

Motor protection circuit breaker

- For thermal and magnetic protection of AC and DC motors
- Conformity to standards IEC 947-2, IEC 947-4-1 and VDE 0660
- Manual push-button operation
- Setting ranges from 0.1 to 25A at 690V AC and 220V DC
- Short-circuit capacity of 65kA up to setting range of 1.6-2.5A/400V

Standards

IEC 947-2
IEC 947-4-1
VDE 0660

Approvals



UL



CSA



CE

- Trip class 10
- Instant magnetic tripping (12 times the maximum operating current Ie)
- Single phase protection
- Ambient temperature compensation between - 5° C and + 40° C
- Internal and external accessories easy to mount
- Quick fixing on DIN rail EN 50022-35 and, with two screws, on plate or wall
- Terminals protected against accidental contacts (IP20)
- Suitable for isolation () and positive padlocking in open position (IEC 947-1 § 7-1-6)

Motor protection circuit breakers



| 3-phase motor AC3 380/415V kW | Magnetical tripping current A | Thermal tripping current (setting range) | | Cat. no. | Ref. no. | Pack |
|-------------------------------------|----------------------------------|--|-----------|----------|----------|------|
| | | Min. A | Max. A | | | |
| 0.02 | 1.9 | 0.1 | 0.16 | SFK0A | 120001 | 1/5 |
| 0.06 | 3.0 | 0.16 | 0.25 | SFK0B | 120002 | 1/5 |
| 0.06 / 0.09 | 4.8 | 0.25 | 0.4 | SFK0C | 120003 | 1/5 |
| 0.12 / 0.18 | 7.5 | 0.4 | 0.63 | SFK0D | 120004 | 1/5 |
| 0.25 | 12 | 0.63 | 1 | SFK0E | 120005 | 1/5 |
| 0.37 / 0.55 | 19 | 1 | 1.6 | SFK0F | 120006 | 1/5 |
| 0.75 | 30 | 1.6 | 2.5 | SFK0G | 120007 | 1/5 |
| 1.1 / 1.5 | 48 | 2.5 | 4 | SFK0H | 120008 | 5 |
| 2.2 | 75 | 4 | 6.3 | SFK0I | 120009 | 5 |
| 3.7 / 4.0 | 120 | 6.3 | 10 | SFK0J | 120010 | 5 |
| 5.5 / 7.5 | 190 | 10 | 16 | SFK0K | 120011 | 5 |
| 9.0 | 240 | 16 | 20 | SFK0L | 120012 | 1/5 |
| 11 / 12.5 | 300 | 20 | 25 | SFK0M | 120013 | 1/5 |

Circuit breaker to protect transformers on request

Technical data

General

| | |
|-------------------------------------|-----------------------------|
| Rated thermal current (Ith) at 40°C | 25A |
| Rated insulation voltage (Ui) | 690V |
| Rated operational voltage (Ue) AC | 690V, 40/60Hz |
| (see application diagram) DC | 220V, with or without earth |

Standards

| | | |
|-----------|-------------|----------|
| IEC 947-2 | IEC 947-4-1 | VDE 0660 |
|-----------|-------------|----------|

Approvals

| | |
|----|-----|
| UL | CSA |
|----|-----|

Main circuit

| | |
|---|----------------------------|
| Category | AC3, DC4 |
| Operational frequency limits | 40 to 60 Hz |
| Opening time | aprox. 7 ms |
| Mechanical endurance | 10 ⁵ operations |
| Electrical endurance category AC3 | 10 ⁵ operations |
| Maximum operating rate | 40 operations/hour |
| Total dissipated power at rated thermal current and hot state | 6 W |

Tripping characteristics

| | |
|--|--|
| Thermal | |
| Symmetrical overloads | Class 10 (see curve 1, tripping curves) |
| Asymmetrical overloads (phase failure) | To IEC 947-4-1 (see curve 2, tripping curves) |
| Temperature compensation | - 5 to + 40°C |

Magnetic

| | |
|--|--|
| | 12 × Ie (Ie = max. thermal setting value) |
|--|--|

Shunt release

| | |
|--------------------------|------------------------------------|
| Operating voltage limits | 0.7 - 1.2 Ue 100% ED |
| Consumption | AC 1 W DC 0.85 - 1.1 Ue 100% ED |

