

Thermal Overload Relays for plug-in mounting



| Setting Range | | Type | Pack pcs. | Weight kg/pc. | Wiring Diagram |
|--|--------------|-----------------|-----------|---------------|----------------|
| D.O.L. (A) | Δ (A) | | | | |
| With Manual Reset, for contactors K(G)3-10.. to K(G)3-22.. .. | | | | | |
| 0,12 - 0,18 | - | U12/16E 0,18 K3 | 1 | 0,10 | |
| 0,18 - 0,27 | - | U12/16E 0,27 K3 | 1 | 0,10 | |
| 0,27 - 0,4 | - | U12/16E 0,4 K3 | 1 | 0,10 | |
| 0,4 - 0,6 | - | U12/16E 0,6 K3 | 1 | 0,10 | |
| 0,6 - 0,9 | - | U12/16E 0,9 K3 | 1 | 0,10 | |
| 0,8 - 1,2 | - | U12/16E 1,2 K3 | 1 | 0,10 | |
| 1,2 - 1,8 | - | U12/16E 1,8 K3 | 1 | 0,10 | |
| 1,8 - 2,7 | - | U12/16E 2,7 K3 | 1 | 0,10 | |
| 2,7 - 4 | - | U12/16E 4 K3 | 1 | 0,10 | |
| 4 - 6 | 7 - 10,5 | U12/16E 6 K3 | 1 | 0,10 | |
| 6 - 9 | 10,5 - 15,5 | U12/16E 9 K3 | 1 | 0,10 | |
| 8 - 11 | 14 - 19 | U12/16E 11 K3 | 1 | 0,10 | |
| 10 - 14 | 18 - 24 | U12/16E 14 K3 | 1 | 0,10 | |
| 13 - 18 | 23 - 31 | U12/16E 18 K3 | 1 | 0,10 | |
| 17 - 23 | 30 - 40 | U12/16E 23 K3 | 1 | 0,10 | |
| 22 - 30 | 38 - 52 | U12/16E 30 K3 | 1 | 0,13 | |



| | | | | | |
|--|-------------|-----------------|---|------|--|
| Mit flinker Auslösecharakteristik für EEx e Motoren und Unterwasserpumpen | | | | | |
| 0,4 - 0,6 | - | U12/16EQ 0,6 K3 | 1 | 0,10 | |
| 0,6 - 0,9 | - | U12/16EQ 0,9 K3 | 1 | 0,10 | |
| 0,8 - 1,2 | - | U12/16EQ 1,2 K3 | 1 | 0,10 | |
| 1,2 - 1,8 | - | U12/16EQ 1,8 K3 | 1 | 0,10 | |
| 1,8 - 2,7 | - | U12/16EQ 2,7 K3 | 1 | 0,10 | |
| 2,7 - 4 | - | U12/16EQ 4 K3 | 1 | 0,10 | |
| 4 - 6 | 7 - 10,5 | U12/16EQ 6 K3 | 1 | 0,10 | |
| 6 - 9 | 10,5 - 15,5 | U12/16EQ 9 K3 | 1 | 0,10 | |
| 8 - 11 | 14 - 19 | U12/16EQ 11 K3 | 1 | 0,10 | |
| 10 - 14 | 18 - 24 | U12/16EQ 14 K3 | 1 | 0,10 | |



