Instructions manual

Series FLOMID

Sensor FLOMID-XL + Converter XL1

The art of measuring

R-MI-FMDXL1 Rev.: 0 english version

PREFACE

Thank you for choosing a product from Tecfluid S.A.

This instruction manual allows the installation, configuration, programming and maintenance. It is recommended to read it before using the equipment.

WARNINGS

- This document shall not be copied or disclosed in whole or in any part by any means, without the written permission of Tecfluid S.A.
- Tecfluid S.A. reserve the right to make changes as deemed necessary at any time and without notice, in order to improve the quality and safety, with no obligation to update this manual.
- Make sure this manual goes to the end user.
- Keep this manual in a place where you can find it when you need it.
- In case of loss, ask for a new manual or download it directly from our website www.tecfluid.com Downloads section.
- Any deviation from the procedures described in this instruction manual, may cause user safety risks, damage of the unit or cause errors in the equipment performance.
- Do not modify the equipment without permission. Tecfluid S.A. are not responsible for any problems caused by a change not allowed. If you need to modify the equipment for any reason, please contact us in advance.

TABLE OF CONTENTS

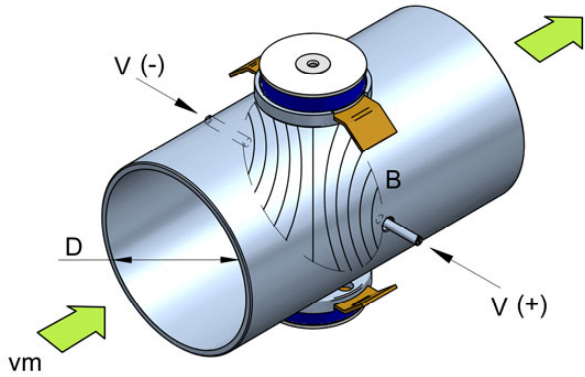
SERIES FLOMID

1 INTRODUCTION

The FLOMID electromagnetic flowmeters with XL1 converter are based on Faraday's induction law.

When an electrically conductive liquid flows through a magnetic field, perpendicular to the flow direction, it induces a voltage V proportional to the liquid velocity.

Two electrodes in contact with the liquid and positioned perpendicularly to the magnetic field, sense this voltage V.



$$V = B \cdot v_m \cdot D$$

Where:

V = Measured voltage in the electrodes
B = Magnetic field
v_m = Average liquid velocity
D = Pipe diameter

The electronic converter is based on the most advanced technology in digital signal processing, in order to obtain accurate and reliable measurements.

The device provides the following features:

- Coil excitation by means of pulsed signal to obtain a negligible zero offset.
- Pulse and current output proportional to the flow rate and user programmable.

2 RECEPTION

The FLOMID electromagnetic flowmeters are supplied conveniently packaged for their protection during transportation and storage, together with their instructions manual for installation and operation.

All the instruments are supplied tested in our flow rigs, obtaining the gain factor of each sensor.

2.1 Unpacking

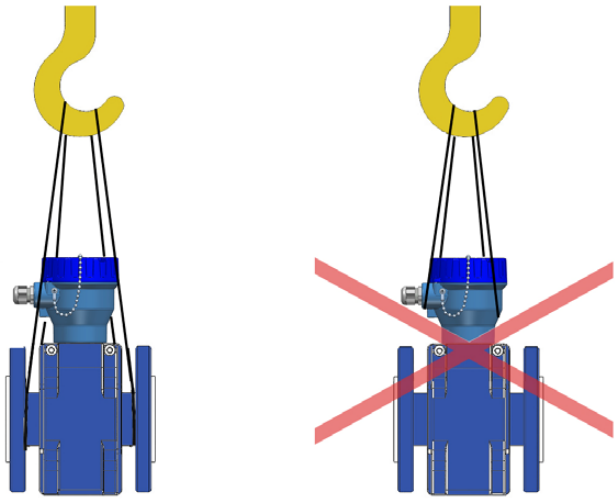
Unpack the instrument carefully, removing any remains of the packing from the inside of the sensor. Do not remove the grease from the neck that couples to the electronics housing.

2.2 Storage temperatures

Sensors linings of:	PTFE and PVDF	-20ºC ..... +60ºC
	PP and EBONITE	-5ºC ..... +50ºC

3 HANDLING

It should always be done with care and without knocks.
The large diameter sensors have rings for holding the elevation elements. If the flowmeter is held using slings, these should hold on the sensor and not on the electronics housing (see drawing).



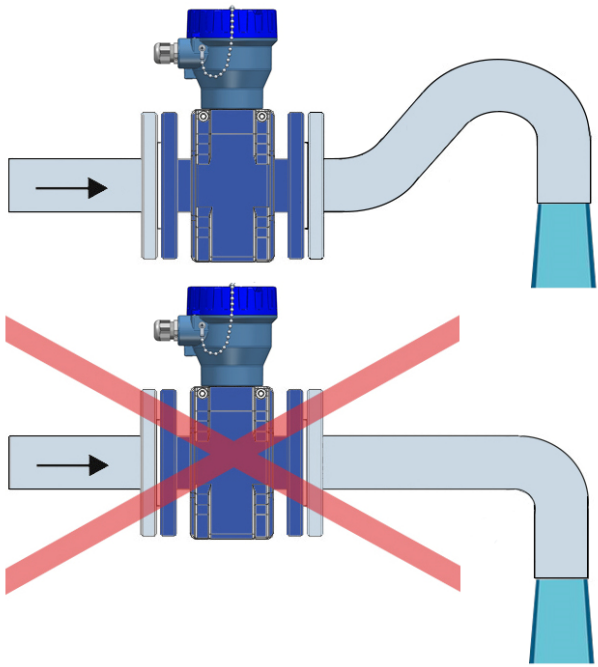
4 INSTALLATION

This should be made in a point that guarantees that the pipe is always completely full.

Avoid high points of the pipes where air pockets usually form, or pipes with falling flow where vacuums can form.

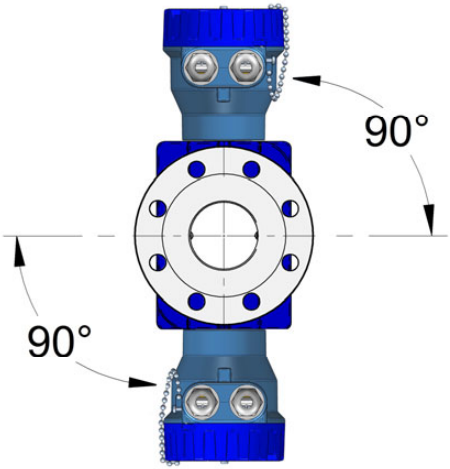
Partially full pipes can produce important reading errors.

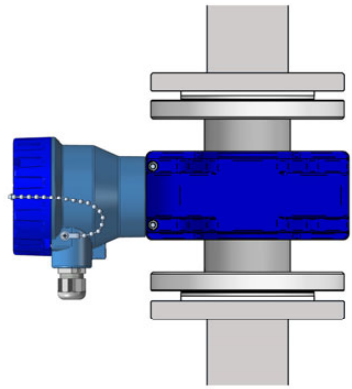
Flow rate measurement with open discharge makes it necessary to install the flowmeter in a pipe section with a siphon which avoids stagnation of air in the sensor.



4.1 Sensor position

The most adequate position is with the electrodes in a horizontal plane. In this way, deposits of particles on the electrodes are avoided.

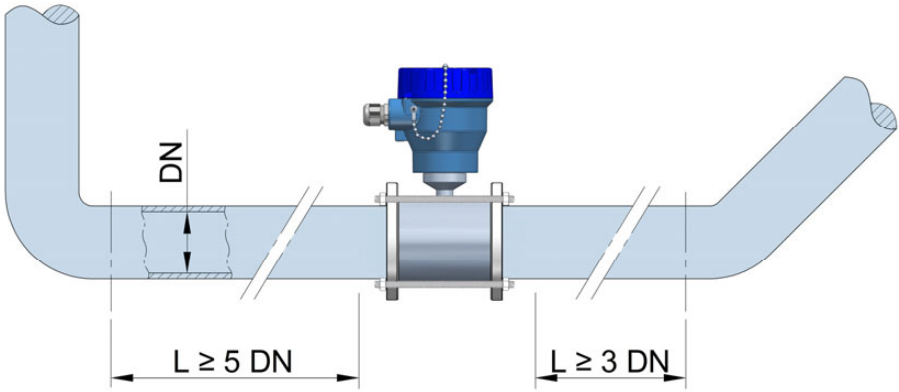




4.2 Straight pipe sections

They are necessary before and after the sensor. The minimum distances are the following:

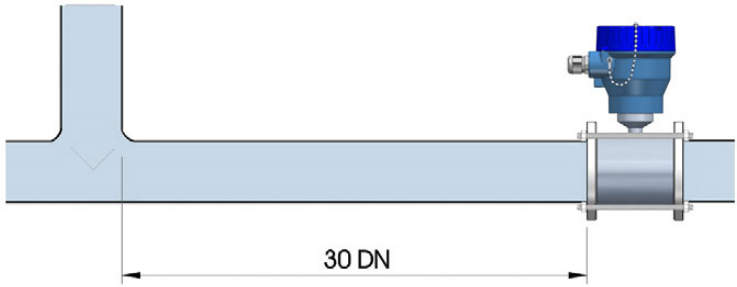
Upstream	5 DN
Downstream	3 DN



In installations with turbulent flow it may be necessary to increase these distances.

4.2.1 Mixtures

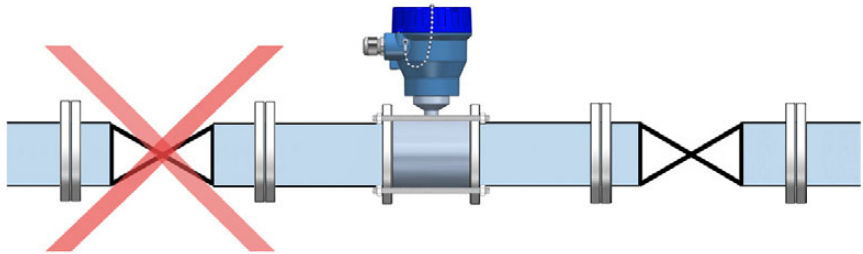
If liquids of different conductivities are mixed it is necessary to install the sensor a minimum of 30 DN from the point of mixture in order to obtain a uniform conductivity of the liquid and stabilize the readings.



If this distance is shorter, readings may be unstable.

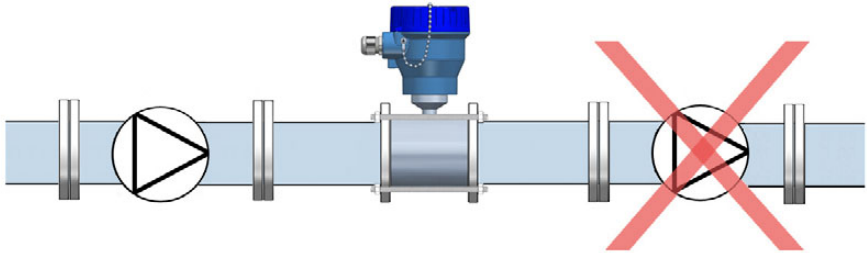
4.3 Valves

Control valves or shut-off valves should always be installed downstream from the sensor to assure that the pipe is always full of liquid.



