

MCB News 2014



## Contents

|   |    |
|---|----|
| ■ <b>MERKUR</b> Electrotechnology                 | 3  |
| ■ Mini Circuit Breakers MGM-18 Series             | 4  |
| ■ Mini Circuit Breakers MGM-18 Accessories        | 8  |
| ■ Mini Circuit Breakers MGM-18 ELCB               | 10 |
| ■ Disconnecter Switch MGH-18 Series               | 13 |
| ■ Residual Current Device MGFIN Series            | 15 |
| ■ Motor protection circuit breaker MGEA Series 17 | 17 |

# MERKUR Electrotechnology



Ulrich Scheller  
Export Manager

For over 100 years – since the time of Werner von Siemens – German Technology is renown for outstanding innovation and technical leadership. **MERKUR**® Ueberseehandel GmbH is committed to this long tradition.

Under **MERKUR**® German Technology we develop and produce warranted, durable high quality products in the following segments:

- Electrotechnology
- **DUPROLUX**® Lighting
- Metering
- Power Distribution
- Climatisation
- Renewable Energy

**MERKUR**® clients worldwide can rely on our vast experience. We offer authorised distributors competitive prices better allowing them to compete in the market. We also successfully cooperate with contractors who are bidding for public utility tenders.

**MERKUR**® is a reliable partner with a tradition of providing individually tailored products and solutions in accordance with customers' needs. Contact us and we gladly assist you with more details about our products and services. Get in touch with us!

Export Manager

# Mini Circuit Breakers MGM-18 Series



## MERKUR Mini Circuit Breaker MGM-18 Series

### Application

This circuit breaker is applied to protect the over-current of electrical apparatus and circuit device of construction and similar buildings in the circuit of AC 50Hz, rated voltage 230V/400V and max rated current 63A. It can also be applied as the infrequent making-breaking operation.

### Main technical parameter

- Frame size rated current  $I_{nm}$ : 63A
- Rated voltage  $U_e$ : 50Hz, 230V/400V.
- Rated current  $I_n$ : 1, 2, 4, 6, 10, 16, 20, 25, 32, 40, 50, 63A.
- Rated limit short circuit breaking capacity  $I_{cu}$ : 10000A.
- Rated limit operation breaking capacity  $I_{cs}$ : 7500A.
- Pole number: 1P, 1P+N, 2P, 3P+N, 4P.
- Mechanical lifetime: 20000 times.
- Electric lifetime: 8000 times.
- Type of instantaneous release and releasing current range:
  - B type  $3I_n \sim 5I_n$ ;
  - C type  $5I_n \sim 10I_n$ ;
  - D type  $10I_n \sim 50I_n$

# Mini Circuit Breakers MGM-18 Series

## More reliable structure design

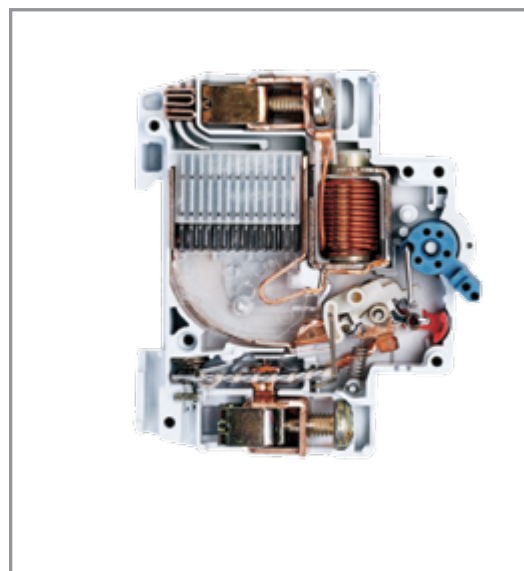
The mini circuit breaker use high accuracy bi-metal for inverse time lag thermal protection element, accurate protection characteristic. The operating mechanism is four link mechanism, small operating physical force, reliable tripping, high sensitivity;

Instantaneous trip, electromagnet, light moving iron core, small interval, quick response, high sensitivity, inner store structure, absolutely no lock phenomena, enhance the reliability much;

Changed the moving contact from crossbeam type to erect type, added rigidity, which ensures the contacts switch in on at a thermal state. Small bulk of moving contact, small operating interval, which ensures the speed of moving contact after break off, in favor of arc distract quickly;

The mini circuit breaker uses big arc chute, arc's track connected by iron acr runner, decreased the arc resistance, it can avoid intercept, 13 pieces grill, the arc can be cut, cooling, extinguish, sprying arc lip use multilayer grill can cooling, extinguish arc more, mostly ensured zero arcing. It can avoid the arc short circuit between poles;

Arc chute protected by special organic material, it will bring a lot of insulating material smoke at high temperature, enhance of the pressure. Controlling the cascade direction of metal smoke in effect, the insulating material smoke can cooling the arc fan and enhance the arc resistance and voltage, it ensured arc extinguish quickly. The insulation material also avoid the cases burning loss, ensured the products high insulation performance.



