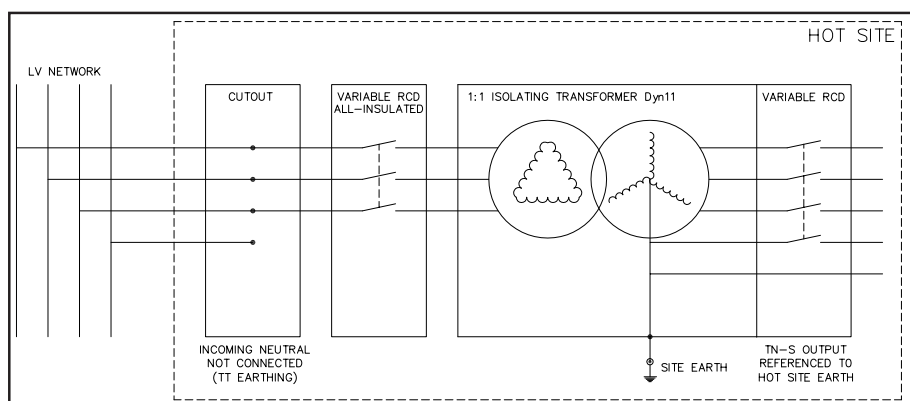


Isolation Transformers for HOT Sites

A HOT site is a high voltage installation (400kV, 132kV, 33kV, etc.) where the Earth Potential Rise (EPR) that can occur during an earth fault can exceed 430V. For installations at these sites, there is a risk that the EPR could be exported onto the HV or LV network and into a consumer's premises, where it could cause danger to life or damage to property. Please note that all National Grid sites are generally classified as HOT.

When an earth fault occurs on a cable at a substation, a proportion of the fault current will return to the source substation through the ground. This "ground return" current will flow into the ground through the earth connection closest to the fault. The current flow through the substation earth resistance will cause the voltage of the substation earth connections to rise above that of a remote (or true) earth. This voltage is known as the earth potential rise or EPR.

On LV installations located within designated HOT sites, one common method of protection against the effects of a high Earth Potential Rise is to design the LV installation as a TT supply and install a 1:1 ratio isolation transformer with RCD protection on the incoming and outgoing, as shown below. The incorporation of an isolation transformer ensures the LV installation cannot be affected by an Earth Potential Rise.



We have recently supplied this arrangement to a new National Grid Project, utilising a 100kVA 1:1 ratio three-phase transformer (see adjacent images). The 160A variable RCD feeding the transformer was housed in an all-insulated enclosure located adjacent to the service cutout. The RCD fitted to the output of the transformer was also rated at 160A with variable sensitivity and time delay but was housed in a segregated compartment fitted on the side of the transformer enclosure.

Similar isolating transformers are also widely installed on the UK Rail Network in locations where traction power is supplied via overhead lines. One of the purposes of the transformer is to prevent an Earth Potential Rise should there be a catastrophic failure of the 25kV overhead line. Single and three-phase transformers can be supplied, for indoor or outdoor installation.

If you have a requirement for a 1:1 ratio isolation transformer for a National Grid HOT site or a Network Rail overhead line installation, please contact our Projects Team who will be pleased to assist.



A7042968, 100kVA 1:1 Isolation Transformer



Incoming Terminal Chamber Door Open



Incoming Terminal Chamber & Outgoing 160A MCCB / RCD assembly



All Insulated MCCB / RCD, 160A Rating