ISOMAG

The friendly magmeter

DATA SHEET

CS3795

CE

NSF Certified to NSF/ANSI 61

WRAS APPROVED MATERIAL

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TECHNICAL DATA

OVERALL FEATURES

Size for pipe line Ø	❏ Size 1 Ø ≤ 500mm ❏ Size 2 Ø ≤ 1000mm ❏ Size 3 Ø ≤ 2000mm
Minimum conductivity	❏ 20 µS/cm
Altitude	❏ -200m up to 4000 m
Humidity Range	❏ 0÷100% (IP 67)
CE Certification	❏ Yes

STANDARD FEATURES

Protection Rate	❏ IP 67
Power Supply/Consumption	❏ min10 / max30 V⎓ - 1W
Electrical connections	❏ 5 pins connector M12X1 complete with plug/2 m of 5 poles cable ALREADY CONNECTED
Full scale value	❏ 0,4...10m/s
Protocols	❏ MCP via USB integrate
Output	❏ N° 1 channel freely programmable OUTPUT for volume pulses/alarms
Data Storage	❏ Eeprom values storing system in case of power failure
Programming Plug In	❏ Protected plug for PC connection
Bi-Directional	❏ Yes
Body material	❏ Stainless steel AISI 316
Nominal pressure	❏ 1600 kPa
Process connection	❏ 1"Threaded end
Version – protection rating	❏ Compact IP67
Connection material	❏ Stainless steel AISI 304
Lining material/gasket	❏ PEEK/FPM
Liquid temperature	❏ -10°C° ÷ 100°C compact version
Electrodes material	❏ Hastelloy C276

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

Pulses/ Alarm Output	❏ N°1 Digital Output
Current Output	❏ N°1 , 0/4...20mA – RL=500 Ω
Size for pipe line Ø	❏ Other on request
Nominal pressure	❏ Others on request
Process connection	❏ Others on request
Electrodes material	❏ Others on request

ACCURACY

Measurements tolerance (board)	❏ Volume = ±0,2% v.l. ❏ Out 4/20 mA = ± 0,2 % v.l.
Accuracy (whole system)	❏ See table below

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OVERALL DIMENSIONS

PG9 USB PLUG

79

L

30

1"

