

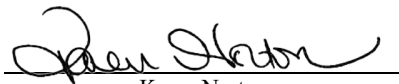
National Technical Systems Test Report for Environmental Testing of the FVT System

Prepared For

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Prepared By

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Karen Norton
Preparer

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Robert Polverari
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This report and the information contained herein represents the results of testing of only those articles/products identified in this document and selected by the client. The tests were performed to specifications and/or procedures approved by the client. National Technical Systems ("NTS") makes no representations expressed or implied that such testing fully demonstrates efficiency, performance, reliability, or any other characteristic of the articles being tested, or similar products. This report should not be relied upon as an endorsement or certification by NTS of the equipment tested, nor does it present any statement whatsoever as to the merchantability or fitness of the test article or similar products for a particular purpose. This document shall not be reproduced except in full without written approval from NTS.



Revision History

Rev.	Description	Issue Date
0	Initial Release	07/30/2021
1	Page 1: Updated title to correct test item from FVP to FVT. Table 3.0-1: Added Items 2 and 3. Table 5.0-1: Added Sections 5.3 and 5.4. Section 5.3: Added information for testing performed 03/01/2021 through 03/04/2021. Section 5.4: Added information for testing performed 04/19/2021 through 04/22/2021.	08/11/2021

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1.0 Introduction

This document presents the test procedures used and the results obtained during the performance of an Environmental test program. The test program was conducted to assess the ability of the specified Equipment Under Test (EUT) to successfully satisfy the requirements listed in Section 2.0.

2.0 References

The following references listed below form a part of this document to the extent specified herein.

- Pro V&V, Inc. Purchase Order(s) 2020-005, 2020-007, 2021-002, dated 07/02/2020, 10/21/2020, 02/11/2021
- National Technical Systems (NTS) Quote(s) OP0554066, dated 06/17/2020
- NTS Corporate Quality Policy Manual, Revision 9, dated 9/20/2018
- ISO/IEC 17025:2017(E) *General Requirements for the Competence of Testing and Calibration Laboratories*, dated 11/1/2017
- Test Specification: MIL-STD-810D

3.0 Product Selection and Description

Pro V&V, Inc. selected and provided the test sample(s) to be used as the Equipment Under Test. Details below:

Table 3.0-1: Product Identification - Equipment Under Test (EUT)

Item	Qty.	Name/Description	Part Number	Serial Number
1	2	FVT System	None	FVT-BBU-001 FVT-BBU-002
2	2	FVT System	None	VST 100 116 VST 100 150
3	3	FVT System	None	VST 100 122 VST 100 150 VST 100 151

3.1 Security Classification

Non-classified

4.0 General Test Requirements

4.1 Test Equipment

NTS-provided equipment is calibrated according to ISO/IEC 17025:2017(E) and calibration is traceable to the National Institute of Standards and Technology (NIST). Calibration records are maintained on file at NTS.

4.2 Notice of Deviation

In accordance with NTS' quality procedures, when the EUT is observed to exceed or display susceptibility, a Notice of Deviation (NOD) document is generated by the technician performing the test. This NOD documents the requirement, how the EUT deviated from the requirement, and allows room for resolution of the deviation.

This document is reviewed and approved by the NTS Program Manager or Engineer and the NTS Quality Assurance Representative, and then forwarded to the customer contact. Once mitigated (or passed over), the steps taken to correct the deviation (or simply instruction from the customer to continue testing) are recorded in the NOD and a copy of the NOD is integrated into the body of the report, in the appropriate location.



5.0 Test Descriptions and Results

Table 5.0-1: Summary of Test Information & Results

Section	Test	Specification	Test Facility	Test Date	Part #	Serial #	Test Result*
5.1	Temperature Power Variation	MIL-STD-810D	Longmont	09/28/2020 - 10/01/2020	None	FVT-BBU-001 FVT-BBU-002	None
5.2	Temperature Power Variation	MIL-STD-810D	Longmont	01/25/2021 - 01/29/2021	None	FVT-BBU-001 FVT-BBU-002	None
5.3	Temperature Power Variation	MIL-STD-810D	Longmont	03/01/2021 - 03/04/2021	None	VST 100 116 VST 100 150	None
5.4	Temperature Power Variation	MIL-STD-810D	Longmont	04/19/2021 - 04/22/2021	None	VST 100 122 VST 100 150 VST 100 151	None

*The decision rule used to state compliance is in accordance with the test specification used for testing. Unless otherwise noted, testing was performed in accordance with the latest published version of test specification at time of test.



