

DESCRIPTION

Atlas™ is a high performance magnetic level indicator (MLI) for level, interface or level and interface measurement. Atlas™ is a single chamber design available in twelve basic configuration styles, including top mount models. Atlas MLI's offer a wide choice of materials of construction, process connections and sizes. Only the most popular choices are published. Consult factory for choices not listed in this bulletin.

Atlas™ may be equipped with the external mount Jupiter®, magnetostrictive transmitter; consult bulletin BE 46-138, or with an Eclipse® Guided Wave radar in an enlarged cage; consult Eclipse Aurora® bulletin BE 57-138.

The basic MLI version of Atlas™ is Vizual®; consult bulletin BE 46-137.

FEATURES

- Precision manufactured float with multiple magnets and flux ring for an optimum Gauss rating.
- Indication rail filled with inert gas for elimination of condensation and a clear read off under all conditions.
- Rubber seal protects the glass of the indicator against heavy vibration and handling.
- Flags are designed with mechanical stop for stable indication of fast varying level changes.
- Shuttle followers for level and interface indication.
- Stainless steel flags in aluminium or stainless steel (optional) indication rail.
- 1/2" NPT vent and drain.
- Max hydrotest pressure of the float: 62 bar (900 psig) - higher pressure at request.
- Min operating process temperature: -50 °C (-60 °F) standard, down to -196 °C (-320 °F) at request.
- Max operating process temperature up to + 540 °C (up to +1000 °F) with factory supplied insulation.
- S.G. range as low as 0, 49 kg/dm³ (lower S.G. at request).
- Bottom and top spring protection of the float avoids float damage during transport, maintenance and surging/ flashing conditions.
- Options:
 - high and low temperature options
 - stainless steel scale for level or volume
 - Jupiter magnetostrictive transmitter.

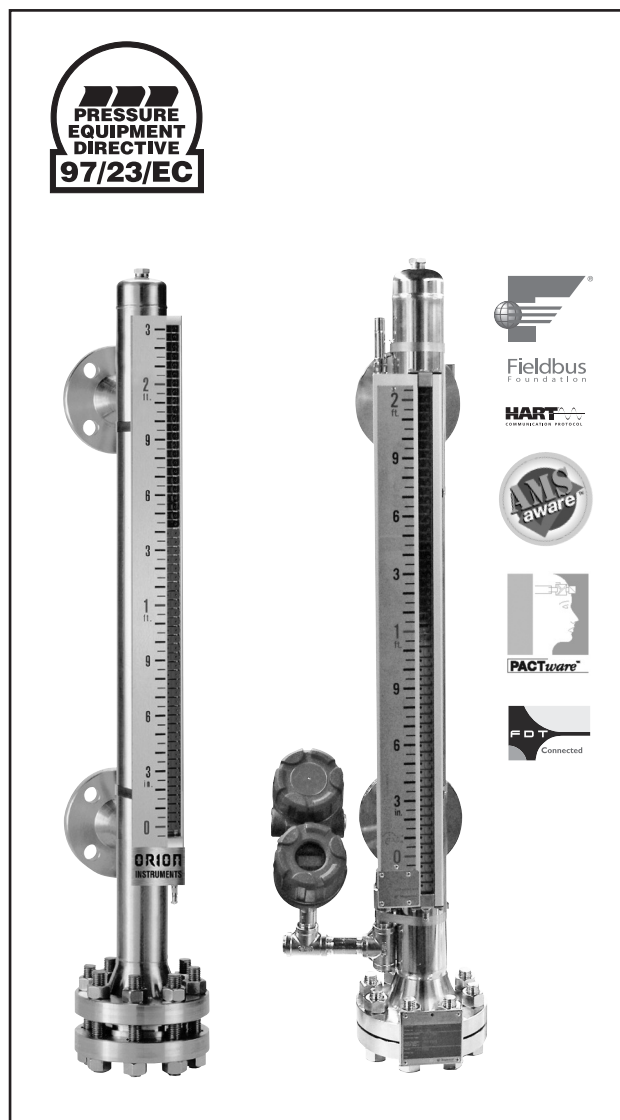
APPLICATIONS

MEDIA: Clean liquids with a density ≥ 0,49 kg/dm³ incl. aggressive, toxic and flammable liquids / liquified gases.