The mini circuit breaker is well current limiting, very short of arcing time, long life, reliable performance; has obvious position state indicate; reasonable of structure design, so power supply input wire can random choose; connecting terminal adopt frame construction, no matter soft, rigidity leads are can hard connect; complete accessories, the mini circuit breaker can with auxiliary contact, alarm contact, shunt release, undervoltage release and residual current operating protector module etc. They are facility for intelligentize apply.

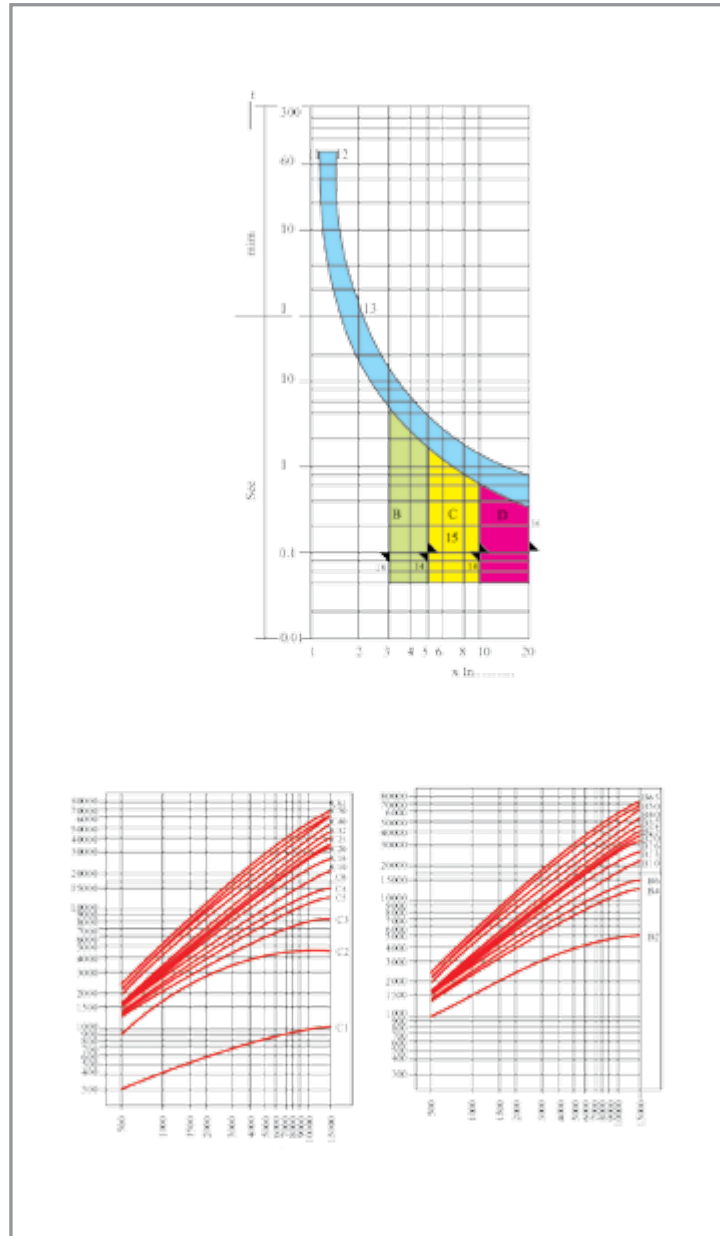
# Mini Circuit Breakers MGM-18 Series

## Normal working condition

- The maximum ambient temperature should be  $-5^{\circ}\text{C}$  –  $+40^{\circ}\text{C}$ .
- Average temperature should be  $\leq 35^{\circ}\text{C}$  at 24h.
- The altitude of installation place should not exceed 2000m.
- The relative humidity should not exceed 50% at  $40^{\circ}\text{C}$ , it permits higher relative humidity when at a higher temperature, the average maximum relative humidity should not exceed 90% at maximum humidity month, and this months average minimum temperature does not exceed  $+25^{\circ}\text{C}$ , and it should take consideration of the condensation on the product's surface for temperature change.

## Installation type

- The mini circuit breaker is installed by standard mounting rail.
- The mini circuit breaker is upright installation, knob upwards is switch on position.
- The installation place is not of obviously impact and librate.



