DNV·GL

Certificate No:
TAM00000G8

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Air/Exhaust Blower

with type designation(s)
EGR10 (STC-DO)

Issued to
Siemens Turbomachinery Equipment GmbH
FRANKENTHAL PFALZ, Germany

is found to comply with
DNV GL rules for classification – High speed and light craft
DNV GL rules for classification – Ships

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.
Max. working press.: ratio 1.1 at maximum flow
Operating media Exhaust Gas

Issued at **Hamburg** on **2017-04-04**
This Certificate is valid until **2022-04-03**.
DNV GL local station: **Augsburg**

Approval Engineer: **Yongju Park**

for **DNV GL**

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

Direct-drive, one-stage turbo compressor for Exhaust Gas Recirculation system consisting of an asynchronous motor equipped with oil lubricated bearings. The unit is an integrally direct-driven turbo-compressor with a Variable Frequency Drive (VFD) and preset inlet guide vanes.

Application/Limitation

The approval is made to EGR blower for the specific application to 2-stroke MAN Diesel engines in accordance with DNV GL Rules for ships Pt.4 Ch.3 Sec.1 11 Auxiliary equipment and components. Other fulfilment of performance requirement and design speicifcation required from the engine maker is not scope of DNV GL Type Approval

Technical Specifications of EGR10 and maximum / minimum inlet running conditions

1) Inlet conditions

		EGR 10
Inlet Temperature [°C]	Min	16
	Max	51
Density [kg/m3]	Min	2.5
	Max	5.5
Ratio of These Specific Heats [cp/cv]		1.385
Gas Constant [J/(kg·K)		270

2) Lubrication

Lubrication		EGR 10
Oil Type		SAE 30 & SAE 40
Viscosity		100 / 140 mm2/s
Purity		Filtration better than 50 µm
Pressure	Min	1,5 barg
	Max	4,0 barg
Temperature	Min	35 °C
	Max	60 °C
	Nominal	43,5 °C

Flow	25 l/min (EGR10 aprox. 25l/min)

3) Cooling

Cooling	EGR 10
Media	Purified Water
PH	Between 4 and 7
Purity	Filtrated to max 100 µm impurities
Pressure, Normal	2.5 – 4.5 barg
Temperature	10-36 °C
Flow	20 l / min at inlet temp 20 °C

Other conditions

1) Variable Frequency Drive (VFD) is not scope of this Type Approval

2) Sealing system is not scope of this Type Approval. It is to be delievered in accordance with MAN Diesel & Turbo´s delievery specification. Sealing system functionality and safety alarm is to be tested on board.

3) Electric cables and installation of this is not covered by this approval and must be verified to complay with the requirement of the Rules Pt.4 Ch.8 – Electrical Installation

Type Approval documentation

1. Operation and Maintenance Manual (EGR5 EGR10 EGR22)
2. EGR10 Impeller burst simulation analysis (2017 Feb)
3. EGR10 Burst Simulation - blade / volute (2017 Jan)
4. Cross sectional drawing - Assembly drawing
5. Dimensional Drawing
6. EGR 10 Blower Technical Data sheet
7. Siemens Quality Assurance Plan
8. House for IGV (inlet guide vane)
9. IGV assembly drawing
10. Impeller drawing
11. Rotor complete
12. Rotor shaft with rotor
13. P&I Diagram

Tests carried out

DNV GL Survey Report No. N141BXVV

Marking of product

The products to be marked with manufacturer's name or trademark and type number identification

Periodical assessment

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

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.

This will be according to Class Guideline DNVGL-CG-0338, Section 4.