

# TYPE APPROVAL CERTIFICATE

**This is to certify:****That the Change over Valve**with type designation(s)  
**06401**

Issued to

**Herose GmbH Armaturen und Metalle  
Bad Oldesloe Schleswig-Holstein, Germany**

is found to comply with

**DNV GL rules for classification – Ships Pt.5 Ch.7 Liquefied gas tankers  
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems  
DNV GL class programme DNVGL-CP-0186 – Type approval – Valves****Application :****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.****Temperature range: -196°C to +185°C  
Max. working press.: PN 160  
Sizes: DN 15, DN 25**Issued at **Høvik** on **2018-01-15**for **DNV GL**This Certificate is valid until **2023-01-14**.DNV GL local station: **Hamburg**Approval Engineer: **Guido Friederich**

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**Olaf Drews  
Head of Section**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



## Product description

Type 06401

For installation of 2 safety valves in parallel on the same (tank) outlet.  
3 types of inlet/outlet connections:

1. In- and outlet: Locking sleeve
2. In- and outlet: Threads for fitting the safety valves
3. In- and outlet: Flange

### Materials:

|                |                |                       |
|----------------|----------------|-----------------------|
| Body:          | Mat.No. 1.4571 | ASTM A276 Grade 316Ti |
| Valve seal     | PCTEF          |                       |
| Plug:          | Mat.No. 1.4571 | ASTM A276 Grade 316Ti |
| Bellow stem:   | Mat.No. 1.4571 | ASTM A276 Grade 316Ti |
| Headpiece      | Mat.No. 1.4571 | ASTM A276 Grade 316Ti |
| Welding piece  | Mat.No. 1.4571 | ASTM A276 Grade 316Ti |
| Locking sleeve | Mat.No. 1.4571 | ASTM A276 Grade 316Ti |
| Flange         | Mat.No. 1.4571 | ASTM A276 Grade 316Ti |

Size range: DN 15, 25

Rating: PN 63, PN 100, PN 125, PN160

## Application/Limitation

May be used for air and cryogenic liquified gases, including LNG

### Limitation

Valves may not be used for media specified as toxic and/or dangerous fluids.

Valves with threaded connections are NOT permitted for installation on board of DNV GL classed liquefied gas tankers and in ship's LNG and gas fuel systems.

For valves to be installed on board of ships other than liquefied gas tankers the following limitations apply:

Valves for installation in systems operating with flammable gases are to be classed within Pipe Class I, see DNV GL Rules Pt. 4 Ch. 6 - Piping systems.

Threaded joints may be used for outside diameters as stated below except for piping systems conveying toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur.

- Threaded joints in CO2 systems shall be allowed only inside protected spaces and in CO2 cylinder rooms
- Threaded joints with tapered thread shall be allowed for pipe class I, outside diameter not more than 33,7 mm.
- Pipe Class II and Class III outside diameter not more than 60,3 mm.
- Threaded joints with parallel thread shall be allowed for Pipe class III, outside diameter not more than 60.3 mm.

Job Id: 262.1-022901-2  
Certificate No: TAP0000186

## Installation

The following valve connections are permitted for installation in liquefied gas applications (including LNG):

- But welded joints with full penetration welding
- Flange connections in accordance with recognized standards

For all types of valve connections the requirements in DNV GL Rules Pt. 5 Ch. 7 – Liquefied gas tankers, Section 5 shall be observed.

## Type Approval documentation

The approval is based on the following documentaiton :

- Manufacturers brochure on each valve
- Design drawings including parts lists
- Test reports submitted with the manufacturers application

## Production testing

### I. Application for Liquefied gas tankers

#### 1. Certification of valves [ DN $\geq$ 100 or Working temperature $<$ -55°C]

For all valves having a nominal Diameter DN  $\geq$  100 or a working temperature below -55°C a product certificate has to be issued by DNV GL based on the following scope of tests and according to:

DNV GL Rules Part 5, Chapter 7 – Liquefied gas tankers, Section 5, Item 13.2

#### Type of test

Shell strength  
Seat tightness test  
Functional test

#### Test pressure

1,5 times the design pressure  
1,1 times the design pressure  
Design / work pressure

Pt. 5 Ch. 7, Section 1, Table 7 – Certification of components

#### DN $\geq$ 100 or

Working temperature  $<$  -55°C

#### Type of certificate / Issued by

VL Certificate / DNV GL

#### 2. Additional cryogenic testing – 10 % of the batch

In addition, cryogenic testing consisting of valve operation and leakage verification for a minimum of 10% of each type and size of valve intended to be used at a working temperature below -55°C shall be carried out.

#### 3. Material certification of valves working temperature $<$ -55°C

DNV GL Rules Part 5, Chapter 7 – Liquefied gas tankers

Pt. 5 Ch. 7, Section 1, Table 8 – Certification of material quality and testing

Material certificates of valve bodies

#### Valve nominal diameter

DN  $>$  100  
DN  $\leq$  100

#### Type of Certificate / Issued by

VL Certificate / DNV GL  
W Works Certificate / Manufacturer

#### 4. Certification of valves [ Working temperature $\geq$ -55°C]

For all valves intended for use at a working temperature  $\geq$  -55°C a works certificate has to be issued based on the tests listed above and according to

DNV GL Rules Part 5, Chapter 7 – Liquefied gas tankers, Section 1

#### Valve nominal size

DN  $<$  100 mm

#### Type of certificate / Issued by

W Works Certificate / Manufacturer

Material certificates (valve bodies)  
W Works Certificate, issued by  
Manufacturer

## Production testing - continuation

### II. Application in machinery piping systems

Valves intended to be installed in piping system listed in DNVGL Rules Pt.4,Ch.6 – Section 1 shall be certified according to DNV GL Rules Pt.4 Ch.6 – Piping systems, Section 9

#### Valve nominal size / Pressure rating

DN > 100 mm / PN > 16 bar

DN ≤ 100 mm / PN ≤ 16 bar

Ship side valves DN > 100 mm  
regardless of pressure rating

#### Type of certificate / Issued by

VL Certificate / DNV GL

W Works Certificate / Manufacturer

VL Certificate / DNV GL

#### Material certificates (valve bodies)

In accordance with DNV GL Rules Pt.4 Ch.6 – Piping systems, Section 2 – Table 3

#### Note:

Valves having a nominal diameter DN >100 and to be fabricated with a design temperature > 400°C shall provide VL material certificates for valve body and bolts.

## Marking of product

For traceability to this type approval the valves are to be marked with:

- Manufacturers name or trade mark
- Type designation
- Size
- Maximum design pressure and temperature

## Periodical assessment

A condition for retention of the Type Approval Certificate in its validity period is that periodical assessments are successfully carried out.

The objective of the periodical assessment is to verify that the conditions for the type approval have not been altered. The main scope of the periodical assessment will normally include:

- Verification of the TA applicant's production and quality system w.r.t ensuring continued consistent production of the type approved products at the TA applicant's own premises and at other companies that are given the responsibility for manufacturing of the products.
- Review of the TA documentation and that this is still used as a basis for the production
- Review of possible changes to the design, the material and the performance of the product
- Verification of the product marking

**END OF CERTIFICATE**