



## Instructions manual

### Serie AD

#### Flow switch and indicator



**HART**  
COMMUNICATION FOUNDATION



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

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- 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](http://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.
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## SERIES AD

### 1 INTRODUCTION

The series AD of flow switches and indicators are flowmeters for liquids and gases.

They are very robust instruments prepared to work under extreme conditions.

They can fit local flow rate indication by means of magnetic coupling, with scales calibrated in l/h, m<sup>3</sup>/h, kg/h, t/h, %, etc.

They can fit switches or electronic transmitters that allow to detect a specific flow rate and provide a flow rate signal to a remote device.

### 2 WORKING PRINCIPLE

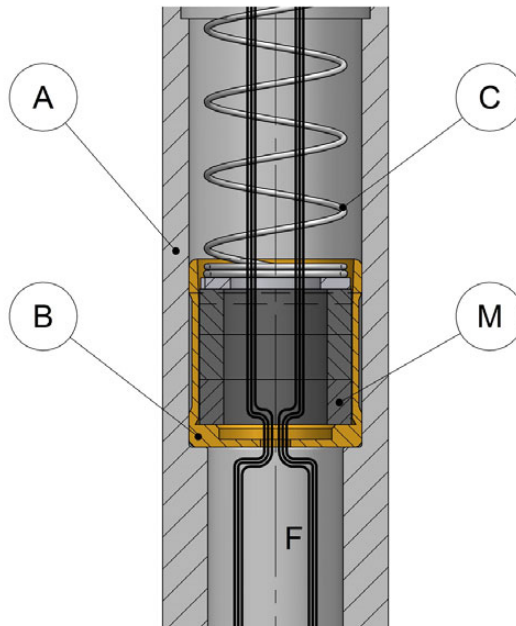
A spring C keeps a calibrated disc B at rest. When a fluid flows at a certain velocity, it pushes the disc B, forcing its displacement to an equilibrium point.

The distance covered by B depends on:

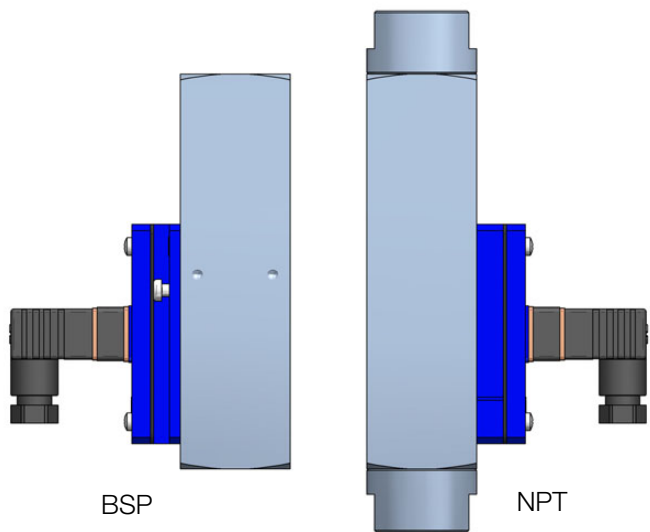
- The force of the fluid flow F.
- The ratio of the areas A and B.
- The opposing force of the spring C.

The equilibrium between the forces F and that generated by C defines the position of the calibrated disc B, equivalent to the flow rate.

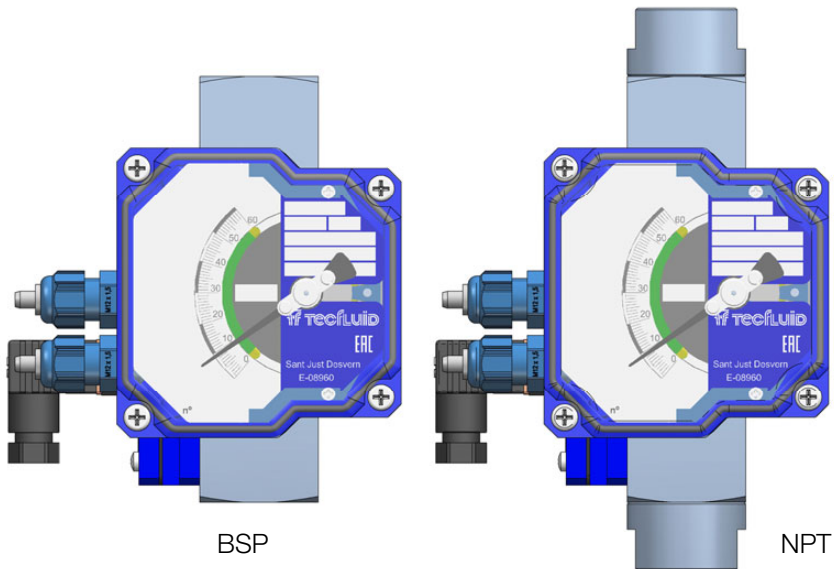
The calibrated disc B has a magnet M. The magnetic field acts on the limit switches and/or the local indicator.



The AD15 model fits 1 or 2 reed based limit switches.



The ADI15 model fits a magnetic flow indicator system using a pointer on a graduated scale. It can also fit the same limit switches as in AD15 model as well as the AMD inductive limit switches.



### 3 RECEPTION

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

The instruments are supplied tested in our calibration rigs, ready for installation and service.

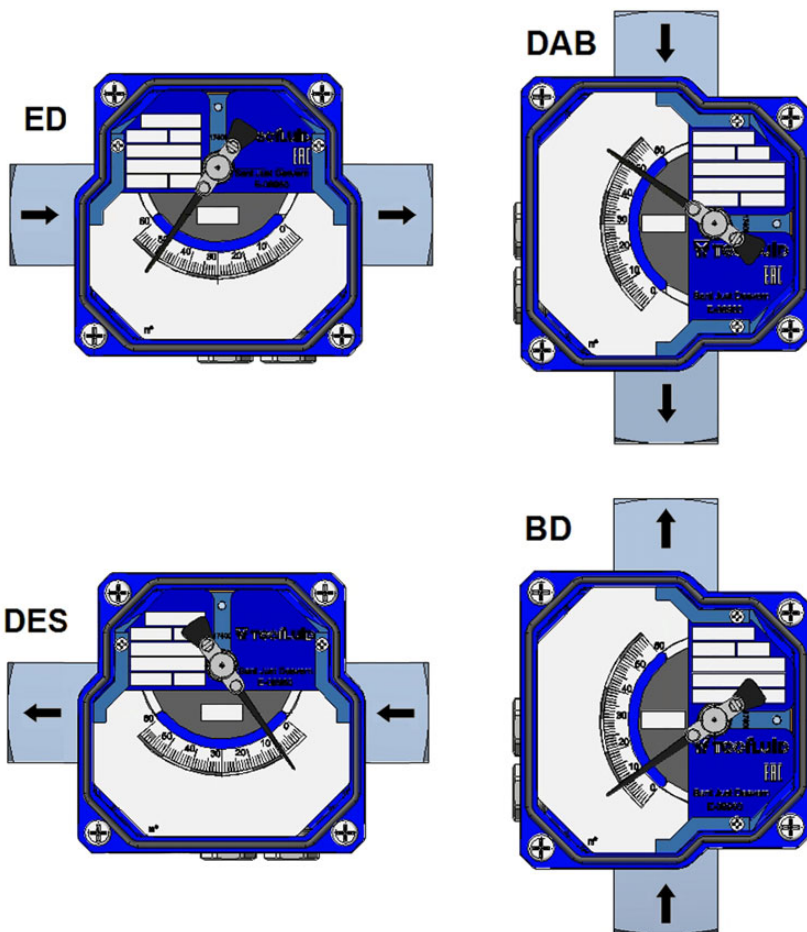
Before installing the flowmeter, remove all the blocking elements.

