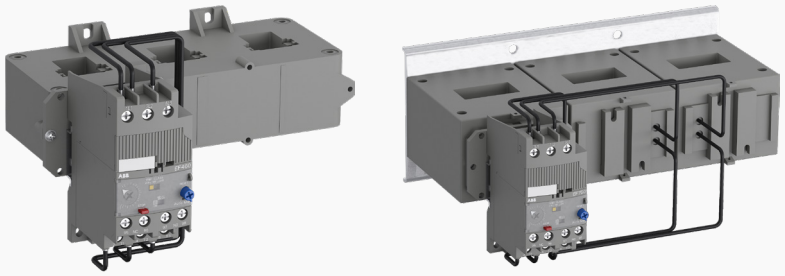
DATA SHEET

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

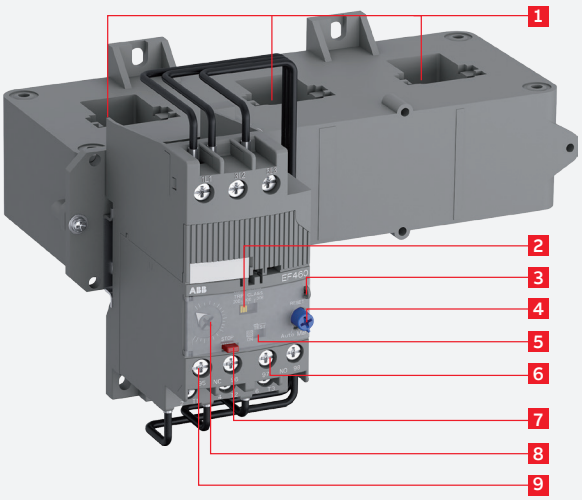
- Overload protection – trip class 10E, 20E, 30E selectable
- Phase loss sensitivity
- Temperature compensation from -25 … +70 °C
- Adjustable current setting for overload protection
- Automatic or manual reset selectable
- Trip-free mechanism
- Status indication
- STOP and TEST function
- Sealable operating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

Order data

EF460, EF750 screw terminal
For AF400 ... AF750 block contactors

Setting range	Type	Order code	Weight
			Pkg (1 pce)
A			kg
150 ... 500	EF460-500	1SAX721001R1101	1.182
250 ... 800	EF750-800	1SAX821001R1101	2.765

Suitable for use with: AF400, AF460, AF580, AF750



Functional description

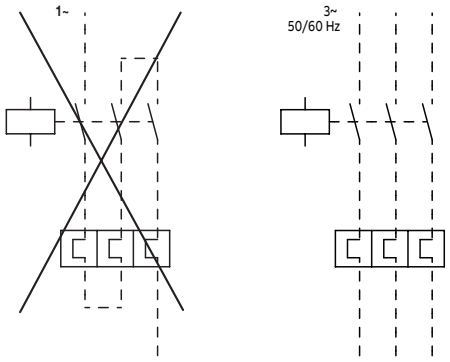
1. Current transformer
2. Trip class 10E, 20E, 30E - selectable
3. Sealable operating elements
4. RESET button
   Automatic or manual reset selectable
5. TEST - Status indication
6. Signaling contacts 97-98
7. STOP
8. Current setting range / Self-test function ST
   Adjustable current setting for overload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

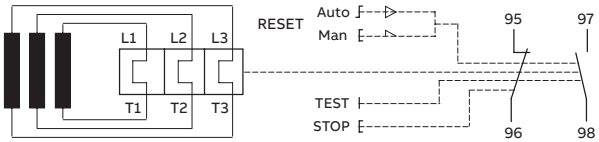
The overload relays have a setting scale in Amperes, which allows the direct adjusting of the relay without any additional calculation. In compliance with international and national standards, the setting current is the rated current of the motor and not the tripping current (no tripping at 1.05 x I, 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

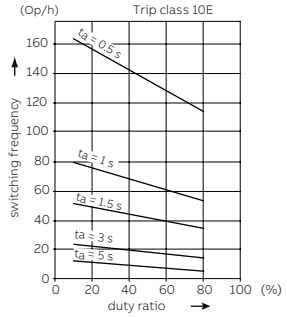
Wiring diagram

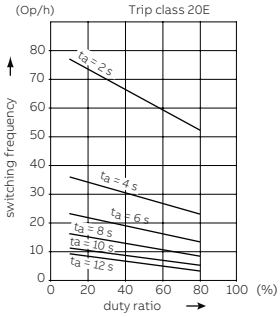


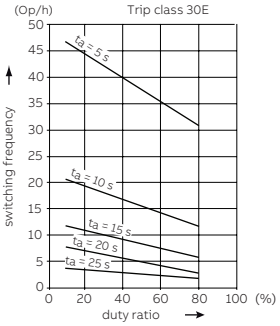
Resistance and power loss per pole and short-circuit protective devices

