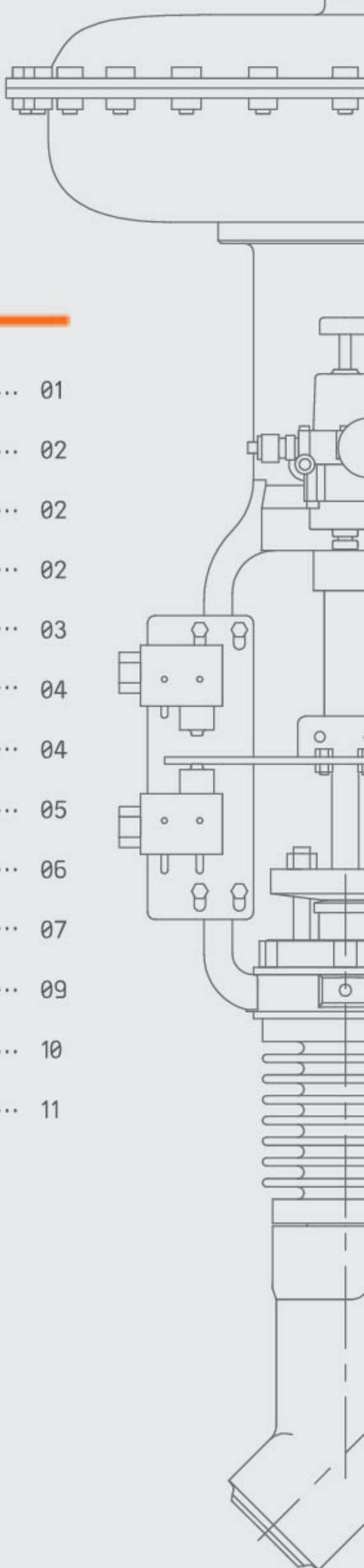


Pneumatic Y-pattern drain valve is our company developed a new generation automated valve based on the features of steam turbine system equipment in power plant. This series valve has a small size, light weight, compact structure, switch sensitive, good sealing, erosion-resistant characteristics. Fully compliance with ASME B16.34 standard, with world-class quality, can be widely used for supercritical and ultra supercritical unit.



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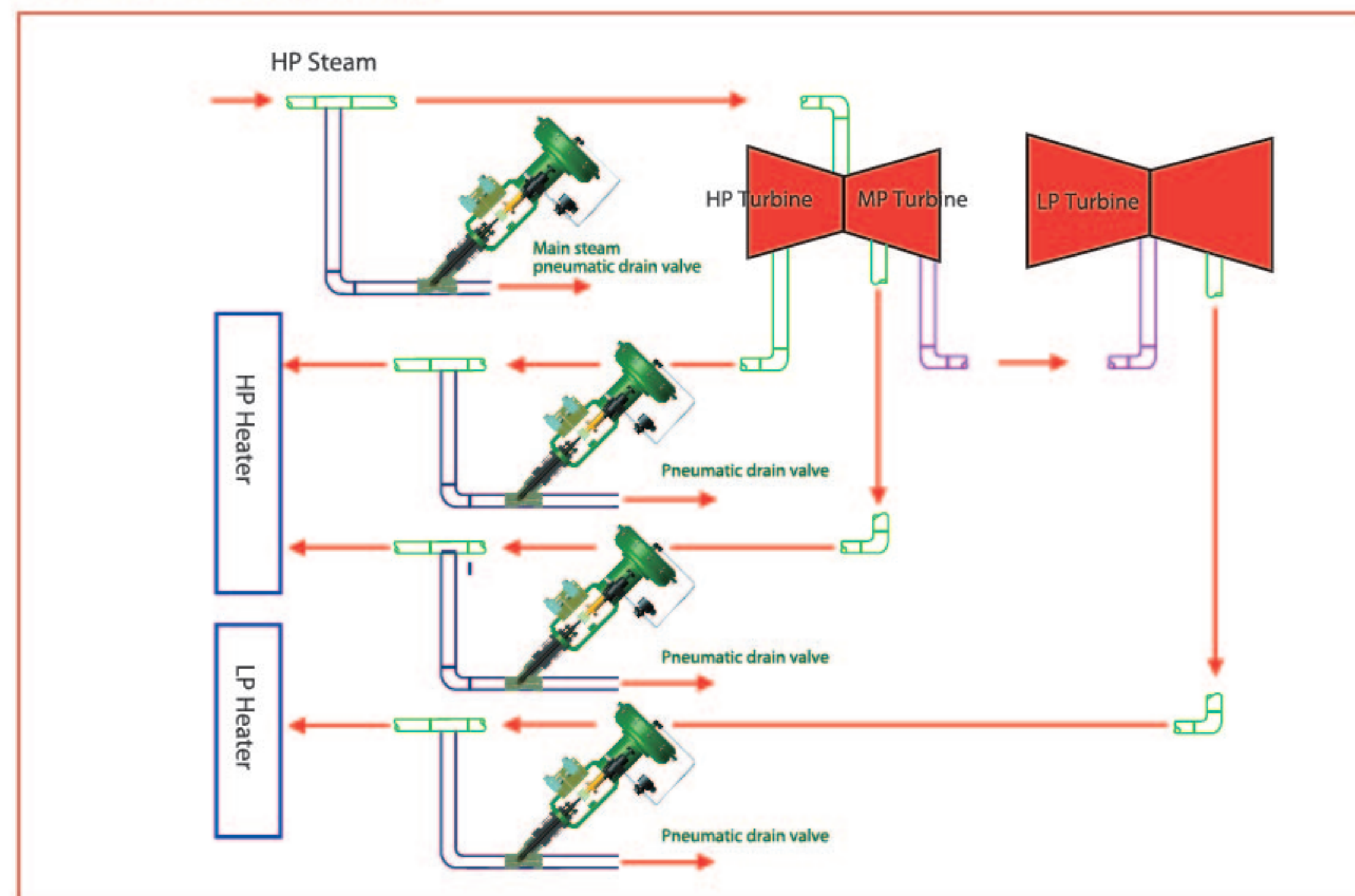


