

MANUAL

Installation / Operation / Maintenance

Flange STD : ANSI 150, PN10/16, JIS 10K

Temp. : -20°C~120°C

Work Pres. : 10 / 16 BAR : DN40~DN600

10 BAR : DN650~DN1200

Pd. Date : 2017.1.13



**Please Read All Of This Instruction Before
Installing Your 3530/353333/737 Valve**

Operating Manual	Issue Date	1, 13, 2017	Edition	3
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1.CE MARKING AND THE PRESSURE EQUIPMENT DIRECTIVE 97/23/EC

This has been implemented in European Union law by the pressure Equipment Regulations SI 1999/2001.

The regulations apply to all valves with a maximum allowable pressure higher than 0.5 bar. Valves with a maximum allowable pressure not exceeding 0.5 bar are outside the scope of the Directive. Valves are categorized in accordance with the maximum working pressure, size and ascending level of hazard, which is dependent on the fluid being transported. Fluids are classified as Group 1, dangerous fluids or Group 2, all other fluid including steam. Categories are SEP (sound engineering practice) and for ascending levels of hazard, I, II, III or IV. All valves designated as SEP do not bear the CE mark. Categories I, II, III or IV carry the CE mark and require a Declaration of Conformity. (Note – all valves up to and included 25 mm (1”) having a maximum allowable pressure greater than 0.5 bar are designed SEP regardless of fluid group.)

2.PRODUCT LIFE CYCLE

The life of the valve is dependent on its application, frequency of use and freedom from misuse. Compatibility with the system into which it is installed must be considered. The properties of the fluid being transported such as pressure, temperature and the nature of the fluid must be taken into account to minimize or avoid premature failure or non-operability. A well-designed system will take into consideration all the factors considered in the valve design, but additionally electrolytic interaction between dissimilar metals in the valve and the system must be examined. Before commissioning a system, it should be flushed to eliminate debris and chemically cleaned as appropriate to eliminate contamination, all of which will prolong the life of the valve.

3.LIMITS OF USE

The valves to which these installation, operation and maintenance instructions apply have been categorized in accordance with the Pressure Equipment Directive.

The fluid to be transported is limited to Group 2 fluids i.e. non-hazardous and on no account must these valves be used on any Group 1 fluid.

The seat material of these valves determines the limit of application as noted in the following table:

Fluid	Group 2 Gas and Group 2 Liquid		
Seat Material	PN	DN	Category
Nitrile Epdm	10	40 - 100	SEP
		125 – 350	I*
		400 – 500	II*
		550 – 1200	III*
	16	40 - 50	SEP
		65 – 200	I*
		250 – 300	II*
		350 – 600	III*

* Category I, II and III require CE mark

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4. OPERATING PRESSURES AND TEMPERATURES

4.1 PN rated valves

Seat Material	Non-shock pressure at Temperature range	Non-shock pressure at Max. temperature
EPDM	10 bar from -20°C to 120°C	10 bar at 120°C
	16 bar from -20°C to 120°C	16 bar at 120°C
Nitrile	10 bar from -10°C to 80°C	10 bar at 80°C
	16 bar from -10°C to 80°C	16 bar at 80°C

Not suitable for fatigue loading, fire testing, fire hazard environment, corrosive or erosive service, transporting fluids with abrasive solids.

4.2 PRESSURE/TEMPERATURE RATING

- ✧ Valves rated at PN10 to EN12334 must be installed in a piping system whose normal pressure and temperature do not exceed these ratings.
- ✧ If system testing will subject the valve to pressure in excess of the working pressure rating, this should be within the test pressure for the body with the pressure applied upstream of the obturator.
- ✧ The maximum allowable pressure in valves as specified in the standards is for non-shock conditions. Water hammer and impact for example, should be avoided.
- ✧ If the limits of use specified in these instructions are exceeded or if the valve is used on applications for which it was not designed, a potential hazard could result.

5. STORAGE CONDITION

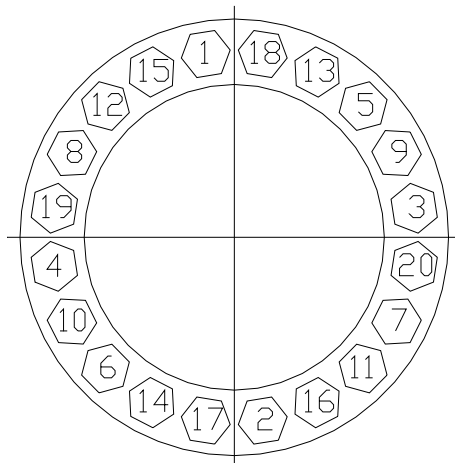
For tentative storage before piping operation or for long-term storage, keep valves indoors in a cool (temperature: -10 to 50 deg., humidity: 70% or less) and dark room, and maintain valve open at round 10 degree. Do not remove the plastic bag covering the valve body. Keep away from excessive dust and take care in protecting the valve and driving unit from excessive load.

If the valve remains unpacked for a long duration, dust and any foreign materials may enter the seat, which may cause seat leakage.

