Since 1980

RASAII

Entire range of Sleeved Plug Valve

E-mail : admin@rflvalves.com

www.rflvalves.com

Our Products:

- PTFE Sleeved Plug Valves
- PFA / FEP Lined Plug Valves
- PFA / FEP Lined Ball Valves
- PFA / FEP Lined Check Valves
- PFA / FEP Lined Inspection Sight Glass Valves
- ‘V’ Notch Control Ball Valves
- Wedge Plug Valve / Double Block & BleedValve (LiftPlugValve)
- Metallic Ball Valves
- Butterfly Valves
- Lined Pipes and Fittings
- Flanges – Exotic alloys only

1 Introduction

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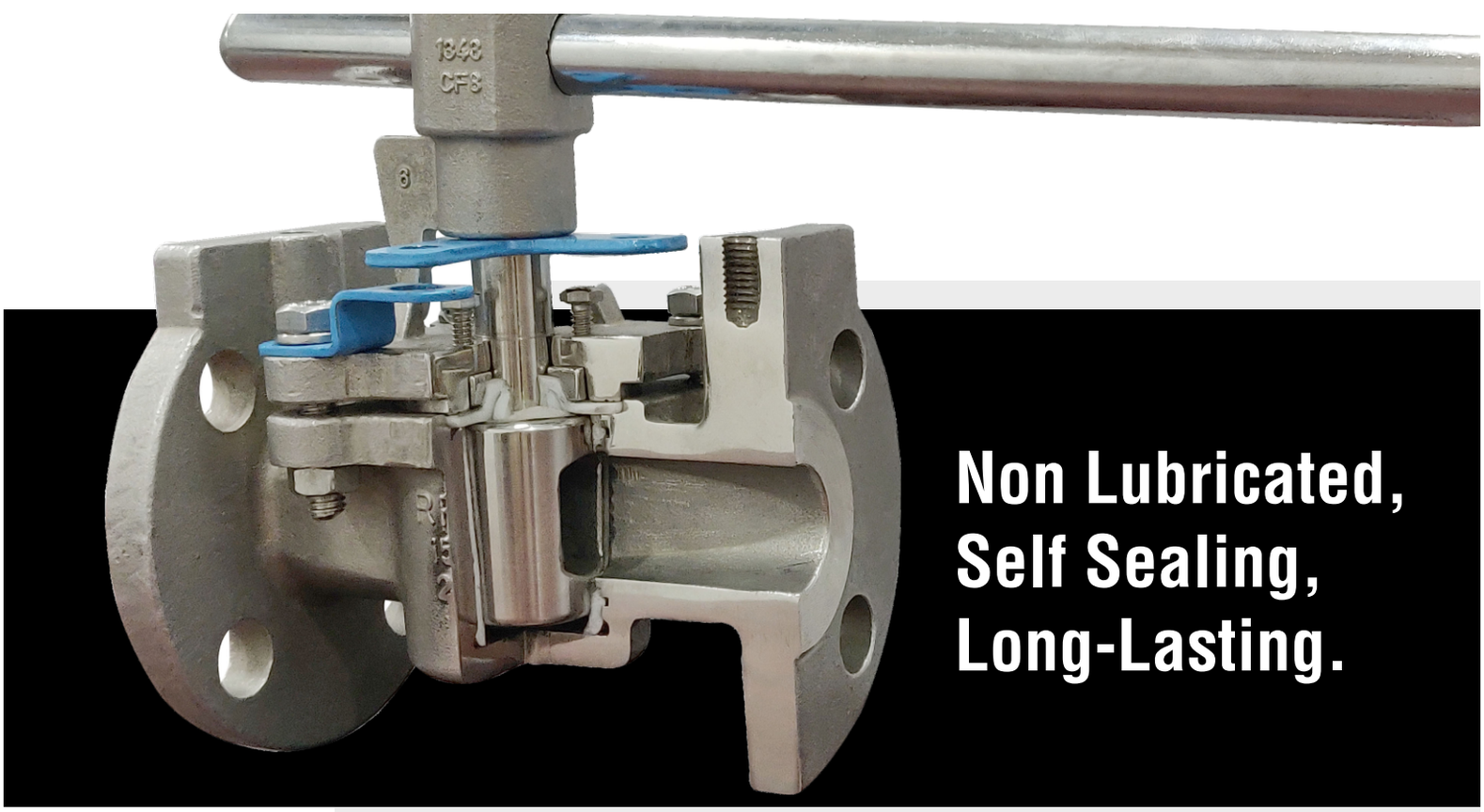

Non Lubricated, Self Sealing, Long-Lasting.

Rasaii Flow Lines (RFL) Sleeved Plug Valves (SPV) are designed for smooth and efficient fluid handling of corrosive medium. Sleeves are generally made from PTFE, which are inert & have low co-efficient of friction and easier to seal. These are primarily ON / OFF valves.

Beign PTFE Sleeved, additional service & periodic lubrication are NOT needed. Our Sleeved Plug Valves are truly “Fit & Forget” Valves. They provide effective sealing even in low pressure service and design variations exist which makes the Sleeved Plug Valve suitable for throttling application. Plug valves should never be left in “Partially Open Position” Since PTFE Sleeve acts as a self – lubricant, ease of operation is assured even when the valve is left open or remains closed for extended period of time.

Valve Design & Construction

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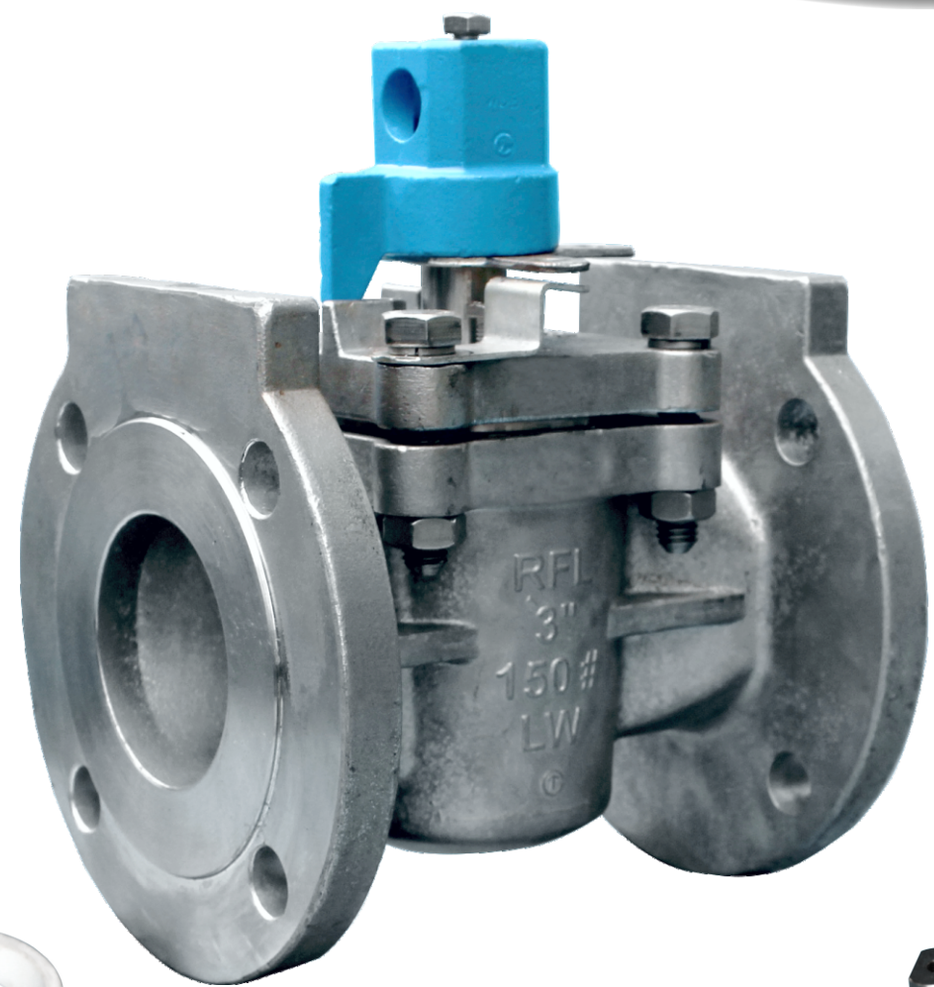

The main valve components are body, plug with integral stem (anti blow out design), Plug and stem are integral in casting, the blow-out proof stem feature will prevent stem from being pushed out by the pressure from inside of the valve. sleeve made of PTFE.

PTFE sleeves are secured properly in the valve body by special double sealing grooves which run completely over the the edge of both Inlet and outlet Valve ports. The sleeves are press fitted using special mandrels in to a secured grip. PTFE completely encircles the plug thus providing 360 degree contact. The sleeves provide a large, circumferential sealing from port to port. Open, closed, or rotating, the seal is assured always.

Three Level Sealing Arrangement

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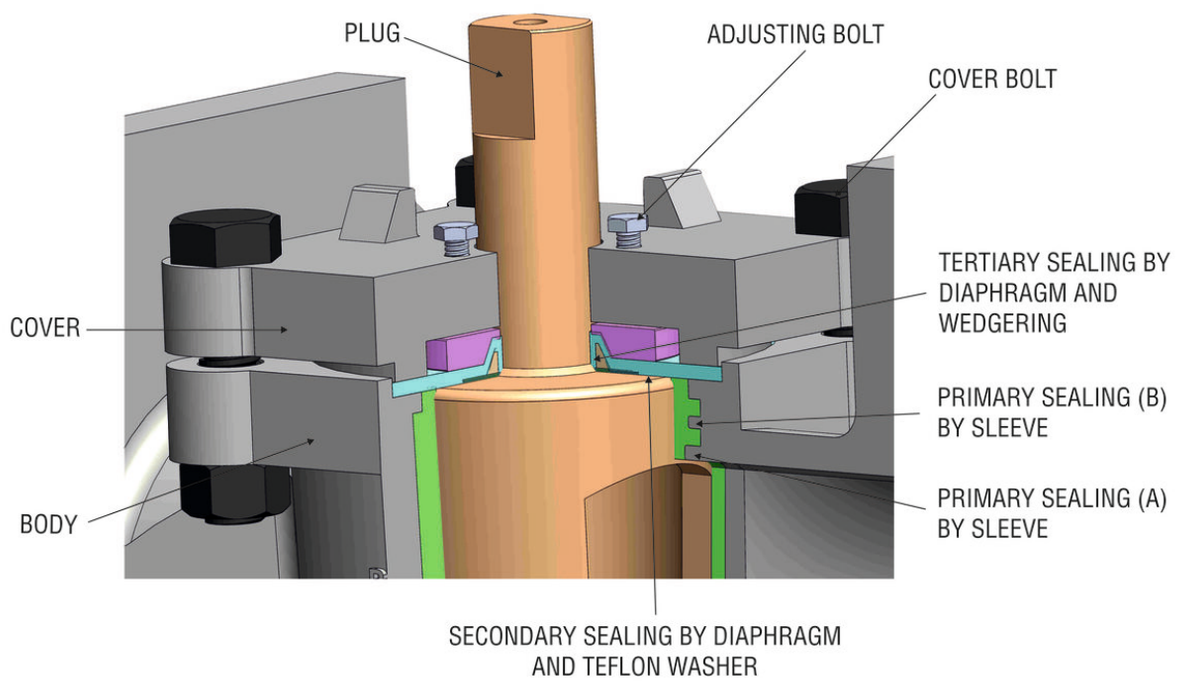

- The leakage to atmosphere is eliminated by resorting to a three levels of sealing. One PTFE Washer, then a PTFE wedge ring and an overlapping PTFE diaphragm sits over the top, all providing an effective leak proof seal from the plug shank / stem. For mechanical stability and rigidity one SS washer / diaphragm is also packed on top of the above set of soft seals. There is also a load adjusting feature which can be utilized in service, in the unlikely event of a leaky stem seal.
- The primary seal is provided by the Valve Sleeve itself as it won't allow any line fluid to enter the stem / shank zone.
- Special models of RFL valves are provided with PTFE 'V' packing seals to meet Fugitive Emission needs as per ISO 15848 requirements. Valves are successfully type tested to API 641 using methane as test medium as well as to ISO 15848 using Helium as test medium.
- Above all, in larger size valves life cycle extension is possible by replacing the PTFE sleeve and other soft parts. The valve then becomes almost a brand new one.

