


# CHEMAT

<b>1. Contents</b>	
<b>2 General</b> .....	1
<b>3 Intended use</b> .....	1
3.1 Restriction of use .....	1
<b>4 Hazard warnings</b> .....	2
4.1 General hazard warnings.....	2
4.2 Warnings for user .....	2
4.3 Special hazards .....	2
4.4 Hazard warnings for maintenance .....	2
4.5 Marking.....	2
<b>5 Conformity assessment referred to directive 94/9/EC (ATEX)</b> .....	3
5.1 Special note .....	3
<b>6 Transport and storage</b> .....	3
<b>7 Installation instructions</b> .....	3
7.1 Installation position of ball valve .....	3
7.2 Installation into pipeline .....	3
<b>8 Valve operation</b> .....	3
8.1 Operation by actuator or gear box.....	3
<b>9 Repair</b> .....	3
9.1 Replacement of ball, seat and body seal of ball valve with spring loaded seats, trunnion mounted and maintenance free; shaft seal TA-Luft.....	3
9.2 Replacement of maintenance free shaft seal.....	4
9.3 Replacement of ball, seat and body seal of ball valve with spring loaded seats, trunnion mounted and maintenance free shaft seal Fire safe/TA-Luft.....	4
9.4 Replacement of maintenance free shaft seal Fire safe/TA-Luft.....	4
<b>10 Spare parts</b> .....	5
<b>Tightening torque values table</b> .....	5

- 2. General**
- Chemat GmbH belongs to the Pentair international Ltd. group. Their products are manufactured and distributed exclusively by Pentair Valves & Controls Distribution GmbH.
  - The operating instructions do not govern the scope of supply. They apply to a number of possible sizes, versions, special features and additional equipment. Their content therefore generally goes beyond the contractual scope of supply agreed in each case. These instructions contain the information necessary for safe and correct installation and operation of the valve in the prescribed manner. If any difficulties are encountered during installation or operation which cannot be solved with the aid of the installation and operating instructions, please contact the supplier/manufacturer for more information.
  - We recommend to instruct operators according to these operating instructions.
  -  This symbol indicates important messages and safety instructions.
  - **Exemption from liability**  
Pentair Valves & Controls Distribution GmbH does not take any liability of damages and breakdowns caused by non-observance of both, these operating and maintenance instructions and the operating and safety instructions.

- 3. Intended use**
- Chemat ball valves type CAPRO 327/627 and 328/628 are two piece ball valves in flanged version for assembling between flanges related to the indicated nominal pressure.
  - Chemat ball valves are exclusively used within their temperature and pressure ranges to isolate media, to which carbon steel and stainless steel are resistive.
  - CAPRO ball valves can be used for fluids of group 1 and 2 related to appendix II diagram 6 of pressure equipment directive 97/23/EC up to category III.
  - Ball valves are intended for ON/OFF applications only. Do not use them for modulating applications.
  - Valves suitable for oxygen applications are identified with a blue sticker and shrink-packed. A warning is given on the package.
  - Range of operation temperature is -60°C to +225°C depending on operating pressure and sealing materials.
  - Intended use presupposes to consider safety instructions given in article 4.

- 3.1 Restrictions of use**
- Restrictions of use may not be exceeded.
  - The valve is not suitable for use with liquids with a proportion of solids of hard consistency. This can lead to damage to the sealing elements and thus to leakage in the valve.
  - Ball valves have to be used only according to the resistance of the used materials.

#### 4. Hazard warnings

##### 4.1 General hazard warnings

Ball valves are liable to the safety instructions of the pipe line system they are built in. Safety instructions named in this literature are additional instructions for ball valves only.

##### 4.2 Warnings for user

End user and not manufacturer of ball valves is responsible to ensure that

- ball valves are used only in accordance with the intended use (see part 3)
- pipe line is installed professional and will be inspected regularly
- ball valve has been installed professional
- a retrofitted actuator has been both, sized and adjusted correct, latter in the end positions of the ball valve, especially in its open position
- usual velocities of flow will not be exceeded during continuous duty and abnormal conditions (e.g. vibrations, cavitations, water-hammer) do not appear
- ball valve will not be used outside its pressure and temperature range



Disregarding of this warning can cause both, danger for the operator and damage of pipe line.

