Clark·Reliance

STEEL WATER COLUMNS

SPECIFICATION AND TRIM SELECTION RECOMMENDATIONS

SPECIFIC GUIDELINES ALLOW ACCURATE AND COMPREHENSIVE ORDERING OF CLARK-RELIANCE STEEL WATER COLUMNS

- Ten Models With Probes Serving Pressure Ranges To 3000 PSI
- Four Models With Floats Serving Pressure Ranges To 900 PSI
- Choose From A Wide Variety Of Models, Gages And Other Trim

Clear communication of complete specification information is vital to fast order processing, manufacture and delivery of water columns and trim. Of major importance are column specifications concerning three critical areas:

1. The arrangement of column connections.
2. The center-to-center dimension between steam and water connections.
3. The dimension from normal water level to water connection center line.

Each of the above three specifications is essential to the completion of an order.

Comprehensive Data Assures Accurate Design

The more thorough the specification, the greater the speed and efficiency in meeting specified requirements. Whenever possible, the following information should be provided:

- Maximum Design Pressure
- Choice Of Float Or Probe Type Alarm System, Or No Alarm
- Size And Type Of Steam And Water Connection
- Distance Between High And Low Alarm Levels
- Gage Visibility Range
- Supply Line Voltage And Frequency
- Choice Of Indoor, Outdoor Or Hazardous Service
- Direction Of Visibility (See Figure 5)

To discuss any water column specification data in detail, contact your local Clark-Reliance representative.

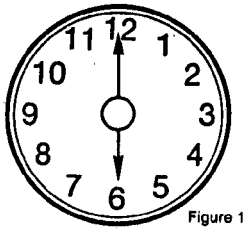


Figure 1

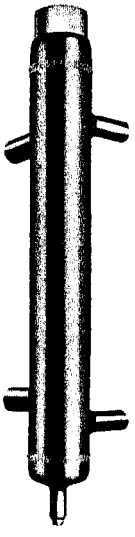
Using The Clock To Clarify Design Requirements

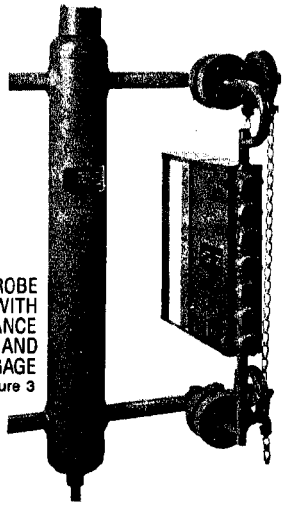
For clear communication in locating water column gages, use a clock. View the column from *above,* and picture a clock face on the top of the column. If steam and water connections are at the six o'clock position on the imaginary clock face, *where will a person stand to read the water gage—positioned at what time? And will the gage be to the right or left of the water column as viewed?* Presenting this key information using a clock face frequently avoids confusion.

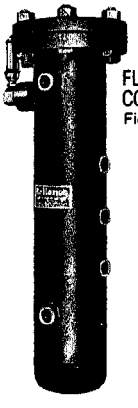
FOR YOUR REVIEW AND REFERENCE

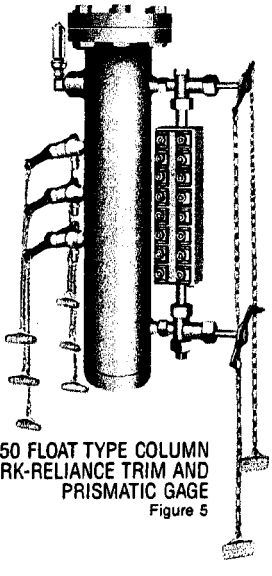
The following pages present tables, drawings and general information to assist you in specifying the proper column and selecting the trim and gages to best meet your requirements.

