

***FLEU***

**OPERATION MANUAL**

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# Ball Valve

Design: Wanghuanyu Checked: Wangtianyuan Approved: Shiyongbin Date: 2014.8.12

Suzhou Fleu Valve Co., Ltd.

No. 767 Huagang Road

Wujiang Economic Development Area

215200 Suzhou/China

Tel: 0086 512 63430669

Fax: 0086 512 63409789

e-mail: [szsales@fleu-valve.com](mailto:szsales@fleu-valve.com)

<http://www.fleu-valve.com>

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### 1. Generalities

The following operation instructions are valid for FLEU-ball valves of the Fig.XXX• 750/751/752/753/754/740/742/743/744, which serve to shut the flow of liquids, gases and steams in pipe lines, and of course to let it through, whenever they are in OPEN status.

By a correct assembling, maintenance or repair we guarantee an activity free of troubles.

The manufacturer carries no responsibility for efficiency and safety of the valves, whenever these operating instructions are not observed and followed accurately.

The valves must not be activated beyond the limits and rules indicated in the different documents (such as operation rules, purchase documents, datasheets). Operations beyond the indicated limits lead to overstrain which cannot be sustained by the valves.



A non-observance of this warning can cause injuries to persons and defects of the machines, such as:

- Injuries caused by escaped medium (cold/hot, toxic, under pressure),
- Affect in activity or damage of the valve.

The descriptions and rules included in this operation instruction refer to standard types but are also valid for alternatives.

#### **ATTENTION!**

It is essential that the valves are handled by skilled staff that must be aware of the interactions between the valves and the system in which they are installed.

An incorrect use of a valve may cause strong consequences to the complete system, such as:

- Escape of medium
- Stop of the unit
- Affects, decreases or increases of operation or work of a system or unit.

For any further inquiries or in case of damage, please contact SUZHOU FLEU VALVE CO.,LTD

In case of local inquiries or orders, especially for spare parts, please indicate the production or factory serial number, the type, the model version and possibly also the year of construction.

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The technical data referring to the valves can be found in their technical documentations (paragraph 4.5).

In case of a return transport it has to be proceeded as explained in paragraph 3 <Transport>.

## 2. Safety

These operation instructions contain essential information that has to be observed by assembling, operation and commissioning of the valves.

For this reason they have to be read by the assembling staff, by the skilled staff and by the operator before the valve is assembled and put into operation and they should always be kept in the proximity of the valve.

Not only the general safety rules indicated in this main paragraph have to be observed, but also the other ones indicated in other paragraphs.

### 2.1 Indication of notes in the operation instructions

The safety warnings contained in this operation instruction, which have to be observed in order to avoid injuries to persons, are indicated by the following general and particular pictographs:

Warning!



Security signal acc. to DIN 4844 W 9  
Beware of the electrical tension!



Security signal acc. to DIN 4844 - W 8

In order to avoid defects of valve efficiency and of its accessories the following warning

**ATTENTION!**

The signs marked directly on the valve have absolutely to be considered and kept in a readable condition.

## **2.2 Dangers that can result if safety instructions are not observed.**

If the safety instructions are not observed injuries to persons, environment and valve, or system can arise and the indemnity rights get lost.

In particular the non-observance of the safety notes can cause dangers such as:

- Break down of important functions of the valve or unit
- Failure of prescribed methods of commissioning and handling
- Danger to persons caused by electrical, mechanical and chemical impacts.
- Environmental injuries caused by a leakage of dangerous materials.

## **2.3 Working with safety consciousness**

The safety instructions included in this paper, the national regulations for prevention of accidents, as well as the internal regulations referring to work, operation and safety have to be observed by the operator.

## **2.4 Safety instructions for the operator / user**

- When ever some hot or cold valve parts may cause any danger, these parts have to be constructed in a way that they are protected from contacts.
- The contact protection for moving parts (such as coupling) must not be taken away while the machine is working.
- Leakages of dangerous conveyed materials (explosive, toxic, hot) have to be removed in a way that no danger to persons or environment can arise.
- Injuries by electrical energy have to be excluded (please find details to this point in local power supply enterprise regulations).

## **2.5 Safety instructions for commissioning, inspection and assembly works.**

It must be provided that all commissioning, inspection and assembly works are executed by skilled staff, who must have previously studied these operation instructions.

Basically when any kind of work on a valve is executed, the valve has to be cooled down and free of pressure and the evaporation temperature of the medium must be lower than the temperature of all parts it gets in contact with.

