

# D SERIE VALVE

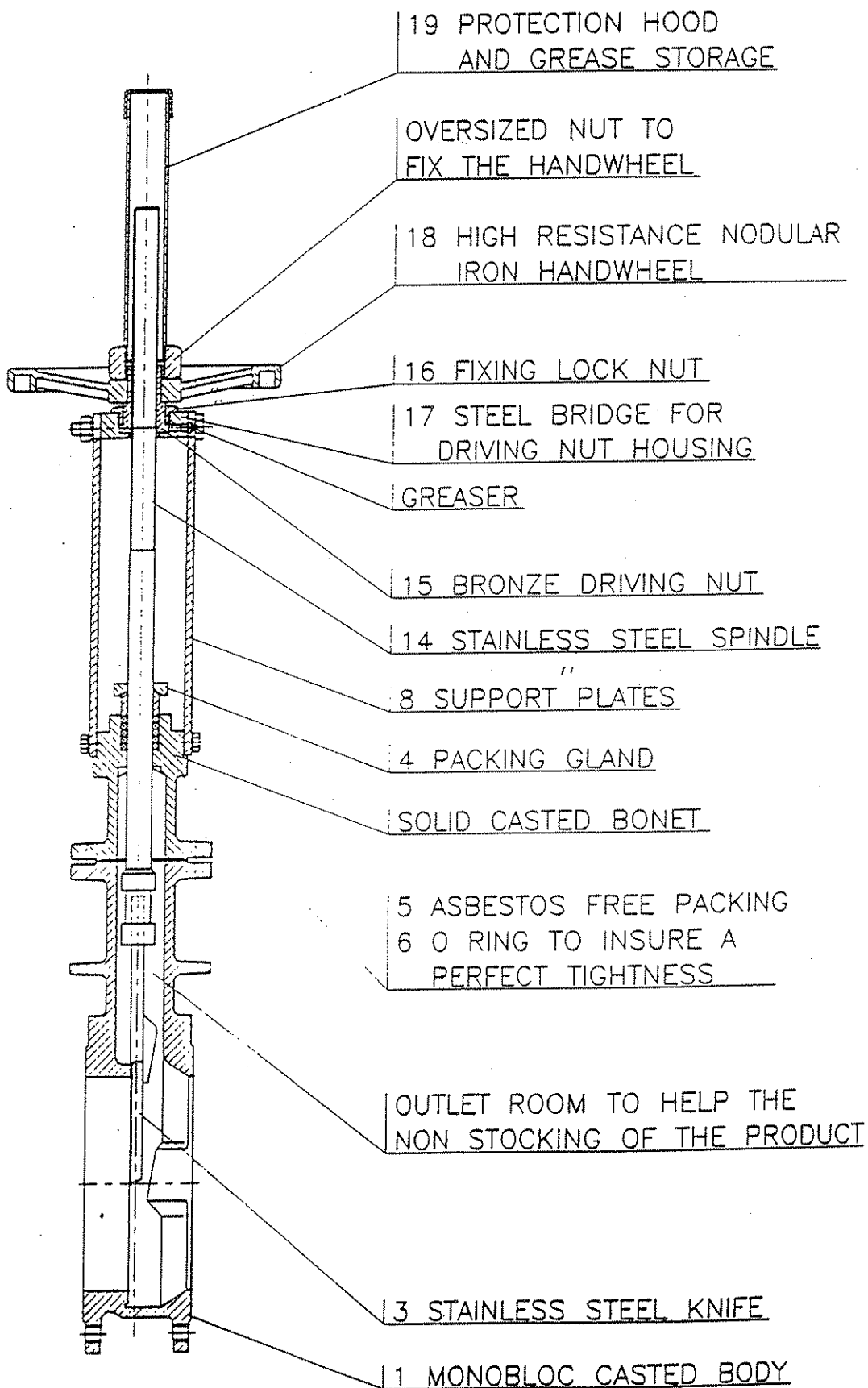
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Fecha: 15-1-97

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Revision:





# VALVE TYPE D

NUMBER:

DATE:11-08-98

REVISION:

PAGE

64

## APPLICATIONS

Gate valve of strong guillotine, especially designed for liquids driving solids.

## MATERIALS

Construction materials, see catalogue.

