



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. A-11971

This is to certify that the  
**Programmable Electronic System**

with type designation(s)  
**AC500 / S500**

Manufactured by  
**ABB Stotz-Kontakt GmbH**  
**HEIDELBERG NECKAR, Germany**

is found to comply with  
Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards

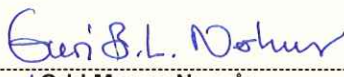
Application  
Location classes:

Temperature	A
Humidity	B
Vibration	A
EMC	A*
Enclosure	Required protection according to DNV Rules shall be provided upon installation on board

\*See page 3 for more details

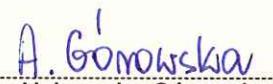
Høvik, 2010-10-14  
for Det Norske Veritas AS

This Certificate is valid until  
2012-06-30

  
-----  
Odd Magne Nesvåg  
Head of Section



DNV local office:  
Essen

  
-----  
Aleksandra Górowska  
Surveyor

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. If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



Certificate No.: A-11971  
 File No.: 862.50  
 Job Id.: 262.1-001017-3

## Product description

ABB AC500 Scalable Programmable Logic Controller with S500 I/O-Modules.

Actual naming of AC500 / S500	Additional naming for AC500F / S500 F	Description
<b>CPUs</b>		
PM571, PM571-ETH, PM571-ARC	-	AC500 CPU 64kB, Option for Ethernet or ARCNET
PM572	-	AC500 CPU 128kB, Ethernet
PM573-ETH	-	AC500 CPU 128kB, Ethernet
PM581, PM581-ETH, PM581-ARC, EC581-ARC	-	AC500 CPU 256kB, Option for Ethernet or ARCNET
PM582, PM582-ETH, PM582-ARC	-	AC500 CPU 512kB, Option for Ethernet or ARCNET
PM583-ETH	PM 783F-ETH	AC500 CPU 1MB, Ethernet
PM590, PM590-ETH, PM590-ARC	-	AC500 CPU 2048kB, Option for Ethernet or ARCNET
PM591, PM591-ETH, PM591-ARC	-	AC500 CPU 4MB, Option for Ethernet or ARCNET
PM592-ETH	-	AC500 CPU 4MB Ethernet
<b>Terminal Bases</b>		
TB511, TB511-ETH, TB511-ARC	TB 711F	AC500 CPU Terminal Base, 1x Coupler Slot
TB521, TB521-ETH, TB521-ARC	-	AC500 CPU Terminal Base, 2x Coupler Slots
TB541, TB541-ETH, TB541-ARC	-	AC500 CPU Terminal Base, 4x Coupler Slots
<b>I/O-Modules</b>		
DI524	DI 724F	S500 32 DI 24V DC, 1-wire
DC522	DC 722F	S500 16 DC (Digital In/Outputs), 24V DC 0,5A
DC523	DC 723F	S500 24 DC (Digital In/Outputs), 24V DC 0,5A
DC532	DC 732F	S500 16 DI + 16 DC, 24V DC 0,5A
DX522	DX 722F	S500 8 DI 24V DC, 8 Relay Outputs, 2-wire
DX531	DX 731F	S500 8 DI 230V AC, 8 Relay Outputs, 2-wire
DC541	-	S500 8 DC 24V DC 0,5A, Connection via CPU Terminal Base
DC505-FBP	DC 705F-FBP	S500 8 DI / 8 DC, 24V DC 0,5A, with Fieldbus Interface
DC551-CS31	-	S500 8 DI / 16 DC, 24V DC 0,5A, with CS31 Interface
AX521	AX 721F	S500 4 AI / 4 AO, U//Pt100, 12-bit+sign, 2-wire
AX522	AX 722F	S500 8 AI / 8 AO, U//Pt100, 12-bit+sign, 2-wire
AI523	AI 723F	S500 16 AI, U//Pt100, 12-bit+sign, 2-wire
AO523	AO 723F	S500 16 AO, 12-bit+sign, 2-wire
DA501	DA 701F	S500 16DI,8DC, 4AI, 2AO, 12-bit+sign
AC522	AC 722F	S500 8AI / 8AO, 12-bit+sign
PD501	-	S500 Positioning module, AI, 24V DC Motor outputs
CI501	-	S500 4 AI / 2 AO, 8DI / 8DO 24V DC, 0,5 A max
CI502	-	S500 8 DI / 8DO / 8 DC, 24V DC, 0,5 A max
CI511	-	S500 4 AI / 2 AO, 8DI / 8DO 24V DC, 0,5 A max
CI512	-	S500 8 DI / 8DO / 8 DC, 24V DC, 0,5 A max
CI590	-	S500 16 DC 24V DC
CI592	-	S500 4 AI / 2AO, 8 DI, 8 DC
AI531	AI 731F	S500 8 AI, U, I, R, RTD and TC
CD522	CD722F	S500 Encoder & PWM Module 2 DI, 8 (DI/DO) 24V DC
<b>Terminal Units</b>		
TU505-FBP, TU506-FBP	TU 705F, TU 706F	AC500 FBP Terminal Unit
TU515, TU516	TU 715F, TU 716F	AC500 I/O Terminal Unit, 24V DC
TU531, TU532	TU 731F, TU 732F	AC500 I/O Terminal Unit, 230V AC
TU541, TU542	-	AC500 Terminal Units for PD501
TU551-CS31, TU552-CS31	-	AC500 Terminal Units for DC551
TU507, TU508	-	Terminal Units for PROFINET or EtherCAT® Bus Modules



