

Type Approval Certificate



[Frequency Converter]

Initial Approval 17th March, 2015
Manufacturer Mitsubishi Electric Corporation, Nagoya works
1-14, Yada-Minami 5-chome, Higashi-ku, Nagoya 461-8670, Japan
Product Description Type : Inverter FR-A800 series
"See Appendix 1"

Approval Condition " See Appendix 1 "

THIS IS TO CERTIFY that the above-mentioned product has been approved in accordance with the relevant requirement of this Society's Rules and / or of the recognized standards as follows.

Pt. 6, Ch. 1, Sec. 2 of the Rules for Classification, Steel Ships.

This Certificate is valid until 16th March, 2025

Reissued at Busan, Korea on 28th March, 2022



This certificate is signed electronically in accordance with IMO FAL.5/Circ.39/Rev.2. Validation and authentication of the certificate can be confirmed from "<http://e-cert.krs.co.kr>" by using the tracking No(ME22008094162) and certificate No.(TKY21652-AC002).



KOREAN REGISTER

*General Manager of
Marine & Ocean Equipment Team*

Note : 1. This certificate will be valid subject to complying with the approval conditions described on the certificate and/or on the Rules of this Society.
2. This certificate will be invalid from the expiry date aforementioned unless the extension or renewal has been granted to the applicant or the manufacturer.
3. Any significant modifications or changes in design or construction to the above product without approval from this Society will render this certificate invalid.
4. Should the specified rules, regulations or standards be amended during the validity of this certificate, the product is to be re-approved by this Society in accordance with the requirements as amended.

Product Description and/or Approval Condition

Date of Issue : 28th March, 2022

Product Description :

1. Standard Model (capacity from 0.4K to 280K)

1) Nomenclature

F R - A 8 4 0 - 0.4K -#
 ----- (a) ----- (b) (c) (d) (e) (f)

Part	Variation	Explanation
(a)	FR-A8	Fixed
(b)	2 4	200V Class model 400V Class model * Only 400V class models are applied to this certificate
(c)	0	Standard Model, whose capacity is from 0.4K to 280K
(d)	-	Fixed
(e)	0.4K to 280K or 00023 to 06830	___K : Designation by applicable motor capacity (kW) in ND (Normal Duty) Setting. ____ : Designation by maximum output current(A).
(f)	-#	Alphanumerical suffix that may to added

2) Products' ranges

- * Input Power Supply Voltage : 3-Phase 50/60Hz 380-500VAC
- * Output Frequency : 0.2-590Hz
- * Output Voltage : 380-500VAC
- * SLD: Super Light Duty, LD: Light Duty, ND: Normal Duty (initial setting), HD: Heavy Duty

Model	Input Power Supply				Output							
	Current [A]				Motor Capacity [kW]				Current [A]			
Capacity (Current) designation	SLD	LD	ND	HD	SLD	LD	ND	HD	SLD	LD	ND	HD
FR-A840-0.4K-# (FR-A840-00023-#)	3.2	3	2.3	1.4	0.75	0.75	0.4	0.2	2.3	2.1	1.5	0.8
FR-A840-0.75K-# (FR-A840-00038-#)	5.4	4.9	3.7	2.3	1.5	1.5	0.75	0.4	3.8	3.5	2.5	1.5
FR-A840-1.5K-# (FR-A840-00052-#)	7.8	7.3	6.2	3.7	2.2	2.2	1.5	0.75	5.2	4.8	4	2.5
FR-A840-2.2K-# (FR-A840-00083-#)	10.9	10.1	8.3	6.2	3.7	3.7	2.2	1.5	8.3	7.6	6	4
FR-A840-3.7K-# (FR-A840-00126-#)	16.4	15.1	12.3	8.3	5.5	5.5	3.7	2.2	12.6	11.5	9	6
FR-A840-5.5K-# (FR-A840-00170-#)	22.5	22.3	17.4	12.3	7.5	7.5	5.5	3.7	17	16	12	9
FR-A840-7.5K-# (FR-A840-00250-#)	31.7	31	22.5	17.4	11	11	7.5	5.5	25	23	17	12

