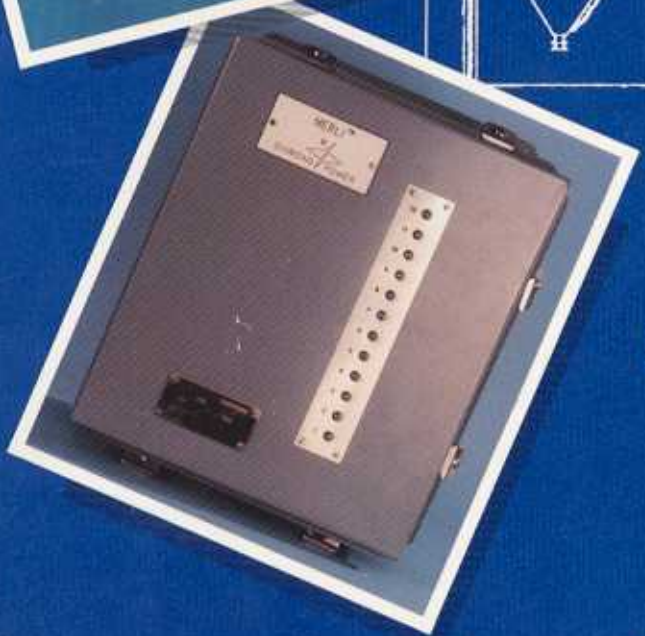
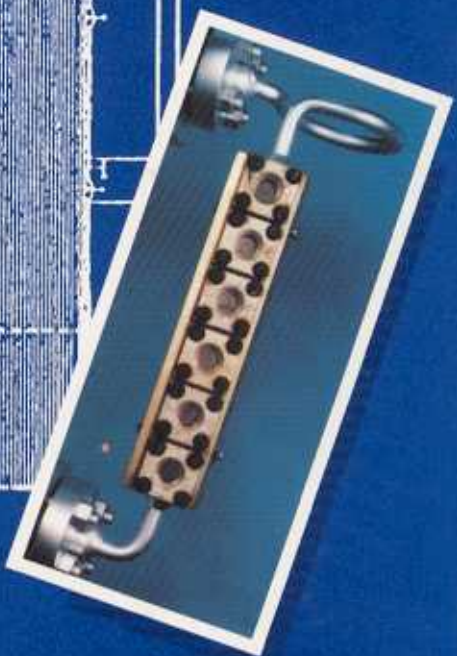
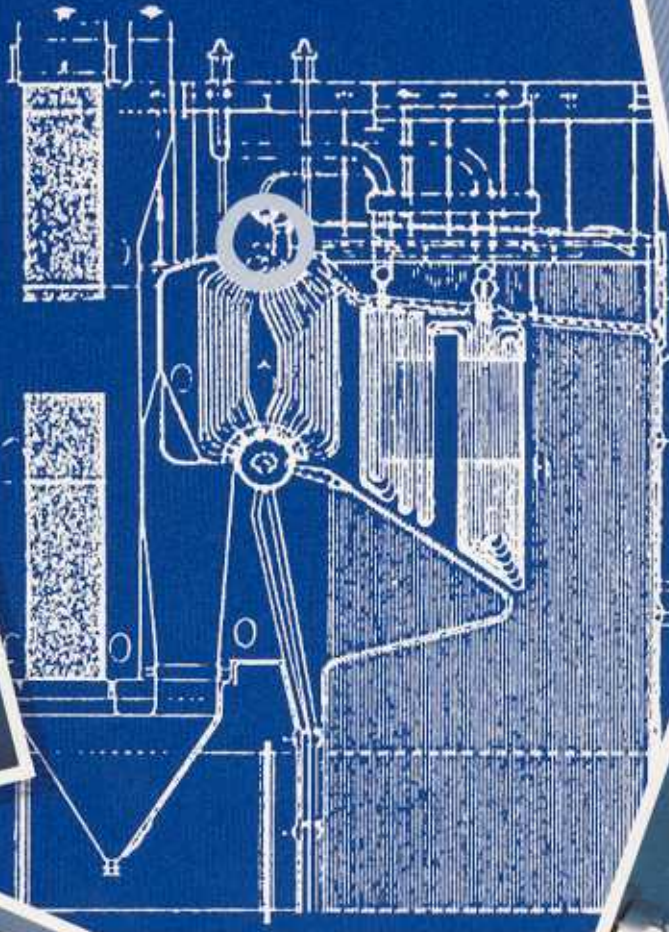
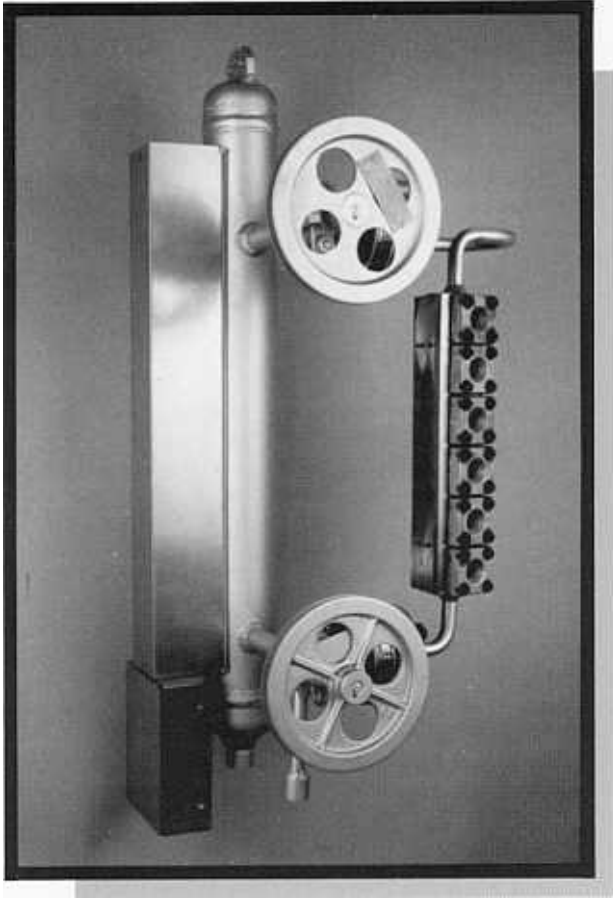