Cross Section

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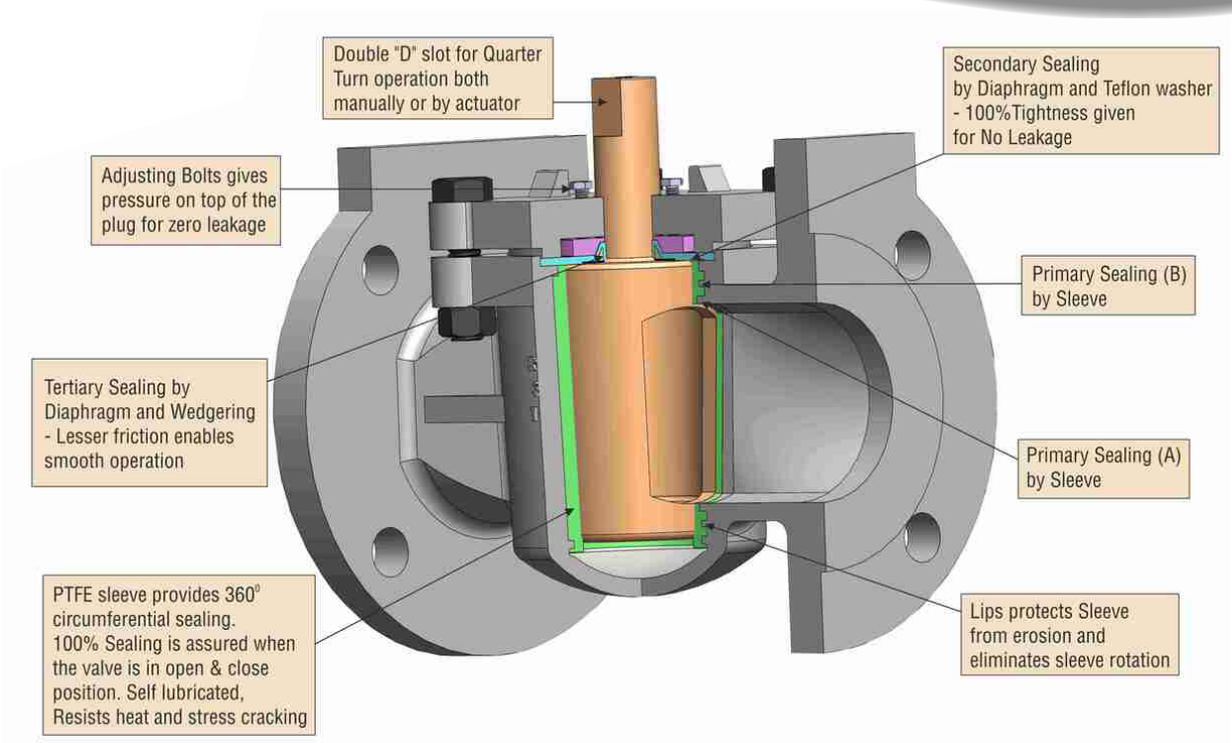

1. **Zero Maintenance**- PTFE is self-lubricating with very low friction factor.
2. **Bubble Tight Shut-Off System-** PTFE sleeves remain in tight contact with plug and arrest leakage.
3. **No Possibility of Ingress of Foreign Particles-** As the plug rotates, 360 degree port lips provide self-cleaning action to remove foreign particles and adhering media.
4. **No Body cavity-** Cavity free design where flow media cannot accumulate and contaminate further process fluid.

D E S I G N F E A T U R E S

- Valves upto 12" in investment casting for 150#
- Valves upto 4" in investment casting for 300# 6” and above made out of Sand or Shell Casting
- Superior Finish and longer life of valve body
- Bi-directional flow
- Positive shut-off with inline adjustment
- Positive stem seal with reverse lip design
- Designed for throttling
- Unique plug and body design for low torque operation
- Non-Lubricated, Self-cleaning of plugs while in operation.
- Zero leakage (Bubble tight shut-off)
- Easy assembling and disassembling.
- Technologically superior design, our specialty.
- Cost effective and top value for your dollar
- Proven performance
- Self-sealing

Advantages

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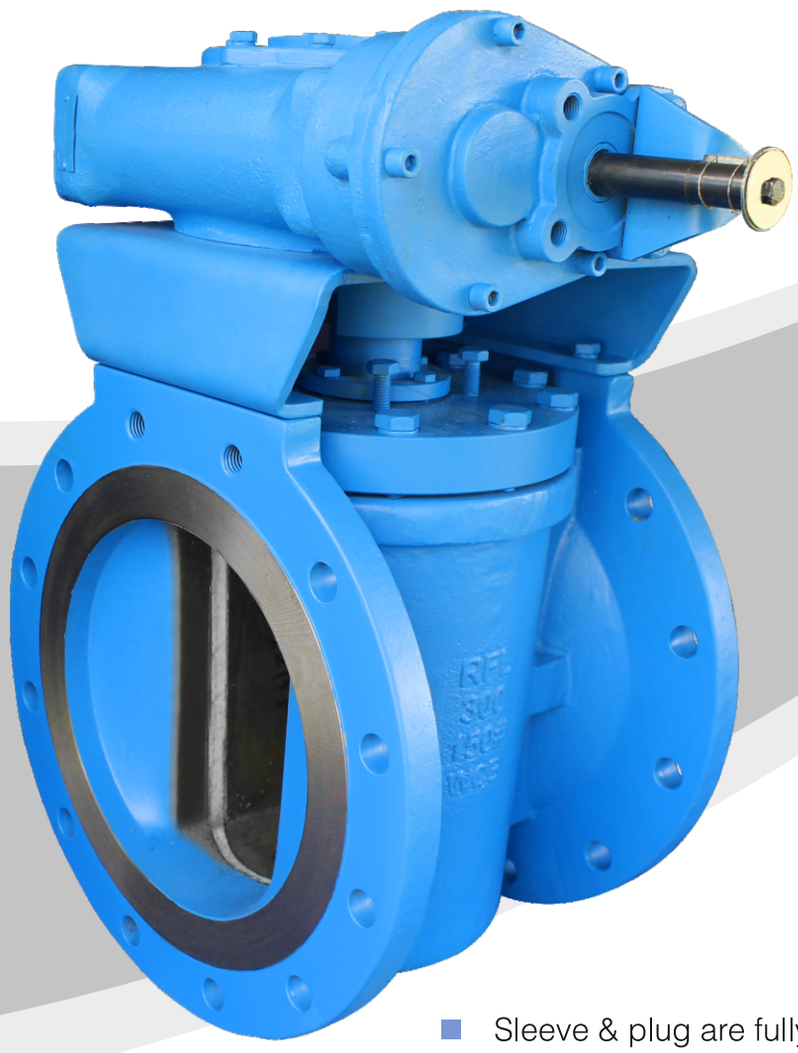

- Sleeve & plug are fully protected from line medium.
- Seat wear and tear is nearly eliminated.
- Internals are easily accessible and so on-line valve service is easier. One need not remove the valve from the pipeline to do any service.
- Plug valves being top entry type, service activity is easier.
- Weight of the plug is distributed over the large surface area of the sleeve. Hence there is no possibility of seat deformation.
- Seat life is the best in a sleeved plug valve design.
- No periodic lubrication needed. Hence we can call these valves “Fit and Forget” type.
- There are no valve cavities and so there is no accumulation of dirt inside the valve

Exploded View

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1. Size range - ½” to 24”
2. Valve Design- API 599, BS5353, EN 12516-1
3. Pressure Rating- ANSI Class 150, ANSI Class 300
4. Temperature Rating – up to 310^{0} C
5. RFL’s SPV are further classified into,

i) By End connection

a) Flanged End

- Raised Face,
- Flat Face,
- Ring Type Joint,
- Toungue and Groove

b) Screwed End

c) Socket weld

d) Butt weld

ii) By Operation

a) Bare stem

b) Wrench operated

c) Gear operated

d) Actuator operated

e) Extended stem operated

f) Dead man handle operated

iii) By Construction

a) Cage type

b) Multi ports (3 way & 4 way)

c) Reduced bore/Rectangular Port

d) Full Bore

e) Inverted/Pressure balanced Type

iv) By Qualification

a) Fire Safe - API 607, API 6FA &ISO 10497

b) Vacuum service - Hood method

c) Low Fugitive Emission - API 641, ISO15848 -RFL Enviro Valves

d) Severe service SPV with Superior Emission control - RFL Enviro 2.0 Valves

v) By Jacket Type

a) Partially Jacketed (Style 1 & 2)

b) Fully Jacketed (Style 3 & 4)

TECHNICAL INFORMATION

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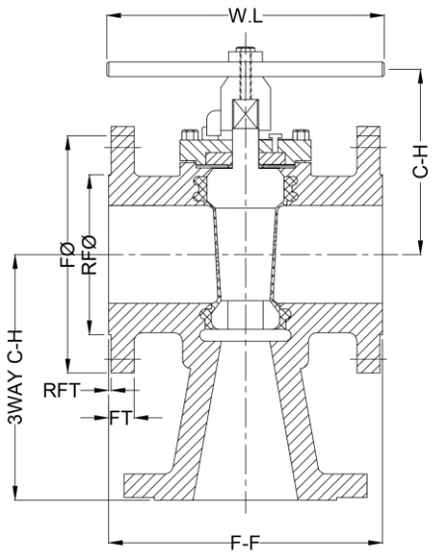
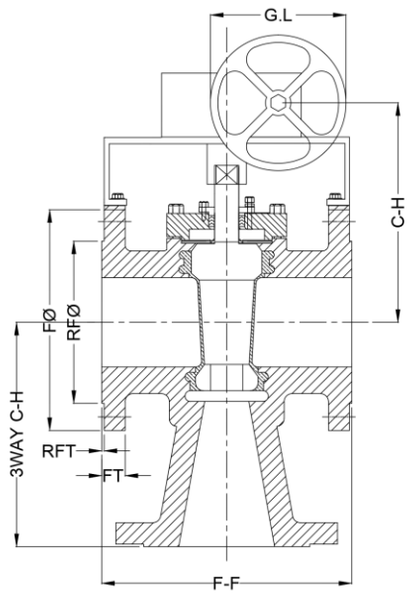
General Assembly Drawing



Note: ½" to 4" are Wrench operated



6" and above are Gear Operated

#150 - DIMENSIONS

SIZE	F-F	FØ	FT	RFØ	RFT	PCD	NOH	SOH	WEIGHT (KG)	W.L	G.L	C - H
15	108	89	11	35	2	60	4	16	2	152		74
20	117	98	11	43	2	70	4	16	3.2	152		74
25	127	108	11	51	2	79	4	16	4.2	178		82
40	165	127	14.3	73	2	98	4	16	7.2	229		95
50	178	152	16	92	2	121	4	19	10.4	305		114
65	203	190	19	105	2	140	4	19	18.4	457		120
80	203	190	19	127	2	152	4	19	18.4	457		127
100	229	229	24	157	2	190	8	19	26.2	762		154
150	267	279	25.4	216	2	241	8	22	90		224	196
200	292	343	29	270	2	298	8	22	116		406	241
250	330	406	30	324	2	362	12	25			406	279
300	356	483	32	381	2	432	12	25			406	317
350	381	527	35	413	2	476	12	29			406	330
400	762	597	37	470	2	540	16	29			459	381

#300 – DIMENSIONS

SIZE	F-F	FØ	FT	RFØ	RFT	PCD	NOH	SOH	WEIGHT (KG)	W.L	G.L	C - H
15	140	96	14.3	35	2	67	4	16	3.5	152		74
20	152	117	16	43	2	83	4	19	4.3	152		74
25	165	124	17.5	51	2	89	4	19	5.4	178		82
40	190	156	20.7	73	2	114	4	22	9.8	229		95
50	216	165	22.3	92	2	127	8	19	13.2	305		114
65	283	210	29	105	2	149	8	22	26.5	457		120
80	283	210	29	127	2	168	8	22	26.5	457		127
100	305	254	32	157	2	200	8	22	37	762		154
150	403	318	37	216	2	270	12	22			224	196
200	419	381	41	270	2	330	12	25			406	241
250	457	445	48	324	2	387	16	29			406	279
300	502	521	51	381	2	450	16	32			406	317
350	762	584	54	413	2	514	20	32			406	330
400	838	648	57.2	470	2	572	20	35			459	381

Note: All dimensions are in "mm"

Legend

F-F	FACE TO FACE	NOH	NUMBER OF HOLES
FØ	FLANGE DIAMETER	SOH	SIZE OF HOLE
FT	FLANGE THICKNESS	W.L	WRENCH LENGTH
RFØ	RAISED FACE DIAMETER	G.L	GEAR LENGTH
RFT	RAISED FACE THICKNESS	C-H	CENTER OF FLANGE TO HEIGHT OF BODY
PCD	PITCH CIRCLE DIAMETER		