# Mini Circuit Breakers MGM-18 Series

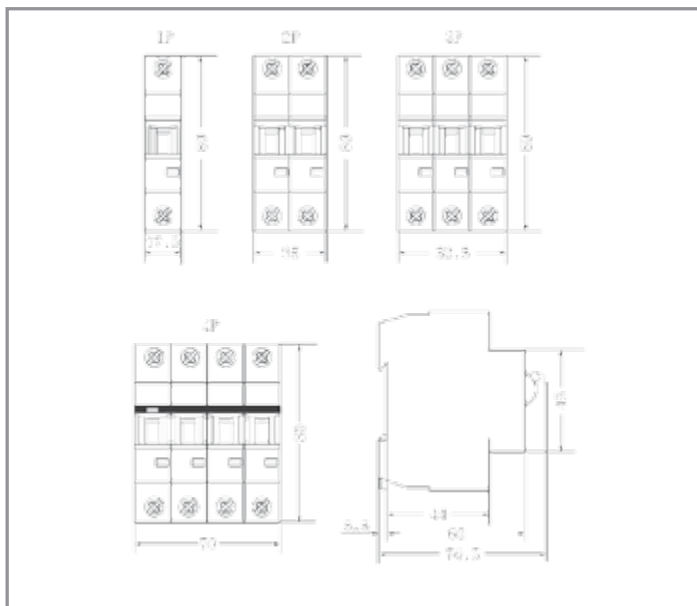
## Tripping characteristic type and application range of breaker

| Type | Tripping characteristic  | Application range                               |
|------|--|---|
| B    | Characteristic B is used in a case where needs shorter tripping time and lower short-circuit current. The allowed short time overload current is $<3 I_n$ .  | Protection against transformer's second circuit |
| C    | Characteristic C is applied in most electric circuit where permit higher short-time load current (Max is $5I_n$ ) and miniature breaker has no action.   | Protection against general electric circuit     |
| D    | Characteristic D is introduced in switch equipment that allows very high short-time load current ( $<10I_n$ ), such as protection against transformers first circuit and electromagnetic valve etc | Protection against Transformer's first circuit  |

## Tripping characteristic

|                   |    | B                 | C                 | D                   | Tripping time |
|-------------------|----|-------------------|-------------------|---------------------|---------------|
| Thermal tripping  | I1 | $1.13 \times I_n$ | $1.13 \times I_n$ | $1.13 \times I_n W$ | $\geq 1h$     |
|                   | I2 | $1.45 \times I_n$ | $1.45 \times I_n$ | $1.45 \times I_n$   | $\leq 1h$     |
| Magnetic tripping | I3 | $3 \times I_n$    | $5 \times I_n$    | $10 \times I_n$     | $\geq 0.1s$   |
|                   | I4 | $5 \times I_n$    | $10 \times I_n$   | $50 \times I_n$     | $\leq 0.1s$   |

## Contour and installation dimension



# Mini Circuit Breakers MGM-18 Accessories



## MERKUR Mini Circuit Breakers MGM-18 accessories

This series accessories should be combined with MGM-18 circuit breakers only.



There are accessories:

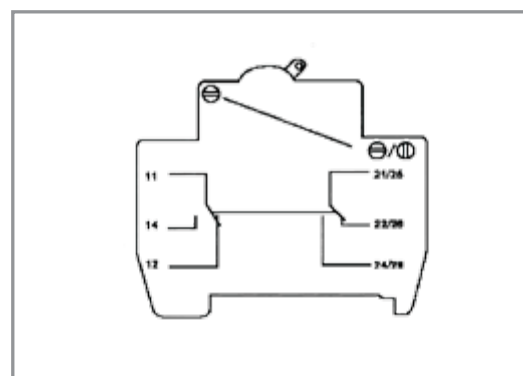
- MGM18-630-F: auxiliary contact
- MGM18-630-FB: auxiliary contact
- MGM18-630-FL: shunt release
- MGM18-630-QY: under-voltage release

MGM-18-630-FL shunt releases rated control power supply voltage ( $U_s$ ) is AC 50Hz, 24V-60V, 100V-400V, DC 24V-60V, 100V-220V. When the applied voltage is  $70\%U_s$ - $110\%U_s$ , shunt release can operate, make the circuit breaker break.

MGM18-630-QY under-voltage releases rated voltage ( $U_e$ ) is divided into 230V and 400V. When the applied voltage is  $70\%U_e$ - $35\%U_e$ , release can operate, make the circuit breaker break;

when the applied voltage is under  $35\%U_e$ , release can prevent the circuit breaker to close; when the applied voltage is  $85\%U_e$ - $110\%U_e$ , release can make the circuit breaker break.

