

High Efficiency

Pilot Operated Safety Valves

Series 810 – Pop Action
Metric Units



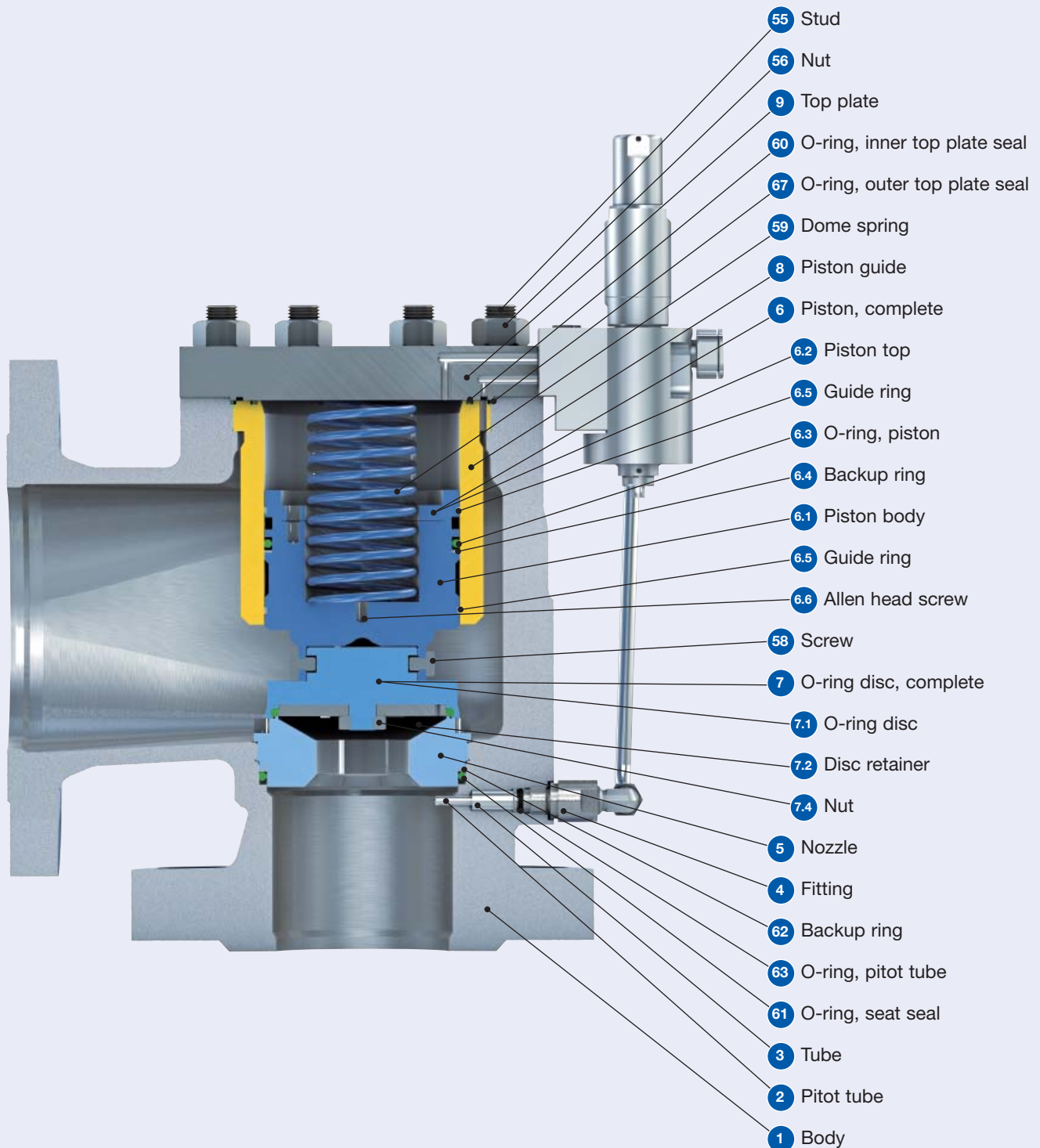
Facts

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⁾	* R05 R06	Viton® (FKM – Fluorocarbon) Buna-EP® (EPDM – Ethylene-Propylene-Dine) 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.

