DNV·GL

Certificate No:
TAM0000150

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Turbocharger

with type designation(s)
METxxSE

Issued to
Mitsubishi Heavy Industries Marine Machinery & Equipment Co., Ltd.
Nagasaki City, Nagasaki Pref., Japan

is found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.3 Sec.1 Reciprocating internal combustion engines

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Issued at **Høvik** on **2020-04-03**
This Certificate is valid until **2024-11-11**.
DNV GL local station: **Kobe**

for **DNV GL**

Approval Engineer: **Tage Olav Alexander Strøm**

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

Exhaust driven turbochargers served by cylinder groups with combined power in the range from 1300 kW up to 19000 kW

Application/Limitation

Type	MET33SE		MET42SE	
Compressor Wheel Tip Diameter [mm]	373		462	
Impeller size	2	3	2	3
Impeller tip dia. [mm]		373		462
Max rated speed (RPM)	26960	25440	21760	20540
Max temperature (^{0}C)	580		580	

Type	MET53SE		MET66SE	
Compressor Wheel Tip Diameter [mm]	586		730	
Impeller size	2	3	2	3
Impeller tip dia. [mm]		586		730
Max rated speed (RPM)	17160	16190	13770	13000
Max temperature (^{0}C)	580		580	

Type	MET71SE	MET83SE	
Compressor Wheel Tip Diameter [mm]	790	924	
Impeller size	3	2	3
Impeller tip dia. [mm]	790		924
Max rated speed (RPM)	12010	10870	10270
Max temperature (^{0}C)	580	580	

Maximum momentary speed is 110% of maximum rated speed.

ALARM LEVELS:
Overspeed, maximum alarm level: 105% of maximum rated speed

High exhaust temperature at turbine entry, maximum alarm level: 550 ºC.

Low lubrication oil pressure at turbocharger inlet, minimum alarm level: 0.6 bar (gauge pressure)

Maximum lubrication oil outlet temperature (alarm level): 85 ºC
Application constraints:

Maximum allowed inclinations for MET turbochargers:
Static: ± 15º
Dynamic (momentary): ± 22.5º

Engine induced vibrations to be within the specified limits given in instruction manuals for METxxSE turbochargers.

Tests carried out

Shop test result of Mitsubishi exhaust gas turbocharger MET 53SE type,
drawing no. Tz – E020 – 0715 and Inspection Report of MET53SD (identical design to MET53SE) drawing no. 98-098, Shop test of MET90SE dated 00-09-29.

Marking of product

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

Periodical assessment

For retention of the type approval, a DNV GL surveyor shall perform an assessment after 2 years and after 3.5 years, both referring to the issue date of the type approval certificate to verify that the conditions of the type approval are complied with. A renewal assessment will be performed at renewal of the certificate.

In cases where the type approved product is manufactured at other companies, the periodical assessment shall verify that the type approval applicant has a quality control system for consistent production at their licensees/subcontractors. Furthermore, periodical assessment shall be carried out randomly at these companies.

END OF CERTIFICATE