DNV·GL

Certificate No:
TAP00000K9

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Ball Valve

with type designation(s)
KHB, KHBG, KHF, KHBF, KHM, KHMG, KHMF , KHMFF

Issued to
HYDAC Accessories GmbH; D-66280 Sulzbach (Saar) / Germany

,

is found to comply with
DNV GL rules for classification – Ships
DNV GL class programme DNVGL-CP-0186 – Type approval – Valves

Application :

May be used in following systems: Fresh and sea-water cooling, fuel - and lube oil, steam, sanitary and compressed air - see page 4 for limitations.

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

Temperature range:	**Dep. on materials, see certificate**
Max. working press.:	**Dep. on size and type, see certificate**
Sizes:	**DN4 to DN100, see certificate**

This Certificate is valid until **2021-10-04**.

Issued at **Hamburg** on **2016-10-05**

for **DNV GL**

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.

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Product description

BALL VALVES

1.
KHB Block type, size DN 04 – 50
KHM Sleve type, size DN 04 – 50
End connections for valve types, KHB and KHM :

G	(int. or ext. threads - ISO 228/1)
LR	(pipe threads for bite/compression, light range - DIN 2353)
SR	(pipe threads for bite/compression, heavy range - DIN 2353)
D1	(60 degr. cone connection - DIN 3863)
NPT	(int. or ext. threads - ASA B 2.1)
SAE	(int or. ext. threads - ASA B 1.1)
M	(int. metric threads - ISO 6149)
M	(ext. metric threads - DIN 13)
F3	Flanges acc. to SAE - ISO 6162, table 1
F6	Flanges acc. to SAE - ISO 6162, table 2
ORFS	(Int. or ext. threads - ISO 8434-3)

2.
KHBG Block type, size DN 16 – 50
KHMG Sleve type, size DN 16 – 50
End connections for valve types, KHBG and KHMG :

F3	Threaded Flanges acc. to SAE - ISO 6162, table 1
F6	Threaded Flanges acc. to SAE - ISO 6162, table 2

3.
KHBF Flange type, DIN / EN 558-1, FTF basic range 1, size DN 16 – 50
KHMF Flange type, DIN / EN 558-1, FTF basic range 1, size DN 16 – 50
End connections for valve types, KHBF and KHMF :

F1	Flanges acc. to DIN / EN 558-1, FTF basic range 1
F1	Flanges acc. to ANSI B 16.5

4.
KHBFF Flange type, DIN / EN 558-1, FTF basic range 14, size DN 32 – 50
KHMFF Flange type, DIN / EN 558-1, FTF basic range 14, size DN 32 – 50
KHMFF Flange type, DIN / EN 558-1, FTF basic range 14, size DN 65 – 100
End connections for valve types, KHBFF / KHMFF :

F4	Flanges acc. to DIN / EN 558-1, FTF basic range 14

5.
KHMFF Flange type, CETOP RP63H, FTF, size DN 32 – 50
End connections for valve types KHMFF :
CETOP- Flanges acc. to CETOP RP63H, size DN 32 – 50

6.
KHF3/6 Block type for Fixed Flanges acc. to SAE - ISO 6162, table 1, size DN 16 - 50
Block type for Fixed Flanges acc. to SAE - ISO 6162, table 2, size DN 16 - 50
End connections for valve types, KHF3/6 :

F3/6	Fixed Flanges acc. to SAE - ISO 6162, table 1 and 2

7.
KHF3 Block type for Fixed Flanges acc. to SAE - ISO 6162, table 1
End connections for valve types, KHF3/6 :
F3 Fixed Flanges acc. to SAE - ISO 6162, table 1
F6 Fixed Flanges acc. to SAE - ISO 6162, table 2

Application/Limitation

Valve types	Size	Ends	Max.pressure (bar) at ambient temperature
KHB / KHM	04 - 13 16 20 - 50	All	500 400 350
KHBG / KHMG	16 20 - 50	Flanges Flanges	400 350
KHBF	16 - 50	Flanges	10 to 315 max. pressure dependant on flange dimensions
KHMF	16 - 50	Flanges	10 to 315 max. pressure dependant on flange dimensions
KHBFF	32 - 50	Flanges	10 to 40 max. pressure dependant on flange dimensions
KHMFF	32 - 50	Flanges	10 to 40 max. pressure dependant on flange dimensions
KHMFF	32 - 50	CETOP Flanges	315 max. pressure dependant on flange dimensions
KHMFF	65 - 100	Flanges	10 to 40 max. pressure dependant on flange dimensions
KHF3/6	16 - 50	Flanges	420
KHF3	65 80 100	Flanges	160 100 25

Max. pressure for threaded pipe ends is limited to 40 bar when the pressure tight joint is made on the threads, (class III piping systems).

