



选型目录 Product Catalog

MM1L 系列

带剩余电流保护塑料外壳式断路器

MM1L Series Moulded Case Earth Leakage Circuit Breaker



MM1L 系列带剩余电流保护塑料外壳式断路器

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Circuit Breaker



产品概述 Outline

该断路器额定绝缘电压至1000V，适用于交流50Hz，额定工作电压至400V，额定工作电流至1250A的配电网络电路中，用来分配电能和保护线路及电源设备免受过载、短路、欠电压等故障的损失。同时也能作为电动机的不频繁启动及过载、短路、欠电压保护。

该断路器具有体积小、分断高、飞弧短等特点，是用户使用的理想产品。断路器垂直安装(即竖装)，亦可水平安装(横装)。

本产品符合IEC60947-2、GB/T14048.2等标准。

This breaker's rated insulation voltage is 1000V, is applied to distribution network circuit of AC 50HZ, rated working voltage up to 400V, rated working current up to 1250A, which is for electroenergy distribution, circuit protection, protecting power supply facility from destroying by the fault of overloading, short circuit and undervoltage, meanwhile it is also used for protection from infrequent starting, over loading, short circuit and undervoltage of the electromotor

This breaker has such characteristics of company volume, high short circuit interrupting capacity, short flange arcing and etc which is a ideal product for users, This breaker can be installed vertically (upright), and also horizontally.

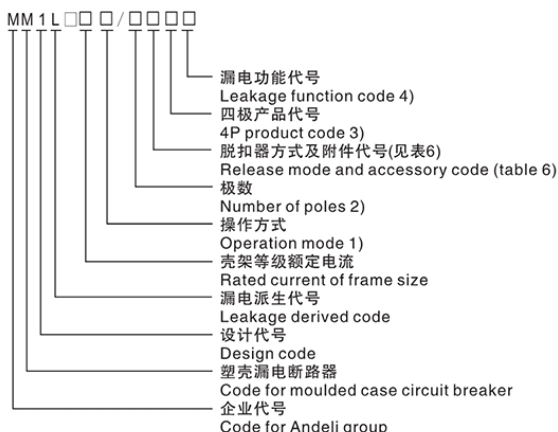
This breaker comply with standard IEC60947-2、GB/T14048.2.

适用工作环境及安装条件 Suitable working environment and installation condition

- 海拔高度2000m以下
- 周围介质温度不高于+40℃ (对船用产品为+45℃) 和不低于-5℃
- 能耐受潮湿空气的影响
- 能采收霉菌的影响
- 能耐受核辐射的影响
- 最大倾斜度为22.5°
- 在受到船舶正常振动时能可靠工作
- 在受到地震情况(4g)能可靠工作
- 在无爆炸危险的介质中，且介质无足以腐蚀金属和破坏绝缘的气体与导电尘埃的地方
- 在没有雨雪侵袭的地方

- Altitude less than 2000m
- Ambient medium temperature is from -5°C to +40 °C (+45 °C for shipping product)
- Can withstand moist air
- Can with stand mold
- Can with stand nuclear radiation
- Max inclination is 22.5 °
- It can still work reliably if the product subjects to the normal vibration from ships
- It can still work reliably if the product subjects to the earthquake(4g)
- Put in the place where is no explosion danger and conductive dust, cant corrode metal and destroy the insulation sleet.
- Put in the place where is no sleet.

断路器型号及含义 Circuit Breakers codes and Implications



注: 1) 手柄直接操作无代号; 电动操作用D表示; 转动操作用Z表示。

2) 三极用3表示; 四极用4表示。

3) A型: N极不安装过电流脱扣元件, 且N极始终接通, 不与其他三极一起合分;

B型: N极不安装过电流脱扣元件, 且N极与其他三极一起合分;

C型: N极安装过电流脱扣元件, 且N极与其他三极一起合分;

D型: N极安装过电流脱扣元件, 且N极始终接通, 不与其他三极一起合分;

4) 漏电脱扣不带报警无代号; 漏电报警又脱扣用I表示; 漏电报警不脱扣用II表示。

Note: 1) Manual vehicle direct operation: no code; D for electric operation: z for rotational operation.

2) The 3 poles is represented by 3; the 4 poles is represented by 4.

3) Type A: Pole N shall not be installed with over-current tripping element, and it always switches on and not switches on or off together with other three poles;

Type B: Pole N shall not be installed with over-current tripping element, and it switches on or off together with other three poles;

Type C: Pole N shall be installed with over-current tripping element, and it switches on or off together with other three poles;

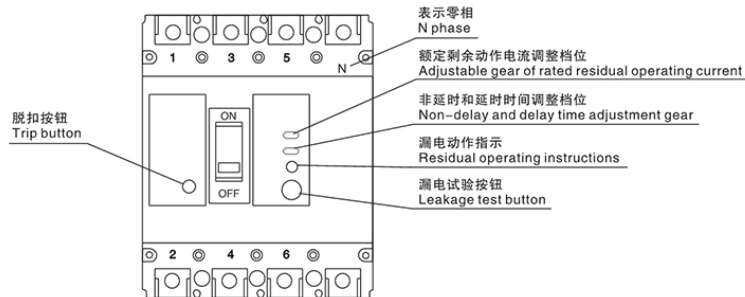
Type D: Pole N shall be installed with over-current tripping element, and it always switches on and not switches on or off together with other three poles;

