

# **TEHRAN DELIK**

## **Technical Information Booklet**

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# TEHRAN DELIK MAGNETIC LEVEL GAUGES

## 1.1 Magnetic Level Gauges

### 1.1.1 Description

### 1.1.2 INTRODUCTION

**Tehran delik** magnetic level gauges (MLG) are indirect reading liquid level indicators. Gauges are manufactured to meet exact specifications of the process LLI73 such as operating pressure, temperature, specific gravity, etc.

The process connections may be:

- Side mounted, flanged or socket welded, threaded
- Top and bottom flanged mounted
- Tank top mounted
- Combination

A variety of mounting styles is available to suit any vessel or piping requirements. Refer to the drawing depicting magnetic level gauge mounting configurations.

### **1.1.3 COMPONENTS**

The gauge chamber contains a magnetic floater and an external level indicator attached to the outside of the gauge chamber.

External indicators consist of either yellow and red-flag model.

The magnetic floater maintains a magnetic field with the external level indicator. As the level of the process medium fluctuates within the tank and gauge chamber, the floater reacts accordingly, and the indicator records the level of the fluid within the chamber.

### **1.1.4 CHAMBER MATERIAL**

Standard chamber materials are 316L/304L stainless steel other Chamber materials.

that are available include PVDF,PP,PVC,Hastelloy,Alloy 20,and Monel

### **1.1.5 INTERNAL FLOATER**

A magnetized floater, contained inside the gauge chamber, is designed for the exact process conditions.

For this reason, floaters are not interchangeable unless the process conditions and gauge chambers are identical.

The floater adjoining vessel moves freely inside the chamber reacting to fluctuating level changes within the adjoining vessel.

### **1.1.6 FLOATER SUBMERGENCE**

Under normal operating conditions, the floater is submerged about 80% or more in the process fluid. It is important to note, however, that the position of the floater in the LLI73 will vary with different process conditions. Floater magnets are located in the upper portion of the floater.

### **1.1.7 GAUGE RATINGS**

Magnetic level gauges can be designed for operating conditions from full vacuum service, and a minimum specific gravity of 0.35. All magnetic gauges with alloy chambers will have full ANSI and DIN ratings based on flange classifications. Gauges with CPVC, (PVDF) chamber flanges are rated to 150 psig maximum.

### **1.1.8 HYDROSTATIC TESTING**

Gauge chambers are hydrostatically tested to 150% of indicated gauge rating without floats installed. Floats are tested individually.

Gauges can be field hydrostatically tested after installation at the operator's discretion.

#### **CAUTION: DO NOT CONDUCT**

**HYDROSTATIC TESTING OF THE MAGNETIC GAUGE CHAMBER**

**ATTACHED TO A PROCESS VESSEL WITH THE FLOATER**

**INSTALLED. IF A GAUGE IS FIELD TESTED WITH THE FLOATER**

**INSTALLED, THE FLOATER MAY COLLAPSE AND THE GAUGE**

**CHAMBER MAY BE DAMAGED. THIS PROCEDURE WILL VOID THE**

**WARRANTY.**

## **1.2 Level Indication**

### **1.2.1 INTRODUCTION**

There are two types of external level indication options offered by Tehran delik for magnetic level gauges:

1.2.2 **Follower** indicator that is recommended for stagnant storage with little or no level fluctuation

1.2.3 **Flap** indicator that is recommended for turbulent or high vibration level condition.

## **1.3 Installation**

### **1.3.1 INSPECTION**

All magnetic level indicators are securely packed in crates to provide maximum protection of the equipment during shipment. It is important to unpack and inspect each gauge upon receipt to insure the indicator and chamber were not damaged in shipment.

If you should find damaged parts, contact Tehran delik immediately. All Tehran delik magnetic gauges are fully insured against damage or loss unless specified by the customer otherwise. Claims must be filed within 15 days from the date of receipt of shipment.

### **1.3.2 CHAMBER ORIENTATION**

The magnetic floater is packaged separately for shipment, which should be removed before installation. The floater chamber should always be leveled vertically. If it is not installed correctly, the indicator may produce inaccurate readings.

### **1.3.3 CONNECTION VALVES**

Valves should be installed between the process vessel and level gauge to allow for isolation, draining, and cleaning.

### **1.3.4 FLOATER ORIENTATION**

The internal magnetic float has a preferred orientation vertically. Install the float properly

by taking note of the correct orientation through the chamber flange connection.

If the float is installed into the chamber

inverted, it will not couple with the external indicator correctly, resulting in improper level indication.

**CAUTION:** internal floater should be installed after any HYDROSTATIC

Field tests of the chamber and connecting vessel.

### **1.3.5 FLANGES AND CONNECTIONS**

Process connections and vent/drain flanges are designed to meet each customer's specifications.

Both male and female threaded connections and socket weld connections are available.

### **1.3.6 SWITCHES**

All level switches may be wired to trip on rising or falling level. After the switch is connected to the desired alarm function, it is

necessary to set the switch.

Limit switch with the help of special clamps is connected to the chamber

By loosening the clamps you can change limit switches position

to place anywhere desired.

## **1.4 Operation**

### **1.4.1 INTRODUCTION**

It is important that all instructions pertaining to entering magnetic level gauges into service be read thoroughly first before commencing with service operations. Failure to do so may void the warranty.

### **1.4.2 PROCEDURES**

1. Check that the operating conditions, (temperature, pressure and specific gravity) are within the maximum rating of the gauge. Each gauge has a permanent nameplate indicating process specifications, serial number, tag number, etc.