5.1 Temperature Power Variation

5.1.1 Test Result

N/A

5.1.2 Test Procedure

See below.

5.1.3 Test Datasheets

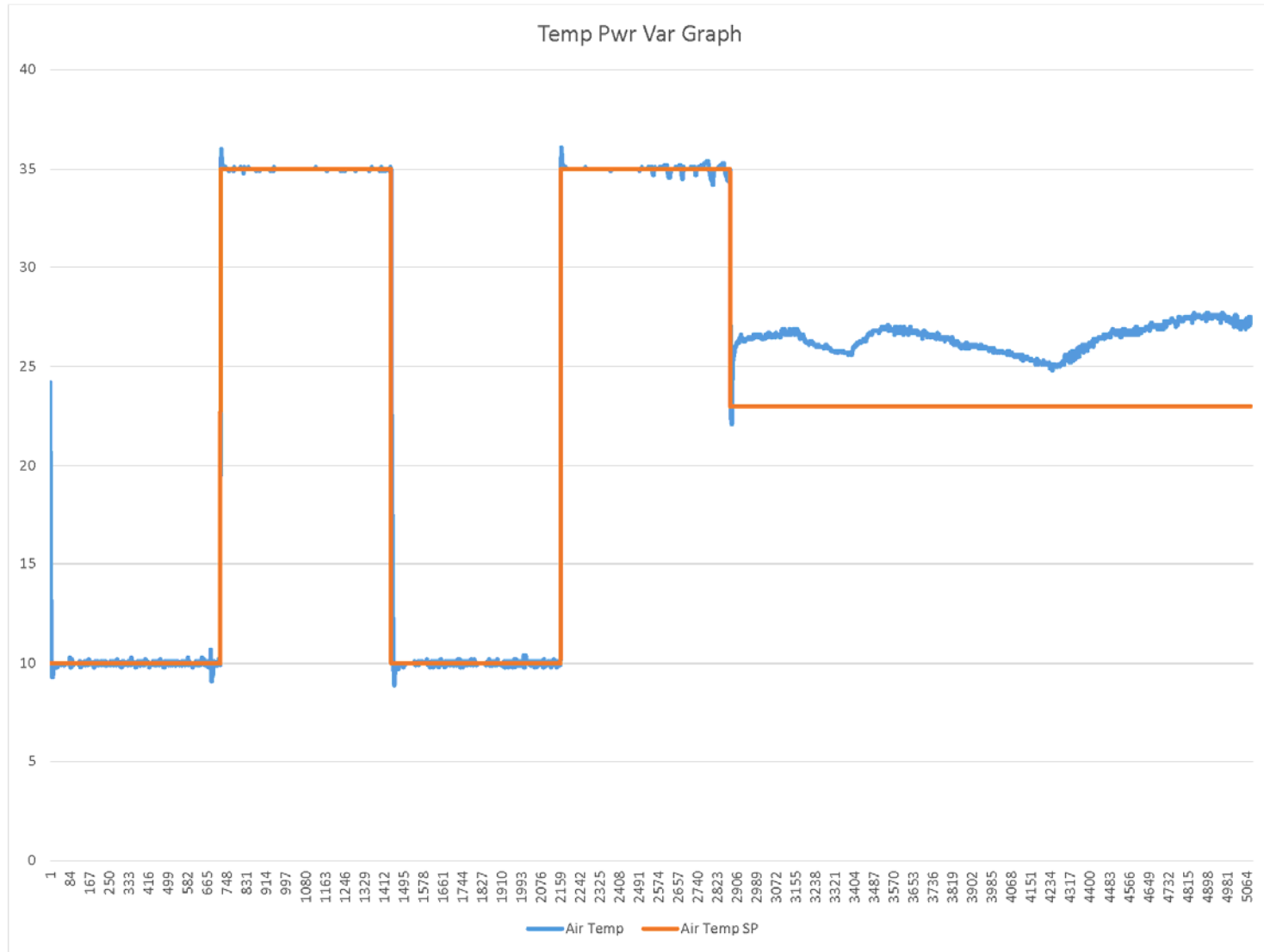
Start Date: 09/28/90		End Date: 10/01/20	MJO No: PR121029-01
Customer: Pro V&V		Test Performed: Temperature Power Variation Test	Test By: KM
Part Name: FVS, FVT, OVCS		Serial No: See UUT Details Sheet	Customer Witness: Yes
Page 1 of 1		Test Specification: MIL-STD_810D	Temp: +10c to +35c Voltage: 105vlts to 129vlts
Date	Time	Remarks	Initials
09/28/20	08:00	Set VAC to 117vlts & ramp to +10c	RSP
09/28/20	08:30	Start dwell at 117vlts & +10c for 4hrs	RSP
09/28/29	12:30	Lower VAC to 105vlts & dwell for 4hrs	MN
09/28/20	16:30	Raise VAC to 129vlts & dwell for 4hrs	RSP
09/28/20	20:30	Lower VAC to 117vlts & Raise temperature to +35c & dwell for 4hrs	KM
09/29/20	00:30	Lower VAC to 105vlts & dwell for 4hrs	KM
09/29/20	04:30	Raise VAC to 129vlts & dwell for 4hrs	KM
09/29/20	08:30	Lower VAC to 117vlts & Lower temperature to +10c & dwell for 4hrs	GM
09/29/20	12:30	Lower VAC to 105vlts & dwell for 4hrs	GM
09/29/20	16:30	Raise VAC to 129vlts & dwell for 4hrs	GM
09/29/20	20:30	Lower VAC to 117vlts & Raise temperature to +35c & dwell for 4hrs	KM
09/30/20	00:30	Lower VAC to 105vlts & dwell for 4hrs	KM
09/30/20	04:30	Raise VAC to 129vlts & dwell for 4hrs	KM
09/30/20	08:30	Lower VAC to 117vlts & ramp to +23c ambient	KM
09/30/20	08:30	Temperature and power variation portion of test has completed	KM
09/30/20	08:30	Test will continue to run at +23c ambient for another 37hrs	KM
10/01/20	22:00	All Testing complete for a total of 85hrs	KM
Note: All test pass or fail determinations decided by Pro V&V Inc.			

