

SMART MOULDED CASE CIRCUIT BREAKER(SMART MCCB)

UEM5Z3-250



INTRODUCTION

Hongfa, (Shanghai Stock Exchange: 600885), founded in 1984, has been adhering to the enterprise spirit of “persevere for progress, strive for excellence”, and has built a complete industry system with complete categories and supporting facilities. At present, Hongfa has more than 30 subsidiaries and has established three districts of R & D and production bases. Its products cover various categories, such as medium and low voltage products, relays, high and low voltage switchgear, capacitors, precision parts and automation equipment.

Xiamen Hongfa Electrical Safety & Controls Co., Ltd. is a wholly-owned subsidiary of Hongfa, which specializes in R & D, design and manufacture medium and low voltage products. Its distribution apparatus, terminal apparatus, control apparatus and other products are widely used in real estate, electric power, new energy, industry, HVAC, transportation, information and other fields.

In the United States, Europe, Southeast Asia and other regions, Hongfa has established localized marketing and service networks with global market operation and technical service. Relying on professional and rigorous technical support, fast response and all-round service, safe and reliable product quality and high cost performance, Hongfa has reached business cooperation relationship with many global top 500 enterprises and other well-known enterprises, such as Enel, GE, Honeywell, Carrier, Trane, Johnson Controls, Danfoss, State Grid, China Southern Power Grid, CRRC, China Mobile, China Unicom, etc.



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In terms of technology R & D and manufacturing, taking the national enterprise technology center as the platform, Hongfa has set up postdoctoral research workstation, academician and expert workstation. Now it has developed into a leading scientific research and production base in the industry. From product development, mold manufacturing, parts manufacturing, automated product assembly and online testing, Hongfa has successfully built an integrated whole industry chain of medium and low voltage products. In terms of product testing, Hongfa testing center has passed the certification of VDE, UL, CNAS and other international organizations, and has complete testing and analysis equipment for low-voltage products, such as 50kA ultimate short circuit test, 8kA electrical life test, 80kA characteristic test, mechanical simulation and testing system, electro-magnetic simulation and testing system.

Hongfa always adheres to the policy of "focused on the market, winning through quality", and has a completed quality assurance system. Its products have passed UL / CUL, VDE, CQC, CCC and other international safety certification. In the process of quality management, Hongfa actively implements the advanced quality concept, constantly improves the quality management system, continuously promotes the product process quality control and testing, strengthens the supply chain management, and is committed to providing each customer with high-quality products and creating greater value.

Advanced technology and strict quality control have created Hongfa's brand strength. Hongfa is willing to work hand in hand with global customers to share the convenience and well-being brought by science and technology.

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Standard

CB	CB	IEC60947-2
	CCC	GB/T 14048.2
	UKCA	BS EN 60947-2
	CE	EN 60947-2

Standard Operation and Installation Conditions

Operation temperature

- UEM5Z3-250 can operate normally at ambient temperatures ranging from - 25 °C to +70 °C , and store at ambient temperatures ranging from - 40 °C to +70 °C .
- The performance of electronic overcurrent releases does not fluctuate due to temperature changes. However, when the temperature is higher than +40 °C , some changes in the copper parts (moving and stationary contacts and connecting terminals) through which the current flows in the circuit breaker may cause a decrease in the rated continuous current, and the maximum setting value of the overload protection function needs to be reduced.
- The performance of the circuit breaker cannot be guaranteed when the ambient temperature is higher than +70 °C .
- To ensure the continuity of the operation of electrical equipment, it is necessary to maintain the temperature at which all equipment can operate normally, rather than only considering the operating temperature of the circuit breaker, such as adopting strong ventilation when necessary.

Altitude

- The performance of UEM5Z3-250 is not affected by altitude within 2000 meters above sea level.
- As altitude increases above 2000 meters, the composition, insulation, cooling, and pressure of the atmosphere change. At this point, the performance of the circuit breaker will decrease, mainly in some main parameters, such as the maximum operating voltage, rated operating current, and dielectric strength.

Altitude (m)	2000	3000	4000
40°C Thermal rated operating current (A)	1xI _n	0.95xI _n	0.90xI _n
Dielectric strength (V)	3000	2500	2100

Pollution degree

Pollution degree 3, and the pollution degree of accessories installed in the circuit breaker is 2

Installation category

The installation category of the main circuit III , and the installation category of the auxiliary and control circuits are II .

