DNV·GL

Certificate No:
TAA00000C4

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Programmable Electronic System

with type designation(s)
Advant OCS and S800 I/O

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 Advant OCS and S800 I/O including 800xA Safety Modules, consisting of:

Advant Controller 410*1.3/1.4/1.5
Advant Controller 450*1.3/2.0/2.1/2.2/2.3, S100 I/O.
Advant Controller 70*1.1/1.2
Where suffixes for controllers denotes product versions/release of software and hardware release assortment.

S800 I/O types according to the following table (from 3BSE075912 Rev D):

Type	Article number	Description	Module Revision Index
Field Communication Interface			
CI801	3BSE022366R1	Profibus-DP Interface,	G
CI801-eA	3BSE022366R2	Profibus-DP Interface,	G
CI810	3BSE008504R1	AF100 Field Comm . Interface	F
CI810A	3BSE013262R1	AF100 Field Comm . Interface	C
CI810B	3BSE020520R1	AF 100 Field Comm. Interface	F
CI820	3BSE013200R1	AF100 Field Comm . Interface	D
CI820V1	3BSE025255R1	AF100 Field Comm . Interface	D
CI830	3BSE013252R1	Profibus-DP Interface	L
CI840	3BSE022457R1	Profibus-DP Interface for red. appl.	F
CI840A	3BSE041882R1	Profibus-DP Interface for red. appl.	D
CI840A-eA	3BSE041882R2	Profibus-DP Interface for red. appl.	D
Accessories			
TC501V150	3BSC550038R3	Termin. 150 Ohm	-
TC505	3BSC840067R1	AF100 Trunk Tap	-
TC506	3BSC840074R1	AF100 Trunk Tap	-
TC513V1	3BSE018405R1	Modem Twisted Pair/Coax, Coax/Twisted Pair.	C
TC514V2	3BSE013281R1	Modem Twisted Pair/Opto, Opto / Twisted Pair.	B
TC515V2	3BSE013284R1	Modem Twisted Pair/ Twisted Pair.	B
AF100K03	3BSE006251R1	Connection Kit, single	-
TK212	3BSC630167R2	Tool Cable	A
I/O modules			
AI801	3BSE020512R1	Analog Input, Light ser.	G
AI801-eA	3BSE020512R2	Analog Input, Light ser.	G
AI810	3BSE008516R1	Analog Input. 1*8ch	AB
AI810-eA	3BSE008516R2	Analog Input. 1*8ch	AB
AI815	3BSE052604R1	Analoq Input 1x8 ch with HART	H
AI815-eA	3BSE052604R2	Analoq Input 1x8 ch with HART	H
AI820	3BSE008544R1	Analog Input 1*4ch,+-20mA,-	K
AI820-eA	3BSE008544R2	Analog Input 1*4ch,+-20mA,-	K
AI830	3BSE008518R1	Analog Input 1x8ch. RTD	L
AI830A	3BSE040662R1	Analog Input 1x8ch. RTD	F
AI830A-eA	3BSE040662R2	Analog Input 1x8ch. RTD	F
AI835	3BSE008520R1	Analog input 8 ch. TC	L
AI835A	3BSE051306R1	Analog input 8 ch. TC	E
AI835A-eA	3BSE051306R2	Analog input 8 ch. TC	E
AI845	3BSE023675R2	Analoq Input 1x8 ch. HART	U
AI845-eA	3BSE023675R1	Analoq Input 1x8 ch. HART	U
AI880A	3BSE039293R1	Analog Input 8 ch. HI Series	G
AI890	3BSC690071R1	Analog input, EXI	-
AI895	3BSC690086R1	Analog input, EXI with HART interface	-