Application

Pneumatic drain valves are installed in steam pipes of thermal power unit. According to their site can be divided into:

- Main Steam Line Drain Valves
- Hot Reheat Line Drain Valves
- Cold Reheat Line Drain Valves
- First stage, second stage, third stage, fourth stage, fifth stage and sixth stage extraction steam line drain valves

Drain Valve Working Diagram



- **Function:** At startup of the turbine, the pneumatic drain valves are opened to exhaust steam-water mixture of each stage steam pipe. Also in the steam turbine failure or load rejection, drain valves will be opened to exhaust the steam and water in the pipeline to the container which ensure the security of the system.

Design Standards

- **Design & Manufacture:** ASME B16.34 API 598
- **Inspection & Test:** MSS SP-61 API 598
- **Connection End**
 - Socket Weld: ASME B16.11
 - Butt Weld: ASME B16.25
 - Flange: ASME B16.5
- **Design Class:** Special Class, Limit Class, Standard Class

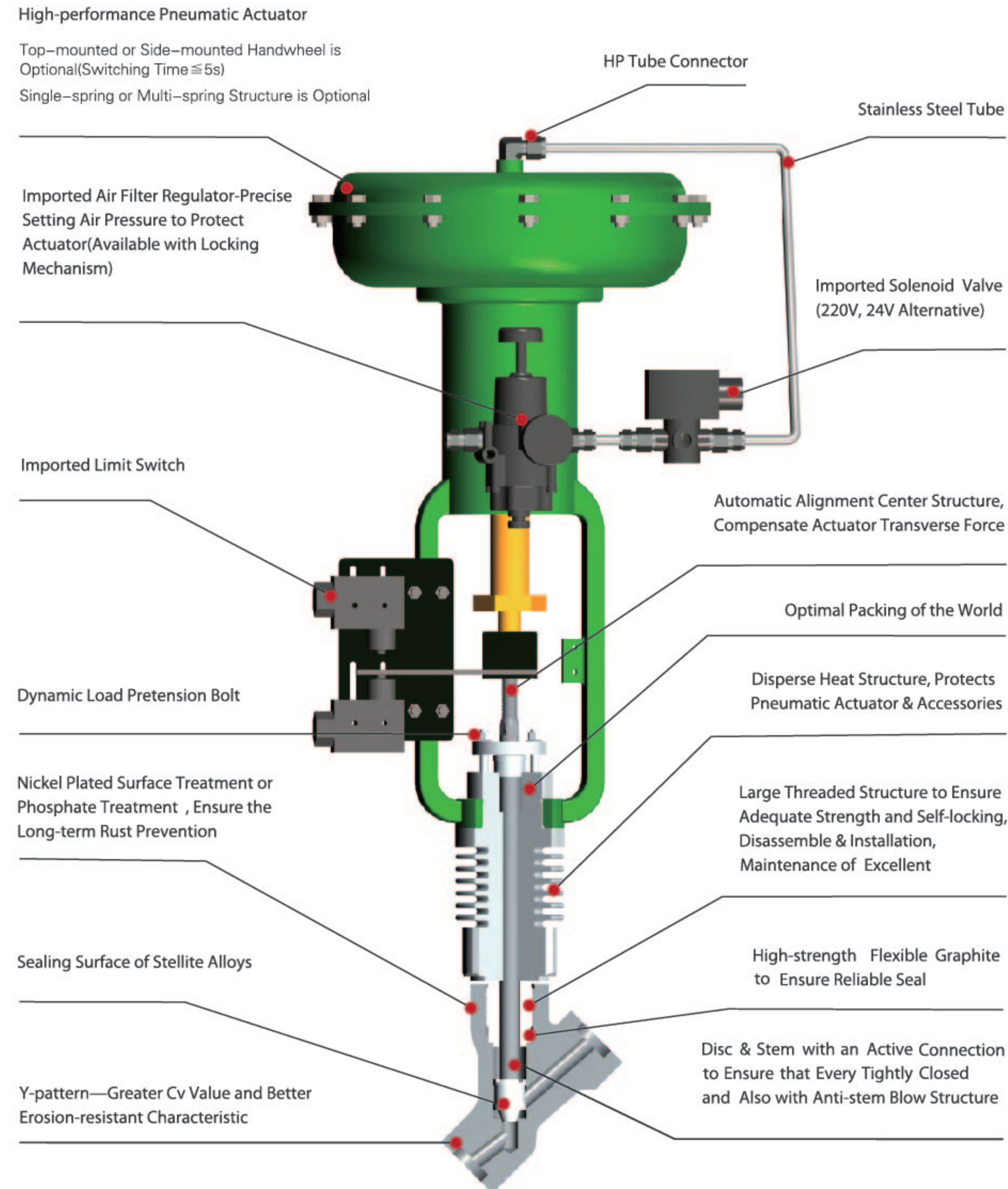
Y-Type Steam Drain Valve Parameters

- **Nominal Diameter:** 3/4" ~ 4"
- **Nominal Pressure:** ANSI 150LB ~ 4500LB
- **Applicable Temperature:** 20°C ~ 610°C
- **Actuator:** Pneumatic Actuator (Electric Motor Actuator is Optional)
- **Leakage Class:** Zero

Valve Characters

- Y-Type forged valve body, low flow resistance, greater Cv value.
- Disc with throttle piece, effectively protect sealing surface, extend valve service life.
- Disc & Seat sealing surface through special craft processing and machining, anti-cavitation, erosion-resistant.
- Processing two guide rings in disc, stem suffer force balanced, flexible movement.
- Stem packing all of imported U.S. Garlock high-quality flexible graphite packing, good chemical properties and flexibility, low friction, long service life.
- Fast switching-speed, normally 3-5 seconds, effective protection of system security, greatly reducing the time of the sealing surface erosion by media.
- There are disperse heat disks in the bonnet, can fully heat dissipation which protects pneumatic actuator & accessories are not subjected to high temperature and failure. Chamber gasket is clip S.S. wire high mesh flexible graphite with a better sealing and reliability than general type.

