



Electrical
Safety Guard

H8M Series **Molded Case Circuit Breaker** **Installation and Operation** **Instruction**

Product Certificate

This product has passed the inspections and meets the requirements of GB/T 14048.2, and therefore is allowed to leave the factory.

Inspector:



Date of inspection: See the product or packaging.

Huanyu Group Zhejiang High-tech Co., Ltd.

The H8M Series Molded Case Circuit Breaker (hereinafter referred to as “circuit breaker”) is the high-tech product in the 21st century. This product is characterized by advanced design, reliable performance, high technical indicators, beautiful appearance, and small size.

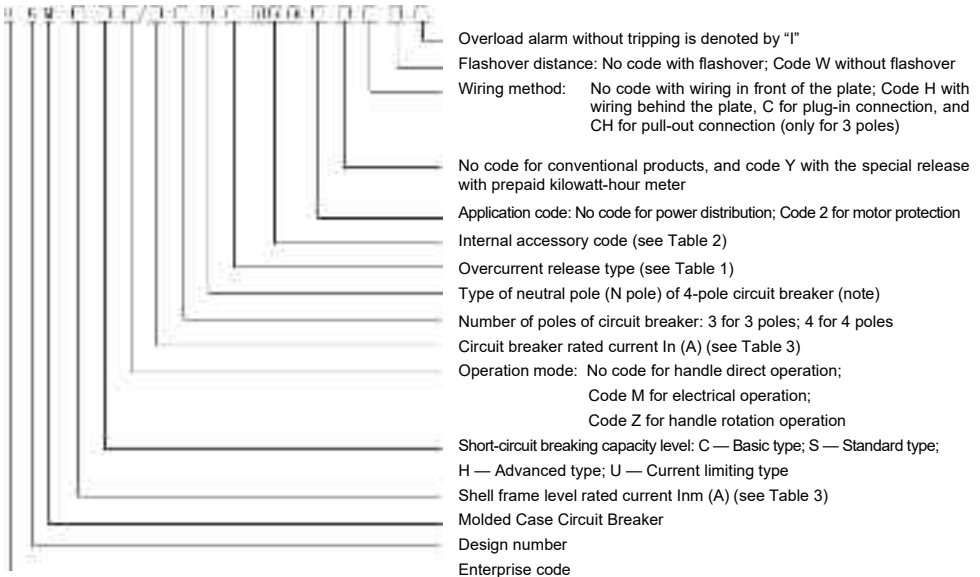
1 Purpose and Scope of Application

This circuit breaker is suitable for the power system with AC 50 Hz, rated isolation voltage up to 800 V, rated working voltage up to 690 V and rated current up to 800 A. It is used to distribute electric energy and protect circuits and power supply equipment from overload, short circuit, undervoltage and other faults, and to prevent the infrequent operation of the motor.

2 Standards Followed

The product complies with GB/T 14048.2-2008 *Low-voltage Switchgear and Controlgear — Part 2: Circuit-breakers* and IEC 60947-2 *Low-voltage Switchgear and Controlgear — Part 2: Low-voltage Circuit Breakers*, etc.

3 Model Description



Note: In 4-pole products, two types are provided for the neutral pole (N pole):
 Type A: The N pole is not equipped with an overcurrent release and is normally on, and is not opened/closed with the other three poles.
 Type B: The N pole is not equipped with an overcurrent release, and is closed/opened with the other three poles.

Table 1 Type of overcurrent release

Serial number	Name	Description
1	Delay release	With the overcurrent inverse time limit protection characteristic
2	Instantaneous release	i.e. electromagnetic release, with the overcurrent instantaneous operation protection characteristic
3	Complex release	With the above two functions

Table 2 Internal accessory code

Inm (A)	I		II		III		Notes
	Code	Description	Code	Description	Code	Description	
63 100 250	0	N/A	0~2	Number of auxiliary contacts	0~2	Number of alarm contacts	
	1	Shunt trip	0~1		0~1		
	2	Undervoltage release	0~1		0~1		
400	0	N/A	0~5		0~2		II+III≤7
	1	Shunt trip	0~3		0~2		II+III≤5
	2	Undervoltage release	0~3		0~2		II+III≤5
	3	Shunt/Undervoltage release	0~1		0~1		II+III≤2
630 800	0	N/A	0~8		0~3		II+III≤11
	1	Shunt trip	0~6		0~3		II+III≤8
	2	Undervoltage release	0~6		0~3		II+III≤8
	3	Shunt/Undervoltage release	0~3	0~2	II+III≤5		

4 Normal Working Conditions

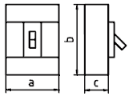
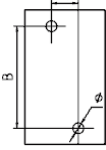
The circuit breaker is suitable for the following working conditions:

