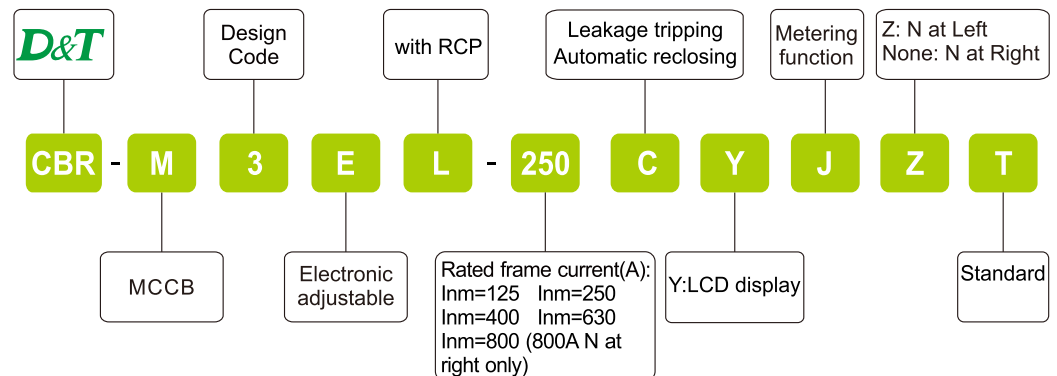


Model & Meaning



Main Functions & Features

- ◆ Utilizes a high-performance 32-bit ARM microprocessor for real-time signal processing and intelligent control.
- ◆ Features a user-friendly LCD display supporting Chinese/English, ensuring simple and convenient operation.
- ◆ Equipped with leakage protection function, the residual current level can be adjusted online, and it has reclosing function.
- ◆ Monitor and track the residual current of the line in real time, automatically adjust the gear to ensure the operation rate and reliability of the product.
- ◆ Provides three-stage protection (Long-time Delay, Short-time Delay, and Instantaneous) with electronic tripping, independent of the control power voltage.
- ◆ Offers high breaking capacity, ensuring reliable short-circuit protection for the line.
- ◆ Includes protections against over-voltage, under-voltage, phase loss, and neutral break; protection functions and parameters can be set and modified online.
- ◆ Displays three-phase power supply voltage and load current in real-time.
- ◆ Measures parameters such as active power, reactive power, apparent power, and power factor in real-time;
- ◆ Identifies, displays, and can store, query, and delete trip records by type (e.g., Residual Current, Lockout, Overload, Under-voltage, Over-voltage, Loss of Voltage, Phase Loss, Neutral Break).
- ◆ Supports remote signaling, telemetry, remote control, and remote adjustment ("Four Remote" functions).
- ◆ Incorporates a HPLC pluggable module and micro-power Bluetooth wireless communication.
- ◆ Metering accuracy from 0.05In to 1.2In can reach Class 1.0.
- ◆ Real-time monitoring of terminal block temperature at the line entry end (optional).
- ◆ Accumulates three-phase active energy.
- ◆ Offers optional modes like time-based control and tariff-based control for more flexible application.
- ◆ Supports DL/T645 and Modbus protocols with automatic recognition.
- ◆ Supports online remote firmware upgrades for easy maintenance.
- ◆ High accuracy class: current and voltage measurement accuracy up to Class 0.5s; active and reactive power measurement accuracy up to Class 1; residual current measurement accuracy up to Class 2.

Operating Environment

The installation site shall be free from conductive dust, corrosive gases, flammable or explosive gases, and rain or snow ingress.

- Altitude: Not exceeding 2000m.
- Ambient Temperature: -5°C to +40°C, with a maximum daily average temperature ≤ +35°C.
- Relative Humidity: ≤ 50% (when the ambient temperature is +40°C).
- The external magnetic field at the installation site shall not exceed five times that of the Earth's magnetic field in any direction.
- The installation location shall have good ventilation and heat dissipation conditions.
- When HPLC (High-speed Power Line Carrier) communication is required, it must be ensured that all communication devices operate under the same transformer.

