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Test Performed By: Peter Frosch  
Test Reviewed By: Manager Name  
Test Previously Performed (Yes/No): No  
Previous Quotation Number: NA

## Pro V&V Voting Machine Testing

Report/Quotation Number: PVV-5028.00 (CM380832205802.0)  
Revision Number of Report: 0

### Pro V&V

700 Boulevard South Ste 102  
Huntsville, AL, USA  
35802  
256-713-1111 ext 103

Test Start Date: May 5, 2016  
Test Completion Date: July 1, 2016  
Report Issue Date: July 7, 2016

Handwritten signature of Peter Frosch in black ink.

Peter Frosch  
Test Technician

14-Jul-16  
Date

Handwritten signature of Ian Wales in black ink.

Ian Wales  
Program Manager

14-Jul-16  
Date

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- Appendix A: Shock Setup and Data (11 pages)
- Appendix B: Vibration Setup and Data (16 pages)
- Appendix C: Low Temperature Setup and Data (1 page)
- Appendix D: High Temperature Setup and Data (1 page)
- Appendix E: Humidity Setup and Data (# pages)
- Appendix F: Temp-Power Variation Setup and Data (5 pages)



## Test Report

### Test Description

Perform MIL-STD-810D environmental testing on supplied Pro V & V (Dominion) Voting system components, as per quotation CM380832205802, and customer's additional instructions by email.

### Test and Setup Procedures

#### *General Setup Description*

Samples provided by the customer were tested as per the following test sections. Refer to the Sample Description and Quantities section, for specific details regarding each sample number.

#### *Shock - Bench Handling (MIL-STD-810D, 516.3, I-3.8)*

Pro V&V samples 1, 2, 5 and 6 were used Pro V&V samples 1 to 6 were used for Shock – Bench Handling tests. Samples were dropped on their edges, as agreed upon with the customer. Using one edge as a pivot, the opposite edge of the chassis unit was lifted until the face reached 45° with horizontal bench top, or 4 inches above bench top (whichever occurred first). This was repeated with each practical edge, of the same horizontal face. Refer to Appendix A: Shock Setup & Data.

#### *Vibration – Basic Transportation (MIL-STD-810D, 514.3, I-3.2.1)*

Pro V&V samples 1 to 6 were used for Vibration – Basic Transportation testing. Vibration was performed at ambient/room temperature (20°C +/-3 °C) in the X, Y and Z axis as per Table 1 (below).

**Table 1: Vibration Profiles**

Axis	Profile
X	BREAKPOINTS FREQ PSD VALU 10 .00013 20 .00065 30 .00065 78 .00002 79 .00019 120 .00019 500 .00001
Y	BREAKPOINTS FREQ PSD VALUE 10 .00650 20 .00650 120 .00020 121 .00300 200 .00300 240 .00150 340 .00003 500 .00015
X	BREAKPOINTS FREQ PSD VALUE 10 .01500 40 .01500 500 .00015

Refer to Appendix B: Vibration Setup and Data.



*Low Temperature - Storage (MIL-STD-810D, 502.2, II-3)*

Pro V&V samples 1 to 24 (plus accessories) were used for Low Temperature - Storage testing. Samples were soaked at a temperature of -4°F (-20°C +/-3 °C) for a duration of 4 hours, after which operation was confirmed by the customer. Samples were not powered, and were soaked in their packaging for the duration of the test. They were removed from the boxes for operational verification after the test. Refer to Appendix C: Low Temperature Setup and Data.

*High Temperature - Storage (MIL-STD-810D, 501.2, I-3.2)*

Pro V&V samples 1 to 24 (plus accessories) were used for High Temperature - Storage testing as per procedure I. Samples were soaked at a temperature of 140°F (60°C +/-3 °C) for a duration of 4 hours, after which operation was confirmed by the customer. Samples were not powered, and were soaked in their packaging for the duration of the test. They were removed from the boxes for operational verification after the test. Refer to Appendix D: High Temperature Setup and Data.

*Humidity – Hot/Humid (MIL-STD-810D, 507.2, I-3.2)*

Pro V&V samples 1 to 24 (plus accessories) were used for Humidity testing as per Procedure I – Hot/Humid. Samples were soaked as per Table 507.2-I, Hot-Humid (Cycle 1), for a duration of 240 hours (10 days), after which operation was confirmed by the customer. Samples were not powered/operational, and were soaked in their packaging for the duration of the test, and were removed from the boxes for operational verification. Refer to Appendix E: Humidity Setup and Data.

*Temp-Power Variation Testing (MIL-STD-810D, 501.2/502.2)*

Pro V&V samples 1 to 24 (plus accessories) were used for Temp-Power Variation testing. Samples completed 85 hours as per the following environment profile (Table 2 – below).

**Table 2: Temp-Power Variation Profile**

1- Ramp to 10°C
2- Hold 10°C for 12 hours
3- Ramp to 35°C over 1 hour
4- Hold 35°C for 12 hours
5- Ramp to 10°C over 1 hour
6- Repeat until 85 hours cycling at profile is achieved
7- Ramp to 35°C over 1 hour
8- Hold 35°C for 12 hours
9- Ramp to 23°C over 1 hour
10- Hold for duration of test

Samples were powered and being operated by the customer for the duration of the environmental profile, to confirm operation. Refer to Appendix F: Temp-Power Variation Setup and Data.



## Sample Description and Quantities

TUV ID	Sample Description	Customer ID	Shock-Bench Handling	Vibration	Low. Temp, High Temp., Humidity, Temp-Power Variation
1	Voting System Component	ICP	X	X	X
2	Voting System Component	ICX 15"	X	X	X
3	Voting System Component	Cannon Image LBP151DW		X	X
4	Voting System Component	HP Laserjet M402dn		X	X
5	Voting System Component	ICX 21"	X	X	X
6	Voting System Component	ICX Samsung	X	X	X
7	Voting System Component	Cannon Image LBP151DW			X
8	Voting System Component	Cannon Image LBP151DW			X
9	Voting System Component	Cannon Image LBP151DW			X
10	Voting System Component	Cannon Image LBP151DW			X
11	Voting System Component				X
12	Voting System Component	Smart Ups 1000/1500VA			X
13	Voting System Component				X
14	Voting System Component	Smart Ups 1000/1500VA			X
15	Voting System Component	Cannon Image LBP151DW			X
16	Voting System Component	Smart Ups 1000/1500VA			X
17	Voting System Component	Cannon ImageDR-M160II			X
18	Voting System Component				X
19	Voting System Component	cart			X
20	Voting System Component	cart			X
21	Voting System Component	Smart Ups 1000/1500VA			X
22	Voting System Component	Smart Ups 1000/1500VA			X
23	Voting System Component	Smart Ups 1000/1500VA			X
24	Voting System Component	Cannon ImageDR-M160II			X
N/a	Voting System Component	Armadillo casing, Joystick, Hand held ATI device, Sip and puff, Tecla (small square device), Lava link (small square device)			X

## Deviations

N/A

## Subcontractors

N/A



## Summary of Test Results

### *Shock - Bench Handling (MIL-STD-810D, 516.3, I-3.8)*

Pro V&V samples 1, 2, 5 and 6 were used Pro V&V samples 1 to 6 were used for Shock – Bench Handling tests. Samples completed the required drops on each edge without any signs of visual damage, and customer stated they remained functional. Refer to Appendix A: Shock Setup & Data.

### *Vibration – Basic Transportation (MIL-STD-810D, 514.3, I-3.2.1)*

Pro V&V samples 1 to 6 were used for Vibration – Basic Transportation testing. Samples completed the required vibration in the X, Y and Z axes without any signs of visual damage, and customer stated they remained functional. Refer to Appendix B: Vibration Setup and Data.

### *Low Temperature - Storage (MIL-STD-810D, 502.2, II-3)*

Pro V&V samples 1 to 24 (plus accessories) were used for Low Temperature - Storage testing. Samples completed the required soak without any signs of visual damage, and customer stated they remained functional. Refer to Appendix C: Low Temperature Setup and Data.

### *High Temperature - Storage (MIL-STD-810D, 501.2, I-3.2)*

Pro V&V samples 1 to 24 (plus accessories) were used for High Temperature - Storage testing as per procedure I. Samples completed the required soak without any signs of visual damage, and customer stated they remained functional. Refer to Appendix D: High Temperature Setup and Data.

### *Humidity – Hot/Humid (MIL-STD-810D, 507.2, I-3.2)*

Pro V&V samples 1 to 24 (plus accessories) were used for Humidity testing as per Procedure I – Hot/Humid. Samples completed the required soak without any signs of visual damage, and customer stated they remained functional. Refer to Appendix E: Humidity Setup and Data.

### *Temp-Power Variation Testing (MIL-STD-810D, 501.2/502.2)*

Pro V&V samples 1 to 24 (plus accessories) were used for Temp-Power Variation testing. Samples completed the required 85 hours without any signs of visual damage, and customer stated they remained functional for the entire duration of the cycle. Refer to Appendix F: Temp-Power Variation Setup and Data.



## Test Equipment & Uncertainty

Equipment Description	Gauge ID	Measurement Uncertainty (K Factor = 2, 95% Confidence Level)
Walk-in Environmental Chamber	CH-ENV-09	1.14C, 2.06% RH
Computer Data Acquisition System	DATA-AQ-13	0.82C
Mitutoyo Digital Protractor	DP-360-02	0.16 deg
Tape Measure	TM-025-01	3.06 mm
Vibration Controller	VR-8500-01	0.12 Vrms
Accelerometer	AC-050-02,	0.84 mv/g

Note: Measurement Uncertainty not factored when evaluating test data.

## Attached Documents

- Appendix A: Shock Setup and Data (11 pages)
- Appendix B: Vibration Setup and Data (16 pages)
- Appendix C: Low Temperature Setup and Data (1 page)
- Appendix D: High Temperature Setup and Data (1 page)
- Appendix E: Humidity Setup and Data (# pages)
- Appendix F: Temp-Power Variation Setup and Data (5 pages)

## Distribution

TÜV SÜD Canada, 1 original copy  
Pro V & V, 1 digital copy



# **Appendix A: Shock and Setup Data**

(11 pages)



Technical Form Number	N/a	Revision Number	N/a	Revision Date	11-Sep-15
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**Shock - Bench Handling - Test Setup Parameters**

Sample Description	Voting Machine Systems
Number of samples	4
Sample Number(s)	5028-1 (ICP) ,5028-2 (ICX 15"), 5028-5 (ICX 21") , 5028-6 (ICX Samsung )
Specification	MIL-STD-810D, Military Standard Environmental Test Methods and Engineering Guidelines
Section	II-3.8 Procedure VI- Bench Handling
Test Description	Using one edge as a pivot, lift the opposite edge of the chassis unit one of the following conditions occur,45° with horizontal bench top or 4 inches above bench top. Repeat using other practical edges of the same horizontal face as a pivot point for a total of four drops.
Data to be Provided	Test Data Sheets and photographs
Requirement	No Visual damage , must remain functional during customers checks.

**Setup Photographs**



Technical Form Number	N/a	Revision Number	N/a	Revision Date	11-Sep-15
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**Shock - Bench Handling - Test Setup Parameters**

Sample Description	Voting Machine Systems
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Sample Number(s)	5028-1 (ICP) , <b>5028-2 (ICX 15")</b> , 5028-5 (ICX 21") , 5028-6 (ICX Samsung )
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Data to be Provided	Test Data Sheets and photographs
Requirement	No Visual damage , must remain functional during customers checks.

