

TEM2E SERIES INTELLIGENT MOLDED CASE CIRCUIT BREAKER

TEM2E系列智能型塑壳断路器



- 断路器具有运行电流光柱指示、预报警指示、过载指示等；
 - 具有智能控制器的自诊断功能及脱扣试验功能；
 - 内部互感器可提供自生电源，三相大于0.2In，单相大于0.5In时，可实现长延时、短延时和瞬时保护特性；
 - 热记忆功能；接地保护功能；断路器内部温度监控功能；
 - 具备通讯接口，可与计算机联网通讯，实现遥控、遥测、遥调、通讯；
 - 本系列断路器具有隔离功能，其相应的符号为： — / I X ；
 - 外形和安装尺寸和 TEM 2 系列塑壳断路器同规格，安装具有较好的互换性。
-
- The breaker is equipped with operating current streamer indicator, pre-alarm indicator and overload indicator, etc;
 - It has the self-diagnostic function and tripping test function of intelligent controller;
 - The mutual inductor in the breaker can provide self-generating power. Long-time delay, short-time delay and instantaneous protective characteristics can be reliably realized when three phases exceed 0.2 In and single phase exceeds 0.5 In;
 - Thermal memory function; ground protection function; internal temperature monitoring function of the breaker;
 - Equipped with communication interface, it can conduct communication through networking with the computer, to realize remote control, remote measurement, remote adjustment and remote communication;
 - This series of breakers have isolating function, and the corresponding symbol is: — / I X ；
 - The boundary and installation dimensions of this series of breakers are the same with the specifications of TEM 2 series molded case circuit breaker, and the installation has good interchangeability.



TEM2E系列智能型塑壳断路器

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TEM2E SERIES INTELLIGENT MOLDED CASE CIRCUIT BREAKER

TEM2E系列智能型塑壳断路器

适用范围及主要特点

TEM2E系列智能型塑壳断路器（以下简称断路器），属TEM2系列产品之一，是本厂采用国际先进设计和制造技术研制开发的新型断路器。其额定绝缘电压为800V，适用于交流50Hz，额定工作电压690V及以下，额定工作电流至800A的电路中作不频繁转换及电动机不频繁起动之用。断路器具有过载长延时反时限、短路短延时反时限、短路短延时定时限、短路瞬时和欠电压保护功能,能保护线路和电源设备不受损坏。

本系列断路器具有结构紧凑、体积小、分断高、飞弧短、内外附件齐全等特点。过载长延时反时限，短路短延时反时限，短路短延时定时限，短路瞬时动作等保护功能参数的整定，方便直观，用户也可自行设定组成所需的保护特性，方便地实现选择性保护，使配电网络中使用的断路器上下级配备更为合理；

- 断路器具有运行电流光柱指示、预报警指示、过载指示等；
- 具有智能控制器的自诊断功能；
- 具有智能控制器的脱扣试验功能；
- 断路器内的互感器可提供自生电源，三相大于0.2In，单相大于0.5In时，即能可靠实现长延时、短延时和瞬时保护特性；
- 热记忆功能；
- 接地保护功能；
- 断路器内部温度监控功能。
- 本系列断路器具有通讯接口。具备了现场总线的通讯功能。可与计算机联网通讯。实现遥控、遥测、遥调、通讯。
- 本系列断路器具有隔离功能。其相应的符号为： 
- 本系列断路器的外形和安装尺寸与TEM2系列塑壳断路器同规格相同，安装具有较好的互换性。


符合标准

TEM2E系列断路器符合下列标准:

- IEC60947-1，GB 14048.1《低压开关设备和控制设备 总则》
- IEC60947-2，GB 14048.2《低压开关设备和控制设备 低压断路器》及附录F《带电子过电流保护断路器的附加要求》
- IEC60947-4，GB 14048.4《低压开关设备和控制设备 低压机电式接触器和电动机启动器》
- IEC60947-5，GB 14048.5《低压开关设备和控制设备 控制电路电器和开关元件 第一部分 机电式控制电路电器》

Scope of application and main characteristics

TEM2E series intelligent molded case circuit breaker (hereinafter referred to as breaker), is one of the TEM2 series products, a new-type breaker researched and developed by our plant with international advanced design and manufacturing technology. Its rated insulation voltage is 800 V, applicable to the non-frequent conversion of the circuit of AC 50 Hz, rated voltage 690 V and below, rated current 800 A and the non-frequent starting of motor. The breaker has the functions of overload long-time delay inverse time limit, short circuit short-time delay inverse time limit, short circuit short-time delay definite time-lag, short circuit instantaneous and under-voltage protection, it can protect the circuits and power-supply device from being damaged. This series of breakers have the characteristics of compact structure, small volume, high breaking, and complete internal and external accessories. The parameter setting of overload long-time delay inverse time limit, short circuit short-time delay inverse time limit, short circuit short-time delay definite time-lag, short circuit instantaneous action and other protective functions are convenient and intuitive, the user also can set the necessary protective characteristics and realize the selective protection easily, make the higher and lower allocation of the breakers used in the distribution network more reasonable;

- The breaker is equipped with operating current streamer indicator, pre-alarm indicator and overload indicator, etc;
- It has the self-diagnostic function of intelligent controller;
- It has the tripping test function of intelligent controller;
- The mutual inductor in the breaker can provide self-regenerating power, long-time delay, short-time delay and instantaneous protective characteristics can be reliably realized when three phases exceeds 0.2 In and single phase exceeds 0.5 In;
- Thermal memory function;
- Ground protection function;
- Function of breaker internal temperature monitoring.
- This series of breakers have communication interface, equipped with the communication function of field bus, can conduct communication through networking with the computer, realize remote control, remote measurement, remote adjustment and remote communication.
- This series of breakers have the isolating function, the corresponding symbol is: 
- The boundary and installation dimensions of this series of breakers are the same with the specifications of TEM 2 series molded case circuit breaker, and the installation has good interchangeability.

