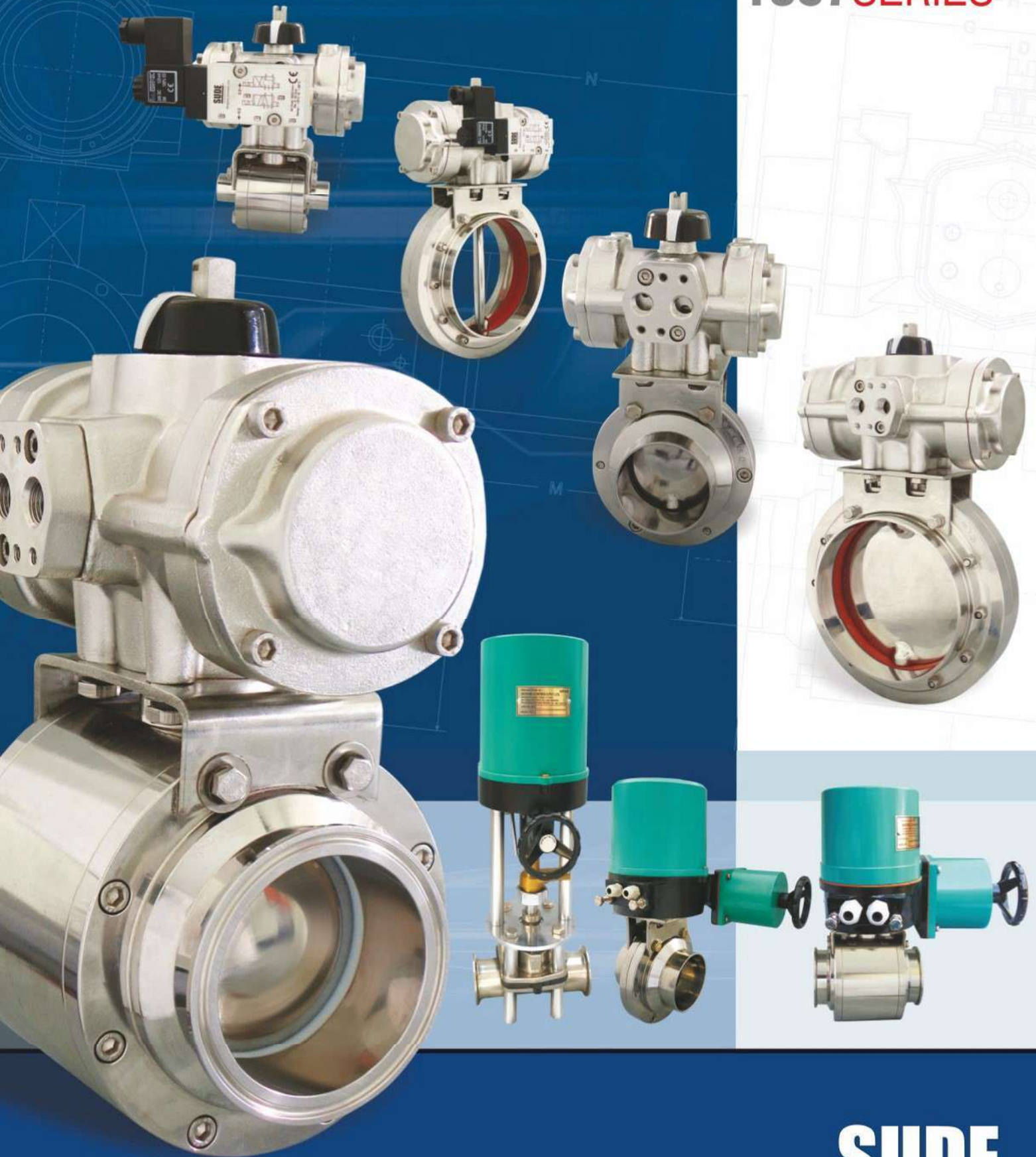


Zero Bacteria Food Grade
Ball & Butterfly Valve
With Pneumatic & Electric Actuator

1257SERIES
1267SERIES
1357SERIES
1367SERIES



SUIDE

2 Way / 3 Way **Electric / Pneumatic Actuated Ball Valves**

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Introduction - Zero Bacteria

Zero bacteria means a product which has to be free from impurities and their Key component areas along with important points which is to be covered in Ball valve and Butterfly valve are as follows:

1. Materials

- Body Materials
- Seat Materials
- Welded component Materials
- Stem seals
- End connections

2. Surface Condition

- Mechanical polishing
- Electro-polishing
- Surface finish

3. Drain ability

- Valve design for minimum hold-up volume
- Installation Angles

4. Material Composition

- 316L
- Sulfur content
- Certification

5. Inspection

6. Clean ability

7. Marking Information

Seating material should meet the FDA guidelines



Materials & Material Composition

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The standard material used for zero bacteria valve is SS316L and its composition is as stated below (Refer table no 1)

Table 1

CHEMICAL COMPOSITION %	
Carbon, MAX	0.035
Chromium	16.00-18.00
Manganese, Max	2.00
Molybdenum	2.00-3.00
Nickel	10.00-15.00
Phosphorus, MAX	0.04
Silicon MAX	0.75
Sulfur	0.005-0.017

The following are the list of tubing's and fittings to be used against each size valve (Refer table no.2)

Table 2

Nominal OD Tubing Sizes			
Nominal Size In.	Tube OD (in)	Tube Wall Thickness (in)	Hygienic Clamp Size. (in)
1"	1.000	0.065	1- 1/2 "
1- 1/2 "	1.500	0.065	1- 1/2 "
2"	2.000	0.065	2"
2- 1/2 "	2.500	0.065	2-1/2"
3"	3.000	0.065	3"
4"	4.000	0.0835	4"
5"	5.000	0.109	5"

Applications

- Bio-Pharm
- Pharmaceutical
- Food/Beverage
- Cosmetics
- Gas Delivery Systems
- Water Purification
- Brewing/Distilling
- Economical-compared to most other valve designs
- High flow rate through an unobstructed flow path
- Quick, quarter-turn operation
- Easy to automate pneumatically or electrically
- Inherently flexible to meet a wide range of pressures and temperatures
- Simple maintainability
- Self-flushing design
- Steam – process temperature control/cleaning
- High purity Water – cleaning
- High purity gas – purging
- CDA (Clean Dry Air) – purging



- Alcohol – deliver alcohol to final product (cosmetics) / cleaning
- Clean Steam
- WFI-Water for Injection
- Ultra filtration
- CDA-Clean Dry Air
- High Purity Water
- Alcohol

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Surface Condition

Under surface condition we should know what is polishing and how they are important for zero bacteria valves.

Mechanical polishing-Mill finishes welds and surfaces that have been in service have differing surface characteristics when viewed under magnification. Mechanical polishing reduces all surface ridges, pits and discrepancies to uniform roughness.

Mechanical polishing is accomplished utilizing aluminum oxide abrasives on rotary equipment. Mechanical polishing can be achieved by hand held tools for large surface areas, such as reactors and vessels in place, or by automatic reciprocating machines for pipe or tubular components. A series of grit polishes is applied in a successively finer sequence until the desired finish or surface roughness is achieved.

Electro polishing is the electrochemical removal of microscopic irregularities from metal surfaces. It results in a general leveling or smoothing of the surface, that when viewed under magnification, appears virtually featureless.

As a result of electro polishing, a metal surface exhibits the following properties :

- 1) Surface roughness is significantly reduced, thus reducing adhesion properties
- 2) Surface area is reduced as much as 7:1
- 3) Surface friction and drag are reduced

- 4) Corrosion resistance is increased due to a chromium enrichment of the surface and the removal of surface contaminants that may promote corrosion

Stain less steel has a natural resistance to corrosion due to its high chromium content (stainless steels are typically 16% chromium or higher). Electro polishing enhances this natural resistance because the process dissolves more iron (Fe) than chromium (Cr). This leaves higher levels of chromium on the stainless steel surface.

The result of any polishing procedure is to create a "smooth" surface defined as the Roughness Average (Ra) in micro inch (m-in) or micro-meter (mm).

Surface smoothness is generally measured with a profilometer an automatic instrument with a stylus-type reciprocating arm. The stylus is traversed across a metal surface, measuring peak height and valley depth. The average peak height and valley depth is then expressed as a roughness average in term of millionths of an inch or micro inch, frequently referred to as Ra.

The relationship between polished and buffed mill finishes, abrasive grit numbers and surface roughness-before and after electro polishing is illustrated in the following table (Refer table 3)

Table 3

Grit No	Before Electro polishing Surface Roughness, Ra		After Electro polishing Surface Roughness, Ra	
	Micro Meters	Micro Inches	Micro Meters	Micro Inches
120	1.14 max	45 max	0.88 - 1.12	35 - 45
180	0.64 max	25 - 30	0.50 - 0.75	20 - 30
240	0.20 to 0.51	8 - 20	0.25 - 0.50	10 - 20
320	0.15 to 0.38	6 - 15	0.20 - 0.38	8 - 15

Drainability

Drain ability is important for maintaining bioprocess systems in a clean and sterile condition. Fluid remaining after draining becomes a colonization site for bacterial or other microorganisms creating an unacceptable bio burden to the system. A corner

where fluid accumulates also may become a corrosion-initiation corner adding additional contaminants to the system and the design of the valve it should be in such a way that this accumulation of product has to be minimized or to be removed.

Clean Ability

The following points are taken care while cleaning the Zero bacteria valves:

- 1 Cleaning is performed in a room segregated from the normal valve production area to eliminate contamination
- 2 The room is outfitted with one alkaline cleaning tank a DI rinse tank and a hot air drying tank
- 3 Work areas are freshly covered with particles-free plastic sheeting before each cleaning.
- 4 Bubble-tight valve testing equipment utilizes clean, dry, oil-free air.
- 5 Capping and bagging is performed on the particle-free surface. All bags are 4 mil and are heat – sealed Double bag option is available
- 6 The basic cleaning is performed using an ultrasonic cleaning system with an approved alkaline agent for cold cleaning and de-greasing in a residue free formulation.
- 7 Each valve component is thoroughly washed in the cleaning agent tank then rinsed in a de-ionized water tank. The components are then dried in a hot air drying vessel.
- 8 Valve assembly is performed on particle-free surface using latex gloves. Clean grease-free tools are used in the assembly of valves.
- 9 After assembly the valves are nitrogen purged with 99.999% pure N2 filters.
- 10 The fully assembled valve is tested for leakage using clean, dry, oil-free air according to industry standards.
- 11 Each valve is capped, bagged and heat-sealed to ensure product quality and purity until installed.

Inspection & Marking

All valves are inspected thoroughly to the required parameters particularly on the Body surface finish and marking is done with the help of following information's:

- a) Heat number on each component part of the fitting if more than one heat is used
- b) Material type
- c) Specification number referencing the BPE standard
- d) Internal surface symbol for the appropriate BPE specification

- e) Color coded handles if applicable

All Zero bacteria valves when subjected to steam sterilization the valve should be designed to withstand a temperature of 150°C for duration of 100 hours under continuous duty mode, of course elastomer has to be chosen properly otherwise the life of the same will be reduced drastically.

Common Terms & Their Definitions

SUDE

Annealing :

A treatment process for the purpose of reducing hardness, improving machinability, facilitating cold working, or producing a desired mechanical physical, or other property.

Aseptic :

Free of pathogenic (causing or capable of causing disease) microorganisms.

Aseptic processing :

Operating in a manner that prevents contamination of the process.

Automatic welding :

Welding with equipment that performs the welding operation without adjustment of the controls by a welding operator. The equipment may or may not perform the loading and unloading of the work.

Bio processing:

The creation of a product utilizing living organisms.

Bio processing equipment :

Equipment, systems, or facilities used in the creation of products utilizing living organisms.

Cavitations:

A condition of liquid flow where, after vaporization of the liquid, the subsequent collapse or vapor bubbles can produce surface damage.

Certification:

Documented testimony by qualified authorities that a system qualification, calibration, validation, or revalidation has been performed appropriately and that the results are acceptable.

Clean:

Free of dirt, residues, detergents, or any contaminants that may affect or adulterate the product or process.

Clean-in-place (CIP):

Internally cleaning a piece of equipment without relocation or disassembly. The equipment is cleaned but not necessarily sterilized. The cleaning is normally done by acid, caustic, or a combination of both, with Water-for-injection (WFI) rinse.

Clean steam:

Steam free from boiler additives that may be purified, filtered, or separated. Usually used for incidental heating in pharmaceutical applications.

Cloudiness:

The appearance of a milky white hue across some portion of a surface resulting from the electro polish process.

Dead leg:

An area of entrapment in a vessel or piping run that could lead to contamination of the product.

Demarcation:

A localized area that is dissimilar to the surrounding areas with a defined boundary after electro polishing.

Fermentation:

The biochemical synthesis of organic compounds by microorganisms or cultivated cells.

Ferment:

A vessel for carrying out fermentation.

Full penetration:

A weld joint is said to be fully penetrated when the depth of the weld extends from its face into the weld joint so that the joint is fully fused. For a tube-to-tube weld, no unused portions of the weld joint shall be visible on the inside diameter of fully penetrated weld.

Heat number:

An alphanumeric identification of a stated tonnage of metal obtained from a continuous melting in a furnace.

Hold-up-volume:

The volume of liquid remaining in a vessel or piping system after it has been allowed to drain.

Hydro test:

A pressure test of piping, pressure vessels, or pressure-containing parts, usually performed by pressurizing the internal volume with water at a pressure determined by the applicable code.

Hygienic :

Of or pertaining to equipment and piping systems that by design, materials of construction, and operation provided for the maintenance of cleanliness so that products produced by these systems will not adversely affect human or animal health.

Hygienic clamp joint:

A tube outside diameter union consisting of two neutered ferrules having flat faces with a concentric groove and mating gasket that is secured with a clamp, providing a non protruding, recess less product contact surface.

Machine welding:

Welding with equipment that performs the welding operation under the constant observation and control of a welding operator. The equipment may or may not perform the loading and unloading of the works.

Micron or micrometer (mm):

One-millionth of a meter.

Orange peel:

An appearance of a pebbly surface.

Passivation:

A final treatment/cleaning process used to remove free iron or other anodic contaminants from the surface of corrosion-resistant steel parts such that uniform formation of a passive layer is obtained.

Passive layer:

A passive oxidized film that forms naturally on the stainless steel surface when exposed to air or similar oxidizing environment protecting the underlying base metal from corrosion.

Pipe:

Pipe size is determined by diameter and schedule. For bioprocess equipment, pipe does not include tube

Porosity:

Cavity-type discontinuities formed by gas entrapment during solidification.

Pure steam:

Steam that is produced by a steam generator which, when condensed, meets requirements for Water-for-injection (WFI).

Pyrogen:

A fever-producing substance.

Ra:

Log of the arithmetic mean of the surface profile. Usually expressed in min as related to roughness.

Self-draining:

The elimination of all fluid from the system due to the force of gravity alone.

Square cut:

A tube end cut perpendicular to the tangent plane.

Steam in place (SIP):

The use of steam to sanitize or sterilize a piece of equipment without the use an autoclave.

Sterile:

Free living organisms.

Surface Inclusion:

Particles of foreign material in a metallic matrix. The particles are usually compounds such as oxides, sulfides, or silicates, but may be a substance foreign to and essentially insoluble in the matrix.

Surface residual:

A foreign substance that adheres to a surface by chemical reaction, adhesion, adsorption, or ionic bonding (for example, corrosion, rouging, and staining).

Tube:

Tube is sized by its nominal outside diameter. For bioprocessing equipment, tube does not include pipe.

Comparison Of Zero Bacteria And Diaphragm Valves

SUDE

Zero Bacteria valves are widely used in process applications because of their inherent versatility. Diaphragm valves offer a limited service range for temperature and pressure and do not meet all of the standards for industrial valves. Zero Bacteria valves are available for:

Cryogenic service	High temperature / Low temperature
High velocity / Low velocity	High pressure / Low pressure
Wider range of seat materials	wider range of body materials
Wider range of end connections	Fire-safe designs

In addition, zero bacteria valve center sections are removable to allow access to the inner weld bead where cleaning and/or polishing may then be performed.

Ball Valve

SUDE

A Precision ball with a full port is positioned inside the valve body between two flanges and two PTFE valve seats. The 90° rotation of the valve stem, through the handle or a pneumatic / Electrical actuator, is transferred, to the ball thereby opening or closing the valve.

Standard Design:

The valve consists of a valve body, two flanges, PTFE valve seats, EPDM O-ring, ball, stem and a handle or actuator. All Seats and seals are made from FDA approved material.

The Valve body, flanges and ball are made of forged 316L stainless steel which ensures non porous, smooth and dimensionally stable construction.

The valve is designed to maintain a full rate, with a minimum pressure drop and it is fully drainable.

A Bottom entry, precision machined stem with a live loaded PTFE thrust washer ensures a Smooth rotation at various temperatures and pressure Conditions.

Purge ports are provided on the valve body for SIP /

Available Sizes:

1", 1 ½", 2", 2 ½", 3", 4"

Available Types:

Butt weld

Sanitary Clamp

I-Line

End connections:

Sanitary Clamp, Butt-Weld, Extended Butt Weld (for high purity applications), I-Line or others on request.

Materials:

AISI 316L or AISI 304L

Actuator option:

Electrical/Pneumatic 90° Open/ Close

Technical Specifications of Ball Valve

SUDE

Material :

Product wetted steel parts	.....	AISI 316L/AISI 304L
Other steel parts	.....	AISI 304

FDA Seals :

Valve Seat	.....	TFM / PTFE
O-ring	.....	EPDM
Cavity filler (optional)	.....	TFM /PTFE

Nominal Pressure :

Maximum product pressure	.....	200 PSI maximum (14 Bars)
		Test pressure 235 PSI (16 Bars)

Temperature Range :

.....	60' Degrees Fahrenheit to +300' Degrees Fahrenheit
	*Other seal material available for higher temperatures

Surface Finish:

Contact with product	.....	Ra</=25μ in (Girt 220g)
Optional	Ra</=15μ in (Girt 320g)

Connections :

.....	Sanitary Clamp (ISO 2852/BS 4825-3)
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Optional :

.....	Butt Weld (ISO 2037/BS 4825-01)
	I-Line, Other connections on request

Purge Port Connections :

.....	1/4" Males BSP (Refer figure no.1)
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Exploded View of Standard Ball Valve

SUDE

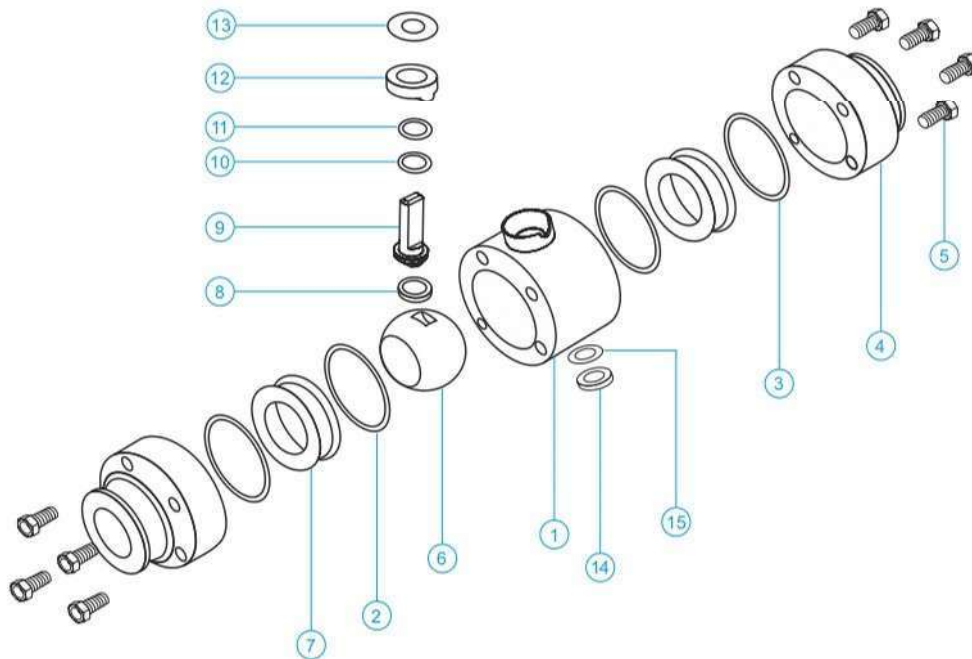


Fig. 1

Sl. No.	Description	Material
1	BODY	AISI 316L/AISI 304L
2	O-RING	EPDM
3	O-RING	EPDM
4	FLANGE	AISI 316L/AISI 304L
5	CAP SCREW	AISI 304
6	BALL	AISI 316L/AISI 304L
7	SEAT	TFM PTFE

Sl. No.	Description	Material
9	STEM	AISI 316L/AISI 304L
10	THRUST RING	PTFE
11	O-RING	EPDM
12	INDEX BASE	AISI 304
13	THRUST WASHER	PTFE
14	DRAIN CAP	AISI 316L/AISI 304L
15	WASHER	PTFE

Butterfly Valve

SUDE

Working Principle:

Quarter turn (90° rotation) operation closes or opens the valve. A wide variety of actuators allow the valve disc to be set at various positions so that the flow rate can be regulated.

Standard Design:

The valve consists of two valve bodies and a disc made from forged stainless steel which ensures a non porous, smooth surface and dimensionally stable construction. The valve disc has a dense and polished surface which combined with a slim design allows for a high Cv. The PTFE stem bushing ensures an extra smooth disc rotation. All seats and seals are made from FDA approved materials. The valves are assembled by means of Allen head cap screws.

Available Sizes:

1", 1 ½", 2", 2 ½", 3", 4", 5", 6", 8"

Available Types:

- Butt-Weld
- Sanitary Clamp
- I-Line

Options:

- Variety of multiple position handles for manual operation.
- Automatic operation by vertical pneumatic / electrical actuators

End Connections :

Sanitary Clamp, Butt-Weld, I-Line, or others on request.

Material:

AISI 316L or AISI 304L

Technical Specification of Ball Valve

SUDE

Material :

Product wetted steel parts	.....	AISI 316L or AISI 304L
Other steel parts	.....	AISI 304

FDA Seals :

Standard	.....	SILICONE
Optional	.....	VITON, EPDM, BUNA, PTFE

Nominal Pressure:

Maximum Product Pressure	147 PSI maximum (10 Bars) Test pressure 176 PSI (12 Bars)
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Surface Finish:

Surface in contact with product	Ra <= 25 µ in (Grit 220g)
Optional	Ra <= 25 µ in (Grit 320g)

Connections

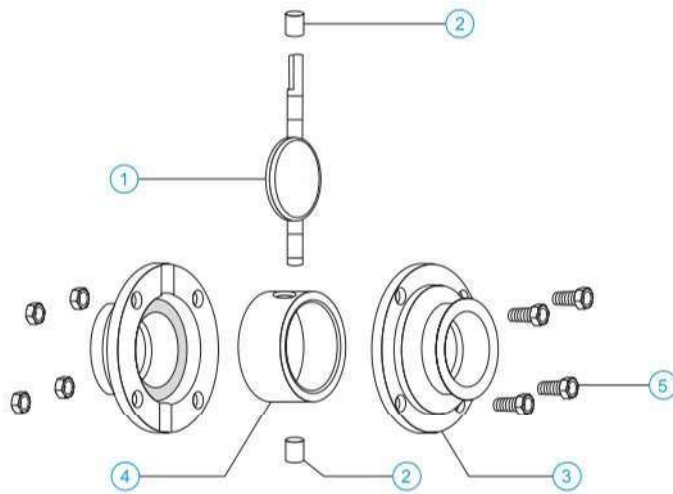
..... Sanitary Clamp (ISO 2852 / BS 4825)

Optional

..... Butt Weld (ISO 2037 / BS 4825), I-Line
(Refer figure No. 2)

Exploded View of Standard Butterfly Valve

SUDE



Sl. No.	Description	Material
1	DISC	AISI 316L/AISI 304L
2	BUSHING	PTFE
3	FLANGE	AISI 316L/AISI 304L
4	SEAT	SILICONE
5	SCREW	AISI 304

Fig. 2

Electrical Actuator

SUDE

Easier interface with digital control devices. Electrical actuators must have a voltage selection, typical actuators voltages are 24V AC, 110V AC, 240 V AC and 415 Volts. Fail safe electric actuators are also called spring return and the fail positioning (open or closed) should be noted. For detail on the Electric actuator refer Sdtork pune and asked for detailed literature. The spring return Electrical actuators are available for low torque, for higher values we suggest you to use reversible stay put type actuator

Actuator Construction

SUDE

Single Phase

Single phase SDTORK Actuator is provided with Stall duty motor used for quarter turn application. Actuator is suitable for inching operation too and they can be supplied with extra limit switches for remote position indication.

The Actuator are available in general purpose, Dust proof & Flame proof & Explosion proof housing approved by CMRS Dhanbad.

Three phases SDTORK Actuator is basically a worm gear type reduction gear box. A single stage grease bath worm gear gives quietness and reliability in operation. The valve can be fully opened, fully closed or adjusted to any intermediate position. The rectory force on the worm shaft which is a 'Floating one' is directly proportional to the out put torque and is absorbed by a set of disc springs. The lateral movement of the worm shaft under load, trips closes the Torque switch.



Three Phase

Three phase Actuator are fitted with torque limit switches & travel limit switches & also they are in built with manual hand wheel used for operating the actuator manually in case of power failure. Actuator is also supplied with various shaft designs to suit rising & non rising stem valve. Three phases are also provided with space heater. This actuator is also available in slow mode operation which is used for multi turn application.

The driving motor is a TEFC squirrel cage class F IP 65 enclosure motor combining low inertia with a high starting and stalling torque.



Accessories For Actuator

- Travel Limit Switches - 2 nos
- Auxiliary Limit Switches - 2 nos
- Hand wheel for Manual operation
- Local position indicator
- Potentiometer for feed back
- Torque limit switches
- Position Transmitter

The Actuators can be supplied with a panel having Auto Calibration facility.

Actuator can also be supplied with :

Single Phase OR Three phase Panel for switching the valve On / Off through Push Buttons for local operation under manual mode OR through PLC under Auto mode through 4-20 mA, 0 to 10V DC.

Common Accessory for Single Phase / Three Phase Actuator :

- Honeywell / any other make PID Controller along with PT 100 sensor with built in panel as an option.
- Honeywell / any other make pressure Transmitter where based on setting pressure valve will open & close through PID with built in panel as a option.
- Sequential timer 0 to 30 channel for sequence operation.
- Cyclic timer having On time - 1 to 60 seconds & Off time - 1 to 60 min for sequencing operation.
- Stimulator –panel mounting type having two knobs used for generating 4 to 20mA with the help of 230 Volt A.C. Supply.

Control Panel Specification

- Input : Single Phase 230 V AC OR 3 Phase 415 V AC, 4 wire supply.
- Output supply: Single Phase 230 V AC OR 3 phase 415 V AC Reversible supply.
- Auto / Manual selection : Selector switch provided. In Auto mode open & close operation is controlled by 4-20mA Input & under Manual mode operation is through Push buttons.
- Indications : Zero to a100% valve position display, R, Y, B Phase Indication [applicable only for 3 phase] Open & Close, Fully open & Fully close indication.
- Main switch - Single Phase OR 3 Phase MCB for mains On / Off.
- Phase fail / error protection provided.
- Fuse protection provided for each phase.
- Protection from over torque - If Actuator gets over torque the torque switch trips & the system protects the motor. Also provided with 10



Fig. 3

Wall Mounted Construction in sheet metal





Pneumatic actuators are available in rotary construction in Double and spring return in on/off and modulating duty format. Actuators will be inherently fail safe but fail position (open or closed) should be noted. Pneumatic actuators are supplied with Electro pneumatic positioners which work on continuous pressurized air of 60psi and input signal of 4 to 20mA with feed back 4to20ma For details refer Actuator catalogue.

Actuator Construction

The piston incorporates racks and end covers are die casted in aluminum alloy. Barrel is extruded aluminium alloy hardened and treated, further finished with deep anodized process to form a protective layer to resist atmospheric corrosion. The actuators are also available in stainless steel 316 & Nylon plastic construction for food grade and chemical industries application. The internal materials of the actuator are having pinion which is made up of steel, precision cut, heat treated and ground & also has a high grade of synthetic seals. The actuators before assembly is lubricated with high temperature resistant smooth grease. The actuators are with compact design operates through 90 degree angle of actuation. The Actuator is also available in 180 degree rotation. **Refer Fig. 4**

Air Pressure Requirement :

- a) For Double Acting Actuator - 3.5 kg / cm² (Minimum) & 8.5kg / cm² (Maximum)
- b) For Spring Return Actuator - 4.0 kg / cm² (Minimum) & 8.5 kg / cm² (Maximum)

However Air Pressure Requirement is much dependent on size of the valve, working pressure, quality of Butterfly valve and many other factors.

For Double Acting Actuator:

4 way 5 port single Coil / Double Coil solenoid valve in general purpose or Flame proof and explosion coils construction.

For Spring Return Actuator:

3 way Single Coil / Double Coil solenoid valve in General purpose or Flame proof and explosion Coils construction.

