

FIGURES 809 TO 815

Compact wafer style design and round unobstructed port to tackle many tough applications



FEATURES

- Minimizes piping support with the compact wafer style body. This range of wafer check valves are two to three times lighter than traditional full-bodied check valves.
- To meet special applications and service conditions, These valves can be offered with many different options, such as: silicone-free cleaning, oxygen-cleaning, vertical service, left-hand operation, levers, weights and cushions.
- For media containing fibrous matter or caustics, These offers an external spring (Figure 813 and Figure 815) which eliminates the spring from the flow path. This will prohibit the possibility of fiber wrapping around the spring or chemical attack of the spring.
- Maintenance is minimal with the field replaceable 0-ring seat, available in all styles and sizes.

GENERAL APPLICATION

These wafer check valves are used to stop flow reversal in chemical refineries, ammonia compressors, waste water treatment plants, HVAC systems and most other industrial applications.

TECHNICAL DATA

Size range: NPS 2 to 36
Pressure rating: 150 - 740 psi
ASME flange rating: 125 - 300

FIGURES 809 TO 815

FIGURE 809 (INTERNAL SPRING) SPECIFICATIONS, ASME 300 RATED

General

The check valve shall be a wafer style (flangeless) swing check design utilizing a torsional spring to assist in faster closure. The valve must be capable of gravity closure should the loss of spring tension occur when system back pressure is present.

Body/Seat

The body shall be of the one-piece construction and shall possess a machined dovetail groove for a polymer seal. The seal shall not be vulcanized to facilitate seat retention, and shall be field replaceable. The seal shall provide positive shut-off at both low and high pressure.

Disc

The valve shall utilize a one-piece disc/arm assembly. The disc shall completely cover the seal when in the closed position to provide positive seal regardless of disc orientation.

Disc/Stem Connection

The stem shall possess a double 'D' design that when mated to the corresponding disc/arm assembly bore provides positive connection.

The valve shall be F809 as manufactured by Emerson.



General

The check valve shall be a wafer style (flangeless) swing check design utilizing a torsional spring to assist in faster closure. The valve must be capable of gravity closure should the loss of spring tension occur when system back pressure is present.

Body/Seat

The body shall be of one-piece construction and shall (1) possess a machined dovetail groove for elastomer and polymer seals, or (2) possess an integral metal seat machined into the body when metal-to-metal seats are required. The resilient seals shall not be vulcanized to facilitate seat retention. The resilient seals shall be field replaceable. The resilient seals shall provide positive shut-off at both low and high pressure.

Disc

The valve shall utilize a one-piece disc/arm assembly. The disc shall completely cover the seal when in the closed position to provide positive seal regardless of disc orientation.

Disc/Stem Connection

The stem shall possess a double 'D' design that when mated to the corresponding disc/arm assembly bore provided positive connection.

The valve shall be F810 as manufactured by Emerson.

FIGURE 813 (EXTERNAL SPRING) SPECIFICATIONS, ASME 125 AND 150 RATED

General

The check valve shall be a wafer style (flangeless) swing check design utilizing an external torsional spring to assist in faster closure. The valve must be capable of gravity closure should the loss of spring tension occur when system back pressure is present. The valve shall have capability to add lever and/or weight for back-flush capabilities. The lever and/or weight assembly to be field installable. The external spring, lever and weight must be field adjustable.

Body/Seat

The body shall be of one-piece construction and shall (1) possess a machined dovetail groove for elastomer and polymer seals, or (2) possess an integral metal seat machined into the body when metal-to-metal seats are required. The resilient seals shall not be vulcanized to facilitate seal retention. The resilient seals shall be field replaceable. The resilient seals shall provide positive shut-off at both low and high pressure.

Disc

The valve shall utilize a one-piece disc/arm assembly. The disc shall completely cover the seal when in the closed position to provide positive seal regardless of disc orientation.

Bushing and Disc/Stem Connection

The valve shall possess (2) stainless steel or bronze bushings to provide support and alignment to the disc/arm and stem. The stem shall possess a double 'D' design that when mated to the corresponding disc/arm assembly bore provides positive connection.

