Town of Needham
Department of Public Works
Public Services Administration Building, 500 Dedham Avenue
Needham, Massachusetts 02492
Telephone (781) 455-7550

ACKNOWLEDGEMENT OF RECEIPT

Release Date	**October 30, 2025**
Bid Title	**On-Call Fire Alarm & Sprinkler Maintenance**
Bid Number	**26DPW167B**
Number of Documents	The Bid Package consists of 2 PDF documents. Returning this form confirms receipt of all the documents.
Pre-Bid Meeting	**N/A**
Questions Due	**November 7, 2025 at 12:30pm**
General Bids are Due	**November 25, 2025 at 1:00pm,** Administration Office of the Department of Public Works located at the Public Services Administration Building, 500 Dedham Ave., Needham, MA, 02492
Please provide the requested information below as acknowledgment that you have received our bid package noted above. It is **recommended** that interested bidders complete this **acknowledgment and return via email to dpwbids@needhamma.gov**. Only by doing this, will the Town be able to provide notification of any addenda or answered questions relating to this bid. **Only those companies or individuals shown on the Distribution Register will receive addenda to this bid. By completing and returning this acknowledgement will ensure you are recorded on the Distribution Register.** Proposals from companies or individuals **not** acknowledging the addenda may be rejected as **not responsive.**	
Name of Company or Individual	
Name / Title of Contact	
Address	
City/Town, State, Zip Code	
Telephone Number	
Fax Number	
Email Address	
Signature	
Date	
Addenda will be posted to the Town's website. Please check the website for addenda before submitting your bid to the Town. Bidders who access the bid package from the Town's website are responsible for checking the website periodically for any addenda that may be issued by the Town.	

On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

Release Date	**October 30, 2025**
Pre-Bid Conference	**N/A**
Deadline for Questions	**November 7, 2025 at 12:30pm**
Sub-bids Due	**November 18, 2025 at 1:00pm** **Director of Administration** **PSAB** **500 Dedham Ave.** **Needham, MA 02492**
Bids Due	**November 25, 2025 at 1:00pm** **Director of Administration** **PSAB** **500 Dedham Ave.** **Needham, MA 02492**

(Advertised in the Hometown Weekly issue of Thursday, October 30, 2025)
(Advertised on the MNPA's website, Thursday, October 30, 2025)
(Published in Central Register issue of Wednesday November 5, 2025)
(Advertised in CommBuys on Thursday, October 30, 2025)

LEGAL NOTICE

Town of Needham
Invitation for Bid (IFB)
Bid # 26DPW167B
On-Call Fire Alarm & Sprinkler Maintenance

The Town of Needham is accepting sealed bids for **On-Call Fire Alarm & Sprinkler Maintenance**. Copies of the Invitation for Bid (IFB) package will be available beginning **October 30, 2025** at the Administration Office of the Public Works Department, 500 Dedham Ave., Needham, MA 02492 during regular business hours, or from the Town's web site www.needhamma.gov/bids.aspx and will be available until submission deadline.

Filed sub bids must be submitted no later than **1:00pm, November 18, 2025** to the Administration Office of the Public Works Department, Town of Needham, 500 Dedham Ave., Needham, MA 02492.

Sealed general bids must be submitted no later than **1:00pm, November 25, 2025** to the Administration Office of the Public Works Department, Town of Needham, 500 Dedham Ave., Needham, MA 02492.

All bids (including filed sub-bids) must be accompanied by a bid deposit in an amount that is not less than five percent (5%) of the value of the bid. LATE BIDS WILL NOT BE CONSIDERED. Bids will be publicly opened after submission deadline. The Town reserves the right to reject any and all bids as determined to be in the best interests of the Town and to waive minor informalities.

Kathleen King
Town Manager
October 30, 2025

26DPW167B
On-Call Fire Alarm & Sprinkler Maintenance
Procurement in Brief

Primary Procurement Contact	**Ashley Ellis, Management Analyst** **781-455-7550**
Contract Manager	**Barry Dulong, Director of Building Maintenance**
Bid Package Available	**October 30, 2025 -** Information and details of bidding requirements may be obtained at the Administration Office DPW, PSAB, 500 Dedham Ave., Needham, MA 02492, or online at the Town's web site http://www.needhamma.gov/bids.aspx
Pre-Bid Meeting	**N/A**
Bid Deposit	**5% bid deposit is required as part of bid**
Deadline for Written Questions	**November 7, 2025 at 12:30pm** By Mail: DPW - 500 Dedham Ave., Needham, MA 02492 By Email: dpwbids@needhamma.gov **Questions are to be clearly labeled as: QUESTIONS - On-Call Fire Alarm & Sprinkler Maintenance, 26DPW167B**
Addenda	If any changes are made to this bid, an addendum will be issued. Addenda will be posted on the Town's webpage and emailed to all bidders on record as having received the bid package.
When and where bids are due	**Filed Sub-bids: 1:00pm, November 18, 2025, Administration Office DPW, PSAB, 500 Dedham Ave., Needham, MA 02492.** **General Bids: 1:00pm, November 25, 2025, Administration Office DPW, PSAB, 500 Dedham Ave., Needham, MA 02492.** **LATE BIDS WILL NOT BE CONSIDERED.**
Where bids will be opened	**Charles River Room, PSAB, 500 Dedham Ave., Needham, MA, 02492, after submission deadline**
Contract Award	**Anticipated January 2026** Approval of Town Manager and Town Counsel is REQUIRED
Contract Length	**This Agreement shall be for a term commencing January 1, 2026 and ending December 31, 2026. This agreement may be renewed or extended for up to 4 years, in one-year terms, at the sole discretion of the Town.**

Upon Award of Contract	
Payment Bond	50% payment bond, if required
Performance Bond	Will NOT be Required
Insurance	Refer to Contract Terms

* Facsimile transmissions for written inquiries must be sent prior to the above date and time deadlines. Any hand delivery or facsimile received after the due date and time will not be addressed. The time/date stamp machine located in the receiving office will govern for the date and time requirements mentioned in the table above and throughout this document. Please allow enough time for hand delivery or facsimile transmissions.
** The time for award may be extended by the Town. The Town reserves the right to change, delay, cancel, or expedite the contract award date. The Bidder agrees that the offer is effective for (a) at least ninety (90) calendar days from the opening date of the bids (b) a contract is executed, or (c) this bid is cancelled, whichever of (a), (b) or (C) occurs first. The Town reserves the right to reject any and all bids as determined to be in the best interests of the Town and to waive minor informalities.

PART 1 – GENERAL CONDITIONS AND SUBMISSION REQUIREMENTS

1.01 Intent

The Town of Needham (hereinafter referred to as the "Town"), acting through its Town Manager, invites highly qualified bidders to submit sealed bids to perform all labor necessary for On-Call Fire Alarm & Sprinkler Maintenance.

All bids are subject to the provisions of M.G.L. Chapter 149. The Town will award the contract to the lowest responsible and eligible bidder as set forth in Section 1.15. The Town of Needham reserves to itself the right to accept or reject any and all bids, or to allow or deny variations from these specifications. Such actions will be deemed to be in the best interest of the Town. Unless sooner rejected or accepted, all bid proposals must be firm and continue in effect for a minimum of ninety (90) calendar days from the date of bid opening.

1.02 Proposed Contract Term

The initial term of this agreement shall commence upon January 1, 2026 and end December 31, 2026. This agreement may be renewed or extended for up to 4 yearly extensions, through December 31, 2027, December 31, 2028, December 31, 2029, and December 31, 2030, respectively, at the sole option of the Town and upon the terms described in the Invitation for Bid. The maximum term of this contract will result in an ending date of December 31, 2030. The successful Bidder must enter into the Form Agreement prepared by Town Counsel (Sample Available Online).

The Town may terminate the Contract at any time upon written notice for any reason including its own convenience or for cause, including but not limited to, failure to perform the work required under the contact, failure to document satisfactorily to the Town amounts being charged, failure to have any necessary local, State or Federal licenses and/or permits, failure to pay any and all required taxes, failure to comply with any local, State or Federal regulations pertaining to services to be provided, failure to promptly correct any performance or lack of performance which conflicts with the Town's use, and failure for satisfactory behavior of all staff and management. In the case of a termination for cause, the Town shall give the Contractor a written notice as provided in the Agreement.

1.03 Pre-Bid Conference and Requests for Interpretation

Refer to Procurement in Brief for details.

Bidders shall promptly raise the issue of any ambiguity, inconsistency, or error, which they may discover upon examination of the bid documents, the work site or any other conditions which apply to the work. Inquiries concerning any part of this Bid shall be directed to the individual(s) listed under the **Procurement in Brief.** Bidders should note that **oral communications are <u>not binding</u> on the Town and only written responses by the Town will be considered.** All requests/questions must be <u>submitted in writing</u>. Questions may be delivered by hand, fax or email as referenced under the **Procurement in Brief** by the deadline. Questions that may be asked during any pre-bid conference should also be sent in writing in order to receive an official response. Requests properly presented that in the opinion of the Town require interpretation, correction, or change in the Bid Documents will result in an issuance of an Addendum to the Bid Documents. Such Addendum shall subsequently become part of the contract. The Town will forward responses to all persons who are on record as receiving the bid package. Questions received after the due date will not be responded to unless the Town determines it is necessary. Bidders, please allow enough time for hand delivery or facsimile transmissions.

1.04 Information About Changes to the Bid (Addenda)

In the event that changes/additions are made to this bid, an addendum will be issued to every person (entity) on record as receiving the bid package. Addenda will be emailed, if an email address was not provided, then it will be faxed. If a fax number was not provided, then the addenda will be mailed. Addenda will also be posted to the website. Please check back on the website for addendums before

submitting your bid to the Town. Bidders may not be notified individually of Addendums.

1.05 Bid Submission

The bidder shall submit his/her proposal upon the bid forms supplied within these specifications. The bidder shall specify the unit prices as requested for each bid item. All bids shall be signed correctly with ink; in order to qualify, the bidder must provide bids for each required item within a section. All bids shall be submitted to the Director of Administration, Town of Needham, Administration Office, 500 Dedham Avenue, Needham, MA 02492. Each bid shall be sealed in an envelope on which is clearly indicated: Name & Address of Bidder, 26DPW167B, On-Call Fire and Sprinkler Maintenance, 12:00pm, April 26, 2023. All submitted bids shall include Invitation for Bids, Bid Information, Bid Scope of Work, and all Addenda issued, and all portions of the BID FORMS must be completed and submitted in order for a submission to be deemed acceptable. Bidders will submit insurance certificates validating current coverage at the time of bid submission. Bids received at the Administration Office after the time of opening of bids designated in the IFB will be returned to the bidder unopened. Bids will be publicly opened and read aloud after the bid due date in the Charles River Room at the Public Services Administration Building, 500 Dedham Avenue, Needham, MA 02492.

1.06 Bid Deposit

All bids must be accompanied by a bid deposit in an amount that is not less than five percent (5%) of the value of the bid. They shall be made payable to the Town of Needham and shall be in the form of certified check, treasurer's or cashier's check issued by a responsible bank or trust company, or a bid bond issued by a surety licensed to do business in the Commonwealth of Massachusetts; and shall be conditioned upon the faithful performance by the principal of the agreements contained in the bid.

1.07 Bid Form

All bids must be made on the attached bid forms.

Bids shall be firm for the duration of the contract. No price adjustments will be allowed. Fuel surcharges or vehicle charges or adjustments will not be allowed. Payment for materials and/or service will be made only after satisfactory performance or all requirements of the specification and upon approval by the Director of Public Works or his designate. The Town reserves the right to accept or reject any or all bids, wholly or in part, and to make the award in the best interest of the Town.

1.08 Bond Requirements

If the value of the contract is over $25,000 or more, the following shall apply:

LABOR & MATERIALS BOND (PAYMENT BOND)

Pursuant to M.G.L. c. 149, § 29, the Contractor shall furnish a payment bond from a surety company qualified to do business under the laws of the Commonwealth of Massachusetts and satisfactory to the Town, in an amount of one half of the total Contract price for payment for labor performed or furnished and materials used or employed therein, when the Contract is executed. The payment bond shall be on the form provided by the Town.

It is distinctly agreed and understood that any changes made in the drawings and specifications for this work, whether such changes increase or decrease the amount of work required, or any change in the manner or time of payments made by the OWNER to the CONTRACTOR, shall in no way void, release or affect the liability and surety on the bond given by the CONTRACTOR.

1.09 Insurance Requirement

Insurance Certificates indicating coverage for general liability, property damage, and workers' compensation as outlined in Sample Agreement available online and must include the Town of Needham

as additionally insured (at time of award). The selected bidder shall take out and maintain during the life of this contract Workers' Compensation Insurance for all employees employed on the site of this project, in a manner and to the extent provided by Chapter 152 of the General Laws and shall provide the Town with written evidence showing compliance with this statute at the time of award.

The selected Bidder shall indemnify and save the Town harmless from and against all claims, suits, damages, and outlays resulting from or by reason of loss, damage, or injury of or to any person or property, wherever located which shall be caused by any action or operation under this agreement.

1.10 OSHA Training

The bidder certifies that all employees to be employed at the worksite shall have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten (10) hours in duration at the time the employee begins work and shall furnish documentation of successful completion of said course with the first certified payroll report for each employee (Chapter 306 of the Acts of 2004).

1.11 DCAMM Certification

DCAMM Certification in the following categories is required for filed sub-bidders for this project: Fire Protection Sprinkler Systems.

DCAMM Certification in the following categories is required for General bidders for this project: Alarm Systems.

1.12 Statement of Compliance

The CONTRACTOR shall submit a Statement of Compliance stating that persons employed by the award recipient are paid in accordance with the provisions of Sections 26 to 27H of Chapter 149 of the General Laws (i.e. "The Prevailing Wage Law").The selected Bidder will not be permitted to either assign or underlet the contract, nor assign either legally or equitably any monies there under, or its claim thereto without the previous written consent of the Town.

1.13 Prevailing Wage Rates

The state prevailing wage law, MGL Chapter 149, Section 27B requires contractors and subcontractors to submit certified payroll records to the Town. Contractors and subcontractors must submit weekly payroll records either by (1) first class mail, or (2) electronic mail. Furthermore, every weekly submittal of payroll records must contain a signed statement by the employer that indicates (1) that the records are correct, and (2) the rate of wages that each worker receives. Please feel free to contact the Department of Labor Standards at (617) 626-6953 if you have any questions. Questions about enforcement of the prevailing wage law may be directed to the Attorney General's Fair Labor and Business Practices Division at (617) 727-3465.

1.14 Duration of Bid Prices

All bids are to remain valid for 90 days after the opening of the bids.

1.15 Contractor Selection

The Town will review all bids and will award the contract to the lowest responsible and eligible bidder based upon the total bid price for Year One.

The Town reserves to itself the right to accept or reject any and all bids, or to allow or deny variations from these specifications.

In the event that there is a **tie bid** between two (2) responsible and eligible bidders, the award of the

contract will be determined by a coin toss. The bidder's whose submission was received earliest shall be assigned "Heads" in the coin toss. In the event that there is a **tie bid** with three (3) or more responsible and eligible bidders, the award shall be made by a draw by lot limited to those bidders. The coin toss/draw by lot shall be scheduled within two (2) business days from when it was determined by the Town to be a tie bid. The bidders involved shall be given an opportunity to attend. The coin toss/drawing shall be witnessed by at least three (3) Town officials. The tie breaker event shall be held at the location of bid submission during regular business hours.

Upon Vendor selection, the Town of Needham will mail to the selected Vendor(s), three (3) contracts to be executed by the Vendor(s) and returned to the Town of Needham with the appropriate insurance certificates. The Town of Needham will then counter execute the three (3) contracts and return one complete contract to the Vendor(s). The Town's Standard Contract is available online. Bidders are expected to review the sample contract "Short Form Agreement". Unless otherwise noted by the Town, the terms and conditions contained therein are **NOT** negotiable.

It is the intention of the Town of Needham not to award a contract under this or any other proposal if the Contractor cannot furnish satisfactory evidence that he/she has the ability and experience to perform this class of work and that he/she has sufficient capital and equipment to enable him/her to prosecute the work successfully and to complete it within the time named in the contract. The Town of Needham reserves the right to reject this or any other proposal or to award the contract as is deemed to be to the best interest of said Town.

For the bid to be considered responsive, the contractor must certify that its Service Department/Technicians are available on a 24-hour, 7 day-a-week basis for all on-call services.

1.16 General Safety, Licenses, & Performance

The contractor's personnel working on this project must hold all necessary licenses and permits to perform the work required under this contract as required by the Town of Needham under the Commonwealth of Massachusetts regulations. The contractor must submit the names and all qualifying materials of the site supervisor that will be assigned to this project. All work will be done in accordance with applicable industry standards, codes and regulations, and/or manufacturer's specifications. Contractor is responsible for providing adequate safety measures during work to ensure protection of life and property. Any Town buildings, grounds and surrounding property damaged by the selected contractor will be restored to its original state, at the cost of the selected contractor.

The contractor shall be informed that there is a thirty (30) day cancellation clause in this contract for improper service. Complaints not rectified within a reasonable length of time from day of notice as determined by the Town may cause the Town to notify the contractor by registered or certified mail that the contract will be cancelled thirty days from the date of the letter. Any defective workmanship shown to be caused by improper or faulty installation shall cause the Contractor to correct, repair and/or replace all material and labor at no cost to the Town. The Contractor will warrant that all workmanship shall be first class and shall be performed by persons qualified and licensed in their respective trades.

Any additional work that is performed beyond this agreement must be approved by the appropriate Town authority. The absence of approval from the appropriate Town authority will be considered a violation of the contract.

1.17 Site Maintenance and Inspection

The selected contractor will be responsible for maintaining the work site in a safe and orderly fashion on a daily basis. The contractor is responsible for the proper securing of all items associated with the project, including but not limited to: debris, tools, material, scaffolding, ladders, etc. The contractor is responsible for the repair or replacement of any item, equipment, space, or area which may be damaged by the contractor during the execution of this project. The contractor is responsible for the removal and disposal of all debris and materials generated from this project.

1.18 Private Property

Before any work is performed on private property, the Contractor must have in his/her possession a RIGHT OF ENTRY form signed by the property owner. The Town may assist the Contractor in obtaining permission.

1.19 Dig Safe Law

Before proceeding with excavation operations, the Contractor shall notify the State of Massachusetts Underground Plant Damage Prevention System (Dig Safe) at 1-888-344-7233, and shall make such supplemental investigations.

1.20 Private Utilities Coordination

Coordination with private utilities is the sole responsibility of the contractor (including natural gas, electricity, telephone, cable, etc.). The contractor shall be responsible for notifying Dig Safe prior to any start of work. Any assistance the Town may offer in coordinating with private utilities shall not absolve the contractor's responsibility to coordinate with private utilities as necessary to accomplish the contract work. The contractor shall be responsible and liable for all damages to the existing utilities and structures.

1.21 Public Utilities Coordination

Coordination with public utilities is the sole responsibility of the contractor (including water, sewer, and drain). The contractor shall be responsible to call the Water, Sewer & Drain Inspectors at least 48 hours prior to the start of work to schedule said inspections at 781-455-7550, Mon.-Fri. 8:30 am - 5:00 pm. The Water Sewer & Drains Inspectors must inspect the work. Any assistance the Town may offer in coordinating the public utilities shall not absolve the contractor's responsibility to coordinate with public utilities as necessary to accomplish the contract work. The contractor shall be responsible and liable for all damages to the existing utilities and structures. At the contractors request the Town will supply water from hydrants for work. The use and operation of Town of Needham fire hydrants is restricted to Town employees only. The Town will set up a fire hydrant connection assembly each day to supply water as needed. The contractor is responsible for proper connection to the hydrant assembly and may operate the click valve only.

1.22 Traffic Controls

The Contractor shall furnish all local Police Officers to direct traffic and to keep the traffic off any part of the roadway in which construction is being carried out on, as, in the opinion of the Engineer are necessary for such purpose. Arrangements for officers shall be made well in advance of the work schedule for each day. If for any reason the Contractor cancels work for that day, and the Needham Police Department is not given advance notice, the Contractor will be responsible for that officer's wages. If the contractor has performed work that has not been accepted by the town and has to be redone to meet the specification, then the contractor is responsible for the expense of the police details due to poor workmanship or warrantee issues. Except in the instance above, the Owner will reimburse the Contractor for all other police details. The contractor must submit payments directly to the Needham Police Department or other police department's that have supplied officers to the job site and supply copies of invoices showing invoice has been paid to the Department of Public Works as proof of payment.

1.23 Material Disposal

The Contractor, at no additional cost to the Town, shall dispose of all material that has been removed from each location.

1.24 Quantities

Unless otherwise stated, the quantities set forth herein are ESTIMATES ONLY. Any quantities indicated on

the Bid Price Form or elsewhere in the bid package are estimates only and are given solely as a basis for the comparison of bids. The Vendor shall have no claim for additional compensation, or refuse to do the work called for, or provide the requested items, by reason of the actual quantities involved being greater or lesser by any amount than those called for in the bid.

1.25 Subcontracting

The Contractor shall keep the work under his personal control and shall not assign by power of attorney or otherwise, or sublet the work or any part thereof, without the previous written consent of the Owner. Should the Contractor require the services of one or more sub-contractors, the Contractor shall submit to the Owner, at the time of submittal of bids, the name and references for the sub-contractor(s) for review and approval by the Owner. Said sub-contractor(s) shall not begin any work or bring any equipment, etc., onto the site until such approval is given. Under no circumstances shall the Contractor sub-contract more than forty percent of the work on the project. The Contractor shall be responsible for the operations of any sub-contractor(s) and the sub-contractor shall be subject to the directions of the Contractor's Project Supervisor.

1.26 Invoices & Reporting

Upon verification that the work has been completed, invoices must be sent to Town of Needham, Administration Division, Department of Public Works, 500 Dedham Avenue, Needham, MA 02492 or dpwadmin@needhamma.gov. Each bill shall contain a cover sheet listing the broken-out labor and materials cost, and back-up documents including materials costs, and other relevant information. Certified payroll will be required. Invoices shall not be processed for payment until the above information is provided in a format acceptable to the Director of Administration or their designee. Invoices for on-call services must specify the cost of labor, hours worked, and cost of materials for each project. Invoices shall be itemized by units and by location or project.

1.27 Payment

Payment shall be made on the amount of work performed based upon the unit prices placed on the bid forms. Payment shall be made upon submission of an invoice and acceptance of the work by the Director of Public Works, or his designated agent. The payment of these amounts shall be considered full and complete payment for all labor, material, and equipment necessary, including traffic control, to perform the specified work.

The Town will not be responsible for payment of any charges not itemized to the Town’s satisfaction. Pre-payment is NOT allowed. Invoices must include the Town’s purchase order number.

Invoices for additional services must include the date and times of the work, the type of the services performed; the number of hours or units to be charged, and the name of the person who authorized the work.

1.28 CORI/SORI

See Article 30 of Sample Agreement.

1.29 Supplemental Equal Opportunity Anti-Discrimination & Affirmative Action Program

This contract is subject to the Supplemental Equal Opportunity Anti-Discrimination and Affirmative Action Program (EEO/AA) provisions attached to the Project Manual.

1.30 Submission Requirements

Quality Requirements

- ✓ **All bidders must furnish proof of a minimum of three (3) continuous years in business.**
- ✓ **All bidders must provide owner contact information for five (5) projects of similar nature and scope completed within the last five (5) years.**
- ✓ The bidder shall submit their proposal upon the bid forms supplied within these specifications. The bidder shall specify the unit prices as requested for each bid item. All bids shall be signed correctly with ink; in order to qualify, the bidder must provide bids for each required item within a section.

Submission Requirements

1. The bid is to be submitted and addressed as follows: Director of Administration, PSAB, 500 Dedham Ave., Needham, MA 02492.

2. The bid is to be clearly marked 26DPW167B, On-Call Fire Alarm & Sprinkler Maintenance.

3. Bidder must acknowledge all addenda related to this IFB, if any.

4. Bidder must submit a completed **Bid Form A1: Filed Sub-Bid Sheet/Bid Form A2: General Bid Sheet** (depending on if a sub-bidder or general bidder) or an exact copy, signed by an individual authorized to negotiate for and contractually bind the Bidder. Bidder MUST ALSO submit a completed **FORM FOR SUB-BID/FORM FOR GENERAL BID** using the forms provided in Attachment A. All prices must be reflective of all costs for delivery. No price adjustments will be allowed. Fuel surcharges or vehicle surcharges or adjustments will not be allowed.

5. Bidder must submit a completed **Bid Form B: Bidder Information Response** form.

6. Bidder must submit a completed **Bid Form C: Authentication Form.**

7. Bidder must submit a signed **Bid Form D: Certificate of Good Faith.**

8. Bidder must submit a completed **Bid Form E: Certificate of Compliance with Massachusetts Tax Laws** or Certificate of Good Standing issued by the Massachusetts Department of Revenue.

9. Bidder must provide the required number of references. For each, provide the following: a contact person and title, customer's name, address, telephone number, email, and a brief description of the actual services provided (sample format included in bid package as **Bid Form F**).

10. Bidder must submit a completed **Bid Form G: Certificate of Authority** (attached) or **Corporate Resolution;** if applicable.

11. Bidder must submit all other required forms as included in **Attachment A**.

12. Bidder must submit a completed **DCAMM Certificate of Eligibility and an Update Statement.**

13. Bids must be received and time stamped no later than the deadline stated in the **Procurement Schedule** (Where and When Bids are Due). LATE BIDS WILL NOT BE CONSIDERED.

14. A **Bid Deposit** is required.

15. Any additional requirements as described in the Scope of Service or the Technical Specifications.

The Town reserves the right to reject any and all bids as determined to be in the best interests of the Town and to waive minor informalities.

PART 2 – SCOPE OF WORK

2.01 General

The Town of Needham is seeking the services of an on-call fire alarm and sprinkler maintenance servicer to commit to annual fire alarm and sprinkler maintenance in addition to any on-call maintenance that may need to be done.

2.02 Hours of Work

Normal hours of work shall be between the hours of 7:00 am and 5:00 pm, Monday through Friday, unless otherwise specified. No work shall be performed on Saturdays, Sundays, Holidays, or any other times other than normal hours of work without express permission from the Director of Public Works or their designee. All work in this contract will be identified by the Director of Public Works and shall be constructed in accordance with Town specifications or as directed by the Director.

2.03 Response Time

The contractor must designate an employee or contact with the authority to speak on behalf of the contractor for initiating requests for service. The Town will select a designee or designees to initiate work on behalf of the Town.

A request for service will be generated in writing via email for work as scheduled. For emergency work, the first point of contact may be a phone call with a follow up written request via email.

Contractor must respond to emergency calls within two (2) hours after receipt of notification. Contractor must respond to on-call immediate response calls within forty-eight (48) hours after receipt of notification. Contractor must respond to scheduled work within forty-eight (48) hours after receipt of notification and schedule work to be completed within two (2) weeks.

Failure to meet these obligations may subject the contractor to penalties of $500 per business day for noncompliance. Failure to meet these objectives may subject the contractor to loss of contract and the contractor may assess the difference between their bid price and the next lowest responsible and eligible bidder.

2.04 Supervision

The contractor shall designate a project supervisor in writing upon a receipt of awarded contract. Any change in supervision shall require the prior approval in writing of the Director of Public Works or his designee. Failure of the contractor complying with this requirement may result in the Town, after one written warning, and at its sole option, charging a penalty of $200 per day until an approved project supervisor is on site. The project supervisor shall be present at each project during the execution of work. Once project has begun, the contractor shall pursue and coordinate all work in a continuous and diligent manner until all work is completed, unless otherwise directed by the Director of Public Works or his designee. The contractor shall employ a minimum of 2 competent workers on site daily. Failure to comply with this requirement may result in a penalty of $200 per business day of noncompliance as determined by the Director of Public Works.

2.05 Specifications

<u>Fire Alarm Systems (Quarterly Preventative Maintenance, Annual Inspections)</u>

The contractor will furnish all materials, equipment, and labor to test and maintain all equipment present at each specified site. All testing will be completed in accordance with the most recent edition of NFPA 72-National Fire Alarm Code.

Associated with the quarterly maintenance and testing cost is the standby time required for the selected vendor to be present when all annual elevator testing takes place. According to state law, fire alarms in elevators are to be tested annually when the elevator is tested by the Massachusetts Public Safety Department. The selected contractor will carry this standby cost, in their quarterly maintenance cost. There are a total of fifteen (15) buildings in the Town of Needham which have elevators cars. The selected vendor will be contacted by the Town's elevator company and notified of the time and date of elevator testing for each building.

Testing must be performed in one (1) 100% test(s) per year on automatic initiating devices that include: heat, smoke, duct smoke, manual pull stations, beam/optical smoke detectors & sensors, and any other relevant equipment found at the site. Testing must be performed in one (1) 100% functional test(s) of notification appliance excluding a Decibel level test. Fire Protection/Sprinkler System Initiating Devices that are connected and supervised by the Fire Alarm system will be tested electronically.

The contractor will submit a written report certifying that such tests and inspections have been completed documenting any deficiencies found which may require corrective action. This report will be submitted to the applicable department. Any additional work performed outside the scope of this agreement or any components which are recommended to be repaired or replaced by the contractor, will require separate reporting as well as separate invoicing. No work, parts, or supplies, except those herein, are included under this agreement.

For buildings managed by the Building Maintenance Division, should call-back service or repairs be required, this work may be provided and invoiced in addition to the contract price, and only upon approval of the Building Maintenance Division. For buildings managed by the Department of Public Works, Water, Sewer, and Drains Division, if call-back service or repairs are required, this work may be provided and invoiced in addition to the contract price, and only upon approval of the Water, Sewer, and Drains Division.

For the bid to be considered responsive, the contractor must certify that its Service Department/Technicians are available on a 24-hour, 7 day-a-week basis.

Approximate inventory of systems is listed below:

	Counts							
Location	**Fire Alarm Control Panels**	**Annunciators**	**Smoke Detectors**	**Heat Detectors**	**Duct Smokes**	**Sprinkler Flow Systems**	**A/V**	**Pull Stations**
Williams School 585 Central Ave.	2	5	92	1	14	145	15	
Broadmeadow School 120 Broad Meadow St.	1	1	85	62	12	8	129	29
Eliot School 135 Wellesley Ave.	1	1	114	18	14	12	114	35
Hillside School 28 Glen Gary Rd	1	1	138	35	14		138	32
Mitchell School 187 Brookline St.	1	1	7	65	8		53	10
Newman School 1155 Central Ave.	1	3	216	8	11	4	200	43
Pollard School 200 Harris Ave.	1	2	215	34	16		327	56
Needham High School 609 Webster St.	1	2	289	72	27	21	407	83
High Rock School 77 Ferndale Rd.	1		75	26	12	13	115	18
Emery Grover 1330 Highland Ave.	1		6					3
Town Hall 1471 Highland Ave.	1	1	70		5	2	83	18

Library 1139 Highland Ave.	1	1	5	14		12	25	16
PSAB 500 Dedham Ave.	1		20	2	1		40	1
Center at the Heights 300 Hillside Ave.	1	1	6	3			25	13
Transfer Station 1471 Central Ave.	1							4
Memorial Park 92 Rosemary St.	1	5	10				33	6
Rosemary Recreation Complex 178 Rosemary St.	1	1	7	2			51	6
Public Safety Building **99 Chestnut St.**	***Plans attached.**	***Plans attached.**	***Plans attached.**	***Plans attached.**	***Plans attached.**	***Plans attached.**	***Plans attached.**	***Plans attached.**
Fire Station #2 **707 Highland Ave.**	***Plans attached.**	***Plans attached.**	***Plans attached.**	***Plans attached.**	***Plans attached.**	***Plans attached.**	***Plans attached.**	***Plans attached.**
Charles River Water Treatment Plant (location to be given to chosen vendor)	1	1	4	3	4	4	2	13
West St. Pump Station (location to be given to chosen vendor)	1			4				2
Great Plain Pump Station (location to be given to chosen vendor)	1		3	6			6	5
Reservoir B Pump Station (location to be given to chosen vendor)	1		2		2		7	4
St. Mary's Pump Station (location to be given to chosen vendor)	1	1	6			4	12	6
6 Bay (location to be given to chosen vendor)	1		3				4	2
Jack Cogswell Building (location to be given to chosen vendor)	1	1		3		5	13	4
Kendrick Street Pump Station (location to be given to chosen vendor)	1		5				4	4

Sprinkler Systems (Annual Preventative Maintenance, Annual Inspections)

The contractor will furnish all materials, equipment, and labor to test and maintain all equipment present at each specified site. All testing will be completed in accordance with the most recent edition of NFPA 25-National Fire Alarm Code.

For a Wet System testing must be performed in one (1) 100% flow test(s) per year on the wet sprinkler systems and one (1) 100% function and visual test(s) on the fire pump. For a Dry System testing must be performed in one (1) 100% function and visual test(s) on the fire pump.

The contractor will submit a written report certifying that such tests and inspections have been completed documenting any deficiencies found which may require corrective action. This report will be submitted to the Town of Needham, Building Maintenance Division, 500 Dedham Avenue, Needham, MA 02492 and via email to contract manager. Any additional work performed outside the scope of this agreement or any components which are recommended to be repaired or replaced by the contractor, will require separate reporting as well as separate invoicing. No work, parts, or supplies, except those herein, are included under this agreement.

For buildings managed by the Building Maintenance Division, should call-back service or repairs be required, this work may be provided and invoiced in addition to the contract price, and only upon approval of the Building Maintenance Division. For buildings managed by the Division of Water & Sewer, should call-back service or repairs be required, this work may be provided and invoiced in addition to the contract price, and only upon approval of the Division of Water & Sewer.

For the bid to be considered responsive, the contractor must certify that its Service Department/Technicians are available on a 24-hour, 7 day-a-week basis.

Approximate inventory of systems is listed below:

Location	System Type	Number of Pumps	Number of Risers
Williams School 585 Central Ave.	Wet/Dry System		3
Broadmeadow School 120 Broad Meadow St	Wet System		1
Eliot School 135 Wellesley Ave.	Wet System	1	
Newman School 1155 Central Ave.	Wet System	1	4
Pollard School 200 Harris Ave.	Wet System	Town Water	2
Needham High School 609 Webster St.	Wet System	1	3
High Rock School 77 Ferndale Rd.	Wet System		1
Emery Grover 1330 Highland Ave.	Wet System		
DPW 470 Dedham Ave.	Dry/Wet System	1 x 1,000 rpm	1
Town Hall 1471 Highland Ave.	Wet System		1
Library 1339 Highland Ave.	Wet System	1 x 500 rpm	1
Transfer Station 1421 Central Ave.	Dry System		
PSAB 500 Dedham Ave.	Wet System		1
Center at the Heights 300 Hillside Ave.	Dry/Wet System		1
Public Safety Building 88 Chestnut St.	Wet System	2	2
Fire Station #2 707 Highland Ave.	Wet System	1	1
Memorial Park 92 Rosemary St.	Wet System		1
Rosemary Recreation Complex 178 Rosemary St.	Dry/Wet System		3
Jack Cogswell Building 1407 Central Ave.	Dry System		
Charles River Water Treatment Plant Location to be given to chosen vendor	Wet System		
Hillside School 28 Glen Gary Road	Dry/Wet System		

2.06 Additional Information & Requests

Quotes for all work must be specified by time (# of hours/rate) and materials for any on-call services.

On-call services will be required for both types of work (fire alarm systems and sprinkler systems).

PART 3 – CHECKLIST AND REQUIRED FORMS FOR SUBMISSION

On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

Company Name: _____

☐ Bidder has completed and returned the **Acknowledgment of Receipt** form (via fax or email).

☐ Bidder has completed, signed, and enclosed the **Bid Form A1: Filed Sub-Bid Sheet/Bid Form A2: General Bid Sheet** (depending on if a sub-bidder or general bidder) or an exact copy, AS WELL AS a completed **FORM FOR SUB-BID**/**FORM FOR GENERAL BID** using the forms provided in Attachment A.

☐ Bidder has completed, signed, and enclosed the **Bid Form B: Bidder Information Response** form.

☐ Bidder has completed, signed, and enclosed the **Bid Form C: Authentication Form.**

☐ Bidder has completed, signed, and enclosed the **Bid Form D: Certificate of Good Faith**.

☐ Bidder has completed, signed, and enclosed the **Bid Form E: Certificate of Compliance with Massachusetts Tax Laws** or Certificate of Good Standing issued by the Massachusetts Department of Revenue.

☐ Bidder has provided at least five (5) references on the **Bid Form F: Professional Reference Form** of which at least three (3) are governmental units (municipal/county/regional district/state agency/special district).

☐ If the bid submission is signed by someone other than the Owner/President of the company, a completed **Bid Form G: Certificate of Authority of Corporate Resolution** for the person who signed the proposal or a valid Corporate Resolution stating the individual has the authority to submit the proposal on behalf of the Company and can bind the Company to the contract if awarded.

☐ Bidder has submitted all other required forms as included in **Attachment A**.

☐ Bidder has submitted a **DCAMM Certificate of Eligibility** (in the "Fire Protection Sprinkler Systems" category for sub-bids and in "Alarm Systems" for general bids), and completed, signed, and enclosed an **Update Statement**.

☐ The Bid Deposit (Bond) enclosed.

☐ Bidder acknowledged all addenda, if any
Addendum Number 1 dated _____
Addendum Number 2 dated _____
Addendum Number 3 dated _____
Addendum Number 4 dated _____
Addendum Number 5 dated _____

This form must be completed and filed with bid submission

Bid Form A1: Filed Sub-Bid Sheet (1 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

Preventative Maintenance & Inspections				
Item 1		**Item 2**	**Item 3**	**Item 4**
Building		**Cost of Fire Alarm PMs & Inspections**	**Cost of Sprinkler PMs & Inspections (SUB-BID)**	**Total Annual Cost of PMs & Inspections (Items 2+3)**
Year One (January 1, 2026 – December 31, 2026)				
1	Williams School			$ -
2	Broadmeadow School			$ -
3	Eliot School			$ -
4	Hillside School			$ -
5	Mitchell School			$ -
6	Newman School			$ -
7	Pollard School			$ -
8	Needham High School			$ -
9	High Rock School			$ -
10	Emery Grover			$ -
11	Town Hall			$ -
12	Library			$ -
13	PSAB			$ -
14	Center at the Heights			$ -
15	Transfer Station			$ -
16	Memorial Park			$ -
17	Rosemary Recreation Complex			$ -
18	Public Safety Building			$ -
19	Fire Station #2			$ -
20	Jack Cogswell Building			$ -
21	6 Bay Garage			$ -
22	DPW Building			$ -
23	Charles River Water Treatment Plant			$ -
24	St. Mary's Pump Station			$ -
25	West St. Pump Station			
26	Great Plain Pump Station			
27	Reservoir B Pump Station			
28	Kendrick St. Pump Station			
29	**Total Cost of PMs & Inspections for Year One (1-28)**			$ -

Company Name: _____

This form must be completed and filed with bid submission

Bid Form A1: Filed Sub-Bid Sheet (2 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

On-Call Services - Sprinklers (SUB-BID)				
Item 1		**Item 2**	**Item 3**	**Item 4**
Description		**Hourly Rate**	**Estimated Quantity**	**Total Annual Cost of On-Call Services**
Year One (Upon execution – December 31, 2023)				
35	Hourly Rate - Weekdays 7AM-5PM		75	$ -
36	Hourly Rate - Weekdays 5PM-7AM and Saturdays		20	$ -
37	Hourly Rate - Sundays and Holidays		10	$ -
38	Estimated Cost of Materials (% markup)		%*$5000 + $5000	$
39	**Total Est. Cost of On-Call Services - Sprinklers (35-38)**			$

40	**Total Est. Cost of On-Call Services**	$
41	**Total Est. Contract Value for Year One - Combined (29+40)**	$

Company Name: _____

This form must be completed and filed with bid submission

[continued on next page]

Bid Form A1: Filed Sub-Bid Sheet (3 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

Preventative Maintenance & Inspections				
Item 1		**Item 2**	**Item 3**	**Item 4**
Building		**Cost of Fire Alarm PMs & Inspections**	**Cost of Sprinkler PMs & Inspections (SUB-BID)**	**Total Annual Cost of PMs & Inspections (Items 2+3)**
Year Two (January 1, 2027 – December 31, 2027)				
1	Williams School			$ -
2	Broadmeadow School			$ -
3	Eliot School			$ -
4	Hillside School			$ -
5	Mitchell School			$ -
6	Newman School			$ -
7	Pollard School			$ -
8	Needham High School			$ -
9	High Rock School			$ -
10	Emery Grover			$ -
11	Town Hall			$ -
12	Library			$ -
13	PSAB			$ -
14	Center at the Heights			$ -
15	Transfer Station			$ -
16	Memorial Park			$ -
17	Rosemary Recreation Complex			$ -
18	Public Safety Building			$ -
19	Fire Station #2			$ -
20	Jack Cogswell Building			$ -
21	6 Bay Garage			$ -
22	DPW Building			$ -
23	Charles River Water Treatment Plant			$ -
24	St. Mary's Pump Station			$ -
25	West St. Pump Station			
26	Great Plain Pump Station			
27	Reservoir B Pump Station			
28	Kendrick St. Pump Station			
29	**Total Cost of PMs & Inspections for Year Two (1-28)**			$ -

Company Name: _____

This form must be completed and filed with bid submission

Bid Form A1: Filed Sub-Bid Sheet (4 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

On-Call Services - Sprinklers (SUB-BID)				
Item 1		**Item 2**	**Item 3**	**Item 4**
Description		**Hourly Rate**	**Estimated Quantity**	**Total Annual Cost of On-Call Services**
Year Two (January 1, 2027 – December 31, 2027)				
35	Hourly Rate - Weekdays 7AM-5PM		75	$ -
36	Hourly Rate - Weekdays 5PM-7AM and Saturdays		20	$ -
37	Hourly Rate - Sundays and Holidays		10	$ -
38	Estimated Cost of Materials (% markup)		%*$5000 + $5000	$
39	**Total Est. Cost of On-Call Services - Sprinklers (35-38)**			$

40	**Total Est. Cost of On-Call Services**	$
41	**Total Est. Contract Value for Year Two - Combined (29+40)**	$

Company Name: _____

This form must be completed and filed with bid submission

[continued on next page]

Bid Form A1: Filed Sub-Bid Sheet (5 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

Preventative Maintenance & Inspections				
Item 1		**Item 2**	**Item 3**	**Item 4**
Building		**Cost of Fire Alarm PMs & Inspections**	**Cost of Sprinkler PMs & Inspections (SUB-BID)**	**Total Annual Cost of PMs & Inspections (Items 2+3)**
Year Three (January 1, 2028 – December 31, 2028)				
1	Williams School			$ -
2	Broadmeadow School			$ -
3	Eliot School			$ -
4	Hillside School			$ -
5	Mitchell School			$ -
6	Newman School			$ -
7	Pollard School			$ -
8	Needham High School			$ -
9	High Rock School			$ -
10	Emery Grover			$ -
11	Town Hall			$ -
12	Library			$ -
13	PSAB			$ -
14	Center at the Heights			$ -
15	Transfer Station			$ -
16	Memorial Park			$ -
17	Rosemary Recreation Complex			$ -
18	Public Safety Building			$ -
19	Fire Station #2			$ -
20	Jack Cogswell Building			$ -
21	6 Bay Garage			$ -
22	DPW Building			$ -
23	Charles River Water Treatment Plant			$ -
24	St. Mary's Pump Station			$ -
25	West St. Pump Station			
26	Great Plain Pump Station			
27	Reservoir B Pump Station			
28	Kendrick St. Pump Station			
29	**Total Cost of PMs & Inspections for Year Three (1-28)**			$ -

Company Name: _____

This form must be completed and filed with bid submission

Bid Form A1: Filed Sub-Bid Sheet (6 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

On-Call Services - Sprinklers (SUB-BID)				
Item 1		**Item 2**	**Item 3**	**Item 4**
Description		**Hourly Rate**	**Estimated Quantity**	**Total Annual Cost of On-Call Services**
Year Three (January 1, 2028 – December 31, 2028)				
35	Hourly Rate - Weekdays 7AM-5PM		75	$ -
36	Hourly Rate - Weekdays 5PM-7AM and Saturdays		20	$ -
37	Hourly Rate - Sundays and Holidays		10	$ -
38	Estimated Cost of Materials (% markup)		%*$5000 + $5000	$
39	**Total Est. Cost of On-Call Services - Sprinklers (35-38)**			$

40	**Total Est. Cost of On-Call Services**	$
41	**Total Est. Contract Value for Year Three - Combined (29+40)**	$

Company Name: _____

This form must be completed and filed with bid submission

[continued on next page]

Bid Form A1: Filed Sub-Bid Sheet (7 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

Preventative Maintenance & Inspections				
Item 1		**Item 2**	**Item 3**	**Item 4**
Building		**Cost of Fire Alarm PMs & Inspections**	**Cost of Sprinkler PMs & Inspections (SUB-BID)**	**Total Annual Cost of PMs & Inspections (Items 2+3)**
Year Four (January 1, 2029 – December 31, 2029)				
1	Williams School			$ -
2	Broadmeadow School			$ -
3	Eliot School			$ -
4	Hillside School			$ -
5	Mitchell School			$ -
6	Newman School			$ -
7	Pollard School			$ -
8	Needham High School			$ -
9	High Rock School			$ -
10	Emery Grover			$ -
11	Town Hall			$ -
12	Library			$ -
13	PSAB			$ -
14	Center at the Heights			$ -
15	Transfer Station			$ -
16	Memorial Park			$ -
17	Rosemary Recreation Complex			$ -
18	Public Safety Building			$ -
19	Fire Station #2			$ -
20	Jack Cogswell Building			$ -
21	6 Bay Garage			$ -
22	DPW Building			$ -
23	Charles River Water Treatment Plant			$ -
24	St. Mary's Pump Station			$ -
25	West St. Pump Station			
26	Great Plain Pump Station			
27	Reservoir B Pump Station			
28	Kendrick St. Pump Station			
29	**Total Cost of PMs & Inspections for Year Four (1-28)**			$ -

Company Name: _____

This form must be completed and filed with bid submission

Bid Form A1: Filed Sub-Bid Sheet (8 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

On-Call Services - Sprinklers (SUB-BID)				
Item 1		**Item 2**	**Item 3**	**Item 4**
Description		**Hourly Rate**	**Estimated Quantity**	**Total Annual Cost of On-Call Services**
Year Four (January 1, 2029 – December 31, 2029)				
35	Hourly Rate - Weekdays 7AM-5PM		75	$ -
36	Hourly Rate - Weekdays 5PM-7AM and Saturdays		20	$ -
37	Hourly Rate - Sundays and Holidays		10	$ -
38	Estimated Cost of Materials (% markup)		%*$5000 + $5000	$
39	**Total Est. Cost of On-Call Services - Sprinklers (35-38)**			$

40	**Total Est. Cost of On-Call Services**	$
41	**Total Est. Contract Value for Year Four - Combined (29+40)**	$

Company Name: _____

This form must be completed and filed with bid submission

[continued on next page]

Bid Form A1: Filed Sub-Bid Sheet (9 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

Preventative Maintenance & Inspections				
Item 1		**Item 2**	**Item 3**	**Item 4**
Building		**Cost of Fire Alarm PMs & Inspections**	**Cost of Sprinkler PMs & Inspections (SUB-BID)**	**Total Annual Cost of PMs & Inspections (Items 2+3)**
Year Five (January 1, 2030 – December 31, 2030)				
1	Williams School			$ -
2	Broadmeadow School			$ -
3	Eliot School			$ -
4	Hillside School			$ -
5	Mitchell School			$ -
6	Newman School			$ -
7	Pollard School			$ -
8	Needham High School			$ -
9	High Rock School			$ -
10	Emery Grover			$ -
11	Town Hall			$ -
12	Library			$ -
13	PSAB			$ -
14	Center at the Heights			$ -
15	Transfer Station			$ -
16	Memorial Park			$ -
17	Rosemary Recreation Complex			$ -
18	Public Safety Building			$ -
19	Fire Station #2			$ -
20	Jack Cogswell Building			$ -
21	6 Bay Garage			$ -
22	DPW Building			$ -
23	Charles River Water Treatment Plant			$ -
24	St. Mary's Pump Station			$ -
25	West St. Pump Station			
26	Great Plain Pump Station			
27	Reservoir B Pump Station			
28	Kendrick St. Pump Station			
29	**Total Cost of PMs & Inspections for Year Five (1-28)**			$ -

Company Name: _____

This form must be completed and filed with bid submission

Bid Form A1: Filed Sub-Bid Sheet (10 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

On-Call Services - Sprinklers (SUB-BID)				
Item 1		**Item 2**	**Item 3**	**Item 4**
Description		**Hourly Rate**	**Estimated Quantity**	**Total Annual Cost of On-Call Services**
Year Five (January 1, 2030 – December 31, 2030)				
35	Hourly Rate - Weekdays 7AM-5PM		75	$ -
36	Hourly Rate - Weekdays 5PM-7AM and Saturdays		20	$ -
37	Hourly Rate - Sundays and Holidays		10	$ -
38	Estimated Cost of Materials (% markup)		%*$5000 + $5000	$
39	**Total Est. Cost of On-Call Services - Sprinklers (35-38)**			$

40	**Total Est. Cost of On-Call Services**	$
41	**Total Est. Contract Value for Year Five - Combined (29+40)**	$

Bidder Acknowledges Addenda #: _____

Company Name: _____ Number of Years in Business: _____

Address: _____

Authorized Signature: _____

Printed Name & Title: _____

This form must be completed and filed with bid submission

Bid Form A2: General Bid Sheet (1 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

Preventative Maintenance & Inspections				
Item 1		**Item 2**	**Item 3**	**Item 4**
Building		**Cost of Fire Alarm PMs & Inspections**	**Cost of Sprinkler PMs & Inspections (SUB-BID)**	**Total Annual Cost of PMs & Inspections (Items 2+3)**
Year One (January 1, 2026 – December 31, 2026)				
1	Williams School			$ -
2	Broadmeadow School			$ -
3	Eliot School			$ -
4	Hillside School			$ -
5	Mitchell School			$ -
6	Newman School			$ -
7	Pollard School			$ -
8	Needham High School			$ -
9	High Rock School			$ -
10	Emery Grover			$ -
11	Town Hall			$ -
12	Library			$ -
13	PSAB			$ -
14	Center at the Heights			$ -
15	Transfer Station			$ -
16	Memorial Park			$ -
17	Rosemary Recreation Complex			$ -
18	Public Safety Building			$ -
19	Fire Station #2			$ -
20	Jack Cogswell Building			$ -
21	6 Bay Garage			$ -
22	DPW Building			$ -
23	Charles River Water Treatment Plant			$ -
24	St. Mary's Pump Station			$ -
25	West St. Pump Station			$ -
26	Great Plain Pump Station			$ -
27	Reservoir B Pump Station			$ -
28	Kendrick St. Pump Station			$ -
29	**Total Cost of PMs & Inspections for Year One (1-28)**			$ -

Company Name: _____

This form must be completed and filed with bid submission

Bid Form A2: General Bid Sheet (2 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

On-Call Services - Fire Alarms				
Item 1		**Item 2**	**Item 3**	**Item 4**
Description		**Hourly Rate**	**Estimated Quantity**	**Total Annual Cost of On-Call Services**
Year One (January 1, 2026 – December 31, 2026)				
30	Hourly Rate - Weekdays 7AM-5PM		80	$ -
31	Hourly Rate - Weekdays 5PM-7AM and Saturdays		25	$ -
32	Hourly Rate - Sundays and Holidays		10	$ -
33	Estimated Cost of Materials (% markup)		%*$25000 + $25000	$
34	**Total Est. Cost of On-Call Services - Fire Alarms (30-33)**			$
40	**Total Est. Cost of On-Call Services**			$
41	**Total Est. Contract Value for Year One - Combined (29+40)**			$

Company Name: _____

This form must be completed and filed with bid submission

Bid Form A2: General Bid Sheet (3 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

Preventative Maintenance & Inspections				
Item 1		**Item 2**	**Item 3**	**Item 4**
Building		**Cost of Fire Alarm PMs & Inspections**	**Cost of Sprinkler PMs & Inspections (SUB-BID)**	**Total Annual Cost of PMs & Inspections (Items 2+3)**
Year Two (January 1, 2027 – December 31, 2027)				
1	Williams School			$ -
2	Broadmeadow School			$ -
3	Eliot School			$ -
4	Hillside School			$ -
5	Mitchell School			$ -
6	Newman School			$ -
7	Pollard School			$ -
8	Needham High School			$ -
9	High Rock School			$ -
10	Emery Grover			$ -
11	Town Hall			$ -
12	Library			$ -
13	PSAB			$ -
14	Center at the Heights			$ -
15	Transfer Station			$ -
16	Memorial Park			$ -
17	Rosemary Recreation Complex			$ -
18	Public Safety Building			$ -
19	Fire Station #2			$ -
20	Jack Cogswell Building			$ -
21	6 Bay Garage			$ -
22	DPW Building			$ -
23	Charles River Water Treatment Plant			$ -
24	St. Mary's Pump Station			$ -
25	West St. Pump Station			$ -
26	Great Plain Pump Station			$ -
27	Reservoir B Pump Station			$ -
28	Kendrick St. Pump Station			$ -
29	**Total Cost of PMs & Inspections for Year Two (1-28)**			$ -

Company Name: _____

This form must be completed and filed with bid submission

Bid Form A2: General Bid Sheet (4 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

On-Call Services - Fire Alarms				
Item 1		**Item 2**	**Item 3**	**Item 4**
Description		**Hourly Rate**	**Estimated Quantity**	**Total Annual Cost of On-Call Services**
Year Two (January 1, 2027 – December 31, 2027)				
30	Hourly Rate - Weekdays 7AM-5PM		80	$ -
31	Hourly Rate - Weekdays 5PM-7AM and Saturdays		25	$ -
32	Hourly Rate - Sundays and Holidays		10	$ -
33	Estimated Cost of Materials (% markup)		%*$25000 + $25000	$
34	**Total Est. Cost of On-Call Services - Fire Alarms (30-33)**			$

40	**Total Est. Cost of On-Call Services**	$
41	**Total Est. Contract Value for Year Two - Combined (29+40)**	$

Company Name: _____

This form must be completed and filed with bid submission

Bid Form A2: General Bid Sheet (5 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

Preventative Maintenance & Inspections				
Item 1		**Item 2**	**Item 3**	**Item 4**
Building		**Cost of Fire Alarm PMs & Inspections**	**Cost of Sprinkler PMs & Inspections (SUB-BID)**	**Total Annual Cost of PMs & Inspections (Items 2+3)**
Year Three (January 1, 2028 – December 31, 2028)				
1	Williams School			$ -
2	Broadmeadow School			$ -
3	Eliot School			$ -
4	Hillside School			$ -
5	Mitchell School			$ -
6	Newman School			$ -
7	Pollard School			$ -
8	Needham High School			$ -
9	High Rock School			$ -
10	Emery Grover			$ -
11	Town Hall			$ -
12	Library			$ -
13	PSAB			$ -
14	Center at the Heights			$ -
15	Transfer Station			$ -
16	Memorial Park			$ -
17	Rosemary Recreation Complex			$ -
18	Public Safety Building			$ -
19	Fire Station #2			$ -
20	Jack Cogswell Building			$ -
21	6 Bay Garage			$ -
22	DPW Building			$ -
23	Charles River Water Treatment Plant			$ -
24	St. Mary's Pump Station			$ -
25	West St. Pump Station			$ -
26	Great Plain Pump Station			$ -
27	Reservoir B Pump Station			$ -
28	Kendrick St. Pump Station			$ -
29	**Total Cost of PMs & Inspections for Year Three (1-28)**			$ -

Company Name: _____

This form must be completed and filed with bid submission

Bid Form A2: General Bid Sheet (6 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

On-Call Services - Fire Alarms				
Item 1		**Item 2**	**Item 3**	**Item 4**
Description		**Hourly Rate**	**Estimated Quantity**	**Total Annual Cost of On-Call Services**
Year Three (January 1, 2028 – December 31, 2028)				
30	Hourly Rate - Weekdays 7AM-5PM		80	$ -
31	Hourly Rate - Weekdays 5PM-7AM and Saturdays		25	$ -
32	Hourly Rate - Sundays and Holidays		10	$ -
33	Estimated Cost of Materials (% markup)		%*$25000 + $25000	$
34	**Total Est. Cost of On-Call Services - Fire Alarms (30-33)**			$

40	**Total Est. Cost of On-Call Services**	$
41	**Total Est. Contract Value for Year Three - Combined (29+40)**	$

Company Name: _____

This form must be completed and filed with bid submission

Bid Form A2: General Bid Sheet (7 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

Preventative Maintenance & Inspections				
Item 1		**Item 2**	**Item 3**	**Item 4**
Building		**Cost of Fire Alarm PMs & Inspections**	**Cost of Sprinkler PMs & Inspections (SUB-BID)**	**Total Annual Cost of PMs & Inspections (Items 2+3)**
Year Four (January 1, 2029 – December 31, 2029)				
1	Williams School			$ -
2	Broadmeadow School			$ -
3	Eliot School			$ -
4	Hillside School			$ -
5	Mitchell School			$ -
6	Newman School			$ -
7	Pollard School			$ -
8	Needham High School			$ -
9	High Rock School			$ -
10	Emery Grover			$ -
11	Town Hall			$ -
12	Library			$ -
13	PSAB			$ -
14	Center at the Heights			$ -
15	Transfer Station			$ -
16	Memorial Park			$ -
17	Rosemary Recreation Complex			$ -
18	Public Safety Building			$ -
19	Fire Station #2			$ -
20	Jack Cogswell Building			$ -
21	6 Bay Garage			$ -
22	DPW Building			$ -
23	Charles River Water Treatment Plant			$ -
24	St. Mary's Pump Station			$ -
25	West St. Pump Station			$ -
26	Great Plain Pump Station			$ -
27	Reservoir B Pump Station			$ -
28	Kendrick St. Pump Station			$ -
29	**Total Cost of PMs & Inspections for Year Four (1-28)**			$ -

Company Name: _____

This form must be completed and filed with bid submission

Bid Form A2: General Bid Sheet (8 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

On-Call Services - Fire Alarms				
Item 1		**Item 2**	**Item 3**	**Item 4**
Description		**Hourly Rate**	**Estimated Quantity**	**Total Annual Cost of On-Call Services**
Year Four (January 1, 2029 – December 31, 2029)				
30	Hourly Rate - Weekdays 7AM-5PM		80	$ -
31	Hourly Rate - Weekdays 5PM-7AM and Saturdays		25	$ -
32	Hourly Rate - Sundays and Holidays		10	$ -
33	Estimated Cost of Materials (% markup)		%*$25000 + $25000	$
34	**Total Est. Cost of On-Call Services - Fire Alarms (30-33)**			$

40	**Total Est. Cost of On-Call Services**	$
41	**Total Est. Contract Value for Year Four - Combined (29+40)**	$

Company Name: _____

This form must be completed and filed with bid submission

Bid Form A2: General Bid Sheet (9 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

Preventative Maintenance & Inspections				
Item 1		**Item 2**	**Item 3**	**Item 4**
Building		**Cost of Fire Alarm PMs & Inspections**	**Cost of Sprinkler PMs & Inspections (SUB-BID)**	**Total Annual Cost of PMs & Inspections (Items 2+3)**
Year Five (January 1, 2030 – December 31, 2030)				
1	Williams School			$ -
2	Broadmeadow School			$ -
3	Eliot School			$ -
4	Hillside School			$ -
5	Mitchell School			$ -
6	Newman School			$ -
7	Pollard School			$ -
8	Needham High School			$ -
9	High Rock School			$ -
10	Emery Grover			$ -
11	Town Hall			$ -
12	Library			$ -
13	PSAB			$ -
14	Center at the Heights			$ -
15	Transfer Station			$ -
16	Memorial Park			$ -
17	Rosemary Recreation Complex			$ -
18	Public Safety Building			$ -
19	Fire Station #2			$ -
20	Jack Cogswell Building			$ -
21	6 Bay Garage			$ -
22	DPW Building			$ -
23	Charles River Water Treatment Plant			$ -
24	St. Mary's Pump Station			$ -
25	West St. Pump Station			$ -
26	Great Plain Pump Station			$ -
27	Reservoir B Pump Station			$ -
28	Kendrick St. Pump Station			$ -
29	**Total Cost of PMs & Inspections for Year Five (1-28)**			$ -

Company Name: _____

This form must be completed and filed with bid submission

Bid Form A2: General Bid Sheet (10 of 10)
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

On-Call Services - Fire Alarms				
Item 1		**Item 2**	**Item 3**	**Item 4**
Description		**Hourly Rate**	**Estimated Quantity**	**Total Annual Cost of On-Call Services**
Year Five (January 1, 2030 – December 31, 2030)				
30	Hourly Rate - Weekdays 7AM-5PM		80	$ -
31	Hourly Rate - Weekdays 5PM-7AM and Saturdays		25	$ -
32	Hourly Rate - Sundays and Holidays		10	$ -
33	Estimated Cost of Materials (% markup)		%*$25000 + $25000	$
34	**Total Est. Cost of On-Call Services - Fire Alarms (30-33)**			$

40	**Total Est. Cost of On-Call Services**	$
41	**Total Est. Contract Value for Year Five - Combined (29+40)**	$

Bidder Acknowledges Addenda #: _____

Company Name: _____ Number of Years in Business: _____

Address: _____

Authorized Signature: _____

Printed Name & Title: _____

This form must be completed and filed with bid submission

Bid Form B: Bidder Information Response
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

Legal Name of the Bidder: _____

Company Name: _____

Company Address: _____

City State Zip: _____

Company Web Address: _____

Company Telephone:_____ Company Fax Number: _____

State of Incorporation (Date): _____

If the bidder is a partnership, give full names and addresses of all partners; and if an individual, give residential address if different from business address.

Company Contacts – Required

Individual submitting the bid: (This is the individual who should sign the Certificate of Good Faith)

Name: _____ Title: _____

Mailing Address: _____

Telephone: _____ Fax Number: _____

Email Address: _____

Individual to be contacted about the bid: (If different from the individual submitting the bid)

Name: _____ Title: _____

Mailing Address: _____

Telephone: _____ Fax Number: _____

Email Address: _____

Best Times to Contact: _____

Individual authorized to contractually bind the company: (This will be the individual whose name and title will appear in the contract documents and will execute the contract if the contract is awarded to the company)

Name: _____ Title: _____

Mailing Address: _____

Telephone: _____ Fax Number: _____

Email Address: _____

Best Times to Contact: _____

1. Has the bid been signed by a person legally authorized to commit the Bidder (Company) to the contract, if awarded? ☐ **Yes** ☐ **No**

2. Is the Bidder prepared to provide the insurances as required? ☐ **Yes** ☐ **No**

3. Has the Bidder placed any conditions or restrictions with its bid to the Town which conflict with the Scope of Services? (If yes, the bid may be deemed conditional.) ☐ **Yes** ☐ **No**

4. Has the Bidder identified any and all exceptions to the Town's specifications and are they included in the submission? ☐ **Yes** ☐ **No**

5. Is the Bidder prepared to execute the Town's contract, if awarded? ☐ **Yes** ☐ **No**

Signature of the Bidder: _____

Printed Name and Title of Signatory: _____

Date: _____

This form must be completed and filed with bid submission

Bid Form C: Authentication Form
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

The undersigned agrees that, if selected as the contractor for any or all of the above bid items, the contractor shall be obligated to provide those services in accordance with the terms of these specifications at the bid price upon receipt of a fully executed contract.

Name of Bidder: _____

Address: _____

Authorized Signature: _____

Printed Name and Title: _____

Date: _____ Phone Number: _____

Fax Number: _____ Email: _____

This form must be completed and filed with bid submission

Bid Form D: Certificate of Good Faith
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

The undersigned agrees that, if he is selected as general contractor, he will within five days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the awarding authority, execute a contract in accordance with the terms of this bid and furnish a labor and materials or payment bond, and if required, a performance bond, each of a surety company qualified to do business under the laws of the commonwealth and satisfactory to the awarding authority and each in the sum of the contract price, the premiums for which are to be paid by the general contractor and are included in the contract price; provided, however, that if there is more than 1 surety company, the surety companies shall be jointly and severally liable.

The undersigned further certifies under the penalties of perjury that this bid is in all respects bona fide, fair, and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the commonwealth under the provisions of section 29F of chapter 29, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

Bidder Name: _____ Date: _____

Signature of Individual Submitting Bid: _____

Individual Full Name and Title: _____

Business Address: _____

This form must be completed and filed with bid submission

Bid Form E: Certificate of Compliance with Massachusetts Tax Laws
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

Certificate of Good Standing issued by the Massachusetts Department of Revenue dated no earlier than 90 days before the bid submission deadline may be submitted in place of this certificate.

Pursuant to M.G.L. c.62C, §49A , the undersigned acting on behalf of the Contractor* certifies under the penalties of perjury that the Contractor is in compliance with all laws of the Commonwealth relating to taxes including payment of all local taxes, fees, assessments, betterments and any other local or municipal charges (unless the Contractor has a pending abatement application or has entered into a payment agreement with the entity to which such charges were owed), reporting of employees and contractors, and withholding and remitting child support.**

(1) Contractor: _____ Date: _____

Print Name: _____

Social Security Number: _____

Corporation, Association, or Partnership: _____

Federal Tax ID Number or Social Security Number: _____

(2) By: _____ Date: _____
(Authorized Corporate Signature)

Name and Title: _____

Note to Contractor***: Please sign at (1) or (2), whichever applies.

In order to comply with all laws of the Commonwealth relating to taxes, the undersigned certifies that Contractor (check applicable item):

1. _____ has filed all tax returns and paid all taxes required by law; or
2. _____ has filed a pending application for abatement of such tax; or
3. _____ has a pending petition before the appellate tax board contesting such tax; or
4. _____ does not derive taxable income from Massachusetts Sources such that it is subject to taxation by the Commonwealth

* As used in this certification, the word "Contractor" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.
* The provision in this Certification relating to child support applies only when the Contractor is an individual.
*** Approval of a contract or other agreement will not be granted until the Town of Needham receives a signed copy of this Certification.

This form must be completed and filed with bid submission

Bid Form F: Professional References
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

Customer: _____

Mailing Address: _____

Period of Service (MM/YYYY): _____ through _____

Is this a Municipal or other Governmental Unit?: ☐ Yes ☐ No

Project Name: _____

Primary Contact: _____ Title: _____

Telephone: _____ Ext: _____

Email: _____

Customer: _____

Mailing Address: _____

Period of Service (MM/YYYY): _____ through _____

Is this a Municipal or other Governmental Unit?: ☐ Yes ☐ No

Project Name: _____

Primary Contact: _____ Title: _____

Telephone: _____ Ext: _____

Email: _____

(Make as many copies as necessary. A minimum of 5 references required)

THIS FORM OR SUBSTITUTE WITH THE REQUESTED INFORMATION MUST BE FILED WITH BID SUBMISSION

Bid Form G: Certificate of Authority
On-Call Fire Alarm & Sprinkler Maintenance
26DPW167B

Complete Only If Applicable

1. I hereby certify that I am the Clerk/Secretary of _____
(insert full name of Corporation)

2. corporation, and that _____
(insert the name of officer who signed the contract and bonds.)

3. is the duly elected _____
(insert the title of the officer in line 2)

4. of said corporation, and that on _____
(insert a date that is **ON OR BEFORE** the date the officer signed the **contract and bonds.**)

at a duly authorized meeting of the Board of Directors of said corporation, at which all the directors were present or waived notice, it was voted that

5. _____ the _____
(insert name from line 2) (insert title from line 3)

of this corporation be and hereby is authorized to execute contracts and bonds in the name and on behalf of said corporation, and affix its Corporate Seal thereto, and such execution of any contract of obligation in this corporation's name and on its behalf, with or without the Corporate Seal, shall be valid and binding upon this corporation; and that the above vote has not been amended or rescinded and remains in full force and effect as of the date set forth below.

6. ATTEST: _____ AFFIX CORPORATE
(Signature of Clerk or Secretary)* SEAL HERE

7. Name: _____
(Please print or type name in line 6)*

8. Date: _____
(insert a date that is **ON OR AFTER** the date the officer signed the **contract and bonds.)**

The name and signature inserted in lines 6 & 7 must be that of the Clerk or Secretary of the corporation.

ATTACHMENT A

1. General and FSB Forms

2. Additional Required Forms

3. Plans for Public Safety Building and Fire Station

4. Prevailing Wage Schedule

FORM FOR GENERAL BID

To the Awarding Authority:

A. The Undersigned proposes to furnish all labor and materials required for On-Call Fire Alarm & Sprinkler Maintenance in Needham, Massachusetts, in accordance with the accompanying plans and specifications prepared by The Town of Needham for the contract price specified below, subject to additions and deductions according to the terms of the specifications.

B. This bid includes addenda numbered _____

C. The proposed contract price is _____ dollars ($_____).

D. The subdivision of the proposed contract price is as follows:

Item 1. The work of the general contractor, being all work other than that covered by Item 2.
$_____

Item 2. Sub-bids as follows: –

Subtrade	Name of Sub-bidder	Amount	Bonds required, indicated by "Yes" or "No"
Fire Detection Sprinkler Systems	_____	$_____	_____

The undersigned agrees that each of the above named sub-bidders will be used for the work indicated at the amount stated, unless a substitution is made. The undersigned further agrees to pay the premiums for the performance and payment bonds furnished by sub-bidders as requested herein and that all of the cost of all such premiums is included in the amount set forth in Item 1 of this bid.

The undersigned agrees that if he is selected as general contractor, he will promptly confer with the awarding authority on the question of sub-bidders; and that the awarding authority may substitute for any sub-bid listed above a sub-bid filed with the awarding authority by another sub-bidder for the subtrade against whose standing and ability the undersigned makes no objection; and that the undersigned will use all such finally selected sub-bidders at the amounts named in their respective sub-bids and be in every way as responsible for them and their work as if they had been originally named in this general bid, the total contract price being adjusted to conform thereto.

FORM FOR GENERAL BID – PAGE 2

E. The undersigned agrees that, if he is selected as general contractor, he will within five days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the awarding authority, execute a contract in accordance with the terms of this bid and furnish a performance bond and also a labor and materials or payment bond, each of a surety company qualified to do business under the laws of the commonwealth and satisfactory to the awarding authority and each in the sum of the contract price, the premiums for which are to be paid by the general contractor and are included in the contract price; provided, however, that if there is more than 1 surety company, the surety companies shall be jointly and severally liable.

The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he will comply fully with all laws and regulations applicable to awards made subject to section 44A.

The undersigned further certifies under the penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

Date _____

_____
(Name of General Bidder)

By_____
(Name of Person Signing Bid and Title)

_____
(Business Address)

_____
(City and State)

FORM FOR SUB-BID

To all General Bidders Except those Excluded:

A. The undersigned proposes to furnish all labor and materials required for completing, in accordance with the hereinafter described plans, specifications and addenda, all the work specified in Section No. 2.05 - Sprinkler Systems (Annual Preventative Maintenance, Annual Inspections) of the specifications and in any plans specified in such section, prepared by The Town of Needham for On-Call Fire Alarm & Sprinkler Maintenance in Needham, Massachusetts, for the contract sum of _____ dollars ($_____).

B. This sub-bid includes addenda numbered _____

C. This sub-bid

☐ may be used by any general bidder except:

_____

_____

☐ may only be used by the following general bidders:

_____

_____

[To exclude general bidders, insert "X" in one box only and fill in blank following that box. Do not answer C if no general bidders are excluded.]

D. The undersigned agrees that, if he is selected as a sub-bidder, he will, within 5 days, Saturdays, Sundays and legal holidays excluded, after presentation of a subcontract by the general bidder selected as the general contractor, execute with such general bidder a subcontract in accordance with the terms of this sub-bid, and contingent upon the execution of the general contract, and, if requested so to do in the general bid by the general bidder, who shall pay the premiums therefor, or if prequalification is required pursuant to section 44D 3/4, furnish a performance and payment bond of a surety company qualified to do business under the laws of the commonwealth and satisfactory to the awarding authority, in the full sum of the subcontract price.

FORM FOR SUB-BID – PAGE 2

E. The names of all persons, firms and corporations furnishing to the undersigned labor or labor and materials for the class or classes or part thereof of work for which the provisions of the section of the specifications for this subtrade require a listing in this paragraph, including the undersigned if customarily furnished by persons on his own payroll and in the absence of a contrary provision in the specifications, the name of each such class of work or part thereto and the bid price for such class of work or part thereof are:

Name	Class of Work	Bid price

[Do not give bid price for any class or part thereof furnished by undersigned.]

F. The undersigned agrees that the above list of bids to the undersigned represents bona fide bids based on the hereinbefore described plans, specifications and addenda and that, if the undersigned is awarded the contract, they will be used for the work indicated at the amounts stated, if satisfactory to the awarding authority.

G. The undersigned further agrees to be bound to the general contractor by the terms of the hereinbefore described plans, specifications, including all general conditions stated therein, and addenda, and to assume toward him all the obligations and responsibilities that he, by those documents, assumes toward the owner.

H. The undersigned offers the following information as evidence of his qualifications to perform the work as bid upon according to all the requirements of the plans and specifications: –

1. Have been in business under present business name _____ years.

2. Ever failed to complete any work awarded?_____

3. List one or more recent buildings with names of the general contractor and architect on which you served as a sub-contractor for work of similar character as required for the above-named building.

	Building	Architect	General Contractor	Amount of Contract
(a)				
(b)				
(c)				

4. Bank reference _____

FORM FOR SUB-BID – PAGE 3

I. The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he will comply fully with all laws and regulations applicable to awards of subcontracts subject to section forty-four F.

The undersigned further certifies under penalties of perjury that this sub-bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

Date_____

_____
(Name of Sub-bidder)

By _____
(Title and Name of Person Signing Bid)

_____
(Business Address)

_____
(City and State)

SECTION 00 43 01.40
BIDDER'S CERTIFICATE OF PAYMENT OF PREVAILING WAGES

23DPW249B - On-Call Fire Alarm & Sprinkler Maintenance

The undersigned bidder hereby certifies, under the pains and penalties of perjury, that the foregoing bid is based upon the payment to laborers to be employed on the project of wages in an amount no less than the applicable prevailing wage rates established for the project by the Massachusetts Department of Labor and Workforce Development. The undersigned bidder agrees to indemnify the Awarding Authority for, from and against any loss, expense, damages, actions or claims, including any expense incurred in connection with any delay or stoppage of the project work, arising out of or as a result of (1) the failure of the said bid to be based upon the payment of the said applicable prevailing wage rates or (2) the failure of the bidder, if selected as the Contractor, to pay laborers employed on the project the said applicable prevailing wage rates.

DATED: _____

NAME OF BIDDER: _____
(COMPANY NAME)

BY: _____
(OFFICER'S NAME AND TITLE)

SIGNATURE: _____

END OF SECTION

SECTION 00 43 01.50
BIDDER'S CERTIFICATE OF NON-COLLUSION

23DPW249B - On-Call Fire Alarm & Sprinkler Maintenance

The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club or other organization, entity, or group of individuals.

DATED: _____

NAME OF BIDDER: _____
(COMPANY NAME)

BY: _____
(OFFICER'S NAME AND TITLE)

SIGNATURE: _____

END OF SECTION

SECTION 00 43 01.60
BIDDER'S CERTIFICATE OF LABOR HARMONY

23DPW249B - On-Call Fire Alarm & Sprinkler Maintenance

The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration (OSHA) that is at least ten hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he will comply fully with all laws and regulations applicable to awards made subject to Section 44E.

DATED: _____

NAME OF BIDDER: _____
(COMPANY NAME)

BY: _____
(OFFICER'S NAME)

SIGNATURE: _____

END OF SECTION

SECTION 00 43 01.70
BIDDER'S CERTIFICATE OF TAX COMPLIANCE

23DPW249B - On-Call Fire Alarm & Sprinkler Maintenance

This certification shall be prepared by a Certified Public Accountant responsible for accounting of the bidding firm.

Pursuant to M.G.L. Chapter 62C, sec. 49A, the undersigned certifies that, to the best of my knowledge and belief, Bidding firm has complied with all the laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting of child support.

DATED: _____

NAME OF BIDDER: _____
(COMPANY NAME)

RESPONDENT CPA's COMPANY NAME: _____
(if different form Bidder) (CPA COMPANY NAME)

RESPONDENT CPA'S ADDRESS: _____
(if different from Bidder.) _____

_____

RESPONDENT CPA's PHONE NUMBER: _____

BY: _____
(RESPONDENT CPA's NAME)

RESPONDENT'S SIGNATURE: _____

END OF SECTION

KAESTLE BOOS
associates, inc

NEEDHAM PUBLIC SAFETY COMPLEX
Needham, MA

TRANSMITTAL
NO. 821

Project: **Needham Public Safety**
Attn: Megan Collins

Date: 10/11/2019

To: Consigli Construction
72 Sumner Street
Milford, MA 01757

Submittal: 260000-193.1 PD: Fire Alarm System (F HQ & P HQ)

WE ARE SENDING:	SUBMITTED FOR:	ACTION TAKEN:
☐ Shop Drawings	☐ Approval	☐ Approved as Noted
☐ Letter	✓ Your Use	✓ Approved as Submitted
☐ Prints	☐ As Requested	☐ No Action taken
☐ Change Order	☐ Review and Comment	☐ Revise & Resubmit
☐ Plans		☐ Rejected
☐ Samples	**Sent Via:**	☐ For Record
☐ Specification	✓ Attached	☐ Returned for Corrections
✓ Other: Product Data	☐ Separate Cover Via:	☐ Due Date:

Package	Submittal	Rev.	Item No.	Copies	Date	Item	Description	Status
	260000-193	**001**		**1**	**10/11/19**	**Submittal**	**PD: Fire Alarm System (F HQ & P HQ)**	**APP**

Remarks:

Approved

CC:

APPROVED KAESTLE BOOS
klowengrub 10:25:50 AM 10/11/2019

Signed:_____

Kaycee Lowengrub

GARCIA•GALUSKA•DESOUSA
Consulting Engineers Inc.
375 Faunce Corner Road – Suite D
Dartmouth, MA 02747-1258
Phone: (508) 998-5700 Fax: (508) 998-0883
Email: info@g-g-d.com

LETTER OF TRANSMITTAL

Date: October 8, 2019
Job #: 850 114 00.00
Attention: Keith Mercy, AIA
Re: Needham Public Safety

To: Kaestle Boos Associates, Inc.
325 Foxborough Boulevard, Suite 10
Foxborough, MA 02035

We Are Sending You: **_x_ Attached** **_x_ The following items via: Procore**

_x_ Shop Drawings **__ Prints** **__ Plans** **__ Specifications**

__ Copy of Letter **__ Change Order** **__ Samples** **__ Drawings**

COPIES	DATE REC'D	GGD NUMBER	DESCRIPTION SUBMITTAL NUMBER	ACTION
1	09/12/2019	E-109-1	Fire Alarm System (F HQ & P HQ) 260000-193-1	Approved

These are transmitted as checked below:

__ For Approval **__ Approved as submitted** **__ Resubmit ____ copies for approval**

_x_ For your use **__ Approved as noted** **__ Submit ____ copies for distribution**

_x_ As requested **__ Returned for corrections** **__ Return ____ corrected prints**

__ For review and comment **__ Forwarded _____**

__ For Bids Due _____, 20 **__ Prints Returned on Loan to Us**

REMARKS:

COPY (S) TO: Rene Croteau, Kaestle Boos Associates, Inc.
Seunghwan Lee, Kaestle Boos Associates, Inc.
Nick Sholtis, Kaestle Boos Associates, Inc.
File

SIGNED: Devin Honeycutt; tb

Project: 1901 - Needham Public Safety
88 Chestnut Street
Needham, Massachusetts 02492

RECEIVED
September 12, 2019
Garcia Galuska & DeSousa

Submittal #260000-193.1
260000 - Electrical

PD: Fire Alarm System (F HQ & P HQ)

APPROVERS:	Megan Collins **(Consigli Construction Co., Inc.)** Christopher Kyne **(Consigli Construction Co., Inc.)** CA GGD **(Garcia Galuska Desousa)** Rene Croteau **(Kaestle Boos Associates (KBA))** Keith Mercy **(Kaestle Boos Associates (KBA))** Kevin Witzell **(Kaestle Boos Associates (KBA))**	**CREATED BY:**	
RESPONSIBLE CONTRACTOR:	Wayne J. Griffin Electric Inc. Kelly Sullivan **(Wayne J. Griffin Electric Inc.)**	**STATUS:**	Pending
TYPE:	Construction	**SPEC SECTION:**	260000 - Electrical
COPIES TO:			
DESCRIPTION:			
ATTACHMENTS:			

ARCHITECT'S STAMP

CONTRACTOR'S STAMP

Consigli Construction Co., Inc.

X	Approved for A/E Review		Revise & Resubmit
	Approved as Noted for A/E Review		Rejected

Spec. Section: 260000	Submittal No.: 260000-193
Date:	By: Megan Collins Christopher Kyne Megan Collins Christopher Kyne

If so marked, approval is given for design only. It does not relieve the subcontractor from complying with the requirements of the contract, contract drawings and specifications. The subcontractor shall be responsible for all dimensions, quantities, schedules and field conditions.

