



# VIZUAL®

## Installation and Operating Manual

### For the Magnetic Level Indicator (MLI)

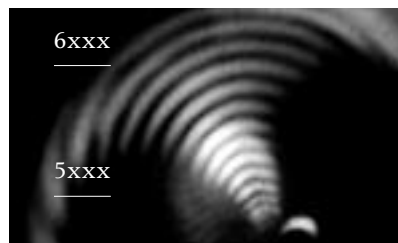


*Magnetic*

*Level*

*Indication*

7xxx



6xxx

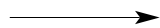
5xxx

4xxx

3xxx

2xxx

1xxx



**Magnetrol®**

## 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 of the carton/crates against the packing slip and report any discrepancies to Magnetrol. Check the nameplate model number (Model number/approvals as per inserted separate sheet) to be sure it agrees with the packing slip and purchase order.

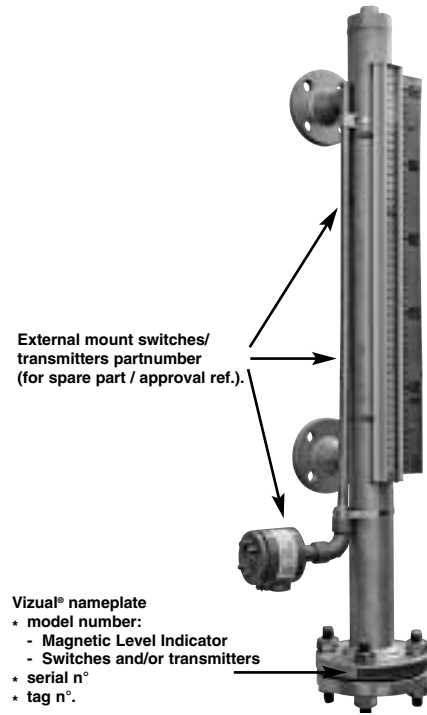
The Vizual® model number defines:

- The Magnetic Level Indicator.
- The Vizual® transmitter and/or switches: each of these components have their own model number that refers to their own approvals (as per separate inserted documents).

Check and record the Vizual® serial number for future reference when ordering parts.

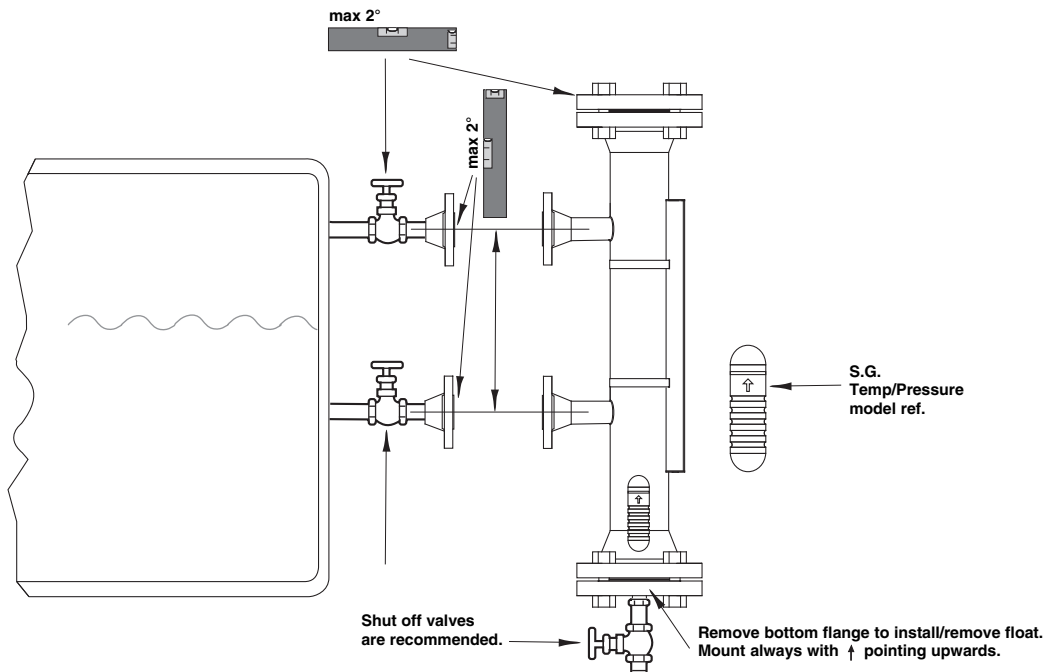
### Pre-installation checklist:

- Verify if the units' center to center distance equals the center to center distance of the vessel.
- Locate the external mounted switches/transmitters.
- Locate the float – separately packed.



