Tecfluid s.a.

Instrumentation for fluids

Level displacer

Series LP

Instructions manual

HART COMMUNICATION PROTOCOL

PREFACE

Thank you for choosing the level displacer series LP from Tecfluid S.A.

This instruction manual allows the installation and operation of the level meter series LP. 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. is 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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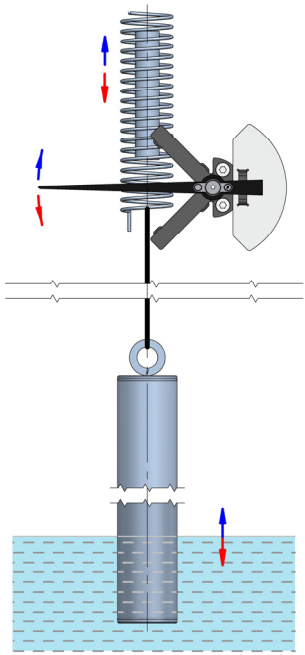
1 WORKING PRINCIPLE

Based on Archimedes principle of a body immersed in a liquid.

A rod with a density similar to the operation liquid is suspended by a spring to maintain an equilibrium with its weight.

Variations in the liquid level causes a change of the weight of the rod (partially immersed), that can be measured by means of the extension or compression of the spring.

Variation on the spring length is transmitted to the indicating needle by means of magnetic coupling.



2 RECEPTION

The LP level displacers are supplied tested in our facilities, ready for installation and service.

The level meters are supplied conveniently packaged for transportation and storage.

2.1 Unpacking

Unpack the instrument carefully, removing any remains of the packing from the inside of the sensor.

It is recommended to check that the measuring system is mechanically correct by means of the following verification:

The indicating needle is initially at 100% of the scale at the top. Pull slowly on the hook under the coupling piece to the tank.

A progressive and even resistance will be noted until the end stop is reached. When pulling on the hook the indicating needle will move towards the beginning of the scale.

When the end stop is reached the indicating needle should coincide with the zero of the scale.

Check that the float length coincides with the level difference to be measured.

2.2 Storage temperatures

-20ºC ..... +60ºC

3 HANDLING

It should always be done with care and without knocks.

4 INSTALLATION

4.1 Float

When the rod is longer than 3 m (or in agreement with the customer) the float is divided into 2 or more parts.

Before starting mounting, study the installation conditions to decide if it is better to assemble the float before, during or after introducing it into the tank. This will depend on the length of the float, availability of manholes etc.

The different parts of the float are assembled by means of a stud on the top of the lower piece and a female thread on the upper piece. A split washer (Grower) should be used on all the joints.

The top of the float has a length of chain (except in the case of the minimum length, 115 mm, in which only the hook is supplied). The last link of the chain should be hung on the s-shaped hook which protrudes from the coupling piece to the tank.

Once the float is mounted, its weight will make the indicating needle descend to the zero of the scale. If we lift the float gently, the indicating needle will move towards the 100% of the graduated scale.

4.2 Installation in the tank

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

Introduce with care the float through the mounting hole until the flange or coupling thread couples with the tank.

In the case of a flange, fix it with the appropriate nuts & bolts.

In the case of a screw fitting, turn until tight. **Do not apply torques greater than 350 Nm**.

If it has been decided to fit the float last, it must be introduced via a manhole and mounted from inside of the tank.

5 MAINTENANCE

5.1 Spring assembly

The following defects may appear:

- Magnetic coupling deterioration,
- Variation of the adjustment of the spring.

If any of these problems occur, it is preferable to repair it in TECFLUID S.A. workshops, as a new calibration will be normally necessary.

5.2 Indicator housing

In order to open the housing, remove the four “Allen” screws M5 (1) and the plastic washers (2), at the back of the indicator housing.

If operating anomalies are detected on meter reception, the following points should be checked:

a) The indicator needle (4) is rubbing on the scale plate (3).

This normally happens if the meter is hit or dropped.

Simply straighten it out by bending it slightly until it is separated by between 2 to 3 mm from the scale plate surface (3).

b) The indicator needle (4) doesn’t read 0 on the scale.