# *Drum Level Indicating Systems*



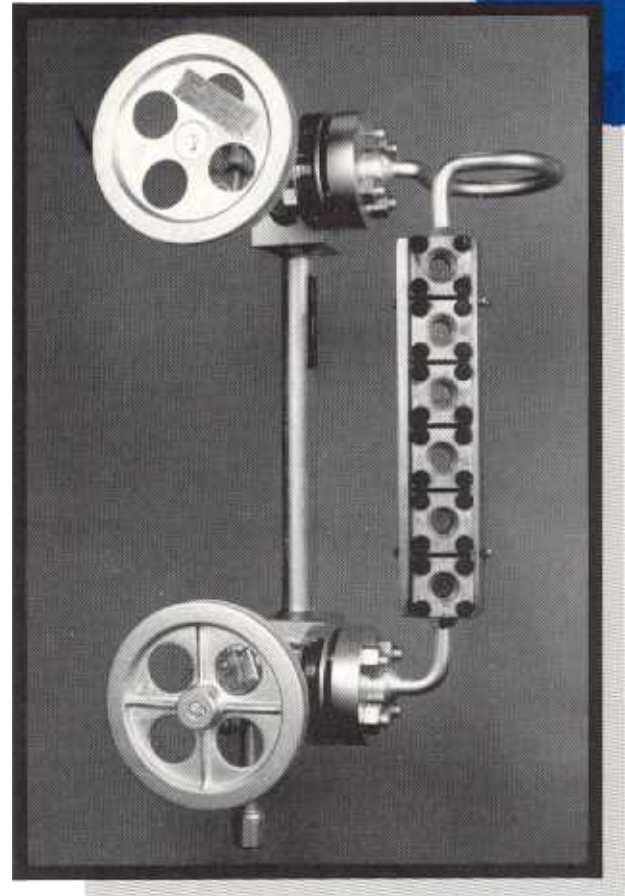
## *Gauges and Viewing Accessories*

# Gauge Mounting Assemblies



**Gauge and Valves Mounted on an Alarm Column**

The column may be either the EACII™ or a MERLI™. Both columns have alarm and cut-off capability.



**Gauge and Valves Mounted on a Support Tube**

The support tube provides a structural member for ease of installation and facilitates gauge washdown.

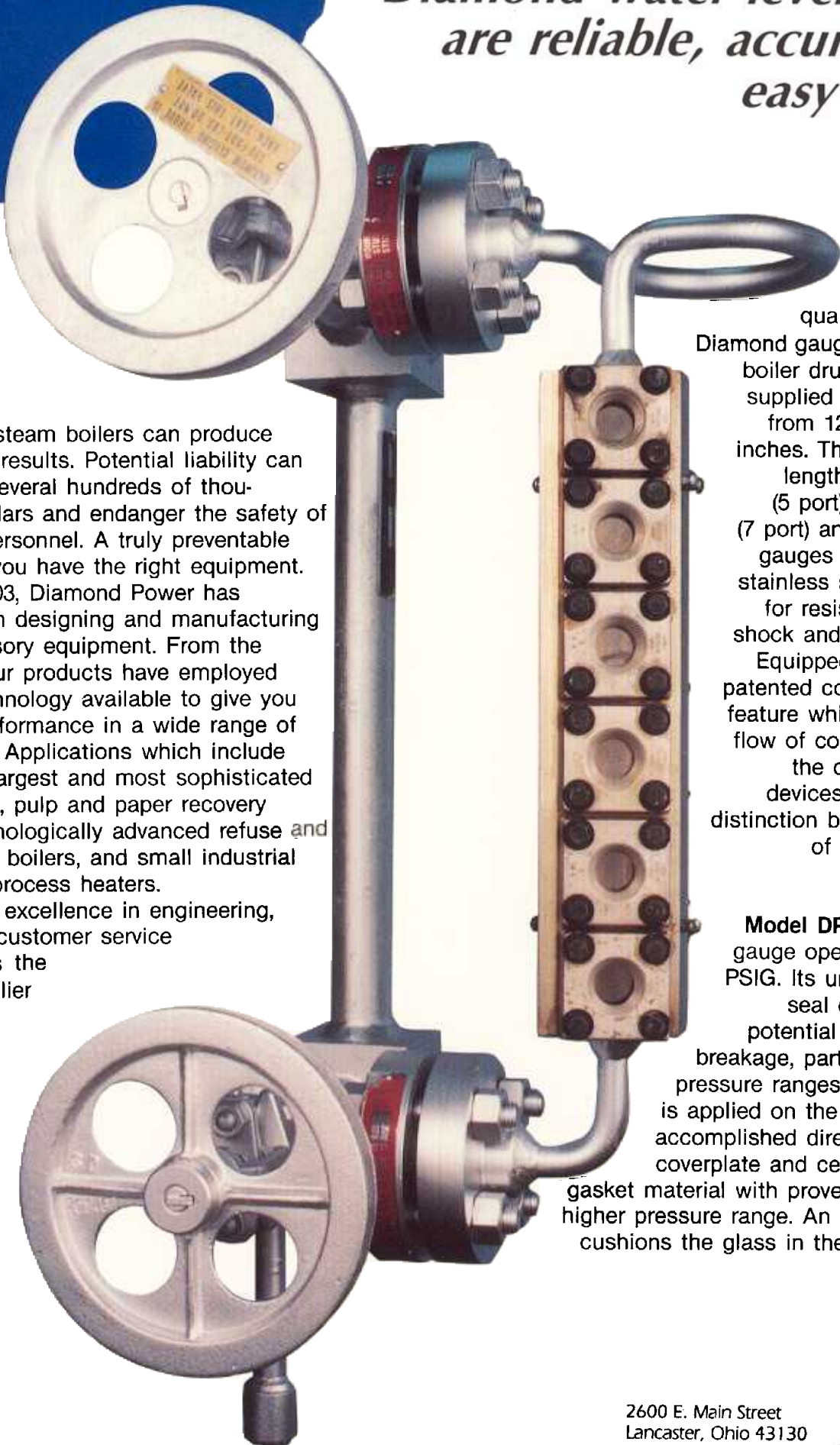
## Mounting Assemblies Feature:

- Right and left hand positions to achieve clearances and optimize viewing.
- Level indication and control capabilities throughout the pressure range of 0 to 3,000 PSI at 696 °F.
- Drain connections to satisfy code requirements.
- Uniquely designed Diamond gauge valves to allow washdown for a distinct water level indication.



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# *Diamond water level gauges are reliable, accurate and easy to read*



Dry-firing in steam boilers can produce catastrophic results. Potential liability can easily cost several hundreds of thousands of dollars and endanger the safety of your plant personnel. A truly preventable situation, if you have the right equipment.

Since 1903, Diamond Power has specialized in designing and manufacturing boiler accessory equipment. From the beginning, our products have employed the best technology available to give you optimum performance in a wide range of applications. Applications which include the world's largest and most sophisticated utility boilers, pulp and paper recovery boilers, technologically advanced refuse and fluidized bed boilers, and small industrial boilers and process heaters.

Diamond excellence in engineering, quality, and customer service has made us the leading supplier of boiler accessory equipment in the world.

Setting industry standards for quality and reliability, Diamond gauges for measuring boiler drum water level are supplied for vision lengths from 12 3/8 inches to 69 inches. The standard vision lengths include 12 3/8" (5 port), 15" (6 port), 18" (7 port) and 21" (8 port). All gauges are supplied with stainless steel centerplates for resistance to thermal shock and stress corrosion. Equipped with Diamond's patented condensate bypass feature which minimizes the flow of condensate through the center bore, these devices achieve superior distinction between the levels of water and steam.

The **DURA-PORT Model DP-3000** water level gauge operates up to 3,000 PSIG. Its unique gasket and seal design minimizes potential leakage or glass breakage, particularly in higher pressure ranges. No bolting load is applied on the glass. Sealing is accomplished directly between the coverplate and centerplate using a gasket material with proven success in the higher pressure range. An additional gasket cushions the glass in the coverplate seat.

