CROATIAN REGISTER OF SHIPPING

Certificate No.	03-002053/031727

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:

Generators Type

UCM 224, 274; UCDM 274K; HCM 434 / S4L1M, HCM 534 / S5L1M, HCM 634; PM 734, 736; S6L1M & S7L1M

Brushless A.C. generators, 3 phases, 4 poles, single or double bearings

MANUFACTURER:

Cummins Generator Technologies Limited

Peterbrough, United Kingdom

ADDITIONAL PLACES OF PRODUCTION:

Cummins Generator Technologies, Stamford, Lincolnshire, United Kingdom (Test Facility)
Cummins Generator Technologies (China) Co. Ltd, Jiangsu, Province, P.R. Chine
Cummins Generator Technologies Romania S.A., Craiova, Dolj, Romania

THE PRODUCT MEETS FOLLOWING RULES/REGULATIONS:

CRS RULES FOR THE CLASSIFICATION OF SHIPS

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

APPROVAL IS VALID UNTIL: **2028-07-04**

Place and date: Split, 2024-07-05 **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:

Brushless A.C. generators, 3 phases, 4 poles, single or double bearings.

Enclosure class:	IP 23
Winding insulation:	Class H
Temperature rise limits:	Class B, F or H
Voltage class:	Up to 690 V
Power class:	Up to 2245 kVA
Frequency class:	50 or 60 Hz
Speed:	1500 or 1800 RPM

Sample table with maximum power continuous rating for 50°C ambient temperature and temperature class H:

Type – UCM 224	50Hz/1500rpm/400V (KVA)	60Hz/1800rpm/440V (KVA)
UCM224C	38.0	44.7
UCM224D	44.0	53.1
UCM224E	52.3	63.0
UCM224F	63.3	75.6
UCM224G	71.5	87.0

Type – UCM 274	50Hz/1500rpm/400V (KVA)	60Hz/1800rpm/440V (KVA)
UCM274C	81.5	102.5
UCM274D	97.0	117.5
UCM274E	120.0	137.5
UCM274F	140.0	162.5
UCM274G	159.0	192.8
UCM274H	175.0	218.8

Type – UCDM 274	50Hz/1500rpm/400V (KVA)	60Hz/1800rpm/440V (KVA)
UCDM274K	205	265

Type – HCM 434 / S4L1M	50Hz/1500rpm/400V (KVA)	60Hz/1800rpm/440V (KVA)
HCM434C / S4L1MC	215	260
HCM434D / S4L1MD	240	305
HCM434E / S4L1ME	295	350
HCM434F / S4L1MF	340	405

Type – HCM 534 / S5L1M	50Hz/1500rpm/400V (KVA)	60Hz/1800rpm/440V (KVA)
HCM534C / S5L1M-C4	390	485
HCM534D / S5L1M-D4	435	520
HCM534E / S5L1M-E4	530	625
HCM534F / S5L1M-F4	585	694

Type – HCM 634	50Hz/1500rpm/400V (KVA)	60Hz/1800rpm/440V (KVA)
HCM634G	650	813
HCM634H	785	913
HCM634J	850	1063
HCM634K	950	1200

Type – PM 734*	50Hz/1500rpm/400V (KVA)	60Hz/1800rpm/440V (KVA)
PM734A	920	1100
PM734B	1005	1170
PM734C	1240	1480
PM734D	1320	1580
PM734E	1435	1800
PM734F	1580	2035
PM734G	1795	2155

* Temperature class F

Type – PM 736**	50Hz/1000rpm/380V-440V (KVA)	60Hz/1200rpm/440V-480V (KVA)
PM736B	525	750
PM736D	655	975
PM736F	900	1240

** 6 poles

Type – S6L1M	50Hz/1500rpm/400V (KVA)	60Hz/1800rpm/440V (KVA)
S6L1M-C4	650	813
S6L1M-D4	785	931
S6L1M-E4	850	1063
S6L1M-F4	950	1200
S6L1M-H4	1100	1300

Type – S7L1M	50Hz/1500rpm/400V (KVA)	60Hz/1800rpm/440V (KVA)
S7L1M-C4	1365	1612
S7L1M-D4	1455	1706
S7L1M-E4	1540	1712
S7L1M-F4	1675	1950
S7L1M-G4	1830	2200
S7L1M-H4	1960	2237
S7L1M-J4	2200	2425

For other temperature classes and voltages see STAMFORD Alternator Ratings Book.