Place the instrument on a non-magnetic surface in its normal working position. If when the float is moved the needle moves but does not return to 0, check that the bushing (6) is well fixed to the shaft (5). If this is not so, proceed to fix the bushing (6) to the conical end of the shaft using a careful and gentle blow.

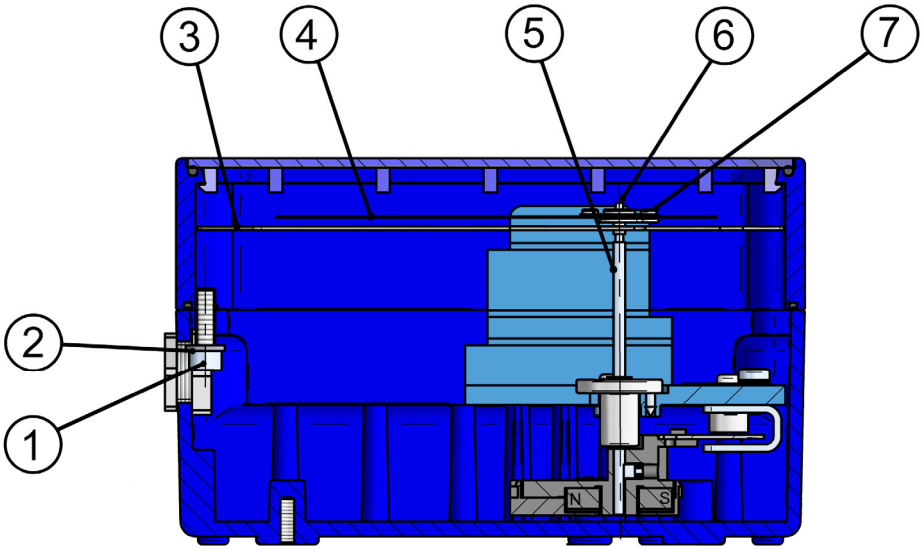
Then match the indicating needle with the zero of the scale using the indicating needle’s adjusting front screw (7), turning left or right as required.

Attention, hold the shaft (5) so that it can not be bent or damaged.

Check that there is no contact between the mobile system of the needle and connecting cables for limit switches or transmitters.

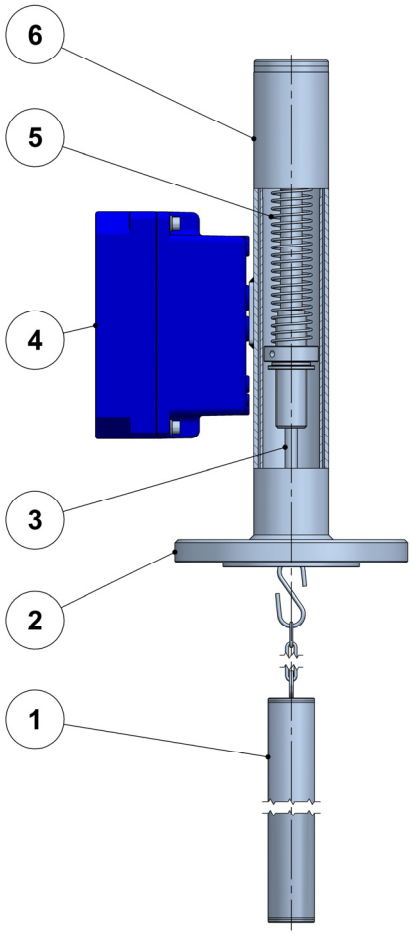
This way the level meter will be properly adjusted to give correct readings.

Close the housing with the four washers and screws.



6 LIST OF COMPONENTS

Nº	Description	Materials		
		LP / SS	LP / Hastelloy	LP / Titanium
1	Rod	EN 1.4404 (AISI 316L) *	Hastelloy C *	Titanium *
2	Connection	EN 1.4404 (AISI 316L)	Hastelloy C	Titanium
3	Rod guide			
4	Enclosure	Coated aluminium **		
5	Spring	EN 1.4401 (AISI 316)	Hastelloy C	Titanium
6	Body	EN 1.4404 (AISI 316L)	Hastelloy C	Titanium



