

TCS - TRIP CIRCUIT SUPERVISION RELAY



Combiflex® housing HX1 (TCS xxxC)

FEATURES

- ◆ ABB Combiflex® system HX1, DIN 35 rail or panel mount housing
- ◆ ABB SPER 1C1, ABB RXEM 1 pin compatible
- ◆ With active power supply or passive supplied version
- ◆ Standard substation battery and network voltages
- ◆ Low auxiliary voltage burden
- ◆ Universal input voltage supervision circuit
- ◆ Low supervision current; around 1 mA
- ◆ LED operation indicators
- ◆ Galvanically separated supervision, auxiliary and output circuits
- ◆ 1 input with the use of external resistor or 2 inputs no external resistor required
- ◆ Latched trip and permanent closed trip contact position (e.g. undervoltage protection) independent
- ◆ Both circuit breaker positions circuit supervision
- ◆ Power supply loss, wire, coil and contact failure and relay self supervision

DESCRIPTION

TCS is a family of trip circuit supervision relays. TCS devices has one output or two outputs which is/are controlled by supervision inputs their logic and time delay. If the supervision current(s) through input is below threshold, binary output is deenergised after around 3 s time. Power supply and supervision inputs are made for standard substation DC voltages and also AC 230 V.

For device operation visual inspection devices are equipped with green LED(s) and one red lamp which indicates output relay state.

TCS xxxC is in HX1 housing and is intended for installing into ABB Combiflex® system and TCS xxxD is intended for DIN35 rail mounting and TCS xxxP is intended for panel mounting (96 x 48 mm).

TCS 1xxx, 2xxx & 4xxx devices has active power supply, one relay output and 1, 2, 4 or 6 low current inputs.

TCS x11x (with ext. resistor) and TCS x21x are intended for supervising 1 circuit breaker trip circuit (single coil CB)

TCS x41P is intended for supervising 2 circuit breaker trip circuits (e.g. medium voltage CB with two coils).

TCS x61P is intended for supervising 3 circuit breaker trip circuits (e.g. high voltage three single pole CB).

TCS Axxx, Bxxx, Cxxx & Dxxx devices are supplied via input. Devices has 1 or 2 inputs and 1 or 2 relay outputs.

TCS x11x device is intended for supervising one circuit breaker trip circuit.

TCS x22x device is intended for supervising two circuit breaker trip circuits.

APPROVALS

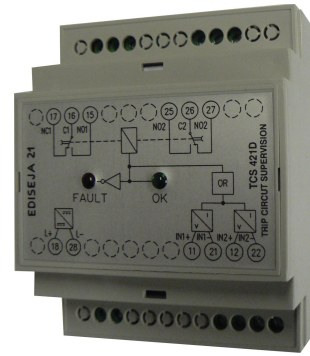
- ◆ Dielectric IEC 60255-27; PS to all, DI to all, DO to all: 4600 V DC, 60 s
DI1 to DI2 & DO1 to DO2 3100 V DC, 60 s
- ◆ Insulation resistance IEC 60255-27; DO, DI, PS to CASE; >100 MΩ at 500 V DC
- ◆ Impulse voltage IEC 60255-27; 5 kV, 1,2/50 μs, 0,5 J
- ◆ Electrostatic discharge IEC 60255-26 Lvl IV
 - ◆ Contact discharge: 8 kV, 150 pF/330 ohm
 - ◆ Air discharge: 15 kV, 150 pF/330 ohm
- ◆ Fast transient disturbance test IEC 60255-26 Class IV, IEC 61000-4-4 Level 4; 4 kV, 5/50 ns, 5 kHz, Rs = 50 ohm
- ◆ Surge immunity IEC 60255-26 Class IV, IEC 61000-4-5 Level 4
 - ◆ com. mode: 4 kV, 1,2/50 us, Rs = 10 Ω
 - ◆ diff. mode: 2 kV, 1,2/50 us, Rs = 2 Ω
- ◆ Power frequency magnetic field immunity IEC 60255-26, IEC 61000-4-8, Level 4
 - ◆ 30 A/m, continuous
 - ◆ 300 A/m, 1 s to 3 s
- ◆ Damped oscillatory wave IEC 60255-26, IEC 61000-4-18; Level 3; 1 MHz, 2,5 kV comm., 1 kV diff.
- ◆ Pulse magnetic field immunity IEC 61000-4-9 Level 5; 1000 A/m
- ◆ Conducted emissions IEC 60255-26, CISPR 22- Class B, EN 55022:2011, IEC 61000-6-3; 0,15- 0,5 MHz: 66-56 dB(μV) QP, 56-46 dB(μV) AV 0,5-5 MHz: 56 dB(μV) QP, 46 dB(μV) AV 5-30 MHz: 60 dB(μV) QP, 50 dB(μV) AV
- ◆ Radiated emission (below 1 GHz IEC 60255-26, CISPR 11- Class B, EN 55011, IEC 61000-6-3: 30-230 MHz: 40 dB(μV/m) QP at 3 m 230-1000 MHz: 47 dB(μV/m) QP at 3 m
- ◆ Radiated immunity IEC 60255-26; IEC 61000-4-3 Level 3, ENV 50204 (GSM); 80 MHz - 6 GHz, 10 V/m
- ◆ Conducted immunity IEC 60255-26, IEC 61000-4-6 Level 3; 0,15 - 80 MHz, 10 V
- ◆ Dry heat IEC 60255-27, IEC 60068-2-2; 70°C, min 16 h, energized, rated load
- ◆ Cold test IEC 60255-27, IEC 60068-2-1 -25°C, min 16 h, cooled unenergized, energized, rated load
- ◆ Cyclic temperature with humidity (Damp Heat Cyclic) IEC 60255-27, IEC 60068-2-30; 55 °C to 25 °C, 95 % Relative Humidity, 12+12 h, 6 cycles

