



**DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION
FACILITIES DEVELOPMENT DIVISION**

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

OFFICE USE ONLY

APPLICATION #: OSP-0154

HCAI Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: Mircom Group of Companies

Manufacturer's Technical Representative: Mara Cherubin

Mailing Address: 25 Interchange Way, Vaughan, ON L4K5W3

Telephone: (905) 660-4655

Email: mcherubin@mircom.com

Product Information

Product Name: Electrical Control Panels on Life Safety/Critical Branch

Product Type: Fire Alarm & Security Panels

Product Model Number: Fire Alarm Control Panel BBX-1024XT and BBX-1024DS

General Description: Fire Alarm Control Panels with varying enclosures and modules.

Mounting Description: Rigid, Wall Mounted

Tested Seismic Enhancements: None

DATE: 11/06/2023

Applicant Information

Applicant Company Name: Dynamic Certification Laboratories

Contact Person: Kelly Laplace

Mailing Address: 1315 Greg Parkway #109, Sparks, NV 89431

Telephone: (775) 358-5085

Email: kelly@shaketest.com

Title: Business Manager



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

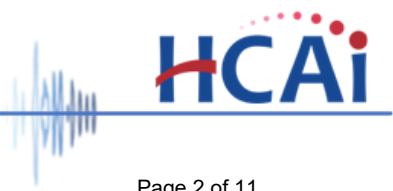
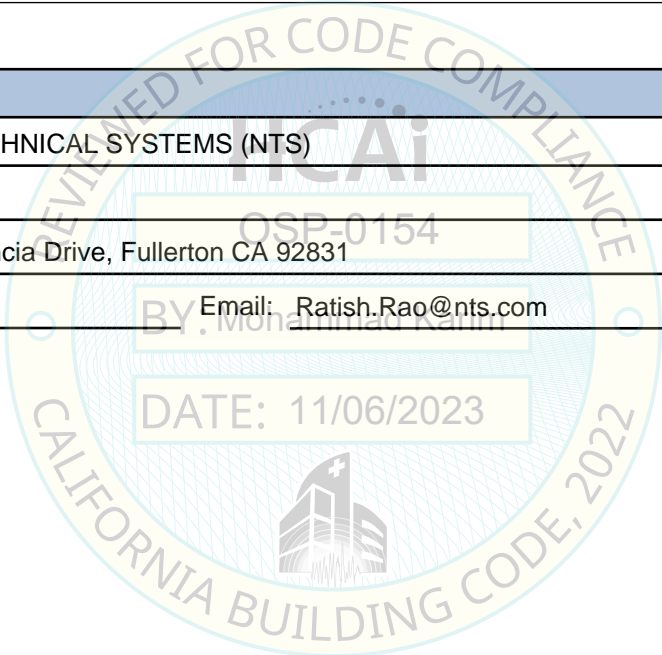
Company Name: THE VMC GROUP
Name: Kenneth Tarlow California License Number: S2851
Mailing Address: 980 9th Street, 16th Floor, Sacramento, CA 95814
Telephone: (832) 627-2214 Email: ken.tarlow@thevmcgroup.com

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: Ratish Rao
Mailing Address: 1536 East Valencia Drive, Fullerton CA 92831
Telephone: (714) 879-6110 Email: Ratish.Rao@nts.com





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Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = 1.85