**Setup Photographs**

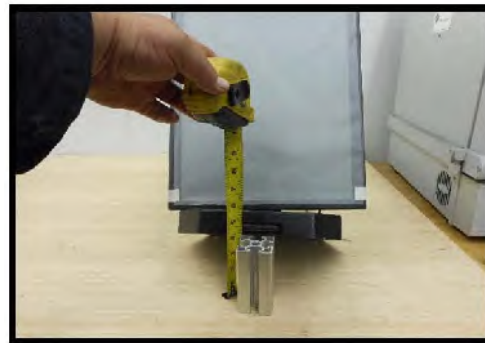


Technical Form Number	N/a	Revision Number	N/a	Revision Date	11-Sep-15
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**Shock - Bench Handling - Test Setup Parameters**

Sample Description	Voting Machine Systems
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Sample Number(s)	5028-1 (ICP) ,5028-2 (ICX 15"), <b>5028-5 (ICX 21")</b> , 5028-6 (ICX Samsung )
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Test Description	Using one edge as a pivot, lift the opposite edge of the chassis unit one of the following conditions occur,45° with horizontal bench top or 4 inches above bench top. Repeat using other practical edges of the same horizontal face as a pivot point for a total of four drops.
Data to be Provided	Test Data Sheets and photographs
Requirement	No Visual damage , must remain functional during customers checks.

**Setup Photographs**

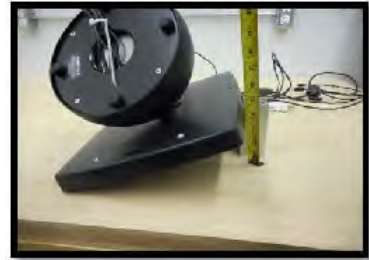


Technical Form Number	N/a	Revision Number	N/a	Revision Date	11-Sep-15
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**Shock - Bench Handling - Test Setup Parameters**

Sample Description	Voting Machine Systems
Number of samples	4
Sample Number(s)	5028-1 (ICP) ,5028-2 (ICX 15"), 5028-5 (ICX 21") , <b>5028-6 (ICX Samsung )</b>
Specification	MIL-STD-810D, Military Standard Environmental Test Methods and Engineering Guidelines
Section	II-3.8 Procedure VI- Bench Handling
Test Description	Using one edge as a pivot, lift the opposite edge of the chassis unit one of the following conditions occur,45° with horizontal bench top or 4 inches above bench top. Repeat using other practical edges of the same horizontal face as a pivot point for a total of four drops.
Data to be Provided	Test Data Sheets and photographs
Requirement	No Visual damage , must remain functional during customers checks.

**Setup Photographs**



Job Number: PVV-5028

Revision Number:

N/a

Job Description: Pro V&V Voting Machine Testing

Revision Date:

N/a

**Shock - Bench Handling - Setup Checklist**

Abuse Chamber	n/a				
Drop Surface	wood	Drop Apply Fixture	n/a		

Feature to be checked	Sample Numbers				
	5028-1 (ICP)	5028-2 (ICX 15")	5028-5 (ICX 21")	5028-6 (ICX Samsung)	
Make sure Sample Matrix updated (Yes)	Yes	Yes	Yes	Yes	
Drop Height verified and recorded from the lowest point of sample to drop surface (4" or 45°)	Yes	Yes	Yes	Yes	
Drop Orientation - Describe desired impact point of sample	Yes	Yes	Yes	Yes	
Drop surface description wood (1.675 inches)	Yes	Yes	Yes	Yes	
Drop surface level: -2° to +2°	Yes	Yes	Yes	Yes	
Drop surface clear of any debris (Yes)	Yes	Yes	Yes	Yes	
Data Logging Rate	N/a	N/a	N/a	N/a	
"Fresh eyes" review of test setup	Yes	Yes	Yes	Yes	
General Set up Photos taken	Yes	Yes	Yes	Yes	
Video of Test Recorded and start time	N/a	N/a	N/a	N/a	
Pre Test Photos taken of sample from each side	Yes	Yes	Yes	Yes	
Post Test Photos taken of sample from each side	Yes	Yes	Yes	Yes	
Gauges used for Set up Recorded	Yes	Yes	Yes	Yes	
Date	15-Jun-16	16-Jun-16	16-Jun-16	16-Jun-16	
Gauges	DP-360-02, TM-025-01	DP-360-02, TM-025-01	DP-360-02, TM-025-01	DP-360-02, TM-025-01	
Initials	P.F	P.F	P.F	P.F	

Technical Form Number

N/a

Revision Number

N/a

Revision Date

1-Jun-15

**Shock - Bench Handling - Pre Test Photographs**

**Pre Test Photographs**



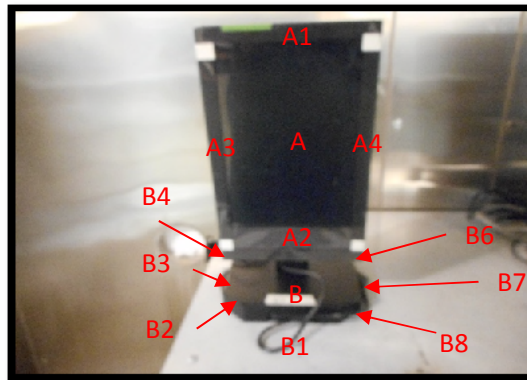


Technical Form Number	N/a	Revision Number	N/a	Revision Date	11-Sep-15
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**Shock - Bench Handling - Data - ICX 15"**

	Measured Drop Height (INCHES)	Gauge	Date	Initials
Free Fall Setup	4"	TH-025-01	16-Jun-16	P.F

Note: Check for visual damage and sample functional following testing.



Face A = Monitor

Face B = Base

Sample Number	Face	Pivot Edge	Impact Edge	4 inch or 45°	Sample still Functional?	Any Visual Damage ?	Initials	Gauges	
5028-2 (ICX 15")	A	A1	A2	4"	yes	No	P.F	DP-360-02 TM-025-01	
	A	A2	A1	4"	yes	No	P.F		
	A	A3	A4	4"	yes	No	P.F		
	A	A4	A3	4"	yes	No	P.F		
5028-2 (ICX 15")	B	B1	B5	Balance	yes	No	P.F	DP-360-02 TM-025-01	
	B	B5	B1	4"	yes	No	P.F		
	B	B2	B6	4"	yes	No	P.F		
	B	B6	B2	4"	yes	No	P.F		
	B	B3	B7	4"	yes	No	P.F		
	B	B7	B3	4"	yes	No	P.F		
	B	B4	B8	4"	yes	No	P.F		
	B	B8	B4	4"	yes	No	P.F		

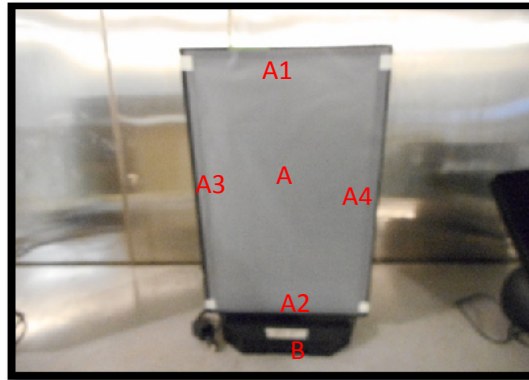


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**Shock - Bench Handling - Data - ICX 21"**

	Measured Drop Height (INCH)	Gauge	Date	Initials
Free Fall Setup	4"	TH-025-01	16-Jun-16	P.F

Note: Check for visual damage and sample functional following testing.



Face A = Monitor

Face B = Base

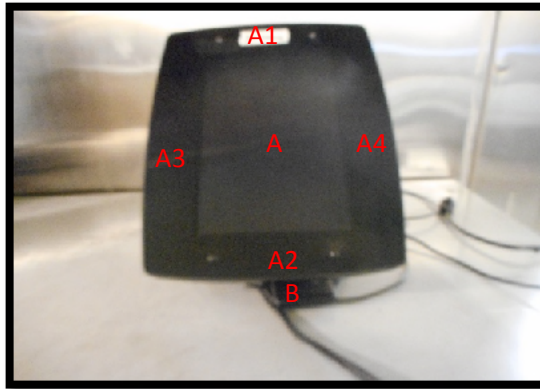
Sample Number	Face	Pivot Edge	Impact Edge	4 inch or 45°	Sample still Functional?	Any Visual Damage ?	Initials	Gauges	
5028-5 (ICX 21")	A	A1	A2	4"	Yes	No	P.F	DP-360-02 TM-025-01	
	A	A2	A1	4"	Yes	No	P.F		
	A	A3	A4	4"	Yes	No	P.F		
	A	A4	A3	4"	Yes	No	P.F		
5028-5 (ICX 21")	B	B1	B5	4"	Yes	No	P.F	DP-360-02 TM-025-01	
	B	B5	B1	Balance	Yes	No	P.F		
	B	B2	B6	4"	Yes	No	P.F		
	B	B6	B2	Balance	Yes	No	P.F		
	B	B3	B7	Balance	Yes	No	P.F		
	B	B7	B3	Balance	Yes	No	P.F		
	B	B4	B8	Balance	Yes	No	P.F		
	B	B8	B4	4"	Yes	No	P.F		

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**Shock - Bench Handling - Data - ICX Samsung**

	Measured Drop Height (INCHES)	Gauge	Date	Initials
Free Fall Setup	4"	TH-025-01	16-Jun-16	P.F

NOTE: Check for visual damage and sample functional following testing. If there is visual damage or loss of function, supplier should label part with "TO THROW AWAY IN CASE OF FREE-FALL"



Face A = Monitor

Face B = Base

Sample Number	Face	Pivot Edge	Impact Edge	4 inch or 45°	Sample still Functional?	Any Visual Damage ?	Initials	Gauges
5028-6(ICX Samsung)	A	A1	A2	4"	Yes	No	P.F	DP-360-02 TM-025-01
	A	A2	A1	4"	Yes	No	P.F	
	A	A3	A4	4"	Yes	No	P.F	
	A	A4	A3	4"	Yes	No	P.F	
5028-6(ICX Samsung)	B	B1	B2	4"	Yes	No	P.F	DP-360-02 TM-025-01
	B	B2	B1	4"	Yes	No	P.F	
	B	B3	B4	4"	Yes	No	P.F	
	B	B4	B3	4"	Yes	No	P.F	

Technical Form Number

N/a

Revision Number

N/a

Revision Date

1-Jun-15

**Shock - Bench Handling - Post Test Photographs**

**Post Test Photographs**





# **Appendix B: Vibration Setup and Data**

(16 pages)

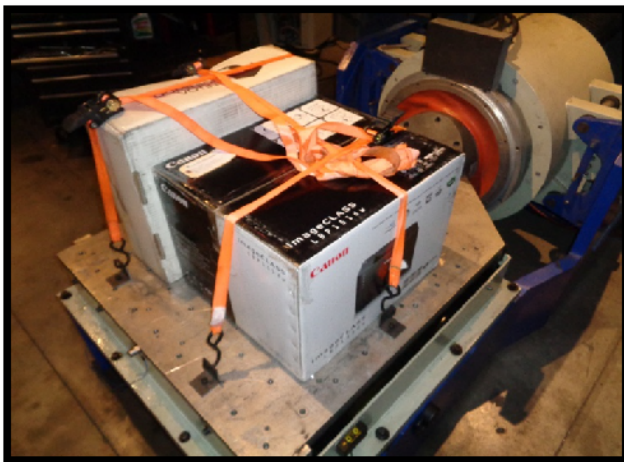
**Vibration - Test Setup Parameters**

Sample Description	Various Voting system components, in shipping boxes
Number of samples	6
Sample Number(s)	5028-1 (ICP) ,5028-2 (ICX 15"), 5028-3 (Canon Image LBP151DW) ,5028-4 (HP Laserjet M402dn),5028-5 (ICX 21") , 5028-6 (ICX Samsung )
Specification	MIL-STD-10D
Section	514.3
Test Description	Basic Transportation in the X ,Y and Z axis
Data to be Provided	Test data sheets and photographs
Requirement	No Visual damage , must remain functional durring customers checks.

