

Knife Edge Gate Valve 1600 **SERIES**
With Electric / Pneumatic Actuator



YES. WE CARE...

SUDE

Knife Edge Gate with Electric / Pneumatic Actuator

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Introduction

SUDE Offers Knife edge gate valve is a compact bi-directional valve with full bore. This valve is specially designed with regard to good flow characteristics and simple maintenance which makes it suited for both liquids and dry media.

The Knife edge gate valve is designed of a one piece valve body in stainless steel and a stainless steel gate. The retainer rings mechanically locks the seats, making them easy to replace. The unique packing, twin pack gives high operation reliability.

Knife Gate Valves are specifically designed and manufactured to meet the worst working conditions in Pulp & Paper, Mining & Steel, Power & Chemical Industries to handle Semi-Solids, Dry-Ash, Chips, Fiber contents Pulps etc. The compact design of the Valves facilitates light weight, minimum space for installing, easy operation and maintenance. The compact Knife edged Wedge is manufactured from Stainless Steel Plates of various grades irrespective of Body material. The bottom of the wedge is having knife type edge Wedge which can cut through Semi-Solid or Paste type Pulp with possible fiber and or Solid contents, fly-Ash, Chemicals with solid contents and ensure smooth shutdown operation and tight shutoff. The Knife Gate Valves are available in wide range of Material. Trim options are available to suit individual requirements for various working conditions.

Knife Gate Valves are available with Soft Sealing and Metal to Metal sealing options to suit varied working conditions.

Knife Gate Valves are also available with varied operational options like Hand Wheel, Pneumatic Cylinder/ Electric Actuator.