The valve shall be F813 as manufactured by Emerson.







FIGURES 809 TO 815

FIGURE 815 (EXTERNAL SPRING) SPECIFICATIONS, ASME 125 AND 150 RATING

General

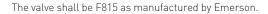
The check valve shall be a semi-lug, swing check design utilizing an external tension spring to assist in faster closure. The valve must be capable of gravity closure should the loss of spring tension occur when system back pressure is present. The valve shall have the capability of adding an adjustable hydraulic cushion for those applications that require damping systems. The external spring (and the damping cushion) must be field adjustable.

Body/Seat

The body shall be of one-piece construction and shall (1) possess a machined dovetail groove for elastomer and polymer seals, or (2) possess a stainless steel or nickel aluminum bronze seat ring. The metal seat ring shall have a machined dovetail groove to mechanically retain the elastomer seal. No vulcanized bonding or chemical bonding is permitted to facilitate seat retention. The seals shall be field replaceable. The elastomer seals to provide positive shut-off at both low and high pressure.

Disc

The disc shall completely cover the seat ring/seal when in the closed position to provide positive seal regardless of disc orientation.



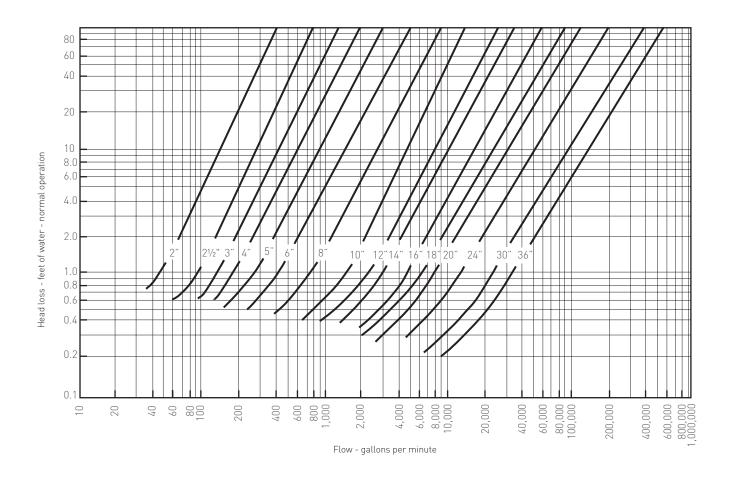


PRODUCT SUMMARY

PRODUCTS		D	C:	Darks marks mind /				
_	ASME	Pressure	Size	Body material/	<i>,</i>			
Туре	flange rating	rating	(NPS)	ASTM	Disc/arm	Seat	Spring	Outside hardware
Figure 809	300	740	2 - 6	Carbon Steel/ ASTM A216 Gr. WCB	316 S/S	PTFE Neoprene	316 S/S (Std.)	-
Figure 810	125	200	2 - 12	Cast Iron/ ASTM A126 Class B	316 S/S	NBR (Std.)EPDM Fluoroelastomer PTFE Metal-to-metal	316 S/S (Std.) 2-5 inch 17-7 PH SS (Std.) 6-12 inch Inconel® 750	-
	150	285	2 - 12	Carbon Steel/ ASTM A216 Gr. WCB 316 S/S ASTM A351 Gr. CF8M	316 S/S	NBR (Std.) EPDM Fluoroelastomer PTFE Metal-to-metal	316 S/S (Std.) 2-5 inch 17-7 PH S/S (Std.) 6-12 inch Incone(® 750	-
Figure 813	125	200	2 - 12	Cast Iron/ ASTM A126 Class B	316 S/S	NBR (Std.) EPDM Fluoroelastomer PTFE Metal-to-metal	316 S/S (Std.) Inconel® 750	2 Pos adjustable spring (Std.) Lever Adjustable Weight
	150	285	2 - 12	Carbon Steel/ ASTM A216 Gr. WCB 316 SS/	316 S/S	NBR (Std.) EPDM Fluoroelastomer PTFE	316 S/S (Std.) Inconet® 750	2 Pos Adjustable spring (Std.) Lever Adjustable Weight
Figure 815	125	200	12 14 - 36	ASTM A351 Gr. CF8M Cast Iron/ ASTM A126 Class B	316 S/S	Metal-to-metal NBR (Std.) EPDM Fluoroelastomer Ni-AB 316 SS	Carbon Steel (Std.) 316 S/S	Adjustable spring Lever Adjustable Wt. (Std.) Hydraulic Cushion Limit Switch
	150	285	12 - 36	Carbon Steel/ ASTM A216 Gr. WCB	316 S/S	NBR (Std.) EPDM	Carbon Steel (Std.) 316 S/S	Adjustable Spring Lever Adjustable Wt. (Std.)
	150	275	12 - 36	316 SS/ ASTM A351 Gr. CF8M		Fluoroelastomer Ni-AB		Hydraulic Cushion Limit Switch