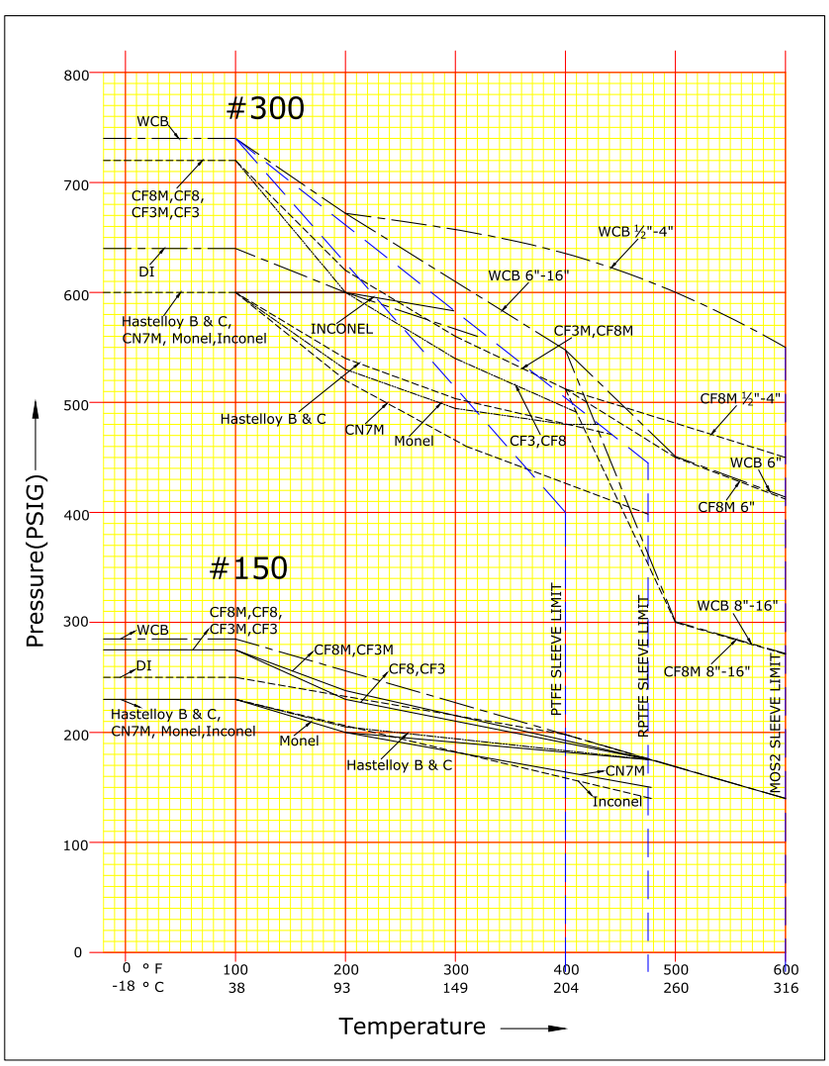
I) Operating Torque for SPV - 2 way, 3 way, #150 & #300

SIZE		OPENING TORQUE (Nm)	OPENING TORQUE With factor of safety (Nm)	MAST VALUE (Nm)	RUNNING TORQUE (Nm)	CLOSING TORQUE (Nm)
inch	mm					
1/2"	15	25.5	38	51	15	20
3/4"	20	25.5	38	51	15	20
1"	25	35	53	70	21	28
1 1/2"	40	52	78	104	31	42
2"	50	71	107	142	43	57
3"	80	110	165	220	66	88
4"	100	165	248	330	99	132
6"	150	370	555	740	222	296
8"	200	1440	2160	2880	864	1152
10"	250	1627	2441	3254	976	1302
12"	300	2373	3560	4746	1424	1898

ii) Cv & Kv for #150 & #300

SIZE		FLOW RATE (VALUE)	
inch	mm	Cv	Kv
1/2"	15	9.5	8
3/4"	20	9.5	8
1"	25	42	36
1 1/2"	40	95	82
2"	50	190	164
3"	80	326	282
4"	100	694	600
6"	150	1112	962
8"	200	1665	1440
10"	250	2483	2148
12"	300	3680	3183

PT CHART



Suitable Temperature Range of Sleeves

PTFE = -20°C to 180°C

Glass Filled PTFE = -20°C to 220°C

Reinforced PTFE = -20°C to 240°C

MOS2 Filled PTFE = -20°C to 310°C

Note: Our Low Fugitive Emission Service models, can Withstand a Maximum Temperature of 150°C

3 CLASSIFICATION

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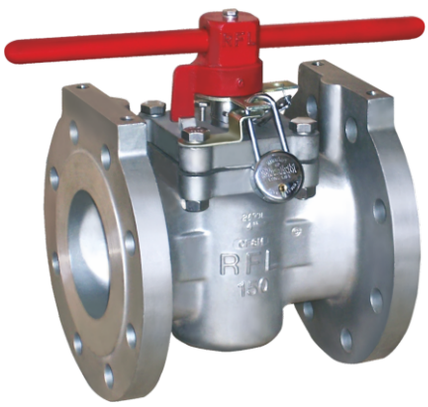
3.1) By End Connection

3.1.1) Flanged End



- RFL flanged end SPV comes with Raised face, Flat face, Small Groove, Large groove, Ring Type Joint Flanges as option.
- SPVs are flanged as per ASME B 16.5; BS 10 Table 'D', 'E' & 'F';

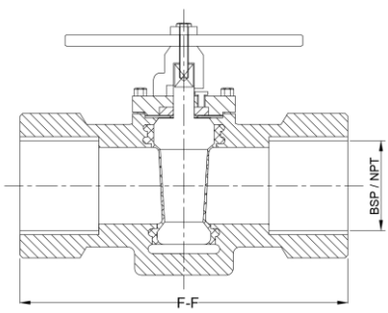
Raised Face – Allows use of wide combination of gasket designs and commonly used in process plant application. The main purpose of RF flanges is to concentrate more pressure on a smaller gasket area and thereby increase the pressure containment capability of the joint.

Flat Face – The gasket surface and bolting circle face are on the same plane. Hence the whole face of the two flanges ensure full contact.

Ring Type Joint – They are predominantly used in high pressure and high temperature service. The flanges provide metal to metal sealing when the metal ring is compressed between the flanges using bolts to create a tight contact between the grooves.

Tongue and Groove – Here the flanges must be matched. One flange face has a tongue, while the other has a groove i.e the mating flange has a matching depression machined on to its face. Tongue and Groove facings are standardized in both large and small types.

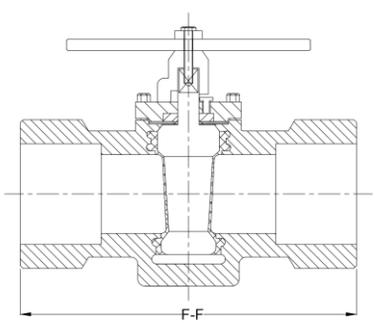
3.1.2) Screwed End



SIZE	15	20	25	40	50
F-F	108	117	127	165	178

- Threaded connections provide a streamlined and compact connection between the pipe and valve.
- The valve generally has a female threaded end connection in which the male threaded pipe fits.
- The end provides tapered or straight pipe threads.

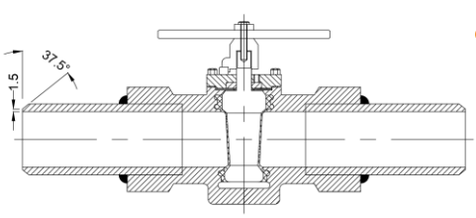
3.1.3) Socket Weld



SIZE	15	20	25	40	50
F-F	108	117	127	165	178

- A socket is provided in the valve ends in which pipe is Inserted and welded. They are normally Used for small pipeline

3.1.4) Butt Weld



SIZE	15	20	25	40	50
F-F	108	117	127	165	178

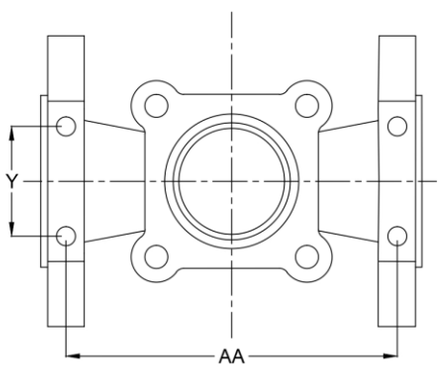
- The pipe end and valve end are in equal diameter, The valve end is beveled to match with the thickness of the pipe and the two ends are butted to the pipeline and welded

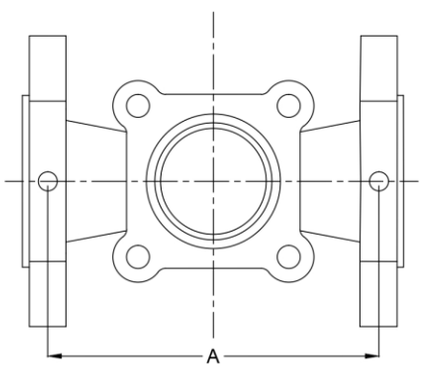
3.2) By Operation

3.2.1) Bare Stem

Valve supplied in open stem condition without any operating equipment.

This will reduce the cost and save time during operational changes in plant.





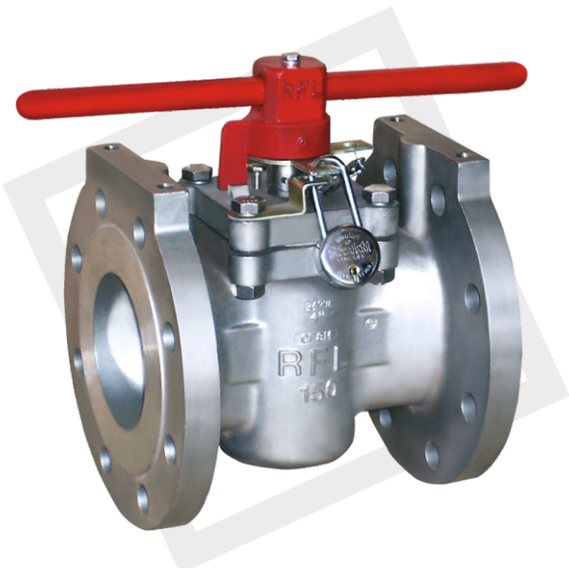
#150 - DIMENSIONS

VALVE SIZE	HOLES	TAP SIZE	A	AA	Y
15	2	5/16" TAP BSW X 1/2" DEPTH	92	-	-
20	2	5/16" TAP BSW X 1/2" DEPTH	95	-	-
25	2	5/16" TAP BSW X 1/2" DEPTH	106.5	-	
25 L	2	5/16" TAP BSW X 1/2" DEPTH	122.5	-	
40	2	5/16" TAP BSW X 1/2" DEPTH	146	-	
50	4	5/16" TAP BSW X 1/2" DEPTH	-	160	57
80	4	3/8" TAP BSW X 5/8" DEPTH	-	180	89
100	4	7/16" TAP BSW X 5/8" DEPTH	-	203	101
150	4	7/16" TAP BSW X 5/8" DEPTH	-	240	101
200	4	1/2" TAP BSW X 5/8" DEPTH	-	259	152
250	4	1/2" TAP BSW X 5/8" DEPTH	-	294	152.4

#300 - DIMENSIONS

VALVE SIZE	HOLES	TAP SIZE	A	AA	Y
15	2	5/16" TAP BSW X 1/2" DEPTH	123	-	-
20	2	5/16" TAP BSW X 1/2" DEPTH	136	-	-
25	2	5/16" TAP BSW X 1/2" DEPTH	-	146	44
40	2	5/16" TAP BSW X 1/2" DEPTH	-	168	44
50	4	5/16" TAP BSW X 1/2" DEPTH	-	192	57
80	4	3/8" TAP BSW X 5/8" DEPTH	-	252	89
100	4	7/16" TAP BSW X 5/8" DEPTH	-	271	101
150	4	7/16" TAP BSW X 5/8" DEPTH	-	355.6	101.6
200	4	1/2" TAP BSW X 5/8" DEPTH	-	371	152.5
250	4	1/2" TAP BSW X 5/8" DEPTH	-	420.6	152

3.2.2) Wrench Operated

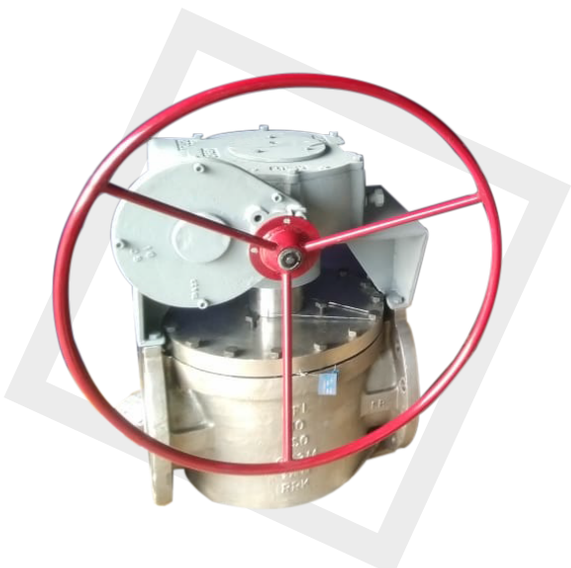


Sleeved plug valves are operated in Quarter turn. Hence for low torque applications a wrench is provided for valve operation. RFL ½" to 4" valves are wrench operated.

