DNV·GL

Certificate No:
TAP00000CC

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Hydraulic Accumulator

with type designation(s)
AK...210-18, AK...350-25, AK...350-36

Issued to
Roth Hydraulics GmbH
Biedenkopf Hessen, Germany

is found to comply with
Det Norske Veritas' Rules for Classification of Ships
Det Norske Veritas' Offshore Standards

Application :

See the certificate.

Type:	Temperature range:	Operating media:	Design pressure:	Sizes:
AK...210-18	-40°C / 80°C	Nitrogen / Hydraulic fluid	210 bar	2 liter to 95 liter
AK...350-25	-40°C / 80°C	Nitrogen / Hydraulic fluid	350 bar	5 liter to 300 liter
AK...350-36	-40°C / 80°C	Nitrogen / Hydraulic fluid	350 bar	40 liter to 950 liter

This Certificate is valid until **2016-12-31**.

Issued at **Hamburg** on **2016-05-23**

for **DNV GL**

DNV GL local station: **Essen**

Approval Engineer: **Christian Kaemmer**

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

Piston accumulators with threaded covers designed according to EN 14359:2006. 1 mm corrosion allowance included.

Type	210-18	350-25	350-36
Inside diameter (mm)	180	250	360
Outside diameter (mm)	210	290	435
Shell Material	P355NH (acc. to EN 10216-3)	P460NL2 (acc. EN10216-3)	P355NH (acc. to EN 10216-3)
End Cover & Ring Material	P355NH (acc. to EN 10222-4)		
Medium	Nitrogen / Hydraulic Fluid		
Length (mm)	390 to 4045	505 to 6515	1035 to 9975
Volume (Liter)	2 to 95	5 to 300	40 to 950

APPLICATION/LIMITATION

Design Data:

Type	210-18	350-25	350-36
Design Pressure (bar)	210	350	350
Test Pressure (bar)	315	525	525
Design Temperature (℃)	-40 ~ 80		
DNV Pressure Class	I		
Load cycles	110-190 bar : n>2.000.000 or 0 – 190 bar: 14000	225 – 318 bar : n>2.000.000 or 0 – 318 bar : n=4000	

All used material shall fulfil requirements in EN 14359 clauses 4.1 & 4.2.

Used Material shall provided with certificates according to DNV Rules for classification of ships Pt.4 Ch.7 Sec.2 Table A1. Each accumulators shall be hydraulically pressure tested according to the test pressure in the above table.

Each accumulator is to be certified by Det Norske Veritas Surveyor.

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

Seamless tubes made by P355NH (for AK 210-18 type) are to be Charpy tested. Charpy-V notch requirement: 27J at –40℃. Otherwise the minimum design temperature shall be increased to -20℃.

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.

TYPE APPROVAL DOCUMENTATION

MARKING OF PRODUCT

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

- date of manufacture, (month/year);
- manufacturer's serial number;
- manufacturer's name/symbol;
- total shell volume in litres;
- allowable temperature range in degrees Celsius;
- maximum allowable pressure P_S;
- test pressure P_T;

PERIODICAL ASSESSMENT

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

END OF CERTIFICATE