VESSELS: Most process and storage tanks up to rated operating pressure and process temperature.

FUNCTION: Continuous liquid level or liquid-liquid interface indication.

12 Configuration styles



AGENCY APPROVALS

Agency	Approvals ^①
ATEX Ex	II 1 G EEx ia IIC T4, intrinsically safe II 1 G EEx ia IIC T4, FISCO – FF intrinsically safe II 1 / 2 G EEx d IIC T6, explosion proof
FM/CSA ^{②③}	Non Incendive / Intrinsically safe / Explosion proof
LRS	Lloyds Register of Shipping (marine applications) (pending)
RosTECH/FSTS GOST-K/GGTN-K	Russian Authorisation Standards (pending)

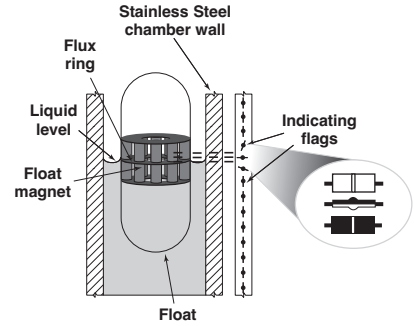
^① Applicable for the Jupiter transmitter

^② Consult factory for proper partnumbers

^③ Applicable for the Jupiter transmitter and the OES/ORS switches.

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-coloured flags that individually contain a magnet. The indicator rail is external mount on the cage and its flags are magnetically coupled/aligned with the magnet of the float. As the level changes, the float will follow and its magnet will attract the magnets in the flags. This will cause the flags to rotate showing their opposite coloured side. The same electro-magnetic coupling will activate/deactivate switches or change the output of an externally clamped on magnetostrictive transmitter.



JUPITER®

Jupiter magnetostrictive transmitters are very accurate level transmitters that can be externally mounted onto an Atlas MLI. The unit generates a low energy pulse that travels over the length of the magnetostrictive wire inside the guide tube of the transmitter. A return signal is generated from the precise location where the electro-magnetic field of float of the Atlas MLI intersects the wire. The unit measures the time-of-flight of the return signal and converts the liquid level, interface level or both levels to a mA output signal. Jupiter is compatible with HART®, AMS, PACTware™-FDT and FOUNDATION™ Fieldbus communication. The transmitter is not affected by process variables and can be easily removed/ installed under operating conditions.

For more details – consult bulletin BE 46-148.



AURORA™

Aurora® is the innovative combination of the Eclipse® Guided Wave Radar and a Magnetic Level Indicator (MLI). The MLI indicator rail offers the Eclipse a highly visible level indication that may obsolete the need for local indicators. The integration of these two independent technologies provides an excellent redundancy in one integrated design. With Aurora®, it is even possible to plan maintenance ahead. Maintenance becomes needed when buildup in an installation has surpassed the allowable limit. Buildup on the float inside the MLI cage will force it to sink deeper in the liquid while the measurement of the Eclipse will not see any buildup until its both lead elements are completely clugged. In this way, the float will indicate a lower level versus the real level measured by the Eclipse. The degree of deviation between both read outs is a worthwhile tool to determine the real need for maintenance.

For more details – consult bulletin 57-138.



