Certificate No:
TAA00003BN

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Control and Monitoring System

with type designation(s)
GVU-GCB Control Box

Issued to
Hu Dong Heavy Machinery Co., Ltd.
Shanghai, **China**

is found to comply with
DNV rules for classification – Ships

Application :

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

Type	Temperature	Humidity	Vibration	EMC	Enclosure
GVU-GCB Control Box	**A**	**B**	**A**	**A**	**B (IP44)**

Issued at **Hamburg** on **2024-03-04**
This Certificate is valid until **2028-11-17**.
DNV local unit: **Shanghai**

Approval Engineer: **Jens Dietrich**

for **DNV**

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.

Place of system manufacture

Hu Dong Heavy Machinery Co., Ltd
No. 2851, Pudong Avenue
Shanghai City, P.R. China

Product description

The GVU-GCB Control Box is installed outside the Gas Valve Unit Enclosure controlling the gas valves in a gas valve unit via a solenoid control box pneumatically.
Functions: Gas supply control, gas leakage testing, manual inerting downstream to consumer, monitoring of gas pressure and temperature, instrument air pressure, inert gas pressure, enclosure differential pressure, valve position feedback; system self-check.
Binary outputs for driving pneumatic solenoid valves
HMI User interface for process visualisation, parametrisation, and alarming and alarm history
Power supply: 2 x 24VDC.

Application/Limitation

The required safety functions with regard to ventilation monitoring and gas detection in the gas valve unit enclosure is to be provided additionally, i.e. by an external fuel gas safety system described in Pt.6 Ch.2 Sec.5, 9.
The required ventilation between the GVU and the engine according to Pt.4 Ch.3 Sec.1, 10.2.7.4 is not covered by this certificate.
Warning signs have to be placed on the GVU enclosure demanding gas-freeing of the GVU before opening the enclosure.
Interlock for bleed valve V02 with GVU inlet supply line valve is to be provided externally.
Inerting of the first section of GVU is not covered by this certificate and needs to be described for the respective application.

Approval conditions

The Type Approval covers hardware and basic design principles of the control system. The following documentation for the actual application is to be submitted for approval in each case:
- Reference to this Type Approval Certificate
- Functional description
- Related P&I diagram
- Details of connected gas consuming unit
- List of control and monitored points / instrument list
- Circuit diagrams
- Test program for application software at manufacturer

Product certificate
Each delivery of the application system is to be certified according to Pt.4 Ch.9 Sec.1. The certification test is to be performed at the manufacturer of the application system before the system is shipped to the yard. After the certification the clause for application software control will be put into force.

Application software control
All changes in software are to be recorded as long as the system is in use on board. Documentation of major changes is to be forwarded to DNV for evaluation and approval before implemented on board.

Tests carried out

-Applicable tests according to DNV CG-0339, August 2021
-Functional Performance test.

Marking of product

Metal name plate on cabinet door showing: Manufacturer, Type designation, Product No., Electric Ratings, Protection Class, Production date, Weight.

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

END OF CERTIFICATE