

**MX-T-GA04NR0000 - Non-rising handwheel - natural rubber sleeve
(GJS 500 body, F304 gate)**

01/02/2021

BIDIRECTIONAL KNIFE GATE VALVE

- Bidirectional knife gate valve.
- Valve suitable for use as end-of-line.
- Monobloc cast iron body.
- Stainless steel through-conduit gate. Two rubber sleeves.
- Provides high flow rates with low pressure drops.
- Various seat materials available.
- Face-to-face distance in accordance with CMO standard.

General applications:

-This knife gate valve is suitable for working in the mining industry, in loaded fluid transport lines such as water with stones, sludge, etc, and, in general, for abrasive fluids in the chemical industry and waste water. Designed for the following applications:

- Mining
- Sewage treatment
- Electrical power stations - Chemical plants
- Energy sector
- Thermal power stations

Sizes: DN50 to DN1500 (larger sizes to order).

Working (ΔP):

	Maximum PN
DN50 to DN600	10 kg/cm ²
DN700 to DN1400	6 kg/cm ²
DN1500	2 Kg/cm ²

- The pressures indicated in the table can be used in either of the valve's two directions.

Flange borehole:DIN PN10 & ANSI B16.5 (150 LB)

Others commonly used:

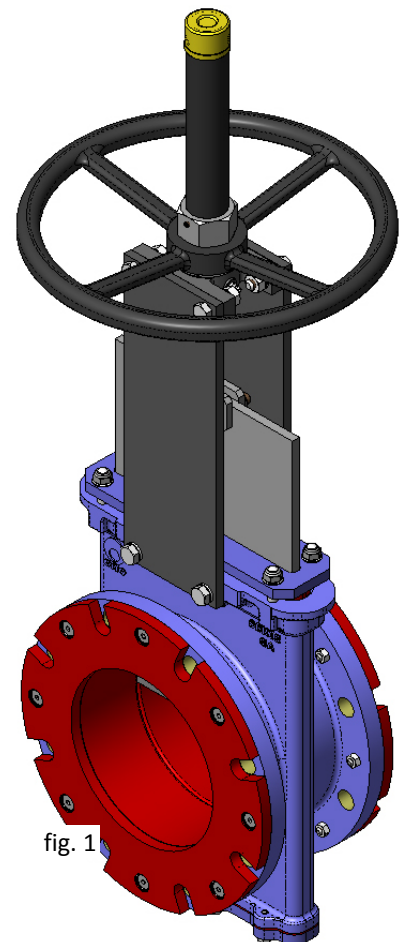
DIN PN 16	JIS standard
DIN PN 6	DIN PN25
Australian Standard	British Standard

Directives:

Machinery Directive: **DIR 2006/42/EC (MACHINERY)**
 Pressure Equipment Directive: **DIR 97/23/EC (PED) ART.3, P.3**
 Potential Explosive Atmospheres Directive: **DIR 94/9/EC (ATEX) CAT.3 ZONE 2 and 22 GD.**For further information on categories and zones please contact the CMO Technical-Commercial Dept.

Quality dossier:-All valves are tested hydrostatically at CMO and material and test certificates can be provided.

- Body test = working pressure x 1.5.
- Seal test = working pressure x 1.1.



**MXT-GA04NR0000 - Non-rising handwheel - natural rubber sleeve
(GJS 500 body, F304 gate)**

Advantages of CMO "GA Model"

- The main characteristic of this knife-gate valve is that it provides a full continuous flow. This means that in open position it produces no cavities and there is no turbulence in the fluid.
- Valve suitable for use as end-of-line.
- The **GA** valve body is a single monobloc piece.
- The stem protection hood is independent from the handwheel securing nut, this means the hood can be disassembled without the need to release the handwheel. This advantage allows regular maintenance operations to be carried out, such as lubricating the stem, etc.
- The CMO valve stem is made from stainless steel 18/8. This is another additional benefit, since some manufacturers supply it with 13% chrome, which quickly rusts.
- The operating wheel is manufactured in nodular cast GJS-500. Some manufacturers supply it in common cast-iron, which can lead to breakage in the event of very high operation torque or a bang.
- The yoke has a compact design with the bronze actuator nut protected in a sealed and lubricated box. This makes it possible to move the valve with a key, even without the handwheel (in other manufacturers' products this is not possible).
- The pneumatic actuator's upper and lower covers are made of GJS-400 nodular cast iron, making them highly shock resistant. This characteristic is essential in pneumatic actuators.
- The pneumatic cylinder sealing joints are commercial products and can be purchased worldwide. This means it is not necessary to contact CMO every time a sealing joint is required.

