

Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

Manufacturer	DEIF A/S
Address	Frisenborgvej 33, Skive, 7800, Denmark
Type	Protective Devices
Description	<p>Multi-function Relay for protection, control measurements and monitoring of applications where generators, transformers, motors and/or feeders.</p> <p>MVR-200 series consisting of: F201, F205, F210, F215, F255 (feeder applications) M210, G215, M215, M255, G257, M257 (generator/motor applications) T215, T216, T256, T257 (transformer applications) V211 (busbar protection)</p> <p>Software Version: V2.1.x.x (F20x, F21x, G21x, M21x, T21x, V21x) Software Version: V2.5.x.x (F25x, G25x, M25x, T25x)</p>
Trade Name	MVR-200 series
Application	Marine, Offshore and Industrial applications for use in environmental categories ENV1 and ENV2 as defined in Lloyd's Register's Type Approval System, Test Specification Number 1 – 2018.
Specified Standard	Manufacturer's Specification. IEC60255-21-1; IEC60255-21-2; IEC 60255-26; IEC 60255-27 Refer to data sheet "4921240605C", dated 2019

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Ratings	Degrees of pollution 2 Insulation Class 1 Overvoltage Category III 24/48VDC (+30/-25%) 100...240VDC (+/-10%) 100...240VAC, 50/60Hz (+/-10%)
Additional Tests	Ingress Protection rating IP54 (front); IP20 (rear) Shock Test 10g / 11ms Dry Heat Test +70°C / 16hrs Low Temperature Test -25°C / 16hrs
Other Conditions	Final functional arrangements are to comply with appropriate Lloyd's Register Rules and will be subject of the Plan Approval process. Devices of the MVR-200 series can only be operated in power distribution zones. A current de-rating shall be done for the digital input and output cards for a thermal continuous rating $\geq 50^{\circ}\text{C}$ from max. 5A to max. 4A (refer to data sheet).

This certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register EMEA of any modification or changes to the equipment in order to obtain a valid Certificate.

The Design Appraisal Document No. HTS/ETS 39457-20/ML and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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Appendix

TYPES

MVR-200 series consisting of:

F201, F205, F210, F215, F255 (feeder applications)
 M210, G215, M215, M255, G257, M257 (generator/motor applications)
 T215, T216, T256, T257 (transformer applications)
 V211 (busbar protection)

Software Version: **V2.1.x.x** (F20x, F21x, G21x, M21x, T21x, V21x)

Software Version: **V2.5.x.x** (F25x, G25x, M25x, T25x)

Protection	ANSI-Code
Three-phase over-current protection stages INST, DT or IDMT	50/51
(Sensitive) Earth-fault protection stages INST, DT or IDMT	50N/51N
Harmonic over-current protection/inrush blocking stages INST, DT or IDMT	50H/51H/68H
Current unbalance/broken conductor protection stages INST, DT or IDMT	46/46R/46L
Under-current monitor	37
Restricted earth-fault protection (low-imp)	87N
Transformer, motor or generator differential protection, 2-winding	87T/G/M
Machine, transformer or line thermal overload protection	49M/T/L
Directional three-phase over-current protection stages DT or IDMT	67
Directional (sensitive) residual over-current protection stages DT or IDMT	67N
Over-voltage protection stages INST, DT or IDMT	59
Residual voltage protection stages INST, DT or IDMT	59N
Positive sequence under-/over-voltage protection stages INST, DT or IDMT	59P/27P/47
Under-voltage protection stages INST, DT or IDMT	27
Synchro check/ Synchroniser	25
Reverse-/under-/over-power protection stages INST, DT or IDMT	32/32R
Motor start-up supervision element	48/14
Frequency protection stages	81O/U

LLOYD'S REGISTER TYPE APPROVAL
Issue by: Hamburg Technical Support Office (HPC1962114)
Issued to: DEIF A/S
For: Medium Voltage Relay
Type: MVR-Series x20x / x21x / x25x