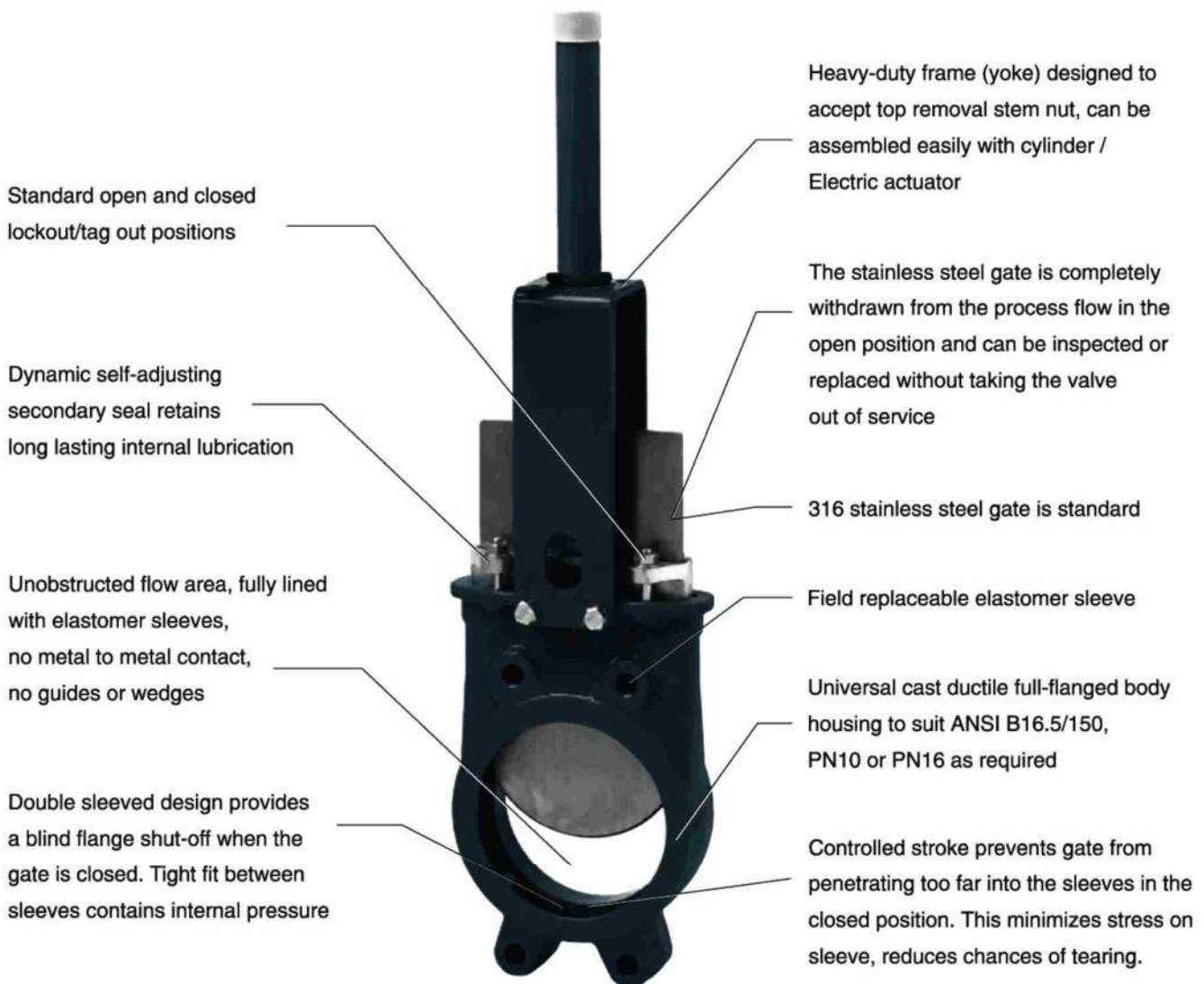
Wafer Style **Slurry Knife Gate Valve**

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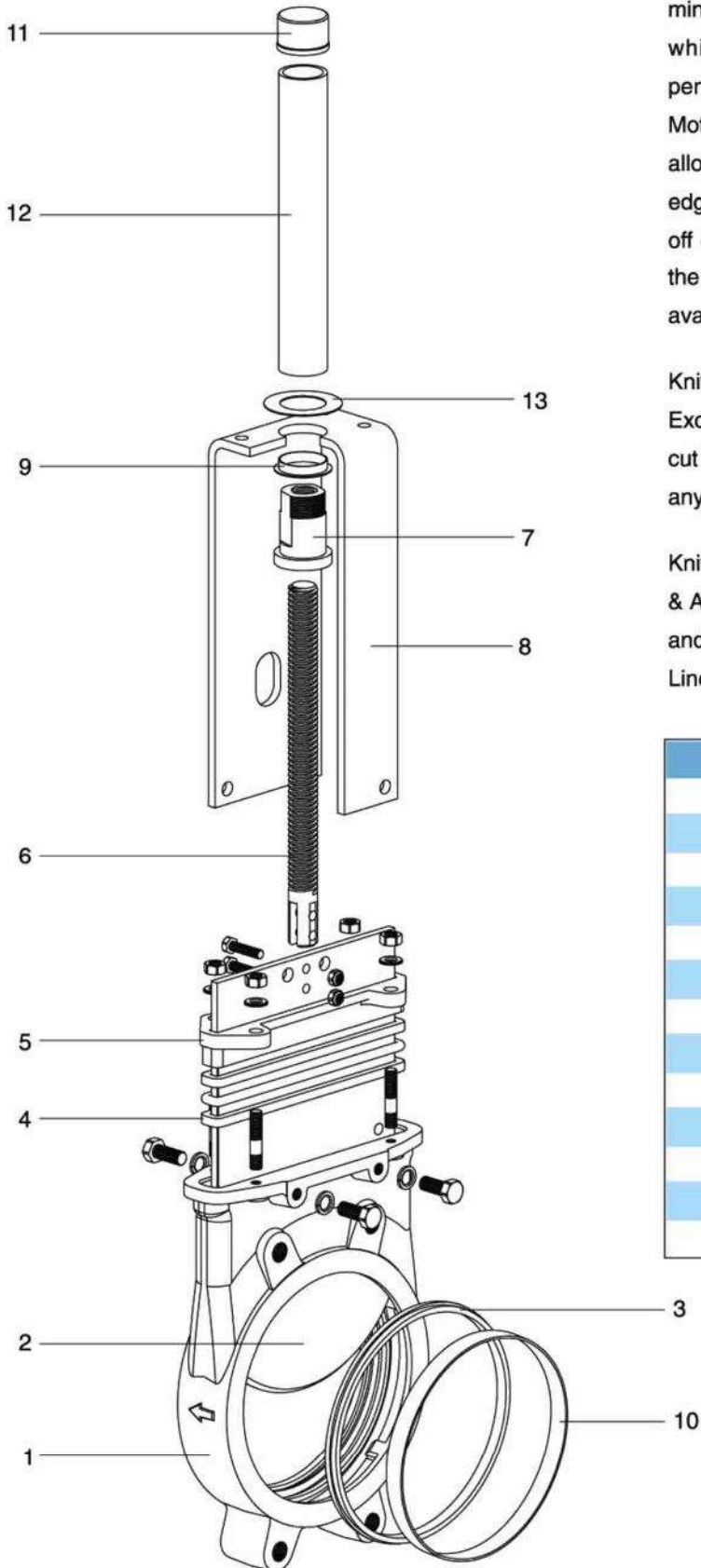
Wafer style, slurry knife gate valve shall be packing less, rubber-lined, bi directional valve suitable for wide range of industrial applications. The full port design shall have no internal obstructions and will provide a "blind flange" shut off when the gate is closed. The valves sealing surface to be between two rubber sleeves that are compressed in to the ductile iron valve housings. The sleeve will be molded with an integral stiffener ring that locates the sleeve in the valve housing and helps the sleeves resist the high shearing forces present when the gate is driven between them. Valve has a one-piece, Molded, replaceable elastomer secondary seal to eliminate any leakage between the knife edge gate and top of the valve body in any orientation and prevent any outside contaminants from getting inside the valve. It shall be dynamically self-adjusting, eliminating the need for continual adjustment. The secondary seal shall retain a silicon-based lubrication to lubricate the gate as it cycles through the seal, providing smoother gate movement and longer seal life, as well as reducing the force required to actuate the gate. The stainless steel gate shall be completely withdrawn from the process flow when in the open position, and can be inspected and replaced, if necessary, without taking the valve out of service.