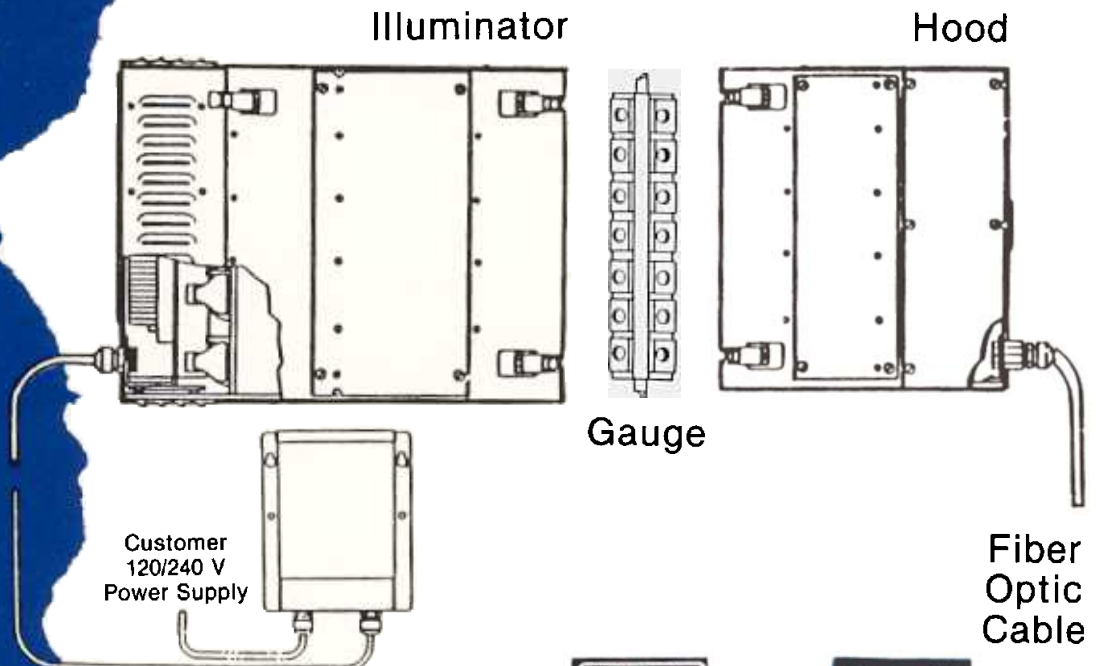
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Specialty Company**  
a McDermott company

# FIBREVIEWER™ 7001 Viewing System

The FIBREVIEWER 7001 Viewing System is state-of-the-art technology for conveying a direct image of the water level to the control room and/or other remote locations.

*A Direct Gauge Reading Device:*



Transformer

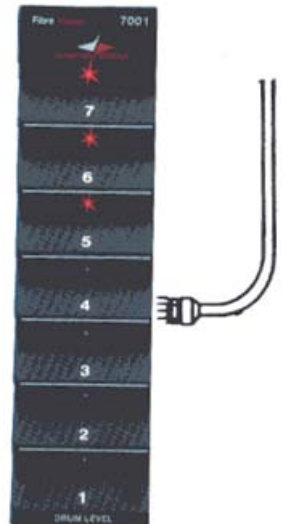
## CONTROL ROOM DISPLAY UNITS

Maximum  
1000 Ft.  
Cable

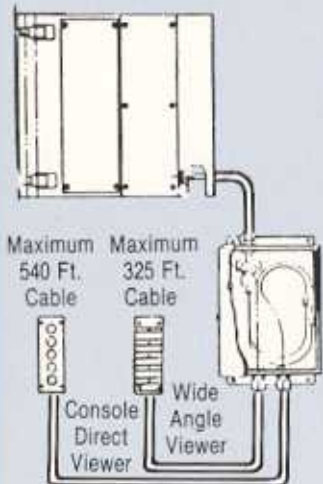
Maximum  
700 Ft.  
Cable



Console  
Direct  
Viewer



Wide  
Angle  
Viewer



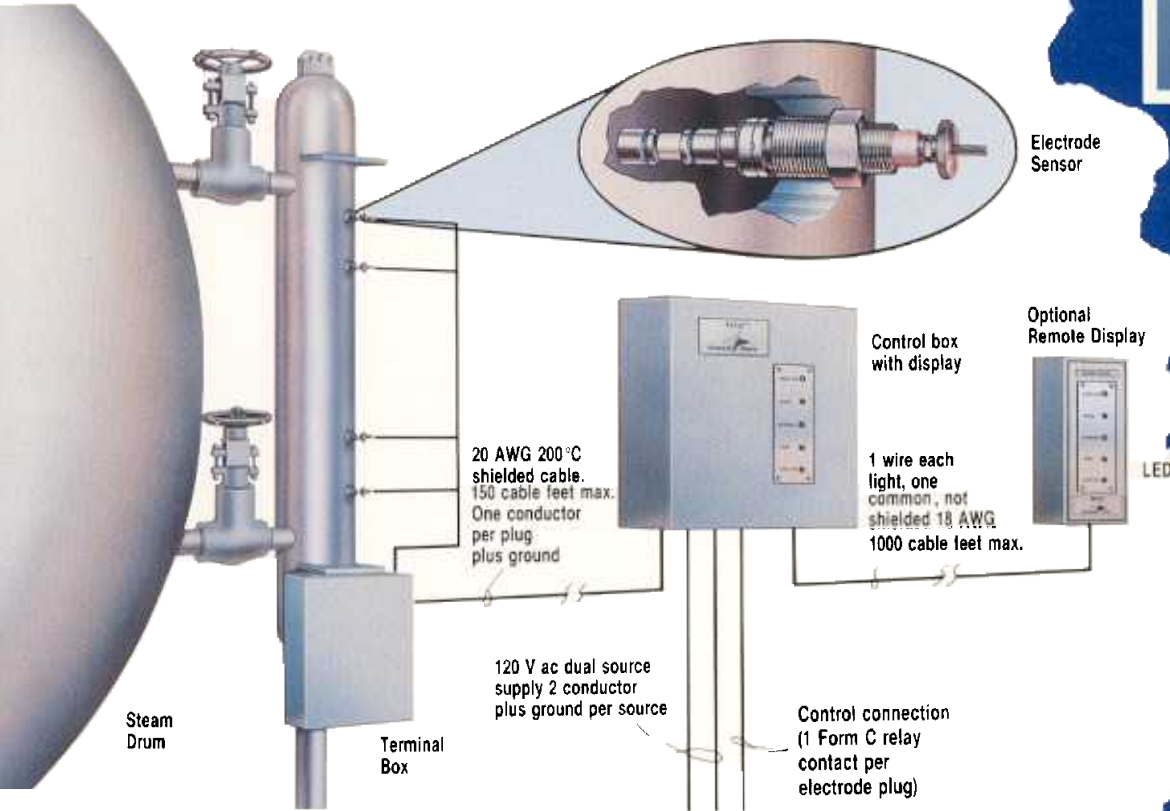
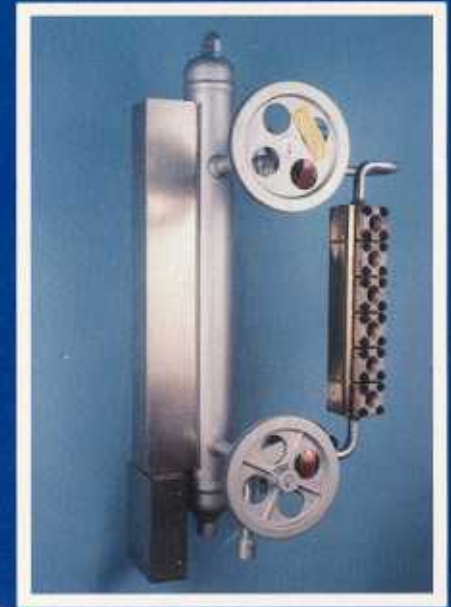
### Two Viewer Option:

- a second panel viewer.
- junction box.
- optic cable between hood and junction box.

