



Magnetic Liquid Level Indicators

Atlas Aurora Gemini

DESCRIPTION

Magnetically coupled liquid level indicators, or MLIs, are in widespread use throughout process industries. Originally designed as an alternative to sight and gage glass devices, the MLI is now commonly used in both new construction and plant expansion as well as replacement for high maintenance sight and gage glasses.

Orion's Atlas, Gemini, and Aurora magnetic level indicators are precision engineered and manufactured to indicate liquid level accurately, reliably and continuously. These units are totally sealed chambers, that require no periodic maintenance; and, they eliminate vapor or liquid emission problems common with sight and gage glasses.

To compliment these products, Orion produces a complete range of level switches and transmitters, including the Eclipse® Guided Wave Radar transmitter.

FEATURES

- Countless chamber styles (or configurations) for each design
- Complete range of level switches and level transmitters, including Eclipse Guided Wave Radar
- Fabricated, non-magnetic chamber assembly produced in a wide range of metal and plastic materials
- ANSI and DIN process connections
- Precision manufactured float with internal magnets and magnetic flux ring
- Flag or shuttle type indicator with optional stainless steel scale to measure height, volume or percentage of level



APPLICATIONS

- Feedwater heaters
- Industrial boilers
- Oil water separators
- Flash drums
- Surge tanks
- Gas chillers
- Deaerators
- Blowdown flash tanks
- Hot wells
- Vacuum tower bottoms
- Alkylation units
- Boiler drums
- Propane vessels
- Storage tanks

TECHNOLOGY

Within the piping column of the magnetic level indicator is a float containing an internal set of magnets. A change of level in the process tank corresponds to a similar change within the piping column. In response to the level movement, the float moves up or down accordingly.

Clamped to the outside of the piping column in complete isolation from the process liquid is a visual indicator housing. It contains the customer's choice of indicator (a series of flags or a follower).

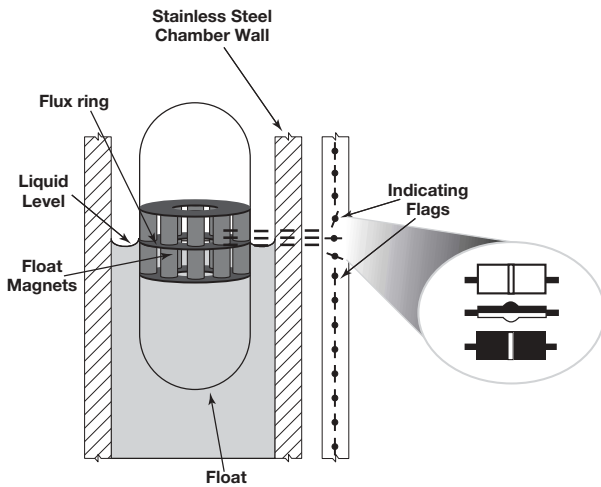


Figure 1

The individual flags or the follower contain an alignment magnet which couples to the float magnets as the float moves up or down the piping column. Refer to figure 1. This magnetic coupling rotates the flags and exposes the backs with their contrasting color or (in the case of the follower) moves the follower to the point of level.

The position of the follower, or the point at which the flags change color, represents true level. Level measurement is indicated or "read" by the corresponding point on the measuring scale. Refer to figure 2.

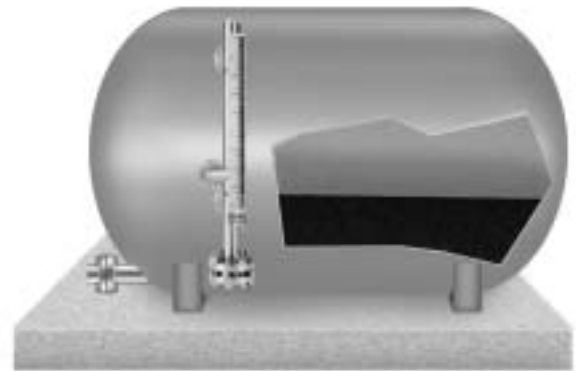


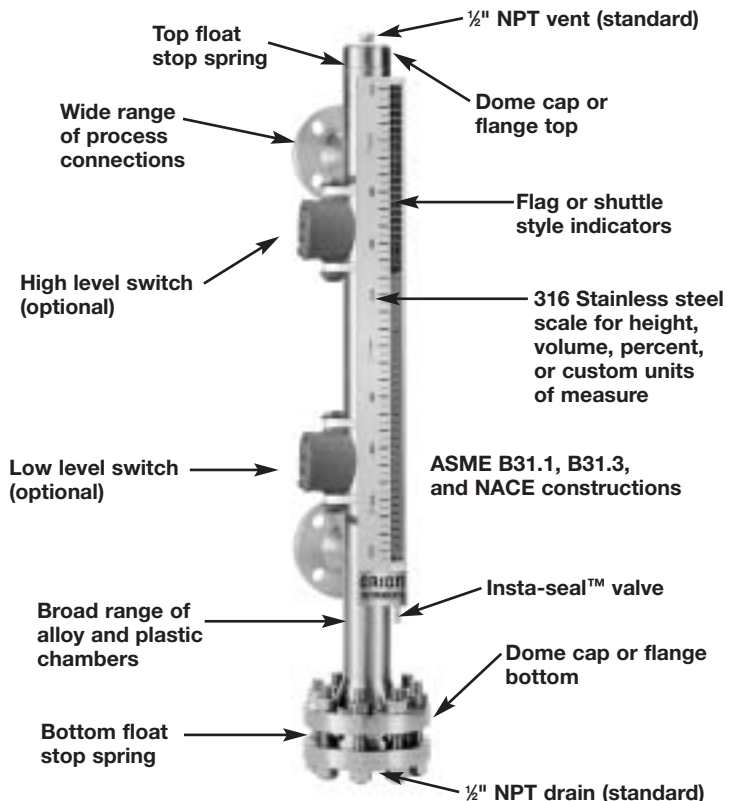
Figure 2

ATLAS

The Atlas is Orion's standard, high performance magnetic level indicator. Atlas is a single chamber design with either 2", 2.5", or 3" chamber diameter, as required by the application. There are twelve basic configuration styles including top mount models. Special configurations are also available.

Atlas magnetic level indicators are produced in a wide range of materials of construction, including plastics. Orion also offers one of the most complete selections of process connection types and sizes in the industry.

Atlas may be equipped with a variety of level transmitters and switches as well as flag and shuttle indicators with or without stainless steel scales. This enables the Atlas to be a complete level and monitoring control.

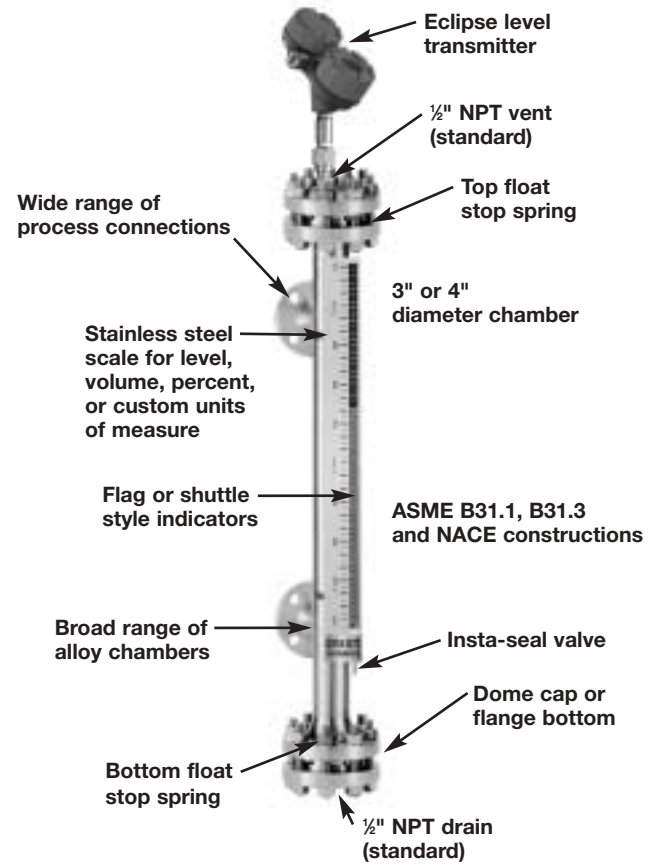


AURORA

Aurora's patented design is the next generation of Magnetic Level Indicators. It is state of the art in this technology and reflects Orion's innovation and commitment to magnetically coupled level indicators.

Aurora is a totally redundant system of continuous level monitoring and control. An Eclipse guided wave radar coaxial probe is housed along with the MLI float in a 3" or 4" diameter chamber. While the indicator relies upon the float and its internal magnets to activate the flags or shuttle, the Eclipse measures the liquid level directly. Two completely separate technologies in a single external chamber ensure redundancy unlike any other MLI. The use of a baffle within the chamber ensures that the float and eclipse coaxial probe work seamlessly within the single chamber.

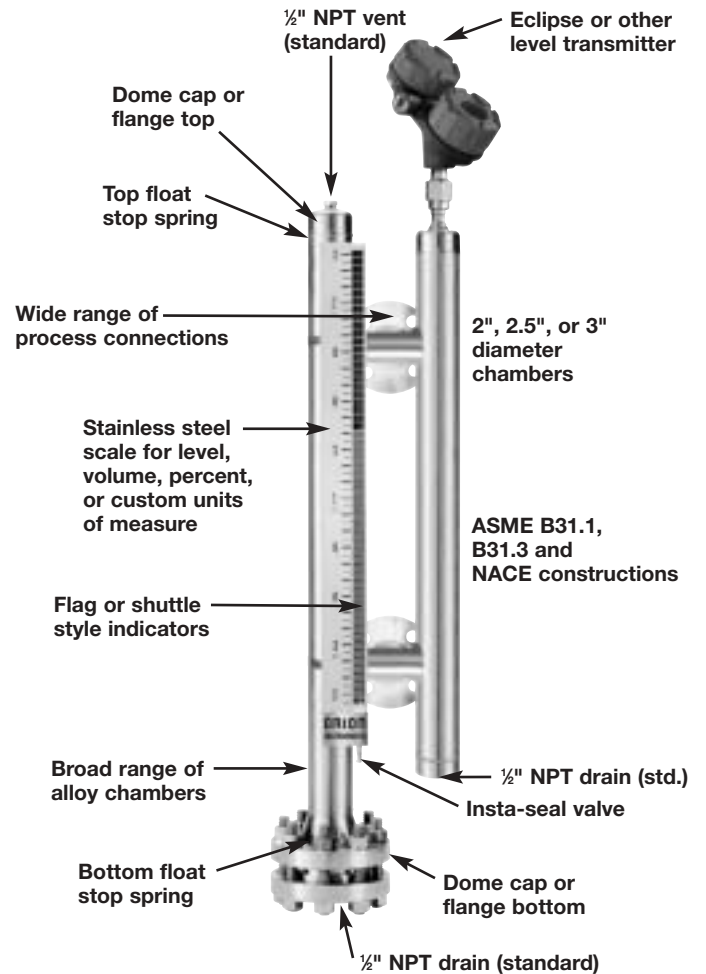
There are six basic configuration styles and over fifteen material selections for Aurora. For the first time ever, the ability to accurately and reliably measure ultra low dielectric media, high pressure/high temperature process conditions, and media with shifting and changing dielectric values can be accomplished with Aurora.



GEMINI

Orion's twin chamber design is unique to the Magnetic level gauge industry. Countless unique configuration styles are available with Gemini. It can be produced in the same metal material selections as Atlas.

The second chamber facilitates the installation of any of a wide selection of transmitters to provide continuous level monitoring in addition to the indication provided by the primary chamber. Eclipse guided wave radar, direct insertion Jupiter magnetostrictive, or Kotron capacitance type level transmitters can be mounted in the secondary chamber to provide totally redundant indication with continuous level output. The primary chamber, which houses the float, can be fitted with clamp-on switches or transmitters for additional level control.



