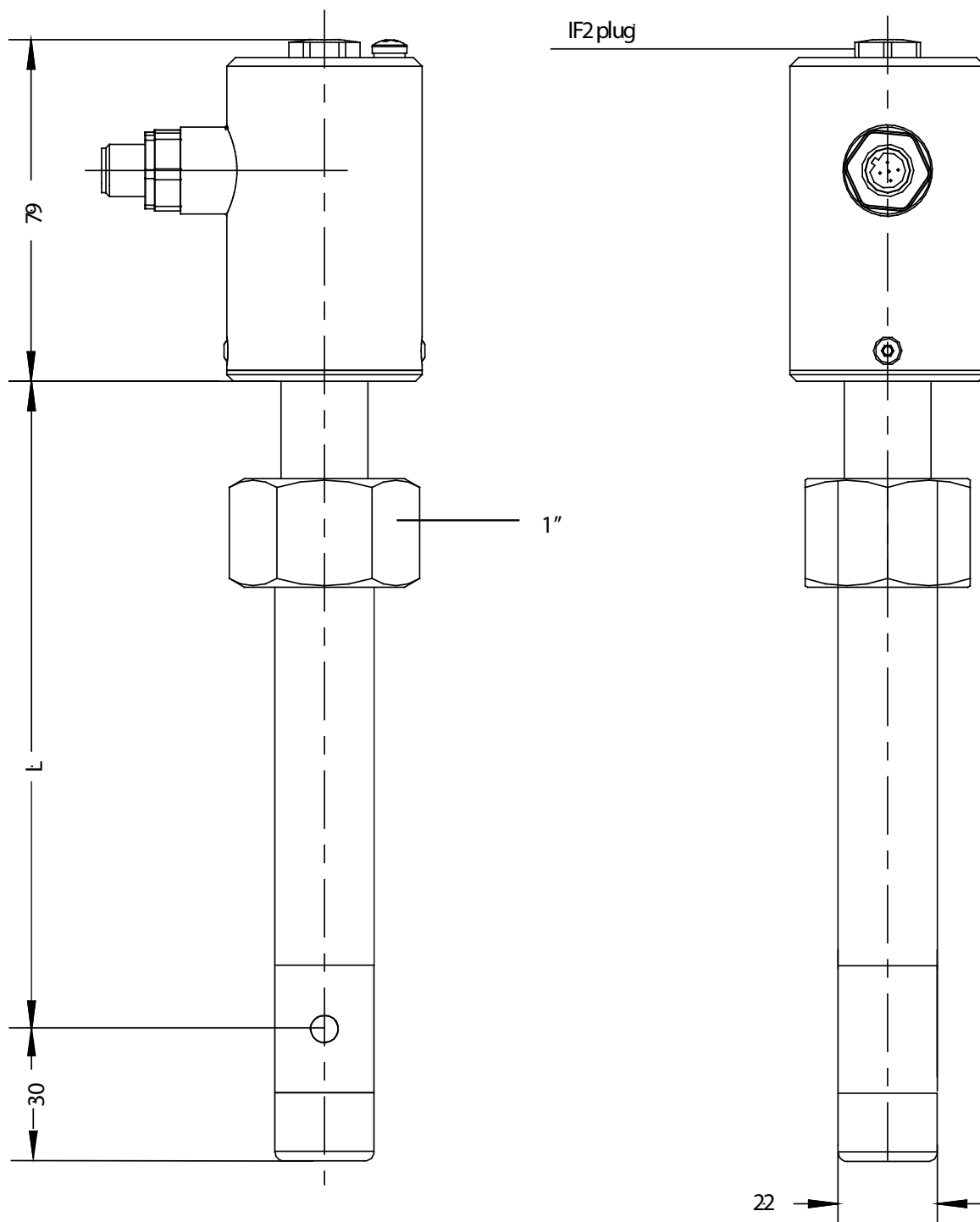
| ■ <b>OVERALL FEATURES</b>   |                                                                                                                                       |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <b>Size for pipe line Ø</b> | <input type="checkbox"/> Size 1 Ø ≤ 500mm<br><input type="checkbox"/> Size 2 Ø ≤ 1000mm<br><input type="checkbox"/> Size 3 Ø ≤ 2000mm |
| <b>Minimum conductivity</b> | <input type="checkbox"/> 20 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                                                                                                          |

