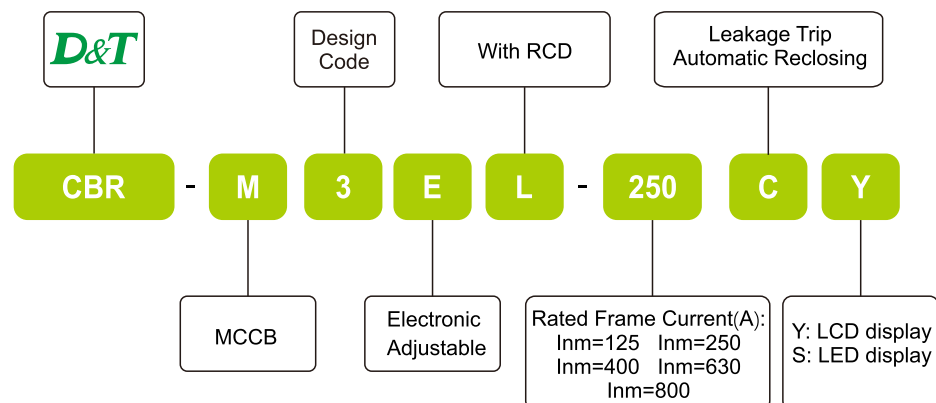




Model & Meaning



Application

The rated insulation voltage of the CBRM3EL Series Residual Current Operated Circuit Breakers is 1000 V. They are suitable for three-phase four-wire TT distribution networks with AC 50 Hz, rated voltage of 400 V, and rated current up to 800 A, where the neutral point is directly earthed.

They are used to provide protection against indirect contact; prevent fire hazards caused by earth fault currents due to insulation breakdown of equipment; and can also be applied for power distribution, as well as protecting lines and power supply equipment against damages from faults such as overload, undervoltage, short circuit, and single-phase earthing.

This product complies with the following standards:

- ◆ IEC60947-1 Low-voltage switchgear and controlgear - Part 1: General rules
- ◆ IEC60947-2 Low-voltage switchgear and controlgear - Part 2: Circuit-breakers
- ◆ IEC 60934: Circuit Breakers for Equipment

Main Functions & Features

- ◆ Adopts high-performance 32-bit ARM microprocessor, enabling real-time signal processing and intelligent control.
- ◆ LCD display, user-friendly human-machine interface and easy operation.
- ◆ Residual current (leakage) protection with online adjustable residual current settings and automatic reclosing function.
- ◆ Monitors and tracks line residual current in real time and automatically adjusts settings to ensure product operation rate and reliability.
- ◆ Three-stage protection: long-time delay, short-time delay and instantaneous protection.
- ◆ Electronic tripping that is independent of power supply voltage
- ◆ High breaking capacity for reliable line short-circuit protection
- ◆ Overvoltage protection, undervoltage protection, phase failure protection;
- ◆ Displays line residual current, three-phase power supply voltage, and load current in real time.
- ◆ Allows online setting and modification of protection functions and parameters.
- ◆ Identifies and displays trip types (residual current, blocking, overload, under-voltage, over-voltage, phase-loss), with data storable, queryable, and deletable.
- ◆ Networked models are equipped with communication functions to realize remote signaling, remote monitoring, remote control, and remote adjustment.
- ◆ Plug-in lightning protection module (optional)
- ◆ Infrared communication function (optional)

Operating Environment

- ◆ The installation site shall be free of conductive dust, corrosive gases, flammable and explosive gases, and shall not be exposed to rain, snow or moisture.
- ◆ Altitude: not exceeding 2000 m;
- ◆ Ambient temperature: -5 °C ~ +40 °C , daily average maximum temperature ≤ +35 °C ;
- ◆ Relative humidity: ≤ 50% (at ambient temperature of +40°C);
- ◆ The external magnetic field at the installation site shall not exceed 5 times the geomagnetic field in any direction;
- ◆ The installation position shall have good ventilation and heat dissipation conditions;
- ◆ When HPLC (High Power Line Communication) is required, ensure that all communication devices operate under the same transformer.