UUT Details			
Qty	Part Name	Part Number	Serial Number
1	FVS	N/A	FVS-VST-100100
1	FVS	N/A	FVS-VST-1001111
1	FVT	N/A	FVT-BBU-001
1	FVT	N/A	FVT-BBU-002
1	Cannon DR-G2140	N/A	JS300070
1	Cannon DR-G2140	N/A	JS300073
1	ETV1500 UPS	N/A	RG2920050093
1	ETV1500 UPS	N/A	RG2920050095

5.1.4 Test Photographs



5.1.5 Test Data





5.1.6 Test Equipment List

Table 5.1-1: Temperature Power Variation Test Equipment List

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
1734	Envirotronics	N/A	N/A	Chamber 42	N/A	N/A
1642	Thermotron	8800	N/A	Controller	09/17/19	10/17/20

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required



5.2 Temperature Power Variation

5.2.1 Test Result

N/A

5.2.2 Test Procedure

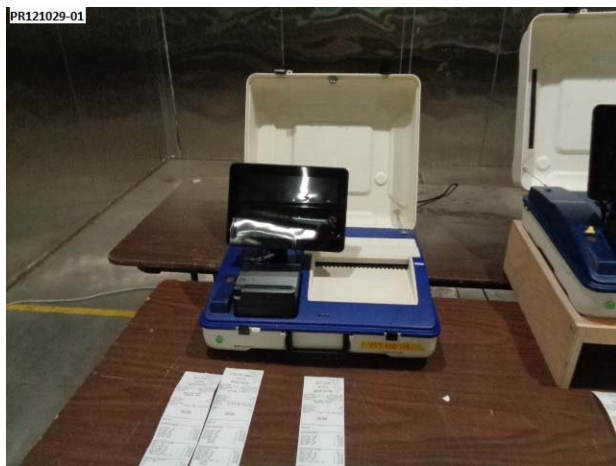
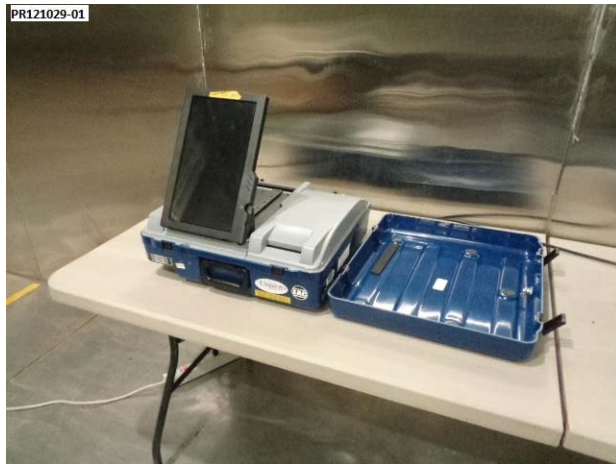
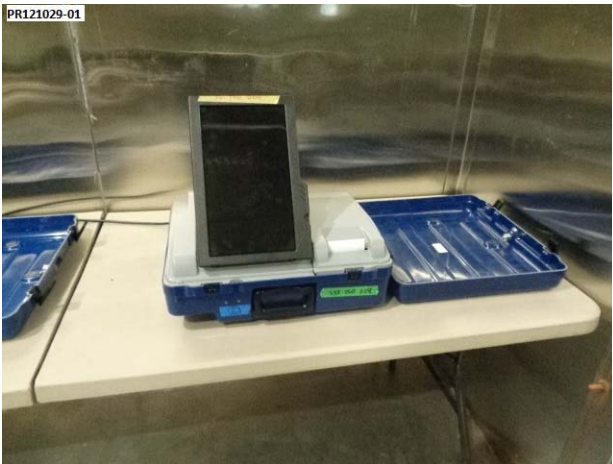
See below.