Standards conformed to

TEM2E series circuit breaker conform to the following standards:

- IEC 60947-1, GB 14048.1 Low-voltage Switchgear and Control Gear General Rules
- IEC 60947-2, GB 14048.2 Low-voltage Switchgear and Control Gear Low-voltage Circuit Breaker and Appendix F Additional Requirements of Circuit Breakers with Electronics Over-current Protection
- EC 60947-4, GB 14048.4 Low-voltage Switchgear and Control Gear Low-voltage Electromechanical Contactors and Motor-Starters
- IEC 60947-5, GB 14048.5 Low-voltage Switchgear and Control Gear Control circuit Devices and Switching Element Part 1: Electromechanical Control Circuit Devices

工作环境

- 周围空气温度为-5℃~+40℃，且24小时的平均值不超过35℃；
- 安装地点的海拔不超过2000m。
- 最高温度为+40℃时，空气的相对湿度不超过50%，在较低的温度下可以允许有较高的相对湿度，例如20℃时达90%。对由于温度变化偶尔产生的凝露应采取特殊措施。
- 污染等级为3级；
- 断路器主电路的安装类别为Ⅲ，其余辅助电路、控制电路安装类别为Ⅱ。

安装方式

- 本系列断路器可以垂直安装，也可以横装。
- 本断路器不可倒进线，即只允许1、3、5接电源线，2、4、6接负载线。

型号及含义 Type and meaning



注:

- 1) 分为板前接线、板后接线、插入式接线（板前接线可以不住）
- 2) 三极产品无代号,四极产品分为C型、D型
C型: 中性极(N极)与其它三极一起合分, 有过电流保护
D型: 中性极(N极)始终接通, 不与其它三极一起合分, 有过电流保护
- 3) 操作方式:手柄直接操作无代号,转动手柄操作用Z表示,电动操作用D表示。
- 4) 分为S型、H型
- 5) 分为 100A、250A、400A、630A、800A。

Note:

- 1) Divided into front-panel wiring, back-panel wiring and plug-in type wiring (the mark of front-panel wiring can be omitted)
- 2) There is no code for tri-pole product, the quadropole product is divided into type C and type D
Type C: N-pole fixed with over-current release unit, it could act with other three poles. (N-pole turns-on primarily, and turns-off posterior.)
Type D: N-pole fixed with over-current release unit, it has been connected all along, and does not act with other three poles to turn on or off.
- 3) Operating mode: There is no code for direct handle operation, use Z to represent turning handle, use D to represent the electrical operation.
- 4) Divided into type S and type H
- 5) Divided into 100 A, 250 A, 400 A, 630 A and 800 A.

TEM2E SERIES INTELLIGENT MOLDED CASE CIRCUIT BREAKER

TEM2E系列智能型塑壳断路器

脱扣器方式及附件代号 Tripping device method and accessory code

附件名称 ACCESSORY NAME	附件代号 ACCESSORY CODE	附件安装及引线方向 ACCESSORY INSTALLATION AND LEAD WIRE DIRECTION		
		脱扣器 TRIPPING DEVICE	TEM2E-100 TEM2E-250	TEM2E-400
报警触头 Alarm contact	408			
分励脱扣器 Shunt tripping device	410			
辅助触头 Auxiliary contact	420			
欠电压脱扣器 Under-voltage tripping device	430			
分励脱扣器、辅助触头 Shunt tripping device and auxiliary contact	440	注		
辅助触头、欠电压脱扣器 Auxiliary contact and under-voltage tripping device	470			
分励脱扣器、报警触头 Shunt tripping device and alarm contact	418	注		
辅助触头、报警触头 Auxiliary contact and alarm contact	428			
欠电压脱扣器、报警触头 Under-voltage tripping device and alarm contact	438			
分励脱扣器、辅助、报警触头 Shunt tripping device, auxiliary and alarm contact	448	注		
欠电压脱扣器、辅助、报警触头 Under-voltage tripping device, auxiliary and alarm contact	478			
不带附件 Without accessory	400			



表中所列的规格为可装内部附件的最大数量，请用户按需选用，在订货时请写明辅助触头和报警触头的数量。同一台断路器中不应该超过表中每格中所规定的项目。有二种安装方向的附件，应按需要在定货时写明左装或右装。若用户不注明，由生产厂安排。
注：TEM2E-100及TEM2E-250的附件代号440、418、448的分励为外挂分励，分励外挂包尺寸见“外形及安装尺寸”。

The specification listed in the table is the maximum number of the internal accessories that can be installed, select and use them according to the user's needs, please write the number of auxiliary contact and alarm contact clearly when ordering. The items in the same breaker shall not exceed that specified in the table. For the accessories with two installation directions, write the left installation or right installation clearly when placing an order according to the user's needs. If the user hasn't specified installation direction, it shall be decided by manufacturing plant.
Note: the shunt with accessory codes 440, 418 and 448 of TEM2E-100 and TEM2E-250 are plug-in shunts, see the "boundary and installing dimensions" for the dimensions of shunt plug-in package

主要性能指标 Main performance index

壳架等级电流Inm (A) Shell frame grade current Inm	100	250	400	630	800							
型号 Type	TEM2E-100	TEM2E-250	TEM2E-400	TEM2E-630	TEM2E-800							
脱扣器额定电流 (A) Rated current of tripping device In	100(32)	250	400	630	800							
整定电流IR (A) Setting current IR	Unit 2 控制器 Controller 0.4/0.5/0.6/0.7/0.8/0.9/1.0xIn+OFF可调 (Adjustable) Unit 6 控制器 Controller (0.4~1.0)xIn+OFF 最小进步 (Minimum step) 1A											
极数 Number of poles	3、4	3、4	3、4	3、4	3、4							
额定绝缘电压Ui (V) Rated insulation voltage Ui	800											
额定工作电压Ue (V) Rated operational voltage Ue	AC400/AC690											
额定冲击耐受电压Uimp (V) Rated impulse withstand voltage Uimp	8000											
飞弧距离(mm) Flashover distance	≥50			≥80								
分断能力级别 Breaking capacity grade	S	H	S	H	S	H	S	H	S	H		
额定极限短路分断能力Icu(kA) Rated ultimate short-circuit breaking capacity Icu	AC400V		50	80	50	80	50	80	50	80	50	80
	AC690V		8	10	8	8	10	15	15	20	15	20
额定运行短路分断能力Ics (kA) Rated operational short-circuit breaking capacity Ics	AC400V		50	50	50	50	50	50	50	50	50	50
	AC690V		4	5	4	6	7.5	7.5	10	15	10	15
额定短时耐受电流Icw(kA)/(1s) Rated short-time withstand current Icw	AC400V		2		3		5		8		10	
	AC690V		1.2									
操作性能(次) Operating performance	通电 Energized		8000			7500						
	不通电 Not energized		20000			20000						
外形尺寸(mm) Boundary dimensions			155	155	165	165	257	257	275	275	275	275
			90	120	105	140	140	185	210	280	210	280
			82	82	91	91	103	103	103	103	103	103
			104	104	121	121	155	155	155	155	155	155
接线方式 Wiring mode	板前接线 Front-panel wiring	√	√	√	√	√	√	√	√	√	√	
	板后接线 Back-panel wiring	√	√	√	√	√	√	√	√	√	√	
	插入式接线 Plug-in type wiring	√	√	√	√	√	√	√	√	√	√	
附件 Annex	电动操作机构 Electric operating mechanism	√	√	√	√	√	√	√	√	√	√	
	旋转手柄操作机构 Rotating handle operating mechanism	√	√	√	√	√	√	√	√	√	√	
	ST-CM显示器 ST-CM display	√	√	√	√	√	√	√	√	√	√	
	ST手持编程器 ST handheld programming unit	√	√	√	√	√	√	√	√	√	√	
	ST-200智能控制模块 ST-200 intelligent control module	√	√	√	√	√	√	√	√	√	√	
	ST-DP通讯协议模块 ST-DP communication protocol module	√	√	√	√	√	√	√	√	√	√	
测试电源模块 Test power module	√	√	√	√	√	√	√	√	√	√		

