ABB
T16
TRIP CLASS 10
STOP
TEST
RESET
95 NC 96
97 NO 98
2T1
4T2
6T3
ABB
TF42
STOP
TEST
RESET
95 NC 96
97 NO 98
2T1
4T2
6T3
ABB
EF19
TRIP CLASS
STOP
TEST
RESET
Auto Man
95 NC 96
97 NO 98
ABB
EF45
TRIP CLASS
STOP
TEST
RESET
Auto Man
95 NC 96
97 NO 98

Overload relays

Overview

Thermal and electronic overload relays 7/2

Thermal overload relays

T16 (0.10 ... 16 A)

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TF42 (0.10 ... 38 A)

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TF65 (22 ... 67 A)

Ordering details 7/12
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TF96 (40 ... 96 A)

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TF140DU (66 ... 142 A)

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TA200DU (66 ... 200 A)

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Electronic overload relays

E16DU (0.10 ... 18.9 A)

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EF19, EF45 (0.10 ... 45 A)

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EF65, EF96, EF146 (20 ... 150 A)

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EF205, EF370 (63 ... 380 A)

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EF460, EF750 (150 ... 800 A)

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E1250DU (375 ... 1250 A)

Ordering details 7/44
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General accessories

WRB, WRH

Ordering details 7/47

Thermal and electronic overload relays

Thermal overload relays

IEC: rated operational power AC-3	**400 V**	0.03 … 4.0 kW	0.03 … 4.0 kW	4.0 … 18.5 kW	18.5 … 30 kW
UL/CSA: 3-phase hp-ratings	**480 V**	1/2 … 5 hp	1/2 … 10 hp	5 … 20 hp	30 … 60 hp
Fitting to contactors		B6, B7	AS09 … AS16	AF09 ... AF38	AF40, AF52, AF65
Type		**T16**	**T16**	**TF42**	**TF65**
Current range		0.10 … 16 A	0.10 … 16 A	0.10 … 38 A	22 … 67 A
Trip class		10	10	10	10
Single mounting kit		DB16	DB16	DB42	-

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Electronic overload relays
with integrated CT

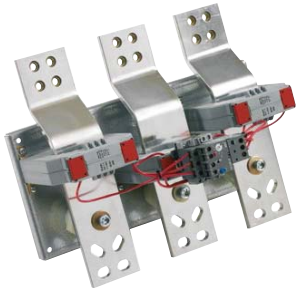
IEC: rated operational power AC-3	**400 V**	4 … 7.5 kW	4 … 7.5 kW	4.0 … 18.5 kW	18.5 … 30 kW
UL/CSA: 3-phase hp-ratings	**480 V**	5 … 10 hp	5 … 10 hp	5 … 20 hp	30 … 60 hp
Fitting to contactors		B6, B7, BC6, BC7, A09 ... A16, AL09 ... AL16, VB6, VB7, VBC6, VBC7	AF09 … AF16	AF26 ... AF38	AF40, AF52, AF65
Type		**E16DU**	**EF19**	**EF45**	**EF65**
Current range		0.10 … 18.9 A	0.10 … 18.9 A	9 … 45 A	20 … 70 A
Trip class		10E, 20E, 30E selectable			
Single mounting kit		DB16E	DB19EF	-	-

Electronic overload relays
with external separate CT

IEC: rated operational power AC-3	**400 V**	200 … 250 kW	315 … 400 kW
UL/CSA: 3-phase hp-ratings	**480 V**	350 … 400 hp	500 … 600 hp
Fitting to contactors		AF400, AF460	AF580, AF750, AF1250
Type		**EF460**	**EF750**
Current range		150 … 500 A	250 … 800 A
Trip class		10E, 20E, 30E selectable	

	37 … 45 kW	55 … 75 kW	90 … 110 kW
	60 hp	75 … 100 hp	125 … 150 hp
	AF80, AF96	AF116, AF140	AF190, AF205
	TF96	**TF140DU**	**TA200DU**
	40 … 96 A	66 … 142 A	66 … 200 A
	10	10A	10A
	-	-	DB200

	37 … 45 kW	55 … 75 kW	90 … 110 kW	132 … 200 kW
	60 hp	75 … 100 hp	125 … 150 hp	200 … 350 hp
	AF80, AF96	AF116, AF140, AF146	AF190, AF205	AF265, AF305, AF370
	EF96	**EF146**	**EF205**	**EF370**
	36 … 100 A	54 … 150 A	63 … 210 A	115 … 380 A
	10E, 20E, 30E selectable			
	-	-	-	-



	475 … 560 kW
	800 … 900 hp
	AF1350, AF1650
	E1250DU
	375 … 1250 A
	10E, 20E, 30E selectable

2CDC106062C0201

TF42 thermal overload relays
0.10 to 38.0 A

2CDC231006F0013

TF42

2CDC231001F0011

DB42

2CDC231026F0013

TF42 + DB42

1SFC151224F0002

KPR-101L

Description

The TF42 thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

- Manual or automatic reset selectable
- Phase loss sensitive acc. to IEC/EN 60947-4-1
- TEST and STOP function – Trip indication on the front
- Temperature compensation
- Suitable for three- and single-phase applications

Ordering details

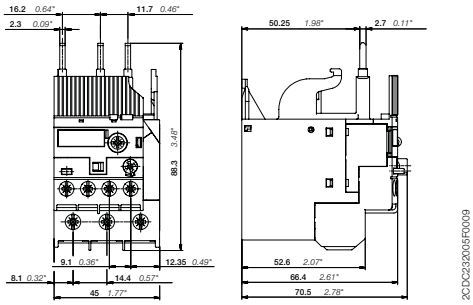
Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pc) kg
0.10 ... 0.13	0.5 A, fuse type T	10	TF42-0.13	1SAZ721201R1005		0.130
0.13 ... 0.17	1.0 A, fuse type T	10	TF42-0.17	1SAZ721201R1008		0.130
0.17 ... 0.23	1.0 A, fuse type T	10	TF42-0.23	1SAZ721201R1009		0.130
0.23 ... 0.31	1.0 A, fuse type T	10	TF42-0.31	1SAZ721201R1013		0.130
0.31 ... 0.41	2.0 A, fuse type gG	10	TF42-0.41	1SAZ721201R1014		0.130
0.41 ... 0.55	2.0 A, fuse type gG	10	TF42-0.55	1SAZ721201R1017		0.130
0.55 ... 0.74	4.0 A, fuse type gG	10	TF42-0.74	1SAZ721201R1021		0.130
0.74 ... 1.00	6.0 A, fuse type gG	10	TF42-1.0	1SAZ721201R1023		0.130
1.00 ... 1.30	6.0 A, fuse type gG	10	TF42-1.3	1SAZ721201R1025		0.130
1.30 ... 1.70	10.0 A, fuse type gG	10	TF42-1.7	1SAZ721201R1028		0.130
1.70 ... 2.30	10.0 A, fuse type gG	10	TF42-2.3	1SAZ721201R1031		0.130
2.30 ... 3.10	10.0 A, fuse type gG	10	TF42-3.1	1SAZ721201R1033		0.130
3.10 ... 4.20	20.0 A, fuse type gG	10	TF42-4.2	1SAZ721201R1035		0.130
4.20 ... 5.70	20.0 A, fuse type gG	10	TF42-5.7	1SAZ721201R1038		0.130
5.70 ... 7.60	35.0 A, fuse type gG	10	TF42-7.6	1SAZ721201R1040		0.130
7.60 ... 10.0	35.0 A, fuse type gG	10	TF42-10	1SAZ721201R1043		0.130
10.0 ... 13.0	40.0 A, fuse type gG	10	TF42-13	1SAZ721201R1045		0.130
13.0 ... 16.0	40.0 A, fuse type gG	10	TF42-16	1SAZ721201R1047		0.130
16.0 ... 20.0	63.0 A, fuse type gG	10	TF42-20	1SAZ721201R1049		0.145
20.0 ... 24.0	63.0 A, fuse type gG	10	TF42-24	1SAZ721201R1051		0.145
24.0 ... 29.0	63.0 A, fuse type gG	10	TF42-29	1SAZ721201R1052		0.145
29.0 ... 35.0	80.0 A, fuse type gG	10	TF42-35	1SAZ721201R1053		0.145
35.0 ... 38.0/40.0	80.0 A, fuse type gG	10	TF42-38	1SAZ721201R1055		0.145

Ordering details accessories

Suitable for	Description	Type	Order code		Weight (1 pc) kg
TF42	Single mounting kit	DB42	1SAZ701902R0001		0.087
TF42	Reset push button*	KPR-101L	1SFA616162R1014		0.027

*Note: for more information see cataloge 1SFC151004C0201

Main dimensions mm, *inches*



TF42

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TF42 thermal overload relays
Technical data

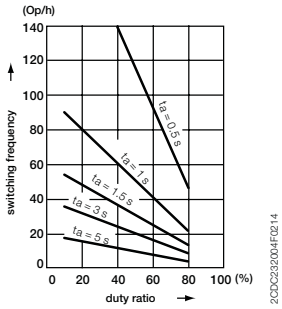
Main circuit – Utilization characteristics according to IEC/EN

Type	TF42
Standards	IEC/EN 60947–4–1, IEC/EN 60947-5-1, IEC/EN 60947-1
Rated operational voltage U_e	690 V AC
Rated frequency	50/60 Hz
Trip class	10
Number of poles	3
Duty time	100 %
Operating frequency without early tripping	Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC

Auxiliary circuit according to IEC/EN

Type		TF42
Rated operational voltage U_e		600 V
Conventional free air thermal current I_{th}	N.C., 95-96	6 A
	N.O., 97-98	4 A
Rated frequency		DC, 50/60 Hz
Number of poles		1 N.O. + 1 N.C.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category		
110-120 V	N.C., 95-96	3.00 A
	N.O., 97-98	0.75 A
220-230-240 V	N.C., 95-96	3.00 A
	N.O., 97-98	0.75 A
440 V	N.C., 95-96	0.75 A
	N.O., 97-98	0.75 A
480-500 V	N.C., 95-96	0.75 A
	N.O., 97-98	0.75 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category		
24 V	N.C., 95-96	1.25 A
	N.O., 97-98	1.25 A
110-120-125 V	N.C., 95-96	0.55 A
	N.O., 97-98	0.55 A
250 V	N.C., 95-96	0.27 A
	N.O., 97-98	0.27 A
Minimum switching capacity		17 V / 3 mA
Short-circuit protective device	N.C., 95-96	6 A, fuse type gG
	N.O., 97-98	4 A, fuse type gG
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V

Technical diagram – Intermittent periodic duty



t_a: Motor starting time

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2CDC106046C0201

TF42 thermal overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type		TF42
Standards		UL 508, CSA 22.2 No. 14
Maximum operational voltage		600 V AC
Trip rating		125 % of FLA
Full load amps (FLA)		See table "Full load amps and short-circuit protective device"
Short-circuit rating RMS symmetrical		See table "Full load amps and short-circuit protective device"
Short-circuit protective device		See table "Full load amps and short-circuit protective device"

Auxiliary circuit according to UL/CSA

Type		TF42
Contact rating	N.C., 95-96	B600, Q300
	N.O., 97-98	D300, Q300
Conventional thermal current	N.C., 95-96	5 A
	N.O., 97-98	2.5 A