5.2.3 Test Datasheets

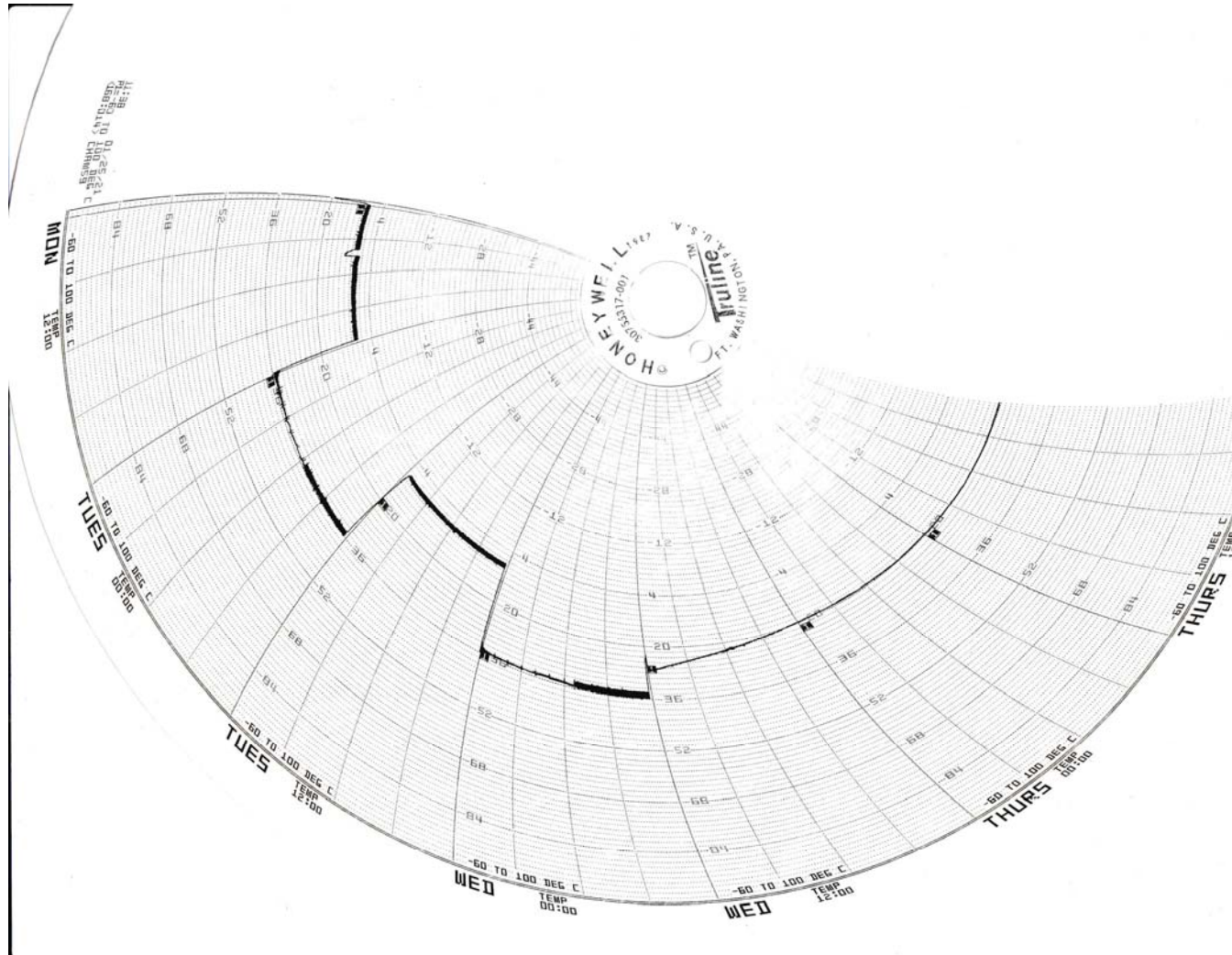
Start Date: 01/25/21		End Date: 01/29/21	MJO No: PR121029-01
Customer: Pro V&V/Unisyn		Test Performed: Temperature Power Variation Test	Test By: KM
Part Name: FVT & FVS System		Serial No: See UUT Details Sheet	Customer Witness: Yes
Page 1 of 1	Test Specification: MIL-STD_810D		Temp: +10c to +35c Voltage: 105vlts to 129vlts
Date	Time	Remarks	Initials
01/25/21	11:40	Set VAC to 117vlts & ramp to +10c	DH
01/25/21	11:50	Start dwell at 117vlts & +10c for 4hrs	DH
01/25/21	15:50	Lower VAC to 105vlts & dwell for 4hrs	DH
01/25/21	19:50	Raise VAC to 129vlts & dwell for 4hrs	KM
01/25/21	23:50	Lower VAC to 117vlts & Raise temperature to +35c & dwell for 4hrs	KM
01/26/21	03:50	Lower VAC to 105vlts & dwell for 4hrs	KM
01/26/21	07:50	Raise VAC to 129vlts & dwell for 4hrs	DH
01/26/21	11:50	Lower VAC to 117vlts & Lower temperature to +10c & dwell for 4hrs	DH
01/26/21	15:50	Lower VAC to 105vlts & dwell for 4hrs	DH
01/26/21	19:50	Raise VAC to 129vlts & dwell for 4hrs	KM
01/26/21	23:50	Lower VAC to 117vlts & Raise temperature to +35c & dwell for 4hrs	KM
01/27/21	03:50	Lower VAC to 105vlts & dwell for 4hrs	KM
01/27/21	07:50	Raise VAC to 129vlts & dwell for 4hrs	DH
01/27/21	11:50	Lower VAC to 117vlts & ramp to +23c ambient	DH
01/27/21	11:50	Temperature and power variation portion of test has completed	KM
01/27/21	11:50	Test will continue to run at +23c ambient for another 37hrs	KM
01/29/21	00:50	All Testing complete for a total of 85hrs	KM
		Note: All test pass or fail determinations decided by Pro V&V Inc.	

