

Electronic overload relays EF460 and EF750

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.

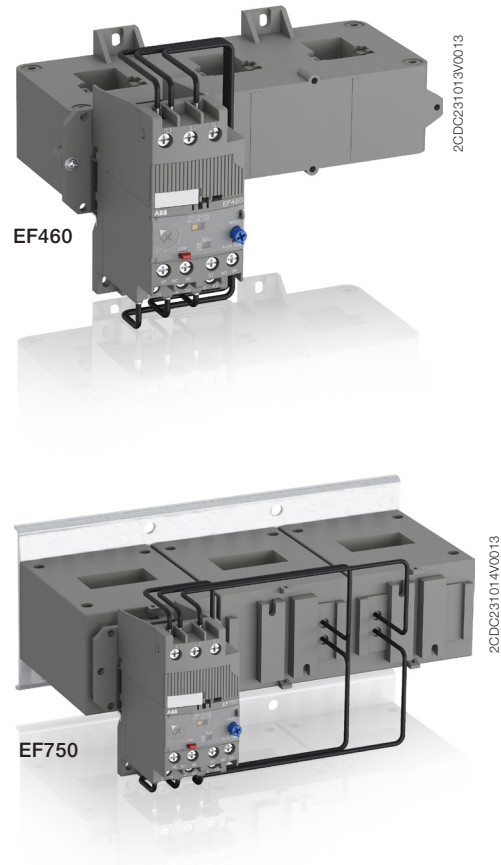
Description

- 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

EF460, EF750 screw terminal

For AF400 ... AF750 block contactors



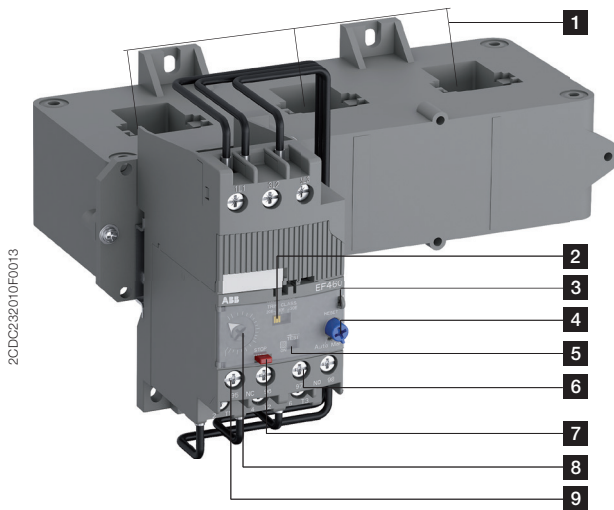
Setting range	Type	Order code	Suitable for	Packing unit	Weight per pc
A				pc	kg
150 ... 500	EF460-500	1SAX721001R1101	AF400, AF460	1	1.182
250 ... 800	EF750-800	1SAX821001R1101	AF580, AF750	1	2.765

Suitable for mounting on:

AF400, AF460

AF580, AF750

Functional description



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

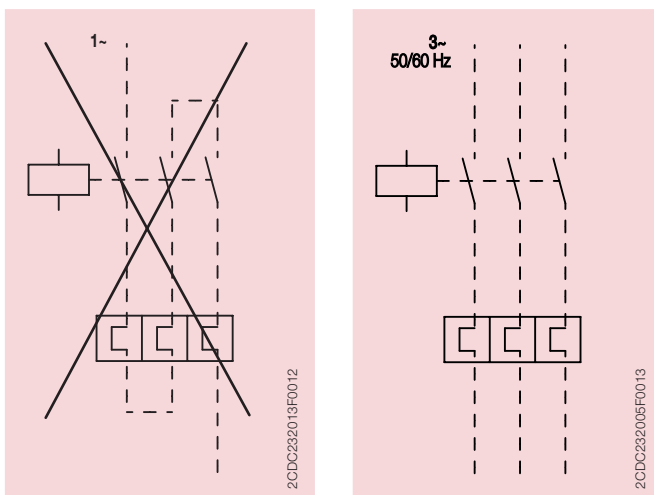
Application / internal function

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 $1.05 \times I$, tripping at $1.2 \times I$; $I =$ 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.