SPV with locking device can be provided to ensure protection of valves from any unauthorized operation.

3.2.3) Gear Operated

For High torque applications Gearbox with hand wheel is provided to Operate the Valve. RFL 6" and above are Gear operated by default, based on our design.



3.2.4) Actuator Operated

For Automated control of valves, RFL can offer actuator operated valves which can be Electric, Pneumatic or Hydraulic.

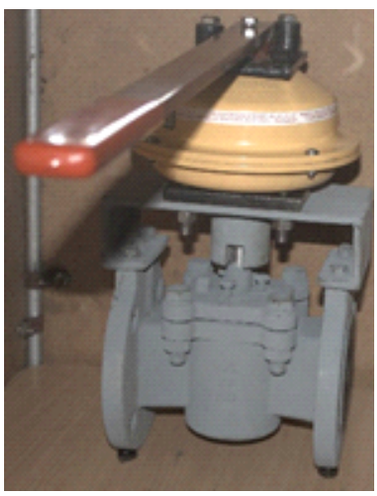
Quick closing spring return actuators are also offered.

RFL facilitates mounting provisions for actuator assembly with necessary holes pre drilled for easy mounting of actuators. Bare stem valve with mounting bracket and coupling can be offered upon customer request. The valves are tailor made for trouble free operation according to customers preference.

For mounting dimension refer Clause 3.2.1

RFL Limit Switch: RFL can outsource and supply valves with wide variety of switching options based on customer's preference

3.2.5) Deadman Handle Operated



These are also known as spring return handle valves. The special handle ensures that the valve will always “spring return” to its original starting position, when hand / manual effort is released. This type of valve finds vast application in critical service were the valve has to be quickly returned to the original position once a manual operation is completed. These valves assure safety and avoid unnecessary wastage of costly medium whenever the valve is allowed to remain in partially open or closed position, inadvertently.

3.2.6) Extended Stem operated

RFL can supply valves with extended stem. These valves are predominantly used in places where the valves are not in close proximity with the operator eg: valve located under water, toxic environment, hot pipe line.

3.3) By Flow

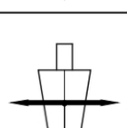
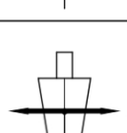
3.3.1) Cage type

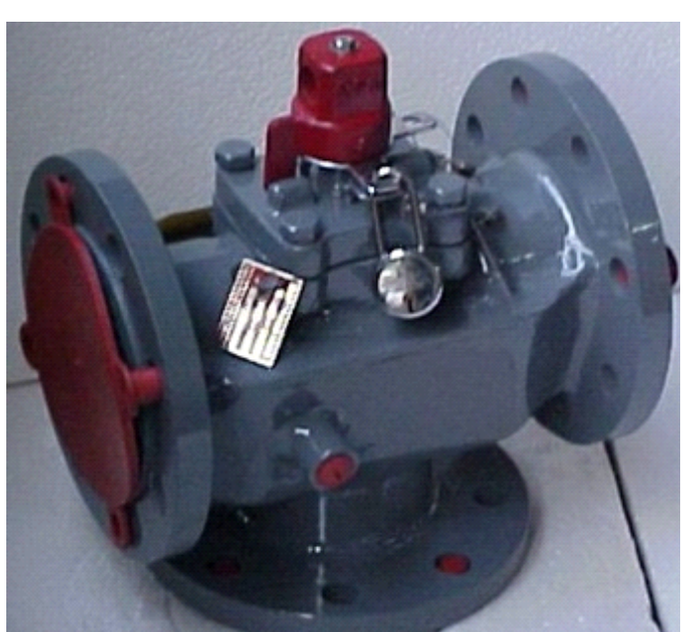
RFL’s Sleeved Plug Valves with caged plugs are mainly used in throttling application and in high pressure drop service. These valves have metal to metal throttling and minimizes turbulence for fluids with high velocity.

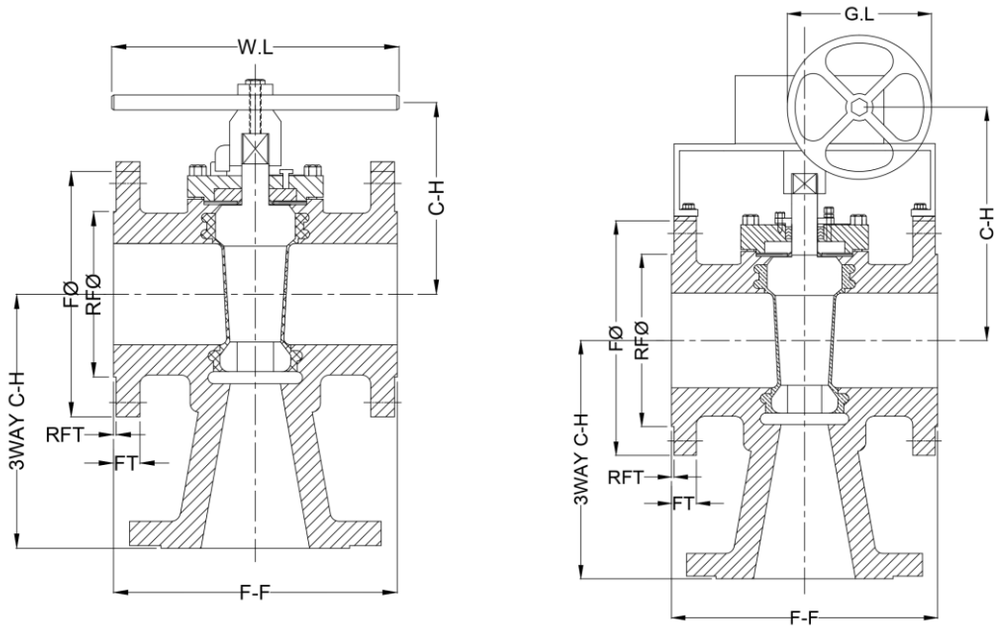
3.3.2) Multi ports (3 way & 4 way)

RFL can offer multi-port valves. We regularly supply 3-way, 4-way valves. Multi – port valves are space saving valves that simplify the distribution system and reduce risk of leaks. These valves can be used to handle multiple fluids or to divert the flow of fluid from one direction to another.

Following are the Flow types

POSITION 0°	POSITION 90°	POSITION 180°	
			FLOW 1
			FLOW 2
			FLOW 3
			FLOW 4
			FLOW 5
			FLOW 6
			FLOW 7
			FLOW 8





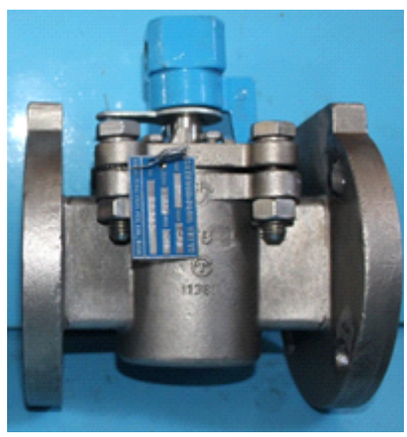
#150 - DIMENSIONS - 3 WAY

SIZE	F-F	FØ	FT	RFØ	RFT	PCD	NOH	SOH	WEIGHT (KG)	W.L	G.L	C - H	3 WAY C-H
15	108	89	11	35	2	60	4	16	2	152		74	70
20	117	98	11	43	2	70	4	16	3.2	152		74	73
25	127	108	11	51	2	79	4	16	4.2	178		82	89
40	165	127	14.3	73	2	98	4	16	7.2	229		95	105
50	178	152	16	92	2	121	4	19	10.4	305		114	114
65	203	190	19	105	2	140	4	19	18.4	457		120	130
80	203	190	19	127	2	152	4	19	18.4	457		127	130
100	229	229	24	157	2	190	8	19	26.2	762		154	152
150	267	279	25.4	216	2	241	8	22	90		224	196	190
200	292	343	29	270	2	298	8	22	116		406	241	229
250	330	406	30	324	2	362	12	25			406	279	280
300	356	483	32	381	2	432	12	25			406	317	
350	381	527	35	413	2	476	12	29			406	330	
400	762	597	37	470	2	540	16	29			459	381	

#300 - DIMENSIONS - 3 WAY

SIZE	F-F	FØ	FT	RFØ	RFT	PCD	NOH	SOH	WEIGHT (KG)	W.L	G.L	C - H	3 WAY C-H
15	140	96	14.3	35	2	67	4	16	3.5	152		74	73
20	152	117	16	43	2	83	4	19	4.3	152		74	76
25	165	124	17.5	51	2	89	4	19	5.4	178		82	96
40	190	156	20.7	73	2	114	4	22	9.8	229		95	111
50	216	165	22.3	92	2	127	8	19	13.2	305		114	121
65	283	210	29	105	2	149	8	22	26.5	457		120	141
80	283	210	29	127	2	168	8	22	26.5	457		127	141
100	305	254	32	157	2	200	8	22	37	762		154	171
150	403	318	37	216	2	270	12	22			224	196	216
200	419	381	41	270	2	330	12	25			406	241	254
250	457	445	48	324	2	387	16	29			406	279	305
300	502	521	51	381	2	450	16	32			406	317	
350	762	584	54	413	2	514	20	32			406	330	
400	838	648	57.2	470	2	572	20	35			459	381	

3.3.3) Reduced bore / Rectangular Port



Rectangular port corresponds to 70% of internal process pipes area.

3.3.4) Full Bore

This product combines the advantages offered by a sleeved plug valve with that of the application possibilities of a Full Bore Valve. They have a bore which is fully circular throughout the valve, including the obturator port. In pipeline fluid transportation, accumulation of dirt and foreign particles can lead to clogging and fluid contamination, especially in oil and gas industry, crude oil pipelines. This calls for PIGGING- Pipeline Inspection and Guaging. The equipment used is called PIG. These PIGs are made to travel inside the pipeline, there by cleaning the pipe. Only a full bore valve allows travel of PIG inside the valve. Since these plug valves do not have cavities they are ideally suited to even food industries. There is no accumulation of fluids inside the valve, leading to less contamination. RFL's Full Port Plug Valves are designed for turbulence free smooth laminar flow of fluids. Full port Plug Valves offer minimum or nil pressure drop across the valve. The Stem is integral with the plug and so they are truly Anti-blowout design.

OPTIONS

1. Available in ANSI Class 150 & 300
2. Flanged, screwed and socket weld
3. Qualified according to API 607
4. Qualified according to API 641 and ISO 15848-1
5. Jacketed as per RFL Styles
6. Temperature- upto 310^{0}C

RASAII
Since 1980

Unique Features:

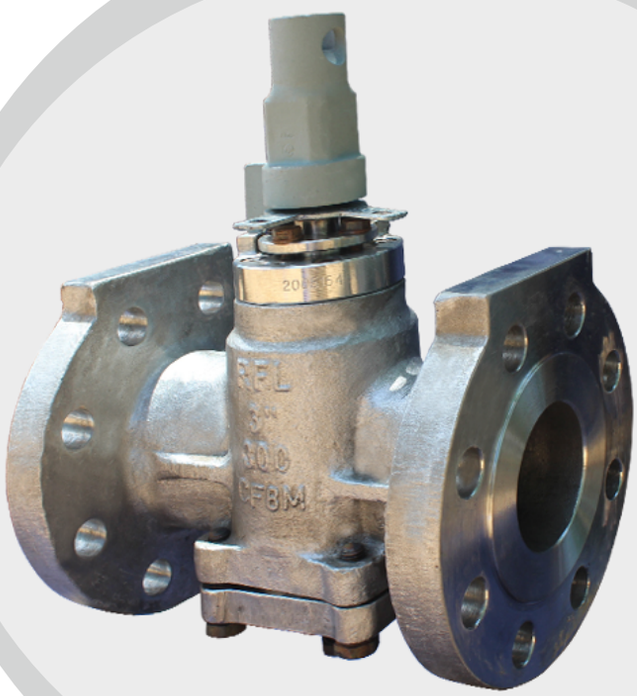
- RFL has shrink - lip feature, any shrinkage of PTFE ensures the packing to compress tightly against the lip.
- Primary external seal is provided by interaction of the surface of the plug along with circumferential sealing of PTFE Sleeve and the Valve body with no body cavities.
- Usage of PTFE ensures chemical inertness, resists heat stress cracking, minimal moisture absorption and self - lubrication.
- Valve is easy to automate, quarter - turn operation.
- RFL Valve is bi-directional to ensure smooth flow.
- Offers no resistance to flow.
- Valve close securely even after long period of not being used.

