



Certificate No. 03-001764/031465

## TYPE APPROVAL CERTIFICATE

This is to certify that this product complies with the Rules for the classification of ships, Part 1 - General requirements, Chapter 3 - Type approval of products.

TYPE AND DESCRIPTION OF PRODUCT:

### Engine Control and Monitoring System for Multiple Propulsion – EMS

EMS2, EMS2.2, EMS2.3 and EMS2.4	- Engine Management System	EVC	- Electronic Vessel Control - 7" Color Display
CIU	- Control Interface Unit	AD	- Alarm Handling Display
MCC	- Marine Commercial Control System	PCU	- Power Train Control Unit
MCU	- Marine Control Unit	HCU	- Helm Station Control Unit
PM	- Power Module	LCD	- Display Unit
SDU	- Shut Down Unit	CAN	- Bus communication
EKS	- Electronic Key System	RP	- Remote Panel
J1587/J1939	- Communication Bus	SDM	- Shut Down Module

MANUFACTURER:

**AB Volvo Penta**  
405 08 Göteborg  
SWEDEN



THE PRODUCT MEETS FOLLOWING RULES/REGULATIONS:

Croatian Register of Shipping: Rules for the classification of ships,  
Part 9. – Machinery, Part 13. – Automation

IACS UR E10

FURTHER DETAILS OF THE PRODUCT AND CONDITIONS FOR CERTIFICATION ARE GIVEN OVERLEAF.

APPROVAL IS VALID UNTIL: **2024-08-27**

Place and date: Split, 2020-08-27

Seal

Marinko Popović, dipl.ing.

NOTE: This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Croatian Register of Shipping of any modification or changes to the product in order to obtain a valid certificate.

**DETAILED PRODUCT DESCRIPTION:**

The basic system architecture comprises an Engine Management System (EMS 2, EMS 2.2, EMS 2.3 and EMS 2.4) which is engine mounted and used to manage all engine parameters such as engine speed and control of electronic fuel injectors; Power Module (PM for v.2 and v.2.2) for primary and secondary battery handling and supervision. This control and monitoring system is for all Volvo Penta marine engines with particular designations D8, D9, D11, D12, D13 & D16 and all future engine variants of the same range fitted on ACCU vessels either as main propulsion or auxiliary power plant.

A Marine Commercial Control (MCC) system consisting of Marine Control Unit (MCU) for control and monitoring of engine running status, relevant gauging and signal converting of analogue/binary inputs/outputs, and switches; Remote Panel (RP) for remote control and monitoring of MCU functions.

Engine shutdown is supervised by an independent solid state Shut Down Unit (SDU). Engine slowdown is supervised by the engine management system (EMS) for propulsion applications. (Slowdown not applicable for genset applications). A Shutdown Module (SDM) is introduced in all diesel engines that utilize EMS 2.3 and EMS 2.4, with the same functionality as SDU but entirely software controlled.

An Aftertreatment Control Module is added in the SCR. The ACM controls the urea injection systems and monitors the SCR parameters as well as managing alarms related to the SCR.

**APPLICATION / LIMITATIONS:**

System is applicable, but not limited on the following engine range – **D8/9/11/12/13/16**

**TYPE APPROVAL DOCUMENTATION:**

- AD – Functional Description 7” Display for Marine Commercial Applications, CPAC SYSTEMS AB
- CPAC SYSTEMS AB – Engineering Statement regarding EVC 7” Display
- The Electronic Key System 2, CPAC dated Nov. 2013
- System Architectural Description (SAD) PEA2 + EMS2.3 systems – Industrial & Marine, document 183777 – 3
- System Architectural Description (SAD) PEA2 + EMS2.3/2.4 systems – Industrial & Marine, document 183777 – 5.25
- System Requirement Specification – Engine Shutdown System (SRS-SDM), document 201793 – 2.0
- Software Requirement Specification – Engine Shutdown System (SDM.SWRS), document 199320 – 3
- Type test program D8 MH/MG, document CL0903.2, and Type test checklist D8 MH/MG, document CL0932

