

# MANUAL OF THE QUALITY ASSURANCE SYSTEM

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(SECTION)PAGINA 1  
(PAGE)

REVIEW

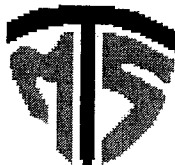
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## QM002 MANUAL OF INSTRUCTIONS FOR MTS VALVES GATE - GLOBE – CHECK

REV.	REASON FOR CHANGES	REV. BY/DATE	APPRO. BY/DATE
0	EDITION OF THE MANUAL OF INSTRUCTIONS AND MAINTENANCE FOR VALVES	C.R. 3/3/93	EOA 3/3/97
1	NEW EDITION	C.R. 22/2/95	EOA. 22/2/95
2	MODIFICATION OF THE POINTS UNDERLINED WITH A VERTICAL LINE	J.P. 10/4/98	E.H. 11/4/98


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## INTRODUCTION

This manual of instructions, is a private document of **MTS**, in which the instructions, systems and processes of our products' development are detailed. The Manual assures the fulfilment of the International standard **EN ISO 9001** requirements and has total approval of the Management and Accountables of the different departments.

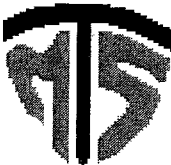
Quality Assurance Department

Approval  
General Director

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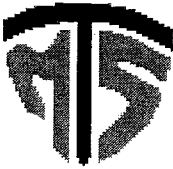
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## 1.0. INTRODUCTION

The purpose of the present manual is to give information to our customers about basic questions; it embraces from the delivery of the valves by MTS until their installation. The manual deals with the following aspects of the MTS valves: Expedition, inspection, storage, selection, installation, disassembly and assembly. It is recommended the strict fulfilment of the detailed instructions along these pages. Modifications and variations related to the mentioned instructions must be notified in writing to MTS.

If any part of the described instructions is not fulfilled, MTS will have no responsibility and will cancel MTS valves guarantee.

Quality Assurance Department

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## 2.0. EXPEDITION

Every valve supplied by MTS is protected by a heatproof paint of aluminium colour in the not mechanised external surfaces in order to prevent oxidation, except for austenitic bronze stainless steels, which are supplied without paint. These valves can wear other colours depending on the quality of the valve material (for more information it is recommended to look at the painting procedure followed by MTS).

The stems are externally protected with a protective material easy to remove. This way, transportation damages are lessened. This material can be paper or similar.

The Size of the valves will wear protectors that hinder the entry of dirt and other contaminating agents, so that the seat rings and seats are not scratched. Thus, the protectors used by MTS, not larger than 6”, consist of some plastic dust guards adjustable to the valve Size. Besides, they protect the finish of lateral flanges. For 8” and larger, wood bonnets are used with a diameter similar to the one of the lateral flange. They are tightened to the external flanges by wires.

In a similar way, valves with ends to be soldered have protectors tied to those ends.

Gate and Globe valves will be shipped completely closed to avoid possible bumps on the seats during their transportation and free of humidity to minimise as much as possible oxidation. MTS will decide whether it is convenient to apply an antioxidant product to the inside of the valve or not.

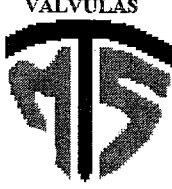
The check valves will have the valve flap fixed to the holes of the flanges by means of a wire or another device, in order to assure that the seats are not damaged.

The gate and globe valves will be supplied with definitive stem packing and with a number of rings as it is indicated in standard API600.

The valves supplied by MTS will go loose or well packed in boxes or pallets protected with plastic, according to MTS’s own criteria (unless it is otherwise specified in the customer’s order).

The identification of the valves and their main characteristics will be done by means of an identification plate that will be hold with a rivet to the body’s main flange, or it will be done according to the customer’s specifications.

The valves that are supplied in closed packages will wear a complete identification, not only inside, but also outside.

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### **3.0. INSPECTION AT RECEPTION**

MTS recommends for every valve a visual inspection at reception in order to detect any damage caused during transportation.

MTS valves tested by means of pressure need special care. Higher pressures than the ones indicated in our Quality Certificates will not be used, and if it were so, MTS would decline that responsibility.

Every fault found in our valves (visual, loss in the pressure test, etc) will be notified in writing to MTS in an immediate term to its reception. Furthermore, MTS recommends an accurate and as concrete as possible definition of the faults, so that the Quality Assurance Department can take proper measures and decisions in each case.

Please do not manipulate the valve without previous authorisation in writing by MTS.

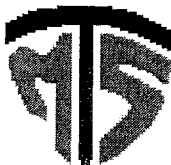
### **4.0. STORAGE**

Every MTS valve must be stored in roofing or similar places, so that they are protected from the weather roughness and contaminating agents of the atmosphere.

They will be stored with protective bonnets that will not be removed until their definitive installation in the pipe-net.

Those valves inspected by means of pressure and packed in boxes must be protected internal and externally until their installation on the pipe.

MTS is not responsible for those faults produced due to wrong use, storage or defective transportation (when the transportation is the responsibility of the client) and the damage cannot be related to defective packing.

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## 5.0. SELECTION

In order to improve efficiency each valve must be selected carefully, not only the type but also the material to be used. Before this, it is necessary to know which fluid runs through the valves, the pressure and the service temperature.

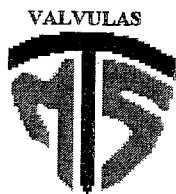
### 5.1. Material selection.

MTS has elaborated a corrosion table for materials indicating, what MTS recommends depending on the fluid.

### CORROSION TABLE FOR METALS AND ELASTOMERS

#### **ADOPTED NOMENCLATURE:**

- A Satisfactory resistance
- B Enough resistance
- C Light resistance
- D No resistance
- No information available



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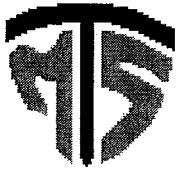
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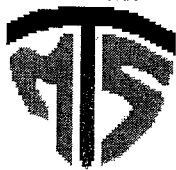
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RESISTENCIA SATISFACTORIA A SATISFACTORY RESISTANCE BASTANTE RESISTENTE B ENOUGH RESISTANCE LEVEMENTE RESISTENTE C LIGHT RESISTANCE NO RESISTENTE D NO RESISTANCE NO TENEMOS INFORMACION - INFORMATION NOT AVAILABLE	MATERIALES METALICOS /METALIC MATERIALS															MATERIALES NO METALICOS NON METALICS MATERIALS		
	HIERRO FUNDIDO Y ACERO AL CARBONO CAST IRON AND CARBON STEEL	HIERRO FUNDIDO CAST IRON	Cr 18% Ni 8% ACERO INOXIDABLE Cr 18% Ni 8% STAINLESS STEEL	MONEL MONEL	NIQUEL NICKEL	BRONCE Cu 85% Zn 15% BRONZE Cu 85% Zn 15%	BRONCE ANTICORROSIVO ANTICORROSIVE BRONZE	BRONCE BRONZE	ALUMINIO ALUMINIUM	PLOMO LEAD	HASTELLOY -A HASTELLOY -A	HASTELLOY -B HASTELLOY -B	HASTELLOY -C HASTELLOY -C	HASTELLOY -D HASTELLOY -D	ALLOY - 20 ALLOY - 20	BUNA - N BUNA - N	NEOPRENO NEOPRENE	TEFLON TEFLON
ACIDO CITRICO CITRIC ACID	D	C	A	A	A	C	A	C	A	-	A	A	A	A	A	A	A	A
GAS DE COKE COKE GAS	A	A	A	C		C	C	C	A	-	-	-	-	-	A	B	C	A
SULFATO DE COBRE COPPER SULFATE	D	C	A	C	C	D	D	D	D	B	A	A	A	A	A	A	A	A
CREOSOTA CREOSOTE	A	A	A	A	A	C	A	C	A	-	A	A	A	A	-	-	-	-
AGUA DESTILADA PURA DISTILLED WATER PURE	D	D	A	D	A	D	D	A	A	D	A	A	A	A	A	A	A	A
AGUA DESTILADA ( RECUPERACION CONDENSADA) DISTILLED WATER ( RETOURN CONDESATE)	A	A	A	A	A	A	A	A	A	D	A	A	A	A	A	A	A	A
ETER ETHER	C	C	A	A	A	A	A	-	A	A	A	A	A	A	B	C	C	A
ETILEN GLICOL ETILENE GLYCOL	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
FORMALDEHIDO FORMALDEHYDE	C	C	A	A	A	A	A	A	A	-	A	A	A	A	B	B	B	A
ACIDO FORMICO FORMIC ACID	D	C	A	B	C	D	C	C	D	-	A	A	A	A	B	D	-	A
FREON HUMEDO FREON GAS WET	C	A	C	A	A	A	A	A	A	-	-	-	-	-	-	-	-	A
GELATINA GELAINE	-	-	A	A	A	D	C	D	A	D	-	-	-	-	A	A	A	A
GLICEROL GLYCEROL	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
GLUCOSA GLUCOSE	A	A	A	A	A	A	A	A	A	-	-	-	-	-	A	A	A	A
HIDROGENO (GAS) HYDROGEN GAS	A	A	A	A	A	A	A	A	A	-	A	A	A	A	A	A	A	A
PEROXIDO HIDROGENO HYDROGEN PEROXIDE	D	D	A	A	A	C	C	D	A	B	C	C	A	C	B	D	D	A
AGUA INDUSTRIAL WATER INDUSTRIAL	A	A	A	A	A	A	A	A	A	C	A	A	A	A	A	A	A	A
CLORURO FERRICO FERRIC CHLORIDE	D	D	D	C	D	D	D	D	C	D	D	D	C	D	D	A	A	A
SULFATO FERRICO FERRIC SULFATE	D	D	A	B	C	D	C	D	D	A	D	D	A	D	A	A	A	A
CLORURO MAGNESICO MAGNESIUM CHLORIDE	C	C	B	A	A	C	A	C	D	D	A	A	A	A	B	A	A	A
HIDROXIDO MAGNESICO MAGNESIUM HYDROXIDE	A	A	A	A	A	C	C	D	D	D	A	A	A	A	A	A	A	A
SULFATO MAGNESICO MAGNESIUM SULFATE	A	A	A	A	A	B	A	A	A	A	A	A	A	A	B	A	A	A
CLORURO DE MERCURIO MERCURY CHLORIDE	C	C	D	C	C	D	D	D	D	D	D	D	A	D	C	-	A	A
MERCURIO MERCURY	A	A	A	A	A	D	D	D	D	D	A	A	A	A	A	A	A	A
LECHE MILK	D	D	A	B	A	D	D	D	A	D	A	A	A	A	A	A	A	A
MEZCLA DE ACIDOS (SO <sub>4</sub> H <sub>2</sub> +NO <sub>2</sub> H; SO <sub>4</sub> H <sub>2</sub> >15% ACIDS COMPOSIT	A	C	D	D	D	D	D	D	D	D	-	-	-	-	-	-	-	-
MEZCLA DE ACIDOS (SO <sub>4</sub> H <sub>2</sub> +NO <sub>2</sub> H; SO <sub>4</sub> H <sub>2</sub> <15% ACIDS COMPOSIT	D	D	C	D	D	D	D	D	D	D	-	-	-	-	-	-	-	-
MEZCLA DE ACIDOS (SO <sub>4</sub> H <sub>2</sub> +NO <sub>2</sub> H; NO <sub>2</sub> H <15% ACIDS COMPOSIT	D	D	D	D	D	D	D	D	D	B	-	-	-	-	-	-	-	-

