



Instructions manual

Series COVOL

Oscillating piston flowmeter



The art of measuring



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.

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SERIES COVOL

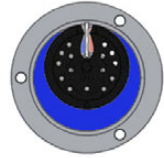
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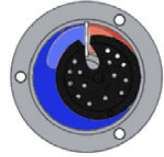
WORKING PRINCIPLE

By means of oscillating piston and an annular measuring chamber.

1– The first figure shows the COVOL flowmeter at the beginning of a cycle, when the measuring chamber (in blue) is completely full.



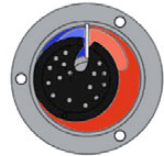
2– The flow of the liquid through the flowmeter makes a force on the oscillating piston, so that it starts turning. From this moment the measuring chamber is divided in two parts: inlet (in red) and outlet (in blue).



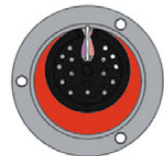
3– The liquid fills progressively the inlet measuring chamber (in red), as it is getting emptied on the outlet (in blue). In the middle of the cycle (see figure) the two chambers are the same size.



4– At this stage the outlet measuring chamber has already emptied almost all the liquid corresponding to a cycle, while on the inlet it is almost filled with the liquid corresponding to the next cycle.

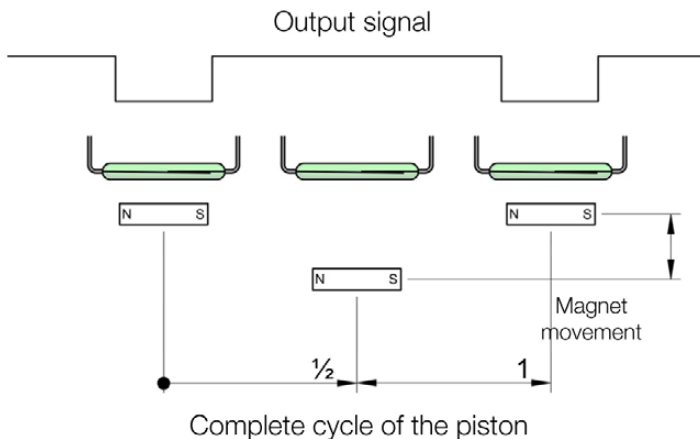


5– At the end of the cycle, the inlet measuring chamber takes all the space. From this moment it can be considered that this is already the outlet chamber, so we are again at the beginning of the cycle.



As one can see, a constant volume of liquid is moved in each cycle.

The piston includes a magnet inside that activates a reed switch each complete turn. The output signal can be treated by means of an electronic converter.



2 RECEPTION

COVOL oscillating piston flowmeters are supplied individually packaged for protection during transport and storage, including their corresponding instructions manual, for their installation and use.

All the flowmeters have been verified in our flow rigs, obtaining the k factor for each device.

3 INSTALLATION

The installation must be made in a point that ensures that the pipe is completely full of liquid.

Highest points in the installation as well as downwards pipes must be avoided, since air pockets or vacuums might occur.

In installations where air can be present, a degasser must be installed before the flowmeter.

Partially full pipe can involve important measurement errors.

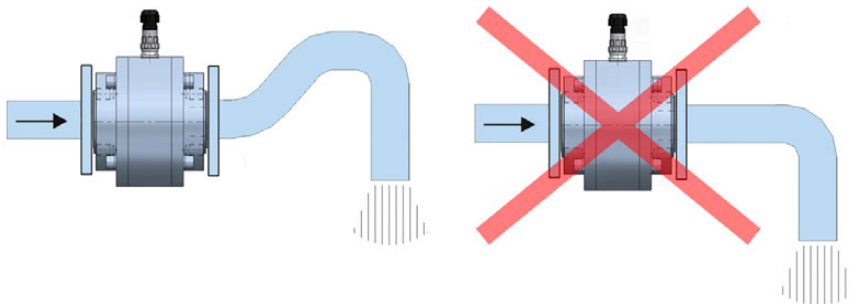
3.1 Filter

The installation of a filter before the COVOL oscillating piston is mandatory. This way a correct performance is guaranteed and severe damage is avoided.

The mesh size must be between 0.1 and 0.2 mm², in order to avoid that bigger particles can block or get embedded in the oscillating piston, stopping or slowing it and providing false readings.

3.2 Open discharge

When the flow measurement is to be made before an open discharge, it is necessary to install the flowmeter in a section of pipe with a trap which avoids the presence of air inside the meter.



3.3 Position

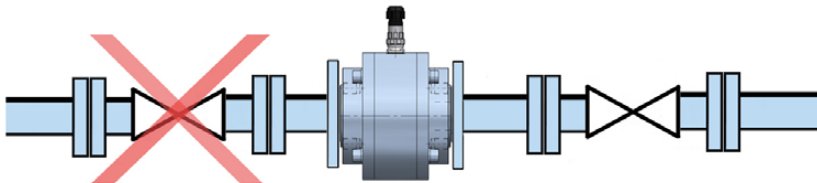
The installation and position of the flowmeter can be either vertical, horizontal or inclined. The flow direction does not affect the flowmeter accuracy. The flowmeter is bidirectional.

3.4 Straight pipe sections

Straight pipe run is not required, the flowmeter can be installed just before or after disturbing elements.

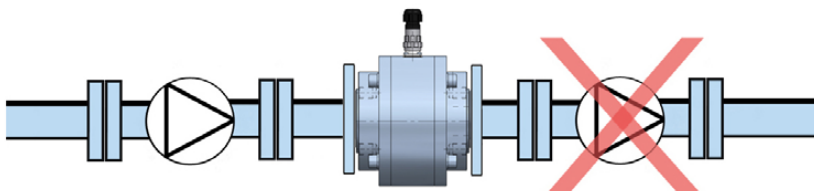
3.5 Valves

Regulating or shut-off valves must always be installed after the flowmeter, in order to assure that pipe is full of liquid.



3.6 Pumps

Pumps must always be installed before the flowmeter in order to avoid cavitation.



This way the presence of air pockets in the flowmeter is avoided, which could cause false readings. In particular, the associated electronics would show a volume higher than real.



