DNV·GL

TYPE APPROVAL CERTIFICATE

Certificate No:
TAP00000NJ
Revision No:
1

This is to certify:

That the Pressure Regulator

with type designation(s)
4186-1, 4186-3

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 class programme DNVGL-CP-0186 – Type approval – Valves

Application :

Pressure Regulator.
Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Type:	Temperature range:	Max. working press.:	Sizes:
4186-1	-196°C to +200°C	PN 50	DN 20
4186-3	-196°C to +200°C	PN 40	DN 20

Issued at **Høvik** on **2018-01-24**

This Certificate is valid until **2023-01-18**.
DNV GL local station: **Hamburg**

Approval Engineer: **Guido Friederich**

for **DNV GL**
Digitally Signed By: Drews, Olaf
Location: DNV GL Hamburg, Germany
Signing Date: 25.01.2018

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

Pressure reducing regulators to be installed for gas pressure control in piping systems.
The pressure regulator type 4186-3 provides a bellow seal design covering the regulator spring

Type 4186-1 Regulator DN 20 / PN50

Materials:

Regulator item	EN Material No.	ASTM Material
Body	1.4308	ASTM A351 CF8
Bonnet	1.4408	ASTM A351 CF8M
Diaphragm	1.4404	ASTM A240 Grade 316L
Support ring	1.4301	ASTM A276 Grade 304
Diaphragm ring	1.4301	ASTM A276 Grade 304
Spring plate	1.4571	ASTM A 313 Grade 316Ti
Spring	1.4310	ASTM A313 Grade 301
Set point screw	1.4301	ASTM A276 Grade 304
Valve seal	PTFE	
Bellow	1.4571	ASTM A313 Grade 316Ti
Bellow spring	1.4571	ASTM A313 Grade 316Ti
Connecting nipple	1.4571	ASTM A313 Grade 316Ti

Type 4186-3 Regulator DN 20 / PN40

Materials:

Regulator item	EN Material No.	ASTM Material
Body	1.4308	ASTM A351 CF8
Bonnet	1.4408	ASTM A351 CF8M
Bellow	1.4571	ASTM A313 Grade 316Ti
Spring plate	1.4571	ASTM A313 Grade 316Ti
Lift stopper	1.4571	ASTM A313 Grade 316Ti
Lift stopper	1.4571	ASTM A313 Grade 316Ti
Spring	1.4310	ASTM A313 Grade 301
Spring plate	1.4571	ASTM A 313 Grade 316Ti
Set point screw	1.4301	ASTM A276 Grade 304
Valve seal	PTFE	
Bellow	1.4571	ASTM A313 Grade 316Ti
Lift stopper	1.4571	ASTM A313 Grade 316Ti
Lift stopper	1.4571	ASTM A313 Grade 316Ti

Pipe connections
Thread connections, metrical thread (M); BSPP (G); NPT (A_A) ; (A_B) (A_C)

Thread	GA_A	M 40 x 2,0	G 1-1/4	NPT 1 1/4”
Thread	GA_B	M 40 x 2,0	G 1-1/4	NPT 1 1/4”
Thread	GA_C	M 26 x 1,5	G 3/4	NPT 3/4”

Application / Limitation

Type 4186-1 ; type 4186-3
Use for air, nitrogen, gases vapours and cryogenic liquefied gases, including LNG
Working temperature: -196°C to 200°C
Ambient temperature: - 40°C to + 65°C

Type 4186-1
Set point range: 1,0 up to 12 bar; 6,0 up to 24 bar; 16,0 up to 38 bar

Type 4186-3
Set point range: 2,0 up to 10 bar; 8,0 up to 22 bar; 20,0 up to 38 bar

Limitation

Regulators may not be used for sour gas and media specified as toxic and/or dangerous fluids.

Regulators and 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 the regulator in pipe systems for pressure control applications has to be observed under consideration of the specific flow applicatons and observation of the applicable DNG GL Rules.

Type Approval documentation

- Regulator design drawings
- Parts lists with material specification
- Product data sheets: Regulator type 4186-1 ; Regulator type 4186-3
- Test report TÜV Nord, issued 2015-07-30
- Type Approval Assessment Report, issued

Tests carried out

- Pressure test
- Flow capacity test
- Functional test

Production testing

II. Application in machinery piping systems
Regulators and 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	Type of certificate / Issued by
DN > 100 mm / PN > 16 bar	VL Certificate / DNV GL
DN ≤ 100 mm / PN ≤ 16 bar	W Works Certificate / Manufacturer
Ship side valves DN > 100 mm regardless of pressure rating	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 products are to be marked with:
- Manufacturers name or trade mark
- Valve / regulator type designation
- Size
- Maximum design pressure and temperature
- Arrow to indicate direction of flow on one way flow valve

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