

# TCC-H

## overview

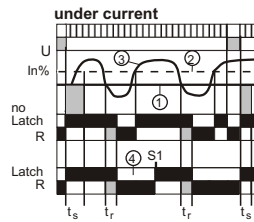
- ◆ AC or DC under or over current monitor
- ◆ DPCO output max. 6A
- ◆ 3 measuring ranges 5mA - 10A RMS
- ◆ level and hysteresis adjustments
- ◆ programmable latch/no latch alarm
- ◆ LED indicators for power supply, contact and reaction timer
- ◆ 45mm DIN rail mount housing



### Function

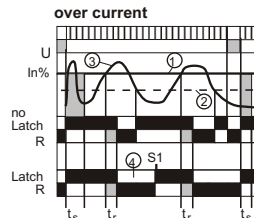
- Control relay active  
Control relay passive
- Contact closed  
Contact open

- ① Threshold "In"
- ② Hysteresis
- ③ Monitored current
- ④ Latch



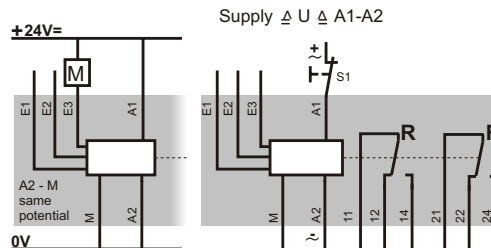
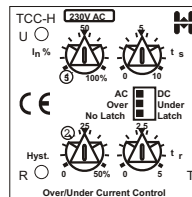
ts... Start surge delay  
tr... Reaction timer  
T... LED indication reaction timer

**Over/under current control relay**  
On application of the supply voltage the output relay pulls in and the timing period  $t_s$  starts.



**Current control with no latch (auto reset) function**  
At the end of  $t_s$ , when the measured current exceeds the set threshold, timing period  $t_r$  starts. At the end of  $t_r$  the output relay changes over. The output relay resets immediately when the monitored current reaches the set value of the hysteresis.

**Current control with latch (manual reset) function.**  
At the end of  $t_s$  when the measured current exceeds the set threshold, timing period  $t_r$  starts. At the end of  $t_r$  the output relay changes over and remains in this condition, even when the monitored current reaches the set value of the hysteresis. An external reset (S1) must be operated to reset the relay.



input	range	resistance	$I_{EMAX}$ (20°C)
E1-M	5mA - 100mA	1,0 Ohm	1,5 A
E2-M	50mA - 1A	0,1 Ohm	3,5 A
E3-M	0,5A - 10A	0,01 Ohm	14 A

## specification

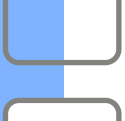
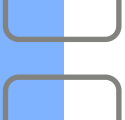
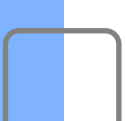
<b>supply voltage variation</b>	nominal voltage +10% / -15%
<b>frequency range</b>	48 - 63 Hz
<b>duty cycle</b>	100%
<b>start surge delay</b>	0 - 10s
<b>reaction time</b>	0 - 5s
<b>reset time</b>	< 100ms
<b>output relay specification</b>	max. 6A 230V~
Ue/Ie AC-15	120V/4A 240V/3A
Ue/Ie DC-13	24V/2A
	EN 60947-5-1 VDE 0435
<b>expected life time</b>	DPCO SPCO
mechanical	$2 \times 10^6$ $1 \times 10^7$
electrical	$1 \times 10^5$ $1 \times 10^5$
<b>operating conditions</b>	-20 to +60 °C non condensing

## ordering information

part no	supply	output	sup. galv. iso*	HIQUEL	housing types
TCC-H 230Vac	230V~ 2,5VA	DPCO	yes	yes	C
TCC-H 115Vac	115V~ 2,5VA	DPCO	yes	yes	C
TCC-H 24Vac	24V~ 2,5VA	DPCO	yes	yes	C
TCC-H 24Vdc	24V= 2W	DPCO	no	yes	C

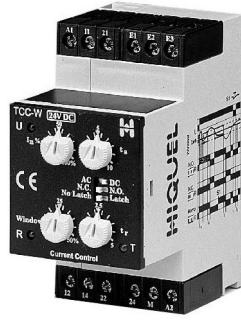
\* The measurement input is galvanically isolated from the power supply





