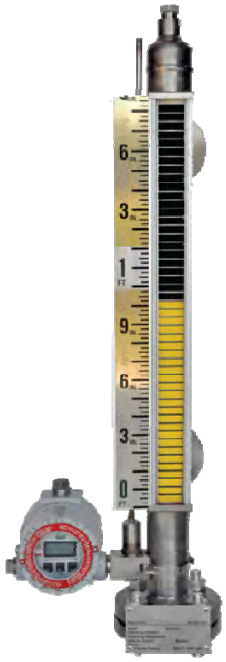
ARCHON INDUSTRIES, INC.

Magnetic Liquid Level Gauge

INSTALLATION, OPERATION AND MAINTENANCE



Installation Instruction: 1006
Issued: 03/99
Rev 1: 08/13
Approved: F.Bongiorni

ARCHON INDUSTRIES, INC.

Installation, Operation and Maintenance Instructions

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Section 2.1.0. - Description

2.1.1. INTRODUCTION

ARCHON Industries, Inc. magnetic level gauge series utilize non-magnetic 2.00-inch, schedule 40 chambers (standard) manufactured to length specifications with process connections that match those of the vessel or tank. For some high pressure, low gravity applications, a 3.00-inch schedule 40 chamber is available. The process connections may be:

1. Side mounted, threaded, flanged or socket welded
2. Top and bottom flanged mounted
3. Tank top mounted
4. 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.

2.1.2. COMPONENTS

The gauge chamber contains a magnetic float and is completely isolated from the indicator housing attached to the outside of the gauge chamber. External indicators consist of a single yellow or continuous flag/flipper models. The magnetic float maintains a magnetic bond with the external level indicator. As the level of the process medium fluctuates within the tank and gauge chamber, the float reacts accordingly with the indicator recording the level of the fluid within the chamber.

2.1.3. CHAMBER MATERIAL

Gauges are manufactured to meet exact specifications of the process media such as operating pressure, temperature, specific gravity, etc. Standard chamber materials are 316/304 stainless steel, however any non-magnetic material may be used. Other chamber materials that are available include CPVC, Kynar, Hastelloy, Alloy 20, Zirconium and Monel etc.

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Section 2.1.0. – Description

2.1.4. INTERNAL FLOAT

A magnetized float is contained inside the float chamber and is designed to the requirements of the process conditions. For this reason floats are not interchangeable unless the process conditions and gauge chambers are identical. The float moves freely inside the chamber reacting to fluctuating level changes within the adjoining vessel.

2.1.5. FLOAT SUBMERGENCE

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

2.1.6. GAUGE RATINGS

Magnetic level gauges can be designed for operating conditions from full vacuum service up to 5000 PSIG, 1100°F, and a minimum gravity of 0.20. All magnetic gauges with alloy chambers will have full ANSI ratings based on flange classifications. Gauges with CPVC, Kynar (PVDF) or Fiberglass shields will have 150 PSIG ratings only.

2.1.7. 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 float installed. If a gauge is field tested with the float installed, the float may crush and chamber may become damaged. This procedure will void the warranty!

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Section 2.2.0. - Level Indication

2.2.1. INTRODUCTION

There are two types of external level indication options offered by ARCHON Industries, Inc., for magnetic level gauges. The single indicator (ST)/(SST) is recommended for stagnant storage level applications with little or no level fluctuations. The wide flag indicator (WF)(SWF) is recommended for turbulent or high vibration level conditions.

2.2.2. SINGLE TRACKER INDICATION (ST or SST)

The single follower assembly used for indicating level consists of a rectangular yellow magnetic follower sealed in a channel with a 316 stainless steel calibration scale marked in feet and inches, total inches or in centimeters. The indicator is mounted parallel and immediately adjacent to the gauge chamber to allow maximum magnetic coupling between the float and the follower within the indicator channel. The indicator is sealed to prevent dirt and moisture accumulation. A red bumper is positioned at the bottom of the channel to cushion the impact of the follower against the cover. Although the yellow follower provides maximum visibility even at night time, retrofit kits for illuminating gauges are available.