TECHNICAL DATA - TCS 1xxx, 2xxx & 4xxx

- ◆ Power supply input voltage: DC: 24 V, 48 V-60 V, 110 V-250 V, AC: 230 V
- ◆ Power supply burden: <1 W
- ◆ Supervision input current: <1 mA
- ◆ 2 galvanically separated Change Over contacts 8 A @ AC 250 V relay

TECHNICAL DATA - TCS Axxx, Bxxx, Cxxx & Dxxx

- ◆ Supervision input voltage: DC: 24 V, 48 V-60 V, 110 V-125 V, 220 V-250 V, AC: 230 V
- ◆ Supervision burden: <1 W (per input)
- ◆ 2 galvanically separated Change Over contacts 8 A @ AC 250 V relay



DIN 35 rail mounting (TCS xxxD)

DESCRIPTION & SCHEMATICS:

TCS 111x (DC 24 V)

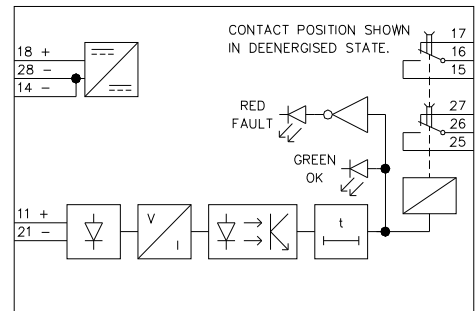
TCS 211x (DC 48 V-60 V)

TCS 411x (DC 110 V-250 V, AC 230 V)

TCS xxxC (ABB SPER 1C1 pin compatible, Combiflex® HX1 housing)

TCS xxxD (housing intended for DIN35 rail mounting)

One channel trip circuit supervision relay. With the use of external resistor can supervise one circuit breaker trip in both circuit breaker positions. It has active power supply and 2xCO potential free relay contacts. Deenergised input deenergise output relay after time delay.



TCS 121x (DC 24 V)

TCS 221x (DC 48 V-60 V)

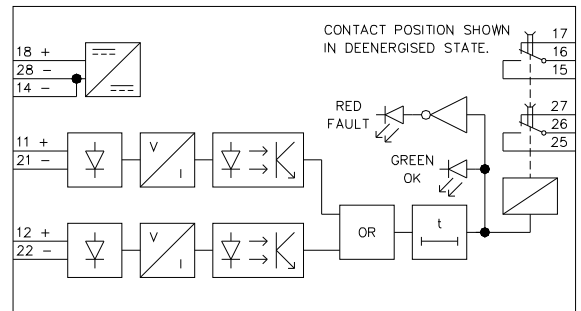
TCS 421x (DC 110 V-250 V, AC 230 V)

TCS xxxC (Combiflex® HX1 housing)

TCS xxxD (DIN35 rail mounting housing)

TCS xxxP (panel mounting 96 x 48 mm housing)

Two channel trip circuit supervision relay. It can supervise one circuit breaker trip circuit in both circuit breaker positions without external resistor. It has active power supply and 2xCO potential free relay contacts. Both deenergised inputs deenergise output relay after time delay.