4) Leakage trip no alarm: no code; I for leakage alarm and trip; II for leakage alarm no trip

主要特点 main feature

- 剩余电流三相保护: MM1L断路器实现接地故障保护, 常规的带剩余电流保护断路器的漏电保护模块工作电源取样为二相, 本系列断路器为三相, 若缺一相, 断路器漏电保护模块仍能正常工作;
- 现场可调: 额定剩余动作电流 $I_{\Delta n}$ 及剩余电流动作时间(非延时和延时)根据实际情况现场可调;
- 低电压保护: 当相电压降低至50V, 漏电保护模块仍能正常工作;
- 具有漏电报警输出功能: 当设备或线路的剩余电流, 达到或超过设定值, 带漏电报警单元模块的断路器输出一个无源接点信号, 驱动相应的报警装置;
- 安装具有互换性: 外形尺寸和安装尺寸与 MM1 系列断路器同规格相同 (MM1L-630与MM1L-800相同), 安装具有较好的互换性。
- Residual current three-phase protection: MM1L circuit breaker achieves ground fault protection. The working power of the conventional leakage protection module with residual current circuit breaker is as follows: Two-phase, this series of circuit breakers are three-phase, if any phase is missing, the circuit breaker leakage protection module can work normally;
- Field adjustable: rated residual operating current $I_{\Delta n}$ and residual current operating time (non-delay and delay) are adjustable on site according to the actual situation;
- Low voltage protection: When the phase voltage is reduced by 50V, the leakage protection module can still work normally;
- With leakage alarm output function: When the residual current of the equipment or line reaches or exceeds the set value, the circuit breaker with the leakage alarm unit module outputs a passive connection Point signal, drive the corresponding alarm device;
- Installation is interchangeable: the external dimensions and installation dimensions are the same as those of the MM1 series circuit breakers (MM1L-630 and MM1L-800 are

面板操作简介 Panel operation introduction



主要技术指标 Main Specifications

□ 漏电动作特性 Leakage operation characteristics

表1 Table 1

剩余电流 Residual current	$I_{\Delta n}$	$2I_{\Delta n}$	$5I_{\Delta n}$	$10I_{\Delta n}$
非延时 最大断开时间 (s) Non-delayed Maximum off time (s)	0.2	0.1	0.04	0.04
延时 最大断开时间 (s) Delay Maximum off time (s)	0.5/1.15/2.15	0.35/1/2	0.25/0.9/1.9	0.25/0.9/1.9
延时 极限不驱动时间 Δt (s) Delay Extreme inactivity time Δt (s)	--	0.1/0.5/1	--	--

保护特性 Protection characteristics

□ 脱扣器动作性能 Trip performance

□ 配电用 For power distribution

表2 Table 2

脱扣器额定工作电流 (A) Release Rated Operating Current (A)	热脱扣器 (环境温度40℃) Thermal release (Ambient temp40℃)		电磁脱扣器动作电流 (A) Operating current of electromagnetic release	备注 Remark
	1.05In(冷态)不动作时间 (h) 1.05In(cold state)Inactivity time (h)	1.30In(热态)动作时间 (h) 1.30 In(Hot state)Action time(h)		
$10 \leq I_n \leq 63$	> 1	< 1	$10I_n \pm 20\%$	配电保护型 Distribution protection type
$63 < I_n \leq 100$	> 2	< 2	$10I_n \pm 20\%$	
$100 < I_n \leq 1250$	> 2	< 2	$10I_n \pm 20\%; 7I_n \pm 20\%$	

□ 保护电动机 Protecting the motor

脱扣器额定工作电流 (A) Release Rated Operating Current (A)	热脱扣器 (环境温度40℃) Thermal release (Ambient temp40℃)				电磁脱扣器动作电流 (A) Operating current of electromagnetic release
	1.0In(冷态)不动作时间 (h) 1.0In(cold state)Inactivity time (h)	1.20In(热态)动作时间 (h) 1.20 In(Hot state)Action time(h)	1.50In(热态)动作时间 (h) 1.50 In(Hot state)Action time(h)	7.20In(冷态)不动作时间 (h) 7.20In(cold state)Inactivity time (h)	
$10 < I_n \leq 1250$	> 2	< 2	8min	$6S < T_p \leq 20s$	$12I_n \pm 20\%; 7I_n \pm 20\%$

功率耗损 Power loss

□ 断路器功率耗损参照表 Circuit breaker power loss reference table

表3 Table 3

型号 Type	通电流(A) Electric current(A)	三极总功率损耗 (W) Three-pole total power loss (W)		
		板前、板后接线 Wiring before and after the board	插入式板前接线 Wiring in front of plug-in board	插入式板后接线 Wiring after plug-in board
MM1L-125(S、M)直热型(Direct heating)(16A-25A)	25	40	42	45
MM1L-125(S、M)间热型(Interheat)(32A-100A)	125	35	37	40
MM1L-250(S、M)	250	62	66	70
MM1L-400	400	115	120	125
MM1L-630	630	187	193	200
MM1L-800	800	262	/	300
MM1L-1600(1250)	1600	386	/	/

