AEG

TECHNICAL GUIDE

B05N ... B45N thermal overload relays and B90NE, B160NE electronic overload relays

B05N ... B45N thermal overload relays and B90NE, B160NE electronic overload relays

Thermal and electronic overload relays provide, in combination with contactors, reliable protection against overloads and phase failures for motors. They allow to set up customized motor starting solutions according to individual needs.

Reliable in extreme conditions

B..N thermal overload relays and B..NE electronic overload relays guarantee reliable operations in hot or cold environments with its temperature compensation.

Efficient operation

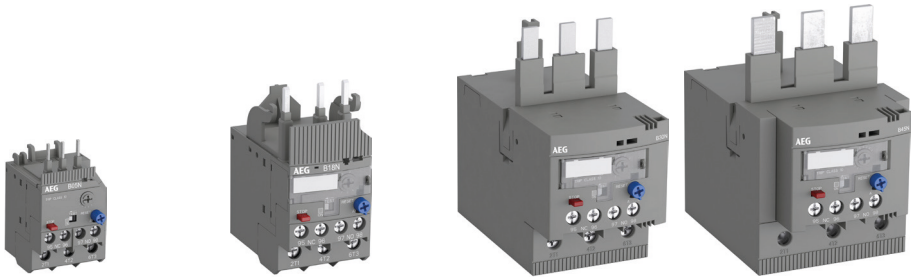
Electronic overload relays combine a high accuracy with an energy efficient design that does not need extra external supply.

Speed up installation

B..N thermal overload relays and B..NE electronic overload relays perfectly match to LS..N contactors allowing an easy and quick starter mounting. For separate mounting, single mounting kits are also available.

Thermal overload relays

Overview



IEC: rated operational power AC-3	400 V	0.06 … 7.5 kW	0.06 … 18.5 kW	11 … 37 kW	18.5 … 45 kW
UL/CSA: 3-phase hp-ratings	480 V	1/2 … 10 hp	1/2 … 25 hp	15 … 50 hp	30 ... 75 hp
Fitting to contactors		LS05K.., LS06K..	LS04N ... LS18N	LS22N, LS30N	LS37N, LS45N
Type		**B05N**	**B18N**	**B30N**	**B45N**
Current range		0,23 … 13 A	0.74 … 38 A	36 … 67 A	65 … 96 A
Trip class		10	10	10	10
Single mounting kit		VST05N	VST18N	VST30N	VST45N
Suitable for 1-phase		yes	yes	yes	yes

Electronic overload relays

Overview

IEC: rated operational power AC-3	400 V	37 … 110 kW	75 … 200 kW
UL/CSA: 3-phase hp-ratings	480 V	50 … 150 hp	100 … 300 hp
Fitting to contactors		LS90N, LS110N	LS132N ... LS200N
Type		**B90NE**	**B160NE**
Current range		63 … 210 A	115 … 380 A
Trip class		10E,20E,30E selectable	10E,20E,30E selectable
Single mounting kit		-	-
Suitable for 1-phase		no	no

B05N thermal overload relays - 0.23 to 13 A

Ordering details

B05N

VST05N

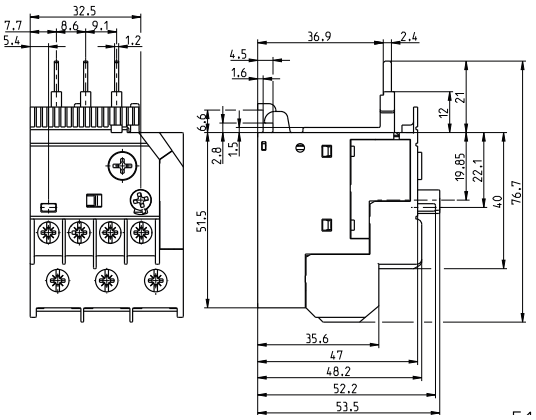
The B05N thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure.
The devices have trip class 10.
The thermal overload relays are three pole relays with bimetal tripping elements. 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

