Instructions manual

Series LE
Level transmitter

The art of measuring

R-MI-LE Rev.: 3 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 LE

1 INTRODUCTION

The level transmitters series LE are very robust equipment with simple construction, resistant to corrosive chemicals.

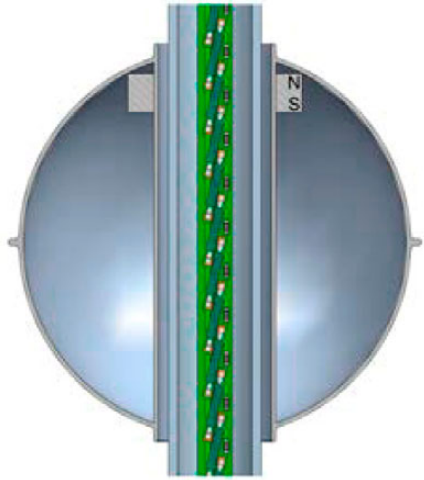
They consist of a resistive sensor based on the variation of the resistance as a function of the height of the float.

2 WORKING PRINCIPLE

By means of float with magnetic field and reed chain.

A reed switches and resistance chain is mounted inside a guide tube.

The changes in liquid level modify the float position in this guide tube, so that it activates the reed switches providing an output signal of variation of resistance, which can be later converted into a two-wire 4-20 mA current output proportional to the level.



3 MODELS

- LE70 Guide tube length longer than 2000 mm and/or depending on liquid density and material, flange connection
- LEM70 Guide tube length shorter than 2000 mm, flange connection
- LE71 Guide tube length longer than 2000 mm and/or depending on liquid density and material, thread connection
- LEM71 Guide tube shorter than 2000 mm, thread connection

4 RECEPTION

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

All the instruments have been verified in our facilities, ready for installation and operation.

Check that the float slides along the entire length of the guide tube (move it gently, accompanying the float manually).

Check that the guide tube has no bumps and is not bent or curved.

Verify that the end stop of the guide tube is correctly mounted.

5 HANDLING

It must be done carefully and without blows.

6 INSTALLATION

Important: Check that the minimum density of the float is lower than the density of the liquid, and the upper position (UP) marked on the float is correct.

The position of the guide tube is vertical, with variation of the level from bottom to top and vice versa.

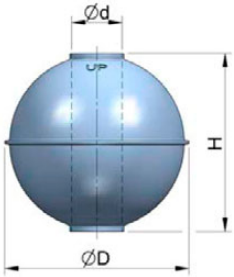
Mount the seal (not supplied) on the flange or on the union thread.

Carefully insert the level transmitter with the float in the lower part through the nozzle of the tank, until the flange or the connecting thread is coupled to the tank. Fix the flange by means of the corresponding bolts.

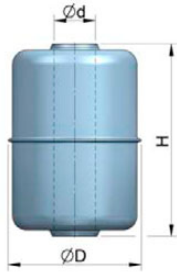
The tightening of the flanges of the level transmitter must be made on the union bolts crosswise and progressive without causing stress.

In the case of a thread, turn until it reaches the stop. Do not perform a torque greater than 60 Nm.

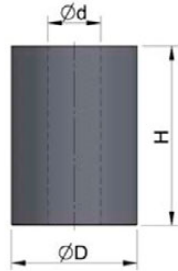
7 FLOAT TYPES



Type 1



Type 2



Type 3

	Floats models LE					
	Type 1		Type 3			
Material	EN 1.4404	EN 1.4404	PVC	PP	PVDF	PVDF
PN	25	25	10	10	10	10
$d_{mín}$	0,6	0,65	0,8	0,7	0,8	1,0
T_{max}	150	150	45	90	135	135
ØD	115	95	63	63	63	63
H	112	92	90	90	150	90
Ød	26	26	26,5	26,5	27	27

	Floats models LEM				
	Type 1	Type 2	Type 3		
Material	EN 1.4404	EN 1.4404	PVC	PP	PVDF
PN	25	25	10	10	10
$d_{mín}$	0,75	0,8	0,8	0,7	1,0
T_{max}	150	150	45	90	135
ØD	52	44	45	45	45
H	52	64	70	70	70
Ød	13,5	13,5	17	21	17