Installation condition

The circuit breaker can be connected vertically or horizontally, with upper incoming and lower outgoing. The external magnetic field of the installation site should not exceed 5 times the geomagnetic field in any direction.

Ordering Information

	UE	M	5	Z3	- 250	L	/ 250	- 4	3	00	0	1	C	- P6	H	LCD
Company code: UE: Xiamen Hongfa Electrical Safety & Controls Co., Ltd.																
Product code M: MCCB																
Design serial number																
Derivative code Z3: electronic + smart measurement																
Frame size: 250																
Breaking capacity: L: standard type																
Rated current 250: 250A 100:100A																
No of poles: 3: 3p 4: 4p																
Release code: 3: thermal dynamic+ electromagnetic protection																
Internal accessory 00: No accessory; 08: alarm contact; 10: shunt release; 20: auxiliary contact; 28: alarm contact + auxiliary contact (Note: maximum one accessory is allowed for one breaker)																
Internal accessory voltage 0: No voltage; 1:AC220V; 2:AC380V; 3:DC24V; 4:DC110V; 5 :DC220V																
Application 1: power distribution																
N pole protection Omitted: 3P; A: N pole is always connected; B: N pole open and close together with other 3 pole without protection; C: N pole open and close together with other 3 pole with protection; D: N pole is always connected with overload protection																
Operation method Omitted: manual operation with lever; PX: electric operation-- P6: CD2B AC220V																
Wiring method Omitted: front connection (without connection plate); Q: front connection (with connection plate); H: rear connection; RQ: Plug-in type front connection; RH: plug-in rear connection																
Protection type LCD: Smart LCD control																

Example:

UEM5Z3-250L/250-430001C-P6LCD: Smart MCCB UEM5Z3, frame size 250A, breaking capacity L, rated current 250A, 4P, thermal dynamic+electromagnetic protection+no accessories, for power distribution protection, N-pole open and close with other poles with overcurrent protection, CD2B AC220V electric operation, front connection (without connecting board), protection type LCD.

Main Technical Data

Accessory number and the meaning

SHT1	-	250	L	D	/ AC220V
Accessory number: see selection table					
Frame size: 250					
Installation position Omitted: No installation position limit; L: mounted in the left side					
Connection type Omitted: standard type; D: lug type					
Operation voltage Omitted: No voltage requirement; AC220V ; AC380V ; DC24V ; DC110V ; DC220V					

Examples:

SHT1-250LD/AC220V: 250A frame shunt release, left size mounted lug type terminal, operational voltage AC220V.

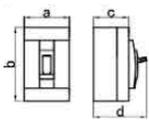
The accessories are shown in Tables 7.1 and 7.2.

Accessory type table

Internal accessory type			External accessory type	
Shunt release	SHT1		Electric operation mechanism motor	CD2B
Auxiliary contact	AX1	1 auxiliary contac		
	AX2	2 auxiliary contac		
Alarm contact	AL1	1 alarm		
Auxiliary +alarm contact	AXAL1	1 auxiliary contact+1 alarm		