22

75

45
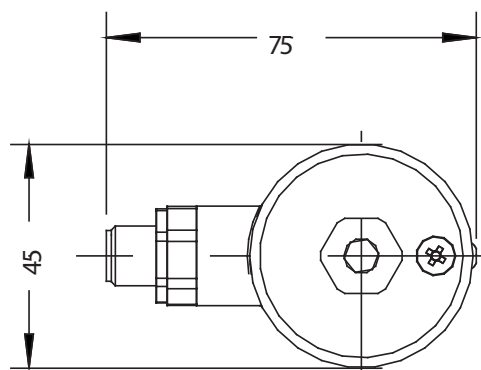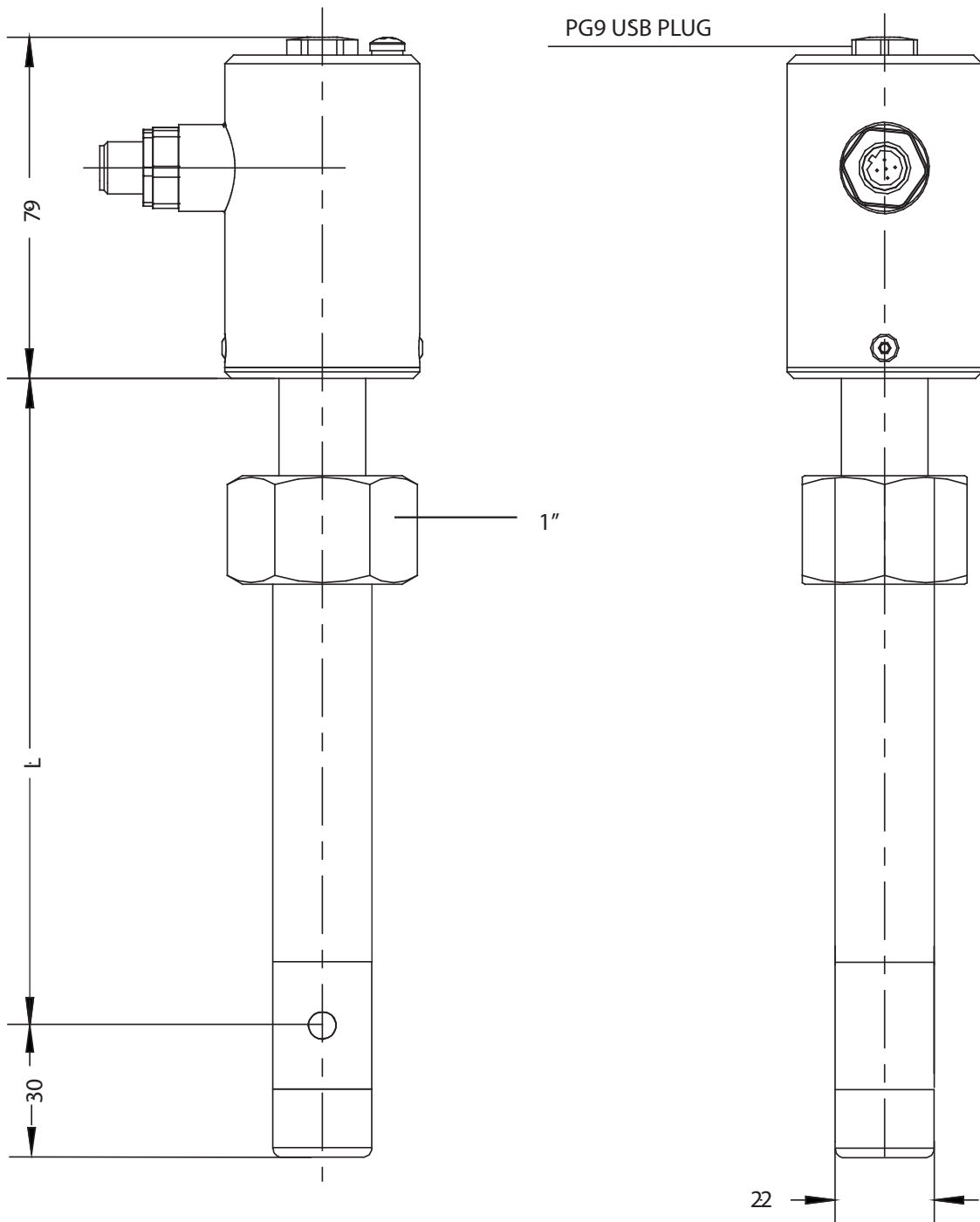
SIZE	"L" DIMENSION
1	176mm
2	244mm
3	462mm

