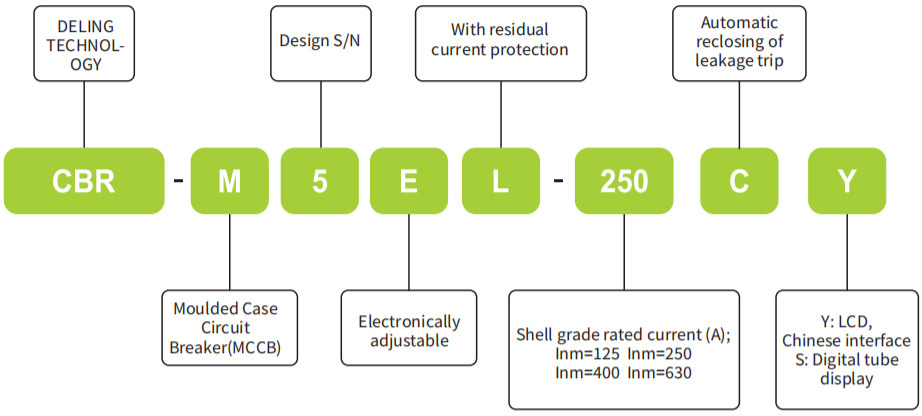
CBRM5EL

Circuit break with residual current protection (intelligent re-closing)

Model and Meaning



Scope of Application

The rated insulation voltage of series residual current operated circuit breaker is 1000V, which is suitable for three-phase four-wire neutral point direct grounding (TT) distribution networks with 50Hz AC, 400V rated voltage and 630A rated current. It is used to provide indirect contact protection; Prevent fire danger caused by grounding fault current due to equipment insulation damage; And it can be used to distribute electric energy and it can also be used to distribute electric energy and protect lines and power supply equipment from overload, undervoltage, short circuit, single-phase grounding and other faults.
Products meet the following standards:
Low-voltage Switchgear and Controlgear Assemblies – Part 1: General (GBT14048.1-2012);
Low-voltage Switchgear and Control Gear - Part 2: Circuit Breaker (IEC60947-2);
Circuit Breaker for Equipment (GBT17701-2008)

Main Functions and Features

High-performance 32-bit ARM microprocessor is used to carry out signal processing and intelligent control in real time;
LCD Chinese/English display provides friendly HMI and simple operation;
For residual current (leakage) protection, the residual current gear can be set online, with reclosing function;
Monitor and track the residual current of the line in real time, and automatically adjust the gear to ensure the operation rate and reliability of the product;
Long delay, short delay and instantaneous three-stage protection, electronic tripping mode is applied, which is independent of supply voltage;
High breaking ability could ensure the reliability of short circuit protection for the line;
Overvoltage protection, undervoltage protection, phase loss protection;
Real-time display of residual current, three-phase supply voltage and load current of the line;
Protection functions and parameters can be set and modified online;
Trip types (residual current, locking, overload, undervoltage, overvoltage, phase loss) can be identified & displayed, and can be stored, inquired & deleted;
Network type has communication function, which can realize remote communication, telemetry, remote control and remote adjustment.
Pluggable lightning protection module (optional)
Infrared communication function (optional)

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Main Technical Parameters

Specification/Model		CBRM5EL-125CY CBRM5EL-125CS	CBRM5EL-250CY CBRM5EL-250CS	CBRM5EL-400CY CBRM5EL-400CS	CBRM5EL-630CY CBRM5EL-630CS
Shell grade rated current (A)		125	250	400	630
No. of poles		3P+N	3P+N	3P+N	3P+N
Rated operating voltage Ue: (V)		AC 400/50HZ			
Rated insulation voltage Ui (V)		800		1000	
Rated impact withstand voltage (V)		8000			
Flashing distance (mm)		≯50		≯100	
Limit short circuit breaking capacity Icu (kA)		50		65	85
Operating short circuit breaking capacity Ics (kA)		35		42	65
Rated residual short circuit on (off) capacity I△m (kA)		12.5		16.25	21.25
Rated short-time withstand current Icw (kA)/S		1.5	3	5	8
Residual current operating features		AC type			
Rated residual operating current I△n (mA)		50/100/200/300/400/500/600/800 MCU automatic tracking or manual setting			100/200/300/400/ 500/600/800/1000 MCU automatic tracking or manual setting
Residual operating time features		Delayed/non-delayed type			
Limit non-drive time of delayed type (s)		0.06 : 2 I△n			
Breaking time (s)		I△n≤0.5; 2I△n≤0.2; 5I△n≤0.15			
Auto re-closing time (s)		20-60			
Operational performance (times)	Powered	1500	1000	1000	
	Not powered	8500	7000	4000	
	Total	10000	8000	5000	
Overload and short circuit features		Three-stage protection, electronically adjustable, see "Description of Protection features" for details			
Overvoltage protection value (V)		Setting value (250~300)±5%			
Undervoltage protection value (V)		Setting value (145~200)±5%			
Link control delay time (ms)		≤40ms			
Communication delay time (ms)		≤200ms			