Accessories

Accessory Common for Double Acting / Spring Return Actuator :

- a) Pressure Regulator
- b) Limit Switches
- c) Filter Regulator with Lubricator
- d) Gear Box with hand wheel for manual operation
- e) Valve Positioner for characteristic controlled application.
- f) I to P Converter.
- g) Electro pneumatic positioners
- h) Position Indicator
- i) Position Transmitter
- j) Cyclic Timer OR Sequential Timer
- k) 3 Way / 4 Way Key operated valves
- l) Stimulator
- m) Travel Stops
- n) Flow Restrictor
- o) Silencers with Flow Control Valve

Optional :

- a) PID Controller along with PT - 100 Senso supplied with panel.
- b) Pressure Transmitter supplied with panel.

The valves are tested according to their respective standards for hydrostatic, seat leakage and working pressure tests. Unless and otherwise specified Ball valves are Constructed and tested for 10 kg/cm² working pressure.

Notes :

- a) Actuator rating is for valve working pressure 10 kg / cm²
- b) Timing given is approximate and is useful as an indicating figure only when solenoid valve is directly coupled with the Actuator. Average time under 50% load condition is 80 PSI working pressure.
- c) All data is compiled in laboratory test, in actual field, working may differ.
- d) Width and weight will change with rating of flanges and accessories.

Exploded View of Pneumatic Actuator

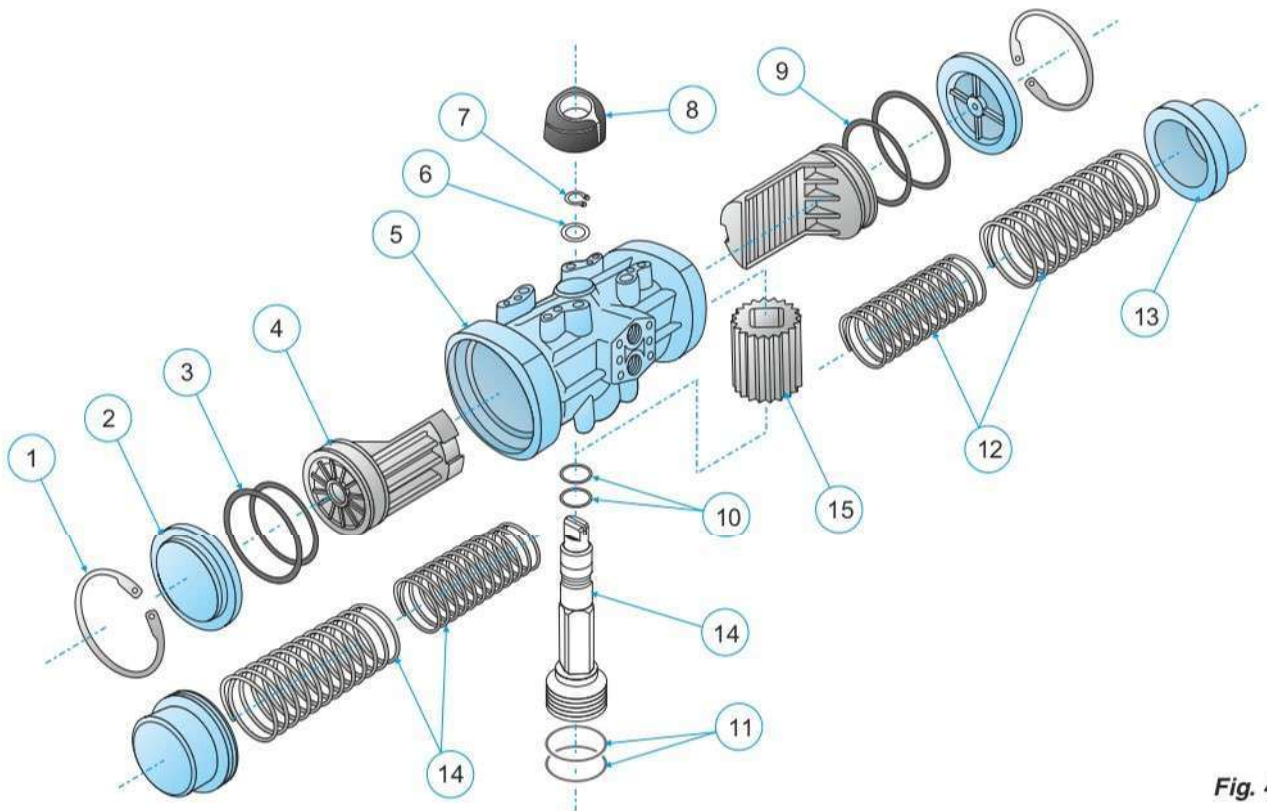
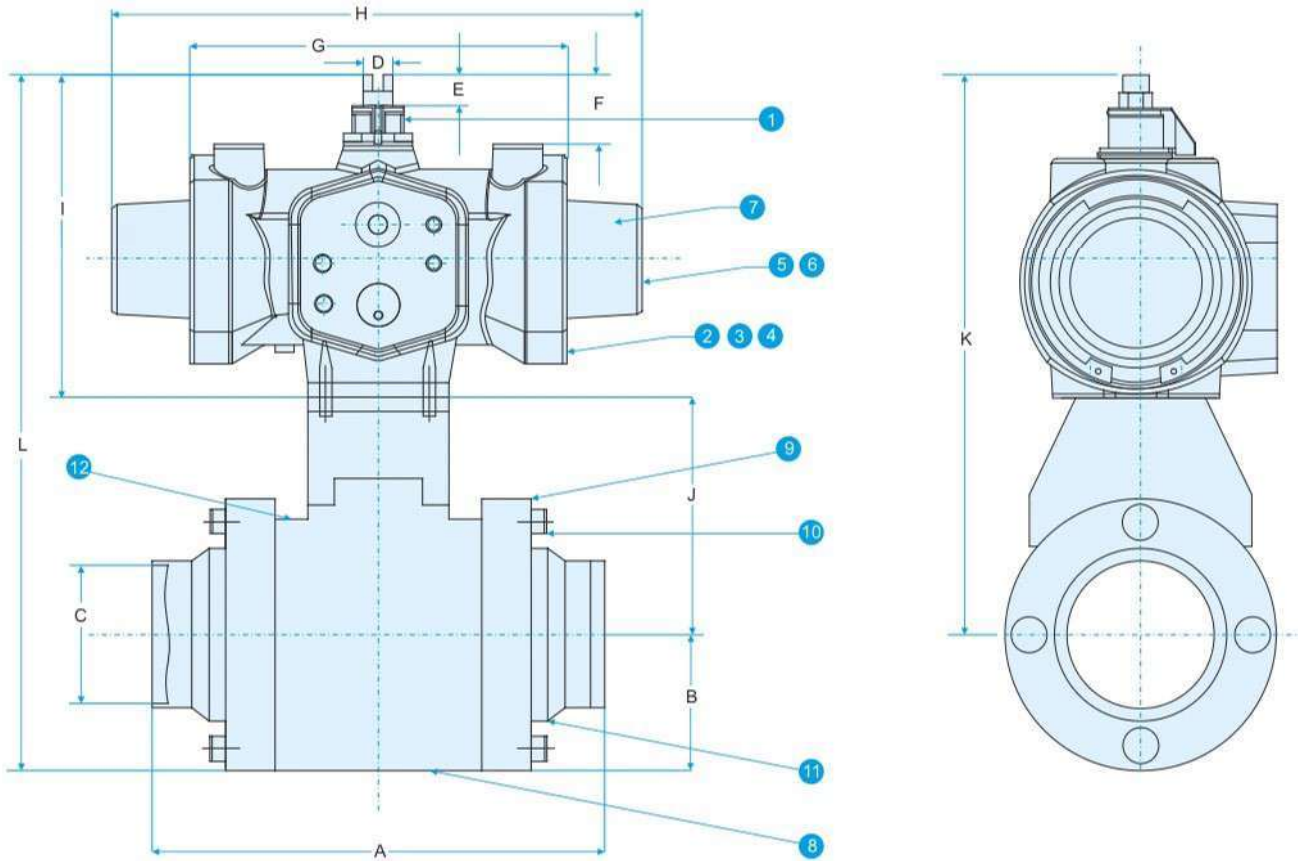


Fig. 4

No.	Description	Quantity	Material
1	Allen Screw	12	AISI -304 Stainless Steel
2	Double Acting Cap	2	Aluminium Alloy (2) + (1)
3	Cap O-ring	2	N.B.R.
4	Piston	2	Aluminium Alloy
5	Cylinder	1	Aluminium Alloy (2) + (1)
6	Washer	1	Polyamide 6
7	Spring Clip	1	Steel (3)
8	Position Indicator	1	Polymide
9	Piston Guide	4	P.T.F.E. + Bronze
10	Guide Ring	2	P.T.F.E. + Bronze
11	Piston O-Ring	4	N.B.R.
12	O-Ring	2	N.B.R.
13	O-Ring	2	N.B.R.
14	Springs Set	1	DIN - 17223-C (2) (4)
15	Spring Return Cap	2	Aluminium Alloy (2) + (1)
16	Shaft	1	Steel (2)
17	Gear	1	Aluminium Alloy (5)
18	Water-tightness Plane Gasket	2	N.B.R.

Butt-Weld Metallic Ball Valve with Pneumatic Rotary Single/Double Acting Actuator SUDE 1367



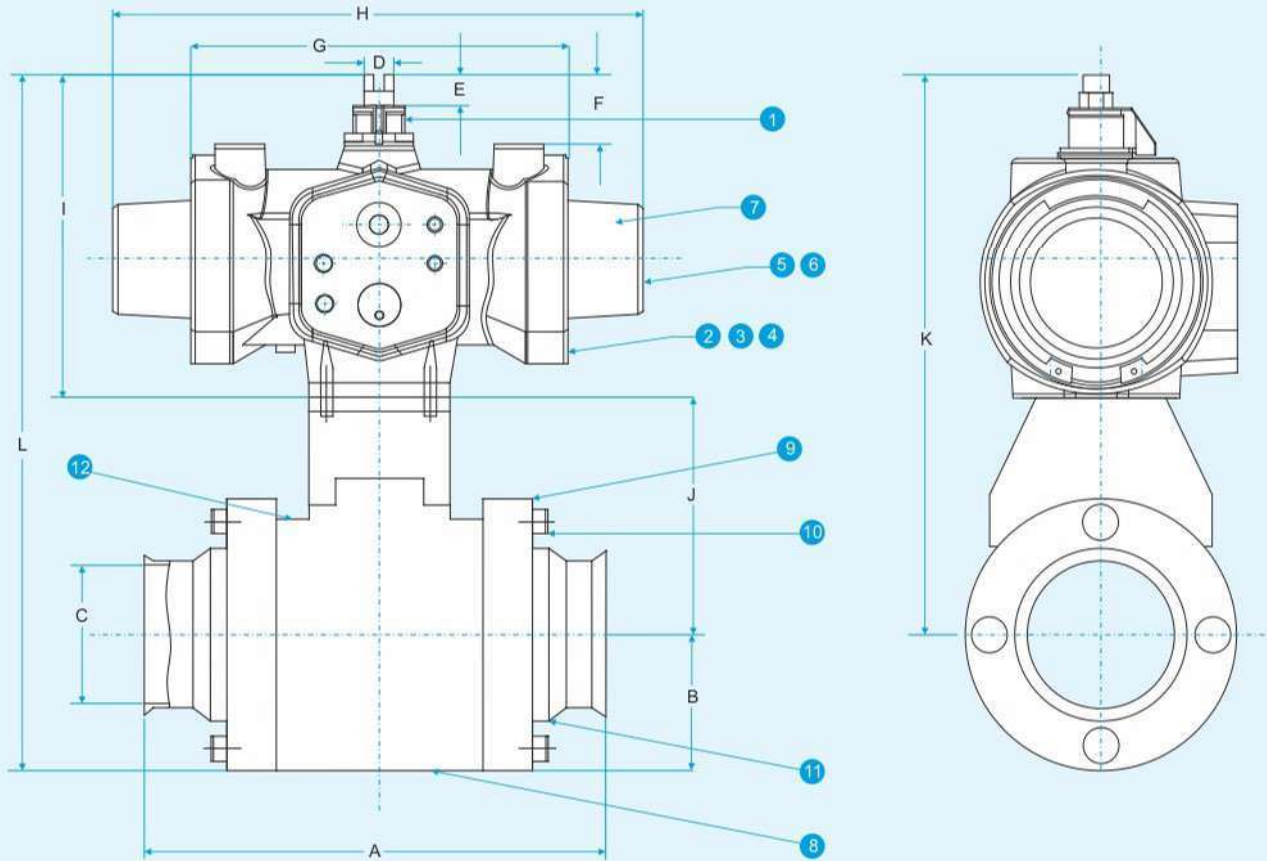
BILL OF MATERIAL OF VALVE WITH ACTUATOR

S.No.	PART	MATERIALS
1	INDICADOR VISUAL POSITION INDICATOR	-
2	PISTON GUIDE	POLYACETAL
3	GUIDE RING	POLYACETAL
4	PISTON O-RING	NITRILE
5	TAPA DOBLE EFECTO DOUBLE ACTING CAP	-
6	SPRING SET	DIN-17223-C
7	SPRING RETURN CAP	ALLUMINUM ALLOY
8	BODY	AI316L
9	FLANGE	AI316L
10	CAP SCREW	AI316
11	O-RING	EPDM
12	SEAT	TFM PTFE