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EXPLODED LAYOUT

Ground connection screw

PG9 plug for USB connection

5 poles plug
(phoenix contact SACC-FS-5SC SH SCO)
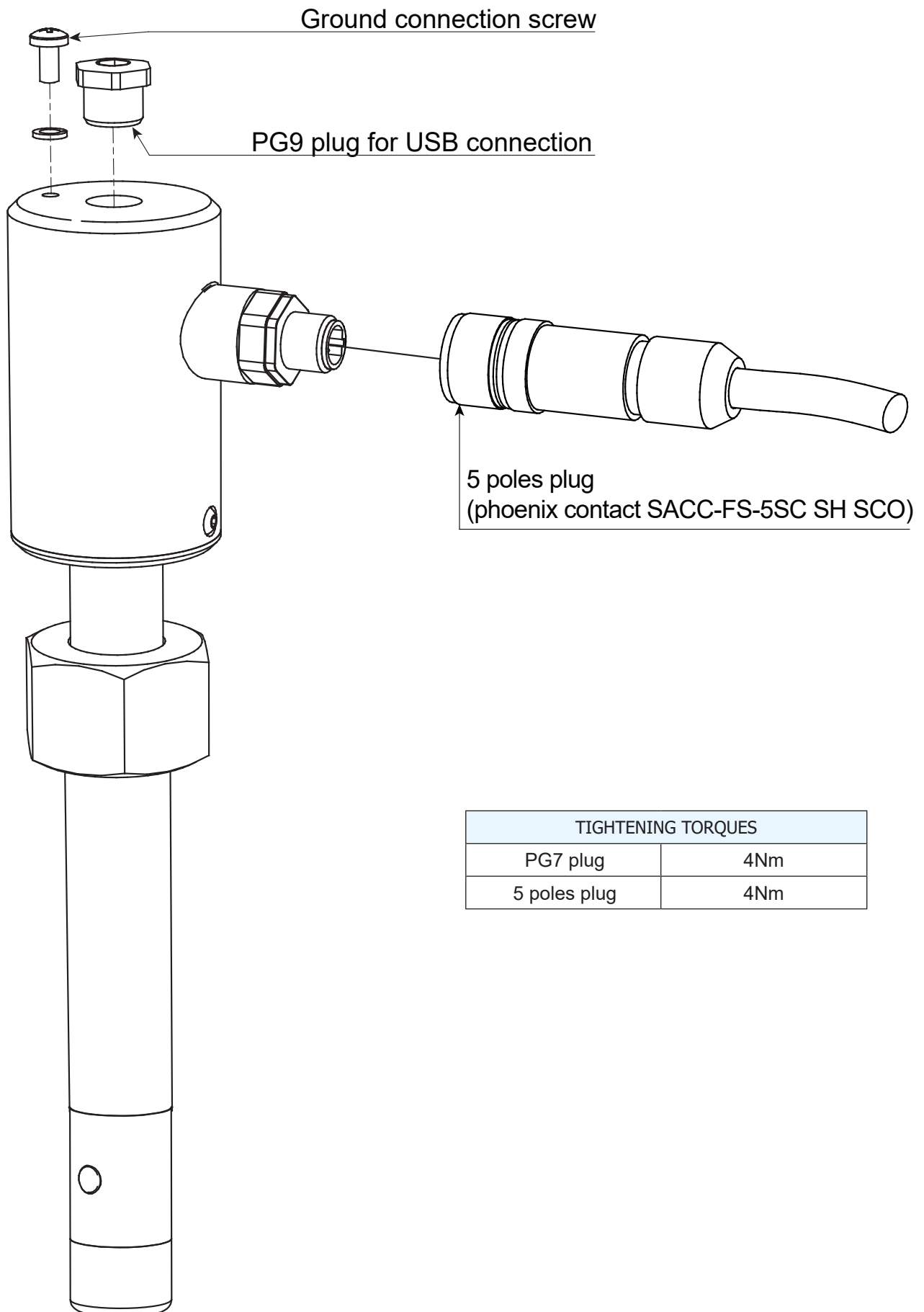
TIGHTENING TORQUES	
PG7 plug	4Nm
5 poles plug	4Nm

