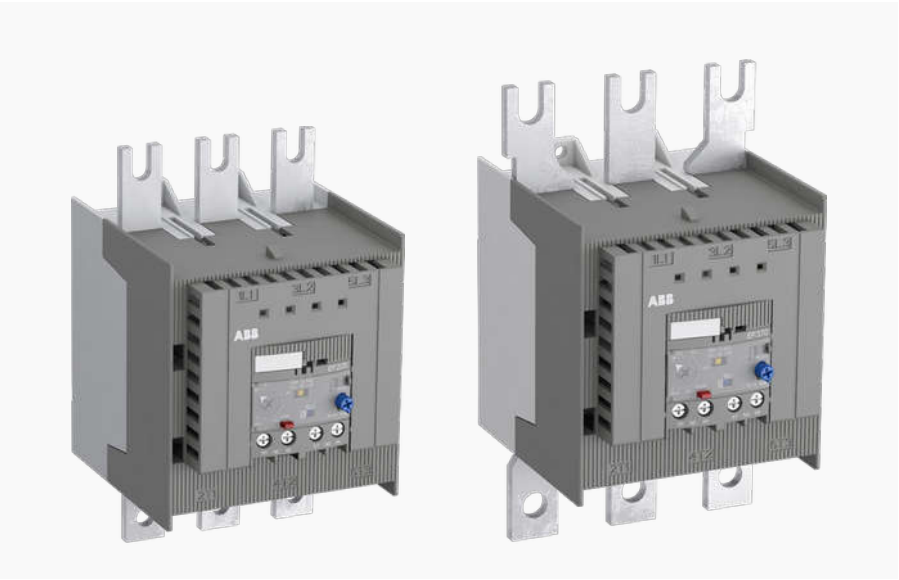
DATA SHEET

Electronic overload relays EF205 and EF370



Electronic overload relays offer reliable protection in case of overload and phase-failure. They are the alternative to thermal overload relays. Motor starters are combinations of overload relays and contactors.

Description

- Overload protection – trip class 10E, 20E, 30E selectable
- Phase loss sensitivity
- Temperature compensation from -25 … +70 °C
- Adjustable current setting for overload protection
- Automatic or manual reset selectable
- Trip-free mechanism
- Status indication
- STOP and TEST function
- Direct mounting onto block contactors
- Sealable operating elements
- Self-supplied devices

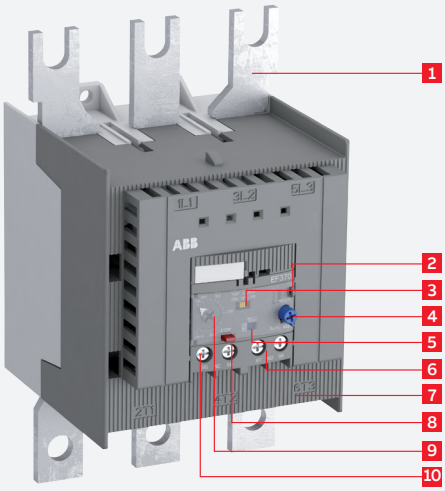


Order data

EF205, EF370 screw terminal
For A145 ... AF370 block contactors

Setting range	Type	Order code	Weight
			Pkg (1 pce)
A			kg
63 ... 210	EF205-210	1SAX531001R1101	1.256
115 ... 380	EF370-380	1SAX611001R1101	1.338

Suitable for mounting on:
A145, A185, AF145, AF185, AF190, AF205
A210, A260, A300, AF210, AF260, AF265, AF300, AF305, AF370



