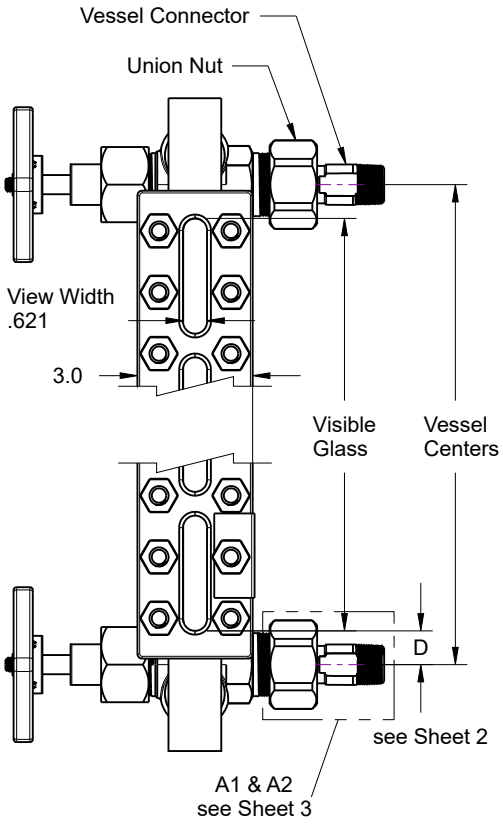
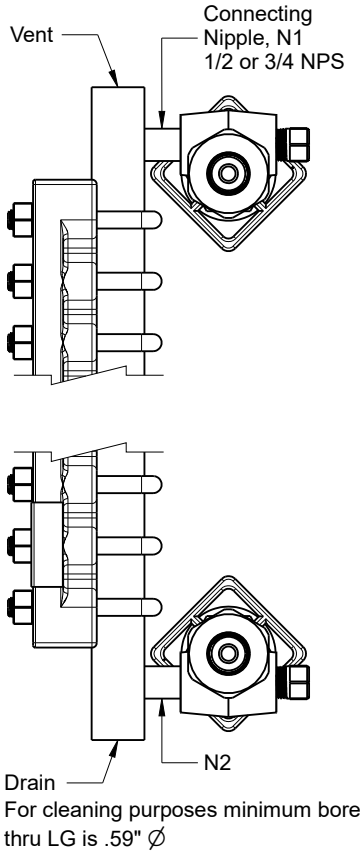
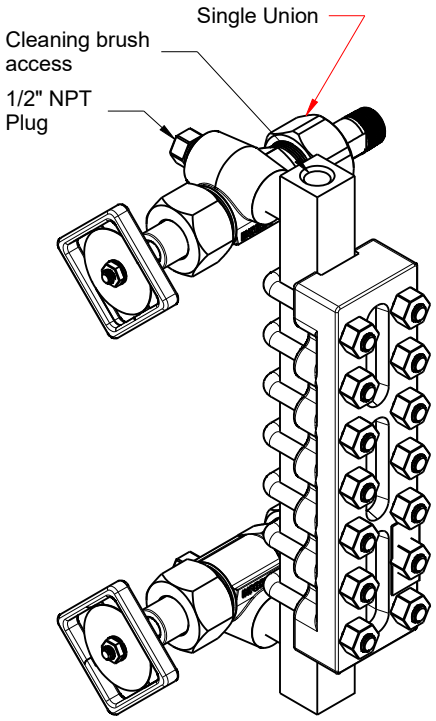
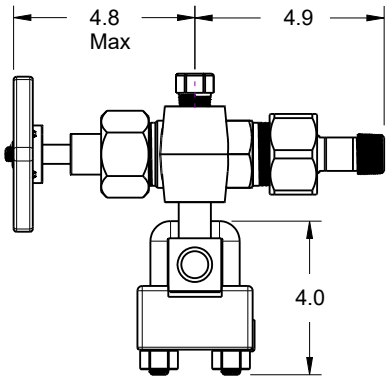






FT "Free Turn"
Patent 6,991,216

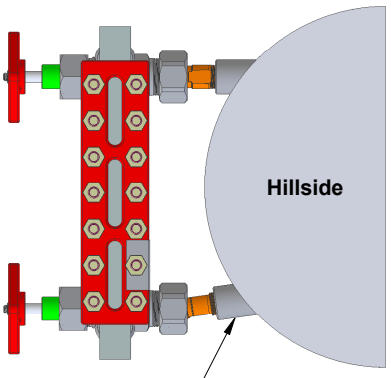


Close Hook-Up "CH" Style LG

- Close Hook-up design insures the longest possible glass length for a given vessel C-C
- LG chamber elongated to accomodate lateral ports
- Gage valves can be set closer together than a standard end connected gage, within 3/8" of the visible glass dimension, see Table
- Permits use of spherical unions