Description of Protection features

◆ Overload long delay protection

operating value setting range

Table 1: Overload Long Delay Parameters Setting

Parameters	Shell current	Set value	Factory setting value
operating setting value Ir1	125	50A、63A、80A、 100A、125A	125A
	250	100A、125A、140A、160A、 180A、200A、225A、250A	250A
	400	160A、180A、200A、225A、250A、 315A、350A、400A	400A
	630	250A、315A、350A、400A、 500A、630A	630A
Delay time setting value tL		3s, 4s, 6s, 8s, 10s, 12s, 16s, 18s, OFF	12s

◆ operating features

Table 2: Protection operating features

Ambient temperature	Current name	Setting current multiple	Agreed time
+40°C	Agreed non-release current	1.05Ir1	⩾2h
	Agreed release current	1.3Ir1	<2h

◆ Delay features

Overload protection is carried out according to inverse time features:

T=(6I1)2tL Delay accuracy: 10%, where T is the operating time value, Ir1 is the long delay protection setting value, I is the fault current, and tL is the long delay time setting value.

◆ Short-circuit short-time delay protection

Short-circuit short-delay protection prevents impedance short-circuit of distribution system. The purpose of trip delay is to realize selective protection.

Setting of related parameters of short-circuit short-delay protection

Table 3: Short Circuit Short-Delay Parameter Setting

Parameters setting	Set value	Factory setting value
Setting value of short-delay operating current Ir2	2Ir1,2.5Ir1,3Ir1,4Ir1,5Ir1, 6Ir1,7Ir1,8Ir1,10Ir1,12Ir1	6Ir1
Setting value of short-delay time ts	0.1s,0.2s,0.3s,0.4s,0.6s、 0.8s,1.0s ,OFF	0.4s

operating features of short-circuit short-delay protection

Table 4: Short-circuit Short-Delay operating features

features	Fault current multiple	Release features	Delay error
Non-operating features	⩽0.85 Ir2	Non-operating	/
Activate features	>1.15 Ir2	Delay operating	±40ms

◆ Instantaneous protection

Setting of related parameters of instantaneous protection

Table 5: Instantaneous Parameters Setting

Parameters setting	Set value	Factory setting value
Instantaneous operating current setting value Ir3	4 Ir1,6 Ir1,7 Ir1,8 Ir1,9 Ir1,10 Ir1, 11 Ir1,12 Ir1,13 Ir1,14 Ir1,OFF	10 Ir1

operating features of short-circuit instantaneous protection

Table 6: Instantaneous operating Features

features	Current multiple (I/Ir3)	Release features	Release time
Non-operating features	⩽0.85	Non-operating	⩾200ms
Activate features	>1.15	operating	<200ms

◆ Residual current protection features

Gear setting range

Parameters	Setting value (125,250,400)	Setting value (630,800)	Factory setting value
Residual operating current I△n	50,100,200,300,400,500, 600,800 automatic	100,200,300,400,500,60 0,800,1000 automatic	500

◆ operating features

Table 2: Protection operating features

Parameters	Parameters			
Rated non-operating current	0.5 I△n			
Rated active current	⩾0.75 I△n			
Delay features	2I△n limit undriven time (△t)	Segment time		
		I△n	2I△n	5 I△n
Non-delay		⩽0.3s	⩽0.15s	⩽0.04s
0.06	⩾0.06s	⩽0.5s	⩽0.2s	⩽0.15s

◆ Automatic gear mode

Each gear value and floating value in automatic gear mode:

Gear value (mA)	Floating value (mA)
50	25
100	50
200	100
300	150
400	200
500	250
600	300
800	400
1000	-

When the residual current is greater than the floating value of the gear but does not reach its operating value and stably maintains for 60s, the gear goes up a gear, and so on, until reaching the maximum gear; When the residual current is less than the floating value of the next gear in this gear and stably maintains for 120s, the gear goes down a gear, and so on, until reaching the minimum gear. Take "Gear 2" and the initial residual current of 100mA of the line as an example. The circuit breaker is powered on, and the gear is automatically set to 300mA. When the residual current increases to more than 150mA and stabilizes for 60s, the gear changes to gear 500mA; When the residual current decreases below 150mA and stabilizes for 120s, the gear changes to gear 200mA.