Setting range [A]	Short-circuit protective device	Trip class	Type	Order code	Weight (1 pce) [Kg]
Suitable for all LS05K.. and LS06K.. variants					
0.23 ... 0.31	1.0 A, fuse type T	10	B05N-0.31	4TQE571104R0000	0.100
0.31 ... 0.41	2.0 A, fuse type gG	10	B05N-0.41	4TQE571105R0000	0.100
0.41 ... 0.55	2.0 A, fuse type gG	10	B05N-0.55	4TQE571106R0000	0.100
0.55 ... 0.74	4.0 A, fuse type gG	10	B05N-0.74	4TQE571107R0000	0.100
0.74 ... 1.00	6.0 A, fuse type gG	10	B05N-1.0	4TQE571108R0000	0.100
1.00 ... 1.30	6.0 A, fuse type gG	10	B05N-1.3	4TQE571109R0000	0.100
1.30 ... 1.70	10.0 A, fuse type gG	10	B05N-1.7	4TQE571110R0000	0.100
1.70 ... 2.30	10.0 A, fuse type gG	10	B05N-2.3	4TQE571111R0000	0.100
2.30 ... 3.10	10.0 A, fuse type gG	10	B05N-3.1	4TQE571112R0000	0.100
3.10 ... 4.20	20.0 A, fuse type gG	10	B05N-4.2	4TQE571113R0000	0.100
4.20 ... 5.70	20.0 A, fuse type gG	10	B05N-5.7	4TQE571114R0000	0.100
5.70 ... 7.60	35.0 A, fuse type gG	10	B05N-7.6	4TQE571115R0000	0.100
7.60 ... 10.0	35.0 A, fuse type gG	10	B05N-10	4TQE571116R0000	0.100
10.0 ... 13.0	40.0 A, fuse type gG	10	B05N-13	4TQE571117R0000	0.100

Accessories

Description	Suitable for	Type	Order code	Weight (1 pce) [Kg]
Single mounting kit	B05N	VST05N	4TQE579001R0000	0.032



B05N

Main dimensions mm, inches

AEG

B05N thermal overload relays - 0.23 to 13 A

Technical data

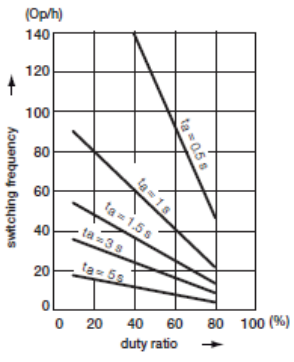
Main circuit – Utilization characteristics according to IEC/EN

Type		B05N
Standards		IEC/EN 60947–4–1, IEC/EN 60947-5-1, IEC/EN 60947-1
Rated operational voltage Ue		690 V AC, - V DC
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 Uimp		6 kV
Rated insulation voltage Ui		690 V AC

Auxiliary circuit according to IEC/EN

Type		B05N
Rated operational voltage Ue		600 V
Conventional free air thermal current Ith	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.
Ie / 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	0.50 A
220-230-240 V	N.C., 95-96	3.00 A
	N.O., 97-98	0.50 A
440 V	N.C., 95-96	0.75 A
	N.O., 97-98	0.50 A
480-500 V	N.C., 95-96	0.75 A
	N.O., 97-98	0.50 A
Ie / 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	0.55 A
	N.O., 97-98	0.55 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 Uimp		6 kV
Rated insulation voltage Ui		690 V

Technical diagram – Intermittent periodic duty



ta: Motor starting time

B05N thermal overload relays - 0.23 to 13 A

Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type		B05N
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		B05N
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
B05N-1.7	1.70 A	18 kA	6 A, K5	100 kA	30 A, Class J
B05N-2.3	2.30 A	18 kA	10 A, K5	100 kA	30 A, Class J
B05N-3.1	3.10 A	18 kA	10 A, K5	100 kA	30 A, Class J
B05N-4.2	4.20 A	18 kA	15 A, K5	100 kA	30 A, Class J
B05N-5.7	5.70 A	18 kA	20 A, K5	100 kA	30 A, Class J
B05N-7.6	7.60 A	18 kA	25 A, K5	100 kA	30 A, Class J
B05N-10	10.0 A	18 kA	35 A, K5	100 kA	45 A, Class J
B05N-13	13.0 A	18 kA	40 A, K5	100 kA	45 A, Class J

