DNV·GL

TYPE APPROVAL CERTIFICATE

Certificate No:
TAM00000SZ

This is to certify:

That the Dual Fuel Engine

with type designation
L28AHX-DF

Issued to
Niigata Power Systems Co., Ltd. Ohta Plant
Ohta-city, Japan

is found to comply with
DNV GL Rules for classification, Ships –
DNVGL-RU-SHIP-Pt4 Ch3 Sec1, Reciprocating Internal Combustion Engines

Application :

Multi engine plant: mechanical propulsion and auxiliary

Product approved by this certificate is accepted for installation on all vessels classed by DNV GL.

This Certificate is valid until **14th February, 2023**.

Issued at **Høvik** on **15th February, 2018**
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.

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

Cylinder bore [mm]	280
Piston stroke [mm]	390
No. of cylinders	6, 8, 9

Additional place of production
Niigata Power Systems Co., Ltd. Niigata Engine Plant, Niigata, Japan

Application/Limitation

Rated power [kW/cyl.]	320
Rated speed [rpm]	800
Mean effective pressure [bar]	19.99
Max. firing pressure [bar]	160

Type Approval documentation

Tests carried out
Documentation:

Test report titel	Shop Test Record - JOB No. K284313 and JOB No.K284313
Place of test	Niigata, Japan
Date of test	2017-06-13 until 2017-06-15 and 2018-01-16

Test engine:

Model	8L28AHX-DF
Serial no.	26117 and 57830
No. of cylinders	8
Power [kW/cyl.]	320
Speed [rpm]	800

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.

Other Conditions
Integration testing to be done on the engine with the control system as delivered before the first delivery of an engine.

Flexible hoses to be Type Approved by DNV GL.

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 and/or as listed in relevant type approval certificates.

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

The explosion protection of the gas admission valves does not comply with the hazardous area zone definition of the IGF Code, paragraph 12.5.1 and -2. For installation of engines on ships subject to that Code, proof of suitability for the intended use, either by (a) explosion protection certification, or (b) any other suitable measures in addition to the existing explosion protection level of the valve, shall be documented in the safety concept and approved accordingly. Additional measures (b) are subject to final acceptance by the relevant flag state administration for ships subject to the IGF Code.

END OF CERTIFICATE