SDS (Design spectral response acceleration at short period, g) = 2.46

a_p (Amplification factor) = 2.5

R_p (Response modification factor) = 6.0

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

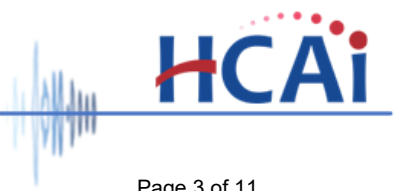
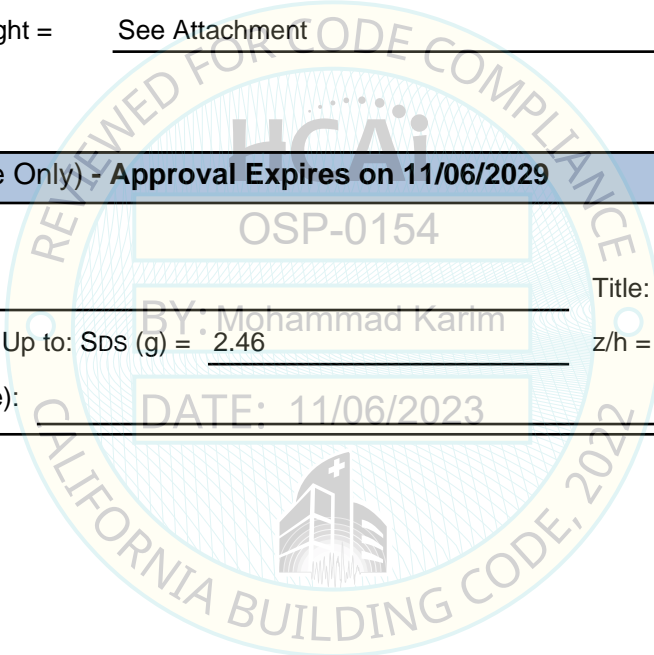
HCAI Approval (For Office Use Only) - Approval Expires on 11/06/2029

Date: 11/6/2023

Name: Mohammad Karim Title: Supervisor, Health Facilities

Special Seismic Certification Valid Up to: SDS (g) = 2.46 z/h = 1

Condition of Approval (if applicable): DATE: 11/06/2023



Special Seismic Certification
Table 1 - Certified Components



DCL Project Number: 76256-2301

Manufacturer: Mircom

Product Line: Fire Alarm Control Panels

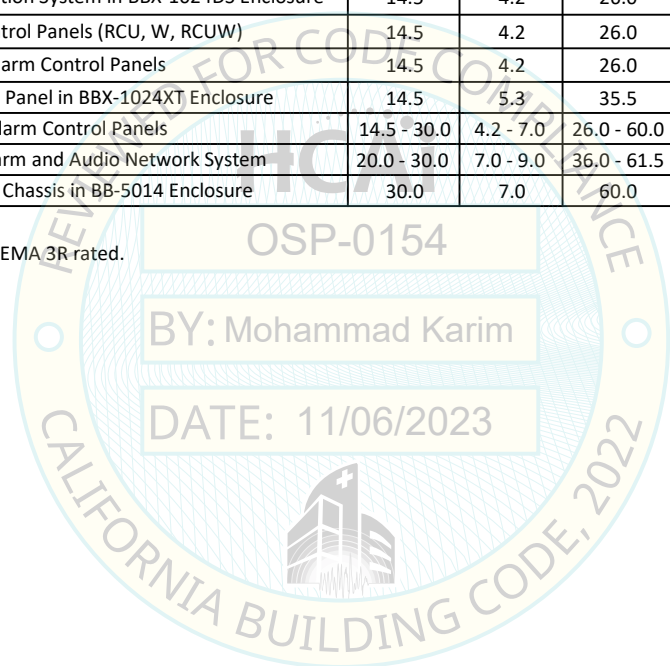
Mounting: Rigid Wall Mount

Certified Seismic Levels: $S_{DS}=2.46\text{ g}$, $z/h=1.0$

Model ¹	Max Dimensions [in.]			Material ²	Max Weight [lb.]	Unit
	Width	Depth	Height			
QBB-5001	24.3	8.0	41.0	16 GA CFS	20	Extrapolated
MR-400	14.5	4.2	21.0	16 GA CFS	42	Extrapolated
FX-400	14.5	4.2	21.0	16 GA CFS	42	Extrapolated
MR-401	14.5	4.2	26.0	16 GA CFS	50	Extrapolated
FX-401	14.5	4.2	26.0	16 GA CFS	50	Extrapolated
FX-2003-6 Compact Main Chassis in BBX-1024 Enclosure	14.5	4.5	26.0	16 GA CFS	52	UUT-3
QX-MINI Emergency Communication System in BBX-1024DS Enclosure	14.5	4.2	26.0	16 GA CFS	52	UUT-2
FX-3500 Fire Alarm Control Panels (RCU, W, RCUW)	14.5	4.2	26.0	16 GA CFS	60	Interpolated
FleXNet Fire Alarm Control Panels	14.5	4.2	26.0	16 GA CFS	60	Interpolated
FX-2000 Fire Alarm Control Panel in BBX-1024XT Enclosure	14.5	5.3	35.5	16 GA CFS	73	UUT-1
FX-2000 Fire Alarm Control Panels	14.5 - 30.0	4.2 - 7.0	26.0 - 60.0	16 GA CFS	85	Interpolated
FleXNet Intelligent Fire Alarm and Audio Network System	20.0 - 30.0	7.0 - 9.0	36.0 - 61.5	16 GA CFS	200	Interpolated
FX-2009S-12 Large Main Chassis in BB-5014 Enclosure	30.0	7.0	60.0	16 GA CFS	234	UUT-4