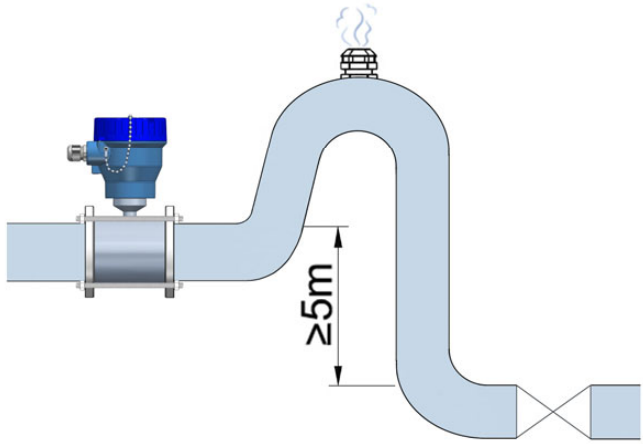
4.4 Pumps

Pumps should be mounted upstream from the sensor to avoid the suction of the pump (vacuum) that could damage the sensor liner.



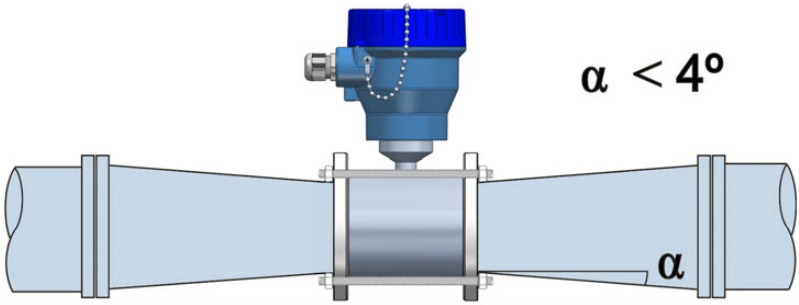
4.5 Aeration

If there is a point where the level difference is higher than 5 m an air inlet valve should be installed after the sensor to avoid a vacuum effect that could damage the sensor liner.



4.6 Reduction of DN

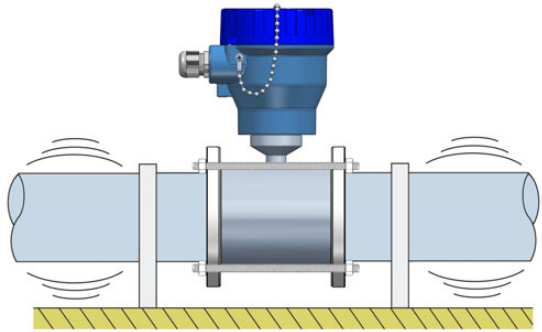
In installations where, due to reasons of the flow rate to be measured, a sensor of a smaller DN than the pipe DN must be mounted, the reduction must be done with an angle smaller than 4º to avoid turbulences that can give false readings.



If the angle cannot be so small, straight pipe sections indicated in 4.2 point must be kept.

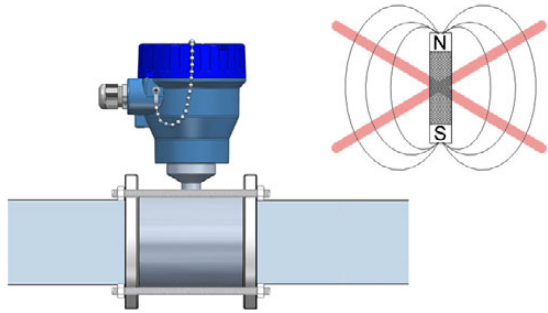
4.7 Vibrations

Vibrations of the pipes should be avoided by anchoring the pipe before and after the sensor. The vibration level should be less than 2.2 g in the range of 20 -150 Hz according to IEC 068-2-34.



4.8 Magnetic fields

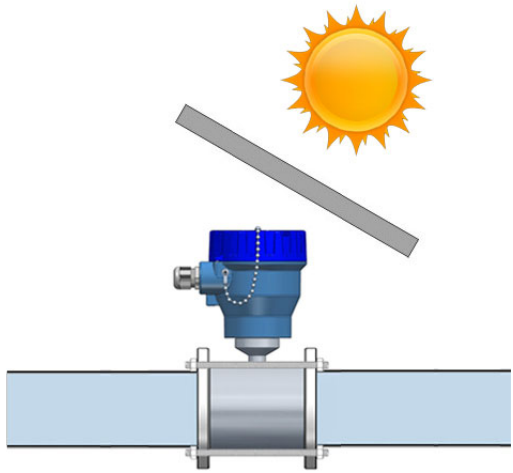
Strong magnetic fields close to the sensor should be avoided.



4.9 Temperature

In open air installations it is recommended to install a protection to avoid direct sun light on the flowmeter.
With thermally insulated pipes DO NOT insulate the sensor. High temperatures can damage it.

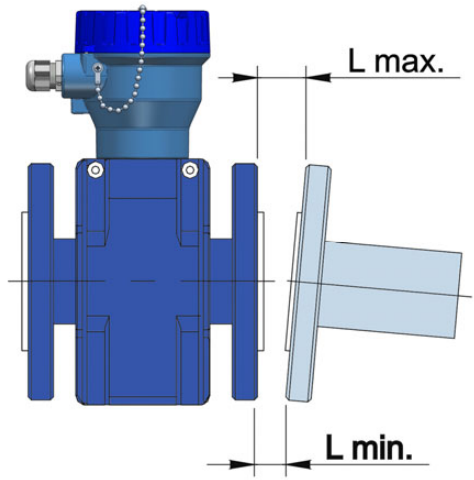
The maximum liquid temperatures are shown on page 32.



5 MOUNTING

5.1 Parallelism

The maximum parallelism error must be less than 0.5 mm (Lmax—Lmin ≤ 0.5 mm).



5.2 Sensor earth connection

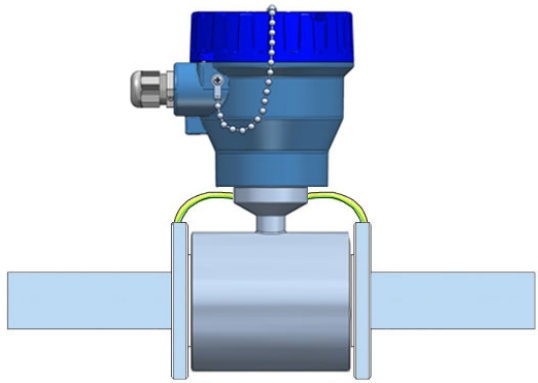
To obtain correct operation the sensor should have its functional earth connected to a point that is in direct contact with the liquid whose flow rate wants to be measured.

The earth cables should assure a good electrical contact. To obtain this, they should be well screwed down and with a good contact on both sides of the sensor. It is important to eliminate paint or coverings that act as insulation of the connection.

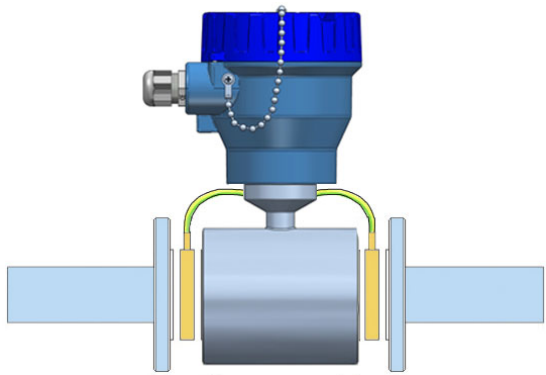
The functional earth connection should be used exclusively for the sensor given that parasitic signals caused by other electrical equipment connected to this earth can cause malfunction of the sensor.

The connection of the functional earth should be made as follows:

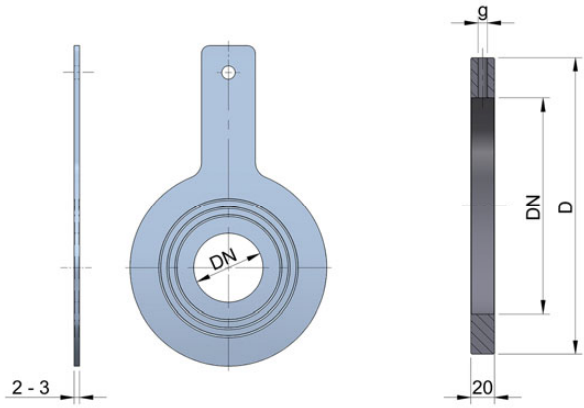
a) In the case of metallic pipes without internal lining connect the earth cables to the counter flanges.



b) In the case of metallic pipes with internal lining or plastic pipes, connect the earth cables to the earthing rings, supplied on request.



Earthing rings are supplied in two versions:



Dimensions in mm

Metallic

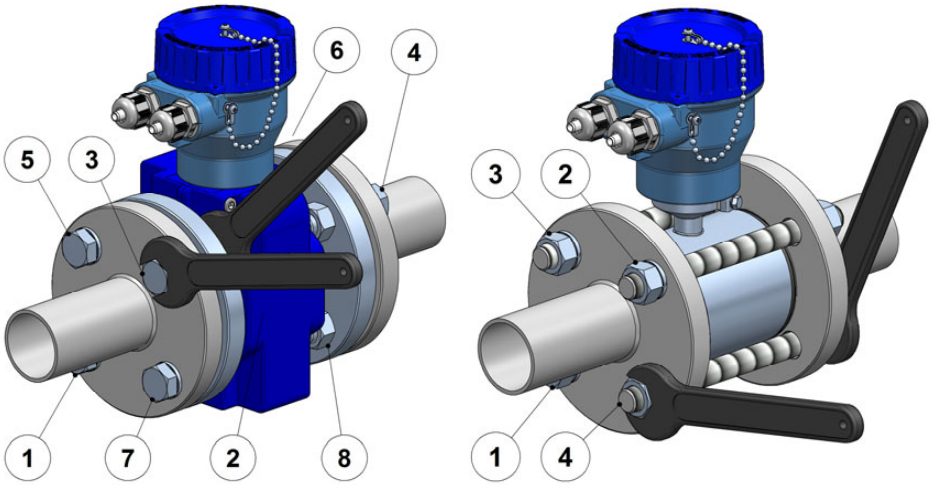
Plastic

Metallic, disk in stainless steel EN 1.4404 (SS 316L), for liquids compatible with this material.

Plastic, with an electrode to make the contact with the liquid. The materials (plastic and metal) depend on the working liquid.

5.3 Tightening

The tightening of the flange bolts should be done uniformly, following the sequence indicated in the drawings according to the number of flange bolts.



6 ELECTRICAL CONNECTION

For the electrical connection, the FLOMID flowmeter with XL1 converter is provided of terminal strips. To help in the wiring of the equipment, the description of the terminals is marked next to each terminal strip.

For the electrical installation it is recommended to use multiple conductor cables with individual cable sections in the order of 0.25 to 0.5 mm^2 in order to make it easier to connect.

