

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Safety Valve**

with type designation(s)

Safety valves with bellow seal, Types: 06800, 06801, 06805, 06806

Issued to

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

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**DNV GL rules for classification – Ships Pt.4 Ch.7 Pressure equipment****DNV GL class programme DNVGL-CP-0186 – Type approval – Valves****Application :****Safety Valve.****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.****Type:****Safety valves with bellow seal****Types: 06800, 06801, 06805, 06806****K. factor:****See safety valve certificate**Issued at **Høvik** on **2018-01-24**for **DNV GL**This Certificate is valid until **2023-01-23**.DNV GL local station: **Essen**Approval Engineer: **Guido Friederich****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.



Job Id: 262.1-027982-1
Certificate No: TAP00000K7
Revision No: 1

Product description

Type 06800:

Spring loaded 90° angle type, metal to metal seating, closed bonnet. The inlet is threaded to the outlet body. Bellow seal on the stem. Working temperature: -270°C to 225°C. Set pressure range: 3-25 bar

3 types of inlet/outlet connections:

[See Limitations]

1. Inlet: Female thread type G (BSPP) acc. to ISO 228/1,
Outlet: female thread type G (BSPP) acc. to ISO 228/1
2. Inlet: Female thread NPT acc to ANSI B1.20.1,
Outlet: female thread type G (BSPP) acc. to ISO 228/1
3. Inlet: Female thread NPT acc to ANSI B1.20.1,
Outlet: Female thread NPT acc to ANSI B1.20.1

Nominal sizes: 1/2", 3/4" and 1"

Materials:

Outlet body: Mat.No. 1.4308 ASTM A351 CF8
Inlet body: Mat.No. 1.4571 ASTM A276 Grade 316Ti
Disc: Mat.No. 1.4541 ASTM A276 Grade 321
Stem: CW453K ASTM B103 UNS C52100

K-values

Nominal size	1/2"	1/2"	3/4 "	1"
α_w , vapours, gases	0.60	0.50	0.60	0.66
α_w , liquids	-	0.39	0.45	0.48

Type 06801:

Spring loaded 90° angle type, metal to metal seating, closed bonnet. The inlet is threaded to the outlet body. Bellow seal on the stem. Working temperature: -270°C to 225°C. Set pressure range: 3-25 bar

4 types of inlet/outlet connection:

[See Limitations]

1. Inlet: male thread type G (BSPP) acc. to ISO 228/1,
Outlet: female thread type G (BSPP) acc. to ISO 228/1
2. Inlet: Male thread type R (BSPT) acc to ISO 7/1,
Outlet: female thread type G (BSPP) acc. to ISO 228/1
3. Inlet: Female thread NPT acc to ANSI B1.20.1,
Outlet: female thread type G (BSPP) acc. to ISO 228/1
4. Inlet: Female thread NPT acc to ANSI B1.20.1,
Outlet: Female thread NPT acc to ANSI B1.20.1

Nominal sizes: 1/2", 3/4" and 1"

Materials:

Outlet body: Mat.No. 1.4308 ASTM A351 CF8
Inlet body: Mat.No. 1.4571 ASTM A276 Grade 316Ti
Disc: Mat.No. 1.4541 ASTM A276 Grade 321
Stem: CW453K ASTM B103 UNS C52100

K-values:

Nominal size	1/2"	3/4 "	1"	1"
α_w , vapours, gases	0.60	0.50	0.60	0.66
α_w , liquids	-	0.39	0.45	0.48

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Type 06805:

Spring loaded 90° angle type, metal to metal seating, closed bonnet, manual checklift. The inlet is threaded to the outlet body. Working temperature: -270°C to 225°C. Set pressure range: 3-25 bar Bellow seal on the stem.

3 types of inlet/outlet connections:

[See Limitations]

1. Inlet: Female thread type G (BSPP) acc. to ISO 228/1,
 Outlet: female thread type G (BSPP) acc. to ISO 228/1
2. Inlet: Female thread NPT acc to ANSI B1.20.1,
 Outlet: female thread type G (BSPP) acc. to ISO 228/1
3. Inlet: Female thread NPT acc to ANSI B1.20.1,
 Outlet: Female thread NPT acc to ANSI B1.20.1

Nominal sizes: 1/2", 3/4" and 1"

Materials:

Outlet body: Mat.No. 1.4308 ASTM A351 CF8
 Inlet body: Mat.No. 1.4571 ASTM A276 Grade 316Ti
 Disc: Mat.No. 1.4541 ASTM A276 Grade 321
 Stem: CW453K ASTM B103 UNS C52100

K-values:

Nominal size	1/2"	1/2"	3/4 "	3/4 "	1"
α_w , vapours, gases	0.60	0.50	0.50	0.60	0.66
α_w , liquids	-	0.39	0.39	0.45	0.48

Type 06806:

Spring loaded 90° angle type, metal to metal seating, closed bonnet, manual checklift. The inlet is threaded to the outlet body. Working temperature: -270°C to 225°C. Set pressure range: 3-25 bar Bellow seal on the stem.