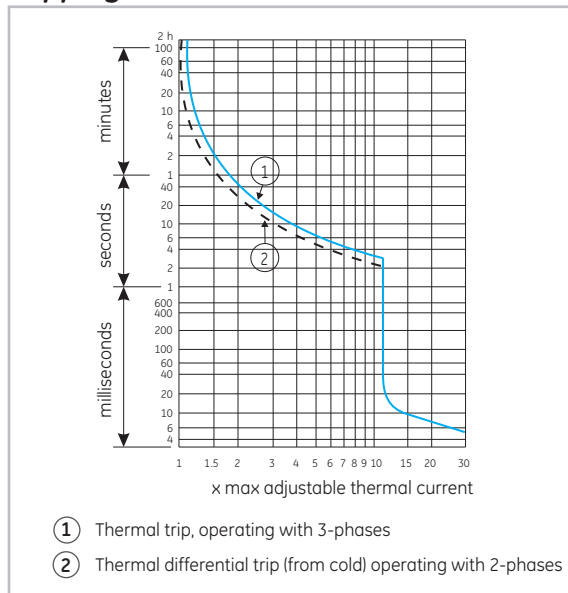
Undervoltage release

| | |
|--------------------------|----------------|
| Operating voltage limits | 0.75 - 0.35 Ue |
| Breaking voltage limits | 2.2 VA |
| Consumption | 1 W |

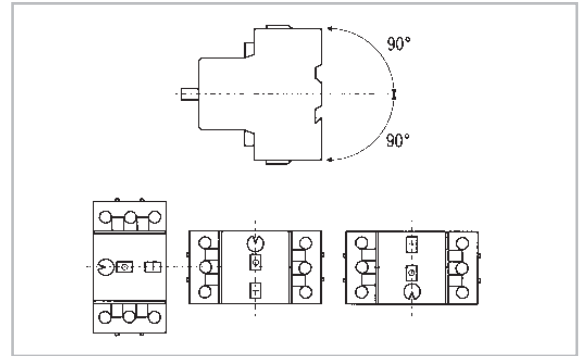
Wiring capacity

| | | |
|---------------|------|--------------------------------|
| Rigid wire | min. | 2 wires of 0,75mm ² |
| | max. | 2 wires of 6mm ² |
| Flexible wire | min. | 2 wires of 0,75mm ² |
| | max. | 2 wires of 4mm ² |

Tripping curve



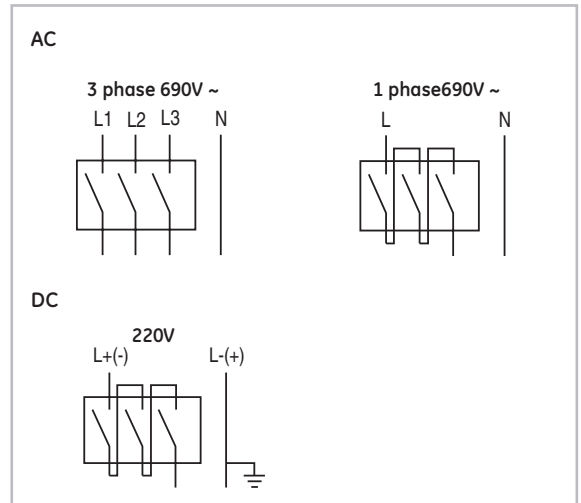
Mounting positions



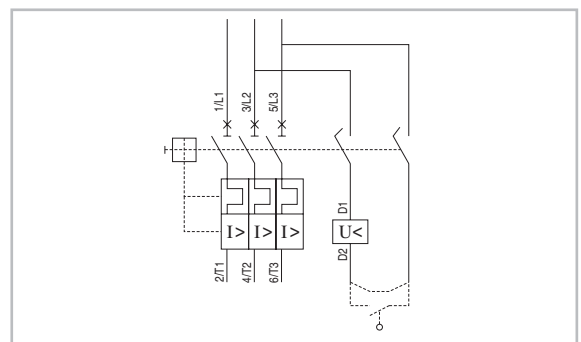
Auxiliary contact blocks

| | SFAL | SFAI - SFAK |
|--|---|---|
| Rated insulation voltage (Ui) according VDE 0110 | 500V | 500V |
| Rated thermal current (Ith) | 6A | 6A |
| AC-15 | Ue 230V 400V 500V Ie 3,5A 2A 1A | 230V 400V 500V 2A 1A 0,5A |
| DC-13 | Ue 60V 110V 220V Ie 1,5A 1A 0,5A | 60V 110V 220V 0,7A 0,55A 0,25A |
| Protective fuse gl | 6A | 6A |
| Wiring capacity, Flexible wire | min. 2 × 0.75mm ² max. 2 × 2.5mm ² | 2 × 0.75mm ² 2 × 2.5mm ² |
| Terminal type | M3,5, Pozidriv, safety flange screws | |

