# 2-WAY CONTROL VALVE TYPE H1FBE AND H1FBE HV

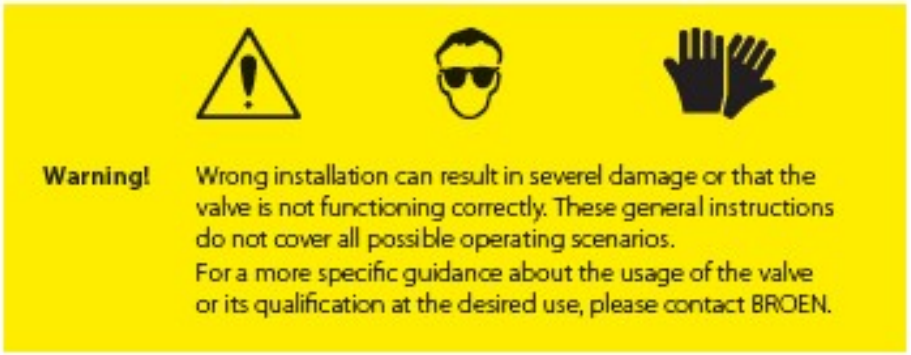
# INSTALLATION & USER MANUAL

NO.: 99.201.01- A
DATE: FEB. 2021 APPROVAL: FEB.2021

Clorius CONTROLS

## WARNING INFORMATION

**Warning!** Media can be hot and cause burning.
Do use safety goggles and gloves.



**Warning!** Wrong installation can result in severel damage or that the valve is not functioning correctly. These general instructions do not cover all possible operating scenarios.
For a more specific guidance about the usage of the valve or its qualification at the desired use, please contact BROEN.

**General safety instructions**

The valves must be installed and serviced by fully trained and qualified personnel only, observing the accepted industry codes and practices. Make sure employees or third persons are not exposed to any danger.

# CONTENT

## CLORIUS CONTROLS installation & user manual

**1. General information/Technical data/Valve dimensions** ..... 4
- Technical data ..... 5
- Technical data valve dimensions ..... 6
- Technical data valve characteristics ..... 7

**2. Transport, storage and marking**
- Transport and protection ..... 8
- Commissioning and installation ..... 9

**3. Installation and operation**
- Name plate information ..... 10
- Installation of pneumatic actuator and positioner ..... 11

**4. Caution** ..... 12

**5. Service and maintenance** ..... 13

**6. Spare parts** ..... 14

**7. Certification** ..... 15

**8. Contact** ..... 16

# General information

## Applications

Control valves type H1FBE are designed for regulating steam and hot water systems. The valves are used in conjunction with Clorius Controls temperature or pressure regulators for controlling industrial processes, municipal or domestic central heating system and marine installations.

Control valves type H1FBE HV are designed for regulating steam and hot water systems. An additional cooling radiator located between the valve and the pneumatic actuator allows this system to be used in high ambient temperature environment. It also protects additional equipment such as positioners, filter regulators etc. from over-heating and prevents damage caused as a result.

## Design

The valve components - spindle, seat and cone - are made of stainless steel.
The valve body is made of cast steel GP240GH with flanges drilled according to EN 1092-1 or alternatively ANSI 150, JIS 5K and JIS 10K.
The compact design allows it to be installed where space is limited.

## Function

Pressure on the spindle causes the valve to close.
The steam valve is based on a "balancing plug" design.
This means that a low and constant actuating force is necessary to operate the valve over all pressure ranges (0 – 25 Bar)
Pneumatic actuator SC ( Spring Close ) causes springs to close the valve (cone) in case of air failure.
The pneumatic actuator contains a manual override function.