注： (32) 规格需特殊订货。

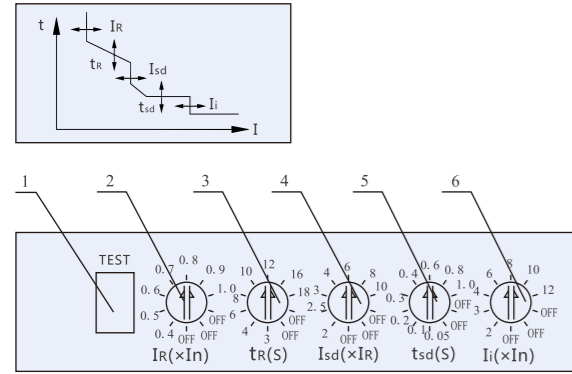
Note: It needs special order for (32) specification.

TEM2E SERIE SINTELLIGENT MOLDED CASE CIRCUIT BREAKER

TEM2E系列智能型塑壳断路器

Unit 2 智能控制器调整面板 Unit 2 intelligent controller adjustment panel

TEM2E-100、TEM2E-250 (下面位置, 三极、四极)
(below, tri-pole and quadropole)

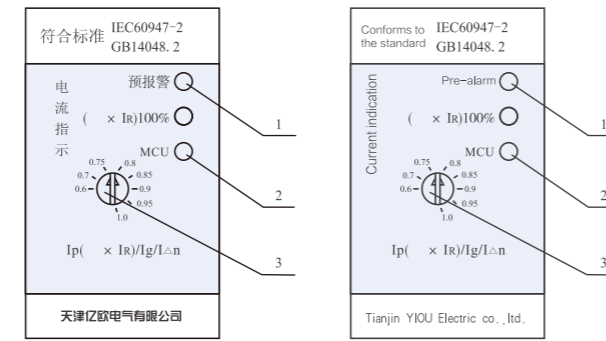


注 / Note:

- 1) 智能控制器的脱扣功能试验插口
- 2) 对长延时整定电流 I_R 进行整定的编码开关
- 3) 对长延时动作时间 t_R 进行整定的编码开关
- 4) 对短路短延时整定电流 I_{sd} 进行整定的编码开关
- 5) 对短路短延时动作时间 t_{sd} 进行整定的编码开关
- 6) 对短路瞬时整定电流 I_i 进行整定的编码开关

- 1) The tripping function test socket of the intelligent controller
- 2) The code switch for setting the long-time delay setting current I_R
- 3) Code switch for setting the long-time delay actuation time t_R
- 4) The code switch for setting the short circuit short-time delay setting current I_{sd}
- 5) The code switch for setting the short circuit short-time delay actuation time t_{sd}
- 6) The code switch for setting the short circuit instantaneous setting current I_i

TEM2E-100、TEM2E-250 (右边位置)
(right side)



注 / Note:

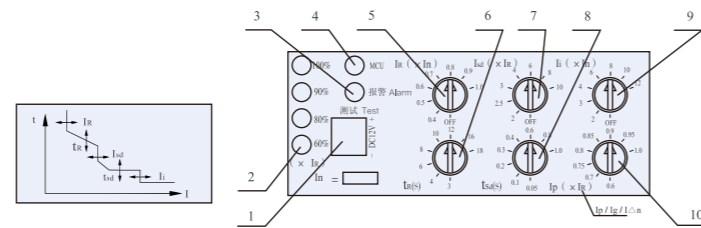
- 1) 运行电流负载指示
- 2) 电源及自诊断指示
- 3) 可选择下面任何一种编码开关
 - a) 对过载报警电流 I_p 进行整定的编码开关 (默认标配功能)
 - b) 对接地保护整定电流 I_g 进行整定的编码开关
 - c) 对漏电电流 $I_{\Delta n}$ 进行整定的编码开关

- 1) Operating current load indicator
- 2) Power and self-diagnostic indicator
- 3) Any of the following code switches can be selected
 - a) The code switch for setting the overload alarm current I_p (default standard function)
 - b) The code switch for setting the ground protection setting current I_g
 - c) The code switch for setting the electric leakage current setting $I_{\Delta n}$

TEM2E-400、TEM2E-630、TEM2E-800

注 / Note:

- 1) 智能控制器的脱扣功能试验插口
- 2) 运行电流负载指示
- 3) 过载报警灯
- 4) 电源及自诊断指示
- 5) 对长延时整定电流 I_R 进行整定的编码开关
- 6) 对长延时动作时间 t_R 进行整定的编码开关
- 7) 对短路短延时整定电流 I_{sd} 进行整定的编码开关
- 8) 对短路短延时动作时间 t_{sd} 进行整定的编码开关
- 9) 对短路瞬时整定电流 I_i 进行整定的编码开关
- 10) 可选择下面任何一种编码开关
 - a) 对过载报警电流 I_p 进行整定的编码开关 (默认标配功能)
 - b) 对接地保护整定电流 I_g 进行整定的编码开关
 - c) 对漏电电流 $I_{\Delta n}$ 进行整定的编码开关



- 1) The tripping function test socket of the intelligent controller
- 2) Operating current load indicator
- 3) Overload alarm light
- 4) Power and self-diagnostic indicator
- 5) The code switch for setting the long-time delay setting current I_R
- 6) Code switch for setting the long-time delay actuation time t_R
- 7) The code switch for setting the short circuit short-time delay setting current I_{sd}
- 8) The code switch for setting the short circuit short-time delay actuation time t_{sd}
- 9) The code switch for setting the short circuit instantaneous setting current I_i
- 10) Any of the following code switches can be selected
 - a) The code switch for setting the overload alarm current I_p (default standard function)
 - b) The code switch for setting the ground protection setting current I_g
 - c) The code switch for setting the electric leakage current $I_{\Delta n}$