Wiring diagram



Application diagram for tooling machines



Short-circuit breaking capacity Icu/Ics according to IEC 947-2

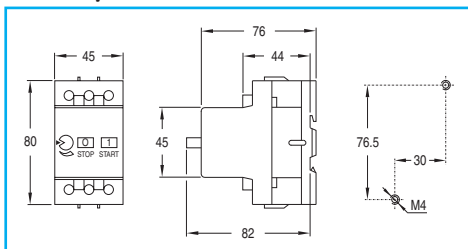
| Thermal adjustment (A) | 230V AC / 220V DC ⁽¹⁾ | | | | 400V AC | | | | 415V AC | | | | 500V AC | | | | 690V AC | | | |
|------------------------|----------------------------------|----------|----------|-------------------------|--------------------|----------|----------|-------------------------|--------------------|----------|----------|-------------------------|--------------------|----------|----------|-------------------------|--------------------|----------|----------|-------------------------|
| | 3ph motor AC3 (kW) | Icu (kA) | Ics (kA) | Fuse ⁽²⁾ (A) | 3ph motor AC3 (kW) | Icu (kA) | Ics (kA) | Fuse ⁽²⁾ (A) | 3ph motor AC3 (kW) | Icu (kA) | Ics (kA) | Fuse ⁽²⁾ (A) | 3ph motor AC3 (kW) | Icu (kA) | Ics (kA) | Fuse ⁽²⁾ (A) | 3ph motor AC3 (kW) | Icu (kA) | Ics (kA) | Fuse ⁽²⁾ (A) |
| 0.1 - 0.16 | - | 65 | 65 | (3) | 0.02 | 65 | 65 | (3) | 0.02 | 65 | 65 | (3) | 0.04 | 65 | 65 | (3) | 0.06 | 42 | 42 | (3) |
| 0.16 - 0.25 | - | 65 | 65 | (3) | 0.06 | 65 | 65 | (3) | 0.06 | 65 | 65 | (3) | 0.06 | 65 | 65 | (3) | 0.12 | 42 | 42 | (3) |
| 0.25 - 0.4 | 0.06 | 65 | 65 | (3) | 0.09 | 65 | 65 | (3) | 0.12 | 65 | 65 | (3) | 0.12 | 65 | 65 | (3) | 0.18 | 42 | 42 | (3) |
| 0.4 - 0.63 | 0.09 | 65 | 65 | (3) | 0.12 | 65 | 65 | (3) | 0.18 | 65 | 65 | (3) | 0.25 | 65 | 65 | (3) | 0.37 | 42 | 42 | (3) |
| 0.63 - 1 | 0.12 | 65 | 65 | (3) | 0.25 | 65 | 65 | (3) | 0.25 | 65 | 65 | (3) | 0.37 | 65 | 65 | (3) | 0.75 | 1 | 1 | 20 |
| 1 - 1.6 | 0.25 | 65 | 65 | (3) | 0.55 | 65 | 65 | (3) | 0.55 | 65 | 65 | (3) | 0.75 | 65 | 65 | (3) | 1.1 | 1 | 1 | 20 |
| 1.6 - 2.5 | 0.37 | 65 | 65 | (3) | 0.75 | 65 | 65 | (3) | 0.75 | 10 | 5 | 25 | 1.1 | 3 | 1.5 | 25 | 1.5 | 1 | 0.5 | 20 |
| 2.5 - 4 | 0.75 | 65 | 65 | (3) | 1.5 | 10 (4) | 5 (4) | 35 | 1.5 | 10 | 5 | 35 | 2.2 | 3 | 1.5 | 35 | 3 | 1 | 0.5 | 25 |
| 4 - 6.3 | 1.1 | 65 | 37.5(4) | (3) | 2.2 | 10 (4) | 5 (4) | 50 | 2.2 | 10 | 5 | 50 | 3 | 3 | 1.5 | 50 | 4 | 1 | 0.5 | 35 |
| 6.3 - 10 | 2.2 | 10 (4) | 5 (4) | 80 | 4 | 4 (4) | 2 (4) | 80 | 4 | 4 | 2 | 80 | 5.5 | 3 | 1.5 | 50 | 7.5 | 1 | 0.5 | 35 |
| 10 - 16 | 4 | 6 (4) | 3 (4) | 80 | 7.5 | 4 (4) | 2 (4) | 80 | 7.5 | 3.5 | 1.75 | 80 | 9 | 3 | 1.5 | 63 | 11 | 1 | 0.5 | 35 |
| 16 - 20 | 5 | 6 (4) | 3 (4) | 80 | 9 | 4 (4) | 2 (4) | 80 | 9 | 2.5 | 1.25 | 80 | 11 | 1.5 | 0.75 | 63 | 15 | 1 | 0.5 | 50 |
| 20 - 25 | 5.5 | 6 (4) | 3 (4) | 80 | 11 | 4 (4) | 2 (4) | 80 | 12.5 | 2.5 | 1.25 | 80 | 15 | 1.5 | 0.75 | 63 | 22 | 1 | 0.5 | 50 |

