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INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Pressure Reducing Valve
with threaded/flanged ends

Ref. GENEBRE: 2274 – 2274N – 2275

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INSTRUCTIONS FOR INSTALLATION, OPERATION & MAINTENANCE MANUAL

1. Product description.

Genebre, S.A. offers a wide range of valves designed and assembled to handwheel and drive fluids in industrial procedures.
The compatibility of materials used to build the valves (see technical specifications) and the application of valves to the different industrial processes is at user's risk. Valves will have an optimal behavior when working conditions do not exceed pressure and temperature limits (pressure curve) for which they have been designed.

Art. 2274: Pressure Reducing Valve with threads according to ISO 7-1 (EN 10226-1).
Art. 2274N: Pressure Reducing Valve with threads according to ASME B1.20.1 NPT
Art. 2275: Pressure Reducing Valve with flanges according to EN 1092-1 PN25

2. Transport and Storage conditions

Transport and storage of this kind of products must be done keeping them in their original package!

VISUAL INSPECTION
Check whether during transport, unloading and placement the products have suffered damages.

During storage it is recommended to keep them into the included protective wrapping to avoid damages or dirt accumulation in the inside part of the valve. The wrap must not be removed until valve is to be installed.

Valves must be stored in a dry and clean environment.

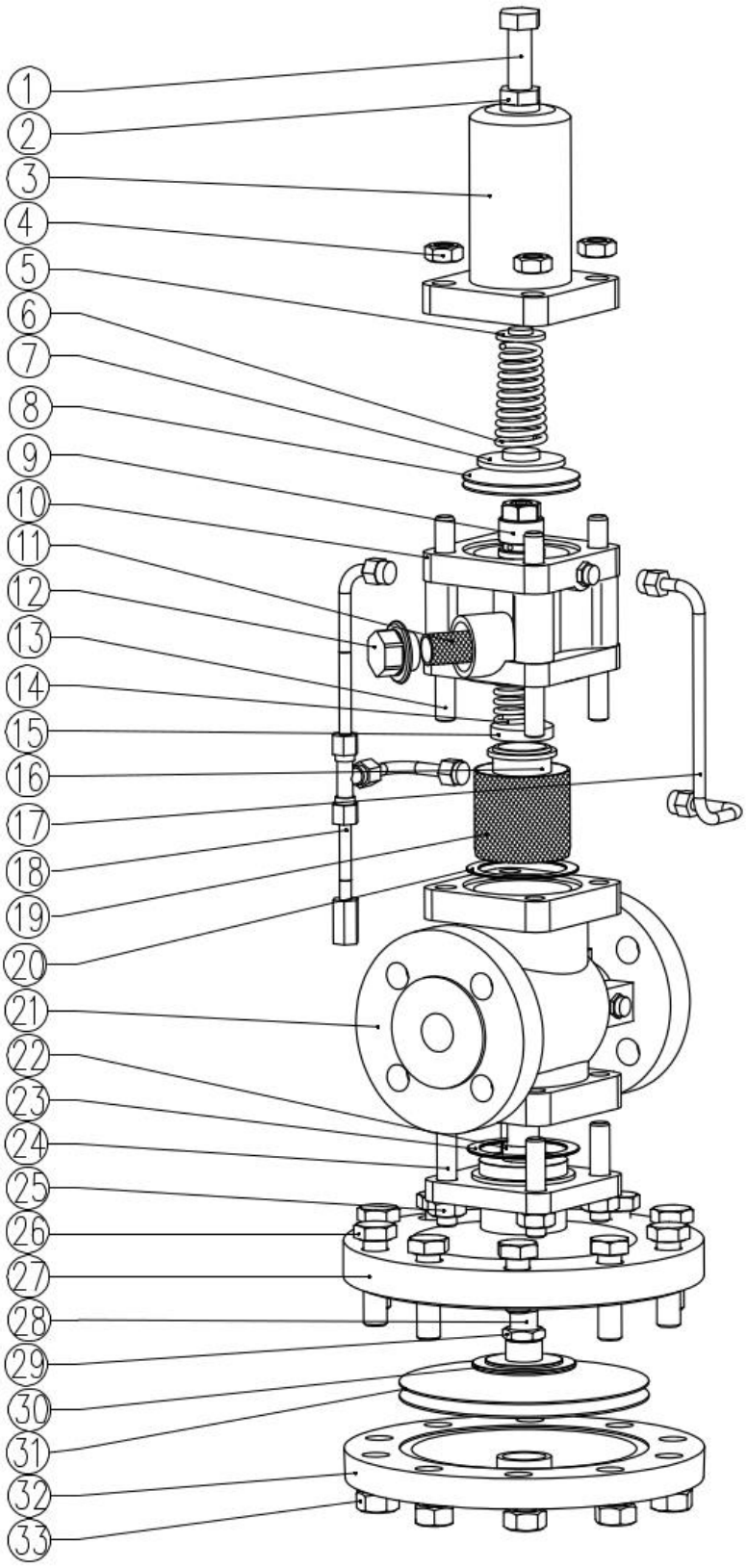
If you notice any kind of anomaly during reception of the goods, contact immediately with GENEBRE in order to determine the possible responsibilities on the issue.