智能断路器的保护特性 Protective characteristics of intelligent breaker

长延时过电流保护反时限动作特性 / LONG-TIME DELAY OVER-CURRENT PROTECTION INVERSE TIME LIMIT ACTION CHARACTERISTICS

控制器类型 CONTROLLER TYPE	Unit2控制器类型 UNIT 2 CONTROLLER TYPE	Unit6控制器类型 UNIT 6 CONTROLLER TYPE
整定电流 Setting current	$I_R = (0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0)I_n + \text{OFF}$	$I_R = (0.4-1.0)I_n + \text{OFF}$
电流 Current	动作时间 Actuation time	
$1.05I_R$	2h内不动作 Non-action for more than 2 hours	
$1.3I_R$	<2h动作 Action for less than 2 hours	
$6I_R$ 整定时间 t_R (s) $6I_R$ setting time t_R	$t_R = (3, 4, 6, 8, 10, 12, 16, 18)s$	$3s - 18s$ (最小步进1s) Minimum step
热记忆 Thermal memory	30min, 断电可清除 The outage can be eliminated	
☆ 动作时间符合 $I^2T = (6I_R)^2t_R$ ☆ 动作时间误差为 ± 10%		
☆ Actuation time conforms to $I^2T = (6I_R)^2t_R$ ☆ Error of actuation time is ± 10%		

短延时过电流保护动作特性 / SHORT-TIME DELAY OVER-CURRENT PROTECTIVE ACTION CHARACTERISTICS

控制器类型 CONTROLLER TYPE	Unit2控制器类型 UNIT 2 CONTROLLER TYPE			Unit6控制器类型 UNIT 6 CONTROLLER TYPE
整定电流 Setting current	$I_{sd} = (2, 2.5, 3, 4, 6, 8, 10)I_R + \text{OFF}$			$I_{sd} = (2-10)I_R + \text{OFF}$
电流 Current	动作时间 Actuation time			
I^2TOFF	$1.3I_{sd}$ 定时限 Definite time delay	整定时间 Setting time	$t_{sd} = (0.05, 0.1, 0.2, 0.3, 0.4, 0.6, 0.8, 1.0)s$	$0.05s - 1s$ (最小步进0.05s) Minimum step
I^2TON	$I_{sd} < I \leq 8I_R$ 反时限 Inverse time delay	动作时间 Actuation time	$I^2T = (8I_R)^2t_R$	$I^2T = (8I_R)^2t_R$
	$I > 8I_R$ 定时限 Definite time delay		$t_{sd} = (0.05, 0.1, 0.2, 0.3, 0.4, 0.6, 0.8, 1.0)s$	$0.05s - 1s$ (最小步进0.05s) Minimum step
热记忆 Thermal memory				30min, 断电可清除 30 min, the outage can be eliminated
☆ I^2TOFF - 短路短延时为定时限保护 ☆ I^2TON - 短路短延时为定时反时限保护				
☆ I^2TOFF - short delay for the definite time short-circuit protection ☆ I^2TON - short circuit short delay is timed anti-time protection				

短路电流保护动作特性 (瞬时) / SHORT CIRCUIT CURRENT PROTECTIVE ACTION CHARACTERISTICS (INSTANTANEOUS)

控制器类型 CONTROLLER TYPE	Unit2控制器类型 UNIT 2 CONTROLLER TYPE	Unit6控制器类型 UNIT 6 CONTROLLER TYPE
整定电流 Setting current	$I_i = (2-3-4-6-8-10-12)I_n + \text{OFF}$	$I_i = (2-12)I_n + \text{OFF}$
动作特性 Action characteristics	$I \leq 0.85I_i$ 不动作 Non-action	
	$I \geq 1.15I_i$ 动作 Action	

接地保护特性 / GROUND PROTECTION CHARACTERISTICS

控制器类型 CONTROLLER TYPE	Unit2控制器类型 UNIT 2 CONTROLLER TYPE	Unit6控制器类型 UNIT 6 CONTROLLER TYPE
整定电流 Setting current	$I_g = (0.2-0.3-0.4-0.5-0.6-0.7-0.8)I_n + \text{OFF}$	$I_g = (0.2-1.0)I_n + \text{OFF}$
动作特性 Action characteristics	动作电流 Action current	在 $0.5I_g-1.0I_g$ 之间动作 Action within $0.5I_g-1.0I_g$
	动作时间 Actuation time	0.4s

TEM2E SERIES INTELLIGENT MOLDED CASE CIRCUIT BREAKER

TEM2E系列智能型塑壳断路器

智能断路器的保护特性 Protective characteristics of intelligent breaker

过载预警特性 / OVERLOAD PRE-ALARM CHARACTERISTICS

控制器类型 CONTROLLER TYPE	Unit2控制器类型 UNIT 2 CONTROLLER TYPE	Unit6控制器类型 UNIT 6 CONTROLLER TYPE
整定电流 Setting current	$I_p = (0.6-0.7-0.75-0.8-0.85-0.9-0.95-1.0) \times I_R$	$I_p = (0.6-1.0) \times I_R$
动作特性 Action characteristics	在 $0.9I_p-1.1I_p$ 之间报警 Alarm within $0.9I_p-1.1I_p$	

漏电保护特性 / ELECTRIC LEAKAGE PROTECTION CHARACTERISTICS

整定电流 $I_{\Delta n}$ RATED CURRENT	0.3A, 0.5A, 0.6A, 0.8A, 1A, 2A, 3A+OFF							
额定不动作电流 Rated non-action current	$0.5I_{\Delta n}$							
额定动作电流 Rated action current	$1.0I_{\Delta n}$							
动作时间(s) Actuation time	非延时型 Non time -delay type	延时型 Time-delay type						
		延时时间设定: ($2I_{\Delta n}$ 时, 极限不驱动时间) (单位: 秒) Delayed time setting: ($2I_{\Delta n}$ hour, limit non-actuating time) (unit: s)						
		0.06	0.1	0.2	0.3	0.4	0.5	1
$I_{\Delta n}$	0.18	0.36	0.5	1	1.5	2	2.5	5
$2I_{\Delta n}$	0.09	0.18	0.25	0.5	0.75	1	1.25	2.5
$5I_{\Delta n}$	0.03	0.072	0.1	0.2	0.3	0.4	0.5	1
$10I_{\Delta n}$								

☆ 动作时间误差为 ±10% ☆ 延时时间出厂默认设定为0.4秒, 其他整定要求, 需特殊订货。
☆ Error of actuation time is ±10% ☆ The default setting of delayed time of leaving the factory is 0.4 s; it needs special orders for other setting requirements.