STANDARD COMPONENTS LIST	
COMPONENT	MXT-GA04NR0000
1- Body	GJS-500
2- Gate	AISI304
3- Packing gland	STEEL
4- Packing seal	NATURAL RUBBER
5- Gasket	LUBRICATED GASKET
6 - Bottom cover	STEEL
7- Sleeve	NATURAL RUBBER
8- Retainer sleeve	NATURAL RUBBER
9- Support plates	STEEL
10- Stem	AISI303
11- Yoke	GJS-500
12- Stem nut	BRONZE
13- Handwheel	GJS-500
14- Stopper nut	STEEL
15- Hood nut	5.6 ZINC
16- Hood	STEEL
17- Protection cap	PLASTIC

Table 1

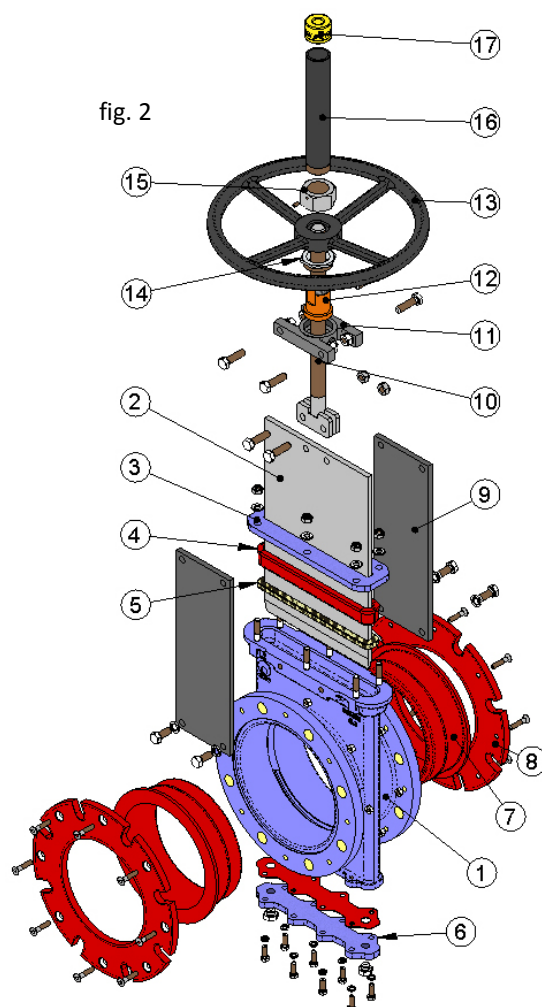


fig. 2

MXT-GA04NR0000 - Non-rising handwheel - natural rubber sleeve (GJS 500 body, F304 gate)

DESIGN CHARACTERISTICS

1- BODY

Reinforced monobloc cast iron body.

The body provides a full continuous flow. This means that in open position it produces no cavities and, therefore, there is no turbulence in the fluid and the load loss is minimal.

For diameters greater than DN600 the body is machine-welded with the necessary reinforcements to withstand the maximum working pressure.

Designed with full passage to provide large flows with small losses of load.

The body's internal design prevents any build-up of solids in the seal area.

The standard manufacturing materials are GJS-500 and CF8M stainless steel (for CF8M, see MXT-GA16NR0000). Other materials such as A216WCB carbon steel and stainless steel alloys (AISI316Ti, Duplex, 254SMO, Uranus B6, Ni-Resist, Ductile Ni-Resist, etc.) are available to order. As standard, iron or carbon steel valves are painted with an anti-corrosive protection of 80 microns of EPOXY (colour RAL 5015). Other types of anti-corrosive protections are available to order.

2- THROUGH-CONDUIT GATE

The standard manufacturing materials are AISI304 stainless steel in valves with GJS-500 body, and AISI316 stainless steel in valves with CF8M body (for CF8M, see MXT-GA16NR0000). Other materials or combinations can be supplied to order.

The through-conduit gate is polished on both sides to provide a smooth contact surface with the resilient seal. At the same time, the sharp edges on the gate are rounded to prevent the seal being cut. There are different degrees of polishing, anti-abrasion treatments and various options to adapt the valves to the customer's requirements.

3- SEAT(sealtight)

The **GA** valve seat comprises two rubber sleeves located symmetrically on each side of the body, both secured with sleeve retainers. Both the sleeve retainers and the sleeves are made of natural rubber with a metal core which helps to keep their shape and also prevent deformations. Whilst the valve is in open position, the sleeves' elasticity ensures they are joined together permanently, preventing the accumulation of solids between the two parts of the body.

The **GA** valve is designed for abrasive fluids, and, therefore, the sleeves protect the entire surface of the body which would be exposed to the abrasive flow. For easier maintenance, the sleeves can be replaced from outside the valve. It is a symmetrical two-piece seat; see the drawing of a seat (fig 3).

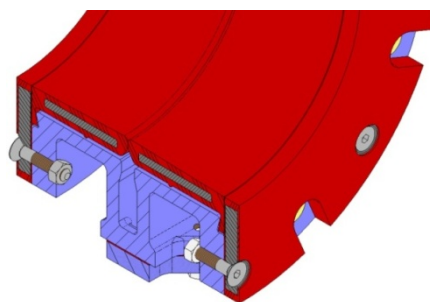


fig. 3

Sealtight materials

NATURAL RUBBER

This is the standard hermetic seal fitted in CMO **GA** model valves. It can be used in multiple applications at temperatures below 90°C with abrasive products, and it provides the valve with 100% sealtight integrity. Application: fluids in general.

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EPDM

Recommended for temperatures below 90°C*. Provides the valve with 100% sealtight integrity.
Application: water and acids.