When the valve is in the closed position, the downstream sleeve can be replaced while the upstream portion of the valve is still holding pressure.

The valve body housing to be flanged, universal type standard drilled and tapped to suit ANSI B16.5/150 with optional PN10 or PN16 or others, as required. Valve is quipped with a cylinder/Electric actuator. All nonferrous exterior surfaces shall be painted to factory standard.



Part List Of Knife Edge Gate Valve



Knife Edge Gate Valve is one of the specific designs among other Industrial Valves. This design ensures minimum contact between the parts of the valve, which reduces the Wear & Tear. The high performance Knife Gate Valves feature, Non Sliding Motion, Avoid Sliding Contact between Body & Gate allow flushing of media form the valve interior, Batten edge of the Gate (Knife –Edge) allows the tight shut off even when solid particles settles at the bottom of the Body. A wide variety of hardened trim options are available on Gate, Seat and Wear Ring.

Knife Gate Valve is generally unidirectional Valves, Excellent hopper Isolation Valves with their ability to cut through flowing media and closed by dislodging any in the seating area.

Knife-Edge Gate Valves withstand high Temperature & Abrasive Slurries in Mining, Steel, Power, Chemical and Paper Industries Ideal for high-density Slurry Lines.

Sl. No.	Description
1	BODY
2	GATE
3	SEAL
4	PACKING RING
5	GLAND FOLLOWER
6	STEM
7	STEM NUT
8	YOKE
9	COLLAR
10	SEAL RETAINER RING
11	CAP
12	STEM PROTECTOR
13	FRICTION WASHER

TYPE GATE VALVE :

Uni – directional / Bi-directional knife Edge Gate valve

MOC :

Cast Iron/Cast Steel/SS 304/316/304L/316L

Body : Cast Corrosion resistant steel or cast iron to provide receptivity against corrosion for all wetted parts.