## Features

- 2-ways steam valve with linear pneumatic actuator
- Manual override operation.
- Linear/equal percentage flow characteristic.
- For control devices such as PPL and PS-2

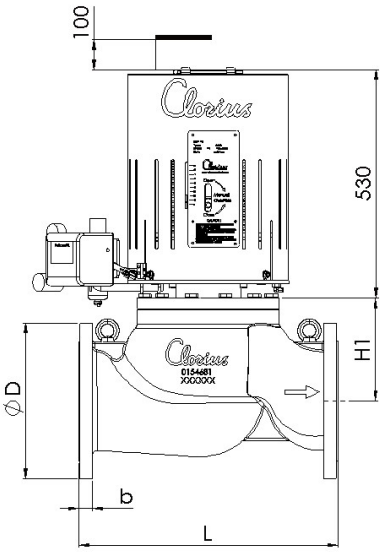
## Technical data

| | |
|---|---|
| **Valve sizes** | DN200/8" |
| | DN250/10" |
| | DN300/12" |
| | |
| **Valve design** | Linear |
| | |
| **Max working temperature** | 225°C steam |
| | |
| **Materials** | |
| Body/Cover | Cast Steel GP240GH |
| Cone/seat/shaft | Stainless steel AISI316/AISI304 |
| Gasket | TFM and PVMQ ; Graphite metal |
| Bolts, Nuts | Stainless steel A2-70 |
| | |
| **Color: Valve / Pneumatic actuator** | RAL7016 / RAL6018 |
| | |
| **Weight** | |
| Set DN200/8" with pneumatic actuator | 220 Kg / with HV version 225 Kg |
| Set DN250/10" with pneumatic actuator | 258 Kg / with HV version 263 Kg |
| Set DN300/12" with pneumatic actuator | 320 Kg / with HV version 325 Kg |
| | |
| **Nominal pressure** | PN25/362.5 PSI for valves in cast Steel 1.0.619+N |
| | |
| **Mounting position** | Vertical and horizontal position |
| | |
| **Flanges drilled according to** | EN 1092-1 PN25 |
| | ANSI150 |
| | JIS 5K , JIS 10K |
| | |
| **Flow characteristic** | Equal percentage + linear |
| | |
| **Counter flanges** | DIN2635 |
| | |
| **Opening** | DN200 75mm |
| | DN250 90mm |
| | DN300 95mm |
| **$K_{vs}$ rating $m^3/h$** | |
| DN200/8" | 725 |
| DN250/10" | 1000 |
| DN300/12" | 1500 |
| | |
| **Seating** | Single seated balanced |
| **Leakage rate** | Up to 0.01% of Kvs [m3/h] |
| | |
| **Actuator** | Pneumatic actuator |
| | Supply air pressure: 3-10 BAR |

## Technical data continued

### Dimensions in [mm]

| | Description | | Positioner |
|---|---|---|---|
| **Fig.1** | Steam Valve with Pneumatic Actuator and Manual Override | H1FBE | EPL ; PS-2 |
| **Fig.2** | Steam Valve with Pneumatic Actuator and Manual Override HV – with cooling unit | H1FBE HV | EPL ; PS-2 |



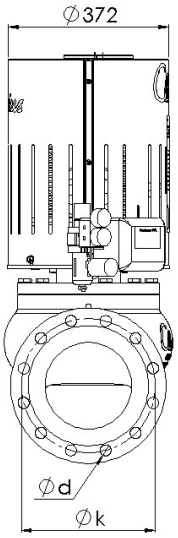
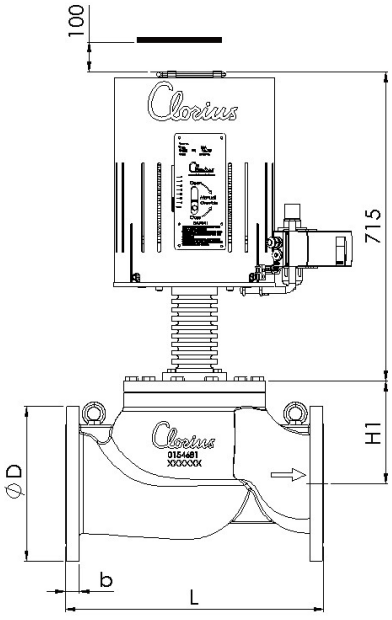