| ■ <b>STANDARD FEATURES</b>         |                                                                                                           |
|------------------------------------|-----------------------------------------------------------------------------------------------------------|
| <b>Protection Rate</b>             | <input type="checkbox"/> IP 67                                                                            |
| <b>Power Supply/Consumption</b>    | <input type="checkbox"/> 18-30V ~ (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"/> ETP                                                                              |
| <b>Output</b>                      | <input type="checkbox"/> N° 1 channel freely programmable OUTPUT for volume pulses/alarms                 |
| <b>Data Storage</b>                | <input type="checkbox"/> Eeprom values storing system in case of power failure                            |
| <b>Programming Plug In</b>         | <input type="checkbox"/> Protected plug for PC connection                                                 |
| <b>Bi-Directional</b>              | <input type="checkbox"/> Yes                                                                              |
| <b>Body material</b>               | <input type="checkbox"/> Stainless steel AISI 316                                                         |
| <b>Nominal pressure</b>            | <input type="checkbox"/> 1600 kPa                                                                         |
| <b>Process connection</b>          | <input type="checkbox"/> 1" Threaded end                                                                  |
| <b>Version – protection rating</b> | <input type="checkbox"/> Compact IP67                                                                     |
| <b>Connection material</b>         | <input type="checkbox"/> Stainless steel AISI 304                                                         |
| <b>Lining material/gasket</b>      | <input type="checkbox"/> PEEK/FPM/Electrodes in                                                           |
| <b>Liquid temperature</b>          | <input type="checkbox"/> -10°C ÷ 100°C compact version                                                    |
| <b>Electrodes material</b>         | <input type="checkbox"/> HC 276                                                                           |

| ■ <b>OPTIONAL FEATURES</b><br>(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=1000Ω |
| <b>Size for pipe line Ø</b>                                                        | <input type="checkbox"/> Other on request            |
| <b>Nominal pressure</b>                                                            | <input type="checkbox"/> Others on request           |
| <b>Process connection</b>                                                          | <input type="checkbox"/> Others on request           |
| <b>Electrodes material</b>                                                         | <input type="checkbox"/> Others on request           |

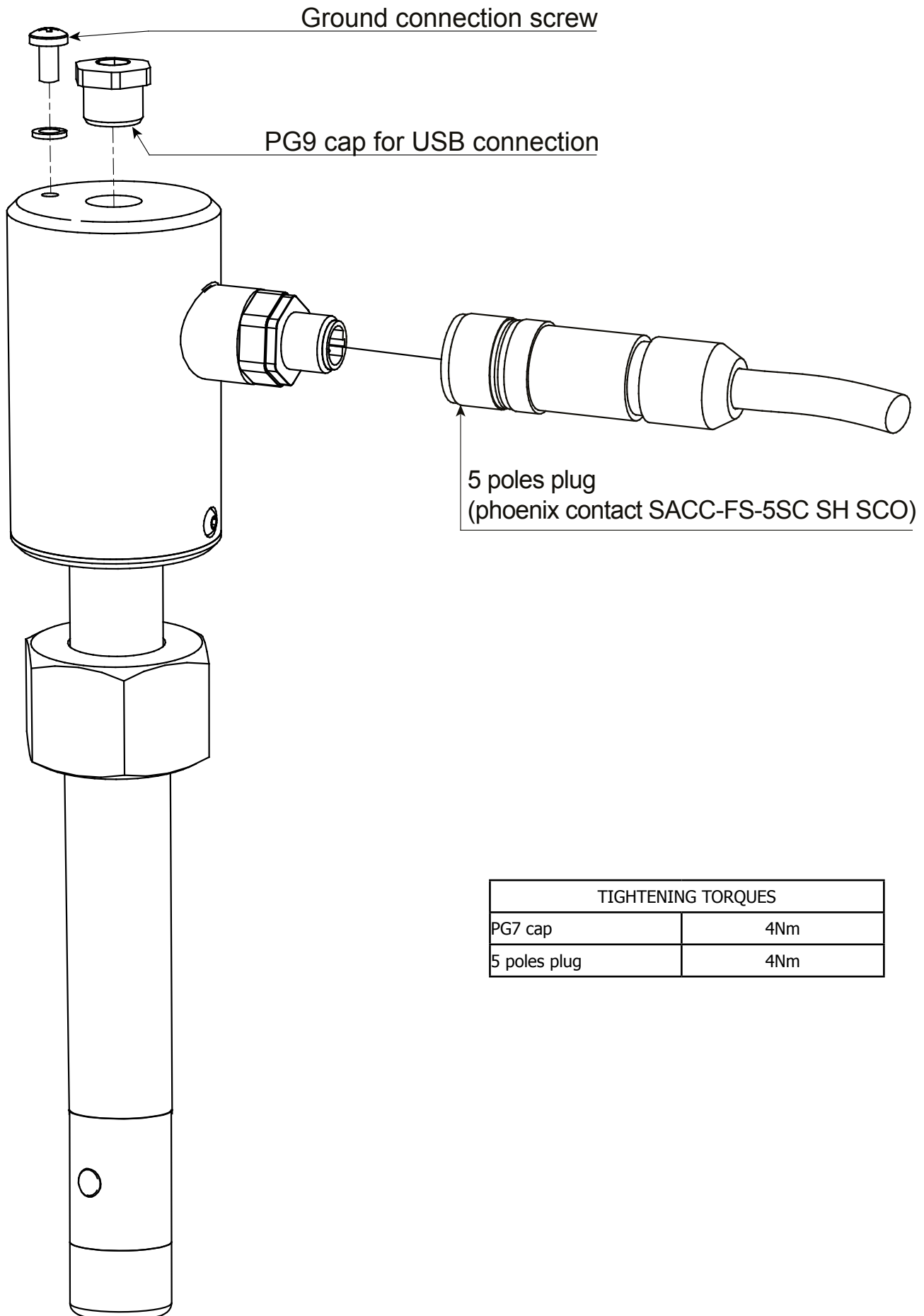
| ■ <b>ACCURACY</b>                     |                                                                                                     |
|---------------------------------------|-----------------------------------------------------------------------------------------------------|
| <b>Measurements tolerance (board)</b> | <input type="checkbox"/> Volume = ±0,2% v.l.<br><input type="checkbox"/> Out 4/20 mA = ± 0,2 % v.l. |
| <b>Accuracy (whole system)</b>        | <input type="checkbox"/> See table below                                                            |