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主要性能指标 Technical Data




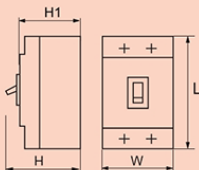
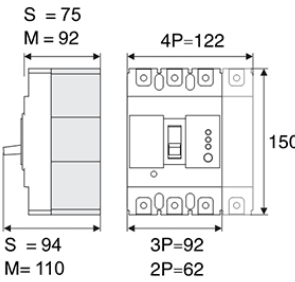
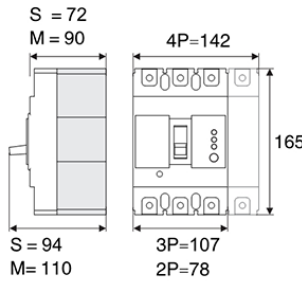
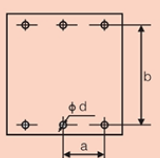
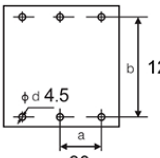
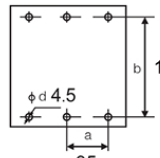
			
型号 Type	MM1L-125(63壳架)	MM1L-125	MM1L-250
壳架电流Inm Frame Inm (A)	125	125	250
额定电流In (A) Rated current (A)	16、20、25、32、40、 50、63、80、100、 125	16、20、25、32、40、 50、63、80、100、 125	100、125、140、160、 180、200、225、250
额定工作电压Ue (V) Rated voltage Ue(V)	AC400	AC400 (2P:230V)	AC400 (2P:230V)
额定绝缘电压Ui (V) Rated insulation voltage Ui(V)	AC800V		
极数 Number of poles	3,4	3,4	2,3,4
额定极限短路分断能力级别 Rated limit short-circuit breaking capacity level	S	S	M
额定剩余动作电流I Δ n Rated residual operating current I Δ n	I 型 I Type 100、300、500mA II 型 II Type 50、100、300mA	100、300、500mA 50、100、300mA	100、300、500mA 50、100、300mA
额定剩余不动作电流 Rated residual non-operating current	I Δ n \times 50%		
额定剩余短路接通(分断)能力I Δ n (mA) Rated residual short-circuit making (breaking) capacity I Δ n (mA)	Icu \times 25%		
额定极限短路分断能力Icu (kA) Rated limit short circuit breaking capacity	AC400V	12	35
额定运行短路分断能力Ics (kA) Rated short-circuit breaking capacity	AC400V	6	22
操作循环次数 Operation life(cycle)	通电 NO 3000 不通电 OFF 7000	3000	2500 6500
飞弧距离 (mm) Arcing distance (mm)	≤ 50		
外形尺寸 (mm) Dimensions	 S = 75.5 4P=100 3P=76 S = 89.3 135	 S = 75 M = 92 4P=122 3P=92 2P=62 S = 94 M = 110 150	 S = 72 M = 90 4P=142 3P=107 2P=78 S = 94 M = 110 165
安装尺寸 (mm) Installation size	 117 25	 129 30	 126 35

表4 Table 4

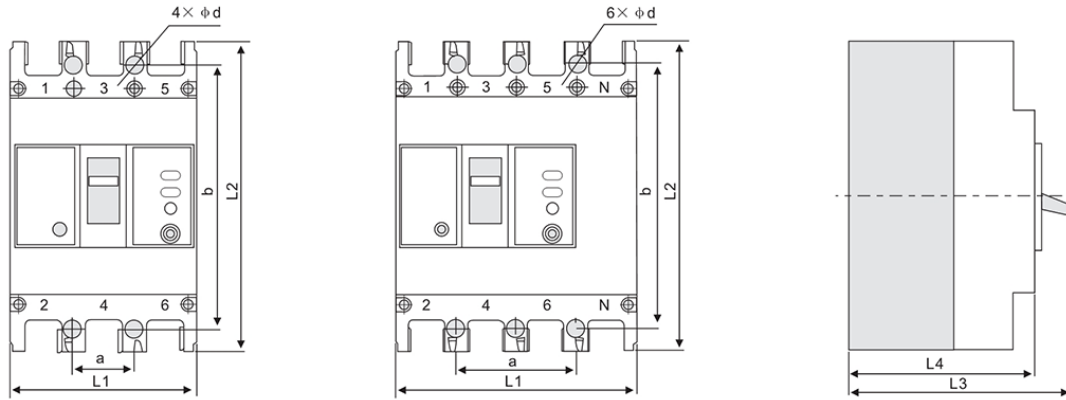
MM1L-400		MM1L-630		MM1L-800		MM1L-1600 (1250)	
400		630		800		1600	
200、225、250、315、 350、400		400、500、630		400、500、630、700、800		630、700、800、1000、 1250、1600	
AC400V						AC400V	
AC800V						AC1000V	
3,4	3,4	3,4	3,4	3,4	3,4	3,4	
	M		M		M		
100、300、500mA		100、300、500mA				300、500、1000、2000mA	
300、500、1000mA		300、500、1000mA					
$I_{\Delta n} \times 50\%$							
$I_{cu} \times 25\%$							
35	65	35	65	35	65	65	
22	45	22	50	22	50	50	
1500		1500		1500		500	
4000		4000		3000		2500	
≤ 100		≤ 100		≤ 100		< 120	

