TYPE APPROVAL CERTIFICATE

Certificate no.:
TAP00000K3
Revision No:
4

This is to certify:

that the Check Valve

with type designation(s)
05414, 05417, 05419, 05614, 05714, 05717, 05719

issued to
HEROSE GMBH Armaturen und Metalle
Bad Oldesloe, Schleswig-Holstein, Germany

is found to comply with
DNV rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV rules for classification – Ships Pt.5 Ch.7 Liquefied gas tankers
DNV class programme DNV-CP-0186 – Type approval – Valves
IMO IGC-Code

Application:

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

Type:	Temperature range:	Max. working press.:	Sizes:
05414, 05417, 05419	**see certificate**	**see certificate**	**see certificate**
05614	**see certificate**	**see certificate**	**see certificate**
05714, 05717, 05719	**see certificate**	**see certificate**	**see certificate**

Issued at **Hamburg** on **2025-12-17**

This Certificate is valid until **2030-12-16**.
DNV local unit: **Essen**

Approval Engineer: **Jörg Hille**

for **DNV**

This document has been digitally signed and will therefore not have handwritten signature

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 05414:
Butt weld or socket weld connection or stainless-steel stubs according to DIN EN ISO 1127 or ASTM A312
Spring loaded closing mechanism designed to open at approx. 0.1 bar

Materials for sizes DN 10, 15, 20, 25, 32, 40, 50, 65, 80, 100, 150 and 200:

Body	DIN 1.4308	ASTM A351 CF8
Bonnet gasket	PTFE	
Cap	DIN 1.4301	ASTM A276 Grade 304
Disc	DIN 1.4301	ASTM A276 Grade 304
Valve seal up to DN50	PTFE/Carbon filled (25%)	
Valve seal from DN 65	PTFE	
Plate (up to DN 150)	DIN 1.4305	ASTM A276 Grade 303
Plate (DN 200)	DIN 1.4571	ASTM A313 Grade 316 Ti

Type 05417:
Spring loaded closing mechanism designed to open at approx. 0.1 bar
Female thread connection (G) acc. to ISO 228/1, (R) acc. to ISO 7-Rc, NPT acc. to ANSI B 1.20.1

Materials for sizes DN 10, 15, 20, 25, 40 and 50:

Body	DIN 1.4308	ASTM A351 CF8
Bonnet gasket	PTFE	
Cap	DIN 1.4301	ASTM A276 Grade 304
Disc	DIN 1.4301	ASTM A276 Grade 304
Valve seal	PTFE/Carbon filled 25%	
Plate	DIN 1.4305	ASTM A276 Grade 303

Type 05419:
Flanged connection acc. to DIN EN 1092-1 PN40 or ANSI B16.5 Class 150/ 300
Spring loaded closing mechanism designed to open at approx. 0.1 bar

Materials for sizes DN 15, 20, 25, 40, 50, 65, 80, 100 and 150:

Body	DIN 1.4308	ASTM A351 CF8
Bonnet gasket PTFE		
Cap	DIN 1.4301	ASTM A276 Grade 304
Disc	DIN 1.4301	ASTM A276 Grade 304
Valve seal up to DN50	PTFE/Carbon filled (25%)	
Valve seal from DN65	PTFE	
Plate	DIN 1.4305	ASTM A276 Grade 303

Type 05614:
Flanged connection acc. to DIN EN 1092-1 PN40 or ANSI B16.5 Class 150/ 300
Spring loaded closing mechanism designed to open at approx. 0.1 bar

Materials for sizes DN 10, 15, 20, 25, 32, 40, 50, 65, 80, 100 and 150:

Body	DIN 1.4308	ASTM A351 CF8
Check disc	DIN 1.4301	ASTM A276 Grade 304
Valve seal	PTFE/Carbon filled (25%)	
Plate	DIN 1.4571	ASTM A313 Grade 316 Ti
Bonnet gasket	Graphite	
Cap	DIN 1.4301	ASTM A276 Grade 304

