MICROFINISH KNIFE EDGE GATE VALVES (PULP VALVES)

INSTALLATION OPERATION AND MAINTENANCE MANUAL

MICROFINISH VALVES PVT. LTD.

Block no.23B, Plot no.1 to 6, Hubballi-Dharwad Bypass Road, Itigatti Village,
Dharwad-580 114, Karnataka state, India. Phone: +91 836 2310015 / 16 / 19
Email: sales@microfinishgroup.com Website: www.microfinishgroup.com

THE AMERICAS

MICROFINISH VALVES, INC.

7505 Bluff Point Drive, Suite 100 Houston, Texas 77086, United States.
Phone: +1 281-885-4250 / +1 281-885-4259 Fax: +1 281-866-0996
Email: usasales@microfinishgroup.com Website: www.microfinishvalvesinc.com

1. INTRODUCTION

Microfinish Knife Edge Gate Valves have been designed and manufactured to give you long, excellent and trouble free service.

This manual provides you with all the relevant information to install, operate and maintain the valve for long trouble free life. **Please note that all the drawings provided in this manual are typical views.**

CAUTION:

1. **The valves should be used in a system and ensure that pressure and temperature limits (as specified in name plate) are not exceeded.**
2. **The valve should be used in a well designed, adequately supported piping system such that it will not be subjected to undue forces or hydraulic shocks during service.**
3. **The valves are not designed to operate during or after earthquakes or under fatigue conditions. It is the responsibility of the owner to determine if fatigue conditions exist.**

2. PRIOR TO INSTALLATION

2.1 Check that the valve and its accessories such as actuators, cylinders, solenoid valves, etc have been damaged during transportation.

2.2 Any wrapping and Protection applied should be left in place until the valve is to be installed. it is advised to store the valves in closed condition.

2.3 If the valves are left exposed, they should be protected against entry of foreign material in the valve parts.

2.4 If the valves are stored for the long time, then before installation all valves and mating pipe parts should be cleaned with compatible Lubricants.

2.5 Expansion or contraction of line should be accommodated by expansion bend or joint, so as to avoid the excessive stresses on the valve and other piping system.

2.6 Flush the pipes clean before mounting the valve. Impurities such as sand and parts of welding electrodes etc could damage the plates and soft seals.

2.7 Valves, stored for long time should be hydraulic tested before installation.

CAUTION:

Microfinish recommends that all products which must be stored prior to installation be stored indoors, in an environment suitable for human occupancy. Do not store product in areas where exposure to relative humidity above 85%, acid or alkali fumes, radiation above normal background, ultraviolet light, or temperatures above 49°C or below 4°C may occur. Do not store within 50 feet of any source of ozone.

3. INSTALLATION

3.1 Be sure that flange gaskets and Fasteners are suitable for the operating conditions.

3.2 Provide sufficient room for the free movement of the spindle.

3.3 The standard valves can be mounted in any convenient position preferably with access to gland packing nuts. actuators if included, for future inspection.

3.4 Avoid as far as possible, the downward position of the spindle. These valves may be installed for flow in either direction. To ensure that good installation is achieved, standard piping practice should be followed.

3.5 Correct the pipe misalignments, if any, before installing the valve so as to avoid excessive pipe stress on the valve.

3.6 Select the proper fasteners and mount the valve between two pipe flanges as shown in figure-01.

3.7 Valves should not carry the weight of pipeline to avoid distortion and jamming.

3.8 while mounting the actuators, care should be taken of alignment and weight of the actuator shall not come on the spindle. It is advisable to have the valve accessories duly mounted by us.

3.9 Tighten gland packing uniformly before installing and again after the trial operation of the valve.

4. FLANGED END VALVE INSTALLATION

4.1 Insert the valve and proper gasket between the mating surfaces aline the flange bolt hole & hold it place.

4.2 Hold the valve between two pipe flanges, insert the through bolts first and finger tight the nuts.

4.3 Screw the studs tightly in the tapped holes of the valve finger tight the nuts.

4.4 Use two spanners to tight the joint. Take one or two turns on one bolt and the opposite. Then middle of remaining and opposite.