MM1L 系列外形及安装尺寸

MM1L Series Outline And Mounting Dimensions

MM1L外形及安装尺寸 Shape and installation dimensions

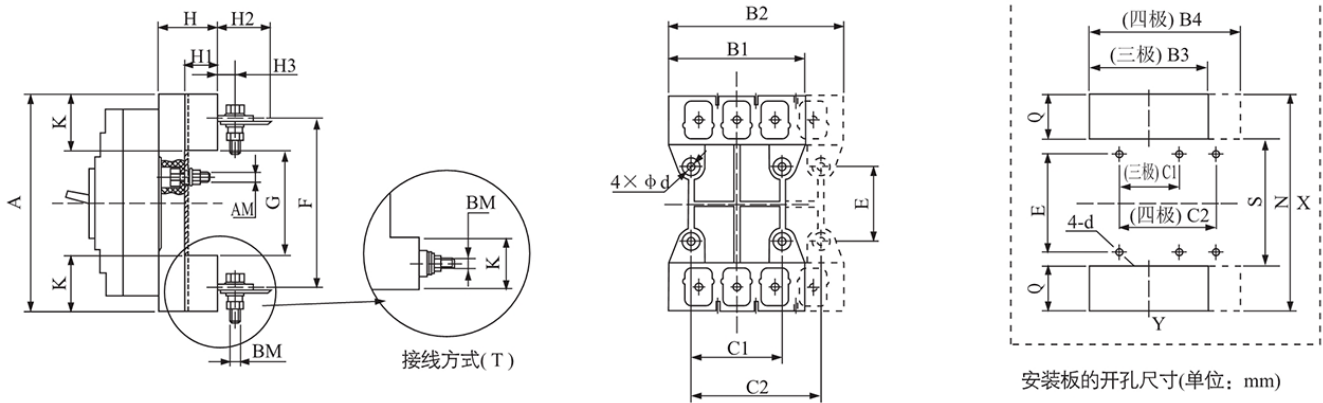
□ 断路器板前接线的外形及安装尺寸 Outline and installation dimensions of circuit breaker front wiring



断路器板前接线 Wiring in front of circuit breaker board

型号 Type	极数 pole	外形尺寸 (mm) Dimensions				安装尺寸(mm)Installation size		
		L1	L2	L3	L4	a	b	φ d
MM1L-125S (63壳架)	3	76max	135max	89.3max	75.5max	25	117	4 × φ 4.5
	4	100max				50		6 × φ 4.5
MM1L-125S	2	62max	150max	94max	75max	-	129	2 × φ 4.5
	3	92max				30		4 × φ 4.5
	4	122max				60		6 × φ 4.5
MM1L-125M	2	62max	150max	110max	92max	-	129	2 × φ 4.5
	3	92max				30		4 × φ 4.5
	4	122max				60		6 × φ 4.5
MM1L-250S	2	78max	165max	94max	72max	-	125	2 × φ 4.5
	3	107max				35		4 × φ 4.5
	4	142max				70		6 × φ 4.5
MM1L-250M	2	78max	165max	110max	90max	-	125	2 × φ 4.5
	3	107max				35		4 × φ 4.5
	4	142max				70		6 × φ 4.5
MM1L-400M	3	154max	257max	152max	108max	44	194	4 × φ 4.5
	4	198max				94		6 × φ 4.5
MM1L-630M	3	182max	270max	157max	111max	58	200	4 × φ 7
	4	240max						6 × φ 7
MM1L-800M	3	210max	280max	169max	115max	70	243	4 × φ 7
	4	280max						6 × φ 7

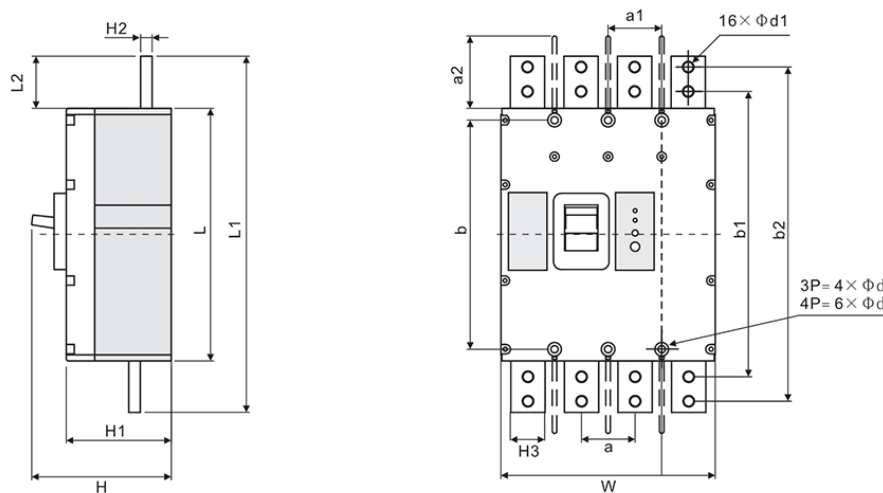
- 插入式板后接线的外形及安装尺寸
- Outline and installation dimensions of the wiring after the plug-in board