2.2.3. SINGLE TRACKER INDICATION - REFERENCE GUIDE

A black reference guide in the center of the yellow follower allows the operator to match the graduated scale with the level of the process fluid. A nameplate at the lower end of the scale provides zero level indication. If the yellow follower is decoupled from the internal float's magnetic field, the follower will descend below the zero point on the scale. Thus, when the vessel is empty, the level gauge will read zero and the yellow follower will remain visible. To prevent the float from losing magnetic coupling with the follower, a spring is mounted inside the top and bottom of the gauge chamber. This cushion the impact of the float against the chamber ends when the vessel is completely full or empty. The float and the follower are magnetically coupled when the follower remains visible. If the magnetic coupling is lost between the float and follower, use a hand magnet to attract the follower until it is contained within the float's magnetic field. Refer to the Troubleshooting portion of the manual, Section, 2.7.2.

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Installation, Operation and Maintenance Instructions

Section 2.2.0. - Level Indication (cont.)

2.2.4. WIDE FLAG/FLIPPER INDICTION (WF),(SWF)

ARCHON Industries Inc. offers a continuous Wide Flag or Flipper style indicator as an option to the Single Yellow Follower indicator. Flag indications are industrial grade level indicators which consist of a series of ceramic flags, black on one side, yellow on the other. As the magnetic float reacts to level fluctuations, each flag or flipper will rotate 180 degrees to reveal the opposite color.
The flipper is housed in a rugged sealed housing with a recessed glass window and rotates on a ceramic and stainless steel surface. This eliminates the flippers from sticking or hanging up. The unique design prevents all flippers from rotating in excess of 180 degrees and each flag is magnetically locked to the next. Wide Flag indicators are recommended where surging or turbulent level conditions exist. Each flag indicator is 1.40 inches wide and is more visible than the standard single indicator. These are available with or without scales up to 20 ft.

2.2.5. WIDE FLAG/FLIPPER INDICATION - REFERENCE GUIDE

Yellow represents liquid column, **Black** represents vapor space.

2.2.6. WIDE FLAG/FLIPPER INDICATION - RETROFIT

When flipper style indicators are purchased with ARCHON magnetic level gauge, no installation is necessary. If the indicator is removed or a retrofit kit is purchased for a gauge already in service, however, the following steps should be noted:

1. The mounting clamps connecting the flipper assembly to the gauge chamber are adjustable to most manufacturers' standard, (i.e. 1.50 inch to 2.50 inch pipe). If the gauge is in service and there is liquid in the tank, only the flippers adjacent to the float will rotate to yellow when the indicator assembly is clamped on.
2. Run a magnet along the window of the indicator from zero to where yellow is showing as noted, or
3. Drain the gauge to zero on the indicator, and then fill again. As the float rises, the level indicator will react accordingly and will be reset properly.

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Section 2.3.0. - Installation

2.3.1. 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 ARCHON Industries, Inc. immediately. All ARCHON 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.

2.3.2. CHAMBER ORIENTATION

The magnetic float is packaged separately for shipment in which the float is strapped externally to the outside of chamber which should be removed before installation. The float chamber should always be leveled vertically. If it is not leveled correctly, the float may be magnetically uncoupled from the level indicator during operations.

2.3.3. CONNECTION VALVES

Valves should be installed between the process vessel and level gauge to allow for isolation, draining, and cleaning purposes. (See section 2.6.2. on Maintenance for more details on cleaning and maintenance procedures). Standard block valves can be ordered with the gauge or separately from ARCHON Industries, Inc. Ball check valves are not necessary for magnetic level gauges. If certain valve specifications are required, please advise ARCHON Industries, Inc.

2.3.4. FLOAT ORIENTATION

The internal magnetic float has a preferred orientation vertically which is inscribed at the top of the float. 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. Floats that are installed in gauges with inverted chamber construction will contain a loop at the top of the float for installation and removal purposes. **Internal floats should be installed after any hydrostatic field tests of the chamber and connecting vessel are complete.**

Section 2.3.0. - Installation (cont.)

2.3.5. CHAMBER GASKETS

Standard magnetic level gauges are supplied with 0.125-inch composition gaskets. If this type of gasket is not compatible with the process media, appropriate gaskets should be used in replacement of those shipped with the gauge.

