

High Efficiency

Pilot Operated Safety Valves

Series 810 – Pop Action
US Units



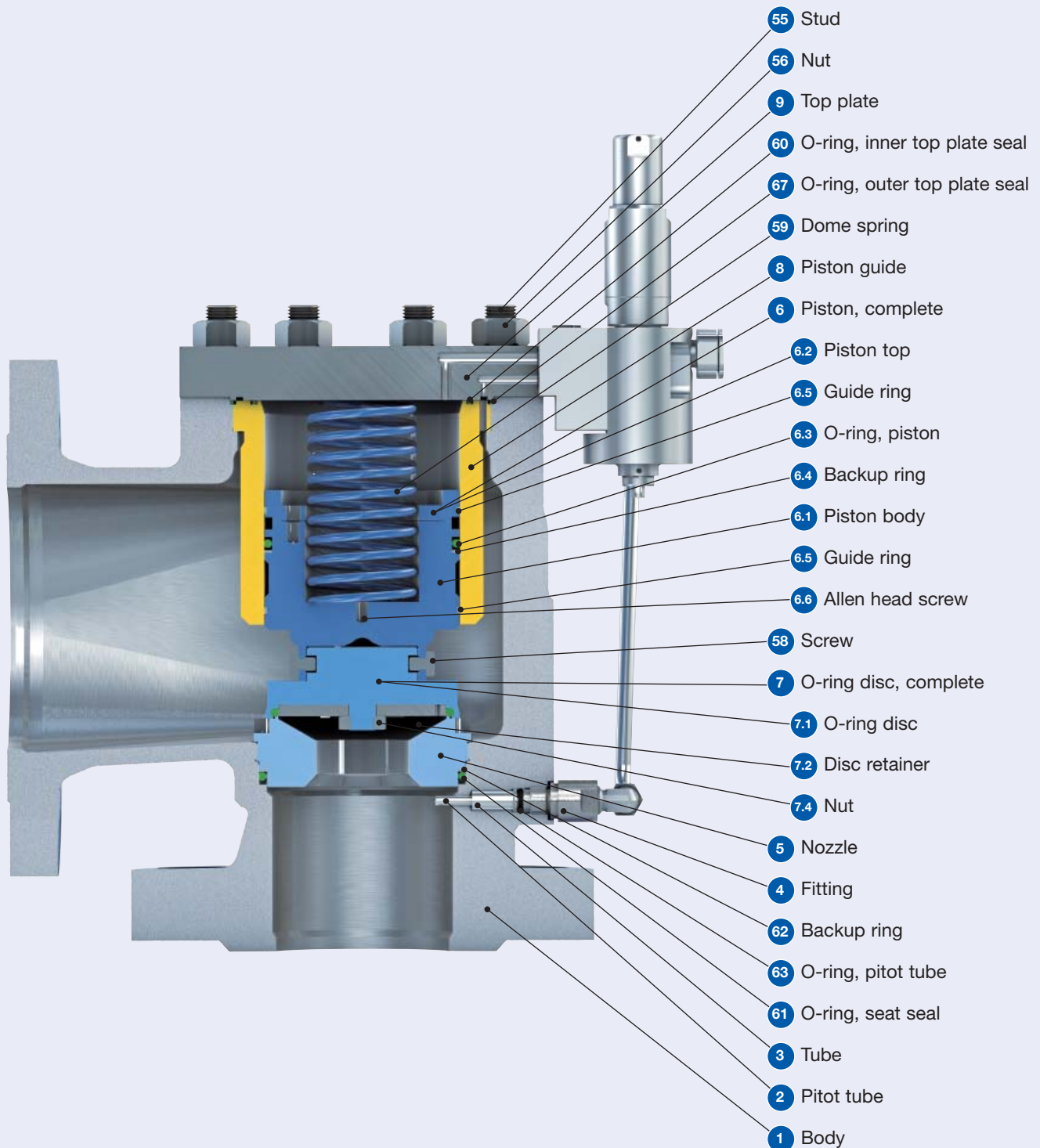
Facts

LESER

The-Safety-Valve.com

Materials Series 810, 820 Main Valve

Below is a schematic drawing of the parts layout for the LESER POSV main valve including both the Standard and Extra Orifice designs. For the related parts listing, see opposite page.



Materials Series 810, 820 Main Valve

Materials				
Item	Component	Type 8112 / 8212	Type 8114 / 8214	Type 8113 / 8213
1	Body	1.0619 SA 216 WCB	1.4408 SA 351 CF8M	SA 352 LCB
2	Pitot tube	1.4404 316L	1.4404 316L	1.4404 316L
3	Tube	1.4404 316L	1.4404 316L	1.4404 316L
4	Fitting	1.4404 316L	1.4404 316L	1.4404 316L
5	Nozzle	1.4404 316L	1.4404 316L	1.4404 316L
6	Piston, complete	1.4404 316L	1.4404 316L	1.4404 316L
6.1	Piston body	1.4404 316L	1.4404 316L	1.4404 316L
6.2	Piston top	1.4404 316L	1.4404 316L	1.4404 316L
6.4	Backup ring	PTFE PTFE	PTFE PTFE	PTFE PTFE
6.5	Guide ring	PTFE with carbon PTFE with carbon	PTFE with carbon PTFE with carbon	PTFE with carbon PTFE with carbon
6.6	Allen head screw	A4-70 Stainless steel	A4-70 Stainless steel	A4-70 Stainless steel
7	O-ring disc, complete	1.4404 316L	1.4404 316L	1.4404 316L
7.1	O-ring disc	1.4404 316L	1.4404 316L	1.4404 316L
7.2	Disc retainer	1.4404 316L	1.4404 316L	1.4404 316L
7.4	Nut	A4-70 Stainless steel	A4-70 Stainless steel	A4-70 Stainless steel
8	Piston guide	1.4404 316L	1.4404 316L	1.4404 316L
9	Top plate	1.0460 SA 105	1.4404 316L	1.406 SA105
55	Stud	1.7225 B7M	1.4401 B8M	1.7225 B7M
56	Nut	1.7225 2H	1.4401 8M	1.7225 2HM
58	Screw	A4-70 Stainless steel	A4-70 Stainless steel	A4-70 Stainless steel
59	Dome spring	1.4310 Stainless steel	1.4310 Stainless steel	1.4310 Stainless steel
62	Backup ring	PTFE PTFE	PTFE PTFE	PTFE PTFE
Option code				
6.3, 6.4, 7.3, 60, 61, 63, 67	O-ring ¹⁾	*	Viton® (FKM – Fluorocarbon)	
		R05	Buna-EP® (EPDM – Ethylene-Propylene-Dine)	
		R06	Kalrez® (FFKM – Perfluoro)	

Please notice:

- Modifications reserved by LESER.
- LESER can upgrade materials without notice.
- Every part can be replaced by other material acc. to customer specification.