Fig.1



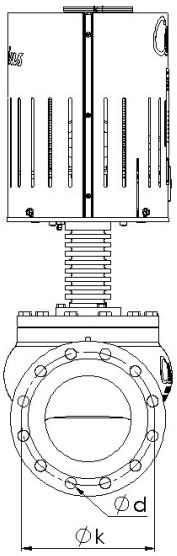
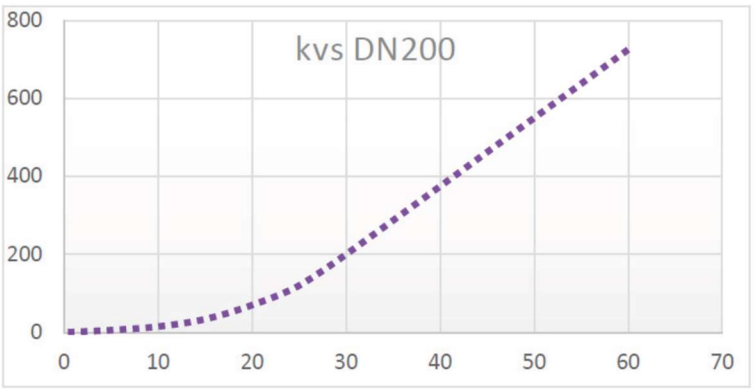



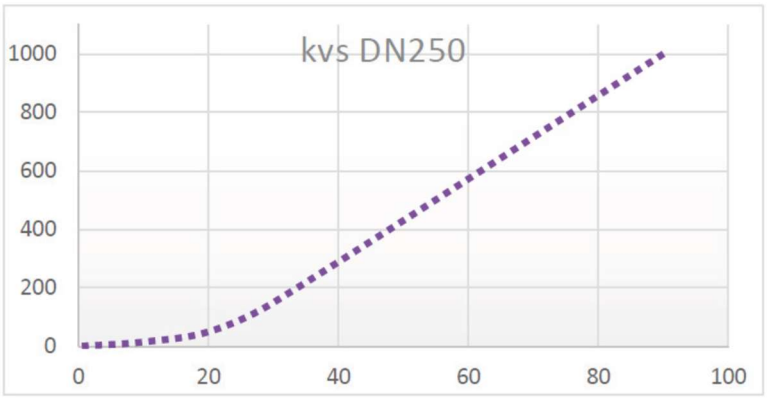

Fig.2

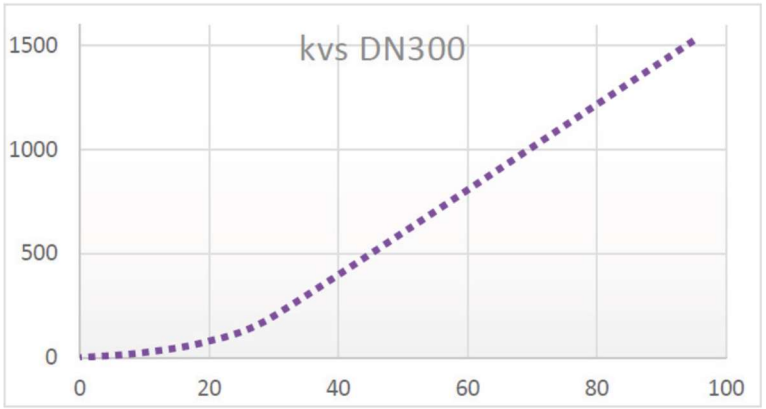
| Size | Norm | L [mm] | H1 [mm] | D [Ø mm] | b [mm] | k [Ø mm] | d [Ø mm] |
|---|---|---|---|---|---|---|---|
| **DN200** | EN 1092-1 PN25 | 600 | 238 | 360 | 30 | 310 | 12xØ26 |
| | ANSI150 | 600 | 238 | 343 | 30 | 298 | 8xØ22 |
| | JIS 5K | 600 | 238 | 320 | 30 | 280 | 8xØ23 |
| | JIS 10K | 600 | 238 | 320 | 30 | 290 | 12xØ23 |
| **DN250** | EN 1092-1 PN25 | 730 | 227 | 425 | 32 | 370 | 12xØ30 |
| | ANSI150 | 730 | 227 | 406 | 32 | 362 | 12xØ25 |
| | JIS 5K | 730 | 227 | 385 | 32 | 345 | 12xØ23 |
| | JIS 10K | 730 | 227 | 400 | 32 | 355 | 12xØ25 |
| **DN300** | EN 1092-1 PN25 | 850 | 301 | 485 | 32 | 430 | 16xØ30 |
| | ANSI150 | 850 | 301 | 483 | 32 | 432 | 12xØ25 |
| | JIS 5K | 850 | 301 | 430 | 32 | 390 | 12xØ23 |
| | JIS 10K | 850 | 301 | 445 | 32 | 400 | 16xØ25 |

