



Type Approval Certificate

[Programmable Logic Controllers]

Initial Approval 12th March, 2021

Manufacturer ABB AG
Eppelheimer Str. 82, DE-69123 Heidelberg, Germany

Product Description Type : AC500, AC500-XC, AC500-S, AC500-S-XC, S500, S500-XC Series

" See Appendix 1 "

* Manufacturing place : ABB STOTZ-KONTAKT GmbH
Hauptstraße 14-16,
78132 Hornberg, Germany

Approval Condition " See Appendix 1 "

THIS IS TO CERTIFY that the above-mentioned product has been approved in accordance with the relevant requirement of this Society's Rules and / or of the recognized standards as follows.

Pt. 6, Ch. 2, Art. 301 of the Rules for Classification, Steel Ships.

This Certificate is valid until 11th March, 2026

Reissued at Busan, Korea on 16th February, 2022



This certificate is signed electronically in accordance with IMO FAL.5/Circ.39/Rev.2. Validation and authentication of the certificate can be confirmed from "<http://e-cert.krs.co.kr>" by using the tracking No(ME22004724342) and certificate No.(HMB39370-AC002).



KOREAN REGISTER

*General Manager of
Marine & Ocean Equipment Team*

Note : 1. This certificate will be valid subject to complying with the approval conditions described on the certificate and/or on the Rules of this Society.
2. This certificate will be invalid from the expiry date aforementioned unless the extension or renewal has been granted to the applicant or the manufacturer.
3. Any significant modifications or changes in design or construction to the above product without approval from this Society will render this certificate invalid.
4. Should the specified rules, regulations or standards be amended during the validity of this certificate, the product is to be re-approved by this Society in accordance with the requirements as amended.

Product Description and/or Approval Condition

Date of Issue : 16th February, 2022

A. Product Description

1. Product Specification

1) Power supply : DC 24V

2) AC500, AC500-S, S500 Series may consist of the following components.

Module	Series	Description
[CPU]		
PM5630-2ETH	AC500	8MB memory, 2xEthernet, 1xRS232/485, CAN
PM5650-2ETH	AC500	80MB memory, 2xEthernet, 1xRS232/485, CAN
PM5670-2ETH	AC500	160MB memory, 2xEthernet, 1xRS232/485, CAN
PM5675-2ETH	AC500	160MB memory, 8GB Flash disk, 2xEthernet, 1xRS232/485, CAN
PM572	AC500	128kB memory, 2xRS232/485, FBP
PM573-ETH	AC500	512kB memory, 2xRS232/485, FBP, 1xEthernet
PM582	AC500	512kB memory, 2xRS232/485, FBP
PM583-ETH	AC500	1MB memory, 2xRS232/485, FBP, 1xEthernet
PM585-ETH	AC500	1MB memory, 2xRS232/485, FBP, 1xEthernet
PM590-ETH	AC500	2MB memory, 2xRS232/485, FBP
PM591-ETH	AC500	4MB memory, 2xRS232/485, FBP, 1xEthernet
PM591-2ETH	AC500	4MB memory, 2xRS232/485, FBP, 2xEthernet
PM592-ETH	AC500	4MB memory, 4GB Flash disk, 2xRS232/485, FBP, 1xEthernet
PM595-4ETH-F	AC500	1.3 GHz, 16MB memory, 2xEthernet, 4xEthernet based fieldbus
PM595-4ETH-M-XC	AC500	1.0 GHz, 16MB memory, 2xEthernet, 4xEthernet based fieldbus
[Safety CPU]		
SM560-S	AC500-S	Safety CPU, safety related module up to SIL 3
SM560-S-FD-1	AC500-S	Safety CPU, safety related module up to SIL 3 with F-Device functionality for 1 PROFIsafe network
SM560-S-FD-4	AC500-S	Safety CPU, safety related module up to SIL 3 with F-Device functionality for up to 4 PROFIsafe networks
[I/O Modules]		
AC522	S500	8AI / 8AO, 12-bit+sign
AI523	S500	16 AI, U/I/RTD, 12-bit+sign, 2-wires
AI531	S500	8 AI/U/I/R/RTD/TC
AO523	S500	16 AO, 12-bit+sign, 2-wires
AX521	S500	4 AI/4 AO, U/I/RTD, 12-bit+sign, 2-wires
AX522	S500	8 AI/8 AO, U/I/RTD, 12-bit+sign, 2-wires
CD522	S500	Encoder & PWM Module 2 DI, 8 (DI/DO) 24V DC

