

## ■ Installation, Operation & Maintenance Manual

### For Modentic Gate, Globe and Check Valves

#### Caution:

Please read these instructions carefully and completely before installation. With the correct installation and maintenance, Modentic valves offer you a long, trouble-free service. The most important thing is to keep off the injury to the personnel and the damage to the equipment.

#### Safety precautions:

1. Any gate, globe and check valves are pressure equipment; therefore the appropriate safety measures need to be taken into account.
2. Any alterations on the valves and the documents without prior approval from Modentic with formal documentation are not permitted and might result in the huge danger.
3. All valves are designed for use within the limits specified herein and described on the valve body. Exceeding these specified limits is to be considered misuse and can lead to serious injuries and/or damage to the installation and environment.
4. When personnel are maintaining a valve, proper eye, head and whole body protection, and protective clothing should always be utilized. The most important thing is to keep off the injury to the personnel and the damage to the equipment.
5. All of the valves should arrive in the open position at the installation site.
6. There is the possibility that the (dangerous) pressurized fluid or gas could be trapped in the cavity of the valve, make sure this is released safely by partly opening the valve.
7. When the valves are operated on low or elevated temperature, operating personnel must take special care to avoid injuries.
8. The valve body rating can be higher than the seat rating. Valve surface temperature may be come extremely hot or cold due to the ambient or operating conditions. Prevent any type of direct contact with the valve that may harm the workers.
9. Valves and accessories must not be used as a sole support of piping or human weight.
10. Safety accessories such as safety relief (overpressure) valves are the responsibility of the system designer.
11. It is the user/system designer's responsibility to use insulation in high temperature applications.
12. Do not disassemble actuator with pressure loaded or warranty will be invalid for inappropriate disassembling.

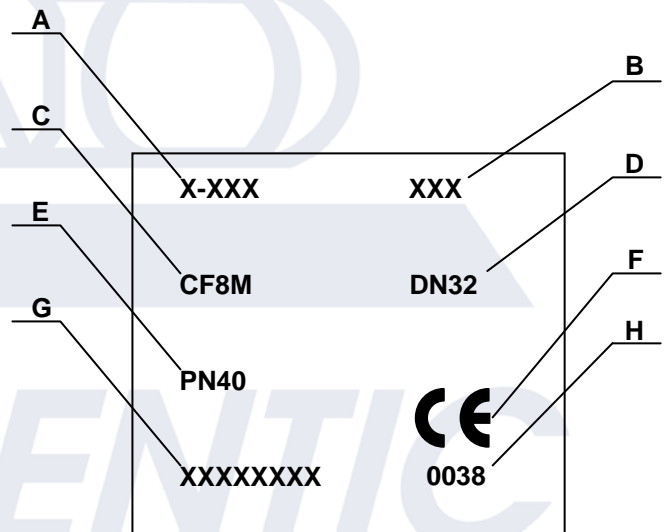
## General:

1. Valve pressure varies under different models, sizes, working temperatures, and the materials of the main parts. Please verify the application within the limits specified herein and as described on the valve body or name plate from Modentic.
2. Any gate, globe and check valves are pressure containing part of the installation with an operational function, maintenance personnel must take this into consideration, therefore the appropriate safety measures have to be taken into account, it is necessary to wear the protective equipments and take appropriate precautions to safeguard against possible injury.
3. Always use Modentic recommended spare parts for maintenance and replacement.
4. Valve Marking:

All the marking information should be cast on the body, or on a metal plate which is spot-welded to the body.

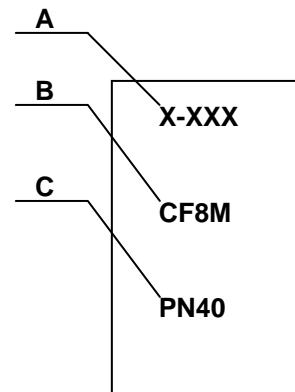
### PED VALVES MARKING

MARK	DESCRIPTION
A	TYPE NO.
B	YEAR OF MANUFACTURE
C	MATERIAL
D	SIZE
E	PRESSURE
F	CE. MAR K
G	TEMPERATURE
H	TUV RHEINLAND / BERLIN-BRANDENBURG
HEAT NO. CAST ON THE BODY AND CAP	
MD LOGO CAST ON THE BODY OR ON THE NAMEPLATE	



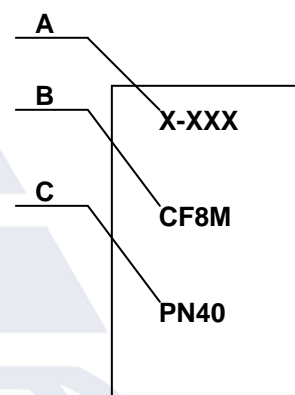
### PED(SEP) VALVES MARKING UNDER DN25

MARK	DESCRIPTION
A	SIZE
B	MATERIAL
C	PRESSURE
HEAT NO. CAST ON THE BODY AND CAP MD	
LOGO CAST ON THE BODY OR ON THE NAMEPLATE	



