

## Class 250 • Y-Pattern • Flanged Ends • Straightway

**Figure 28E**

Flanged, Y-Pattern with Bolted Bonnet Straightway

**Size Range:**

2-1/2 through 10 inches

**Working Pressures Non-Shock**

250 psi Steam, Basic Rating

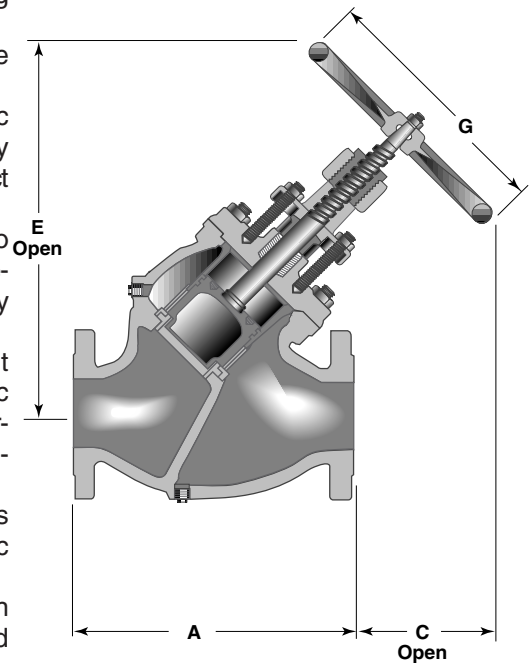
500 psi Cold Working Pressure

**Features**

- For installation between boilers supplying the same steam header, and positioned with pressure under the disc. Straightway is for horizontal or vertical line with upward flow. Angle valves are for "horizontal-downward" or "upward-horizontal" flow.
- These valves will perform the four following important functions:
  1. Act as an automatic-non return valve applied as a containment device to prevent gross backflow of steam from main header to boiler in case the boiler fails.
  2. Assist in cutting out boiler, when ceasing to fire. In this case, valve disc automatically closes to restrict backflow of steam to the boiler.
  3. Assist in returning boiler after a shutdown.
  4. Restricts backflow of steam from header into boiler which has been shut down and accidentally opened. The check valve feature should not be relied upon for primary shut-off.
- Cylindrical shaped disc is the only pressure-actuated part, light in weight with

ample guiding surface. It is specially designed to produce a maximum lift at minimum velocities. There are no wing guides to cause "spinning" with resultant rapid wear.

- Long throttling lip on disc retards flow when seating position is approached. Disc chattering is prevented and wiredrawing of seating surfaces is reduced.
- Flat Seats, accurately machined, facilitate true seating.
- Removable cast iron liner guides the disc throughout its full travel. Being entirely independent of the body, it is not subject to distortion by expansion strains.
- Piston Ring 6" and larger adds to dashpot's ability to avoid rapid disc movements. Where pulsations are extremely severe, two rings can be installed.
- Dashpot is self-contained in the liner. It provides an effective cushion for the disc to prevent pipe line vibrations or hammering on the seat at low velocities or on pulsating loads.
- Flanges conform to ANSI B16.1. Flanges have 1/16" raised face with concentric grooves.
- The body has integral bosses for drain connections. The bosses are tapped and plugged.
- Determining the proper valve size needed is important. The size of a stop check valve should be based on the boiler capacity and steam flow through the valve, rather than on the size of the boiler outlet or existing piping.


**Dimensions and Weights**

Inches (millimeters) - pounds (kilograms)

Valves	2 1/2 (65)	3 (80)	4 (100)	5 (125)	6 (150)	8 (200)	10 (250)
A	13.00 (330)	14.75 (375)	17.00 (432)	19.00 (483)	21.50 (546)	26.00 (660)	30.00 (762)
C*	5.00 (127)	7.25 (184)	7.75 (197)	10.50 (267)	11.75 (298)	16.25 (413)	17.75 (451)
E*	15.75 (400)	19.75 (502)	21.75 (552)	25.75 (654)	29.25 (743)	36.75 (933)	41.75 (1060)
G	9.00 (229)	10.00 (254)	10.00 (254)	14.00 (356)	16.00 (406)	20.00 (508)	20.00 (508)
Wt.	103 (47)	140 (64)	226 (103)	307 (139)	420 (191)	737 (335)	1250 (568)