保护特性常规整定表 Conventional setting table for protective characteristics

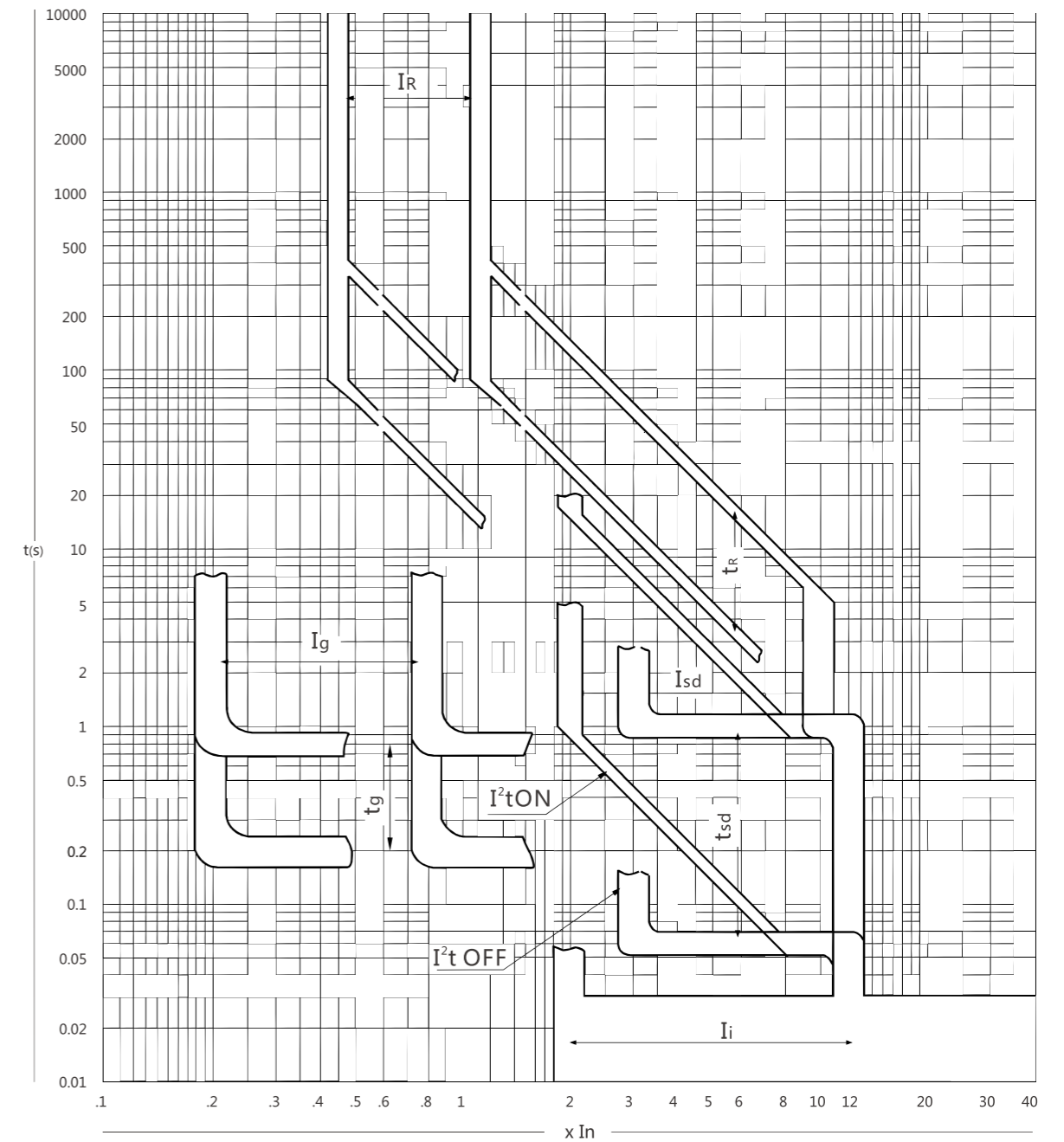
各种保护特性的出厂整定值, 用户应按“订货规范”注明, 如用户订货时无特殊要求, 各保护特性在出厂时即按“保护特性出厂常规整定表”配置。

The user shall specify the default setting value of each protective characteristics according to “Order Specifications”, if the user has no special requirements, the protective characteristics shall be configured according to the “Conventional Setting Table for Protective Characteristics” when leaving the factory.

	保护特性 PROTECTIVE CHARACTERISTICS	备注 REMARK
过载长延时 Overload long-time delay	整定电流 I_R Setting current	$1.0 \times I_n$
	整定时间 t_R Setting time	18s 当 $I = 6I_R$ 时 When $I = 6I_R$
短路短延时 Short circuit short-time delay	整定电流 I_{sd} Setting current	$6 \times I_R$
	整定时间 t_{sd} Setting time	0.05s 默认为定时限保护 Default as definite time limit protection
短路瞬时 Short circuit instantaneous	整定电流 I_i Setting current	$10 \times I_n$
接地保护 Ground protection	整定电流 I_g Setting current	$0.6 \times I_n$
	整定时间 Setting time	0.4s
漏电保护 Electric leakage protection	整定电流 $I_{\Delta n}$ Setting current	1A 延时0.4s Time delay for 0.4s
预报警 Pre-alarm	整定电流 I_p Setting current	$0.9 \times I_R$

动作特性曲线 Action characteristics curve

过电流保护动作特性曲线 / ACTION CHARACTERISTICS CURVE OF OVER-CURRENT PROTECTION



TEM2E SERIES INTELLIGENT MOLDED CASE CIRCUIT BREAKER

TEM2E系列智能型塑壳断路器

智能断路器的通讯接口及外部模块的配合使用

The cooperative usage of the communication interface of intelligent breaker and external module

TEM2E系列可通讯智能化塑壳断路器备有通讯接口，按MODBUS通讯接口规约。

当TEM2E系列可通讯智能化塑壳断路器不用于组网通讯，而是单独使用时，手持编程器可通过通讯接口对断路器进行保护特性整定等操作；也可以在通讯接口接上ST-CM显示模块；用以监视断路器的运行电流和故障信息。

当TEM2E系列可通讯智能化塑壳断路器用于组网通讯时，可直接挂接到相应的现场总线；针对不同协议的现场总线，可选用ST-DP协议转换模块，将MODBUS协议转换后再挂接到相应的现场总线。

TEM2E系列可通讯智能化塑壳断路器单独使用

断路器的保护参数设计时，需专业人员采用ST手持编程器按下图所示方式连接，再按手持编程器的操作说明进行操作。

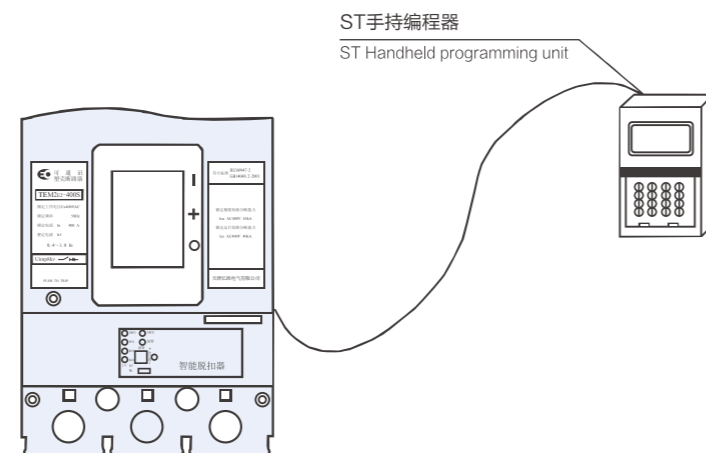
The TEM2E series communicable intelligent molded case circuit breaker is equipped with communication interface, stipulated according to MODBUS communication interface.