- 4.1 The ambient air temperature shall not be higher than +40°C or lower than -5°C.
- 4.2 Altitude ≤ 2,000 m.
- 4.3 The relative air humidity shall not exceed 50% at the maximum temperature of +40°C. A higher relative humidity is allowed at a lower temperature. The average minimum temperature of the wettest month shall not exceed +25°C, and the average maximum relative humidity of that month shall not exceed 90%.
- 4.4 Contamination grade: Grade 3. There is no explosion danger and no gas or conductive dust that corrodes metals or damages insulation in the surrounding air.
- 4.5 The installation category is Grade III.
- 4.6 The "1, 3, 5 and N1" terminals of the circuit breaker are connected to the power supply, and the "2, 4, 6 and N2" terminals are connected to the load, which cannot be reversed.
- 4.7 The installation surface of the circuit breaker shall be vertical to the horizontal plane. The circuit breaker is basically installed vertically, with the power supply terminal at the top and the load terminal at the bottom, and can also be installed horizontally.

5 Main Technical Performance Indicators

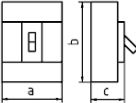
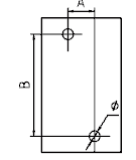
5.1 The main technical performance indicators are shown in Table 3.

Table 3 Main technical performance indicators

Shell frame level rated current Inm (A)	63	100						250						
Product model	H8M-63S	H8M-100C	H8M-100S		H8M-100H	H8M-100U	H8HM-250C	H8M-250S	H8M-250H	H8M-250U				
Rated current In (A)	10,16,20 25,32,40 50,63	16,25,32,40,50,63,80,100						100,125,150,160,175,200,225,250						
Number of poles	3	3	4	3	4	3	3	3	4	3	4	3	3	
Rated insulation voltage Ui (V)	AC 600	AC 800						AC 800						
Rated impulse withstand voltage Uimp (kV)	8													
Flashover distance (mm)	≤50(0)*	≤50 (0) *						≤50 (0) *						
Rated ultimate/service short-circuit breaking capacity Ics (kA)	690 V	-	-	5/3	10/5	10/5	-	5/5	10/5	10/5				
	400 V	35/35	35/35	55/55	85/85	125/125	35/35	55/55	85/85	125/125				
Operation performance (times)	Energizing	8,000	8,000						8,000					
	De-energizing	20,000	20,000						20,000					
Outline dimensions (mm) 	a	75	90	120	90	120	90	90	105	140	105	140	105	105
	b	130	155				216		165			240		
	c	68	68						68					
Installation dimensions (mm) 	A	25	30						35					
	B	111	132				193		126			201		
	Φ	5	5						5					

* The flashover distance, if zero, shall be indicated when ordering.

Table 3 Main technical performance indicators (completed)

Shell frame level rated current Inm (A)	400				630				800										
Product model	H8M-400C	H8M-400S	H8M-400H	H8M-400U	H8M-630C	H8M-630S	H8M-630H	H8M-630U	H8M-800C	H8M-800S	H8M-800H	H8M-800U							
Rated current In (A)	250,300,350,400				400,500,630				630,700,800										
Number of poles	3	4	3	4	3	3	3	4	3	3	3	4	3	4	3	3			
Rated insulation voltage Ui (V)	AC 800				AC 800				AC 800										
Rated impulse withstand voltage Uimp (kV)	8																		
Flashover distance (mm)	≤100 (0) *				≤100 <0) *				≤100 (0) *										
Rated ultimate/service short-circuit breaking capacity Icu/Ics (kA)	690 V	10/10	10/10	15/10	35/35	10/10	15/15	20/15	35/35	10/10	15/15	20/15	35/35						
	400 V	50/50	75/75	100/100	125/125	50/50	75/75	100/100	125/125	50/50	75/75	100/100	125/125						
Operation performance (times)	Energizing	7,500				7,500				7,500									
	De-energizing	10,000				10,000				10,000									
Outline dimensions (mm) 	a	140	185	140	180	140	140	210	280	210	280	210	210	210	280	210	280	210	210
	b	257		297		275		322		275		322							
	c	103		200		103		200		103		200							
Installation dimensions (mm) 	A	44				70				70									
	B	194		234		243		290		243		290							
	Φ	7				7				7									

* The flashover distance, if zero, shall be indicated when ordering.