5. OPERATION AND MAINTENANCE

5.1 Manual operated valves should be opened and closed slowly to avoid hammering effect on the valve and pipeline.

5.2 Valve should be 'Fully opened' or 'Fully closed' so that wire drawing effect can be reduced. Avoid the use of valve for throttling purposes.

5.3 If the valve do not hold the tight don't use extra force on the spindle, Instead take the valve apart and inspect to locate the cause of leak.

5.4 After a long service life, when thro valve leakage is observed due to seal failure then replace the soft seals.

5.5 Spindle projection is the indication of port position. Full up is full open and full down is full close.

5.6 It is advisable to use only for on-off applications.

5.7 Packing lakes should be corrected immediately by tightening.

5.8 If the gland has compressed the packing to its limits, replace with new packing of the same material.

5.9 Be sure that the valve is depressurized and purged when replacing the packing.

5.10 Replacing the stem packing in service is not possible.

5.11 Do not over tighten the body and cover jointing studs and nuts to avoid the body seal leak, instead body seal should be removed & replaced with new one

6. DISASSEMBLY FROM PIPE LINE

6.1 Be sure what is there in line and its nature.

6.2 Wear the protective clothing to avoid injury from damages fluid in the line or the residual trapped in the valve.

6.3 Depressurized the line and drain the system fluid completely.

6.4 Always keep the hands out of the valve cavity in case of handling the remotely actuated valves.

6.5 Unfasten the stud bolts from the valves.

6.6 Remove the through the bolts.

6.7 Take away the valve from pipe line.

CAUTION:

Do not try to operate a valve that exhibits any sign of leakage. Isolate the valve and either repair or replace it.

7. DISASSEMBLY OF VALVE

7.1 Remove the valve along the actuator from pipe line and place it on a level surface.

WARNING!

VALVES SHALL NOT BE DISMANTLED IN CLOSED POSITION

7.2 Flush the valve to remove the residual left in the valve.

7.3 Remove the actuator mounting screw and take out the actuator and then the mounting bracket (only for electric & Pneumatic operated valves.

7.4 Unscrew the bolts of the connector and separate out plate and spindle.

7.5 Gland packing can be removed easily.

7.6 Remove the gate carefully.

7.7 Unscrew the body and cover connection studs and separate out the body and covers.

7.8 Take out seat neoprene O ring carefully.

7.9 Clean all parts, remove the dirt and observe any damage or scratch on seat and plate surface, spindle gland packing etc

7.10 Replace the damage with new ones.

CAUTION:

Follow the safety rules and regulations to avoid personal injury or equipment damage.

8. REASSEMBLY

8.1 After complete disassembling becomes necessary, replacement of seats & seals is recommended.

8.2 Clean and inspect all the parts for damage & change any part if in doubt.

8.3 For reassembly follow the disassembly in reverse procedure.

8.4 For handling the actuator please refer the actuator manual.

9. WARNINGS

9.1 Don't run SYNCROSET ACTUATOR from direct three phase supply. Instead take a power supply through control box with contractors.

9.2 Don't run Actuator to limits with incorrect phase rotation, hence, before starting on power keep the valve half open and conform the correct phase rotation.

9.3 Don't meddle with actuator control settings as they are already set for the travel and torque limits.

9.4 Always connect the motor thermostat in series with both (open & close) contact coils for motor protection.

9.5 Don't trip the actuator by torque limits at open & close they already set for travel limits, but at higher torques they will automatically trip on torque also.

