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## THERMAL OVERLOAD RELAYS TYPE TM 40

### Features

- In conformity with: IEC 60947-4
- Ambient temperature compensated
- Differential tripping
- With selectable manual or auto reset
- Trip indication
- 1NO + 1NC auxiliary contact

### Selection and ordering data

#### Thermal overloads

For direct mounting onto contactor	Overload setting range (A)	Type	Weights kg
 <p>CNN 9, CNN 12, CNN 18, CNN 25, CNN 32, CNN 40</p>	<p>0.1 - 0.16 0.16 - 0.25 0.25 - 0.4 0.4 - 0.63 0.63 - 1.0 0.2 - 5.0 0.8 - 1.25 1.0 - 1.6 1.25 - 2.0 1.6 - 2.5 2.0 - 3.2 2.5 - 4.0 3.2 - 5.0 4.0 - 6.3 5.0 - 8.0 6.3 - 10.0 8.0 - 12.5 10 - 16 12.5 - 20 16 - 25</p>	<b>TM 40</b>	0.15
 <p>CNN 25; CNN 32, CNN 40,</p>	<p>22 - 30 28 - 38</p>	<b>TM 40</b>	0.16

## THERMAL OVERLOAD RELAYS type TRM 12 - TRM 22

### Features

- In conformity with: IEC 60947-4
- Ambient temperature compensated
- Differential tripping
- With selectable manual or auto reset
- Trip indication
- 1NO + 1NC auxiliary contact

### Selection and ordering data

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#### Thermal overloads



For direct mounting onto contactor	Overload setting range (A)	Type	Weights kg
CNP 21, CNP 31, CNM 9, CNM 12, CNB 9, CNB 12	0.1 - 0.16	<b>TRM 12</b>	0.16
	0.16 - 0.25		
	0.25 - 0.4		
	0.4 - 0.63		
	0.63 - 1.0		
	0.8 - 1.25		
	1.0 - 1.6		
	1.25 - 2		
	1.6 - 2.5		
	2.0 - 3.2		
	2.5 - 4.0		
	3.2 - 5.0		
	4.0 - 6.3		
	5.0 - 8.0		
	6.3 - 10.0		
8.0 - 12.5			
10 - 16			
CNM 16, CNM 22, CNM 30 CNB 16, CNB 22, CNB 30	0.1 - 0.16	<b>TRM 22</b>	0.16
	0.16 - 0.25		
	0.25 - 0.4		
	0.4 - 0.63		
	0.63 - 1.0		
	0.8 - 1.25		
	1.0 - 1.6		
	1.25 - 2.0		
	1.6 - 2.5		
	2.0 - 3.2		
	2.5 - 4.0		
	3.2 - 5.0		
	4.0 - 6.3		
	5.0 - 8.0		
	6.3 - 10.0		
8.0 - 12.5			
10 - 16			
12.5 - 20			
16 - 25			
22 - 30			

# THERMAL OVERLOAD RELAYS type TRM 75 - TRM 400

## Selection and ordering data

### Thermal overloads

For direct mounting onto contactor	Overload setting range (A)	Type	Weights kg
CNM 36	16 - 25 20 - 32 25 - 40	<b>TRM 75 - 36</b>	0.38
CNM 45 CNM 60	16 - 25 20 - 32 25 - 40 32 - 50 40 - 57 50 - 63	<b>TRM 75 - 60</b>	0.39
CNM 75 CNM 90 CNM 110	16 - 25 20 - 32 25 - 40 32 - 50 40 - 57 50 - 63 57 - 70 63 - 80	<b>TRM 75 - 110</b>	0.40
For individual mounting CNM 110 CNM 140 CNM 170 CNM 200 CNM 250 CNM 315 CNM 400	70 - 100 80 - 125 100 - 160 125 - 200 160 - 250 200 - 320 250 - 400	<b>TRM 400</b>	2.4

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### ORDER-THERMAL OVERLOAD RELAYS

Type

Setting range (Upper value)

Example: Thermal overload relay type TRM 22, current range ( 10 - 16 ) A

**TRM 22** | **16 A**

### ADAPTOR FOR SEPARATE INSTALLATION ASM 40,ASM 22, ASM 75

For thermal overload relays type	Type	Weights kg
TM 40	<b>ASM 40</b>	0.04
TRM 12 TRM 22	<b>ASM 22</b>	0.065
TRM 75	<b>ASM 75</b>	0.135

