DNV·GL

Certificate No:
TAP000018M

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Hydraulic cylinders for steering and reversing of water jet units

with type designation(s)
SH-8118 (steering), SH-8119 (reversing)

Issued to
PMC Cylinders AB
Sävsjö, Sweden

is found to comply with
DNV GL rules for classification – Ships
DNV GL class guideline DNVGL-CG-0194 – Hydraulic cylinders

Application :

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

Type	Design pressure (push)	Design pressure (pull)	Cylinder sizes
SH-8118 (steering)	175 bar	175 bar	65/40x213
SH-8119 (reversing)	175 bar	175 bar	65/40x180

Issued at **Høvik** on **2018-01-30**
This Certificate is valid until **2023-01-29**.
DNV GL local station: **Gothenburg**

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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Job Id: **262.1-027451-1**
Certificate No: **TAP000018M**

Product description

Hydraulic cylinders for steering and reversing of waterjet units.

Cylinder type	Tube Outer Diameter	Tube Inner Diameter	Rod Diameter	Stroke	Working Pressure, push/pull	Design Pressure, push/pull
Steering cylinder, SH-8118	75 mm	65 mm	40 mm	180 mm	140 bar	175 bar
Reverse cylinder, SH-8119	75 mm	65 mm	40 mm	213 mm	140 bar	175 bar

	Cylinder tube	Piston rod
Material	E355+SR	1.4460/1.4462

Design temperature: -20°C / 80°C

Application/Limitation

1. All welding is to be carried out by qualified welders and according to approved welding procedures. Non-destructive testing of all welds are to be performed according to DNVGL-CG-0194 - Hydraulic Cylinders. Minimum requirement to NDT is UT and MT.
2. The cylinder tube and piston rod are to be delivered with VL material certificates.
3. The end cover and piston are to be delivered with works material certificates.

Type Approval documentation

Production test and Certification

Each cylinder is to be hydraulically pressure tested to 1.5 times of the design pressure and be delivered with a DNV GL product certificate.The test pressure is to be applied on both sides of the piston in sequence. Testing are to be in accordance with to DNVGL class guideline CG-0194 - Hydraulic Cylinders in presence of DNV GL surveyor.

Marking of product

The hydraulic cylinders are to be marked with manufacturer’s name or trademark, type designations and serial number.

Periodical assessment

For retention of the Type Approval, a DNV GL surveyor shall perform a survey – every second year and before the expire date of the certificate – to verify that the conditions for the approval are complied with. Scope of the survey is to check that no alterations are made to the product design or choice of materials.