NOTES

- 1. Left hand versions available on all external spring models for horizontal service.
- 2. Not for use in pulsating or reciprocating services.



NOTES

- 1. Curves are for water at 60°F.
- 2. Feet of water x 0.4335 = psi
- 3. Use curves for estimating purposes only. Performance is based upon ideal inlet and outlet conditions with no springs or weights.

Disc Cracking Pressure

All valves equal approximately 0.5 psi without lever/weight or cushion. For valves with lever/weight or cushion, contact your sales representative.

TYPICAL DATA - AIR FLOW AT 60°F - S.C.F.M.

IIIICAL	ם בות ב	(III I EO	** ~ 1 00	1 - 3.0												
Pressure																
drop																
PSI	2	21/2	3	4	5	6	8	10	12	14	16	18	20	24	30	36
0.1	85	235	275	360	525	855	1555	2875	4710	5200	8565	11700	16000	30600	47750	77100
0.2	120	330	390	510	745	1210	2200	4050	6650	7350	12110	16500	22550	43500	67500	109000

FLOW COEFFICIENT - Cv

FLUW CU	EFFICIE	N I - CV														
Size																
(NPS)	2	21/2	3	4	5	6	8	10	12	14	16	18	20	24	30	36
C	70	190	225	295	//30	700	1270	2350	3850	425N	7000	9550	13000	25000	39000	63000

FIGURES 809 TO 815

For Liquids

Pressure Drop = S.G. $\left(\frac{Q_L}{C_V}\right)^2$

Where:

QL = Flow in gallons per minute

S.G. = Specific Gravity of Liquid

 C_v = Valve flow coefficient from table

NOTE

30 fps is the nominal maximum allowable velocity for liquids.

For Gases

Pressure Drop = $\frac{Q_g^2 GT}{514 P_1 C_v^2}$

Where:

 Q_{α} = Flow in standard cubic feet per minute

 P_1^9 = Upstream pressure absolute (psi + 14.7)

G = Specific Gravity of Gas

T = Temperature (Rankin)(°F + 460°)

 C_v = Valve flow coefficient from table

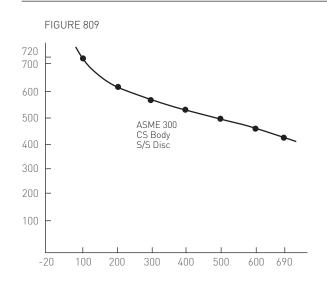
NOTE

120 fps is the nominal maximum velocity for gases.

NOTE

Where valve construction consists of more than one material, the effective service range of the valve is the same as that of the most restrictive material in the valve

SIZE - TEMPERATURE - PRESSURE RATINGS



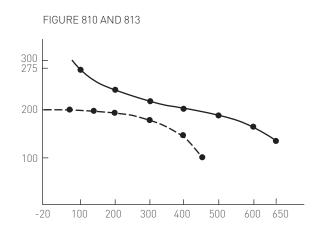
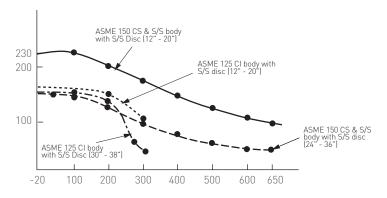
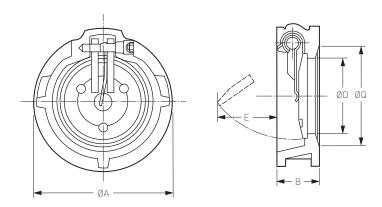