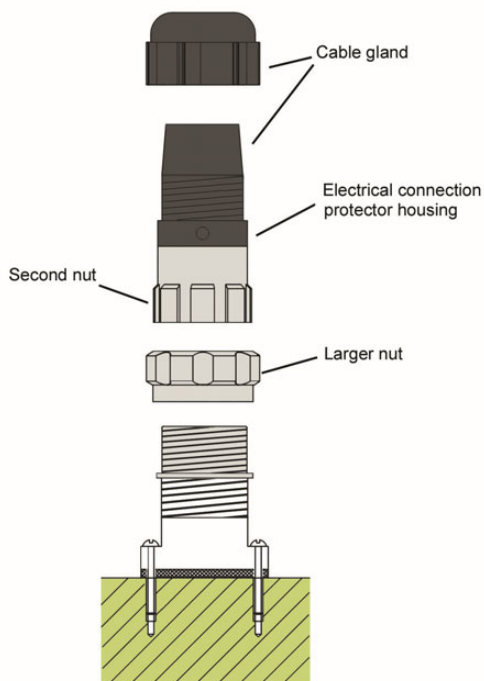
Note: In order to avoid cavitation, the API Std 2534 standard must be taken into account. This standard states that on the outlet of the flowmeter the pressure must be at least twice the pressure drop of the flowmeter (in case of COVOL, this pressure drop is 3 mH₂O or 0.3 bar, for fluids with viscosity 1 mPa·s at maximum flow rate), plus 1.25 times the vapour pressure of the liquid or its most volatile components.

3.7 Electrical connection



It is important to keep the connecting cable between the flowmeter and the associated electronics away from mains or power supply cables, in order to avoid interferences. In any case, those should be separated at least 5 cm.

The COVOL oscillating piston flowmeter has a connector fastened to the counter by means of 4 screws. The connector consists of 3 parts joined by threaded nuts. (See figure).



Loosening the larger nut in the middle of the connector allows us to withdraw the half where the cable will be later soldered.

The other half of the connector is fixed to the counter and should not be removed, except when servicing the detector (See point 4.3 of the MAINTENANCE section).

The removable part of the connector consists of the cable gland at the top and the electrical connection protector housing.

Before starting the installation, check that the cable gland is the right size for the cable to be used. This will guarantee the instrument will stay watertight. The cable gland used has a PG11 thread and is for cables with outside diameters between 6 mm and 10 mm.

The electrical connection protector housing is dismantled by loosening the second nut.

When this is removed, the three connector terminals are visible.

The terminals are numbered 1 to 3 and the connection is as follows:

- N. 1 & 2: Electrical switch connection.
- N. 3: This terminal has a short-circuit with terminal N.1. Don't connect anything to this terminal.

Before soldering the connections, unscrew the cable gland and feed it, together with the electrical connection protector housing, over the cable.

The joint between the cable and the connector should always be soldered, and should be tidy and without short circuits between terminals.

Peel the outside insulation to free the inner cables. It is recommended to tin the ends of the wires to avoid loose ends.

Once the connections have been made, the housing should be mounted screwing it on and then the cable gland should be tightened to avoid entry of any liquid or humidity.

Once assembled the half of the connector, the mounting in the base has only one position defined by the keyway between the two parts.

Check that the rubber seal is in its position inside the connector base. If this is the case, introduce the connector half in the base, positioning by the keyway, and screw on the nut until the end of the thread is reached.

4 MAINTENANCE

In normal working conditions the COVOL flowmeter has a long life. Normally it will not be necessary to change any parts.

The life of the parts depends mainly on the abrasive characteristics of the product to be measured and the flow rate.

The combination of these two factors, together with the construction material of the flowmeter, makes it difficult to estimate the life of the device in good working conditions

If the maximum flow rate for each DN shown in the chart below is exceeded the life of the pieces can be considerably reduced.

Flow ranges

DN	Flow scales l/h water	Max. intermittent l/h water	pulses / litre approx.
10 / ¼" (H)	25-250	500	100
10	40-350	800	100
15	150-1500	2700	20
25	500-4500	9000	10
40	800-8500	15500	4
50	1500-16000	28000	2
80	3000-28000	50000	1
100	5000-60000	104000	0.2

4.1 Disassembly

The list of the different elements is shown in the chart and figure in "Part List" on page 11.

The device consists of the following elements:

- Flowmeter body (chamber and connections)
- Rotary piston
- Inlet / outlet separator
- Guide disks (2)

Flowmeter body

The disassembly of the body should be started at the side marked with the number 2, and this is done by loosening the external bolts (9) that connect the outlet chamber (1) with the measuring chamber (4).

Once loosened and removed, outlet chamber (1) can be detached. The o-ring (2) and the smooth exterior part of the measuring chamber's disk (3), marked with number 2, can now be seen.

The guide disc (3) has in the center a threaded metric hole of variable size according to the DN, which allows fixing a screw that facilitates its removal smoothly.

The disk should be withdrawn perpendicularly, uncovering the measuring chamber (4) with the rotary piston (10) and the inlet/outlet separator (5).

The rotary piston (13) is easily removed and it has a drop form to fit the inlet / outlet separator (5) which acts as a guide for the rotation of the piston.

The inlet / outlet separator joins the measuring chamber ring to the central circle of rotation of the guide disk (3). It can be removed by pulling it out perpendicularly.

In this way the measuring chamber (4) is completely dismantled for inspection and thorough cleaning if necessary.

If the measuring chamber (4) is damaged due to the effect of abrasive products or non-filtered hard particles that scratched its inner wall, said chamber must be machined at Tecfluid S.A. facilities and proceed with the re-adjustment with a new rotary piston as well.

In case it was necessary to clean the inlet chamber (7) marked with number 1, the external screws (14) must be loosen. Once unscrewed and removed, the inlet chamber (7), also marked with number 1, can be separated. The inlet chamber o-ring (6) and the external smooth side of the inlet guide disk (8) can be seen.

Once the inlet guide disk is removed, all components can be cleaned.

Rotary piston

This is the only moving piece of the COVOL oscillating piston flowmeter.

It has a long life due to the composition of the material it is made of, that makes it very wear resistant and gives it a low friction coefficient.

Premature wear can only be due to abrasive products and flow rate higher than those indicated in the table of page 8, which can cause excessive knocks at the inflection point of the oscillating turning of the piston, producing breakage at very high speeds.

Non-filtered particles can also damage the piston.

4.2 Mounting

If the COVOL flowmeter has been completely disassembled, reassembly should start by placing the inlet guide disk (8) in the measuring chamber (4), matching the positioning hole with the metering chamber (4) pin.

Then place the inlet chamber o-ring (6), and finally, the inlet chamber (7), which is marked with number 1.

Fix the inlet chamber (7) to the metering chamber (4) by tightening the screws (14) and washers. Tight until a rigid assembly is obtained (the final tightening will be done later).