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Model	Input Power Supply				Output							
	Current [A]				Motor Capacity [kW]				Current [A]			
Capacity (Current) designation	SLD	LD	ND	HD	SLD	LD	ND	HD	SLD	LD	ND	HD
FR-A840-11K-# (FR-A840-00310-#)	40.3	38.2	31	22.5	15	15	11	7.5	31	29	23	17
FR-A840-15K-# (FR-A840-00380-#)	48.2	44.9	40.3	31	18.5	18.5	15	11	38	35	31	23
FR-A840-18.5K-# (FR-A840-00470-#)	58.4	53.9	48.2	40.3	22	22	18.5	15	47	43	38	31
FR-A840-22K-# (FR-A840-00620-#)	76.8	75.1	56.5	48.2	30	30	22	18.5	62	57	44	38
FR-A840-30K-# (FR-A840-00770-#)	97.6	89.7	75.1	56.5	37	37	30	22	77	70	57	44
FR-A840-37K-# (FR-A840-00930-#)	115	106	91	75.1	45	45	37	30	93	85	71	57
FR-A840-45K-# (FR-A840-01160-#)	141	130	108	91	55	55	45	37	116	106	86	71
FR-A840-55K-# (FR-A840-01800-#)	180	144	134	108	75/90	75	55	45	180	144	110	86
FR-A840-75K-# (FR-A840-02160-#)	216	180	144	110	110	90	75	55	216	180	144	110
FR-A840-90K-# (FR-A840-02600-#)	260	216	180	144	132	110	90	75	260	216	180	144
FR-A840-110K-# (FR-A840-03250-#)	325	260	216	180	160	132	110	90	325	260	216	180
FR-A840-132K-# (FR-A840-03610-#)	361	325	260	216	185	160	132	110	361	325	260	216
FR-A840-160K-# (FR-A840-04320-#)	432	361	325	260	220	185	160	132	432	361	325	260
FR-A840-185K-# (FR-A840-04810-#)	481	432	361	325	250	220	185	160	481	432	361	325
FR-A840-220K-# (FR-A840-05470-#)	547	481	432	361	280	250	220	185	547	481	432	361
FR-A840-250K-# (FR-A840-06100-#)	610	547	481	432	315	280	250	220	610	547	481	432
FR-A840-280K-# (FR-A840-06830-#)	683	610	547	481	355	315	280	250	683	610	547	481

Product Description and/or Approval Condition

Date of Issue : 28th March, 2022

2. Separated Converter Type (capacity from 315K to 500K)

1) Nomenclature

F R - A 8 4 2 - 315K -#
 ----- (a) ----- (b) (c) (d) (e) (f)

Part	Variation	Explanation
(a)	FR-A8	Fixed
(b)	4	400V Class model
(c)	2	Separated converter model, whose capacity is from 315K to 500K
(d)	-	Fixed
(e)	315K to 500K or 07700 to 12120	___K : Designation by applicable motor capacity (kW) in ND (Normal Duty) Setting. ____ : Designation by maximum output current(A).
(f)	-#	Alphanumerical suffix that may be added.

2) Products' ranges

- * The separated converter type beginning with "FR-A842" is to be used together with the corresponding converter units according to the applied motor capacity.
- * Input Power Supply Voltage : 430-780VDC
- * Output Frequency : 0.2-590Hz
- * Output Voltage : 380-500VAC (3-Phase AC)
- * SLD: Super Light Duty, LD: Light Duty, ND: Normal Duty (initial setting), HD: Heavy Duty