- ball valves used within a temperature range of  $>+50^{\circ}\text{C}$  and  $<-20^{\circ}\text{C}$  have to be protected against contact by isolation



Disregarding of this warning can cause danger for the operator.

- competent personal handles and maintains the valves.

##### 4.3 Special hazards



When the valve is to handle hot fluids or fluids where exothermic reactions may take place, it should be ensured that the hot surface of the valve cannot provide a source of danger for both, people and the surrounding atmosphere.

- Operation temperature and ignition temperature of dust have to be attended in dust applications.
- If ball valve is used as dead-end valve, special precautions have to be taken. Lever operators should be locked (e.g. padlock) or outlet connection should be plugged.



Open ball valve very carefully if it is used as dead-end valve and pipe line is pressurized. In this case, you have to take care that medium spread out does not cause damages.

##### 4.4 Hazard warnings for maintenance work



Shaft of ball valve is tightened by a shaft seal. Pipe line has to be de-pressurized, before loosening locking ring to avoid leakage of medium.



Before removing the valve from the pipeline system, ensure that the pipeline is de-pressurized thus no medium can spray out undefined.



When opening and dismantling the valve, residues of medium can still escape or be trapped in the clearance volumes of the valve. There may be further discharge from the system even when it is de-pressurized



Tooling appropriate to the working area is used for installation or maintenance only, especially in plants where explosive atmosphere can occur.

##### 4.5 Marking

Manufacturer: CHEMAT  
Type: CAPRO  
Nominal diameter: DN  
Nominal pressure: PN  
Material: e.g. 1.4408  
Cast no.: e.g. H5426  
Serial no.: e.g. 07488  
Year of manufacture: P = 2003; Q = 2004; R = 2005

## 5. Conformity assessment referred to directive 94/9/EC (ATEX)

A systematic procedure to identify ignition hazards according to EN13463-1:2001 has been done with the result that no potential ignition source is available. Therefore, CAPRO ball valves are not within the scope of directive 94/9/EC (ATEX) and may not be marked.

Use of ball valves within its intended use is possible in areas, where explosive atmospheres can occur.

### 5.1 Special note

All metallic parts of the ball valve including the ball are connected to each other thus the electric resistance is  $<10^6$  Ohm. The ball valves can be used for all flammable media in any explosive atmosphere.

However, we draw attention to the fact, that ball valves have to be part of potential equalisation procedures, if a potential (static electricity) can occur in case of use within specific media and velocities of flow, which is liable to operating conditions and therefore within responsibility of end user.

## 6. Transport and storage

Valves must be stored at a temperature of  $-20^{\circ}\text{C}$  to  $+65^{\circ}\text{C}$  in a dry place protected from the effects of weather.

In order to prevent damage during loading and unloading, the valves must be handled manually or using suitable lifting equipment. Valves must be protected from external force (impact, shock, vibration) during transportation. We recommend a leak test before commissioning after a long period of storage.

Flanges are provided with protective caps to prevent dust and dirt ingress and to prevent damage to the sealing surfaces during transportation.

Remove protective caps only about to install valves in the pipe line.

## 7. Installation instructions

### 7.1 Installation position of ball valve

The ball valve can be installed in the pipeline in any position. The flow direction is not specified unless the ball is provided with a discharge hole.

### 7.2 Installation into pipeline

After removal of the protective caps make sure that the interior of the ball valve remains clean and free of fouling.

The valve can be installed directly in to the pipeline system. Insert the valve and align it that it can be fitted without any stress.

## 8. Valve operation

### 8.1 Operation

Bare shaft is the standard on ball valves over DN 100; and here the position of the double D indicates the position of ball bore. The closing direction is clockwise.