The inlet / outlet separator (5) is fitted with the bevelled part in the groove of the input guide disk (8) rings and the part with sharp edges in the groove of measuring chamber (4).

The rotary piston (13) is mounted taking care that the drop form opening fits over the inlet / outlet separator (5) and that the piston shaft fits into the circular groove formed by the two rings of the input guide disk (8). Check that the piston rotates smoothly without rubbing in its complete path.

With the help of the extractor screw that we have mounted during disassembly, mount the outlet guide disk (3) with the flat side outwards, coupling the inlet / outlet separator (5) in its position.

Note that the guide disk (3) has its mounting position defined by the groove for the inlet / outlet separator.

If this is not done as indicated, the guide disk (3) could be damaged also avoiding a hermetic sealing of the flowmeter.

Check the perfect fitting of the guide disk (3), place the outlet chamber o-ring (2) on the guide disk and adjust it around the edge of the measuring chamber (4).

Mount the outlet chamber (1). Assemble the fixing screws (9) and tighten them until the two pieces are firmly against each other.

Tighten the screws of the inlet chamber (14).

The COVOL flowmeter is ready for installation and operation.

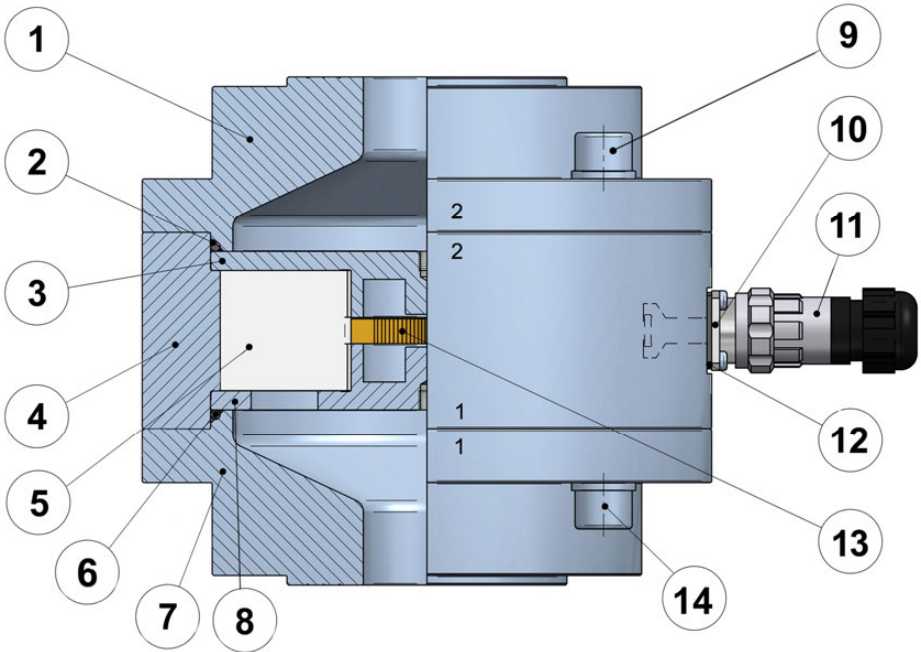
4.3 Replacing the reed switch group

The female connector (11), as already indicated in the Installation section, is removed from the base by the larger nut. The connector base is mounted together with the reed switch group (10).

Unscrew the female connector (11) to separate the cable and then loosen the 4 screws of the reed switch group (10).

In order to replace the reed switch group please follow the opposite procedure taking care that the gasket (12) is correctly positioned.

5 PART LIST



N°	Description	Materials	
		AISI 316L	PTFE / PVC / PP
1	Outlet chamber + connection	EN 1.4404 (AISI 316L)	PTFE / PVC / PP
2	Outlet chamber o-ring	NBR / PTFE / EPDM / VITON® / SILICONE	
3	Outlet guide disk	EN 1.4404 (AISI 316L)	PTFE / PVC / PP
4	Measuring chamber	EN 1.4404 (AISI 316L)	PTFE / PVC / PP
5	Inlet / outlet Separator	EN 1.4404 (AISI 316L)	PTFE / PVC / PP
6	Inlet chamber o-ring	NBR / PTFE / EPDM / VITON® / SILICONE	
7	Inlet chamber + connection	EN 1.4404 (AISI 316L)	PTFE / PVC / PP
8	Inlet guide disk	EN 1.4404 (AISI 316L)	PTFE / PVC / PP
9	Outlet chamber screws	EN 1.4401 (AISI 316)	
10	Reed sensor group	---	
11	Connector	Aluminium alloy + Polyamide	
12	Gasket	NBR	
13	Rotary piston	PTFE + Graphite / Bronze / Aluminium / PVDF	
14	Inlet chamber screws	EN 1.4401 (AISI 316)	

6 TECHNICAL CHARACTERISTICS

Accuracy

± 0.8% measured value

Repeatability

± 0.3% measured value

Measuring range: 10:1

Installation: Horizontal or vertical.

Connections

Compatible with EN 1092-1 PN16 flanges. Others on request.

Materials

Body: AISI 316L, PVC, PTFE, PP

Piston: PTFE-Graphite, PVDF, Aluminium, Bronze. Others on request.

Working pressure

AISI 316L: PN 16

PVC / PTFE / PP: PN 10

Others on request

Working temperature

AISI 316L: -40°C ... +150°C

PVC: 0°C ... +40°C

PTFE: -20°C ... +130°C

PP: -10°C ... +80°C

Electrical connection

By means of IP65 connector.

Recommended cable

Shielded bifilar up to 50 m length.

Reed switch characteristics

V max: 30 VDC. I max: 20 mA.

NOTE: For distances up to 100 m a DFD420 amplifier can be used.

Associated electronics

CIP II: Battery powered volumetric counter.

CP ... CH420: 2-wire analog transmitter with flow rate and volume indication.

HART protocol in model CH420. Loop signal can reach up to 3000 m.

MT03F: Flow rate and volume indicator with preset for batching and flow rate alarms.

DFD420: Pulse divider and 2-wire analog transmitter. Loop signal can reach up to 3000 m.

7 SAFETY INSTRUCTIONS

The series COVOL of flow meters are in conformity with all essential requirements of all EC directives applicable to them:

2014/68/EU Pressure equipment directive (PED)

Limit switches:

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).

2014/35/EU Low voltage directive (LV)

Equipment for hazardous areas:

2014/34/EU Equipment and protective systems intended for use in potentially explosive atmospheres (ATEX).