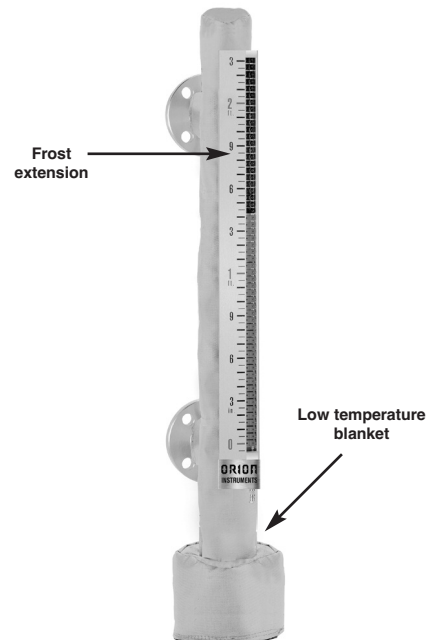
TEMPERATURE OPTIONS

HIGH

Magnetic level indicators can be ordered with several different tracing options to heat the external chamber. Tracing systems sometimes require that a special insulation blanket (custom designed to meet the customer's specifications) cover the entire chamber and tracing equipment.

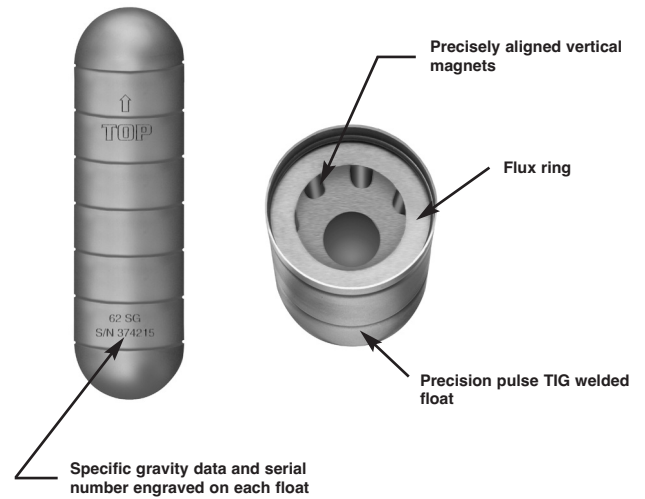
LOW

To facilitate operation where the product is kept cold via chillers, refrigerants and condensers, a frost extension option and low temperature insulation are offered. The frost extension is constructed of durable acrylic plastic and suitable for contact with media as cold as -196 °C (-320 °F) such as liquid nitrogen.



FLOAT

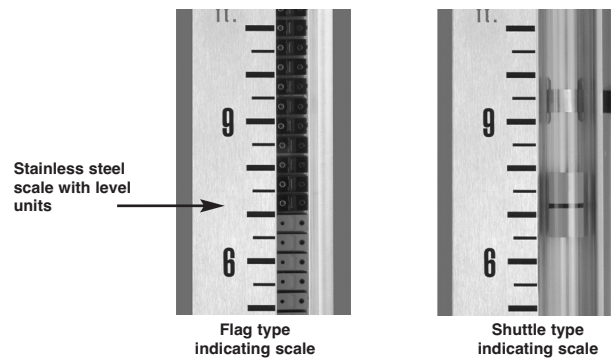
Manufactured from a wide range of alloys, including Titanium, the float is precision welded by a pulse TIG process. Within the float are high strength magnets precisely aligned and held in place with a retainer ring that assures a uniform 360° magnetic field and gauss rating. The magnets are designed for long-term service even in elevated temperatures and pressures.