VALVE SIZE	MODEL NUMBER	DIMENSIONS (MM)											APPROX. TIME		AIR CONSUMPTION IN LTR		Cv Value	WT. OF ASSY IN KGS.	
		A	B	C	D	E	F	G	H	I	J	K	L	FOR OPEN	FOR CLOSE	FOR OPEN			FOR CLOSE
25	1367/25/BW/AISI316L/AISI316L/DAW	94.05	34.13	22.22	8	7.5	20	109		85	72.23	157.23	191.36	0.2	0.2	0.075	0.05	66	2.15
	1367/25/BW/AISI316L/AISI316L/SAW	94.05	34.13	22.22	8	7.5	20		143.5	85	72.23	157.23	191.36	0.3	0.3	0.075		66	2.3
40	1367/40/BW/AISI316L/AISI316L/DA00	107.15	41.27	34.92	10	11	30	125		110	81.35	191.35	232.62	0.3	0.3	0.15	0.1	192	2.9
	1367/40/BW/AISI316L/AISI316L/SA00	107.15	41.27	34.92	10	11	30		160.00	110	81.35	191.35	232.62	0.3	0.3	0.15		192	3.15
50	1367/50/BW/AISI316L/AISI316L/DA05	117.07	49.21	47.62	10	11	30	146		122	98.42	220.42	269.63	0.4	0.4	0.28	0.25	434	4.1
	1367/50/BW/AISI316L/AISI316L/SA05	117.07	49.21	47.62	10	11	30		194.00	122	98.42	220.42	269.63	0.4	0.4	0.28		434	4.9
65	1367/65/BW/AISI316L/AISI316L/DA10	135.73	59.53	60.32	10	11	30	182		127	107.15	234.15	293.68	0.5	0.5	0.33	0.32	723	6.47
	1367/65/BW/AISI316L/AISI316L/SA10	135.73	59.53	60.32	10	11	30		236.00	127	107.15	234.15	293.68	0.5	0.5	0.33		723	7.18
80	1367/80/BW/AISI316L/AISI316L/DA10	157.95	65.88	72.62	10	11	30	182		127	114.3	241.3	307.18	0.5	0.5	0.33	0.32	1124	10.37
	1367/80/BW/AISI316L/AISI316L/SA15	157.95	65.88	72.62	10	11	30		236.00	127	114.3	241.3	307.18	0.6	0.6	0.33		1124	12.45
100	1367/100/BW/AISI316L/AISI316L/DA15	170.25	86.91	97.63	10	11	30	203		148	127.00	275.00	361.91	0.8	0.8	0.8	0.7	2100	17.1

Sanitary Clamp Metallic Ball Valve with Pneumatic Rotary Single/Double Acting Actuator SUDE 1367

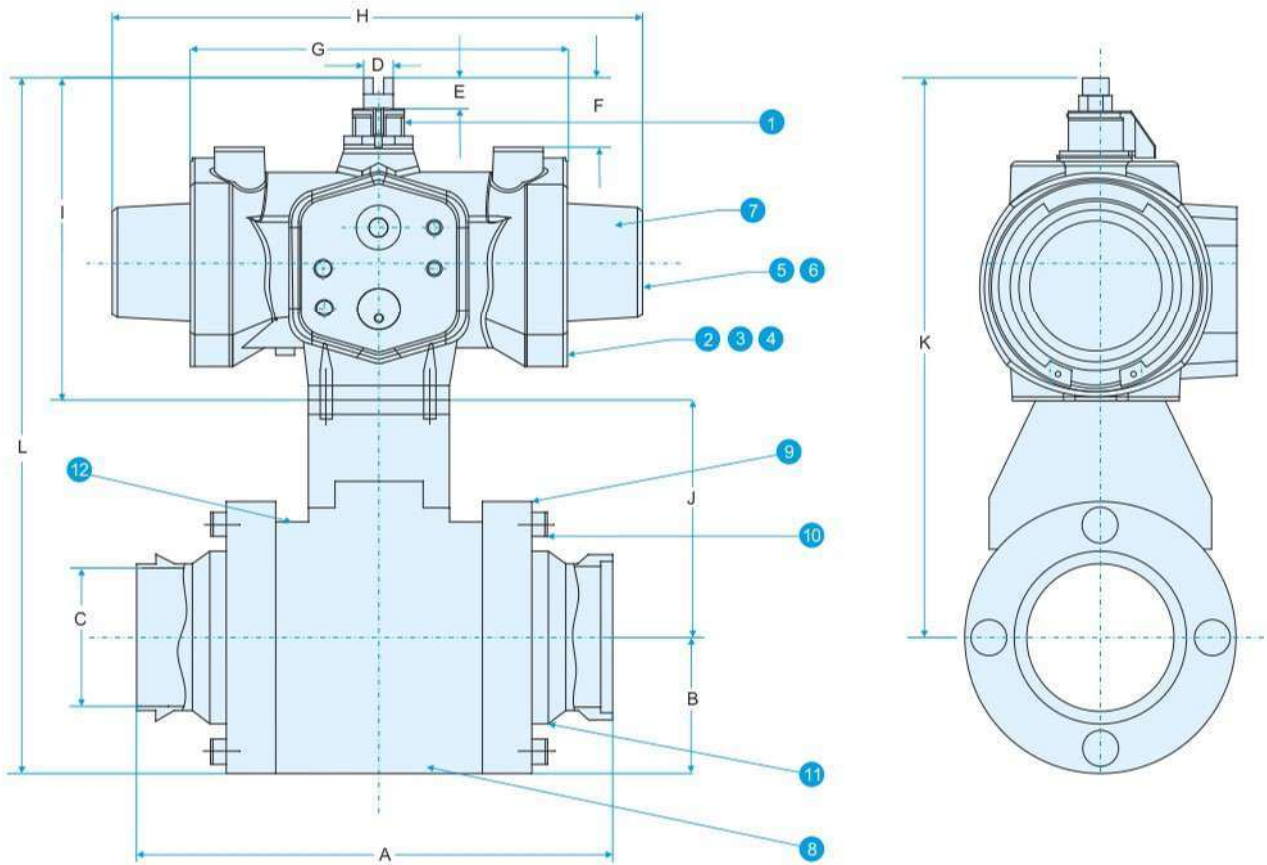


BILL OF MATERIAL OF VALVE WITH ACTUATOR

S.No.	PART	MATERIALS
1	INDICADOR VISUAL POSITION INDICATOR	--
2	PISTON GUIDE	POLYACETAL
3	GUIDE RING	POLYACETAL
4	PISTON O-RING	NITRILE
5	TAPA DOBLEEFFECTO DOUBLE ACTING CAP	--
6	SPRING SET	DIN-17223-C
7	SPRING RETURN CAP	ALLUMINIUM ALLOY
8	BODY	AISI316L
9	FLANGE	AISI316L
10	CAP SCREW	AISI 304
11	O-RING	EPDM

VALVE SIZE	MODEL NUMBER	DIMENSIONS (MM)											APPROX. TIME		AIR CONSUMPTION IN LTR		Cv	WT. OF ASSY IN KGS.		
		A	B	C	D	E	F	G	H	I	J	K	L	FOR OPEN	FOR CLOSE	FOR OPEN			FOR CLOSE	
25	1367/25/SC/AISI316L/AISI316L/DAW	94.05	34.13	22.22	8	7.5	20	109		85	72.23	157.23	191.36		0.2	0.2	0.075	0.05	66	2.65
	1367/25/SC/AISI316L/AISI316L/SAW	94.05	34.13	22.22	8	7.5	20		143.5	85	72.23	157.23	191.36		0.3	0.3	0.075		66	2.8
40	1367/40/SC/AISI316L/AISI316L/DA00	107.15	41.27	34.92	10	11	30	125		110	81.35	191.35	232.62		0.3	0.3	0.15	0.1	192	3.4
	1367/40/SC/AISI316L/AISI316L/SA00	107.15	41.27	34.92	10	11	30		160.00	110	81.35	191.35	232.62		0.3	0.3	0.15		192	3.60
50	1367/50/SC/AISI316L/AISI316L/DA05	117.07	49.21	47.62	10	11	30	146		122	98.42	220.42	269.63		0.4	0.4	0.28	0.25	434	4.6
	1367/50/SC/AISI316L/AISI316L/SA05	117.07	49.21	47.62	10	11	30		194.00	122	98.42	220.42	269.63		0.4	0.4	0.28		434	5.4
65	1367/65/SC/AISI316L/AISI316L/DA10	135.73	59.53	60.32	10	11	30	182		127	107.15	234.15	293.68		0.5	0.5	0.33	0.32	723	6.97
	1367/65/SC/AISI316L/AISI316L/SA10	135.73	59.53	60.32	10	11	30		236.00	127	107.15	234.15	293.68		0.5	0.5	0.33		723	7.68
80	1367/80/SC/AISI316L/AISI316L/DA10	157.95	65.88	72.62	10	11	30	182		127	114.3	241.3	307.18		0.5	0.5	0.33	0.32	1124	10.87
	1367/80/SC/AISI316L/AISI316L/SA15	157.95	65.88	72.62	10	11	30		236.00	127	114.3	241.3	307.18		0.6	0.6	0.33		1124	12.95
100	1367/100/SC/AISI316L/AISI316L/DA15	170.25	86.91	97.63	10	11	30	203		148	127.00	275.00	361.91		0.8	0.8	0.8	0.7	2100	17.6

I-Line Metallic Ball Valve with Pneumatic Rotary Single/Double Acting Actuator SUDE 1367



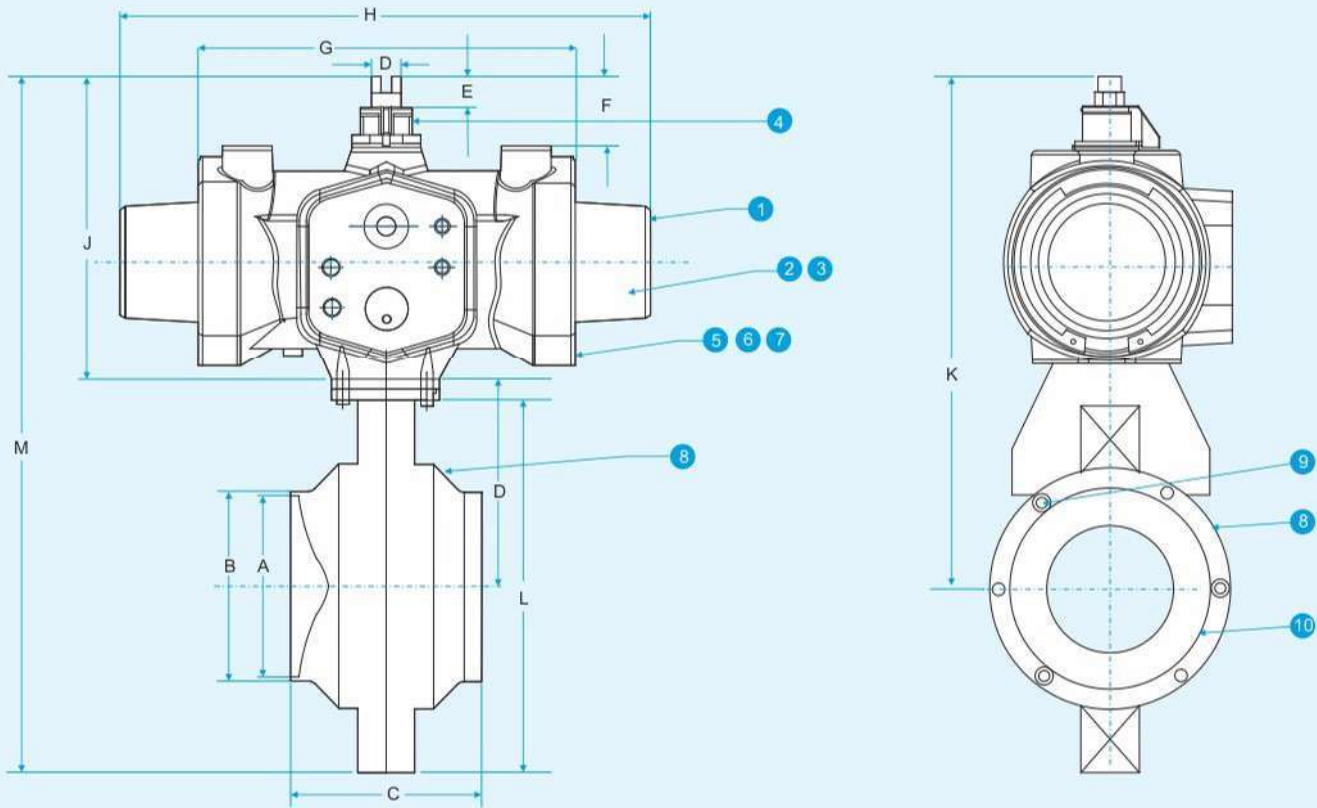
BILL OF MATERIAL OF VALVE WITH ACTUATOR

S.No.	PART	MATERIALS
1	INDICADOR VISUAL POSITION INDICATOR	-
2	PISTON GUIDE	POLYACETAL
3	GUIDE RING	POLYACETAL
4	PISTON O-RING	NITRILE
5	TAPA DOBLE EFECTO DOUBLE ACTING CAP	-
6	SPRING SET	DIN-17223-C
7	SPRING RETURN CAP	ALLUMINUM ALLOY
8	BODY	AI316L
9	FLANGE	AI316L
10	CAP SCREW	AI316L
11	O-RING	EPDM
12	SEAT	TFMPTFE



VALVE SIZE	MODEL NUMBER	DIMENSIONS (MM)											APPROX. TIME		AIR CONSUMPTION IN LTR		Cv	WT. OF ASSY IN KGS.	
		A	B	C	D	E	F	G	H	I	J	K	L	FOR OPEN	FOR CLOSE	FOR OPEN			FOR CLOSE
25	1367/25/I/AI316L/AI316L/DAW	101.99	34.13	22.22	8	7.5	20	109		85	72.23	157.23	191.36	0.2	0.2	0.075	0.05	66	3.09
	1367/25/I/AI316L/AI316L/SAW	101.99	34.13	22.22	8	7.5	20		143.5	85	72.23	157.23	191.36	0.3	0.3	0.075		66	3.24
40	1367/40/I/AI316L/AI316L/DA00	109.93	41.27	34.92	10	11	30	125		110	81.35	191.35	232.62	0.3	0.3	0.15	0.1	192	3.88
	1367/40/I/AI316L/AI316L/SA00	109.93	41.27	34.92	10	11	30		160.00	110	81.35	191.35	232.62	0.3	0.3	0.15		192	4.13
50	1367/50/I/AI316L/AI316L/DA05	140.49	49.21	47.62	10	11	30	146		122	98.42	220.42	269.63	0.4	0.4	0.28	0.25	434	5.22
	1367/50/I/AI316L/AI316L/SA05	140.49	49.21	47.62	10	11	30		194.00	122	98.42	220.42	269.63	0.4	0.4	0.28		434	6.02
65	1367/65/I/AI316L/AI316L/DA10	142.08	59.53	60.32	10	11	30	182		127	107.15	234.15	293.68	0.5	0.5	0.33	0.32	723	8.02
	1367/65/I/AI316L/AI316L/SA10	142.08	59.53	60.32	10	11	30		236.00	127	107.15	234.15	293.68	0.5	0.5	0.33		723	8.73
80	1367/80/I/AI316L/AI316L/DA10	170.65	65.88	72.62	10	11	30	182		127	114.3	241.3	307.18	0.5	0.5	0.33	0.32	1124	12.67
	1367/80/I/AI316L/AI316L/SA15	170.65	65.88	72.62	10	11	30		236.00	127	114.3	241.3	307.18	0.6	0.6	0.33		1124	14.75
100	1367/100/I/AI316L/AI316L/DA15	202.00	86.91	97.63	10	11	30	203		148	127.00	275.00	361.91	0.8	0.8	0.8	0.7	2100	20.6

Butt-Weld Metallic Butterfly Valve with Pneumatic Rotary Single/Double Acting Actuator SUDE 1267

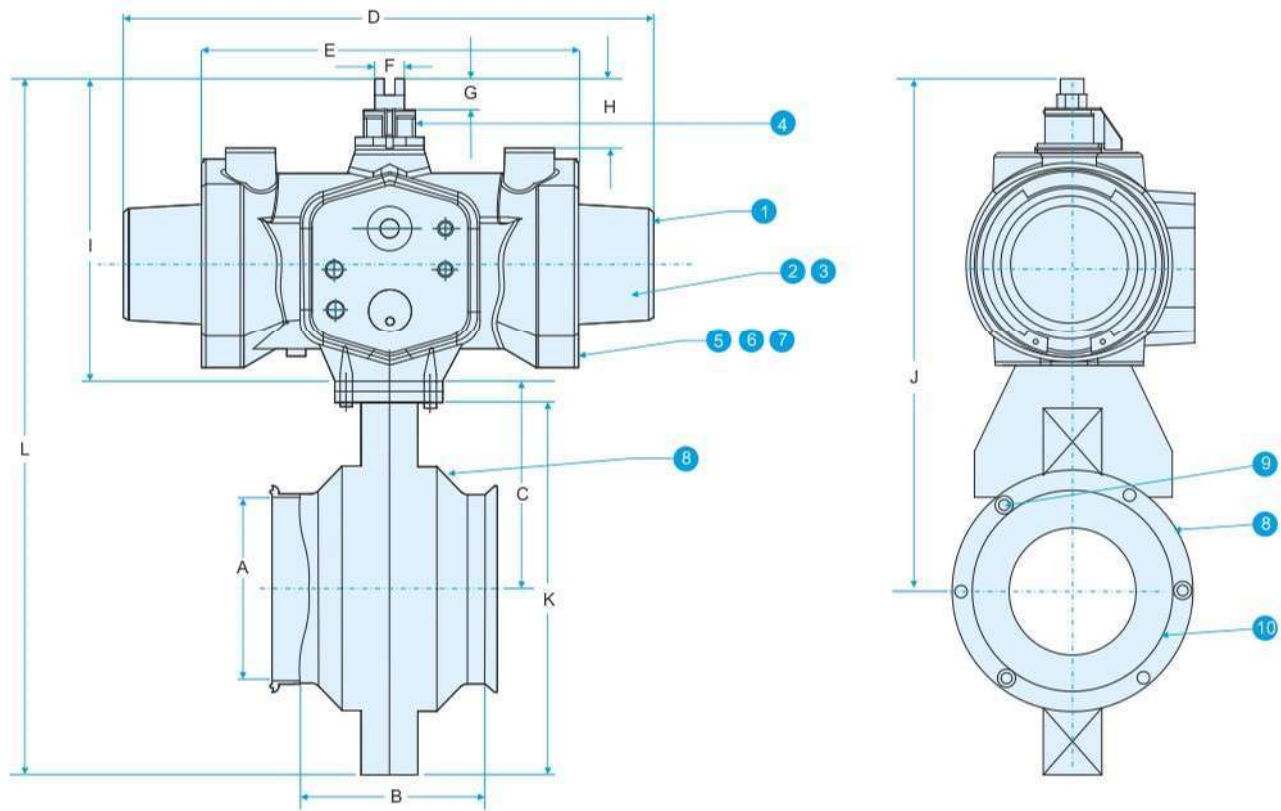


BILL OF MATERIAL OF VALVE WITH ACTUATOR

S.No.	PART	MATERIALS
1	TAPA DOUBLE EFECTO DOUBLE ACTING CAP	-
2	SPRING SET	DIN-17223-C
3	SPRING RETURN CAP	ALLUMINIUM ALLOY
4	VISUAL POSITION INDICATOR	-
5	PISTON GUIDE	POLYACETAL
6	GUIDE RING	POLYACETAL
7	PISTON ORING	NTRILE
8	FLANGE	AISI 316L
9	SCREW	AISI 304
10	SEAT	SILICON

VALVE SIZE	MODEL NUMBER	DIMENSIONS (MM)													Cv	OPPROX. TIME		AIR CONSUMPTION IN LTR		WT.OF ASSY IN KGS.
		A	B	C	D	E	F	G	H	I	J	K	L	M		FOR OPEN	FOR CLOSE	FOR OPEN	FOR CLOSE	
25	1267/25/BW/AISI316L/AISI316L/DAW	22.22	25.4	68.07	84.82	1435	109.00	8.00	7.5	20.00	85.00	169.82	79.24	209.44	22	0.2	0.2	0.075	0.05	1.05
	1267/25/BW/AISI316L/AISI316L/SAW	22.22	25.4	68.07	84.82	1435	109.00	8.00	7.5	20.00	85.00	169.82	79.24	209.44	22	0.3	0.3	0.075		1.2
40	1267/25/BW/AISI316L/AISI316L/DAW	34.92	38.1	76.2	87.36	1435	109.00	8.00	7.5	20.00	85.00	172.36	84.83	214.77	80	0.2	0.2	0.075	0.05	1.15
	1267/25/BW/AISI316L/AISI316L/SAW	34.92	38.1	76.2	87.36	1435	109.00	8.00	7.5	20.00	85.00	172.36	84.83	214.77	80	0.3	0.3	0.075		1.15
50	1267/25/BW/AISI316L/AISI316L/DA00	47.62	50.8	80.01	97.52	160.00	125.00	10.00	11.00	30.00	110.00	207.52	104.64	259.84	195	0.3	0.3	0.15	0.1	3.1
	1267/25/BW/AISI316L/AISI316L/SA00	47.62	50.8	80.01	97.52	160.00	125.00	10.0	11.00	30.00	110.00	207.52	104.64	259.84	195	0.4	0.4	0.15		2.25
65	1267/25/BW/AISI316L/AISI316L/DA00	60.32	63.5	80.01	101.85	160.00	125.00	10.00	11.00	30.00	110.00	211.85	111.76	268.73	250	0.3	0.3	0.15	0.1	3.5
	1267/25/BW/AISI316L/AISI316L/SA05	60.32	63.5	80.01	101.85	160.00	125.00	10.00	11.00	30.00	110.00	211.85	111.76	268.73	250	0.4	0.4	0.15		3.7
80	1267/25/BW/AISI316L/AISI316L/DA05	72.61	76.2	80.01	107.95	194.00	146.00	10.00	11.00	30.00	122.00	229.95	124.46	292.18	400	0.4	0.4	0.28	0.25	3
	1267/25/BW/AISI316L/AISI316L/SA05	72.61	76.2	80.01	107.95	194.00	146.00	10.00	11.00	30.00	122.00	229.95	124.46	292.18	400	0.4	0.4	0.15		3.6
100	1267/25/BW/AISI316L/AISI316L/DA05	97.61	101.6	88.9	124.61	194.00	146.00	10.00	11.00	30.00	122.00	246.61	156.97	325.09	840	0.4	0.4	0.28	0.25	4.5
	1267/25/BW/AISI316L/AISI316L/SA10	97.61	101.6	88.9	124.61	194.00	146.00	10.00	11.00	30.00	122.00	246.61	156.97	325.09	840	0.5	0.5	0.28		5.58
125	1267/25/BW/AISI316L/AISI316L/DA10	121.43	127	88.9	149.86	236.00	182.00	10.00	11.00	30.00	127.00	276.86	180.08	366.9	1200	0.5	0.5	0.33	0.32	6.57
	1267/25/BW/AISI316L/AISI316L/SA15	121.43	127	88.9	149.86	236.00	182.00	10.00	11.00	30.00	127.00	276.86	180.08	366.9	1200	0.6	0.6	0.33		8.65
150	1267/25/BW/AISI316L/AISI316L/DA15	146.83	152.4	89.07	165.86	266.00	203.00	10.00	11.00	30.00	148.00	313.86	211.83	419.77	1900	0.8	0.8	0.8	0.7	7.8
	1267/25/BW/AISI316L/AISI316L/SA20	146.83	152.4	89.07	165.86	266.00	203.00	10.00	11.00	30.00	148.00	313.86	211.83	419.77	1900	1	1	0.8		10.96
200	1267/25/BW/AISI316L/AISI316L/DA20	200.02	203.2	89.66	187.96	312.00	234.00	16.00	11.00	30.00	161.00	348.96	256.28	477.1	3200	1	1	1.5	1.2	11.07

Sanitary Clamp Metallic Butterfly Valve with Pneumatic Rotary Single/Double Acting Actuator SUDE 1267



BILL OF MATERIAL OF VALVE WITH ACTUATOR

S.No.	PART	MATERIALS
1	TAPA DOUBLE EFECTO DOUBLE ACTING CAP	-
2	SPRING SET	DIN-17223-C
3	SPRING RETURN CAP	ALLUMINIUM ALLOY
4	VISUAL POSITION INDICATOR	-
5	PISTON GUIDE	POLYACETAL
6	GUIDE RING	POLYACETAL
7	PISTON O-RING	NITRILE
8	FLANGE	AISI 316L
9	SCREW	AISI 304
10	SEAT	SILICON

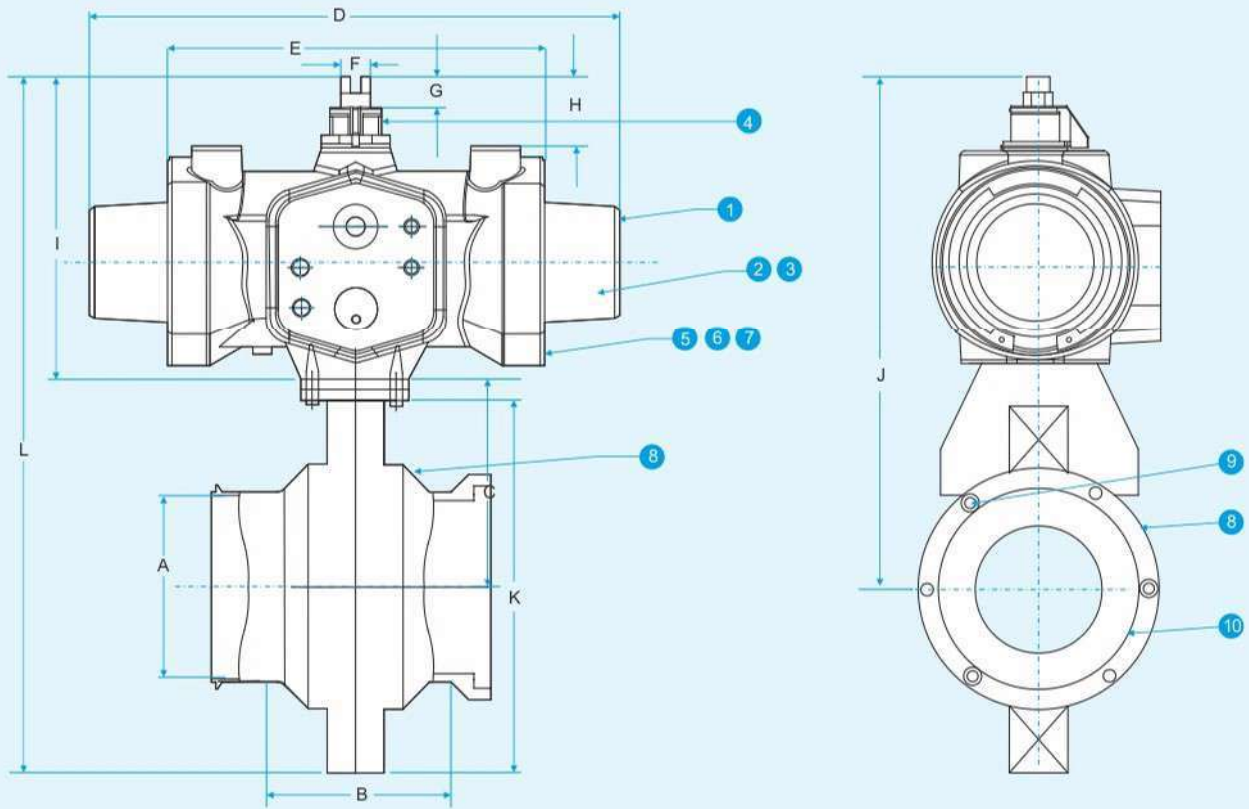


VALVE SIZE	MODEL NUMBER	DIMENSIONS (MM)											Cv	OPPROX. TIME		AIR CONSUMPTION IN LTR		WT. OF ASSY IN KGS.	
		A	B	C	D	E	F	G	H	I	J	K		L	OPEN (SEC.)	CLOSE (SEC.)	TO OPEN		TO CLOSE
25	1267/25/SC/AISI316L/AISI316L/DAW	22.22	68.07	84.82	143.5	109.00	8.00	7.5	20.00	85.00	169.82	79.24	209.44	22	0.2	0.2	0.075	0.05	1.25
	1267/25/SC/AISI316L/AISI316L/SAW	22.22	68.07	84.82	143.5	109.00	8.00	7.5	20.00	85.00	169.82	79.24	209.44	22	0.3	0.3	0.075		1.4
40	1267/25/SC/AISI316L/AISI316L/DAW	34.92	76.2	87.36	143.5	109.00	8.00	7.5	20.00	85.00	172.36	84.83	214.77	80	0.2	0.2	0.075	0.05	1.3
	1267/25/SC/AISI316L/AISI316L/SAW	34.92	76.2	87.36	143.5	109.00	8.00	7.5	20.00	85.00	172.36	84.83	214.77	80	0.3	0.3	0.075		1.45
50	1267/25/SC/AISI316L/AISI316L/DA00	47.62	80.01	97.52	160.00	125.00	10.00	11.00	30.00	110.00	207.52	104.64	259.84	195	0.3	0.3	0.15	0.1	3.5
	1267/25/SC/AISI316L/AISI316L/SA00	47.62	80.01	97.52	160.00	125.00	10.00	11.00	30.00	110.00	207.52	104.64	259.84	195	0.4	0.4	0.15		2.65
65	1267/25/SC/AISI316L/AISI316L/DA00	60.32	80.01	101.85	160.00	125.00	10.00	11.00	30.00	110.00	211.85	111.76	268.73	250	0.3	0.3	0.15	0.1	3.9
	1267/25/SC/AISI316L/AISI316L/SA05	60.32	80.01	101.85	160.00	125.00	10.00	11.00	30.00	110.00	211.85	111.76	268.73	250	0.4	0.4	0.15		4.1
80	1267/25/SC/AISI316L/AISI316L/DA05	72.61	80.01	107.95	194.00	146.00	10.00	11.00	30.00	122.00	229.95	124.46	292.18	400	0.4	0.4	0.28	0.25	3.5
	1267/25/SC/AISI316L/AISI316L/SA05	72.61	80.01	107.95	194.00	146.00	10.00	11.00	30.00	122.00	229.95	124.46	292.18	400	0.4	0.4	0.15		4.3
100	1267/25/SC/AISI316L/AISI316L/DA05	97.61	88.9	124.61	194.00	146.00	10.00	11.00	30.00	122.00	246.91	156.97	325.09	840	0.4	0.4	0.28	0.25	5
	1267/25/SC/AISI316L/AISI316L/SA10	97.61	88.9	124.61	194.00	146.00	10.00	11.00	30.00	122.00	246.91	156.97	325.09	840	0.5	0.5	0.28		6.08
125	1267/25/SC/AISI316L/AISI316L/DA10	121.43	88.9	149.86	236.00	182.00	10.00	11.00	30.00	127.00	276.86	180.08	366.9	1200	0.5	0.5	0.33	0.32	7.07
	1267/25/SC/AISI316L/AISI316L/SA15	121.43	88.9	149.86	236.00	182.00	10.00	11.00	30.00	127.00	276.86	180.08	366.9	1200	0.6	0.6	0.33		9.15
150	1267/25/SC/AISI316L/AISI316L/DA15	146.83	89.07	165.86	266.00	203.00	10.00	11.00	30.00	148.00	313.86	211.83	419.77	1900	0.8	0.8	0.8	0.7	8.6
	1267/25/SC/AISI316L/AISI316L/SA20	146.83	89.07	165.86	266.00	203.00	10.00	11.00	30.00	148.00	313.86	211.83	419.77	1900	1	1	0.8		11.76
200	1267/25/SC/AISI316L/AISI316L/DA20	200.02	89.66	187.96	312.00	234.00	16.00	11.00	30.00	161.00	348.96	256.28	477.1	3200	1	1	1.5	1.2	11.77