NITRILE

Used in fluids containing fats or oils at temperatures no higher than 90°C*. Provides the valve with 100% sealtight integrity.

VITON

Suitable for corrosive applications and high temperatures of up to 190°C and peaks of 210°C. Provides the valve with 100% sealtight integrity.

SEAT/SEALS		
Material	Max. Temp.(°C)	Applications
Natural rubber	90	General
EPDM (E)	90*	Non-mineral oils, water and acids.
Nitrile (N)	90*	Hydrocarbons, oils and greases
Viton (V)	200	Hydrocarbons and solvents

Table 2

NOTE: More details and other materials available to order.

*→EPDM and Nitrile: possible up to max temp 120°C on request.

4- GASKET

CMO's standard gasket is composed of a specially designed EPDM O-ring which provides sealtight integrity between the body and the gate, preventing any type of leakage to the atmosphere. It also has a lubricated gasket strip to help the valve's operation during the opening and closing functions. It is located in an easily accessible place and can be replaced without dismantling the valve from the pipeline.

5- STEM

The CMO valve stem is made from stainless steel 18/8. This characteristic makes it highly resistant and provides excellent properties against corrosion.

The valve design can be rising stem or non-rising stem. When a rising stem is required for the valve, a stem hood is supplied to protect the stem from contact with dust and dirt, besides keeping it lubricated.

6- PACKING GLAND

The packing gland allows uniform force and pressure to be applied to the gasket to ensure sealtight integrity.

As standard, valves with steel body include steel packing glands, whilst valves with stainless steel body have stainless steel packing glands.

7- ACTUATORS

It is possible to supply all types of actuators, with the advantage that the CMO design is completely interchangeable. This design means customers can change the actuator themselves without any additional assembly accessories. A design characteristic of CMO valves is that all actuators are interchangeable.

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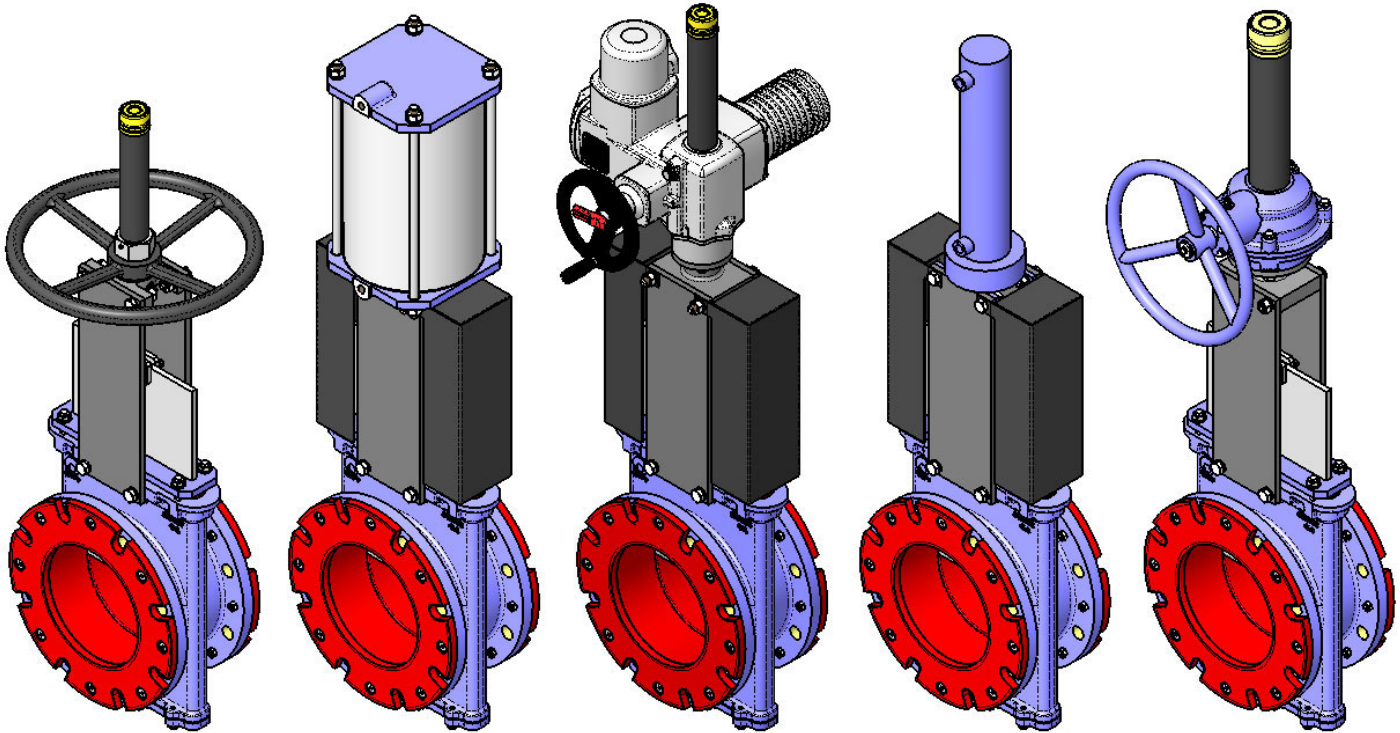
Manual:

- Handwheel with rising stem
- Handwheel with non-rising stem
- Chainwheel
- Lever
- Gearbox
- Others (square stem, etc)

Automatic:

- Electric actuator
- Pneumatic cylinder
- Hydraulic cylinder

fig. 4



Handwheel
with rising
stem

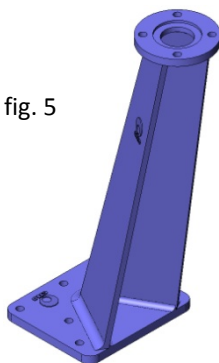
Pneumatic
actuator

Electric-motor
actuator

Hydraulic
actuator

Handwheel
with
gearbox

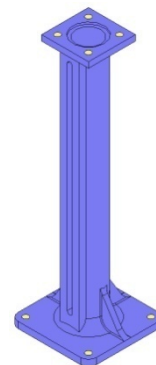
fig. 5



Wide range of accessories available:

- Mechanical stoppers
- Locking devices
- Emergency manual actuators
- Electrovalves
- Positioners
- Limit switches
- Proximity detectors
- Straight floor stand (fig. 6)
- Leaning floor stand (fig. 5)

fig. 6



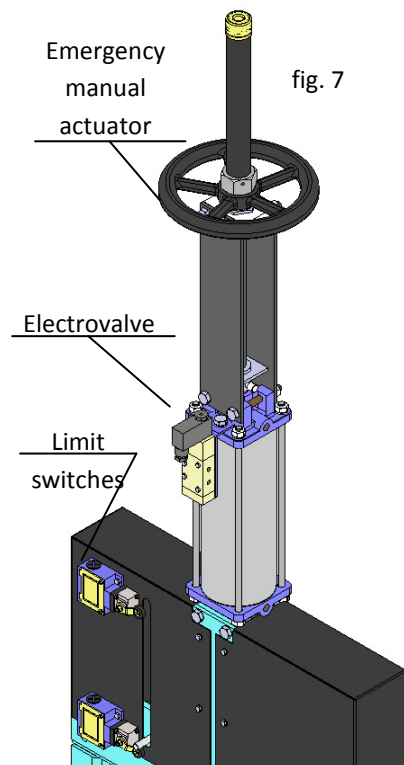
Stem extensions have also been developed, allowing the actuator to be located far away from the valve, to suit all needs. Please check with our technicians beforehand.

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ACCESSORIES AND OPTIONS

Different accessories are available to adapt the valve to specific working conditions such as:

- **Mirror polished through-conduit gate:** The mirror polished through-conduit gate is especially recommended in the food industry and, as standard, in applications in which solids can stick to the gate. It is an alternative to ensure the solids slide off and do not stick to the gate.
- **PTFE coated through-conduit gate:** As with the mirror polished through-conduit gate, this improves the valve's resistance to products which can stick to the gate.
- **Stellited through-conduit gate:** Stellite is added to the inner circle of the through-conduit gate to protect it from abrasion.
- **Scraper in the gasket:** Its function is to clean the gate during the opening movement and prevent possible damage to the gasket.
- **Cased body:** Recommended in applications in which the fluid can harden and solidify inside the valve body. An external casing keeps the body temperature constant, preventing the fluid from solidifying.
- **Flushing holes in the body:** Several holes are drilled in the body to flush air, steam or other fluids out with the aim of cleaning the valve seat before sealing.
- **Electrovalves (fig. 7):** For air distribution to pneumatic actuators.
- **Junction boxes, wiring and pneumatic piping:** Units supplied fully assembled with all the necessary accessories.
- **Mechanical limit switches, inductive sensors and positioners:** Limit switches or sensors are installed to indicate precise valve position, as well as positioners to indicate continuous position (fig. 7).
- **Junction boxes, wiring and pneumatic piping:** Units supplied fully assembled with all the necessary accessories.
- **Mechanical locking device:** Allows the valve to be mechanically locked in a set position for long periods.
- **Stroke limiting mechanical stops:** Allow the stroke to be mechanically adjusted, limiting the valve run.
- **Emergency manual actuator (hand wheel/gearbox)(fig. 7):** Allows manual operation of the valve in the event of power or air failure.
- **Interchangeable actuators:** All actuators are easily interchangeable.
- **Actuator or yoke support:** Made of EPOXY-coated steel (or stainless steel to order), its robust design gives it great rigidity in order to withstand the most adverse operation conditions.
- **Epoxy coating:** All cast iron and carbon steel bodies and components in CMO valves are EPOXY coated, giving the valves great resistance to corrosion and an excellent finish. CMO's standard colour is blue, RAL-5015.
- **Through-conduit gate safety guard:** In accordance with European Safety Standards ("EC" marking), CMO automatic valves are fitted with metal guards in the gate run in order to prevent objects from being accidentally caught or dragged along.



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TYPES OF EXTENSION

When the valve needs to be operated from a distance, the following different types of actuators can be fitted:

1 - Extension: Floor Stand.

This extension is done by coupling a rod to the stem. The desired extension is achieved by defining the length of the rod. A floor stand is normally installed to support the actuator.