Before starting the installation, check that the cable glands are the right size for the cables to be used. This will guarantee the instrument will stay watertight. The cable glands used are for cables with outside diameters between 5 mm and 12 mm.

It is better to maintain the cables with mains voltage (power supply) separated from the cables with low level signals (4-20 mA or pulses).

To connect the cables, peel the outside insulation to free the inner cables. Then pass the cables through the cable glands and screw down in the corresponding positions of the terminal strip as indicated in the following point.

Grip carefully the cables with the cable glands to maintain the degree of protection.

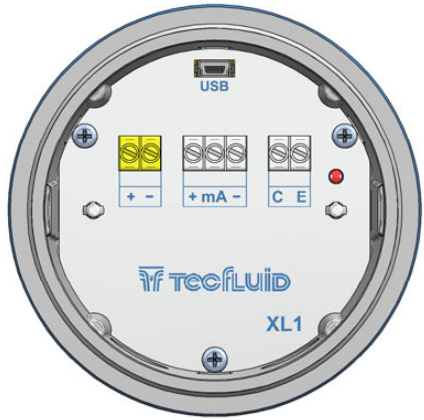
Incorrect installation of the cable gland or inadequate cable placement can cause irreparable damage to the converter.

IMPORTANT NOTE: To ensure smooth operation of the equipment, it is recommended to make the electrical connection according to the following points:

- For output signals, use shielded cable when possible.
- Keep wires away from strong sources of noise.

6.1 Power supply wiring

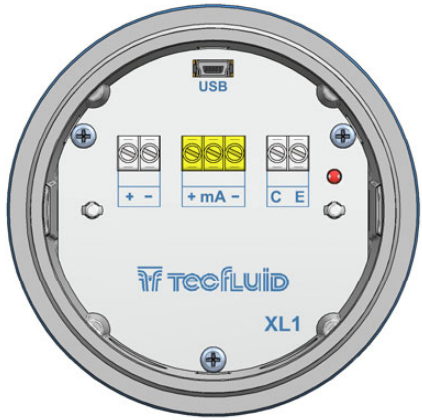
Before starting the installation of the equipment, check that the supply voltage available is the same as marked on the label of the flowmeter.



Terminal	
+	Power supply positive
-	Power supply negative

When the device is powered, the led will be on.

6.2 Analog output wiring



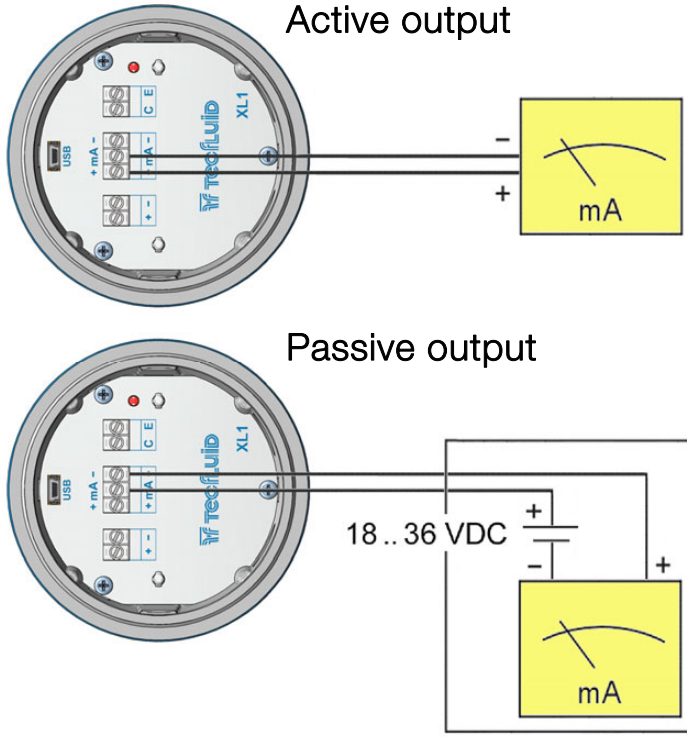
Terminal	
+	mA (positive, active output)
mA	mA
-	mA (negative, passive output)

The analog output is a current loop working linearly between 4 and 20 mA and proportional to flow rate. When the converter detects empty pipe, the current loop gives a value of 3.6 mA, and when the flow rate is negative and the current output is configured as unidirectional (see point 7.5.1), the loop will give 21 mA.

The analog output is galvanically isolated. It can be either active (which means that the receiving device must be passive) or passive (which means that the receiver must supply the power for the current loop). It is recommended to use a receptor with an input resistance of less than 700 Ω to guarantee correct operation.

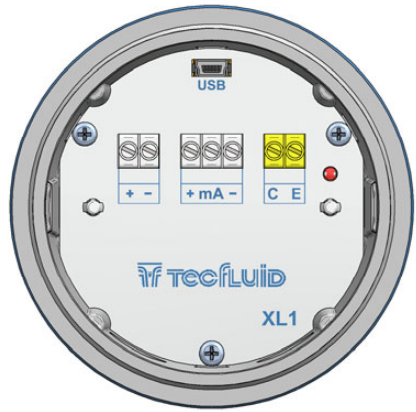
The configuration of the analog output mode (active or passive) is done by means of the connection to the terminal strip. For active mode, terminals “+” and “mA” are connected. For passive mode, terminals “mA” and “-” are connected.

NOTE: The analog output has protection against reversed polarity. Due to another protection against over voltages, if a loop supply voltage of more than 32 V is connected the converter may be damaged.



NOTE: Never connect the load between entre terminals "+" and "–". The analog output could be damaged.

6.3 Digital output wiring



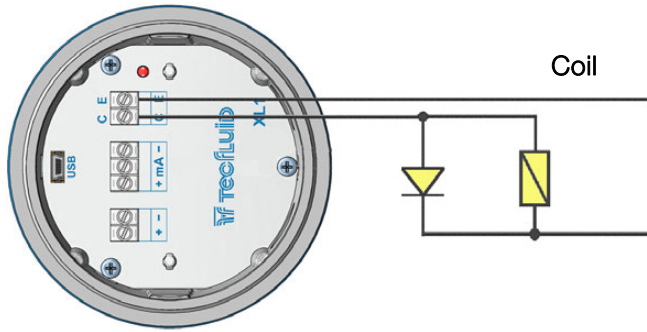
Terminal	
C	Collector
E	Emitter

The digital output is opto-isolated. The terminals are the collector and emitter of a NPN bipolar transistor.

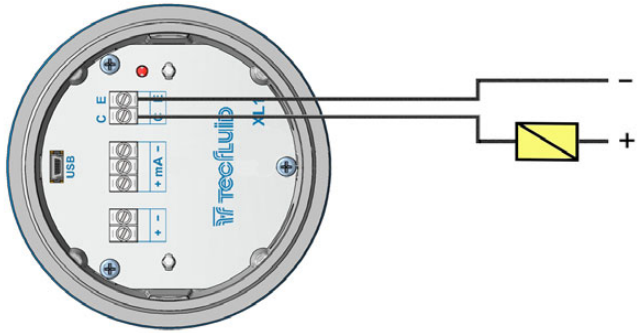
If the equipment is configured as pulse mode (see page 26), the led will alternate between green and red if there is a flow, and will remain green if there is no flow.

If it is configured as alarm mode (see page 26), the led will light red when the alarm is activated and green when it is not.

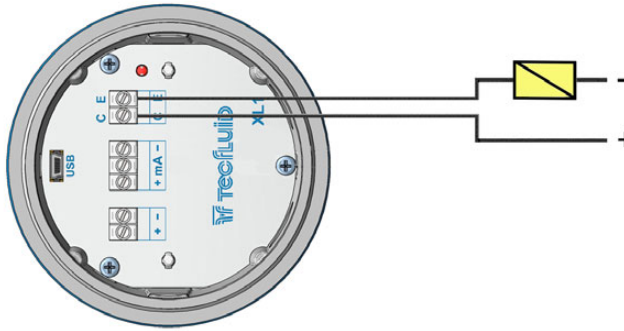
In the case of using inductive loads, in order to protect the output transistor, the use of free wheeling diodes is required.



Example. Connection with the load at the collector



Example. Connection with the load at the emitter



7 ASSOCIATED SOFTWARE WINSMETER XL1

By means of this associated software, calibration and adjustment of the instrument can be done in a comfortable and intuitive way.

Such software can be downloaded from the “Downloads” section of the Tecfluid S.A. www.tecfluid.com/downloads

7.1 USB cable connection and software installation

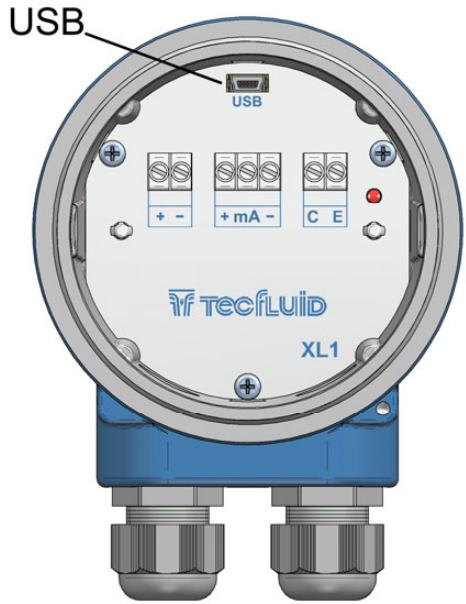
Extract the files from the Winsmeter XL1.zip to a new system folder.

Execute the Setup.exe file and follow the steps for the installation.

In order to connect the converter to a computer an USB cable is required. This cable is type A at one end and mini USB type B at the other, and it is readily available on the market.

The ends of the cables can be seen in the picture.

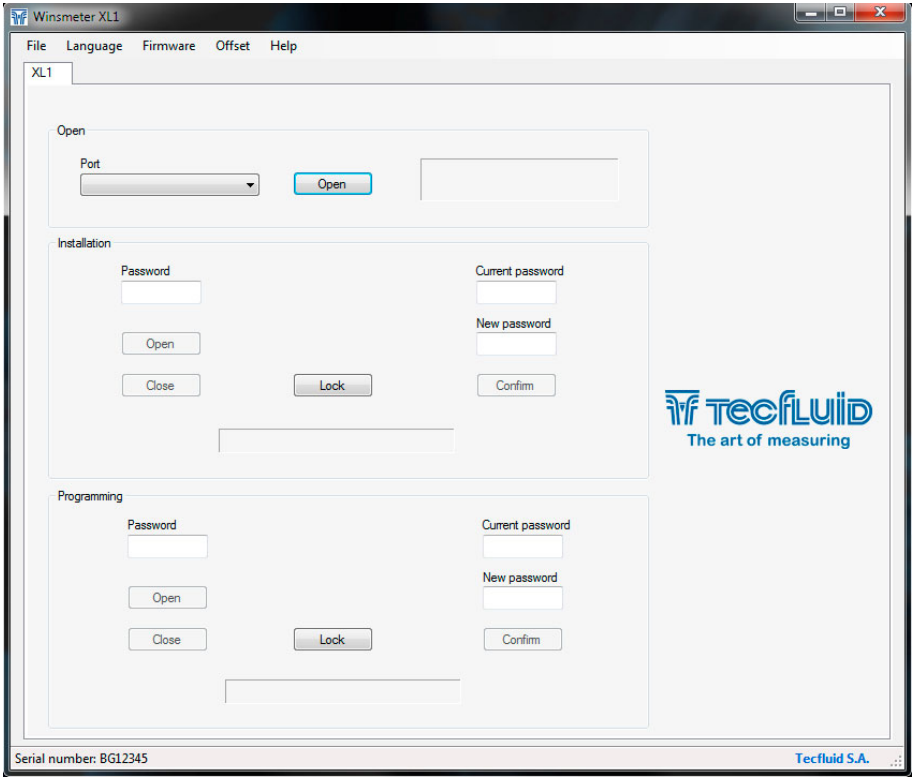
The USB connector is located at the opposite side of the cable glands.



