



CERTIFICATE NUMBER 15-LD1432093-5-PDA
EFFECTIVE DATE 25-Jan-2019
EXPIRATION DATE 11-Nov-2020
ABS TECHNICAL OFFICE London

CERTIFICATE OF

Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

KONGSBERG MARITIME AS
located at
POSTBOKS 483, N-3601 KONGSBERG, Norway

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product Alarm, Monitoring and Control System

Model K-Chief 700 and K-Safe

This Product Design Assessment (PDA) Certificate remains valid until 10-Sep-2020 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau of Shipping

Theodoros Chatzigiakaidas, Senior Engineer

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

KONGSBERG MARITIME AS

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Tier: 5 - Unit Certification Required TC

Product: Alarm, Monitoring and Control System

Model: K-Chief 700 and K-Safe

Intended Service:

For use on ABS classed vessels and offshore facilities in accordance with the listed ABS Rules and International Standards.

Description:

K-Chief 700 automation system is based on a concept of distributed local process control stations, operator consoles comprising computer units, high-resolution colour flat screens, dedicated function keyboards and dual redundant communication network links for connection with local process stations and other control systems. Local process control stations utilise main controllers (RCU500, RCU501, RCU502, RCU510, RCU502i and RCU 602) and additional I/O units (RMP420/422, RDIOR400/420 and other units of 400/420 range).

K-Chief 700 can carry out the following functions: Alarm and monitoring system, Power Management and Control of Machinery, Cargo, Ballast, Auxiliary machinery control.

K-Safe computerized safety system comprising operator stations and controller cabinets with RCU 500/501/502/502i/510 processor units with additional I/O units for direct connections to process shutdown field devices, fire and gas detection units, emergency shutdown push buttons and matrix panel for alarm and indications. Communication with the other controllers and operator stations can be obtained via hubs, switches and network cards.

K-Safe can carry out the following functions:

Alarm Management, Power Management, Process Shutdown and Fire and Gas detection and protection system. K Safe 2 and K Safe 3 systems comprise redundant power supplies, computers, RIO units and communication links.

Rating:

Power supply: 115 / 230 VAC (+10%, -15%);

Cabinet: IP 22; RCU 602 and RMC-ST: IP 20

Operating temperature: -15 Deg. C to 55 Deg. C

Service Restriction:

Unit Certification is required for both products, K-Chief 700 and K-Safe, specified on ABS Steel Vessels Rules (2015) 4-1-1/table 3 item 35 (computer-based systems category II for K-Chief 700 and Category III for K-Safe Safety systems).

Evidence and documentation as required by 4-9-3/Table 2 of the ABS Rules for Building and Classing Steel Vessels (2015), is to be submitted for review when requested.

Fault simulation and factory acceptance testing, as these are detailed in 4-9-3/Table 2, Items 3.6 and 3.7 of the ABS Rules for Building and Classing Steel Vessels (2015) are to be witnessed by an ABS Surveyor.

On-board complete system and integration testing, as these are detailed in 4-9-3/Table 2, Items 4.1 and 4.2 of the ABS Rules for Building and Classing Steel Vessels (2015) are to be witnessed by an ABS Surveyor.

Comments:

The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

K-Chief 700 Alarm and monitoring systems are listed as System Category II in accordance with 4-9-3/Table 1 of the ABS Rules for Building and Classing Steel Vessels (2018).

K-Safe Safety systems are listed as System Category III in accordance with 4-9-3/Table 1 of the ABS Rules for Building and Classing Steel Vessels (2018).

Tests and approval are for the basic K-Chief 700 components and K Safe Components. Each configuration and external connection is to be specifically approved.

Notes/Drawing/Documentation:

Please see attached drawing list and hardware list.

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Tier: 5 - Unit Certification Required

Terms of Validity:

This Product Design Assessment (PDA) Certificate 15-LD1432093-5-PDA, dated 25/Jan/2019 remains valid until 11/Nov/2020 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA.

Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

STANDARDS

ABS Rules:

- Steel Vessels (2015): 1-1-4/7.7, 1-1-A3, 1-1-A4, 4-9-1/7.3.3, 4-9-1/7.3.5, 4-9-2/3.1.1, 4-9-2/3.1.2, 4-9-2/3.1.3, 4-9-2/3.1.4, 4-9-2/3.1.5, 4-9-2/3.5, 4-9-2/3.7, 4-9-2/7.1, 4-9-2/7.5, 4-9-2/7.7, 4-9-2/7.9, 4-9-2/7.11, 4-9-2/7.13, 4-9-3/5, 4-9-3/7, 4-9-3/11, 4-9-3/13.1, 4-9-4, 4-9-8/1, 4-9-8/3, 4-9-8/7, 4-9-8/13, 4-9-8/Table 1 and Table 2.
- Steel Vessels Under 90 Meters (295 Feet) in Length (2015): 1-1-4/7.7, 1-1-A3, 1-1-A4, 4-7-1/1
- Facilities on Offshore Installations (2015): 1-1-4/9.7, 1-1-A2, 1-1-A3
- Offshore Support Vessels (2015): 1-1-4/7.7, 1-1-A3, 1-1-A4, 4-9-1/7.3.3, 4-9-1/7.3.5, 4-9-2/3.1.1, 4-9-2/3.1.2, 4-9-2/3.1.3, 4-9-2/3.1.4, 4-9-2/3.1.5, 4-9-2/3.5, 4-9-2/3.7, 4-9-2/7.1, 4-9-2/7.5, 4-9-2/7.7, 4-9-2/7.9, 4-9-2/7.11, 4-9-2/7.13, 4-9-3/5, 4-9-3/7, 4-9-3/11, 4-9-3/13.1, 4-9-4, 4-9-8/1, 4-9-8/3, 4-9-8/7, 4-9-8/13, 4-9-8/Table 1 and Table 2
- Mobile Offshore Drilling Units (2015): 1-1-4/9.7, 1-1-A2, 1-1-A3, 6-1-1/9, 6-1-1/13
- Steel Vessels for Service on Rivers and Intracoastal Waterways (2015): 1-1-4/7.7, 1-1-A3, 1-1-A4
- High Speed Crafts (2015): 1-1-4/11.9, 1-1-A2, 1-1-A3
- Steel Barges (2015): 1-1-4/7.7, 1-1-A3, 1-1-A4

National:

NA

International:

IACS UR E10 Rev.6:2014

IEC 60529:1989+A1:1999+A2:2013, IEC 60945 Ed.4.0:2002+Cor1:2008, IEC 61508 (parts 1-7) Ed.2:2010, IEC 62061 Ed.1.0:2005

Government:

NA

EUMED:

NA

OTHERS:

IACS E22 (CAT II)



Date: 25.01.2019

PDA Number: 15-LD1432093-5-PDA

Hardware and Drawing List



Hardware List:

Module	Type/Model	Part No.	HW Module Descr. No
Cabinets	FS400 cabinet	700933	
	FS240 cabinet	701449	
	Network Distribution Unit (NDU)	310123	
	FS120 cabinet	318775	
Console	Cabinet / OS-650-KM05	603495	1012662
	Wire Isolators / KM Damper kit	603185	
	Deep line / Navigation OS	303399	
	Rubber isolation / MS2040+	305083	
COP	Panel Input Mk2 COP 05	330951	300984
	COP 05 Input Panel	603524	300984
	Control Room Panel	603525	300989
	ALC Panel	603526	300977
	BU AUT Panel	603529	301028
EFI	Earth Failure Indicator (EFI)	318367	320518
	EFI-16	321492	324876
EAP	EAP 200	370304	383722
Media Converter	Fiber Converter RMC-ST	321520	325472
Printer	Matrix Printer /OKI ML280 ELIT	703654	179057
	Printer / HP Laserjet Pro M401dn	380589	384405
	Lexmark CS510 230/115 VAC	394774/394775	397559
Watch Call	WCC 600	373860	381827
Controller	Remote Controller Unit RCU501	603439	300991
	RCU 502	330924	358190
	RCU 502i	421768	429804
	RCU 602	383962	408644
IO Units	RMP420	306712	311165
	RDIOR420	306713	311163
	RTB420	326843	326849
	RDIO401S	603432	301087
	RDIO420S	316564	323936
	RMP422S	363350	381885
	RMP422i	408442	424828
	RMP422Si	408406	424829
Other	RHUB200-5	603442	300994
	RHUB200-4	603444	300993