B05N thermal overload relays - 0.23 to 13 A

Technical data

General technical data

Type			**B05N**
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			**B05N**
Connecting capacity			
	Rigid	1 x	0.75 ... 4 mm²
		2 x	0.75 ... 1.5 mm² or 1.5 ... 4 mm² (1)
	Flexible	1 x or 2 x	0.75 ... 4 mm²
	Stranded acc. to UL/CSA	1 x or 2 x	AWG 18-10
	Flexible acc. to UL/CSA	1 x or 2 x	AWG 18-10
Stripping length			12 mm
Tightening torque			1.1 ... 1.5 Nm / 9 … 13 lb.in
Recommended screw driver			M4 (Pozidriv 2)
Auxiliary circuit			
Type			**B05N**
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 (1)
	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)

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

B18N thermal overload relays - 0.74 to 38.0 A

Ordering details

B18N

VST18N

The B18N 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.

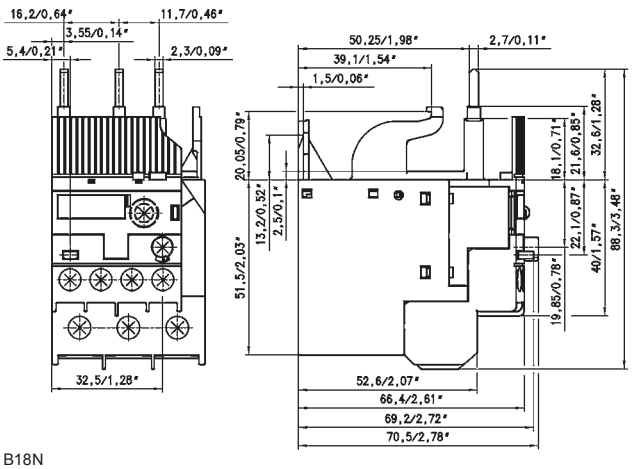
The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release 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

Setting range [A]	Short-circuit protective device	Trip class	Type	Order code	Weight (1 pce) [Kg]
Suitable for LS04N ... LS18N contactors					
0.74 ... 1.00	6.0 A, fuse type gG	10	B18N-1.0	4TQE572108R0000	0.130
1.00 ... 1.30	6.0 A, fuse type gG	10	B18N-1.3	4TQE572109R0000	0.130
1.30 ... 1.70	10.0 A, fuse type gG	10	B18N-1.7	4TQE572110R0000	0.130
1.70 ... 2.30	10.0 A, fuse type gG	10	B18N-2.3	4TQE572111R0000	0.130
2.30 ... 3.10	10.0 A, fuse type gG	10	B18N-3.1	4TQE572112R0000	0.130
3.10 ... 4.20	20.0 A, fuse type gG	10	B18N-4.2	4TQE572113R0000	0.130
4.20 ... 5.70	20.0 A, fuse type gG	10	B18N-5.7	4TQE572114R0000	0.130
5.70 ... 7.60	35.0 A, fuse type gG	10	B18N-7.6	4TQE572115R0000	0.130
7.60 ... 10.0	35.0 A, fuse type gG	10	B18N-10	4TQE572116R0000	0.130
10.0 ... 13.0	40.0 A, fuse type gG	10	B18N-13	4TQE572117R0000	0.130
13.0 ... 16.0	40.0 A, fuse type gG	10	B18N-16	4TQE572118R0000	0.130
16.0 ... 20.0	63.0 A, fuse type gG	10	B18N-20	4TQE572119R0000	0.130
20.0 ... 24.0	63.0 A, fuse type gG	10	B18N-24	4TQE572120R0000	0.145
24.0 ... 29.0	63.0 A, fuse type gG	10	B18N-29	4TQE572121R0000	0.145
29.0 ... 35.0	80.0 A, fuse type gG	10	B18N-35	4TQE572122R0000	0.145
35.0 ... 38.0/40.0	80.0 A, fuse type gG	10	B18N-38	4TQE572113R0000	0.145

