



Marine & Offshore

Certificate number: 37962/C1 BV

File number: AP4535

Product code: 2897H

This certificate is not valid when presented without the full attached schedule composed of 7 sections

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TYPE APPROVAL CERTIFICATE

This certificate is issued to

MITSUBISHI ELECTRIC CORPORATION Nagoya Works
Nagoya - JAPAN

for the type of product

INVERTERS

FR-A800 series.

Requirements:

Bureau Veritas Rules for the Classification of Steel Ships.
IEC 61800-5-1 (2007).

EC Code: 21

This certificate is issued to attest that Bureau Veritas Marine & Offshore did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 06 Feb 2027

For Bureau Veritas Marine & Offshore,

At BV KOBE, on 05 Jun 2023,
Shinichi Takemoto

This certificate was created electronically and is valid without signature



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with Bureau Veritas Marine & Offshore. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

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BV Mod. Ad.E 530 June 2017

This certificate consists of 6 page(s)

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION :

FR-A800 series are inverters for Marine and Offshore applications

1.1 - Products' ranges:

Model		Input Power Supply				Output										
capacity designation	current designation	Voltage 3-Phase AC 50/60Hz	Current [A]				Motor Capacity [kW]				Current [A]				Freq. Hz	Voltage 3-Phase AC
			SLD	LD	ND	HD	SLD	LD	ND	HD	SLD	LD	ND	HD		
FR-A840-0.4K-#	FR-A840-00023-#	380-500VAC	3.2	3	2.3	1.4	0.75	0.75	0.4	0.2	2.3	2.1	1.5	0.8	0.2-590	380-500VAC
FR-A840-0.75K-#	FR-A840-00038-#	380-500VAC	5.4	4.9	3.7	2.3	1.5	1.5	0.75	0.4	3.8	3.5	2.5	1.5	0.2-590	380-500VAC
FR-A840-1.5K-#	FR-A840-00052-#	380-500VAC	7.8	7.3	6.2	3.7	2.2	2.2	1.5	0.75	5.2	4.8	4	2.5	0.2-590	380-500VAC
FR-A840-2.2K-#	FR-A840-00083-#	380-500VAC	10.9	10.1	8.3	6.2	3.7	3.7	2.2	1.5	8.3	7.6	6	4	0.2-590	380-500VAC
FR-A840-3.7K-#	FR-A840-00126-#	380-500VAC	16.4	15.1	12.3	8.3	5.5	5.5	3.7	2.2	12.6	11.5	9	6	0.2-590	380-500VAC
FR-A840-5.5K-#	FR-A840-00170-#	380-500VAC	22.5	22.3	17.4	12.3	7.5	7.5	5.5	3.7	17	16	12	9	0.2-590	380-500VAC
FR-A840-7.5K-#	FR-A840-00250-#	380-500VAC	31.7	31	22.5	17.4	11	11	7.5	5.5	25	23	17	12	0.2-590	380-500VAC
FR-A840-11K-#	FR-A840-00310-#	380-500VAC	40.3	38.2	31	22.5	15	15	11	7.5	31	29	23	17	0.2-590	380-500VAC
FR-A840-15K-#	FR-A840-00380-#	380-500VAC	48.2	44.9	40.3	31	18.5	18.5	15	11	38	35	31	23	0.2-590	380-500VAC
FR-A840-18.5K-#	FR-A840-00470-#	380-500VAC	58.4	53.9	48.2	40.3	22	22	18.5	15	47	43	38	31	0.2-590	380-500VAC
FR-A840-22K-#	FR-A840-00620-#	380-500VAC	76.8	75.1	56.5	48.2	30	30	22	18.5	62	57	44	38	0.2-590	380-500VAC
FR-A840-30K-#	FR-A840-00770-#	380-500VAC	97.6	89.7	75.1	56.5	37	37	30	22	77	70	57	44	0.2-590	380-500VAC
FR-A840-37K-#	FR-A840-00930-#	380-500VAC	115	106	91	75.1	45	45	37	30	93	85	71	57	0.2-590	380-500VAC
FR-A840-45K-#	FR-A840-01160-#	380-500VAC	141	130	108	91	55	55	45	37	116	106	86	71	0.2-590	380-500VAC
FR-A840-55K-#	FR-A840-01800-#	380-500VAC	180	144	134	108	75/90	75	55	45	180	144	110	86	0.2-590	380-500VAC
FR-A840-75K-#	FR-A840-02160-#	380-500VAC	216	180	144	110	110	90	75	55	216	180	144	110	0.2-590	380-500VAC
FR-A840-90K-#	FR-A840-02600-#	380-500VAC	260	216	180	144	132	110	90	75	260	216	180	144	0.2-590	380-500VAC
FR-A840-110K-#	FR-A840-03250-#	380-500VAC	325	260	216	180	160	132	110	90	325	260	216	180	0.2-590	380-500VAC
FR-A840-132K-#	FR-A840-03610-#	380-500VAC	361	325	260	216	185	160	132	110	361	325	260	216	0.2-590	380-500VAC
FR-A840-160K-#	FR-A840-04320-#	380-500VAC	432	361	325	260	220	185	160	132	432	361	325	260	0.2-590	380-500VAC
FR-A840-185K-#	FR-A840-04810-#	380-500VAC	481	432	361	325	250	220	185	160	481	432	361	325	0.2-590	380-500VAC
FR-A840-220K-#	FR-A840-05470-#	380-500VAC	547	481	432	361	280	250	220	185	547	481	432	361	0.2-590	380-500VAC
FR-A840-250K-#	FR-A840-06100-#	380-500VAC	610	547	481	432	315	280	250	220	610	547	481	432	0.2-590	380-500VAC
FR-A840-280K-#	FR-A840-06830-#	380-500VAC	683	610	547	481	355	315	280	250	683	610	547	481	0.2-590	380-500VAC