## PRESSURES

Unidirectional valve. The main pressure must follow the direction of the arrow stamped on the body side - see pressure rates - it is allowed 1/2 of this pressure in the opposite direction of the arrow.

In general, the flanges of this valve are drilled and screwed following some standards (DIN PN10, ASA150 lbs,...) In this type of valve the standar of the flange drilling is related to the working pressure of the valve.



# ADVANTAGES VALVE TYPE D

NUMBER:

DATE:11-08-98

REVISION:

PAGE

65

## ADVANTAGES OF THE C.M.O. VALVE TYPE "D" FROM SIMILARS

The basic idea of the design of this gate valve is to avoid the problems that the traditional gate valve has. When the fluids drive solids, these get stored in the cavity intended for the wedge, in the traditional gate valves.

In the gate valve CMO this problem is solved as there are no cavities where the solids can get stored, it can be considered a selfcleaning valve.

The allowed working pressures in this type of valve go from PN6 up to PN100, depending on the size.

The stem hood is independent from the fixation of the handwheel, so, the hood can be removed without removing the handwheel, this allows the normal maintenance operations as greasing of the spindle, etc.

The spindle of the valve C.M.O. is made of stainless steel 18/8. This point is very important because there are manufacturers who mount it of 13% CR and it gets rusty in a very short time.

The handwheel of the manual actuator is made of nodular iron GGG-50. This is basic, some manufacturers mount it of cast iron and it gets broken very easily when receiving any effort or knock.

The bridge of the manual actuator C.M.O. is manufactured in a compact way, with the bronze nut protected in a greased and closed box. So it can be moved with a key even without the handwheel. ( With other manufacturers this is not possible )

In the pneumatic actuator the upper and lower covers of the cylinder C.M.O. are made of nodular iron GGG-50, therefore their resistance to the knocks is very high. This characteristic is essential in this type of pneumatic cylinder without damper. Special care must be taken with cylinders with covers in aluminium or cast iron.

The joints of the pneumatic cylinders are commercial and they can be bought all over the world, it is not needed, therefore, to contact C.M.O. every time that these spares are requested.



# ACCESORIES

NUMBER:

DATE:11-08-98

REVISION:

PAGE

66

GATE MIRROR POLISH. (For Food Industry)  
GATE PTFE LINED (Adhesion protection)  
GATE REINFORCED WITH STELLITE (Wear protection)  
SCRAPER AT THE PACKING GLAND (Gate cleaning)  
CLEANING FLUSHING POINTS ON THE BODY  
AIR CHAMBER AT THE PACKING GLAND  
BONNET ON THE BODY (For toxic gas)  
HEATING CHAMBER  
MECHANICAL LIMIT SWITCHES  
INDUCTIVE SWITCHES  
SOLENOID VALVES  
END STOPS  
EMERGENCY HANDWHEEL (GEAR)  
POSITIONERS  
HYDRAULIC ACTUATOR  
HEAT DISSIPATORS  
RULES GRADUATED IN MM  
LOCKING SYSTEM  
ELECTRIC CONEXION BOXES  
MANEUVER COLUMN  
EXTENSIONS



# DRIVERS

NUMBER:

DATE: 11-08-98

REVISION:

PAGE

67

## HANDWHEEL -V-

The manual actuation by handwheel has to be used when the number of cycles is reduced. There is the possibility of rising and non rising spindle.

## PNEUMATIC DOUBLE EFFECT -N-

Used for automatic opening and closing. Standard air pressure 6-8 bar. Normally this type of valve D needs oversized pneumatic cylinder.

## PNEUMATIC SINGLE ACTING -N-

Used for automatic opening and closing. Standard air pressure 6-8 bar.

## MANUAL GEAR -R-

It is used for valves of big diameter or for high pressures.

## MANUAL LEVER -P-

To be used in small diameters (max. DN300) and systems without pressure. This driver is not recommended for valve type D.

## MOTORIZED -M-

Can be used in all sizes and mainly for regulation. It is very important to consider the working pressure in order to choose the correct actuator.

## MANUAL CHAIN WHEEL -C-

Used when the valves are installed in high positions.