Also basically, works on a valve have to be executed when it is stopped. The procedure to stop a valve operation is described in this paper and has absolutely to be observed.

Valves which get in touch with health injuring media have to be decontaminated.

Immediately after the work is done, all safety and protection devices have to be put into position or operation again. Before putting the valve into operation again, the points referring to paragraph 6 <putting into operation> have to be observed.

## **2.6 Arbitrary reconstruction and manufacture of spare parts**

Reconstructions or modifications of the valve are only acceptable under agreement with the manufacturer. The use of original spare parts and by the manufacturer authorized accessories promotes safety. If any damage is caused by using other parts the liability for the consequences can be cancelled.

## 2.7 Inadmissible operation modes

A safe operation is only guaranteed if the valve is used according to the determinations included in the “generalities” of this operation instruction. The limits included in the technical documentation must not be exceeded.

## 3. Transport and storage

### 3.1 Corrosion protection

#### 3.1.1 Carbon steel valves

Valves made out of unalloyed or low alloyed cast steel are painted with a hard sticking primer made of a 2-components colour based on epoxy resin paint. The minimum film thickness is 70 µm. The inner surfaces are free of paint and only coated with a temporary corrosion protection (e.g. oil). Machined flange facings are protected against outside influences with a strippable vanish.

#### 3.1.2 Stainless steel valves

Valves made out of stainless steel will be delivered without coating. Stainless steel ball valves are supplied with a passivated treatment to ensure body is protected against the adhesion of ferritic particles.

### 3.2 Transport

The valves are delivered in a closed condition and its connecting holes are shut up by cover caps.

Valves will be supplied as ready for operation.

#### **ATTENTION!**

During transportation and storage valve have to be closed. Connecting holes have to be shut up by suitable means (cover caps, foils) in order to avoid any damage to the valve seats.

#### **ATTENTION!**

Transport or lifting a valve by suitable equipment refer to the weight of the valves.



Valves must not be lifted by the handle!

### 3.3 Storage

The storage has to be effected in a way that it can work perfectly even after a longer storage period.

For this purpose it is necessary

- To keep the valve closed (in order to protect the seat facings)
- To take measures against soiling (dust, sand, mortar, respectively building materials), frost and corrosion using plastic foils.
- Stainless steel and carbon steel valves should be stored separately, to protect the stainless steel against corrosion.

When storing valves with soft gaskets (of elastomer) the storage regulations for elastomer have to be observed:

- The store must be dry, free of dust and moderately ventilated. Store temperature should not go over 25°C.,
- stocks on hand have to be used up in order to avoid long storage periods,
- As already mentioned above, the valves have to be in “closed” position during the storage. However the soft closure elements should be shut with little power, in order to avoid a rush aging of the elastomer.

## 4. Description / documents

### 4.1 Structure and standards

Split body, full bore,

Anti-static structure, blow out proof stem,

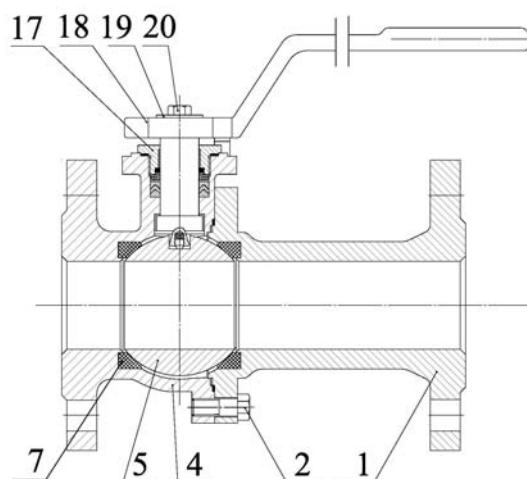
Flanges acc. to EN 1092-1(for ANSI valves acc. to ASME B16.5 )

Face to face acc. to EN 558-1(for ANSI valves acc. to ASME B16.5 )

Firesafe acc. to API 607

Test acc. to EN12266-1(for ANSI valves acc. to API 598 )

### 4.2 General view and parts list



NO.	Part	Material	
1	Adapter	1.4408	1.0619
2	Bolts	A4-70	1.7225
4	Body	1.4408	1.0619
5	Ball	1.4401	1.4301
7	Seat	RPTFE / PTFE with fiberglass / VX1	RPTFE / PTFE with fiberglass / VX1
17	Nut	1.4401	45
18	Lever	1.4308(DN≤100) / C45 Galvanization (DN>	GGG40(DN≤100) / C45 (DN>100)
19	Gasket	1.4301	1.4301
20	Bolts	A2-70	35