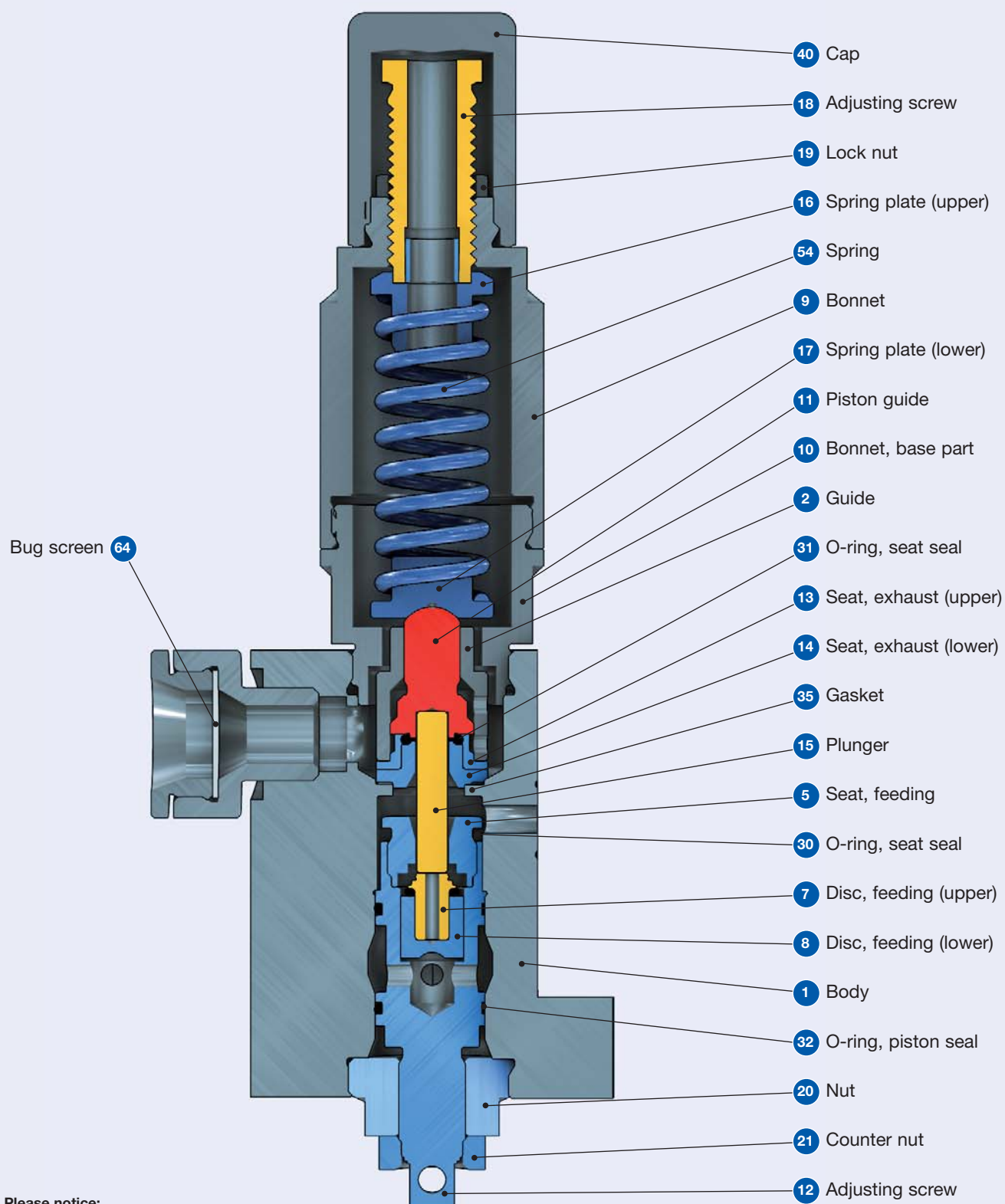
¹⁾ For further soft seal materials refer to page 02/15

Product Description

LESER

Materials Series 810 Pop Action Pilot Valve

Below is a schematic drawing of the parts layout for the LESER Series 810 – Pop Action pilot valve.
For the related parts listing, see opposite page.



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- LESER can upgrade materials without notice.
- Every part can be replaced by other material acc. to customer specification.

Materials Series 810 Pop Action Pilot Valve

Materials			
Item	Component	Standard	NACE
1	Body	1.4404	1.4404
		SA 479 316L	SA 479 316L
2	Guide	1.4404	1.4404
		316L	316L
5	Seat, feeding	1.4404	1.4404
		316L	316L
7	Disc, feeding (upper)	1.4404	1.4404
		316L	316L
8	Disc, feeding (lower)	1.4404	1.4404
		316L	316L
9	Bonnet	1.4404	1.4404
		SA 479 316L	SA 479 316L
10	Bonnet, base part	1.4404	1.4404
		SA 479 316L	SA 479 316L
11	Piston guide	1.4404	1.4404
		316L	316L
12	Adjusting screw	1.4404	1.4404
		316L	316L
13	Seat, exhaust (upper)	1.4404	1.4404
		316L	316L
14	Seat, exhaust (lower)	1.4404	1.4404
		316L	316L
15	Plunger	1.4404	1.4404
		316L	316L
16	Spring plate (upper)	1.4404	1.4404
		316L	316L
17	Spring plate (lower)	1.4404	1.4404
		316L	316L
18	Adjusting screw	1.4404	1.4404
		316L	316L
19	Lock nut	1.4404	1.4404
		316L	316L
20	Nut	1.4404	1.4404
		316L	316L
21	Counter nut	1.4404	1.4404
		316L	316L
26	Piston	1.4404	1.4404
		316L	316L
35	Gasket	PTFE	PTFE
40	Cap	1.4404	1.4404
		316L	316L
54	Spring	1.4310 Stainless steel	2.4669 INCONEL X750
64	Bug screen	Plastic	Plastic
		Plastic	Plastic
Option code			
30, 31, 32	O-ring ¹⁾	*	Viton® (FKM – Fluorocarbon)
		R05	Buna-EP® (EPDM – Ethylene-Propylene-Dine)
		R06	Kalrez® (FFKM – Perfluo)

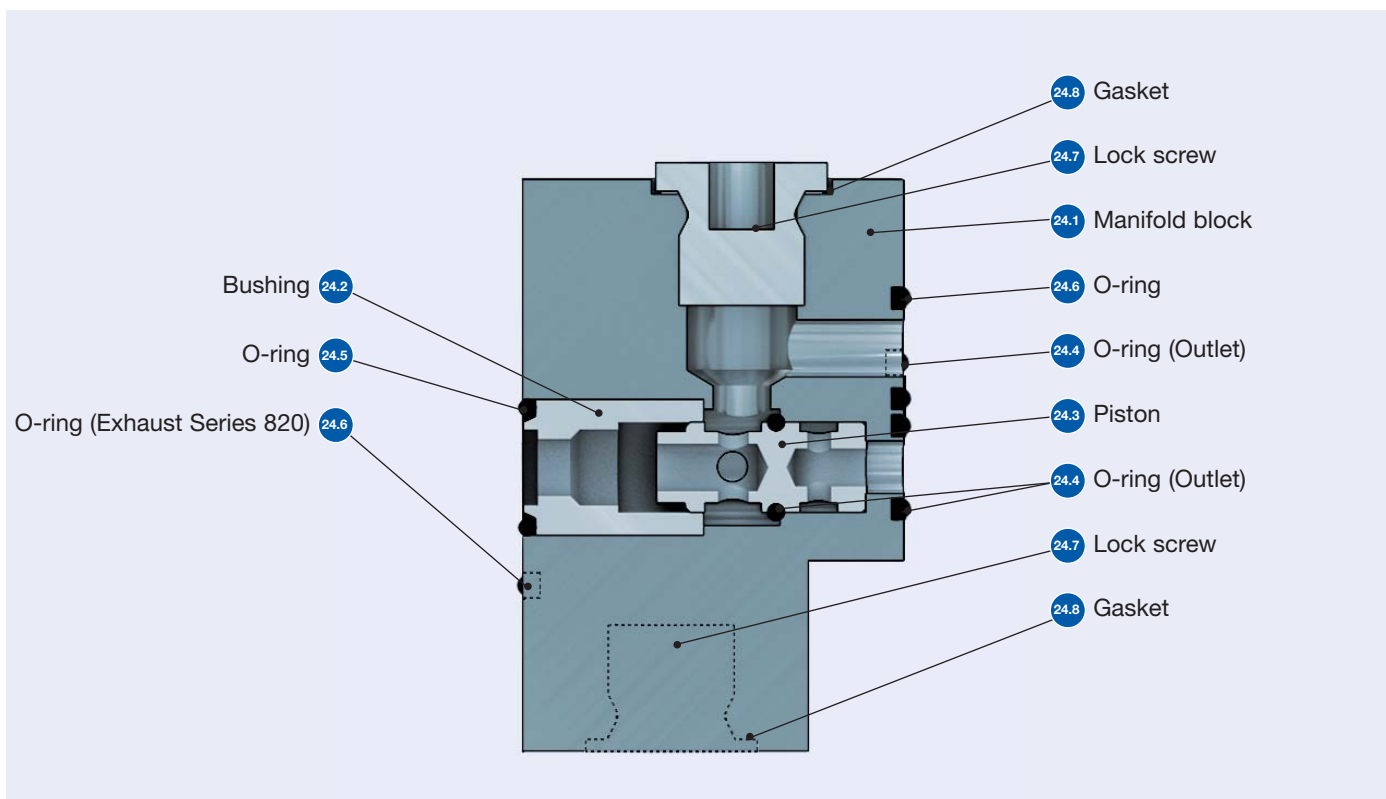
¹⁾ For further soft seal materials refer to page 02/15

Product Description

LESER

Materials Series 810, 820 Manifold block

Below is a schematic drawing of the parts layout for the Manifold block.
For the related parts listing, see opposite page.



