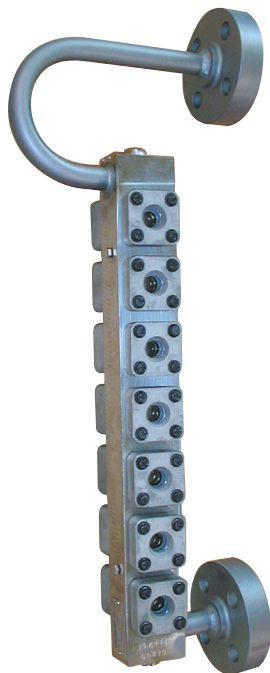




## YARWAY COLOR-PORT® WATER LEVEL GAUGES

Bi-color, direct reading, ported style water level gauge for low, medium and high pressure boilers



### FEATURES

- Combination of design and durable materials assures long service life.
- Individual port assemblies can be replaced in minutes with the gauge in place.
- Spring loading maintains proper pressure on glasses and gaskets at all times.
- Contrasting red and green readings show water level through high visibility illuminator display view slots.
- Choice of direct or mirror viewing systems.
- Choice of low, medium or high pressure designs for use with stuffing box gaugecocks or Welbloc L200V valves.
- Glasses accurately molded and tempered to high specifications.
- Glass, mica and gasket assembly is registered precisely in the body's gasket groove.
- High quality mica protects the inner surface of each glass from the erosive action of steam, water and alkalis.
- Specially-molded flexible graphite gasket between mica and gauge body ensures a tight seal.
- PED 97/23/EC conformance available.

### GENERAL APPLICATION

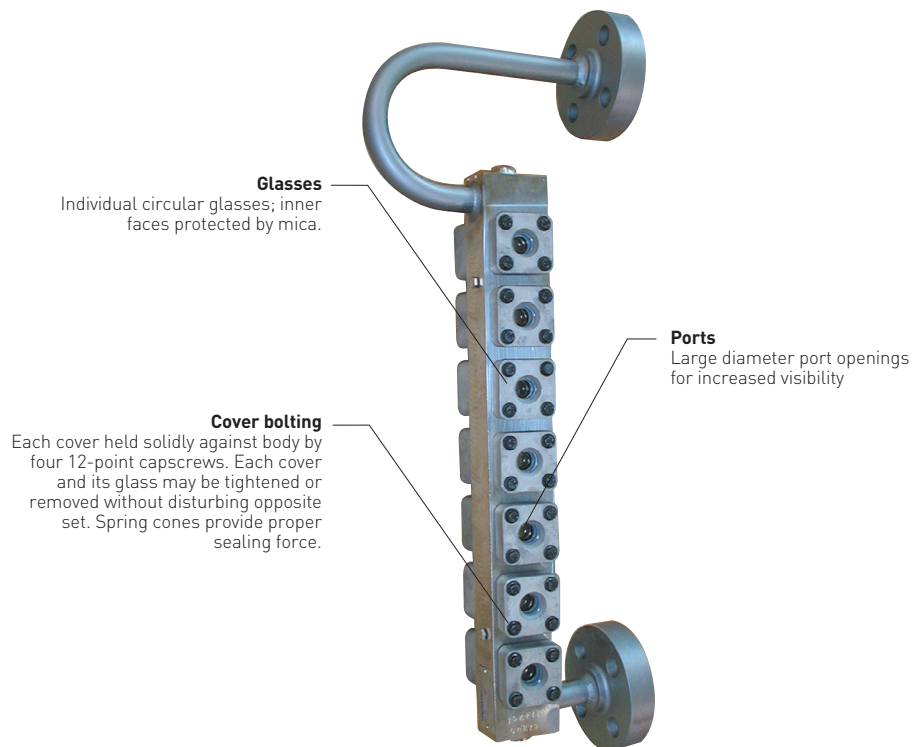
Color-Port gauges provide continuous indication of boiler water levels as required by the ASME Boiler and Pressure Code PG-60.