INDICATING SCALE AND INDICATORS

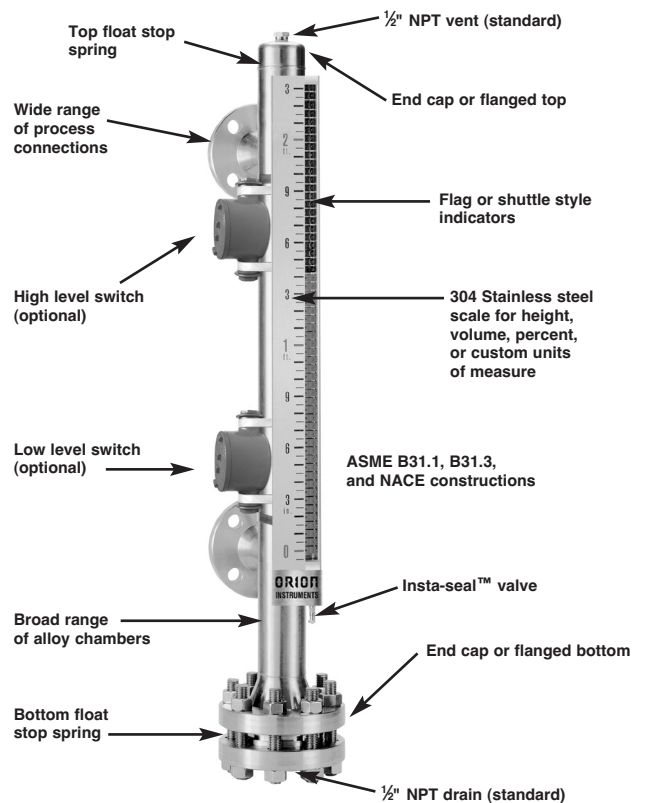
The indicating scale is standard in 304 SST for displaying a variety of engineering units of measure. This scale is mounted in adjacent to the indication rail and shows level, volume or % of span. Custom-made scales are available at request.

Two types of indicators exist: flags or shuttles. The flags are SST and available in 3 bi-colour options: red/white, black/ orange or Black/yellow. The orange shuttles are strictly used for dual measurement (level and interface) applications.



ATLAS

The Atlas MLI is a premium gauge with many standard features on board. The indicator rail is filled with inert gas to eliminate condensation. A rubber insert seals off the rail from the outside and protects the glass against handling and vibration.



SELECTION DATA

A complete measuring system consists of:

- Order code for ATLAS™ MLI (for modified models or adders, put an "X" in front of the closest matching order code and specify the modifications separately. E.g. XAAA-1AJR-2B0/200 X = with material certification EN 10204-3.1
- Order code for Jupiter external mount transmitter – consult bulletin BE 46-148

Note: many selections are not published – consult factory for options not enlisted.

BASIC MODEL NUMBER -

ANSI chambers

A A	Atlas - 150 lbs chamber class rating
A B	Atlas - 300 lbs chamber class rating
A C	Atlas - 600 lbs chamber class rating
A D	Atlas - 900 lbs chamber class rating
A E	Atlas - 1500 lbs chamber class rating
A F	Atlas - 2500 lbs chamber class rating

Consult factory for EN/DIN flanged units up to 320 bar

MATERIALS OF CONSTRUCTION

A	316/316L SST (1.4401-1.4404)
K	Hastelloy® C (2.4819)

CHAMBER MOUNTING CONFIGURATION

	Process Connection	Top	Bottom
1	side/side	End cap	RF slip-on with blind flange
2	side/side	RF slip-on with blind flange	End cap
3	side/side	RF slip-on with blind flange	RF slip-on with blind flange
4	side/side for interface	End cap	RF slip-on with blind flange
5	top/bottom	RF slip-on flange	RF slip-on flange
6	top/bottom with spool pieces	RF slip-on flange	RF slip-on flange
7	top mounted	n/a	RF slip-on flange
8	top mounted with stilling well	n/a	RF slip-on flange
A	side/side	End cap	RF weldneck with blind flange
B	side/side	RF weldneck with blind flange	End cap
C	side/side	RF weldneck with blind flange	RF weldneck with blind flange
D	side/side for interface	End cap	RF weldneck with blind flange

PROCESS CONNECTION SIZE

ANSI chambers

A	1/2"
B	3/4"
C	1"
D	1 1/2"
E	2" ^①
G	3" (only for Top Mount units, configuration 7 & 8)
H	4" (only for Top Mount units, configuration 7 & 8)

