

## 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.

<b>Manufacturer</b>	<b>ABB Electrification Sweden AB</b>
<b>Address</b>	Motorgränd 20, Västerås, 721 61, Sweden
<b>Place of Production</b>	ABB India Limited  Power Systems, Substation Automation & Protection, Plot No. 5 & 6, II Phase,, Peenya Industrial Area, Bangalore, KA, 560058, India
<b>Place of Production</b>	ABB Xinhui Low Voltage Switchgear Co., Ltd.  Jinguzhou Industrial Development Zone, Xinhui Dist., Jiangmen, 529100, China
<b>Place of Production</b>	ABB Electrification Sweden AB  Motorgränd 20, Västerås, 72161, Sweden
<b>Type</b>	Contactors
<b>Description</b>	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.

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<b>Trade Name</b>	AF-series
<b>Application</b>	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.
<b>Specified Standard</b>	IEC 60947-1: 2007 + A1: 2011 + A2: 2014 IEC 60947-4-1: 2009 + A1: 2012 IACS E10 Rev. 8 / 2021
<b>Ratings</b>	<p>Contactors:</p> <p>Rated insulation voltage <math>U_i</math>: 1.000 V (acc. to IEC 60947-4-1) Rated impuls withstand voltage <math>U_{imp}</math>: 8 kV Ingress protection IP00 Number and kind of contact elements: 3 NO + 0 NC</p> <p>Auxiliary contact block CAL18 (1 NO + 1 NC): Rated insulation voltage <math>U_i</math>: 690 V (acc. to IEC 60947-5-1) Rated impuls withstand voltage <math>U_{imp}</math>: 6 kV Rated operational voltage (<math>U_e</math>): 24 -690 VAC Rated Frequency: 50/60 Hz</p> <p>Software version PLC-Controller: 2.1.x</p> <p>For detailed ratings, pls. refer to appendix.</p>
<b>Other Conditions</b>	<p>Manufacturer's derating table is to be observed. Ventilation arrangement is to be arranged as per manufacturer's instructions.</p> <p>Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations.</p> <p>If the specified standards are amended during the validity of this certificate,</p>

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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.

## 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:

<b>Contactors type</b>		<b>AF400-30</b>			
Rated insulation voltage (U <sub>i</sub> )	VAC	1000			
Rated impulse withstand voltage (U <sub>imp</sub> )	kV	8 kV			
Rated Frequency	Hz	50/60			
Rated thermal current (I <sub>th</sub> )	A	600			
Utilization category		AC-3			AC-1
Ambient temperature	°C	55	55	55	40
Rated operational voltage (U <sub>e</sub> )	V	1000	690	500	1000
Rated operational current (I <sub>e</sub> /I <sub>scl</sub> )	A	155	350	400	600

<b>Contactors type</b>		<b>AF460-30</b>			
Rated insulation voltage (U <sub>i</sub> )	VAC	1000			
Rated impulse withstand voltage (U <sub>imp</sub> )	kV	8 kV			
Rated Frequency	Hz	50/60			
Rated thermal current (I <sub>th</sub> )	A	700			
Utilization category		AC-3			AC-1
Ambient temperature	°C	55	55	55	40
Rated operational voltage (U <sub>e</sub> )	V	1000	690	500	1000
Rated operational current (I <sub>e</sub> /I <sub>scl</sub> )	A	200	400	460	700

<b>Contactors type</b>		<b>AF580-30</b>			
Rated insulation voltage (U <sub>i</sub> )	VAC	1000			
Rated impulse withstand voltage (U <sub>imp</sub> )	kV	8 kV			
Rated Frequency	Hz	50/60			
Rated thermal current (I <sub>th</sub> )	A	800			
Utilization category		AC-3			AC-1
Ambient temperature	°C	55	55	55	40
Rated operational voltage (U <sub>e</sub> )	V	1000	690	500	1000
Rated operational current (I <sub>e</sub> /I <sub>scl</sub> )	A	250	500	580	800

<b>Contactors type</b>		<b>AF750-30</b>				
Rated insulation voltage (U <sub>i</sub> )	VAC	1000				
Rated impulse withstand voltage (U <sub>imp</sub> )	kV	8 kV				
Rated Frequency	Hz	50/60				
Rated thermal current (I <sub>th</sub> )	A	600				
Utilization category		AC-3			AC-1	
Ambient temperature	°C	55	55	55	40	40
Rated operational voltage (U <sub>e</sub> )	V	1000	690	500	1000	690
Rated operational current (I <sub>e</sub> /I <sub>scl</sub> )	A	300	650	750	1000	1050

