# Instruction Manual

**Series 3411LG: BPL**

# Magnetic Level Indicator

**Series 3411LG: BPL By-Pass Level Indicator Side mounted / Top mounted**

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# Section 1 Introduction

## 1.1 Product Description

STRATAA CONTROLS Magnetic Level Indicators (3411:LI Series) are built to be simple, rugged, reliable and cost-effective. STRATAA CONTROLS Indicators have basic features. but are precision engineered and manufactured to guarantee a long lifetime.
The STRATAA CONTROLS BPL models are higher end gauges offering a wider choice. of materials, special finishes, higher pressure and temperature ratings.

BPL models are widely used to replace sight and gauge glass indicators because. These often require more maintenance.

Optional switches and transmitters transfer the local level readings to a remote DCS/PLC system.

## Features

Display of liquid level for corrosive, toxic & Flammable media with separation from Measurement to indicating compartments.

Magnetic transmission of liquid level from Vessel to gauge is continuous & resistance to Vibration can be used for the level measurement for the atmospheric & pressurized. condition.

Great reliability at high temp. & pressure.

Great visibility of level even years after convenience to put contacts at different desired. levels can be coupled with the electronic transmitter giving 4 - 20ma output.

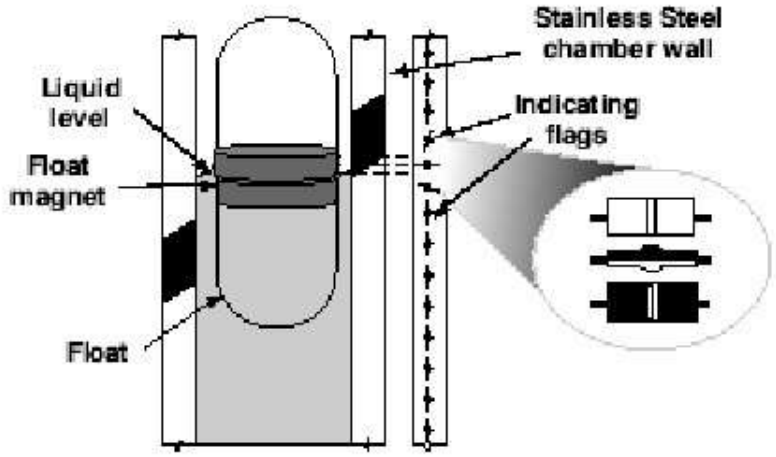
Enhanced security due to metallic chamber.

## Applications

Processing tanks
Tank farm
Custody transfer
Pharmaceutical & beverage plant
Chemical & fertilizer plant
Used for under grounds tanks (top mounted level indicator)

## 1.2 Principle Of Operation

The MLI (Magnetic Level Indicator) consists of a sealed bypass cage, a float. containing a magnet and a visual indicator rail with bi-colored flags or rollers that individually contain a magnet. The indicator rail is external mount on the cage and its flags/rollers are magnetically coupled/aligned with the magnet of the .oat. As the level changes, the .oat will follow, and its magnet will attract the magnets in these /rollers. This will cause the flags/rollers to rotate showing. their opposite-colored side. The same electro - magnetic coupling will activate /deactivate switches or change the output of an externally clamped transmitter. (optional).