Notes:

- All enclosures are NEMA 1 and NEMA 3R rated.
- CFS = cold-formed carbon steel.



Special Seismic Certification
Table 2 - Certified Subcomponents



DCL Project Number: 76256-2301

Subcomponent [MFR]	Part Number	Description	Weight [lb.]	Unit
Main Control Unit [Mircom]	FX-2000MNS	Main Network Board	9	Extrapolated
	ECX-0012	Expander Chassis	12	UUT-4
	FX-2003-6DS-16LED	Compact Main Control Unit	15	Interpolated
	FX-2003-6DS	Compact Main Control Unit	15	Interpolated
	FX-2003-12DS	Compact Main Control Unit	15	UUT-3
	PS-2040	Network Fire Alarm and Audio Power Supply	17	Interpolated
	FX-2003-12XTDS	Compact Main Control Unit	20	UUT-1
	QMB-5000N	Integrated Audio Network Control Chassis	22	Interpolated
	FX-2009-12DS	Mid-size Main Control Unit	25	UUT-4
	FX-2017-12ADS	Large Main Control Unit	25	Interpolated
	QX-MINI-BP	Booster Panel	41	Interpolated
	QX-MINI -LOC	Local Operating Console	41	Interpolated
	QX-MINI	Master Panel	41	UUT-2
Enclosures [Mircom]	DOX-1024DS	White Door for UB1024DS Backbox	9	Extrapolated
	DOX-1024DSR	Red Door for UB1024DS Backbox	9	Extrapolated
	BBX-1024XT	Enclosure 26"Hx14.5"Wx4.5"D	13	UUT-1
	CCH-5008	Custom Mounting Kit for BB-5008	15	Interpolated
	CCH-5014	Custom Mounting Kit for BB-5014	15	UUT-4
	DOX-5008M	White Metal Door for BB-5008	17	Interpolated
	DOX-5008MR	Red Metal Door for BB-5008	17	Interpolated
	UB-1024DS	Universal Black Box 26" H x 14.5" W x 4.2" D	18	Interpolated
	FX-400/MR-400	Enclosure 21"Hx14.5"Wx4.2"D	19	Interpolated
	BBX-1024	Enclosure 26"Hx14.5"Wx4.5"D	20	UUT-3
	BBX-1024DS	Enclosure 26"Hx14.5"Wx4.5"D	20	UUT-2
	BB-5008	Lobby Control Centre Wallbox Enclosure 36"H x 30"Wx7"D	21	Interpolated
	BBX-1072ADSR	Backbox Enclosure	24	Interpolated
	BBX-1072A	Enclosure 32.5"Hx25"Wx6.5"D	24	Interpolated
	DOX-5014M	White Metal Door for BB-5014	33	Interpolated
	DOX-5014MR	Red Metal Door for BB-5014	33	UUT-4
	BBX-1072ADS	Backbox Enclosure 32.5"H x 25"W x 6.5"D	52	Interpolated
	BBX-FXMNS	Enclosure	80	Interpolated
BB-5014	Lobby Control Centre Wallbox Enclosure 60"H x 30"W x 7" D	90	UUT-4	
Lead-Acid Batteries [Mircom]	BAT-12V18A	Mircom Sealed Lead-Acid Batteries 12V, 18 AH	12	UUT-2
	BAT-12V26A	Mircom Sealed Lead-Acid Batteries 12V, 26 AH	19	UUT-1
Power Supply [Mircom]	INX-10AC	Internal Booster Power Supply Module	2	Extrapolated
	MD-764	24VDC, 9.5 Amp	3	UUT-1
	MD-1078	Auxiliary 24V Supply	4	UUT-2
Adder Loop and Network Controller Modules [Mircom]	ALC-H16	Hardware Loop Controller Module	< 1	UUT-1, UUT-4
	ALCN-792D	Daughter Board for Quad Loop Controller Module	< 1	Interpolated
	ALC-198S	Single Analog Loop Controller Module	1	Interpolated
	ALC-396S	Dual Analog Loop Controller Module	1	UUT-4
	ALC-480	Dual Loop Controller Module	1	Interpolated
	ALC-636	Dual Loop Controller Module	1	Interpolated
	ALCN-396S	Dual Loop Controller Module	1	UUT-4
	FNC-2000	Fire Network Controller module	2	Extrapolated
	FOM-2000-SP	Fiber Optic Network Adder Module	2	Extrapolated
	ANC-5000	Audio Network Controller Module	2	Extrapolated
	TNC-5000	Telephone Network controller Module	2	Extrapolated
ALCN-792M	Quad Loop Controller Module	2	Extrapolated	