MAGNETIC INDICATOR SPECIFICATIONS

Design	Atlas and Aurora – single chamber Gemini – dual chamber
Materials of construction – MLI	Metal alloys 316/316L or 304/304L stainless steel, 321 stainless steel, 347 stainless steel, Titanium, Monel, Hastelloy B, Hastelloy C-276, Inconel 625, Inconel 825, Alloy 20, Electropolished 316 stainless steel, 904L stainless steel and other non-magnetic alloys
Materials of construction – Float	Plastics Fiberglass, PVC, CPVC, kynar, polypropylene Same as chamber materials, 316 SS or titanium standard
Construction options	Conformance to ASME B31.1, ASME B31.3 or NACE MR0175 available
Certified material test reports (CMTR)	Available upon request
Pressure class ratings	ANSI 150#, 300#, 600#, 900#, 1500#, 2500# DIN PN16, PN25/40, PN64, PN100, PN160, PN250, PN320
Process connection sizes	½" to 8" DN 20 to DN 150
Process connection types	MNPT, FNPT, weldolet®, sockolet®, threaded couplings, threaded nipples, butt weld nipples, plain-end nipples, slip-on flanges, weldneck flanges, lap joint flanges, tri-clamp fitting, Van Stone flanges
Measuring range	12 to 600 inch (30 to 1524 centimeters) standard Consult factory for lengths over 600 inch (50 feet)
Temperature range	-320° to +1000° F (-196° to +538° C)
Pressure range	Full vacuum to 4500 psig (310 bar)
Specific gravity range	As low as 0.35 S.G.U.
Indicators	Magnetically actuated flag assembly in contrasting orange/black, yellow/black, red/white colors, or high visibility shuttle follower
Flag assembly seal	Inert gas filled and hermetically sealed with Insta-seal valve
Visual indication	Easily visible from 75 to 100 feet (23 to 30 meters)
Scale options	Etched stainless steel with either height, volume, or percentage units
Switch options	Model OES-100 electric cam operated snap action Model OPS-200 pneumatic Model ORS-300 electric reed type
Transmitter options	Model 705 Eclipse Guided Wave Radar Model 2xx Jupiter Magnetostrictive Model OCT-400 analog reed chain
High temperature options	Electric or steam tracing with or without special high temperature insulation
Low temperature options	Cryogenic insulation with special polymeric frost extension

ELECTRO-MAGNETIC SWITCHES SPECIFICATIONS

Switch Type ①:	Model OES-100 Magnetically actuated, bi-stable cam drive snap action switch Two SPDT 10.1 amp 125-250 VAC, 0.5 amp @ 125 VDC, 0.25 amp @ 250 VDC	Model ORS-300 Bi-stable reed switch One SPDT contact rated 1.0 amp @ 250 VDC 25 Watt maximum
Maximum Dead Band:	±0.75" float travel	±0.50" float travel
Temperature Range:	-58° to +392° F ② (-50° to +200° C)	-58° to +482° F ② (-50° to +250° C)
Enclosure Rating:	NEMA 4X/7/9	NEMA 4X/7/9
Enclosure Material:	Cast Aluminum (standard) 316 SS (optional)	Stainless steel

PNEUMATIC SWITCH SPECIFICATIONS

Model:	OPS-200
Medium:	Instrument air or dry filtered air or gas
Supply Pressure:	Vacuum to 200 psig
Air Flow:	295 CFM @ 100 psig
Air Consumption:	0 SCFM
Maximum Temperature:	+200° F (+59° C) ②

- ① All switch ratings are for non-inductive loads.
- ② Consult factory for higher temperature options.

Atlas with high and low level switches



Model OES-100



Model OPS-200



Model ORS-300

TRANSMITTER SPECIFICATIONS

	Eclipse Guided Wave Radar	Jupiter Magnetostrictive	OCT-400 Reed Chain
Measuring Range:	6 to 240 inches (15 to 610 cm)	6 to 420 inches (15 to 1067 cm)	6 to 198 inches (15 to 503 cm)
Resolution:	0.01 mA analog 0.1 inch digital	0.01 mA analog 0.1 inch digital	±0.50 inch (13 mm)
Repeatability:	< 0.1 inch (3 mm)	±0.005 inch (0.127 mm)	< 0.25 inch (6 mm)
Non-Linearity:	< 0.1% of probe length or 0.1 inch (2.5 mm)(whichever is greater)	0.020% full span or 0.031 inch (0.79 mm)(whichever is greater)	< 0.4% full span averaged over span
Upper Dead Zone:	None	None	None
Lower Dead Zone:	None	Approximately 2 inches (51 mm)	4 inches (102 mm)
Damping:	0-45 seconds adjustable	0-45 seconds adjustable	None
Power Input:	GP/IS 11 to 28 VDC EP 13.5 to 28 VDC	12 to 28 VDC	12 to 36 VDC
Signal Output:	3.8 to 20.5 mA	3.8 to 20.5 mA	4 to 20 mA
Digital Output:	HART DDs	HART 5.0, generic code	None
Display:	2 line × 8 character LCD	2 line × 8 character LCD	None
Housing Type:	NEMA 4X, IP66	NEMA 4X, IP66	NEMA 4X, IP66
Housing Material:	Aluminum A356T6 or 316 SS optional	Aluminum A356T6 or 316 SS optional	Cast aluminum or 316 SS
Area Classifications:	FM/CSA/ATEX EP, IS, NI	FM/CSA EP, NI	FM/CSA EP
Process Temperature:	-230° to +750° F (-150° to +400° C) Probe dependent	-40° to +245° F (-40° to +118° C) at waveguide +800° F (+427° C) process with insulation	-40° to +500° F (-40° to +260° C) with insulation
Ambient Temperature: at Electronics	-40° to +175° F (-40° to +79° C) LCD: -5° to +160° F (-21° to +71° C)	-40° to +175° F (-40° to +79° C)	-40° to +158° F (-40° to +70° C)
Mounting Arrangement:	Direct insertion probe with integral top mount or remote mount electronics	External mount probe with integral top or bottom mount electronics	External mount probe with integral top or bottom mount electronics



**Model OCT-400
with cast aluminum housing**



**Reed chain
transmitter with
stainless steel
housing mounted
on Atlas**



**Atlas with Jupiter
magnetostrictive
transmitter**

ECLIPSE PROBE SPECIFICATIONS

Probe Type	Probe 3rd Digit	Maximum Pressure	Maximum Temperature	Minimum Temperature	Dielectric Range	Length
Standard Coaxial	A	1000 psig @ +70° F (70 bar @ +20° C)	+300° F @ 400 psig (+150° C @ 27 bar)	-40° F @ 750 psig (-40° C @ 50 bar)	1.4 to 80	24" to 240" (60 to 610 cm)
Standard Twin Rod	B	750 psig @ +70° F (50 bar @ +20° C)	+400° F @ 200 psig (+200° C @ 13 bar)	-40° F @ 750 psig (-40° C @ 50 bar)	2.0 to 80	24" to 240" (60 to 610 cm)
HT/HP Coaxial	D	5000 psig @ +70° F (345 bar @ +20° C)	+750° F @ 2000 psig (+400° C @ 133 bar)	-230° F @ 2000 psig (-150° C @ 135 bar)	2.0 to 80	24" to 240" (60 to 610 cm)
HP Coaxial	P	5000 psig @ +70° F (345 bar @ +20° C)	+400° F @ 4250 psig (+200° C @ 290 bar)	-230° F @ 2000 psig (-150° C @ 135 bar)	1.7 to 80	24" to 240" (60 to 610 cm)
Overfill Coaxial	R	5000 psig @ +70° F (345 bar @ +20° C)	+400° F @ 270 psig (+200° C @ 18)	-40° F @ 750 psig (-40° C @ 50 bar)	1.4 to 80	24" to 240" (60 to 610 cm)
Steam Coaxial	S	1585 psig @ +605° F (110 bar @ +315° C) Saturated Steam	+605° F @ 1585 psig (+315° C @ 110 bar) Saturated Steam	n/a	10 to 80	24" to 180" (60 to 455 cm)



Eclipse with Standard Coaxial Probe



Eclipse with Standard Twin Rod Probe



Eclipse with High Temp/High Pressure Coaxial Probe



Eclipse with High Pressure Coaxial Probe







Eclipse with Overfill Coaxial Probe



Eclipse with Steam Coaxial Probe

AGENCY APPROVALS

AGENCY	MODEL	APPROVAL CATEGORY
Factory Mutual  APPROVED	2xx-100x-xxx	Class I, Div. 1, Grps B, C, & D Class I, Div. 2, Grps A, B, C, & D Class II, Div. 1, Grps E, F, & G Class II, Div. 2, Grps F & G Class III, Type 4X, IP66
Canadian Standards Association 	OES-100E-001	Class I, Div. 1, Grps B, C, & D Class II, Div. 1 Grps E, F, & G Class III, Type 4X
	ORS-300E-001	Class I, Div. 1, Grps B, C, & D Class I, Div. 2, Grps A, B, C, & D Class II, Div. 1, Grps E, F, & G Class III, Type 4X
	OCT-400x-xxx	Class I, Div. 1, Grps B, C, & D Class I, Div. 2, Grps A, B, C, & D Class II, Div. 1, Grps E, F, & G Class III, Type 4X
CE 	ORS-300E-001	Installation Category II, Pollution Degree 2
	OES-100E-001	Low Voltage Directives, 73/23/EEC & 93/68/EEC per Harmonized Standard EN 61010-1/1993 & Amendment No. 1
	2xx-100x-xxx 705-5xxx-xxx OCT-4xxx-xxx	These units have been tested to EN 50081-2 and EN 50082-2 and are in compliance with the EMC Directive 89/336/EEC
ATEX 	705/7/8-5XXX-AXX	Intrinsically Safe
	705/7/8-5XXX-BXX	Ⓜ II 1G, EEx ia IIC T4
	705/7/8-5XXX-CXX	Explosion Proof ①
	705/7/8-5XXX-DXX	Ⓜ II 1/2G, EEx d [ia] IIC T4
	705/7/8-5XXX-EXX	Non-Incendive ②
705/7/8-5XXX-FXX	Ⓜ II 3G, EEx n IIC T6	

① Factory Sealed: This product has been approved by Factory Mutual Research (FM), and Canadian Standards Association (CSA), as a Factory Sealed device.

② Measured media inside vessel must be non-flammable only.

MODEL NUMBER - ATLAS

ATLAS

1	Atlas MLI – Indication range in inches
A	Atlas MLI – Indication range in centimeters

CHAMBER – ANSI PRESSURE CLASS RATING

A	150# ANSI Class
B	300# ANSI Class
C	600# ANSI Class
D	900# ANSI Class
E	1500# ANSI Class
F	2500# ANSI Class

CHAMBER – DIN PRESSURE CLASS RATING

M	PN 16	DIN Class
N	PN 25/40	DIN Class
P	PN 64	DIN Class
Q	PN 100	DIN Class
R	PN 160	DIN Class
S	PN 250	DIN Class
T	PN 320	DIN Class

CHAMBER MATERIALS OF CONSTRUCTION ①

A	316/316L stainless steel
B	316/316L SS w/carbon steel flanges
C	304/304L stainless steel
D	304/304L SS w/carbon steel flanges
F	321 stainless steel
G	Titanium
H	Monel
J	Hastelloy B
K	Hastelloy C-276
L	Inconel 625

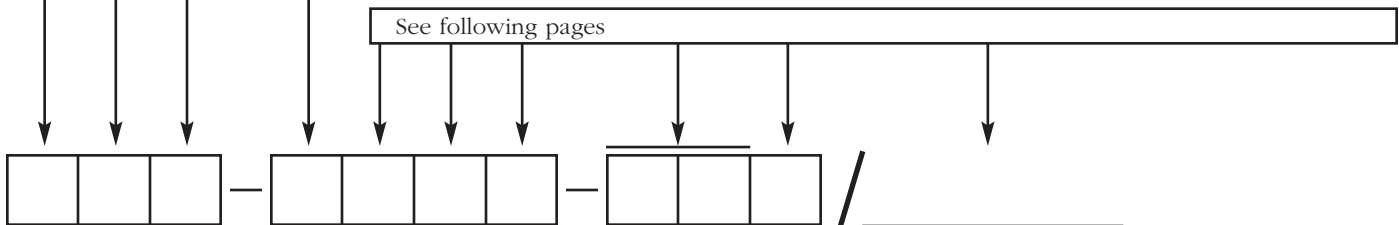
M	Inconel 825
N	Alloy 20
P	Electropolished 316 stainless steel
Q	904L stainless steel
R	347 stainless steel
1	Fiberglass
2	PVC
3	CPVC
4	Kynar
5	Polypropylene

① Internal coatings available, consult factory.

