

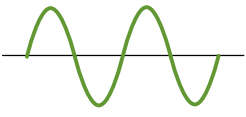
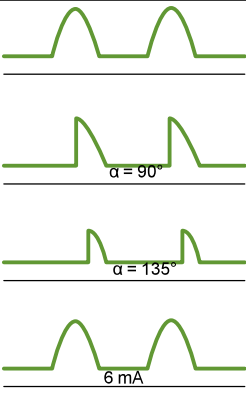
# Electrical and electromagnetic interference

## Operation of earth leakage protection devices (cont.)

### Risk of non-tripping in a dangerous situation

When an insulation fault occurs in the DC stage of a switch-mode power supply (e.g. variable speed drive) or on a DC network supplied by a converter, the leakage current is rectified and is no longer a sine wave. This current waveform may not be transmitted correctly by the transformer located inside the earth leakage protection device. Consequently, a leakage current with a dangerous amplitude (greater than the nominal sensitivity of the earth leakage protection device) may not cause it to trip.

In order to select earth leakage protection devices that are appropriate to each situation, the IEC 60755 and IEC 61008 standards define three types of earth leakage protection devices, according to the waveforms that cause them to trip.

| Type of earth leakage protection device | Checking fault-current tripping                                                                 |                 | Supply circuit protection                                                                                                      |
|-----------------------------------------|-------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------|
|                                         | Waveform                                                                                        | RMS value       |                                                                                                                                |
| <b>AC type</b>                          | DB123640<br>   | $I\Delta n$     | Current loads                                                                                                                  |
| <b>A type</b>                           | DB123641<br>  | $1.4 I\Delta n$ | Single-phase loads with rectifiers (low-power variable speed drive, rectifier/charger, etc.)                                   |
| <b>B type</b>                           | DB123642<br> | $2 I\Delta n$   | Three-phase loads with rectifiers (three-phase high-power high-duty variable speed drive, three-phase rectifier/charger, etc.) |

Schneider Electric's **SI** earth leakage protection devices are also protected against the risk of non-tripping due to atmospheric conditions:

- Very cold temperatures (risk of mechanical parts freezing up): up to  $-25^{\circ}\text{C}$ .
- Corrosive chemical agents (risk of corrosion of alloys used to manufacture sensitive mechanical components). For information on using earth leakage protection devices in corrosive atmospheres, see module CA908027.