For models ADI, with the instrument in its working position, move the disc and check that the indicating needle moves all over the scale and returns to zero.

### 4 INSTALLATION

If the flow switch model is AD15, it should be installed in a pipe so that the arrow on the label points towards the fluid direction.

If it is an ADI15 model, the flow direction should coincide with that indicated on the scale. The four possible positions are:



The "0" on the scale indicates the fluid inlet on the meter, and the end of the scale indicates the fluid outlet.

## 1A / 2A LIMIT SWITCH

### 5 INTRODUCTION

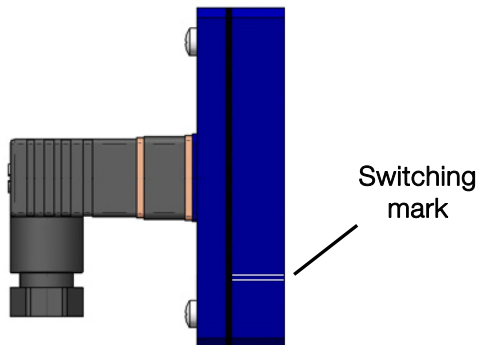
It is a SPDT reed type switch that is used to generate an alarm or an operation when the circulating flow reaches a certain value.

It consists of a bistable reed sensor (SPDT), in other words, when the flow exceeds the set point the sensor changes its state and maintains it until the flow decreases below that value.

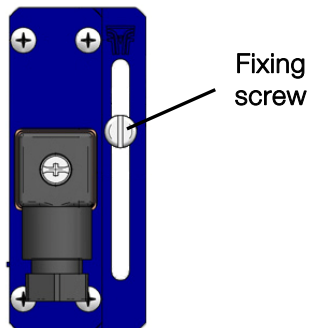
In the same instrument, there may be one or two sensors, depending on the points to be detected.

#### 5.1 Set point adjustment

The switch housing has a mark on the side next to the graduated scale. The position of this mark indicates the value at which the switch will be activated.



To adjust the position, loosen the fixing screw and slide the switch through the slot until the set point coincides with the desired flow rate on the scale.





## 5.2 Electrical connection

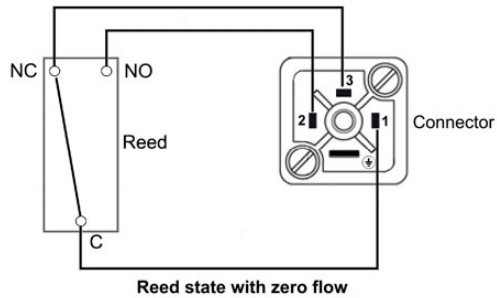
For the electrical installation, a multi-conductor cable should be used to obtain a good seal with the cable gland. The connector is provided with a PG 7 cable gland, suitable for a 4.5 to 7 mm outside diameter cable.

Terminal 1: Common

Terminal 2: Normally open (NO)

Terminal 3: Normally closed (NC)

Earth terminal: Not connected  
conexión

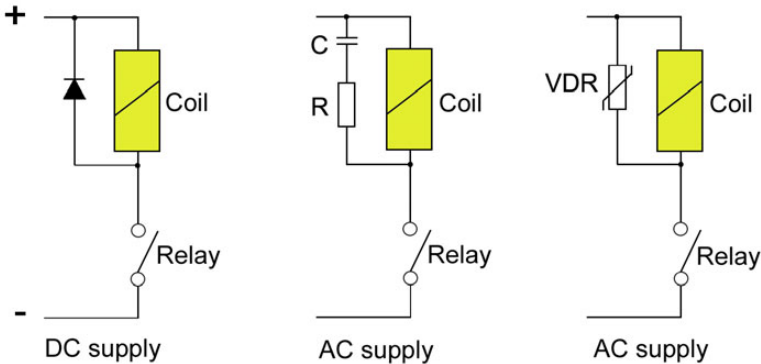


The electrical installation should provide a fuse or circuit breaker to protect the reed switch from overloads.

When installing the connector, make sure that the cable gland closes over the cable and that the connector with the rubber seal is well screwed down to maintain its IP rating.

Make sure that the contact rating is not exceeded (see section 17.2 in page 21). If high loads are to be switched, use an auxiliary relay.

When using inductive loads, such as relays or electro-valve coils, surge arresters should be installed to protect the reed contacts (VDR in case of AC supply and free willing diodes in case of DC supply).



## AMD LIMIT SWITCH

### 6 INTRODUCTION

The AMD limit switch can be used to generate an alarm or an operation when the flow rate that the instrument is measuring reaches a preset value on the scale plate.

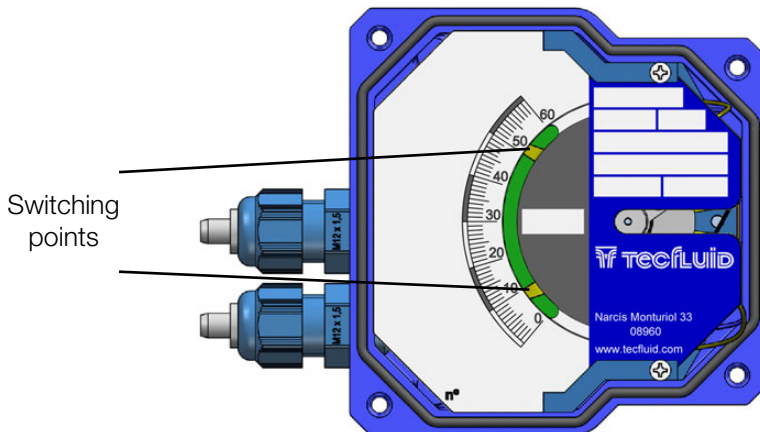
The AMD limit switch consists of a NAMUR slot type inductive sensor, that is actuated by a vane. Given that there is no physical contact in the operation, the limit switch has no influence on the indicator needle movement.