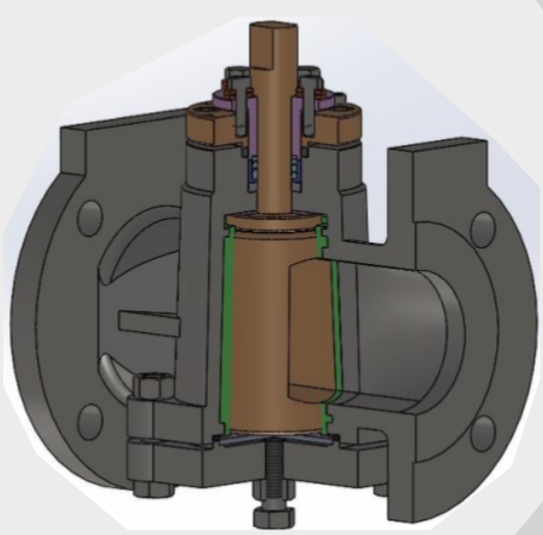
SPV Full Bore Valve Dimension

CLASS	SIZE	F-F	FØ	F.T	RFØ	RFT	P.C.D	NOH	SOH
#150	15	140	89	11	35	2	60	4	16
	20	152	98	11	43	2	70	4	16
	25	165	108	11	51	2	79	4	16
	40	190	127	14.3	73	2	98	4	16
	50	216	152	16	92	2	121	4	19
	65	283	190	19	105	2	140	4	19
	80	283	190	19	127	2	152	4	19
	100	305	229	24	157	2	190	8	19
	150	403	279	25.4	216	2	241	8	22
	200	419	343	29	270	2	298	8	22
	250	457	406	30	324	2	362	12	25
	300	502	483	32	381	2	432	12	25
	350	762	527	35	413	2	476	12	29
	400	838	597	37	470	2	539	16	29
#300	15	140	96	14.3	35	2	67	4	16
	20	152	117	16	43	2	83	4	19
	25	165	124	17.5	51	2	89	4	19
	40	190	156	20.7	73	2	114	4	22
	50	216	165	22.3	92	2	127	8	19
	65	283	210	29	105	2	149	8	22
	80	283	210	29	127	2	168	8	22
	100	305	254	32	157	2	200	8	22
	150	403	318	37	216	2	270	12	22
	200	419	381	41	270	2	330	12	25
	250	457	445	48	324	2	387	16	29
	300	502	521	51	381	2	450	16	32
	350	762	584	54	413	2	514	20	32
	400	838	648	57.2	470	2	572	20	35

3.3.5) Inverted/Pressure Balanced Type

Rasaii Sleeved Plug Valves are designed for smooth and efficient fluid handling of corrosive mediums Sleeves are generally made from PTFE, which are inert & having low co-efficient of friction and easier to seal. In "Inverted Sleeved Plug Valves the plug is located inside the body in a reverse position with the larger diameter resting at the bottom side. The major advantage is complete avoidance of Plug Jamming & lower operating torques. "The plug as in normal sleeved plug valve designs, are completely encircled within a press fitted PTFE sleeve. The Stem / Shank is a separate member which engages with a drive slot in the plug. The advantage being the stem can be made of higher strength bar / forgings, thereby enhancing the stem life that of stem housing and sealing life. The goodness of triple sealing features are incorporated, in the Inverted Sleeve Plug Valves as well. PTFE Chevron packing are provided to make the valve meet stringent Fugitive Emission Norms.





The Inverted Sleeved Plug Valves completely eliminates the jamming Possibility of Plug with Valve body sleeves. The self-weight of the plug would always provide a dis-engagement tendency, which is ably countered by an adjustable and supporting screw at the bottom The valve break opening torques are lesser by 20 to 25% as compared to that of a standard sleeved plug valves. This is a major saving, especially when valves are automated, leading to smaller actuators and lesser running costs. The adjusting screws that provide required tightness are easily approachable & so adjustable from the outside. This feature ensures that valve torque and seal abilities are under precise control and can be adjusted any time when needed. The separate valve stem / shank allows usage of any high strength and exotic stem materials, independent of the plug material. Blow-out proof stem, provides safe working atmosphere.

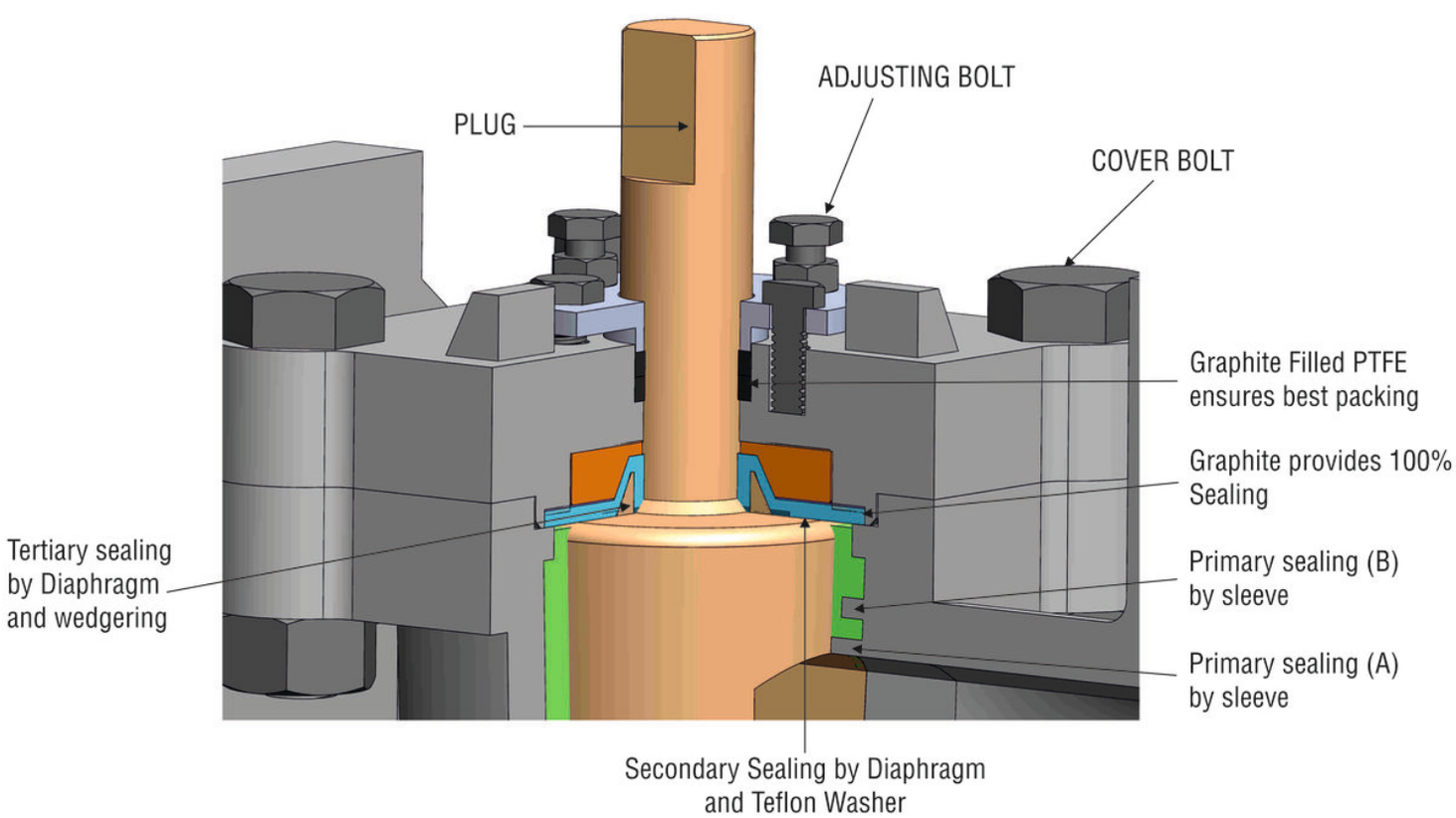
Refer clause 2 – “Technical Information” for Dimension details

3.4) By Qualification

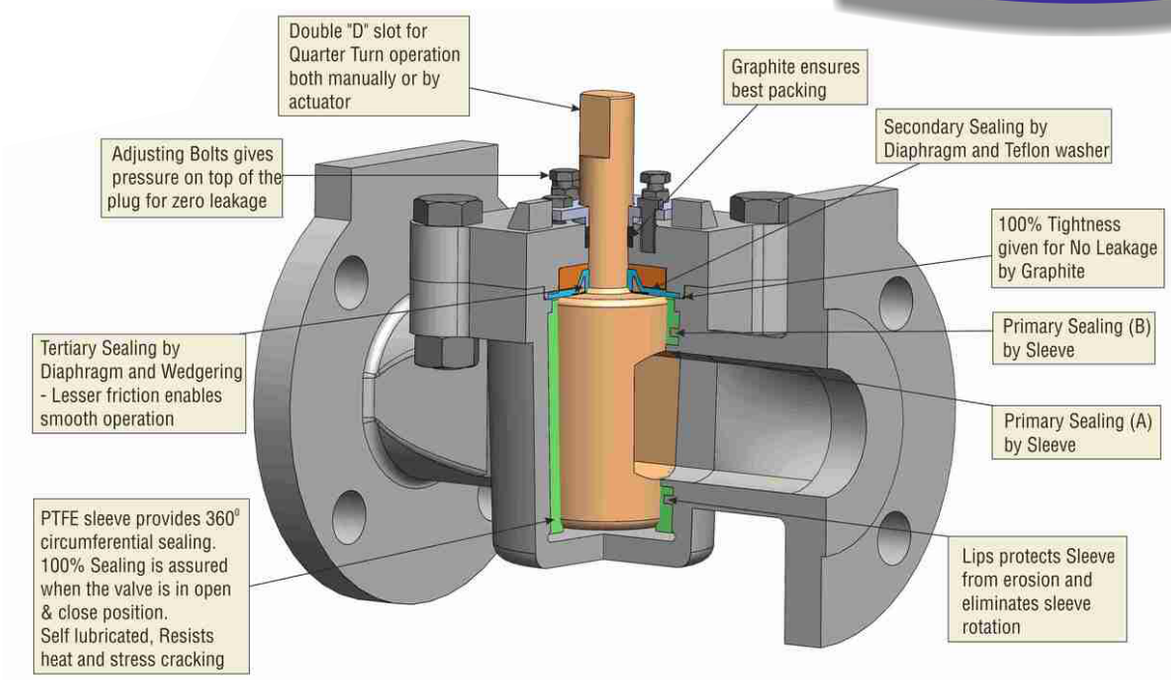
3.4.1) Fire safe

API 607

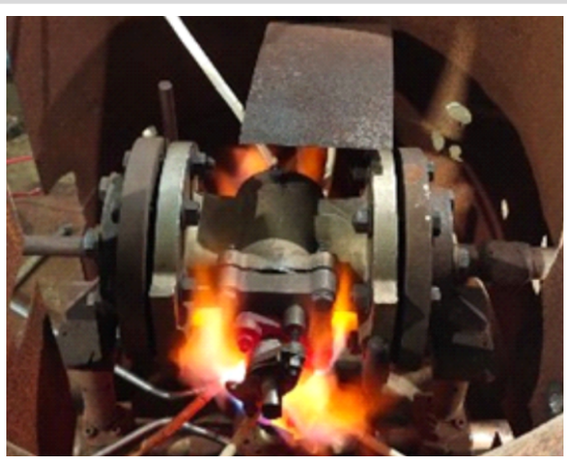
API 6FA



RFL’s fire tested sleeved plug valves are in accordance with API 607 standard. These valves have an additional sealing feature to prevent leakage after the PTFE sleeve and other soft sealing parts are totally destroyed by fire. Fire Tests on 2”, 4”, 8” class 150# valve, qualifies all larger sizes & pressure classes up to Class 300. We can conduct Fire Tests to other standards like API 6FA & ISO 10497, as needed.