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<p>6. <u>INSTALLATION</u></p> <ul style="list-style-type: none"> ✧ Unpack the valve and check the inner parts are clean and free from foreign material and the disk could be operated smoothly. All special packaging material must be removed. ✧ The Fig. 3530/3533/737 butterfly valves are wafer pattern and are designed for bi-direction tight shut off and to fit between flanges, located within the flange bolting. ✧ Valves are precision manufactured items and as such, should not be subjected to misuse such as careless handling, allowing dirt to enter the valve through the end ports, lack of cleaning both valve and system before operation and excessive force during bolting. ✧ When large valves are provided with lifting lugs or nuts, these should be used to lift the valve. ✧ When installing butterfly valve directly to a check valve or pump, an extension piece should be employed to prevent the disc of valve from touching check valve or pump. ✧ Valves must be provided with adequate support. Adjoining pipework must be supported to avoid the imposition of pipeline strains on the valve body. ✧ Valve end protectors should only be permanently removed immediately before installation. The valve interior should be inspected through the end ports to determine whether it is clean and free from foreign matter. ✧ The mating faces of the valve and of the adjoining pipework flanges should be checked for correct flange, surface and condition. Do not use the flange gasket. If a condition is found which might cause leakage, no attempt to assemble should be made until the condition has been corrected. ✧ Install the valve after the completion of all welding operations around the valve in order to prevent damage caused by adhesion of welding patters. ✧ Wait until the welded flange has cooled before installing the valve to the pipe. Never weld the flange with the valve installed. ✧ Parallel alignment of flanges is especially important in the case of the assembly of a valve into an existing system. ✧ Chamfer the edged of the flange mating with valve seat ring to avoid possible damage to the seat ring. ✧ Do not blow air after the valve installed in the pipe. Otherwise this may damage seat ring. ✧ Clean the matching flange surface, if any rust or foreign matter adhere, remove with solution such as organic solvent. ✧ Check and see any distortion of the piping flange, misalignment, and damage to the gasket surface of the flange. 				

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<p>✧ Set a jack bolt to maintain the gap between flanges to insert the valve, the distance between flanges should be 10mm wider than valve body, then the valve could be inserted without interfere with flanges.</p> <p>✧ After center the pipe, insert bolts through the lugs of the valve and prevent it from dropping.</p> <p>✧ Before tightening the piping bolts, make sure the disc at an opened position and does not interfere with the flange.</p> <p>✧ Tighten the piping bolts with a torque not higher than the torque shown in following table.</p>																																																																																										
<table border="1"> <thead> <tr> <th>Nonaimal Bolts Size inch</th> <th>Taget Torque ft-lb</th> </tr> </thead> <tbody> <tr><td>1/2</td><td>60</td></tr> <tr><td>5/8</td><td>120</td></tr> <tr><td>3/4</td><td>210</td></tr> <tr><td>7/8</td><td>350</td></tr> <tr><td>1</td><td>750</td></tr> <tr><td>1-1/8</td><td>1050</td></tr> <tr><td>1-1/4</td><td>1400</td></tr> <tr><td>1-3/8</td><td>1800</td></tr> <tr><td>1-1/2</td><td>2350</td></tr> <tr><td>1-5/8</td><td>2950</td></tr> <tr><td>1-4/3</td><td>3650</td></tr> <tr><td>1-7/8</td><td>4500</td></tr> <tr><td>2</td><td>6500</td></tr> <tr><td>2-1/2</td><td>9000</td></tr> <tr><td>2-3/4</td><td>12000</td></tr> <tr><td>3</td><td>15700</td></tr> <tr><td>3-1/4</td><td>20100</td></tr> <tr><td>3-1/2</td><td>25300</td></tr> <tr><td>3-4/3</td><td>31200</td></tr> <tr><td>4</td><td>38000</td></tr> </tbody> </table>		Nonaimal Bolts Size inch	Taget Torque ft-lb	1/2	60	5/8	120	3/4	210	7/8	350	1	750	1-1/8	1050	1-1/4	1400	1-3/8	1800	1-1/2	2350	1-5/8	2950	1-4/3	3650	1-7/8	4500	2	6500	2-1/2	9000	2-3/4	12000	3	15700	3-1/4	20100	3-1/2	25300	3-4/3	31200	4	38000	<table border="1"> <thead> <tr> <th>Nonaimal Bolts Size inch</th> <th>Taget Torque N-m</th> </tr> </thead> <tbody> <tr><td>M14-2</td><td>110</td></tr> <tr><td>M16-2</td><td>160</td></tr> <tr><td>M20-2.5</td><td>350</td></tr> <tr><td>M24-3</td><td>550</td></tr> <tr><td>M27-3</td><td>800</td></tr> <tr><td>M30-3</td><td>1150</td></tr> <tr><td>M33-3</td><td>1550</td></tr> <tr><td>M36-3</td><td>2050</td></tr> <tr><td>M39-3</td><td>2650</td></tr> <tr><td>M42-3</td><td>3350</td></tr> <tr><td>M45-3</td><td>4200</td></tr> <tr><td>M48-3</td><td>5100</td></tr> <tr><td>M52-3</td><td>6600</td></tr> <tr><td>M56-3</td><td>8200</td></tr> <tr><td>M64-3</td><td>12400</td></tr> <tr><td>M70-3</td><td>16100</td></tr> <tr><td>M76-3</td><td>20900</td></tr> <tr><td>M82-3</td><td>26400</td></tr> <tr><td>M90-3</td><td>35100</td></tr> <tr><td>M95-3</td><td>41600</td></tr> <tr><td>M100-3</td><td>48500</td></tr> </tbody> </table>			Nonaimal Bolts Size inch	Taget Torque N-m	M14-2	110	M16-2	160	M20-2.5	350	M24-3	550	M27-3	800	M30-3	1150	M33-3	1550	M36-3	2050	M39-3	2650	M42-3	3350	M45-3	4200	M48-3	5100	M52-3	6600	M56-3	8200	M64-3	12400	M70-3	16100	M76-3	20900	M82-3	26400	M90-3	35100	M95-3	41600	M100-3	48500
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<p>GENERAL NOTES: The values shown are based on a Target Prestree of 50 ksi (root area). See Target Torque Determination. The root areas are based on coarse-thread series for sizes 1 in. and smaller, and 8-pitch thread series for sizes 1 1/8 in. and larger.</p>		<p>GENERAL NOTES: The values shown are based on a Target Prestree of 345 Mpa (root area). See Target Torque Determination. The root areas are based on coarse-thread series for sizes M27. and smaller, and 3-mm pitch thread series for sizes M30 and larger.</p>																																																																																								

