

Earthing

Earthing is an important element in electrical system. If earthing is not properly provided, it will have an adverse impact in terms of safety to persons as well as possible property damages upon the occurrence of an electrical fault. The purpose of providing a good earthing is to limit the voltage on metallic parts of electrical equipment to a safe value and enable a good return fault current path for tripping of the associated protective device when an electrical fault occurs.

In colloquial Cantonese term, the 'earthing' is traditionally also called as 水氣. The story behind would likely be back in the 50's or earlier when the household electrical equipment was just lighting, fan and rice cooker. At that time, the earthing was enhanced by an additional connection to water pipes as part of the earth return. Modern building has a direct connection made to the genuine earth and further equipped by some protective Residual Current Device (RCD) device. Because of the nature to detecting earth fault current, the device is also called 水氣掣!

RCD is a generic term for all products which use the principle of detecting earth fault current by measuring the difference in current magnitude flowing in phase and neutral conductors. Therefore, a residual current operated circuit-breaker (RCCB), residual current operated circuit-breaker with integral overcurrent protection (RCBO), residual current monitor (RCM) and even a combination of an earth fault protection relay with 4 current transformers (for a 3-phase and neutral system) would also be under the category of RCD. A typical RCD, installed in a miniature circuit breaker (MCB) board, would operate, upon a fault, within a very short period of time (less than 0.4 sec) for a current leakage setting of 30mA. It is normally applied to LV socket outlet circuits to enhance safety to people who may be in contact with some portable and hand-held electrical equipment. Considerations must be given to its application as RCD is a sensitive device and if not properly set up, it may result in some nuisance tripping.

The Electrical Blog is contributed by Electrical Division. If you would like to know more about this topic please contact the Division Hon. Secretary Ir Gary Ko, cwko@kumshing.com.hk