Materials Series 810, 820 Manifold block

Materials		
Item	Component	Standard
24.1	Manifold block	1.4404
		316L
24.2	Bushing	1.4404
		316L
24.3	Piston	1.4404
		316L
24.7	Lock screw	1.4101
		Stainless steel
24.8	Gasket	1.4101
		Stainless steel
Option code		
24.4, 24.5, 24.6	O-ring ¹⁾	*
		R05
		R06
		Viton® (FKM – Fluorocarbon)
		Buna-EP® (EPDM – Ethylene-Propylene-Dine)
		Kalrez® (FFKM – Perflu)

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- LESER can upgrade materials without notice.
- Every part can be replaced by other material acc. to customer specification.

¹⁾ For further soft seal materials refer to page 02/15

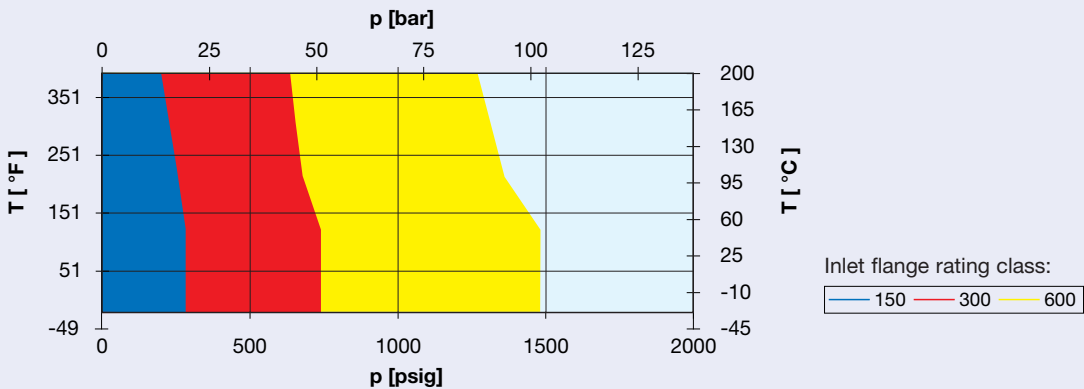
3

Reference: Identifying the Flange Pressure Rating (ASME)

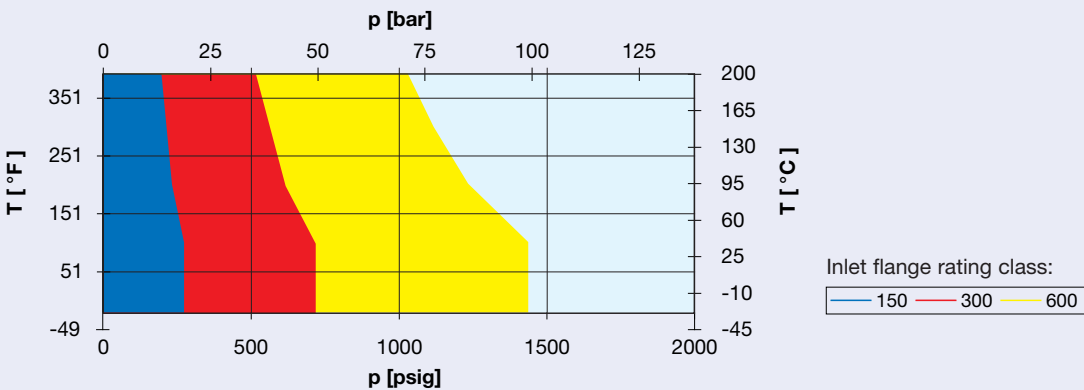
The following selection charts help you identify the flange pressure rating of your LESER safety valve based on the operating pressure and operating temperature of your plant depending on the required body material.

The flange pressure rating is shown inside the color-coded fields of each chart. For the numerical selection tables see opposite page.

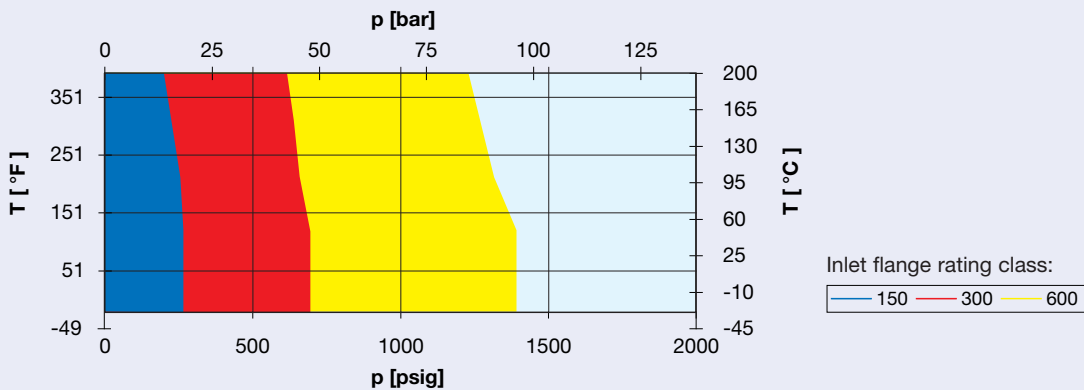
Body material: WCB



Body material: CF8M



Body material: LCB



4

Reference: Identifying the Valve Code, Series 810, Orifice D – K+

In the selection charts below you identify the article number based on your flange pressure rating ("flange class"), connection size ("valve size") and orifice. If you

specified the Extra Orifice (or "Full bore" orifice) for your nozzle design, refer to row "Extra Orifice", otherwise use row "API Standard Orifice acc. to API 526".

Series 810 – Pop Action, API Standard Orifice and Extra Orifice All Connection Sizes, Orifice D – K+, by Flange Pressure Rating

DN _{L+O}	25 x 50				40 x 50				40 x 80			50 x 80			
Valve size	1" x 2"				1½" x 2"				1½" x 3"			2" x 3"			
API Standard Orifice acc. to API 526	D	E	F		D	E	F		G	H		G	H	J	
Extra Orifice				G				H			J				K+

Body material: WCB 1.0619

Flange class Art.-No.

150 x 150	8112.	0010	0020	0030	1820	0040	0050	0060	1830	0070	0080	1840	0090	0100	0110	1850
300 x 150	8112.	0220	0230	0240	1900	0250	0260	0270	1910	0280	0290	1920	0300	0310	0320	1930
600 x 150	8112.	0640	0650	0660	2060	0670	0680	0690	2070	0700	0710	2080	0720	0730	0740	2090

Body material: CF8M 1.4408

Flange class Art.-No.

150 x 150	8114.	0010	0020	0030	1820	0040	0050	0060	1830	0070	0080	1840	0090	0100	0110	1850
300 x 150	8114.	0220	0230	0240	1900	0250	0260	0270	1910	0280	0290	1920	0300	0310	0320	1930
600 x 150	8114.	0640	0650	0660	2060	0670	0680	0690	2070	0700	0710	2080	0720	0730	0740	2090

Body material: LCB

Flange class Art.-No.