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BOLT TIGHTENING SEQUENCE

- ✧ The piping bolts should be tightened alternately and evenly. Tighten one bolt and another diagonally, and then repeat the same procedure to insure well balanced tightening. Please refer to above **BOLT TIGHTENING SEQUENCE**.
- ✧ On the completion of the piping, open and close the valve to make sure that the disc does not touch the piping.

7. OPERATING

- ✧ Prior to operation, clean the outside of the piping by air-purging, and the inside of the piping by running water through the pipe.
- ✧ On the completion of piping, open and close the valve once every two weeks, if the valve was not in use for a long duration, open and close several times before actual operation.
- ✧ Keep the valve fully open during the pressure test (in which applied pressure exceeds the rated pressure). Never fully close the valve and use it as a blind flange.
- ✧ To avoid possible damage to the lever, hand-wheel and valve, never use an extension bar on the lever or "F" wrench on the hand-wheel. Unlike gate valves or glove valves, no torque tighten is required.
- ✧ Do not release the piping bolts before de-pressure the pipe system.

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8. MAINTENANCE

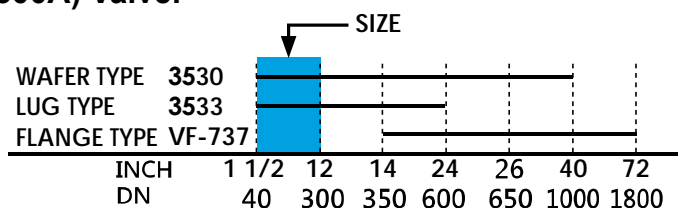
The many Value features minimize wear and maintenance requirements. No routine lubrication is required. All components - stem, disc, seat, taper pin, bushing, stem- seal, etc., are field replaceable, no adjustment is required. If components require replacement, the valve may be removed from the line by placing the disc near the closed position, then supporting the valve and removing the flange bolts.

9. DISASSEMBLY AND ASSEMBLY

9.1. Disassembly

1. 1.5"(40A) - 12"(300A) Valve.

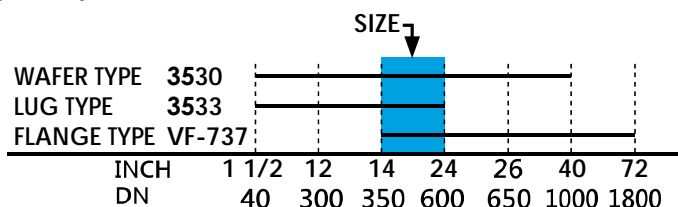
DN 40~300
INCH 1 1/2~12



- Remove handle, manual gearbox or actuator from mounting flange.
- Open the valve and position the disc around 135 degree from the fully close position. The retainer pin is then exactly positioned inside the slot of the top flange.
- Remove the retainer pin with a screwdriver or any sharp tool.
- Pull out the stem from the body.
- Take out the disc and liner from the body.

2. 14"(350A) - 24"(600A) Valve.

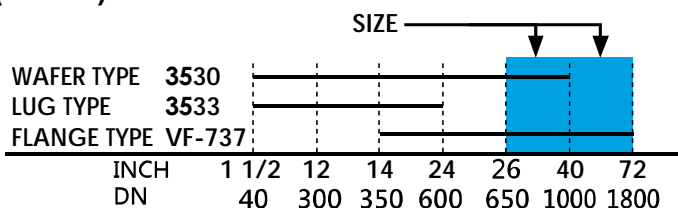
DN 350~600
INCH 14~24



- Remove manual gearbox or actuator from mounting flange.
- Remove the screws of upper cover. Remove the upper cover.
- Loose the bottom cover bolts, remove the bottom cover.
- Pull out both upper & lower stem from the body.
- Take out the disc and liner from the body.

3. 26"(650A) - 48"(1200A) Valve.