**Setup Parameters**

Random Profile	<table border="1"> <thead> <tr> <th>BREF</th> <th>POINTS</th> </tr> <tr> <th>FREQ</th> <th>PSD VALU</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>.00013</td> </tr> <tr> <td>20</td> <td>.00065</td> </tr> <tr> <td>30</td> <td>.00065</td> </tr> <tr> <td>78</td> <td>.00002</td> </tr> <tr> <td>79</td> <td>.00019</td> </tr> <tr> <td>120</td> <td>.00019</td> </tr> <tr> <td>500</td> <td>.00001</td> </tr> </tbody> </table>	BREF	POINTS	FREQ	PSD VALU	10	.00013	20	.00065	30	.00065	78	.00002	79	.00019	120	.00019	500	.00001	Test Temperature	20°C +/-4°C
		BREF	POINTS																		
		FREQ	PSD VALU																		
		10	.00013																		
20	.00065																				
30	.00065																				
78	.00002																				
79	.00019																				
120	.00019																				
500	.00001																				
Relative Humidity	N/a																				
Atmospheric Pressure	N/a																				
Test Axes	X	Duration per Axis	30 minutes per axis																		

**Setup Photographs**



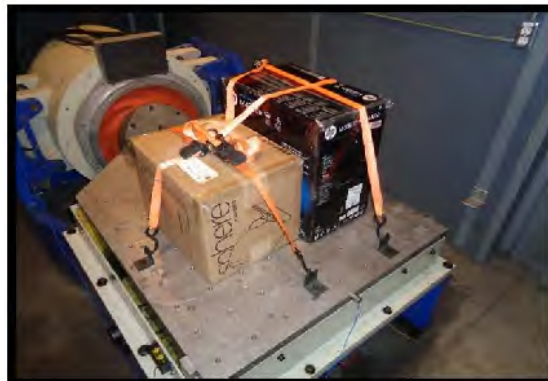
**Vibration - Test Setup Parameters**

Sample Description	Various Voting system components, in shipping boxes
Number of samples	6
Sample Number(s)	6-Jan
Specification	MIL-STD-10D
Section	514.3
Test Description	Basic Transportation in the X ,Y and Z axis
Data to be Provided	Test data sheets and photographs
Requirement	No Visual damage , must remain functional durring customers checks.

**Setup Parameters**

Random Profile	<table border="1"> <thead> <tr> <th colspan="2">BREAKPOINTS</th> </tr> <tr> <th>FREQ</th> <th>PSD VALUE</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>.00650</td> </tr> <tr> <td>20</td> <td>.00650</td> </tr> <tr> <td>120</td> <td>.00020</td> </tr> <tr> <td>121</td> <td>.00300</td> </tr> <tr> <td>200</td> <td>.00300</td> </tr> <tr> <td>240</td> <td>.00150</td> </tr> <tr> <td>340</td> <td>.00003</td> </tr> <tr> <td>500</td> <td>.00015</td> </tr> </tbody> </table>	BREAKPOINTS		FREQ	PSD VALUE	10	.00650	20	.00650	120	.00020	121	.00300	200	.00300	240	.00150	340	.00003	500	.00015	Test Temperature	20°C +/-4°C
		BREAKPOINTS																					
		FREQ	PSD VALUE																				
10	.00650																						
20	.00650																						
120	.00020																						
121	.00300																						
200	.00300																						
240	.00150																						
340	.00003																						
500	.00015																						
Relative Humidity	N/a																						
Atmospheric Pressure	N/a																						
Test Axes	Y	Duration per Axis	30 minutes per axis																				

**Setup Photographs**



**Vibration - Test Setup Parameters**

Sample Description	Various Voting system components, in shipping boxes
Number of samples	6
Sample Number(s)	6-Jan
Specification	MIL-STD-10D
Section	514.3
Test Description	Basic Transportation in the X ,Y and Z axis
Data to be Provided	Test data sheets and photographs
Requirement	No Visual damage , must remain functional durring customers checks.

**Setup Parameters**

Random Profile	<b>BREAKPOINTS</b> <b>FREQ            PSD VALUE</b> <b>10                .01500</b> <b>40                .01500</b> <b>500               .00015</b>	Test Temperature	20°C +/-4°C
		Relative Humidity	N/a
		Atmospheric Pressure	N/a
Test Axes	Z	Duration per Axis	30 minutes per axis

**Setup Photographs**









<b>TUV SUD Canada</b>	<b>Technical Form Number:</b> N/a	Page: VIB-05
<b>Job Number:</b> PVV-5028	<b>Revision Number:</b> N/a	
<b>Job Description:</b> Voting Machine Environmental & Vibration	<b>Revision Date:</b> N/a	

**Vibration - Setup Checklist**

Env. Chamber	N/a	Load Fixture	N/a	Data Acquisition Cart ( 1 )	VR-8500-01
Base Fixture	N/a			Data Acquisition Cart ( 2 )	N/a

Feature to be checked	Sample Numbers					
	Samples 1-6					
Sample Description - Make sure Sample Matrix updated	Voting System Component					
Profile Plotted in Vibration controller	Yes					
Duration:30 minutes per axis	Yes					
Sample Checked for function after Axis	N/A- Customer to do evaluation					
Accelerometer scaling set on controller	Yes					
Fixture Mounted securely to table	Yes					
Sample mounted securely to fixture	N/A					
Test Temperature (20°C +/-4°C)	Yes					
Pre Test Photos taken of sample from each side (and in fixture setup)	Yes					
"Fresh eyes" review of test setup	Yes					
General Set up Photos taken	Yes					
Video of Test Recorded and Start Time	N/A					
Post Test Photos taken of sample from each side	Yes					
Date	9-Jun-16					
Gauges	VR-8500-01 AC-050-02,					
Initials	C.G					

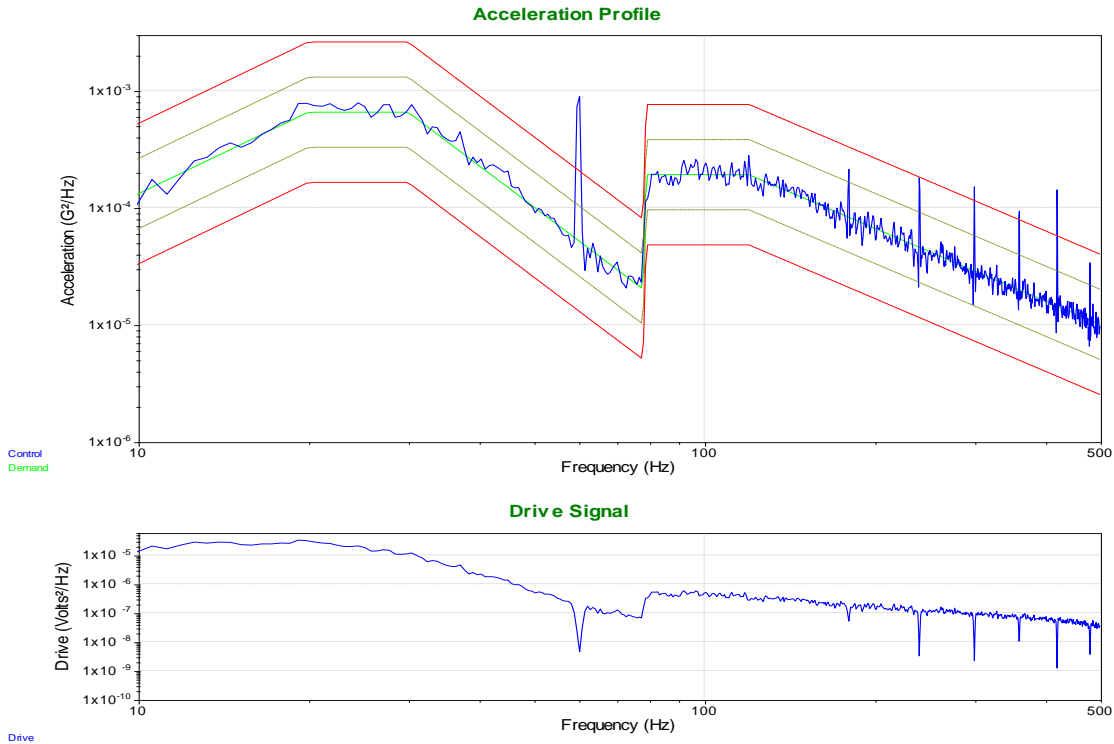
Basic Transportation										Specification: CETP:00.00-E-412, SEC 5.11, Table 6.4.6.b		
Sample Number	Repeating Acceleration Profile	Duration per Axis (30 Minutes)			Start Date	Start Time	Initials	End Date	End Time	Initials	Gauges	Comments
		X	Y	Z								
1	See Setup Sheets	30			9-Jun-16	2:55PM	C.G	9-Jun-16	3:25PM	C.G	AC-050-02, VR-8500-01	No signs of visual damage following test, and customer stated samples were operational.
			30		9-Jun-16	3:45PM	C.G	9-Jun-16	3:45PM	C.G		
				30	10-Jun-16	9:30AM	C.G	10-Jun-16	10:00AM	C.G		
2		30			10-Jun-16	2:05PM	C.G	10-Jun-16	2:35PM	C.G	AC-050-02, VR-8500-01	No signs of visual damage following test, and customer stated samples were operational.
			30		10-Jun-16	1:15PM	C.G	10-Jun-16	1:45PM	C.G		
				30	10-Jun-16	3:00PM	C.G	10-Jun-16	3:30PM	C.G		
3		30			9-Jun-16	2:55PM	C.G	9-Jun-16	3:25PM	C.G	AC-050-02, VR-8500-01	No signs of visual damage following test, and customer stated samples were operational.
			30		9-Jun-16	3:45PM	C.G	9-Jun-16	3:45PM	C.G		
				30	9-Jun-16	4:25PM	C.G	9-Jun-16	4:55PM	C.G		
4		30			9-Jun-16	12:00PM	C.G	9-Jun-16	12:30PM	C.G	AC-050-02, VR-8500-01	No signs of visual damage following test, and customer stated samples were operational.
			30		9-Jun-16	1:30PM	C.G	9-Jun-16	2:00PM	C.G		
				30	9-Jun-16	2:10PM	C.G	9-Jun-16	2:40PM	C.G		
5		30			10-Jun-16	2:05PM	C.G	10-Jun-16	2:35PM	C.G	AC-050-02, VR-8500-01	No signs of visual damage following test, and customer stated samples were operational.
			30		10-Jun-16	1:15PM	C.G	10-Jun-16	1:45PM	C.G		
				30	10-Jun-16	3:00PM	C.G	10-Jun-16	3:30PM	C.G		
6		30			9-Jun-16	12:00PM	C.G	9-Jun-16	12:30PM	C.G	AC-050-02, VR-8500-01	No signs of visual damage following test, and customer stated samples were operational.
			30		9-Jun-16	1:30PM	C.G	9-Jun-16	2:00PM	C.G		
				30	9-Jun-16	2:10PM	C.G	9-Jun-16	2:40PM	C.G		