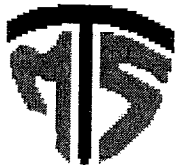


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ACETONA ACETONE	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	D	C	A
ACIDO ACETICO ACETIC ACID	C	C	C	B	C	C	A	C	C	B	A	A	A	A	A	D	D	A
ACIDOACETICO (PURO) ACETIC ACID(PURE)	D	D	B	B	C	D	A	D	A	B	A	A	A	A	A	D	D	A
ACIDO ACETICO (VAPORES) ACETIC ACID (VAPORS)	D	D	B	C	-	D	D	D	C	B	A	A	A	A	A	C	C	A
ANHIDRICO ACETICO ACETIC ANHYDRIDE	C	A	A	A	-	D	C	C	A	B	A	A	A	A	B	C	C	A
ACETATO DISOLVENTE DISOLVENT ACETATE	C	C	C	A	A	C	A	C	A	A	A	A	A	A	A	D	D	A
SULFATO ALUMINIO ALUMINIO SULFATE	C	C	A	A	-	C	C	D	C	A	A	A	A	A	A	A	A	A
CLORURO AMONIACO AMMONIUM CHLORIDE	C	A	C	A	C	D	D	A	D	C	A	A	A	A	C	B	A	A
NITRATO AMONIACO AMMONIUM NITRATE	A	C	A	C	C	D	D	D	A	-	D	D	-	D	A	A	A	A
POSFATO AMONIACO (MONOBASICO) AMMONIUM PHOSPHATE (MONOBASIC)	D	C	A	C	-	D	A	D	D	A	A	A	A	A	C	A	A	A
POSFATO AMONIACO (DIBASICO) AMMONIUM PHOSPHATE (DI-BASIC)	C	A	A	B	-	C	C	D	A	-	A	A	A	A	C	A	A	A
POSFATO AMONIACO (TRIBASICO) AMMONIUM PHOSPHATE (TRI-BASIC)	A	A	A	A	A	C	C	C	A	-	A	A	A	A	C	A	A	A
AMMONIUM SULFATE	A	A	C	A	A	C	A	C	C	A	C	A	C	A	B	A	A	A
AMONIACO (GAS) AMMONIA (AIR)	A	A	A	D	A	D	D	D	A	A	A	A	A	A	-	-	-	-
ASFALTO ASPHALTUM	A	A	A	A	A	A	A	A	A	-	-	-	-	-	A	B	C	A
BORAX BORAX	A	A	A	A	A	C	C	C	C	-	A	A	A	A	A	A	A	A
ACIDO BORICO BORIC ACID	D	C	A	A	A	C	A	C	A	A	A	A	A	A	A	A	A	A
BUTANO- BUTILENO BUTANE- BUTYLENE	A	A	A	C	C	A	A	A	A	A	-	-	-	-	A	D	D	A
BISULFITO CALCICO CALCIUM BISULFITE	D	D	A	D	D	D	C	D	C	B	-	-	-	-	A	A	A	A
CLORURO CALCICO CALCIUM CHLORIDE	A	A	C	A	A	A	A	C	D	-	A	A	A	A	D	A	A	A
BIOXIDO CARBONO (SECO) CARBONO DIOXIDE (DRY)	A	A	A	A	A	A	A	A	A	A	-	-	-	-	-	-	-	-
BIOXIDO CARBONO (HUMEDO) CARBONO DIOXIDE (WET)	C	C	A	C	A	B	C	C	A	C	-	-	-	-	-	-	-	-
HIPOCLORITO CALCICO CALCIUM HYPOCHLORITE	C	C	D	C	C	C	C	C	C	-	D	D	A	D	C	B	B	A
TETRACLORURO DE CARBONO CARBON TETRACHLORIDE	C	C	D	A	A	C	C	C	C	-	A	A	A	A	A	-	-	-
CLORO (SECO) CHLORINE (DRY)	A	A	C	A	A	C	C	-	C	A	-	-	-	-	A	C	C	A
CLORO (HUMEDO) CHLORINE (WET)	D	D	D	C	D	D	D	D	D	B	D	D	C	D	D	D	D	A
ACIDO CROMICO CHROMIC ACID	C	C	A	C	C	D	C	D	C	A	D	D	A	D	C	D	D	A
ACETILENO ACETYLENE	A	A	A	A	A	D	D	A	A	-	-	-	-	-	A	A	A	A