DN 650~1800
INCH 26~72



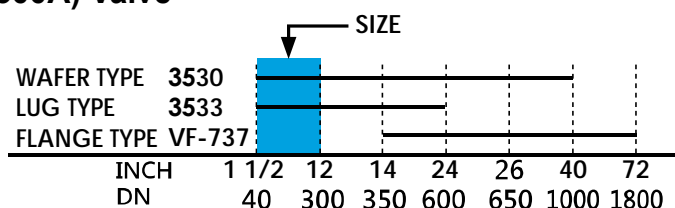
- Remove manual gearbox or actuator from mounting flange.
- Put a match mark on disc before pull out the pins.
- Pull out the upper stem and bottom stem.
- Take out the disc and liner from the body.

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9.2 . Assembly

1. 1.5"(40A) - 12"(300A) Valve

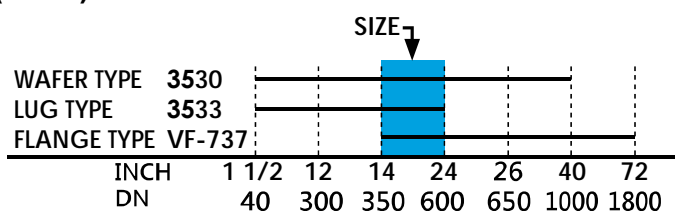
DN 40~300
INCH 1 1/2~12



- ✧ Push the valve liner into an oval and push it into the body with seat stem holes aligned to body stem holes.
- ✧ Insert stem seal and bushing, and then push the stem into the stem hole of the body until the bottom of the stem is flush with the inner top edge of the liner.
- ✧ Install a light coating of silicone on the I.D. of the liner. Insert the disc into the seat by lining up the disc hole with the stem hole of the seat. (Note: The broached octagon hole in the disc must be toward the bottom of the valve body)
- ✧ With a downward pressure the stem back and forth and rotating the disc, until the stem touches the bottom of the body stem hole.
- ✧ Pull out stem slightly and replace the stem seal and bush, make the dent of square stem to be parallel with disc, then replace the retainer pin and push back the stem.
- ✧ Drive the disc clockwise to close position.
- ✧ Reassemble the actuator and adjust the open and close position.

2. 14"(350A) - 24"(600A) Valve.

DN 350~600
INCH 14~24

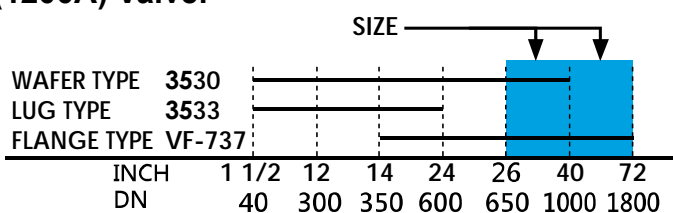


- ✧ Push the valve liner into an oval and push it into the body with seat stem holes aligned to body stem holes.
- ✧ Insert stem seal and bushing, and then push the bottom stem into the stem hole of the body until the bottom of the stem is flush with the inner top edge of the liner.
- ✧ Install a light coating of silicone on the I.D. of the liner. Insert the disc into the seat by lining up the disc hole with the stem hole of the seat. (Note: The broached octagon hole in the disc must be toward the upper of the valve body)
- ✧ Upside down the body let the bottom side of the body on the ground vertically and rotating the disc and the bottom stem will go into the disc hole automatically.
- ✧ Push the upper stem into the stem hole of the body,
- ✧ Drive the stem and let the slot parallels with disc, then insert the pin and put on the upper cover.
- ✧ Screw up the bolts and tighten them up.
- ✧ Insert the pin to the lower stem, then put on O-ring seal and bottom cover and tighten.
- ✧ Reassemble the actuator and adjust the open and close position.

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3. 26"(650A) - 48"(1200A) Valve.

DN 650~1800
INCH 26~72



- ✧ Push the valve liner into an oval and push it into the body with seat stem holes aligned to body stem holes.
- ✧ Insert stem seal and bushing, then push the bottom stem into the stem hole of the Body until the bottom of the stem is flush with the inner top edge of the liner.
- ✧ Install a light coating of silicone or grease on the I.D. of the liner. Place the mounting flange of the body on the ground vertically. Insert the disc into the seat by lining up the disc hole with the stem hole of the seat. (Note: The match marks made on the disc before disassemble are recognized which is upper side.)
- ✧ Upside down the body let the bottom side of the body on the ground vertically and rotating the disc and the bottom stem will go into the disc hole automatically.
- ✧ Push the upper stem into the stem hole of the body, and put the pins into the pin holes.
- ✧ Replace the tape seal of the plugs, and then tighten them up.
- ✧ Reassemble the actuator and adjust the open and close position.