I-Line Metallic Butterfly Valve with

Pneumatic Rotary Single/Double Acting Actuator SUDE

1267



BILL OF MATERIAL OF VALVE WITH ACTUATOR

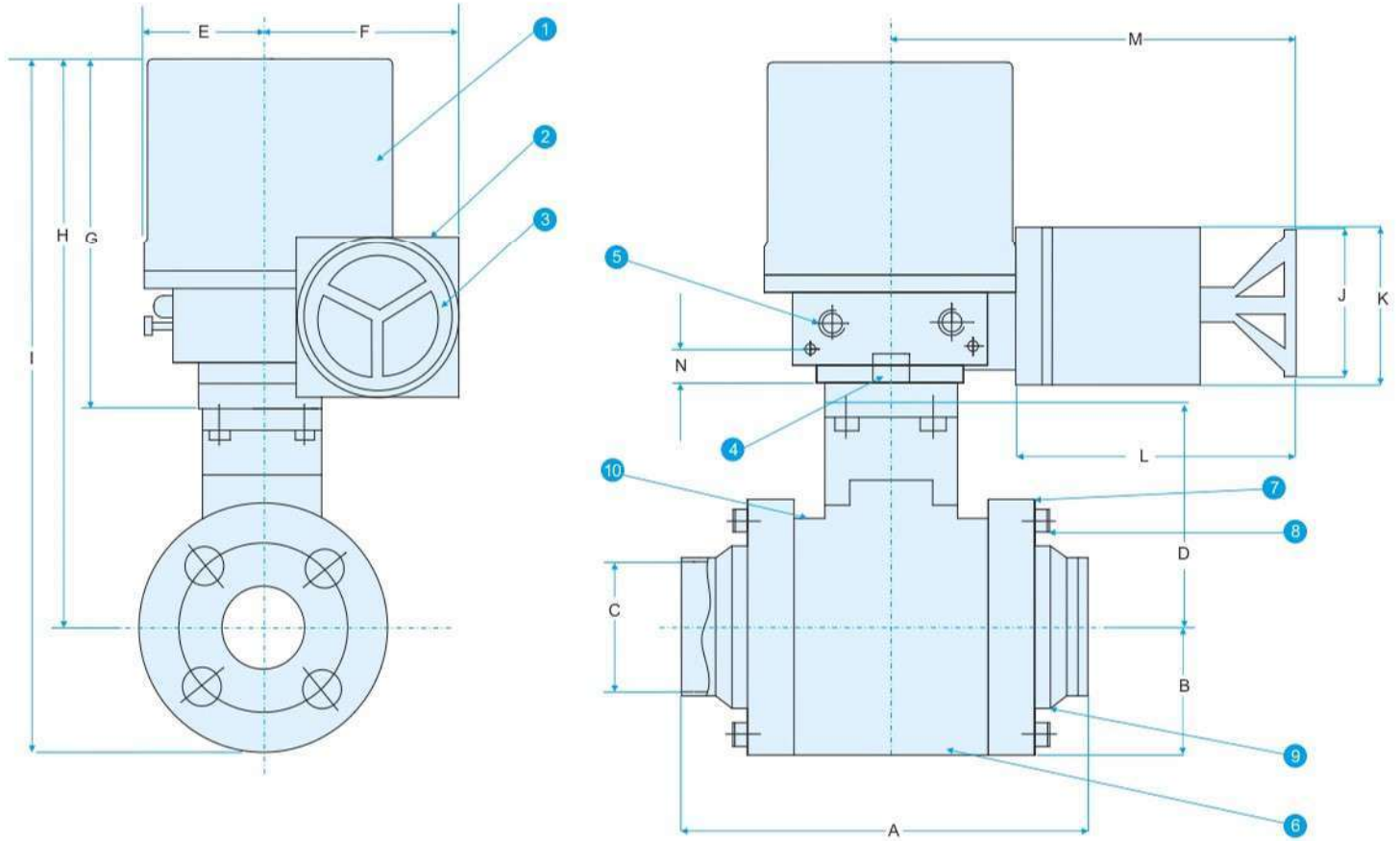
S.No.	PART	MATERIALS
1	TAPA DOUBLE EFECTO DOUBLE ACTING CAP	-
2	SPRING SET	DIN-17223-C
3	SPRING RETURN CAP	ALLUMINIUM ALLOY
4	VISUAL POSITION INDICATOR	-
5	PISTON GUIDE	POLYACETAL
6	GUIDE RING	POLYACETAL
7	PISTON ORING	NITRILE
8	FLANGE	AISI 316L
9	SCREW	AISI 304
10	SEAT	SILICON

VALVE SIZE	MODEL NUMBER	DIMENSIONS (MM)											Cv	OPPROX. TIME		AIR CONSUMPTION IN LTR		WT.OF ASSY IN KGS.	
		A	B	C	D	E	F	G	H	I	J	K		L	OPEN (SEC.)	CLOSE (SEC.)	TO OPEN		TO CLOSE
25	1267/25/IL/AISI316L/AISI316L/DAW	22.22	75.00	84.82	143.5	109.00	8.00	7.5	20.00	85.00	169.82	79.24	209.44	22	0.2	0.2	0.075	0.05	1.41
	1267/25/IL/AISI316L/AISI316L/SAW	22.22	75.00	84.82	143.5	109.00	8.00	7.5	20.00	85.00	169.82	79.24	209.44	22	0.3	0.3	0.075		1.56
40	1267/25/IL/AISI316L/AISI316L/DAW	34.92	75.00	87.36	143.5	109.00	8.00	7.5	20.00	85.00	172.36	84.83	214.77	80	0.2	0.2	0.075	0.05	1.47
	1267/25/IL/AISI316L/AISI316L/SAW	34.92	75.00	87.36	143.5	109.00	8.00	7.5	20.00	85.00	172.36	84.83	214.77	80	0.3	0.3	0.075		1.62
50	1267/25/IL/AISI316L/AISI316L/DA00	47.62	85.72	97.52	160.00	125.00	10.00	11.00	30.00	110.00	207.52	104.64	259.84	195	0.3	0.3	0.15	0.1	3.78
	1267/25/IL/AISI316L/AISI316L/SA00	47.62	85.72	97.52	160.00	125.00	10.00	11.00	30.00	110.00	207.52	104.64	259.84	195	0.4	0.4	0.15		2.93
65	1267/25/IL/AISI316L/AISI316L/DA00	60.32	84.12	101.85	160.00	125.00	10.00	11.00	30.00	110.00	211.85	111.76	268.73	250	0.3	0.3	0.15	0.1	4.26
	1267/25/IL/AISI316L/AISI316L/SA05	60.32	84.12	101.85	160.00	125.00	10.00	11.00	30.00	110.00	211.85	111.76	268.73	250	0.4	0.4	0.15		4.46
80	1267/25/IL/AISI316L/AISI316L/DA05	72.61	92.07	107.95	194.00	146.00	10.00	11.00	30.00	122.00	229.95	124.46	292.18	400	0.4	0.4	0.28	0.25	3.9
	1267/25/IL/AISI316L/AISI316L/SA05	72.61	92.07	107.95	194.00	146.00	10.00	11.00	30.00	122.00	229.95	124.46	292.18	400	0.4	0.4	0.15		4.7
100	1267/25/IL/AISI316L/AISI316L/DA05	97.61	109.93	124.61	194.00	146.00	10.00	11.00	30.00	122.00	246.91	156.97	325.09	840	0.4	0.4	0.28	0.25	5.7
	1267/25/IL/AISI316L/AISI316L/SA10	97.61	109.93	124.61	194.00	146.00	10.00	11.00	30.00	122.00	246.91	156.97	325.09	840	0.5	0.5	0.28		6.78
125	1267/25/IL/AISI316L/AISI316L/DA10	121.43	113.48	149.86	236.00	182.00	10.00	11.00	30.00	127.00	276.86	180.08	366.9	1200	0.5	0.5	0.33	0.32	8.11
	1267/25/IL/AISI316L/AISI316L/SA15	121.43	113.48	149.86	236.00	182.00	10.00	11.00	30.00	127.00	276.86	180.08	366.9	1200	0.6	0.6	0.33		10.19
150	1267/25/IL/AISI316L/AISI316L/DA15	146.83	113.48	165.86	266.00	203.00	10.00	11.00	30.00	148.00	313.86	211.83	419.77	1900	0.8	0.8	0.8	0.7	9.8
	1267/25/IL/AISI316L/AISI316L/SA20	146.83	113.48	165.86	266.00	203.00	10.00	11.00	30.00	148.00	313.86	211.83	419.77	1900	1	1	0.8		12.96
200	1267/25/IL/AISI316L/AISI316L/DA20	200.02	113.48	187.96	312.00	234.00	16.00	11.00	30.00	161.00	348.96	256.28	477.1	3200	1	1	1.5	1.2	13.41

Butt-Weld Metallic Ball Valve with

Single Phase **Electrical** Actuator **SIDE**

1357



BILL OF MATERIAL OF VALVE WITH ACTUATOR

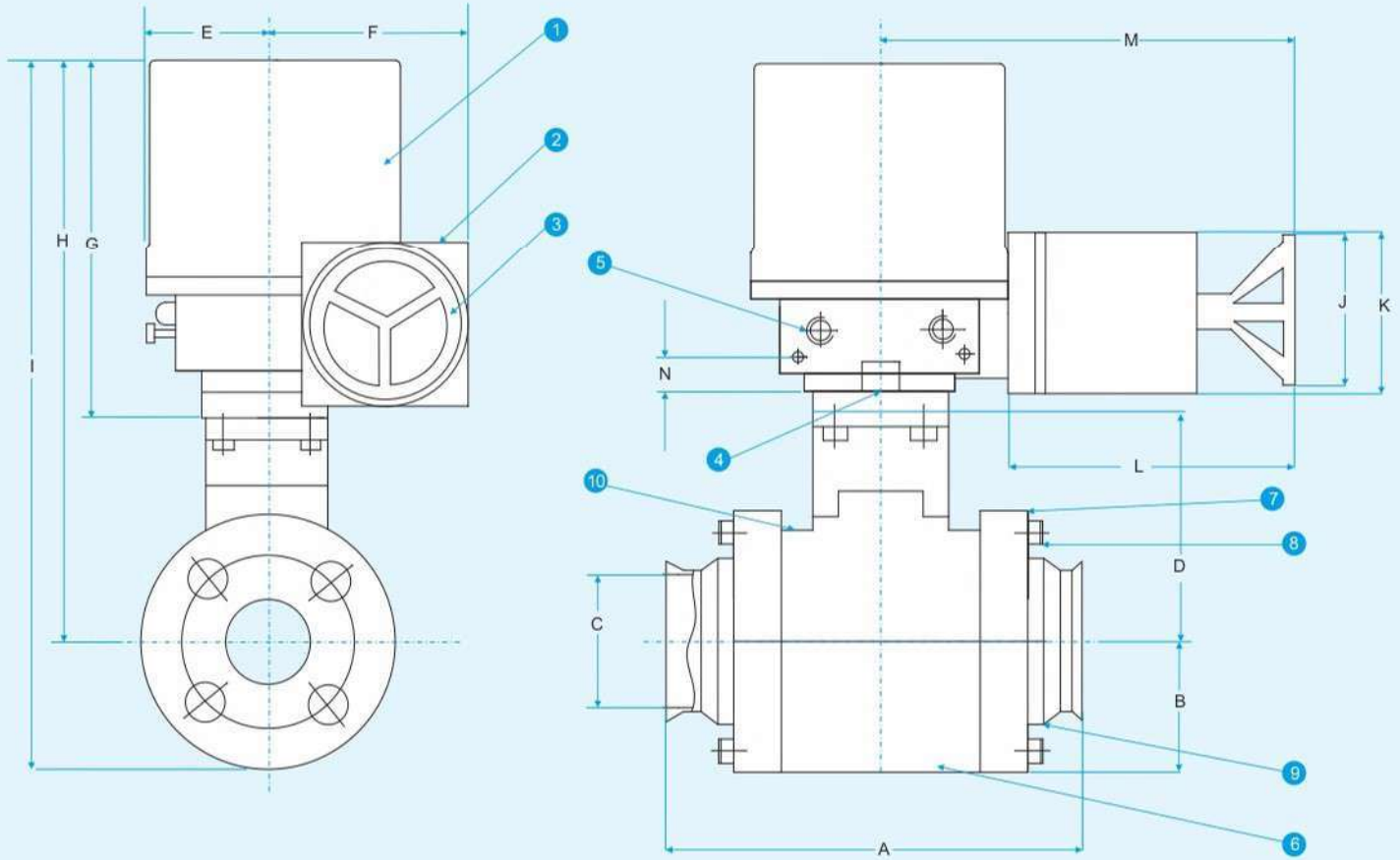
S.No.	PART	MATERIALS
1	ELECTRIC ACTUATOR STAY PUT TYPE	
2	MOTOR	
3	HAND WHEEL	SDTORCK MAKE
4	OUTPUT BORE	
5	CABLE GLANDS	
6	BODY	AISI316L
7	FLANGE	AISI316L
8	CAP SCREW	AISI 304
9	ORING	EPDM
10	SEAT	TFMPTFE