Drawing list for K-Chief 700 and K-Safe

- Drawing No. AIM -2000, SW Release Note AIM 8, Revision: A, Date: 11 Sep 2018, Pages: 7
- Drawing No. E18081, Test Report, NEMKO Group, Norway, Revision: 00, Date: 23 April 2018, Pages: 82
- Drawing No. TAA00000W5 Rev, DNVGL TYPE APPROVAL CERTIFICATE, Revision:02, Date: 01 Oct 2018, Pages: 6
- Drawing No. 429810A, RCU502i DS Data Sheet, Revision: 00, Date: January 2018, Pages: 2
- Drawing No. 429804A, RCU502i Hardware Module Description, Revision: A, Date: January 2018, Pages: 38
- Drawing No. 53826-A0 BV, BV TYPE APPROVAL CERTIFICATE, Revision:00, Date: 20.09.2018, Pages: 6
- Drawing No. 424829, Hardware Module Description RMP422Si - 408406, Revision: A, April 2017, Pages: 22
- Drawing No. 424828, Hardware Module Description RMP422i - 408442, Revision: A, April 2017, Pages: 22
- Drawing No. 301087D, Hardware Module Description RDIO401S, Revision: D, June2013, Pages: 34
- Drawing No. DANAK 1910121, Test report RDIO401S - 603432, NEMKO Group, Norway, Revision: 00, 27 March 2018, Pages: 93
- Drawing No. 179057, Hardware Module Description Printer OKI ML280 703654, Revision: A, 07 May 2005 Pages: 04
- Drawing No. NEMKO 39760, Test Report Printer OKI ML280 703654, NEMKO Group, Norway, Revision: A, 02 Feb 2005, Pages: 17
- Drawing No. 1012662, KM Installation Drawing for Console OS-650-KM05 603495, Revision: G, 06 Sep 2009, Pages: 17
- Drawing No. 1912618, Test Report – EAP, Delta, Denmark, Revision: 00, 21-November-2012, Pages: 58
- Drawing No. 171691, Test Report, KONGSBERG FIMAS AS, Norway, Revision: A, Date: 09 Jan 2002, Pages: 157
- Drawing No. 1001823, Test report for Cabinet FS120 - 318775, NEMKO Group, Norway, Revision: A, Date: 28 Oct 2004, Pages: 186
- Drawing No. 174324, Test report for Cabinet FS240, Teknologisk institutt, Norway Revision: A, 25 April 2004, Pages: 152