Functional description

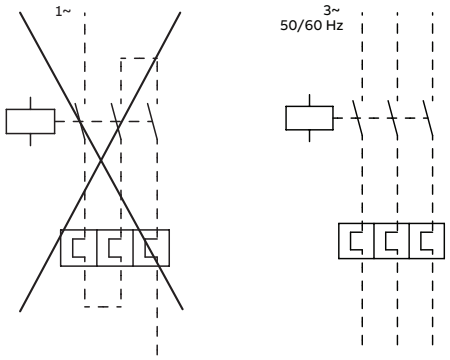
1. Terminals 1L1, 3L2, 5L3
2. Sealable operating elements
3. Trip class 10E, 20E, 30E selectable
4. RESET - Automatic or manual reset selectable
5. TEST - Status indication
6. Signaling contacts 97-98
7. Terminals 2T1, 4T2, 6T3
8. STOP
9. Current setting range / Self-test function ST
   Adjustable current setting for overload protection
10. Tripping contacts 95-96

Application / internal function

The self-supplied electronic overload relays are three pole electronic/mechanical devices. The motor current flows through build-in current transformers and an evaluation circuit will recognize an overload (over current). This will lead to a release of the relay and a change of the contacts switching position (95-96 / 97-98). The contact 95-96 is used to control the load contactor. The electronic overload relay is self-supplied, which mean no extra external supply is needed.

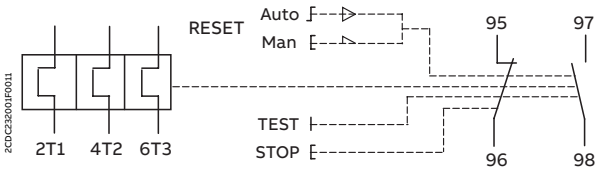
The overload relays have a setting scale in Amperes, which allows the direct adjusting of the relay without any additional calculation. In compliance with international and national standards, the setting current is the rated current of the motor and not the tripping current (no tripping at 1.05 x I, tripping at 1.2 x I; I = setting current). The relays are constructed in a way that they protect themselves in the event of an overload. The overload relay has to be protected against short-circuit. The appropriate short-circuit protective devices are shown in the following tables. To prevent thermal overloads in heavy duty applications, the correct cable sizes have to be selected.

Operation mode



	Contact 95-96	Contact 97-98	Opto-mechanical slide	Comment
Trip state	open	closed		
RESET state	closed	open	ON	
TEST manual reset mode	open	closed		
TEST auto reset mode	open	closed		
STOP while device is in trip state	open	closed		STOP button has no function
STOP while device is in RESET state	open	open		while STOP button is pressed

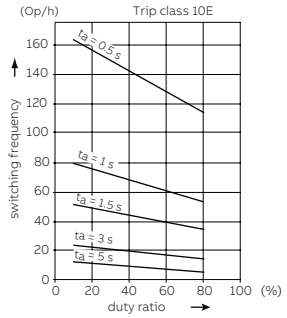
Wiring diagram

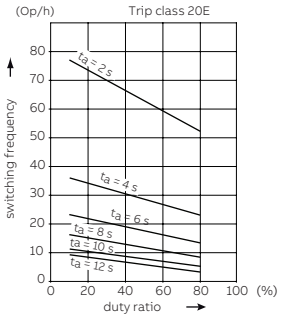


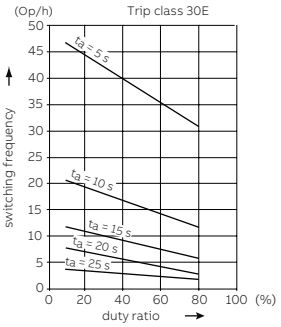
Resistance and power loss per pole and short-circuit protective devices

Type	Setting range		Resistance per pole	Power loss per pole		Short-circuit protective devices coordination type 2
	lower value A	upper value A	 mΩ	at lower value W	at upper value W	
EF205-210	63	210	0.027	0.107	1.191	Fuse 1250 A, Type gG
EF370-380	115	380	0.028	0.370	4.043	Fuse 1600 A, Type gG