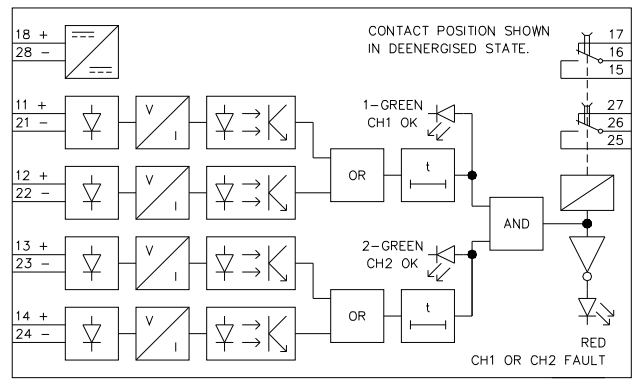


TCS 141P (DC 24 V)

TCS 241P (DC 48 V-60 V)

TCS 441P (DC 110 V-250 V, AC 230 V)

Four channel trip circuit supervision relay. It can supervise two circuit breaker trip circuits in both circuit breaker positions without external resistor (e.g. medium voltage circuit breaker with two coils). It has active power supply and has 2xCO relay potential free contacts. Any deenergised input pair deenergise output relay after time delay.



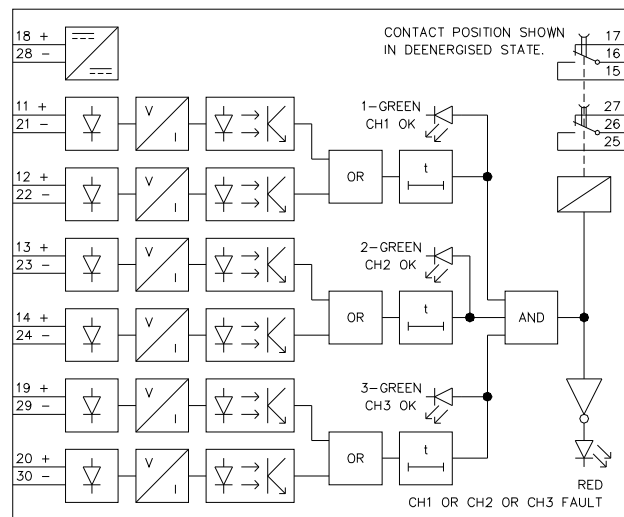
Panel mounting (TCS xxxP)

TCS 161P (DC 24 V)

TCS 261P (DC 48 V-60 V)

TCS 461P (DC 110 V-250 V, AC 230 V)

Six channel trip circuit supervision relay. It can supervise three circuit breaker trip circuits in both circuit breaker positions without external resistor (e.g. high voltage three single pole circuit breaker). It has active power supply and has 2xCO relay potential free contacts. Any deenergised input pair deenergise output relay after time delay.



TCS A11x (DC 24 V)

TCS B11x (DC 48 V-60 V)

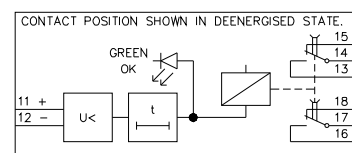
TCS C11x (DC 110 V-125 V)

TCS D11x (DC 220 V)

TCS xxxC (Combiflex® HX1 housing)

TCS xxxD (housing intended for DIN35 rail mounting)

One channel trip circuit supervision relay. It can supervise one circuit breaker trip circuit in both circuit breaker positions with the use of external resistor. Output has 2xCO potential free relay contacts. Deenergised input deenergise output relay after time delay.



TCS A22x (DC 24 V)

TCS B22x (DC 48 V-60 V)

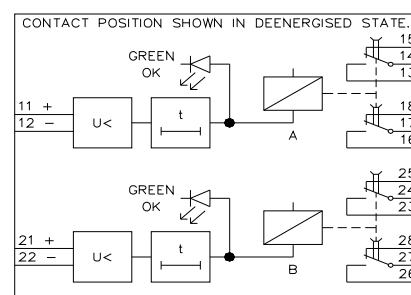
TCS C22x (DC 110 V-125 V)

TCS D22x (DC 220 V)

TCS xxxC (ABB RXEM 1 pin compatible, Combiflex® HX1 housing)