An instrument can be equipped with one or two sensors, depending on the number of points to be detected. A NAMUR amplifier with a relay output can be supplied as an option.

### 7 OPERATION

The indicator needle moves together with the vane mounted on its shaft. When the vane enters into the slot of the sensor, the limit switch changes its state.

The sensor is mounted on a support which includes a needle that indicates the switching position. The needle, that is below the scale plate, can be seen through the scale slot.



# 8 MOUNTING THE LIMIT SWITCH IN AN EXISTING EQUIPMENT

When the AMD limit switch is to be fitted to an existing device, please follow these steps.

## 8.1 Kit contents

The kit contains the following elements:

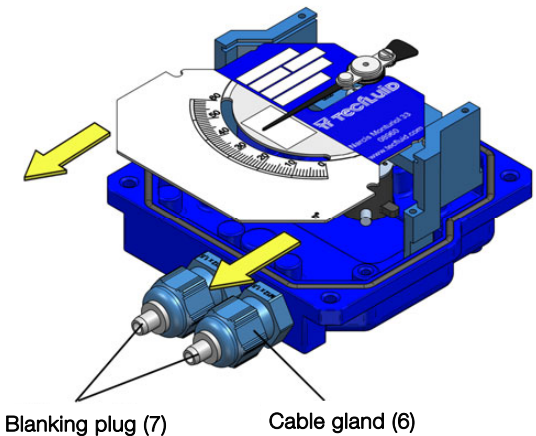
	AMD kit	
Quantity	Material	Position
1	AMD limit switch circuit	1
2	Self tapping screw DIN7982 B-2,2 x 9,5 N°2 A2	2
1	AMD vane	3
1	Self tapping screw DIN7982 B-2,2 x 9,5 N°2 A2	4
2	Gasket	5
2	Cable gland IP68	6
2	Cable gland blanking plug	7

In the kits, the gaskets (5) and the blanking plugs (7) are not provided as loose parts. They are incorporated in the cable glands (6).

## 8.2 Preparing the kit

Remove the cover, unscrewing the four screws M4.

Slide the scale plate in the direction indicated in the figure, until it is released from the slot.



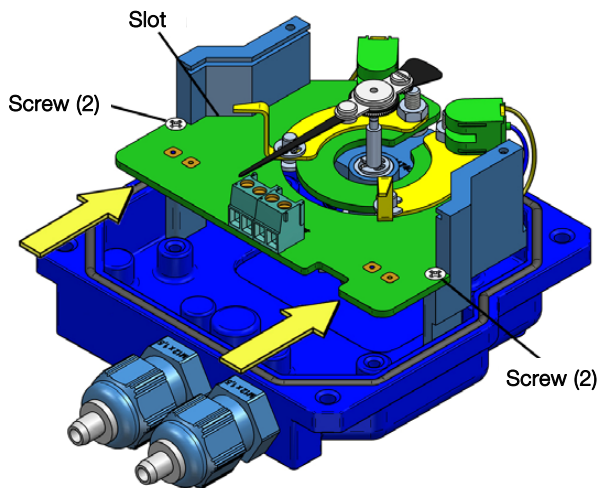
Ensure that the rings (5) are placed in the thread of the gland (6). If not, they should be placed. Remove the plugs from the indicator box with a flat screwdriver and replace them by the two cable glands.



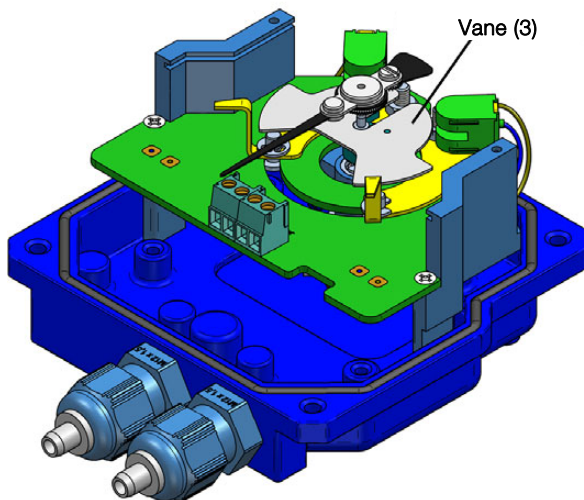
The cable glands that are not expected to be used should be left with the blanking plug (7) placed to preserve watertight.

### 8.3 Assembling the AMD kit

Slide the circuit (1) into the slot until it stops, and then screw it as shown in the figure.



Place the vane (3) in the position shown in the figure. The height on the shaft should be such that when the vane passes through the sensor slots, remains centered without touching them. Tighten the screw (4) holding the vane against the shaft.

