

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Engine Safety, Control and Alarm System

with type designation(s)
YECS-1000

Issued to

Yumyung Engineering Co., Ltd.
Ulsan, Republic of Korea

is found to comply with

DNV GL rules for classification – Ships, offshore units, and high speed and light craft

Application :

Location classes:

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

Temperature	A
Humidity	B
Vibration	B
EMC	A
Enclosure	B

Issued at **Busan** on **2017-04-17**

This Certificate is valid until **2019-04-16**.

DNV GL local station: **Ulsan**

for **DNV GL**

Approval Engineer: **Eun Sook Kim**

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Michael Jost Auf der Stroth
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

YECS-1000 control & monitoring & safety system is exclusively approved for Hyundai Himsen Engines of types H17/28M, J17/28U(E), H21/32M, H25/33M, H32/40M.

Hardware consists of a monitoring box and a terminal box.

Monitoring box consists of the following units:

YECS-1000D OPU: Operating Unit (M1)
YECS-1000T TPM: Temperature & Pressure Monitor Unit (M3)
YECS-1000E ETM: Exhaust Gas Temperature Monitor Unit (M2)

Terminal box consists of the following units:

YECS-1000S SCU: Safety Control & Cable Supervision Unit (U2)
YECS-1000M MCU: Main Control Unit (U3)
YECS-1000A ACU: Analog / Communication Unit (U1)
YECS-1000SIF SIF: Safety Interface Board (P4)
YECS-1000MIF MIF: Main Interface Board (P1)
MCB: Main Circuit Breaker
Terminal Block

Software Version: **V12.02.xx** (applicable for all units)

xx: These digits are updated in case of bug fixes only

Place of system manufacture

Yumyung Engineering Co.
Ulsan
Republic of Korea

Application/Limitation

1. This certificate is valid only for systems made and delivered by Yumyung Engineering Co. from production centers listed under place of system manufacture for engines up to 9 cylinders on below (generator prime mover) applications only:
 - Auxiliary engine for multi-engine plants used for power generation and not for:
 - o Multi-engine plants used for diesel electric propulsion
 - o Emergency generator prime move engines
2. Speed governor is not included in this type approval. It may be of hydraulic, mechanical or electro-mechanical type. For electro-mechanical governors, governor failure alarm is released by YECS-1000 system. See also approval conditions.
3. Engines with output power above 2250kW shall be arranged with oil mist detection pre-warning alarm and automatic shutdown. Oil Mist Detector separately type approved (ref certificate TAA00000M9) may be used on applicable engine types.
4. Sensors and actuators are not covered by this type approval. Datasheets for field instruments shall be presented upon surveyor's request to be verified against Pt.4 Ch.9 Sec.5 2.
5. System itself cannot perform loadsharing and load reduction functions.
6. List of control & monitored points (including alarms, shutdowns, set points, etc.) shall be according to the engine's intended function (auxiliary engine, emergency genset, etc.) and shall comply with the vessel's main class requirements in DNVGL rules for Ships and DNVGL rules for High speed and light craft Pt.4 Ch.3 Sec.1 Tables 10, 11 and, if Ship Rules and E0 notation apply, Pt.6 Ch.2 Sec.2 Table 8.
7. Two 24V dc power supply feeds (one for safety system, one for alarm/monitoring and start/stop system) shall be arranged.
8. In case of differences between listed below documentation required for approval and documents submitted for approval will be found, the system documentation needs to be case-by-case approved and system certification may be required. Approval fee or certification fee will be applied. Documentation required for approval in this case can be extended to what is listed in DNVGL rules for Ships and DNVGL rules for High speed and light craft Pt.1 Ch.3 Sec.3 I200.

9. If, during approval or onboard survey, differences will be found between actual delivery setup (difference in alarms and safety actions, firmware versions, sensors setup, monitoring functions, etc.) and setup required by this Type Approval certificate for specific vessel notations and main class, then the system needs to be case-by-case approved and system certification may be required. Approval fee or certification fee will be applied. Documentation required for approval in this case can be extended to what is listed in DNVGL rules for Ships and DNVGL rules for High speed and light craft Pt.1 Ch.3 Sec.3 I200.

Approval conditions

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

- Reference to this Type Approval Certificate
- Information about engine type and intended use (propulsion, auxiliary, etc.)
- Software version used in specific delivery
- System block diagram (presenting all major units, speed governor, oil mist detection system when applicable)
- Confirmation that List of control & monitored points is like stated in Application/Limitation point 6
- Confirmation that power supply arrangement is like stated in Application/Limitation point 7

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

Product certificate

As long as the units are covered by this Type Approval, a product certificate according to Pt.4 Ch.9 Sec.1 will **not be** required for system applications made and delivered according to the requirements listed under Application/Limitation (including approval documentation submittal requirements). Correct configuration and set up for each delivery to be tested during commissioning after installation.

Clause for application function 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 DNVGL 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 specific vessel delivery.

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

Type Approval documentation

Tests carried out

Applicable tests according to Class Guideline DNVGL-CG-0339, November 2016
Function test at Yumyung Engineering, dated 2012-03-21.

Marking of product

Manufacturer: Yumyung Engineering Co.
Model name: As listed under Product description, unit name and SW version
Serial number: Unique for each delivered item

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)



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Certificate No: **TAA000016H**

- 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