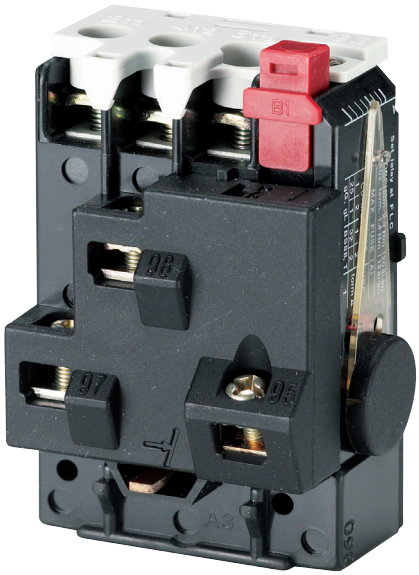
Thermal overload relays TI 9C-5 – TI 86C

For the series of contactors CI 5, CI 6-50 and CI 61-98, we offer an appropriate range of thermal overload relays (thermobimetal design). The thermobimetal versions are subjected to the individual calibration procedure during the production process, which provides a full guarantee of correct operation. For multi-motor systems, controlled, for example, by means of a frequency converter, it is possible to mount TI individually on a DIN rail adapter. These devices protect the circuits of induction motors against overload and phase loss or turn-to-turn short circuit. An additional feature, ensuring the stability of settings in a wide range of operating temperatures, is the temperature compensation implemented by means of an additional thermobimetal element in the temperature range from - 5°C to + 40°C. The relays are equipped with two signal contacts and the ability to automatically "arm" the device after the thermobimetals have cooled down. Each device has a "TEST" button to check the correct operation of signaling circuits.



Electrical parameters

Current range		Fuse		For contactor	Code number	Type
Direct start	Y/D start	type 1	type 2			
0.13 – 0.20 A	–	25 A	–	CI 5	047H3130	TI 9C-5
0.27 – 0.42 A	–	25 A	2 A	CI 5	047H3132	TI 9C-5
0.4 – 0.62 A	–	25 A	2 A	CI 5	047H3133	TI 9C-5
0.6 – 0.92 A	–	25 A	4 A	CI 5	047H3134	TI 9C-5
0.85 – 1.3 A	–	25 A	4 A	CI 5	047H3135	TI 9C-5
1.2 – 1.9 A	–	25 A	6 A	CI 5	047H3136	TI 9C-5
1.8 – 2.8 A	3.2 – 4.8 A	25 A	6 A	CI 5	047H3137	TI 9C-5
2.7 – 4.2 A	4.7 – 7.3 A	25 A	16 A	CI 5	047H3138	TI 9C-5
4.0 – 6.2 A	6.9 – 10.7 A	35 A	20 A	CI 5	047H3139	TI 9C-5
6.0 – 9.2 A	10 – 16 A	50 A	20 A	CI 5	047H3140	TI 9C-5
0.13 – 0.20 A	–	25 A	–	CI 6	047H0200	TI 16C
0.19 – 0.29 A	–	25 A	–	CI 6	047H0201	TI 16C
0.27 – 0.42 A	–	25 A	2 A	CI 6	047H0202	TI 16C
0.4 – 0.62 A	–	25 A	2 A	CI 6	047H0203	TI 16C
0.6 – 0.92 A	–	25 A	4 A	CI 6	047H0204	TI 16C
0.85 – 1.3 A	–	25 A	4 A	CI 6	047H0205	TI 16C
1.2 – 1.9 A	–	25 A	6 A	CI 6	047H0206	TI 16C
1.8 – 2.8 A	3.2 – 4.8 A	25 A	6 A	CI 6	047H0207	TI 16C
2.7 – 4.2 A	4.7 – 7.3 A	25 A	16 A	CI 6	047H0208	TI 16C
4.0 – 6.2 A	6.9 – 10.7 A	35 A	20 A	CI 6	047H0209	TI 16C
6.0 – 9.2 A	10 – 16 A	50 A	20 A	CI 9	047H0210	TI 16C
8.0 – 12 A	13 – 20.8 A	63 A	25 A	CI 12	047H0211	TI 16C
11 – 16 A	19 – 27 A	80 A	25 A	CI 16	047H0212	TI 16C
15 – 20 A	26 – 35 A	80 A	35 A	CI 20	047H0213	TI 25C
19 – 25 A	33 – 43 A	80 A	63 A	CI 25	047H0214	TI 25C
24 – 32 A	41 – 55 A	80 A	63 A	CI 30	047H0215	TI 30C
16 – 23 A	28 – 40 A	125 A	63 A	CI 32	047H1013	TI 80
22 – 32 A	38 – 56 A	125 A	63 A	CI 32	047H1014	TI 80
30 – 45 A	52 – 78 A	125 A	100 A	CI 45	047H1015	TI 80
42 – 63 A	75 – 109 A	100 A	100 A	CI 61	047H1016	TI 80
60 – 80 A	105 – 138 A	125 A	125 A	CI 86	047H1017	TI 80
74 – 85 A	130 – 147 A	125 A	125 A	CI 86	047H1018	TI 86