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

## MOUNTING – Magnetic Level Indicator

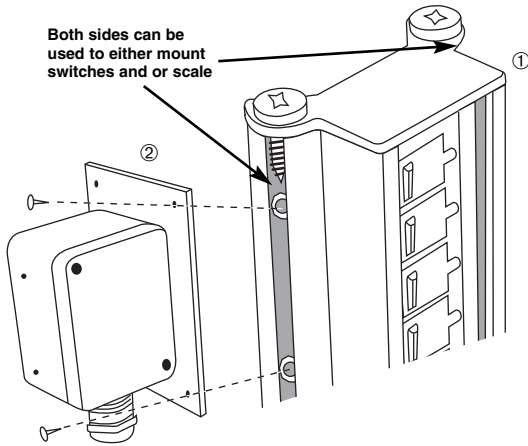


**Note:** The float is packed separately to protect against transport damage.

**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.

## MOUNTING – Magnetic Level Indicator

### Assembly guidelines – switches/scale

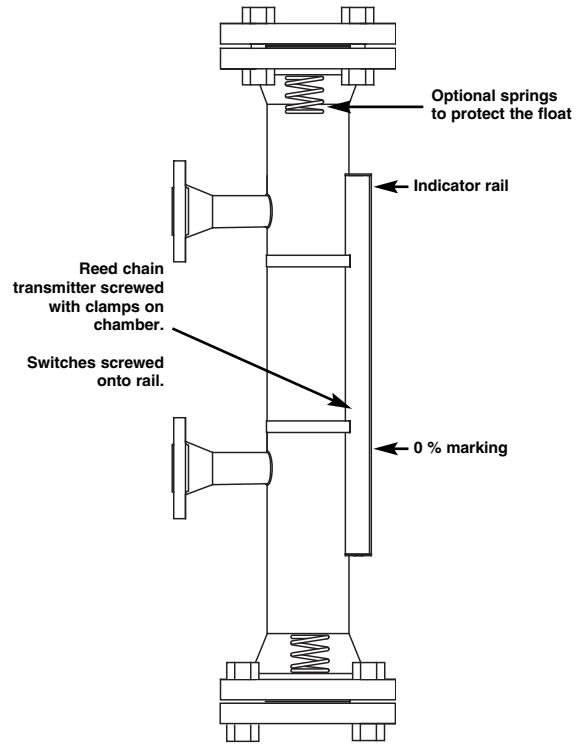


- ① Remove top cap to insert additional nuts.
- ② Fix switches at the desired switching point (see switching point marked on switch).

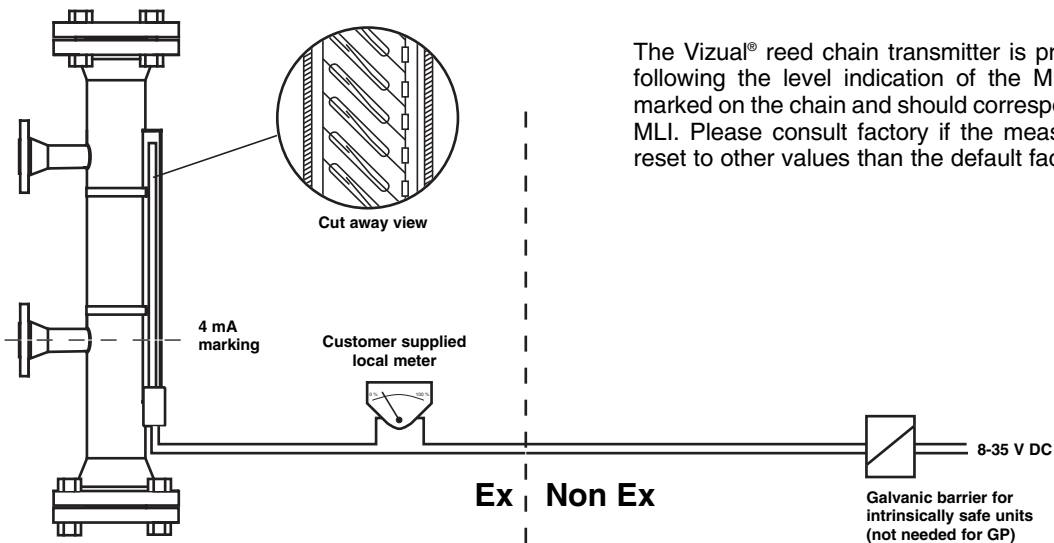
Switches/transmitter and scale can easily be screwed on the indicator rail. Simply, slide the fastening screws down on the rail to the desired location and fasten with the locking screws.