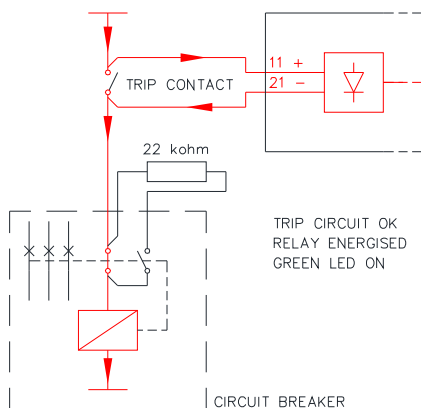
TCS xxxD (housing intended for DIN35 rail mounting)

Two channel trip circuit supervision relay. It can supervise two circuit breaker trip circuits in both circuit breaker positions with the use of external resistor in each channel. Each output has 2xCO potential free relay contacts. Deenergised input deenergise dependent output relay after time delay.

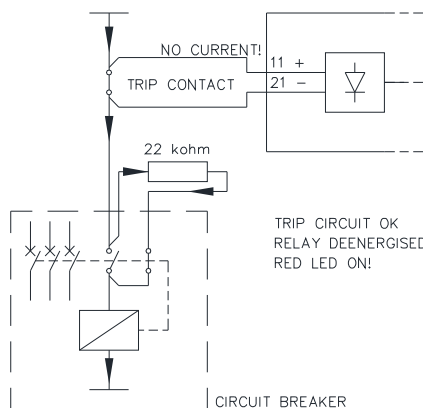


OPERATION: TCS 1(2,4)11x, A(B,C,D)11x, A(B,C,D)22x - single channel with external resistor