* PVC, PP, PVDF on request

** EN 1.4404 (AISI 316L) on request

7 TECHNICAL CHARACTERISTICS

Accuracy

± 5 mm of the measured value

Scale length

~100 mm

Scale

% or height

Liquid density

0,6 ... 2 kg/l

Measuring range

300 mm to 6 m

Fluid temperature

-60ºC ... 150ºC

on request -120ºC ... 400ºC with thermal separator

Ambient temperature:

-10ºC ... 80ºC

Working pressure

PN40 (others on request)

Installation

Vertically, on top of the tank or side mounted by means of external chamber

Connections

EN 1092-1 DN40 flange

Thread connections G1½ or 1½" NPT

sanitary connections according to ISO 2852, SMS 1145, DIN 11851, TRI-CLAMP®

(Other connections on request)

Optional limit switches in the indicator housing:

LP-AMM

1 o 2 SPDT micro-switches with potential free contacts

Maximum current: 3A.

Maximum voltage: 250 VAC.

LP-AMD

1 o 2 slot inductive sensors, according to EN60947–5-6 standard (NAMUR)

Power supply: 8.2 VDC

Optional transmitters:

TH7 … TH7H

2-wire transmitter with 4-20 mA analog output

Power supply: 12 to 36 VDC

HART protocol with model TH7H

TH5 Ex … TH5H Ex

2-wire transmitter with 4-20 mA analog output

Certified Ex ia IIC T4 or T6 (ATEX)

Power supply: 12 to 30 VDC

HART Protocol with model TH5H Ex

Conforms to Pressure Equipment Directive 97/23/CE

This equipment is considered as being a pressure accessory and **NOT** a safety accessory as defined in the 97/23/CE directive, Article 1, paragraph 2.1.3.

Conforms with Directive 2006/95/EC (Low Voltage)

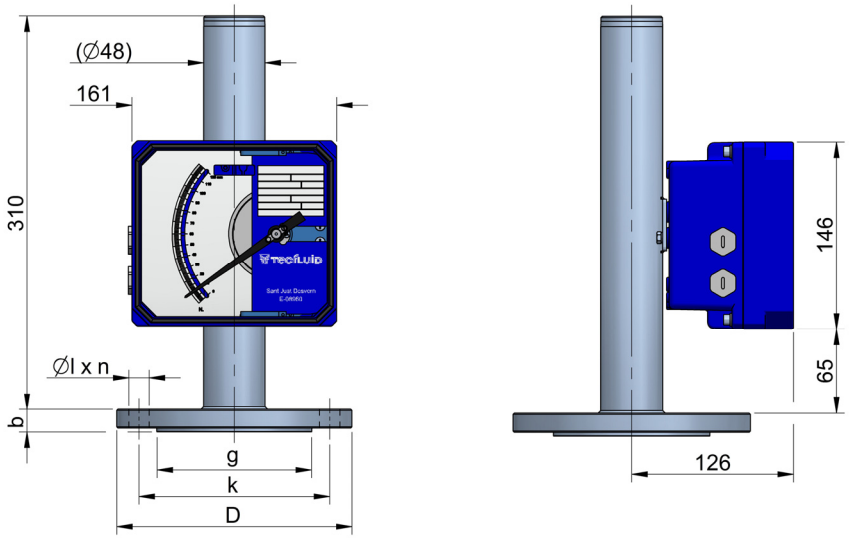
Conforms with Directive 2004/108/EC (Electromagnetic compatibility)

Conforms with Directive 2002/96/EC (Waste electrical and electronic equipment)

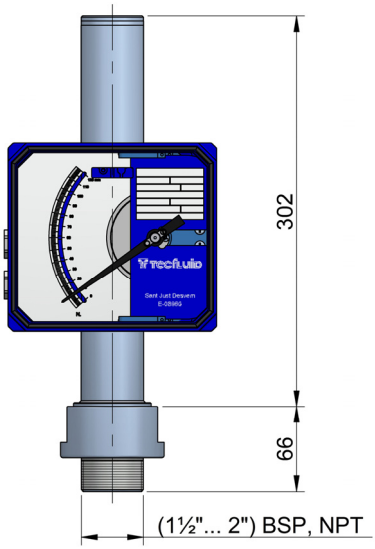
All the limit switches and transmitters can be optionally supplied for use in potentially explosive atmospheres.