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device			
		480 / 600 V AC		480 / 600 V AC	
		Short circuit rating RMS symmetrical	Fuse type	Short circuit rating RMS symmetrical	Fuse type
TF42-0.13	0.13 A	18 kA	1 A, K5	100 kA	30 A, Class J
TF42-0.17	0.17 A	18 kA	1 A, K5	100 kA	30 A, Class J
TF42-0.23	0.23 A	18 kA	1 A, K5	100 kA	30 A, Class J
TF42-0.31	0.31 A	18 kA	3 A, K5	100 kA	30 A, Class J
TF42-0.41	0.41 A	18 kA	3 A, K5	100 kA	30 A, Class J
TF42-0.55	0.55 A	18 kA	3 A, K5	100 kA	30 A, Class J
TF42-0.74	0.74 A	18 kA	3 A, K5	100 kA	30 A, Class J
TF42-1.0	1.00 A	18 kA	6 A, K5	100 kA	30 A, Class J
TF42-1.3	1.30 A	18 kA	6 A, K5	100 kA	30 A, Class J
TF42-1.7	1.70 A	18 kA	6 A, K5	100 kA	30 A, Class J
TF42-2.3	2.30 A	18 kA	10 A, K5	100 kA	30 A, Class J
TF42-3.1	3.10 A	18 kA	10 A, K5	100 kA	30 A, Class J
TF42-4.2	4.20 A	18 kA	15 A, K5	100 kA	30 A, Class J
TF42-5.7	5.70 A	18 kA	20 A, K5	100 kA	30 A, Class J
TF42-7.6	7.60 A	18 kA	25 A, K5	100 kA	30 A, Class J
TF42-10	10.0 A	18 kA	35 A, K5	100 kA	45 A, Class J
TF42-13	13.0 A	18 kA	40 A, K5	100 kA	45 A, Class J
TF42-16	16.0 A	18 kA	60 A, K5	100 kA	45 A, Class J
TF42-20	20.0 A	18 kA	80 A, K5	100 kA	60 A, Class J
TF42-24	24.0 A	18 kA	80 A, K5	100 kA	60 A, Class J
TF42-29	29.0 A	18 kA	100 A, K5	100 kA	100 A, Class J
TF42-35	35.0 A	18 kA	150 A, K5	100 kA	175 A, Class J
TF42-38	38.0 A	18 kA	150 A, K5	100 kA	175 A, Class J

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TF42 thermal overload relays
Technical data

General technical data

Type		TF42
Pollution degree		3
Phase loss sensitive		Yes
Ambient air temperature		
Operation	Open - compensated	-25 ... +60 °C
	Open	-25 ... +60 °C
Storage		-50 ... +80 °C
Ambient air temperature compensation		Acc. to IEC/EN60947-4-1
Maximum operating altitude permissible		2000 m
Resistance to shock acc. to IEC 60068-2-27		25g / 11 ms
Resistance to vibrations acc. to IEC 60068-2-6		3g / 3 ... 150 Hz
Mounting position		Position 1-5
Mounting		Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit on DIN rail (35 mm)
Degree of protection	Housing	IP20
	Main circuit terminals	IP10

Electrical connection

Main circuit

Type			TF42 (TF42-0.13 ... TF42-16)	TF42 (TF42-20 ... TF42-38)
Connecting capacity				
	Rigid	**1 x or 2 x**	0.75 ... 4 mm²	1.5 ... 2.5 mm² or 2.5 ... 10 mm² [1]
	Flexible with insulated ferrule	**1 x or 2 x**	0.75 ... 4 mm²	2.5 ... 4 mm² or 4 ... 6 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 18-10	AWG 14-6
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 18-10	AWG 14-6
Stripping length			12 mm	
Tightening torque			1.5 - 2.5 Nm / 13 ... 22 lb.in	2.5 - 2.7 Nm / 22 lb.in
Recommended screw driver			M4 (Pozidriv 2)	

[1] Only connect two different "conductor/wire" cross-sections, if they are within the indicated ranges

Auxiliary circuit

Type			TF42
Connecting capacity			
	Rigid	**1 x or 2 x**	0.75 ... 4 mm²
	Flexible with ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible with insulated ferrule	**1 x**	0.75 ... 2.5 mm²
		2 x	0.75 ... 1.5 mm²
	Flexible	**1 x or 2 x**	0.75 ... 1 mm² or 1 ... 2.5 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 18-12
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 18-12
Stripping length			9 mm
Tightening torque			1.1 ... 1.5 Nm / 9 ... 13 lb.in
Recommended screw driver			M3 (Pozidriv 2)

2CDC106046C0201

TF65 thermal overload relays
22.0 to 67.0 A

TF65

KPR-101L

7

Description

The TF65 thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

- Manual or automatic reset selectable
- Phase loss sensitive acc. to IEC/EN 60947-4-1
- TEST and STOP function – Trip indication on the front
- Temperature compensation
- Suitable for three- and single-phase applications

Ordering details

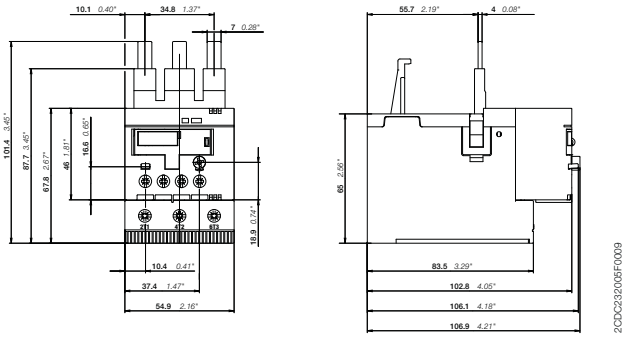
Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pc) kg
22.0 ... 28.0	80 A, gG Type Fuses	10	TF65-28	1SAZ811201R1001		0.456
25.0 ... 33.0	80 A, gG Type Fuses	10	TF65-33	1SAZ811201R1002		0.456
30.0 ... 40.0	100 A, gG Type Fuses	10	TF65-40	1SAZ811201R1003		0.456
36.0 ... 47.0	125 A, gG Type Fuses	10	TF65-47	1SAZ811201R1004		0.456
44.0 ... 53.0	125 A, gG Type Fuses	10	TF65-53	1SAZ811201R1005		0.456
50.0 ... 60.0	125 A, gG Type Fuses	10	TF65-60	1SAZ811201R1006		0.466
57.0 ... 67.0	160 A, gG Type Fuses	10	TF65-67	1SAZ811201R1007		0.466

Ordering details accessories

Suitable for	Description	Type	Order code		Weight (1 pc) kg
TF65	Reset push button*	KPR-101L	1SFA616162R1014		0.027

*Note: for more information see cataloge 1SFC151004C0201

Main dimensions mm, *inches*



TF65

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TF65 thermal overload relays
Technical data

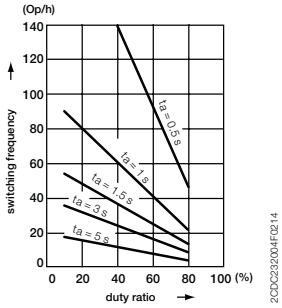
Main circuit – Utilization characteristics according to IEC/EN

Type	TF65
Standards	IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1
Rated operational voltage U_e	690 V AC
Rated frequency	50/60 Hz
Trip class	10
Number of poles	3
Duty time	100 %
Operating frequency without early tripping	Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"
Rated impulse withstand voltage U_{imp}	8 kV
Rated insulation voltage U_i	690 V

Auxiliary circuit according to IEC/EN

Type		TF65
Rated operational voltage U_e		600 V
Conventional free air thermal current I_{th}	N.C., 95-96	6 A
	N.O., 97-98	4 A
Rated frequency		DC, 50/60 Hz
Number of poles		1 N.O. + 1 N.C.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category		
110-120 V	N.C., 95-96	3.00 A
	N.O., 97-98	0.75 A
220-230-240 V	N.C., 95-96	3.00 A
	N.O., 97-98	0.75 A
440 V	N.C., 95-96	0.75 A
	N.O., 97-98	0.75 A
480-500 V	N.C., 95-96	0.75 A
	N.O., 97-98	0.75 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category		
24 V	N.C., 95-96	1.25 A
	N.O., 97-98	1.25 A
110-120-125 V	N.C., 95-96	0.55 A
	N.O., 97-98	0.55 A
250 V	N.C., 95-96	0.27 A
	N.O., 97-98	0.27 A
Minimum switching capacity		17 V / 3 mA
Short-circuit protective device	N.C., 95-96	6 A, gG Type Fuses
	N.O., 97-98	4 A, gG Type Fuses
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V

Technical diagram – Intermittent periodic duty



t_a: Motor starting time

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2CDC106063C0201

TF65 thermal overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type		TF65
Standards		UL 60947-1, UL 60947-4-1
Maximum operational voltage		600 V AC
Trip rating		125 % of FLA
Full load amps (FLA)		See table "Full load amps and short-circuit protective device"
Short-circuit rating RMS symmetrical		See table "Full load amps and short-circuit protective device"
Short-circuit protective device		See table "Full load amps and short-circuit protective device"

Auxiliary circuit according to UL/CSA

Type		TF65
Contact rating	N.C., 95-96	B600, Q600
	N.O., 97-98	D300, Q600
Conventional thermal current	N.C., 95-96	6 A
	N.O., 97-98	4 A

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device			
		480 / 600 V AC		480 / 600 V AC	
		Short circuit rating RMS symmetrical	Fuse type	Short circuit rating RMS symmetrical	Fuse type
TF65-28	28 A	5 kA	100 A, K5 / RK5	18 kA	110 A, Class J
TF65-33	33 A	5 kA	100 A, K5 / RK5	18 kA	110 A, Class J
TF65-40	40 A	5 kA	100 A, K5 / RK5	18 kA	110 A, Class J
TF65-47	47 A	5 kA	125 A, K5 / RK5	18 kA	125 A, Class J
TF65-53	53 A	10 kA	125 A, K5 / RK5	18 kA	125 A, Class J
TF65-60	60 A	10 kA	150 A, K5 / RK5	18 kA	150 A, Class J
TF65-67	67 A	10 kA	150 A, K5 / RK5	18 kA	150 A, Class J

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TF65 thermal overload relays
Technical data

General technical data

Type		TF65
Pollution degree		3
Phase loss sensitive		Yes
Ambient air temperature		
Operation	Open - compensated	-25 ... +60 °C
	Open	-25 ... +60 °C
Storage		-50 ... +80 °C
Ambient air temperature compensation		Acc. to IEC/EN 60947-4-1
Maximum operating altitude permissible		2000 m
Resistance to shock acc. to IEC 60068-2-27		25g / 11 ms
Resistance to vibrations acc. to IEC 60068-2-6		5g / 3 ... 150 Hz
Mounting position		Position 1
Mounting		Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit on DIN rail (35 mm)
Degree of protection	Housing	IP20
	Main circuit terminals	IP10

Electrical connection

Main circuit

Type			TF65
Connecting capacity			
	Rigid	**1 x or 2 x**	2.5 ... 16 mm²
		1 x	2.5 ... 35 mm²
	Flexible with ferrule	**1 x or 2 x**	2.5 ... 10 mm²
		1 x	2.5 ... 35 mm²
	Flexible with insulated ferrule	**1 x or 2 x**	2.5 ... 4 mm²
		1 x	2.5 ... 35 mm²
	Flexible	**1 x or 2 x**	2.5 ... 16 mm²
		1 x	2.5 ... 35 mm²
	Stranded acc. to UL/CSA	**1 x**	AWG 12 ... 2
		2 x	AWG 12 ... 6
	Flexible acc. to UL/CSA	**1 x**	AWG 12 ... 2
		2 x	AWG 12 ... 6
Stripping length			17 mm
Tightening torque			4.0 - 4.5 Nm / 35 ... 40 lb.in
Recommended screw driver			M6 (Pozidriv 2)

[1] Only connect two different "conductor/wire" cross-sections, if they are within the indicated ranges

Auxiliary circuit

Type			TF65
Connecting capacity			
	Rigid	**1 x or 2 x**	0.75 ... 4 mm²
	Flexible with ferrule	**1 x or 2 x**	0.75 ... 4 mm²
	Flexible with insulated ferrule	**1 x**	0.75 ... 2.5 mm²
		2 x	0.75 ... 1.5 mm²
	Flexible	**1 x or 2 x**	0.75 ... 1 mm² or 1 ... 2.5 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 18 ... 12
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 18 ... 12
Stripping length			9 mm
Tightening torque			1.1 ... 1.5 Nm / 9 ... 13 lb.in
Recommended screw driver			M3 (Pozidriv 2)