*Test reports:*

- Type Testing of EMS System and PM module, DnV Technical Report No. 2002-0707 Rev. 01
- Type Testing of CIU and Display unit, DnV Technical Report No. 2003-3172 Rev. 01
- Type Testing of EMS2 System and PM module, DnV Technical Report No. 2004-3217 Rev. 01
- Type Testing of EVC-B System, DnV Technical Report No. 2004-3347 Rev. 02
- EMC tests on complete D12 engine, SP Report F203181
- EMC and Environmental Testing of EMS2.2 System, DnV Technical Report No. 2010-3223
- EKS – Needle flame test according to IEC60695-11-5 (2004), SP test report No. PX17794-02, dated 2011-12-07
- EKS – Salt mist test, SP test report No. PX17794-01, dated 2011-12-27
- Two EKS – E10 Type approval tests, SP test report No. PX17794\_A, dated 2012-01-23
- EKS – EMC test, SP test report No. FX110628, dated 2012-02-10
- EKS – CPAC Summary of the E10 verification tests, dated 2014-03-03
- EKS – Classification of degree of protection by enclosure, SP test report No. PX17794-03:A, dated 2012-03-07
- Two + Four EKS – Environmental tests, SP test report No. PX17794\_B, dated 2012-03-12
- EKS – Compass Safe Distance, SP test report No. FX205883, dated 2012-03-27
- EKS – Environmental tests, SP test report No. PX17794\_C, dated 2012-03-30
- Classification of degree of protection provided by enclosure (IPX7) – SP test report No. 4F014605, dated 2014-11-07
- EKS – IPX7 test report, SP test report No. 4F022662, dated 2014-11-21
- Classification of degree of protection provided by enclosure (IP6X) – SP test report No. 5F001278, dated 2015-02-18
- SDU – EMC test report, SP test report No. 6P00968, dated 2016-01-27
- EMC test of SDM Shutdown Module Safety System, SP test report No. 6P06962-E1, dated 2016-10-17
- EMC test of EMS Engine Management System D13imo3 with EATS, SP test report No. 6P09335-E1, dated 2017-01-17
- Environmental testing of marine engine control boxes ACM and ECU, SP test report No. 6P09878, dated 2017-01-26
- Salt mist test of EMS2.4, RISE test report No. 8P09239-02-rev1, dated 2019-02-25
- Environmental durability testing of EMS2.4, RISE test report No. 8P09239, dated 2019-03-04
- EMC testing of EATSD8, RISE test report No. 9P09697-E1D08 RevB, dated 2019-09-19
- EMC testing of EATSD13, RISE test report No. 9P09697-E1D13 RevB, dated 2019-09-19

*Drawings:*

- *SDU – GENERAL ARRANGEMENT DRAWINGS, 22633775 REV.01*
- *CONTROL SYSTEM D13 MARINE CC IMO3 CAMS PROP ENGINE MCC, 23237010 REV.03*
- *CONTROL SYSTEM D13 MARINE CC IMO3 CAMS GENSET ENGINE MCC, 23237011 REV.03*
- *WIRING DIAGRAM D13 1000HP TYPE APP. INB COMMERCIAL EL SYS, 23102296 REV.02*
- *WIRING DIAGRAM D13 1000HP TYPE APP. IPS SDM EMS2.3, 22996867 REV.01*
- *WIRING DIAGRAM D13 MARINE CC IMO3 EVC-E, 22665500 REV.05*
- *WIRING DIAGRAM EATS SYSTEM ACM2 IMO3 D13 D16, 22796918 REV.04*
- *WIRING DIAGRAM EATS MUFFLER IMO3 HDEP, 22931670 REV.02*
- *WIRING DIAGRAM D8 MARINE R1-R2, 23188484 REV.02*
- *WIRING DIAGRAM SHUTDOWN IN BOX D8 MARINE CC, 22762342 REV.03*

**MARKING OF PRODUCT:**

In accordance with IEC60945 – Marking and identification ( The Manufacturer and Type Designation of the product, serial number, date of manufacture, safe distance to magnetic compass, supply voltage, software version...).

**CONDITIONS FOR CERTIFICATION:**

Major changes in the hardware and software are to be approved before being installed on the vessel.

All changes in hardware or 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 CRS for evaluation and approval.