# EACII™

## ELECTRODE ALARM COLUMN

State-of-the-art sensing technique provides reliability for indirect indication accompanied by a direct reading gauge.



### Features

- Column (0-3000 psi), control box and display, and remote display.
- Indications 2, 3, or 4 alarms.
- Water level indications, LED.
- Redundant power source capability.
- Plug fault indication.
- Reserve circuitry redundancy.
- Adjustable conductivity.
- Control connections (terminal block in control box).
- Protective electrode cover.

- Drum connections: socket welded, butt welded, or flanged.
- Electrode plugs are prewired to terminal box.
- Fault tolerant logic.
- Optional remote display.

**NOTE:** Valves by others.

# Gauge Arrangement



## Gauge Arrangements

	Flange Connected	End Stem	Flange Rotatable	Flange Connected End Stem Replacement
Type and pressure rating	MP-1050 (0 thru 1050 psig) DP-3000 (0 thru 3000 psig)	MP-1050 (0 thru 1050 psig)	MP-1050 (0 thru 1050 psig) DP-3000 (0 thru 3000 psig)	MP-1050 (0 thru 1050 psig) DP-3000 (0 thru 3000 psig)
Vision length	12-3/8 in. thru 69-1/4 in.	12-3/8 in. thru 69-1/4 in.	12-3/8 in., thru 69-1/4	12-3/8 in. thru 69-1/4 in.
Standard stocked vision lengths	12-3/8 in., 15 in., 18 in., 21 in.	12-3/8 in., 15 in., 18 in., and 21 in.	12-3/8 in., 15 in., 18 in., 21 in.	12-3/8 in., 15 in., 18 in., and 21 in.
Port diameter and spacing	1 in. dia. on 2-27/32 in. centers	1 in. dia. on 2-27/32 in. centers	1 in. dia. on 2-27/32 in. centers	1 in. dia. on 2-27/32 in. centers
Standard flange connections or valve centers	21 in. (12-3/8 in. vision) thru 18 in. vision) 27 in. (12-3/8 in. vision) thru 21 in. vision)	26-5/8 in. (12-3/8 in. vision) 31-1/2 in. (12-3/8 in. thru 18 in. vision) 36-1/8 in. (12-3/8 in. thru 21 in. vision)	21 in. (12-3/8 in. vision) 27 in. (15 in., 18 in. vision) 30 in., (21 in. vision)	26-5/8 in. (12 3/8 in. vision) 31-1/2 in. (12-3/8 in. thru 18 in. vision) 36-1/8 in. (12-3/8 in. thru 21 in. vision)
Centerplate material	Stainless steel type 304	Stainless steel type 304	Stainless steel type 304	Stainless steel type 304
Flange or stem size and type	3/4-2500# ASA large male flange	in. dia.—stems	4 botl—4 in. square flange	3/4-2500# ASA large male flange
Flange or stem material specifications	ASME SA-105 GR2—flange	Stainless steel type 304—stems	ASME SA-105 GR2—flange	ASME SA-105 GR2—flange
Flange gasket	Spiral wound Non-asbestos	Not applicable	Spiral wound Non asbestos	Spiral wound non asbestos
End stem packing size	Not applicable	1/2 in. x 1 in.—4 rings	Not applicable	Not applicable
Application	Installation with pressure range of 0 thru 3000 psig	Recommended for pressure under 600 psig	Installations that require positioning after installation	Replacement of end stem gauge where required to hold existing horizontal and/or vertical gauge centerlines



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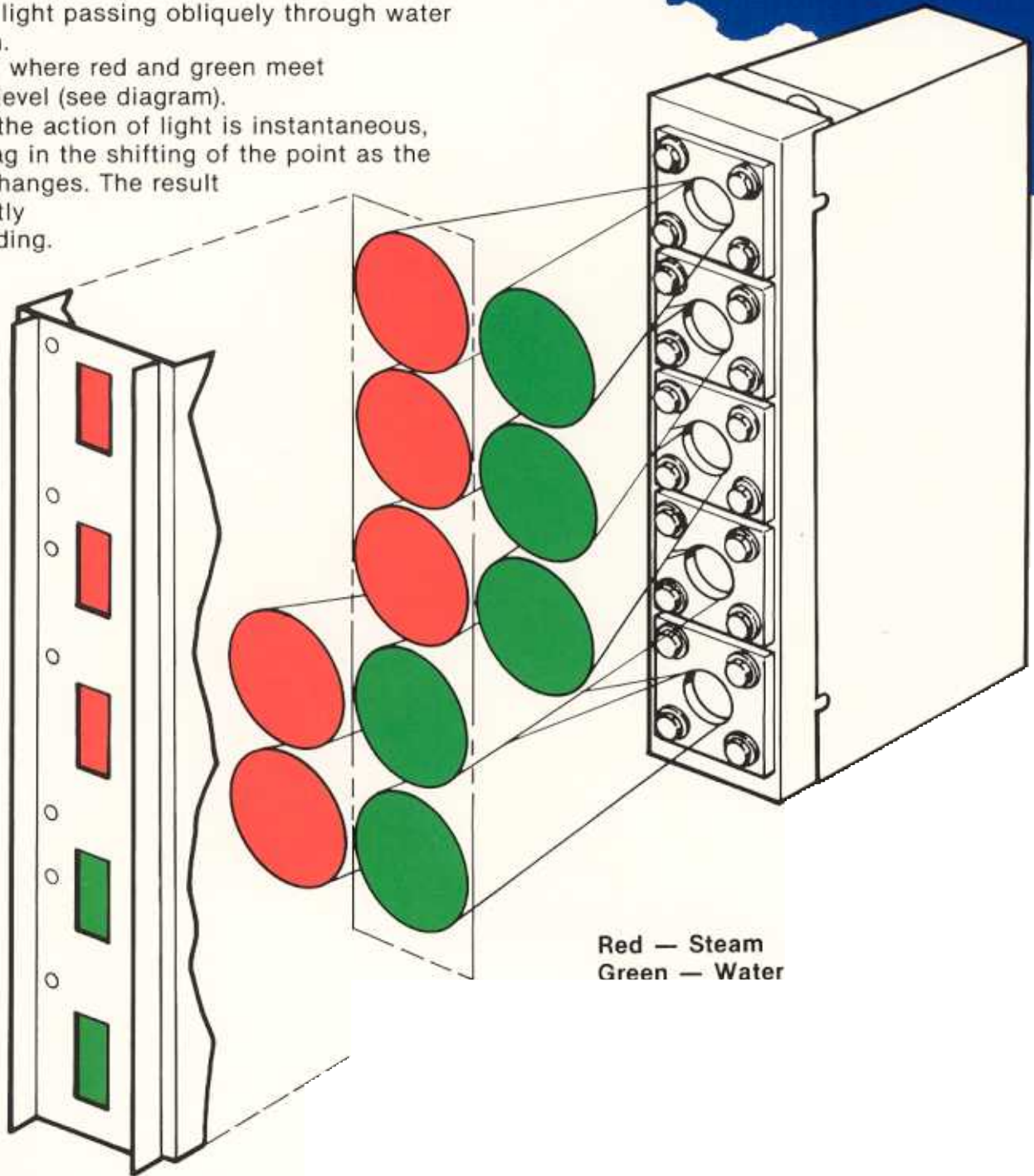
**NOTE:** When ordering refer to above chart or specify previous Diamond gauge serial number on centerplate.