### TECHNICAL DATA

Sizes:	1/2" to 3/4" (15 to 19 mm)
Max. pressure	
Low pressure design:	850 psi (59 bar)
Medium pressure design:	1800 psi (124 bar)
High pressure design:	3000 psi (207 bar)
Number of ports:	5 to 26
Visibility:	12 3/16" to 72 9/16" (310 to 1843 mm)

## YARWAY COLOR-PORT® WATER LEVEL GAUGES

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### PG-60.1 WATER LEVEL INDICATORS

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**Color-Port gauges provide continuous indication of boiler water levels as required by the ASME\* Boiler and Pressure Code. Under PG-60, the Code states:**

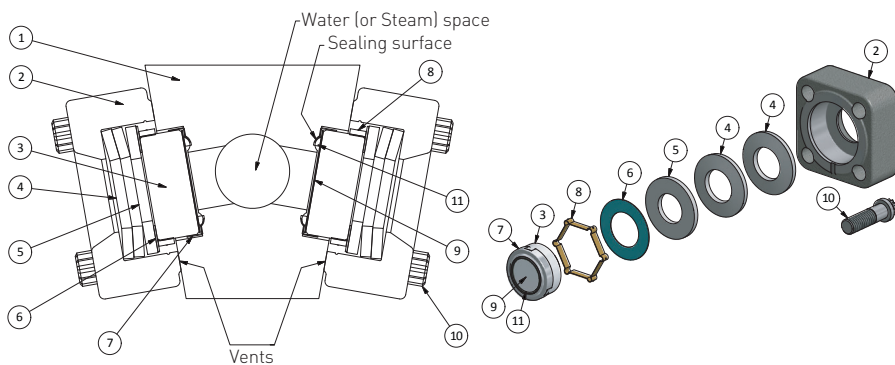
**PG-60.1:** all boilers having a fixed water level (steam and water interface) shall have at least one gauge glass (a transparent device that permits visual determination of the water level).

**PG-60.1.1:** boilers having a maximum allowable working pressure exceeding 400 psi (2800 kPa) shall have two gauge glasses. Instead of one of the two required gauge glasses, two independent remote water level indicators (two discrete systems that continuously measure, transmit, and display water level) may be provided. Boilers not having a fixed water level, such as forced-flow steam generators and high-temperature water boilers of the forced circulation type, are not required to have a gauge glass. Electrode type electric boilers are required to have only one gauge glass, regardless of MAWP.

**PG-60.1.1.1:** when the water level in at least one gauge glass is not readily visible to the operator in the area where control actions are initiated, either a fiber optic cable (with no electrical modification of the optical signal) or mirrors shall be provided to transfer the optical image of the water level to the control area. Alternatively, any combination of two of the following shall be provided: (a) an independent remote water level indicator; (b) an independent continuous transmission and display of an image of the water level in a gauge glass.

\* The American Society of Mechanical Engineers, Boiler and Pressure Vessel Committee, establishes rules of safety governing the design, fabrication and inspection of boilers and unfired pressure vessels.

# YARWAY COLOR-PORT® WATER LEVEL GAUGES



Item No.	Part Name
1	Gauge Body
2	Cover
3	Glass*
4	Spring Cones(s)
5	Washer
6	Cushion Gasket*
7	Clip Ring*
8	Retaining Spring
9	Mica*
10	Cap Screws
11	Sealing Gasket*

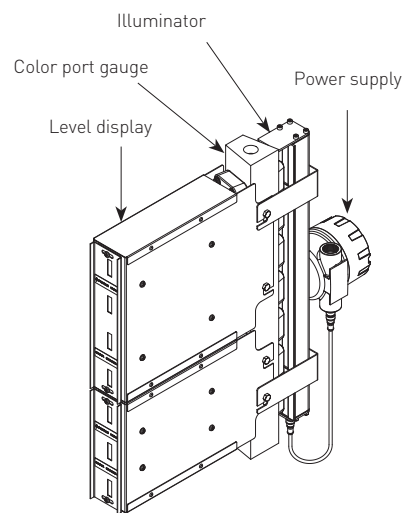
\*Furnished in kit - P/N 7Y584-000  
Groove clean up tool - (stainless wire brush) P/N 301160

A complete Color-Port system includes the gauge, a water column or tie bar, two gauge valves and an illuminator/display.