# THERMAL OVERLOAD RELAYS TM and TRM

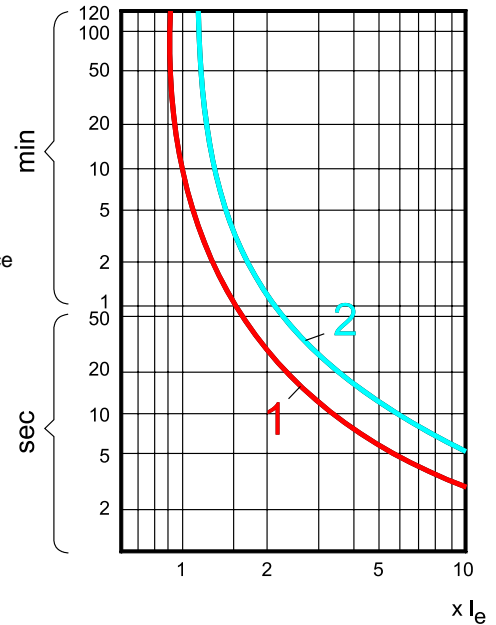
## Application, standards and installation

Thermal overload relays TRM are intended to protect low voltage motors and other consumers against nonpermissible overloads and phase-failure operation. Relays are in conformity with IEC 60947-4-1, EN 60947-4-1 and VDE 0660. They are normally intended for mounting on our contactors see ordering table. Individual screw mounting of the TM 40, TRM 12 and TRM 22 relays on plane surface or snap-on fastening to 35 mm mounting rail (according to DIN EN 50022) is possible by using a special adaptor type ASM 40 and ASM 22. The relay TRM 400 is intended for individual screw mounting.

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## Current time curves

The current time curves give correlation between the tripping time and the multiplier of the present current  $I_e$ . They are presented for a cold initial state of the relay. For relays warmed by  $1,0 \times I_e$  load, the tripping times are lower by 25%. The curve 2 is given for 3-phase operation. The curve 1 is given for 2-phase operation. For the protection of a 1-phase, or DC motor, serial connection of the main circuit of relays is necessary. For that connection the tripping curve 2 is valid.







Technical data						
Relay type		TM 40	TRM 12	TRM 22	TRM 75	TRM 400
Insulation rating $U_i$	V	690			1000	690
Permissible ambient temperature	°C	- 25 to +55				
Degree of protection		IP00				
Releasetimeclassification		class 10 (release time 4 s ... 10 s at $7,2 \times I_e$ from cold state)				
Temperature compensation		+	+	+	+	+
Phase failure protection by differential phase shift		+	+	+	+	+
Test button		+	+	+	+	+
Reset button		+	+	+	+	+
Switch position indicator		+	+	+	+	+
Changeover to hand or automatic resetting		+	+	+	+	+
Vibration resistance	g	8	8	8	8	8
<b>Main circuit</b>						
rated operational current (AC 50 to 400 Hz or DC)	A	38	16	30	80	400
conductor cross - section	mm <sup>2</sup>	2,5 - 10	2,5 - 6	2,5 - 6	2,5 - 35	120/24
solid or stranded	mm <sup>2</sup>	1,5 - 6	1,5 - 4	1,5 - 4	1,5 - 25	
finely stranded with end sleeve						
Screw/Screw head		M4/PZ2	M4/PZ2	M4/PZ2	M6	M10
Tightening torque	Nm	1.6	1.2	1.2	2.5	
<b>Power input per pole</b>						
max. at setting range min.	W/VA	0,9	0,9	0,9	2,6	5
max. at setting range max.	W/VA	2,25	2,25	2,25	4	12
<b>Auxiliary circuit</b>		1 NO + 1 NC (galvanically separated)				
number and type of contacts						
conductor cross - section	mm <sup>2</sup>	2 x (1 - 2,5)				
solid or stranded	mm <sup>2</sup>	2 x (0,75 - 1,5)				
finely stranded with end sleeve		M3.5/PZ1				
Screw/Screw head		0.8				
Tightening torque	Nm	6				
rated thermal current	A	400				
rated insulation voltage AC:		690				
unequal potential	V	2				
equal potential	V	1.5				
rated current	A	1.15				
	A	1.1				
	A	1				
	A	1				
	A	0.4				
	A	0.22				
	A	0.1				

