



### TRANSIENT EARTH LEAKAGE CURRENTS

All Wylex residual current devices incorporate a high level of immunity to tripping when subjected to transient earth leakage currents. Such transients can occur when there is a significant level of capacitance to earth as can result from cable capacitance (particularly MICC) or RF filter networks. Wylex RCDs are therefore less susceptible to nuisance tripping due to transient earth leakage currents.

### RESIDUAL TRIPPING CURRENTS

#### 10mA

Used in special applications where additional protection against contact is essential due to the nature of the installation.

#### 30mA

Tripping current designated by the IEE Wiring Regulations to provide additional protection against direct contact shock, ie socket outside the equipotential zone. TT systems, caravan installation, etc.

#### 100mA

Suitable for use against indirect contact shock or where protection is provided to guard against firehazard, etc, rather than to provide additional protection to personnel, and where the earthing requirements need supplementing by RCD protection.

#### 100mA time delay

Suitable for use when total RCD protection is required to supplement the system earthing and where local 30mA RCDs are used to give additional protection against direct contact. The time delay RCD will discriminate with the 30mA RCD.

#### 300mA time delay

For use in large installations where plant and equipment protection are the main considerations and high levels of earth leakage are experienced.

#### 500mA time delay (4 pole only)

Used for total RCD protection on large 3 phase installations when plant protection is required due to high system earth loop impedances and where local 30mA RCDs are fitted down line when discrimination is needed.

### OPERATION

The RCD employs the current balance principle which involves the supply conductors to the load (phase and neutral) being wound onto a common transformer core to form the primary windings.

Under healthy circuit conditions, the current in the phase conductor is equal to the current in the neutral, and the vector sum of the current is zero.

In the event of an earth fault, an amount of current will flow to earth, creating an out of balance situation in the transformer assembly.

This out of balance is detected by the secondary winding of the transformer and at a pre-determined level of out of balance will activate the trip mechanism.

Single phase and neutral or three phase and neutral units (suitable for 3 or 4 wire systems) are available, the latter being suitable for balanced or unbalanced 3 phase loads.

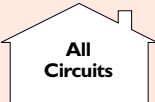

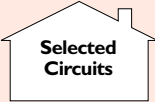

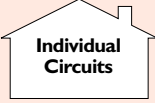





The RCD trip mechanism will operate at a residual current of between 50–100% of its rating tripping current (sensitivity).

### APPLICATION GUIDE FOR RESIDUAL CURRENT DEVICES

A test button is provided on all RCDs to enable the operation of the device to be checked.

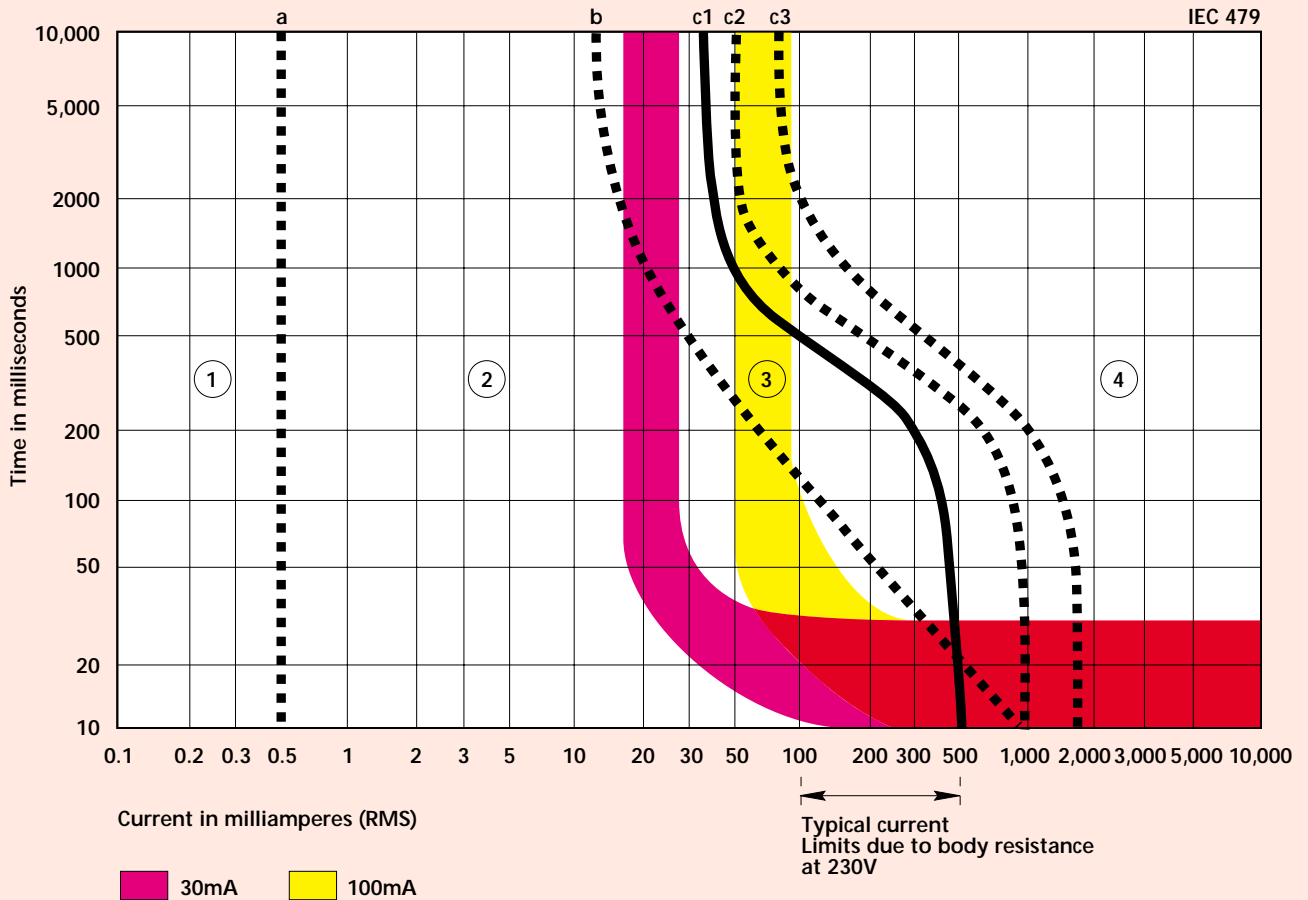
It is recommended that an RCD is tested at least quarterly.

