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Thermal overload relays with standard trip characteristic

For individual mounting

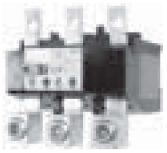


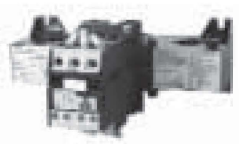
Contactor attached (either plug-in, or by separate connectors)



B27T







Type	B 27T	B 77S	B 177S	B 375K
Relay settings:				
Low range, from/toA	0.12/0.18	11/17	55/80	175/280
High range, from/toA	15/23	63/80	150/180	430/700
SIngle phasing prevention				
X-yes	X	X	X	X
Temperature compensation				
Effective from/to deg. C	-25/+60	-20/+60	-20/+60	-25/+60
Attachable to contactor Type	LS4, 7, 17, 27, 37	LS27, 37	LS87*, 107	
plug-in, or	SP4, 17, 27, 37	LS 47, 57, 77, 87	LS 107, 177	
bus connectors	OR Type K Contactors	OR Type K Contactors	OR Type K Contactors	
Standard Contacts, Isolated	NO/NC	NO/NC	NO/NC * To 80 Amp	

D.C. Type B overloads can be used in D.C. systems with 3 poles in series.



TYPE B 27T
Plug-On Mount

(For Plug-On to Contactors LS4, LS7, LS17, LS27, 37)
LS4K, 5K, 7K, 11K, 15K, 18K

O.L., Relay Setting Range (Amps)	Catalog No. Suffix
0.12-0.18	B27T-A
0.18-0.28	B27T-B
0.28-0.4	B27T-C
0.4-0.6	B27T-D
0.56-0.8	B27T-E
0.8-1.2	B27T-F
1.2-1.8	B27T-G
1.8-2.8	B27T-H
2.8-4	B27T-I
4-6	B27T-K
5.6-8	B27T-L
8-12	B27T-M
11-17	B27T-N
15-23	B27T-O
20-32	B77S-P-32A

Adaptors to Separate Mount B27T Overloads.
Catalog No.
B 27T-AD (910-391-281)
Adapter to Separate Mount B77S Overloads.
B77-AD (910-391-268)

TYPE B 27T
Separate Mount

(Overload & Separate Mount Adapter as an Assembly)



Catalog No.
B 27T-AS
B 27T-BS
B 27T-CS
B 27T-DS
B 27T-ES
B 27T-FS
B 27T-GS
B 27T-HS
B 27T-IS
B 27T-KS
B 27T-LS
B 27T-MS
B 27T-NS
B 27T-OS
B 77-PS

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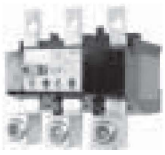
Type B 77S
11-80A



B77S

Catalog No.	Relay Setting range (Amps)	Max. Back-up fuse rating (A delayed)
For separate mounting and for mounting on contactors LS37-77 & LS22K-37K Bus Links are included with overload. See below for BUS LINKS to bus connect special combination overloads to contactors.		
B 77S-17A	11-17A	
B 77S-25A	16-25A	50
B 77S-32A	20-32A	63
B 77S-50A	32-50A	100
B 77S-63A	50-63A	100
B 77S-80A	63-80A	125
B 77-AD Adapter to Separate Mount B 77S Overload		

B177S
55-180A

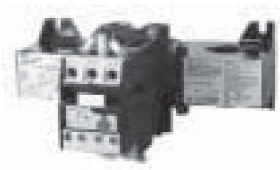


B177S

For separate mounting and for mounting on contactors Types LS 87*, LS 107, LS 177, LS 247		
B 177S-80A*	55-80	125
B 177S-110A	80-110	200
B 177S-135A	110-135	315
B 177S-160A	135-160	315
B 177S-180A	150-180	315
NO extra bus links are required to connect to LS 107, 177.		

*Only useable to 80 Amp with LS 87

B 375
175-700A



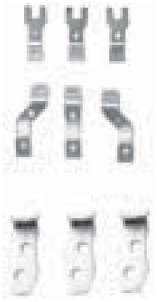
B 375K-280A ▲	175-280	**Buss Links Sold Separately See Below**	
B 375K-400A ▲	250-400		
B 375K-500A ▲	315-500		
B 375K-700A ▲	430-700		

▲ B375K Buss includes brackets to direct mount to contactor. B375K Buss Link must be ordered separately. See below.