Irregularities in parallelism of upper & lower vessel nozzles can cause the vessel unions to be out of square. The two point attachment of a typical sight glass requires simultaneous squareness when making up the unions - otherwise leak at the union or excessive strain of the connector and the "connecting nipples" will result

Spherical Union Advantages:
- Minimize piping strain
- Minimize leak at union
- 1.7x stronger in bending than regular Flat Floating Union vessel connector.... more suitable for long and heavy gages



Angular misalignment often seen on horizontal vessels and field constructed piping

Corrected with use of spherical unions - as shown

Reference Documents: EN.RT-S5, Eng. Notes
M991980, MOC

General Arrangement Drawing
Level Gage & Gage Valve Combo

Reflex Style: R100 / R200
Level Gage, Back Connected
Gage Valves, Single Union: FT15 / 15A
Assembly Orientation: Fig. 5-4-L
Offsets Inside

All dimensions in Inches

Inferno Manufacturing Corporation
115 Ricou St. Shreveport, LA USA 71107
T (318) 221-8454 F (318) 222-4106

http://www.infernomfg.com/

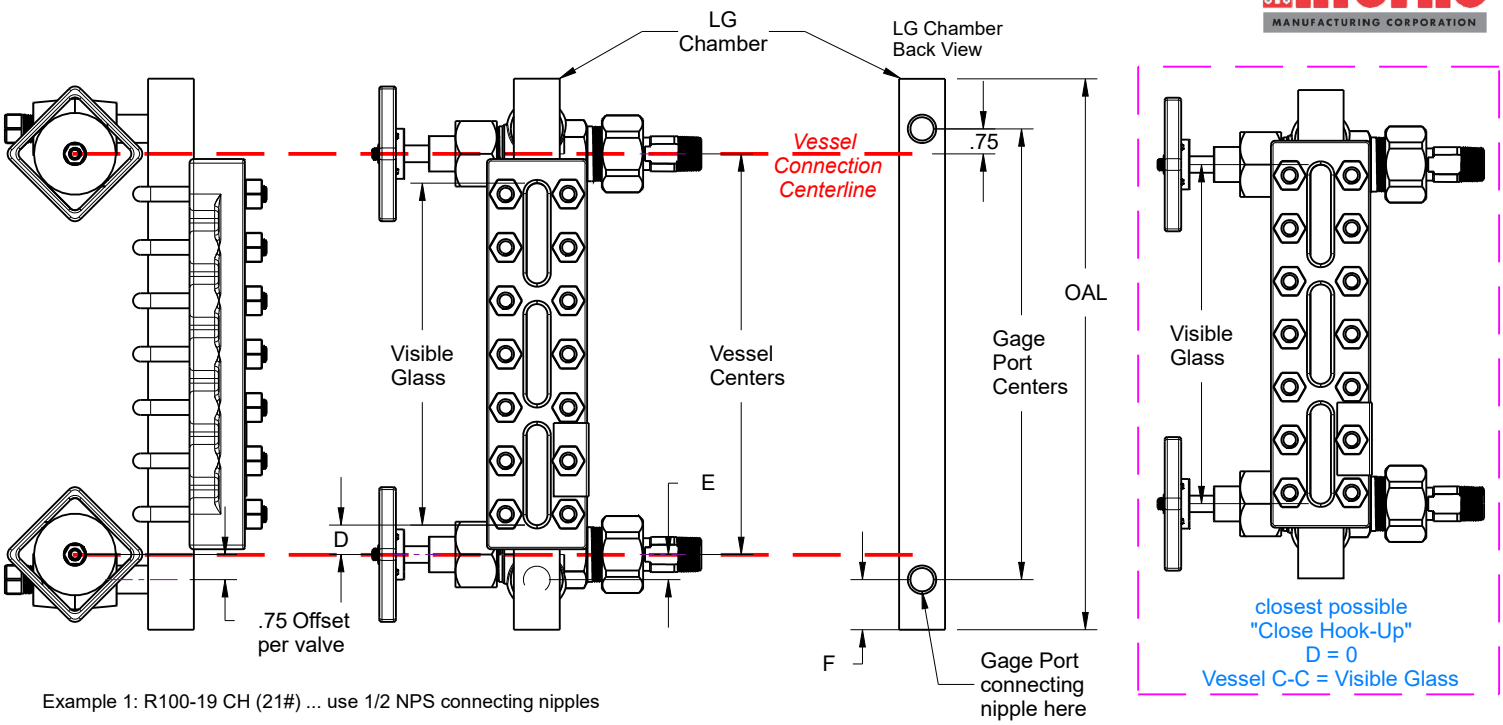
inferno@infernomfg.com

Drawing No: **GA.RS5-4-L**

Drawing Date: 2/14/2020

Revision: 0

Rev Date: N/A



Example 1: R100-19 CH (21#) ... use 1/2 NPS connecting nipples

Case A, Typical arrangement: mounted on 14" vessel centers ...
D = (14 - 12.625 vis. glass) / 2 = .687"