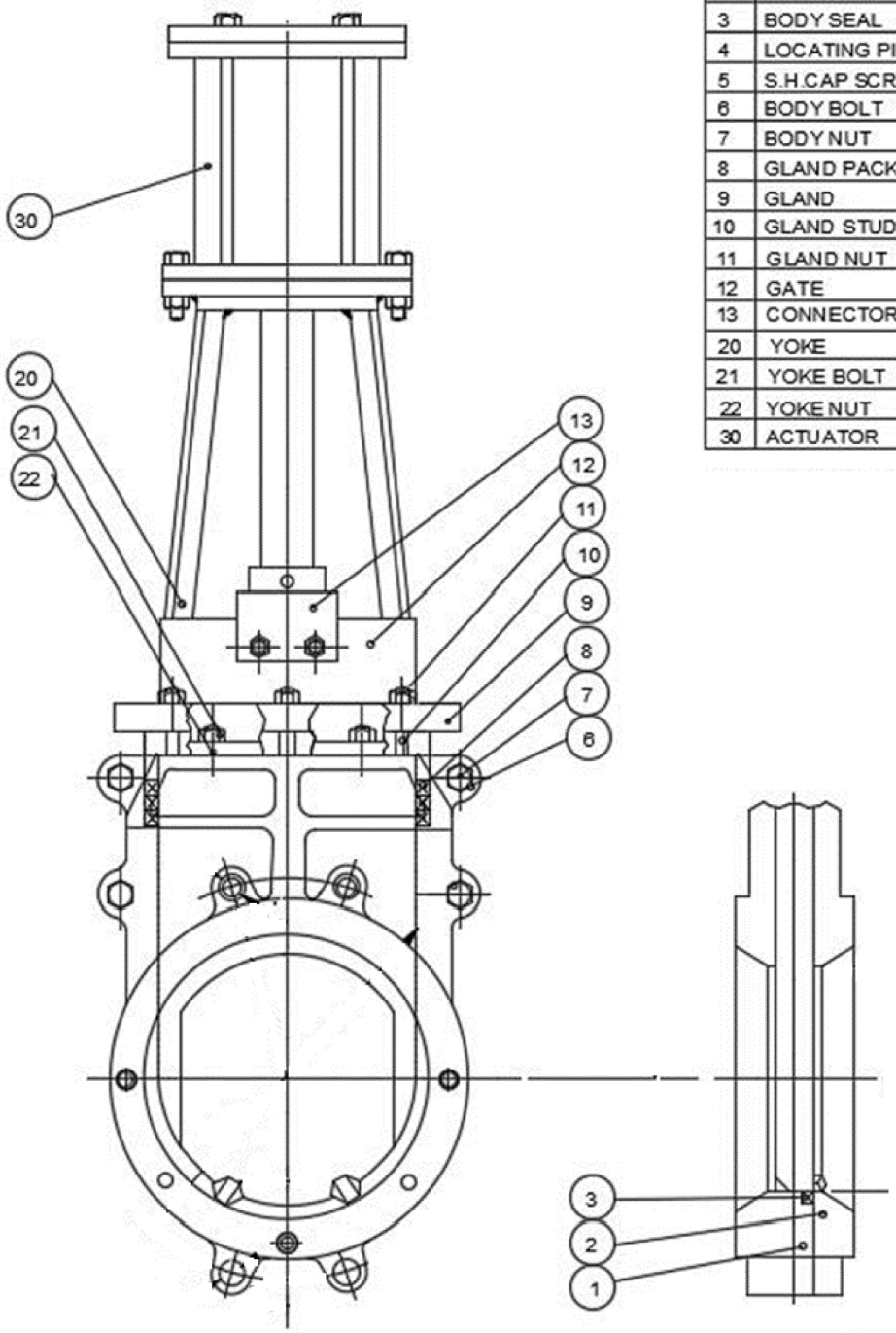
9.6 Don't engage the hand lever when actuator is running.

9.7 If Actuator/Bracket is dismantled from the valve resetting of the travel /torque limit switch is required. Refer the actuator manual for resetting the limit switches.

9.8 Replacing the gland packing shall be done without dismantling the actuator or bracket from the valve. Setting is likely to be disturbed when dismantled.

KNIFE EDGE GATE VALVE PNEUMATIC OPERATED,

SERIES: 54



No.	Part Name	Material
1	BODY	WCB/CF8/CF8M/CI
2	COVER	
3	BODY SEAL	NEOPRENE/VITON
4	LOCATING PIN	STEEL
5	S.H.CAP SCREW	STEEL
6	BODY BOLT	ASTM A 193 Gr B7
7	BODY NUT	ASTM A 194 Gr 2H
8	GLAND PACKING	TIBA
9	GLAND	WCB/CF8/CF8M/CI
10	GLAND STUD	ASTM A 193 Gr B7
11	GLAND NUT	ASTM A 194 Gr 2H
12	GATE	ASTM A 276 Type 304/316
13	CONNECTOR	STEEL
20	YOKE	STEEL
21	YOKE BOLT	ASTM A 193 Gr B7
22	YOKE NUT	ASTM A 194 Gr 2H
30	ACTUATOR	STANDARD