Special Seismic Certification
Table 2 - Certified Subcomponents (Continued)



DCL Project Number: 76256-2301

Subcomponent [MFR]	Part Number	Description	Weight [lb.]	Unit
Adder Hardware Modules [Mircom]	DM-1008A	Eight Initiating Circuit Module	3	UUT-1, UUT-3, UUT-4
	RM-1008A	Eight Relay Circuit Module	3	UUT-3, UUT-4
	SGM-1004A	Four Notification Appliance Circuit Module	3	UUT-4
Graphics and Display Modules [Mircom]	RAM-1016TZDS	16 Zone Remote LED Annunciator	1	Extrapolated
	RAX-1048TZDS	Adder Remote LED Annunciator	2	UUT-1, UUT-4
	RAM-1032TZDS	Main Remote LED Annunciator	2	Interpolated
	RAM-3500-LCD	Remote LCD Annunciator	2	Interpolated
	AGD-048	Graphic Annunciator Adder Driver Module	2	UUT-4
	MGD-32	Graphic Annunciator Driver Module	2	UUT-4
	AGD-048	Adder Graphic Driver Module	2	Interpolated
	MGD-32	Master Graphic Driver Module	2	UUT-1
	DSPL-420	Main LCD Display	2	UUT-1
	DSPL-2440	Graphical Main Display	2	Interpolated
	RAX-LCD-Lite	Remote LCD Annunciator	4	Interpolated
	RAXN-LCD	Remote LCD Annunciator	4	Interpolated
	RAXN-LCDG	Remote Graphic LCD Annunciator	4	Interpolated
	RAX-LCD	Remote Shared LCD Display	4	UUT-4
	Audio Modules [Mircom]	QAA-4CLA	Class 'A' Amplifier Converter Module	< 1
QAA-4CLAS		Class 'A' Amplifier Converter Module	< 1	Extrapolated
QAD-30		Amplifier Module	2	UUT-2
QAZT-5302DS		Paging and Telephone Selector Panel	4	Interpolated
QAA-5415-70		70 Volt Quad 15 Watt Amplifier	5	Interpolated
QAA-5415-25		25 Volt Quad 15 Watt Amplifier	5	Interpolated
QAA-5230S-70/25		25 or 70 Volt Dual 30 Watt Amplifier	5	Interpolated
QAA-5230-70/25		25 or 70 Volt Dual 30 Watt Amplifier	5	Interpolated
QAA-5160-70/25		25 or 70 Volt 60 Watt Amplifier	5	Interpolated
QMT-5302NV		Master Network Telephone Module	7	Interpolated
QMP-5101NV		Master Network Paging Control Module	7	UUT-2
QX-MINI-RM	Remote Microphone	7	UUT-2	
Programmable Modules [Mircom]	IPS-2424DS	Programmable Input Switches Module	1	UUT-4
	RAX-1048TZDS	Programmable Zone LED Annunciator Module	2	UUT-1, UUT-3
	FDX-024	Fan Damper Control Module	2	Interpolated
	FDX-008	Fan Damper Control Module	2	UUT-4
Adder Auxiliary Modules [Mircom]	PCS-100	Power Supply Interface Board	< 1	Extrapolated
	PR-300	Polarity Reversal/City Tie Module	2	UUT-4
	UDACT-300A	Digital Alarm Communicator Transmitter/Dialer Module	2	UUT-1, UUT-3
Transformers [Mircom]	TR-061 29VAC/200VA	Yeo Hung Electronics	5	UUT-3
	TR-063 29VAC/377VA	Yeo Hung Electronics	7	UUT-4
	TR-063 29VAC/377VA	Standex Electronics	7	UUT-1
	TR-063 29VAC/377VA	Signal Transformer	7	UUT-2

