



Certificate No:
TAA0000310

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Fuel Gas Control and Monitoring System

with type designation(s)
iGPR-Control

Issued to

Winterthur Gas & Diesel Ltd.
Winterthur, ZH, Switzerland

is found to comply with

DNV GL rules for classification – Ships

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Issued at **Hamburg** on **2021-11-11**

This Certificate is valid until **2023-11-10**.

DNV local station: **Essen**

for **DNV**

Approval Engineer: **Marco Rinkel**

.....
Joannis Papanuskas
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.



Form code: TA 251

Revision: 2021-03

www.dnv.com

Page 1 of 4

Product description

The integrated Gas Pressure Regulation- iGPR is designed for gas pressure and mass flow control on WinGD two-stroke dual-fuel (DF) engines. The iGPR is designed as an essential part of the WinGD X-DF engines. The iGPR operation is carried out by the iGPR-control system upon request from the engine control system (ECS)

Module	Description
CCU	Cylinder Control Unit
MCU	Main Control Unit
GTU	Gateway Unit
MCP	Manual Control Panel

System functions

Automatic Functions of iGPR

- Degassing
- Transfer from LFO to fuel gas
- Fuel Gas Pressure Regulation active
- Automatic Inerting
- Transfer from fuel gas to LFO

Manual Functions of iGPR

- Manual Valve Operation
- Manual Leakage Test
- Manual Inerting

Approval Conditions

When the type approved software is revised (affecting all future deliveries) DNVGL is to be informed by forwarding updated software version documentation. If the changes are judged to affect functionality for which rule requirements apply a new functional type test may be required and the certificate may have to be renewed to identify the new software version.

- The software modifications are based on the "A&C Software Development Process" DAAD122889
- Minor updates of Software have no influence on the safety critical functions and their release is performed by submission of Design Update Notes including information about software version and implemented changes.
- Major updates of Software, which alter the safety critical functions, are introduced after performance of a Type Approval Test witnessed and approved by the classification societies.

Product certificate

A separate control system product certificate according to Pt.4 Ch.9 will not be required provided that:

- The set up for each engine type identified and tested at the engine type approval test in accordance with
Instruction TAT of DF engines with UNIC-flex DAAD064916
Instruction TAT of DF engines with WiCE DAAD109434
- The set up for each delivery identified and tested at the engine shop test in accordance with
Instruction FAT of DF engines with UNIC-flex DAAD064913
Instruction FAT of DF engines with WiCE DAAD109419
- Control system software identified and tested at quay and sea trials as specified in
Instruction SYD of DF engines with UNIC-flex DAAD064914
Instruction SYD of DF engines with WiCE DAAD109421

Application documentation

The following documentation of the actual application is to be submitted for approval in each case:

- Reference to this and other applicable Type Approval Certificates
- Control system block diagram for the complete system showing location of main components and power supply arrangement
- Equipment list covering all electronic modules as identified above
- Signal interfaces to other systems (signal lists or drawings)

After delivery of the vessel the clause for application software control will be in force:

Clause for application software control

As long as the system is in use onboard all software modifications are to be recorded. The records identifying the running software version(s) are to be available onboard for evaluation by DNVGL upon request. Major software changes are to be approved before being installed onboard.

Actual versions: 20.1.0

The modification content of iGPR-Control software version/builds is listed in the related software modification information.

Application/Limitation

Gas pressure and flow control unit to be used and installed on WinGD X-DF engines.
The Sensors and Actuators according to List DAAD121106 are not covered.

Type Approval documentation

See ANNEX

Tests carried out

Functional Tests according to TAT Report iGPR on DU3999 8X52DF - DU3999_DAAD105181A
Tests according TAT-Report for iGPR-5.2 - CL-21-032_TAT-Report_iGPR-5.2_CSS043
Settlement of open points from iGPR-5.2 TAT - CL-21-061_Settlement_TAT-Remarks_iGPR-5.2
Applicable tests according to class guideline DNVGL-CG-0339, November 2016.on LDU-20(TAA00000CT) and MCM-11(TAA00001UD).

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed at least at renewal of this certificate.

END OF CERTIFICATE



Job Id: 262.1-033691-1
Certificate No: TAA0000310

ANNEX
Type Approval documentation
(hidden)