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FLUIDS																		
MELAZA MOLASSES	A	A	A	A	A	B	A	A	A	D	A	A	A	A	-	-	-	-
GAS NATURAL GAS NATURAL	A	A	A	A	A	B	C	C	A	A	D	D	A	D	A	A	A	A
CLORURO DE NIQUEL NICKEL CHLORIDE	D	D	C	A	C	D	D	C	D	-	D	D	A	D	D	A	A	A
SULFATO DE NIQUEL NICKEL SULFATE	-	-	A	C	C	C	C	C	D	A	D	D	A	D	B	A	A	A
ACIDO NITRICO NITRIC ACID	D	-	C	D	D	D	D	D	C	D	D	D	C	D	A	C	B	A
ACIDO NITRICO (PURO) NITRIC ACID (PURE)	D	D	D	D	D	D	D	D	B	C	D	D	C	D	A	D	D	A
ACEITES VEGETALES VEGETABLE OILS	A	A	A	A	A	A	A	-	A	-	A	A	A	A	A	A	B	A
ACIDO OLEICO OLEIC ACID	C	C	A	A	-	C	A	C	A	B	A	A	A	A	B	A	C	A
ACIDO OXALICO OXALIC ACID	C	C	B	A	-	C	A	C	A	-	A	A	A	A	B	C	A	A
OXIGENO GAS OXYGEN	A	D	A	A	-	A	A	A	A	-	-	-	-	-	A	-	-	A
ACIDO PALMITICO PALMITIC ACID	C	C	A	A	-	A	A	D	A	B	-	-	-	-	B	B	B	A
ACIDO FOSFORICO PHOSPHORIC ACID	C	C	C	D	C	D	D	C	D	A	A	A	A	A	B	D	A	A
ACIDO FOSFORICO (CONCENT < 45%) PHOSPHORIC ACID (CONCENT < 45%)	D	C	A	C	-	D	C	C	D	A	A	A	A	A	B	B	A	A
ACIDO FOSFORICO (CAL. CONCENT > 45%) PHOSPHORIC ACID (COLD. CONCERN > 45%)	D	C	A	D	-	D	D	C	D	C	A	A	A	A	A	C	B	A
ACIDO FOSFORICO (ALTA CONCENT > 45%) PHOSPHORIC ACID (HIGH CONCENT > 45%)	D	C	B	D	D	D	D	C	D	D	A	A	A	A	A	C	B	A
ACIDO FOSFORICO (CONCENT < 10%) PHOSPHORIC ACID (CONCENT < 10%)	D	C	D	A	C	C	A	C	A	A	A	D	D	A	B	B	A	A
ACIDO PICRICO PICRIC ACID	A	B	A	D	D	D	D	-	A	-	A	A	A	A	B	C	A	A
ACIDO PICRICO (SOLUCION ACUOSA) PICRIC ACID (AQUEOUS SOLUTION)	C	A	A	D	D	D	D	-	A	A	A	A	A	A	-	-	-	-
CLORURO POTASICO POTASSIUM CHLORIDE	A	A	C	A	A	A	A	A	C	-	A	A	A	A	C	A	A	A
HIDROXIDO POTASICO POTASSIUM HYDROXIDE	A	A	A	A	A	D	D	D	D	D	-	A	A	A	A	A	A	A
SULFATO POTASICO POTASSIUM SULFATE	A	A	C	A	A	A	A	A	A	A	-	-	-	-	B	A	A	A
GAS PROPANO PROPANE GAS	A	A	A	A	A	A	A	A	A	A	-	-	-	-	A	A	B	A
AGUA DEL MAR SEA WATER	C	A	C	A	C	A	A	A	D	A	A	A	A	A	A	A	A	A
BICARBONATO SODICO SODIUM BICARBONATE	B	A	A	A	A	C	A	C	C	-	A	A	A	A	A	A	A	A
BISULFATO SODICO SODIUM BISULFATE	D	B	A	A	A	C	A	C	A	A	A	A	A	A	A	A	A	A
CARBONATO SODICO SODIUM CARBONATE	A	A	A	A	A	C	C	C	D	C	A	A	A	A	B	A	A	A
CLORURO SODICO SODIUM CHLORIDE	A	A	D	A	A	A	A	A	C	C	A	A	A	A	B	A	A	A
HIDROXIDO SODICO SODIUM HYDROXIDE	A	A	A	A	A	C	C	C	D	D	A	A	A	A	A	A	A	A



# QM002 MANUAL OF INSTRUCTIONS FOR MTS VALVES GATE - GLOBE - CHECK

## RESISTENCIA SATISFACTORIA

A SATISFACTORY RESISTANCE

BASTANTE RESISTENTE

B ENOUGH RESISTANCE

LEVEMENTE RESISTENTE

C LIGHT RESISTANCE

NO RESISTENTE

D NO RESISTANCE

NO TENEMOS INFORMACION

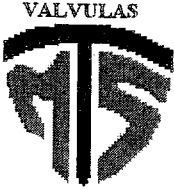
INFORMATION NOT AVAILABLE

## FLUIDS

## MATERIALES METALICOS /METALIC MATERIALS

MATERIALES NO METALICOS  
NON METALICS  
MATERIALS

	HIERRO FUNDIDO Y ACERO AL CARBONO CAST IRON AND CARBON STEEL	HIERRO FUNDIDO CAST IRON	Cr 18% Ni 8% ACERO INOXIDABLE Cr 18% Ni 8% STAINLESS STEEL	MONEL MONEL	NIQUEL NICKEL	BRONCE Cu 85% Zn 15% BRONZE Cu 85% Zn 15%	BRONCE ANTICORROSIVO ANTICORROSIVE BRONZE	BRONCE BRONZE	ALUMINIO ALUMINIUM	PLOMO LEAD	HASTELLOY -A HASTELLOY -A	HASTELLOY -B HASTELLOY -B	HASTELLOY -C HASTELLOY -C	HASTELLOY -D HASTELLOY -D	ALLOY - 20 ALLOY - 20	BUNA - N BUNA - N	NEOPRENO NEOPRENE	TEFLON TEFLON
HIPOCLORITO SODICO SODIUM HYPOCHLORITE	B	C	C	C	C	D	D	D	D	D	D	D	A	D	C	C	D	A
METASFOSFATO SODICO SODIUM METAPHOSPHATE	B	-	A	A	-	B	A	C	A	-	A	A	A	A	A	A	A	A
NITRATO SODICO SODIUM NITRATE	A	A	A	A	A	C	C	A	A	-	D	D	A	D	B	C	A	A
PERBORATO SODICO SODIUM PERBORATE	C	B	A	A	A	C	C	C	B	-	D	D	A	D	B	C	A	A
FOSFATO SODICO (MONOBASICO) SODIUM PHOSPHATE (MONO-BASIC)	C	-	A	A	A	C	A	C	A	-	A	A	A	A	-	-	-	-
FOSFATO SODICO (DIBASICO) SODIUM PHOSPHATE (DI-BASIC)	C	A	A	A	A	A	A	A	A	-	A	A	A	A	B	A	A	A
FOSFATO SODICO (TRI-BASICO) SODIUM PHOSPHATE (TRI-BASIC)	A	A	A	A	A	D	D	C	D	-	A	A	A	A	B	B	B	A
SILICATO SODICO SODIUM SILICATE	A	A	A	A	A	D	D	C	D	B	A	A	A	A	B	A	A	A
SULFATO SODICO SODIUM SULFATE	A	A	A	A	A	A	A	-	A	A	A	A	A	A	A	A	A	A
SULFURO SODICO SODIUM SULFIDE	A	A	A	C	A	D	D	C	D	A	A	A	A	A	B	A	A	A
ACIDO ESTEARICO STEARIC ACID	B	B	A	A	A	C	C	C	A	-	A	A	A	A	B	A	C	A
AZUFRE	A	C	C	C	C	D	D	D	B	-	A	A	A	A	A	D	-	A
CLORURO DE AZUFRE SULFUR CHLORIDE	B	A	C	A	A	D	D	D	-	A	A	A	A	A	-	-	-	-
DIOXIDO DE AZUFRE (SECO) SULFUR DIOXIDE (DRY)	A	A	A	A	-	A	A	C	A	A	D	D	A	D	-	-	-	-
TRIOXIDO DE AZUFRE (SECO) SULFUR TRIOXIDE (DRY)	A	C	A	A	-	A	A	A	A	A	D	D	A	D	-	-	-	-
ACIDO SULFURICO (CONCEN. 98%) SULFURIC ACID	A	C	B	D	D	D	D	C	C	D	D	A	D	A	A	A	A	A
ACIDO SULFURICO (CONDEN 75 + 98%) SULFURIC ACID	A	C	D	D	D	D	D	D	D	C	D	D	D	A	C	C	C	A
ACIDO SULFURICO (CONCEN 10 + 75%) SULFURIC ACID	D	C	D	B	C	D	C	D	C	A	D	D	D	A	C	C	B	A
ACIDO SULFUROSO SULFUROSO ACID	D	C	A	D	D	D	A	A	C	A	D	D	A	D	B	C	C	A
HIDROGENO SULFUROSO HYDROGEN SULFIDE	B	C	A	C	C	D	D	D	A	-	-	-	-	-	-	-	-	-
ALQUITRAN RESIN AND OIL	A	A	A	A	A	A	A	A	A	-	-	-	-	-	A	B	C	A
ACIDO TARTARICO TARTARIC ACID	D	C	A	A	A	C	A	C	A	C	A	A	A	A	B	C	A	A
TOLUOL O TOLUENO TOLUOL O TOLUENO	A	A	A	A	-	A	A	A	A	-	-	-	-	-	A	D	D	A
CLORURO DE ZINC ZINC CHLORIDE	C	C	D	A	-	D	D	D	D	A	D	C	C	D	B	B	A	A
SULFURO DE ZINC ZINC SULFIDE	C	A	A	A	-	C	C	C	C	A	C	C	A	C	-	-	-	-

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## 5.2. Type selection

- **Gate Valves.** The use is recommended only with the stem in a completely open position or totally closed.

In the completely open position, the fluid passes through without changing direction; therefore it has a great application and it is used in many installations.

If the stem were in an intermediate position, it would cause turbulence in the fluid and produce a rattling in the wedge of the seat.

Likewise, the seat surfaces that are exposed to the fluid would gradually and fast become eroded. Moreover, the fluid would increase its speed when passing through the wedge, therefore it would have less space to follow its way, which may cause a problem of hammering. The wedge types (solid, double seat gate, parallel and flexible wedge) have their particular application. The most recommended is the last one, because it closes better with the ring seat, thus not allowing any kind of leakage.

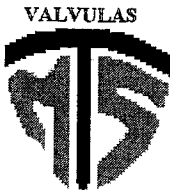
- **Globe Valves.** These valves are directed to regulate the fluid along the pipe. The seal surfaces of the valves are parallel to the direction of the fluid, distributed in the whole surface, so that much smaller erosion is produced, proportionally in the seats.

There is an interrelation between the size of the valve and the opening of the valve; a small valve half-opened has a longer life than a larger valve operating at an almost closed position (at equality of fluid).