SUBMITTAL WORKFLOW

#	NAME	SUBMITTER/ APPROVER	SENT DATE	DUE DATE	RETURNED DATE	RESPONSE	ATTACHMENTS	COMMENTS
1	Megan Collins	Submitter		9/12/2019		Pending		
2	Christopher Kyne	Submitter		9/12/2019	9/12/2019	Submitted	HQ Fire Alarm RESUBMITTAL.pdf	
3	Megan Collins	Approver		9/12/2019		Pending		
4	Christopher Kyne	Approver		9/12/2019	9/12/2019	Approved		Comments made by GGD are addressed within by Wayne Griffin Electric.
5	CA GGD	Approver		9/26/2019		Pending		
6	Rene Croteau	Approver		10/10/2019		Pending		
7	Keith Mercy	Approver		10/10/2019		Pending		

72 Sumner Street
Milford, Massachusetts 01757

Submittal #260000-193.1
260000 - Electrical

#	NAME	SUBMITTER/ APPROVER	SENT DATE	DUE DATE	RETURNED DATE	RESPONSE	ATTACHMENTS	COMMENTS
8	Kevin Witzell	Approver		10/10/2019		Pending		

BY **DATE** **COPIES TO**

ENGINEERING
SHOP DRAWING REVIEW

GARCIA·GALUSKA·DESOUSA
Consulting Engineers Inc.
375 Faunce Corner Road Suite D, Dartmouth, MA 02747

DATE: October 7, 2019

PROJECT: Needham Public Safety
Needham, MA

850 114 00.00

SHOP DWG. NO.: E-109-1

TITLE: Fire Alarm System (F HQ & P HQ)
260000-193-1

REVIEWED BY: Devin Honeycutt

APPROVED	X
APPROVED AS NOTED	
AMEND & RESUBMIT	
NOT APPROVED	

Shop drawing review is for general conformance with the design concept and for compliance with the contract documents. Marking or comments made on the shop drawing do not relieve the contractor from compliance with the requirements of the contract documents. Contractor is responsible for confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating its' work with that of other trades, and performing its work in a safe and satisfactory manner.

Date 10/7/2019 By DH

GARCIA, GALUSKA & DESOUSA, INC.
CONSULTING ENGINEERS

Review Notes:

CONTRACTOR: Consigli Construction

PROJECT: Needham Public Safety

PARAGRAPH. NO.: 2.18 SUBMITTAL NO.: 260000-193

CONTRACTOR HAS DETERMINED AND VERIFIED MATERIALS, FIELD MEASUREMENTS AND FIELD CONSTRUCTION CRITERIA AND HAS CHECKED AND COORDINATED THE INFORMATION CONTAINED IN THIS SUBMITTAL WITH THE REQUIREMENTS OF THE WORK AND OF THE CONTRACT DOCUMENTS AND RECOMMENDS APPROVAL BY THE ARCHITECT/ENGINEER.

BY: CK DATE: 9/12/2019

KAESTLE BOOS ASSOC. PROJECT NO.: _____

ARCHITECTS/ENGINEERS DATE RECEIVED: _____

COMMENTS MADE ON THE SUBMITTALS DURING THIS REVIEW DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE CONTRACT DOCUMENTS. REVIEWING IS ONLY FOR CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS TO BE CONFIRMED AND CORRELATED AT THE SITE; FOR INFORMATION THAT PERTAINS SOLELY TO THE FABRICATION PROCESSES OR TO THE MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES OF CONSTRUCTION; AND FOR COORDINATION OF THIS WORK WITH THE WORK OF ALL TRADES.

☒ APPROVED ☐ APPROVED AS CORRECTED

IF CHECKED ABOVE, FABRICATION MAY BE UNDERTAKEN. APPROVAL DOES NOT AUTHORIZE CHANGES TO THE CONTRACT SUM OR CONTRACT TIME UNLESS STATED IN A SEPARATE LETTER.

☐ REVISE AND RESUBMIT ☐ NOT APPROVED

BY: Kaycee Lowengrub DATE: 10/11/2019

WAYNE J. GRIFFIN ELECTRIC, INC.
116 Hopping Brook Road
HOLLISTON, MASSACHUSETTS, 01746
PHONE (508) 429-8830
FAX (508) 429-7825

LETTER OF TRANSMITTAL

DATE	9/5/2019	JOB NO:	2464
ATTENTION	Megan Collins		
RE:	NEEDHAM PUBLIC WORKS		

TO **Consigli Construction Co, Inc.**
75 Sumner Street
Milford, MA 02492

WE ARE SENDING YOU ☐ Attached ☐ Under Separate Cover Via _____ the following items:

☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of Letter ☐ Change Order ☒ Resubmittal

COPIES	DATE	NO.	DESCRIPTION
1		1	HQ Fire Alarm & Detection System 26 00 00 - 2.18

THESE ARE TRANSMITTED as checked below:

☐ For record ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☒ For your approval ☐ Approved as noted ☐ Submit _____ copies for distribution

☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS Submittal uploaded to Procore.

COPY TO File To: 2464-6

SIGNED: *Kelly Sullivan*
Kelly Sullivan - Project Engineer

Licenses:
MA A8999 VT EM3303 NH 4223M ME MC60017598 CT ELC.0123697-E1
AL 16318 RI AC-00165 GA EN213065 NC 16529U

If enclosures are not as noted, kindly notify us at once.

WAYNE J.
GRIFFIN ELECTRIC
INC.

September 5, 2019

PROJECT:	Needham Public Safety Building and Fire Station 2 1471 Highland Avenue Needham, MA 02492
OWNER:	Town of Needham 1471 Highland Avenue Needham, MA 02492
GENERAL CONTRACTOR:	Consigli 72 Sumner Street Milford, MA 01757
ARCHITECT:	Kaestle Boos Associates, Inc. 16 Chestnut Street, Suite 301 Foxborough, MA 02035
ELECTRICAL ENGINEER:	Garcia Galuska Desousa 370 Faunce Corner Road Dartmouth, MA 02747
ELECTRICAL CONTRACTOR:	Wayne J. Griffin Electric, Inc. 116 Hopping Brook Road Holliston, MA 01746

We herein submit the following electrical equipment on the **Needham Public Safety Building** Project for approval:

Headquarters Fire Alarm & Detection System Resubmittal 26 00 00 – 2.18

Police & Fire Headquarters
Needham Public Safety
Needham, Massachusetts

GAMEWELL/FCI FIRE ALARM SYSTEM
RESPONSE TO SUBMITTAL REVIEW COMMENTS of 6/11/19
By Garcia Galuska Desousa

Response By: R.B. Allen Co., Inc.

Response Date: 6/24/2019

Reviewed By: Kristine Beliveau, P.M. – R.B. Allen Co., Inc.

NOTE: Garcia Galuska Desousa comments are shown in *ITALICIZED* type. In some cases the complete comment is not repeated for the sake of brevity. R.B. Allen responses are shown in **BOLD** type.

1. Comment: *Coordinate and obtain final approval for this submittal with the Fire Department...*
   Response: WJ Griffin Electric will be submit to Needham Fire Department for approval.
2. Comment: *Coordinate all room names with Architect prior to programming...*
   Response: WJ Griffin Electric will verify all room numbers prior to programming.
3. Comment: *Provide a contact closure in interface with Zetron Fire Alerting system...*
   Response: See revised riser diagram.
4. Comment: *Provide a control module and interface with building management system...*
   Response: A control module has been provided to building management system (BMS).
5. Comment: *Provide isolation modules for every 20 devices...*
   Response: Isolation modules have been provided. See riser diagram.
6. Comment: *Provide complete floor plans and & risers with all devices shown...*
   Response: See revised riser diagram. Floor plans will be provided with close out documentation.
7. Comment: *Confirm manufacturer warranty covers Inspection and Testing in accordance...*
   Response: RB Allen Co will provide testing contract documents upon completion of job. Contract will state additional cost.
8. Comment: *Revise and resubmit fire alarm riser diagram and bill of materials incorporating...*
   Response: See revised bill of material and riser diagram.
9. Comment: *Smoke detector in elevator lobby on recall level shall recall elevator to alternate floor...*
   Response: Elevator smoke detectors shall be programmed in accordance with Elevator Code.
10. Comment: *Initiation of sprinkler Waterflow, smoke or heat detectors shall recall...*
    Response: Per Elevator Code, only smoke in elevator lobbies and elevator machine room shall recall elevator.
11. Comment: *Coordinate sequence of operations matrix with Fire Department. Take particular consideration of door open...*
    Response: RB Allen will coordinate door open relay operation with building owner prior to programming.
12. Comment: *Incorporate Owner requested changes issued as part of PR16...*
    Response: Any scope enhancements, once approved, will be reflected in as-built documents.

We trust these responses and the attached materials shall answer and/or clarify all the concerns generated by the original submittal. Please feel free to contact this office should you need any further clarification or require additional information.

Kristine Beliveau
RB Allen Co., Inc.
Project Management Department

EST-EDWARDS SYSTEMS TECHNOLOGY
FIRE ALARM SYSTEM
Police and Fire Headquarters
Needham, Massachusetts

Click on a Description to View Data Sheet

Revision 1 - Changes shown inRED

ITEM #	QTY.	CAT#	DESCRIPTION	DATA SHEET #
1			**Fire Alarm Control Panel**	
	1	3X-SFS1R	EST3X Fire Alarm Control Panel Consisting of	E85005-0133
		4X-CAB6B	Back box	E85005-0133
		4X-CAB6DR	Red Door	E85005-0133
		PS10-B	Main Power Supply	E85005-0133
		SFS1	Main CPU Module	E85005-0133
		4X-LCD	Display / User Interface	E85005-0133
		3-SDC1	Addressable Loop Controller	E85005-0133
	1	3-MODCOM	Digital Dialer	E85005-0107
	2	SLA1165	55Ah Batteries	INTERSTATE
	1	SSU00500	Battery Cabinet	ED0089
2			**Remote Annunciator**	
	1	RLCD-CR	Remote Annunciator with Controls	E85005-0128
	1	RA-ENC1	Enclosure for Remote Annunciator	E85005-0128
3			**Initiating Devices**	
	17	SIGA-CR	Addressable Control Relay (Building Controls, Door Controls)	E85001-0239
	8	SIGA-CR	Addressable Control Relay (HVAC Shutdown)	E85001-0239
	5	SIGA-CR	Addressable Control Relay (Elevator Controls)	E85001-0239
	11	SIGA-MCR	Addressable Control Relay (Radio Box)	E85001-0239
	20	SIGA-CT1	Addressable Single Point Monitor Module	E85001-0241
	16	SIGA-CT2	Addressable Dual Point Monitor Module	E85001-0241
	8	SIGA-SD	Addressable Duct Smoke Detector	E85001-0584
	8	SD-TRK	Remote Test Station for Duct Smoke	E85001-0584
	8	SD-T60	Sampling Tube (60" Length)	E85001-0584
	15	SIGA-278	Addressable Pull Station - Double Action	E85001-0279
	7	SIGA-PS	Addressable Smoke Detector - For Detention Areas	E85001-0269
	127	SIGA-PD	Addressable Smoke Detector	E85001-0646
	134	SIGA-SB	Standard Detector Base	E85001-0646
	9	CO1224-T	Carbon Monoxide Detector	SYSSENSOR
	5	CO1224-TR	Carbon Monoxide Detector - Round For Detention Areas	SYSSENSOR
	5	SIGA-CC1S	Addressable Synchronization Module	E85001-0543
	11	SIGA-IM	Isolation Module	E85001-0271
	2	SIGA-UIO6R	6 Slot Input/Output Motherboard	E85001-0365

EST-EDWARDS SYSTEMS TECHNOLOGY
FIRE ALARM SYSTEM
Police and Fire Headquarters
Needham, Massachusetts

Click on a Description to View Data Sheet

Revision 1 - Changes shown inRED

ITEM #	QTY.	CAT#	DESCRIPTION	DATA SHEET #
4			**Indicating / Miscellaneous Devices**	
	14	G1F-HDVM	Horn/Strobe Wall Mount (White, Adjustable Candela)	E85001-0573
	21	G1F-VM	Strobe Only Wall Mount (White, Adjustable Candela)	E85001-0573
	97	GCF-HDVM	Horn/Strobe Ceiling Mount (White, Adjustable Candela)	E85001-0559
	1	WG4WF-HVMC	Weatherproof Horn Strobe (White, Adjustable Candela)	E85001-0628
	1	449	Weatherproof Back Box	E85001-0628
	5	BPS6A	Remote Booster Power Supply	E85005-0125
	6	BSL1075	8Ah Batteries	INTERSTATE
	2	BSL1105	12Ah Batteries	INTERSTATE
	2	SLA1116	18Ah Batteries	INTERSTATE
	2	MBC	Mini Battery Cabinet	SPACEAGE
	1	495S-1280R	Red Exterior Beacon	TOMAR
	2	PR-1	Multi-voltage Relay	SYSSENSOR
	2	5000-HR1	Key Box	EAS
	1	DTK120SRD	120v Surge Suppressor	DITEK
	1	DTX16	SIGCOM Radio Masterbox	SIGCOM
	1	438D-6N5R	Waterflow Bell	E85001-0333
	1	GD8	Graphic Map	SPACEAGE
	2	TC1	Terminal Cabinet	SPACEAGE
	5	STI-8100	Tamper Resistant Cover for Carbon Monoxide Detectors	STI
	7	SIGA-DG	Tamper Resistant Cover for Smoke Detectors	E85001-0359
	7	SIGA-DGMF	Tamper Resistant Guard Flange Mount	E85001-0359
	1	STI-1225	Tamper Resistant Cover for Strobe Only	STI
	8	STI-1215	Tamper Resistant Cover for Horn Strobe Wall/ Ceiling Mount	STI

5 **Supporting Documentation**

Click on a Document to View Content

System Descriptive Narrative
System Sequence of Operation Matrix
System Warranty
Fire Alarm Control Panel Battery Calculations
Horn / Strobe Booster Panel Battery Calculations
Horn / Strobe Circuit Wire Length Calculations
Fire Alarm System Riser Diagram

Click Here to Return to
Bill of Material/Index

iO1000R Addressable Fire Alarm System
Needham Public Safety Building
Police & Fire Headquarters and Fire Station #2
Needham, Massachusetts

System Narrative

In the event of an alarm from an actuated device, the following shall occur:

(Devices reporting an alarm: Manual Station, Smoke Detector, Sprinkler Waterflow, Carbon Monoxide Detector, Duct Smoke Detector, Preaction Panel Alarm)

1) Notify Needham Fire Department via Radio Masterbox

2) Annunciate audibly, visually, and in plain English the active initiating device at the fire alarm control panel and remote annunciator

3) Sound a Code 3 Temporal on all Horn Circuits; including sounder bases if applicable

4) Flash all strobe appliance circuits in a synchronized manner

5) If designated elevator recall smoke detector is activated, recall elevator to appropriate floor.

6) If duct smoke detector is activated, shutdown associated HVAC unit.

7) Activate relays associated with AV, lighting, PA, sound, security and BMS systems.

In the event of a supervisory condition from an actuated device, the following shall occur:

(Devices reporting an supervisory: Sprinkler Tamper Switch)

1) Notify Needham Fire Department via Radio Masterbox

2) Annunciate audibly, visually, and in plain English the active initiating device at the fire alarm control panel and remote annunciator

In the event of a system trouble report, the following shall occur:

1) Notify Needham Fire Department via Radio Masterbox

2) Annunciate audibly, visually, and in plain English the active initiating device at the fire alarm control panel and remote annunciator

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iO1000R Addressable Fire Alarm System
Needham Public Safety Building
Police & Fire Headquarters and Fire Station #2
Needham, Massachusetts

SEQUENCE OF OPERATION MATRIX

System Inputs	A: Alarm Signal to Needham Fire Department via Radio Masterbox	B: Annunciate at Fire Alarm Control Panel and Annunciator	C: Activate Horn Strobe Circuits	D: Activate Sounder Base Circuits if Applicable	E: Recall Elevator to Appropriate Floor	F: Activate Relays for AV, Security, Lighting, Sound, PA and BMS Systems	G: Activate Door Open Relays	H: Shutdown Associated HVAC Unit	I: Record Event In Memory	J: Supervisory Signal to Needham Fire Department via Radio Masterbox	K: Trouble Signal to Needham Fire Department via Radio Masterbox	System Inputs
Manual Pull Station	x	x	x	x		x	x		x			Manual Pull Station
Area Smoke Detector	x	x	x	x		x	x		x			Area Smoke Detector
Elevator Smoke Detector	x	x	x	x	x	x	x		x			Elevator Smoke Detector
Carbon Monoxide Detector	x	x	x	x		x	x		x			Carbon Monoxide Detector
Duct Smoke Detector	x	x	x	x		x	x	x	x			Duct Smoke Detector
Sprinkler Waterflow	x	x	x	x		x	x		x			Sprinkler Waterflow
Sprinkler Tamper Switch		x							x	x		Sprinkler Tamper Switch
Preaction Panel Alarm	x	x	x	x		x	x		x			Preaction Panel Alarm
Preaction Panel Trouble		x							x		x	Preaction Panel Trouble
Fire Alarm - AC Failure		x							x		x	Fire Alarm - AC Failure
Fire Alarm - Low Battery		x							x		x	Fire Alarm - Low Battery
Signal Line Open Circuit		x							x		x	Signal Line Open Circuit
Signal Line Ground Fault		x							x		x	Signal Line Ground Fault
Horn/Strobe Circuit Open		x							x		x	Horn/Strobe Circuit Open
Horn/Strobe Circuit Ground		x							x		x	Horn/Strobe Circuit Ground
System Ground Fault		x							x		x	System Ground Fault
	A	B	C	D	E	F	G	H	I	J	K	

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SINCE 1966
R.B. Allen Co., Inc.
NE 1-800-258-7264
FAX (603) 964-8885
P.O. Box 770
131 Lafayette Rd.
No. Hampton, NH 03862
(603) 964-8140

Service and Warranty

The R.B. Allen Co., Inc., established in 1966, is a UL Certified and ISO 9001 registered Fire Alarm Distributor with offices located in North Hampton, NH and throughout New England. The service policy of the R.B. Allen Company is no charge to the customer for warranty work including parts and labor for a period of one (1) year from the time of final acceptance.

The R.B. Allen Company, Inc. warranty applies only to the equipment it provides and does not cover defective wiring or equipment provided by the Electrical Contractor or third party.

Service calls resulting from acts of nature, acts of vandalism, or acts which are beyond the control of the equipment manufacturer are excluded under the warranty and shall be considered a billable call.

R.B. Allen Company factory trained and certified technicians will provide job site supervision during installation of the system and perform final connections, testing, and adjusting of the Fire Alarm System. They also will instruct the owner's personnel on the proper operation and maintenance of the Fire Alarm System.

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Needham Public Safety
Police & Fire Headquarters

Fire Alarm Panel
NAC Circuit Voltage Drop/Maximum Length Calculations

Formulas Used:

$R_t = (D) \times (R_w) / 1000'$

$V_d = (R_t) \times (I_t)$

Substitute for (R_t) and solve for D

$D = ((4.0) \times (1000)) / ((R_w) \times (I_t))$

R_t = Total Circuit Resistance
D = Total Circuit Length (Feet)
R_w = Wire Resistance (Ω) per 1000' Pair (Ohms)
V_D = Circuit Voltage Drop (Max allowed is 4.0Vdc)

Notes:

1. NAC Circuit terminal voltage 24Vdc.
2. A maximum allowable voltage drop of 4Vdc will provide a minimum of 20 Vdc per circuit.
3. Current values listed per device are based on 20Vdc.

STROBE CIRCUIT MAX WIRE LENGTH CALCULATION

	G1RF-HDVM (Horn/Strobe)				WP HS	CO Det	Sounder	GCF-HDVM (Ceiling HS)			G1RF-VM (Strobe Only)				Total Circuit Current	Ω per 1000' Pair
	15cd	30cd	75cd	110cd	75cd	n/a	Base	15cd	30cd	75cd	15cd	30cd	75cd	110cd		
	88	109	193	248	159	20/40	6/76	80	108	185	71	98	188	240		14AWG (5.2)
Circuit 1-1	0	0	4	0	0	0	0	4	8	0	0	1	0	0	1.9100	402.74 Ft
Circuit 1-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0000	#DIV/0! Ft
Auxiliary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0000	#DIV/0! Ft
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0000	#DIV/0! Ft

Needham Public Safety
Police & Fire Headquarters
Booster Panel #1 (NAC Extender) Standby Battery Calculations

Strobe Booster Panel (BPS6A) (Candela Ratings are Indoor per UL 1971 UON)

	G1F-HDVM (Wall Horn/Strobe)				WP HS	CO Det	Sounder	GCF-HDVM (Ceiling HS)			G1F-VM (Strobe Only)				Quies (Amp)	Alarm (Amp)	Remaining % Circuit Capacity
	15cd	30cd	75cd	110cd	15cd	n/a	Base	15cd	30cd	75cd	15cd	30cd	75cd	110cd			
	81	94	161	203	107	20/40	6/76	80	108	185	59	82	152	191			
															0.0700	0.2700	
Circuit 1-1			2					1	2	3	1				0.0000	1.2320	58.93
Circuit 1-2								6		4					0.0000	1.2200	59.33
Auxiliary						5									0.1000	0.2000	93.33
															0.0000	0.0000	100.00
															0.1700	**2.9220**	51.30
															Total Quiescent	Total Alarm	Remaining % BPS Capicity

All currents are expressed as mA.

Max current per ckt = 3 Amps. Max current per panel = 6 Amps.

Total Quiescent Amp x Time Required (60 Hours)	10.200	AmpHr
Total Alarm Amp x Time Required (15 Minutes)	0.731	AmpHr
Total Battery Required (Quiescent + Alarm AmpHr)	10.931	AmpHr
Battery Supplied	**12**	AmpHr

NAC Circuit Voltage Drop/Maximum Length Calculations

Formulas Used:

R_t = (D) x (R_w) / 1000'
V_d = (R_t) x (I_t)
Substitute for (R_t) and solve for D
D = ((4.0) x (1000)) / ((R_w) x (I_t))

R_t = Total Circuit Resistance
D = Total Circuit Length (Feet)
R_w = Wire Resistance (Ω) per 1000' Pair (Ohms)
V_D = Circuit Voltage Drop (Max allowed is 4.0Vdc)

Notes:

1. **NAC Circuit terminal voltage 24Vdc.**
2. **A maximum allowable voltage drop of 4Vdc will provide a minimum of 20 Vdc per circuit.**
3. **Current values listed per device are based on 20Vdc.**

STROBE CIRCUIT MAX WIRE LENGTH CALCULATION

	G1RF-HDVM (Horn/Strobe)				WP HS	CO Det	Sounder	GCF-HDVM (Ceiling HS)			G1RF-VM (Strobe Only)				Total Circuit Current	Ω per 1000' Pair
	15cd	30cd	75cd	110cd	75cd	n/a	Base	15cd	30cd	75cd	15cd	30cd	75cd	110cd		14AWG (5.2)
	88	109	193	248	159	20/40	6/76	80	108	185	71	98	188	240		
Circuit 1-1	0	0	2	0	0	0	0	1	2	3	1	0	0	0	1.2320	624.38 Ft
Circuit 1-2	0	0	0	0	0	0	0	6	0	4	0	0	0	0	1.2200	630.52 Ft
Auxiliary	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0.2000	3846.15 Ft
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0000	#DIV/0! Ft

Needham Public Safety
Police & Fire Headquarters
Booster Panel #2 (NAC Extender) Standby Battery Calculations

Strobe Booster Panel (BPS6A) (Candela Ratings are Indoor per UL 1971 UON)

	G1F-HDVM (Wall Horn/Strobe)				WP HS	CO Det	Sounder	GCF-HDVM (Ceiling HS)			G1F-VM (Strobe Only)				Quies (Amp)	Alarm (Amp)	Remaining % Circuit Capacity
	15cd	30cd	75cd	110cd	15cd	n/a	Base	15cd	30cd	75cd	15cd	30cd	75cd	110cd			
	81	94	161	203	107	20/40	6/76	80	108	185	59	82	152	191			
															0.0700	0.2700	
Circuit 2-1			1					4	4	3			1		0.0000	1.6200	46.00
Circuit 2-2	2			4				1		5	1				0.0000	2.0380	32.07
Auxiliary															0.0000	0.0000	100.00
															0.0000	0.0000	100.00
															0.0700	**3.9280**	34.53
															Total Quiescent	Total Alarm	Remaining % BPS Capicity

All currents are expressed as mA.

Max current per ckt = 3 Amps. Max current per panel = 6 Amps.

Total Quiescent Amp x Time Required (60 Hours)	4.200	AmpHr
Total Alarm Amp x Time Required (15 Minutes)	0.982	AmpHr
Total Battery Required (Quiescent + Alarm AmpHr)	5.182	AmpHr
Battery Supplied	**8**	AmpHr

NAC Circuit Voltage Drop/Maximum Length Calculations

Formulas Used:

R_t = (D) x (R_w) / 1000'
V_d = (R_t) x (I_t)
Substitute for (R_t) and solve for D
D = ((4.0) x (1000)) / ((R_w) x (I_t))

R_t = Total Circuit Resistance
D = Total Circuit Length (Feet)
R_w = Wire Resistance (Ω) per 1000' Pair (Ohms)
V_D = Circuit Voltage Drop (Max allowed is 4.0Vdc)

Notes:

1. **NAC Circuit terminal voltage 24Vdc.**
2. **A maximum allowable voltage drop of 4Vdc will provide a minimum of 20 Vdc per circuit.**
3. **Current values listed per device are based on 20Vdc.**

STROBE CIRCUIT MAX WIRE LENGTH CALCULATION

	G1RF-HDVM (Horn/Strobe)				WP HS	CO Det	Sounder	GCF-HDVM (Ceiling HS)			G1RF-VM (Strobe Only)				Total Circuit Current	Ω per 1000' Pair
	15cd	30cd	75cd	110cd	75cd	n/a	Base	15cd	30cd	75cd	15cd	30cd	75cd	110cd		14AWG (5.2)
	88	109	193	248	159	20/40	6/76	80	108	185	71	98	188	240		
Circuit 2-1	0	0	1	0	0	0	0	4	4	3	0	0	1	0	1.6200	474.83 Ft
Circuit 2-2	2	0	0	4	0	0	0	1	0	5	1	0	0	0	2.0380	377.44 Ft
Auxiliary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0000	#DIV/0! Ft
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0000	#DIV/0! Ft

Needham Public Safety
Police & Fire Headquarters
Booster Panel #3 (NAC Extender) Standby Battery Calculations

Strobe Booster Panel (BPS6A) (Candela Ratings are Indoor per UL 1971 UON)

	G1F-HDVM (Wall Horn/Strobe)				WP HS	CO Det	Sounder	GCF-HDVM (Ceiling HS)			G1F-VM (Strobe Only)				Quies (Amp)	Alarm (Amp)	Remaining % Circuit Capacity
	15cd	30cd	75cd	110cd	15cd	n/a	Base	15cd	30cd	75cd	15cd	30cd	75cd	110cd			
	81	94	161	203	107	20/40	6/76	80	108	185	59	82	152	191			
															0.0700	0.2700	
Circuit 3-1								3		5	2				0.0000	1.2830	57.23
Circuit 3-2			1					4		5	2				0.0000	1.5240	49.20
Auxiliary															0.0000	0.0000	100.00
															0.0000	0.0000	100.00
															0.0700	**3.0770**	48.72
															Total Quiescent	Total Alarm	Remaining % BPS Capicity

All currents are expressed as mA.

Max current per ckt = 3 Amps. Max current per panel = 6 Amps.

Total Quiescent Amp x Time Required (60 Hours)	4.200	AmpHr
Total Alarm Amp x Time Required (15 Minutes)	0.769	AmpHr
Total Battery Required (Quiescent + Alarm AmpHr)	4.969	AmpHr
Battery Supplied	**8**	AmpHr

NAC Circuit Voltage Drop/Maximum Length Calculations

Formulas Used:

$R_t = (D) \times (R_w) / 1000'$

$V_d = (R_t) \times (I_t)$

Substitute for (R_t) and solve for D

$D = ((4.0) \times (1000)) / ((R_w) \times (I_t))$

R_t = Total Circuit Resistance

D = Total Circuit Length (Feet)

R_w = Wire Resistance (Ω) per 1000' Pair (Ohms)

V_D = Circuit Voltage Drop (Max allowed is 4.0Vdc)

Notes:

1. **NAC Circuit terminal voltage 24Vdc.**
2. **A maximum allowable voltage drop of 4Vdc will provide a minimum of 20 Vdc per circuit.**
3. **Current values listed per device are based on 20Vdc.**

STROBE CIRCUIT MAX WIRE LENGTH CALCULATION

	G1RF-HDVM (Horn/Strobe)				WP HS	CO Det	Sounder	GCF-HDVM (Ceiling HS)			G1RF-VM (Strobe Only)				Total Circuit Current	Ω per 1000' Pair
	15cd	30cd	75cd	110cd	75cd	n/a	Base	15cd	30cd	75cd	15cd	30cd	75cd	110cd		
	88	109	193	248	159	20/40	6/76	80	108	185	71	98	188	240		14AWG (5.2)
Circuit 3-1	0	0	0	0	0	0	0	3	0	5	2	0	0	0	1.2830	599.56 Ft
Circuit 3-2	0	0	1	0	0	0	0	4	0	5	2	0	0	0	1.5240	504.74 Ft
Auxiliary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0000	#DIV/0! Ft
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0000	#DIV/0! Ft

Needham Public Safety
Police & Fire Headquarters
Booster Panel #4 (NAC Extender) Standby Battery Calculations

Strobe Booster Panel (BPS6A) (Candela Ratings are Indoor per UL 1971 UON)

	G1F-HDVM (Wall Horn/Strobe)				WP HS	CO Det	Sounder	GCF-HDVM (Ceiling HS)			G1F-VM (Strobe Only)				Quies (Amp)	Alarm (Amp)	Remaining % Circuit Capacity
	15cd	30cd	75cd	110cd	15cd	n/a	Base	15cd	30cd	75cd	15cd	30cd	75cd	110cd			
	81	94	161	203	107	20/40	6/76	80	108	185	59	82	152	191			
															0.0700	0.2700	
Circuit 4-1					1				2	7	1				0.0000	1.6770	44.10
Circuit 4-2									1	6	4				0.0000	1.4540	51.53
Auxiliary															0.0000	0.0000	100.00
															0.0000	0.0000	100.00
															0.0700	**3.4010**	43.32
															Total Quiescent	Total Alarm	Remaining % BPS Capicity

All currents are expressed as mA.

Max current per ckt = 3 Amps. Max current per panel = 6 Amps.

Total Quiescent Amp x Time Required (60 Hours)	4.200	AmpHr
Total Alarm Amp x Time Required (15 Minutes)	0.850	AmpHr
Total Battery Required (Quiescent + Alarm AmpHr)	5.050	AmpHr
Battery Supplied	**8**	AmpHr

NAC Circuit Voltage Drop/Maximum Length Calculations

Formulas Used:

R_t = (D) x (R_w) / 1000'
V_d = (R_t) x (I_t)
Substitute for (R_t) and solve for D
D = ((4.0) x (1000)) / ((R_w) x (I_t))

R_t = Total Circuit Resistance
D = Total Circuit Length (Feet)
R_w = Wire Resistance (Ω) per 1000' Pair (Ohms)
V_D = Circuit Voltage Drop (Max allowed is 4.0Vdc)

Notes:

1. **NAC Circuit terminal voltage 24Vdc.**
2. **A maximum allowable voltage drop of 4Vdc will provide a minimum of 20 Vdc per circuit.**
3. **Current values listed per device are based on 20Vdc.**

STROBE CIRCUIT MAX WIRE LENGTH CALCULATION

	G1RF-HDVM (Horn/Strobe)				WP HS	CO Det	Sounder	GCF-HDVM (Ceiling HS)			G1RF-VM (Strobe Only)				Total Circuit Current	Ω per 1000' Pair
	15cd	30cd	75cd	110cd	75cd	n/a	Base	15cd	30cd	75cd	15cd	30cd	75cd	110cd		14AWG (5.2)
	88	109	193	248	159	20/40	6/76	80	108	185	71	98	188	240		
Circuit 4-1	0	0	0	0	1	0	0	0	2	7	1	0	0	0	1.6770	458.69 Ft
Circuit 4-2	0	0	0	0	0	0	0	0	1	6	4	0	0	0	1.4540	529.04 Ft
Auxiliary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0000	#DIV/0! Ft
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0000	#DIV/0! Ft

Needham Public Safety
Police & Fire Headquarters
Booster Panel #5 (NAC Extender) Standby Battery Calculations

Strobe Booster Panel (BPS6A) (Candela Ratings are Indoor per UL 1971 UON)

	G1F-HDVM (Wall Horn/Strobe)				WP HS	CO Det	Sounder	GCF-HDVM (Ceiling HS)			G1F-VM (Strobe Only)				Quies (Amp)	Alarm (Amp)	Remaining % Circuit Capacity
	15cd	30cd	75cd	110cd	15cd	n/a	Base	15cd	30cd	75cd	15cd	30cd	75cd	110cd			
	81	94	161	203	107	20/40	6/76	80	108	185	59	82	152	191			
															0.0700	0.2700	
Circuit 5-1										10	2				0.0000	1.9680	34.40
Circuit 5-2										9	6				0.0000	2.0190	32.70
Auxiliary						7									0.1400	0.2800	90.67
															0.0000	0.0000	100.00
															0.2100	**4.5370**	24.38
															Total Quiescent	Total Alarm	Remaining % BPS Capicity

All currents are expressed as mA.

Max current per ckt = 3 Amps. Max current per panel = 6 Amps.

Total Quiescent Amp x Time Required (60 Hours)	12.600	AmpHr
Total Alarm Amp x Time Required (15 Minutes)	1.134	AmpHr
Total Battery Required (Quiescent + Alarm AmpHr)	13.734	AmpHr
Battery Supplied	**18**	AmpHr

NAC Circuit Voltage Drop/Maximum Length Calculations

Formulas Used:

$R_t = (D) \times (R_w) / 1000'$

$V_d = (R_t) \times (I_t)$

Substitute for (R_t) and solve for D

$D = ((4.0) \times (1000)) / ((R_w) \times (I_t))$

R_t = Total Circuit Resistance

D = Total Circuit Length (Feet)

R_w = Wire Resistance (Ω) per 1000' Pair (Ohms)

V_D = Circuit Voltage Drop (Max allowed is 4.0Vdc)

Notes:

1. **NAC Circuit terminal voltage 24Vdc.**
2. **A maximum allowable voltage drop of 4Vdc will provide a minimum of 20 Vdc per circuit.**
3. **Current values listed per device are based on 20Vdc.**

STROBE CIRCUIT MAX WIRE LENGTH CALCULATION

	G1RF-HDVM (Horn/Strobe)				WP HS	CO Det	Sounder	GCF-HDVM (Ceiling HS)			G1RF-VM (Strobe Only)				Total Circuit Current	Ω per 1000' Pair
	15cd	30cd	75cd	110cd	75cd	n/a	Base	15cd	30cd	75cd	15cd	30cd	75cd	110cd		14AWG (5.2)
	88	109	193	248	159	20/40	6/76	80	108	185	71	98	188	240		
Circuit 5-1	0	0	0	0	0	0	0	0	0	10	2	0	0	0	1.9680	390.87 Ft
Circuit 5-2	0	0	0	0	0	0	0	0	0	9	6	0	0	0	2.0190	381.00 Ft
Auxiliary	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0.2800	2747.25 Ft
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0000	#DIV/0! Ft

EDWARDS
United Technologies
LIFE SAFETY & INCIDENT MANAGEMENT

EST3X Life Safety Control System

FM APPROVED
FDNY COA 6087
7165-1657: 0186/0306
UL UL C S3000

Description

EST3X represents the latest generation of life safety control panels for mid to large sized applications. With large multi-message displays and innovative controls, intuitive interfaces, and bold colored cabinets — these systems capture the imagination, and catch the eye. But behind the LCD display is where they really shine.

New microprocessors and chipsets take full advantage of the latest advances in computing technology, leading to smarter, faster, higher-capacity processing and more efficient designs. EST3X's patented Voltage Boost™ technology, for example, delivers consistent voltage – even at low battery power – resulting in lighter cable requirements and/or longer runs. That saves time and money.

Meanwhile, advanced communications provide integrated IP communications via existing Ethernet networks directly to subscribed central stations. Email and text messaging options enrich this advanced communication environment with instant notification — anywhere, any time.

High performance processing also leads to powerful networking features and versatile digital audio functionality. The wide range of EST3X configurations include standalone operation, networking with up to 64 nodes, or integration with an EST3 network comprising as many as 64 nodes — complete with mass notification capabilities and display of security events.

EST3X sets a new standard in front-panel life safety control interfaces. Its exclusive SpeedTouch™ rotary control offers nimble forward and back scrolling through events and options, while a mere tap of the control selects items with a clean fluidity of motion. Its extra-large backlit display reveals up to eight concurrent messages, and switch/LED strips provide ample space for meaningful custom labels. And for end users, large tactile control buttons instill confidence and promote quick response when time is of the essence.

Standard Features

- Up to six intelligent analog loops hosting as many as 1,500 Signature Series devices per panel
- Optional integrated eight-channel digital audio
- 10 amp power supply with universal 94 to 264 Vac input voltage
- Patented Voltage Boost™ technology delivers consistent voltage — even at low battery power
- Four built-in 3-amp notification/auxiliary circuits
- Large 24-line by 40-character backlit LCD
- Simplified operation with the SpeedTouch™ rotary control
- 65 amp hour battery charger
- 64-node network nodes using copper and/or fiber
- Supports up to 30 R-Series remote annunciators
- Part of an end-to-end audio solution suitable for low frequency signaling in sleeping areas
- Space for up to three additional option cards such as extra SLC loops, amplifiers, or dialer/modem
- Optional Ethernet Interfaces for central station communication, email, and diagnostics
- 1,100 event history log
- Optional earthquake hardening: OSHPD seismic pre-approval for component Importance Factor 1.5
- UL2572 Listed for Mass Notification, UL864 UUKL Listed for Smoke Control, UL864 Listed for releasing applications using SIGA-REL

Application

Application flexibility is where EST3X's computing power is put to best use. This generation of control panels is equally at home as the center of a simple single-building standalone system as it is when part of a sophisticated life safety network serving thousands of points across multiple buildings. Optional voice evacuation bridges the gap left by other mid-range systems, and makes these panels a cost-effective solution for most applications.

Strong Networking

Networking is among EST3X's strong suits. Highly efficient RS485 connectivity, plus fiber-optic communications deliver faster response times and more sophisticated diagnostic capabilities, while cost-effective remote annunciation solutions keep basic monitoring and control always within reach.

A simple EST3X network can comprise up to 64 nodes – enough to serve the needs of most campuses and larger buildings. Its ability to join an EST3 network with as many as 64 nodes extends EST3X's reach into mass notification applications, security reporting, as well as making it an ideal candidate for retrofits.

High Capacity Audio

EST3X features a full eight channels of integrated digital audio with up to two minutes of on-board programmable message storage. An optional high quality paging microphone gives live access to local, as well as remote, audio functions. Auxiliary inputs are available for mass notification operations, and ZA Series amplifiers may be mounted directly on the EST3X rail assembly.

An optional paging microphone provides local, as well as remote, audio functions.

High Fidelity Audio Approved for Sleeping Areas

EST3X is part of an end-to-end low frequency/high fidelity solution listed to UL 464 and UL 864. Its audio system approved for code-compliant 520 Hz signaling in sleeping areas when used in conjunction with:

- a factory-supplied 520 Hz audio file
- one or more of the following amplifiers: 3-ZA20A, 3-ZA20B, 3-ZA40A, 3-ZA40B, 3-ZA95, SIGA-AA30, SIGA-AA50, 1B3-125, or 1B3-250
- one or more Genesis High Fidelity speakers (G4HF or GCHF series)

Consult the EST3X Compatibility List for details.

Seamless System Integration

EST3X borrows much from it's larger sibling, the venerable EST3 Life Safety Platform. And for good reason: by integrating with the EST3 networking and computing environment, an EST3X control panel can serve as a cost-effective remote node for extinguishing, smoke control, or even mass notification functions — all within the same compliance framework.

Retrofits and expansions benefit enormously from this arrangement, but programming and equipment management for new installations is equally efficient as a result of these shared resources. EST3X will accommodate up to three EST3 modules on its own rail assembly, giving it access to such proven EST3 successes as zoned amplifiers, conventional device circuits, modem communicators, and RS-485 functions. Meanwhile, installers familiar with EST3 configuration will find that the two systems share many of the same programming and diagnostic conventions.

Local and Remote Annunciation

Up to 30 R-Series annunciators may be configured for each node on the EST3X network.

Up to 30 R-Series LCD, LED annunciators and driver interface cards may be configured for each node on the EST3X network. No additional nodes are required for annunciation purposes. In addition, EST3X supports EST3 network annunciators, while GCI and GCIX driver interface cards provide cost-effective graphic annunciation solutions. And all annunciator inputs and outputs are easily programmable through the rules and labels function of EST3X's Software Definition Utility.

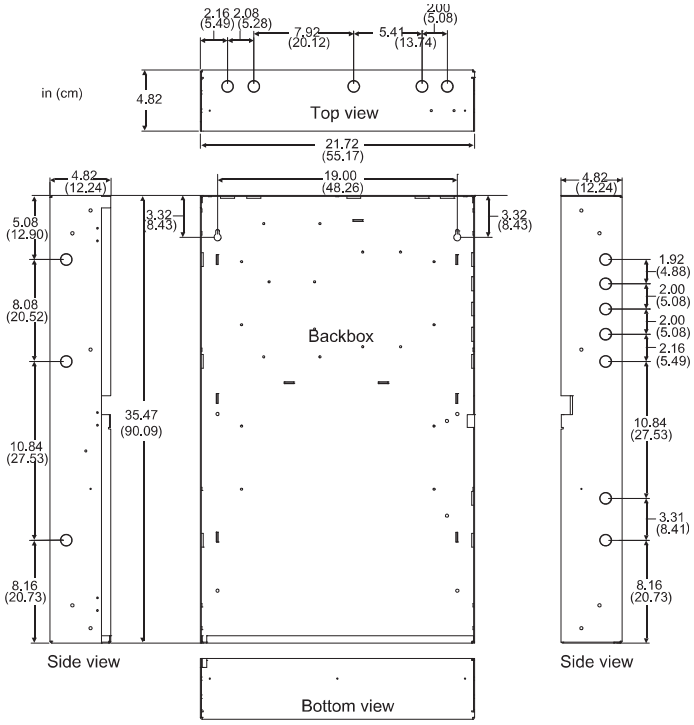
Power to Count On

EDWARDS' patented Voltage Boost™ technology delivers a consistent 22.5 Vdc – even at low battery power. This means lighter gauge cable can be used for equivalent distances compared with conventional power supplies, or longer wire runs on the same gauge cable. Either way, this breakthrough technology saves time and equipment costs, making EST3X not only a high-performance solution — but a cost-effective one as well.

EST3X's four on-board Notification Appliance Circuits are fully synchronized to UL 1971 standards — without the need for external modules or other electronics. It's ample 10-amp power supply is finely tuned to get the most out of EDWARDS' widely-acclaimed low profile Genesis notification appliances.

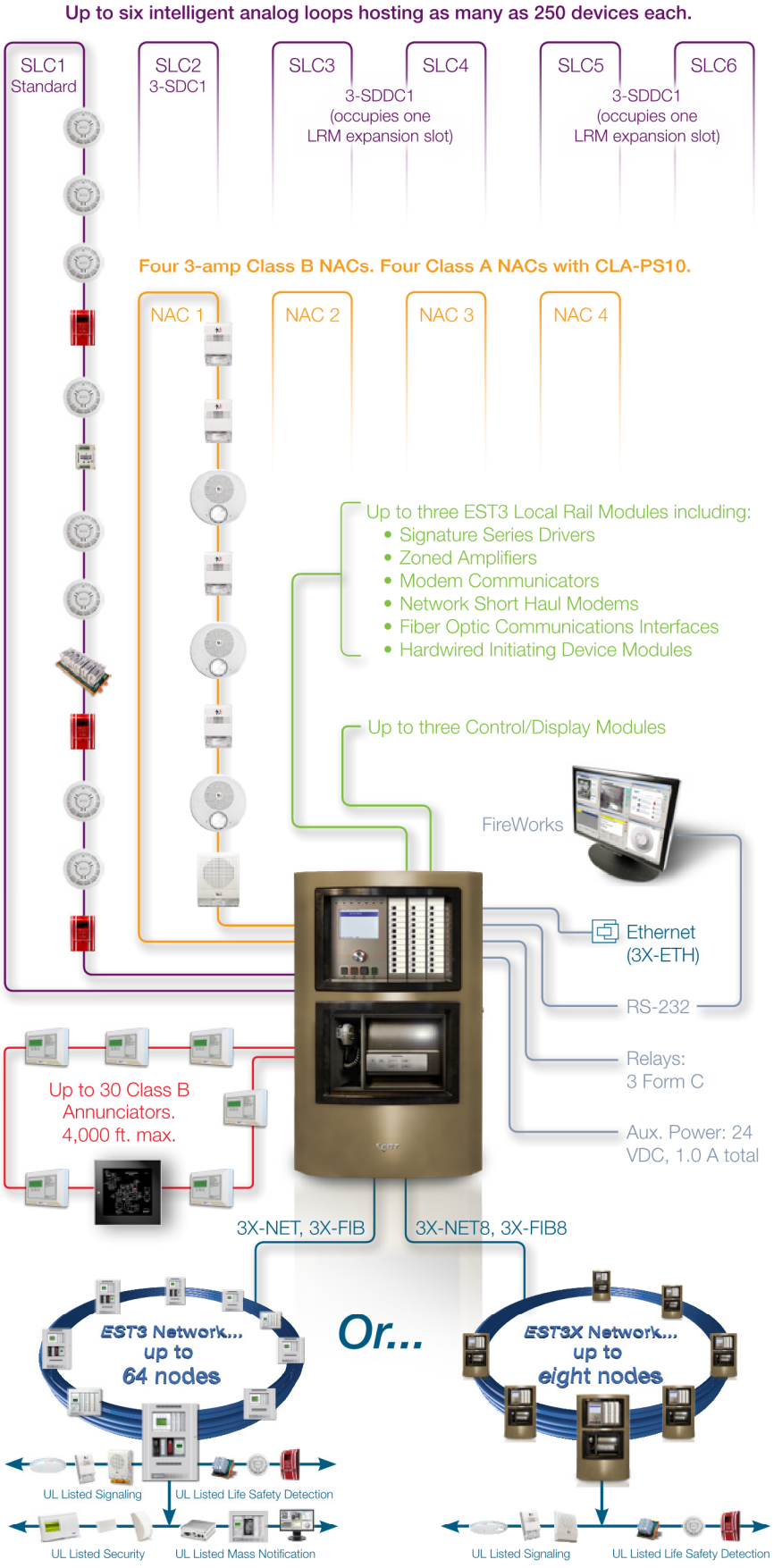
Dimensions

The backbox is designed for semiflush or surface mounting. Conduit and nail knockouts, keyhole style mounting holes, and wide wiring troughs facilitate efficiency during installation.



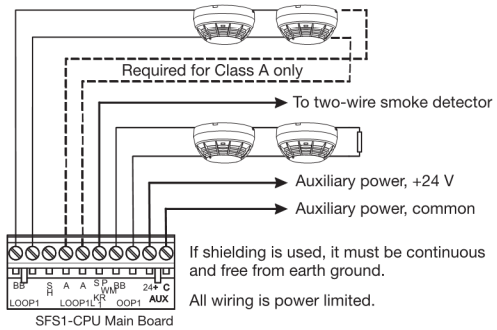
Note: Add 0.25 in (0.64 cm). to height and width dimensions to allow for knockouts when framing in the backbox for semiflush mounting.

System Layout

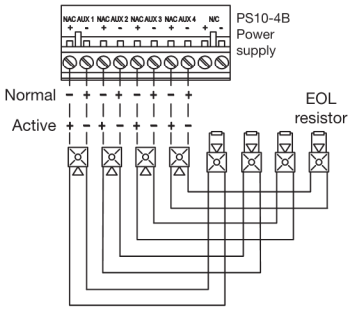


Wiring

■ Signature (initiating) Data Circuit



■ Notification Appliance Circuits



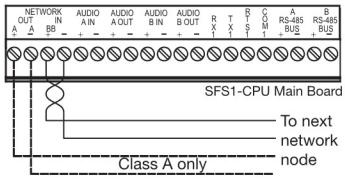
Wiring is supervised and power limited.

TB2 terminal marking indicates signal polarity when the circuit is active. Polarity reverses when the circuit is active.

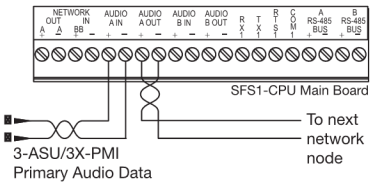
For proper circuit supervision, break the wire run at each notification appliance and install the EOL resistor at the end of the circuit.

Do not loop wires around notification appliance terminals.

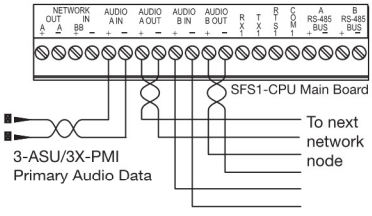
■ Network data circuit



■ Network data circuit, Class B audio

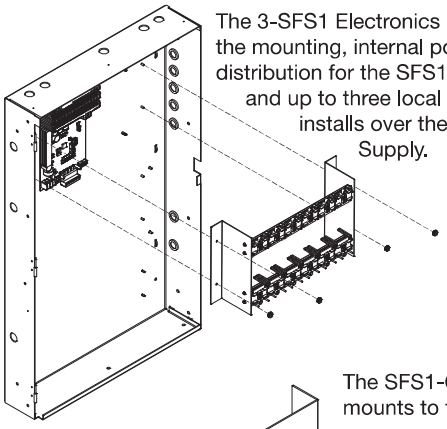


■ Network data circuit, Class A audio

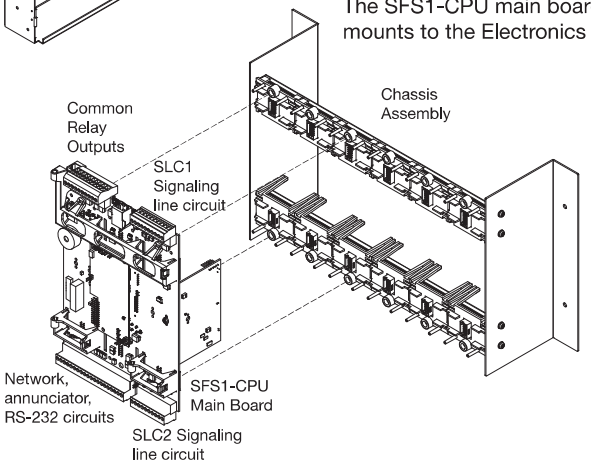


Main Component Assembly

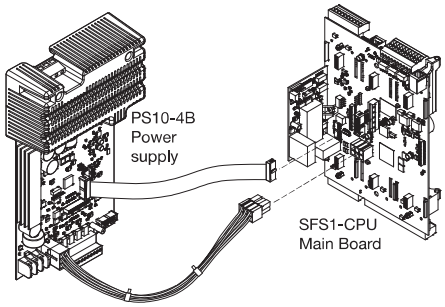
EST3X systems are designed for quick assembly and easy access in the field. Components are modular and require no special tools to service or replace.



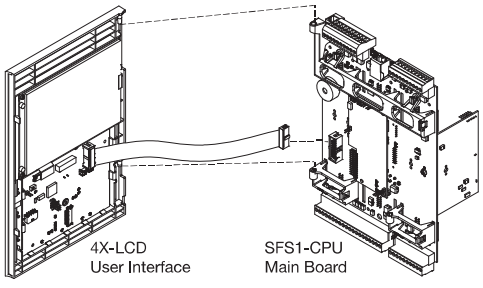
The 3-SFS1 Electronics Chassis provides the mounting, internal power, and data distribution for the SFS1-CPU main board and up to three local rail modules. It installs over the PS10-4B Power Supply.



The SFS1-CPU main board mounts to the Electronics Chassis.

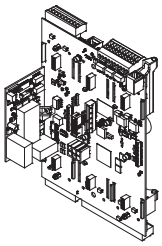


Two cables connect the PS10-4B Power Supply to the back of the SFS1-CPU main board.



The 4X-LCD assembly mounts to hinge pins on the CPU and connects with a single ribbon cable.

SFS1-CPU Main Board



The SFS1-CPU main board processes all information from modules installed within the cabinet as well as data received from other panels over the network data riser. When a network card is installed, the CPU employs a command set to determine its type.

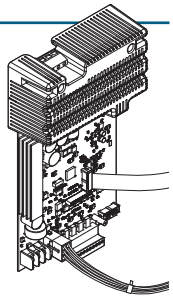
SFS1-CPU Specifications

Voltage	24 VDC
Current	
Standby	115 mA at 24 VDC
Alarm	115 mA at 24 VDC
Relay outputs	
Quantity	3 (alarm, supervisory, and trouble)
UL type	Common
Contact arrangement	Form C
Rating	30 VDC at 1 A resistive
AUX power outputs	
Quantity	2
Voltage	24 VDC, resettable or continuous
Current	1.0 A each circuit, 1.0 A total
Data network (RS-485)	
Nodes	2 to 64 (requires optional network card)
Performance class	Class A or Class B
Wire type	Twisted pair, 6 twists per foot, min.
Circuit length	5,000 ft. (1,524 m) between any three panels
Circuit resistance	90 Ω, max.
Circuit capacitance	0.3 µF, max.
Serial Port (RS-232)	
The on-board serial port supports communication to the FireWorks graphical users interface or the FSB-PC series of protocols converters for ancillary communications to BMS systems.	
Circuit length	20 ft. (6 m) max.
Circuit resistance	13 Ω, max.
Circuit capacitance	0.7 µF, max.
Annunciator port (RS-485)	
Performance class	Class B and Redundant Class B
Baud rate	9600 and 38400
Wire type	Twisted pair, 6 twists per foot, min.
Circuit length	4,000 ft. (1,219 m)
Circuit resistance	90 Ω, max.
Circuit capacitance	0.3 µF, max.
Signaling line circuit	
Quantity	2 (second SLC requires optional 3-SDC1 card)
Performance class	Class A or Class B
Circuit capacity	125 detectors, 125 single address modules
Circuit resistance	100 Ω, max.
Circuit capacitance	0.5 µF, max.
Wire size	18 to 12 AWG (0.75 mm² to 2.50 mm²)
Ground fault impedance	10 kΩ
Operating environment	
Temperature	32 to 120°F (0 to 49°C)
Relative humidity	0 to 93% noncondensing

Notes

- For battery calculations, standby and alarm currents include all listed primary power supplies.
- The common trouble relay operation does not include AC trouble delay functionality and cannot be used for reporting troubles off premises per UL 864 9th edition.

PS10-4B Power Supply Card



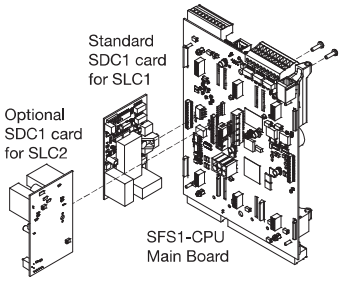
The PS10-4B Power Supply Card provides the required power and related supervision functions for the control panel, as well as filtered, regulated power to the rail chassis modules. It also provides 24 VDC for operating ancillary equipment.

PS10-4B Specifications

Mains voltage	94 to 264 VAC, 50/60 Hz
AC Input Current	
Standby	1.5 amps
Alarm	3.0 amps
Brownout level	93 VRMS
Battery charging capacity	65 Ah max.
Total Power	Voltage 24vdc
Standby Current	88mA
Alarm Current	169mA
Supply Ratings	Current 10 amps (UL), 9.0amps (ULC)
Notification appliance/Auxiliary power circuits	
UL rating	
Quantity	4
Circuit configuration	Class B[1]
Output voltage	Special: 24 Vdc Regulated: 24 Vdc
Output current	Special: 3 amps Regulated: 1.5 amps
EOLR	15 kΩ (UL P/N EOL-15, ULC P/N EOL-P1)
Wiring	
Mains input[2]	Supervised, non power-limited
Battery input	Supervised, non power-limited
NAC outputs	Supervised, power-limited
Wire size	18 to 12 AWG (0.75 mm² to 2.50 mm²)
Ground fault impedance	10 kΩ
Operating environment	
Temperature	32 to 120 °F (0 to 49 °C)
Relative humidity	0 to 93% noncondensing

[1]Class A when a CLA-PS10 Class A adapter card is installed.
[2] Connect the mains supply using a dedicated branch.

3-SDC1 Signature Data Circuit Card



Each 3-SDC1 Signature Data Circuit Card provides one Class A or Class B signaling line circuit (SLC1) that supports up to 125 Signature Series detectors and 125 Signature Series module addresses. These modules also provide connection for powering conventional two-wire smoke detector circuits on Signature Series modules.

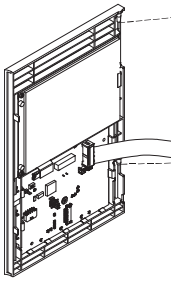
EST3X comes standard with one 3-SDC1 card installed as SLC1. An optional second 3-SDC1 card may be installed to provide SLC2, thus doubling system signaling line capacity.

3-SDC1 Specifications

Voltage	24 VDC
Operating current with fully loaded loop	
Standby	3-SSDC1 144 mA; 3-SDDC1 264 mA
Alarm	3-SSDC1 204 mA; 3-SDDC1 336 mA
Smoke power	19.95 VDC max.[1]
Circuit	
Configuration	Class B, Style 4, DCLB; Class A, Style 6, DCLA
Capacity	125 Signature Series detectors and 125 Signature Series modules per SLC
Resistance	100 Ω with 250 devices
Capacitance	0.5 µF max.
Wire size	12 AWG (1.5 mm²) max.
Termination	Removable plug-in terminal strips on the SFS1-CPU main board and Signature module
Operating environment	
Temperature	32 to 120 °F (0 to 49 °C)
Relative humidity	0 to 93% noncondensing

[1]For special applications, refer to EST3 ULI/ULC Compatibility Lists (P/N 3100427)

4X-LCD User Interface

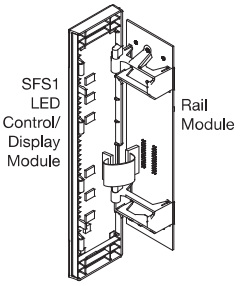


Included in the EST3X basic package, the 4X-LCD provides the user interface for the EST3X system. It connects to the SFS1-CPU main board with a ribbon cable, and attaches to the CPU via hinges. Only one display module is required to provide a point of control for the entire network. Additional displays can be added to any EST3X panel in the network to provide additional points of control.

4X-LCD Specifications

Operating current	
Standby	55mA
Alarm	66mA
LCD display	Backlit liquid crystal display 240 x 320 pixels 24 lines of 40 characters
Operating environment	
Temperature	32 to 120 °F (0 to 49 °C)
Relative humidity	0 to 93% noncondensing

SFS1 LED Control/ Display Module

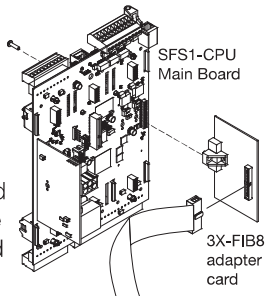


The SFS1 LED Control/Display Module provides additional operator interface capability for the SFS1 system. It can be mounted on any of the three right-most local rail modules on the 3-SFS1 electronics chassis. Inserts are provided for labeling switches and LEDs.

SFS1 Specifications

Voltage	24 VDC
Operating current	
Standby	2.0 mA plus 1.5 mA for each active LED
Alarm	2.0 mA plus 1.5 mA for each active LED
Operating environment	
Temperature	32 to 120 °F (0 to 49 °C)
Relative humidity	0 to 93% noncondensing

3X-FIB fiber optic network module



The 3X-FIB fiber optic network module gives an EST3X panel the ability to network 64 EST3X panels, or interface with an EST3 network. Both Class A and Class B connections are supported. The module consists of the adapter card and electronics card.

The 3X-FIB supports the following fiber optic transceivers:

Model	Description
SMXLO2	Standard output single mode fiber optic transceiver
SMXHI2	High output single mode fiber optic transceiver
MMXVR	Standard output multimode fiber optic transceiver

The 3X-FIB provides terminals for connecting a 24 VDC backup power source to maintain data transmissions in the event the panel is powered down.

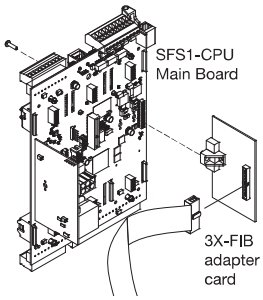
Note: All networked panels must have the 3X-FIB network card installed.

3X-FIB Specifications

Voltage	19.2 to 27.6 VDC (24 VDC nominal)
Fiber optics network and audio Budget	
SMXLO2	15 dBm between two interfaces
SMXHI2	25 dBm max. and 8 dBm min. 10 dBm between two interfaces
MMXVR	50/125, 62.5/125, or 100/140 for MMXVR
Cable type	
Connectors	50/125, 62.5/125, or 100/140 for
SMXLO2, SMXHI2	Type Duplex SC
MMXVR	Type ST
Network data circuit	
Circuit configuration	Class B (style 4) or Class A (style 7)
Data rate	19.2 K, 38.4 kbps
Isolation	Isolated from previous panel CPU when using copper. Total isolation when using fiber optics.
Digitized audio data circuit	
Circuit configuration	Class B (style 4) or Class A (style 7)
Data rate	327 kbps
Isolation	Isolated from previous panel CPU when using copper. Total isolation when using fiber optics.
Copper wired network data circuit segment Circuit	
Length	5,000 ft. (1,524 m) max. between any three panels
Resistance	90 Ω max.
Capacitance	0.3 µF max.[1]
Wire type	Twisted Pair, 18 AWG (0.75 mm²) min.
Operating environment	
Temperature	32 to 120 °F (0 to 49 °C)
Relative humidity	0 to 93% noncondensing

[1]Include shield capacitance, if shielding is used.

3X-FIB8 fiber optic network module



The 3X-FIB8 fiber optic network module gives an EST3X panel the ability to network up to eight EST3X nodes. Both Class A and Class B connections are supported. The module consists of the adapter card and electronics card.

The 3-FIB8 supports the following fiber optic transceivers:

Model	Description
SMXLO2	Standard output single mode fiber optic transceiver
SMXHI2	High output single mode fiber optic transceiver
MMXVR	Standard output multimode fiber optic transceiver

The 3X-FIB8 provides terminals for connecting a 24 VDC backup power source to maintain data transmissions in the event the panel is powered down.

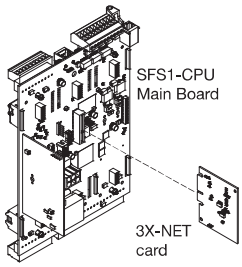
Note: All networked panels must have the 3X-FIB8 network card installed.

3X-FIB8 Specifications

Voltage	19.2 to 27.6 VDC (24 VDC nominal)
Fiber optics network and audio Budget	
SMXLO2	15 dBm between two interfaces
SMXHI2	25 dBm max. and 8 dBm min. 10 dBm between two interfaces
MMXVR	50/125, 62.5/125, or 100/140 for MMXVR
Cable type	
Connectors	50/125, 62.5/125, or 100/140 for
SMXLO2, SMXHI2	Type Duplex SC
MMXVR	Type ST
Network data circuit	
Circuit configuration	Class B (style 4) or Class A (style 7)
Data rate	19.2 K, 38.4 kbps
Isolation	Isolated from previous panel CPU when using copper. Total isolation when using fiber optics.
Digitized audio data circuit	
Circuit configuration	Class B (style 4) or Class A (style 7)
Data rate	327 kbps
Isolation	Isolated from previous panel CPU when using copper. Total isolation when using fiber optics.
Copper wired network data circuit segment Circuit	
Length	5,000 ft. (1,524 m) max. between any three panels
Resistance	90 Ω max.
Capacitance	0.3 µF max.[1]
Wire type	Twisted Pair, 18 AWG (0.75 mm²) min.
Copper wired audio data circuit Circuit	
Length	5,000 ft. (1,524 m) max. between any three panels
Resistance	90 Ω max.
Capacitance	0.09 µF, max[1]
Wire type	Twisted pair, 18 AWG (0.75 mm²) min.
Operating environment	
Temperature	32 to 120 °F (0 to 49 °C)
Relative humidity	0 to 93% noncondensing

[1]Include shield capacitance, if shielding is used.

3X-NET Network Adapter Card



The 3X-NET network adapter card gives an SFS1-CPU main board the ability to network up to 64 nodes on an EST3 network. The card supports Class B and Class A wiring.

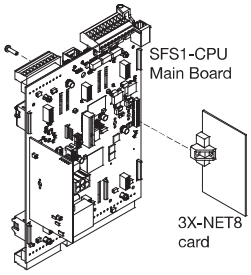
The 3X-NET adapter card provides two independent RS 485 circuits: one for network data communications and one for digital audio communications.

3X-NET Specifications

Voltage	24 VDC
Operating Current	
Standby	98 mA at 24 VDC
Alarm	98 mA at 24 VDC
Circuit configuration	
Network data	Class A, Style 6 & Class B, Style 4
Network audio	Class A, Style 6 & Class B, Style 4
Isolation	
Network data	Network A port not isolated; Network B port isolated
Network audio	Audio A IN and Audio B IN isolated Audio A OUT and Audio B OUT not isolated
Wire size	Twisted pair[1] 18 AWG (0.75 mm) min.
Circuit length	5,000 ft. (1,524 m) between any three panels
Circuit resistance	90 Ω max.
Circuit capacitance	Data: 0.3 µF max.; Audio 0.09 µF max.
Operating environment	
Temperature	32 to 120 °F (0 to 49 °C)
Relative humidity	0 to 93% noncondensing

[1]Six twists per foot minimum

3X-NET8 network card



The 3X-NET8 RS-485 network card gives an SFS1-CPU main board the ability to network through dedicated copper wire up to eight EST3X control panels. The card supports Class B and Class A wiring.

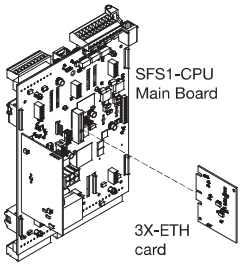
Note: All networked panels must have a 3X-NET8 network card installed.

3X-NET8 Specifications

Voltage	24 VDC
Operating Current	
Standby	98 mA at 24 VDC
Alarm	98 mA at 24 VDC
Circuit configuration	
Network data	Class A, Style 6 & Class B, Style 4
Isolation	
Network data	Network A port not isolated, Network B port isolated
Wire size	Twisted pair[1] 18 AWG (0.75 mm) min.
Circuit length	5,000 ft. (1,524 m) between any three panels
Circuit resistance	90 Ω max.
Circuit capacitance	0.3 µF max.
Operating environment	
Temperature	32 to 120 °F (0 to 49 °C)
Relative humidity	0 to 93% noncondensing

[1] Six twists per foot min.

3X-ETH Ethernet Adapter Cards



Three optional Ethernet adapter cards are available for EST3X applications. Each of these provide specific features such as panel programming, diagnostics, and status monitoring, as well as central station connectivity, and email or email-to-text messaging capability.

Supported communications	ETH1	ETH2	ETH3
CU communications with the Panel for Programming and Diagnostic Functions	•	•	•
FireWorks (ECP/IP) Gateway Communications	•	•	•
IP Dialer Communications		•	•
Email and Text Communications			•

Each EST3X control panel supports up to eight IP services, which can provide connection to any combination of the following functions:

- Programming
- FireWorks Graphical User Interfaces
- IP Dialer (IP-DACT)
- Email

Each EST3X network supports up to:

- 10 ECP Connections, and;
- 100 Dialer Accounts, and;
- 100 Email Accounts (up to 20 email addresses per account).

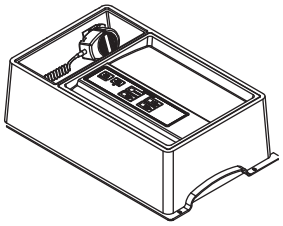
3X-ETH1, 3X-ETH2, 3X-ETH3 Specifications

See Ordering Information for adapter card functional descriptions

Ethernet	10/100 Base-T
Voltage	24 VDC
Operating current	
Standby	42 mA at 24 VDC
Active	42 mA at 24 VDC
Connection mode	Auto negotiation
Wire runs	
Distance	200 ft. (60 m) max.[1]
Type	Cat 5
Connector	RJ-45
Operating environment	
Temperature	32 to 120 °F (0 to 49 °C)
Relative humidity	0 to 93% noncondensing

[1]Panel to communication equipment

3X-PMI Paging Microphone Interface

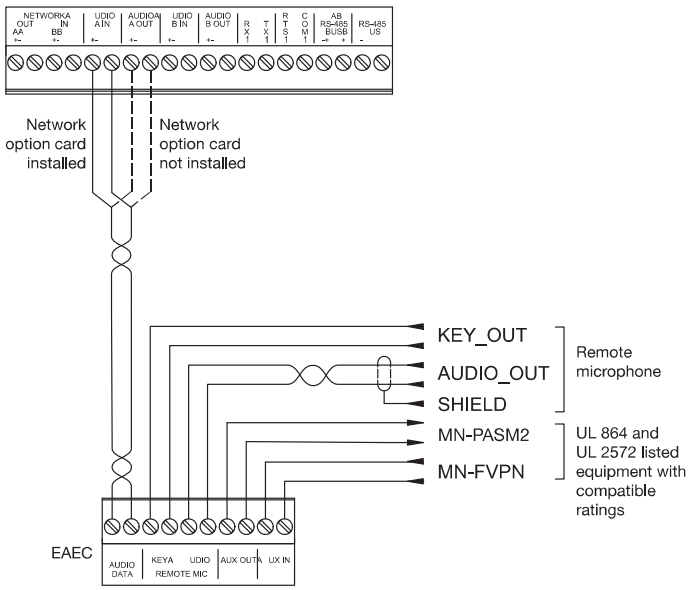


The 3X-PMI Paging Microphone Interface provides controls for emergency voice/alarm communications. It consists of an audio mounting bracket, EAEC Emergency Audio Evacuation Controller card, audio enclosure, and paging microphone.

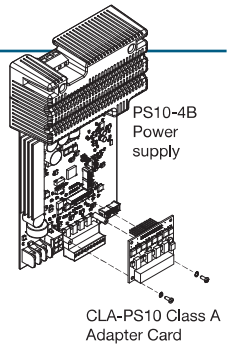
3X-PMI Paging Microphone Interface Specifications

Voltage	24 VDC
Current	
Standby	23mA
Alarm	29mA
Ground fault impedance	10 kΩ
Wire size	18 to 12 AWG (0.75 to 2.50 mm²)
Audio channels	8 simultaneous
Audio inputs	
Local microphone	Isolated and supervised
Remote microphone	Isolated and supervised
Remote audio	Isolated and supervised
EAEC communication	See the EAEC Emergency Audio Evacuation Control Installation Sheet (P/N 3101789)
Messages	
Storage	2 min. total
Length	39 sec. max.
Controls and indicators	
Common	
Paging Volume	Indicates relative signal strength during active page
Ready To Page	Flashes during preannouncement tone, steady when ready to page
Paging Microphone	
All Call	Activates/deactivates page to all areas
All Call Minus	Activates/deactivates page to areas not receiving EVAC or Alert message
Page To Evac	Activates/deactivates page to areas currently receiving the EVAC message
Page To Alert	Activates/deactivates page to areas currently receiving the Alert message
Operating environment	
Temperature	32 to 120°F (0 to 49°C)
Relative humidity	0 to 93% noncondensing

SFS1-CPU



CLA-PS10 Class A Adapter Card



CLA-PS10 Class A Adapter Card

The CLA-PS10 Class A Adapter Card is an optional card used to convert the four Class B notification appliance/auxiliary power circuits on the power supply card to Class A.

CLA-PS10 Specifications

Voltage	24 VDC
Notification appliance/Auxiliary power circuits	
UL rating	Special application or Regulated
Quantity	4
Performance class	Class A
Output current	Special 3.0 A; Regulated: 1.5 A each circuit
EOLR	15 kΩ (UL P/N EOL-15, ULC P/N EOL-P1)
Wiring	Supervised, power-limited
Wire size	18 to 12 AWG (0.75 mm² to 2.50 mm²)
Operating environment	
Temperature	32 to 120 °F (0 to 49 °C)
Relative humidity	0 to 93% noncondensing

Ordering Information

Intelligent Analog Control Panels

Model	Door Color	Language	Description
3X-SFS1B	Bronze	English	FACP, complete system with user interface, CPU, one loop with second loop expansion, three option card slots, four Class B NAC, universal 110/220v 10 amp power supply. Order 3-SDC1 for second loop.
3X-SFS1R	Red		
3X-SFS1Bi	Bronze	Selectable	
3X-SFS1Ri	Red		
TRIM6			Flush trim ring

Network communication option cards

3X-NET8	RS485, eight node max. Class A/B network. Use on 3-SFS systems only.
3X-NET	RS485, Class A/B network. For connection with node counts above eight or to EST3 systems.
3X-FIB8	Fiber, 8 node max. Uses MMXVR, SMXHI2, SMXLO2. Use on 3-SFS systems only.
3X-FIB	Fiber motherboard for connection to EST3 systems. Used with MMXVR, SMXHI2 and SMXLO2.
SMXLO2	Standard output single mode fiber optic transceiver
SMXHI2	High output single mode fiber optic transceiver
MMXVR	Standard output multimode fiber optic transceiver

Communication Options *(See 3X-ETH installation sheet P/N 3101794-EN for details on wiring specific applications.)*

3X-ETH1	Ethernet Adapter, 10/100. Provides Ethernet connection from system to 3-SDU for remote programming and diagnostics, and to FireWorks computer graphics workstation.
3X-ETH2	Ethernet Adapter, 10/100. Provides the functions of ETH1 plus IP for central station communications.
3X-ETH3	Ethernet adapter card. Provides the functions of the 3X-ETH2 plus the added capability of sending email messages as well as SMS text messages by means of email-to-text.

Front Panel LED/Switch display modules

4X-12/S1GY	LED Display/Control Module - 12 Switches, 1 Green, 1 YELLOW LED per switch.
4X-12/S1RY	LED Display/Control Module - 12 Switches, 1 RED, 1 YELLOW LED per switch.
4X-12SR	LED Display/Control Module - 12 Switches with 12 RED LEDs.
4X-12RY	LED Display Module - 12 pairs of LEDs (1 Red; 1 Yellow)
4X-24Y	LED Display Module - 24 YELLOW
4X-24R	LED Display Module - 24 RED
4X-6/3S1G2Y	LED/Switch Module - six groups of three Switches with one LED each.
4X-6/3S1GYR	LED/Switch Module - six groups of three Switches with one LED each.
4X-4/3SGYWR	LED/Switch Module, four groups of three switches and four LEDs. LED colors: Green, Red, Yellow and White.
4X-LKF	Label Kit, French

Option Cards and Interfaces

3X-PMI	Paging Microphone Interface
3-SSDC1	Single Signature Driver Controller, c/w one 3-SDC1
3-SDDC1	Dual Signature Driver Controller, c/w two 3-SDC1s
3-SDC1	Signature Device Card - expands the 3X base panel to two loops
3-SDC1-HC	3-SDC1-HC used with circuits that contain more than 90 isolators.
3-ZA20A	20 Watt Zoned Amplifier w/Class A/B Audio & Class A/B 24 VDC outputs
3-ZA20B	20 Watt Zoned Amplifier w/Class B Audio & Class B 24 VDC outputs
3-ZA40A	40 Watt Zoned Amplifier w/Class A/B Audio & Class A/B 24 VDC outputs
3-ZA40B	40 Watt Zoned Amplifier w/Class B Audio & Class B 24 VDC outputs
3-MODCOM	Modem/Dialer (DACT)
3-AADC1	Addressable Analog Module
3-IDC8/4	Initiating Device Circuit Module
3-LDSM	LED Display Support Module. Provides interface for one LED/Switch display module. Mounts in an option card slot where no Option cards are installed.
3-OPS	Off Premises Signaling module
CLA-PS10	Class A Adapter, PS10 NACs
CDR-3	PSNI Coder Module
GCI	Graphic Annunciator Driver Master, provides outputs for 32 LEDs and connection to common control switches and LEDs for R-Series annunciators.
GCIX	Graphic Annunciator Driver Expander, provides outputs for 48 LEDs and inputs for 24 switches.

LIFE SAFETY & INCIDENT MANAGEMENT

Contact us...

Email: edwards.fire@fs.utc.com
Web: *Edwards-fire.com*

EDWARDS is a UTC brand.
1016 Corporate Park Drive
Mebane, NC 27302

Accessories

PS10-4B	Power Supply, Replacement
SFS1-ELEC	Base Electronics, replacement
4X-LCD	Main user interface assembly, monochrome. Eight line 1/4 VGA LCD, four controls plus rotary knob. English language.
4X-LCD-LC	Main user interface assembly, monochrome. Eight Line 1/4 VGA LCD, four controls plus Rotary knob. Insertable language, shipped with English inserts. Order alternate languages separately.
4X-DR	Blank hinged local rail module door
4X-CAB6D	Replacement door, bronze
4X-CAB6DR	Replacement door, red
CAB6B	Backbox, black
CAB6BEQ	Seismic hardening Kit for batteries up to 17Ah.

Note: For earthquake anchorage, including detailed mounting weights and center of gravity detail, please refer to *Seismic Application Guide 3101676-EN*. Approval of panel anchorage to site structure may require local AHJ, structural, or civil engineer review.

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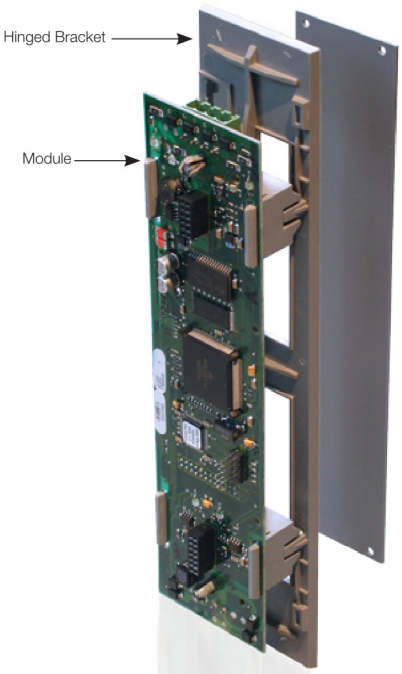
Modem Communicator

3-MODCOM, 3-MODCOMP



S3000

7165-1657:
0186/0306

FDNY
APPROVED

FM
APPROVED

Overview

The Modem Communicator is a two-way local rail module that performs a variety of off-premise communications functions for the EST3 system.

Using the latest in digital signal processing (DSP) techniques, the Modcom provides off premise communication features unavailable on any other system.

The module has provisions for supervising two loop-start telephone lines. The module features a modular jack for telephone line connections. The Modcom's configuration and firmware can also be updated from any network node.

Modcom series modules occupy a single local rail space and can be mounted in any node on the network. Any EST3 Control/Display module can be mounted on the face of a Modcom series module. Power for the Modcom is supplied by the EST3 system supply.

The Modcom provides an enhanced level of survivability in the event of a network CPU failure by notifying the Central Monitoring Station of the failure and entering a degraded mode of operation. In degraded mode, the Modcom can transmit a default fire alarm message during a fire alarm condition.

Standard Features

- Listed for fire, security and access control
- V.32bis 14.4K full duplex modem
- Digital alarm communicator transmitter supporting: SIA DCS protocol, Contact ID protocol, 3/1 and 4/2 pulse format protocol
- Supports "tap" alphanumeric pager protocol
- Fully programmable messages
- Alarm override of upload/download
- Two phone line capability
- Field upgradable firmware
- Split and multiple reporting to as many as 80 different receivers
- 255 subscriber accounts
- Supports control/display modules
- Supervised by the network controller
- Supports Cellular communications

DATA SHEET E85010-0107
Not to be used for installation purposes. Issue 1

Application

Two versions of the Modcom are available:

3-MODCOM - Has an internal V.32bis 14.4K baud full duplex modem. The modem permits upload and download of system data remotely via a telephone line. In addition, the 3-MODCOM has a Digital Alarm Communications Transmitter (DACT) or dialer function that transmits network status information to Central Monitoring Stations (CMS) via telephone. Four DACT protocols are available:

1. Digital Communicator Standard (DCS) "SIA forma" Dialer – 300 baud format, which transmits alphanumeric system status data to the CMS;
2. Contact ID;
3. SIA 3/1 dialer; and,
4. SIA 4/2 dialer.

Alarm code content is determined by system rules.

3-MODCOMP – In addition to all modem and dialer (DACT) functions of the 3-MODCOM, the 3-MODCOMP can dial directly into paging systems using Telelocator Alphanumeric Protocol (TAP). Alphanumeric system data can be sent to a single pager or group(s) of pagers. Some pager services can forward messages via e-mail and Fax.

Multiple Priority

Each Modcom can buffer up to 500 events in its event queue. It reviews all active events in the queue and identifies the highest priority event and dials the associated receiver. When the receiver is contacted, the MODCOM will transmit the highest priority message for that receiver. If the message is successfully received, the MODCOM identifies the next highest priority message and the process repeats.

Phone Line Friendly

The Modcom series has been designed for installation on the same phone lines with other devices such as phones and faxes. The module makes its first dial out attempt on either of the two phone lines that is not in use. This prevents unnecessary interruption of calls in progress by the line seizure relays. In the event that both lines are busy, the module seizes line one.

A fixed DACT testing time can be set at an off-hour, e.g. 2:00am, again minimizing interruptions and phone line costs. The call time is programmable, and allows testing of the DACT with the central station.