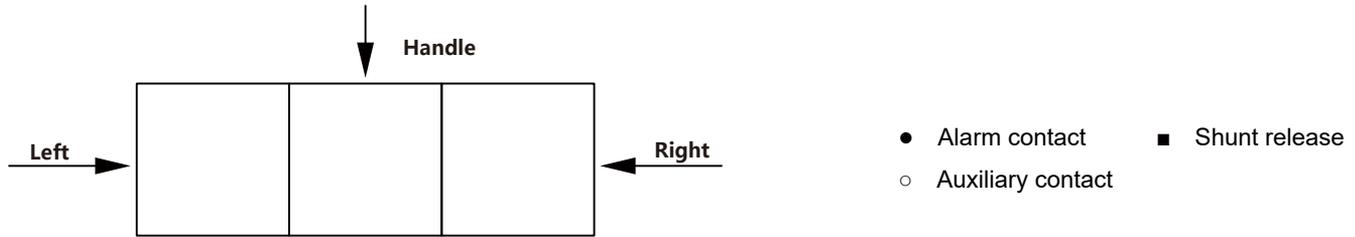
Main Technical Data

Main technical parameter

Frame size (A)		250
Breaking capacity		L
Rated current I_n (A)		100、250
Setting current I_r (A) No. of		40A~100A($I_n=100A$) 100A~250A($I_n=250A$)
poles		3、4
Rated insulation voltage U_i (V)		AC800
Rated operational voltage U_e (V)		AC400
Rated impulse withstand voltage U_{imp} (V)		8000
Arcing distance (mm)		≤50
Selective category		A
Pollution degree		3
Rated ultimate short-circuit breaking capacity I_{cu} (kA)	AC400V	35
Rated service short-circuit breaking capacity I_{cs} (kA)		25
Rated short time withstand current I		3KA/1s
Overall dimension (mm) 	a (3P/4P)	105 / 140
	b	165
	c	88
	d	101
Durability (cycles)	Electrical	1000
	Mechanical	7000
	Total operations	8000
Mode of connection	Front connection	•
	Rear connection	•
	Plug-in connection	•
Accessory	Shunt release	•
	Auxiliary contact	•
	Alarm contact	•
	Electric operation mechanism motor	•
Protection function		load long delay, short circuit short delay, short circuit instantaneous, overvoltage/undervoltage, phase loss, terminal overtemperature
Overcurrent release		electronic adjustable
3P/4P weight (kg)		2.1/ 2.5

Main Technical Data

Accessory Code



Code	Name	Mode No. of poles	UEM5Z3-250		
			3, 4		
00	No accessory		—		
08	Alarm contact		●		
20	Auxiliary contact		○		
10	Shunt release		■		
28	Alarm contact Auxiliary contact		●	○	

Note: The standard auxiliary contact is 1NO+1NC. If other combination is required, please specify.

Protection characteristics

UEM5Z3 Inverse time limit operation characteristics of overcurrent protection

UEM5Z3-250 operation characteristics for power distribution protection (reference temperature+40 °C)

Test current	Setting current	Agreed time		State of start
		$I_n \leq 63A$	$I_n > 63A$	
Agreed non tripping current	1.05	$\geq 1h$	$\geq 2h$	Cold state
Agreed tripping current	1.30	$< 1h$	$< 2h$	Hot state
Return characteristic current	3.0	Returnable time		Cold state
		5s	8s	

Breaking Characteristics of Overcurrent Release under Short Circuit Condition

The short circuit protection current setting value of the circuit breaker for power distribution protection is $10I_n$ (the above short-circuit protection current setting value has an accuracy of $\pm 15\%$)

Main Technical Data

Electronic protection type

Overload long delay protection+short circuit short delay protection+short circuit instantaneous protection+pre alarm protection.

Protection value

Overload long delay protection and alarm		
Rated current I _r (Accuracy±10%)	In=100A	40, 50, 63, 70, 80, 90, 100A, default 100A
	In=250A	100, 125, 140, 160, 180, 200, 225, 250A, default 250A
Operating time T _r (Tolerance ±10%)		12, 36, 60, 80, 100s+ OFF, default 12s
Current I≥1.15×I _r The protection is according to the		
inverse time characteristic: $I^2t=(2 I_r)^2t_r$		40%~100% I _r , default 80% I _r
Short circuit short delay protection and alarm		
Protection current I _s (accuracy ± 15%)		2/3/4/5/6/7/8/9/10/11/12× I _r , default: 8× I _r
Protection time T _s (Tolerance ± 15%)		0.1s, 0.2s, 0.3s, default: 0.3s
Alarm value		40%~100% I _s , default 80% I _s
Short circuit instantaneous protection		
Protection current I _i (accuracy ± 15%)		3/4/5/6/7/8/9/10/11/12× I _r , default 10× I _r
Protection current I _i (accuracy ± 15%)		<200ms
Neutral line protection (only available for 4P)		
Protection current I _i (N)		0.5, 0.6, 0.8, 1.0× I _i + OFF, default 1.0 I _i
Terminal over temperature protection and alarm		
Operation value		85~120°C, setting step 1°C, default: 110°C
Protection delay time		10s~100s, setting step 1s, default 20s
Alarm value		85~120°C, default: 100°C
Under voltage protection and alarm		
Operation value		130V~220V, setting step 1V; default: 165V
Protection delay time		3s~30s, setting step 1s, default 10s
Alarm value		130V~220V, default 180V
Overvoltage protection and alarm		
Operation value		220V~286V, setting step 1V; default: 275V
Protection delay time		1s~30s, setting step 1s, default 10s
Alarm value		220V~270V, default 260V
Phase loss protection and alarm		
Operation value		5%~90%, setting step 1%, default: 70%
Protection delay time		3~30s, setting step 1s, default 10s
Alarm value		10%~90%, default: 80%