Model		Input Power Supply				Output										
capacity designation	current designation	Voltage DC	Current [A]				Motor Capacity [kW]				Current [A]				Freq. Hz	Voltage 3-Phase AC
			SLD	LD	ND	HD	SLD	LD	ND	HD	SLD	LD	ND	HD		
FR-A842-315K-#	FR-A842-07700-#	430-780VDC	-	-	-	-	400	355	315	280	770	683	610	547	0.2-590	380-500VAC
FR-A842-355K-#	FR-A842-08660-#	430-780VDC	-	-	-	-	450	400	355	315	866	770	683	610	0.2-590	380-500VAC
FR-A842-400K-#	FR-A842-09620-#	430-780VDC	-	-	-	-	500	450	400	355	962	866	770	683	0.2-590	380-500VAC
FR-A842-450K-#	FR-A842-10940-#	430-780VDC	-	-	-	-	-	500	450	400	1094	962	866	770	0.2-590	380-500VAC
FR-A842-500K-#	FR-A842-12120-#	430-780VDC	-	-	-	-	-	-	500	450	1212	1094	962	866	0.2-590	380-500VAC

Model	Input Power Supply		Output
	Voltage 3-Phase AC 50/60Hz	Current [A]	Voltage DC
FR-CC2-H315K-#	380-500V	610	430-780VDC
FR-CC2-H355K-#	380-500V	683	430-780VDC
FR-CC2-H400K-#	380-500V	770	430-780VDC
FR-CC2-H450K-#	380-500V	866	430-780VDC
FR-CC2-H500K-#	380-500V	962	430-780VDC

Model		Input Power Supply			Output					
capacity designation	current designation	Voltage	Current[A]		Motor Capacity [kW]		Current [A]		Freq.	Voltage
		3-Phase AC 50/60Hz	LD	ND	LD	ND	LD	ND	Hz	3-Phase AC
FR-A846-0.4K-#2#	FR-A846-00023-#2#	380/500VAC	2.1	1.5	0.75	0.4	2.1	1.5	0.2-590	380-500VAC
FR-A846-0.75K-#2#	FR-A846-00038-#2#	380/500VAC	3.5	2.5	1.5	0.75	3.5	2.5	0.2-590	380-500VAC
FR-A846-1.5K-#2#	FR-A846-00052-#2#	380/500VAC	4.8	4	2.2	1.5	4.8	4	0.2-590	380-500VAC
FR-A846-2.2K-#2#	FR-A846-00083-#2#	380/500VAC	7.6	6	3.7	2.2	7.6	6	0.2-590	380-500VAC
FR-A846-3.7K-#2#	FR-A846-00126-#2#	380/500VAC	11.5	9	5.5	3.7	11.5	9	0.2-590	380-500VAC
FR-A846-5.5K-#2#	FR-A846-00170-#2#	380/500VAC	16	12	7.5	5.5	16	12	0.2-590	380-500VAC
FR-A846-7.5K-#2#	FR-A846-00250-#2#	380/500VAC	23	17	11	7.5	23	17	0.2-590	380-500VAC
FR-A846-11K-#2#	FR-A846-00310-#2#	380/500VAC	29	23	15	11	29	23	0.2-590	380-500VAC
FR-A846-15K-#2#	FR-A846-00380-#2#	380/500VAC	35	31	18.5	15	35	31	0.2-590	380-500VAC
FR-A846-18.5K-#2#	FR-A846-00470-#2#	380/500VAC	43	38	22	18.5	43	38	0.2-590	380-500VAC
FR-A846-22K-#2#	FR-A846-00620-#2#	380/500VAC	57	44	30	22	57	44	0.2-590	380-500VAC
FR-A846-30K-#2#	FR-A846-00770-#2#	380/500VAC	70	57	37	30	70	57	0.2-590	380-500VAC
FR-A846-37K-#2#	FR-A846-00930-#2#	380/500VAC	85	71	45	37	85	71	0.2-590	380-500VAC
FR-A846-45K-#2#	FR-A846-01160-#2#	380/500VAC	106	86	55	45	106	86	0.2-590	380-500VAC
FR-A846-55K-#2#	FR-A846-01800-#2#	380/500VAC	144	110	75	55	144	110	0.2-590	380-500VAC
FR-A846-75K-#2#	FR-A846-02160-#2#	380/500VAC	180	144	90	75	180	144	0.2-590	380-500VAC
FR-A846-90K-#2#	FR-A846-02600-#2#	380/500VAC	216	180	110	90	216	180	0.2-590	380-500VAC
FR-A846-110K-#2#	FR-A846-03250-#2#	380/500VAC	260	216	132	110	260	216	0.2-590	380-500VAC
FR-A846-132K-#2#	FR-A846-03610-#2#	380/500VAC	325	260	160	132	325	260	0.2-590	380-500VAC