MGM18-630-FB auxiliary alarm contact, has two groups switchover contact, when the yellow indication at , Two groups to auxiliary contact, when the yellow indication at , left is auxiliary contact, right is alarm contact.





# Mini Circuit Breakers MGM-18 Accessories

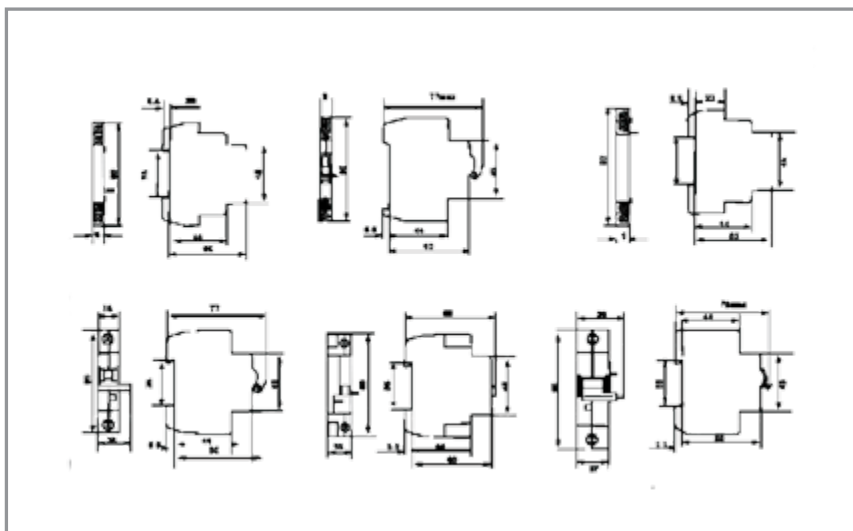
## Main technical parameter (MGM18-630-F)

| Using type | Ue V | Ie A | Contact number |
|------------|------|------|----------------|
| AC-13      | 230  | 6    | 1NO+1NC        |
|            | 400  | 2    |                |
| DC-13      | 60   | 4    |                |
|            | 110  | 2    |                |
|            | 220  | 0.5  |                |

## Main technical parameter (MGM18-630-FB)

| Using type | Ue V | Ie A | Contact number                  |
|------------|------|------|---------------------------------|
| AC-13      | 230  | 2    | Two groups of transform contact |
| AC-15      | 230  | 1    |                                 |
| DC-12      | 220  | 0.5  |                                 |

## Contour and installation dimension



### When you place an order, please note

:

Circuit breaker assemble with accessories, not only specify the circuit breaker model No., specifications, quantity, also should specify accessories model No., name, quantity, assemble type.

When you place the order for accessories, please specify the model No., name, quantity, thereinto, the shunte release, under-voltage release should have rated voltage.

# Mini Circuit Breakers MGM-18 ELCB



## MERKUR MGM-18 Series Earth Leakage Mini Circuit Breaker

power supply neutral point earthing. Main use in protect of person get an electric shock and protect the buildings circuit devices over current, it also can protect the earthing fault.

### Application

The ELCB apply to the circuit of AC 50Hz with rated voltage up to 400V, rated current up to 50A,

The ELCB is according with IEC61009-1:1991, GB16917.1-1997 standard.

### Main specification

| Frame case grade rated current Inm (A) | Pole | Add neutral wire | Rated residual operating current I <sub>n</sub> (mA) | Rated residual non operating current I <sub>n</sub> (mA) | Rated short circuit breaking capacity |      |      | Rated residual switch on breaking capacity (A) | Over current instantaneous release type |
|--|------|------------------|--|--|---------------------------------------|------|------|--|---|
|  |      |                  |  |  | Rate                                  | Rate | Rate |  |   |
| 50                                     | 1    | N                | 1N0+1NC  | 30, 50, 100, 300   | 230                                   | 1000 | 0,5  | 3000   | B, C, D (D type In up to 40A)           |
|  | 2    |                  |  |  |                                       |      |      |  |   |
|  | 3    | N                |  |  |                                       |      |      |  |   |
|  | 4    |                  |  |  |                                       |      |      |  |   |
| 40                                     | 1    | N                | 6, 10, 16, 20, 25, 32, 40                            | 30, 50, 100, 300   | 230                                   | 1000 | 0,5  | 3000   | B, C, D (D type In up to 20A)           |

# Mini Circuit Breakers MGM-18 ELCB

## ELCB s residual current breaking time

| Type             | I $\Delta$ n(mA) | In (A) | Maximum(residual current) breaking time |     |      |       |      |
|------------------|------------------|--------|---|-----|------|-------|------|
|                  |                  |        | I/n                                     | I/n | I/n  | 250mA | I/t  |
| Indirect conatct | $\geq 30$        | Any    | 0.2                                     | 0.1 | 0.04 | -     | 0.04 |
| Direct conatct   | $\leq 30$        | Any    | 0.1                                     | -   | -    | 0.04  |      |