Gate: The Stainless steel knife gate plate is precision-buffed on both sides, to enhance Packing life and ensure positive shut off even for heavy or high-viscous fluid.

Stem: Stainless steel or as desire, having double start thread rising/non-rising spindle, for fast closing and opening.

Seat: Renewable Metal-to Metal, replaceable type soft seat and other Suitable to application. In addition to standard stainless steel seat ring, rubber ring and Teflon seat rings are available as options. Gland Packing: Multi layer gland packing in a variety of materials to suit condition provides total sealing.

PORT :

Round Port, "V" Notch

END CONNECTION :

Flanged End / full Lugged, Wafer Flangeless, Two Lug.

SIZES :

50mm to 800mm (higher size on request)

RATING :

10 bar up to 600mm

DRILLING :

Option Include ANSI, Din, BS, JIS and as standard; others on request.

WIDELY USED FOR :

Knife Edge Gate Valves for Slurry Lines, Sludge and Viscous Media Handling, Pulp and Paper Stock Lines. Dry Solid and Powder Handling, High Temperature Gas Line and Many More.

OPERATION :

Knife Edge Gate Valves Operation-Manual, Cylinder and, Electrical.

ADVANTAGES OVER FABRICATED VALVES:

- Cast stainless steel body and investment cast yoke. In fabricated valves, leakage of corrosive medium due to neglected maintenance on the packing, or line pressure surges causes corrosion and failure of most carbon steel or cast iron components.
- An all stainless steel valve offers better corrosion resistant than cast iron lined valves. The total cost of ownership becomes more attractive than the initial savings.

GENERAL APPLICATIONS

Knife-Edge Gate Valves are widely used in various application such as Thermal Power Plants, Mining's Collieries, Cement Industries of Slurry Line, Pulp & Paper Industries for Stock Lines, Carbon Black Plants for High temperature gas lines, Dry solid powder handling such as polymer chips handling. Sewage and waste water treatment, chemical sludges, sticky media and molasses for sludges and viscous media handling, Steel plant, Sugar industries, fly ash, powders, clean or Corrosive gases.

- Mining
- Power
- Pulp and paper
- Alumina
- Chemical
- Cement

FEATURES:

- Field replaceable elastomer sleeves available in a wide range of elastomer to meet varied applications.
- Dynamic self-adjusting secondary seal.
- Long lasting lubrication.

- No metal parts in contact with the flowing slurry.
- Unobstructed flow eliminates turbulence, minimizes pressure drop across valve.
- 100% isolation; bubble-tight shut-off results in absolutely zero downstream leakage.
- Double-seated design provides bi-directional flow and shut-off.
- No seat cavity where solids can collect and prevent full gate closer.
- No gate or stem packing is required, eliminating packing leakage and maintenance.
- Adaptable frame (yoke) design featuring a top-removal stem nut can be field modified to an air cylinder/Electric actuator or bevel gear.

THICKER KNIFE GATE:

- Thicker knife gate to eliminate distortion under maximum differential pressure and to provide tight seating.
- Precision ground blade on both sides for tighter packing chamber sealing. Sealing face of the gate is lapped to provide the best possible seat tightness.
- Precision machined beveled gate end provides long life of seating components.
- Gate guides and lugs guiding for the moving gate, while jambs at the bottom hold the knife gate to assure proper seating.

RAISED FACE SEAT:

- The groove around the seat permits the gate to push particles aside and prevents clogging. When the valve is open the flow cleans the groove.
- Lapped seat ensure tight closure.

RELIABLE PACKING CHAMBER:

- Smooth and uniform chamber.
- Gate ground on the sides.
- Equally distributed gland bolts provide uniform compression.

Factory Testing:

- Each valve is pressure tested for seat tightness, shell and packing integrity including cycling tests to check for reliability of operation.