| | | | | | |
|--|-------------|------------|---|------|--|
| For contactors K3-10A.. to K3-40A.. | | | | | |
| 0,12 - 0,18 | - | U3/32 0,18 | 1 | 0,14 | |
| 0,18 - 0,27 | - | U3/32 0,27 | 1 | 0,14 | |
| 0,27 - 0,4 | - | U3/32 0,4 | 1 | 0,14 | |
| 0,4 - 0,6 | - | U3/32 0,6 | 1 | 0,14 | |
| 0,6 - 0,9 | - | U3/32 0,9 | 1 | 0,14 | |
| 0,8 - 1,2 | - | U3/32 1,2 | 1 | 0,14 | |
| 1,2 - 1,8 | - | U3/32 1,8 | 1 | 0,14 | |
| 1,8 - 2,7 | - | U3/32 2,7 | 1 | 0,14 | |
| 2,7 - 4 | - | U3/32 4 | 1 | 0,14 | |
| 4 - 6 | 7 - 10,5 | U3/32 6 | 1 | 0,14 | |
| 6 - 9 | 10,5 - 15,5 | U3/32 9 | 1 | 0,14 | |
| 8 - 11 | 14 - 19 | U3/32 11 | 1 | 0,14 | |
| 10 - 14 | 18 - 24 | U3/32 14 | 1 | 0,14 | |
| 13 - 18 | 23 - 31 | U3/32 18 | 1 | 0,14 | |
| 17 - 24 | 30 - 41 | U3/32 24 | 1 | 0,14 | |
| 23 - 32 | 40 - 55 | U3/32 32 | 1 | 0,14 | |



| | | | | | |
|---|---------|----------|---|------|--|
| For contactors K3-24A.. to K3-40A .. | | | | | |
| 10 - 14 | 18 - 24 | U3/42 14 | 1 | 0,30 | |
| 14 - 20 | 24 - 35 | U3/42 20 | 1 | 0,30 | |
| 20 - 28 | 35 - 48 | U3/42 28 | 1 | 0,30 | |
| 28 - 42 | 48 - 73 | U3/42 42 | 1 | 0,30 | |

Thermal Overload Relays

Fuses for U3/32, U3/42, U3/74, U12/16E, U85, U180, U320 and U800

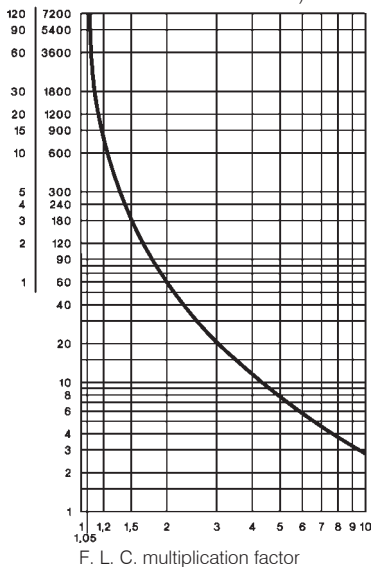
| Type | Setting Range | | | | Max. Fuse Size According to Coordination-type | | | | Fuse UL | SCCR |
|--------------------|----------------|-------------|-------------|----|---|-------------------|-------------------|----|---------|------|
| | DOL | A | | A | "2" ¹⁾ | | "1" ¹⁾ | | | |
| | | A | Δ | | quick | slow, gL(gG) | slow, gL(gG) | aM | A | A |
| U3/32 (U12/16E) | 0,12 - | 0,18 | - | | 0,5 ²⁾ | 0,5 ²⁾ | 25 | - | 15 | 5 |