The definition variables are as follows:

- H1:** Distance from the valve shaft to the base of the stand.
- d1:** Separation from the wall to the end of the connecting flange.

Characteristics:

- Can be coupled to any type of actuator.
- A stem support-guide is recommended (fig. 8) every 1.5 m.
- The standard floor stand is 800 mm high (fig. 9). Other floor stand measurements available to order.
- Option of fitting an indicator rule in order to determine the degree of opening of the valve.
- Option of leaning floor stand (fig. 10).

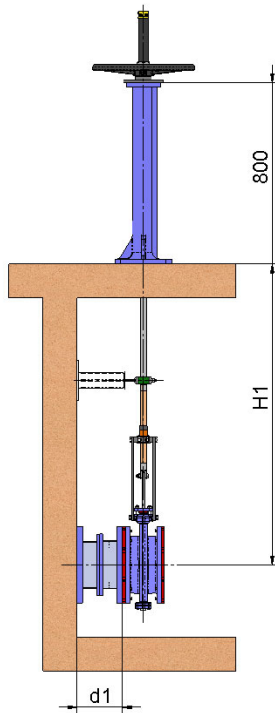


fig. 9

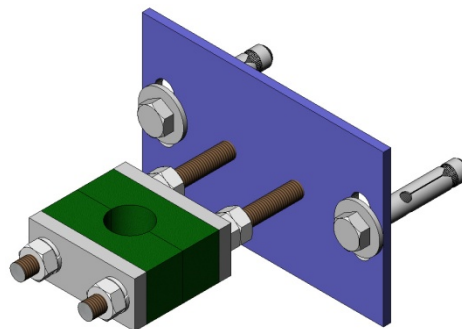


fig. 8

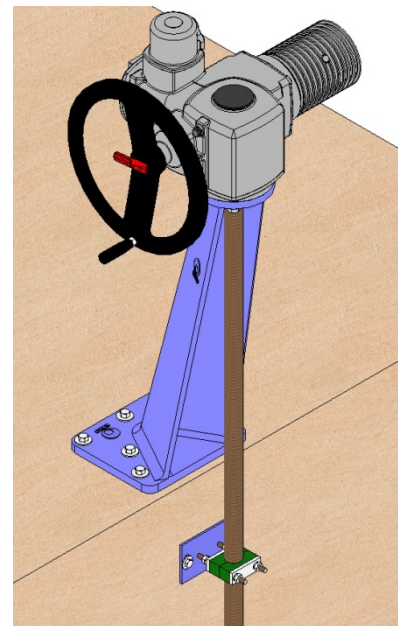
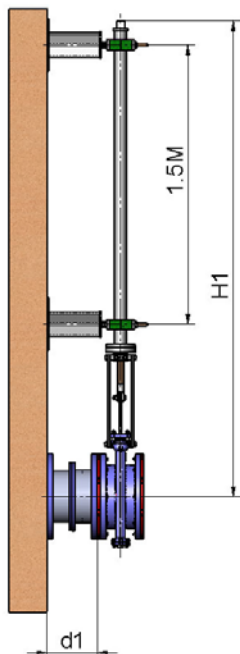


fig. 10

COMPONENTS LIST	
Component	Standard Version
Stem	AISI 303
Rod	AISI 304
Guide-support	Carbon steel with EPOXI coating
Slide	Nylon
Floor Stand	GJS-500 with EPOXY coating

Table 3

**MXT-GA04NR0000 - Non-rising handwheel - natural rubber sleeve
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2 - Extension: Pipe (fig. 11)

This consists of raising the actuator. The pipe will rotate with the wheel or key when the valve is operated, although this will always remain at the same height.

The definition variables are as follows:

H1: Distance from the valve shaft to the required height of the actuator.

d1: Separation from the wall to the end of the connecting flange.

Characteristics:

- Standard actuators: handwheel and square stem.
- A pipe support-guide is recommended every 1.5 m.
- The standard materials are: Stainless steel or EPOXY coated carbon steel.

3 - Extension: Extended Support Plates (fig. 12)

When a short extension is required, it can be achieved by extending the support plates. An intermediate yoke can be fitted to reinforce the support plates structure.

fig. 12

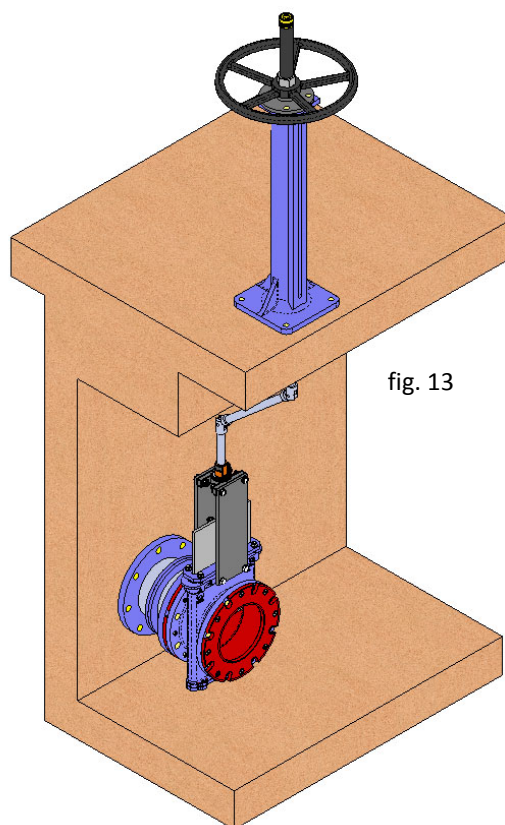


fig. 13

4 - Extension: Universal joint (fig. 13)

If the valve and the actuator are not in correct alignment, the problem can be resolved by fitting a universal joint.

