

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Position Controller**with type designation(s)
4Q Actuator Driver

Issued to

Heinzmann GmbH & Co. KG
Schönau im Schwarzwald, Baden-Württemberg, Germanyis found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft**Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**

Temperature	B
Humidity	B
Vibration	A
EMC	A
Enclosure	Required protection according to DNV GL Rules shall be provided upon installation on board

Issued at **Hamburg** on **2019-11-08**for **DNV GL**This Certificate is valid until **2024-11-07**.DNV GL local station: **Augsburg**Approval Engineer: **Jens Dietrich**

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.



Product description

4 Quadrant Actuator Driver Module for Heinzmann Actuators StG90/StG180.

The unit is working as a positioner unit and can accept following setpoint signals:

Analogue, PWM, Heinzmann CAN bus, Heinzmann customer module protocol, Modbus, SAE J1939 CAN protocol, CAN open protocol.

Technical data:

- CPU: ARM M4 core, 16bit ADC, buffered real time clock
- 4Q full bridge, 15A continuous current, 30A peak current
- Over-current and over-temperature shut-down
- Power supply: 24VDC or 48VDC
- 1 x isolated analogue input: 0...5V or 0...22mA
- 2 x isolated PWM inputs: 0...100kHz, or digital input
- 4 x isolated digital inputs V_{high} 9...24V
- 1 x binary input, V_{high} 3...24V
- 1 x analogue output 0...5V or 0...22mA
- 3 x digital output: 2 high-side: 2.5A, 1 digital output low-side 0.5A
- Degree of protection: IP00.

Communication:

- 1x electrically isolated CAN
- 1x RS485 isolated (i.e. Modbus)
- 1x RS232

SW-Versions:

- | | |
|----------|--|
| 00.00.xx | I/O-Modul HZM-CAN (Setpoint input over HZM-CAN-Bus) |
| 00.01.xx | AD-/PWM-Positioner (Setpoint input: analogue oder PWM) |
| 00.51.xx | Customer-Modul im HZM-CAN (Setpoint input: HZM CAN as customer module) |
| 00.61.xx | Modbus-Positioner (Setpoint input over Modbus) |
| 00.81.xx | SAE-Positionierer (Setpoint input over SAE-J1939-CAN-Bus) |
| 00.91.xx | CANopen-Positionierer (Setpoint input over CANopen-CAN-Bus) |
| 04.01.xx | MAN version: AD-/PWM-Positioner (Setpoint input: analogue oder PWM). |

Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV GL, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV GL rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.

As long as the units are covered by the Type Approval, a product certificate according to Pt.4 Ch.9 Sec.1 will not be required. Correct configuration and set up for each application is to be tested in conjunction with the respective combustion engine during test-bed run.

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 GL for evaluation and approval before implemented on board. Certification of modified functionality may be required for the particular vessel.

Application/Limitation

The 4Q Actuator driver is not suitable for single main propulsion engines.

Job Id: **262.1-031052-1**
Certificate No: **TAA00002J1**

Type Approval documentation

Heinzmann System Description 4 Quadrant Actuator Driver for StG90/StG 180, DG 17 001-e/11-18,
Heinzmann Climatic Tests, dated 2018-11-09,
Heinzmann Vibration Test Report 2018-050, dated 2018-12-04,
Heinzmann High Voltage Test Report, dated 2018-11-16,
Heinzmann Power Supply Variation Test Report, dated 2018-07-02,
LCIE Electromagnetic compatibility, no. 156268-723383-A, vers.01, dated 2018-06-29,
KRIWAN Test Report 180054-01-01-A-01-e, dated 2019-10-10,
Witnessed Performance Test Report, dated 2019-10-24,
Type Approval Assessment Report, DNV GL Augsburg, dated 2019-11-12.

Tests carried out

Applicable tests according to class guideline DNVGL-CG-0339, November 2016.
Functional Performance test with I/O simulation.

Marking of product

The products to be marked with:

- manufacturer name
- model name
- serial number
- power supply ratings

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