

MCB News 2014



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MERKUR Electrotechnology



Ulrich Scheller
Export Manager

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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 applied as the unfrequent 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

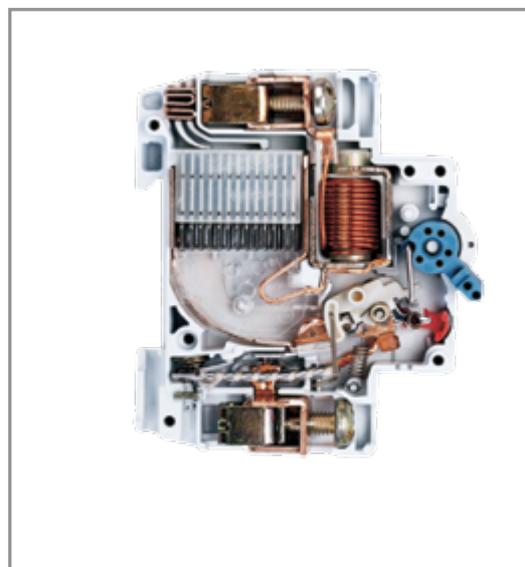
The mini circuit breaker use high accuracy bi-metal for inverse time lag thermal protection element, accurate protection characteristic. The operating mechanism is four link mechanism, small operating physical force, reliable tripping, high sensitivity;

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 arc runner, decreased the arc resistance, it can avoid intercept, 13 pieces grill, the arc can be cut, cooling, extinguish, spraying 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.

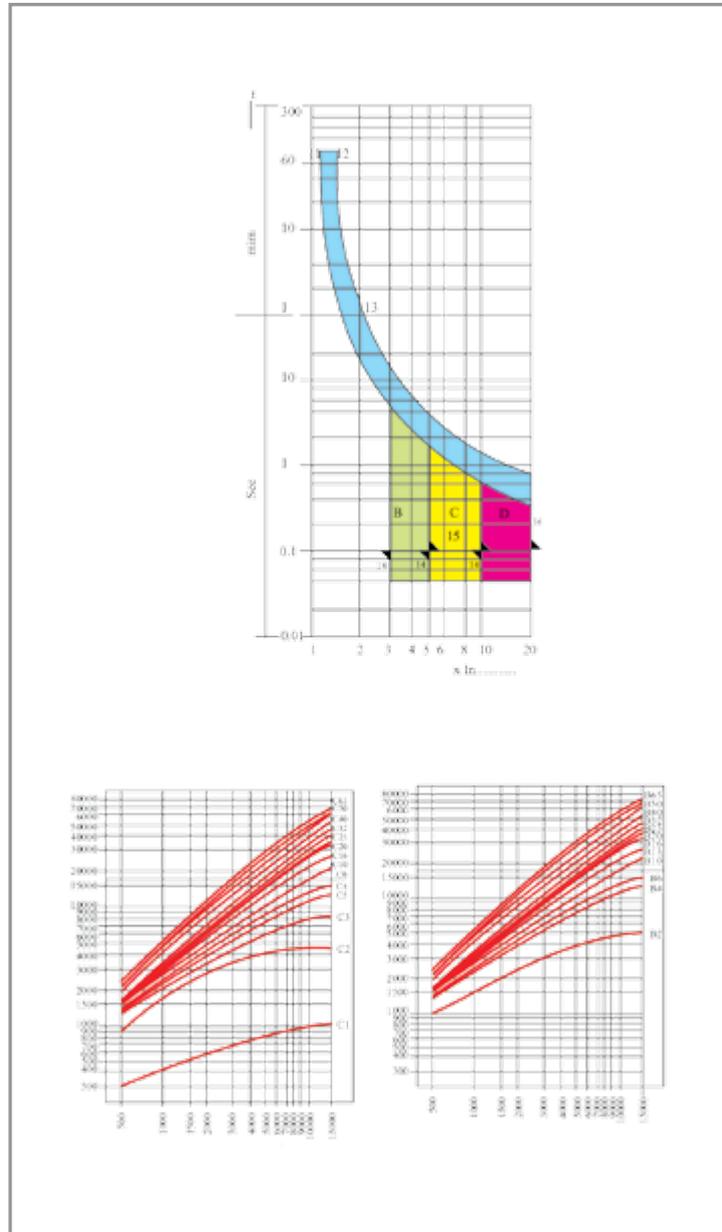
Mini Circuit Breakers MGM-18 Series

Normal working condition

- The maximum ambient temperature should be -5°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°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