150 x 150	8113.	0010	0020	0030	1820	0040	0050	0060	1830	0070	0080	1840	0090	0100	0110	1850
300 x 150	8113.	0220	0230	0240	1900	0250	0260	0270	1910	0280	0290	1920	0300	0310	0320	1930
600 x 150	8113.	0640	0650	0660	2060	0670	0680	0690	2070	0700	0710	2080	0720	0730	0740	2090

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Reference: Identifying the Valve Code, Series 810, Orifice J – T+

In the selection charts below you identify the article number based on your flange pressure rating ("flange class"), connection size ("valve size") and orifice. If you

specified the Extra Orifice (or "Full bore" orifice) for your nozzle design, refer to row "Extra Orifice", otherwise use row "API Standard Orifice acc. to API 526".

Series 810 – Pop Action, API Standard Orifice and Extra Orifice All Connection Sizes, Orifice J – T+, by Flange Pressure Rating

DN I+O	80 x 100				100 x 150					150 x 200			200 x 250	
Valve size	3" x 4"				4" x 6"					6" x 8"			8" x 10"	
API Standard Orifice acc. to API 526	J	K	L		L	M	N	P		Q	R		T	
Extra Orifice				N+					P+			R+		T+

Body material: WCB 1.0619

Flange class	Art.-No.													
150 x 150	8112.	0120	0130	0140	1860	0150	0160	0170	0180	1870	0190	0200	1880	0210 1890
300 x 150	8112.	0330	0340	0350	1940	0360	0370	0380	0390	1950	0400	0410	1960	0420 1970
600 x 150	8112.	0750	0760	0770	2100	0780	0790	0800	0810	2110	0820	0830	2120	0840 2130

Body material: CF8M 1.4408

Flange class	Art.-No.													
150 x 150	8114.	0120	0130	0140	1860	0150	0160	0170	0180	1870	0190	0200	1880	0210 1890
300 x 150	8114.	0330	0340	0350	1940	0360	0370	0380	0390	1950	0400	0410	1960	0420 1970
600 x 150	8114.	0750	0760	0770	2100	0780	0790	0800	0810	2110	0820	0830	2120	0840 2130

Body material: LCB

Flange class	Art.-No.													
150 x 150	8113.	0120	0130	0140	1860	0150	0160	0170	0180	1870	0190	0200	1880	0210 1890
300 x 150	8113.	0330	0340	0350	1940	0360	0370	0380	0390	1950	0400	0410	1960	0420 1970
600 x 150	8113.	0750	0760	0770	2100	0780	0790	0800	0810	2110	0820	0830	2120	0840 2130

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Reference: Available Accessories

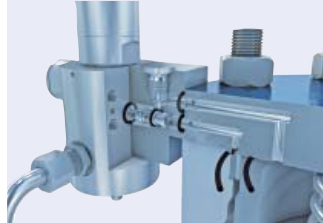
Specify one or more of the following option codes to order the required accessories for your LESER POSV.

Field test connection R26



Set pressure testing with external test medium

Backflow preventer (Standard)



Prevents return flow of the medium from the discharge into the system to be secured

Pilot supply filter R30



Filter to prevent plugging of the pilot

Manual blowdown R27 to atmosphere R24 into main valve outlet



Functional test of main valve piston

NACE sour gas application R70 MR0175/ISO 15156 MR0103

Remote Sensing R28



Actual operating pressure sensed to pilot.
No influence of inlet pressure losses, stable function of POSV

Soft sealing POSV complete O-ring disc, Piston guide, Seat, Tubing, Cover R05: EPDM R06: FFKM R04: FKM (Standard = *)

Main valve disc R71 metal sealing

Drain hole J19: G $\frac{1}{2}$ " R48: NPT $\frac{1}{2}$ "

Pilot lifting device R25

Pilot test gag R33

Blowdown adjusted to fixed value (for type 811 only) R44

Mechanical lifting of pilot for verification of POSV operation

Blocking of operation in case of required hydrostatic testing of vessel

Blowdown adjusted: Closing pressure difference as a fixed value between 2 – 15%. Standard adjustment between 3 – 7%