In the last sections of this manual the EC type certificate and the declarations of conformity according to the ATEX directive are attached.

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



7.1 Pressure equipment directive

Tecfluid S.A. have subjected the series COVOL 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.

7.2 Certificate of conformity TR CU (EAC marking)

Tecfluid S.A. have subjected the series COVOL 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.



8 ADDITIONAL INSTRUCTIONS FOR THE ATEX VERSION

This chapter only applies to equipment intended for use in explosive atmospheres.

8.1 Intrinsic safety

COVOL flowmeters, when they include only the reed sensor and the connector, can be considered as simple apparatus according to the IEC 60079-11 standard. In these cases they can be installed in a hazardous area as long as they are connected to an intrinsic safety barrier or isolator. Consult us for recommended models.

8.2 Flameproof enclosure

These equipment conform with the directive 2014/34/EU (Equipment and protective systems intended for use in potentially explosive atmospheres) as indicated in the EC-type examination certificate LOM 14ATEX2006 X and its marking.

Given that this instrument belong to group II, it is intended for use in places likely to become endangered by explosive atmospheres, but not in mines.

The category is 2GD, that is, it is intended for use in areas in which explosive atmospheres caused by mixtures of air and gases, vapours, mists or air/dust mixtures are likely to occur.

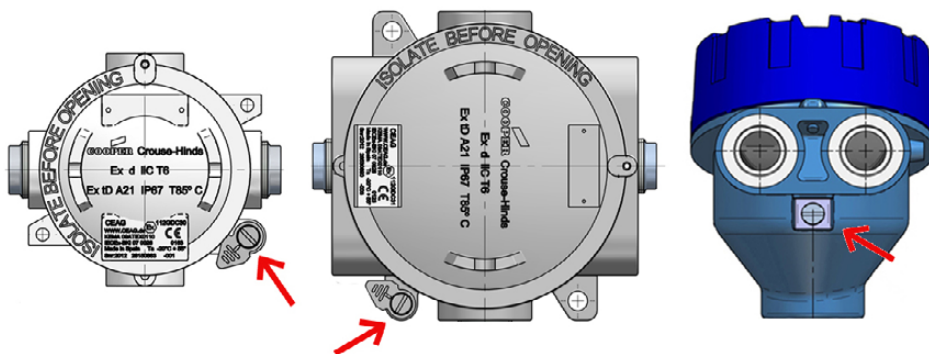
8.2.1 Surface temperature

Equipment is certified as Exd IIC T6.

Maximum allowed surface temperature is 85°C.

8.2.2 Connecting conductive parts to earth

When the instrument is not grounded securely through the connection process, it should be grounded through the housing screw, as shown in the figure.



8.2.3 Maintenance



NOTE: When the flameproof enclosure contains an electronics model CIP II, **it should never be opened in presence of explosive atmosphere.**

For the rest of models, before any maintenance that involves opening the flameproof enclosure, **make sure there is no voltage in any of internal components.**

There is no special maintenance for the ATEX version.

8.2.4 Technical characteristics of the ATEX version

Temperature

Ambient temperature: -20°C ... +60°C

Electrical connection

Inside the flameproof enclosure.

Recommended cable

The standard thread supplied for the cable gland connection is 3/4" NPT.

ATEX cable glands for non-armoured or armoured cables can be placed .

ATEX cable glands can be supplied on request.

The outer diameter of the cables that fits the 3/4" NPT cable glands is between 6 and 21 mm.

Associated electronics

CIP II: Battery powered volumetric counter.

CP ... CH420: 2-wire analog transmitter with flow rate and volume indication.

HART protocol in model CH420.

MT03F: Flow rate and volume indicator with preset for batching and flow rate alarms.

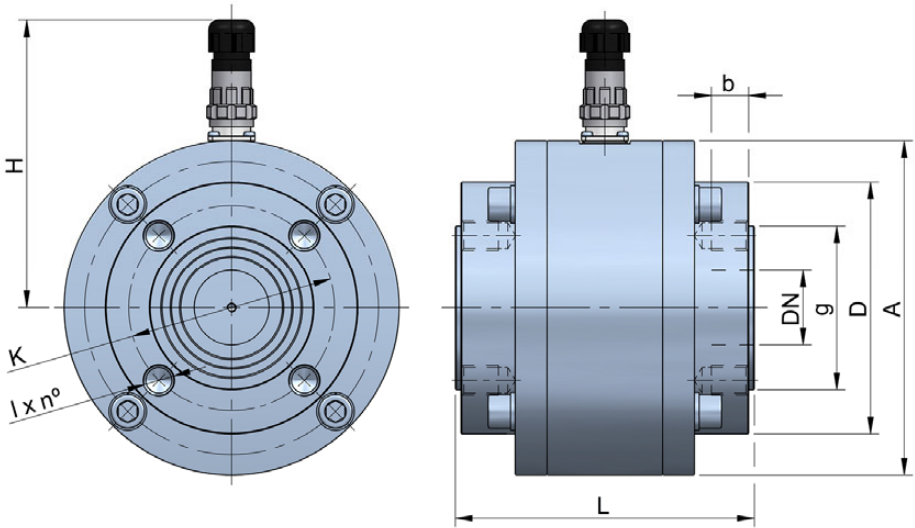
DFD420: Pulse divider and 2-wire analog transmitter.

The rest of characteristics are the same as in the point 6.

8.2.5 Marking



9 DIMENSIONS



Model AISI 316L

DN	D	g	K	(l x n°) x b	L	A	H
10	77	40	60	(M12 x 4) x 15	90	100	110
15	84	45	65	(M12 x 4) x 15	110	110	115
25	107	68	85	(M12 x 4) x 15	120	140	135
40	135	88	110	(M16 x 4) x 20	150	180	155
50	154	102	125	(M16 x 4) x 20	180	200	165
80	200	138	160	(M16 x 8) x 20	200	250	190