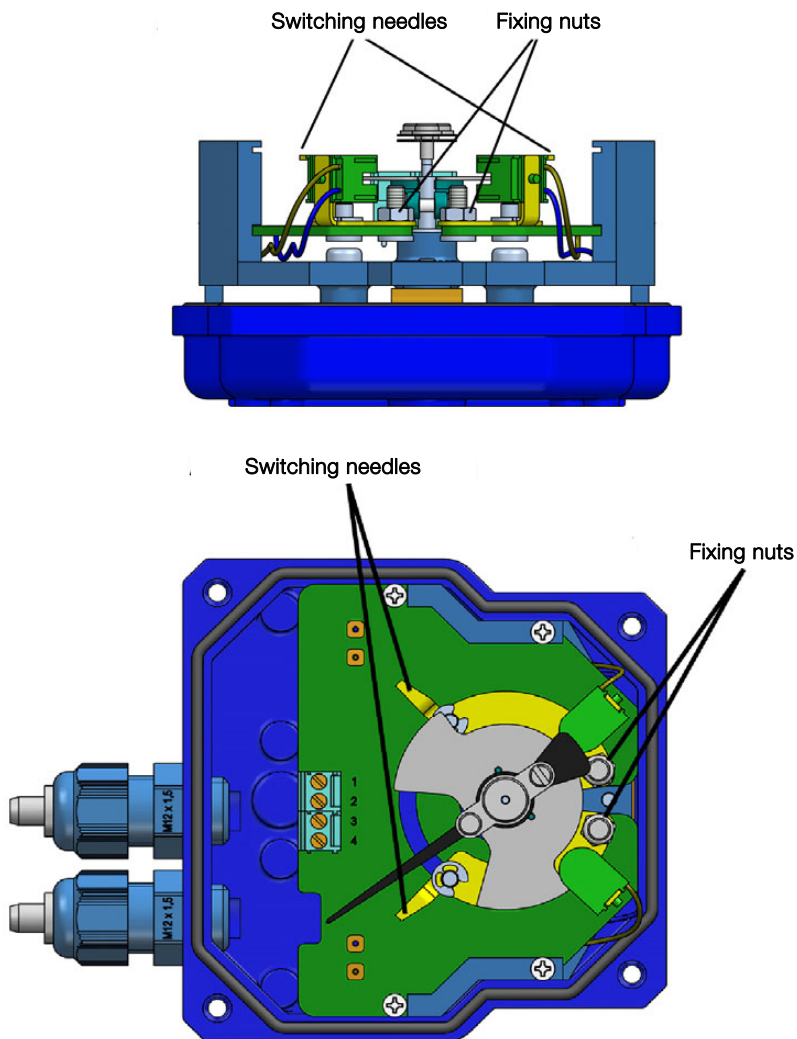


## 8.4 Switching point adjustment

At the bottom of the switching needle, the fixing nuts of the switching points can be found.

To move the switching point, the fixing nuts have to be slightly loosen without removing the scale plate (see figure on the next page). After that, place the switching point at the required scale value, and fix it with the nuts.

As standard, when the instrument has only one AMD, it is configured as a minimum limit switch.

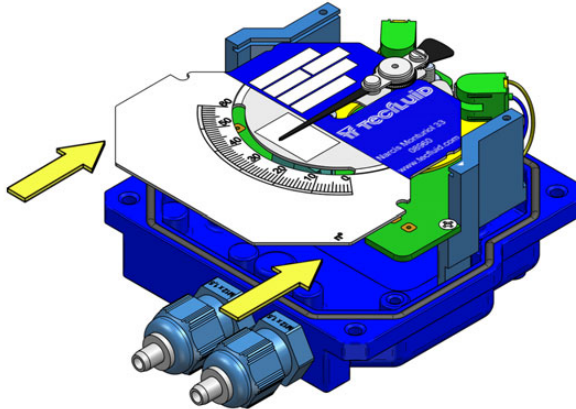


### 8.5 Electrical connection

Proceed according to section 9.

### 8.6 Mounting

Slide the scale plate into the slot until it stops as shown in the figure. Mount the cover with the four screws M4.



## 9 ELECTRICAL CONNECTION

For the electrical connection, the instrument is provided with a four terminal connector.

For the electrical installation it is recommended to use multiple conductor cables with sections of 0.25 or 0.5 mm<sup>2</sup>, in order to make it easier to connect.

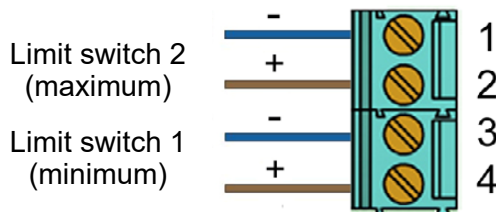
Before starting the installation, check that the cable glands are the right size for the cables to be used, this will guarantee the instrument will stay watertight. The M12x1.5 cable glands used are for cables with outside diameters between 2.5 mm and 6.5 mm.

Peel the outside insulation to free the inner cables. It is recommended to tin the ends of the wires to avoid loose ends. Pass the cables through the cable glands and screw down in the corresponding positions of the terminal strip. Once the wiring is finished make sure that the cables are well gripped by the cable glands to maintain the degree of protection.

The cable glands must be always closed. Entry of dust or some types of vapours can damage the internal system of bearings and therefore the equipment.

To gain access to the terminal block, the scale plate must be removed. To do this, slide it to the left through the slot until released.

The numeration of the terminals is the following:



# TH6 TRANSMITTERS

## 10 INTRODUCTION

Transmitters TH6 are electronic position transducers with a microprocessor. The instrument uses the Hall effect to capture the field of a magnet. This signal, after the microcontroller processing, is converted into a current signal of 4-20 mA in a 2-wire loop. This signal is proportional to the flow rate.

## 11 MODELS

### 11.1 TH6

It is a 4 to 20 mA transmitter proportional to flow rate. 4 mA corresponds to beginning of the scale. 20 mA corresponds to full scale. Between the beginning of the scale and the first point of the scale the analog output is constant at 4 mA, to avoid false readings of flow rate.

### 11.2 TH6H

It is a TH6 transmitter that incorporates HART™ protocol compatibility. With this protocol the user can change the measuring range of the 4-20 mA loop, and data like flow rate, with its associated measuring units.

## 12 ELECTRICAL CONNECTION

For the electrical connection, the transmitter has two screw terminals.

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<sup>2</sup> in order to make it easier to connect.

A twisted pair wiring should be used to avoid electrical interferences in the 4-20 mA loop. In some instances, shielded cable may be necessary.

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 M12x1.5 cable glands used are for cables with outside diameters between 2.5 mm and 6.5 mm.

Peel the outside insulation to free the inner cables. It is recommended to tin the ends of the wires to avoid loose ends. Pass the cables through the cable glands and screw down in the corresponding positions of the terminal strip. Once the wiring is finished make sure that the cables are well gripped by the cable glands to maintain the degree of protection.



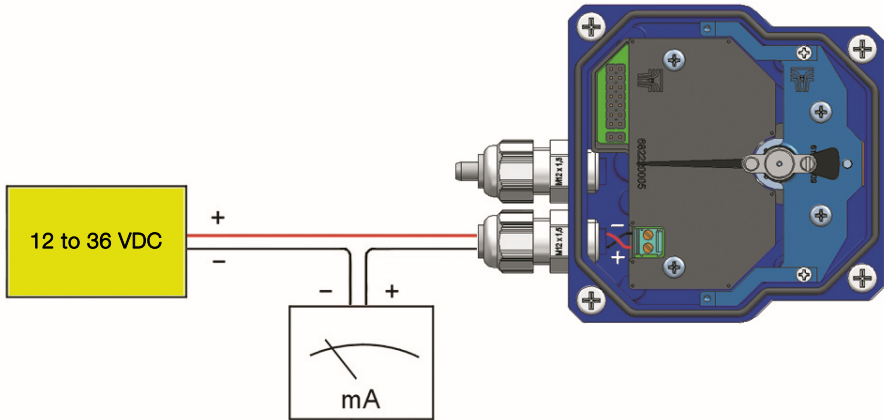
The cable glands must be always closed. Entry of dust or some types of vapours can damage the internal system of bearings and therefore the equipment.