VALVE SIZE	MODEL NUMBER	DIMENSION (MM)														APPROX. TIME		Cv	WT. OF ASSY IN KGS.
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	FOR OPEN	FOR CLOSE		
25	1357/25/BW/AISI316L/AISI316L/SD-1000-03	94.05	34.13	22.22	72.23	68	117	175	247.2	281.36	100	110	145	215	32	17.00	17.00	66	9.70
40	1357/40/BW/AISI316L/AISI316L/SD-1000-03	107.15	41.27	34.92	81.35	68	117	175	256.3	297.62	100	110	160	215	32	17.00	17.00	192	9.90
50	1357/50/BW/AISI316L/AISI316L/SD-1000-05	117.07	49.21	47.62	98.42	68	117	175	273.4	322.63	100	110	160	225	32	17.00	17.00	434	11.60
65	1357/65/BW/AISI316L/AISI316L/SD-1000-05	135.73	59.53	60.32	107.15	95	148	250	357.1	416.68	100	110	170	225	37	20.00	20.00	723	13.60
80	1357/80/BW/AISI316L/AISI316L/SD-1000-10	157.95	65.88	72.62	114.3	95	148	250	364.3	430.18	100	110	185	285	37	20.00	20.00	1124	20.50

Sanitary Clamp Metallic Ball Valve with

Single Phase **Electrical** Actuator **SUDE**

1357



BILL OF MATERIAL OF VALVE WITH ACTUATOR

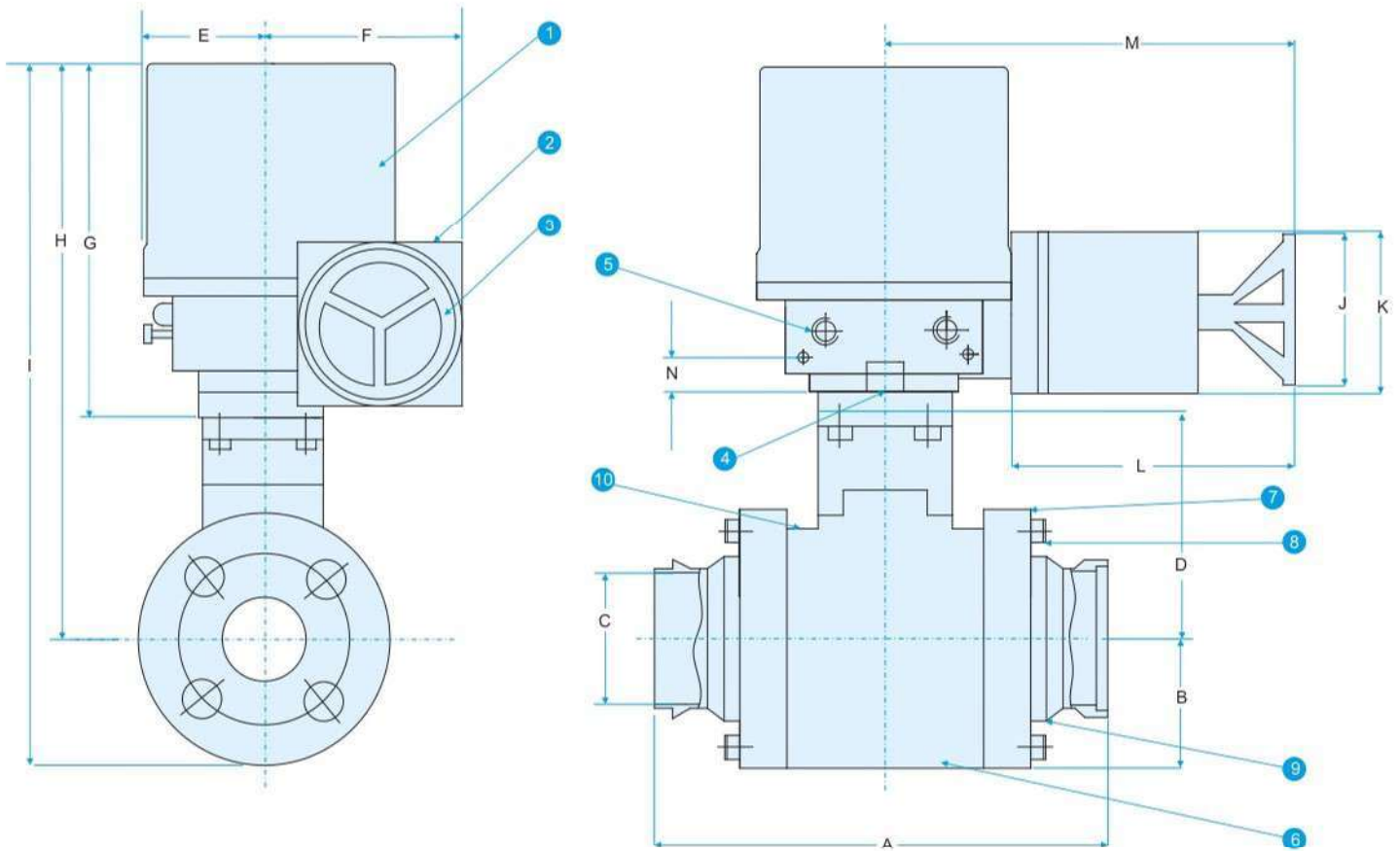
S.No.	PART	MATERIALS
1	ELECTRIC ACTUATOR STAY PUT TYPE	
2	MOTOR	
3	HAND WHEEL	SDTORK MAKE
4	OUTPUT BORE	
5	CABLE GLANDS	
6	BODY	AISI316L
7	FLANGE	AISI316L
8	CAP SCREW	AISI 304
9	O-RING	EPDM
10	SEAT	TFMPTFE

VALVE SIZE	MODEL NUMBER	DIMENSIONS (MM)														APPROX. TIME		C _v	WT. OF ASS'Y IN KGS.
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	FOR OPEN	FOR CLOSE		
25	1357/25/SC/AISI316L/AISI316L/SD-1000-03	94.05	34.13	22.22	72.23	68	117	175	247.2	281.36	100	110	145	215	32	17.00	17.00	66	10.20
40	1357/40/SC/AISI316L/AISI316L/SD-1000-03	107.15	41.27	34.92	81.35	68	117	175	256.3	297.62	100	110	160	215	32	17.00	17.00	192	10.40
50	1357/50/SC/AISI316L/AISI316L/SD-1000-05	117.07	49.21	47.62	98.42	68	117	175	273.4	322.63	100	110	160	225	32	17.00	17.00	434	12.10
65	1357/65/SC/AISI316L/AISI316L/SD-1000-05	135.73	59.53	60.32	107.15	95	148	250	357.1	416.68	100	110	170	225	37	20.00	20.00	723	14.10
80	1357/80/SC/AISI316L/AISI316L/SD-1000-10	157.95	65.88	72.62	114.30	95	148	250	364.3	430.18	100	110	185	285	37	20.00	20.00	1124	22.80

I-Line Metallic Ball Valve with

Single Phase **Electrical** Actuator **SUDE**

1357



BILL OF MATERIAL OF VALVE WITH ACTUATOR

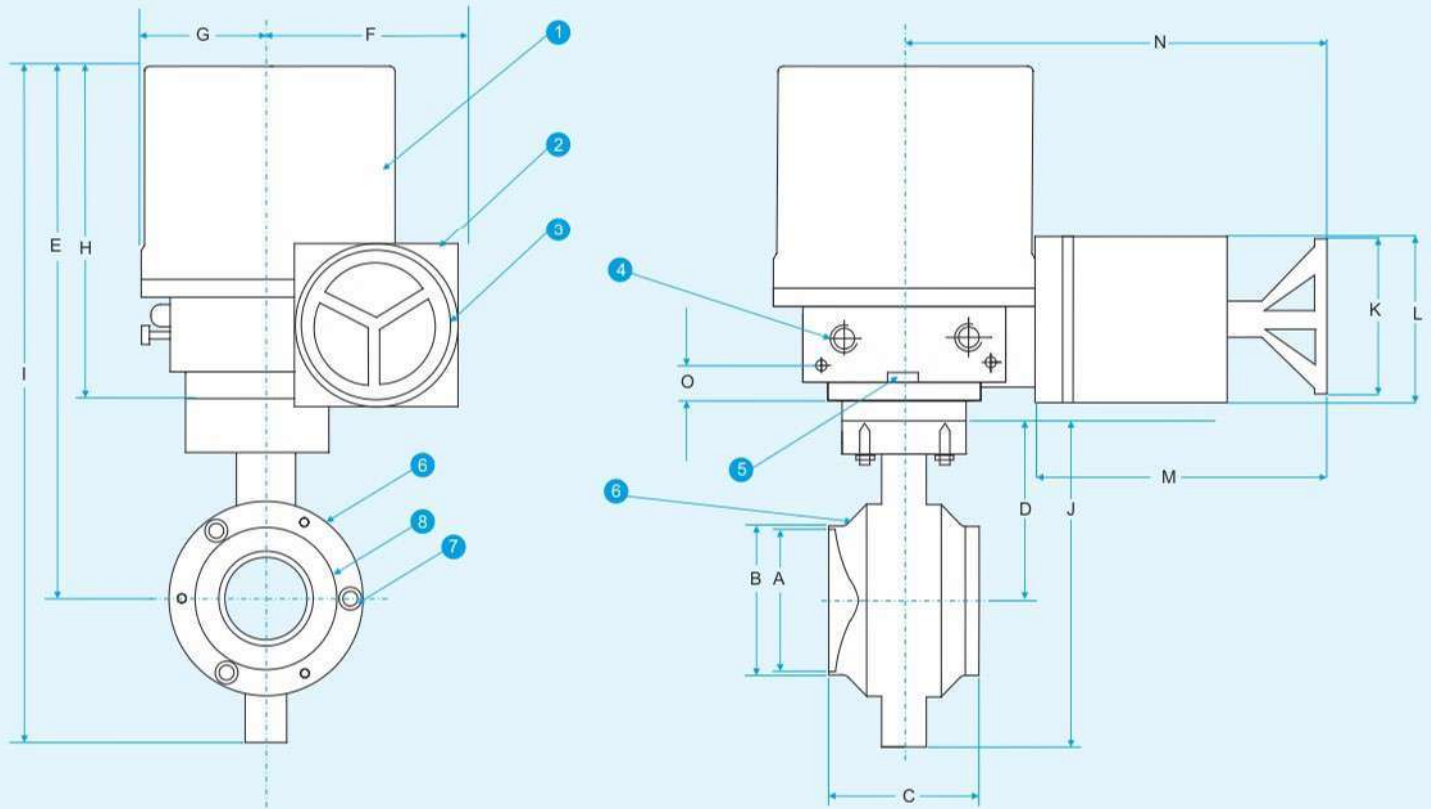
S.No.	PART	MATERIALS
1	ELECTRIC ACTUATOR STAY PUT TYPE	
2	MOTOR	
3	HAND WHEEL	SDORK MAKE
4	OUTPUT BORE	
5	CABLE GLANDS	
6	BODY	AISI316L
7	FLANGE	AISI316L
8	CAP SCREW	AISI 304
9	ORING	EPDM
10	SEAT	TFMPTFE

VALVE SIZE	MODEL NUMBER	DIMENSIONS (MM)														APPROX. TIME		Cv	WT. OF ASSY IN KGS.
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	FOR OPEN	FOR CLOSE		
25	1357/25/I/L/AISI316L/AISI316LSD-1000-03	101.99	34.13	22.22	72.23	68	117	175	247.2	281.36	100	110	145	215	32	17.00	17.00	66	10.64
40	1357/40/I/L/AISI316L/AISI316LSD-1000-03	109.93	41.27	34.92	81.35	68	117	175	256.3	297.62	100	110	160	215	32	17.00	17.00	192	10.88
50	1357/50/I/L/AISI316L/AISI316LSD-1000-05	140.49	49.21	47.62	98.42	68	117	175	273.4	322.63	100	110	160	225	32	17.00	17.00	434	12.72
65	1357/65/I/L/AISI316L/AISI316LSD-1000-05	142.08	59.53	60.32	107.15	95	148	250	357.1	416.68	100	110	170	225	37	20.00	20.00	723	15.15
80	1357/80/I/L/AISI316L/AISI316LSD-1000-10	170.65	65.88	72.62	114.30	95	148	250	364.3	430.18	100	110	185	285	37	20.00	20.00	1124	22.8

Butt Weld Metallic Butterfly Valve with

Single Phase **Electrical** Actuator **SIDE**

1257



BILL OF MATERIAL OF VALVE WITH ACTUATOR

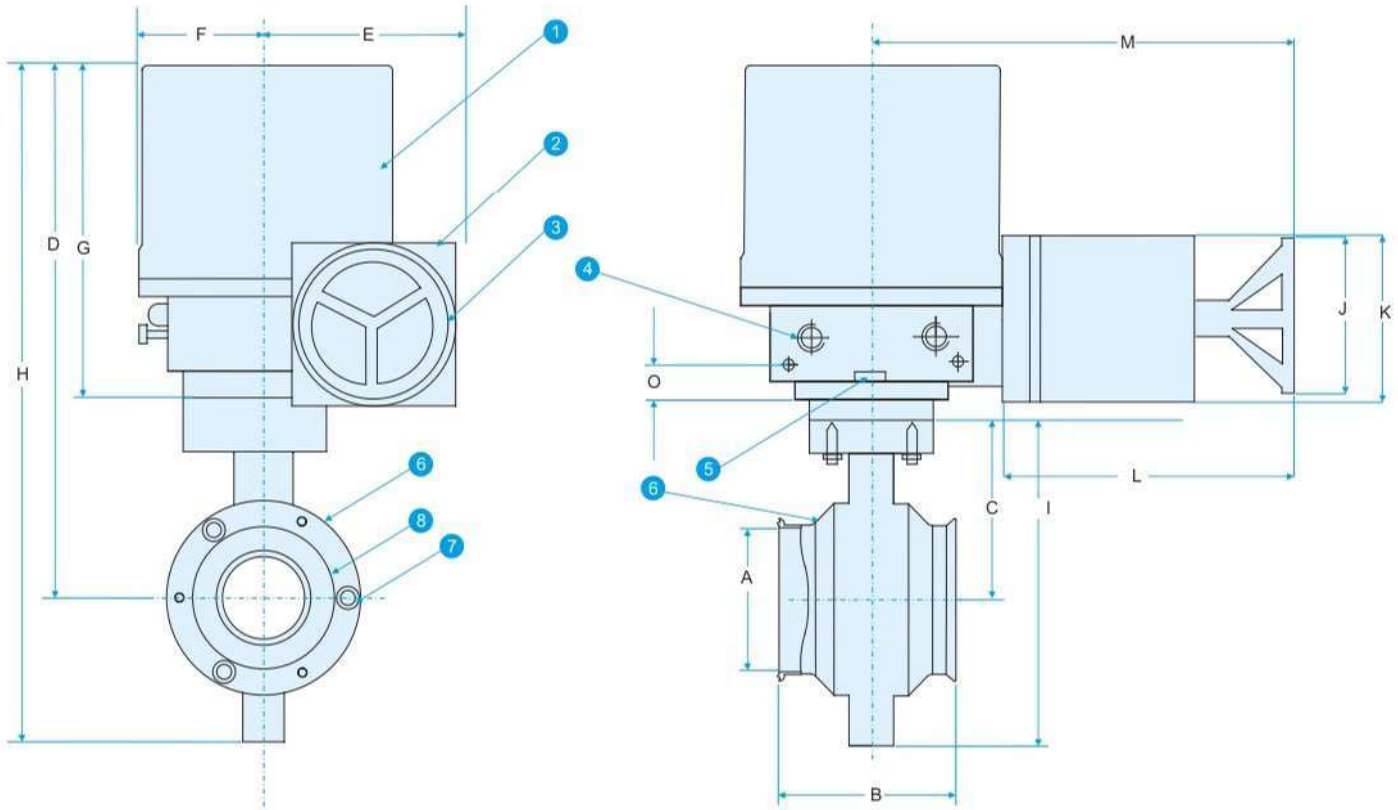
S.No.	PART	MATERIALS
1	ELECTRIC ACTUATOR STAY PUT TYPE	
2	MOTOR	
3	HAND WHEEL	SDTORK MAKE
4	CABLE GLANDS	
5	OUTPUT BORE	
6	FLANGE	AISI316L
7	SCREW	AISI 304
8	SEAT	SILICON