Type 05714:
Butt weld or socket weld connection or stainless-steel stubs according to DIN EN ISO 1127 or ASTM A312
Spring loaded closing mechanism designed to open at approx. 0.1 bar

Materials for size DN 10, 15, 20, 25, 32, 40, 50, 65, 80, 100, 150 and 200:

Body	DIN 1.4409,	ASTM A351 CF3M
Bonnet gasket	Graphite	
Cap	DIN 1.4404	ASTM A276 Grade 316L
Cone plate	DIN 1.4404	ASTM A276 Grade 316L
Seal	PCTFE	
Plate	DIN 1.4571	ASTM A313 Grade 316 Ti

Type 05717:
Female thread connection (G) acc. to ISO 228/1, (R) acc. to ISO 7-Rc, NPT acc. to ANSI B 1.20.1
Spring loaded closing mechanism designed to open at approx. 0.1 bar

Materials for sizes DN 10, 15, 20, 25, 40 and 50:

Body	DIN 1.4409	ASTM A351 CF3M
Bonnet gasket	Graphite	
Cap	DIN 1.4404	ASTM A276 Grade 316L
Disc	DIN 1.4404	ASTM A276 Grade 316L
Valve seal	PTFE/Carbon filled (25%)	
Plate	DIN 1.4404	ASTM A276 Grade 316L

Type 05719:
Spring loaded closing mechanism designed to open at approx. 0.1 bar
Flanged connection acc. to DIN EN 1092-1 PN40 or ANSI B16.5 Class150 / 300

Materials for sizes DN 10, 15, 20, 25, 40, 50, 65, 80, 100, 150 and 200:

Body	DIN 1.4409	ASTM A351 CF3M
Check disc	DIN 1.4404	ASTM A276 Grade 316L
Valve seal up to DN50	PTFE/Carbon filled (25%)	
Valve seal from DN65	PTFE	
Valve seal DN 200	PCTFE	
Bonnet gasket	Graphite	
Cap	DIN 1.4404	ASTM A276 Grade 316L

Application

Stainless steel check valves approved for the use in ships piping, machinery piping, fuel systems and cargo handling piping systems. Operating media include flammable gases, nitrogen and cryogenic liquefied gases including LNG[1,2].

Pressure rating	DN10 to DN100	PN50
	DN150	PN40
	DN200	PN25
Working temperature	05414, 05417, 05419, 05614	-196°C to +120°C
	05714, 05717, 05719	-255°C to +120°C

Limitation

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

Valve subjected to hydrogen service conditions are not covered within this type approval.

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

Valves with threaded connections shall only be used for accessory lines and instrumentation lines with external diameters of 25 mm or less.

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-RU-SHIP Pt. 4 Ch. 6 - Piping systems.

Threaded connections may be used for the outside diameters specified below, but not in piping systems that transport toxic or flammable media, or in applications where fatigue, severe erosion or crevice corrosion is expected.
Threaded connections in CO2 systems are only permitted in protected rooms and in CO2 cylinder rooms.
Threaded connections with tapered threads are permitted for pipe class I with an external diameter of no more than 33.7 mm, pipe class II and class III with an external diameter of no more than 60.3 mm.
Threaded connections with parallel threads are permitted for pipe class III with an external diameter of no more than 60.3 mm.

Valve designs for use and installation in ammonia (NH3) and methanol (CH3OH) ship fuel systems require additional approval by the flag state administration for each particular ship as these fuels are not covered by the IGF Code at present. The interim Guideline for Safety of Ships using Ammonia as fuels - MSC.1-Cir.1687 published on 2025-02-26 shall be observed.

Valve designs for installation in ship's liquid nitrogen (LN2) systems require additional approval by the flag state administration for each particular ship as liquid nitrogen (LN2) with a design temperature of -196° C is not covered by the IGF Code and IGC Code. The minimum design temperature in the IGF
Code and IGC Code is limited to -165°C for LNG, while LN2 is only referred for testing with
a test temperature of -196 °C.