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ELECTRICAL CONNECTIONS

OUTPUTS (CONNECTOR)
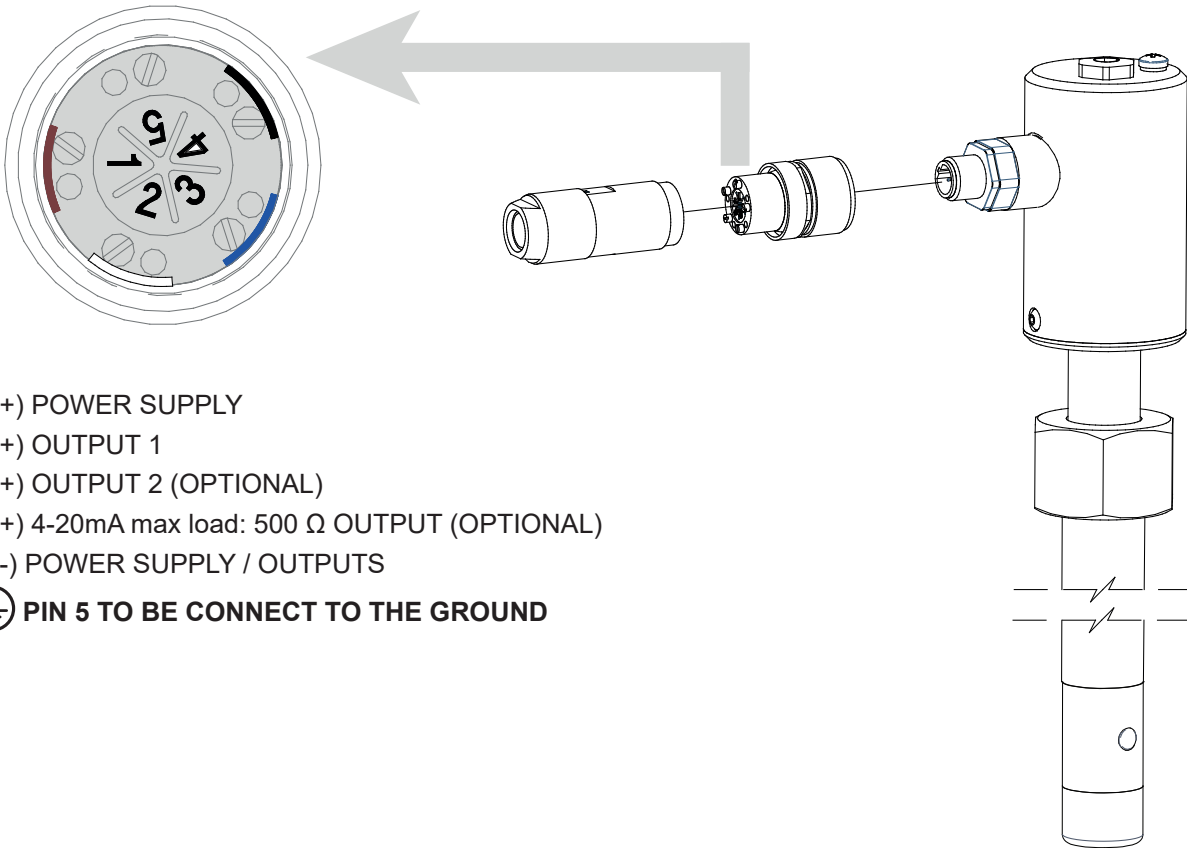
1 (+) POWER SUPPLY

2 (+) OUTPUT 1

3 (+) OUTPUT 2 (OPTIONAL)

4 (+) 4-20mA max load: 500 Ω OUTPUT (OPTIONAL)