# Water Level Gauges

**MULTI-PORT** and **DURA-PORT** gauges operate on an in-varying optical principle: the difference in the refraction of light passing obliquely through water versus steam.

The point where red and green meet is the water level (see diagram).

Because the action of light is instantaneous, there is no lag in the shifting of the point as the water level changes. The result is a constantly accurate reading.

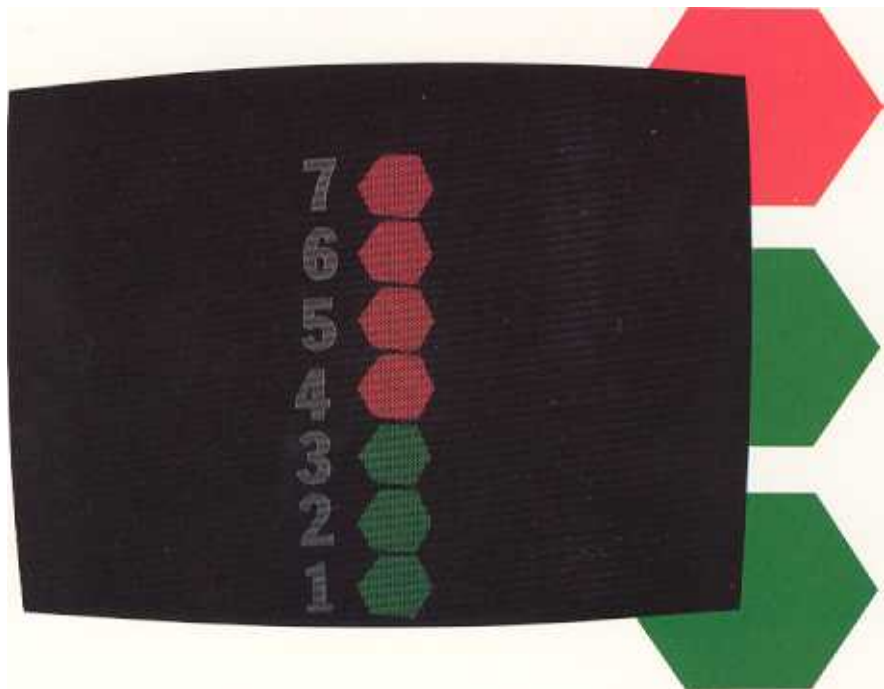


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# *Fibreview Imaging System™*

## *Color Monitor Water Level Indicator*

- Brilliant level indication
- Water level displayed at gauge
- Easy gauge access — no re-alignment
- 100% solid state camera
- Adapts to existing fiber optic systems
- No expansion concerns
- No prisms to adjust
- No cooling air required — less maintenance
- No after image or burning of monitor



Control Room Monitor

Red Indicates Steam  
Green Indicates Water



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Specialty Company®**

a McDermott company

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## *Optional Valve Flanged/Flanged Rotatable*

Hydrostatically shell tested according to ASA B16.34 and hydro-tested with MSS SP-61.

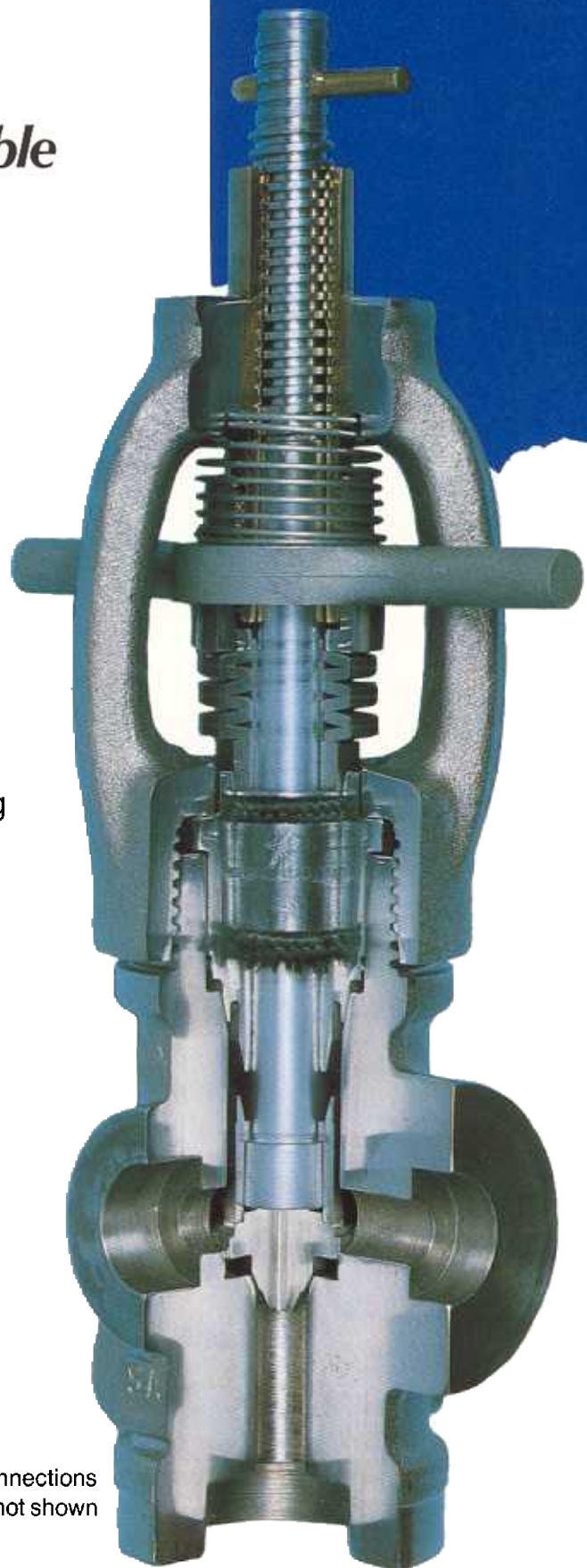
Clampseal® Valves are designed for rapid in-line maintainability to ease the demands on maintenance resources and can be renewed, in-line, without welding or nondestructive testing.