CHAMBER MOUNTING CONFIGURATION

	Process Connections	Top	Bottom
1	Side/side	Dome cap	RF slip-on with blind flange
2	Side/side	RF slip-on with blind flange	Dome cap
3	Side/side	RF slip-on with blind flange	RF slip-on with blind flange
4	Side/side for interface	Dome 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	Dome cap	RF weldneck with blind flange
B	Side/side	RF weldneck with blind flange	Dome cap
C	Side/side	RF weldneck with blind flange	RF weldneck with blind flange
D	Side/side for interface	Dome cap	RF weldneck with blind flange

See following pages



MODEL NUMBER - ATLAS

PROCESS CONNECTION SIZE

A	½"
B	¾"
C	1"
D	1½"
E	2"
F	2½"
G	3"
H	4"
J	6"
K	8"

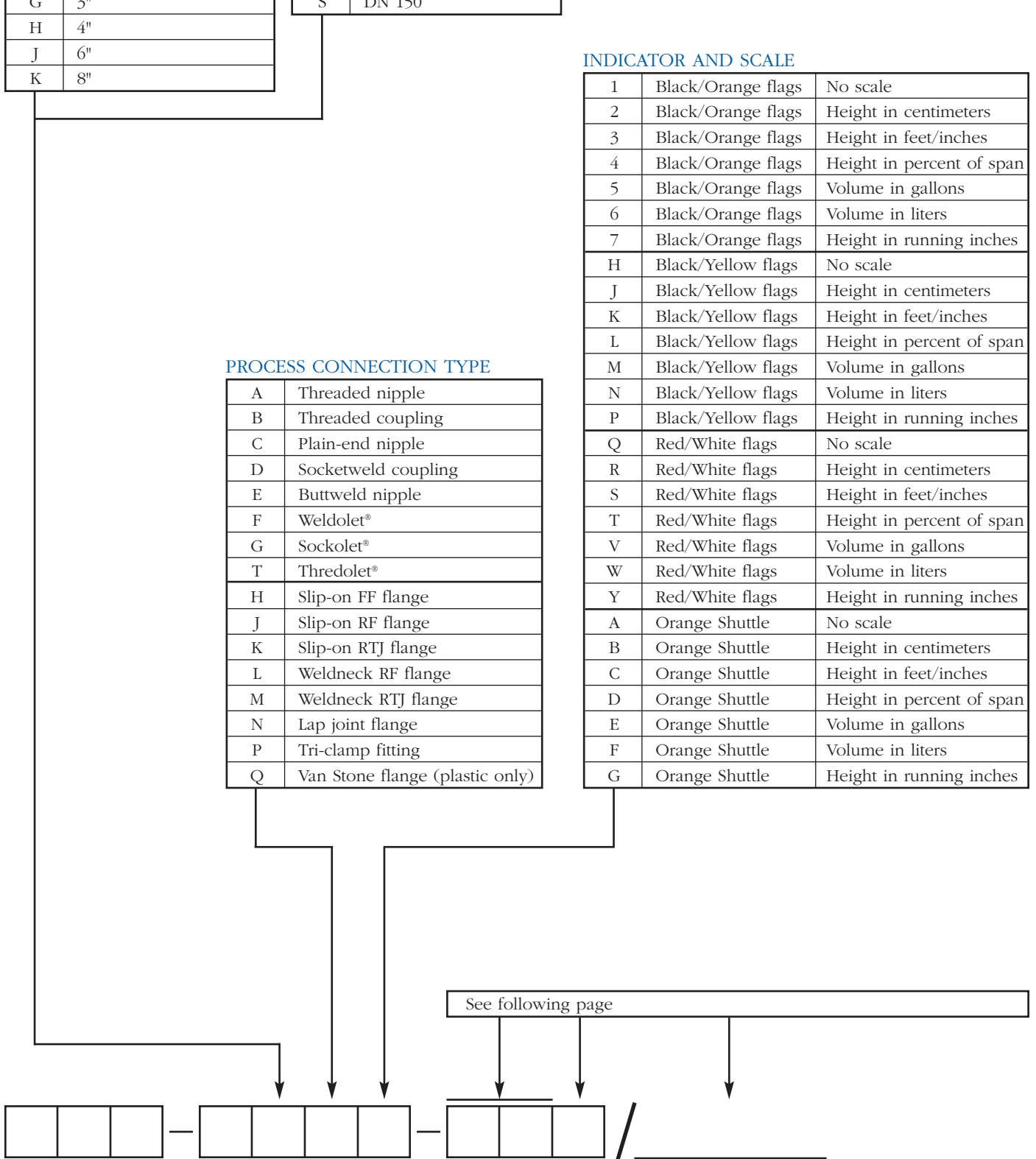
L	DN 20
M	DN 25
N	DN 40
P	DN 50
Q	DN 80
R	DN 100
S	DN 150

INDICATOR AND SCALE

1	Black/Orange flags	No scale
2	Black/Orange flags	Height in centimeters
3	Black/Orange flags	Height in feet/inches
4	Black/Orange flags	Height in percent of span
5	Black/Orange flags	Volume in gallons
6	Black/Orange flags	Volume in liters
7	Black/Orange flags	Height in running inches
H	Black/Yellow flags	No scale
J	Black/Yellow flags	Height in centimeters
K	Black/Yellow flags	Height in feet/inches
L	Black/Yellow flags	Height in percent of span
M	Black/Yellow flags	Volume in gallons
N	Black/Yellow flags	Volume in liters
P	Black/Yellow flags	Height in running inches
Q	Red/White flags	No scale
R	Red/White flags	Height in centimeters
S	Red/White flags	Height in feet/inches
T	Red/White flags	Height in percent of span
V	Red/White flags	Volume in gallons
W	Red/White flags	Volume in liters
Y	Red/White flags	Height in running inches
A	Orange Shuttle	No scale
B	Orange Shuttle	Height in centimeters
C	Orange Shuttle	Height in feet/inches
D	Orange Shuttle	Height in percent of span
E	Orange Shuttle	Volume in gallons
F	Orange Shuttle	Volume in liters
G	Orange Shuttle	Height in running inches

PROCESS CONNECTION TYPE

A	Threaded nipple
B	Threaded coupling
C	Plain-end nipple
D	Socketweld coupling
E	Buttweld nipple
F	Weldolet®
G	Sockolet®
T	Thredolet®
H	Slip-on FF flange
J	Slip-on RF flange
K	Slip-on RTJ flange
L	Weldneck RF flange
M	Weldneck RTJ flange
N	Lap joint flange
P	Tri-clamp fitting
Q	Van Stone flange (plastic only)



MODEL NUMBER - ATLAS

PRESSURE AND SPECIFIC GRAVITY SELECTION (for temperatures up to +450° F (+232° C)) ①

200 psig Maximum Pressure	
2 A	0.75 S.G. min.
2 B	0.64 S.G. min.
2 H	0.49 S.G. min.
300 psig Maximum Pressure	
3 A	0.75 S.G. min.
3 B	0.64 S.G. min.
3 H	0.49 S.G. min.
400 psig Maximum Pressure	
4 A	0.88 S.G. min.
4 B	0.64 S.G. min.
4 H	0.49 S.G. min.
500 psig Maximum Pressure	
5 A	0.88 S.G. min.
5 B	0.64 S.G. min.
5 H	0.49 S.G. min.

600 psig Maximum Pressure	
6 B	0.64 S.G. min.
6 H	0.49 S.G. min.
700 psig Maximum Pressure	
7 B	0.64 S.G. min.
7 H	0.49 S.G. min.
800 psig Maximum Pressure	
8 B	0.64 S.G. min.
8 H	0.49 S.G. min.
900 psig Maximum Pressure	
9 K	0.57 S.G. min.

① Orion's capabilities exceed those listed here. Consult factory for higher pressures or lower specific gravity.

TEMPERATURE OPTIONS

Y	HT insulation pad at +375° F (+191° C) or higher on chamber only ②
A	HT insulation blanket to +500° F (+260° C) on chamber only ③
B	HT insulation blanket to +1000° F (+538° C) on chamber only ③
C	HT insulation blanket to +500° F (+260° C) on chamber and chamber flanges ③
D	HT insulation blanket to +1000° F (+538° C) on chamber and chamber flanges ③
N	Cryogenic insulation to -100° F (-73° C)
P	Cryogenic insulation to -200° F (-129° C)
Q	Cryogenic insulation to -320° F (-196° C)
R	Steam tracing
S	Steam tracing with blanket
T	Electric heat tracing +40° F (+4° C) and below with insulation blanket ④
U	Electric heat tracing +40° to +200° F (+4° to +93° C) with insulation blanket ④
V	Electric heat tracing +200° to +500° F (+93 to +260° C) with insulation blanket ④
W	Electric heat tracing +500° to +800° F (+260° to +427° C) with insulation blanket ④
0	None

② For process temperatures of +375° to +499° F (+191° to +259° C), an HT insulation pad is required.

③ For process temperatures of +500° F (+260° C) and above, an HT insulation blanket is required

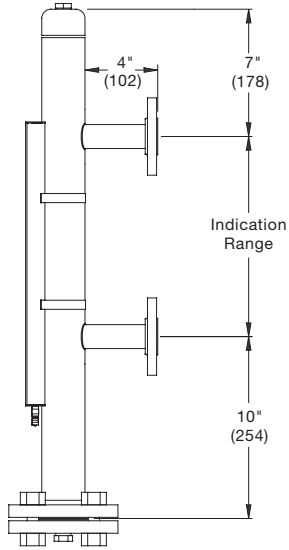
④ Field voltage, area classification and required temperature must be specified at time of order placement.

Specify length in inches when first digit is 1, in lengths from 12 to 600 inches
Specify length in centimeters when first digit is A, in lengths from 30 to 1524 cm.