- **Check Valves.** These valves allow the fluid to run in only one direction and it serves as a way to control the direction of the fluid along the pipe.

They have a valve flap that is up when the fluid exerts its pressure from the inner side of the disc and closed when the pressure is exerted at the back.

The complete opening of the valve flap depends on the type of check. MTS specialises in swing check type, which has the advantage of allowing a larger flow.

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## 6.0. INSTALLATION

MTS recommends cleaning the inside part of the valve with water or compressed air to prevent the dirt that may be accumulated due to the storage time.

The elevation of the valve is connected to the pipe via nylon or hemp straps. If they were metal-made, they would have to be protected with plastic or something similar, so that the surfaces are not damaged.

The strap will go through the inside of the bridge and never through the handwheel or drive.

Depending on the type and weight of the valve to be elevated it is important to utilise a machine adequate to the weight of the valve. MTS has a weight list for every valve. SEE WEIGHT TABLE

The pipe must be well supported to avoid transmitting too much weight to the valve body, and the valve flanges must be perfectly aligned with the pipes to allow an adequate tightening.

The valves have to be installed in their right position (globe and check valves have an arrow that indicate the direction in which the fluid flows).

The best valve installation is produced when the stem is placed in vertical or horizontal position.

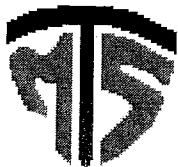
It is recommended to leave enough place to access the valve and also for a better maintenance.

The gripping device of the valve flap should be removed from the check valve before the pipe is installed.

Suitable tools must be used at the time of connecting the valve and the pipe. When the valves are connected with flanges, the bolts will be crossed screwed in.

Not only the valve, but also the pipe should be butt welded with the taper component and, after well aligned, welded around. Protection rings can be used (of copper, ceramics) to avoid the entry of scale to the inside, because it can damage the seat surface of the valves.

In order to avoid the problem of hammering and water condensation, due to a sudden fluid stop, a suitable air chamber or another up-water holder must be installed not very far from the valve.

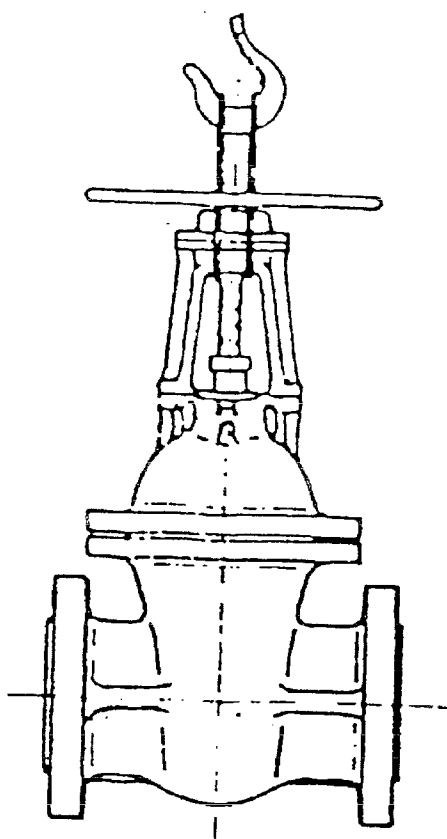
**QM002 MANUAL OF INSTRUCTIONS FOR MTS VALVES  
GATE - GLOBE - CHECK**

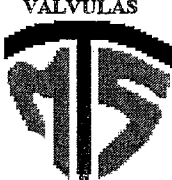
In case the hydrostatic test of the pipe is carried out with the valve assembled, the testing pressure used when the valve was inspected in the factory cannot be exceeded. Test pressures are included in the Quality Certificate. The hydrostatic test can be carried out with the valve completely open, in such a way that the stem closes at the back against the bonnet seat.

If one wishes to test the stem packing, the valve must not be opened totally.

Once the valve has been heated with the fluid up to the service temperature, it may be necessary to adjust the stem packing to eliminate leakage. This operation is carried out tightening alternately the two gland flange nuts, thus avoiding damages in the stem.

The drains and bypasses must be effected in those points marked in our charts. No perforation for drains, bay passes, etc. can be done over the bonnet body without first asking for permission to MTS.



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## 7.0. MAINTENANCE

MTS recommends a periodic inspection to avoid possible leakage even if the leakage is small.

It is important to take into account that the valves can be inspected without disassembling the pipe body. The bonnet can be disassembled to observe the condition of the seat surfaces. Besides, the large quantity of valves allows their inspection without a serious service interruption.

Revise from time to time the valve socket to maintain always a perfect alignment.

When there is a leakage at the body-bonnet connection, proceed to make it tight. If the leakage does not stop, replace the gaskets for new ones.

If there is a leakage produced due to the stem packing, the stuffing-box bonnets and nuts will be tightened and this should be enough. If the leakage still continues, that stem packing will be replaced; this operation can be performed without interrupting the fluid circulation. In order to make this, the stem will be totally opened until it is sealed at the back and the stem packing is changed. The time needed for the stem packing is smaller, when more operations are performed on the valve. Thus when it is completely open, there is less wear, than if it is being opened and closed constantly.

If the leakage is produced for another reason and the valve has to be disassembled, MTS recommends complying with the disassembling standards that stay on this Manual

## 8.0. OPERATIONS TO DISASSEMBLE MTS VALVES


### 8.1. Gate and globe valves.(screwed bonnet)

Operations to disassemble the body bonnet.

- Do it with the valve in open position.
- Ease the stuffing box pressure off.
- Release the body-bonnet nuts by loosening them crossed.
- Remove the body-bonnet studs.
- Proceed to lift the upper assembly (bonnet-stem) towards the stem.

The body seats and the wedge can be revised following these steps, with no need to disassemble any other pieces.

Do not forget to check the reference when revising the wedge, in order to mount it back in the same way.

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8.2. To disassemble the stem, follow the next indications:

- After performing operations mentioned at the previous point:
  - Unscrew the stem from its stem nut. For gate valves turn the stem nut with the correspondent open-end wrench, or use its own handwheel, while the stem is firmly hold, so that it does not rotate over and over. In this operation, take special care not to damage the stem important areas, such as the 45° seal and its polished diameter.

For globe valves the operation will be carried out by holding the bonnet to avoid rotation and using a pressure wrench fixed to the stem to make it turn and to unscrew it from its stem nut. As in the previous point, this operation must be performed carefully. Also, do not forget to observe that the stem and stem packing are not wearing off, just in case it is needed to replace one of the two.

8.3. Check valves (screwed bonnet).

To disassemble the body bonnet follow the next operations:


- Unscrew the body-bonnet nuts crossed.
- Remove the body-bonnet studs.

This way, every internal valve part is accessible.

8.4. To disassemble the valve flap follow the next operations:

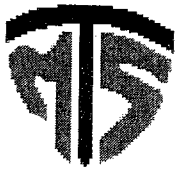
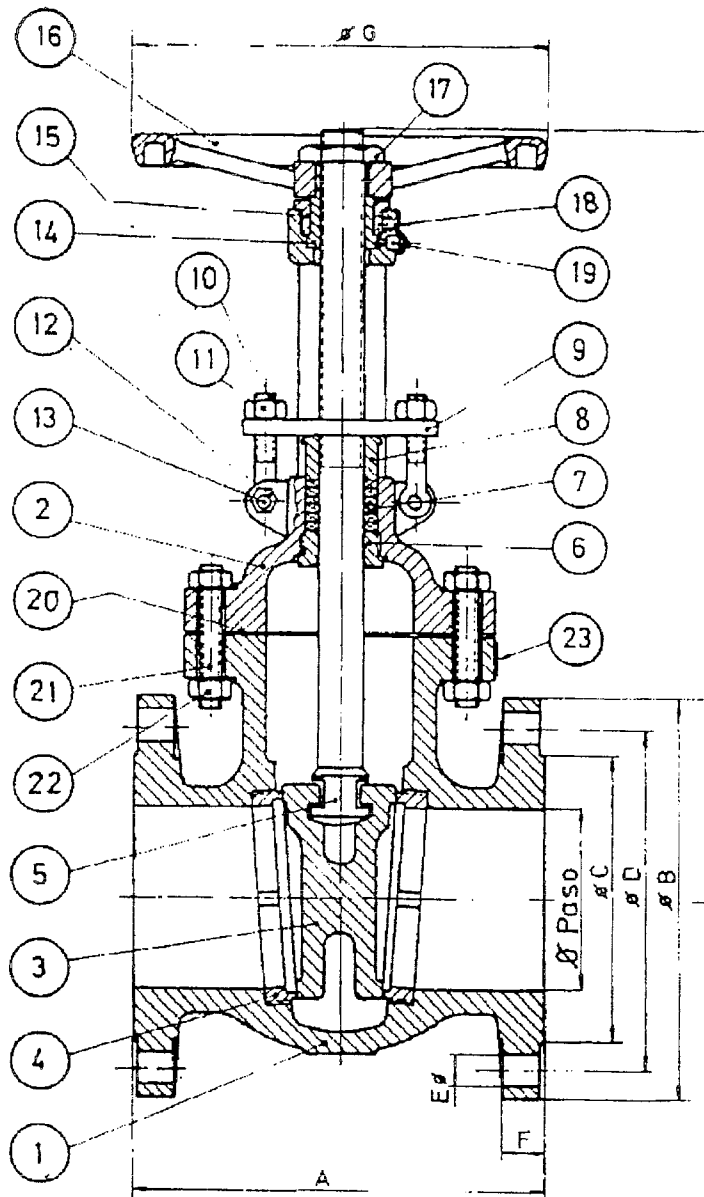
-After performance of the operations mentioned at the previous points continue with:

- Unscrew the body dust guards.
- Remove the axis; the valve flap is freed.