Accessories

Description	Suitable for	Type	Order code	Weight (1 pce) [Kg]
Single mounting kit	B18N	VST18N	4TQE579002R0000	0.087



B18N

Main dimensions mm, inches

AEG

B18N thermal overload relays - 0.74 to 38.0 A

Technical data

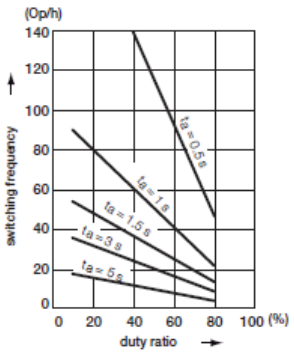
Main circuit – Utilization characteristics according to IEC/EN

Type		B18N
Standards		IEC/EN 60947–4–1, IEC/EN 60947-5-1, IEC/EN 60947-1
Rated operational voltage Ue		690 V AC, 600 V DC
Rated frequency		DC, 50/60 Hz, 400 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 Uimp		6 kV
Rated insulation voltage Ui		690 V AC

Auxiliary circuit according to IEC/EN

Type		B18N
Rated operational voltage Ue		600 V
Conventional free air thermal current Ith	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.
Ie / 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	0.50 A
220-230-240 V	N.C., 95-96	3.00 A
	N.O., 97-98	0.50 A
440 V	N.C., 95-96	0.75 A
	N.O., 97-98	0.50 A
480-500 V	N.C., 95-96	0.75 A
	N.O., 97-98	0.50 A
Ie / 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 Uimp		6 kV
Rated insulation voltage Ui		690 V

Technical diagram – Intermittent periodic duty



ta: Motor starting time

B18N thermal overload relays - 0.74 to 38.0 A

Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	B18N
Standards	UL 508, CSA 22.2 No. 14
Maximum operational voltage	600 V AC / DC
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		B18N
Contact rating	N.C., 95-96	B600, Q600
	N.O., 97-98	D300, Q600
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
B18N-0.74	0.74 A	18 kA	3 A, K5	100 kA	30 A, Class J
B18N-1.0	1.00 A	18 kA	6 A, K5	100 kA	30 A, Class J
B18N-1.3	1.30 A	18 kA	6 A, K5	100 kA	30 A, Class J
B18N-1.7	1.70 A	18 kA	6 A, K5	100 kA	30 A, Class J
B18N-2.3	2.30 A	18 kA	10 A, K5	100 kA	30 A, Class J
B18N-3.1	3.10 A	18 kA	10 A, K5	100 kA	30 A, Class J
B18N-4.2	4.20 A	18 kA	15 A, K5	100 kA	30 A, Class J
B18N-5.7	5.70 A	18 kA	20 A, K5	100 kA	30 A, Class J
B18N-7.6	7.60 A	18 kA	25 A, K5	100 kA	30 A, Class J
B18N-10	10.0 A	18 kA	35 A, K5	100 kA	45 A, Class J
B18N-13	13.0 A	18 kA	40 A, K5	100 kA	45 A, Class J
B18N-16	16.0 A	18 kA	60 A, K5	100 kA	45 A, Class J
B18N-20	20.0 A	18 kA	80 A, K5	100 kA	60 A, Class J
B18N-24	24.0 A	18 kA	80 A, K5	100 kA	60 A, Class J
B18N-29	29.0 A	18 kA	100 A, K5	100 kA	100 A, Class J
B18N-35	35.0 A	18 kA	150 A, K5	100 kA	175 A, Class J
B18N-38	38.0 A	18 kA	150 A, K5	100 kA	175 A, Class J

B18N thermal overload relays - 0.74 to 38.0 A

Technical data

General technical data

Type			**B18N**
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 1-5
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			**B18N (B18N-0.13 … B18N-20)**	**B18N (B18N-24 … B18N-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 (1)
	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)	
Auxiliary circuit				
Type			**B18N**	
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 (1)	
	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 ... 1,2 Nm / 9 ... 11 lb.in	
Recommended screw driver			M3 (Pozidriv 2)	