2CDC106063C0201

TF96 thermal overload relays
40.0 to 96.0 A

TF96

KPR-101L

7

Description

The TF96 thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

- Manual or automatic reset selectable
- Phase loss sensitive acc. to IEC/EN 60947-4-1
- TEST and STOP function – Trip indication on the front
- Temperature compensation
- Suitable for three- and single-phase applications

Ordering details

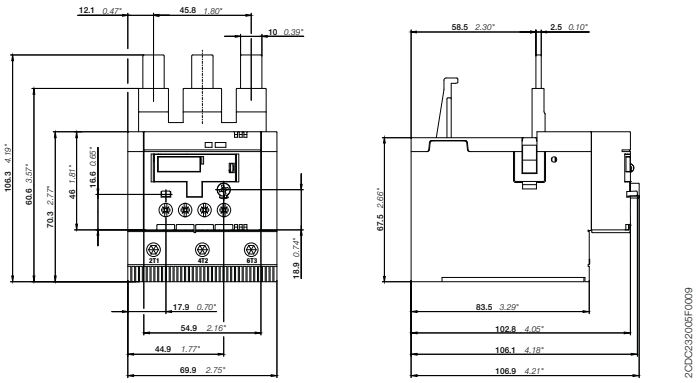
Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pc) kg
40.0 ... 51.0	125 A, gG Type Fuses	10	TF96-51	1SAZ911201R1001		0.620
48.0 ... 60.0	160 A, gG Type Fuses	10	TF96-60	1SAZ911201R1002		0.620
57.0 ... 68.0	160 A, gG Type Fuses	10	TF96-68	1SAZ911201R1003		0.620
65.0 ... 78.0	200 A, gG Type Fuses	10	TF96-78	1SAZ911201R1004		0.620
75.0 ... 87.0	200 A, gG Type Fuses	10	TF96-87	1SAZ911201R1005		0.620
84.0 ... 96.0	250 A, gG Type Fuses	10	TF96-96	1SAZ911201R1006		0.630

Ordering details accessories

Suitable for	Description	Type	Order code		Weight (1 pc) kg
TF96	Reset push button*	KPR-101L	1SFA616162R1014		0.027

*Note: for more information see cataloge 1SFC151004C0201

Main dimensions mm, *inches*



TF96

2CDC106064C0201

TF96 thermal overload relays
Technical data

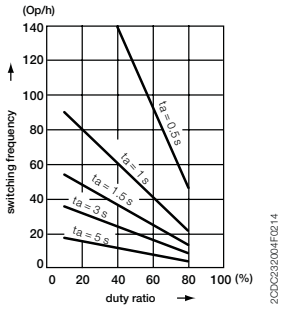
Main circuit – Utilization characteristics according to IEC/EN

Type	TF96
Standards	IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1
Rated operational voltage U_e	690 V AC
Rated frequency	50/60 Hz
Trip class	10
Number of poles	3
Duty time	100 %
Operating frequency without early tripping	Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"
Rated impulse withstand voltage U_{imp}	8 kV
Rated insulation voltage U_i	690 V

Auxiliary circuit according to IEC/EN

Type		TF96
Rated operational voltage U_e		600 V
Conventional free air thermal current I_{th}	N.C., 95-96	6 A
	N.O., 97-98	4 A
Rated frequency		DC, 50/60 Hz
Number of poles		1 N.O. + 1 N.C.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category		
110-120 V	N.C., 95-96	3.00 A
	N.O., 97-98	0.75 A
220-230-240 V	N.C., 95-96	3.00 A
	N.O., 97-98	0.75 A
440 V	N.C., 95-96	0.75 A
	N.O., 97-98	0.75 A
480-500 V	N.C., 95-96	0.75 A
	N.O., 97-98	0.75 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category		
24 V	N.C., 95-96	1.25 A
	N.O., 97-98	1.25 A
110-120-125 V	N.C., 95-96	0.55 A
	N.O., 97-98	0.55 A
250 V	N.C., 95-96	0.27 A
	N.O., 97-98	0.27 A
Minimum switching capacity		17 V / 3 mA
Short-circuit protective device	N.C., 95-96	6 A, fuse type gG
	N.O., 97-98	4 A, fuse type gG
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V

Technical diagram – Intermittent periodic duty



t_a: Motor starting time

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2CDC106064C0201

TF96 thermal overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	TF96
Standards	UL 60947-1, UL 60947-4-1
Maximum operational voltage	600 V AC
Trip rating	125 % of FLA
Full load amps (FLA)	See table "Full load amps and short-circuit protective device"
Short-circuit rating RMS symmetrical	See table "Full load amps and short-circuit protective device"
Short-circuit protective device	See table "Full load amps and short-circuit protective device"

Auxiliary circuit according to UL/CSA

Type		TF96
Contact rating	N.C., 95-96	B600, Q600
	N.O., 97-98	D300, Q600
Conventional thermal current	N.C., 95-96	6 A
	N.O., 97-98	4 A

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device			
		480 / 600 V AC		480 / 600 V AC	
		Short circuit rating RMS symmetrical	Fuse type	Short circuit rating RMS symmetrical	Fuse type
TF96-51	51 A	5 kA	150 A, K5 / RK5	18 kA	125 A, Class J
TF96-60	60 A	10 kA	150 A, K5 / RK5	18 kA	150 A, Class J
TF96-68	68 A	10 kA	150 A, K5 / RK5	18 kA	150 A, Class J
TF96-78	78 A	10 kA	175 A, K5 / RK5	18 kA	175 A, Class J
TF96-87	87 A	10 kA	200 A, K5 / RK5	18 kA	200 A, Class J
TF96-96	96 A	10 kA	250 A, K5 / RK5	18 kA	200 A, Class J

2CDC106064C0201

TF96 thermal overload relays
Technical data

General technical data

Type		TF96
Pollution degree		3
Phase loss sensitive		Yes
Ambient air temperature		
Operation	Open - compensated	-25 ... +60 °C
	Open	-25 ... +60 °C
Storage		-50 ... +80 °C
Ambient air temperature compensation		Acc. to IEC/EN60947-4-1
Maximum operating altitude permissible		2000 m
Resistance to shock acc. to IEC 60068-2-27		25g / 11 ms
Resistance to vibrations acc. to IEC 60068-2-6		5g / 3 ... 150 Hz
Mounting position		Position 1
Mounting		Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit on DIN rail (35 mm)
Degree of protection	Housing	IP20
	Main circuit terminals	IP10

Electrical connection

Main circuit

Type			TF96
Connecting capacity			
	Rigid	**1 x or 2 x**	6 ... 35 mm²
		1 x	6 ... 50 mm²
	Flexible with ferrule	**1 x or 2 x**	6 ... 35 mm²
		1 x	6 ... 50 mm²
	Flexible with insulated ferrule	**1 x or 2 x**	6 ... 16 mm²
		1 x	6 ... 50 mm²
	Flexible	**1 x or 2 x**	6 ... 35 mm²
		1 x	6 ... 50 mm²
	Stranded acc. to UL/CSA	**1 x**	AWG 8 ... 1
		2 x	AWG 8 ... 3
	Flexible acc. to UL/CSA	**1 x**	AWG 8 ... 1
		2 x	AWG 8 ... 3
Stripping length			22 mm
Tightening torque			6.5 - 9 Nm / 57 ... 80 lb.in
Recommended screw driver			M8 (Hexagon)

[1] Only connect two different "conductor/wire" cross-sections, if they are within the indicated ranges

Auxiliary circuit

Type			TF96
Connecting capacity			
	Rigid	**1 x or 2 x**	0.75 ... 4 mm²
	Flexible with ferrule	**1 x or 2 x**	0.75 ... 4 mm²
	Flexible with insulated ferrule	**1 x**	0.75 ... 2.5 mm²
		2 x	0.75 ... 1.5 mm²
	Flexible	**1 x or 2 x**	0.75 ... 1 mm² or 1 ... 2.5 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 18 ...12
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 18 ... 12
Stripping length			9 mm
Tightening torque			1.1 ... 1.5 Nm / 9 ... 13 lb.in
Recommended screw driver			M3 (Pozidriv 2)

2CDC106064C0201

TF140DU thermal overload relays
66 to 142 A

2CDC231012F0012

TF140DU

1SFC151224F0002

KPR-101L

Description

The TF140DU thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10A.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

- Manual or automatic reset selectable
- Phase loss sensitive acc. to IEC/EN 60947-4-1
- TEST and STOP function – Trip indication on the front
- Temperature compensation
- Suitable for three- and single-phase applications

Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pc) kg
66 ... 90	200 A, fuse type gG	10A	TF140DU-90	1SAZ431201R1001		0.820
80 ... 110	224 A, fuse type gG	10A	TF140DU-110	1SAZ431201R1002		0.820
100 ... 135	224 A, fuse type gG	10A	TF140DU-135	1SAZ431201R1003		0.820
110 ... 142	250 A, fuse type gG	10A	TF140DU-142	1SAZ431201R1004		0.820

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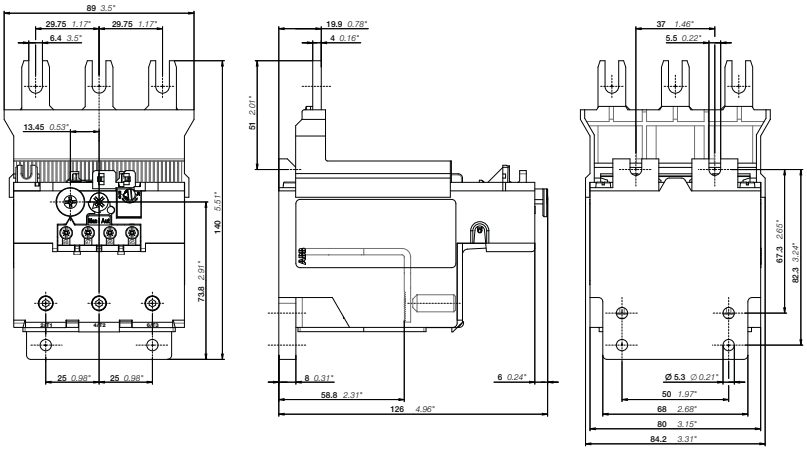
Ordering details accessories

Suitable for	Description	Type	Order code		Weight (1 pc) kg
TF140DU	Reset push button*	KPR-101L	1SFA616162R1014		0.027

*Note: for more information see cataloge 1SFC151004C0201

Main dimensions mm, *inches*



2CDC232008F0012

TF140DU

2CDC106054C0201

TF140DU thermal overload relays
Technical data

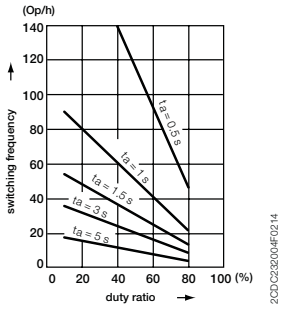
Main circuit – Utilization characteristics according to IEC/EN

Type	TF140DU
Standards	IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1
Rated operational voltage U_e	690 V AC
Rated frequency	DC, 50/60 Hz
Frequency range	0 ... 400 Hz
Trip class	10A
Number of poles	3
Duty time	100 %
Operating frequency without early tripping	Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"
Rated impulse withstand voltage U_{imp}	8 kV
Rated insulation voltage U_i	690 V

Auxiliary circuit according to IEC/EN

Type		TF140DU
Rated operational voltage U_e		500 V AC, 440 V DC
Conventional free air thermal current I_{th}	N.C., 95-96	10 A
	N.O., 97-98	6 A
Rated frequency		DC, 50/60 Hz
Number of poles		1 N.O. + 1 N.C.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category		
110-120 V	N.C., 95-96	3.00 A
	N.O., 97-98	1.50 A
220-230-240 V	N.C., 95-96	1.50 A
	N.O., 97-98	1.50 A
440 V	N.C., 95-96	1.00 A
	N.O., 97-98	1.00 A
480-500 V	N.C., 95-96	1.00 A
	N.O., 97-98	1.00 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category		
24 V	N.C., 95-96	1.25 A
	N.O., 97-98	1.25 A
60 V	N.C., 95-96	0.25 A
	N.O., 97-98	0.25 A
110-120-125 V	N.C., 95-96	0.25 A
	N.O., 97-98	0.25 A
250 V	N.C., 95-96	0.12 A
	N.O., 97-98	0.04 A
Minimum switching capacity		17 V / 3 mA
Short-circuit protective device	N.C., 95-96	10 A, fuse type gG
	N.O., 97-98	6 A, fuse type gG
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V