Valves for installation in ship's hydrogen (H2) systems require additional product certification and approval by the flag state administration for each particular ship as hydrogen (H2) is not covered by the IGF Code and IGC Code.

Materials for fuel pipes shall be as given in Pt.2 Ch.2 Sec.5 and materials in LFL piping systems shall be provided with documentation as required for cargo piping in accordance with Pt.5 Ch.6.

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 valves connections, the requirements in DNV-RU-SHIP Pt. 5 Ch. 7 – Liquefied gas tankers, Section 5 must be observed.

Type Approval documentation

For TA renewal rev.3.

Drawings

- 05414-x-000x-WkStListe, rev. F.2, dated 2020-02-10
- 05414-DN200-Zulassung, rev. A.2, dated 2024-05-22
- 05417-x-000x-WkStListe, rev. -.0, dated 2015-08-25
- 05419-x-000x-WkStListe, rev. A2, dated 2016-10-17
- 05614-DNxx-Zulassung, rev. -.1, dated 2020-09-30
- 05714-DN200-Zulassung, rev. A.2, dated 2024-05-15
- 05717-x-000x-WkStListe, rev. A.2, dated 2019-10-01
- 05719- DNxx-Zulassung, rev. -.1, dated 2020-04-27
- 05719- DN200-Zulassung, rev. B.2, dated 2024-05-15

Specifications

- DN200__05414_05614_baubeschr_2024-04
- DN200__05714_05719_baubeschr_2024-04

Reports

- Type Approval Assessment Report, dated 2025-09-10
- Test Plan for cryogenic valves acc. to BS6364 for globe valves of types 01841, 01843, witnessed by Lloyds Register, dated 2019-10-08
- Test Plan for cryogenic valves acc. to BS6364 for check valves of type 05414, covers also types 05414, 05417, 05419 and 05714, witnessed by Lloyds Register, dated 2019-10-08

Tests carried out

Burst test, pressure test, tightness test.

Production testing and valve certification

I. Application for Liquefied gas tankers

1. Certification of valves [DN ≥ 100 **or** Working temperature < -55°C]
   For all valves having a nominal diameter DN ≥ 100 or a working temperature below -55°C a Product Certificate (PC) shall be issued by DNV based on the following scope of tests and according to:
   DNV-RU-SHIP Part 5, Chapter 7 – Liquefied gas tankers, Section 5, Item 13.1

Type of test	Test pressure
Shell strength	1,5 times the design pressure
Tightness test of pressure bearing housing	1,1 times the design pressure
Seat tightness test	1,1 times the design pressure
Functional test	Design / work pressure

DNV-RU-SHIP Pt. 5 Ch. 7, Section 1, Table 7 – Compliance documents

Valve nominal diameter / Working temperature	Type of certificate / Issued by
DN ≥ 100 or working temperature < -55°C	Product Certificate (PC) / DNV

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
DNV-RU-SHIP Part 5, Chapter 7 – Liquefied gas tankers

Pt. 5 Ch. 7, Section 1, Table 8 – Compliance documents for material quality and testing
Material certificates of valve bodies

Valve nominal diameter	Type of certificate / Issued by
DN > 100, design temperature <-55°C	Material Certificate (MC) / DNV
DN > 100, design temperature ≥ -55°C	Material Declaration (MD) / Manufacturer
DN ≤ 100	Material Declaration (MD) / Manufacturer

4. Certification of valves [DN < 100 and working temperature ≥ -55°C]
For all valves having a nominal diameter DN < 100 intended for use at a working temperature ≥ -55°C a Product Declaration (PD) shall be issued based on the tests listed above and according to DNV-RU-SHIP Part 5, Chapter 7 – Liquefied gas tankers, Section 1, Table 7 – Compliance documents

Valve nominal diameter	Type of certificate / Issued by
DN < 100	Product Declaration (PD) / Manufacturer

II. Application in Gas as fuel systems

For each valve intended to be installed in ship's gas fuel supply systems a Product Certificate (PC) shall be issued based on the following scope of tests and according to DNV Rules Part 6, Chapter 2, Section 5 – Gas fuelled ship installations

1.