Icu = Ultimate short-circuit breaking capacity
Ics = Service short-circuit breaking capacity

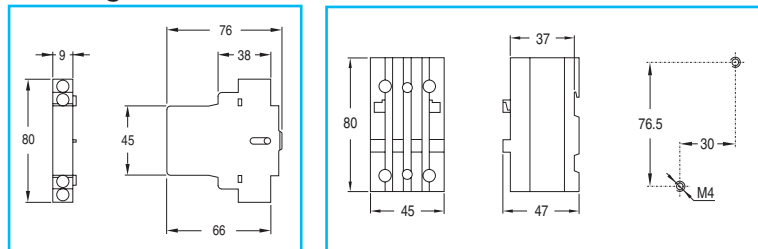
- (1) At 220V, t = 15 ms
- (2) Maximum value of the fuses when the presumed short circuit current is higher than the breaking capacity of the device. Type D, slow or NH type gG/gL.
- (3) No back-up fuse required to the Icu value
- (4) 50 kA in combination with current limiter

Dimensional drawings

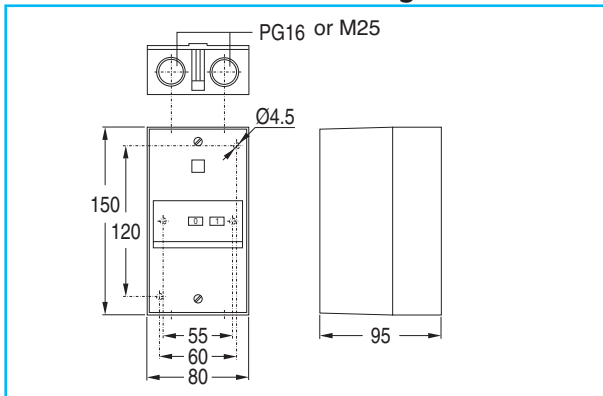
Motor protection circuit breaker



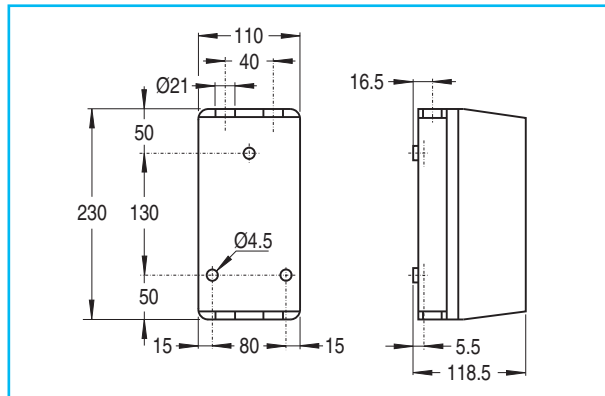
Auxiliary contact block Current limiter



Enclosures: surface mounting



Enclosure to combine with contactor



Enclosures: flush mounting