# CONTACTORS WITH THERMAL OVERLOAD RELAYS

In conformity with: IEC 60947-1, IEC 60947-4, VDE 0660

## Selection and ordering data

Data for <b>AC2</b> and <b>AC3</b> utilization categories			Auxiliary contacts	Type of relay	Type	Weights
Rated operational current <b>I<sub>e</sub>/400V</b> A	Motor rating at 50Hz		 NO NC	Overload setting range  A		
	230 V kW	400V kW				
<b>CONTACTORS WITH THERMAL RELAY</b>						
 CNMR 9, CNMR 12 (10,01)	9	2.2	4	1 0	<b>TRM 12</b> 0.1 - 0.16 0.16 - 0.25 0.25 - 0.4 0.4 - 0.63 0.63 - 1.0 0.8 - 1.25 1.0 - 1.6 1.25 - 2 1.6 - 2.5 2.0 - 3.2 2.5 - 4.0 3.2 - 5.0 4.0 - 6.3 5.0 - 8.0 6.3 - 10.0 8.0 - 12.5 10 - 16	<b>CNMR 9 10</b>  <b>CNMR 9 01</b>  <b>CNMR 12 10</b>  <b>CNMR 12 01</b>  <b>CNMR 12 11</b>  <b>CNMR 12 22</b>
	9	2.2	4	0 1		
	12	3	5.5	1 0		
	12	3	5.5	0 1		
	12	3	5.5	1 1		
	12	3	5.5	2 2		
 CNMR 12	16	4	7.5	1 1	<b>TRM 22</b> 0.1 - 0.16 0.16 - 0.25 0.25 - 0.4 0.4 - 0.63 0.63 - 1.0 0.8 - 1.25 1.0 - 1.6 1.25 - 2.0 1.6 - 2.5 2.0 - 3.2 2.5 - 4.0 3.2 - 5.0 4.0 - 6.3 5.0 - 8.0 6.3 - 10.0 8.0 - 12.5 10 - 16 12.5 - 20 16 - 25 22 - 30	<b>CNMR 16 11</b>  <b>CNMR 16 22</b>  <b>CNMR 22 11</b>  <b>CNMR 22 22</b>  <b>CNMR 30 11</b>  <b>CNMR 30 22</b>
	16	4	7.5	2 2		
	22	5.5	11	1 1		
	22	5.5	11	2 2		
	30	7.5	15	1 1		
	30	7.5	15	2 2		
 CNMR 30	36	11	18.5	2 2	<b>TRM 75-36</b> 16 - 25 20 - 32 25 - 40	<b>CNMR 36 22</b>  <b>CNMR 36 44</b>
	36	11	18.5	4 4		



# CONTACTORS WITH THERMAL OVERLOAD RELAYS

In conformity with: IEC 60947-1, IEC 60947-4, VDE 0660

## Selection and ordering data



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CNMR 60



CNMR 110

Data for <b>AC2</b> and <b>AC3</b> utilization categories			Auxiliary contacts		Type of relay	Type	Weights
Rated operational current <b>I<sub>e</sub>/400V</b> A	Motor rating at 50Hz		  <b>NO NC</b>	Overload setting range  A			
	230 V kW	400V kW					
<b>CONTACTORS WITH THERMAL RELAY</b>							
45	15	<b>22</b>	2	2	<b>TRM 75-60</b>	<b>CNMR 45 22</b>	
45	15	<b>22</b>	4	4	16 - 25	<b>CNMR 45 44</b>	
60	18.5	<b>30</b>	2	2	20 - 32	<b>CNMR 60 22</b>	
60	18.5	<b>30</b>	4	4	25 - 40 32 - 50 40 - 57 50 - 63	<b>CNMR 60 44</b>	
75	22	<b>37</b>	2	2	<b>TRM 75-110</b>	<b>CNMR 75 22</b>	
75	22	<b>37</b>	4	4	16 - 25	<b>CNMR 75 44</b>	
90	26	<b>45</b>	2	2	20 - 32	<b>CNMR 90 22</b>	
90	26	<b>45</b>	4	4	25 - 40 32 - 50	<b>CNMR 90 44</b>	
110	37	<b>55</b>	2	2	40 - 57 50 - 63	<b>CNMR 110 22</b>	
110	37	<b>55</b>	4	4	57 - 70 63 - 80	<b>CNMR 110 44</b>	