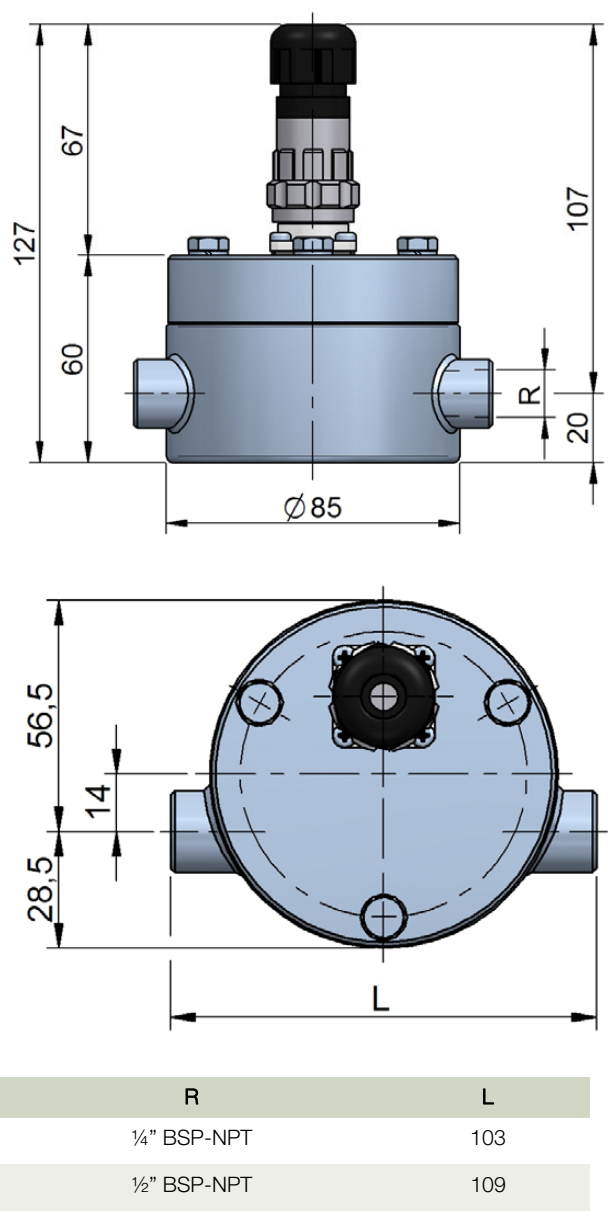
Available for DN100 with special design. Please consult factory

Models PTFE / PVC / PP

DN	D	g	K	(l x n°) x b	L	A	H
10	90	40	60	(M12 x 4) x 18	100	115	120
15	95	45	65	(M12 x 4) x 20	125	125	130
25	115	68	85	(M12 x 4) x 25	140	150	140
40	145	88	110	(M16 x 4) x 25	160	180	155
50	160	102	125	(M16 x 4) x 25	195	200	165
80	200	138	160	(M16 x 8) x 25	235	250	190

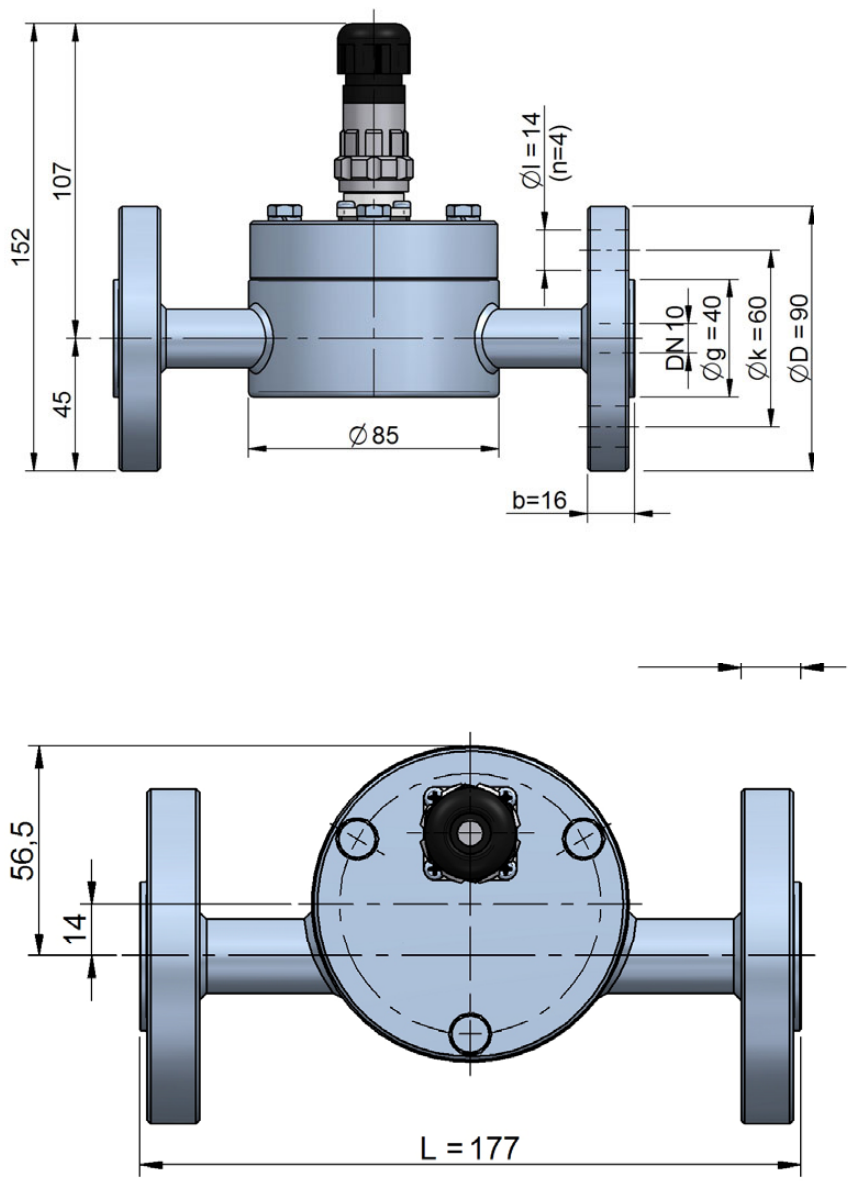
All dimensions in mm (L±1,5 mm)