## OVERALL DIMENSIONS



| SIZE | "L" DIMENSION |
|------|---------------|
| 1    | 176mm         |
| 2    | 244mm         |
| 3    | 462mm         |

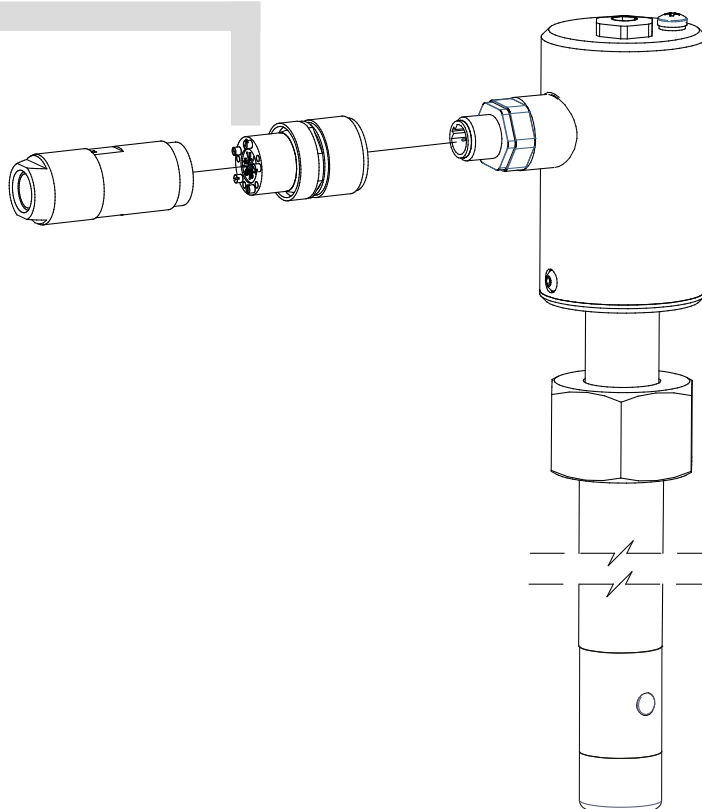
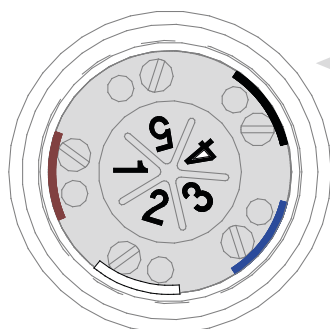
## ■ EXPLODED LAYOUT



| TIGHTENING TORQUES |     |
|--------------------|-----|
| PG7 cap            | 4Nm |
| 5 poles plug       | 4Nm |

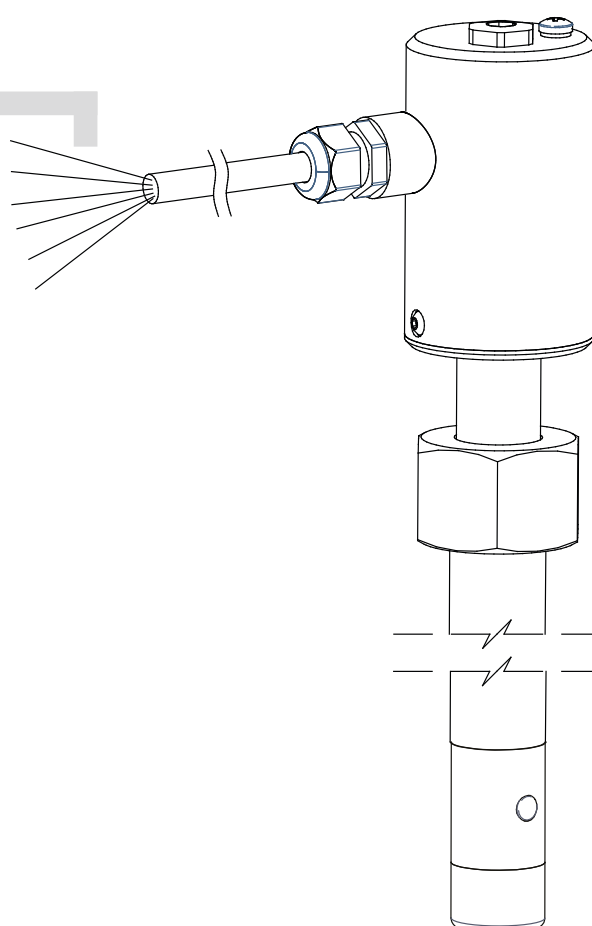
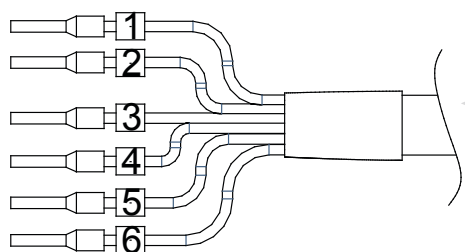
## ELECTRICAL CONNECTIONS