(See BS 7671 Regulation 514-12-02).

Scope of Protection	Application Method	Type
 All Circuits	 RCCB controlled consumer unit	RCCB
 Selected Circuits	 Split load consumer unit	RCCB
 Individual Circuits	 Consumer unit with RCBO controlling individual circuit	RCBO
 Individual Socket Outlets	 Combined RCD / socket outlet*	SRCD
 Individual Appliances	 Combined RCD / adaptor*	PRCD

\*products available from Volex Accessories

TIME/CURRENT ZONES OF EFFECT OF AC CURRENT (15–100Hz) ON PERSONS



Zone Physiological effects

- 1 Usually no reaction effects.
- 2 Usually no harmful physiological effects.
- 3 Usually no organic damage to be expected. Likelihood of muscular contraction and difficulty of breathing, reversible disturbances of formation and conduction of impulses in the heart, and transient cardiac arrest without ventricular fibrillation increases with current magnitude and time.
- 4 In addition to the effects of zone 3, probability of ventricular fibrillation increased up to 5% (Curve C2), up to 50% (Curve C3) and above 50% beyond Curve C3. Increasing with magnitude and time, pathophysiological effects such as cardiac arrest, breathing arrest and heavy burns may occur.

FAULT CURRENT SENSITIVITY

Semi-conductor devices are now incorporated in equipment used throughout industry, commerce and in the home. Typically, the purpose of these semi-conductor devices is for monitoring and controlling industrial equipment, eg speed controls for small motors and temperature controls, along with extensive use in computers, VDUs, printers, washing machines, etc.

As the equipment is fed from the mains electrical supply, in the event of an earth fault the presence of semi-conductors may result in the normal ac waveform being replaced by a non-sinusoidal fault current. In some cases the waveform may be rectified or chopped. These waveforms are said to contain a pulsating dc component which can either partially desensitise or totally disable a standard Type AC RCD. New International standards IEC 1008 (RCCBs) and IEC 1009 (RCBOs) divide RCDs into two performance classes:

Type AC

RCDs for which tripping is ensured for residual sinusoidal alternating currents, whether suddenly applied or slowly arising.

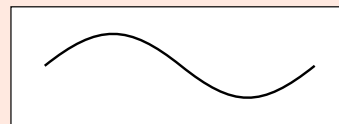
Type A

RCDs for which tripping is ensured for residual sinusoidal alternating currents and residual pulsating direct currents, whether suddenly applied or slowly arising.

To ensure the correct level of protection, check for the following symbols:

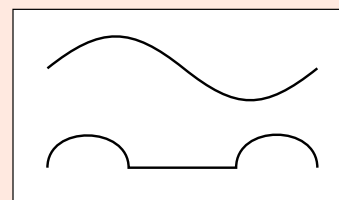
TYPE AC

normal ac sensitivity



TYPE A

pulsating dc sensitivity



Wylex RCDs are available as both Type AC and Type A devices.