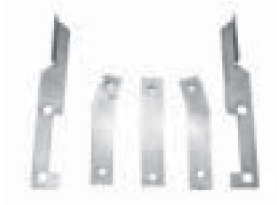
LED TRIP INDICATOR for visual indication of O.L. contact trip. Cat. No. LS-B-LA2

Overloads-Connections
Overload Relay Combinations with Contactors

OL Type	Amp Rating	Contactor	Catalog No. Bus Link (set of 3)	
B05	0-14	LS07(mini), LS05	*	
B27T	0-23A	LS4, 7, 17, 27	*	
		SP4, 7, 17, 27	*	
		LS4K - LS18K	*	
B77S-P-32A		LS, SP27	BL-269 **	
B77S	11-32A	LS37, SP37	BL-271 **	
	15-80A ▲old	LS47, 57, 77,	BL-270 **	
	▲new	SP47, 57, 77, 87	BL-273 **	
	ALL	LS15K, 18K	BL-284	
	ALL	LS22K, 30K, 37K	BL-283	
B177S	55-80A	LS87	BL-274	
	80-180A	LS107, 177	BL-275 *	
		LS45K, 55K	BL-285	
		LS75K, 90K	*	
B375K	175-700A	LS110K-LS160K	hard wired	Must order separately
		LS220K, 280K	BL-280	
		LS375K	BL-375	



BL-271
BL-274
BL-275



BL-375

***Direct Connect Overload to Contactors Listed. No extra parts needed.**
** **BL-271** is included with B77S from 11-32 Amps. **BL-270** use in contactors without Finger Touch Guards, 32-80A **BL-269** is included with B77S-P-32A.
** **BL-273** is included with B77S from 32-80 Amps. New contactors, LS47,57,77,87 with Finger Touch Guards require **BL-273** for Bus Connection to O.L.
** **B177S** Overload. No extra Bus Links are required to connect B177 **to Contactors LS107, 177.**
** **BL-283** is required to mount B77S to LS22K - LS37K
Note: For other Contactor/Overload Connections, overload must be separate wired to contactors.

▲ Old - Designed pre 1993
▲ New - 1993 to present

Design and function of thermal overload relays

AEG thermal overload relays have three bimetal strips combied with a snap-action operating mechanism enclosed with a moulded plastic casing. As an overload current develops, the direct-heated strips heat up and deflect. At a present current marked on the relay setting scale, the snap-action mechanism releases, and actuates a change-over contact.

Tripping characteristics

Thermal relays always release with a certain delay period, t_A. This latter period varies inversely with the load current. The trip characteristic curves apply to overload tripping from the cold motor state. When warmed up to the final selected-current temperature, tripping already occurs with some 25% to 30% of the diagram-listed values.

The lowest reponse current starts with the cold-state figure,1.05 x I_E, and should not initiate tripping in less than two hours. After warming up, the current setting, 1.2 x I_E must have caused tripping within two hours while in operation.

Tripping delay from “cold” for a 6 x I_E reponse value serves to define relay differentials in regard to diverse tripping characteristics.

Characteristic T II = trips after 5 s
for 6 x I_E

When a relay responds much later than 5 seconds, its delay period is added to the designation T II e.g.TII/30 s = trips within 30 seconds for 6 x I_E full-load current.

The majority of all thermal relays work to grade T II for all practical purposes. Standard drive motors are thereby afforded a good measure of protectionduring a safe run-up.

Temperature compensation

Variations of ambient temperature over the range from -20°C to +60°C (with types b 05, b 27, b77 and b 177: -20°C to +60°C) do not effect the release timing because of the inbuilt temperature compensating feature provided with all thermal overload relays. The prevailing ambient temperature is that measured close to the contactor.

NOTE: In position A or H the auxiliary contact 95-96 cannot inadvertently be opened.

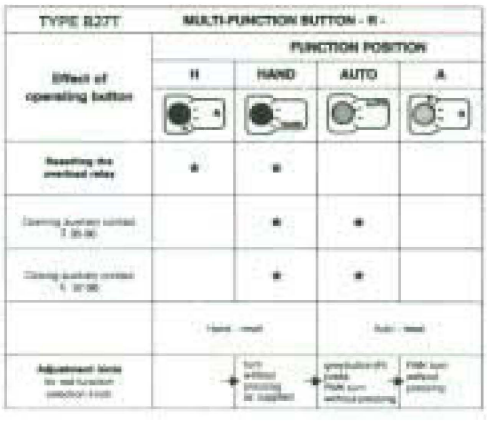
Single Phasing Mode of Operation

A three-phase bimetal overload relay having no loss-of-phase protection is equipped with only one slide #1 (as in Fig. 1). This slide component lies **ahead** of the bimetal strips and transmits their deflection onto the the trip mechanism. The thermal relays equipped with **single-phasing protection** are fitted with a second similar slide #2 (as in Fig. 1) set **behind** the bimetal strips. This is linked with a two-armed trip lever #3.