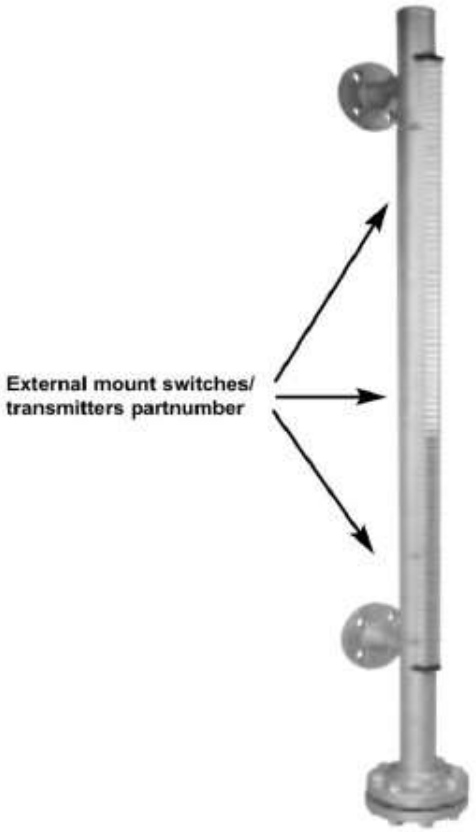
# Section 2 Installation

## 2.1 Unpacking

Unpack the instrument carefully. Make sure all components have been removed from the foam protection. Inspect all components for damage. Report any concealed damage to the carrier within 24 hours. Check the contents o f the carton/ crates against the packing slip and report any discrepancies to STRATAA CONTROLS INC.

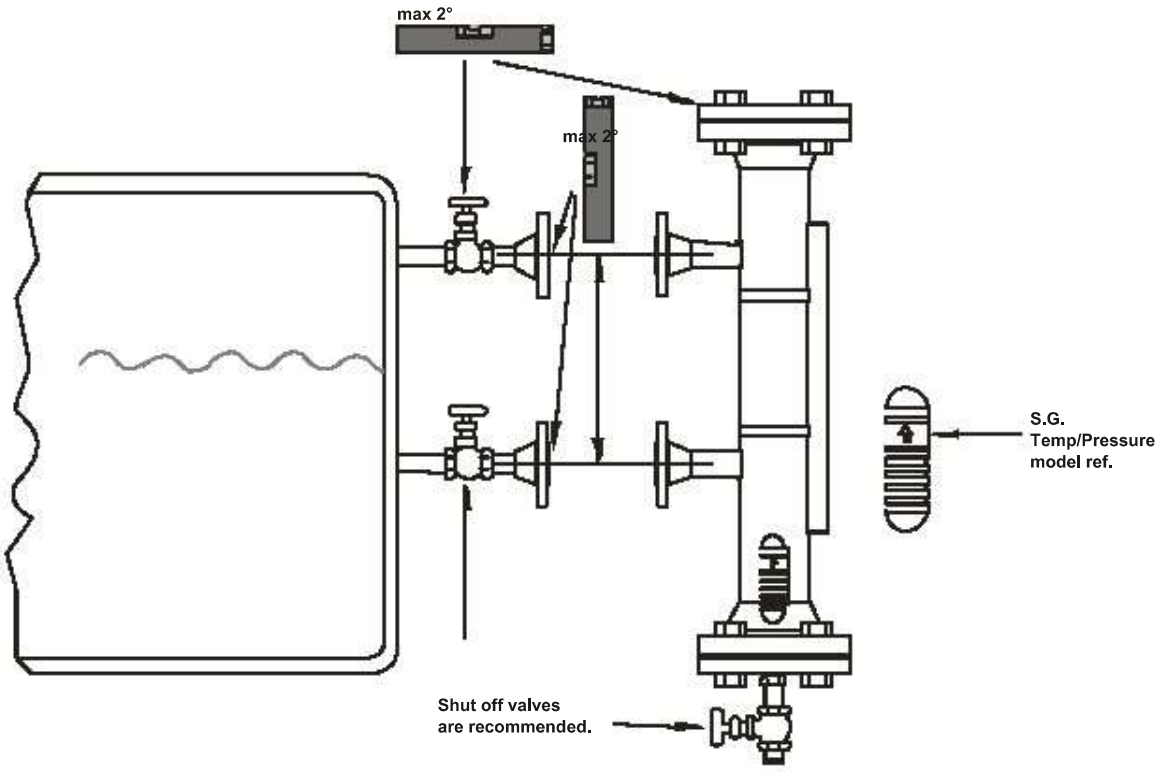
The BPL model number defines:
The Magnetic Level Indicator.
The Magnetostrictive transmitter and/or Switches : each of these components have their own model number.
Check and record the BPL Model number for future reference when ordering parts.

**Pre-installation checklist:**
Verify if the units' center to center distance equals the center to center distance of the vessel.
Locate the external mounted switches/transmitters.
Verify the float.