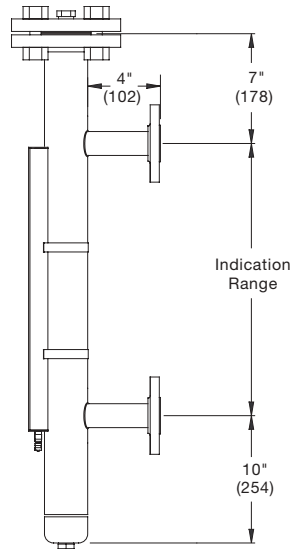


ATLAS CHAMBER STYLES

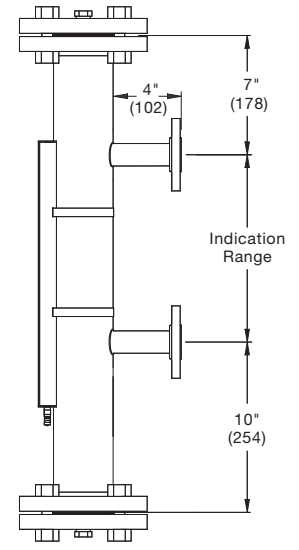
inches (mm)



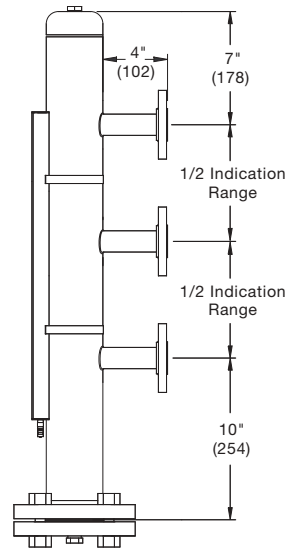
Configuration 1
Side Mount, Bottom Flange



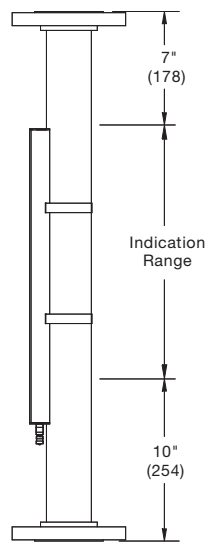
Configuration 2
Side Mount, Top Flange



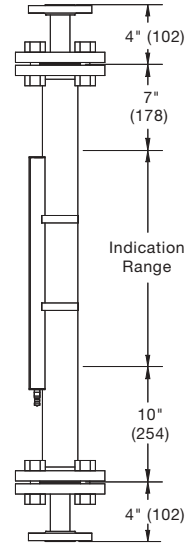
Configuration 3
Side Mount, Top & Bottom Flanges



Configuration 4
Side Mount Interface, Bottom Flange



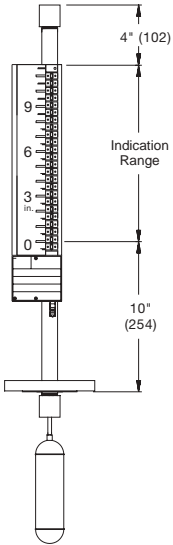
Configuration 5
Top/Bottom Mount



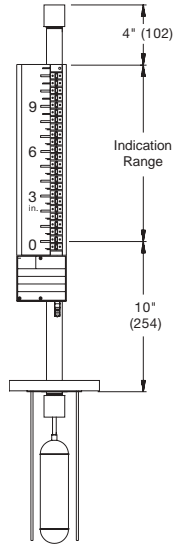
Configuration 6
Top/Bottom Mount
with Spool Pieces

ATLAS CHAMBER STYLES

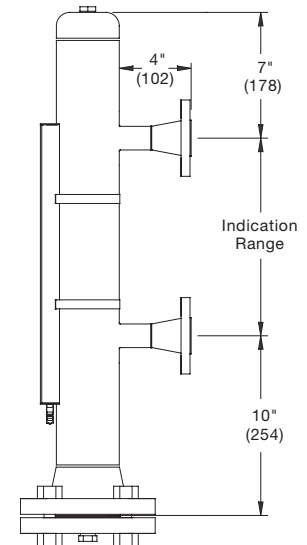
inches (mm)



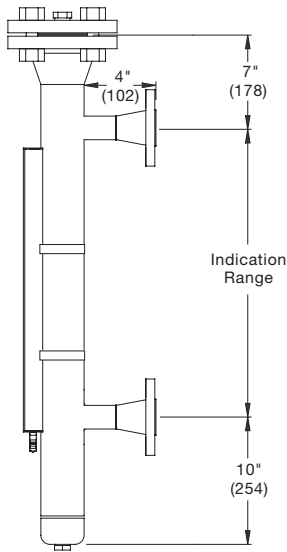
Configuration 7
Top Mount



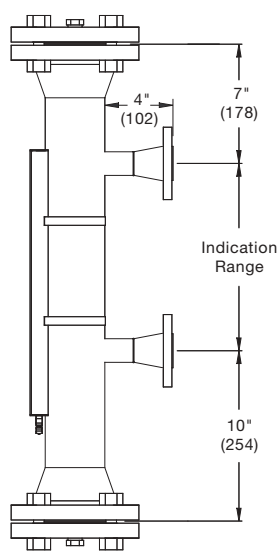
Configuration 8
Top Mount with Stilling Well



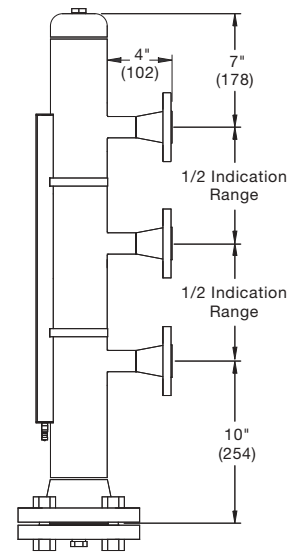
Configuration A
Side Mount, Bottom Flange, Weldneck



Configuration B
Side Mount, Top Flange, Weldneck



Configuration C
Side Mount, Top & Bottom Flanges, Weldneck



Configuration D
Interface, Bottom Flange, Weldneck

MODEL NUMBER - AURORA

CHAMBER MOUNTING CONFIGURATION

	Process Connections	Top	Bottom
2	Side/side	RF slip-on with probe sealwelded to blind flange	Dome cap
3	Side/side	RF slip-on with probe sealwelded to blind flange	RF slip-on with blind flange
4	Side/side for interface	RF slip-on with probe sealwelded to blind flange	RF slip-on with blind flange
B	Side/side	RF weldneck with probe sealwelded to blind flange	Dome cap
C	Side/side	RF weldneck with probe sealwelded to blind flange	RF weldneck with blind flange
D	Side/side for interface	RF weldneck with probe sealwelded to blind flange	RF weldneck with blind flange
E	Side/side	RF slip-on with probe threaded into blind flange	Dome cap
F	Side/side	RF slip-on with probe threaded into blind flange	RF slip-on with blind flange
G	Side/side for interface	RF slip-on with probe threaded into blind flange	RF slip-on with blind flange
S	Side/side	RF slip-on with probe threaded into blind flange	Dome cap
T	Side/side	RF slip-on with probe threaded into blind flange	RF weldneck with blind flange
U	Side/side for interface	RF slip-on with probe threaded into blind flange	RF weldneck with blind flange

PROCESS CONNECTION SIZE

A	½"	L	DN 20
B	¾"	M	DN 25
C	1"	N	DN 40
D	1½"	P	DN 50
E	2"	Q	DN 80
F	2½"	R	DN 100
G	3"	S	DN 150

PROCESS CONNECTION TYPE

A	Threaded nipple
B	Threaded coupling
C	Plain-end nipple
D	Socketweld coupling
E	Buttweld nipple
F	Weldolet
G	Sockolet
T	Thredolet
H	Slip-on FF flange
J	Slip-on RF flange
K	Slip-on RTJ flange
L	Weldneck RF flange
M	Weldneck RTJ flange
N	Lap joint flange
P	Tri-clamp fitting

INDICATOR AND SCALE

1	Black/Orange flags	No scale
2	Black/Orange flags	Height in centimeters
3	Black/Orange flags	Height in feet/inches
4	Black/Orange flags	Height in percent of span
5	Black/Orange flags	Volume in gallons
6	Black/Orange flags	Volume in liters
7	Black/Orange flags	Height in running inches
H	Black/Yellow flags	No scale
J	Black/Yellow flags	Height in centimeters
K	Black/Yellow flags	Height in feet/inches
L	Black/Yellow flags	Height in percent of span
M	Black/Yellow flags	Volume in gallons
N	Black/Yellow flags	Volume in liters
P	Black/Yellow flags	Height in running inches
Q	Red/White flags	No scale
R	Red/White flags	Height in centimeters
S	Red/White flags	Height in feet/inches
T	Red/White flags	Height in percent of span
V	Red/White flags	Volume in gallons
W	Red/White flags	Volume in liters
Y	Red/White flags	Height in running inches
A	Orange Shuttle	No scale
B	Orange Shuttle	Height in centimeters
C	Orange Shuttle	Height in feet/inches
D	Orange Shuttle	Height in percent of span
E	Orange Shuttle	Volume in gallons
F	Orange Shuttle	Volume in liters
G	Orange Shuttle	Height in running inches

See following page



MODEL NUMBER - AURORA

PRESSURE AND SPECIFIC GRAVITY SELECTION (for temperatures up to +450° F (+232° C)) ①

200 psig Maximum Pressure		500 psig Maximum Pressure	
2 A	0.75 S.G. min.	5 A	0.88 S.G. min.
2 B	0.64 S.G. min.	5 B	0.64 S.G. min.
2 H	0.49 S.G. min.	5 K	0.49 S.G. min.
300 psig Maximum Pressure		550 psig Maximum Pressure	
3 A	0.75 S.G. min.	6 B	0.64 S.G. min.
3 B	0.64 S.G. min.	600 psig Maximum Pressure	
3 H	0.49 S.G. min.	6 K	0.49 S.G. min.
400 psig Maximum Pressure		700 psig Maximum Pressure	
4 A	0.88 S.G. min.	7 K	0.49 S.G. min.
4 B	0.64 S.G. min.	775 psig Maximum Pressure	
4 H	0.49 S.G. min.	8 K	0.49 S.G. min.
450 psig Maximum Pressure			
5 A	0.88 S.G. min.		
5 B	0.64 S.G. min.		
5 H	0.49 S.G. min.		

① Orion's capabilities exceed those listed here. Consult factory for higher pressures or lower specific gravity.

TEMPERATURE OPTIONS

Y	HT insulation pad at +375° F (+191° C) or higher on chamber only ②
A	HT insulation blanket to +500° F (+260° C) on chamber only ③
B	HT insulation blanket to +1000° F (+538° C) on chamber only ③
C	HT insulation blanket to +500° F (+260° C) on chamber and flanges ③
D	HT insulation blanket to +1000° F (+538° C) on chamber and flanges ③
N	Cryogenic insulation to -100° F (-73° C)
P	Cryogenic insulation to -200° F (-129° C)
Q	Cryogenic insulation to -320° F (-196° C)
R	Steam tracing
S	Steam tracing with blanket
T	Electric heat tracing +40° F (+4° C) and below with insulation blanket ④
U	Electric heat tracing +40° to +200° F (+4° to +93° C) with insulation blanket ④
V	Electric heat tracing +200° to +500° F (+93 to +260° C) with insulation blanket ④
W	Electric heat tracing +500° to +800° F (+260° to +427° C) with insulation blanket ④
0	None

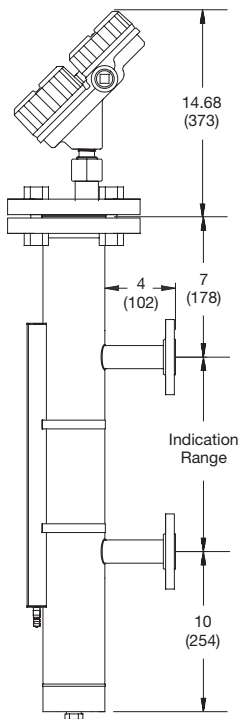
- ② For process temperatures of +375° to +499° F (+191° to +259° C), an HT insulation pad is required.
- ③ For process temperatures of +500° F (+260° C) and above, an HT insulation blanket is required
- ④ Field voltage, area classification and required temperature must be specified at time of order placement.

Specify length in inches when first digit is 1, in lengths from 12 to 600 inches
Specify length in centimeters when first digit is A, in lengths from 30 to 1524 cm.

