

Installation Guidelines for ROLI Transmitters

(Type 55055)

Instruction Bulletin No. 78452 (Rev B)
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Some of the information contained herein is to be used only as a general guideline. Because of various factors such as the liquid being monitored, tank temperature, pressure and materials of construction, we cannot be held liable for consequential damages arising from the use of this guide.

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Product Description

The ROLI is an encapsulated electronic device designed to monitor liquid level with the use of a magnetic float. Each ROLI is shipped on a cardboard spool for ease of installation (**See Fig. 1**). The Factory has taken great care to assure that a quality ROLI was shipped. Although each unit is factory tested, it is recommended that certain tests be performed prior to closing of the tanks. The bottom end of the ROLI has a plastic spacer attached to it. This spacer will have to be sized at installation to assure proper alignment between the float and the ROLI.

Precautions: These units can withstand a certain amount of rough handling, but we recommend the following precautions be taken:

1. Do not allow the ROLI to free fall inside of a pipe.
2. Do not insert the ROLI into a pipe which contains any type of liquid or obstruction.
3. Do not uncoil the ROLI from its spool until ready to insert directly into the pipe.
4. Never allow the ROLI to bend sharply at any point. The minimum recommended bend radius is 12".
5. The ROLI should be stored as received on its shipping spool. The storage area should be protected from the effects of inclement weather and should be dry at all times. Storage temperature should be 40°F to 110°F.
6. The pipe housing the ROLI should withstand a 25 psi test. This pipe must not leak.
7. Electrical power should never be applied to a coiled ROLI.
8. **Never enter a tank which has not been certified as safe for human exposure.**

Installation (See Figure 2)

1. Position the ROLI adjacent to the pipe.
2. Test the pipe to assure that there are no obstructions or liquid of any type.
3. Carefully uncoil the ROLI, while maintaining a minimum bend radius of 12", and lower it into the pipe.
4. Save the shipping spool until all tests have been performed.

Testing: There are two methods which can be used to test the operation of the ROLI. The method used should be decided at the job site.

Method A (Preferred Method)

This method requires that an ohmmeter be connected to the ROLI at the pipe location.

1. The ROLI requires three electrical connections, but they are supplied with a four-conductor cable. The conductors necessary for operation are color coded red, black, and white. The green conductor is not used.
2. Connect an ohmmeter to the black and white wires. With the float at the bottom rest position, the ohmmeter should read 330 ohms $\pm$ 30 ohms. Raise the float to its uppermost travel and in doing so, the resistance should increase steadily.
3. With the float at the uppermost position and the ohmmeter connected to the red and white wires, the ROLI should provide an ohmmeter reading of 330 ohms $\pm$ 30 ohms.
4. When the float is at either end of its travel, the ohmmeter should never indicate an open circuit. If an open circuit is detected, it may be necessary to move the float stops toward the center of the pipe, just enough (perhaps an inch or so), to obtain the 330 ohm reading.
5. In most instances it will be necessary to shorten (by cutting) the spacer to obtain the 330 ohm readings. Should this be necessary, then the ROLI should be withdrawn from the pipe and coiled on the shipping spool.

Method B (Alternate Method)

1. Connect the ROLI to one of the Gems receivers.
2. Assure that the receiver has been properly calibrated according to the published specifications.
3. Raise the float to its uppermost position and in doing so, observe that the meter deflection is steadily increasing.
4. Hold the float at the uppermost position and verify that the meter deflection is at 100% of travel. If the meter drops to a zero indication the upper collar will have to be lowered. If the meter does not reach the 100% deflection, the collar will have to be raised.