Type of test	Test pressure
Shell strength	1,5 times the design pressure
Tightness test of pressure bearing housing	1,1 times the design pressure
Seat tightness test	1,1 times the design pressure
Functional test	Design / work pressure

2. Valves in LNG / Gas fuel system – Table 3 Certification required

Valve design conditions - Test and certification	Type of certificate / Issued by
Design temperature < 0°C / DNV Pt.5 Ch.7 irrespective of size	Product Certificate (PC) / DNV
Design pressure > 10 bar/ DNV Pt.5 Ch.7 irrespective of size	Product Certificate (PC) / DNV
Design pressure ≤ 10 bar Design temperature ≥ 0°C	Product Declaration (PD) / Manufacturer

3. Material certificates
DNV Pt. 6 Ch.2 Section 5 – Gas fuelled ship installations
Table 4 Certification of material quality and testing

Design temperature	Type of certificate / Issued by
< 0°C	Material Certificate (MC) / DNV
≥ 0°C	Material Declaration (MD) / Manufacturer

III Application in Ammonia as fuel systems

Valves intended to be installed in piping systems listed in DNV Rules Pt.4 Ch.6 – Section 1 shall be certified according to DNV Rules Pt.6 Ch.2, Section 14 – Gas fuelled ship installations – Gas fuelled ammonia, Table 5 – Compliance documents

Valve nominal size / Pressure rating	Type of certificate / Issued by
Design temperature < 0°C	DNV Pt.5 Ch.7, Section 5, irrespective of size Product Certificate (PC), / DNV
Design pressure > 10 bar	DNV Pt.5 Ch.7, Section 5, irrespective of size Product Certificate (PC) / DNV

Material certificates (valve bodies)
In accordance with DNV Rules Pt.6 Ch.2, Section 14 – Gas fuelled ship installations – Gas fuelled ammonia, Table 6 - Table 6 Compliance documents for material quality and testing

IV Application in machinery piping systems

Valves intended to be installed in piping systems listed in DNV Rules Pt.4 Ch.6 – Section 1 shall be certified according to DNV Rules Pt.4 Ch.6 – Piping systems, Section 1, Table 3 Compliance documents – piping components

Valve nominal size / Pressure rating	Type of certificate / Issued by
DN > 100 mm / PN > 16 bar	Product Certificate (PC) / DNV
DN ≤ 100 mm / PN ≤ 16 bar	Product Declaration (PD) / Manufacturer

Material certificates (valve bodies)
In accordance with DNV Rules Pt.4 Ch.6 – Piping systems, Section 2, Table 3 – Material certificates

Marking of product

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

- manufacturer's name or trade mark
- valve type designation
- size
- maximum design pressure and temperature
- arrow to indicate direction of flow on one way flow valves
- material designation
- minimum design temperature (for cryogenic applications).

Manufacturer

Production place

- Herose GmbH Armaturen und Metalle, Elly-Heuss-Knapp-Straße 12, 23843 Bad Oldesloe, Germany

Responsibility
Herose GmbH Armaturen und Metalle, locates in 23843 Bad Oldesloe, Germany, is responsible for the design and the production procedures with relation to ensuring continued consistent production of the type approved products. Reference DNV CP-0338 Type approval scheme, Section 4.

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment to verify that the conditions for the Type Approval are complied with. Refer to the Class Programme DNV-CP-0338, Section 4.

In addition, burst pressure tests must be carried out on selected sizes as part of the certificate renewal process.

To check the validity of this certificate, please look it up in https://approvalfinder.dnv.com

--- END OF CERTIFICATE ---