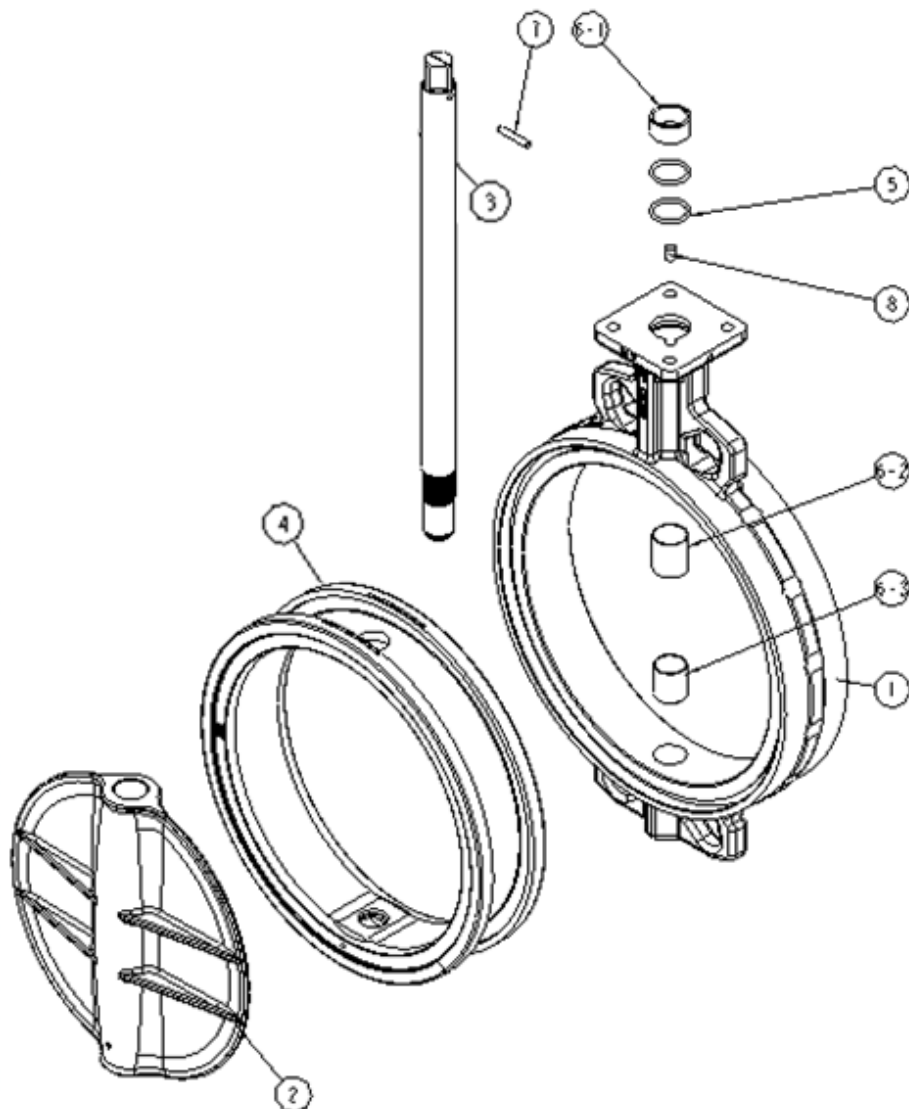
10. INSPECTION

- ✧ The valve should be at zero pressure and ambient temperature prior to any inspection.
- ✧ Maintenance Engineers & Operators are reminded to use correct fitting tools and equipment.
- ✧ A full risk assessment and methodology statement must be compiled prior to any maintenance.
- ✧ The risk assessment must take into account the possibility of the limits of use being exceeded whereby a potential hazard could result.
- ✧ A maintenance program should therefore include checks on the development of unforeseen conditions, which could lead to failure.
- ✧ In systems where corrosion could be a potential hazard, wall thickness checks on the body and bonnet should be made. This requires the removal of the valve from the pipeline at zero pressure. If the wall and disc thickness has reduced by 25%, the valve must be replace.
- ✧ For the supply of genuine Value spares or technical assistance contact KLINGER Denmark A/S

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3530/3533/VF-73_ Series IRON Body 2"~12"