Technical diagram – Intermittent periodic duty



t_a: Motor starting time

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2CDC106054C0201

TF140DU thermal overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type		TF140DU
Standards		UL 508, CSA 22.2 No. 14, UL 60947-4-1A
Maximum operational voltage		600 V AC
Trip rating		125 % of FLA
Full load amps (FLA)		See table "Full load amps and short-circuit protective device"
Short-circuit rating RMS symmetrical		See table "Full load amps and short-circuit protective device"
Short-circuit protective device		See table "Full load amps and short-circuit protective device"

Auxiliary circuit according to UL/CSA

Type		TF140DU
Contact rating	N.C., 95-96	B600
	N.O., 97-98	C300
Conventional thermal current	N.C./N.O.	10 A / 6 A

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device					
		480 / 600 V AC		480 / 600 V AC		480 / 600 V AC	
		Short circuit rating RMS symmetrical	Fuse type	Short circuit rating RMS symmetrical	Fuse type	Short circuit rating RMS symmetrical	Listed circuit breaker
TF140DU-90	90 A	10 kA	250 A, K5 / RK5	100 kA	250 A, Class J	100 kA	250 A
TF140DU-110	110 A	10 kA	250 A, K5 / RK5	100 kA	250 A, Class J	100 kA	250 A
TF140DU-135	135 A	10 kA	250 A, K5 / RK5	100 kA	250 A, Class J	100 kA	250 A
TF140DU-142	142 A	10 kA	250 A, K5 / RK5	100 kA	250 A, Class J	100 kA	250 A

2CDC106054C0201

TF140DU thermal overload relays
Technical data

General technical data

Type		TF140DU
Pollution degree		3
Phase loss sensitive		Yes
Ambient air temperature		
Operation	Open - compensated	-25 ... +55 °C
	Open	-25 ... +55 °C
Storage		-40 ... +70 °C
Ambient air temperature compensation		Acc. to IEC/EN 60947-4-1
Maximum operating altitude permissible		2000 m
Resistance to shock acc. to IEC 60068-2-27		12g / 11 ms
Mounting position		Position 1-5
Mounting		Mount on the contactor and tighten the screws of the main circuit terminals
Degree of protection	Housing	IP20
	Main circuit terminals	IP00

Electrical connection

Main circuit

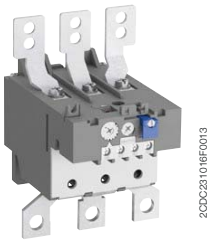
Type			TF140DU
Connecting capacity			
	Rigid	**1 x**	16 ... 70 mm²
		2 x	-
	Flexible	**1 x**	16 ... 70 mm²
		2 x	-
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 6-2/0
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 6-2/0
Stripping length			25 mm
Tightening torque			8 ... 10 Nm / 77 ... 88 lb.in
Recommended screw driver			M8 (Hexagon)

Auxiliary circuit

Type			TF140DU
Connecting capacity			
	Rigid	**1 x or 2 x**	0.75 ... 4 mm²
	Flexible with ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible with insulated ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible	**1 x or 2 x**	0.75 ... 2.5 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 18-14
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 18-14
Stripping length			9 mm
Tightening torque			0.8 ... 1.3 Nm / 12 lb.in
Recommended screw driver			M3.5 (Pozidriv 2)

2CDC106054C0201

TA200DU thermal overload relays
66 to 200 A



TA200DU

KPR-101L

Description

The TA200DU thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10A.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

- Manual or automatic reset selectable
- Phase loss sensitive acc. to IEC/EN 60947-4-1
- TEST and STOP function – Trip indication on the front
- Temperature compensation
- Suitable for three- and single-phase applications

Ordering details

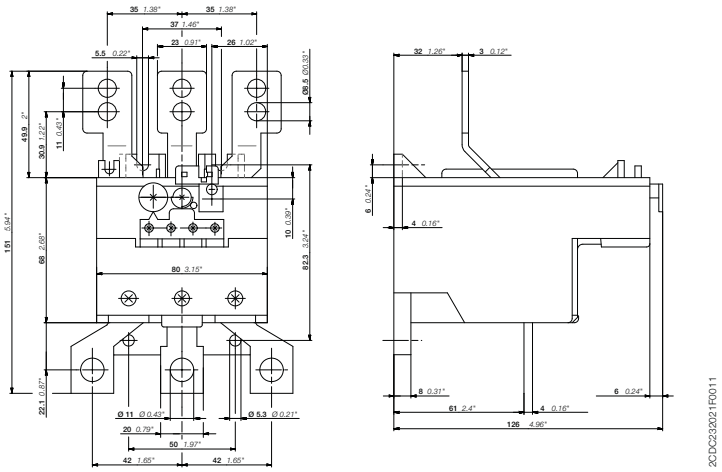
Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pc) kg
66 ... 90	200 A, fuse type gG / 125 A aM	10A	TA200DU-90	1SAZ421201R1001		0.755
80 ... 110	224 A, fuse type gG / 160 A aM	10A	TA200DU-110	1SAZ421201R1002		0.760
100 ... 135	224 A, fuse type gG / 200 A aM	10A	TA200DU-135	1SAZ421201R1003		0.760
110 ... 150	250 A, fuse type gG / 200 A aM	10A	TA200DU-150	1SAZ421201R1004		0.760
130 ... 175	315 A, fuse type gG / 250 A aM	10A	TA200DU-175	1SAZ421201R1005		0.770
150 ... 200	315 A, fuse type gG / 250 A aM	10A	TA200DU-200	1SAZ421201R1006		0.785

Ordering details accessories

Suitable for	Description	Type	Order code		Weight (1 pc) kg
TA200DU	Terminal shroud	LT200/A	1SAZ401901R1001		0.090
TA200DU	Single mounting kit	DB200	1SAZ401110R0001		0.225
TA200DU	Reset push button*	KPR-101L	1SFA616162R1014		0.027

*Note: for more information see cataloge 1SFC151004C0201

Main dimensions mm, *inches*



TA200DU

2CDC108038C0201

TA200DU thermal overload relays
Technical data

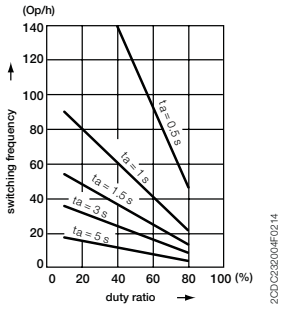
Main circuit – Utilization characteristics according to IEC/EN

Type	TA200DU
Standards	IEC/EN 60947-1, IEC/EN 60947-4-1
Rated operational voltage U_e	690 V AC
Rated frequency	DC, 50/60 Hz
Frequency range	0 ... 400 Hz
Trip class	10A
Number of poles	3
Duty time	100 %
Operating frequency without early tripping	Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"
Rated impulse withstand voltage U_{imp}	6 kV
Rated insulation voltage U_i	690 V AC

Auxiliary circuit according to IEC/EN

Type		TA200DU
Rated operational voltage U_e		500 V AC, 440 V DC
Conventional free air thermal current I_{th}	N.C., 95-96	10 A
	N.O., 97-98	6 A
Rated frequency		DC, 50/60 Hz
Number of poles		1 N.O. + 1 N.C.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category		
110-120 V	N.C., 95-96	3.00 A
	N.O., 97-98	1.50 A
220-230-240 V	N.C., 95-96	3.00 A
	N.O., 97-98	1.50 A
440 V	N.C., 95-96	1.00 A
	N.O., 97-98	1.00 A
480-500 V	N.C., 95-96	1.00 A
	N.O., 97-98	1.00 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category		
24 V	N.C., 95-96	1.25 A
	N.O., 97-98	1.25 A
60 V	N.C., 95-96	0.25 A
	N.O., 97-98	0.25 A
110-120-125 V	N.C., 95-96	0.25 A
	N.O., 97-98	0.25 A
250 V	N.C., 95-96	0.12 A
	N.O., 97-98	0.04 A
Minimum switching capacity		17 V / 3 mA
Short-circuit protective device	N.C., 95-96	10 A, fuse type gG
	N.O., 97-98	6 A, fuse type gG
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V

Technical diagram – Intermittent periodic duty



t_a: Motor starting time

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2CDC106038C0201

TA200DU thermal overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type		TA200DU
Standards		UL 508, CSA 22.2 No. 14
Maximum operational voltage		600 V AC
Trip rating		125 % of FLA
Full load amps (FLA)		See table "Full load amps and short-circuit protective device"
Short-circuit rating RMS symmetrical		See table "Full load amps and short-circuit protective device"
Short-circuit protective device		See table "Full load amps and short-circuit protective device"

Auxiliary circuit according to UL/CSA

Type		TA200DU
Contact rating	N.C., 95-96	C600
	N.O., 97-98	B600
Conventional thermal current		5 A

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device						
		480 / 600 V AC						
		Short circuit rating RMS symmetrical	Fuse type	Listed circuit breaker	Short circuit rating RMS symmetrical	Fuse type	Short circuit rating RMS symmetrical	Listed circuit breaker
TA200DU-90	90 A	10 kA	250 A, K5 / RK5	225 A	100 kA	250 A, Class J	100 kA	250 A
TA200DU-110	110 A	10 kA	250 A, K5 / RK5	225 A	100 kA	250 A, Class J	100 kA	250 A
TA200DU-135	135 A	10 kA	300 A, K5 / RK5	225 A	100 kA	250 A, Class J	100 kA	250 A
TA200DU-150	150 A	10 kA	300 A, K5 / RK5	225 A	100 kA	250 A, Class J	100 kA	250 A
TA200DU-175	175 A	10 kA	300 A, K5 / RK5	225 A	100 kA	300 A, Class J	100 kA	300 A
TA200DU-200	200 A	10 kA	400 A, K5 / RK5	400 A	100 kA	400 A, Class J	100 kA	400 A

2CDC106038C0201

TA200DU thermal overload relays
Technical data

General technical data

Type		TA200DU
Pollution degree		3
Phase loss sensitive		Yes
Ambient air temperature		
Operation	Open - compensated	-25 ... +55 °C
	Open	-25 ... +55 °C
Storage		-40 ... +70 °C
Ambient air temperature compensation		Acc. to IEC/EN60947-4-1
Maximum operating altitude permissible		2000 m
Resistance to shock acc. to IEC 60068-2-27		12g / 15 ms
Mounting position		Position 1-6
Mounting		Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit
Degree of protection	Housing	IP20
	Main circuit terminals	IP00

Electrical connection

Main circuit

Type			TA200DU
Connecting capacity			
	Rigid	**1 x**	25 ... 120 mm²
	Flexible	**1 x**	25 ... 120 mm²
	Stranded acc. to UL/CSA	**1 x**	AWG 4 ... 0000
	Flexible acc. to UL/CSA	**1 x**	AWG 4 ... 0000
	Lugs		L > 10 mm
Tightening torque			25 Nm / 220 lb.in
Recommended screw driver			Open bars

Auxiliary circuit

Type			TA200DU
Connecting capacity			
	Rigid	**1 x or 2 x**	0.75 ... 4 mm²
	Flexible with ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible with insulated ferrule	**1 x or 2 x**	0.75 ... 2.5 mm²
	Flexible	**1 x or 2 x**	0.75 ... 2.5 mm²
	Stranded acc. to UL/CSA	**1 x or 2 x**	AWG 18 ... 14
	Flexible acc. to UL/CSA	**1 x or 2 x**	AWG 18 ... 14
Stripping length			9 mm
Tightening torque			0.8 ... 1.3 Nm / 12 lb.in
Recommended screw driver			M3.5 (Pozidriv 2)

2CDC106038C0201

E16DU electronic overload relays
0.10 to 18.9 A

E16DU-1.0

DB16E

KPR-101L

Description

The E16DU is self-supplied electronic overload relays, which means no extra external supply is needed. It offers reliable protection for motors in the event of overload or phase failure. Easy to use like a thermal overload relay and compatible with standard motor applications, the electronic overload relay is convincing, above all, due to its wide setting range, high accuracy, high operational temperature range and the possibility to select a trip class (10E, 20E, 30E). Further features are the temperature compensation, trip contact (N.C.), signal contact (N.O.), automatic or manual reset selectable, trip-free mechanism, STOP and TEST function and a trip indication. The overload relays are connected directly to the contactors.