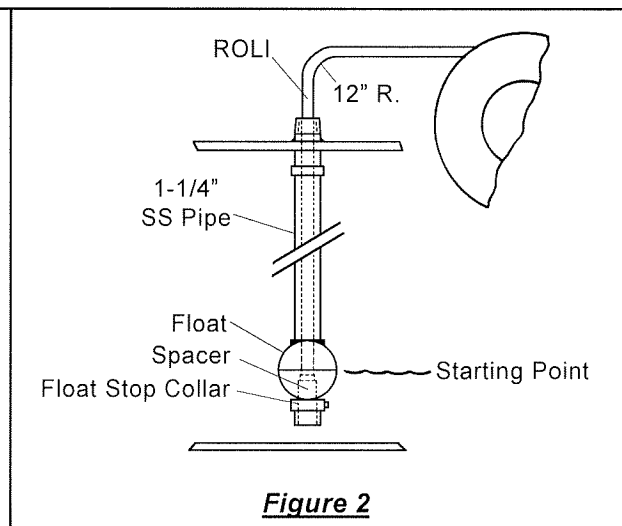
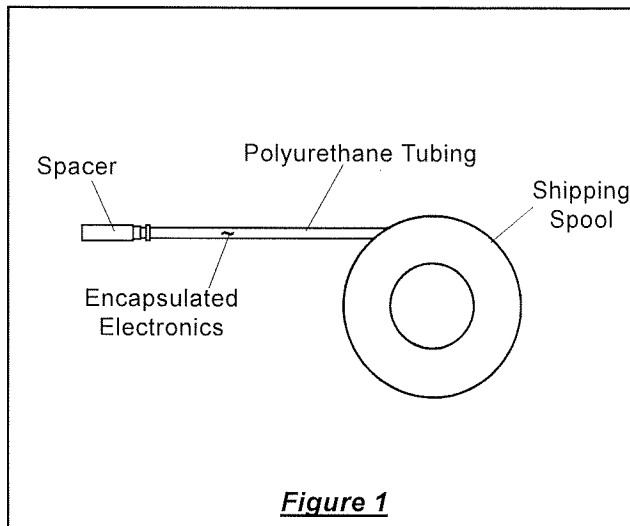
This completes the installation and testing of the ROLI. Please contact the Factory for technical assistance if the ROLI appears to be malfunctioning.

Removal and Servicing

1. Disconnect all electrical sources to the ROLI.
2. Provide a spool or similar device for proper coiling of the ROLI.
3. Raise the ROLI and carefully coil it directly onto the spool. Keep the bend radius at 12" or greater.

Precautions:

- Do not allow the ROLI to bend sharply at any point.
 - Do not twist or snap the ROLI.
 - Do not leave the ROLI laying around, uncoiled or unattended, for any period of time.
4. If the ROLI is to be stored, it should be done on a spool. Never store the ROLI uncoiled, laid out on the floor, or hanging from a structural member.
 5. Secure the ROLI to the spool and store it in a protected area.
 6. The ROLI is not field servicable except by trained Company personnel. Contact Gems Sensors Inc. if field servicing is required.



The information provided in this section is to be used only as a general guideline.

Tank Piping Suggestions

The ROLI transmitter must be installed within a 1-1/4" stainless steel, non-magnetic, Schedule 40 pipe. The inner and outer diameters of the pipe must be free of all burrs, weld slag, etc., which could prevent free clearance for insertion of the ROLI or movement of the float.

When sections of pipe must be joined together, they should be so constructed as to allow free passage of the ROLI. **Figure 1a** describes a possible method which could be used.

The bottom end of the pipe must be sealed and watertight. This end should also be supported if the pipe length will be greater than ten feet. **See Figure 1b and 1c.**

The top of the pipe should be welded (all around) to the top of the tank and a means provided to protect the ROLI from being damaged or flooded. **See Figures 2a and 2b.**