5 (-) POWER SUPPLY / OUTPUTS

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

OUTPUTS (CABLE)
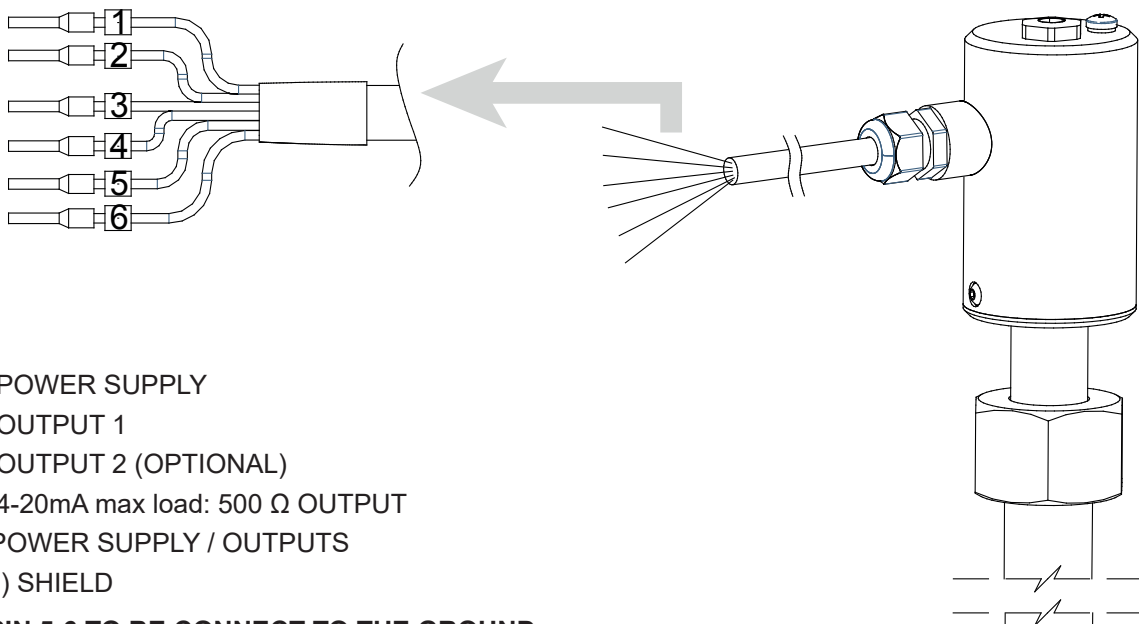
1 (+) POWER SUPPLY

2 (+) OUTPUT 1

3 (+) OUTPUT 2 (OPTIONAL)

4 (+) 4-20mA max load: 500 Ω OUTPUT

5 (-) POWER SUPPLY / OUTPUTS

6 (SH) SHIELD

⏚ **PIN 5-6 TO BE CONNECT TO THE GROUND**

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OUTPUTS:

DIGITAL OUTPUTS
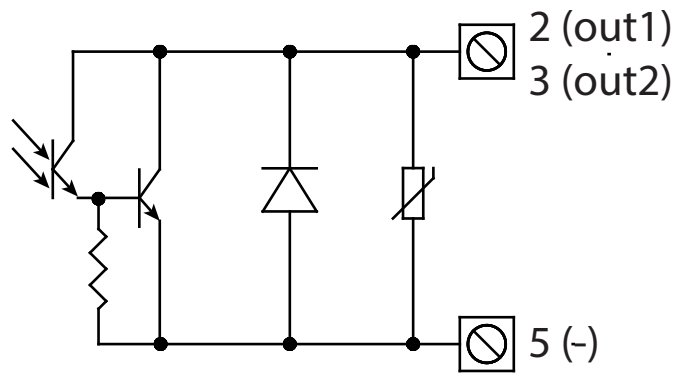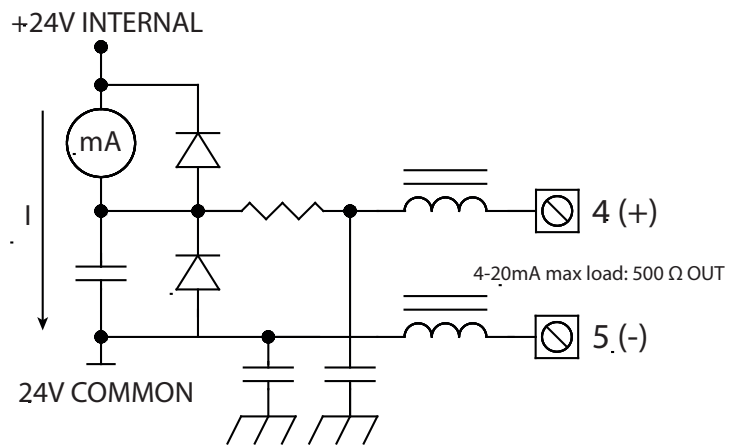
2 (out1)
3 (out2)

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5 (–)

ANALOG OUTPUT

+24V INTERNAL

mA

I

4 (+)

4-20mA max load: 500 Ω OUT

5 (-)