COVOL-H threaded connection, low flow, horizontal

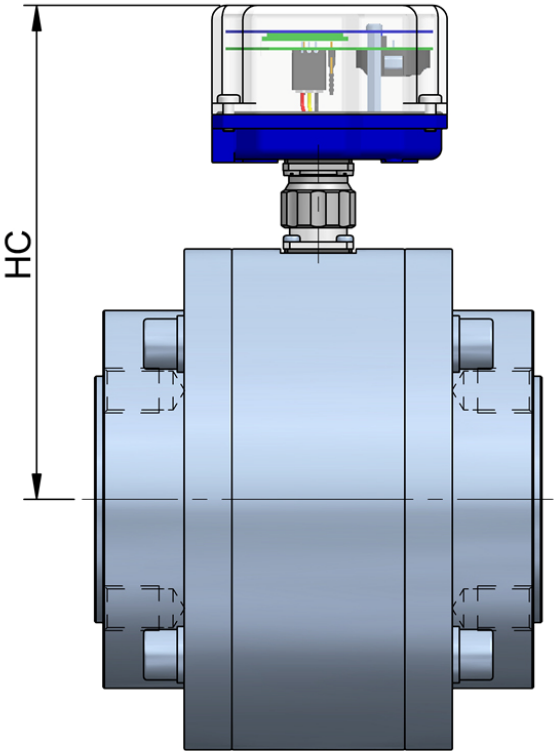


All dimensions in mm (L±1,5 mm)

COVOL-H DN10 flange connection, low flow, horizontal



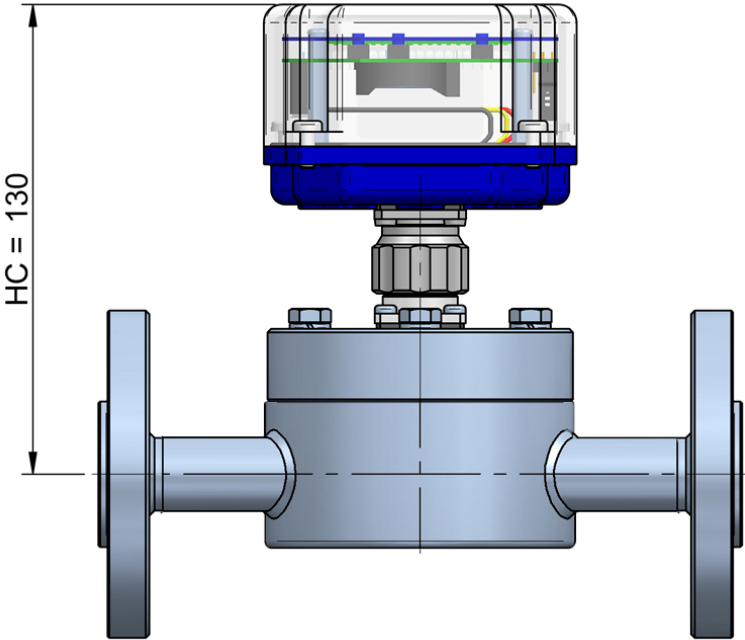
All dimensions in mm (L \pm 1,5 mm)



DN	HC	HC
	AISI 316L	PP/PVC/PTFE
10 (H)	130	130
10	135	145
15	140	155
25	160	165
40	180	180
50	190	190
80	215	215

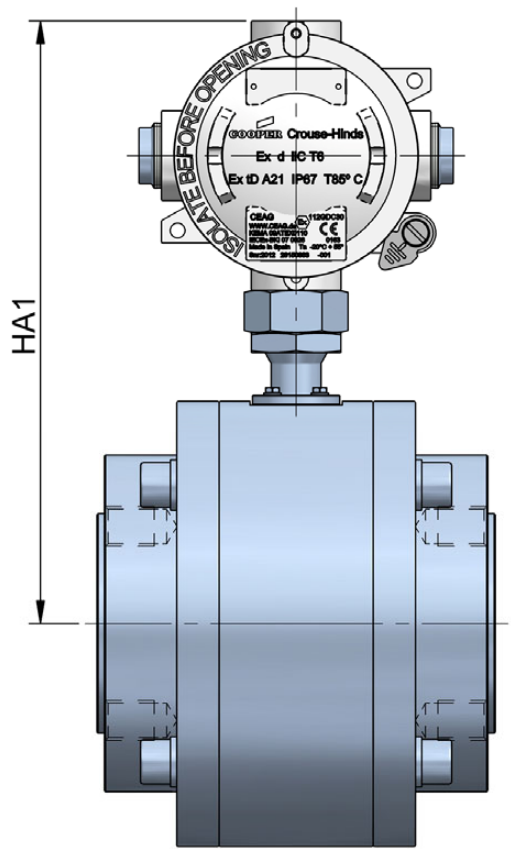
All dimensions in mm (L±1,5 mm)

COVOL-H DN10 / ¼" low flow, horizontal + CIP II / CP ... CH420L



All dimensions in mm (L±1,5 mm)

Model Exd ADF30

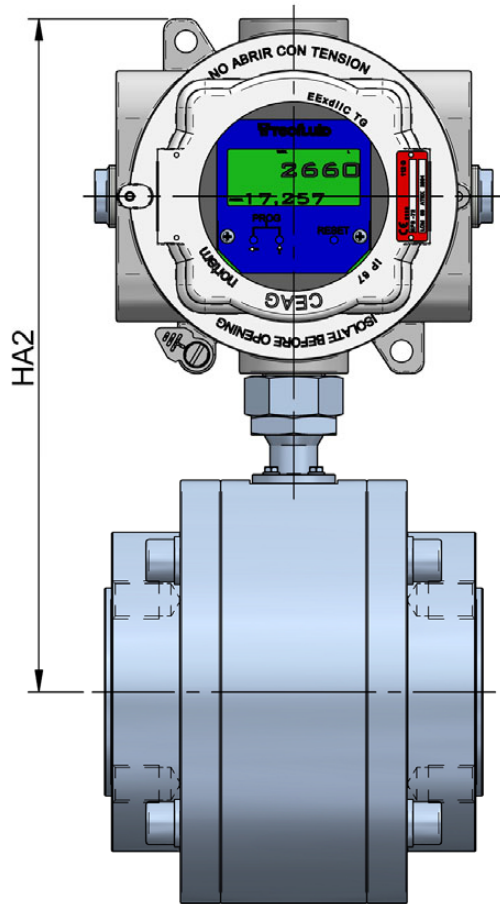


DN	HA1	HA1
	AISI 316L	PP/PVC/PTFE
15	205	220
25	225	230
40	245	245
50	255	255
80	280	280

Exd housings are not available for flowmeter sizes DN10 (H) and DN10
DN100 on request

All dimensions in mm (L±1,5 mm)