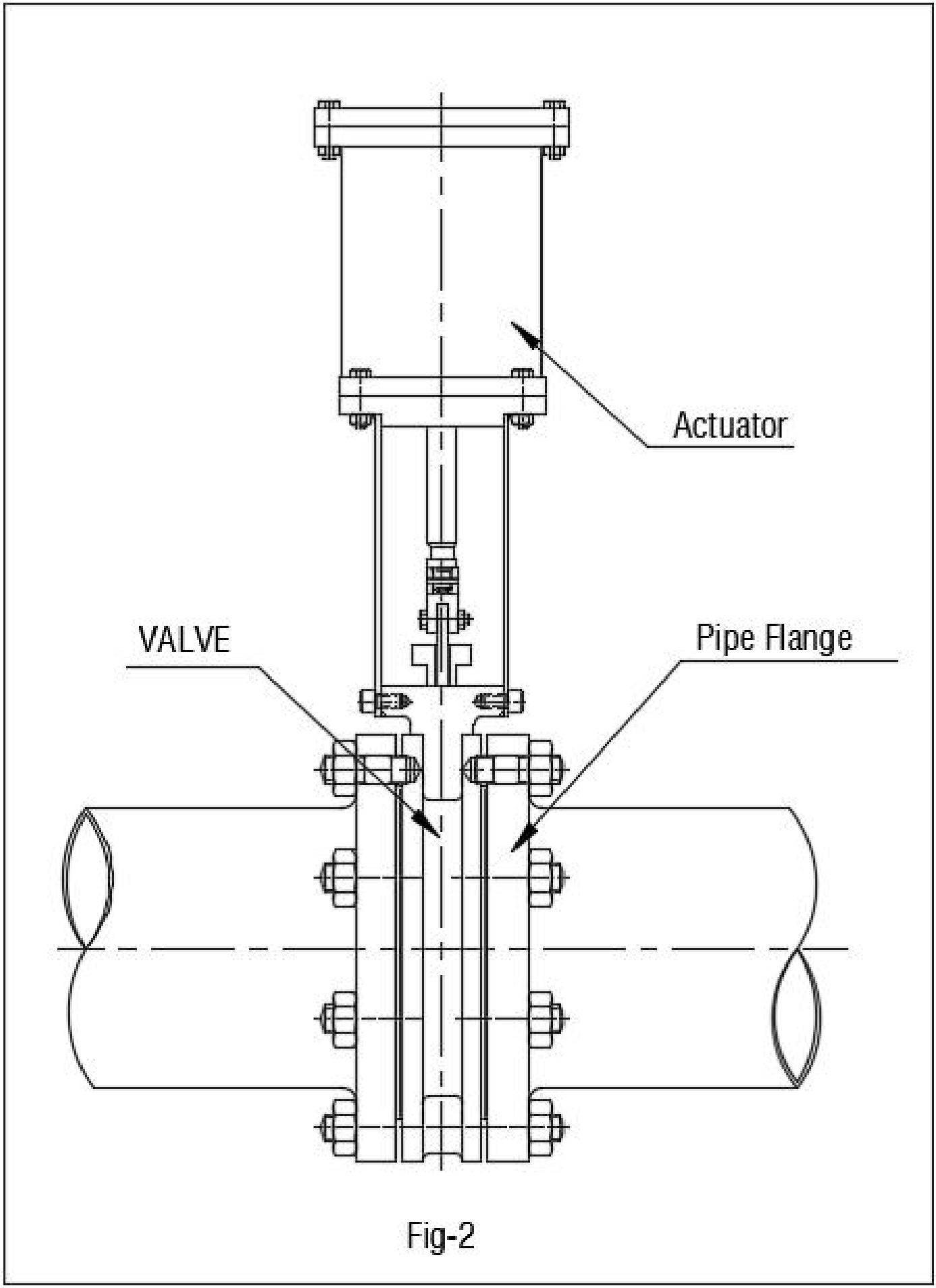