## Illuminators

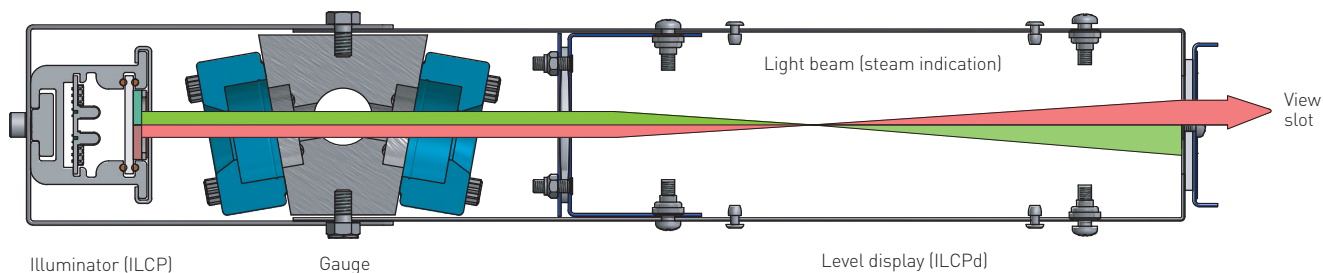
Illuminators are designed to be mounted readily to the color-port gauge chamber and comprise three main components: level display, illuminator and power supply. An LED lighting source is standard.

All illuminators are complete with a color screen containing two strips of glass - one red and one green. Due to the difference in the index of refraction of light through water and steam, only the corresponding color is seen: green for water, red for steam.

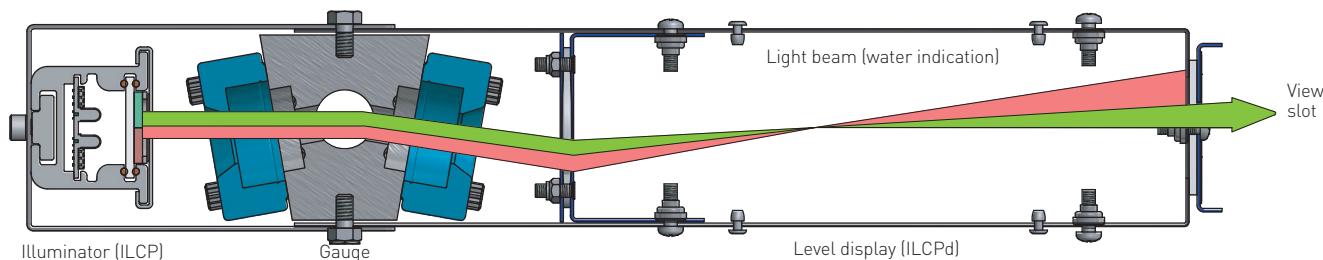


LED PORTED GAUGE ILLUMINATOR AND LEVEL DISPLAY

## SHOWING STEAM PRESENT



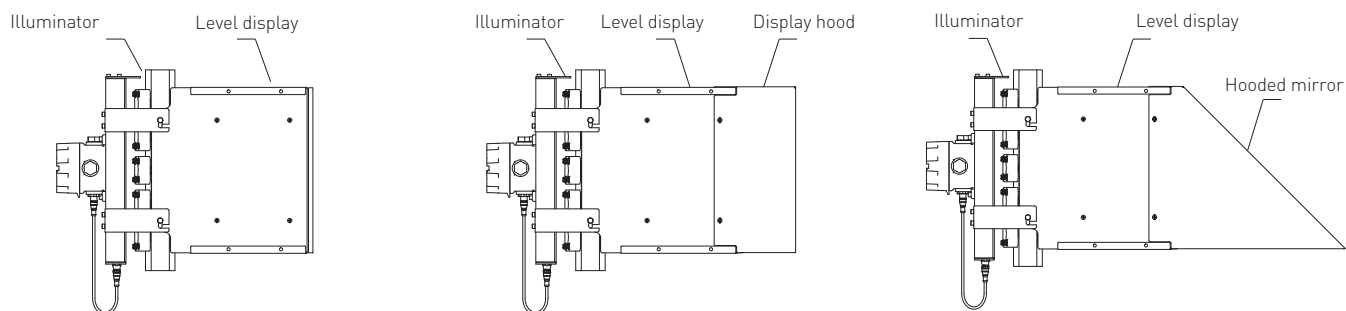
## SHOWING WATER PRESENT



# YARWAY COLOR-PORT® WATER LEVEL GAUGES

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## TYPICAL VIEWING SYSTEMS


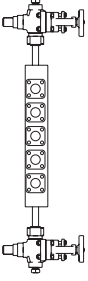
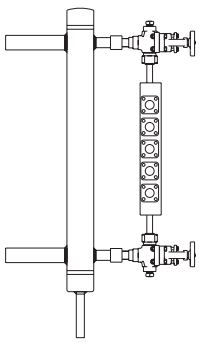
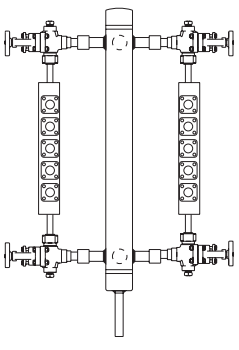