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Module	Series	Description
DA501	S500	16 DI, 8 DC, 4 AI, 2 AO, 12-bit+sign
DA502	S500	16 DO, 8 DC, 4 AI, 2 AO
DC522	S500	16 DC (Digital In/Outputs), 24V DC 0,5A, 1-wire
DC523	S500	24 DC (Digital In/Outputs), 24V DC 0,5A, 2-wires
DC532	S500	16 DI/16 DC, 24V DC 0,5A, 1-wire
DC541-CM	S500	8 DC 24V DC 0,5A, Connection via CPU Terminal Base
DI524	S500	32 DI 24V DC, 1-wire
DO524	S500	32 DO, 24 VDC / 0.5 A, 1-wire
DO526	S500	8 DO, 24 VDC / 2 A, 1-wire
DX522	S500	8 DI 24V DC, 8 Relay Outputs, 1-wire
DX531	S500	8 DI 230V AC, 8 Relay Outputs, 2-wires
FM502-CMS	S500	Function module
AI581-S	AC500-S	Safety analog input module
DI581-S	AC500-S	Safety digital input module
DX581-S	AC500-S	Safety digital I/O module
[Communication interface modules]		
CI501-PNIO	S500	PROFINET IO, 4AI / 2AO, 8DI / 8DO 24V DC, 0.5 A max
CI502-PNIO	S500	PROFINET IO, 8DI / 8DO / 8 DC, 24V DC, 0.5 A max
CI504-PNIO	S500	PROFINET IO, 3xRS232/422/485
CI506-PNIO	S500	PROFINET IO, 2xRS232/422/485, 1xCAN
CI521-MODTCP	S500	Ethernet Modbus TCP, 4AI / 2AO / 8DI / 8DO, 24V DC, 0.5 A
CI522-MODTCP	S500	Ethernet Modbus TCP, 8DI / 8DO / 8DC, 24V DC, 0.5 A
CI541-DP	S500	Profibus-DP, 4AI / 2AO, 8DI / 8DO 24V DC, 0.5 A max
CI542-DP	S500	Profibus-DP, 8DI / 8 DO 24V DC, 0.5 A max
CI581-CN	S500	CANopen, 4AI / 2AO, 8DI / 8DO 0.5 A max
CI582-CN	S500	CANopen 8DI, 8DO / 8DC 24V DC, 0.5A max
[Communication modules]		
CM574-RS	AC500	CS31, RS232, RS485 (Modbus, ASCII)
CM579-PNIO	AC500	PROFINET, Integrated 2-port switch
CM582-DP	AC500	Profibus DP
CM588-CN	AC500	CANopen