- **Application**
  Oil and gas, petrochemical
- **General specification**
  ANSI classes- 150 & 300
- **Sizes offered**
  1/2" to 24"
- **Temperature rating**
  Upto 310°C
- **End connection**
  Flanged End, Socket weld, Screwed End
- **Actuation**
  Valves can be supplied with desired actuation



Unique Features:

- RFL's fire safe valves are tested in accordance to API 607, 7th edition.
- After a certain period of Fire outbreak, the exposed fire safe designed valves can maintain its Pressure containing capability.
- The stem seal and cover seal provides robust sealing.
- Graphite cover and graphite packing arrests leakage when the PTFE components are destroyed by fire.
- RFL's Fire Safe Valves are uni-directional with vented plug on the upstream side to relieve the pressure built due to heat produced by occurrence of fire.

Refer clause 2 – "Technical Information" for Dimension details

3.4.2) Vacuum Service – Hood method

We have successfully conducted Vacuum test on our Sleeved Plug Valves. Test was conducted according to the ASME Section V, Article 10, Mandatory Appendix – IX, which calls for Helium Mass Spectrometer Test – Hood Method.

This test establishes the capability of our sleeved plug valve to withstand Helium Leak under vacuum condition. Valve internals are evacuated and checked for leak using helium, through the gland packing and body – cover join. This is a global method of leak detection and so the detected leak is a total measure of the stem gland packing and body -cover joint put together.

TEST RESULT & ACCEPTANCE LEVEL

For tests where no change in output signal occurs before and after injection of Helium, confirms the system leakage is “below the detectable range of the system” and the valve is deemed to have passed the test.

During test, when there is a noticeable Helium detection, the acceptance criteria are limited to 1 x 10- 6 cc / sec. When maximum measured values are lesser than 1 x 10-6 cc/sec, the valve shall be deemed to have passed the test.

HELIUM TEST REPORT - HOOD METHOD by TPI

HELIUM LEAK TEST REPORT (AS PER ASME Section V, Article 10, Apendix IX,2017 - Hood Method)

TEST REPORT NO.	RFL/VT/150/15/TR-01	TEST DONE ON	29.11.2018
MANUFACTURER	RASAII FLOW LINES PVT. LTD., 150/2, SIPCOT INDUSTRIAL COMPLEX, PUDUKKOTTAI-622002		
TEST PERFORMED BY	NEXUS NDT SERVICES	INSPECTION WITNESSED BY	TUV - NORD
TEST MEDIUM	HELIUM GAS (99.995% PURITY)	VALVE PARTICULARS:	
EQUIPMENT MAKE	ADIXEN	SERIAL NO.	84629
EQUIPMENT MODEL & SL.NO.	ASM110 & HLD 1404033	BODY & PLUG MATERIAL	WCB & CF8M
EQUIPMENT SENSITIVITY	1X10^-12 mbar.l/sec	VALVE TYPE	SLEEVED PLUG VALVE
HELIUM STANDARD LEAK	6240 (Valid upto 19.08.2019)	VALVE SIZE AND CLASS	DN 15 - 150#
CALIBRATED LEAK RATE (CL)	1.2X10^-7 mbar.l/sec	DESIGN STANDARD	BS 5353 & API 599
VACUUM RANGE	<5x10^-3 mbar	VALVE MODEL	SPV-1-03-04-N-W-FE-0050
HOOD MATERIALS	PLASTIC BAG	VALVE GROUP	E
EXTERNAL VACUUM PUMP	EDWARDS 8 STAGE	ACCEPTABLE He LEAK RATE	<or=1.0x10^-6 std cm^3/sec*
TEST PROCEDURE REF.	RFL/SPV/VT/PR-01	TEST STANDARD	ASME Section V, Article 10, Apendix IX, 2017 (Hood Method)
TESTING TEMPERATURE	AMBIENT TEMPERATURE (32°C)		

Valve Information	
Manufacturer	RASAII FLOW LINES PVT. LTD., 150/2, SIPCOT INDUSTRIAL COMPLEX, PUDUKKOTTAI-622002
Stem Seal Description	GRAPHITE
Model/Type	SLEEVED PLUG VALVE
Valve general assembly drawing number	181128001 REV 00

HELIUM MASS SPECTROMETER READING DURING TEST:

M1 - Initial stable reading with calibrated standard leak open. (Unit - std cm^3/sec)*

M2 - Reading after Closing/Isolating the standard leak, after the sysytem response time and reading stabilization. (Unit - std cm^3/sec)*

M3 - Instrument reading, after it gets stablized (the response time) (Unit - std cm^3/sec)*

M4 - Instrument reading after the standard leak shall once again opened to the line. (Unit - std cm^3/sec)*

SYSTEM CORRECTION FACTORS:

Preliminary Calibration Factor (PSCF) & Final Correction Factor (FCSF)

PSCF = CL/(M1-M2)

FCSF = CL/(M4-M3)

SYSTEM MEASURED LEAK RATE

The system leakage rate, in std cc/sec, shall be determined as follows Q=[[FSCF(M3-M2)]*100)/%TG ** std cm^3/sec

(The component tested is acceptable when the measured leakage rate Q is equal to or less than 1x10^-6 std cm^3/sec)

TEST RELIABILITY: The value of FSCF shall be with in ± 30% of the PSCF. This can be stated as 0.77<PSCF/FSCF<1.43. If this requirement of the test reliability is not met, the component shall be retested

HELIUM MASS SPECTROMETER TEST READING:

VALVE SI.NO	Valve tested	M1 (mbar.l/sec)	M1 Response time	M2 (mbar.l/sec)	M3 (mbar.l/sec)	M4 (mbar.l/sec)	M4 Response time
84629	DN 15 #150 SLEEVED PLUG VALVE	1.3X10^-7	24 sec	1.6X10^-8	2.1X10^-8	1.2X10^-7	25 sec

S1 = PSCF = CL/(M1-M2) = 1.052X10^-7

S2 = FSCF = CL/(M4-M3) = 1.212X10^-7

S1/S2 = FSCF/PSCF=0.868 (0.77<PSCF/FSCF<1.43)

Q=[[FSCF(M3-M2)]*100)/%TG = 6.121X10^-9 mbar.l/sec

Test result: Standard leakage rate Q is with in acceptable value, Hence the test is deemed as sucessful/satisfactory

Note: * 1.0 std cm^3/sec = 1.0 mbar.l/sec , **Tracer gas (TG) = 97%

Manufacturer: N.VIJAY ANANDH, MANAGER, RASAII FLOW LINES PVT. LTD.

Valve tested by: T.THIAGARAJAN, ASNT LEVEL-II, NEXUS NDT SERVICES

Third party Witness: RAJAN BABU BOSE, TUV-NORD

The test parameters and observed mass spectrometer reading

Valve Tested- 2” 300# Sleeved Plug Valve
M1- 1.9x10-7 mbar.l/sec
Response time- 25 sec
M2- 2.3x10-9 mbar.lsec
M3- 3.8x10-9 mbar.l/sec
M4- 1.9x10-7 mbar.l/sec
Response time – 26 sec
Q={[FSCF(M3-M2)]*100} /%TG= 1.660824x10-9 mbar.l/sec
Standard leakage rate Q is within acceptable value. Hence the test is deemed as successful/satisfactory

Refer clause 2 – “Technical Information” for Dimension details

3.4.3) Low Fugitive Emission – API 641 / ISO 15848 – RFL Enviro

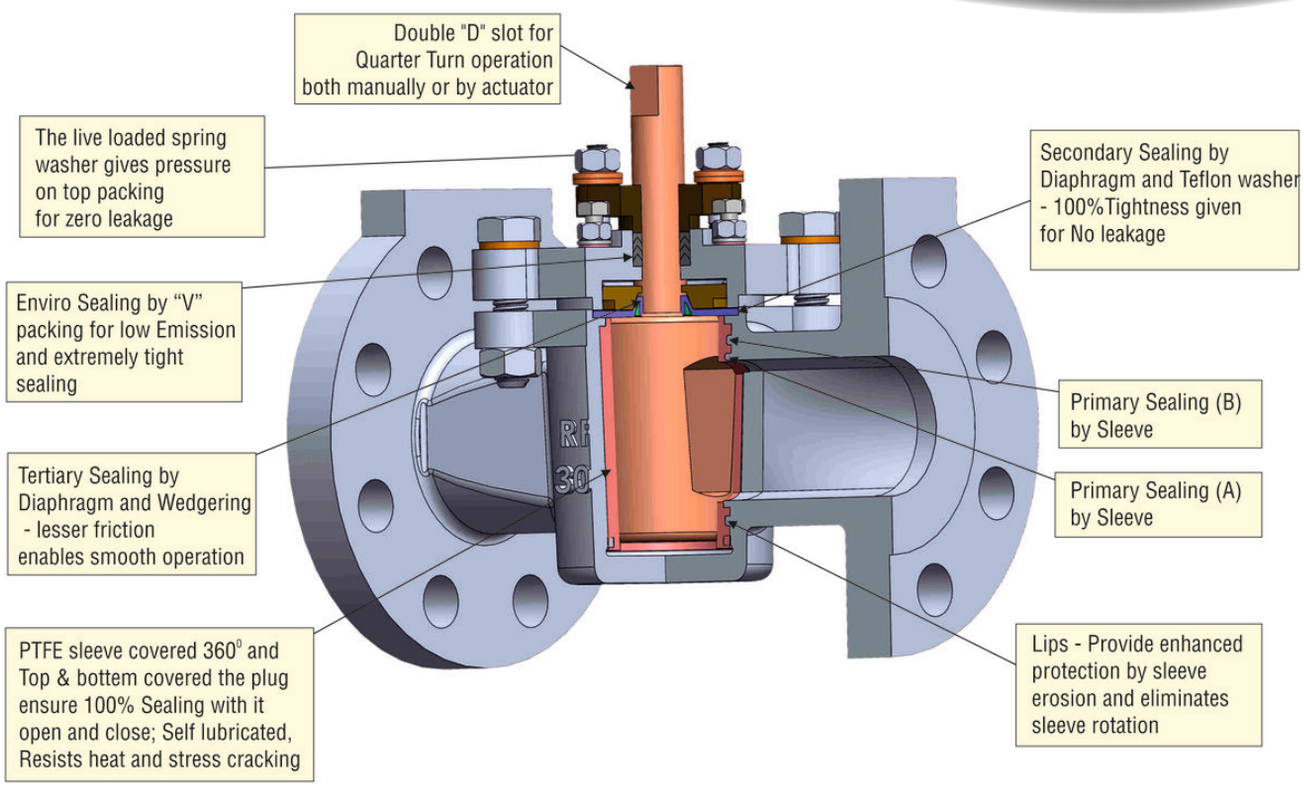
LOW FUGITIVE EMISSION VALVES

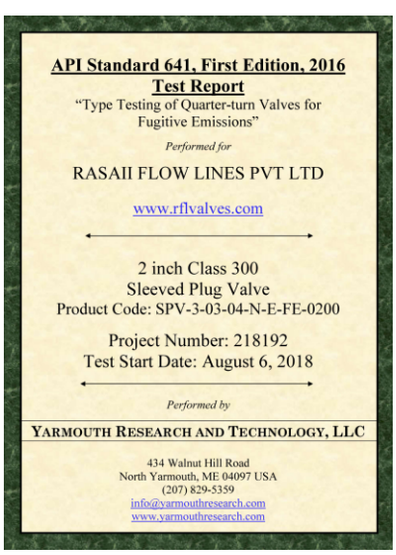
RFL ENVIRO VALVES MEETING API 641 NORMS

RFL's low (Fugitive) emission valves comply to API 641 or ISO 15848 -1. Valves are type tested with both Methane & Helium, with type tests procedures fully complying to API 641 & ISO 15848 - 1 standard requirements. Type testing to API 641 was done, successfully, in the renowned US test laboratory. Ie YARMOUTH LABORATORY, USA. RFL can supply Fugitive Emission Compliant Valves as per ISO 15848-part1 and can provide ISO 15848 – part 2 production test certificates, as part of order requirement.