2.3.6. FLANGES AND CONNECTIONS

Process connections and vent/drain flanges are designed to meet each customer's specifications. All flange bolt holes straddle the centerline unless otherwise specified. Both male and female threaded connections and socket weld connections are available. ***DO NOT WELD ON MAGNETIC GAUGE OR ON THE VESSEL WITH INDICATOR AND FLOAT INSTALLED. THIS WILL DESTROY THE MAGETIC CIRCUIT.***

2.3.7. INTERFACE APPLICATIONS

Magnetic gauges can be used to identify fluid interfaces only if the proper specific gravities have been identified at the maximum operating conditions. The float can designed to float in one media while sinking in the other. Immiscible oil over water levels is an example. Care should be exercised when using magnetic gauges in interface applications because *rag layers* may exist which are difficult to identify.

Do not install a gauge with two floats and two single indicators on one chamber for an interface**.** In this case the two floats may *collide* causing incorrect readings. Chambers can be manufactured with multiple connections for maximum process influx. The proper method is to install one gauge per process phase, not a combination.

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Installation, Operation and Maintenance Instructions

Section 2.4.0. - Operation

2.4.1. 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 by subjecting the gauge to a potential safety hazard.

2.4.2. PROCEDURES

1. Check that the operating conditions, (temperature, pressure and specific gravity) are within that maximum rating of the gauge. Each gauge has a permanent nameplate indicating process specifications, serial number, tag number, etc. It is critically important to check that the specific gravity of the process media is specified at the maximum operating conditions.

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. For *standard* gauges, install the float 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. Reinstall the bottom drain blind flange with a new flange gasket after the float is in place.

4. For *inverted* gauges, remove the top vent blind flange from the gauge chamber. Install the float by inserting a string through the float loop and lower the float into position slowly. Remove the string from the float and chamber after the float is resting on the bottom of the gauge. An auxiliary magnet may be required to recouple the indicator, (either single follower or flipper indicator), to the internal float.

5. Reinstall the blind flange with a new gasket. The gauge chamber should be isolated with no opening to atmosphere. Check to see that all drain and vent plugs are securely in place and that any vent and drain connections are closed.

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Installation, Operation and Maintenance Instructions

Section 2.4.0. - Operation

2.4.2. PROCEDURES (cont.)

6. 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 equalize with the gauge slowly and reach operating conditions at a slow, even, and reasonable rate.

7. **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 INTO THE TOP OF THE CHAMBER CAUSING SEVERE DAMAGE TO THE FLOAT AND CHAMBER.

8. After the float 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 float and indicator may react or rise to condensate accumulation migrating through the top valve with the bottom valve closed.

9. 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 or flipper indication will result in black to yellow rotation of the flippers as the fluid rises. At this point, installation should be complete. Allow at least 30 minutes for both top and bottom valve procedures.

10. Please note, under elevated operating conditions, the indicator may record a significant level from condensate influx through the top valve *before* the bottom valve is opened. If this is the condition, it is possible the indicator (and float) may readjust and fall slightly from the effects of final process equalization after the bottom valve is completely opened.

11. Extended Storage: All magnetic gauges and accessories not put in service shall be stored inside in the original creates

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Installation, Operation and Maintenance Instructions

Section 2.5.0. - Removal from Service

2.5.1. 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.

2.5.2. PROCEDURES

1. Close the bottom process connection valve first to prevent further process influx to the gauge.

2. Completely close the top process connection valve to isolate the gauge from the process

3. Attach proper vapor collection equipment to the gauge vent connection if

4. Open the vent valve slowly to relieve gauge pressure and allow ambient air

5. Attach the proper liquid collection equipment to the drain connection is required.

6. Open the drain valve slowly to remove remaining gauge

7. **CAUTION**: Never use the vent or drain on a gauge as a pressure relief mechanism for the process system. Doing so may permanently damage parts of the gauge as well as inducing a safety hazard.

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Installation, Operation and Maintenance Instructions

Section 2.6.0. - Maintenance

2.6.1. INTRODUCTION

ARCHON magnetic level gauges contain a standard 0.50 inch vent and drain plug in the top and bottom of the gauge chamber to allow cleaning and removal of the process fluid if required. Socket weld vent and drain valve connections are available. Some gauges are connected to a solvent or steam line that allows **empty gauges without floats** to be decontaminated or *blown down* periodically without removing the gauge from the vessel location. ARCHON magnetic gauges should be maintained and inspected on at least on an annual basis, or more frequently depending on the process system.

2.6.2. PROCEDURES

1. Block in 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 dictate the use of a suitable solvent for cleaning.

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

Section 2.6.0. - Maintenance

2.6.2. PROCEDURES (cont.)

8. Check the stainless steel pipe clamps to insure they are tight and adjust the scale channel. Correctly match the zero point to process connection elevations.