IMPORTANT NOTE:

Before installing and/or manipulating these elements, READ CAREFULLY these instructions for use and OBSERVE all contained information. If you fail to understand any of their content, please contact GENEBRE, S.A.

User is responsible for the safe use of these products, according to present instructions for use and specific technical documentation of the device.

3) Exploded view



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Nº	Denominación / *Name*	Material	Acabado Superf. *Finishing Surface*	Recambios *Spare Parts*
1	Tornillo Regulación / *Regulating Bolt*	Acero al Carbono / *Carbon Steel*	Pavonado / *Blued*	------
2	Tuerca / *Nut*	Acero al Carbono / *Carbon Steel*	Pavonado / *Blued*	------
3	Tapa superior / *Upper cover*	Acero Fundido / *Cast Steel* 1.0619 (WCB)	Pintado / *Painted*	------
4	Tuerca / *Nut*	Acero al Carbono / *Carbon Steel*	Pintado / *Painted*	------
5	Guía Muelle / *Spring Guide*	Acero Inox / *Stainless Steel* 2Cr13	------	------
6	Regulating Spring / *Muelle Regulación*	Acero / *Steel* 50CrVA	------	M2274
7	Pletina Muelle / *Spring Pad*	ZCuAl10Fe3	------	------
8	Diafragma / *Diaphragm*	Acero Inox / *SS* 12Cr17Ni7	HRC 52-56	DR2274
9	Válvula Piloto / *Pilot Valve*	Acero Inox / *Stainless Steel* 2Cr13	------	VP2274
10	Cámara Válvula Piloto / *Pilot Valve Chamber*	Acero Fundido / *Cast Steel* 1.0619 (WCB)	------	------
11	Filtro Válvula Piloto / *Pilot Valve Strainer*	Acero Inox / *Stainless Steel* 1Cr18Ni9Ti	------	FR2274
12	Tapón / *Plug*	Acero Inox / *Stainless Steel* 2Cr13	------	------
13	Espárrago / *Stud*	Acero al Carbono / *Carbon Steel*	Pintado / *Painted*	------
14	Muelle Principal / *Main Valve Spring*	Acero / *Steel* 50CrVA	------	K2274
15	Disco / *Disc*	Acero Inox / *Stainless Steel* 2Cr13	------	K2274
16	Asiento / *Seat*	Acero Inox / *Stainless Steel* 2Cr13	------	K2274
17	Tuberias Control / *Control Pipes*	Acero Inox / *Stainless Steel* AISI 304	------	------
18	Tuberías Equilibrio / *Balancing Pipes*	Acero Inox / *Stainless Steel* AISI 304	------	------
19	Filtro Principal / *Main Strainer*	Acero Inox / *SS* 1Cr18Ni9Ti	------	FP2274
20	Junta Cuerpo / *Gasket*	Inoxidable + Grafito / *SS+ Graphite*	------	JC2274 K2274 FP2274
21	Cuerpo / *Body*	Acero Fundido / *Cast Steel* 1.0619 (WCB)	Pintado / *Painted*	------
22	Casquillo / *Bushing*	Acero Inox / *SS* 2Cr13	------	------
23	Junta Cuerpo / *Gasket*	Inoxidable + Grafito / *SS + Graphite*	------	JC2274 K2274 FP2274
24	Espárrago / *Stud*	Acero al Carbono / *Carbon Steel*	Pintado / *Painted*	------
25	Tuerca / *Nut*	Acero al Carbono / *Carbon Steel*	Pintado / *Painted*	------
26	Tornillo / *Bolt*	Acero al Carbono / *Carbon Steel*	Pintado / *Painted*	------
27	Tapa superior diafragma / *Diaphragm upper cover*	Acero Fundido / *Cast Steel* 1.0619 (WCB)	Pintado / *Painted*	------
28	Eje / *Stem*	Acero Inox / *SS* 2Cr13	------	------
29	Tuerca / *Nut*	Acero al Carbono / *Carbon Steel*	Pintado / *Painted*	------
30	Plato diafragma / *Diaph Tray*	Acero Inox / SS 2Cr13	------	------
31	Diafragma princ. / *Main diaphragm*	Acero Inox / *SS* 12Cr17Ni7	HRC 52-56	DP2274
32	Tapa inferior diafragma / *Diaphragm under cover*	Acero Fundido / *Cast Steel* 1.0619 (WCB)	Pintado / *Painted*	------
33	Tuerca *Nut*	Acero al Carbono / *Carbon Steel*	Pintado / *Painted*	------