BOLTED BONNET KNIFE GATE VALVE DESIGN FEATURES

- Bonnet design: Standard body-bonnet joint with an efficient non-asbestos reinforced fiber or PTFE gasket.
- Long life leak proof stem seal: standard packing chamber with 125 RMS wall finish, burnished on-rotating stem and PTFE or graphite packing rings.
- Virtually no contamination of the environment: No dewatering of stock, unlike standard knife gate valves.
- Easy repacking in-line: (valve should be de-pressurized when repacking in-line.)

EASY OPERATION

- Lower running torque due to reduced friction. Friction between stem and packing in bolted bonnet knife gate valve is far less than the friction between the blade and the packing in a standard knife gate valve.
- Low friction, acid resistant Ni-resist stem nut.

ALL CAST STAINLESS STEEL DESIGN

- One-piece stainless steel, fully lugged, cast body is stronger than welded bodies and less subject to distortion due to thermal stress. Posts are stainless steel instead of chrome-plated carbon steel for longer life.
- Designed for vertical or horizontal line operations
- Standard wafer, face-to-face for easy replacement of leaky standard knife gate valves.
- Maintenance and adjustment free: Long cycle life.
- Suitable for most pulp and paper applications can be used throughout the mill as a general purpose knife gate valve.

Various types of cylinders are available for operating Knife gate valves. The most commonly used cylinders are operated by air.

In most designs, the valve stem serves as a piston rod, with the knife fastened directly to the actuator. Actuators with double ended piston rod option can be supply to install position indicator or limit switches and for connecting an emergency device for manual actuation of the valve.

Hand wheels and gear boxes can be mounted on top of the cylinders for emergency operation due to loss of operating medium in the cylinder.

If specified by the customer, Sude can offer with mounting pads for most steel cylinders with Electro pneumatic positioners for throttling control.

TYPE OF ACTUATOR

Sude offers different types of Cylinder Actuator suitable for knife Gate Valve. Cylinder Actuator is double acting design and is available in a wide range of cylinder diameter and stroke lengths, for details refer 1100 series literature.

- Standard Cycle duty Air cylinder up to 8 bar rated

Type : Double Acting

Cylinder size Range: 65 to 350mm and other sizes can be offered on request.

Rating: Suitable for normal operation with Air supply up to 8 bar.

ACCESSORIES :

Cylinder actuator also can be supplied with different types of accessories required for specific application and automation requirements (For knife edge gate valves)

MANUAL OVERRIDE:

Manual Override can be offered as hand operation facility with cylinder actuator. This is a very useful at the time of Air or Electric supply failure.

SOLENOID VALVE

- Type – 5x2 ways
Body – Aluminum, Brass, S.S.
Coil Voltage – 220 V / 110 V / 24 V.D.C. Weather Proof, Ex-Proof, IIA, IIB.
Size – ¼ “to 1”

AIR FILTER REGULATOR OF:

¼ “to ¾ “NPT (F)

LIMIT SWITCHES:

Design – Mechanical, Proximity Switch

ELECTRO PNEUMATIC POSITIONER

I/P=4-20mA, O/P=4-20mA



Fig-3 : Electro-Pneumatic Cylinder with Electro pneumatic Positioner

CYLINDER SPECIFICATIONS:

- **Maximum Working Pressure :** 150 psig Maximum
- **Working Temperature :** 80°C
- **Control Signal Pressure rang:** 3 to 15 psig [0.2 to 1.0kg/cm²]

AIR CONSUMPTION:

1 SCFM [1.76NMCH] of free air at 80 psig [5.6kg /cm²]

Thrust-available thrust may be considered as 70% of Cylinder bore area multiplied by operating air pressure.

Specification of Electro Pneumatic Positioner

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The Electro pneumatic positioner is a digital field device with a highly integrated micro controller. The positioner consists of the following components: Casing and cover

PCB with corresponding electronics with or without communication via HART or with electronics for communication according to the PROFIBUS PA specification, IEC 1158-2 bus supplied device. Actuator travel detection system. Terminal housing with screw terminals. Pneumatic valve manifold with piezoelectric valve pre-control.