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HANDWHEEL with rising stem

- **B = max width** of the valve (no actuator).
- **D = max height** of the valve (no actuator).
- Options:
 - Locking devices.
 - Extensions: stand, pipe, plates, etc.
 - DN higher than those shown in the table.
- Actuator comprising:
 - Handwheel.
 - Stem.
 - Nut.
 - Stem protection hood.
- Available: DN50 to DN1000, other DN to order.
- From DN350 (inclusive) the actuator has a gearbox.

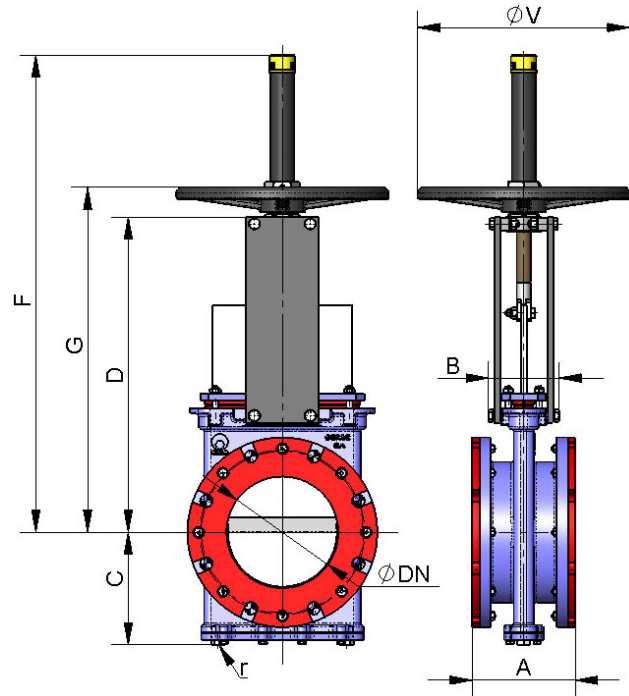


fig. 14

DN	ΔP (Kg/cm ²)	DRAFT (Nw)	TORQUE (Nm)	A	B	C	D	G	F	ØV	r (B.S.P.)
50	10	905.21	2.06	175	109	106	280	319	449	225	1/4"
65	10	1506.9	3.48	175	109	113	306	345	500	225	1/4"
80	10	2312.5	5.28	175	109	122	332	372	551	225	1/4"
100	10	3609.8	8.24	175	109	136	368	407	587	225	1/4"
125	10	5639.4	16.1	178	126	153	421	474	713	325	1/4"
150	10	8121.1	23.18	178	126	168	466	519	757	325	1/4"
200	10	14449	41.28	184	126	199	565	618	957	325	3/8"
250	10	22591	64.54	225	197	234	626	749	1125	450	1/2"
300	10	32569	93.05	257	197	272	739	837	1213	450	1/2"
350	10	44419	172.2	257	350	297	842	942	1342	--	1/2"
400	10	58040	224.9	279	350	330	933	1033	1483	--	3/4"
450	10	73382	284.5	311	350	355	1019	1119	1619	--	3/4"
500	10	90869	496.8	359	380	391	1156	1256	1806	--	3/4"
600	10	131156	717.1	372	400	461	1338	1438	2088	--	1"
700	6	107739	589.1	378	400	534	1425	1525	2440	--	1"
750	6	129527	718	395	400	559	1520	1620	2555	--	1"
800	6	141228	772.2	411	400	584	1615	1715	2665	--	1"
900	6	179489	1164	470	400	649	1823	1923	2823	--	1"
1000	6	221406	1436	534	440	699	1992	2092	3192	--	1"

Table 4

**MXT-GA04NR0000 - Non-rising handwheel - natural rubber sleeve
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INFORMATION ON FLANGE DIMENSIONS

EN 1092-2 PN10

DN	ΔP (Kg/cm ²)	o	ϕd	P	ϕK
50	10	4	18	32	125
65	10	4	18	32	145
80	10	8	18	32	160
100	10	8	18	32	180
125	10	8	18	32	210
150	10	8	22	32	240
200	10	8	22	33	295
250	10	12	22	35	350
300	10	12	22	37	400
350	10	16	22	37	460
400	10	16	26	41	515
450	10	20	26	45	565
500	10	20	26	46	620
600	10	20	30	49	725
700	6	24	30	56	840
750	6	24	33	58	900
800	6	24	33	59	950
900	6	28	33	62	1050
1000	6	28	36	69	1160
1100	6	32	36	72	1270
1200	6	32	39	74	1380
1300	6	32	39	80	1490
1400	6	36	42	81	1590
1500	2	38	45	82	1705