Qty	Part Name	Part Number	Serial Number
1	FVT System	N/A	N/A
1	VST	N/A	VST150004
1	VST	N/A	VST150301
1	FVS System	N/A	N/A
1	VST	N/A	VST100122
1	VST	N/A	VST100116

5.2.4 Test Photographs



5.2.5 Test Data





5.2.6 Test Equipment List

Table 5.2-1: Temperature Power Variation Test Equipment List

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
1733	N/A	N/A	N/A	Chamber 59	N/A	N/A
1653	Watlow	F4	N/A	Controller	10/05/20	10/05/21
1654	Honeywell	N/A	N/A	Chart Recorder	10/05/20	10/05/21

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required



5.3 Temperature Power Variation

5.3.1 Test Result

N/A

5.3.2 Test Procedure

See below.

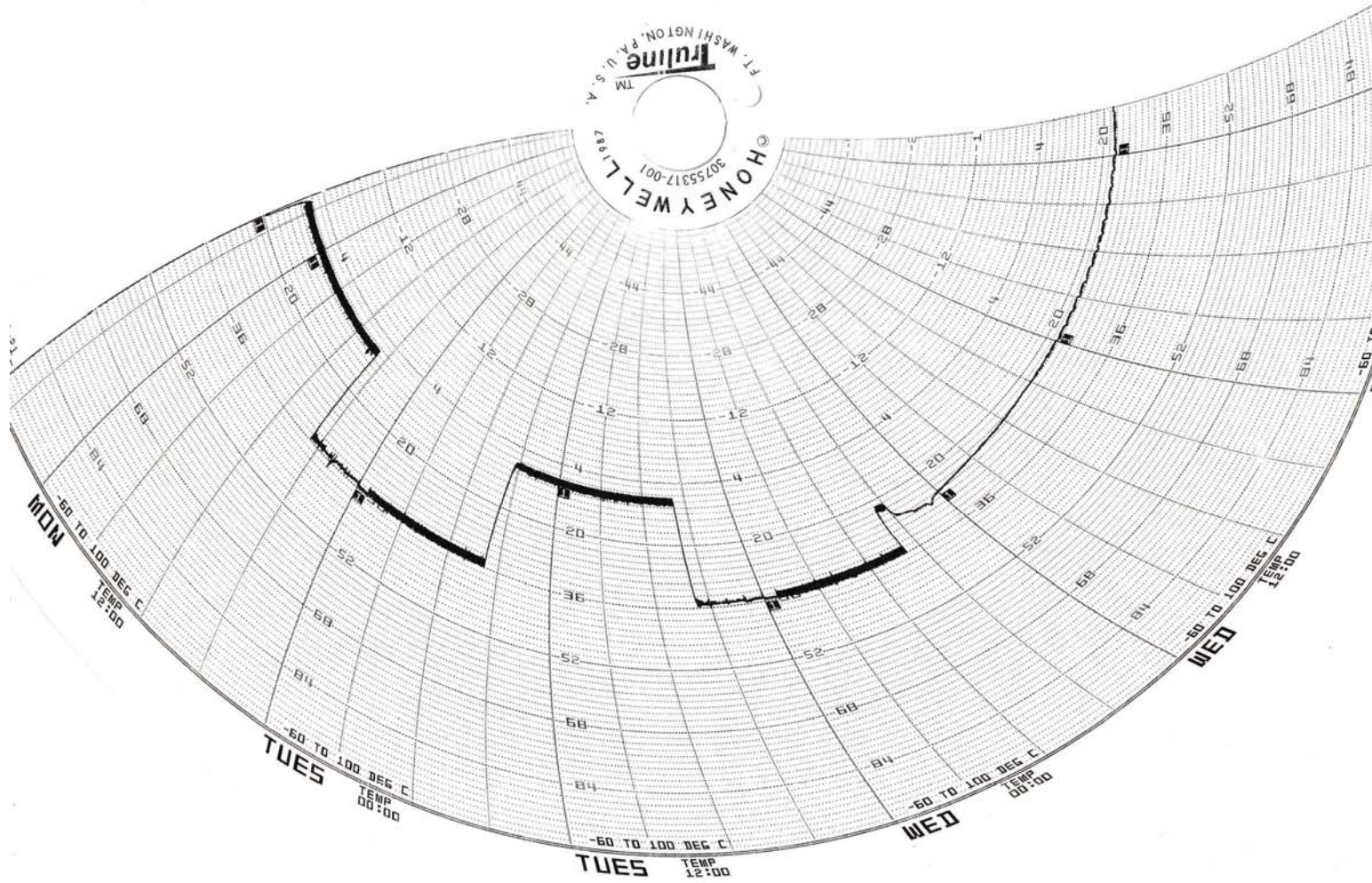
5.3.3 Test Datasheets

Start Date: 03/01/21		End Date: 03/04/21		MJO No: PR129029	
Customer: Pro V&V/Unisyn		Test Performed: Temperature Power Variation Test		Test By:	KM
Part Name: FVT Qty-2		Serial No: VST 100 116 & VST 100 150		Customer Witness:	Yes
Page 1 of 1		Test Specification: MIL-STD-810D/ 502.2 & 501.2		Temp: Voltage:	+10c to +35c 105vlts to 129vlts
Date	Time	Remarks			Initials
03/01/21	09:15	Set VAC to 117vlts & ramp to +10c			GM
03/01/21	09:30	Start dwell at 117vlts & +10c for 4hrs			GM