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

B30N thermal overload relays - 36.0 to 67.0 A

Ordering details

B30N

VST30N

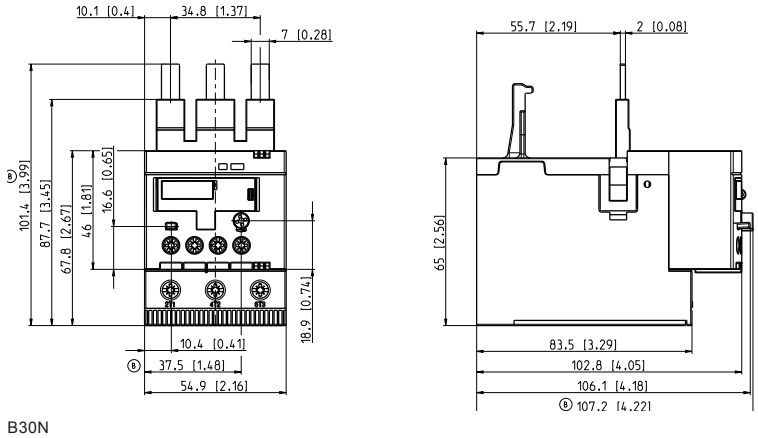
The B30N thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure.
The devices have trip class 10.
The thermal overload relays are three pole relays with bimetal tripping elements. 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

Setting range [A]	Short-circuit protective device	Trip class	Type	Order code	Weight (1 pce) [Kg]
Suitable for LS22N, LS30N contactors					
36.0 ... 47.0	125 A, gG Type Fuses	10	B30N-47	4TQE572204R0000	0.372
44.0 ... 53.0	125 A, gG Type Fuses	10	B30N-53	4TQE572205R0000	0.372
50.0 ... 60.0	125 A, gG Type Fuses	10	B30N-60	4TQE572206R0000	0.382
57.0 ... 67.0	160 A, gG Type Fuses	10	B30N-67	4TQE572207R0000	0.382

Accessories

Description	Suitable for	Type	Order code	Weight (1 pce) [Kg]
Single mounting kit	B30N	VST30N	4TQE579003R0000	0.132



B30N

Main dimensions mm, inches

B30N thermal overload relays - 36.0 to 67.0 A

Technical data

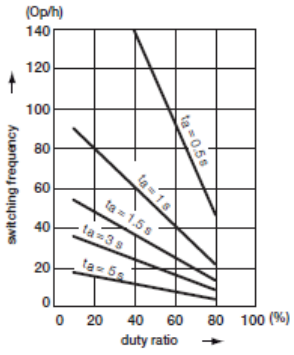
Main circuit – Utilization characteristics according to IEC/EN

Type		B30N
Standards		IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1
Rated operational voltage Ue		690 V AC, 440 V DC
Rated frequency		DC, 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 Uimp		6 kV
Rated insulation voltage Ui		690 V AC

Auxiliary circuit according to IEC/EN

Type		B30N
Rated operational voltage Ue		600 V
Conventional free air thermal current Ith	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.
Ie / 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	0.50 A
220-230-240 V	N.C., 95-96	3.00 A
	N.O., 97-98	0.50 A
440 V	N.C., 95-96	0.75 A
	N.O., 97-98	0.50 A
480-500 V	N.C., 95-96	0.75 A
	N.O., 97-98	0.50 A
Ie / 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		12 V / 3mA
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 Uimp		6 kV
Rated insulation voltage Ui		690 V

Technical diagram – Intermittent periodic duty



ta: Motor starting time

B30N thermal overload relays - 36.0 to 67.0 A

Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	B30N
Standards	UL 60947-1, UL 60947-4-1
Maximum operational voltage	600 V AC / DC
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		B30N
Contact rating	N.C., 95-96	B600, Q600
	N.O., 97-98	D300, Q600
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
B30N-47	47 A	5 kA	125 A, K5 / RK5	100 kA	125 A, Class J
B30N-53	53 A	10 kA	125 A, K5 / RK5	100 kA	125 A, Class J
B30N-60	60 A	10 kA	150 A, K5 / RK5	100 kA	150 A, Class J
B30N-67	67 A	10 kA	150 A, K5 / RK5	100 kA	150 A, Class J