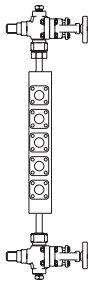
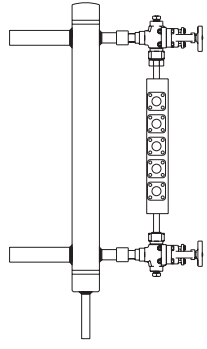
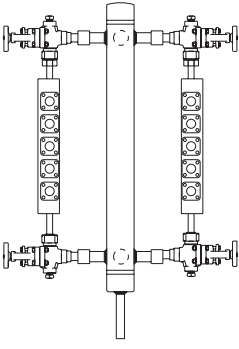
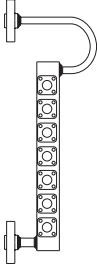
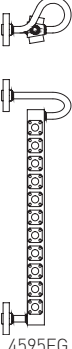
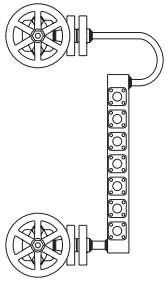
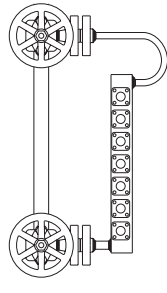
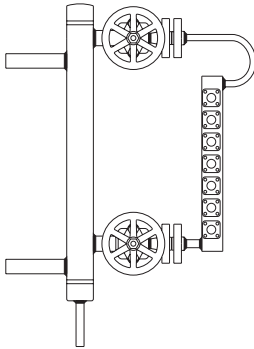
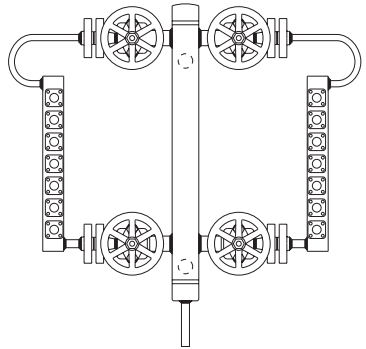


### Features and benefits

- Meets ASME Boiler Code requirements for direct gauge viewing.
- Up to 100,000 hours service.
- Designed to be assembled and disassembled from the gauge easily.
- Power supply housed in an aluminum explosion-proof housing with  $\frac{3}{4}$ " NPTF electrical connection.
- Input voltage 115 or 230 VAC at 50-60 Hz.
- Power consumption up to 400 mA max at 115 / 230 V AC.
- Power supply can be mounted integrally or remote mounted up to 200 feet from illuminator. Consult factory for longer distance requirements.

# YARWAY COLOR-PORT® WATER LEVEL GAUGES

## COLOR-PORT GAUGE COLUMN CHARTS

<b>850 psi (59 bar)</b>	 <p>4511N</p>	 <p>4511N w/780 gaugecocks</p>	 <p>4511N w/780 gaugecocks assembled to column</p>	 <p>Dual 4511N w/780 gaugecocks assembled to column</p>
<b>1800 psi (124 bar)</b>	 <p>4511N w/spacer</p>	 <p>4511N w/spacer and 780 gaugecocks</p>	 <p>4511N w/spacer and 780 gaugecocks assembled to column</p>	 <p>Dual 4511N w/spacer and 780 gaugecocks assembled to column</p>
<b>3000 psi (207 bar)</b>	 <p>4595F</p>	 <p>4595FG</p>	 <p>4595F w/Welbloc L200V</p>	 <p>4595F w/Welbloc L200V and circulating tie bar</p>
<b>3000 psi (207 bar)</b>	 <p>4595F w/Welbloc L200V assembled to column</p>		 <p>Dual 4595F w/Welbloc L200V assembled to column</p>	

# YARWAY COLOR-PORT® WATER LEVEL GAUGES

## STANDARD INSTALLATION ARRANGEMENTS

### Wide range of assemblies

Various assemblies and visibilities are available with low, medium or high pressure gauges by using single or multiple gauges and various columns.