Table 13

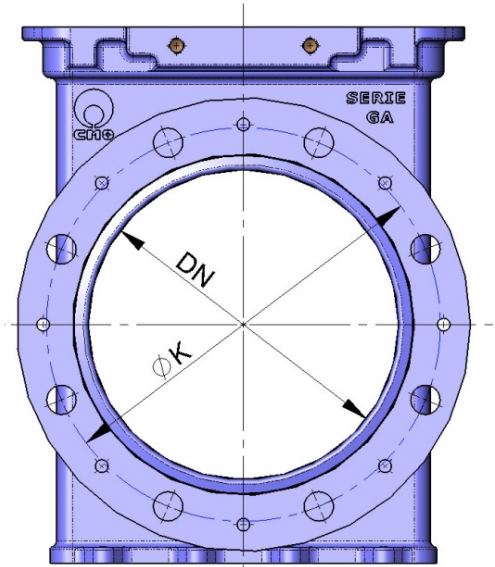


fig. 23

o THROUGH BOREHOLE

ANSI B16, class 150

DN	ΔP (Kg/cm ²)	o	R UNC	P	ϕK
2"	10	4	3/4"	1.28"	4.75"
2 1/2"	10	4	3/4"	1.28"	5.5"
3"	10	4	3/4"	1.28"	6"
4"	10	8	3/4"	1.28"	7.5"
5"	10	8	7/8"	1.28"	8.5"
6"	10	8	7/8"	1.28"	9.5"
8"	10	8	7/8"	1.32"	11.75"
10"	10	12	1"	1.4"	14.25"
12"	10	12	1"	1.48"	17"
14"	10	12	1 1/8"	1.48"	18.75"
16"	10	16	1 1/8"	1.64"	21.25"
18"	10	16	1 1/4"	1.8"	22.75"
20"	10	20	1 1/4"	1.84"	25"
24"	10	20	1 3/8"	1.96"	29.5"
28"	6	28	1 3/8"	2.24"	34"
30"	6	28	1 3/8"	2.32"	36"
32"	6	28	1 5/8"	2.36"	38.5"
36"	6	32	1 5/8"	2.48"	42.75"
40"	6	36	1 5/8"	2.76"	47.25"

Table 14

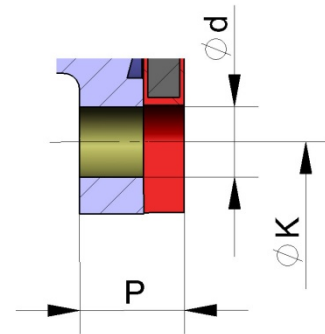
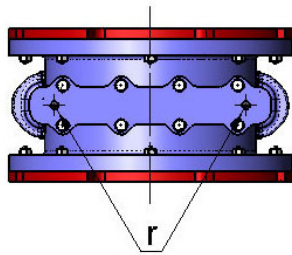
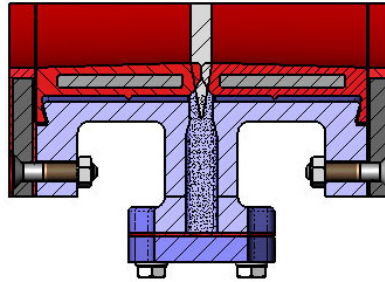


fig. 24

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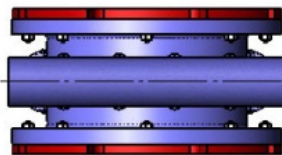
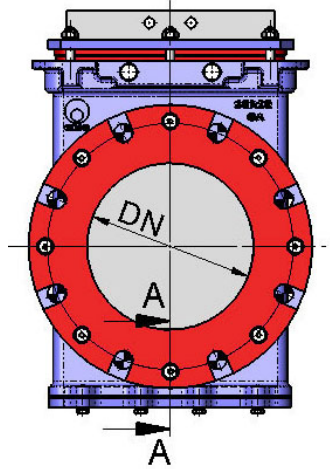


STANDARD VERSION

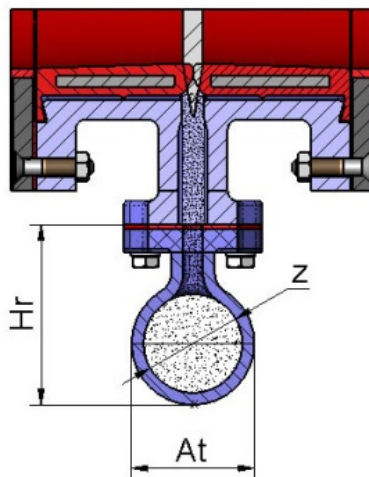


SECTION A-A

DN	r (B.S.P.)
50	1/4"
65	1/4"
80	1/4"
100	1/4"
125	1/4"
150	1/4"
200	3/8"
250	1/2"
300	1/2"
350	1/2"
400	3/4"
450	3/4"
500	3/4"
600	1"

