ECON MAGNETIC LEVEL GAUGES

Fig. 7190 & 7191

Installation & Operation Manual for Magnetic Level Gauges:
Fig. 7190 & 7191

Content **Page**

These instructions are to be fully examined and understood, prior to installation and/or using the magnetic level gauge. Noncompliance of the instructions can cause damage to the property and possible result in serious injury.

1. ERIKS operating companies

ECON magnetic level gauges are being delivered by several ERIKS operating companies on a worldwide basis. In this manual these will be referred to as 'ERIKS', the individual terms of delivery of the ERIKS operating company having executed the order are applicable.

2. Product description

The ECON magnetic level gauges are designed according the information on our website, www.eriks.com and should be used in accordance with the applicable pressure-temperature rating as stated on this website. Level gauges are provided with a nameplate. The marking makes the identification of the level gauge easier and contains:

- Figure number
- Serial number
- Year of production
- Pressure/temperature range
- Pressure rating

3. Requirements for maintenance staff

The staff assigned to assembly, operating and maintenance tasks should be qualified to carry out such jobs and, in any circumstance, ensure personal safety.

4. Transport and storage

During transport and storage, the level gauges should be protected against external forces. The level gauges should be stored in an unpolluted space and should also be protected against all atmospheric circumstances. There should be taken care of the temperature and humidity in the room, in order to prevent condensate formation.

5. Function

ECON level gauges are designed to indicate the liquid level of a tank. There are many kinds of different level gauges:

Type:	2 side connections (Fig.7190), or one side connection (Fig.7191)
Connections:	DN15, DN20, DN25, ANSI 150LBS, ANSI 300LBS threaded or BW.
Pressure rating:	DIN PN40 or ASME 150/300LBS
Indicator rail:	Polycarbonate, aluminum or stainless steel with red/white segments.
Indicators:	High and low in SS (not available with SS indicator rail)
Draining and venting:	1/4" or ½" BSP plug or ball valve
Max. measurement range:	6000 mm (= centre to centre) from one piece, segmented if longer range.

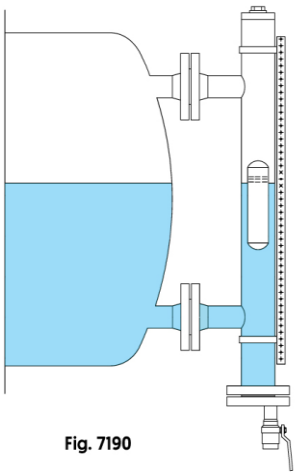


Fig. 7190

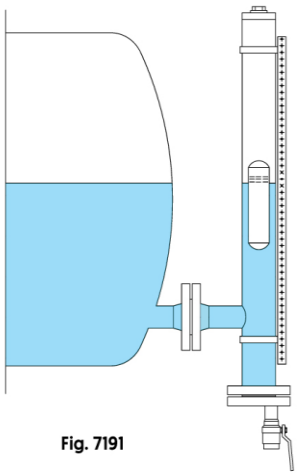


Fig. 7191

6. Application

The ECON level gauges are exceptionally suitable for indicating liquid level on many types of vessels and systems. The level gauges are designed for standard operating conditions. For the use of extreme conditions e.g. aggressive or abrasive media, it is recommended to mention this at the ordering stage, to verify whether the level indicator is suitable. The installation designer is responsible for the level indicator selection, suitable for the working conditions. The level indicators are unsuitable, without written permission of an ERIKS company, to apply for hazardous media as referred into Regulation (EC) No 1272/2008

7. Installation

During the assembly of the level gauges, the following rules should be observed:

- make sure, before assembly, that the level gauges were not damaged during transport or storage, are executed according request and are to your order specification and are suitable for the job.
- remove pollution, as burrs and welding parts from the new tank connection.
- fasten the magnetic level gauge. Turn if necessary, the indicator rail into the position you want.
- mount the level switches on the desired level, do the same with the level transmitter, if these were ordered.
- the level gauge can be insulated to prevent the danger of ignition and burn. For the function of the level gauge insulation is not a problem but do not insulate switches and/or the reed chain transmitter.
- make sure the device is grounded. A provision for this is usually made on the side or rear of the bottom flange.
- mount the float with top side up into the measuring chamber through the bottom stop. Change if necessary the gasket. If the float has to be installed by the top flange, the float has a lifting hook. Slowly bring down the float by the lifting hook to prevent damaging the float.
- bring the float into the measuring chamber to its max. position and back to its starting position for the right moving of the flaps c.q. switches.
- after installation, a tightness check must be made on the joint seals, bolts and nuts.
- the bolt torque should also be checked, after the first few hours of installation.