Case B, Factory minimum - Catalog standard: design vessel nozzles at 12.625" C-C, to match the visible glass length ...
D = 0

Example 2: R100-89 CH (163#) ... use 3/4 NPS connecting nipples

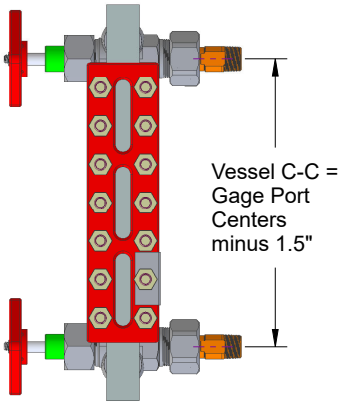
Case A, Typical arrangement: mounted on 114" vessel centers ...
D = (114 - 111.5 vis. glass) / 2 = 1.25"

Case B, Factory minimum - Catalog standard: design vessel nozzles at 111.875" C-C (111.5 +.375), to "match" the visible glass length ...
D = .187"

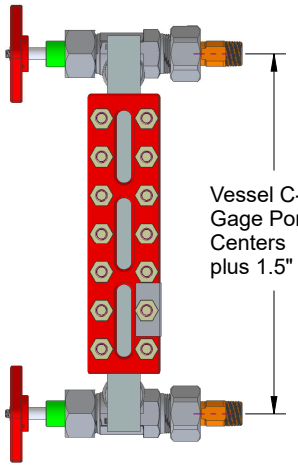
Table - Ref. Fig. 5-4

Gage Port NPS	Minimum Vessel C-C Equals	D = distance from lower glass view to lower vessel C/L	Min. D	Min. Gage Port C-C	E = distance from lower glass view to lower gage port	F
1/2	Visible Glass	(Vessel C-C minus Visible Glass / 2)...or specify asymmetry if required	0	Visible Glass + 1.5"	Min. .75"	1.5"
3/4	Visible Glass + .375"		.187"	Visible Glass + 1.875"	Min. 1.062"	2"

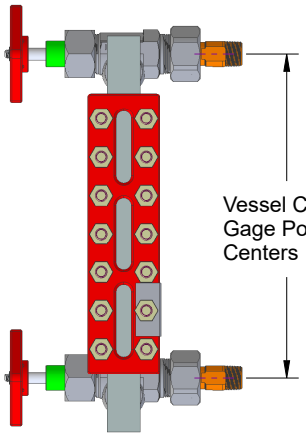
Offsets Inside



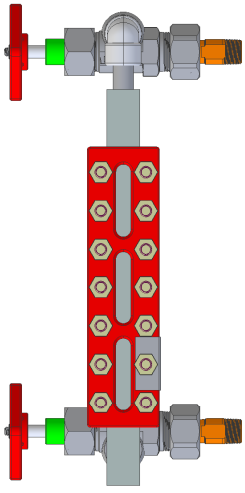
Offsets Outside



Offsets Parallel



Special Side / End Connected



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Drawing Date: 2/14/2020

Revision: 0

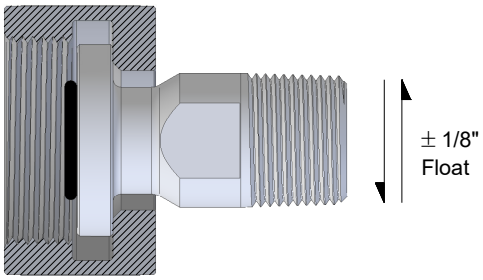
Rev Date: N/A

Choice of Vessel Union Connector

3/8" inside diameter flow path

FLAT / FLOATING UNION

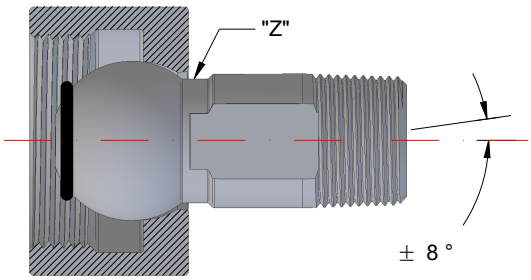
Linear Adjustment



Permits up to 1/4" on vessel centers (pair)

