



MAGNETROL  
REGISTERED TO  
**ISO 9001**  
Your Assurance of  
Quality and Service

## General Installation, Operation, and Maintenance Instructions

### IMPORTANT

The following instructions should be carefully studied before attempting to install or operate your level control. The information provided will also prove helpful in the event servicing becomes necessary.

Due to the greatly varied liquids with which level controls are used, it is not possible to use one type of material to meet all conditions. In some cases, corrosive by-products are formed in a process, which could not be anticipated beforehand, and become evident only after installation. Because of this indeterminate factor, the five year guarantee is only valid if the control is used on liquids of concentrations, analyses, and temperatures specified on the original order (refer to warranty on page 4).

Models with special materials will have an "X" preceding the model number stamped on the nameplate. When ordering parts or communicating about such a control, be certain always to specify the complete model and serial numbers. The serial number will be found stamped on the nameplate or on a small aluminum tag, attached to the switch housing base (refer to bulletin 41-310 included).

### GENERAL PIPING INSTRUCTIONS

**NOTE: If float extends into vessel, disregard these instructions.**

Pipe the level control to vessel so that the switch actuating level mark on float chamber corresponds with the liquid level in vessel at which switch control is desired (refer to dimensional drawing, if furnished, or catalog data). If necessary, provide a stand or hanger to help support its weight.

Adjust piping as required to bring control to a vertical position. Level controls must be mounted within three (3°) degrees of vertical. Three degrees slant is noticeable by eye, but installation should be checked with a spirit level on top or sides of float chambers.

All piping should be straight and free of pockets so that all

liquid will drain toward the vessel to which the control is mounted. All vapor lines (top connection to float chamber) should drain toward the control. If the control is used with a low temperature liquid (one which will "boil" in the float chamber, if outside heat is absorbed), the chamber and piping should be insulated, since such boiling in the chamber will cause false level indications. Do NOT insulate switch mechanism housing.

If liquids tend to leave deposits in piping between the control and vessel, each turn in the piping should be made with cross type fittings equipped with plugs in unused openings. Removal of plugs will allow pipe line to be rod-ded clean. A drain or blow down valve, at the bottom of the control, will assist in washing out float chamber and pipe lines.

### GENERAL WIRING INSTRUCTIONS

**NOTE: If control is equipped with pneumatic switch mechanism, disregard these instructions, and refer to instruction bulletin on mechanism furnished for air (or gas) connections.**

Most level control switch housings are designed to provide 360° positioning of conduit outlet by loosening the set screw(s) located under the housing base. Diagrams of the control's internal electrical circuits (switching action between terminals) will be found in the switch mechanism instruction bulletin included.

On high temperature applications, above 250° F (121° C) in float chamber, high temperature wire should be used between control and first junction box located in a cooler area. Supply wires (conductors) are brought into the switch housing, wrapped around the enclosing tube under the baffle plate and then brought up to the proper terminals. Excess wire should be positioned so as not to

interfere with switch mechanism or housing cover.

Some controls are furnished with an explosion proof (cast) switch housing or a vapor tight (gasketed) type. These housings are used in hazardous locations, or when liquid temperature is so low that excessive condensation and frosting of switch parts are likely. After wiring connections have been completed, explosion proof housings must be sealed at the conduit outlet with a suitable compound to prevent entrance of air. Check cover to base fit on explosion proof and vapor tight housings to be certain gasketed joint is tight. A positive seal is necessary to prevent infiltration of moisture laden air or corrosive gases into switch housing.

Connect power supply to control and test switch action by varying liquid level. If switch mechanism fails to function, check vertical alignment of control and consult installation bulletin on mechanism furnished.

# PREVENTIVE MAINTENANCE

Periodic inspections are a necessary means to keep your level control in good working order. This control is, in reality, a safety device to protect the valuable equipment in services. Therefore, a systematic program of "Preventive Maintenance" should be implemented when control is placed into service. If the following instructions are observed, your control will provide reliable protection for your capital equipment.

## WHAT TO DO

### 1. Keep Control Clean

Be sure the switch housing cover is always in place on the control. This cover is designed to keep dust and dirt from interfering with switch mechanism operation. In addition, it protects against damaging moisture and acts as a safety feature by keeping bare wires and terminals from being exposed. Should the housing cover become damaged or misplaced, order a replacement immediately.