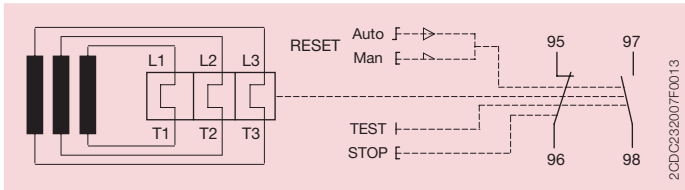
To prevent thermal overloads in heavy duty applications, the correct cable sizes have to be selected.

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 while STOP button is pressed
STOP while device is in RESET state	open	open		

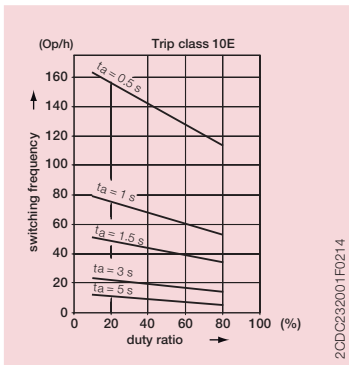
Wiring diagram



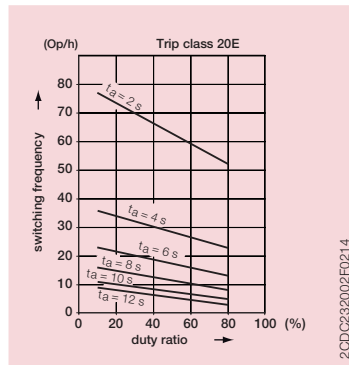
Resistance and power loss per pole and short-circuit protective devices

Type	Setting range		Resistance per pole mΩ	Power loss per pole		Short-circuit protective devices coordination type 2
	lower value A	upper value A		at lower value W	at upper value W	
EF460-500	150	500	-	-	-	690 V: 630 A, Type gG 1000 V: 1600 A, Type gG
EF750-800	250	800	-	-	-	690 V: 800 A, Type gG 1000 V: 1600 A, Type gG