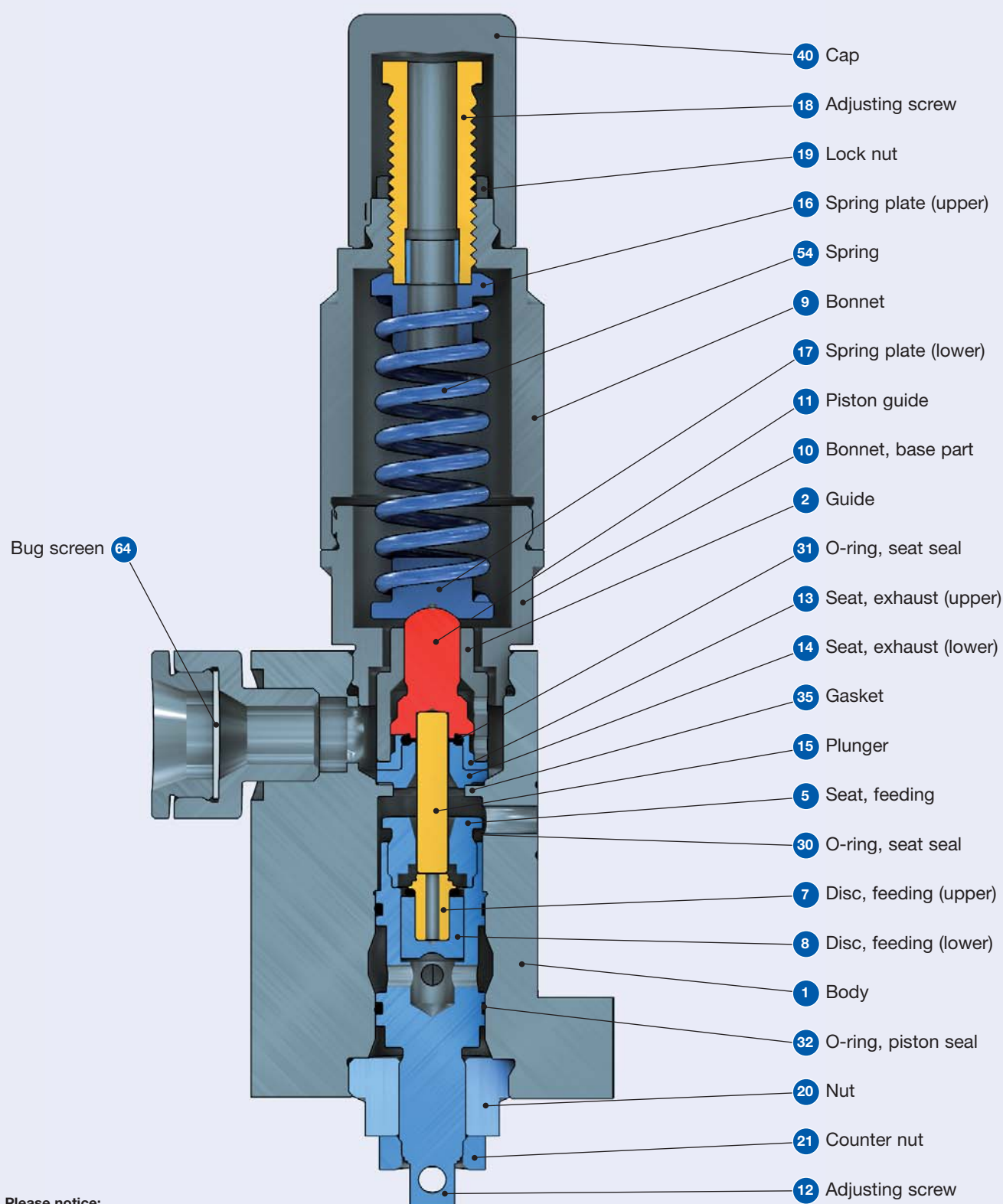
¹⁾ For further soft seal materials refer to page 02/15

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.