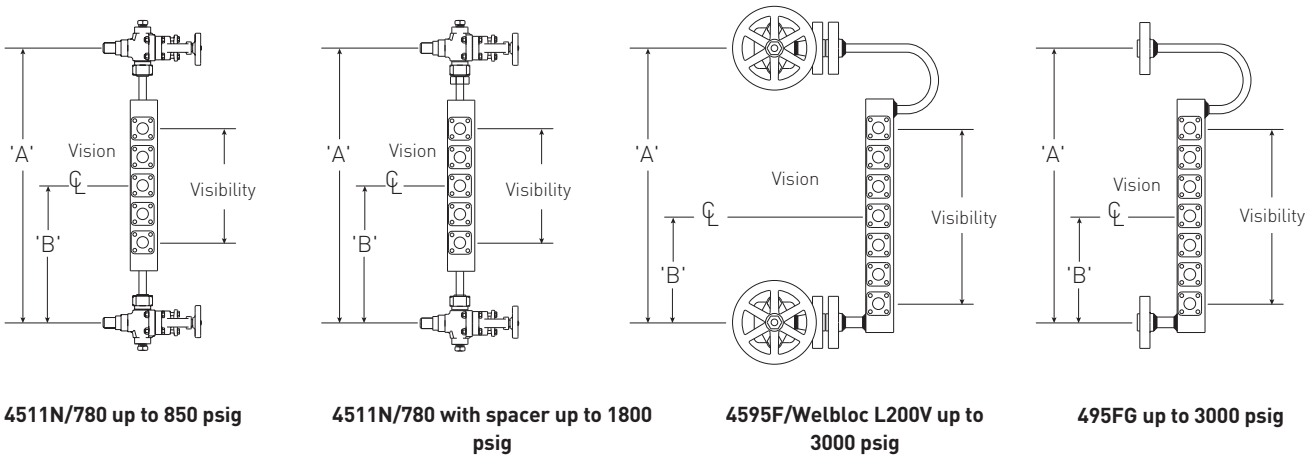
### Other gauge glass availability

Medium and high pressure flat glass gauges as well as low pressure (250 psi to 650 psi) armored transparent and reflex gauges are available.

### How to order Color-Port gauges

For proper Color-Port gauge assembly, pressure, visibility and gauge connections consult selection and visibility charts.

When ordering a separate replacement gauge, provide the serial number of the existing gauge.



## VISIBILITY CHART, inches (mm)

	12.188	15.063	17.938	20.813	23.688	26.563	29.438	32.313	35.188	38.063	40.938
Visibility	(310)	(383)	(456)	(529)	(602)	(675)	(748)	(821)	(894)	(967)	(1040)
No. of ports	5	6	7	8	9	10	11	12	13	14	15
<b>4511N with 780 gaugecocks - up to 850 psi (59 bar)</b>											
Dimension 'A'	24.75	27.625	30.5	33.375	36.25	39.125	42	44.875	47.75	50.625	53.5
Minimum	(629)	(702)	(775)	(848)	(921)	(994)	(1067)	(1140)	(1213)	(1286)	(1359)
Dimension 'B'	12.375	13.813	15.25	16.688	18.125	19.563	21	22.438	23.875	25.313	26.75
Minimum	(314)	(351)	(387)	(424)	(460)	(497)	(533)	(570)	(606)	(643)	(679)
<b>4511N with 780 gaugecocks and spacer - up to 1800 psi (124 bar)</b>											
Dimension 'A'	25.125	28	30.875	33.75	36.625	39.5	42.375	45.25	48.125	51	53.875
Minimum	(638)	(711)	(784)	(857)	(930)	(1003)	(1076)	(1149)	(1222)	(1295)	(1368)
Dimension 'B'	12.563	14	15.438	16.875	18.313	19.75	21.188	22.625	24.063	25.5	26.938
Minimum	(319)	(356)	(392)	(429)	(465)	(502)	(538)	(575)	(611)	(648)	(684)
<b>4595F with Welbloc L200V valves - up to 3000 psi (207 bar)</b>											
Dimension 'A'	20.25	23.125	26	28.875	31.75	34.625	37.5	40.375	43.25	46.125	49
Minimum	(514)	(587)	(660)	(733)	(806)	(879)	(953)	(1026)	(1099)	(1172)	(1245)
Dimension 'B'	7.625	9.063	10.5	11.938	13.375	14.813	16.25	17.688	19.125	20.563	22
Minimum	(194)	(230)	(267)	(303)	(340)	(376)	(413)	(449)	(486)	(522)	(559)
<b>4595FG with Welbloc L200V valves - up to 3000 psi (207 bar)</b>											
Dimension 'A'	17.5	20.375	23.25	26.125	29	31.875	34.75	37.625	40.5	43.375	46.25
Minimum	(445)	(518)	(591)	(664)	(737)	(810)	(883)	(956)	(1029)	(1102)	(1175)
Dimension 'B'	7.625	9.063	10.5	11.938	13.375	14.813	16.25	17.688	19.125	20.563	22
Minimum	(194)	(230)	(267)	(303)	(340)	(376)	(413)	(449)	(486)	(522)	(559)