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Module	Series	Description
CM589-PN10	AC500	PROFINET, Integrated 2-port switch
CM589-PN10-4	AC500	PROFINET, Integrated 2-port switch, 4xI/O devices
CM592-DP	AC500	Profibus DP Master
CM597-ETH	AC500	Ethernet TCP/IP, UDP/IP, Modbus TCP
CM598-CN	AC500	CANopen
[Terminal Bases]		
TB511-ETH	AC500	1xProcessor module, 1xCommunication module, 1xEthernet RJ45 connector
TB521-ETH	AC500	1xProcessor module, 2xCommunication modules, 1xEthernet RJ45
TB523-2ETH	AC500	1xProcessor module, 2xCommunication modules, 2xEthernet RJ45
TB541-ETH	AC500	1xProcessor module, 4xCommunication modules, 1xEthernet RJ45
TB5600-2ETH	AC500	1xProcessor module, 2xEthernet RJ45, 1xCAN and 1xCOM1
TB5610-2ETH	AC500	1xProcessor module, 1xCommunication module, 2xEthernet RJ45, 1x CAN and 1xCOM1
TB5620-2ETH	AC500	1xProcessor module, 2xCommunication modules, 2xEthernet RJ45, 1xCAN and 1xCOM1
TB5640-2ETH	AC500	1xProcessor module, 4xCommunication modules, 2xEthernet RJ45, 1xCAN and 1xCOM1
TB5660-2ETH	AC500	1xProcessor module, 6xCommunication modules, 2xEthernet RJ45, 1xCAN and 1xCOM1
TF501-CMS	AC500	1xFunction module FM502-CMS, 1xProcessor module PM592-ETH, 1xCommunication module, 1xEthernet RJ45 connector
TF521-CMS	AC500	1xFunction module FM502-CMS, 1xProcessor module PM592-ETH, 2xCommunication modules, 1xEthernet RJ45 connector
[Terminal Units]		
TU507-ETH	S500	Ethernet terminal unit, 24 VDC, screw terminals
TU508-ETH	S500	Ethernet terminal unit, 24 VDC, spring terminals
TU509 / TU510	S500	24 VDC, screw / spring terminals
TU515 / TU516	S500	I/O terminal unit, 24 VDC, screw / spring terminals
TU517 / TU518	S500	24 VDC, screw / spring terminals
TU520-ETH	S500	PROFINET I/O terminal unit, 24 VDC, spring terminals
TU531 / TU532	S500	230 VAC, relays, screw / spring terminals
TU541 / TU542	S500	I/O terminal unit, 24 VDC, screw / spring terminals

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Module	Series	Description
TU582-S	AC500-S	Safety I/O terminal unit, 24V DC
[Accessories]		
MC502	AC500	SD Memory Card
TA521	AC500	Lithium Battery
TA541	AC500	Lithium Battery
TA524	AC500	Dummy communication module
TA526	AC500	Wall mounting accessory

2. Approved Drawings and Documents

1) Datasheets

- 3ADR010001, 5, en_US, 3ADR010002, 5, en_US, 3ADR010003, 5, en_US,
 3ADR010004, 5, en_US, 3ADR010009, 5, en_US, 3ADR010010, 5, en_US,
 3ADR010011, 5, en_US, 3ADR010012, 5, en_US, 3ADR010013, 5, en_US,
 3ADR010014, 5, en_US, 3ADR010019, 5, en_US, 3ADR010020, 5, en_US,
 3ADR010021, 5, en_US, 3ADR010022, 5, en_US, 3ADR010023, 5, en_US,
 3ADR010024, 6, en_US, 3ADR010025, 6, en_US, 3ADR010026, 5, en_US,
 3ADR010027, 5, en_US, 3ADR010029, 5, en_US, 3ADR010030, 5, en_US,
 3ADR010034, 5, en_US, 3ADR010036, 5, en_US, 3ADR010037, 5, en_US,
 3ADR010039, 5, en_US, 3ADR010040, 5, en_US, 3ADR010041, 6, en_US,
 3ADR010042, 5, en_US, 3ADR010043, 5, en_US, 3ADR010044, 5, en_US,
 3ADR010047, 5, en_US, 3ADR010052, 6, en_US, 3ADR010053, 6, en_US,
 3ADR010059, 6, en_US, 3ADR010060, 6, en_US, 3ADR010063, 5, en_US,
 3ADR010064, 5, en_US, 3ADR010066, 5, en_US, 3ADR010067, 5, en_US,
 3ADR010069, 5, en_US, 3ADR010070, 5, en_US, 3ADR010071, 5, en_US,
 3ADR010072, 5, en_US, 3ADR010073, 5, en_US, 3ADR010074, 5, en_US,
 3ADR010084, 1, en_US, 3ADR010085, 1, en_US, 3ADR010086, 1, en_US,
 3ADR010087, 1, en_US, 3ADR010088, 1, en_US, 3ADR010126, 5, en_US,
 3ADR010273, 1, en_US, 3ADR010341, 9, en_US, 3ADR010342, 9, en_US