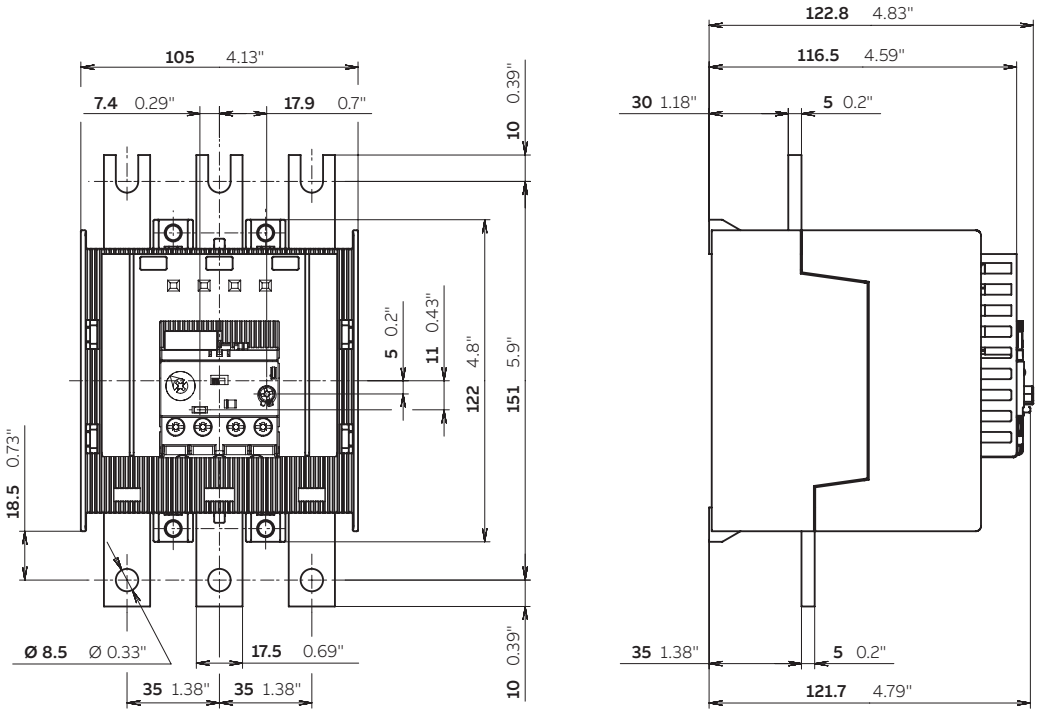
Intermittent periodic duty



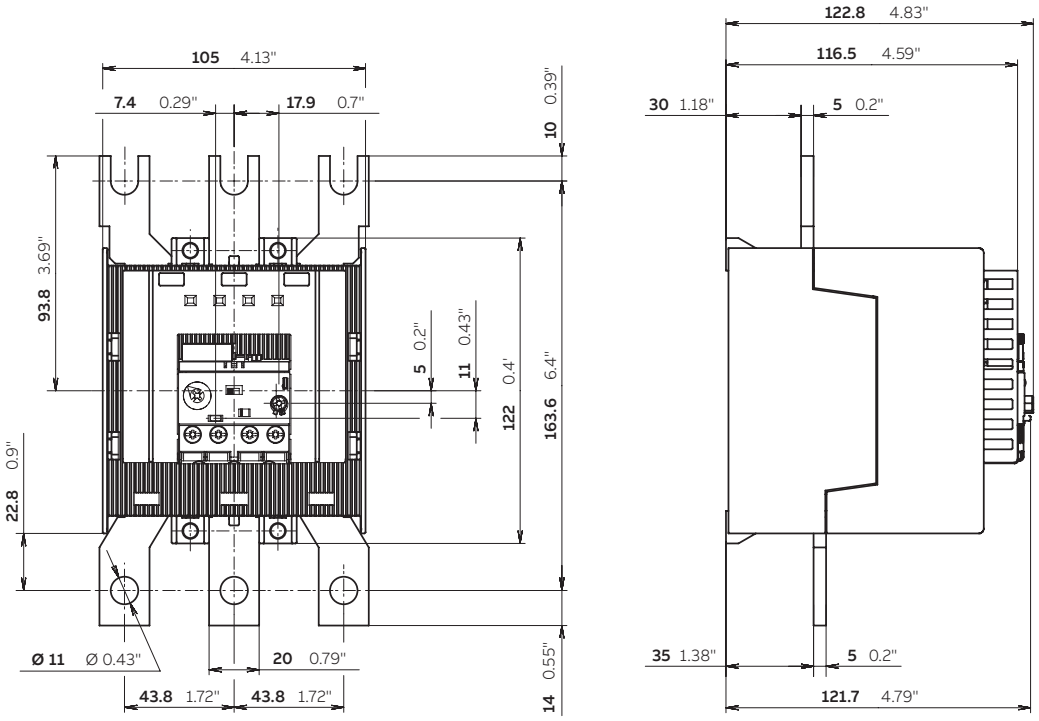




Dimensions



EF205-210



EF370-380

Technical data IEC/EN

Data at Ta = 40 °C and at rated values, if nothing else indicated

Main circuit

	EF205, EF370
Rated operational voltage Ue	1000 V AC
	- V DC
Setting range - electronic overload protection	see table on page 1
Rated operational current AC-3 Ie	see upper value of setting range, on page 5
Trip class	10E, 20E, 30E, selectable
Rated frequency	50/60 Hz
Number of poles	3
Resistance per pole	see table on page 5
Power loss per pole	see table on page 5
Short-circuit protective devices	see table on page 5

Isolation data

	EF205, EF370
Rated impulse withstand voltage Uimp	8 kV
Rated insulation voltage Ui	1000 V
Pollution degree	3
Overvoltage category	up to III

Electrical connection

Type		EF205	EF370
rigid with cable lug		1 x 16 ... 185 mm² 2 x 16 ... 120 mm²	50 ... 240 mm² 50 ... 150 mm²
flexible with cable lug		1 x 16 ... 185 mm² 2 x 16 ... 120 mm²	50 ... 240 mm² 50 ... 150 mm²
Stripping length		-	-
Tightening torque		18 Nm	28 Nm