FIGURE 815



Seat Temperature Ratings								
NBR	0 to 212°F							
EPDM	-40 to 250°F							
FKM	-40 to 400°F							
PTFE	-40 to 300°F							
Metal	Refer to Temperature/pressure charts							

FIGURE 809 Sizes NPS 3 to 6



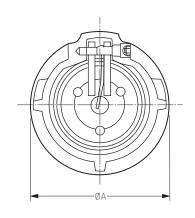
DIMENSIONS (inches)

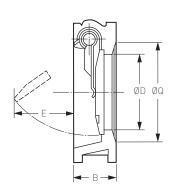
Size NPS	ØA	В	ØQ¹	ØD	E	Wt. (lbs.)
3	57/8	2	31/16	21/16	2	7
4	71/8	21/4	41/32	31/32	2	11
5	81/2	21/2	51/32	31/8	3	15
6	97/8	23/4	61/16	43/4	313/16	22

NOTE

The Q dimension is the minimum pipe or companion flange inside diameter for proper valve operation.

FIGURE 810 Sizes NPS 2 to 12





DIMENSIONS (inches)

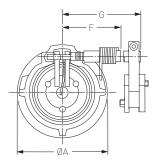
DIFICIATIONS	(IIICIICO)					
Size NPS	ØA	В	ØQ¹	ØD	E	Wt. (lbs.)
2	41/8	13/4	21/16	1 17/32	13/16	4
21/2	47/8	17/8	215/32	13/4	11/16	5
3	53/8	2	31/16	21/16	15/8	7
4	67/8	21/4	41/32	31/32	21/4	11
5	73/4	21/2	51/32	37/8	3	15
6	83/4	23/4	61/16	43/4	33/4	22
8	11	215/16	$7^{31}/_{32}$	67/16	45/8	30
10	133/8	31/8	10	75/8	67/16	58
12	161/8	31/2	12	91/2	81/8	85

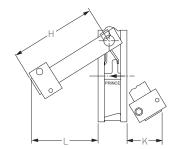
NOTE

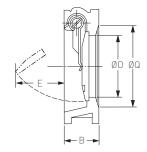
The Q dimension is the minimum pipe or companion flange inside diameter for proper valve operation.

FIGURES 809 TO 815

FIGURE 813 (with optional lever and weight) Sizes NPS 2 to 12







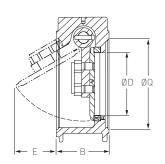
DIMENSIONS (inches)