Please notice:

- Modifications reserved by LESER.
- 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

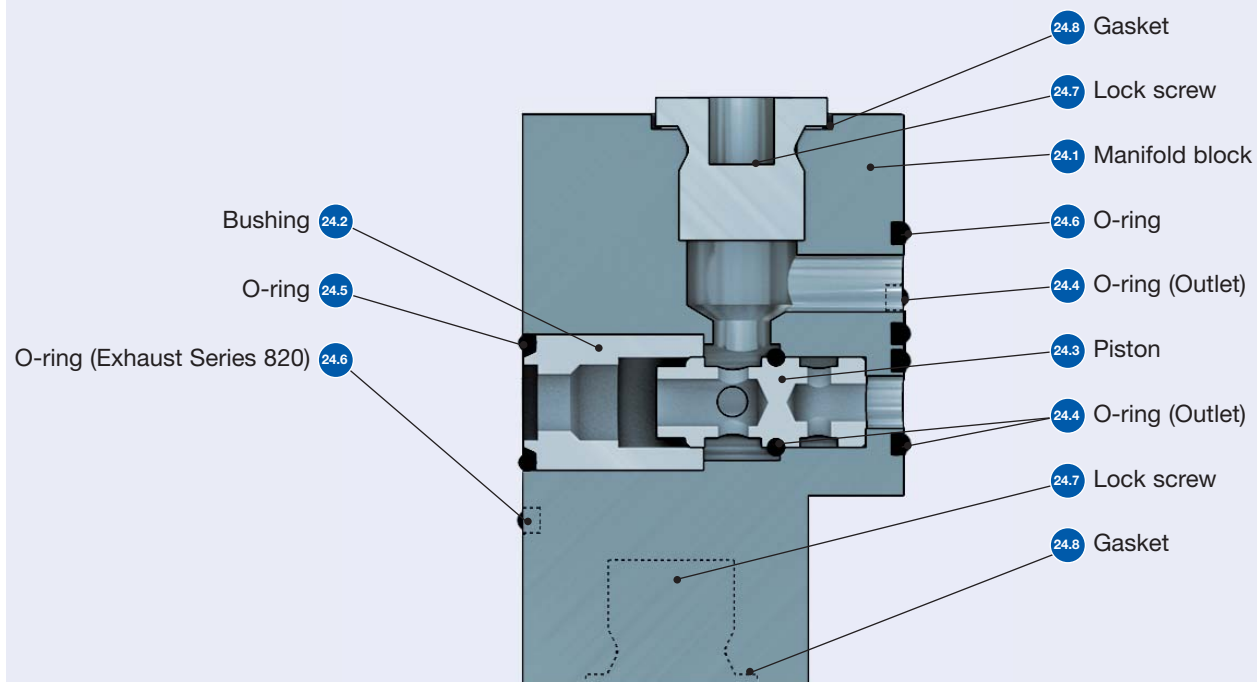
Materials				
Item	Component		Standard	NACE
1	Body		1.4404	1.4404
			SA 479 316L	SA 479 316L
2	Guide		1.4404	1.4404
			316L	316L
5	Seat, feeding		1.4404	1.4404
			316L	316L
7	Disc, feeding (upper)		1.4404	1.4404
			316L	316L
8	Disc, feeding (lower)		1.4404	1.4404
			316L	316L
9	Bonnet		1.4404	1.4404
			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	2.4669
			Stainless steel	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

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

Please notice:

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

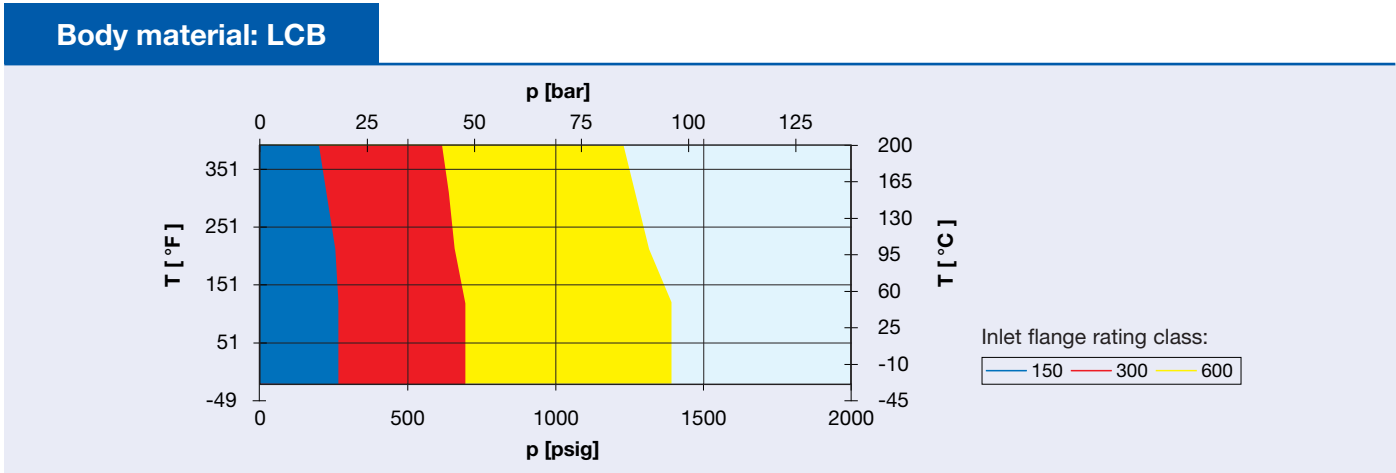
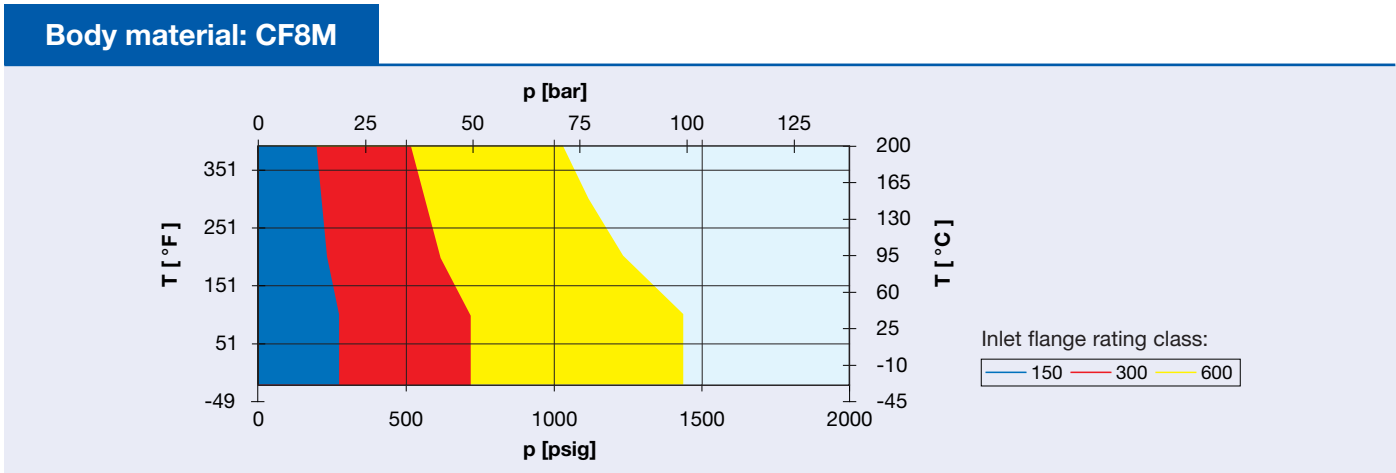
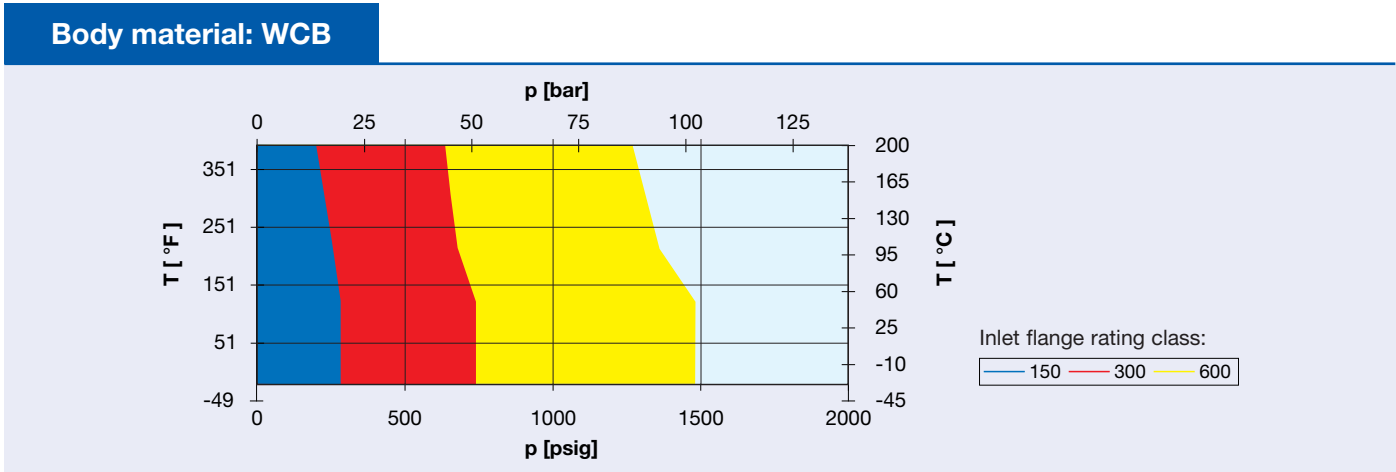
¹⁾ For further soft seal materials refer to page 02/15