Model	Input Power Supply				Output							
	Current [A]				Motor Capacity [kW]				Current [A]			
Capacity (Current) designation	SLD	LD	ND	HD	SLD	LD	ND	HD	SLD	LD	ND	HD
Capacity (Current) designation	SLD	LD	ND	HD	SLD	LD	ND	HD	SLD	LD	ND	HD
FR-A842-315K-# (FR-A842-07700-#)	-	-	-	-	400	355	315	280	770	683	610	547
FR-A842-355K-# (FR-A842-08660-#)	-	-	-	-	450	400	355	315	866	770	683	610
FR-A842-400K-# (FR-A842-09620-#)	-	-	-	-	500	450	400	355	962	866	770	683
FR-A842-450K-# (FR-A842-10940-#)	-	-	-	-	-	500	450	400	1094	962	866	770
FR-A842-500K-# (FR-A842-12120-#)	-	-	-	-	-	-	500	450	1212	1094	962	866

Product Description and/or Approval Condition

Date of Issue : 28th March, 2022

3. IP55 Compatible Model

1) Nomenclature

F R - A 8 4 6 - 0.4K - # 2 #
 ----- (a) ----- (b) (c) (d) (e) (f) (g) (h) (i)

Part	Variation	Explanation
(a)	FR-A8	Fixed
(b)	4	4: 400V Class model
(c)	6	6: IP55 compatible model, whose capacity is from 0.4K to 132K
(d)	-	Fixed
(e)	0.4K to 132K or 00023 to 03610	___K : Model Designation by applicable motor capacity (kW) in ND (Normal Duty) Setting. ____ : Model designation by maximum output current(A).
(f)	-	Fixed
(g)	#	Alphanumerical suffix.
(h)	2	2: built-in C2 class EMC filter
(i)	#	Alphanumerical suffix that may be added.

2) Products' ranges

- * Input Power Supply Voltage : 3-Phase 50/60Hz 380-500VAC
- * Output Frequency : 0.2-590Hz
- * Output Voltage : 3-Phase 380-500VAC
- * LD: Light Duty, ND: Normal Duty (initial setting)

Model	Input Power Supply		Output			
	Current [A]		Motor Capacity [kW]		Current [A]	
Capacity (Current) designation	LD	ND	LD	ND	LD	ND
FR-A846-0.4K-#2# (FR-A846-00023-#2#)	2.1	1.5	0.75	0.4	2.1	1.5
FR-A846-0.75K-#2# (FR-A846-00038-#2#)	3.5	2.5	1.5	0.75	3.5	2.5
FR-A846-1.5K-#2# (FR-A846-00052-#2#)	4.8	4	2.2	1.5	4.8	4
FR-A846-2.2K-#2# (FR-A846-00083-#2#)	7.6	6	3.7	2.2	7.6	6
FR-A846-3.7K-#2# (FR-A846-00126-#2#)	11.5	9	5.5	3.7	11.5	9
FR-A846-5.5K-#2# (FR-A846-00170-#2#)	16	12	7.5	5.5	16	12

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Model	Input Power Supply		Output			
	Current [A]		Motor Capacity [kW]		Current [A]	
Capacity (Current) designation	LD	ND	LD	ND	LD	ND
FR-A846-7.5K-#2# (FR-A846-00250-#2#)	23	17	11	7.5	23	17
FR-A846-11K-#2# (FR-A846-00310-#2#)	29	23	15	11	29	23
FR-A846-15K-#2# (FR-A846-00380-#2#)	35	31	18.5	15	35	31
FR-A846-18.5K-#2# (FR-A846-00470-#2#)	43	38	22	18.5	43	38
FR-A846-22K-#2# (FR-A846-00620-#2#)	57	44	30	22	57	44
FR-A846-30K-#2# (FR-A846-00770-#2#)	70	57	37	30	70	57
FR-A846-37K-#2# (FR-A846-00930-#2#)	85	71	45	37	85	71
FR-A846-45K-#2# (FR-A846-01160-#2#)	106	86	55	45	106	86
FR-A846-55K-#2# (FR-A846-01800-#2#)	144	110	75	55	144	110
FR-A846-75K-#2# (FR-A846-02160-#2#)	180	144	90	75	180	144
FR-A846-90K-#2# (FR-A846-02600-#2#)	216	180	110	90	216	180
FR-A846-110K-#2# (FR-A846-03250-#2#)	260	216	132	110	260	216
FR-A846-132K-#2# (FR-A846-03610-#2#)	325	260	160	132	325	260

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4. Converter Units

1) Nomenclature

* To be used together with any of the FR-A842 inverters whose capacity is from 315K to 500K

F R - C C 2 - H - 315K -#
----- (a)----- (b) (c) (d) (e)

Part	Variation	Explanation
(a)	FR-CC2-	Fixed
(b)	H	400V Class model
(c)	-	Fixed
(d)	315K to 500K	Applicable motor capacity
(e)	-#	Alphanumeric suffix that may be added.

