

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Check Valve**with type designation(s)
RHDI, RHD, RHV, RHZ

Issued to

**Parker Hannifin Manufacturing Germany GmbH & Co KG
BIELEFELD, 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****DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018****Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Temperature range: Refer to certificate.****Max. working press.: 250bar up to 400bar****Sizes: 1/8" up to 1 1/2", 6mm up to 42mm**Issued at **Hamburg** on **2018-09-18**This Certificate is valid until **2023-09-17**.for **DNV GL**DNV GL local station: **Hamburg**Approval Engineer: **Hagen Markus**

**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

Valve type	Connection
RHD	EO 24° cone end / EO 24° cone end
RHDI	Female BSPP thread / Female BSPP thread (ISO 1179-1)
RHV-R-ED	EO 24° cone end / Male metric thread – ED seal
RHV-M-ED	EO 24° cone end/Male metric thread – ED-seal (ISO 9974)
RHZ-R-ED	Male BSPP thread – ED-seal (ISO 1179) / EO 24° cone end
RHZ-M-ED	Male metric thread – ED-seal (ISO 9974) / EO 24° cone end
RHDMLOS	O-Lok ORFS end / O-Lok ORFS end
RHV42EDMLOS	Male BSPP thread-ED-seal (ISO 1179) / O-Lok ORFS end
RHZ42EDMLOS	O-Lok ORFS end / Male BSPP thread-ED-seal (ISO 1179)
RHV50MLOS	Male UN/UNF thread-O-ring (ISO 11926) / O-Lok ORFS end
RHZ50MLOS	O-Lok ORFS end / Male UN/UNF thread-O-ring (ISO 11926)
RHV82EDMLOS	Male metric thread – ED -seal (ISO 9974) /O-Lok ORFS end
RHZ82EDMLOS	O-Lok ORFS end / Male metric thread – ED -seal (ISO 9974)
RHDMTXS	Triple-Lok flare end / Triple-Lok flare end
RHV42EDMXS	Male BSPP thread-ED-seal (ISO 1179) / Triple-Lok flare end
RHZ42EDMXS	Triple-Lok flare end / Male BSPP thread-ED-seal (ISO 1179)
RHV50MXS	Male UN/UNF thread-O-ring (ISO 11926) / Triple-Lok flare end
RHZ50MXS	Triple-Lok flare end / Male UN/UNF thread-O-ring (ISO 11926)
RHV82EDMXS	Male metric thread – ED -seal (ISO 9974) / Triple-Lok flare end
RHZ82EDMXS	Triple-Lok flare end / Male metric thread – ED -seal (ISO 9974)

Production places

This certificate includes in addition the following production places:

Production place	DNV GL Station
Parker Hannifin Sp.z.o.o. ul. Eugeniusza Kwiatkowskiego 16 PL- 55011 Siechnice, Poland Valve types: RHD, RHV, RHZ, RHDI	Gdansk

Responsibility

The company Parker Hannifin Manufacturing Germany GmbH & Co. KG takes the responsibility that both design and production are in compliance with the DNV GL Rules and Class Programme listed on page 1.

Materials¹

The tables below specify the standard types of materials.

For detailed standard material designation refer to Parker Hannifin Catalogue 4100, Section C.

	Material designation
Valve body	Steel, zinc plated, Cr(VI)-free
	Stainless steel
Sealing material	FKM, NBR, EPDM ²

Notes

¹ Special materials acc. to Parker Hannifin overview "List of material grades".

Application/Limitation

The Parker Hannifin check valves are type approved for application in machinery piping systems included in pipe class I, II and III installed on board ships and offshore installations.

Service media fuel -, lubricating - and hydraulic oil, technical water, compressed air.

The valves are not approved for application in:

- steam, combustible / explosive gas, oxygen
- high pressure fuel injection systems of combustion engines
- where seat tightness is required under fire conditions, e.g. "fire-safe" applications

Selection of materials

It shall be noted that the selection of the materials considers the applicable service condition with respect to type of media, flow velocity, media temperature etc. and installation area of the piping system. In addition, service life is to be considered.

For application in sea water piping systems or unprotected installation, e.g. open deck special materials stainless steel grades with a minimum pitting resistance equivalent number (PREN) of > 33 shall be used. Refer to Parker Hannifin overview "List of material grades".

Reference is further made to DNVGL Rules Pt.4, Ch.6 – Section 2 – Materials.

Sizes and pressure range¹

Serial L			
Carbon Steel		Stainless Steel	
Pipe O.D. mm	Nominal pressure PN	Pipe O.D. mm	Nominal pressure PN
6 - 18	400	6 - 15	250
22 - 42	250	18 - 22	160
		28 - 42	100
Serial S			
Carbon steel		Stainless steel	
Pipe O.D. mm	Nominal pressure PN	Pipe O.D. mm	Nominal pressure PN
6 - 25	420	6 - 12	400
30 , 38	250	14, 16	315
		20 - 38	250

Notes

¹ Pressure reductions factors for elevated service temperatures are to be observed. Ref. to Catalogue 4100, Section "Performance data".

Temperature range

Material	Lowest allowable temperature	Maximum allowable temperature
Carbon steel	- 20°C ³	+ 200°C
Stainless steel	- 55°C	+ 400°C
NBR	- 35°C / - 40°C ¹	+ 100°C / + 120°C ¹
FKM	- 25°C / - 35°C ¹	+ 200°C ¹
EPDM ²	- 40°C	+ 150°C

Notes

- ¹ Applicable to ambient temperature of hydraulic and pneumatic applications.
Refer to "Parker Hannifin Catalogue 4100-10/UK", Section C2.
- ² Fittings with O-Ring made of EPDM shall not be used for hydrocarbon service.
- ³ Lowest medium temperature -20°C and lowest environmental temperature -40°C.
Refer to DIN 3859-1.

Temperature range examples

Stainless steel pipe fitting with NBR sealing: - 35°C up to +100°C (Media)
Carbon steel pipe fitting with FKM sealing: - 20°C up to +200°C

Assembling and Installation

For assembly and installation, the Parker Hannifin Catalogues 4100, section F is to be observed.

Production testing

Each check valve shall be subjected to a function test (check of opening pressure) and gas seat leakage test acc. to Parker Hannifin production instruction "FBU Steel / VSS/M&A-7810".

Certification of valves

Valves shall be delivered with material certificate type TR (EN 10204, 2.2).

Type Approval documentation

Tests carried out

Marking of product

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

Scope	Example
Manufacturers name or trade mark	Parker, identification sign of manufacturer
Opening pressure in bar (if other than 1 bar)	5, 0.5
Arrow to indicate direction of flow	→
Nut	EO/P on nut size

Periodical assessment

For retention of the type approval certificate periodical assessments shall be carried out at production places by DNVGL surveyor.

Job Id: **262.1-022088-1**
Certificate No: **TAP00001EH**

The objective of the periodical assessment is to verify that the design and production conditions for the type approval have not been altered.

Main scope of the assessment:

- verification of the production and quality control system
- review of quality control documentation of recent deliveries
- review of drawings in production to verify any design changes which may have an impact on data specified in the type approval certificate, performance and range of application
- verification of the product marking
- witness of burst testing on selected sizes from production.

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

End of certificate