9. If necessary, use a permanent magnet to attract the yellow indicator until it is coupled to the float inside the chamber.

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Installation, Operation and Maintenance Instructions

Section 2.7.0. - Troubleshooting

2.7.1. INTRODUCTION

ARCHON 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.

2.7.2. FLOAT & INDICATOR DETACHMENT

1. 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.

2. 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.

3. Check to ensure the internal magnetic float within the chamber is right side up. If the float was installed inverted, the single yellow indicator will magnetically couple, but the actual process level will be higher that what the indicator records. All floats are clearly marked TOP. Floats designed for *inverted* gauges will have a loop welded at the top of the float for installation and removal purposes.

4. If the float springs mounted in the top and bottom of the gauge chamber have been removed, the float could rise past the top of the indicator and lose magnetic coupling with the indicator.
5. If the process connection dimension has been miscalculated and the gauge length is too long do not attempt installation because it will warp the chamber. A warped chamber will prohibit the float to move freely. This can cause float and indicator detachment.

2.7.3. DIFFERENTIAL LEVEL

This can occur during startup and is easily corrected. Under normal operating conditions, most floats are about 80% submerged in the process media. It is important to note that the position of the float in the fluid will vary with different process conditions. To attain a true level elevation, adjust the scale vertically to get an exact reading.

ARCHON INDUSTRIES, INC.

Installation, Operation and Maintenance Instructions

Section 2.7.0. - Troubleshooting (cont.)

2.7.4. DEFECTIVE INDICATOR

If the glass indicator cover is cracked or broken, a replacement cover can be shipped within 24 hours after receipt of order. One advantage of the magnetic level gauge is the indicator assembly can be serviced without removing the gauge chamber from service. To replace the indicator cover, remove the four screws from cover plate at the top and bottom of the indicator channel. There are two red gaskets beneath each cover that require removal. Remove the two red seal strips and slide the glass plate cover out of the channel. Clean any debris or fragments. Replace the glass cover with the new glass plate by sliding into the channel again. Replace each red side and top gaskets with the top and bottom covers. If the gauge is inexcess of 6 feet in length, it may be easier to remove the indicator from the channel.

2.7.5. SWITCH MALFUNCTIONING

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. This is accomplished by passing the float either manually or by filling the gauge chamber until it passes the highest switch. This will trip the switch to the desired setting so it will alarm properly with rising or falling level.

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Installation, Operation and Maintenance Instructions

Section 2.8.0. - Parts List

2.8.1. INTRODUCTION

When ordering spare parts for the magnetic level gauges the following information will be required.

1. Serial number of the gauge or accessory item.
2. Description of parts to be ordered.
3. Model number of the parts to be ordered, if known.
4. Original purchase order, if known.

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2.8.2. CHAMBER

1. Vent plug.
2. Float chamber
3. Chamber blind flange, spring, and gasket.
4. Drain plug.
5. Internal magnetic float.

2.8.3. INDICATOR & SCALE ASSEMBLY

1. Channel assembly
2. Anodized Alum. Indicator track with single tracker follower or wide flag indication
3. Stainless Steel Indicator track with single tracker follower or wide flag indication
4. Top and bottom seals
5. Calibration scale (total inches, feet & inches, centimeters)
6. Chamber clamps
7. Identification Tag.

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Installation, Operation and Maintenance Instructions

Section 2.9.0. - Warranty

PRODUCT WARRANTY

Archon Industries Inc., warrants its products as designed and manufactured by Archon to be free of defects in material and workmanship for a period of one year after the date of installation or eighteen months after the date of manufacture, whichever is earliest. Archon will, at its option, replace or repair any products which fail during the warranty period due to defective material or workmanship.

Prior to submitting any claim for warranty service, the owner must submit proof of purchase to Archon and obtain written authorization to return the product. Thereafter, the product shall be returned to Archon in Suffern, New York, with freight prepaid.

This warranty shall not apply if the product has been disassembled, tampered with, repaired or altered outside of the Archon factory, or if it has been subjected to misuse, neglect or accident.

Archon's responsibility hereunder is limited to repairing or replacing the product at its expense. Archon shall not be liable for loss, damage, or expenses directly or indirectly related to the installation or use of its products, or from any other cause or for consequential damages. It is expressly understood that Archon is not responsible for damage or injury caused to other products, building, property or persons, by reason of the installation or use of its products.