Certificate No.: A-11971  
 File No.: 862.50  
 Job Id.: 262.1-001017-3

Actual naming of AC500 / S500	Additional naming for AC500F / S500 F	Description
<b>Communication Couplers</b>		
CM572-DP	CM572F	AC500 Communication Module Profibus DP Master
CM575-DN	-	AC500 Communication Module DeviceNet Master
CM577-ETH	-	AC500 Communication Module Ethernet TCP/IP
CM578-CN	-	AC500 Communication Module CanOpen Master
CM574 RCOM	-	AC500 Communication Module RS232, RS485(RCOM)
CM574 RS	-	AC500 Communication Module CS31,RS232,RS485 (Modbus, ASCII)
CM579 PNIO	-	AC500 Profinet RT (dual-port RAM)
CM579-Ethcat	-	AC500 Communication Module for PM57x, PM58x, PM59x
<b>Accessories</b>		
MC502	-	AC500 Memory Card
TA521	-	AC500 Lithium Battery
TA524	TA 724F	AC500 Communication dummy module
TA526	-	AC500 Wall Mounting

### Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV, 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 Rules for Ships Pt.4 Ch.9 Control and Monitoring Systems.

#### 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 for evaluation and approval. Major changes in the software are to be approved before being installed in the computer.

### Application/Limitations

Modules DC505 and DC551 require a power supply filter Schaffner FN 610-3/06 or equivalent to satisfy EMC class A requirements for conducted emission.

CPU modules PM5xx and EC-5xx require a snap ferrite WE 74270012 or equivalent on the power supply input to satisfy the requirements for radiated emission.

The equipment must be placed in a standard steel cabinet to satisfy the ESD immunity requirements.

### Type Approval documentation

Test reports:

paconsult 0790-05 dated 2005-12-08  
 paconsult 1094-05 dated 2006-10-16  
 paconsult 09-2475B dated 2009-07-06  
 EMV Rhein Neckar GmbH 3893-359 dated 2006-02-09  
 EMV Rhein Neckar GmbH 3893-365 dated 2006-06-26  
 EMV Rhein Neckar GmbH 3893-384 dated 2009-02-14  
 EMV Rhein Neckar GmbH 3893-385e dated 2009-04-25 (CM574)  
 EMV Rhein Neckar GmbH 3893-386e dated 2009-05-16 (CI590)  
 EMV Rhein Neckar GmbH 3893-388e dated 2009-06-01 (CI592)  
 EMV Rhein Neckar GmbH 3893-390e dated 2009-06-01  
 EMV Rhein Neckar GmbH 3893-392e dated 2009-06-27  
 EMV Rhein Neckar GmbH 3893-395a dated 2009-11-06  
 EMV Rhein Neckar GmbH 3893-399 dated 2010-07-21  
 ABB High Voltage Test protocol D2005051 dated 2005-12-19  
 ABB High Voltage Test protocol D2006054 dated 2006-08-02  
 ABB High Voltage Test protocol D2009032 dated 2009-07-28  
 ABB Vibration protocol V20110039 rev. 1.1



Certificate No.: A-11971  
File No.: 862.50  
Job Id.: 262.1-001017-3

System description: Clima\_Tests\_For\_Ship\_PM58x-ETH\_PM57x-ETH\_1.pdf  
Introduction to AC500 dated 08.2005  
Installation instructions: Clima\_Tests\_For\_Ship\_PM59x-ETH\_0.pdf  
Ship Approval Test Specification ver. 1.4 dated 2009-05-12  
DC541-CM, DC551-CS31, DX531, PD501-4CH, PM571, PM581 PM582, PM591, TB511, TB521, TB541, TU515, TU516, TU531, TU532, TU541, TU542, TU551-CS31, TU552-CS31  
Product data sheets: ABB AC500/S500 2008 Catalogue Chapter 8 (pages 8/5-8/19)  
ABB Automation products 2009 AC500, AC31, CP400, WISA  
Data sheets for modules: AI531, CD522, CI501, CI502, CI511, CI512, CM574-RCOM, CM574-RS, CM579-EtherCat, CM579-PNIO, TU507\_508, DA501, PM57x, PM58x, and PM59x, TA521, TA526  
A-10533 Retention Survey Report dated 2009-03-24, DNV Essen.

### Tests carried out

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

### Certificate retention survey

The scope of the retention/renewal survey 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 survey 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

Retention survey is to be performed at least every second year and at renewal of this certificate.

END OF CERTIFICATE