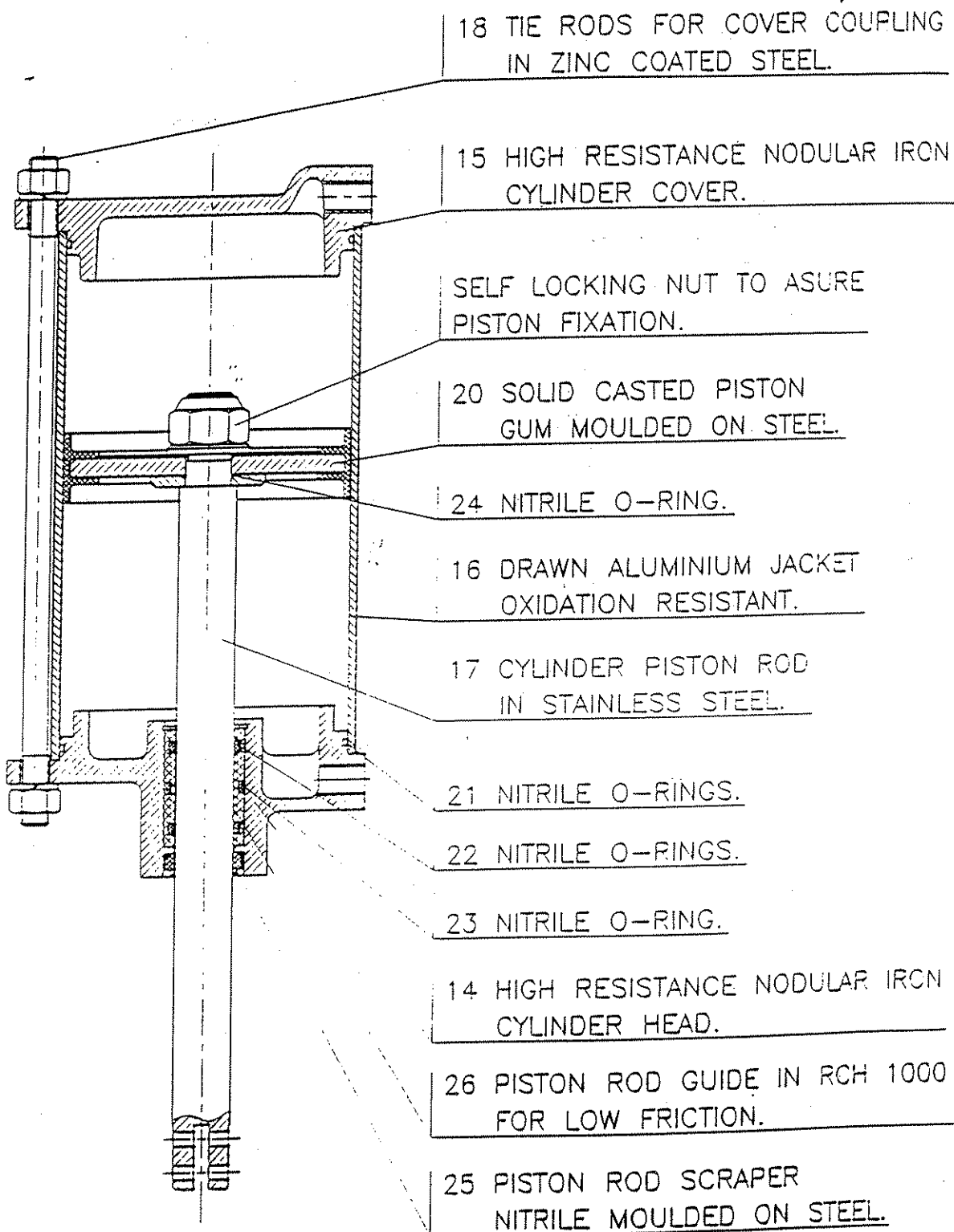
# PNEUMATIC CYLINDER

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Revision:





# PACKINGS

NUMBER:

DATE:11-08-98

REVISION:

PAGE

69

## SEALING

To achieve the sealing in the upper part of the valve -packing gland- we use packing lines. This packing is made with cotton threads or other braided products.

