



TECHNICAL INFORMATION

TITLE: MPU-16A/FPU-16 TESTS

The MPU-16A has been tested for Dielectric Strength, Insulation Resistance, Impulse Voltage Withstand, High-Frequency Disturbance, Electromagnetic Interference Immunity and Susceptibility, and Surge Withstand Capability. The FPU hardware is essentially identical to that of the MPU-16A.

The MPU-16A has been independently tested by the following authorities:

- Canadian Standards Association
 - Test Report No: LR 62897
 - Standards Complied With: CSA C22.2 No. 0
 - CSA C22.2 No. 0.4
 - CSA C22.2 No. 14
 - Electrical Notice No. 575
 - Underwriters Laboratories Standard No. 508

- Sydney County Council Testing Laboratories
 - Test Report No: 63650
 - Test Requirements: IEC 255-4 Appendix E, Test Voltage Class III
 - IEC 255-5 Clauses 6 and 7

- Electronic Test Centre
MPB Technologies Inc.
 - Test Report No's: 023S01-R01
 - 023S01-R02
 - 023S01-R03
 - Test Requirements: CISPR II, Class A, Immunity PR EN50082-2
 - EN61000-4-2 ESD, 4-kV Contact, 8 kV air
 - ENV50140 RF Susceptibility, 80 MHz - 1000 MHz
 - EMF 10 V/m, AM @ 80% Sine
 - ENV50140 RF 900 ± 5 MHz, EMF 10 V/m
 - PM-50% Duty Cycle @ 200 Hz Sine
 - IEC 801-4FTB, 2 kV Direct, 1 kV Indirect
 - FCC Part 15, Class A

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Tests Performed:

1. Dielectric Strength

The Canadian Standards Association and the Sydney County Council Testing Laboratories confirmed that the MPU-16A complies with the standard 1500 to 2000 Vrms for one minute dielectric test specified by CSA, UL, and IEC.

2. Insulation Resistance

The Sydney County Council Testing Laboratory verified that the MPU-16A complies with IEC 255.5, Clause 7 insulation resistance test.

3. Impulse Withstand

The Sydney County Council Testing Laboratory verified that the MPU-16A complies with IEC 255.4, Appendix E, Class III impulse withstand tests.

4. High-Frequency Disturbance

The Sydney County Council Testing Laboratory verified that the MPU-16A complies with IEC 255.4, Appendix E, Class III high frequency disturbance tests.

5. Electromagnetic Interference Immunity and Susceptibility

Tests performed by the Electronic Test Centre confirm that the MPU-16A meets the Group 1 Class A radiated and conducted requirements of CISPR II, "Limits and Methods of Measurement of Electromagnetic Disturbance Characteristics of Industrial, Scientific and Medical (ISM) Radio Frequency Equipment". The MPU-16A was also found to survive and/or remain operational when subjected to electrostatic discharges (ESD) radiated electric fields (radiated susceptibility RS), and direct and indirect fast transient/burst (FTB) when tests were performed in accordance with EN61000-4-2 (1995), EN50140 (1994), IEC 801-4 (1991). By meeting these requirements, the MPU-16A is in conformity with EC Council Directive of 14 June 1989 relating to Machinery (89/392/EEC) and is in conformance with the relevant provisions of EMC Directive 89/336/EEC and may bear the CE mark.

Tests performed by the Electronic Test Centre also confirm that the MPU-16A meets the requirements of FCC Part 15, Class A.

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6. Surge Withstand Capability (SWC)

Surge withstand and fast transient tests of the MPU-16A were performed by Startco Engineering Ltd.

Test Methods

Testing was done in accordance with procedures set forth in ANSI C37.90.1-1989, "IEEE Standard Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems".

Test Equipment

Beckwith Electric Company Inc, SWC Tester M-0180B

Procedure

The following input groupings were identified per ANSI C37.90.1-1989

Current Circuits (Common Mode)

ICT-2

- PHASE A CT (Terminals 1, 2, 3, 4)
- PHASE B CT (Terminals 5, 6, 7, 8)
- PHASE C CT (Terminals 9, 10, 11, 12)
- EARTH FAULT (Terminals 23, 24, 25, 26, 27)

MPU

- ICT (Terminals 13, 14, 15, 16)
- EF (Terminals 21, 22)

Digital Data Circuits

None

Output Circuits (Common Mode, Transverse Mode)

- ALARM (Terminals 10, 11, 12)
- TRIP (Terminals 5, 6, 7)

Power Supply Circuits (Common Mode, Transverse Mode)

- L1 & L2 (Terminals 1/2, 3/4)

Signal Circuit (Common Mode, Traverse Mode)

- RS-485 (Terminals 23, 24 or 25, 26)
- TEMP (Terminals 17, 18, 19)
- ANALOG OUTPUT (Terminals 23, 24)

Voltage Circuits

None

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Both Oscillatory and Fast Transient waveforms were applied to each group as outlined in the standard. Each input group was tested in all wiring configurations outlined in the manual.

Results

All test points passed.

If required, copies of the relevant test reports can be provided.

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