**IMPORTANT:** Floats are designed as per operating conditions. It might occur that the float indication is incorrect at the time of start up under ambient conditions.

### Assembly guidelines – transmitter



## WIRING – Transmitter



The Vizual® reed chain transmitter is pre-calibrated from factory following the level indication of the MLI. The 4 mA setting is marked on the chain and should correspond to the marking on the MLI. Please consult factory if the measuring span needs to be reset to other values than the default factory settings.

Only terminals for + and - should be used for wiring up the device in the field. Terminals 3, 4, 5 and 6 are for factory use only.

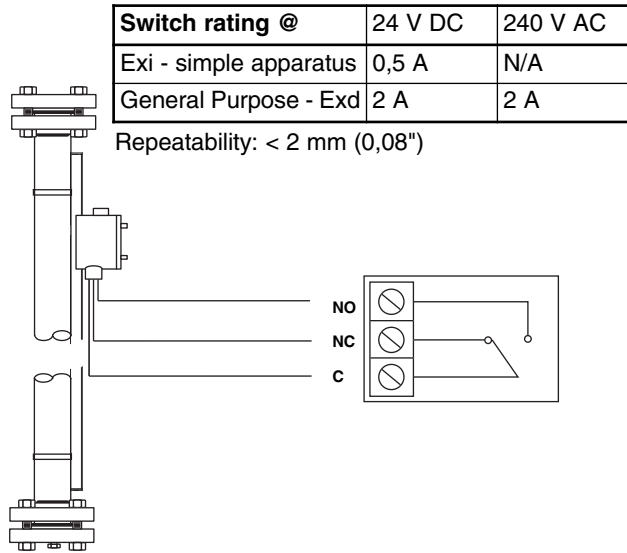
## WIRING – Switches

**Hermetically sealed and vibrating resistant 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.

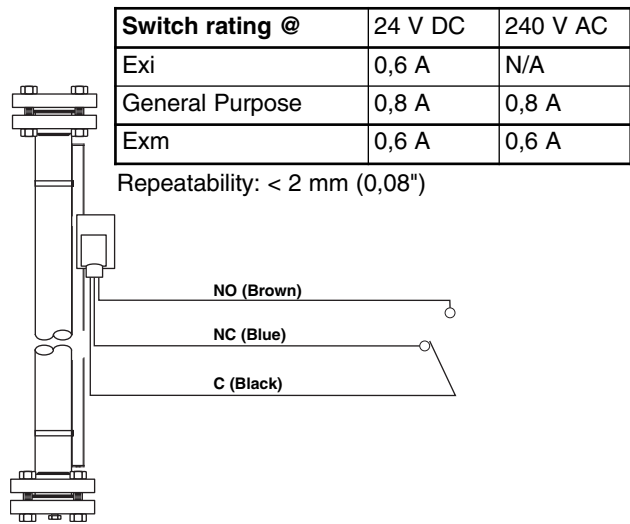


**Bi Stable reed switch**

**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.

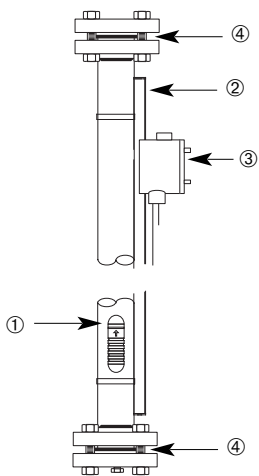
Make sure that the switches are always mounted as close as possible to the indicator rail.