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.



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

4

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

7

Reference: Available Accessories

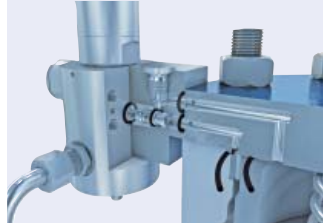
Specify one or more of the following option codes to order the required accessories for your LESER POSV.

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

Mechanical lifting of pilot for verification of POSV operation

Pilot test gag R33

Blocking of operation in case of required hydrostatic testing of vessel

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

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

Dimensions and Weights – Series 810 and 820

Metric 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 [mm]		11	14.7	18.4	23	11	14.7	18.4	29	23.6	29.4	35.7	23.6	29.4	38	48	
A ₀ [mm²]		95.0	169.7	265.9	415.5	95.0	169.7	265.9	660.5	437.4	678.9	1001	437.4	678.9	1134.1	1809.6	
Flange class 150 x 150																	
a		105	105	105	105	124	124	124	124	130	130	130	137	137	137	137	
b		114	114	114	114	121	121	121	121	124	124	124	124	124	124	124	
H Series 810		330	330	330	330	359	359	359	359	370	370	370	386	386	386	386	
H Series 820		456	456	456	456	485	485	485	485	496	496	496	512	512	512	512	
S ₁		20	20	20	20	31	31	31	31	31	31	31	36	36	36	36	
S ₂		24	24	24	24	24	24	24	24	29	29	29	29	29	29	29	
A		143	143	143	143	152	152	152	152	160	160	160	179	179	179	179	
B		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
C		14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	
D		182	182	182	182	186	186	186	186	200	200	200	209	209	209	209	
E		283	283	283	283	296	296	296	296	304	304	304	311	311	311	311	
m		22,5	22,5	22,5	22,5	27	27	27	27	31	31	31	37	37	37	37	
Flange class 300 x 150																	
a		111	111	111	111	124	124	124	124	130	130	130	137	137	137	137	
b		114	114	114	114	121	121	121	121	124	124	124	124	124	124	124	
H Series 810		336	336	336	336	359	359	359	359	370	370	370	386	386	386	386	
H Series 820		462	462	462	462	485	485	485	485	496	496	496	512	512	512	512	
S ₁		26	26	26	26	31	31	31	31	31	31	31	36	36	36	36	
S ₂		24	24	24	24	24	24	24	24	29	29	29	29	29	29	29	
A		143	143	143	143	152	152	152	152	160	160	160	179	179	179	179	
B		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
C		14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	
D		182	182	182	182	186	186	186	186	200	200	200	209	209	209	209	
E		283	283	283	283	296	296	296	296	304	304	304	311	311	311	311	
m		19,5	19,5	19,5	19,5	24	24	24	24	28	28	28	34	34	34	34	
Flange class 600 x 150																	
a		111	111	111	111	124	124	124	124	130	130	130	137	137	137	137	
b		114	114	114	114	121	121	121	121	124	124	124	124	124	124	124	
H Series 810		336	336	336	336	359	359	359	359	370	370	370	386	386	386	386	
H Series 820		462	462	462	462	485	485	485	485	496	496	496	512	512	512	512	
S ₁		26	26	26	26	31	31	31	31	31	31	31	36	36	36	36	
S ₂		24	24	24	24	24	24	24	24	29	29	29	29	29	29	29	
A		143	143	143	143	152	152	152	152	160	160	160	179	179	179	179	
B		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
C		14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	
D		182	182	182	182	186	186	186	186	200	200	200	209	209	209	209	
E		283	283	283	283	296	296	296	296	304	304	304	311	311	311	311	
m		22,5	22,5	22,5	22,5	27	27	27	27	31	31	31	37	37	37	37	

d₀ = Actual discharge diameter [mm]
 A₀ = Actual discharge area [mm²]
 a = Center to face [mm]
 b = Center to face [mm]
 H = Heights [mm]
 S₁ = Inlet flange thickness [mm]
 S₂ = Outlet flange thickness [mm]