Anatomical Drawing

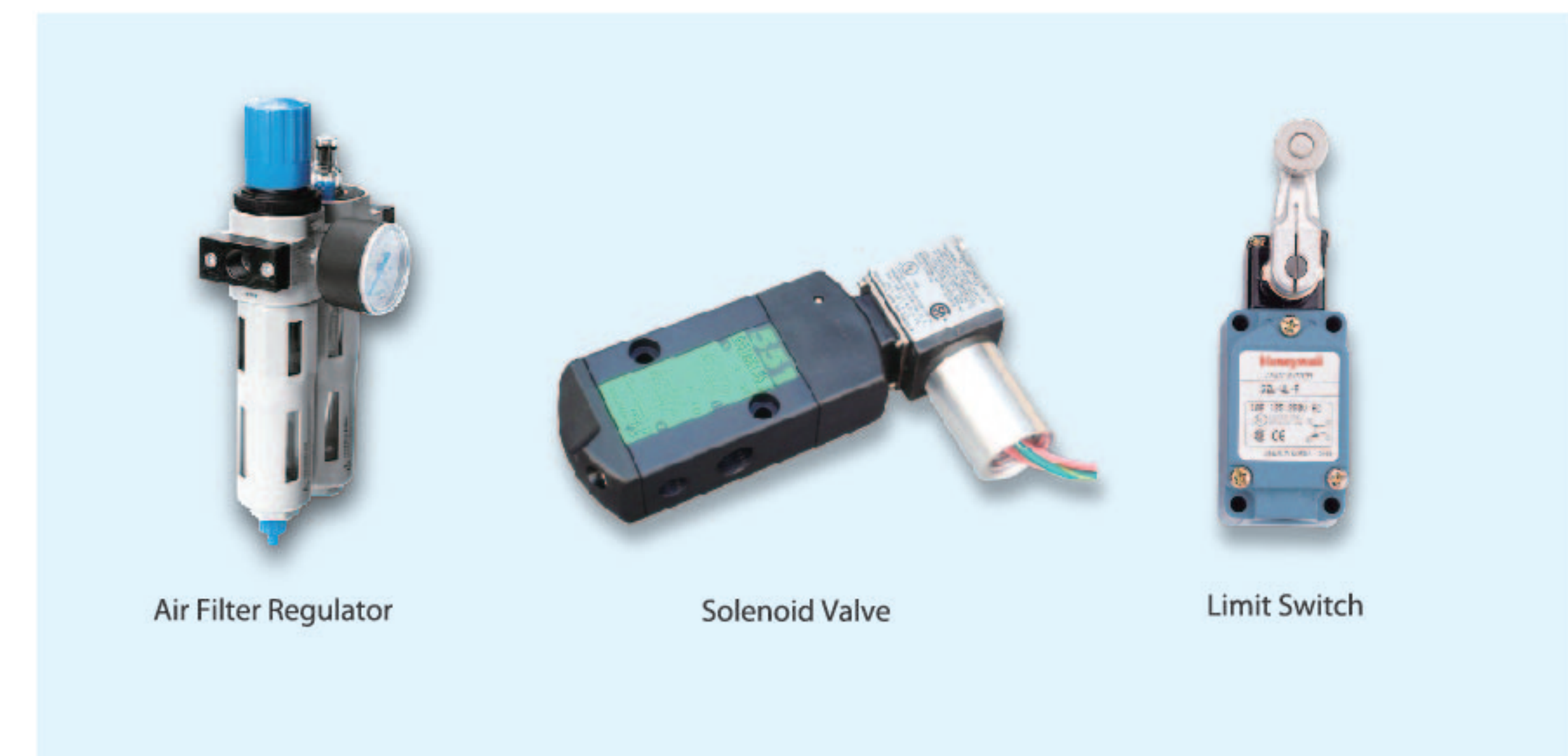


Performance Parameters

- **Valve body type:** Y-pattern 45°Angle
- **Body material:** A105、F22、F91、F92、F316
- **Bonnet:** Basic type, Disperse heat type
- **Trim:**
 - Integral Type: Integral overlaying welding seat
 - Internal parts can be replaced: Seat、Disc、Bonnet quick replacement、Maintenance performance