**MCCB
Classification
& Functions**

Function Classification		Standard Type	Metering Type	PV Type
Protection function	Overload Protection	●	●	●
	Short Circuit Protection	●	●	●
	Auto-reclosing	●	●	●
	Phase-loss Protection	●	●	●
	Overvoltage Protection	●	●	●
	Undervoltage Protection	●	●	●
	Neutral-loss Protection	●	●	●
	Over/Under Frequency Protection	●	●	●
	Power-off Protection	●	●	●
	Phase-sequence Protection	●	●	●
	Islanding Protection	○	○	●
	Overtemperature Protection	△	△	●
	Power Quality Monitoring & Protection	○	△	●
Measurement & Display	3-phase Operating Voltage	●	●	●
	3-phase Operating Current	●	●	●
	Active Power	○	●	●
	Reactive Power	○	●	●
	Apparent Power	○	●	●
	Voltage Unbalance	○	●	●
	Current Unbalance	○	●	●
Programmable Settings	Overload Long-time Delay	●	●	●
	Short Circuit Short-time Delay	●	●	●
	Short Circuit Instantaneous	●	●	●
	Overvoltage Protection Setting	●	●	●
	Undervoltage Protection Setting	●	●	●
	Time, Date	●	●	●
	Protection Enable/Disable	●	●	●
	Phase-loss Protection Setting	●	●	●
	Over/Under Frequency Protection Setting	○	●	●
	Voltage Unbalance Protection Setting	○	●	●
	Current Unbalance Protection Setting	○	●	●
Query & Display	Operation Records, Fault Records	●	●	●
Communication Functions	RS-485 Modbus	●	●	●
	Power Line Carrier (PLC)	△	△	△
	Bluetooth	△	●	●
	Topology	△	△	△

● Available △ Optional ○ Not available

Measurement Accuracy Class

Parameter	Accuracy (Permissible Error)
Current	±0.5%、±1.0%
Voltage	±0.5%、±1.0%
Active power	±1.0%、±1.5%、2.0%、2.5%
Reactive power	±1.0%、±1.5%、2.0%、2.5%
Residual current	±1.0%、±2.0%

Main Technical Specifications

Model	125	250	400、630	630	800
Frame rated current (A)	125	250	400、630	630	800
Number of poles	3P+N				
Rated operational voltage Ue(V)	AC 400/50HZ				
Rated insulation voltage Ui(V)	1000				
Rated impulse withstand voltage Uimp(V)	8000				
Arc distance (mm)	≥ 50		≥ 100		
Ultimate short-circuit breaking capacity Icu (kA)	50 70 (H type)		65 85(H type)	65 85(H type)	65 85(H type)
Service Short-circuit Breaking Capacity Ics (kA)	35 50 (H type)		42 55(H type)	50 65(H type)	42 55(H type)
Rated residual short-circuit making/breaking capacity IΔm(kA)	12.5 17.5(H type)		16.25 21.25(H type)		
Residual current operating characteristic	AC type				
Rated residual operating current IΔn(mA)	30/50/75/100/200/300/500/600/800Auto		30/50/100/200/300/400/500/600/800/1000/Auto		
Rated short-time withstand current Icw (kA) / duration (s)	3		400:5 630:8	8	10
Residual operating time characteristic	Time delay type / Non-time delay type				
Time-delayed type ultimate non-tripping time (s)	0.06/0.1/0.2: 2 I Δ n				
Breaking time (s)	I Δ n≤0.5; 2I Δ n≤0.2; 5I Δ n≤0.15				
Auto-reclosing time (s)	20-60				
Operating performance (Cycles)	with current	1000		500	
	without current	7000		2500	
	Total	8000		3000	
Overload & short-circuit characteristics	3-stage protection, electronic adjustable, see "Protection Characteristics" for details				
Overvoltage protection setting (V)	Setting Value (231~330) /Default value 275V				
Undervoltage protection setting(V)	Setting Value (88~209) /Default value145V				
Phase loss protection setting (V)	Setting Value (10~130) /Default value30V				
Interlock delay time (ms)	≤40ms				
Communication delay time (ms)	≤200ms				

