DNV·GL

Certificate No:
TAA00000C5

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Programmable Electronic System

with type designation(s)
AC 800M Controller

Issued to
ABB AB
Västerås, Sweden

is found to comply with
DNV GL rules for classification – Ships and offshore units

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**
Enclosure	**Required protection according to relevant rules shall be provided upon installation on board**

This Certificate is valid until **2020-12-31**.

Issued at **Høvik** on **2016-03-09**

for **DNV GL**

DNV GL local station: **Stockholm**

Approval Engineer: **Nils Jarem**

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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Product description

ABB AC 800M Controller, including 800xA Safety Modules according to the following table (from 3BSE075911 Rev.D):

Type	Article number	Description	Module Revision Index
AC 800M packages (module and base plate included)			
PM851AK01	3BSE066485R1	Processor Unit	B
PM851AK01-eA	3BSE066485R2	Processor Unit	B
PM856K01	3BSE018104R1	Processor Unit	K
PM856AK01	3BSE066490R1	Processor Unit	B
PM856AK01-eA	3BSE066490R2	Processor Unit	B
PM860K01	3BSE018100R1	Processor Unit	M
PM860AK01	3BSE066495R1	Processor Unit	C
PM860AK01-eA	3BSE066495R2	Processor Unit	C
PM861K01	3BSE018105R1	Processor Unit	N
PM861K02	3BSE018107R1	Processor Units, Redundant	N
PM861AK01	3BSE018157R1	Processor Unit	F
PM861AK01-eA	3BSE018157R2	Processor Unit	F
PM861AK02	3BSE018160R1	Processor Units, Redundant	F
PM861AK02-eA	3BSE018160R2	Processor Units, Redundant	F
PM864K01	3BSE018150R1	Processor Unit	H
PM864K02	3BSE018153R1	Processor Units, Redundant	H
PM864AK01	3BSE018161R1	Processor Unit	F
PM864AK01-eA	3BSE018161R2	Processor Unit	F
PM864AK02	3BSE018164R1	Processor Units, Redundant	F
PM864AK02-eA	3BSE018164R2	Processor Units, Redundant	F
PM865K01	3BSE031151R1	Processor Unit	H
PM865K02	3BSE031150R1	Processor Units, Redundant	H
PM866K01	3BSE050198R1	Processor Unit	G
PM866K01-eA	3BSE050198R2	Processor Unit	G
PM866K02	3BSE050199R1	Processor Units, Redundant	G
PM866K02-eA	3BSE050199R2	Processor Units, Redundant	G
PM891K01	3BSE053241R1	Processor Unit	A
PM891K01-eA	3BSE053241R2	Processor Unit	A
PM891K02	3BSE053242R1	Processor Units, Redundant	A
PM891K02-eA	3BSE053242R2	Processor Units, Redundant	A
SM811K01	3BSE018173R1	Safety CPU module kit	B
BC810K01	3BSE031154R1	CEX-Bus Interconnection Box	G
BC810K02	3BSE031155R1	CEX-Bus Interconnection Box, Redundant	G
BC820K01	3BSE071501R1	CEX-bus and RCU-link Interconnection Unit	A
BC820K02	3BSE071500R1	CEX-bus and RCU-link Intercon. Unit, Redundant	A
AC 800M certified modules and units			
PM851A	3BSE066484R1	CPU module	B
PM851A-eA	3BSE066484R2	CPU module	B
PM856	3BSE018128R1	CPU module	F
PM856A	3BSE066489R1	CPU module	B
PM856A-eA	3BSE066489R2	CPU module	B
PM860	3BSE018110R1	CPU module	J
PM860A	3BSE066494R1	CPU module	C
PM860A-eA	3BSE066494R2	CPU module	C
PM861	3BSE018129R1	CPU module	M
PM861A	3BSE018158R1	CPU module	F