Main Technical Parameters

Specification		CBRM3EL-125CY CBRM3EL-125CS	CBRM3EL-250CY CBRM3EL-250CS	CBRM3EL-400CY CBRM3EL-400CS	CBRM3EL-630CY CBRM3EL-630CS	CBRM3EL-800CY CBRM3EL-800CS
Frame Rated Current(A)		125	250	400	630	800
Number of Poles		3P+N	3P+N, 2P	3P+N	3P+N	3P+N
Rated Operating Voltage U _e (V)		AC 400/50Hz				
Rated Insulation Voltage U _i (V)		1000				
Rated Impulse Withstand Voltage U _{imp} (V)		8000				
Arc Distance(mm)		≥50		≥100		
Ultimate Short-circuit Breaking Capacity I _{cu} (kA)		50(H-type 70)		65(H-type 85)	65	
Service Short-circuit Breaking CapacityI _{cs} (kA)		35(H-type 50)		42(H-type 65)	42	
Rated Residual Short-circuit Making/ Breaking Capacity I _{Δm} (kA)		12.5(H-type 17.5)		16.5 (H-type 21.5)	16.25	
Rated Short-time Withstand Current I _{tw} (kA)s		1.5	3	5	8	10
Residual Current Operating Characteristic		AC type				
Rated Residual Operating Current I _{Δn} (mA)		50/100/200/300/400/500/600/800mA (MCU auto-tracking or manual setting)				100/200/300/400/500/600/800/1000mA (MCU auto-tracking or manual setting)
Residual Operating Time Characteristic		Time delay type / Non-time-delay type				
Time-delayed ultimate non-operating time (s)		0.06/0.1/0.2s optional, at 2I _{Δn}				
Breaking Time(s)		I _{Δn} ≤0.5; 2I _{Δn} ≤0.2; 5I _{Δn} ≤0.15				
Automatic Reclosing Time(s)		20-60				
Electrical/Mechanical Operating Cycles	With current	1500	1000	1000		500
	Without current	8500	7000	4000		2500
	Total	10000	8000	5000		3000
Overload & Short-circuit Characteristic		Three-stage protection, electronic adjustable, see "Protection Characteristic Description"				
Overvoltage Protection(V)		Setting range (250~300)±5%				
Undervoltage Protection(V)		Setting range (145~200)±5%				
Interlock Delay Time(ms)		≤40ms				
Communication Delay Time(ms)		≤200ms				

Protection Characteristic

Table 1: Overload long-time delay parameter setting

Parameter	Frame Current (A)	Setting Value	Factory Setting
Operating setting value (I _{r1})	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
	800	315A、350A、400A、500A、 630A、700A、800A	800A
Time-delay Setting (t _L)		3s,4s,6s,8s,10s, 12s,16s,18s,OFF	12s

Table 2: Tripping Characteristic

Ambient Temperature	Current Type	Setting Current Multiple	Tripping Time
+40°C	Non-tripping current	1.05I _{r1}	≥2h
	Tripping current	1.3I _{r1}	<2h

◆ Time-delay Characteristic

Overload protection follows the inverse time characteristic:

$$T = (6I_r/I)^2 t_L$$

Delay accuracy: ±10%

Where T is the tripping time value, I_{r1} is the long-time delay protection setting value, I is the fault current, and t_L is the long-time delay setting value.

◆ Short-circuit Short-time Delay Protection

Short-circuit short-time delay protection prevents resistive short circuits in the power distribution system, and tripping delay is implemented to achieve selective protection.

Table 3: Short-circuit Short-time Delay Parameter Setting

Parameter Setting	Setting Value	Factory Default
Short-time delay setting current I _{r2}	2I _{r1} , 2.5I _{r1} , 3I _{r1} , 4I _{r1} , 5I _{r1} , 6I _{r1} , 7I _{r1} , 8I _{r1} , 10I _{r1} , 12I _{r1}	6I _{r1}
Short-time delay setting timer(ts)	0.1s, 0.2s, 0.3s, 0.4s, 0.6s, 0.8s, 1.0s, OFF	0.4s

