



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, Västerås, 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, Västerås, 721 61, Sweden
Type	Contactors
Description	Three and four pole contactors AF116-30, AF116-40 AF140-30/AF140-40 AF146-30 AF190-30/AF190-40 AF205-30/AF205-40 AF265-30/AF265-40 AF305-30/AF305-40 AF370-30/AF370-40

Units 1702-1704, 17th Floor (Level-13), Building
Q2, Aurum Q Parc; Gen 4/1 TTC, Thane-Belapur
Road, Ghansoli, Navi Mumbai, 400710, India

Ashwinikumar Mhamal

Electrical & Control Technical Manager -
Africa, Middle East & India to Lloyd's Register
Marine and Offshore India LLP

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Type Approval Certificate

Three 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, CAL19

For detailed product description, pls. refer to appendix.

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 60947-1:2020/COR2:2024
IEC 60947-4-1:2023
IACS E10 Rev. 9 / 2023

Ratings

Contactors:
AF116-30 to AF370-30
Rated operational voltage (Ue): 440 – 1000 V
Rated Frequency: 50/60 Hz
Rated operational current AC-1 (Ie): 160 – 600 A (690 V / 40 °C)
Rated operational current AC-3 (Ie): 116 – 370 A (440 V / 60 °C)

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Auxiliary contact block CAL19 (1NO+1NC)

AF116-40 to AF370-40

Rated operational voltage (Ue): 440 – 1000 V

Rated Frequency: 50/60 Hz

Rated operational current AC-1 (Ie): 160 – 525 A (690 V / 40 °C)

Rated operational current AC-3 (Ie): 116 – 370 A (440 V / 60 °C)

Auxiliary contact block CAL19 (1NO+1NC)

AF400-30 to AF2850-30

Rated insulation voltage Ui: 1.000 V (acc. to IEC 60947-4-1)

Rated impulse withstand voltage Uimp: 8 kV

Ingress protection IP00

Number and kind of contact elements: 3 NO + 0 NC

Auxiliary contact block CAL18 (1NO+1NC)

Auxiliary contact block CAL18/ CAL19 (1 NO + 1 NC):

Rated insulation voltage Ui: 690 V (acc. to IEC 60947-5-1)

Rated impulse withstand voltage Uimp: 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.

Additional Tests Low temperature test: -15 °C / 16 h (AF140-30, AF146-30, AF205-30, AF305-30, AF370-30)
Low temperature test: -25 °C / 16 h (for AF116-30, AF190-30, AF265-30)

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 (as required by LR Rules) the

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requirements for further review or for the product to be further inspected and/or surveyed to be installed in ships classed or intended to be classed with LR

If the specified standards are amended during the validity of this certificate, the product is to be reapproved 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 Marine and Offshore India LLP of any modification or changes to the equipment in order to obtain a valid Certificate.

Previous Version: LR2002421TA, LR2256673TA

The Design Appraisal Document TSO-25-029295-E-01 and its supplementary Type Approval Terms and Conditions form part of this Certificate.

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Appendix

DESCRIPTION

Three and four pole contactors
 Types: AF116-30, AF116-40
 AF140-30, AF140-40
 AF146-30
 AF190-30, AF190-40
 AF205-30, AF205-40
 AF265-30, AF265-40
 AF305-30, AF305-40
 AF370-30, AF370-40
 Auxiliary contact block, CAL19

RATINGS

Rated making capacity AC-3: 10 x I_e AC-3 acc. to IEC 60947-4-1
 Rated breaking capacity AC-3: 8 x I_e AC-3 acc. to IEC 60947-4-1
 Supply voltage codes: Code 11: U_s = 24-60 V AC / 20-60 VDC
 Code 12: U_s = 48-130 V AC / DC
 Code 13: U_s = 100-250 V AC / DC
 Code 14: U_s = 250-500 V AC / DC
 Code 31: U_s = 24-60 V AC / 20-60 VDC (PLC-control)
 Code 32: U_s = 48-130 V AC/ DC (PLC-control)
 Code 33: U_s = 100-250 V AC / DC (PLC-control)
 Code 34: U_s = 250-500 V AC / DC (PLC-control)
 Code 42: U_s = 110-120V 50/60Hz
 Code 43: U_s = 220-240V 50/60Hz

Contactor type		AF116-30			
Rated insulation voltage (U _i)	V	1000			
Rated Frequency	Hz	50/60			
Rated thermal current (I _{th})	A	160			
Utilization category		AC-3			AC-1
Ambient temperature	°C	60	60	60	40
Rated operational voltage (U _e)	V	690	500	440	690
Rated operational current (I _e /I _{scl})	A	65	110	116	160

Contactor type		AF116-40			
Rated insulation voltage (U _i)	V	1000			
Rated Frequency	Hz	50/60			
Rated thermal current (I _{th})	A	160			
Utilization category		AC-3			AC-1
Ambient temperature	°C	-	-	60	40
Rated operational voltage (U _e)	V	-	-	440	690
Rated operational current (I _e /I _{scl})	A	-	-	116	160