The packing can be of various types according to the use and characteristics demanded. The main packing materials used are the following:

### ***GREASED COTTON. HYDRAULIC SERVICES .***

This packing is made with cotton threads and has impregnated both the inside and the outside with tallow. It is manufactured by the solid system. It is a packing for general use in hydraulic services for pumps as well as for valves.

P(bar) = 10    T °C = 100    PH = 6-8

### ***DRY COTTON***

This packing is made with cotton threads. It is manufactured by the solid system. This is a packing only for solid products.

P(bar) = 0.5    T °C = 100    PH = 6-8

### ***COTTON + P.T.F.E.***

This packing is made with cotton threads and has the inside and outside impregnated with P.T.F.E. It is manufactured by the solid system. It is a packing for general use in hydraulic services for pumps as well as for valves.

P(bar) = 30    T °C = 120    PH = 6-8

### ***P.T.F.E. LUBRICATED***

It is made of PTFE filament threads which are impregnated using vacuum with a dispersion of PTFE and a special lubricant which helps the work at high speed.

It is braided by the diagonal system. Suitable for valves and pumps working with nearly all the fluids, specially the more corrosives, including concentrated oils and oxidants. It is also suitable for fluids with solid contents.

P(bar) = 100    T °C = -200+270    PH = 0-14



# PACKINGS

NUMBER:

DATE: 11-08-98

REVISION:

PAGE

70

## *GRAPHITE FILAMENT*

It is made of graphite threads of high purity. It is braided by the diagonal system and impregnated with a small quantity of graphite and lubricant which helps to reduce the porosity and makes easier the running.

It is a packing with low friction coefficient and high heat conductivity.

It has a wide range of applications, as the graphite withstands the steam, water, oils, dissolvents, alkalis and most of the acids.

The chemical products that attack this packing are strong oxidizers as the oleum, the fuming nitric acids, the dichromates and the oxygen.

P(bar) = 40    T °C = 650    PH = 0-14

## *CERAMIC FIBER*

It is made with ceramic threads. Its application is only for air or gas at high temperature and low pressure.

P(bar) = 0.3    T °C = 1400    PH = 0-14





# REPLACEMENT OF PACKINGS

NUMBER:  
DATE:11-08-98  
REVISION:

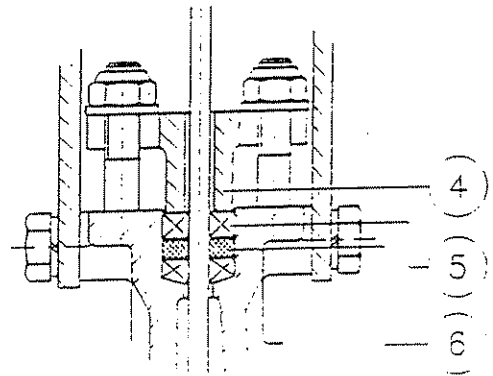
PAGE  
71

A new packing from the factory allows several retightenings. As soon as a leakage is appreciated from the packing gland area, this must be retightened.

The life of the packing material depends on the number of handlings and, of course, on its correct choosing, determined by the characteristics of the media.

## REPLACEMENT OF THE PACKING MATERIAL

- 1.- Remove all pressure and media from the inside of the installation.
- 2.- Place the valve in open position.
- 3.- Release the screws of the packing gland.
- 4.- Fasten the packing gland in the upper side.
- 5.- Take out the damaged packing using a sharp tool, with care to avoid any damage of the gate.
- 6.- Clean carefully the packing housing and make sure that no metallic remains get inside.
- 7.- Insert the new packing. Both ends must be perfectly joined.
- 8.- Place the packing gland in its first position, tighten slightly the screws, check if there is the same distance on both sides, between the gate and the packing gland.
- 9.- Make a cycle slowly, stop if you find any difficulty, if this happens is because the packing gland has not been correctly centered.
- 10.- Insert some pressure into the valve and retighten equally the packing gland, just enough to avoid any leakage to the outside.



4	PACKING GLAND
5	PACKING
6	C-RING



# SEATS

NUMBER:

DATE:11-08-98

REVISION:

PAGE

72

## TIGHTNESS

The sealing systems of the knife gate valve can be of two types :

**-Metal/Metal:** it is used for solids and liquids with concentration of solids maximum 3% and for regulation.

The level of tightness of this seat is of a 99.5 %

**-Metal/Rubber:** the soft seats used normally are EPDM, Nitrile, Viton, Silicone. P.T.F.E can also be used for sealing purposes.