Note:

Customer: PVV-5028 Voting Machine Vibration  
 Job#: Samples 1 and 3 X-Axis

Data: C:\VibeSuite\Data\2016-06\2016Jun09-1454-0001.vrd  
 Test: C:\Documents and Settings\User\Desktop\TUV Test Jobs\PVV-5028\X-Axis Random (Transverse).vrp  
 Data stored on Jun 09, 2016 15:24:53

**End of Test**



**Breakpoint table**

Frequency	G²/Hz	dB/Octave
10 Hz	0.00013	6.99
20 Hz	0.00065	0
30 Hz	0.00065	-10.97
78 Hz	2e-005	532
79 Hz	0.00019	0
120 Hz	0.00019	-6.211
500 Hz	1e-005	

**Measurements:**

Demand: 0.2036 G RMS      0.4713 mm pk-pk  
 Control: 0.2107 G RMS      0.4944 mm pk-pk

**Channel Measurements:**

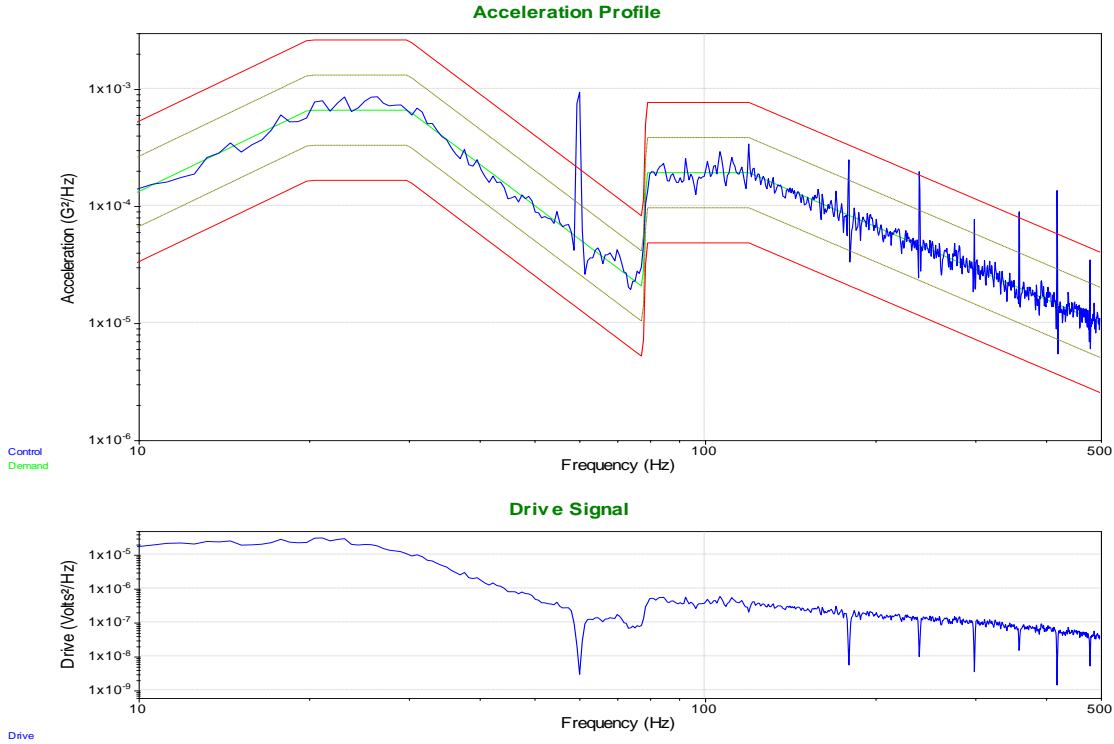
Ch1: 0.2086 G RMS      Ch1 in-band: 0.2107 G RMS  
 Ch2: 0.005257 G RMS      Ch2 in-band: 0.001011 G RMS  
 Ch3: n/a      Ch3 in-band: n/a  
 Ch4: n/a      Ch4 in-band: n/a  
 Drive voltage: 0.02303 Vrms

System gain is 0.1093 Volts/G (Max system gain limit = 5 Volts/G)

Customer: PVV-5028 Voting MACHine Vibration  
 Job#: Samples 2 and 5 X-Axis

Data: C:\VibeSuite\Data\2016-06\2016Jun10-1405-0001.vrd  
 Test: C:\Documents and Settings\User\Desktop\TUV Test Jobs\PVV-5028\X-Axis Random (Transverse).vrp  
 Data stored on Jun 10, 2016 14:36:01

**End of Test**



**Breakpoint table**

Frequency	G²/Hz	dB/Octave
10 Hz	0.00013	6.99
20 Hz	0.00065	0
30 Hz	0.00065	-10.97
78 Hz	2e-005	532
79 Hz	0.00019	0
120 Hz	0.00019	-6.211
500 Hz	1e-005	

**Measurements:**

Demand: 0.2036 G RMS      0.4713 mm pk-pk  
 Control: 0.2086 G RMS      0.49 mm pk-pk

**Channel Measurements:**

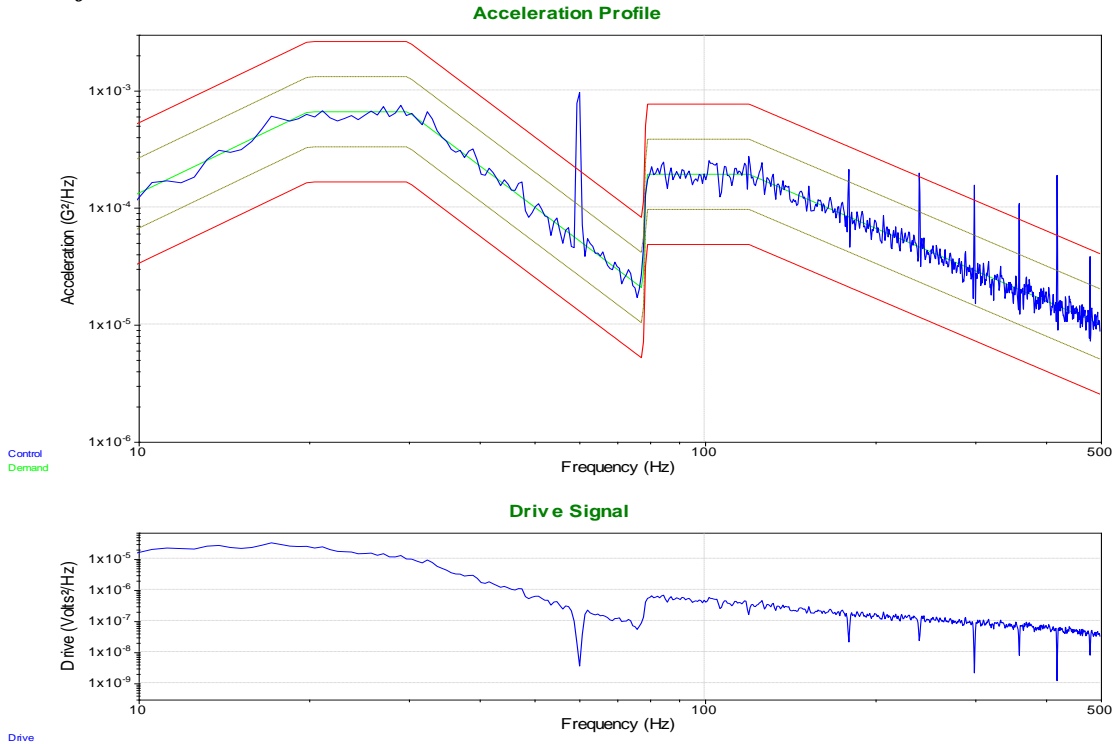
Ch1: 0.2102 G RMS      Ch1 in-band: 0.2085 G RMS  
 Ch2: 0.008914 G RMS      Ch2 in-band: 0.00102 G RMS  
 Ch3: n/a      Ch3 in-band: n/a  
 Ch4: n/a      Ch4 in-band: n/a  
 Drive voltage: 0.02309 Vrms

System gain is 0.1107 Volts/G (Max system gain limit = 5 Volts/G)

Customer: PVV-5028 Voting MACHine Vibration  
 Job#: Samples 4 and 6 X-Axis

Data: C:\VibeSuite\Data\2016-06\2016Jun09-1203-0001.vrd  
 Test: C:\Documents and Settings\User\Desktop\TUV Test Jobs\PVV-5028\X-Axis Random (Transverse).vrp  
 Data stored on Jun 09, 2016 12:34:16

**End of Test**



**Breakpoint table**

Frequency	G <sup>2</sup> /Hz	dB/Octave
10 Hz	0.00013	6.99
20 Hz	0.00065	0
30 Hz	0.00065	-10.97
78 Hz	2e-005	532
79 Hz	0.00019	0
120 Hz	0.00019	-6.211
500 Hz	1e-005	

**Measurements:**

Demand: 0.2036 G RMS      0.4713 mm pk-pk  
 Control: 0.208 G RMS      0.4813 mm pk-pk

**Channel Measurements:**

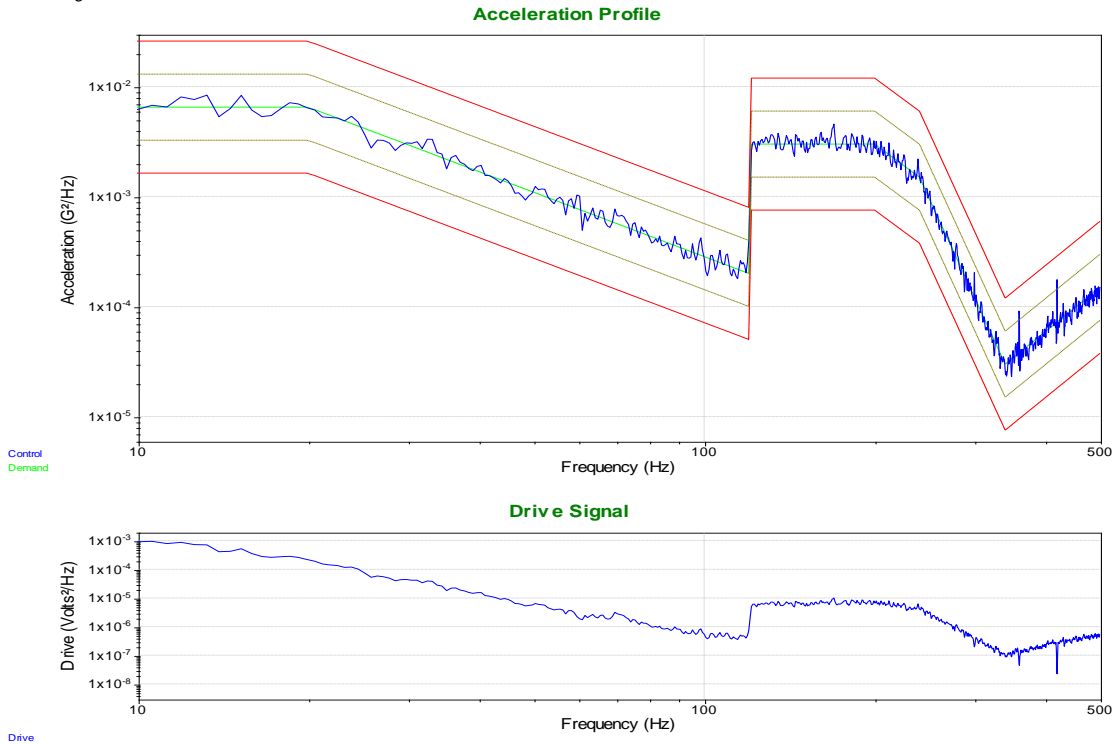
Ch1: 0.2099 G RMS      Ch1 in-band: 0.2079 G RMS  
 Ch2: 0.005111 G RMS      Ch2 in-band: 0.001008 G RMS  
 Ch3: n/a      Ch3 in-band: n/a  
 Ch4: n/a      Ch4 in-band: n/a  
 Drive voltage: 0.02301 Vrms

