

INSTALLATION AND MAINTENANCE HANDBOOK

KNIFE GATE VALVES



SERIE 18

INTRODUCTION

The knife gate valve is a unique, patented, low cost, bi-directional on-off valve that by design always ensures a bubble-tight shut off. The valve is available with bodies in cast iron, carbon steel or various stainless steels. Nitrile, Viton, EPDM, natural rubber and PTFE are available as seat materials, depending on the service medium and temperature. The valve may be supplied handwheel operated or fitted with electric or pneumatic actuators.

The valves' design permits a simple and rapid change of actuator.

It has the following advantages:

Its light weight and short face to face dimension allows easy installation and results in low piping support loads. It is a full opening, full bore valve permitting easy passage of liquid of whatever viscosity. Compared to other designs, the knife gate valve does not have body cavities below the disc where the pumped medium can collect. For particulate or abrasive media disc scrapers and deflector cones can be provided.

It is important to advise your supplier of the working temperature, pressure, medium and operation frequency to ensure that the correct valve is fitted.

APPLICATION AND TEMPERATURE RANGE

EPDM-

Advantages: It has excellent resistance to heat, ozone and sunlight, very good flexibility at low temperature, good resistance to alkalis, acids, and oxygenated solvents and superior resistance to water and steam.

Limitations: poor resistance to oil, Gasoline and hydrocarbon based solvents.

Maximum continuous operating temperature $-40^{\circ}\text{C}/+100^{\circ}\text{C}$

NBR-NITRIL

Advantages: very good resistance to oil, gasoline, alkalis and acids, good resistance to hydrocarbon based solvents.

Limitations: inferior resistance to ozone and oxygenated solvents.

Maximum continuous operating temperature $-30^{\circ}\text{C}/+90^{\circ}\text{C}$

GUM RUBBER

This category includes all natural gum elastomers, both filled and unfilled and synthetic. It has high tensile strength, superior resistance to tear and abrasion and good flexibility at low temperatures. Maximum continuous operating temperature $+75^{\circ}\text{C}$

VITON

Advantages: very good resistance to ozone and sunlight, very good flexibility at low temperature, good resistance to alkalis and acids and very good resistance to hot water.

Maximum continuous operating temperature $-40^{\circ}\text{C}/+230^{\circ}\text{C}$

TP: Test pressure in Kg/cm²
Test fluid: H₂O

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
T.P.	16	16	16	16	16	16	14	14	10	10	8	7	6	6
W.P.	10	10	10	10	10	10	8	8	6	6	5	5	4	4

INSTALLATION

1-Prepare two G-ST-FLANGE GASKET (COVERING THE FULL FACE OF THE FLANGE) of material suitable for the service medium, pressure and the facing of the mating flanges. Since the threaded holes are painted at the works to inhibit corrosion, wire brushing and greasing the threads should ease fitting the bolting.

2-The valve is bi-directional; it can be inserted between the two flanges without regard to the flow direction. However, if a deflector cone for abrasive media is supplied, it must be fitted at the upstream end of the valve in order to function correctly.

3-Valves fitted with pneumatic actuators have BSP threaded air input and output ports. Tight shut off of the valve will be ensured by having at least 6 BAR air supply at the actuator. The valve is designed to be installed with the cylinder in a vertical position sufficient support for the cylinder must be provided.

WARNING: Depending on service pressure, an actuator air supply pressure lower than 6 BAR may cause the valve to open or close slowly and to shut off incompletely.

4-The knife gate valve maintains its bubble-tight seal by pressure of the gate against the u-shaped and the packing material. In higher pressure valves, the force of the gate against the seat is naturally higher requiring a higher force to operate the valve. Therefore, in valves designed for high pressure service, the valve spindle must be lubricated by a waterproof, neutral grease to reduce the operating force required. We advise as lubrication product Grease AL/SI 3653, graisse silicone multi usages MOLYDAL OR SILICONE GREASE FROM LOCTITE.