## CHARACTERISTICS

Working characteristics describe a change in flow as a function of the stroke for a variable pressure drop in the valve, in the installed state.
For an equal percentage characteristic, the equal increase in relative stroke "h" corresponds to an equal percentage increase in relative flow coefficient "kv".
The valve characteristic is based on the design.



# 2. Transport, Storage and Marking

The valve must be transported and stored in a dry and clean condition. In humid rooms, a desiccant or heating must be used to avoid condensation.

During transport and intermediate storage the valve should not be exposed to temperatures less than -10°C/+14°F up to +65°C/+149°F.

The valves are painted (top coated) on the outside. This coating must remain Undamaged, otherwise the faulty spots must be repaired immediately.

The standard packaging protects valves and equipment against rain and snow during shipping.

Protect against external forces (such as impacts, vibration etc.)
Valve mountings such as actuators, positioners, filters and protection shields must not be used as a shield for external forces.
Suitable materials handling and lifting equipment should be used.
The valves are designed with a special lifting eye also located on the valve body. (Fig. 3)
The weight of assembled valve is indicated on the data sheet no. 2.4.04.

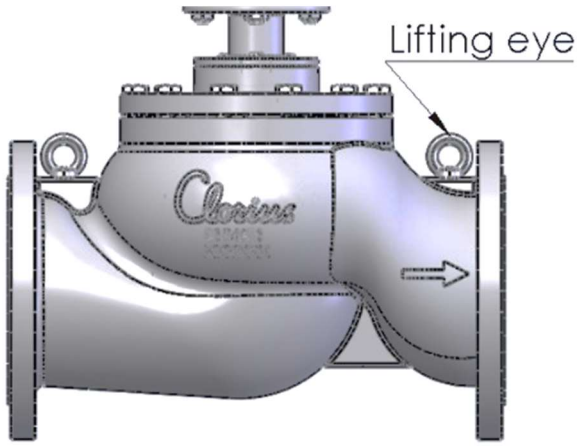


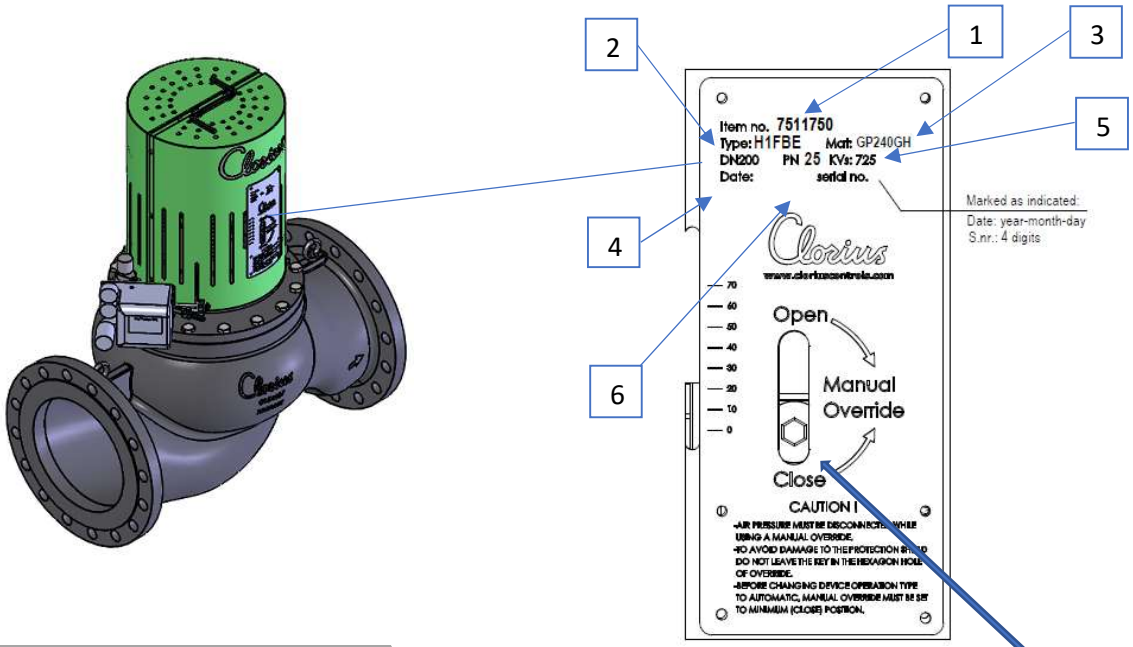

Fig.3