4 types of inlet/outlet connection:

[See Limitations]

1. Inlet: male thread type G (BSPP) acc. to ISO 228/1,
 Outlet: female thread type G (BSPP) acc. to ISO 228/1
2. Inlet: Male thread type R (BSPT) acc to ISO 7/1,
 Outlet: female thread type G (BSPP) acc. to ISO 228/1
3. Inlet: Female thread NPT acc to ANSI B1.20.1,
 Outlet: female thread type G (BSPP) acc. to ISO 228/1
4. Inlet: Female thread NPT acc to ANSI B1.20.1,
 Outlet: Female thread NPT acc to ANSI B1.20.1

Nominal sizes: 1/2", 3/4" and 1"

Materials:

Outlet body: Mat.No. 1.4308 ASTM A351 CF8
 Inlet body: Mat.No. 1.4571 ASTM A276 Grade 316Ti
 Disc: Mat.No. 1.4541 ASTM A276 Grade 321
 Stem: CW453K ASTM B103 UNS C5
 2100

Nominal sizes: 1/2", 3/4" and 1"

K-values all types:

Nominal size	1/2"	3/4 "	1"	1"
α_w , vapours, gases	0.60	0.50	0.60	0.66
α_w , liquids	-	0.39	0.45	0.48

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Requirements for safety valves depending on pipe classes and application

The requirements on the safety relief valve design, material grades and certificates of pressurised parts as well as the scope and requirements of production testing depends on the application and pipe class. For the range of application specified on page 1 of this certificate the following DNVGL Rules are to be observed:

- DNV GL Pt. 2, Ch. 1, Sec. 2 (Approval of material manufacturers)
- Ch.2, Sec. 8 – 5 Castings for boilers, pressure vessels and piping systems
- Sec. 8 – 6 Ferritic steel castings for low temperature service
- Sec. 8 – 7 Stainless steel castings
- DNV GL Pt. 4, Ch. 6, Sec. 1 – Table 1 (pipe classes)
- Sec. 1 – Table 4 (certification requirements)
- Sec. 2 - Table 3 (material certificates acc. to pipe classes)

In addition, for steam and pressure vessels application

- DNV GL Pt.4, Ch. 7, Sec.1 - General Requirements
- Sec.2 - Materials
- Sec.3 - Thermal-oil installations
- Sec.5 – 2 Safety Valves (steam boilers)
- Sec.7 – Manufacture, workmanship and testing

In addition, for cryogenic application

- DNV GL Pt. 5, Ch. 7, Sec. 1, Table 7 - Certification of components
- Ch. 7, Sec. 6 – Materials of Construction, Quality Control and Marking
- DNV GL Pt. 6, Ch. 2, Sec. 5, Table 4 - Certification of material quality and testing

Application/Limitation

Safety relief valves for air, gases, vapours, cryogenic liquefied gases.

Limitation

Safety 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.

The installation of safety valves in pressurized systems has to be observed under consideration of the specific operating conditions, type of flowing media and observation of the applicable DNG GL Rules and Pipe Classes.

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Tests carried out

Flow test, Seat and leakage test, Cryogenic test

Type Approval documentation

The approval is based on the following documentation: :

- Manufacturer's brochure on each valve.
- Test reports submitted with the manufacturers application
- Design drawings
- Parts lists with material specifications

Pressure safety valve production testing and certification

The following tests (to be done on each valve) are to be performed under the supervision by a DNV GL Surveyor:

Type of test	Test standard
Determination of discharge coefficient Verification of discharge capacity Hydarulic pressure test of the valve housing Test pressure = 1,5 times the design presssure Check of set pressure and reset pressure at room temperature	Recognized standard, e.g. ISO 4126

Note

¹ Sufficient valve capacity is to be approved for each application.

² Set pressure is to be sealed by the DNV GL Surveyor

Each safety relief valve is subject to production testing according to the applicable DNVGL Rules as following:

- Part 4, Chapter 6 – Piping systems, Section 9-3 - Valves
- Part 4, Chapter 7 – Pressure equipment, Section 5 and Section 7

Certification and Documentation

The following minimum scope of documents have to accompany each product/delivery:

- Instruction and maintenance manuals.
- Surveyor's Report.
- Documentation of materials used for safety valves for installation on board of DNV GL classed ships in accordance with DNV GL Rules Part2 Materials and Welding, Chapter 1, Ch.2 and Ch.4.
- Material certificates in accordance with DNV GL Rules Pt. 4 Ch. 6 - Piping Systems,
- Table 3 - Material Certificates.

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Marking of product

For traceability to this Type Approval the products are at least to be marked with:

- Manufacturer's name or trade mark
- Valve type designation
- Size
- Maximum design pressure and temperature
- Set pressure

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