Valve Type Qualified

Sleeved Plug Valve(SPV)
Non-Lubricated
Body & Cover Plate-
ASTM 216WCB
Plug & Stem-
ASTM A351CF8M Integral
Seat-PTFE Sleeve
Bolting-ASTM A193GrB7
Body Gasket-PTFE,
Diaphragm and WedgeRing
Stem Seal-PTFE'V'packing
Other Stem Seal Material-
PTFE
Size & Class - 2"&300#
Design Standard - BS5353&
API599
Face to Face F-F-ANSI
B16.10
Valve Group-'E'
Valve Testing-API598
End Connection-Flanged to ANSI B16.5





API Standard 641, First Edition, 2016
Test Report
"Type Testing of Quarter-turn Valves for Fugitive Emissions"

Performed for

RASAII FLOW LINES PVT LTD

www.rflvalves.com

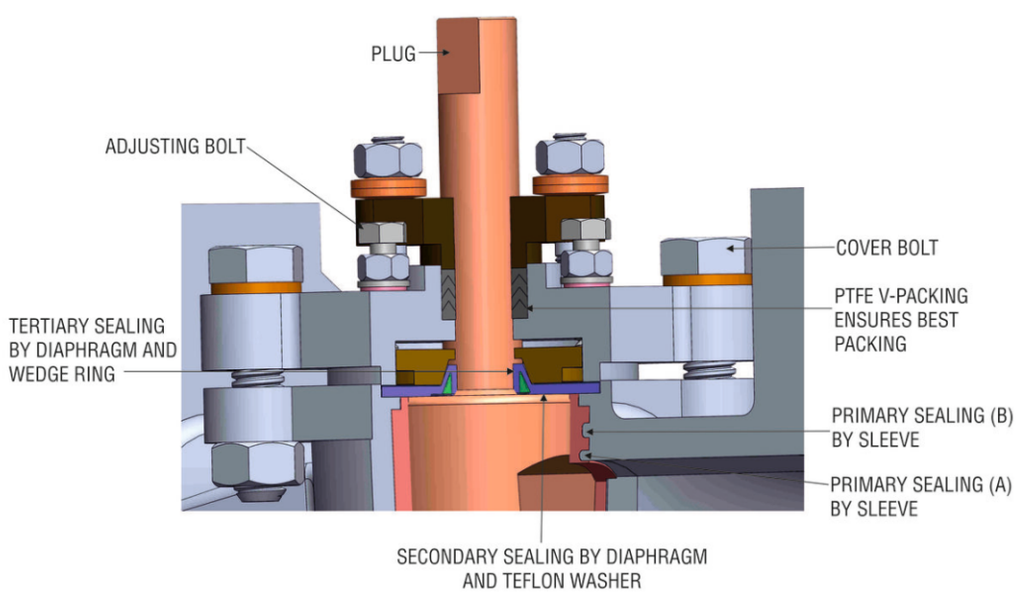
2 inch Class 300
Sleeved Plug Valve
Product Code: SPV-3-03-04-N-E-FE-0200

Project Number: 218192
Test Start Date: August 6, 2018

Performed by

YARMOUTH RESEARCH AND TECHNOLOGY, LLC

434 Walnut Hill Road
North Yarmouth, ME 04097 USA
(207) 829-5359
info@yarmouthresearch.com
www.yarmouthresearch.com



Unique Features:

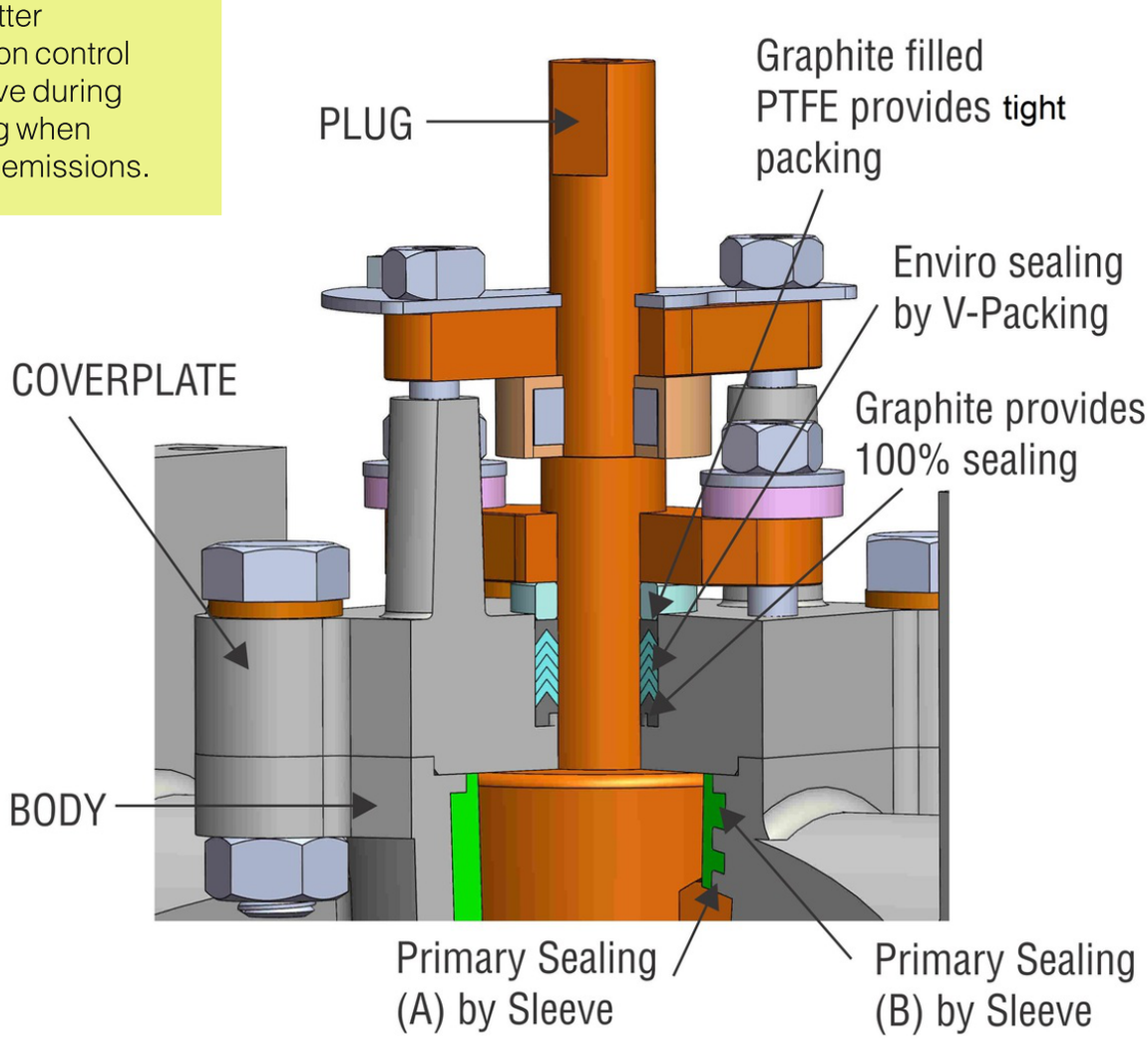
- RFL's Enviro valves are tested in accordance to API 641 & ISO 15848 Part - 1
- 'V' Packing provides outward sealing expansion when it is compressed and eliminates fugitive emissions through stem bore.
- Live loaded disc spring washer continuously provide pressure on the top of packing when components of valve expand thermally.

Refer clause 2 – "Technical Information" for Dimension details

3.4.4) Severe service SPV with Superior Emission control – RFL Enviro 2.0

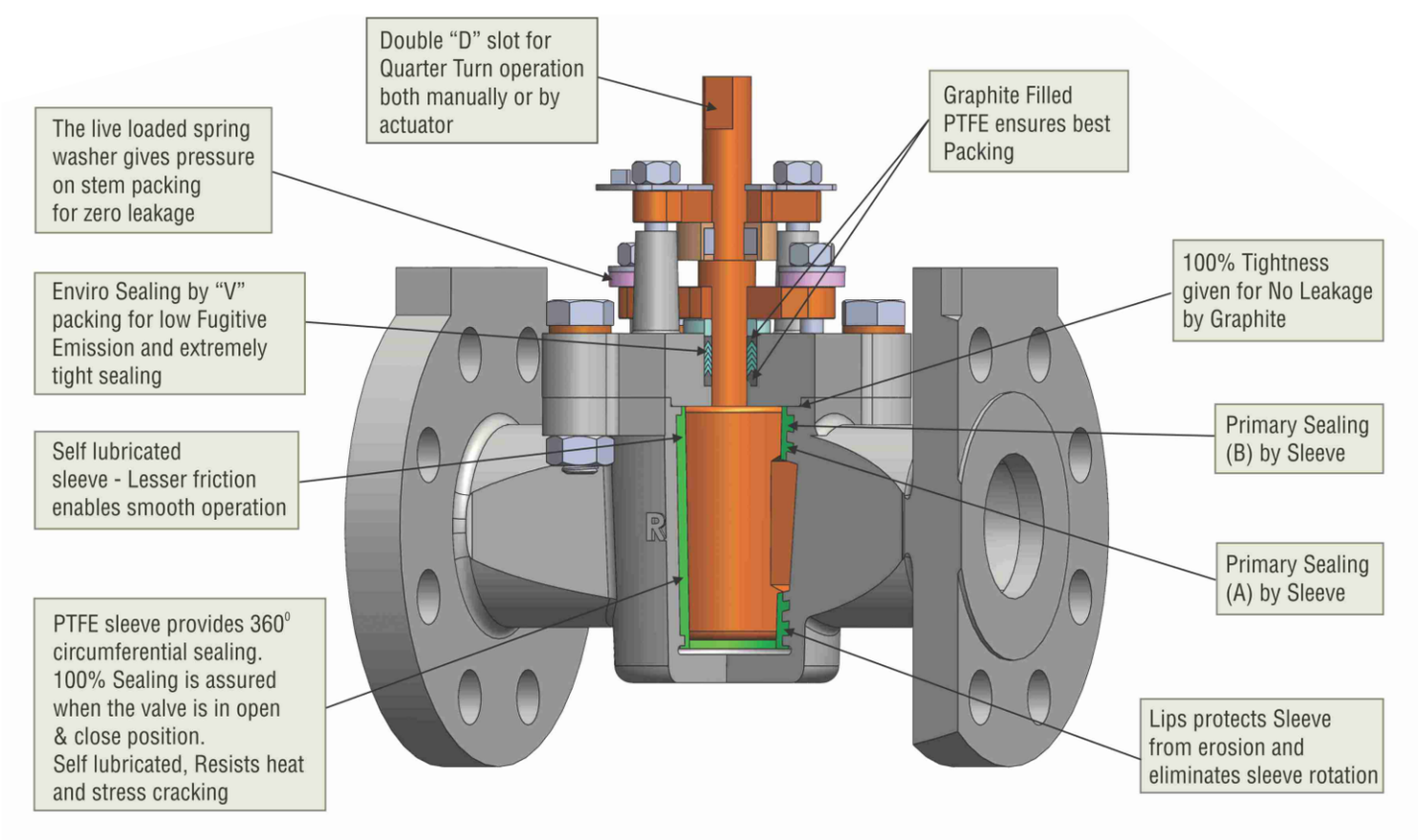
RFL SEVERE SERVICE EMISSION CONTROL VALVES- ENVIRO 2.0

RFL ENVIRO 2.0 provides foolproof sealing to atmosphere through Sleeve,Special V packing and unique design graphite packing. These valves offer better fugitive emission control and are effective during thermal cycling when there are more emissions.



RASAII
Since 1980

“Superior Fugitive Emission control Valves with Quadruple sealing along with RFL ENVIRO packing”



Here the Primary sealing is achieved through the sleeve that provides 360 degree circumferential sealing from port to port. Secondary sealing is provided by cover gasket in Graphite. Tertiary sealing is achieved through Diaphragm & Wedge ring and quartenary sealing is provided by special ENVIRO packing at the stem for low emission. The graphite filled PTFE end rings at the stem along with V packing ensures robust sealing.

The live loaded disc spring washer provides uniform and constant pressure on the Enviro packing. The graphite end rings prevents displacement of the PTFE chevron rings The Packing system is renewable and can be changed even when the valve is open on stream.