| | 0,18 - | 0,27 | - | | 1,0 ²⁾ | 1,0 ²⁾ | 25 | - | 15 | 5 |
| | 0,27 - | 0,4 | - | | 2 | 2 | 25 | - | 15 | 5 |
| | 0,4 - | 0,6 | - | | 2 | 2 | 25 | - | 15 | 5 |
| | 0,6 - | 0,9 | - | | 4 | 4 | 25 | - | 15 | 5 |
| | 0,8 - | 1,2 | - | | 4 | 4 | 25 | 2 | 15 | 5 |
| | 1,2 - | 1,8 | - | | 6 | 6 | 25 | 2 | 15 | 5 |
| | 1,8 - | 2,7 | - | | 10 | 10 | 25 | 4 | 15 | 5 |
| | 2,7 - | 4 | - | | 16 | 10 | 25 | 4 | 15 | 5 |
| | 4 - | 6 | 7 - 10,5 | | 20 | 16 | 25 | 6 | 15 | 5 |
| | 6 - | 9 | 10,5 - 15,5 | | 35 | 25 | 35 | 10 | 25 | 5 |
| | 8 - | 11 | 14 - 19 | | 35 | 25 | 35 | 16 | 30 | 5 |
| | 10 - | 14 | 18 - 24 | | 50 | 35 | 63 | 16 | 40 | 5 |
| 13 - | 18 | 23 - 31 | | 50 | 35 | 63 | 20 | 50 | 5 | |
| 17 - | (23)24 | 30 - (40)41 | | 63 | 50 | 63 | 25 | 60 | 5 | |
| (22)23 | -(30)32 | (38)40 | -(52)55 | 80 | 63 | 80 | 35 | 70 | 5 | |
| U3/42 | 10 - | 14 | 18 - 24 | | 50 | 35 | 80 | 16 | 40 | 5 |
| | 14 - | 20 | 24 - 35 | | 63 | 50 | 80 | 25 | 60 | 5 |
| | 20 - | 28 | 35 - 48 | | 80 | 63 | 80 | 35 | 80 | 5 |
| | 28 - | 42 | 48 - 73 | | 100 | 80 | 150 | 50 | 110 | 5 |
| U3/74 | 20 - | 28 | 35 - 48 | | 100 | 80 | 150 | 35 | 80 | 5 |
| | 28 - | 42 | 48 - 73 | | 125 | 100 | 150 | 50 | 110 | 5 |
| | 40 - | 52 | 70 - 90 | | 160 | 100 | 150 | 63 | 200 | 5 |
| | 52 - | 65 | 90 - 112 | | 160 | 125 | 150 | 80 | 250 | 10 |
| | 60 - | 74 | 104 - 128 | | 160 | 125 | 150 | 80 | 250 | 10 |
| U85 | 60 - | 90 | 104 - 156 | | | | | | 300 | 10 |
| | 80 - | 120 | 140 - 207 | | | | | | - | 10 |
| U180, U320 U800 | all ranges | | | | For short circuit protecting overload relays with current transformer use fuse according to the contactor of the combination. | | | | - | - |