**RATINGS (continued)**

<b>Contactor type</b>		<b>AF1250-30</b>			
Rated insulation voltage (U <sub>i</sub> )	VAC	1000			
Rated impulse withstand voltage (U <sub>imp</sub> )	kV	8 kV			
Rated Frequency	Hz	50/60			
Rated thermal current (I <sub>th</sub> )	A	1260			
Utilization category		-			AC-1
Ambient temperature	°C	-	-	-	40
Rated operational voltage (U <sub>e</sub> )	V	-	-	-	1000
Rated operational current (I <sub>e</sub> /I <sub>scl</sub> )	A	-	-	-	1260

<b>Contactor type</b>		<b>AF1350-30</b>			
Rated insulation voltage (U <sub>i</sub> )	VAC	1000			
Rated impulse withstand voltage (U <sub>imp</sub> )	kV	8 kV			
Rated Frequency	Hz	50/60			
Rated thermal current (I <sub>th</sub> )	A	1350			
Utilization category		AC-3			AC-1
Ambient temperature	°C	55	55	55	40
Rated operational voltage (U <sub>e</sub> )	V	1000	690	440	1000
Rated operational current (I <sub>e</sub> /I <sub>scl</sub> )	A	375	800	860	1350

<b>Contactor type</b>		<b>AF1650-30</b>			
Rated insulation voltage (U <sub>i</sub> )	VAC	1000			
Rated impulse withstand voltage (U <sub>imp</sub> )	kV	8 kV			
Rated Frequency	Hz	50/60			
Rated thermal current (I <sub>th</sub> )	A	1650			
Utilization category		AC-3			AC-1
Ambient temperature	°C	55	55	55	40
Rated operational voltage (U <sub>e</sub> )	V	1000	690	440	1000
Rated operational current (I <sub>e</sub> /I <sub>scl</sub> )	A	400	970	1060	1650

<b>Contactor type</b>		<b>AF2050-30</b>			
Rated insulation voltage (U <sub>i</sub> )	VAC	1000			
Rated impulse withstand voltage (U <sub>imp</sub> )	kV	8 kV			
Rated Frequency	Hz	50/60			
Rated thermal current (I <sub>th</sub> )	A	2050			
Utilization category		AC-3			AC-1
Ambient temperature	°C	55	55	55	40
Rated operational voltage (U <sub>e</sub> )	V	1000	690	440	1000
Rated operational current (I <sub>e</sub> /I <sub>scl</sub> )	A	425	970	1060	2050

**RATINGS (continued)**

<b>Contact type</b>		<b>AF2650-30</b>			
Rated insulation voltage (U <sub>i</sub> )	VAC	1000			
Rated impulse withstand voltage (U <sub>imp</sub> )	kV	8 kV			
Rated Frequency	Hz	50/60			
Rated thermal current (I <sub>th</sub> )	A	2650			
Utilization category		-			AC-1
Ambient temperature	°C	-	-	-	40
Rated operational voltage (U <sub>e</sub> )	V	-	-	-	1000
Rated operational current (I <sub>e</sub> /I <sub>scl</sub> )	A	-	-	-	2650

<b>Contact type</b>		<b>AF2850-30</b>			
Rated insulation voltage (U <sub>i</sub> )	VAC	1000			
Rated impulse withstand voltage (U <sub>imp</sub> )	kV	8 kV			
Rated Frequency	Hz	50/60			
Rated thermal current (I <sub>th</sub> )	A	2850			
Utilization category		-			AC-1
Ambient temperature	°C	-	-	-	40
Rated operational voltage (U <sub>e</sub> )	V	-	-	-	1000
Rated operational current (I <sub>e</sub> /I <sub>scl</sub> )	A	-	-	-	2850

Rated control circuit voltage supply (U<sub>c</sub>):

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

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

<b>Auxiliary contact block</b>		<b>CAL18</b>
Rated insulation voltage (U <sub>i</sub> )		690 V
Rated impulse withstand voltage (U <sub>imp</sub> )		6 kV
Rated operational voltage (U <sub>e</sub> )		24 - 690 VAC
Rated Frequency		50/60 Hz
Degree of protection		20
Rated thermal current (I <sub>th</sub> ) θ ≤ 40 °C		16 A
Utilization category		AC-15, DC-13
Number and kind of contact elements		1NO + 1NC