^① 2" flanged connection with reducer welded to chamber

PROCESS CONNECTION STYLE

ANSI rated chambers

B	Threaded coupling: NPT-F (up to 1 1/2" size)
D	Socket weld (up to 1 1/2" size)
J	Slip on RF flange (up to 1 1/2" size)
L	Weldneck RF flange
M	Weldneck RJ flange

A /

complete order code for Atlas™ Magnetic Level Indicator

INDICATOR AND SCALE
Flags for level or interface applications

Flag colours			Scale
Red/White	Black/Orange	Black/Yellow	
Q	1	H	No scale
R	2	J	Level in cm
T	4	L	% of span

Consult factory for tailor made scales

Orange shuttles for level and interface applications

A	No scale
B	Level in cm
D	% of span

Consult factory for tailor made scales

PRESSURE AND SPECIFIC GRAVITY SELECTION (for temperatures up to +230 °C (+450 °F))

2 A	0.75 S.G. min.	13,8 bar / 200 psig maximum Pressure
2 B	0.64 S.G. min.	13,8 bar / 200 psig maximum Pressure
2 H	0.49 S.G. min.	13,8 bar / 200 psig maximum Pressure
3 A	0.75 S.G. min.	20,7 bar / 300 psig maximum Pressure
3 B	0.64 S.G. min.	20,7 bar / 300 psig maximum Pressure
3 H	0.49 S.G. min.	20,7 bar / 300 psig maximum Pressure
4 A	0.88 S.G. min.	27,6 bar / 400 psig maximum Pressure
4 B	0.64 S.G. min.	27,6 bar / 400 psig maximum Pressure
4 H	0.49 S.G. min.	27,6 bar / 400 psig maximum Pressure
5 A	0.88 S.G. min.	34,5 bar / 500 psig maximum Pressure
5 B	0.64 S.G. min.	34,5 bar / 500 psig maximum Pressure
5 H	0.49 S.G. min.	34,5 bar / 500 psig maximum Pressure
6 B	0.64 S.G. min.	41,4 bar / 600 psig maximum Pressure
6 H	0.49 S.G. min.	41,4 bar / 600 psig maximum Pressure
7 B	0.64 S.G. min.	48,3 bar / 700 psig maximum Pressure
7 H	0.49 S.G. min.	48,3 bar / 700 psig maximum Pressure
8 B	0.64 S.G. min.	55,1 bar / 800 psig maximum Pressure
8 H	0.49 S.G. min.	55,1 bar / 800 psig maximum Pressure
9 K	0.57 S.G. min.	62,0 bar / 900 psig maximum Pressure

Consult factory for higher pressures or lower specific gravity

TEMPERATURE OPTIONS

Y	HT insulation pad at +190 °C (+375 °F) or higher on chamber only ^①
A	HT insulation blanket to +260 °C (+500 °F) on chamber only ^②
B	HT insulation blanket to +540 °C (+1000 °F) on chamber only ^②
C	HT insulation blanket to +260 °C (+500 °F) on chamber and chamber flanges ^②
D	HT insulation blanket to +540 °C (+1000 °F) on chamber and chamber flanges ^②
R	Steam tracing
S	Steam tracing with blanket
T	Electric heat tracing +5° C (+40° F) and below with insulation blanket ^③
0	None

^① For process temperatures of +190 °C to +259 °C (+375 °F to +500 °F), an HT insulation pad is required.

^② For process temperatures of +260 °C (+500 °F) and above, an HT insulation blanket is required.

^③ Field voltage, area classification and temperature must be specified at time of order placement.