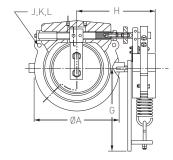
, (11161165)										
ØA	В	ØQ¹	ØD	Е	F	G	Н	J	K	Wt. (lbs.)
41/8	13/4	21/16	117/32	13/16	31/16	4 ²³ / ₃₂	61/2	55/32	221/32	5
47/8	17/8	215/32	13/4	11/16	35/16	57/32	71/2	57/8	33/32	6
53/8	2	37/16	21/16	15/8	31/2	511/16	81/2	613/16	35/8	9
67/8	21/4	41/32	31/32	21/4	31/4	613/32	81/2	63/4	313/32	13
73/4	21/2	51/32	37/8	3	515/32	77/32	83/8	619/32	31/2	19
83/4	23/4	61/16	43/4	33/4	5 ²⁹ / ₃₂	73/4	83/8	6 ²¹ / ₃₂	31/4	24
11	215/16	731/32	67/16	45/8	631/32	95/32	93/8	77/16	35/8	32
133/8	31/8	10	75/8	67/16	55/16	1013/32	103/8	81/16	43/16	60
161/8	31/2	12	91/2	81/8	61/4	127/32	12	93/8	411/16	87
	ØA 41/8 41/8 53/8 67/8 73/4 83/4 11 133/8	ØA B 4½ 1¾ 4½ 1½ 5½ 1½ 6½ 2½ 6¾ 2½ 8¾ 2½ 8¾ 2¾ 11 2½ 13¾ 3½	ØA B ØQ¹ 4½ 2½16 4½ 2½16 4½ 2½32 5¾8 2 3½16 6½8 2½4 4½32 7¾4 2½2 5½32 8¾4 2¾4 6½16 11 2½5/16 73½2 13¾6 3½8 10	ØA B ØQ¹ ØD 4½ 1¾ 2½16 1½32 4½6 1¾ 2½52 1¾ 5¾ 2 3½16 2½16 6½8 2½4 4½32 3⅓32 7¾ 2½ 5½32 3½ 8¾ 2¾ 6½16 4¾ 11 2½5/6 7³½2 6½16 13¾ 3½ 10 7½6	ØA B ØQ¹ ØD E 4½ 1¾ 2½16 1½32 1¾6 4½ 1½6 1½32 1¾4 1¼6 5¾ 2 3½16 2½16 1½6 6½ 2½4 4½32 3⅓32 2½4 7¾ 2½ 5½32 3½6 3 8¾ 2¾ 6½16 4¾4 3¾4 11 2½16 7¾32 6½16 4½8 13¾ 3½8 10 7½6 6½16	ØA B ØQ¹ ØD E F 4½ 1¾ 2½16 1½32 1¾6 3½6 4½ 1½6 1½52 1¾ 1¼6 3½6 5¾ 2 3½16 2½16 1½8 3½2 6½ 2¼ 4½2 3⅓32 2¼ 3¼ 7¾ 2½2 5⅓32 3½8 3 5½32 8¾ 2¾ 6¼16 4¾ 3¾ 5½8 11 2½16 7¾32 6¼16 4½8 6¾52 13¾ 3½8 10 7½6 6¾16 5½16	ØA B ØQ¹ ØD E F G $41/8$ $13/4$ $21/16$ $117/32$ $13/16$ $31/16$ $42^{23}/32$ $47/8$ $11/8$ $215/32$ $13/4$ $11/16$ $35/16$ $57/32$ $53/8$ 2 $37/16$ $21/16$ $15/8$ $31/2$ $51^{11}/16$ $67/8$ $21/4$ $41/32$ $31/32$ $21/4$ $31/4$ $613/32$ $73/4$ $21/2$ $51/32$ $37/6$ 3 $515/32$ $77/32$ $83/4$ $29/4$ $61/16$ $49/4$ $39/4$ $52^{29}/32$ $79/4$ 11 $215/16$ $731/32$ $67/16$ $45/6$ $631/32$ $95/32$ $133/6$ $31/6$ 10 $75/6$ $67/16$ $55/16$ $1013/32$	ØA B ØQ¹ ØD E F G H 41 /8 13 /4 21 /16 $11^{7}/32$ 13 /16 31 /16 $42^{23}/32$ 61 /2 47 /8 17 /8 $21^{15}/32$ 13 /4 11 /16 35 /16 $5^{7}/32$ 71 /2 5 /8 2 $3^{7}/16$ 21 /16 15 /8 31 /2 $51^{11}/16$ 81 /2 $6^{7}/8$ 21 /4 $4^{1}/32$ $3^{1}/32$ $2^{1}/4$ $3^{1}/4$ $6^{13}/32$ $8^{1}/2$ $7^{3}/4$ 21 /2 $5^{1}/32$ $3^{7}/8$ 3 $5^{15}/32$ $7^{7}/32$ $8^{3}/8$ $8^{3}/4$ $2^{9}/4$ $6^{1}/16$ $4^{9}/4$ $3^{9}/4$ $5^{29}/32$ $7^{9}/4$ $8^{9}/8$ 11 $2^{15}/16$ $7^{31}/32$ $6^{7}/16$ $4^{9}/8$ $6^{31}/32$ $9^{5}/32$ $9^{9}/8$ $13^{3}/8$ $3^{1}/8$ $3^{1}/8$ $3^{1}/8$ $5^{5}/16$ $10^{13}/32$ $10^{9}/8$	ØA B ØQ¹ ØD E F G H J $41/6$ $13/4$ $21/16$ $117/32$ $13/16$ $31/16$ $4^{23}/32$ $61/2$ $5^{5}/32$ $47/8$ $11/6$ $21^{15}/32$ $13/4$ $11/16$ $3^{5}/16$ $5^{7}/32$ $71/2$ $5^{7}/6$ $53/8$ 2 $3^{7}/16$ $2^{1}/16$ $15/6$ $31/2$ $5^{11}/16$ $81/2$ $6^{13}/16$ $67/8$ $21/4$ $4^{1}/32$ $3^{1}/32$ $2^{1}/4$ $3^{1}/4$ $6^{13}/32$ $8^{1}/2$ $6^{3}/4$ $7^{3}/4$ $21/2$ $5^{1}/32$ $3^{7}/8$ $3^{15}/32$ $7^{7}/32$ $88/6$ $6^{19}/32$ $8^{3}/4$ $2^{3}/4$ $6^{1}/16$ $4^{3}/4$ $3^{3}/4$ $5^{2}/32$ $7^{3}/4$ $8^{3}/6$ $6^{2}/32$ 11 $2^{15}/16$ $7^{3}/32$ $6^{7}/16$ $4^{5}/6$ $6^{3}/32$ $9^{5}/32$ $9^{9}/6$ $7^{7}/16$ $13^{3}/6$ $3^{1}/6$ <td< td=""><td>ØA B ØQ1 ØD E F G H J K $4\sqrt{8}$ 1.94 $2.1/6$ $1.17/32$ $1.3/16$ $3.1/16$ $4.23/32$ $6.1/2$ $5.5/32$ $2.21/32$ $4.7/8$ $1.17/8$ $2.15/32$ $1.3/4$ $1.1/16$ $3.5/16$ $5.7/32$ $7.1/2$ $5.7/8$ $3.3/32$ $5.9/8$ 2 $3.7/16$ $2.1/16$ $1.5/8$ $3.1/2$ $5.11/16$ $8.1/2$ $6.13/16$ $3.5/8$ $6.7/8$ $2.1/4$ $4.1/32$ $3.1/32$ $2.1/4$ $3.1/4$ $6.13/32$ $8.1/2$ $6.3/4$ $3.13/32$ $7.3/4$ $2.1/2$ $5.1/32$ $3.1/8$ $3.1/8$</td></td<>	ØA B ØQ1 ØD E F G H J K $4\sqrt{8}$ 1.94 $2.1/6$ $1.17/32$ $1.3/16$ $3.1/16$ $4.23/32$ $6.1/2$ $5.5/32$ $2.21/32$ $4.7/8$ $1.17/8$ $2.15/32$ $1.3/4$ $1.1/16$ $3.5/16$ $5.7/32$ $7.1/2$ $5.7/8$ $3.3/32$ $5.9/8$ 2 $3.7/16$ $2.1/16$ $1.5/8$ $3.1/2$ $5.11/16$ $8.1/2$ $6.13/16$ $3.5/8$ $6.7/8$ $2.1/4$ $4.1/32$ $3.1/32$ $2.1/4$ $3.1/4$ $6.13/32$ $8.1/2$ $6.3/4$ $3.13/32$ $7.3/4$ $2.1/2$ $5.1/32$ $3.1/8$