Connect the USB cable at one end to the converter and at the other to the computer where the software is installed.

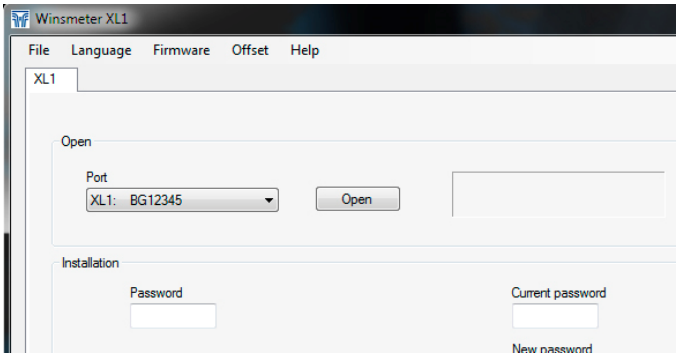
Power on the electronic converter.

Execute the program WinsmeterXL1 following the sequence Start – Programs – Tecfluid S.A. - WinsmeterXL1.

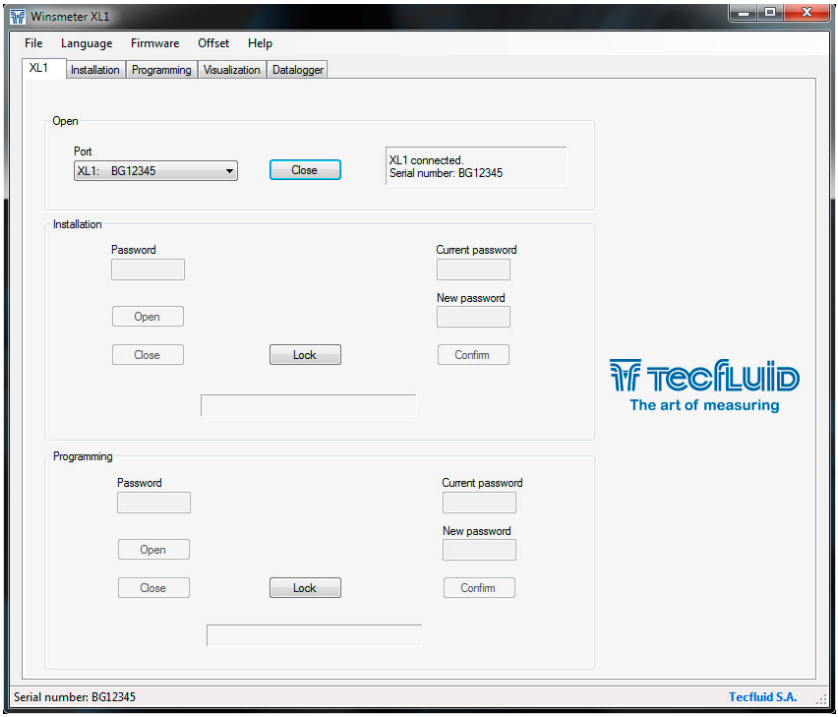


7.2 Port connection

In the "Port" section, choose the appropriate port for the converter. This will appear with the name of the port followed by XL1 and its serial number. Then click "Open".



Once the port is open, the button "Lock" is activated.



7.3 Password

The XL1 converter can be locked so that programming data can be modified only with previous password access.

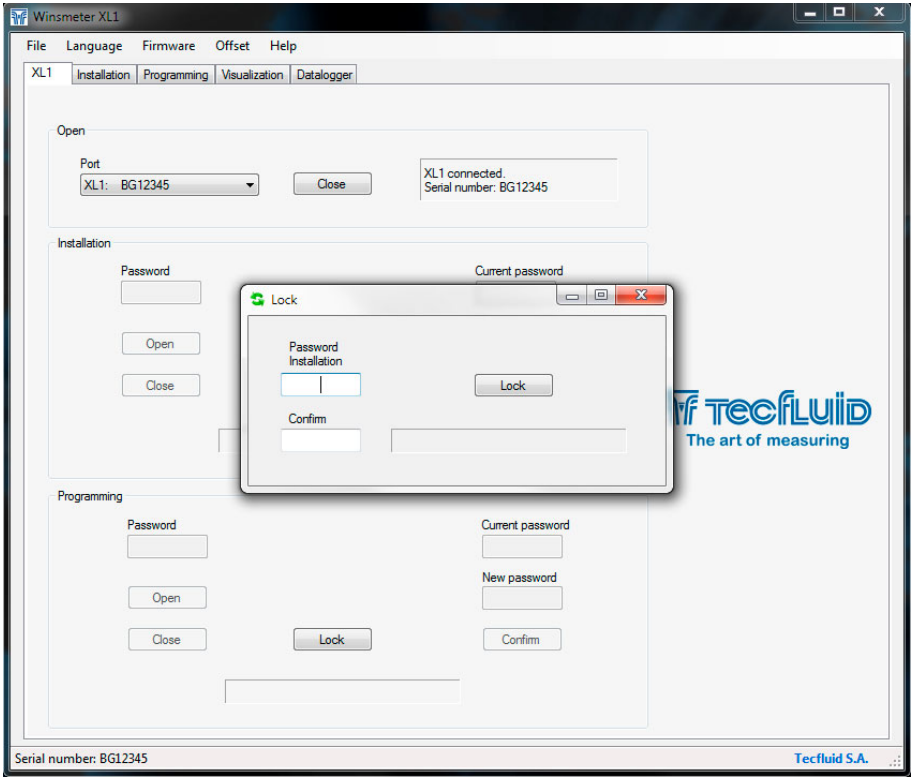
When the converter is locked, data can be read but not modified.

By default the device is unlocked. All data can be modified by means of the program Winsmeter XL1.

To set a password access to a section (“Installation” or “Programming”), the section must be unlocked. To do this, simply press the “Lock” button in the desired section.

Each section can be locked or unlocked independently. Passwords are equally independent for each section.

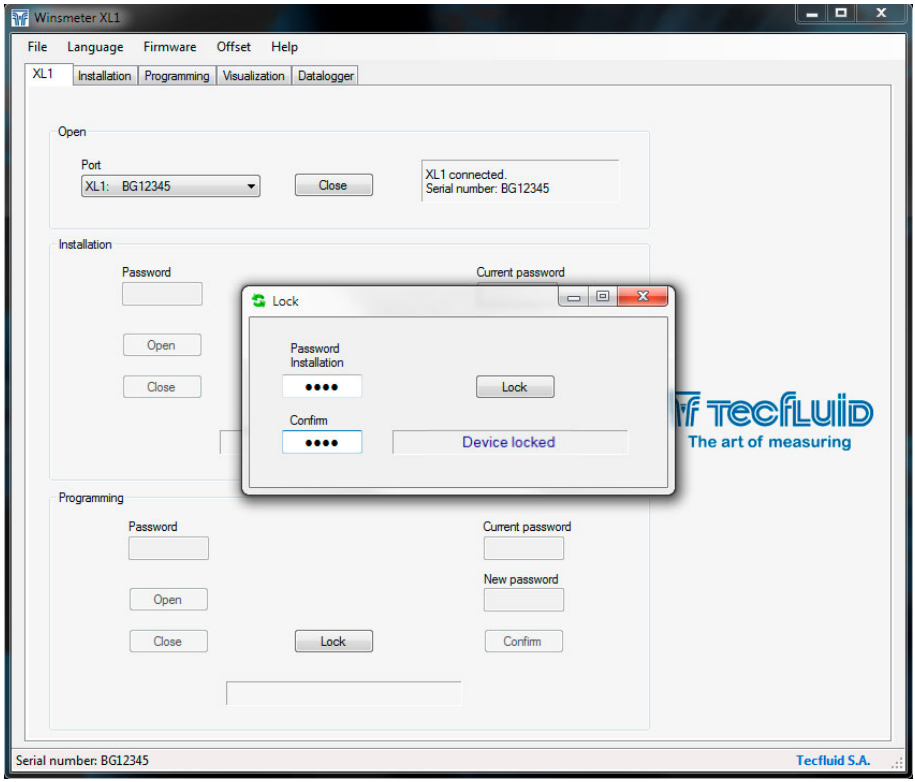
Once done, the following window will appear:



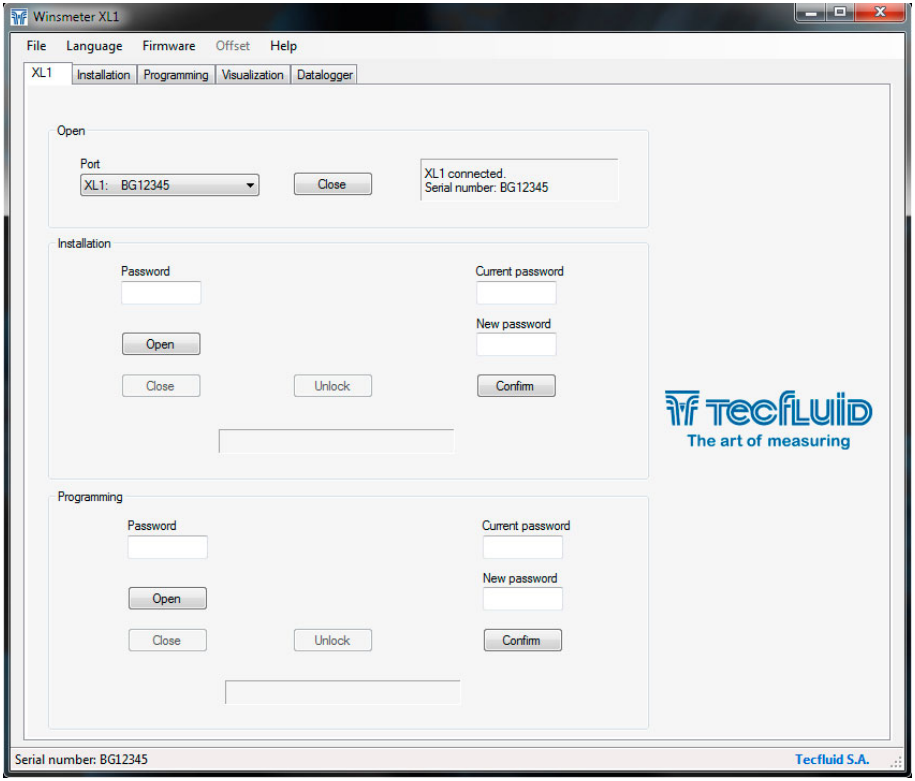
In the “Password” textbox a 4 numeric digit code should be entered, and in the “Confirm” textbox, the code is confirmed to avoid unintentional errors.

