environ
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MINNEAPOLIS, MINNESOTA 55431-2621

ENGINEERING REPORT NO. 29448-2

"WATER INTRUSION TEST"

for

MECHATRONICS, INC.
8152 - 304th AVENUE S.E.
PRESTON, WA 98050

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APPROVED BY:	David M. Gillen Vice President

REVISION HISTORY

Revision	Total Number of Pages	Date	Description
-	5	28 Mar 2003	Original

PREPARED FOR:	TEST DATES:
MECHATRONICS, INC. 8152 - 304th AVENUE S.E. PRESTON, WA 98050 ATTN: Mr. David Hazlett	**Start:** 3/13/2003 **Completion:** 3/13/2003 **ENVIRON TEST NO.:** **29448-2** **PURCHASE ORDER NO.:** **6947** **PURCHASE DATE:** 3/7/2003

WATER INTRUSION TEST

1.0 ABSTRACT

1.1 Object

Subject two (2) Fans to a Water Intrusion Test per Mechatronics, Inc. Purchase Order No. 6947, dated March 7, 2003, in accordance with IEC 60529, IPX5 Requirements.

1.2 Conclusions

Both test units remained operational throughout the test. A visual inspection conducted upon completion of the exposure period found no visible evidence of damage or degradation. The test units met the passing requirements for IEC 60529, IPX5.

2.0 UNIT(S) TESTED

MANUFACTURER:	MECHATRONICS, INC.	
DEVICE:	Fans	
MODEL/PART NO.:	UF15P23	UF12A23
SERIAL NO.:	-----	

The results of this test apply only to the units identified in this Engineering Report by device identifier and model / part number, or serial number.

3.0 TEST REQUESTED

Subject the test units to a Water Intrusion Test per IEC 60529 for second characteristic numeral 5 as described in Paragraph 14.2.5. The test is to be made by spraying the enclosure from all practicable directions with a stream of water from a standard test nozzle such that the following conditions are met:

1. The internal diameter of the nozzle is to be 6.3mm.
2. The delivery rate is to be 12.5 liters/min ±5% at whatever water pressure is necessary to achieve this flow.
3. The core of the substantial stream is to be a circle of approximately 40mm diameter at a distance of 2.5m from the nozzle.
4. Test duration per square meter of the enclosure surface likely to be sprayed is to be 1 minute.
5. The minimum duration is 3 minutes.
6. The distance from the nozzle to the enclosure surface is to be 2.75 ±.25m.

4.0 INSTRUMENTATION, PROCEDURE AND RESULTS

4.1 Instrumentation

All instrumentation is calibrated regularly by instruments directly traceable to the National Institute of Standards and Technology, and in accordance with MIL-I-45208A, ANSI/NCSL Z540-1-1994 and ISO/IEC 17025:1999.

Equipment Number	Description	Manufacturer	Model No.	Last Calibration	Due Calibration	Range
400-030	Stopwatch	Radio Shack	63-5014	3/29/2002	3/29/2003	0 to 10 Hours
717-053	Flowmeter	Omega Instruments	FL-75B	1/21/2003	1/21/2004	1 to 10.3 GPM

4.2 Procedure

The test units were placed onto the test stand and connected to the appropriate voltage source. Each test unit was sprayed with a stream of water from a 6.3mm diameter nozzle for a period of 1 minute and 30 seconds. The test units were then rotated 180° and opposite face of the test units were sprayed for an additional 1 minute and 30 seconds for a total of 3 minutes of exposure.

4.3 Results

Both test units remained operational throughout the test. A visual inspection conducted upon completion of the exposure period found no visible evidence of damage or degradation. The test units met the passing requirements for IEC 60529, IPX5.