Table 4: Short-circuit Short-time Delay Tripping Characteristic

Characteristic	Fault Current Multiple	Tripping Characteristic	Time Delay Error
Non-tripping	≤0.85 I _{r2}	Non-tripping	/
Tripping	>1.15 I _{r2}	Delayed tripping	±40ms

◆ Instantaneous Protection

Table 5: Short-circuit Instantaneous Protection Parameter Setting

Parameter Setting	Setting Value	Factory Default
Instantaneous Operating Current Setting (I _{r3})	4 I _{r1} , 6 I _{r1} , 7 I _{r1} , 8 I _{r1} , 10 I _{r1} , 11 I _{r1} , 12 I _{r1} , 13 I _{r1} , 14 I _{r1} , OFF	10 I _{r1}

Table 6: Instantaneous Operating Characteristic

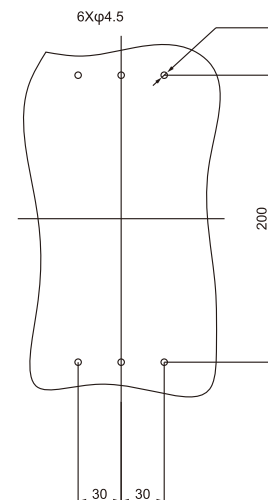
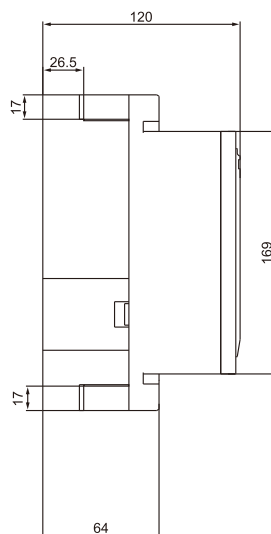
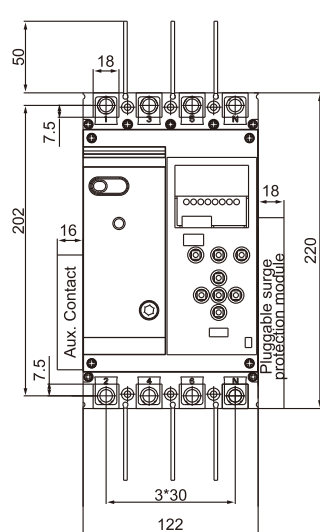
Characteristic	Current Multiple (I/I _{r3})	Tripping Characteristic	Tripping Time
Non-tripping	≤0.85	Non-tripping	≥200ms
Tripping	>1.15	Instantaneous tripping	<200ms

◆ Residual Current Protection Characteristic

Gear Setting Range

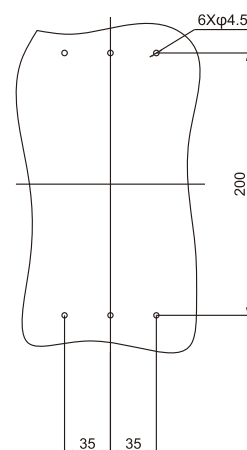
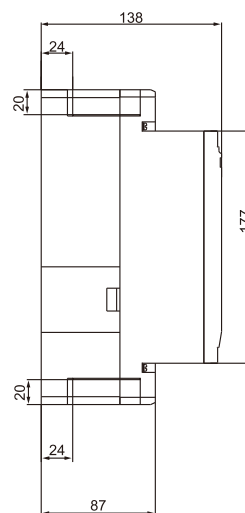
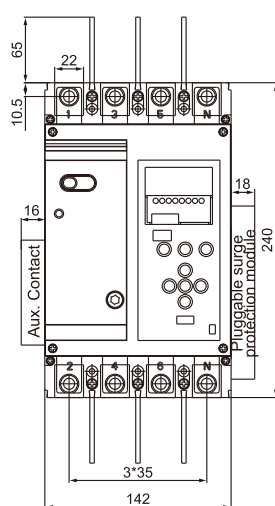
Parameter	Setting Range (125, 250, 400)	Setting Range (630, 800)	Factory Default
Residual Operating Current (I _{Δn})	50, 100, 200, 300, 400, 500, 600, 800 Auto	100, 200, 300, 400, 500, 600, 800, 1000 Auto	500