Type	Article number	Description	Module Revision Index
AO801	3BSE020514R1	Analog output, Light series	H
AO801-eA	3BSE020514R2	Analog output, Light series	H
AO810	3BSE008522R1	Analog out. 1*8 ch,	L
AO810V2	3BSE038415R1	Analog out. 1*8 ch	E
AO810V2-eA	3BSE038415R2	Analog out. 1*8 ch	E
AO815	3BSE052605R1	Analog Output 1x8 ch	E
AO815-eA	3BSE052605R2	Analog Output 1x8 ch	E
AO820	3BSE008546R1	Analog output 20 mA,	L
AO820-eA	3BSE008546R2	Analog output 20 mA,	L
AO845A	3BSE045584R1	Analog Output 1x8 ch HART	G
AO845A-eA	3BSE045584R2	Analog Output 1x8 ch HART	G
AO890	3BSC690072R1	Analog output, EXI	-
DI801	3BSE020508R1	Digital input, Light ser.	E
DI801-eA	3BSE020508R2	Digital input, Light ser.	E
DI802	3BSE022360R1	Digital input, 120V, Light ser.	C
DI802-eA	3BSE022360R2	Digital input, 120V, Light ser.	C
DI803	3BSE022362R1	Digital input, 230 V, Light ser.	C
DI803-eA	3BSE022362R2	Digital input, 230 V, Light ser.	C
DI810	3BSE008508R1	Digital Input.24V	G
DI810-eA	3BSE008508R2	Digital Input.24V	G
DI811	3BSE008552R1	Digital Input 48V	F
DI811-eA	3BSE008552R2	Digital Input 48V	F
DI814	3BUR001454R1	Digital Input, 24V source	F
DI814-eA	3BUR001454R2	Digital Input, 24V source	F
DI818	3BSE069052R1	Digital Input, 24V source	A
DI818-eA	3BSE069052R2	Digital Input, 24V source	A
DI820	3BSE008512R1	Digital Input,120 V	G
DI820-eA	3BSE008512R2	Digital Input,120 V	G
DI821	3BSE008550R1	Digital Input 230V 8 ch.	G
DI821-eA	3BSE008550R2	Digital Input 230V 8 ch.	G
DI828	3BSE069054R1	Digital Input 120V 16 ch.	A
DI828-eA	3BSE069054R2	Digital Input 120V 16 ch.	A
DI830	3BSE013210R1	Digital Input 24V, SOE	T
DI830-eA	3BSE013210R2	Digital Input 24V, SOE	T
DI831	3BSE013212R1	Digital Input 48V, SOE	T
DI831-eA	3BSE013212R2	Digital Input 48V, SOE	T
DI840	3BSE020836R1	Oiaital Input. 24V d.c., 1x16 ch	E
DI840-eA	3BSE020836R2	Oiaital Input. 24V d.c., 1x16 ch	E
DI880	3BSE028586R1	Digital Input 16 ch. HI Series	L
DI885	3BSE013088R1	Digital inputs 24/48Vd.c., SOE	J
DI890	3BSC690073R1	Digital input, EXI	-
DO801	3BSE020510R1	Digital output, Light ser	F
DO801-eA	3BSE020510R2	Digital output, Light ser	F
DO802	3BSE022364R1	Digital output, relay, Light ser	C
DO802-eA	3BSE022364R2	Digital output, relay, Light ser	C
DO810	3BSE008510R1	Digital Output,16 ch, 24 V	H
DO810-eA	3BSE008510R2	Digital Output,16 ch, 24 V	H
DO814	3BUR001455R1	Digital Output 24V	G
DO814-eA	3BUR001455R2	Digital Output 24V	G
DO815	3BSE013258R1	Digital Output, 8 ch, 24V	E
DO815-eA	3BSE013258R2	Digital Output, 8 ch, 24V	E
DO818	3BSE069053R1	Digital Output 32 ch.	A
DO818-eA	3BSE069053R2	Digital Output 32 ch.	A