# Crane Bolted Bonnet Stop-Check Valves Selecting the Proper Size – Determining Pressure Drop



## Technical Data • Y-Pattern Stop Check Valve

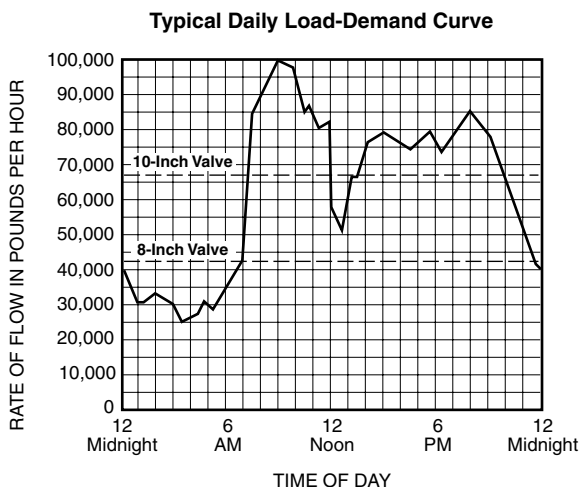
### Selecting the Proper Size – Determining Pressure Drop

Since stop-check valves have a floating disc member, it is important the valve be sized to provide full disc lift under flow conditions prevailing during the major portion of the service life. If the valve is too large, the disc will float in a partially open position and may cause fluttering of the disc and rapid wear. Conversely, if the valve is too small, pressure drop will be excessive.

The chart on the following page is a graphic presentation of flow data determined by test. Its use offers a simple method of determining the best size stop-check valve, as well as the pressure drop under varying conditions of flow, without any computation.

### How to Use the Chart Shown on the Following Page

**Given:** Steam Pressure-Temperature...250 psig 450°F  
Flow Rate...Typical Daily Demand Curve



**Find:** Valve Catalog No. and the best size for above installation.

**Solution:**

1. Enter the Temperature chart at 450°F. Move vertically upward to the curved line for 250 psi, then horizontally to the right to establish a point on the specific volume scale. From this point, draw a line through the flow rate being investigated (100,000 Lb/H) and establish a point on Index 1.

2. From that point, draw another line through the valve size, for example the 8-inch size, and establish a point on Index 2. Now move horizontally to the diagonal pressure drop line on the right side. Where these lines intersect, the pressure drop is 7.5 psi for the 8-inch, Class 250 globe valve and 8.5 psi for the 8-inch Class 250 angle valve.

Chart solutions resulting in a point on Index 2 that falls below the Line A-A for Class 250 valves indicate the disc will not be fully lifted under the flow conditions used. Operation under such conditions is not recommended but, at times, must be tolerated for short periods during the low loads.

3. Enter the chart where Line A-A intersects Index 2 for Class 250 valves. Move diagonally upward through the size being investigated (8-inch) and establish a second point on Index 1. From this point, extend a line to the specific volume established in Step 1 and at its intersection with the flow rate line, read 48,000 Lb/H as the minimum flow rate at which the disc will be in the fully lifted position. The pressure drop at this flow rate is 1.9 psi for globe and 2.1 psi for angle valves.