# YARWAY COLOR-PORT® WATER LEVEL GAUGES

## VISIBILITY CHART, inches (mm) (continued)

	43.813	46.688	49.563	52.438	55.313	58.188	61.063	63.938	66.813	69.688	72.563
Visibility	(1113)	(1186)	(1259)	(1332)	(1405)	(1478)	(1551)	(1624)	(1697)	(1770)	(1843)
No. of ports	16	17	18	19	20	21	22	23	24	25	26
<b>4511N with 780 gaugecocks - up to 850 psi (59 bar)</b>											
Dimension 'A'	56.375	59.25	62.125	65	67.875	70.75	73.625	76.5	79.375	82.25	85.125
Minimum	(1432)	(1505)	(1578)	(1651)	(1724)	(1797)	(1870)	(1943)	(2016)	(2089)	(2162)
Dimension 'B'	28.188	29.625	31.063	32.5	33.938	35.375	36.813	38.25	39.688	41.125	42.563
Minimum	(716)	(752)	(789)	(826)	(862)	(899)	(935)	(972)	(1008)	(1045)	(1081)
<b>4511N with 780 gaugecocks and spacer - up to 1800 psi (124 bar)</b>											
Dimension 'A'	56.75	59.625	62.5	65.375	68.25	71.125	74	76.875	79.75	82.625	85.5
Minimum	(1441)	(1514)	(1588)	(1661)	(1734)	(1807)	(1880)	(1953)	(2026)	(2099)	(2172)
Dimension 'B'	28.375	29.813	31.25	32.688	34.125	35.563	37	38.438	39.875	41.313	42.75
Minimum	(721)	(757)	(794)	(830)	(867)	(903)	(940)	(976)	(1013)	(1049)	(1086)
<b>4595F with Welbloc L200V valves - up to 3000 psi (207 bar)</b>											
Dimension 'A'	51.875	54.75	57.625	60.5	63.375	66.25	69.125	72	74.875	77.75	80.625
Minimum	(1318)	(1391)	(1464)	(1537)	(1610)	(1683)	(1756)	(1829)	(1902)	(1975)	(2048)
Dimension 'B'	23.438	24.875	26.313	27.75	29.188	30.625	32.063	33.5	34.938	36.375	37.813
Minimum	(595)	(632)	(668)	(705)	(741)	(778)	(814)	(851)	(887)	(924)	(960)
<b>4595FG with Welbloc L200V valves - up to 3000 psi (207 bar)</b>											
Dimension 'A'	49.125	52	54.875	57.75	60.625	63.5	66.375	69.25	72.125	75	77.875
Minimum	(1248)	(1321)	(1394)	(1467)	(1540)	(1613)	(1686)	(1759)	(1832)	(1905)	(1978)
Dimension 'B'	23.438	24.875	26.313	27.75	29.188	30.625	32.063	33.5	34.938	36.375	37.813
Minimum	(595)	(632)	(668)	(705)	(741)	(778)	(814)	(851)	(887)	(924)	(960)

## GAUGE ACCESSORIES

### Gauge valves

780 gaugecocks are designed to be used with stuffing box type (nipple end) low and medium pressure gauges (up to 1800 psi, 124 barg) to isolate the gauges from the pressure vessel when it becomes necessary to drain and service them. These models feature:

- Outside screw and yoke.
- A vertical rising lower and horizontal leaky upper ball check shut-off.
- An offset pattern that allows the inside of the gauge glass to be cleaned easily with a minimum of disassembly.
- Solid shank vessel connection (NPT, socketwelding or flanged ends).
- Threaded renewable seat and backseating stem.

