

Page 1 of 3 Certificate No: LR2256673TA Issue Date: 24/03/2022 Expiry Date: 04/02/2026

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 | ABB Electrification Sweden AB |
|---------------------|---|
| Address | Motorgränd 20, Västeras, 721 61, Sweden |
| Place of Production | ABB India Limited |
| | Power Systems, Substation Automation & Protection, Plot No. 5 & 6, II Phase,, Peenya Industrial Area, Bangalore, KA, 560058, India |
| Place of Production | ABB Xinhui Low Voltage Switchgear Co., Ltd. |
| | Jinguzhou Industrial Development Zone, Xinhui Dist., Jiangmen, 529100, China |
| Place of Production | ABB Electrification Sweden AB |
| | Motorgränd 20, Västeras, 72161, Sweden |
| Туре | Contactors |
| Description | 3 pole contactors AF400-30, AF460-30, AF580-30, AF750-30, AF1250-30, AF1350-30, AF1650-30, AF2050-30, AF2650-30, AF2850-30 |
| | Auxiliary contact block CAL18 |
| | For detailed product description, pls. refer to appendix. |
| | |

Matthias Karg

Specialist to Lloyd's Register EMEA A member of the Lloyd's Register group

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Page 2 of 3 Certificate No: LR2256673TA Issue Date: 24/03/2022 Expiry Date: 04/02/2026

Type Approval Certificate

| Trade Name | AF-series |
|--------------------|---|
| Application | Marine, Offshore and Industrial applications for use in environmental categories ENV1, ENV2 and ENV3, as defined in Lloyd's Register Type Approval System, Test Specification Number 1 – December 2021. |
| Specified Standard | IEC 60947-1: 2007 + A1: 2011 + A2: 2014 IEC 60947-4-1: 2009 + A1: 2012 IACS E10 Rev. 8 / 2021 |
| Ratings | Contactors: Rated insulation voltage U _i : 1.000 V (acc. to IEC 60947-4-1) Rated impuls withstand voltage U _{imp} : 8 kV Ingress protection IP00 Number and kind of contact elements: 3 NO + 0 NC |
| | Auxiliary contact block CAL18 (1 NO + 1 NC): Rated insulation voltage U _i : 690 V (acc. to IEC 60947-5-1) Rated impuls withstand voltage U _{imp} : 6 kV Rated operational voltage (Ue): 24 -690 VAC Rated Frequency: 50/60 Hz |
| | Software version PLC-Controller: 2.1.x |
| | For detailed ratings, pls. refer to appendix. |
| Other Conditions | Manufacturer's derating table is to be observed. Ventilation arrangement is to be arranged as per manufacturer's instructions. |
| | Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations. |
| | If the specified standards are amended during the validity of this certificate, |

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Page 3 of 3 Certificate No: LR2256673TA Issue Date: 24/03/2022 Expiry Date: 04/02/2026

Type Approval Certificate

the product is to be re- approved prior to it being supplied to vessels to which the amended standards apply.

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 HTS/ETS 42257-22/MK and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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Page 1 of 3 Certificate No: Issue Date: Expiry Date:

LR2256673TA 24/03/2022 04/02/2026

Appendix

DESCRIPTION

3 pole low voltage contactors, AF-series Auxiliary contact block, CAL 18

RATINGS

Utilization characteristics acc. to IEC 60947-1 / 60947-4-1:

| Contactor type | | AF400-30 | | | |
|---|-----|----------|----------------------------------|-----|------|
| Rated insulation voltage (Ui) | VAC | | 10 | 000 | |
| Rated impulse withstand voltage (Uimp) | kV | | 8 | kV | |
| Rated Frequency | Hz | 50/60 | | | |
| Rated thermal current (Ith) | Α | 600 | | | |
| Utilization category | | AC-3 | | | AC-1 |
| Ambient temperature | °C | 55 | 55 | 55 | 40 |
| Rated operational voltage (Ue) | V | 1000 | 690 | 500 | 1000 |
| Rated operational current (le/lscl) | Α | 155 | 350 | 400 | 600 |
| Ambient temperature Rated operational voltage (Ue) | V | 1000 | AC-3 55 55 55 1000 690 500 | | |

| | 1 | | | | | |
|--|-----|----------|-------|-----|------|--|
| Contactor type | | AF460-30 | | | | |
| Rated insulation voltage (Ui) | VAC | | 1000 | | | |
| Rated impulse withstand voltage (Uimp) | kV | | 8 | kV | | |
| Rated Frequency | Hz | | 50/60 | | | |
| Rated thermal current (Ith) | Α | 700 | | | | |
| Utilization category | | AC-3 | | | AC-1 | |
| Ambient temperature | °C | 55 | 55 | 55 | 40 | |
| Rated operational voltage (Ue) | V | 1000 | 690 | 500 | 1000 | |
| Rated operational current (le/lscl) | Α | 200 | 400 | 460 | 700 | |

| Contactor type | | AF580-30 | | | | |
|--|-----|----------|-------|-----|------|--|
| Rated insulation voltage (Ui) | VAC | | 10 | 000 | | |
| Rated impulse withstand voltage (Uimp) | kV | | 8 | kV | | |
| Rated Frequency | Hz | | 50/60 | | | |
| Rated thermal current (Ith) | Α | | 800 | | | |
| Utilization category | | AC-3 AC | | | AC-1 | |
| Ambient temperature | °C | 55 | 55 | 55 | 40 | |
| Rated operational voltage (Ue) | V | 1000 | 690 | 500 | 1000 | |
| Rated operational current (le/lscl) | Α | 250 | 500 | 580 | 800 | |

| Contactor type | | AF750-30 | | | | |
|--|-----|-----------|-----|------|------|------|
| Rated insulation voltage (Ui) | VAC | | | 1000 | | |
| Rated impulse withstand voltage (Uimp) | kV | | | 8 kV | | |
| Rated Frequency | Hz | 50/60 | | | | |
| Rated thermal current (Ith) | Α | 600 | | | | |
| Utilization category | | AC-3 AC-1 | | | | 2-1 |
| Ambient temperature | °C | 55 | 55 | 55 | 40 | 40 |
| Rated operational voltage (Ue) | V | 1000 | 690 | 500 | 1000 | 690 |
| Rated operational current (le/lscl) | Α | 300 | 650 | 750 | 1000 | 1050 |