24V COMMON

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USER INTERFACE

CS3795 can be programmed by MCP interface (USB cable is required see below)
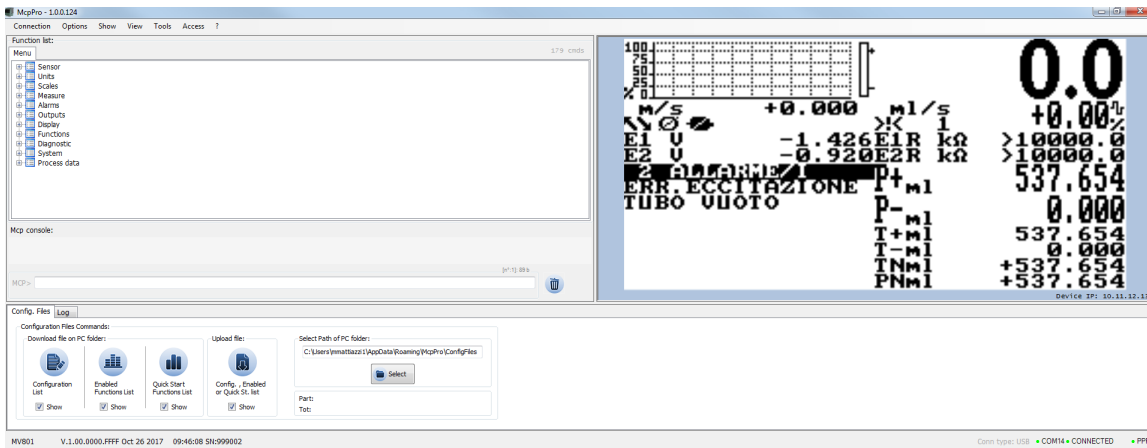
Make the USB connection as shown in the following picture.
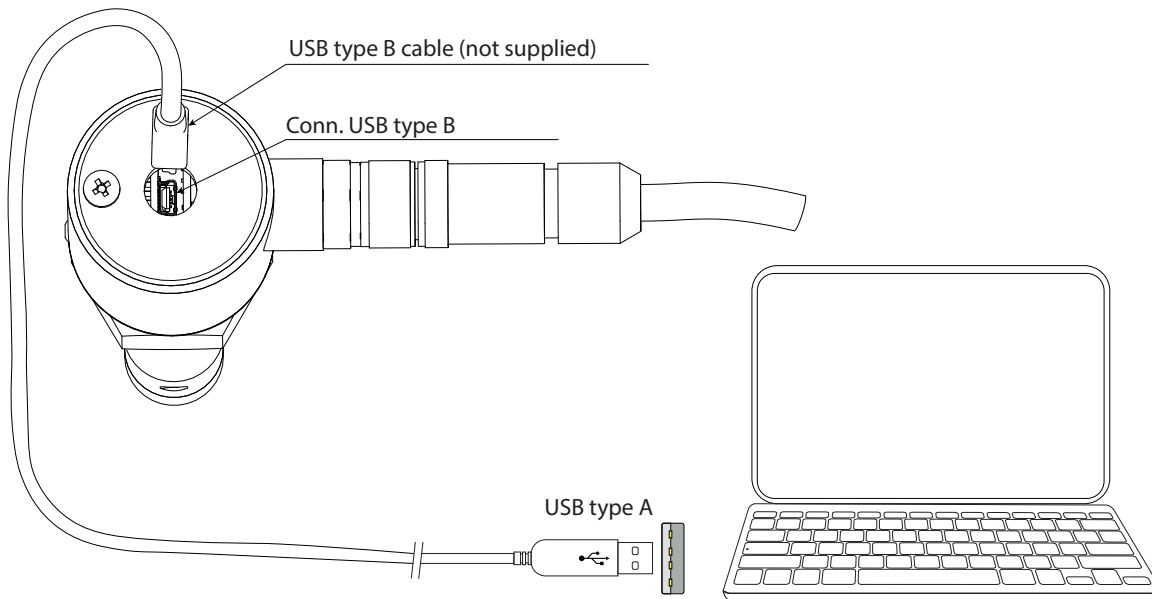
USB type B cable (not supplied)