◆ Automatic reclosing

When the residual current exceeds the operating current value, the gear can automatically reclose after 20 ~ 60s, but the manual closing is not limited by time. If the fault current is eliminated within 5s after closing, the closing is successful and the circuit breaker runs normally; If the fault current is not eliminated, the circuit breaker trips again and is locked, so it cannot be reclosed automatically, but must be closed manually.

◆ Overvoltage protection function

When the line phase voltage is higher than the set value of overvoltage protection, the circuit breaker protection trips. When the line voltage returns to normal, the circuit breaker can be automatically closed for operation. The setting value range of overvoltage protection is 231V~330V, and the factory setting is 275V. Users can set or close the protection.

◆ Undervoltage protection function

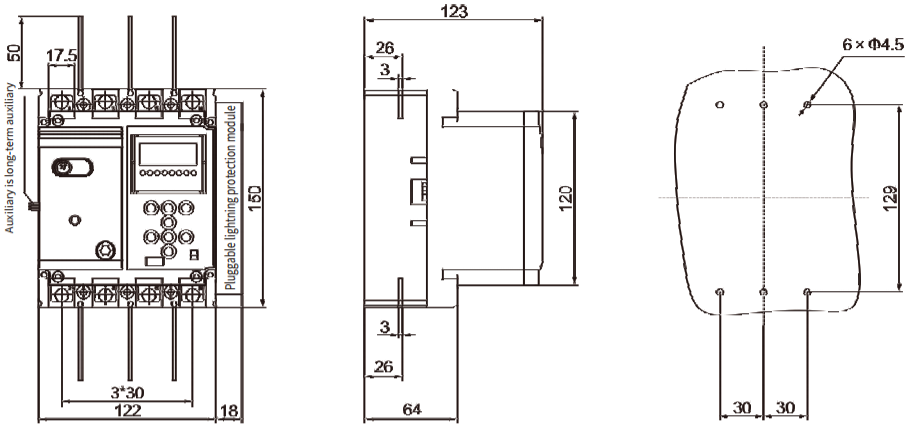
When the line phase voltage is lower than the set value of undervoltage protection, the circuit breaker protection trips. When the line voltage returns to normal, the circuit breaker can be automatically closed for operation.

The setting value range of undervoltage protection is 88V ~ 209V, and the factory setting is 145V. Users can set or close the protection.

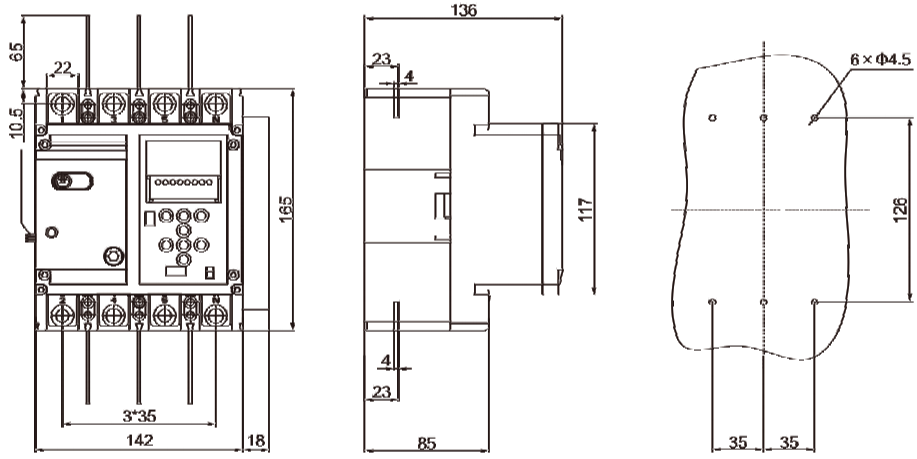
◆ Phase loss protection function

When the power supply terminal of the line is of phase loss, the circuit breaker protection trips. When the line voltage returns to normal, the circuit breaker can be automatically closed for operation.