Tripping Characteristics for U3/32, U3/42, U3/74 and U12/16E

Detailed tripping times for each range see table page 106

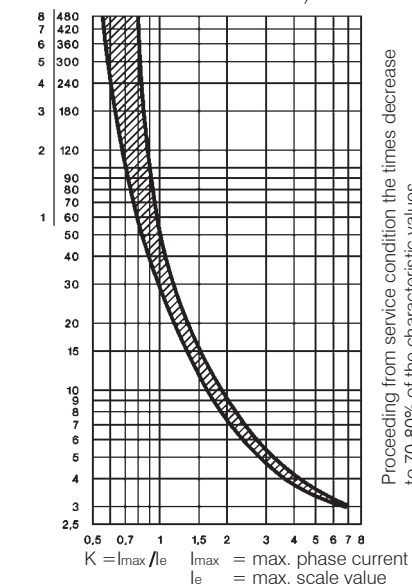
with three-phase load

Tripping time (Average value of typical tolerance curves from cold condition)



with two-pole load

Tripping time (Typical tolerance curve from cold condition)



1) Coordination-type according to IEC 947-4-1:
"2": Light contact welding accepted. Thermal overload relay must not be damaged.
"1": Welding of contactor and damage of the thermal overload relay allowed.

2) Miniature fuse

3) Suitable for use on a capability of delivering not more than

Thermal Overload Relays

Data according to IEC 947-4-1, IEC 947-5-1, VDE 0660, EN 60947-4-1, EN 60947-5-1

| Type | U3/32 | U12/16 ⁶⁾ | U3/42 | U3/74 | U85 | U180 | U320 | U800 | UAT21 | UAT22 | UAT23 | |
|--|---|----------------------|-------------------------------|------------------------|--------------------|--------|----------|---------------------|-----------------|------------------------|--------|--------|
| Rated insulation voltage $U_i^{1)}$ | V~ | 690 | 690 | 690 | 690 | 750 | 690 | 1000 | 690 | 690 | 690 | |
| Permissible ambient temperature | | | | | | | | | | | | |
| operation | open °C | | | -25 to +60 | | | | -25 to +55 | | -25 to +60 | | |
| storage | °C | | | -50 to +70 | | | | -40 to +70 | | -50 to +70 | | |
| Trip class according to IEC 947-4-1 10A | 10A | 10A | 10A | 10A | 20 | 10A | 10A | 10 | 30 | 30 | 30 | |
| Cable cross-section | | | | | | | | | | | | |
| main connector | solid or stranded mm ² | 0,75-6 | 0,75-6+0,75-2,5 ²⁾ | 0,75-10 | 4-35 ²⁾ | 3) | 7) | - | 7) | 0,5-10 | 0,5-16 | 0,5-25 |
| | flexible mm ² | 1-4 | 0,75-4+0,5-2,5 ²⁾ | 0,75-6 | 6-25 ²⁾ | | | | | 0,5-6 | 0,5-10 | 0,5-16 |
| | flexible with multicore cable end mm ² | 0,75-4 | 0,5-2,5+0,5-1,5 | 0,75-6 | 4-25 | | | | | 0,5-6 | 0,5-10 | 0,5-16 |
| Cables per clamp | number | 2 | 1+1 | 2 | 1 | | | | | 1 | 1 | 1 |
| auxiliary connector | solid mm ² | | | 0,75-2,5 ²⁾ | | | | 1-2,5 ²⁾ | | 0,75-2,5 ²⁾ | | |
| | flexible mm ² | | | 0,5-2,5 ²⁾ | | | | 1-2,5 ²⁾ | | 0,5-2,5 ²⁾ | | |
| | flexible with multicore cable end mm ² | | | 0,5-1,5 | | | | 1-2,5 ²⁾ | | 0,5-1,5 | | |
| Cables per clamp | number | | | 2 | | | | 2 | | 2 | | |
| Type | U3/32 | U12/16A | U12/16E | U12/16EQ | U3/42 | U85 | U180 | U800 | UAT21 | UAT22 | UAT23 | |
| Auxiliary contacts | | | | | | | | | | | | |
| Rated insulation voltage $U_i^{1)}$ | | | | | | | | | | | | |
| same potential | V~ | 690 | 690 | 690 | 690 | 690 | 690 | 500 | 690 | | | |
| different potential | V~ | 440 | - | 440 | 440 | 250 | 440 | 500 | 440 | | | |
| Utilization category AC15 | | | | | | | | | | | | |
| Rated operational current I_e | 24V A | 3 | 4 | 5 | 5 | 4 | 5 | 3 | 4 ⁵⁾ | 5 | | |
| | 230V A | 2 | 2,5 | 3 | 3 | 2,5 | 3 | 2 | 2,5 | 3 | | |
| | 400V A | 1 | 1,5 | 2 | 2 | 1,5 | 2 | 1 | 1,5 | 2 | | |
| | 690V A | 0,5 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,5 | 0,6 | 0,6 | | |
| Utilization category DC13 | | | | | | | | | | | | |
| Rated operational current I_e | 24V A | 1 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | | |
| | 110V A | 0,15 | 0,15 | 0,15 | 0,15 | 0,15 | 0,15 | 0,15 | 0,15 | 0,15 | | |
| | 220V A | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | | |
| Short circuit prot. (without welding 1kA) | | | | | | | | | | | | |
| highest fuse rating | gL (gG) A | 4 | 4 | 6 | 6 | 6 | 6 | 4 | 6 | 6 | | |
| Type | U3/32 | U12/16 | U12/16E | U3/42 | U3/42 | U3/74 | U3/74 | U85 | | | | |
| Setting range | all | to 23A | 22 - 30A | to 28A | 28 - 42A | to 52A | 52 - 65A | all | | | | |
| Power loss per current path (max.) | | | | | | | | | | | | |
| minimum setting value | W | 1,1 | 1,1 | 1,7 | 1,3 | 1,3 | 2,0 | 1,1 | | | | |
| maximum setting value | W | 2,3 | 2,3 | 3,7 | 2,6 | 3,3 | 3,7 | 2,5 | | | | |