RATINGS (continued)

Contact type		AF140-30				
Rated insulation voltage (U _i)	V	1000				
Rated Frequency	Hz	50/60				
Rated thermal current (I _{th})	A	200				
Utilization category		AC-3			AC-1	
Ambient temperature	°C	60	60	60	40	
Rated operational voltage (U _e)	V	690	500	440	690	
Rated operational current (I _e /I _{scl})	A	80	130	140	200	

Contact type		AF140-40				
Rated insulation voltage (U _i)	V	1000				
Rated Frequency	Hz	50/60				
Rated thermal current (I _{th})	A	200				
Utilization category		AC-3			AC-1	
Ambient temperature	°C	-	-	60	40	
Rated operational voltage (U _e)	V	-	-	440	690	
Rated operational current (I _e /I _{scl})	A	-	-	140	200	

Contact type		AF146-30				
Rated insulation voltage (U _i)	V	1000				
Rated Frequency	Hz	50/60				
Rated thermal current (I _{th})	A	225				
Utilization category		AC-3			AC-1	
Ambient temperature	°C	60	60	60	40	
Rated operational voltage (U _e)	V	1000	690	440	1000	
Rated operational current (I _e /I _{scl})	A	60	93	146	225	

Contact type		AF190-30				
Rated insulation voltage (U _i)	V	1000				
Rated Frequency	Hz	50/60				
Rated thermal current (I _{th})	A	275				
Utilization category		AC-3			AC-1	
Ambient temperature	°C	60	60	60	40	40
Rated operational voltage (U _e)	V	1000	690	440	1000	690
Rated operational current (I _e /I _{scl})	A	85	135	190	250	275



RATINGS (continued)

Contact type		AF190-40				
Rated insulation voltage (U _i)	V	1000				
Rated Frequency	Hz	50/60				
Rated thermal current (I _{th})	A	275				
Utilization category		AC-3			AC-1	
Ambient temperature	°C	-	-	60	40	40
Rated operational voltage (U _e)	V	-	-	440	1000	690
Rated operational current (I _e /I _{scl})	A	-	-	190	250	275

Contact type		AF205-30				
Rated insulation voltage (U _i)	V	1000				
Rated Frequency	Hz	50/60				
Rated thermal current (I _{th})	A	350				
Utilization category		AC-3			AC-1	
Ambient temperature	°C	60	60	60	40	40
Rated operational voltage (U _e)	V	1000	690	440	1000	690
Rated operational current (I _e /I _{scl})	A	100	165	205	275	350

Contact type		AF205-40				
Rated insulation voltage (U _i)	V	1000				
Rated Frequency	Hz	50/60				
Rated thermal current (I _{th})	A	350				
Utilization category		AC-3			AC-1	
Ambient temperature	°C	-	-	60	40	40
Rated operational voltage (U _e)	V	-	-	440	1000	690
Rated operational current (I _e /I _{scl})	A	-	-	205	275	350

Contact type		AF265-30				
Rated insulation voltage (U _i)	V	1000				
Rated Frequency	Hz	50/60				
Rated thermal current (I _{th})	A	400				
Utilization category		AC-3			AC-1	
Ambient temperature	°C	60	60	60	40	40
Rated operational voltage (U _e)	V	1000	690	440	1000	690
Rated operational current (I _e /I _{scl})	A	113	250	265	350	400



RATINGS (continued)

Contact type		AF265-40				
Rated insulation voltage (U _i)	V	1000				
Rated Frequency	Hz	50/60				
Rated thermal current (I _{th})	A	400				
Utilization category		AC-3			AC-1	
Ambient temperature	°C	-	-	60	40	40
Rated operational voltage (U _e)	V	-	-	440	1000	690
Rated operational current (I _e /I _{scl})	A	-	-	265	350	400

Contact type		AF305-30				
Rated insulation voltage (U _i)	V	1000				
Rated Frequency	Hz	50/60				
Rated thermal current (I _{th})	A	500				
Utilization category		AC-3			AC-1	
Ambient temperature	°C	60	60	60	40	40
Rated operational voltage (U _e)	V	1000	690	440	1000	690
Rated operational current (I _e /I _{scl})	A	131	290	305	375	500

Contact type		AF305-40				
Rated insulation voltage (U _i)	V	1000				
Rated Frequency	Hz	50/60				
Rated thermal current (I _{th})	A	500				
Utilization category		AC-3			AC-1	
Ambient temperature	°C	-	-	60	40	40
Rated operational voltage (U _e)	V	-	-	440	1000	690
Rated operational current (I _e /I _{scl})	A	-	-	305	375	500

Contact type		AF370-30				
Rated insulation voltage (U _i)	V	1000				
Rated Frequency	Hz	50/60				
Rated thermal current (I _{th})	A	600				
Utilization category		AC-3			AC-1	
Ambient temperature	°C	60	60	60	40	40
Rated operational voltage (U _e)	V	1000	690	440	1000	690
Rated operational current (I _e /I _{scl})	A	141	315	370	400	600