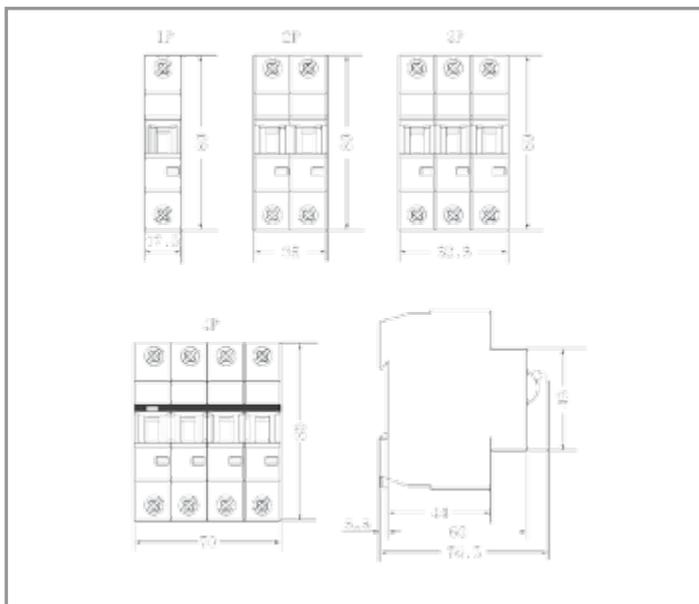
Tripping characteristic type and application range of breaker

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:

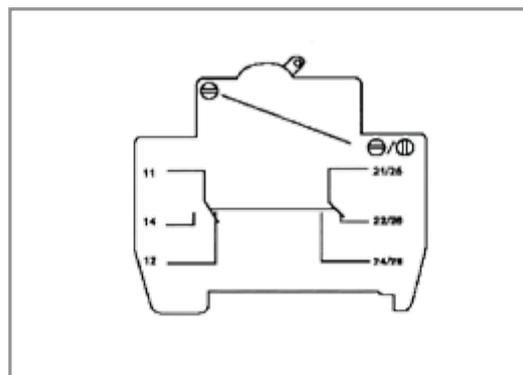
- MGM18-630-F: auxiliary contact
- MGM18-630-FB: auxiliary contact
- MGM18-630-FL: shunt release
- MGM18-630-QY: under-voltage release

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

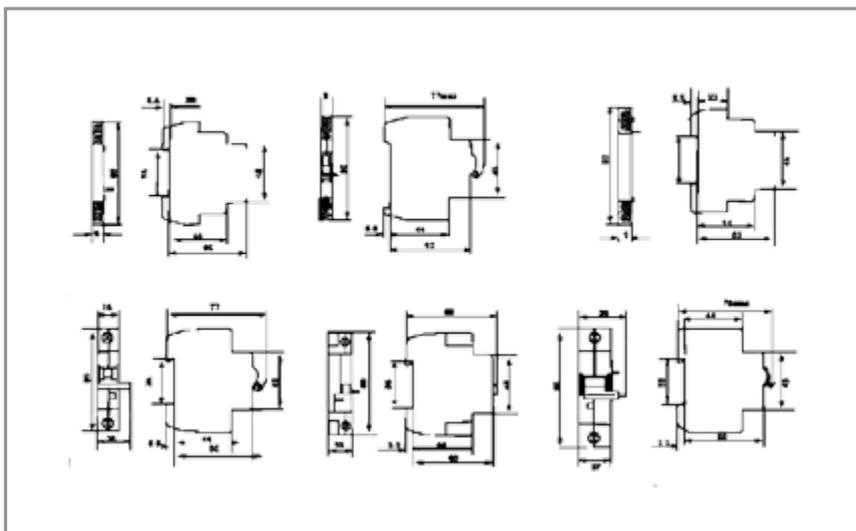
Main technical parameter (MGM18-630-F)

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 In (mA)	Rated residual non operating current In (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			400				
	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 Δ n(mA)	In (A)	Maximum(residual current) breaking time				
			I/n	I/n	I/n	250mA	I/t
Indirect conatct	≥ 30	Any	0.2	0.1	0.04	-	0.04
Direct conatct	≤ 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	≥ 1h
	I2	1.45In	1.45In	1.45In	≤ 1h
Magnetic release	I4	3In	7In	7In	≥ 0.1s
	I5	5In	153In	153In	≤ 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).