型号 Type	安装尺寸(mm)Installation size																				
	A	B1	B2	C1	C2	E	F	G	K	H	H1	H2	H3	N	S	Q	B3	B4	AM	BM	4-d
MM1L-125 (63壳架)	135	75	100	50	75	60	117	100	18	28	18	16	10	145	90	28	85	110	M5	M5	φ 5.5
MM1L-125	168	91	125	60	90	56	132	92	38	50	33	28	19	178	82	48	101	135	M6	M8	φ 6.5
MM1L-250	186	107	145	70	105	54	145	94	46	50	33	37	20	196	84	56	117	155	M6	M8	φ 6.5
MM1L-400	280	149	200	60	108	129	224	170	55	60	38	46	24	290	160	65	159	210	M8	M12	φ 8.5
MM1L-630	300	182	242	100	158	123	234	170	65	60	39	50	32	310	160	75	192	252	M8	M12	φ 8.5
MM1L-800	305	210	280	90	162	146	242	181	62	87	60	22	/	315	171	72	220	290	M10	M14(T)	φ 11

MM1L-1600(1250)外形及安装尺寸 Shape and installation dimensions

- 断路器板前接线的外形及安装尺寸
- Outline and installation dimension of front wiring of circuit breaker board



型号 Type	极数 pole	外形尺寸 (mm) Dimensions							安装尺寸(mm)Installation size								
		L	L1	L2	W	H	H1	H2	H3	a	a1	a2	b	b1	b2	φ d	φ d1
MM1L-1250	3	330	466	68	210	190	139	15	45	70	70	107	300	370	436	9.5	12.9
	4	330	466	68	280	190	139	15	45	70	70	107	300	370	436	9.5	12.9
MM1L-1600	3	330	510	90	210	190	139	16	45	70	70	107	300	390	470	9.5	12.9
	4	330	510	90	280	190	139	16	45	70	70	107	300	390	470	9.5	12.9

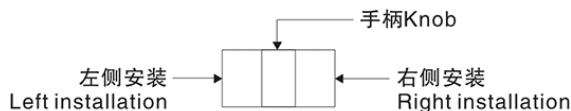
MM1L 系列带剩余电流保护塑料外壳式断路器

MM1L Series Moulded Case Earth Leakage Circuit Breaker

脱扣器方式及附件代号 Release mode and accessory code

□ 脱扣器方式及内部附件 (表6)

Tripping mode and inner accessory (Table 6)



- 报警触头 Alarm contact
- 辅助触头 Aux contact
- 分励脱扣器 Shunt release
- 欠电压脱扣器 Under voltage release(UVT)
- 引线方向 Lead the direction of

表6 Table 6

代号 Code	附件名称 Accessory name	型号Model											
		MM1L-125		MM1L-250		MM1L-400		MM1L-630		MM1L-800		MM1L-1600(1250)	
	极数No. of poles	3P	4P	3P	4P	3P	4P	3P	4P	3P	4P	3P	4P
208、308	报警触头 Alarm contact	□	□	□	□	□	□	□	□	□	□	□	□
210、310	分励脱扣器 Shunt release	●	●	●	●	●	●	●	●	●	●	●	●
220、320	辅助触头 Auxiliary contact	■	■	■	■	■	■	■	■	■	■	■	■
230、330	欠电压脱扣器 Under-voltage release	○	○	○	○	○	○	○	○	○	○	○	○
240、340	分励脱扣器、辅助触头 Shunt auxiliary contact	●	■	—	●	■	—	●	■	—	●	■	—
250、350	分励脱扣器、欠电压脱扣器 Shunt release UVT	—	○	●	—	○	●	—	○	●	—	○	●
260、360	二组辅助开关 Two groups auxiliary contacts	■	■	■	■	■	■	■	■	■	■	■	■
270、370	辅助触头、欠电压脱扣器 Auxiliary contact UVT	—	○	■	—	○	■	—	○	■	—	○	■
218、318	分励脱扣器、报警触头 Shunt alarm contact	—	●	□	—	●	□	—	●	□	—	●	□
228、328	辅助触头、报警触头 Auxiliary alarm contact	■	■	■	■	■	■	■	■	■	■	■	■
238、338	欠电压脱扣器、报警触头 UVT alarm contact	—	○	□	—	○	□	—	○	□	—	○	□
248、348	分励脱扣器、辅助触头、报警触头 Shunt auxiliary alarm contact	—	●	■	—	●	■	—	●	■	—	●	■
268、368	二组辅助触头、报警触头 Two groups aux alarm contact	—	□	■	—	□	■	—	□	■	—	□	■
278、378	辅助触头、欠电压脱扣器、报警触头 Aux contact UVT alarm contact	—	○	■	—	○	■	—	○	■	—	○	■