4. Installation instructions

4.1) Preparation

Remove any material remains of the valve wrapping.
Serious problems may arise with the installation of a valve in a dirty pipe.
Make sure the pipe is not dirty and doesn't have welding particles, for example, before installing it. This may cause irreparable damages in the valve when the equipment is started → *prepare a clean working area*.
Plan beforehand enough space for future maintenance operations.

4.2) Assembling

Art. 2274 / 2274N: Make sure that the pipe and the valve thread are clean and also that they are compatible with each other (thread standard). Apply an appropriate sealant to the pipe threads and screw in the valve, being careful not to overtighten the tapered threads. To tighten the valve to the pipe, the use of a fixed wrench or spanner is recommended, applying force only on the hexagonal area of the end. It is recommended that this applied force be less than 30 N·m.

Art. 2275: Use gaskets between valve and pipe flanges to keep sealing. The valves are designed for mounting between EN 1092 PN25 flanges. Check the good parallelism of the flanges. Leave enough space between the two so that the valve can be easily inserted or removed. Tighten the flange bolts to hold the valve firmly. Apply alternate tightening method to ensure proper installation.

Design for this kind of valves allows only one position for assembling it to the pipe, specified by means of an arrow in the valve's body that indicates the direction in which the fluid needs to circulate.

The valve needs to be installed in a horizontal pipeline and with the main diaphragm at the bottom.

Valves do not have to support pipe's efforts, so it is advisable to anticipate a good alignment and parallelism of such pipe.

If a pressure reduction higher than 10 to 1 is required, the installation of two valves in series can be considered. In this case, a sufficient distance must be left between them and improve the drainage by means of interleaved steam traps.

It is strongly recommended the use of filters in the pipes (upstream) for proper operation, as well as to prolong the life cycle of the pressure reducing valve. On the

other hand, it is also recommended to install a pressure gauge and a shut-off valve both upstream and downstream and isolate the valve by means of a 'bypass'.
It is also necessary to install a safety valve at the valve outlet, in order to protect the entire downstream installation, whose set pressure must keep a sufficient margin with respect to the working pressure and thus allow the restart or blowdown of the safety valve; otherwise, the valve will not close properly and will leak.

It is important that the length of straight pipe both upstream and downstream is at least 10 times the diameter of the pipe.

4.3) Commissioning

1- Close the shut-off valves (upstream and downstream) and bypass the steam to clean the condensate and dirt from the pipeline.

2- Open the shut-off valves of all the pressure gauges.

3- Using a wrench, turn the Regulating Bolt (part.1) counterclockwise to loosen the Regulating Spring (part.6).

4- Open the downstream shut-off valve slightly and then slowly open the upstream shut-off valve.

5- Now the valve is ready for adjustment or regulation (see section 5.2).