MEASURING RANGE – per 1 cm (0.39") increments

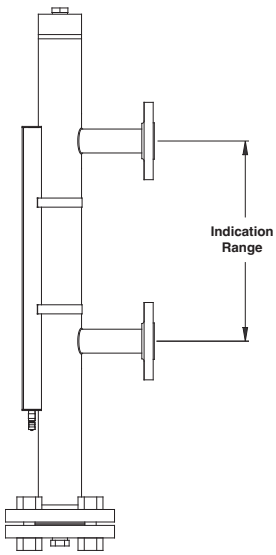
0 3 0	minimum 30 cm (12")
5 7 0	maximum 570 cm (224")
Consult factory for longer lengths up to 15 m (600")	

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

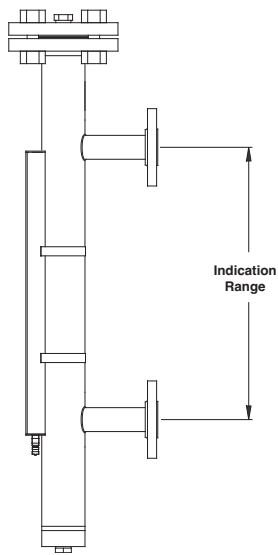


complete order code for Atlas™ Magnetic Level Indicator

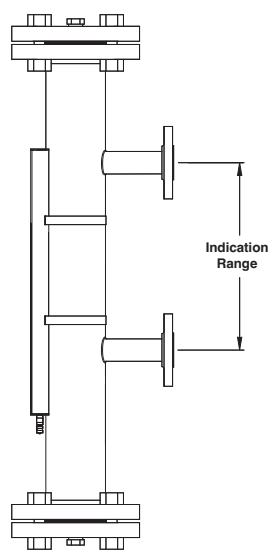
MOUNTING CONFIGURATIONS



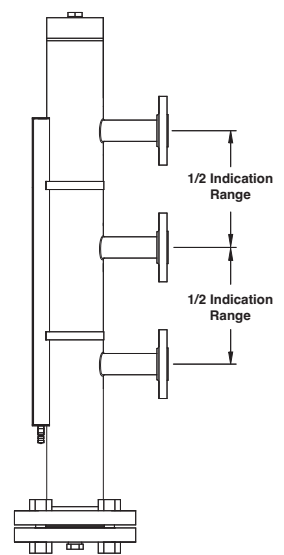
Configuration 1
Side Mount, Bottom Flange



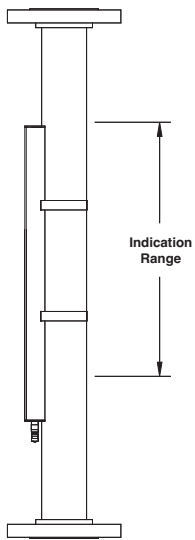
Configuration 2
Side Mount, Top Flange



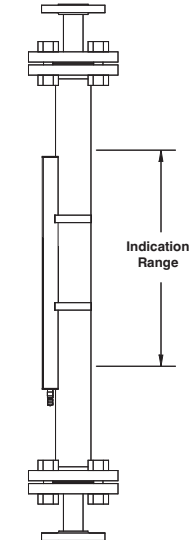
Configuration 3
Side Mount, Top & Bottom Flanges



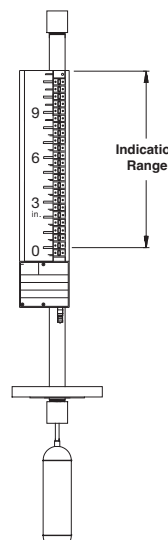
Configuration 4
Side Mount Interface,
Bottom Flange



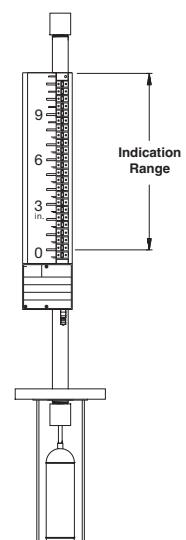
Configuration 5
Top/Bottom Mount



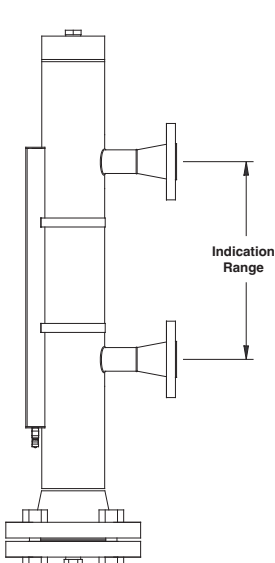
Configuration 6
Top/Bottom Mount
with Spool Pieces