# 3. Commissioning and installation

3.1: Always check that the equipment delivered is in accordance with specifications and without any damage or errors.
3.2: It is recommended to use a strainer in front of the control valve, if liquid contains suspended particles
3.3: The valves can be installed both vertically and horizontally.

**Layout and data for the nameplate**

Item number, type, material, diameter, nominal pressure, KVs, serial number and date of manufacture are stated on the name plate and riveted in front of the valve.




| | Description |
|---|---|
| 1 | Set item number |
| 2 | Valve type |
| 3 | Body/Cover Material |
| 4 | Valve size |
| 5 | KVs. Valve rating |
| 6 | Nominal pressure |

**CAUTION**
**TO AVOID DAMAGE TO THE PROTECTION SHIELD DO NOT LEAVE THE KEY IN THE HEX. OVERRIDE HOLE.**

**Note:** Steam valves are operated by pneumatic or electric positioners. In the event of air failure, manual control can be used.
When selecting the type of positioners, the parameters should must be taken into account.

## Positioner technical data

**SET 1**

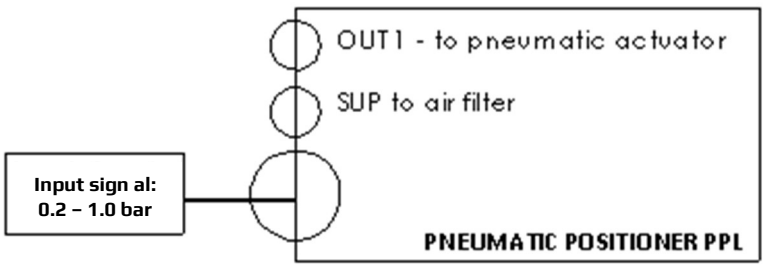
**PNEUMATIC ACTUATOR AND POSITIONER TYPE PPL 0.2-1 BAR FOR STEAM VALVE DN200 , DN250, DN300 H1FBE AND H1FBE HV , PN25**

**PNEUMATIC ACTUATOR- SC TYPE**

- SUPPLY AIR PRESSURE: 3-10 BAR
- PAINTED RAL 6018

**PNEUMATIC POSITIONER PPL**

- INPUT SIGNAL:0.2 - 1.0 BAR
- TEMPERATURE RANGE: -20 ~ +70C
- PROTECTION CLASS: IP66
- FILTER TYPE AW20K-F02CE
- INCL. MANOMETER AND FILTER
- CONNECTION: 1/4"