B30N thermal overload relays - 36.0 to 67.0 A

Technical data

General technical data

Type			**B30N**
Pollution degree			3
Phase loss sensitive			Yes
Ambient air temperature			
	Operation	Open - compensated	-40 ... +70 °C
		Open	-40 ... +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 to 6
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			**B30N**
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 ... 10 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)
Auxiliary circuit			
Type			**B30N**
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 ... 1,2 Nm / 9 ... 11 lb.in
Recommended screw driver			M3 (Pozidriv 2)

B45N thermal overload relays - 65.0 to 96.0 A

Ordering details

B45N

VST45N

The B45N thermal overload relays are economic electromechanical protection devices for the main cir-cuit. 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.

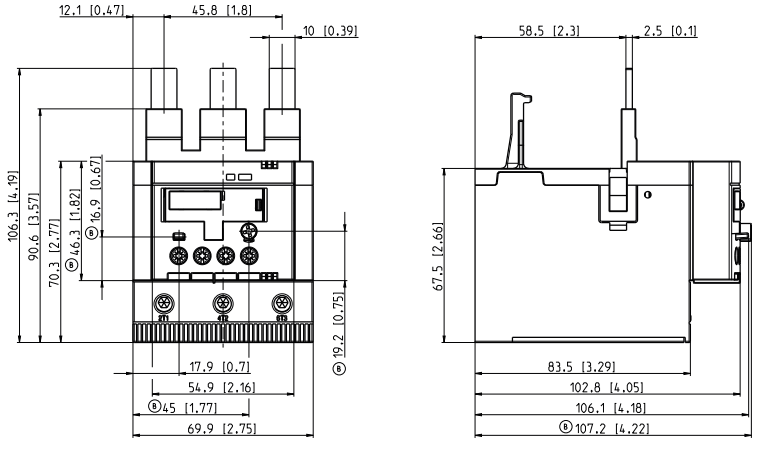
In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a re-lease of the relay and a change of the contacts switching position (95-96 / 97-98).

- 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

Setting range [A]	Short-circuit protective device	Trip class	Type	Order code	Weight (1 pce) [Kg]
Suitable for LS37N, LS45N contactors					
65.0 ... 78.0	200 A, gG Type Fuses	10	B45N-78	4TQE572304R0000	0.520
75.0 ... 87.0	200 A, gG Type Fuses	10	B45N-87	4TQE572305R0000	0.520
84.0 ... 96.0	250 A, gG Type Fuses	10	B45N-96	4TQE572306R0000	0.530

Accessories

Description	Suitable for	Type	Order code	Weight (1 pce) [Kg]
Single mounting kit	B45N	VST45N	4TQE579004R0000	0.190



B45N

Main dimensions mm, inches

B45N thermal overload relays - 65.0 to 96.0 A

Technical data

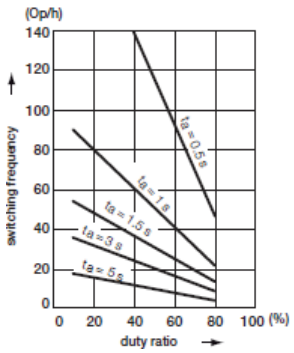
Main circuit – Utilization characteristics according to IEC/EN

Type		B45N
Standards		IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1
Rated operational voltage Ue		690 V AC, 440 V DC
Rated frequency		DC, 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 Uimp		8 kV
Rated insulation voltage Ui		690 V AC

Auxiliary circuit according to IEC/EN

Type		B45N
Rated operational voltage Ue		600 V
Conventional free air thermal current Ith	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.
Ie / 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	0.50 A
220-230-240 V	N.C., 95-96	3.00 A
	N.O., 97-98	0.50 A
440 V	N.C., 95-96	0.75 A
	N.O., 97-98	0.50 A
480-500 V	N.C., 95-96	0.75 A
	N.O., 97-98	0.50 A
Ie / 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		12 V / 3mA
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 Uimp		6 kV
Rated insulation voltage Ui		690 V

