



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **A-11773**

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

with type designation(s)  
**SAIA PLC type PCD1, PCD2, PCD4, PCD7 and PCS1 Series**

Manufactured by  
**Saia-Burgess Controls AG**  
**MURTEN, Switzerland**

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:**

<b>Temperature</b>	<b>C</b>
<b>Humidity</b>	<b>A</b>
<b>Vibration</b>	<b>A</b>
<b>EMC</b>	<b>A in general</b> <b>B for PCD1.M125/M135</b> <b>B for PCD2.M5_ and PCD2.C2000</b>
<b>Enclosure</b>	<b>Required protection according to the Rules to be provided upon installation onboard.</b>

**Høvik, 2010-05-12**  
for **Det Norske Veritas AS**

This Certificate is valid until  
**2011-12-31**

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**Odd Magne Nesvåg**  
**Head of Section**

DNV local office:  
**Essen**

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**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.

**Serie PCD1/2 Programmable Controller:**

Module Type	Function / Reference
<b>Processor and supply modules</b>	
PCD1.M110/M120/M130/M137/T240, PCD1.M125/M135	Base unit for 4 I/O modules
PCD2.M110/M120/M127/M150/M170/M157/M177	Base unit for 8 I/O modules
PCD2.M5440	Base unit for 8 I/O modules, with RS232 and RS485, without Ethernet TCP/IP
PCD2.M5540	Base unit for 8 I/O modules, with RS232 and RS485, with Ethernet TCP/IP
PCD2.M5547	Similar to PCD2.M5540, programmable with Step 7
PCD2.M480/M487	Base unit for 8 I/O modules
<b>Memory Modules</b>	
PCD7.R4xx	Flash Memory Backup module
<b>Extension modules</b>	
PCD2.C10x	Extension unit for 8 I/O modules
PCD2.C15x	Extension unit for 4 I/O modules
PCD2.C2000	Extension unit for 8 I/O modules
<b>Digital Input/Output Modules</b>	
PCD2.E11x	8 Inputs 24V DC sink/source
PCD2.E16x	16 Inputs 24V DC sink/source
PCD2.E61x	8 Inputs 24V DC opto isolated
PCD2.E500	6 Inputs 115-230V AC opto isolated
PCD2.E520	6 Inputs 24V AC opto isolated
PCD2.E523	6 Inputs 48V AC opto isolated
PCD2.A2xx	4 relay outputs 230V/2A with VDR/RC prot.
PCD2.A220	6 relay outputs 230V/2A
PCD2.A250	8 relay outputs 48V/2A
PCD2.A300	6 transistor outputs 24V/2A
PCD2.A400	8 transistor outputs 24V/0.5A
PCD2.A410	8 transistor outputs 24V/0.5A, opto isolated
PCD2.A46x	16 transistor outputs 24V/0.5A
PCD2.B100	8 combined inputs/outputs, 24V/24V/0.5A
<b>Analogue Input/Output Modules</b>	
PCD2.W10x	4 Inputs (0..10V, ±10V, 0..20mA, ±20mA)
PCD2.W11x	4 Inputs (Pt100, Ni100, Pt1000, Ni1000)
PCD2.W2xx	8 Inputs (0..10V, 0..20mA, Pt1000)
PCD2.W3xx	8 Inputs (0..10V, 0..20mA, PT/Ni 100, Pt1000)
PCD2.W305/W315/W325	7 Inputs (0..10V, 0..20mA, ±10V)
PCD2.W4xx	4 Inputs(0..10V, 0..20mA)
PCD2.W5xx	4 In/outputs(0..10V, 0..20mA)
PCD2.W6xx	4 Outputs(0..10V, ±10V, 0..20mA)
PCD2.W605/W615/W625	6/4/6 Output (0..10V, 0..20mA, ±10V)
PCD2.W745	Universal temperature measurement module for up to 4 measuring inputs, resolution 16 bits, for TC Type J & K and Pt 100/1000 & Ni 100/1000
<b>Combined Digital / Analogue Modules</b>	
PCD2.G400	4 I/O modules combined from: .W200/.W400.A400.E110
PCD2.G410	4 I/O modules combined from: .E610/.A200/.W410/.W2.xx
<b>Counting and Motion Control Modules</b>	
PCD2.H1xx	Counter module 20/100kHz
PCD2.H150	Serial synchronous interface (SSI) module
PCD2.T500	MP-Bus Interface (two channels)
<b>Serial Interface Modules</b>	
PCD7.F1xx	Interface (RS422/485, RS232, 20mA CL opto isolated, RS485 opto isolated)
PCD7.F121	Interface RS232
PCD7.F180	MP-Bus Interface (one channel)
<b>Communication Modules</b>	
PCD2.F5xx	Real Time Clock (RTC), 7-segment display, serial ports, Interface for display PCD7.D160