5.2 See Table 4 (for power distribution) and Table 5 (for motor) for the overcurrent protection characteristics.

Table 4 Overcurrent protection characteristics of circuit breakers for power distribution

Rated current In (A)	Thermal release (ambient temperature +40°C)		Operating current of electromagnetic release (A) [Note]
	1.05 In non-operating time (h) (initial state: cold state)	1.30 In operating time (h) (initial state: thermal state)	
≤63	>1	≤1	(10±2)In
>63	>2	≤2	

Table 5 Overcurrent protection characteristics of circuit breakers for motors

Rated current In (A)	Thermal release (ambient temperature +40°C)				Operating current of electromagnetic release (A) [Note]
	1.0 In non-operating time (h) (initial state: cold state)	1.2 In operating time (h) (initial state: thermal state)	1.5 In operating time (min) (initial state: thermal state)	7.2 In operating time (s) (initial state: cold state)	
In ≤ 63	>2	≤2	≤2	2 < Tp ≤ 10	(12 ± 2.4) In
63 < In ≤ 250			≤4	4 < Tp ≤ 10	
250 < In ≤ 800			≤8	6 < Tp ≤ 20	

[Note]: The operating current of the electromagnetic release of H8M-630 and 800 (400 A ≤ In ≤ 800 A) is (5 ± 1) In to 14 In.

Adjustable reference value: Low (4 ~ 6) In; Relatively low (6 ~ 8.3) In; Relatively high (8.3 ~ 10.9) In; High (10.9 ~ 14) In.

6 Circuit Breaker Accessories

6.1 List of accessory models (see Table 6).

Table 6 List of accessory models

Shell frame level rated current Inm (A)		63	100	250	400	630, 800	
Internal accessories	Alarm contact	B1	B2	B3	B4		
	Auxiliary contact	F1	F2	F3	F4		
	Shunt trip	FL1	FL2	FL3	FL4		
	Undervoltage release	QY1	QY2	QY3	QY4		
	Accessory terminal	JX					
	Special release with prepaid kilowatt-hour meter	Y					
External accessories	Rotation operating handle	CS1-63	CS1-100	CS1-250	CS1-400	CS1-630	
	Electric operating mechanism	MDX0	MDX1	MDX2	MDX3	MDX4	
	Mechanical interlock	3-pole	N1-3	N2-3	N3-3	N4-3	N5-3
		4-pole	—	N2-4	N3-4	N4-4	N5-4

6.2 Rated values of auxiliary contacts and alarm contacts

Conventional thermal current I_{th} = 6 A;

Rated working current I_e = 0.79 A (230 V, AC) I_e = 0.47 A (400 V, AC);

I_e = 0.15 A (220 V, DC).

6.3 Shunt trip parameters

Rated voltage U_s: AC: 110 V, 230 V, 400 V; input capacity: 180 VA;

DC: 24 V, 48 V, 110 V; input capacity: 60 W.

The circuit breaker can interrupt reliably under (70% ~ 110%) U_s, and the operating time is 10 ms ~ 30 ms.

When the rated control power supply voltage of the shunt trip is DC 24 V, the maximum length of the copper conductor shall meet the requirements of Table 7.

Table 7 Maximum length of the copper conductor

Rated control power supply voltage U_c (DC 24 V)	Conductor area	
	1.5mm ²	2.5mm ²
100% U_c	150m	250m
80% U_c	100m	160m

If the requirements of the above table are not met, it is recommended to design the control circuit of the shunt trip according to Figure 1.

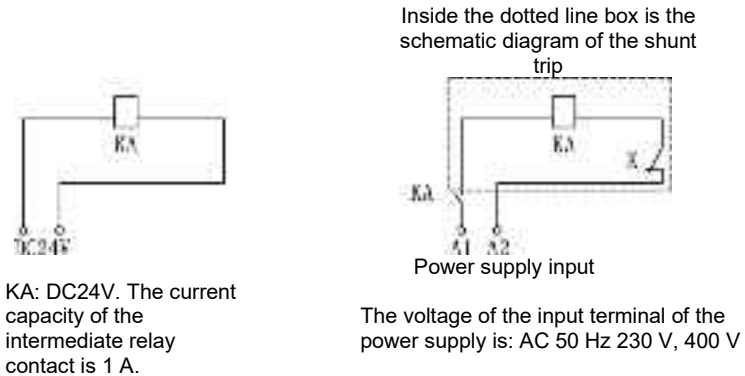


Figure 1 Shunt trip control circuit design

6.4 Parameters of the undervoltage release

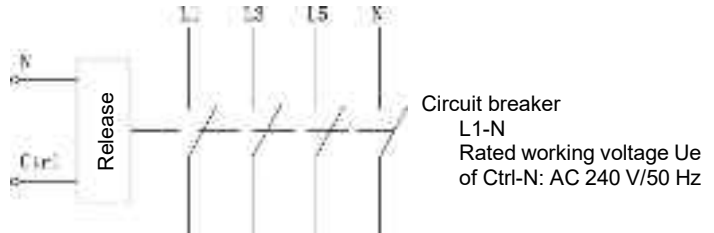
Rated voltage U_e : AC: 110 V, 230 V, 400 V;

DC: 24 V, 48 V, 110 V.