5. Operating instructions

5.1) Usage

Valve materials have to be fully compatible with the fluid circulating through the valve. Otherwise, valve could be seriously damaged. **These valves are specifically designed for use with steam, air, or inert gases.**

The main purpose of pressure reducing valves is to reduce the fluid pressure to optimum operating values, constantly below the maximum permitted vales so as not to damage installations after the reducing valve.

This valve has a high reduction capacity, the maximum ratio being approximately 10: 1. For higher reductions use two valves in series (see section 4.2). The regulating spring that comes from the factory is used for an outlet pressure range of 0.5 to 12 bar.

5.2) Instructions for regulation

The pressure reducing valve is supplied at the minimum regulation pressure (0 or almost 0). To increase the outlet pressure, follow the instructions below:

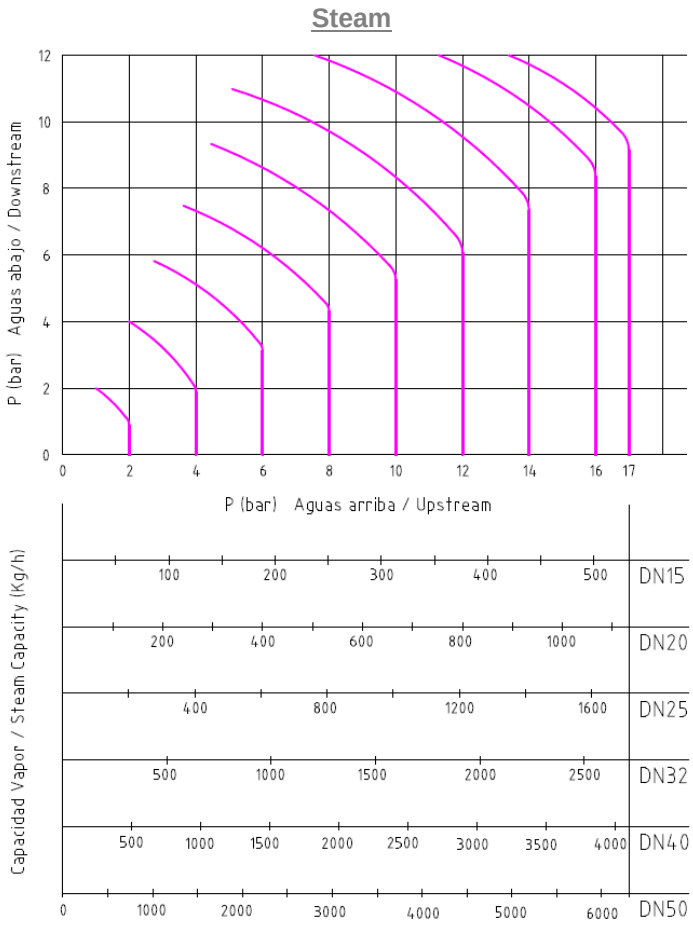
a. Prepare the installation as indicated in section 4.3) Commissioning.

b. Using a wrench, turn the Regulating Bolt (part.1) clockwise until the desired pressure is reached.

c. Fully open the downstream shut-off valve and recheck the outlet pressure.