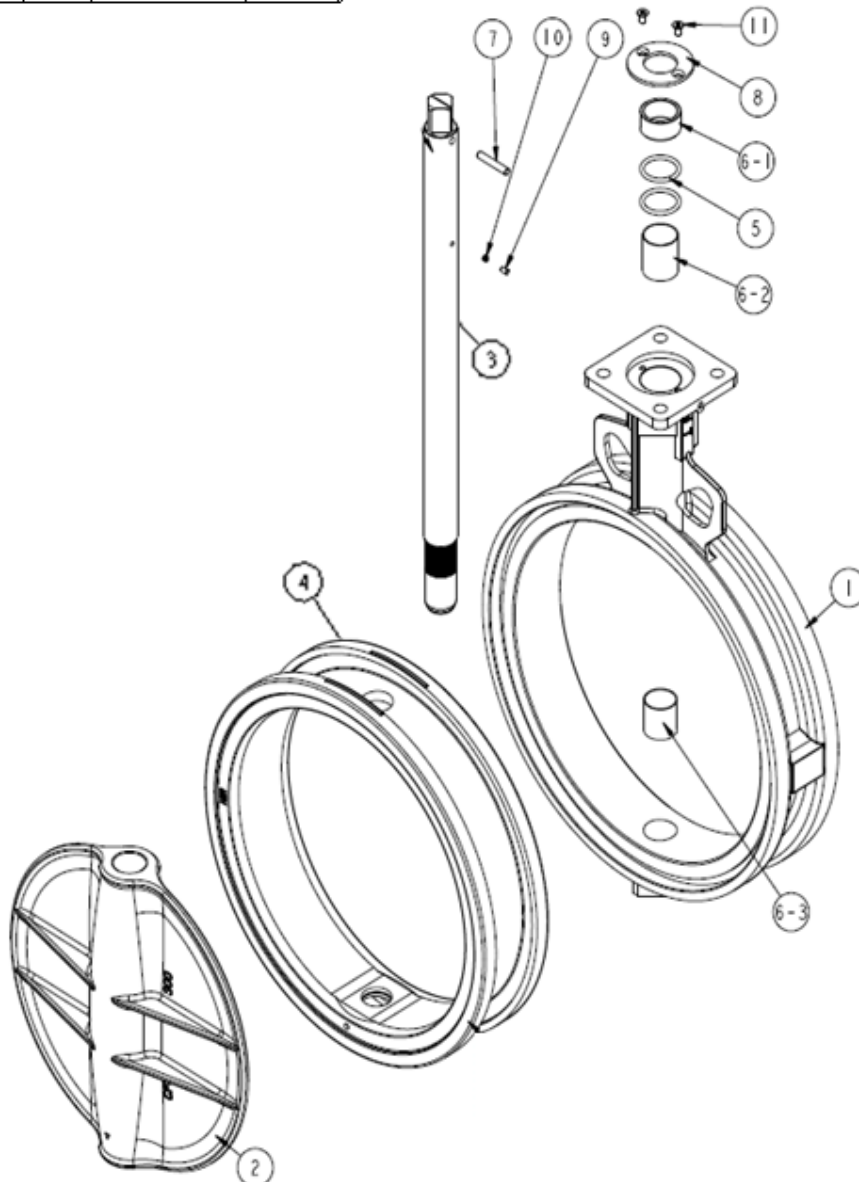
No	Name	Materials	Spare parts	No	Name	Materials	Spare parts
1	BODY	A126 Cl. B		5	O-RING	NITRILE(NBR)	*
		A536 65-45-12		6-1		DELFIN	*
2	DISC	A536 65-45-12		6-2	BUSHING	RPTFE+A.240 Gr. F304	*
		A351 Gr. CF8		6-3		B62	*
		A351 Gr. CF8M		7	FIN	A182 Gr. F304	*
		B148 C95400		8	FLUG	NITRILE(NBR)	*
3	SHAFT	A182 Gr. F6a					
		A182 Gr. F304					
		A182 Gr. F316					
		A564 Gr. 630					
4	SEAT	NITRILE(NBR)					
		EPDM					
		EPT					
		NEOPRENE(CR)					
		SILICON					
		HYPALON(CSM)					
VITON							



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3530/3533/VF-73_ Series Steel Body 2"~12"

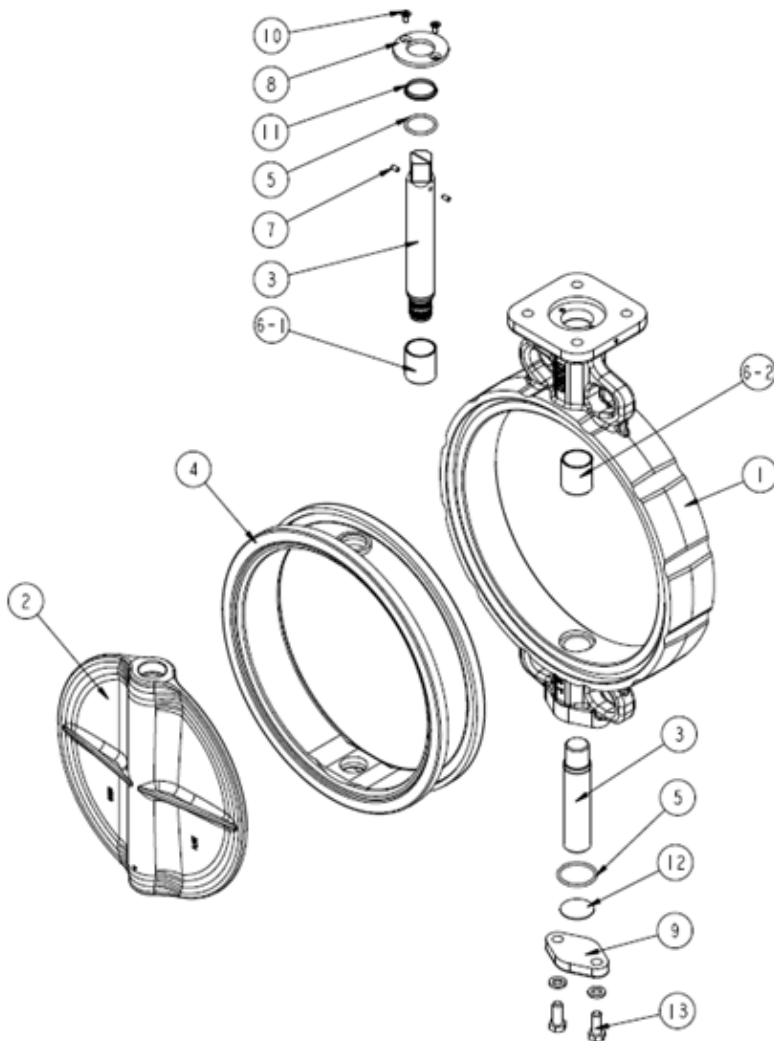
No	Name	Materials	Spare parts	No	Name	Materials	Spare parts
1	BODY	A216 Gr. WCB		5	O-RING	NITRILE(NBR)	*
		A351 Gr. CF8		6-1	BUSHING	DELRIN	*
		A351 Gr. CF8M		6-2		RPTFE+A240 Gr. F304	*
6-3		*					
2	DISC	A351 Gr. CF8		7	FIN	A182 Gr. F304	*
		A351 Gr. CF8M					
3	SHAFT	A182 Gr. F6a		8	UPPER COVER	A240 Gr. F304	
		A182 Gr. F304		9	FIN(ANTI-STATIC)	A182 Gr. F304	*
		A182 Gr. F316		10	SPRING	A182 Gr. F304	*
		A564 Gr. 630		11	BOLT	A193 Gr. B8	
4	SEAT	NITRILE(NBR)					
		EPDM					
		EPT					
		NEOPRENE(CR)					
		SILICON					
		HYPALON(CSM)					
VITON							