System gain is 0.1106 Volts/G (Max system gain limit = 5 Volts/G)

Customer: PVV-5028 Voting Machine Vibration  
 Job#: Sample 1 and 3 Y-Axis

Data: C:\VibeSuite\Data\2016-06\2016Jun09-1543-0001.vrd  
 Test: C:\Documents and Settings\User\Desktop\TUV Test Jobs\PVV-5028\Y-Axis Random (Longitudinal).vrp  
 Data stored on Jun 09, 2016 16:13:27

**End of Test**



**Breakpoint table**

Frequency	G <sup>2</sup> /Hz	dB/Octave
10 Hz	0.0065	0
20 Hz	0.0065	-5.849
120 Hz	0.0002	982.3
121 Hz	0.003	0
200 Hz	0.003	-11.44
240 Hz	0.0015	-33.81
340 Hz	3e-005	12.56
500 Hz	0.00015	

**Measurements:**

Demand: 0.7419 G RMS      2.277 mm pk-pk  
 Control: 0.7498 G RMS      2.488 mm pk-pk

**Channel Measurements:**

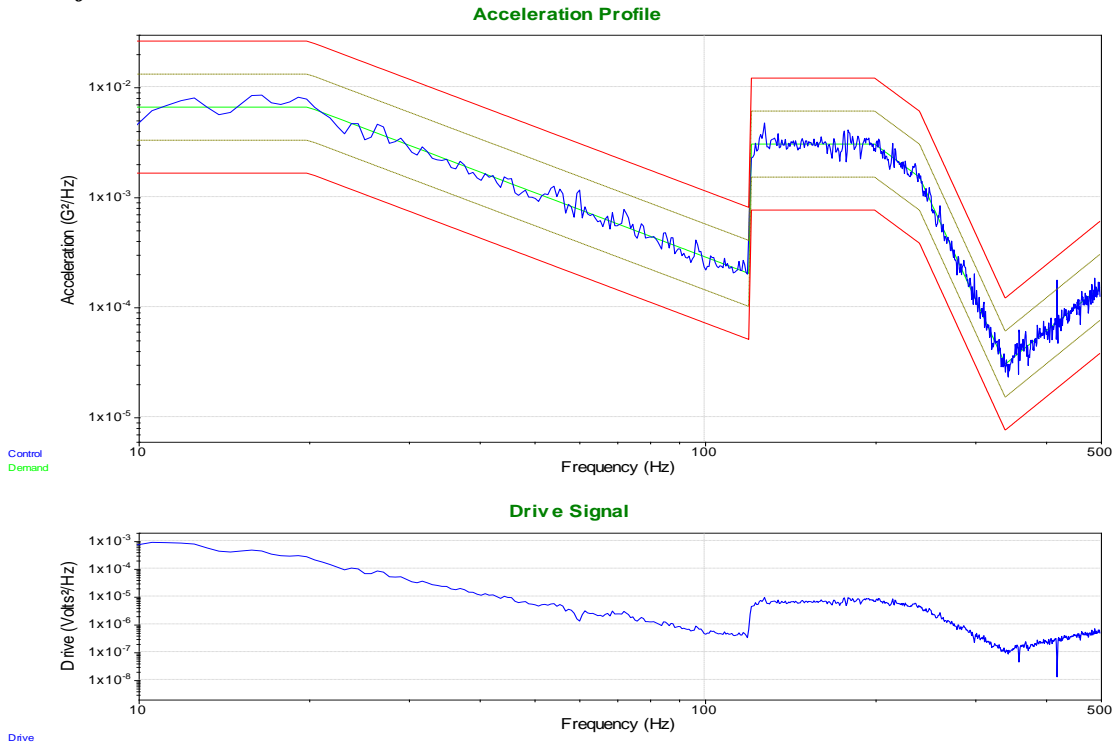
Ch1: 0.7443 G RMS      Ch1 in-band: 0.7484 G RMS  
 Ch2: 0.008574 G RMS      Ch2 in-band: 0.001129 G RMS  
 Ch3: n/a      Ch3 in-band: n/a  
 Ch4: n/a      Ch4 in-band: n/a  
 Drive voltage: 0.08777 Vrms

System gain is 0.1171 Volts/G (Max system gain limit = 5 Volts/G)

Customer: PVV-5028 Voting Machine Vibration  
 Job#: Sample 2 and 5 Y-Axis

Data: C:\VibeSuite\Data\2016-06\2016Jun10-1309-0001.vrd  
 Test: C:\Documents and Settings\User\Desktop\TUV Test Jobs\PVV-5028\Y-Axis Random (Longitudinal).vrp  
 Data stored on Jun 10, 2016 13:40:13

**End of Test**



**Breakpoint table**

Frequency	G <sup>2</sup> /Hz	dB/Octave
10 Hz	0.0065	0
20 Hz	0.0065	-5.849
120 Hz	0.0002	982.3
121 Hz	0.003	0
200 Hz	0.003	-11.44
240 Hz	0.0015	-33.81
340 Hz	3e-005	12.56
500 Hz	0.00015	

**Measurements:**

Demand: 0.7419 G RMS      2.277 mm pk-pk  
 Control: 0.7449 G RMS      2.401 mm pk-pk

**Channel Measurements:**

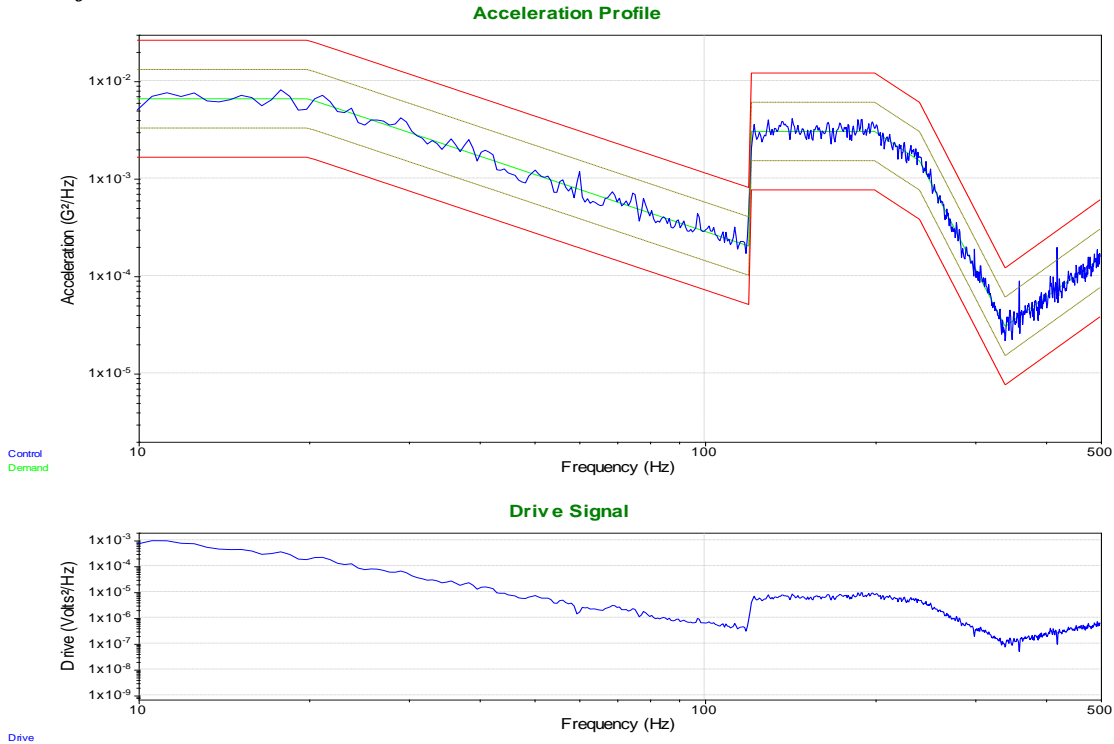
Ch1: 0.7421 G RMS      Ch1 in-band: 0.7438 G RMS  
 Ch2: 0.007164 G RMS      Ch2 in-band: 0.001177 G RMS  
 Ch3: n/a      Ch3 in-band: n/a  
 Ch4: n/a      Ch4 in-band: n/a  
 Drive voltage: 0.08709 Vrms

System gain is 0.1169 Volts/G (Max system gain limit = 5 Volts/G)

Customer: PVV-5028 Voting Machine Vibration  
 Job#: Samples 4 and 6 Y-Axis

Data: C:\VibeSuite\Data\2016-06\2016Jun09-1332-0001.vrd  
 Test: C:\Documents and Settings\User\Desktop\TUV Test Jobs\PVV-5028\Y-Axis Random (Transverse).vrp  
 Data stored on Jun 09, 2016 14:02:28

**End of Test**



**Breakpoint table**

Frequency	G <sup>2</sup> /Hz	dB/Octave
10 Hz	0.0065	0
20 Hz	0.0065	-5.849
120 Hz	0.0002	982.3
121 Hz	0.003	0
200 Hz	0.003	-11.44
240 Hz	0.0015	-33.81
340 Hz	3e-005	12.56
500 Hz	0.00015	

**Measurements:**

Demand: 0.7419 G RMS      2.277 mm pk-pk  
 Control: 0.7506 G RMS      2.42 mm pk-pk

**Channel Measurements:**

Ch1: 0.751 G RMS      Ch1 in-band: 0.7494 G RMS  
 Ch2: 0.008175 G RMS      Ch2 in-band: 0.00115 G RMS  
 Ch3: n/a      Ch3 in-band: n/a  
 Ch4: n/a      Ch4 in-band: n/a  
 Drive voltage: 0.08664 Vrms

