

DECISION SHEET

Standard(s)- (year and edition): IEC 60601-1:1988 Ed.2 Am1+Am2	Sub clause(s): 18f)	Sheet n°: DSH-432
Subject: Protective Impedance versus no-load voltage	Key words: Protective, impedance, earth, connection, no-load	Confirmed by CTL at its 39th meeting, in Cologne
<p>Question:</p> <p>EQUIPMENT for example having a rated current of 30 A require a test current of 1.5 times 30 A. With a maximum impedance of 0.2 Ω the voltage drop has to be 9 V (0.2 Ω * 45 A = 9 V). This is in contradiction to the required no-load voltage of 6 V maximum.</p> <p>Decision:</p> <p>Measuring the protective earth connection has in fact two reasons. It is to determine impedance and cross-sectional area of protective earth connections. For a measuring current of 25 A both can be done with one measurement. Requiring a measuring current of more than 25 A it shall be splitted up into two measurements. In this case, the impedance shall be determined first, using a voltage not exceeding 6 V.</p> <p>If cross-sectional area of the protective earth connections cannot be determined as equal to the one for the phase by measurement of the area, then measurement with current shall be from a source with a higher voltage than 6 V.</p> <p>Explanatory notes:</p> <p>A circuit to the PROTECTIVE EARTH TERMINAL may have zones of higher impedance, for example due to oxidation of materials. Voltages higher than 6 V prevent detection of such zones because of their ability to flash through. In this case, the impedance shall be determined first, using a voltage not exceeding 6 V.</p> <p>Using low voltages <u>and</u> low currents has a great impact on the accuracy of the measurement of low impedances. Impedances in the range of 0.1 Ω and 0.2 Ω then require a sophisticated measuring device.</p> <p>The relation between rated current of the EQUIPMENT and measuring current is because to check cross-sectional areas of protective earth connections. If parts of the construction or printed circuit boards are used for protective earth connections the cross-sectional areas and the ability of carrying short circuit currents are in doubt.</p>		