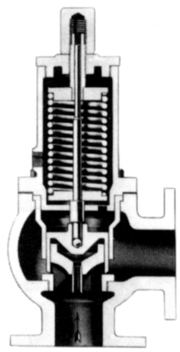
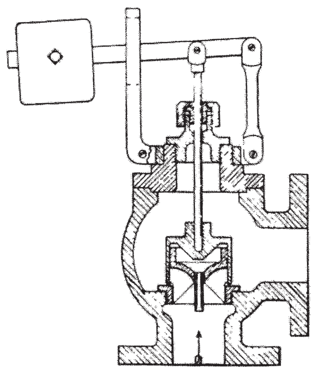
KECKLEY

TYPES 135, 145
BACK PRESSURE VALVES

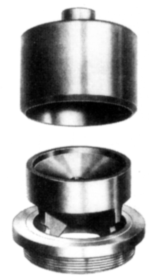
Angle or Globe Pattern
Cup Disc Type
Steam, Air, Water, Oil Service



TYPE 135 ANGLE



TYPE 145



CUP DISC, SEAT-BUSHING

Cup Disc back pressure and relief valves set a new standard in valve performance giving far greater capacity with closer regulation than is possible for conventional type valves. Type 135 is recommended for any clean fluid and for pressures from 5 psi up to the maximums listed below. Type 145 is offered for 0 to 15 psi.

Design and Operation: The inner valve is cup formed and slides over a stationary piston which is part of the seat bushing casting. The edge of the cup cuts across the outlets of the passages between the piston and seat to control the flow and pressure. Valve is normally closed.

Pressure from the valve inlet is transmitted by a short tube to the space above the piston where it tends to lift the cup against the spring force. As this tube faces upstream, the velocity head of the entering fluid is changed into additional pressure to lift the cup.The tube may extend outside the valve to transmit pressure from a remote point.

A close fitting sleeve surrounds the cup to prevent pressure in the outlet chamber from acting downward on the cup and raising the inlet pressure.

A vent in the spring housing prevents an accumulation of pressure above the disc.

Since there is always some fluid leakage between the sleeve and the cup, this vent connection should be piped back to the reservoir when liquids are used. The piping should be kept as short as possible to avoid pressure buildup above the cup.

When used as a relief valve without the sleeve and vent, the capacities are reduced as indicated in the table. The smoother and more chatter free characteristics of the cup construction are retained.

Although the spring can be designed for a wide range of adjustment, much better regulation results if the spring is specified and designed for a definite pressure with a moderate adjustment range. The cap locks the adjusting screw and prevents leakage.

Capacity: The outstanding advantage of this valve is its very large capacity with excellent regulation at all rates of flow. The size ordinarily is half the size required with other types.

Materials: Sizes 1½ inch and smaller have bronze body and trim. Larger sizes have cast iron body and bronze trim. Prices for valves made of other materials will be supplied on request.

TYPES 135 AND 145—DIMENSIONS—WEIGHTS (approximate)

Size Inches	Globe—F to F—Inches Screwed	Globe Flanged 125#	Globe Flanged 250#	Angle—Cen. to F—Inches Screwed	Angle Flanged 125#	Angle Flanged 250#	Maximum Inlet Pressure lbs./sq. in.	Shipping Weight Screwed	Shipping Weight Flanged 125#	Shipping Weight Flanged 250#	Cap. Factor with sleeve 5% rise	Cap. Factor without sleeve 10% rise
¾	4¼	—	—	1⁵⁄₁₆	—	—	300	12	—	—	.16	.11
1	5	—	—	2¹⁄₁₆	—	—	300	15	—	—	.27	.19
1¼	5⅛	—	—	2⅛	—	—	250	16	—	—	.48	.33
1½	5¼	—	—	2½	—	—	200	17	—	—	.64	.45
2	7⁹⁄₁₆	8¼	8¾	3⁷⁄₁₆	4⅛	4⅜	180	43	52	60	1.1	.77
2½	8¾	9½	10⅛	3¹⁵⁄₁₆	4¾	5¹⁄₁₆	150	53	65	72	1.5	1.1
3	9¾	10½	11¼	4½	5¼	5⅝	140	73	85	100	2.4	1.7
4	—	12¼	12⅞	—	6⅛	6⁷⁄₁₆	125	—	120	140	4.4	3.1
5	—	14½	15⅜	—	7¼	7¹¹⁄₁₆	100	—	170	195	6.4	4.5
6	—	16¼	17⅛	—	8⅛	8⁹⁄₁₆	90	—	200	235	8.8	6.1
8	—	19⅛	20⅛	—	9⅛	9⅝	80	—	350	380	16.0	11.0

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TYPES 135, 145
BACK PRESSURE VALVES

Capacity Table

The maximum capacity of any back pressure valve depends on its size and on the inlet and outlet pressures at the maximum rate of flow. The capacity depends also on the type and design of control mechanism. It is necessary to have all this information to figure the capacity accurately. Although a very large capacity can be obtained from any back pressure or relief valve if the inlet pressure rises enough, only the capacity obtainable with a moderate and safe pressure rise is important.