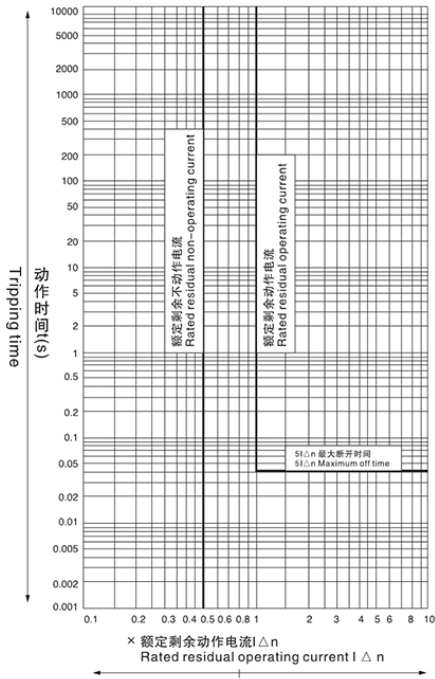
注:

- 脱扣器方式及内部附件代号首位数字2表示电磁(瞬时)脱扣器, 3表示热动—电磁(复式)脱扣器;后两位数字表示内部附件代号,如无附件则用00表示。
- MM1L-400、630中228、328、248、348规格辅助触头为一对触头(即一常开,一常闭), 268、368规格辅助为三对触头(即三常开,三常闭)。
- MM1L-100、225中220、320、240、340规格辅助触头可提供二对触头(即二常开,二常闭),但须在订货时注明。
- MM1L系列如带漏电报警单元模块,则附件只提供▲规格;漏电报警单元模块有以下两种方式,用户根据需要在订货时注明:
方式一:当发生漏电,漏电报警模块发出信号,同时断路器脱扣;
方式二:当发生漏电,漏电报警模块发出信号,但断路器不脱扣,此方式为满足特殊场合需要,用户采用此功能保护电器时请慎重考虑。
- 漏电报警模块接线图见产品标识或使用说明书, P1-P2、 P3-P4为常开及常闭触点,触头容量为AC230V5A, P5-P6端输入电源为AC50Hz, 230或400V(根据用户需要选择)。

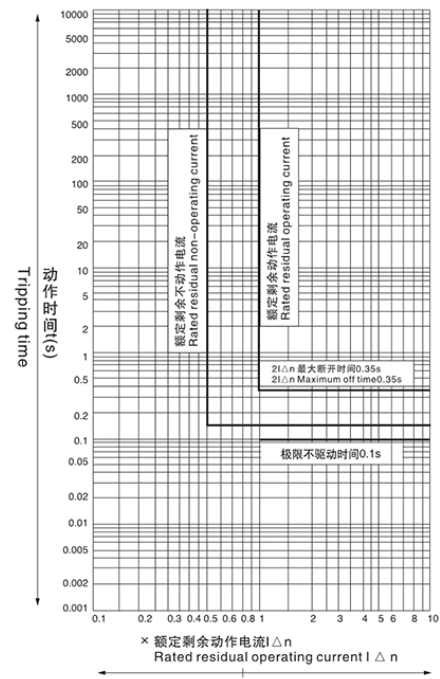
Note:
 □ Release mode and internal accessory code The first digit 2 indicates the electromagnetic (instantaneous) release, 3 indicates the thermodynamic-electromagnetic (duplex) release; the last two digits indicate the internal accessory code, if there are no accessories, use 00.
 □ In MM1L-400, 630, the auxiliary contacts of 228, 328, 248, and 348 specifications are a pair of contacts (that is, one normally open, one normally closed), and the auxiliary of 268, 368 specifications are three pairs of contacts (that is, three normally open, three normally closed).
 □ MM1L-100, 225 220, 320, 240, 340 auxiliary contacts can provide two pairs of contacts (ie two normally open, two normally closed), but must be specified when ordering.
 □ If the MM1L series has a leakage alarm unit module, the attachment only provides ▲ specifications; there are two ways for the leakage alarm unit module, which the user indicates when ordering:
 Method 1: When a leakage occurs, the leakage alarm module sends a signal and the circuit breaker trips at the same time;
 Method 2: When a leakage occurs, the leakage alarm module sends a signal, but the circuit breaker does not trip. In order to meet the needs of special occasions, users should consider this carefully when using this function to protect electrical appliances.
 □ See the product identification or instruction manual for the wiring diagram of the leakage alarm module. P1-P2, P3-P4 are normally open and normally closed contacts, the contact capacity is AC230V5A, and the input power of P5-P6 is AC50Hz, 230 or 400V (according to the user Need to choose).