Make sure that enough space is available to operate the ball valve

### 8.2 Operation by actuator or gear box

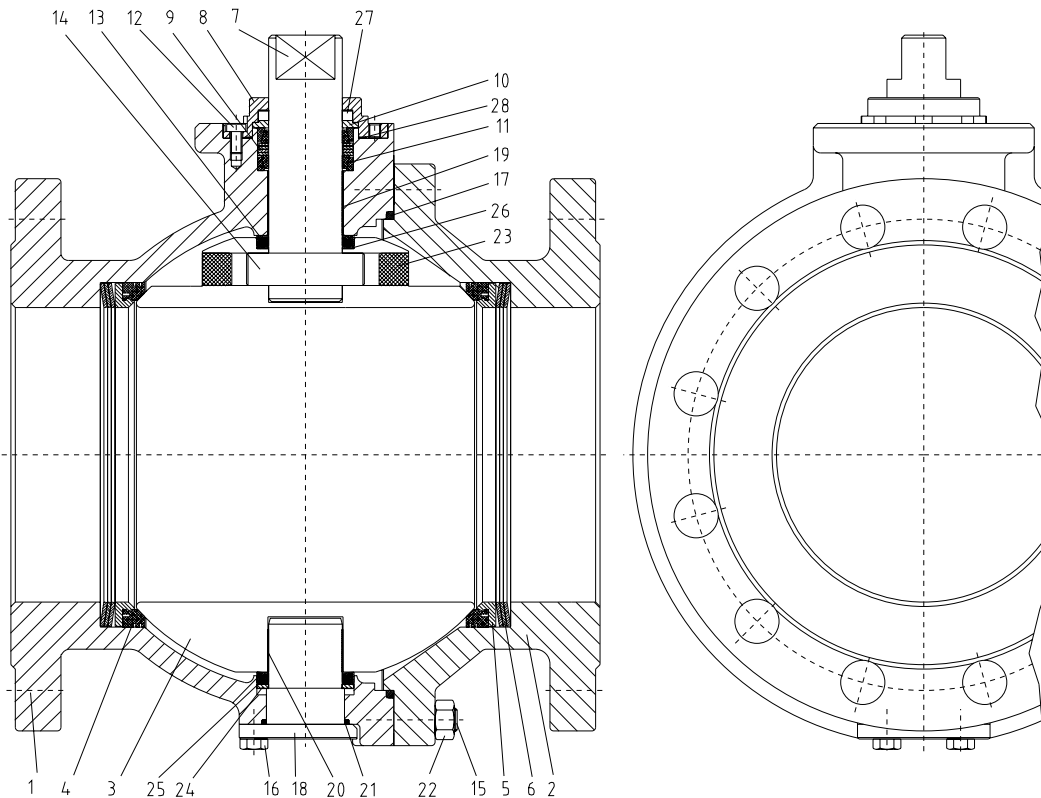
On the CAPRO type ball valve, the mounting flange for  $90^{\circ}$  drives is designed in accordance with ISO 5211. Refer to operating torques of valves published in catalog sheet for actuator sizing.

## 9. Repair

**Article 4 in this brochure has to be considered before starting repairs.**

### 9.1 Replacement of ball, seat and body seal of ball valve with adjustable shaft seal

- 9.1.1 Remove ball valve in open position by loosening the nuts (22)
- 9.1.2 Close ball valve, remove body seal (17), ball seat (4), seat support ring (5) and spring washers (6)
- 9.1.3 Disassemble blind plug (23) and remove the taper pin
- 9.1.4 Unscrew the bolts (12) from the gland ring
- 9.1.5 Unscrew the bolts (16) to remove the stem bearing (18)
- 9.1.6 Take out the ball
- 9.1.7 Remove ball seat (4), seat support (5) and spring washers (6)
- 9.1.8 Spring washers has to be checked during repair. Eventually existing pollutions and/or deposits have to be removed.  
Inspect spring for defects and replace it if necessary
- 9.1.9 Replace defective parts, reassemble in reverse order.
- 9.1.10 Functional and pressure tests have to be done after reassembling. In case of leakage of ball passage, repeat reassembly.



## 9.2 Replacement of low-maintenance shaft seal

- 9.2.1 Dismantle ball valve as described under 9.1.
- 9.2.2 Remove cover (8) by loosening bolts (12) Take out the pressure ring (10).
- 9.2.3 Remove defective packing (11) including spring washers (9).
- 9.2.4 Insert the new packing through the body taking care not to damage the new packing.
- 9.2.5 Reassemble in reverse order.