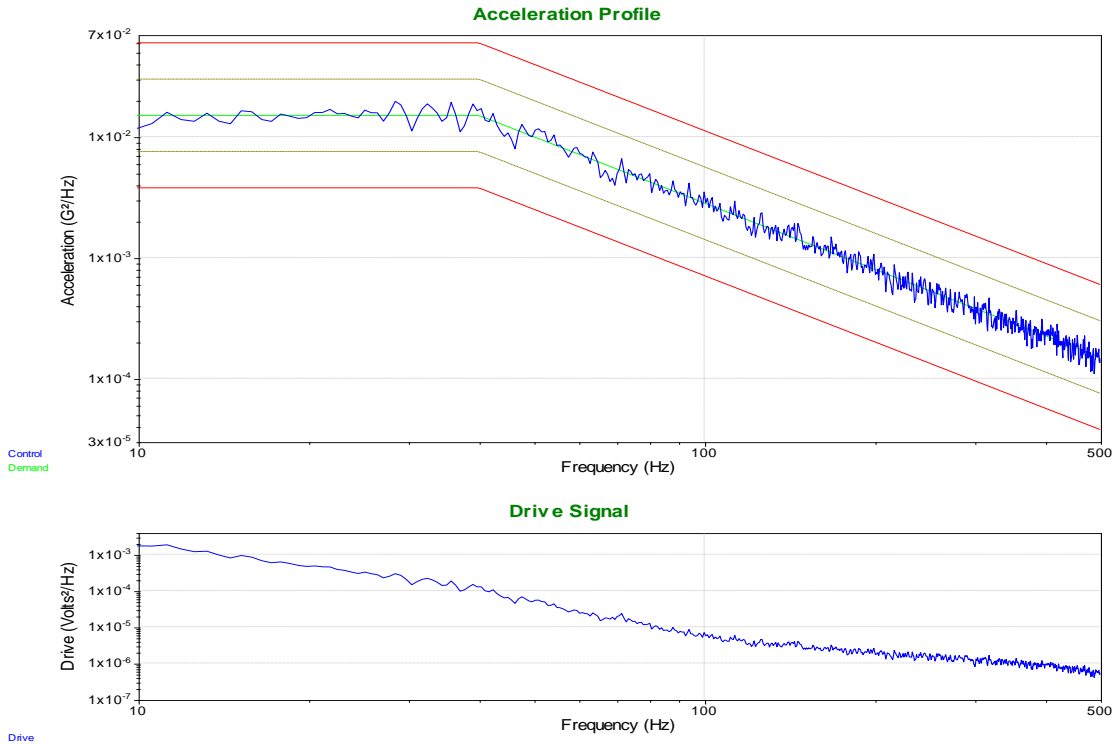
System gain is 0.1154 Volts/G (Max system gain limit = 5 Volts/G)



Customer: PVV-5028 Voting Machine Vibration  
 Job#: Sample 1 Z-Axis

Data: C:\VibeSuite\Data\2016-06\2016Jun10-1057-0001.vrd  
 Test: C:\Documents and Settings\User\Desktop\TUV Test Jobs\PVV-5028\Z-Axis Random (Vertical).vrp  
 Data stored on Jun 10, 2016 11:27:52

**End of Test**



**Breakpoint table**

Frequency	G²/Hz	dB/Octave
10 Hz	0.015	0
40 Hz	0.015	-5.489
500 Hz	0.00015	

**Measurements:**

Demand: 1.046 G RMS      3.528 mm pk-pk  
 Control: 1.049 G RMS      3.645 mm pk-pk

**Channel Measurements:**

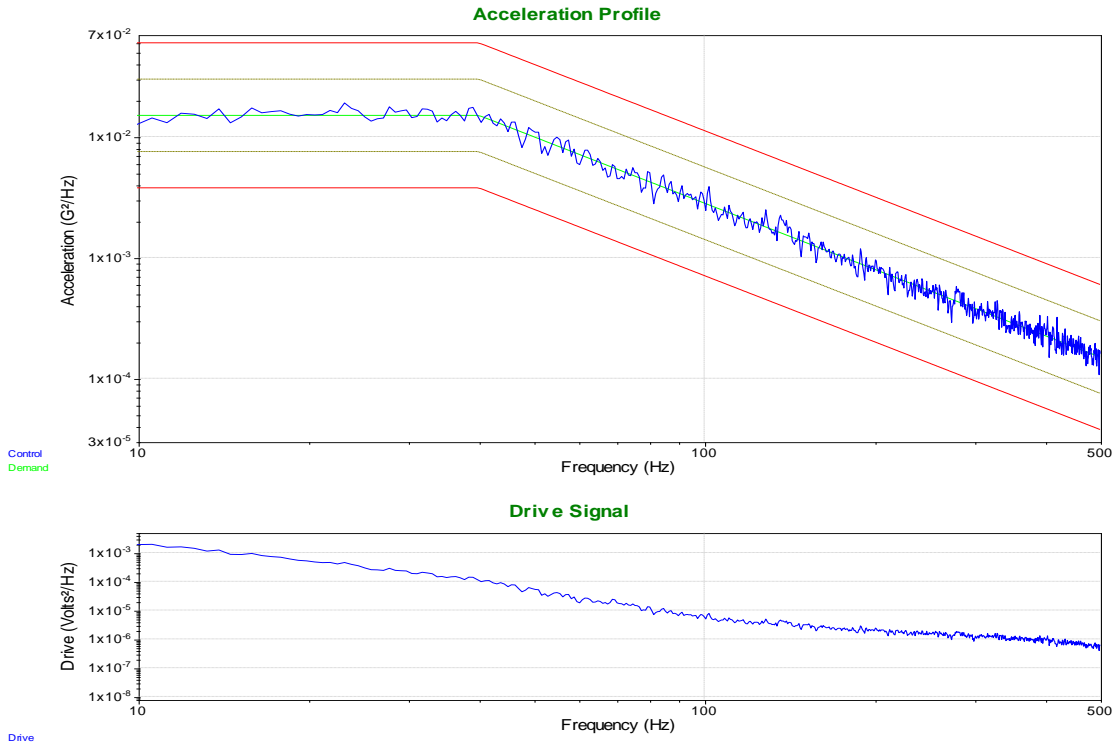
Ch1: 1.053 G RMS      Ch1 in-band: 1.047 G RMS  
 Ch2: 0.005823 G RMS      Ch2 in-band: 0.001206 G RMS  
 Ch3: n/a      Ch3 in-band: n/a  
 Ch4: n/a      Ch4 in-band: n/a  
 Drive voltage: 0.1362 Vrms

System gain is 0.1298 Volts/G (Max system gain limit = 5 Volts/G)

Customer: PVV-5028 Voting Machine Vibration  
 Job#: Samples 2 and 5 Z-Axis

Data: C:\VibeSuite\Data\2016-06\2016Jun10-1459-0001.vrd  
 Test: C:\Documents and Settings\User\Desktop\TUV Test Jobs\PVV-5028\Z-Axis Random (Vertical).vrp  
 Data stored on Jun 10, 2016 15:29:24

**End of Test**



**Breakpoint table**

Frequency	G²/Hz	dB/Octave
10 Hz	0.015	0
40 Hz	0.015	-5.489
500 Hz	0.00015	

**Measurements:**

Demand: 1.046 G RMS                      3.528 mm pk-pk  
 Control: 1.054 G RMS                      3.688 mm pk-pk

**Channel Measurements:**

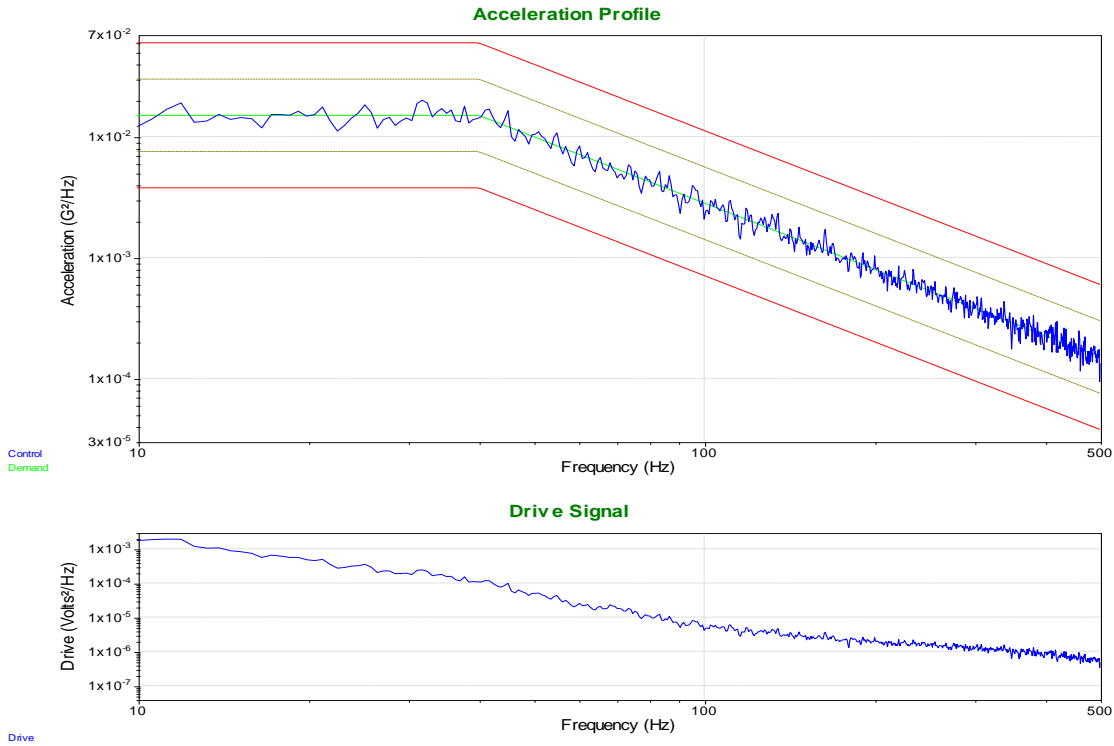
Ch1: 1.053 G RMS                      Ch1 in-band: 1.052 G RMS  
 Ch2: 0.007736 G RMS                      Ch2 in-band: 0.001179 G RMS  
 Ch3: n/a                                      Ch3 in-band: n/a  
 Ch4: n/a                                      Ch4 in-band: n/a  
 Drive voltage: 0.1378 Vrms

System gain is 0.1308 Volts/G (Max system gain limit = 5 Volts/G)

Customer: PVV-5028 Voting Machine Vibration  
 Job#: Sample 3 Z-Axis

Data: C:\VibeSuite\Data\2016-06\2016Jun09-1626-0001.vrd  
 Test: C:\Documents and Settings\User\Desktop\TUV Test Jobs\PVV-5028\Z-Axis Random (Vertical).vrp  
 Data stored on Jun 09, 2016 16:56:27

**End of Test**



**Breakpoint table**

Frequency	G²/Hz	dB/Octave
10 Hz	0.015	0
40 Hz	0.015	-5.489
500 Hz	0.00015	

**Measurements:**

Demand: 1.046 G RMS                      3.528 mm pk-pk  
 Control: 1.048 G RMS                      3.699 mm pk-pk

