

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Hydraulic Accumulator**

with type designation(s)

hydropneumatic diaphragm type accumulator, with two spherical screwed parts

Issued to

**Hydro Leduc
AZERAILLES, France**

is found to comply with

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 all vessels classed by DNV GL.****Temperature range:** -20 °C/120 °C**Operating media:** Gas, Hydraulic fluid**Design pressure:** 400 bar**Sizes:** 4L, 10LThis Certificate is valid until **2022-05-19**.Issued at **Høvik** on **2017-05-20**DNV GL local station: **Paris CMC / VMC**for **DNV GL**Approval Engineer: **Mehdi Rowshan**

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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.

Product description

Type	4L		10L	
End connection	Conventional	Flanged	Convention	Flanged
Outside diameter (mm)	251	251	339	339
Height (mm)	265.8	265.8	354.1	354,1
Interior capacity (Litre)	4	4	10	10
DNV GL Category	I	I	I	I

Type: hydropneumatic bladder type accumulator as Seamless bottle with hemispherical ends

Material Designation:

- Body: 25CrMo4 (1.7218)/ Rm 685 Mpa according to EN 10083-3
- MINIMESS Inflating valve to screw: steel 1.0718
- Stop of the membrane: 2030 aluminium in T3 as per NF A 50411/ X6CrNiMoTi stainless steel 17-12-2 as per NF EN 10088-3.

Method of production: Mechanical assembly of forged machined elements.

Design code: EN 14359:2006.

Application/Limitation

Design data:

Design pressure (bar)	400	
Test pressure (bar)	600	
Maximum/Minimum service temperature (°C)	-20 /120	
Corrosion allowance (mm)	1	
Maximum load cycles @ $\Delta P=265 \pm 50$ bar	Type:4L	Type:10L
	786000	35000

- The materials used shall fulfill requirements given in EN 14359 clauses 4.1 & 4.2.
- The materials shall be delivered with material certificates in accordance with DNV GL Ship Rules Pt.4 Ch.7 Sec.1 Table 5.
- All manufacturing, workmanship and testing shall be done in accordance with EN 14359.
- Each accumulator manufactured to this type approval is to be certified by DNV GL and delivered with DNV GL product certificate when it is required by DNV GL Rules or purchaser.
- Each accumulator shell / seamless gas bottle shall be hydraulically pressure tested at to 600 bar and certified by DNV GL Surveyor.
- Final inspection of assembled product shall also be witnessed by DNV GL Surveyor.

Type Approval documentation

AS04.00_060121_sp_DNV-U
AS04.00_066645_sp_DNV-E
AS10.00_060141_sp_DNV-R
AS10.00_066895_sp_DNV-E
DH_AS04.00_060121_DNV-GL_E_NFEN14359_EN
DH_AS04.00_066645_DNV-GL_E_NFEN14359_EN
DH_AS10.00_060141_DNV-GL_E_NFEN14359_EN
DH_AS10.00_066895_DNV-GL_E_NFEN14359_EN
A-17050171-RA00001-A
A-17050171-RA00002-A

Tests carried out

N/A

Marking of product



Job Id: **262.1-018870-1**
Certificate No: **TAP00000CM**

Each pressure vessel shall be marked with the following:

- Name of manufacturer
- Type designation
- Maximum allowable working pressure at maximum temperature
- Minimum design metal temperature at maximum allowable working pressure
- Fluid medium
- Hydro test pressure
- NDT level
- Year of manufacture.

Periodical assessment

For retention of the Type Approval, a DNV GL surveyor shall perform a survey every second year and before the expiry date of this certificate to verify that the conditions of the type approval are complied with.