**SET 2**

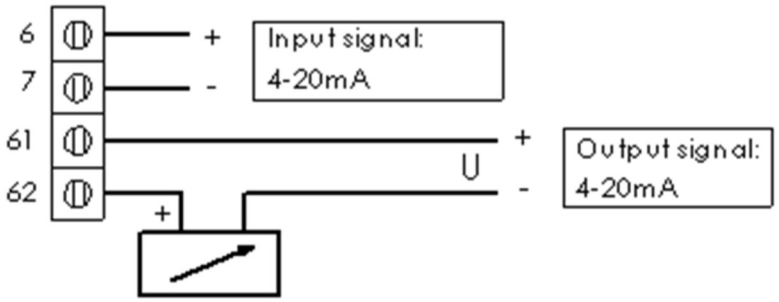
**PNEUMATIC ACTUATOR AND POSITIONER TYPE PS-2 FOR STEAM VALVE DN200 , DN250, DN300 H1FBE AND H1FBE HV, PN 25**

**PNEUMATIC ACTUATOR - SC TYPE**

- SUPPLY AIR PRESSURE: 3-10 BAR
- PAINTED RAL 6018

**ELECTRO PNEUMATIC POSITIONER PS-2**

- INPUT: 4-20 mA, TWO CORE,
- FEEDBACK 4-20 mA
- CONNECTION: M20 & G1/4
- FILTER TYPE AW20K-F02CE
- INCL. MANOMETER AND FILTER
- CONNECTION: 1/4"

