

Use of ELCB/RCD protection in Anylight installations

The 17th Edition regulations (411.3.3) require use of RCD protection on all circuits with socket outlets [except in specific locations - usually in commercial premises for use by supervised or skilled personnel]. This includes all lighting circuits with 2A or 5A sockets for light fittings such as table lamps, standard lamps etc.

The 17th Edition regulations also require use of RCD protection on all bathroom circuits including lighting circuits, and near showers, swimming pools etc.

TT installations usually require earth leakage protection on all circuits in order to provide the necessary level of circuit protection on.

Electricians are used to installing RCDs on the incoming supply to distribution boards in order to provide the required level of earth leakage protection across a number of circuits including bathroom, ring main and lighting circuits as specified above. In combining such circuits, they consider the expected total earth leakage arising from the known appliances, and it is good practice to keep this current below 25% of the RCD trip current (which is usually 30mA).

The equivalent practice for Anytronics dimming or switching packs would be to replace the normal double pole isolator on the incoming supply with an RCD device, and Anytronics can supply packs from the factory wired in this way.

Whether a distribution board or a dimming / switching pack, a common problem encountered with this arrangement is that when there is any type of earth leakage problem, power is removed from all the circuits, and commonly the premises are plunged into darkness as a result. The alternative solution that may reduce this problem is either

1. to fit RCDs only on the circuits where they are specifically required by using multiple or split distribution boards, (or even circuit by circuit), or
2. to fit RCBOs to provide combined earth leakage and over current protection circuit by circuit in the distribution board.

This second solution is typically two or three times the price.

The equivalent practice with a dimming / switching pack would be

1. to combine the circuits requiring earth leakage protection in one pack which is fitted with an RCD in place of the double pole supply isolator, or
2. to fit RCBOs on individual circuits.

If possible avoid using an RCD on the pack with the Anylight interface, otherwise, when this RCD trips it will disable the whole system.

A further problem can arise with earth leakage currents when switching the power to lighting circuits. Many modern lighting ballasts for halogens and LEDs use switch mode power supplies with Y class capacitors connected between Live and Earth to reduce RF emissions. These capacitors give rise to earth leakage currents which may combine to values which would not be expected from traditional lighting circuits. Good lighting manufacturers will be able to provide data on the expected earth leakage currents for their equipment, and the likely total currents can be calculated in advance.

These filter capacitors can also give rise to a significant surge in Earth current when the lighting is switched on, so that the combined surge in Earth current may trip RCDs if many channels of lighting are turned on together. Normally this is not a problem, but now when using computer controlled dimming / switching packs it is possible to switch on many lighting circuits at once with a single command. If this type of operation is necessary and is found to trip RCDs in an installation, the RCD wiring strategy may have to be reconsidered, or else a progressive switching strategy adopted to reduce the maximum instantaneous surge in Earth current.