Drawing No. 325472D, Remote Media Converter Hardware Module Description, Revision: D, Pages: -
Drawing No. 353301A, Remote Media Converter RMC-ST, Revision: A, Pages: -
Drawing No. 408644A, Remote Controller Unit Hardware Module Description, Revision: A, Pages: -
Drawing No. 418371A, Remote Controller Unit RCU 602, Revision: -, Pages: -
Drawing No. NEMKO E15165, RCU & RMC Test Report, 28-04-2017, NEMKO Group, Revision: -, Pages: -
Drawing No. 332662A, Advanced Generator Supervisor GS, Revision: 3, Pages: -
Drawing No. 333334A, K-Chief 700 DS, Revision: -, Pages: -
Drawing No. FAT AGS + Smart Zone, AGS & SmartZone FAT, 20-03-2017, Revision: A, Pages: -
Drawing No. KM AGS and Smart Zone Protection ABS 03, Brochure, Revision: -, Pages: -
Drawing No. Type Approval Application Smart Zone Protection, Type Approval Application Smart Zone Protection, Revision: 0, Pages: 1
Drawing No. 1005166, Environmental Test Report - OKI ML 280 Elite (Matrix Printer), NEMKO Group, 25-02-2002 Revision: 0, Pages: 1
Drawing No. 163875, Product Description - K-Safe, Revision: 0, Pages: 1
Drawing No. 178001, Product Description - MOXA EDS308 (Network Switch), Revision: 0, Pages: 1
Drawing No. 300977, Product Description - COP05, ALC (Operator Input Device), Revision: 0, Pages: 1
Drawing No. 300984, Product Description - COP05, Input Panel (Operator Input Device), Revision: 0, Pages: 1
Drawing No. 300989, Product Description - COP05, CRP (Operator Input Device), Revision: 0, Pages: 1
Drawing No. 300991, Product Description - RCU501 (Controller), Revision: 0, Pages: 1
Drawing No. 300993, Product Description - RSER200-4 (Serial Interface Unit), Revision: 0, Pages: 1
Drawing No. 300994, Product Description - RHUB200-5 (RBus Hub), Revision: 0, Pages: 1
Drawing No. 301028, Product Description - COP05, BU-AUT (Operator Input Device), Revision: 0, Pages: 1
Drawing No. 304844, Product Description - K-Chief 700, Revision: 0, Pages: 1
Drawing No. 307741, Environmental Test Report - Vibration test KM05 Console (Operator Station) on wire, 04-December-2006, NEMKO Group, Revision: 0, Pages: 1
Drawing No. 308039, Environmental Test Report - Vibration test KM05 Console (Operator Station) on rubber, 04-December-2006, NEMKO Group, Revision: 0, Pages: 1
Drawing No. 310806, Environmental Test Report - RMP420 and RDIOR420 (IO Units), 15-March-2007, NEMKO Group, Revision: 0, Pages: 1
Drawing No. 310806_Stat, Environmental Test Report (Statement) - RMP420S (IO Unit), NEMKO Group, Revision: 0, Pages: 1
Drawing No. 311163, Product Description - RDIOR420 (IO Unit), Revision: 0, Pages: 1
Drawing No. 311165, Product Description - RMP420 (IO Unit), Revision: 0, Pages: 1
Drawing No. 311729, Manual for the IP22 kit for KM05 Console (Operator Station), Revision: 0, Pages: 1
Drawing No. 314243, Environmental Test Report - RCU501 (Controller), RSER200-4 (Serial Unit), RHUB200-5 (RBus Hub), 17-October-2006, NEMKO Group, Revision: 0, Pages: 1
Drawing No. 320518, Product Description - EFI (Earth Fault Indicator), Revision: 0, Pages: 1
Drawing No. 320853, Environmental Test Report - RDIO420S (IO Unit), 27-March-2008, NEMKO Group, Revision: 0, Pages: 1
Drawing No. 323935, Product Description - RMP420S (IO Unit), Revision: 0, Pages: 1
Drawing No. 323936, Product Description - RDIO420S (IO Unit), Revision: 0, Pages: 1
Drawing No. 324876, Product Description - EFI-16 (Earth Fault Indicator), Revision: 0, Pages: 1
Drawing No. 325438, Environmental Test Report - EFI (Earth Fault Indicator), 01-September-2008, NEMKO Group, Revision: 0, Pages: 1
Drawing No. 325472, Product Description - RMC-ST (Media Converter), Revision: 0, Pages: 1
Drawing No. 326403, Product Description - 10A Power Supply (Phoenix Contact), Revision: 0, Pages: 1
Drawing No. 326849, Product Description - RTB420 (IO Unit), Revision: 0, Pages: 1
Drawing No. 326940, Environmental Test Report - EFI-16 (Earth Fault Indicator), 14-October-2008, NEMKO Group, Revision: 0, Pages: 1
Drawing No. 327102, Environmental Test Report - RMC-ST (Media Converter), 19-September-2008, NEMKO Group, Revision: 0, Pages: 1
Drawing No. 327446, Product Description - 20A Power Supply (Phoenix Contact), Revision: 0, Pages: 1
Drawing No. 332618, Operator Manual - K-Chief 700, Revision: 0, Pages: 1
Drawing No. 334416, Product Description - Drop-in Display, Hatteland 19", Revision: 0, Pages: 1
Drawing No. 339191, Product Description - 5A Power Supply (Phoenix Contact), Revision: 0, Pages: 1
Drawing No. 340312, Product Description - Drop-in Display, Hatteland 15", Revision: 0, Pages: 1
Drawing No. 340313, Product Description - Drop-in Display, Hatteland 20,1", Revision: 0, Pages: 1
Drawing No. 342886, Release Note_AIM_8_3 & Updates, Revision: 0, Pages: 1
Drawing No. 343879, Product Description - MOXA EDS205A (Network Switch), Revision: 0, Pages: 1
Drawing No. 343964, Operator Manual - K-Safe, Revision: 0, Pages: 1
Drawing No. 349736, Product Description - Drop-in Display, Hatteland 23,1", Revision: 0, Pages: 1
Drawing No. 351452, Product Description - 40A Power Supply (Phoenix Contact), Revision: 0, Pages: 1
Drawing No. 352676, Product Description - MOXA EDS316 (Network Switch), Revision: 0, Pages: 1
Drawing No. 353833, Environmental Test Report - RTB420 (IO Unit), 19 March 2010, NEMKO Group, Revision: 0, Pages: 1
Drawing No. 355613, Environmental Test Report (supplementary) - WBU and WCU (Watch Call), 06-July-2004, Revision: 0, Pages: 1
Drawing No. 355691, Environmental Test Report - WBU and WCU (Watch Call), May 1998, NEMKO Group, Revision: 0, Pages: 1
Drawing No. 355867, Environmental Test Report - COP05 Input Panel (new trackerball), 13 July 2010, Revision: 0, Pages: 1
Drawing No. 355954, Environmental Test Report - COP05 series, 15-June-2007, NEMKO Group, Revision: 0, Pages: 1
Drawing No. 356290, Environmental Test Report - RCU501 (Controller), RSER200-4 (Serial Unit), RHUB200-5 (RBus Hub), RMP420 (IO Unit, Multi-Purpose), 11-June-2009, NEMKO Group, Revision: 0, Pages: 1
Drawing No. 358190, Product Description - RCU502 (Controller), Revision: 0, Pages: 1
Drawing No. 363084, Environmental Test Report - RCU502 (Controller), 26-October-2012, NEMKO Group, Revision: 0, Pages: 1
Drawing No. 363084_Comment, Environmental Test Report (Comment) - RCU502 (Controller), Revision: 0, Pages: 1
Drawing No. 366813, Maintenance Manual - MP8200 (PC), Revision: 0, Pages: 1
Drawing No. 368836, Release Note_AIM_8_5 & Updates, Revision: 0, Pages: 1
Drawing No. 383722, Hardware Module Description EAP - (Extended Alarm Panel), Revision: A, Pages: 1
Drawing No. 376291, Product Description - MOXA EDS309 (Network Switch), Revision: 0, Pages: 1
Drawing No. 376528, Product Description - HP3600-24 v2 (Network Switch), Revision: 0, Pages: 1
Drawing No. 376529, Product Description - HP3600-24 SFP v2 (Network Switch), Revision: 0, Pages: 1
Drawing No. 381559, Environmental Test Report - RMP422S (IO Unit), 2015-March-11, NEMKO Group, Revision: 0, Pages: 1
Drawing No. 381885, Product Description - RMP422S (IO Unit), Revision: 0, Pages: 1
Drawing No. 384404, Environmental Test Report - HPLaserjetPro M401dn (Printer), NEMKO Group, Revision: 0, Pages: 1
Drawing No. 384405, Product Description - HPLaserjet Pro M401dn (Printer), Revision: 0, Pages: 1
Drawing No. 384621, Product Description - ISIC Display for KM05, Revision: 0, Pages: 1
Drawing No. 384633, Product Description - Drop-in Display, ISIC, Revision: 0, Pages: 1
Drawing No. 386986, Maintenance Manual - MP8300 (PC), Revision: 0, Pages: 1
Drawing No. 387189, Release Note_AIM_8_6 & Updates, Revision: 0, Pages: 1
Drawing No. 389191, Maintenance Manual - KM05 Console (Operator Station) Changed file size, org = 53.5 MB, Revision: 0, Pages: 1
Drawing No. 394774, Product Description - Lexmark CS510 (Printer), Revision: 0, Pages: 1
Drawing No. 396445, Environmental Test Report - Lexmark CS510 (Printer), 13-08-2013, NEMKO Group, Revision: 0, Pages: 1