Coordination of short circuit protection

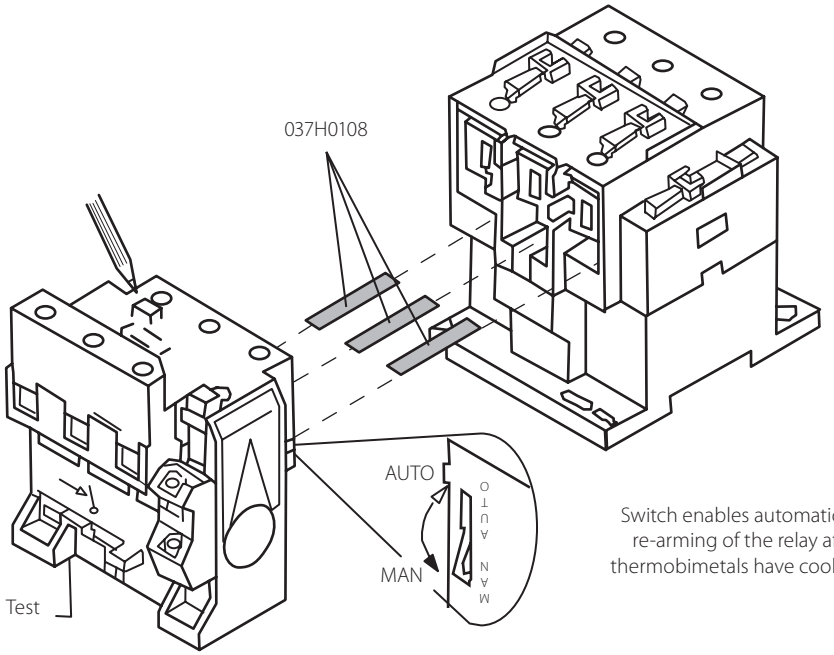
Type 1:
After a short circuit occurs, it is possible to damage the motor starter components and to replace the thermal overload relay

Type 2:
After a short circuit occurs, it is not possible to damage the motor starter components, only a light contact welding is permissible

Accessories

Installation of thermal overload relays - independent; used in the control of one contactor for several motors.

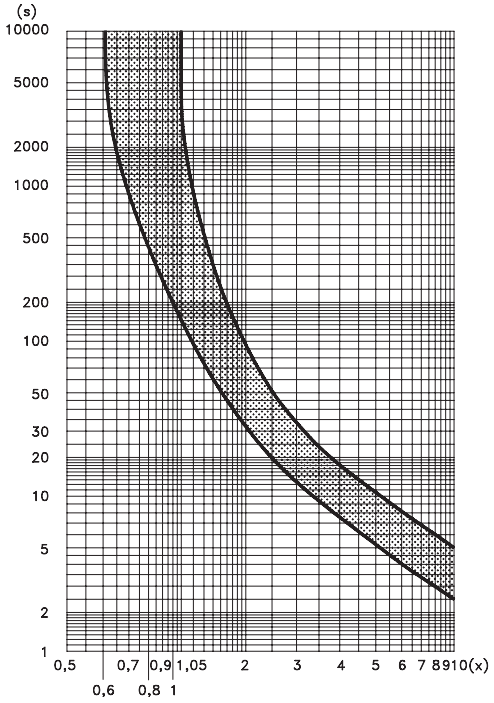
Type	Description	Code number
base	DIN rail adapter for TI 16C – TI 30C	047H016566
base	Adapter for panel mounting for TI 80	047L045666
	Busbar set (3 pieces) for TI 80 + CI 32 – CI 98	037H010866



Switch enables automatic "AUTO" re-arming of the relay after the thermobimetals have cooled down.

Test allows checking the functioning of signal circuits.

Explanation of graphs



Mean value curves
The upper curve: three-phase trip and two-phase trip at minimal setting.
The lower curve: two-phase trip at maximum setting.
When tripping from the operationally warm condition, the tripping times are approx. 30% of the values shown.
These values apply at an ambient temperature = 20 °C.
Three-phase tripping: x = (measured current)/(rated motor current)
Asymmetric load tripping: x = (measured current)/
(max. scale value on overload relay)
Tripping time 2 < Tp 10 s at 7.2 x Ie, class 10 A

Note! Thermal overload relays are generally calibrated to the current at full motor load.

5

Three-phase overload

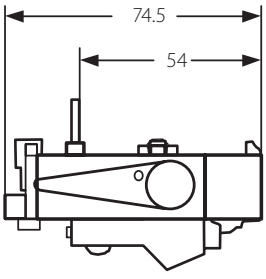
1) Measure the overload current.
2) Find the overload factor (x) by dividing the measured value by the set value of the thermal overload relay (motor full load current)
3) Find the value of the coefficient (x) on the horizontal axis andfollow a line vertically up until it intersects the upper curve.
4) From the intersection point, follow a horizontal line to the left and read off on the vertical axis the time that will elapse before the thermal overload relay cuts out the motor.

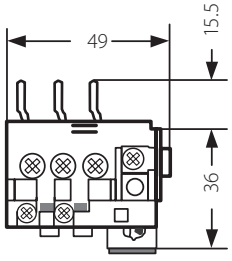
Two-phase overload (asymmetric load tripping)

1) Measure the current in undamaged phases.
2) Find the overload factor (x) by dividing the measured value by the maximum scale value of the thermal overload relay
3) Find the value of the coefficient (x) on the horizontal axis and follow a line vertically up until it intersects the lower curve.
4) From the intersection point, follow a horizontal line to the left and read off on the vertical axis the time that will elapse before the thermal overload relay cuts out the motor.

Dimensions

TI 9C-5, 16C, 25C, 30C





TI 80, 86