## Protection characteristic of over current release

| Release type     |    | A      | B      | C      | Tripping time |
|------------------|----|--------|--------|--------|---------------|
| Thermal release  | I1 | 1.13In | 1.31In | 1.31In | $\geq 1h$     |
|                  | I2 | 1.45In | 1.45In | 1.45In | $\leq 1h$     |
| Magnetic release | I4 | 3In    | 7In    | 7In    | $\geq 0.1s$   |
|                  | I5 | 5In    | 153In  | 153In  | $\leq 0.1s$   |

## Other protection

The ELCB not only has earth leakage protection function, it also can protect the power network fault to bring voltage risen much. Over voltage set up value  $U_{vo}=280V$ , set up range  $U_{vo}5\%$  (just for rated voltage is AC 230V circuit).

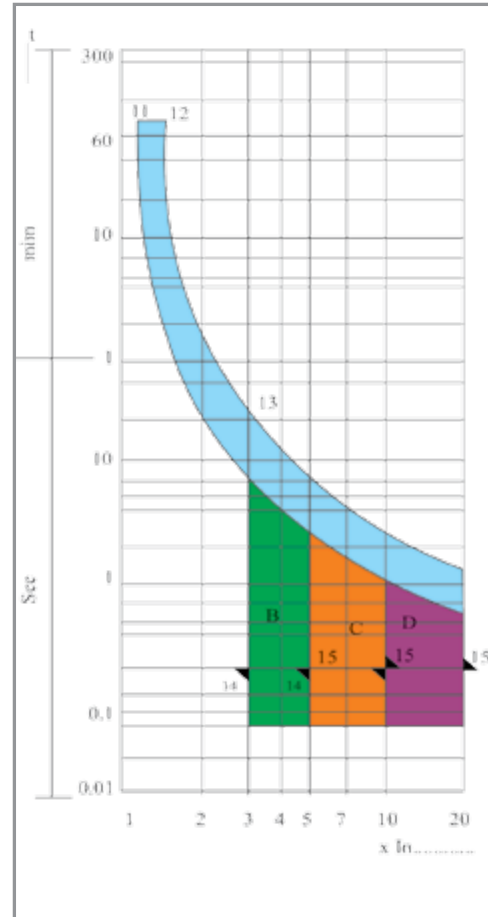
# Mini Circuit Breakers MGM-18 ELCB



## Structure and operating principle

MGM-18 series ELCB is current operating electronic type earth leakage circuit breaker, it consists of HUM18 high breaking capacity mini circuit breaker and earth leakage release.

When the circuit is electric leakage or a person gets an electric shock, and the electric leakage current  $I_n$  is up to operating current, the circuit breaker will switch off immediately. The ELCB also has the protection functions of electric appliance over-load and short-circuit.



# Disconnecter Switch MGH-18 Series



## MERKUR MGH-18 Series Disconnecter switch

MGH-18-series disconnecter switch is our new product, small bulk, facility installing, elegant appearance. The product is applicable to disconnect the circuit of AC 50Hz, rated voltage 230V, 400V, rated current up to 100A, it can also be used for infrequent switch on and switch off circuit. It accord with IEC60947-3 and GB14048.3 standard.

## Main technical parameter

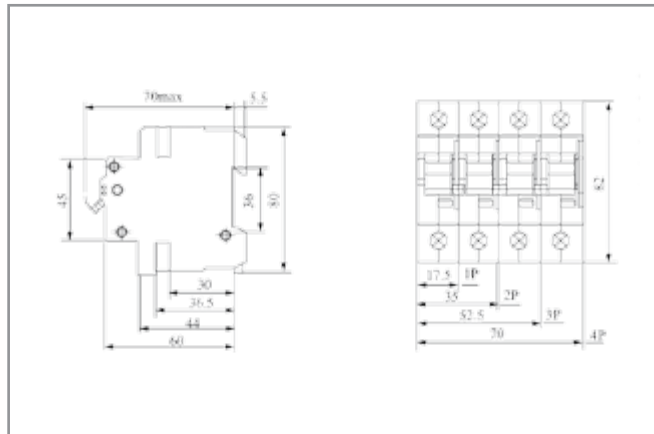
- Frame size rated current  $I_{nm}$ : 100A
- Rated voltage  $U_e$ : 50Hz, 230V/400V.
- Rated current  $I_n$ : 40A, 63A, 80A, 100A.
- Rated short time withstand capacity: 25KA (connect with 100A fuse for protection)
- Pole number: 1P, 2P, 3P, 4P.
- Life: operating cycle is 10000 times, there-into 1500 times of load; operating frequency is 120 times/h.
- Use type: AC-22
- Protection grade: IP20

# Disconnecter Switch MGH-18 Series

## Structure characteristics

The mini disconnecter switch design novel, manual operating, double breakpoint, enhanced the disconnect distance, has obvious contact switch on and switch off indication. Connecting terminal adopt upgrade type frame construction, the maximum connection lead is 50mm 2, and has two connection function. It is installed by 35mm standard mounting rail, facility installation, have locked function, avoid in error switch on and switch off, the diameter of the lock is 5.5mm.