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3530/3533/VF-73_ Series Iron Body 14"~24"

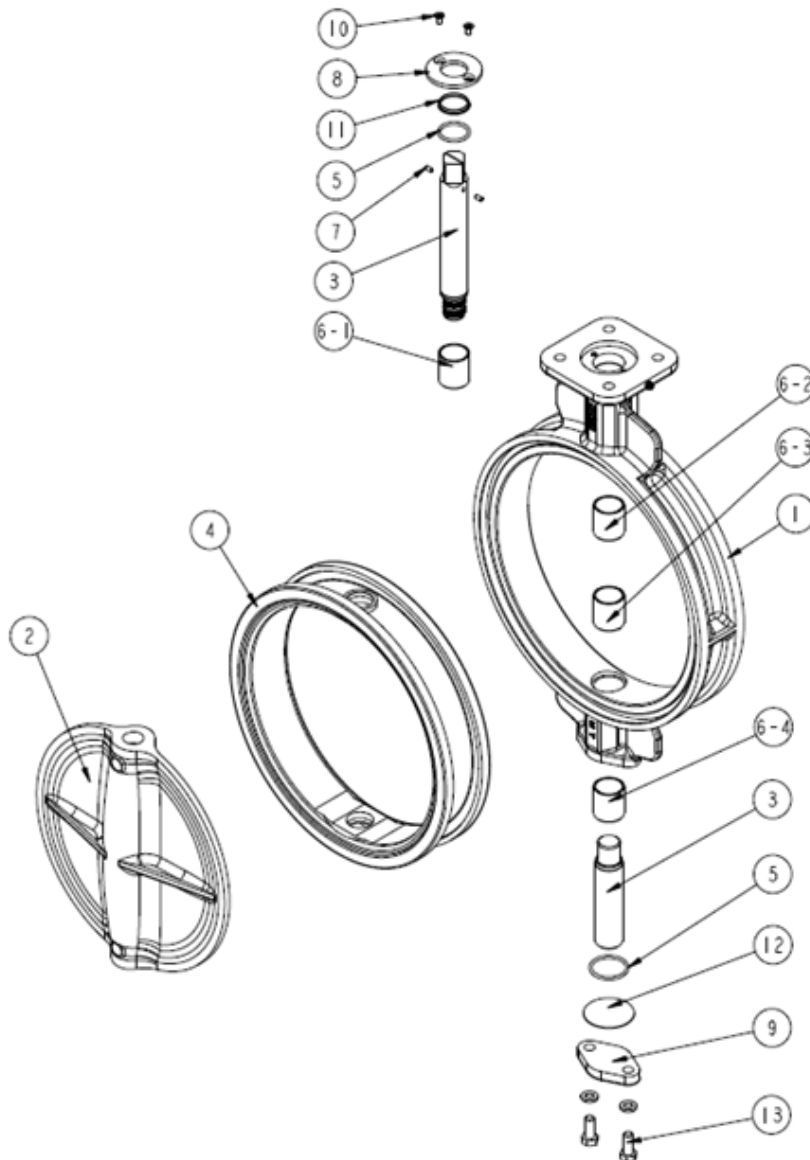
No	Name	Materials	Spare parts	No	Name	Materials	Spare parts
1	BODY	A126 Cl. B		5	O-RING	NITRILE(NBR)	*
		A536 65-45-12		6-1	BUSH	RPTFE+A240Gr. F304	
2	DISC	A536 65-45-12		6-2			
		A351 Gr. CF8		7	PIN	A182 Gr. F304	*
		A351 Gr. CF8M		8	UPPER COVER	A126 Cl. B	
		B148 C95400				A240 Gr. F304	
						A126 Cl. B	
3	SHAFT	A182 Gr. F6a		9	BOTTOM COVER	A240 Gr. F304	
		A182 Gr. F304				A126 Cl. B	
		A182 Gr. F316		10	BOLT	A307 Gr. B	
		A564 Gr. 630		11	TRUST RING	A240 Gr. F304	*
4	SEAT	NITRILE(NBR)		12	PACKING	PTFE	
		EPDM		13	BOLT	A307 Gr. B	
		EPT					
		NEOPRENE(CR)					
		SILICON					
		HYPALON(CSM)					
	VITON						



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3530/3533/VF-73_ Series Steel Body 14"~24"