### 2. Inspect Switch Mechanism, Terminals, and Connections Monthly

a. Dry contact switches should be inspected for excessive wear on actuating lever or misalignment of adjustment screw at point of contact between screw and lever. Such conditions can cause false switch actuating levels. Adjust switch mechanism to compensate (if possible) or replace switch.

**DO NOT** operate your control with defective or maladjusted switch mechanism (refer to bulletin on switch mechanism furnished for service instructions).

b. Level controls may sometimes be exposed to excessive heat or moisture. Under such conditions, insulation on electrical wire may become brittle, eventually breaking or peeling away. The resulting bare wires can cause short circuits. Check wiring carefully and replace the entire switch mechanism at first sign of brittle insulation.

c. Vibration may sometimes cause terminal screws to work loose. Check all terminal connections to be certain that screws are tight. Air (or gas) operating medium lines, subjected to vibration, may eventually crack or become loose at connections causing leakage. Check lines and connections carefully and repair or replace, if necessary.

## WHAT TO AVOID

1. **NEVER** leave switch housing cover off the control longer than necessary to make routine inspections.

2. **NEVER** use lubricants on pivots of switch mechanism. A sufficient amount of lubricant has been applied at the factory to ensure a lifetime of service. Further oiling is unnecessary, and will only tend to attract dust and dirt which can interfere with mechanism operation.

3. **NEVER** place a jumper wire across terminals to cut-out the control. If a jumper is necessary for test purposes, be certain it is removed before placing control into service.

4. **NEVER** attempt to make adjustments or replace switches without reading instructions carefully. Certain adjustments provided for in level controls should not be attempted in the field. When in doubt, consult the factory or your local representative.

# TROUBLESHOOTING

The instructions contained in this bulletin are general and can be applied to most any level control. If difficulties are encountered which cannot be identified, consult the factory or your local representative for assistance. A complete description of the trouble should be provided, along with information concerning piping and mounting arrangement and a description of your operation sequence. Sketches or photographs showing the installation are also beneficial.

When communicating about your control, be certain to always specify the complete model and serial numbers.

Usually the first indication of improper operation is failure of the controlled equipment to function – pump will not start or stop, signal lamps fail to light, etc. When these symptoms occur, whether at time of installation or during routine service thereafter, check the following external causes first.

- Fuses may be blown.
- Reset button(s) may need resetting.
- Power switch may be open.
- Controlled equipment may be faulty.
- Stem may be bent causing hang-up.
- Wiring, or medium lines, leading to control may be defective.

If a thorough inspection of these possible conditions fails to locate the trouble, proceed next to a check of the control's switch mechanism.

1. Pull disconnect switch or otherwise assure that electrical circuit(s) through the control is deactivated.
2. Remove switch housing cover.
3. Swing magnet assembly in and out by hand, checking carefully for any sign of binding. Assembly should require no force, however slight, to move it through its full swing.
4. If binding exists, magnet may be rubbing the enclosing tube, or pivot sockets may be overly tightened. Readjust pivot sockets as required until a slight amount of side play is evident. If magnet is rubbing, loosen magnet clamp screw, and shift magnet position.
5. If switch magnet assembly swings freely and mechanism still fails to actuate, check installation of control (using a spirit level on side of enclosing tube in two places 90° apart) to make certain it is within the specified three (3°) degrees of vertical.

**NOTE:** As a matter of good practice, spare switches should be kept on hand at all times.

If switch mechanism is operating satisfactorily, a test of the complete control's performance is the next likely step.

6. Reconnect power supply and carefully actuate switch mechanism manually, using a non-conductive tool on electrical switch mechanism, to determine whether controlled equipment will operate.

**CAUTION:** With electrical power on, care should be taken to avoid contact with switch leads and connections at terminal block.

7. If controlled equipment responds to manual actuation test, trouble may be located in level sensing portion of the control (float or displacer, stem and magnetic attracting sleeve).

**NOTE:** Check first to be certain liquid is entering float chamber or storage vessel. A valve may be closed or pipe line plugged.

8. With liquid in float chamber or vessel, proceed to check level sensing action by removing switch housing assembly.

**CAUTION:** Be certain to pull disconnect switch or otherwise assure that electrical circuit(s) through control is deactivated. Close operating medium supply valve on controls equipped with pneumatic switch mechanism.

