DNV·GL

Certificate No:
TAM0000068

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Reduction Gear for Auxiliary Turbine

with type designation(s)
GB24

Issued to
Opra Turbines B.V.
Hengelo, Netherlands

is found to comply with
Det Norske Veritas' Rules for Classification of Ships
DNV-OS-E201 "Oil and Gas Processing Systems" October 2010
DNV's Offshore Standard DNV-OS-D101 "Marine and Machinery Systems and Equipment"

Application :

The gears are approved for gas turbine application.
The approval is based on DNV Rules Pt.4 Ch.4 Sec.2 "Gear Transmissions"

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.
Input torque see page 2
Input speed see page 2

This Certificate is valid until **2017-06-30**.

Issued at **Høvik** on **2016-03-01**
DNV GL local station: **Rotterdam** for **DNV GL**

Approval Engineer: **Terje Ingvar Arvidsen**

Oddvar Deinboll
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

GB24 Two stage epicyclic gear

Field of application:

- Gas turbine packages for on- and offshore power
- Electric power generation for ships

Application/Limitation

GB24 (50 Hz) No. 6009000/nnnn/sss and 6100077/nnnn/sss		
Input power	2400	kW
Input speed	26041	Rpm
Gear rating	1:17.33	-

GB24 (60 Hz) No. 6009010/nnnn/sss and 6100095/nnnn/sss		
Input power	2400	kW
Input speed	26041	Rpm
Gear rating	1:14.44	-

Where nnnn indicates the sequence number and sss indicates the supplier code

Type Approval documentation

Tests carried out

OPRA Turbines Test program 2.4 MW gearbox: 05-11-2012

Marking of product

The product is to be marked with the manufacturer's name or trade mark and type number designation

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 of the type approval are complied with.

The objective of the Periodical Assessment is to verify that the conditions for the Type Approval are not altered since the
Type Approval Certificate was issued. The main scope of the Periodical Assessment will normally include:

- Verification of the Type Approval applicant's production and quality system w.r.t. ensuring continued consistent production of the Type Approved products at the Type Approval applicant's own premises and at other companies that are given the responsibility for manufacturing of the products.
- Review of the Type Approval documentation and that this is still used as basis for the production
- Review of possible changes to the design, the material and the performance of the product
- Verification of the product marking.

Other conditions

The type approval does not cover:

- Electric wiring, instrumentation and automation
- Lubrication system

- Connection to external shaft components.
- Fastening and foundation of the gearbox including chocking calculations

END OF CERTIFICATE