

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Control and Monitoring System

with type designation(s)
Pleiger Process Control System (PPC)

Issued to
Pleiger Elektronik GmbH & Co. KG
Witten, 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.

Issued at **Hamburg** on **2017-12-11**

This Certificate is valid until **2022-11-30**.

DNV GL local station: **Essen**

for **DNV GL**

Approval Engineer: **Dariusz Lesniewski**

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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

Computer based system for displaying, operating and monitoring of:

- Valves, pumps, tank contents and alarms, suitable for building redundant control systems

Integrated systems:

- Anti-Heeling Control System – for use under supervision only
- In Service Inclining Test System (ISITS)
- Water Ingress Detection System (WIDS)
- Data Logging and Report Generating System (for BWMS)

System software:

- Operating system: Windows XP embedded, SP2
- Application software: Version:

Tank Level Measurement	01.x.y
Valve Control	01.x.y
Ballast Automatic	01.x.y
Data Transfer	01.x.y
IO Functions	01.x.y
System Functions	02.x.y
Heeling ISITS	01.x.y
Pump control	01.x.y
Data Logging System	1.x.y

System hardware components:

- Industrial PCs (one or more):
 - Pleiger PPC-IPC-S, Pleiger PPC-PLD-7 or comparable DNV GL type approved (connected via Ethernet-LAN (10 or 100Mbit/s))
- TFT-Display(s) one or more DNV GL type approved
- Ethernet Switch (optional) DNV GL type approved
- Interfaces (four or more) to Pleiger PCM and Pleiger PCL or to other systems (communication protocol: Modbus RTU or Modbus TCP)

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 the Type Approval Certificates of the hardware components
- Functional description
- System block diagram
- Application software name/version (project related)
- Test program for certification

This Type Approval covers software listed under 'product description'.

The current software numbers and versions are listed in document PleigerLib_xx_yy_zz "Pleiger Library".

When the type approved software is revised (affecting all future deliveries) DNV GL 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.

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 GL for evaluation and approval before implemented on board.

Type Approval documentation

Tests carried out

Rules for Classification – Ships, Pt. 4, Cht 9 (System and components / Control and monitoring systems)
PPC-Data Logging and Report Generation System – Systemvorführung Stand 09/2017 (13.09.2017)

Marking of product

The products to be marked with:

- manufacturer name
- system designation, project name/number

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