Welbloc L200V type gauge valves are designed to be used with flanged end high pressure gauges (up to 3000 psig, 207 barg). Welbloc L200V gauge valves feature a Stellite disc and integral Stellite seat. Internals are completely accessible with the valve connected in the line.

Chain and line pulls are available for 780 and Welbloc L200V gauge valves.

### Drain connections

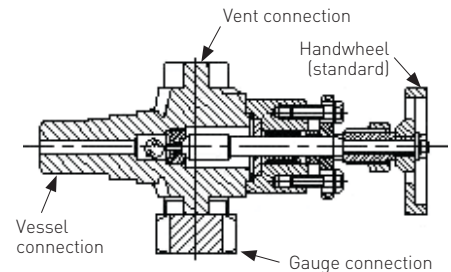
780 stuffing box gaugecocks: 1/2" and 3/4" NPTF and socketwelding available; located on lower gaugecock.

Welbloc L200V gauge valves: 3/4" socketweld connection located at bottom on lower valve block.

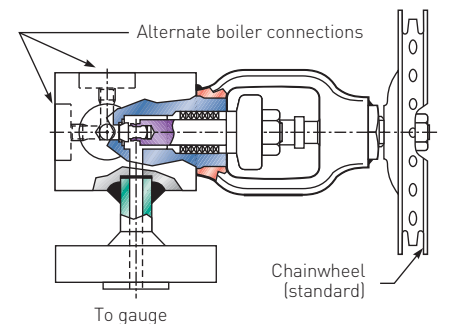
Water columns: 3/4" socketweld connection located at bottom of column.

Tie bar: 3/4" socketweld connection located at bottom of tie bar assembly.

780 upper stuffing box gaugecock (side view)



Upper Welbloc L200V gauge valve (Left hand plan view shown)



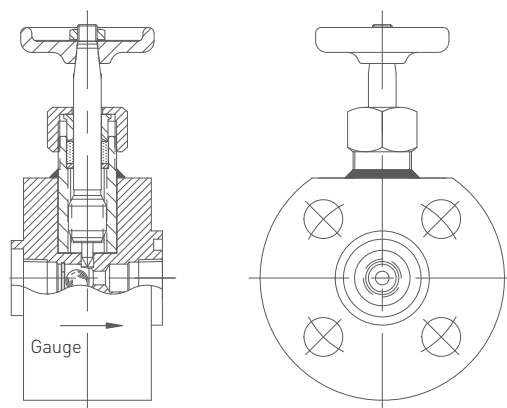
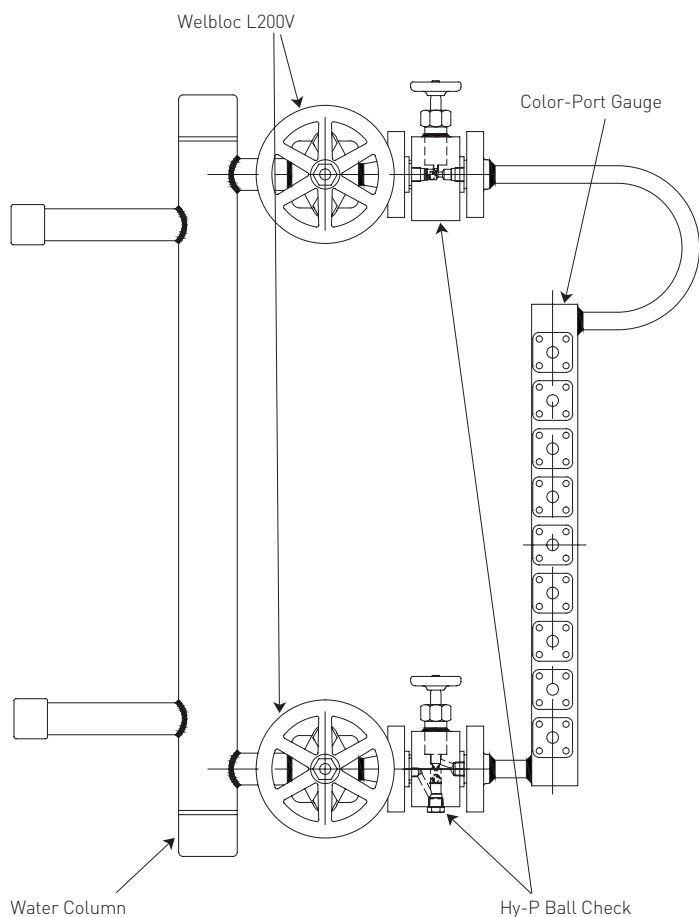
Determining gauge valve 'hand': when facing chain wheels, valve is left hand when gauge is on your left; valve is right hand when gauge is on your right.