SPHERICAL UNION

Angular Adjustment



Larger section modulus "Z" than FLAT floating union connector, 1.7x stronger in bending

Recommended for angular misalignment due to non-jig set construction, vibration service, & long / heavy gages

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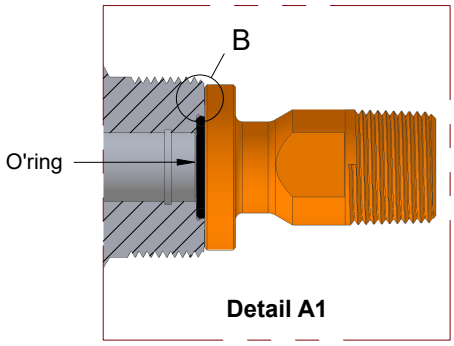
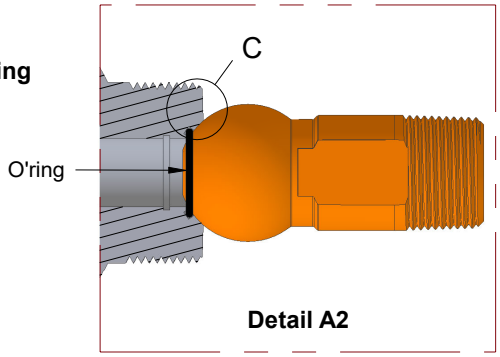
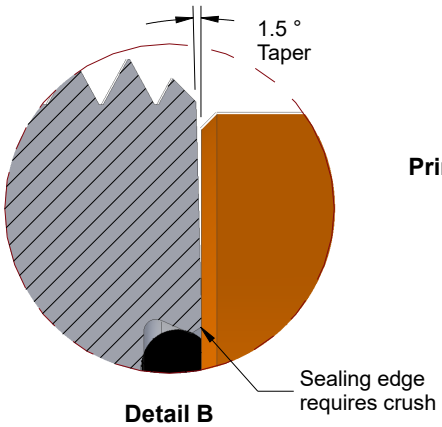


Soft Seal: Static O'ring

Standard feature

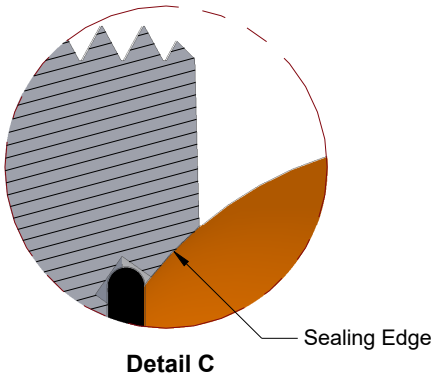


Union Nut omitted for clarity



Primary Seal: Metal to Metal

O'ring not required



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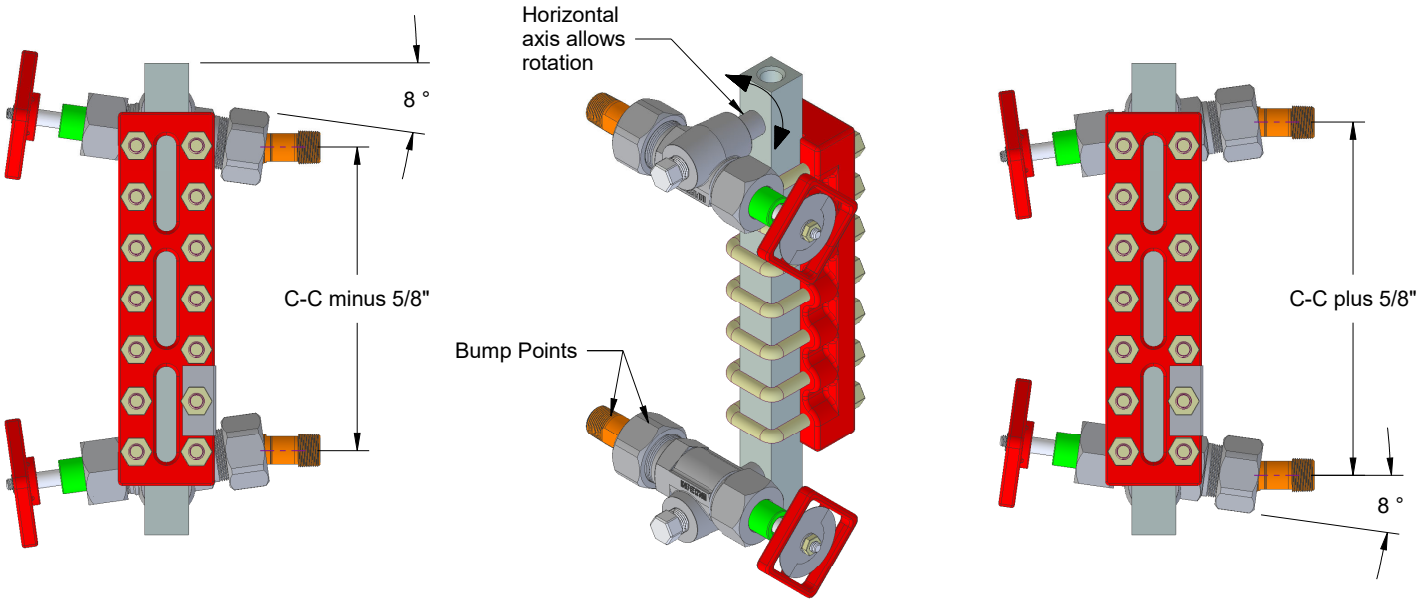
Revision: 0