2. The gauge chamber should be leveled vertically, empty, blocked in and isolated. Check to see that all drain and vent plugs are in place. Close all vent and drain valves if plugs are not used.

3. Install the floater by removing the bottom drain flange located at the base of the gauge. The float is marked top to insure proper orientation. A spring is attached to the inside of the drain flange to cushion the float when the vessel is empty.



4. When the gauge is mounted and ready for placement into service, PARTIALLY OPEN THE TOP PROCESS CONNECTION VALVE FIRST and very slowly to allow initial pressure and temperature equalization between the vessel and the level gauge. This allows the process conditions of the vessel to slowly equalize with the gage and reach operating conditions.

CAUTION. DO NOT OPEN THE BOTTOM PROCESS CONNECTION VALVE FIRST. IF THE BOTTOM VALVE IS OPENED FIRST WITH THE TOP VALVE CLOSED AND THE VESSEL IS UNDER PRESSURE, THE INTERNAL FLOAT WILL RISE INSTANTLY AND LODGE ITSELF IN THE TOP OF THE CHAMBER ,CAUSING SEVERE DAMAGE TO THE FLOAT AND CHAMBER.

5. After the floater chamber has reached process conditions, continue to open the TOP process connection valve slowly, allowing any liquid or condensate to enter the gauge slowly. This procedure is critically important for high pressure and temperature applications. The floater and indicator may react or rise to condensate accumulation migrating through the top valve with the bottom valve closed.

6. When the gauge chamber has attained normal operating conditions, open the BOTTOM process valve connection slowly. This will allow proper fluid entry into the gauge chamber under normal operating conditions. The level indicator should rise vertically, thus rendering a fluid level. Flag indication will result in red to yellow rotation of the flags as the fluid rises.

## **1.5 Removal from Service**

### **1.5.1 INTRODUCTION**

To remove the gauge from service, the next steps should be followed to prevent danger to personnel and damage to the gauge when the vessel is pressurized.

### **1.5.2 PROCEDURES**

1. Close the bottom process connection valve first
2. Completely close the top process connection valve to isolate the gauge from the process conditions.
3. Open the vent valve slowly to relieve gauge pressure and allow ambient air influx.
4. Open the drain valve slowly to remove remaining gauge liquid.

## **1.6 Maintenance**

### **1.6.1 PROCEDURES**

1. Close the gauge chamber with the process connection valves or wait until the vessel is empty and out of service.
2. Close the bottom valve first and the top valve second.
3. Open the vent valve slowly or remove vent plug carefully to depressurize the gauge especially if the gauge has been under pressure.
4. Open the drain valve slowly or remove the drain plug carefully to allow any remaining fluid to drain from the chamber.
5. When all of the gauge fluid has been drained, carefully remove the drain flange and float from the gauge chamber .

Be sure to examine the float for excessive wear and clean as required.

6. Clean the inside wall of the chamber with a "bottle brush" or similar scrubbing tool. Some processes may require the use of a suitable solvent for cleaning.

7. After cleaning the chamber, replace the float and drain flange. A new flange gasket should be installed. Use gaskets compatible with the process media if replaced. Note the orientation of the float before installation.

## **1.7 TROUBLE SHOOTING**

### **1.7.1 INTRODUCTION**

magnetic level gauges are simple to install and operate.

The following troubleshooting tips may be of assistance during installation and startup. Complete reading of this is required.

- If detachment is a frequent problem, it could be caused by several factors, most of them resulting from improper installation of the gauge, particularly the float.
- Check to ensure that the scale and channel assembly is fastened tight against the gauge chamber so that magnetic coupling is maintained from top to bottom of the indicator.
- Check to ensure the internal magnetic floater within the chamber is right side up.

If the process connection dimension has been wrong ordered

, do not attempt installation

because it will warp the chamber. A warped chamber will inhibit float movement, possibly causing float and indicator detachment.

## **1.8 part list**

### 1.8.1 CHAMBER PARTS

- Vent plug.
- Float chamber
- Chamber blind flange, spring, and gasket.
- Drain plug.
- Internal magnetic floater.

### 1.8.2 INDICATOR AND SCALE PARTS

-follower indicator

-flap indicator

- Top and bottom seals
- Calibration scale
- indicator clamps
- name plate

## **1.9 warranty**

### 1.9.1 INTRODUCTION

Tehran delik Instruments controls may request the return of a or any part of an instrument for complete rebuilding or replacement. They will be rebuilt or replaced promptly.

Tehran delik will repair or replace the control at no cost to the purchaser other than transportation cases.

if:

Returned within the warranty period

The factory inspection finds the cause of the claim to be covered under the warranty.

## **1.10 Terms and Conditions of Sale**

### **1.10.1 INTRODUCTION**

All orders are to be entered to the following address:

Tehran Delik co.  
Designer & manufacturer  
Of Magnetic Level Gauge  
NO.FM100,Gol-e-sorkh  
11St sarvestan Blvd.,  
Shams Abad Ind.Estate  
Tehran 1834185161 Iran.  
P.O.box:18335-338  
[Tel: +98 21 56235717-8](tel:+9821562357178)  
Fax:+98 21 56235719

### **1.10.2 TERMS**

The payment terms are 50% of total price at the time of order and  
50% On time delivery.

### **1.10.3 SHIPMENT**

Freight charges are normally prepaid  
and added to invoice unless specified otherwise.

### **1.10.4 RESTOCKING**

Every magnetic level gauge is designed and manufactured to exact customer  
specifications. As a result, there will be no restocking  
option after shipment is made.

### **1.10.5 CANCELLATION**

Customer is responsible for all production charges and material costs in the  
event of an order cancelation.