03/01/21	13:30	Lower VAC to 105vlts & dwell for 4hrs			GM
03/01/21	14:18	Test power supply failed at 14:18 and was restored at 15:38			KM
03/01/21	17:30	Raise VAC to 129vlts & dwell for 4hrs			KM
03/01/21	21:30	Lower VAC to 117vlts & Raise temperature to +35c & dwell for 4hrs			KM
03/02/21	01:30	Lower VAC to 105vlts & dwell for 4hrs			KM
03/02/21	05:30	Raise VAC to 129vlts & dwell for 4hrs			GM
03/02/21	09:30	Lower VAC to 117vlts & Lower temperature to +10c & dwell for 4hrs			GM
03/02/21	13:30	Lower VAC to 105vlts & dwell for 4hrs			GM
03/02/21	17:30	Raise VAC to 129vlts & dwell for 4hrs			KM
03/02/21	21:30	Lower VAC to 117vlts & Raise temperature to +35c & dwell for 4hrs			KM
03/03/21	01:30	Lower VAC to 105vlts & dwell for 4hrs			KM
03/03/21	05:30	Raise VAC to 129vlts & dwell for 4hrs			GM
03/04/21	09:30	Lower VAC to 117vlts & ramp to +23c ambient			GM
03/04/21	09:30	Temperature and power variation portion of test has completed			KM
03/04/21	09:30	Test will continue to run at +23c ambient for another 37hrs			KM
03/04/21	17:00	Testing has been halted and will not complete Temp_Pwr_Var Test			KM
Note: All test pass or fail determinations decided by Pro V&V Inc.					