THIS IS ARCHON'S SOLE WARRANTY AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED WHICH ARE HEREBY EXCLUDED,
INCLUDING IN PARTICULAR ALL WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This document and the warranty contained herein may not be modified and no other warranty, expressed or implied, shall be made by or on behalf of Archon unless modified or made in writing and signed by the President or a Vice President of Archon.

ARCHON INDUSTRIES, INC.

Pneumatic Level Control
Installation, Operation and Maintenance Instructions

Section 3.1.0. - Non Bleed, Block & Bleed Switches (MGS-100)

3.1.1. INTRODUCTION

MGS-100 pneumatic switches are designed for use on magnetic gauges only.
The MGS-100 is a non-bleed, block and bleed pneumatic switch that operates when the magnetic field of an ARCHON Industries magnetic float passes by it, either on a rising or falling level condition. Since there is no physical interaction or connection between the switch and float, it is very important that all installation instructions be followed properly for the switch to function reliably. Please read all installation and operation instructions before beginning installation.

3.1.2. OPERATING SPECIFICATIONS

Medium:	Filtered Air or Gas
Supply Pressure:	VAC to 200 PSIG
Max. Temp:	200 degrees F (93C)
Air Flow:	29 SCFM @ 100 PSIG
Air Consumption:	Zero SCFM

3.1.3. INSTALLATION

1. Loosen the included hose clamps completely and install them so they surround the gauge chamber. Reattach the clamp to itself, make 2 or 3 turns of the clamp's screw but do not reattach completely.

2. Insert the top "L" shaped bracket under the top hose clamp and tighten the clamp to the gauge chamber. The top bracket is the bracket above the front label if the writing is right side up. Before tightening, you may adjust the height at which you would like the alarm to trigger. The trigger point is at the midpoint of the enclosure.

3. Since the switch should be securely fastened to the gauge chamber by the top clamp, slide the bottom hose clamp over the bottom bracket and tighten the clamp to the gauge chamber.

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Pneumatic Level Control
Installation, Operation and Maintenance Instructions

Section 3.1.0. - Non Bleed, Block & Bleed Switches MGS-100

3.1.4. INSTALLATION - (cont.)

4. The alarm switch should be mounted so that it is level with the ground. If it is not level, loosen the hose clamps, adjust the switch's alignment, and when the switch is level, retighten the hose clamps. Improper alignment may cause the switch to malfunction.

5. The switch must also be flush and tighten against the chamber. Failure to do this results in vibration and rattling of the switch, which may in extreme circumstances cause the switch to fail.

6. No material should be present between the switch housing and the gauge chamber. Any material present can interfere with the magnetic field of the internal float and prevent proper activation of the switch.

3.1.6. OPERATION & MAINTENANCE

1. The pneumatic supply line must be connected to the connection labeled 1 OR 2 The output to the alarm or other signaling device must be connected to the connection labeled **PORT 3**.
2. **PORT 1** is the supply port that will activate the output when the float passes above the switch. Port 2 is the vent It is to be used as a *HIGH LEVEL* indicator.
3. **PORT 2** activates the output when the float passes below the switch. Port 1 is the vent It is to be used as a *LOW LEVEL* indicator.
4. All input and output connections are 1/4-inch NPT connections.
5. The muffler must remain uncovered and clean for proper non-bleeding functioning of the switch. If covered, the interior of the switch may pressurize and explode.
6. Pneumatic connections must provide air or gas that is free of particulate matter or debris. Dirty supply gas may cause the valve inside to clog and lead the switch to failure.
7. When the switch is first installed, **it is necessary to set the switch for normal operation**. This is accomplished by passing the float pass the switch, the chamber can be filled with liquid so the float will pass the highest switch and then drained, or by manually sliding the switch pass the float in both directions. If the switch is being positioned above the float, the float must pass in the down direction before installation and if the switch is positioned below the float.

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Pneumatic Level Control
Installation, Operation and Maintenance Instructions

Section 3.2.0. - Pneumatic Level Controller (LCP)

3.2.1. INTRODUCTION

The LCP Pneumatic Level Switch Controller provides supply and vent air control for two pneumatic switches used in a high and low point level application. The LCP is designed to be used with pneumatic switches on magnetic gauges only.