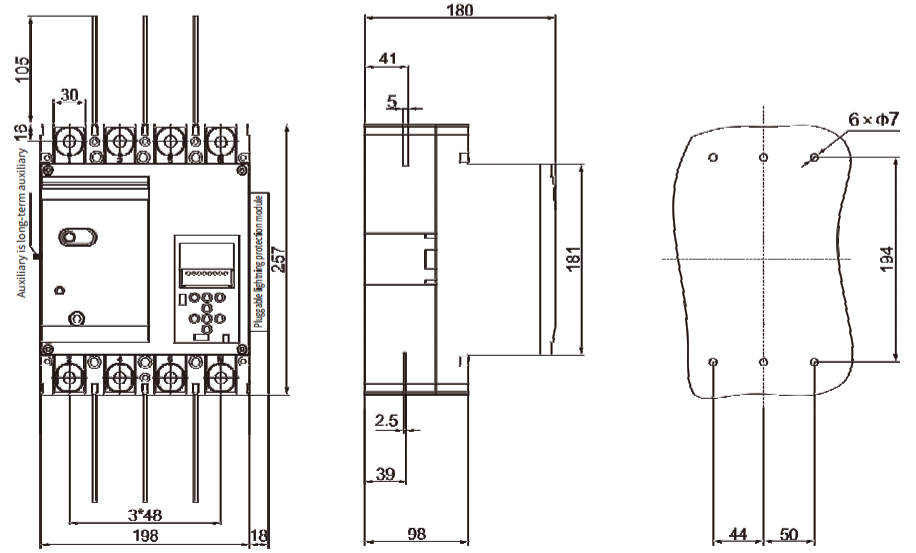
Overall and Installation Dimensions



CBRM5EL-125CY
CBRM5EL-125CS



CBRM5EL-250CY
CBRM5EL-250CS



CBRM5EL-400CY
CBRM5EL-400CS

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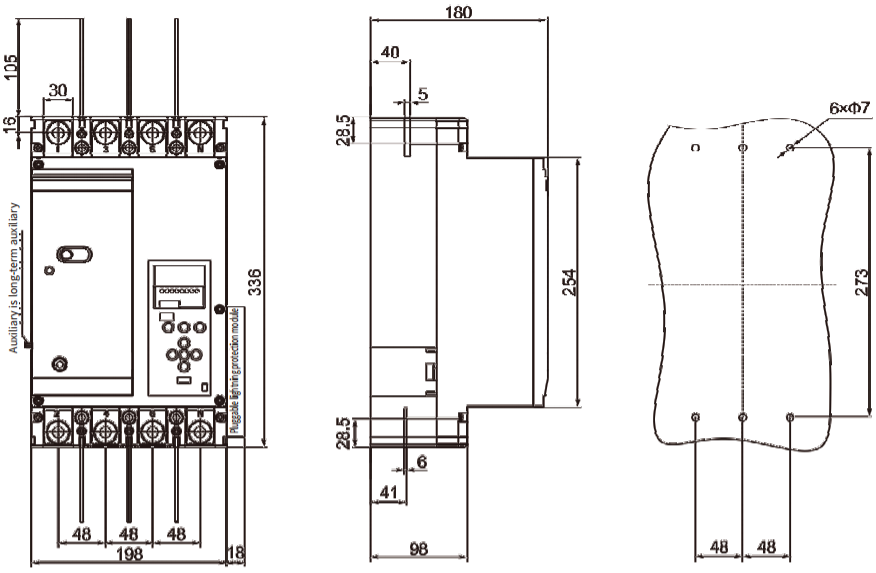
Overall and Installation Dimensions



CBRM5EL-630CY
CBRM5EL-630CS

Diagram

◆ Linkage protection function

Linkage protection can be carried out with other fire fighting equipment through linkage interface as follows:

DI input setting		Description of function	Priority	Delay time
Input control	IN1 is short-circuited to DCOM	Circuit breaker closing	Low	≤40ms
	IN3 is short-circuited to DCOM	Circuit breaker opening	High	≤40ms

Note: Long-term short-circuiting will make the short circuit always be in the open state.