剩余电流保护特性曲线 Characteristic curve of residual current protection

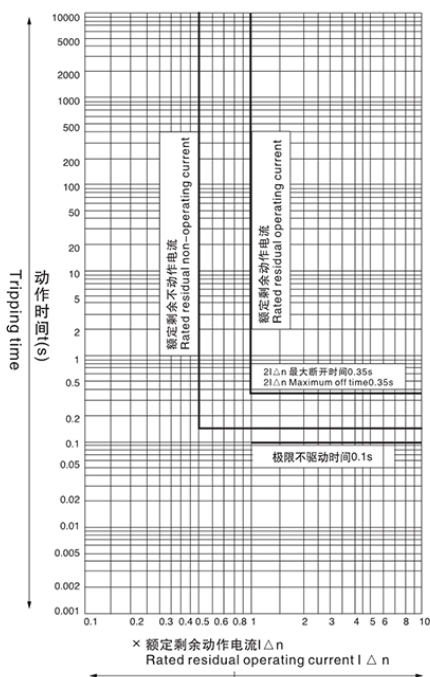
$I\Delta n = 0.03/0.1/0.3/0.5/1(A)$
非延时型剩余电流保护时间/电流特性曲线
Non-delayed residual current protection time / current characteristic curve



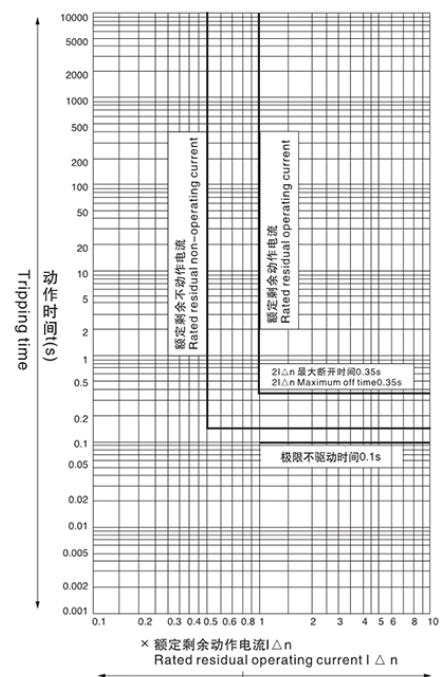
$I\Delta n = 0.1/0.3/0.5/1(A)$
延时型剩余电流保护时间/电流特性曲线
Delay type residual current protection time / current characteristic curve



$I\Delta n = 0.1/0.3/0.5/1(A)$
延时型剩余电流保护时间/电流特性曲线
Delay type residual current protection time / current characteristic curve



$I\Delta n = 0.1/0.3/0.5/1(A)$
延时型剩余电流保护时间/电流特性曲线
Delay type residual current protection time / current characteristic curve

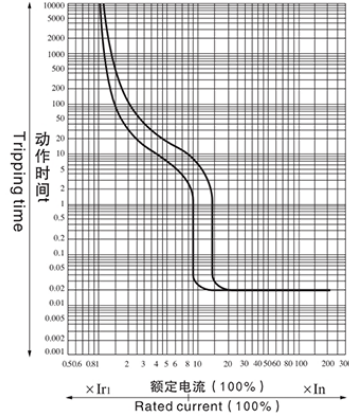
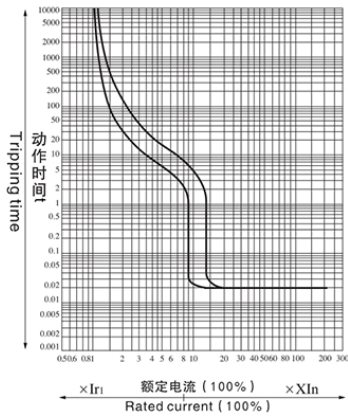
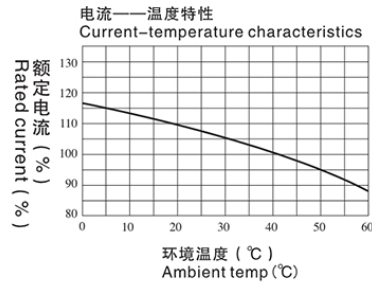
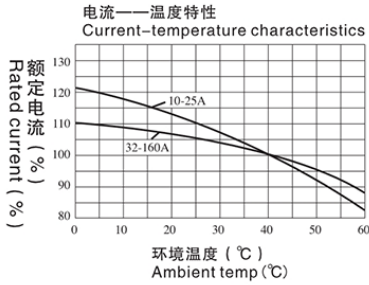


