



**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION**

**APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)**

OFFICE USE ONLY

APPLICATION #: OSP-0683

OSHPD Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: L&H Airco

Manufacturer's Technical Representative: Kevin Castle

Mailing Address: 2530 Warren Drive, Rocklin, CA 95677

Telephone: (559) 301-9913

Email: kevinc@lhairco.com

Product Information

Product Name: Industrial Control Panels

Product Type: HVAC Control Panels

Product Model Number: L&H Airco Temperature Control Panels

General Description: Control panels in light-gauge metal enclosures for buildings and mechanical equipment

Mounting Description: Rigid, Wall Mounted

Tested Seismic Enhancements: None

DATE: 07/28/2021

Applicant Information

Applicant Company Name: Forell/Elsesser Engineers

Contact Person: Christopher Tung

Mailing Address: 160 Pine Street, 6th Floor, San Francisco, CA 94111

Telephone: (415) 248-3047

Email: c.tung@forell.com

Title: Engineer





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California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)

Company Name: FORELL / ELSESSER ENGINEERS, INC.
Name: Marco Scanu California License Number: S4454
Mailing Address: 160 Pine Street, Suite 600, San Francisco, CA 94111
Telephone: (415) 837-0700 Email: scanu@forell.com

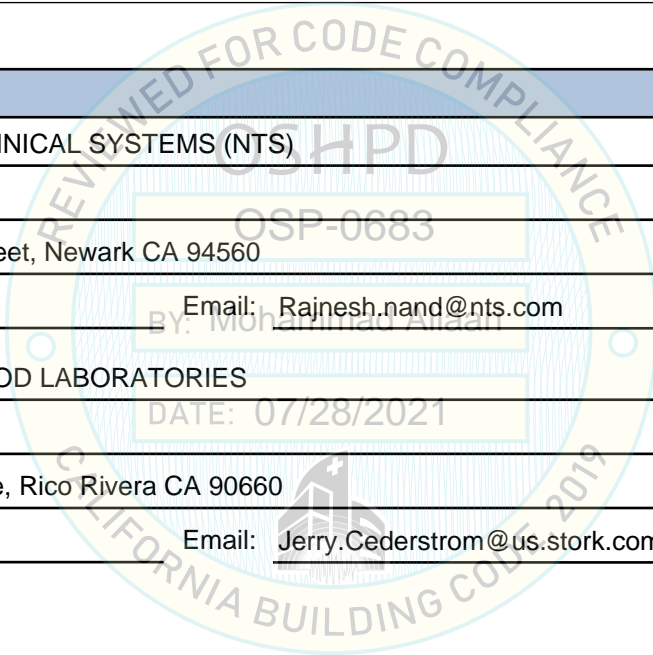
Certification Method

GR-63-Core ICC-ES AC156 IEEE 344 IEEE 693 NEBS 3
 Other (Please Specify): _____

Testing Laboratory

Company Name: NATIONAL TECHNICAL SYSTEMS (NTS)
Contact Person: Rajnish Nand
Mailing Address: 38995 Cherry Street, Newark CA 94560
Telephone: (510) 578-3500 Email: Rajnish.nand@nts.com

Company Name: STORK GARWOOD LABORATORIES
Contact Person: Jerry Cederstrom
Mailing Address: 7829 Industry Ave, Rico Rivera CA 90660
Telephone: (562) 679-4159 Email: Jerry.Cederstrom@us.stork.com





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Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 1.17