FIGURE 6: Required Specification Dimensions And Arrangement Options
FIGURE 7: Typical Connection Configurations
FIGURE 8: Standard Connections And Sizes
FIGURE 9: Materials And Construction Data
FIGURE 10: Welding Data
FIGURE 11: Component Model Numbers And Assembly Data
FIGURE 12: Review Of Code Requirements
FIGURE 13: Clark-Reliance Model Numbering Code


PROBE TYPE COLUMN
Figure 2


SERIES 1250 PROBE TYPE COLUMN WITH CLARK-RELIANCE TRIM AND SIMPLIPORT® GAGE
Figure 3

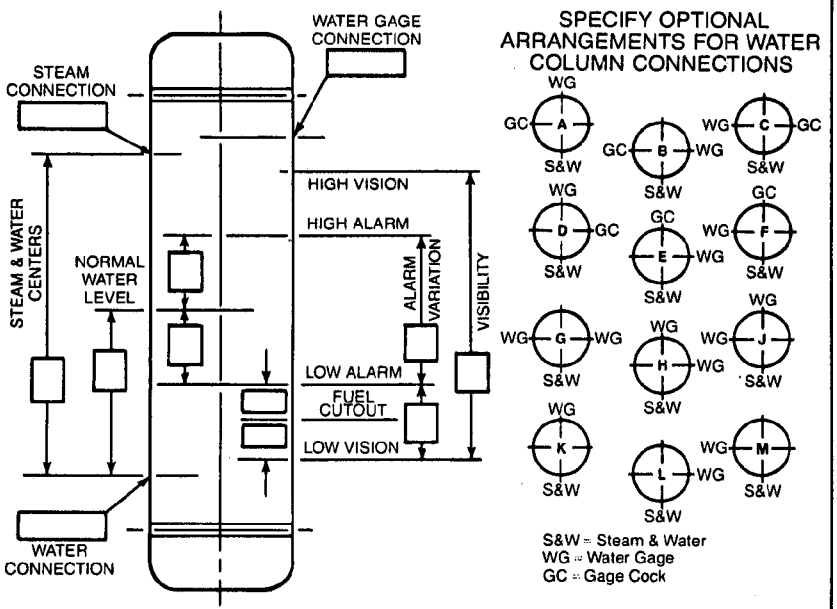

FLOAT TYPE COLUMN
Figure 4


SERIES 350 FLOAT TYPE COLUMN WITH CLARK-RELIANCE TRIM AND PRISMATIC GAGE
Figure 5

REQUIRED SPECIFICATION DIMENSIONS AND ARRANGEMENT OPTIONS, STEEL COLUMNS

WATER COLUMN TYPE REQUIRED:

Probe Type ( ) Float Type ( ) Design Pressure _____ PSI



DIMENSIONAL LIMITATIONS FOR STEEL WATER COLUMNS

- 3" Minimum Dimension Between Gage Cocks
- Columns Longer Than 48" Require Special Pricing
- Refer To Figure 12 For Code Requirement Information

Figure 6

TYPICAL CONNECTION CONFIGURATIONS FOR STEEL COLUMN DESIGNS

Types of connections are not limited to standard models shown here. Columns can be manufactured to meet specific customer requirements.

SERIES W0350

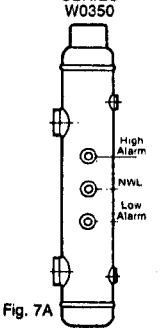


Fig. 7A

SERIES W0450 THROUGH W3000

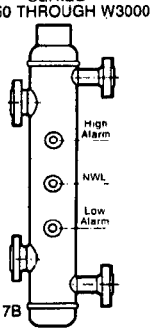


Fig. 7B

SERIES W0350, W0450, W0600, W0900

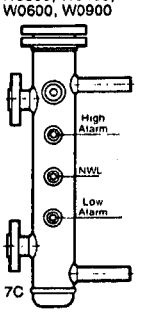


Fig. 7C

SERIES W1100 THROUGH W3000

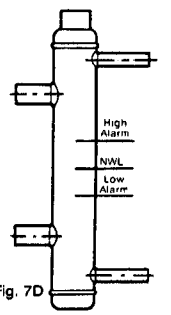


Fig. 7D

Figure 7

STANDARD CONNECTIONS AND SIZES FOR CLARK-RELIANCE STEEL COLUMNS

(1) Top steam available on 350 PSI Float Type and No-Alarm columns.

(2) Gage Cocks can not be used above 400 PSI in place of a second gage.