**The stuffing box structure see the datasheet.**

### **4.3 Temperature**

4.3.1 Body material suitable for Temperature as follow:

- a. Carbon steel 1.0619: -29°C~+425°C
- b. Carbon steel WCB: -29°C~+425°C
- c. Stainless steel 1.4408: -196°C~+540°C (for flanged connection valves)  
+815°C (for carbon content  $\geq 0.04\%$ )
- d. Stainless steel CF8M: -196°C~+540°C (for flanged connection valves)  
+815°C (for carbon content  $\geq 0.04\%$ )

4.3.2 Gasket material suitable for Temperature as follows:

- a. PTFE: -180°C~+200°C
- b. Flexible graphite: -200°C~+570°C (Oxidizing medium)  
+800°C (Non-oxidizing medium)
- c. Metal sealing circle the same as 4.3.1

### **4.4 Medium**

For carbon steel valves: non-corrosive, such as water, steam, and oil.

For stainless steel valves: can be corrosive,  $4.0 \leq \text{PH} \leq 10.0$



The valves should be operated during the limits range refer to par. 4.3 and 4.4.

## **5. Installation**

### **5.1 Generalities**

#### **ATTENTION!**

The pipeline has to be installed in a way that injurious shearing and bending forces during installation and activity are kept away from the valve bodies. This is to avoid leakiness and destruction of the body.

If possible, valve shall be mounted in such way to allow periodic inspections.

#### **ATTENTION!**

Before installation the cover caps have to be removed from the connecting holes.

The flange facings must be clean and undamaged.

The flange gaskets must be well centralized.

Only bolts and gaskets of admissible materials may be used.

For the flange connection all flange drill holes have to be used.

Once the installation is completed, valve must be operated for at least one opening and closing action to ensure perfect operation.



When varnishing the pipelines, no bolts and nuts, stems, stuffing boxes and accessories must be painted (function affects). During any construction work the valves

have to be protected from dust, sand and any other construction material. (Please cover with suitable means).

Valve by-passes and all other adjacent parts must not be used as steps.



Valves and pipe lines working in high temperatures ( $>50^{\circ}\text{C}$ ) or low ( $<0^{\circ}\text{C}$ ) must be protect from touch by insulating. Alternatively the danger must be indicated by warning boards on the valve side.

### **5.2 Installation position**

Ball valves can be installed with the stem in vertical or horizontal position or any other position., but preferably to be installed with the stem in vertical position. Valves are bidirectional, so fluid can run in both directions.

### **5.3 Valves with motor**



All electric devices such as adjusters, switch boxes, magnetic valves, end switches, etc., have to be installed in dry rooms and safe from overflow. Tension and frequency have to correspond to the data on the factory label.

## **6. Operation / putting into and out of operation**

### **6.1 Operation/putting into operation**

#### 6.1.1 Generalities

Before putting the valve into operation its material, pressure and temperature data have to be compared with the operation terms of the pipe line.

#### **ATTENTION!**

The line system of new plants and especially after repair works has to be flushed in order to remove harmful solid matters, respectively bead of weld.

### **6.2 Operation**

Looked at from above the valves can be closed or opened by turning the handle  $90^{\circ}$  . There is a limit nut which shall not be exceeded.

#### **ATTENTION!**

The use of any auxiliary lever to turn the handle is not admitted. Too big forces could be injurious because their seat seals could be squeezed.

Generally, ball valves are applied in a way that they are either completely open or completely closed.

### **6.3 Function check up**

The following functions have to be checked up:

The shutting function of the installed valve must be checked up opening and closing it several times.

The stuffing box packing efficiency has to be checked up before the first loading by full operation pressure and temperature. If necessary the stuffing box glands or nuts, have to be evenly tightened.

The sealing efficiency of the bolted bonnet connections with the flat seal must be examined after the first loading/warming up of the valve. (Maintenance-free valves too!) If necessary



the bolts connections have to be gently, crosswise and evenly tightened.

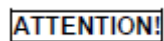
#### **6.4 Putting out of operation**

During longer standstill periods liquids whose form can change in concentration due to polymerization, crystallization, solidification or the like, have to be let out of the line system. If necessary the line system has to be rinsed by completely open valve.

### **7. Commissioning / maintenance**

#### **7.1 Safety notes**

During all commissioning and maintenance works on the valves the following safety notes as well as the general indications under paragraph 2 <safety> must be observed.