5.3.4 Test Photographs



5.3.5 Test Data





5.3.6 Test Equipment List

Table 5.3-1: Temperature Power Variation Test Equipment List

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
1733	STK	Walk In	12345	Chamber 59	10/05/20	10/05/21
1653	Watlow	F4	6165	Controller	10/05/20	10/05/21
1654	Honeywell	DR45AT	0350Y361340900004	Chart Recorder	10/05/20	10/05/21

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required



5.4 Temperature Power Variation

5.4.1 Test Result

N/A

5.4.2 Test Procedure

See below.

5.4.3 Test Datasheets

Start Date: 04/19/21		End Date: 04/22/21		MJO No: PR129029	
Customer: Pro V&V/Unisyn			Test Performed: Temperature Power Variation Test		Test By: KM
Part Name: FVT Voting System Qty-3			Serial No: VST 100 122, VST 100 150 & VST 100 151		Customer Witness: Yes
Page 1 of 1		Test Specification: MIL-STD-810D/ 502.2 & 501.2		Temp: Voltage:	+10c to +35c 105vlts to 129vlts
Date	Time	Remarks			Initials
04/19/21	08:00	Set VAC to 117vlts & ramp to +10c			RSP
04/19/21	08:15	Start dwell at 117vlts & +10c for 4hrs			RSP
04/19/21	12:15	Lower VAC to 105vlts & dwell for 4hrs			RSP
04/19/21	16:15	Raise VAC to 129vlts & dwell for 4hrs			KM
04/20/21	20:15	Lower VAC to 117vlts & Raise temperature to +35c & dwell for 4hrs			KM
04/20/21	00:15	Lower VAC to 105vlts & dwell for 4hrs			KM
04/20/21	04:15	Raise VAC to 129vlts & dwell for 4hrs			KM
04/20/21	08:15	Lower VAC to 117vlts & Lower temperature to +10c & dwell for 4hrs			GM
04/20/21	12:15	Lower VAC to 105vlts & dwell for 4hrs			GM
04/20/21	16:15	Raise VAC to 129vlts & dwell for 4hrs			GM
04/20/21	20:15	Lower VAC to 117vlts & Raise temperature to +35c & dwell for 4hrs			KM
04/21/21	00:15	Lower VAC to 105vlts & dwell for 4hrs			KM
04/21/21	04:15	Raise VAC to 129vlts & dwell for 4hrs			KM
04/21/21	08:15	Lower VAC to 117vlts & ramp to +23c ambient			GM
04/21/21	08:15	Temperature and power variation portion of test has completed			KM
04/21/21	08:15	Test will continue to run at +23c ambient for another 16hrs			KM
04/22/21	00:30	All Testing complete for a total of 64hrs			KM
Note: All test pass or fail determinations decided by Pro V&V Inc.					

