

## Self-learning mains disconnection relay FR12-230V



1 NO contact not potential free 16 A/250V AC.  
Incandescent lamp load 2300W.

Standby loss 0.8 watt only.

230V supply voltage and switching voltage.

**The FR12-230V mains disconnection relay disconnects the power supply once all series connected loads are turned off, thus preventing any electromagnetic interference fields from occurring.**

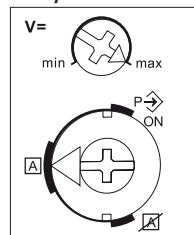
Small loads up to 200 mA, are acceptable and, once major loads are disconnected, they do not prevent field disconnection. There is no need to manually set the limit; it is learned by the FR12. Loads drawing more than 200 mA are consistently defined as loads which should cause the line power to be connected.

As long as no major load is turned on, one pole of the monitored circuit remains isolated from the mains. Neutral and earth are connected continuously to avoid acting as an aerial.

A DC voltage with an extremely low residual ripple is applied for monitoring. Therefore, **it is prohibited to bridge the relay contact**, which would ultimately cause device failure.

When a load is turned on, the mains disconnection switch connects the monitored phase after approx. 1 sec and the LED lights red.

### Rotary switches



#### Function of the lower rotary switch

In the function ON/P→ position, the relay contact is continuously closed and field disconnection deactivated.

Turn the switch to the position **A** = 'automatic with self-learn mode', the actual current value is saved as a switch-off value. When this value is reached, the FR12 breaks the electrical circuit regardless whether small consumers such as electronic dimmers are connected. Therefore, the lighting must always be OFF for "learning by means of the rotary switch".

When the switch is in the **A** position the FR12 adapts to changes in connected consumers. The FR12 performs a new learn-in routine after phase is activated and when the power supply is restored after a power failure.

If a new small load is switched on for more than 24 hours, the total current drawn by

the monitored circuit is less than 200 mA, the FR12 is set to **A** mode and in the meantime the light has been switched on and off, the new load is learned in and the conductor is switched off. When the rotary switch is set briefly from **A** to P→, learn-in takes place immediately after connecting a new load.

If the function self-learn is not required, set the rotary switch to **A** 'automatic OFF'.

#### Function of the upper rotary switch

The monitoring voltage can be adjusted in the range from 5V DC to 230V DC. Due to its low residual ripple, it generates no measurable alternating field even at 230V DC. The higher the adjustment, the greater the number of capacitive loads detectable without switching on a base load. It can therefore be reduced until the loads are barely detectable. In many applications, even the lowest monitoring voltages are detectable.

#### Base load

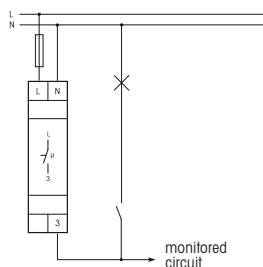
A base load is used if loads cannot be detected due to their capacitance but are meant to switch on the line voltage. Base loads must consistently start or operate in parallel with the related load and be turned off with the latter. Higher stand by loads may affect or jam the detection of a base load. Typical applications: Fluorescent lamps, dimmer circuits and electronic transformers.

#### GLE base load element

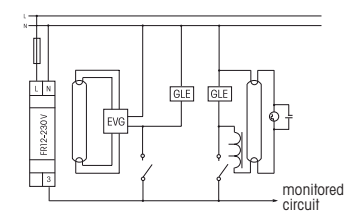
PTC in a small coupler with connecting leads; can be used directly in a load, a switch box or a junction box. It is not capable of keeping the mains disconnection relay in the connected state without an additional load connected.

### Typical circuits

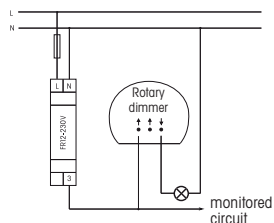
#### Standard connection



#### Mains disconnection switch with GLE base load element

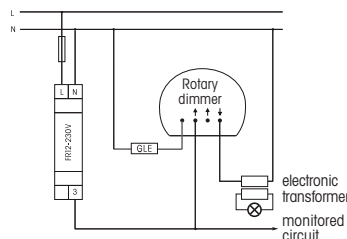


**Elder rotary dimmers with phase cut on (ON before zero crossing) for resistive and inductive loads** can mostly be operated at  $V = \max$  if no additional standby consumer is in the circuit. Otherwise see 'Modern rotary dimmers'.



#### Modern rotary dimmers and rotary dimmers with phase cut-off (OFF before zero crossing) for electronic transformers

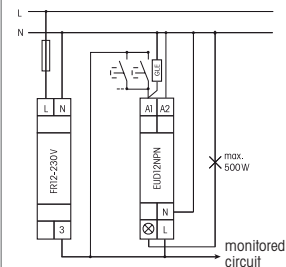
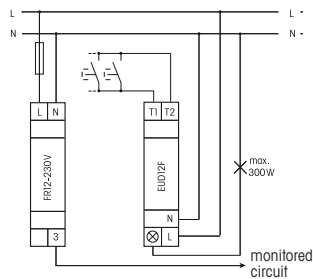
Only dimmers with an additional terminal mains disconnection switch can be used.



**Touch dimmers and sensor dimmers** cannot be used. The universal dimmer switch EUD61NPN and a push-button from the associated switching product range can replace a touch dimmer.

#### Remote control dimmers

We recommend as remote control dimmers the impulse dimmer switches EUD12F. On these devices, terminal L is 'tapped' ahead of the mains disconnection relay, thus, maintaining the complete function. An integrated cut-off relay takes over the mains disconnection of the circuit. Mechanical push-buttons are connected to T1 and T2. Only a low DC voltage is impressed on the control wire. If the application of the EUD12F is not possible for reasons of installation the type EUD12NPN can be used. Here the terminal L is connected **after** the mains disconnection relay.



#### Switched-mode power supplies in consumer electronic units (e.g. TV sets) and plug-in power supply units:

Only specific units or power supplies are detected and disconnected by the mains disconnection switch, even while in standby mode. Where units or power supplies in a monitored circuit are not to be disconnected these must be isolated from line power by a switched socket outlet or a plug connector so that the function of the mains disconnection switch is not affected.

#### Switching power supply units in the distribution box:

The switching power supply unit WNT12 are recognised at primary switching-on from 50V DC monitoring voltage. At secondary switching-on of the load the full monitoring voltage is necessary.

**Roller shutter control:** In order to operate tube-mounted motors with electronic limit switches, it is best if the lighting is switched on to reactivate the monitored circuit before the electromechanical switch or push-button switch is operated. In case of automatic controls in monitored circuits, the mains disconnection (MD) must be inhibited for the period when the roller shutters are controlled. This can be achieved by fitting a time switch in the distributor. However, in this case, do not bridge L-3 of the mains disconnection relay under any circumstances. Instead, connect the time switch change-over contact between terminal L of the MD and the monitored circuit.

#### Plug-in consumers with power control

These devices (vacuum-cleaners, standard lamps with dimmer) are often not detected when switching on the mains disconnection relay. For operation of these kind of devices therefore the normal lighting must be switched on first.



The strain relief clamps of the terminals must be closed, that means the screws must be tightened for testing the function of the device. The terminals are open ex works.

## Warning!

**Only a trained electrician may install this equipment, otherwise there is a risk of fire or electric shock.**