VALVE SIZE	MODEL NUMBER	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Cv	OPPROX. TIME		WT OF ASSY IN KGS.
																		FOR OPEN	FOR CLOSE	
25	1257/25/BW/AISI316L/AISI316L/SD-1000-03	22.22	25.4	68.07	84.82	259.82	117.00	92.00	175.00	298.44	79.24	100	110.00	145.00	215.00	32.00	22	17.00	17.00	8.6
40	1257/25/BW/AISI316L/AISI316L/SD-1000-03	34.92	38.1	76.2	87.36	262.36	117.00	92.00	175.00	303.62	84.83	100	110.00	145.00	215.00	32.00	80	17.00	17.00	8.7
50	1257/25/BW/AISI316L/AISI316L/SD-1000-03	47.62	50.8	80.01	97.52	272.52	117.00	92.00	175.00	323.84	104.64	100	110.00	145.00	215.00	32.00	195	17.00	17.00	9
65	1257/25/BW/AISI316L/AISI316L/SD-1000-03	60.32	63.5	80.01	101.85	276.85	117.00	92.00	175.00	332.73	111.76	100	110.00	145.00	215.00	32.00	250	17.00	17.00	9.4
80	1257/25/BW/AISI316L/AISI316L/SD-1000-05	72.61	76.2	80.01	107.95	282.95	117.00	92.00	175.00	345.18	124.46	100	110.00	160.00	225.00	32.00	400	17.00	17.00	10.5
100	1257/25/BW/AISI316L/AISI316L/SD-1000-05	97.61	101.6	88.9	124.61	299.61	117.00	92.00	175.00	378.09	156.97	100	110.00	160.00	225.00	32.00	840	17.00	17.00	12
125	1257/25/BW/AISI316L/AISI316L/SD-1000-10	121.43	127	88.9	149.86	399.86	148.00	125.00	250.00	489.9	180.08	100	110.00	170.00	270.00	37.00	1200	20.00	20.00	16.7
150	1257/25/BW/AISI316L/AISI316L/SD-1000-10	146.83	152.4	89.07	165.86	415.86	148.00	125.00	250.00	521.77	211.83	100	110.00	170.00	270.00	37.00	1900	20.00	20.00	17.2

Sanitary Clamp Metallic Butterfly Valve with

Single Phase **Electrical** Actuator **SUDE**

1257



BILL OF MATERIAL OF VALVE WITH ACTUATOR

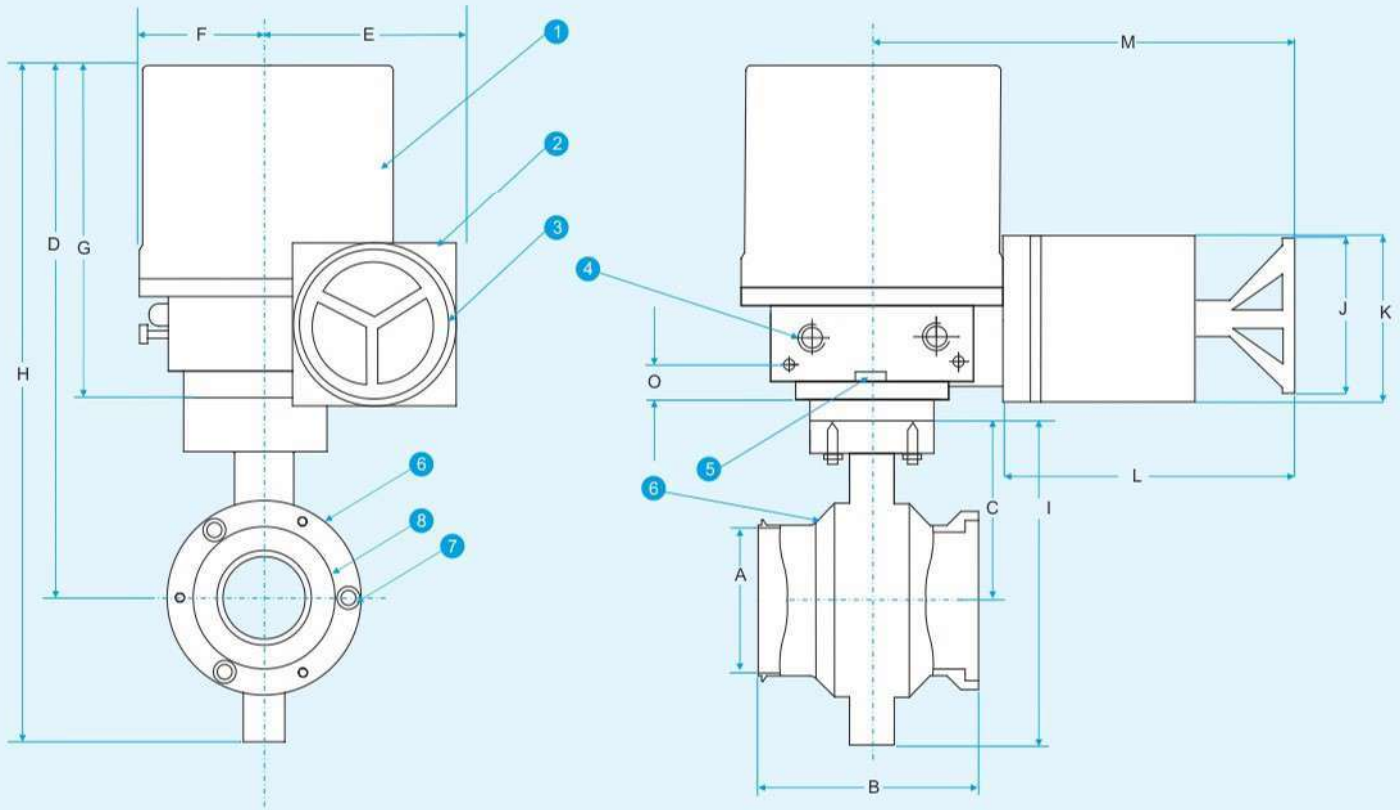
S.No.	PART	MATERIALS
1	ELECTRIC ACTUATOR STAY PUT TYPE	SOTORK MAKE
2	MOTOR	
3	HAND WHEEL	
4	CABLE GLANDS	
5	OUTPUT BORE	
6	FLANGE	AISI316L
7	SCREW	AISI 304
8	SEAT	SILICON

VALVE SIZE	MODEL NUMBER	DIMENSIONS (MM)														Cv	OPPROX. TIME		WT. OF ASSY IN KGS.
		A	B	C	D	E	F	G	H	I	J	K	L	M	N		FOR OPEN	FOR CLOSE	
25	1257/25/SC/AISI316L/AISI316L/SD-1000-03	22.22	68.07	84.82	259.82	117.00	92	175	298.44	79.24	100.00	110.00	145.00	215.00	32.00	22	17.00	17.00	8.8
40	1257/25/SC/AISI316L/AISI316L/SD-1000-03	34.92	76.2	87.36	262.36	117.00	92	175	303.52	84.83	100.00	110.00	145.00	215.00	32.00	80	17.00	17.00	8.85
50	1257/25/SC/AISI316L/AISI316L/SD-1000-03	47.62	80.01	97.52	272.52	117.00	92	175	323.84	104.64	100.00	110.00	145.00	215.00	32.00	195	17.00	17.00	9.4
65	1257/25/SC/AISI316L/AISI316L/SD-1000-03	60.32	80.01	101.85	276.85	117.00	92	175	332.73	111.76	100.00	110.00	145.00	215.00	32.00	250	17.00	17.00	9.8
80	1257/25/SC/AISI316L/AISI316L/SD-1000-05	72.61	80.01	107.95	282.95	117.00	92	175	345.18	124.46	100.00	110.00	160.00	225.00	32.00	400	17.00	17.00	11.00
100	1257/25/SC/AISI316L/AISI316L/SD-1000-05	97.61	88.9	124.61	299.61	117.00	92	175	378.09	156.97	100.00	110.00	160.00	225.00	32.00	840	17.00	17.00	12.5
125	1257/25/SC/AISI316L/AISI316L/SD-1000-10	121.43	88.9	149.86	399.86	148.00	125	250	489.9	180.08	100.00	110.00	170.00	270.00	37.00	1200	20.00	20.00	17.2
150	1257/25/SC/AISI316L/AISI316L/SD-1000-10	146.83	89.07	165.86	415.86	148.00	125	250	521.77	211.83	100.00	110.00	170.00	270.00	37.00	1900	20.00	20.00	18.00

I-Line Metallic Butterfly Valve with

Single Phase **Electrical** Actuator **SUDE**

1257



BILL OF MATERIAL OF VALVE WITH ACTUATOR

S.No.	PART	MATERIALS
1	ELECTRIC ACTUATOR STAY PUT TYPE	
2	MOTOR	
3	HAND WHEEL	SDTORK MAKE
4	CABLE GLANDS	
5	OUTPUT BORE	
6	FLANGE	AISI316L
7	SCREW	AISI 304
8	SEAT	SILICON

VALVE SIZE	MODEL NUMBER	DIMENSIONS (MM)														Cv	APPROX. TIME		WT. OF ASSY IN KGS.
		A	B	C	D	E	F	G	H	I	J	K	L	M	N		FOR OPEN	FOR CLOSE	
25	1257/25/IL/AISI316L/AISI316L/SD-1000-03	22.22	75	84.82	259.82	117.00	92.00	175.00	298.44	79.24	100.00	110.00	145.00	215.00	32.00	22	17.00	17.00	8.96
40	1257/25/IL/AISI316L/AISI316L/SD-1000-03	34.92	75	87.36	262.36	117.00	92.00	175.00	303.52	84.83	100.00	110.00	145.00	215.00	32.00	80	17.00	17.00	9.02
50	1257/25/IL/AISI316L/AISI316L/SD-1000-03	47.62	85.72	97.52	272.52	117.00	92.00	175.00	323.84	104.64	100.00	110.00	145.00	215.00	32.00	195	17.00	17.00	9.68
65	1257/25/IL/AISI316L/AISI316L/SD-1000-03	60.32	86.2	101.85	276.85	117.00	92.00	175.00	332.73	111.76	100.00	110.00	145.00	215.00	32.00	250	17.00	17.00	10.16
80	1257/25/IL/AISI316L/AISI316L/SD-1000-05	72.61	92.07	107.95	282.95	117.00	92.00	175.00	345.18	124.46	100.00	110.00	160.00	225.00	32.00	400	17.00	17.00	11.4
100	1257/25/IL/AISI316L/AISI316L/SD-1000-05	97.61	109.93	124.61	299.61	117.00	92.00	175.00	378.09	156.97	100.00	110.00	160.00	225.00	32.00	840	17.00	17.00	13.2
125	1257/25/IL/AISI316L/AISI316L/SD-1000-10	121.43	113.48	149.86	369.86	148.00	125.00	250.00	489.9	180.08	100.00	110.00	170.00	270.00	37.00	1200	20.00	20.00	18.24
150	1257/25/IL/AISI316L/AISI316L/SD-1000-10	146.83	113.48	165.86	415.86	148.00	125.00	250.00	521.77	211.83	100.00	110.00	170.00	270.00	37.00	1900	20.00	20.00	19.2



*Yes... We Care
Zero Bacteria*





OUR OTHER PRODUCTS



- Solenoid Valves.
- Pneumatically operated Control Valves.
- Motorised Valves.
- Pneumatic & Electric Operated Ball / Butterfly valves.
- Pneumatic & Motorised Dampers.
- Pneumatic & Motorised VIV Dampers.
- Motorised Rising & Non-rising Sluice Valve.

- Heavy duty – Single phase & Three phase actuators for operating Gates & Chutes.
- Pneumatic & Motorised Pinch Valve.
- Pneumatic & Motorised Flush Bottom Valve.
- Entire range of Electrical Actuator.
- And Instrumentation Product likes Pressure Transmitter, PID Controller, Flow meter etc., for System Integration.

NOTE : TECHNICAL SPECIFICATIONS, DETAILS & DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE. DIMENSIONS IN THE TABLE ARE APPROXIMATE SUBJECT TO FINAL CONFIRMATION BY SUDE.

Head Office, Bangalore



SUDE ENGINEERING CORPORATION

Registered Office / Works :

Shop No. 1106, 10th Main Road, R.P.C. Layout,
Near R.P.C. Layout Bus Stop, Hampinagar,
Bangalore 560 104. (Old Pin 560040) Karnataka, India

Tel. : +91 80 2330 2145 / 2314 1104 / 2340 2297

Fax : +91 80 2330 5729

Pune Office / Works :

Gat No. 94/2, Plot No.1, Alandi Markal Road,
Village - Dhanore, Tal - Khed, Pune 412105.
Maharashtra, India

Tel. : +91 9763719689, 9763719690

SUDE