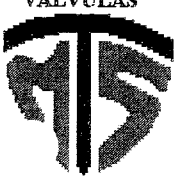
VALVULAS 	<b>MANUAL OF THE QUALITY ASSURANCE SYSTEM</b>	SECCIÓN (SECTION)
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## 9.0. COMPONENTS OF THE GATE VALVES

- 1.- BODY
- 2.- BONNET
- 3.- WEDGE
- 4.- SEAT RING
- 5.- STEM
- 6.- BACK SEAT BUSHING
- 7.- STEM PACKING
- 8.- GLAND BUSHING
- 9.- GLAND FLANGE
- 10.- EYE BOLT
- 11.- GLAND EYE NUT
- 12.- SPLIT NUT FOR THE EYE BOLT
- 13.- SPLIT BOLT OF THE EYE BOLT
- 14.- STEM NUT
- 15.- YOKE NUT
- 16.- HANDWHEEL
- 17.- HANDWHEEL NUT
- 18.- HOLLOW SETSCREW
- 19.- GREASE CUP
- 20.- BODY-BONNET GASKET
- 21.- BODY-BONNET STUD
- 22.- BODY-BONNET NUT
- 23.- IDENTIFICATION PLATE

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GATE - GLOBE - CHECK

SIZE	A	B	C	D	E N° X Ø	F	G	H	
								OPEN	CLOSED
2"	177,8	152,4	92	120,6	4 DE 19	16	200	365	290
2 ½"	190,5	177,8	104,8	139,7	4 DE 19	17,5	225	430	345
3"	203,2	190,5	127	152,4	4 DE 19	19	225	460	375
3 ½"	216	215,9	139,7	177,8	8 DE 19	20,5	225	480	400
4"	228,6	228,6	157,2	190,5	8 DE 19	24	275	560	445
5"	254	254	185,7	215,9	8 DE 22	24	325	745	580
6"	266,7	279,4	215,9	261,3	8 DE 22	25,5	325	745	580
8"	292	342,9	270	298,4	8 DE 22	28,5	375	980	770
10"	330,2	406,4	323,8	361,9	12 DE 25	30,5	450	1170	900
12"	355,5	482,6	381	431,8	12 DE 25	31,5	500	1420	1100

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## **10.0 COMPONENTS OF THE GLOBE VALVES**

- 1.- BODY
- 2.- BONNET
- 3.- DISC
- 4.- SEAT RING
- 5.- STEM
- 6.- DISC BOLT
- 7.- SPLIT WASHER
- 8.- FRICTION WASHER
- 9.- DISC HOLLOW SETSCREW
- 10.- BACK SEAT BUSHING
- 11.- STEM PACKING
- 12.- GLAND BUSHING
- 13.- GLAND FLANGE
- 14.- EYE BOLT
- 15.- GLAND EYE NUT
- 16.- EYE BOLT SPLIT NUT
- 17.- SPLIT BOLT OF THE EYE BOLT
- 18.- STEM NUT
- 19.- KNOCKOUT PIN
- 20.- HANDWHEEL
- 21.- HANDWHEEL WASHER
- 22.- HANDWHEELNUT
- 23.- BODY-BONNET GASKET
- 24.- BODY-BONNET STUD
- 25.- BODY-BONNET NUT
- 26.- IDENTIFICATION PLATE



# MANUAL OF THE QUALITY ASSURANCE SYSTEM

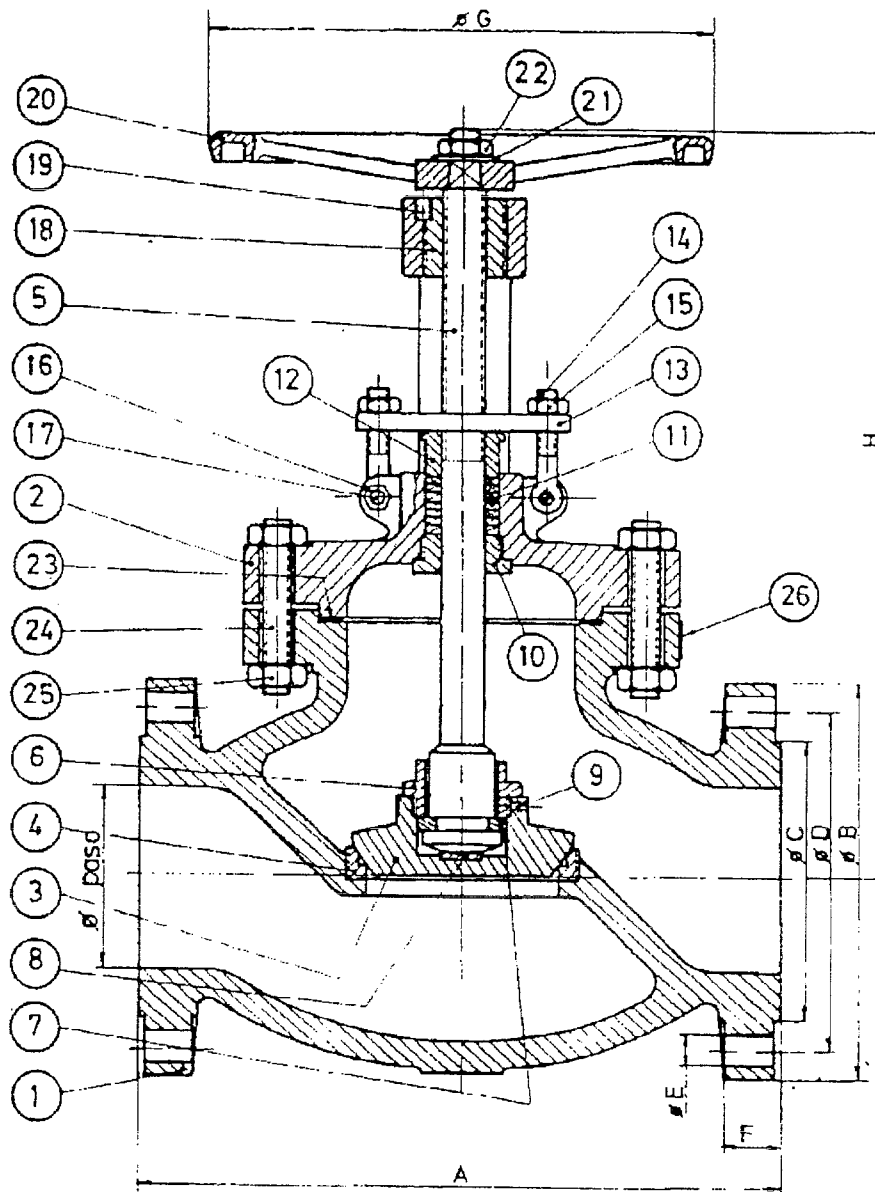
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(SECTION)

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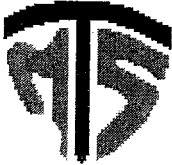
REVIEW

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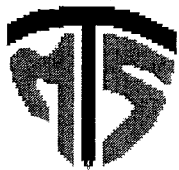
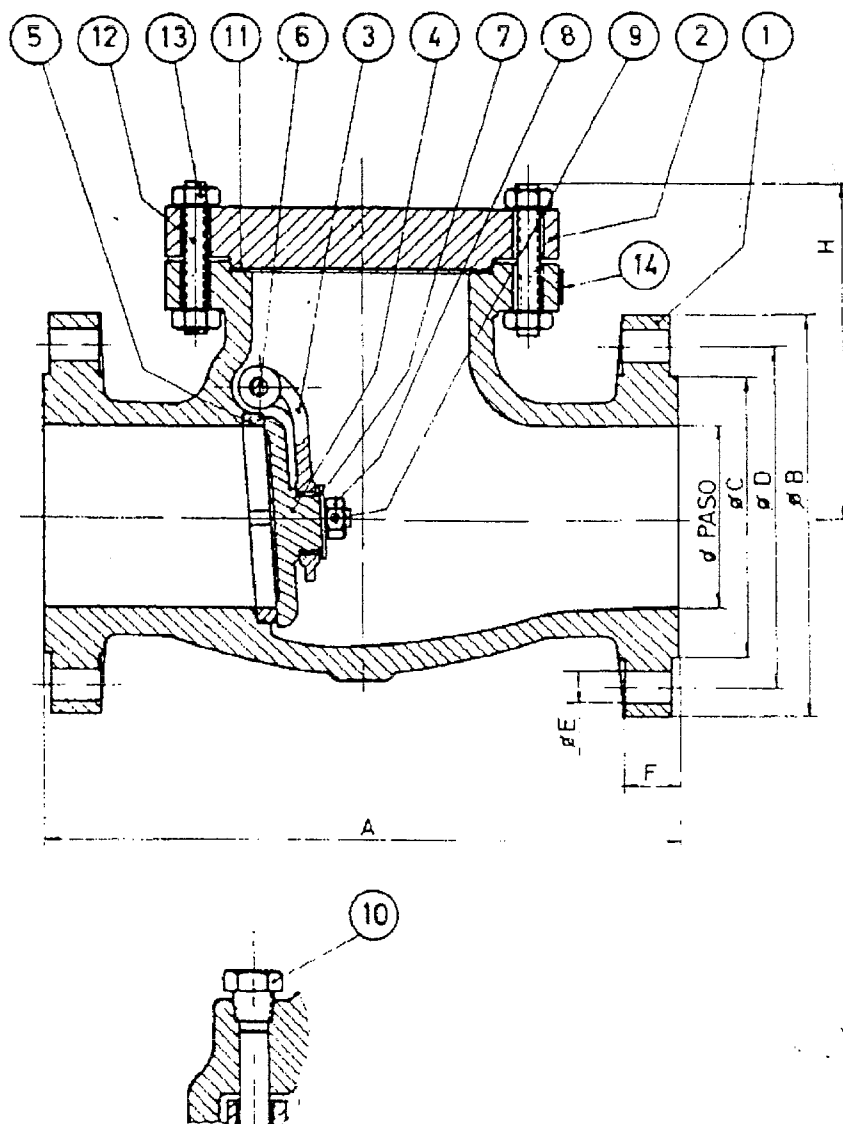


SIZE	A	B	C	D	E N° X Ø	F	G	H	
								OPEN	CLOSED
2"	203	152.4	92	120.6	4 DE 19	16	225	340	315
2 ½"	215.9	177.8	104.8	139.7	4 DE 19	17.5	225	365	340
3"	241.3	190.5	127	127	4 DE 19	19	275	420	380
3 ½"	266.7	215.9	139.7	139.7	8 DE 19	20.5	275	440	390
4"	292.1	228.6	157.2	157.2	8 DE 19	24	325	485	430
5"	330.2	254	185.7	185.7	8 DE 22	24	325	615	535
6"	355.6	279.4	215.9	215.9	8 DE 22	25.5	450	615	535
8"	495.3	342.9	270	270	8 DE 22	28.5	620	680	580
10"	622.3	406.4	323.8	323.8	12 DE 25	30.5	600	760	680
12"	698.5	482.6	381	381	12 DE 25	31.5	600	860	765

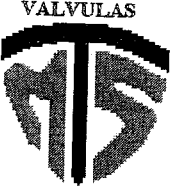
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### **11.0. COMPONENTS OF CHECK VALVES**

- 1.- BODY
- 2.- BONNET
- 3.- DISC ARM
- 4.- VALVE FLAP
- 5.- SEAT RING
- 6.- DISC ARM PIN
- 7.- WASHER NUT PIN
- 8.- DISC NUT PIN
- 9.- SPLIT DISC NUT PIN
- 10.- HEXAGONAL DUST GUARD
- 11.- BODY-BONNET GASKET
- 12.- BODY-BONNET STUD
- 13.- BODY-BONNET NUTS
- 14.- IDENTIFICATION PLATE

QM002 MANUAL OF INSTRUCTIONS FOR MTS VALVES  
GATE - GLOBE - CHECK

SIZE	A	B	C	D	E N° X Ø	F	G	H
2"	203	152,4	92	120,6	4 DE 19	16	-	145
2 ½"	215,9	177,8	104,8	139,7	4 DE 19	17,5	-	150
3"	241,3	190,5	127	127	4 DE 19	19	-	175
3 ½"	266,7	215,9	139,7	139,7	8 DE 19	20,5	-	-
4"	292,1	228,6	157,2	157,2	8 DE 19	24	-	205
5"	330,2	254	185,7	185,7	8 DE 22	24	-	240
6"	355,6	279,4	215,9	215,9	8 DE 22	25,5	-	240
8"	495,3	342,9	270	270	8 DE 22	28,5	-	292
10"	622,3	406,4	323,8	323,8	12 DE 25	30,5	-	346
12"	698,5	482,6	381	381	12 DE 25	31,5	-	395

	<b>MANUAL OF THE QUALITY ASSURANCE SYSTEM</b>	SECCIÓN (SECTION)
	<b>QM002 MANUAL OF INSTRUCTIONS FOR MTS VALVES GATE - GLOBE – CHECK</b>	PAGINA 23 (PAGE)  REVIEW “ 0 03/03/93 “ 1 22/02/95 “ 2 10/04/98

## 12.0. OPERATIONS TO ASSEMBLE VALVES

Take special care to see that no piece is damaged and that surfaces are as clean as possible (do a complete cleaning of the inside of the valve).

### 12.1. Gate and globe valve (screwed body and bonnet.)

- Introduce the stem through the back seat bushing (that it is screwed to the bonnet) and place the gland and the gland flange
- Screw the stem to the stem nut until the stem head stands out.
- Join the stem to the wedge or to the disc by means of the back seat bushings. This operation is carried out with the valve in open position.
- Introduce the studs to hold the body-bonnet (placing previously a new gasket) and tighten the nut crossed and strongly enough
- Place the stem packing, the eye bolt and the handwheel holding tied to the stem nut by means of the handwheel nut.

### 12.2. Check Valve.

- Adjust the disc arm to the valve flap, by means of a washer, nut and pin.
- Introduce the hinge pin through the body and disc-arm holes, thus forming a unit of body/hinge-pin/disc-arm/valve flap well assembled.
- Before placing the bonnet verify that the unit disc arm/valve flap swings without rubbing. If it were so, put the bonnet on the body.
- Screw the body to the bonnet by means of the studs and nuts, tighten them crossed (previously a new gasket has to be placed).



*Lázaro Ituarte Internacional, S.A.*

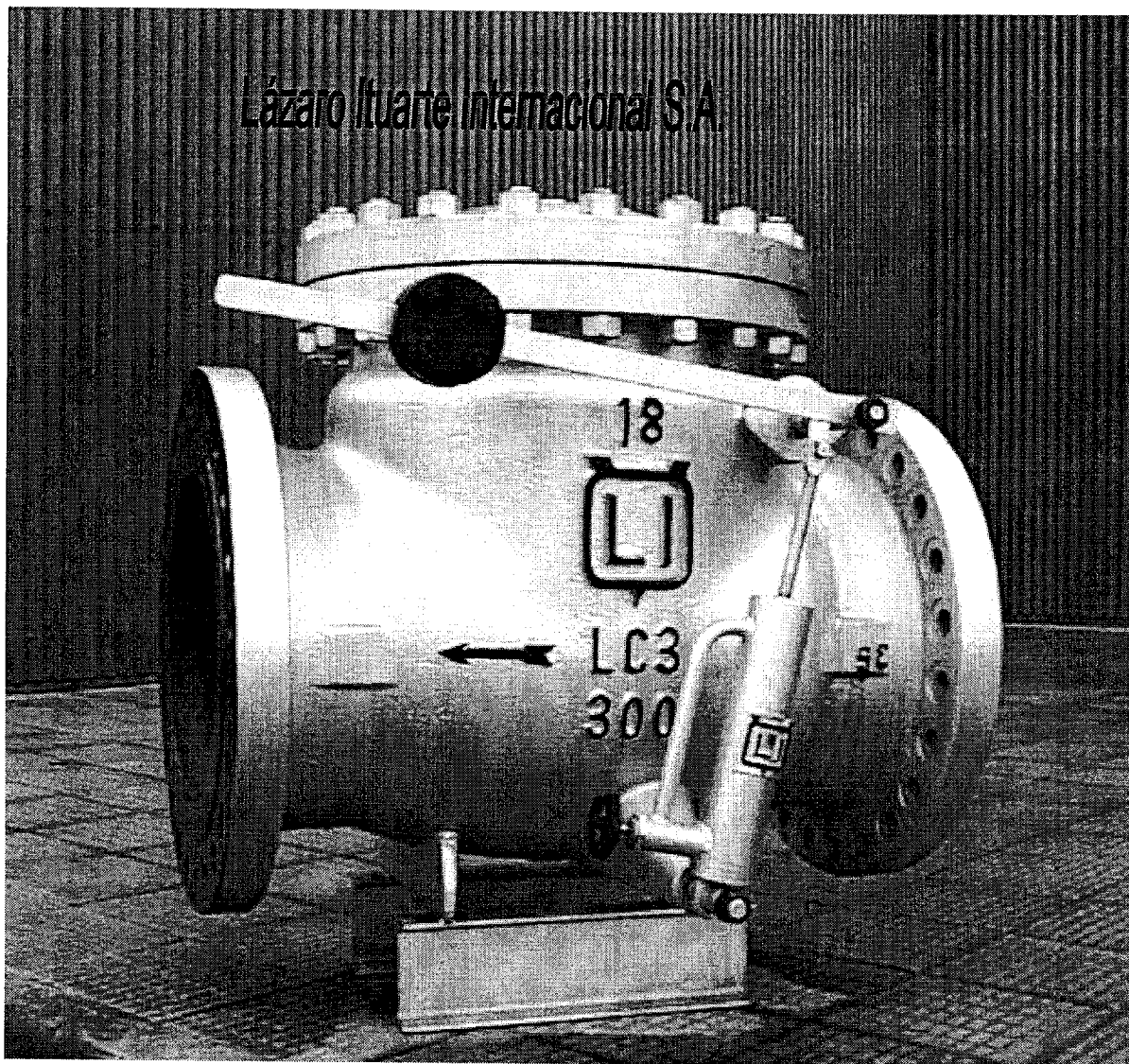
## MANUAL INSTRUCTIONS FOR SWING CHECK VALVES

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# Instructions Manual - Swing Check Valve

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Lázaro Ituarte Internacional, S.A.