# TCC-W

## overview

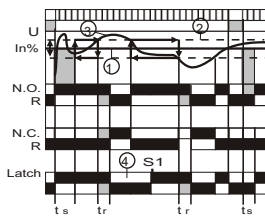


- ◆ AC or DC under or over current monitor with window function
- ◆ DPCO output max. 6A
- ◆ 3 measuring ranges 5mA - 10A RMS
- ◆ level and hysteresis adjustments
- ◆ programmable latch/no latch alarm
- ◆ LED indicators for power supply, contact and reaction timer
- ◆ 45mm DIN rail mount housing

### Function

- Control relay active
- Control relay passive
- Contact closed
- Contact open

- ① Threshold "In"
- ② Hysteresis
- ③ Monitored current
- ④ Latch

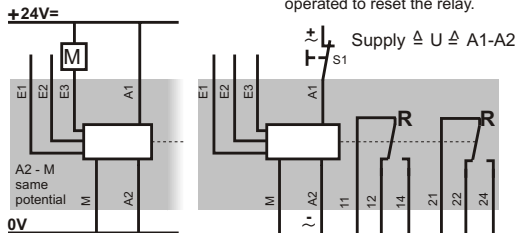
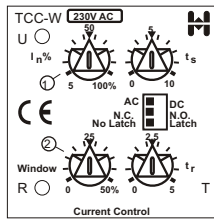


ts... Start surge delay  
tr... Reaction timer  
T... LED indication reaction timer

On application of the supply voltage with N.O. Mode selected, the output relay pulls in and the timing period  $t_s$  starts.

**Current control with no latch (auto reset) function**  
At the end of  $t_s$ , when the measured current exceeds the window in any direction, timing period  $t_r$  starts. At the end of  $t_r$  the output relay changes over. The output relay resets immediately, when the monitored current reaches the set value of the hysteresis.

**Current control with latch (manual reset) function**  
At the end of  $t_s$ , when the measured current exceeds the window in any direction, timing period  $t_r$  starts. At the end of  $t_r$  the output relay changes over and remains in this condition, even when the monitored current reaches the set value of the hysteresis. An external reset (S1) must be operated to reset the relay.



input	range	resistance	$I_{EMAX}$ (20°C)
E1-M	5mA - 100mA	1,0 Ohm	1,5 A
E2-M	50mA - 1A	0,1 Ohm	3,5 A
E3-M	0,5A - 10A	0,01 Ohm	14 A

part no	supply	output	sup. galv. iso*	HIQUEL	housing types
TCC-W 230Vac	230V~ 2,5VA	DPCO	yes	yes	C
TCC-W 115Vac	115V~ 2,5VA	DPCO	yes	yes	C
TCC-W 24Vac	24V~ 2,5VA	DPCO	yes	yes	C
TCC-W 24Vdc	24V= 2W	DPCO	no	yes	C

\* The measurement input is galvanically isolated from the power supply

## specification

supply voltage variation	nominal voltage +10% / -15%
frequency range	48 - 63 Hz
duty cycle	100%
start surge delay	0 - 10s
reaction time	0 - 5s
reset time	< 100ms
output relay specification	max. 6A 230V~ Ue / Ie AC-15 120V/4A 240V/3A Ue / Ie DC-13 24V/2A
expected life time	EN 60947-5-1 VDE 0435 DPCO SPCO mechanical 2 x 10 <sup>6</sup> 1 x 10 <sup>7</sup> electrical 1 x 10 <sup>5</sup> 1 x 10 <sup>5</sup>
operating conditions	-20 to +60 °C non condensing

## ordering information

# TCC-H2

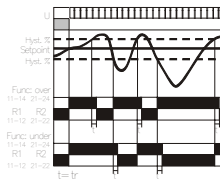
## overview

- ◆ AC or DC under or over current monitor
- ◆ 2 x SPCO output max. 6A
- ◆ 2 measuring ranges 0,25-5A and 0,5-10A RMS
- ◆ 2 separate switch points independently adjustable
- ◆ programmable latch/no latch alarm
- ◆ LED indicators for power supply, relay 1(R1) and relay 2(R2)
- ◆ 45mm DIN rail mount housing



### Function

- Control relay active
- Control relay passive
- Contact closed
- Contact open



Control relay for monitoring AC and DC voltage with two separately adjustable relay outputs.

Under or over current function can be set independently for R1 and R2 by DIP-Switch selection.

The Hysteresis of the switchpoint can be set independently for both R1 and R2 from 5-50%.

At the end of  $t_r$ , the output relay changes when the measured current exceeds the set value of the hysteresis. The time  $t_r$  is valid for both relays.

When the measured current returns to within the permitted range, the corresponding relay changes back immediately.