### INPUT/OUTPUTS (CONNECTOR)



- 1 (+) POWER SUPPLY
- 2 (+) OUTPUT 1 / INPUT
- 3 (+) OUTPUT 2 (OPTIONAL)
- 4 (+) 4-20mA OUTPUT
- 5 (-) POWER SUPPLY / OUTPUTS / INPUT

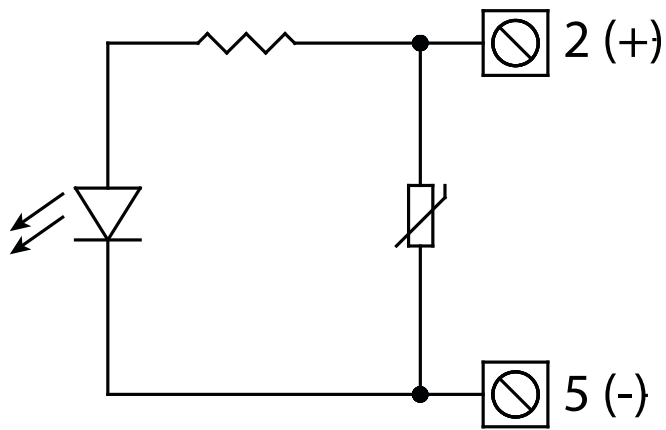
### INPUT/OUTPUTS (CABLE)



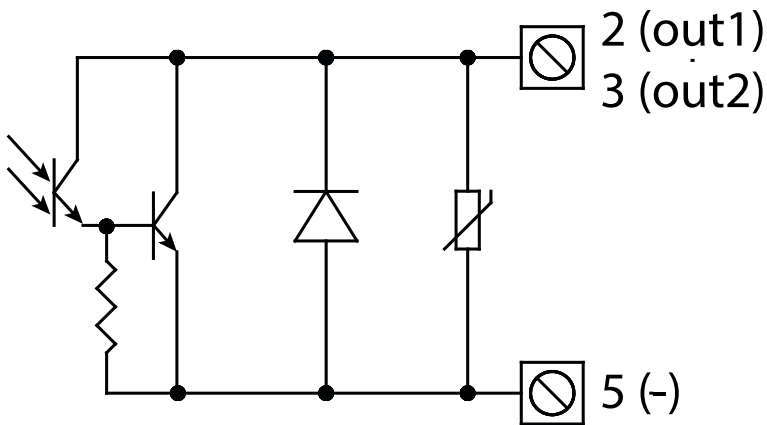
- 1 (+) POWER SUPPLY
- 2 (+) OUTPUT 1 / INPUT
- 3 (+) OUTPUT 2 (OPTIONAL)
- 4 (+) 4-20mA OUTPUT
- 5 (-) POWER SUPPLY / OUTPUTS / INPUT
- 6 SHIELD (CONNECT TO GROUND)