The valve manifold is located in the housing the pneumatic connections for the inlet air and the positioning pressure on the right hand side. A pressure gauge block and / or a safety solenoid valve can be connected there as option. The circuit board container in the casing

provides slots for separately ordered boards with the following functions.

IV module

Position feedback as two wire signal 4 to 20mA

Alarm module [3outputs, 1 input]:

Signaling of two limits of the travel or angle by binary signals. The two limits can be set independently as maximum or minimum values. Output of an alarm if the set point position of the final control element is not reached in automatic mode or if a device fault occurs. Second Binary input for alarm signal of for triggering safety reaction or for blocking / signaling function or safety position

Electric Actuators

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Motorized controls may be applied to valves of any size, for operation in practically any position or location. All units, whether installed directly on a valve on or a floor stand, can be manually operated in case of power failure.



Fig-4-a, Electric Actuator

The units are available with single and three phase Actuators and are sized for specified conditions of operation. Motor units are available with limit switches and push button controls which can be selected to meet customer's requirements.

SDTORK Electric Actuator can be directly assembled with the Knife edge Gate valve The 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 intermediately position. The rectory force on the worm shaft which is a Floating one is directly proportional to the output torque and is absorbed by a set of disc springs. The lateral movement of the worm shaft under load, trip closes the Torque switch. The driving motor is a TEFC/TESC squirrel cage class induction motor combining low inertial with a high starting and stalling torque. The output sleeve is provided with suitable coupling



Fig-4-b : Electric Actuator with Gear Box

Actuators with IP67 / 68 class protection are available on demand.

Three phase Actuators are fitted with Torque Limit switches & Travel Limit switches & also in built with Manual Hand wheel used for operating the Actuator in case of power failure. Actuator is supplied with various shafts Designs to suit Rising & Non-rising stem valve. All actuators can be supplied with various kinds of accessories to make system QCS/DCS/PLC compatible

Accessories for Actuators

- 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

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 4-20mA, 0 to 10 V DC or up/down pulses. All this can also be supplied in integral mode.

Control Panel Specifications

- a) Input : Single Phase 230 V AC OR 3 Phase 415 V AC, 4 wire supply.
- b) Output supply: Single Phase 230 V AC OR 3 phase 415 V AC Reversible supply.
- c) 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.
- d) Indications : Zero to a100% valve position display, R, Y, B Phase Indication [applicable only for 3 phase] Open & Close, Fully open & Fully close indication.
- e) Main switch - Single Phase OR 3 Phase MCB for mains On / Off.
- f) Phase fail / error protection provided.
- g) Fuse protection provided for each phase.
- h) Protection from over torque - If Actuator gets over torque the torque switch trips & the system protects the motor. Also provided with 10 metres



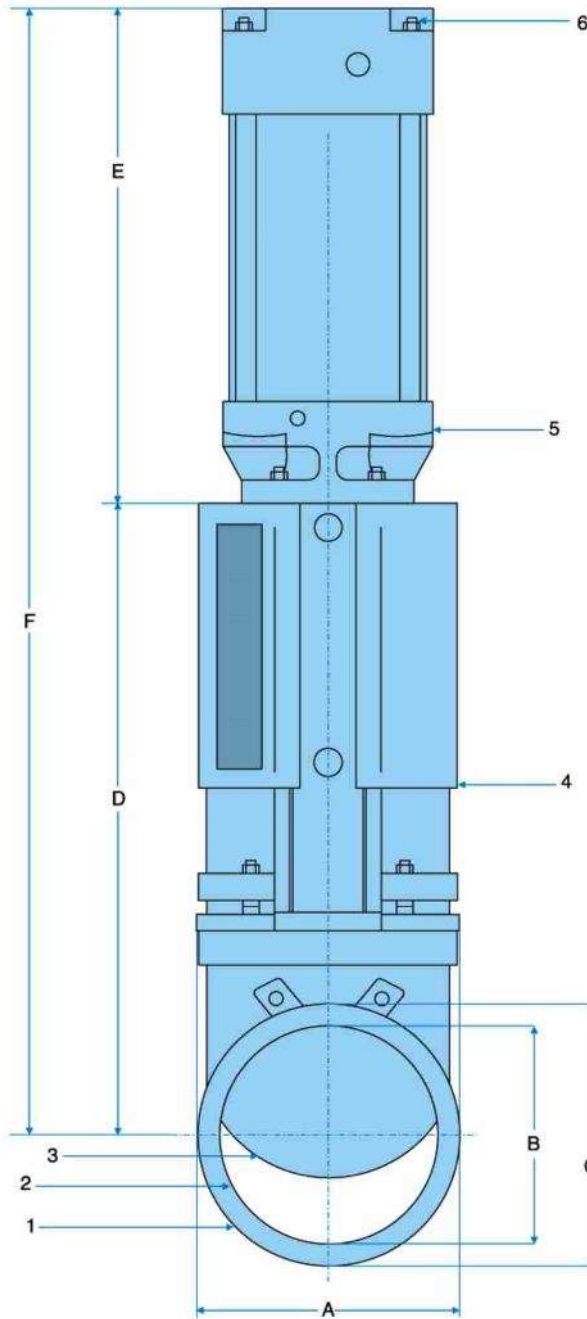
Wall mounted control panel.