Main Technical Data

Communication function

Communication terminal	Terminal type	Communication protocol	Address	Communication rate
RS485	External terminal	Modbus-RTU	1-247	4800-38400 (Adjustable)

Cable connection requirement

The cross-sectional area and corresponding rated current of the connecting cable are shown in the following table

Rated current (A)	40/50	63	80	100	125/140	160	180/200/225	250
Cross-sectional area (mm ²)	10	16	25	35	50	70	95	120

Derating coefficient

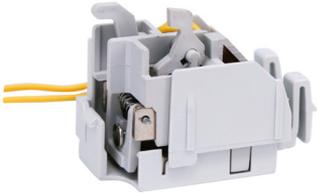
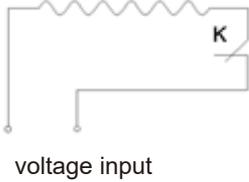
Part number of breaker	40°C	45°C	50°C	55°C	60°C	65°C	70°C
UEM5Z3-250	1I _n	1I _n	1I _n	0.95 I _n	0.93 I _n	0.9 I _n	0.87 I _n

Accessories and Functions

Internal accessory

Shunt release (SHT1)

- The shunt release is used to remotely control the opening of the circuit breaker.
- Rated operational voltage: AC 50Hz, 220V or 380V; DC 24V, 110V, or 220V.
- When the applied voltage of the shunt release is 70% to 110% of the rated control voltage of the shunt release, the shunt release shall reliably trip the circuit breaker

Appearance	Wiring diagram
	 <p>voltage input</p>

Note: When users use a DC24V shunt release, the power supply must meet the minimum requirement of 50W

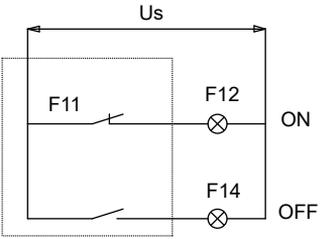
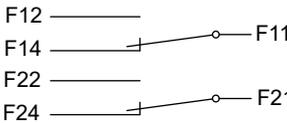
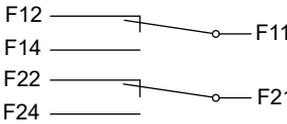
Auxiliary contact (AX1, AX2), alarm contact (AL1)

- The auxiliary contact is used for automatic control of the control circuit of the circuit breaker, like signal indication of the opening and closing status of the circuit breaker.
- The alarm contact is used for alarming "free tripping" caused by circuit breaker load and line faults.
Rated operational voltage: AC 50Hz, 220V or 380V; DC 220V.

Technical parameters of auxiliary contact and alarm contact

Type	Frame size	Conventional thermal current I _{th} (A)	I _e (A)	
			AC380V	DC220V
Auxiliary contact	250A	3	0.30	0.15
Alarm contact	250A	3	0.30	0.15

Auxiliary Contact Wiring Diagram

Breaker status	Auxiliary contact wiring diagram	A set of auxiliary contact states
The circuit breaker is in the "ON" positions	A set of auxiliary contact states: 	
	Two set of auxiliary contact states: 	
The circuit breaker is in the "OFF" positions	A set of auxiliary contact states: 	
	Two set of auxiliary contact states: 	

Accessories and Functions

Internal accessory

Alarm Contact Wiring Diagram

Breaker status	Alarm contact status	Wiring diagram	
The circuit breaker is in the "ON" and "OFF" positions			
The circuit breaker is in the "free tripping" position		<p>The circuit breaker is in the "ON" and "OFF" positions</p>	<p>The circuit breaker is in the "free tripping" position</p>

External accessory

Electric operating mechanism motor

- The electric operating mechanism motor is used to remotely control the opening and closing of the circuit breaker after being assembled with the circuit breaker .
- CD2B type - Ultrathin type, driven by a permanent magnet DC motor, powered by a switching power supply, low power, wide voltage range, universal for AC and DC, suitable for operation of frame size 250A circuit breakers.

electric operating mechanism motor	Part number	Applicable for breaker	Rated control voltage (V)	Operating current (A)	Overall and installation dimension (mm)			
					A	B	H1	H2
CD2B	CD2B-250/UEM5 Z3	UEM5Z3-250	AC220V/DC220V	≤0.8	90	152	76	143.5

