

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Multifunction Relay**with type designation(s)
SYMAP BC / BCG, SYMAP X / XG, SYMAP Y-SERIES

Issued to

Stucke Elektronik GmbH
Hamburg, Germany

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.**Issued at **Hamburg** on **2018-04-13**This Certificate is valid until **2019-06-02**.DNV GL local station: **Hamburg**for **DNV GL**Approval Engineer: **Thomas Hartmann**

Arne Schaarmann
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.



Product description

Digital protection relay with protection functions for generators, motors, transformers and power lines.

Power supply: 100 - 450 V / 1A or 5A AC, 50/60Hz;
Auxiliary supply: 24 V AC/DC(12-36), 60 V AC/DC(36-72), 230 V AC/DC(80-300)

The systems may be assembled of the following components:

SYMAP BC / BCG:
CMA 190, CMA 191, CMA 192, CMA 193, CMA 194, CMA 195, CMA 199

SYMAP X / XG:
CMA 200, CMA 201, CMA 202, CMA 219

SYMAP Y-Series (EC/ ECG/ F/ G/ M/ T/ LD):
CMA202, CMA240, CMA241, CMA243, CMA245, CMA246

Common components for SYMAP series:
CMA198, CMA211, CMA212, CMA215, CMA216, CMA217, CMA218, CMA220, CMA221, CMA222, CMA244

System may provide the following functions, according to ANSI:

ANSI no.:

2	Time relay starting or closing
12	Overspeed device
14	Underspeed device
25/A	Automatic synchronizing
27	Undervoltage, instantaneous, definite time
27B	Undervoltage, def. time (Bus 1 only)
32	Reverse power
37	Undercurrent or underpower
46	Reverse phase or phase balance current
47	Phase sequence voltage
49	Thermal overload protection
50BF	Circuit-breaker failure
50	Overcurrent, instantaneous
50G/N	Current earth fault, instantaneous
51	Overcurrent, def. time, IDMT (8 curves)
51G/N	Current earth fault, def. time, IDMT (8 curves)
51LR	Locked rotor
51V	Voltage restrained Overcurrent
59	Overvoltage, instantaneous, def. time, IDMT
64/59N	Ground overvoltage / residual overvoltage
66	Number of start
67	AC directional Overcurrent, def. time
67GS/GD	AC directional earth fault, def. time
78	Phase-angle measuring
79	Auto reclosing
81	Frequency supervision
86	Electrical lock out
87M	Motor differential
87T	Transformer differential
87G	Generator differential
87N	Restrict earth fault
87L	Cable differential
94	Trip circuit supervision
95i	Inrush blocking

- Diesel generator control.
 - Overspeed protection for diesel engine via two independent diverse channels.
 - System run time from detecting overspeed to activate the relay stop output = 150ms.
 - Power management.
 - Event builder with free programmable logic.
 - Five main breaker controls can be activated with interlock logic.
 - Recording function for event history.
 - Detailed protection function history.
 - Data recorder for digital and analogue I/O's.
 - Communication: 1 x RS232, 2 x CAN, 1 x RS422/485 and 1 x Profibus DP.
- PC software for SYMAP®:
- Parameter tool for change tracing, recorder tool for data logger and flash loader for application software.

Application/Limitation

Location Classes:

Temperature: B, Humidity: B, Vibration: A, EMC: A

Generator Instrumentation:

When SYMAP® systems are used for generator protection/control, additional instruments will be required to be fitted in the switchboard as required in DNV GL Rules, Pt.4 Ch.8 Electrical Installations.

Overspeed protection:

Rule requirements for separate prime mover safety functions (e.g. diesel engine overspeed protection) are to be observed.

Power Management Functions:

The applicable rules for the respective ship type and class notation may require additional power management functions than those that have been type approved.

Clause for application software control:

All changes in software are to be recorded as long as the system is in use on board. The records of all changes are to be forwarded to DNV GL for evaluation and approval.

Major changes in the software are to be approved before being installed in the computer.

A Certification of Application Functions may be required for the particular vessel.

Software version:

CU (Control Unit) : 1.10

MU (Measuring Unit) : 1.10

RU (Recording Unit) : 1.10

Operating instruction of the manufacturer to be observed

Type Approval documentation

Tests carried out

Cold, dry heat, damp heat, vibration, flame retardancy and EMC.

Marking of product

Stucke Elektronik GmbH - Type designation - Main data.

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.

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