## MANUAL INSTRUCTIONS FOR SWING CHECK VALVES

### 1.1 SWING CHECK VALVE

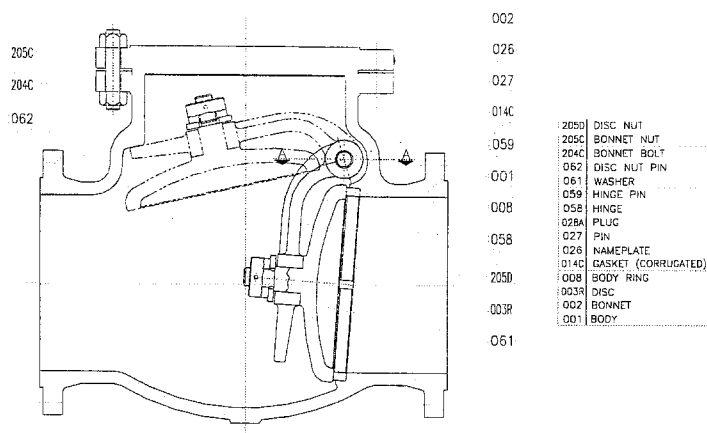


FIG. 1A

ONLY ON ONE SIDE

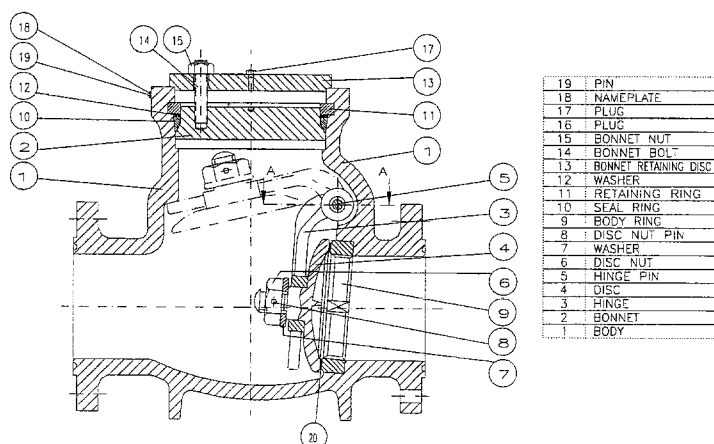
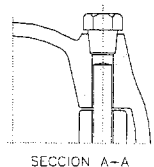
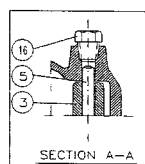
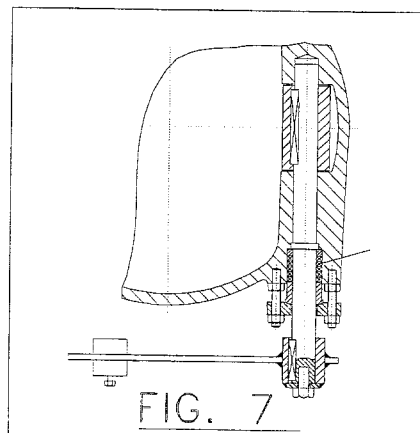
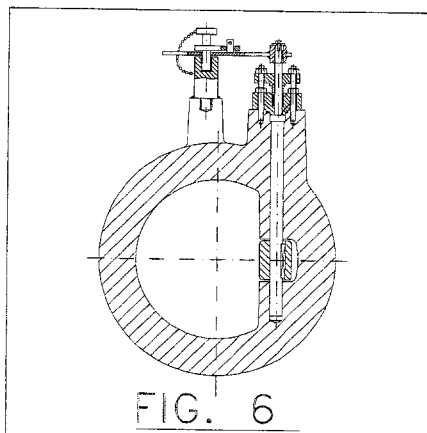
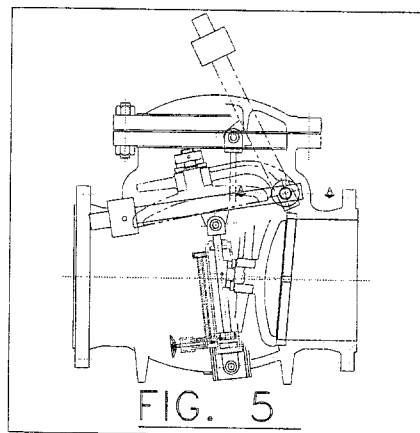
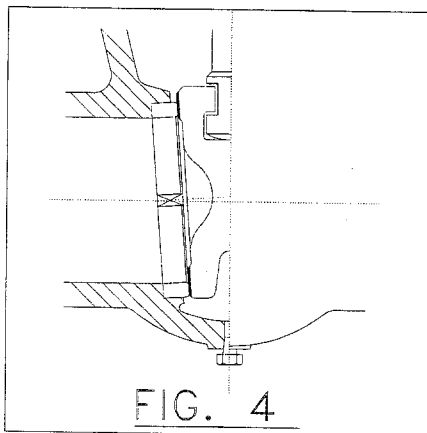
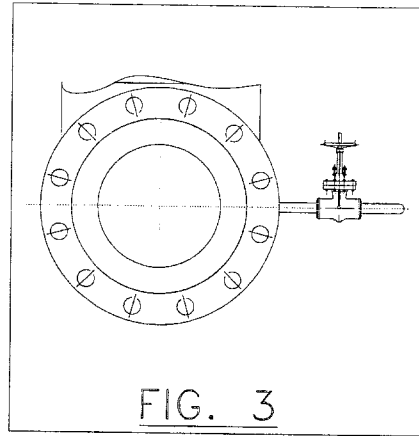
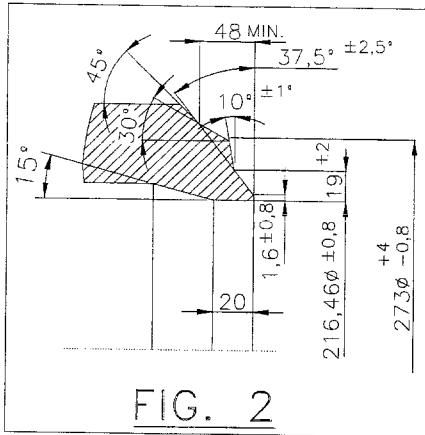


FIG. 1B





## 1.2 OPTIONAL ACCESSORIES





## **2.- INTRODUCTION**

### ***2.1.- GENERAL NOTES***

This Instructions Manual has been prepared by the Engineering Department of *Lázaro Ituarte Internacional, S.A* in order to give to the user the storage, maintenance, handling and installation instructions for the supplied valves .

In case the user may require any scope of manipulation in the valve, it is required to contact firstly and beforehand the manufacturer in order to avoid defects resulting from wrong manipulation of the valve.

#### **WARNING**

This instructions manual describes the most suitable procedures for a correct handling, installation and maintenance for the valves manufactured by Lazaro Ituarte. These procedures must be followed step by step and thoughtfully to prevent damage caused by any misuse or manipulation.

***The valves as all the equipment subject to pressure can be dangerous if not correctly handled.***

***Do not dismantle any valve device unless prior approval from the manufacturer.***



## **2.2.- DESCRIPTION IN DETAILS OPTIONAL ACCESORIES:**

- *Figure 1 A* ► it represents a swing check valve, bolted bonnet, including a direct actuation with a wheel and flanged.
- *Figure 1B* ► it represents a pressure-seal swing check valve.

Drawings 2 to 14 are options which the user can demand according to his needs:

- *Figure 2* ► it represents butt weld end.
- *Figure 3* ► it represents a by-pass.
- *Figure 4* ► it represents a plug of drain connection its location will be done according to the customer's requirements.
- *Figure 5* ► it represents a swing check valve with dashpot for slow down the drop of the disc.
- *Figure 6* ► it represents a swing check valve with blocked system by lever, opened or closed according to the customer's requirements.
- *Figure 7* ► it represents a swing check valve with counter weight for:
  - to keep disc balanced. It 's reduce the stroke in the drop of the disc and the time of the closing is larger.
  - in horizontal piping this system is used to keep the disc against the closing surfaces of the valve.