## Contour and installation dimension



## Normal working condition

- The maximum ambient temperature should be  $-5^{\circ}\text{C}$  -  $+40^{\circ}\text{C}$ , average temperature should be  $35^{\circ}\text{C}$  at 24h.
- The altitude of installation place should not exceed 2000m.
- The relative humidity should not exceed 50% at  $40^{\circ}\text{C}$ , It permitted higher relative humidity when at higher temperature, the average maximum relative humidity should not exceed 90% at maximum humidity month, and this months average minimum temperature not exceed  $+25$ , and should take consider of the condensation on the products surface for temperature change.
- Pollution grade: 3

## Installation condition

- Installation type:
- The mini circuit breaker is installed by 35mm standard DIN rail.
- The disconnecter switch should be upright-ness installed, knob upwards is switch on position.
- The installation place should not obviously impact and librate.

## When you place an order, please note:

Please specify the model No., rated current, pole, quantity.

# Residual Current Device MGFIN Series



## MERKUR MGFIN series residual current device(RCD)

The Residual Current Device(RCD) MGFIN is in conformity with the standards of IEC 1008, VDE 0664, CEE27 and BS 4293.

It can cut off the fault circuit immediately on the occasion of shock hazard or earth leakage of

trunk line. Thus it is suitable to avoid the shock hazard and fire caused by earth leakage. MGFIN RCD is mainly suitable for using in varieties of plants, enterprises, buildings, constructions, commerce, hotels and families. It can be used in circuits up to single phase 240V, three phase 415V, 50 or 60Hz.

### Specifcator

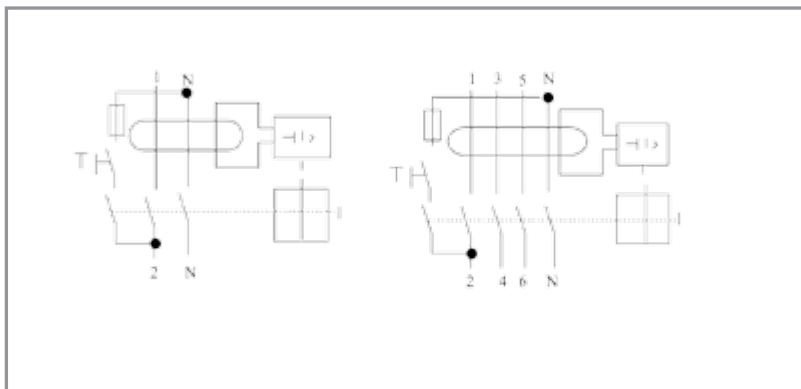
| Type  | MGFIN25             | MGFIN40 | MGFIN63       | MGFIN100 |
|---|---------------------|---------|---------------|----------|
| Rated current(A)                                  | 25                  | 40      | 63            | 100      |
| Rated operating current for earth leakage (A)     | 0.03, 0.1, 0.3, 0.5 |         | 0.1, 0.3, 0.5 |          |
| Rated non-operating current for earth leakage (A) | 0.5I n              |         |               |          |
| Voltage(V)  | 240(220) 415(380)   |         |               |          |
| Pole  | 2, 4                |         |               |          |