Bolt tightening torques					
A2 – A4	**Nm**	**B7**	**Nm**	**B8(M) CL2**	**Nm**
M12-70	48	½”	118	½”	90
M16-70	121	5/8”	231	5/8”	180
M20-70	235	¾”	406	¾”	315
M24-70	405	1”	970	1”	610

 If the magnetic level gauge must be pressurized as a part of the installation, please do not do this with the float. **The float has not any safety factor.**

8. Operating instructions

Start up

- purge the gauge if an explosive mixture can be expected.
- open top flange (gas side), vent if necessary.
- check if the connections of the level gauge are closed (flange connections and plugs)
- open bottom process valve (liquid side) slowly
- level gauge is in operation.
- do not use the drain as bleed valve.

Shut down

- purge the gauge if an explosive mixture can be expected.
- close bottom valve (liquid side).
- close top valve (gas side).
- open vent slowly (watch out for the possibility of an explosive air-gas mixture.
- check before opening the level gauge if the float is on the lowest position.
- open drain (pay attention to the liquid jet, hot or explosive liquids).

9. Maintenance and cleaning

During maintenance, the following rules must be observed:

- Maintenance is only necessary if the liquid is sticky, clean the measuring chamber periodically. Special types are available. Lifetime of flaps is limited if temperature > 160ºC (>105 ºC for Polycarbonate).
- always keep personal safety precautions in mind and always use appropriate protection e.g. clothing, masks, gloves etc.
- be alert that the temperature still can be very high or low and can cause burns.
- make sure that the pressure is reduced to atmospheric pressure.
- only clean the level gauge, indicator rail, tag plate and/or transmitter/switches etc. with a wet cloth to avoid static electricity and/or shocks.

10. Service and repair

All service and repair jobs should be carried out by authorized staff, using suitable tools and user shall use genuine valve parts.

- welding repair and drilling of the valve is forbidden.
- after installation, the gauges should be checked and maintained periodically at least every 3 months, depending on the medium.

11. Installation switches

Important

The power must be switched **OFF** before wiring the unit.
The density of the liquid can be changed by fluctuating pressure/temperature, so the float can indicate another level when installing the level gauge.
If necessary, make sure that a galvanic barrier is used for intrinsically safe units.
The process temperature of the switches may depend on the insulation options of the level gauge.

Operating instructions for switches.

Mount the switch on the correct position.
Move the float from bottom to top and back.

Check the function of the switch.
If necessary, change the cables of the switch if another function is required.
Connect the switch to the supply.

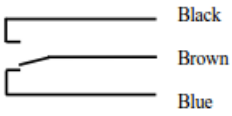
Surge Protection of reed switches

Capacitive loads (in extremely long cable runs) and lamp loads are prone to high inrush currents which can greatly reduce the life of the switch contacts on closure. The addition of a surge suppression circuit in series with the switch and as close as possible to the switch will alleviate this problem.
For normal signal circuits the capacitance in the cable can be ignored as several hundreds of meters of the cable will need to be connected to the switch before damage may be caused.

The integrated cables must be protected from pulling, twisting and mechanical damage.

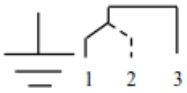
Reedswitches

Type HLS-15
24VAC/DC 2,5A 60W 60VA
230VAC/DE 250mA 60W 60VA



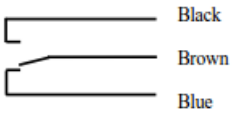
T process -25°C to +90°C

Type LMS-Ha2
24VAC/DC 2,5A 60W 60VA
230VAC/DE 250mA 60W 60VA



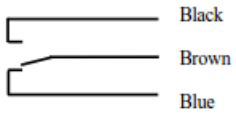
T process -40°C to +180°C

Type HLS-25i
Ui=30V; Ii=250mA; Pi=1,3W



II 1 GD Exia IIC T6 Ga
II 1 GD Exia IIIC T85°C IP66/67 Da
Ta -20°C to +80°C
T process -40°C to +100°C