### **Features:**

- Back seating extends packing life
- Live loaded packing
- Integral wrench provides easy packing adjustment
- Spare parts availability
- Service tool kit available

### **Optional feature:**

- Ballcheck



Flanger/connections  
not shown



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# Sighting Equipment

## Illuminators



### "Indoor"

#### High Intensity Illuminator

12 3/8, 15, 18, and 21 in. (stacked for vision lengths 27 in. or more.)

Wiring Series or parallel with transformer.

Lamps 20-volt—40 watt reflector spot behind each port.

Lamp replacement Bayonet mounted.

Electrical design Male/female electrical connection 110 V ac or dc, or 200 V ac.

Construction Riveted anodized aluminum. Illuminator depth from centerline gauge, approx. 9 in. Allow 5 in. rear for access. Color screens, lens, lamps, wiring assembly enclosed.

Application Provides gauge with lighting and optics for bi-color image.

### Indoor/Outdoor

#### Halogen Illuminator

12 3/8, 15, 18 and 21 in. Larger lengths are available.

Parallel with transformer.

12 volts—75 watts collimated light rays.

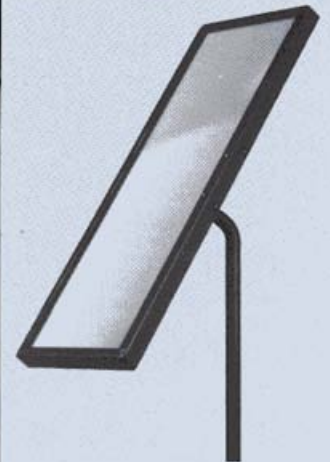
Bracket mounted pin connection.

Terminal block and transformer primary service 120 V ac 6 amp.

Steel construction. Illuminator depth from centerline of gauge approx. 18 in. Allow 5 in. rear access. Color screens lens, lamps, wiring assembly enclosed.

Provides gauge with lighting and optics for bi-color image.

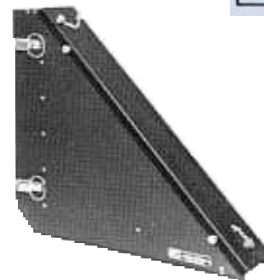
## Mirrors



Mirrors are available for use on steel work or a floorstand to reflect water level image to a remote location.

## Hoods

A **direct reading hood** with frosted glass is designed for local viewing. An **open front hood** with clear glass is designed to be used with a mirror. A special hood has been designed for use with a halogen illuminator in high ambient light situations. Vision lengths include 12 3/8, 15, 18, and 21 in.



**Reflector hood.** Vision lengths: 12 3/8 in., 15 in., 18 in., 21 in. Construction: Riveted anodized aluminum. Mirror door can be removed for maintenance and cleaning. Application: transmit image 90° downward at the gauge location.



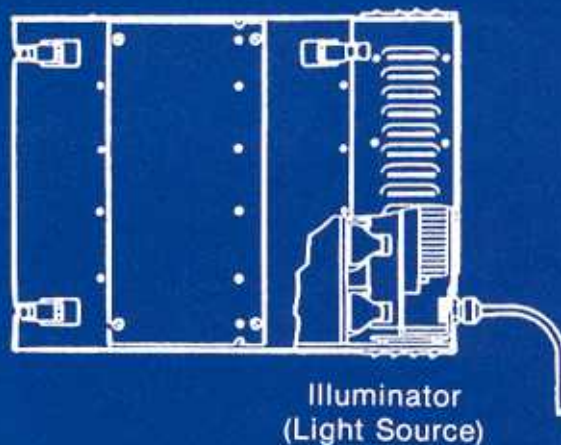
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# Sighting Equipment

The application of sighting equipment to Diamond Power gauges assures distinct water level indication with red and green colors.

To accurately define the water level a viewing hood is required.

The water level may be viewed locally or transmitted to the control room or other remote locations by using an illuminator in conjunction with one of the following viewing hood arrangements.

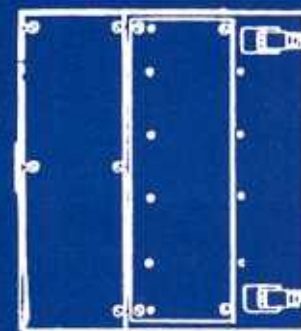


## ASME Direct Reading Arrangements

**Direct Hood** — Local see-at-a-glance reading from 45° right or left and 60° up or down from the gauge location. (frosted glass)

**Reflector Hood** — The water level image is reflected to a mirror at a lower elevation.

**Fibreviewer™ 7001** — The water level image is conveyed to a remote location by an optic cable.



### ASME Section I 60.1 Water Level Indicators

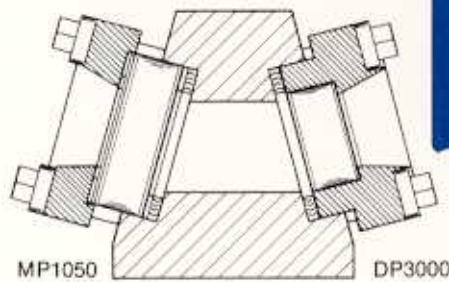
60.1.1 Each boiler, except forced-flow steam generators with no fixed steam and waterline, and high-temperature water boilers of the forced circulation type that have no steam and waterline, shall have at least one water gage glass. Boilers operated at pressures over 400 psi shall be provided with two water gage glasses which may be connected to a single water column or connected directly to the drum.

Two independent remote level indicators may be provided instead of one of the two required gage glasses for boiler drum water level indication in the case of power boilers with all drum safety valves set at or above 900 psi. When both remote level indicators are in reliable operation, the remaining gage glass may be shut off, but shall be maintained in serviceable condition.

When the direct reading of gage glass water level is not readily visible to the operator in his working area, two dependable indirect indications shall be provided, either by transmission of the gage glass image or by remote level indicators.

# Gasket Sealing Arrangement

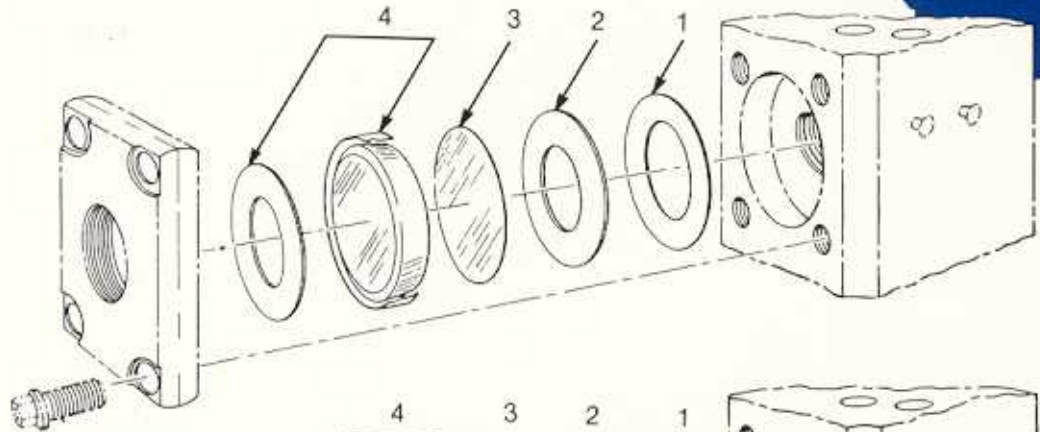
Do it right — use complete kits for optimal performance.