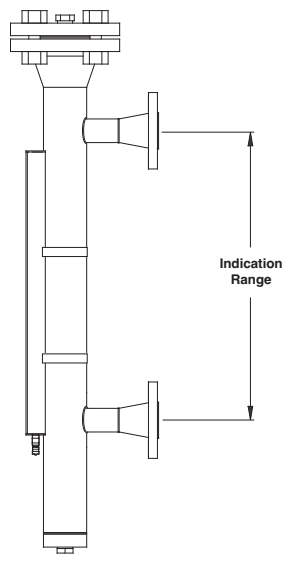
Configuration 7
Top Mount



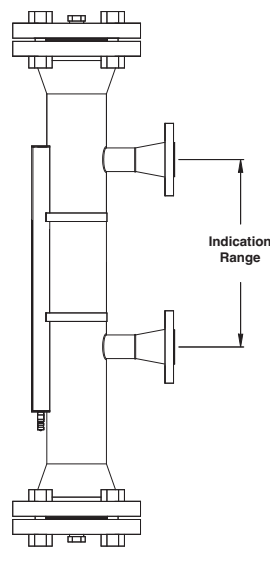
Configuration 8
Top Mount with Stilling Well



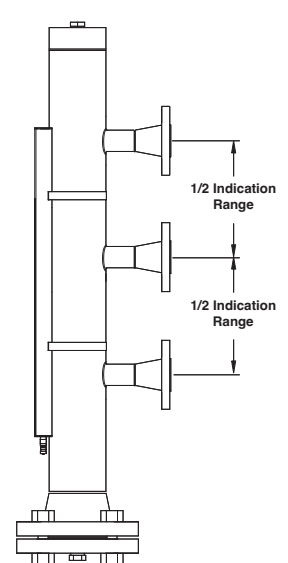
Configuration A
Side Mount, Bottom Flange,
Weldneck



Configuration B
Side Mount, Top Flange,
Weldneck



Configuration C
Side Mount, Top & Bottom
Flanges, Weldneck



Configuration D
Interface, Bottom Flange,
Weldneck

SPECIFICATIONS

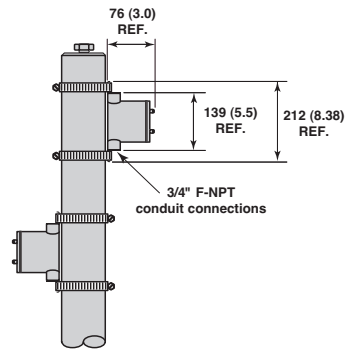
Description		Specification
Measured value		Liquid level and liquid-liquid interface (only with flag indicator) or both simultaneously (only with shuttle indicator).
Density range		Min 0,49 kg/dm ³ . Consult factory for S.G.'s down to 0,35 kg/dm ³ Interface units: min S.G. difference between upper and lower liquid > 0,1 (consult factory for smaller distances).
Operating temperature		-50 °C up to +540 °C (-60 °F up to +1000 °F). -196 °C (-320 °F) at request.
Operating pressure		From full vacuum up to 345 bar (5000 psig). Vented floats for high pressures.
Measuring range		From 30 cm (12") up to 570 cm (224") – for longer lengths consult factory. Cages with lengths > 570 cm (224") are segmented.
Indicator rail		Rubber sealed glass in an aluminium rail – optional stainless steel rail. Inert gas filled and hermetically sealed with Insta-seal valve.
Flags/shuttles		Red-white flags, black-orange flags or black-yellow flags. Orange shuttles for dual measurement (level and interface).
Resolution		12 mm (0.47"). Higher resolution for units with shuttle.
Scale		Etched stainless steel with level, volume, or % of span – consult factory for optional engineering units.
Materials	Cage	Standard materials incl. 316/316L (1.4401-1.4404) and Hastelloy C (2.4819). Other materials available at request.
	Float	316/316L (1.4401-1.4404), Titanium or Hastelloy C (2.4819).
Process connections		Threaded, socket welded, ANSI flanges – others at request.
Design standards		PED 97/23EC (standard), NACE MR 0175 (optional).
Hydro test		1,5 x operating pressure (without float)
Transmitter options		Jupiter® 200 series. Consult bulletin BE 46-148 for more details
High temperature options		Electric or steam tracing with or without high temperature insulation
Low temperature options		Cryogenic insulation with special frost extension