Type	Article number	Description	Module Revision Index
DO820	3BSE008514R1	Digital Outp.Relay.	H
DO820-eA	3BSE008514R2	Digital Outp.Relay.	H
DO821	3BSE013250R1	Digital Outp. Relay.	F
DO821-eA	3BSE013250R2	Digital Outp. Relay.	F
DO880	3BSE028602R1	Digital Output 16 ch. HI series	M
DO890	3BSC690074R1	Digital output, EXI	-
Pulse Counting Modules			
DP820	3BSE013228R1	Incr. Pulse Counter	K
DP820-eA	3BSE013228R2	Incr. Pulse Counter	K
DP840	3BSE028926R1	Pulse Counter	E
DP840-eA	3BSE028926R2	Pulse Counter	E
Termination Units			
TU810V1	3BSE013230R1	Compact MTU, 50V	G
TU811V1	3BSE013231R1	Compact MTU, 250V	J
TU812V1	3BSE013232R1	Compact MTU, 50V, D-SUB	G
TU814V1	3BSE013233R1	Compact MTU, 50V	G
TU818	3BSE069209R1	Compact MTU, 50V	A
TU819	3BSE068891R1	Compact MTU, 50V	A
TU830V1	3BSE013234R1	Extended MTU, 50V	H
TU831V1	3BSE013235R1	Extended MTU, 250V	G
TU833	3BSE038726R1	Extended MTU, 50V	A
TU834	3BSE040364R1	Extended MTU, 50V	A
TU835V1	3BSE013236R1	Extended MTU, 50V	G
TU836V1	3BSE013237R1	Extended MTU, 250V	G
TU837V1	3BSE013238R1	Extended MTU, 250V	G
TU838	3BSE008572R1	Extended MTU, 50V	H
TU840	3BSE020846R1	For red. Opt. Modlib FCI	B
TU841	3BSE020848R1	For red. Opt. Modlib FCI	D
TU842	3BSE020850R1	Redundant horizontal MTU	A
TU844	3BSE021445R1	Redundant horizontal MTU	A
TU847	3BSE022462R1	For red. Profibus	B
TU848	3BSE042558R1	For red. Opt. Modlib FCI	B
TU849	3BSE042560R1	For red. Opt. Modlib FCI	B
TU851	3BSE068782R1	Extended MTU, 250V	A
TU890	3BSC690075R1	Compact MTU, for EXI in/out in Ex appl.	A
TU891	3BSC840157R1	Compact MTU, for EXI in/out in non Ex appl.	A
TY801	3BSE023607R1	Schunt stick	B
ModuleBus Communication Parts			
TB805	3BSE008534R1	Bus outlet, modulebus ext	C
TB806	3BSE008536R1	Bus inlet, modulebus ext	C
TB807	3BSE008538R1	Bus terminator, modulebus	A
TB810	3BSE008560R1	Optical cluster port	E
TB811	3BSE008568R1	Optical cluster port	G
TB815	3BSE013204R1	Interconn unit for CI820	E
TB820	3BSE008555R1	Optical non-red cluster port	B
TB820V2	3BSE013208R1	Optical non-red cluster port	E
TB820V2-eA	3BSE013208R2	Optical non-red cluster port	E
TB825	3BSE036634R1	Optical media converter	D
TB825-eA	3BSE036634R2	Optical media converter	D
TB840	3BSE021456R1	For opt red IO cluster	W
TB840-eA	3BSE021456R2	For opt red IO cluster	W
TB840A	3BSE037760R1	For opt red mdleb IO clust	B
TB842	3BSE022464R1	Optical mdlbus port to CI840	C

Type	Article number	Description	Module Revision Index
TK801V003	3BSC950089R1	Modulebus Extension Shielded Cable 0.3m	-
TK801V006	3BSC950089R2	Modulebus Extension Shielded Cable 0.6m	-
TK801V012	3BSC950089R3	Modulebus Extension Shielded Cable 1.2m	-
TK811V015	3BSC950107R1	Opto Cable. Duplex plastic fiber. 1.5m	-
TK811V050	3BSC950107R2	Opto Cable. Duplex plastic fiber. 5m	-
TK811V150	3BSC950107R3	Opto Cable. Duplex plastic fiber. 15m	-
TK812V015	3BSC950118R1	Simplex plastic fiber. 1.5m	-
TK812V050	3BSC950118R2	Simplex plastic fiber. 5m	-
TK812V150	3BSC950118R3	Simplex plastic fiber. 15m	-
Power Supply			
SD811	3BSC610022R1	AC 115/230 V; DC 24 V, 2.5A	-
SD812	3BSC610023R1	AC 115/230 V; DC 24 V, 5A	-
SD832	3BSC610065R1	AC 115/230 V; DC 24 V, 5A	-
SS832	3BSC610068R1	Voting device 2 x 10A	-

Modules included as found in general product information:

- Overview Product Guide 3BSE 016 140F0001 Rev. A
- AC410 Product Guide 3BSE 015 966R101 Rev. -
- AC450 Product Guide 3BSE 015 953R101 Rev. -
- S100 I/O Product Guide 3BSE 015 967R101 Rev. -
- S800 I/O Product Guide 3BSE 015 969R5001 Rev. -
- Spec. of revision index Advant Controller 3BSE 024057 Rev. - dated 2001-03-01
- Marine design description of Advant Controller 400, 3BSE 024059 Rev. B dated 2004-04-16
- S800 I/O Marine Design Description 3BSE 057257 Rev. A dated 2014-03-11
- List of S800 I/O marine certified articles 3BSE 075912 Rev. C 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.

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 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 installed in the computer. Approval Test of Application Software may be required.

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