## INPUT/OUTPUTS: SCHEMATICS

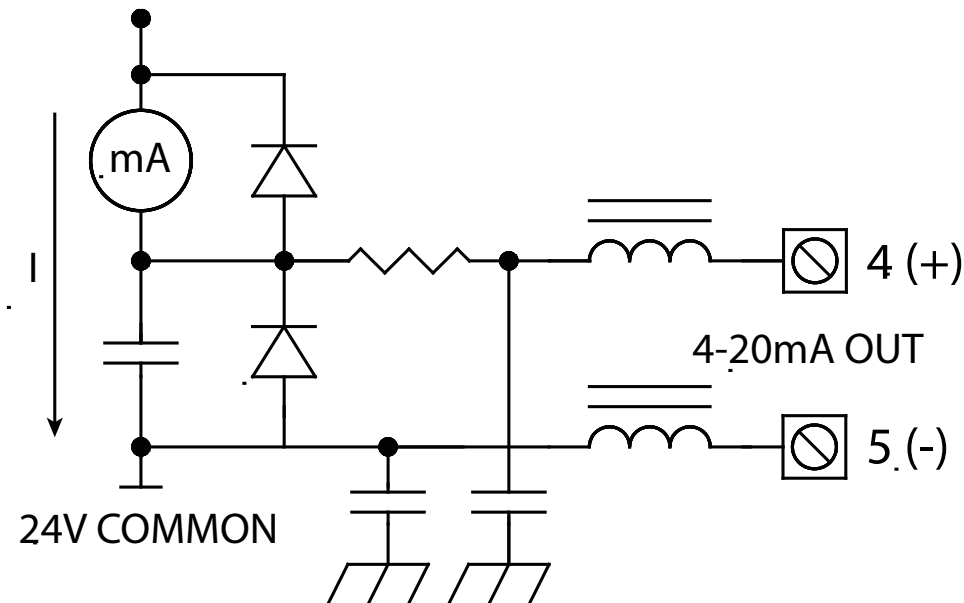


**DIGITAL INPUT**



**DIGITAL OUTPUTS**

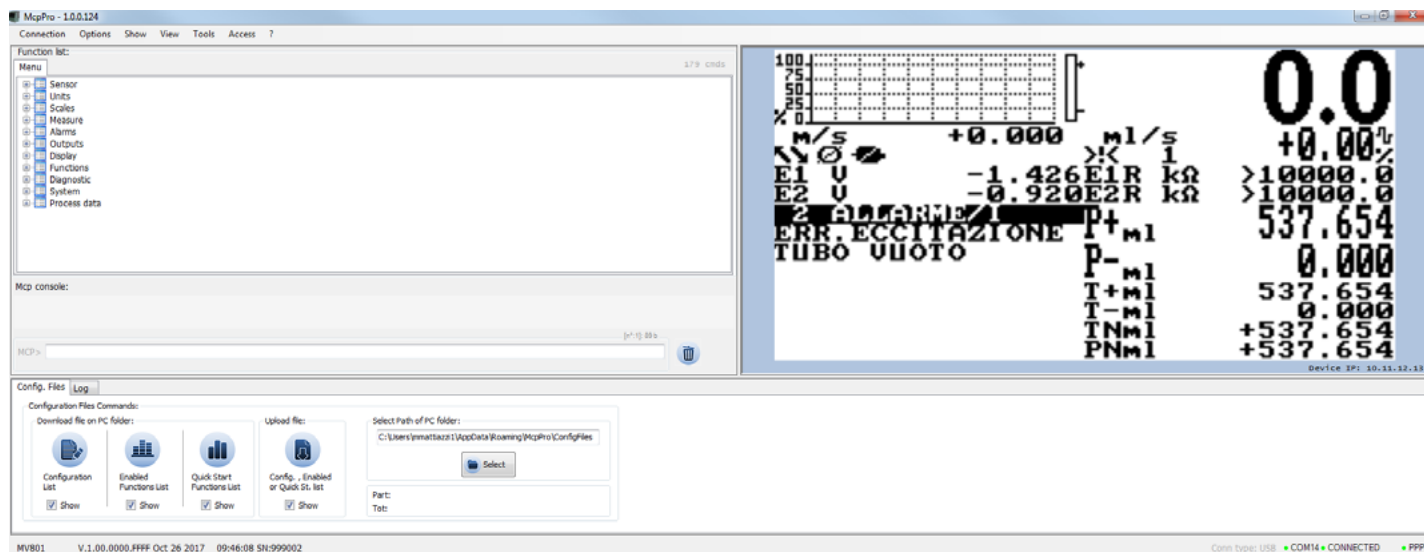
+24V INTERNAL



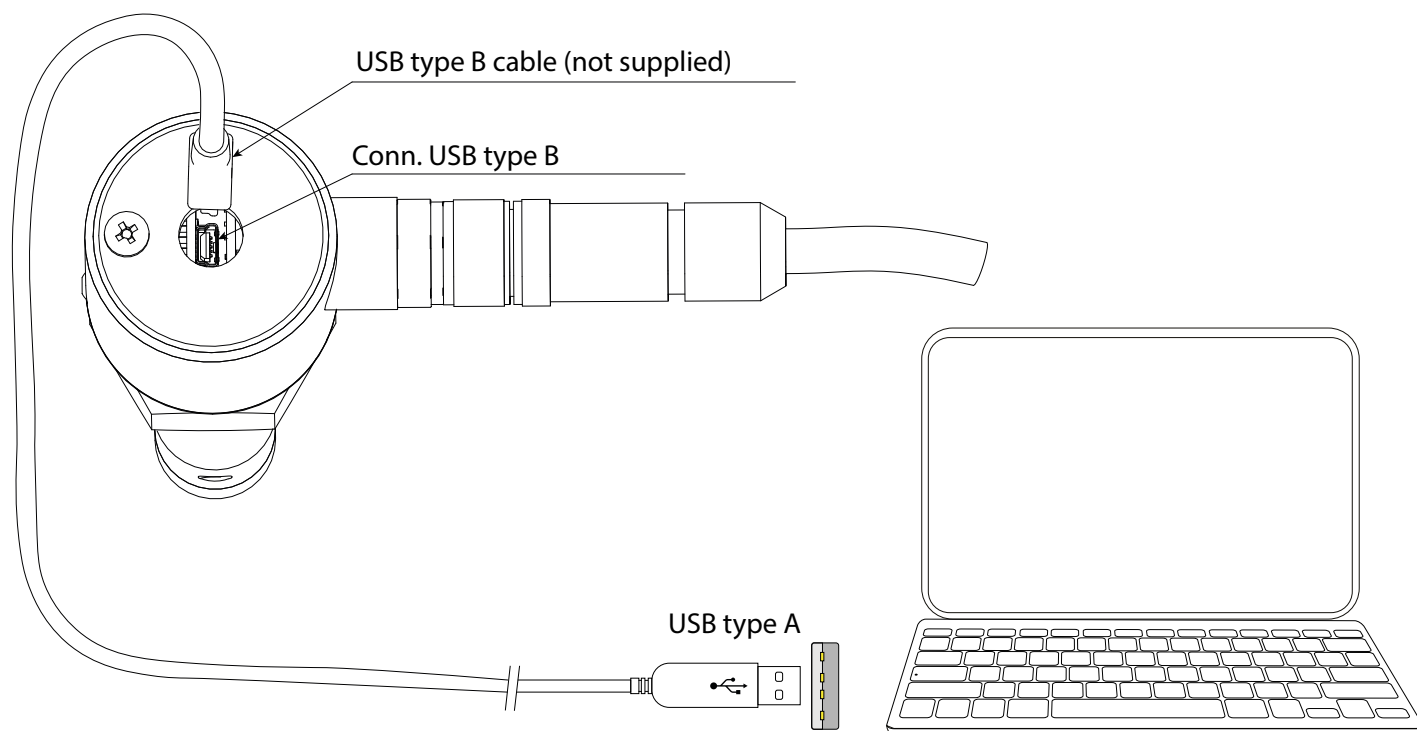
**ANALOG OUTPUT**

## USER INTERFACE

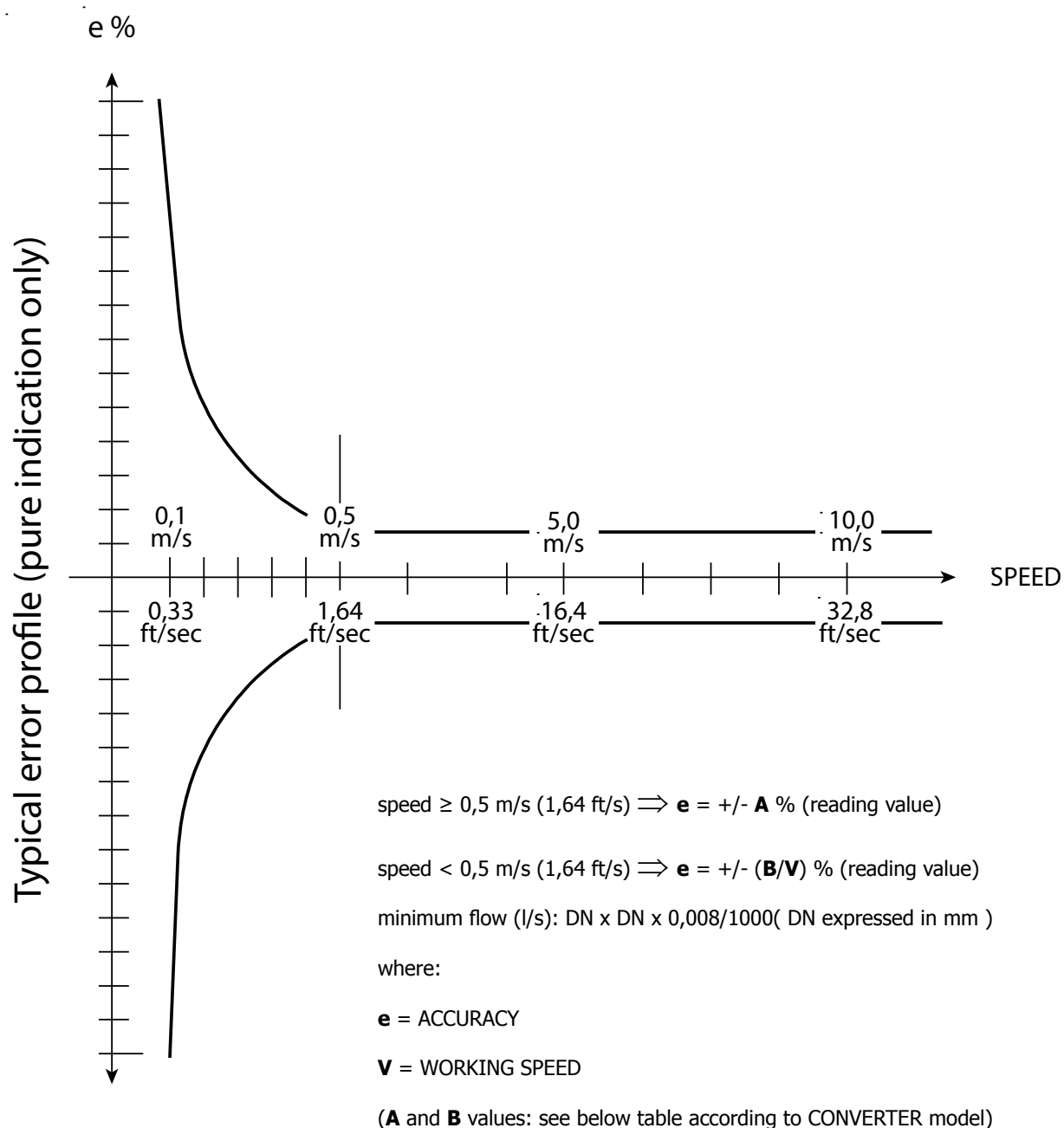
CS3795 can be programmed by MCP interface (USB cable is required see below)



Make the USB connection as shown in the following picture.