## MP1050 Gasket Kit

For Applications  
Up to 1050 PSIG.

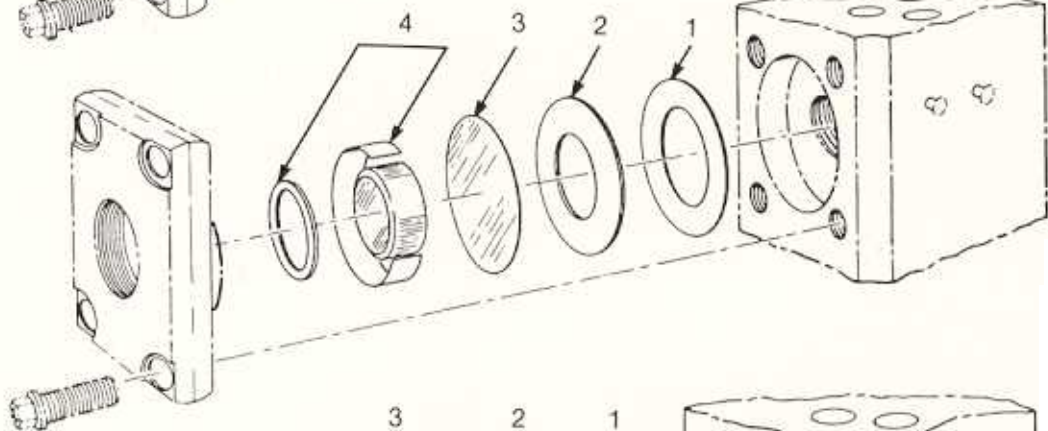
1. Sealing Gasket
2. Protective Gasket
3. Mica
4. Glass Assy  
Packing Strip  
Cushion Gasket



## DP-3000 Gasket Kit

For Applications  
Up to 3000 PSIG.

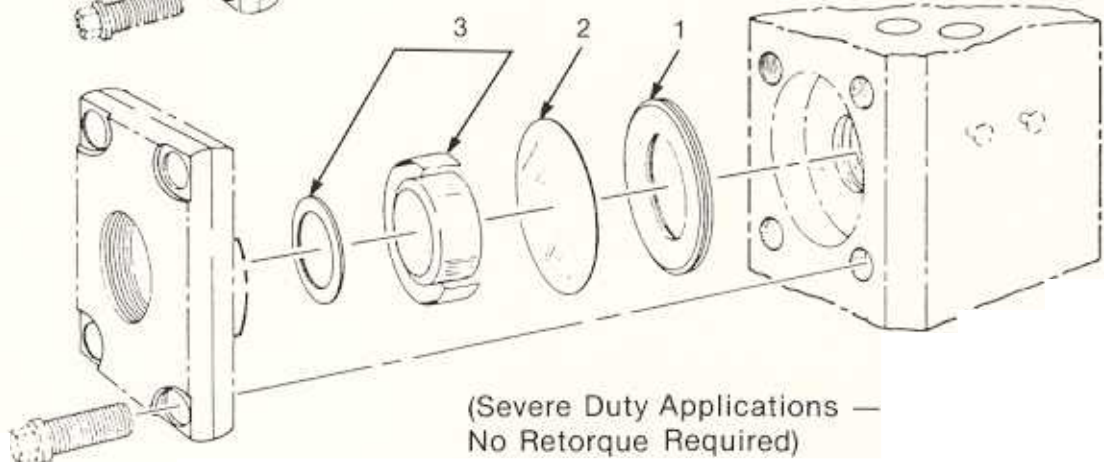
1. Sealing Gasket
2. Protective Gasket
3. Mica
4. Glass Assy  
Packing Strip  
Cushion Gasket



## Premium DP-3000 Gasket Kit

For Applications  
Up to 3000 PSIG.

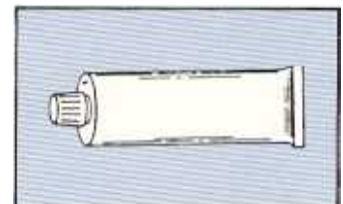
1. Sealing Gasket
2. Mica
3. Glass Assy  
Packing Strip  
Cushion Gasket



(Severe Duty Applications —  
No Retorque Required)

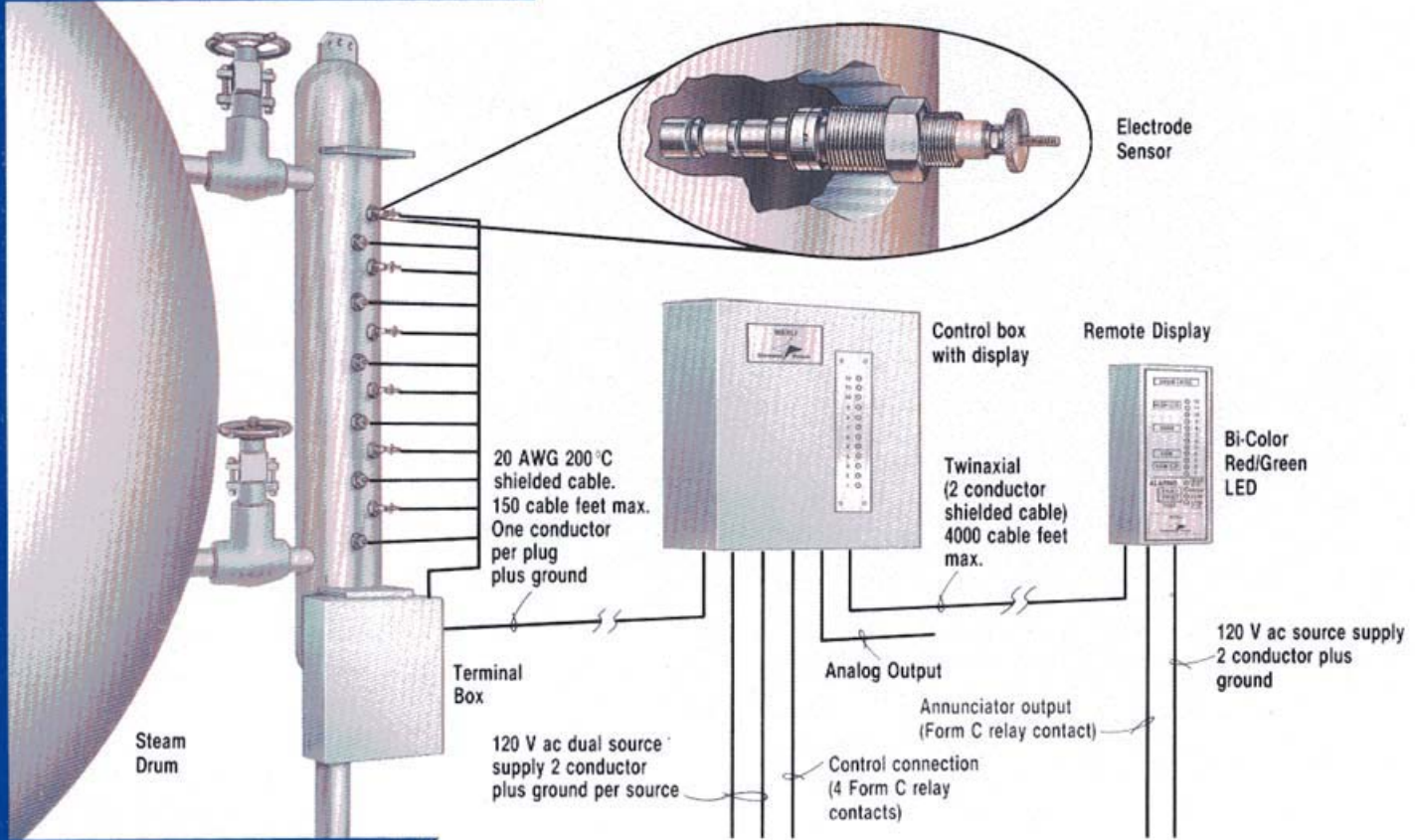
The Above Gasket Kits Do **Not** Contain Asbestos.