To help in the wiring of the equipment, the description of the terminals is marked on the printed circuit next to the terminal strip.



Before connecting the power supply, you must be sure that the supply voltage is the correct for the installation. The power supply voltage is indicated on the label of the transmitter.

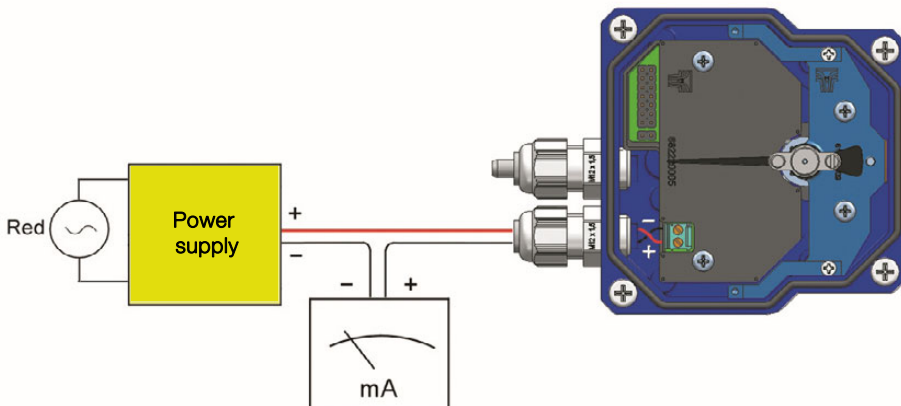
### 12.1 Power supply and analog output



The connection is made in the terminal block. The positive terminal of the power supply is connected to the position + and the positive terminal of the load in the position -. The negative terminals of the power supply and the load are connected together. The instrument works in a 2-wire system, that is, the supply and signal line is the same. It is recommended to use a twisted pair wiring or shielded cable to avoid interferences in the current loop.

### 13 4-WIRE CONNECTION

If Direct Current power supply for the transmitter is not available in the installation, it will be necessary to incorporate an additional power supply as in the following figure.





## 14 HART TRANSMITTERS

The TH6H transmitters have a modem for HART communication.

TH6H transmitters are fully compatible with the **HART Server** software from HART Communication Foundation.



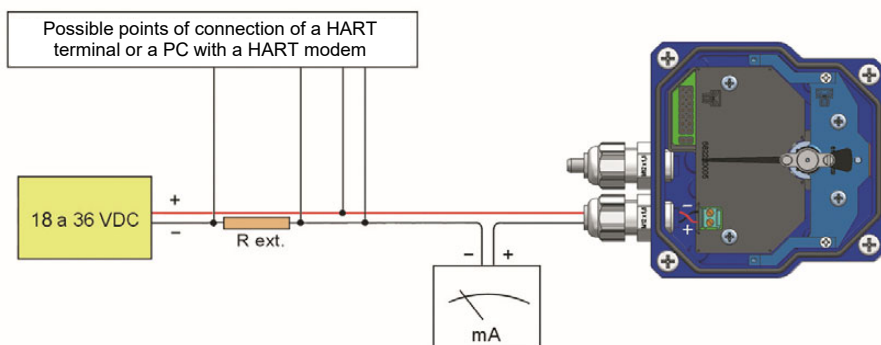
Tecfluid S.A. do not guarantee that the TH6H transmitter is compatible with the different servers on the market.

When connecting the transmitter, an external resistor (R ext.) should be included. Its minimum value needs to be 200 Ω, and the maximum value depends on the power supply as follows:

$$R(\text{Ohm}) = \frac{V - 14}{20 \cdot 10^{-3}}$$

In this case the power supply voltage needs to be 18 VDC minimum.

In order to establish HART communication, it is necessary to connect a terminal or PC with a HART modem, in one of the points indicated in the following figure.



### 14.1 Additional functions with HART communication

By means of the implemented commands, the user can obtain the following information:

- Flow rate value in the scale units
- Totalizer value (even if the equipment does not have a display).
- Reset or writing of a totalizer value.
- Change of beginning and end of scale of the current loop.
- Possibility of writing tags and messages into the instrument.

### 14.2 HART communication characteristics

The detail of the characteristics with respect to the HART communication are available in the corresponding "Field Device Specification" document.

## Summary of the main communication characteristics:

Manufacturer, Model and Revision	Tecfluid S.A., TH6H, Rev. 0
Device type	Transmitter
HART revision	6.0
Device Description available	No
Number and type of sensors	1
Number and type of actuators	0
Number and type of host side signals	1, 4 – 20 mA analog
Number of Device Variables	2
Number of Dynamic Variables	1
Mappable Dynamic Variables	No
Number of Common Practice Commands	5
Number of Device Specific Commands	0
Bits of Additional Device Status	12
Alternative working modes?	No
Burst mode?	No
Write Protection?	Yes

Electrical characteristics referred to the analog loop and communications:

Reception impedance:

Rx	>	3,3 M $\Omega$
Cx	<	1000 pF

## 15 “WRITE PROTECT”

The instrument has a jumper that can be used to avoid changes in the configuration. When the jumper is connected the instrument can be configured via HART. When the jumper is removed, “Write Protect” is activated for HART, thus avoiding any changes in the configuration.

## 16 MAINTENANCE

### 16.1 Series AD

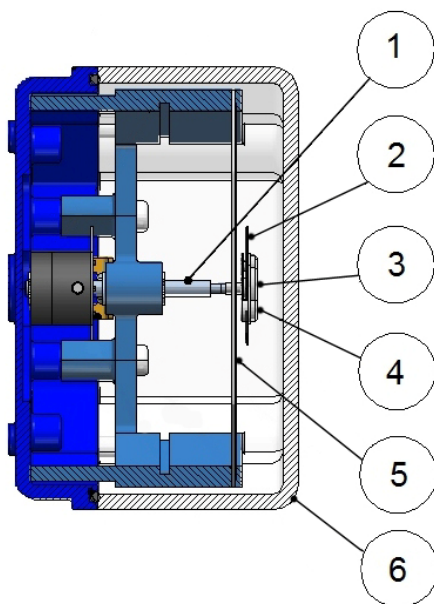
No special maintenance is required.

### 16.2 Potential problems with the indicator housing

#### 16.2.1 The indicator pointer rubs on the reading scale

To remove the cover (6), remove the four screws M4 at the corners of the indicator housing.