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Drawing No. 398468, Overview of supporting documents for PDA certificate for K-Chief 700 and K-Safe, Revision: 0, Pages: 1
Drawing No. 398468, Overview of supporting documents for PDA certificate for K-Chief 700 and K-Safe, Revision: B, Pages: 1
Drawing No. 60529, Environmental Test Report - COP05 series, IP22, 08-2006, NEMKO Group, Revision: 0, Pages: 1
Drawing No. 900662-01, ISO9000, Revision: 0, Pages: 1
Drawing No. 900662-02, ISO9000, Revision: 0, Pages: 1
Drawing No. 901102-01, ISO14000, Revision: 0, Pages: 1
Drawing No. 901102-02, ISO14000, Revision: 0, Pages: 1
Drawing No. 907057-01, ISO18000, Revision: 0, Pages: 1
Drawing No. 907057-02, ISO18000, Revision: 0, Pages: 1
Drawing No. 379618_A, Test_Report_BT 1, Kongsberg Maritime AS, Revision: A, Date: 28.11.2013, Pages: 12
Drawing No. 379620_A_RRR_BT 1, Software_Testing, Kongsberg Maritime AS, Revision: A, Date: 22.11.2013, Pages: 12
Drawing No. 396445, Environmental Test Report - Lexmark CS510 (Printer), Revision: 0, Pages: 1
Drawing No. FMEA K-Safe-Template, Revision: B, Date: 22.11.2012, Pages: 71
Drawing No. DANAK-198637, IP22_KM05, Environmental Test Report, Delta, Denmark, Revision: 00, Date: 30.01.2007, Pages: 13
Drawing No. KFDD - General System Template, v016, Revision: A, Date: 02.02.2015, Pages: 38
Drawing No. KFDD_K-Safe_Template, Revision: D, Date: 15.08.2014, Pages: 102
Drawing No. KM-PROC-0001_Rev, Product_Management, Revision: B, Date: 05.06.2012, Pages: 23
Drawing No. KM-PROC-0005, GCS Main Process Description, Revision: E, Date: 05.12.2013, Pages: 23