**CAUTION: When handling units with longer measuring range, assure that these are supported over the entire length to avoid bowing causing deformation / glass breakage.**

## 2.2 Mounting

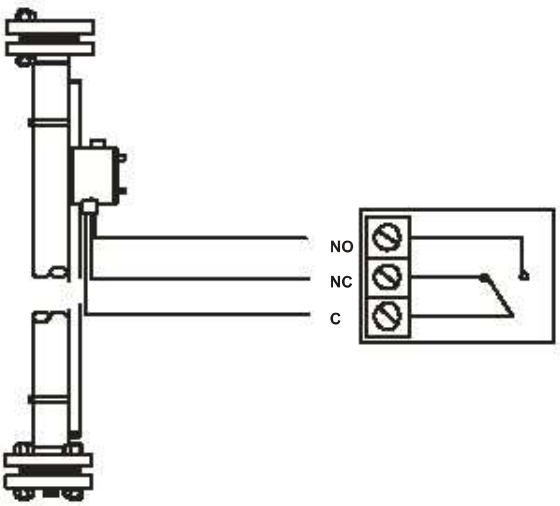



**CAUTION:** In case shut off valves are used, care must be taken when opening the valves to prevent a surge of fluid and gases through the chamber. A surge can cause the float to be propelled to the far end of the chamber, resulting in float damage.

## 2.3 Wiring

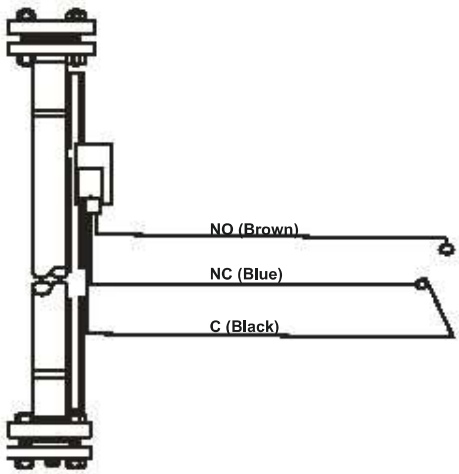
Hermetically sealed reed switch

**CAUTION: Power must be switched OFF before wiring the unit.**




Bi Stable micro switch

**CAUTION: Power must be switched OFF before wiring the unit.**




The switch will actuate slightly above the center of the unit and de-actuate slightly below the center of the unit. Make sure that the switches are always properly retightened on the indicator rail.

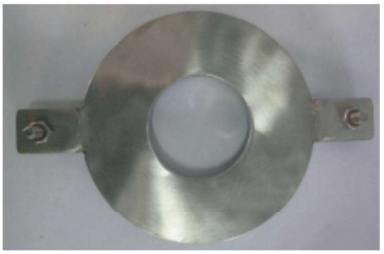
## 2.4 Maintenance

If the process liquid is clean (no solids or deposits), the MLI should require minimum maintenance. If the process liquid is dirty (solids and deposits), it is recommended that the external cage be isolated from the process and flushed periodically. For complete cleaning, after draining the unit, remove the bottom flange and float, inspect cage and .oat for build up and clean if required.