### *EPDM*

This is the standard seat mounted in CMO valves and its price is included on the price lists.

It can be used in many applications, but generally is used for water and products diluted in water at a temperature not higher than 90 °C.

The EPDM rubber can also be used for abrasive products.

### *NITRIL*

It is used for greasy fluids or oils at temperatures not higher than 90 °C.

### *VITON*

Appropriate for acid products and high temperatures being able to support 190 °C in continuous and picks of 210 °C.

### *SYLICONE*

The use of the silicone is focused into the food and pharmaceutical products with temperatures not higher than 200 °C.

\*\* For other applications different rubbers are used as the hypalon, the butyl, the buna, the natural rubber, ... these special cases to be discussed.

### *P.T.F.E.*

It is used for acid products and PH of 2 to 12.

The thightness is of a 99.95 %.



# REPLACEMENT OF THE SEALING RING

NUMBER:

DATE: 11-08-98

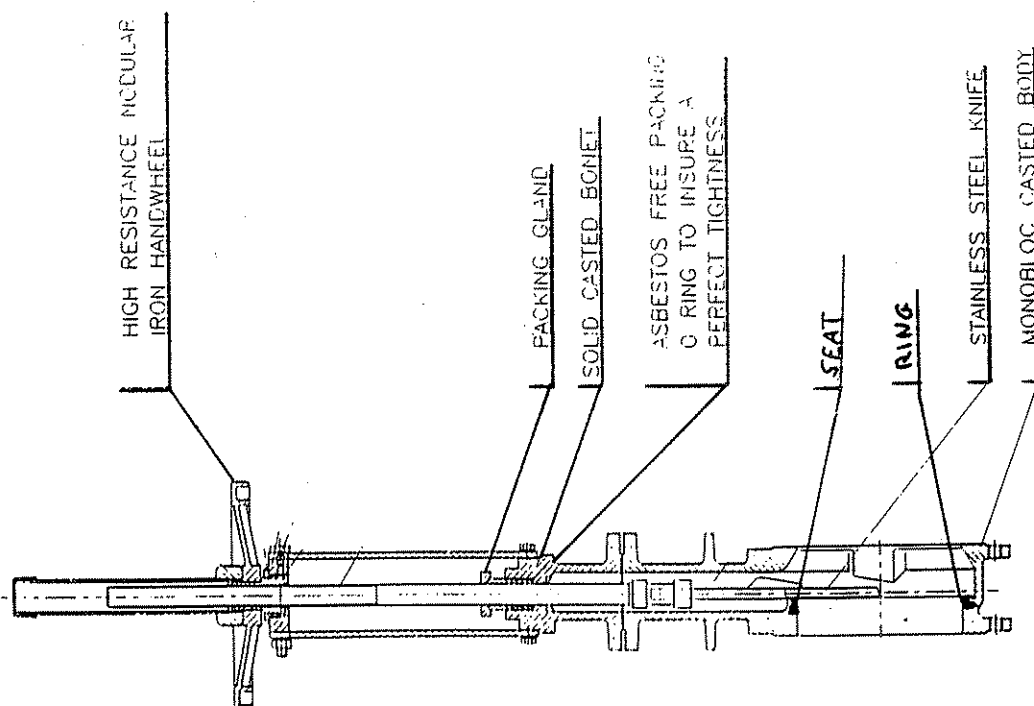
REVISION:

PAGE

73

Once the valve has been removed from the pipeline, follow the next steps:

- 1.- Remove the actuator.
- 2.- Remove the packing gland.
- 3.- Remove the packing with care to avoid the damage of the O ring.
- 4.- Remove the gate carefully without loosing the slides.
- 5.- Clean the inside of the valve.
- 6.- With a tool of bronze give a few knocks at the base of the metallic ring till it comes off.
- 7.- Remove the sealing joint and clean the housing channel.
- 8.- Fix a joint similar to the replaced.
- 9.- Insert the sealing ring as follows:
  - Place the ring perfectly parallel to the sealing joint.
  - Push the ring towards the channel base all the surface at the same time.
  - Verify that all parts of the ring are perfectly inserted and in perfect contact with the valve.
- 10.- Mount the rest of the valve following the opposite steps of the dismantling.