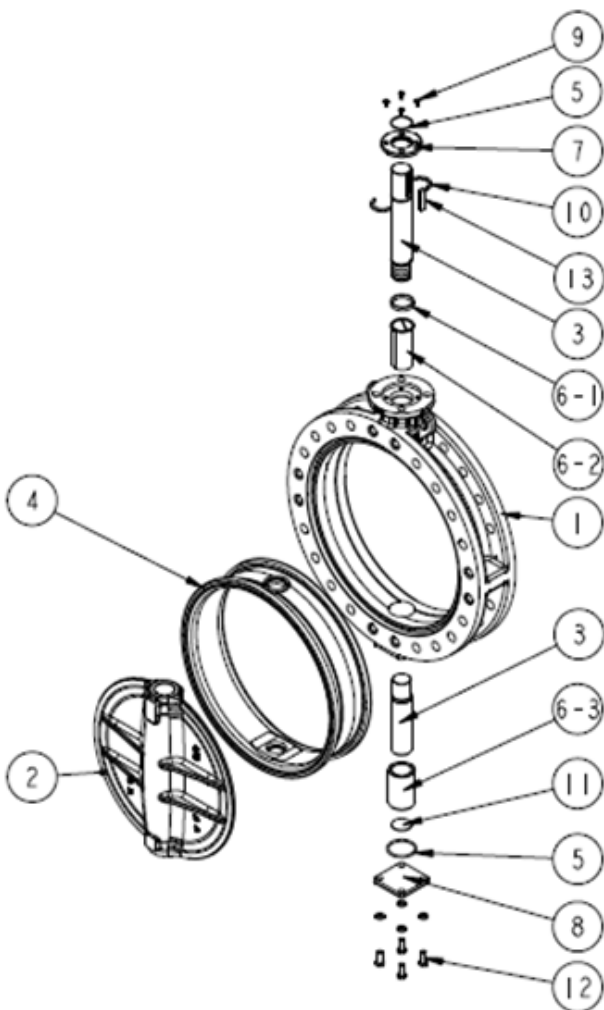
No	Name	Materials	Spare parts	No	Name	Materials	Spare parts	
1	BODY	A351 Gr. CF8		5	O-RING	NITRILE(NBR)	*	
		A351 Gr. CF8M		6-1	BUSH	RPTFE+A240Gr. F304		
2	DISC	A351 Gr. CF8		6-2				
		A351 Gr. CF8M		6-3				
3	SHAFT	A182 Gr. F5a		6-4				
		A182 Gr. F304		7	PIN	A182 Gr. F304	*	
		A182 Gr. F316		8	UPPER COVER	A240 Gr. F304		
		A564 Gr. 630		9	BOTTOM COVER	A240 Gr. F304		
				10	BOLT	A307 Gr. B		
4	SEAT	NITRILE(NBR)		11	TRUST RING	A240 Gr. F304	*	
		EPDM		12	PACKING	PTFE		
		EPT		13	BOLT	A307 Gr. B		
		NEOPRENE(CR)						
		SILICON						
		HYPALON(CSM)						
		VITON						



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3530/3533/VF-73_ Series 26”~36”

No	Name	Materials	Spare parts	No	Name	Materials	Spare parts
1	BODY	A536 65-45-12		5	O-RING	NITRILE(NBR)	*
		A216 Gr. WCB		6-1	BUSHING	B62	
		A351 Gr. CF8		6-2		PTFE+SUS316	
		A351 Gr. CF8M		6-3		STAINLESS STEEL+RTFE	
2	DISC	A536 65-45-12		7	UPPER COVER	A126 Cl. B	
		A216 Gr. WCB		8	BOTTOM COVER	A126 Cl. B	
		A351 Gr. CF8		9	BOLT	A307 Gr. B	
		A351 Gr. CF8M		10	TRUST RING	A240 Gr. 316	
3	STEM	A182 Gr. F6a		11	PACKING	PTFE	
		A182 Gr. F304		12	BOLT	A307 Gr. B	
		A182 Gr. F316		13	KEY	A29 1045	
4	SEAT	NITRILE(NBR)					
		EPDM					
		EPT					
		NEOPRENE(CR)					
		SILICON					
		HYPALON(CSM)					
VITON							



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3530/3533/VF-73_ Series 38”~48”

No	Name	Materials	Spare parts	No	Name	Materials	Spare parts
1	BODY	A536 65-45-12		5	O-RING	NITRILE(NBR)	*
		A216 Gr. WCB		6-1	BUSHING	B62	
		A351 Gr. CF8		6-2		PTFE+SUS316	
		A351 Gr. CF8M		6-3		STAINLESS STEEL+RTFE	
2	DISC	A536 65-45-12		7	UPPER COVER	A126 Cl. B	
		A216 Gr. WCB		8	BOTTOM COVER	A126 Cl. B	
		A351 Gr. CF8		9	BOLT	A307 Gr. B	
		A351 Gr. CF8M		10	TRUST RING	A240 Gr. 316	
3	STEM	A182 Gr. F6a		11	PACKING	PTFE	
		A182 Gr. F304		12	BOLT	A307 Gr. B	
		A182 Gr. F316		13	KEY	A29 1045	
4	SEAT	NITRILE(NBR)					
		EPDM					
		EPT					
		NEOPRENE(CR)					
		SILICON					
		HYPALON(CS) VITON					