STANDARD CONNECTIONS					
DESIGN PRESSURE	FIGURE	STEAM & WATER CONNECTIONS	WATER GAGE CONNECTIONS	GAGE COCK CONNECTIONS	DRAIN CONNECTIONS
350(1)	7A	1¼" NPT/S.W. Boss	¾" NPT Boss	¾" NPT Boss	¾" NPT
450	7B	1½"-300 Lb. R.F. Flange	¾"-300 Lb. R.F. Flange	¾" NPT Boss	¾" NPT
	7C	1½"-300 Lb. R.F. Flange	¾" NPT Ext. Neck	¾" NPT Boss	¾" NPT
600	7B	1½"-300 Lb. R.F. Flange	¾"-900 Lg. Fem. Flange	(2)	¾" NPT
	7C	1½"-300 Lb. R.F. Flange	¾" NPT Ext. Neck	(2)	¾" Fem. S.W.
900	7B	1½"-600 Lb. R.F. Flange	¾"-900 Lb. Lg. Fem. Flange	(2)	¾" Fem. S.W.
	7C	1½"-600 Lb. R.F. Flange	¾" NPT Ext. Neck	(2)	¾" Fem. S.W.
1100	7B	1½"-600 Lb. R.F. Flange	¾"-900 Lb. Lg. Fem. Flange	(2)	¾" Fem. S.W.
	7D	1½" Fem. S.W. Exten.	¾" NPT Ext. Neck	(2)	¾" Fem. S.W.
1250	7B	1½"-1500 Lb. R.F. Flange	¾"-900 Lb. Lg. Fem. Flange	(2)	¾" Fem. S.W.
	7D	1½" Fem. S.W. Ext.	¾" NPT Ext. Neck	(2)	¾" Fem. S.W.
1500	7B	1½"-1500 Lb. R.F. Flange	¾"-900 Lb. Lg. Fem. Flange	(2)	¾" Fem. S.W.
	7D	1½" Fem. S.W. Ext.	¾" NPT Ext. Neck	(2)	¾" Fem. S.W.
1800	7B	1½"-1500 Lb. R.F. Flange	¾"-900 Lb. Lg. Fem. Flange	Not Available	¾" Fem. S.W.
	7D	1½" Fem. S.W. Ext.	¾" NPT Ext. Neck	Not Available	¾" Fem. S.W.
2500	7B	1½"-1500 Lb.	¾"-1500 Lb.	Not Available	¾" Fem. S.W.
	7D	1½" Fem. S.W. Ext.	¾" NPT Ext. Neck	Not Available	¾" Fem. S.W.
3000	7B	1½"-2500 Lb.	¾"-2500 Lb.	Not Available	¾" Fem. S.W.
	7D	1½" Fem. S.W. Ext.	¾" Male S.W.	Not Available	¾" Fem. S.W.