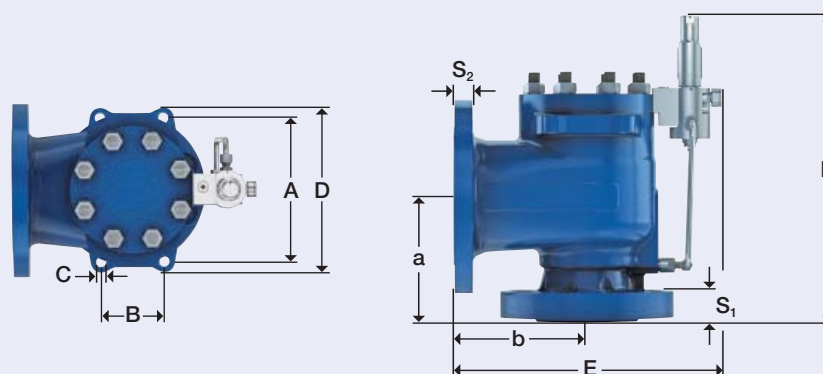
A = Bracket [mm]
 B = Bracket [mm]
 C = Hole diameter [mm]
 D = Total width [mm]
 E = Total length [mm]
 m = Weight [kg]

Dimensions and Weights – Series 810 and 820

Metric 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 [mm]	38	45	56	75	56	63	69	83	95	110	133	142	168	180
A ₀ [mm ²]	1134.1	1590.4	2463.0	4417.9	2463.0	3117.3	3739.3	5410.6	7088.2	9503.3	13892.9	15836.8	22167.0	25446.9
Flange class 150 x 150														
a	156	156	156	156	197	197	197	197	197	240	240	240	276	276
b	162	162	162	162	210	210	210	210	210	241	241	241	279	279
H Series 810	428	428	428	428	481	481	481	481	481	580	580	580	683	683
H Series 820	554	554	554	554	607	607	607	607	607	706	706	706	809	809
S ₁	36	36	36	36	49	49	49	49	49	52	52	52	45	45
S ₂	29	29	29	29	30	30	30	30	30	47	47	47	35	35
A	223	223	223	223	249	249	249	249	249	320	320	320	356	356
B	110	110	110	110	110	110	110	110	110	160	160	160	160	160
C	18	18	18	18	18	18	18	18	18	18	18	18	18	18
D	259	259	259	259	305	305	305	305	305	381	381	381	430	430
E	370	370	370	370	432	432	432	432	432	528	528	528	561	561
m	59	59	59	59	89	89	89	89	89	195	195	195	263	263
Flange class 300 x 150														
a	156	156	156	156	197	197	197	197	197	240	240	240	276	276
b	162	162	162	162	210	210	210	210	210	241	241	241	279	279
H Series 810	428	428	428	428	481	481	481	481	481	580	580	580	683	683
H Series 820	554	554	554	554	607	607	607	607	607	706	706	706	809	809
S ₁	36	36	36	36	49	49	49	49	49	52	52	52	45	45
S ₂	29	29	29	29	30	30	30	30	30	47	47	47	35	35
A	223	223	223	223	249	249	249	249	249	320	320	320	356	356
B	110	110	110	110	110	110	110	110	110	160	160	160	160	160
C	18	18	18	18	18	18	18	18	18	18	18	18	18	18
D	259	259	259	259	305	305	305	305	305	381	381	381	430	430
E	370	370	370	370	432	432	432	432	432	528	528	528	561	561
m	59	59	59	59	89	89	89	89	89	195	195	195	263	263
Flange class 600 x 150														
a	162	162	162	162	197	197	197	197	197	246	246	246	297	297
b	162	162	162	162	210	210	210	210	210	241	241	241	279	279
H Series 810	434	434	434	434	481	481	481	481	481	586	586	586	689	689
H Series 820	560	560	560	560	607	607	607	607	607	712	712	712	815	815
S ₁	42	42	42	42	49	49	49	49	49	58	58	58	66	66
S ₂	29	29	29	29	30	30	30	30	30	47	47	47	35	35
A	223	223	223	223	249	249	249	249	249	320	320	320	356	356
B	110	110	110	110	110	110	110	110	110	160	160	160	160	160
C	18	18	18	18	18	18	18	18	18	18	18	18	18	18
D	259	259	259	259	305	305	305	305	305	381	381	381	430	430
E	370	370	370	370	432	432	432	432	432	528	528	528	561	561
m	59	59	59	59	89	89	89	89	89	195	195	195	263	263