Data according to cULus

| Type | U3/32 | U12/16A | U12/16E | U12/16EQ | U3/42 | U3/74 | U85 |
|---------------------------------|-------|---------|---------|----------|-------|-------|-----|
| Rated insulation voltage | V~ | 600 | 600 | 600 | 600 | 600 | 600 |
| Rated current | A | 32 | 23 | 23 | 23 | 42 | 85 |
| Auxiliary contacts | | | | | | | |
| Rated voltage | | | | | | | |
| same potential | V AC | 600 | 600 | 600 | 600 | 600 | 600 |
| different potential | V~ | 150 | - | 150 | 150 | 150 | 150 |
| Switching capacity AC | | | | | | | |
| of aux. contacts | VA | 500 | 500 | 500 | 500 | 600 | 600 |
| | A | 2 | 3 | 4 | 4 | 4 | 4 |

Temperature Compensation

In case of higher ambient temperature use the following formula:
 (Ambient temperature - 20) x 0,125 = correction factor in % of the full load motor current

Example: Ambient temperature 70°C, full load motor current 7A
 (70 - 20) x 0,125 = 6,25%
 Setting value: 7A + 6,25% = 7,44A

1) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): $U_{imp} = 4kV$ (at 440V), 6kV (at 690V).
 Data for other conditions on request.

2) Maximum cable cross-section with prepared conductor

3) Without terminals, suitable for bushing one connector 70mm² (stranded) per phase

4) Switching capacity of the start contact: AC15 300VA, max. 1,5A, DC13 (max. 220V) 30W, max. 1,5A

5) Switching capacity of the make contact: AC15 400VA, max. 1,7A, DC13 (max. 220V) 10W, max. 1A

6) U12/16E 30: Cable cross-section for main connector like type U3/42, one connector only