Dimensions and Weights – Series 810 and 820

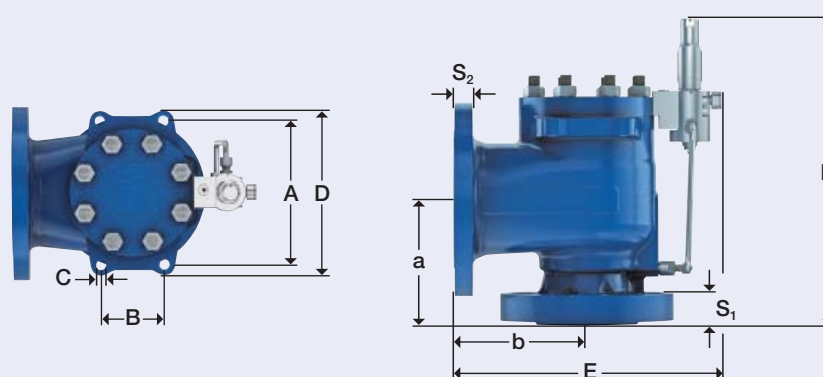
US Units				Orifice D – K+														
DN _{I+O}				25 x 50				40 x 50				40 x 80			50 x 80			
Valve size				1" x 2"				1½" x 2"				1½" x 3"			2" x 3"			
API Standard orifice acc. to API 526				D	E	F		D	E	F		G	H		G	H	J	
Extra Orifice							G				H			J				K+
d ₀ [inch]				0.433	0.579	0.724	0.906	0.433	0.579	0.724	1.142	0.929	1.157	1.406	0.929	1.157	1.496	1.890
A ₀ [inch²]				0.147	0.264	0.412	0.643	0.147	0.264	0.412	1.025	0.677	1.052	1.552	0.677	1.052	1.758	2.806
Flange class 150 x 150																		
a				4⅛	4⅛	4⅛	4⅛	4⅞	4⅞	4⅞	4⅞	5⅛	5⅛	5⅛	5⅜	5⅜	5⅜	5⅜
b				4½	4½	4½	4½	4¾	4¾	4¾	4¾	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞
H Series 810				13	13	13	13	14 ⁴ / ₃₂	14 ⁴ / ₃₂	14 ⁴ / ₃₂	14 ⁴ / ₃₂	14 ⁵ / ₈	14 ⁵ / ₈	14 ⁵ / ₈	15 ⁶ / ₃₂	15 ⁶ / ₃₂	15 ⁶ / ₃₂	15 ⁶ / ₃₂
H Series 820				18	18	18	18	19⅛	19⅛	19⅛	19⅛	19 ⁵ / ₈	19 ⁵ / ₈	19 ⁵ / ₈	20 ⁶ / ₃₂	20 ⁶ / ₃₂	20 ⁶ / ₃₂	20 ⁶ / ₃₂
S ₁				25 ²⁵ / ₃₂	25 ²⁵ / ₃₂	25 ²⁵ / ₃₂	25 ²⁵ / ₃₂	17 ¹⁷ / ₃₂	17 ¹⁷ / ₃₂	17 ¹⁷ / ₃₂	17 ¹⁷ / ₃₂	17 ¹⁷ / ₃₂	17 ¹⁷ / ₃₂	17 ¹⁷ / ₃₂	11 ¹³ / ₃₂	11 ¹³ / ₃₂	11 ¹³ / ₃₂	11 ¹³ / ₃₂
S ₂				30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂
A				5 ⁵ / ₈	5 ⁵ / ₈	5 ⁵ / ₈	5 ⁵ / ₈	6	6	6	6	6 ⁵ / ₁₆	6 ⁵ / ₁₆	6 ⁵ / ₁₆	7 ¹ / ₁₆	7 ¹ / ₁₆	7 ¹ / ₁₆	7 ¹ / ₁₆
B				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
C				9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆
D				7 ³ / ₁₆	7 ³ / ₁₆	7 ³ / ₁₆	7 ³ / ₁₆	7 ⁵ / ₁₆	7 ⁵ / ₁₆	7 ⁵ / ₁₆	7 ⁵ / ₁₆	7 ¹⁴ / ₁₆	7 ¹⁴ / ₁₆	7 ¹⁴ / ₁₆	8 ⁴ / ₁₆	8 ⁴ / ₁₆	8 ⁴ / ₁₆	8 ⁴ / ₁₆
E				11 5 ⁵ / ₃₂	11 5 ⁵ / ₃₂	11 5 ⁵ / ₃₂	11 5 ⁵ / ₃₂	11 21 ²¹ / ₃₂	11 21 ²¹ / ₃₂	11 21 ²¹ / ₃₂	11 21 ²¹ / ₃₂	11 ³¹ / ₃₂	11 ³¹ / ₃₂	11 ³¹ / ₃₂	12 1 ¹ / ₄	12 1 ¹ / ₄	12 1 ¹ / ₄	12 1 ¹ / ₄
m				49.6	49.6	49.6	49.6	59.5	59.5	59.5	59.5	68.3	68.3	68.3	81.6	81.6	81.6	81.6
Flange class 300 x 150																		
a				4 ³ / ₈	4 ³ / ₈	4 ³ / ₈	4 ³ / ₈	4⅞	4⅞	4⅞	4⅞	5⅛	5⅛	5⅛	5⅜	5⅜	5⅜	5⅜
b				4½	4½	4½	4½	4¾	4¾	4¾	4¾	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞
H Series 810				13 ⁷ / ₃₂	13 ⁷ / ₃₂	13 ⁷ / ₃₂	13 ⁷ / ₃₂	14 ⁴ / ₃₂	14 ⁴ / ₃₂	14 ⁴ / ₃₂	14 ⁴ / ₃₂	14 ⁵ / ₈	14 ⁵ / ₈	14 ⁵ / ₈	15 ⁶ / ₃₂	15 ⁶ / ₃₂	15 ⁶ / ₃₂	15 ⁶ / ₃₂
H Series 820				18 ² / ₈	18 ² / ₈	18 ² / ₈	18 ² / ₈	19⅛	19⅛	19⅛	19⅛	19 ⁵ / ₈	19 ⁵ / ₈	19 ⁵ / ₈	20 ⁶ / ₃₂	20 ⁶ / ₃₂	20 ⁶ / ₃₂	20 ⁶ / ₃₂
S ₁				1 ¹ / ₃₂	1 ¹ / ₃₂	1 ¹ / ₃₂	1 ¹ / ₃₂	17 ¹⁷ / ₃₂	17 ¹⁷ / ₃₂	17 ¹⁷ / ₃₂	17 ¹⁷ / ₃₂	17 ¹⁷ / ₃₂	17 ¹⁷ / ₃₂	17 ¹⁷ / ₃₂	11 ¹³ / ₃₂	11 ¹³ / ₃₂	11 ¹³ / ₃₂	11 ¹³ / ₃₂
S ₂				30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂
A				5 ⁵ / ₈	5 ⁵ / ₈	5 ⁵ / ₈	5 ⁵ / ₈	6	6	6	6	6 ⁵ / ₁₆	6 ⁵ / ₁₆	6 ⁵ / ₁₆	7 ¹ / ₁₆	7 ¹ / ₁₆	7 ¹ / ₁₆	7 ¹ / ₁₆
B				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
C				9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆
D				7 ³ / ₁₆	7 ³ / ₁₆	7 ³ / ₁₆	7 ³ / ₁₆	7 ⁵ / ₁₆	7 ⁵ / ₁₆	7 ⁵ / ₁₆	7 ⁵ / ₁₆	7 ¹⁴ / ₁₆	7 ¹⁴ / ₁₆	7 ¹⁴ / ₁₆	8 ⁴ / ₁₆	8 ⁴ / ₁₆	8 ⁴ / ₁₆	8 ⁴ / ₁₆
E				11 5 ⁵ / ₃₂	11 5 ⁵ / ₃₂	11 5 ⁵ / ₃₂	11 5 ⁵ / ₃₂	11 21 ²¹ / ₃₂	11 21 ²¹ / ₃₂	11 21 ²¹ / ₃₂	11 21 ²¹ / ₃₂	11 ³¹ / ₃₂	11 ³¹ / ₃₂	11 ³¹ / ₃₂	12 1 ¹ / ₄	12 1 ¹ / ₄	12 1 ¹ / ₄	12 1 ¹ / ₄
m				49.6	49.6	49.6	49.6	59.5	59.5	59.5	59.5	68.3	68.3	68.3	81.6	81.6	81.6	81.6
Flange class 600 x 150																		
a				4 ³ / ₈	4 ³ / ₈	4 ³ / ₈	4 ³ / ₈	4⅞	4⅞	4⅞	4⅞	5⅛	5⅛	5⅛	5⅜	5⅜	5⅜	5⅜
b				4½	4½	4½	4½	4¾	4¾	4¾	4¾	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞	4⅞
H Series 810				13 ⁷ / ₃₂	13 ⁷ / ₃₂	13 ⁷ / ₃₂	13 ⁷ / ₃₂	14 ⁴ / ₃₂	14 ⁴ / ₃₂	14 ⁴ / ₃₂	14 ⁴ / ₃₂	14 ⁵ / ₈	14 ⁵ / ₈	14 ⁵ / ₈	15 ⁶ / ₃₂	15 ⁶ / ₃₂	15 ⁶ / ₃₂	15 ⁶ / ₃₂
H Series 820				18 ² / ₈	18 ² / ₈	18 ² / ₈	18 ² / ₈	19⅛	19⅛	19⅛	19⅛	19 ⁵ / ₈	19 ⁵ / ₈	19 ⁵ / ₈	20 ⁶ / ₃₂	20 ⁶ / ₃₂	20 ⁶ / ₃₂	20 ⁶ / ₃₂
S ₁				1 ¹ / ₃₂	1 ¹ / ₃₂	1 ¹ / ₃₂	1 ¹ / ₃₂	17 ¹⁷ / ₃₂	17 ¹⁷ / ₃₂	17 ¹⁷ / ₃₂	17 ¹⁷ / ₃₂	17 ¹⁷ / ₃₂	17 ¹⁷ / ₃₂	17 ¹⁷ / ₃₂	11 ¹³ / ₃₂	11 ¹³ / ₃₂	11 ¹³ / ₃₂	11 ¹³ / ₃₂
S ₂				30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	30 ³⁰ / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂	1 ⁵ / ₃₂
A				5 ⁵ / ₈	5 ⁵ / ₈	5 ⁵ / ₈	5 ⁵ / ₈	6	6	6	6	6 ⁵ / ₁₆	6 ⁵ / ₁₆	6 ⁵ / ₁₆	7 ¹ / ₁₆	7 ¹ / ₁₆	7 ¹ / ₁₆	7 ¹ / ₁₆
B				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
C				9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆	9 ⁹ / ₁₆
D				7 ³ / ₁₆	7 ³ / ₁₆	7 ³ / ₁₆	7 ³ / ₁₆	7 ⁵ / ₁₆	7 ⁵ / ₁₆	7 ⁵ / ₁₆	7 ⁵ / ₁₆	7 ¹⁴ / ₁₆	7 ¹⁴ / ₁₆	7 ¹⁴ / ₁₆	8 ⁴ / ₁₆	8 ⁴ / ₁₆	8 ⁴ / ₁₆	8 ⁴ / ₁₆
E				11 5 ⁵ / ₃₂	11 5 ⁵ / ₃₂	11 5 ⁵ / ₃₂	11 5 ⁵ / ₃₂	11 21 ²¹ / ₃₂	11 21 ²¹ / ₃₂	11 21 ²¹ / ₃₂	11 21 ²¹ / ₃₂	11 ³¹ / ₃₂	11 ³¹ / ₃₂	11 ³¹ / ₃₂	12 1 ¹ / ₄	12 1 ¹ / ₄	12 1 ¹ / ₄	12 1 ¹ / ₄
m				49.6	49.6	49.6	49.6	59.5	59.5	59.5	59.5	68.3	68.3	68.3	81.6	81.6	81.6	81.6

d₀ = Actual discharge diameter [inch]
 A₀ = Actual discharge area [inch²]
 a = Center to face [inch]
 b = Center to face [inch]
 H = Heights [inch]
 S₁ = Inlet flange thickness [inch]
 S₂ = Outlet flange thickness [inch]