- a. Disconnect wiring from supply side of switch mechanism(s) and remove electrical conduit or operating medium line connections to switch housing.
- b. Relieve pressure from vessel and drain off liquid "head" above control mounting position.

**NOTE:** Control chamber, connections and pipe lines need not be removed from vessel.

- c. Remove switch housing assembly by loosening hex nut located immediately below housing base.

9. With switch housing assembly removed, inspect attraction sleeve (or piston) and inside of enclosing tube for excessive corrosion or solids build-up which could restrict movement, preventing sleeve from reaching field of switch magnet.

10. If the differential adjustment has been changed in the field, by repositioning the lower jam nuts on the float stem, check for tightness and position of the jam nuts.

**NOTE:** Differential adjustment affects a change in the amount of level travel between "switch on" and "switch off" actuations. **DO NOT** attempt adjustment without first consulting factory for assistance in computing level differential change for your control.

11. Check float, if used, to be certain it is buoyant in the liquid (float chamber or vessel must have adequate liquid level). If float is determined to be filled with liquid or collapsed, it must be replaced immediately.  
**DO NOT ATTEMPT TO REPAIR A FLOAT.**

**NOTE:** When in doubt about the condition or performance of a level control, return it to the factory. Refer to Service Policy on page 4.

# IMPORTANT

## PRODUCT WARRANTY

All Magnetrol mechanical level and flow controls are warranted free of defects in materials or workmanship for five full years from the date of original factory shipment. Repair parts are warranted free of defects in materials and workmanship for one year from the date of shipment. Materials, specifications, and contents are subject to change without prior written notice.

If returned within the warranty period; and, upon factory inspection of the control, the cause of the claim is determined to be covered under the warranty; then, Magnetrol will repair or replace the control at no cost to the purchaser (or owner) other than transportation.

Magnetrol shall not be liable for misapplication, labor claims, direct or consequential damage or expense arising from the installation or use of equipment. There are no other warranties expressed or implied, except special written warranties covering some Magnetrol products.

## QUALITY ASSURANCE

The quality assurance system in place at Magnetrol guarantees the highest level of quality throughout the company. Magnetrol is committed to providing full customer satisfaction both in quality products and quality service.



Magnetrol's quality assurance system is registered to ISO 9001 affirming its commitment to known international quality standards providing the strongest assurance of product/service quality available.

## ASSURED QUALITY & SERVICE COST LESS

### SERVICE POLICY

Owners of Magnetrol may request the return of a control or any part of a control for complete rebuilding or replacement. They will be rebuilt or replaced promptly. Controls returned under our service policy must be returned by Prepaid transportation. Magnetrol will repair or replace the control at no cost to the purchaser (or owner) other than transportation if:

1. Returned within the warranty period; and
2. The factory inspection finds the cause of the claim to be covered under the warranty.

If the trouble is the result of conditions beyond our control; or, is NOT covered by the warranty, there will be charges for labor and the parts required to rebuild or replace the equipment.

In some cases it may be expedient to ship replacement parts; or, in extreme cases a complete new control, to replace the original equipment before it is returned. If this is desired, notify the factory of both the model and serial numbers of the control to be replaced. In such cases, credit for the materials returned will be determined on the basis of the applicability of our warranty.

No claims for misapplication, labor, direct or consequential damage will be allowed.

### LOW VOLTAGE DIRECTIVE

For use in Category II installations. If equipment is used in a manner not specified by manufacturer, protection provided by equipment may be impaired.

### RETURN MATERIAL PROCEDURE

So that we may efficiently process any materials that are returned, it is essential that a "Return Material Authorization" (RMA) number be obtained from the factory, prior to the material's return. This is available through Magnetrol's local representative or by contacting the factory. Please supply the following information:

1. Company Name
2. Description of Material
3. Serial Number
4. Reason for Return
5. Application

Any unit that was used in a process must be properly cleaned in accordance with OSHA standards, before it is returned to the factory.

A Material Safety Data Sheet (MSDS) must accompany material that was used in any media.

All shipments returned to the factory must be by prepaid transportation.

All replacements will be shipped F.O.B. factory.



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