



DNV

TYPE APPROVAL CERTIFICATE

Certificate No:
TAM000019W

This is to certify:

That the Diesel Engine with injection control unit

with type designations
AYEM-GT(WS), ET(WS), ST(WS)

Issued to

Yanmar Power Technology Co., Ltd. Tsukaguchi Plant
661-0001 Amagasaki, Japan

is found to comply with

DNV Rules for classification, Ships - DNV-RU-SHIP-Pt4 Ch3 Sec1, Reciprocating Internal Combustion Engines
DNV-RU-SHIP-Pt.4 Ch.9, Control and monitoring systems

Application :

mechanical propulsion, multi engine plant

Issued at **Høvik** on **13th July, 2022**

This Certificate is valid until **12th July, 2027**.

DNV local station:

for **DNV**

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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Product description

Four stroke, in-line engine, v-engine, non-reversible, trunk-piston, with supercharging, with charge air cooling, pulsating pressure charging system, direct injection, injection operation electronically controlled, valve operation by cams, liquid fuel

Cylinder bore [mm]	155
Piston stroke [mm]	180
No. of cylinders	6 in-line, 12 in-vee

GT, ST, ET – rating definition (TIER II)
WS – TIER III

Electronic controlled fuel injection system is covered by this type approval certificate. System consists of following components produced by BOSCH:

Name	Model. No
Controller	EDC17-CV41
Rotation sensor	DG6
Phase sensor	PG3.8
Fuel pressure sensor	RDS4-18
Solenoid valve for fuel injection	DMV28
Solenoid valve for fuel pressure regulation	MPROP

Electronic controlled fuel injection system components environmental classes:

Temperature	Humidity	Vibration	EMC
A	B	B	A

Application/Limitation

Rated power [kW/cyl.]	80.83	85.83	101.67	92.5	124.83
Rated speed [rpm]	1900	1800	1900	1840	2000
Mean effective pressure [bar]	15	16.9	18.9	17.8	22.1
Max. firing pressure [bar]	134	118	143	136	162
Definition	ST	ST(WS)	ET(WS)	ET(WS)	GT(WS)

Type Approval documentation

Tests carried out

Documentation:

Test report title	Test report of Tpe Approval Test
Place of test	Yanmar, Japan
Date of test	2022-05-19 until 2022-05-20

Test engine:

Model	6AYEM-GTWS
Serial no.	9256
No. of cylinders	6
Power [kW/cyl.]	124.83
Speed [rpm]	2000

Marking of product

The product 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.

In case 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.



Job Id: **262.1-037178-1**
Certificate No: **TAM000019W**

Other Conditions

Flexible hoses with couplings to be type approved by DNV.

Engine safety, control and monitoring systems, including sensors and actuators are not covered by this type approval certificate. Documentation for engine safety, control including speed governing and monitoring systems shall be submitted for approval according to the rules Pt.4 Ch.9 Sec.1 Table 5 - Documentation requirements.

Electric cables and cabling are not covered by this approval and must be verified to comply to the rules Pt.4 Ch.8 - Electrical Installation.

END OF CERTIFICATE