SDS (Design spectral response acceleration at short period, g) = 1.56

a_p (Amplification factor) = 2.5

R_p (Response modification factor) = 6

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 1

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

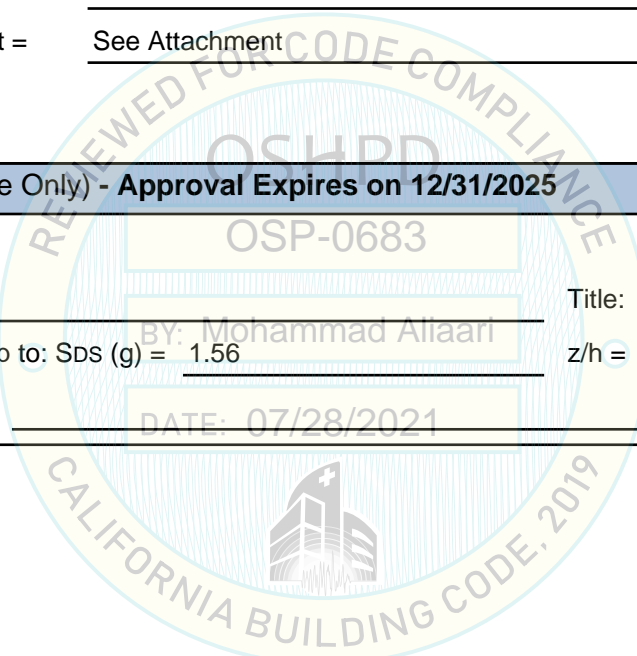
OSHPD Approval (For Office Use Only) - Approval Expires on 12/31/2025

Date: 7/28/2021

Name: Mohammad Aliaari Title: Senior Structural Engineer

Special Seismic Certification Valid Up to: SDS (g) = 1.56 z/h = 1

Condition of Approval (if applicable): DATE: 07/28/2021

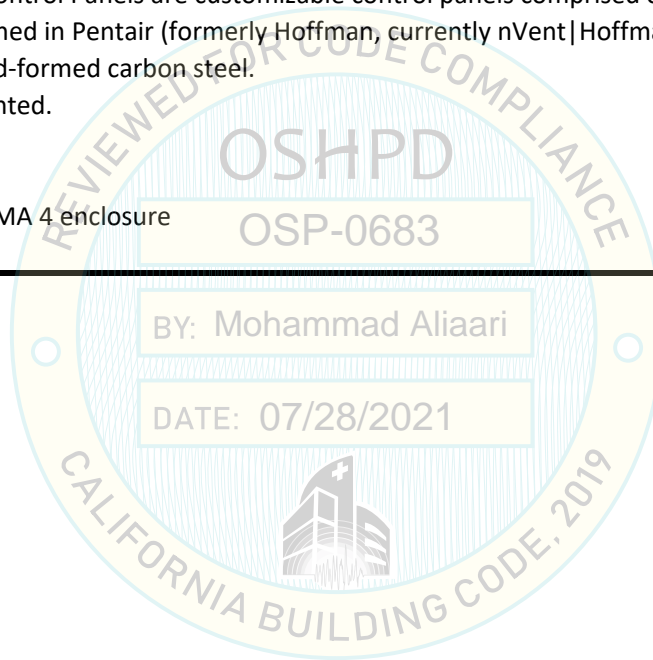


**L&H Airco - Temperature Control Panels
Certified Component Table**

Height	Width	Depth	Max. Service Weight	Notes	Test Status
24"	20"	6.6"	45 lbs	1,2,3	TCP-1
24"	20"	10"	84 lbs	1,2,4	TCP-4
36"	24"	6.6"	96 lbs	1,2,3	TCP-2
36"	24"	8.0"	98 lbs	1,2,6	TCP-5
24"-60"	20"-36"	6.6"-12"	248 lbs	1,2,5	Interpolated
60"	36"	12"	248 lbs	1,2,4	TCP-3

Notes:

1. L&H Airco Temperature Control Panels are customizable control panels comprised of the Certified Subcomponent Table contained in Pentair (formerly Hoffman, currently nVent|Hoffman) enclosures constructed out of 14 ga cold-formed carbon steel.
2. Units are rigidly wall mounted.
3. NEMA 1 rated
4. NEMA 3R rated
5. NEMA 1, NEMA 3R, or NEMA 4 enclosure
6. NEMA 4 rated