- **Packing:** Flexible graphite clip stainless steel wire
- **Flow characteristic:** Quick opening
- **Two kinds of actuator can be chosen:**
 - Pneumatic diaphragm actuator (single-spring & multi-spring type actuator, top-mounted & side-mounted hand-wheel can be chosen) Cylinder piston actuator

Accessories

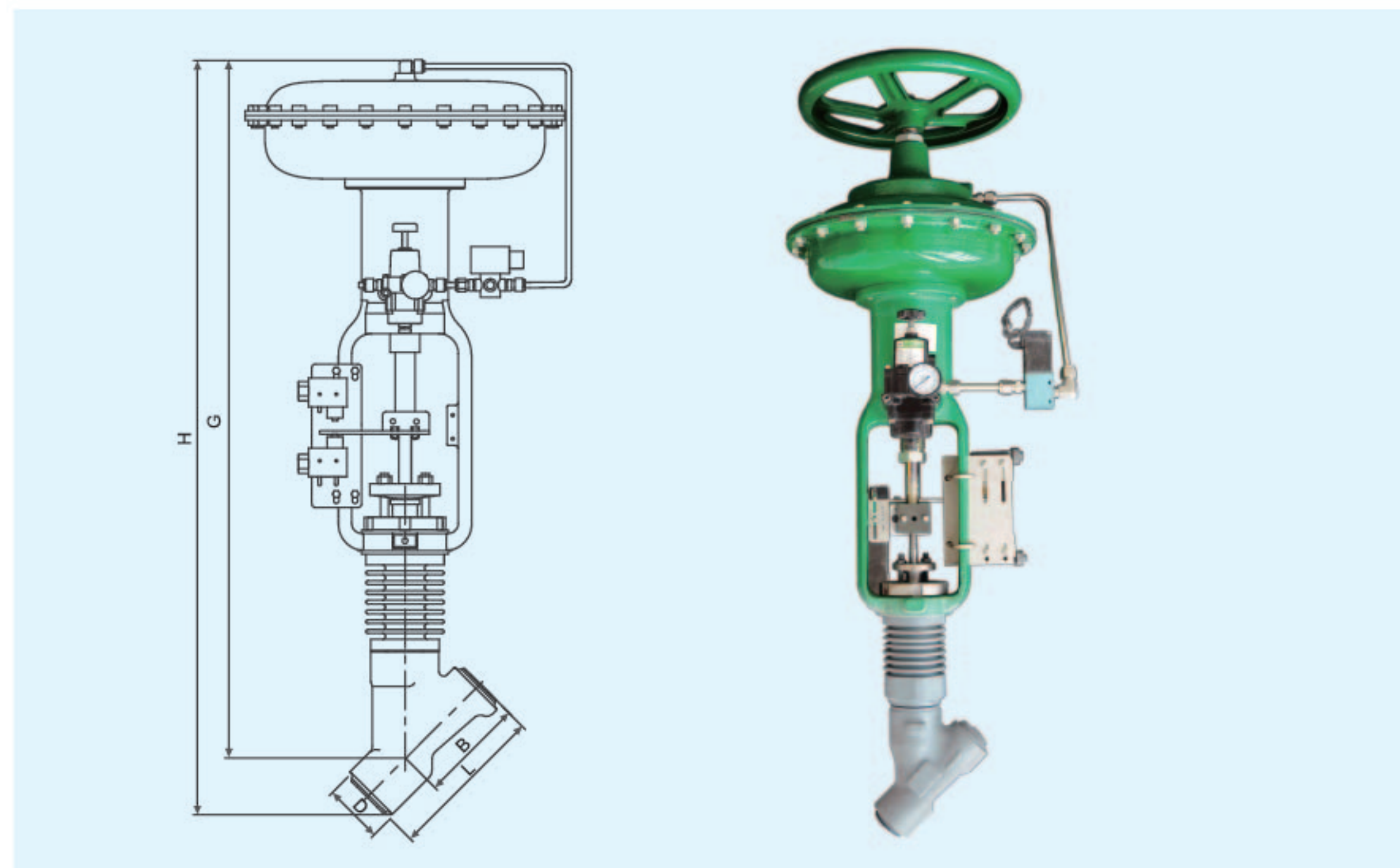
Can be selected according to customer requirements



