

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Level Indicating System**

with type designation(s)

Cargomaster ver. 5./Signal Control Unit (SCU);**Cargomaster ver. 5./Tank installation equipment (TIE)**

Issued to

**KROHNE Marine
BREVIK, Norway**

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.****Location classes:**

Type	Temperature	Humidity	Vibration	EMC	Enclosure
Cargomaster ver. 5./ Signal Control Unit (SCU)	A	B	A	A	Required protection acc. to the Rules to be provided upon install. on board.
Cargomaster ver. 5./ Tank installation equipment (TIE)	D	B	A	B	Required protection acc. to the Rules to be provided upon install. on board.

This Certificate is valid until **2018-12-31**.Issued at **Høvik** on **2016-12-07**DNV GL local station: **Sandefjord**Approval Engineer: **Jens Erling Bråten**for **DNV GL**

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Odd Magne Nesvåg
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.

Job Id:
Certificate No: **TAA00000XW**

Product description

Level indicating system Cargomaster ver.5, consisting of:

Signal Control Unit (SCU) including:

- Tank input card TI-400
- Radar input card RI-400
- WAGO I/O system, DNV GL T.A. certificate No.:¹⁾

Tank Installation Equipment (TIE):

- Junction boxes JB25xxxx, JB18xxxx, JB11xxxx, JB07xxxx & TP05xxxx
- AD-card AD-410
- Pressure sensors P105-0101, P105-0102, P106-0101, P106-0102, P130
- Temperature sensor Pt1000 (separate cable or integrated in the pressure sensor)

Computer Unit (Workstation):

- Personal computer, DNV GL type approved.
Make and type:²⁾
DNV GL T.A.certificate no:²⁾

1) Radar inputs may be interfaced to type approved WAGO I/O system, (located in the SCU), instead of the RI-400 (radar input circuit board). The WAGO I/O system may also be used for some 4-20 mA inputs including pressure sensors and/or values from other systems like level measurements. The TI-400 (tank input circuit board) will still be used for temperature sensors (PT-1000), and in some cases pressure sensors. Reference to valid type approval certificate to be given for each delivery.

2) Reference to valid type approval certificate to be given for each delivery.

Software ver. no.: CARGOMASTER Version 5 Release 1.xx

As the system fulfils the intentions of DNV GL Rules Pt.5 Ch.5 Sec.9 [4] (regarding self checking and alarms for all credible faults), high level alarm and level gauging of cargo tanks may be combined in a single unit for Oil Carriers, thus waiving the requirement for a separate high level alarm system

Approval conditions

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

- Reference to this Type Approval Certificate
- Reference to Type Approval Certificate for workstation PC and WAGO I/O system, ref 1) and 2) above.
- System block diagram
- Power supply arrangement (may be part of the System block diagram)

The Type Approval covers hardware and software listed under Product description.

The software number and version is/will be listed and described in "Cargomaster Version 5 Release 1.xx Documentation" and "Cargomaster Version 5 Software Release Document", at present dated 2002-05-10.

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.

Clause for application software control

All changes in software are to be recorded as long as the system is in use on board. The records of all changes are to be forwarded to DNV GL for evaluation and approval.

Major changes in the software are to be approved before being installed in the computer.

Certification of Application Functions may be required for the particular vessel.

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Application/Limitation

Ex-certification is not covered by this certificate. For Ex verification reference is made to certificate no.: DNV-2005-OSL-ATEX-0463X and DNV-2007-OSL-ATEX-3823X
Ex-installations to be approved in each case according to the Rules and valid Ex-certificate

Type Approval documentation

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 every second year and at renewal of this certificate.

END OF CERTIFICATE