7) Busbar sets see accessories page 103

Thermal Overload Relays

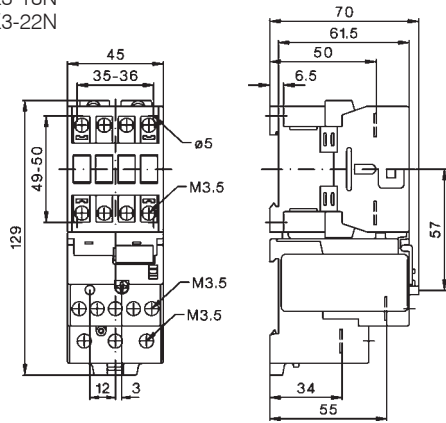
Dimensions

K3-10N + U3/32

K3-14N

K3-18N

K3-22N

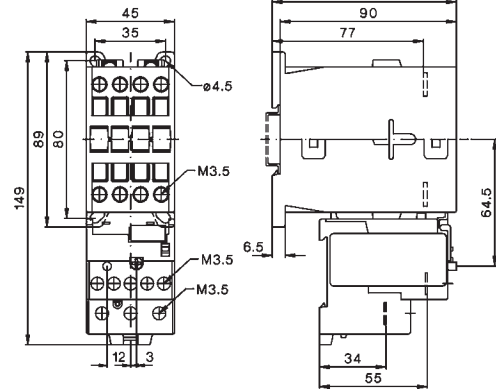


KG3-10 + U3/32

KG3-14

KG3-18

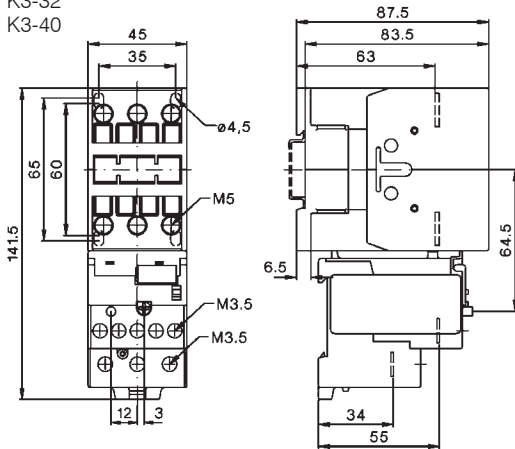
KG3-22



K3-24 + U3/32

K3-32

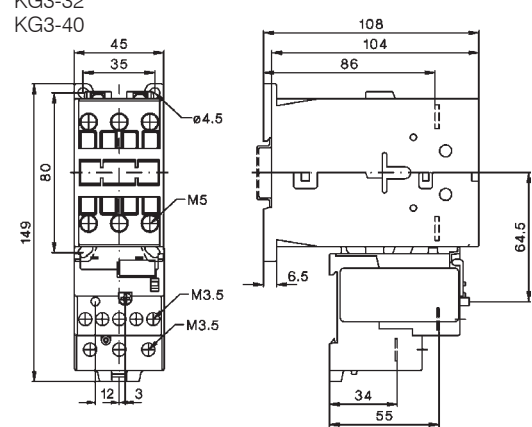
K3-40



KG3-24 + U3/32

KG3-32

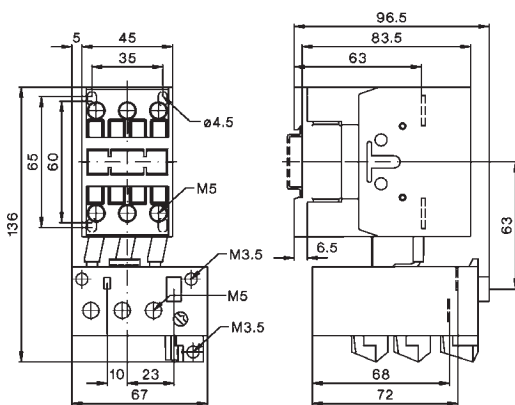
KG3-40



K3-24 + U3/42

K3-32

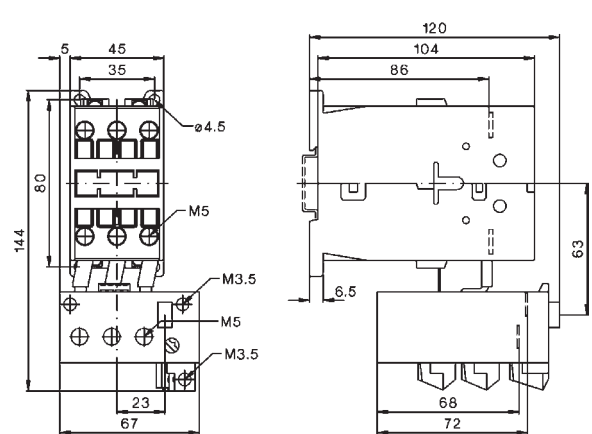
K3-40



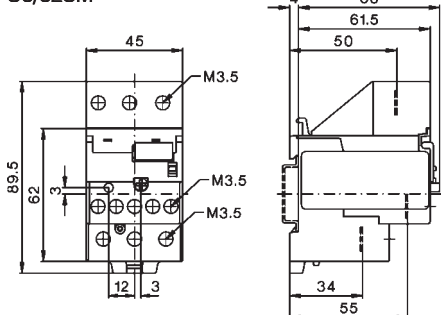
KG3-24 + U3/42

KG3-32

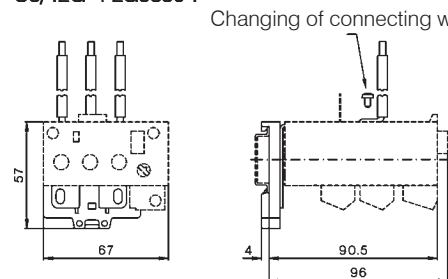
KG3-40



U3/32SM



U3/42G + LG5830-



Changing of connecting wire with 1,8Nm