When the TEM2E series communicable intelligent molded case circuit breaker is used alone instead of using in the network communication, the handheld programmable unit can conduct protective characteristics setting and other operation for the breaker through communication interface, and it also can connect ST-CM display module on the communication interface to monitor the operating current and fault information of the breaker.

The TEM2E series communicable intelligent molded case circuit breaker can be directly hooked to the corresponding field bus when it is used in network communication; ST-DP protocol conversion module can be used for the field bus with different agreements, switch the MODBUS agreement and then hook it to corresponding field bus.

Exclusive use of KFM2E series communicable intelligent molded case circuit breaker alone

When setting the protective parameter of the breaker, it needs professional personnel to adopt ST handheld programming unit to connect according to the way in the figure below, and operate according to the operation instruction of the handheld programming unit.

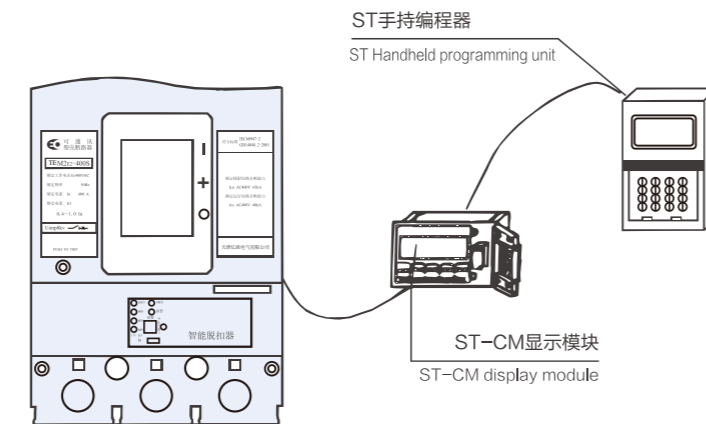


TEM2E系列可通讯智能化塑壳断路器和ST-CM显示模块配合使用

正常运行，显示模块可监视断路器的运行电流和故障信息。断路器保护参数设定，需专业人员采用ST手持编程器按下图方式连接，再按手持编程器的操作说明进行操作。

Cooperative use of TEM2E series communicable intelligent molded case circuit breaker and ST-CM display module

Normal operation, display module can monitor the operating current and fault information of the breaker. When setting the protective parameter of the breaker, it needs professional personnel to adopt ST handheld programming unit to connect according to the way in the figure below, and operate according to the operation instruction of the handheld programming unit.



智能断路器的通讯接口与外部模块的配合使用

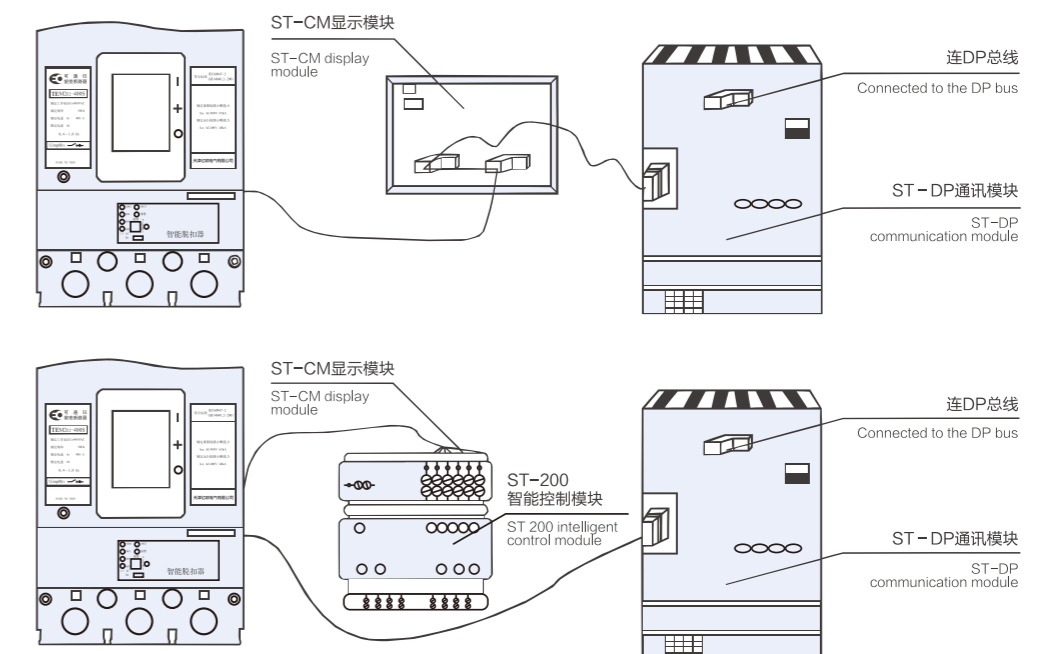
The cooperative usage of the communication interface of intelligent breaker and external module

TEM2E系列可通讯智能化塑壳断路器的通讯组网

通讯组网可按下图两种方案进行连接。针对不同协议可选不同的协议模块，以下为选用ST-DP通讯协议的方案。断路器的报警信号及分合闸信号可通过ST200智能控制模块实现所需的转换输出。

The communication network of the TEM2E communicable intelligent molded case circuit breaker

The communication network can be connected according to the two schemes displayed in the figures below. Different protocol modules can be selected and used for different protocols, and the following is a scheme for selected ST-DP communication protocol. The necessary transform output of the alarm signal and switching signal can be realized through ST 200 intelligent control module.