RATINGS (continued)

Contactor type		AF370-40				
Rated insulation voltage (Ui)	V	1000				
Rated Frequency	Hz	50/60				
Rated thermal current (Ith)	A	525				
Utilization category		AC-3			AC-1	
Ambient temperature	°C	-	-	60	40	40
Rated operational voltage (Ue)	V	-	-	440	1000	690
Rated operational current (Ie/Iscl)	A	-	-	370	400	525

DESCRIPTION

Three pole low voltage contactors

Types: AF400-30

AF460-30

AF580-30

AF750-30

AF1250-30

AF1350-30

AF1650-30

AF2050-30

AF2650-30

AF2850-30

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	1000			
Rated impulse withstand voltage (Uimp)	kV	8 kV			
Rated Frequency	Hz	50/60			
Rated thermal current (Ith)	A	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 (Ie/Iscl)	A	155	350	400	600

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)	A	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 (Ie/Iscl)	A	200	400	460	700



RATINGS (continued)

Contactor type		AF580-30				
Rated insulation voltage (U _i)	VAC	1000				
Rated impulse withstand voltage (U _{imp})	kV	8 kV				
Rated Frequency	Hz	50/60				
Rated thermal current (I _{th})	A	800				
Utilization category		AC-3			AC-1	
Ambient temperature	°C	55	55	55	40	
Rated operational voltage (U _e)	V	1000	690	500	1000	
Rated operational current (I _e /I _{scl})	A	250	500	580	800	

Contactor type		AF750-30				
Rated insulation voltage (U _i)	VAC	1000				
Rated impulse withstand voltage (U _{imp})	kV	8 kV				
Rated Frequency	Hz	50/60				
Rated thermal current (I _{th})	A	600				
Utilization category		AC-3			AC-1	
Ambient temperature	°C	55	55	55	40	40
Rated operational voltage (U _e)	V	1000	690	500	1000	690
Rated operational current (I _e /I _{scl})	A	300	650	750	1000	1050

Contactor type		AF1250-30				
Rated insulation voltage (U _i)	VAC	1000				
Rated impulse withstand voltage (U _{imp})	kV	8 kV				
Rated Frequency	Hz	50/60				
Rated thermal current (I _{th})	A	1260				
Utilization category		-			AC-1	
Ambient temperature	°C	-	-	-	40	
Rated operational voltage (U _e)	V	-	-	-	1000	
Rated operational current (I _e /I _{scl})	A	-	-	-	1260	

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



RATINGS (continued)

Contactor type		AF1650-30			
Rated insulation voltage (U _i)	VAC	1000			
Rated impulse withstand voltage (U _{imp})	kV	8 kV			
Rated Frequency	Hz	50/60			
Rated thermal current (I _{th})	A	1650			
Utilization category		AC-3			AC-1
Ambient temperature	°C	55	55	55	40
Rated operational voltage (U _e)	V	1000	690	440	1000
Rated operational current (I _e /I _{sc})	A	400	970	1060	1650

Contactor type		AF2050-30			
Rated insulation voltage (U _i)	VAC	1000			
Rated impulse withstand voltage (U _{imp})	kV	8 kV			
Rated Frequency	Hz	50/60			
Rated thermal current (I _{th})	A	2050			
Utilization category		AC-3			AC-1
Ambient temperature	°C	55	55	55	40
Rated operational voltage (U _e)	V	1000	690	440	1000
Rated operational current (I _e /I _{sc})	A	425	970	1060	2050

Contactor type		AF2650-30			
Rated insulation voltage (U _i)	VAC	1000			
Rated impulse withstand voltage (U _{imp})	kV	8 kV			
Rated Frequency	Hz	50/60			
Rated thermal current (I _{th})	A	2650			
Utilization category		-			AC-1
Ambient temperature	°C	-	-	-	40
Rated operational voltage (U _e)	V	-	-	-	1000
Rated operational current (I _e /I _{sc})	A	-	-	-	2650

Contactor type		AF2850-30			
Rated insulation voltage (U _i)	VAC	1000			
Rated impulse withstand voltage (U _{imp})	kV	8 kV			
Rated Frequency	Hz	50/60			
Rated thermal current (I _{th})	A	2850			
Utilization category		-			AC-1
Ambient temperature	°C	-	-	-	40
Rated operational voltage (U _e)	V	-	-	-	1000
Rated operational current (I _e /I _{sc})	A	-	-	-	2850



RATINGS (continued)

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:

Auxiliary contact block	CAL18/CAL19
Rated insulation voltage (U _i)	690 V
Rated impulse withstand voltage (U _{imp})	6 kV
Rated operational voltage (U _e)	24 - 690 VAC
Rated Frequency	50/60 Hz
Degree of protection	20
Rated thermal current (I _{th}) $\theta \leq 40$ °C	16 A
Utilization category	AC-15, DC-13
Number and kind of contact elements	1NO + 1NC