# YARWAY COLOR-PORT® WATER LEVEL GAUGES

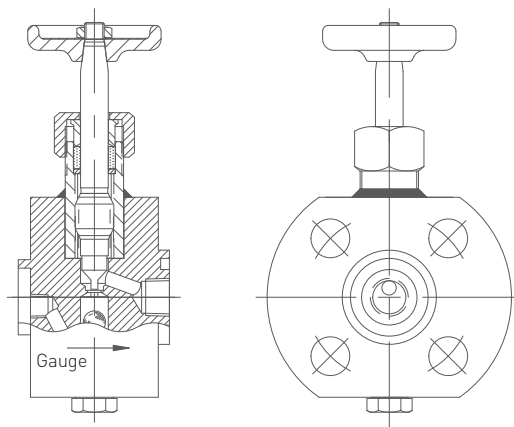
## GAUGE ACCESSORIES

### Ball check shut off

Series Hy-P ball checks are designed for high pressure applications (up to 3000 psig, 207 barg) to limit the flow of process fluid due to sudden downstream pressure loss such as glass breakage. The benefit of the ball check is to safeguard personnel and property from the sudden escape of high pressure steam or water. These models are supplied in pairs (upper and lower) with a vertical rising ball for the lower mount application and a horizontal ball with leaky seat for upper mounting to meet ASME Boiler and Pressure Vessel Code Section I applications.



Series HY-P upper ball check



Series HY-P lower ball check



# YARWAY COLOR-PORT® WATER LEVEL GAUGES

## Water column

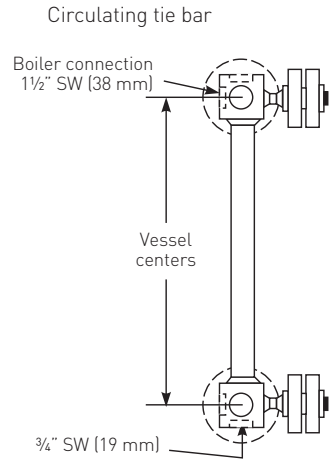
As an option, gauge glasses can be supplied with any of our electronic remote level indicator systems, which consist of a water column with low voltage conductivity probes, a detection and verification unit and a remote display (optional with some systems). These systems can be installed for pressures up to 3000 psig (207 barg) and temperatures up to 1200°F (650°C).

Customers can select the number and spacing of the probes, which are mounted horizontally in the column at the desired distance from the normal water level or lower tap either to indicate level or energize alarms and/or trips for high and low water. A low voltage signal is supplied and sensed by the detection and verification unit and is used to activate the display device(s) and/or relays to perform the required functions. For more detailed information, please see the brochures for the following models:

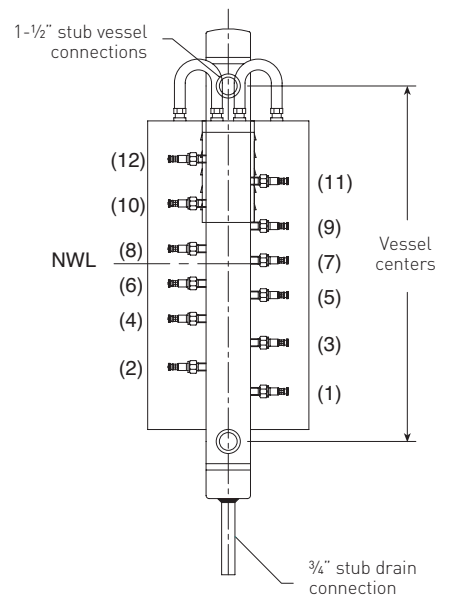
- 1 probe: Model 1001
- 2 probes: Model 1002
- 3-4 probes: Model 1004
- 5+ probes: Model 2000  
Model 3000

Water column: for working pressure up to 3000 psi (207 bar). Can be provided with special boiler centers and special connections for level control probes.

Circulating tie bar: for working pressure up to 3000 psi (207 bar). This compact design reduces installation space, provides greater rigidity and assures minimum temperature differential by allowing more direct flow between drum and gauge. 27" (686 mm) standard gauge and boiler connections.



Column with optional level probe control system







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