The undernoted documents have been reviewed for compliance with the requirements of the Lloyd's Register Type Approval System Procedure TA14 Version 03 (July 2017) and this Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

V 2019.05	LR Type Approval Application Checklist	24.09.2019
GMS03-11-14	Request for Marine Services – Type Approval (2502TA)	11.11.2019
EPC730-03/JFL	Overview product range for MVR – series	20.09.2019
4921240605C	Data Sheet – MVR-200 series	2019
0172-00-2019-05-20	Test Certificate for EN60255-1 and EN60255-149	20.05.2019
4189341221A	Designer's Handbook – MVR-200 series	2019
4189341219A	Installation Instructions – MVR-200 series	2019
4189341220A	Operator's Manual – MVR-200 series	2019
PRJ11100235828-1	LR PQA report for ARQTEC (Place of Production)	18.02.2020
Unnumbered	Software development guideline (Rev.5)	18.02.2020
10137670	ISO9001:2015 Certificate DEIF A/S, issued by LR	18.09.2018
FIHSK10556337A	ISO9001:2015 Certificate ARQTEC, issued by BV	12.09.2018
SQP_Rev.B	Software Quality Plan – AQ-x21x & MVR-x21x (V2.1.1.1-18)	07.02.2020
PRJ11100235828-1	Review report – Software development procedure for MVR-series	18.02.2020
Unnumbered	Software Lifecycle V1	09.03.2020

TEST REPORTS

20/2019	Test Report – Protection Relay acc. IEC60255-1 & IEC60255-149	20.05.2019
ANSI25	Test Report – Synchro-Check for F215	15.05.2019
ANSI49F	Test Report – Thermal overload for F215	30.01.2019
ANSI50 51	Test Report – Phase overcurrent for F215	05.03.2019
ANSI81O 81U	Test Report – Over-/Under-frequency for F215	15.05.2019
ANSI87N	Test Report – Differential protection for F215	15.05.2019
ANSI27	Test Report – Undervoltage for M215	13.05.2019
ANSI32 32R 37	Test Report – Over-, Reverse, Under-power for M215	15.05.2019
ANSI46	Test Report – Current unbalance for M215	07.05.2019
ANSI47 27P 59P	Test Report – Sequence voltage for M215	15.05.2019

TEST REPORTS (continued)

ANSI49M	Test Report – Thermal overload for M215	21.12.2018
ANSI50H 51H 68H	Test Report – Harmonic overcurrent for M215	15.05.2019
ANSI50N 51N	Test Report – Earth fault for M215	07.05.2019
ANSI59	Test Report – Overvoltage for M215	13.05.2019
ANSI59N	Test Report – Residual voltage protection for M215	15.05.2019
ANSI67	Test Report – Directional phase overcurrent for M215	15.05.2019
ANSI67N	Test Report – Directional earth fault for M215	15.05.2019
ANSI49T	Test Report – Thermal overload (transformer) for T216	19.12.2018
ANSI87T 87N	Test Report – Transformer differential and REF for T216	15.05.2019
EPC0730_V0.1	Test Report – Overcurrent release during network storm	13.06.2018
4910213120F	Test Report – Damp Heat Test DEIF A/S, witnessed by BV	05.09.2019
4910213115G	Test Report – Damp Heat Test Marine DEIF A/S, witnessed by BV	05.09.2019
4910217501Q	Test Report – Burst Test DEIF A/S, witnessed by BV	05.09.2019
4910214120F	Test Report – Flammability DEIF A/S, witnessed by BV	03.09.2019
4910215100I	Test Report – Insulation Resistance DEIF A/S, witnessed by BV	05.09.2019
4910217507L	Test Report – RF Common Mode DEIF A/S, witnessed by BV	03.09.2019
4910213100G	Test Report – Cold Test DEIF A/S, witnessed by BV	31.01.2019
4910213105G	Test Report – Dry Heat DEIF A/S, witnessed by BV	31.01.2019
4910217506M	Test Report – Surge DEIF A/S, witnessed by BV	31.01.2019
4910217513J	Test Report – Variations DC Power, witnessed by BV	31.01.2019
4910217515H	Test Report – Interruptions DC Power DEIF A/S, witnessed by BV	31.01.2019
4910216501J	Test Report – Radiated Emission DEIF A/S, witnessed by BV	31.01.2019
4910216502I	Test Report – Conducted Emissions DEIF A/S, witnessed by BV	31.01.2019
4910217502M	Test Report – RF E-Field Immunity DEIF A/S, witnessed by DNV-GL	25.06.2019
4910217505J	Test Report – ESD DEIF A/S, witnessed by DNV-GL	26.09.2019
4910217509F	Test Report – Low frequency harmonics, witnessed by DNV-GL	26.06.2019