# Residual Current Device MGFIN Series

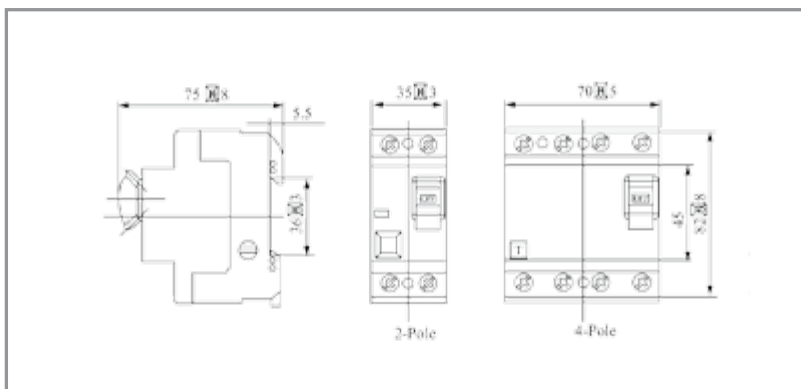
## Main technical data

|   |                  |                  |                              |
|---|------------------|------------------|------------------------------|
| Operating time(second)  | 1I <sub>Δn</sub> | 2I <sub>Δn</sub> | 0.25A<br>or 5I <sub>Δn</sub> |
|   | 0.2              | 0.1              | 0.04                         |
| Limited value of non-operating current for balanced load or unbalanced load | 2I <sub>Δn</sub> |                  |                              |
| In minimum value of rated making and breaking capacity                      | In=25            | In=40            | In=63                        |
|   | 200              | 300              | 400                          |
| Rated conditional short circuit current Inc(A)                              | 1500             | 2000             | 0.1, 0.3, 0.5                |
| Endurance(times)  | 4000             |                  |                              |

## Operation principle figure



## Dimension





# Motor protection circuit breaker MGEA Series



Specification Conforms to IEC157-1 IEC292-1 GB1497-85

## MERKUR MGEA series motor protection circuit breaker

The circuit breaker is suitable for the circuit with rated AC voltage up to 660V, frequency 50 or 60 Hz rated from 0.1 to 0.63A. It is used for overload and short-circuit protection in the motor with small capacity and circuit, can also be used for direct starting of motor and circuit of uninfrequent operation under normal condition.

| Type   |        | 3VE1   | 3VE3  | 3VE4  |
|--|--------|--|---|---|
| Pole number                                    |        | 3  | 3   | 3   |
| Rated voltage(V)                               |        | 20V  | 32V   | 63V   |
| The setting range of tripping current (A)      |        | 0.1-0.16 0.16-0.25 0.25-0.4 0.4-0.63 0.63-1 1-1.6 1.6-2.5 2-3.2 2.5-4 3.2-5 4-63 5-8 6.3-10 8-12.5 10-16 14-20 | 1-1.6 1.6-2.5 2.5-4 4-6.3 6.3-10 8-12.5 10-16 12.5-20 16-25 22-32 | 6.3-10 10-16 16-25 2-32 28-40 36-50 45-63 45-56 |
| Switch capacity (effective value) of motor(kW) | 220V   | 1.5/0.95   | 10/0.5  | 20/0.3  |
|  | 380V   | 1.5/0.95   | 10/0.5  | 20/0.3  |
|  | 660V   | 1.0/0.95   | 3/0.9   | 5/0.7   |
| Power of controlled motor (kW)                 | 220V   | 14   | 16  | 32  |
|  | 380V   | 13   | 26  | 58  |
|  | 660V   | 1  | 1   | 0.6   |
| Protective feature                             | 1.05Ie | Not act within 2hrs<br>Act within 2hrs<br>Action snap  |   |   |
|  | 1.2Ie  |  |   |   |
|  | 1.2Ie  |  |   |   |
| Weight (kg)                                    |        | 0.285  | 0.52  | 1.2   |

# MERKUR German CF-Technology



## Safe and reliable cable jointing technology

**MERKUR** made in Germany cast resin products offer stainless untainted workflow by application of the CF system. The principle of "concealed filling" ensures that that when applied professionally during installation there will be no contact made by the technician with the resin at all.

Resin and hardener are being mixed in a transparent 2-chamber poly pack. The technician can determine the readiness of the material by means of comparing the changing color of the compound within the poly pack. By application of a patented formula the compound will have

at the end the same green color as the packing and show in itself that it is ready to be used.

With the filler neck supplied in the pack being connected to the adapter, which is incorporated in the poly pack, joint and poly pack can be attached to each other securely. The transparent joint casing allows to keep watch of the proper filling of the joint. The hydrophobic resin is environmentally compatible and can be disposed of after installation in the normal household waste. Due to its excellent hydrolytic stability our cable jointing kits are especially suitable for long term applications.