Figure 8

MATERIALS AND CONSTRUCTION DATA, STEEL COLUMNS

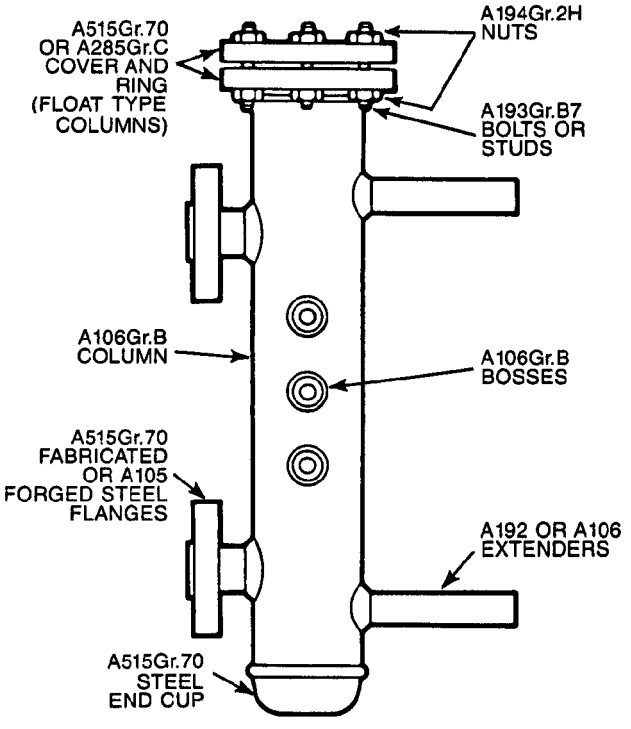


Figure 9

WELDING DATA, STEEL COLUMNS

Clark-Reliance Steel Water Columns are welded in compliance with Sections I and IX of the ASME Boiler Code and with ANSI B16.11 for socketwelds and B16.9 for buttwelds. As illustrated below, Clark-Reliance employs "deep" bosses which provide for screwed in connection only (A), screwed and welded (B), or welded only (C). Also, extenders (D) and bosses are welded to water columns in accordance with provisions covered in the ASME Boiler Code, Section I, Power Boilers. Refer to Figure PW-16.1z.

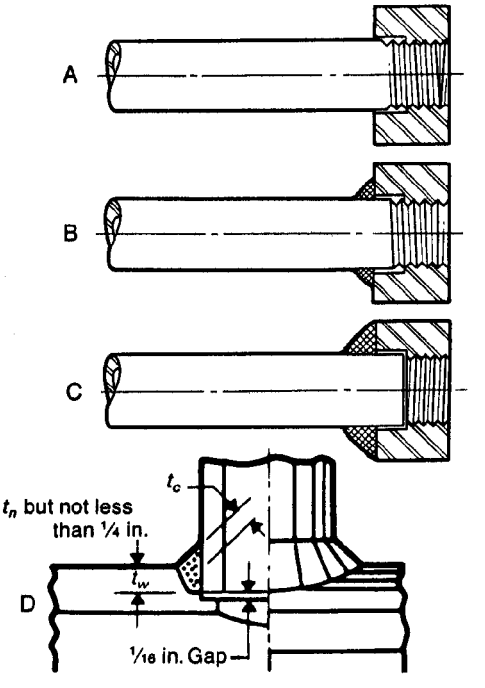


Figure 10

COMPONENT MODEL NUMBERS AND ASSEMBLY DATA, STEEL COLUMNS

For additional information on Clark-Reliance water column trim, refer to Catalog 500:

Water Gage Valves ..... *Sections AB5.1/5.4*
Prismatic Gages ..... *Sections AB7.1/7.2*
Flat Glass Gages ..... *Sections AB7.3/7.4*
Hoods & Illuminators ..... *Sections AB8.1/8.2*
Simpliport Gages ..... *Sections AB7.5/7.8*

Refer to Figure 12 for ASME Code requirement information.

Note that Simpliport Gages must be furnished with Hoods and Illuminators.

DESIGN PRESSURE (PSI)	WATER GAGE VALVES		WATER GAGES			GAGE COCKS
	FLANGED	NPT/S.W.	PRISMATIC	FLAT GLASS	SIMPLIPORT	
350	•	404RS	"S" Series	FG900 Series	P3000 Series	451
450	503RA	404RS	•	FG900 Series	P3000 Series	451
600	SG860	SG854	•	FG900 Series	P3000 Series	302
900	SG860	SG854	•	FG900 Series	P3000 Series	302
1100	SG860	SG854	•	FG1500 Series	P3000 Series	302
1250	SG860	SG854	•	FG1500 Series	P3000 Series	302
1500	SG777F	SG777	•	FG1500F Series	P3100 Series	302
1800	SG777F	SG777	•	•	P3100 Series	•
2500	SG777F	SG777	•	•	P3100 Series	•
3000	SG677F	SG677	•	•	P3100 Series	•