Max. pressure to be de-rated dependant on temperature.
General de-rating factors at 250 °C:
Carbon steel un-alloyed: 0,72
Low alloyed steels : 0,81
Stainless steels : 0,67

Temperature limitation:

Ball seal material	Spindle seal material	Max. temp.	Max. pressure
Polyacetal	-	100 °C	500 bar
Nitrile	-	100 °C	100 bar
PTFE	-	250 °C	100 bar
	Nitrile	100 °C	500 bar
	Viton	200 °C	500 bar
	EPDM	150 °C	500 bar
	PTFE	250 °C	100 bar

The approval does not cover systems with oxygen.
The approval does not include any operating gear for remote control of the valves.
The valve may not be used for services where “fire safe” applications are required. See below table

System		Closing valves	Regulation valves
Flammable fluids (Flash point ≤60^0 C)			
1	Cargo oil	No	Yes
2	Crude oil washing	Yes	Yes
3	Vent	Yes	Yes
Flammable fluids (Flash point >60^0 C)			
4	Cargo oil lines	No	Yes
5	Fuel oil	No	Yes
6	Lubrication oil	No	Yes
7	Hydraulic oil	No	Yes
8	Thermal oil	No	Yes
Inert gas			
9	Water seal effluent lines	Yes	Yes
10	Scrubber effluent lines	Yes	Yes
11	Main lines	Yes	Yes
12	Distribution lines	Yes	Yes
Sea water			
13	Bilge lines	No	Yes
14	Fire main and water spray	No	No
15	Foam	No	No
16	Sprinkler	No	No
17	Ballast	No	Yes
18	Cooling water	No	Yes
19	Tank cleaning	Yes	Yes
20	Non-essential	Yes	Yes
Fresh water			
21	Cooling water	No	Yes
22	Condensate return	No	Yes
23	Non-essential	Yes	Yes
LNG			
24	Liquefied gas, working temperature t < -55^0 C	No	No
25	Liquefied gas, working temperature t ≥ -55^0 C	No	No
26	LPG	No	No
Miscellaneous			
27	Starting/control air	Yes	Yes
28	Service air (Non-essential)	Yes	Yes
29	Brine	No	Yes
30	Co_2	Yes	Yes
31	Steam	Yes	Yes
32	Sanitary	Yes	Yes
33	Refrigerants	Yes	Yes

Each valve to be surveyed and certified by DNV GL when required by DNV GL Rules, or by the Purchaser.

Each valve is to be subjected to a hydrostatic pressure test at minimum 1.5 times the design pressure.
Holding time : 2 minutes for all sizes
No leakage is permitted.
Each valve assembly shall be subjected to a hydrostatic seat leakage test at minimum 1.1 times the design pressure. The test shall be performed with closed valve with the other end open to atmosphere.
Holding time : 5 minutes for all sizes
Acceptable leakage : Drop tight

Type Approval documentation

Leaflets: E5.501.14/2.95, E5.502.12/96 and E5.512.3/4.96.
Application tables,
List of spare parts,
Test Reports with test results from burst testing received with letter dated 12th Dec. 1990.
Test Reports with test results from burst testing dated 11th Dec. 2001
Test Reports with test results from burst testing dated 20th Sep. 2002
DNV Certificate Retention Survey report, 2003-11-14
DNV Certificate Retention Survey report, 2007-11-28
DNV Certificate Retention Survey report, 2012-05-09

Tests carried out

Burst Test

Marking of product

For traceability to this type approval, each valve is at least to be marked with:

- Manufacturer's trade mark:
- Type designation
- Size
- Max. design pressure or pressure class

Periodical assessment

A condition for retention of the Type Approval Certificate in its validity period is that periodical assessments are successfully carried out. Periodical assessments will be carried out bi-yearly.

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