8 TRANSMITTERS

8.1 Models

Depending on the need of each application, the following transmitters can be supplied:

- TR3420. 4-20 mA transmitter
- TR2420H. 4-20 mA transmitter + HART. Ex zone 2
- TR2420FP. 4-20 mA transmitter + Profibus PA / Foundation Fieldbus. Ex zone 2
- TR2420Ex. 4-20 mA transmitter. Ex ia IIC T6
- TR2420HEx. 4-20 mA transmitter + HART. Ex ia IIC T6
- TR2420FPEx. 4-20 mA transmitter + Profibus PA / Foundation Fieldbus. Ex ia IIC T6

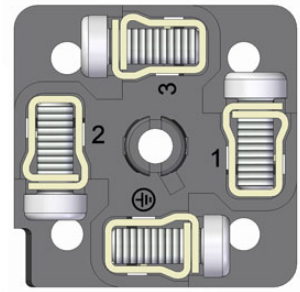
Information related to these transmitters can be found in the transmitter specific instructions manual.

8.2 Remote transmitter (only for non-ATEX version)

When the transmitter is remote, the resistive system includes a connector DIN 43650A.

8.2.1 Electrical connection

For the electrical installation it is recommended to use multiple conductor cables, and not single cables, in order to guarantee the cable gland will stay watertight. The connector has a PG9 cable gland for cables with outer diameters between 4.5 mm and 7 mm. The numbering of the terminals is the following:

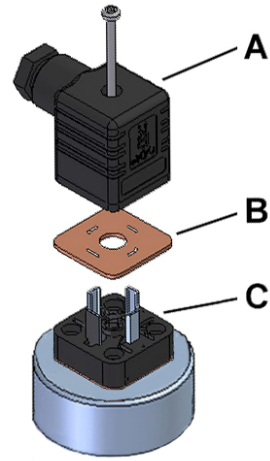


In the female connector:

Terminal 1:	Resistive sensor
Terminal 2:	Resistive sensor
Terminal 3:	Not connected
Earth terminal:	Not connected

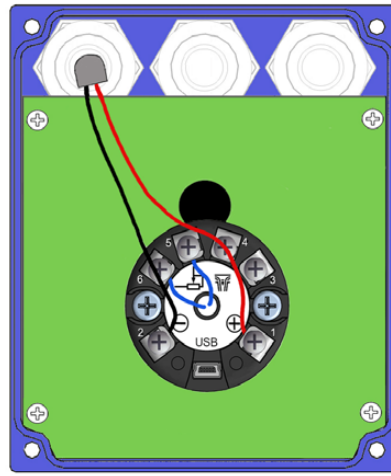
8.2.2 Mounting

Once the electrical connection is made and the cable gland is tightened, connect the female connector (A) to the male base (C) in the correct position, placing the gasket (B) between them.

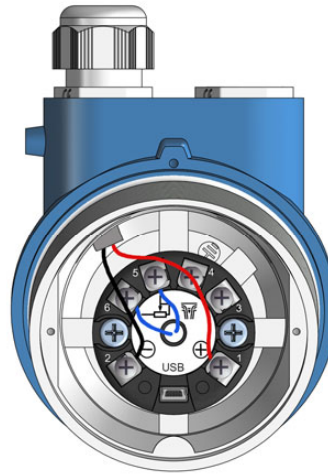


8.3 Compact transmitter

When the transmitter is compact, it can be supplied with plastic or aluminium housing.



Transmitter in plastic housing (not available in ATEX Exd version)



Transmitter in aluminium housing

Connection of these transmitters can be found in the transmitter specific instructions.

9 MAINTENANCE

No special maintenance is required.