Pipe Details

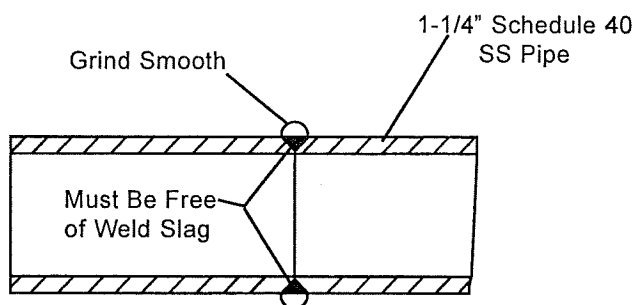


Figure 1a

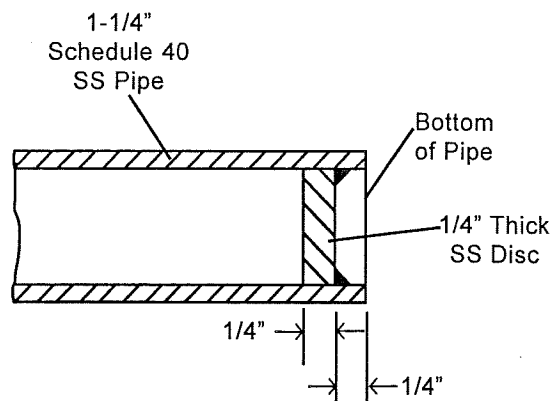


Figure 1b

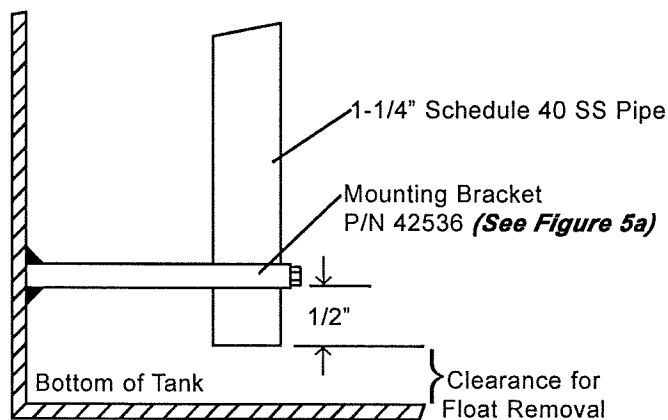


Figure 1c

Enclosures

Flange Enclosure

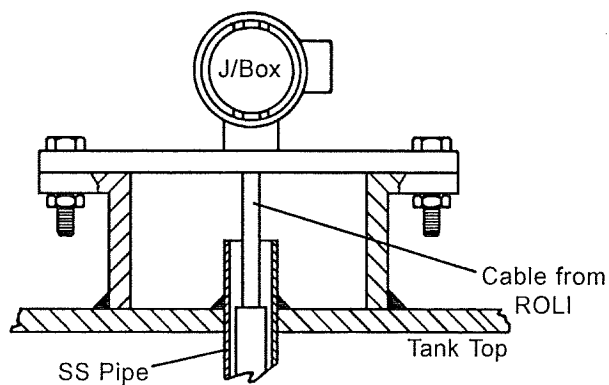


Figure 2a

Threaded Enclosure

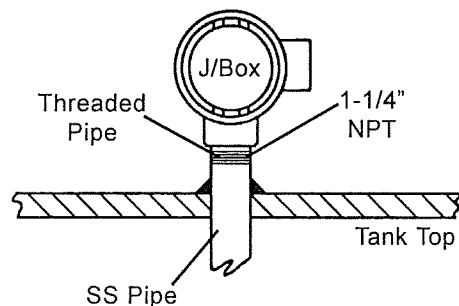


Figure 2b

Glossary of Terms (See Figures 3 and 4)

Pipe Length

The length of pipe inside the tank can be found by subtracting the value shown in Column L from the tank depth. ($L = TD - XX$)

Float Stops

Float stops are used to limit the float travel within the indicated range of the ROLI. Two types of float stops are available. (See Figure 5b)

1. The standard type is used when there is hardly any wave action in the tank (land-based indicators).
2. The second type has a spring welded to it to protect the float against the effects of hammering when there is turbulence or continuous wave action in the tank (shipboard indicators).

The distance between float stops (D) can be found by subtracting the value shown in Column D from the tank depth. ($D = TD - XX$)

Indicated Range

The indicated range - inches of indication - (C) can be found by subtracting the value shown in Column C from the tank depth. ($C = TD - XX$) Two tables are given; one is for the standard float stop and the other is for the spring stop.