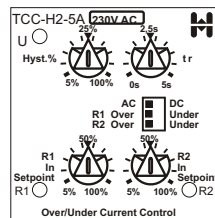
Switch "AC-DC" is used to select AC or DC input.

$$\text{upper threshold: } [Y \cdot (100 + \text{Hyst}\%)] / 100$$

$$\text{lower threshold: } [Y \cdot (100 - \text{Hyst}\%)] / 100$$

$$Y = (Z \cdot \text{Setpoint}\%) / 100$$

$$Z = 10V \text{ or } 20mA$$



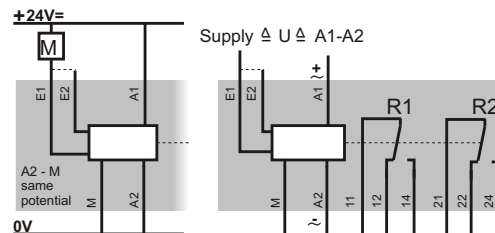
## specification

<b>supply voltage variation</b>	nominal voltage +10% / -15%
<b>frequency range</b>	48 - 63 Hz
<b>duty cycle</b>	100%
<b>reaction time</b>	0 - 5s
<b>reset time</b>	< 100ms
<b>output relay specification</b>	max. 6A 230V~
Ue/Ie AC-15	120V/4A 240V/3A
Ue/Ie DC-13	24V/2A
	EN 60947-5-1 VDE 0435
<b>expected life time</b>	SPCO
mechanical	5 x 10 <sup>6</sup> 1 x 10 <sup>7</sup>
<b>operating conditions</b>	-20 to +60 °C non condensing

## ordering information

part no	supply	output	sup. galv. iso*	HIQUEL <sup>®</sup>	housing types
TCC-H2 5A 230Vac	230V~ 2,5VA	2 x SPCO	yes	yes	C
TCC-H2 5A 115Vac	115V~ 2,5VA	2 x SPCO	yes	yes	C
TCC-H2 5A 24Vac	24V~ 2,5VA	2 x SPCO	yes	yes	C
TCC-H2 5A 24Vdc	24V= 2W	2 x SPCO	no	yes	C

\* The measurement input is galvanically isolated from the power supply



input	range	resistance	I <sub>EMAX</sub> (20°C)
E1-M	0,25A - 5A	0,01 Ohm	7 A
E1+E2-M	0,5A - 10A	0,005 Ohm	14 A



# TCC-GW

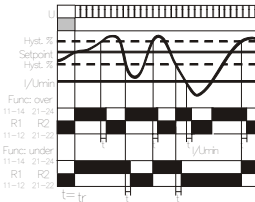
## overview

- ◆ current / voltage dual trip for analogue signals
- ◆ 2x SPCO output max. 6A
- ◆ 2 measuring ranges 0-10V and 0-20mA DC
- ◆ 2 separate switch points independently adjustable
- ◆ LED indicators for power supply, contact and reaction timer
- ◆ 45mm DIN rail mount housing



### Function

- Control relay active
- Control relay passive
- Contact closed
- Contact open



Control relay for monitoring AC current and AC voltage with two separately adjustable relay outputs.

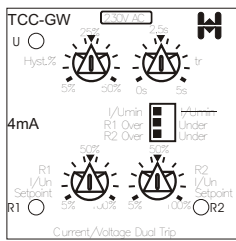
Under or over current function can be set independently for R1 and R2 by DIP-Switch selection.

The Hysteresis of the switchpoint can be set independently for both R1 and R2 from 5-50%.

At the end of  $t_r$ , the output relay changes as soon as the measured current exceeds the set value of the hysteresis. The time  $t_r$  is valid for both relays.

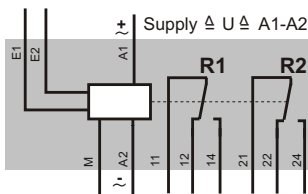
When the measured current returns to within the permitted range, the corresponding relay changes back immediately.