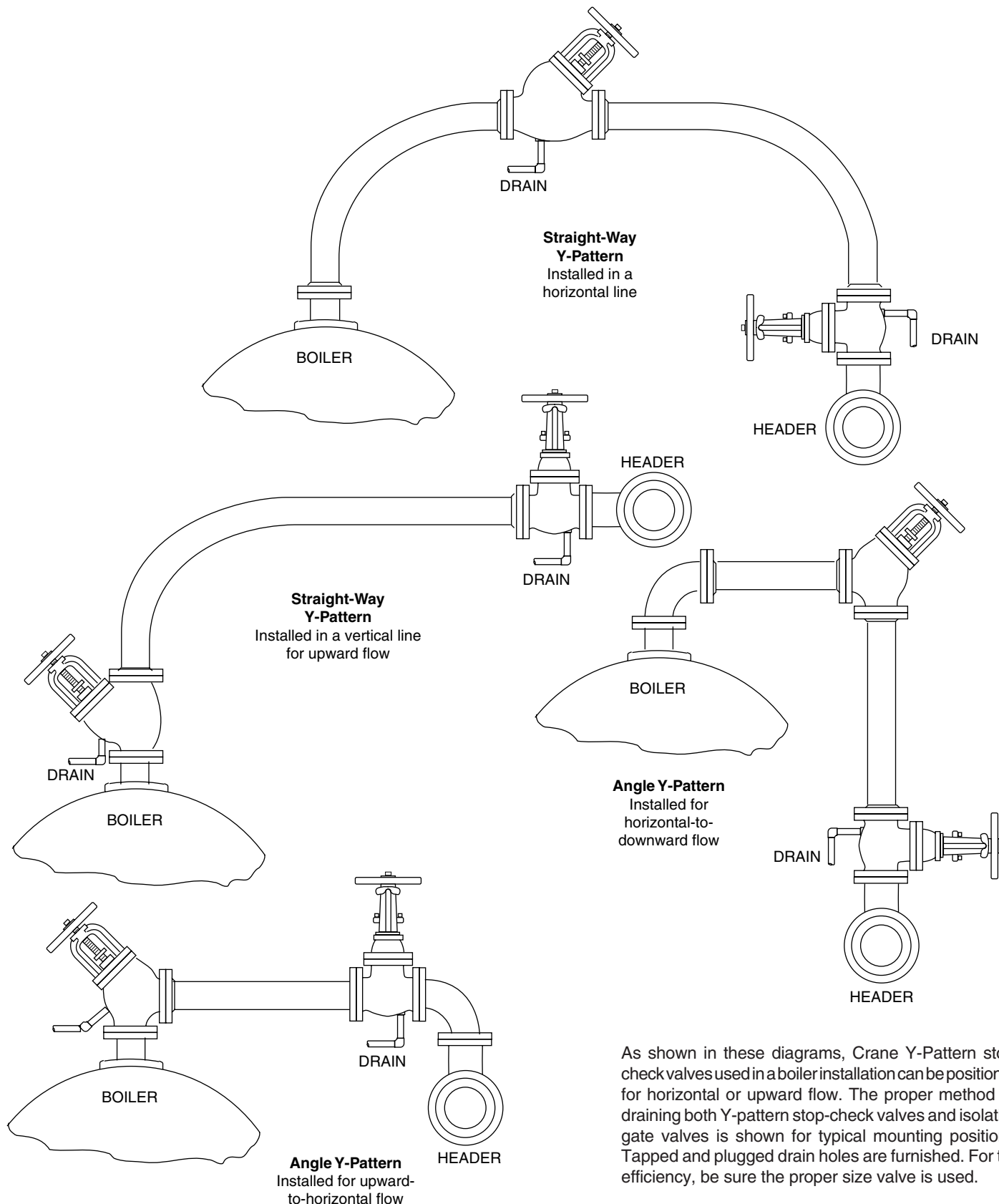
4. Repeat Steps 2 and 3 for other possible valve sizes, tabulate results, and make size selection on basis of pressure drop and duration of partial disc lift considerations.

Valve Size (Inches)	Press drop @ Max.Min. Flow rate (100,000 #/Hr.), psi		Flow Rate for Wide open valve #/Hr.
	Globe	Angle	
6	20.5	22.5	26,500
8	7.5	8.5	48,000
10	3.3	3.6	68,000

Dotted lines on Demand Curve indicate minimum flow rates for wide open 8" and 10" valves.

5. The best choice for this example would be the 10" size because pressure drop is much lower and duration of partially lifted disc is only slightly greater than for the 8" size.
6. Pressure drop for any intermediate flow condition can be determined as outlined in Steps 1 and 2.

## Y-Pattern Stop-Check and Isolation Gate Valves



As shown in these diagrams, Crane Y-Pattern stop-check valves used in a boiler installation can be positioned for horizontal or upward flow. The proper method for draining both Y-pattern stop-check valves and isolation gate valves is shown for typical mounting positions. Tapped and plugged drain holes are furnished. For top efficiency, be sure the proper size valve is used.