Model Exd ADF60V

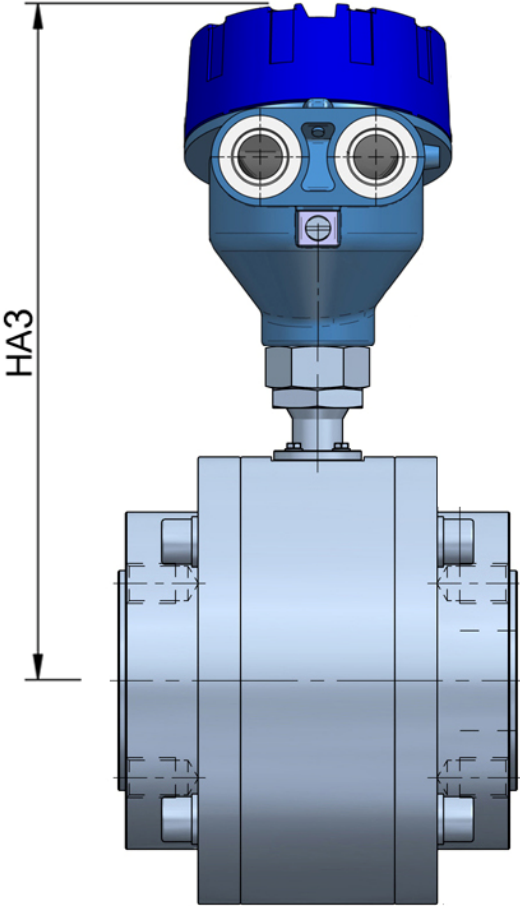


DN	HA2	HA2
	AISI 316L	PP/PVC/PTFE
15	250	265
25	270	275
40	290	290
50	300	300
80	325	325

Exd housings are not available for flowmeter sizes DN10 (H) and DN100 on request

All dimensions in mm (L±1,5 mm)

Model Exd ADF40



DN	HA3	HA3
	AISI 316L	PP/PVC/PTFE
15	250	230
25	270	240
40	290	255
50	300	265
80	325	290

Exd housings are not available for flowmeter sizes DN10 (H) and DN10
DN100 on request

All dimensions in mm (L±1,5 mm)

10 k FACTOR (PULSES / LITRE)

DN	Pulses / litre ± 12%	cm³ / pulse ± 10%
10 / ¼" (H)	100	10
10	100	10
15	20	50
25	10	100
40	4	250
50	2	500
80	1	1000
100	0,2	5000

Measured values for water at 20 °C

11 TROUBLESHOOTING

Problem	Possible cause	Solution
The associated electronics do not totalize or the flowmeter does not emit pulses	Blockage or friction of the piston by particles	Install a filter according to specification (maximum mesh size between 0.1 y 0.2 mm²).
	Damaged reed group	Change the reed group
	Disconnected cables between the COVOL and the associated electronics	Replace the cable connection
The associated electronics totalize less than the actual volume	Operating liquid with properties very different from water at 20°C (calibration liquid)	Correct the k factor
	Blockage or friction of the piston by particles	Install a filter according to specification (maximum mesh size between 0.1 y 0.2 mm²).
	Bad programming or incorrect value of the k factor	Program the k factor marked on the label
The associated electronics totalize more than the actual volume	Operating liquid with properties very different from water at 20°C (calibration liquid)	Correct the k factor
	Presence of air pockets	Control the minimum tank level. Provide an air degasser upstream of the counter if air intakes can be expected
	Excessive emptying of storage tanks	
	Bad programming or incorrect value of the k factor	Program the k factor marked on the label
The flow rate indicated by the associated equipment is unstable	The pipe is not completely full	Make sure that the pipe is completely full, for example, installing the counter in a vertical pipe with upwards flow



LABORATORIO OFICIAL J. M. MADARIAGA

**(1) EC-TYPE EXAMINATION CERTIFICATE****(2)** Equipment or protective system intended for use in potentially explosive atmospheres

Directive 94/9/EC

(3) EC-Type Examination Certificate nr **LOM 14ATEX2006 X****(4)** Equipment or protection system

Volumetric counters

Type COVOL

(5) Manufacturer

TECFLUID, S.A.

(6) Address

Narcís Monturiol, 33

08960 Sant Just Desvern (Barcelona)

SPAIN

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.**(8)** Laboratorio Oficial J.M. Madariaga (LOM), notified body number 0163 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.The examination and test results are recorded in confidential report nr. **LOM 13.344 GP****(9)** Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

Standards

EN 60079-0:2009

EN 60079-1:2007

EN 60079-31:2009

(10) If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.**(11)** This EC-Type Examination Certificate relates only to the design and construction of this specified equipment or protective system in accordance with the Directive 94/9/EC. Further requirements of the Directive apply to the manufacture and supply of this equipment or protective system. These are not covered by this certificate.**(12)** The marking of the equipment or protective system shall include the following:

II 2G

Ex d IIC T6 Gb

II 2D

Ex tb IIC T85 C Db

Getafe, 2014-02-03

Carlos Fernández Ramon

Responsible of the Certification Committee

This Certificate is a translation from the original in Spanish. The LOM liability applies only on the Spanish text

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 UNIVERSIDAD POLITÉCNICA DE MADRID
 ENSAYOS E INVESTIGACIONES DE MATERIALES Y EQUIPOS PARA ATMÓSFERAS EXPLOSIVAS Y MINERÍA
 (Real Decreto 334/1992 de 3 de Abril - BOE 1992-04-29)


Eric Kandel, I-28906 GETAFE (MADRID) • ☎ (34) 91 4421366 • ✉ (34) 91 4419933 • ✉ lom@lom.upm.es



LABORATORIO OFICIAL J. M. MADARIAGA

(A1) SCHEDULE

(A2) FC-Type Examination Certificate nr: LOM 14ATEX2006 X

(A3) Description of equipment or protective system

Volumetric counters with rotary piston for liquids, used in closed pipes. The equipment consists of a main body which includes the mechanical pieces of the counter, an enclosure containing the electronics; a magnetic sensor into a union piece and a thread adapter. The assembly of the enclosure, the magnetic sensor and the thread adapter are part of a flameproof enclosure or with protection by enclosure.

There are three types of enclosure containing electronic circuits depending on the device model:

- Only with terminal strip

This enclosure can be type either C30 or C31 from Cooper Crouse-Hinds. The sensor terminals are directly connected to an internal terminal strip that allows connection to the outside.

- CIP or CIP2 totalizer

This enclosure can be type either C30 or EFS-72 from Cooper Crouse-Hinds. The enclosure includes electronic circuits for flow rate totalization and LCD display. The circuits are powered by an internal 3.3V, 560 mA battery.

- CP420 or CH420 transmitters

This enclosure can be type either C30 or EFS-72 from Cooper Crouse-Hinds. The enclosure includes electronic circuits for determining the flow rate and volume as well as signal transmission and local LCD display. The external power supply between 12 and 36 V comes from the 4-20 mA current loop, optionally with HART protocol.