Type HLS-15
24VDC 2,5A 60W
110 VAC 540mA 60W
230VAC 250mA 60W

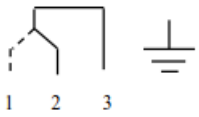


II 2 GD Exia IIC T6 Gb
II 2 GD Exia IIIC T85°C Db
Ta -20°C to +70°C
T process -40°C to +100°C

Micro switches

Type HLS-Ha1 & HLS Ha1E
For type HLS-Ha1
10-250VAC/DC 5A 100W 100VA

For type HLS Ha1E
Ui=30V; Ii=500mA; Pi=1,3W
Exi „Simple apparatus“



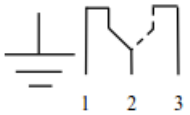
T process -50°C to +380°C

Type HLS-Ha3 & HLS Ha3E (NAMUR)
For type HLS-Ha3
8.2 VDC

For type HLS Ha3E
8.2 VDC Exi „Simple apparatus“
2 + 3 Normally closed
1 + 3 Normally open

T process -50°C to +380°C

Type HLS-HaD
10-230 VAC/DC 5A 100W 100VA



II 2 GD Ex db IIC T5.. T1 Gb
II 2 GD Ex tb IIIC T100°C.. Db
Ta -40°C to +60°C
T process -50°C to +350°C

Process temp.		Temp. class (EPL Gb)	Max. surface temp. (EPL Db)
-50 to -24°C	1)	T5	T100°C
-25 to +160°C		T3	T160°C
161 to +300°C	2)	T2	T300°C
301 to +350°C	3)	T1	T350°C

Protections between process pipe and switch:
1) 1 layer of Armaflex
2) 1 layer of Insulair
3) 2 layers of Insulair (2x5mm)

Reedchain transmitter

Type P-05, P-10, P-15, P-25
(GP, Exi or Exd)

If necessary mount in transmitter on the level gauge. The 4 mA setting is marked on the chain and should correspond with the lowest point of the bottom process connection.

Supply 12 – 30VDC

Only the terminals + and - should be used for wiring up the device. The other terminals (3,1,5 and 6) are for factory use only.

Ta -40°C to +60°C
T process -50°C to +400°C

For Exi:
II 1 G Ex ia IIC T4…T6 Ga
II 1 D Ex ia IIIC Da

For Exd:
II 2 G Ex db IIC T5…T1 Gb
II 2 D Ex tb IIIC T100°C…. T400°C Db

Process temp.		Temp. class (EPL Gb)	Max. surface temp. (EPL Db)
-50.. -25°C	1)	T5	T100°C
-24.. +135°C		T4	T135°C
+136.. +160°C		T3	T160°C
+161.. +200°C	2)	T3	T200°C
+201.. +300°C	2)	T2	T300°C
+301.. +400°C	3)	T1	T400°C

Protections between process pipe and reedchain:
1) layer of Armaflex or PER
2) layer of Insulair
3) 2 layers of Insulair (2x5mm)

12. Troubleshooting

It is essential that the safety regulations are observed when identifying the fault.
If anything is missing or not working anymore or you need extra options or spare parts, please let us know. We do need our production (job reference) number so we can check what you need. The job ref. / order nr. Is always on the tag plate. If you need more info or help please let us know. We are happy to assist you.

Problem	Possible cause	Corrective measures
No flow level	Empty tank	Fill
	Obstruction in connection or column	Clear obstruction
	Incorrect air ventilation	Check air ventilation
Filling level indicator failed	Incorrect use	See operating instructions, Chapter 8

13. Removal

Dismantled and rejected valves cannot be disposed with household waste. The valves are made of materials which can be re-used and should be delivered to designated recycling centers.

If you have questions about this product,

Please contact the nearest ECON distributor.

You can find them on www.eriks.com

ERIKS Flow Control

Cypresbaan 63,

2908 LT Capelle aan den IJssel,

The Netherlands

Phone: +31 (0)88 855 8001