Rubbing normally happens if the meter has been hit or dropped. Simply straighten the pointer (2) by bending it slightly until it is separated between 2-3 mm from the reading scale surface (5)



#### 16.2.2 Deviation of the zero on the scale

When the indicator pointer (2) does not point zero in its rest position, place the flowmeter in its real working position on top of a non-magnetic table. If when the float is moved the pointer moves but does not return to 0, check that the pointer hub (3) is firmly attached to the pointer shaft (1). If it isn't, secure the pointer hub (3) onto the conical tip (1) of the shaft by tapping it lightly and carefully.

If the pointer hub is fixed, make the indicator pointer coincide with the 0 on the scale using the frontal adjusting screw (4) on the indicator pointer. Make sure that the shaft (1) is held fast so as not to be bent or damaged

Check that there is no rubbing between the pointer movement system and the cables connected to a limit switch or transmitter.

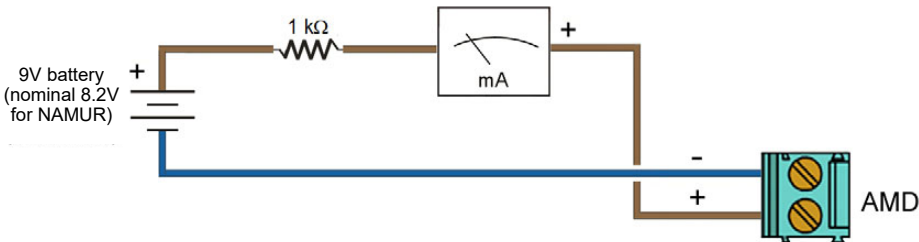
### 16.3 AMD limit switch maintenance

#### 16.3.1 Electrical verification

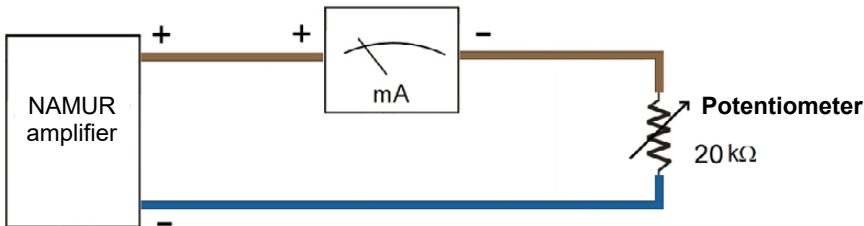
Check that the voltage at the terminals + and - is over 7.5 V when the vane is in the slot. Connect a multimeter with the scale in DC mA, in series with the terminal +.

Verify that the current is less than 1 mA when the vane is into the slot and more than 3 mA when the vane is out of the slot.

The verification can be done with the following circuit diagram:



Without the sensor, the operation of the amplifier can be checked using the following circuit diagram:



With the potentiometer the current through the NAMUR amplifier can be modified. The switching point must be between 1.2 mA and 2.1 mA. That is, with the current below 1.2 mA the output relay must have a state and above 2.1 mA the output relay must have the other state.

### 16.4 TH6 transmitter maintenance

No special maintenance is required.

## 17 TECHNICAL CHARACTERISTICS

### 17.1 Series AD

Accuracy:	±5% full scale
Scales:	Direct in engineering units or in %
Materials:	Brass, from 1/4" to 2 1/2" Aluminium, from 1 1/4" to 2 1/2" EN 1.4404 (AISI 316L) on request
Working temperature:	-20°C ... +100°C
Working pressure:	PN16 (others on request )
Connections:	1/4" ... 2 1/2" BSP / NPT
Housing:	IP65

### 17.2 1A / 2A limit switch

Reed sensor:	Sizes 1/4" ... 1", 0.25A 125 VDC 5W Sizes 1 1/4" ... 2 1/2", 1A 250 V 60 VA
--------------	--

### 17.3 AMD limit switch

Nominal voltage	8 V
Working voltage	5 ... 25 V
Power supply internal resistance	1 kΩ
Current with the vane into the slot	< 1 mA
Current with the vane out of the slot	≥ 3 mA
Standard:	DIN EN 60947-5-6 (NAMUR)
Ambient temperature	-25°C ... +100°C

### 17.4 TH6 transmitter

#### 17.4.1 Power supply

2 wire	
Minimum voltage (TH6):	0.02 Z + 12 (Volt) (Z is the load in the current loop in Ohm) The minimum value is 12 VDC for Z=0 Ohm
Minimum voltage (TH6H):	0.02 (Z+Rext) + 14 (Volt) (Z is the load in the current loop in Ohm) The minimum value is 18 VDC for Z=0 Ohm and Rext = 200 Ohm
Maximum voltage:	36 VDC
Consumption:	maximum 20 mA

#### 17.4.2 Outputs

Analog output:	4 - 20 mA, factory calibrated
Maximum load in the 4-20 loop:	1.1 kW (at 36 VDC supply voltage)

#### 17.4.3 General characteristics

Accuracy (analog output respect the magnetic field):	< 0.6 %
Ambient temperature:	-20°C ... +70°C
Cable gland:	M12 x 1.5

## 18 SAFETY INSTRUCTIONS

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

2014/68/EU Pressure equipment directive (PED)

Limit switches and transmitters:

2014/30/EU Electromagnetic compatibility directive (EMC)

2012/19/EU Waste electric and electronic equipment (WEEE).

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



### 18.1 Pressure equipment directive

Tecfluid S.A. have subjected the series AD 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 CATII

G Gases and vapours

1 Group of liquids 1

CATII Category II

Devices that, due to their size, are rated as Category I are not within 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.

### 18.2 Certificate of conformity TR CU (EAC marking)

Tecfluid S.A. have subjected the series AD 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.

## 19 ADDITIONAL INSTRUCTIONS FOR THE ATEX VERSION

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

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 and in its marking.

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

The category is 1GD, that is, it is intended for use in areas in which explosive atmospheres caused by mixtures of air and gases, vapours, mists or dust are present continuously, for long periods or frequently.

### 19.1 Non-metallic parts



#### **WARNING: POTENTIAL RISK OF ELECTROSTATIC CHARGE**

The front of the housing consists of a transparent plastic window in order to let the user see the position of the pointer on the scale.