3.2.2. OPERATION

1. As the float rises past the high pneumatic switch level, it will supply air to the port P4 of the controller.

2. When port P4 has air supplied to it there will be a pneumatic signal out of port 2 of the controller. The pneumatic signal will continue until the float passes the low pneumatic switch.

3. The low switch will supply a signal to port P2 on the controller therefore shutting the pneumatic signal off. The output signal will stay off until the float rises past the high pneumatic switch.

4. The cycle will then repeat.

5. To reverse the output on the controller, connect the high pneumatic switch to port P2, and the low pneumatic switch to P4 on the controller.

ARCHON INDUSTRIES, INC

Installation, Operation and Maintenance Instructions

Section 4.1.0. – Electric Level Switches (MGS-200EX/MGS-200EX2)

4.1.1 INTRODUCTION

The MGS-200EX and MGS-200EX2 are hermetically sealed bistable-latching switches designed for magnetic gauges only. The MGS-200EX has single pole double throw contacts (SPDT) and the MGS-200EX2 has double pole, double throw contacts (DPDT). The switch will change state when the float passes by it in a rising or falling level condition. The switch remains in a latched position until the float passes the switch in the opposite direction.

4.1.2 SPECIFICATIONS

Maximum switching voltage:	150 VDC/VAC
Maximum switching current amps:	1.0 amps (VDC/VAC)
Maximum switching wattage:	25 watts (VDC/VAC)
Minimum breakdown volts:	250 VDC
Maximum Temperature (standard):	350 degrees F
Maximum Temperature (HT option):	650 degrees F
Dead Band:	0.35 inch

4.1.3 MOUNTING

The MGS-200EX/EX2 is mounted to the magnetic gauges chamber with all 316 Stainless Steel wormgear pipe clamps. Rod mounted switch assemblies are available as a factory installed option. Switch points can be changed at any time by loosening the clamps and sliding the switch vertically to the desired set point.

4.1.4 OPERATION

When the switch is first installed, it is necessary to set the switch for normal operation. This is accomplished by passing the float pass the switch, The chamber can be filled with liquid so the float will pass the highest switch and then drained, or by manually sliding the switch pass the float in both directions. If the switch is being positioned above the float, the float must pass in the down direction before installation and if the switch is positioned below the float.

ARCHON INDUSTRIES, INC

Electronic Level Control
Installation, Operation and Maintenance Instructions

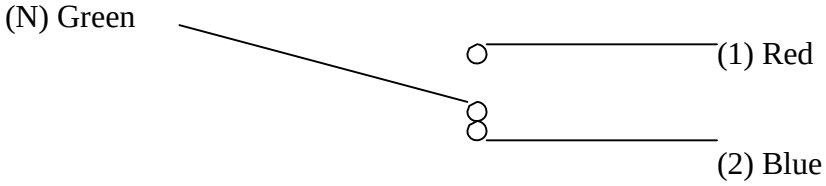
Section 4.3.0. – Electric Level Switches (MGS-200EX/MGS-200EX2)

4.1.5 ELECTRICAL WIRING – RISING LEVEL

N/O	Red	Terminal 1	Closes on rising level.
C	Green	Terminal N	
N/C	Blue	Terminal 2	Opens on rising level.

4.1.6 ELECTRICAL WIRING – FALLING LEVEL

N/C	Red	Terminal 1	Opens on falling level.
C	Green	Terminal N	
N/O	Blue	Terminal 2	Closes on falling level.



ARCHON INDUSTRIES, INC

Electronic Level Control
Installation, Operation and Maintenance Instructions

Section 4.2.0. – Electric Level Switches (MGS-500EX/MGS-500EX2)

4.2.1 INTRODUCTION

The MGS-500EX and MGS-500EX2 are hermetically sealed bistable-latching switches designed for magnetic gauges only. The MGS-500EX has single pole double throw contacts (SPDT) and the MGS-500EX2 has double pole, double throw contacts (DPDT). The switch will change state when the float passes by it in a rising or falling level condition. The switch remains in a latched position until the float passes the switch in the opposite direction.

4.2.2 SPECIFICATIONS

Maximum switching voltage:	500 VDC/VAC
Maximum switching current amps:	3.0 amps (VDC/VAC)
Maximum switching wattage:	100 watts (VDC/VAC)
Minimum breakdown volts:	1000 VDC
Maximum Temperature (standard):	350 degrees F
Maximum Temperature (HT option):	650 degrees F
Dead Band:	0.35 inch

4.2.3 MOUNTING

The MGS-500EX/EX2 is mounted to the magnetic gauge chamber with all 316 Stainless Steel wormgear pipe clamps. Rod mounted switch assemblies are available as a factory installed option. Switch points can be changed at any time by loosening the clamps and sliding the switch vertically to the desired set point.

