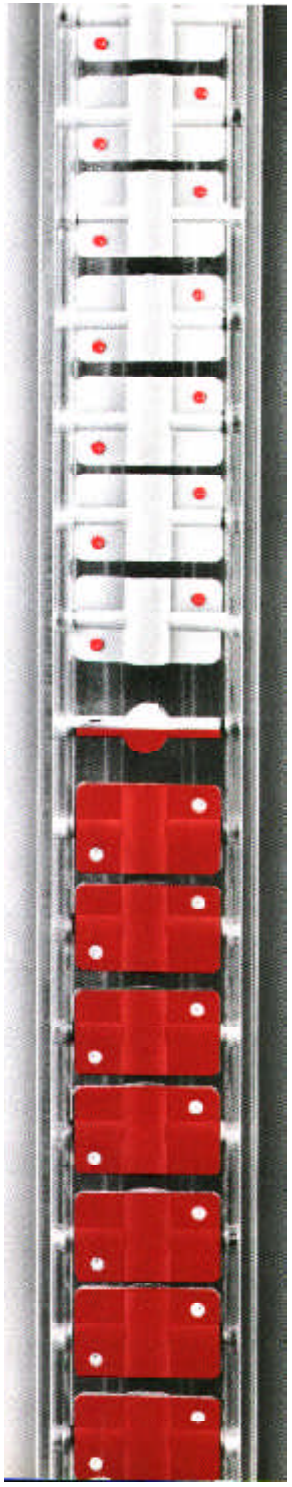
3. Troubleshooting

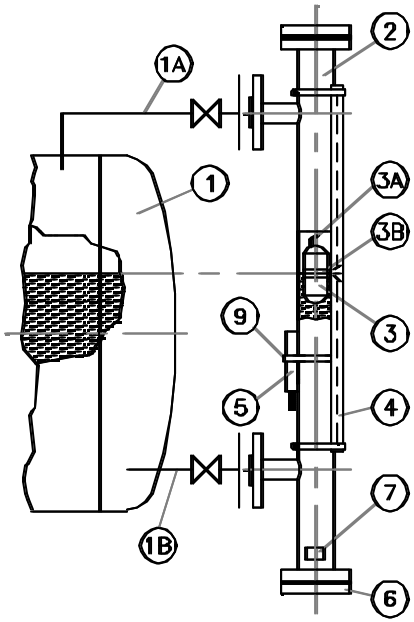
Problem	Possible reason	Remedy
No visual indication in spite of a sufficiently high liquid level in the vessel	- Process valves are shut off	- Open the process valves
	- Sticking of the float in standpipe	- Open service flanges and thoroughly clean gaugepipe and the float
	- Float leakage. Float has been filled up and drowned	- Float has to be replaced
	- Float is attracted by iron parts close to the level indicator.	- Remove all iron parts
Failure of magnet switches in spite of visual indication	- Switch wired incorrectly	- Compare wiring diagram with switch contact arrangement
	- Switch in wrong position	- Correct switch position cable up or down and opposite indication rail
	- Switch failure due to excessive temperature or electrical lead	- Replace switch. Check actual operating temperature and/or reduce switch load i.e. with an auxilliary relay.
Magnet switch does close but does not work	- Hysteresis between on and off position. The bar magnet cannot reach the 2nd switching point.	- Raise or lower the switch direction by 5 to 10mm so that the float magnet can reach the 2nd switching point.

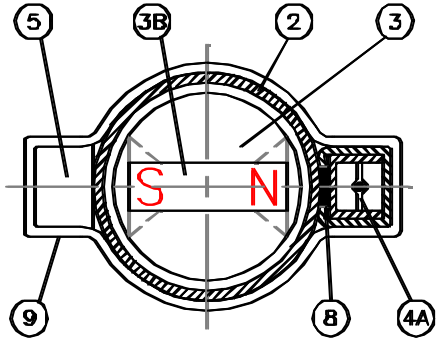
ABLE reserves the right to revise this publication from time to time and make changes to the content herein without obligation to notify any person of such revisions or changes.

