DNV·GL

Certificate No:
TAP00001GU

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Hydraulic Accumulator

with type designation(s)
SK400

Issued to
HYDAC Technology GmbH
Sulzbach, Saarland, Germany

is found to comply with
DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018
DNVGL-OS-E101 – Drilling facilities, Edition January 2018
DNV GL rules for classification – Ships Pt.4 Ch.7 Pressure equipment

Application :

Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.

Temperature range:	**-30°C / 100°C**
Operating media:	**Hydraulic fluid / Nitrogen**
Design pressure:	**400 bar**
Sizes:	**0.5 liter to 30 liter**

Issued at **Høvik** on **2018-10-01**
This Certificate is valid until **2023-06-29**.
DNV GL local station: **Essen Business Support**

Approval Engineer: **Iselinn Vindstad**

for **DNV GL**

Marianne Spæren Marveng
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

Piston accumulator with threaded covers designed according to EN14359:2017.

Inside dimater: 100 mm
Outside diameter:123 mm
Length: 260 mm to 4015 mm
DNV GL Vessel class : I
Corrosion allowance : 1mm
Number of load cycles (ΔP = 400 bar): 2 000 000
Design temperature: -30^0 C to $+100^0$ C

Part	Material
Shell/Cylinder	P460NL1, according to specification 03 100 995 4 03135514 (EN 10216-3)
End cover	P355QH1*, according to specification 03 100 995 4 03141488 (EN 10222-4) P355NH, according to specification 03 100 995 4 03277796 (EN 10273) P460NH*, according to specification 03 100 995 4 03141428 (EN 10273)
Piston	EN AW-6082 T6, S355J2+N (EN 10025-3), P460NH (EN10273), P355QH1 (EN10222-4), 1.4462 (EN10272)

*The material is Charpy V-tested at -40°C, guaranteed impact value 27 J.

Application/Limitation

Each accumulator shall be protected on both gas and hydraulic fluid side by a safety device such as relief valve, fuse plug or rupture disc to prevent excess pressure if overheated. When the accumulator is an integral part of a system with such a safety device, the accumulator itself need not be supplied with a safety device.

For accumulators certified according to DNVGL-OS-E101 special attention to DNVGL-OS-E101 Ch. 2 Sec. 2 [2.7] are to be made.

Based on DNVGL-RU-SHIP Pt. 4 Ch. 7 and DNVGL-OS-D101 these hydraulic accumulators could also be used for lifting appliances and offshore gangways, covered by the following DNV GL standards:
- DNVGL-ST-0377 "Standard for shipboard lifting appliances"
- DNVGL-ST-0378 "Standard for offshore and platform lifting appliances"
- DNVGL-ST-0358 "Offshore gangways"

Type Approval documentation

Tests carried out

N/A

Production testing

Each accumulator shell/seamless gas bottle shall be hydraulically pressure tested at 572 bar in the presence of a DNV GL Surveyor.

Final inspection of assembled product shall also be witnessed by DNV GL Surveyor.

Certification

Each accumulator is to be certified by a DNV GL Surveyor.

For accumulators certified according to DNVGL-RU-SHIP Pt. 4 Ch. 7 and DNVGL-OS-D101, the materials are to be delivered with certificates as per DNVGL-RU-SHIP Pt. 4 Ch. 7 Sec. 1 Table 5.
For accumulators certified according to DNVGL-OS-E101, 3.1 material certificate is sufficient for pressurized parts.

All manufacturing, workmanship and testing shall be done in accordance with EN 14359.

Marking of product

Each pressure equipment shall be permanently and legibly marked on the pressure part or on a nameplate permanently attached to a principal pressure part to show its identity and origin.
The marking of pressure vessels shall show at least the following particulars:
— manufacturer's name and address
— type designation and serial number
— year of manufacture
— maximum allowable working pressure
— hydrostatic test pressure.

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.