### 3. - SERVICE REQUIREMENT AND USE

#### 3.1.- SERVICE REQUIREMENT

Check valves are used as unidirectional valves that are opened by the flow in one direction and will automatically stop flow in the opposite direction when the fluid in the line stops or reserves.

#### 3.2.- USER INDICATIONS

- The user will have to select the adequate material to avoid corrosion risks.
- The user will have to select the valve's "class" according to pressure and temperature data in accordance to standards (ASME B16.34 or any applicable standard) in order not to produce efforts above the acceptable limits.
- The user will have to select between standard or special class (according to ASME B 16.34 standard) in order to avoid efforts above the acceptable limits.
- When the valve works at a temperature higher than 454°C or lower than -24°C, the user will have to select the adequate material for the bolting.
- The valve should not be subject to pressures and temperatures higher than those indicated by standards (ASME B16.34 or any applicable standard).
- In the case of valves with counter weight (see figure 7 in page 4 of 13), the customer will have to indicate the application of the valve, the pressure and temperature service. In some cases, depending of the application and size of the valve, that element is not possible.
- The Cv value of the valve is given with the valve completely open. In the case of check valves, due that the fluid open the disc, it's recommended the minimum speed of the fluid  $v \geq 60\sqrt{v_{esp}}$ , with  $v_{esp}$  = specific volume of the fluid (pie<sup>3</sup>/lb).
- The recommended speed of the fluid is:  $60\sqrt{v_{esp}} \leq v < 240\sqrt{v_{esp}}$ , with v (pie/s).
- The swing check valves operate in better conditions when the fluid is stable, the fluid open the disc and does not cause oscillations in the disc. That oscillations could origin erosions in the hinge and the hinge pin.
- After any element that can origin turbulences in the fluid, for example the exit of a pump, it's required an straight length of piping before the fluid come in to the valve. This straight length of piping might be between 4 or 5 times larger the diameter of the piping.

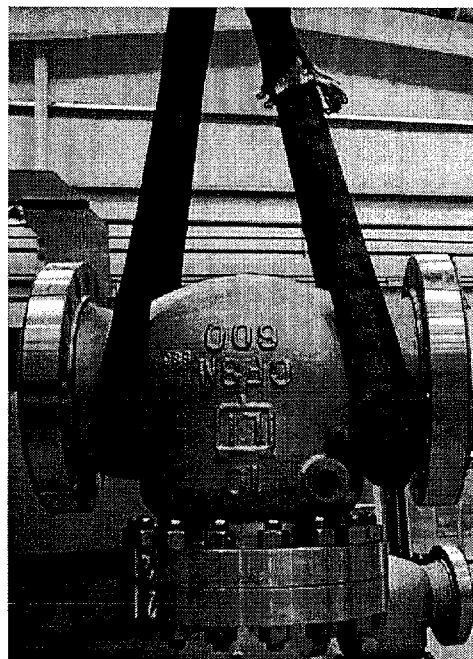
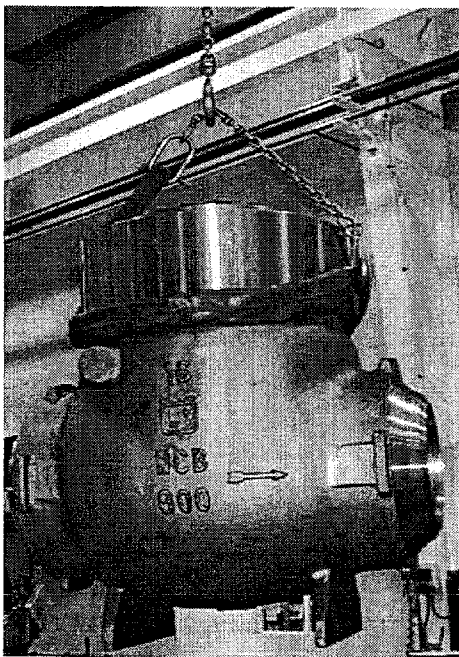


#### **4. HANDLING AND STORAGE**

Unless otherwise specified and agreed the valve is packed in closed position in standard pallets.

##### ***4.1.- HANDLING***

When the valve is going to be handled with lifting lugs , the two pictures shown the correct handling through the flange ends (picture at the right side) when the valve is in reversed position, or trough the neck (picture at the left side).



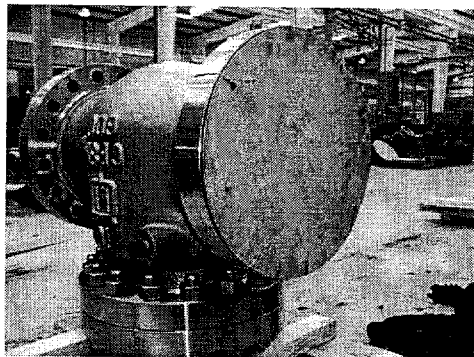


In order to avoid damage in any part of the valve, we recommend the use of a polyester lifting lug . Using a steel lifting lug, you must especially pay attention that steel in contact with the important parts of the valves. The choice of the lifting lug must be adequate with the weight of the valve.

For stainless steel valves never handle, brush or manipulate with material other than stainless steel. The use of dissolvent halogen ad is not permitted .

#### ***4.2.- STORAGE BEFORE INSTALLATION***

Both ends calked with plastic or wood protections attached to the valve's body, these protections must be only withdrawn at the time of the installation.



When the valve is going to be stored during a long time, it's recommendable the packing of the valves in cases protected by waterproof and introduce in the same bags non-humidity.



## **5. INSTALLATION**

A wrong valve installation can bring serious consequences, a bad handling can require expensive services to repair it. When receiving the valve, check the state of the packing in order to note possible external damages which will could have damage the valve.

### **5.1.- *CHEKING BEFORE INSTALLATION***

- Check on the valve's plate: size, class and trim and make sure that those are adequate for the installation.
- All the precautions necessary must be taken to avoid the introduction of external elements into the valve which can caused serious damage on the seat surface before and after installation.
- The end's protections must be withdrawn in order to clean the close surface by fluxing. At this time the wheel should not be operated.
- It's very important to clean the piping before the installation: small pieces of metal, deposits of welding in the piping can produce a damage on the seat surface of the valve.
- When the valve works with high or low temperature, the valve should not be manipulated before it would be technically equilibrated it could create a loss of seal and in case of galling on stem. and the seats.
- It must be remembered that during the installation the thermal stress piping and the fluid's weight produce considerable mechanics stress to the valve. Therefore, it can originate distortions in the body of the valve causing backlash in the seats and consequently the leaks.
- During the procedure of valve's ends welding to the pipe take attention that metal does not fall on the seat surface. It is also necessary to take into account the high temperature which can deform the seat of the valve.

***Once checking made of all those different points, the valve is ready to being installed.***



### **5.2.- ENDS CONNECTIONS**

- For unidirectional gate valves, make sure the flow direction according to the valve design.
- The valve's ends will be aligned parallel to the ends of the piping to avoid unreasonable stress.
- Once the valve is placed in the piping, you will process with a partial tightening of all bolting, per pair opposed diametrically around the support. You will proceed of the same manner for the total tightening .
- The final tightening will be the corresponding to the size and material of the bolting.

### **5.3.- BUTT WELDING CONECTIONS**

- For the simple circuit valve, make sure the flow direction according to the valve design.
- The ends of the valve will be aligned parallel to the ends it piping to avoid efforts.
- When it has been produced changes material structure and thermal stress in the body of the valve during the ends welding process , it will be done a post weld heat treatment.

### **5.4.- CONSIDERATIONS AFTER INSTALLATION**

- Once the valve is installed, the seat surfaces are still vulnerable to foreign particles like sands or deposit of welding in the system of piping. Therefore it is recommended to carry out cleaning of the system with all the valves open before the plant functions.
- When the valve is installed in high temperature systems, it is advised to verify the closing of nuts after a short initial operate period.



## **6. MAINTENANCE**

By programming a periodic maintenance of the valve, potential problems it can be detected and therefore it is possible to extend the life of the valve. The periodic maintenance program must be prepared by the engineering department. The frequency of these revisions must be based on the user's experience who installs the equipment. Lázaro Ituarte International recommends the revision of the following parts:

### ***BOLTING:***

The systems of piping are subject to certain vibrations which can loosen and disassembled the bolting, therefore, all bolting will have to be checked and inspected regularly.

## **7. RECOMMENDED SPARE PARTS**

The gaskets are the recommended spare parts by Lázaro Ituarte Internacional, S.A.

When ordering spares or requesting any information about the swing check valve ensure that the following information is quoted:

- type, size and rating swing check valve
- valve serial number

Above information is stamped on valve nameplate.