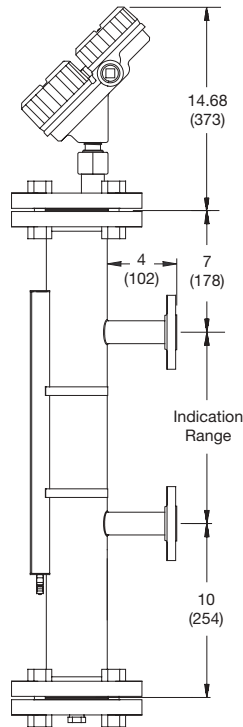
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AURORA CHAMBER STYLES

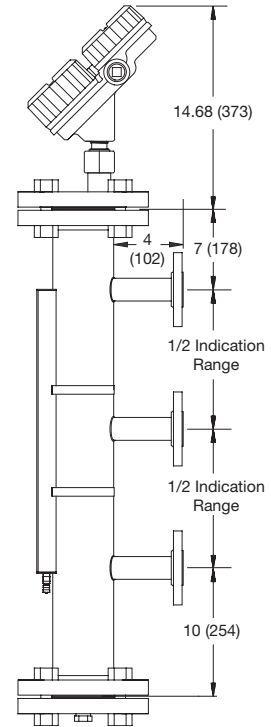
inches (mm)



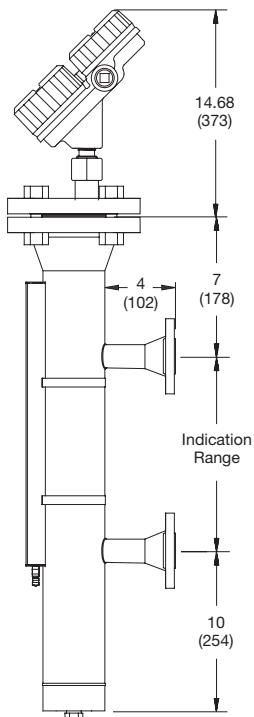
Configuration 2
Side Mount, Top Flange
(probe sealwelded to flange)



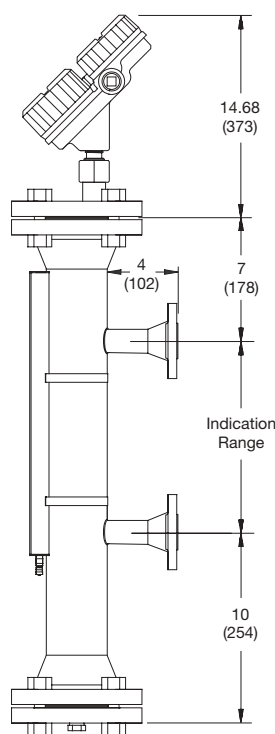
Configuration 3
Side Mount, Top & Bottom Flanges
(probe sealwelded to flange)



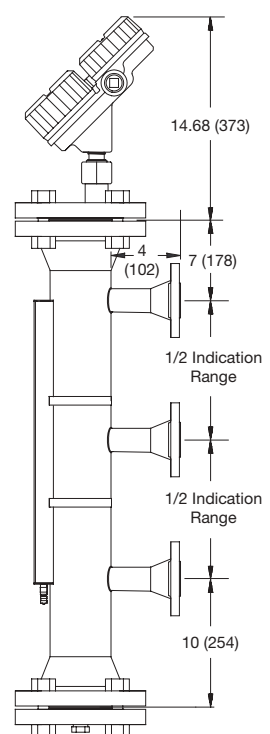
Configuration 4
Side Mount, Interface,
Top & Bottom Flanges
(probe sealwelded to flange)



Configuration B
Side Mount, Top Flange, Weldneck
(probe sealwelded to flange)



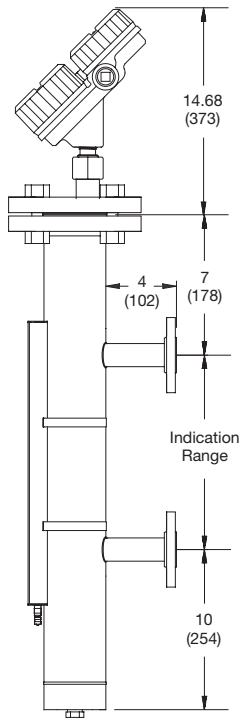
Configuration C
Side Mount, Top & Bottom Flanges,
Weldneck
(probe sealwelded to flange)



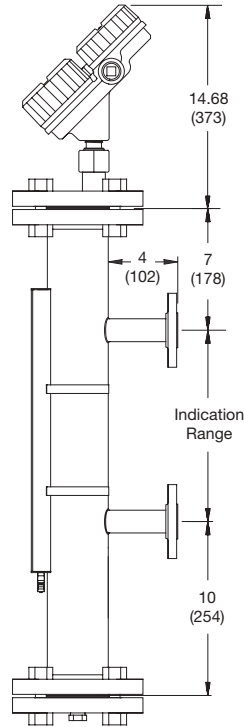
Configuration D
Side Mount, Interface,
Top & Bottom Flanges, Weldneck
(probe sealwelded to flange)

AURORA CHAMBER STYLES

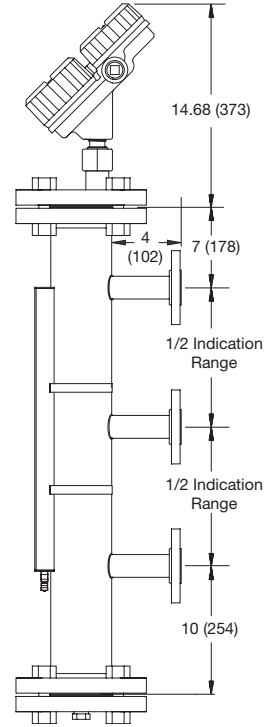
inches (mm)



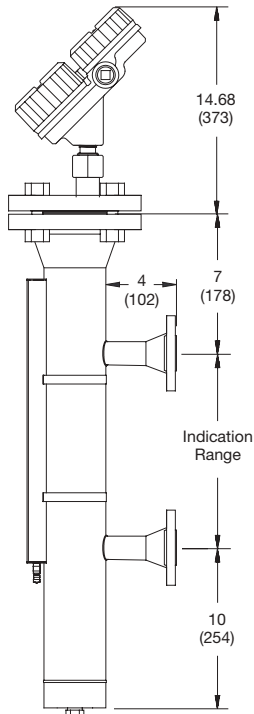
Configuration E
Side Mount, Top Flange
(probe threaded to flange)



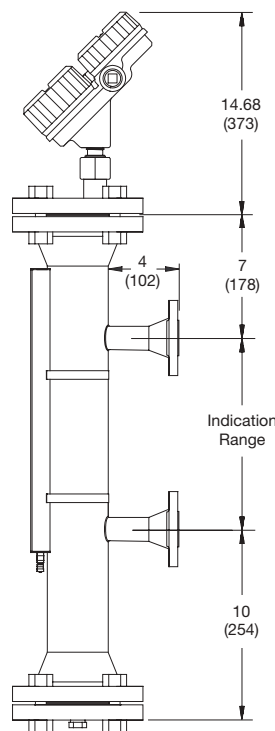
Configuration F
Side Mount, Top & Bottom Flanges
(probe threaded to flange)



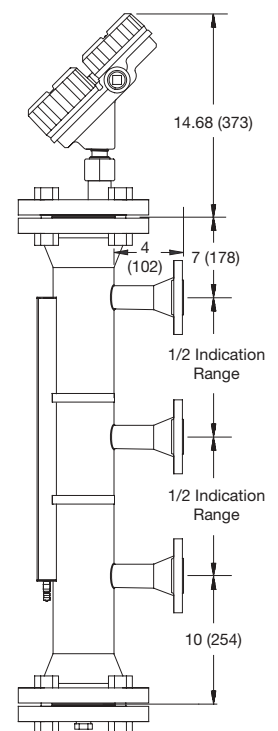
Configuration G
Side Mount, Interface,
Top & Bottom Flanges
(probe threaded to flange)



Configuration S
Side Mount, Top Flange, Weldneck
(probe threaded to flange)



Configuration T
Side Mount, Top & Bottom Flanges,
Weldneck
(probe threaded to flange)



Configuration U
Side Mount, Interface,
Top & Bottom Flanges, Weldneck
(probe threaded to flange)

MODEL NUMBER - GEMINI

GEMINI

3	Gemini MLI – Indication range in inches
C	Gemini MLI – Indication range in centimeters

CHAMBER – ANSI PRESSURE CLASS RATING ①

A	150# ANSI Class
B	300# ANSI Class
C	600# ANSI Class
D	900# ANSI Class
E	1500# ANSI Class
F	2500# ANSI Class

CHAMBER – DIN PRESSURE CLASS RATING

M	PN 16	DIN Class
N	PN 25/40	DIN Class
P	PN 64	DIN Class
Q	PN 100	DIN Class
R	PN 160	DIN Class
S	PN 250	DIN Class
T	PN 320	DIN Class

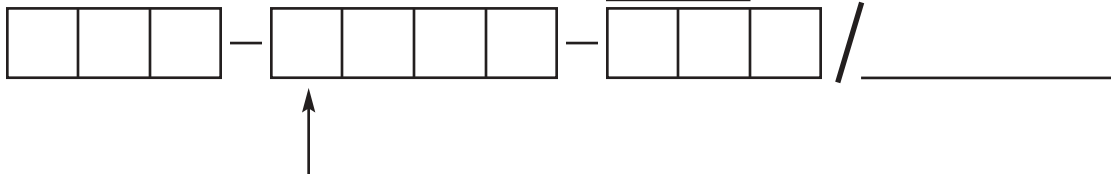
CHAMBER MATERIALS OF CONSTRUCTION ①

A	316/316L stainless steel
B	316/316L SS w/carbon steel flanges
C	304/304L stainless steel
D	304/304L SS w/carbon steel flanges
F	321 stainless steel
G	Titanium
H	Monel
J	Hastelloy B

K	Hastelloy C-276
L	Inconel 625
M	Inconel 825
N	Alloy 20
P	Electropolished 316 stainless steel
Q	904L stainless steel
R	347 stainless steel

① Internal coatings available, consult factory.

See following pages



CHAMBER MOUNTING CONFIGURATION

	Process Connections	Top	Bottom	Secondary Chamber	
1	Side/side	Dome cap	RF slip-on with blind flange	Dome cap	Dome cap
2	Side/side	RF slip-on with blind flange	Dome cap	Dome cap	Dome cap
3	Side/side	RF slip-on with blind flange	RF slip-on with blind flange	Dome cap	Dome cap
4	Side/side for interface	Dome cap	RF slip-on with blind flange	Dome cap	Dome cap
5	Top/bottom	RF slip-on flange	RF slip-on flange	Dome cap	Dome cap
6	Top/bottom w/spool pcs.	RF slip-on flange	RF slip-on flange	Dome cap	Dome cap
A	Side/side	Dome cap	RF weldneck with blind flange	Dome cap	Dome cap
B	Side/side	RF weldneck with blind flange	Dome cap	Dome cap	Dome cap
C	Side/side	RF weldneck with blind flange	RF weldneck with blind flange	Dome cap	Dome cap
D	Side/side for interface	Dome cap	RF weldneck with blind flange	Dome cap	Dome cap
J	Side/side	Dome cap	RF slip-on with blind flange	RF slip-on flange	Dome cap
K	Side/side	RF slip-on with blind flange	Dome cap	RF slip-on flange	Dome cap
L	Side/side	RF slip-on with blind flange	RF slip-on with blind flange	RF slip-on flange	Dome cap
M	Top/bottom	RF slip-on flange	RF slip-on flange	RF slip-on flange	Dome cap
N	Top/bottom w/spool pcs.	RF slip-on flange	RF slip-on flange	RF slip-on flange	Dome cap
P	Side/side	Dome cap	RF weldneck with blind flange	RF weldneck flange	Dome cap
Q	Side/side	RF weldneck with blind flange	Dome cap	RF weldneck flange	Dome cap
R	Side/side	RF weldneck with blind flange	RF weldneck with blind flange	RF weldneck flange	Dome cap

MODEL NUMBER - GEMINI

PROCESS CONNECTION SIZE

A	½"
B	¾"
C	1"
D	1½"
E	2"
F	2½"
G	3"
H	4"
J	6"
K	8"