Material Table

1	2	3	5	6	7
Body	Seat	Disc	Stem	Stuffing Box	Packing
A105	A105+Stellite	12Cr1MoV+Stellite	F6a	A105	Flexible Graphite
F22	F22 +Stellite	F22 +Stellite	25Cr2Mo1V	F22	Flexible Graphite
F91	F91+Stellite	F91+Stellite	25Cr2Mo1V	F91	Flexible Graphite
F92	F92+Stellite	F92+Stellite	25Cr2Mo1V	F92	Flexible Graphite
F316	F316+Stellite	F316+Stellite	F316	F316	Flexible Graphite

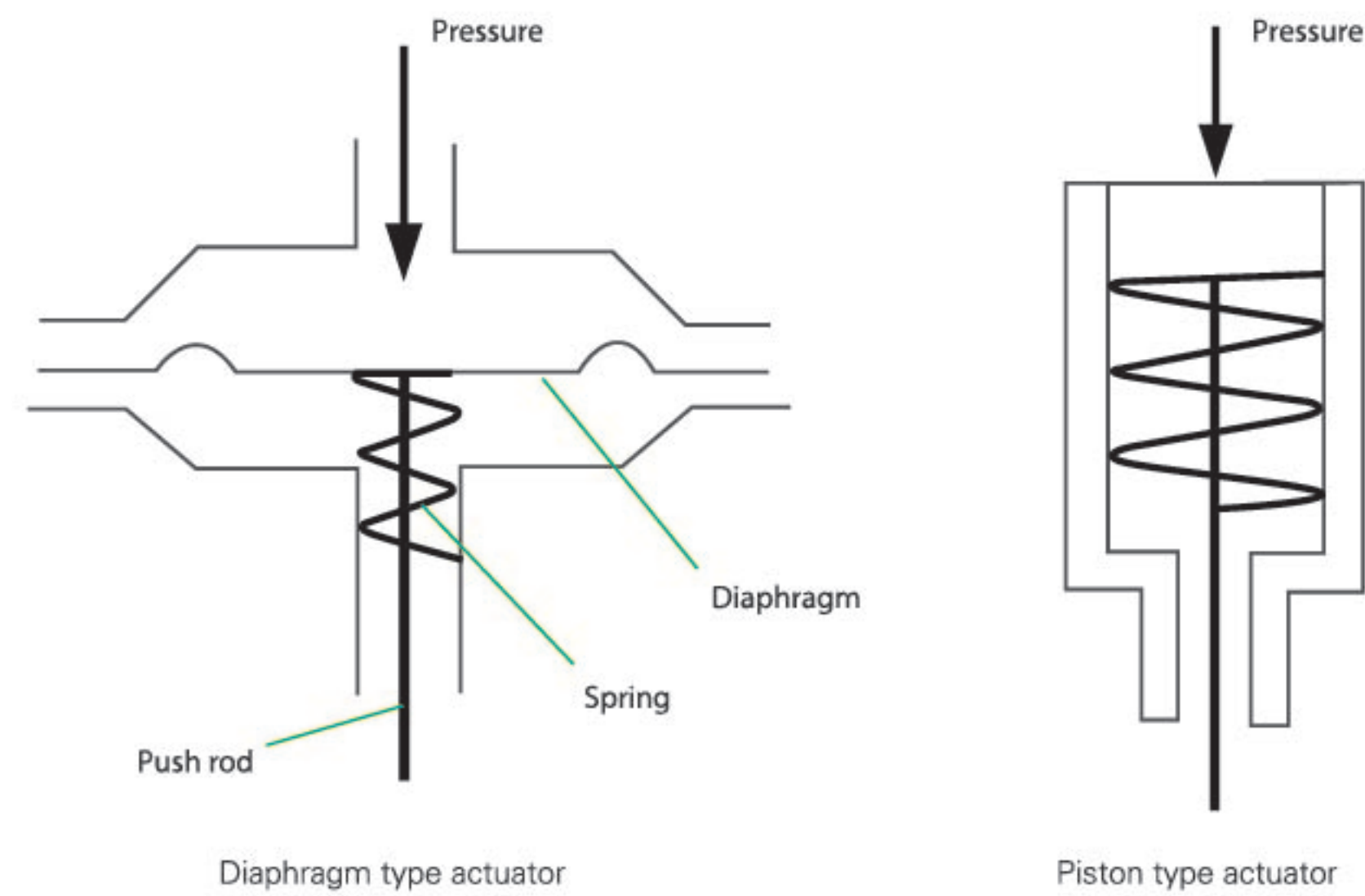
Dimension and Weight



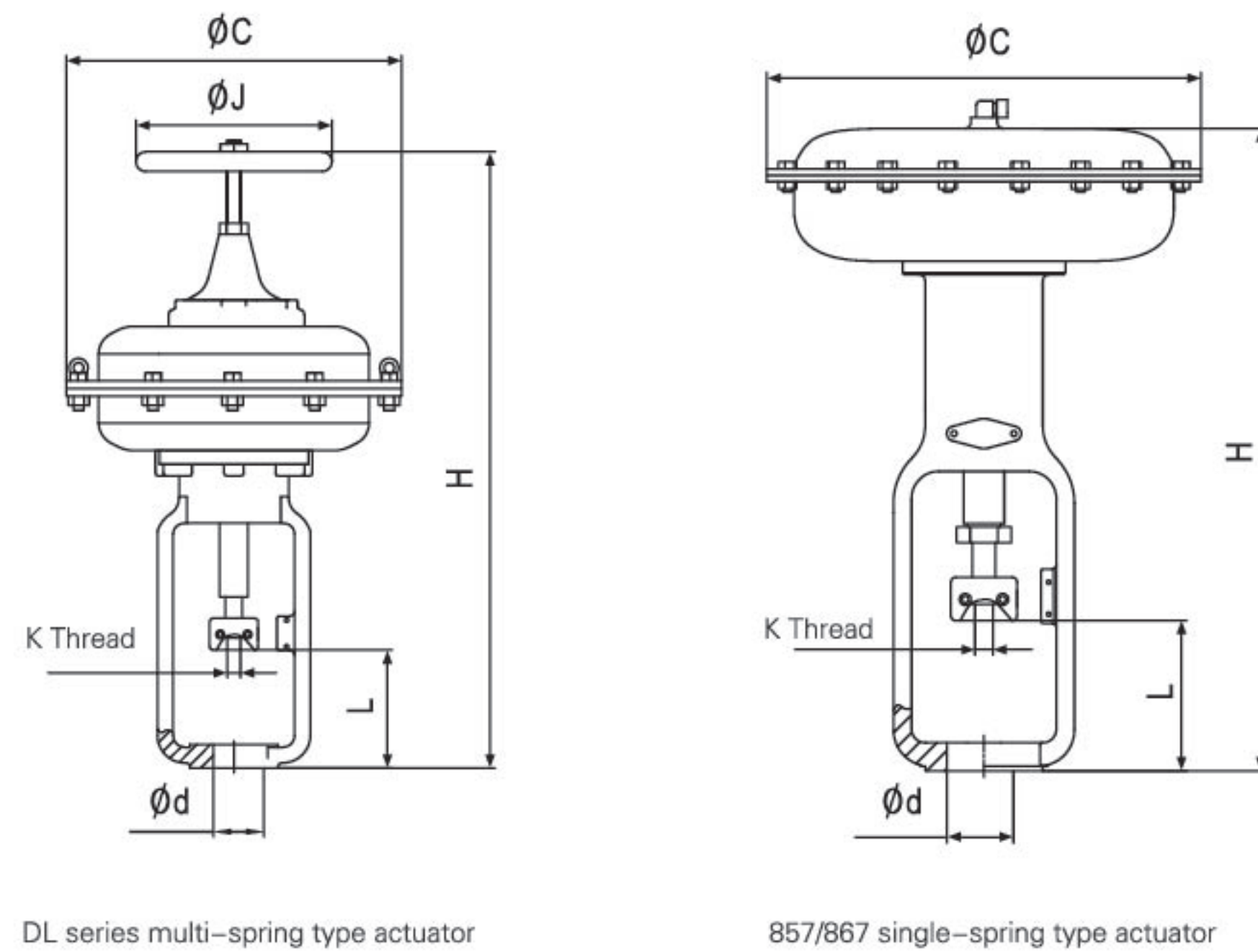
Pressure Rating	Nominal Diameter		L	D	B	H	G	Valve Body WT(Kg)
	Inch	mm						
≅ 900lb	1/2"	15	152	60	102	675	735	13
	3/4"	20	152	60	102	675	735	13
	1"	25	152	60	102	675	735	13
	1-1/4"	32	152	60	102	840	785	13
	1-1/2"	40	180	81	132	865	805	15.8
	2"	50	180	81	132	865	805	15.8
	2-1/2"	65	272	102	180	1128	1026	37.8
	3"	80	272	102	180	1128	1026	37.8
1500lb	1/2"	15	152	60	102	675	735	13
	3/4"	20	152	60	102	838	781	13
	1"	25	152	60	102	838	781	13
	1-1/4"	32	180	81	132	865	803	15.8