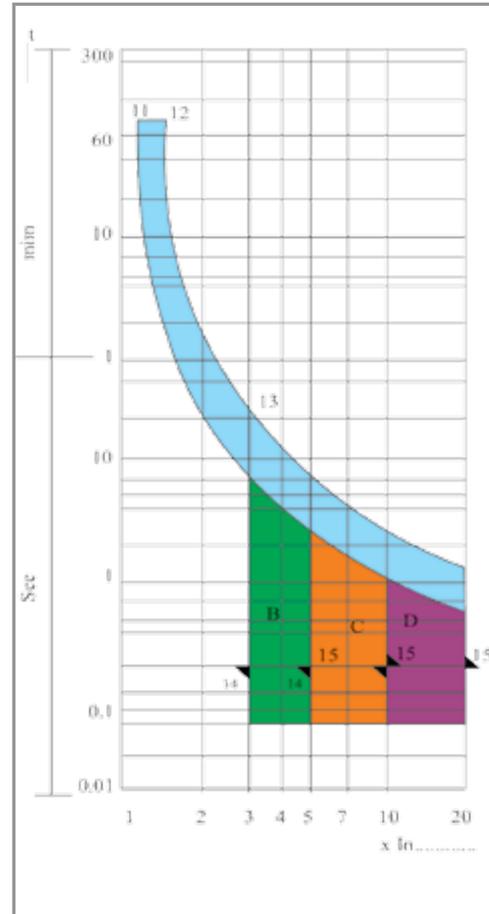
Mini Circuit Breakers MGM-18 ELCB



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

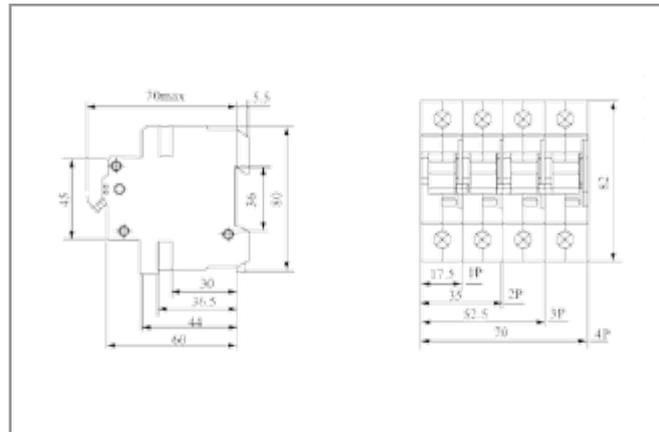
- Frame size rated current I_{nm} : 100A
- Rated voltage U_e : 50Hz, 230V/400V.
- Rated current I_n : 40A, 63A, 80A, 100A.
- Rated short time withstand capacity: 25KA (connect with 100A fuse for protection)
- Pole number: 1P, 2P, 3P, 4P.
- Life: operating cycle is 10000 times, there-into 1500 times of 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°C - $+40^{\circ}\text{C}$, average temperature should be 35°C at 24h.
- The altitude of installation place should not exceed 2000m.
- The relative humidity should not exceed 50% at 40°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

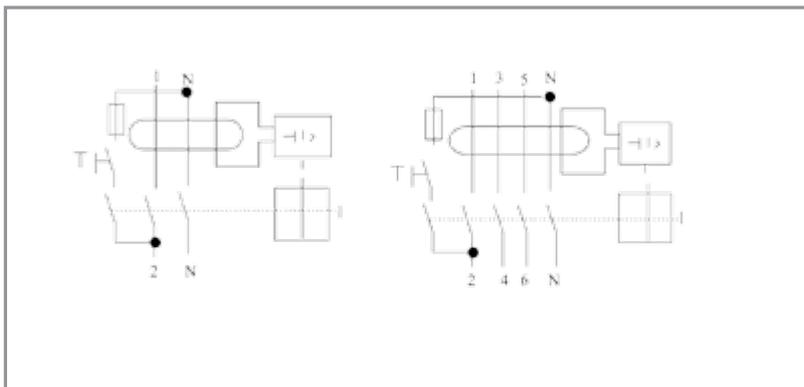
Type	MGFIN25	MGFIN40	MGFIN63	MGFIN100
Rated current(A)	25	40	63	100
Rated operating current for earth leakage (A)	0.03, 0.1, 0.3, 0.5		0.1, 0.3, 0.5	
Rated non-operating current for earth leakage (A)	0.5I _n			
Voltage(V)	240(220) 415(380)			
Pole	2, 4			

Residual Current Device MGFIN Series

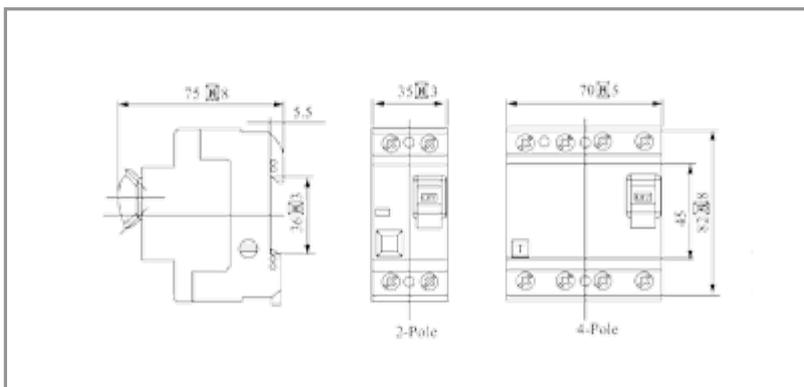
Main technical data

Operating time(second)	1I _{Δn}	2I _{Δn}	0.25A or 5I _{Δn}
	0.2	0.1	0.04
Limited value of non-operating current for balanced load or unbalanced load	2I _{Δn}		
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 unfrequent 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 Act within 2hrs Action snap		
	1.2Ie			
	1.2Ie			
Weight (kg)		0.285	0.52	1.2

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