Technical diagram – Intermittent periodic duty



B45N thermal overload relays - 65.0 to 96.0 A

Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	B45N
Standards	UL 60947-1, UL 60947-4-1
Maximum operational voltage	600 V AC / DC
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		B45N
Contact rating	N.C., 95-96	B600, Q600
	N.O., 97-98	D300, Q600
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
B45N-78	78 A	10 kA	175 A, K5 / RK5	100 kA	175 A, Class J
B45N-87	87 A	10 kA	200 A, K5 / RK5	100 kA	200 A, Class J
B45N-96	96 A	10 kA	250 A, K5 / RK5	100 kA	200 A, Class J

AEG

B45N thermal overload relays - 65.0 to 96.0 A

Technical data

General technical data

Type			**B45N**
Pollution degree			3
Phase loss sensitive			Yes
Ambient air temperature			
	Operation	Open - compensated	-40 ... +70 °C
		Open	-40 ... +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 to 6
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			**B45N**
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			20 mm
Tightening torque			6 ... 9 Nm / 53 ... 80 lb.in
Recommended screw driver			M8 (Hexagon)

Auxiliary circuit			
Type			**B45N**
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 ... 1,2 Nm / 9 ... 11 lb.in
Recommended screw driver			M3 (Pozidriv 2)

B90NE, B160NE electronic overload relays – 63 to 380 A

Ordering details

B90NE-210

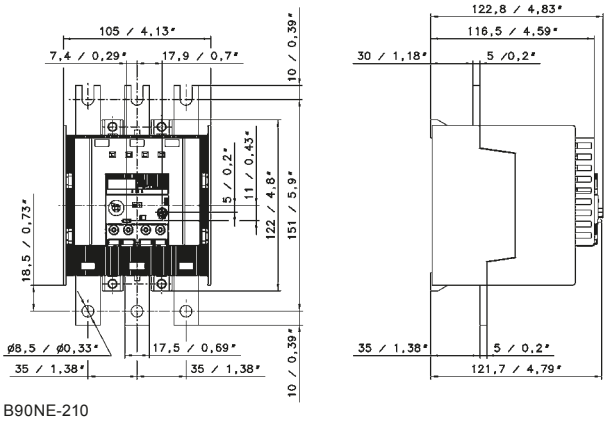
The B90NE and B160NE are self-supplied electronic overload relays, which means no extra external supply is needed. It offers reliable protection for motors in the event of overload or phase failure. Easy to use like a thermal overload relay and compatible with standard motor applications, the electronic 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. The B90NE and B160NE have ATEX and IECEx certification.

B160NE-380

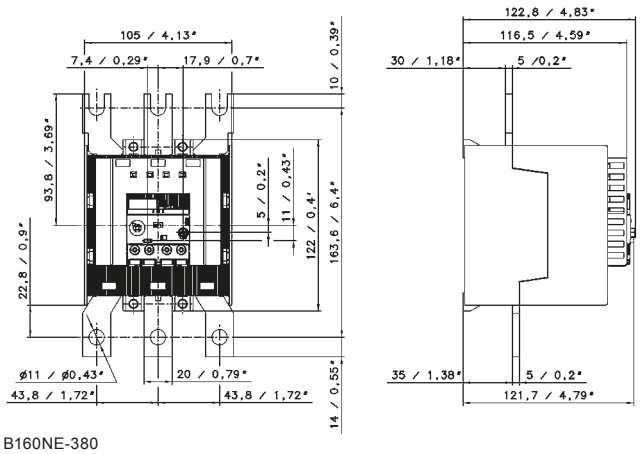
Setting range [A]	Short-circuit protective device	Trip class	Type	Order code	Weight (1 pce) [Kg]
Suitable for LS90N, LS110N contactors					
63 ... 210	1250 A, fuse type gG	10E, 20E, 30E	B90NE-210	4TQE573401R0000	1.210
Suitable for LS132N, LS160N, LS200N contactors					
115 ... 380	1600 A, fuse type gG	10E, 20E, 30E	B160NE-380	4TQE573501R0000	1.430