The Modcom series also has the ability to detect Type 1, Type 2 and Type 3 distinctive ringing patterns, permitting it to share its phone lines with other devices and still have a unique phone number for incoming modem calls.

Multiple Modcoms per Network

Multiple Modcoms can be installed in a single cabinet or located in nodes throughout the network to provide added availability and enhanced redundancy of off premise communications.

Multiple Receiver Capability

In large system applications the EST3 system may be partitioned such that it supports a number of different customers, each using different Central Monitoring Stations and/or paging companies. The Modcom can accommodate up to 255 different accounts using up to 80 different receivers.

The Modcom supports split reporting, a process where the system directs the Modcom to send some events or event types to one receiver, and different events to alternate receivers. The module's multi-dial reporting capability permits an individual event to be transmitted to multiple receivers, including pagers.

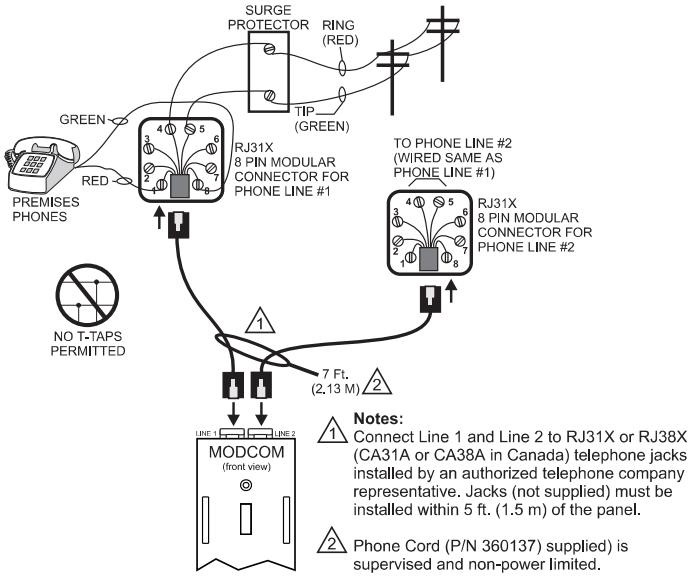
Remote Data Upload/Download

The modem permits data to be downloaded into the memories of the various components making up an EST3 system. Data can be remotely uploaded and downloaded for use with the EDWARDS Access Control Database Program. In the event that an alarm is received during upload/download activity, the Modcom automatically terminates the call and transmits the alarm events to the appropriate receivers. When completed sending the events, the download will continue where it left off.

Engineering Specification

The system shall provided an off premise communications module capable of transmitting system events to multiple Central Monitoring Station (CMS) receivers. The module shall provide the CMS with point identification of system events via 4/2, Contact ID or SIA DCS protocols. <The module shall also be capable of transmitting alphanumeric system activity by event to a commercial paging system using TAP Pager protocol.> The dialer shall have the capability to support up to 255 individual accounts and to send account information to eighty (80) different receivers, each having a primary and secondary telephone access number. System events shall be capable of being directed to one or more receivers depending on event type or location as specified by the system designer. The module shall have a degrade mode capable of transmitting fire alarm signals to the CMS in the event of system CPU failure. The module shall provide a high speed (V.32bis or greater) modem function in order to upload and download system data to/from a remote location.

Typical Wiring



For cellular dialer capture module wiring refer to the installation manual received with the cellular capture module.

Specifications

Agency Listings	UL, FCC Part 68 / CFR 47, ULC. See Note 1.
Installation	Takes up one LRM space in 3-CHAS7
Input Power	24 Vdc @ 60mA standby, 95 mA active
Modem Protocol	ITU - V.32bis 14.4K baud full duplex using standard PC modem compatible data
Dialer Protocol	SIA 3/1 (format P2) and 4/2 (format P3): 20 pulses per second, double round Contact ID (DTMF format) Digital Communications Standard (DCS) "SIA format": Level 2 (300 baud, Bell 103)
Pager Protocol (3-MODCOMP only)	Telocator Alphanumeric Protocol (TAP), Version 1.8, 300 baud, Bell 103
Telephone	
Dialing	Pulse or Tone (DTMF)
Connector	Two 8-position modular phone jacks
CMS Telephone Numbers	
Quantity	Two per receiver - 160 max.
Available Digits	Up to 24 digits per number
Receivers	Supports up to 80 individual receivers.
Event Buffer	500 events
Operating Environment	32°F (0°C) to 120°F (49°C), 93% RH Non-condensing

Receivers Tested

Format	Manufacturer	Model	Receiver Card
4/2 and 3/1	Ademco	685	685-1 or 685-8
	FBI (Fire Burglary Instruments)	CP220	
	Osborne-Hoffman	OH2000	
	Radionics	D6600	
	Silent Knight	9000	9032
	Sur-Gard	MLR2, SG-SLR	
	MCDI	TLR, TLR+	
Contact ID	Ademco	685	685-8
	Osborne-Hoffman	OH2000	
	Sur-Gard	MLR2, SG-SLR	
	Radionics	D6600	
	Silent Knight	9000	9032
	MCDI	TLR, TLR+	
SIA DCS	Sur-Gard	MLR2, SG-SLR	

Note 1:
The EST3 is modularly listed under the following standards:
UL 864 categories: UOJZ, UOXX, UUKL and SYZV, UL 294 category ALVY, UL 609 category AOTX, UL 636 category ANET, UL 1076 category APOU, UL 365 category APAW, UL 1610 category AMCX, UL 1635 category AMCX
ULC-S527, ULC-S301, ULC-S302, ULC-S303, ULC-S306, ULC/ORD-C1076 and ULC/ORD-C693
Please refer to EST3 Installation and Service Manual for complete system requirements.

Compatible Dialer Capture Modules
Telguard TG-7FS - UL approved Cellular Alarm Communicator for Commercial Fire applications over 3G/4G networks.
DSC 3G3070 - ULC approved Cellular Alarm Communicator for commercial fire applications.

Ordering Information

Catalog Number	Description	Ship Wt. lb (kg)
3-MODCOM	Modem/Dialer (DACT) version	0.5 (0.23)
3-MODCOMP	Modem/Dialer (DACT) w/TAP Pager Protocol	0.5 (0.23)
3-FP	Filler Plate, order separately when no LED or LED/Switch module installed.	0.1 (0.05)

LIFE SAFETY & INCIDENT MANAGEMENT

Contact us...

Email: edwards.fire@fs.utc.com
Web: *Edwards-fire.com*

EDWARDS is a UTC brand.
1016 Corporate Park Drive
Mebane, NC 27302

Power Patrol® Batteries

Specification Sheet

Sealed Rechargeable Lead-Acid Batteries SLA1165

Specifications

NOMINAL VOLTAGE: 12V

NOMINAL CAPACITY:
20 hr. rate of 2.75A to 10.5V 55Ah
10 hr. rate of 5.14A to 10.5V 51.4Ah
5 hr. rate of 9.52A to 10.2V 48.1Ah
1 hr. rate of 37.8A to 9.60V 37.8Ah

WEIGHT (approx.): 39 pounds (17.7kgs)

ENERGY DENSITY (20 hr. rate):
1.45 WH/cubic inch (90 WH/liter)

SPECIFIC ENERGY (20 hr rate):
17 WH/pound (38 WH/kg)

INTERNAL RESISTANCE OF CHARGED BATTERY:
7.8 milliohms (approx.)

MAXIMUM DISCHARGE CURRENT WITH STANDARD TERMINALS:
150 amperes

MAXIMUM SHORT-DURATION DISCHARGE CURRENT:
500 amperes

OPERATING TEMPERATURE RANGE:
CHARGE 5°F to 122°F (-15°C to 50°C)
DISCHARGE -4°F to 140°F (-20°C to 60°C)

CHARGE RETENTION (shelf life) at 68°(20°C):
1 month 97%
3 months 91%
6 months 85%

LIFE EXPECTANCY:
STANDBY USE 3 to 5 years
CYCLE USE (approx.):
100% depth of discharge 250 cycles
50% depth of discharge 550 cycles
30% depth of discharge 1200 cycles

SEALED CONSTRUCTION:
Can be operated in any position without leakage.

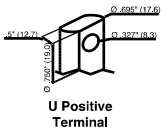
STANDARD TERMINAL:
Universal or options in terminal diagram

HOUSING MATERIAL:
PP Resin

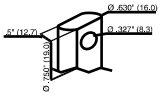
OPTIONAL:
Container and cover made from Flame Retardent PP (UL94-V0/L.O.I.>28%)

Terminal

Standard



U Positive Terminal



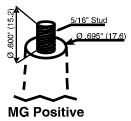
U Negative Terminal

Terminal height above cover

Terminal Type	NP55-12 mm	NP55-12 ins
B	3.3	0.13
NB	21.1	0.83
MJ	26.9	1.06
AP	21.1	0.83
MG	36.3	1.43
U	21.1	0.83

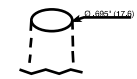
Note:
Dimensions are in inches (mm)
Tolerances are ± 0.04 in. (± 1mm) and ± 0.08 in. (± 2mm) for height dimensions

Optional



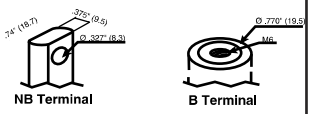
MG Positive

MG Negative



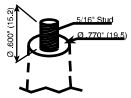
Automotive Type AP Positive

Automotive Type AP Negative

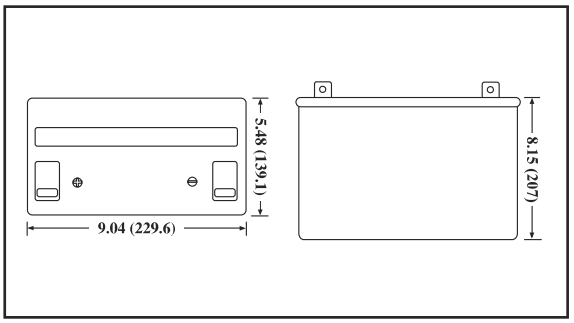


NB Terminal

B Terminal



MJ Terminal



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NO EXCUSES!

BCA

Battery Cabinet Accessory

RED SAE P/N: SSU00500
BLACK SAE P/N: SSU00501

The BCA Battery Cabinet Accessory is designed for the professional installation of systems requiring battery storage and meets the requirement of NFPA 72 (1-5.2.9) standby battery storage for battery backup. The BCA allows for easy access and maintenance of the batteries while also assisting against unnecessary power drain, interference or degeneration of the battery. The unit can be mounted securely to a wall, preventing mechanical injury or damage to other equipment.

Constructed from heavy duty 16 gauge steel with a full length piano hinged door to allow optimum access to your equipment within the cabinet. Other features include a high security CAT 30 keyed door lock and vented sides. Complete interior and exterior finish is accomplished by a phosphate treatment followed by a durable baked-on textured polyester coating.

Standard Features:

- 16 Gauge (.062 thk.) cold rolled steel
- Stainless steel piano hinge
- Red or black textured finish
- CAT 30 keyed door lock
- Dimensions:
  22” wide x 10” high x 8 1/2” deep
- Four 1/2” and 3/4” EMT conduit knockouts located on both sides and back
- Wall mounting holes

ADA

NFPA

ISO9001
REGISTERED

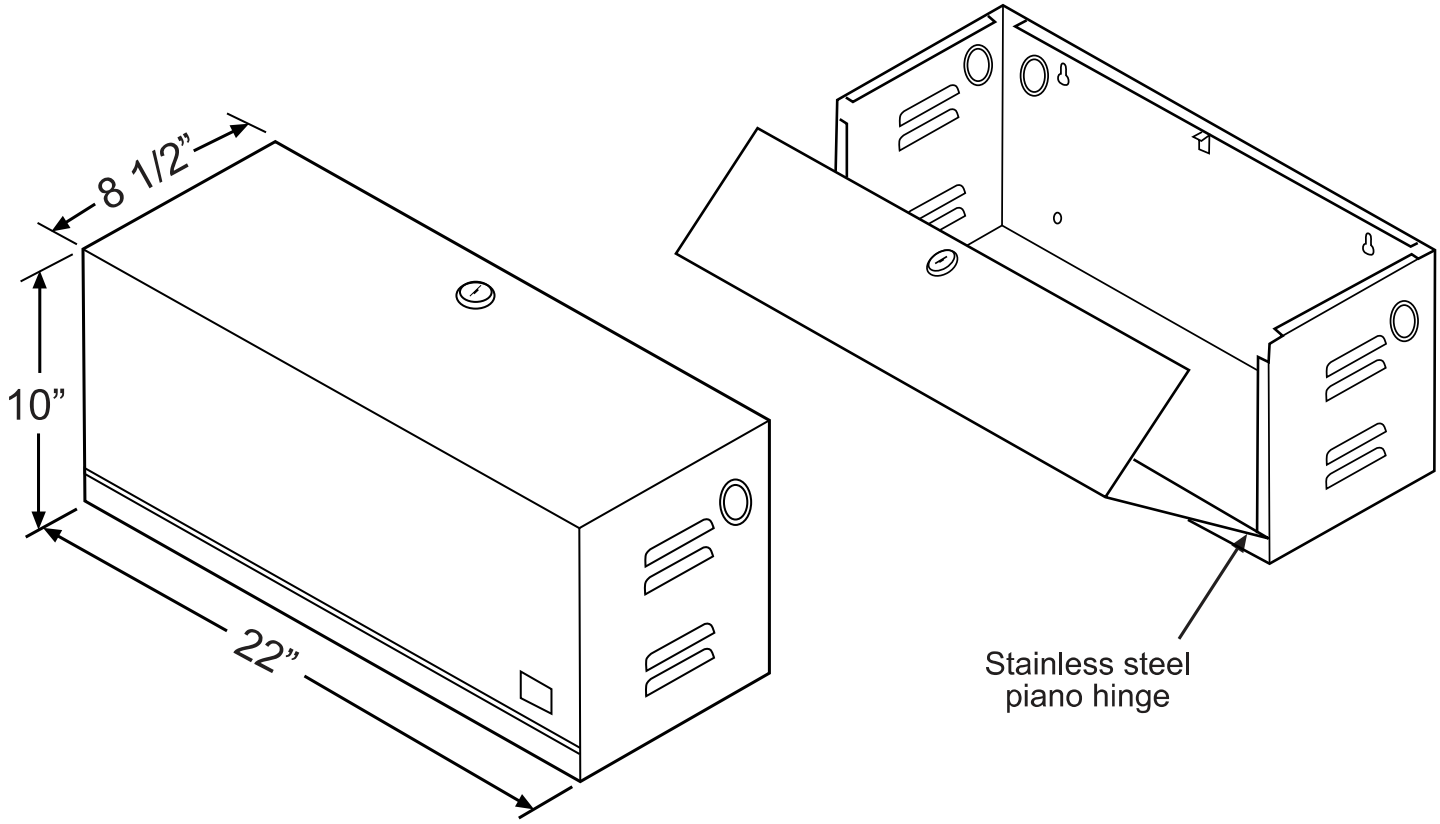
Made In U.S.A.

Integration Accessories
Space Age Electronics, Inc.
406 Lincoln Street
Marlboro, MA 01752-2195
www.1sae.com
800.486.1723—voice
508.485.0966
508.485.4740—fax

No Excuses Just Solutions!

Description:

The **BCA Battery Cabinet Accessory** is constructed of 16 gauge (.062 thk.) cold rolled steel and finished with a complete interior and exterior durable red or black textured, heat-resistant baked-on enamel finish. The front cover features a full length stainless steel piano hinge and includes a high security CAT 30 keyed door lock. Overall dimensions measure 22” wide by 10” high by 8 1/2” deep. Four 1/2” and 3/4” EMT conduit knockouts are located on the sides and back. The battery cabinet meets NFPA 72 (1-5.2.9) and the National Electric Code requirements. Batteries not included.



Ordering Information:

Part #	Description
SSU00500	BCA Battery Cabinet Accessory - Red
SSU00501	BCA Battery Cabinet Accessory - Black

Click Here to Return to Bill of Material/Index

Integration Accessories
Space Age Electronics, Inc.
406 Lincoln Street
Marlboro, MA 01752-2195
www.1sae.com
800.486.1723—voice
508.485.0966
508.485.4740—fax

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LIFE SAFETY & INCIDENT MANAGEMENT

R-Series Remote Annunciators

RLCD, RLCD-C, RLED, RLED-C, RLED24, GCI

FM APPROVED FDNY COA 6020 COA 6087 7120-1657: 0254 S3424

Overview

EDWARDS R-Series Annunciators are high-performance remote annunciators that provide status indication and common controls for compatible fire alarm control panels, including iO-Series small analog fire alarm systems. This family of annunciators offers LCD or LED annunciation. Models are available with and without common controls.

There are three R-Series annunciator models, plus an LED-based expander. Up to two expanders can be connected to any annunciator. The expander includes 24 pairs of LEDs that extend the capabilities of any of the annunciators.

All annunciator models include status LEDs and an internal buzzer. Two models have an LCD text display, and one has 16 pairs of LEDs for zone annunciation. LCD models feature a large back-lit, four by twenty character per line, super-twist liquid crystal display.

R-Series annunciators and expanders are mounted on a standard 4-inch square electrical box, using the included mounting ring. They can also be surface mounted in locking steel enclosures. Three different enclosures are available.

A keyswitch and graphic annunciator interface is available for R-Series annunciator applications. The keyswitch enables or disables common controls. The graphic annunciator interface cards supports 32 LEDs and 16 switches on the graphic panel display.

Features

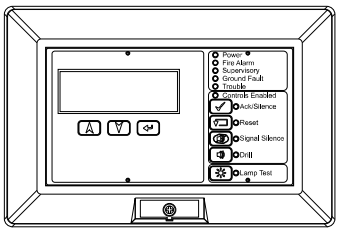
- LCD models feature large 4 x 20 character backlit LCD display
- LED models provide 16 pairs of LEDs for zone annunciation
- Available expander extends capability with 24 pairs of LEDs
- Up to two expanders may be wired to each annunciator
- Status LEDs and internal buzzer standard on all models
- Common controls available for LED and LCD display models
- Available keyswitch for disabling common controls
- Standard 4-inch square electrical box mounting
- Class B or Class A RS485 wiring standard
- One-, two-, and three-position enclosures available
- Graphic Annunciator interface, includes common control, indicators and 32 LEDS
- No programing required, set the address and unit receives all information from panel

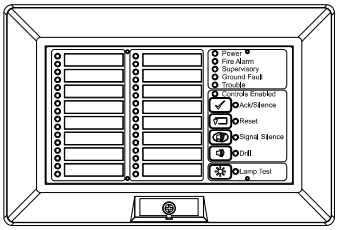
DATA SHEET E85005-0128
Not to be used for installation purposes. Issue 1

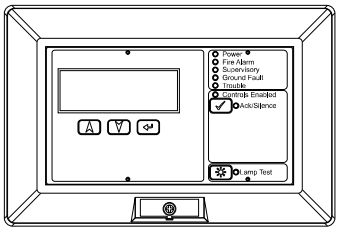
Application

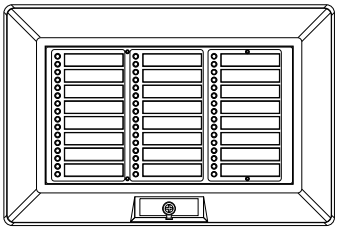
R-Series annunciators communicate with the FACP on the RS-485 data riser. This can be configured for Class A or Class B communication. Annunciators do not provide ground fault isolation.

These annunciators are stand-alone units that can be powered by the FACP or by an approved power supply.


RLCD-C


RLED-C


RLCD


RLED24

Features by model	RLCD	RLCD-C	RLED-C	RLED24
Reset	✓	✓	✓	-
Ack/Silence	✓	✓	✓	-
Fire Alarm	✓	✓	✓	-
Supervisory	✓	✓	✓	-
Ground Fault	✓	✓	✓	-
Trouble	✓	✓	✓	-
Controls Enabled	✓	✓	✓	-
Ack/Silence	✓	✓	✓	-
Reset		✓	✓	-
Signal Silence		✓	✓	-
Drill		✓	✓	-
Lamp Test	✓	✓	✓	-
LCD Display	✓	✓	-	-
Zone Active LEDs	-	-	16 *	24 **
Zone Trouble LEDs	-	-	16	24

** zones 13-16 may be selected as Supervisory on IO64*
*** zones 13-16 and 29-32 may be selected as Supervisory on iO1000*

Graphic Annunciator Interface

The GCI Graphic Annunciator Driver is an interface card that connects the fire alarm control panel to the display panel of an LED-based graphic annunciator.

The annunciator card supports 32 LEDs and 16 switches on the graphic panel display. It includes status LEDs and an internal buzzer.

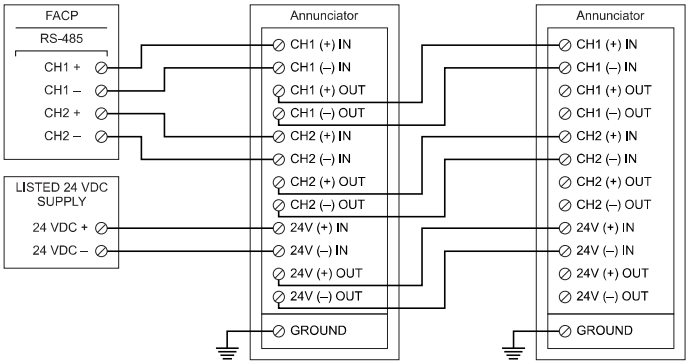
The graphic interface is supplied with snap track mounting. It is attached to a plastic mounting rail that requires two EIA panels.

The annunciator communicates with the FACP on the RS-485 data riser. This can be configured for Class A or Class B communication. The annunciator does not provide ground fault isolation. It is a stand-alone unit that can be powered by the FACP or by an approved power supply.

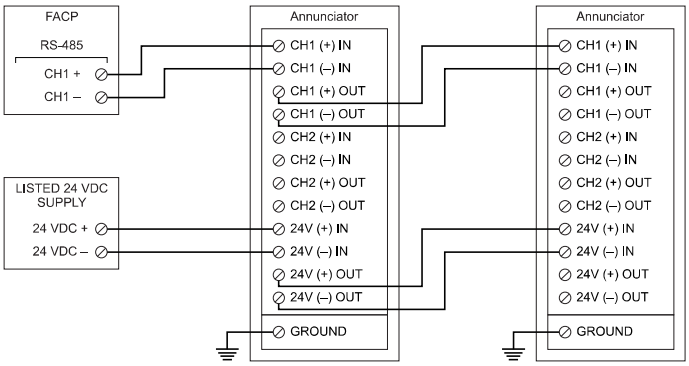
Graphic Annunciator Interface Specifications	
Alarm current	146 mA at 24 Vdc (with 36 LEDs ON)
Standby current	36 mA at 24 Vdc (with no LEDs ON)
Maximum current	10 mA per LED

Annunciator Wiring

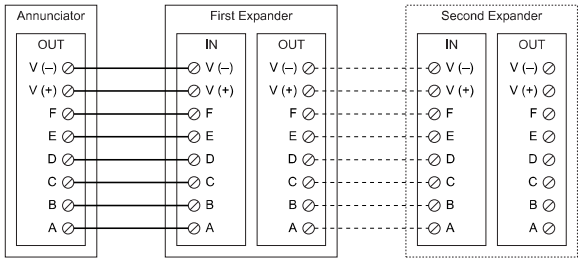
Annunciator, Class A



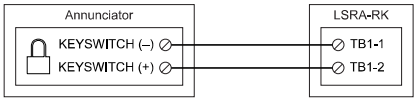
Annunciator, Class B



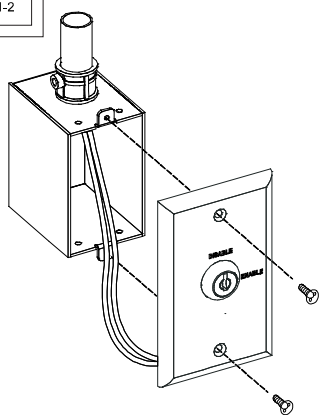
Expander



Remote Keyswitch

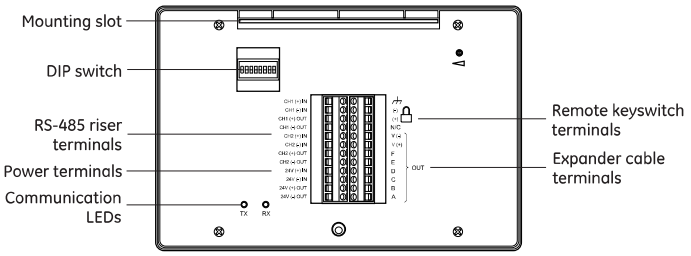


Keyswitch Specifications	
Maximum voltage	5 Vdc
Maximum current	200 mA
Mounting	2-1/2 in (64 mm) deep 1-gang box
Termination	Screw terminals
Maximum wire size	12 AWG (2.5 mm sq)
Contact configuration	Normally open

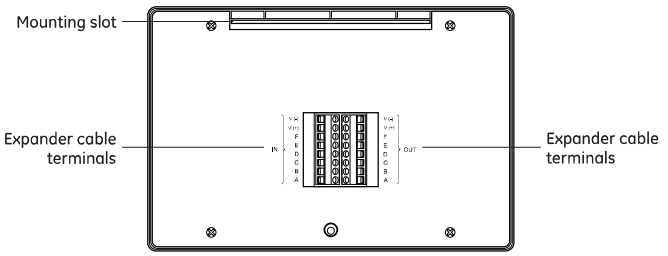


Annunciator Connections

Annunciator

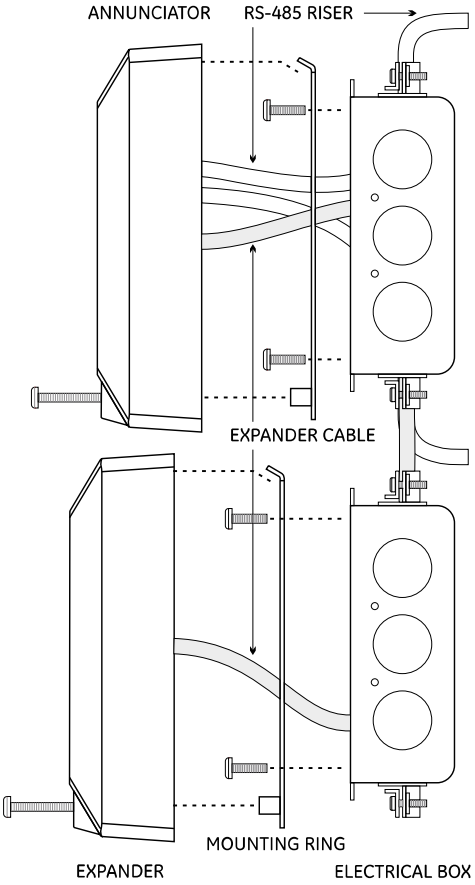


Expander



DIP switch settings	
Switch	**Description and values**
S1 to S5 Network address	The annunciator network address (in binary). The factory setting is for address 2. Examples: 10000 = 1 01000 = 2 11000 = 3 00100 = 4
S6 Network baud rate	OFF = 9600 baud (factory default setting) ON = 38,400 baud
S7 to S8	Not used

Annunciator Mounting

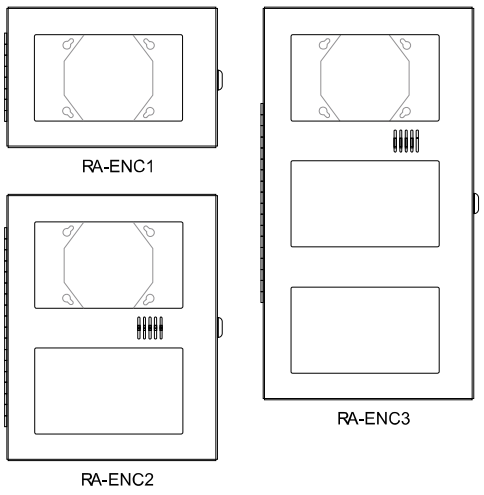


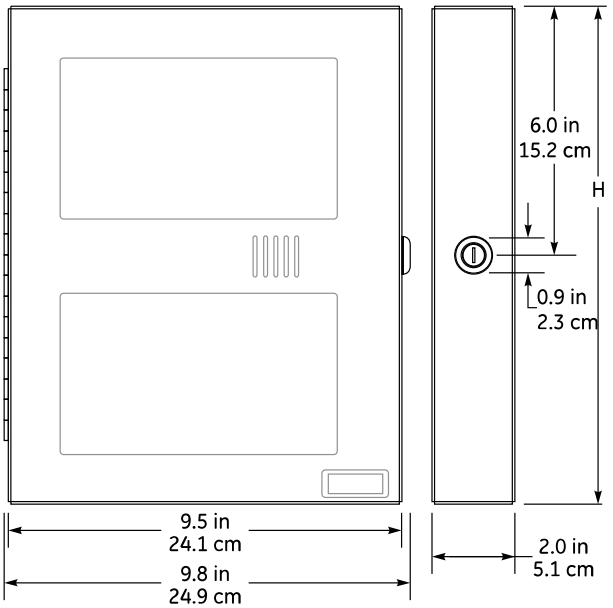
Annunciator Enclosures

The RA Remote Annunciator Enclosures provide secure, surface mounted protection for annunciators and extenders. Each consists of a back plate, hinged cover, and key lock.

The enclosures are 16-gauge welded steel with a white, painted finish. Each enclosure includes a security lock and two keys. The two- and three-position enclosures have wiring channels for correct routing of interconnections.

The enclosures attach to a standard electrical box, and provide a mounting lip that takes the place of the integral mounting ring supplied with the annunciators and expanders.





Dimensions (H x W x D)	
RA-ENC1	6.3 x 9.8 x 2.0 in (16.0 x 24.9 x 5.1 cm)
RA-ENC2	12.0 x 9.8 x 2.0 in (30.5 x 24.9 x 5.1 cm)
RA-ENC3	17.7 x 9.8 x 2.0 in (45.0 x 24.9 x 5.1 cm)

Note: Allow approximately 2 inches (50 cm) clearance on both sides of the enclosure, to permit inserting and removing the key, and opening the door through 90 degrees.

EDWARDS
United Technologies
LIFE SAFETY & INCIDENT MANAGEMENT

Contact us...
Email: edwards.fire@fs.utc.com
Web: *Edwards-fire.com*

EDWARDS is a UTC brand.
1016 Corporate Park Drive
Mebane, NC 27302

Specifications

	RLCD-C	RLCD	RLED-C	RLED24
Operating voltage	24 VDC, continuous.			
Standby current	99 mA	98 mA	28 mA	6 mA
Alarm current	115 mA	113 mA	62 mA	34 mA
RS-485 communications	Class A or Class B, 9600 baud			
Data wiring	18 to 14 AWG (1.0 to 2.5 sq mm) twisted pair (6 twists per foot minimum). Maximum wire run is 4,000 ft. (1,219 m)			
Remote key switch circuit	5 VDC at 1 mA, power-limited, unsupervised			
Ground fault impedance	0			
Power wiring	18 to 14 AWG (1.0 to 2.5 sq. mm)			
Display area	4 lines of 20 characters each			
Dimensions (H x W x D)	5-5/8 x 8-1/2 x 1-1/2 in. (14.3 x 21.4 x 3.8 cm)			
Mounting	North American 4-inch square electrical box or listed enclosure			
Agency Listing	UL, ULC			
Operating environment	Temperature: 32 to 120°F (0 to 49°C) Humidity: 0 to 93% RH, noncondensing at 90°F (32°C)			

Ordering Information

Part	Description
Remote Annunciators	
RLCD	LCD text annunciator without common controls. English.
RLCD-R	LCD text annunciator without common controls. English. Red.
RLCDF	LCD text annunciator without common controls. French.
RLCD-C	LCD text annunciator with common controls. English.
RLCD-CR	LCD text annunciator with common controls. English. Red.
RLCD-CF	LCD text annunciator with common controls. French.
RLED-C	16-pair LED zone annunciator with common controls. English.
RLED-CR	16-pair LED zone annunciator with common controls. English. Red.
RLED-CF	16-pair LED zone annunciator with common controls. French.
Remote Expanders	
RLED24	24-pair LED zone expander with expander cable and zone card insert.
RLED24R	24-pair LED zone expander with expander cable and zone card insert. Red.
Enclosures	
RA-ENC1	One-position enclosure for Remote Annunciator.
RA-ENC2	Two-position enclosure for Remote Annunciator and one Remote Expander, including one interconnection cable.
RA-ENC3	Three-position enclosure for Remote Annunciator and two Remote Expanders, including two interconnection cables.
LSRA-SB	Surface Mount Box - for single R Series annunciator.
Graphic Annunciator Drivers	
GCI	Graphic Annunciator Driver, provides outputs for common indicators and 32 alarm/supv zones as well as inputs for common switches. Provided with a snap track for mounting in custom graphic enclosures.
Accessories	
RKEY	Remote key switch on plate for enabling or disabling common controls (Lock/Unlock).
27193-16	Electrical box, surface mount, white, single-gang, for RKEY.

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EDWARDS
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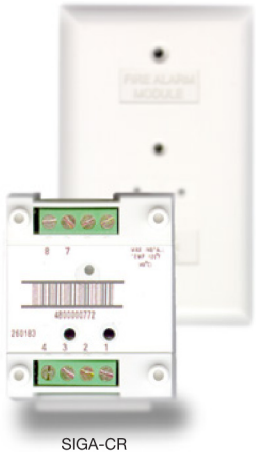
LIFE SAFETY & INCIDENT MANAGEMENT

Control Relay Modules

SIGA-CR, SIGA-MCR, SIGA-CRR, SIGA-MCRR


SIGA-MCR


SIGA-CR

FM APPROVED MEA 7300-1657: 0121 S3424

Overview

The Control Relay Module and the Polarity Reversal Relay Module are part of the Signature Series system. They are intelligent analog addressable devices available in either plug-in (UIO) versions, or standard 1-gang mount versions.

The SIGA-CR/MCR Control Relay Module provides a Form "C" dry relay contact to control external appliances such as door closers, fans, dampers etc. This device does not provide supervision of the state of the relay contact. Instead, the on-board microprocessor ensures that the relay is in the proper ON/OFF state. Upon command from the loop controller, the SIGA-CR/MCR relay activates the normally open or normally-closed contact.

The SIGA-CRR/MCRR Polarity Reversal Relay Module provides a Form "C" dry relay contact to power and activate a series of SIGA-AB4G Audible Sounder Bases. Upon command from the Signature loop controller, the SIGA-CRR reverses the polarity of its 24 Vdc output, thus activating all Sounder Bases on the data loop.

Standard-mount versions (SIGA-CR and SIGA-CRR) are installed to standard North American 1-gang electrical boxes, making them ideal for locations where only one module is required. Separate I/O and data loop connections are made to each module.

Plug-in UIO versions (SIGA-MCR and SIGA-MCRR) are part of the UIO family of plug-in Signature Series modules. They function identically to the standard mount versions, but take advantage of the modular flexibility and easy installation that characterizes all UIO modules. Two- and six-module UIO motherboards are available. All wiring connections are made to terminal blocks on the motherboard. UIO assemblies may be mounted in EDWARDS enclosures.

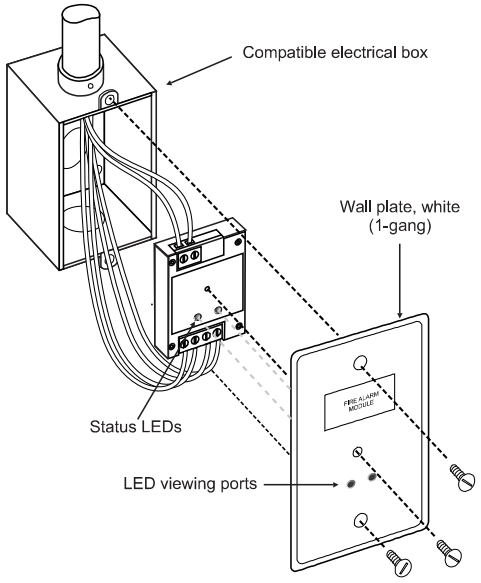
Standard Features

- **Provides one no/nc contact (SIGA-CR/MCR)**
  Form "C" dry relay contact can be used to control external appliances such as door closers, fans, dampers etc.
- **Allows group operation of sounder bases**
  The SIGA-CRR/MCRR reverses the polarity of its 24 Vdc output, thus activating all Sounder Bases on the data loop.
- **Plug-in (UIO) or standard 1-gang mount**
  UIO versions allow quick installation where multiple modules are required. The 1-gang mount version is ideal for remote locations that require a single module.
- **Automatic device mapping**
  Signature modules transmit information to the loop controller regarding their circuit locations with respect to other Signature devices on the wire loop.
- **Electronic addressing**
  Programmable addresses are downloaded from the loop controller, a PC, or the SIGA-PRO Signature Program/Service Tool; there are no switches or dials to set.
- **Intelligent device with microprocessor**
  All decisions are made at the module to allow lower communication speed with substantially improved control panel response time and less sensitivity to line noise and loop wiring properties; twisted or shielded wire is not required.

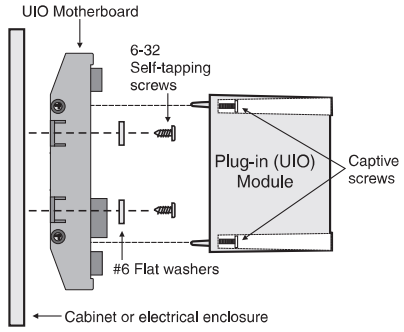
DATA SHEET E85001-0239
Not to be used for installation purposes. Issue 1

Installation

SIGA-CR and SIGA-CRR: modules mount to North American 2½ inch (64 mm) deep 1-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 1-gang covers and SIGA-MP mounting plates. The terminals are suited for #12 to #18 AWG (2.5 mm^2 to 0.75 mm^2) wire size.



SIGA-MCR and SIGA-MCRR: mount the UIO motherboard inside a suitable EDWARDS enclosure with screws and washers provided. Plug the module into any available position on the motherboard and secure the module to the motherboard with the captive screws. Wiring connections are made to the terminals on the motherboard (see wiring diagram). UIO motherboard terminals are suited for #12 to #18 AWG (2.5 mm^2 to 0.75 mm^2) wire size.



Electronic Addressing - The loop controller electronically addresses each module, saving valuable time during system commissioning. Setting complicated switches or dials is not required. Each module has its own unique serial number stored in its onboard memory. The loop controller identifies each device on the loop and assigns a "soft" address to each serial number. If desired, the modules can be addressed using the SIGA-PRO Signature Program/Service Tool.

EDWARDS recommends that this module be installed according to latest recognized edition of national and local fire alarm codes.

Application

The operation of Signature Series control relays is determined by their sub-type code or "Personality Code."

Personality Code 8: CONTROL RELAY (SIGA-CR/MCR) - Dry Contact Output. This setting configures the module to provide one Form "C" DRY RELAY CONTACT to control Door Closers, Fans, Dampers, etc. Contact rating is 2.0 amp @ 24 Vdc; 0.5 amp @ 120 Vac (or 0.25A @ 220 Vac for non-UL applications). Personality Code 8 is assigned at the factory. No user configuration is required.

Personality Code 8: POLARITY REVERSAL RELAY MODULE (SIGA-CRR/MCRR). This setting configures the module to reverse the polarity of its 24 Vdc output. Contact rating is 2.0 amp @ 24 Vdc (pilot duty). Personality Code 8 is assigned at the factory. No user configuration is required.

Compatibility

These modules are part of EDWARDS's Signature Series intelligent processing and control platform. They are compatible with EST3, EST3X and iO Series control panels.

Warnings & Cautions

This module will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguards with your local fire protection specialist.

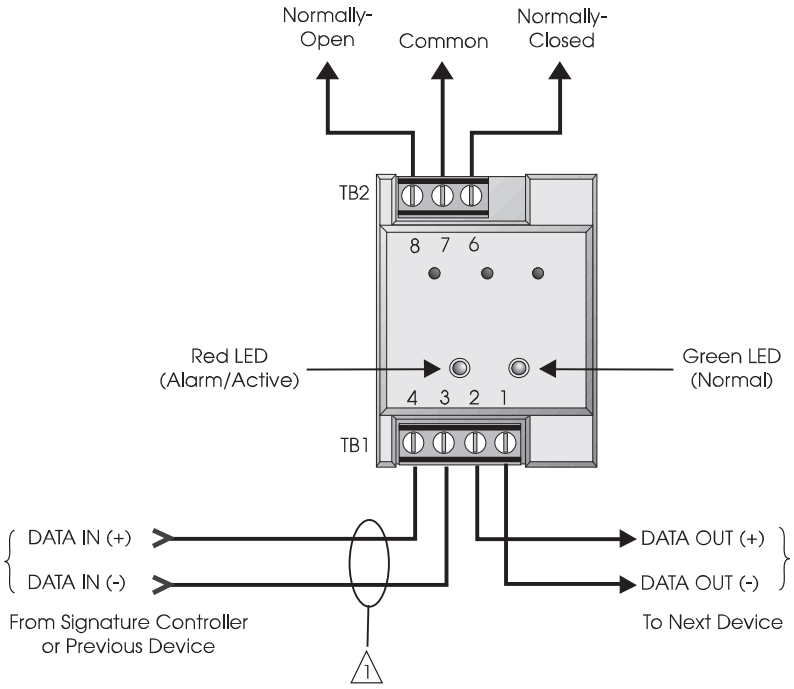
Testing & Maintenance

The module's automatic self-diagnosis identifies when it is defective and causes a trouble message. The user-friendly maintenance program shows the current state of each module and other pertinent messages. Single modules may be turned off (deactivated) temporarily, from the control panel. Availability of maintenance features is dependent on the fire alarm system used. Scheduled maintenance (Regular or Selected) for proper system operation should be planned to meet the requirements of the Authority Having Jurisdiction (AHJ). Refer to current NFPA 72 and ULC CAN/ULC 536 standards.

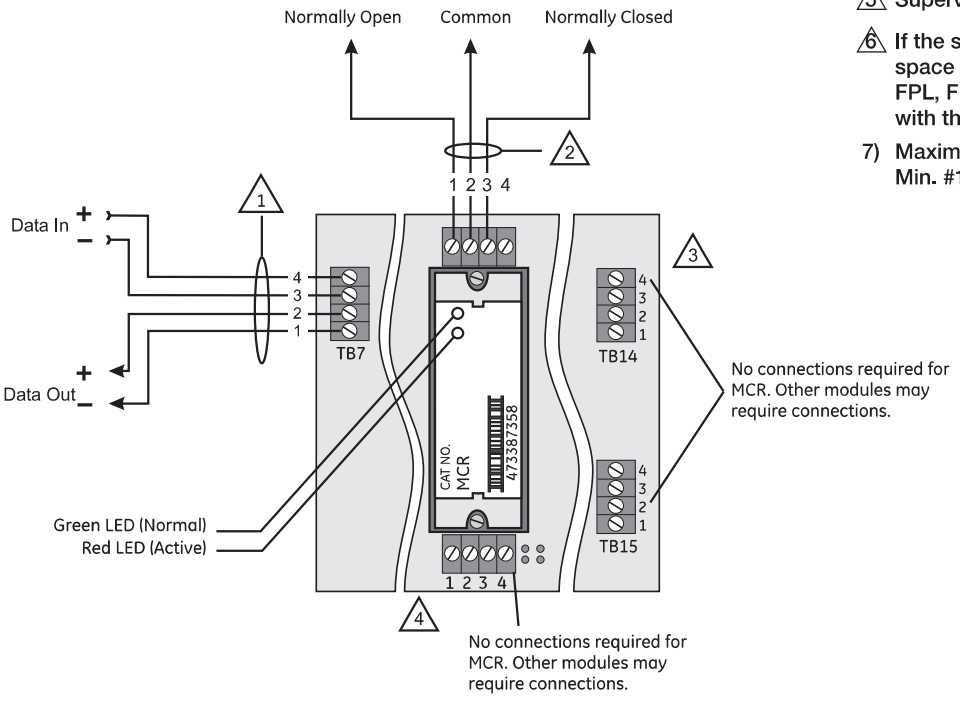
Typical Wiring

Modules will accept #18 AWG (0.75mm^2), #16 (1.0mm^2), #14 AWG (1.50mm^2) and #12 AWG (2.5mm^2) wire sizes.

Note: Sizes #16 AWG (1.0mm^2) and #18 AWG (0.75mm^2) are preferred for ease of installation. See Signature Loop Controller catalog sheet for detailed wiring requirement specifications.



SIGA-CR Control Relay



SIGA-MCR Control Relay

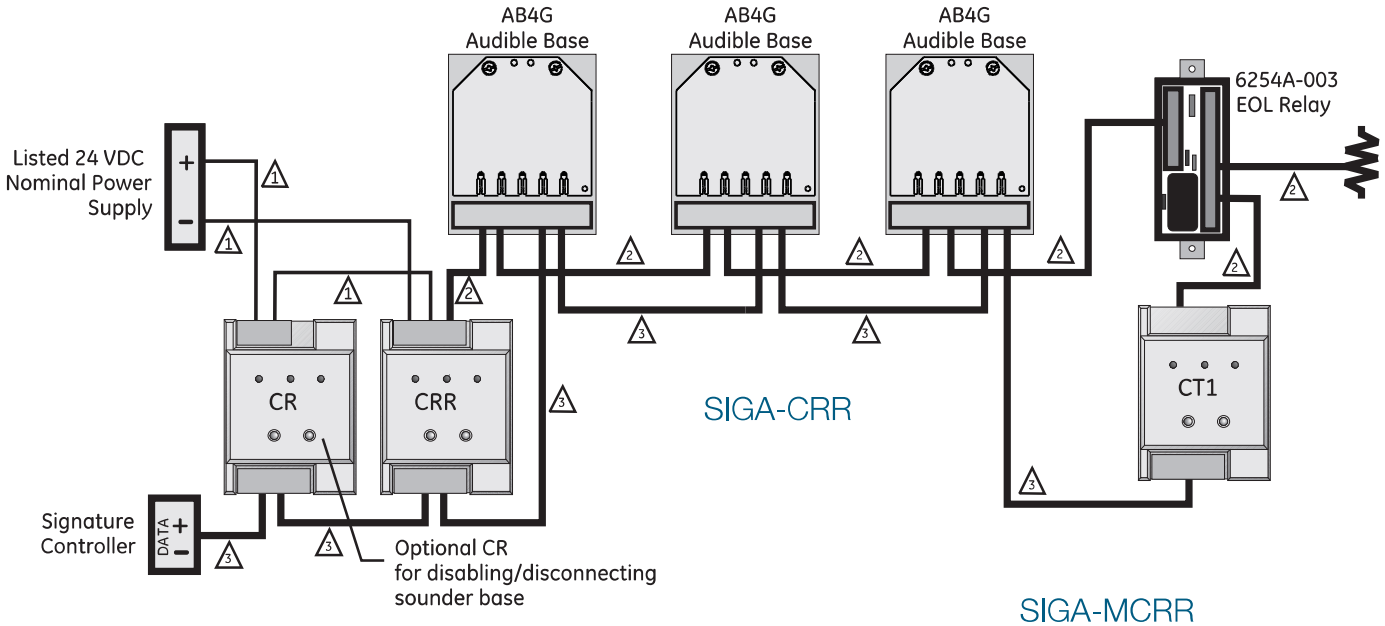
Notes

1. Refer to Signature Loop Controller Installation Sheet for wiring specifications.
2. NFPA 72 requires that the SIGA-CR/SIGA-MCR be installed in the same room as the device it is controlling. This requirement may not apply in all markets. Check with your local AHJ for details.
3. The SIGA-UIO6R and the SIGA-UIO2R do not come with TB14.
4. The SIGA-UIO6 does not come with TB8 through TB13.
5. Supervised and power-limited.
6. If the source is nonpower-limited, maintain a space of 1/4 inch from power-limited wiring or use FPL, FPLP, FPLR, or an equivalent in accordance with the National Electrical Code.
7) Maximum #12 AWG (2.5mm^2) wire. Min. #18 (0.75mm^2).

Typical Wiring

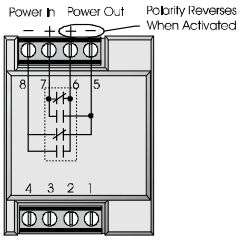
Modules will accept #18 AWG (0.75mm²), #16 (1.0mm²), #14 AWG (1.50mm²) and #12 AWG (2.50mm²) wire sizes.

Note: Sizes #16 AWG (1.0mm²) and #18 AWG (0.75mm²) are preferred for ease of installation. See Signature Loop Controller catalog sheet for detailed wiring requirement specifications.

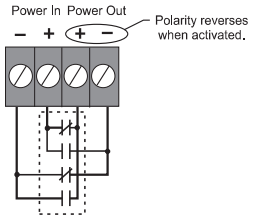


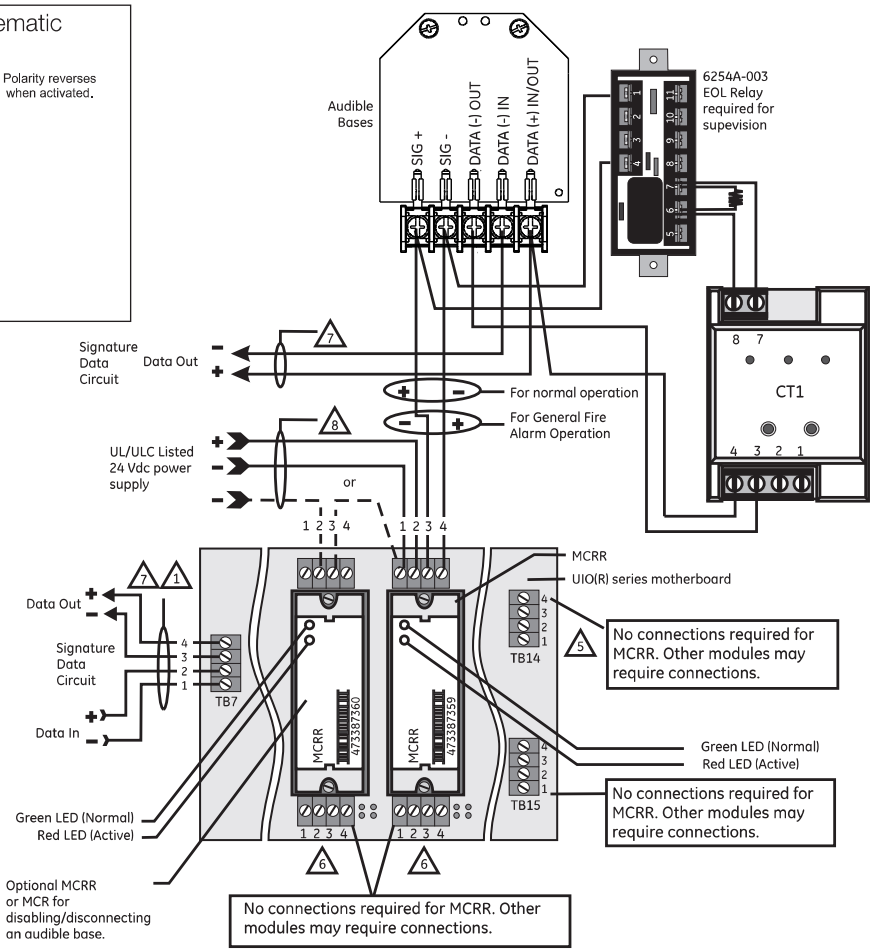
SIGA-MCRR

SIGA-CRR Schematic



SIGA-MCRR Schematic





Notes

1. Refer to the Signature controller installation sheet for wiring.
2. One Pair of Wires (24 Vdc power).
3. One Pair of Wires (Signature Data).
4. Single Wire (24 Vdc power).
5. The SIGA-UIO6R and the SIGA-UIO2R do not come with TB14.
6. The SIGA-UIO6 does not come with TB8 through TB13.
7. Supervised and power-limited.
8. If the source is nonpower-limited, maintain a space of 1/4 inch from power-limited wiring or use FPL, FPLP, FPLR, or an equivalent in accordance with the National Electrical Code.
9. Maximum #12 AWG (2.5 mm²) wire; Minimum #18 AWG (0.75 mm²).
10. End-of-Line Relay must monitor and report power supply trouble to control panel.
11. Class B Data wiring may be “T-tapped.”

Specifications

Catalog Number	SIGA-CR	SIGA-MCR	SIGA-CRR	SIGA-MCRR
Description	Control Relay		Polarity Reversal Relay	
Type Code	Personality Code 8 (Factory Set)		Personality Code 8 (Factory Set)	
Address Requirements	Uses 1 Module Address			
Operating Current	Standby = 75 µA Activated = 75 µA			
Operating Voltage	15.2 to 19.95 Vdc (19 Vdc nominal)			
Relay Type and Rating	Form C, 2 Amps @ 24 Vdc (pilot duty), 0.5 Amps @ 120 Vac and 0.25 Amps @ 220 Vac (220 Vac is non-UL) Not rated for capacitive loads.			
Mounting	North American 2½ inch (64 mm) deep 1-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 1-gang covers and SIGA-MP mounting plates	Plugs into UIO2R, UIO6R or UIO6 Motherboards	North American 2½ inch (64 mm) deep 1-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 1-gang covers and SIGA-MP mounting plates	Plugs into UIO2R, UIO6R or UIO6 Motherboards
Construction & Finish	High Impact Engineering Polymer			
Storage and Operating Environment	Operating Temperature: 32°F to 120°F (0°C to 49°C) Storage Temperature: -4°F to 140°F (-20°C to 60°C) Humidity: 0 to 93% RH			
LED Operation	On-board Green LED - Flashes when polled On-board Red LED - Flashes when in alarm/active			
Compatibility	Use With: Signature Loop Controller			
Agency Listings	UL, ULC, CSFM, MEA			

Ordering Information

Catalog Number	Description	Ship Weight - lbs (kg)
SIGA-CR	Control Relay Module (Standard Mount)	0.4 (0.15)
SIGA-MCR	Control Relay Module (UIO Mount)	0.18 (0.08)
SIGA-CRR	Polarity Reversal Relay Module (Standard Mount)	0.4 (0.15)
SIGA-MCRR	Polarity Reversal Relay Module (UIO Mount)	0.18 (0.08)

Related Equipment		
27193-11	Surface Mount Box - Red, 1-gang	1 (0.6)
27193-16	Surface Mount Box - White, 1-gang	1 (0.6)
SIGA-UIO2R	Universal Input-Output Module Board w/Riser Inputs - Two Module Positions	0.32 (0.15)
SIGA-UIO6R	Universal Input-Output Module Board w/Riser Inputs - Six Module Positions	0.62 (0.28)
SIGA-UIO6	Universal Input-Output Module Board - Six Module Positions	0.56 (0.25)
SIGA-AB4G	Audible (Sounder) Detector Base	0.3 (0.15)

Accessories		
MFC-A	Multifunction Fire Cabinet - Red, supports Signature Module Mounting Plates	7.0 (3.1)
SIGA-MB4	Transponder Mounting Bracket (allows for mounting two 1-gang modules in a 2-gang box)	0.4 (0.15)
SIGA-MP1	Signature Module Mounting Plate, 1 footprint	1.5 (0.70)
SIGA-MP2	Signature Module Mounting Plate, 1/2 footprint	0.5 (0.23)
SIGA-MP2L	Signature Module Mounting Plate, 1/2 extended footprint	1.02 (0.46)

LIFE SAFETY & INCIDENT MANAGEMENT

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1016 Corporate Park Drive
Mebane, NC 27302

Signature Series Overview

The Signature Series intelligent analog-addressable system from EDWARDS is an entire family of multi-sensor detectors and mounting bases, multiple-function input and output modules, network and non-network control panels, and user-friendly maintenance and service tools. Analog information from equipment connected to Signature devices is gathered and converted into digital signals. An onboard microprocessor in each Signature device measures and analyzes the signal and decides whether or not to input an alarm. The microprocessor in each Signature device provides four additional benefits – Self-diagnostics and History Log, Automatic Device Mapping, and Fast, Stable Communication.

Self-diagnostics and History Log – Each Signature Series device constantly runs self-checks to provide important maintenance information. The results of the self-check are automatically updated and permanently stored in its non-volatile memory. This information is accessible for review any time at the control panel, PC, or using the SIGA-PRO Signature Program/Service Tool. The information stored in device memory includes:

- Device serial number, address, and type
- Time and date of last alarm
- Most recent trouble code logged by the detector — 32 possible trouble codes may be used to diagnose faults.

Automatic Device Mapping –The Signature Data Controller (SDC) learns where each device's serial number address is installed relative to other devices on the circuit. The SDC keeps a map of all Signature Series devices connected to it. The Signature Series Data Entry Program also uses the mapping feature. With interactive menus and graphic support, the wired circuits between each device can be examined. Layout or "as-built" drawing information showing branch wiring (T-taps), device types and their address are stored on disk for printing hard copy. This takes the mystery out of the installation. The preparation of as-built drawings is fast and efficient.

Device mapping allows the Signature Data Controller to discover:

- Unexpected additional device addresses
- Missing device addresses
- Changes to the wiring in the circuit.

Most Signature modules use a personality code selected by the installer to determine their actual function. Personality codes are downloaded from the SDC during system configuration and are indicated during device mapping.

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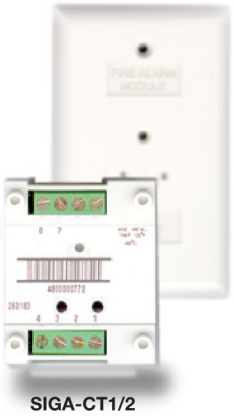
LIFE SAFETY & INCIDENT MANAGEMENT

Input Modules

SIGA-CT1, SIGA-CT1HT, SIGA-CT2, SIGA-MCT2



FM APPROVED MEA

7300-1657: 0121

S3424

Overview

The SIGA-CT1 Single Input Module, SIGA-CT1HT High Temperature Single Input Module and SIGA-CT2/SIGA-MCT2 Dual Input Modules are intelligent analog addressable devices used to connect one or two Class B normally-open Alarm, Supervisory, or Monitor type dry contact Initiating Device Circuits (IDC).

The actual function of these modules is determined by the "personality code" selected by the installer. This code is downloaded to the module from the Signature loop controller during system configuration.

The input modules gather analog information from the initiating devices connected to them and convert it into digital signals. The module's on-board microprocessor analyzes the signal and decides whether or not to input an alarm.

The SIGA-CT1, SIGA-CT1HT and SIGA-CT2 mount to standard North American 1-gang electrical boxes, making them ideal for locations where only one module is required. Separate I/O and data loop connections are made to each module.

The SIGA-CT1HT module operates at an expanded temperature range of 32 ”F to 158 ”F (0 ”C to 70 ”C) for those applications requiring more extreme environmental temperature variation.

The SIGA-MCT2 is part of the UIO family of plug-in Signature Series modules. It functions identically to the SIGA-CT2, but takes advantage of the modular flexibility and easy installation that characterizes all UIO modules. Two- and six-module UIO motherboards are available. All wiring connections are made to terminal blocks on the motherboard. UIO assemblies may be mounted in EDWARDS enclosures.

Standard Features

- **Multiple applications**
  Including Alarm, Alarm with delayed latching (retard) for waterflow applications, Supervisory, and Monitor. The installer selects one of four "personality codes" to be downloaded to the module through the loop controller.
- **SIGA-CT1HT rated for high temperature environments**
  Suitable for attic installation and monitoring high temperature heat detectors.
- **Plug-in (UIO) or standard 1-gang mount**
  UIO versions allow quick installation where multiple modules are required. The 1-gang mount version is ideal for remote locations that require a single module.
- **Automatic device mapping**
  Signature modules transmit information to the loop controller regarding their circuit locations with respect to other Signature devices on the wire loop.
- **Electronic addressing**
  Programmable addresses are downloaded from the loop controller, a PC, or the SIGA-PRO Signature Program/Service Tool. There are no switches or dials to set.
- **Ground fault detection by address**
  Detects ground faults right down to the device level.

Signature Series Overview

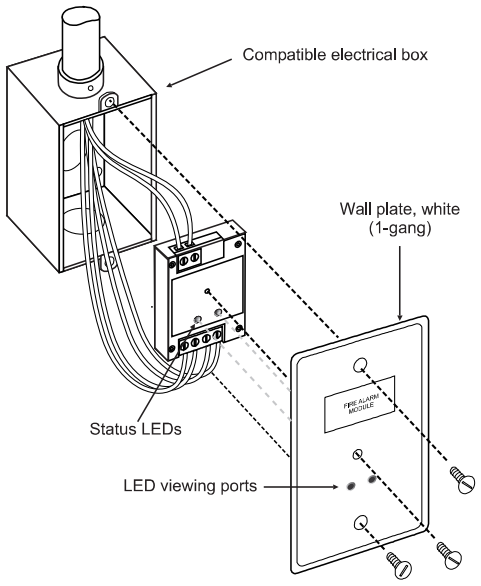
The Signature Series intelligent analog-addressable system from EDWARDS Security is an entire family of multi-sensor detectors and mounting bases, multiple-function input and output modules, network and non-network control panels, and user-friendly maintenance and service tools. Analog information from equipment connected to Signature devices is gathered and converted into digital signals. An onboard microprocessor in each Signature device measures and analyzes the signal and decides whether or not to input an alarm. The microprocessor in each Signature device provides four additional benefits – Self-diagnostics and History Log, Automatic Device Mapping, and Fast, Stable Communication.

Self-diagnostics and History Log – Each Signature Series device constantly runs self-checks to provide important maintenance information. The results of the self-check are automatically updated and permanently stored in its non-volatile memory. This information is accessible for review any time at the control panel, PC, or using the SIGA-PRO Signature Program/Service Tool.

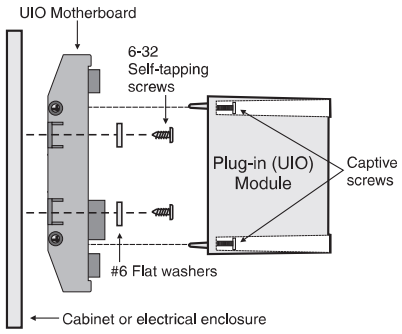
Automatic Device Mapping –The Signature Data Controller (SDC) learns where each device's serial number address is installed relative to other devices on the circuit. The SDC keeps a map of all Signature Series devices connected to it. The Signature Series Data Entry Program also uses the mapping feature. With interactive menus and graphic support, the wired circuits between each device can be examined. Layout or "as-built" drawing information showing branch wiring (T-taps), device types and their address are stored on disk for printing hard copy.

Installation

SIGA-CT1, SIGA-CT1HT and SIGA-CT2: modules mount to North American 2½ inch(64 mm) deep 1-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 1-gang covers and SIGA-MP mounting plates. The terminals are suited for #12 to #18 AWG (2.5 mm^2 to 0.75 mm^2) wire size.



SIGA-MCT2: mount the UIO motherboard inside a suitable EDWARDS enclosure with screws and washers provided. Plug the SIGA-MCT2 into any available position on the motherboard and secure the module to the motherboard with the captive screws. Wiring connections are made to the terminals on the motherboard (see wiring diagram). UIO motherboard terminals are suited for #12 to #18 AWG (2.5 mm^2 to 0.75 mm^2) wire size.



Electronic Addressing - The loop controller electronically addresses each module, saving valuable time during system commissioning. Setting complicated switches or dials is not required. Each module has its own unique serial number stored in its on-board memory. The loop controller identifies each device on the loop and assigns a "soft" address to each serial number. If desired, the modules can be addressed using the SIGA-PRO Signature Program/Service Tool.

EDWARDS recommends that this module be installed according to latest recognized edition of national and local fire alarm codes.

Application

The duty performed by the SIGA-CT1 and SIGA-CT2/MCT2 is determined by their sub-type code or "Personality Code". The code is selected by the installer depending upon the desired application and is downloaded from the loop controller.

One personality code can be assigned to the SIGA-CT1. Two personality codes can be assigned to the SIGA-CT2/MCT2. Codes 1, 2, 3 and 4 can be mixed on SIGA-CT2/MCT2 modules only. For example, personality code 1 can be assigned to the first address (circuit A) and code 4 can be assigned to the second address (circuit B).

NORMALLY-OPEN ALARM - LATCHING (Personality Code 1) - Assign to one or both circuits. Configures either circuit A or B or both for Class B normally open dry contact initiating devices such as Pull Stations, Heat Detectors, etc. An ALARM signal is sent to the loop controller when the input contact is closed. The alarm condition is latched at the module.

NORMALLY-OPEN ALARM - DELAYED LATCHING (Personality Code 2) - Assign to one or both circuits. Configures either circuit A or B or both for Class B normally-open dry contact initiating devices such as Waterflow Alarm Switches. An ALARM signal is sent to the loop controller when the input contact is closed for approximately 16 seconds. The alarm condition is latched at the module.

NORMALLY-OPEN ACTIVE - NON-LATCHING (Personality Code 3) - Assign to one or both circuits. Configures either circuit A or B or both for Class B normally-open dry contact monitoring input such as from Fans, Dampers, Doors, etc. An ACTIVE signal is sent to the loop controller when the input contact is closed. The active condition is not latched at the module.

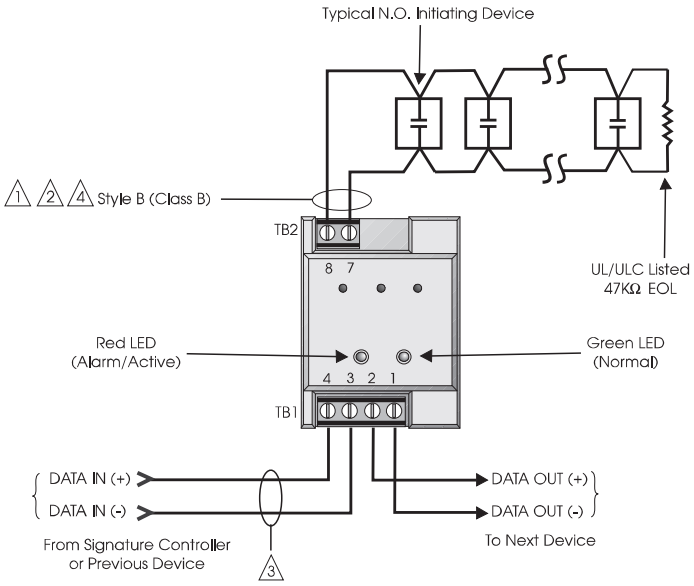
NORMALLY-OPEN ACTIVE - LATCHING (Personality Code 4) - Assign to one or both circuits. Configures either circuit A or B or both for Class B normally open dry contact monitoring input such as from Supervisory and Tamper Switches. An ACTIVE signal is sent to the loop controller when the input contact is closed. The active condition is latched at the module.

Typical Wiring

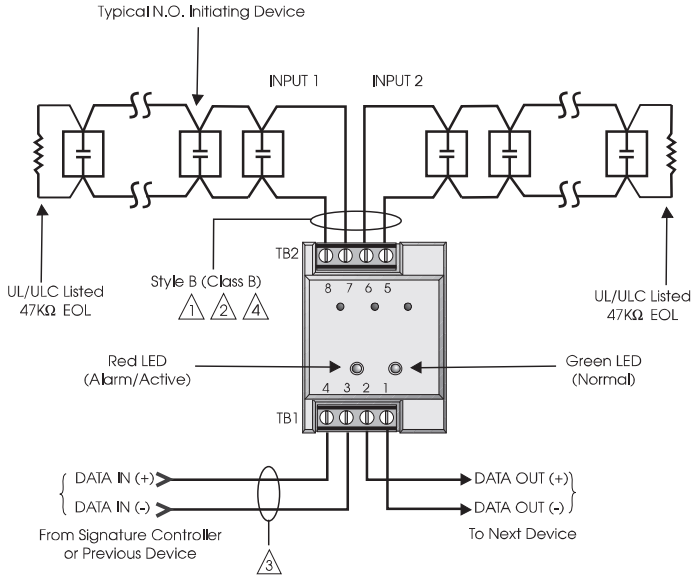
Modules will accept #18 AWG (0.75mm^2), #16 (1.0mm^2), and #14AWG (1.50mm^2), and #12 AWG (2.50mm^2) wire sizes.

Note: Sizes #16 AWG (1.0mm^2) and #18 AWG (0.75mm^2) are preferred for ease of installation. See Signature Loop Controller catalog sheet for detailed wiring requirement specifications.

Initiating (Slave) Device Circuit Wire Specifications		
Maximum Allowable Wire Resistance	50 ohms (25 ohms per wire) per Circuit	
Maximum Allowable Wire Capacitance	0.1µF per Circuit	
For Design Reference:	**Wire Size**	**Maximum Distance to EOLR**
	#18 AWG (0.75 mm^2)	4,000 ft (1,219 m)
	#16 AWG (1.00 mm^2)	
	#14 AWG (1.50 mm^2)	
	#12 AWG (1.50 mm^2)	



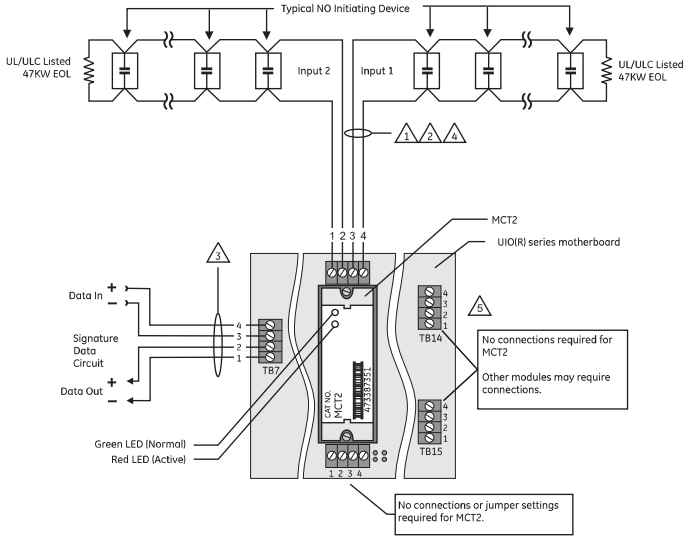
SIGA-CT1, SIGA-CT1HT



SIGA-CT2

NOTES

1. Maximum 25 Ohm resistance per wire.
2. Maximum #12 AWG (2.5 mm^2) wire; Minimum #18 AWG (0.75 mm2).
3. Refer to Signature controller installation sheet for wiring specifications.
4. Maximum 10 Vdc @ 350 µA
5. The SIGA-UIO6R and the SIGA-UIO2R do not come with TB14.
6. All wiring is supervised and power-limited.
7. These modules will not support 2-wire smoke detectors.



SIGA-MCT2

Warnings & Cautions

This module will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguards with your local fire protection specialist.

Compatibility

These modules are part of EDWARDS's Signature Series intelligent processing and control platform. They are compatible with EST3, EST3X and iO Series control panels.

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1016 Corporate Park Drive
Mebane, NC 27302

Specifications

Catalog Number	SIGA-CT1HT	SIGA-CT1	SIGA-CT2	SIGA-MCT2
Description	Single Input Module		Dual Input Module	
Type Code	48 (factory set) Four sub-types (personality codes) are available		49 (factory set) Four sub-types (personality codes) are available	
Address Requirements	Uses One Module Address		Uses Two Module Addresses	
Operating Current	Standby = 250µA; Activated = 400µA		Standby = 396µA; Activated = 680µA	
Operating Voltage	15.2 to 19.95 Vdc (19 Vdc nominal)			
Construction	High Impact Engineering Polymer			
Mounting	North American 2½ inch (64 mm) deep one-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with one-gang covers and SIGA-MP mounting plates			UIO2R/6R/6 Motherboard
Operating Environment	32°F to 158°F (0°C to 70°C)	32°F to 120°F (0°C to 49°C)		
Storage Environment	-4°F to 140°F (-20°C to 60°C); Humidity: 0 to 93% RH			
LED Operation	On-board Green LED - Flashes when polled; On-board Red LED - Flashes when in alarm/active.			
Compatibility	Use with Signature Loop Controller			
Agency Listings	UL, ULC, MEA, CSFM			

Ordering Information

Catalog Number	Description	Ship Wt. lbs (kg)
SIGA-CT1	Single Input Module — UL/ULC Listed	0.4 (0.15)
SIGA-CT1HT	Single Input Module High Temperature Operation UL/ULC Listed	0.4 (0.15)
SIGA-CT2	Dual Input Module — UL/ULC Listed	0.4 (0.15)
SIGA-MCT2	Dual Input Plug-in (UIO) Module — UL, ULC Listed	0.1 (0.05)

Related Equipment		
27193-11	Surface Mount Box - Red, 1-gang	1.0 (0.6)
27193-16	Surface Mount Box - White, 1-gang	1.0 (0.6)
SIGA-UIO2R	Universal Input-Output Module Board w/Riser Inputs — Two Module Positions	0.32 (0.15)
SIGA-UIO6R	Universal Input-Output Module Board w/Riser Inputs — Six Module Positions	0.62 (0.28)
SIGA-UIO6	Universal Input-Output Module Board — Six Module Positions	0.56 (0.25)
MFC-A	Multifunction Fire Cabinet — Red, supports Signature Module Mounting Plates	7.0 (3.1)
SIGA-MB4	Transponder Mounting Bracket (allows for mounting two 1-gang modules in a 2-gang box)	0.4 (0.15)
SIGA-MP1	Signature Module Mounting Plate, 1 footprint	1.5 (0.70)
SIGA-MP2	Signature Module Mounting Plate, 1/2 footprint	0.5 (0.23)
SIGA-MP2L	Signature Module Mounting Plate, 1/2 extended footprint	1.02 (0.46)

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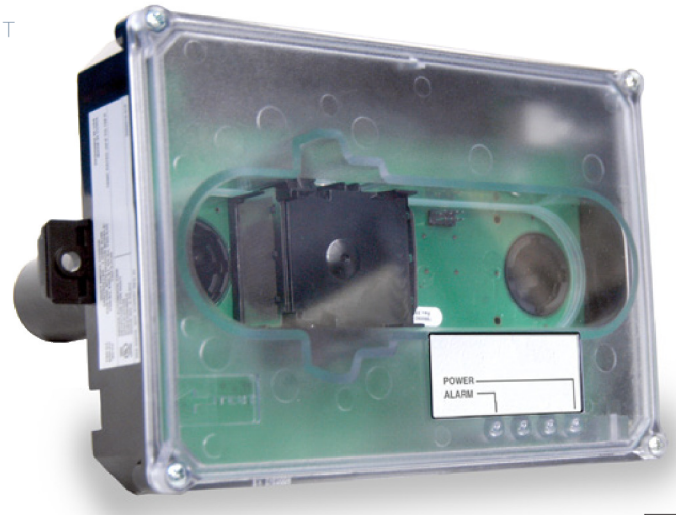
Intelligent Duct Smoke Detector

SIGA-SD



FM APPROVED MEA 3242-1657: 0223 UL ULC S853

Overview

The EDWARDS *SuperDuct* Signature Series smoke detector is the most advanced and most reliable device in its class. Designed for easy installation and superb reliability, *SuperDuct* represents the perfect balance of practical design and advanced technology.

***SuperDuct* detectors** feature a unique design that speeds installation and simplifies maintenance. Removable dust filters, conformally coated circuit boards, and optional water-resistant gaskets keep contaminants away from components, ensuring years of trouble-free service. When cleaning is required, the assemblies come apart easily and snap back together in seconds.

A Signature Series photoelectric sensor is incorporated into the design of each SIGA-SD duct smoke detector. This sensor inherits the power and benefits of this exceptional line of intelligent devices.

Signature Series sensors gather analog information from their smoke sensing elements and convert it into digital signals. The sensor measures and analyses these signals and compares the information to historical readings and time patterns to make an alarm decision. Digital filters remove signal patterns that are not typical of fires, which virtually eliminates unwanted alarms.

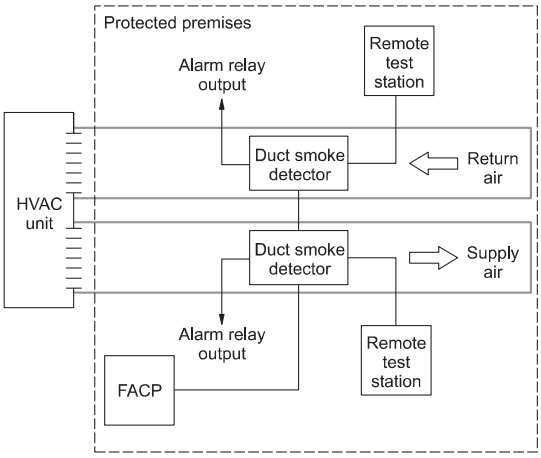
WARNING: Duct detectors have specific limitations. Duct detectors are not a substitute for an open area smoke detector. Duct detectors are not a substitute for early warning detection or a replacement for a building's regular fire detection system. Smoke detectors are not designed to detect toxic gases which can build up to hazardous levels in some fires. These devices will not operate without electrical power. As fires frequently cause power interruptions, EDWARDS suggests you discuss further safeguards with your local fire protection specialist.

Standard Features

- Less than 2" deep for easy installation and applications where space is tight
- -20°F to 158°F (-29°C to 70°C) operating range with 100 ft/min. to 4,000 ft/min air velocity rating assures reliability under harsh environmental conditions
- Status LEDs remain visible through clear assembly cover
- Cover monitor switch for added security
- Standard sampling tube spacing for easy drop-in migration from other detectors
- Sampling tube can be installed with or without the cover in place and can be rotated in 45-degree increments to ensure proper alignment with duct airflow
- 15.2 to 19.95 Vdc operation
- Magnet-activated test switch
- One Form C auxiliary alarm relay for controlling ancillary equipment (e.g., HVAC controls)
- No special tools required for easy access to field connections
- Signature Series intelligence
- Environmental compensation with differential sensing for reliable, stable, and drift-free sensitivity
- Wide 0.79% to 2.46% obscuration/ft. smoke sensitivity
- Identification of dirty or defective detectors

Application

SuperDuct detectors are ideally suited to duct smoke detection applications where early indication of combustion is required within the confined space of ventilation ductwork. Its primary purpose is to provide early warning of an impending fire and to prevent smoke from circulating throughout the building. It is typically used to detect smoke in the supply side of the HVAC system but can provide supervision of the return side as well.



SuperDuct detectors continually sample air flow in the HVAC duct and initiate an alarm condition whenever smoke is detected. An alarm is activated when the quantity (percent obscuration) of combustion products in that air sample exceeds the detector's sensitivity setting.

Signature Series Intelligence

Like all Signature detectors, the SIGA-SD features electronic addressing and issues a dirty sensor warning when it reaches its preset limit. The dirty sensor warning indicates the sensor is operating within its specified limits but is in need of servicing. When the detector's ability to compensate for environmental changes has reached its limit, the duct smoke detector signals a trouble condition.

The SIGA-SD also uses differential sensing to prevent gradual environmental changes from triggering unwanted alarms. A rapid change in environmental conditions, such as smoke from a fire, causes the detector to signal an alarm state, but dust and debris accumulated over time does not change alarm sensitivity.

Each Signature Series SuperDuct detector contains a microprocessor that performs comprehensive self-diagnostics and stores the results in nonvolatile memory. Stored results include details such as hours of operation, last maintenance date, and number of alarms and troubles. This information can be retrieved and reviewed when desired.

Detector Configuration

The detector assembly cover provides easy access to the smoke sensor, its wiring connections, sample and exhaust tubes, and the smoke chamber itself.

Air enters the detector's sensing chamber through a sampling tube (ordered separately) that extends into the duct and is directed back into the ventilation system through an exhaust tube (included). The difference in air pressure between the two tubes pulls the sampled air through the sensing chamber. When a sufficient amount of smoke is detected in the sensing chamber, the detector initiates an alarm.

The sampling tube may be installed from either the duct side of the assembly or from inside the sensor compartment, as preferred by the installer. (The exhaust tube must be installed from the duct side.) Sampling tubes may be rotated in 45-degree increments so that air-holes can be aligned to allow the unit to be mounted at virtually any angle relative to the air flow.

In installations where the duct smoke detector's controls and indicators are hidden from view, a remote test station or an LED indicator can be connected to the detector to provide these functions.

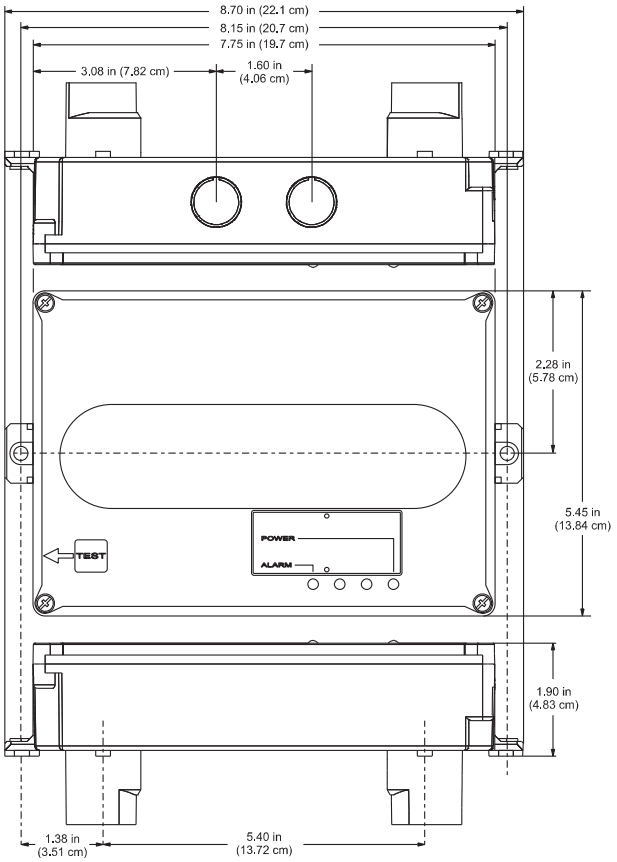
Remote Test Stations

Labor-saving Remote Test/Reset stations provide alarm testing from the convenience of a remote location. Tests can be performed quickly and safely – without having to climb to the roof. Magnetically-operated and key-operated one-gang models are available. Signature SuperDuct detectors are also compatible with SIGA-LED remote alarm LED.