Ordering details

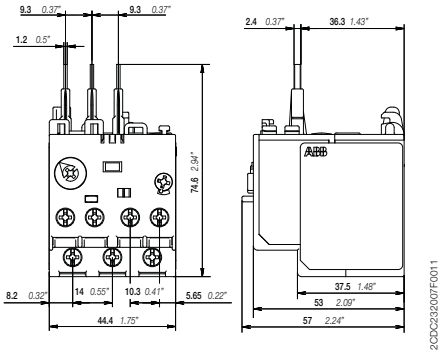
Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pc) kg
E16DU electronic overload relays						
0.10 ... 0.32	1 A, fuse type gG	10E, 20E, 30E	E16DU-0.32	1SAX111001R1101		0.150
0.30 ... 1.00	4 A, fuse type gG	10E, 20E, 30E	E16DU-1.0	1SAX111001R1102		0.150
0.80 ... 2.70	10 A, fuse type gG	10E, 20E, 30E	E16DU-2.7	1SAX111001R1103		0.150
2.00 ... 6.30	20 A, fuse type gG	10E, 20E, 30E	E16DU-6.3	1SAX111001R1104		0.150
5.70 ... 18.9	50 A, fuse type gG	10E, 20E, 30E	E16DU-18.9	1SAX111001R1105		0.150

Ordering details accessories

Suitable for	Description	Type	Order code		Weight (1 pc) kg
E16DU	Single mounting kit	DB16E	1SAX101110R0001		0.035
E16DU	Reset push button*	KPR-101L	1SFA616162R1014		0.019

*Note: for more information see cataloge 1SFC151004C0201

Main dimensions mm, *inches*



E16DU

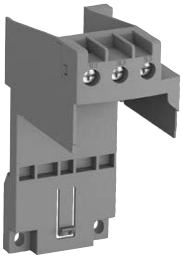
EF19, EF45 electronic overload relays
0.10 to 45.0 A

1SBC101147F0010

EF19-18.9

1SBC101148F0010

EF45-30


2CDC231024V0013

DB19EF

2CDC231002V0014

DB45EF

1SFC151224F0002

KPR-101L

Description

The EF19 and EF45 are self-supplied electronic overload relays, which means no extra external supply is needed. It offers reliable protection for motors in the event of overload or phase failure. Easy to use like a thermal overload relay and compatible with standard motor applications, the electronic overload relay is convincing, above all, due to its wide setting range, high accuracy, high operational temperature range and the possibility to select a trip class (10E, 20E, 30E). Further features are the temperature compensation, trip contact (N.C.), signal contact (N.O.), automatic or manual reset selectable, trip-free mechanism, STOP and TEST function and a trip indication. The overload relays are connected directly to the contactors.

Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pc) kg
EF19 electronic overload relays						
0.10 ... 0.32	1 A, fuse type gG	10E, 20E, 30E	EF19-0.32	1SAX121001R1101		0.158
0.30 ... 1.00	4 A, fuse type gG	10E, 20E, 30E	EF19-1.0	1SAX121001R1102		0.158
0.80 ... 2.70	10 A, fuse type gG	10E, 20E, 30E	EF19-2.7	1SAX121001R1103		0.158
1.90 ... 6.30	20 A, fuse type gG	10E, 20E, 30E	EF19-6.3	1SAX121001R1104		0.158
5.70 ... 18.9	50 A, fuse type gG	10E, 20E, 30E	EF19-18.9	1SAX121001R1105		0.158
EF45 electronic overload relays						
9.00 ... 30.0	160 A, fuse type gG	10E, 20E, 30E	EF45-30	1SAX221001R1101		0.362
15.0 ... 45.0	160 A, fuse type gG	10E, 20E, 30E	EF45-45	1SAX221001R1102		0.362

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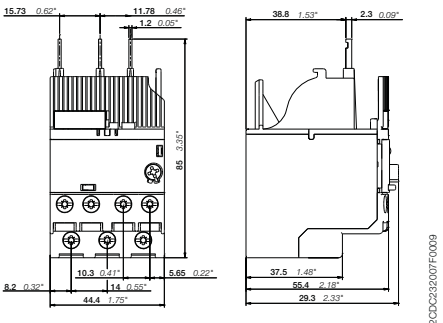
Ordering details accessories

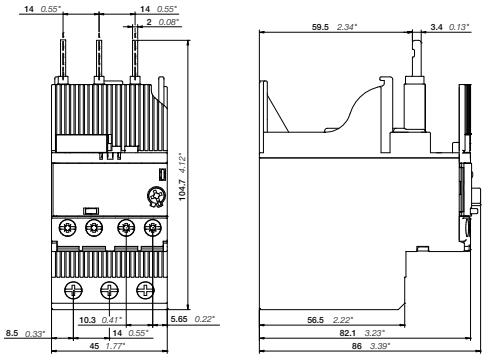
Suitable for	Description	Type	Order code		Weight (1 pc) kg
EF19	Single mounting kit	DB19EF	1SAX101910R1001		0.046
EF45	Single mounting kit	DB45EF	1SAX201910R0001		0.100
EF19, EF45	Reset push button*	KPR-101L	1SFA616162R1014		0.019

*Note: for more information see cataloge 1SFC151004C0201

Main dimensions mm, *inches*



EF19



EF45

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2CDC232008F0009

2CDC107093C0201

E16DU, EF19, EF45 electronic overload relays
Technical data

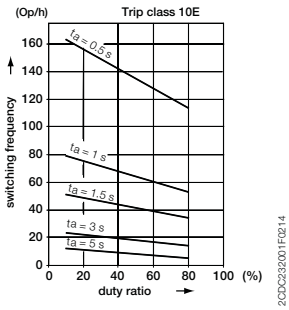
Main circuit – Utilization characteristics according to IEC/EN

Type	E16DU	EF19	EF45
Standards	IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1		
Rated operational voltage U_e	690 V AC		
Rated frequency	50/60 Hz – not suitable for DC applications		
Trip class	10E, 20E, 30E, selectable		
Number of poles	3		
Duty time	100 %		
Operating frequency without early tripping	Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"		
Rated impulse withstand voltage U_{imp}	6 kV		
Rated insulation voltage U_i	690 V AC		

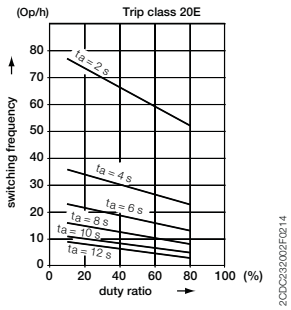
Auxiliary circuit according to IEC/EN

Type		E16DU	EF19	EF45
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		1 N.C. + 1 N.O.		
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category				
110-120 V	50/60 Hz	3.00 A		
220-230-240 V	50/60 Hz	3.00 A		
440 V	50/60 Hz	1.10 A		
480-500 V	50/60 Hz	0.75 A		
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category				
24 V		1.50 A		
60 V		0.55 A		
110-120-125 V		0.55 A		
250 V		0.27 A		
Minimum switching capacity		12 V / 3 mA		
Short-circuit protective devices		6 A, fuse type gG		
Rated impulse withstand voltage U_{imp}		6 kV		
Rated insulation voltage U_i		690 V		

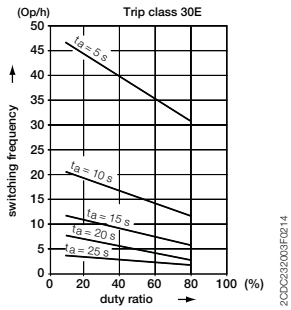
Technical diagram – Intermittent periodic duty



Trip class 10E



Trip class 20E



Trip class 30E

E16DU, EF19, EF45 electronic overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type		E16DU	EF19	EF45
Standards		UL 508, CSA 22.2 No. 14		
Maximum operational voltage		600 V AC		
Trip rating		125 % of FLA		
Full load amps (FLA)		See table "Full load amps and short-circuit protective device"		
Short-circuit rating RMS symmetrical		See table "Full load amps and short-circuit protective device"		
Short-circuit protective device		See table "Full load amps and short-circuit protective device"		

Auxiliary circuit according to UL/CSA

Type		E16DU	EF19	EF45
Contact rating	N.C., 95-96	B600, Q300	B600, Q600	
	N.O., 97-98	B600, Q300	B600, Q600	
Conventional free-air thermal current		6 A		

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device					
		480 V AC		600 V AC			
		SCCR	Fuse type	SCCR	Fuse type	SCCR	Fuse type
E16DU-0.32	0.32 A	50 kA	2 A, Class J	5 kA	2 A, K5 / RK5	100 kA	2 A, Class J
E16DU-1.0	1.00 A	50 kA	2 A, K5 / RK5	5 kA	2 A, K5 / RK5	100 kA	2 A, Class J
E16DU-2.7	2.70 A	50 kA	4 A, K5 / RK5	5 kA	4 A, K5 / RK5	100 kA	4 A, Class J
E16DU-6.3	6.30 A	50 kA	15 A, K5 / RK5	5 kA	15 A, K5 / RK5	100 kA	15 A, Class J
E16DU-18.9	18.90 A	50 kA	30 A, K5 / RK5	5 kA	30 A, K5 / RK5	100 kA	30 A, Class J

Type	Full load amps (FLA)	Short-circuit protective device					
		480 V AC		600 V AC			
		SCCR	Fuse type	SCCR	Fuse type	SCCR	Fuse type
EF19-0.32	0.32 A	50 kA	2 A, Class J	5 kA	2 A, K5 / RK5	100 kA	2 A, Class J
EF19-1.0	1.00 A	50 kA	2 A, K5 / RK5	5 kA	2 A, K5 / RK5	100 kA	2 A, Class J
EF19-2.7	2.70 A	50 kA	4 A, K5 / RK5	5 kA	4 A, K5 / RK5	100 kA	4 A, Class J
EF19-6.3	6.30 A	50 kA	15 A, K5 / RK5	5 kA	15 A, K5 / RK5	100 kA	15 A, Class J
EF19-18.9	18.90 A	50 kA	30 A, K5 / RK5	5 kA	30 A, K5 / RK5	100 kA	30 A, Class J

Type	Full load amps (FLA)	Short-circuit protective device					
		480 V AC		600 V AC			
		SCCR	Fuse type	SCCR	Fuse type	SCCR	Fuse type
EF45-30	30 kA	18 kA	150 A, K5 / RK5	18 kA	150 A, K5 / RK5	100 kA	150 A, Class J
EF45-45	45 kA	18 kA	200 A, K5 / RK5	18 kA	200 A, K5 / RK5	100 kA	200 A, Class J

2CDC107093C0201

E16DU, EF19, EF45 electronic overload relays
Technical data

General data

Type		E16DU	EF19	EF45
Pollution degree		3		
Phase loss sensitive		Yes		
Ambient air temperature				
Operation	Open - compensated	-25 ... +70 °C		
Storage		-50 ... +85 °C		
Ambient air temperature compensation		Acc. to IEC/EN60947-4-1		
Maximum operating altitude permissible		2000 m		
Resistance to shock acc. to IEC 60068-2-27		15g / 11 ms pulse	25g / 11 ms pulse	
Resistance to vibrations acc. to IEC 60068-2-6		5g / 3 ... 150 Hz	3g / 3 ... 150 Hz	
Mounting position		Position 1-6		
Mounting		Mount on the contactor and tighten the screws of the main circuit terminals		
Degree of protection	Housing	IP20		
	Main circuit terminals	IP20		

