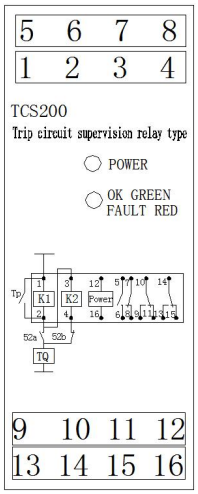
TCS200 系列跳闸回路监视继电器

◆概述

在保护系统中，断路器的跳闸电路至关重要。 如果跳闸电路发生中断，则可能的系统故障将不会被断开，并且必须由电力系统中的上游的另一个保护来清除。 只有一个跳闸线圈和断路器跳闸至关重要时，监控功能尤其重要。 例如，用于发电机断路器或配电网络中的任何其他重要断路器。监控继电器型号 TCS200 用于连续监控断路器跳闸电路，并给出辅助电源丢失报警，跳闸线圈故障 或与断路器连接的开关及电路断线，断路器辅助触点故障和监控继电器本身的故障。



◆技术特性

监控额定电压：AC,DC 24V、48V、100V、110V、125V、220V、250V
工作电压范围：80~110% Ue（额定电压）
辅助电源电压：AC,DC 30~265V
监控电流：2~3mA（高阻输入）
动作和返回电流：0.3~0.7mA，在额定电压 Ue 及 25℃时。
延时返回时间：0.6~0.7s，在额定电压 Ue 及 25℃时。
接点输出：1 开 NO+1 闭 NC+2 转换 2CO
触点容量：AC,DC250V,5A(纯阻性负载)，
在 DC 48/110/220V 中，时间常数 L/R<40ms，能断开电流 1A/0.25A/0.15A。
环境条件：工作温度-20~55℃，环境湿度不大于 90%RH
绝缘电阻：在电源-输入-输出端子之间，不小于 100MΩ,在 500 VDC 测试下
介质耐压：在电源-输入-输出端子之间，能承受 2000V,1min 试验，无击穿和闪络现象。
抗干扰能力：能承受 1MHz 和 100kHz 衰减震荡波的高频干扰试验，第一个半波电压幅值共模为 2.5kV、差模 1.0Kv，产品不应出现误动或拒动现象。

◆原理及接线图

监控继电器 TCS200 设计用于跳闸电路和其他重要的控制和监控电路的监控。继电器的框图如图 1，2 所示。

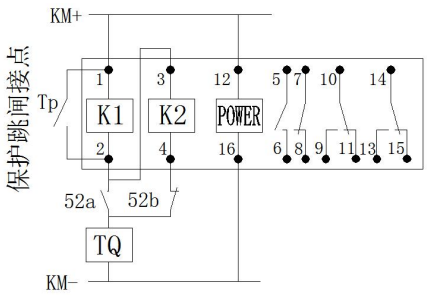


图1 跳闸回路监视继电器系统接线图

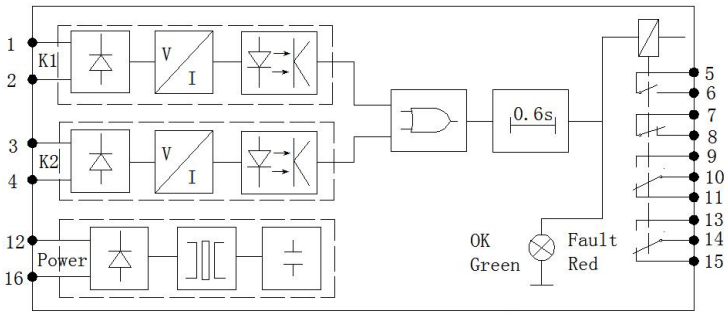


图2 TCS-2跳闸回路监视继电器原理框图

在正常情况下，指示灯 LED 呈绿色亮起，输出继电器处于“动作”状态。发生故障时，如果测量电流低于继电器工作值（0.3－0.7 mA）或完全停止流动。监控继电器在延迟 0.6 秒后返回，指示灯 LED 红色亮起。

监控继电器由于其功能需要额定值的辅助电压（AC 或 DC）连接到端子’12’和’16’。该电压可以与监控电路相同，或者可以是单独电源供电。如果辅助电源出现故障，LED 不发光，输出继电器掉电。

监控功能基于低电流（∽3 mA）注入原理，注入的电流由两个光耦合器感测，断路器跳闸电路三种稳态的监控功能可以从图 3,4 和 5 中看出。图 6 为断路器动作后，其辅助触点转换过程，52b 断开先于 52a 闭合，此时会造成 52a 和 52b 都断开，此过程将持续 40ms 左右，继电器将延时返回，如果在继电器 0.6-0.7s 的延时返回时间内，断路器完成转换，继电器不返回，如果转换时间超过继电器返回延时，则判定为断路器失灵或控制回路断线，继电器返回并报警输出。