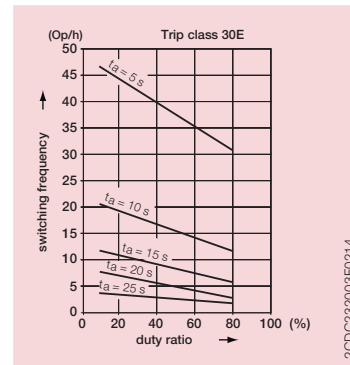
Intermittent periodic duty



Trip class 10E

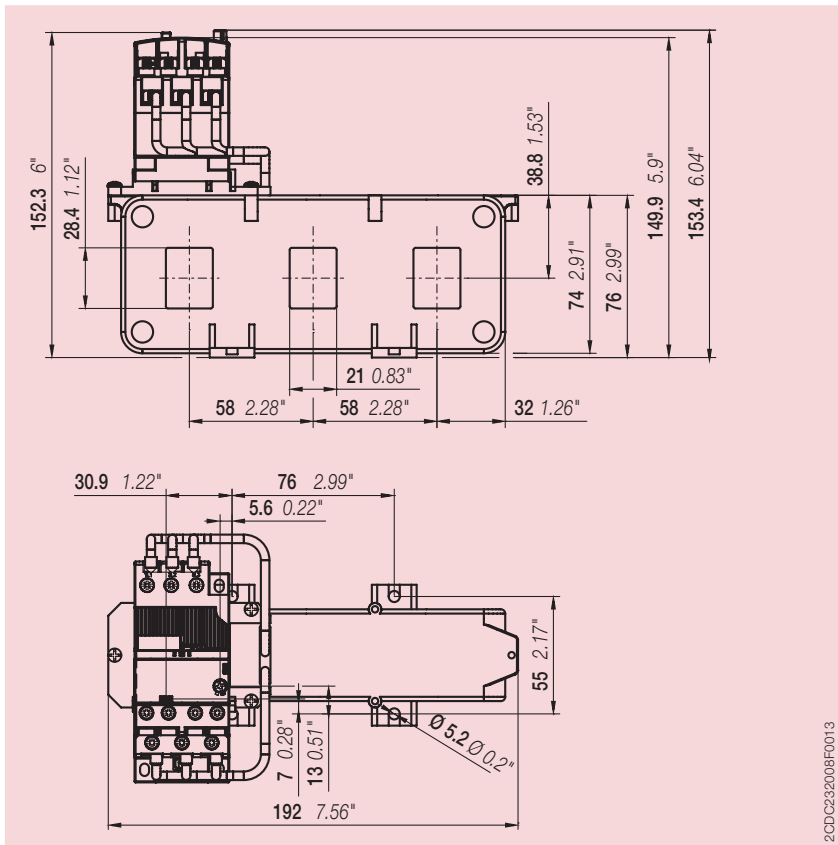


Trip class 20E

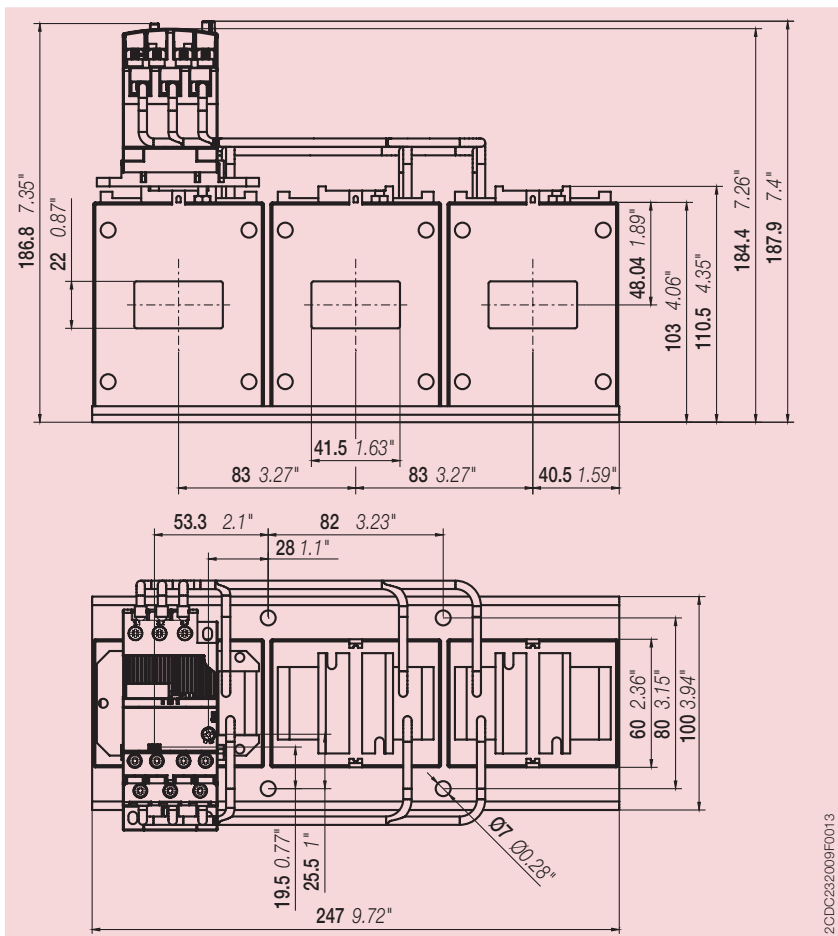


Trip class 30E

Dimensions



EF460-500



EF750-800

Technical data IEC/EN

Data at $T_A = 40\text{ °C}$ and at rated values, if nothing else indicated

Main circuit

EF460, EF750	
Rated operational voltage U_e	1000 V AC - V DC
Setting range - electronic overload protection	see table on page 1
Rated operational current AC-3 I_e	see upper value of setting range, on page 3
Trip class	10E, 20E, 30E, selectable
Rated frequency	50/60 Hz
Number of poles	3
Resistance per pole	see table on page 3
Power loss per pole	see table on page 3
Short-circuit protective devices	see table on page 3