	1-1/2"	40	180	81	132	1036	974	15.8
	2"	50	272	102	180	1122	1021	37.8
	2-1/2"	65	325	122	224	1151	1037	63
	3"	80	325	122	224	1151	1037	63
2500lb	1/2"	15	152	60	102	838	781	13
	3/4"	20	152	60	102	838	781	13
	1"	25	152	60	102	838	781	13
	1-1/4"	32	180	81	132	865	803	15.8
	1-1/2"	40	180	81	132	1036	974	15.8
	2"	50	272	102	180	1122	1021	37.8
	2-1/2"	65	325	122	224	-	-	63
	3"	80	325	122	224	-	-	63
3500lb	1/2"	15	152	60	102	838	781	13
	3/4"	20	152	60	102	838	781	13
	1"	25	152	60	102	838	781	13
	1-1/4"	32	180	81	132	865	803	15.8
	1-1/2"	40	180	81	132	1036	974	15.8
	2"	50	272	102	180	1122	1021	37.8
	2-1/2"	65	325	122	224	-	-	63
	3"	80	325	122	224	-	-	63
4500lb	1/2"	15	152	60	102	838	781	13
	3/4"	20	152	60	102	838	781	13
	1"	25	152	60	102	838	781	13
	1-1/4"	32	180	81	132	865	803	15.8
	1-1/2"	40	180	81	132	1036	974	15.8
	2"	50	272	102	180	1122	1021	37.8
	2-1/2"	65	325	122	224	-	-	63
	3"	80	325	122	224	-	-	63
4500lb	4"	100	325	122	224	-	-	63

