DNV·GL

Certificate No:
TAD00000K3

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Hoisting, Rotation and Pipehandling Equipment

with type designation(s)
BSAK 500-R-300 & BSAB 600-R-300

Issued to
Svendborg Brakes ApS
VEJSTRUP, Denmark

is found to comply with
DNVGL-OS-E101 – Drilling plant, Edition July 2015
DNVGL-SI-0166 – Verification for compliance with Norwegian shelf regulations, Edition July 2015

Application :

Active brakes, hydraulically activated and hydraulically released disc brakes BSAK 500-R-300 & BSAB 600-R-300. Maximum braking force 196 kN and 320 kN respectively.

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

This Certificate is valid until **2021-12-31**.

Issued at **Høvik** on **2017-01-23**
DNV GL local station: **Fredericia** for **DNV GL**

Approval Engineer: **Mohsen Mohebbi**

Per Esvall
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:
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Reference standards

- EN 1993-1-9:2005, Eurocode 3 "Design of steel structures"
- VDI-Richtlinie 2230 B1.1, "Systematic calculation of high duty bolted joints – Joints with one cylindrical bolt"

Product description

The BSAK 500-R-300 and BSAB 600-R-300 brakes are active disc brakes, hydraulically activated and hydraulically released. The two calipers are connected to a bracket with a slip resistant joint consisting of 6 bolts. The bracket is NOT included in this Type Approval.

Application/Limitation

The brakes are approved for the following particulars:

- Min. Design Temperature: -20° C
- Max. Design Temperature: 70° C

BSAK 500-R-300

- Max braking force[1)]: 196 kN
- Coefficient of friction, μ: 0,36
- Max operating pressure[2)]: 177 bar
- Max clamping force: 272 kN

BSAB 600-R-300

- Max braking force[1)]: 320 kN
- Coefficient of friction, μ: 0,36
- Max operating pressure[2)]: 175 bar
- Max clamping force: 445 kN

1) Braking force is based on max calmping force, nominal coefficient of friction μ = 0.36 and 2 brake surfaces.
2) The operating pressure is the pressure needed for to achieve maximum braking force.

Type Approval documentation

Tests carried out

- Each product is to be tested according to DNV GL's Offshore Standard DNV GL-OS-E101 "Drilling Plant", Ch.2, Sec.6, Clause 4.
- Charpy testing shall be performed in accordance with DNV GL-OS-E101 "Drilling Plant" Ch.2, Sec.2, Clause 2.
- NDE/NDT procedures shall be performed in accordance with DNV GL-OS-E101 "Drilling Plant" Ch.2, Sec.6, Clause 3.
- Qualification of welding procedures and qualification of welders shall be in accordance with DNV GL-OS-E101 "Drilling Plant" Ch.2, Sec.6, Clause 2.

Marking of product

For traceability the following marking is to be carried out on each product:

- Part No.
- Serial No.
- Rated Braking capacity
- Manufacturers Name or Mark

Other conditions and comments

- The brakes can only be used as parking brakes and are not approved as emergency brakes.
- The structure in the brakes can handle braking forces equivalent to a coefficient of friction μ = 0.45.

- The bracket and the mounting and connection of the bracket to supporting structure is not covered by this type approval and must be approved for each delivery.
- The hydraulic system (control system) is not covered in this type approval and must be approved for each drawwork delivery.
- 10.9 bolts shall be delivered with 3.1 certificate and min Charpy value 42 Joule at -20°C.
- Eyebolts for installation lifting are not included in this type approval.
- Each product is to be surveyed during fabrication in accordance with the requirements for equipment of Category I as defined in DNV GL's Offshore Standard DNV GL-OS-E101 Drilling Plant, followed by issuance of Product Certificate. If the intended installation is DNV GL classed, then this automatically means DNV GL Product Certificate. Fabrication records are to be maintained in accordance with DNV GL-OS-E101 Ch.3, Sec.3, Clause 2.
- This document may be used as part of the documentation required to comply with European Union (EU) Directives referenced in PSA's Acts, regulations and provisions for the petroleum activities. It should however be noted that the scope covered by this document does not necessarily cover all aspects required to issue the EU Declaration of Conformity and to affix the CE-mark. It is the manufacturer's/operator's responsibility to ensure compliance with relevant EU Directives.

Periodical assessment

For retention of the Type Approval, DNV GL representative shall carry out biennial Product Audits in accordance with DNV GL type approval scheme (DNVGL-CP-0338), Section 4, dated October 2015.

END OF CERTIFICATE