3. Test Reports, etc.

1) Test reports

- paconsult 09-2475B dated 2009-07-06, 11-3684 dated 2011-08-19,
 12-4737 Rev.1 dated 2012-12-14, 16-7720 dated 216-06-10,
 17-9139 dated 2017-10-04, 18-10585 Rev.2 dated 2018-09-17,
 18-11059 Rev.1 dated 2019-01-23, 0790-05 dated 2005-12-08,
 1094-05 dated 2006-10-16
 - EMV 3893-365 dated 2006-06-26, 3893-395a dated 2009-11-06,
 3893-395b dated 2017-07-27, 3893-399a dated 2017-07-22,
 3893-3105 dated 2011-09-26, 3893-3113a dated 2012-12-19,
 3893-3116a dated 2014-10-07, 3893-3117 dated 2014-09-23,
 3893-3118 dated 2014-12-17, 3893-3121a dated 2016-11-25,
 3893-3122 dated 2016-11-12, 3893-3127 dated 2018-1-06,
 3893-3128 dated 2018-11-06, 3893-3131a dated 2019-10-15,
 3893-3132a dated 2019-09-19, 3893-3136 dated 2019-07-22,
 3893-3137a dated 2019-09-19, 3893-3139 dated 2019-09-19,
 3893-3140 dated 2020-06-10
 - ABB D2006034 dated 2006-06-12, D2009021 dated 2009-03-27,
 D2012022 dated 2012-05-23, D2013005 dated 2013-05-28,
 D2014006 dated 2014-08-18, D2014009 dated 2014-08-19,
 D2016007 dated 2016-07-30, D2018005 dated 2018-10-17,
 D2019001 dated 2019-01-18, D2019005 dated 2019-03-15,
 D2019006 dated 2019-03-15, D2019007 dated 2019-03-15,
 D2019008 dated 2019-03-15, D2019017 dated 2019-05-14,
 D2019018 dated 2019-05-15,

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- EMC FS-2109-450318-007 dated 2021-11-26, FS-2109-450318-009 dated 2021-11-26,
FS-2109-450318-010 dated 2021-11-26, FS-2109-450318-011 dated 2021-11-26,
FS-2109-450318-011 dated 2021-11-26
- 2) Technical files, hardware manual, construction drawings, circuit diagrams

B. Approval Condition

1. Application & Limitation

- 1) This approval is granted on the basis of the test reports and the approved documentation.
- 2) The manufacturer should inform this Society of all kinds of revisions of the equipment. If the changes are recognized to affect functionality of the approved equipment, type test to confirm the reliability of the revised equipment may be performed in the presence of our surveyor.
- 3) Degree of protection shall be complied with Rule Pt.6 Ch.1 Sec.2 201.2. (5).
- 4) This certificate covers hardware listed under Product specification.
- 5) The products shall not be installed on open decks.
- 6) When this system is to be installed in the vicinity of a standard or a steering magnetic compass, it should have the minimum safe distance 5 m or more at which it may be mounted from such compasses.
- 7) Power supply filter of type Schaffner FN2010-10-06 or equivalent is required for the products installed in the bridge.

2. Individual Product Cert. and Drawing Approval Requirement

- 1) Individual product certification is not required.

3. Marking

- 1) The product or packing is to be marked with the manufacturer's name and type designation on a suitable position.

4. Others

- 1) Test condition (IACS UR E10 Rev.8)

Test	Condition	Remark
EMC	All locations including the bridge and deck zone	(1)
	All locations excluding the bridge and deck zone	(2)
Temperature	0 ~ +70 °C	(3)
	-25 ~ +70 °C	-
Vibration	Acceleration $\pm 0.7g$	-

* Remark

- (1) : CPU PM591-2ETH, CPU PM585-ETH, TB523-2ETH, TB541-ETH, CM574-RS, CM598-NC, AX521, DA501, TU51617, CM579-ETH, CM589-PN10, D0524, PM595-4ETH-F, PM595-4ETH-M-XC, PM5630-2ETH, PM5650-2ETH, PM5670-2ETH, PM5675-2ETH, TB5600-2ETH, TB5610-2ETH, TB5620-2ETH, TB5640-2ETH, TB5660-2ETH
- (2) : All modules excluding (1)
- (3) : DI524, DC532, AX522, DX522, DX531

- 2) Compass Safety Distance

Type	Standard Compass	Steering Compass
AC500 / S500 /AC500-XC / S500-XC	150cm	130cm

< End of Certificate >