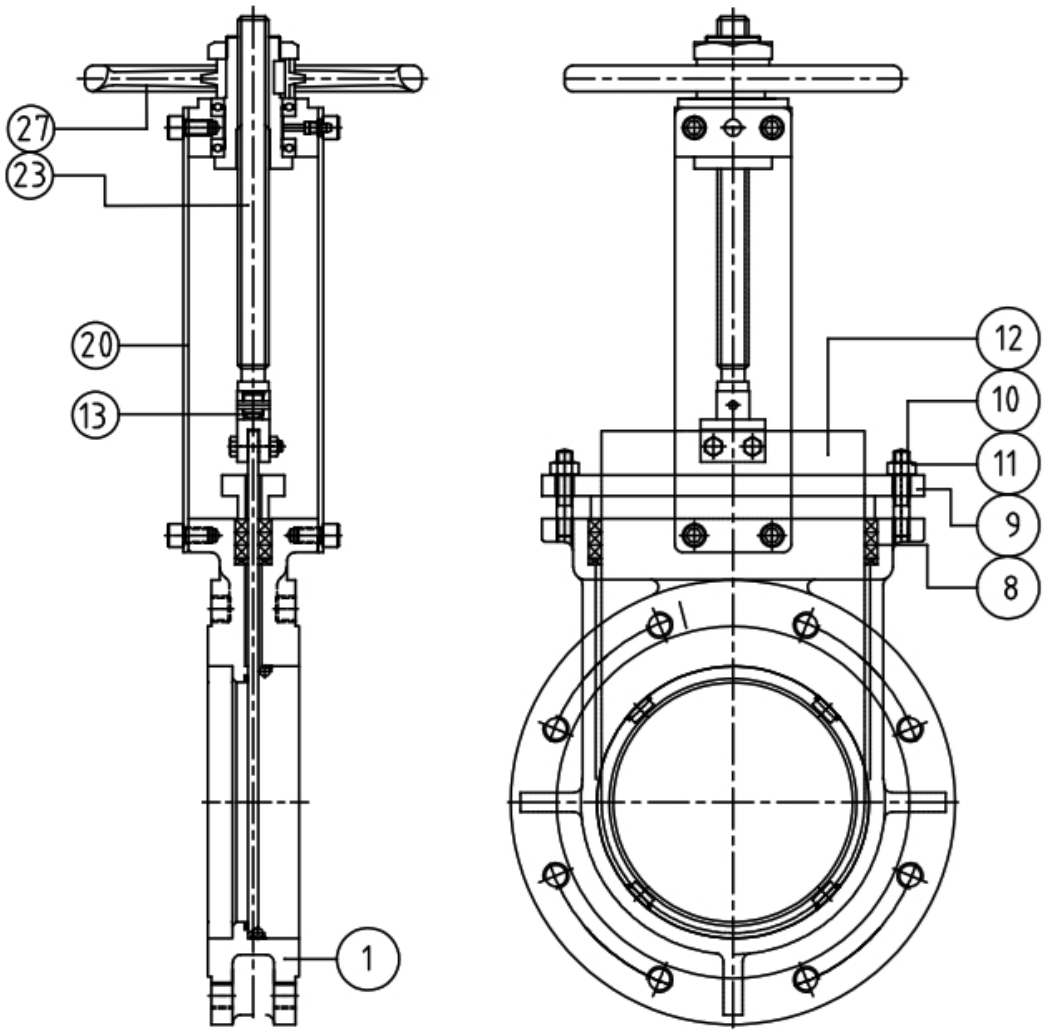