10 TECHNICAL CHARACTERISTICS

Resolution

10 mm

Hysteresis

±5 mm

Liquid density

Models LEM: depending on material, ≥ 0,7 kg/l

Models LE: depending on material, ≥ 0,6 kg/l

Liquid viscosity

Maximum 1500 cSt

Measuring range

Models LEM: 150 mm ... 2000 m

Models LE:

- EN 1.4404 (AISI 316L): 150 ... 6000 mm
- PVC / PP / PTFE / PVDF: 150 ... 2500 mm
- PVC / PP / PTFE / PVDF, with AISI 316L inside: 150 ... 6000 mm

Others on request

Temperature

Process temperature:

- EN 1.4404 (AISI 316L): -20ºC ... +150ºC
- PTFE, PVDF: -20ºC ... +150ºC
- PVC: 0ºC ... +50ºC
- PP: -10ºC ... +90ºC

Ambient temperature:

- EN 1.4404 (AISI 316L): -20ºC ... +60ºC
- PTFE, PVDF: -20ºC ... +60ºC
- PVC: 0ºC ... +50ºC
- PP: -10ºC ... +60ºC

Working pressure

- EN 1.4404 (AISI 316L) y PVC / PP / PTFE con interior AISI 316L: PN16
- PVC / PP / PTFE: PN10

Others on request

Connections

Models LEM: EN 1092-1 DN50 flange, G1½ or 1½" NPT thread

Models LE: EN 1092-1 DN100 flange

Others on request

Ingress protection:

Plastic housing: IP67

Connector DIN43650A: IP65

Aluminium housing: IP68 10 m H_2O

11 SAFETY INSTRUCTIONS

The series LE of level transmitters 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 directive (WEEE).

2011/65/EU Directive relating restriction of the use of certain hazardous substances in electrical and electronic equipment (ROHS).

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

11.1 Pressure equipment Directive

Series LE of level transmitters, 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.

11.2 Certificate of conformity TR CU (EAC marking)

Tecfluid S.A. have subjected the series LE of level transmitters 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.

12 ADDITIONAL INSTRUCTIONS FOR THE ATEX VERSION

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

NOTE: ATEX Exd equipment are always compact and the head or enclosure for the transmitter is always made in aluminium, never in plastic.

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 19ATEX1045 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.

Por ser de categoría 2G y 2D, pueden utilizarse en un medio ambiente en el que es probable que se produzcan atmósferas explosivas debidas a mezclas de aire con gases, vapores, nieblas o polvo.

12.1 Surface temperature

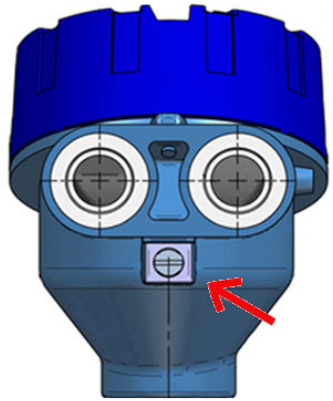
Equipment is certified as Exd IIC T6.

Maximum allowed surface temperature depends on the product temperature.

Temperature class	Maximum product temperature	Maximum Surface temperature
T6	80ºC	80ºC
T5	95ºC	95ºC
T4	130ºC	130ºC
T3	150ºC	195ºC

12.2 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.



12.3 Maintenance

NOTE: 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.

12.4 Technical characteristics of the ATEX Exd version

Temperature

Ambient temperature: -20ºC ... +40ºC

Electrical connection

Inside the flameproof enclosure.

Recommended cable

The standard thread supplied for the cable gland connection is M20 or ¾" 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 cable glands is between 6 and 21 mm.

Associated electronics

TR3420: 2-wire analog transmitter.

Other transmitters: Any 2-wire transmitter whose characteristics are the following:

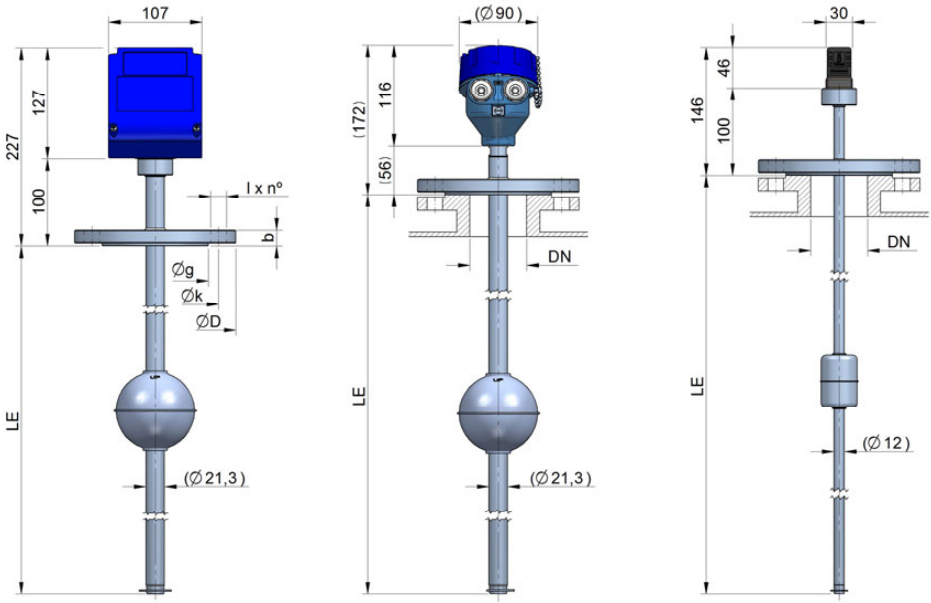
Power supply: Maximum 36 V
Consumption: Maximum 0,78 W
Maximum current: 21 mA

The rest of characteristics are the same as in the point 10.

12.5 Marking

An example of equipment marking is attached.

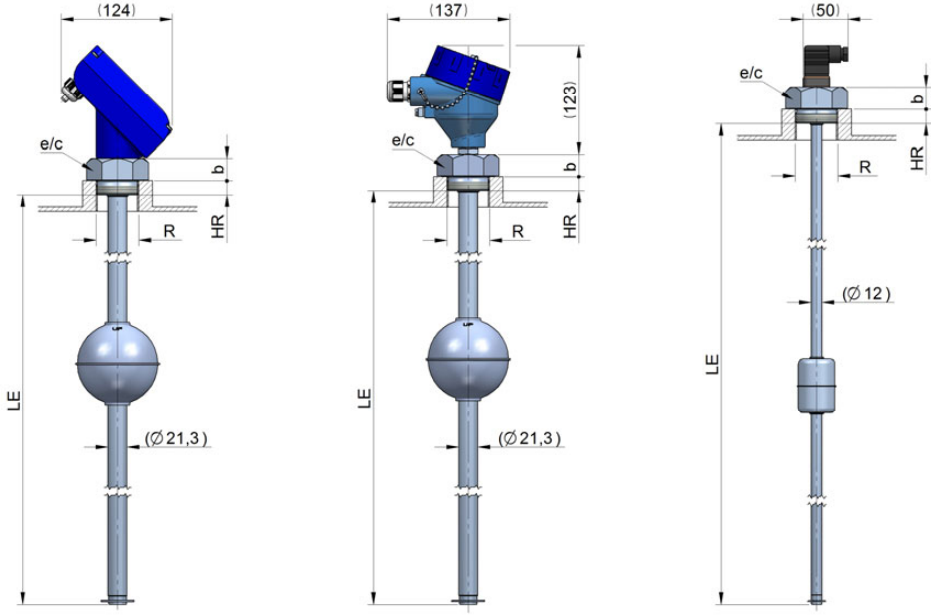
13 DIMENSIONS



Models	DN	PN	D	g	k	lxn°	b	LE
LEM	50	40	165	102	125	18x4	20	According to order
LE	100	16	220	158	180	18x8	20	

Note: The three models in the figure can be supplied with a Ø21.3 tube (LE) or with a Ø12 tube (LEM)

All dimensions in mm



Models	R	e/c	b	HR	LE
LE / LEM	G1½	60	25	16	According to order

Note: The three models in the figure can be supplied with a Ø21.3 tube (LE) or with a Ø12 tube (LEM)

All dimensions in mm

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

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Quality Management System ISO 9001 certified by

Pressure Equipment Directive certified by Lloyd's Register

ATEX European Directive certified by

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