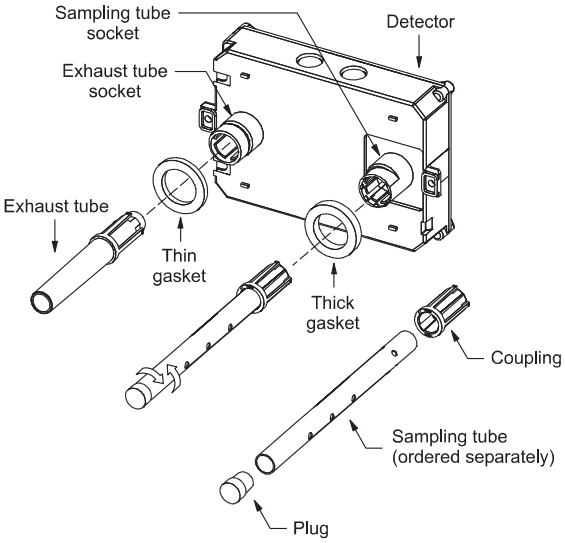
Air velocity in the duct as low as 100 ft/min. maintains adequate air flow into the sensor smoke chamber through air holes in the air sampling tube and discharges through the exhaust tube. *SuperDuct* air sampling tubes must be installed with the inlet holes facing the airstream. Sampling tubes may be rotated in 45-degree increments so that air-holes can be aligned to allow the unit to be mounted in virtually any angle relative to the airflow.

SuperDuct sensors are engineered to operate optimally under the harsh environmental conditions frequently found in HVAC ductwork. Nonetheless, before installing the detector, test the duct air velocity, temperature, and humidity to verify that it is within the operating range of the *SuperDuct* detector. Consult the *SuperDuct* installation sheet for details.

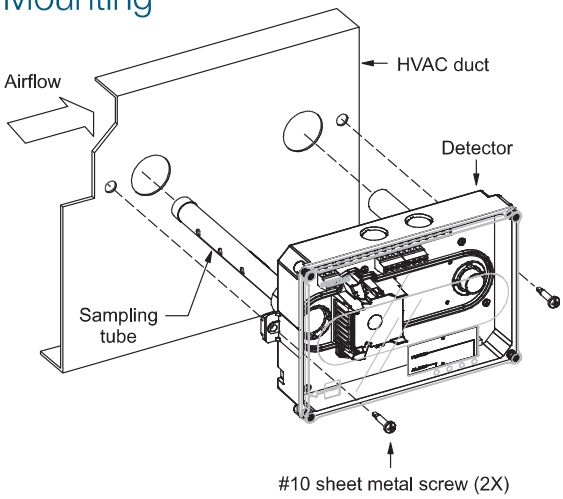
Dimensions



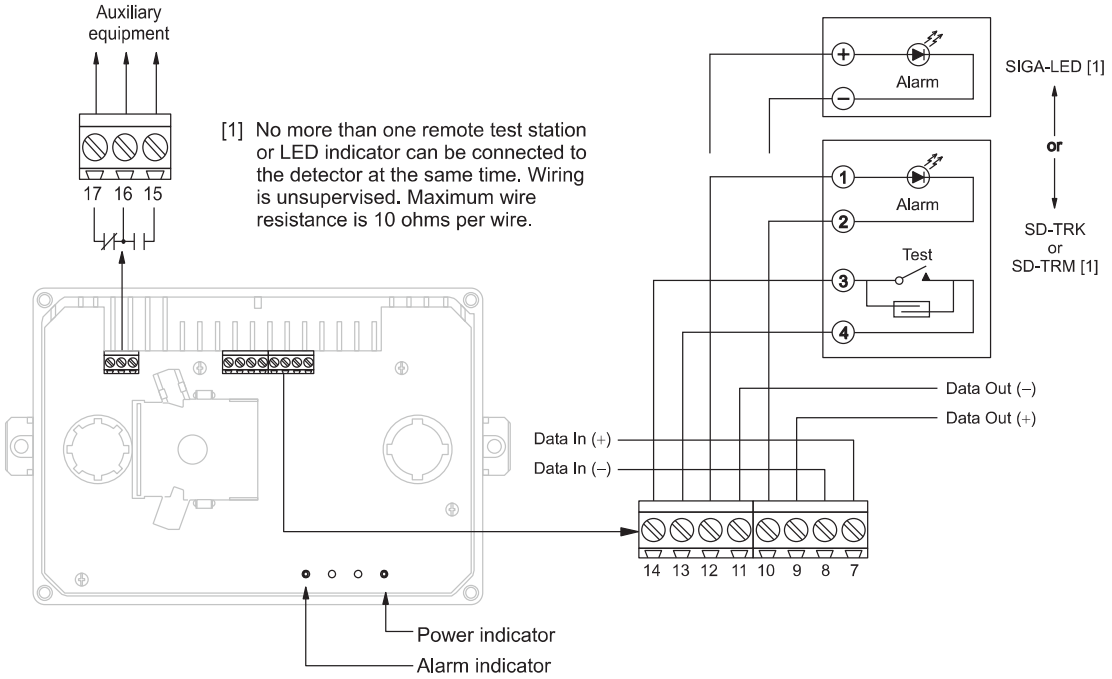
Assembly



Mounting

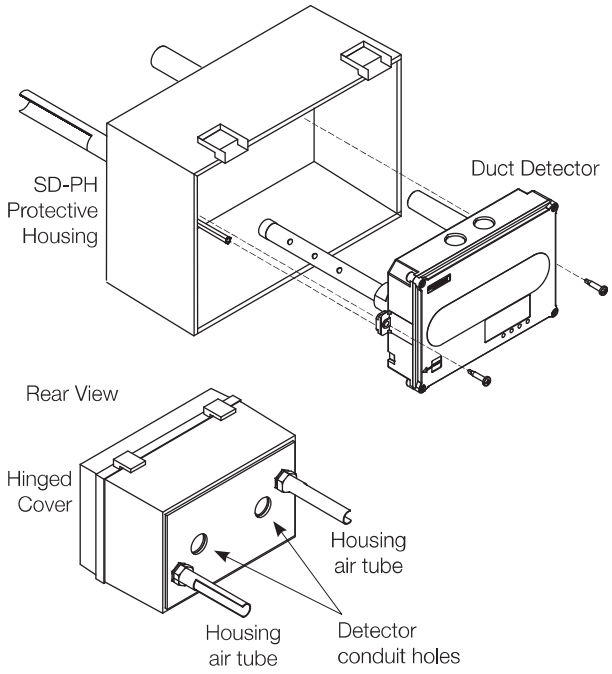


Wiring



High-humidity environments

Use the SD-PH Protective Housing when installing SuperDuct detectors in high-humidity environments. The SD-PH is a weatherized housing that prevents condensation on the device by insulating the detectors and providing circulated air from the monitored HVAC duct. The SD-PH also adds a layer of protection against physical damage to the unit.



The SD-PH is easy to install and service. The hinged and transparent cover provides ready access to the detector, while keeping its status indicators visible at all times.

Note: The SD-PH Protective Housing is weatherized against outdoor air, but it is not intended for direct outdoor exposure.

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Specifications, detector

Dimensions	8.70 x 5.45 x 1.90 inches (221 x 138 x 48 mm)
Wire size	14 to 22 AWG
Detection method	Photoelectric (light scattering principle)
Air velocity rating	100 to 4,000 ft/min and meets the required minimum air pressure differential
Air pressure differential	0.005 to 1.00 inches of water
Sensitivity	0.79 to 2.46 %/ft obscuration
Alarm test response time	5 seconds
LED indicators	Alarm (red), Power (green)
Common alarm relay	Unsupervised and power-limited Quantity: 1 Type: Form C Ratings: 2.0 A at 30 Vdc (resistive)
Operating voltage	15.2 to 19.95 Vdc
Operating current	Standby: 45 µA Alarm: 45 µA Inrush: 1 mA Standalone alarm: 18 mA
Operating environment	Temperature (UL): -20 to 158 °F (-29 to 70 °C). Temperature (ULC): -4 to 120 °F (-29 to 49 °C) Relative humidity: 10 to 93%, noncondensing
Agency listings	UL, ULC, CSFM, FM, MEA

Specifications, test stations

Remote Test/Reset Stations provide alarm test, trouble indication, and reset capability from a remote location. They include a one-gang plate, momentary SPST switch, red alarm LED, and terminal block. Magnetically-operated models (TRM) or key-operated models (TRK) are available.

Compatible electrical boxes	North American 1-gang box Standard 4-in square box, 1-1/2 inches deep, with 1-gang cover
LED indicators	Alarm (red)
LED type	Clear lens
Wire size	14 to 22 AWG
Resistance per wire	10 Ohms, max.
Current requirements	See controller specifications
LED circuit ratings	Voltage: 3 Vdc, max. Current: 30 mA, max.
Switch ratings (SD-TRK)	Voltage: 125 Vdc, max. Current: 4 A, max.
Switch ratings (SD-TRM)	Voltage: 200 Vdc, max. Current: 0.5 A, max.
Compatible detectors	SuperDuct conventional two-wire and Signature duct smoke detectors
Operating environment	-4°F to 158°F (-20°C to 70°C) Humidity: 93% RH, noncondensing
Storage temperature	-4 to 140 °F (-20 to 60 °C)
Agency listings	UL, ULC, MEA, CSFM

Ordering Information

Catalog Number	Description	Ship Wt., lb. (kg)
SIGA-SD	Intelligent SuperDuct Detector	2.4 (1.1)
Accessories		
SD-T8	8-inch sampling tube	0.5 (0.2)
SD-T18	18-inch sampling tube	1.5 (0.7)
SD-T24	24-inch sampling tube	2.7 (1.2)
SD-T36	36-inch sampling tube	3.0 (1.4)
SD-T42	42-inch sampling tube	3.5 (1.6)
SD-T60	60-inch sampling tube	5.8 (2.6)
SD-T78	78-inch sampling tube	7.5 (3.4)
SD-T120	120-inch sampling tube	11.5 (5.2)
SD-PH	Protective housing for high humidity environments	5.5 (2.5)
SIGA-LED	Remote alarm LED	1.0 (0.5)
SD-TRM	Remote test station, magnetic	1.0 (0.5)
SD-TRK	Remote test station, keyed	1.0 (0.5)
SD-VTK	Air velocity test kit (stoppers only, etc)	1.0 (0.5)
SD-GSK	Cover gasket kit	0.5 (0.2)
SD-MAG	Test magnet kit	0.5 (0.2)
SIGA-SDPCB	Replacement PCB/Signature sensor kit	1.0 (0.5)

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Manual Pull Stations

SIGA-270, SIGA-270P, SIGA-278

SIGA-270 SERIES

SIGA-278

Patented

MEA FM APPROVED 7150-1657: 0129 S2318

Overview

The SIGA-270 and SIGA-278 series Manual Pull Stations are part of EDWARDS's Signature Series system. The SIGA-270 Fire Alarm Manual Pull Stations feature our very familiar teardrop shape. They are made from die-cast zinc and finished with red epoxy powder-coat paint complemented by aluminum colored stripes and markings. With positive pull-lever operation, one pull on the station handle breaks the glass rod and turns in a positive alarm, ensuring protection plus fool-proof operation. Presignal models (SIGA-270P) are equipped with a general alarm (GA) keyswitch for applications where two stage operation is required. The up-front highly visible glass rod discourages tampering, but is not required for proper operation.

EDWARDS's double action single stage SIGA-278 station is a contemporary style manual station made from durable red colored lexan. To initiate an alarm, first lift the upper door marked "LIFT THEN PULL HANDLE", then pull the alarm handle.

Standard Features

Note: *Some features described here may not be supported by all control systems. Check your control panel's Installation and Operation Guide for details.*

- **Traditional familiar appearance**
  SIGA-270 models feature our familiar teardrop design with simple positive pull action and sturdy die-cast metal body.
- **One stage (GA), two stage (pre-signal), and double action models**
  SIGA-270 models are available for one or two stage alarm systems. The single stage double action SIGA-278 features a rugged Lexan housing with keyed reset mechanism.
- **Break glass operation**
  An up-front visible glass rod on the SIGA-270 discourages tampering.
- **Intelligent device with integral microprocessor**
  All decisions are made at the station allowing lower communication speed while substantially improving control panel response time. Less sensitive to line noise and loop wiring properties; twisted or shielded wire is not required.
- **ADA Compliant**
  Meets ADA requirements for manual pull stations.
- **Electronic Addressing with Non-volatile memory**
  Permanently stores programmable address, serial number, type of device, and job number. Automatically updates historic information including hours of operation, last maintenance date, number of alarms and troubles, and time and date of last alarm.
- **Automatic device mapping**
  Each station transmits wiring information to the loop controller regarding its location with respect to other devices on the circuit.
- **Diagnostic LEDs**
  Status LEDs; flashing GREEN shows normal polling; flashing RED shows alarm state.
- **Designed for high ambient temperature operation**
  Install in ambient temperatures up to 120 °F (49 °C).

Application

The operating characteristics of the fire alarm stations are determined by their sub-type code or "Personality Code". NORMALLY-OPEN ALARM - LATCHING (Pesonality Code 1**)** is assigned by the factory; no user configuration is required. The device is configured for Class B IDC operation. An ALARM signal is sent to the loop controller when the station's pull lever is operated. The alarm condition is latched at the station.

Compatibility

Signature Series manual stations are compatible only with EDWARDS's Signature Loop Controller.

Warnings & Cautions

This device will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguards with your local fire protection specialist.

Testing & Maintenance

To test (or reset) the station simply open the station and operate the exposed switch. The SIGA-270 series are opened with a tool; the SIGA-278 requires the key which is supplied with that station.

The station's automatic self-diagnosis identifies when it is defective and causes a trouble message. The user-friendly maintenance program shows the current state of each Signature series device and other pertinent messages. Single devices may be deactivated temporarily, from the control panel. Availability of maintenance features is dependent on the fire alarm system used.

Scheduled maintenance (Regular or Selected) for proper system operation should be planned to meet the requirements of the Authority Having Jurisdiction (AHJ). Refer to current NFPA 72 and ULC CAN/ULC 536 standards.

Typical Wiring

The fire alarm station's terminal block accepts #18 AWG (0.75mm^2) to #12 AWG (2.5mm^2) wire sizes. See Signature Loop Controller catalog sheet for detailed wiring requirement specifications.

Wiring Notes

1. Refer to Signature Loop Controller manual for maximum wire distance.
2. All wiring is power limited and supervised.

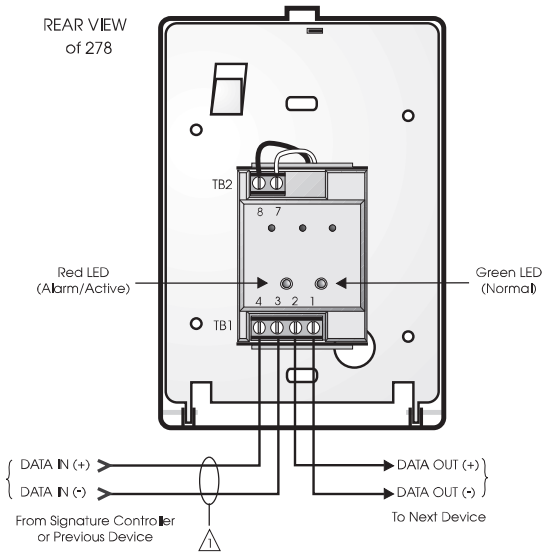

Figure 4. Single Stage Systems

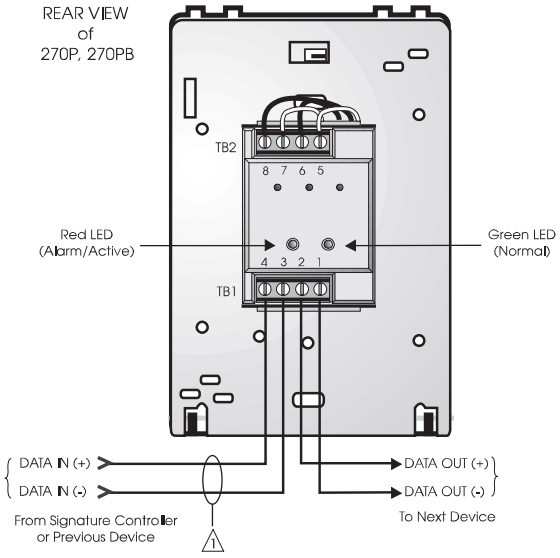

Figure 5. Two Stage Systems

Installation

Single-stage Signature Series fire alarm manual pull stations mount to North American 2½ inch (64 mm) deep 1-gang boxes.

Two stage presignal (270P) models require 1½ inch (38 mm) deep 4-inch square boxes with 1-gang, ½-inch raised covers. Openings must be angular. *Rounded openings are not acceptable.* Recommended box: Steel City Model 52-C-13; in Canada, use Iberville Model CI-52-C-49-1/2.

All models include terminals are suited for #12 to #18 AWG (2.5 mm^2 to 0.75 mm^2) wire size. EDWARDS recommends that these fire alarm stations be installed according to latest recognized edition of national and local fire alarm codes.

Electronic Addressing: The loop controller electronically addresses each manual station, saving valuable time during system commissioning. Setting complicated switches or dials is not required. Each station has its own unique serial number stored in its on-board memory. The loop controller identifies each device on the loop and assigns a "soft" address to each serial number. If desired, the stations can be addressed using the SIGA-PRO Signature Program/Service Tool.

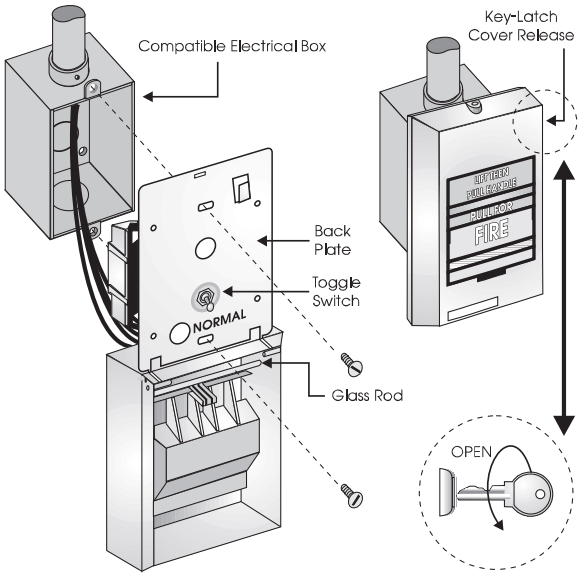

Figure 1. SIGA-278 installation

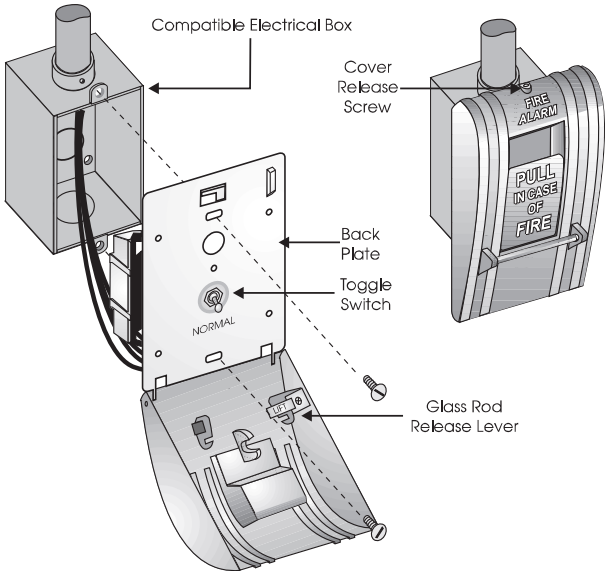

Figure 2. SIGA-270, SIGC-270F, SIGC-270B installation

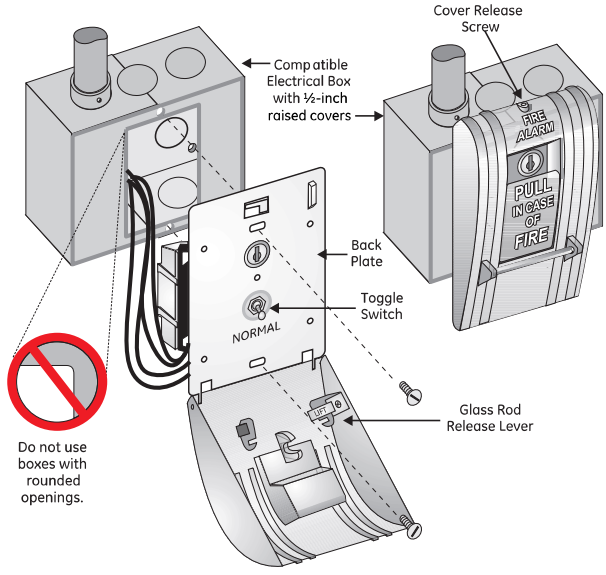

Figure 3. SIGA-270P, SIGC-270PB installation

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Specifications

Catalog Number	SIGA-270, SIGC-270F, SIGC-270B	SIGA-270P, SIGC-270PB	SIGA-278
Description	Single Action - One Stage	Single Action -Two Stage (Presignal)	Double Action - One Stage
Addressing Requirements	Uses 1 Module Address	Uses 2 Module Addresses	Uses 1 Module Address
Operating Current	Standby = 250µA Activated = 400µA	Standby = 396µA Activated = 680µA	Standby = 250µA Activated = 400µA
Construction & Finish	Diecast Zinc - Red Epoxy with aluminum markings		Lexan - Red with white markings
Type Code	Factory Set		
Operating Voltage	15.2 to 19.95 Vdc (19 Vdc nominal)		
Storage and Operating Environment	Operating Temperature: 32"F to 120"F (0"C to 49"C) Storage Temperature: -4"F to 140"F (-20"C to 60"C) Humidity: 0 to 93% RH		
LED Operation	On-board Green LED - Flashes when polled On-board Red LED - Flashes w hen in alarm		
Compatibility	Use With: Signature Loop Controller		
Agency Listings	UL, ULC (note 1), MEA, CSFM, FM		

Note: *SIGC-270F, SIGC-270B and SIGC-270PB are ULC listed only. Suffix "F" indicates French markings. Suffix "B" indicates English/French biling ual markings.*

Ordering Information

Catalog Number	Description	Ship Wt. lbs (kg)
SIGA-270	One Stage Fire Alarm Station, English Markings - UL/ULC Listed	1 (0.5)
SIGC-270F	One Stage Fire Alarm Station, French Markings - ULC Listed	
SIGC-270B	One Stage Fire Alarm Station, French/English Markings - ULC Listed	
SIGA-270P	Two Stage (Presignal) Fire Alarm Station, English Markings - UL/ULC Listed	
SIGC-270PB	Two Stage (Presignal) Fire Alarm Station, French/English Markings - ULC Listed	
SIGA-278	Double Action (One Stage) Fire Alarm Station, English Markings - UL/ULC Listed	

Accessories		
32997	GA Key w/Tag - for pre-signal station (CANADA ONLY)	0.1 (.05)
276-K2	GA Key - for pre-signal station (USA ONLY)	
276-K1	Station Reset Key, Supplied with all Key Reset Stations	
27165	12 Glass Rods - for SIGA-270 series (CANADA ONLY)	
270-GLR	20 Glass Rods - for SIGA-270 series (USA ONLY)	
276-GLR	20 Glass Rods - for SIGA-278 series	
276B-RSB	Surface Mount Box, Red - for SIGA pull stations	1 (0.6)

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EDWARDS
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Intelligent Photoelectric Smoke Detector

SIGA-PS

FM APPROVED
UL UL/C S853
7272-1657: 0126

Overview

The Signature Series Model SIGA-PS Intelligent Photoelectric Smoke Detector gathers analog information from its smoke sensing element and converts it into digital signals. The detector's on-board microprocessor measures and analyzes these signals. It compares the information to historical readings and time patterns to make an alarm decision. Digital filters remove signal patterns that are not typical of fires. Unwanted alarms are virtually eliminated.

The microprocessor in each detector provides four additional benefits - Self-diagnostics and History Log, Automatic Device Mapping, and Fast, Stable Communication.

Self-diagnostics and History Log - Each Signature Series detector constantly runs self-checks to provide important maintenance information. The results of the self-check are automatically updated and permanently stored in the detector's non-volatile memory

Automatic Device Mapping - The loop controller learns where each device's serial number address is installed relative to other devices on the circuit. The mapping feature provides supervision of each device's installed location to prevent a detector from being reinstalled (after cleaning etc.) in a different location from where it was originally.

Fast Stable Communication - On-board intelligence means less information needs to be sent between the detector and the loop controller. Other than regular supervisory polling response, the detector only needs to communicate with the loop controller when it has something new to report.

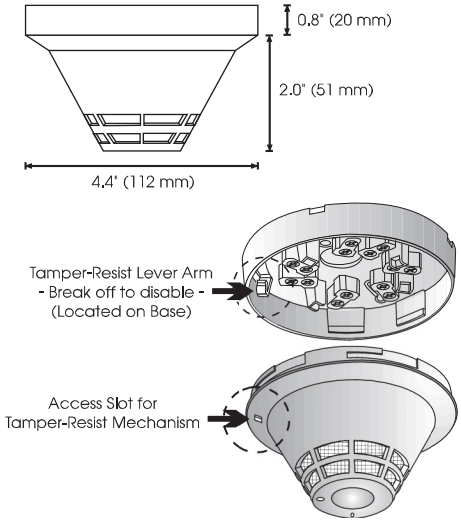
Standard Features

- Integral microprocessor
- Non-volatile memory
- Automatic mapping device
- Electronic addressing
- Environmental compensation
- Intelligent detector
- Wide 0.67% to 3.77%/ft. sensitivity range
- Twenty pre-alarm sensitivity values, set in 5% increments
- Identification of dirty or defective detectors
- Automatic day/night sensitivity adjustment
- Twin RED/GREEN status LEDs
- Standard, relay, fault isolator, and audible mounting bases
- Designed and manufactured to ISO 9001 standards

DATA SHEET E85001-0269
Not to be used for installation purposes. Issue 1

Installation

Signature Series detectors mount to North American 1-gang boxes, 3-1/2 inch or 4 inch octagon boxes, and to 4 inch square electrical boxes 1-1/2 inches (38 mm) deep. They mount to European BESA and 1-gang boxes with 60.3 mm fixing centers.



Testing & Maintenance

Each detector automatically identifies when it is dirty or defective and causes a "dirty detector" message. The detector's sensitivity measurement can also be transmitted to the loop controller. A sensitivity report can be printed to satisfy NFPA sensitivity measurements which must be conducted at the end of the first year and every two years thereafter.

The user-friendly maintenance program shows the current state of each detector and other pertinent messages. Single detectors may be turned off temporarily from the control panel. Availability of maintenance features is dependent on the fire alarm system used. Scheduled maintenance (Regular or Selected) for proper detector operation should be planned to meet the requirements of the Authority Having Jurisdiction (AHJ). Refer to current NFPA 72 and ULC CAN/ULC 536 standards.

Compatibility

The SIGA-PS detectors are compatible only with the Signature Loop Controller.

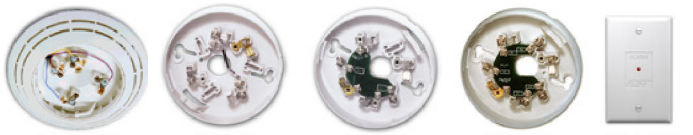
Warnings & Cautions

This detector will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguards with your fire protection specialist.

This detector will NOT sense fires that start in areas where smoke cannot reach the detector. Smoke from fires in walls, roofs, or on the opposite side of closed doors may not reach the detector to alarm it.

Accessories

All detector mounting bases have wiring terminals that are accessible from the "room-side" after mounting the base to the electrical box. The bases mount to North American 1-gang boxes and to 3½ inch or 4 inch octagon boxes, 1½ inches (38 mm) deep. They also mount to European BESA and 1-gang boxes with 60.3 mm fixing centers. The SIGA-SB4, SIGA-RB4, and SIGA-IB4 mount to North American 4 inch sq. electrical boxes in addition to the above boxes. They include the SIGA-TS4 Trim Skirt which is used to cover the "mounting ears" on the base. The SIGA-AB4G mounts to a 4" sqare box only.



SIGA-AB4G Audible Base | **SIGA-SB** Standard Base | **SIGA-IB** Isolator Base | **SIGA-RB** Relay Base | **SIGA-LED** Remote LED

Standard Base SIGA-SB, SIGA-SB4 - This is the basic mounting base for EDWARDS Signature Series detectors. The SIGA-LED Remote LED is supported by the Standard Base.

Relay Base SIGA-RB, SIGA-RB4 - This base includes a relay. Normally open or closed operation is selected during installation. The dry contact is rated for 1 amp (pilot duty) @ 30 Vdc. The relay's position is supervised to avoid accidentally jarring it out of position. The SIGA-RB can be operated as a control relay if programmed to do so at the control panel (EST3 V.2 only). The relay base does not support the SIGA-LED Remote LED.

Audible Base SIGA-AB4G - This base is designed for use where localized or group alarm signaling is required. When the detector senses an alarm condition, the audible base emits a local alarm signal. The optional SIGA-CRR Polarity Reversal Relay can be used for sounding to other audible bases on the same 24 Vdc circuit.

Relay and Audible Bases operate as follows:

- at system power-up or reset, the relay is de-energized
- when a detector is installed in the base with the power on, the relay energizes for four seconds, then de-energizes
- when a detector is removed from a base with the power on, the relay is de-energized
- when the detector enters the alarm state, the relay is energized.

Isolator Base SIGA-IB, SIGA-IB4 - This base includes a built-in line fault isolator for use on Class A circuits. A detector must be installed for it to operate. The isolator base does not support the SIGA-LED Remote LED.

The isolator operates as follows:

- a short on the line causes all isolators to open within 23 msec
- at 10 msec intervals, beginning on one side of the Class A circuit nearest the loop controller, the isolators close to provide the next isolator down the line with power
- when the isolator next to the short closes, reopens within 10 msec.

The process repeats beginning on the other side of the loop controller.

Remote LED SIGA-LED - The remote LED connects to the SIGA-SB or SIGA-SB4 Standard Base only. It features a North American size 1-gang plastic faceplate with a white finish and red alarm LED.

SIGA-TS4 Trim Skirt - Supplied with 4 inch bases, it can also be ordered separately to use with the other bases to help hide surface imperfections not covered by the smaller bases.

Application

Although photoelectric detectors have a wide range of fire sensing capabilities they are best suited for detecting slow, smoldering fires. The table below shows six standard test fires used to rate the sensitivity of smoke and heat detectors. The table indicates that no single sensing element is suited for all test fires.

EDWARDS recommends that this detector be installed according to latest recognized edition of national and local fire alarm codes.

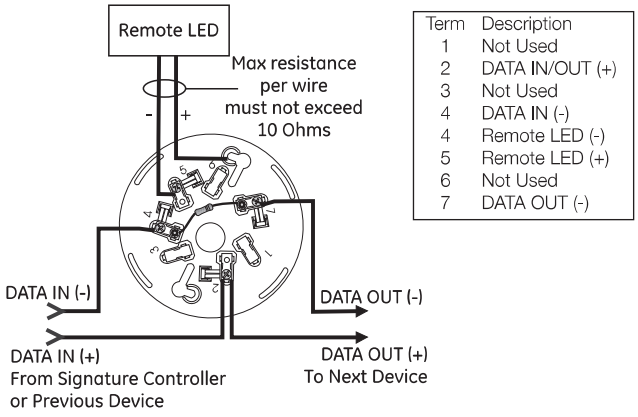
Test Fire	SIGA-PS Photo	SIGA-HRS and SIGA-HFS Rate-of-Rise/ Fixed Temp.	SIGA-PHS Photo Heat 3D	SIGA-IPHS Ion/Photo/Heat 4D
Open Wood	unsuitable	**optimum**	very suitable	**optimum**
Wood Pyrolysis	**optimum**	unsuitable	**optimum**	**optimum**
Smouldering Cotton	**optimum**	unsuitable	**optimum**	**optimum**
Poly Urethane Foam	very suitable	suitable	very suitable	**optimum**
n-Heptane	very suitable	very suitable	**optimum**	**optimum**
Liquid Fire without Smoke	unsuitable	**optimum**	very suitable	very suitable

Typical Wiring

The detector mounting bases accept #18 AWG (0.75mm^2), #16 (1.0mm^2), #14 AWG (1.5mm^2), and #12 AWG (2.5mm^2) wire sizes.

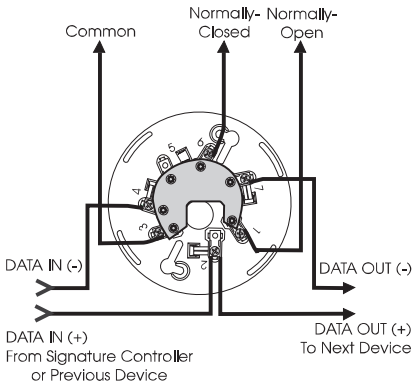
Note: Sizes #16 AWG (1.0mm^2) and #18 AWG (0.75mm^2) are preferred for ease of installation. See Signature Loop Controller catalog sheet for detailed wiring requirement specifications.

Standard Detector Base, SIGA-SB, SIGA-SB4



Term	Description
1	Not Used
2	DATA IN/OUT (+)
3	Not Used
4	DATA IN (-)
4	Remote LED (-)
5	Remote LED (+)
6	Not Used
7	DATA OUT (-)

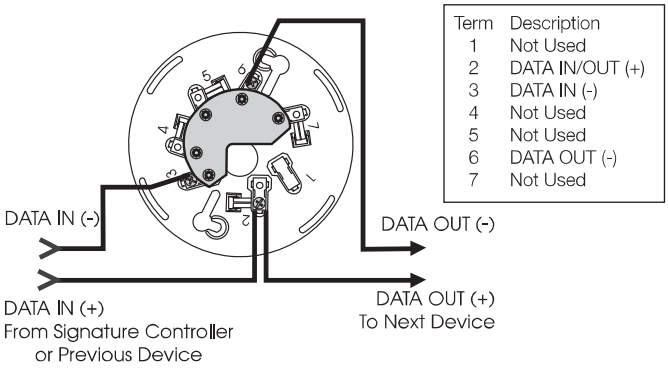
Relay Detector Base, SIGA-RB, SIGA-RB4



Term	Description
1	Normally Open
2	DATA IN/OUT (+)
3	Common
4	DATA IN (-)
5	Not Used
6	Normally-Closed
7	DATA OUT (-)

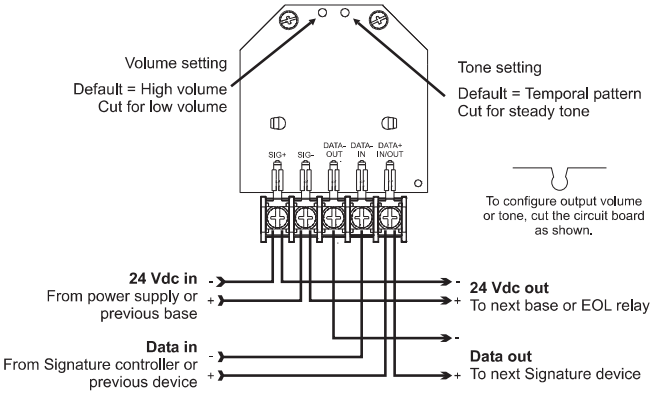
CONTACT RATING
1.0 Amp @ 30 VDC
(Pilot Duty)

Isolator Detector Base, SIGA-IB, SIGA-IB4



Term	Description
1	Not Used
2	DATA IN/OUT (+)
3	DATA IN (-)
4	Not Used
5	Not Used
6	DATA OUT (-)
7	Not Used

Audible Detector Base, SIGA-AB4G



LIFE SAFETY & INCIDENT MANAGEMENT

Contact us...

Email: edwards.fire@fs.utc.com
Web: *Edwards-fire.com*

EDWARDS is a UTC brand.
1016 Corporate Park Drive
Mebane, NC 27302

Specifications

Sensing Element	Photoelectric - Light Scattering Principle
Storage & Operating Environment	Air Velocity Range: 0 to 5,000 ft/min (0 to 25.39 m/s); Humidity: 0 to 93% RH, Non-Condensing Operating Temp: 32"F to 120"F (0"C to 49"C); Storage Temp: -4"F to 140"F (-20"Cto 60"C)
Sensitivity Range	ULI/ULC - 0.67% to 3.77% obscuration/foot
User Selected Alarm Sensitivity Settings	Most Sensitive: 1.0%/ft.; More Sensitive: 2.0%/ft.; Normal: 2.5%/ft.; Less Sensitive: 3.0%/ft.; Least Sensitive: 3.5%/ft.
Pre-alarm Sensitivity	5% increments, allowing up to 20 pre-alarm settings
Operating Voltage	15.2 to 19.95 Vdc (19 Vdc nominal)
Operating Current	Quiescent: 45µA @ 19 V. Alarm: 45µA @ 19 V. Pulse Current: 100 µA (100 msec). During Communication: 9 mA max.
Construction & Finish	High Impact Engineering Polymer - White
Compatible Mounting Bases	SIGA-SB Standard Base, SIGA-RB Relay Base, SIGA-IB Isolator Base, SIGA-AB4, SIGA-AB4G Audible Bases
LED Operation	On-board Green LED - Flashes when polled; On-board Red LED - Flashes when in alarm. Compatible Remote Red LED (model SIGA-LED) Flashes when in alarm.
Compatibility	Use With: SIGNATURE Loop Controller
Address Requirements	Uses one Device Address
Agency Listings	UL, ULC, MEA, CSFM, FM
UL Listed Spacing	30 ft

Ordering Information

Catalog Number	Description	Ship Wt. lbs (kg)
SIGA-PS	Intelligent Photoelectric Detector - UL/ULC Listed	0.5 (.23)
Accessories		
SIGA-SB	Detector Mounting Base - Standard	0.2 (.09)
SIGA-SB4	4-inch Detector Mounting Base c/w SIGA-TS4 Trim Skirt	
SIGA-RB	Detector Mounting Base w/Relay	
SIGA-RB4	4-inch Detector Mounting Base w/Relay, c/w SIGA-TS4 Trim Skirt	
SIGA-IB	Detector Mounting Base w/Fault Isolator	
SIGA-IB4	4-inch Detector Mounting Base w/ Fault Isolator, c/w SIGA-TS4 Trim Skirt	
SIGA-LED	Remote Alarm LED	
SIGA-AB4G	Audible (Sounder) Base	.3 (0.15)
SIGA-TS4	Trim Skirt (supplied with 4-inch bases)	.1 (.04)

Click Here to Return to Bill of Material/Index

LIFE SAFETY & INCIDENT MANAGEMENT

Intelligent Smoke Detector

SIGA-PD

S853

Overview

The Signature Series SIGA-PD optical smoke detector brings advanced sensing technology to a practical design that increases efficiency, saves installation time, cuts costs, and extends life safety and property protection capabilities. Continuous self-diagnostics ensure reliability over the long-haul, while environmental compensation helps reduce maintenance costs.

Like all Signature Series detectors, the SIGA-PD is an intelligent device that gathers analog information from its optical sensor, converting this data into digital signals. To make an alarm decision, the detector's on-board microprocessor measures and analyzes sensor readings and compares this information to historical data. Digital filters remove signal patterns that are not typical of fires, thus virtually eliminating unwanted alarms.

Standard Features

Note: *Some features described here may not be supported by all control systems. Check your control panel's Installation and Operation Guide for details.*

- Next Generation Optical Smoke Sensing Technology
- Wide 0.53 to 3.94 %/ft. (1.7 to 12.35 %/m) smoke obscuration
- Uses Existing Wiring
- Automatic Device Mapping
- Up To 250 Total Signature Addresses Per Loop
- Two Levels of Environmental Compensation
- Two Levels of Dirty Detector Warning
- Twenty Pre-Alarm Settings
- Five Sensitivity Settings
- Non-Volatile Memory
- Electronic Addressing
- Identification of Dirty or Defective Detectors
- Automatic Day/Night Sensitivity Adjustment
- Bicolor (Green/Red) Status Led
- Standard, Relay, Fault Isolator, and Audible Mounting Bases
- Sensor Markings Provide Easy Testing Identification

Application

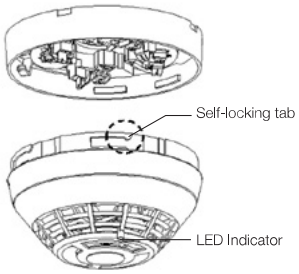
The SIGA-PD detects extremely small particles of combustion and triggers an alarm at the first sign of smoke. Thanks to its high-performance forward-scattering reflective response technology, the photoelectric smoke sensor responds quickly and reliably to a wide range of fire types, especially slow burning fires fuelled by combustibles typically found in modern multi-use buildings.

Compatibility

The SIGA-PD detector is compatible only with the Signature Loop Controller.

Installation

Signature Series detectors mount to North American 1-gang boxes, 3-1/2 inch or 4 inch octagon boxes, and to 4 inch square electrical boxes 1-1/2 inches (38 mm) deep. They mount to European BESA and 1-gang boxes with 60.3 mm fixing centers. See mounting base installation and wiring for more information.



Sensing and reporting technology

The microprocessor in each detector provides additional benefits - Self-diagnostics and History Log, Automatic Device Mapping, and Fast, Stable Communication.

Self-diagnostics and History Log - Each Signature Series detector constantly runs self-checks to provide important maintenance information. The results of the self-check are automatically updated and permanently stored in the detector's non-volatile memory

Automatic Device Mapping - The loop controller learns where each device's serial number address is installed relative to other devices on the circuit. The mapping feature provides supervision of each device's installed location to prevent a detector from being reinstalled (after cleaning etc.) in a different location from where it was originally.

Fast Stable Communication - On-board intelligence means less information needs to be sent between the detector and the loop controller. Other than regular supervisory polling response, the detector only needs to communicate with the loop controller when it has something new to report.

Testing & Maintenance

Each detector automatically identifies when it is dirty or defective and causes a "dirty detector" message. The detector's sensitivity measurement can also be transmitted to the loop controller. A sensitivity report may be printed to satisfy NFPA sensitivity measurements, which must be conducted at the end of the first year and every two years thereafter.

The user-friendly maintenance program shows the current state of each detector and other pertinent messages. Single detectors may be turned off temporarily from the control panel. Availability of maintenance features is dependent on the fire alarm system used.

Accessories

Detector mounting bases have wiring terminals that are accessible from the "room-side" after mounting the base to the electrical box. The bases mount to North American 1-gang boxes and to 3½ inch or 4 inch octagon boxes, 1½ inches (38 mm) deep. They also mount to European BESA and 1-gang boxes with 60.3 mm fixing centers. The SIGA-SB4, SIGA-RB4, and SIGA-IB4 mount to North American 4 inch sq. electrical boxes in addition to the above boxes. They include the SIGA-TS4 Trim Skirt, which is used to cover the "mounting ears" on the base. The SIGA-AB4G mounts to a 4 inch square box only.

SIGA-AB4G/T/LF Audible Base | **SIGA-SB** Standard Base | **SIGA-IB** Isolator Base | **SIGA-RB** Relay Base | **SIGA-LED** Remote LED

Remote LED SIGA-LED - The remote LED connects to the SIGA-SB or SIGA-SB4 Standard Base only. It features a North American size 1-gang plastic faceplate with a white finish and red alarm LED.

SIGA-TS4 Trim Skirt - Supplied with 4 inch bases, it can also be ordered separately to use with the other bases to help hide surface imperfections not covered by the smaller bases.

Sounder Bases - Signature Series sounder bases are designed for use where localized or group alarm signaling is required.

- **SIGA-AB4G** bases provide sounder capability to Signature Series to heat and smoke detectors. They are not intended for use with combination carbon monoxide detectors in Fire-plus-CO mode.
- **SIGA-AB4GT** bases provide sounder capability to Signature Series smoke and heat detectors, as well as carbon monoxide detectors when used with a SIGA-TCDR Temporal Pattern Generator.
- **SIGA-AB4G-LF** bases provide 520 Hz low frequency sounder capability to Signature Series smoke and heat detectors, as well as carbon monoxide detectors when used with a SIGA-TCDR Temporal Pattern Generator. The SIGA-AB4G-LF is suitable for applications requiring low frequency audible tones.

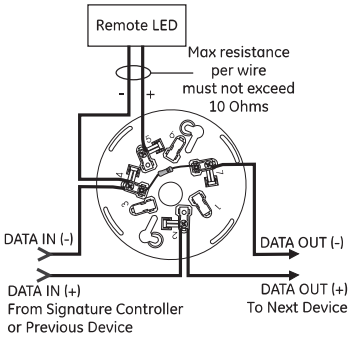
Typical Wiring

The detector mounting bases accept #18 AWG (0.75mm^2), #16 (1.0mm^2), #14 AWG (1.5mm^2), and #12 AWG (2.5mm^2) wire sizes. Sizes #16 AWG (1.0mm^2) and #18 AWG (0.75mm^2) are preferred for ease of installation.

Standard Detector Base, SIGA-SB, SIGA-SB4

This is the basic mounting base for EDWARDS Signature Series detectors. The SIGA-LED Remote LED is supported by this Base.

Term	Description
1	Not Used
2	DATA IN/OUT (+)
3	Not Used
4	DATA IN (-)
4	Remote LED (-)
5	Remote LED (+)
6	Not Used
7	DATA OUT (-)



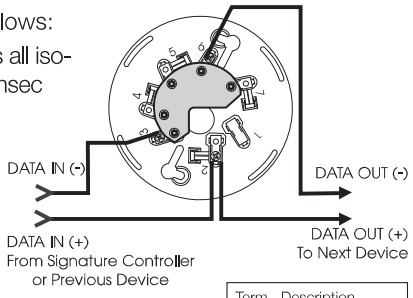
Isolator Detector Base, SIGA-IB, SIGA-IB4

This base includes a built-in line fault isolator for use on Class A circuits. A detector must be installed for it to operate. The isolator base does not support the SIGA-LED Remote LED.

The isolator operates as follows:

- a short on the line causes all isolators to open within 23 msec
- at 10 msec intervals, beginning on one side of the Class A circuit nearest the loop controller, the isolators close to provide the next isolator down the line with power
- when the isolator next to the short closes, it reopens within 10 msec.

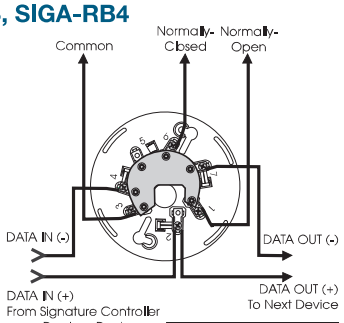
The process repeats beginning on the other side of the loop controller.



Term	Description
1	Not Used
2	DATA IN/OUT (+)
3	DATA IN (-)
4	Not Used
5	Not Used
6	DATA OUT (-)
7	Not Used

Relay Detector Base, SIGA-RB, SIGA-RB4

This base includes a relay. Normally Open or Normally Closed operation is selected during installation. The dry contact is rated for 1 amp (pilot duty) @ 30 Vdc. The relay's position is supervised to avoid accidentally jarring it out of position. The SIGA-RB can be operated as a control relay if programmed to do so at the control panel. The relay base does not support the SIGA-LED Remote LED.

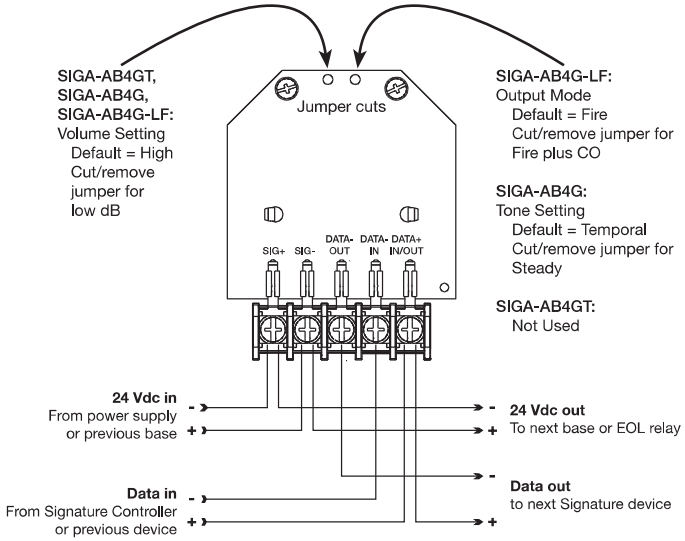


CONTACT RATING
1.0 Amp @ 30 VDC
(Pilot Duty)

Term	Description
1	Normally Open
2	DATA IN/OUT (+)
3	Common
4	DATA IN (-)
5	Not Used
6	Normally-Closed
7	DATA OUT (-)

Audible Sounder Bases, Fire Mode

AB4GT, AB4G, AB4G-LF sounder bases



Warnings & Cautions

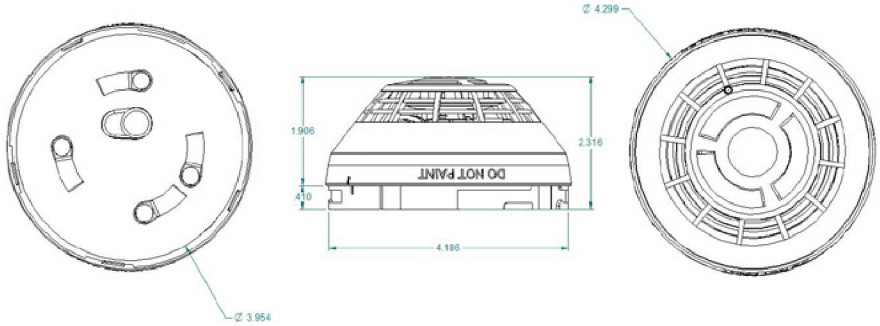
- This detector does not operate without electrical power. As fires frequently cause power interruption, discuss further safeguards with the local fire protection specialist.
- This detector does not sense fires in areas where smoke cannot reach the detector. Smoke from fires in walls, roofs, or on the opposite side of closed doors may not reach the detector.
- Photoelectric detectors have a wide range of fire-sensing capabilities and are best suited for detecting slow, smoldering fires.
- In Canada, install according to CAN/ULC-S524 Standard for the Installation of Fire Alarm Systems, CSA C22.1 Canadian Electrical Code, and the local authority having jurisdiction.

EDWARDS
United Technologies
LIFE SAFETY & INCIDENT MANAGEMENT

Contact us...
Email: edwards.fire@fs.utc.com
Web: *Edwards-fire.com*

EDWARDS is a UTC brand.
1016 Corporate Park Drive
Mebane, NC 27302

Dimensions



Specifications

Operating voltage	15.20 to 19.95 VDC
Normal operating current	32 µA
Alarm current	32 µA
Smoke Sensitivity Range	UL/ULC: 0.53 to 3.94 %/ft. (1.7 to 12.35 %/m) obscuration
Vibration level	10 to 35 Hz, with an amplitude of 0.01 in.
Air velocity	0 to 4,000 ft./min (0 to 20 m/s)
Wall mounting	12 in. (305 mm) max. from ceiling
Compatible bases	See Ordering Information
Compatible detector testers	Testifire 1000, Testifire 2000
Operating environment	32 to 120°F (0 to 49°C), 0 to 93% RH, noncondensing
Construction	High Impact Engineering Polymer, White
Storage temperature	-4 to 140°F (-20 to 60°C)
Environmental compensation	Automatic
Agency Listings	CAN/ULC-S529, UL 268, UL 268A

Ordering Information

Catalog Number	Description	Ship Wt. lbs (kg)
SIGA-PD	Intelligent Optical Smoke Detector	0.4 (0.16)
Accessories		
SIGA-SB	Detector Mounting Base - Standard	
SIGA-SB4	4-inch Detector Mounting Base c/w Trim Skirt	
SIGA-RB	Detector Mounting Base w/Relay	
SIGA-RB4	4-inch Detector Mounting Base w/Relay, c/w Trim Skirt	0.2 (.09)
SIGA-IB	Detector Mounting Base w/Fault Isolator	
SIGA-IB4	4-inch Detector Mounting Base w/ Fault Isolator, c/w Trim Skirt	
SIGA-LED	Remote Alarm LED (not for EN54 applications)	
SIGA-AB4G	Audible (Sounder) Base for Fire Detectors	0.3 (0.15)
SIGA-AB4G-LF	Low Frequency Audible (Sounder) Base for CO and Fire Detectors	0.3 (0.15)
SIGA-AB4GT	Audible (Sounder) Base for CO and Fire Detectors	0.3 (0.15)
SIGA-TS4	Trim Skirt (supplied with 4-inch bases)	0.1 (0.04)
SIGA-TS	Trim Skirt - (optional for non 4-inch bases)	0.1 (0.04)
SIGA-DMP	Detector Mounting Plate	3.0 (1.4)
SIGA-RTA	Detector Removal Tool	
SIGA-VA	Detector Cleaning Tool	

CO1224T and CO1224TR Carbon Monoxide Detectors with RealTest® Technology

The System Sensor CO1224T and CO1224TR (round) Carbon Monoxide (CO) Detectors use a highly accurate and reliable electrochemical sensing cell to provide early warning of dangerous CO levels.

Features

- RealTest® enables a functional test using canned CO
- Full compliance with UL 2075
- A code-required trouble relay
- Wiring supervision with SEMS terminals
- A six-year end-of-life timer
- 12/24 VDC
- A low current draw of 20 mA in standby and 40 mA in alarm
- Versatile mounting for wall and ceiling
- Accurate and reliable electrochemical sensing technology
- Optional CO-PLATE CO Detector Replacement Plate to upgrade previously installed competitor detectors to the CO1224T

With RealTest® technology, the CO gas sensing cell used in the CO1224T and CO1224TR CO detectors can be tested using a CO gas agent, fully meeting the requirements of NFPA 720: 2009. Simply put the detector into RealTest mode, spray a small amount of CO into the detector per the installation instructions, and within seconds the detector will alarm, indicating successful gas entry. (See the reverse page or the user manual for complete instructions.)

When dangerous amounts of CO are detected, the CO1224T and CO1224TR detectors alert residents by sounding and flashing a temp 4 signal alarm. With 24/7 central station monitoring, residents are guaranteed protection whether they are away from home, sleeping, or already suffering from the effects of CO.

The CO1224T and CO1224TR are designed for system operation. These detectors are fully listed to UL 2075 and offer a code-required trouble relay to send a sensor failure or end-of-life signal to the control panel and the central station. The CO1224T and CO1224TR also use SEMS-type terminal Philips head screws for quicker and more positive wiring connections and code-required wiring supervision. With a low current draw, these detectors enable more devices to be connected to the panel, limiting the need to purchase extra power supplies or more expensive panels. As 12/24 VDC detectors, the CO1224T and CO1224TR will operate on most industry security and fire alarm control panels.

Agency Listings

UL LISTED E307195

E304075

CO1224T and CO1224TR Carbon Monoxide Detector Specifications

Architectural/Engineering Specifications

Carbon monoxide (CO) detector shall be a system-connected System Sensor model number CO1224T or CO1224TR listed to Underwriters Laboratories UL 2075 for Gas and Vapor Detectors and Sensors. The detector shall be equipped with a sounder and a trouble relay. The detector's base shall be able to mount to a single-gang electrical box or direct (surface) mount to the wall or ceiling. Wiring connections shall be made by means of SEMS screws. The detector shall provide dual-color LED indication that blinks to indicate normal standby, alarm, or end-of-life. When the sensor supervision is in a trouble condition, the detector shall send a trouble signal to the panel. When the detector gives a trouble or end-of-life signal, the detector shall be replaced. The detector shall provide a means to test CO gas entry into the CO sensing cell. The detector shall provide this with a test mode that accepts CO gas from a test agent and alarms immediately upon sensing CO entry. The detector shall perform in the detection of CO up to 12,000 feet above sea level and alarm within the time specified by ANSI/UL 2034 for CO concentrations of 70, 150 and 400 parts per million (ppm), as verified by a Nationally Recognized Test Laboratory.

Electrical Specifications	
Operating Voltage	12/24 VDC
Audible Signal	85 dB in alarm
Standby Current	20 mA
Alarm Current	40 mA (75 mA test)
Alarm Contact Ratings	0.5 A @ 30 VDC
Trouble Contact Ratings	0.5 A @ 30 VDC
Physical Specifications	
Size: CO1224T	Length: 5.1 in, Width: 3.3 in, Height: 1.3 in
CO1224TR	Diameter: 6 in, Height: 1.3 in
Approximate Weight	CO1224T: 7 oz ; CO1224TR: 11 oz
Operating Temperature Range	32°F to 104° F (0°C to 40° C)
Operating Humidity Range	22 to 90% RH
Input Terminals	14 to 22 AWG
Mounting	Single-gang back box; surface mount to wall or ceiling

Operation Modes

Operation Mode	Green LED	Red LED	Sounder
Normal (standby)	Blink 1 per minute	—	—
Alarm	—	Blink in temp 4 pattern	Sound in temp 4 pattern

RealTest® Feature: The System Sensor CO1224T and CO1224TR Carbon Monoxide Detectors with RealTest enable evaluation of the functionality of the CO sensing cell using a canned CO test agent.

Push and hold the Test/Hush button for two seconds to enter RealTest mode. The green LED will flash once every second to indicate RealTest mode has started.

Spray canned CO agent into the detector.

Verify CO sensing at the control panel. The detector will automatically exit RealTest alarm mode after about 20-60 seconds.

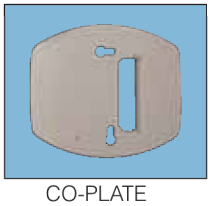
NOTE: Check with local codes and the AHJ to determine if a functional gas test is desired for an installation.

Hush Feature: Pushing the Test/Hush button will silence the sounder for 5 minutes (except in RealTest mode).

Trouble Feature: When the detector is in a trouble condition, it will send a trouble signal to the panel.

End-of-Life Timer: After the detector's internal sensor has reached the end of its life, a trouble signal will be sent to the panel to indicate it is time to replace the detector. An electrochemical CO detector lifespan is about six years. The detector must be replaced by the date marked on the inside of the product.

CO-PLATE: System Sensor also offers the CO-PLATE CO Detector Replacement Plate to cover the footprint (when necessary) of previously installed competitive carbon monoxide detectors that require replacement.



CO-PLATE

Ordering Information

Part No.	Description
CO1224T	12/24 volt, 4-wire system-monitored carbon monoxide detector with RealTest® Technology
CO1224TR	12/24 volt, 4-wire system-monitored round carbon monoxide detector with RealTest® Technology
CO-PLATE	CO detector replacement plate to cover the footprint of previously installed competitive detectors as necessary

SYSTEM SENSOR®

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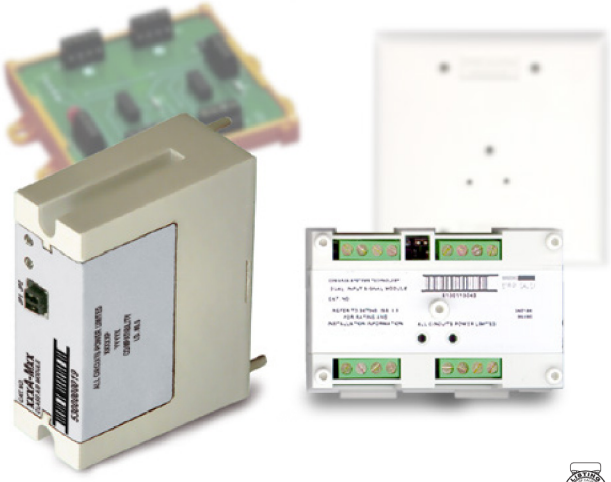
Synchronization Output Module

SIGA-CC1S, MCC1S



Patented

FM APPROVED MEA 7300-1657: 0121 S3424

Overview

SIGA-CC1S and MCC1S Synchronization Output Modules are intelligent analog addressable devices that form part of EDWARDS's Signature line of products. The actual operation of the SIGA-CC1S and MCC1S is determined by the "personality code" selected by the installer, which is downloaded to the module from the Signature loop controller during system configuration.

Depending on their assigned personality, Synchronization Output Modules may be used as a signal power riser selector to provide synchronization of fire alarm signals across multiple zones, or for connecting, upon command from the loop controller, supervised Class B signal or telephone circuits to their respective power inputs. The power inputs may be polarized 24 Vdc to operate audible and visible signal appliances or 25 and 70 VRMS to operate audio evacuation speakers and firefighter's telephones.

Standard Features

- **Provides UL 1971-compliant auto-sync output for visual signals**
  Use for connecting a supervised output circuit to a supervised 24 Vdc riser input and synchronizing multiple notification appliance circuits.
- **Functions as an audible signal riser selector**
  Use as a synch module or for connecting supervised 24 Vdc Audible/Visible signal circuits, or 25 and 70 VRMS Audio Evacuation and Telephone circuits to their power inputs.
- **Built-in ring-tone generator**
  When configured for telephone circuits, the SIGA-CC1S generates its own ring-tone signal, eliminating the need for a separate ring-tone circuit.
- **Automatic device mapping**
  Signature modules transmit information to the loop controller regarding their circuit locations with respect to other Signature devices on the wire loop.
- **Electronic addressing**
  Programmable addresses are downloaded from the loop controller, a PC, or the SIGA-PRO Signature Program/Service Tool; there are no switches or dials to set.
- **Intelligent device with microprocessor**
  All decisions are made at the module to allow lower communication speed with substantially improved control panel response time and less sensitivity to line noise and loop wiring properties; twisted or shielded wire is not required.

DATA SHEET E85001-0543
Not to be used for installation purposes. Issue 1

Application

The SIGA-CC1S mounts to a standard North American two-gang electrical box, making it ideal for locations where only one module is required. Separate I/O and data loop connections are made to each module.

The SIGA-MCC1S is part of the UIO family of plug-in Signature Series modules. It functions identically to the SIGA-CC1S, but takes advantage of the modular flexibility and easy installation that characterize all UIO modules. Two- and six-module UIO motherboards are available. These can accommodate individual risers for each on-board module, or risers that are shared by any combination of its UIO modules. All wiring connections are made to terminal blocks on the motherboard. UIO assemblies may be mounted in EDWARDS enclosures.

Personality Codes

The operation of the SIGA-CC1S is determined by their sub-type code or "Personality Code". The code is selected by the installer depending upon the desired application and is downloaded from the loop controller.

Personality Code 5: Signal Power or Audio Evacuation (single riser). Configures the module for use as a Class B Audible/Visible Signal power (24 Vdc polarized) or Audio Evacuation (25 or 70 VRMS) power selector. The ring-tone generator is disabled. The output circuit is monitored for open or shorted wiring. If a short exists, the control panel inhibits the activation of the audible/visible signal circuit to prevent connection to the power circuit.

Personality Code 6: Telephone with ring-tone (single riser). Configures the module for use as a Telephone power selector. When a telephone handset is plugged into its jack or lifted from its hook, the module generates its own Ring-Tone signal. A separate ring-tone circuit is not needed. The module sends this signal to the control panel to indicate that an off-hook condition is present. When the system operator responds to the call, the ring-tone signal is disabled.

Personality Code 25: Visual Signal Synchronization. This personality code configures the module to provide synchronization of fire alarm signals across multiple zones. It functions as a signal power (24 Vdc) riser selector. The output wiring is monitored for open circuits and short circuits. A short circuit will cause the fire alarm control panel to inhibit the activation of the audible/visual signal circuit so the riser is not connected to the wiring fault.

Warnings & Cautions

This module will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguards with your fire protection specialist.

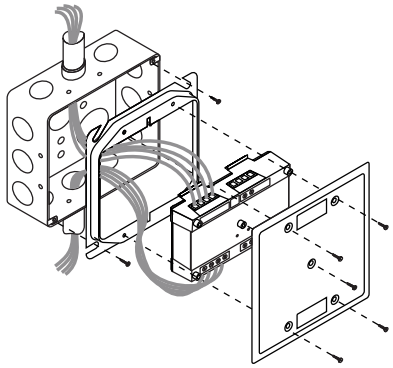
EDWARDS recommends that these modules be installed according to latest recognized edition of national and local fire alarm codes.

Compatibility

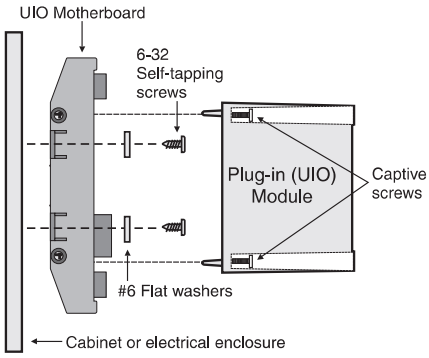
These modules are part of EDWARDS's Signature Series intelligent processing and control platform. They are compatible with EST3, EST3X and iO Series control panels.

Installation

The SIGA-CC1S: mounts to North American 2-1/2 inch (64 mm) deep 2-gang boxes and 1-1/2 inch (38 mm) deep 4 inch square boxes with 2-gang covers and SIGA-MP mounting plates. The terminals are suited for #12 to #18 AWG (2.5 mm^2 to 0.75 mm^2) wire size.



SIGA-MCC1S: mount the UIOxR motherboard inside a suitable EDWARDS enclosure with screws and washers provided. Plug the module into any available position on the motherboard and secure the module to the motherboard with the captive screws. Wiring connections are made to the terminals on the motherboard (see wiring diagram). UIOxR motherboard terminals are suited for #12 to #18 AWG (2.5 mm^2 to 0.75 mm^2) wire size.



Electronic Addressing

The loop controller electronically addresses each module saving valuable time during system commissioning. Setting complicated switches or dials is not required. Each module has its own unique serial number stored in its "on-board memory". The loop controller identifies each device on the loop and assigns a "soft" address to each serial number. If desired, the modules can be addressed using the SIGA-PRO Signature Program/Service Tool.

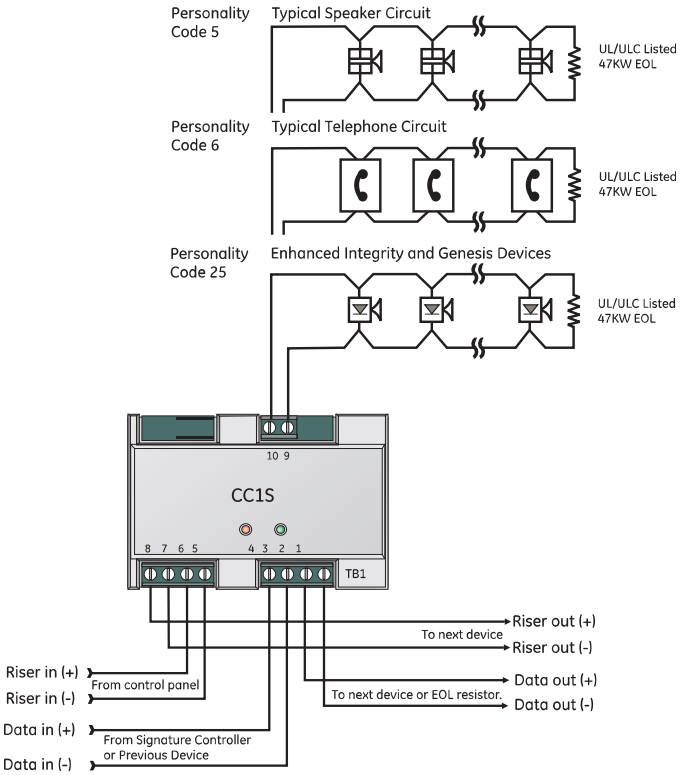
Testing & Maintenance

The module's automatic self-diagnosis identifies when it is defective and causes a trouble message. The user-friendly maintenance program shows the current state of each module and other pertinent messages. Single modules may be turned off (de-activated) temporarily, from the control panel.

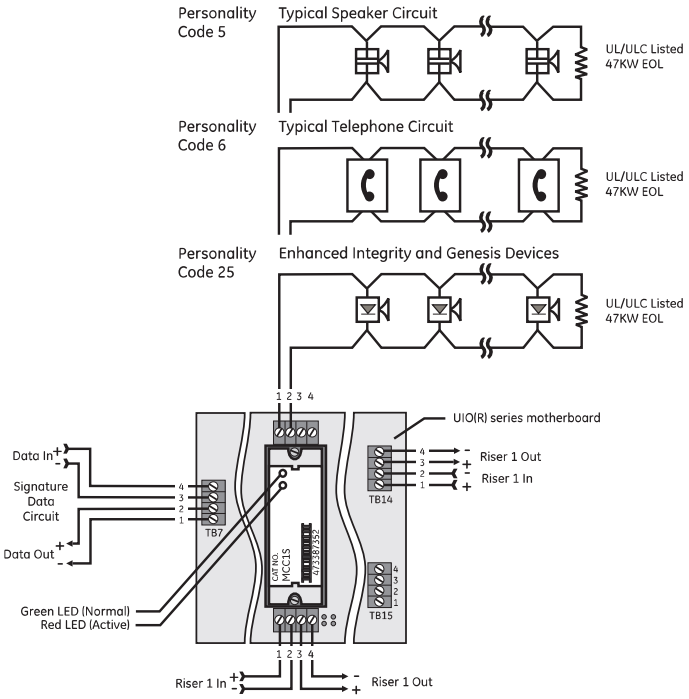
Scheduled maintenance (Regular or Selected) for proper system operation should be planned to meet the requirements of the Authority Having Jurisdiction (AHJ). Refer to current NFPA 72 and ULC CAN/ULC 536 standards.

Typical Wiring

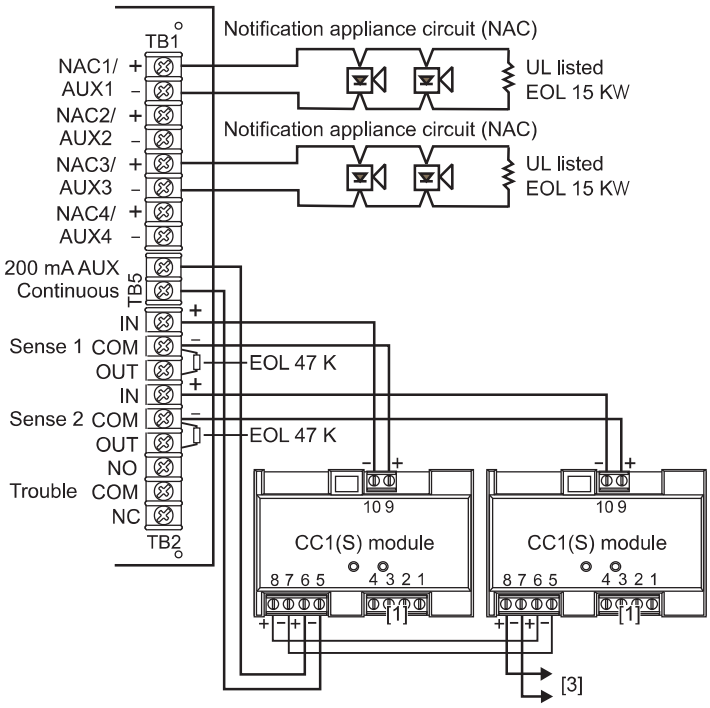
SIGA-CC1S (Standard Mount)



SIGA-MCC1S (UIO Mount)



Multiple CC1(S) modules using the BPS's sense inputs



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Web: *Edwards-fire.com*

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1016 Corporate Park Drive
Mebane, NC 27302

Specifications

Catalog Number	SIGA-CC1S	SIGA-MCC1S
Mounting	North American 2½ inch (64 mm) deep two-gang boxes and 1½ inch (38 mm) deep 4 inch square boxes with 2-gang covers and SIGA-MP mounting plates	Plugs into UIO2R, UIO6R or UIO6 Motherboards
Description	Synchronization Output Module	
Type Code	50 (factory set)	
Address Requirements	Uses one module address	
Wiring Terminations	Suitable for #12 to #18 AWG (2.5 mm^2 to 0.75mm^2)	
Operating Current	Standby = 223µA Activated = 100µA	
Operating Voltage	15.2 to 19.95 Vdc (19 Vdc nominal)	
Output Rating	24 Vdc = 2 amps 25 V Audio = 50 watts 70 V Audio = 35 watts	
Construction	High Impact Engineering Polymer	
Storage and Operating Environment	Operating: 32°F to 120°F (0°C to 49°C) Storage: -4°F to 140°F (-20°C to 60°C) Humidity: 0 to 93% RH	
LED Operation	Green LED - Flashes when polled Red LED - Flashes when in alarm/ active	
Compatibility	Use with: Signature Loop Controller under EST3 version 2.0 or higher	
Agency Listings	UL, ULC, CSFM, MEA	

Ordering Information

Catalog Number	Description	Shipping Wt. lbs (kg)
SIGA-CC1S	Synchronization Output Module (Standard Mount) - UL/ULC Listed	0.5 (0.23)
SIGA-MCC1S	Synchronization Output Module (UIO Mount) - UL/ULC Listed	0.18 (0.08)

Related Equipment		
27193-21	Surface Mount Box - Red, 2-gang	2 (1.2)
27193-26	Surface Mount Box - White, 2-gang	2 (1.2)
SIGA-UIO2R	Universal Input-Output Module Board w/Riser Inputs - Two Module Positions	0.32 (0.15)
SIGA-UIO6R	Universal Input-Output Module Board w/Riser Inputs - Six Module Positions	0.62 (0.28)
SIGA-UIO6	Universal Input-Output Module Board - Six Module Positions	0.56 (0.25)
235196P	Bi-polar Transient Protector	0.01 (0.05)
MFC-A	Multifunction Fire Cabinet - Red, supports Signature Module Mounting Plates	7.0 (3.1)
SIGA-MP1	Signature Module Mounting Plate, 1 footprint	1.5 (0.70)
SIGA-MP2	Signature Module Mounting Plate, 1/2 footprint	0.5 (0.23)
SIGA-MP2L	Signature Module Mounting Plate, 1/2 extended footprint	1.02 (0.46)

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LIFE SAFETY & INCIDENT MANAGEMENT

Isolator Module

SIGA-IM

S3424

7300-1657: 0121

MEA

Overview

The SIGA-IM Isolator Module is part of EDWARDS's Signature Series system. This intelligent device enables part of the Signature data loop to continue operating should a short circuit occur. The module can be wired into a Class A data loop at any point.

If a fault occurs, the isolator cuts power to all devices beyond the isolator on the loop as follows:

- a short on the line causes all isolators to open within 23 msec.
- at 10 msec intervals, beginning on one side of the Class A circuit nearest the loop controller, the isolators close to provide the next isolator down the line with power.
- when the isolator next to the short closes, it reopens within 10 msec.

Once activated, the line fault isolator continuously checks the faulted side of the loop to determine if the short still exists. When the fault is corrected and system reset, the module automatically restores the entire data loop to the normal condition.

The microprocessor in every Signature module provides at least three important benefits — Self-diagnostics and History Log, Automatic Device Mapping, and Fast, Stable Communication.

Self-diagnostics and History Log - Each Signature Series module constantly runs self-checks to provide important maintenance information. This information is automatically updated and permanently stored in the module's non-volatile memory and is accessible for review any time using the SIGA-PRO Signature Program / Service Tool.

Automatic Device Mapping - The Signature loop controller learns keeps a map where each device's serial number address is installed relative to other devices on the data circuit.

Fast Stable Communication - Built-in intelligence means less information needs to be sent between the module and the loop controller. Other than regular supervisory polling response, the module only needs to communicate with the loop controller when it has something new to report.

Standard Features

- **Automatic device mapping**
  Each module transmits wiring information to the loop controller regarding its location with respect to other devices on the circuit.
- **Electronic addressing**
  Addresses are downloaded and permanently stored from a PC, or the SIGA-PRO Signature Program / Service Tool. There are no switches or dials to set.
- **Ground fault detection by address**
  Detects ground faults right down to the device level.
- **2-gang mounting**
- **Designed to ISO 9001 standards**

DATA SHEET E85001-0271
Not to be used for installation purposes. Issue 1

Testing & Maintenance

The module's automatic self-diagnosis identifies when it is defective and causes a trouble message. The user-friendly maintenance program shows the current state of each module and other pertinent messages. Single modules may be turned off (deactivated) temporarily, from the control panel. Availability of maintenance features is dependent on the fire alarm system used. Scheduled maintenance (Regular or Selected) for proper system operation should be planned to meet the requirements of the Authority Having Jurisdiction (AHJ). Refer to current NFPA 72 and ULC CAN/ ULC 536 standards.

Warnings & Cautions

This module will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguardwith your fire protection specialist.

Typical Wiring and Installation

The SIGA-IM module mounts to North American 2-1/2 inch (64 mm) deep 2-gang boxes and 1-1/2 inch (38 mm) deep 4 inch square boxes with 2 gang covers and SIGA-MP mounting plates. The module will accept #18 AWG (0.75mm^2), #16 (1.0mm^2), #14 AWG (1.50mm^2), and #12 AWG (2.50mm^2) wire sizes. *Note: Sizes #16 AWG (1.0mm^2) and #18 AWG (0.75mm^2) are preferred for ease of installation. See Signature Loop Controller catalog sheet for detailed wiring requirement specifications.*

EDWARDS recommends that this module be installed according to latest recognized edition of national and local fire alarm codes.

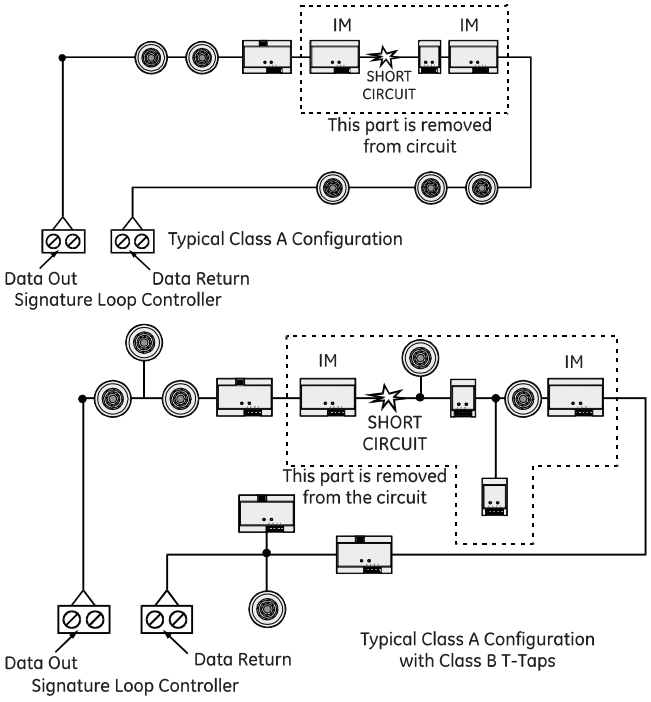
Application

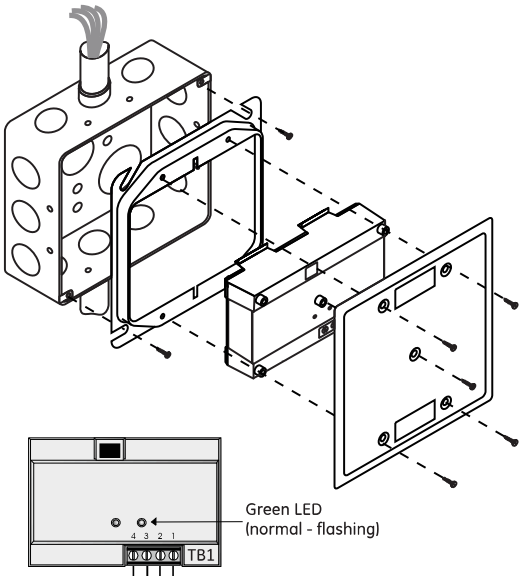
This module should only be used on Class A circuits. The operation of the SIGA-IM is determined by its hardware type code and is assigned at the factory. No user configuration is required.

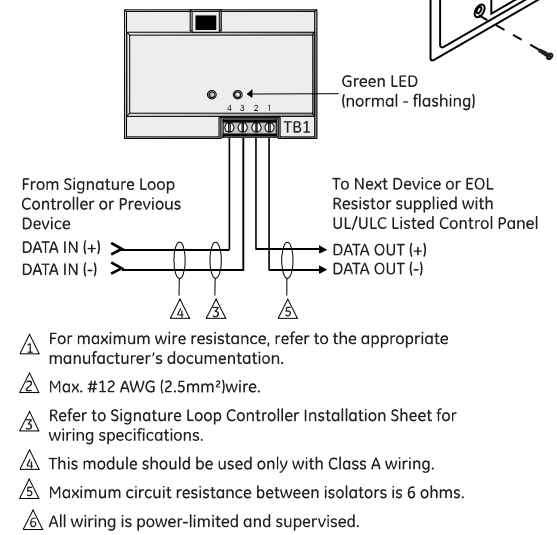
Compatibility

These modules are part of EDWARDS's Signature Series intelligent processing and control platform. They are compatible with EST3, EST3X and iO Series control panels.

Typical Wiring







1. For maximum wire resistance, refer to the appropriate manufacturer's documentation.
2. Max. #12 AWG (2.5mm^2)wire.
3. Refer to Signature Loop Controller Installation Sheet for wiring specifications.
4. This module should be used only with Class A wiring.
5. Maximum circuit resistance between isolators is 6 ohms.
6. All wiring is power-limited and supervised.