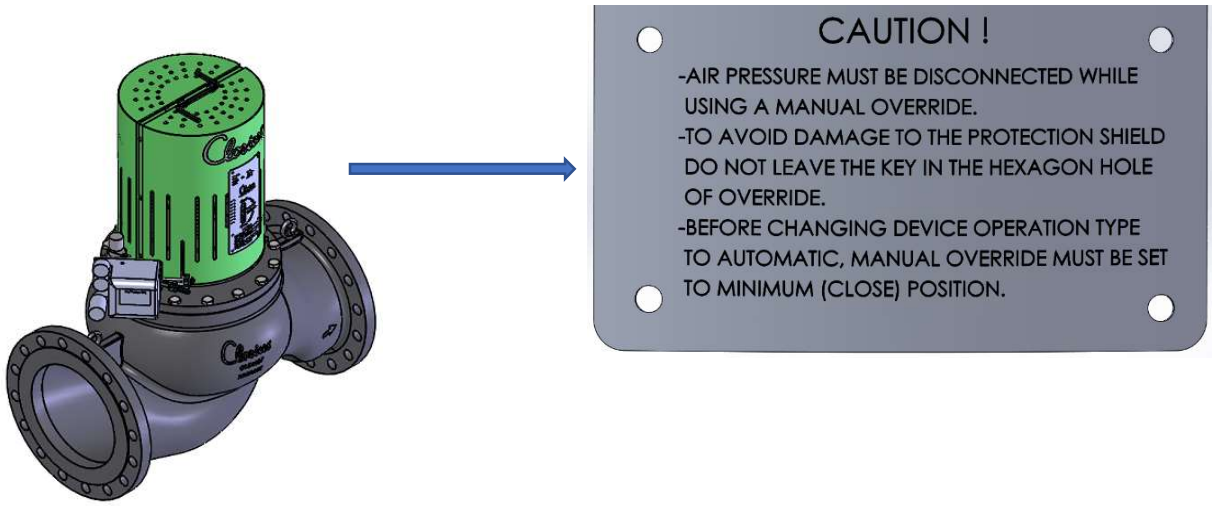



# 4. Caution

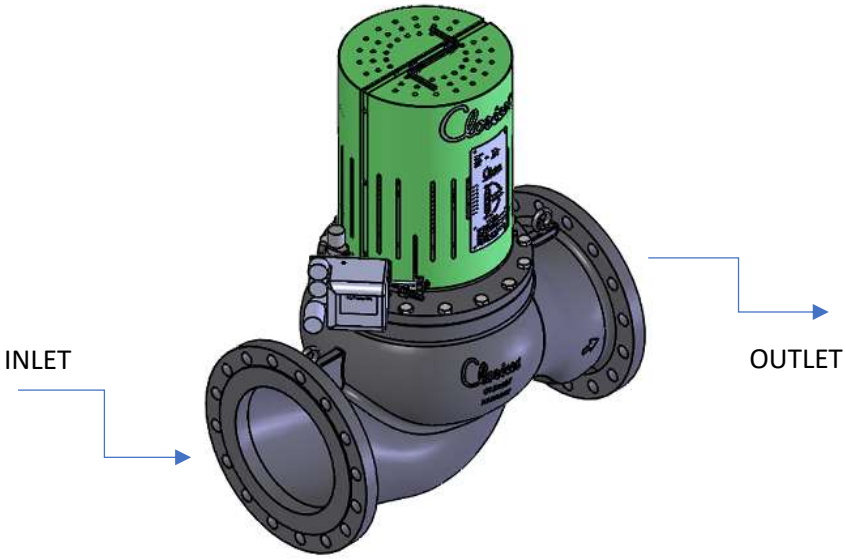
Clorius steam valves should be operated in accordance with the manual.
The manual override should be operated as follows:

AIR PRESSURE MUST BE DISCONNECTED WHEN USING MANUAL OVERRIDE.
BEFORE CHANGING DEVICE OPERATION TYPE TO AUTOMATIC,
MANUAL OVERRIDE MUST BE SET TO MINIMUM (CLOSE) POSITION.

Operation safety instructions are stated on the nameplate.




**FLOW DIRECTION**



# 5. Service and maintenance

Service and maintenance intervals must be determined by the operator according to the service conditions.
No special tools are required to dismantle parts or perform maintenance.
The steam valve set is fully tested prior to shipment from the factory.
In the event of critical technical problems that cannot be resolved, please contact Clorius Controls or an authorized agents for customer service support.

**Warranty Information:**

The warranty will be void under the following conditions:

- Failure or damage caused by misuse or abuse.
- Failure or damage caused by unauthorized modifications or repairs carried out on the set.
- Failure caused by fire, flood damage or any other influence caused by natural conditions.

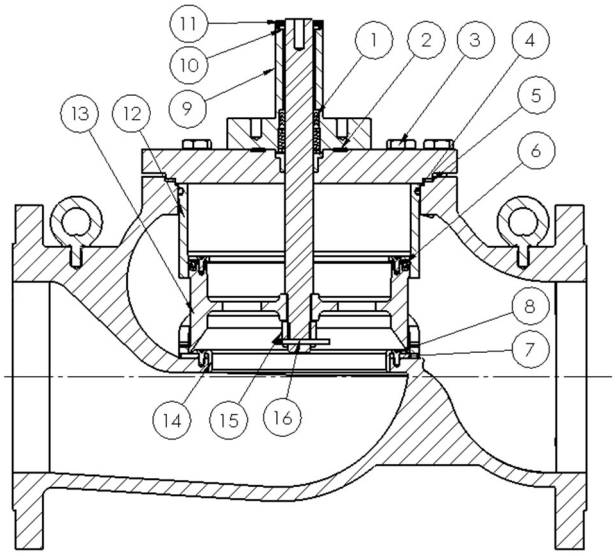
THE GUARANTEE PERIOD IS 12 MONTHS FROM
THE DATE OF DELIVERY TO THE OWNER.

UP TO MAXIMUM 18 MONTHS FROM THE DATE OF THE INVOICE.