## Parts List

STILL WELL WITH FLOAT

END CAP



STILL WELL ADDITIONAL PORTION

MAGNET ASSEMBLY

TOP CHAMBER WITH INDICATING CHANNEL

STILL WELL RETAINING FLANGE

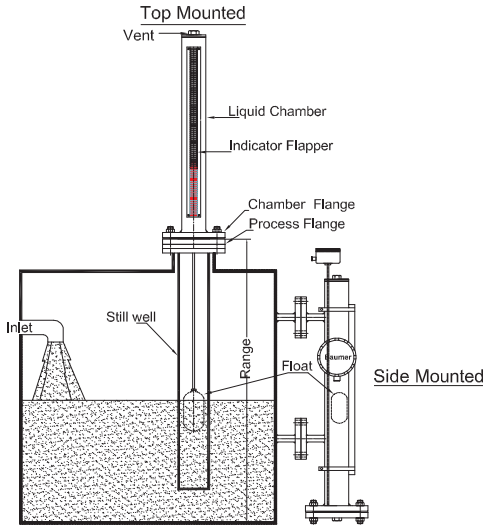
PTFE WASHER

NUTS & BOLTS

# Series 3411LG: BPL
# By-Pass Level Indicator
# Side mounted / Top mounted



## Mounting Type - Top or Side




## How To Order - Ordering Example: 3411LG: BPL.T.SS.T2.P2.F.F.T.2NPM.800mm.A.RW.2.ST

| Basic Model | 3411LG : BPL |
|---|---|

| Code | Mounting | Code | Mounting |
|---|---|---|---|
| T | Top | S | Side |

| Code | Wetted Parts | | |
|---|---|---|---|
| SS3 | Float / Chamber / Process Connection - AISI 304 SS | SSL | Float / Chamber / Process Connection - AISI 316L SS |
| SS | Float / Chamber / Process Connection - AISI 316 SS | PP | Float / Chamber / Process Connection - Polypropylene |
| IY | Chamber / Process Connection - Incoloy* | MON | Chamber / Process Connection - Monel# |

*For option code IY & MON - Titanium float

| Code | Temperature Range | | | | | | |
|---|---|---|---|---|---|---|---|
| T1 | 0 to 80°C* | T2 | -20 to 120°C (Standard) | T3 | -20 to 300°C | T4 | -20 to 400°C |

*For option code PP

| Code | Pressure Range | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| P1 | 0 to 3 kg/cm² * | P2 | 0 to 10 kg/cm² (Standard) | P3 | 0 to 35 kg/cm² | P4 | 0 to 50 kg/cm² | P5 | 0 to 110 kg/cm² # |

*For option code PP #For option code P5 - Titanium float

| Code | Gasket | Code | Gasket | Code | Gasket | Code | Gasket |
|---|---|---|---|---|---|---|---|
| F | CAF (Standard) | P | PTFE | G | Graphoil | SS3 | SS304 Spiral Wound Graphite Filler |

| Code | Top Side Vent | Code | Top Side Vent | Code | Top Side Vent |
|---|---|---|---|---|---|
| F | Welded Flat Top+Plug - ½" NPT (M) (Std) | I | Welded Flat Top + Valve - ½" NPT (F) | C | Customized Design (Non - Standard) |

| Code | Bottom Side Drain | Code | Bottom Side Drain |
|---|---|---|---|
| K | Dual Flange + Plug - ½"NPT (M) (Standard) | N | Dual Flange + Valve - ½" NPT (M) |
| T | Single Flanged (for Top Mounted) | C | Customized Design (Non - Standard) |

Note: Design and Specifications subject to change without prior notice.

# Series 3411LG: BPL
# By-Pass Level Indicator
# Side mounted / Top mounted



| Code | Process Connection | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Screwed Connections | | | | Flanged Connections (As per ANSI B 16.5) | | | | | |
| **2NPM** | ½" NPT (M) | **2BSM** | ½" BSP (M) | **B09** | ½" 150# RF | **B22** | 1" 300# RF | **B41** | 2" 600# RF |
| **2NPF** | 1/2" NPT (F) | **2BSF** | 1/2" BSP (F) | **B10** | 1/2" 300# RF | **B23** | 1" 600# RF | **B51** | 3" 150# RF |
| **34NPM** | 3/4" NPT (M) | **34BSM** | 3/4" BSP (M) | **B11** | 1/2" 600# RF | **B33** | 1½" 150# RF | **B52** | 3" 300# RF |
| **34NPF** | 3/4" NPT (F) | **34BSF** | 3/4" BSP (F) | **B15** | 3/4" 150# RF | **B34** | 1½" 300# RF | **B53** | 3" 600# RF |
| **1NPM** | 1"NPT (M) | **1BSM** | 1"BSP (M) | **B16** | 3/4" 300# RF | **B35** | 1½" 600# RF | **C33** | 4" 150# RF* |
| **1NPF** | 1"NPT (F) | **1BSF** | 1"BSP (F) | **B17** | 3/4" 600# RF | **B39** | 2" 150# RF | **C34** | 4" 300# RF* |
| **C** | Customized Design | | | **B21** | 1" 150# RF | **B40** | 2" 300# RF | **C35** | 4" 600# RF* |