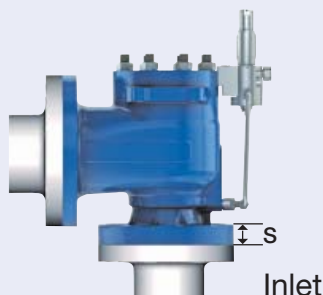
Screw Dimensions acc. to DIN EN 1092-1

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 DIN EN 1092-1. 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 DIN EN 1092-1 standard.

Metric 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 [mm]				11	14,7	18,4	23	11	14,7	18,4	29	23,6	29,4	35,7	23,6	29,4	38	48
A ₀ [mm²]				95	170	266	415	95	170	266	661	437	679	1001	437	679	1134	1810
Flange Class 150 x 150																		
Inlet	Qty	Hexagon screws		PN 10 – PN 16	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		Nuts			4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Hexagon screw diameter nut size [mm]		M12		M12	M12	M12	M16	M16	M16	M16	M16	M16	M16	M16	M16	M16	M16
	Screw dim	Raised face flange type [mm]			65	65	65	65	80	80	80	80	80	80	80	85	85	85
Outlet	Qty	Hexagon screws		PN 10 – PN 16	4	4	4	4	4	4	4	4	8	8	8	8	8	8
		Nuts			4	4	4	4	4	4	4	8	8	8	8	8	8	8
	Hexagon screw diameter nut size [mm]		M16		M16	M16	M16	M16	M16	M16	M16	M16	M16	M16	M16	M16	M16	M16
	Screw dim	Raised face flange type [mm]			75	75	75	75	75	75	75	75	80	80	80	80	80	80
Flange class 300 x 150																		
Inlet	Qty	Hexagon screws		PN 25 – PN 40	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		Nuts			4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Hexagon screw diameter nut size [mm]		M12		M12	M12	M12	M16	M16	M16	M16	M16	M16	M16	M16	M16	M16	M16
	Screw dim	Raised face flange type [mm]			65	65	65	65	80	80	80	80	80	80	80	85	85	85
Outlet	Qty	Hexagon screws		PN 10 – PN 16	4	4	4	4	4	4	4	4	8	8	8	8	8	8
		Nuts			4	4	4	4	4	4	4	8	8	8	8	8	8	8
	Hexagon screw diameter nut size [mm]		M16		M16	M16	M16	M16	M16	M16	M16	M16	M16	M16	M16	M16	M16	M16
	Screw dim	Raised face flange type [mm]			75	75	75	75	75	75	75	75	80	80	80	80	80	80
Flange class 600 x 150																		
Inlet	Qty	Hexagon screws		PN 36	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		Nuts			4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Hexagon screw diameter nut size [mm]		M12		M12	M16	M16	M16	M16	M16	M16	M16	M20	M20	M20	M20	M20	M20
	Screw dim	Raised face flange type [mm]			65	65	80	80	80	80	80	80	80	100	100	100	100	110
Outlet	Qty	Hexagon screws		PN 10 – PN 16	4	4	4	4	4	4	8	8	8	8	8	8	8	8
		Nuts			4	4	4	4	4	4	8	8	8	8	8	8	8	8
	Hexagon screw diameter nut size [mm]		M16		M16	M16	M16	M16	M16	M16	M16	M16	M16	M16	M16	M16	M16	M16
	Screw dim	Raised face flange type [mm]			75	75	75	75	75	75	80	80	80	80	80	80	80	80