Pneumatically Operated Knife Edge Gate Valve

SUDE

1660



PART LIST

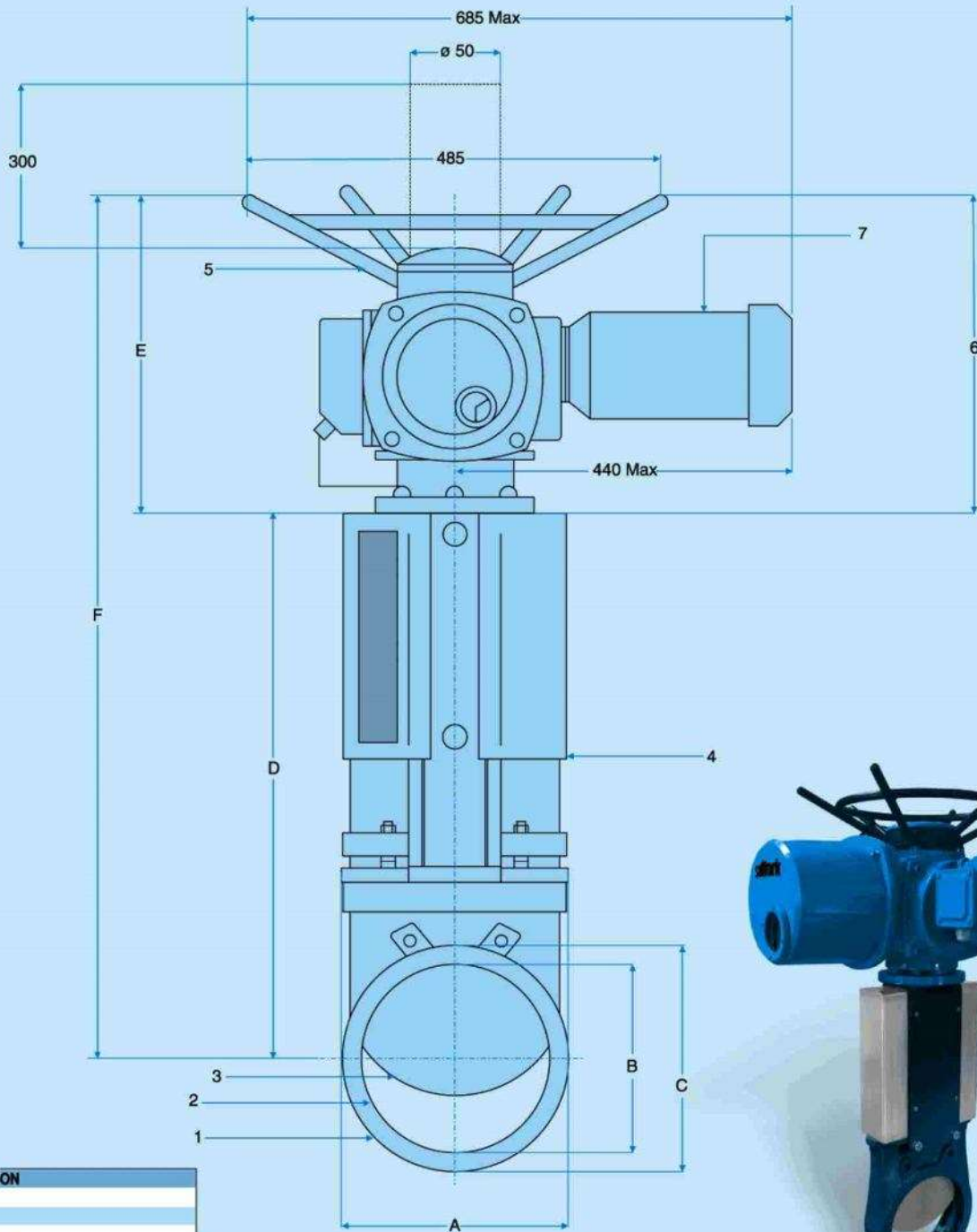
S.No.	DESCRIPTION
1	BODY
2	SEAL
3	GATE
4	GATE GUARD
5	CYLINDER
6	SCREW NUT

VALVE SIZE	ACTUATOR MODEL NUMBER	A	B	C	D	E	F	WT. OF ASSY IN KGS.
80	1660/80/C1/S4/100-100	140	80	138	314	268	582	25
100	1660/100/C1/S4/100-100	158	100	158	352	268	620	26
125	1660/125/C1/S4/100-150	188	125	188	393	318	711	34
150	1660/150/C1/S4/100-150	212	150	212	437	318	755	37
200	1660/200/C1/S4/150-250	277	200	269	546	460	1006	64
250	1660/250/C1/S4/150-250	331	250	322	640	460	1100	78
300	1660/300/C1/S4/200-300	382	300	372	734	510	1244	104
350	1660/350/C1/S4/200-350	437	350	432	841	636	1477	148
400	1660/400/C1/S4/250-400	488	400	481	936	686	1622	249

Electrically Operated Knife Edge Gate Valve

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1650



PART LIST

S.No.	DESCRIPTION
1	BODY
2	SEAL
3	GATE
4	GATE GUARD
5	HAND WHEEL
6	ELECTRIC ACTUATOR STAY PUT OUT TYPE
7	MOTOR (TEFC/TESC)

VALVE SIZE	ACTUATOR MODEL NUMBER	A	B	C	D	E	F	WT. OF ASSY IN KGS.
80	1650/80/CI/S4/SD-3000-08-A	140	80	138	314	450	764	129
100	1650/100/CI/S4/SD-3000-08-A	158	100	158	352	450	802	131
125	1650/125/CI/S4/SD-3000-08-A	188	125	188	393	450	843	135
150	1650/150/CI/S4/SD-3000-08-A	212	150	212	437	450	887	138
200	1650/200/CI/S4/SD-3000-20-A	277	200	269	546	450	996	150
250	1650/250/CI/S4/SD-3000-20-A	331	250	322	640	450	1090	164
300	1650/300/CI/S4/SD-3000-20-SG2.5-A	382	300	372	734	450	1184	178
350	1650/350/CI/S4/SD-3000-20-SG2.5-A	437	350	432	841	450	1291	216
400	1650/400/CI/S4/SD-3000-20-SG04-A	488	400	481	936	450	1386	244

OUR OTHER PRODUCTS:

- Solenoid valves.
- Pneumatically operated control valves.
- Motorised valves.
- Pneumatic & Electric Operated Ball / Butterfly valves.
- Pneumatic & motorised Dampers.
- Pneumatic & motorised VIV Dampers.
- Heavy duty – Single phase & Three phase actuators for operating Gates & chutes.
- Motorised Rising & Non-rising Sluice valve.
- Pneumatic & motorised pinch valve.
- Pneumatic & motorised Flush Bottom valve.
- Entire range of Electrical Actuator.
- 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.



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