Lubrication is  
Provided in All  
Kits for Bolt  
Thread Application.



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*An Indirect Level Reading Device*



**Advanced Technology provides reliable Indirect Level Indication. Enhanced circuitry for reliable water/steam discrimination from start-up through operation.**

**Features:**

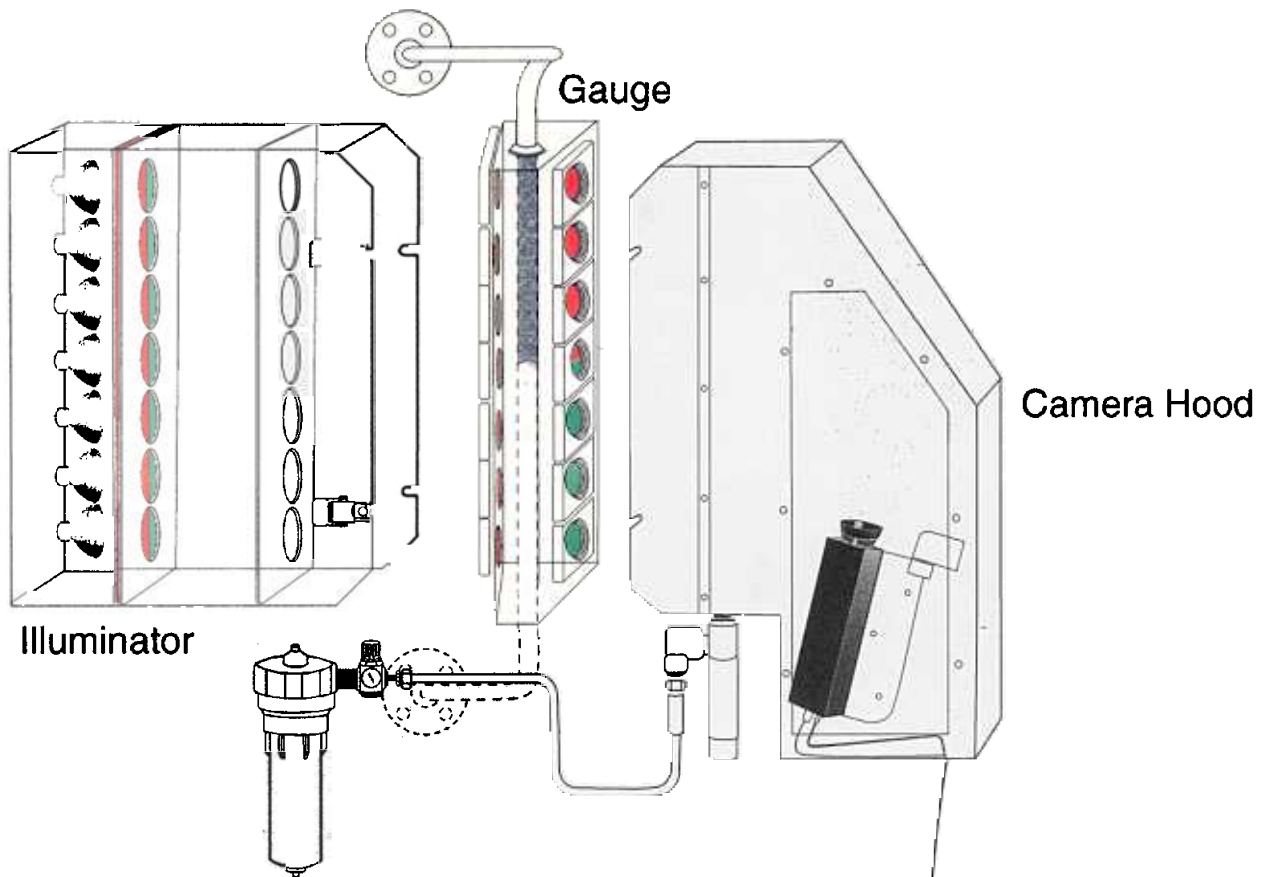
- Column (0-3000 psi), control box and display, and remote display.
- Indications 8, 12, or 16 elevations.
- Bi-color water level indications, red/green LED.
- Redundant power source.
- Fault detection: process, system, and remote display.
- Analog output for computer interface or other equipment: 4-20 mA or 0-10/1-5 volts (terminal block in control box). Built-in integrator provides smooth response for modulating control valves.

- Annunciator connection.
- Self-adjusting to conductive changes.
- Control connections (terminal block in control box).
- Protective electrode cover.
- Drum connections: socket welded, butt welded, or flanged.
- Electrode plugs are prewired to terminal box.

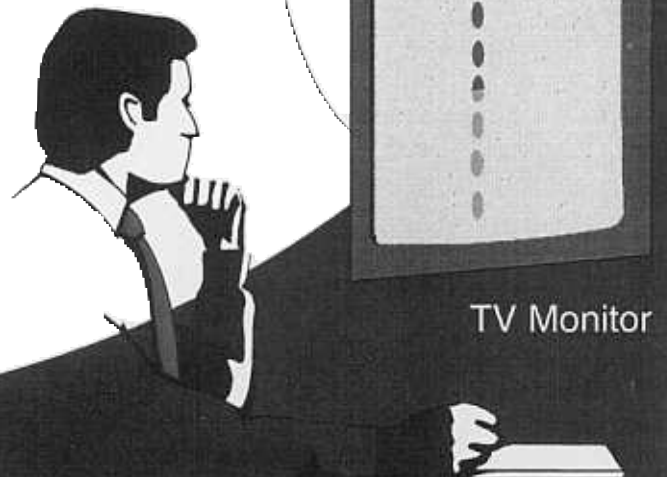
Options: Valves and wiring.

# Diamond Power Specialty Company

## Camera Hood Brings Drum Water Monitoring Into the New Millennium



- Bi-color lighting shows water in green and steam/air in red.
- Clear, sharp video allows the operator to see the actual water level meniscus and action in the gauge.
- View gauge up to 5,000 feet away.
- Gauge hood eliminates nuisance video smearing by overhead lights or view blockage by personnel in intervening aisle ways.
- Cooled enclosure to protect camera from heat and keep it dust-free.



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