ABLE Instruments & Controls Ltd.
Cutbush Park, Danehill, Lower Earley,
Reading, Berkshire, RG6 4UT.
Tel: +44 (0) 118 931 1188 Fax: +44 (0) 118 931 2161
Email: sales@able.co.uk Website:www.able.co.uk
Buy Online: www.247able.com

INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS
ABLE MAGNETIC LEVEL INDICATORS







1	Vessel
1A, 1B	Connecting pipes
2	Standpipe
3	Float
3A	Capillary tube
3B	Bar magnet
4	Indication Rail
4A	Indication Flaps
5	Magnetic switch
6	Float entry flange
7	Nameplate
8	Magnetic Tape
9	Connecting dip

1. Operating Principle

The vessel(1) is connected by two stand pipes 1A & 1B with the main gauge tube of the Magnetic Level Indicator.

The liquid in the MLI always seeks the same level as in the vessel being monitored. Fluid level changes are indicated on the Indication rail(4) which has red & white flaps (red for contents , white for air) via the magnetic coupling between the indication rail and the magnet inside the float.

The bar magnet's(3B) northern pole inside the float (3) always points to the indication rail due to the magnetic guide tape located beneath the indication rail. This self-aligning feature allows the arbitrary positioning of the rail through 360 Degrees according to the requirements of the application.

The indication flaps(4A) are interlocked by individual magnets in each of the flaps which ensures a stable indication under the most severe operating conditions i.e. Vibration or fast changes in liquid level.

The magnetic field of the bar magnet rotates the flaps through 180 degrees thus changing the colour and indicating the actual level inside the vessel.

The floats inside the Able Magnetic Level Indicators are specifically calibrated for the operating conditions , density , operating pressure and temperature of a specific application therefore ensuring that the inferred level is accurate and repeatable. Due this calibration, floats should not be interchanged between gauges. Always consult the factory prior to any changes.

The southern pole of the bar magnet located at 180 degrees to the indication rail is used to operate the switches or transmitters which are clamped onto the outside of the gauge tube.

For spare parts please note the serial number and part number located on the nameplate of the indicator prior to contacting the Factory.

2. Installation

Preparation

For Transportation purposes the float(3) of the Able Magnetic Level Indicator has been secured with a string which is attached to the lower side connection flange. Prior to installation this string has to be removed.
Place the Gauge in a horizontal position on a flat surface and remove the bottom float entry flange(6). Cut the securing string and pull the float out. Remove the string completely and re-insert the float with the capillary tube uppermost. Do not drop the float !!
Replace the bottom float entry flange(6) and tighten.

Mechanical Installation

Ensure that the mating flanges on the vessel, or piping, onto which the Level Indicator will be installed are completely flush. Excessive misalignment will cause bending and/or twisting of the nozzles on the Level Indicator, and the standpipe(2). Any misalignment can prevent the float operating correctly and should be avoided. Ensure that the Level Indicator is installed with the nameplate(7) reading the correct way up. The Level Indicator is connected to the end user's vessel, or piping, as part of an assembly. Therefore all safety devices, such as pressure limiting devices, temperature control devices and external fire protection devices, shall be installed by the end user, as part of the end user's overall assembly.
Where appropriate, the end user shall install personnel protection to safeguard against any hazard caused by the surface temperature of the Level Indicator. The gaskets, studs and nuts used to assemble the Level Indicator to the end user's vessel, or piping, shall be supplied by the end user.

Operation Start-up and shut-down should both be gradual in order to avoid any rapid pressure and temperature fluctuations. Rapid pressure and temperature fluctuations during normal operation should be avoided.

Maintenance- for any reason the float has to be removed from the main gauge tube, i.e. for cleaning, please ensure that the following is observed :

1. Ensure that the system is no longer under pressure.
2. Ensure that the system has cooled to an ambient temperature.
3. The float must be reinstalled with the capillary tube uppermost.
4. The bottom float entry flange gasket must be replaced with a new gasket.

Electrical Installation

Maximum switch ratings of Able Magnetic Switches are indicated on the switch label. Under no circumstances must this rating be exceeded.

The switches are preferably installed opposite the indication rail. In the event whereby switches are required to have a very small short switching distance between them, they may be positioned next to each other provided that they are within a 45 degree angle opposite the indication rail.

If the indication rail is adjusted, ensure that the switches are adjusted correspondingly.

The operating principle of the Able Magnetic Level Gauges is based on the bar magnet field. Under no circumstances should iron particles such as screws, mounting brackets, bolts etc. be located in the vicinity as these will adversely disrupt the operation.

IMPORTANT : Do not exceed the design temperatures or pressures shown on the nameplate.