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Engineering Recommendation P23

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Guidance on Earth Fault Loop Impedance at Customers' Intake Supply Terminals

(Former title: Consumers' earth fault protection for compliance
with the IEE Wiring Regulations for Electrical Installations)

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**Operations Directorate
Energy Networks Association
6th Floor, Dean Bradley House
52 Horseferry Rd
London
SW1P 2AF**

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Amendments since publication

Issue	Date	Amendment
2	2018	General updating to refer to PD IEC/TR 60725, to reflect changes to BS 7671 (IET Wiring Regulations Seventeenth Edition) and to clarify the responsibilities of Network Operators.

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GUIDANCE ON EARTH FAULT LOOP IMPEDANCE AT CUSTOMERS' INTAKE LV SUPPLY TERMINALS

1. SCOPE

This Engineering Recommendation provides guidance on the earth fault loop impedance at customer's intake LV supply terminals.

NOTE: In multi-occupied buildings, this is at the intake to the building with all other internal systems disconnected.

2. INTRODUCTION

The Electricity Safety Quality and Continuity Regulations 2002, Regulation 28(b), and, in Northern Ireland, the Electricity Safety Quality and Continuity Regulations (Northern Ireland) 2012, Regulation 29(b), require Network Operators to provide a written statement of: "*for low voltage connections, the maximum earth loop impedance of the earth fault path outside the installation*".

This Engineering Recommendation, together with EREC P25, has been written to enable Network Operators (DNOs and IDNOs) to comply with this requirement. It has been updated to reflect BS 7671:2008+A3:2015 (IET Wiring Regulations Seventeenth Edition) and to clarify the responsibilities of Network Operators.

Section 5 provides details of typical earth fault loop impedance values for single-phase and three-phase supplies from the LV distribution system. Section 6 provides guidance for installation designers.

3. REFERENCES

S.I. 2002 No.2665 – Electricity, Safety, Quality and Continuity Regulations, 2002 (as amended).

S.I. 2012 No.381 - Electricity Safety, Quality and Continuity Regulations (Northern Ireland) 2012 (as amended)

BS 7671:2008 incorporating Amendment No 3: 2015 – Requirements for Electrical Installations (IET Wiring Regulations Seventeenth Edition)

PD IEC/TR 60725:2012 - Consideration of reference impedances and Public Supply Network impedances for use in determining disturbance characteristics of electrical equipment having rated current <75 A per phase

EREC G81 - Framework for design and planning, materials specification, installation and record for low voltage housing development installations and associated new HV/LV distribution substations.

EREC G87 - Guidelines for the provision of low-voltage connections to Multiple Occupancy buildings

EREC P25 - The short-circuit characteristics of single-phase and three-phase low voltage distribution networks

4. DEFINITIONS

DNO

Distribution Network Operator.

Earth Fault

A fault of the insulation of a live conductor to the exposed conductive parts of the installation which are connected to the main earthing terminal.