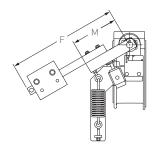
NOTES

- $1. \quad \text{The Q dimension is the minimum pipe or companion flange inside diameter for proper valve operation}.$
- 2. Right hand valve is shown.

FIGURE 815 (with optional cushion) Sizes NPS 12 to 36







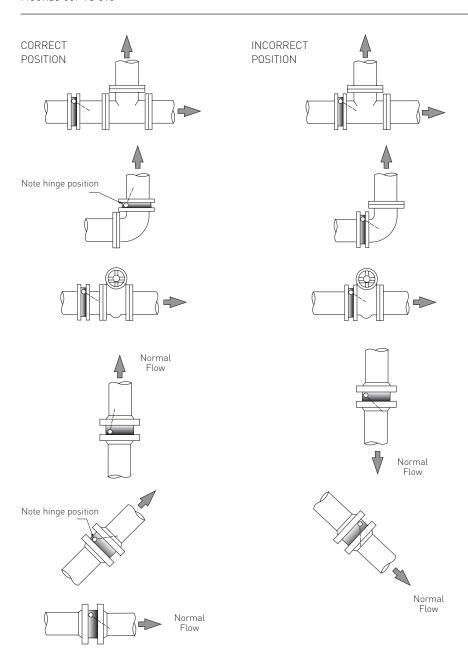
DIMENSIONS (inches)

DIMENSIO	M2 (IIICIIES))											
Size NPS	ØA	В	ØQ¹	ØD	Е	F	G	Н	J	K	L	М	Wt. (lbs.)
12	16	43/4	12	91/2	77/32	18	71/2	153/4	17	4	7/8 - 9	45/8	212
14	175/8	73/4	131/4	103/16	63/4	30	207/32	171/4	183/4	4	1 - 8	123/4	350
16	201/8	83/4	151/4	113/16	731/32	30	195/32	185/8	211/4	6	1 - 8	123/4	410
18	211/2	83/4	171/4	1211/16	93/8	30	183/16	193/8	223/4	4	11/8 - 7	123/4	450
20	235/8	93/4	191/4	15	117/16	30	171/4	201/2	25	6	11/8 - 7	14	775
24	28	93/4	231/4	181/2	15	30	16	223/4	291/2	6	11/4 - 7	14	925
30	341/2	93/4	291/4	231/2	197/32	30	26	263/4	36	8	11/4 - 7	14	1225
36	411/8	141/2	351/4	277/8	197/16	40	237/16	3815/16	423/4	8	11/2 - 6	201/8	2100

NOTES

- 1. The Q dimension is the minimum pipe or companion flange inside diameter for proper valve operation.
- 2. Right hand valve is shown.

FIGURES 809 TO 815



FLANGE AND BOLTING DATA - FIGURE 809

	ASME 300										
Size	Diameter of										
(NPS)	bolt circle	No. of bolts	Bolt thread								
2	5	8	5/8 - 11								
3	65/8	8	3/4 - 10								
4	77/8	8	3/4 - 10								
5	91/4	8	3/4 - 10								
6	105/8	12	3/4 - 10								
8	13	12	7/8 - 9								
10	151/4	16	1 - 8								
12	173/4	16	11/8 - 7								

FLANGE AND BOLTING DATA - FIGURE 809

ASME CLASS 125/150									
Size	Diameter of								
(NPS)	bolt circle	No. of Bolts	Bolt thread						
2	43/4	4	5/8 - 11						
21/2	51/2	4	5/8 - 11						
3	6	4	5/8 - 11						
4	71/2	8	5/8 - 11						
5	81/2	8	3/4 - 10						
6	91/2	8	3/4 - 10						
8	113/4	8	3/4 - 10						
10	141/2	12	7/8 - 9						
12	17	12	7/8 - 9						
14	183/4	12	1 - 8						
16	211/2	16	1 - 8						
18	223/4	16	11/8 - 7						
20	25	20	11/8 - 7						
24	291/2	20	11/4 - 7						
30¹	36	28	11/4 - 7						
36 ¹	423/4	32	11/2 - 6						

NOTE

1. ASME Class 125 Only

RECOMMENDATIONS FOR INSTALLATION POSITION

- 1. Position the check valve to promote smooth flow.
- 2. Allow clearance for disc movement.
- 3. Install the valve in horizontal or upward flow for proper valve closure.
- 4. Allow 5 pipe diameters between valve and turbulance-producing elements.

CAUTION

Do not use with reciprocating compressors, or in other pulsating services.

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