CD2B	CD2B overall dimension	Wiring diagram

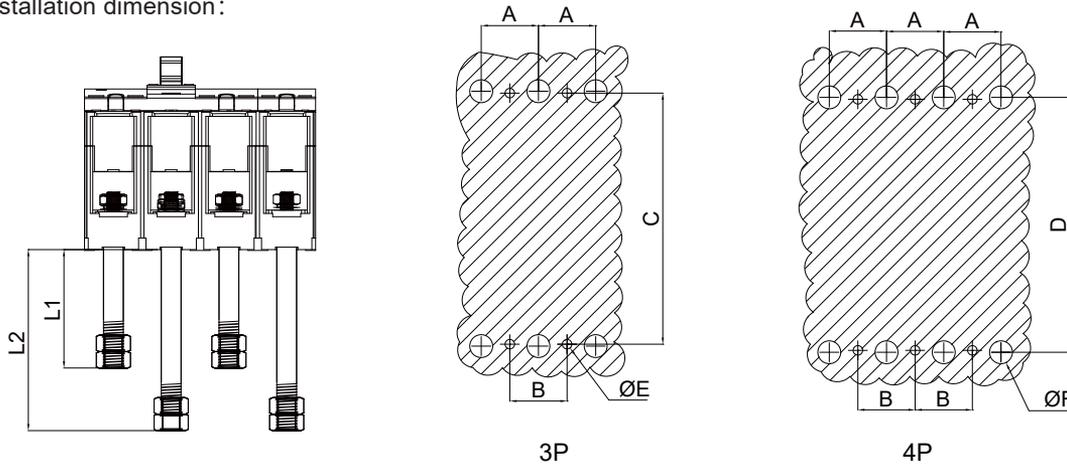
Wiring method and installation dimension

Rear connection overall and installation dimensions (BJT2)

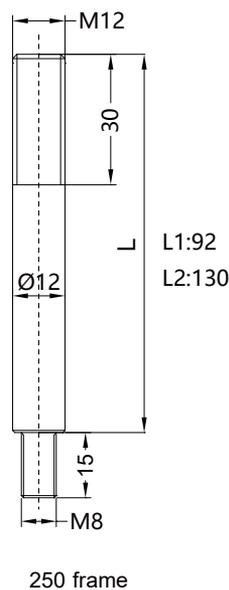
The rear connection post is installed on the circuit breaker terminal, suitable for wiring from the back of the cabinet. Each frame has a matching post. During installation, it is necessary to pay attention to whether the insulating sleeve on the post is broken.

Rear connection type	Applicable for breaker	外形及安装尺寸(mm)					
		A	B	C	D	E	F
BJT2-250	250 frame	35	35	126	145	5	12

Overall and installation dimension:



Rear connection post dimension:



Wiring method and installation dimension

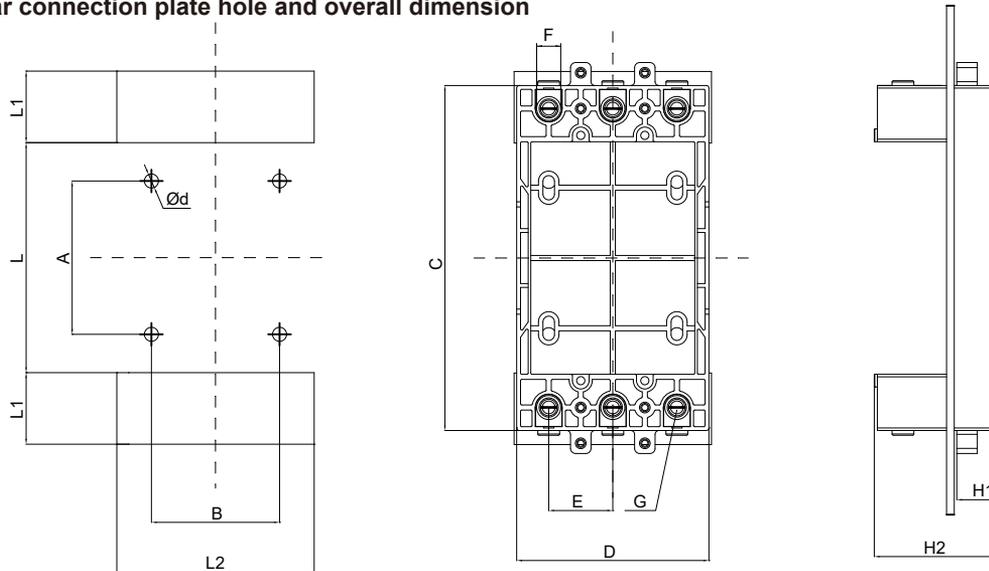
Plug-in wiring overall and installation dimension (BJT1)