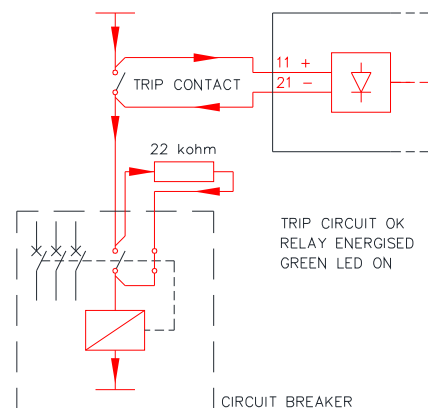
CIRCUIT BREAKER = ON
TRIP = OFF
ADDITIONAL RESISTOR



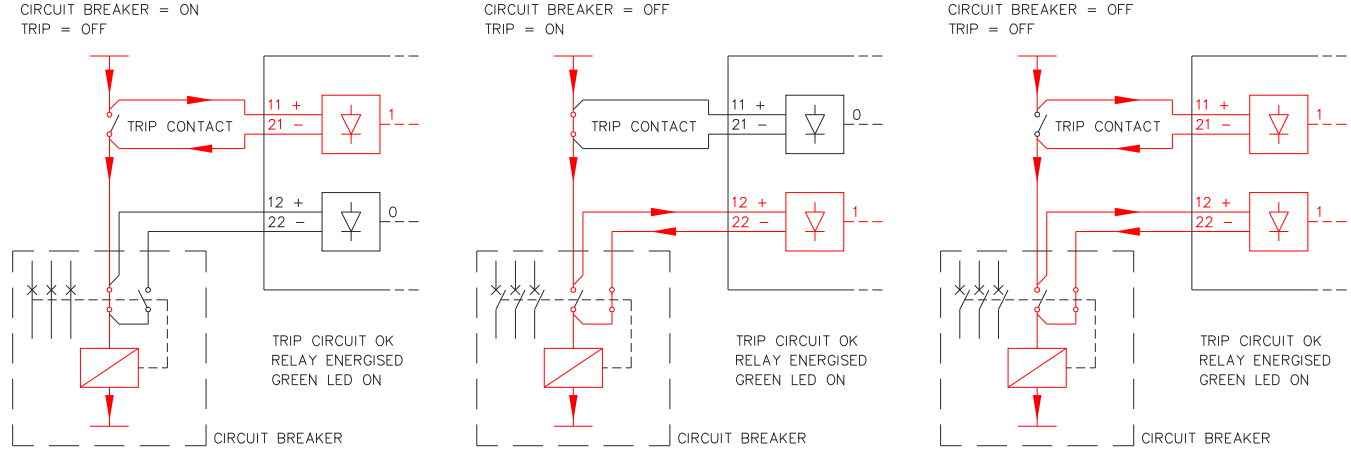
CIRCUIT BREAKER = OFF
TRIP = ON
ADDITIONAL RESISTOR



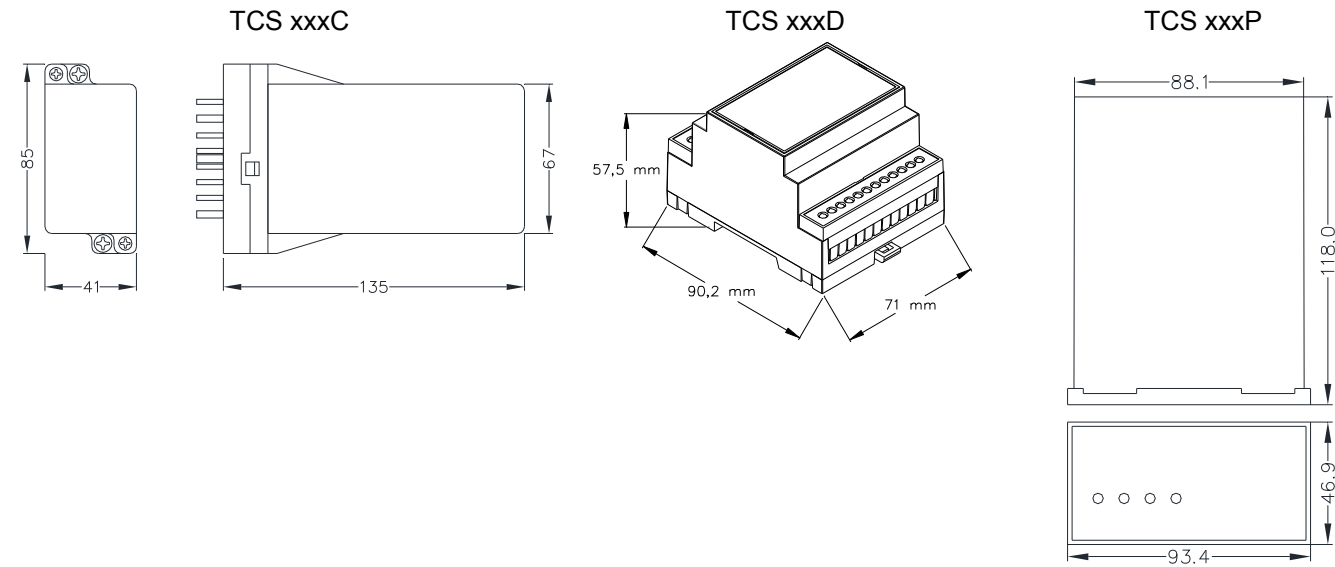
CIRCUIT BREAKER = OFF
TRIP = OFF
ADDITIONAL RESISTOR



TCS 1(2,4)2(4,6)1x - two inputs - no external resistor required



DIMENSIONS:



ORDERING CODE:

| WITH ACTIVE POWER SUPPLY | TCS | | | |
|------------------------------------------------|-----|---|---|--|
| Digital input and power supply voltage: | | | | |
| DC 24 V | 1 | | | |
| DC 48 V-60 V (in development) | 2 | | | |
| DC 110 V-220 V, AC 230 V | 4 | | | |
| Number of DIs and DOs: | | | | |
| 1 DI, 1 DO (ext. resistor required) | 1 | 1 | | |
| 2 DIs, 1 DO | 2 | 1 | | |
| 4 DIs, 1 DO (panel mount only (x41P)) .. | 4 | 1 | | |
| 6 DIs, 1 DO (panel mount only (x61P)) .. | 6 | 1 | | |
| Housing: | | | | |
| Combiflex® HX1 housing | | | C | |
| DIN 35 rail | | | D | |
| Panel mount (WxH) 96 x 48 mm | | | P | |

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| WITHOUT ACTIVE POWER SUPPLY | TCS | | | |
|------------------------------------|-----|---|---|--|
| Digital input voltage: | | | | |
| DC 24 V | A | | | |
| DC 48 V-60 V | B | | | |
| DC 110 V-125 V | C | | | |
| DC 220 V | D | | | |
| Number of DIs and DOs: | | | | |
| 1 DI, 1 DO (1 pair) | 1 | 1 | | |
| 1 DI, 1 DO (2 pairs) | 2 | 2 | | |
| Housing: | | | | |
| Combiflex® HX1 housing | | | C | |
| DIN 35 rail | | | D | |
| Panel mount (WxH) 96 x 48 mm | | | P | |