# ACCESORIES

NUMBER:

DATE:11-08-98

REVISION:

PAGE

74

## WEAR PROTECTION RING

This piece has ring shape and it is mounted at the bore of the valve to protect it against abrasion. It can be made of several materials depending on the hardness of the media. These materials can be CA-15, CF8M, NI-HARD, etc. The knife gate valve type L has two of these rings.

## DEFLECTOR RING

This deflector ring has conical shape. It is mounted on the bore of the valve in the side where the media comes in. It concentrates this media towards the centre of the pipe. It can be made of several materials depending on the hardness of the media. These materials are CA-5, CF8M, Ni-HARD, etc.

## DIAPHRAGM

The diaphragms are rings with geometric shapes used for regulation of fluids. In the type L this diaphragm has square shape.

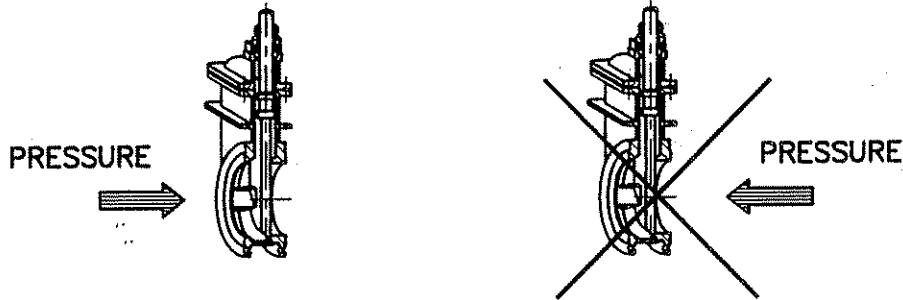
All the valves with diaphragm have an indication rule graduated in millimeters and an indication rod.

They are casted in several material, the standard are GG25 and CF8M.

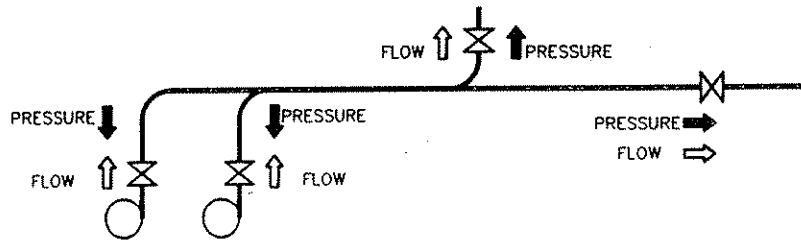


**1 INSTALLATION.**

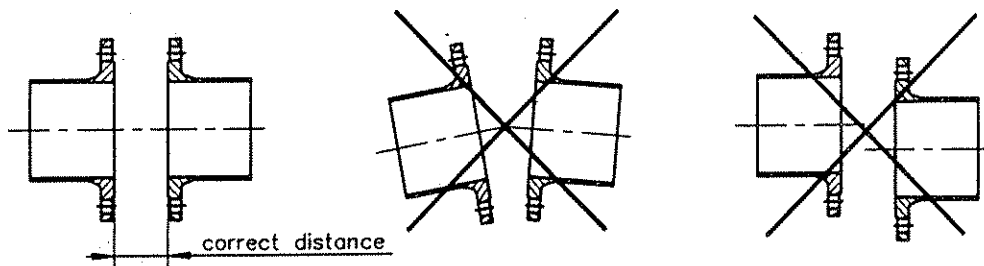
1.1 The knife valve serie D is single way. The direction of the highest pressure is indicated by the arrow. But the closing system by wedges allows a back pressure of aproximate a 50% from the maximum working pressure, to be able to guarantee a tight sealing on the metal/metal valves.



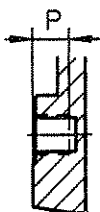
1.2 TAKE NOTE THAT THE PRESSURE AND FLOW DIRECTIONS ARE NOT ALWAYS COINCIDENT



1.3 Special care is needed when establishing the correct distance between the counterflanges, their line-up and parallelism. The wrong placement of the counterflanges will cause distortions in the body therefore difficulties when handling.