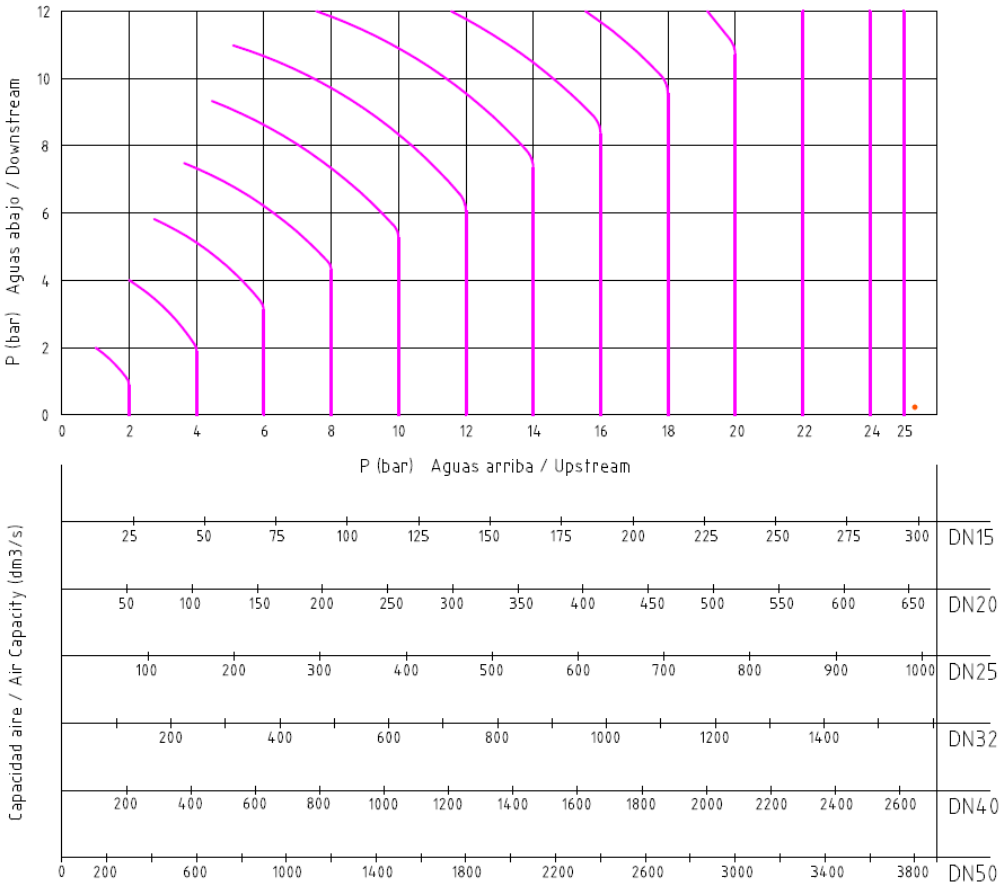
d. Rectify, if necessary, turning the Regulating Bolt.

5.3) Capacity Chart



Example: a valve size DN40 reducing from 10 bar (upstream) to 7 bar (downstream) is able to flow until 2000 Kg/h of steam, approximately.

Compressed Air



The previous diagrams show the discharge capacity of the pressure reducing valves of GENEBRE, S.A. art. 2274 / 2274N / 2275, according to the relationship between the Inlet Pressure (P1) and the Outlet Pressure (P2), for both steam and compressed air.

6. Maintenance instructions

Frequency, place and process of maintenance will be determined by the user by taking into account usage of the product.

Before disassembling the pipe's valve to clean or replace it, make sure that line has been closed and depressurized because a bad operational procedure could cause a serious accident to staff and installation system

6.1) Overhaul of the Pilot Valve Strainer (part.11)

a. Isolate the valve from fluid and pressure.

b. Loosen the Plug (part.12) and remove the Strainer (part.11).

c. Clean the Strainer under running water with a brush if necessary. Let dry.

d. Put the Strainer back in its housing and tighten the Plug firmly with PTFE tape on the thread to ensure tightness.

e. If necessary, replace the filter with a new one (see section 6.6).

6.2) Replacement of the Regulating Spring (part.6)

a. It is not necessary to isolate the valve from the rest of the installation.

b. Release the pressure of the Regulating spring by turning the Regulating Bolt (part.1) counterclockwise.

c. Remove the 4 nuts (part.4) using a wrench and remove the Upper Cover (part.3) and the Spring Guides (part.5).

d. Replace the Spring (part.6) with another that is suitable for the required regulation pressure. Use only original GENEBRE, S.A. spare parts (see section 6.6).

e. Reassemble in reverse process.

6.3) Replacement of the Pilot Valve (part.9)

The pilot valve is the element in charge of modulating the control pressure and transmitting it to the main diaphragm (part.31), which in turn is in charge of regulating the fluid pressure. It is made up of several components. After intensive use, it could become damaged and stop regulating properly, so it should be replaced with a new set. Next, the replacement of the Pilot Valve is explained step by step:

a. Isolate the valve from fluid and pressure.

b. Release the pressure of the Regulating Spring by turning the Regulating Bolt (part.1) counterclockwise.

c. Remove the 4 nuts (part.4) using a wrench and remove the Upper Cover (part.3), the Spring (part.6), the two Guides (part.5) and the two Diaphragms (part.8).

d. d. Unscrew the Pilot Valve assembly using a 19 mm spanner and replace with a new one, tightening it to a torque of approximately 50 N · m.

e. Reassemble in reverse process, keeping in mind the cleanliness of all components.

f. The Diaphragms (part.8) must be mounted in the same position in which they were removed. Apply liquid sealant (eg PTFE) on the outside on both sides. If not available, wrap the entire perimeter of both diaphragms with PTFE tape on the outside.