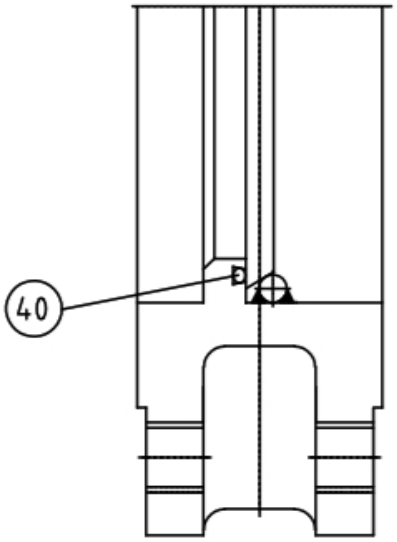
Fig-2

Uni-directional, Round Port, Wafer Flange Design, Knife Edge Gate Valve Hand Wheel Operated.

Series : S50SF



No.	Part Name	Material
1	BODY	ASTM A216 Gr WCB
8	GLAND PACKING	BRAIDED GRAFOIL WITH INHIBITOR
9	GLAND	ASTM A216 Gr WCB
10	GLAND STUD	ASTM A193 Gr B7
11	GLAND NUT	ASTM A194 Gr 2H
12	GATE	SS304
13	CONNECTOR	CARBON STEEL
20	YOKE	CARBON STEEL
23	SPINDLE	ASTM A479 Type 304
27	HAND WHEEL	S.G.IRON
40	"O" RING	NEOPRENE



Soft Seated

10. HANDLING

Lifting options are as shown below figure A or figure B to lift valve assemblies that are in a vertical orientation for. Hand wheel operated knife edge gate valve.