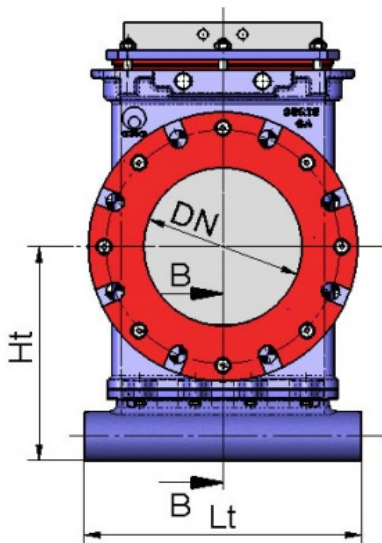


OPTION 1

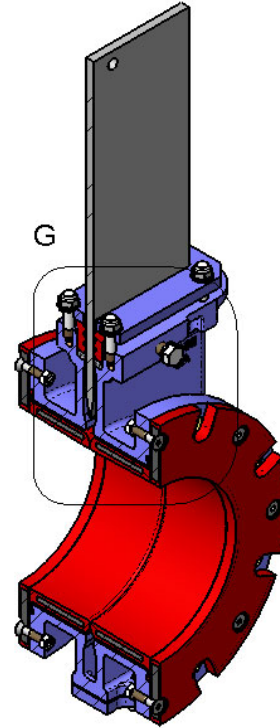
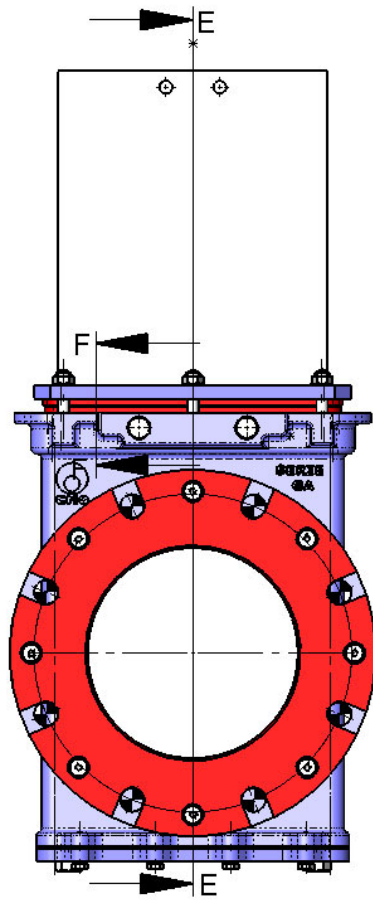


SECTION B-B

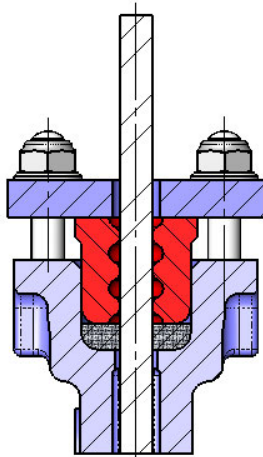
DN	Ht	Lt	At	Hr	z (B.S.P.)
50	158	185	42	68	1"
65	168	200	42	68	1"
80	174	220	42	68	1"
100	188	240	42	68	1"
125	208	265	42	73	1"
150	223	290	42	73	1"
200	272	350	62	93	1 3/4"
250	310	400	62	98	1 3/4"
300	348	450	62	98	1 3/4"
350	373	520	62	98	1 3/4"
400	403	560	62	98	1 3/4"
450	428	610	62	98	1 3/4"
500	472	690	70	107	2"
600	542	790	70	107	2"



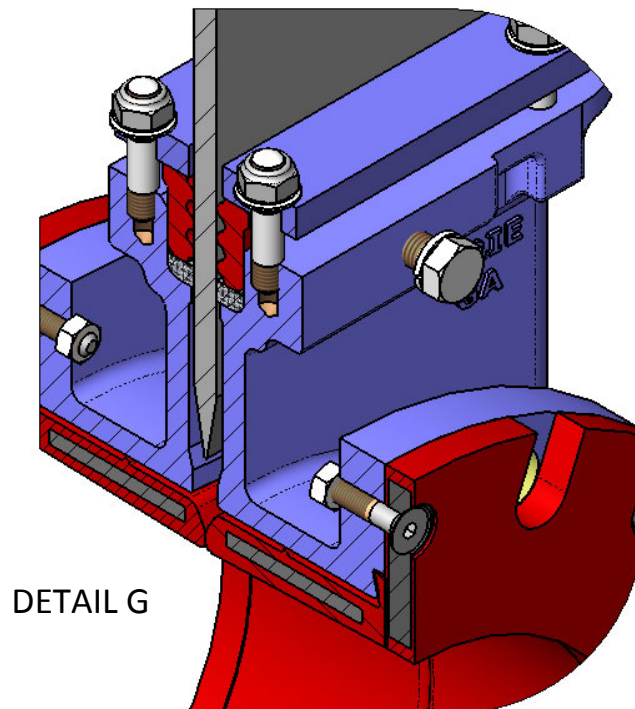
**MXT-GA04NR0000 - Non-rising handwheel - natural rubber sleeve
(GJS 500 body, F304 gate)**



SECTION E-E



SECTION F-F



DETAIL G