### ORDER FOR CNMR:

Type

Standard control voltage AC/DC 24, 48, 110, 220/230, 380/400 V

For AC control: 50 Hz or 60 Hz

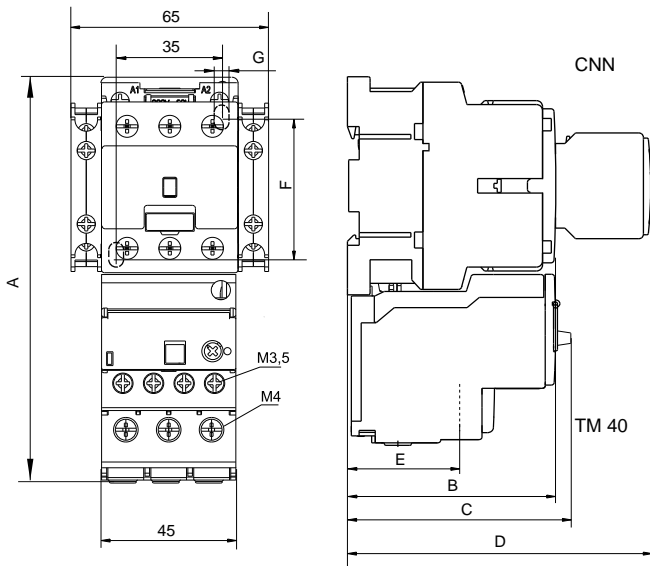
Setting range (Upper value)

**Example:** Contactor with thermal relay type CNMR 16 22, control voltage 220/230 V, 50 Hz, thermal overload relay type TRM 22, current range (10-16)A

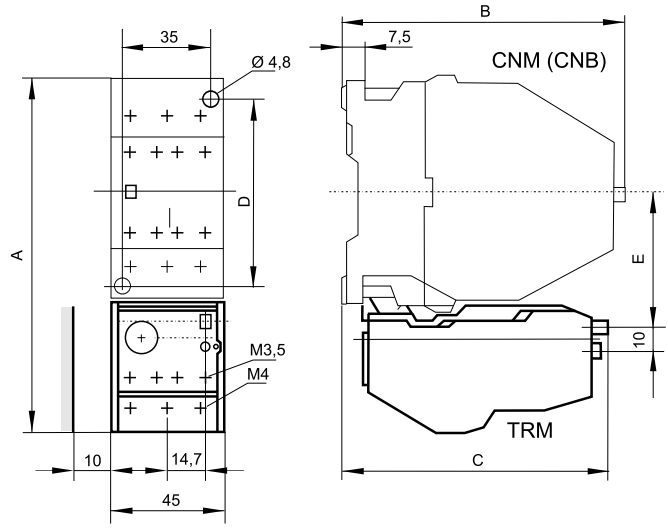
**CNMR 16 22** | **220/230 V** | **50 Hz** | **16A**



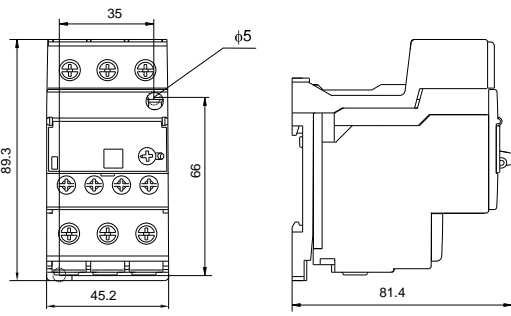
**DIMENSION DRAWINGS (dimensions in mm)**



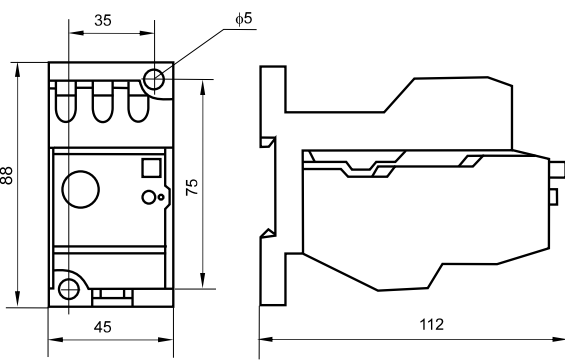
Type	A	B	C	D	E	F	G
TM 40 + CNN 9; 12; 18	132.2	71	74	101	31	60-65	4.5
TM 40 + CNN 25	134	71	75.5	101	32.8	60-65	4.5
TM 40 + CNN 32, 40	143.5	84.5	86	114	43.5	60-70	5