(A4) Test report nr. LOM 13.344 GP

(A5) Special conditions for safe use

- CIP/CIP2 variants, which include internal battery, cannot be opened when there is an explosive atmosphere present.

(A6) Individual tests

- Equipment is excluded from individual tests to be overcome overpressure type tests at 4 times the reference pressure.

(A7) Essential Health and Safety Requirements

Explosion safe requirements are covered by application of the standards indicated in the first page of this certificate.

(A8) Descriptive documents

- Technical dossier nr. R-ET-CIATEX

Rev. 2 Date 2014-01-24

- Drawings nr.:

249400003

0

2013-09-13

261050037

0

2013-09-27

261170066

1

2013-09-13

268910110

0

2013-11-25

ADFC/C30

0

2013-11-29

CO/ADFC/C30

0

2013-11-19

CO/ADFC/C31

0

2013-11-19

RECIPER 07.32

Rev 0

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LABORATORIO OFICIAL J. M. MADARIAGA



SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE

2	Equipment or Protective System Intended for use in Potentially Explosive Atmospheres: Directive 2014/34/EU
3	Supplementary EU-Type Examination Certificate Number LOM 14ATEX2006X/1 issue 0
4	Product Volumetric counters Type COVOL
5	Manufacturer TECFLUID, S.A.
6	Address Narcís Monturiol, 33 08960 Sant Just Desvern (Barcelona) SPAIN
7	This supplementary certificate extends EC – Type Examination Certificate No. LOM 14ATEX2006X to apply to products designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.
8	Laboratorio Oficial J.M. Madariaga (LOM), Notified Body number 0163 in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that the product, as modified by this supplementary certificate, has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive
9	In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Supplementary Certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016.
	Gatafe
	FERNANDEZ RAMON, CARLOS (FIRMA)
	2018.04.11 19:35:27 +02'00"
	Head of Certification Committee

RCPCR 25.17/3

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LABORATORIO OFICIAL J. M. MADARIAGA

13 ANEXO

14 Supplementary EU-Type Examination Certificate Number LOM 14ATEX2006X/1

15 Description of the variation to the Product

Alternative use of a new head using an enclosure type XD-AD of Limatherm Components, with certificate FTZÜ 03 ATEX 0047U.

A new signal transmitter with current loop output 4-20 mA and in pulses with optical isolation is also used. The maximum consumption of this module is 0.8 W and power supply from 12 V to 36 V.

16 Report Number 17.799P

17 Specific Conditions of Use

None

18 Essential Health and Safety Requirements

No changes

19 Documents and drawings

Number	Sheets	Issue	Date	Description
R-ET-CIATEX	10	3	2017-05-18	Technical description
R-MI-COVOL	22	5	--	Safety instructions




EU Declaration of Conformity

Manufacturer: TECFLUID S.A.
Narcís Monturiol, 33
E 08960 Sant Just Desvern

Equipment: Series COVOL of volumetric counters

Models: COVOL, COVOL+CIP, COVOL+CIP2, COVOL+CP420,
COVOL+CH420

Certification: LOM 14ATEX2006X

Group and category:  II 2G Ex d IIC T6 Gb
II 2D Ex tb IIIC T85°C Db

Standards to which conformity is declared:

Directive ATEX 2014/34/EU

EN60079-0:2009 Equipment. General requirements
EN6009-1:2007 Equipment protection by flameproof enclosures "d"
EN60079-31:2009 Equipment dust ignition protection by enclosure "t"

Changes in the current standards regarding the standards mentioned in this declaration of conformity do not affect the EC-type examination certificate LOM 14ATEX2006 X corresponding to this equipment

For production, Tecfluid S.A. complies with the Module D (annex IV) of the directive 2014/34/EU, having the notification for production quality assurance n. LOM 02ATEX9033, of the notified body with identification number 0163 (Laboratorio Oficial J.M. Madariaga)

I, the undersigned, declare that the equipment stated above is in conformity with the essential requirements of the Directives of the European Parliament and the Council on the approximation of the laws of Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres.

In Sant Just Desvern
Date: July 20, 2017

Esteve Cusidó (R&D manager)



Declaration of Conformity

Manufacturer: TECFLUID S.A.
Narcís Monturiol, 33
E 08960 Sant Just Desvern

Equipment: Volumetric counter

Models: COVOL

Standards to which conformity is declared:

Directive ATEX 2014/34/EU

EN60079-0:2013 Equipment. General requirements

EN6009-11:2013 Equipment protection by intrinsic safety "I"

Declaration:

This device is considered Simple apparatus according to EN60079-11:2013 standard, clause 5.7, since it does not have its own source of ignition, therefore it does not require certification by a notified body and it does not need to be marked in conformity with the ATEX directive.

Characteristics:

Maximum ambient Temperature: 40 °C

Reeds:

Maximum Switched Power: 0.6 VA

Maximum Switched Voltage: 30 V

Maximum Switched Current: 20 mA

Ca: 0.5 pF

Plastic versions

Having reviewed the essential health and safety requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, Tecfluid S.A. considers that this device does not contain any potential ignition sources.

Special emphasis has been done in the following points of the directive (Annex II):

1.1.1. The materials used for the construction of the equipment can cause an explosion.

1.3.1. Hazards arising from different ignition sources.

It does not exist any potential ignition source. Since the equipment itself does not generate any increase of heat, the maximum temperature will depend on the operating conditions (process temperature).

1.3.2. Hazards arising from static electricity.

The metering body can be made of plastic. The used materials are: PVC, PP and PTFE. Because the risk of ignition by electrostatic discharge when rubbing the equipment cannot be avoided, the instruments include a warning label with the safety measures to be applied during service.

1.3.4. Hazards arising from overheating.

The internal part in movement of the equipment does not generate overheating.

1.6.4. Hazards arising from connections.

The equipment is fitted with a suitable cable entry. It has an IP65 ingress protection.

I, the undersigned, declare that the equipment stated above conforms to the essential requirements of the Directives of the European Parliament and the Council on the approximation of the laws of Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres.

In Sant Just Desvern

Date: June 8, 2016

A handwritten signature in blue ink, consisting of a stylized 'E' with a vertical line through it, and a horizontal line at the bottom.

Esteve Cusidó (R&D manager)

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 S.A.

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Quality Management System ISO 9001 certified by



Pressure Equipment Directive certified by



ATEX European Directive certified by



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