Note : Screwed connection is applicable for Side Mounting only. * For Top Mounting option

| Code | Center To Center Distance |
|---|---|
| **XX** | Please specify in mm<br>(e.g. Write 800 for 800 mm Center to Center Distance) |

| Code | Material Of Scale | Code | Material Of Scale | Code | Material Of Scale |
|---|---|---|---|---|---|
| **A** | Aluminium (standard) | **S** | AISI 304 SS | **C** | Acrylic |

| Code | Indicator | Code | Indicator | Code | Indicator |
|---|---|---|---|---|---|
| **RW** | Bicolor Flappers (White & Red) | **BW** | Bicolor Flappers (White & Blue) | **CP** | Follower Capsule (Max 150°) |

| Code | No. Of Magnetic Switches | | | | | | |
|---|---|---|---|---|---|---|---|
| **1** | One | **2** | Two | **3** | Three | **4** | Four |

| Code | Magnetic Switch with Housing | | |
|---|---|---|---|
| **A** | SPST (Reed Switch, 1A 230 VAC) | **C** | SPDT (Micro Switch , Ex-proof IP66, 3A 230 VAC) |
| **B** | SPDT (Micro Switch , WP IP65 Housing, 3A 230 VAC) | **D** | SPDT (Bistable Switch , WP IP65 Housing, 5A 230VAC) |

| Code | Transmitter |
|---|---|
| **LT** | Transmitter With 4-20 mA Output |

| Code | Still Well (for Top Mounting) | | | | |
|---|---|---|---|---|---|
| **WC** | Still Well - Carbon Steel | **WS** | Still Well - AISI 304 SS | **WL** | Still Well - AISI SS 316 |

| Code | Options | Code | Options | Code | Options | Code | Options |
|---|---|---|---|---|---|---|---|
| **IV** | Isolation Valve | **MF** | Matching Flange | **ST** | SS Tag Plate | **MTC** | Material Test Certificates ** |

For non standard products / optional items, please contact factory for delivery and minimum quantity of order.
** Material test certificates will be provided for wetted parts only with chemical composition testing.
For others, please consult factory.



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# Section 3 Specifications

## 3.1 Physical Specifications

| Description | Specification |
|---|---|
| Measured value | Liquid level<br>Standard models : min S.G. 0.75 Density range |
| Measuring range | From 200 mm up to 3500 mm. Consult factory for longer lengths |
| Indicator | Engineered Plastic (blue/yellow) |
| Resolution | 10 mm (0.4") - height of flapper/roller |
| Scale (Optional) | In cm or tailor made in Polyester or Aluminum (at request) |
| Materials | Cage: stainless steel Float: 316 Ti SST (1.4571) Process flanges: stainless steel or carbon steel |
| Process connections | Threaded, Welded or flanged (ANSI/DIN) |
| Hydro test | 1,5 x operating pressure (without float) |

## Section 4 Troubleshooting

| Problem | Solution |
|---|---|
| Flags/Rollers do not rotate with level change. | Test flags/rollers with a magnet from bottom to top (magnet not included). If flags/rollers test O.K, check if float is present or for float obstruction (see maintenance). |
| Switch does not actuate with level change. | Check switch for continuity. Replace if damaged, if O.K, remove switch from piping column and test switch magnet assembly with re-alignment magnet, by moving magnet over the housing face. If the switch magnet assembly fails to respond, replace the switch. If the switch checks O.K, check float travel. |
| Reed transmitter does not track level. | Remove transmitter assembly from piping column and test with re-alignment magnet. Run magnet from bottom to top of reed chain. Check zero and span calibration. If no change in output, replace. |
| Flags/Rollers rotate at different height than actual level. | Float selected for different specific gravity. Replace float with a float with correct specific gravity rating. Confirm correctness of float orientation. Top is up. |
| Float inside the level gauge is moving slowly or not at all. | Make sure the MLI is levelled vertically.<br><br>The process fluid being measured may be too viscous and heat tracing may be required to make the material more fluid. Heat tracing can be purchased from the factory.<br><br>The specific gravity of the process fluid and the float weight may need to be reverified.<br><br>The liquid being measured may contain magnetic particles collecting on the magnetic section of the float causing drag.<br><br>Visual inspection of the float may be required to see if the float has collapsed. |
| Scale is at zero to the center of the bottom process connection, but the indicator is above or below zero. | The scale assembly is mounted to the chamber using stainless steel gear clamps. It can be easily adjusted in the field using a screwdriver. Make sure the scale zero is in line with the center of the process connection. |