Pneumatic Actuator

Pneumatic actuator has diaphragm and piston type to be chosen



DELAN pneumatic operated y-pattern drain valves provide two kinds of pneumatic diaphragm actuator to be chosen: DL series multi-spring type actuator and 857/867 single-spring type actuator



DL Series Actuator Technical Parameters

Model	Max Travel (mm)	Nominal Effective Diaphragm Area (cm ²)	Spring Range (Kpa)	Diaphragm Material Temperature Capabilities (°C)	L (mm)	Without Handwheel h(mm)		Top-mounted Handwheel		Φ d (mm)	K Thread	Φ c (mm)	Weight (Kg)	
						H(mm)	Φ J(mm)	Without Handwheel	Top-mounted Handwheel					
DL ^A _B 23	25	350	20~100	Ethylene-propylene rubber clip nylon -30~120	115	371	525	200	54	3/8"- 24UNF	285	15	20	
DL ^A _B 34	40	560			177	470	675	200	71	1/2"- 20UNF	360	24	31	
DL ^A _B 45	60	900			236	600	840	300	90	3/4"- 16UNF	470	42	49	

857/867 Actuator Technical Parameters

Model	Max Travel (mm)	Nominal Effective Diaphragm Area (cm ²)	Spring Range (Kpa)	Diaphragm Material Temperature Capabilities (°C)	L(mm)		Without Handwheel H(mm)		Top-mounted Handwheel H(mm)		Φ d (mm)	K Thread	Φ c (mm)	Weight (Kg)	
					857	867	857	867	857	867				857	867
30	19	297	20~100	Nitrile synthetic rubber-40~+82	212.7	193.6	440	478	561	597	54	3/8"-24UNF	289	16	15
34	29	445			220.7	225.5	498	573	662	694	54	3/8"-24UNF	333	22	22
40	38	445			272.2	248.1	548	594	712	731	71	1/2"-20UNF	333	23	23
45	51	677	40~200	Silane synthetic rubber-54~+149	290.5	310.1	659	768	861	927	71	1/2"-20UNF	406	37	41
46	51	1006			290.5	310.1	656	748	858	907	71	1/2"-20UNF	473	49	55
50	51	677	200	Fluorous rubber -18~+149	354	325.4	722	784	924	943	90	3/4"-16UNF	406	42	43
60	51	1006			354	325.4	722	784	924	943	90	3/4"-16UNF	473	53	55
70	76	1419			406	375	840	933	1153	1219	90	3/4"-16UNF	536	107	115