Given a three-pole overload trip (as under Fig. 1(b), all three bent strips will have shifted from their “cold state” setting k, to the “three-pole warm” position, w 3. This motion makes slide #2 give way to the bimetal strips right-handed motion, and the hinged lever #3 is shifted accordingly. The resulting travel s2 of lever #3 and of slides #1 and #2 equals in this case the bimetals travelled distance s1, and so effects tripping on reaching point S.

Given a two-pole trip operation however (as illustrated in Fif. 1 (c), the one unheated bimetal strip in the middle blocks any movement of slide #2. However, the lever-arm ratio of u enlarges the distance s1 so travelled by the two bending bimetal strips to their “two-pole warm” end position w2, changing into s2 as traveled by two armed lever #3. In other words, the two-pole overload makes for quicker tripping of a thermal relay with single phasing protection as compared to a regualr three-phase state of overloading.

Should the loss of a single phase happen to a so far three-pahse loaded drive relay system with a single phasing protection, then the affected bimetal strip will cool down. In doing so, it straightens and returns the bottom slide #2 to it’s cold-starting position. In this case, also, the overload trips more quickly.



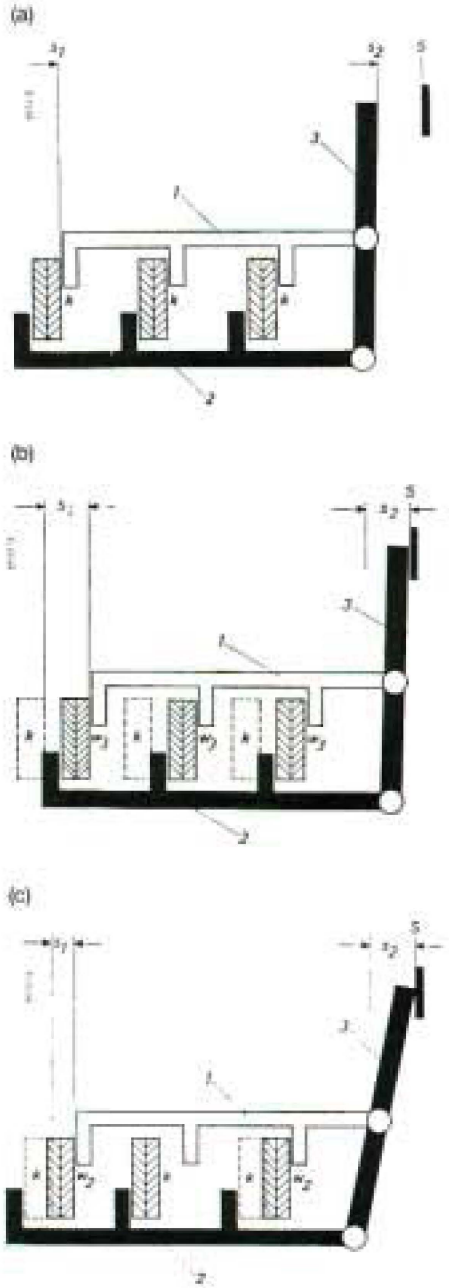


Fig. 1: Mode of operation of thermal overload relay fitted with single-phasing protection.
(a) **Unexcited**
bimetal strips cold:
$s_2 = s_1 = 0$
(b) **Three-phase tripping**
3 strips warm:
$s_2 = s_1$
(c) **Two-phase excited**
midway strip cold,
outer strips warm:
$s_2 = ü \cdot s_1$

where:
k = bimetal “cold” position
w_3 = bimetal “warm, 3-pole” position
w_2 = bimetal “warm, 2-pole” position
1 = top slide 1
2 = bottom slide 2
3 = two-armed lever
S = tripping point
s_1 = bimetals travel to trip
s_2 = lever 3 travels to trip
ü = two-armed lever ratio

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