Once the password is confirmed, press the “Lock” button and the section (“Installation” or “Programming”) will be locked.

The text “Device locked” will appear, and the program returns to the home screen.



After accessing back to the port and pressing the “Open” button, the screen shows the textbox to enter or change the locked passwords.

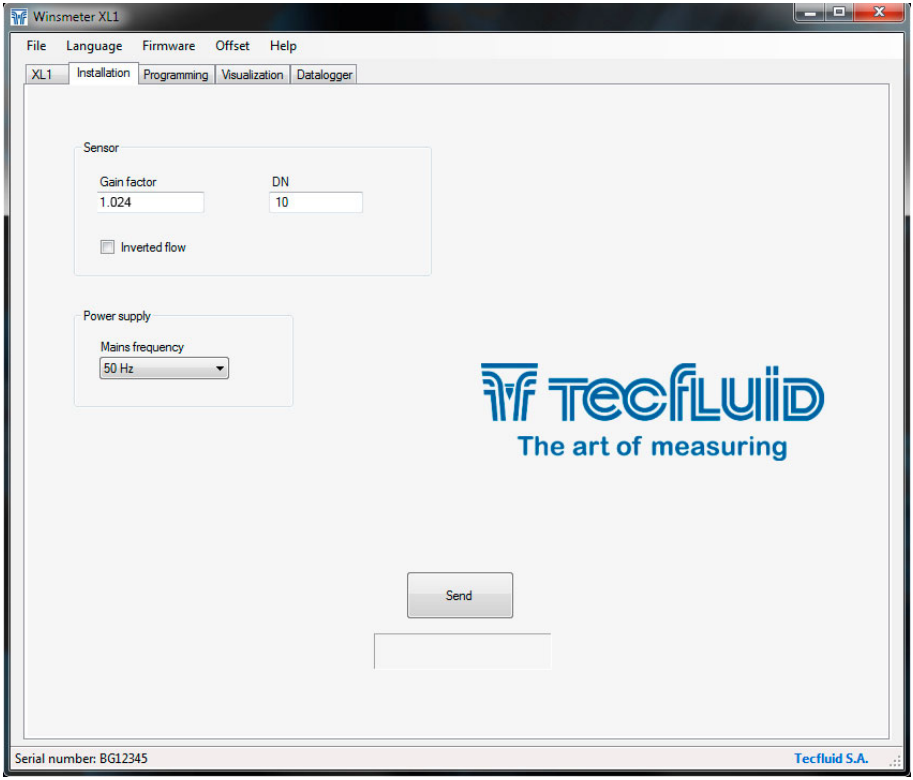


To unlock the section it is necessary to write the correct password and press “Enter” or the “Open” button. The text “Installation enabled” or “Programming enabled” will appear at the bottom of the section

Once a section is enabled, pressing the corresponding button “Unlock”, the section will be unlocked.

7.4 Access to “Installation”

To enter to “Installation” window, press the corresponding tab.



Changing the parameters of this window, the functions of the equipment that affect the measurement can be programmed. Once the changes have been made, press the "Send" button to save all data into the device memory.

7.4.1 Sensor

In the Sensor section, the Gain factor, the nominal diameter (DN) and the flow direction can be configured.

The **Gain factor** is composed of an integer and three decimals.

It must match the Fg parameter on the device label.

DN is the inner diameter of the sensor. It is also printed on the device label.

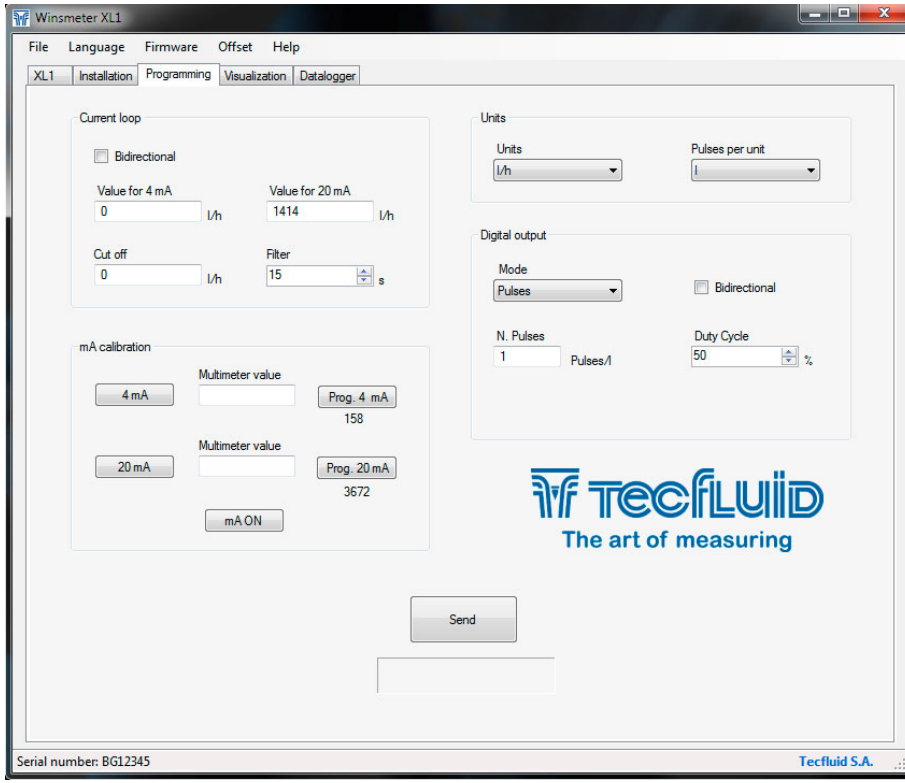
The flow rate has a positive sign when going from left to right, looking at the front flowmeter, and negative in the opposite direction. To change that sign, activate the **Inverted flow** checkbox .

7.4.2 Power supply

In this section the mains frequency of the country where the instrument is installed should be selected.

7.5 Access to “Programming”

To enter the Programming window, simply press the corresponding tab.



Changing the parameters in this screen, the different functions of the equipment can be programmed. Once the changes are made, press the “Send” button to save all data into the device memory.

7.5.1 Current loop

In this section parameters related to the current loop can be configured.

If the **Bidirectional** checkbox is selected, the analog output will have a value proportional to flow rate, whether it is positive or negative.

If the checkbox is not selected, the analog output will give a value between 4 mA and 20 mA proportional to flow rate when it is positive, and it will give a value of 21 mA when the flow rate is negative.

Values for 4 mA and 20 mA are those that correspond to the current range limits. Therefore, the current loop will give a linear signal between 4 mA and 20 mA when the input signal has a value between the programmed values in these textboxes.

By default, the flowmeter is delivered programmed with flow rate values corresponding to liquid velocities of 0 m/s (4 mA) and 5 m/s (20 mA).

The textbox **Cut off** is useful to program the value below which the XL1 converter will consider that the flow rate is zero, and therefore the analog output will give 4 mA and the digital output will be deactivate if it is programmed as Pulses.

By default, the flowmeter is delivered programmed with a cut off value corresponding to a liquid velocity of 0,5 m/s.

In the box **Damping** the value in seconds of the filter can be programmed. This filter allows to obtain stable current readings despite of fluctuations of the flow rate.

The integration time is selected in seconds, with a minimum value of 1 and a maximum value of 25 seconds.

When there is a sudden variation of the frequency then the filter should react as fast as possible to give a correct reading of the new value. Therefore, the filter controls for each reading the deviation of the instantaneous frequency with respect to a reference. If this deviation exceeds 25%, the filter will stop acting, indicating the instant value, and will start again the filtering process.

7.5.2 Units

In order to program the device more intuitively, the **Flow rate** units can be changed so that the desired working units are selected. Programming parameters that have flow rate units will update their value when the units are changed.

In the same way, the volume units related to the pulse output can be selected, which are given in **Pulses / Unit of volume**.

7.5.3 Digital output

In the textbox **Digital output** this output can be configured as pulse output or as several types of alarm.

As in the analog output, if the **Bidirectional** checkbox is selected, the pulse output will be operative whether the flow rate is positive or negative.

If it is not selected, the pulse output will be operative only when the flow rate is positive.

In the textbox **Number of pulses** per volume unit, a number of pulses can be programmed. This number will give information of each generated pulse, since this will correspond to a determined volume. If the programmed value involves exceeding the maximum frequency that the device can supply (5000 Hz), a warning message will appear.

In the textbox **Duty cycle**, the width of the output pulse can be programmed as a percentage. The value indicates the percentage of time that the pulse is active with respect to a complete period. The minimum and maximum values of Duty cycle are 10 and 90%.

Note: Regardless of the Duty cycle value, the pulse width can not exceed 180 ms.

When the digital output does not operate as a pulse output, it can be programmed as an empty pipe indication, as an inverted flow indication or as a flow alarm.

In this latter case, the values corresponding to the activation and deactivation of the alarm can be programmed.

7.5.4 Current loop calibration

The XL1 flowmeter is delivered with the current output already calibrated. If you want to correct a derive of the 4 or 20 mA current values because they do not coincide with the ammeter used, it can be done in the following way:

To calibrate the 4 mA point, press the button “4 mA”. The transmitter will fix the output to this value. Then enter the current value indicated in the multimeter and press the button “Prog. 4 mA”. The transmitter will adjust its output and the multimeter will show 4 mA.

Follow the same steps for the 20 mA point.

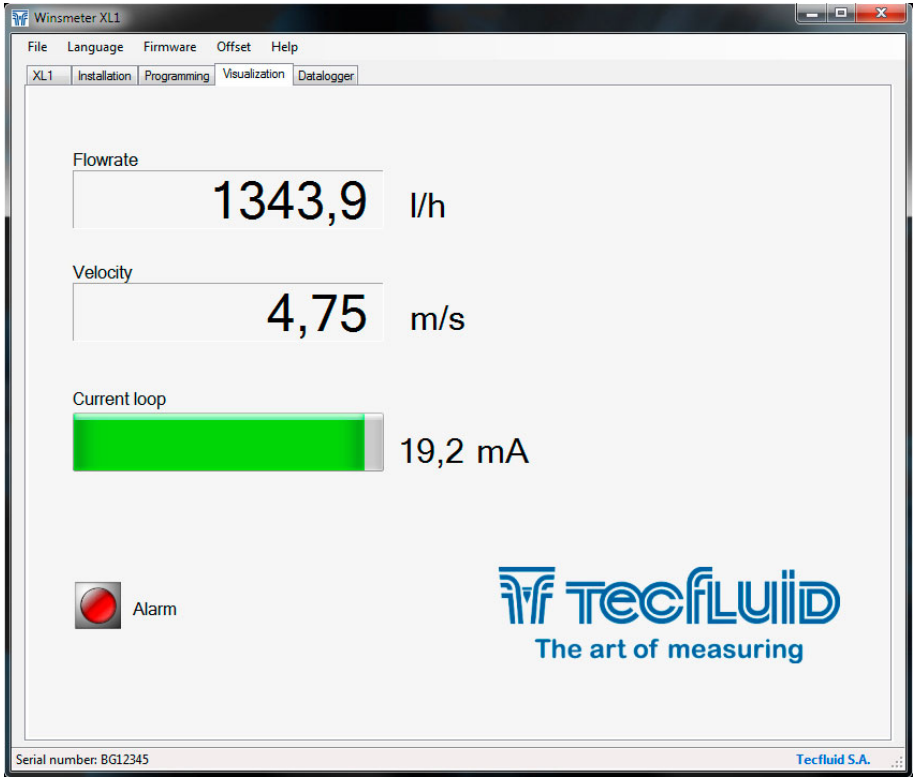
Finally, press the “mA ON” button. The current loop will be calibrated.