Protection Characteristics

◆Overload Long-Time Delay Protection

Action value setting range

Table 1: Overload Long-Time Delay Parameter Setting

Parameter	Frame Current	Setting Range	Factory Default
Trip value Ir1	125	40A、50A、63A、80A、100A、125A	125A
	250	63A、80A、100A、125A、140A、160A、180A、200A、225A、250A	250A
	400, 630	160A、180A、200A、225A、250A、315A、350A、400A、450A、500A、560A、630A	400A 630A
	630	250A、300A、315A、350A、400A、500A、560A、630A	630A
	800	315A、350A、400A、450A、500A、560A、630A、700A、800A	800A
Time delay setting tL		3s, 4s, 6s, 8s, 10s, 12s, 16s, 18s, OFF	3s

Overload long-time delay operating characteristics

Table2

Ambient temperature	Current Type	Current	Time
+40°C	Conventional non-tripping current	1.05I _{r1}	≥2h
	Conventional tripping current	1.3I _{r1}	< 2h

◆ Time-delay Characteristic

Overload protection follows the inverse time characteristic:

$$T = (6I_r1/I)^2 t_L \quad \text{Delay accuracy: } \pm 10\%$$

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.

Table3: 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} , 9 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)	Setting Range (400, 630, 800)	Factory Default
Residual Operating Current (I _{Δn})	30, 50, 75, 100, 200, 300, 500, 600, 800 Auto	30, 50, 100, 200, 300, 400, 500, 600, 800, 1000 Auto	500

Table 2: Characteristics of Protection Actions

Parameter	Characteristics			
Rated non-tripping current	0.5 I Δ n			
Rated tripping current	≥ 0.8 I Δ n			
Time-delay characteristic	Maximum non-actuate time at 2I Δ n(Δ t)	Breaking time		
		I Δ n	2I Δ n	5 I Δ n
Non-time-delayed characteristic		≤ 0.3 s	≤ 0.15 s	≤ 0.04 s
0.06	≥ 0.06 s	≤ 0.5 s	≤ 0.2 s	≤ 0.15 s
0.1	≥ 0.10 s	≤ 0.8 s	≤ 0.3 s	≤ 0.3 s
0.2	≥ 0.20 s	≤ 1.0 s	≤ 0.4 s	≤ 0.4 s

◆ Automatic Gear Mode

In automatic gear mode, the values and floating values of each gear are as follows:

Gear Value (mA)	Floating Value (mA)
30	15
50	25
75	37.5
100	50
200	100
300	150
400	200
500	250
600	300
800	400
1000	-

When the residual current exceeds the floating value of the current gear but does not reach its operating value and remains stable for 60 seconds, the gear will shift up by one level, and so on until reaching the maximum gear. When the residual current is lower than the floating value of the next lower gear and remains stable for 120 seconds, the gear will shift down by one level, and so on until reaching the minimum gear.

Take "Auto 2" gear with an initial line residual current of 100 mA as an example. When the circuit breaker is energized, the gear is automatically set to 300 mA. When the residual current increases above 150 mA and remains stable for 60 seconds, the gear will switch to 500 mA. When the residual current decreases below 150 mA and remains stable for 120 seconds, the gear will switch to 200 mA.

◆ Auto-Reclosing Function

After tripping due to residual current exceeding the operating threshold, the circuit breaker can automatically reclose within 20–60 seconds. Manual closing is not subject to this time restriction.

If the fault current is cleared within 5 seconds after reclosing, the closing is successful, and the circuit breaker resumes normal operation. If the fault persists, the circuit breaker will trip again and lock out, prohibiting automatic reclosing. Manual closing operation is required thereafter.

◆ Overvoltage Protection

When the phase voltage exceeds the overvoltage protection setting value, the circuit breaker trips. Once the line voltage returns to the normal range, the circuit breaker can automatically reclose and resume operation. The setting range of overvoltage protection 250V and 300V, with a factory default at 275V. Users can set the value or disable the protection function as needed.

◆ Undervoltage Protection

If the phase voltage drops below the undervoltage protection setpoint, the circuit breaker trips. When voltage is returns to normal, the circuit breaker can automatically reclose and resume operation. The setting range of undervoltage protection is 145V and 200V, with a factory default at 145V. Users can set the value or disable the protection function as needed.

◆ Phase Loss Protection

When a phase loss occurs at the power supply side of the line, the circuit breaker will trip for protection. After the line voltage returns to normal, the circuit breaker can automatically close and resume operation.