## ■ ACCURACY TABLE



| <b>A</b> | <b>B</b><br>(speed in m/s) | <b>B</b><br>(speed in ft/s) |
|----------|----------------------------|-----------------------------|
| 2        | 1                          | 3,28                        |

### Reference conditions:

- ☐ Constant flow rate during the test
- ☐ Pressure:  $>30$  kPa
- ☐ Flow condition : fully developed flow profile
- ☐ Zero stability  $\pm 0,005$  %
- ☐ ID accuracy: mean value better than 1%, IDmin/IDmax $>0,98$

## PROGRAMMING FUNCTIONS

|                    |                                                                                      |
|--------------------|--------------------------------------------------------------------------------------|
| MAIN MENU          |                                                                                      |
| 1-Sensor           |                                                                                      |
| 2-SENSOR           |                                                                                      |
| 3-S.model= 027     | 1.1 Sensors model: Enter the first two characters of the serial number of the sensor |
| 4-Lining= PEEK     | 1.2 Flow sensor lining material type                                                 |
| 5-S.type= INSER.   | 1.3 Type of sensor: fullbore or insertion                                            |
| 6-U.type= METRIC   | 1.4 Type of measure units for sensor parameter: metric or imperial                   |
| 7-Diam.=mm 00025.0 | 1.5 Insert ND of sensor (0-2500)                                                     |
| 8-KA= +01.0000     | 1.6 Calibration data of sensor visualized on sensor's label                          |
| 9-KZ= +0000000     | 1.7 Sensor coefficient KZ (zero point)                                               |
| 10-KD= +000000     | 1.8 Sensor coefficient KD                                                            |
| 11-Ins.position= 0 | 1.9 Insertion position                                                               |
| 12-KP dynamic= OFF | 1.10 KP dynamic, coefficient for insertion                                           |
| 13-Ki= +01.8727    | 1.11 Sensor coefficient Ki                                                           |
|                    | 1.12 Sensor coefficient Kp                                                           |
|                    | 1.13 Sensor coefficient KC                                                           |
|                    | 1.14 Sensor excitation current                                                       |
|                    | 1.15 Current regulator proportional band                                             |
|                    | 1.16 Current regulator derivation constant                                           |
|                    | 1.17 Measure sampling frequency                                                      |
|                    | 1.18 Enables the empty pipe detection feature                                        |
|                    | 1.19 Empty pipe detection threshold                                                  |
|                    | 1.20 Signal error delay (n. sample)                                                  |
|                    | 1.21 Automatic sensor verify enable                                                  |
|                    | 1.22 Pipe hydraulic zero calibration                                                 |

|                    |                                                                        |
|--------------------|------------------------------------------------------------------------|
| MAIN MENU          |                                                                        |
| 1-Sensor           |                                                                        |
| 2-Units            |                                                                        |
| 3-UNITS            |                                                                        |
| 4-Diam.= mm        | 2.1 Nominal diameter measure unit                                      |
| 5-FR.unit= METRIC  | 2.2 Flowrate type measure unit: metric or imperial                     |
| 6-Pl1 unit=        | 2.3 Pulse 1 type measure unit: metric or not metric                    |
| 7-Pl2 unit= METRIC | 2.4 Pulse 2 type measure unit: metric or not metric                    |
| 8-T+ unit= METRIC  | 2.5 Total direct totalizer measure unit type: metric or imperial       |
| 9-T+ unit= g       | 2.6 Total direct totalizer measure unit                                |
| 10-P+ unit= METRIC | 2.7 Partial direct totalizer measure unit type: metric or not metric   |
| 11-P+ unit= g      | 2.8 Partial direct totalizer measure unit                              |
| 12-T- unit= METRIC | 2.9 Total reverse totalizer measure unit type: metric or not metric    |
| 13-T- unit= g      | 2.10 Total reverse totalizer measure unit                              |
|                    | 2.11 Partial reverse totalizer measure unit type: metric or not metric |
|                    | 2.12 Partial reverse totalizer measure unit                            |
|                    | 2.13 Temperature measure unit                                          |
|                    | 2.14 Enable/disable the selection of mass units on full scale set      |
|                    | 2.15 Specific gravity coefficient                                      |

|                     |                                                         |
|---------------------|---------------------------------------------------------|
| MAIN MENU           |                                                         |
| 1-Sensor            |                                                         |
| 2-Units             |                                                         |
| 3-Scales            |                                                         |
| 4-SCALES            |                                                         |
| 5-FS1= g/s 4908.7   | 3.1 Full scale flow rate 1                              |
| 6-FS2= g/s 4908.7   | 3.2 Full scale flow rate 2                              |
| 7-Pls1= 1000.0      | 3.3 Pulse value on channel 1                            |
| 8-Tpls1gms 1000.00  | 3.4 Duration of the pulse generated on channel 1        |
| 9-Frq1=Hz 0050.0    | 3.5 Full scale frequency for channel 1 (0.1Hz-1000.0Hz) |
| 10-Pls2= 1000.0     | 3.6 Duration of the pulse generated on channel 2        |
| 11-Tpls2=ms 1000.00 | 3.7 Pulse value on channel 2                            |
| 12-Frq2=Hz 0050.0   | 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 | 4.1 Measure filter                                     |
| 7-Cut-off=% 00.0 | 4.2 Low flow zero threshold: 0-25% of full scale value |
| 8-Cal.verify= ON | 4.3 Automatic calibration verify                       |
| 9-Autorange= ON  | 4.4 Automatic change of measurement range              |