Outlet



Inlet

Screw Dimensions acc. to DIN EN 1092-1

Metric Units				Orifice J – T+														
DN I+O				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 [mm]				38	45	56	75	56	63	69	83	95	110	133	142	168	180	
A ₀ [mm²]				1134	1590	2463	4418	2463	3117	3739	5411	7088	9503	13893	15837	22167	25447	
Flange Class 150 x 150																		
Inlet	Qty	Hexagon screws		PN 10 – PN 16	8	8	8	8	8	8	8	8	8	8	8	12	12	
		Nuts			8	8	8	8	8	8	8	8	8	8	8	12	12	
	Hexagon screw diameter nut size [mm]		M16		M16	M16	M16	M16	M16	M16	M16	M16	M20	M20	M20	M20	M20	M20
	Screw dim	Raised face flange type [mm]			90	90	90	90	100	100	100	100	100	120	120	120	130	130
Outlet		Qty	Hexagon screws		PN 10 – PN 16	8	8	8	8	8	8	8	8	12	12	12	12	12
	Nuts		8	8		8	8	8	8	8	8	12	12	12	12	12		
	Hexagon screw diameter nut size [mm]		PN 10	M16		M16	M16	M16	M20	M20	M20	M20	M20	M20	M20	M20	M20	M20
			PN 16	M16		M16	M16	M16	M20	M20	M20	M20	M20	M20	M20	M20	M24	M24
Outlet	Screw dim	Raised face flange type [mm]		PN 10	80	80	80	80	90	90	90	90	90	110	110	110	100	100
				PN 16	80	80	80	80	90	90	90	90	90	110	110	110	110	110
	Flange class 300 x 150																	
	Inlet	Qty	Hexagon screws		PN 25 – PN 40	8	8	8	8	8	8	8	8	8	8	8	12	12
Nuts			8	8		8	8	8	8	8	8	8	8	8	12	12		
Hexagon screw diameter nut size [mm]		PN 25	M16	M16		M16	M16	M20	M20	M20	M20	M20	M24	M24	M24	M24	M24	
		PN 40	M16	M16		M16	M16	M20	M20	M20	M20	M20	M24	M24	M24	M24	M24	
Outlet	Screw dim	Raised face flange type [mm]		PN 25	95	95	95	95	110	110	110	110	110	130	130	130	140	140
				PN 40	95	95	95	95	110	110	110	110	110	130	130	130	150	150
	Outlet	Qty	Hexagon screws		PN 10 – PN 16	8	8	8	8	8	8	8	8	8	8	8	8	8
			Nuts			8	8	8	8	8	8	8	8	8	8	8	8	8
Hexagon screw diameter nut size [mm]		PN 10	M16	M16		M16	M16	M20	M20	M20	M20	M20	M20	M20	M20	M20	M20	
		PN 16	M16	M16		M16	M16	M20	M20	M20	M20	M20	M20	M20	M20	M24	M24	
Outlet	Screw dim	Raised face flange type [mm]		PN 10	80	80	80	80	90	90	90	90	90	110	110	110	100	100
				PN 16	80	80	80	80	90	90	90	90	90	110	110	110	110	110
	Flange class 600 x 150																	
	Inlet	Qty	Hexagon screws		PN 63	8	8	8	8	8	8	8	8	8	8	8	12	12
Nuts			8	8		8	8	8	8	8	8	8	8	8	12	12		
Hexagon screw diameter nut size [mm]		M20	M20	M20		M20	M24	M24	M24	M24	M24	M30	M30	M30	M33	M33		
Screw dim		Raised face flange type [mm]		110		110	110	110	120	120	120	120	120	100	100	100	100	110
	Outlet	Qty	Hexagon screws		PN 10 – PN 16	8	8	8	8	8	8	8	8	8	8	8	8	
Nuts			8	8		8	8	8	8	8	8	8	8	8	8			
Hexagon screw diameter nut size [mm]		PN10	M16	M16		M16	M16	M20	M20	M20	M20	M20	M20	M20	M20	M20		
		PN16	M16	M16		M16	M16	M20	M20	M20	M20	M20	M20	M20	M24	M24		
Outlet	Screw dim	Raised face flange type [mm]		PN10	80	80	80	80	90	90	90	90	90	110	110	110	100	100
				PN16	80	80	80	80	90	90	90	90	90	110	110	110	110	110