Specifications

Description	Isolator Module - factory set hardware type code
Address Requirements	Uses One Detector Address
Circuit Resistance	Six ohms maximum between isolators
Operating Current	Standby = 45µA; Activated = 45µA
Operating Voltage	15.2 to 19.95 Vdc (19 Vdc nominal)
Construction & Finish	High Impact Engineering Polymer 2-gang front plate - White Finish
Storage Environment	Temperature: -4°F to 140°F (-20°C to 60°C)
Operating Environment	Temperature: 32°F to 120°F (0°C to 49°C); Humidity: 0 to 93% RH
LED Operation	On-board Green LED - Flashes when polled (normal)
Compatibility	Use with: Signature Loop Controller
Agency Listings	UL, ULC, CSFM, MEA, FM

Ordering Information

Catalog Number	Description	Ship Wt. lb (kg)
SIGA-IM	Fault Isolator Module - UL/ULC Listed	.5 (.23)
Accessories		
27193-21	Surface Mount Box - 2-gang RED	1 (.4)
27193-26	Surface Mount Box - 2-gang WHITE	
MFC-A	Multifunction Fire Cabinet - Red, supports Signature Module Mounting Plates	7.0 (3.1)
SIGA-MP1	Signature Module Mounting Plate, 1 footprint	1.5 (0.70)
SIGA-MP2	Signature Module Mounting Plate, 1/2 footprint	0.5 (0.23)
SIGA-MP2L	Signature Module Mounting Plate, 1/2 extended footprint	1.02 (0.46)

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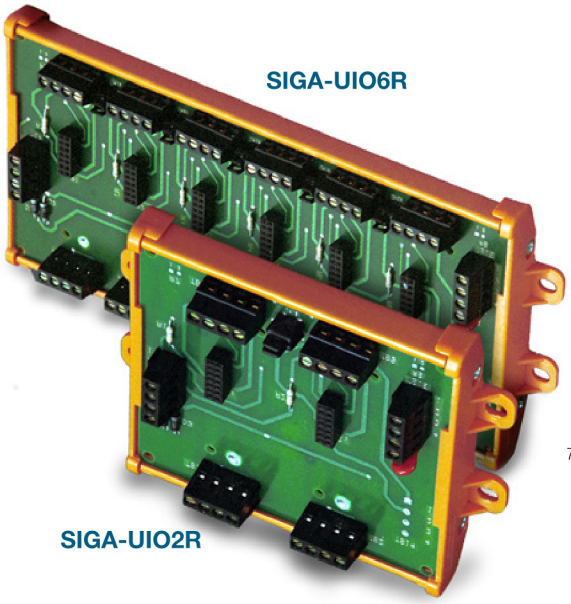
Universal Input/ Output Module Motherboards

SIGA-UIO2R, SIGA-UIO6R,



FM APPROVED
7300-1657: 0121
S3424

Overview

Signature Series Universal Input-Output Module Motherboards provide mounting and wiring terminations for up to six Signature Series plug-in UIO (SIGA-"M" series) modules. UIO motherboards slide into a rigid extruded track (included) with mounting pads for convenient mounting into a variety of equipment enclosures. UIO modules plug into the board and are held securely in place with captive machine screws. All field wiring connects to terminal blocks on the motherboard, which permits rapid removal and replacement of modules for troubleshooting.

The **SIGA-UIO2R** provides mounting and wiring terminations for up to two UIO modules, and the **SIGA-UIO6R** provides mounting and wiring terminations for up to six UIO modules. Both mother-boards feature a riser #1 input and a riser #2 input bus. Jumpers on riser #1 input, between modules, facilitate sharing a single riser among more than one module. This significantly reduces wiring requirements. Removing the jumpers provide separate riser inputs to each adjacent module. Riser #2 input is fixed to each module position and cannot be split.

The **SIGA-UIO6** provides mounting and wiring terminations for up to six UIO modules. This motherboard provides two riser inputs that are common to all modules.

Standard Features

- **Modular flexibility**
  Wide assortment of multi-function plug-in modules provides total flexibility.
- **Minimum wiring requirements**
  Integral jumpers between modules allow sharing of risers to reduce installation wiring.
- **Easy installation**
  #12 AWG (2.5 mm2) terminal blocks and sturdy mounting pads ensure quick installation into EDWARDS enclosures.
- **Supports automatic device mapping**
  All compatible UIO modules transmit information to the loop controller regarding their circuit locations with respect to other Signature devices on the wire loop.
- **Supports intelligent devices**
  On-board modules make decisions and input an alarm from initiating devices connected to them even if the loop controller's polling interrogation stops.
- **Twisted or shielded wire not required**
  Because all decisions are made at the on-board modules, lower communication speeds are possible. This results in substantially improved control panel response time and less sensitivity to line noise and loop wiring properties.
- **Supports electronic addressing**
  Programmable addresses are downloaded to compatible UIO modules from the loop controller, a PC, or the SIGA-PRO Signature Program/Service Tool. There are no switches or dials to set.

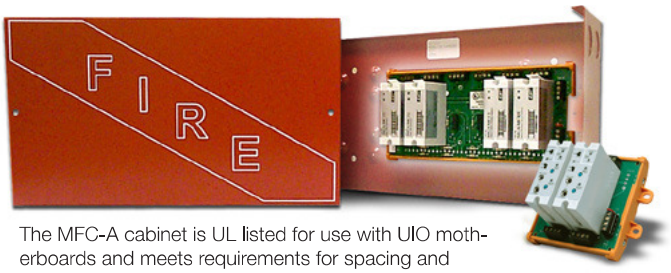
DATA SHEET E85001-0365
Not to be used for installation purposes. Issue 1

Mounting and Installation

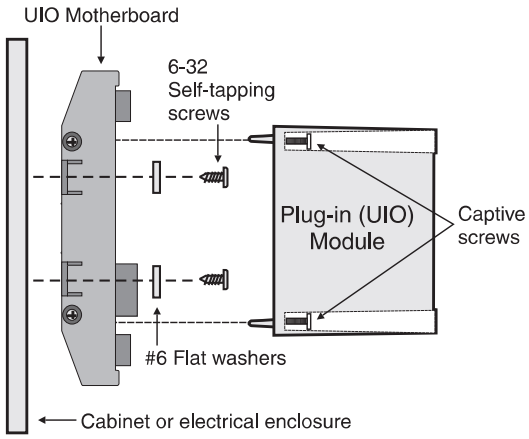
Mount the UIO motherboard inside a EDWARDS MFC-A cabinet or other suitable electrical enclosure with screws and washers provided. Each MFC-A will hold one UIO2R motherboard or one UIO6 or UIO6R motherboard complete with their full complement of modules.

Plug a Signature Series UIO module into any available position on the motherboard and secure the module to the motherboard with the captive screws. Wiring connections are made to the terminals on the motherboard (see wiring diagram). UIO motherboard terminals are suited for #12 to #18 AWG (2.5 mm^2 to 0.75 mm^2) wire size.

EDWARDS recommends that all boards and modules be installed according to latest recognized edition of national and local fire alarm codes.



The MFC-A cabinet is UL listed for use with UIO motherboards and meets requirements for spacing and clearance around the components.



Testing & Maintenance

The module's automatic self-diagnosis identifies when it is defective and causes a trouble message. The user-friendly maintenance program shows the current state of each module and other pertinent messages. Single modules may be turned off (de-activated) temporarily, from the control panel.

Scheduled maintenance (Regular or Selected) for proper system operation should be planned to meet the requirements of the Authority Having Jurisdiction (AHJ). Refer to current NFPA 72 and ULC CAN/ULC 536 standards.

Compatibility

Signature Series Universal Input/Output Module Boards are compatible only with SIGA-"M" Series I/O Modules, which require a Signature Data Controller. They are compatible with EST3, EST3X and iO Series control panels.

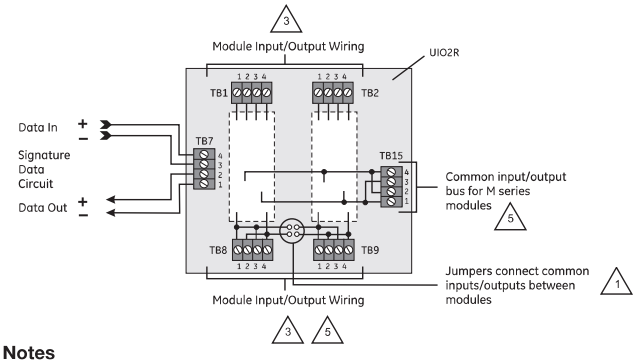
Warnings & Cautions

Signature devices will not operate without electrical power. As fires frequently cause power interruption, we suggest you discuss further safeguards with your fire protection specialist.

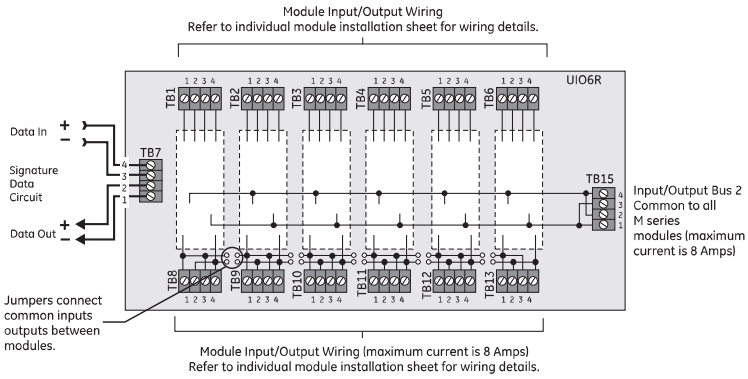
Typical Wiring

Signature Series Universal Input/Output Motherboards have terminal blocks to accept #18 AWG (0.75mm^2), #16 AWG (1.0mm^2), #14 AWG (1.5mm^2), and #12 AWG (2.5mm^2) wire sizes. See Signature Data Controller catalog sheets for detailed wiring requirements and specifications.

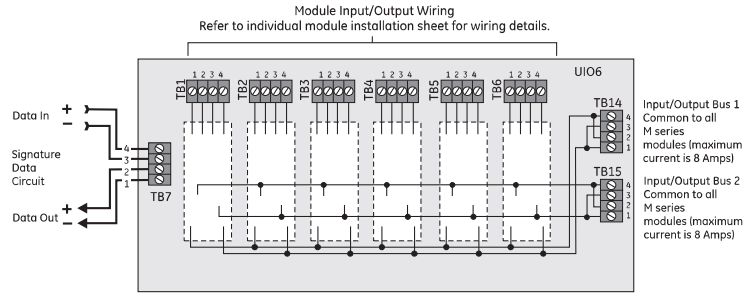
SIGA-UIO2R



SIGA-UIO6R



SIGA-UIO6



Notes

1) Jumpers may be used to make the inputs/outputs between modules common.

2) Not all modules use the SIGA-UIO2R terminals for the same functions.

3) Refer to individual SIGA-M series installation sheets for jumper settings and wiring information. Installations with multiple SIGA-UIO motherboards or enclosures (which include other wiring) require FPL, FPLR, FPLP, or equivalent NEC-approved wire for all power limited wiring. Observe the details of supervision and power limited versus non-power limited circuits. Refer to the SIGA-M series installation sheets.

4) Do not mix incompatible signals.

5) Maximum current is 8 Amps.

7) Refer to Signature Data Controller Installation Sheets for wiring specifications.

LIFE SAFETY & INCIDENT MANAGEMENT

Contact us...

Email: edwards.fire@fs.utc.com
Web: *Edwards-fire.com*

EDWARDS is a UTC brand.
1016 Corporate Park Drive
Mebane, NC 27302

Specifications

Catalog Number	SIGA-UIO2R	SIGA-UIO6R	SIGA-UIO6
Module Capacity	Two	Six	Six
Dimensions (with module installed)	5.4 inch L (across mounting feet) x 4.3 inch W x 3.2 inch H	9.56 inch L (across mounting feet) x 4.3 inch W x 3.2 inch H	
Address Requirements	no address required		
Type Code	none		
Compatible Modules	All SIGA-Mxxx Signature Series		
Operating Voltage	15.2 to 19.95 Vdc (19 Vdc nominal)		
Mounting (cabinets)	Directly into suitable enclosures (e.g.: MFC-A) - Notes 1, 2, 3.		
Wiring Terminals	#12 AWG (2.5mm²) to #18 AWG (0.75mm²)		
Storage and Operating Environment	Operating Temperature: 32°F to 120°F (0°C to 49°C) Storage Temperature: -4°F to 140°F (-20°C to 60°C) Operating and Storage Humidity: 0 to 93% RH		
Agency Listing	UL, ULC, MEA, CSFM		

Notes:

1. Allow a minimum clearance of one inch around all sides of the UIO motherboard.
2. On-site drilling of mounting holes may be required. Self-tapping mounting screws are provided.
3. Suitable cabinets: MFC-A, CAB2, 3-CAB5, 3-CAB7, 3-CAB14, 3-CAB21, 3-RCC series, RACC series.

Ordering Information

Catalog Number	Description	Ship Wt. - lb (kg)
SIGA-UIO2R	Universal Input-Output Module Board w/Riser Inputs - Two Module Positions	0.32 (0.15)
SIGA-UIO6R	Universal Input-Output Module Board w/Riser Inputs - Six Module Positions	0.62 (0.28)
SIGA-UIO6	Universal Input-Output Module Board - Six Module Positions	0.56 (0.25)
MFC-A	UL listed cabinet for mounting UIO motherboards, red with white “FIRE” 8 inch H X 14 inch W X 3.5 inch D (203 mmH X 356 mm W X 89 mm D)	7.0 (3.1)

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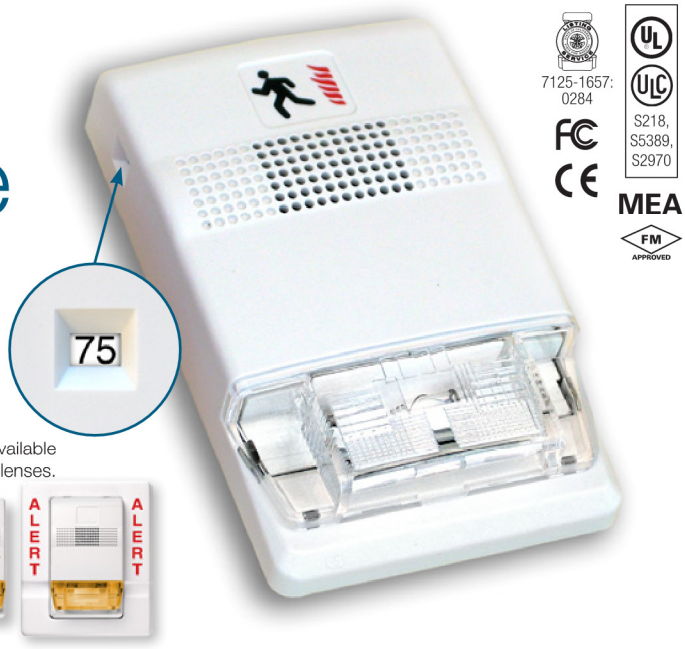
EDWARDS
United Technologies

LIFE SAFETY & INCIDENT MANAGEMENT

Field Configurable Horns and Strobes

Genesis Series



7125-1657: 0284
S218, S5389, S2970
MEA
FM APPROVED

ECS/MNS appliances available with clear or amber lenses.

Overview

The Genesis line of fire alarm and mass notification/emergency communications (ECS/MNS) signals are among the smallest, most compact audible-visible life safety signaling devices in the world. About the size of a deck of playing cards, these devices are designed to blend with any decor.

Thanks to patented breakthrough technology, EDWARDS Genesis strobes do not require bulky specular reflectors and lenses. Instead, an exclusive cavity design conditions light to produce a highly controlled distribution pattern. Significant development efforts employing this new technology have given rise to a new benchmark in strobe performance – FullLight technology.

FullLight strobe technology produces a smooth light distribution pattern without the spikes and voids characteristic of specular reflectors. This ensures the entire coverage area receives consistent illumination from the strobe flash. As a result, Genesis strobes with FullLight technology go well beyond the UL-1971 and ULC-S526 light distribution requirements.

Genesis strobes and horn-strobes offer selectable candela output by means of a conveniently-located switch on the side of the device. Models are also available that offer fixed 15/75 cd output. The candela output setting remains clearly visible even after final installation, yet it stays locked in place to prevent unauthorized tampering.

Genesis ECS/MNS appliances offer emergency signaling with clear or amber lenses and with optional ALERT housing labels. They are ideal for applications that require differentiation between fire alarm and mass notification alerts.

Standard Features

- **Unique low-profile design**
  - The most compact UL-1971/ULC-S526 listed strobe available
  - Ultra-slim – protrudes less than one inch
  - Attractive appearance
  - No visible mounting screws
- **Four field-configurable options in one device**
  - Select 15, 30, 75, or 110 cd strobe output
  - Select high (default) or low dB horn output
  - Select temporal (default) or steady horn output
  - Select public mode flash rate (default) or private mode temporal flash
- **Fixed 15/75 cd model available**
- **ECS/MNS models available**
- **Easy to install**
  - Fits standard 1-gang electrical boxes – no trim plate needed
  - Optional trim plate accommodates oversized openings
  - Pre-assembled with captive hardware
  - #12 AWG terminals – ideal for long runs or existing wiring
- **Unparalleled performance**
  - Industry's most even light distribution
  - Meets tough synchronizing standards for strobes
  - Single microprocessor controls both horn and strobe
  - Independent horn control over a single pair of wires
  - Highly regulated in-rush current
  - Multiple frequency tone improves sound penetration
  - Field-programmable temporal strobe output option

Application

Genesis strobes are UL 1971-listed for use indoors as wall-mounted public-mode notification appliances for the hearing impaired. Prevailing codes require strobes to be used where ambient noise conditions exceed 105 dBA (87dBA in Canada), where occupants use hearing protection, and in areas of public accommodation as defined in the *Americans with Disabilities Act (see application notes – USA)*.

Combination horn-strobe signals must be installed in accordance with guidelines established for strobe devices. Consult with your Authority Having Jurisdiction for details.

All Genesis strobes exceed UL synchronization requirements (within 10 milliseconds over a two-hour period) when used with a synchronization source. Synchronization is important in order to avoid epileptic sensitivity.

WARNING: These devices will not operate without electrical power. As fires frequently cause power interruptions, further safeguards such as backup power supplies may be required.

Horns

Genesis horn output reaches as high as 99 dB and features a unique multiple frequency tone that results in excellent sound penetration and an unmistakable warning of danger. Horns may be configured for either coded or non-coded signal circuits. They can also be set for low dB output with a jumper cut that reduces horn output by about 5 dB. Horn-only models may be ceiling-mounted or wall-mounted.

The suggested sound pressure level for each signaling zone used with alarm signals is at least 15 dB above the average ambient sound level, or 5 dB above the maximum sound level having a duration of at least 60 seconds, whichever is greater, measured 5 feet (1.5 m) above the floor. The average ambient sound level is, A-weighted sound pressure measured over a 24-hour period.

Doubling the distance from the signal to the ear will theoretically result in a 6 dB reduction of the received sound pressure level. The actual effect depends on the acoustic properties of materials in the space. A 3 dBA difference represents a barely noticeable change in volume.

ECS/MNS Applications

Genesis ECS/MNS strobe appliances bring the same high-performance fire alarm features and unobtrusive design to mass notification applications. Available with amber lenses and optional ALERT housing labels, they are ideal for applications that require differentiation between fire alarm and mass notification alerts.

Installation

Genesis horns and strobes mount to any standard one-gang surface or flush electrical box. Matching optional trim plates are used to cover oversized openings and can accommodate one-gang, two-gang, four-inch square, or octagonal boxes, and European 100 mm square.

Genesis Horn/Strobe with optional trim plate

All Genesis signals come pre-assembled with captive mounting screws for easy installation. Two tabs at the top of the signal unlock the cover to reveal the mounting hardware. The shallow depth of Genesis devices leaves ample room behind the signal for extra wiring. Once installed with the cover in place, no mounting screws are visible.

Field Configuration

Temporal horn and horn-strobe models are factory set to sound in a **three-pulse temporal pattern**. Units may be configured for use with coded systems by cutting a jumper on the circuit board. This results in a **steady output** that can be turned on and off (coded) as the system applies and removes power to the signal circuit. A Genesis Signal Master is required when horn-strobe models are configured for coded systems. Non-temporal, horn-only models sound a steady tone.

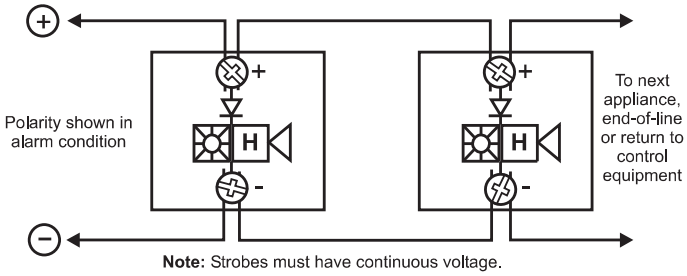
Genesis clear strobes and horn-strobes are shipped from the factory ready for use as **UL 1971 compliant** signals for public mode operation. These signals may be configured for **temporal flash** by cutting a jumper on the circuit board. This battery-saving feature is intended for private mode signaling only.

Genesis clear strobes and horn-strobes may be set for **15, 30, 75, or 110 candela output**. The output setting is changed by simply opening the device and sliding the switch to the desired setting. The device does not have to be removed to change the output setting. The setting remains visible through a small window on the side of the device after the cover is closed.

Horns and horn-strobes are factory set for **high dB output**. **Low dB output** may be selected by cutting a jumper on the circuit board. This reduces the output by about 5 dB.

Wiring

Field wiring terminals accommodate #18 to #12 AWG (0.75 mm^2 to 2.5 mm^2) wiring. Horns, strobes, and combination horn-strobes are interconnected with a single pair of wires as shown below.



Note: Strobes must have continuous voltage.

Current Draw

Strobes, Horn-Strobes

Multi-cd Wall Strobes (G1-VM)

UL Rating	15 cd* RMS	30 cd* RMS	15/75 cd** RMS	75 cd* RMS	110 cd* RMS
16 Vdc	103	141	152	255	311
16 Vfwr	125	179	224	346	392

*G1-VM multi-cd; **G1F-V1575 fixed 15/75 cd

Typical Current	15 cd RMS	30 cd RMS	15/75 RMS	75 cd RMS	110 cd RMS
16 Vdc	85	127	150	245	285
20 Vdc	71	98	123	188	240
24 Vdc	59	82	104	152	191
33 Vdc	46	64	84	112	137
16 Vfwr	119	169	223	332	376
20 Vfwr	103	143	189	253	331
24 Vfwr	94	129	169	218	262
33 Vfwr	87	112	148	179	205

Wall Temporal Horn-strobes – High dB Setting

UL Rating	15 cd* RMS	30 cd* RMS	15/75 cd** RMS	75 cd* RMS	110 cd* RMS
16 Vdc	129	167	172	281	337
16 Vfwr	176	230	269	397	443

*G1-HDVM multi-cd
**G1F-HDV1575 fixed 15/75 cd

Typical Current	15 cd RMS	30 cd RMS	15/75 RMS	75 cd RMS	110 cd RMS
16 Vdc	102	135	160	246	309
20 Vdc	88	109	137	193	248
24 Vdc	81	94	122	161	203
33 Vdc	74	72	106	124	154
16 Vfwr	144	182	247	352	393
20 Vfwr	141	162	220	274	362
24 Vfwr	136	152	203	235	282
33 Vfwr	125	144	196	201	232

Wall Temporal Horn-strobes – Low dB Setting

UL Rating	15 cd* RMS	30 cd* RMS	15/75 cd** RMS	75 cd* RMS	110 cd* RMS
16 Vdc	122	160	146	274	330
16 Vfwr	162	216	231	383	429

*G1-HDVM multi-cd
**G1F-HDV1575 fixed 15/75 cd

Typical Current	15 cd RMS	30 cd RMS	15/75 RMS	75 cd RMS	110 cd RMS
16 Vdc	96	130	158	243	302
20 Vdc	79	104	133	189	241
24 Vdc	68	88	119	156	197
33 Vdc	56	71	100	118	146
16 Vfwr	128	180	241	344	389
20 Vfwr	118	157	213	266	343
24 Vfwr	113	144	195	230	279
33 Vfwr	112	137	182	197	226

Horns

Wall or Ceiling Mounted Temporal Horns (G1-HD)

UL Rating	High dB (RMS)	Low dB (RMS)
16 Vdc	26	19
24 Vdc	36	27
33 Vdc	41	33
16 Vfwr	51	37
24 Vfwr	69	52
33 Vfwr	76	70

Typical Current	High dB RMS	Low dB RMS
16 Vdc	22	17
20 Vdc	24	19
24 Vdc	27	22
33 Vdc	32	26
16 Vfwr	34	30
20 Vfwr	40	34
24 Vfwr	45	38
33 Vfwr	52	47

Wall or Ceiling Mounted Horns (G1-P)

UL Designation	Voltage Range	Max. Current, RMS
Regulated 24 Vdc	16 - 33 Vdc	13 mA
24 fwr	16 - 33 Vfwr	11 mA

Typical Current	RMS
24 Vdc	10
24 Vdc	11
31 Vdc	12
20 Vfwr	9
24 Vfwr	10

Current values are shown in mA.

dBA output

Temporal Horns, Horn-strobes (G1-HD, G1-HDVM series)

High dB Setting	UL464		Average	Peak
	Temporal	Steady	Temporal/ Steady	Temporal/ Steady
16 Vdc	81.4	85.5	91.4	94.2
24 Vdc	84.4	88.6	94.5	97.6
33 Vdc	86.3	90.4	96.9	99.5

Low dB Setting	UL464		Average	Peak
	Temporal	Steady	Temporal/ Steady	Temporal/ Steady
16 Vdc	76.0	80.1	86.3	89.2
24 Vdc	79.4	83.5	89.8	92.5
33 Vdc	82.1	86.5	92.5	95.3

Steady Tone Horns (G1-P series)

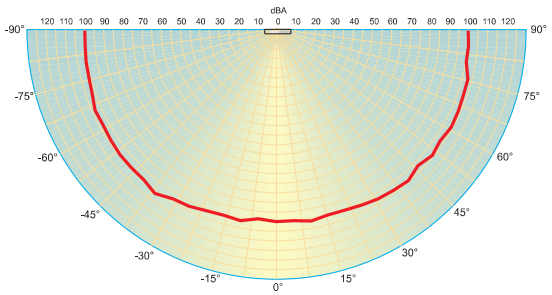
	UL464	Average	Peak
16 Vdc	77 dBA, min	85 dBA	91 dBA
16 Vfwr	77 dBA, min	85 dBA	91 dBA

Notes

1. All values shown are dBA measured at 10 feet (3.01m).
2. UL464 values measured in reverberant room.
3. Average and Peak values are measured in anechoic chamber.

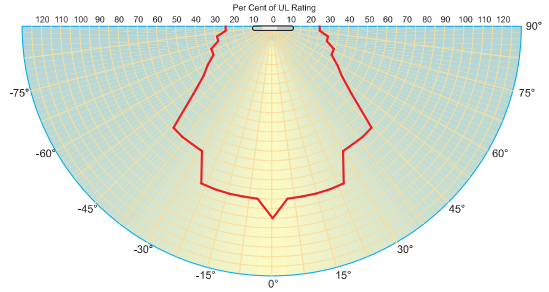
Average Sound Output (dBA)

(High dB setting, anechoic, 24V, measured at 10ft)



Light output - (effective cd)

Percent of UL rating versus angle



Specifications

Housing	Red or white textured UV stabilized, color impregnated engineered plastic. Exceeds 94V-0 UL flammability rating.
Lens	Optical grade polycarbonate (clear)
Mounting (indoor only)	Strobes and horn-strobes are for wall-mount installation only. Horn-only models may be ceiling- or wall-mounted. Flush mount: 2½ inch (64 mm) deep one-gang box Surface mount: Model 27193 surface mount box, wiremold box, or equivalent surface-mount box With optional trim plate: One-gang, two-gang, four-inch square, octagonal, or European single-gang box
Wire connections	Screw terminals: single input for both horn and strobe. #18 to #12 AWG (0.75 mm^2 to 2.5 mm^2) wire size
Operating environment	Indoor only: 32-120°F (0-49°C) ambient temperature. 93% relative humidity
Agency listings/approvals	UL 1971 (S218), UL 1638 (S218), UL 464 (S218), ULC S525, ULC S526, CSFM, CE, FCC, MEA. (All models comply with ADA Code of Federal Regulation Chapter 28 Part 36 Final Rule.)
Dimensions (HxWxD)	Signal: 4-1/2" x 2-3/4" x 13/16" (113 mm x 68 mm x 21 mm) Trimplate: 5" (127 mm); Height – 5-7/8" (149 mm); Depth – ½" (13 mm)
Operating voltage	G1-HD series temporal-tone horns: non-coded, filtered 16-33 Vdc or unfiltered 16-33 Vdc FWR (or coded when horn set to steady tone) G1-HDVM series temporal-tone horn-strobes: non-coded, filtered 16-33 Vdc or unfiltered 16-33 Vdc FWR (or coded (audible NAC only) when used with optional G1M Genesis Signal Master) G1-VM series strobes: non-coded, filtered 16 - 33 Vdc or unfiltered 16-33 Vdc FWR G1-P series steady-tone horns: coded or non-coded, filtered 20-31 Vdc or unfiltered 20-27 Vfwr
Strobe output rating	UL 1971, UL 1638, ULC S526: selectable 15 cd, 30 cd, 75 cd, or 110 cd output UL 1971: 15 cd (fixed 15/75 cd models) UL 1638, ULCS526: 75 cd (fixed 15/75 cd models)
Strobe flash rate	G1-VM strobes and G1-HDVM series temporal-tone horn-strobes: one flash per second synchronized with optional G1M Genesis Signal Master indefinitely within 10 milliseconds. Temporal setting (private mode only): synchronized to temporal output of horns on same circuit
Synchronization Sources	SIGA-CC1S, SIGA-MCC1S, SIGA-CC2A, SIGA-MCC2A, G1M-RM BPS6A, BPS10A, APS6A, APS10A, iO64, iO500, Fireshield Plus 3, 5 and 10 zone. Add G1M for G1-CVM &G1-HDVM devices only.
Horn pulse rate	G1-HD temporal-tone horns and G1-HDVM series temporal-tone horn-strobes: temporal rate synchronized with optional G1M Genesis Signal Master indefinitely within 10 milliseconds. G1-P steady-tone horns: continuous, steady tone only
Temporal audible pattern	½ sec ON, ½ sec OFF, ½ sec ON, ½ sec OFF, ½ sec ON, 1½ sec OFF, then repeat cycle

Candela Output

Lens Color	Rating	Switch Position A	Switch Position B	Switch Position C	Switch Position D
Amber	UL 1638	110 cd	75 cd	30 cd	15 cd
Amber	UL 1971*	88 cd	60 cd	24 cd	12 cd
Clear	UL 1971	110 cd	75 cd	30 cd	15 cd

** Equivalent Rating*

Fire appliances available with white or red housings.

ECS/MNS appliances available with clear or amber lenses.

Ordering Information

Model	Housing	Marking	Lens	Strobe	Horn	Ship Wt. lbs (kg)
Fire Alarm Appliances (c/w running man icon screen printed on housing)						
G1-VM	White	None	Clear	Selectable 15, 30, 75, or 110 cd	Strobe only	0.25 (0.11)
G1F-HD	White	FIRE	Clear	Horn only	Selectable high/low dB	0.25 (0.11)
G1F-HDV1575	White	FIRE	Clear	15/75 cd[1]	Temporal hi/lo dB-24V	0.25 (0.11)
G1F-HDVM	White	FIRE	Clear	Selectable 15, 30, 75, or 110 cd	Selectable high/low dB	0.25 (0.11)
G1F-P	White	FIRE	Clear	Steady Horn (not compatible with Genesis Signal Master)		0.25 (0.11)
G1F-V1575	White	FIRE	Clear	15/75 cd[1]	Strobe only	0.25 (0.11)
G1F-VM	White	FIRE	Clear	Selectable 15, 30, 75, or 110 cd	Strobe only	0.25 (0.11)
G1-HD	White	None	Clear	Horn only	Selectable high/low dB	0.25 (0.11)
G1-HDVM	White	None	Clear	Selectable 15, 30, 75, or 110 cd	Selectable high/low dB	0.25 (0.11)
G1-P	White	None	Clear	Steady Horn (not compatible with Genesis Signal Master)		0.25 (0.11)
G1RF-HD	Red	FIRE	Clear	Horn only	Selectable high/low dB	0.25 (0.11)
G1RF-HDV1575	Red	FIRE	Clear	15/75 cd[1]	Temporal hi/lo dB-24V	0.25 (0.11)
G1RF-HDVM	Red	FIRE	Clear	Selectable 15, 30, 75, or 110 cd	Selectable high/low dB	0.25 (0.11)
G1RF-P	Red	FIRE	Clear	Steady Horn (not compatible with Genesis Signal Master)		0.25 (0.11)
G1RF-V1575	Red	FIRE	Clear	15/75 cd[1]	Strobe only	0.25 (0.11)
G1RF-VM	Red	FIRE	Clear	Selectable 15, 30, 75, or 110 cd	Strobe only	0.25 (0.11)
G1R-HD	Red	None	Clear	Horn only	Selectable high/low dB	0.25 (0.11)
G1R-HDVM	Red	None	Clear	Selectable 15, 30, 75, or 110 cd	Selectable high/low dB	0.25 (0.11)
G1R-P	Red	None	Clear	Steady Horn (not compatible with Genesis Signal Master)		0.25 (0.11)
G1R-VM	Red	None	Clear	Selectable 15, 30, 75, or 110 cd	Strobe only	0.25 (0.11)
ECS/MNS Appliances (no running man icon on housing)						
G1WA-VMA	White	ALERT	Amber	Selectable A, B, C or D	Strobe only	0.25 (0.11)
G1WA-VMC	White	ALERT	Clear	Selectable 15, 30, 75, or 110 cd	Strobe only	0.25 (0.11)
G1WN-VMA	White	None	Amber	Selectable A, B, C or D	Strobe only	0.25 (0.11)
G1WN-VMC	White	None	Clear	Selectable 15, 30, 75, or 110 cd	Strobe only	0.25 (0.11)
Trim Plates						
G1T	White	None	Genesis Trim Plate (for two-gang or 4" square boxes)			0.15 (0.7)
G1RT	Red	None	Genesis Trim Plate (for two-gang or 4" square boxes)			0.15 (0.7)
G1T-FIRE	White	FIRE	Genesis Trim Plate (for two-gang or 4" square boxes)			0.15 (0.7)
G1RT-FIRE	Red	FIRE	Genesis Trim Plate (for two-gang or 4" square boxes)			0.15 (0.7)
G1WT-ALERT	White	ALERT	Genesis Trim Plate (for two-gang or 4" square boxes)			0.15 (0.7)
Surface Boxes						
27193-16	White	N/A	One-gang surface mount box			1 (0.4)
27193-11	Red	N/A	One-gang surface mount box			1 (0.4)

[1] These 15/75 cd models provide fixed output and are not multi-candela devices. The 15 cd output component complies with UL1971, while the 75 cd output component complies with UL 1638.

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Field Configurable Ceiling Horn -Strobes

Genesis Series

One or more patents pending.

FM APPROVED FC MEA CE 7300-1657: 0202 UL ULC S218

Overview

Genesis ceiling horn-strobes are small, compact, and attractive audible-visible emergency signaling devices. Protruding no more than 1.6" (41 mm), Genesis horn-strobes blend with any decor.

Thanks to patented breakthrough technology, EDWARDS Genesis strobes do not require bulky specular reflectors and lenses. Instead, an exclusive cavity design conditions light to produce a highly controlled distribution pattern. Significant development efforts employing this new technology have given rise to a new benchmark in strobe performance – FullLight technology.

FullLight strobe technology produces a smooth light distribution pattern without the spikes and voids characteristic of specular reflectors. This ensures the entire coverage area receives consistent illumination from the strobe flash. As a result, Genesis strobes with FullLight technology go well beyond the minimum UL-required "cross" pattern.

Depending on the model, Genesis horn-strobes feature 15 to 95, or 95 to 177 candela output (see ordering information), which is selectable with a conveniently-located switch on the front of the device. The candela output setting is clearly visible even after final installation, yet it remains locked in place to prevent unauthorized movement after installation.

Genesis horn-strobes feature textured housings in architecturally neutral white or eye-catching fire alarm red. An ingenious iconographic symbol indicates the purpose of the device. This universal symbol is code-compliant and is easily recognized by all building occupants regardless of what language they speak. Models with "FIRE" markings are also available.

Standard Features

- **Field configurable – no need to remove the device!**
  - 15/30/75/95 cd and 95/115/150/177 cd models available
  - Switch settings remain visible even after the unit is installed
  - Low/high dB settings
- **Unique low-profile design**
  - 30 per cent slimmer profile than comparable signals
  - No visible mounting screws
  - Available with white or red housings
- **Easy to install**
  - Fits all standard 4" square electrical boxes with plenty of room behind the signal for extra wire – no extension ring or trim plate needed
  - Pre-assembled with captive hardware – no loose pieces
  - #18 to #12 AWG terminals – ideal for long runs or existing wiring
- **Unparalleled performance**
  - Exclusive FullLight strobe technology produces the industry's most even light distribution
  - Single high-efficiency microprocessor controls both horn and strobe
  - Low current draw minimizes system overhead
  - Independent horn control provided over a single pair of wires
  - Highly regulated in-rush current allows the maximum number of strobes on a circuit
  - 100 dB peak – multiple frequency tone improves wall penetration

Application

Genesis strobes are UL 1971-listed for use indoors as ceiling- or wall-mounted public-mode notification appliances for the hearing impaired. Prevailing codes require strobes to be used where ambient noise conditions exceed 105 dBA (87dBA in Canada), where occupants use hearing protection, and in areas of public accommodation as defined in the *Americans with Disabilities Act (see application notes – USA)*.

Combination horn-strobe signals must be installed in accordance with guidelines established for strobe devices.

Strobes

Genesis strobes are UL 1971-listed for use indoors as ceiling- or wall-mounted public-mode notification appliances for the hearing impaired. Prevailing codes require strobes to be used where ambient noise conditions exceed specified levels, where occupants use hearing protection, and in areas of public accommodation. Consult with your Authority Having Jurisdiction for details.

All Genesis strobes exceed UL synchronization requirements (within 10 milliseconds other over a two-hour period) when used with a synchronization source. Synchronization is important in order to avoid epileptic sensitivity.

NOTE: The flash intensity of some visible signals may not be adequate to alert or waken occupants in the protected area. Research indicates that the intensity of strobe needed to awaken 90% of sleeping persons is approximately 100 cd. EDWARDS recommends that strobes in sleeping rooms be rated at at least 110 cd.

WARNING: These devices will not operate without electrical power. As fires frequently cause power interruptions, further safeguards such as backup power supplies may be required.

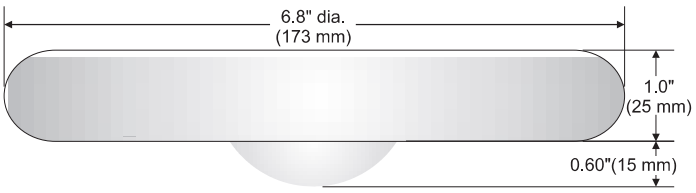
Horns

Genesis horn output reaches as high as 99 dB (peak) and features a unique multiple frequency tone that results in excellent wall penetration and an unmistakable warning of danger. All models may be configured for either coded or non-coded signal circuits. They can also be set for low dB output with a jumper cut that reduces horn output by about 5 dB.

The suggested sound pressure level for each signaling zone used with alert or alarm signals is at least 15 dB above the average ambient sound level, or 5 dB above the maximum sound level having a duration of at least 60 seconds, whichever is greater, measured 5 feet (1.5 m) above the floor. The average ambient sound level is, A-weighted sound pressure measured over a 24-hour period.

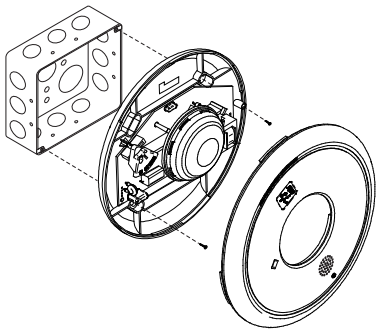
Doubling the distance from the signal to the ear will theoretically result in a 6 dB reduction of the received sound pressure level. The actual effect depends on the acoustic properties of materials in the space. A 3 dBA difference represents a barely noticeable change in volume.

Dimensions



Installation and Mounting

All models are intended for indoor wall or ceiling applications only. Horn-strobes mount to any flush North-American 4" square electrical box.



Genesis ceiling horn-strobes simply unlatch and twist to open. This gains access to mounting screws and the selectable candela switch. The shallow depth of Genesis devices leaves ample room behind the signal for extra wiring. Once installed with the cover in place, no mounting screws are visible.

EDWARDS recommends that these fire alarm horn-strobes always be installed in accordance with the latest recognized edition of national and local fire alarm codes.

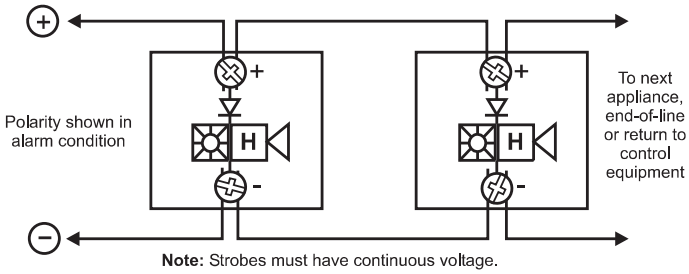
Field Configuration

Depending on the model, Genesis horn-strobes may be set for 15 to 95, or 95 to 177 candela output (see ordering information). The output setting is changed by simply opening the device and sliding the switch to the desired setting. The horn-strobe does not have to be removed to change the output setting. The setting remains visible through a small window on the front of the device after the cover is closed.

The horn-strobe comes factory set for high dB output. Low dB output may be selected by cutting a jumper on the circuit board. This reduces the output by about 5 dB.

Wiring

Field wiring terminals accommodate #18 to #12 AWG (0.75 mm^2 to 2.5 mm^2) wiring. Horn/strobes are interconnected with a single pair of wires as shown below.



Note: Strobes must have continuous voltage.

Current Draw

GC-HDVM Temporal Horn-strobe: High dB Setting

UL Rating	15 cd RMS	30 cd RMS	75 cd RMS	95 cd RMS
16 Vdc	147	190	316	372
16 Vfwr	189	253	417	451

GC-HDVM Temporal Horn-strobe: High dB Setting

Typical Current	15 cd		30 cd		75 cd		95 cd	
	RMS	Mean	RMS	Mean	RMS	Mean	RMS	Mean
16 Vdc	111	95	152	143	281	276	333	328
20 Vdc	91	80	124	117	219	214	257	251
24 Vdc	80	71	108	101	185	180	212	207
33 Vdc	69	62	89	84	144	140	160	156
16 Vfwr	153	81	218	123	388	240	420	268
20 Vfwr	141	70	190	100	325	188	378	219
24 Vfwr	135	64	176	90	280	154	310	180
33 Vfwr	139	61	167	80	241	122	254	133

GC-HDVM Temporal Horn-strobe: Low dB Setting

Typical Current	15 cd		30 cd		75 cd		95 cd	
	RMS	Mean	RMS	Mean	RMS	Mean	RMS	Mean
16 Vdc	108	91	149	139	275	269	327	322
20 Vdc	87	75	120	113	214	209	250	245
24 Vdc	76	66	103	97	180	175	205	201
33 Vdc	64	57	85	80	138	135	153	150
16 Vfwr	141	76	204	118	384	239	418	265
20 Vfwr	127	65	176	95	312	181	371	214
24 Vfwr	118	60	162	82	262	149	301	171
33 Vfwr	127	56	155	73	229	118	249	129

GC-HDVMH High cd Temporal Horn-strobe: High dB Setting

95 cd RMS	115 cd RMS	150 cd RMS	177 cd RMS
341	399	506	570
487	578	670	711

GC-HDVMH High cd Temporal Horn-strobe: High dB Setting

95 cd		115 cd		150 cd		177 cd	
RMS	Mean	RMS	Mean	RMS	Mean	RMS	Mean
324	322	377	374	477	474	554	551
258	256	299	296	369	366	417	414
220	217	252	249	304	301	341	338
172	169	188	185	223	220	244	241
463	265	535	312	665	400	718	442
392	211	439	240	517	287	587	334
346	179	382	212	458	246	498	271
296	142	323	152	358	178	387	194

GC-HDVMH High cd Temporal Horn-strobe: Low dB Setting

95 cd		115 cd		150 cd		177 cd	
RMS	Mean	RMS	Mean	RMS	Mean	RMS	Mean
317	315	378	376	480	477	544	542
252	250	292	290	364	362	414	411
212	211	245	243	297	295	334	332
159	157	181	179	215	213	234	232
461	265	521	305	656	396	705	432
381	208	437	242	508	285	576	326
335	172	370	195	440	235	485	264
285	134	308	149	349	169	373	186

Notes and Comments

1. Current values are shown in mA.
2. UL Nameplate Rating can vary from Typical Current due to measurement methods and instruments used.
3. EDWARDS recommends using the Typical Current for system design including NAC and Power Supply loading and voltage drop calculations.
4. Use the Vdc RMS current ratings for filtered power supply and battery AH calculations. Use the Vfwr RMS current ratings for unfiltered power supply calculations.
5. Fuses, circuit breakers and other overcurrent protection devices are typically rated for current in RMS values. Most of these devices operate based upon the heating affect of the current flowing through the device. The RMS current (not the mean current) determines the heating affect and therefore, the trip and hold threshold for those devices.
6. Our industry has used 'mean' currents over the years. However, UL will direct the industry to use the 2004 RMS values in the future.

dBA output

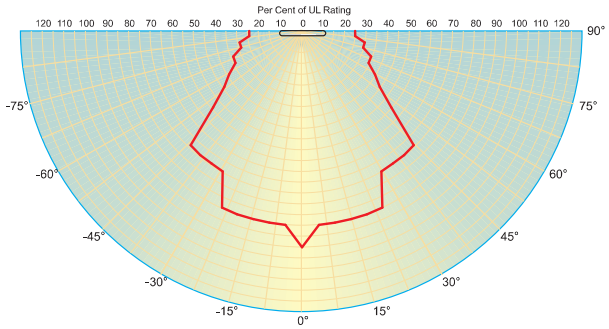
High dB Setting	UL464		Average	Peak
	Temporal	Steady	Temporal/ Steady	Temporal/ Steady
16 Vdc	79.8	83.2	90.6	93.6
24 Vdc	83.3	85.4	93.6	96.6
33 Vdc	85	87.8	95.7	98.7

Low dB Setting	UL464		Average	Peak
	Temporal	Steady	Temporal/ Steady	Temporal/ Steady
16 Vdc	75	79.3	86.3	88.7
24 Vdc	78	83	88.8	92.4
33 Vdc	80.9	85.9	91.8	95.1

Notes
1. All values shown are dBA measured at 10 feet (3.01m); **2.** UL464 values measured in reverberation room; **3.** Average and Peak values are measured in anechoic chamber.

Light output - (effective cd)

Percent of UL rating versus angle



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EDWARDS is a UTC brand.
1016 Corporate Park Drive
Mebane, NC 27302

Specifications

Housing	Textured UV stabilized, color impregnated engineered plastic. Exceeds 94V-0 UL flammability rating. Red and white models available.
Lens	Optical grade polycarbonate (clear)
Mounting	North-American 4" square box, 2 1/8" (54 mm) deep (indoor wall or ceiling applications only).
Wire connections	Screw terminals: single input for both horn and strobe. #18 to #12 AWG (0.75 mm^2 to 2.5 mm^2) wire size
Operating environment	Indoor: 32-120°F (0-49°C) ambient temperature. 93% relative humidity
Agency listings/approvals	Meets or exceeds ULC-S525 & ULC-S526, year 2004 UL requirements for standards UL1638 and UL1971, and complies with UL1480. All horn-strobes comply with ADA Code of Federal Regulation Chapter 28 Part 36 Final Rule. CSFM, MEA, FM.
Operating voltage	GC-HDVM series temporal-tone horn-strobes: non-coded, filtered 16-33 Vdc or unfiltered 16-33 Vdc FWR (or coded (audible NAC only) when used with optional G1M Genesis Signal Master)
Strobe output rating	UL 1971, UL 1638, ULC S526: selectable 15/30/75/95 cd (GC-HDVM) and 95/115/150/177 cd (GC-HDVMH)
Strobe flash rate	GC-HDVM series temporal-tone horn-strobes: one flash per second synchronized with optional G1M Genesis Signal Master indefinitely within 10 milliseconds (or self-synchronized within 200 milliseconds over thirty minutes on a common circuit without G1M Genesis Signal Master) Temporal setting (private mode only): synchronized to temporal output of horns on same circuit
Synchronization Sources	G1M-RM, SIGA-CC1S, SIGA-MCC1S, BPS6A, BPS10A
Horn pulse rate	GC-HDVM series temporal-tone horn-strobes: temporal rate synchronized with optional G1M Genesis Signal Master indefinitely within 10 milliseconds (or self-synchronized within 200 milliseconds over thirty minutes on a common circuit without G1M Genesis Signal Master)
Temporal audible pattern	½ sec ON, ½ sec OFF, ½ sec ON, ½ sec OFF, ½ sec ON, 1½ sec OFF, then repeat cycle

Ordering Information

Catalog Number	Housing Color	Marking	Description	Ship Wt. lbs (kg)
GC-HDVM	White	None	Genesis Ceiling/Wall Horn-Strobe with selectable 15, 30, 75, or 95 cd output	0.82 (1.8)
GCF-HDVM	White	"FIRE"		
GCFR-HDVM	Red	"FIRE"		
GC-HDVMH	White	None	Genesis Ceiling/Wall Horn-Strobe with selectable 95, 115, 150, or 177 cd output	
GCF-HDVMH	White	"FIRE"		

Accessories		
G1M-RM	Genesis Signal Master – Remote Mount (1-gang)	0.2 (0.1)
SIGA-CC1S	Intelligent Synchronization Output Module (2-gang)	0.5 (0.23)
SIGA-MCC1S	Intelligent Synchronization Output Module (Plug-in UIO)	0.18 (0.08)

White Field Configurable Ceiling Horn-Strobes may be ordered with or without optional 'FIRE' marking. Red Horn-Strobes come with 'FIRE" marking.

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Outdoor Rated Horns and Horn-Strobes

Genesis WG4 Series

Overview

Genesis WG4 Series horns and horn-strobe appliances are among the most versatile emergency appliances of their kind. Rated for indoor or outdoor use, they are suitable for a wide range of wet and harsh environments with a listed operating temperature range of as low as -40 °F to as high as 151 °F (-40 °C to 66 °C).

Field-configurable light and sound output settings add to their on-site flexibility, while optional FIRE markings make them ideal for fire alarm applications.

These appliances are suitable for indoor and outdoor applications, and are ideal for challenging conditions such as parking garages and process areas. They are available for mounting on the ceiling or the wall, and thanks to an ingenious optional full backplane sealing gasket, can be installed to recessed (in-the-pour/block) electrical boxes. WG4 notification appliances also mount to suitable surface boxes. Optional color-matched trim skirts provide a clean, finished appearance. All appliance wiring is accomplished room-side for easy installation.

WG4 Series appliances feature an efficient and powerful piezo sounder. The multi-candela strobes are available with clear lenses in two output categories – standard and high-output. They are precision-timed to meet UL 1971 synchronization standards, and field-configurable for one of four candela intensities. Candela settings are viewable even after installation through an innovative sealed viewport display.

Standard Features

- Outdoor and indoor rated
- Low-profile design
- Wall or ceiling mount
- Room-side wiring accepts 18 to 12 AWG (0.75 to 2.5 mm^2)
- Wide operating temperature range
- Field-selectable settings
- Fully-compatible with Genesis synchronization protocols
- Standard and high-output strobe intensities
- Horn only and horn-strobe options

DATA SHEET E85001-0628
Not to be used for installation purposes. Issue 1

Application

Horns

Genesis horn output reaches as high as 97 dBA in accordance with UL 464 (104 dBA in accordance with ULC-S525) and features a unique frequency tone that results in excellent sound penetration and an unmistakable warning of danger. Horns may be configured for either coded or non-coded notification circuits. They can also be set for low dB output with a jumper cut that reduces horn output by about 5 dB.

The suggested sound pressure level for each notification zone used with alarm notification appliances is at least 15 dB above the average ambient sound level, or 5 dB above the maximum sound level having a duration of at least 60 seconds, whichever is greater, measured 5 feet (1.5 m) above the floor. The average ambient sound level is A-weighted (fast response) sound pressure measured over a 24-hour period.

Doubling the distance from the notification appliance to the ear will theoretically result in a 6 dB reduction of the received sound pressure level. The actual effect depends on the acoustic properties of materials in the space. A 3 dBA difference represents a barely noticeable change in volume.

Strobe Application

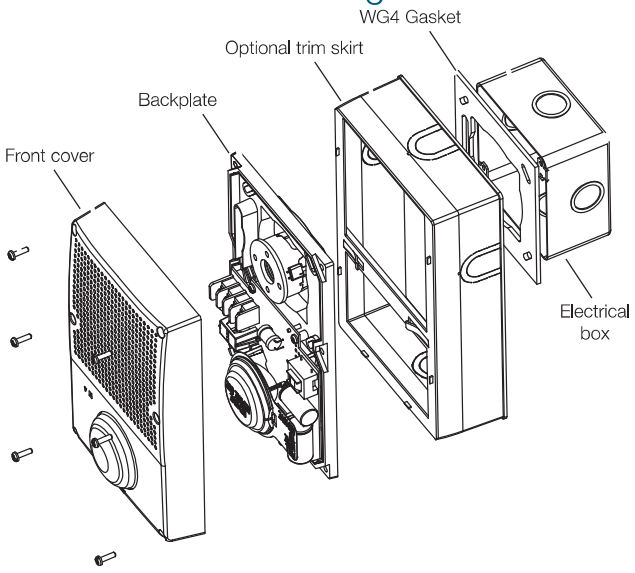
Genesis clear-lensed strobes are UL 1971-listed for use indoors as wall- or ceiling-mounted public-mode notification appliances for the hearing impaired, and UL 1638-listed for outdoor applications. Prevailing codes require strobes to be used where ambient noise conditions exceed specified levels, where occupants use hearing protection, and in areas of public accommodation.

Visible appliance synchronization is required to avoid causing issues with people who have Photosensitive Epilepsy (PSE). Notification appliance synchronization is also generally required when more than two strobe appliances are in the same field of view from any one location. All Genesis strobes meet UL synchronization requirements (within 10 milliseconds over a two-hour period) when used with a synchronization source.

WARNING: These devices will not operate without electrical power. As fires frequently cause power interruptions, we suggest you discuss further safeguards with your local fire protection specialist.

EDWARDS recommends that these devices always be installed in accordance with the latest recognized edition of national and local codes. Refer to the appropriate codes and standards for mounting height information.

Installation and Mounting

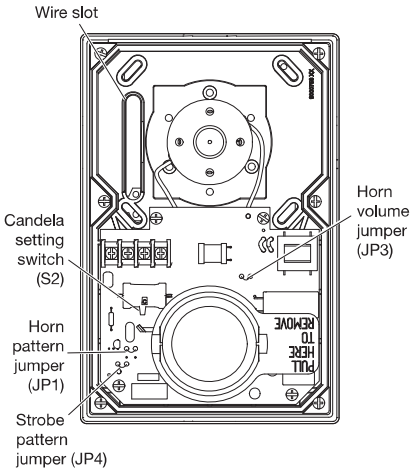


WG4 notification appliances are rated for outdoor use and are suitable for indoor or outdoor applications on walls or ceilings. For surface-mounting in outdoor or wet applications, appliances must be mounted to a 449 or 74347U electrical box. In dry conditions, they are compatible with standard 4-inch square by 1½-inch deep electrical boxes. When using the optional WG4WTS or WG4RTS trim skirt, a 449 or 4-inch square by 2-1/8" deep box must be used.

The Genesis WG4 horn and horn-strobe may be wall- or ceiling-mounted, and may be placed in one of four positions: strobe above, strobe below, and strobe to either side. The shallow depth of Genesis devices leaves room behind the appliance for extra wiring.

Field Configuration

Horn pattern: Audible output for WG4 horns and horn-strobes is factory set to to sound in a three-pulse temporal pattern. Units may be configured for use with coded systems by cutting a JP1 on the circuit board. This results in a steady output that can be turned on and off (coded) as the system applies and removes power to the notification circuit. A Genesis Signal Master is required when horn-strobe models are configured for coded systems.



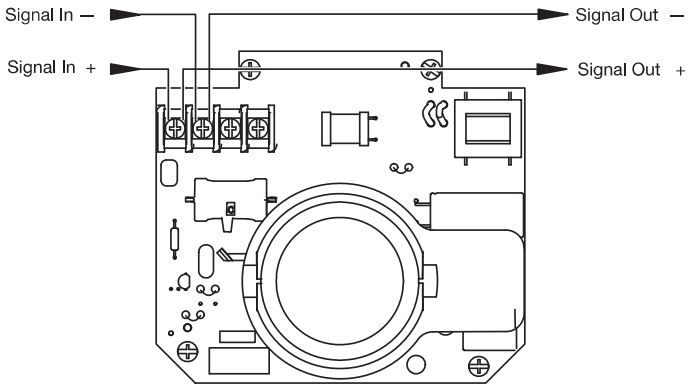
Horn output: Horns and horn-strobes are factory set for high dB output. Low dB output may be selected by cutting a jumper on the circuit board. This reduces the output by about 5 dB.

Strobe pattern: Genesis WG4 horn-strobes are factory set for use as UL 1971 compliant notification appliances for public mode operation. These notification appliances may be configured for temporal flash by cutting JP4 on the circuit board. This battery-saving feature is intended for private mode signaling only.

Strobe output: Genesis WG4 horn-strobes may be set for one of four output intensities.The output setting is changed by simply opening the device and sliding the switch to the desired setting. The device does not have to be removed to change the output setting. The setting remains visible after the cover is closed through a small window on the front of the device.

Wiring

Field wiring is connected to WG4 notification appliances with terminals that accommodate #18 to #12 AWG (0.75 mm² to 2.5 mm²) wiring.



–/+ designations indicate the signal polarity required to activate the device.

Specifications

Horns and Horn-strobes

Operating voltage	24 VDC, 24 VFWR nominal
Dimensions (W × H × D)	5.6 × 8.5 × 1.4 in. (142 × 216 × 36 mm)
Horn tone	3.2 kHz
Wire size	12 to 18 AWG (0.75 to 2.50 mm²)
Compatible electrical box	
Outdoor	Model 449 or 74347U
Indoor	4 in. square by 1.5 in. deep box
Operating environment	
Temperature	-40 to 151°F (-40 to 66°C)
Relative humidity	0 to 95% noncondensing

Compatible Synchronization Sources

Horn-strobes

Auto-sync Output Modules	SIGA-CC1S, SIGA-CC2A, SIGA-MCC1S, SIGA-MCC2A
Genesis Signal Master	G1M-RM
Booster & Auxiliary Power Supplies	APS6A, APS10A, BPS6A, BPS10A
Control Panels with Genesis Synchronization built-in	FireShield Plus, iO Series, EST3X

Sound Output

Horns and Horn-strobes (dBA)

Volume Setting	16V		24V		33V	
	UL 464	ULC-S525	UL 464	ULC-S525	UL 464	ULC-S525
Continuous High	89.7	94.0	94.7	99.6	97.4	102.9
Continuous Low	85.4	92.8	89.5	97.2	92.5	98.6
Temporal High	84.2	96.5	90.5	100.5	93.5	104.2
Temporal Low	81.7	90.3	85.4	94.2	88.1	97.0

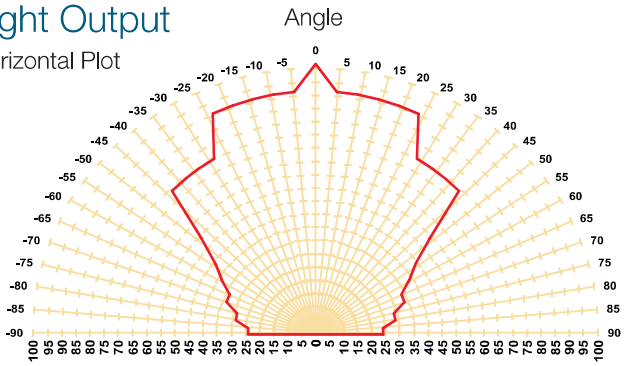
dBA = Decibels, A-weighted.

UL 464: Sound level output measured in a reverberant room at 10 ft. (3.05m).

CAN/ULC-S525: Sound level output measured in an anechoic room at 10ft (3.05m).

Light Output

Horizontal Plot



Standard Candela Horn-strobes

Standard/rating		Strobe Switch Position			
		D	C	B	A
UL 1971	Indoor	15 cd	29 cd	70 cd	87 cd
UL 1638	Outdoor @ -35°C	6 cd	12 cd	28 cd	35 cd
CAN/ULC-S526	Outdoor @ -40°C	1 cd	3 cd	8 cd	10 cd

High Candela Horn-strobes

Standard/rating		Strobe Switch Position			
		D	C	B	A
UL 1971	Indoor	102cd	123cd	147cd	161cd
UL 1638	Outdoor @ -35°C	41cd	50 cd	60 cd	65 cd
CAN/ULC-S526	Outdoor @ -40°C	11 cd	14 cd	17 cd	18 cd

Operating Current

(UL specifies current ratings at 16 volts)

Standard Candela Horn-strobes in RMS (mA), continuous

Input Voltage	Strobe Switch Position			
	D	C	B	A
16 VDC	127	168	297	351
16 VFWR	218	239	393	422
24 VDC	107	130	210	238
24 VFWR	190	222	325	356

High Candela Horn-strobes in RMS (mA), continuous

Input Voltage	Strobe Switch Position			
	D	C	B	A
16 VDC	342	408	517	526
16 VFWR	447	502	614	679
24 VDC	240	271	327	365
24 VFWR	390	400	486	540

Horn only models (mA)

Setting	16V RMS, continuous		24V, typical	
	High dB	Low dB	High dB	Low dB
VDC	69.1	41.2	49.0	32.3
VFWR	135	91.3	99.1	67.1

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Mebane, NC 27302

Ordering Information

Model	Housing	Marking	Strobe Output	Ship Wt.
WG4RF-HVMC	Red	FIRE	Selectable standard candela output	1.5 lbs. (0.68 kg)
WG4WF-HVMC	White			
WG4RN-HVMC	Red	None		
WG4WN-HVMC	White			
WG4RF-HVMHC	Red	FIRE	Selectable high candela output	
WG4WF-HVMHC	White			
WG4RN-HVMHC	Red	None		
WG4WN-HVMHC	White			
WG4RF-H	Red	FIRE	Horn Only	
WG4WF-H	White			
WG4RN-H	Red	None		
WG4WN-H	White			

Accessories

WG4WTS	Surface Skirt for Genesis WG4 appliance family, white.
WG4RTS	Surface Skirt for Genesis WG4 appliance family, red.
WG4GSKT	Full Body Mounting Gasket for smooth surfaces, WG4 appliance family
74347U	Surface mount box, outdoor rated, red
449	Surface mount box, outdoor rated, gray

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Remote Booster Power Supplies

BPS6A, BPS10A

FM APPROVED
MEA 476-91-E Vol.13
UL UL S3424
7300-1657: 0229

Overview

The Booster Power Supply (BPS) is a UL 864, 9th Edition listed power supply. It is a 24 Vdc filtered-regulated, and supervised unit that can easily be configured to provide additional notification appliance circuits (NACs) or auxiliary power for Mass Notification/ Emergency Communication (MNEC), as well as life safety, security, and access control applications.

The BPS contains the circuitry to monitor and charge internal or external batteries. Its steel enclosure has room for up to two 10 ampere-hour batteries. For access control-only applications, the BPS can support batteries totaling up to 65 ampere-hours in an external enclosure. The BPS has four Class B (convertible to two Class A) NACs. These can be activated in one or two groups from the BPS's unique dual input circuits.

The BPS is available in 6.5 or 10 ampere models. Each output circuit has a capacity of three amperes; total current draw cannot exceed the unit's rating.

The BPS meets current UL requirements and is listed under the following standards:

Standard (CCN)	Description
UL864 9th ed.ition (UOXX)	Fire Alarm Systems
UL636 (ANET, UEHX7)	Holdup Alarm Units and Systems
UL609 (AOTX, AOTX7)	Local Burglar Alarm Units and Systems
UL294 (ALVY, UEHX7)	Access Control Systems
UL365 (APAW, APAW7)	Police Station Connected Burglar Alarm Units and Systems
UL1076 (APOU, APOU7)	Proprietary Burglar Alarm System Units
UL1610 (AMCX)	Central Station Alarm Unit
ULC-S527 (UOXXC)	Control Units, Fire Alarm (Canada)
ULC-S303 (AOTX7)	Local Burglar Alarm Units and Systems (Canada)
C22.2 No. 205	Signaling Equipment (Canada)

Standard Features

- Allows for reliable filtered and regulated power to be installed where needed
- Cost effective system expansion
- Provides for Genesis and Enhanced Integrity notification appliance synchronization
- Supports coded output operation
- Self-restoring overcurrent protection
- Multiple signal rates
- Can be cascaded or controlled independently
- Easy field configuration
- On-board diagnostic LEDs identify wiring or internal faults
- Standard EDWARDS keyed lockable steel cabinet with removable door
- 110 and 230 Vac models available
- Accommodates 18 to 12 AWG wire sizes
- Optional tamper switch
- Dual battery charging rates
- Optional earthquake hardening: OSHPD seismic pre-approval for component Importance Factor 1.5

Application

The BPS provides additional power and circuits for notification appliances and other 24 Vdc loads. It is listed for indoor dry locations and can easily be installed where needed.

Fault conditions are indicated on the on-board diagnostic LEDs, opening the BPS input sense circuit and the trouble relay (if programmed). While this provides indication to the host system, the BPS can still be activated upon command. A separate AC Fail contact is available on the BPS circuit board, which can be programmed for trouble or AC Fail. There are seven on-board diagnostic LEDs: one for each NAC fault, one for battery fault, one for ground fault, and one for AC power.

The unique dual-input activation circuits of the BPS can be activated by any voltage from 6 to 45 VDC (filtered-regulated) or 11 to 33 Vdc (full-wave rectified, unfiltered). The first input circuit can be configured to activate 1-4 of the four possible outputs. The second input circuit can be configured to control circuits 3 and 4. When outputs are configured for auxiliary operation, these circuits can be configured to stay on or automatically deactivate 30 seconds after AC power is lost. This feature makes these circuits ideal for door holder applications. The BPS also has a separate 200 mA 24 Vdc output that can be used to power internal activation modules.

BPS NACs can be configured for a 3-3-3 temporal or continuous output. California temporal rate outputs are also available on certain models. This makes the BPS ideal for applications requiring signaling rates that are not available from the main system.

In addition to the internally generated signal rates, the BPS can also be configured to follow the coded signal rate of the main system NACs. This allows for the seamless expansion of existing NACs.

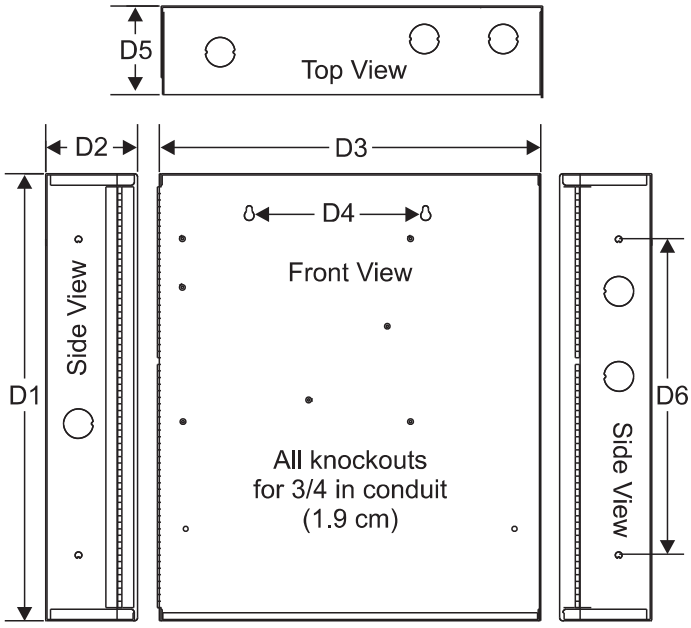
The BPS enclosure has mounting brackets for up to three Signature modules to the right of the circuit board.

Engineering Specification

Supply, where needed, EDWARDS BPS Series Booster Power Supplies (BPS) that are interconnected to and supervised by the main system. The BPS shall function as a stand-alone auxiliary power supply with its own fully-supervised battery compliment. The BPS battery compliment shall be sized to match the requirements of the main system. The BPS shall be capable of supervising and charging batteries having the capacity of 24 ampere-hours for Mass Notification/Emergency Communication (MNEC), life safety and security applications, and the capacity of 65 ampere-hours for access control applications.

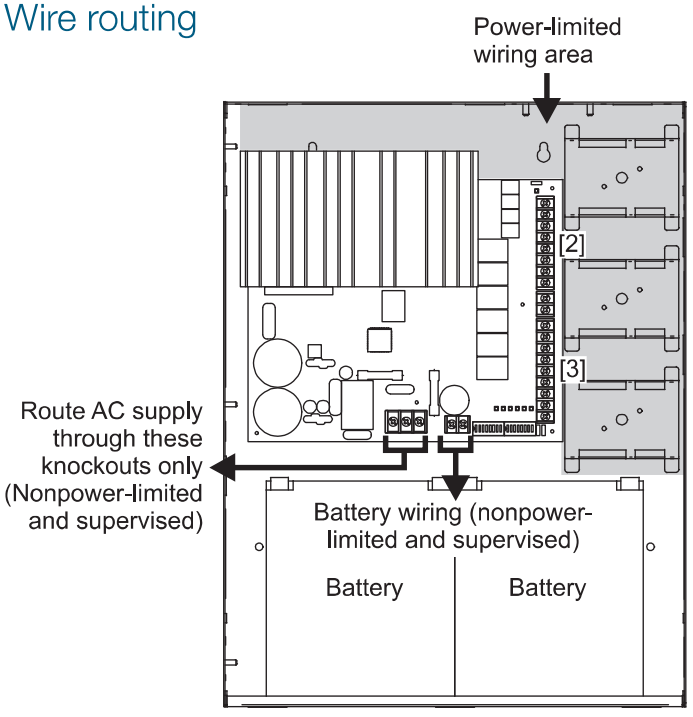
<<The BPS shall be capable of installation for a seismic component Importance Factor of 1.5.>> The BPS shall provide a minimum of four independent, fully supervised Class B circuits that can be field configurable for notification appliance circuits or auxiliary 24 Vdc power circuits. BPS NACs shall be convertible to a minimum of two Class A NACs. Each BPS output circuit shall be rated at 3 amperes at 24 Vdc. Each output circuit shall be provided with automatically restoring overcurrent protection. The BPS shall be operable from the main system NAC and/or EDWARDS Signature Series control modules. BPS NACs shall be configurable for continuous, 3-3-3 temporal or optionally, California rate. Fault conditions on the BPS shall not impede operation of main system NAC. The BPS shall be provided with ground fault detection circuitry and a separate AC fail relay.

Dimensions



D1	D2	D3	D4	D5	D6
17.0 in (43.2 cm)	3.5 in (8.9 cm)	13.0 in (33.0 cm)	6.5 in (16.5 cm)	3.375 in (8.6 cm)	12.0 in (30.4 cm)

Wire routing



Notes

1. Maintain 1/4-inch (6 mm) spacing between power-limited and nonpower-limited wiring or use type FPL, FPLR, or FPLP cable per NEC.

[2] Power-limited and supervised when not configured as auxiliary power. Non-supervised when configured as auxiliary power.

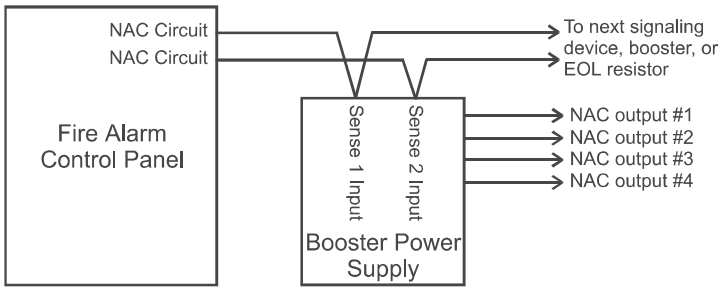
[3] Source must be power-limited. Source determines supervision.

4. When using larger batteries, make sure to position the battery terminals towards the door.

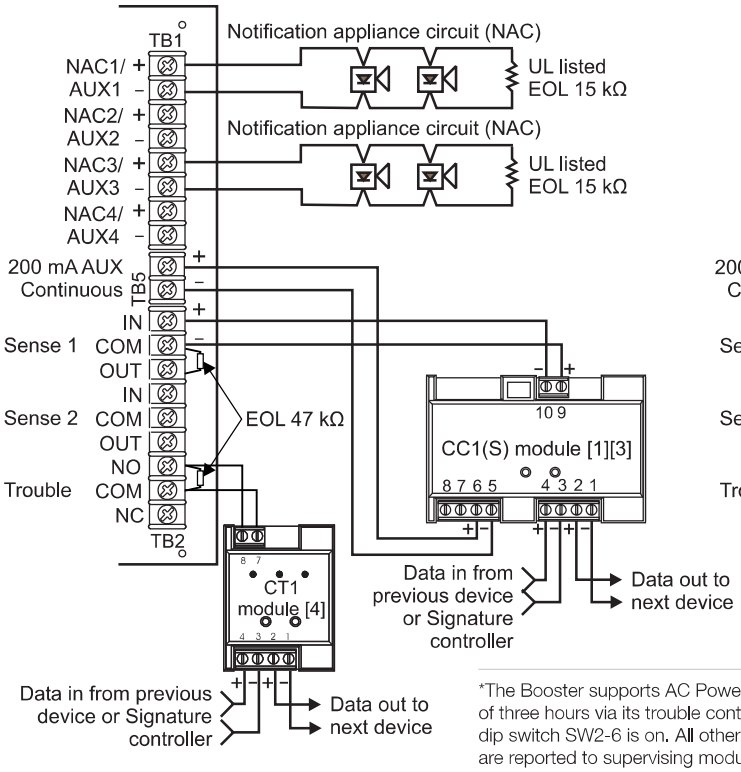
Typical Wiring

Single or cascaded booster anywhere on a notification appliance circuit

Existing NAC end-of-line resistors are not required to be installed at the booster's terminals. This allows multiple boosters to be driven from a single NAC circuit without the need for special configurations.

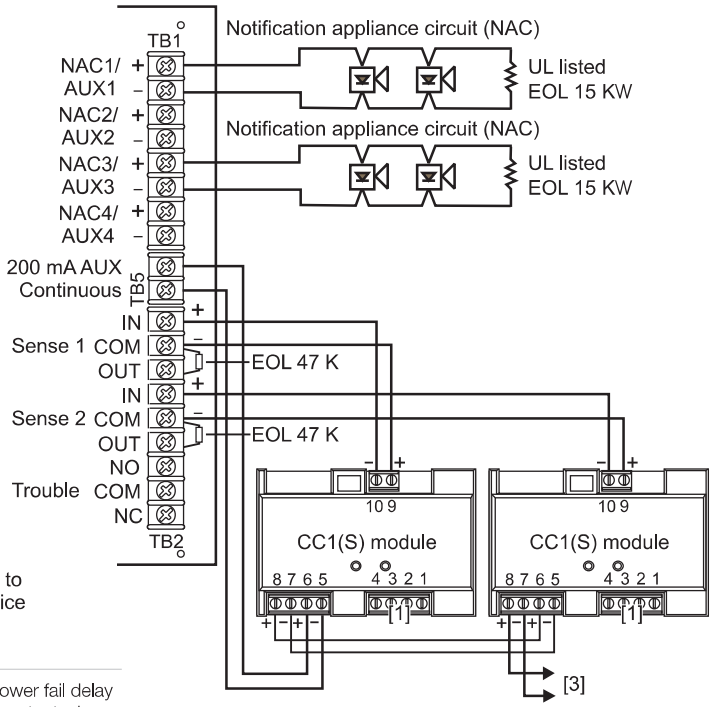


Configuring the Booster for AC Power Fail delay operation*

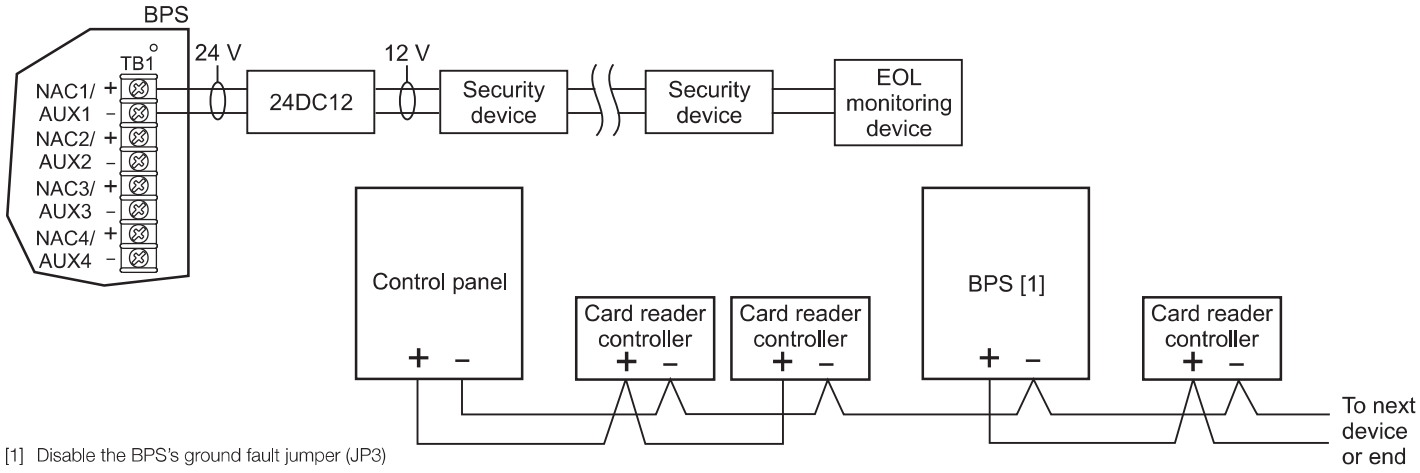


*The Booster supports AC Power fail delay of three hours via its trouble contact when dip switch SW2-6 is on. All other troubles are reported to supervising module or panel without delay via Sense inputs.

Multiple CC1(S) modules using the BPS's sense inputs



Security and access



[1] Disable the BPS's ground fault jumper (JP3)

EDWARDS
United Technologies
LIFE SAFETY & INCIDENT MANAGEMENT

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Web: *Edwards-fire.com*

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1016 Corporate Park Drive
Mebane, NC 27302

Specifications

Model	6.5 amp Booster	10 amp Booster
AC Line Voltage	120VAC or 220-240VAC 50/60Hz 390 watts	120VAC or 220-240VAC 50/60Hz 580 watts
Notification Appliance Circuit Ratings	3.0A max. per circuit @ 24Vdc nominal 6.5A max total all NACs	3.0A max. per circuit @ 24Vdc nominal 10A max total all NACs
Trouble Relay	2 Amps @ 30Vdc	
Auxiliary Outputs	Four configurable outputs replace NACs 1, 2, 3 or 4. as auxiliary outputs and 200 mA dedicated auxiliary. (See note 2.)	
Input Current (from an existing NAC)	3mA @ 12Vdc, 6mA @ 24Vdc	
Booster Internal Supervisory Current	70mA + 35 mA for each circuit set to AUX	
Booster Internal Alarm Current	270mA	
Signature Mounting Space	Accomodates three two-gang modules.	
Maximum Battery Size	10 Amp Hours (2 of 12V10A) in cabinet up to 24 Amp hours with external battery cabinet for fire and security applications; up to 65 Amp hours for access control applications in external battery box.	
Terminal Wire Gauge	18-12 AWG	
Relative Humidity	0 to 93% non condensing @ 32°C	
Temperature Rating	32° to 120°F (0° to 49°C)	
NAC Wiring Styles	Class A or Class B	
Output Signal Rates	Continuous, California rate, 3-3-3 temporal, or follow installed panel's NAC. (See note 1.)	
Ground Fault Detection	Enable or Disable via jumper	
Agency Listings	UL, ULC, CSFM	

1. Model BPS*CAA provides selection for California rate, in place of temporal.
2. Maximum of 8 Amps can be used for auxiliary output.