## 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 float for build up and clean if required.

## REPLACEMENT PARTS



Item		Part number	
1	Float – provide S.G, model code on float and serial n° of MLI	–	
2	Indicator rail	Consult factory	
3	Switches	Micro switches	
		General Purpose	048-8510-003
		Exi simple apparatus	048-8510-001
	Exd	048-8508-001	
	Reed switches	General Purpose	048-8509-002
		Exi	048-8509-001
Exm		048-8507-001	
4	Transmitter Last 3 digits specify measuring range in 1 cm increments	General Purpose	039-4052-xxx
		Ex i	039-4053-xxx
		Exd	039-4054-xxx
4	Body gasket	150 lbs	012-1301-027
		300/ 600 lbs	012-1301-028

## TROUBLESHOOTING

Problem	Solution
Flags do not rotate with level change.	Test flags with a magnet from bottom to top (magnet not included). If flags 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 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.	<p>Make sure the MLI is levelled vertically.</p> <p>The process fluid being measured may be too viscous and heat tracing may be required to make the material more fluid.</p> <p>The specific gravity of the process fluid and the float weight may need to be reverified.</p> <p>The liquid being measured may contain magnetic particles collecting on the magnetic section of the float causing drag.</p> <p>Visual inspection of the float may be required to see if the float has collapsed.</p>
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.

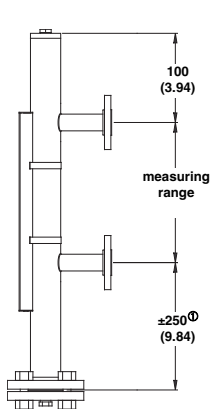
## PHYSICAL SPECIFICATIONS

Description	Specification
Measured value	Liquid level and liquid-liquid interface
Density range	Standard models: min S.G. 0,56 - max S.G. 1,5 - Consult factory for different S.G.'s Interface units: min. S.G. difference between upper and lower liquid > 0,1 (consult factory for smaller differences)
Measuring range	From 30 cm (12") up to 570 cm (224"). Consult factory for longer lengths
Indicator	≤ +250 °C (+480 °F): Polycarbonate window / aluminium rail / SST flags > +250 °C (+480 °F): Glass window / aluminium rail / SST flags Red-white flags (optional float failure warning: blue-white)
Resolution	10 mm (0.4") - height of flapper
Scale (Optional)	In cm or tailor made (at request) in 304 stainless steel
Materials	Cage/Flanges: 316/316L stainless steel Float: 316 Ti SST (1.4571) standard. Titanium for custom made floats
Process connections	Threaded, socket welded or flanged (ANSI - EN/DIN)
Design standards	In compliance to PED regulations and essential safety requirements
Hydro test	1,5 x operating pressure (without float)