Accessories

Description	Suitable for	Type	Order code	Weight (1 pce) [Kg]
Terminal shroud	B90NE	B90NE-LT	4TQE579005R0000	0.085
Terminal shroud	B160NE	B160NE-LT	4TQE579006R0000	0.105



B90NE-210



B160NE-380

Main dimensions mm, inches

B90NE, B160NE electronic overload relays – 63 to 380 A

Technical data

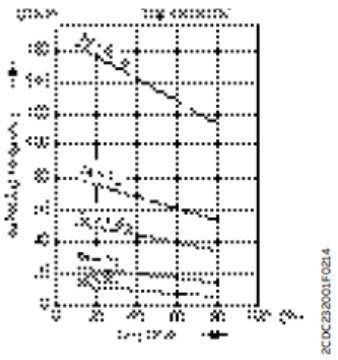
Main circuit – Utilization characteristics according to IEC/EN

Type	B90NE, B160NE
Standards	IEC/EN 60947-1, IEC/EN 60947-4-1, IEC/EN 60947-5-1
Rated operational voltage Ue	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 â€“ Intermittent periodic duty"
Rated impulse withstand voltage Uimp	8 kV
Rated insulation voltage Ui	1000 V

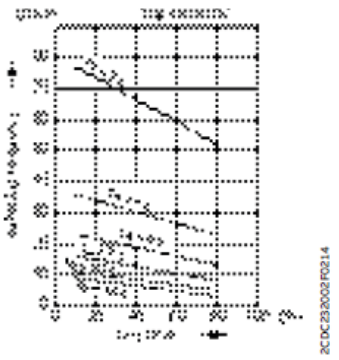
Auxiliary circuit according to IEC/EN

Type		B90NE, B160NE
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.O. + 1 N.C.
Ie / 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
Ie / 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 / 3mA
Short-circuit protective device		6 A, fuse type gG
Rated impulse withstand voltage Uimp		6 kV
Rated insulation voltage Ui		690 V

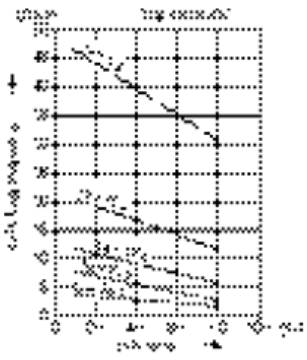
Technical diagram – Intermittent periodic duty



Trip class 10E



Trip class 20E



Trip class 30E

B90NE, B160NE electronic overload relays – 63 to 380 A

Technical data

Main circuit – Utilization characteristics according to UL/CSA

Type	B90NE, B160NE
Standards	UL 60947-1, UL 60947-4-1
Maximum operational voltage	600 V AC / DC
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		B90NE, B160NE
Contact rating	N.C., 95-96	B600, Q600
	N.O., 97-98	D300, Q600
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			
		SCCR	Fuse type	SCCR	Fuse type	SCCR	Fuse type
B90NE-210	210 A	10 kA	400 A, K5/RK5	10 kA	400 A, K5/RK5	100 kA	400 A, J
B160NE-380	380 A	18 kA	800 A, L/T	18 kA	800 A, L/T	100 kA	600 A, J

B90NE, B160NE electronic overload relays – 63 to 380 A

Technical data

General technical data

Type			B90NE	B160NE
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 to 6	
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			B90NE	B160NE
Connecting capacity				
	Rigid	1 x	16 ... 185 mm²	50 ... 240 mm²
		2 x	16 ... 120 mm²	50 ... 150 mm²
	Flexible with ferrule	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	18 Nm / 160 lb.in
Recommended screw driver			M8	M10

Auxiliary circuit

Type			B90NE, B160NE
Connecting capacity			
	Rigid	1 x or 2 x	1 ... 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 18-10
	Flexible acc. to UL/CSA	1 x 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)

AEG

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