**L&H Airco - Temperature Control Panels
Certified Subcomponents Table**

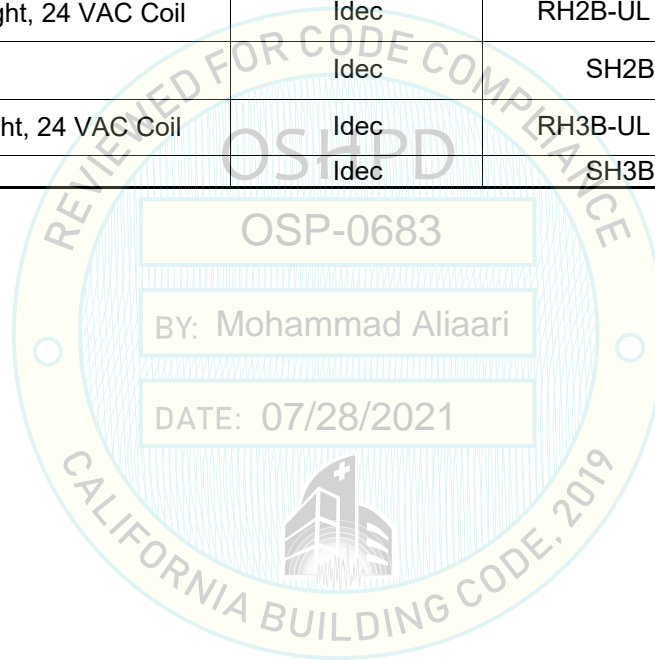
Control Transformers	Manufacturer	Model	Test Status
RIB Transformer, 120-24 VAC, 40 VA	Functional Devices	RIB TR40VA001	TCP-5
RIB Transformer, 120-24 VAC, 100 VA	Functional Devices	RIB TR100VA001	TCP-2
Power Supply	Manufacturer	Model	Test Status
40 VA, 120-24 VAC w/ outlets	Functional Devices	PSH40AB10	TCP-2
2x100 VA, 120-24 VAC w/ outlets	Functional Devices	PSH100A100AB10	TCP-5
24 VAC to 1.5-28 VCD	Functional Devices	PSM24A24DAS	Interpolated
2x100 VA, 120-24 VAC w/ outlets	Functional Devices	PSH100A100AW	TCP-4
Battery Backup w/ Surge Protection	Manufacturer	Model	Test Status
600 VA w/ LCD	Cyber Power	CP600LCD	TCP-1, 2, 4
Ethernet Port & Switch	Manufacturer	Model	Test Status
Elinx 7 Port 10/100 Ethernet w/ 1 Port Single Mode Fiber Switch	B&B Electronics	EIR208-ST	TCP-2
Netgear Etherfast 5 Port 10/100 Switch	NETGEAR	FS-105	TCP-5
Control Modules	Manufacturer	Model	Test Status
Field Controller	Alerton BACtalk	VAV-DD7	Interpolated
Field Controller	Alerton BACtalk	VAV-DD7-E	Interpolated
Field Controller	Alerton BACtalk	VAV-SD2A	Interpolated
Field Controller	Alerton BACtalk	VAV-SD2A-E	Interpolated
Field Controller	Alerton BACtalk	VAV-SD-A	Interpolated
Field Controller	Alerton BACtalk	VAV-SD-E	Interpolated
Field Controller	Alerton BACtalk	VAViH-SD	Interpolated
Field Controller	Alerton BACtalk	VLD-362	Interpolated
Field Controller	Alerton BACtalk	VLC-444	Interpolated
Field Controller	Alerton BACtalk	VLC-444e	Interpolated
Field Controller	Alerton BACtalk	VLC-550	Interpolated
Field Controller	Alerton BACtalk	VLC-550-E	Interpolated
Field Controller	Alerton BACtalk	VLC-651R	Interpolated
Field Controller	Alerton BACtalk	VLC-651R-E	Interpolated
Field Controller	Alerton BACtalk	VLC-660R	Interpolated
Field Controller	Alerton BACtalk	VLC-660R-E	Interpolated

**L&H Airco - Temperature Control Panels
Certified Subcomponents Table**

Field Controller	Alerton BACtalk	VLC-853	TCP-1
Field Controller	Alerton BACtalk	VLC-853-E	Interpolated
Field Controller	Alerton BACtalk	VLC-1188	Interpolated
Field Controller	Alerton BACtalk	VLC-1188-E	Interpolated
Field Controller	Alerton BACtalk	VLCA-1688	Interpolated
Field Controller	Alerton BACtalk	VLC-1600	Interpolated
Field Controller	Alerton BACtalk	VLC-1600-E	Interpolated
Field Controller	Alerton BACtalk	VLC-16160	Interpolated
Field Controller	Alerton BACtalk	VLC-16160-E	Interpolated
Field Controller	Alerton BACtalk	MSTP-REP	Interpolated
Field Controller	Alerton BACtalk	FLG-MODBUS	Interpolated
Field Controller	Alerton BACtalk	VLX	TCP-3
Field Controller	Alerton BACtalk	VLX Platinum	Interpolated
Control Modules	Manufacturer	Model	Test Status
Field Controller	Alerton BACtalk	EXP-1048	TCP-3
Field Controller	Alerton BACtalk	EXP-10120	Interpolated
Field Controller	Alerton BACtalk	EXP-2200	TCP-3
Field Controller	Alerton BACtalk	ACM	TCP-5
Field Controller	Alerton BACtalk	ACM-BATT	TCP-5
Field Controller	Alerton BACtalk	ACM-OC-2X485	TCP-5
Field Controller	Alerton BACtalk	AXM 10-12-0	TCP-5
Field Controller	Alerton BACtalk	AXM 10-4-8	TCP-5
Field Controller	Alerton BACtalk	AXM 22-0-0	Interpolated
Control Module Power Supply	Alerton BACtalk	BCM-PWS 715000000	TCP-2
Control Module Ethernet Module	Alerton BACtalk	BCM-ETH 715000100	TCP-2
Control Module Modem	Alerton BACtalk	BCM-MDM 715000200	TCP-2
Control Module w/ Modbus Gateway	Alerton BACtalk	BCM-MDBS 715000900	Interpolated
Control Module w/ IBEX TUX Trunk	Alerton BACtalk	BCM-TUX 715000400	Interpolated
Control Module w/ 1 MS/TP Segment	Alerton BACtalk	BCM-MS/TP 715000300	TCP-2

**L&H Airco - Temperature Control Panels
Certified Subcomponents Table**

Transducers	Manufacturer	Model	Test Status
Universal Differential Pressure Transducer	Veris	PXULX055 w/ LCD	TCP-1, TCP-3
Universal Differential Pressure Transducer	Veris	PX3ULX05	TCP-5
Relays	Manufacturer	Model	Test Status
SPDT Relay, Indicator Light, 24 VAC Coil	Idec	RH1B-UL AC24V	TCP-1
SPDT Relay Base	Idec	SH1B-05	TCP-1
DPDT Relay, Indicator Light, 24 VAC Coil	Idec	RH2B-UL AC24V	TCP-1, TCP-3
DPDT Relay Base	Idec	SH2B-05	TCP-1, TCP-3
3PDT Relay, Indicator Light, 24 VAC Coil	Idec	RH3B-UL AC24V	TCP-5
DPDT Relay Base	Idec	SH3B-05	TCP-5



L&H Airco - Temperature Control Panels
Description of Unit Under Test – Equipment Sheets

Test Report R002900 Rev A – TCP-1

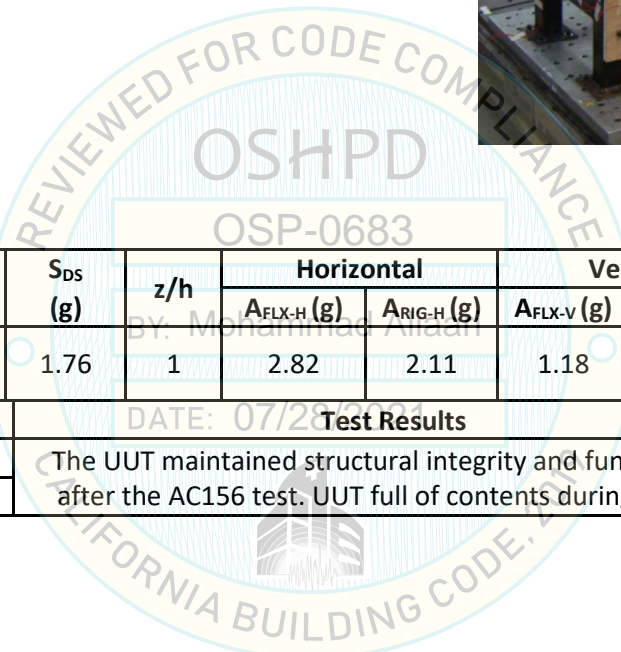
Model Number: TCP-1

TCP-1 Component Panel for FC-1

24”H x 20”W x 6.6”D NEMA 1, 45 lbs

TCP-1 is the bottom component shown in picture

Rigid Wall mounted (4) -1/4” bolts attached to wood panels



Building Code	Test Criteria	S _{DS} (g)	z/h	Horizontal		Vertical	
				A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-H} (g)
CBC 2019	ICC-ES AC 156	1.76	1	2.82	2.11	1.18	0.47
Natural Frequencies			Test Results				
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.				
n/a	n/a	n/a					

Subcomponents	Manufacturer	Part #
Controls Enclosure	Hoffman	A24N20ALP
Field Controller	Alerton BACtalk	VLC-853
Univ. Diff. Pressure Transducer w/ LCD	Veris	PXUL055
RIB Transformer, 40VA	Functional Devices	RIB TR40VA001
Battery Backup w/ Surge Protection, 600VA	Cyber Power	CP600LCD
SPDT Relay, Indicator Light, 24VAC Coil	Idec	RH1B-UL AC24V
SPDT Relay Base	Idec	SH1B-05
DPDT Relay, Indicator Light, 24VAC Coil	Idec	RH2B-UL AC24V
DPDT Relay Base	Idec	SH2B-05

L&H Airco - Temperature Control Panels
Description of Unit Under Test – Equipment Sheets

Test Report R002900 Rev A – TCP-2

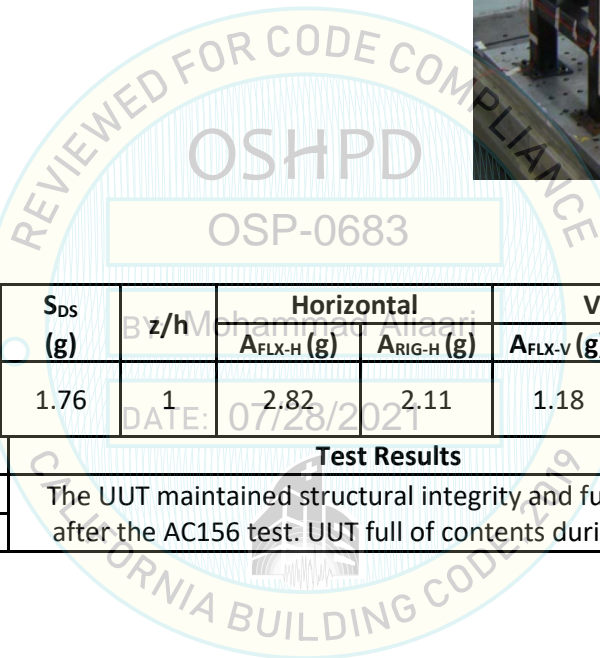
Model Number: TCP-2

TCP-2 Component Panel Global

36”H x 24”W x 6.6”D NEMA 1, 96 lbs

TCP-2 is the top component shown in picture

Rigid Wall mounted (4) – 3/8” bolts attached to wood panels



Building Code	Test Criteria	S _{DS} (g)	z/h	Horizontal		Vertical	
				A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-H} (g)
CBC 2019	ICC-ES AC 156	1.76	1	2.82	2.11	1.18	0.47
Natural Frequencies			Test Results				
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.				
n/a	n/a	n/a					

Subcomponents	Manufacturer	Part #
Controls Enclosure	Hoffman	A36N24ALP
Control Module Power Supply	Alerton BACtalk	BCM-PWS 715000000
Control Module Ethernet w/ MS/TP	Alerton BACtalk	BCM-ETH 715000100
Control Module Modem	Alerton BACtalk	BCM-MDM 715000200
Control Module w/ MS/TP	Alerton BACtalk	BCM-MS/TP 715000300
Elinx 7 Port 10/100 Ethernet, 1 Port Single Mode Switch	B&B Electronics	EIR208-ST
40VA Power Supply 120-24VAC	Functional Devices	PSH40AB10
Battery Backup w/ Surge Protection, 600VA	Cyber Power	CP600LCD
RIB Transformer, 100VA	Functional Devices	RIB TR100VA001

OSP APPLICATION
L&H Airco - Temperature Control Panels
Description of Unit Under Test – Equipment Sheets

Date: 7/14/2021

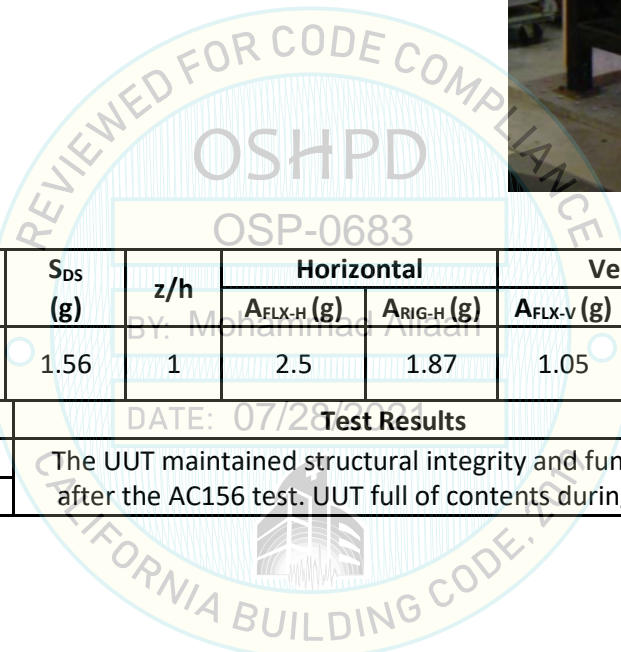
Test Report R002900 Rev A – TCP-3

Model Number: TCP-3

TCP-3 Component Panel for AH-1

60”H x 36”W x 12”D NEMA 3R, 248 lbs

Rigid Wall mounted (4) – 3/8” bolts attached to Steel Frame



Building Code	Test Criteria	S _{Ds} (g)	z/h	Horizontal		Vertical	
				A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-H} (g)
CBC 2019	ICC-ES AC 156	1.56	1	2.5	1.87	1.05	0.42
Natural Frequencies			Test Results				
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.				
n/a	n/a	n/a					

Subcomponents	Manufacturer	Part #
Controls Enclosure	Hoffman	A60R3612HCR
Building Controller	Alerton BACtalk	VLX
Building Controller – Expansion	Alerton BACtalk	EXP-1048
Building Controller – Expansions	Alerton BACtalk	EXP-2200
Univ. Diff. Pressure Transducer w/LCD	Veris	PXUL055
DPDT Relay, Indicator Light, 24VAC Coil	Idec	RH2B-UL AC24V
DPDT Relay Base	Idec	SH2B-05

L&H Airco - Temperature Control Panels
Description of Unit Under Test – Equipment Sheets

Test Report R002900 Rev A – TCP-4

Model Number: TCP-4

TCP-4 Power Panel for AH-1 Power

24”H x 20”W x 10”D NEMA 3R, 84 lbs

Rigid Wall mounted (4) – 1/4” bolts attached to Wood Panel



Building Code	Test Criteria	S _{DS} (g)	z/h	Horizontal		Vertical	
				A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-H} (g)
CBC 2019	ICC-ES AC 156	1.56	1	2.5	1.87	1.05	0.42
Natural Frequencies			Test Results				
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.				
n/a	n/a	n/a					

Subcomponents	Manufacturer	Part #
Controls Enclosure	Hoffman	A24R2010HCR
Battery Backup w/ Surge Protection, 600VA	Cyber Power	CP600LCD
2x100VA Power S. 120-24VAC	Functional Devices	PSH100A100AW

L&H Airco - Temperature Control Panels
Description of Unit Under Test – Equipment Sheets

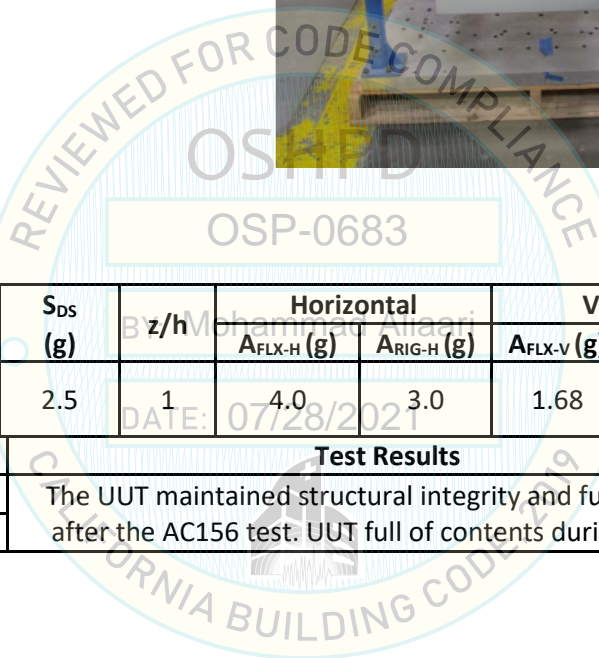
Test Report FR-126887.01-ENV Rev 0 – TCP-5

Model Number: TCP-5

TCP-5 Temperature Control Panel

36”H x 24”W x 8”D NEMA 4, 98 lbs

Rigid Wall mounted (4) – 3/8” x 1 ½ lag bolts
attached to wood panel



Building Code	Test Criteria	S _{DS} (g)	z/h	Horizontal		Vertical	
				A _{FLX-H} (g)	A _{RIG-H} (g)	A _{FLX-V} (g)	A _{RIG-H} (g)
CBC 2019	ICC-ES AC 156	2.5	1	4.0	3.0	1.68	0.7
Natural Frequencies			Test Results				
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.				
n/a	n/a	n/a					

Subcomponents	Manufacturer	Part #
RIB Transformer, 120-24 VAC, 40 VA	Functional Devices	RIB TR40VA001
2x100 VA, 120-24 VAC w/ outlets	Functional Devices	PSH100A100AB10
Netgear Etherfast 5 Port 10/100 Switch	NETGEAR	FS-105
Field Controller	Alerton BACtalk	ACM
Field Controller	Alerton BACtalk	ACM-BATT
Field Controller	Alerton BACtalk	ACM-OC-2X485
Field Controller	Alerton BACtalk	AXM 10-12-0
Field Controller	Alerton BACtalk	AXM 10-4-8
Universal Differential Pressure Transducer	Veris	PX3ULX05
3PDT Relay, Indicator Light, 24 VAC Coil	Idec	RH3B-UL AC24V
DPDT Relay Base	Idec	SH3B-05