Screw type		M8	M10
 Lug/ Bar	L	≤ 24 mm	32 mm
	Ø	> 8 mm	10 mm

Auxiliary circuit

		EF205, EF370
Rated operational voltage Ue		600 V AC / DC
Conventional free air thermal current Ith		6 A
Rated frequency		DC, 50/60 Hz
Number of poles		1 N.C. + 1 N.O.
Rated operational current Ie acc. to IEC/EN 60947-5-1 for utilization category		
at AC-15 at 110-120 V	N.C. 95-96	3.00 A
	N.O. 97-98	3.00 A
at AC-15 at 220-230-240 V	N.C. 95-96	3.00 A
	N.O. 97-98	3.00 A
at AC-15 at 400 V	N.C. 95-96	1.10 A
	N.O. 97-98	1.10 A
at AC-15 at 480-500 V	N.C. 95-96	0.75 A
	N.O. 97-98	0.75 A
at DC-13 at 24 V	N.C. 95-96	1.50 A
	N.O. 97-98	1.50 A
at DC-13 at 60 V	N.C. 95-96	0.55 A
	N.O. 97-98	0.55 A
at DC-13 at 110-120-125 V	N.C. 95-96	0.55 A
	N.O. 97-98	0.55 A
at DC-13 at 250 V	N.C. 95-96	0.27 A
	N.O. 97-98	0.27 A
Minimum switching capacity		12 V / 3 mA $\lambda = 10^{-7}$; Ukd = 3 V / 500.000 operating cycles
Short-circuit protective devices		fuse 6 A, Type gG

Isolation data

	EF205, EF370
Rated impulse withstand voltage Uimp	6 kV
Rated insulation voltage Ui	690 V
Pollution degree	3
Overvoltage category	up to III