智能断路器的外部配置模块（可选件）

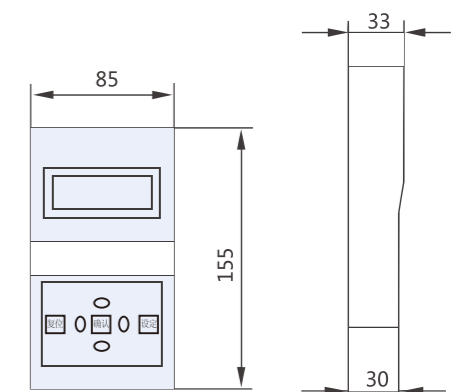
External configuration module of intelligent breaker (optional accessory)

ST型手持编程器

ST型手持编程器用来对智能断路器进行现场操作或参数编程设置，具有设备自动搜索功能、电源监视功能、通讯状态指示功能、自动切断远程通讯功能、工作权限确认功能。

ST type handheld programming unit

The ST type handheld programming unit is used for the field operation or parameter programming setting for the intelligent breaker. It has the functions of equipment automatic search, power supply monitoring, communication status display, automatically cutting off the remote communication and working permission confirmation.



TEM2E SERIES INTELLIGENT MOLDED CASE CIRCUIT BREAKER

TEM2E系列智能型塑壳断路器

智能断路器的外部配置模块（可选用）

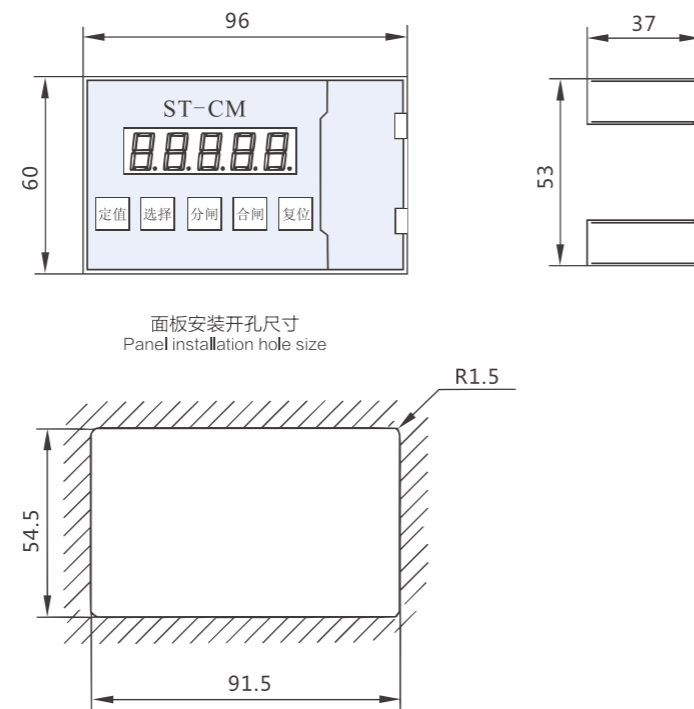
External configuration module of intelligent breaker (optional accessory)

ST-CM型显示模块

面板式安装，可安装在柜体小室门上；
可用于智能断路器和手持编程器、远程通讯端口之间转接及现场运行参数的监视，同时对智能断路器提供辅助工作电源。

ST-CM display module

Panel installation, it can be installed on the cubicle door;
It can be used for the switching among intelligent breaker, handheld programming unit and remote communication port and monitoring of field operation parameters, providing auxiliary working power supply for the intelligent breaker at the same time.



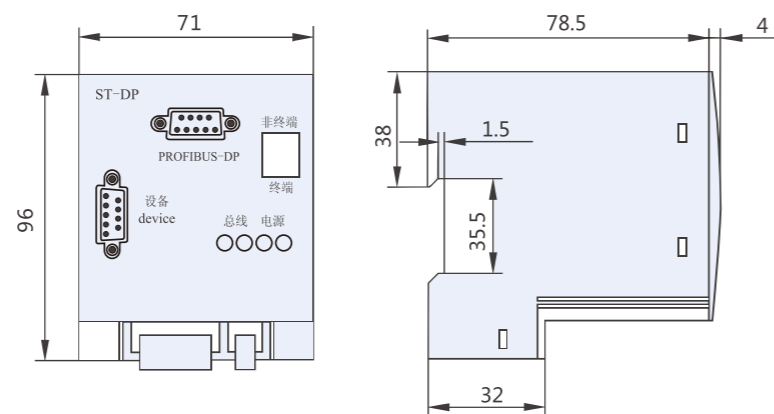
面板安装开孔尺寸
Panel installation hole size

ST-DP通讯协议模块

通过该模块可把多种专用或通用协议产品经转换后，挂接到所对应的现场总线上。

ST-DP communication protocol module

This communication protocol module can switch multiple kinds of proprietary or general protocols and hook them to corresponding field bus.



智能断路器的外部配置模块（可选用）

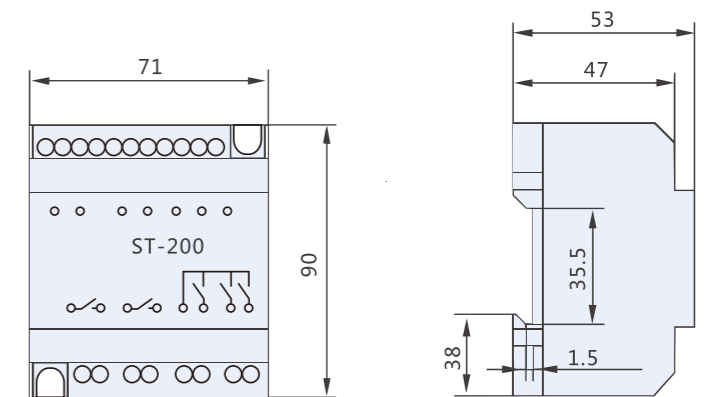
External configuration module of intelligent breaker (optional accessory)

ST-200智能控制模块

ST-200型智能控制模块采用标准导轨式安装。智能控制模块以光隔信号输入,各种报警和断路器分合信号以触点信号输出。

ST-200 intelligent control module

The ST-200 intelligent control module adopts standard guide rail type installation. The intelligent control module inputs through optical isolation signals, various kinds of alarm and breaker switching signals are output through contact signals.