Rev Date: N/A

Center to Center Adjustment using Spherical Unions

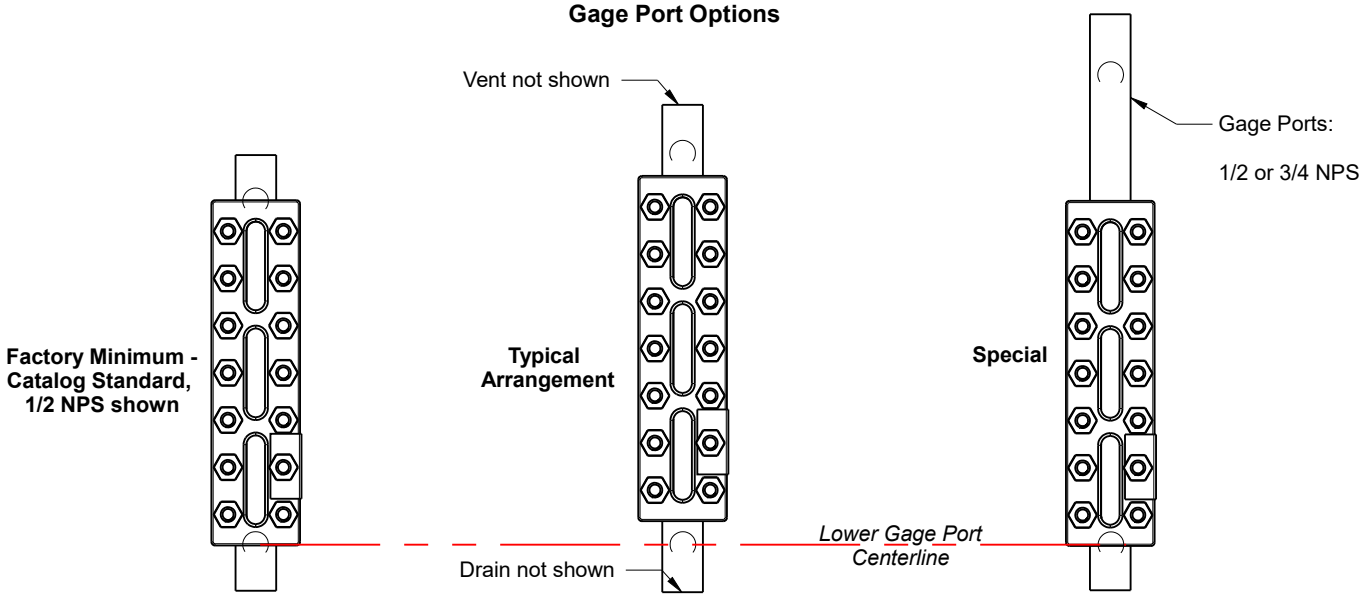
Vessel connectors remain parallel after rotation



If required, use a soft hammer to "bump" the spherical union vessel connector into "rotated" position.

Note: the horizontal connecting axis between LG and GV permits use of spherical union, which will overcome both angular AND vessel C-C misalignment at the same time.

Gage Port Options



Minimum Gage Port C-C

Design vessel C-C distance using Table 1... where
Vessel C-C = Visible Glass (1/2 NPS), or
Vessel C-C = Visible Glass + .375" (3/4 NPS)

Extended Gage Port C-C

Factory customized to match vessel centers

Asymmetrical Gage Port C-C

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