Ordering Information

Catalog Number	Description	Shipping Wt. lb (kg)
BPS6A	6.5 Amp Booster Power Supply	13 (5.9)
BPS6AC	6.5 Amp Booster Power Supply (ULC)	13 (5.9)
BPS6A/230	6.5 Amp Booster Power Supply (220V)	13 (5.9)
BPS6CAA	6.5 Amp Booster Power Supply with California rate	13 (5.9)
BPS10A	10 Amp Booster Power Supply	13 (5.9)
BPS10AC	10 Amp Booster Power Supply (ULC)	13 (5.9)
BPS10A/230	10 Amp Booster Power Supply (220V)	13 (5.9)
BPS10CAA	10 Amp Booster Power Supply with California rate	13 (5.9)
Related Equipment		
12V6A5	7.2 Amp Hour Battery, two required	3.4 (1.6)
12V10A	10 Amp Hour Battery, two required	9.5 (4.3)
3-TAMP	Tamper switch	
BC-1EQ	Seismic Kit for BC-1. Order BC-1 separately. See note 3.	
BPSEQ	Seismic kit for BPS6A or BPS10 Booster Power Supplies. See note 3	
BC-1	Battery Cabinet (up to 2 - 40 Amp Hour Batteries)	58 (26.4)
BC-2	Battery Cabinet (up to 2 - 17 Amp Hour Batteries)	19 (8.6)
12V17A	18 Amp Hour Battery, two required (see note 1)	13 (5.9)
12V24A	24 Amp Hour Battery, two required (see note 1)	20 (9.07)
12V40A	40 Amp Hour Battery, two required (see notes 1, 2)	32 (14.5)
12V50A	50 Amp Hour Battery, two required (see notes 1, 2)	40 (18.14)
12V65A	65 Amp Hour Battery, two required (see notes 1, 2)	49 (22.2)

1. Requires installation of separate battery cabinet.
2. BPS supports batteries greater than 24 Amp hours for access control applications only.
3. For earthquake anchorage, including detailed mounting weights and center of gravity detail, refer to Seismic Application Guide 3101676. Approval of panel anchorage to site structure may require local AHJ, structural or civil engineer review.

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Battery Specification Sheet

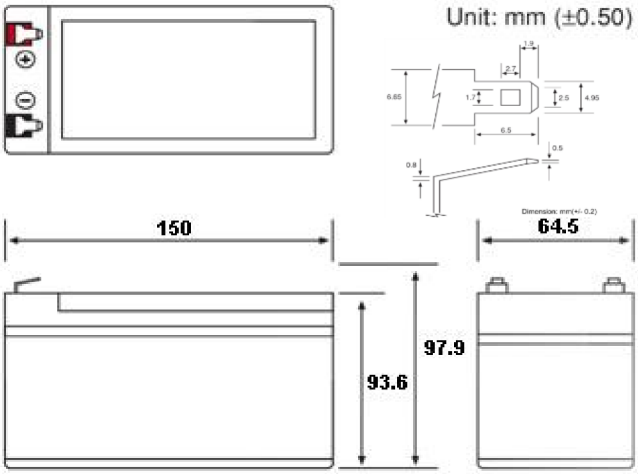
BSL1075

Technical Specifications

Nominal Voltage	12 V
Nominal Capacity	8.0 Ah (20 Hr Rate)
Chemistry	Lead Acid - AGM

Physical Specifications

Length:	150 mm	5.91 in.
Width:	64.5 mm	2.54 in.
Height:	93.6 mm	3.69 in.
Height w/ Terminal:	97.9 mm	3.85 in.
Weight	2.75 kg	6.06 lbs.
Terminal Type		.187" Faston
Case Material		Black ABS



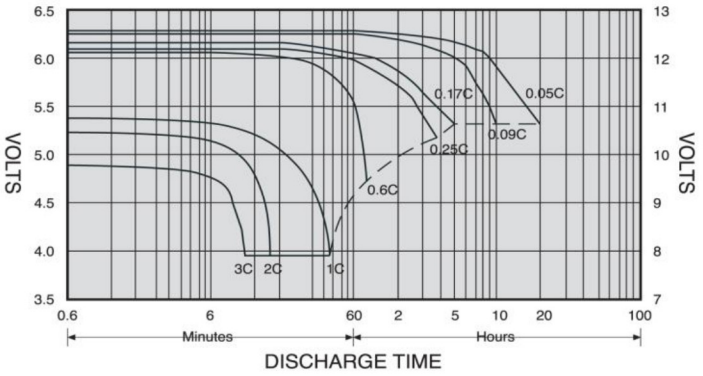
Charging Specifications

Max. Charge Current	2.16 A
Approx Final Charge Current (2.25 volts/cell Float)	0.014 A
Approx Final Charge Current (2.45 volts/cell Cycle)	0.07 A

Capacity Specifications

Cut-off Voltage	20 Hr Rate (.36A)	8 Ah
1.75 volts/cell @ 25ºC	10 Hr Rate (.65A)	6.5 Ah
1.70 volts/cell @ 25ºC	5 Hr Rate (1.14A)	5.7 Ah
1.55 volts/cell @ 25ºC	1 Hr Rate (4.1A)	4.1 Ah

		Bloc	Per Cell
Charge Voltage *(constant)*	Float	13.5~13.8	2.25~2.30
	Cycle	14.4~14.7	2.40~2.45
Discharge Current *(5 seconds maximum)*			80 A
Discharge Current *(maximum continuous)*			50 A
Self Discharge *(to 80% capacity)*		9 months @ 21°C	
Internal Resistance			25 mΩ



Due to changes in the manufacturing processes, specifications are subject to change without notice

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Battery Specification Sheet

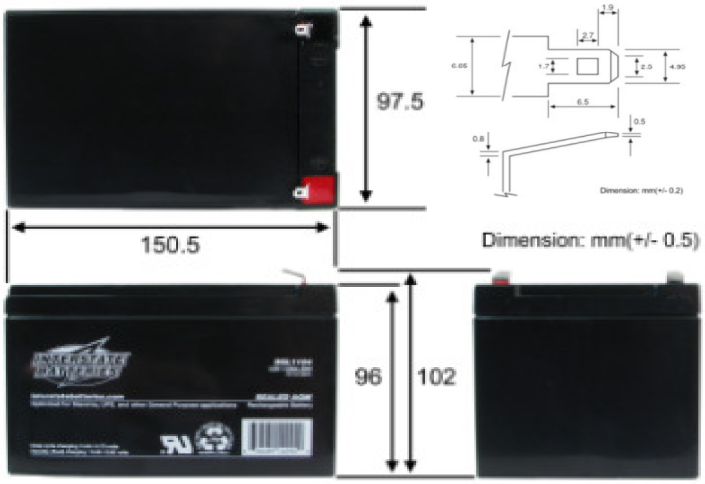
BSL1105

Technical Specifications

Nominal Voltage	12 V
Nominal Capacity	12.0 Ah (20 Hr Rate)
Chemistry	Lead Acid - AGM

Physical Specifications

Length:	150.5 mm	5.93 in.
Width:	97.5 mm	3.84 in.
Height:	96.0 mm	3.78 in.
Height w/ Terminal:	102.0 mm	4.02 in.
Weight	4.28 kg	9.44 lbs.
Terminal Type		.187" Faston
Case Material		Black ABS

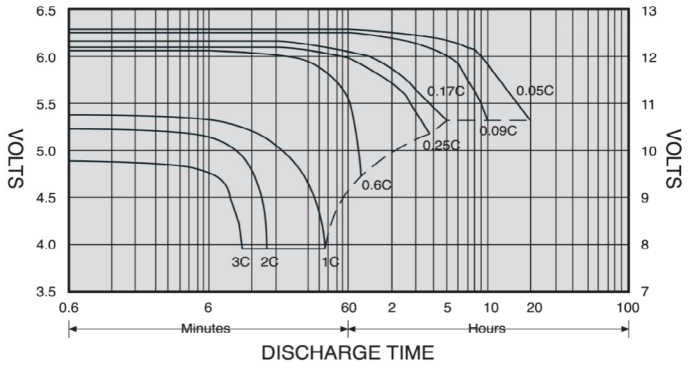


Charging Specifications

		Bloc	Per Cell
Charge Voltage *(constant)*	Float	13.5~13.8	2.25~2.30
	Cycle	14.4~14.7	2.40~2.45
Max. Charge Current			3.6 A
Approx Final Charge Current (2.25 volts/cell Float)			0.024 A
Approx Final Charge Current (2.45 volts/cell Cycle)			0.12 A

Capacity Specifications

Cut-off Voltage	20 Hr Rate	(0.60A)	12.0 Ah
1.75 volts/cell @ 25ºC	10 Hr Rate	(1.12A)	11.2 Ah
1.70 volts/cell @ 25ºC	5 Hr Rate	(1.92A)	9.6 Ah
1.55 volts/cell @ 25ºC	1 Hr Rate	(7.10A)	7.1 Ah
Discharge Current *(5 seconds maximum)*			80 A
Discharge Current *(maximum continuous)*			50 A
Self Discharge *(to 80% capacity)*		9 months @ 21℃	



Due to changes in the manufacturing processes, specifications are subject to change without notice

Power Patrol® Batteries

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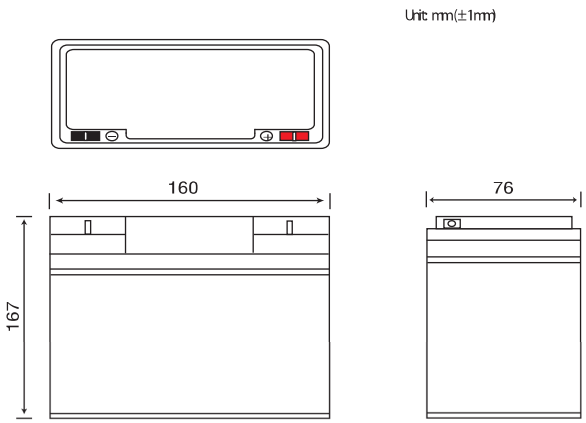
Specification Sheet

Sealed Lead-Acid Batteries — SLA1116

Technical Specifications

Nominal Voltage		12V
Nominal Capacity		18.0 Ah (20 Hr Rate)
Dimensions	Length:	180 mm (7.20 in)
	Width:	76 mm (3.00 in)
	Height:	167 mm (6.60 in)
Total Height w/ Teminal:		167 mm (6.60 in)
Weight		Approx 6.2 Kg (13.85 Lbs.)
Terminal Type		Nut & Bolt (w/faston adapter)



Capacity Characteristics

Cut Off Voltage	20 Hr Rate (0.90A)	18.0AH
1.75 v/c @ 25ºC	10 Hr Rate (1.60A)	16.0AH
1.70 v/c	5 Hr Rate (2.9A)	14.5AH
1.55 v/c	1 Hr Rate (9.8A)	9.8AH

Charge Voltage (constant)

	Bloc	Per Cell
Float	13.5~13.8	2.25~2.30
Cycle	14.4~14.7	2.40~2.45

Discharge Current Amps *(5 seconds maximum)*	250
Discharge Current Amps *(maximum continuous)*	80
Max. Charge Current	5.1A
Approx Final Charge Current *(2.25 v/c Float)*	0.03 (30 mA)
Approx Final Charge Current *(2.45 v/c Cycle)*	0.15 (150 mA)
Self Discharge	9 months@21ºC
Case Material	ABS - *Gray or Black

Due to changes in the manufacturing process, specifications may change without notice.
*Gray option is Flame Retardent ABS.

Actual Wattage / Ampere Capacity at Various Discharge Times (Volt per Cell @ 25º C)

Cut Off Wattage \ Time		5 Min	10 Min	15 Min	30 Min	45 Min	60 Min
1.75 v/c	W	107.4	72.33	55.6	33.79	24.68	19.78
25ºC	A	61.37	41.33	31.77	19.31	14.1	11.3
1.67 v/c	W	104.79	72.16	55.31	33.48	25.05	20.04
25ºC	A	62.75	43.21	33.12	20.05	15.0	12.0
1.60 v/c	W	116.8	73.76	54.72	32.19	24.37	19.33
25ºC	A	73.0	46.1	34.2	20.12	15.23	12.08

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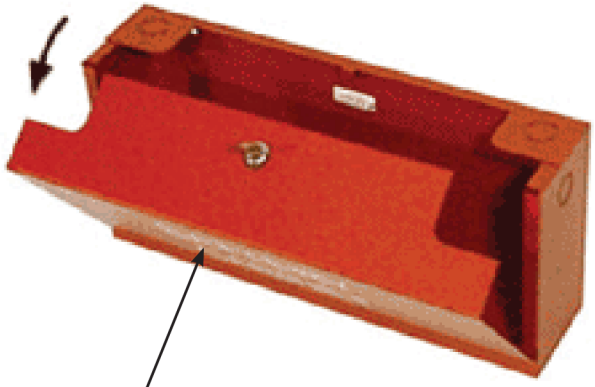
MBC

Mini Battery Cabinet

The MBC "BATTERY CABINET" is designed for the professional installation of systems requiring battery storage and meets the requirement of NFPA 72 (1-5.2.9) stand-by battery storage for battery backup.

The MBC allows for easy access and maintenance of the batteries while also assisting against unnecessary power drain, interference or degeneration of the battery. The unit can be mounted securely to a wall, preventing mechanical injury or damage to other equipment.



The door of the MBC lifts away for worry free wiring and battery change-out.

Standard Features:

- 16 Gauge (.062 thk.) cold rolled steel
- White 2" lettering "BATTERY CABINET"
- Green ground screw with threaded insert
- Formed lift-a-way hinge
- Red or Black textured finish
- CAT 30 keyed door lock
- Dimensions:
  17" wide x 8" high x 4" deep
- Six 1/2" and 3/4" EMT conduit knockouts located on both sides, top and back
- NFPA 72 National Electric Code

NEMA

NFPA

Made In U.S.A.

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ADA

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508.485.4740 Fax

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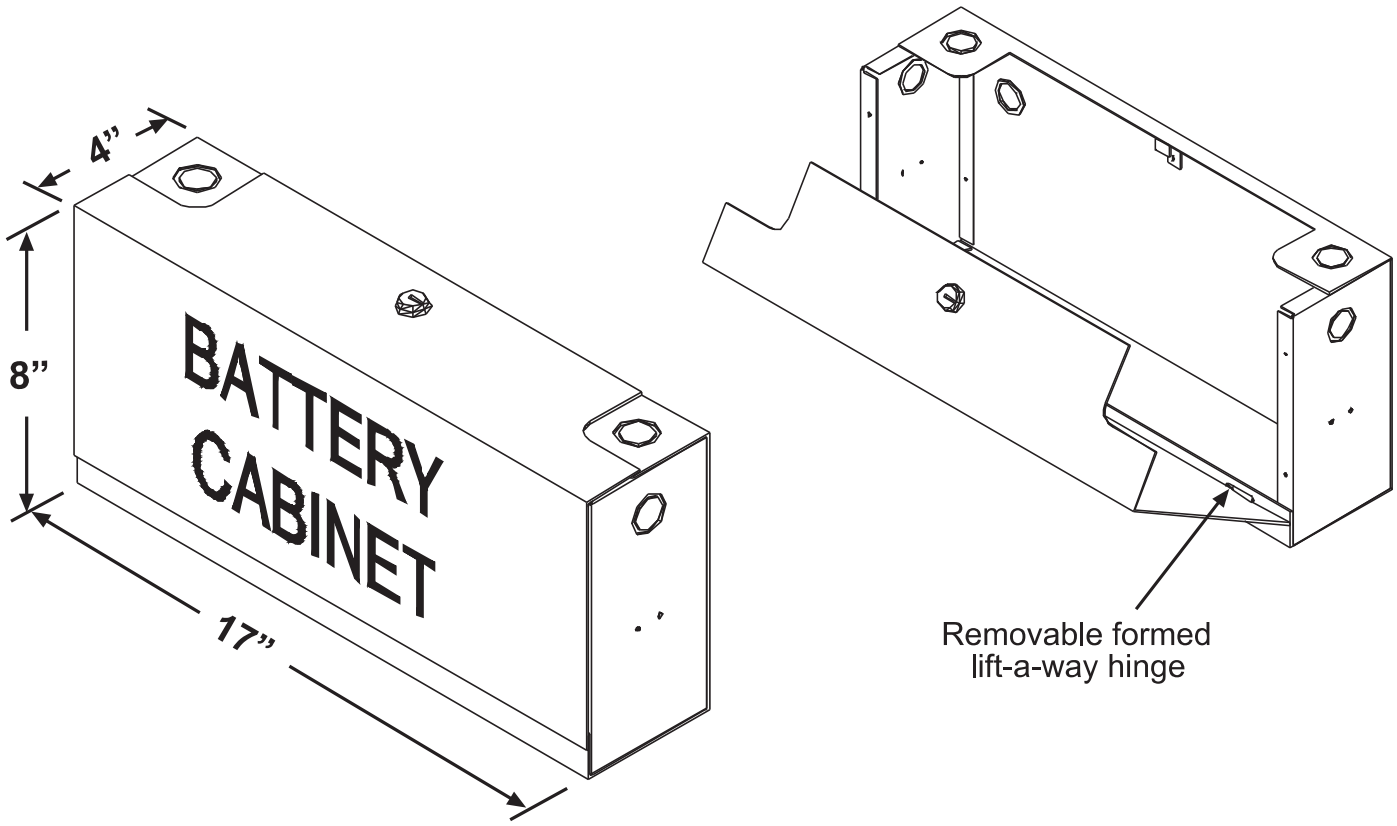
Specifications:

The MBC Mini Battery Cabinet is constructed of 16 gauge (.062 thk.) cold rolled steel and finished with a durable red or black textured, heat-resistant baked-on enamel finish. The front cover is engineered with a removable formed lift-a-way hinge, displays “BATTERY CABINET” in 2” white screened lettering and includes a high security CAT 30 keyed door lock. The unit comes with a green ground screw with threaded insert. Overall dimensions measure 17” wide by 8” high by 4” deep. Six 1/2” and 3/4” EMT conduit knockouts are located on both sides, top and back. The battery cabinet meets NFPA 72 National Electric Code requirements. Batteries not included.



Ordering Information:

Part #	Description
SSU00505	MBC Mini Battery Cabinet - Red
SSU00506	MBC Mini Battery Cabinet - Black

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MICRO IV™

Low Profile - Single Flash Strobe

- wide input voltage range
- universal mounting
- built-in RFI filters
- 10,000 hour strobe lamp
- ten year warranty on power supply
- one year warranty on lamp
- available in six lens colors
- UL recognized (all models)
- lens has hermetic o-ring seal
- NEMA 4X

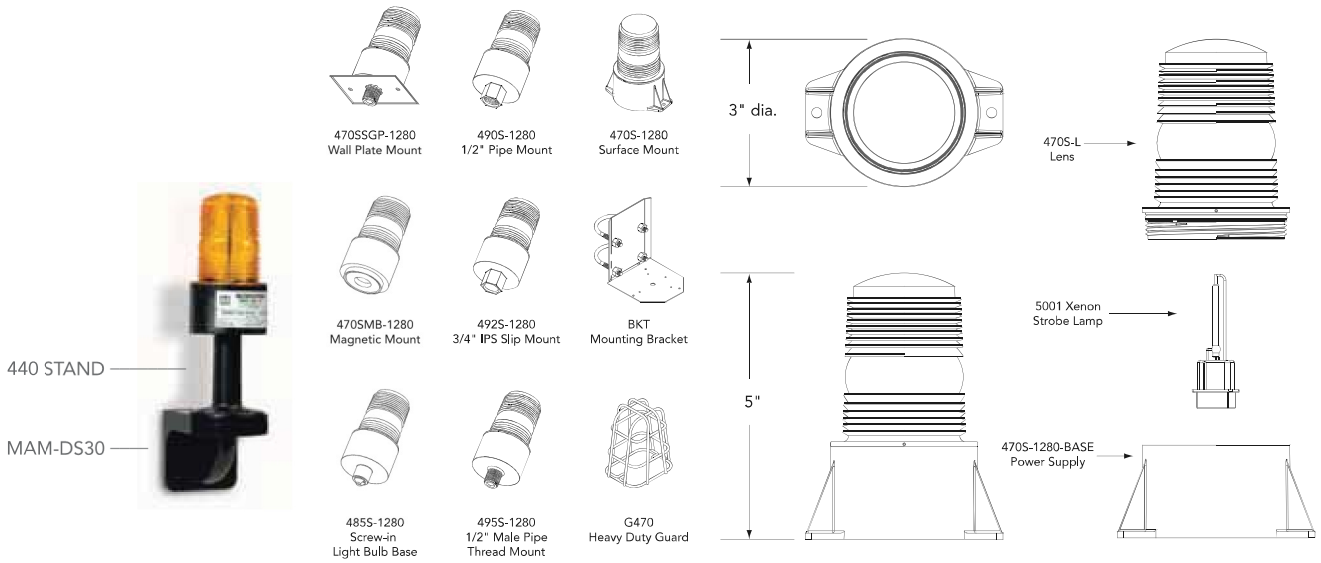
The MICRO IV strobe family is an enhanced version of the MICROSTROBE featuring a power supply which operates over a wide input voltage range of 12–80VDC or 16–24VAC. The supply has a regulated output so that the lamp brightness and flash remain constant when operated over the rated input voltage range. The power supply is potted in polyurethane for the ultimate in protection from moisture, vibration and exposure to high voltage. The enclosure is all Lexan®, and the plug-in lamp is field replaceable. All units are polarity protected and have built-in filters to protect against radio interference and spike voltages. The MICRO IV is covered by a 10 year warranty. The MICRO IV and its guard are UL component recognized for type E, EE, and ES electric industrial trucks covered by UL standard #583.

Lens Colors

Ordering Information

Please specify lens colors and model number when ordering. Available colors are Amber, Blue, Clear, Green, Purple and Red.

Model No.	Description	Voltage
470SSGP–1280	DC strobe, wall plate mount	12 – 80VDC
470S–1280	DC strobe, surface mount	12 – 80VDC
470SMB–1280	DC strobe, magnetic mount and 6' straight cord	12 – 80VDC
470SMB–1280/CC	DC strobe, magnetic mount and coil cord	12 – 80VDC
490S–1280	DC strobe, 1/2" female pipe mount	12 – 80VDC
492S–1280	DC strobe, 3/4" IPS slip mount	12 – 80VDC
495S–1280	DC strobe, 1/2" male thread mount	12 – 80VDC



Specifications

Item	Description
Flash Rate	60 to 80 flashes per minute
Light Output	50 effective candlepower (ECP)*
Voltage and Amperage	12-80VDC draws 0.4A average @ 12VDC tapering to 0.05A average @ 80VDC 16-24VAC draws 0.35A average
Power Supply Output 2.7 Watts	1.9 joules per flash. 190,000 Peak Candlepower**
Size and Weight	5" tall x 3" dia. x 0.6 lbs (127mm x 76mm x 0.27kg)
Operating Temperature	-40 C to 65 C
Encapsulation	Fully potted in urethane material with no exposure to High Voltage possible

Available Options

NOTE: All "/" options are factory installed only.

Model No.	Description
G470	Heavy duty guard
BKT	Mounting bracket
LBO–MINI	Lens blackout segment 180°
MICROSHIELD	Vinyl, 180° lens blackout

Replacement Parts

Model No.	Description
5001	Xenon strobe lamp
470S–L	Colored lens (please specify color)
470S–1280–PSA	12 – 80VDC power supply, surface mount
470SMB–1280–PSA	12 – 80VDC power supply, magnetic mount and 6' straight cord
470SMB–1280/CCB	12 – 80VDC power supply, magnetic mount and coil cord
490S–1280–PSA	12 – 80VDC power supply, 1/2" female pipe mount
492S–1280–PSA	12 – 80VDC power supply, 3/4" IPS slip mount
495S–1280–PSA	12 – 80VDC power supply, 1/2" male thread mount

Mounting Options

Item	Description
BKT	Mounting bracket
440 STAND	Plastic Stand (Thread mount MicroLert models only)
MAM-DS30	Wall mount bracket

Architect and Engineer Specifications

The strobe light shall be Tomar model number series 470, 480, 485, 490, 492, 495 or approved equal. The light source shall be a plug-in field replaceable single-flash xenon strobe tube. The strobe light must have built-in RFI filters to protect against radio interference and spike voltages. It shall be polarity protected, and have a power supply fully potted in polyurethane. Voltage ranges shall be 12-80VDC or 16-24VAC, 120 VAC, and 240VAC. The strobe light shall be UL listed and of NEMA 4X type weatherproof design with screw-on Lexan® lens.

*ECP (Effective Candlepower) is the intensity that would appear to an observer if the light were burning steadily.

**Peak Candlepower is the maximum light intensity generated by a flashing light during its light pulse.

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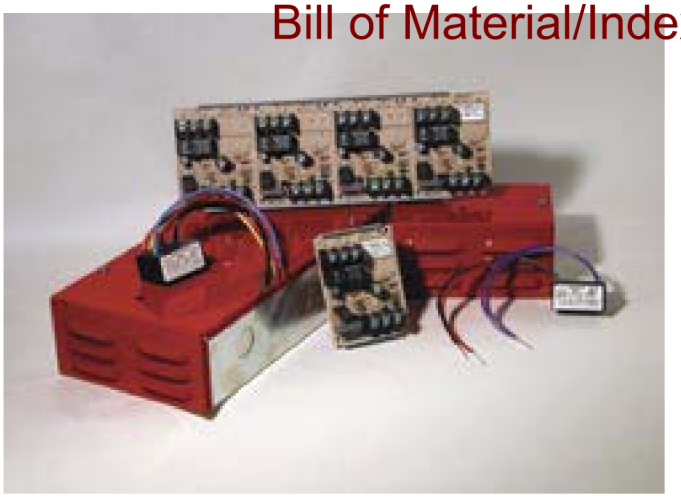
Multi-Voltage Conventional Relays



System Sensor's multi-voltage conventional relays are used for high-current switching applications such as fan and damper assembly control, door control, air handling unit controls, and other types of system interfacing.

Features

- Multi-voltage operation
- Activation LEDs
- Easy and flexible installation
- Reliable and robust design
- Multipurpose field installations
- Multi-voltage relays with terminal strip field wiring connections, mounting track, and hardware for R-10T/20T and R-14T/24T
- Removable front cover on steel enclosure for R-10E/R-20E and R-14/R-24E, which mount inside the enclosure
- LED viewing hole on top of the steel enclosure's cover
- Extra pair of wires for redundant power input on PR-3
- Terminal strip field wiring connections, mounting track, and hardware

The R-10T, R-20T, R-14T, and the R-24T models are multi-voltage relays with terminal strip field wiring connections, mounting track, and hardware. The R-10T is a single FORM–C (SPDT) relay with a red activation LED, and the R-14T is a four-gang 1 FORM–C (SPDT) relay with four red activation LEDs. The R-20T is a single 2 FORM–C (DPDT) relay with a red activation LED, and the R-24T is a four-gang 2 FORM–C (DPDT) relay with four red activation LEDs.

The R-10E/R-20E and R-14E/R-24E are similar to the T-series track mount relays, but they are mounted into a steel enclosure. The enclosure has a removable front cover that provides easy access and an LED viewing hole on the top of the cover.

PR-1/PR-2/PR-3 are epoxy encapsulated multi-voltage relays. They are single-pole double-throw relays that use a red LED as a visible indication of relay coil energization. PR–3 is identical to PR–2, except it has an extra pair of wires for redundant power input.

Model EOLR-1 is an epoxy encapsulated, single-pole single-throw, normally open relay that can be used as an end of line device in fire alarm systems, e.g. to supervise power supplies.

Agency Listings

UL LISTED ULC MEA approved

Multi-Voltage Conventional Relay Specifications

Specifications: R-10T/R-14T/R-20T/R-24T	
Operating Voltage	18 – 35 VDC, 18 – 35 VAC, 115 VAC, 230 VAC
Operating Current	20 mA DC max. @ 24 VDC, 24 VAC, 115 VAC, 230 VAC (R-10T/R-14T) 40 mA DC max. @ 24 VDC, 24 VAC, 115 VAC, 230 VAC (R-20T/R-24T)
Operating Temperature	–40°F to 158°F (–40°C to 70°C)
Humidity Range	10% – 93% non-condensing
Dimensions	R-10T/R-20T: 2.5˝L × 3.35˝W × 1.2˝H R-14T/R-24T: 10˝L × 3.35˝W × 1.2˝H
Contact Ratings	24 VDC: 7 A with L/R = 5 mS 120 VAC: 10 A 120 VAC: 1/6 HP 230 VAC: 7 A

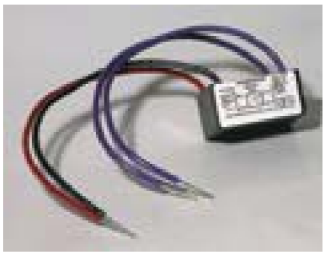
Specifications: R-10E/R-14E/ R-20E/R-24E	
Operating Voltage	18 – 35 VDC, 18 – 35 VAC, 115 VAC, 230 VAC
Operating Current	20 mA DC max. @ 24 VDC, 24 VAC, 115 VAC, 230 VAC (R-10E/R-14E) 40 mA DC max. @ 24 VDC, 24 VAC, 115 VAC, 230 VAC (R-20E/R-24E)
Operating Temperature	–40°F to 158°F (–40°C to 70°C)
Humidity Range	10% – 93% non-condensing
Dimensions	R-10E/R-20E: 5.1˝L × 3.75˝W × 2.5˝H R-14E/R-24E: 11˝L × 5.3˝W × 2.5˝H
Contact Ratings	24 VDC: 7 A with L/R = 5 mS 120 VAC: 10 A 120 VAC: 1/6 HP 230 VAC: 7 A

Specifications: PR-1	
Operating Voltage	18 – 35 VDC, 18 – 35 VAC, 120 VAC
Operating Current	15 mA DC max. @ 24 VDC, 24 VAC, 120 VAC
Operating Temperature	–40°F to 158°F (–40°C to 70°C)
Humidity Range	10 – 93% RH
Wire Length	8˝ minimum
Dimensions	0.87˝H × 2.01˝W × 1.42˝D
Contact Ratings	24 VDC: 7 A with L/R = 5 mS 120 VAC: 7 A max. (0.35 PF) 250 VAC: 10 A resistive 30 VDC: 10 A resistive

Specifications: PR-2/PR-3	
Operating Voltage	10 to 40 VDC
Operating Current	30 mA DC max.
Operating Temperature	–40°F to 158°F (–40°C to 70°C)
Humidity Range	10 – 93% RH
Wire Length	8˝ minimum
Dimensions	0.91˝H × 1.65˝W × 1.22˝D
Contact Ratings	120 VAC: 10 A max. (resistive load) 120 VAC: 7 A max. (0.35 PF) 250 VAC: 10 A max. (resistive load) 30 VDC: 10 A max. (resistive load)

Specifications: EOLR-1	
Operating Voltage	9 to 40 VDC
Operating Current	20 mA DC max.
Operating Temperature	–22°F to 140°F (–30°C to 60°C)
Humidity Range	10 – 93% RH
Wire Length	8˝ minimum
Contact Ratings	120 VAC: 0.5 A max. (resistive load) 30 VDC: 3 A max. (resistive load)

PR–1



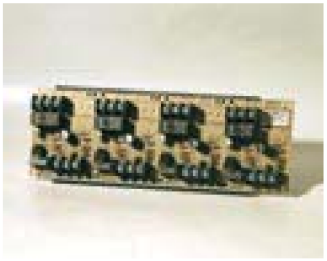
EOLR–1

PR–3

R-10E & R-20E Enclosure

PR–2

R–10T



R–14T

R-14E & R-24E Enclosure

SYSTEM SENSOR®

3825 Ohio Avenue • St. Charles, IL 60174
Phone: 800-SENSOR2 • Fax: 630-377-6495

A05-0372-005 • 3/07 • #1782

DTK-120SRD

54kA Series Connected Surge Protector with Dry Contacts
General Product Specifications

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DITEK's DTK-120SRD protects 120V power on electrical circuits and control panels and has Dry Contacts for remote notification of surge protection status. The hybrid series design provides maximum critical load protection, with EMI/RFI filtering. The 120SRD is ideal for use in UL Listed control panels where a UL Recognized Component is required. Use DITEK's DTK-TSS4D when a UL Listed series surge protector with Dry Contacts is required.

DTK-120SRD

Product Features

- Series design for fast response and best protection
- Compact design fits in a variety of control panels
- Suitable for use on circuit breakers rated at 10kA AIC
- Multi-stage hybrid circuit design
- UL 1283 EMI/RFI filtering
- LED indicates protection status
- Form C Dry Contact circuit
- Ten Year Limited Warranty

Specifications

Agency Approvals: UL1449 3rd Edition, cUL, UL1283
Protector Type: Type 2 Component Assembly for use in Type 2 Applications
Nominal Discharge Current Rating (In): 3kA
SCCR: 10kA
Operating Voltage: 120VAC
MCOV: 150VAC
Peak Surge Current: 54,000 Amps
Maximum Continuous Current: 20A
EMI/RFI Attenuation: Up to 35dB, 100kHz-100MHz
Protection Modes: All modes (L-N, L-G, N-G)
Voltage Protection Rating: 600V
Temperature Range: 32°F – 104°F (0°C - 40°C)
Dimensions: 6.87" x 3.50" x 2.50"
(174.50 mm x 88.90 mm x 63.50 mm)
Weight: 12.16 oz.
Housing: ABS

One DITEK Center
1720 Starkey Road
Largo, FL 33771

1-800-753-2345 Direct 1-727-812-5000
Technical Support: 1-888-472-6100
www.ditekcorp.com

Document: SPS-100007-005 Rev 1 03/13

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DTX Series
Alarm Transceiver

Description

SigCom's DTX Series is a family of extremely versatile and cost effective Alarm Reporting/Command & Control Transceivers. The DTX may be configured to operate as a one-way radio transmitter, a two-way radio transceiver or a combination of both radio configurations and fiber-optic communications. The two-way configuration allows the system to be used for command/control functions that are well suited for industrial, institutional and military applications including *Mass Notification Systems*. Each means of communications is independent of the other, providing maximum reliability.

When combined with SigCom's Vision 21 System Processor, all of the DTX configurations are Factory Mutual (FM) Approved as both Public and Proprietary Alarm Reporting Systems (NFPA 72).

The DTX is available with 4 or 16 supervised, dry contact inputs that can be used for zone alarm reporting and or other status reporting functions as needed per application requirements. There is also an additional input used for external, user operated alarm activation. The DTX can also interface with a serial port (RS-232 or RS-485) connection from a control panel. Zone input circuits and external switch contacts can be assigned with up to 32 different event types.

The relay option provides 4 relays with Form C contacts that can be programmed to operate by that DTX, by remote control from the Vision 21 System Processor (in a two-way system) or combinations of local and remote control. These relays can be programmed to operate upon receipt of a specific zone alarm and /or trouble event.

When used with our optional Mass Notification (Incident Reporting & Notification) software, the output relays can be used to activate live or pre-recorded voice communication to outdoor areas, specific buildings, groups of buildings or throughout an entire military complex, campus or industrial/ institutional facility. Serial interfaces are also available for enhanced functionality in some applications.

Features

- One or Two-Way Radio
- Four or Sixteen Supervised Initiation Circuits
- Prioritized Alarm & Trouble Messages
- Transmits 32 Different Event Types

Optional:

- Multi-Mode Fiber- Optic Transceiver
- Serial Port for Data Communications with Intelligent Panels and Devices
- 4 Command /Control Relays (Form C)
- Mass Notification
- Weatherproof Enclosure (NEMA 3R)

FM APPROVED

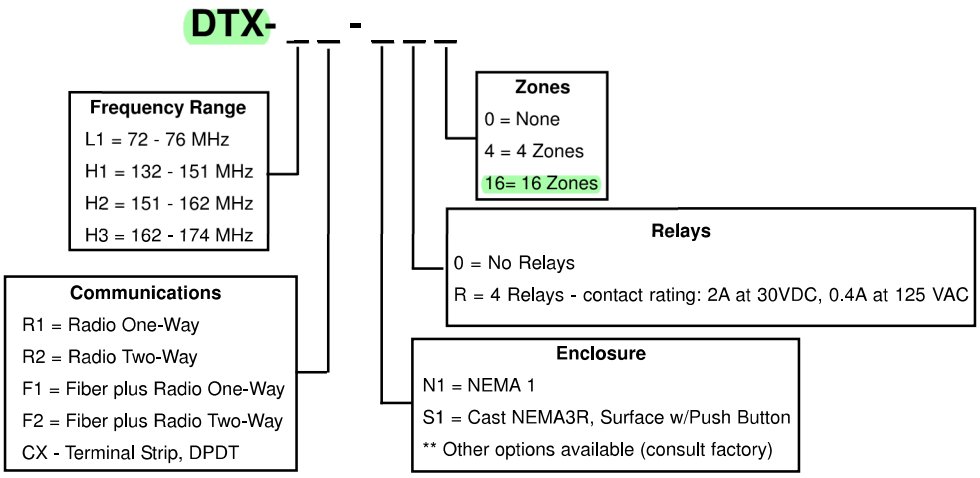
SIG COM

Signal Communications Corporation

Specifications

Listings:	FM Approved
Zone Inputs:	4 or 16
Zone Display:	Alarm & Trouble per Zone
Serial Input:	RS-232 or RS-485 96 Zones, 32 Functions, 999 Devices per Zone
Enclosure, Indoor:	Sheet Metal NEMA 1 (14"h x 12"w x 6"d)
Enclosure Outdoor:	Cast Metal NEMA 3R (21"h x16"w x 9 7/16"d)
Temperature Range:	-40^{0}F to 150^{0}F (-40^{0}C to 65^{0}C)
<u>Radio Transmitter</u>	
Output Power:	Narrowband FM Transmission 1 Watt (72 - 76 MHz) 4 Watts (138 - 170 MHz)
<u>Fiber-Optic Interface</u>	
Fiber:	62.5/125 Micron, Multi-Mode
Light Sources:	850 nm LED
Connectors:	ST Type
<u>Power Supply</u>	
Primary Power:	120 VAC
DC Power:	24 VDC
Battery:	12 V, 7AH
Back Up:	Minimum 72 hours with fully configured system Up to 144 hours depending on configuration

Ordering Information



Signal Communications Corporation
P.O. Box 2588 Woburn, MA 01888 Tel.: 781 933 0998 Fax.:781 933 5019
www.sigcom.com

DTX Box Installation Guide

Note: Please see local fire chief or district supervisor for box key.

IMPORTANT: Be sure to notify the fire department or other authority before initializing or servicing the box.

1.1 Mounting the DTX Transmitter Box Housing

IMPORTANT NOTICE - PLEASE READ CAREFULLY

The DTX Transmitter box must be installed in accordance with manufacturer's instruction to maintain the warranty. It is the responsibility of the installer to assure a weather-tight installation. All fittings and joints shall be sealed with an appropriate compound, which will maintain an effective seal over temperature extremes and time. Compression type fittings are not recommended.

***CAUTION**: Do not connect batteries or AC power until completing all steps in Sections 1.1-1.4 Step 4.*

1.1.1 Mounting the NEMA 1 Enclosure

Refer to Drawing **1000-0569-1, Illustration, NEMA 1 Box Enclosure**

If possible, try to locate the box on the side of the building closest to the antenna to minimize the cable run from the box to the antenna.

Below are step-by-step instructions for mounting the NEMA 1 enclosure.

1. Open the enclosure.

2. Loosen the captive screw on the right side of the label plate and undo the 6-32 screws on the left side of the label plate.

3. Disconnect the cables from the printed circuit board making note of which jacks they were plugged into.

4. Remove the label plate and the P.C. board assembly from the enclosure.

5. Remove four 10-32 screws from the corners of the backplate and pull the backplate from the enclosure.

6. Mount the enclosure to the wall using four ¼-inch bolts and the appropriate wall anchors.

1.1.2 Mounting the Cottage-Shape Enclosure

Refer to Drawings **1000-0144, Flush Mount Master Box Installation** and **1000-0172, Surface Mount Master Box Installation**

If possible, try to locate the box on the side of the building closest to the antenna to minimize the cable run from the box to the antenna.

Below are step-by-step instructions for mounting the cottage-shape enclosure.

1. Open the enclosure.

2. Loosen the captive screw on the right side of the label plate and undo the 6-32 screws on the left side of the label plate.

3. Disconnect the cables from the printed circuit board making note of which jacks they were plugged into.

4. Remove the label plate and the P.C. board assembly from the enclosure.

5. Remove four ¼-20 hex-socket head bolts from the corners of the backplate and pull the backplate from the enclosure.

6. Mount the enclosure to the wall using four 3/8-inch bolts and appropriate wall anchors. If the box is to be mounted on a pole, refer to Drawing **1000-0568, Typical Master Box Installation**.

1.2 Antenna & Cable Installation

Refer to Drawing **1000-0173-1, Surface Mounted Antenna Installation**

The standard antenna mounting consists of a short support tube and wall brackets that stand the antenna off the wall to ensure proper radiation characteristics. The antenna should be mounted on the side of the building facing the receive site. The immediate surroundings of the antenna should be free of obstructions such as trees and other buildings that tend to attenuate the radio signal. In certain installations, the support tube may be extended to allow proper clearance over such obstructions. Avoid mounting the antenna near any large metal objects that would distort the propagation pattern of the radio signal or affect the VSWR of the antenna

The antenna cable should be installed in conduit with all joints completely sealed to prevent water entry. The connection from the antenna to the point of entry to the box should be made using RG-

213 cable or equivalent with 50 ohm characteristic impedance. Inside the box, a short section of RG-58 "pigtail" adapter is supplied with the proper connectors to make the final connection to the transmitter. Please refer to Drawing **1000-0173-1** for typical surface mounted antenna installation, and Drawing **1000-0568** for typical pole mounted antenna installation.

Below are step-by-step instructions for installing the antenna, antenna cable and conduit:

1. Determine the mount location for the antenna that will offer the best radio path to the receiving console and minimize the antenna cable length (under 75 ft. is preferred).

2. Mount the two antenna supports (p/n 190-0392) as shown in Drawing **1000-0173**. The antenna supports come complete with hardware necessary for most installations. The top support should be at least 13 ft. from ground level.

3. Secure the antenna mounting tube (p/n 890-1484) in place as shown in the drawing.

4. Insulate the exterior union of the antenna cable to the antenna using the insulation tape provided in the installation kit. Wrap the joint in a clockwise manner tightly and completely, keeping the striped side of the tape to the outside.

1.3 External Wiring

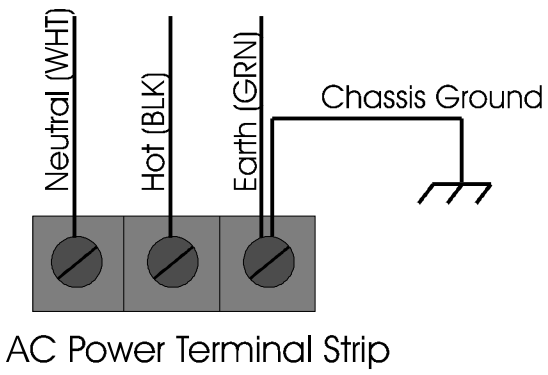
Before power up, the DTX Transmitter box requires connections to the following: The AC power service, the zone input circuits and/or fire alarm control panel, the antenna, and fiber optic cable if applicable. Separate conduit must be used for the AC cable, the zone input cable, and the antenna cable.

See Section **1.2 Antenna & Cable Installation** for details about the antenna installation and connections.

1.3.1 AC Power

The AC power service to the DTX Transmitter box connects to the 3-position terminal block on the top right side of the backplate. The AC power input must be supplied in its own conduit from a 120VAC source with a protective earth ground (green) conductor. If possible, the DTX Transmitter box and the interior fire alarm control panel (if used) should share the same AC power circuit.

The AC power input is protected by a 3/8 Amp slow blow fuse in the power supply assembly (490-0180). The AC fuse is labeled "F2 AC Fuse" on the front of the power supply bracket and it mounts inside a twist-on type of fuse holder. Pulling out the AC fuse holder will disconnect AC power from the system and generate an AC fault transmission. When powering up the system, the AC fuse must be installed before the battery fuse.



1.3.2 Zone Input Circuits

IMPORTANT

The zone input conductors **must not carry any induced AC voltages**. AC voltages / currents on the zone input wires may cause unpredictable effects. Connect to **DRY CONTACT** devices only.

1. It is recommended to run wiring conductors and AC current carrying conductors in separate conduits.

2. For loop conductors longer than 100 feet, it is recommended to use twisted pair shielded cable. The cable should be grounded to the box's frame which is located at the metal backplate.

The Zone Input Circuits (initiating device circuits) to the DTX Transmitter box connect to connectors J1, J3, J5, and J6 on the Zone Input PCB assembly. These terminal blocks can be unplugged from the printed circuit board for wiring purposes. The end of line resistors provided should be removed from the terminal block and installed at the last initiating device in each loop. Once the loop wires are secured to each terminal block, it can be plugged into the corresponding connector. To disconnect a zone input circuit from the system and place it in a fault condition, simply unplug the corresponding terminal block. 18 AWG solid conductor size is adequate for wiring the zone input circuits. However, zone circuit wiring must meet local codes and requirements for low voltage/low current circuits. The zone input terminal blocks can accept up to a size 14 AWG conductor.

Zone input loop wiring is considered low voltage wiring (6vdc max) and it must not be run in the same conduit as AC power circuits. To avoid interference and false alarms keep zone input wiring away from AC power wiring and from any other circuits that carry digital switching currents such as addressable loops, serial communications circuits, and other sources of electromagnetic interference.

Each initiating device circuit can support an unlimited number of devices. The devices installed must have normally open contacts that close for alarm conditions. The maximum wire length of a zone input circuit is dependent on the wire gauge used for the installation. For 18 AWG wire,

zone input circuits of up to ½ mile can be supported, provided that the wiring is properly shielded from noise and interference (consult the factory for applications requiring zone input circuit wiring ½ mile or longer). It is recommended to use twisted pair, overall shielded cable, for installations that have long runs of wiring for the zone input circuits. Adequate lightning protection must be provided for wiring that runs outside in areas that are susceptible to lightning. Lightning protection devices must be installed at the point where the wiring enters the building and not at the DTX Transmitter box. After the wiring is completed, record identifying information regarding each zone or device monitored on the door label provided.

1.3.3 Control Panel

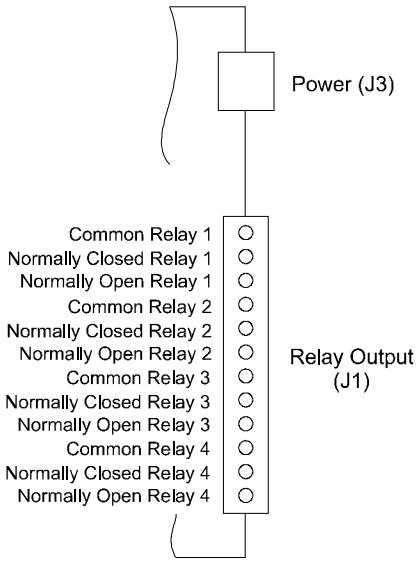
*Note: Do not connect the control panel to the DTX Transmitter until the box parameters have been programmed (see Section **2.0 Programming Software**).*

The control panel connects to the DTX Transmitter through the serial port located on the DTX Main PCB. The serial port's communication parameters and interface (RS-232 or RS-485) are factory programmed. The control panel connects to the serial port via a 9 pin male D connector. The required lines for cables for individual panels are detailed in **Section 3.0**. JP1 should be removed to enable the DTX Transmitter's control panel protocol. *Note: Leave the jumper connected to one pin of JP1 to prevent losing it. This jumper is necessary when box programming is required.* See **Section 4.0** for the serial port and jumper locations.

The DTX Transmitter's intrusion switch overrides the JP1 jumper causing the serial port to revert to the control panel protocol when the DTX Transmitter's door is closed.

1.3.4 Relay Outputs

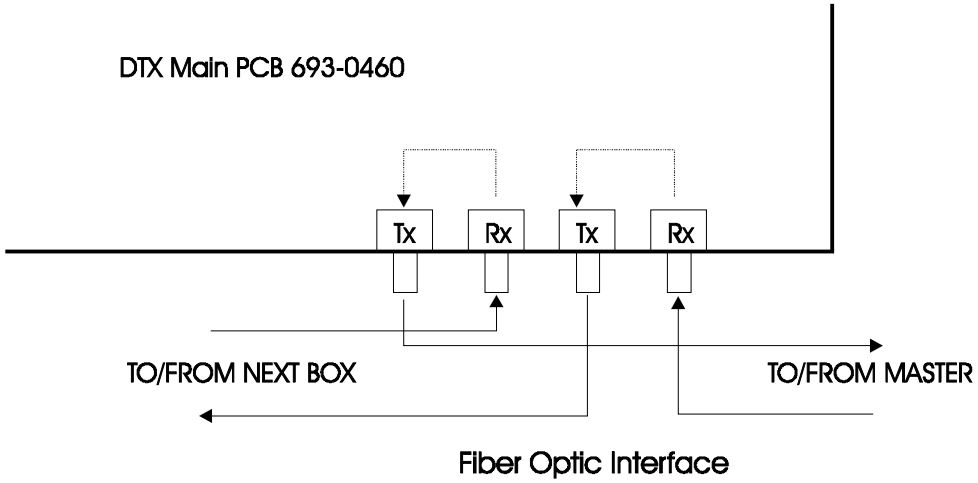
Terminal block J1 provides connections to the Auxiliary Relay contacts. The Auxiliary Relays have a form C contact arrangement where the normally closed, normally open, and the common contacts of each relay are available on terminal block J1. Please refer to the relay connection diagram below for a detailed pinout of terminal block J1. Also refer to the specifications section at the end of this document for the contact ratings of the relays.



Relay Connections

1.3.5 Fiber Optic Interface

The fiber optic interface is integrated on the main printed circuit board and consists of two transmitters and two receivers with integrated ST type connectors to provide two-way fiber optic communications. The system is designed to interface with standard 62.5/125 micron, multi-mode fiber (2 fibers), using 850nm LED sources. In order to maximize the distance between boxes, care should be taken to minimize the attenuation due to connector terminations and splicing in the fiber.



Fiber Optic Interface

1.4 Reassembly & Start Up

Below are step-by-step instructions for reassembling and starting up the DTX Transmitter box.

1. Turn off the circuit breaker supplying AC power to the box.

2. Install the backplate into the enclosure with four 10-32 screws.

3. Connect the zone input circuits to the Zone Input Circuit PCB as described in Section **1.3.2 Zone Input Circuits**.

4. Remove AC terminal strip plastic cover. Attach the AC power wires to the AC terminal block as described in Section **1.3.1 AC Power**. Be sure to replace the plastic cover over the terminal.

5. Attach the antenna cable coax connector to the radio transmitter.

6. Remount the label plate assembly to its brackets using the 6-32 screws. Reconnect the cables to the P.C. board.

7. Remove the 1.0 amp DC battery fuse (F1). Leave the AC fuse F2 in place.

8. You **MUST** notify the fire department before applying power to the box. Turn on the circuit breaker supplying AC power to the box.

9. When AC power is applied to the box, the green AC Power LED indicator will light and the beeper will sound on and off once per second. No other function will be performed until the box is properly configured .

10. Connect the DTX Programmer laptop to the serial port and proceed with programming the box as described in Section **2.0 Programming the DTX Transmitter**.

11. If necessary, connect the control panel to the DTX Transmitter's serial port as described in Section **1.3.3 Control Panel**.

12. After the configuration is complete and the box is reset, the DTX Transmitter box will detect a low battery condition, turn on the Common Fault LED and sound the steady tone indicator.

13. Connect the red and black battery power wires to the positive and negative terminals of the battery respectively. Verify that the battery is properly seated in the enclosure.

14. Install the battery fuse (F1). The low battery fault condition should clear within 10 seconds.

15. Remove the AC fuse (F2), the green AC Power LED will go off. The DTX Transmitter box will transmit an AC fault signal immediately if it is programmed to do so.

16. Replace the AC fuse and verify that all fault conditions clear.

2.0 Programming the DTX Transmitter

The DTX Transmitter can be programmed at any time. All box operations are maintained during the programming except control panel communications.

The DTX Transmitter utilizes its serial port for communicating with a control panel and the DTX Programmer. Therefore, it must be configured via JP1 to identify the connected device. Remove JP1 to allow the DTX Transmitter to communicate with a control panel. Install JP1 to allow the DTX Transmitter to communicate with the DTX Programmer. *Note: closing the DTX Transmitter's door overrides the JP1 jumper setting and the serial port reverts to a control panel port.*

The PC COM port used for the communication must be configured with the same communication parameters used by the control panel attached to the DTX Transmitter (See **Section 3.0**).

2.1 Connecting the DTX Programmer

Steps for connecting the DTX Programmer PC to the DTX Transmitter.

1. Open the DTX Transmitter door
2. Install jumper JP1
3. Disconnect control panel (if any) from the DTX Transmitter's serial port. *Note: the control panel will go into trouble while it is disconnected from the DTX.*
4. Connect the PC cable to the serial port. Consult section **3.0 Serial Port Communications** for the appropriate cable connections for your DTX Transmitter.

2.2 Setting Box Parameters

The following are the basic steps involved in configuring a DTX Transmitter with the DTX Programmer. See the DTX Programmer help file for more detailed instructions on programming the DTX Transmitter.

1. Start the DTX Programmer software.
2. Select and configure a COM port. Consult section **3.0 Serial Port Communications** for the appropriate port settings for your DTX Transmitter.
3. If you have DTX Programmer 1.3 or later click the **Connect** button to initiate communication with the DTX Transmitter. Otherwise, proceed to step 4.
4. Click the **Get Settings** button to get the current settings for the connected box.
5. Click the Settings tab to determine what parameters must be set. *Any parameters displayed in red must be set for the DTX Transmitter to operate.*
6. Optionally, load the settings from a previously saved file or template.
7. Set/change the desired parameters.
8. Save the new box settings to disk.
9. If the DTX Transmitter is being programmed for the first time or is being reprogrammed as the result of an error with the programmed settings, it must be reset after the programming is complete.

2.3 Disconnecting the DTX Programmer

Steps for disconnecting the DTX Programmer PC from the DTX Transmitter.

1. Disconnect the PC cable from the serial port.
2. Reconnect the control panel (if any) to the DTX Transmitter's serial port.
3. Remove jumper JP1
4. Close the DTX Transmitter door.

3.0 Serial Port Communications

Cables

The DTX Transmitter's serial port communicates using three or four wires for RS-232 connections and 2-wire (18 AWG minimum), half-duplex for the RS-485 connection. The following table details the required cable pin connections for the supported interfaces.

Control Panel		**DTX Serial Port Pin**			
		2 (RX)	**3 (TX)**	**5 (GND)**	**7 (RTS)**
IQ-140 Port 3		3	2	-	-
HSC 3030 Port 3		3	2	-	-
Cerberus MXL IQ TB3 or TB 4 (RS-485)		XMIT +	XMIT -	-	-
EST2 RS-232 Terminal Block		TXD	RXD	COM	-
Simplex Port B		Tx	Rx	GND	CTS
Simplex 4010 P6 Port B, CRT/Keyboard		1 (TXD)	2 (RXD)	3 (RTN)	5 (CTS)
Notifier RS-485		Tx +	Tx -	-	-
Notifier NFS-640 Printer Terminal Block		Tx	Rx	REF	
Notifier 3030 TB5		2	1	3	5
DVS/DVS+ J2		4	6	1	-
FCI 7100		Use FCI cable RJ11-DB9PC			
DTX Programmer	RS-232	3	2	5	-
	RS-485	XMIT +	XMIT -	-	-

Device	**DTX Secondary Serial Port U17**		
	3 (RX)	**2 (TX)**	**1 (GND)**
DVS+ J2	4 (T)	6 (R)	1 (G)

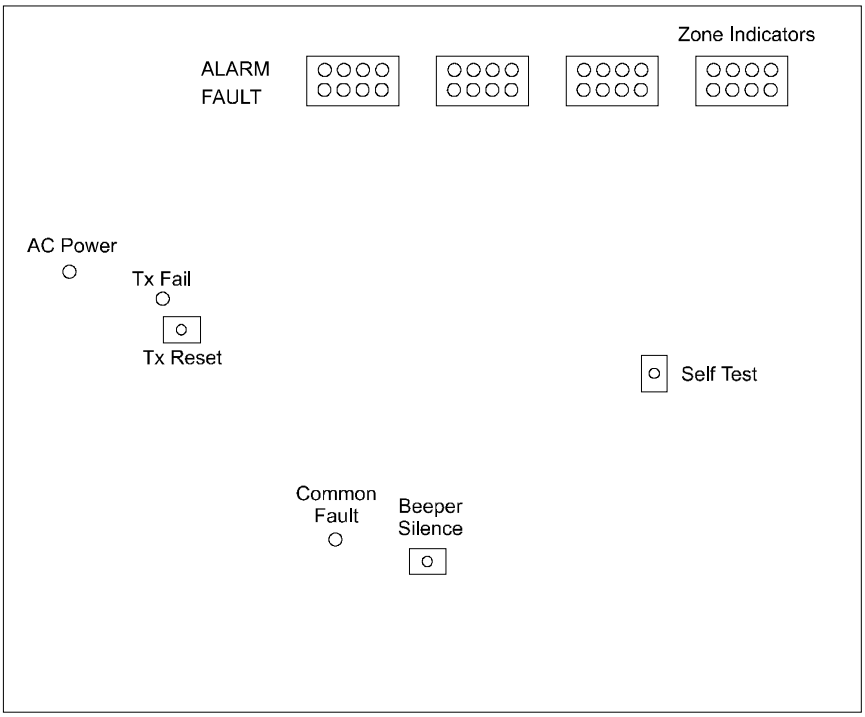
Communication Parameters

The DTX Transmitter's serial port comes preset with the following serial communication parameters based on the factory programmed control panel interface.

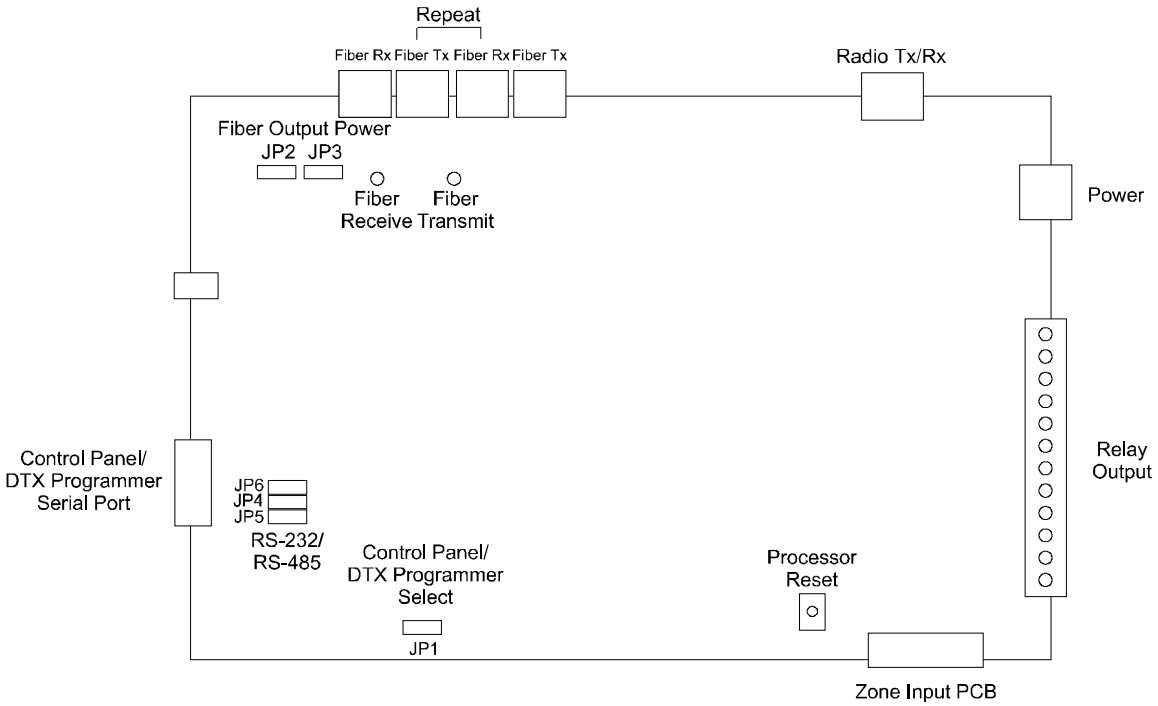
Control Panel	Interface	Baud Rate	Data Bits	Stop Bits	Parity
IQ-140	RS-232	9600	8	1	Even
HSC 3030	RS-232	9600	8	1	Even
Cerberus/Siemens MXL-IQ	RS-485	1200	7	1	Even
EST 2	RS-232	9600	8	1	Even
Simplex with 4100 Computer Port Protocol	RS-232	9600	8	1	Even
Simplex 4010	RS-232	9600	8	1	Even
Notifier w/ SigCom Protocol	RS-485	9600	8	1	None
Notifier AFP-200 or NFS-640	RS-232	2400	8	1	None
Notifier 3030	RS-232	2400	8	1	None
FCI 7100	RS-232	9600	8	1	None
No control panel	RS-232	9600	8	1	None

4.0 DTX Front Panel LEDs, Buttons and Connectors

Front



Back



Drawings

Drawing 1000-0569-1, Illustration, DTX, Enclosure, NEMA 1

Drawing 1000-0144, Flush Mount Master Box Installation

Drawing 1000-0172, Surface Mount Master Box Installation

Drawing 1000-0568, Typical Master Box Installation

Drawing 1000-0173-1, Surface Mounted Antenna Installation

Drawing 1000-0727, Installation, DTX Box, NEMA 1/Cast Enclosure

Drawing 1000-0550-1, DTX Zone Installation

Installation Kit Parts Breakdown, SigCom Assembly #DTX-IK-01

	Quantity	
1. Pn# 190-0713 Antenna Fiberglass 72-75 MHz	1	
2. Pn# 290-0039 Connector Coaxial Plug (PL-259)	2	
3. Pn# 290-0049 Connector Coaxial Adapter (PL-258)	1	
4. Pn# 190-0392 Antenna Mounting Bracket	1	
5. Pn# 590-0055 Antenna Interface Cable	1	
6. Pn# 195-0082 Silicone Insulating Tape	8”	
7. Pn# 890-1484 Antenna Adapter Tube 24”	1	
8. Pn# 291-1195 End of Line Resistor 1W 20K	16	(Note: if 16 zone box)
9. Pn# A10074 End of Line Resistor 1W 10K	4	(Note: if 4 zone box)

Installation Kit Parts Breakdown, SigCom Assembly #DTX-I K-11

	Quantity	
1. Pn# 190-0730 Antenna Fiberglass 120-150 MHz	1	
2. Pn# 290-0039 Connector Coaxial Plug (PL-259)	2	
3. Pn# 290-0049 Connector Coaxial Adapter (PL-258)	1	
4. Pn# 190-0392 Antenna Mounting Bracket	1	
5. Pn# 590-0055 Antenna Interface Cable	1	
6. Pn# 195-0082 Silicone Insulating Tape	8”	
7. Pn# 890-1484 Antenna Adapter Tube 24”	1	
8. Pn# 291-1195 End of Line Resistor 1W 20K	16	(Note: if 16 zone box)
9. Pn# A10074 End of Line Resistor 1W 10K	4	(Note: if 4 zone box)
10. Pn# 190-0718 Hose Clamp	1	

Additional Items for Pole Mount Installations

	Quantity
1. Pn# 890-1123R Pole Clamp	2
2. Pn# 390-0068 Antenna Adapter	1
3. Pn# 290-0016 Ground Strap	1
4. Pn# 191-0056 8-32 3/8 Binder Head Screw	1
5. Pn# 193-0000 #8 Washer	1
6. Pn# 191-0075 3/8-16 1” Hex Head Bolt	4
7. Pn# 190-0119 Sealing Washer	4
8. Pn# 191-0112 ¼-20.3/4 Hex Nut	3
9. Pn# 193-0021 ¼ Lockwasher	3
10. Pn# 590-0148 Antenna Cable	1

All DTX Assemblies will automatically include the following

	Quantity
1. Pn# BATT12V6.5AH Battery	1

UHF Cable Assembly Instructions

PL-259 Connector

PROCEDURE

1) Evenly cut the cable end.

2) Strip the jacket, braid, and dielectric to the dimensions shown in Diagram A. All cuts should be sharp and square. Do not nick the braid, dielectric, or center conductor. After cutting through the dielectric, the braid should be pulled back, not cut. (note 4)

3) Tin the entire length of the exposed center conductor. (note 5)

4) Lightly tin several places around the braid. The braid should have a complete circle of solder while the amount of solder drawn under the insulating jacket is minimized. The connector may not work properly if the conductor and braid are not adequately tinned. (note 5)

5) Slide the coupling ring on the cable. (note 3)

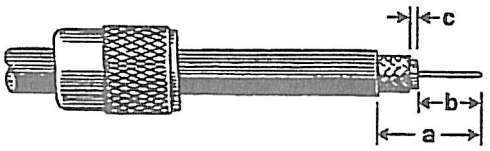
6) Screw the plug sub-assembly onto the cable. See Diagram B.

7) Solder the plug to the braid through the 4 solder holes, making a good bond between the braid and shell. The solder should dimple into the holes.

8) Solder the center conductor to the contact. Do not use excessive heat.

9) For final assembly move the coupling ring for ward and screw into place on the plug sub-assembly. See Diagram C.

Diagram A



	Description	Length
a	Insulation jacket to end	1 ¼ inches
b	Center conductor exposed	⅝ inches
c	Dielectric exposed	1/16 inches

Diagram B

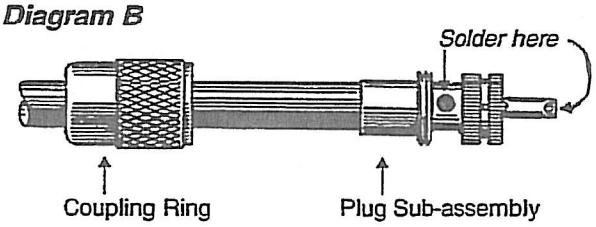
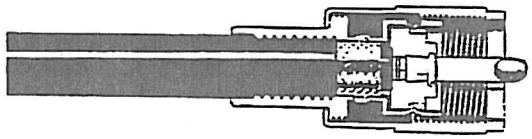


Diagram C



NOTES

1) Use at least a 140 Watt soldering iron.

2) PL-259 Connector is to be used with RG-213 or RG8U cable.

3) A cable cannot be used if the coupling ring is left off. The coupling ring is used to attach the cable to a jack and provides a path for the circuit ground.

4) If many cables need to be assembled a coax cable stripper may be beneficial. The tool may be purchased from SigCom or other suppliers.

5) Tinning is the process of preparing a material before two pieces are soldered together. The material is heated to the melting point of the solder. The solder is placed in contact with the material, not the soldering iron. When the material reaches the appropriate temperature, the solder melts and spreads, creating a solid bond between the solder and material. Failure to properly tin a material results in a cold solder joint which is physically weak and results in a poor electrical connection.

Antenna Installation Precautions

1) Determine the appropriate mounting location for the antenna that offers the best radio path to the receiving console and minimizes the cable length. (A cable length less than 75 feet is desired.)

2) Avoid mounting the antenna where the building is in the transmit path.

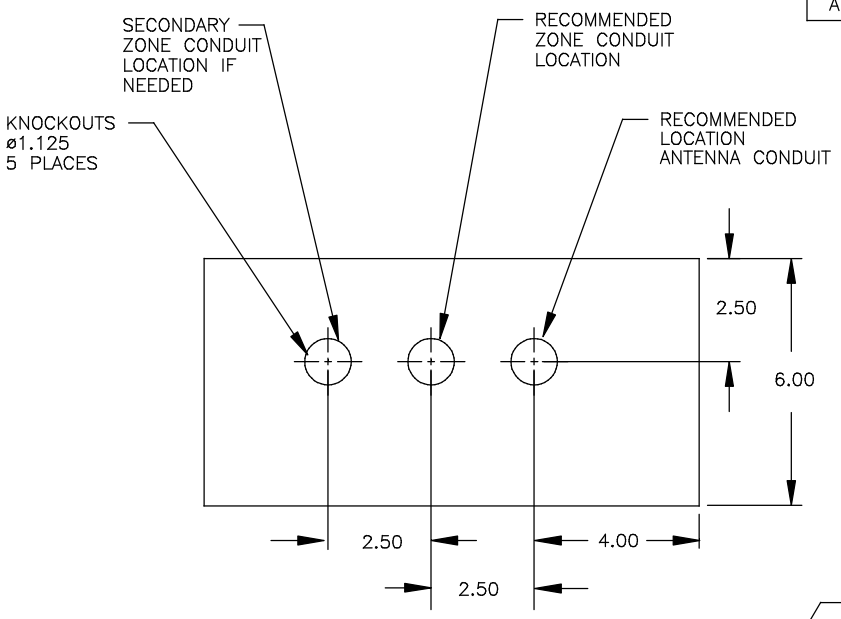
3) Avoid mounting the antenna where the fiberglass portion of the antenna is next to a metal surface, such as drain pipes, gutters, flushing, aluminum siding, etc.

4) Be sure all outdoor conduit connections are water tight. All LB bottoms, or any point where water may gather need to have drain holes.

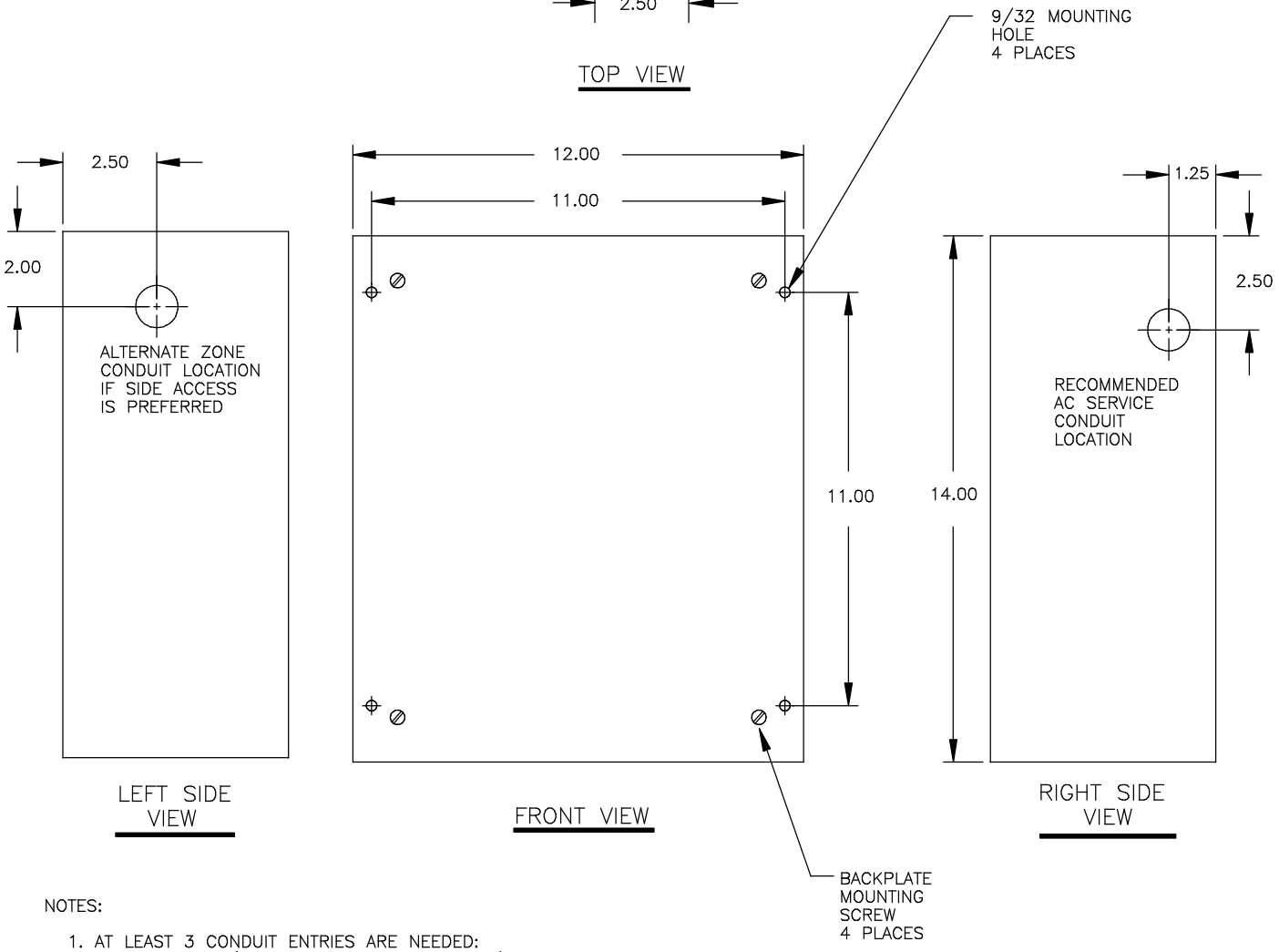
5) Installation of the PL-259 connectors are a critical part of the antenna system. Great care should be taken to ensure proper preparation of the cable and soldering of the connector.

6) Be sure to test the forward and reflected power of the antenna system. Make sure a good signal is received at the console.

REV	DATE	DESCRIPTION	DR.	APPRVL
A	2/06/02	RFD #892	FC	



TOP VIEW



LEFT SIDE VIEW

FRONT VIEW

RIGHT SIDE VIEW

NOTES:

1. AT LEAST 3 CONDUIT ENTRIES ARE NEEDED:
   - AC SERVICE (120V HOT, NEUTRAL, GROUND)
   - ANTENNA COAX
   - ZONE WIRES

   MORE THAN ONE CONDUIT MAY BE USED FOR ZONE WIRES IF NEEDED, OR PREFERRED, DEPENDING ON INSTALLATION SITE AND ZONE ROUTINGS.
2. HINGES AND DOOR NOT SHOWN.
3. REFER TO DWG. 1000–0727 FOR BACKPLATE INSTALLATION.
4. REFER TO SIGCOM MANUALS FOR MORE INSTALLATION INFORMATION.

DRAWN	FC
SCALE	NONE
	THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.
	DO NOT SCALE PRINT

SIGNAL COMMUNICATIONS CORP.
WOBURN, MASS.

TITLE ILLUSTRATION, DTx, ENCLOSURE, NEMA 1

UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES

DATE 2/07/02

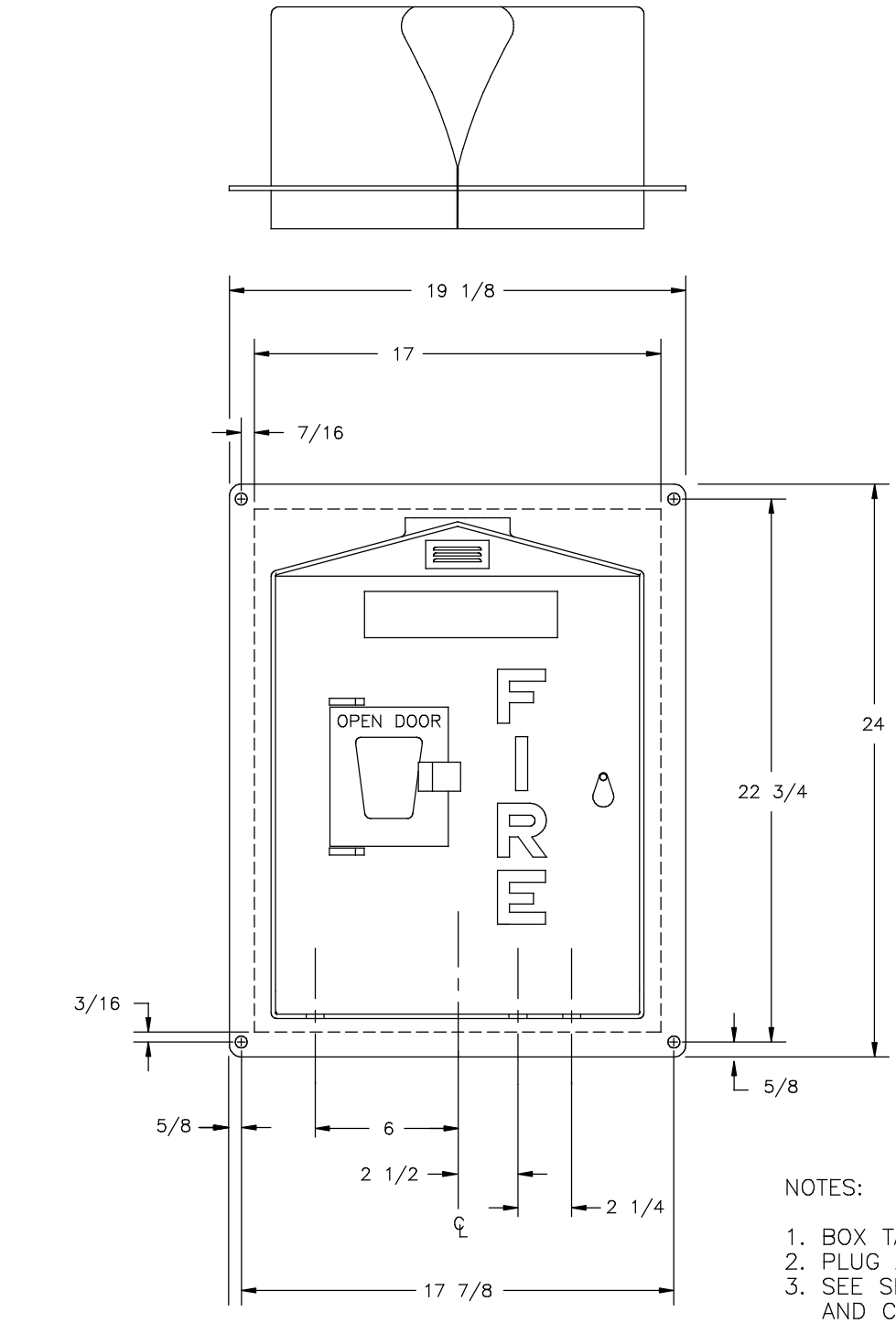
SIZE A | DRAWING NO. 1000–0569–1 | CAD FILE NO. 1000\0569–11A

SHEET 1 OF 1

REV A

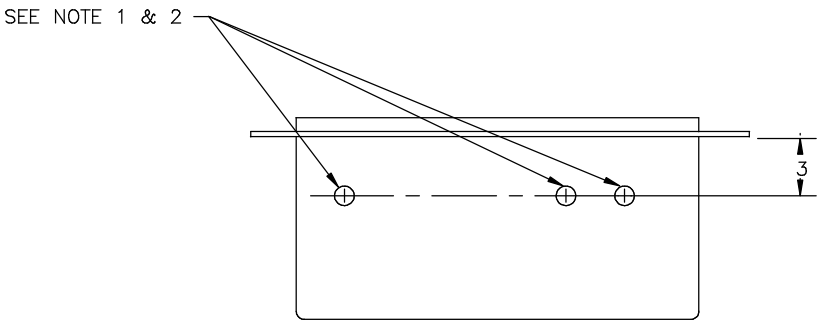
REV	DATE	DESCRIPTION	DR.	APPRVL
A	8/28/92	ECN #1955	BJC	
B	12-1-98	ECN 2313	FC	

TOP VIEW



NOTES:

1. BOX TAPPED 3/4 NPT, 3 PLACES.
2. PLUG ANY UNUSED HOLES.
3. SEE SHEET 2 FOR WOOD FRAME AND CONCRETE INSTALLATION AND ELEVATION SPECIFICATIONS.
4. THIS VIEW USED FOR ALL FLUSH MOUNTED INSTALLATIONS.