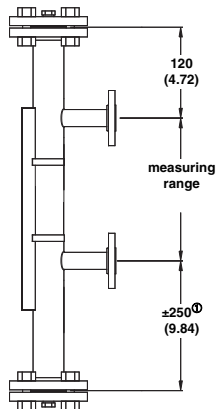
# ELECTRICAL SPECIFICATIONS

Description		Specification		
Switch ratings	Micro switch	24 ... 240 V AC / V DC	0,5 A / 30 V A / 20 W	- Exi (simple apparatus)
		240 V AC	2 A / 100 V A / 40 W	- General Purpose / Exd
	Reed switch	24 ... 240 V AC / V DC	0,8 A / 60 V A / 40 W 0,6 A / 45 V A / 45 W	- General Purpose - Exm/Exi
Switch Repeatability		< 2 mm (0.08")		
Signal output	Switches	SPDT micro-switches (optional DPDT), bi-stable SPDT reed switches		
	Transmitter	8-30 V DC Loop powered transmitter: reed chain type: 4-20 mA output (opt. HART®) Accuracy: < 5 mm.		
Approvals		LRS (marine applications) ATEX II 1G EEx ia II C T6, intrinsically safe (for reed chain transmitters) ATEX II 2G EEx d II C T6, explosion proof (for micro switches) ATEX II 2G EEx ia II C T6, intrinsically safe (for reed switches) ATEX II 2G EEx m II C T6 (for reed switches)		
Temperature ranges	Micro switch	-50 °C to +380 °C (-55 °F to +715 °F) – General Purpose / Exi (simple apparatus) -50 °C to +300 °C (-55 °F to +570 °F) – Exd		
	Reed switch	-25 °C to +75 °C (-10 °F to +165 °F) – General Purpose -25 °C to +85 °C (-10 °F to +185 °F) – Exm/Exi		
	Reed chain transmitter	-40 °C to +150 °C (-40 °F to +300 °F) – General Purpose -40 °C to +120 °C (-40 °F to +250 °F) – Exi/Exd (higher temp. at request)		
Housing	Micro switch	IP 65, Aluminium with M20 x 1.5 cable entry (cable gland incl.) – GP/Exi (simple apparatus) IP 65, Cast aluminium with dual 3/4" NPT cable entries – Exd		
	Reed switch	IP 67, Polyamide with flying leads (5 m of cable included) – General Purpose IP 67, Cast aluminium with flying leads (5 m of cable included) – Exm/Exi		
	Reed chain transmitter	IP 67, ABS with M16 x 1.5 cable entry (cable gland included) – General Purpose / Exi IP 65, Cast aluminium with 1/2" NPT cable entry – Exd		

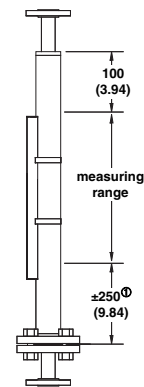
# MOUNTING CONFIGURATIONS AND DIMENSIONS in mm (inches)



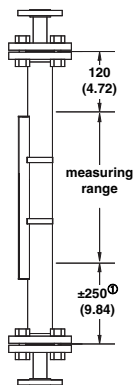
**GS Type**  
Side-side



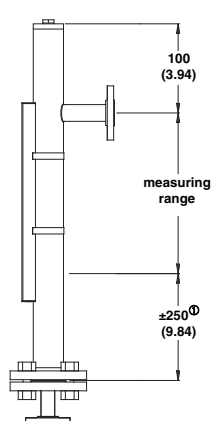
**GR Type**  
Side-side



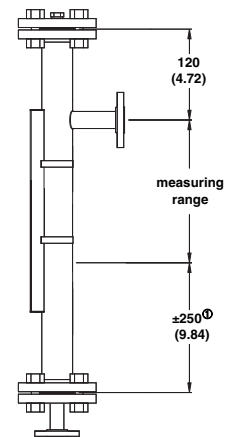
**GT Type**  
Top-Bottom



**GU Type**  
Top-Bottom



**GA Type**  
Side-Bottom



**GB Type**  
Side-Bottom

① Depending float size.

## MODEL IDENTIFICATION

A complete measuring system consists of:

- Code for Vizual® MLI cage (for modified models or adders, put an "X" in front of the closest matching order code and specify the modifications separately. E.g. XGSD-H23F-120 X = with material certification EN 10204-3.1
  - Always specify operating temperature/ pressure/ S.G. and viscosity if > 80 cP
  - Code for options:
    - Reed chain transmitter / Micro-switches / Bi-stable (reed type) switches: consult factory
    - Scale: standard 304 stainless steel
- Code: **032-3930-xxx**: scale in cm. Consult factory for tailor made scales  
 3-last digits represent the measuring range in cm increments (e.g. 120 = 120 cm)

BASIC MODEL NUMBER - ANSI CLASS CAGES IN 316/316L (1.4401/1.4404) - FLANGES AND CAGE

G A	Side/bottom process connection with sealed top cap
G B	Side/bottom process connection with flanged top
G S	Side/Side process connection with sealed top cap
G R	Side/Side process connection with flanged top
G T	Top/bottom process connection with sealed top cap
G U	Top/bottom process connection with flanged top