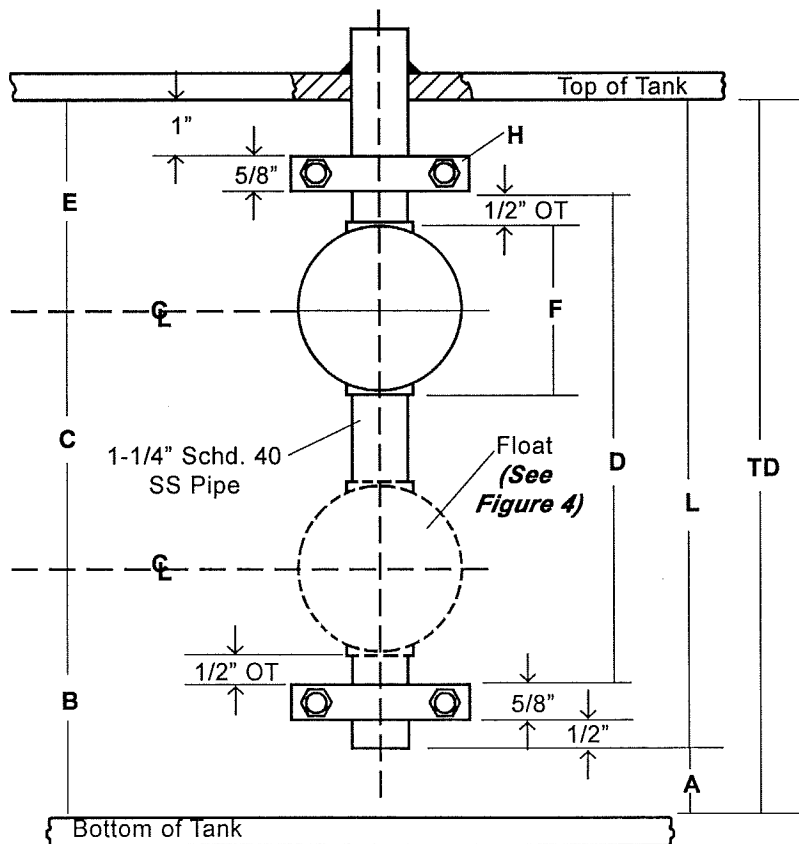
Minimum Level

The minimum level indicated by the ROLI (B) can be found in Column B of the appropriate float stop table.

Maximum Level

The maximum level indicated by the ROLI (E) can be found in Column E of the appropriate float stop table.

Typical ROLI Set-Up (Figure 3)



A = Minimum Clearance for Float Removal
B = Minimum Level Indicated
C = Inches of Indication
D = Distance Between Float Stops
E = Maximum Level Indicated

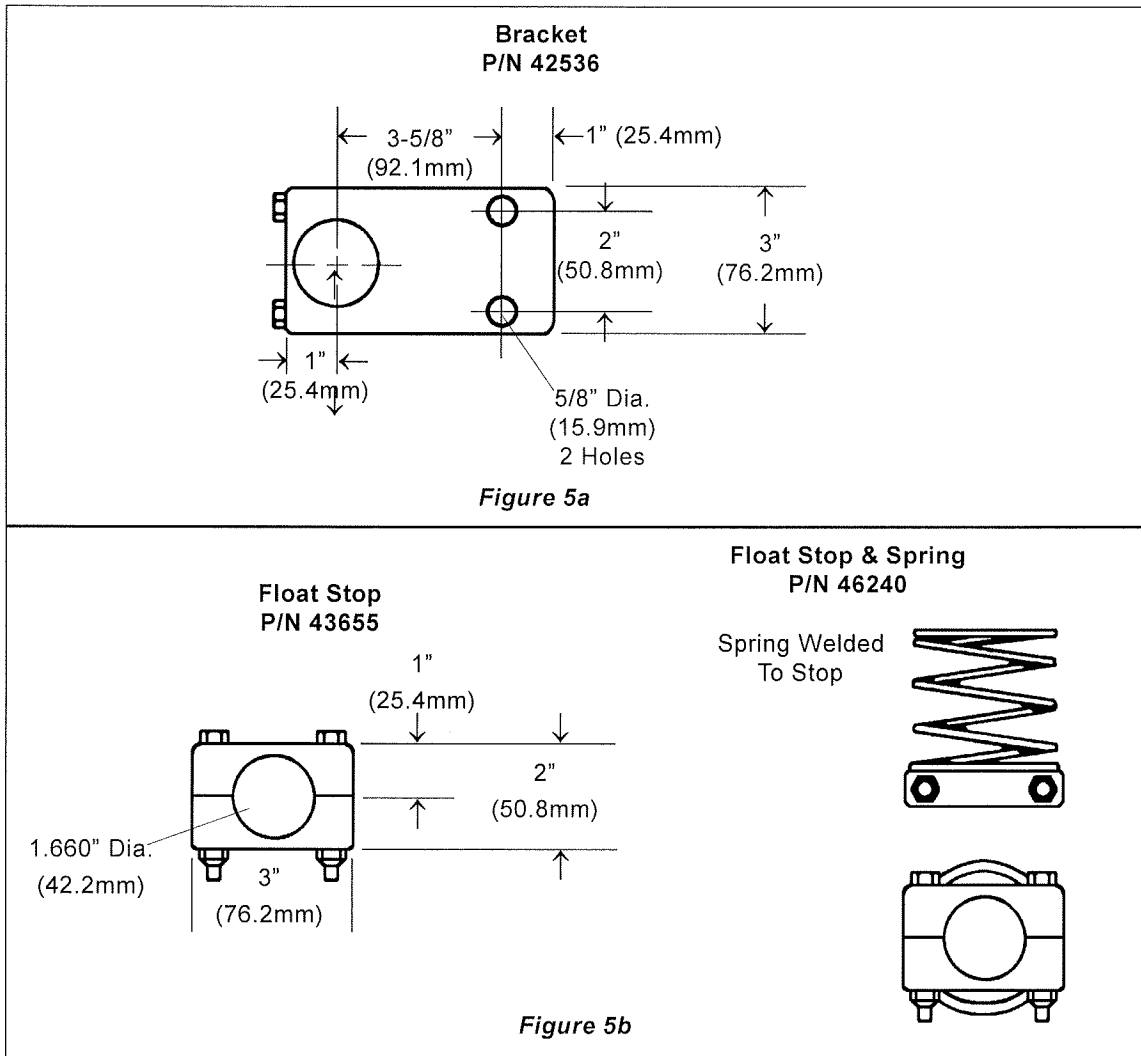
F = Float Height
H = Float Stop Assembly
L = Pipe Length
OT = Overtravel
TD = Tank Depth

