Certificate No:
TAE00004V3

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Frequency Converter

with type designation(s)
FRENIC-MEGA

Issued to
FUJI ELECTRIC EUROPE GMBH
Offenbach am Main, Hessen, Germany

is found to comply with
DNV rules for classification – Ships, offshore units, and high speed and light craft

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Range:
0.4 kW to 630 kW 380 - 480 V AC supply

Issued at **Høvik** on **2024-04-15**
This Certificate is valid until **2029-04-14**.
DNV local station: **Area NB/CMC Iberia**

Approval Engineer: **Nicolay Horn**

for **DNV**

Frederik Tore Elter
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Name and place of manufacturer

Fuji Electric Co., Ltd
5520 Minami Suzuka Mie 513-8633
Japan

Product description

FRN	0,4	G2	S	-	4	Jxxxxx
	①	②	③		④	⑤

Motor output (kW or A)			
Input voltage	**kW**	**A***	**A****
400V class	0,4	0002	-
	0,75	0003	-
	1,5	0004	-
	2,2	0006	-
	3,7	0009	-
	5,5	0018	-
	7,5	0023	-
	11	0035	0031
	15	0041	0038
	18,5	0045	-
	22	0060	-
	30	0085	0075
	37	0105	0091
	45	0139	0112

Motor output (kW or A)			
Input voltage	**kW**	**A***	**A****
400V class	55	0179	0150
	75	0217	0180
	90	0261	0216
	110	0290	0260
	132	0376	0325
	160	0431	0377
	200	0547	0432
	220	0610	0520
	280	0739	0650
	315	0840	0740
	355	1039	0960
	400	1169	1040
	500	1385	1170
	630	1480	1386

* New
**Models in operation

② **Applicable field**
G:FRENIC-MEGA（G2）

③ **Enclosure**
S : Basic type (IP 20 / 00)

④ **Input voltage**
4 : Three phase 380V to 480V class

⑤ **Shipping destination / Manual language**
J : Japan / Japanese
C : China / Chinese
G : Global
X : Blank, letter or numbers

Application/Limitation

Supply voltage range:	380 - 480 V, 50 / 60 Hz
Voltage variation:	+10 - 15 % stationary, ± 20% transient
Frequency variation:	± 5 % stationary, ± 10% transient
Temperature range in operation:	- 10 to + 55 °C
For temperatures 50 to 55 °C see table:	
Protection degree:	IP00 / IP20
Temperature class:	A
Vibration class:	A
Humidity class:	B
EMC class:	A

Documents for the actual application are to be submitted for approval in each case in accordance with DNV Rules Pt.4, Ch.8, Sec.1 Table 2. A product certificate is required case by case in accordance with Rule requirement Pt.4. Ch.8. Sec.1 for units ≥ 100 kW.

For product certification, the following documents should be submitted for approval, Ref. to DNV Pt.4 Ch.8 Sec.1 Table 2:
-Reference to this Type Approval Certificate
-(E180) A drawing showing external location of instruments and devices for operation (panel layout)
-(E240) Functional description for the intended use, configuration and interface (e.g. alarms, monitoring and auxiliary power supplies)
-(Z252) Test program at manufacturer for routine tests and functional tests as per DNV Pt.4 Ch.8 Sec.7, 2.1.1
-Single line diagram (only applicable for multi drive configuration)
-If additional components to the type approved frequency converter are delivered, documentation according to DNV rules Pt.4 Ch.8 Sec.1 table 2 shall be submitted for review.

To be installed in an enclosure with an IP degree in accordance with DNV Rules w.r.t. location.

For IT installations, Earth Monitoring System compatibility, must be investigated prior to installation onboard.

To be installed in climatically controlled areas.

Type Approval documentation

Tests carried out

Type tests in accordance with the IEC 61800 series. Environmental tests in accordance with DNV-CG-0339 as Visual inspection, Performance, Power supply failure, Power supply variations,
Voltage/frequency variation, Vibration, Dry heat, Damp heat static, Insulation resistance, High voltage.

EMC: The following tests are in accordance with DNV-CG-0339 / IEC 61800-3: Electrical fast transient (Burst), electrical slow transient (Surge), RF-common mode Voltage, radiated RF-electromagnetic fields, electric discharge (ESD), radiated and conducted emission.

Marking of product

Fuji Electic Co.Ltd – FRENIC-MEGA - Type designation – Power – Voltage

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the Type approval are complied with and that no alterations are made to the product design or choice of materials.

The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routine tests (RT) checked (if not available tests according to RT to be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Assessment to be performed at 2 and 3.5 year and at renewal.

END OF CERTIFICATE