Switch "I/Umin" can be used to enable or disable the minimum signal control (<4mA or <2V). This could be helpful particularly with 4.20mA signals in function "Over".



upper threshold:  $[Y \cdot (100 + \text{Hyst}\%) ] / 100$   
 lower threshold:  $[Y \cdot (100 - \text{Hyst}\%) ] / 100$

$Y = (Z \cdot \text{Setpoint}\%) / 100$   
 $Z = 10V \text{ or } 20mA$



input	range	resistance	$I_{N,MAX}$ (20°C)
E1-M	0 - 10V	98 kOhm	20V
E2-M	0 - 20mA	50 Ohm	40mA

## specification

supply voltage variation	nominal voltage +10% / -15%
frequency range	48 - 63 Hz
duty cycle	100%
reaction time	0 - 5s
reset time	< 100ms
output relay specification	max. 6A 230V
	Ue/Ie AC-15 240V/3A
	Ue/Ie DC-13 24V/2A
	EN 60947-5-1 VDE 0435
expected life time	SPCO
	mechanical 5 x 10 <sup>6</sup>
operating conditions	-20 to +60 °C non condensing

## ordering information

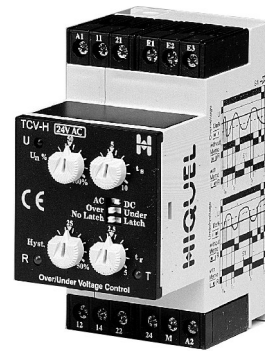
part no	supply	output	sup. galv. iso*	CE	housing types
TCC-GW 230Vac	230V~ 2,5VA	2 x SPCO	yes	yes	C
TCC-GW 115Vac	115V~ 2,5VA	2 x SPCO	yes	yes	C
TCC-GW 24Vac	24V~ 2,5VA	2 x SPCO	yes	yes	C
TCC-GW 24Vdc	24V= 2W	2 x SPCO	no	yes	C

\* The measurement input is galvanically isolated from the power supply

# TCV-H

## overview

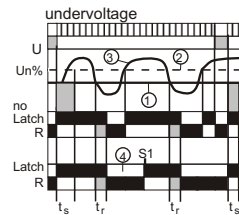
- ◆ AC or DC under or over voltage monitor
- ◆ DPCO output max. 6A
- ◆ 3 measuring ranges 0.5 - 600V RMS
- ◆ level and hysteresis adjustments
- ◆ programmable latch/no latch alarm
- ◆ LED indicators for power supply, contact and reaction timer
- ◆ 45mm DIN rail mount housing



### Function

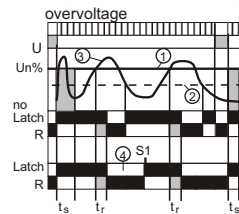
- Control relay active
- Control relay passive
- Contact closed
- Contact open

- ① Threshold "Un"
- ② Hysteresis
- ③ Monitored current
- ④ Latch



- ts... Start surge delay
- tr... Reaction timer
- T... LED indication reaction timer

On the application of the supply voltage the output relay pulls in and the timing period  $t_s$  starts.

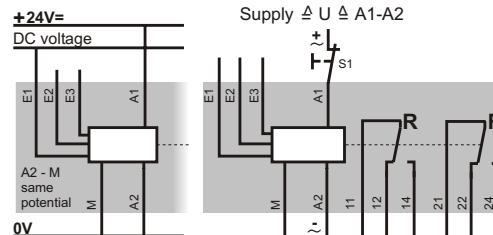
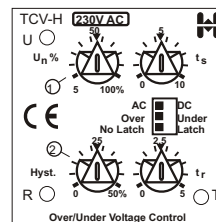


### Voltage monitor with no latch (auto reset) function

At the end of  $t_s$ , when the measured voltage exceeds the set threshold, timing period  $t_r$  starts. At the end of  $t_r$  the output relay changes over. The output relay resets immediately when the monitored voltage reaches the set value of the hysteresis.

### Voltage monitor with latch (manual reset) function.

At the end of  $t_s$ , when the measured voltage exceeds the set threshold, timing period  $t_r$  starts. At the end of  $t_r$  the output relay changes over and remains in this condition, even when the monitored voltage reaches the set value of the hysteresis. An external reset (S1) must be operated to reset the relay.



input	range	resistance	$U_{EMAX}$ (20°C)
E1-M	0,5V - 10V	3,9 kOhm	30V
E2-M	3V - 60V	68 kOhm	130V
E3-M	30V - 600V	820 kOhm	660V

## specification

supply voltage variation	nominal voltage +10% / -15%
frequency range	48 - 63 Hz
duty cycle	100%
start surge delay	0 - 10s
reaction time	0 - 5s
reset time	< 100ms
output relay specification	max. 6A 230V~
Ue/Ie AC-15	120V/4A 240V/3A
Ue/Ie DC-13	24V/2A
	EN 60947-5-1 VDE 0435
expected life time	DPCO SPCO
mechanical	$2 \times 10^6$ $1 \times 10^7$
electrical	$1 \times 10^5$ $1 \times 10^5$
operating conditions	-20 to +60 °C non condensing

## ordering information

part no	supply	output	sup. galv. iso*	HIQUEL <sup>®</sup>	housing types
TCV-H 230Vac	230V~ 2,5VA	DPCO	yes	yes	C
TCV-H 115Vac	115V~ 2,5VA	DPCO	yes	yes	C
TCV-H 24Vac	24V~ 2,5VA	DPCO	yes	yes	C
TCV-H 24Vdc	24V= 2W	DPCO	no	yes	C

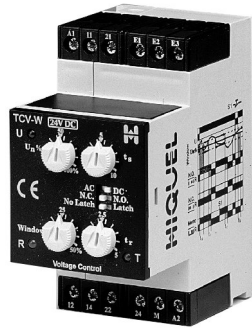
\* The measurement input is galvanically isolated from the power supply





# TCV-W

## overview

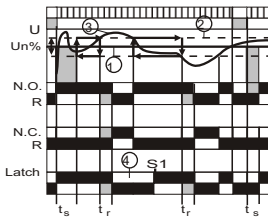


- ◆ AC or DC under or over voltage monitor with window function
- ◆ DPCO output max. 6A
- ◆ 3 measuring ranges 0.5 - 600V RMS
- ◆ level and hysteresis adjustments
- ◆ programmable latch/no latch alarm
- ◆ LED indicators for power supply, contact and reaction timer
- ◆ 45mm DIN rail mount housing

### Function

- Control relay active
- Control relay passive
- Contact closed
- Contact open

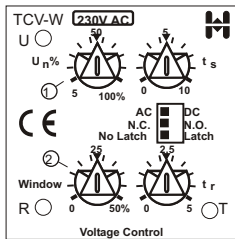
- ① Threshold "Un"
- ② Hysteresis
- ③ Monitored current
- ④ Latch



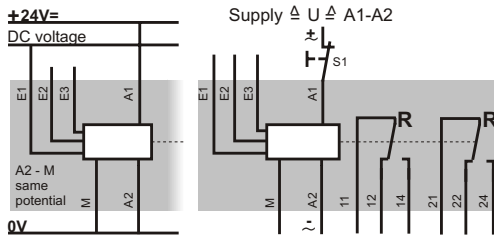
ts... Start surge delay  
tr... Reaction timer  
T... LED indication reaction timer

On application of the supply voltage the output relay pulls in and the timing period  $t_s$  starts.

**Voltage monitor with no latch (auto reset) function**  
At the end of  $t_s$  when the measured voltage exceeds the set threshold, timing period  $t_r$  starts. At the end of  $t_r$  the output relay changes over. The output relay resets immediately when the monitored voltage reaches the set value of the hysteresis.



**Voltage monitor with latch (manual reset) function**  
At the end of  $t_s$  when the measured voltage exceeds the window in any direction, timing period  $t_r$  starts. At the end of  $t_r$  the output relay changes over and remains in this condition, even when the monitored voltage reaches the set value of the hysteresis. An external reset (S1) must be operated to reset the relay.



input	range	resistance	$U_{EMAX}$ (20°C)
E1-M	0,5 - 10V	3,9 kOhm	30V
E2-M	3 - 60V	68 kOhm	130V
E3-M	30 - 600V	820 kOhm	660V

part no	supply	output	sup. galv. iso*	UL	housing types
TCV-W 230Vac	230V~ 2,5VA	DPCO	yes	yes	C
TCV-W 15Vac	115V~ 2,5VA	DPCO	yes	yes	C
TCV-W 24Vac	24V~ 2,5VA	DPCO	yes	yes	C
TCV-W 24Vdc	24V= 2W	DPCO	no	yes	C

## specification

<b>supply voltage variation</b>	nominal voltage +10% / -15%	
<b>frequency range</b>	48 - 63 Hz	
<b>duty cycle</b>	100%	
<b>start surge delay</b>	0 - 10s	
<b>reaction time</b>	0 - 5s	
<b>reset time</b>	< 100ms	
<b>output relay specification</b>	max. 6A 230V~	
	Ue/Ie AC-15	120V/4A 240V/3A
	Ue/Ie DC-13	24V/2A
	EN 60947-5-1 VDE 0435	
<b>expected life time</b>	DPCO	SPCO
	mechanical	$2 \times 10^6$ $1 \times 10^7$
	electrical	$1 \times 10^5$ $1 \times 10^5$
<b>operating conditions</b>	-20 to +60 °C non condensing	

## ordering information

\* The measurement input is galvanically isolated from the power supply