Calculation Chart (Figure 4)

Dimensions in Inches - $\pm 1/16$ "

Float Part Number	Units with Standard Float Stop - P/N 43655							Unit with Spring Stop P/N 46240		
	A	B	C	D	E	F	L	B	C	E
40780	6-1/2	11-1/8	TD-17-1/4	TD-10-1/4	6-1/8	6	TD-6-1/2	13-1/4	TD-21	7-3/4
41605	8-3/8	13	TD-20	TD-11-1/8	6	7-7/8	TD-8-3/8	15	TD-20	9-5/8
42485	4-7/8	8-3/4	TD-13	TD-7-5/8	4-3/8	4-3/8	TD-4-7/8	9-7/8	TD-15-1/4	7-1/2
43609	8-3/8	13	TD-20	TD-11-1/8	6	7-7/8	TD-8-3/8	15	TD-20	9-5/8
45260	6-3/8	11	TD-16	TD-9-1/8	5	5-7/8	TD-6-3/8	12	TD-18-1/4	6-1/4
49110	4-7/8	8-3/4	TD-13	TD-7-5/8	4-3/8	4-3/8	TD-4-7/8	9-7/8	TD-15-1/4	7-1/2
53790	4-1/2	8-1/8	TD-13-1/4	TD-8-1/4	5-1/8	4	TD-4-1/2	10-1/4	TD-17	6-3/4
54474	6-1/2	11-1/8	TD-17-1/4	TD-10-1/4	6-1/8	6	TD-6-1/2	13-1/4	TD-21	7-3/4
54610	3-7/8	11-7/8	TD-16-7/8	TD-12-5/8	5	3-5/16	TD-3-7/8	13-7/8	TD-21	7-1/8
57582	9-3/8	15-1/2	TD-22	TD-12-1/8	6-5/8	8-7/8	TD-9-3/8	16-5/8	TD-24-1/4	7-3/4
57735	9-3/8	15-1/2	TD-22	TD-12-1/8	6-5/8	8-7/8	TD-9-3/8	16-5/8	TD-24-1/4	7-3/4
64750	3-7/8	11-7/8	TD-16-7/8	TD-12-5/8	5	3-11/32	TD-3-7/8	13-7/8	TD-21	7-1/8