A = Bracket [inch]
 B = Bracket [inch]
 C = Hole diameter [inch]
 D = Total width [inch]
 E = Total length [inch]
 m = Weight [lb]

Dimensions and Weights – Series 810 and 820

US Units		Orifice J – T+													
DN I+O	80 x 100				100 x 150						150 x 200			200 x 250	
Valve size	3" x 4"				4" x 6"						6" x 8"			8" x 10"	
API Standard orifice acc. to API 526	J	K	L		L	M	N	P		Q	R		T		
Extra Orifice				N+					P+			R+		T+	
d ₀ [inch ²]	1.496	1.772	2.205	2.953	2.205	2.480	2.717	3.268	3.740	4.331	5.236	5.591	6.614	7.087	
A ₀ [inch ²]	1.758	2.465	3.818	6.848	3.818	4.832	5.796	8.386	10.987	14.730	21.534	24.547	34.359	39.443	
Flange class 150 x 150															
a	6 ¹ / ₈	6 ¹ / ₈	6 ¹ / ₈	6 ¹ / ₈	7 ³ / ₄	7 ³ / ₄	7 ³ / ₄	7 ³ / ₄	7 ³ / ₄	9 ⁷ / ₁₆	9 ⁷ / ₁₆	9 ⁷ / ₁₆	10 ⁷ / ₈	10 ⁷ / ₈	
b	6 ³ / ₈	6 ³ / ₈	6 ³ / ₈	6 ³ / ₈	8 ¹ / ₄	8 ¹ / ₄	8 ¹ / ₄	8 ¹ / ₄	8 ¹ / ₄	9 ¹ / ₂	9 ¹ / ₂	9 ¹ / ₂	11	11	
H Series 810	16 ²⁷ / ₃₂	16 ²⁷ / ₃₂	16 ²⁷ / ₃₂	16 ²⁷ / ₃₂	18 ¹⁵ / ₁₆	18 ¹⁵ / ₁₆	18 ¹⁵ / ₁₆	18 ¹⁵ / ₁₆	18 ¹⁵ / ₁₆	22 ²⁷ / ₃₂	22 ²⁷ / ₃₂	22 ²⁷ / ₃₂	26 ² / ₈	26 ² / ₈	
H Series 820	21 ¹⁴ / ₁₆	21 ¹⁴ / ₁₆	21 ¹⁴ / ₁₆	21 ¹⁴ / ₁₆	23 ¹⁵ / ₁₆	23 ¹⁵ / ₁₆	23 ¹⁵ / ₁₆	23 ¹⁵ / ₁₆	23 ¹⁵ / ₁₆	27 ¹³ / ₁₆	27 ¹³ / ₁₆	27 ¹³ / ₁₆	31 ⁵ / ₁₆	31 ⁵ / ₁₆	
S ₁	1 ⁷ / ₁₆	1 ⁷ / ₁₆	1 ⁷ / ₁₆	1 ⁷ / ₁₆	1 ¹⁵ / ₁₆	1 ¹⁵ / ₁₆	1 ¹⁵ / ₁₆	1 ¹⁵ / ₁₆	1 ¹⁵ / ₁₆	2 ² / ₃₂	2 ² / ₃₂	2 ² / ₃₂	1 ¹² / ₁₆	1 ¹² / ₁₆	
S ₂	1 ² / ₁₆	1 ² / ₁₆	1 ² / ₁₆	1 ² / ₁₆	1 ³ / ₁₆	1 ³ / ₁₆	1 ³ / ₁₆	1 ³ / ₁₆	1 ³ / ₁₆	1 ²⁷ / ₃₂	1 ²⁷ / ₃₂	1 ²⁷ / ₃₂	1 ⁶ / ₁₆	1 ⁶ / ₁₆	
A	8 ²⁵ / ₃₂	8 ²⁵ / ₃₂	8 ²⁵ / ₃₂	8 ²⁵ / ₃₂	9 ¹³ / ₁₆	9 ¹³ / ₁₆	9 ¹³ / ₁₆	9 ¹³ / ₁₆	9 ¹³ / ₁₆	12 ¹⁹ / ₃₂	12 ¹⁹ / ₃₂	12 ¹⁹ / ₃₂	14 ¹ / ₃₂	14 ¹ / ₃₂	
B	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	6 ⁵ / ₁₆	6 ⁵ / ₁₆	6 ⁵ / ₁₆	6 ⁵ / ₁₆	6 ⁵ / ₁₆	
C	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	
D	10 ⁶ / ₃₂	10 ⁶ / ₃₂	10 ⁶ / ₃₂	10 ⁶ / ₃₂	12	12	12	12	12	15	15	15	16 ³⁰ / ₃₂	16 ³⁰ / ₃₂	
E	14 9 ⁹ / ₁₆	14 9 ⁹ / ₁₆	14 9 ⁹ / ₁₆	14 9 ⁹ / ₁₆	17	17	17	17	17	20 25 ²⁵ / ₃₂	20 25 ²⁵ / ₃₂	20 25 ²⁵ / ₃₂	22 3 ³ / ₃₂	22 9 ⁹ / ₃₂	
m	130.1	130.1	130.1	130.1	196.2	196.2	196.2	196.2	196.2	429.9	429.9	429.9	579.8	579.8	
Flange class 300 x 150															
a	6 ¹ / ₈	6 ¹ / ₈	6 ¹ / ₈	6 ¹ / ₈	7 ³ / ₄	7 ³ / ₄	7 ³ / ₄	7 ³ / ₄	7 ³ / ₄	9 ⁷ / ₁₆	9 ⁷ / ₁₆	9 ⁷ / ₁₆	10 ⁷ / ₈	10 ⁷ / ₈	
b	6 ³ / ₈	6 ³ / ₈	6 ³ / ₈	6 ³ / ₈	8 ¹ / ₄	8 ¹ / ₄	8 ¹ / ₄	8 ¹ / ₄	8 ¹ / ₄	9 ¹ / ₂	9 ¹ / ₂	9 ¹ / ₂	11	11	
H Series 810	16 ²⁷ / ₃₂	16 ²⁷ / ₃₂	16 ²⁷ / ₃₂	16 ²⁷ / ₃₂	18 ¹⁵ / ₁₆	18 ¹⁵ / ₁₆	18 ¹⁵ / ₁₆	18 ¹⁵ / ₁₆	18 ¹⁵ / ₁₆	22 ²⁷ / ₃₂	22 ²⁷ / ₃₂	22 ²⁷ / ₃₂	26 ² / ₈	26 ² / ₈	