Type	Article number	Description	Module Revision Index
PM861A-eA	3BSE018158R2	CPU module	F
PM864	3BSE018151R1	CPU module	G
PM864A	3BSE018162R1	CPU module	F
PM864A-eA	3BSE018162R2	CPU module	F
PM865	3BSE030193R1	CPU module	H
PM866	3BSE050200R1	CPU module	E
PM866-eA	3BSE050200R2	CPU module	E
PM891	3BSE053240R1	CPU module	A
PM891-eA	3BSE053240R2	CPU module	A
SM811	3BSE018174R1	Safety CPU module	B
Communication packages (module and base plate included)			
CI851K01	3BSE018101R1	Profibus-DP Interface	H
CI852K02	3BSE018102R1	Foundation Fieldbus H1	D
CI853K01	3BSE018103R1	Dual RS232-C Interface	F
CI853K01-eA	3BSE018103R2	Dual RS232-C Interface	F
CI854K01	3BSE025961R1	Profibus DP/V1 Interface	A
CI854AK01	3BSE030220R1	Profibus DP/V1 Interface	G
CI854AK01-eA	3BSE030220R2	Profibus DP/V1 Interface	G
CI858K01	3BSE018135R1	Drivebus Interface	D
CI867K01	3BSE043660R1	Modbus TCP/IP Interface	D
CI867K01-eA	3BSE043660R2	Modbus TCP/IP Interface	D
CI868K01	3BSE048845R1	IEC61850-Ed1 Communication Interface	D
CI868K01-eA	3BSE048845R2	IEC61850-Ed1 Communication Interface	D
CI871K01	3BSE056767R1	PROFINET IO Communication Interface	C
CI871K01-eA	3BSE056767R2	PROFINET IO Communication Interface	C
CI873K01	3BSE056899R1	Ethernet/IP Communication Interface	C
CI873K01-eA	3BSE056899R2	Ethernet/IP Communication Interface	C
Communication interfaces			
CI851	3BSE018116R1	Profibus-DP Com. Interface	G
CI852	3BSE018120R1	Foundation Fieldbus Interface	C
CI853	3BSE018124R1	RS232-C Com. Interface	D
CI853-eA	3BSE018124R2	RS232-C Com. Interface	D
CI854	3BSE025347R1	Profibus-DP/V1 Com. Interface	B
CI854A	3BSE030221R1	Profibus-DP/V1 Com. Interface	B
CI854A-eA	3BSE030221R2	Profibus-DP/V1 Com. Interface	B
CI854B	3BSE069448R1	Profibus-DP/V1 Com. Interface	A
CI854B-eA	3BSE069448R2	Profibus-DP/V1 Com. Interface	A
CI855	3BSE018133R1	MB300 Interface Module	G
CI858	3BSE018136R1	Drive bus interface	D
CI867	3BSE043661R1	Modbus TCP/IP Interface	C
CI867-eA	3BSE043661R2	Modbus TCP/IP Interface	C
CI868	3BSE048846R1	IEC61850-Ed1 Communication Interface	C
CI868-eA	3BSE048846R2	IEC61850-Ed1 Communication Interface	C
CI871	3BSE056768R1	PROFINET IO Communication Interface	B
CI871-eA	3BSE056768R2	PROFINET IO Communication Interface	B
CI873	3BSE056900R1	Ethernet/IP Communication Interface	B
CI873-eA	3BSE056900R2	Ethernet/IP Communication Interface	B
TC562	3BSC630049R1	Short Distance Modem	A
BC810	3BSE030230R1	CEX-bus Interconnection Box	G
BC810-eA	3BSE030230R2	CEX-bus Interconnection Box	G
BC820	3BSE071502R1	CEX-bus and RCU-link Interconnection Unit	A
BC820-eA	3BSE071502R2	CEX-bus and RCU-link Interconnection Unit	A