Conn. USB type B

USB type A

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PROGRAMMING FUNCTIONS

SENSOR

```
MAIN MENU
1-Sensor
2-
3-
4-
5-
7-
9-
11-
12-
13-
```

```
SENSOR
S.model=           000
Lining=     UNSPEC.
S.type=      F.BORE
U.type= METRICHE
Diam.=mm         25
KA=        +00.7771
KA-=        01.0000
KZ=        +0000000
KD=          +00000
Ins.position=      0
KP dynamic=      OFF
Ki=        +01.8727
Kp=        +01.0000
KC=         1.00000
C.Curr.=mA  025.0
C.Reg.PB=        010
C.Reg.DK=        025
S.Freq.=Hz        10
E.P.Detect=       ON
R max=kohm     0500
S.err.delay=    010
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

UNITS

```
MAIN MENU
1-Sensor
2-Units
3-
4-
5-
7-
9-
11-
12-
13-
```

```
UNITS
Diam.=             MM
FR.unit=     METRIC
Pl1 unit=    METRIC
Pl2 unit=    METRIC
T+ unit=     METRIC
T+ unit=          g
T+ D.P.=           3
P+ unit=     METRIC
P+ unit=          g
P+ D.P.=           3
T- unit=     METRIC
T- unit=          g
T- D.P.=           3
P- unit=     METRIC
P- unit=          g
P- D.P.=           3
Temp.unit=        °C
Mass units=       ON
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

SCALES

```
MAIN MENU
1-Sensor
2-Units
3-Scales
4-
5-
7-
9-
11-
12-
13-
```

```
SCALES
FS1=   g/s  4908.7
FS2=   g/s  4908.7
Pls1=       1000.0
Tpls1gms 1000.00
Frq1=Hz     0050.0
Pls2=       1000.0
Tpls2=ms 1000.00
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)

MEASURE

```
MAIN MENU
1-Sensor
2-Units
3-Scales
4-Measure
5-
7-
9-
11-
12-
13-
```

```
MEASURE
Damping=     SMART
Cut-off=%     00.0
Cal.verify=       ON
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

ALARMS

```
MAIN MENU
 1-Sensor
 2-Units
 3-Scales
 4-Measure
 5-Alarms
 7-
ALARMS
Max.thr+=%      000
Max.thr-=%      000
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 / Soglia di portata massima per la portata inversa
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

OUTPUTS

```
MAIN MENU
 1-Sensor
 2-Units
 3-Scales
 4-Measure
 5-Alarms
 7-Outputs
OUTPUTS
Out1=       FREQ.-
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

DISPLAY

```
MAIN MENU
 1-Sensor
 2-Units
 3-Scales
 4-Measure
 5-Alarms
 7-Outputs
 9-Display
DISPLAY
Language=        GB
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

FUNCTIONS

```
FUNCTIONS
T+ reset
P+ reset
T- reset
P- reset
Load Sens.f.def
Load Conv.f.def
Save Sens.f.def
Save Conv.f.def
Calibration
11-Functions
12-Diagnostic
13-System
```

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

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DIAGNOSTIC

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

| 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

```
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
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

ACCURACY TABLE
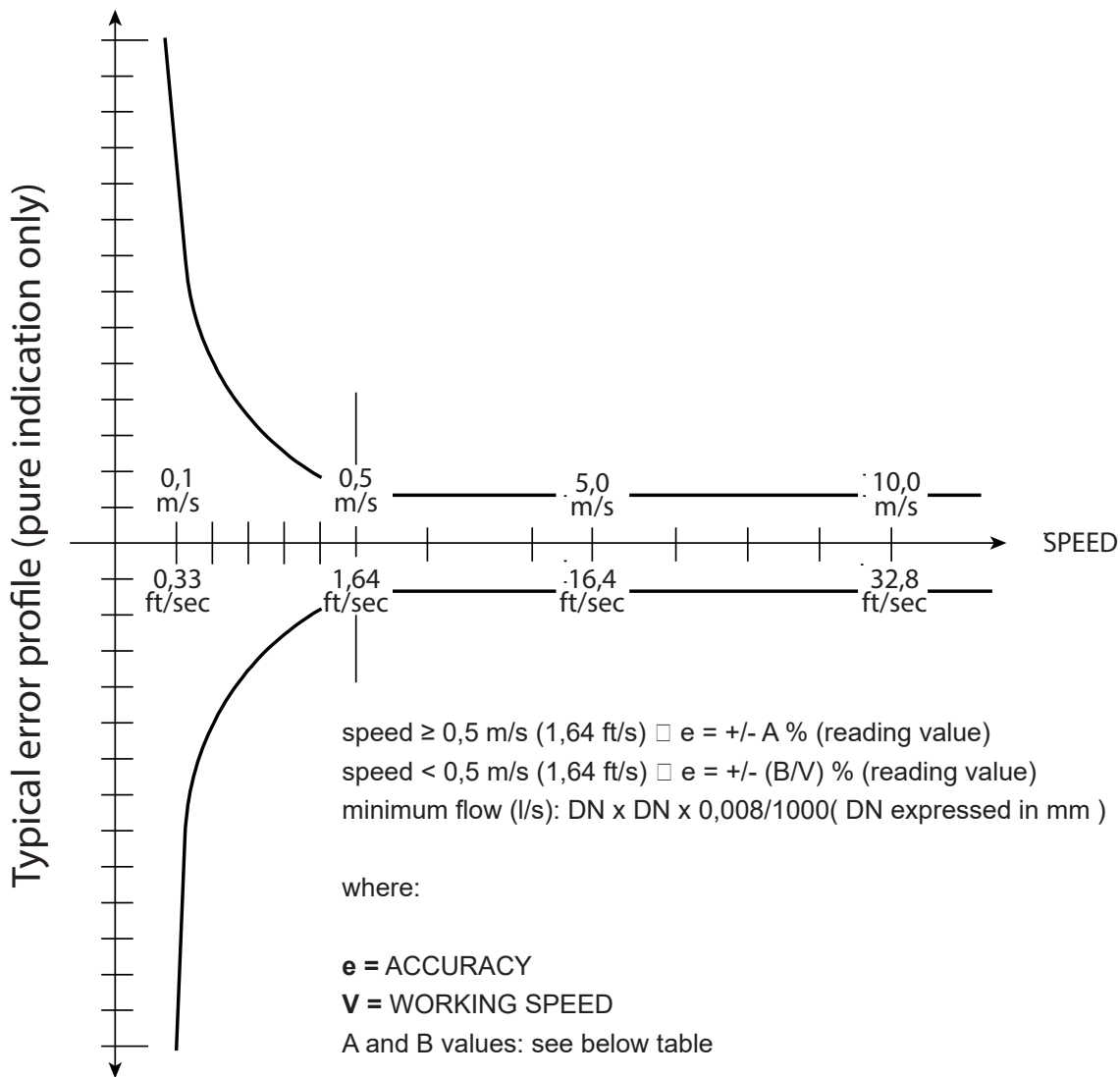
Typical error profile (pure indication only)

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| 0,1 m/s | | 0,5 m/s | | 5,0 m/s | | 10,0 m/s | |
| 0,33 ft/sec | | 1,64 ft/sec | | 16,4 ft/sec | | 32,8 ft/sec | |

SPEED

speed ≥ 0,5 m/s (1,64 ft/s) □ e = +/- A % (reading value)

speed < 0,5 m/s (1,64 ft/s) □ e = +/- (B/V) % (reading value)

minimum flow (l/s): DN x DN x 0,008/1000(DN expressed in mm)

where:

e = ACCURACY

V = WORKING SPEED

A and B values: see below table

A	B (speed in m/s)	B (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 +/- 0,005 %

❑ ID accuracy: mean value better than 1%, IDmin/IDmax>0,98

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HOW TO ORDER

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

Complete code example for order → **CS3795-A1A0A1**

The manufacturer guarantees only English text available on our web site www.isoil.com

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