**Channel Measurements:**

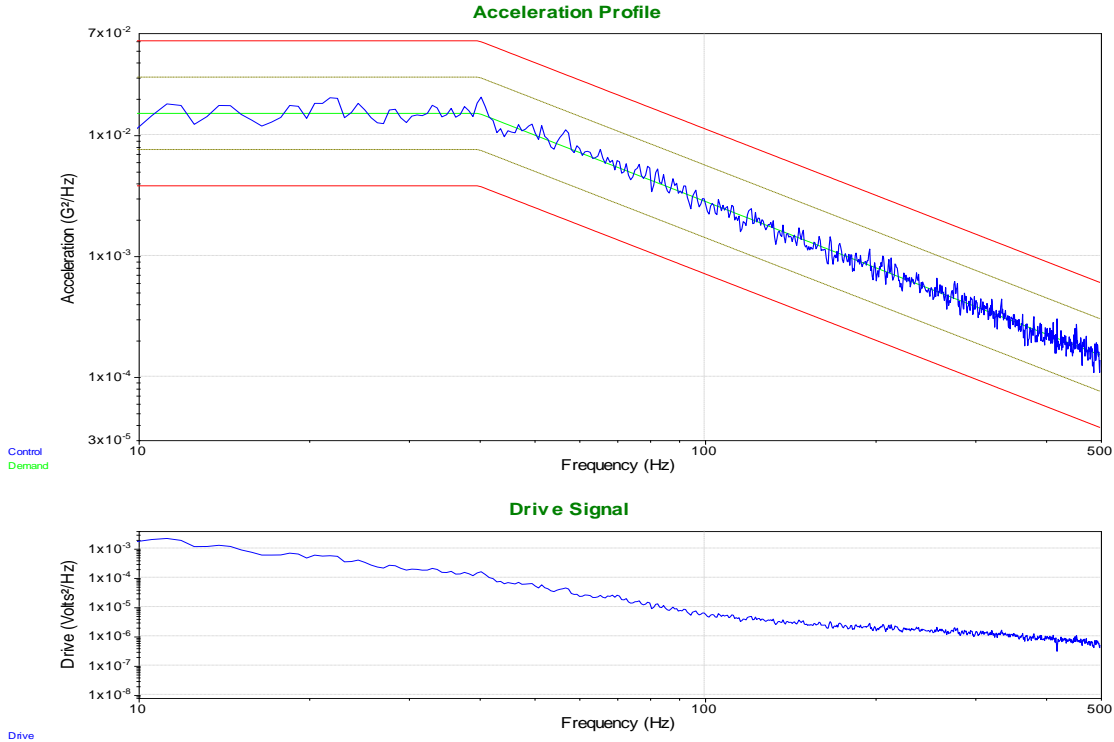
Ch1: 1.052 G RMS                      Ch1 in-band: 1.046 G RMS  
 Ch2: 0.007835 G RMS                      Ch2 in-band: 0.001201 G RMS  
 Ch3: n/a                                      Ch3 in-band: n/a  
 Ch4: n/a                                      Ch4 in-band: n/a  
 Drive voltage: 0.1356 Vrms

System gain is 0.1294 Volts/G (Max system gain limit = 5 Volts/G)

Customer: PVV-5028 Voting Machine Vibration  
 Job#: Samples 1 and 3 X-Axis

Data: C:\VibeSuite\Data\2016-06\2016Jun09-1411-0001.vrd  
 Test: C:\Documents and Settings\User\Desktop\TUV Test Jobs\PVV-5028\Z-Axis Random (Vertical).vrp  
 Data stored on Jun 09, 2016 14:41:34

**End of Test**



**Breakpoint table**

Frequency	G²/Hz	dB/Octave
10 Hz	0.015	0
40 Hz	0.015	-5.489
500 Hz	0.00015	

**Measurements:**

Demand: 1.046 G RMS                      3.528 mm pk-pk  
 Control: 1.059 G RMS                      3.706 mm pk-pk

**Channel Measurements:**

Ch1: 1.047 G RMS                      Ch1 in-band: 1.057 G RMS  
 Ch2: 0.008475 G RMS                      Ch2 in-band: 0.001198 G RMS  
 Ch3: n/a                                      Ch3 in-band: n/a  
 Ch4: n/a                                      Ch4 in-band: n/a  
 Drive voltage: 0.1381 Vrms

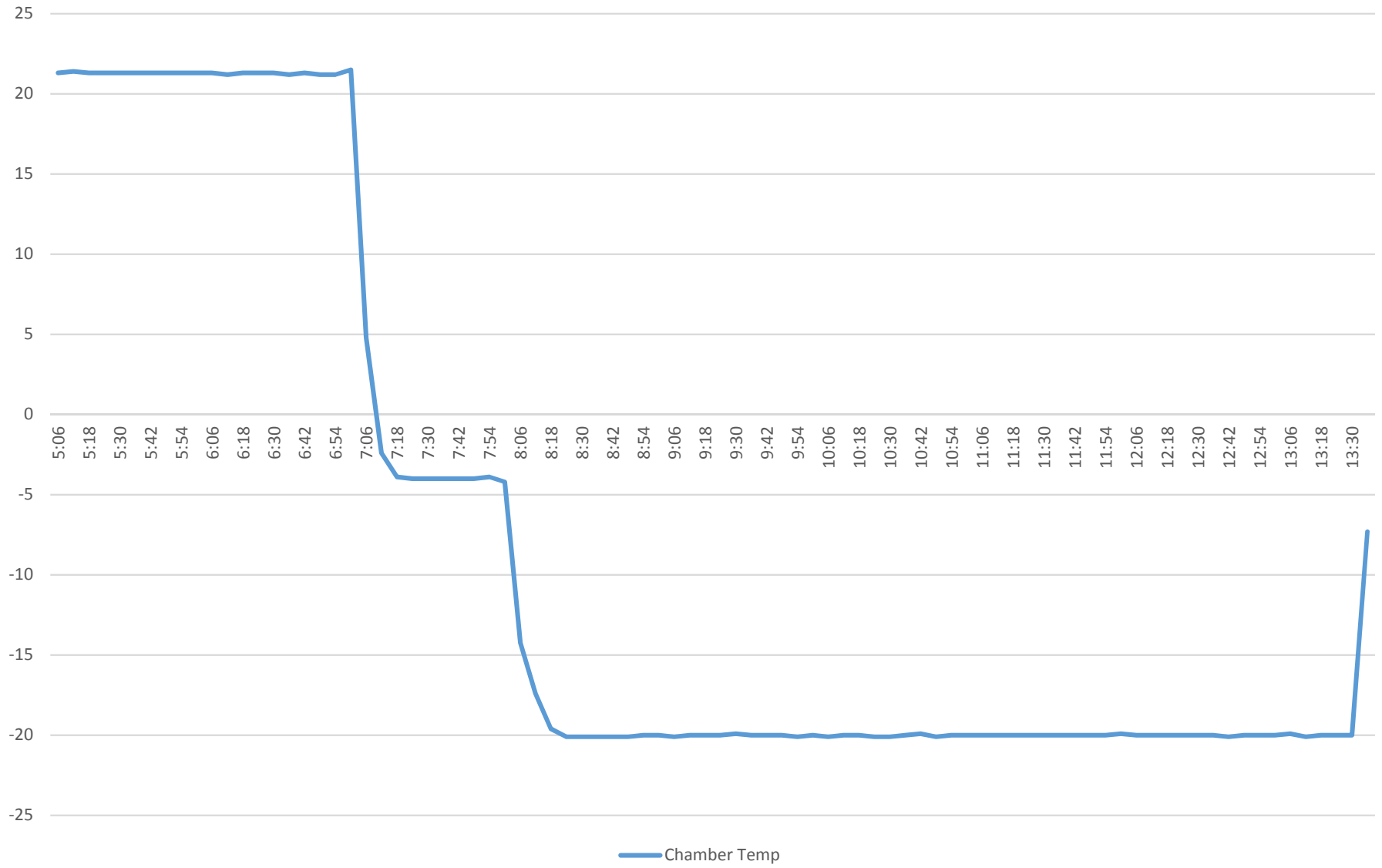
System gain is 0.1304 Volts/G (Max system gain limit = 5 Volts/G)



# **Appendix C: Low Temperature Setup and Data**

(1 page)

Project : Pro-V&V  
Job : PVV-5028  
Description : 4HRS @ -20°C

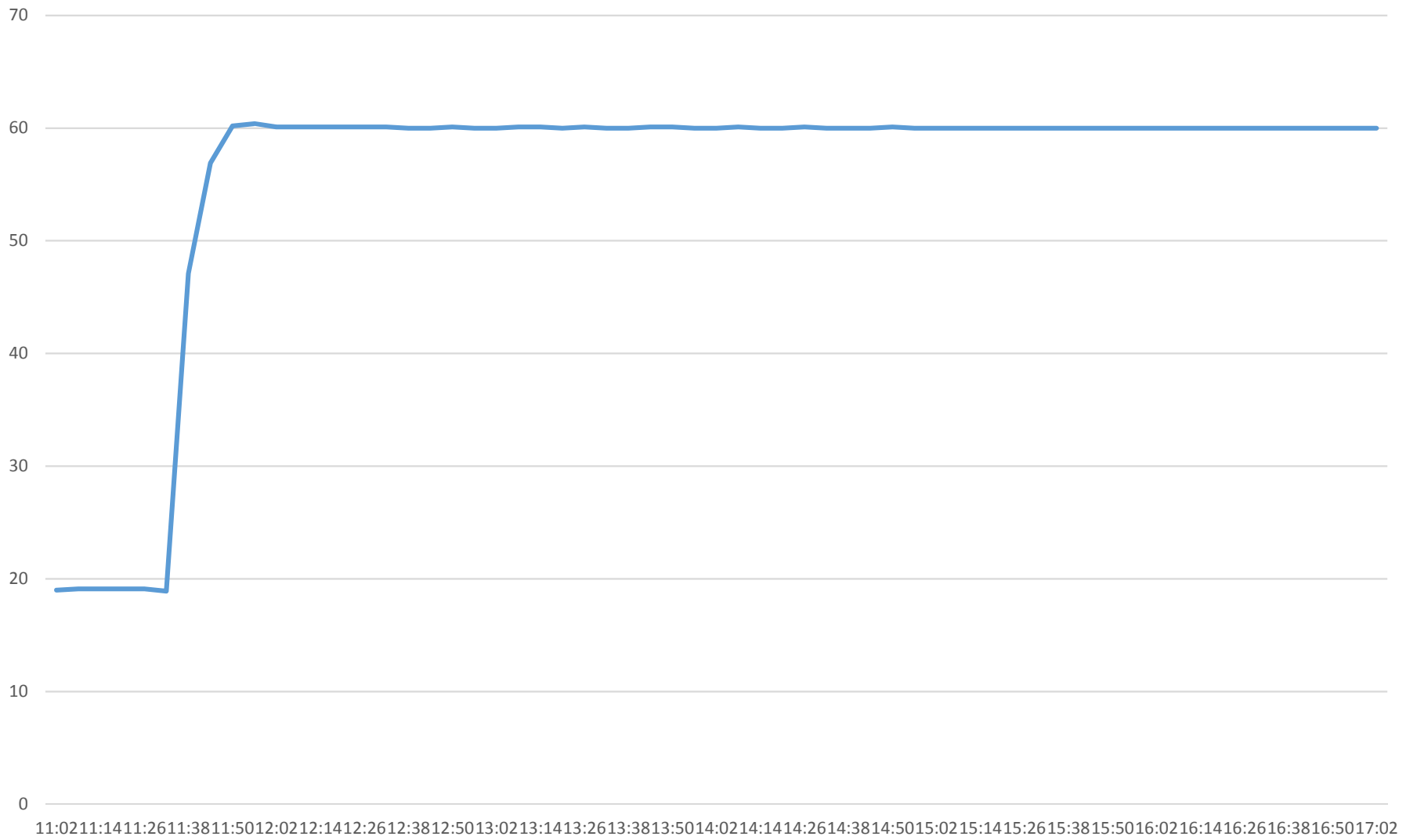




# **Appendix D: High Temperature Setup and Data**

(?? pages)