Electrical connection

Main circuit

Type			E16DU	EF19	EF45
Connecting capacity					
	Rigid	1 or 2 x	1 ... 4 mm²	1 ... 4 mm²	2.5 ... 16 mm²
	Flexible with insulated ferrule	1 or 2 x	0.75 ... 2.5 mm²	0.75 ... 2.5 mm²	2.5 ... 10 mm²
	Stranded acc. to UL/CSA	1 or 2 x	AWG 16-10	AWG 16-10	AWG 14-6
	Flexible acc. to UL/CSA	1 or 2 x	AWG 16-10	AWG 16-10	AWG 14-6
Stripping length			9 mm	9 mm	13 mm
Tightening torque			0.8 ... 1.5 Nm / 7 ... 13 lb.in	0.8 ... 1.5 Nm / 7 ... 13 lb.in	2.3 ... 2.6 Nm / 20 ... 22 lb.in
Recommended screw driver			M3.5 (Pozidriv 2)	M3.5 (Pozidriv 2)	M3.5 (Pozidriv 2)

Auxiliary circuit

Type			E16DU	EF19	EF45
Connecting capacity					
	Rigid	1 or 2 x	1 ... 4 mm²	1 ... 4 mm²	1 ... 4 mm²
	Flexible with ferrule	1 or 2 x	0.75 ... 2.5 mm²	0.75 ... 2.5 mm²	0.75 ... 2.5 mm²
	Flexible with insulated ferrule	1 or 2 x	0.75 ... 2.5 mm²	0.75 ... 2.5 mm²	0.75 ... 2.5 mm²
	Flexible	1 or 2 x	0.75 ... 2.5 mm²	0.75 ... 2.5 mm²	0.75 ... 2.5 mm²
	Stranded acc. to UL/CSA	1 or 2 x	AWG 16-10	AWG 18-10	AWG 18-10
	Flexible acc. to UL/CSA	1 or 2 x	AWG 16-10	AWG 18-10	AWG 18-10
Stripping length			9 mm	9 mm	9 mm
Tightening torque			0.8 ... 1.2 Nm / 7 ... 11 lb.in	0.8 ... 1.2 Nm / 7 ... 11 lb.in	0.8 ... 1.2 Nm / 7 ... 11 lb.in
Recommended screw driver			M3 (Pozidriv 2)	M3 (Pozidriv 2)	M3 (Pozidriv 2)

2CDC107073C0201

EF65, EF96, EF146 electronic overload relays
20 to 150 A

2CDC231001F0012

EF65-70

2CDC231002F0012

EF96-100

2CDC231003F0012

EF146-150

1SFC151224F0002

KPR-101L

Description

The EF65, EF96 and EF146 are self-supplied electronic overload relays, which means no extra external supply is needed. It offers reliable protection for motors in the event of overload or phase failure. Easy to use like a thermal overload relay and compatible with standard motor applications, the electronic overload relay is convincing, above all, due to its wide setting range, high accuracy, high operational temperature range and the possibility to select a trip class (10E, 20E, 30E). Further features are the temperature compensation, trip contact (N.C.), signal contact (N.O.), automatic or manual reset selectable, trip-free mechanism, STOP and TEST function and a trip indication. The overload relays are connected directly to the contactors.

Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pc) kg
20 ... 56	160 A, fuse type gG	10E, 20E, 30E	EF65-56	1SAX331001R1102		0.821
25 ... 70	160 A, fuse type gG	10E, 20E, 30E	EF65-70	1SAX331001R1101		0.821
36 ... 100	200 A, fuse type gG	10E, 20E, 30E	EF96-100	1SAX341001R1101		0.802
54 ... 150	315 A, fuse type gG	10E, 20E, 30E	EF146-150	1SAX351001R1101		0.879

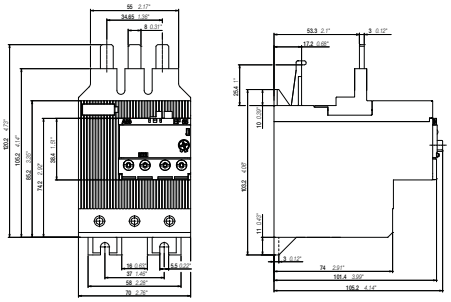
Ordering details accessories

Suitable for	Description	Type	Order code		Weight (1 pc) kg
EF65, EF96, EF146	Reset push button*	KPR-101L	1SFA616162R1014		0.019

*Note: for more information see cataloge 1SFC151004C0201

7

Main dimensions mm, *inches*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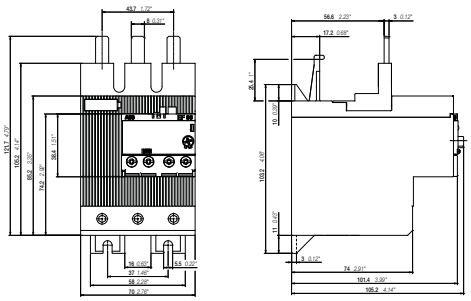
EF65-56 / EF65-70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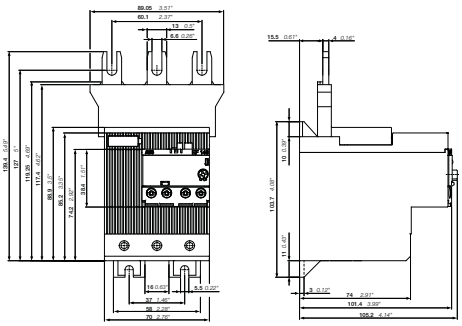
EF96-100


2CDC232003F0012

EF146-150

2CDC107038C0201

EF65, EF96, EF146 electronic overload relays
Technical data

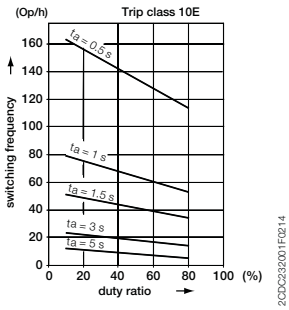
Main circuit – Utilization characteristics according to IEC/EN

Type	EF65, EF96, EF146
Standards	IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1
Rated operational voltage U_e	1000 V AC
Rated frequency	50/60 Hz – not suitable for DC applications
Trip class	10E, 20E, 30E, selectable
Number of poles	3
Duty time	100 %
Operating frequency without early tripping	Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"
Rated impulse withstand voltage U_{imp}	8 kV
Rated insulation voltage U_i	1000 V

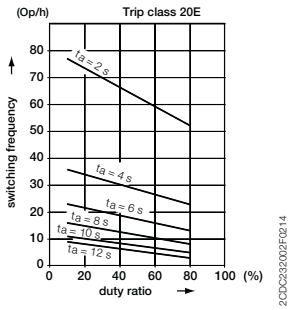
Auxiliary circuit according to IEC/EN

Type		EF65, EF96, EF146
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		1 N.C. + 1 N.O.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category		
110-120 V	50/60 Hz	3.00 A
220-230-240 V	50/60 Hz	3.00 A
400 V	50/60 Hz	1.10 A
480-500 V	50/60 Hz	0.75 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category		
24 V		1.50 A
60 V		0.55 A
110-120-125 V		0.55 A
250 V		0.27 A
Minimum switching capacity		12 V / 3 mA
Short-circuit protective device		6 A, fuse type gG
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V

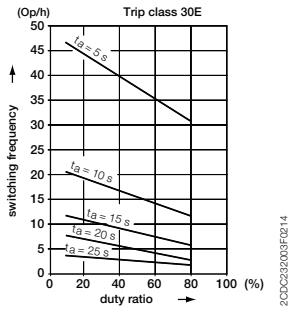
Technical diagram – Intermittent periodic duty



Trip class 10E



Trip class 20E



Trip class 30E

EF65, EF96, EF146 electronic overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	EF65, EF96, EF146
Standards	UL 508, CSA 22.2 No. 14, UL 60947-4-1A
Maximum operational voltage	600 V AC
Trip rating	125 % of FLA
Full load amps (FLA)	See table "Full load amps and short-circuit protective device"
Short-circuit rating RMS symmetrical	See table "Full load amps and short-circuit protective device"
Short-circuit protective device	See table "Full load amps and short-circuit protective device"

Auxiliary circuit according to UL/CSA

Type		EF65, EF96, EF146
Contact rating	N.C., 95-96	B600, Q600
	N.O., 97-98	B600, Q600
Conventional thermal current		6 A

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device					
		480 V AC		600 V AC			
		SCCR	Fuse type	SCCR	Fuse type	SCCR	Fuse type
EF65-56	56 A	10 kA	150 A, R5/RK5	10kA	150 A, R5/RK5	100 kA	175 A, J
EF65-70	70 A	10 kA	150 A, R5/RK5	10kA	150 A, R5/RK5	100 kA	175 A, J
EF96-100	100 A	10 kA	200 A, R5/RK5	10kA	200 A, R5/RK5	100 kA	225 A, J
EF146-150	150 A	10 kA	250 A, R5/RK5	10kA	250 A, R5/RK5	100 kA	350 A, J

2CDC107098C0201

EF65, EF96, EF146 electronic overload relays
Technical data

General data

Type		EF65, EF96, EF146
Pollution degree		3
Phase loss sensitive		Yes
Ambient air temperature		
Operation	Open - compensated	-25 ... +70 °C
Storage		-50 ... +85 °C
Ambient air temperature compensation		Acc. to IEC/EN 60947-4-1
Maximum operating altitude permissible		2000 m
Resistance to shock acc. to IEC 60068-2-27		15g / 11 ms
Resistance to vibrations acc. to IEC 60068-2-6		5g / 3 ... 150 Hz
Mounting position		Position 1-6
Mounting		Mount on the contactor and tighten the screws of the main circuit terminals
Degree of protection	Housing	IP20
	Main circuit terminals	IP10

Electrical connection

Main circuit

Type			EF65	EF96	EF146
Connecting capacity					
	Rigid	**1 x**	4 ... 35 mm²	6 ... 70 mm²	10 ... 95 mm²
		2 x	4 ... 35 mm²	6 ... 35 mm²	10 ... 35 mm²
	Flexible	**1 x**	4 ... 35 mm²	6 ... 50 mm²	10 ... 70 mm²
		2 x	4 ... 35 mm²	6 ... 35 mm²	10 ... 35 mm²
	Stranded acc. to UL/CSA	**1 x**	AWG 10-2	AWG 8-2	AWG 6-00
		2 x			AWG 6-2
	Flexible acc. to UL/CSA	**1 x**	AWG 10-2	AWG 8-2	AWG 6-00
		2 x			AWG 6-2
Stripping length			20 mm	20 mm	20 mm
Tightening torque			4 Nm / 35 lb.in	6 Nm / 55 lb.in	8 Nm / 70 lb.in
Recommended screw driver			M8 (Pozidriv 2)	M8 (Hexagon 4)	M8 (Hexagon 4)

Auxiliary circuit

Type			EF65, EF96, EF146
Connecting capacity			
	Rigid	**1 or 2 x**	1 ... 4 mm²
	Flexible with ferrule	**1 or 2 x**	0.75 ... 2.5 mm²
	Flexible with insulated ferrule	**1 or 2 x**	0.75 ... 2.5 mm²
	Flexible	**1 or 2 x**	0.75 ... 2.5 mm²
	Stranded acc. to UL/CSA	**1 or 2 x**	AWG 18-10
	Flexible acc. to UL/CSA	**1 or 2 x**	AWG 18-10
Stripping length			9 mm
Tightening torque			0.8 ... 1.2 Nm / 7 ... 11 lb.in
Recommended screw driver			M3.5 (Pozidriv 2)

2CDC107098C0201

EF205, EF370 electronic overload relays
63 to 380 A

2CDC231004F0012

EF205-210

2CDC231005F0012

EF370-380

1SFC151224F0002

KPR-101L

Description

The EF205 and EF370 are self-supplied electronic overload relays, which means no extra external supply is needed. It offers reliable protection for motors in the event of overload or phase failure. Easy to use like a thermal overload relay and compatible with standard motor applications, the electronic overload relay is convincing, above all, due to its wide setting range, high accuracy, high operational temperature range and the possibility to select a trip class (10E, 20E, 30E). Further features are the temperature compensation, trip contact (N.C.), signal contact (N.O.), automatic or manual reset selectable, trip-free mechanism, STOP and TEST function and a trip indication. The overload relays are connected directly to the contactors.

Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pc) kg
63 ... 210	1250 A, fuse type gG	10E, 20E, 30E	EF205-210	1SAX531001R1101		1.210
115 ... 380	1600 A, fuse type gG	10E, 20E, 30E	EF370-380	1SAX611001R1101		1.430

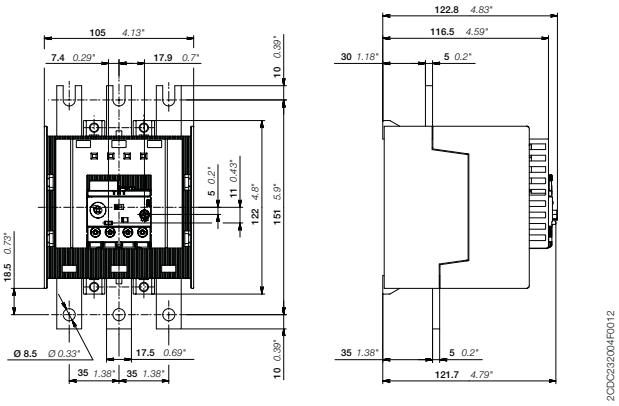
Ordering details accessories

Suitable for	Description	Type	Order code		Weight (1 pc) kg
EF205, EF370	Reset push button*	KPR-101L	1SFA616162R1014		0.027

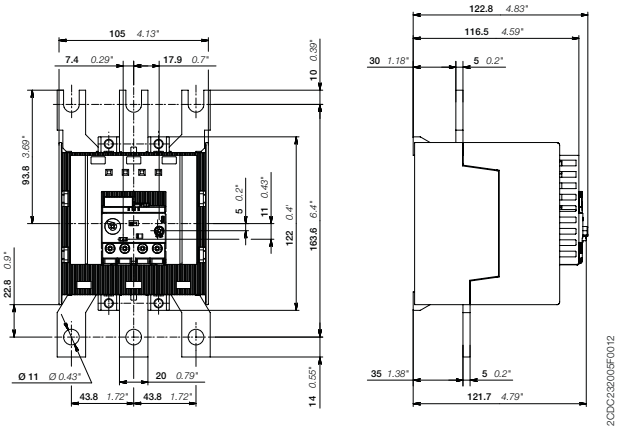
*Note: for more information see cataloge 1SFC151004C0201

7

Main dimensions mm, *inches*



EF205-210



EF370-380

2CDC107040C0201

EF205, EF370 electronic overload relays
Technical data

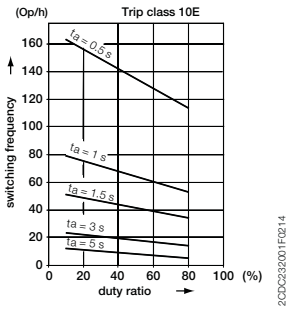
Main circuit – Utilization characteristics according to IEC/EN

Type	EF205, EF370
Standards	IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1
Rated operational voltage U_e	1000 V AC
Rated frequency	50/60 Hz – not suitable for DC applications
Trip class	10E, 20E, 30E, selectable
Number of poles	3
Duty time	100 %
Operating frequency without early tripping	Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"
Rated impulse withstand voltage U_{imp}	8 kV
Rated insulation voltage U_i	1000 V

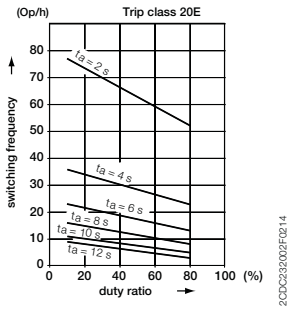
Auxiliary circuit according to IEC/EN

Type		EF205, EF370
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		1 N.C. + 1 N.O.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category		
110-120 V	50/60 Hz	3.00 A
220-230-240 V	50/60 Hz	3.00 A
400 V	50/60 Hz	1.10 A
480-500 V	50/60 Hz	0.75 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category		
24 V		1.50 A
60 V		0.55 A
110-120-125 V		0.55 A
250 V		0.27 A
Minimum switching capacity		12 V / 3 mA
Short-circuit protective device		6 A, fuse type gG
Rated impulse withstand voltage U_{imp}		6 kV
Rated insulation voltage U_i		690 V

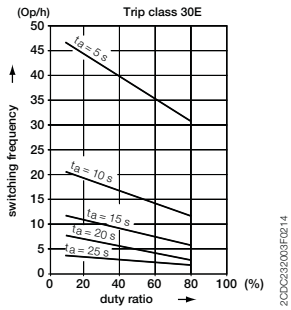
Technical diagram – Intermittent periodic duty



Trip class 10E



Trip class 20E



Trip class 30E

EF205, EF370 electronic overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type		EF205, EF370
Standards		UL 508, CSA 22.2 No. 14, UL 60947-4-1A
Maximum operational voltage		600 V AC
Trip rating		125 % of FLA
Full load amps (FLA)		See table "Full load amps and short-circuit protective device"
Short-circuit rating RMS symmetrical		See table "Full load amps and short-circuit protective device"
Short-circuit protective device		See table "Full load amps and short-circuit protective device"

Auxiliary circuit according to UL/CSA

Type		EF205, EF370
Contact rating	N.C., 95-96	B600, Q600
	N.O., 97-98	B600, Q600
Conventional thermal current		6 A

Full load amps and short-circuit protective device

Type	Full load amps (FLA)	Short-circuit protective device					
		480 V AC		600 V AC			
		SCCR	Fuse type	SCCR	Fuse type	SCCR	Fuse type
EF205-210	210 A	10 kA	400 A, R5/RK5	10kA	400 A, R5/RK5	100 kA	400 A, J
EF370-380	380 A	18 kA	800 A, L/T	18kA	800 A, L/T	-	-

2CDC107040C0201

EF205, EF370 electronic overload relays
Technical data

General data

Type		EF205	EF370
Pollution degree		3	
Phase loss sensitive		Yes	
Ambient air temperature			
Operation	Open - compensated	-25 ... +70 °C	
Storage		-50 ... +85 °C	
Ambient air temperature compensation		Acc. to IEC/EN 60947-4-1	
Maximum operating altitude permissible		2000 m	
Resistance to shock acc. to IEC 60068-2-27		25g / 11 ms	
Resistance to vibrations acc. to IEC 60068-2-6		5g / 3 ... 150 Hz	
Mounting position		Position 1-6	
Mounting		Mount on the contactor and tighten the screws of the main circuit terminals	
Degree of protection	Housing	IP20	
	Main circuit terminals	IP20	

Electrical connection

Main circuit

Type			EF205	EF370
Connecting capacity				
	Rigid	1 x	16 ... 185 mm²	50 ... 240 mm²
		2 x	16 ... 120 mm²	50 ... 150 mm²
	Flexible	1 x	16 ... 185 mm²	50 ... 240 mm²
		2 x	16 ... 120 mm²	50 ... 150 mm²
	Lugs	L ≤	24 mm	32 mm
	Bars	Ø >	8 mm	10 mm
	Stranded acc. to UL/CSA	1 x	AWG 6-0000	AWG 1-500 kcmil
		2 x	AWG 6-0000	AWG 1-500 kcmil
	Flexible acc. to UL/CSA	1 x	AWG 6-0000	AWG 1-500 kcmil
		2 x	AWG 6-0000	AWG 1-500 kcmil
Stripping length			-	-
Tightening torque			18 Nm / 160 lb.in	28 Nm / 247 lb.in
Recommended screw driver			M8	M10

Auxiliary circuit

Type			EF205, EF370
Connecting capacity			
	Rigid	1 or 2 x	1 ... 4 mm²
	Flexible with ferrule	1 or 2 x	0.75 ... 2.5 mm²
	Flexible with insulated ferrule	1 or 2 x	0.75 ... 2.5 mm²
	Flexible	1 or 2 x	0.75 ... 2.5 mm²
	Stranded acc. to UL/CSA	1 or 2 x	AWG 18-10
	Flexible acc. to UL/CSA	1 or 2 x	AWG 18-10
Stripping length			9 mm
Tightening torque			0.8 ... 1.2 Nm / 7 ... 11 lb.in
Recommended screw driver			M3.5 (Pozidriv 2)

2CDC107040C0201

EF460, EF750 electronic overload relays
150 to 800 A

2CDC231013F0013

EF460-500

2CDC231014F0013

EF750-800

1SFC151224F0002

KPR-101L

Description

The EF460 and EF750 are self-supplied electronic overload relays, which means no extra external supply is needed. It offers reliable protection for motors in the event of overload or phase failure. Easy to use like a thermal overload relay and compatible with standard motor applications, the electronic overload relay is convincing, above all, due to its wide setting range, high accuracy, high operational temperature range and the possibility to select a trip class (10E, 20E, 30E). Further features are the temperature compensation, trip contact (N.C.), signal contact (N.O.), automatic or manual reset selectable, trip-free mechanism, STOP and TEST function and a trip indication. Busbar kits are available as accessory for contactor mounting.

Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pc) kg
EF460 electronic overload relay						
150 ... 500	690 V: 630 A, Type gG 1000 V: 1600 A, Type gG	10E, 20E, 30E	EF460-500	1SAX721001R1101		1.170
EF750 electronic overload relay						
250 ... 800	690 V: 800 A, Type gG 1000 V: 1600 A, Type gG	10E, 20E, 30E	EF750-800	1SAX821001R1101		3.905

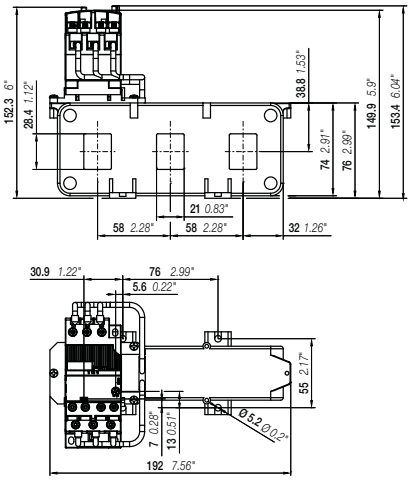
Ordering details accessories

Suitable for	Description	Type	Order code		Weight (1 pc) kg
EF460, EF750	Reset push button*	KPR-101L	1SFA616162R1014		0.027

*Note: for more information see cataloge 1SFC151004C0201

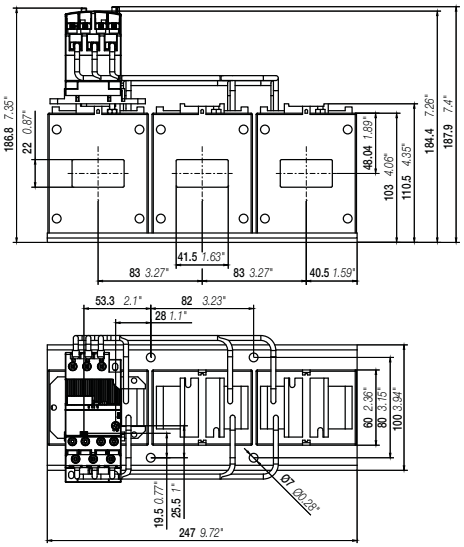
7

Main dimensions mm, *inches*



2CDC232009F0013

EF460-500



2CDC232009F0013

EF750-800

2CDC107045C0201

EF460, EF750 electronic overload relays
Technical data

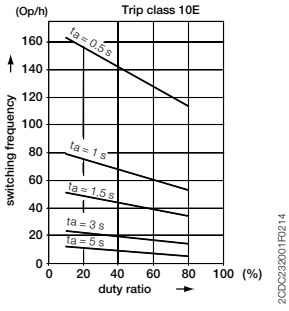
Main circuit – Utilization characteristics according to IEC/EN