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

7-**ALARMS**  
9  
11 Max. thr+=% 000  
12 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**

9  
11 **OUTPUTS**  
12 Out1= FREQ.-  
13 Out2= PULSES+/-  
Out mA1=4.22 -0+  
A1S= 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**

11 **DISPLAY**  
12 Language= GB  
13 D.rate=Hz 1  
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

11 **FUNCTIONS**  
12 T+ reset  
13 P+ reset  
T- reset  
P- reset  
Load Sens.f.def  
Load Conv.f.def  
Save Sens.f.def  
Save Conv.f.def  
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

|    |    |                  |                                        |
|----|----|------------------|----------------------------------------|
| MA | 1  | DIAGNOSTIC       |                                        |
| 1  | 1  | Self test        | 12.1 Self test diagnostic function     |
| 2  | 2  | Sens.verify      | 12.2 Function tests physical display   |
| 3  | 3  | Flow sim.= OFF   | 12.3 Sensor verify diagnostic function |
| 4  | 4  | Display measures | 12.4 Flow rate simulation enabling     |
| 5  | 5  | Disp.comm.vars   | 12.5 Display internal measured value   |
| 6  | 6  | Display graphs   | 12.6 Display comm. diagnostic values   |
| 7  | 7  | Firmware info    | 12.7 Display measure as graphs         |
| 8  | 8  | S/N=             | 12.8 Firmware version/revision         |
| 9  | 9  | WT=              | 12.9 Board serial number               |
| 11 | 11 |                  |                                        |
| 12 | 12 | Diagnostic       |                                        |
| 13 | 13 | System           |                                        |

|                  |            |                                       |
|------------------|------------|---------------------------------------|
| SYSTEM           |            |                                       |
| L1               | code=***** | 13.1 Access level 1 code              |
| L2               | code=***** | 13.2 Access level 2 code              |
| L3               | code=***** | 13.3 Access level 3 code              |
| L4               | code=***** | 13.4 Access level 4 code              |
| L5               | code=***** | 13.5 Access level 5 code              |
| L6               | code=***** | 13.6 Access level 6 code              |
| Restr.access=OFF |            | 13.7 Restricted access level          |
| Device IP addr=  |            | 13.8 Device IP network address        |
| Client IP addr=  |            | 13.9 Client IP network address        |
| Network mask=    |            | 13.10 Network mask                    |
| KT=              | 1.00000    | 13.11 Calibration coefficient KT      |
| KS=              | 1.00000    | 13.12 Calibration coefficient KF      |
| KR=              | 1.00000    | 13.13 Calibration coefficient KR      |
| DAC1 4mA=        | 02460      | 13.14 DAC1 out 4mA calibration point  |
| DAC1 20mA=       | 11050      | 13.15 DAC1 out 20mA calibration point |
| FW update        |            | 13.16 firmware update                 |



## HOW TO ORDER

| Example code                                                     | CS 3795 |                                                                                                           |
|------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------|
|                                                                  | DN      |                                                                                                           |
| A                                                                | A       | Suitable for diameter $\leq 500$ mm ; with MV801 board, Complete of n° 1 freely programmable digital I/O  |
|                                                                  | B       | Suitable for diameter $\leq 1000$ mm ; with MV801 board, Complete of n° 1 freely programmable digital I/O |
|                                                                  | C       | Suitable for diameter $\leq 2000$ mm ; with MV801 board, Complete of n° 1 freely programmable digital I/O |
| <b>Sensor and electrodes material / lining / internal gasket</b> |         |                                                                                                           |
| 1                                                                | 1       | Materials : Sensor housing in AISI316 (head in PEEK), electrodes in HC276 , gasket in FKM                 |
|                                                                  | 2       | Sensor material: to be specified                                                                          |
| <b>Connection type</b>                                           |         |                                                                                                           |
| A                                                                | A       | 1" UNI 338 (GAS) female threaded connection                                                               |
|                                                                  | B       | 1" NPT female threaded connection                                                                         |
|                                                                  | C       | Connection: to be specified                                                                               |
| <b>Analog Output</b>                                             |         |                                                                                                           |
| 0                                                                | 0       | without Analog Out                                                                                        |
|                                                                  | 1       | with Analog Out                                                                                           |
| <b>Digital Output</b>                                            |         |                                                                                                           |
| A                                                                | A       | without Additional Digital Out                                                                            |
|                                                                  | B       | n° 1 additional digital out                                                                               |
| <b>Electrical Connections</b>                                    |         |                                                                                                           |
| 1                                                                | 1       | 5 poles connectors                                                                                        |
|                                                                  | 2       | 2 meters of N° 5 poles cable ALREADY CONNECTED                                                            |



**CS3795-A1A0A1** (Complete code example for order)



## ISOIL INDUSTRIA S.p.A.

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