Valves that are to be electrically actuated in the field must have the spindle lubricated as stated above. Failure to do so will make operating the valve inordinately difficult. To avoid any problem we recommend that the high pressure service valves are fitted with actuators at our factory. The level of spindle lubrication must be checked periodically and maintained at an adequate level.

5-When the valve is first put into service it is prudent to check the packing mechanism at the upper part of the body. The packing bolts are set to an average tightness at the works. However, different service pressure require different degrees of tightness. If the service medium is seen to be weeping from the upper part of the body, tighten the packing gland bolts according to the table below:

TORQUE TABLE FOR PACKING BOLTS

DN	TORQUE RANGE (KG/M)	
	MIN	MAX
50	0.25	0.36
65	0.28	0.36
80	0.32	0.45
100	0.36	0.50
150	0.43	0.58
200	0.45	0.60
250	0.50	0.68
300	0.60	0.82
350	0.85	1.10
400	1.00	1.30
450	1.40	1.60
500	1.50	1.90
600	2.70	3.20
700	3.20	3.80
800	4.00	4.70

6-Once the valve is installed on the line ; the technician must apply NEUTRAL GREASE to the spindle to ensure ease of operation.

7-Those valves operated by electric actuator (specially with modulating actuators) must be inspected and lubricated every week.

Further, the grease nipple at the actuator and the threaded spindle should be checked and lubricated periodically. The operation and maintenance instructions of the electric actuator manufacturer should be followed by the customer.

OPERATION

-To open, turn the handwheel in a clockwise direction.

-To close, turn handwheel anti-clockwise. Valve must be tightened down firmly to ensure a bubble tight seal.

APPROXIMATE N° OF TURNS FOR MANUALLY OPERATED VALVES

DN	XD
50	14
65	17.5
80	21
100	26
125	32.5
150	31
200	41
250	51
300	61
350	71
400	81
450	65
500	72
600	86

-To open the pneumatic cylinder actuated valve, apply air pressure to the underside of the actuator piston.

-To close the pneumatic cylinder actuated valve, make sure that you have at least 5.5 BAR at the upper cylinder head to insure sufficient force for a bubble tight seal.

CYLINDER CAPACITY IN LITERS OF AIR AT 1 BAR OF PRESSURE

AIR PRESSURE Min 6 Bar
Max 10 bar

DN	ØCILINDER	CAPACITY
50	80	0.35
65	80	0.43
80	100	0.72
100	100	0.97
125	125	1.87
150	160	3.48
200	190	6.44
250	190	7.85
300	190	9.25
350	250	18.61
400	250	21.25
450	300	34.07
500	300	37.68
600	300	44.75

To operate motor actuated valves, follow actuator manufacturer's instructions.

THE TABLE BELOW SHOWS THE KNIFE GATE VALVE'S DATA

VALVE	AUMA TYPE	MIN. TORQUE	MAX TORQUE	N° TURNS	THREAD
50	SA 07.1 F-10	8 Nm	16 Nm	13.75	18X4
65	SA 07.1 F-10	10 Nm	17Nm	17.50	18X4
80	SA 07.1 F-10	12 Nm	19Nm	21.25	20X4
100	SA 07.1 F-10	15 Nm	22Nm	26.25	20X4
125	SA 07.1 F-10	17 Nm	24Nm	32.50	20X4
150	SA 07.5 F-10	22 Nm	48Nm	31.20	24X5
200	SA 07.5 F-10	27 Nm	53Nm	41	24X5
250	SA 10.1 F-10	50 Nm	69Nm	51	24X5
300	SA 10.1 F-10	63 Nm	84Nm	61	28X5
350	SA 10.1 F-10	68Nm	92Nm	71	28X5
400	SA 10.1 F-10	78 Nm	106Nm	81	28X5
450	SA 14.1 F-14	115 Nm	159Nm	65	40X7
500	SA 14.1 F-14	123 Nm	188Nm	72.14	40X7
600	SA 14.1 F-14	149 Nm	220Nm	86.14	40X7
700	SA 14.1 F-14	230 Nm	336Nm	88.75	50X8
800	SA 14.1 F-14	320 Nm	470Nm	101.50	50X8
900	SA 14.1 F-16	412 Nm	683Nm	114.375	50X8
1000	SA 14.1 F-16	520 Nm	887Nm	113	60X9