Project: Pro V&V  
Job : PVV-5028  
Description : 60°C (4 Hours)



— Chamber temp





# **Appendix E: Humidity Setup and Data**

(7 pages)

Technical Form Number	N/a	Revision Number	N/a	Revision Date	25-May-16
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**Humidity Testing - Test Setup Parameters/Diagrams**

Sample Description	Voting Machine Systems
Number of samples	6 Samples
Sample Number(s)	5028-1 (ICP) ,5028-2 (ICX 15"), 5028-3 (Cannon Image LBP151DW) ,5028-4 (HP Laserjet M402dn), 5028-5 (ICX 21") , 5028-6 (ICX Samsung )
Specification	MIL-STD-810D, Military Standard Environmental Test Methods and Engineering Guidelines
Section	Method 507.2 Humidity - Procedure I - Natural (Hot-Humid, Cycle 1)
Test Description	Place the samples in an environmental walk-in chamber, and perform the Hot-Humid (Cycle 1) humidity profile outlined under MIL-STD-810D, Table 507.2-1 (Cycle 1), for a total of 10 cycles (240hrs).
Data to be Provided	Temperature and Humidity Data. Photographs of Setup Photographs of samples before and after test
Requirement	Completion of required humidity cycles. Customer to perform final operational check

**Setup Parameters**

Supply Voltage	N/a (Customer)	Line Resistance (ohms)	N/a (Customer)
Cycles	10	Cycle Duration	24 hours
Operation during Test	Non-operating		
Profile	MIL-STD-810D, Table 507.2-1 (Cycle 1)		

Customer Supplied monitoring Equipment? (Yes or No)	Yes
Customer Supplied Equipment Details and Notes (If Applicable)	Customer to monitor equipment when required

**Setup Photographs**

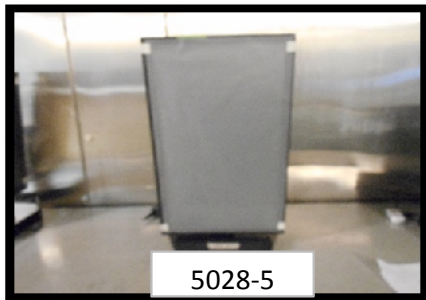






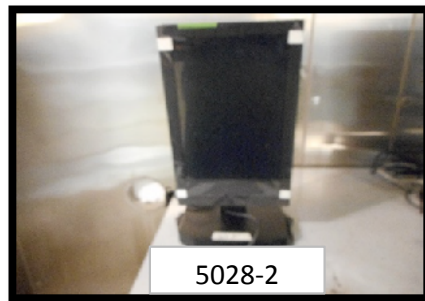


**Humidity Testing - Pre Test Photographs**





**Humidity Testing - Post Test Photographs**







# **Appendix F: Temp-Power Variation Setup and Data**

(5 pages)

Technical Form Number	N/a	Revision Number	N/a	Revision Date	12-May-15
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### Temperature Testing

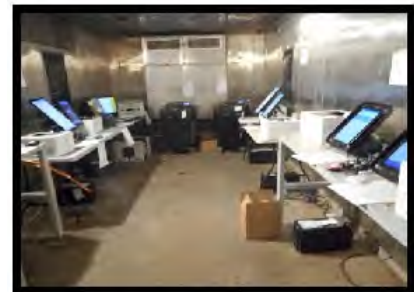
Samples Under Test	5028-1 (ICP) ,5028-2 (ICX 15"), 5028-3 (Canon Image LBP151DW) ,5028-4 (HP Laserjet M402dn), 5028-5 (ICX 21") , 5028-6 (ICX Samsung )
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Specification	Customer email request, sent October 15, 2015 at 11:54 AM		
Supply Voltage	N/a	Line Resistance (ohms)	N/a
Hours	85hrs	Part acclimatization Time (T <sub>s</sub> )	N/a
Exposure Time (T <sub>1</sub> )	12hrs	Hot Temperature (T <sub>max</sub> )	35°C (+/- 3°C)
Ramp Time (T <sub>2</sub> )	1 hr	Cold Temperature (T <sub>min</sub> )	10°C (+/- 3°C)

Customer Supplied monitoring Equipment? (Yes or No)	No
Customer Supplied Equipment Details and Notes (If Applicable)	N/a
Operating Status During Testing	Operational - customer monitored.

Data Acquisition Program & Worksheet: 4TC Logger App.vi			
Measurement Description	Data Aq. System	Data Aq. Freq.	Channel
Temperature Monitoring	DATA-AQ-13	10Hz	TC-01,

#### Pre Test Setup photograph



Technical Form Number	N/a	Revision Number	N/a	Revision Date	12-May-15
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**Temperature Profile**

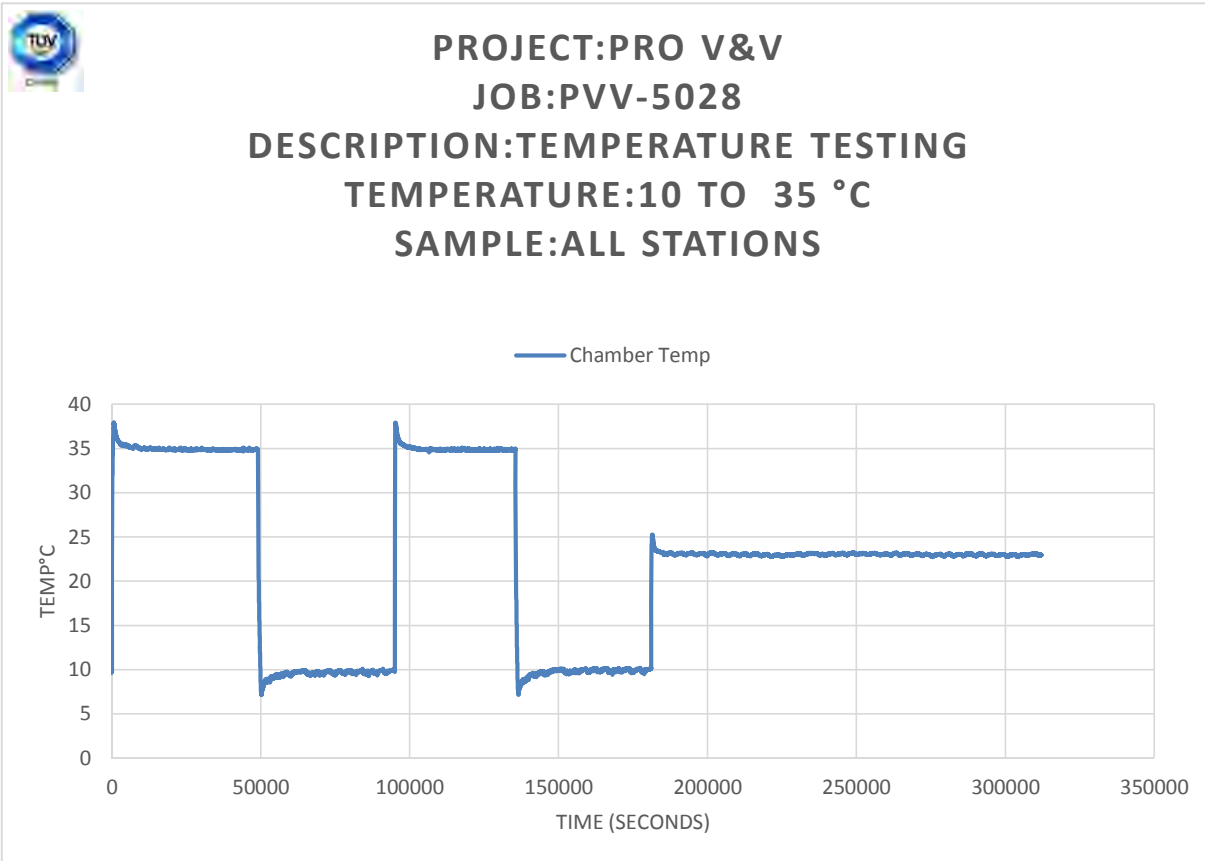
Samples Under Test	5028-1 (ICP) ,5028-2 (ICX 15" ) ,5028-3 (Cannon Image LBP151DW) ,5028-4 (HP Laserjet M402dn) ,5028-5 (ICX 21" ) , 5028-6 (ICX Samsung )
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Specification	Customer email request, sent October 15, 2015 at 11:54 AM		
Supply Voltage	N/a	Line Resistance (ohms)	N/a
Hours	85hrs	Part acclimatization Time (T <sub>s</sub> )	N/a
Exposure Time (T <sub>1</sub> )	12hrs	Hot Temperature (T <sub>max</sub> )	35°C (+/- 3°C)
Ramp Time (T <sub>2</sub> )	1 hr	Cold Temperature (T <sub>min</sub> )	10°C (+/- 3°C)

Customer Supplied monitoring Equipment? (Yes or No)	No
Customer Supplied Equipment Details and Notes (If Applicable)	N/a
Operating Status During Testing	Operational - customer monitored.

Data Acquisition Program & Worksheet:	4TC Logger App.vi		
Measurement Description	Data Aq. System	Data Aq. Freq.	Channel
Temperature Monitoring	DATA-AQ-13	10Hz	TC-01

**Temperature Profile**



**Job Number:** PVV-5028

**Revision Number:** N/a

**Job Description:** Pro V&V Voting Machine Testing

**Revision Date:** 12-May-15

**Setup Checklist - Thermal Shock Testing**

Setup Parameters	Group Numbers									
	5028-1	5028-2	5028-3	5028-4	5028-5	5028-6				
Sample Description - Make sure Sample Matrix updated	Yes	Yes	Yes	Yes	Yes	Yes				
Exposure Time (T <sub>1</sub> ) =12 hours	12hrs	12hrs	12hrs	12hrs	12hrs	12hrs				
Ramp Time (T <sub>2</sub> ) (Automatic, <1 hour)	1hr	1hr	1hr	1hr	1hr	1hr				
Part acclimatization Time (Ts) (N/A)	N/a	N/a	N/a	N/a	N/a	N/a				
Cycle Preset (85 hours)	Yes	Yes	Yes	Yes	Yes	Yes				
Graph of one Hot/Cold Cycle recorded (Yes)	Yes	Yes	Yes	Yes	Yes	Yes				
Required Powering Profile Confirmed (N/a)	N/a	N/a	N/a	N/a	N/a	N/a				
"Fresh eyes" review of test setup	Yes	Yes	Yes	Yes	Yes	Yes				
General Set up Photos taken	Yes	Yes	Yes	Yes	Yes	Yes				
post photo's taken	Yes	Yes	Yes	Yes	Yes	Yes				
Date	27-Jun-16	27-Jun-16	27-Jun-16	27-Jun-16	27-Jun-16	27-Jun-16				
Time	10:30 pm	10:30 pm	10:30 pm	10:30 pm	10:30 pm	10:30 pm				
Gauges	CH-ENV-09 DATA-AQ-13	CH-ENV-09 DATA-AQ-13	CH-ENV-09 DATA-AQ-13	CH-ENV-09 DATA-AQ-13	CH-ENV-09 DATA-AQ-13	CH-ENV-09 DATA-AQ-13				
Initials	P.F	P.F	P.F	P.F	P.F	P.F				



Technical Form Number

N/a

Revision Number

N/a

Revision Date

12-May-15

### Temperature Testing - Post Test Photographs

#### Post Test Photographs