Special Seismic Certification

Table 4 - Tested Units



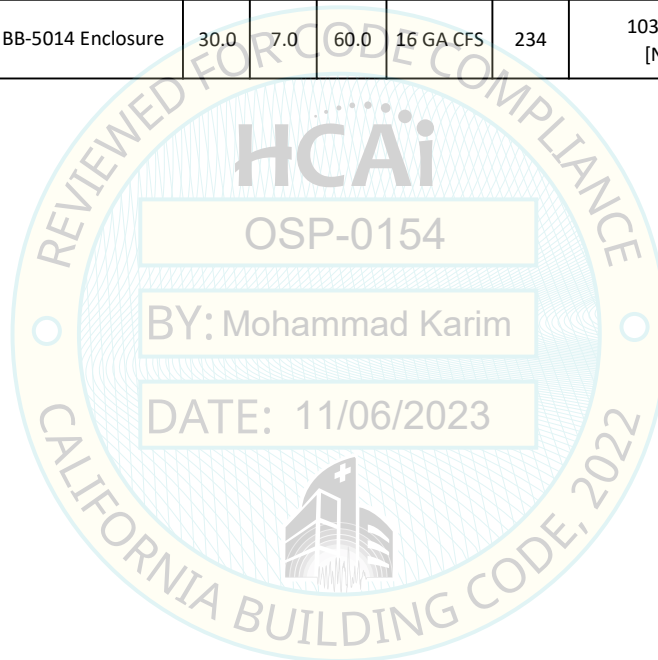
DCL Project Number: 76256-2301

Manufacturer: Mircom

Product Line: Fire Alarm Control Panels

Mounting: Rigid Wall Mount

Model	Dimensions [in.]			Material	Weight [lb.]	Test Report Number [Lab]	Tested Sds level (g) at z/h=1	Unit
	Width	Depth	Height					
FX-2003-6 Compact Main Chassis in BBX-1024 Enclosure	14.5	4.5	26.0	16 GA CFS	52	103-1665 [NTS]	2.50	UUT-3
QX-MINI Emergency Communication System in BBX-1024DS Enclosure	14.5	4.2	26.0	16 GA CFS	52	PR049078 [NTS]	2.50	UUT-2
FX-2000 Fire Alarm Control Panel in BBX-1024XT Enclosure	14.5	5.3	35.5	16 GA CFS	73	PR049078 [NTS]	2.50	UUT-1
FX-2009S-12 Large Main Chassis in BB-5014 Enclosure	30.0	7.0	60.0	16 GA CFS	234	103-1665 [NTS]	2.46	UUT-4



UUT-1 - NTS Test Report PR049078



UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Mircom

Product Line: Fire Alarm Control Panels

Model Number: FX-2000

Product Construction Summary: 16 GA Cold-Formed Carbon Steel

Options / Component Summary: Compact Main Control Unit, Enclosure 26"Hx14.5"Wx4.5"D, Sealed Lead-Acid Batteries, Hardware Loop Controller Module, Eight Initiating Circuit Module, Adder Remote LED Annunciator, Programmable Zone LED Annunciator Module, Master Graphic Driver Module, Digital Alarm Communicator Transmitter/Dialer Module, Standex Transformer. All subcomponents were manufactured by Mircom.