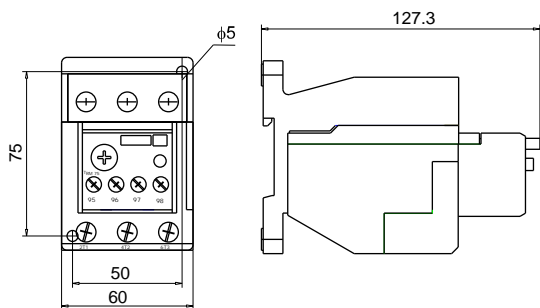
Type	A	B	C	D	E
TRM 12 + CNM 9	126	85	112	60	43
TRM 12 + CNM 12	130	102	103	60	47
TRM 22 + CNM 16, 22, 30	142	113	110	75	51
TRM 12 + CNB 9	141	129	156	60	43
TRM 12 + CNB 12	145	145	146	60	47
TRM 22 + CNB 16, 22, 30	126	157	154	75	51



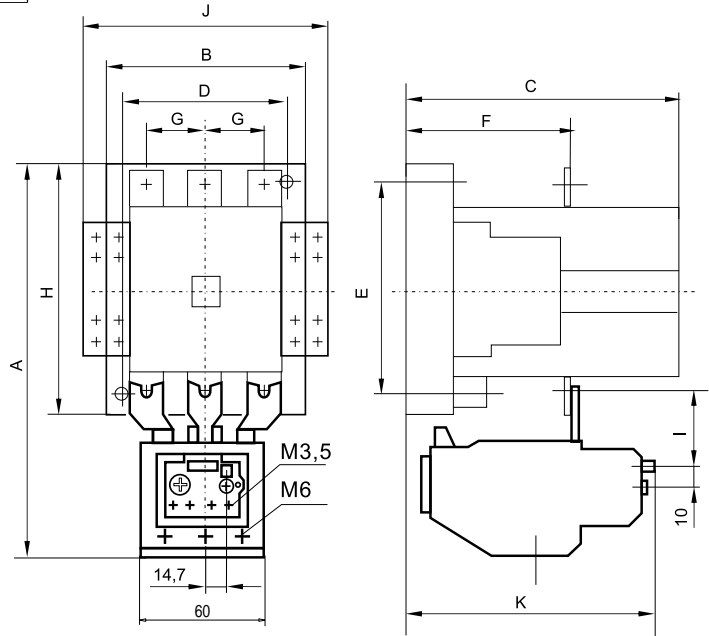
TM 40 + ASM 40



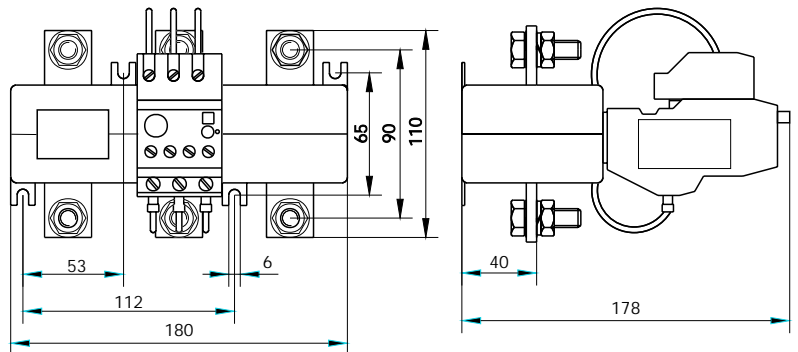
TRM 12/22 + ASM 22



TRM 75 + ASM 75



Tip	A	B	C	D	E	F	G	H	I	J	K
TRM 75-36 + CNM 36	153	70	95	50	75	68	15.5	94	22	-	115
TRM 75-60 + CNM 45, 60	180	87	111	60	100	81	19.5	114	24	112	121
TRM 75-110 + CNM 75, 110	199	100	142	80	110	86.5	30	132	24	125	126



TRM 400