The circuit breaker can interrupt reliably under (35%~70%) U_s , and the operating time is 10 ms~30 ms. When the power supply voltage is less than 35% U_e , the circuit breaker can be prevented from closing. When the power supply voltage is more than or equal to 85%, the circuit breaker can be reliably closed.

6.5 Special release with prepaid kilowatt-hour meter

The rated working voltage U_e of the special release with prepaid kilowatt-hour meter is AC 240 V/50 Hz. It can work normally in the range of (65%~110%) U_e . When the Ctrl terminal is cut off, the breaker will delay opening by 0.5 s ~ 2 s. See Figure 2 for the wiring diagram.



Note: N is connected to the power neutral wire, and Ctrl is connected to the control signal terminal of the prepaid kilowatt-hour meter.

Figure 2 Wiring diagram of the special release with prepaid watt-hour meter

6.6 See Table 7 for the parameters of the electric operating mechanism.

Table 7 Main technical parameters of the MDX Electric Operating Mechanism

Shell frame level rated current I_{nm} (A)	63	100	250	400	630, 800
Model of electric operating mechanism	MDX0	MDX1	MDX2	MDX3	MDX4
Rated working voltage U_e (V)	AC 110 V~230 V, 50 Hz; DC 110V ~220 V				
Starting current (A)	≤ 0.5			≤ 2	
Operating time (S)	≤ 0.8				
Rated operating frequency (times/h)	180			120	
Mechanical life (times)	15,000	9,000	5,000	3,000	

The power supply capacity of the electric operating mechanism shall be large enough to ensure that the voltage applied to the electric operating mechanism under the starting current is not less than 85% U_e .

6.7 See Figure 1 for the wiring diagram of the electric operating mechanism.

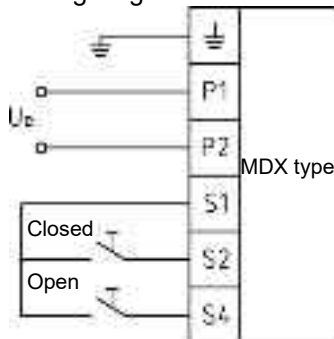


Figure 1 Wiring diagram of the MDX Electric Operating Mechanism

7 Use and Maintenance

7.1 Considerations before installation of the circuit breaker

The appearance of the circuit breaker is in good condition, and no-load operation works normally.

The insulation resistance between the poles of the circuit breaker and the incoming and outgoing line terminals of the same pole in the interrupting state shall not be less than 1.5 MΩ.

The rated values of the circuit breaker and its accessories shall be consistent with the working conditions of the installation site.

There shall be no significant impact vibration at the installation, which meets the normal working conditions.

7.2 The cross-section area of the connecting conductor of the circuit breaker shall not be less than that specified in Table 8, and the connecting screws shall be tightened.

Table 8 Cross-section area of the connecting conductor

Rated current In (A)	10	16 20	32	40 50	63	80	100	125 150	160 175	200 225	250	300 350	400
Cross-section area of the conductor (mm ²)	1.5	2.5	6	10	16	25	35	50	70	95	120	185	240

Rated current In (A)		500	630	700, 800
Copper conductor	Pcs	2	2	2
	Cross-section area (mm ²)	150	185	240
Copper busbar	Pcs	2	2	2
	Cross-section area (mm ²)	30×5	40×5	50×5

7.3 Various characteristics of the circuit breaker and its accessories are set by our company according to the order requirements, and cannot be adjusted freely during use.

7.4 The handle of the circuit breaker can be in three positions: "Closed", "Open" and "Tripped". When the handle is in the trip position, it shall be pulled in the "Open" direction to make the circuit breaker trip again, and then the "Closing" operation can be carried out.

7.5 During the installation of the internal accessories, the circuit breaker must be tripped and interrupted before installation.

Company Commitment

On the premise that users abide by the use and storage conditions and that the product seals are intact, if the product is damaged or cannot be used normally due to manufacturing quality problems within 18 months from the production date of the product, our company will be responsible for the repairing or replacement free of charge. If the warranty period expires, users shall pay for the repair. However, if the damage is caused by the following circumstances, the fees for repair still shall be charged even within the warranty period:

- (1) Misuse, self-modification, improper maintenance, etc.
- (2) Use beyond the standard specification requirements.
- (3) Falling, damage during transportation, etc. after purchase.
- (4) Earthquake, fire, lightning strike, abnormal voltage, other natural disasters and secondary disasters, etc.

In case of any questions, please contact the dealer or our customer service department.

Dear customers:

To protect our environment, please recycle the product or its components when the product is scrapped. For materials that cannot be recycled, please handle them properly. Thank you very much for your cooperation and support.



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