APPLICATION / LIMITATIONS:

Generator is intended for ship's use according to CRS Rules for the Classification of Ships.

To comply with the IP23 enclosure, air outlets are to be fitted with louvers. The standard ratings shall be derated if the following configuration is applied: Air inlet filter fitted - Derate by 5%.

To comply with the IP44 enclosure, air outlet louvers are to be fitted. The standard ratings shall be derated if the following configuration is applied: Air inlet filter fitted - Derate by 10%.

TYPE APPROVAL DOCUMENTATION:

STAMFORD UC Alternators – Installation, Service and Maintenance Manual – A040J848,
STAMFORD HC Alternators – Installation, Service and Maintenance Manual – A040J849,
STAMFORD P7 Alternators – Owner Manual – A040J850,
STAMFORD S4/S6 Alternators – Owner Manual – A055Z165,
STAMFORD S5 Alternators – Owner Manual – A061R621,
STAMFORD S7 Alternators – Owner Manual – A061S225,
STAMFORD UCM224C – Winding 311, Technical Data Sheet,
STAMFORD UCDM274K – Technical Data Sheet,
STAMFORD PM734A/B/C/D/E/F/G – Technical Data Sheet,
STAMFORD PM736B/D/F – Technical Data Sheet,
STAMFORD S4L1M-C4/D4/E4/F4 – Technical Data Sheet,
STAMFORD S5L1M-C4/D4/E4/F4 – Technical Data Sheet,
STAMFORD S6L1M-C4/D4/E4/F4/H4 – Technical Data Sheet,
STAMFORD S7L1M-C4/D4/E4/F4/G4/H4/J4 – Technical Data Sheet,
Technical Centre Report – REF/TR01 rev.04, Marine Society Type Appr. Test UCDM274K1 205kVA,
Technical Centre Report – REF/TR01 rev.04, Marine Society Type Appr. Test UCDM274K1 285kVA,
Technical Centre Report – REF/TR01 rev.08, Class “H” Temperature Rise Test HCM634G1 875kVA,
AC Generator Routine Test Certificate – REF/TR02 Rev.04, Type HCM534E2 dated 2015/01/23,
Stamford CRS witness Test dated 2015/03/12: Insulation resistance, Winding resistance, High voltage, Voltage regulation, Excitation voltage, Overload, Overspeed and Temperature at full load,
AC Generator Test Certificate – REF/TR03 Rev.04, Type S4L1M-E42 dated 2019/05/23,
Test Report – C19D138471, Type PM736F2 dated 2019/06/19,
Test Report – C19D138517, Type PM734A2 dated 2019/07/10,
Marine Environment Engineering and Reliability Laboratory NO.704 Research Institute of CSIC Report No.; S610A-FS-2019
Marine Environment Engineering and Reliability Laboratory NO.704 Research Institute of CSIC Report No.; S390A-FC-2022
AC Generator Test Certificate – REF/TR02 Rev.04, Type S5L1M-F41dated 2023/10/20,
AC Generator Test Certificate – REF/TR02 Rev.04, Type S6L1M-E42 dated 2024/02/20,
AC Generator Test Certificate – REF/TR02 Rev.04, Type S7L1M-C42 dated 2023/12/06,
AC Generator Test Certificate – REF/TR02 Rev.04, Type S7L1M-E42 dated 2023/12/11.

MARKING OF PRODUCT:

The following information are to be marked on the rating plate: manufacturer's name, product type, serial number, year of manufacture, number of phases, rated power, rated current, rated voltage, rated frequency, degree of protection, thermal class and maximum ambient temperature.

CONDITIONS FOR CERTIFICATION:

CRS product certificate is required.