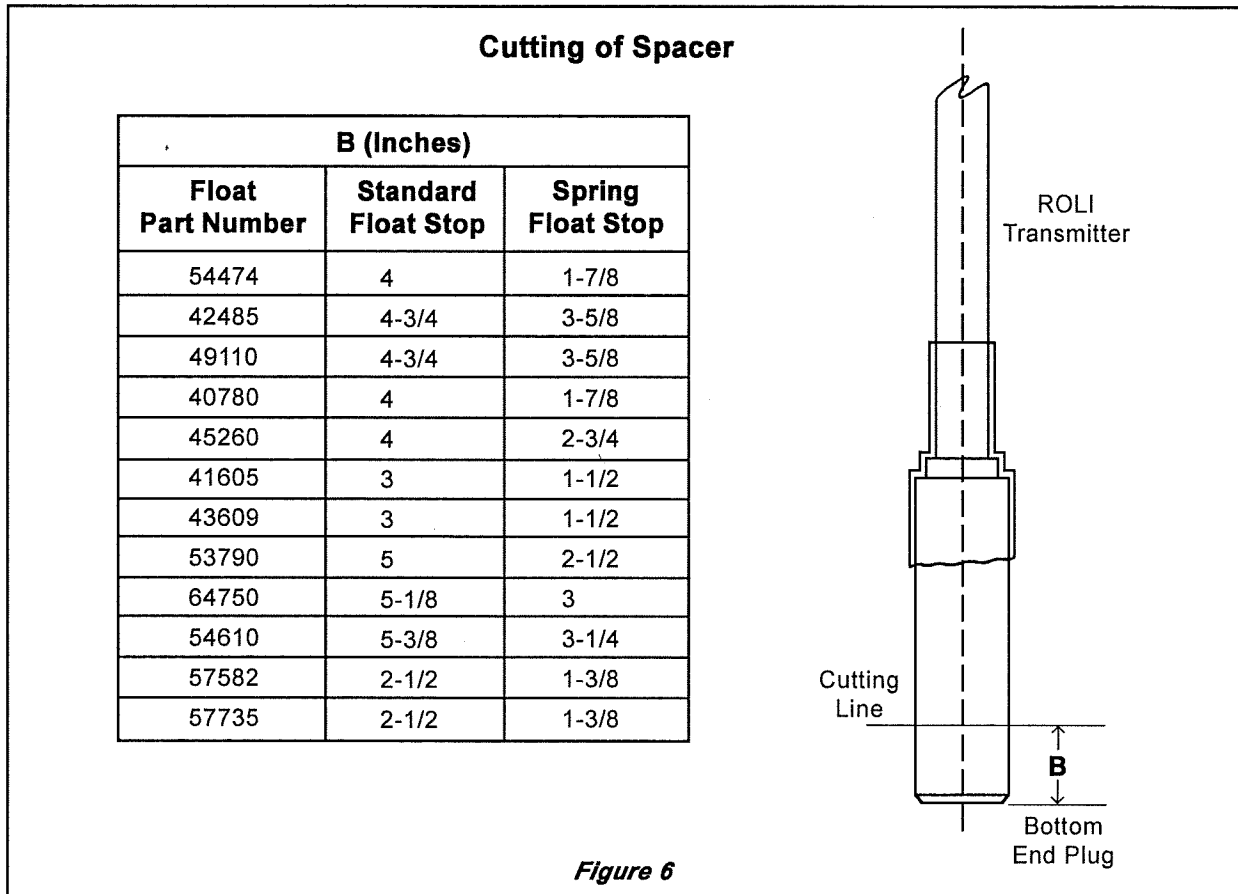
TD = Tank Depth



Spacer

The spacer located at the bottom of the ROLI will have to be cut at the job site. This spacer provides proper alignment between the float, when at bottom rest position, and the first indicating capsule within the ROLI.

Spacer length is a function of the size of the float. If the pipe installation is exactly as described in this manual, then the spacer length will be as shown in **Figure 6**. If the installation is different than described, it will be necessary to electrically test the ROLI before cutting the spacer. See testing procedure described on page 1 for additional information.



LIST OF CAUTIONS

1. The pressure limitations shown in the individual catalogs and drawings for the specified tank level indicator involved must not be exceeded. These pressures must take into consideration possible system surge pressures and their frequencies.
2. For hazardous area application, such as, but not limited to, ignitable mixtures, combustible dust and flammables, the use of an approved intrinsically-safe device is strongly recommended.
3. The liquids used must be compatible with the materials of construction. Specifications of materials will be given on request.
4. The tank level indicator system has been designed to be shock and vibration-resistant. However, shock and vibration should be minimized.
5. Excessive contaminants in the fluids may inhibit float operation.
6. The tank level indicators are custom-designed for particular applications. Any change in the application of the unit, the factory must be consulted.
7. The ambient temperature change does affect the alarm setpoint. Refer to product drawings for tolerances.
8. To compensate for temperature effects at time of meter readings, the system must be full referenced.
9. Alarm contacts are wearable parts and therefore need to be checked regularly. Their life expectancy varies with the application.
10. Elastomer seals in the sensor and cable are subject to deterioration and aging and therefore need to be checked regularly. Their life expectancy varies with the application.
11. Troubleshooting and maintenance of the tank level indicator system must be in strict compliance with the procedure set forth in the troubleshooting and maintenance section of the technical brochures, installation, operation and maintenance bulletins.
12. Transmitters and cables must not be field-repaired. All other field repairs must be performed by qualified personnel only.
13. Be sure power is "OFF" when connecting or disconnecting any components or wiring within receiver.



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