H Series 820	21 ¹⁴ / ₁₆	21 ¹⁴ / ₁₆	21 ¹⁴ / ₁₆	21 ¹⁴ / ₁₆	23 ¹⁵ / ₁₆	23 ¹⁵ / ₁₆	23 ¹⁵ / ₁₆	23 ¹⁵ / ₁₆	23 ¹⁵ / ₁₆	27 ¹³ / ₁₆	27 ¹³ / ₁₆	27 ¹³ / ₁₆	31 ¹⁴ / ₁₆	31 ¹⁴ / ₁₆	
S ₁	1 ⁷ / ₁₆	1 ⁷ / ₁₆	1 ⁷ / ₁₆	1 ⁷ / ₁₆	1 ¹⁵ / ₁₆	1 ¹⁵ / ₁₆	1 ¹⁵ / ₁₆	1 ¹⁵ / ₁₆	1 ¹⁵ / ₁₆	2 ² / ₃₂	2 ² / ₃₂	2 ² / ₃₂	1 ¹² / ₁₆	1 ¹² / ₁₆	
S ₂	1 ² / ₁₆	1 ² / ₁₆	1 ² / ₁₆	1 ² / ₁₆	1 ³ / ₁₆	1 ³ / ₁₆	1 ³ / ₁₆	1 ³ / ₁₆	1 ³ / ₁₆	1 ²⁷ / ₃₂	1 ²⁷ / ₃₂	1 ²⁷ / ₃₂	1 ⁶ / ₁₆	1 ⁶ / ₁₆	
A	8 ²⁵ / ₃₂	8 ²⁵ / ₃₂	8 ²⁵ / ₃₂	8 ²⁵ / ₃₂	9 ¹³ / ₁₆	9 ¹³ / ₁₆	9 ¹³ / ₁₆	9 ¹³ / ₁₆	9 ¹³ / ₁₆	12 ¹⁹ / ₃₂	12 ¹⁹ / ₃₂	12 ¹⁹ / ₃₂	14 ¹ / ₃₂	14 ¹ / ₃₂	
B	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	6 ⁵ / ₁₆	6 ⁵ / ₁₆	6 ⁵ / ₁₆	6 ⁵ / ₁₆	6 ⁵ / ₁₆	
C	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	
D	10 ⁶ / ₃₂	10 ⁶ / ₃₂	10 ⁶ / ₃₂	10 ⁶ / ₃₂	12	12	12	12	12	15	15	15	16 ³⁰ / ₃₂	16 ³⁰ / ₃₂	
E	14 9 ⁹ / ₁₆	14 9 ⁹ / ₁₆	14 9 ⁹ / ₁₆	14 9 ⁹ / ₁₆	17	17	17	17	17	20 25 ²⁵ / ₃₂	20 25 ²⁵ / ₃₂	20 25 ²⁵ / ₃₂	22 3 ³ / ₃₂	22 9 ⁹ / ₃₂	
m	130.1	130.1	130.1	130.1	196.2	196.2	196.2	196.2	196.2	429.9	429.9	429.9	579.8	579.8	
Flange class 600 x 150															
a	6 ³ / ₈	6 ³ / ₈	6 ³ / ₈	6 ³ / ₈	7 ³ / ₄	7 ³ / ₄	7 ³ / ₄	7 ³ / ₄	7 ³ / ₄	9 ¹¹ / ₁₆	9 ¹¹ / ₁₆	9 ¹¹ / ₁₆	11 ¹¹ / ₁₆	11 ¹¹ / ₁₆	
b	6 ³ / ₈	6 ³ / ₈	6 ³ / ₈	6 ³ / ₈	8 ¹ / ₄	8 ¹ / ₄	8 ¹ / ₄	8 ¹ / ₄	8 ¹ / ₄	9 ¹ / ₂	9 ¹ / ₂	9 ¹ / ₂	11	11	
H Series 810	17 ³ / ₃₂	17 ³ / ₃₂	17 ³ / ₃₂	17 ³ / ₃₂	18 ¹⁵ / ₁₆	18 ¹⁵ / ₁₆	18 ¹⁵ / ₁₆	18 ¹⁵ / ₁₆	18 ¹⁵ / ₁₆	23 ² / ₃₂	23 ² / ₃₂	23 ² / ₃₂	27 ¹ / ₈	27 ¹ / ₈	
H Series 820	22 ¹ / ₁₆	22 ¹ / ₁₆	22 ¹ / ₁₆	22 ¹ / ₁₆	23 ¹⁵ / ₁₆	23 ¹⁵ / ₁₆	23 ¹⁵ / ₁₆	23 ¹⁵ / ₁₆	23 ¹⁵ / ₁₆	28 ¹ / ₁₆	28 ¹ / ₁₆	28 ¹ / ₁₆	32 ² / ₁₆	32 ² / ₁₆	
S ₁	1 ¹⁰ / ₁₆	1 ¹⁰ / ₁₆	1 ¹⁰ / ₁₆	1 ¹⁰ / ₁₆	1 ¹⁵ / ₁₆	1 ¹⁵ / ₁₆	1 ¹⁵ / ₁₆	1 ¹⁵ / ₁₆	1 ¹⁵ / ₁₆	2 ⁹ / ₃₂	2 ⁹ / ₃₂	2 ⁹ / ₃₂	2 ¹⁰ / ₁₆	2 ¹⁰ / ₁₆	
S ₂	1 ² / ₁₆	1 ² / ₁₆	1 ² / ₁₆	1 ² / ₁₆	1 ³ / ₁₆	1 ³ / ₁₆	1 ³ / ₁₆	1 ³ / ₁₆	1 ³ / ₁₆	1 ²⁷ / ₃₂	1 ²⁷ / ₃₂	1 ²⁷ / ₃₂	1 ⁶ / ₁₆	1 ⁶ / ₁₆	
A	8 ²⁵ / ₃₂	8 ²⁵ / ₃₂	8 ²⁵ / ₃₂	8 ²⁵ / ₃₂	9 ¹³ / ₁₆	9 ¹³ / ₁₆	9 ¹³ / ₁₆	9 ¹³ / ₁₆	9 ¹³ / ₁₆	12 ¹⁹ / ₃₂	12 ¹⁹ / ₃₂	12 ¹⁹ / ₃₂	14 ¹ / ₃₂	14 ¹ / ₃₂	
B	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	4 ¹¹ / ₃₂	6 ⁵ / ₁₆	6 ⁵ / ₁₆	6 ⁵ / ₁₆	6 ⁵ / ₁₆	6 ⁵ / ₁₆	
C	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	2 ²³ / ₃₂	
D	10 ⁶ / ₃₂	10 ⁶ / ₃₂	10 ⁶ / ₃₂	10 ⁶ / ₃₂	12	12	12	12	12	15	15	15	16 ³⁰ / ₃₂	16 ³⁰ / ₃₂	
E	14 9 ⁹ / ₁₆	14 9 ⁹ / ₁₆	14 9 ⁹ / ₁₆	14 9 ⁹ / ₁₆	17	17	17	17	17	20 25 ²⁵ / ₃₂	20 25 ²⁵ / ₃₂	20 25 ²⁵ / ₃₂	22 3 ³ / ₃₂	22 9 ⁹ / ₃₂	
m	130.1	130.1	130.1	130.1	196.2	196.2	196.2	196.2	196.2	429.9	429.9	429.9	579.8	579.8	