DRAWINGS

AQB006C1	BOM – AQ200 series CPU module	05.04.2019
AQB007F1	BOM – AQ200 baseboard	05.03.2019
AQB009C	BOM – Current Measurement	27.05.2016
AQB010B2	BOM – Display module	14.10.2013
AQB015B	BOM – DO Option card for AQ200	03.04.2018
AQB017D	BOM – Voltage measurement card	21.09.2015
AQB018C	BOM – HSR/PRP ethernet card for AQ200-series	07.09.2018
AQB021F1	BOM – AQ200 baseboard with small PSU	05.03.2019
AQB023F	BOM – Isolated DI-option card for AQ200 series	05.03.2019
AQB028D	BOM – AQ250 CPU module	24.04.2019
AQB031E1	BOM – AQ250 Display card	18.10.2019
AQB032E1	BOM – AQ250 baseboard, high range PSU	25.10.2019

DRAWINGS (continued)

AQB033F	BOM – AQ250 motherboard	undated
AQB034B1	BOM – DO Option card for AQ200 (SPI)	02.11.2018
AQB035C1	BOM – 4 pcs mA output + 1pcs mA-input card for AQ200	14.08.2019
AQB045D1	BOM – AQ250 baseboard, low range PSU	25.10.2019
AQB046C	BOM – Isolated DI-option card for AQ250 series (SPI)	05.03.2019
AQZ006F	Layout – AQ200 series CPU module	29.09.2016
AQZ007I	Layout – AQ200 series high range PSU	27.08.2018
AQZ009E	Layout – current measurement module	25.05.2016
AQZ010C	Layout – AQ200 series display module	18.10.2012
AQZ012C	Layout – AQ200 series DO module	06.04.2018
AQZ018D	Layout – Voltage measurement card	22.09.2015
AQZ020C	Layout – AQ200/250 series LC Ethernet module	04.09.2018
AQZ027D	Layout – AQ200 series DI module	04.03.2019
AQZ028D	Layout – AQ250 series CPU module	23.04.2019
AQZ036G	Layout – AQ250 series motherboard	18.04.2019
AQZ037E	Layout – AQ250 series high range PSU	23.04.2019
AQZ038E	Layout – AQ250 series display module	24.04.2019
AQZ039B	Layout – AQ250 series DO module	07.02.2018
AQZ040C	Layout – AQ200/250 series mA I/O module	06.03.2018
Unnumbered	Overview BOM and Layout Drawings AQ200/250 series	20.03.2020



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Supplementary Type Approval Terms and Conditions

Type Approval certifies that a representative sample of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein. It does not mean or imply approval for any other use, nor approval of any product(s) designed or manufactured otherwise than in strict conformity with the said representative sample.

Type Approval is based on the understanding that the manufacturer's recommendations and instructions and any relevant requirements of the Rules and Regulations are complied with.

Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations. Lloyd's Register EMEA reserves the right to cancel or withdraw this Type Approval Certificate in accordance with the Lloyd's Register Type Approval System Procedure.