Isolation data	
Rated impulse withstand voltage U_{imp}	8 kV
Rated insulation voltage U_i	1000 V
Pollution degree	3
Overvoltage category	up to III

Auxiliary circuit

			EF460, EF750
Rated operational voltage U_e			600 V AC / DC
Conventional free air thermal current I_{th}			6 A
Rated frequency			DC, 50/60 Hz
Number of poles			1NC + 1NO
Rated operational current I_e			
acc. to IEC/EN 60947-5-1 for utilization category			
at AC-15 at 110-120 V	NC, 95-96		3.00 A
	NO, 97-98		3.00 A
at AC-15 at 220-230-240 V	NC, 95-96		3.00 A
	NO, 97-98		3.00 A
at AC-15 at 400 V	NC, 95-96		1.10 A
	NO, 97-98		1.10 A
at AC-15 at 480-500 V	NC, 95-96		0.75 A
	NO, 97-98		0.75 A
at DC-13 at 24 V	NC, 95-96		1.50 A
	NO, 97-98		1.50 A
at DC-13 at 60 V	NC, 95-96		0.55 A
	NO, 97-98		0.55 A
at DC-13 at 110-120-125 V	NC, 95-96		0.55 A
	NO, 97-98		0.55 A
at DC-13 at 250 V	NC, 95-96		0.27 A
	NO, 97-98		0.27 A
Minimum switching capacity			12 V / 3 mA
Short-circuit protective devices			$\lambda = 10^{-7}$; $U_{kg} = 3$ V / 500,000 operating cycles fuse 6 A, Type gG
Isolation data			EF460, EF750
Rated impulse withstand voltage U_{imp}			6 kV
Rated insulation voltage U_i			690 V
Pollution degree			3
Overvoltage category			up to III
Electrical connection			EF460, EF750
Connecting capacity	rigid	1x	1 ... 4 mm ²
		2x	1 ... 4 mm ²
	flexible with ferrule	1x	0.75 ... 2.5 mm ²
		2x	0.75 ... 2.5 mm ²
	flexible with insulated ferrule	1x	0.75 ... 2.5 mm ²
		2x	0.75 ... 2.5 mm ²
	flexible	1x	0.75 ... 2.5 mm ²
		2x	0.75 ... 2.5 mm ²
Stripping length			9 mm
Tightening torque			0.8 ... 1.2 Nm
Recommended screw driver			Pozidriv 2

General data

	EF460	EF750
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	
Mounting on plate	M5	M6
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	IP00
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		-25 ... +70 °C
Ambient air temperature compensation		acc. to IEC/EN 60947-4-1
Resistance to vibrations acc. to IEC 60068-2-6		3g / 3 ... 150 Hz
Resistance to shock acc. to IEC 60068-2-27		25g / 11 ms

Standards / directives

Standards	IEC/EN 60947-4-1
	IEC/EN 60947-5-1
	IEC/EN 60947-1
	UL60947-1
	UL60947-4-1
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			
		600 V AC SCCR	Fuse J	600 V AC SCCR	Circuit breaker
EF460-500	500 A	100 kA	refer to AF	refer to AF	refer to AF
EF750-800	800 A	100 kA	refer to AF	refer to AF	refer to AF

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

Auxiliary circuit

Conventional thermal current	6 A
Making and breaking capacity	NC / NO B600, Q600

Electrical connection	
Connecting capacity	stranded
	1x AWG 18 ... 10
	2x AWG 18 ... 10
	flexible
1x AWG 18 ... 10	
2x AWG 18 ... 10	
Stripping length	9 mm
Tightening torque	7 ... 11 lb.in
Recommended screw driver	Pozidriv 2

Contact us

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