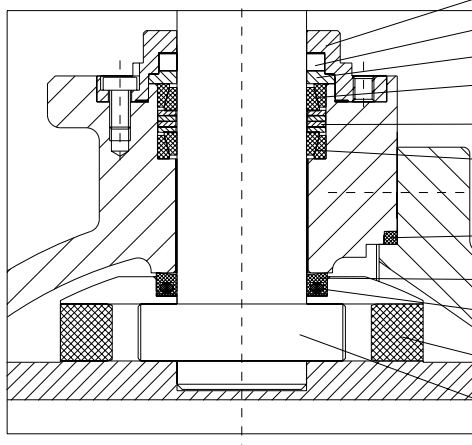
## 9.3 Replacement of ball, seat and body seal of ball valve with spring loaded shaft, trunnion mounted and maintenance-free shaft seal FireSafe/TA-Luft

- 9.3.1 Remove ball valve in open position by loosening the nuts (22)
- 9.3.2 Close ball valve, remove body seal (17), ball seat (4), seat support ring (5) and spring washers (6)
- 9.3.3 Disassemble blind plug (23) and remove the taper pin (14)
- 9.3.4 Unscrew the bolts (12) from the gland ring put out the stem (7)
- 9.3.5 Unscrew the bolts (16) to remove the stem bearing (18)
- 9.3.6 Take out the ball (3)
- 9.3.7 Remove ball seat (4), seat support (5) and spring washers (6)
- 9.3.8 Spring washers has to be checked during repair. Eventually existing pollutions and/or deposits have to be removed.  
Inspect spring for defects and replace it if necessary
- 9.3.9 Replace defective parts, reassemble in reverse order.
- 9.3.10 Functional and pressure tests have to be done after reassembling. In case of leakage of ball passage, repeat reassembly.

## 9.4 Replacement of low-maintenance shaft seal Fire Safe/TA-Luft

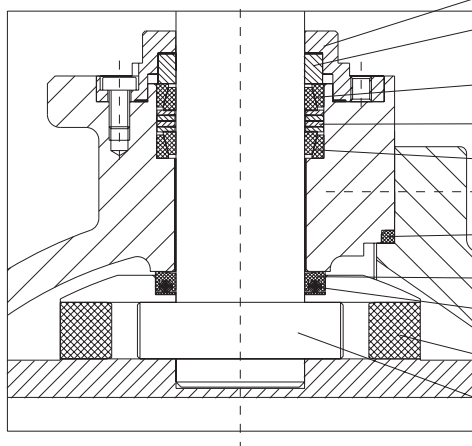
- 9.4.1 Dismantle ball valve as described under 9.3.
- 9.4.2 Remove cover (8) by loosening bolts (12) Take out the pressure ring (10) and the sealing (17).
- 9.4.3 Remove defective packing (11) including spring washers (9).
- 9.4.4 Insert the new packing through the body taking care not to damage the new packing.
- 9.4.5 Reassemble in reverse order.
- 9.4.6 Functional and pressure tests have to be done after reassembling. In case of leakage of ball passage, repeat reassembly.

**Maintenance free Fire Safe TA-Luft**



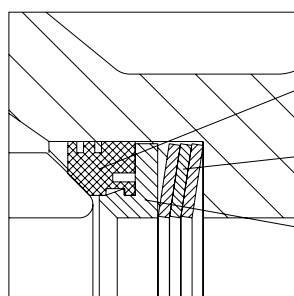
- Cover
- Sealing
- Pressure ring
- Conical packing
- Spring cones
- Conical packing
- Body seal
- Duo sealing
- O-Ring
- Blind plug

**Maintenance free**



- Cover
- Pressure ring
- Conical packing
- Spring cones
- Conical packing
- Body seal
- Duo sealing
- O-Ring
- Blind plug
- Taper pin

**Picture A**



- Seat (4)
- Spring cones (6)
- Seat support (5)

**Tightening torque values for body bolts and nuts CAPRO 327/627**

**Bolt material: A2-70/A4**

PN	DN	Thread	Torque (Nm)
40	125	M12	80
	150	M16	80
	200	M16	80
16	125	M12	80
	150	M16	80
	200	M16	80

**10. Spare parts**

Spare parts from Pentair Valves & Controls Distribution GmbH may be used only. Pentair Valves & Controls Distribution GmbH does not take any liability of damages and breakdowns caused by using non-original spare parts. Ordering spare parts, please name

- Serial number.
- Type of ball valve
- Size of ball valve