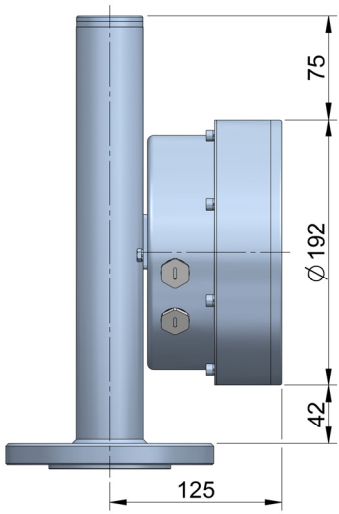
ATEX certification **II 1 GD** **Ex ia IIC T4 or T6**

8 DIMENSIONS



DN	PN	D	k	g	∅l x n	b
40	40	150	110	88	18 x 4	18


302
66
(1½"... 2") BSP, NPT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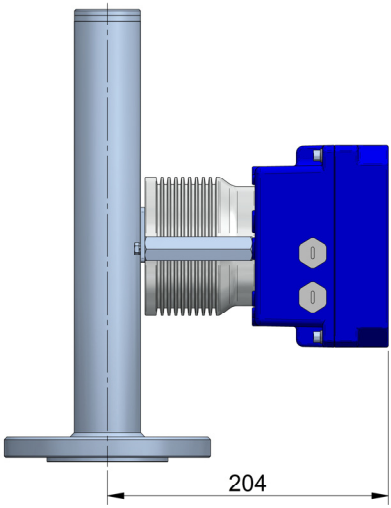
42
125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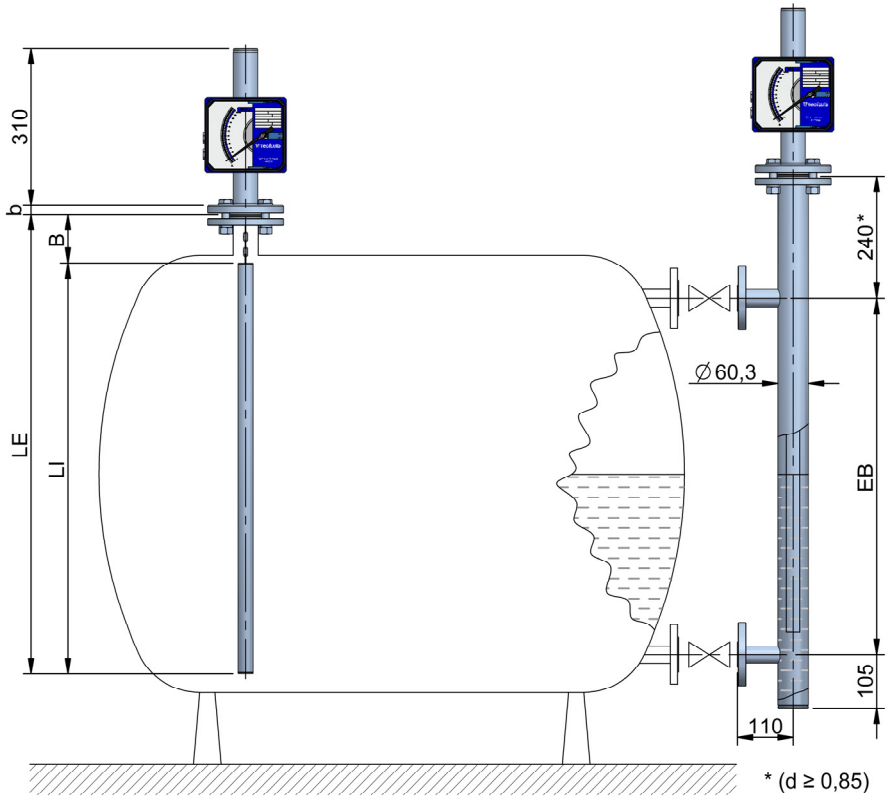

LP80 **LP80+80ME**

DN	PN	b	B	EB	LE	LI
40	40	18	to be specified *			

* Dimensions B, EB, LE & LI according to upper drawing
Other flange sizes and standards on request

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 Applus

Pressure Equipment Directive 97/23/CE certified by Lloyd's Register

ATEX European Directive 94/9/CE certified by LCIE