PCD7.F700	Profibus FMS module
PCD7.F750	Profibus DP Master module
PCD7.F77x	Profibus DP Slave module
PCD7.F80x	LON module
PCD7.F65x	Ethernet module
<b>Modem Modules</b>	
PCD2.T813	Analogue modem 33.6 kbps
PCD2.T850	Digital modem ISDN-TA
<b>Bus components for RS485 Networks</b>	
PCD7.T1xx	Repeater RS485, Converter RS232 and RS485 Termination box
<b>Text Terminals</b>	
PCD7.D16x	Terminal, direct mounting on PCD1/PCD2
<b>Accessories</b>	
PCD2.K106	Bus extension cable
PCD2.K010	Bus extension connector

**Serie PCD4 Programmable Controller:**

Module Type	Function / Reference
<b>CPU Bus Modules (for Power Supply and CPU)</b>	
PCD4.C1xx	With 1 serial interface 20mA CL, RS232, RS422/485
PCD4.C340	With 3 serial interfaces and 4 I/O modules
<b>Input/Output Bus Modules</b>	
PCD4.C22x	For 2 I/O modules
PCD4.C260	For 6 I/O modules
<b>Processor Modules</b>	
PCD4.M110	With PGU
PCD4.M120	With PGU + 1 additional serial interface
PCD4.M140	With PGU + 3 additional serial interfaces
PCD4.M125	With PGU + 1 additional serial interface
PCD4.M145	With PGU + 3 additional serial interfaces
PCD4.M170, PCD4.M170Fxx	With PGU, and Profibus (FMS, DP Master, DP Slave) resp. Ethernet
PCD4.M445	With PGU + 3 additional interfaces and PROFIBUS co-processor
<b>Power Supply Modules</b>	
PCD4.N200	24VDC; 5V/4A
PCD4.N210	24VDC; 5V/4A; +15V/0.5A; -15V/0.45A
<b>Public Memory Modules</b>	
PCD7.R1xx	2 sockets for EPROM or RAM (max 256kByte), accumulator, HW clock, RAM for F/T/C/R media
PCD7.R2xx	2 sockets for EPROM or RAM, equipped with RAM 256kByte, accumulator, HW clock, RAM for F/T/C/R media
PCD7.R3xx	2 sockets for EPROM or RAM (max.428kByte), accumulator, HW clock, RAM for F/T/C/R media
<b>Digital Input/Output Modules</b>	
PCD4.E1xx	16 inputs 24V DC
PCD4.E600	16 inputs 24V DC opto isolated
PCD4.A200	8 relay outputs 230V / 2A with VDR/RC protection
PCD4.A250	16 relay outputs 230V / 2A
PCD4.A350	8 transistor outputs 24V / 2A
PCD4.A400	16 transistor outputs 24V / 0.5A
PCD4.A410	16 transistor outputs 24V / 0.5A opto isolated
PCD4.B900	16 inputs 24V DC and 16 transistor outputs 24V / 0,5A
<b>Analogue Input/Output Modules</b>	
PCD4.W100	4 inputs + 2 outputs 12 Bit (range selected with PCD7.Wxxx modules)
PCD4.W300	8 inputs 12 Bit + sign (range selected with PCD7.Wxxx modules)
PCD4.W400	8 outputs 8 Bit 0..10V/0..20mA
PCD4.W500	8 inputs/outputs 12 Bit, galvanic separated (range selected with PCD7.Wxxx modules)
PCD4.W600	8 outputs 12 Bit, galvanic separated (range selected with PCD7.Wxxx modules)

<b>Analogue Range Modules</b>	
PCD7.W1xx	4 inputs (0..10V, 0..20mA, Pt1000)
PCD7.W2xx	1 output (+/-10V, 0..10V, 0..20mA, 4..20mA)
PCD7.W3xx	2 outputs (+/-10V, 0..10V, 0..20mA, 4..20mA)
<b>Vario Plus Modules</b>	
PCD7.L97x	VARIO-PLUS reduced
PCD7.L98x	VARIO-PLUS standard
PCD7.L99x	VARIO-PLUS extended
<b>Serie PCD7 Text Terminals</b>	
PCD7.D170	Terminal via serial interface RS232
PCD7.D202	Terminal via serial interface RS232
PCD7.D23x (x=0,1 or 2)	Terminal via serial interface RS232/RS422/RS485
PCD7.D250	Terminal via serial interface RS232
<b>Serie PCS1 Compact Controller</b>	
PCS1.C8xx(xxxx)	Base unit including 36 Digital +Analog I/O, 4 N.O + 4 SPDT Relay outputs
PCS1.C6xx(xxxx), PCS1.C4xx(xxxx)	Base unit as PCS1 with less I/O

### 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.

### Tests carried out

Applicable tests according to Standard for Certification No. 2.4.  
 PLC type PCD2.M5 and PCD2.C2000 series satisfies Vibration Class C requirements.  
 PCD2.C2000 satisfies Humidity Class B requirements.

### Type Approval documentation


### 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.

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File No.: 862.50  
Job Id.: 262.1-003528-3

END OF CERTIFICATE