The plug-in post is installed on the circuit breaker terminal, and the plug-in base is installed on the cabinet, suitable for wiring from the back of the cabinet, convenient for installation and maintenance.

Plug-in type	Applicable for breaker	Wiring method	Overall and installation dimension (mm)												
			A	B	L	L1	L2	d	C	D	E	H1	H2	F	G
BJT1-250	250 frame	Rear	74	70	100	55	110	6.5	179	105	35	27	73.2	29	M8
		Front	150	35		223		M4	179	105	35	32	74	29	8.5

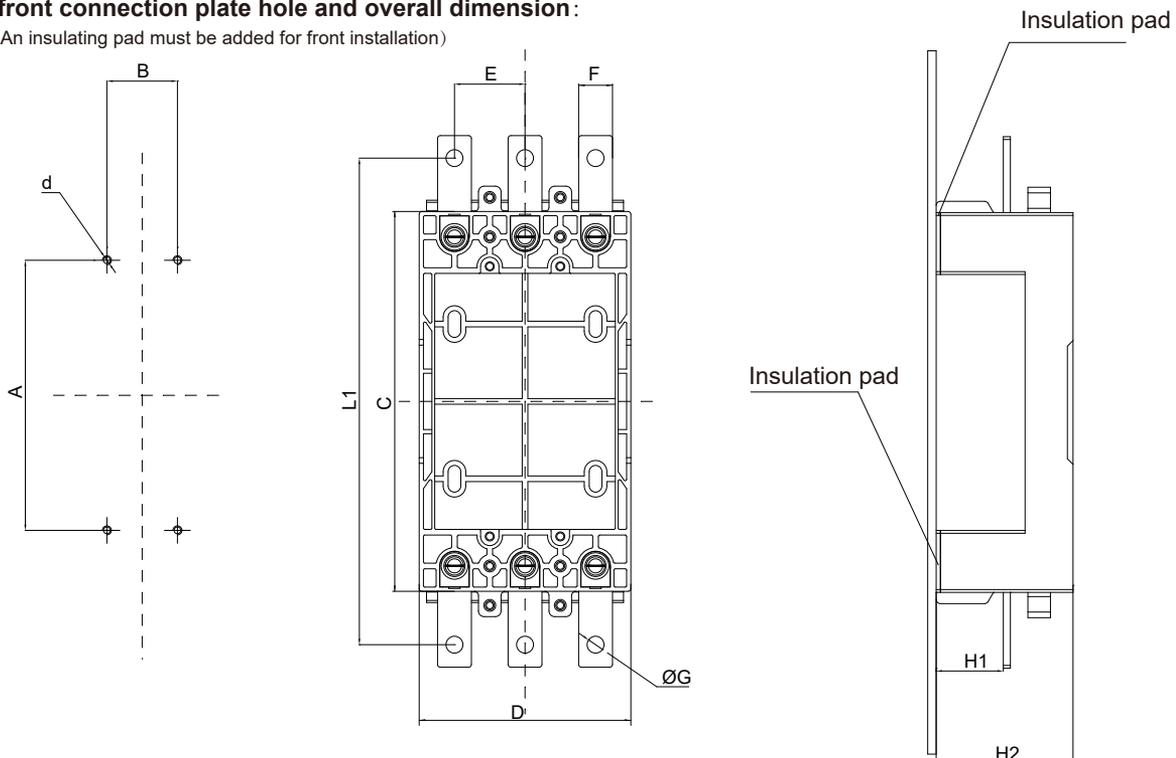
Note: For four-pole switch, the phase distance E is increased for dimensions of B, L2, and D

Plug-in rear connection plate hole and overall dimension



Plug-in front connection plate hole and overall dimension:

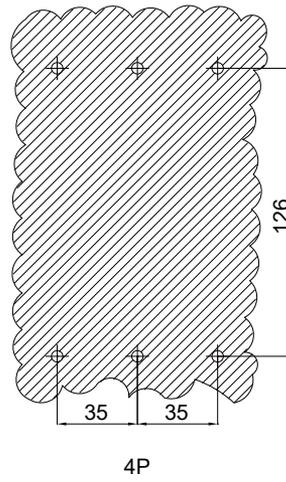
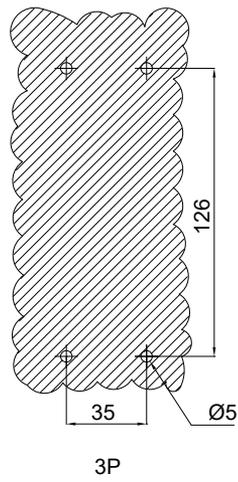
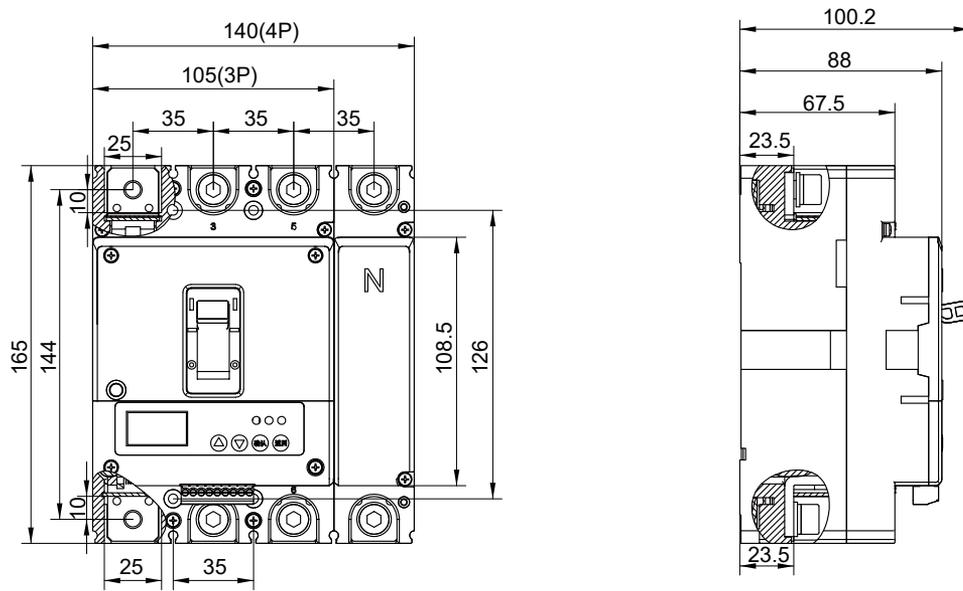
(Warning: An insulating pad must be added for front installation)



Product overall dimension and the installation hole

UEM5Z3-250L

Unit: mm



installation hole

Ordering Specifications

Internal accessory

Shunt release SHT1

	Name	Type
	250A frame, shunt release, left mounted, AC220-240V terminal typ	SHT1-250LD/AC220V
	250A frame, shunt release, left mounted, AC380-440V terminal type	SHT1-250LD/AC380V
	250A frame shunt release, left mounted DC110-127V terminal type	SHT1-250LD/DC24V
	250 frame shunt release, left mounted DC110-127V terminal type	SHT1-250LD/DC110V
	250 frame shunt release, left mounted DC220-250V terminal type	SHT1-250LD/DC220V

Auxiliary contact AX1, AX2

	Name	Type
	250A frame auxiliary contact, left mounted 1NO+1NC terminal type	AX1-250LD
	250A frame auxiliary contact, left mounted 2NO+2NC terminal type	AX2-250LD