Type	Setting range		Resistance per pole	Power loss per pole		Short-circuit protective devices
	lower value A	upper value A	 mΩ	at lower value W	at upper value W	coordination type 2
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

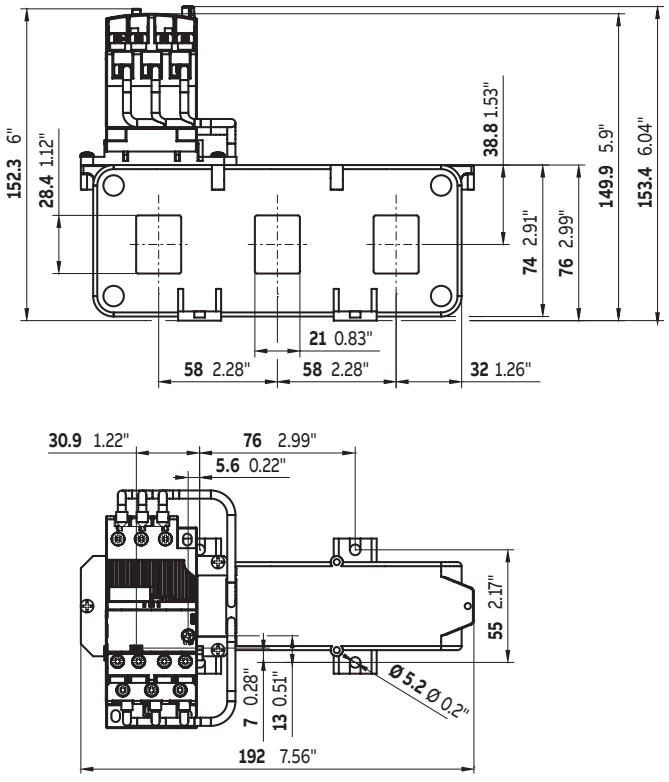
Intermittent periodic duty



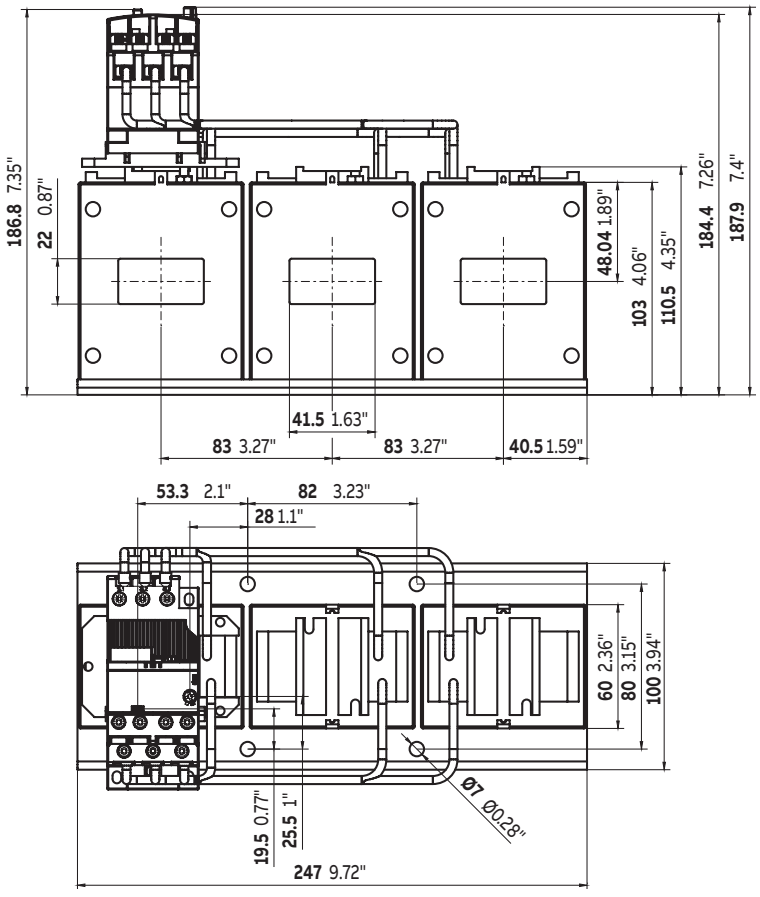




Dimensions



EF460-500



EF750-800

Technical data IEC/EN

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

Main circuit

	EF460, EF750
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 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

	EF460, EF750
Rated impulse withstand voltage Uimp	8 kV
Rated insulation voltage Ui	1000 V
Pollution degree	3
Overvoltage category	up to III

Auxiliary circuit

		EF460, EF750
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

	EF460, EF750
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	**95-96, 97-98**
 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

		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	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		-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		600 V AC	
		SCCR	Fuse J	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	N.C. / N.O.	B600, Q600

Electrical connection

Auxuliary circuit	**EF460, EF750**
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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