Maintenance



Repair tool reference table

Size Code	Lapping Tools			Refacing Tools
	Lapping rods	Facing bars	Position threaded sleeve	
* A	TY-A-27	TY-B-27	TY-C-39	TH-27
* B	TY-A-34	TY-B-34	TY-C-48	TH-34
* C				
* E				
* D	TY-A-40	TY-B-40	TY-C-56	TH-40
* F	TY-A-44	TY-B-44	TY-C-60	TH-44
* G	TY-A-50	TY-B-50	TY-C-72	TH-72
* H				
* K				
* J	TY-A-56	TY-B-56	TY-C-84	TH-56



refacing Tools



Lapping rods

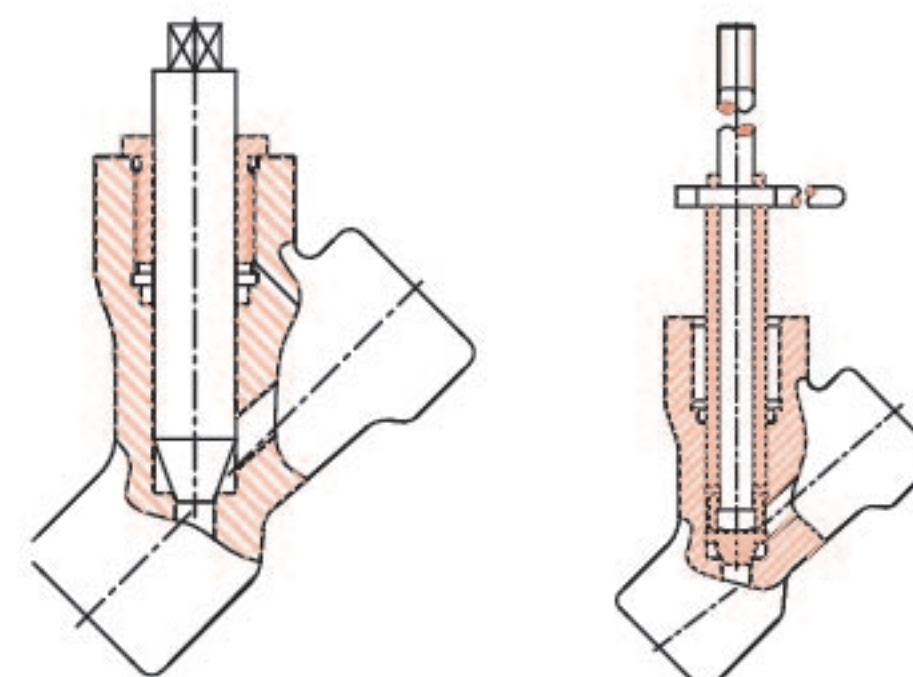
Note: * represent the first bit of size code can be freely selected

Seat refurbishment

The integral valve seat can not be through the replacement of the valve seat to repair. If valve seat sealing surface required to repair, according to the degree of sealing surface damage to determine the best repair method. The slight valve seat damage may only to grinds through the valve disc and seat repairs, serious damage may need to grind through the special tools(See the above table) or to reprocessing of the seat, and then again to grind through the valve disc and seat repairs.

After valve seat repaired, valve seat and disc must be repaired by lapping. To prevent the sealing surface scratches, note that can not lapping with too much load, regular lift the valve disc repositioning and clean the sealing surface.

The best seat lapping through the valve with color pen mark on the disc and gently turning the disc to determine a complete sealing surface contact effect on the seat to form a complete circle.



Seat Lapping

Facing

Product Model

Size	Product Type	Pressure Class	End Connection	Drive Mode	Body Material
2"	SY	20	F	1	C
Metric: mm	SY: Y-pattern Drain Valve	1=150LB	W: Butt Weld	1: Pneumatic Actuator	C: A105
Imperial: Inch	ST: T-pattern Drain Valve	3=300LB	S: Socket Weld	2: Electric Actuator	F22: F22
		6=600LB	F: Flange		F91: F91
		9=900LB			F92: F92
		20=1690LB			R: F316
		30=2680LB			
		45=4500LB			

Selected Model : 2" SY20FIC



How to Order :

Required to provide detailed technical parameters of the valve, As follows :

- Design Pressure, Design Temperature
- Working Pressure, Working Temperature
- Body Material
- End Connection & Pipeline Size
- Voltage of Solenoid Valve
- Limit Switch

Our engineer will make model selection according to your data

- Material
- Economic Suitable Valve Body
- Pneumatic Actuator
- Accessory



