

OSM/IN DECISION

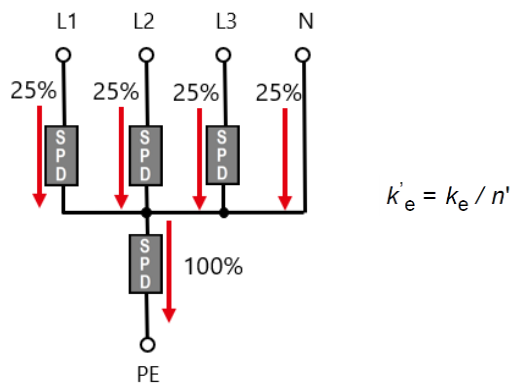
Standard(s): EN IEC 61643-01:2025 + A11:2025 EN IEC 61643-11:2025 + A11:2025	Sub clause(s): 8.3.5 operating duty test 9.3.5 operating duty test	Sheet N°:	OSM/IN 290
Subject: Application of operating duty tests on SPDs in 1+1 or 3+1 connection Category: PROT	Key words: - operating duty - sample preparation	Meeting N°: Inquiry:	31 (2021) OSM-IN(Inq)-198_2021

Question:

How to prepare and test the neutral-to-earth mode of multipole SPDs in 3+1 connection?

Proposal:

Acc. to EN 61643-11:2012 + A11:2018 SPDs have to be tested mode by mode of protection. This implies that for a multipole SPD in 3+1 connection design the neutral-to-earth mode including the internal wiring and the neutral terminal has to carry the full declared set of parameters. On the other hand, the installation of a multipole SPD requires connection to all poles in accordance with the manufacturer's installation instructions (see clause 8.1). Due to the special design of a 3+1 circuit the neutral-to-earth mode needs to be specified for the total current of all connected poles (modes), although in real world and according to EN 62305-1 Annex E each of the unshielded n' conductors of the line is expected to carry an equal part of the lightning current $k'_e = k_e / n'$; n' being the total number of conductors.



To ensure that the above service conditions are met, a symmetrical current injection as shown in figure 1 is being proposed as an option for the operating duty test of the neutral-to-earth mode. The same approach can be applied for SPDs in 1+1 connection.

Note: This document is based on decision sheet OSM IN 289.

Explanatory Notes:

Proposal:

The impulse tests acc. 8.3.4 on the neutral-to-earth mode of a multipole SPD in 3+1 connection may be performed by applying the impulse to all SPD modes according to the figure 1 above and ensuring a symmetrical current distribution. In this case the tolerances acc. table 21 shall be kept.

This is only applicable with the agreement of the manufacturer.

Sample preparation

When the test is performed using all SPD modes, a symmetrical current distribution can be achieved by replacing the voltage limiting and voltage switching components of the line to neutral modes by appropriate copper blocks (dummies).

This replacement has to be done by the manufacturer.

OSM SHEET