



CERTIFICATE NUMBER 22-2218586-PDA

EFFECTIVE DATE 14-APR-2022

EXPIRATION DATE 13-APR-2027

ABS TECHNICAL OFFICE Yokohama Engineering Services

CERTIFICATE OF

Product Design Assessment

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

ENDRESS + HAUSER CONDUCTA GMBH + CO. KG

located at

GERLINGEN, Germany

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 Transmitter

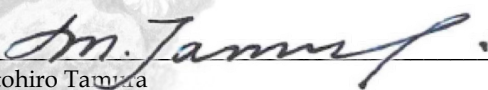
Model Liquiline CM442, CM444, CM448, CM442R, CM444R, CM448R

This Product Design Assessment (PDA) Certificate remains valid until 13-April-2027 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


Motohiro Tamura
Engineer/Consultant

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)

ENDRESS + HAUSER CONDUCTA GMBH + CO. KG

DIESELSTR. 24

D-70839 GERLINGEN

Germany

Telephone: +49 7156 209878

Fax: +49 7156 209243

Email: uwe.roessiger@conducta.endress.com

Web: www.conducta.endress.com

Tier: 2 - PDA Issued

Product: Transmitter
Model: Liquiline CM442, CM444, CM448, CM442R, CM444R, CM448R
Endorsements:

Intended Service:
Control and monitoring functions for Marine Applications.

Description:
A multi-parameter transmitter for monitoring and controlling processes.
All CM44x and CM44x(R) variants contain the same communication module FXHC2 connected to the FC4W3 backplane.

Rating:
Field mounted type (CM442, CM444, CM448):
Input signals: up to max. 8 binary sensor signals, 8 x 0/4 to 20 mA analog, 4x Relais, Modbus TCP, PROFIBUS DP, Modbus RS485, Webserver, HART, Ethernet/IP, PROFINET IO;
Power supply: 100 to 230 V AC, 50/60 Hz (CM442 optionally with 24 V AC/DC, 50/60 Hz);
IP66 / IP67

Cabinet mounted type (CM442R, CM444R, CM448R):
Input signals: up to max. 8 x binary sensor signal, 8 x 0/4 to 20 mA (optional), 4 Relais, passive, potentially isolated from one another and from the sensor inputs, 0 to 30 V, Modbus TCP, PROFIBUS DP, Modbus RS485, Webserver, HART, Ethernet/IP, PROFINET IO;
Power supply: 24 V DC, Maximum permitted fluctuation of mains supply voltage: + 20/- 15 % of nominal voltage (CM442R optionally with 230 V AC 50/60 Hz);
Transmitter: IP20, Optional Display: IP66

Service Restriction:
Unit Certification is not required for this product.
If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

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

Notes/Drawing/Documentation:
Drawing No. 001, Ordercode CM442
Drawing No. 002, Ordercode CM444
Drawing No. 003, Ordercode CM448
Drawing No. 004, Vibration Testreport
Drawing No. 005, Technical Informationen, Revision: 1
Drawing No. 13-L-00387-01R_EMV_CM448_EH, Test Report, EMC
Drawing No. 200031, Nameplate drawing
Drawing No. 401228, Nameplate Housing
Drawing No. 970003308, IP Testreport
Drawing No. 970003309, IP Testreport
Drawing No. 970003310, IP Testreport
-----Revision 1 (2019) -----
Drawing No. 001-18_V1U, EMC test report CM448R TREO Lal. Kiel 03-May-2018
Drawing No. 081-19_V1U, EMC test report DC/DC Converter CD5, CM448R Treo Lab. Kiel, 22-Mar-2019
Drawing No. 14-5856-BE-Liquiline CM444R (Endress u. Hauser), Vibration Test report CM444R Paconsult, Mar-2014
Drawing No. 17-9052B-BE- External graphical display (Endress und Hauser Messtechnik), Vibration Test report

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External Graphical Display Paconsult, June 2017

Drawing No. 19-11390-BE-Rail Mouted Liquiline System (Endress u. Hauser)_Sig, Enviromental test report
CM448R Paconsult, Feb-2019

Drawing No. 200640-000-B_Label external graphical display, Drawing Nameplate

Drawing No. 201675-000-A, Drawing Nameplate

Drawing No. 201676-000-A (002), Drawing Nameplate

Drawing No. 401228-F, CM44x Approval Drawing Housing

Drawing No. 402351-A, Drawing Display

Drawing No. 414613-B, CM44xR Approval Drawing Housing

Drawing No. ATM DAL with Control Drawing 403936-E, CSA document

Drawing No. BA01225CEN_1119, Operating Instructions - CM44xR Cabinet installation

Drawing No. BA01227CEN_0113, Operating Instructions - CM44xR Maintenance & diagnostics

