principle
Insulation monitoring is provided on IT systems to detect and indicate insulation faults as soon as they occur. The basic function is carried out by an Insulation Monitoring Device (IMD), also referred to in certain documentation as a permanent or continuous insulation monitor (PIM or CIM respectively). The monitoring device injects a DC or low-frequency AC voltage between the installation and earth. The insulation resistance is determined from the resulting current. This technique can be used on all types of installations: AC, DC, rectified, mixed AC/DC, etc.

communication features
In addition to displaying the insulation values it measures for the installation as a whole, an insulation monitoring device can also provide a centralized display for information concerning specific circuits. It receives this information from communicating insulation fault locators and detectors distributed throughout the installation. All this information may also be transmitted to a remote supervisory system. These communication features satisfy the operating requirements of modern electrical installations. All information concerning the insulation can be transmitted via a communication bus for display on a centralized insulation monitoring device or to a supervision system for centralized processing and management.

prevention of insulation faults
Prevention is the best way to ensure the continuity of supply of electrical installations. It may be applied in two ways:

- The insulation monitoring device signals a drop in the insulation resistance below a non-critical prevention threshold determined by the user;
- The measurements are transmitted to a supervisor, which can then process them to predict insulation faults on ageing cables. These indications can be used to schedule preventive maintenance.
fault locating

Insulation monitoring can be coupled with a fault locating system. The devices of the Vigilohm range and the Vigilohm system offer two ways of locating faults. The first is automatic and the second manual.

Automatic fault locating
The faulty circuit is located automatically, without any human intervention. A detection or locating device (XD301/XD312/XD308C, XL308/XL316, XML308/XML316) is connected to toroids installed on the various circuits. It automatically identifies the faulty circuit by capturing the low-frequency fault locating signal emitted by the insulation monitoring device. In addition, the XL308/XL316 and XML308/XML316 locating devices measure the insulation resistance of each circuit.

Manual fault locating
The fault is located by testing different points in the installation, one after another, using a Vigilohm System XRM mobile receiver and a current probe. The receiver captures the low-frequency fault locating signal.
Two cases may be encountered:
- the installation is equipped with an XM200 or XM300C insulation monitoring device (Vigilohm System).
- the installation (relatively small or an isolated sub-system) is equipped with an insulation monitoring device for DC applications. In this case, a Vigilohm XGR portable generator is used together with an XRM receiver.