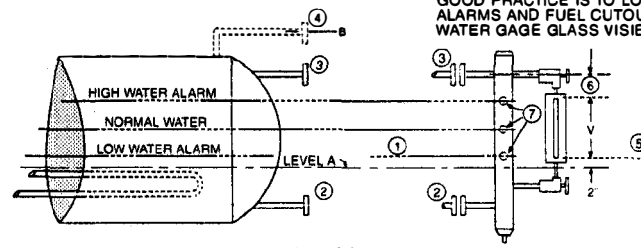
Figure 11

PROFESSIONAL PRACTICES GOVERNING WATER COLUMN INSTALLATION AND OPERATIONS

- Water columns should be mounted as close to the boiler drum as is practical for greatest accuracy of water level reading.
- Piping between the drum and water column causes a drop in water temperature (and increased water density) at the gage glass, with resulting lower level reading. Insulation of water columns and piping is helpful in reducing this type of water level error.
- When shutoff valves are used in the piping to a water column, they must be (1) outside screw and yoke, (2) of flow-through construction, (3) indicate open or closed position, and (4) locked or sealed open.
- Steam connection pipe should preferably slope from the drum down to the water column. Water connection pipe should be level or slope from the column down to the boiler drum.
- Provide for cleaning piping by installing crosses with plugs or blind flanges at all right angle turns.
- No outlet connections except for water level recorder, feed water regulator, drains or steam gages shall be placed on the pipes connecting the water column to the boiler. Any device requiring a flow of steam or water, taken from the water column piping, could create a false level in the water gage glass.
- Water columns shall be fitted with a drain valve, with a suitable connection to some safe point of waste.
- If the water connection to the column has a rising bend or pocket which can not be drained by means of the water column, an additional drain shall be placed on this connection in order that it may be blown off to clear any sediment from the pipe.
- It is recommended that drain valves be operated periodically to clear all passageways. Frequency of column blowdowns depends on condition of drum water.

REVIEW OF CODE REQUIREMENTS, WATER COLUMN CONNECTION AND OPERATIONS

GOOD PRACTICE IS TO LOCATE ALL ALARMS AND FUEL CUTOUTS WITHIN WATER GAGE GLASS VISIBILITY.



SHUTOFF VALVES BETWEEN DRUM AND COLUMN MUST BE OS&Y, OF THROUGH-FLOW DESIGN AND ORIENTATION, SHOW POSITION AS OPEN OR CLOSED, AND HAVE LOCK-OPEN CAPABILITY.

ASME WATER GAGE REQUIREMENTS

UNDER 400 PSIG
- 2 Direct Reading Gages Or
- 1 Direct Reading Gage And 3 Gage Cocks

400 PSIG TO 900 PSIG
- 2 Direct Reading Gages

900 PSIG AND ABOVE
- 2 Direct Reading Gages Or
- 1 Direct Reading Gage And 2 Remote Reading Gages

SYSTEM SCHEMATIC DETAIL

1. **Lowest permissible water level** – at which level there will be no danger of overheating (Level A).
2. **Water connection for Water Column** – must be at least 1" below low visibility point of gage glass – must be at least 1" NPT. Line should be level or slope downward from column to drum.
3. **Steam connection for Water Column** – must be at 1" NPT minimum and located above high visibility point of gage glass. Line should slope downward from drum to column.
4. **Steam connection may come out of top of vessel** – centerline of steam connection would be at point marked "B".
5. **The lowest visible part of water gage glass** – must be at least 2" above the lowest permissible water level (Level A).
6. **The highest visible part of water gage glass** – must be at least 1" below center of steam connection.
7. **Gage Cock connections** – shall not be less than ½" pipe size and located within gage visibility range "V." Gage Cocks not required with two gages are used.

Figure 12

Rely On Clark-Reliance

Clark-Reliance remains the foremost name in water column design and manufacture. Since 1884, Clark-Reliance has enjoyed a reputation of leadership, assuring customers of quality materials, precision manufacturing and superior design. All columns and components are hydrostatically tested to 1½ times designed pressure. All products are manufactured in compliance with ASME Boiler Code provisions.

REFER TO COMPANION CLARK-RELIANCE CATALOGS FOR INFORMATION ON CAST IRON WATER COLUMNS, ALARM SYSTEMS, ACCESSORIES AND RELATED EQUIPMENT.

CLARK-RELIANCE MODEL NUMBERING CODE, STEEL WATER COLUMNS

W 0350 EA 4

- 4 — Number of Probes (2 through 6)*
- EA — Alarm Type: EA = Electrode, FA = Float, NA = No Alarm
- 0350 — Design Pressure: 350 (1250), 450 (1500), 600 (1800), 900 (2500), 1100 (3000)
- W — Water Column

*Note: Maximum Of Three FG Probes In Columns Above 1800 PSI

Figure 13

For additional information, contact your local Clark-Reliance representative

Clark·Reliance

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