Electrical connection

Auxiliary circuit	**EF205, EF370**
 rigid	1 x 1 ... 4 mm² 2 x 1 ... 4 mm²
 flexible with ferrule	1 x 0.75 ... 2.5 mm² 2 x 0.75 ... 2.5 mm²
 flexible with ferrule insulated	1 x 0.75 ... 2.5 mm² 2 x 0.75 ... 2.5 mm²
 flexible	1 x 0.75 ... 2.5 mm² 2 x 0.75 ... 2.5 mm²
Stripping length	9 mm
Tightening torque	0.8 ... 1.2 Nm
Recommended screw driver	Pozidriv 2

General data

Duty time		100 %
Operating frequency without early tripping		see diagrams on page 3
Dimensions (W x H x D)		see dimension drawing
Weight		see ordering data
Mounting		screw with two screws on plate and tighten the screws of the main circuit terminals
Mounting on plate		M5 2 Nm / 18 lb.in
Mounting position		optional, position 1-6
Minimum distance to other units same type	horizontal	none
	vertical	not applicable
Minimum distance to electrical conductive board	horizontal	1.5 mm
	vertical	1.5 mm
Degree of protection	housing	IP20
	main circuit terminals	IP10
Maximum operating altitude		2000 m

Electromagnetic compatibility

Immunity acc. to IEC 60947-1	Environment A
Emission acc. to IEC 60947-1	Environment B

Environmental data

Ambient air temperature		
Operation	open - compensated	-25 ... +70 °C
	open	-25 ... +70 °C
Storage		-50 ... +85 °C
Ambient air temperature compensation		acc. to IEC/EN 60947-4-1
Resistance to vibrations acc. to IEC 60068-2-6		5g / 3 ... 150 Hz
Resistance to shock acc. to IEC 60068-2-27		15g / 11 ms

Standards / directives

Standards	IEC/EN 60947-1 IEC/EN 60947-4-1 IEC/EN 60947-5-1 UL 60947-1 UL 60947-4-1
Low Voltage Directive	2014/35/EU
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EU
ATEX Directive	2014/34/EC

Technical data UL/CSA

Full load amps and short-circuit protective devices

Type	Full load amps (FLA)	Short circuit protective devices								
		480 V AC		600 V AC			600 V AC		600 V AC	
		SCCR	Circuit breaker	SCCR	Fuse K5 / RK5	Circuit breaker	SCCR	Fuse J	SCCR	Circuit breaker
EF205-210	210 A	100 kA	400 A	10 kA	400 A	400 A	100 kA	400 A	100 kA	400 A
EF370-380	380 A	100 kA	800 A	18 kA	800 L/T	800 A	100 kA	600 A	100 kA	600 A

Main circuit

Maximum operational voltage	600 V AC
Trip rating	125 % of FLA
Full load amps (FLA)	see table above
Short-circuit rating RMS symmetrical	see table above
Short-circuit protective devices	see table above

Electrical connection

Type		EF205	EF370
stranded with cable lug		1 x AWG 6 ... 0000 2 x AWG 6 ... 0000	1 x AWG 1 ... 500 kcmil 2 x AWG 1 ... 500 kcmil
flexible with cable lug		1 x 6 ... 0000 2 x 6 ... 0000	1 x AWG 1 ... 500 kcmil 2 x AWG 1 ... 500 kcmil
Lug/Bar	L	≤ 24 mm	32 mm
	Ø	> 8 mm	10 mm
Stripping length		-	-
Tightening torque		160 lb.in	247 lb.in
Screw type		M8	M10

Auxiliary circuit

Conventional thermal current		6 A
Making and breaking capacity	N.C. / N.O.	B600, Q600

Electrical connection

Aixiliary circuit	EF205, EF370
stranded	1 x AWG 18 ... 10 2 x AWG 18 ... 10
flexible	1 x AWG 18 ... 10 2 x AWG 18 ... 10
Stripping length	9 mm
Tightening torque	7 ... 11 lb.in
Recommended screw driver	Pozidriv 2

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