In any case, also in emergency, only suitable spare parts and tools have to be used, otherwise a perfect function is not guaranteed.

#### **7.2 Valve disassembly**

Before dismounting from the pipe line or before commissioning and repair works are made directly on the valve, more precisely:

- before loosening the bolted bonnet
- before loosening the gland flange bolts,
- before loosening the stuffing box nut,

the valve has to be completely discharged from pressure and has to be cooled up until the evaporation temperature of the medium is lower than all the chambers getting in contact with it. Then any scald can be excluded.



Opening a valve under pressure is a lethal danger!

In case those toxic or easily inflammable mediums are conveyed, or mediums the residues of which in contact with humidity of the air can lead to corrosion damages, the valve has to be drained and flushed, respectively ventilated.

If necessary protecting clothes and protective masks have to be worn.

Due to the installation position the residual liquid possibly remained in the valve have to be drained off and correctly disposed.

Before a possible transportation, the valves have to be carefully emptied and flushed.

#### **7.3 Maintenance**

The valves are constructed in almost all of their parts maintenance-free. Materials for sliding parts are chosen which cause a very minimal wear. In order to improve operation safety and to minimize repair costs, all valves, specially those ones which are seldom put into operation or are hard to get to, should be regularly tested, that means, put into operation (OPEN – CLOSED) at least once or twice a year.

The operator is responsible to determine the convenient test and maintenance intervals depending on the application of the valve.

The durability of maintenance-free valves and can be extended if:

- the stem and stuffing chamber surfaces are kept clean and undamaged;
- the mobile parts, such as stems are greased (except oxygen valves) by using standard

- lubricants;
- the stuffing box is punctually additionally packed or the packing is renewed;
  - the gasket is punctually renewed;
- The safety warnings in par. 2, 7,1 and in par. 8 must be observed.

## 8.Troubleshooting

### 8.1 Generalities

All repair and maintenance works have to be done with suitable tools and original spare parts.

The safety notes in par.2 and 7 have to be observed.

### 8.2 Troubleshooting table

Description of trouble	Probable cause	Solution
Leakage of packing	<ol style="list-style-type: none"> <li>1.Tightening of the packing not enough.</li> <li>2. Insufficiency of packing rings.</li> <li>3. Failure of the packing</li> </ol>	<ol style="list-style-type: none"> <li>1.Retighten the nut of packing evenly.</li> <li>2. Add some more pieces of packing.</li> <li>3. Replace the packing by new one.</li> </ol>
Leakage between sealing surface	<ol style="list-style-type: none"> <li>1.Dirt on the sealing surface.</li> <li>2.Damage of sealing surface</li> </ol>	<ol style="list-style-type: none"> <li>1.Clean the dirt</li> <li>2.repair the sealing surface of replace the disc and seat ring.</li> </ol>
Leakage at the connection of body and bonnet	<ol style="list-style-type: none"> <li>1.Untightening of connecting of it .</li> <li>2. Damage of the sealing surface of the body-bonnet flange or that of the bonnet and body of valve sealed by pressure.</li> <li>3. Failure of gasket or damage of metal sealing ring</li> </ol>	<ol style="list-style-type: none"> <li>1.Tighten the bolts uniformly .</li> <li>2. Repair the sealing surface of the body-bonnet flange or the body-bonnet flange or the of the bonnet and body of valve sealed by pressure.</li> <li>3. Replace gasket or repair the metal sealing ring.</li> </ol>
Handle can't be turned flexibly or the ball can't be open or close	<ol style="list-style-type: none"> <li>1.Over tighten the packing .</li> <li>2.Crookedness of gland</li> <li>3.Damage of the stem nut or dirt on it .</li> <li>4.Wear or puncture of screw thread of stem nut</li> <li>5.Bend of stem</li> </ol>	<ol style="list-style-type: none"> <li>1.Loose the nuts of packing properly.</li> <li>2.Rectify the gland</li> <li>3.Revise the screw thread of stem nut, and clean the dirt.</li> <li>4.Replace the stem nut .</li> <li>5.Rectify or replace the stem</li> </ol>
Breakdown of electric	See the instruction of electric actuator	See the instruction of electric actuator

For any further information please contact SUZHOU FLEU VALVE CO., LTD

## **9. Guarantee**

The warrantee for our product is one year after commissioning date, or 18 Months from shipment whichever happens earlier. In this period, If there is any damage caused by material defect, improper manufacture, and unreasonable design, or it takes place under the normal condition. Repair and replacement of part is free of charge.