2) Products' ranges

Model	Input Power Supply		Output
	Voltage	Current	Voltage
	3-Phase AC 50/60Hz	[A]	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

5. Documents

- 1) Product catalog : L (NA) 06075ENG-B (1403) MEE, L (NA) 06075ENG-C (1503) MEE
- 2) Instruction Manuals : IB (NA) -0600493-B (Nov 2013) (up to 280K)
IB (NA) -0600534ENG-A (Feb 2014) (315K or more)
IB (NA) -0600543ENG-A (Feb 2014) (converter unit)
IB (NA) -0600531ENG-D (FR-846)
- 3) Product Drawings : NSH-14046-06 (2014. 10. 07), NSH-15015-05 (2015. 9. 25)
(Product Drawings include Outline Drawings, Assembly Diagrams, Elementary Diagrams and Main Component Lists)

6. Test Reports

- 1) Japan Certification Corporation
 - NSH-13067-36 (2014. 07. 04)
 - NSH-14023-01 (2014. 07. 31)
 - NSH-14061-01 (2015. 05. 19)
- 2) TUV Rheinland
 - R 50251060 (2013. 11. 27)
 - R 50251060 (2013. 05. 01)
 - R 50251060 (2014. 01. 28)
 - R 50277670 (2014. 03. 12)
 - R 50274511 (2014. 02. 25)
 - R 50274511 (2014. 04. 24)
 - R 50274511 (2014. 11. 04)
 - R 50274511 (2014. 12. 03)
 - EMC Test Report for 18.5K (2014. 02. 19)
 - EMC Test Report for 0.4K (2014. 05. 14)
 - EMC Test Report for 55K (2014. 12. 11)
 - 50007851 001 (2014. 04. 22)

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- 12031029 001 (2014. 01. 10)
- 12312045 004 (2014. 10. 27)
- 12312045 006 (2014. 11. 27)

3) IPS Corporation

- EMC14088 (2014. 06. 04)
- EMC14130 (2014. 07. 23)

4) MITSUBISHI ELECTRIC

- Test Results for Relevant IEC Standard (2014. 03. 27)
- EMC Test Report for 18.5K (2013. 12. 02)
- EMC Test Report for 0.4K (2014. 05. 08)
- EMC Test Report for 55K (2014. 10. 10)

5) JQA

- JQA Test Report_KL80150008 (2015. 05. 11)
- JQA Test Report_KL80150009 (2015. 05. 11)

6) KEC

- KEC Test Report_A-071-14-B (2015. 04. 13)

7) LABOTECH

- LIC 12-21-140 (2021. 11. 10)

7. Approval Condition

- 1) This approval is granted on the basis of the test reports & submitted documents.
(IACS UR E10 Rev.8 Basis)
- 2) The product or packing is to be marked with manufacturer name and type designation on a suitable position.
- 3) Inverter FR-A800 can be installed in a zone other than bridge and deck zone.
- 4) This product except the IP55 compatible models is to be placed in a metal box.
- 5) This product is to have the appropriate IP grade according to Pt. 6, Ch. 1, Sec. 103 of the Rules for Classification, Steel Ships.
- 6) This product except the IP55 compatible models is to have the appropriate external noise filter specified by the manufacturer.
- 7) If the converters are used as parts of the motor controller which drive essential auxiliaries specified in KR Rule Pt. 5, Ch. 1, 102 and exceed the output 7.5 kW, Individual Product Certification is required for the motor controller.

< End of Certificate >