MM1L 系列带剩余电流保护塑料外壳式断路器

MM1L Series Moulded Case Earth Leakage Circuit Breaker

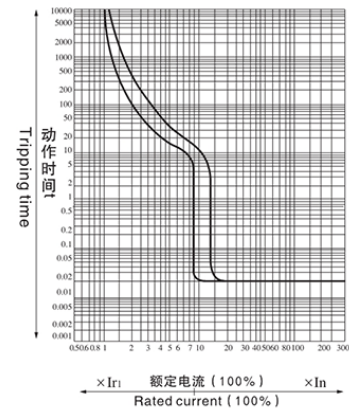
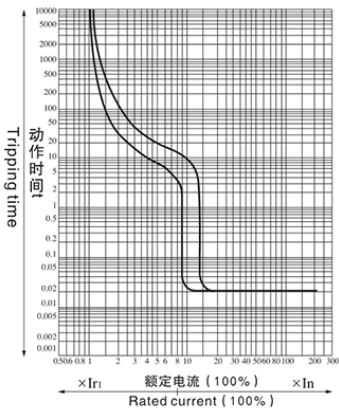
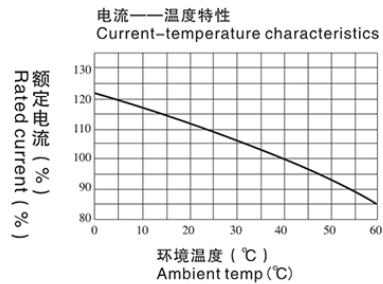
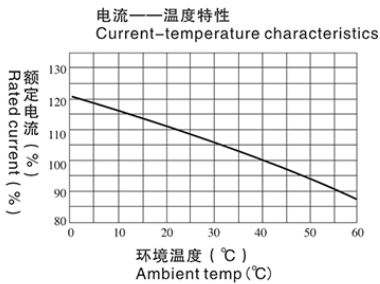
断路器特性曲线 Tripping characteristics (curve)

- 说明：特性曲线是在冷态，三相负载下测得。
- Note: The characteristic curve is measured under the cold state and three-phase load.



MM1L-125S、M 时间/电流特性曲线
MM1L-125S、M Time / current characteristic curve

MM1L-250S、M 时间/电流特性曲线
MM1L-250S、M Time / current characteristic curve

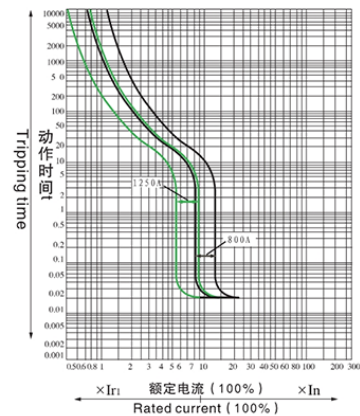
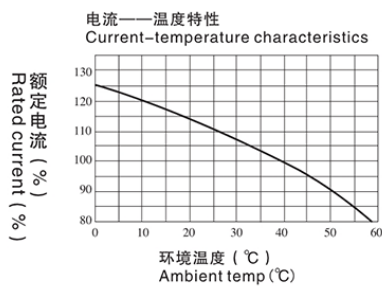


MM1L-400M 时间/电流特性曲线
MM1L-400M Time / current characteristic curve

MM1L-630M 时间/电流特性曲线
MM1L-630M Time / current characteristic curve

断路器特性曲线 Tripping characteristics(curve)

- 说明：特性曲线是在冷态，三相负载下测得。
 Note: The characteristic curve is measured under the cold state and three-phase load.



MM1L-800、1250 时间/电流特性曲线
MM1L-800、1250 Time / current characteristic curve

降容系数 Derating factor

- 断路器环境温度变化的降容系数
Derating factor of circuit breaker ambient temperature change

表5 Table 5

型号 Type	降容系数 (In) Derating factor (In)				
	+40℃	+45℃	+50℃	+55℃	+60℃
MM1L-125(63壳架)	1	0.94	0.88	0.81	0.74
MM1L-125	1	0.96	0.91	0.85	0.78
MM1L-250	1	0.97	0.94	0.90	0.86
MM1L-400	1	0.95	0.89	0.82	0.75
MM1L-630	1	0.94	0.88	0.82	0.76
MM1L-800	1	0.94	0.87	0.80	0.72
MM1L-1600(1250)	1	0.92	0.85	0.79	0.70

注：以上降容系数均在通于壳架额定电流下测得
 Note: The above derating factors are measured under the rated current through the shell.

使用与维护 Use and maintenance

断路器各种特性及附件由制造厂整定，在使用中不要随意调节，用户务必对本产品技术资料详细了解后再对断路器的相关参数进行调整。

断路器手柄可以处在三个位置，分别表示闭合、断开、自由脱扣三种状态，当手柄处于自由脱扣位置时，应向断开方向扳动手柄,此时断路器再扣，然后才能合闸。

请用户遵守存储和使用条件，从制造厂发货之日起不超过12个月，产品如因制造质量问题发生损坏或不能正常使用时，制造厂负责维修或更换。

various characteristics and accessories of the circuit breaker shall be set by the manufacturer and shall not be adjusted arbitrarily during use. The user must understand the technical data of the product in detail before adjusting the relevant parameters of the circuit breaker.

the handle of the circuit breaker can be in three positions, which respectively represent the three states of closing, opening and free tripping. When the handle is in the free tripping position, pull the handle in the opening direction. At this time, the circuit breaker can be closed only after it is pulled again.

the user shall observe the storage and use conditions, which shall not exceed 12 months from the date of delivery by the manufacturer. If the product is damaged or cannot be used normally due to manufacturing quality problems, the manufacturer shall be responsible for repair or replacement.

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