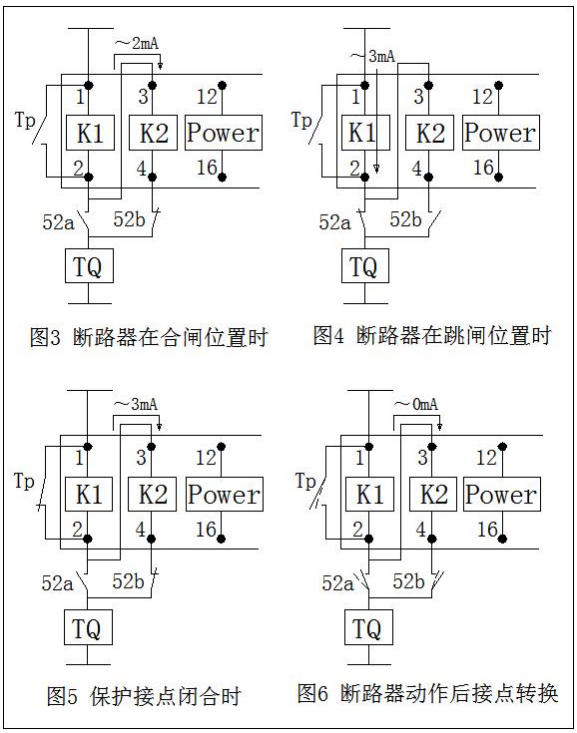


图3 断路器在合闸位置时　图4 断路器在跳闸位置时

图5 保护接点闭合时　图6 断路器动作后接点转换

◆型号规格

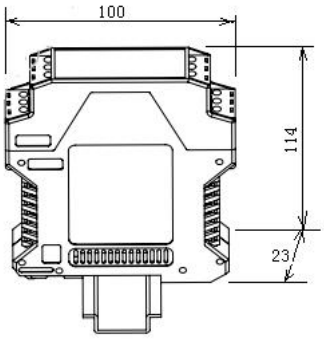
TCS2□□-□

辅助电源	F1:AC,DC30~265V F2:DC24V F3:用户自定
额定电压	1:DC110V 5:DC24V 2:DC220V 6:AC100V 3:DC125V 7:AC220V 4:DC48V 8:AC250V 9:用户自定
输出接点	1:2转换CO 2:1开NO+1闭NC+2转换CO

跳闸回路监视继电器

◆外形尺寸安装

外形尺寸：100x114x23
安装方式：35mm 标准导轨式卡装



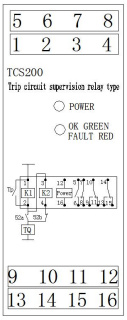
◆订货须知

订货时请注明型号规格及数量
订货型号例：TCS212-F1
2CO 接点，DC220V 额定电压，AC/DC30~265V 辅助电源。

TCS200 Series Trip circuit supervision relay

◆Overview

In a protection system the trip circuit of the circuit breaker is crucial. If an interruption occurs in the trip circuit a possible network fault will not be disconnected and would have to be cleared by another protection upstream in the power system. The supervision function is particularly important when there is only one tripping coil and CB tripping is vital. For instance, for generator circuit breakers or any other important circuit breaker in distribution networks.The supervision relay type TCS200 is intended for a continuous supervision of circuit breaker trip circuit and to give an alarm for loss of auxiliary supply, faults on the trip-coil or its wires independent of the breaker position, faults on the breaker auxiliary contacts and faults in the supervision relay itself.



◆Technical characteristics

Rated voltage of supervised：AC,DC 24V、48V、100V、110V、125V、220V、250V
Operative voltage range：80~110% Ue（Rated voltage）
Rated voltage of auxiliary circuit：AC,DC 30~265V
Supervision current：2~3mA（High resistance input）
Pick-up & Drop-off current：0.3~0.7mA，at rated voltage Ue & 25℃。
Operate (Drop-off) time：0.6~0.7s，at rated voltage Ue & 25℃。
Contact configuration (self reset)：1NO+1NC+2C0
Contact capacity：AC,DC250V,5A(Pure resistive load），Breaking capacity for DC with circuit 1A/0.25A/0.15A，time-constant L/R < 40 ms，at 48/110/220 VDC。
Environmental conditions: Operating temperature -20 ~ 55 ℃, the ambient humidity is not greater than 90% RH。
Insulation resistance: between the power supply - input - output terminals, not less than 100MΩ, at 500 VDC test。
Dielectric withstand voltage: between the power supply - input - output terminals, can withstand 2000V, 1min test, no breakdown and flashover phenomenon.
frequency interference test, the first half-wave voltage amplitude Common mode is 2.5kV, differential mode 1.0Kv, the product should not be a malfunction or refusing phenomenon.

◆Working principle and wiring diagram

The supervision relay TCS200 is designed for monitoring of trip circuits and other important control and monitoring circuits. The block diagram of the relay is shown in Figure 1 and Figure 2.