Drawing No. BA01245CEN_0719, Operating Instructions - Memosens

Drawing No. CM44-Railmount_TR_CE_6_2_Accessible-Parts_EN, IP rating testreport

Drawing No. CM442_EVR_FPAN2_FPDN2_Approval test_EN, EMC test report - internal

Drawing No. CM44x(R) new backplane marine, CM44x(R) new backplane marine

Drawing No. CM44x_REP_Differences_485_ETH-Modules_EN, CM44x_REP_Differences_485_ETH-Modules_EN

Drawing No. Drawing_FARC1_modified, Drawing

Drawing No. Drawing_FBDP1_modified, Drawing

Drawing No. Drawing_FC4W3_new, Drawing

Drawing No. Drawing_FD4W2, Drawing

Drawing No. Drawing_FIDC1_modified

Drawing No. Drawing_FIEB1, Drawing

Drawing No. Drawing_FPEA1_modified, Drawing

Drawing No. Drawing_FPED1, Drawing

Drawing No. Drawing_FXHC1_modified, Drawing

Drawing No. Drawing_FXIO1, Drawing

Drawing No. Drawing_FA2R1_FA4R1_modified, Drawing

Drawing No. Hutschienen-Netzteil_Puls_24V, Hutschienen-Netzteil_Puls_24V

Drawing No. Internal_CM442_EVR_FPAN2_FPDN2_Approval test_EN, EMC test report - internal

Drawing No. KA01160CEN_0618, Brief Operating Instructions CM44xR

Drawing No. Ordercode for Liquiline Railmont System CM448R_rev06, Ordercode for Liquiline Railmont System
CM448R

Drawing No. Overview Modules of xM44x, Overview Modules of xM44x

Drawing No. Release Notes V01.06.06 - draft, Software Release note

Drawing No. S6_CoFC_70208479_EN_incl_ctrl.dwg, CSA document

Drawing No. S9_2313376_Report, CSA Report

Drawing No. SD01190CDE_0113, Service Information CM44xR

Drawing No. SD01293CDE_0214, Service Information CM44xR

Drawing No. TI01112CEN_0819, Technical Information CM44xR

Drawing No. cd5_241, Information DC/DC converter

-----Revision 2 (2019)-----

Drawing No. CM44 Marine S3 - Produktdokumentation v0.2, Drawing Overview

Drawing No. CM442(R) Uebersicht Pruefaufbau Marine v0.3, Overview EUTs Certificate

Drawing No. CM44x(R) FXHC2, new PCB Board FXHC2

Drawing No. E190664E1, Test Report EMV CM442R, Phoenix Testlab, 02-09-2019

Drawing No. E190664E2, Test Report EMV CM442, Phoenix Testlab, 02-09-2019

Drawing No. Ordercodes CM44xR incl CM442xR_v02, Ordercodes

Drawing No. TI00444CEN_1916, Technical Information CM442

Drawing No. TI01112CEN_0315, Technical Information CM442R

Drawing No. U190664E1, Test Report Env. CM442R, Phoenix Testlab, 12-07-2019

Drawing No. U190664E2 (Box), Test Report Env. CM442, Phoenix Testlab, 12-07-2019

-----Revalidation 2021-----

Drawing No. CM448, E201948E1, EMC Test Report (6GHZ), Phoenix Testlab, 19.01.2021

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Drawing No. CM448R, E201948E1, EMC Test Report (6GHZ), Phoenix Testlab, 19.01.2021

Drawing No. TI00444CEN_2319, Datasheet Liquiline CM442/CM444/CM448

Drawing No. TI01112CEN_0919, Datasheet Liquiline CM442R/CM444R/CM448R

Drawing No. Ordercodes CM44xR incl CM442xR_v04, Ordercodes v04

----- Revalidation 2022-----

Drawing No. CM44x_2DSExi_EXD Technical Description_IECEX_ATEX_EN, Technical_Description

Drawing No. CM44_EX, General Information 2DSExi

Drawing No. E210641E1, EMC Test Report, Phoenix Testlab, 28.06.2021

Drawing No. U210641E12nd Version, Environmental Test Report, Phoenix Testlab, 26.01.2022

Drawing No. U212423E1, Damp heat Test Report, Phoenix Testlab, 18.01.2022

Drawing No. IECEx_TUR_21.0004_000, ex Certificate, TUV Rheinland, 19.02.2021

Drawing No. TUV_20_ATEX_8597_x_DE_EN, ex Certificate, TUV Rheinland, 19.02.2021

Drawing No. Ordercodes CM44xR incl CM442xR_v05, Ordercodes v05

Terms of Validity:

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STANDARDS

ABS Rules:

2022 Marine Vessel Rules: 1-1-4/7.7, 1-1-A3 and 1-1-A4, 4-8-3/1.7, 4-8-3/1.11.1, 4-8-3/1.17, 4-9-9/7, 4-9-9/13.1, 4-9-9/Table 1

2022 Mobile Offshore Unit Rules: 1-1-4/9.7, 1-1-A2 and 1-1-A3, 4-3-1/11, 4-3-1/15, 4-3-1/17

National:

NA

International:

NA

Government:

NA

EUMED:

NA

OTHERS:

NA