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb.)	Dimensions (in)				Lowest Natural Frequency (Hz)		
	Tested Unit	Depth	Width	Height	Front-Back	Side-Side	Vertical
73	UUT-1	5.3	14.5	35.5	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.50	1.0	1.5	4.00	3.00	1.68	0.68

Unit Mounting Description:

UUT-1 was mounted directly to the rigid wall fixture using (4) 3/8" diameter lag screw bolts.



UUT-1 Overall View

UUT-2 - NTS Test Report PR049078



UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Mircom

Product Line: Fire Alarm Control Panels

Model Number: QX-MINI

Product Construction Summary: 16 GA Cold-Formed Carbon Steel

Options / Component Summary: Master Panel, Enclosure 26"Hx14.5"Wx4.5"D, Sealed Lead-Acid Batteries, Auxiliary 24V Supply, Remote Microphone, Signal Transformer. All subcomponents were manufactured by Mircom.

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb.)	Dimensions (in)				Lowest Natural Frequency (Hz)		
	Tested Unit	Depth	Width	Height	Front-Back	Side-Side	Vertical
52	UUT-2	4.2	14.5	26.0	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.50	1.0	1.5	4.00	3.00	1.68	0.68

Unit Mounting Description:

UUT-2 was mounted directly to the rigid wall fixture using (4) 3/8" diameter lag screw bolts.



UUT-2 Overall View

UUT-3 - NTS Test Report 103-1665



UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Mircom

Product Line: Fire Alarm Control Panels

Model Number: FX-2003-6

Product Construction Summary: 16 GA Cold-Formed Carbon Steel

Options / Component Summary: Compact Main Control Unit, Enclosure 26"Hx14.5"Wx4.5"D, Eight Initiating Circuit Module, Programmable Zone LED Annunciator Module, Digital Alarm Communicator Transmitter/Dialer Module. All subcomponents were manufactured by Mircom.

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb.)	Dimensions (in)				Lowest Natural Frequency (Hz)		
	Tested Unit	Depth	Width	Height	Front-Back	Side-Side	Vertical
52	UUT-3	4.5	14.5	26.0	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.50	1.0	1.5	4.00	3.00	1.68	0.68

Unit Mounting Description:

UUT-3 was mounted directly to the rigid wall fixture using (4) 3/8" diameter lag screw bolts.



UUT-3 Control Interface (Left) and External View (Right)

UUT-4 - NTS Test Report 103-1665



UNIT UNDER TEST (UUT) Summary Sheet

Manufacturer: Mircom

Product Line: Fire Alarm Control Panels

Model Number: FX-2009S-12

Product Construction Summary: 16 GA Cold-Formed Carbon Steel

Options / Component Summary: Adder Remote LED Annunciator, Programmable Input Switches Module, Fan Damper Control Module, Eight Initiating Circuit Module, Four Indicating Circuit Module, Eight Relay Circuit Module, Polarity Reversal/City Tie Module, Hardwire Loop Controller, Dual Analog Loop Controller, Dual Loop Controller, Digital Alarm Communicator. All subcomponents were manufactured by Mircom.

Note: The UUT was operational before and after shaking and was full of operating content during the tests. The structural integrity of the component and attachment system and force-resisting systems was maintained.

UUT Properties

Operating Weight (lb.)	Dimensions (in)				Lowest Natural Frequency (Hz)		
	Tested Unit	Depth	Width	Height	Front-Back	Side-Side	Vertical
234	UUT-4	7.0	30.0	60.0	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds (g)	z/h	Ip	Aflx-H (g)	Arig-H (g)	Aflx-V (g)	Arig-V (g)
CBC 2022	ICC-ES AC156	2.46	1.0	1.5	3.94	2.95	1.65	0.66

Unit Mounting Description:

UUT-4 was mounted directly to the rigid wall fixture using (4) 3/8" diameter lag screw bolts.

DATE: 11/06/2023



UUT-4 Control Interface (Left), Internal View (Middle), and External View (Right)