

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Engine Ignition Controller**with type designation(s)
MIC6, MIC6-Marine

Issued to

MOTORTECH GmbH
Celle, Niedersachsen, Germany

is 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	C
Humidity	B
Vibration	B
EMC	A
Enclosure ¹⁾	B

¹⁾ Required protection according to DNV GL Rules shall be provided upon installation on board**ADDITIONAL TESTS:** Degrees of protection: IP69
Temperature: -40°C for 2 hoursThis Certificate is valid until **2023-09-10**.Issued at **Hamburg** on **2018-09-11**DNV GL local station: **Magdeburg**for **DNV GL**Approval Engineer: **Didier Girardin**

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

1. Arrangement type: Ignition controller MIC6-Marine

Arrangement Number (A/N): 65*.**.H0Q*-000-*A-A
("*" = Amount of available resp. activated ignition output banks (max. 2)
"*)" = Amount of available resp. activated ignition output channels (max. 24)
"*" = Code for Configuration of 2nd input connector: (35 poles or 26 poles)
"*)" = Code for different OEM-Customers (e.g. different label design))

Part Number (P/N): 92.00.64*-*
("*" = Code for Configuration of 2nd input connector: (35 poles or 26 poles)
"*)" = Amount of available resp. activated ignition output channels (max. 24))

Revision Number (R/N): R0101*****-01.00.*
("*****" = six-digit ID for clear assignment to a specific A/N,
"*)" = two digits to count minor changes)

General description:

Ignition controller for gas engines with up to 24 cylinders and with primary energy up to 600 mJ/spark, including 6 pickup terminals for redundant position sensor inputs, several I/Os, two insulated CAN ports, and one insulated RS485 port. A primary ignition circuit health monitoring for each cylinder is providing a shut down signal in case of critical errors.

Connectors:

- 35 pole military style connector (socket) for ignition outputs
- 35 pole military style connector (pin) for input wiring (power-supply, 3xPickup, binary and analog I/O, CAN)
- 26 or 35 pole military style connector (pin) for input wiring (3xPickup, binary I/O, CAN, RS485)

Software:

- Bootloader: 0.44.*
 - Firmware: 1.0.*
- ("*" = indices to count minor software changes)

2. Arrangement type: Ignition controller MIC6

Arrangement Number (A/N): 652.24.H0Q0-004-EB-A
Part Number (P/N): X59550800006
Revision Number (R/N): R0101000001-01.00.*
("*" = two digits to count minor changes)

General description:

Ignition controller for gas engines with up to 24 cylinders and with primary energy up to 600 mJ/spark, including 3 pickup terminals, several I/Os, and one insulated CAN port. A primary ignition circuit health monitoring for each cylinder is providing a shut down signal in case of critical errors.

Connectors:

- 35 pole military style connector (socket) for ignition outputs
- 35 pole military style connector (pin) for input wiring (power-supply, 3xPickup, binary and analog I/O, CAN)
- USB connector for configuration and diagnosis only

Software:

- Bootloader: 0.44.*
 - Firmware: 1.0.*
- ("*" = indices to count minor software changes)

Application/Limitation

- Pertinent configuration and software version for specific engines is not covered by present certificate and shall be provided based on performance and integration test on running engine. Integration testing with respective engine is required according to Pt.4 Ch.3 Sec.1 [1.3.6] in order to verify engine response in case of control system failures.
- IP class shall be in accordance with installed area on board.
- Ex-certification is not covered by this certificate. Application in hazardous area to be approved in each case according to the Rules and Ex-Certification/ Special Condition for Safe Use listed in valid Ex-Certificate issued by a notified/recognized Certification Body.

Approval conditions

The Type Approval covers hardware and basic software listed under Product description. For each project integrating present component, the following documentation is to be submitted for approval:

- Reference to this Type Approval Certificate
- Information about engine type and intended use (propulsion, auxiliary, etc.)
- System block diagram showing overall system layout
- Power supply arrangement (may be part of the System block diagram)
- List of controlled and monitored points (alarms & safety functions) incl. type, range and threshold
- Traceability matrix of monitored failure alarm messages from respective integrated systems
- Specific software versions for particular delivery
- Functional description
- Test program for certification

Product certificate

With reference to DNVGL Pt.4 Ch.9 Sec.1, the ignition system implementing the MIC 6/MIC6-Marine controller shall be delivered with a product certificate. For each such delivery the certification test is to be performed at the manufacturer of the application system, preferably at the engine/system application maker integrating control, monitoring and safety system, before the system is shipped to the yard. The test shall be done according to an approved test program. After the certification the clause for application software control will be put into force.

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.

Tests carried out

Applicable tests according to Class Guideline DNVGL-CG-0339, Nov 2016

Marking of product

The products to be marked with:

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

Documentation

See Annex

Job Id: **262.1-023792-1**
Certificate No: **TAA00000ZZ**

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

Job Id: **262.1-023792-1**
Certificate No: **TAA00000ZZ**

ANNEX

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