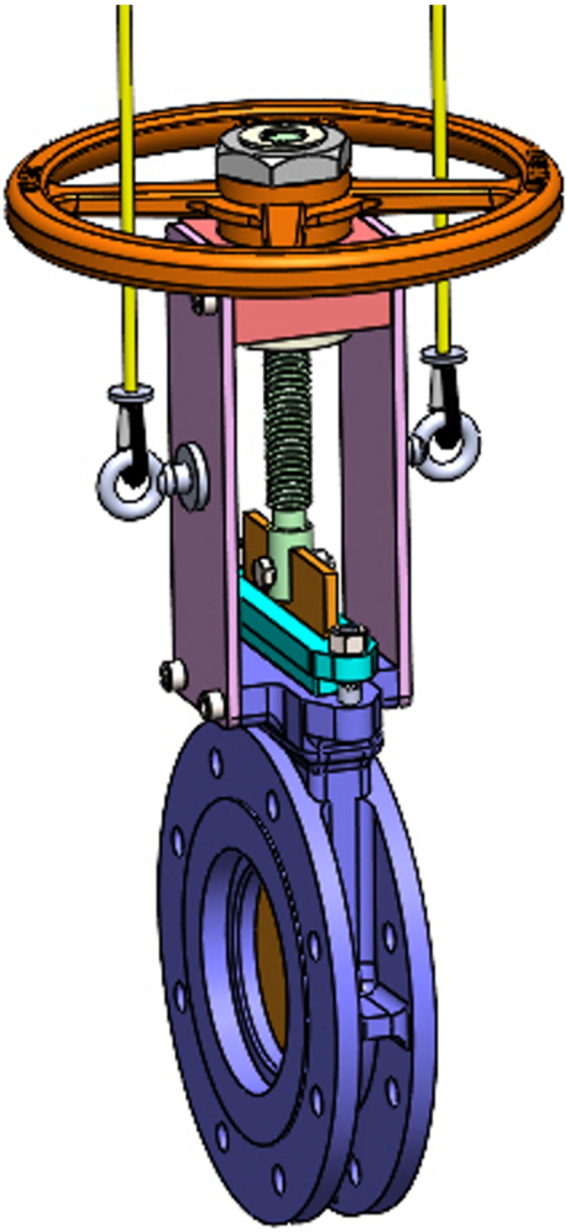


Figure A

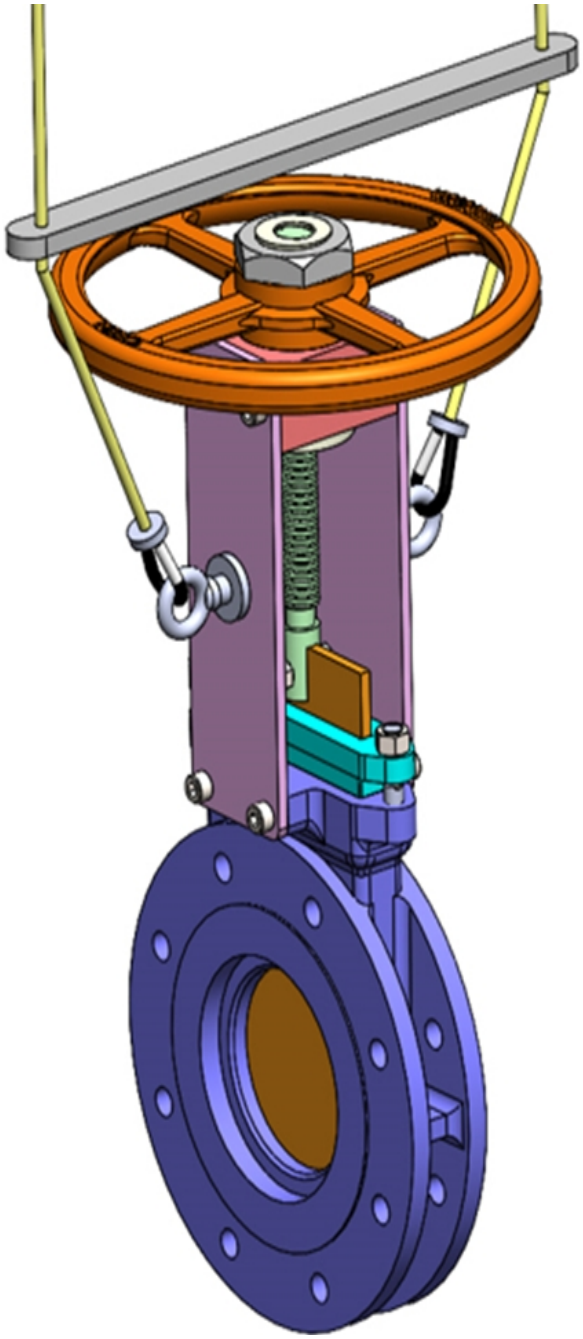


Figure B

Knife Gate Valve with Hand wheel Vertical Lifting

- **Eye bolts**: Make sure the eyebolts have the same thread as the boss holes and they are all well secured. It should be supported by two eyebolts screwed into the tapped fixing holes in the boss.

  Use caution to not put any side load on the valve's threaded stem

11. TROUBLE SHOOTING

Sl.No	Name of Defect	Cause	Remedy
1	Seat leakage	• Valve not properly closed/seated • Internal components damaged or worn	• Check to see if valve is tightly closed • Replace the worn out seat
2	Gland Leakage	• Loosening of gland nut • Gasket is damaged • Misalignment of actuator, • & stem.	• Tighten the gland nut. • Disassemble and install a new gasket. • Ensure correct alignment.
3	Body Seal Leakage	• Improper closing / seating of valve • Internal components damaged or worn	• Check to see if valve is tightly closed. • Replace the worn out seat
4	Valve operating problem	• Stem binding during travel • Gland packing exerts excessive force on stem • Stem damaged	• Lubricate stem with proper greasing by removing dirt • Check torque on gland nuts. • Repair or replace as required.
		• Misalignment between stem and gate	• Loosen the actuator and yoke. • Check the alignment. • Retighten the hardware.
5	Jerky operation	• Insufficient air supply	• For pneumatically and hydraulically operated valves increase supply pressure.
		• Solenoid valve dirty	• Remove and clean solenoid valve, possibly install filter
		• Piston rod seal damaged	• Remove and clean piston rod seal, exchange and lubricate cylinder seals
		• Valve clogged	• Clean valve and lubricate

12. VALVE OPERATING TORQUE AND THRUST.

Size	Torque Value (N-m)	Thrust Value (N)
50	430	1825
65	509	2159
80	723	3071
100	2263	8414
125	2221	8259
150	4199	15614
200	3465	10570
250	4882	14521
300	6387	17666
350	7554	20896
400	9231	21963
450	9121	21703
600	14709	34997

13. GLAND FLANGE STUD NUT TIGHTENING TORQUE

DN	Gland flange Bolt size	Tightening Torque for fasteners
50	M8X1.25	16 to 20
65	M8X1.25	16 to 20
80	M8X1.25	16 to 20
100	M10X1.5	30 to 33
125	M12X1.75	51 to 54
150	M12X1.75	51 to 54
200	M12X1.75	51 to 54
250	M16X2	123 to 130
300	M16X2	123 to 130
350	M16X2	123 to 130
400	M16X2	123 to 130
450	M16X2	123 to 130
600	M16X2	123 to 130