6.4) Overhaul of the Main Strainer (part.19), Disc (part.15) & Seat (part.16)

a. Isolate the valve from fluid and pressure.

b. Release the pressure of the adjustment spring by turning the Adjustment Screw (part.30) counterclockwise.

c. Remove the 4 nuts (part.4) using a wrench and remove the Upper Cover (part.3), the Spring (part.6) and the two Guides (part.5).

d. Loosen the upper nut of the Control and Balancing Pipes (part 17 and 18) in order to extract the Chamber of the pilot valve (part 10) upwards.

e. Extract the Strainer (part 19) and clean it under running water with a brush. Let dry. If necessary, replace with a new one (see section 6.6).

f. Remove the Gasket (part.20), the Spring (part.14), the Disc (part.15) and the Seat (part.16).

g. Clean up any dirt you find on these parts. If the Disc or Seat are noticeably scratched or worn, proceed with their replacement.

h. Replace the Gasket (part.20) with a new one.

i. Reassemble in reverse process, keeping in mind the cleanliness of all components.

j. When reassembling the Disc (part.15) and the Seat (part.16) you must take into account the clearance that must remain between these two parts. See below:

Valve size	Disc lift
DN15-1/2”	2,5 mm
DN20-3/4”	2,5 mm
DN25-1”	3 mm
DN32-11/4”	3,5 mm
DN40-11/2”	4,5 mm
DN50-2”	5 mm

k. Use a depth gauge to make the measurement easier.

l. Rectify, if necessary, the height of the Stem (part.28) by tightening or loosening the Nut (part.29).

6.5) Overhaul of the Main Diaphragms (part.31)

a. Isolate the valve from fluid and pressure.

b. Invert the position of the valve (turning 180º) to facilitate its manipulation.

c. Unscrew the Bolts (part.26) and the Nuts (part.33) to remove the Diaphragm Under Cover (part.32).

d. Clean thoroughly the inside of both Covers (part.27 and part.32).

e. Visually inspect both diaphragms. If any damage is observed, they must be replaced with new units. In case of being reused, they must be mounted in the same position in which they were removed. Apply liquid sealant (eg PTFE) on the outside on both sides. If not available, wrap the entire perimeter of both diaphragms with PTFE tape on the outside.

It is advisable to carry out <u>periodic maintenance</u> of the valve (every 12-24 months depending on the use) by means of a visual inspection of all the internal components, replacing or cleaning according to the state in which they are found.

6.6) Spare Part Codes

PART	CÓDIGO/*CODE*	MEDIDA/*SIZE*					
		1/2"	3/4"	1"	11/4"	11/2"	2"
31	DP2274 XX	04	05	06	07	08	09
14-15-17-20	K2274 XX	04	05	06	07	08	09
16-20	FP2274 XX	04	05	06	07	08	09
10-20	JC2274 XX	04	05	06	07	08	09
11	FR2274	04~09					
9	VP2274	04~09					
8	DR2274	04~09					
6	M2274	04~09					

XX = must indicate the size

7. Hygiene and Safety Instructions:

7.1) Fluids that go through a valve can be corrosive, toxic, flammable or pollutant. They can also be found at very high or low temperature. When operating valves, you must follow the security instructions and it is recommended to use personal protection gadgets:

1) Protect your eyes.
2) Wear gloves and appropriate working clothes.
3) Wear safety footwear.
4) Wear a helmet.
5) Have running water at hand.
6) To operate flammable fluids, make sure you have an extinguisher at hand.

Before removing a valve from a pipe, always check if the line is completely drained and depressurized.

7.2) Always operate the valve in open position to make sure there is no pressure in the internal cavity.

7.3) Any valve being used by toxic services department needs to obtain a cleanliness certificate before being operated.

7.4) Any type of repair or maintenance should be performed in ventilated places.