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Fundamentals of Industrial Measurement Technology

# HIPOT – AC/DC Voltage Withstand Test

| Application points | Test voltage for protection class I | Test voltage for protection class II | Test voltage for protection class III |
|---|---|---|---|
| Between live parts and accessible metal parts, separated from live parts by: | | | |
| - Basic insulation only | 1000 VAC / 1500 VDC | 400 VAC / 600 VDC | |
| - Double or reinforced insulation | 2500 VAC / 3750 VDC | 2500 VAC / 3750 VDC | |
| Between live parts and metal parts, separated from live parts only by basic insulation | | 1000 VAC / 1500 VDC | |

ProDSP Post Series Nr.35.

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During AC/DC voltage withstand tests, the **insulation capability** of the product is also verified; however, in these tests the primary parameters are **time and leakage current**.

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# What is the difference compared to insulation resistance measurement?

- The main parameters here are: time + leakage current
- The exact resistance value is secondary
- The test is typically performed at a multiple of the rated operating voltage

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# DC Voltage Withstand

- Voltage–time characteristic is similar to insulation resistance measurement
- Charging → voltage hold → discharging
- Monitoring of leakage current

# AC Voltage Withstand

- There is no point in delaying the measurement after charging
- The leakage current is continuously alternating

# Standards background

- Test voltage and duration are defined by standards
- e.g. EN 50344-1 / EN 50106
- Values are classified according to the rated operating voltage

👉 The test is considered successful if the leakage current remains below the permitted limit for the entire measurement duration.

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