Type	EF460	EF750
Standards	IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1	
Rated operational voltage U_e	1000 V AC	
Rated frequency	50/60 Hz – not suitable for DC applications	
Trip class	10E, 20E, 30E, selectable	
Number of poles	3	
Duty time	100 %	
Operating frequency without early tripping	Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"	
Rated impulse withstand voltage U_{imp}	8 kV	
Rated insulation voltage U_i	1000 V AC	

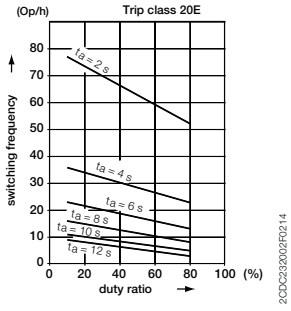
Auxiliary circuit according to IEC/EN

Type		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		1 N.C. + 1 N.O.	
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category			
110-120 V	**50/60 Hz**	3.00 A	
220-230-240 V	**50/60 Hz**	3.00 A	
400 V	**50/60 Hz**	1.10 A	
480-500 V	**50/60 Hz**	0.75 A	
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category			
24 V		1.50 A	
60 V		0.55 A	
110-120-125 V		0.55 A	
250 V		0.27 A	
Minimum switching capacity		12 V / 3 mA	
Short-circuit protective device		6 A, fuse type gG	
Rated impulse withstand voltage U_{imp}		6 kV	
Rated insulation voltage U_i		690 V	

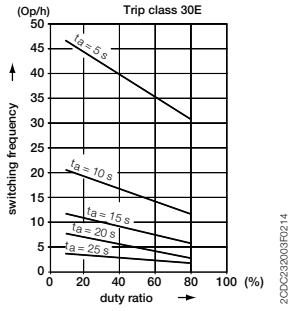
Technical diagram – Intermittent periodic duty



Trip class 10E



Trip class 20E



Trip class 30E

2CDC107045C0201

EF460, EF750 electronic overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	EF460	EF750
Standards	UL60947-1, UL60947-4-1	
Maximum operational voltage	600 V AC	
Trip rating	125 % of FLA	

Auxiliary circuit according to UL/CSA

Type		EF460	EF750
Contact rating	N.C., 95-96	B600, Q300	
	N.O., 97-98	B600, Q300	
Conventional thermal current		5 A	

General data

Type		EF460	EF750
Pollution degree		3	
Phase loss sensitive		Yes	
Ambient air temperature			
Operation	Open - compensated	-25 ... +70 °C	
Storage		-25 ... +70 °C	
Ambient air temperature compensation		Acc. to IEC/EN60947-4-1	
Maximum operating altitude permissible		2000 m	
Resistance to shock acc. to IEC 60068-2-27		25g / 11 ms	
Resistance to vibrations acc. to IEC 60068-2-6		3g / 3 ... 150 Hz	
Degree of protection	Housing	IP20	
	Main circuit terminals	IP00	

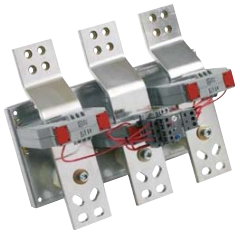
Electrical connection

Auxiliary circuit

Type			EF460	EF750
Connecting capacity				
	Rigid	1 or 2 x	1 ... 4 mm²	
	Flexible with ferrule	1 or 2 x	0.75 ... 2.5 mm²	
	Flexible with insulated ferrule	1 or 2 x	0.75 ... 2.5 mm²	
	Flexible	1 or 2 x	0.75 ... 2.5 mm²	
	Stranded acc. to UL/CSA	1 or 2 x	AWG 18-10	
	Flexible acc. to UL/CSA	1 or 2 x	AWG 18-10	
Stripping length			9 mm	
Tightening torque			0.8 ... 1.2 Nm / 7 ... 11 lb.in	
Recommended screw driver			M3.5 (Pozidriv 2)	

2CDC107045C0201

E1250DU electronic overload relays
375 to 1250 A



1SFC101025F0201

E1250DU-1250

Description

The E1250DU are self-supplied electronic overload relays, which means no extra external supply is needed. It offers reliable protection for motors in the event of overload or phase failure. Easy to use like a thermal overload relay and compatible with standard motor applications, the electronic overload relay is convincing, above all, due to its wide setting range, high accuracy, high operational temperature range and the possibility to select a trip class (10E, 20E, 30E). Further features are the temperature compensation, trip contact (N.C.), signal contact (N.O.), automatic or manual reset selectable, trip-free mechanism, STOP and TEST function and a trip indication. Busbar kits are available as accessory for contactor mounting.

Ordering details

Setting range A	Short-circuit protective device	Trip class	Type	Order code		Weight (1 pc) kg
E1250DU electronic overload relay						
375 ... 1250	-	10E, 20E, 30E	E1250DU-1250	1SFA739001R1000		12.181

7

2CDC107031C0201

E1250DU electronic overload relays
Technical data

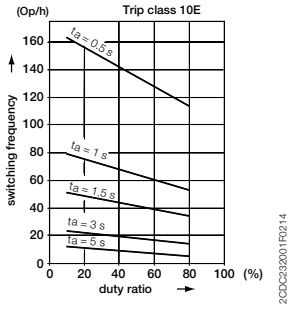
Main circuit – Utilization characteristics according to IEC/EN

Type	E1250DU
Standards	IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1
Rated operational voltage U_e	1000 V AC
Rated frequency	50/60 Hz – not suitable for DC applications
Trip class	10E, 20E, 30E, selectable
Number of poles	3
Duty time	100 %
Operating frequency without early tripping	Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty"
Rated impulse withstand voltage U_{imp}	8 kV
Rated insulation voltage U_i	1000 V AC

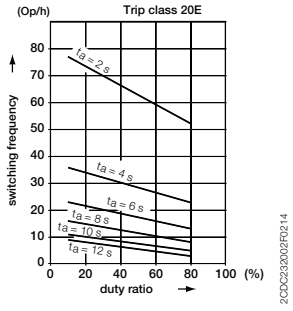
Auxiliary circuit according to IEC/EN

Type		E1250DU
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		1 N.C. + 1 N.O.
I_e / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category		
110-120 V	50/60 Hz	3.00 A
220-230-240 V	50/60 Hz	3.00 A
440 V	50/60 Hz	1.10 A
480-500 V	50/60 Hz	0.72 A
I_e / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category		
24 V		1.50 A
60 V		0.55 A
110-120-125 V		0.55 A
250 V		0.27 A
Minimum switching capacity		12 V / 3 mA
Short-circuit protective device		6 A, fuse type gG
Rated impulse withstand voltage U_{imp}		8 kV
Rated insulation voltage U_i		690 V

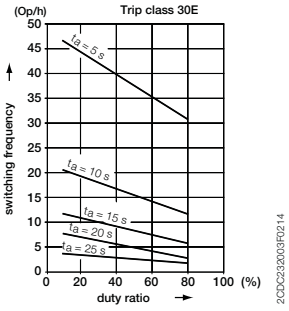
Technical diagram – Intermittent periodic duty



Trip class 10E



Trip class 20E



Trip class 30E

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2CDC107031C0201

E1250DU electronic overload relays
Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type		E1250DU
Standards		UL 508, CSA 22.2 No. 14
Maximum operational voltage		600 V AC
Trip rating		125 % of FLA

Auxiliary circuit according to UL/CSA

Type		E1250DU
Contact rating	N.C., 95-96	B600, Q300
	N.O., 97-98	B600, Q300
Conventional thermal current		5 A

General data

Type			E1250DU
Pollution degree			3
Phase loss sensitive			Yes
Ambient air temperature			
	Operation	Open - compensated	-25 ... +70 °C
	Storage		-50 ... +85 °C
Ambient air temperature compensation			Acc. to IEC/EN60947-4-1
Maximum operating altitude permissible			2000 m
Resistance to shock acc. to IEC 60068-2-27			15g / 11 ms
Resistance to vibrations acc. to IEC 60068-2-6			5g / 3 ... 150 Hz
Degree of protection	Housing		IP20
	Main circuit terminals		IP20

7

Electrical connection

Auxiliary circuit

Type			E1250DU
Connecting capacity			
	Rigid	1 or 2 x	1 ... 4 mm²
	Flexible with ferrule	1 or 2 x	0.75 ... 2.5 mm²
	Flexible with insulated ferrule	1 or 2 x	0.75 ... 2.5 mm²
	Flexible	1 or 2 x	0.75 ... 2.5 mm²
	Stranded acc. to UL/CSA	1 or 2 x	AWG 16-10
	Flexible acc. to UL/CSA	1 or 2 x	AWG 16-10
Stripping length			9 mm
Tightening torque			0.8 ... 1.2 Nm / 7 lb.in
Recommended screw driver			M3.5 (Pozidriv 2)

2CDC107031C0201

Thermal and electronic overload relays
General accessories

WRB-400

WRH-F

Description

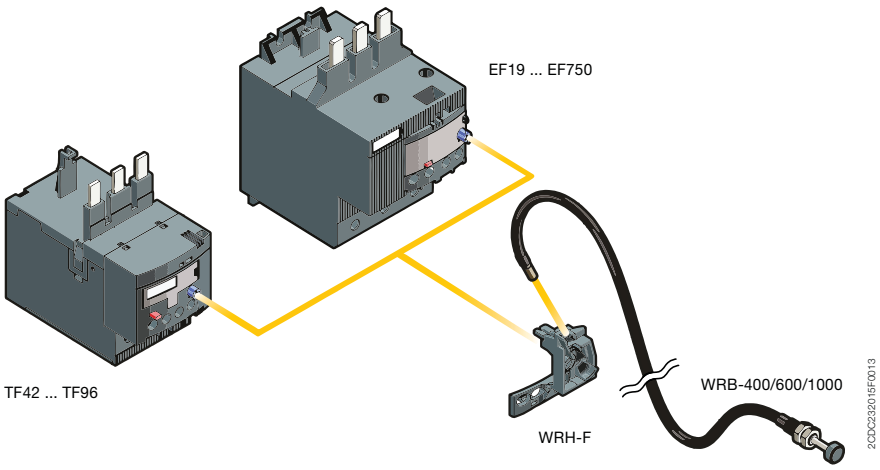
The wire reset is a general accessory for thermal and electronic overloads relays. In installations which are difficult to access, like a motor control centre or compact cubical, the accessory allows the user to remotely reset the overload relays.

The wire reset consists of two parts, the bowden wire with actuator and the holder. The actuator should be mounted into a door of a panel. The holder will be mounted on the overload relay. The actuator and holder are connected via the bowden wire.

Ordering details

Suitable for	Description	Length mm	Type	Order code		Weight (1 pc) kg
Holder						
TF42, TF65, TF96, EF19, EF45, EF65, EF96, EF146, EF205, EF370, EF460, EF750	Holder for tool less direct mounting		WRH-F	1SAZ701903R1001		0.006
Bowden wire with actuator						
WRH-F	Bowden wire with actuator, hole diameter: 7.3 mm, maximum panel thickness: 12 mm	400	WRB-400	1SAZ701903R1011		0.030
		600	WRB-600	1SAZ701903R1012		0.040
		1000	WRB-1000	1SAZ701903R1013		0.060
IP54 gasket						
WRB-400 WRB-600 WRB-1000	IP54 Panel seal gasket		WRBG	1SAZ701903R1030		0.037

Overload relays with accessory wire reset (WRH, WRB)



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