# Cable Jointing Kits

| Type       | for outer cable diameter (mm) | suitable conductor cross section (mm <sup>2</sup> ) |                  | joint dimensions (A/B) (mm) | Resin qty                                |
|------------|-------------------------------|---|------------------|-----------------------------|--|
|            |                               | from  | to               |                             |  |
| MJK-CF-0   | 7 - 16                        | 3 x 1,5   | 5 x 2,5          | 182 / 25                    | 95 ml / 130 g                            |
| MJK-CF-1   | 8 - 24                        | 3 x 1,5   | 4 x 10 or 5 x 6  | 190 / 36                    | 165 ml / 226 g                           |
| MJK-CF-1,5 | 8 - 24                        | 3 x 1,5   | 4 x 16 or 5 x 10 | 215 / 39                    | 220 ml / 301 g                           |
| MJK-CF-2   | 14 - 30                       | 5 x 1,5   | 4 x 25 or 5 x 16 | 276 / 49                    | 400 ml / 548 g                           |
| MJK-CF-3   | 23 - 35                       | 5 x 10  | 4 x 50 or 5 x 35 | 360 / 54                    | 655 ml / 897 g                           |
| MJK-CF-4   | 28 - 47                       | 4 x 25  | 4 x 95           | 400 / 69                    | 1140 ml / 1562 g                         |
| MJK-CF-5   | 33 - 55                       | 4 x 50  | 4 x 150          | 520 / 100                   | 2 x 1450 ml / 1987 g                     |
| MJK-CF-6   | 48 - 70                       | 4 x 150   | 4 x 240          | 700 / 128                   | 4 x 1640 ml / 2247 g                     |
| MJK-CF-7   | 55 - 77                       | 4 x 185   | 4 x 400          | 870 / 140                   | 4 x 2240 ml / 3069g<br>1 x 800ml / 1096g |

## Cable Jointing Kits S-Series CF (concealed filling)

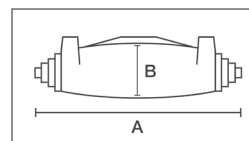
**MERKUR** Made in Germany Cable Jointing Kits i-line SF are the perfect solution for cable joint applications throughout the 0,6/1KV low voltage network. PVC-, PW-, EPR-, and VPE insulated cables alike can be jointed with our **MERKUR** cable joints.

### Product Characteristics:

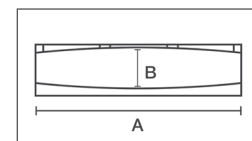
- immediately ready to use
- waterproof
- due to CF-system the joints can be cast / filled under influence of water
- 48 months shelf life

### Applications:

- indoors
- outdoors
- in water



MJK-CF-0 up to 6



MJK-CF-7

- in air
- in cable channels

### Purchased parts packages contain:

- resin **MERKUR** PUR33 ready to be mixed in a transparent 2-chamber poly bag
- housing consisting of 2 transparent , shock-proof moulded shells
- CF-filler neck and adapter
- protective gloves
- sponge to roughen the outer cable insulation
- **MERKUR** ITP150 PVC insulation tape
- mounting instruction

Headquarter Germany

Mattentwiete 5  
20457 Hamburg  
Germany

☎ +49 - 40 32 08 27 3  
☎ +49 - 40 32 08 27 59

✉ mail@merkur-hamburg.de

Office United Arab Emirates

Level 41, Emirates Towers  
Sheikh Zayed Road  
P.O. Box: 31 303  
Dubai - U.A.E.

☎ +971 - 43 13 28 92  
☎ +971 - 43 13 27 53

Office Hongkong

Unit 1202, Level 12,  
One Peking Building  
1 Peking Road, Tsim Sha Tsui  
Hongkong

☎ +852 - 39 80 92 25  
☎ +852 - 39 80 92 34

Distributors

**Afghanisatan**

Liberty Corporation Co.  
64m Street, Herat City  
Afghanistan  
☎ +937 - 99 69 44 81

**Bahrain**

Shaheen Group  
P.O.Box 405  
Manama  
Kingdom of Bahrain  
☎ +973 -17 81 35 35z

**Cameroon**

CALICO Sarl  
BP 15566  
Douala  
Cameroon  
☎ +237- 22 43 80 44

**Ghana**

Luminant Electricals  
P.O. Box CT5204  
Cantonment-Accra  
Ghana  
☎ +233 - 27 52 29 62 2

**Lebanon**

Tele Project  
P.O. Box 55268  
Sin el Fil  
Lebanon  
☎ +961 - 16 87 900

**Oman**

Trade Links and Services Co. LLC  
P.O.Box 2901  
Ruwi 112  
Sultanate of Oman  
☎ +968 - 24 70 67 75

**Saudi Arabia**

Ahmed Omer Bagazy Est.  
P.O. Box 16367  
Jeddah 21464  
Saudi Arabia  
☎ +966 - 26 47 29 28

**Sri Lanka**

Rotax Limited  
332 Galle Road  
Colombo 04  
Sri Lanka  
☎ +94 - 11 55 74 07 0

**United Arab Emirates**

Gilco Trading LLC  
P.O. Box 4916  
Daira, Dubai  
United Arab Emirates  
☎ +971 - 43 96 15 25

**Yemen**

Al Ashwal for Electrical Trade &  
Agencies  
Shoub Street  
Sana'a  
Yemen Republic  
☎ +967 - 12 82 43 2