Outline & Mounting Dimensions

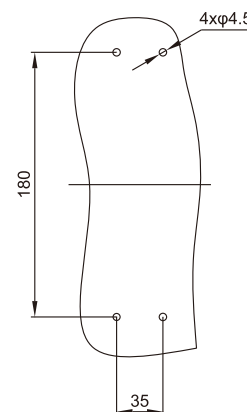
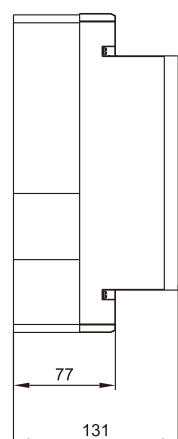
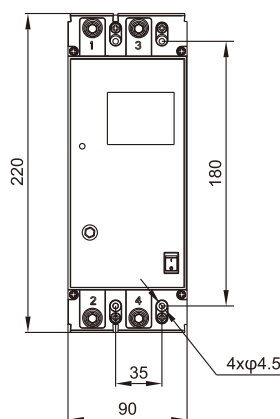


CBRM3EL-125CY
CBRM3EL-125CS

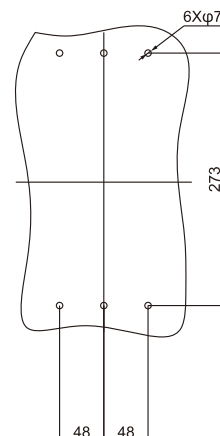
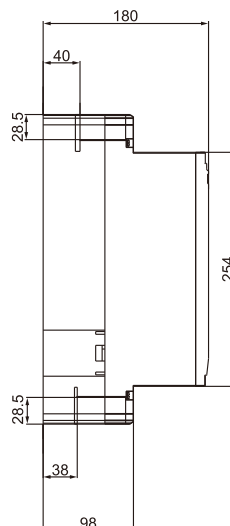
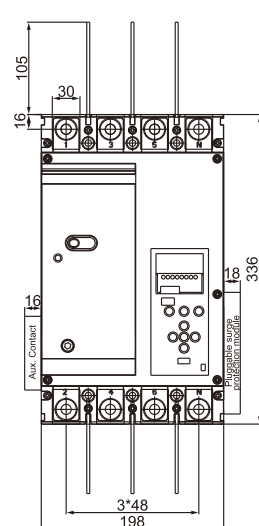
Note: The accessory on the left side of the diagram is the auxiliary contact, and the one on the right is the surge protection module; accessories of all models have the same dimensions.



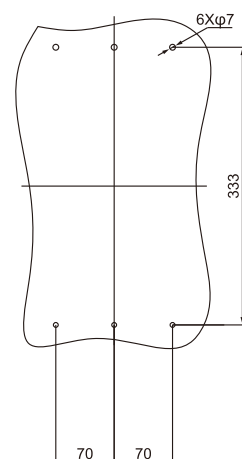
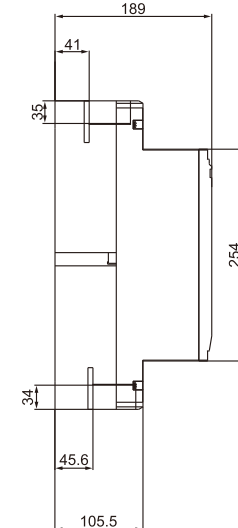
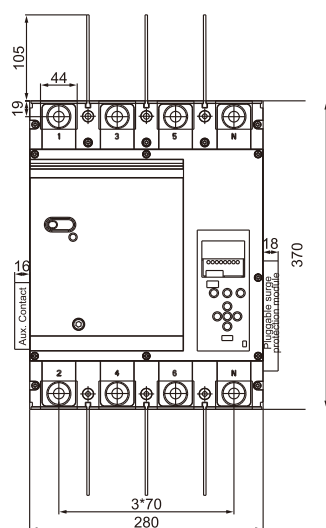
CBRM3EL-250CY



CBRM3EL-250CY/2P



CBRM3EL-400CY
CBRM3EL-400CS



CBRM3EL-630~800CY
CBRM3EL-630~800CS

Characteristic Curve