1.4 The screws to fix the valve to the blind drill, must use the screw at maximum but never reach the bottom. **LENGTH EXCESS OR DEFECT OF THOSE SCREWS OR BIGGER CLAMPING THAN THE INDICATED WILL BREAK THE BODY OF THE VALVE.**



DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
TRHEADED DEPTH	8	8	9	9	9	9	10	10	12	12	21	22	22	22
TORQUE SETTING Nm	25	25	30	30	30	35	35	35	40	40	50	50	50	60



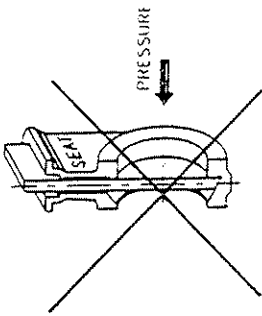
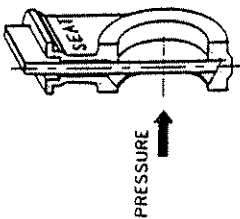
CONSTRUCCIONES METALICAS DE OBTURACION

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### INSTRUCTIONS FOR THE INSTALLATION, SERVICE AND MAINTENANCE OF THE UNIDIRECTIONAL CMO VALVES

#### STORING

It is important that the valves are kept perfectly clean. If not there is the danger that seals get damaged and complete tightness of the valve is no longer obtainable.

#### STANDARD INSTALLATION

- 1.- The valve can be installed in any required position, depending on the actuator. The valve will be installed so that the fluid pressure will follow the direction of the arrow stamped on the body of the valve. Only when the valve is working with solid particles, dust, dross of metals, etc. the valve must be fitted in the opposite direction to the shown by the arrow.
- 2.- Stress to the valve body due to inaccurately aligned pipelines should be avoided.
- 3.- Fitting bolts into the blind holes. The bolts when tightened must not touch the base of the blind hole.
- 4.- No special instruction are required for operation. The valve may be opened closed quickly or slowly, although of course, any forcing of the valve must be avoided.
- 5.- Valves are suitable for regulating as the slide can be adjusted to any intermediate position. Special vee notch inserts or pentagonal inserts are also available for those cases where very fine flow control is required.
- 6.- With pneumatically operated valves, it is very important to ensure that all airlines, control valves and cylinders are thoroughly checked and "blown through" before pulling the slide valve into operation. A filtered lubricated air supply should be used. The air pressure must not exceed 8 bar or be less than 5 bar.

#### SPECIAL INSTALLATIONS

For those cases where the valves are being installed on dry powder applications, or if there are of the vee notch or pentagonal notch type, please note the following point: these valves should be installed so that the arrow stamped on the body of the valve points at the opposite direction to that followed by the flow.

#### Very important: "Piping with dry powder or solid particles"

The engineer or person in charge of the installation must consider the position of the valve (horizontal, upright, inclined) when deciding on what way to install the valve. If the valves are provided with a deflection cone to slow down the wearing off on the body of the valve, that should also be taken into account when doing the installation. We recommend to discuss these cases with our Technical Office before starting the installation of the valves, giving as much information as possible on the subject i.e. type of fluid, flow direction, pressure, temperature and upright or horizontal position of the piping.

#### MAINTENANCE

- 1.- Hand operated valves will be provided with lubricator on the yoke. The valves should be lubricated at least once every 6 months.
- 2.- Replacement of the packing.
  - a) Take the pressure out of the piping and open the valve.
  - b) Screw off the gland, take out the old packing and replace it for an appropriate one to the working conditions.
  - c) When the packing is evenly spread in its lodging, tighten up the gland until there are no leaks detected and gets parallel to the body.
- 3.- Replacement of seal rings.
  - a) Free off the pressure tight or soldered and take it out.
  - b) Take out the elastic ring and replace it for an original CMO seal ring. Place the socket back in its original position.
- 4.- Pneumatic actuators.
  - a) Check and make sure that the two chambers in the cylinder are not interlinked.
  - b) If they are interlinked, that is due to the fact that the seal ring or the cylinder jacket are deteriorated.
  - c) Replace the deteriorated elements by original CMO spare parts.
  - d) The pneumatic actuators in big size valves (from 110400) must be supported by the customer in the installation at his own expense.