# 6. Spare parts

| PACKING SET | | | | |
|---|---|---|---|---|
| **VALVE SIZE** | **DN200** | **DN250** | **DN300** | **POS.NO** |
| **ITEM NO.** | 2992820 | 2992824 | 2992828 | 1 - 8 |

| TRIM SET | | | | |
|---|---|---|---|---|
| **VALVE SIZE** | **DN200** | **DN250** | **DN300** | **POS.NO** |
| **ITEM NO.** | 2992822 | 2992826 | 2992830 | 1 - 16 |

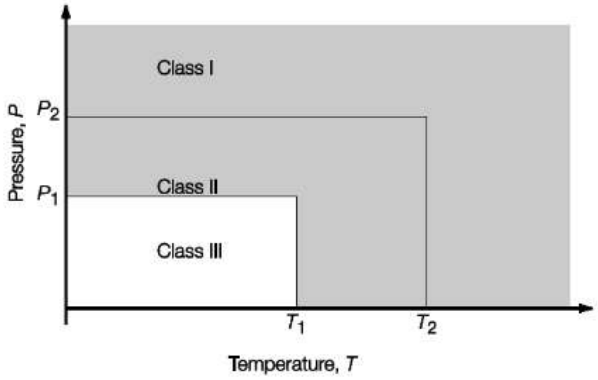



| COMPONENT LIST | |
|---|---|
| **POS. NO.** | **DESCRIPTION** |
| 1 | CHEVRON SEALING |
| 2 | GASKET |
| 3 | BOLT |
| 4 | O-RING |
| 5 | COVER GASKET |
| 6 | LIP SEAL |
| 7 | GASKET |
| 8 | SCREW M6X16 |
| 9 | VALVE STEM |
| 10 | TOP SEAL |
| 11 | RING FOR LIP SEAL |
| 12 | VALVE RING |
| 13 | VALVE PLUG |
| 14 | BOTTOM RING |
| 15 | NUT M24 |
| 16 | SPLIT PIN 5X50 |

# 7. Certification

Clorius Steam valves can be supplied with the following documents.
The documents must be requested when placing the order.

3.1 material certificate
2.2 certificate
Declaration of conformity (DoC)
Factory acceptance test report (FAT)
Green Passport (MD + MD management)
Marine class society certificate:
If operating condition is declared by the customer as class III we are able to to supply a corresponding marine certificate
If the valve working conditions is declared by the customer as class II or I we are able to supply a corresponding marine certificate but specifying 3.2 material.




NOTE
$T_1$ and $P_1$ correspond to the maximum temperatures and pressures for a Class III piping system and $T_2$ and $P_2$ to those for a Class II piping system depending on the service.

*Figure 12.1.1 Classes of piping system*

**Table 12.1.1 Maximum pressure and temperature conditions for Class II and III piping systems**

| Piping system | Class II | | Class III | |
|---|---|---|---|---|
| | $P_2$ | $T_2$ | $P_1$ | $T_1$ |
| | MPa | °C | MPa | °C |
| Steam | 1,6 | 300 | 0,7 | 170 |
| Thermal oil | 1,6 | 300 | 0,7 | 150 |
| Flammable Liquids, see Note 1 | 1,6 | 150 | 0,7 | 60 |
| Other media, see Note 2 | 4 | 300 | 1,6 | 200 |
| Cargo oil | 4 | 300 | 1,6 | 200 |

Note 1. Flammable liquids include fuel oil, lubricating oil and flammable hydraulic oil.

Note 2. Including water, air, gases, non-flammable hydraulic oil.

# 8. Contact

**Denmark**

Clorius Controls
Skovvej 30
DK5610 Assens
Tel: +45 77 32 31 30

**USA**

Clorius Controls - USA
27657 Commerce Oaks Drive
Oak Ridge North, TX 77385
Tel: +1 920 350 3622

**Poland**

Clorius Controls – Poland
UL. Strefowa 19
58-200 Dzierżoniów
Tel: +48 74 832 79 51

**China**

Room 1910-1911, Unicom International
Tower, No 547 West Tian Mu Road
Shanghai 200070 P.R. China
Tel: +86 21 33 030 279

Email**: mail@cloriuscontrols.com**

See also **www.cloriuscontrols.com** for further information

End of manual