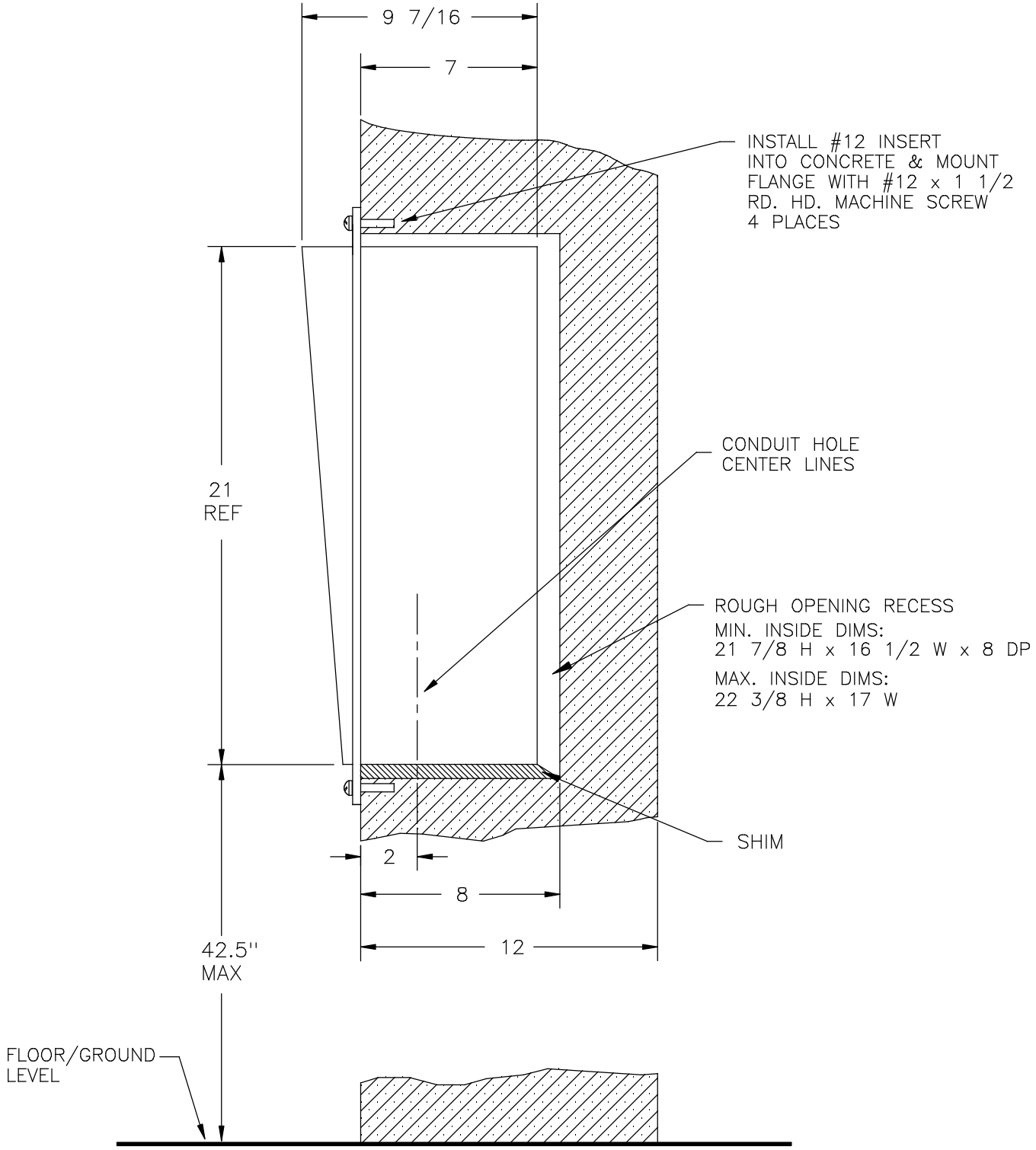


BOTTOM VIEW

DRAWN BJC	SIGNAL COMMUNICATIONS CORP. WOBURN, MASS.	
SCALE NONE		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE FLUSH MOUNTED INSTALLATION MASTER BOX PERMANENT MOLD	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 8/28/92
DO NOT SCALE PRINT	SIZE A; DRAWING NO. 1000-0144; CAD FILE NO. 1000\0144-01B	SHEET 1 OF 3; REV B

REV	DATE	DESCRIPTION	DR.	APPRVL
A	8/28/92	ECN #1955	BJC	
B	12-1-98	ECN 2313	FC	

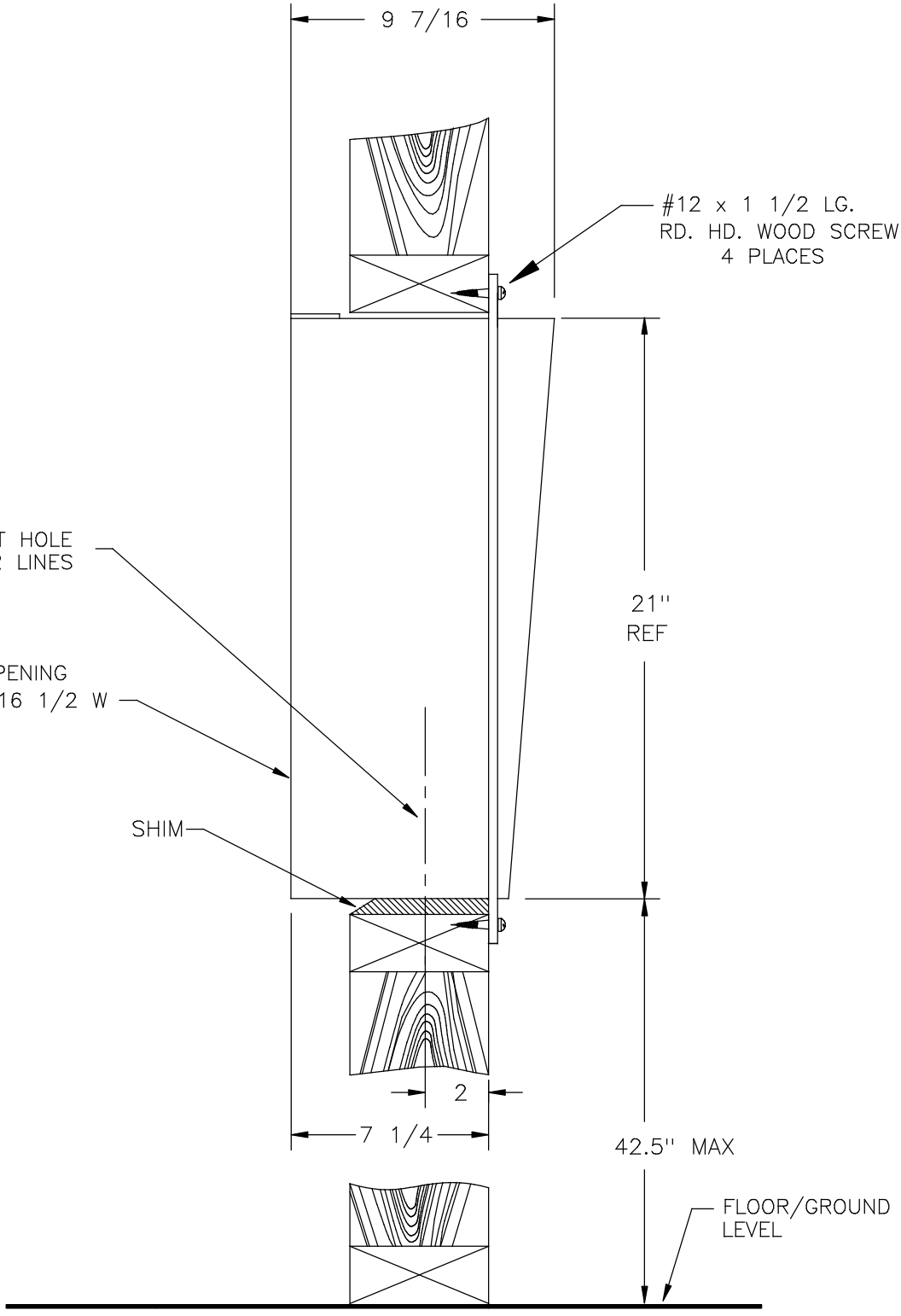
CEMENT BLOCK WALL



DRAWN BJC	SIGNAL COMMUNICATIONS CORP. WOBURN, MASS.	
SCALE NONE		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE FLUSH MOUNTED INSTALLATION MASTER BOX PERMANENT MOLD	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 8/28/92
DO NOT SCALE PRINT	SIZE A; DRAWING NO. 1000-0144; CAD FILE NO. 1000\0144-02B	SHEET 2 OF 3; REV B

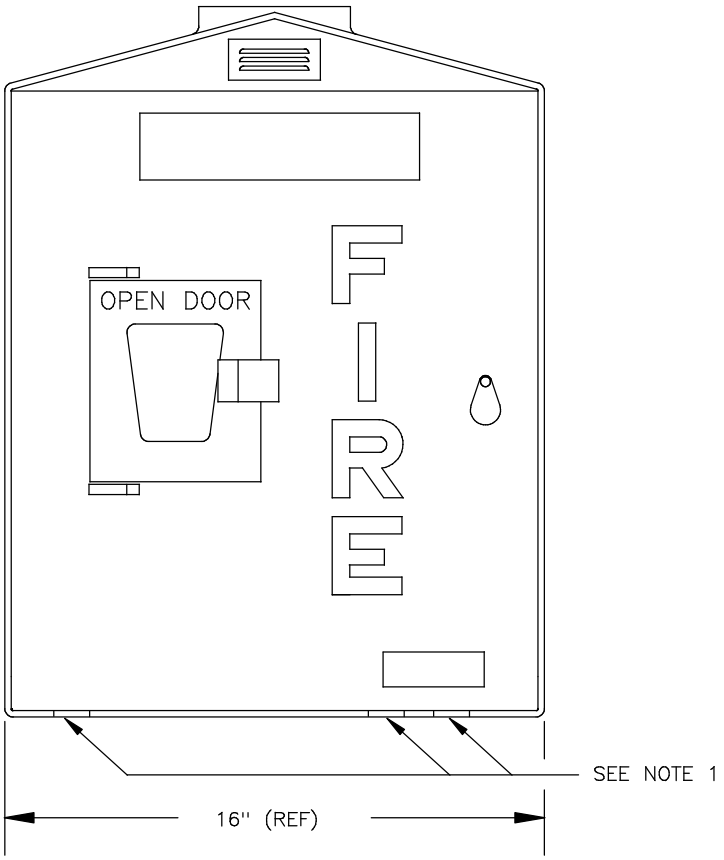
REV	DATE	DESCRIPTION	DR.	APPRVL
A	8/28/92	ECN #1955	BJC	
B	12-1-98	ECN 2313	FC	

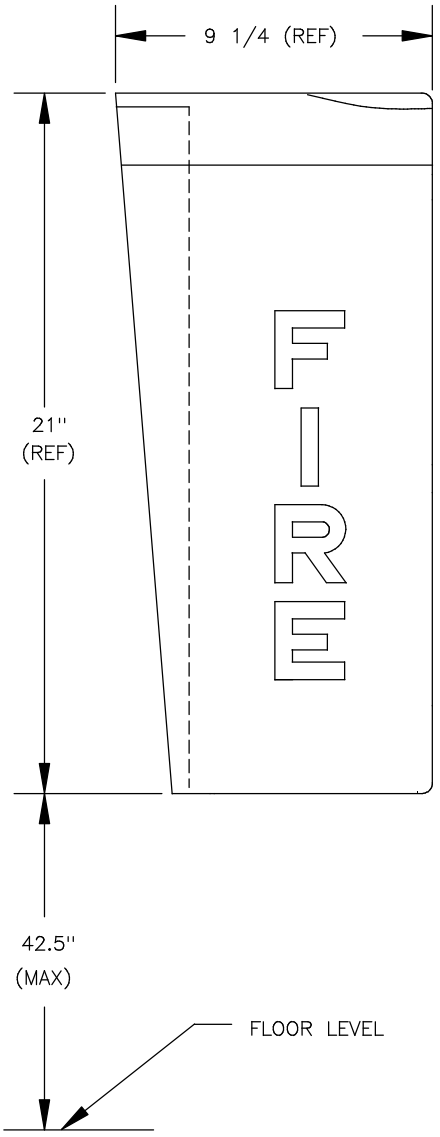
WOOD FRAME WALL



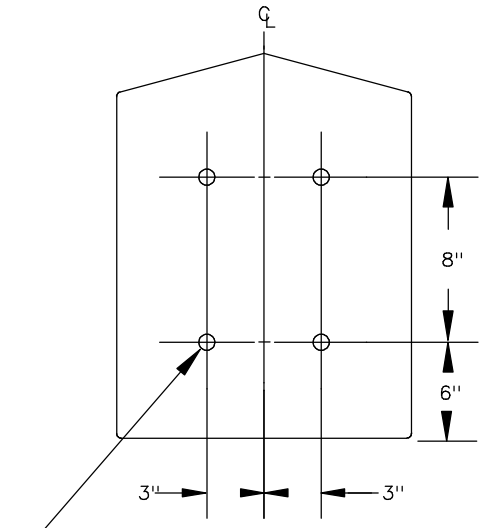
DRAWN BJC	SIGNAL COMMUNICATIONS CORP. WOBURN, MASS.	
SCALE NONE		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE FLUSH MOUNTED INSTALLATION MASTER BOX PERMANENT MOLD	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 9/1/92
DO NOT SCALE PRINT	SIZE A / DRAWING NO. 1000-0144 / CAD FILE NO. 1000\0144-03B	SHEET 3 OF 3 / REV B

REV	DATE	DESCRIPTION	DR.	APPRVL
A	7/27/92	ECN #1944	BJC	
B	10/13/94	ECN #2078	FC	
C	12-1-98	ECN 2313	FC	





MOUNTING PATTERN



Ø7/16 4 HOLES
USE 5/16" x 1 1/2" L
BOLTS OF TYPE COMPATIBLE
WITH WALL CONSTRUCTION

NOTES:

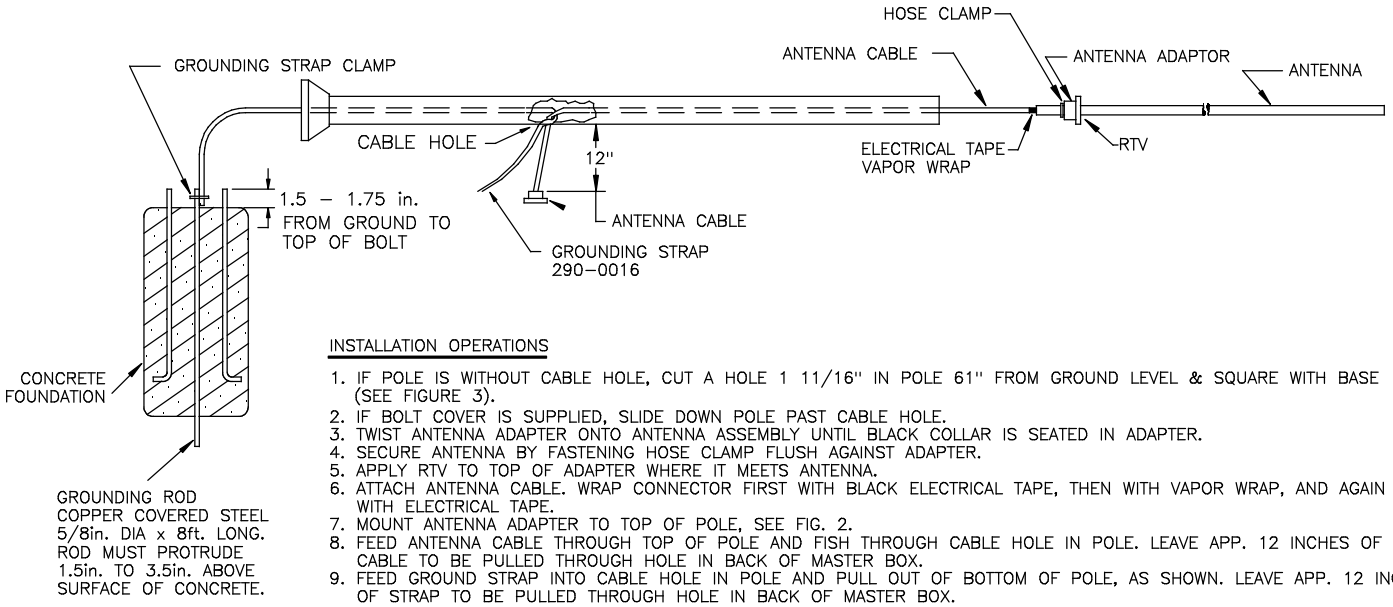
1. ALL CONDUIT ENTRY HOLES 3/4-14. THREADED PIPE ONLY. SEAL WITH TEFLON TAPE.
   3 IN BOTTOM.

DRAWN BJC	SIGNAL COMMUNICATIONS CORP. WOBURN, MASS.	
SCALE NTS		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE SURFACE MOUNTED INSTALLATION MASTERBOX	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 8/6/92
DO NOT SCALE PRINT	SIZE A / DRAWING NO. 1000-0172 / CAD FILE NO. 1000\0172-01C	SHEET 1 OF 1 / REV C

REV	DATE	DESCRIPTION	DR.	APPRVL
A	6/25/92	RFD #338	BJC	

FIG.1

ANTENNA ASSEMBLY & POLE PREPARATION

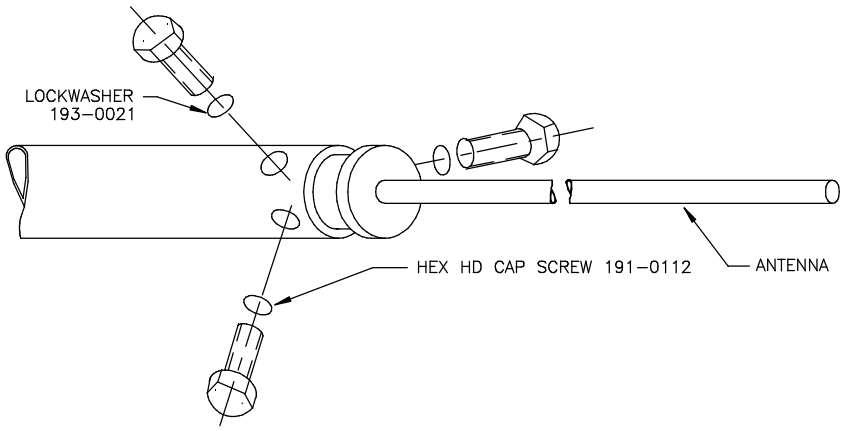


INSTALLATION OPERATIONS

1. IF POLE IS WITHOUT CABLE HOLE, CUT A HOLE 1 11/16" IN POLE 61" FROM GROUND LEVEL & SQUARE WITH BASE (SEE FIGURE 3).
2. IF BOLT COVER IS SUPPLIED, SLIDE DOWN POLE PAST CABLE HOLE.
3. TWIST ANTENNA ADAPTER ONTO ANTENNA ASSEMBLY UNTIL BLACK COLLAR IS SEATED IN ADAPTER.
4. SECURE ANTENNA BY FASTENING HOSE CLAMP FLUSH AGAINST ADAPTER.
5. APPLY RTV TO TOP OF ADAPTER WHERE IT MEETS ANTENNA.
6. ATTACH ANTENNA CABLE. WRAP CONNECTOR FIRST WITH BLACK ELECTRICAL TAPE, THEN WITH VAPOR WRAP, AND AGAIN WITH ELECTRICAL TAPE.
7. MOUNT ANTENNA ADAPTER TO TOP OF POLE, SEE FIG. 2.
8. FEED ANTENNA CABLE THROUGH TOP OF POLE AND FISH THROUGH CABLE HOLE IN POLE. LEAVE APP. 12 INCHES OF CABLE TO BE PULLED THROUGH HOLE IN BACK OF MASTER BOX.
9. FEED GROUND STRAP INTO CABLE HOLE IN POLE AND PULL OUT OF BOTTOM OF POLE, AS SHOWN. LEAVE APP. 12 INCHES OF STRAP TO BE PULLED THROUGH HOLE IN BACK OF MASTER BOX.
10. ATTACH BOTTOM OF GROUND STRAP TO GROUND ROD, USING CLAMPS AS SHOWN.

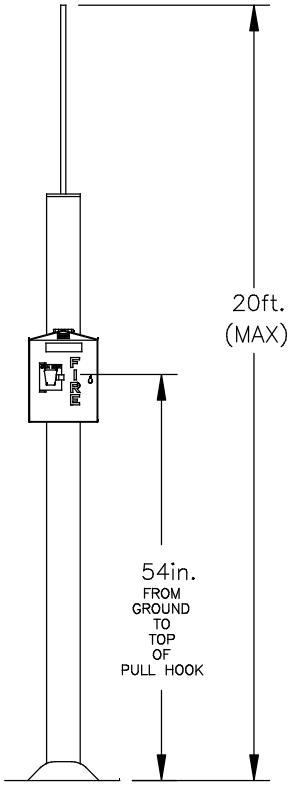
FIG.2

ANTENNA MOUNTING



11. INSERT ANTENNA ASSEMBLY INTO TOP OF POLE AS SHOWN.
12. ATTACH THIS ASSEMBLY – USING 3 BOLTS – AS SHOWN. TAKE CARE TO NOT BEND THE ANTENNA WHIP DURING HANDLING ON THE GROUND.

FIG.3



CAUTION

DO NOT TRANSPORT THE POLE WITH THE ANTENNA ASSEMBLY ATTACHED. THIS COULD CAUSE SEVERE DAMAGE TO THE ANTENNA.

NOTE:
POLE, POLE BASE, ANCHOR BOLTS AND FOUNDATION MAY VARY PER CONTRACT.

DRAWN BJC	SIGNAL COMMUNICATIONS CORP. WOBURN, MASS.	
SCALE NONE		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE TYPICAL MASTER BOX INSTALLATION	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 9/2/92
DO NOT SCALE PRINT	SIZE A / DRAWING NO. 1000–0568 / CAD FILE NO. 1000\0568–01A	SHEET 1 OF 3 / REV A

REV	DATE	DESCRIPTION	DR.	APPRVL
A	8/28/92	RFD #338	BJC	

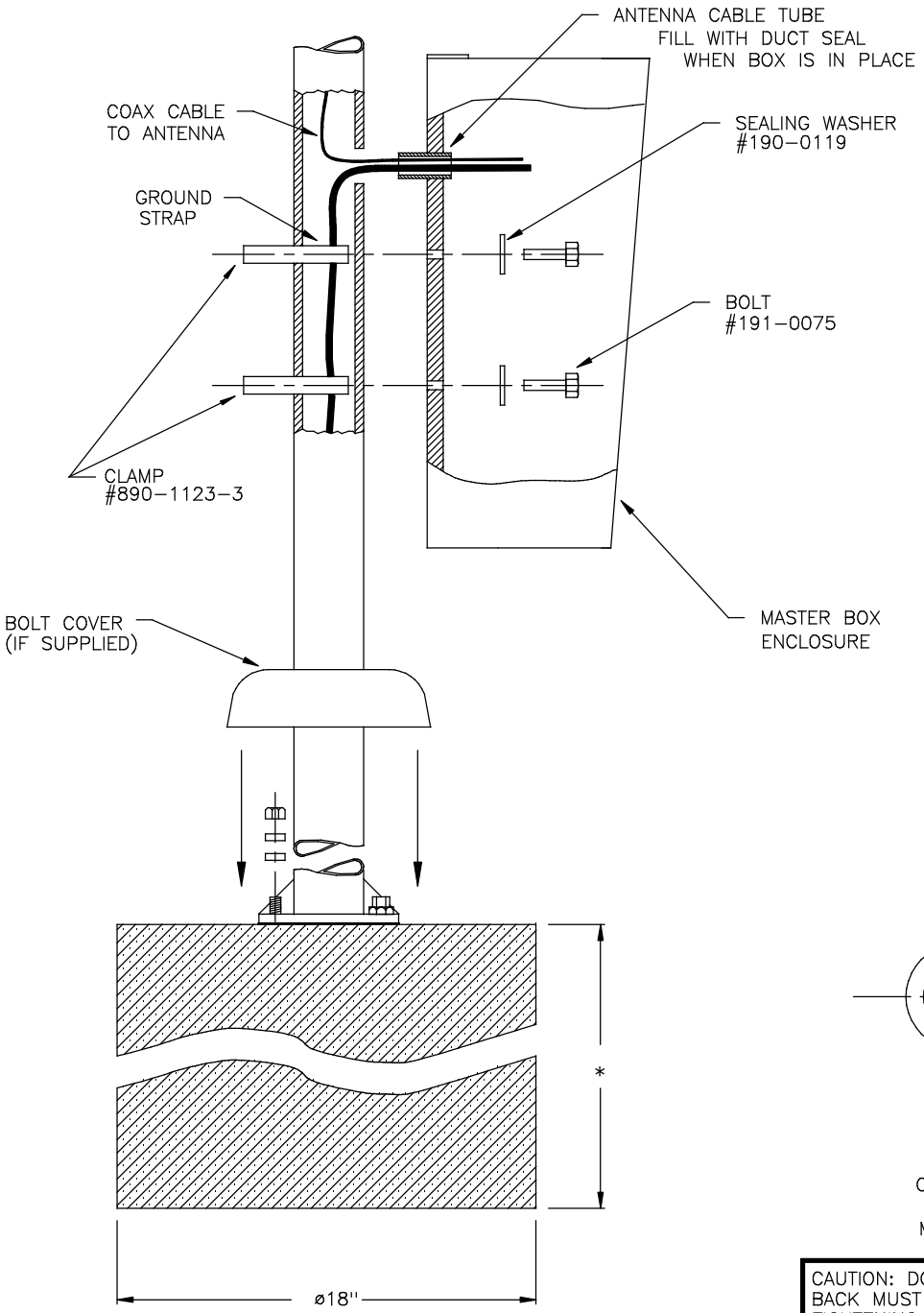
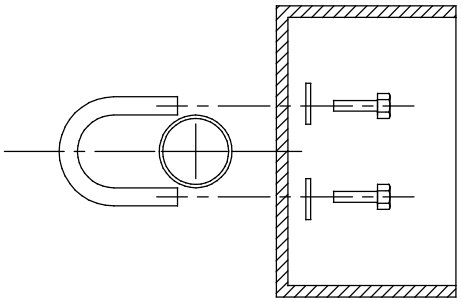


FIG. 4
POLE & MASTER BOX MOUNTING



TOP VIEW
OF CLAMP & BACK OF
MASTER BOX
MAX. TORQUE 6 in. lbs.

CAUTION: DO NOT OVERTIGHTEN NUTS; BACK MUST BE FLUSH WITH POLE BEFORE TIGHTENING. REPEAT FOR LOWER CLAMP.

13. RAISE POLE UPRIGHT, POSITION ON TOP OF ANCHOR BOLTS.
14. SECURE THE POLE WITH THE HEX NUTS, OVERWASHERS, AND LOCKWASHERS.
15. PLACE BOLT COVER, IF SUPPLIED, IN POSITION AND SECURE.
16. OPEN MASTER BOX AND REMOVE BACKPLATE.
17. PUSH ANTENNA CABLE AND GROUND STRAP THROUGH HOLE IN THE BACK OF THE BOX, LINE UP THE ANTENNA TUBE TO HOLE IN THE POLE.
18. POSITION THE MOUNTING CLAMP AROUND THE POLE SO THE HOLES IN CLAMP ALIGN WITH HOLES IN BACK OF BOX. FINISHED ENDS OF CLAMPS MUST BE PARALLEL TO BACK OF THE MASTER BOX. CLAMPS SHOULD BE SQUARE ON CENTER LINE OF POLE.
19. INSERT BOLT WITH SEALING WASHER THROUGH BACK OF BOX AND INTO CLAMPS. BACK OF THE BOX MUST BE FLUSH WITH THE POLE BEFORE TIGHTENING. TIGHTEN BOLTS UNTIL THEY ARE SNUG. 6 in.lbs. MAX. CAUTION: DO NOT OVERTIGHTEN BOLTS.
20. FILL ANTENNA TUBE WITH DUCT SEAL.

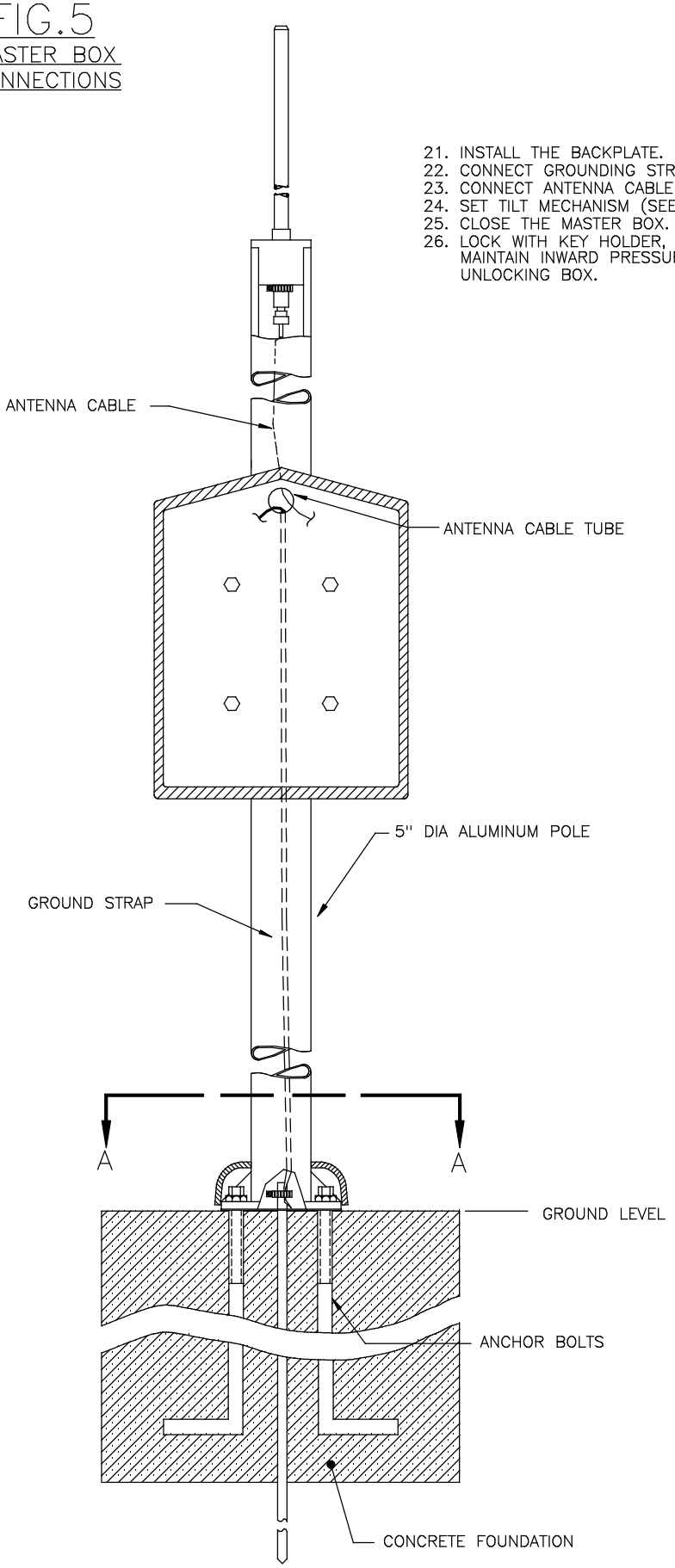
NOTE: POLE, POLE BASE, ANCHOR BOLTS AND FOUNDATION MAY VARY PER CONTRACT.
* REFER TO SPEC. FOR DIMENSIONS.

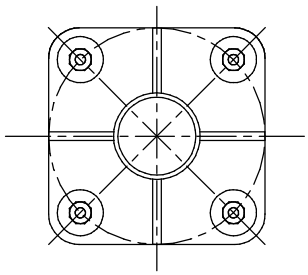
DRAWN BJC	SIGNAL COMMUNICATIONS CORP. WOBURN, MASS.	
SCALE none		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE TYPICAL MASTER BOX INSTALLATION	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 9/2/92
DO NOT SCALE PRINT	SIZE A / DRAWING NO. 1000-0568 / CAD FILE NO. 1000\0568-02A	SHEET 2 OF 3 / REV A

REV	DATE	DESCRIPTION	DR.	APPRVL
A	8/28/92	RFD #338	BJC	

FIG.5
MASTER BOX CONNECTIONS

21. INSTALL THE BACKPLATE.
22. CONNECT GROUNDING STRAP TO BACKPLATE.
23. CONNECT ANTENNA CABLE TO TRANSMITTER.
24. SET TILT MECHANISM (SEE SERVICE MANUAL).
25. CLOSE THE MASTER BOX.
26. LOCK WITH KEY HOLDER, HAND TIGHT, REVERSE TURN TO REMOVE KEY. MAINTAIN INWARD PRESSURE ON KEY HOLDER WHILE LOCKING OR UNLOCKING BOX.





VIEW A–A

FOUR 3/4 IN. DIA. ANCHOR BOLTS EQUALLY SPACED ON A 7.5 IN., 8.0 IN. OR 8.5 IN. BOLT CIRCLE

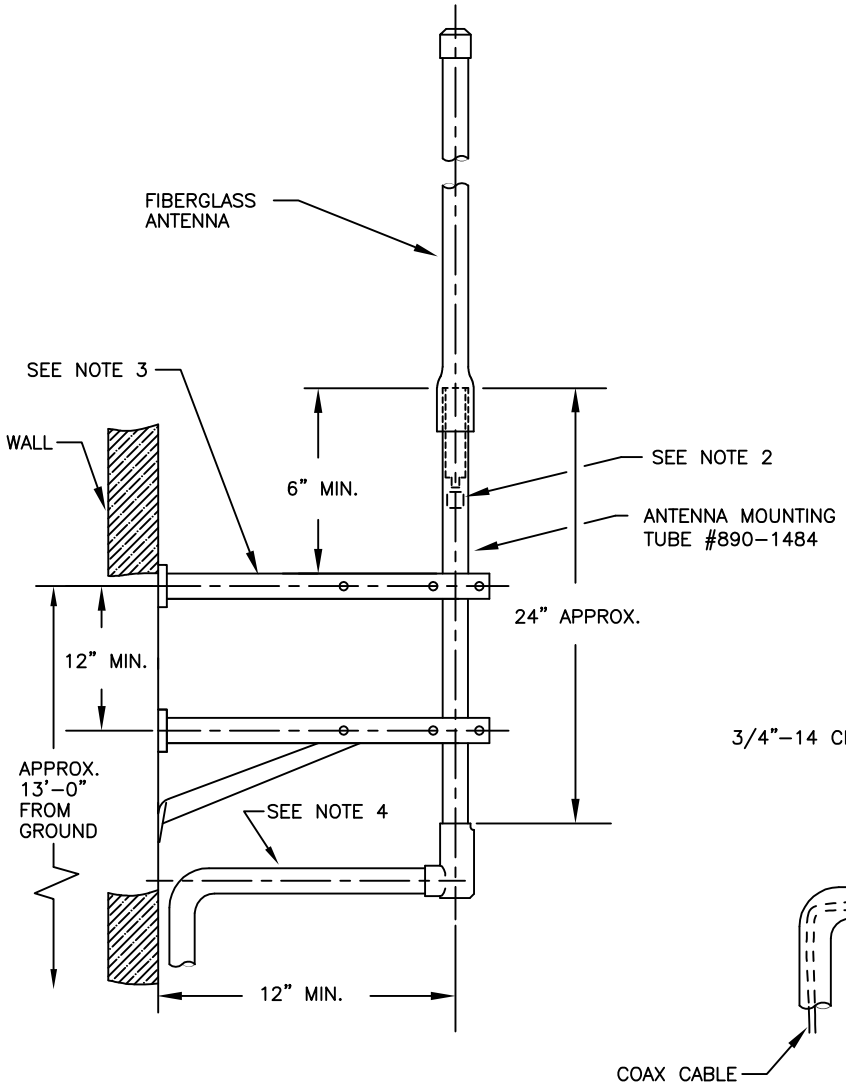
NOTE: POLE, POLE BASE, ANCHOR BOLTS AND FOUNDATION MAY VARY PER CONTRACT

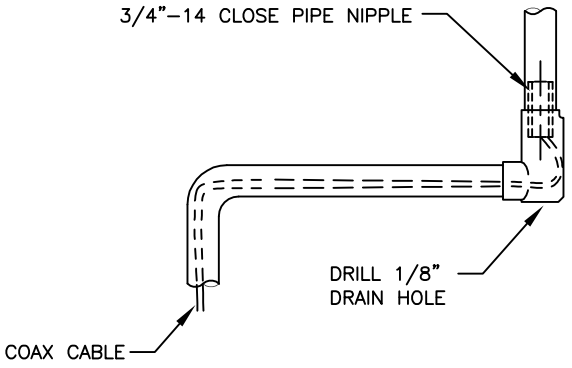
FOR FURTHER INSTALLATION INFO:	
MASTER BOX	DRAWING #
8MTJ	1000–0563
8MTJ–A–16	1000–0557

DRAWN BJC	SIGNAL COMMUNICATIONS CORP. WOBURN, MASS.	
SCALE NONE		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE TYPICAL MASTER BOX INSTALLATION	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 9/8/92
DO NOT SCALE PRINT	SIZE A / DRAWING NO. 1000–0568 / CAD FILE NO. 1000\0568–03A	SHEET 3 OF 3 / REV A

REV	DATE	DESCRIPTION	DR.	APPRVL
A	6/6/83		LB	
B	3/3/88	ECN 1245	JB	
C	1/1/91	ECN 1776	BJC	
D	8/10/92	ECN 1944	BJC	
E	4/26/93	ECN 1987	FC	
F	12/18/96	ECN 2231	FC	
–	4/5/05	See note 2	FC	
G	1/10/06	ECN 2619	FC	

MUNICIPAL ANTENNA INSTALLATION





NOTES:

1. **THIS IS SIGCOM'S TYPICAL RECOMMENDED INSTALLATION ONLY. CONFORMANCE TO ANY STANDARD OR CODE IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR/ INSTALLER. SEE CONTRACT FOR SPECIFICATIONS.**

2. LOCATION OF ANTENNA CABLE CONNECTION. CONNECTOR PROVIDED BY SIGCOM. IT IS THE RESPONSIBILITY OF THE CONTRACTOR/INSTALLER TO ASSEMBLE CONNECTOR ONTO ANTENNA CABLE RUNNING TO BOX:
   ANTENNA CABLE PROVIDED BY CONTRACTOR, SHALL BE TO CONTRACT SPECS. TYPICALLY:
   G MAX 75'–RG213 OR EQUIVALENT
   CONSULT FACTORY FOR DISTANCES > 75'.

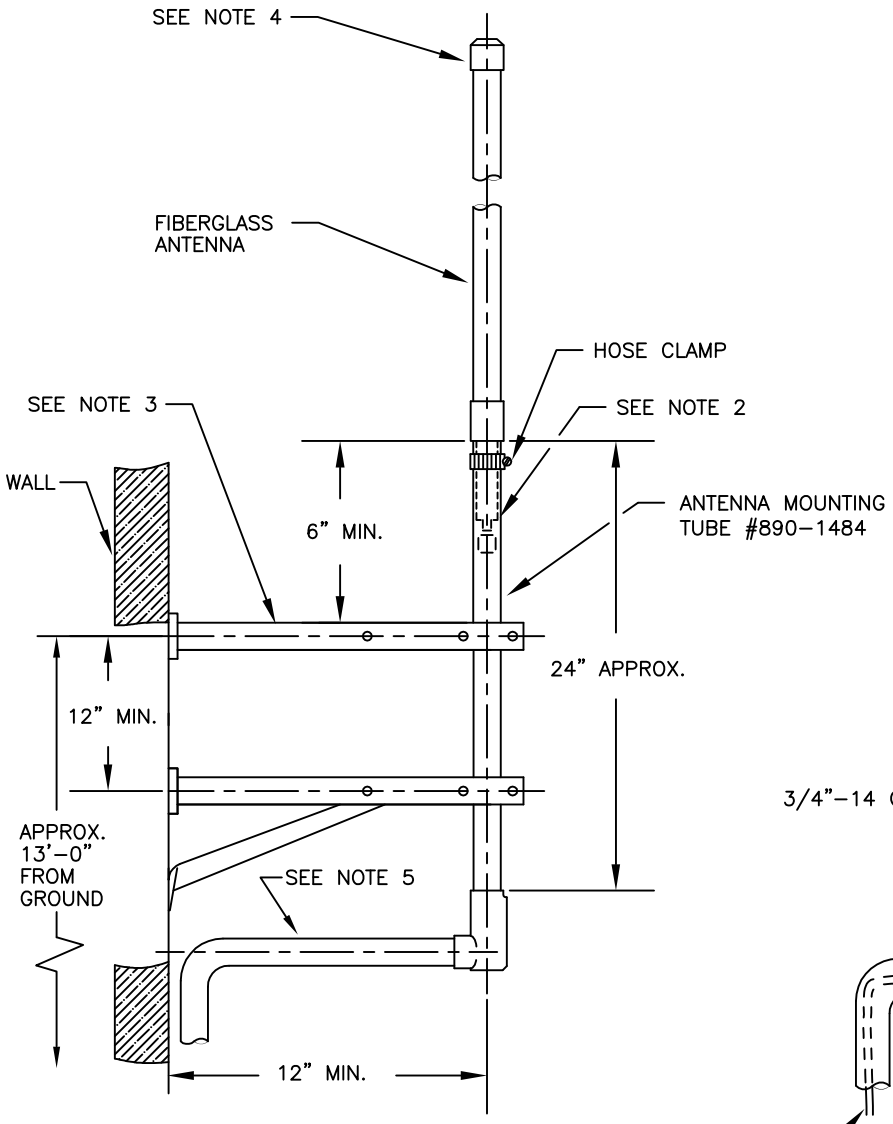
3. ANTENNA SUPPORT PROVIDED BY SIGCOM; #190–0392. INSTALLATION CONTRACTOR SHALL APPROPRIATELY ANCHOR ANTENNA BRACKET WITH SUFFICIENT STRENGTH TO WALL.

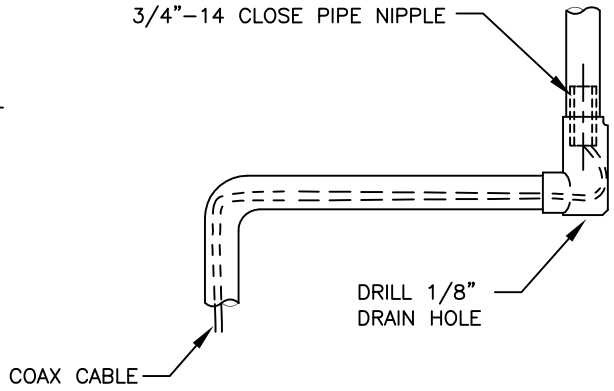
4. ANY EXPOSED ANTENNA CABLE SHALL BE COVERED WITH METAL CONDUIT ALL AROUND TO BOX. CONDUIT AND FITTINGS WILL BE PROVIDED BY INSTALLATION CONTRACTOR.

DRAWN BJC	*SIGNAL COMMUNICATIONS CORP.* WOBURN, MASS.	
SCALE NONE		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE SURFACE MOUNTED ANTENNA INSTALLATION, MUNICIPAL	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 8/10/92
DO NOT SCALE PRINT	SIZE A; DRAWING NO. 1000–0173–1; CAD FILE NO. 1000\0173–11G	SHEET 1 OF 1; REV G

REV	DATE	DESCRIPTION	DR.	APPRVL
A	8/10/02	RFD #916	FC	
–	4/5/05	SEE NOTE 2	FC	
B	1/12/06	ECN 2619	FC	

MILITARY ANTENNA INSTALLATION





NOTES:

1. **THIS IS SIGCOM'S TYPICAL RECOMMENDED INSTALLATION ONLY. CONFORMANCE TO ANY STANDARD OR CODE IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR/ INSTALLER. SEE CONTRACT FOR SPECIFICATIONS.**

2. LOCATION OF ANTENNA CABLE CONNECTION. CONNECTOR PROVIDED BY SIGCOM. IT IS THE RESPONSIBILITY OF THE CONTRACTOR/INSTALLER TO ASSEMBLE CONNECTOR ONTO ANTENNA CABLE RUNNING TO BOX:
   ANTENNA CABLE PROVIDED BY CONTRACTOR, SHALL BE TO CONTRACT SPECS. TYPICALLY:
   (B) MAX 75'–RG213 OR EQUIVALENT
   CONSULT FACTORY FOR DISTANCES > 75'.

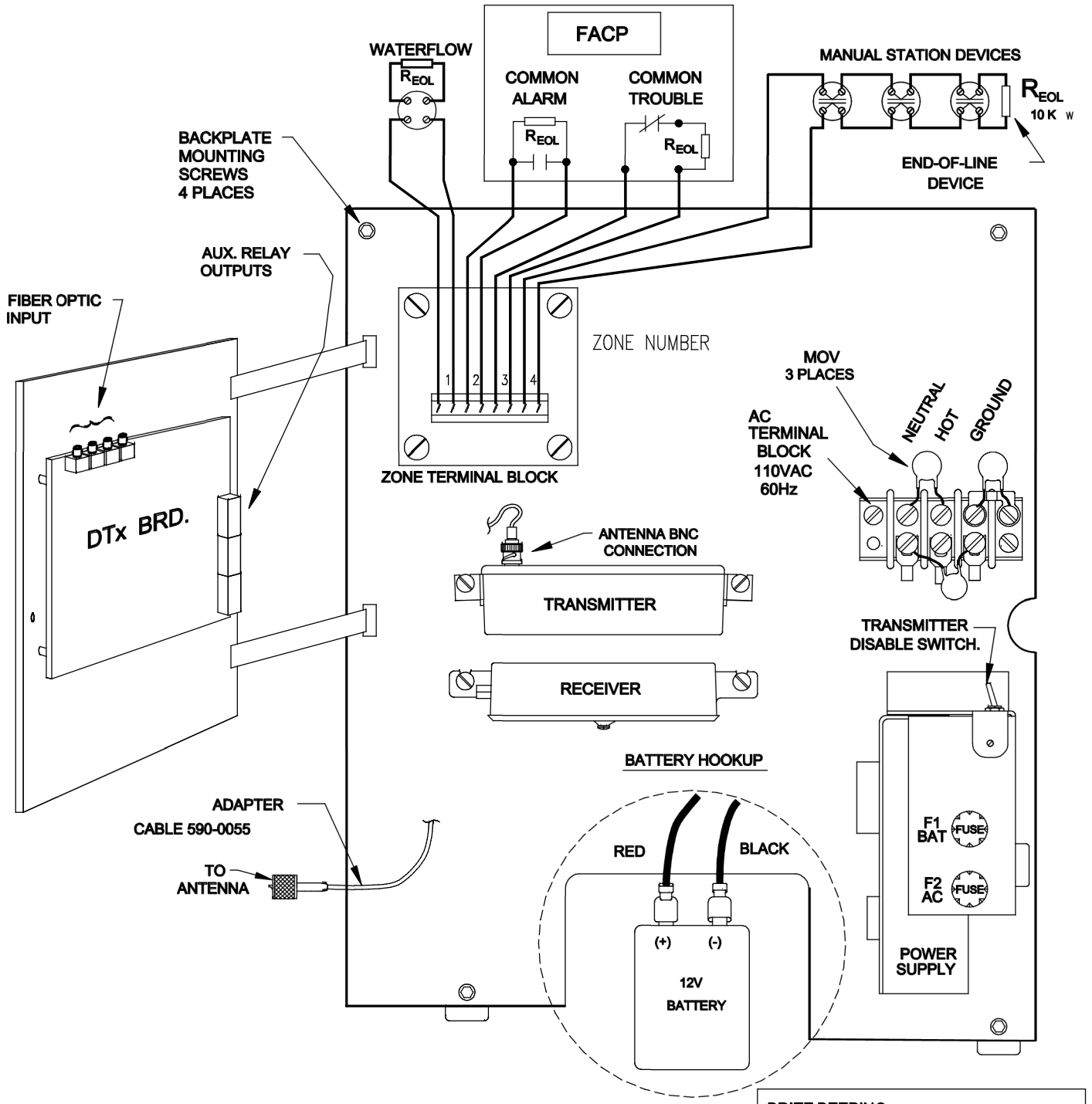
3. ANTENNA SUPPORT PROVIDED BY SIGCOM; #190–0392. INSTALLATION CONTRACTOR SHALL APPROPRIATELY ANCHOR ANTENNA BRACKET WITH SUFFICIENT STRENGTH TO WALL.

4. ANY EXPOSED ANTENNA CABLE SHALL BE COVERED WITH METAL CONDUIT ALL AROUND TO BOX. CONDUIT AND FITTINGS WILL BE PROVIDED BY INSTALLATION CONTRACTOR.

DRAWN FC	*SIGNAL COMMUNICATIONS CORP.* WOBURN, MASS.	
SCALE NONE		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE SURFACE MOUNTED ANTENNA INSTALLATION, MILITARY	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 9/24/02
DO NOT SCALE PRINT	SIZE A; DRAWING NO. 1000–0173–2; CAD FILE NO. 1000\0173–21B	SHEET 1 OF 1; REV B

REV	DATE	DESCRIPTION	DR.	APPRVL
A	10/15/01	RFD # 863	FC	

TYPICAL CONFIGURATIONS



BRIEF BEEPING :
INDICATES SIGNAL SENT
CONTINUOUS TONE OR BEEPING:
NOTIFY FIRE DEPARTMENT
ALARM SYSTEM MUST BE INSPECTED

IMPORTANT:

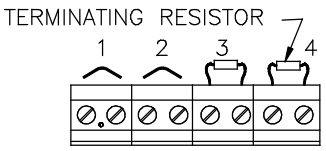
THIS DRAWING ILLUSTRATES SIGCOM'S TYPICAL RECOMMENDED INSTALLATION ONLY. IT DOES NOT REFLECT THE REQUIREMENTS OR ANY CONTRACT SPECIFICATION, FIRE STANDARD OR CODE. CONFORMANCE TO ANY SPECIFICATION, CONTRACT OR CODE SHALL REMAIN THE SOLE RESPONSIBILITY OF THE INSTALLER AND/OR AUTHORITY HAVING JURISDICTION.

DRAWN FC	SIGNAL COMMUNICATIONS CORP. WOBURN,MASS.	
SCALE NONE		
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	TITLE INSTALLATION, DTx BOX, NEMA 1/CAST ENCLOSURE	
	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 10/15/01
DO NOT SCALE PRINT	SIZE A / DRAWING NO. 1000-0727 / CAD FILE NO. 1000\0727-01A	SHEET 1 OF 1 / REV A

REV	DATE	DESCRIPTION	DR.	APPRVL
A	2/26/02	RFD # 893	FC	
B	6/24/04	ECH 2564		

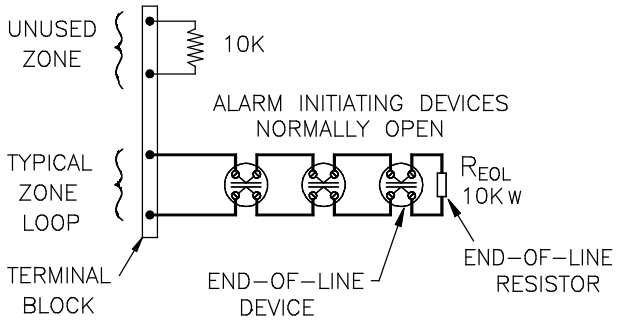
DTX ZONE INSTALLATION

DTX 4 ZONE BRD

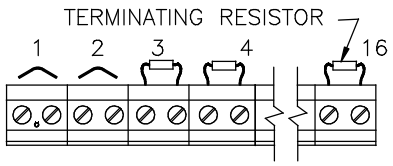


ZONE TERMINAL BLOCK

1. UNUSED ZONES MUST HAVE 10Kw TERMINATING RESISTOR INSTALLED AT THE ZONE TERMINAL BLOCK.
2. END-OF-LINE RESISTOR (10Kw 1/4w) MUST BE REMOVED FROM TERMINAL BLOCK. INSTALL THE 10K 1 WATT RESISTOR (SUPPLIED) AT THE END OF THE ZONE LOOP.
3. SERIES CONNECTED ALARM RESISTORS ARE NOT NECESSARY FOR NORMALLY OPEN DEVICES.
4. TERMINALS ACCEPT WIRE FROM 22 AWG UP TO 12 AWG, SOLID OR STRANDED.
5. USE A SCREWDRIVER WITH A FLAT BLADE 1/8'' WIDE TO SECURE WIRES OR RESISTORS.

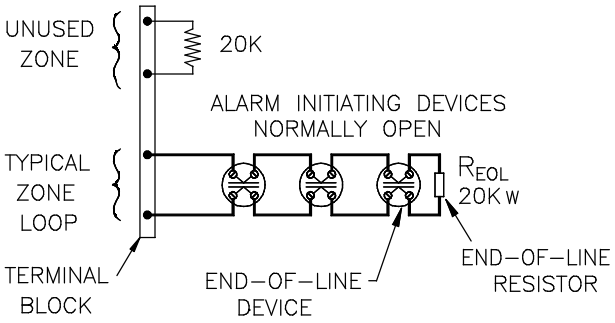


DTX 16 ZONE BRD



ZONE TERMINAL BLOCK

1. UNUSED ZONES MUST HAVE 20Kw TERMINATING RESISTOR INSTALLED AT THE ZONE TERMINAL BLOCK.
2. END-OF-LINE RESISTOR (20K w 1/4 W) MUST BE REMOVED FROM TERMINAL BLOCK. INSTALL THE 20K 1 WATT RESISTOR (SUPPLIED) AT THE END OF THE ZONE LOOP.
3. SERIES CONNECTED ALARM RESISTORS ARE NOT NECESSARY FOR NORMALLY OPEN DEVICES.
4. TERMINALS ACCEPT WIRE FROM 22 AWG UP TO 12 AWG, SOLID OR STRANDED.
5. USE A SCREWDRIVER WITH A FLAT BLADE 1/8'' WIDE TO SECURE WIRES OR RESISTORS.



DO NOT SCALE PRINT	DRAWN FC	SIGNAL COMMUNICATIONS CORP. WOBURN,MASS.	
THE INFORMATION CONTAINED HEREIN IS PROPRIETARY AND IS NOT TO BE RELEASED OR REPRODUCED.	CHECKED	TITLE DTX, 4 & 16 ZONE INSTALLATION	
	ELEC. ENG.		
	MECH. ENG.		
	SCALE NTS	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES	DATE 2/26/02
USED ON / NEXT ASSY	TOLERANCES ±.XX= ± — ±.XXX= ± — ±ANG.= ± —	SIZE A / DRAWING NO. 1000-0550-1 / CAD FILE NO. 1000\0550-11B	SHEET 1 OF 1 / REV B

LIMITED WARRANTY
&
LIMITATION OF LIABILITY

Signal Communications Corporation warrants that its products are free from manufacturing and material defects, under ordinary and proper use and service, for a period of one (1) year from the date of shipment, provided such material is installed, maintained and operated in accordance with any and all instructions and manuals supplied by Signal Communications Corporation. Signal Communications Corporation's obligation under this warranty is limited to the replacement or repair of such products, at Signal Communications Corporation's factory.

Defective material may be returned to Signal Communications Corporation for replacement or repair provided Signal Communications Corporation has been notified of such defects within TEN (10) BUSINESS DAYS from the discovery of the defective merchandise or one (1) year from the receipt of such merchandise, whichever is earlier. This warranty is limited to replacement or repair of defective material, is non-transferable, is contingent upon proper use of the material, and does not cover material which has been modified or which has been subject to unintended use. The warranty and remedies set forth above are exclusive and in lieu of all others, oral or written, expressed or implied. No material will be accepted for replacement or repair without the authorization of Signal Communications Corporation. Replacement or repair shall be made only after an examination at Signal Communications Corporation's facility shows defective material or workmanship.

Damage or defects resulting from accident, fire, storm, water, negligence, misuse, vandalism, power failure, current fluctuations, lightning surges, acts of God, failure due to non-Signal Communications Corporation parts, service, attachments or devices or any other cause external to the equipment or not directly under the control of Signal Communications Corporation are specifically excluded from this warranty.

Signal Communications Corporation makes no warranties or representations as to performance of products or as to service to Customer or to any other person, except as set forth above and in Signal Communications Corporation's limited warranty accompanying delivery of products. Signal Communications Corporation reserves the right to change the warranty and service policy set forth in such limited warranty at any time without notice or liability to the Customer or any other person. Except as set forth above, all implied warranties, including, but not limited to, implied warranties of merchantability and fitness for a particular purpose are hereby excluded. In no event shall Signal Communications Corporation be liable for any indirect, incidental, consequential, or special damages, including lost profits, sustained or incurred in connection with use, maintenance or repair of the products or caused by product defects or the partial or total failure of the product, regardless of the form of action, whether in contract, tort and/or delict, including negligence, strict liability or otherwise, and whether or not such damages were foreseen or unforeseen.

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LIFE SAFETY & INCIDENT MANAGEMENT

Fire Alarm Bells

FM APPROVED

MEA

S218, S2202

7136-1657: 0150

Overview

EDWARDS Fire Alarm Bells are specially designed for fire alarm applications. The gongs are made of selected alloy steel to give the loud, resonant tones necessary in fire alarm systems.

Two gong sizes are available to overcome different ambient noise level.

The Fire Alarm Bells are of the underdome type with heavy duty mechanisms. Each bell is supplied with a mounting plate that fits any standard single-gang opening (see Installation Data). For weather-proof application EDWARDS offers an optional surface weatherproof back box. Refer to the Specification chart for ap-plicability and cata-log number of the weatherproof back box for the respective bell.

Finish — Standard gong and housing furnished gray with red label. Optional red finish available. **Add Suffix "R" to Catalog Number.**

FM — 438 and 439 Series Bells shown below are FM approved.

Standard Features

- Vibrating and single stroke
- 6 inch (150mm), 8 inch (200mm), 10 inch (250mm) sizes
- Red or gray finish
- Rugged compact mechanism
- Heavy duty cast housing
- Low power drain
- Wide voltage selection
- Indoor or weatherproof

LIFE SAFETY & INCIDENT MANAGEMENT

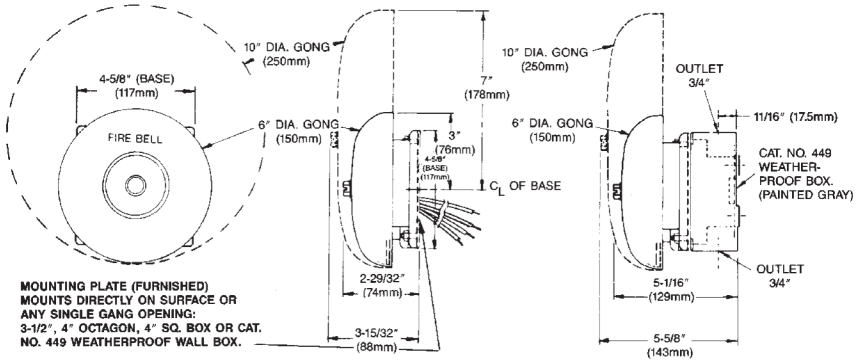
Contact us...

Email: edwards.fire@fs.utc.com
Web: *Edwards-fire.com*

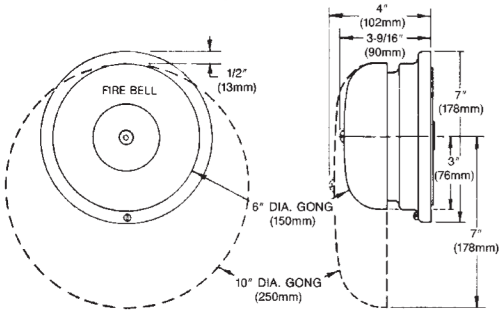
EDWARDS is a UTC brand.
1016 Corporate Park Drive
Mebane, NC 27302

Installation

Cat. Nos. 438D and 439D 6" and 10" Bells



Cat. Nos. 323D and 10" (254mm) Bells



WARNING: These devices will not operate without electrical power. As fires frequently cause power interruptions, we suggest you discuss further safeguards with your local fire protection specialist.

EDWARDS recommends that these Fire Alarm Bells always be installed in accordance with the latest recognized editions of national and local codes.

Specifications & Ordering Information

Cat. No.	DB @ 10 ft	Description	Volts	Amps	Weatherproof Box
323D-10AW-R	79	10" (250mm) Single Stroke, Diode	20-24 Vdc	0.33	N/A
438D-6N5-R	76	6" (150mm) Vibrating, Diode	120 Vac	0.034	449
438D-10N5-R	88	10" (250mm) Vibrating, Diode	120 Vac	0.034	449
439D-6AW-R	83	6" (150mm) Vibrating, Diode	20-24 Vdc	0.085	449
439D-10AW-R	86	10" (250mm) Vibrating, Diode	20-24 Vdc	0.085	449
438D-8N5-R	86	8" (200mm) Vibrating, Diode	120 Vac	0.034	449
439D-8AW-R	84	8" (200mm) Vibrating, Diode	20-24 Vdc	0.085	449
439D-6AWC-R	83	6" (150mm) Vibrating, Diode, ULC listed	20-24 Vdc	0.085	449
439D-10AWC-R	86	10" (250mm) Vibrating, Diode, ULC listed	20-24 Vdc	0.085	449

Mounting Accessories

449	Weatherpoof surface mount box, grey. C/w gasket.

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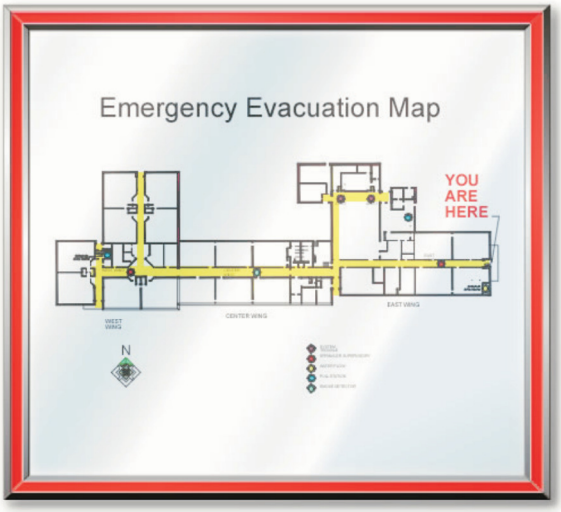
NO EXCUSES!

GD8

CS Graphic Display Frame



Your supplied graphic/map will be professionally displayed and securely held.

Color Inlay Applications
(Check your local AHJ for possible requirements)

Red = Fire, Emergency
Blue = Information, Egress, OSHA Requirements, Maintenance

The GD8 CS Graphic Display Frame is designed to assist in the effective preparation of a proactive Emergency Operation Plan (EOP). Evacuation site maps are an essential component of a complete emergency fire alarm life safety installation. A GD8 Graphic display provides a clear static layout of a building or campus and aids in requirements for public awareness of the building layout and evacuation egress routes. With changing requirements from NFPA it provides the means and support as a year round training tool in the aid of fire drills and meeting emergency evacuation training requirements.

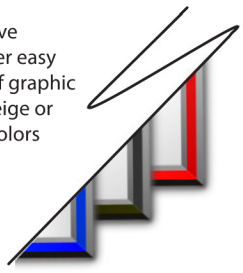
The GD8 CS Graphic Display Frame is designed to hold a field supplied evacuation egress map. It is ideally suited for customer supplied paper plots or architectural drawings for that professional look.

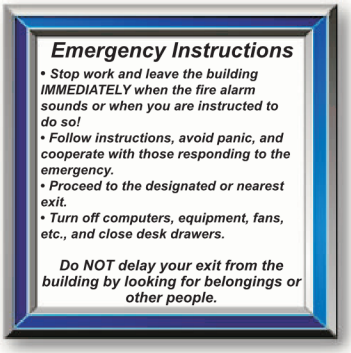
The GD8 frame features a 1/2" colored reflective inlay trim. Reflective inlays are ideal for quickly identifying the life safety information map during an emergency or for public awareness. The reflective inlays are easily identified when any light is passed over it or emergency backup lights are illuminated.

Standard Features:

- 1/16" crystal clear polycarbonate protective window
- Rigid 1/8" ABS plastic back plate
- Architecturally designed low profile aluminum frame with natural aluminum matte finish
- Continuous 1/2" inlay accent trim (reflective red, reflective blue, reflective black, beige or custom color)
- Assembly and mounting hardware supplied
- Concealed hardware, eliminating unauthorized access or tampering
- Available in 3 standard sizes, with custom sizes available up to 34" x 44"

Special Reflective Inlay Colors offer easy identification of graphic or message. (beige or other custom colors available)





Example of color coded inlay application using Blue for Emergency Instructions.

ADA

ISO 9001 REGISTERED COMPANY

NFPA

Made In U.S.A

PANELVu
Space Age Electronics, Inc.
www.1sae.com
800.486.1723 Toll Free
508.485.0966 Local
508.485.4740 Fax

No Excuses, Just Solutions!

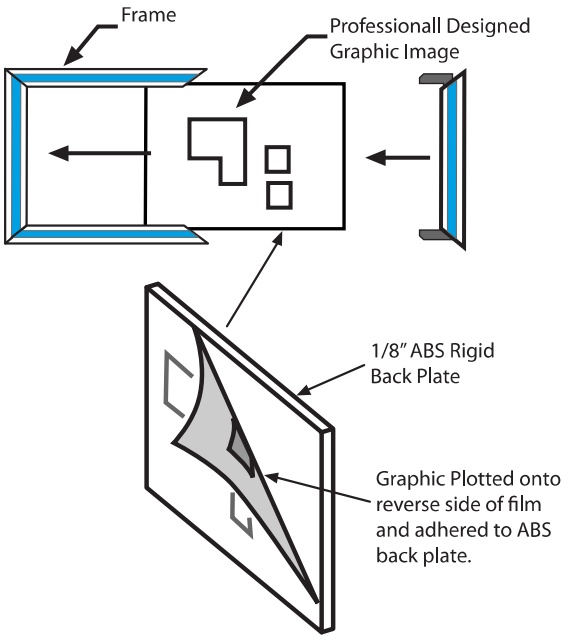
SPACE AGE ELECTRONICS, INC.

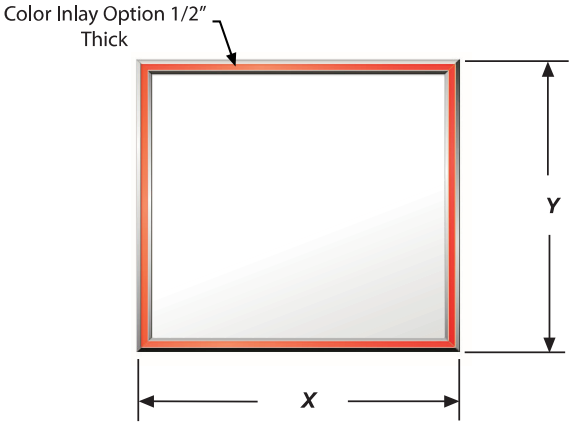
Specifications:

The GD8 CS Graphic Display Frame will be constructed of a 1/8" thick aluminum extruded frame. The finish will be an architectural soap matte finish all over, assembled with 45 degree mitered corners and concealed hardware for assembly. The GD8 frame will encapsulate the graphic/text message once assembled. The GD8 will be securely mounted to a wall. The GD8 frame will have continuous 1/2" light reflective trim all around the graphic/text image. The mounting hardware will be concealed for security to prevent any unauthorized removal or alteration.

CS Assembly:

The GD8 CS graphic map will be securely encapsulated in the GD8 frame. A 1/16" crystal clear polycarbonate protective viewing window in front of image and the supplied artwork shall be backed with a solid white 1/8" ABS rigid back plate.





Size	X	Y	Viewable Graphic Area
1	8 1/2"	11"	1 1/8" x 10 5/8"
2	11"	17"	10 5/8" x 15 5/8"
3	11"	17"	10 5/8" x 16 5/8"

Custom Size Maximum Dimensions

4	(up to 34") x (up to 44")	up to 33 5/8" x 43 5/8" Subtract 3/8" vertically and horizontallly from overall size.

Ordering Information:

Part #	Description
SSU52000	Size 1 (8 1/2" x 11") Display Frame
SSU52001	Size 2 (11" x 17") Display Frame
SSU52002	Size 3 (17" x 17") Display Frame
SSU52003	Size 4 Custom Sized Display Frame up to 34" x 44"
SSU52005	GD8 CS graphic display plotted, polycarb color encapsulated
SSU52006	Graphic design layout service CAD/ENG additional time/proc

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UL LISTED

TC1

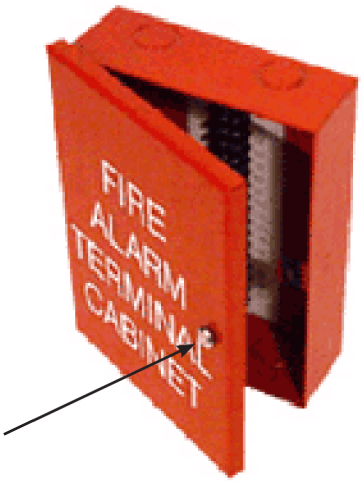
18 Point Terminal Cabinet

The TC1 18 point “FIRE ALARM TERMINAL CABINET” is designed to enhance your fire alarm systems. Ideally suited for maintenance and troubleshooting with easy identification of system wiring.

White 7/8” highly visible lettering and a “lift-a-way” hinged door with captive fastener or high security Cam Lock makes this an ideal “quick and easy” termination point. This surface mount cabinet is fabricated from 16 gauge steel with a durable red textured, baked-on powder coat finish.
The TC1 is UL listed for life safety.

Standard Features:

- Dimensions:
  6 1/2” wide x 8 1/2” high x 2 1/2” deep
- 16 gauge cold rolled steel construction
- Captive Screw or Cam Lock securing devices
- Wall mounting holes
- Durable red textured finish
- White 7/8” indelible lettering
- “FIRE ALARM TERMINAL CABINET”
- Lift-a-way hinge
- Interior labeling of terminal strip
- Field identification label inside cover
- Standard 1/2” & 3/4” EMT knockouts
- Single 18 point high barrier terminal strip
- Terminal points rated for 12 gauge wire
- Terminal strip rated for 20 amp max 250V
- (Class B/UL) 300V (CSA)



The TC1 door can be equipped with a friction catch or a high security CAT 30 key and lock set.

NEMA

ADA

Uses UL Recognized Components

NFPA

Made In U.S.A.

ISO 9001 REGISTERED COMPANY

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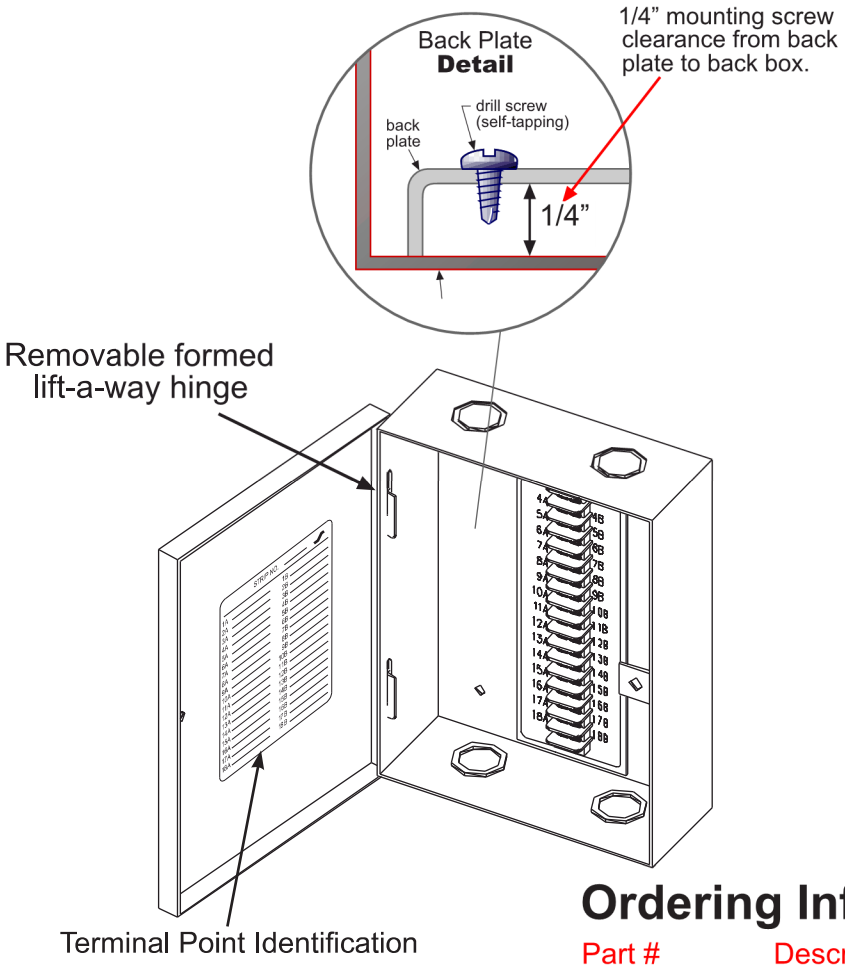
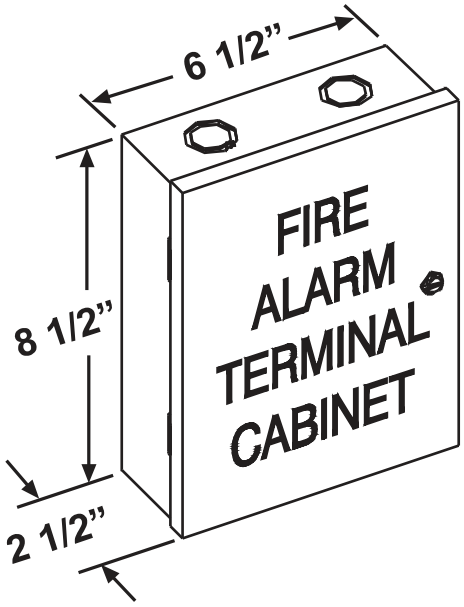
SPACE AGE ELECTRONICS, INC.

Specifications:

The TC1 18 Point Terminal Cabinet is constructed of 16 gauge (.062 thk.) cold rolled steel and finished with a durable red textured, heat-resistant baked-on enamel finish. The front cover displays “FIRE ALARM TERMINAL CABINET” in 7/8” white screened indelible lettering, and is engineered with a removable formed lift-a-way hinge. The choice of a captive fastener or CAT-30 Cam Lock secures the front cover. The interior of the box has a field identification label on the inside cover, corresponding to the terminal strip’s labeling inside the back box. Overall dimensions measure 6 1/2” wide by 8 1/2” high by 2 1/2” deep. The cabinet includes standard 1/2” and 3/4” EMT knockouts on the top and bottom. A single 18 point high barrier terminal strip is rated for 12 gauge wire and 20 amp max 250V (Class B/UL) 300V (CSA).





Ordering Information:

Part #	Description
SSU00635	TC1 18 Point Terminal Cabinet w/Caaptive Fastener
SSU00536	TC1 18 Point Terminal Cabinet w/CAT30 Lock*

Agency Approvals:

UOXX.S2580 UL Listed Control Unit Accessories

* TC1 w/CAT30 Lock is not UL Listed

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STI Smoke Detector Damage Stopper®

STI-8100

STI-8200-W

STI-8230-SS

PRODUCT OVERVIEW

Stainless Steel

This heavy-duty, 1.2 mm stainless steel cover features a natural resistance to corrosion making it an excellent choice for applications where food is present as well as water treatment plants and correctional facilities. Available for flush mount (STI-8200-SS) or with a conduit spacer for surface mount (STI-8230-SS, shown) applications. Easy to install, it helps assure the smoke detector will remain operational where vandalism and accidental damage are causing false fire alarms or high maintenance costs.

Coated Cold-Rolled Steel

Here is a protective cover for persons who prefer the strength and durability of steel but need not be concerned with the presence of food in the area. Fabricated from 1.5 mm cold rolled steel, it has a white corrosion-resistant polyester coating. As the stainless steel cover, it is available for flush mount (STI-8200-W) or with a spacer for surface mount (STI-8230-W) applications. Surface models include tamper-resistant fasteners for added protection against vandalism. Tamperproof fastners are available for flush models.

Polycarbonate

Two models available: STI-8100 for flush mount and STI-8130 with a spacer for surface mount. They are offered in clear, black or white polycarbonate.

FEATURES

- Covers protect against severe vandalism and accidental damage.
- Helps assure smoke detectors will be operational when needed.
- Easy installation and easy removal for servicing detectors.
- Aesthetically pleasing with the choice of stainless steel, coated cold rolled steel or polycarbonate.
- Exceptional durability.
- Available conduit spacers allow them to be easily mounted over surface mount detectors with or without conduit.
- UL Listed to U.S. and Canadian safety standards for use with specific smoke detectors. See reverse for details.
- Three year guarantee against breakage in normal use.

STI Smoke Detector Damage Stopper®

Dimensions and Technical Information

MODELS AVAILABLE

Polycarbonate

STI-8100	Clear, flush mount Damage Stopper with mounting hardware
STI-8100-BK	Black, flush mount Damage Stopper with mounting hardware
STI-8100-W	White, flush mount Damage Stopper with mounting hardware
STI-8130	Surface mount Damage Stopper, STI-8100, STI-8101 conduit spacer and mounting hardware

Stainless Steel (1.2 mm)

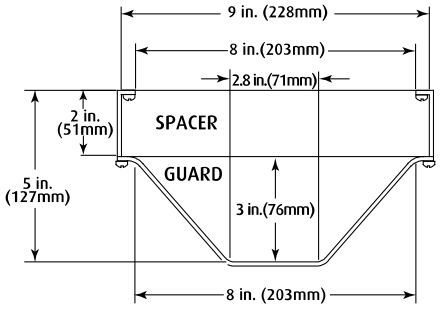
STI-8200-SS	Smoke Detector Damage Stopper - flush mount - stainless steel
STI-8230-SS	Smoke Detector Damage Stopper with conduit spacer - surface mount - stainless steel

Cold Rolled Steel coated white (1.5 mm)

STI-8200-W	Smoke Detector Damage Stopper - flush mount - white coated steel
STI-8230-W	Smoke Detector Damage Stopper with conduit spacer - surface mount - white coated steel

Accessories

STI-8101	Polycarbonate stackable 2” conduit spacer for use with STI-8100 (included with STI-8130)
STI-8170	Mounting backplate for flush and surface mount models. Recommended for irregular and unstable mounting surfaces such as drop ceilings and beams
STI-8201-SS	Stainless steel spacer for conduit applications
STI-8201-W	Cold rolled steel spacer for conduit applications
SUB-81	Tamper resistant screws, #8 X 2 “ snake eye (quantity 4) for use with STI-8100
SUB-82	Tamper proof stainless steel screws for flush mounted covers
19038	Tamper bit for SUB-81 and SUB-82



STI-8200 AND STI-8230 PRODUCT DIMENSIONS

APPROVALS & WARRANTY

TESTING

STI-8100 models are UL Listed (No. S3504) for use with no sensitivity adjustment with the following smoke detectors:
Sentrol Smoke Detector Models 611UD, 612UD, 721UD and 731UD, System Sensor 2251, 2251T, 2251B, 2251TB, 2251TM, 2251TMB, 2251BR, 2551, 2551T, FTX-P1 Smoke Detectors, FCI Model ASD-PL, ASD-P, ASD-PH, ASD-PTL, ASD-FILTREX, ASD-FILTREXF, MCS-ACCLIMATE, ASD-PL2, ASD-PL2F, ASD-PTL2, ASD-PTL2F, MCD-ACCLIMATE2, MCS-ACCLIMATE2F, ASD-PL2FR, Secutron Model MRI-2251, Honeywell Model TC806B1001, Mircom Model MIX-2251, Intelligent Systems Model ISL 2251, Siemens detector head models PE-11, HFP-11, HFPO-11, SPF-11, SPFO-11 to be used with detector base model DB-11, and EST Model 2251F, all under 300 fpm.

STI-8130 models are UL Listed (No. S3504) for use with no sensitivity adjustment with the following smoke detectors:
Sentrol Smoke Detector Models 611UD, 612UD, 721UD and 731UD, under 300 fpm.

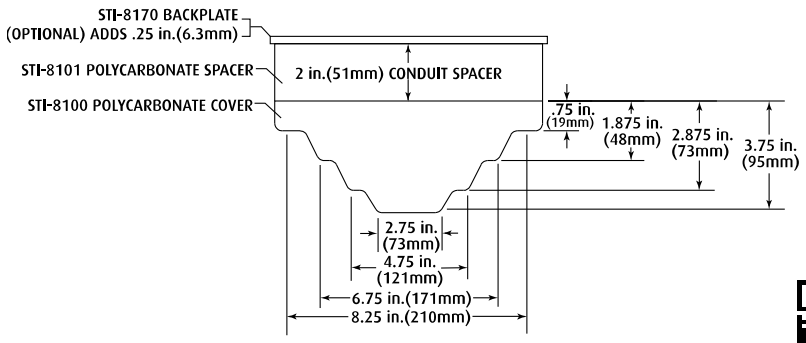
STI-8200 models are UL Listed (No. S3504) for use with no sensitivity adjustment with the following smoke detectors:
System Sensor 2251, 2251T, 2251B, 2251TB, 2251TM, 2251TMB, 2251BR, 2551, 2551T Smoke Detectors, FCI Model ASD-PL, ASD-P, ASD-PH, ASD-PTL, ASD-FILTREX, ASD-FILTREXF, MCS-ACCLIMATE, ASD-PL2, ASD-PL2F, ASD-PTL2, ASD-PTL2F, MCD-ACCLIMATE2, MCS-ACCLIMATE2F, ASD-PL2FR, Secutron Model MRI-2251, EST Model 2251F, Mircom Model MIX-2251, Intelligent Systems Model ISL 2251, and Honeywell Model TC806B1001.

STI-8230 (cover and spacer) models are UL Listed (No. S3504) for use with no sensitivity adjustment with the following smoke detectors:
System Sensor Model 2251, 2251T, 2251B, 2251TB, 2251TM, 2251TMB, 2251BR, 2551, 2551T, FCI Model ASD-PL, ASD-P, ASD-PH, ASD-PTL, ASD-FILTREX, ASD-FILTREXF, MCS-ACCLIMATE, ASD-PL2, ASD-PL2F, ASD-PTL2, ASD-PTL2F, MCD-ACCLIMATE2, MCS-ACCLIMATE2F, ASD-PL2FR, Secutron Model MRI-2251, EST Model 2251F, Mircom Model MIX-2251, Intelligent Systems Model ISL 2251,or Honeywell Model TC806B1001.

NOTE: STI-8100 series covers are to be used at your own risk if mounted over a non UL Listed product.

WARRANTY

Three year guarantee against breakage in normal use.



STI-8100 AND STI-8130 PRODUCT DIMENSIONS

Safety Technology International, Inc.

2306 Airport Road
Waterford, Michigan
48327, USA

Tel: 248-673-9898
Fax: 248-673-1246
Toll-free: 800-888-4784
info@sti-usa.com
www.sti-usa.com

Unit 49G Pipers Road
Park Farm Industrial Estate
Redditch, Worcestershire
B98 0HU England

Tel: 44 (0) 1527 520 999
Fax: 44 (0) 1527 501 999
Free: 0800 085 1678 (UK)
www.sti-europe.com

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EDWARDS
United Technologies
LIFE SAFETY & INCIDENT MANAGEMENT

Smoke Detector Guard

SIGA-DG

SIGA-DG
(Shown with optional mounting flange)

S2490

7300-1657:
0127

Overview

The SIGA-DG Smoke Detector Guard protects Signature Series smoke detectors from damage and tampering without affecting airflow to the detector head. The sophisticated louver configuration on the detector guard allows Signature smoke detectors to be installed at their listed spacing and has no affect on the detector's selected operating sensitivity. The guard is constructed of rugged 16-guage steel and is finished with durable white baked powder coat enamel.