Since the danger of ignition by electrostatic discharge when rubbing this window can not be avoided, **the instrument must always be cleaned with a damp cloth.**



#### **WARNING: RISK OF IMPACT**

Because the housing base is made of aluminium, **the equipment must be installed and operated always in locations at low risk of impact.**

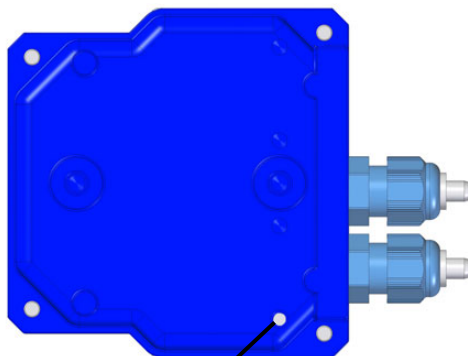


#### **WARNING: WIRING**

The wiring of the variants containing transmitter and inductive sensor must be kept separated.

### 19.2 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.



Earth connection

### 19.3 AMD limit switch

When the equipment includes an AMD limit switch, it is certified as intrinsic safety with the following parameters:

Specific parameters	Ui : 16 V
	Ii : 25 mA
	Pi : 64 mW
	Ci : 30 nF
	Li : 100 uH

### 19.4 TH6 transmitters

Transmitters TH6 are certified to be installed in potentially explosive atmospheres. They are intrinsic safety devices.

The electrical connection and the information with respect to the HART protocol is the same as in the TH6 transmitter (see sections 10 to 15).

The technical characteristics that differ from TH6 transmitters are the following:

Maximum voltage: 30 VDC  
Maximum load in the 4-20 loop: 900  $\Omega$  (at 30 VDC supply voltage)  
Ambient temperature: -20°C ... +40°C

The rest of characteristics are the same as TH6 transmitter (see section 17.4).

The specific intrinsic safety parameters are the following:

Specific parameters	Ui : 30 V
	Pi : 1,3 W
	Ci : 56 nF



### 19.5 Marking

An example of marking is shown as follows.

The marking of the equipment shows the following characteristics:

- Manufacturer
- Model
- Serial number
- CE marking
- ATEX marking
- Certification number
- Address of the manufacturer

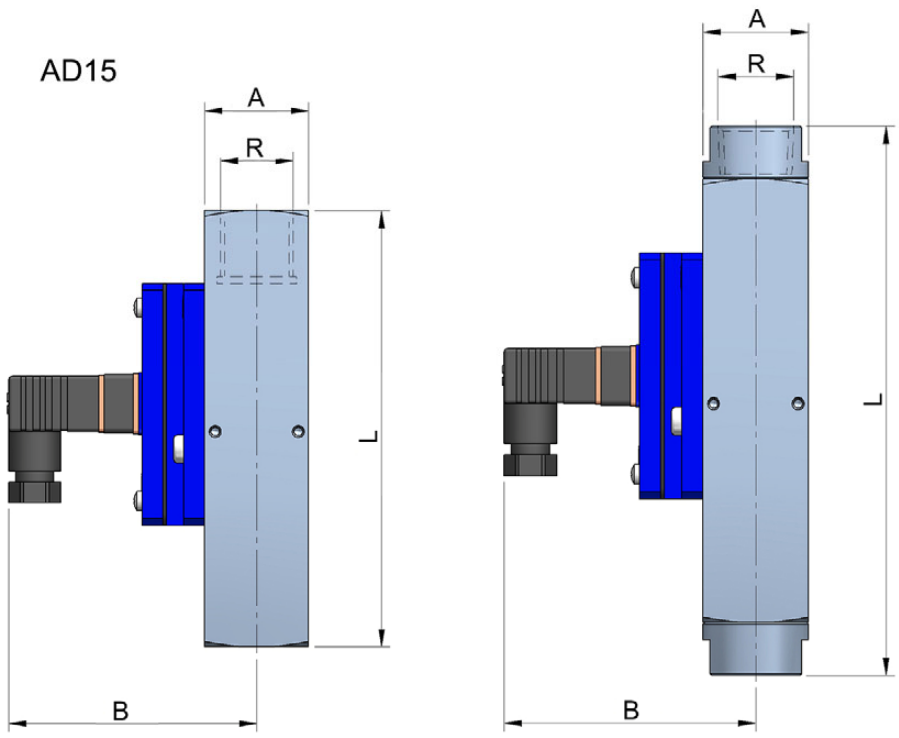


### 20 FLOW RANGES

Thread (BSP / NPT)	Flow scales (l/min water)
1/4"	0,25 ... 1
	0,5 ... 2,5
1/2"	1 ... 5
	1,5 ... 10
	2 ... 17
3/4"	5 ... 30
	6 ... 40
1"	10 ... 50
1 1/4"	15 ... 70
1 1/2"	40 ... 160
2"	70 ... 220
2 1/2"	100 ... 270

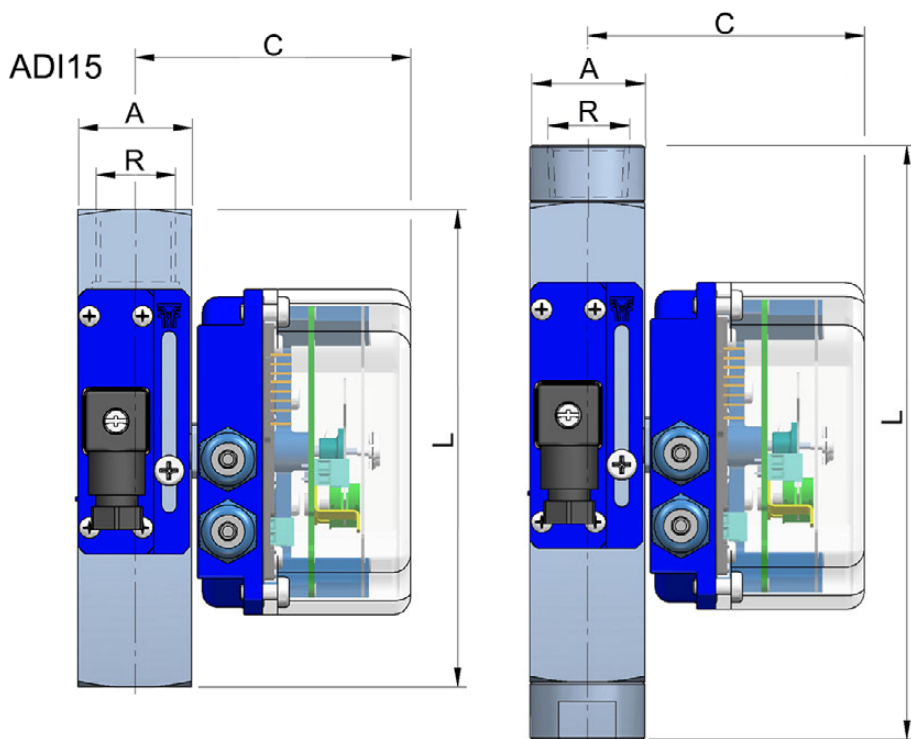
Equivalent flow ranges for air at 1 bar abs 20°C in NI/min can be calculated approximately by multiplying by 8 the flow rate in water.