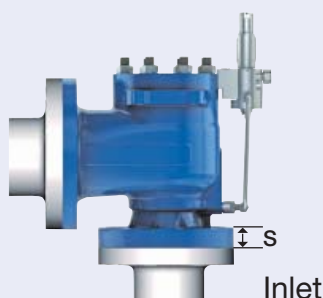
Screw Dimensions acc. to ASME B16.5

The flange thickness of the inlet and outlet flanges of the Pilot Operated Safety Valve (POSV) may differ from the standard. Therefore stud-bolts for the flange connections may also be longer than stated in ASME B16.5. To simplify the calculation of the correct bolt length, the

quantity and sizes of the stud-bolts and nuts for the inlet and outlet flange connections are given below. The listed screw dimensions are rounded to standard dimensions. The connection flanges are based on the ASME B16.5 standard.

US Units				Orifice D – K+															
DN I+O				25 x 50				40 x 50				40 x 80			50 x 80				
Size				1" x 2"				1½" x 2"				1½" x 3"			2" x 3"				
API Standard orifice acc. to API 526				D	E	F		D	E	F		G	H		G	H	J		
Extra Orifice							G				H			J				K+	
d ₀ [inch]				0.433	0.579	0.724	0.906	0.433	0.579	0.724	1.142	0.929	1.157	1.406	0.929	1.157	1.496	1.890	
A ₀ [inch²]				0.147	0.264	0.412	0.643	0.147	0.264	0.412	1.025	0.677	1.052	1.552	0.677	1.052	1.758	2.806	
Flange class 150 x 150																			
Inlet	Qty	Stud bolts		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
		Nuts		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
	Bolt dim	Stud bolt diameter nut size [inch]			½	½	½	½	½	½	½	½	½	½	½	½	⅝	⅝	
		Raised face flange type [inch]			¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	4	4	4	4
Ring type joint flange [inch]			¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	4¼	4¼	4¼	4¼		
Outlet	Qty	Stud bolts		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
		Nuts		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
	Bolt dim	Bolt size [inch]			⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝
		Raised face flange type [inch]			¾	¾	¾	¾	¾	¾	¾	¾	4	4	4	4	4	4	4
Ring type joint flange [inch]			4	4	4	4	4	4	4	4	4¼	4¼	4¼	4¼	4¼	4¼	4¼		
Flange class 300 x 150																			
Inlet	Qty	Stud bolts		4	4	4	4	4	4	4	4	4	4	4	8	8	8	8	
		Nuts		8	8	8	8	8	8	8	8	8	8	8	16	16	16	16	
	Bolt dim	Bolt size [inch]			⅝	⅝	⅝	⅝	¾	¾	¾	¾	¾	¾	¾	⅝	⅝	⅝	⅝
		Raised face flange type [inch]			¾	¾	¾	¾	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼	4¼
Ring joint flange [inch]			¾	¾	¾	¾	4½	4½	4½	4½	4½	4½	4½	4¼	4¼	4¼	4¼		
Outlet	Qty	Stud bolts		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
		Nuts		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
	Bolt dim	Bolt size [inch]			⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝
		Raised face flange type [inch]			¾	¾	¾	¾	¾	¾	¾	¾	4	4	4	4	4	4	4
Ring type joint flange [inch]			4	4	4	4	4	4	4	4	4¼	4¼	4¼	4¼	4¼	4¼	4¼		
Flange class 600 x 150																			
Inlet	Qty	Stud bolts		4	4	4	4	4	4	4	4	4	4	4	8	8	8	8	
		Nuts		8	8	8	8	8	8	8	8	8	8	8	16	16	16	16	
	Bolt dim	Bolt size [inch]			⅝	⅝	⅝	⅝	¾	¾	¾	¾	¾	¾	¾	⅝	⅝	⅝	⅝
		Raised face flange type [inch]			4	4	4	4	¾	¾	¾	¾	¾	¾	¾	4½	4½	4½	4½
Ring type joint flange [inch]			4	4	4	4	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾		
Outlet	Qty	Stud bolts		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
		Nuts		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
	Bolt dim	Bolt size [inch]			⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝
		Raised face flange type [inch]			¾	¾	¾	¾	¾	¾	¾	¾	4	4	4	4	4	4	4
Ring type joint flange [inch]			4	4	4	4	4	4	4	4	4¼	4¼	4¼	4¼	4¼	4¼	4¼		

Outlet



Inlet

Screw Dimensions acc. to ASME B16.5

US Units				Orifice J – T+															
DN _{ISO}				80 x 100				100 x 150				150 x 200			200 x 250				
Size				3" x 4"				4" x 6"				6" x 8"			8" x 10"				
API Standard orifice acc. to API 526				J	K	L		L	M	N	P		Q	R		T			
Extra Orifice							N+					P+			R+		T+		
d ₀ [inch]				1.496	1.772	2.205	2.953	2.205	2.480	2.717	3.268	3.740	4.331	5.236	5.591	6.614	7.087		
A ₀ [inch²]				1.758	2.465	3.818	6.848	3.818	4.832	5.796	8.386	10.987	14.730	21.534	24.547	34.359	39.443		
Flange class 150 x 150																			
Inlet	Qty	Stud bolts		4	4	4	4	8	8	8	8	8	8	8	8	8	8		
		Nuts		8	8	8	8	16	16	16	16	16	16	16	16	16	16		
	Bolt dim	Stud bolt diameter nut size [inch]			5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	3/4	3/4	3/4	3/4	3/4	
		Raised face flange type [inch]			4 1/2	4 1/2	4 1/2	4 1/2	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	5 1/2	5 1/2	5 1/2	6	6	
		Ring type joint flange [inch]			4 3/4	4 3/4	4 3/4	4 3/4	5	5	5	5	5	5 3/4	5 3/4	5 3/4	6 1/4	6 1/4	
Outlet	Qty	Stud bolts		8	8	8	8	8	8	8	8	8	8	8	8	12	12		
		Nuts		16	16	16	16	16	16	16	16	16	16	16	16	16	24	24	
	Bolt dim	Bolt size [inch]			5/8	5/8	5/8	5/8	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	7/8	7/8	
		Raised face flange type [inch]			4	4	4	4	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	5 1/4	5 1/4	5 1/4	5 1/4	5 1/4
		Ring type joint flange [inch]			4 1/4	4 1/4	4 1/4	4 1/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2
Flange class 300 x 150																			
Inlet	Qty	Stud bolts		8	8	8	8	8	8	8	8	8	12	12	12	12	12		
		Nuts		16	16	16	16	16	16	16	16	16	16	24	24	24	24	24	
	Bolt dim	Bolt size [inch]			3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	7/8	7/8	
		Raised face flange type [inch]			5	5	5	5	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2	6	6	6	7	7	
		Ring type joint flange [inch]			5 1/2	5 1/2	5 1/2	5 1/2	5 3/4	5 3/4	5 3/4	5 3/4	5 3/4	6 1/4	6 1/4	6 1/4	7 1/4	7 1/4	
Outlet	Qty	Stud bolts		8	8	8	8	8	8	8	8	8	8	8	8	12	12		
		Nuts		16	16	16	16	16	16	16	16	16	16	16	16	16	24	24	
	Bolt dim	Bolt size [inch]			5/8	5/8	5/8	5/8	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	7/8	7/8	
		Raised face flange type [inch]			4	4	4	4	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	5 1/4	5 1/4	5 1/4	5 1/4	5 1/4
		Ring type joint flange [inch]			4 1/4	4 1/4	4 1/4	4 1/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2
Flange class 600 x 150																			
Inlet	Qty	Stud bolts		8	8	8	8	8	8	8	8	8	8	8	8	12	12		
		Nuts		16	16	16	16	16	16	16	16	16	16	24	24	24	24	24	
	Bolt dim	Bolt size [inch]			3/4	3/4	3/4	3/4	7/8	7/8	7/8	7/8	7/8	7/8	1	1	1	1 1/8	1 1/8
		Raised face flange type [inch]			5 1/2	5 1/2	5 1/2	5 1/2	6 1/4	6 1/4	6 1/4	6 1/4	6 1/4	6 1/4	7 1/2	7 1/2	7 1/2	8 1/2	8 1/2
		Ring type joint flange [inch]			5 1/2	5 1/2	5 1/2	5 1/2	6 1/2	6 1/2	6 1/2	6 1/2	6 1/2	6 1/2	7 1/2	7 1/2	7 1/2	8 1/2	8 1/2
Outlet	Qty	Stud bolts		8	8	8	8	8	8	8	8	8	8	8	8	12	12		
		Nuts		16	16	16	16	16	16	16	16	16	16	16	16	16	24	24	
	Bolt dim	Bolt size [inch]			5/8	5/8	5/8	5/8	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	7/8	7/8	
		Raised face flange type [inch]			4	4	4	4	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	5 1/4	5 1/4	5 1/4	5 1/4	5 1/4
		Ring type joint flange [inch]			4 1/4	4 1/4	4 1/4	4 1/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	4 3/4	5 1/2	5 1/2	5 1/2	5 1/2	5 1/2