### OUTSIDE THE EU COUNTRIES NON-PED VALVES MARKING

MARK	DESCRIPTION
A	SIZE
B	MATERIAL
C	PRESSURE
HEAT NO. CAST ON THE BODY AND CAP MD	
LOGO CAST ON THE BODY OR ON THE NAMEPLATE	



### Limitations:

1. Valves are not to be used in safety functions such as safety loops or separating incompatible fluids
2. **Gate valve:**
  - a. Do not use for flow regulation or throttling.
  - b. Do not use if frequent manual operation is required.
  - c. Do not use for slurries or fluids containing solids that can build up in valve cavities.
  - d. Gate valves are usually bi-directional, and therefore may be installed in either direction.
3. **Globe Valve:**
  - a. It is not suitable if full flow at minimal pressure drop is required
  - b. It is not suitable for slurries or fluids containing solids that can build up in valve cavities.
  - c. Globe valves are unidirectional; make sure the valves are installed in accordance with the flow indicator on the valve body.

#### 4. **Check Valve:**

- a. Zero leakage of metal-to-metal check valves cannot be readily achieved without an elastomeric element in the seating arrangement.
- b. Sizing and pressure drop is critical to ensure full lift of valve piston.
- c. Use swing check valve design for “boiler feed water” and other services where internal rusting may occur in service.
- d. Use spring-controlled lift check valve for compressor service.
- e. Use swing check valves when maximum flow at minimal pressure drop desired.
- f. Check valves are unidirectional; make sure the valves are installed in accordance with the flow indicator on the valve body.
- g. Do not use for slurries or fluids containing solids that can build up in valve cavities

### Installation:

1. Valve pressure varies under different valve series, sizes, application temperatures and the material of the main parts. Please verify the application within the limits and as described on the valve body or nameplate from Modentic.
2. Prior to the installation, check the valve as well as the connecting parts to make sure they are free from dirt and burrs. And it might be necessary to flush the valve, valve cavity and the pipes to remove the accumulated dirt and burrs. Do not remove protective end coverings until immediately prior to valve installation.
3. Verify that the space available is adequate to allow the valve to be installed and to be operated, comfortably.
4. Do not disassemble or modify a MODENTIC valve in any way prior to installation. This will void the factory warranty if it occurs.
5. Remove protective end caps, and inspect the valve ends for damages to avoid leakage before installation.
6. Actuate the valve full-open to full-closed to check for possible damage from shipping and handling.
7. Inspect end connections to be sure that pipe threads and flange faces are free from scratches, nicks, or dents.
8. **Flanged Ends**
  - a. Verify that companion of flanges are dimensionally compatible with the flanges on the valve body and make sure sealing surfaces are free of grease, dirt etc.
  - b. Prepare the suitable gasket for flanges connection and set the gasket between the connecting flanges.
  - c. Connect the flanges with the appropriate size bolts and heavy hex nuts which confirm to comparison standard.
  - d. Tight flange bolts as recommended by gasket manufacturer and standard.
  - e. Following installation, execute leak and operating tests.

## 9. Threaded Ends

- a. Check specification of threads on mating pipe.
- b. Apply joint compound to the male end of joint only.
- c. Be careful to prevent applying torque to the joint of the valve body.
- d. We do not recommend any back welding. It is possible to damage the seats because of overheating while welding.
- e. Following installation, carry out leak and operating tests.

## 10. Socket Weld Ends

- a. It should be tightly closed before welding or installation to prevent damage to the seating surfaces and stem caused by thermal expansion during the socket welding process.
  - b. Prior to welding, end caps must be removed to prevent seat or gasket from being damaged by the overheating while welding.
  - c. Weld the end caps on the pipe stub. Be careful for the welded part, it may be super heat for minutes before completely cool down.
  - d. Prior to assembly the body back to the end caps, clean both end caps carefully. Any particle left could damage the ball surface or the valve port which would lead to leakage.
  - e. Tightened the body bolts evenly, check the valve for proper operation.
  - f. Following installation, perform leak and operating tests.
11. When installing flanged or ring joint end flex wedge gate or globe valves into the line, it is advisable to have the valve slightly open to prevent the wedge from becoming "stuck" due to thermal expansion and to discourage damage to the seating surfaces.
  12. There is an exception to install Butt-weld end valves, they should be installed in a lightly closed position.
  13. Check valve must be installed with the inlet in the direction of flow. This has to be checked carefully before installation of the valve. Otherwise check valve will stop the flow.
  14. Lift check valve should be installed only in horizontal pipeline as the disc closes only by gravitational force.
  15. 'Y' type check valves are provided with spring loaded discs. They may be installed in either horizontal or vertical pipeline.
  16. Swing type check valve can be installed either in horizontal or vertical pipelines. In vertical pipelines the flow should be in the upward direction.
  17. After installation, the line system should be cleaned by flushing to remove any unwanted material. Open and close the valve while flushing to ensure the valve operation is normal.
  18. Pressurized the line and see if there is any leakage occurred, make sure there is not any leakage before using.