OPTIONS

1. Fire tested to API 607
2. Vaccum Tested with Helium gas
3. Available in ANSI class 150, 300
4. Flanged, Screwed and Socket Weld
5. Multiport Configurations Available

APPLICATION

- Used to handle hazardous chemicals and f luids
- Mainly used in Ethyl, Methyl, Glycol, Hydro carbon, Hydrogen service

Unique Features:

- Spring washers are available for any expansion and contraction of PTFE packing rings due to temperature fluctuations.
- Spring washers are completely enclosed to avoid damage and particle intrusion. PTFE end rings prevent extrusion of the PTFE packing and with PTFE cover seal

Refer clause 2 – “Technical Information” for Dimension details

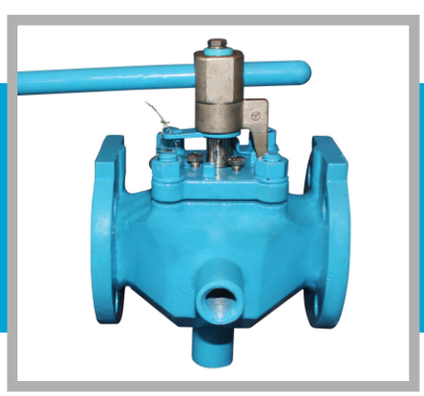
RASAII
Since 1980

3.5) By Jacket Type

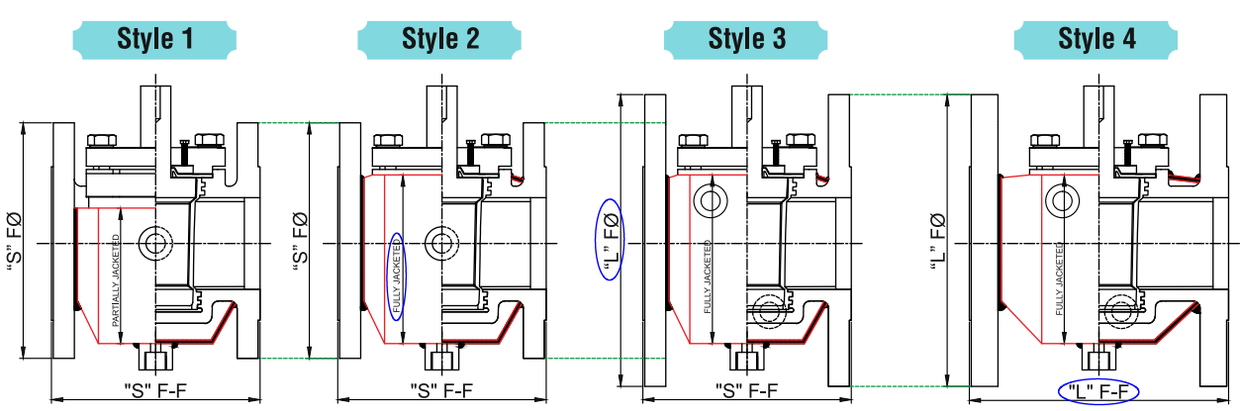
Non Lubricated Triple sealing arrangement
Superior Finish quarter Turn operation

1. Available in ANSI class 150 & 300
2. Qualified According to API 607
3. Qualified According to API 641
4. Models to be specified as per RFL Styles

Jacketed valves are mainly used to handle complex fluid applications such as Tar, Molten Sulphur, adhesives etc. The jacketed valve is specially designed for circulation of hot liquids/gases where the process temperature must be maintained through the valve in order to keep the process media in molten stage. This valve mainly prevents the media from solidifying. The jackets are suitable for heating media such as hot oil, steam and water. It has outlet connections for proper jacket drainage and the oversized flanges are in accordance to international standard. The jacket ensures rapid consistent heating.



- RFL manufactures both partially and fully jacketed valves.
- Fully jacketed valves are with over sized flanges
- Jacket extends from flange to flange and allows maximum heat transfer and consistent heating
- Solid casted jacket



"S" FØ - SMALLER SIZE FLANGE DIAMETER
"S" F-F - SMALLER SIZE FACE TO FACE

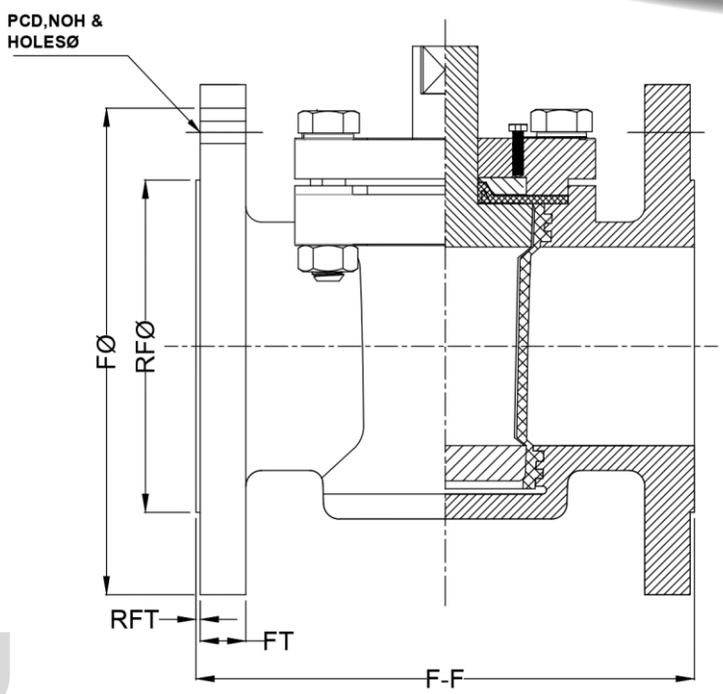
"L" FØ - LARGER SIZE FLANGE DIAMETER
"L" F-F - LARGER SIZE FACE TO FACE

Partially Jacketed Valve
* Valve and Corresponding flanges are of same size

Full Partially Jacketed Valve- Jacket extends till cover plate
* Valve and Corresponding flanges are of same size

Fully Jacketed Valve - 1
* Valve with oversized flanges and face to face corresponding to valve size

Fully Jacketed Valve - 2
* Valve with oversized flanges and face to face corresponding to over size flange size



STYLE 1 & 2

CLASS	SIZE	F-F	FØ	F.T	RFØ	RFT	P.C.D	NOH	SOH
#150	15	140	89	11	35	2	60	4	16
	20	152	98	11	43	2	70	4	16
	25	165	108	11	51	2	79	4	16
	40	190	127	14.3	73	2	98	4	16
	50	216	152	16	92	2	121	4	19
	65	283	190	19	105	2	140	4	19
	80	283	190	19	127	2	152	4	19
	100	305	229	24	157	2	190	8	19
	150	403	279	25.4	216	2	241	8	22
	200	419	343	29	270	2	298	8	22
	250	457	406	30	324	2	362	12	25
	300	502	483	32	381	2	432	12	25
	350	762	527	35	413	2	476	12	29
	400	838	597	37	470	2	539	16	29
#300	15	140	96	14.3	35	2	67	4	16
	20	152	117	16	43	2	83	4	19
	25	165	124	17.5	51	2	89	4	19
	40	190	156	20.7	73	2	114	4	22
	50	216	165	22.3	92	2	127	8	19
	65	283	210	29	105	2	149	8	22
	80	283	210	29	127	2	168	8	22
	100	305	254	32	157	2	200	8	22
	150	403	318	37	216	2	270	12	22
	200	419	381	41	270	2	330	12	25
	250	457	445	48	324	2	387	16	29
	300	502	521	51	381	2	450	16	32
	350	762	584	54	413	2	514	20	32
	400	838	648	57.2	470	2	572	20	35

STYLE 3

CLASS	SIZE	F-F	FØ	F.T	RFØ	RFT	P.C.D	NOH	SOH
#150	25 X 50	127	152	11	92	2	121	4	19
	40 X 50	165	152	14.3	92	2	121	4	19
	50 X 80	178	190	16	127	2	152	4	19
	65 X 80	203	190	19	127	2	152	4	19
	80 X 100	203	229	19	157	2	190	8	19
	100 X 150	229	279	24	216	2	241	8	22
	150 X 200	267	343	25.4	270	2	298	8	22
	200 X 250	292	406	29	324	2	362	12	25
	250 X 300	330	483	30	381	2	432	12	25
#300	25 X 50	165	165	17.5	92	2	127	8	19
	40 X 50	190	165	20.7	92	2	127	8	19
	50 X 80	216	210	22.3	127	2	168	8	22
	65 X 80	283	210	29	127	2	168	8	22
	80 X 100	283	254	29	157	2	200	8	22
	100 X 150	305	318	32	216	2	270	12	22
	150 X 200	403	381	37	270	2	330	12	25
	200 X 250	419	445	41	324	2	387	16	29
	250 X 300	457	521	48	381	2	450	16	32

STYLE 4

CLASS	SIZE	F-F	FØ	F.T	RFØ	RFT	P.C.D	NOH	SOH
#150	25 X 50	178	152	16	92	2	121	4	19
	40 X 50	178	152	16	92	2	121	4	19
	50 X 80	203	190	19	127	2	152	4	19
	65 X 80	203	190	19	127	2	152	4	19
	80 X 100	229	229	24	157	2	190	8	19
	100 X 150	267	279	25.4	216	2	241	8	22
	150 X 200	292	343	29	270	2	298	8	22
	200 X 250	330	406	30	324	2	362	12	25
	250 X 300	356	483	32	381	2	432	12	25
#300	25 X 50	216	165	22.3	92	2	127	8	19
	40 X 50	216	165	22.3	92	2	127	8	19
	50 X 80	283	210	29	127	2	168	8	22
	65 X 80	283	210	29	127	2	168	8	22
	80 X 100	305	254	32	157	2	200	8	22
	100 X 150	403	318	37	216	2	270	12	22
	150 X 200	419	381	41	270	2	330	12	25
	200 X 250	457	445	48	324	2	387	16	29
	250 X 300	502	521	51	381	2	450	16	32

RASAII
Since 1980

How to Order Your Sleeved Plug Valve?

VALVE TYPE	
SPV	SLEEVED PLUG VALVE
SPC	SLEEVED PLUG VALVE CAGE TYPE
SPJ	SLEEVED PLUG VALVE PARTIALLY JACKETED
SFJ	SLEEVED PLUG VALVE FULLY JACKETED
SFB	SLEEVED PLUG VALVE FULL BORE
SFP	SLEEVED PLUG VALVE FULL BORE PARTIALLY JACKETED
SFF	SLEEVED PLUG VALVE FULL BORE FULLY JACKETED
SPI	INVERTED SLEEVED PLUG VALVE
SPF	SLEEVED PLUG VALVE FIRE SAFE DESIGN
SFG	SLEEVED PLUG VALVE LOW FUGITIVE DESIGN
SPE	SLEEVED PLUG VALVE ENVIRO 2.0 - SEVERE SERVICE VALVE

PRESSURE CLASS	
1	150#
3	300#

PLUG MATERIAL	
01	CI
02	DI
03	WCB
04	CF8M (SS316)
05	CF3M (SS316L)
06	CD4Mcu
07	CN7M (ALLOY 20)
08	Hastalloy 'B'
09	Hastalloy 'C'
10	MONEL 400
11	CF8 (SS 304)
12	CF3 (SS 304L)
13	LCB
14	NICKEL CZ 100
15	904L
16	DUPLEX ST 4A
17	ARGONITE
18	CG8M
19	INCONNEL 600
20	WCC
21	ASTM A 890 Gr. 5A
22	CG3M

BODY MATERIAL	
01	CI
02	DI
03	WCB
04	CF8M (SS316)
05	CF3M (SS316L)
06	CD4Mcu
07	CN7M (ALLOY 20)
08	Hastalloy 'B'
09	Hastalloy 'C'
10	MONEL 400
11	CF8 (SS 304)
12	CF3 (SS 304L)
13	LCB
14	NICKEL CZ 100
15	904L
16	DUPLEX ST 4A
17	ARGONITE
18	CG8M
19	INCONNEL 600
20	WCC
21	ASTM A 890 Gr. 5A
22	CG3M

LINING	
N	NO LINING

OPERATION	
W	WRENCH OPERATED
G	GEAR OPERATED
P	PNEUMATIC OPERATED
E	ELECTRICAL ACTUATOR

END CONNECTION	
FE	FLANGED END
SE	SCREWED END
BW	BUTT WELD
SW	SOCKET WELD
3W	3 WAY
4W	4 WAY

EXAMPLE	
SLEEVED PLUG VALVE	SPV
CLASS 300#	3
WCB Body	03
SS 316 Plug	04
No Lining	N
Wrench Operated	W
Flanged End	FE
Size 1 1/2"	150

SIZES	INCHES	MM
0050	1/2"	15
0075	3/4"	20
0100	1"	25
0150	1 1/2"	40
0200	2"	50
0300	3"	80
0400	4"	100
0600	6"	150
0800	8"	200
1000	10"	250
1200	12"	300
1400	14"	350
1600	16"	400

Example 1: SPV30304NWFE0150

SLEEVED PLUG VALVE, CLASS 300#, BODY – WCB, PLUG – CF8M, SLEEVE – N (NO LINING), WRENCH OPERATED, END CONNECTION – FLANGED END, SIZE – 1 ½”

Example 2: SFG11104NPSE0300

SLEEVED PLUG VALVE – LOW FUGITIVE DESIGN, CLASS 150#, BODY – CF8,PLUG – CF8M, SLEEVE – N (NO LINING), PNEUMATIC OPERATED, END CONNECTION – SCREWED END, SIZE – 3”

Example 3: SPE10307NGFE0600

SLEEVED PLUG VALVE – ENVIRO 2.0 SEVERE SERVICE, CLASS 150#, BODY – WCB, PLUG – CN7M, SLEEVE – N (NO LINING), GEAR OPERATED, END CONNECTION – FLANGED END, SIZE – 6”

Manufactured by :

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TUV NABCB QM002

ISO 9001 : 2008

Our Distributor / Representative :