21    DIMENSIONS



R	A	B	L	Weight (kg)
1/4"	30	72	140	0,9
1/2" BSP	30	72	126	1,2
1/2" NPT	30	72	156	1,3
3/4" BSP	35	74	126	1,6
3/4" NPT	35	74	166	1,7
1" BSP	40	77	126	1,8
1" NPT	40	77	180	1,9
1 1/4"	50	82	160	2,4
1 1/2"	60	87	180	3
2"	80	97	200	3,2
2 1/2"	100	107	200	3,6

(dimensions in mm)



The dimension B of the AD15 model (previous page) is valid for ADI15

R	A	C	L	Weight (kg)
1/4"	30	73	140	0,9
1/2" BSP	30	73	126	1,2
1/2" NPT	30	73	156	1,3
3/4" BSP	35	75	126	1,6
3/4" NPT	35	75	166	1,7
1" BSP	40	78	126	1,8
1" NPT	40	78	180	1,9
1 1/4"	50	83	160	2,4
1 1/2"	60	88	180	3
2"	80	98	200	3,2
2 1/2"	100	108	200	3,6

(dimensions in mm)



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 13ATEX2001 X**(4) Equipment or protection system  
Flow meters  
Types M21 and AD\*\*(5) Manufacturer  
Tecfluid S.A.(6) Address  
Narcís Monturiol, 33  
08090 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 12.475 VP**

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

Standards	<b>EN 60079-0:2009</b>	<b>EN 60079-11:2012</b>	<b>EN 60079-26:2007</b>
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(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 1GD Ex ia IIC T4, T6 Ga  
 Ex ia IIIC T85 °C Da

OFICIAL



Getafe, 2013-01-22

 Carlos Fernández Ramón  
 DIRECTOR OF THE LABORATORY



 Angel Vega Remesal  
 Head of the ATEX area

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

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 Rev 0

 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, 1 - 28906 GETAFE (MADRID) • (34) 91 4421366 • (34) 91 4419933 • lom@lom.upm.es





# LABORATORIO OFICIAL J. M. MADARIAGA



## (A1) SCHEDULE

(A2) **EC-Type Examination Certificate nr: LOM 13ATEX2001 X**

## (A3) Description of equipment or protective system

M21 and AD \* flow meters are based on a section of pipe through pass a fluid, in some cases by displacing a float and other displacing a disk. Attached to the pipe is placed an enclosure containing the reading flow system. This enclosure can be made of aluminium, stainless steel or polypropylene.

Types and variants

M21	Flow meter with conical float with reading system enclosure
AD	Impact disk flow meter without reading system enclosure
ADI	Impact disk flow meter without reading system enclosure

The equipment with two wire transmission include a circuit called HALLTEC VI having two variants, TH6 with 4-20 mA output and TH6H with HART support. This circuit can be encapsulated. The temperature class is T6 when the circuit is encapsulated and T4 without encapsulation.

Equipment with limit switch detectors include one or two detectors:

M1-AMD1	One NAMUR inductive detector
M1-AMD2	Two NAMUR inductive detector
1A	One reed micro-switch
2A	Two reed micro-switch

Type codification:

\*\*\* \*\*

Type: M21, AD, ADI

Transmitter variant: without transmitter, TH6 or TH6H

Limit switch variant: without limit switch, AMD1, AMD2, 1A o 2A

Specific parameters of the type of protection

Variants with transmitter TH6 / TH6H	Variants that only include inductive detectors	Variants that only include reed micro switches
U <sub>i</sub> : 30 V	U <sub>i</sub> : 16 V	I <sub>i</sub> : 25 mA
C <sub>i</sub> : 56 nF	P <sub>i</sub> : 64 mW	C <sub>i</sub> : 30 nF
P <sub>e</sub> : 1,3 W	L <sub>i</sub> : 100 uH	Without parameters

When combined variants with transmitter and inductive sensors, the connection of the respective circuits should be kept separate by independent cables.

(A4) **Test report nr. LOM 12.475 VP**

## (A5) Special conditions for safe use

- These apparatuses may only be used in locations with low risk of mechanical impact due to aluminium enclosures
- There is electrostatic hazard due to the plastic part of the enclosure. It shall follow the manufacturer instructions.
- The wiring of the variants containing transmitter and inductive sensor must be kept separated

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## LABORATORIO OFICIAL J. M. MADARIAGA

### (A1) SCHEDULE

### (A2) EC-Type Examination Certificate nr: LOM 13ATEX2001 X

### (A6) Individual tests

None

### (A7) Essential Health and Safety Requirements

Explosion safe requirements are covered by application of the standards indicated in page 1/3 of this certificate.

### (A8) Descriptive documents

	Rev.	Date
- Technical dossier nr.: R-ET-AV2ATEX	1	2012-09-26
- Drawings nr.: 239520071	0	2011-09-10
268910106	0	2012-10-21
P239520071/02	0	2012-04-04
P693120046/03	0	2012-08-29
P116810010/02	0	2012-02-17
P116810012/02	0	2012-02-17
P116810014/02	0	2012-02-17
P116810016/02	0	2012-02-17
- Component list nr.: 239520071/01	0	2012-04-04



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## UE Declaration of Conformity

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


**Equipment:** Series M21 and AD of flow meters

**Models:** M21, AD, ADI

**Switches:** AMD1, AMD2, 1A, 2A

**Transmitters:** TH6, TH6H

**Certification:** LOM 13ATEX2001X

**Group and category:**  II 1G Ex ia IIC T4 ... T6 Ga  
II 1D Ex ia IIIC T85°C Da

### Standards to which conformity is declared:

Directive ATEX 2014/34/EU

EN60079-0:2009 Equipment. General requirements  
EN6009-11:2012 Equipment protection by intrinsic safety "i"  
EN60079-26:2007 Equipment with equipment protection level (EPL) Ga

Changes in the current standards regarding the standards mentioned in this declaration of conformity do not affect the EC-type examination certificate LOM 13ATEX2001 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)



## 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](http://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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[www.tecfluid.com](http://www.tecfluid.com)

Quality Management System ISO 9001 certified by



Pressure Equipment Directive certified by



ATEX European Directive certified by



HART is a trademark of FieldComm Group <sup>TM</sup>

The technical data described in this manual is subject to modification without notification if the technical innovations in the manufacturing processes so require.