Before making a current calibration, be sure that the ammeter used for that is showing the real measure.

7.6 Visualization

When the communication with the computer port is established (see section 7.2), the tab "Visualization" opens. This tab lets you view real-time flow rate as well as the liquid velocity.

The current value of the analog output and the status of the digital output if configured as alarm can also be shown.



It also has messages or warnings regarding the status of the flow meter, such as empty pipe, coil errors or excessive fluid velocity.

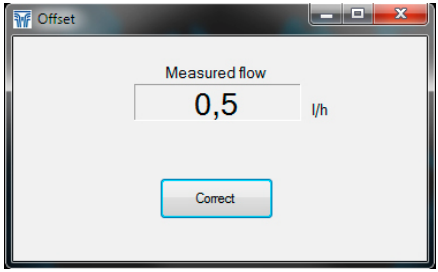
It is an intuitive tool to verify that the instrument has been installed and programmed correctly.

7.7 Zero flow drift adjustment

In the case that there is a zero flow drift (Offset), it is convenient to make an adjustment.

IMPORTANT: The flowmeter is delivered with the zero flow adjusted. Do not make a new adjustment if it is not a really necessary case. An improper adjustment can impact on incorrect flow values.

The adjustment is made by accessing to “Offset” menu. The following window will appear:



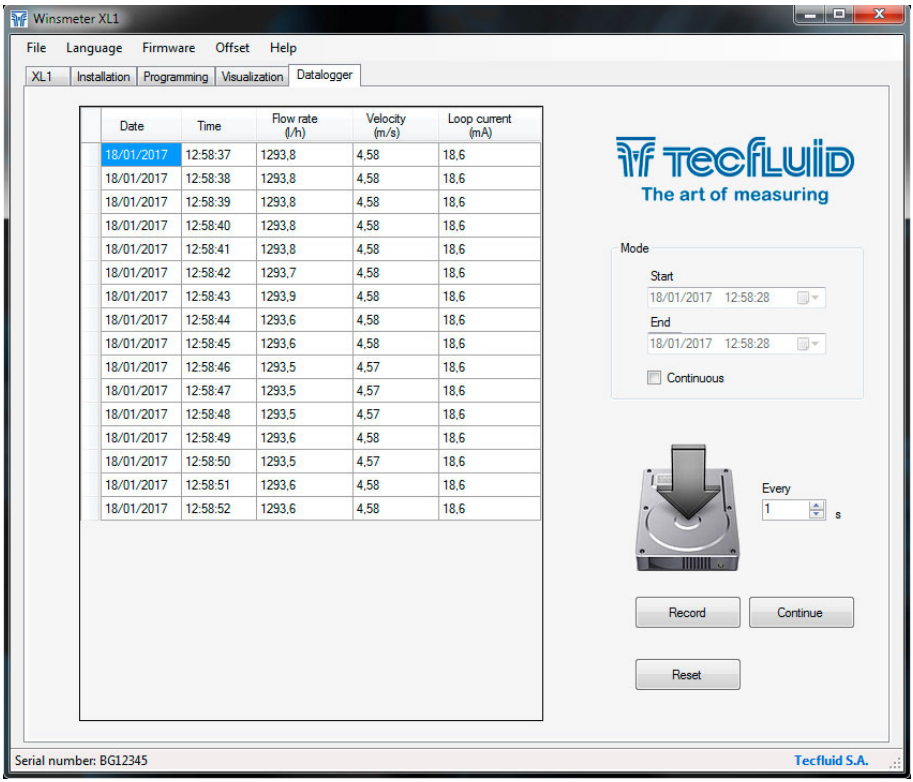
To correct the offset, the flow rate in the installation should be zero, that is, the liquid inside the pipe where the flowmeter is installed must be completely stopped. In addition, it must be ensured that the pipe is completely full of liquid so that this adjustment become effective.

Under these conditions, the flow measured by the instrument will appear in the "Measured flow" box. If this flow has an important zero drift, the text "Very high offset" will appear.

To correct the offset, press the button "Correct".

From this moment, the box "Measured flow" should indicate a value close to zero. The offset is already corrected. To conclude, close the window.

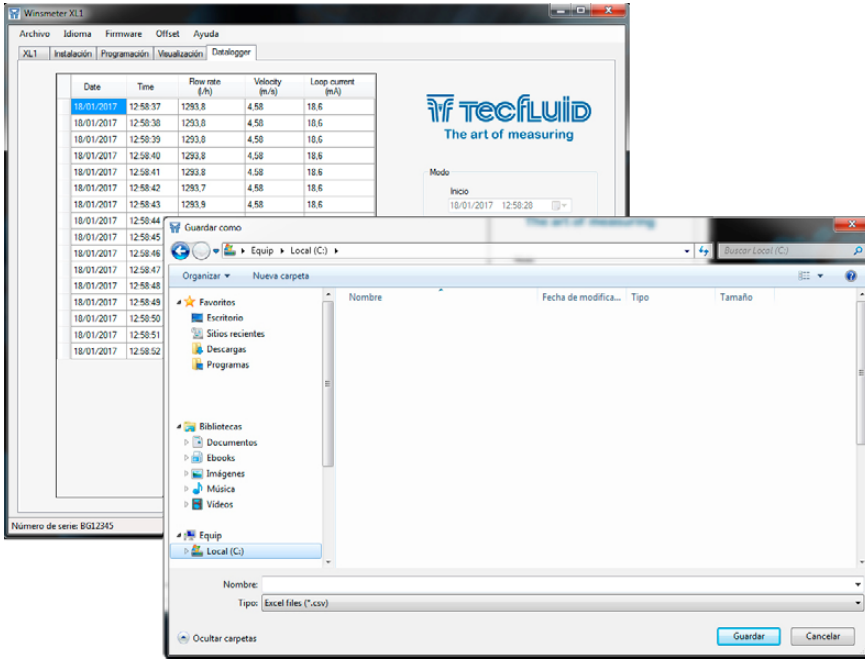
7.8 Datalogger



In this window the process of the different variables of the equipment can be registered in a file.

The time between samples, as well as the start and end time of the record can be selected.

When the "Register" button is pressed, the screen that allows to name the file and select its location appears.



The created file has CSV format, which can be viewed directly with a spreadsheet.

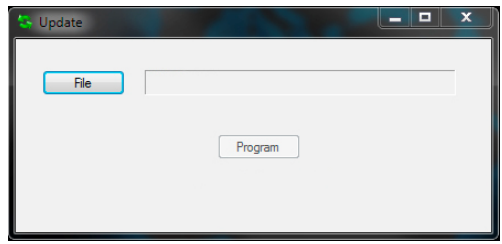
7.9 Firmware updates

New firmware updates can be published in the website. These updates contain improvements or bug fixes that make that the equipment operates at best conditions.

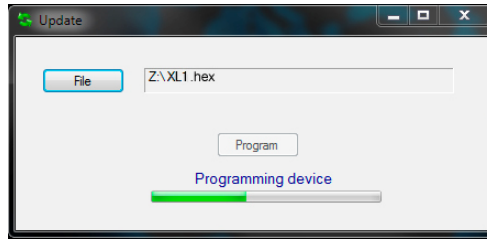
The updates can be downloaded from the following link of Tecfluid S.A. website:

www.tecfluid.com\downloads

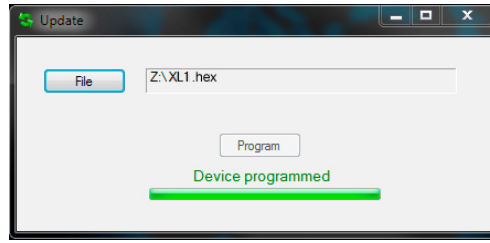
To update the device, go to menu “Firmware” - “Update”, and a screen with the button “File” will appear. Pressing this button the file explorer can be accessed. The downloaded file has to be searched there.



Once the file is selected, press the “Program” button. A message “Programming device” will appear.



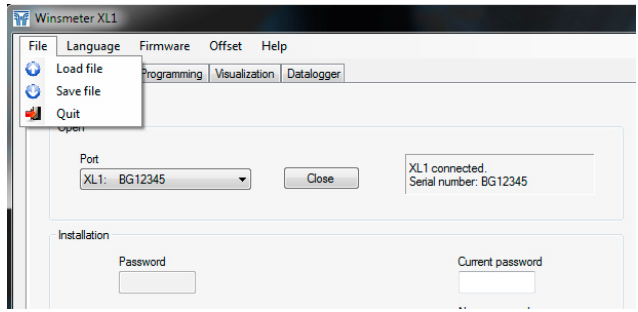
Progress bar will indicate the process, after which the message “Device programmed” will appear.



From this moment, the XL1 converter already has the new version of Firmware.

7.10 Configuration file

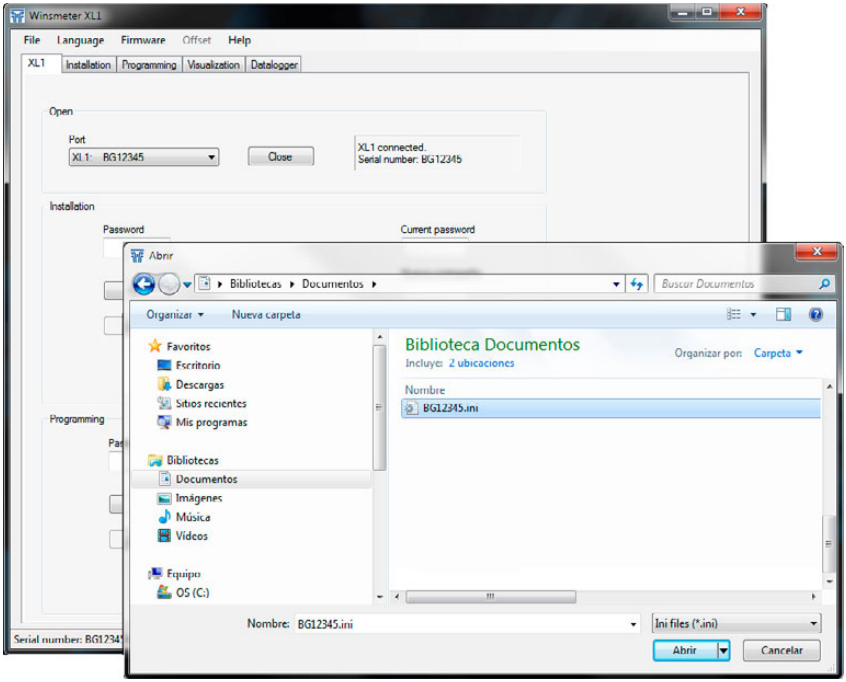
A device configuration backup can be made by saving data into a file. To do this, go to menu “File” - “Save file”.