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Page 2 of 3 Certificate No: Issue Date: Expiry Date:

LR2256673TA 24/03/2022 04/02/2026

RATINGS (continued)

| Contactor type | | AF1250-30 | | | |
|--|-----|-----------|----|------|------|
| Rated insulation voltage (Ui) | VAC | | 10 | 000 | |
| Rated impulse withstand voltage (Uimp) | kV | | 8 | kV | |
| Rated Frequency | Hz | | 50 |)/60 | |
| Rated thermal current (Ith) | Α | 1260 | | | |
| Utilization category | | - | | | AC-1 |
| Ambient temperature | °C | - | - | - | 40 |
| Rated operational voltage (Ue) | V | - | - | - | 1000 |
| Rated operational current (le/lscl) | Α | - | - | - | 1260 |

| Contactor type | | AF1350-30 | | | | |
|--|-----|-----------|-------|-----|------|--|
| Rated insulation voltage (Ui) | VAC | | 1000 | | | |
| Rated impulse withstand voltage (Uimp) | kV | | 8 kV | | | |
| Rated Frequency | Hz | | 50/60 | | | |
| Rated thermal current (Ith) | Α | 1350 | | | | |
| Utilization category | | AC-3 AC | | | AC-1 | |
| Ambient temperature | °C | 55 | 55 | 55 | 40 | |
| Rated operational voltage (Ue) | V | 1000 | 690 | 440 | 1000 | |
| Rated operational current (le/lscl) | Α | 375 | 800 | 860 | 1350 | |

| Contactor type | | AF1650-30 | | | | |
|--|-----|-----------|-------|------|------|--|
| Rated insulation voltage (Ui) | VAC | | 1000 | | | |
| Rated impulse withstand voltage (Uimp) | kV | | 8 | kV | | |
| Rated Frequency | Hz | | 50/60 | | | |
| Rated thermal current (Ith) | Α | 1650 | | | | |
| Utilization category | | AC-3 | | | AC-1 | |
| Ambient temperature | °C | 55 | 55 | 55 | 40 | |
| Rated operational voltage (Ue) | V | 1000 | 690 | 440 | 1000 | |
| Rated operational current (le/lscl) | Α | 400 | 970 | 1060 | 1650 | |

| Contactor type | | AF2050-30 | | | |
|--|-----|-----------|-----|------|------|
| Rated insulation voltage (Ui) | VAC | | 10 | 000 | |
| Rated impulse withstand voltage (Uimp) | kV | | 8 | kV | |
| Rated Frequency | Hz | 50/60 | | | |
| Rated thermal current (Ith) | Α | 2050 | | | |
| Utilization category | | AC-3 A | | | AC-1 |
| Ambient temperature | °C | 55 | 55 | 55 | 40 |
| Rated operational voltage (Ue) | V | 1000 | 690 | 440 | 1000 |
| Rated operational current (le/lscl) | Α | 425 | 970 | 1060 | 2050 |

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Page 3 of 3 Certificate No: Issue Date: Expiry Date:

LR2256673TA 24/03/2022 04/02/2026

RATINGS (continued)

| Contactor type | | AF2650-30 | | | | |
|--|-----|-----------|------|-----|------|--|
| Rated insulation voltage (Ui) | VAC | | 1000 | | | |
| Rated impulse withstand voltage (Uimp) | kV | | 8 | kV | | |
| Rated Frequency | Hz | | 50 | /60 | | |
| Rated thermal current (Ith) | Α | 2650 | | | | |
| Utilization category | | - // | | | AC-1 | |
| Ambient temperature | °C | - | - | - | 40 | |
| Rated operational voltage (Ue) | V | - | - | - | 1000 | |
| Rated operational current (Ie/Iscl) | Α | - | - | - | 2650 | |
| | | | | | | |

| Contactor type | | AF2850-30 | | | |
|--|-----|-----------|----|-----|------|
| Rated insulation voltage (Ui) | VAC | | 10 | 000 | |
| Rated impulse withstand voltage (Uimp) | kV | 8 kV | | | |
| Rated Frequency | Hz | 50/60 | | | |
| Rated thermal current (Ith) | Α | 2850 | | | |
| Utilization category | | - AC | | | AC-1 |
| Ambient temperature | °C | - | - | - | 40 |
| Rated operational voltage (Ue) | V | - | - | - | 1000 |
| Rated operational current (le/lscl) | Α | - | - | - | 2850 |

Rated control circuit voltage supply (Uc):

Code 68: Uc = 24-60 VAC / 20-60 VDC (with PLC-control) Code 69: Uc = 48-130 VAC/DC (with PLC-control) Code 70: Uc = 100-250 VAC/DC (with PLC-control) Code 71: Uc = 250-500 VAC/DC (with PLC-control)

Contact utilization characteristics acc. to IEC 60947-1 / 60947-5-1:

| CAL18 |
|--------------|
| 690 V |
| 6 kV |
| 24 - 690 VAC |
| 50/60 Hz |
| 20 |
| 16 A |
| AC-15, DC-13 |
| 1NO + 1NC |
| |

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