Note: The FR-A846 series are IP55compatible models.

means any alphanumerical suffix that may be added.

2. DOCUMENTS AND DRAWINGS :

Instructions manuals, and data sheet N° 14-7E.

List of models N°NSH-13067-12, dated 28.Feb.2014 and N°NSH-14062-15, dated 13.Feb.2015.

Test sample selection document N°NSH-14062-17, dated 16.Feb.2015.

List of drawings:

Document	Outline drawing	Assembly diagram	Elementary diagram	Main component list
Model	Document No.	Document No.	Document No.	Document No.
FR-A840-0.4K-#	BC112C102	BC121A728	BC102C216	GC102A021
FR-A840-0.75K-#				
FR-A840-1.5K-#				
FR-A840-2.2K-#	BC111C997	BC121A675		
FR-A840-3.7K-#				
FR-A840-5.5K-#	BC111C998	BC121A676	BC102C217	GC102A022
FR-A840-7.5K-#	BC111C999	BC121A677	BC102C218	GC102A023
FR-A840-11K-#				
FR-A840-15K-#	BC112C000	BC121A678	BC102C219	GC102A024
FR-A840-18.5K-#				
FR-A840-22K-#				
FR-A840-30K-#	BC112C001	BC121A679	BC102C220	GC102A025
FR-A840-37K-#	BC112C003	BC121A772	BC102C221	GC102A247
FR-A840-45K-#				
FR-A840-55K-#				
FR-A840-75K-#	BC112C004	BC121A682	BC102C222	GC102A027
FR-A840-90K-#	BC112C109	BC121A683		
FR-A840-110K-#		BC121A773	BC102B366	GC102A243
FR-A840-132K-#		BC121A774		
FR-A840-160K-#	BC112C121	BC121A795	BC102B367	GC102A244
FR-A840-185K-#	BC112C122	BC121A809	BC102B368	GC102A245
FR-A840-220K-#				
FR-A840-250K-#				
FR-A840-280K-#	BC112C138	BC121A807	BC102B393	GC102A313
FR-A842-315K-#				
FR-A842-355K-#				
FR-A842-400K-#	BC112C139	BC121A808	BC102B394	GC102A314
FR-A842-450K-#				
FR-A842-500K-#				

Document	Outline drawing	Assembly diagram	Elementary diagram	Main component list
Model	Document No.	Document No.	Document No.	Document No.
FR-CC2-H315K-#	BC112C136	BC121A805	BC102B395	GC102A311
FR-CC2-H355K-#				
FR-CC2-H400K-#	BC112C137	BC121A806	BC102B396	GC102A312
FR-CC2-H450K-#				
FR-CC2-H500K-#				