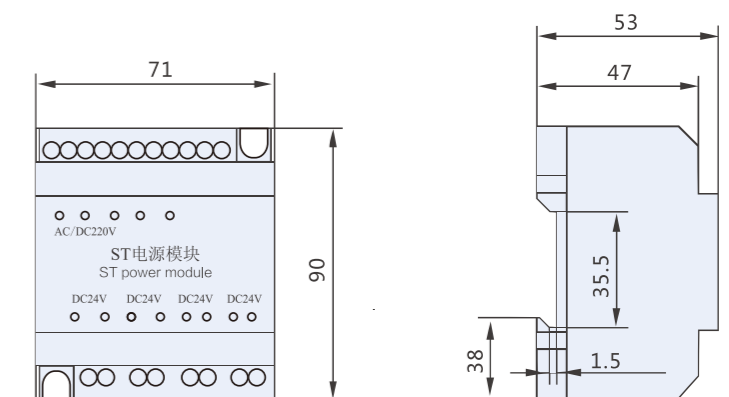


ST电源模块

ST电源模块采用标准导轨式安装。用于对智能型断路器在现场进行“脱扣试验”测试。也可为ST-CM提供直流电源。

ST power module

The ST power module adopts standard guide rail type installation. It is used for the field testing of “tripping test” of intelligent breaker. It also can provide direct-current power supply for ST-CM.



TEM2E SERIES INTELLIGENT MOLDED CASE CIRCUIT BREAKER

TEM2E系列智能型塑壳断路器

技术性能注释

Technical performance annotation

热记忆特性

反复的过负荷可能引起导体发热，控制器因过载等故障延时动作后，具有模拟双金属片特性的热效应，长延时能量 30min 释放结束，短延时能量15min 释放结束，在此期间如再次闭合断路器发生过载故障，则延时动作时间变短，可使线路或设备得到较合适的保护。控制器断电复位一次可清除积累热效应（该特性根据需要可关断）。预报警和负载监控均和过载保护特性相联。出厂时一般关断热记忆功能。

短延时反时限特性

针对TEM2E智能型断路器，短延时有两种方式选择，一为定时限保护，故障电流大于整定值按延时定值延时动作，延时时间与电流值无关；另一种为反时限+定时限保护，低倍电流（指 $I > I_{sd}$ 且 $K8I_R$ ）按反时限保护，延时动作时间与故障电流值相关，电流值越大，延时时间越短，高倍故障电流（指 $I > I_{sd}$ 且 $K8I_R$ ）时控制器自动转为定时限保护。但针对具有热记忆特性的控制器，热效应是积累的。出厂时一般为定时限特性。

控制器的自诊断

控制器的自诊断功能主要用于对自身单片机芯片的工作运行的检查和保护，当控制器内部环境温度超过 $80^{\circ}\text{C}+5^{\circ}\text{C}$ ，MCU发光二极管闪烁；当控制器内部单片机工作中出现异常现象时，MCU 发光二极管闪烁或熄灭。

故障检查

断路器故障分闸后，在有辅助电源的情况下，断电后仍具有故障记忆功能，重新上电后，按一下编程器的“检查”功能，则指示上一次故障跳闸的原因。如再发生新故障则清除过去故障记忆，保留新故障记忆。

注：记忆故障时,辅助电源必须接上。

Thermal memory characteristics

Repeating over-load may cause the conductor heating, the controller has the heating effect of simulating the bimetal characteristics after conducting time-delay action due to overload and other faults. The long-time delay energy can be released within 30 minutes and short-time delay energy can be released within 15 minutes. If overload fault occurs to the breaker during this period, the duration of time-delay action will be shortened, to properly protect the circuit or equipment. The accumulated heating effect can be eliminated by resetting the controller through outage (This characteristic can be shut off according to needs). Both the pre-alarm and overload monitoring are linked with the overload protection characteristics. The thermal memory function is generally shut off when leaving the factory.

Short-time delay inverse-time characteristics

As for the TEM2E intelligent breaker, there are two selections for short-time delay, the first is definite-time protection, operate according to the delayed constant value when the fault current is greater than the setting value, the delay time has nothing to do with the current value; the other is inverse-time + definite-time protection, the low power current ($I > I_{sd}$ and $I \leq 8 I_R$) applies inverse-time protection, the time of time-delay action is related to the fault current value, the delay time is shorter when the current value is greater; the high power fault current ($I > I_{sd}$ and $I > 8I_R$) controller switches to definite-time protection automatically. But for the controller with thermal memory characteristics, the heating effect is accumulated. It generally is set with definite-time characteristics when leaving the factory.

Self-diagnosis of the controller

The self-diagnostic function of the controller is mainly used for the checking and protection of the operation of its own single chip. The MCU luminous diode flickers when the internal ambient temperature of the controller exceeds $80^{\circ}\text{C}+5^{\circ}\text{C}$. The MCU luminous diode flickers or dies out when abnormal phenomena occur during the operation of the internal single chip of the controller.

Fault checking

After the breaker switches off due to fault, it still has the function of fault memory after outage when equipped with auxiliary power supply, press the “check” function of the programming unit after energizing it again, the reason of the previous tripping fault will be displayed. Eliminate the former fault memory and keep the new one if a new fault occurs. Note: If a memory fault occurs, the auxiliary power supply shall be connected.

技术性能注释

Technical performance annotation

用户在使用前，须仔细阅读“使用说明书”，了解本产品的特点和性能以及使用方法。

安装调试时用户应注意对控制器的保护，以防重击或擦伤，控制器面罩不得随意打开，以免设定参数被改变或面板元件被损坏。投运前应由专人检查参数是否正确、控制器是否在正常运行状态，动作过程中用户可通过观察指示灯查看负荷情况，以便及时处理。

设定保护参数时，各种参数不得交叉，要求 $I_R < I_{sd} < I_i$ ；断路器配线必须符合上进下出，即1、3、5端子接电源线，2、4、6端子接负载线，不允许倒进线。在用户遵守保管和使用条件下，从制造厂发货之日起18个月内，封印完好，若为本厂生产质量问题，本厂负责修理或更换。

断路器外形及安装尺寸、内外部附件、使用及维护

The shape and installation dimensions, internal and external accessories, usage and maintenances

TEM2E系列断路器的外形及安装尺寸、内外部附件、使用及维护，参见“TEM2/TEM2E/TEM2L系列外形及安装尺寸”样本C15-C36页内容。

Before using the product, the user shall read the “Operation Manual” carefully to know the characteristics and using methods of this product.

The user shall protect the controller from thumping or scratching while installing and debugging. The controller mask can't be optionally opened to prevent the setting parameter from being changed or the panel components from being damaged. Specially-assigned people shall check whether the parameters are right and the controller is in normal operating status or not before put them into operation. In the operating process the user can check the load condition through observation for duly treatment.

Various parameters can't be crossed when setting the protective parameters, it is required that $I_R < I_{sd} < I_i$;

The wiring of the breaker must conform to upper-lower path, namely terminal 1, 3 and 5 connecting to power line while terminal 2,4 and 6 connecting to load line. No reversed wiring sequence is allowed.

Within the period of 18 months since the products is delivered to the user from the manufacturing plant, if the user abides by the safekeeping and service regulation and the product.