Type	Article number	Description	Module Revision Index
Base plates			
TP830	3BSE018114R1	Base Plate for PM860	C
TP850	3BSE071504R1	Base Plate for BC820	A
TP851	3BSE018118R1	Base Plate for CI851	A
TP852	3BSE018122R1	Base Plate for CI852	A
TP853	3BSE018126R1	Base Plate for CI853	C
TP854	3BSE025349R1	Base Plate for CI854	A
TP857	3BSE030192R1	Base Plate for BC810	B
TP858	3BSE018138R1	Base Plate for CI858	B
TP867	3BSE043664R1	Base Plate for CI867	B
TP868	3BSE018176R1	Base Plate for SM811	B
Cables and Terminators			
TB807	3BSE008538R1	Modulebus Terminator	A
TB850	3BSC950193R1	CEX-bus Terminator, DB25P	A
TB851	3BSC950194R1	CEX-bus Terminator, DB25S	A
TB852	3BSC950263R1	RCU-link Terminator	A
TK212	3BSC630167R2	Tool Cable	A
TK850V007	3BSC950192R1	CEX-bus Extension Cable	B
TK851V010	3BSC950262R1	RCU-link cable	A
TK853V020	3BSC950201R1	Modem Cable	B
Power Supply and Battery			
SB822	3BSE018172R1	Rechargeable battery unit	-
SD821	3BSC610037R1	Power Supply, 24 V, 2.5 A	-
SD822	3BSC610038R1	Power Supply 24 V, 5 A	-
SD822Z	3BSC610054R1	Power Supply 24 V, 5 A	-
SD823	3BSC610039R1	Power Supply 24 V, 10 A	-
SD831	3BSC610064R1	Power Supply 24 V, 3 A	-
SD832	3BSC610065R1	Power Supply 24 V, 5 A	-
SD834	3BSC610067R1	Power Supply 24 V, 20 A	-
SS822	3BSC610042R1	Voting Device	-
SS822Z	3BSC610055R1	Voting Device	-
SS823	3BSE038226R1	Voting Device	-
SS832	3BSC610068R1	Voting Device	-
GHS	3BSE022262R1	Mains Breaker Kit with GHS2820001R Miniature Circuit Breaker	-
Mounting Rails			
	3BSE022472R1	Terminal for DIN rail	
	3BSE022473R1	Terminal Accessories Kit	
	3BSE022470R1	Terminal Group for Distribution of 24 V	
	3BSE022471R1	Terminal Group Mounting Kit	
	3BSE022256R1	AL-profile (24”)	
	3BSE022257R1	AL-profile (28.3”)	
	3BSE022255R1	AL-profile (19”)	
External RTA Communication Unit			
PU410K01	3BSE051826R1	RTA Communication Kit for MB300 and CBA	C
PU410	3BSE056478R1	RTA Communication Unit	B

Modules included as found in:

- Marine Design Description of AC 800M*4.0/4.1/5.0/5.1 3BSE057258 Rev.A dated 2014-03-11

But limited to modules and units listed in marine specific product documentation for the version/release.

System for software version control and hardware updating as described in:

- ABB Guidelines "Marine R&D Procedures" 3BSE018260 Rev.4

SW: Firmware FW860 series *4.0/4.1/5.0/5.1 Control SW *4.0/4.1/5.0/ 5.1 incl. Function Libraries et al.

Application/Limitation

The following documentation of the actual application is to be submitted for approval in each case:

- Reference to this Type Approval Certificate
- System block diagram
- Power supply arrangement (may be part of the System block diagram)
- List of control and monitored points
- Test program for certification

The Type Approval covers hardware and software listed under Product description.

Product certificate
Each delivery of the application system is to be certified according to Pt.4 Ch.9 Sec.1. The certification test is to be performed at the manufacturer of the application system according to an approved test program before the system is shipped to the yard. After the certification the clause for application software control will be put into force.

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.

Type Approval documentation

Tests carried out

Applicable tests according to Standard for Certification No. 2.4, April 2006.

Marking of product

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

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 at least every second year and at renewal of this certificate.

END OF CERTIFICATE