L	DN 20
M	DN 25
N	DN 40
P	DN 50
Q	DN 80
R	DN 100
S	DN 150

PROCESS CONNECTION TYPE

A	Threaded nipple
B	Threaded coupling
C	Plain-end nipple
D	Socketweld coupling
E	Buttweld nipple
F	Weldolet
G	Sockolet
T	Thredolet
H	Slip-on FF flange
J	Slip-on RF flange
K	Slip-on RTJ flange
L	Weldneck RF flange
M	Weldneck RTJ flange
N	Lap joint flange
P	Tri-clamp fitting

INDICATOR AND SCALE

1	Black/Orange flags	No scale
2	Black/Orange flags	Height in centimeters
3	Black/Orange flags	Height in feet/inches
4	Black/Orange flags	Height in percent of span
5	Black/Orange flags	Volume in gallons
6	Black/Orange flags	Volume in liters
7	Black/Orange flags	Height in running inches
H	Black/Yellow flags	No scale
J	Black/Yellow flags	Height in centimeters
K	Black/Yellow flags	Height in feet/inches
L	Black/Yellow flags	Height in percent of span
M	Black/Yellow flags	Volume in gallons
N	Black/Yellow flags	Volume in liters
P	Black/Yellow flags	Height in running inches
Q	Red/White flags	No scale
R	Red/White flags	Height in centimeters
S	Red/White flags	Height in feet/inches
T	Red/White flags	Height in percent of span
V	Red/White flags	Volume in gallons
W	Red/White flags	Volume in liters
Y	Red/White flags	Height in running inches
A	Orange Shuttle	No scale
B	Orange Shuttle	Height in centimeters
C	Orange Shuttle	Height in feet/inches
D	Orange Shuttle	Height in percent of span
E	Orange Shuttle	Volume in gallons
F	Orange Shuttle	Volume in liters
G	Orange Shuttle	Height in running inches

See following page



MODEL NUMBER - GEMINI

PRESSURE AND SPECIFIC GRAVITY SELECTION (for temperatures up to +450° F (+232° C)) ①

200 psig Maximum Pressure	
2 A	0.75 S.G. min.
2 B	0.64 S.G. min.
2 H	0.49 S.G. min.
300 psig Maximum Pressure	
3 A	0.75 S.G. min.
3 B	0.64 S.G. min.
3 H	0.49 S.G. min.
400 psig Maximum Pressure	
4 A	0.88 S.G. min.
4 B	0.64 S.G. min.
4 H	0.49 S.G. min.
500 psig Maximum Pressure	
5 A	0.88 S.G. min.
5 B	0.64 S.G. min.
5 H	0.49 S.G. min.

600 psig Maximum Pressure	
6 B	0.64 S.G. min.
6 H	0.49 S.G. min.
700 psig Maximum Pressure	
7 B	0.64 S.G. min.
7 H	0.49 S.G. min.
800 psig Maximum Pressure	
8 B	0.64 S.G. min.
8 H	0.49 S.G. min.
900 psig Maximum Pressure	
9 B	0.64 S.G. min.
9 K	0.57 S.G. min.

① Orion's capabilities exceed those listed here. Consult factory for higher pressures or lower specific gravity.

TEMPERATURE OPTIONS

Y	HT insulation pad at +375° F (+191° C) or higher on chamber only ②
A	HT insulation blanket to +500° F (+260° C) on chamber only ③
B	HT insulation blanket to +1000° F (+538° C) on chamber only ③
C	HT insulation blanket to +500° F (+260° C) on chamber and flanges ③
D	HT insulation blanket to +1000° F (+538° C) on chamber and flanges ③
N	Cryogenic insulation to -100° F (-73° C)
P	Cryogenic insulation to -200° F (-129° C)
Q	Cryogenic insulation to -320° F (-196° C)
R	Steam tracing
S	Steam tracing with blanket
T	Electric heat tracing +40° F (+4° C) and below with insulation blanket ④
U	Electric heat tracing +40° to +200° F (+4° to +93° C) with insulation blanket ④
V	Electric heat tracing +200° to +500° F (+93 to +260° C) with insulation blanket ④
W	Electric heat tracing +500° to +800° F (+260° to +427° C) with insulation blanket ④
0	None

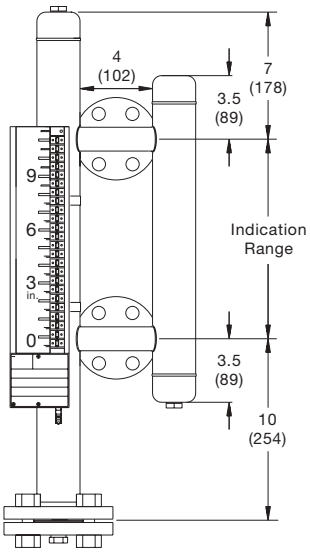
- ② For process temperatures of +375° to +499° F (+191° to +259° C), an HT insulation pad is required.
- ③ For process temperatures of +500° F (+260° C) and above, an HT insulation blanket is required
- ④ Field voltage, area classification and required temperature must be specified at time of order placement.

Specify length in inches when first digit is 1, in lengths from 12 to 600 inches
Specify length in centimeters when first digit is A, in lengths from 30 to 1524 cm.

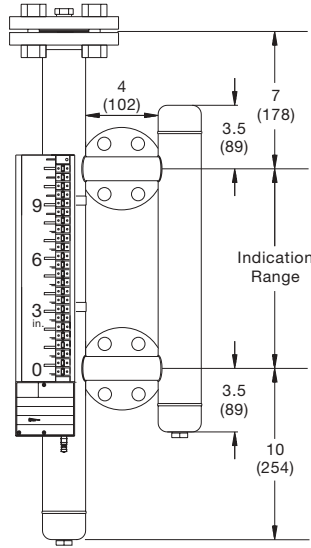
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GEMINI CHAMBER STYLES

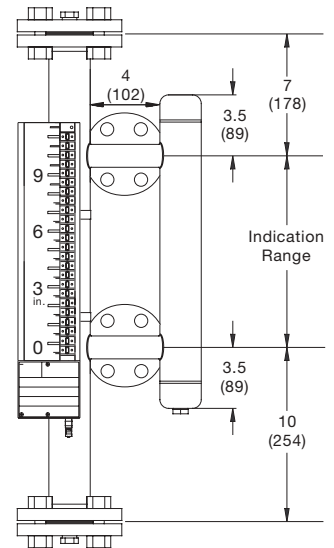
inches (mm)



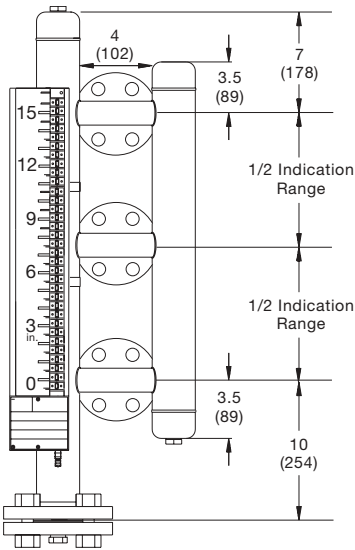
Configuration 1
Side Mount Twin Chambers,
Bottom Flange



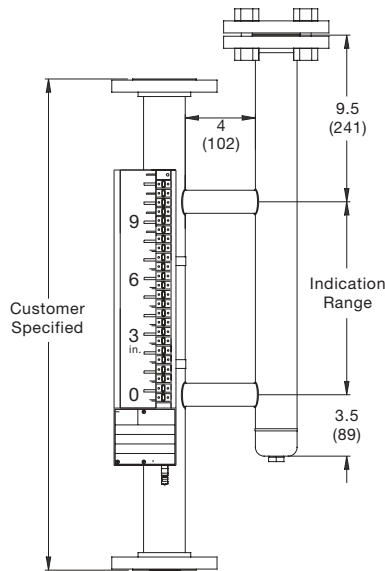
Configuration 2
Side Mount Twin Chambers,
Top Flange



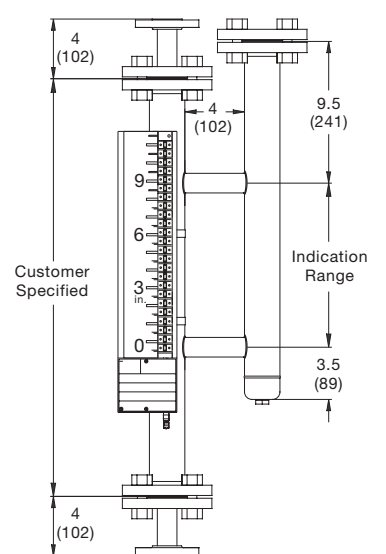
Configuration 3
Side Mount Twin Chambers,
Top & Bottom Flanges



Configuration 4
Side Mount Twin Chambers,
Interface, Bottom Flange



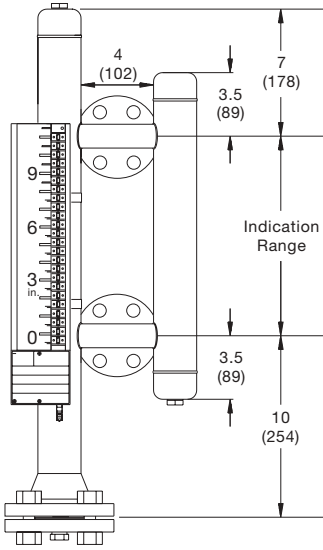
Configuration 5
Top/Bottom Mount
Twin Chambers



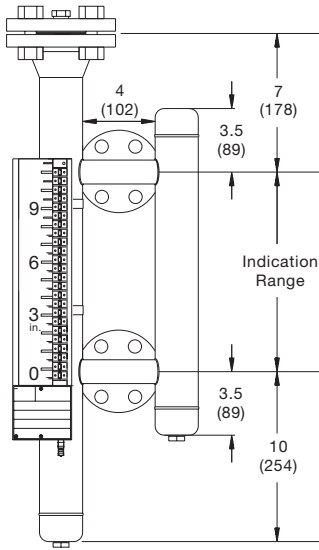
Configuration 6
Top/Bottom Mount
Twin Chambers with Spool Pieces

GEMINI CHAMBER STYLES

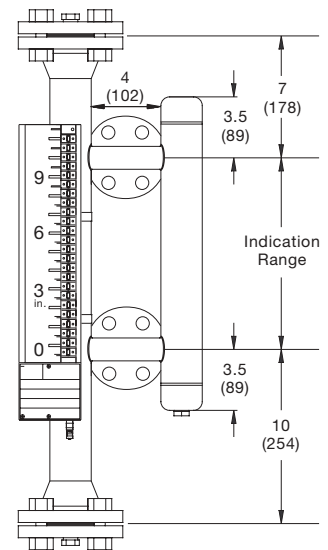
inches (mm)



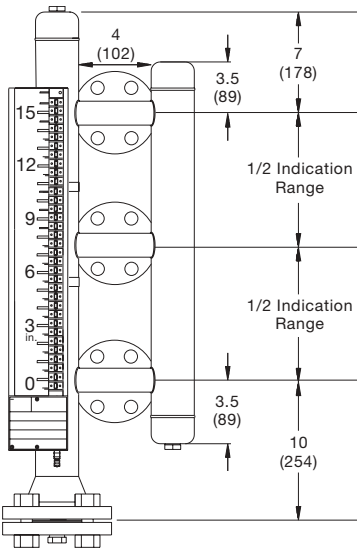
Configuration A
Side Mount Twin Chambers,
Bottom Flange, Weldneck



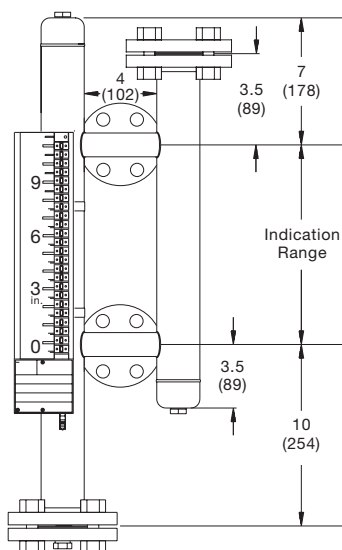
Configuration B
Side Mount Twin Chambers,
Top Flange, Weldneck



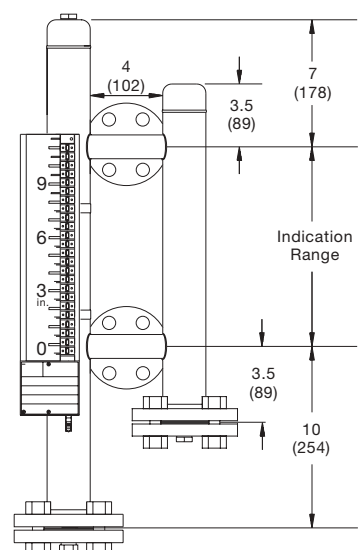
Configuration C
Side Mount Twin Chambers,
Top & Bottom Flanges, Weldneck



Configuration D
Side Mount Twin Chambers,
Interface, Bottom Flange, Weldneck



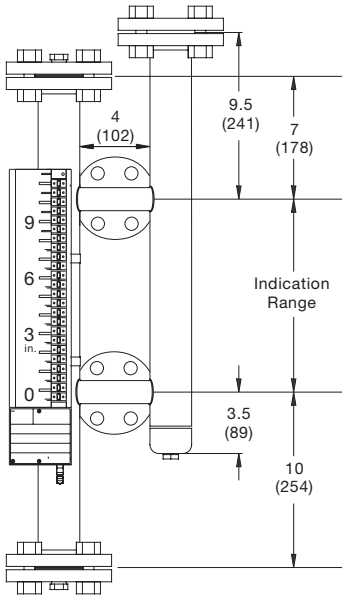
Configuration J
Side Mount Flanged
Twin Chambers



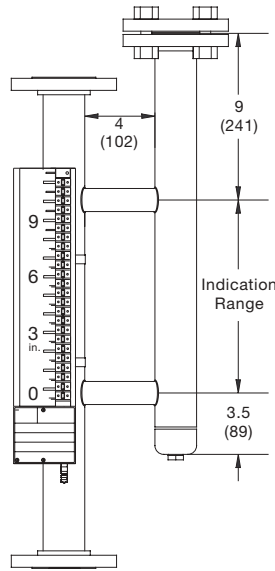
Configuration K
Side Mount Flanged
Twin Chambers

GEMINI CHAMBER STYLES

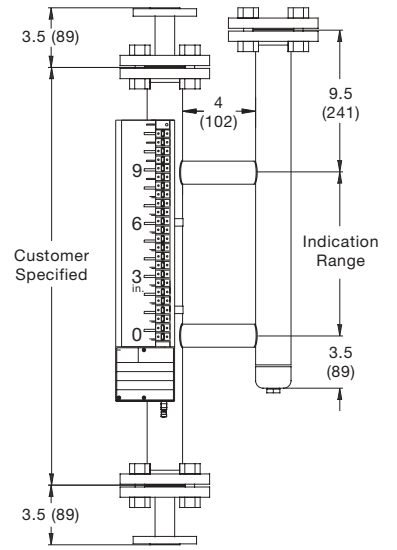
inches (mm)



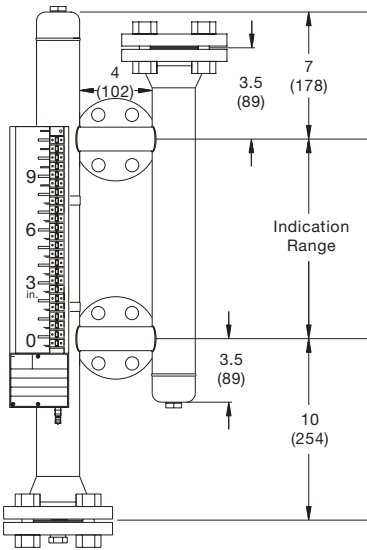
Configuration L
Side Mount Flanged
Twin Chambers



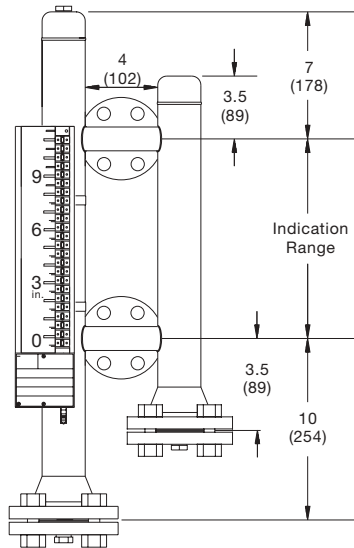
Configuration M
Top/Bottom Mount
Twin Chambers



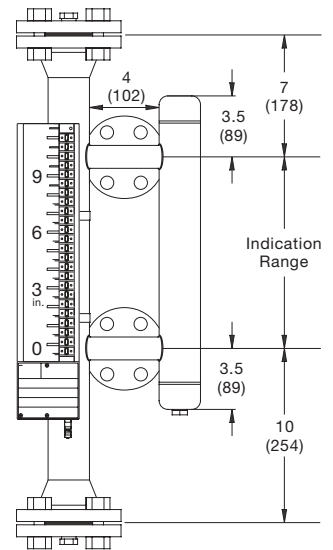
Configuration N
Top/Bottom Mount
Twin Chambers with
Spool Pieces



Configuration P
Side Mount Flanged
Twin Chambers, Weldneck



Configuration Q
Side Mount Flanged
Twin Chambers, Weldneck



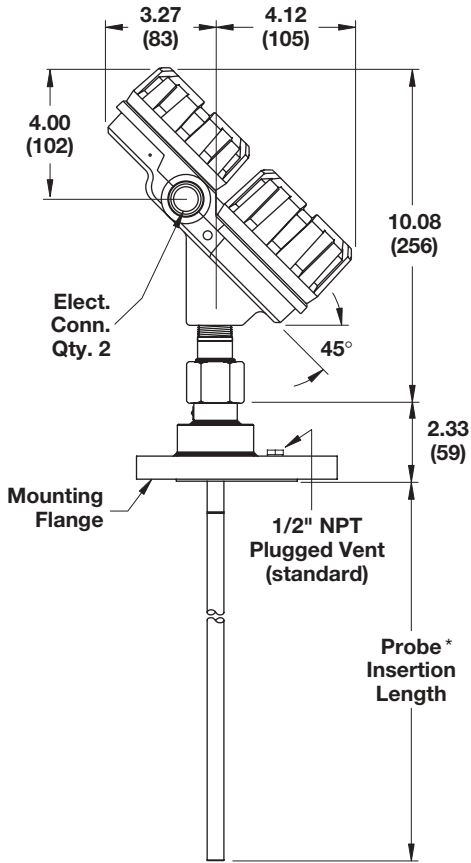
Configuration R
Side Mount Flanged
Twin Chambers, Weldneck

MODEL NUMBER - ACCESSORIES

AURORA ECLIPSE TRANSMITTER

OUTPUT

0	4-20 mA
1	4-20 mA with HART



Eclipse with standard coaxial probe

* Probe length specified should be indication range of MLI plus 13 inches (33 cm)

MENU LANGUAGE

1	English
2	Spanish
3	French
4	German

DISPLAY AND KEYPAD

0	None
A	Digital display and keypad

TRANSMITTER MOUNTING AND APPROVALS

1	Integral, GP, IS & NI, FM/CSA
2	Remote, GP, IS & NI, FM/CSA
3	Integral, EP & NI, FM/CSA
4	Remote, EP & NI, FM/CSA
A	Integral, GP & IS, ATEX Exia
B	Remote, GP & IS, ATEX Exia
C	Integral, EP, ATEX Exd
D	Remote, EP, ATEX Exd
E	Integral, NI, ATEX Exn
F	Remote, NI, ATEX Exn

HOUSING MATERIAL

1	Cast aluminum
2	316 stainless steel

CONDUIT ENTRY

0	3/4" NPT
1	M20
2	PG 13.5
3	PG 16

7 0 5 — 5 —

MODEL NUMBER - ACCESSORIES

AURORA ECLIPSE PROBE

UNIT OF MEASURE

E	English unit of measure (inches)
M	Metric unit of measure (centimeters)

AURORA PROBE TYPE

A	Coaxial
D	HTHP coaxial
P	HP coaxial
R	Overfill coaxial
S	Steam coaxial

AURORA PROBE AND SEAL WELDED FLANGE MATERIAL

Z	316/316L SS probe and carbon steel flange (all probe types)
Y	316/316L SS (all probe types)
T	Hastelloy C (probe types A, D, P & R only)
U	Monel (probe types A & R only)

AURORA THREADED PROBE MATERIAL

A	316/316L SS (all probe types)
B	Hastelloy C (probe types A, D, P & R only)
C	Monel (probe types A & R only)

AURORA PROBE MOUNTING CONNECTION

Aurora ninth digit A, B	
1 1	3/4" NPT Thread (w/4th digit A, B or C)
5 3	150# RF ANSI flange
5 4	300# RF ANSI flange
5 5	600# RF ANSI flange
5 6	900# RF ANSI flange
5 7	1500# RF ANSI flange
5 8	2500# RF ANSI flange

Aurora ninth digit H, K	
1 1	3/4" NPT Thread (w/4th digit A, B or C)
6 3	150# RF ANSI flange
6 4	300# RF ANSI flange
6 5	600# RF ANSI flange
6 6	900# RF ANSI flange
6 7	1500# RF ANSI flange
6 8	2500# RF ANSI flange

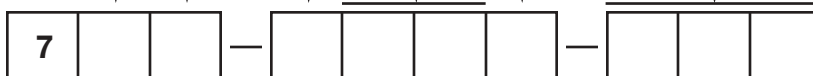
O-RING MATERIAL

0	Viton GFLT (use with probe types A & R)
1	EPDM (use with probe types A & R)
2	Kalrez 4079 (use with probe types A & R)
8	Aegis PF128 (use with probe type S)
N	None (use with probe types D & P)

MEASURING RANGE

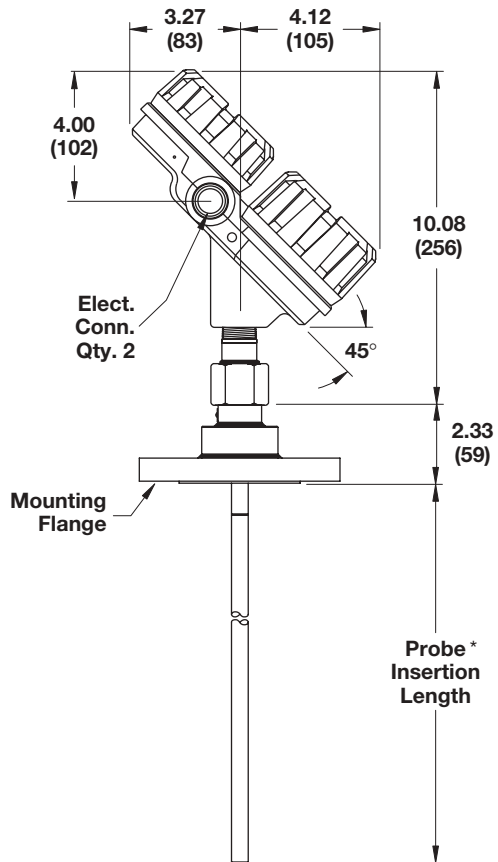
X X X	Probe length*
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* Inches with second digit E (Probe length specified should be indication range of MLI plus 13 inches)
Centimeters with second digit M (Probe length specified should be indication range of MLI plus 33 cm)



MODEL NUMBER - ACCESSORIES

GEMINI ECLIPSE TRANSMITTER



Eclipse with standard coaxial probe

* Probe length specified should be indication range of MLI plus 13 inches (33 cm)