4.2.4 OPERATION

When the switch is first installed, it is necessary to set the switch for normal operation. This is accomplished by passing the float pass the switch, The chamber can be filled with liquid so the float will pass the highest switch and then drained, or by manually sliding the switch pass the float in both directions. If the switch is being positioned above the float, the float must pass in the down direction before installation and if the switch is positioned below the float.

ARCHON INDUSTRIES, INC

Electronic Level Control
Installation, Operation and Maintenance Instructions

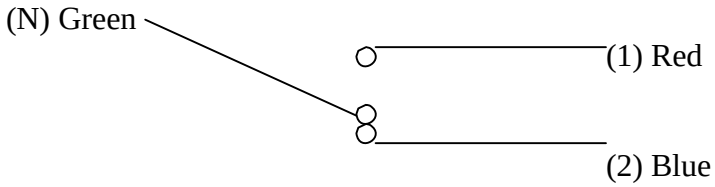
Section 4.2.0. – Electric Level Switches (MGS-500EX/MGS-500EX2)

4.2.5 ELECTRICAL WIRING – RISING LEVEL

N/O	Red	Terminal 1	Closes on rising level.
C	Green	Terminal N	
N/C	Blue	Terminal 2	Opens on rising level.

4.2.6 ELECTRICAL WIRING – FALLING LEVEL

N/C	Red	Terminal 1	Opens on falling level.
C	Green	Terminal N	
N/O	Blue	Terminal 2	Closes on falling level.



ARCHON INDUSTRIES, INC

Electronic Level Control
Installation, Operation and Maintenance Instructions

Section 4.3.0. – Electric Level Switches (MGS-700EX(/2),MGS-900EX2(/2))

4.3.1 INTRODUCTION

The MGS-700/900EX and MGS-700/900EX2 are bistable-latching switches designed for magnetic gauges only. The MGS-700/900EX has single pole double throw contacts (SPDT) and the MGS-700/900EX2 has double pole, double throw contacts (DPDT). The switch will change state when the float passes by it in a rising or falling level condition. The switch remains in a latched position until the float passes the switch in the opposite direction.

4.3.2 SPECIFICATIONS

	MGS-700EX(/2)	MGS-900EX(/2)
Maximum switching voltage:	250 VAC	250 VAC
Maximum switching current amps:	10.0 amps VAC	15.0amps VAC
Maximum switching wattage:	2500 watts VAC	3250 watts VAC
Maximum Temperature (standard):	350 degrees F	350 degree F
Maximum Temperature (HT option):	650 degrees F	650 degree F
Dead Band:	0.35 inch	0.35 inch

4.3.3 MOUNTING

The MGS-700EX/900EX,(/2) is mounted to the magnetic gauge chamber with all 316 Stainless Steel worm gear pipe clamps. The switch must be mounted with TOP facing up. Rod mounted switch assemblies are available as a factory installed option. Switch points can be changed at any time by loosening the clamps and sliding the switch vertically to the desired set point.

4.3.4 OPERATION

When the switch is first installed, it is necessary to set the switch for normal operation. This is accomplished by passing the float pass the switch, The chamber can be filled with liquid so the float will pass the highest switch and then drained, or by manually sliding the switch pass the float in both directions. If the switch is being positioned above the float, the float must pass in the down direction before installation and if the switch is positioned below the float.

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Electronic Level Control
Installation, Operation and Maintenance Instructions

Section 4.3.0. – Electric Level Switches (MGS-700EX(/2), MGS-900EX2(/2))

4.3.5 ELECTRICAL WIRING – RISING LEVEL

N/O	Red	Terminal 1(4)	Closes on rising level.
C	Green	Terminal 2(5)	
N/C	Blue	Terminal 3(6)	Opens on rising level.

4.3.6 ELECTRICAL WIRING – FALLING LEVEL

N/C	Red	Terminal 1(4)	Opens on falling level.
C	Green	Terminal 2(5)	
N/O	Blue	Terminal 3(6)	Closes on falling level.

*(#) DPDT