The file is saved in the same folder where the Winsmeter XL1 software is located.

In the same way, a configuration data file can be loaded into the device. To do this, go to the menu “File” - “Load file”, and the file explorer will appear. The file has to be searched there.

The filename is the serial number and the extension is INI.



NOTE: When the configuration is saved into a file, the stored data are those in the device memory. These data may be different from those shown on the Winsmeter program. To ensure that the data match press the "Send" button in the "Programming" tab.

IMPORTANT: The USB connection is used only for the configuration and commissioning of the device. In no case it is intended to be used continuously, as a normal mode of operation in an industrial environment.

8 MAINTENANCE

It is recommended to clean the electrodes in installations where incrustations or appreciable sedimentations can occur.
Cleaning can be done using liquid detergents and medium hard brushes.

9 TECHNICAL CHARACTERISTICS

Accuracy

±0.5% reading value for v > 0.4 m/s

$\frac{\pm 0.2}{v\ (m/s)}$ % reading value for v < 0.4 m/s

Repeatability

± 0.15 % Reading value ± 0.75 mm/s

Velocity range

0.15 ...10 m/s

Temperature

Process temperature:

PP: -10ºC … +80ºC
PTFE, PVDF: -20ºC … +120ºC
Ebonite: -20ºC … +90ºC

Ambient temperature: -20ºC ... +70ºC

Minimum conductivity

20 µS/cm

Power supply

20 ... 30 VDC 4-wire system Power consumption: ≤ 5 W

Analog output

4-20 mA. Active or passive. Galvanically isolated from the power supply.

Pulse output

Opto-isolated. NPN bipolar transistor. Vmax: 30 VDC. Imax: 30 mA.
Maximum frequency : 5000 Hz
Minimum frequency : 0.01 Hz

General characteristics

Sensor materials:

<table>
<tr><th></th><th>Neck</th><th>Flanges</th><th>Enclosure of the coils housing</th><th>Outside of the Metering tube</th><th>Liner</th><th>Electrodes</th></tr>
<tr><td>FLOMID-0XL</td><td rowspan="3">EN 1.4301 (AISI 304)</td><td>-</td><td>-</td><td rowspan="3">EN 1.4404 (AISI 316L)</td><td>PP
PVDF</td><td rowspan="3">Hastelloy C
AISI 316L
Titanium
Zirconium
Tantalum</td></tr>
<tr><td>FLOMID-2XL, 4XL (DN ≤ 80)</td><td rowspan="2">Coated steel</td><td>Coated aluminium</td><td rowspan="2">PTFE
Ebonite</td></tr>
<tr><td>FLOMID-2XL, 4XL (DN > 80)</td><td>Coated steel</td></tr>
</table>

XL1 Converter material: Coated aluminium

Ingress protection:

FLOMID-0XL: IP65
FLOMID-2XL, 4XL: IP67
Converter XL1: IP66/IP67

10 SAFETY INSTRUCTIONS

The series FLOMID flowmeters are in conformity with all essential requirements of all EC directives applicable to them:

2014/68/EU	Pressure equipment directive (PED)
2014/30/EU	Electromagnetic compatibility directive (EMC)
2012/19/EU	Waste electric and electronic equipment (WEEE).
2011/65/EU	Restriction of the use of certain hazardous substances in electrical and electronic equipment (ROHS).

The declarations UE of conformity can be downloaded from the section "Download" of the Tecfluid S.A. website. www.tecfluid.com

10.1 Pressure equipment directive

Tecfluid S.A. have subjected the series FLOMID of flowmeters to a conformity assessment method for the pressure equipment directive, specifically according to module H (full quality assurance).

Conformity with the directive is reflected by the CE marking in each pressure equipment and by the written declaration of conformity. The CE marking is accompanied by the identification number of the notified body involved at the production control phase.

The marking of the equipment takes into account the fluid type, the group of fluid and the category, for example: G1 CATI

G	Gases and vapours
1	Group of liquids 1
CATI	Category I

Devices that, due to their size, are not subject to conformity assessment, are considered outside the scope of the directive and therefore they have not the CE mark according to pressure directive. These devices are subject to applicable sound engineering practice (SEP).

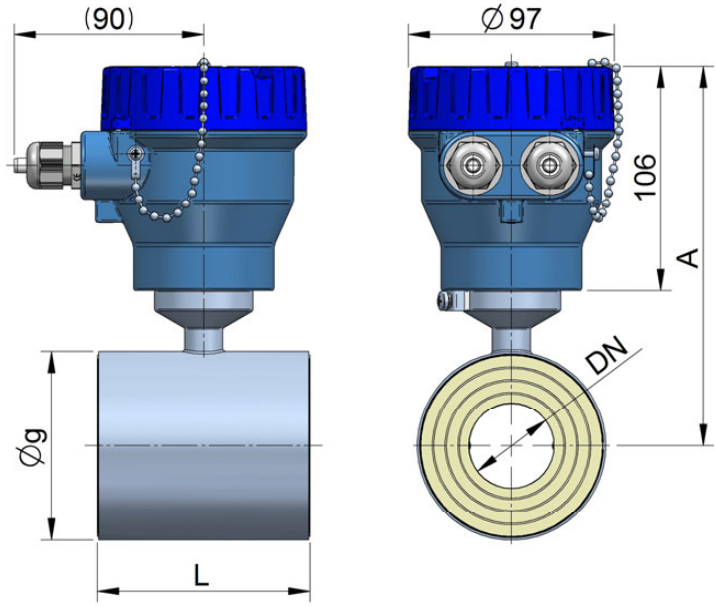
This equipment is considered as being a pressure accessory and **NOT** a safety accessory as defined in the 2014/68/EU directive, Article 2, paragraph 4.

10.2 Certificate of conformity TR CU (EAC marking)

Tecfluid S.A. have subjected the series FLOMID of flowmeters to a certification procedure according to the technical regulations of the Customs Union of the Eurasian Economic Union (EEU).

This Certificate is an official document confirming the quality of production with the standards on the territory of the Customs Union, particularly regarding safety requirements and electromagnetic compatibility.

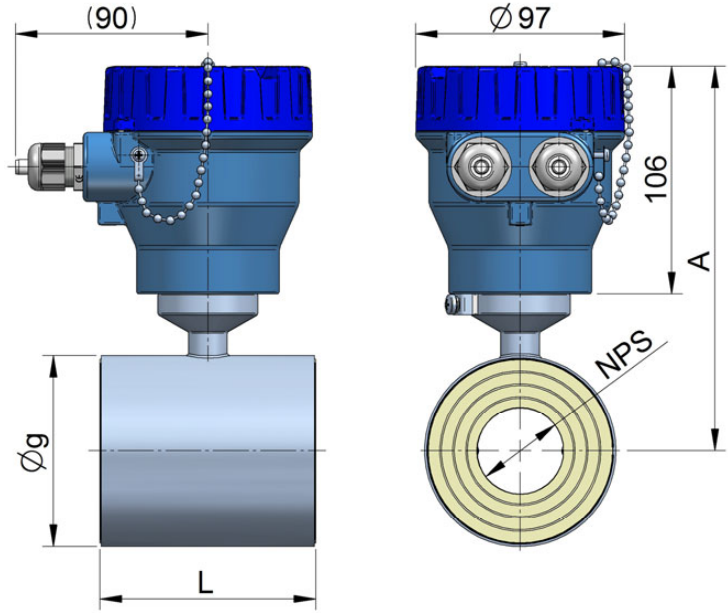
11 DIMENSIONS



FLOMID-0XL (EN 1092-1 wafer mounted)

DN	PN	g	L	A	Weight (kg)
3		48	65	158	1.3
6		48	65	158	1.3
10		48	65	158	1.3
15		54	65	161	1.4
20		63	65	166	15
25	16	73	80	171	1.7
32		84	80	177	1.8
40		89	100	179	2.1
50		108	100	189	2.5
65		129	120	199	3.1
80		141	120	205	3.7
100		154	165	212	4.3
125	10	192	165	232	8.0
150		218	165	245	9.5

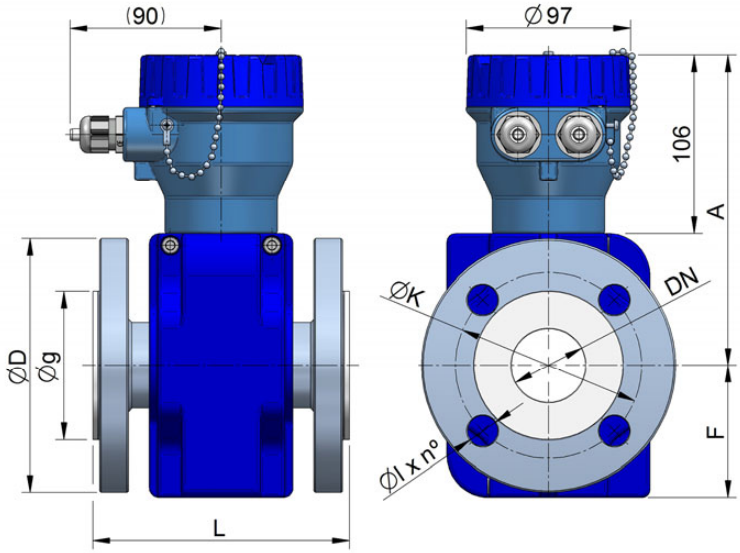
All dimensions in mm



FLOMID-0XL (ASME B16.5 150# wafer mounted)

NPS	Class	g	L	A	Weight (kg)
⅛"		48	65	158	1.3
⅜"		48	65	158	1.3
½"		48	65	158	1.3
¾"		54	65	161	1.4
1"		63	65	166	1.5
1 ¼"		73	80	171	1.7
1 ½"	150#	84	80	177	1.8
2"		89	100	179	2.1
2 ½"		108	100	189	2.5
3"		129	120	199	3.1
4"		154	165	212	4.3
5"		192	165	232	8.0
6"		218	165	245	9.5

