DNV·GL

Certificate No:
TAA00001RN

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Programmable Electronic System

with type designation(s)
MICREX-SX series Programmable Controller

Issued to
Fuji Electric Co., Ltd.
Hino, Tokyo, Japan

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

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Location classes:

Temperature	**B**
Humidity	**B**
Vibration	**A**
EMC	**B (See Application/Limitation on page 3)**
Enclosure	**Required protection according to relevant rules shall be provided upon installation on board**

Issued at **Høvik** on **2018-03-05**
This Certificate is valid until **2022-12-31**.
DNV GL local station: **Yokohama**

for **DNV GL**

Approval Engineer: **Ståle Sneen**

Odd Magne Nesvåg
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.

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Job Id: **262.1-007553-4**
Certificate No: **TAA00001RN**

Product description

MICREX-SX series Programmable Controller consisting of:

Product name	Type
Power supply	NP1S-22 NP1S-42
CPU modules	NP1PS-32 NP1PS-74 NP1PS-117 NP1PS-32R NP1PS-74R NP1PS-117R NP1PS-245R NP1PH-08 NP1PH-16 NP1PM-48R NP1PM-48E NP1PM-256E NP1PM-256H
Base boards	NP1BS-03 NP1BS-06 NP1BS-08 NP1BS-11 NP1BS-13 NP1BP-13 NP1BS-08D NP1BS-11D NP1BS-13D NP1BP-08D NP1BP-11D NP1BP-13D
Digital input modules	NP1X1606-W NP1X3206-W NP1X3202-W NP1X6406-W NP1X0810 NP1X1610 NP1X0811
Digital output modules	NP1Y08T0902 NP1Y16T09P6 NP1Y32T09P1 NP1Y64T09P1 NP1Y08U0902 NP1Y16U09P6 NP1Y32U09P1 NP1Y64U09P1 NP1Y06S NP1Y08S NP1Y08R-04 NP1Y16R-08 NP1Y08R-00
Digital input/output modules	NP1W1606T NP1W3206T NP1W6406T NP1W1606U NP1W3206U

Product name	Type
Analog input modules	NP1AXH4-MR NP1AXH8V-MR NP1AXH8I-MR NP1AX04-MR
Analog input modules	NP1AX08V-MR NP1AX08I-MR NP1AXH8VG-MR NP1AXH8IG-MR NP1AXH4-PT NP1AXH6G-PT NP1AXH4-TC NP1AXH8G-TC
Analog output modules	NP1AYH2-MR NP1AYH4V-MR NP1AYH4I-MR NP1AYH4VG-MR NP1AYH4IG-MR NP1AYH8V-MR NP1AYH8I-MR NP1AY02-MR
Dummy module	NP1F-DMY
Communication modules	NP1L-RS1 NP1L-RS2 NP1L-RS4 NP1L-RS5 NP1L-LE1 NP1L-LL1 NP1L-LL2 NP1L-TMA NP1L-TMB NP1L-TMB2 NP1L-ET1
T-link modules	NP1L-TL1 NP1L-TS1 NP1L-RT1
P-link module	NP1L-PL1
PE-link module	NP1L-PE1
OPCN-1 link modules	NP1L-RJ1 NP1L-JP1
Communication unit	NP2L-BH1
Data backup battery	NP8P-BT
SX bus expansion cables	NP1C-P3 NP1C-P6 NP1C-P8 NP1C-02 NP1C-05 NP1C-10 NP1C-25
SX bus terminating plug	NP8B-BP
SX-bus branching unit	NP8B-TB
Loader cable with converter	NP4H-CNV

Product name	Type
Digital input units	NP2X16-RT1C NP2X32-RT1C
Digital output units	NP2Y16R-RT1C NP2Y32R-RT1C

Product name	Type
PCI bus based bord	NP3L-LL2PCS
I/O Terminal	NR1TX-1606DT NR1TY-08R07DT NR1TY-16T05DT NR1TW-16T65DT

Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV GL, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV GL rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.

Product certificate

If specified in the Rules, ref. Pt.4 Ch.9 Sec.1, the control and monitoring system in which the above listed hardware is used shall be delivered with a product certificate. For each such delivery the certification test is to be performed at the manufacturer of the application system before the system is shipped to the yard. The test shall be done according to an approved test program. After certification the clause for software control will be put into force.

Software control

All changes in software are to be recorded as long as the system is in use on board. Documentation of major changes is to be forwarded to DNV GL for evaluation and approval before implemented on board. Certification of modified functionality may be required for the particular vessel.

Application/Limitation

- To pass the EMC radiated emission test, the equipment was tested with steel cabinet type EC-SCF25-78 (NITTO KOGYO CORP.), and should be installed in is a cabinet with equivalent RF-shielding properties
- The power supply was tested with an EMC filter type NBH-06-432 (COSEL) with ferrite ZCAT3035-1330 (TDK) on both sides of the filter, each ferrite with two turns of the power cable
- SX-bus communication bus cable to unit NP2L-BH1 has to be of shielded type and equipped with ferrite ZCAT3035-1330 (TDK) mounted close to the unit. The ferrite to be installed with three turns of the bus cable.
- Ethernet cable to module NP1L-ET1 has to be equipped with ferrite ZCAT2035-0930 (TDK) mounted close to the module

To satisfy the maritime EMC requirements, the equipment should be installed with the same protection as the tested configuration described in the above. Solutions documenting equivalent protection to the tested solutions may also be accepted. For further information and requirements for installation, please refer to User's Manual FEH249b (Conformance with Standards).

Type Approval documentation

Tests carried out

Applicable tests according to class guideline DNVGL-CG-0339, November 2016.

Marking of product

The products to be marked with:
- manufacturer name
- model name
- serial number
- power supply ratings

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE