

# EARTH CONDUCTOR DISCONNECT TERMINAL BLOCKS

## Functions of earth-wire disconnect terminal block

Weidmüller's earth-wire disconnect terminal helps detect earth faults and enables the earthing of the auxiliary circuit to be disconnected. It is connected on the input side to the 0 and 24 V control circuit and on the output side to the earth potential. The 0 V potential is directly connected to the earth potential via the closed disconnector. The 24 V potential is above the earth potential green LED at or above the green LED and the closed disconnector at the 0 V potential.

## The two LEDs show the status of the earthing

- The red LED indicates an interruption of the earthing. This LED is bypassed by the disconnector during normal operation. If it is opened, the system continues to operate unearthing.
- The green LED indicates an operating voltage is present and no earth fault is detected in the supply line to the load.

## This results in the following states

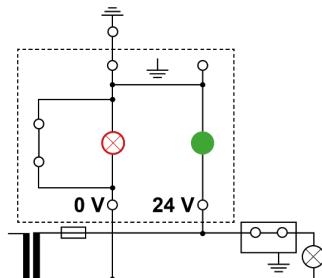
- Red on, green on:  No earth fault detected  
The earthing is interrupted
- Red on, green off:  Earth fault detected  
The earthing is interrupted, the system can continue (e.g. until the end of the process flow or until the next possible service)
- Red off, green on:  No earth fault detected  
Earthing is active
- Red off, green off:  Earth fault that is similar to a short circuit  
The overcurrent protection will release - the earth fault must be fixed or the earthing must be disabled until maintenance is performed.

## CAUTION!

If there is an earth fault on the return conductor side (after the load), the red LED is bypassed regardless of switch position and the green LED lights up continuously. This is called an „unusual fault case due to double earthing“.

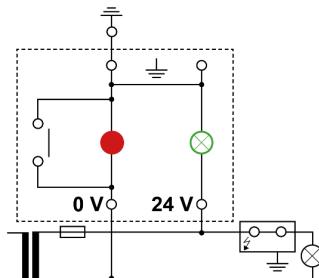
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## 1 Operating state – earthed system



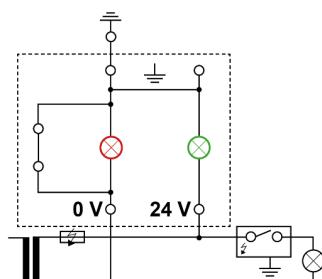
- Earth potential is connected to the isolating unit
- Isolator is closed and bridges the red LED
- Green LED lights up
- No earth fault in the control circuit

## 3 Operating fault – disconnection unit is not earthed



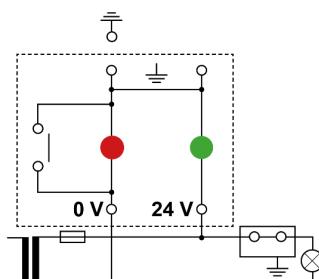
- Earth potential is connected to the disconnection unit, but only via the two LEDs  
→ no real earthing
- Disconnector is open
- Red LED lights up
- An earth fault occurs in the supply line to the load

## 2 Operating fault – disconnection unit is earthed



- Earth potential is connected to the disconnection unit
- Disconnector is closed and bridges the red LED
- Earth fault in the supply line to the load is present  
→ Overcurrent protection releases
- The current flows from the supply line, via earth fault and earthing, through the disconnection unit, back to the source
- Neither of the two LEDs is lit  
→ The scenario means: short circuit

## 4 Test positions of the LEDs



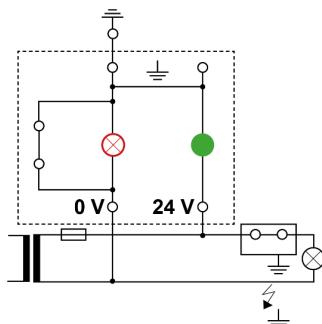
- Earth conductor has been removed from the clamping point  
→ Earth potential is not connected to the disconnection unit
- Disconnector is open
- Green and red LED light up with reduced intensity  
→ There is no earth fault in the control circuit  
→ The plant runs without malfunction

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## Unusual fault case due to double earthing

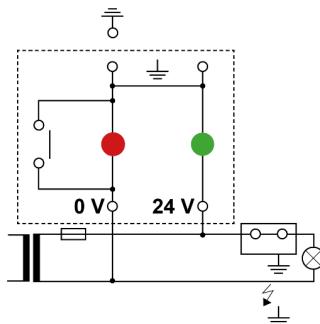
If an intentional or unintentional earth fault occurs in the cable routing behind the load, the green LED lights up while the red LED cannot be switched on. This can be caused, for example, by an earthed power supply unit or an earthed load. The current flows via the green LED and then, depending on the switch position, either via the disconnector or via the earth fault in the cable routing. If the earth wire is removed at the disconnect terminal, the red LED can be reactivated. If there is an earth fault in both the supply line and the return line, the earthing bridges the load and generates a short circuit, which triggers the overcurrent protection.

## Operating status



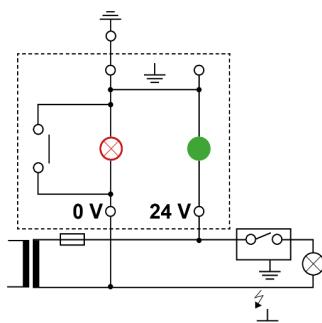
- Earth potential is connected to the disconnection unit
- Disconnector is closed and bridges the red LED
- The green LED lights up
  - An earth fault or an earth connection occurs in the cable routing behind the load
  - The additional earthing of the return line (earth fault, earthed power supply, or earthed load) is not signalled

## Test position of the LEDs



- Earth conductor has been removed from the terminal point
  - Earth potential not connected to the isolating unit
  - double grounding is cancelled
- Separating slide is open
- Green and red LED light up with reduced intensity
  - Ground fault or ground connection in the cable routing behind the consumer is present

## Operating status with open disconnector



- Disconnector is open
- Earth potential is connected to the disconnection unit, but only via the red LED
  - No real earthing
  - Double earthing bypasses the red LED
- If the green LED lights up instead of the red LED when the disconnection slide is open, this indicates double earthing or an earth fault in the return conductor