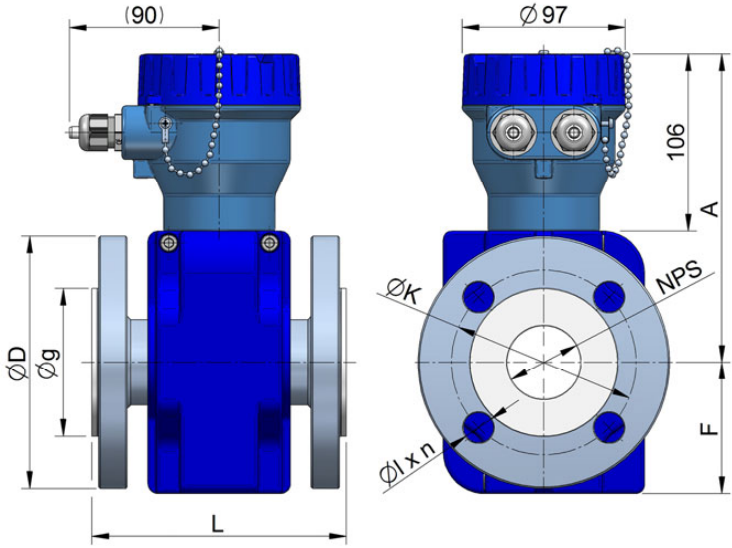
All dimensions in mm



FLOMID-2XL (EN 1092-1) flanges

DN	PN	D	K	l x n	g	L	A	F	Weight (kg)
10		90	60	14 x 4	40	150	177	71	3.5
15		95	65	14 x 4	45	150	177	71	3.5
20		105	75	14 x 4	58	150	177	71	4.0
25		115	85	14 x 4	68	150	177	71	5.5
32		140	100	18 x 4	78	160	184	78	6.0
40	16	150	110	18 x 4	88	160	184	78	6.5
50		165	125	18 x 4	102	200	211	105	8.0
65		185	145	18 x 8	122	200	211	105	10.0
80		200	160	18 x 8	138	200	211	105	11.0
100		220	180	18 x 8	158	250	238	110	15.0
125		250	210	18 x 8	188	250	251	125	17.0
150		285	240	22 x 8	212	300	266	143	20.0
200		340	295	22 x 8	268	350	295	170	31.0
250		395	350	22 x 12	320	400	323	198	45.0
300		445	400	22 x 12	370	500	340	223	53.0
350	10	505	460	22 x 16	430	500	373	253	62.0
400		565	515	26 x 16	482	600	390	283	76.0
450		615	565	26 x 20	532	600	445	309	85.0
500		670	620	26 x 20	585	600	470	335	98.0

All dimensions in mm



FLOMID-4XL (ASME B16.5 150#) flanges

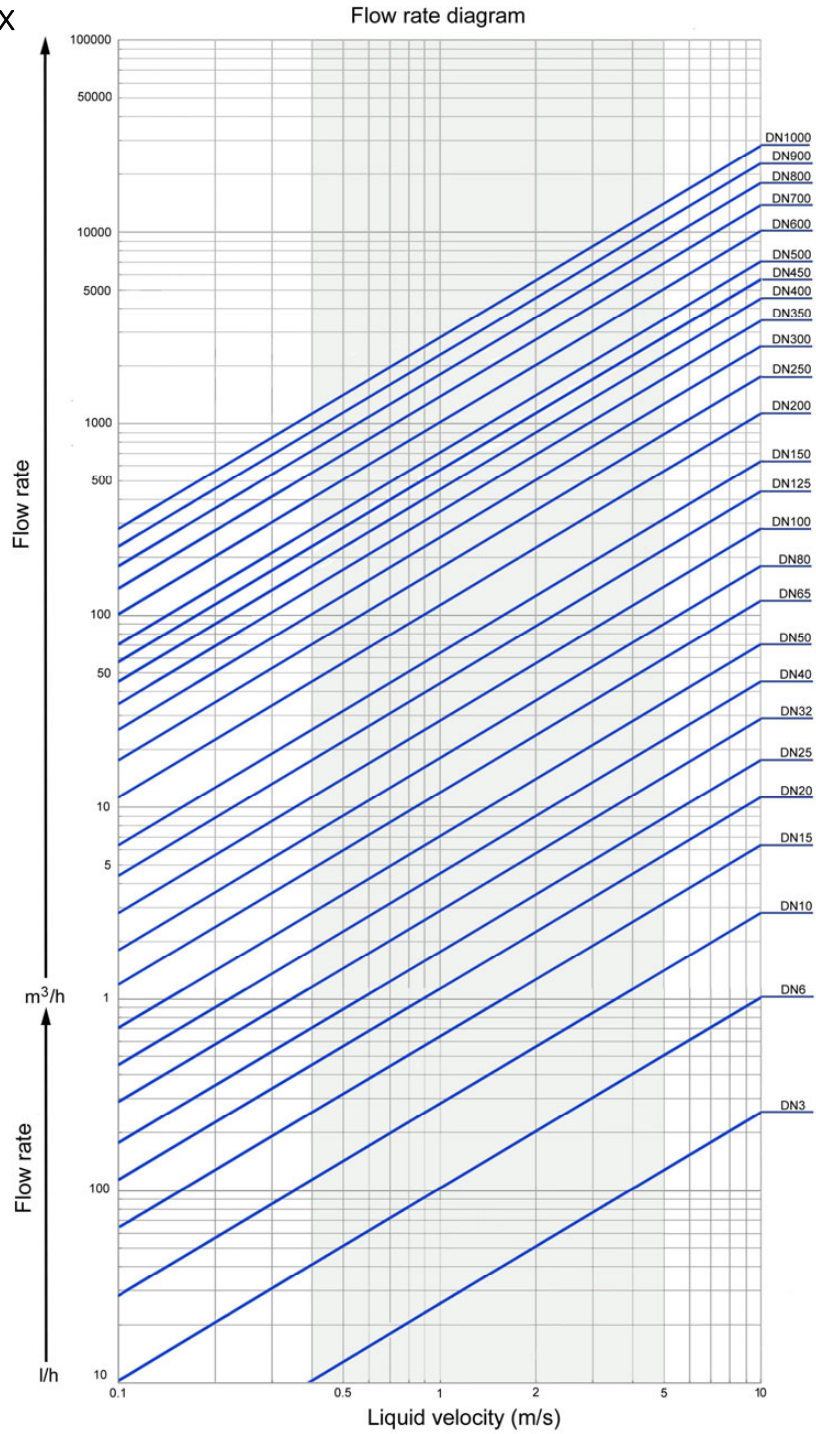
NPS	Class	D	K	l x n	g	L	A	F	Weight (kg)
½"	150#	90	60.3	5/8" x 4	34.9	150	177	71	3.5
¾"		100	69.9	5/8" x 4	42.9	150	177	71	4.0
1"		110	79.4	5/8" x 4	50.8	150	177	71	5.0
1¼"		115	88.9	5/8" x 4	63.5	160	184	78	6.0
1½"		125	98.4	5/8" x 4	73.0	160	184	78	6.5
2"		150	120.7	¾" x 4	92.1	200	211	105	8.2
2½"		180	139.7	¾" x 4	104.8	200	211	105	10.0
3"		190	152.4	¾" x 4	127.0	200	211	105	11.4
4"		230	190.5	¾" x 8	157.2	250	238	115	15.7
5"		255	215.9	7/8" x 8	185.7	250	251	128	17.5
6"		280	241.3	7/8" x 8	215.9	300	266	140	20.0
8"		345	298.5	7/8" x 8	269.9	350	295	173	31.7
10"		405	362.0	1" x 12	323.8	400	323	203	45.5
12"		485	431.8	1" x 12	381.0	500	340	243	53.0
14"		535	476.3	1 1/8" x 12	412.7	500	373	268	62.0
16"		595	539.8	1 1/8" x 16	469.9	600	390	298	76.0
18"		635	577.9	1 1/8" x 16	533.4	600	445	318	85.0
20"		700	635.0	1 1/8" x 20	584.2	600	470	350	98.0

All dimensions in mm

12 TROUBLESHOOTING

Problem	Probable cause	Solution
Empty pipe alarm (current loop at 3.6 mA or Winsmeter)	Pipe is empty	Make sure that the pipe is completely full, for example, installing the flowmeter in a vertical pipe with upwards flow
	The functional earth is not connected	Connect the functional ground of the flowmeter to a metallic point of the installation in contact with the liquid
	Isolation of the electrodes	Clean the sensor electrodes.
	Electrode cable disconnected	Connect the cable between the sensor and the electronic converter
	Liquid with very low conductivity	The flowmeter is not adequate for the application
The flow rate is unstable	Dirt on the electrodes	Clean the sensor electrodes
	The product contains air or non-conductive particles in suspension	Verify that the flowmeter is adequate for this application
The indicated flow rate is 0 (current loop at 4 mA or Winsmeter)	Coil cable disconnected	Connect the cable between the sensor and the electronic converter
	The flow rate is smaller than programmed as CUT OFF	Decrease the value of the cut off (see page 26)
The instrument indicates a value when there is not flow	The sensor is damaged due to electrodes corrosion Electrode material not adequate for the liquid	Change the sensor
	The functional earth is not connected and the empty pipe option is OFF	Connect the functional ground of the flowmeter to a metallic point of the installation in contact with the liquid
	Sensor flooded by vacuum operation	Change the sensor and check the installation
The displayed flow rate is higher than expected	The electrodes are immersed but the pipe is not completely full	Make sure that the pipe is completely full, for example, installing the flowmeter in a vertical pipe with upwards flow
The LED is off	Not enough current from the power supply	Change the power supply
The analog output gives always 4 mA or 20 mA	Current output range not properly programmed	Program the range properly (see page 25)
The analog output gives always 0 mA	Cable disconnected	Check the cable connection

ANNEX


Flow rate diagram
Flow rate
m³/h
Flow rate
l/h
100000
50000
10000
5000
1000
500
100
50
10
5
1
100
10
DN1000
DN900
DN800
DN700
DN600
DN500
DN450
DN400
DN350
DN300
DN250
DN200
DN150
DN125
DN100
DN80
DN65
DN50
DN40
DN32
DN25
DN20
DN15
DN10
DN6
DN3
0.1
0.5
1
2
5
10
Liquid velocity (m/s)

WARRANTY

Tecfluid S.A. guarantee all the products for a period of 24 months from their sale, against all faulty materials, manufacturing or performance. This warranty does not cover failures which might be imputed to misuse, use in an application different to that specified in the order, the result of service or modification carried out by personnel not authorized by Tecfluid S.A., wrong handling or accident.

This warranty is limited to cover the replacement or repair of the defective parts which have not damaged due to misuse, being excluded all responsibility due to any other damage or the effects of wear caused by the normal use of the devices.

Any consignment of devices for repair must observe a procedure which can be consulted in the website www.tecfluid.com, “After-Sales” section.

All materials sent to our factory must be correctly packaged, clean and completely exempt of any liquid, grease or toxic substances.

The devices sent for repair must enclose the corresponding form, which can be filled in via website from the same “After-Sales” section.

Warranty for repaired or replaced components applies 6 months from repair or replacement date. Anyway, the warranty period will last at least until the initial supply warranty period is over.

TRANSPORTATION

All consignments from the Buyer to the Seller´s installations for their credit, repair or replacement must always be done at freight cost paid unless previous agreement.

The Seller will not accept any responsibility for possible damages caused on the devices during transportation.

Tecfluid
The art of measuring

Tecfluid S.A.
Narcís Monturiol 33
08960 Sant Just Desvern
Barcelona
Tel: +34 93 372 45 11
Fax: +34 93 473 08 54
tecfluid@tecfluid.com
www.tecfluid.com

Quality Management System ISO 9001 certified by

Pressure Equipment Directive certified by Lloyd's Register

ATEX European Directive certified by