In normal condition, the indicator LED glows green and output relays are in ‘picked-up’ condition. In the event of a fault, if the measuring current drops below the operating value of the relay (0.3 - 0.7 mA) or completely stops flowing. The supervision relay operates (drops-off) after a delay of 0.6 sec and the indicator LED turns red.

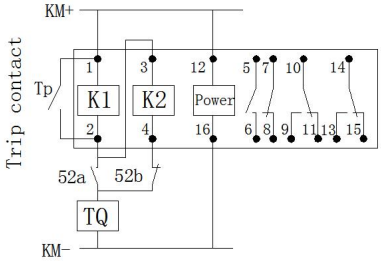


Figure 1, trip circuit supervision relay system wiring diagram

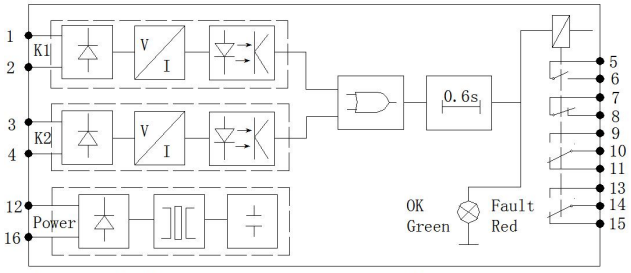


Figure 2, TCS200 trip circuit supervision relay block diagram

The supervision relay, for its functioning requires an auxiliary voltage (AC or DC) of rated value to be connected to the terminals ‘12’ and‘16’.This voltage can be the same as that of the supervised circuit or it could be a separate source with the same magnitude (AC or DC).Should a fault occur in the auxiliary voltage supply, the LED does not glow and the output relay drops off.

The supervision function is based on a low-level (~ 3 mA) current injection principle. The injected current is sensed by two opto-couplers. The supervision function in three steady states of circuit breaker-trip circuit can be seen from fig.2, 3 and 4. Figure 6 for the circuit breaker action, the auxiliary contact conversion process, 52b off before 52a closed, this time will cause 52a and 52b are disconnected, this process will last about 40ms, the relay will delay to return, if the relay 0.6-0.7s delay time, the circuit breaker to complete the conversion, the relay does not return, if the conversion time exceeds the relay return delay, then determine the circuit breaker failure or control circuit disconnected, the relay returns and alarm output.

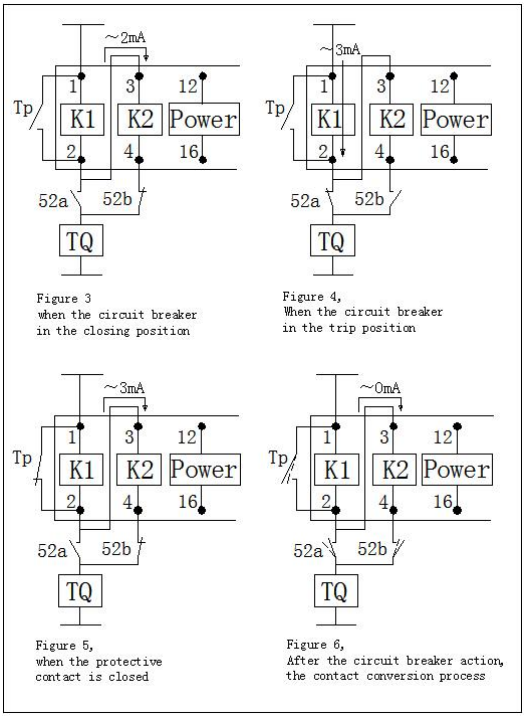


Figure 3 when the circuit breaker in the closing position

Figure 4, When the circuit breaker in the trip position

Figure 5, when the protective contact is closed

Figure 6, After the circuit breaker action, the contact conversion process

◆Model specifications

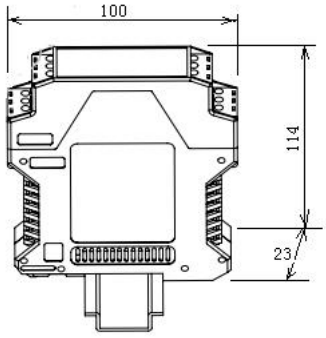
TCS2□□-□

Auxiliary power	F1:AC, DC30~265V F2:DC24V F3:User customize
Rated voltage	1:DC110V 5:DC24V 2:DC220V 6:AC100V 3:DC125V 7:AC220V 4:DC48V 8:AC250V 9:User customize
Output contact	1:2CO 2:1NO+1NC+2CO

Trip circuit supervision relay

◆Shape size and installation

Shape size：100x114x23
Installation：35mm standard rail card



◆Ordering instructions

Please specify the model specifications and quantity when ordering
Order Model Example：TCS212-F1
2CO Contact，DC220V Rated voltage，AC/DC30~265V Auxiliary power。