IMPORTANT NOTICE

EU regulation require all valves to be opened and closed at least twice a year to establish that they are in proper operating condition.

COATING

Binder system: Resistant polyster coating

Colour RAL 5017 (Blue)

Film thickness 80-150 microns

MAINTENANCE

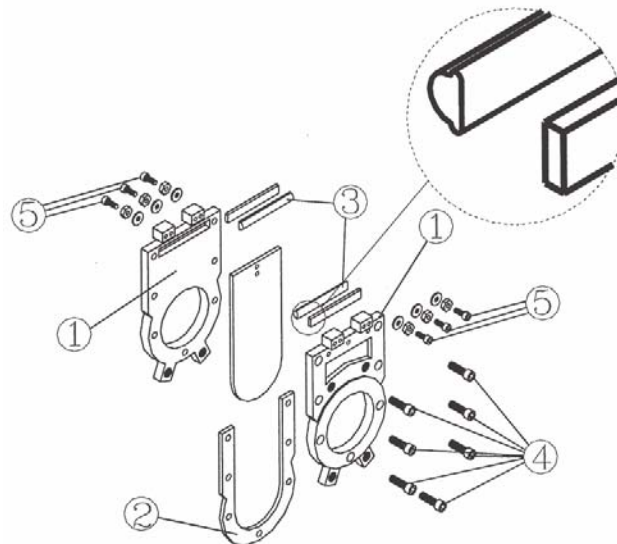
When the body material, seat elastomer and packing material used in the service medium are according to the manufacturer's recommendations, the valve is virtually maintenance-free.

When routine inspection of the process piping is scheduled, it would be prudent to inspect the elastomer seat and packing. As all elastomers degrade to some extent when exposed to the atmosphere and sunlight, careful inspection will reveal the relative integrity of the seals and gland seal material.

Should a decision be made to change the gland and/or seat, proceed as follows:

WARNING

RELIEVE PIPELINE PRESSURE PRIOR TO LOOSENING GLAND NUTS OR FLANGE BOLTS. FAILURE TO RELIEVE PIPELINE PRESSURE COULD RESULT IN PERSONAL INJURY AND/OR EQUIPMENT DAMAGE.



To change U-SEAT and gland seal, proceed as follows:

-With a wrench remove the bolts fixing the yoke-plates to the body and upper platform. Remove the bolts fixing the spindle to the disc. Set yoke-plates and upper works aside.

-Remove the body bolting (n°4). Once removed, separate the valve bodies (n°1) and replace the spare seat and gland seal (n°2 and n°3).

AVERAGE TIGHTENING TORQUE FOR PACKING GLAND BOLTS GO TO PARAGRAPH "INSTALLATION" (N°5 IN THE DRAWING)

IMPORTANT: Once leakage has stopped, do not continue tightening the packing gland screw. Over-tightening the gland screws will result in higher valve operating torques and premature packing failure.

AVERAGE TIGHTENING TORQUE FOR BODY BOLTS (N°4 IN THE DRAWING)

DN	Torque(Nm)
50	40
65	40
80	40
100	40
125	40
150	75
200	75
250	75
300	75
350	75
400	75
450	75
500	120
600	120

STORAGE OF RUBBER PRODUCTS

While the various types of rubber possess differing degrees of resistance to the deteriorating influences which may be present during storage, the same general recommendations apply to all vulcanized rubber product, they should be stored in a cool, dry, dark place away from steam pipes, sunlight ecc.