OUTPUT

0	4-20 mA
1	4-20 mA with HART

MENU LANGUAGE

1	English
2	Spanish
3	French
4	German

DISPLAY AND KEYPAD

0	None
A	Digital display and keypad

TRANSMITTER MOUNTING AND APPROVALS

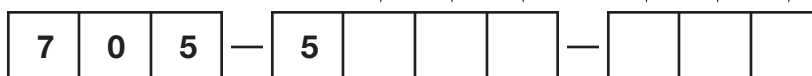
1	Integral, GP, IS & NI, FM/CSA
2	Remote, GP, IS & NI, FM/CSA
3	Integral, EP & NI, FM/CSA
4	Remote, EP & NI, FM/CSA
A	Integral, GP & IS, ATEX Exia
B	Remote, GP & IS, ATEX Exia
C	Integral, EP, ATEX Exd
D	Remote, EP, ATEX Exd
E	Integral, NI, ATEX Exn
F	Remote, NI, ATEX Exn

HOUSING MATERIAL

1	Cast aluminum
2	316 stainless steel

CONDUIT ENTRY

0	3/4" NPT
1	M20
2	PG 13.5
3	PG 16



MODEL NUMBER - ACCESSORIES

GEMINI ECLIPSE PROBE

UNIT OF MEASURE

E	English unit of measure (inches)
M	Metric unit of measure (centimeters)

GEMINI PROBE TYPE

A	Coaxial
B	Twin rod
D	HTHP coaxial
P	HP coaxial
R	Overfill coaxial
S	Steam coaxial

GEMINI PROBE AND FLANGE MATERIAL

A	316/316L SS (all probe types)
B	Hastelloy C (probe types A,B,D,P&R only)
C	Monel (probe types A, B & R only)
K	316/316L SS to ASME B31.1 (probe type S only)

GEMINI PROBE MOUNTING CONNECTION ①

Probe Type A, D, P, R, S		Probe Type B	
1 1	3/4" NPT thread	4 2	2" NPT thread
4 3	150# RF ANSI flange	5 3	150# RF ANSI flange
4 4	300# RF ANSI flange	5 4	300# RF ANSI flange
4 5	600# RF ANSI flange	5 5	600# RF ANSI flange
4 6	900/1500# RF ANSI flange	5 6	900/1500# RF ANSI flange
4 8	2500# RF ANSI flange	5 8	2500# RF ANSI flange

① All flanges are sealwelded to probes

O-RING MATERIAL

0	Viton GFLT (use with probe types A, B & R)
1	EPDM (use with probe types A, B & R)
2	Kalrez 4079 (use with probe types A, B & R)
8	Aegis PF128 (use with probe type S)
N	None (use with probe types D & P)

MEASURING RANGE

X X X	Probe length*
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* **Inches** with second digit E (Probe length specified should be indication range of MLI plus 13 inches)
Centimeters with second digit M (Probe length specified should be indication range of MLI plus 33 cm)



MODEL NUMBER - ACCESSORIES

JUPITER TRANSMITTER (FOR USE WITH ATLAS, AURORA, OR GEMINI)

OUTPUT

2	4-20 mA with LCD
4	4-20 mA with HART and LCD

CONFIGURATION ①②- measuring range in inches

1	Top mount
2	Top mount offset
3	Bottom mount offset

CONFIGURATION ①②- measuring range in centimeters

A	Top mount
B	Top mount offset
C	Bottom mount offset

- ① Use top mount offset configuration with Atlas chamber mounting configurations 2, 3, 5, 6, B, C, Gemini configurations 2, 3, 5, 6, B, C, L, M, N, R, all Aurora.
- ② Consult factory for use with process temperatures over +175° F (+79° C).

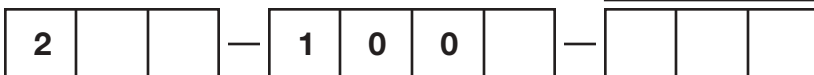
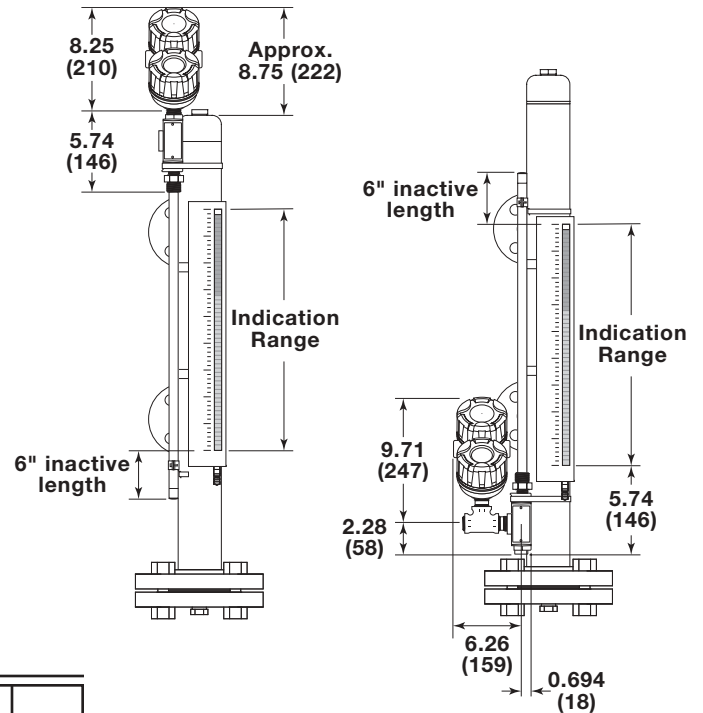
TRANSMITTER HOUSING

1	Cast aluminum with 3/4" NPT conduit entry, FM/CSA: EP, IS, NI
2	Cast aluminum with M20 conduit entry, FM/CSA: EP, IS, NI
3	316 SS with 3/4" NPT conduit entry, FM/CSA: EP, IS, NI
4	316 SS with M20 conduit entry, FM/CSA: EP, IS, NI

MEASURING RANGE

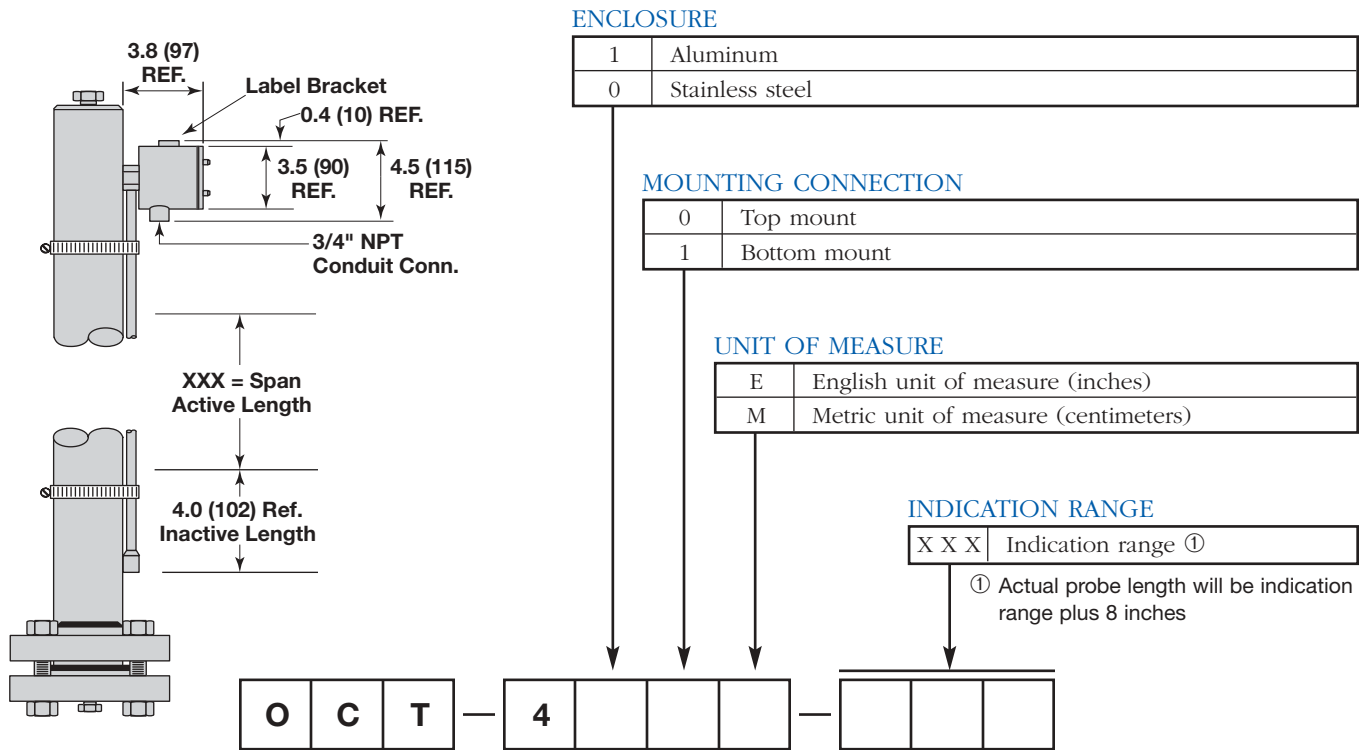
X X X	Probe length ③
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- ③ Inches with third digit numeric (Probe length specified should be indication range of MLI plus 6 inches)
- Centimeters with third digit alpha (Probe length specified should be indication range of MLI plus 15 cm)



MODEL NUMBER - ACCESSORIES

REED CHAIN (FOR USE WITH ATLAS, AURORA, OR GEMINI)



MODEL NUMBER

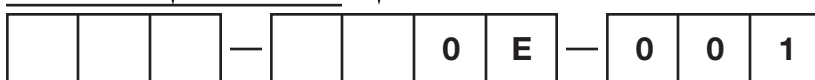
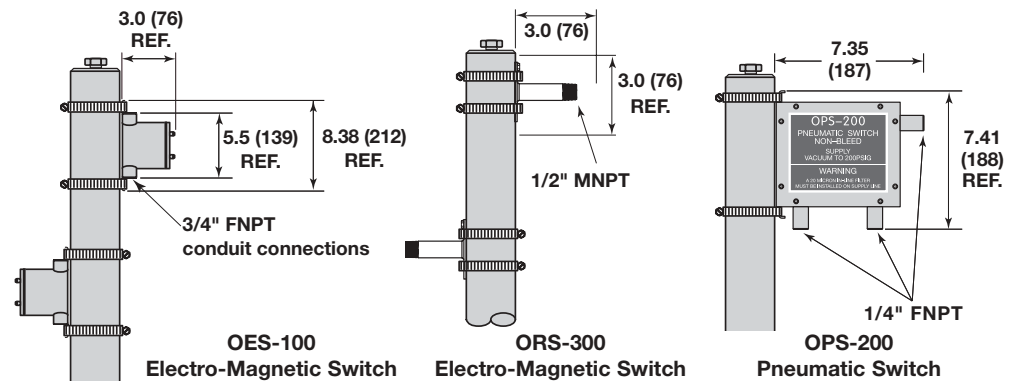
SWITCH (FOR USE WITH ATLAS, AURORA, OR GEMINI)

SWITCH FOR ATLAS

O E S - 1	Electric 10 amp DPDT snap switch in cast aluminum clamp-mounted housing, NEMA 4X/7/9
O P S - 2	Pneumatic non-bleed 200 psig maximum switch in stainless steel clamp-mounted housing, NEMA 4X
O R S - 3	Electric bi-stable 1 amp SPDT reed switch in stainless steel clamp-mounted housing, NEMA 4X/7/9

ENCLOSURE

0	Standard enclosure
2	Standard enclosure with cast aluminum junction box (ORS-3 only)
3	Standard enclosure with stainless steel junction box (ORS-3 only)





ORION

INSTRUMENTS

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