The capacities of valves in this bulletin are based on 10% rise or accumulation in inlet pressure above the set opening pressure, except Type 135 based on 5% rise.

Don't base your selection of valve size merely on size of pipe.

1. To find Valve Capacity—Multiply Capacity Factor by Orifice Capacity.

2. To find Valve Size needed—Divide Required Capacity by Orifice Capacity to obtain Capacity Factor. Then use Table No. 1.

Capacity Factors in Table No. 1 represent the capacity of each valve, with good regulation, as compared to the capacity of a standard orifice under the same conditions.

Orifice Capacities in Tables Nos. 2, 3, 4 and 5 are the rates of flow through a perfect (100% coefficient) orifice or nozzle of 1 sq. in. area for various combinations of inlet and outlet pressures.

Corrections for superheat and for fluids of different specific gravities are shown.

Maximum inlet temperature 450˚F.

Example: Find steam capacity of 3" Type 135 Inlet pressure 20 lbs. —Outlet 8 lbs. or lower. Capacity Factor = 2.4 (See Table No. 1). Orifice Capacity = 1,900 lbs. per hr. (Table No. 3). Valve Capacity = 2.4 x 1,900 = 4,560 lbs. per hr. steam.

table no. 1—capacity factors—valves

	⅜"	½"	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	5"	6"	8"	10"	12"	14"
No. 135			.16	.27	.48	.64	1.1	1.5	2.4	4.4	6.4	8.8	16			

table no. 2—orifice capacities—high pressure steam

Outlet Pressure Lbs. per Square Inch Gage	Initial Gage Pressure—Lbs. per Square Inch							
	200	175	150	125	100	80	60	50
	Lbs. of Steam per Hour per Square Inch of Orifice							
125	10570	8820	6270					
100	10900	9580	7960	5640				
80	10900	9650	8400	6840	4620			
60	10900	9650	8400	7150	5720	4100		
50	10900	9650	8400	7150	5900	4670	2760	
40	10900	9650	8400	7150	5900	4900	3580	2550
30	10900	9650	8400	7150	5900	4900	3885	3225
25	10900	9650	8400	7150	5900	4900	3900	3360
20-0	10900	9650	8400	7150	5900	4900	3900	3400

If the steam is initially superheated multiply the above weights by 1—(0.00065 x degrees Fahr. superheat)

table no. 3—orifice capacities—low pressure steam

Outlet Pressure Lbs. per Square Inch Gage	Initial Gage Pressure—Lbs. per Square Inch							
	40	30	25	20	15	10	8	5
	Lbs. of Steam per Hour per Square Inch of Orifice							
30	2310							
25	2710	1575						
20	2840	2050	1480					
15	2900	2370	1930	1385				
10	2900	2400	2115	1780	1235			
8	2900	2400	2150	1900	1540	760		
5	2900	2400	2150	1900	1600	1110	860	
1	2900	2400	2150	1900	1600	1310	1075	915
O-Vac.	2900	2400	2150	1900	1600	1330	1210	985

If the steam is initially superheated multiply the above weights by 1—(0.00065 x degrees Fahr. superheat)

table no. 4—orifice capacities for air

Outlet Pressure Lbs. per Square Inch Gage	Initial Gage Pressure—Lbs. per Square Inch									
	100	90	80	70	60	50	40	30	20	10
	Cu. Ft. per Min. of Free Air (60˚F.—14.7#/sq. in.) per Sq. In.									
70	1886	1535	1100							
60	2035	1770	1453	1023						
50	2090	1880	1643	1355	958					
40	2100	1913	1725	1505	1235	881				
35	2100	1913	1735	1530	1317	1025	590			
30	2100	1913	1735	1550	1350	1120	802			
25	2100	1913	1735	1550	1370	1165	910	533		
20	2100	1913	1735	1550	1370	1185	978	696		
15	2100	1913	1735	1550	1370	1185	1002	812	460	
10	2100	1913	1735	1550	1370	1185	1002	815	580	
5	2100	1913	1735	1550	1370	1185	1002	818	635	375
0	2100	1913	1735	1550	1370	1185	1002	818	635	446

For other gases, divide above CFM by $\sqrt{\text{specific gravity of the gas}}$.

table no. 5—orifice capacities for water

	Pressure Drop through Orifice—Lbs. per Square Inch											
Pressure Drop	100	85	70	60	50	40	30	25	20	15	10	5
GPM per Square Inch	380	350	318	294	269	240	208	190	170	147	120	85

For other liquids, divide above GPM by $\sqrt{\text{specific gravity of the liquid}}$.