## Operation:

### 1. Gate valve:

- a. Gate valves are used for on-off service where full flow with minimum pressure drop is desired in full open condition.
- b. Gate valves are not recommended for throttling service. These valves should be used only in the fully opened or fully closed position.
- c. Rotation of the handwheel in the clockwise direction will close the valve, and vice versa.
- d. Shut off should be achieved by application of the handwheel torque only. Excessive application of force may result in failure of the thrust assembly or damage to the valve seating.

### 2. Globe valve:

- a. Globe valves are designed to throttle the flow where certain pressure drop is permitted in a pipeline.
- b. Globe valves can be used for on-off service also. The disc is designed to completely stop flow and form a tight seal with pressure under the disc. Continuous throttling at less than 25% open may cause excessive vibration, noise and damage to discs and seats.
- c. To provide an optimum service life, globe valve should not be at fully backing seated condition normally.
- d. Y-Globe valves are suitable to close off, open up or throttle the flow in a pipeline. The disc is designed to completely stop flow and form a tight seal with pressure under the disc. Continuous throttling at less than 25% open may cause excessive vibration, noise and damage to discs and seats.
- e. Rotation of the handwheel in the clockwise direction will close the valve, and vice versa.
- f. Shut off should be achieved by application of the handwheel torque only. Excessive application of force may result in failure of the thrust assembly or damage to the valve seating.

### 3. Check valve:

- a. Check valves are one-way valves that function to automatically stop a flow reversal in a flowing line.
- b. A check valve closure can also cause downstream fluid column rupture just as in the case of shutoff valves. Furthermore, on fluid column reassembly, the pressure surge may be of sufficient magnitude to reopen the check valve, starting another sequence of closure, surge, etc.
- c. The check characteristically does not require any outside force or signal to operate properly. Check valves allow flow in one direction only.
- d. Swing check valve is self-operation non-return valve. The normal direction of flow in the line will open the valve, and any attempt by the flow to reverse will close the valve completely.

- e. Swing, lift and tilting disc check valves are designed to be operated by line pressure only. When the upstream line is pressurized, flow will open the disc. When the pressure is reduced upstream, or if there is backpressure, the disc will close.
  - f. Lift check valves and stop check valves are designed to be opened by the flow of system pressure in one direction and close automatically when the system flows in the opposite direction.
  - g. Stop check valves (sometimes called non-return valves) have the additional feature of throttling the flow in the open direction or closing the flow off completely. Continuous throttling at less than 25% open may cause excessive vibration, noise, wear and damage to disc and seat ring.
  - h. Rotation of the handwheel in the clockwise direction will close the valve, and vice versa.
  - i. Shut off should be achieved by application of the handwheel torque only. Excessive application of force may result in failure of the thrust assembly or damage to the valve seating.
4. When the valves are operated on low or elevated temperature operating, personnel must take special care to avoid injuries.
  5. Operate the valve within the pressure Vs temperature range.(The valve can be damaged by operating beyond the allowable range.)
  6. Do not step on the valve or apply excessive weight on valve. (It can be damaged.)
  7. Allow sufficient space for maintenance and inspection.
  8. Keep the valve away from excessive heat or fire. (It can be deformed, or destroyed.)
  9. The valve is not designed to bear any kind of external load. Never stand on or place anything heavy on the valve at anytime.
  10. The valve body rating can be higher than the seat rating. Valve surface temperature may become extremely hot or cold due to the ambient or operating conditions. Prevent any type of direct contact with the valve that may harm the workers.

## Maintenance:

1. Before making the maintenance, always advise the maintenance personnel that the proper eye, head and whole body protection always be utilized.
2. Before making the maintenance, always make sure the pressure is released safely by partly opening the valve.
3. Prior to the maintenance, flush the valves and the pipe lines attached and make sure that no (dangerous) residues are left. Ensure that the installation, together with pressure containing parts is depressurized and secured.
4. There is a possibility that a dangerous pressurized fluid or gas is trapped in the valve cavity, release this safely by partly opening the ball valve.
5. Most valves are actuated manually by causing rotational movement of a handwheel, wrench, handle, etc. Periodically check the nut to ensure tightness is necessary.
6. If leakage develops at the body/bonnet joint of a bolted bonnet valve, the bonnet stud nuts should be tightened uniformly. Do not overstress the bolting. If leakage continues, the gasket should be replaced.

7. It is impossible to predict the frequency of the maintenance interval. The maintenance interval is dependant upon several factors which are not foreseeable by the manufacturer.
8. It is important to recognize stem and seat leakage and this is not to be left unattended.
9. To ensure reliable operation and to reduce repair costs, all valves especially those which are seldom operated or where access is difficult should be checked periodically.

### User's note:

1. End-users have the responsibility to check the wall thickness in regular intervals due to wear/ tear/ corrosion of the fluid in order to ensure the wall thickness is not below the minimum safety thickness allowed in the standard.
2. The most important thing is to keep off the injury to the personal and the damage to the equipment.

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**MODENTIC**