Alarm contact AI1

	Name	Type
	250A frame alarm contact, terminal type	AL1-250D

Auxiliary and alarm AXAL1

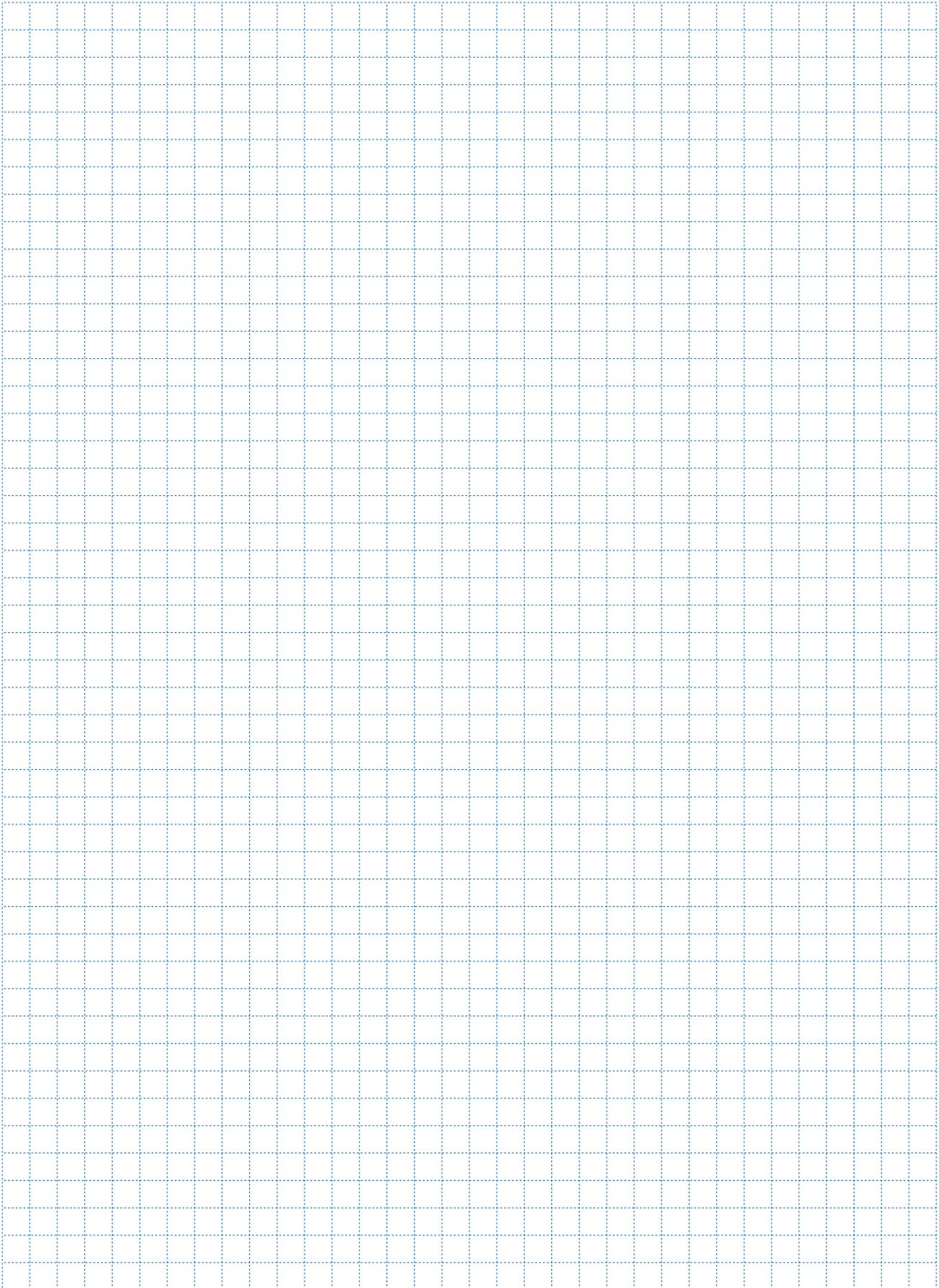
	Name	Type
	250A frame auxiliary and alarm contact, terminal type	AXAL1-250D

External accessories

Electric operating mechanism motor CD2B

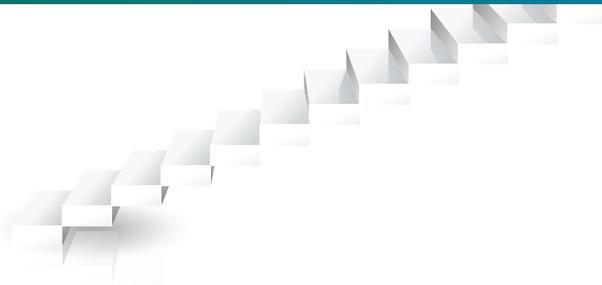
	Name	Type
	250A frame electric operating motor AC220-240V without plug-in type	CD2B-250/AC220V

Note: (1) Please refer to 3.1 for product model description. (2) Accessories should be used together with the breaker and not sold separately.



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