SWITCHES (for higher temperature ratings; consult factory)

Description		Specification
OES 100		Micro switch; bi-stable cam drive snap action switch 2 x SPDT: 10 A @ 125-250 V AC, 0.5 A @ 125 V DC min -50 °C up to +200 °C (-60 °F up to +390 °F) Cast aluminium housing FM-CSA approved (no ATEX approvals available) Class I, Div. 1 Grps B, C and D Class II, Div. 2 Grps A, B, C and D Class III, Type 4X
ORS 300		Clamp on reed switch; bi-stable reed switch with flying leads (30 cm (12")) 1 x SPDT: 10 A @ 250 V DC min -50 °C up to +250 °C (-60 °F up to +480 °F) Optional clamp on, with cast aluminium or cast stainless steel housing FM-CSA approved (no ATEX approvals available) Class I, Div. 1 Grps B, C and D Class II, Div. 2 Grps A, B, C and D Class III, Type 4X

SWITCH OPTIONS

OES 100

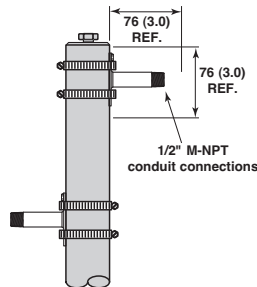


Bi-stable micro switch

Order code:

OES-100E-001: with standard cast aluminium housing

ORS 300



Bi-stable reed switch

Order code:

ORS-300E-001: standard clamp on switch

ORS 320/330

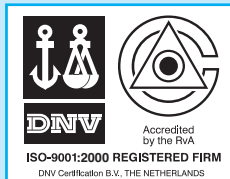


Bi-stable reed switch

Order code:

ORS-320E-001: with cast aluminium housing

ORS-330E-001: with stainless steel housing



QUALITY ASSURANCE - ISO 9001:2000

THE QUALITY ASSURANCE SYSTEM IN PLACE AT MAGNETROL GUARANTEES THE HIGHEST LEVEL OF QUALITY DURING THE DESIGN, THE CONSTRUCTION AND THE SERVICE OF CONTROLS. OUR QUALITY ASSURANCE SYSTEM IS APPROVED AND CERTIFIED TO **ISO 9001:2000** AND OUR TOTAL COMPANY IS COMMITTED TO PROVIDING FULL CUSTOMER SATISFACTION BOTH IN QUALITY PRODUCTS AND QUALITY SERVICE.

PRODUCT WARRANTY

ALL MAGNETROL MECHANICAL LEVEL CONTROLS ARE WARRANTED FREE OF DEFECTS IN MATERIALS AND WORKMANSHIP FOR FIVE FULL YEARS FROM THE DATE OF ORIGINAL FACTORY SHIPMENT.

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 INTERNATIONAL 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 THE EQUIPMENT. THERE ARE NO OTHER WARRANTIES EXPRESSED OR IMPLIED, EXCEPT, SPECIAL WRITTEN WARRANTIES COVERING SOME MAGNETROL PRODUCTS.



BULLETIN N°:
EFFECTIVE:
SUPERSEDES:

BE 46-138.0
JUNE 2008
New

UNDER RESERVE OF MODIFICATIONS

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