5.4.4 Test Photographs

PR121029 - Pro V&V - Temp & Power Variation Retest

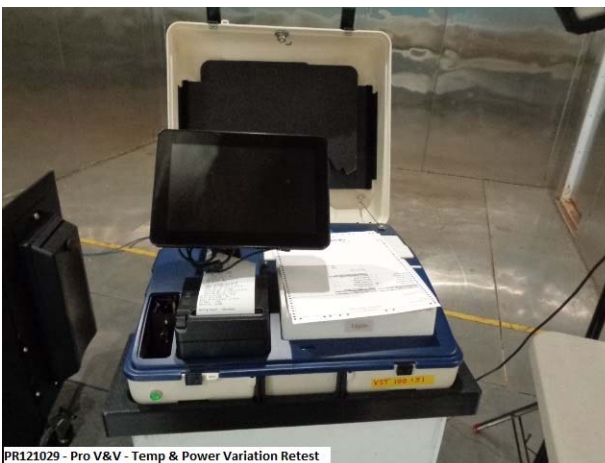


PR121029 - Pro V&V - Temp & Power Variation Retest

PR121029 - Pro V&V - Temp & Power Variation Retest



PR121029 - Pro V&V - Temp & Power Variation Retest



PR121029 - Pro V&V - Temp & Power Variation Retest



PR121029 - Pro V&V - Temp & Power Variation Retest

PR121029 - Pro V&V - Temp & Power Variation Retest



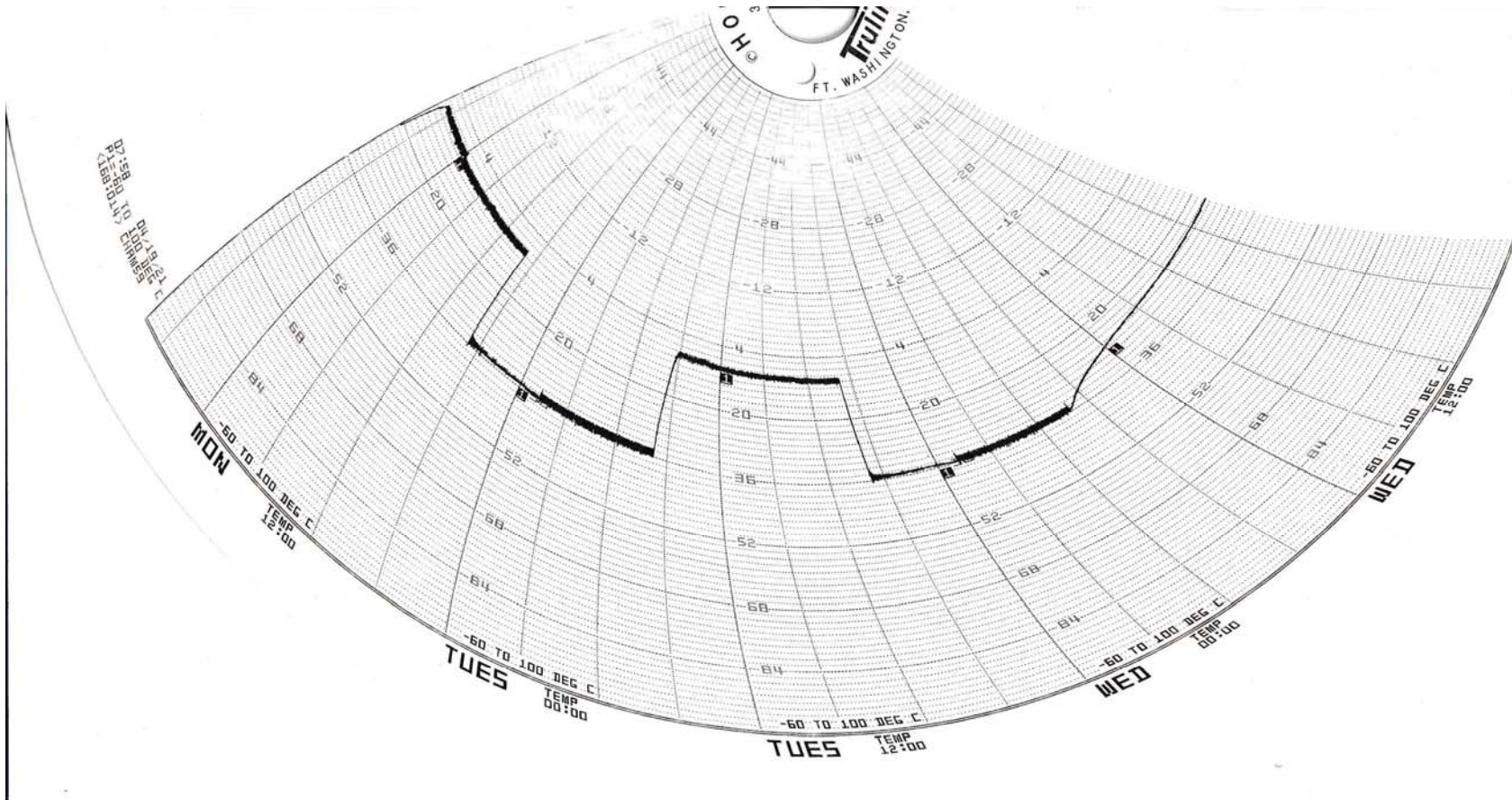
PR121029 - Pro V&V - Temp & Power Variation Retest

PR121029 - Pro V&V - Temp & Power Variation Retest



PR121029 - Pro V&V - Temp & Power Variation Retest

5.4.5 Test Data





5.4.6 Test Equipment List

Table 5.4-1: Temperature Power Variation Test Equipment List

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
1733	STK	Walk In	12345	Chamber 59	10/05/20	10/05/21
1653	Watlow	F4	6165	Controller	10/05/20	10/05/21
1654	Honeywell	DR45AT	0350Y361340900004	Chart Recorder	10/05/20	10/05/21

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required



End of Report