Document	Outline drawing	Assembly diagram	Elementary diagram	Main component list
Model	Document No.	Document No.	Document No.	Document No.
FR-A846-0.4K-#2#	BC112C103	BC121A800	BC102C383	GC102A444
FR-A846-0.75K-#2#				
FR-A846-1.5K-#2#				
FR-A846-2.2K-#2#				GC102A440
FR-A846-3.7K-#2#				
FR-A846-5.5K-#2#				
FR-A846-7.5K-#2#	BC112C104	BC121A766	BC102C355	GC102A208
FR-A846-11K-#2#				
FR-A846-15K-#2#				
FR-A846-18.5K-#2#				
FR-A846-22K-#2#	BC112C105	BC121A767	BC102C356	GC102A209
FR-A846-30K-#2#				
FR-A846-37K-#2#				
FR-A846-45K-#2#				
FR-A846-55K-#2#	BC112C106	BC121A768	BC102B357	GC102A210
FR-A846-75K-#2#				
FR-A846-90K-#2#				
FR-A846-110K-#2#	BC112C107	BC121A769	BC102B358	GC102A211
FR-A846-132K-#2#				

3. TEST REPORTS :

Japan Certification Corporation:

- Tests report N°NSH-13067-36, dated 04.Jul.2014.
- Tests report N°NSH-14023-01, dated 31.Jul.2014.
- Tests report N°NSH-14061-01, dated 19.May.2015.

IPS Corporation:

- Tests report N°EMC14088, dated 04.Jun.2014.
- Tests report N°EMC14130, dated 23.Jul.2014

Mitsubishi Electric:

- Tests results for relevant IEC standards, dated 27.Mar.2014.

TUV:

- Certificate N°R 50251060, dated 28.Jan.2014.
- Certificate N°R 50277670, dated 12.Mar.2014.
- Certificate N°R 50251060, dated 01.May.2013.
- Certificate N°R 50251060, dated 27.Nov.2013.
- Certificates N°R 50274511, dated 24.Apr.2014.
- Certificates N°R 50274511, dated 25.Feb.2014.
- Certificates N°R 50274511, dated 04.Nov.2014.
- Certificates N°R 50274511, dated 03.Dec.2014.
- IP55 tests report N°50007851001, dated 22.Apr.2014.
- IP55 tests report N°12031029001, dated 10.Jan.2014.
- IP55 tests report N°12312045004, dated 27.Oct.2014.
- IP55 tests report N°12312045006, dated 27.Nov.2014.

KEC:

- Tests report N°A-071-14-B, dated 13.Apr.2015.

JQA:

- Tests report N°KL80150008 & N°KL80150009, dated 11.May.2015.

LABOTECH:

- Test Report No. LIC 12-21-140, dated 10 Nov. 2021.

4. APPLICATION / LIMITATION :

- 4.1 - BUREAU VERITAS Rules and Regulations for the Classification of Steel Ships.
 4.2 - Approval valid for ships intended to be granted with the following additional class notations: **AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS.**
 4.3 - BUREAU VERITAS Environmental Category, **EC Code: 21**
 4.4 - The equipment fulfils the EMC requirements for installation in General Power Distribution Zones.
 4.5 - The FR-A800 series (except FR-A846, IP55 compatible models) shall be contained in a metal box, console or housing that attenuates the electromagnetic emission of the products.
 4.6 - Equipment covered by this Type Approval certificate has been tested according to requirements of IACS UR E10 rev7.

5. PRODUCTION SURVEY REQUIREMENTS :

- 5.1 - The above products are to be supplied by **mitsubishi electric corporation Nagoya Works** in compliance with the type described in this certificate.
 5.2 - This type of product is within the category HBV of Bureau Veritas Rule Note NR320 and as such does not require a BV product certificate.
 5.3 - **mitsubishi electric corporation Nagoya Works** has to make the necessary arrangements to have its works recognised by Bureau Veritas in compliance with the requirements of NR320 for HBV products.
 5.4 - For information, **mitsubishi electric corporation Nagoya Works** has declared to Bureau Veritas the following production sites:

mitsubishi electric corporation Nagoya Works
5-1-14, Yada-Minami, Higashi-ku
461-8670 Nagoya
JAPAN

Mitsubishi Electric Dalian Industrial Products Co.,Ltd.
Dongbei 3-5,
Dalian Economic &
Technical Development Zone,
Liaoning Province,
DALIAN
CHINA

mitsubishi electric india pvt. ltd.
EL31/15, J-Block
MIDC, Bhosari,
PUNE , 411026 , MAHARASHTRA
INDIA

6. MARKING OF PRODUCT :

- 6.1 - Trade name.
 6.2 - Date of manufacture and serial number.
 6.3 - Equipment type or model identification under which it was type-tested

7. OTHERS :

- 7.1 - It is **mitsubishi electric corporation Nagoya Works's** responsibility to inform shipbuilders or their sub-contractors of the proper methods of fitting, use and general maintenance of the approved equipment and the conditions of this approval.
 7.2 - This certificate supersedes the Type Approval Certificate No. 37962/C0 BV issued on 06 Feb 2022 by the Society.

*** END OF CERTIFICATE ***