SPECIFIC GRAVITY RANGE AND FLOAT HYDROTEST PRESSURE<sup>①</sup>

**ALWAYS SPECIFY EXACT OPERATING S.G, max temp & pressure when ordering Vizual**

Hydrotest 36 bar @ +40 °C		Hydrotest 52 bar @ +40 °C		Hydrotest 85 bar @ +40 °C	
A	0,56 to 0,60	F	0,58 to 0,61	M	0,62 to 0,70
B	0,61 to 0,70	G	0,62 to 0,70	N	0,71 to 0,80
C	0,71 to 0,80	H	0,71 to 0,80	O	0,81 to 0,90
D	0,81 to 0,90	J	0,81 to 0,90	P	0,91 to 1,50
E	0,91 to 1,50	K	0,91 to 1,50		

<sup>①</sup> Consult factory for low S.G, interface applications or high pressure floats

MATERIALS OF CONSTRUCTION

**CAGE & FLANGES:** 316/316L (1.4401/1.4404) – **FLOAT:** 316 Ti (1.4571) except code A: Titanium

	Indication rail without scale <sup>①</sup>	Temperature range
H	Aluminium rail / SST flappers / Polycarbonate window	-20 °C upto +160 °C (-5 °F upto +320 °F)
J	Aluminium rail / SST flappers / Polycarbonate window	-50 °C upto +125 °C (-60 °F upto +260 °F)
K	Aluminium rail / SST flappers / Polycarbonate window	-20 °C upto +200 °C (-5 °F upto +390 °F)
L	Aluminium rail / SST flappers / Polycarbonate window	-20 °C upto +250 °C (-5 °F upto +480 °F)
M	Aluminium rail / SST flappers / Glass window	-20 °C upto +300 °C (-5 °F upto +570 °F)
N	Aluminium rail / SST flappers / Glass window	-20 °C upto +350 °C (-5 °F upto +660 °F)
P	Aluminium rail / SST flappers / Glass window	-20 °C upto +400 °C (-5 °F upto +750 °F)

<sup>①</sup> See options for scales

PROCESS CONNECTION: SIZE

0	1/2"
1	3/4"
2	1"
3	1 1/2"
4	2" <sup>①</sup>

Z	DN 15
A	DN 20
B	DN 25
C	DN 40
D	DN 50 <sup>①</sup>

<sup>①</sup> 2"/DN 50 process flanges are machined to 1" size

PRESSURE RATING - FLANGE TYPE (if applicable)

**ANSI**

3	150 lbs - RF flange
4	300 lbs - RF flange
5	600 lbs - RF flange

**EN/DIN**

A	PN 16	EN 1092-1 B1 flange
B	PN 25/40	EN 1092-1 B1 flange
D	PN 63	EN 1092-1 B2 flange
E	PN 100	EN 1092-1 B2 flange

PROCESS CONNECTION: STYLE

N	NPT-F coupling (size: max 1")
S	Socket weld coupling (size: max 1")
F	Flanged (all sizes)

MEASURING RANGE (as per drawings at left page) – per 1 cm (0.39") increments

0 3 0	minimum 30 cm (12")
5 7 0	maximum 570 cm (224")

Note: segmented cage for lengths > 570 cm (224"), consult factory

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**complete code for Vizual® Magnetic Level Indicator**

# IMPORTANT

## SERVICE POLICY

Owners of Magnetrol products 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. Magnetrol International will repair or replace the control, at no cost to the purchaser, (or owner) **other than transportation cost** if:

- a. Returned within the warranty period; and,
- b. The factory inspection finds the cause of the malfunction to be defective material or workmanship.

If the trouble is the result of conditions beyond our control; or, is **NOT** covered by the warranty, there will be charges for labour 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, labour, direct or consequential damage will be allowed.

## RETURNED MATERIAL PROCEDURE

So that we may efficiently process any materials that are returned, it is essential that a "Return Material Authorisation" (RMA) form will be obtained from the factory. It is mandatory that this form will be attached to each material returned. This form is available through Magnetrol's local representative or by contacting the factory. Please supply the following information:

1. Purchaser Name
2. Description of Material
3. Serial Number and Ref Number
4. Desired Action
5. Reason for Return
6. Process details

All shipments returned to the factory must be by prepaid transportation. Magnetrol **will not accept** collect shipments.

All replacements will be shipped FOB factory.

UNDER RESERVE OF MODIFICATIONS

BULLETIN N°: BE 46-637.2  
EFFECTIVE: APRIL 2007  
SUPERSEDES: March 2004



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