Standard Features

- **Agency listed with Signature Series smoke detectors**
  Tested and listed by Underwriters' Laboratories Inc.
- **Compatible with Signature Series 4D and PS smoke detectors**
  Advanced design does not affect detector sensitivity; does not reduce the listed detector spacing.
- **Rugged, tamper-proof design**
  16-gauge steel louvered construction provides superior physical protection. Special fasteners guard against unauthorized access to the detector.
- **Easy mounting**
  Simple design ensures very fast, very secure installation, yet allows easy removal for detector cleaning and inspection.
- **Flush or surface mount**
  SIGA-DGSB Surface Mount Accessory allows installation over surface mounted conduit and electric boxes.

Application

Detector guards should be used wherever flying objects may accidentally damage the detector, or wherever they may be intentionally damaged or used to conceal contraband. Typical applications include correctional or detention facilities, mental hospitals, industrial or warehousing spaces, sports facilities and gymnasiums.

NFPA 72 Section 5-1.3.1 states "*Where subject to mechanical damage, an initiating device shall be protected. A mechanical guard used to protect a smoke or heat detector shall be listed for use with the detector being used*".

The SIGA-DG Detector Guard is designed for use only with SIGA-IPHS 4D and SIGA-PS smoke detectors. The SIGA-DG fully complies with NFPA 72 when used with these detectors.

LIFE SAFETY & INCIDENT MANAGEMENT

Contact us...

Email: edwards.fire@fs.utc.com
Web: *Edwards-fire.com*

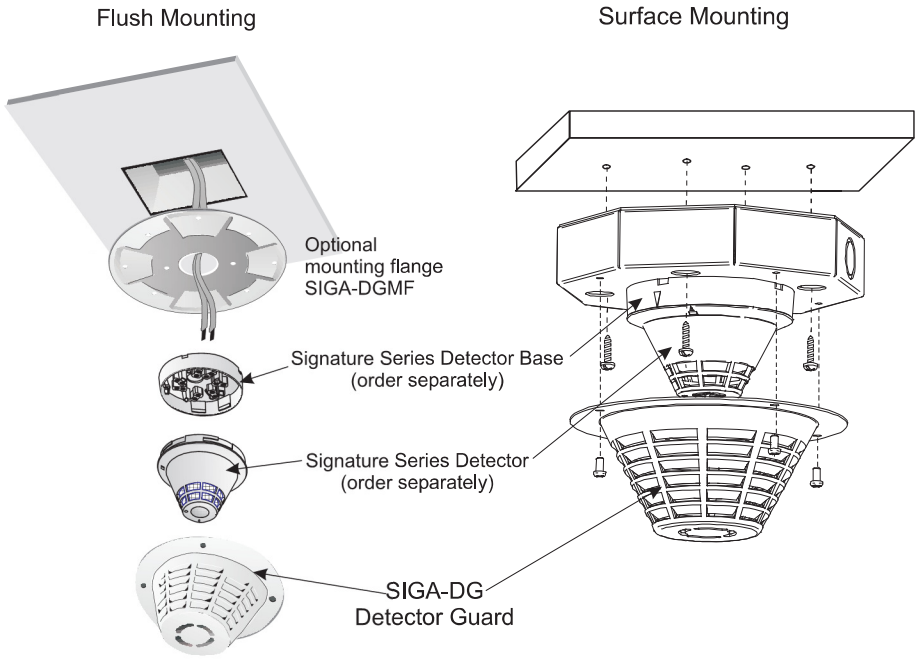
EDWARDS is a UTC brand.
1016 Corporate Park Drive
Mebane, NC 27302

EDWARDS recommends that fire alarm systems and devices always be installed in accordance with the latest recognized edition of national and local fire alarm codes.

Installation and Mounting

The SIGA-DG may be mounted one of three ways:

1. Directly to the ceiling, enclosing a detector installed to a flush-mounted electrical box.
2. To the SIGA-DGSB Surface Mount Adapter, which encloses a surface-mount electrical box.
3. To the optional mounting flange. This accessory is useful where the detector guard is removed periodically for inspection.



Specifications

	SIGA-DG Detector Guard	SIGA-DGSB Detector Guard Surface Adapter
Construction	16 gauge steel	
Dimensions	6.5 inch (165mm) diameter x 3.25 inch (83mm) high	8.9 inch (225mm) octagonal x 2.25 inch (57mm) high
Finish	White; baked powder coat enamel	
Mounting	Mounts over flush 1-gang, octagon, and four-inch square North American electric boxes	Encloses surface mounted octagon or one-gang electric box
Compatible Detectors	Agency listed with the following Signature Series detectors at a maximum air velocity of 500 ft./min. Does not affect detector operating sensitivity, listed area of coverage, or spacing requirements: SIGA-IPHS 4D Multisensor; SIGA-PS Photoelectric	
Agency Listings	UL, ULC	-

Ordering Information

Catalog Number	Description	Ship Wt., lb. (kg)
SIGA-DG	Smoke Detector Guard	0.8 (0.36)
SIGA-DGSB	Detector Guard Surface Mount Accessory	2 (0.9)
SIGA-DGMF	Mounting Flange (optional)	2. (0.9)

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STI Horn/Strobe Damage Stoppers®

STI-1210B

STI-1221E

STI-1217

STI-1225

c UL us
ADA Compliant
MEA STI-1210 AND STI-1221 ONLY

PRODUCT OVERVIEW

These virtually indestructible covers (slotted for horn or speaker units and solid for strobe-only alarms) are designed to stop vandalism and accidental damage. Molded of clear, thick, UV-stabilized polycarbonate material, they are backed by a three year guarantee against breakage in normal use. Slots in the STI-1210, 1215, 1217 and 1219 allow the horn to be heard. The STI-1221, 1225, 1227 and 1229 are for strobes only. Many tough, clear spacers are available for larger strobe/horn units, retrofits, surface-mount and weather resistant applications. For the STI-1210/1221 series, spacer A has a four inch deep enclosed backbox, spacer B has an enclosed backbox molded with an integral double-gang outlet box. Spacer C has an open back for retrofit applications. Spacer D accommodates deeper units and applications with exposed conduit electrical connections. Spacer E has an open back frame for flush-mount applications. An appliance mounting plate comes with the STI-1219/1229. Unique Enviro Kits are available for extreme conditions where dampness or water is present.

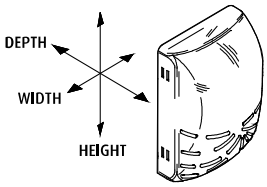
FEATURES

- Helps prevent accidental and intentional damage or vandalism.
- Enviro Kit available for harsh conditions.
- Various backbox and spacer depths are available to accommodate special applications.
- Covers are UV-stabilized.
- See chart for light and sound loss information.
- Typical working properties of polycarbonate are -40° to 250°F (-40° to 121°C).
- Easy access for service.
- See STI-1229HTR heated Type 4X enclosure for strobes in freezing conditions.
- Three year guarantee against breakage of polycarbonate in normal use.

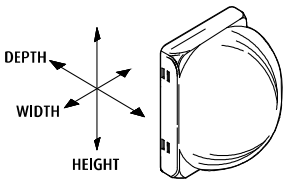
STI Horn/Strobe Damage Stoppers®

MODELS AVAILABLE

STI-1210A	Horn/Strobe Damage Stopper cover and enclosed backbox, 4" deep, weather resistant
STI-1210B	Horn/Strobe Damage Stopper cover and enclosed backbox with double-gang outlet box
STI-1210C	Horn/Strobe Damage Stopper cover open backbox with external mounting tabs
STI-1210D	Horn/Strobe Damage Stopper cover and open backbox with conduit knockout
STI-1210E	Horn/Strobe Damage Stopper cover and open backbox for flush mount
STI-1221A	Strobe Damage Stopper cover and enclosed backbox, 4" deep, weatherproof with drain vent, Type 3R
STI-1221A4X	Strobe Damage Stopper cover and enclosed backbox, 4" deep, weatherproof, Type 4X
STI-1221B	Strobe Damage Stopper cover and solid enclosed backbox and double-gang outlet box
STI-1221C	Strobe Damage Stopper cover and open backbox with external mounting tabs
STI-1221D	Strobe Damage Stopper cover and open backbox with conduit knockout
STI-1221E	Strobe Damage Stopper cover and open backbox for flush mount
SUB-84	Tamper resistant screws
SUB-121	Enviro Kit for D and E models
SUB-122	Enviro Kit for B and C models
SUB-06297D	"D" spacer only
SUB-06297E	"E" spacer only
STI-1283	Backplate for "D" and "E" models
19038	Bit for tamper resistant screws
SUB-6297B20	3/4" conduit hub for "B" and "C" backbox outdoor rated)



STI-1210



STI-1221

STI-1210 Series Horn/Strobe Covers				STI-1221 Series Strobe Covers		
Spacer	H	W	D	H	W	D
A	8.5 in. (216mm)	6.5 in. (165mm)	6.25 in. (159mm)	8.5 in. (216mm)	6.5 in. (165mm)	6.25in. (159mm)
B	8.5 in. (216mm)	6.5 in. (165mm)	3.5 in. (89mm)	8.5 in. (216mm)	6.5 in. (165mm)	3.5 in. (89mm)
C	8.5 in. (216mm)	6.5 in. (165mm)	4.75 in. (120mm)	8.5 in. (216mm)	6.5 in. (165mm)	4.75 in. (120mm)
D	8.5 in. (216mm)	6.5 in. (165mm)	5.75 in. (146mm)	8.5 in. (216mm)	6.5 in. (165mm)	5.75 in. (146mm)
E	8.5 in. (216mm)	6.5 in. (165mm)	4 in. (102mm)	8.5 in. (216mm)	6.5 in. (165mm)	4 in. (102mm)

APPROVALS & WARRANTY

TESTING

It has been tested and approved or listed by:
· Underwriter Laboratories and Canadian UL File S7025
· cUL approval for UL 1638 only
· CSFM needs local approval
· MEA STI-1210 and STI-1221 series only
· UL Listed for fire voice speakers for STI-1210 series only
· ADA Compliant

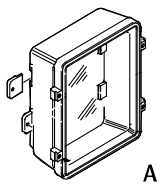
WARRANTY

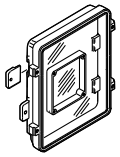
Three year guarantee against breakage of polycarbonate in normal use.

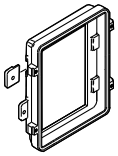
Performance Review Manufacturer	Light Loss %
STI-1210 SERIES	
ADT SECURITY (ADTG1-V Series), EST/EDWARDS(G1-V Series, G1-HV Series, G1-HOV Series, EG1-V Series, EG1-HV Series, EG1-HOV Series), HONEYWELL (XLSG1-V, XLSG1-HV, XLSG1-HOV Series), MIRCOM (MG1-V, MG1-HV, MG1-HOV Series), SIEMENS (G1-V Series), ZITON PTY LTD (ZG1-V Series)	40%
EST/EDWARDS (2440S, 202 Series), HONEYWELL (XLS202 Series), MIRCOM (MS Series), MIRTONE (MG1-V Series), SIEMENS (202 Series)	43%
AMSECO-(SL24W-153075 CLEAR, A, B, G or R, SL24C-3075110 A, B, G or R, CSL24W-A, B, G or R, CSL24C-A, B, G or R), MIRCOM (FS-240), POTTER ELECTRIC (AS-24-153075R, AS-24-153075W)SYSTEM SENSOR (SS24110ADA)	47%
SYSTEM SENSOR (P2, PC2, P4, PC4, SX, SC)	53%
STI-1221 SERIES	
AMSECO-(SL24W-153075 CLEAR, A, B, G or R, SL24C-3075110 A, B, G or R, CSL24W-A, B, G or R, CSL24C-A, B, G or R), MIRCOM (FS-240), POTTER ELECTRIC (AS-24-153075R, AS-24-153075W)	26%
DETECTION SYSTEMS (GES24 Series), GENTEX (GES24 Series), HARRINGTON SIGNAL (GES24 Series), NATIONAL TIME & SIGNAL (GES24 Series), SECUTRON (GES24 Series)	31%
ADT SECURITY (ADTG1-V Series), EST/EDWARDS (G1-V Series, G1-HV Series, G1-HOV Series, EG1-V Series, EG1-HV Series, EG1-HOV Series), HONEYWELL (XLSG1-V Series, XLSG1-HV Series, XLSG1-HOV Series), MIRCOM (MG1-V, MG1-HV, MG1-HOV Series), SIEMENS (G1-V Series), ZITON PTY LTD. (ZG1-V Series)	34%
AMESCO (SL24W-153075), SYSTEM SENSOR (SS24110ADA)	37%
EST/EDWARDS (2440S, 202 Series), HONEYWELL (XLS202 Series), MIRCOM (MS Series), MIRTONE (MG1-V Series), SIEMENS (202 Series)	45%
FARADAY LLC (2700)	57%
SYSTEM SENSOR (P2, PC2, P4, PC4, SX, SC)	61%

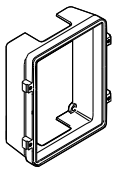
Use of horn/strobe cover on audible device decreases the sound output by 6dB(A).

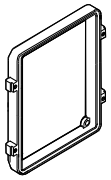
SPACER	DESCRIPTION
A	Enclosed backbox, 4" deep (includes neoprene gasket)
A4X	Enclosed backbox, 4" deep Type 4X (includes silicone gasket)
B	Enclosed backbox with double-gang outlet box
C	Open backbox with external mounting tabs
D	Open backbox with conduit knockout
E	Open backbox for flush mount


A SPACER


B SPACER


C SPACER


D SPACER


E SPACER

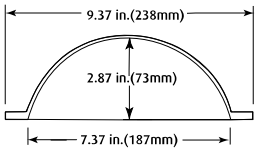
STI Stopper® Dome

Dimensions and Technical Information

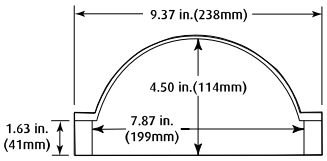
MODELS AVAILABLE

STI-1215	Stopper Dome for Horn/ Speaker/Strobe for flush mount
STI-1217	Stopper Dome for Horn/ Speaker/Strobe with open backbox
STI-1219	Stopper Dome for Horn/ Speaker/Strobe with enclosed backbox
STI-1225	Stopper Dome for Strobe only flush mount
STI-1227	Stopper Dome for Strobe only with open backbox
STI-1229*	Stopper Dome for strobe only with enclosed backbox, Type 4X
STI-1212	Spacer kit
STI-1222	Enclosed backbox for Stopper Dome
STI-1284	Single Gang Mounting Adapter for STI-1219 and STI-1229
SUB-84	Tamper resistant screws
SUB-123	Enviro Kit includes three gaskets
19038	Bit for tamper resistant screws

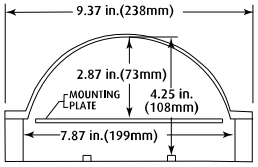
***Hazardous models available. See STI-1229.**



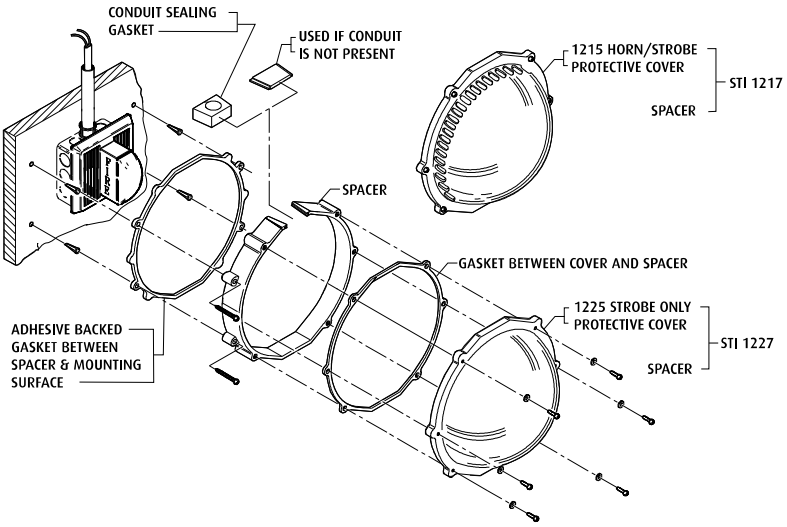
STI-1215 / STI-1225



STI-1217 / STI-1227



STI-1219 / STI-1229



APPROVALS & WARRANTY

TESTING

It has been tested and approved or listed by:

- Underwriter Laboratories and Canadian UL File S7025
- cUL approval for UL 1638 only
- CSFM needs local approval
- For hazardous applications in Canada, to meet cUL, your strobe must be ULC Listed
- ADA Compliant

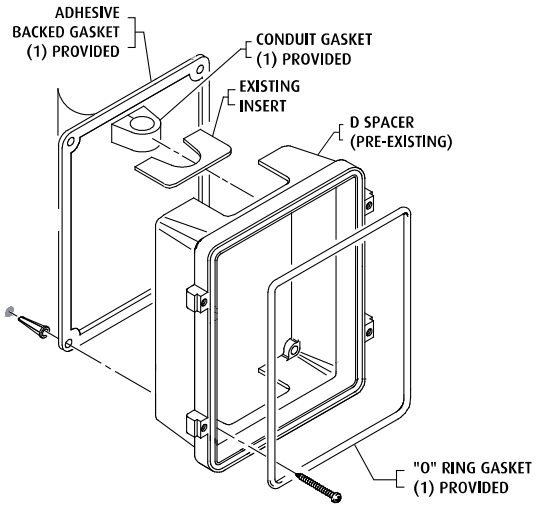
WARRANTY

Three year guarantee against breakage of polycarbonate in normal use.

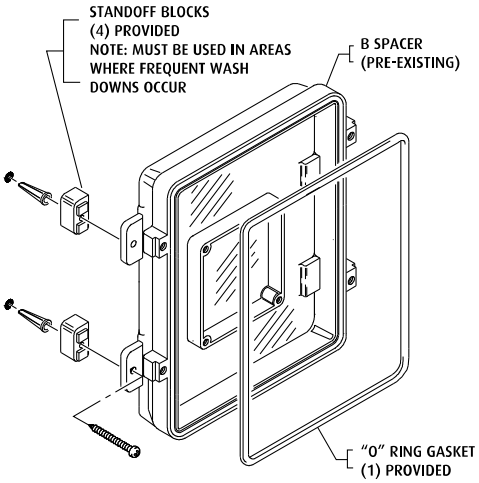
Performance Review Manufacturer	Light Loss %
STI-1215/17/19 SERIES	
ADT SECURITY (ADTG1-V Series), EST/EDWARDS (G1-V Series, G1-HV Series, G1-HOV Series, EG1-V Series, EG1-HV Series, EG1-HOV Series), HONEYWELL (XLSG1-V Series, XLSG1-HV Series, XLSG1-HOV Series), MIRCOM (MG1-V Series, MG1-HV Series, MG1-HOV Series), MIRTONE (MG1-V Series), SIEMENS (G1-V Series), ZITON PTY LTD (ZG1-V SERIES)	20%
AMSECO (SL24W-153075), AMSECO-COLORED LENSES (SL24W-153075 A, B, G or R, SL24C-3075110 A, B, G or R, CSL24W-A, B, G or R, CSL24C-A, B, G or R), MIRCOM (FS-240), POTTER ELECTRIC (AS-24-153075R, AS-24-153075W)	22%
FARADAY (2700), SIEMENS (U-MCS Series)	23%
DETECTION SYSTEMS (GES24 Series, GES24-15/75), GENTEX (GES24 Series, GES224-15/75), HARRINGTON SIGNAL (GES24 Series, GES24-15/75), NATIONAL TIME & SIGNAL (GES24 Series, GES24-15/75), SECUTRON (GES24 Series, GES24-15/75)	27%
SYSTEM SENSOR (SS24110ADA)	26%
EST/EDWARDS (2440S Series, 202 Series), HONEYWELL (XLS202 Series), MIRCOM (MS Series), SIEMENS (202 Series)	33%
WHEELOCK (RSS-24MCW)	34%
WHEELOCK (RSS-24MCC)	36%
SYSTEM SENSOR (P2, PC2, P4, PC4, SX, SC)	39%
STI-1225/27/29 SERIES	
SYSTEM SENSOR (P2, PC2, P4, PC4, SX, SC)	28%
WHEELOCK (RSS-24MCW)	31%
ADT SECURITY (ADTG1-V Series), EST/EDWARDS (G1-V Series, G1-HV Series, G1-HOV Series, EG1-V Series, EG1-HV Series, EG1-HOV Series), HONEYWELL (XLSG1-V Series, XLSG1-HV Series, XLSG1-HOV Series), MIRCOM (MG1-V Series, MG1-HV Series, MG1-HOV Series), MIRTONE (MG1-V Series), SIEMENS (G1-V Series), ZITON PTY LTD. (ZG1-V SERIES)	32%
FARADAY (2700), SIEMENS (U-MCS Series)	33%
EST/EDWARDS (2440S Series, 202 Series), HONEYWELL (XLS202 Series), MIRCOM (MS Series), SIEMENS (202 Series)	34%
WHEELOCK (RSS-24MCC)	35%
SYSTEM SENSOR (SS24110ADA)	36%
AMSECO (SL24W-153075), AMSECO-COLORED LENSES (SL24W-153075 A, B, G or R, SL24C-3075110 A, B, G or R, CSL24W-A, B, G or R, CSL24C-A, B, G or R) SCM24W), DETECTION SYSTEMS (GES24 Series, GES24-15/75), GENTEX (GES24 Series, GES224-15/75), HARRINGTON SIGNAL (GES24 Series, GES24-15/75), HONEYWELL (XLSG1-HOV Series), MIRCOM (FS-240), NATIONAL TIME & SIGNAL (GES24 Series, GES24-15/75), POTTER ELECTRIC (AS-24-153075R, AS-24-153075W), SECUTRON (GES24 Series, GES24-15/75)	37%

Sound loss for STI-1215, 1217 and 1219
Horns: Amseco Audible Horn Sounders - 6.2 dBA
Speakers: Siemens Adapter Series (0.5, 1, or 2 watt taps only) - 4.1 dBA

STI Horn/Strobe Damage Stoppers®

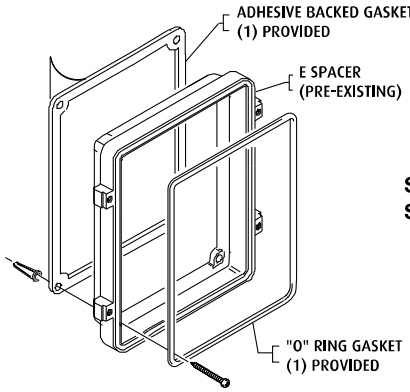


SUB-121

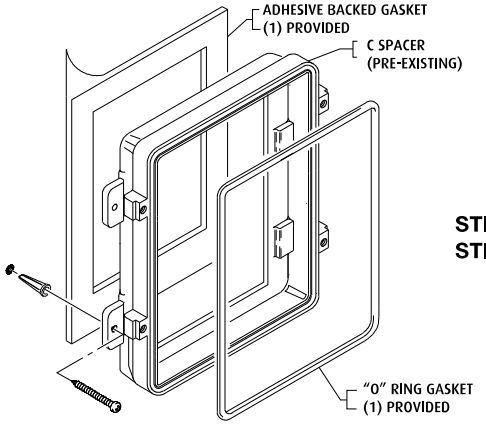


STI-1210B
STI-1221B

SUB-122



STI-1210E
STI-1221E



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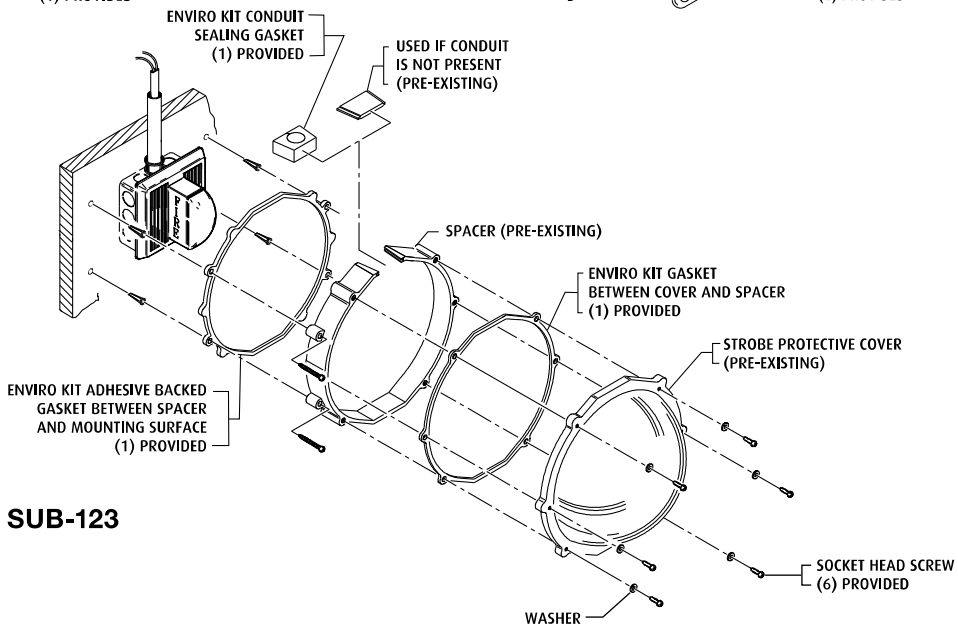
STI-1221C



SUB-123

Safety Technology International, Inc.

2306 Airport Road
Waterford, Michigan
48327, USA

Tel: 248-673-9898
Fax: 248-673-1246
Toll-free: 800-888-4STI
info@sti-usa.com
www.sti-usa.com

Unit 49G Pipers Road
Park Farm Industrial Estate
Redditch, Worcestershire
B98 0HU England

Tel: 44 (0) 1527 520 999
Fax: 44 (0) 1527 501 999
Free: 0800 085 1678 (UK)
www.sti-europe.com

Subject to change without notice. 06/09

LEGEND:

RISER DIAG SYM	NFPA SYMBOL*	DESCRIPTION	CATALOG #
FACP	FACP	Fire Alarm Control Panel	EST-3X
ANN	FAA	Fire Alarm Annunciator	RLCD-CR
BPS	FACU	Notification Power Extender (Fire Alarm Control Unit)	BPS6A
FATC	FATC	Fire Alarm Terminal Cabinet	SAE
F	P	Manual Pull Station	SIGA-278
PS		Smoke Detector w/Base (PS indicates Detention Area Devices)	SIGA-PD w/ SIGA-SB SIGA-PS
CO R	C	Carbon Monoxide Detector (R indicates Round for Detention Area)	CO1224-T(R)
D	D	Duct Smoke Detector with Remote Test Switch & Sampling Tube	SIGA-SD, SD-TRK
		Heat Detector	SIGA-HRD
CT x / MCT2	AIM	Addressable Input Module (x Denotes 1 or 2 Inputs, M Denotes Motherboard Required)	SIGA-CT1, -CT2 SIGA-MCT2, UIO Board
CR / MCR	AOM	Addressable Relay Module (M Denotes Motherboard Required)	SIGA-CR Siga-MCR, UIO Board
MCC1	AOM	Addressable Signal Module (M Denotes Motherboard Required)	SIGA-MCC1
MCC1S	AOM	Addressable Class Synchronizing Signal Module (M Denotes Motherboard Required)	SIGA-MCC1S, UIO Bd
WF	WF	Waterflow Switch	FBO
TS	VS	Tamper Switch (Valve Supervisory)	FBO

LEGEND:

RISER DIAG SYM	NFPA SYMBOL*	DESCRIPTION	CATALOG #
MRM1		Riser Monitor Module	SIGA-MRM1
ISO		Isolation Module	SIGA-IM
#		Strobe Unit - White Wall Mount (# indicates candela rating)	G1F-VM
#		Horn/Strobe Unit - White Wall Mount (# indicates candela rating)	G1F-HDVM
WP #	WP	Weatherproof Horn/Strobe Unit - White w/ Backbox (WP indicates weatherproof, # indicates candela rating)	757-7A-TW 757-WB
#		Horn/Strobe Unit - White Ceiling Mount (# indicates candela rating)	GCF-HDVM
DH		Door Holder	FBO
B	SL	Exterior Beacon	495S-1280
PR1		Multi-Voltage Relay	PR-1
		Waterflow Bell (120 VAC FBO)	438D-6N5R
MB		Radio Masterbox	DET16

* NFPA 170 (2009)
Tables: 6.5, 6.7.1, 6.7.2, & 6.7.3
(Some symbols may not appear on drawing)

GENERAL NOTES:

1. ALL WIRING IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE, COMMONWEALTH OF MASSACHUSETTS BUILDING CODE (IBC), AUTHORITY HAVING JURISDICTION AND MANUFACTURER'S REQUIREMENTS AND RECOMMENDATIONS.

2. RISER DRAWING BASED ON ENGINEER PLANS DATED 11/07/2018

WIRING NOTES:

1. **ALL ADDRESSABLE DEVICES MUST BE INSTALLED IN A DRY HEATED LOCATION.**

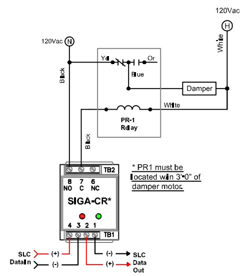
2. ADDRESSABLE CONTROL RELAYS (CR'S) SHALL SWITCH ONLY 12/24V (AC/DC) @ 2.0 Amps OR LESS. SWITCHED CIRCUITS REQUIRING HIGHER VOLTAGE SHALL USE AN INTERMEDIATE LISTED FOR THE PURPOSE.

3. Addressable loop consists of (1) 2c #16 Twisted non-shielded from FACP/FATC to 1st device, (1) 2c #16 Twisted non-shielded through remaining devices on circuit and return to FACP/FATC to maintain original loop integrity. Maintain proper separation between feeds and returns.

4. All Strobe circuits consist of a minimum of 2c #14 from Strobe BPS to 1st device, 2c #14 through remaining devices on circuit and return to Strobe BPS to maintain a class "A" circuit. Maintain proper separation between feeds and returns. See booster calculations provided with submittal package for maximum circuit lengths.

5. Low-frequency room sounder base circuits consist of 2c #14 from booster power supply to associated terminal cabinet, 2c #14 from terminal cabinet to first device, 2c #14 through remaining devices on circuit and return to associated terminal cabinet. Maintain proper separation between feeds and returns. See auxiliary power supplies and terminal cabinets for circuit number allocation. See auxiliary power supply calculations provided with submittal package for maximum circuit lengths.

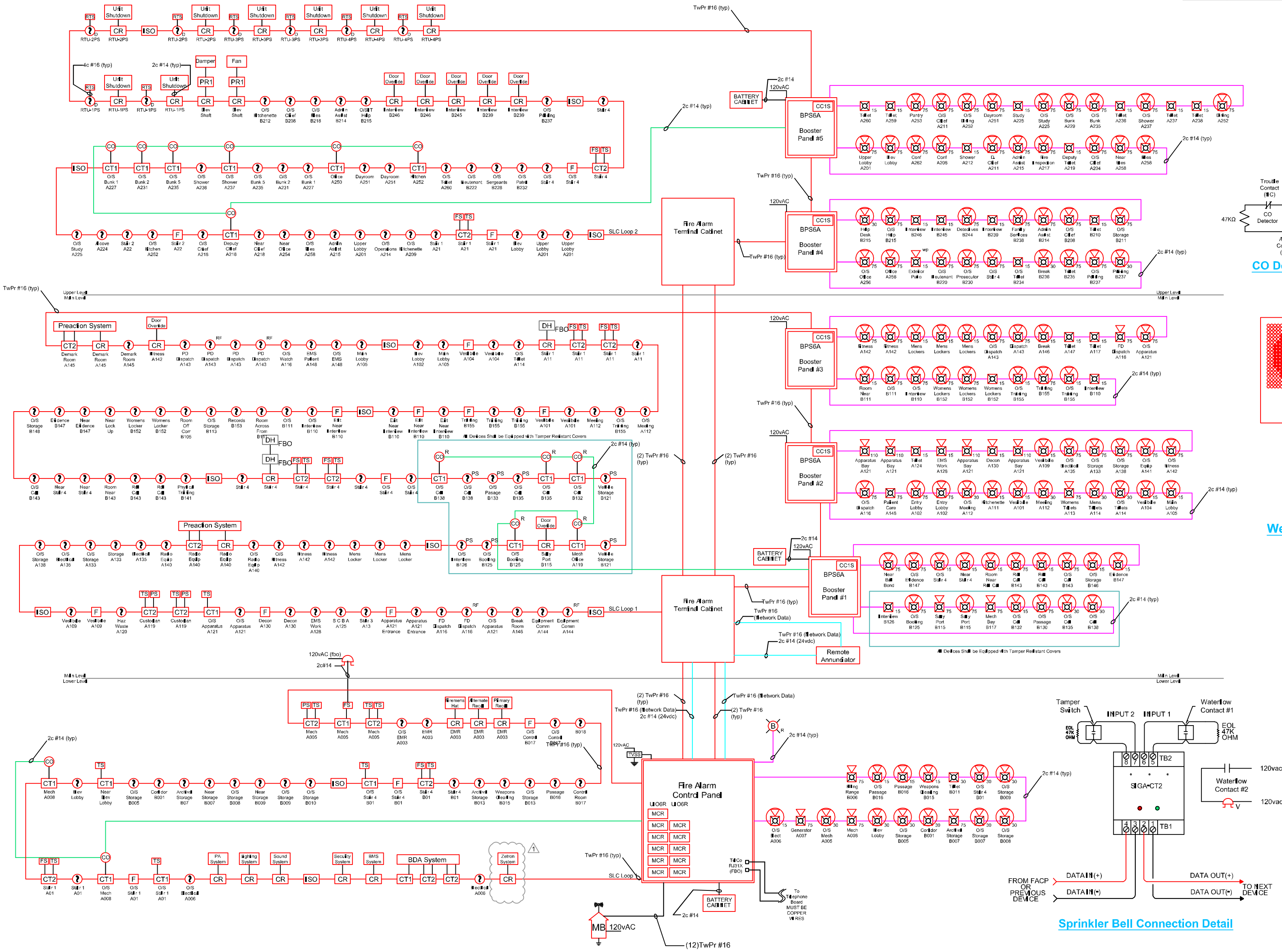
6. Remote annunciator wiring shall consist of (1) 2c #16 Twisted non-shielded and 2c #14 from FACP to Remote Annunciator and (1) 2c #16 Twisted non-shielded returned to FACP. Maintain proper separation between feeds and returns.

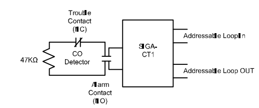


120Vac Damper Detail

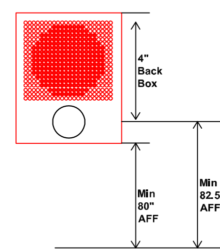
RADIO BOX ZONES

ZONE 1	SPRINKLER ZONE MAIN FLOW & PRESSURE SWITCHES
ZONE 2	SPRINKLER ZONE 1 - FD SIDE
ZONE 3	SPRINKLER ZONE 2 - PD 1ST FLOOR
ZONE 4	SPRINKLER ZONE 3 - DETENTION AREAS
ZONE 5	SPRINKLER ZONE 2 - PD 2ND FLOOR
ZONE 6	DUCT SMOKE DETECTORS
ZONE 7	PULL STATIONS - 1ST FLOOR
ZONE 8	PULL STATIONS - 2ND FLOOR
ZONE 9	AUTOMATIC DEVICES - 1ST FLOOR
ZONE 10	AUTOMATIC DEVICES - 2ND FLOOR
ZONE 11	SYSTEM SUPERVISORY
ZONE 12	SYSTEM TROUBLE
ZONE 13	SPARE
ZONE 14	SPARE
ZONE 15	SPARE
ZONE 16	SPARE





CO Detector Connection Detail



Weatherproof Horn Strobe Detail

Sprinkler Bell Connection Detail

REV.	DESCRIPTION	DATE	DRWN:	RVW'D:
1	Changes per Engineers Comments dated 6/11/19	6/19	KMB	kmb
0	Original Issue	3/19	KMB	kmb

SCALE: NTS

PO No. __

Needham Public Safety
Police & Fire Headqrts
Needham, MA
FIRE ALARM RISER
DWG NO. NPFHQ_Rsr

JOB NAME:
Needham Public Safety
Ploice & Fire Headquarters
Needham, Massachusetts
FIRE ALARM RISER DIAGRAM

R.B. Allen Co., Inc.
P.O. BOX 770
131 LAFAYETTE RD
NO. HAMPTON, NH 03862
1-800-258-7264
EDWARDS SYSTEM TECHNOLOGY

DWG NAME:
Needham Public Safety
Police & Fire Headquarters
Needham, Massachusetts
FIRE ALARM RISER DIAGRAM
DWG NAME: NPFHQ_RSR

1 EP4.00 LOWER LEVEL FLOOR PLAN - FIRE ALARM
SCALE 1/8" = 1'-0"

LEGEND:

RISER DIAG SYM	NFPA SYMBOL*	DESCRIPTION	CATALOG #
FACP	FACP	Fire Alarm Control Panel	EST-3X
ANN	FAA	Fire Alarm Annunciator	RLCD-CR
BPS	FACU	Notification Power Extender (Fire Alarm Control Unit)	BPS6A
FATC	FATC	Fire Alarm Terminal Cabinet	SAE
F	P	Manual Pull Station	SIGA-278
PS		Smoke Detector w/Base (PS indicates Detention Area Devices)	SIGA-PD w/ SIGA-SB SIGA-PS
CO R	C	Carbon Monoxide Detector (R indicates Round for Detention Area)	CO1224-T(R)
D	D	Duct Smoke Detector with Remote Test Switch & Sampling Tube	SIGA-SD, SD-TRK
		Heat Detector	SIGA-HRD
CTx MCT2	AIM	Addressable Input Module (x Denotes 1 or 2 Inputs, M Denotes Motherboard Required)	SIGA-CT1, -CT2 SIGA-MCT2, UIO Board
CR MCR	AOM	Addressable Relay Module (M Denotes Motherboard Required)	SIGA-CR Siga-MCR, UIO Board
MCC1	AOM	Addressable Signal Module (M Denotes Motherboard Required)	SIGA-MCC1
MCC1S	AOM	Addressable Class Synchronizing Signal Module (M Denotes Motherboard Required)	SIGA-MCC1S, UIO Bd
WF	WF	Waterflow Switch	FBO
TS	VS	Tamper Switch (Valve Supervisory)	FBO
MRM1		Riser Monitor Module	SIGA-MRM1
ISO		Isolation Module	SIGA-IM
#		Strobe Unit - White Wall Mount (# indicates candela rating)	G1F-VM
#		Horn/Strobe Unit - White Wall Mount (# indicates candela rating)	G1F-HDVM
WP #	WP	Weatherproof Horn/Strobe Unit - White w/ Backbox (WP indicates weatherproof, # indicates candela rating)	757-7A-TW 757-WB
#		Horn/Strobe Unit - White Ceiling Mount (# indicates candela rating)	GCF-HDVM
DH		Door Holder	FBO
B	SL	Exterior Beacon	495S-1280
PR1		Multi-Voltage Relay	PR-1
		Waterflow Bell (120 VAC FBO)	438D-6I5R
MB		Radio Masterbox	DET16

* NFPA 170 (2009)
Tables 6.5, 6.7.1, 6.7.2, & 6.7.3
(Some symbols may not appear on drawing)

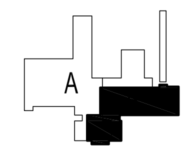
ISSUE DATE

DATE	DESCRIPTION
8.15.19	ORIGINAL ISSUE

REVISIONS

DATE	DESCRIPTION

FOR ALL ABBREVIATIONS, SYMBOL LEGENDS, AND GENERAL NOTES SEE SHEET R0.01



KEY PLAN

SCALE: 1/8" = 1'-0" 0' 4' 8' 16'
PROJECT TRUE

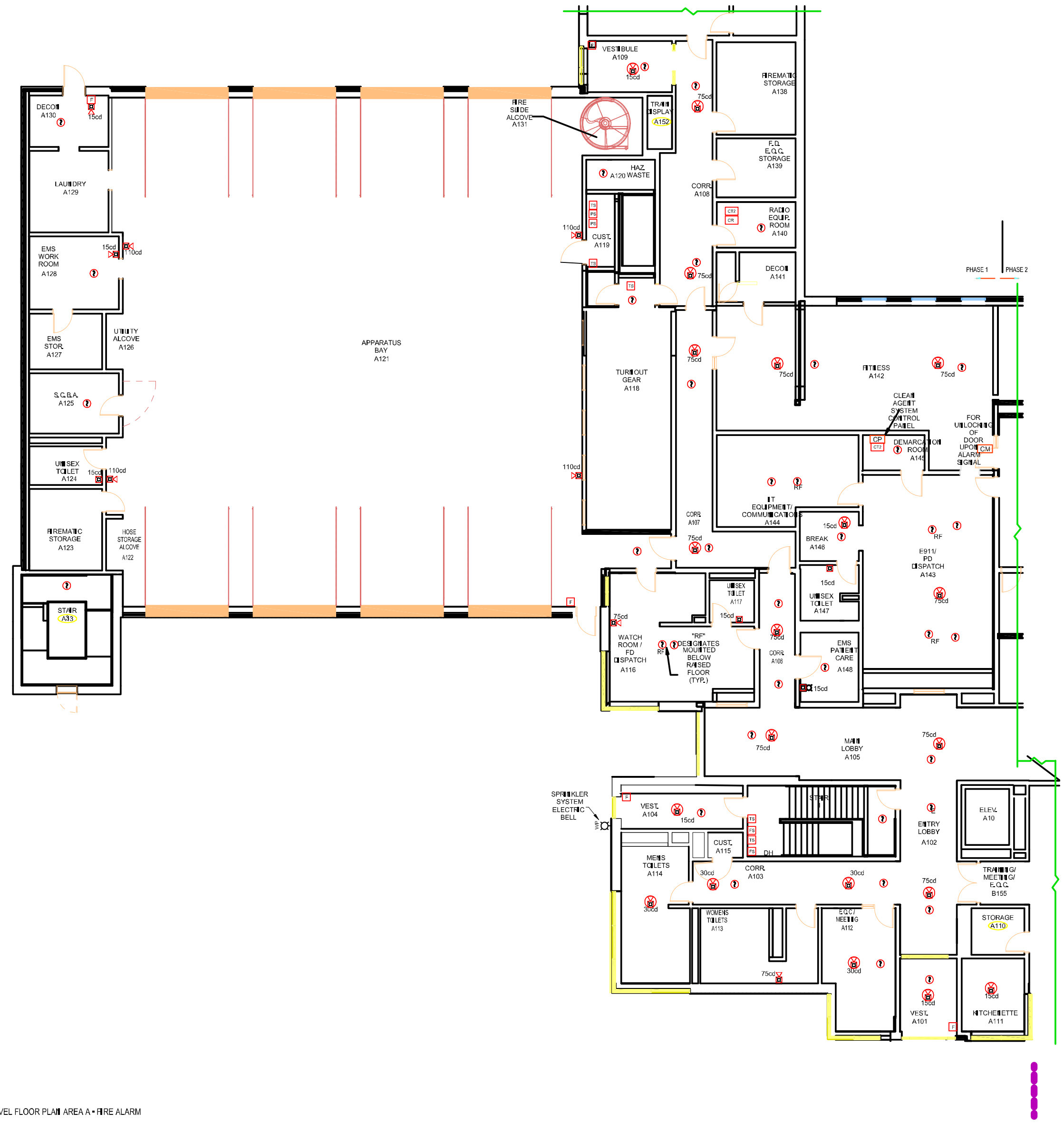
NEEDHAM POLICE AND FIRE HEADQUARTERS

88 CHESTNUT STREET
NEEDHAM, MA 02492

PROJECT NO.: DRAWN BY:

LOWER LEVEL FLOOR PLAN - FIRE ALARM

DRAWING NO.:
HQ-100

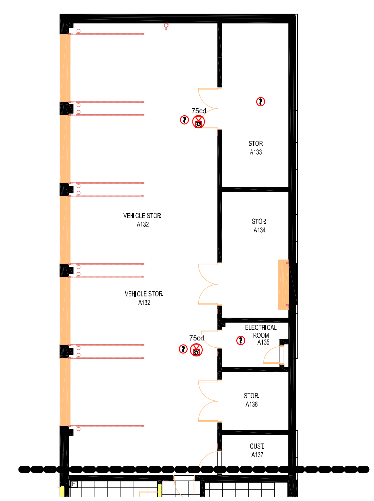


2 EP4.01 PARTIAL MAIN LEVEL FLOOR PLAN AREA A - FIRE ALARM
SCALE: 1/8" = 1'-0"

LEGEND:

RISER DIAG SYM	NFPA SYMBOL*	DESCRIPTION	CATALOG #
FACP	FACP	Fire Alarm Control Panel	EST-3X
ANN	FAA	Fire Alarm Annunciator	RLCD-CR
BPS	FACU	Notification Power Extender (Fire Alarm Control Unit)	BPS6A
FATC	FATC	Fire Alarm Terminal Cabinet	SAE
F	P	Manual Pull Station	SIGA-278
PS		Smoke Detector w/Base (PS indicates Detention Area Devices)	SIGA-PD w/ SIGA-SB SIGA-PS
CO R	C	Carbon Monoxide Detector (R indicates Round for Detention Area)	CO1224-T(R)
D	D	Duct Smoke Detector with Remote Test Switch & Sampling Tube	SIGA-SD, SD-TRK
		Heat Detector	SIGA-HRD
CTx, MCT2	AIM	Addressable Input Module (x Denotes 1 or 2 Inputs, M Denotes Motherboard Required)	SIGA-CT1, -CT2 SIGA-MCT2, UIO Board
CR, MCR	AOM	Addressable Relay Module (M Denotes Motherboard Required)	SIGA-CR Siga-MCR, UIO Board
MCC1	AOM	Addressable Signal Module (M Denotes Motherboard Required)	SIGA-MCC1
MCC1S	AOM	Addressable Class Synchronizing Signal Module (M Denotes Motherboard Required)	SIGA-MCC1S, UIO Bd
WF	WF	Waterflow Switch	FBO
TS	VS	Tamper Switch (Valve Supervisory)	FBO
MRM1		Riser Monitor Module	SIGA-MRM1
ISO		Isolation Module	SIGA-IM
#		Strobe Unit - White Wall Mount (# indicates candela rating)	G1F-VM
#		Horn/Strobe Unit - White Wall Mount (# indicates candela rating)	G1F-HDVM
WP #	WP	Weatherproof Horn/Strobe Unit - White w/ Backbox (WP indicates weatherproof, # indicates candela rating)	757-7A-TW 757-WB
#		Horn/Strobe Unit - White Ceiling Mount (# indicates candela rating)	GCF-HDVM
DH		Door Holder	FBO
B	SL	Exterior Beacon	495S-1280
PR1		Multi-Voltage Relay	PR-1
		Waterflow Bell (120 VAC FBO)	438D-6N5R
MB		Radio Masterbox	DET16

* NFPA 170 (2009)
Tables: 6.5, 6.7.1, 6.7.2, & 6.7.3
(Some symbols may not appear on drawing)



1 EP4.01 PARTIAL MAIN LEVEL FLOOR PLAN AREA A - FIRE ALARM
SCALE: 1/8" = 1'-0"
NOTE: ALL WORK IN THIS AREA TO BE COMPLETED AS PART OF PHASE 1.

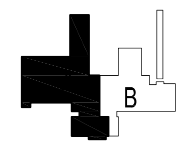
ISSUE DATE

DATE	DESCRIPTION
6.12.2019	ORIGINAL ISSUE

REVISIONS

DATE	DESCRIPTION

FOR ALL ABBREVIATIONS, SYMBOL LEGENDS, AND GENERAL NOTES SEE SHEET R0.01



KEY PLAN

0' 4' 8' 16'
SCALE: 1/8" = 1'-0"
PROJECT TRUE

NEEDHAM POLICE AND FIRE HEADQUARTERS

88 CHESTNUT STREET
NEEDHAM, MA 02492

PROJECT NO.:
DRAWN BY:

MAIN LEVEL FLOOR PLAN AREA A - FIRE ALARM

DRAWING NO.:
HQ1.01

1 EP4.02 MAIN LEVEL FLOOR PLAN AREA B - FIRE ALARM
SCALE: 1/8" = 1'-0"

LEGEND:

RISER DIAG SYM	NFPA SYMBOL*	DESCRIPTION	CATALOG #
FACP	FACP	Fire Alarm Control Panel	EST-3X
ANN	FAA	Fire Alarm Annunciator	RLCD-CR
BPS	FACU	Notification Power Extender (Fire Alarm Control Unit)	BPS6A
FATC	FATC	Fire Alarm Terminal Cabinet	SAE
F	P	Manual Pull Station	SIGA-278
PS		Smoke Detector w/Base (PS Indicates Detention Area Devices)	SIGA-PD w/ SIGA-SB SIGA-PS
CO R	C	Carbon Monoxide Detector (R indicates Round for Detention Area)	CO1224-T(R)
D	D	Duct Smoke Detector with Remote Test Switch & Sampling Tube	SIGA-SD, SD-TRK
		Heat Detector	SIGA-HRD
CT x / MCT2	M	Addressable Input Module (x Denotes 1 or 2 Inputs, M Denotes Motherboard Required)	SIGA-CT1, -CT2 SIGA-MCT2, UIO Board
CR / MCR	AOM	Addressable Relay Module (M Denotes Motherboard Required)	SIGA-CR Siga-MCR, UIO Board
MCC1	AOM	Addressable Signal Module (M Denotes Motherboard Required)	SIGA-MCC1
MCC1S	AOM	Addressable Class Synchronizing Signal Module (M Denotes Motherboard Required)	SIGA-MCC1S, UIO Bd
WF	WF	Waterflow Switch	FBO
TS	VS	Tamper Switch (Valve Supervisory)	FBO
MRM1		Riser Monitor Module	SIGA-MRM1
ISO		Isolation Module	SIGA-IM
#		Strobe Unit – White Wall Mount (# indicates candela rating)	G1F-VM
#		Horn/Strobe Unit – White Wall Mount (# indicates candela rating)	G1F-HDVM
WP #	WP	Weatherproof Horn/Strobe Unit – White w/ Backbox (WP indicates weatherproof, # indicates candela rating)	757-7A-TW 757-WB
#		Horn/Strobe Unit – White Ceiling Mount (# indicates candela rating)	GCF-HDVM
DH		Door Holder	FBO
B	SL	Exterior Beacon	495S-1280
PR1		Milli-Voltage Relay	PR-1
		Waterflow Bell (120 VAC FBO)	438D-6N5R
MB		Radio Masterbox	DET16

* NFPA 170 (2009)
Tables: 6.5, 6.7.1, 6.7.2, & 6.7.3
(Some symbols may not appear on drawing)

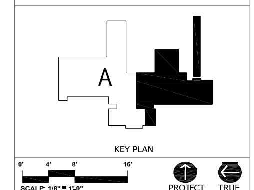
ISSUE DATE

DATE	DESCRIPTION
8.15.19	ORIGINAL ISSUE

REVISIONS

DATE	DESCRIPTION

FOR ALL ABBREVIATIONS, SYMBOL LEGENDS, AND GENERAL NOTES SEE SHEET RQ.01



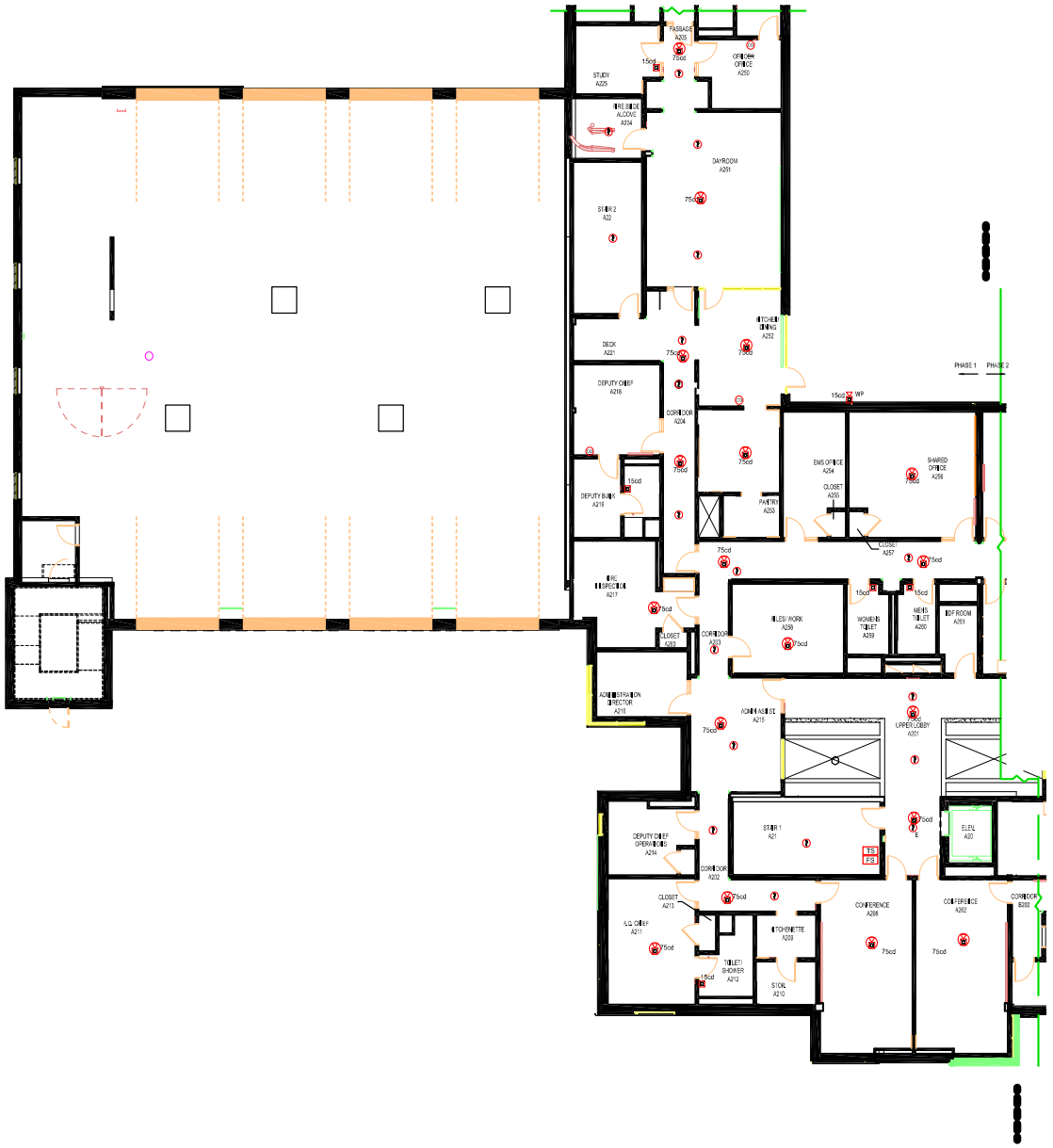
NEEDHAM POLICE AND FIRE HEADQUARTERS

88 CHESTNUT STREET
NEEDHAM, MA 02492

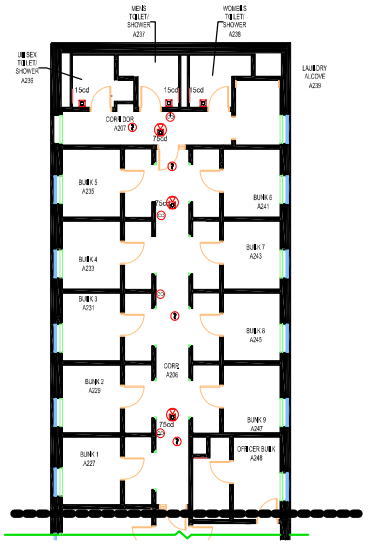
PROJECT NO:
DRAWN BY:

MAIN LEVEL FLOOR PLAN AREA B - FIRE ALARM

DRAWING NO:
HQ1.03



2 EP4.05 PARTIAL UPPER LEVEL FLOOR PLAN AREA A - FIRE ALARM
SCALE: 1/8" = 1'-0"



1 EP4.03 PARTIAL UPPER LEVEL FLOOR PLAN AREA A - FIRE ALARM
SCALE: 1/8" = 1'-0"
NOTE: ALL WORK IN THIS AREA TO BE COMPLETED AS PART OF PHASE 1

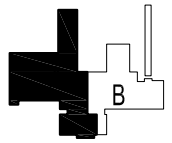
ISSUE DATE

DATE	DESCRIPTION
8/15/19	ORIGINAL ISSUE

REVISIONS

DATE	DESCRIPTION

FOR ALL ABBREVIATIONS, SYMBOL LEGENDS, AND GENERAL NOTES SEE SHEET RL.01



KEY PLAN

0' 4' 8' 16'
SCALE: 1/8" = 1'-0"
PROJECT TRUE

NEEDHAM POLICE AND FIRE HEADQUARTERS

88 CHESTNUT STREET
NEEDHAM, MA 02492

PROJECT NO:
DRAWN BY:

UPPER LEVEL FLOOR PLAN AREA A - FIRE ALARM

DRAWING NO:
HQ1.04

1 EP4.04 UPPER LEVEL FLOOR PLAN AREA B - FIRE ALARM
SCALE: 1/8" = 1'-0"

LEGEND:

RISER DIAG SYM	NFPA SYMBOL*	DESCRIPTION	CATALOG #
FACP	FACP	Fire Alarm Control Panel	EST-3X
ANN	FAA	Fire Alarm Annunciator	RLCD-CR
BPS	FACU	Notification Power Extender (Fire Alarm Control Unit)	BPS6A
FATC	FATC	Fire Alarm Terminal Cabinet	SAE
F	P	Manual Pull Station	SIGA-278
PS		Smoke Detector w/Base (PS Indicates Detention Area Devices)	SIGA-PD w/ SIGA-SB SIGA-PS
CO R	C	Carbon Monoxide Detector (R Indicates Round for Detention Area)	CO1224-T(R)
D	D	Duct Smoke Detector with Remote Test Switch & Sampling Tube	SIGA-SD, SD-TRK
		Heat Detector	SIGA-HRD
CTx MCT2	AIM	Addressable Input Module (x Denotes 1 or 2 Inputs, M Denotes Motherboard Required)	SIGA-CT1, -CT2 SIGA-MCT2, UIO Board
CR MCR	AOM	Addressable Relay Module (M Denotes Motherboard Required)	SIGA-CR Siga-MCR, UIO Board
MCC1	AOM	Addressable Signal Module (M Denotes Motherboard Required)	SIGA-MCC1
MCC1S	AOM	Addressable Class Synchronizing Signal Module (M Denotes Motherboard Required)	SIGA-MCC1S, UIO Bd
WF	WF	Waterflow Switch	FBO
TS	VS	Tamper Switch (Valve Supervisory)	FBO
MRM1		Riser Monitor Module	SIGA-MRM1
ISO		Isolation Module	SIGA-IM
#		Strobe Unit - White Wall Mount (# indicates candela rating)	G1F-VM
#		Horn/Strobe Unit - White Wall Mount (# indicates candela rating)	G1F-HDVM
WP #	WP	Weatherproof Horn/Strobe Unit - White w/ Backbox (WP Indicates weatherproof, # indicates candela rating)	757-7A-TW 757-WB
#		Horn/Strobe Unit - White Ceiling Mount (# indicates candela rating)	GCF-HDVM
DH		Door Holder	FBO
B	SL	Exterior Beacon	495S-1280
PR1		Multi-Voltage Relay	PR-1
		Waterflow Bell (120 VAC FBO)	438D-6N5R
MB		Radio Masterbox	DET16

* NFPA 170 (2009)
Tables: 6.5, 6.7.1, 6.7.2, & 6.7.3
(Some symbols may not appear on drawing)

ISSUE DATE

DATE	DESCRIPTION
8.15.19	ORIGINAL ISSUE

REVISIONS

DATE	DESCRIPTION

FOR ALL ABBREVIATIONS, SYMBOL LEGENDS, AND GENERAL NOTES SEE SHEET R0.01

KEY PLAN

SCALE: 1/8" = 1'-0" 0' 4' 8' 16'

PROJECT TRUE

NEEDHAM POLICE AND FIRE HEADQUARTERS

88 CHESTNUT STREET
NEEDHAM, MA 02492

PROJECT NO.: 16015.00 DRAWN BY: DH

UPPER LEVEL FLOOR PLAN AREA B - FIRE ALARM

DRAWING NO.:
HQ1.05

Detailed Specifications & Technical Data

ENGLISH MEASUREMENT VERSION

5120UL Multi-Conductor - Commercial Applications - 2 Conductors Cabled

For more Information please call

1-800-Belden1

Description:

14 AWG bare copper conductors, PP insulation, conductors cabled together, PVC jacket with ripcord, sequential footage marking every two feet.

Usage (Overall)

Suitable Applications:	Fire Protections, Alarm, Signal, Monitor/Detection, Audio Circuits, Control Circuits, Initiating Circuits, Notification Circuits

Physical Characteristics (Overall)

Conductor

AWG:

# Conductors	AWG	Stranding	Conductor Material
2	14	Solid	BC - Bare Copper

Insulation

Insulation Material:

Insulation Material	Wall Thickness (in.)
PP - Polypropylene	0.010

Outer Shield

Outer Shield Material:

Outer Shield Material
Unshielded

Outer Jacket

Outer Jacket Material:

Outer Jacket Material	Nom. Wall Thickness (in.)
PVC - Polyvinyl Chloride	0.017

Outer Jacket Ripcord:	Yes

Overall Cable

Overall Cabling Lay Length & Direction:

Length (in.)	Twists (ft.)
3.25	3.7

Overall Cabling Color Code Chart:

Number	Color
1	Black
2	Red

Overall Nominal Diameter:	0.205 in.

Mechanical Characteristics (Overall)

Operating Temperature Range:	-20°C To +75°C
UL Temperature Rating:	75°C
Bulk Cable Weight:	36 lbs/1000 ft.
Max. Recommended Pulling Tension:	99.400 lbs.
Min. Bend Radius (Install)/Minor Axis:	2 in.

Applicable Specifications and Agency Compliance (Overall)

Applicable Standards & Environmental Programs

NEC/(UL) Specification:	FPLR
NEC Articles:	760
EU CE Mark:	Yes
EU Directive 2000/53/EC (ELV):	Yes
EU Directive 2002/95/EC (RoHS):	Yes
EU RoHS Compliance Date (mm/dd/yyyy):	04/01/2005
EU Directive 2002/96/EC (WEEE):	Yes
EU Directive 2003/11/EC (BFR):	Yes
CA Prop 65 (CJ for Wire & Cable):	Yes
MII Order #39 (China RoHS):	Yes
Other Specification:	California State Fire Marshall

Flame Test

UL Flame Test:	UL1666 Vertical Shaft
CSA Flame Test:	FT4

Plenum/Non-Plenum

Plenum Number:	6120UL

Electrical Characteristics (Overall)

Nom. Inductance:

Inductance (µH/ft)
.15

Nom. Capacitance Conductor to Conductor:

Capacitance (pF/ft)
23.000

Nom. Conductor DC Resistance:

DCR @ 20°C (Ohm/1000 ft)
2.43

Max. Operating Voltage - UL:

Voltage
300 V RMS

Max. Recommended Current:

Current
8 Amps per conductor @ 25°C

Related Documents:

No related documents are available for this product

Put Ups and Colors:

Item #	Putup	Ship Weight	Color	Notes	Item Desc
5120UL D151000	1,000 FT	38.000 LB	BLUE	C	2 #14 PP FRPVC
5120UL 0021000	1,000 FT	34.000 LB	RED	C	2 #14 PP FRPVC
5120UL 002500	500 FT	17.500 LB	RED	C	2 #14 PP FRPVC
5120UL 0041000	1,000 FT	34.000 LB	YELLOW		2 #14 PP FRPVC
5120UL 0101000	1,000 FT	38.000 LB	BLACK		2 #14 PP FRPVC

Notes:
C = CRATE REEL PUT-UP.

5120UL Multi-Conductor - Commercial Applications - 2 Conductors Cabled

Revision Number: 3 Revision Date: 12-14-2011

Although Belden makes every reasonable effort to ensure their accuracy at the time of this publication, information and specifications described herein are subject to error or omission and to change without notice, and the listing of such information and specifications does not ensure product availability.
Belden provides the information and specifications herein on an "AS IS" basis, with no representations or warranties, whether express, statutory or implied. In no event will Belden be liable for any damages (including consequential, indirect, incidental, special, punitive, or exemplary damages) whatsoever, even if Belden has been advised of the possibility of such damages, whether in an action under contract, negligence or any other theory, arising out of or in connection with the use, or inability to use, the information or specifications described herein.

All sales of Belden products are subject to Belden's standard terms and conditions of sale.
Belden believes this product to be in compliance with EU RoHS (Directive 2002/95/EC, 27-Jan-2003). Material manufactured prior to the compliance date may be in stock at Belden facilities and in our Distributor's inventory. The information provided in this Product Disclosure, and the identification of materials listed as reportable or restricted within the Product Disclosure, is correct to the best of Belden's knowledge, information, and belief at the date of its publication. The information provided in this Product Disclosure is designed only as a general guide for the safe handling, storage, and any other operation of the product itself or the one that it becomes a part of. This Product Disclosure is not to be considered a warranty or quality specification. Regulatory information is for guidance purposes only. Product users are responsible for determining the applicability of legislation and regulations based on their individual usage of the product.
Belden declares this product to be in compliance with EU LVD (Low Voltage Directive 73/23/EEC), as amended by directive 93/68/EEC.

Part Number: 5220FN

Fire Alarm, #16-2c BC, Shielded, NPLF

Product Description

Fire Alarm Cable, Rated-NPLF, 2-16 AWG solid bare copper conductors with PVC/nylon insulation, overall Beldfoil® shield, PVC jacket with ripcord

Technical Specifications

Product Overview

Suitable Applications:	Fire Alarm, Audio Circuits, Control Circuits, Initiating Circuits, Notification Circuits, Non-Power Limited Signaling Cable

Physical Characteristics (Overall)

Conductor

AWG	Stranding	Material	No. of Conductors
16	Solid	BC - Bare Copper	2

Conductor Count:	2
Conductor Size:	16 AWG

Insulation

Material	Nominal Wall Thickness
PVC/Nylon - Polyvinyl Chloride/Nylon	0.021 in

Color Chart

Number	Color
1	Black
2	Red

Outer Shield Material

Type	Material	Material Trade Name	Coverage [%]	Drainwire Material	Drainwire AWG	Drainwire Construction n x D
Tape	Aluminum/Polyester	Beldfoil®	100 %	TC - Tinned Copper	20	Solid

Outer Jacket Material

Material	Nominal Diameter	Nominal Wall Thickness	Ripcord
PVC - Polyvinyl Chloride	0.266 in	0.037 in	Yes

Construction and Dimensions

Cabling

Twists
4.4 twist/ft

Electrical Characteristics

Conductor DCR

Nominal Conductor DCR	Nominal Outer Shield DCR
4 Ohm/1000ft	15.25 Ohm/1000ft

Capacitance

Nom. Capacitance Conductor to Conductor	Nom. Capacitance Conductor to Other Conductor to Shield

48 pF/ft	86.4 pF/ft

Inductance

Nominal Inductance
0.19 µH/ft

Current

Max. Recommended Current [A]
6.3 Amps per conductor @ 25°C A

Voltage

UL Voltage Rating
150 V RMS

Temperature Range

UL Temp Rating:	75°C
Operating Temp Range:	-20°C To +75°C

Mechanical Characteristics

Bulk Cable Weight:	39.7 lbs/1000ft
Max Recommended Pulling Tension:	75 lbs
Min Bend Radius/Minor Axis:	2.5 in

Standards

NEC Articles:	760
NEC/(UL) Specification:	NPLF

Applicable Environmental and Other Programs

EU Directive 2000/53/EC (ELV):	Yes
EU Directive 2003/96/EC (BFR):	Yes
EU Directive 2011/65/EU (ROHS II):	Yes
EU Directive 2012/19/EU (WEEE):	Yes
EU Directive Compliance:	EU Directive 2003/11/EC (BFR)
EU CE Mark:	Yes
EU RoHS Compliance Date (yyyy-mm-dd):	2005-07-01
CA Prop 65 (CJ for Wire & Cable):	Yes
MII Order #39 (China RoHS):	Yes

Suitability

Suitability - Indoor:	Yes

Flammability, LS0H, Toxicity Testing

UL Flammability:	UL1685 UL Loading
UL voltage rating:	150 V RMS

Plenum/Non-Plenum

Plenum (Y/N):	No

Part Number

Variants

Item #	Color	Footnote
5220FN 0021000	Red	C

Footnote:	C - CRATE REEL PUT-UP.

Belden believes this product to be in compliance with all applicable environmental programs as listed in the data sheet. The information provided is correct to the best of Belden's knowledge, information and belief at the date of its publication. This information is designed only as a general guide for the safe handling, storage, and any other operation of the product itself or the one that it becomes a part of. The Product Disclosure is not to be considered a warranty or quality specification. Regulatory information is for guidance purposes only. Product users are responsible for determining the applicability of legislation and regulations based on their individual usage of the product.

TYPE MC-LED (MC-PCS) LIGHTING CABLE - COPPER CONDUCTOR
THHN/THWN-2 INNERS

ENGINEERING SPECIFICATIONS

Standards

Underwriters Laboratories Standards UL-66, UL-83, UL-1479, UL-1569, UL-1581, UL-2556; Federal Specification A-A-59544; ASTM-B3 and B8; NFPA 70 (NEC®) Article 250.118(10)(a), 300.22(C)(1), 330, 392, 396, 501, 502, 503, 504, 505, 518, 520, 530, 645, 725;
ARRA 2009 Section 1605 "Buy American" Compliant; UL CRD Type MC-PCS - 12/19/2014 (Effective 2/1/2015); RoHS Compliant;
MasterSpec Division 26 Sections 260519, 260523; UL Listing #E-301130

RoHS COMPLIANT

Listed E-301130

SMART COLOR iD®

CONSTRUCTION

Conductors

Lighting (Power or Class 1) - Solid or Stranded 12-10 AWG soft, uncoated copper per ASTM-B3; Class 2 and Class 3 - Solid 16 AWG soft, uncoated copper per ASTM-B3

Insulation

Color-coded Polyvinyl Chloride (PVC) compound meeting the required thickness of Type THHN/THWN-2 with a heat-stabilized Nylon rated for 90°C for use in dry or wet locations.

Class 2 and Class 3 Conductors

Color-coded (purple/gray) 16 AWG twisted jacketed pair with 600V insulation. The National Electrical Code (NEC) and UL 1569 permits electric light and power circuits conductors in an MC Cable with class 2 and class 3 circuits in accordance with NEC Section 725.136(I)(1).

Assembly

Two conductors and a green equipment grounding conductor cabled together with an individually-jacketed twisted pair included. The entire assembly is wrapped with separator tape containing the information print legend. Interlocked aluminum or galvanized steel armor is applied over the entire assembly. MC-LED is also available in PVC Jacketed for Wet and Damp Locations.

APPLICATIONS

MC-LED (Type MC-PCS) cable is designed for use with LED and Fluorescent dimming systems and smart building technology that offers optimal control over building's lighting systems including outdoors, such as parking decks, sporting arenas, and parking lots where PVC jacketed. MC-LED may be surface mounted, fished and/or embedded in plaster in wet, damp, or dry locations. MC-LED eliminates the need to install a separate low-voltage cable and traditional lighting/power MC Cable to a single luminaire. UL Classified for 1, 2 and 3 hour through penetrations (Fire-Stop). Jacketed MC-LED is identified for use in corrosive conditions, such as direct burial in earth or embedded in concrete. Meets acceptable uses in accordance with NEC 250.118(10)(a), 300.22(C), 330.12(2)(a), 330, 392, 396, 501, 502, 503, 504, 505, 518, 520, 530, 645 and 725.

1. Removable SmartColorID[1] Label
2. Interlocked Aluminum or Galvanized Lightweight Steel Armor
3. Separator Tape
4. PVC Nonmetallic Sheathing
5. TFN or Equivalent Copper Conductors
6. THHN/THWN-2 or Equivalent Solid or Stranded Copper Conductors

Size (AWG)	No. of Strands	Ground Wire Size (AWG)	Twisted Jacketed Pair (AWG)	Outside Diameter Over Armor (in)	Approximate Net Weight (lbs/1000 ft)		Allowable Ampacity (Amps)[2]		Standard Packaging (ft)
					Aluminum	Steel	75°	90°	
12/2	Solid	12 AWG Green Insulated	16/2 Solid	0.581	144.39	223.92	25	30	250' 1000'
10/2	Solid	10 AWG Green Insulated	16/2 Solid	0.649	190.60	280.98	35	40	250' 1000'
12/3	Solid	12 AWG Green Insulated	16/2 Solid	0.622	170.46	256.52	25	30	250' 1000'
10/3	Solid	10 AWG Green Insulated	16/2 Solid	0.679	229.03	324.21	35	40	250' 1000'
12/4	Solid	12 AWG Green Insulated	16/2 Solid	0.651	196.17	286.87	25	30	250' 1000'
12/2	Stranded	12 AWG Green Insulated	16/2 Solid	0.609	147.94	231.94	25	30	250' 1000'
10/2	Stranded	10 AWG Green Insulated	16/2 Solid	0.677	195.75	290.61	35	40	250' 1000'
12/3	Stranded	12 AWG Green Insulated	16/2 Solid	0.666	175.76	268.86	25	30	250' 1000'

[1] SmartColorID manufactured under Patent No. 7,954,530, 8,454,785, 8,826,960 & 8,905,108
[2] Ampacity of conductors are based on NFPA 70 (NEC) Table 310.15(B)(16). See 110.14(C), 240.4(D) and 310.15(B) for other limitations where applicable.
The above data is approximate and subject to normal manufacturing tolerances.

NOW AVAILABLE

MC-LED is available with a PVC jacket for wet and damp locations. It is flame-retardant, sunlight-resistant and applied over the armor.

FEATURES

Installation costs reduced up to 50% over raceway and wire. Insulating anti-short bushings are supplied with each reel or coil, but not required per Section 330.40 of the NEC. SmartColorID labels are spaced at regular intervals on the exterior of the metal sheathing and are removable. For ease of installation and pulling, cable is reverse wound on reels. Coils are designed to be pulled from the inside.

Standard Conductor Color Coding

Phase Conductors	120V/208V/240V
2	Black/White
3	Black/White/Red
Ground	Green

Phase Conductors	277V/480V
2	Brown/Gray
3	Brown/Orange/Gray
Ground	Green

Additional colors available subject to ERQ

Sub-Assembly	
2	Purple/Gray

SmartColorID Legend:

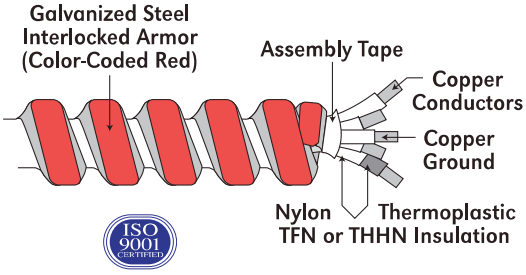
Fire Alarm/Control Cable™ Type MC – FPLP Fully Plenum Rated Technical Specifications

Specification Description

Specification	Fire Alarm/Control Cable
Armor	Galvanized Interlocking Steel Strip (red-striped)
Conductors	Solid Copper
Conductor Insulation	TFN 18 & 16 AWG and/or THHN 14 & 12 AWG
Assembly	Polyester Assembly Tape; Twisted Shielded: Laminated Aluminum/Mylar® Shield with Tinned Copper drain wire
Maximum Temperature Rating	FPLP: 105°C (dry) MC: 90°C (dry)
Grounding	One or more grounding conductors may be bare or insulated green, see chart below
Neutral Conductor	White
Maximum Voltage Rating	300V (FPLP) 600V (MC)

References & Ratings

- U.L. 66, 83, 1424, 1479, 1569, 1581, File Reference E80042
- NEC 300.22(C), 392, 330, 430.2, 518, 530, 645, 725, 760, 760.71(D)
- Federal Specification A-A-59544 (formerly J-C-30B)
- Cable Tray installations per NEC
- 1, 2 and 3-hour Through-Penetration Fire Wall Rated File R-14929
- NFPA 262 (formerly U.L. 910) Plenum Rated - Type FPLP



For the electrical properties of Red Fire Alarm/Control Cable and twists per foot information, see page 39.

Product Codes, Trade Sizes, Conductors, Packaging & Weights

Product Code 250' Coil	500' Reel	750' Reel	1000' Reel	Trade Size	Grounding Conductor AWG	Approx. Weight/1000 Feet (lbs.)	Armor Minimum O.D. (inches)
Solid TFN							
1801R42-00	1801R45-00	1801R47-00	1801R60-00	18-2 Solid (black, white)	18 bare	115	0.410
1803R42-00	1803R45-00	1803R47-00	1803R60-00	18-4 Solid (black, white, red, blue)	18 bare	130	0.430
1805R42-00	1805R45-00	1805R47-00	1805R60-00	18-6 Solid (black, white, red, blue, yellow, orange)	18 bare	170	0.490
1807R42-00	1807R45-00	1807R47-00	1807R60-00	18-8 Solid (black, white, red, blue, yellow, orange, brown, purple)	18 bare	190	0.510
1810R42-00	1810R45-00	1810R47-00	1810R60-00	16-2 Solid (black, white)	16 bare	130	0.420
1813R42-00	1813R45-00	1813R47-00	1813R60-00	16-4 Solid (black, white, red, blue)	16 bare	155	0.440
1815R42-00	1815R45-00	1815R47-00	1815R60-00	16-6 Solid (black, white, red, blue, yellow, orange)	16 bare	205	0.510
1817R42-00	1817R45-00	1817R47-00	—	16-8 Solid (black, white, red, blue, yellow, orange, brown, purple)	16 bare	230	0.520
Solid THHN							
1834R42-00	1834R45-00	1834R47-00	1834R60-00	14-2 Solid (black, white)	14 (solid green)	175	0.470
1837R42-00	1837R45-00	1837R47-00	1837R60-00	14-4 Solid (black, white, red, blue)	14 (solid green)	230	0.510
1823R42-00	1823R45-00	—	—	14-6 Solid (black, white, red, blue, yellow, orange)	14 (solid green)	250	0.520
1824R42-00	1824R45-00	—	—	14-8 Solid (black, white, red, blue, yellow, orange, brown, purple)	14 (solid green)	325	0.585
1835R42-00	1835R45-00	1835R47-00	1835R60-00	12-2 Solid (black, white)	12 (solid green)	215	0.495
1840R42-00	1840R45-00	—	1840B60-00	12-4 Solid (black, white, red, blue)	12 (solid green)	295	0.565
Twisted Shielded Pairs							
1850R42-00	1850R45-00	1850R47-00	1850R60-00	18-2 Solid (1 pair) (black, white)	18 tinned†	120	0.420
1827R42-00	1827R45-00	1827R47-00	1827R60-00	18-2 Solid (1pair) (black, red) & 14-2 Solid (1 pair) (black, white)	18 & 14 tinned†	290	0.640
1860R42-00	1860R45-00	1860R47-00	1860R60-00	16-2 Solid (1 pair) (black, white)	16 tinned†	135	0.430
1843R42-00	1843R45-00	1843R47-00	1843R60-00	16-4 Solid (2 pair) (black, white) (red, blue)	2–16 tinned†	160	0.450
1895R42-06	1895R45-06	1895R47-06	1895R60-06	16-2 Solid (1 pair) (black, red)	16 tinned†, & 16 (solid green)	190	0.500
4901R42-00	4901R45-00	4901R47-00	4901R60-00	16-2 Solid (1 pair) (black, white) & 12-2 Solid (1 pair) (black, red)	16 tinned†, & 12 (solid green)	280	0.585
1828R42-00	1828R45-00	1828R47-00	1828R60-00	14-2 Solid (1 pair) (black, white)	16 tinned†, & 14 (solid green)	170	0.470
1881R42-00	1881R45-00	—	—	14-4 Solid (2 pair) (black, red) (blue, white)	2–16 tinned†, & 14 (solid green)	230	0.565
Specialty Colors							
1834R42-05	1834R45-05	1834R47-05	1834R60-05	14-2 Solid (blue, white)	14 (solid green)	175	0.470
1834R42-06	1834R45-06	1834R47-06	1834R60-06	14-2 Solid (black, red)	14 (solid green)	175	0.470
1834R42-23	1834R45-23	1834R47-23	1834R60-23	14-2 Solid (orange, yellow)	14 (solid green)	175	0.470
1834R42-37	1834R45–37	1834R47-37	1834R60-37	14-2 Solid (brown, purple)	14 (solid green)	175	0.470
1834R42-44	1834R45-44	1834R47-44	1834R60-44	14-2 Solid (gray, gray*)	14 (solid green)	175	0.470
1837R42-05	1837R45-05	1837R47-05	1837R60-05	14-4 Solid (blue, blue*, white, white*)	14 (solid green)	230	0.510
1837R42-06	1837R45-06	1837R47-06	1837R60-06	14-4 Solid (black, black*, red, red*)	14 (solid green)	230	0.510

NOTE: All dimensions and weights are subject to normal manufacturing tolerances.
* with silver stripe
† Tinned copper drain/grounding conductor.

ENGINEERING SPECIFICATIONS:

EmergMC® Fire Alarm Cable — UL® Listed E-331832

RoHS COMPLIANT

SmartColorID®

Standards:

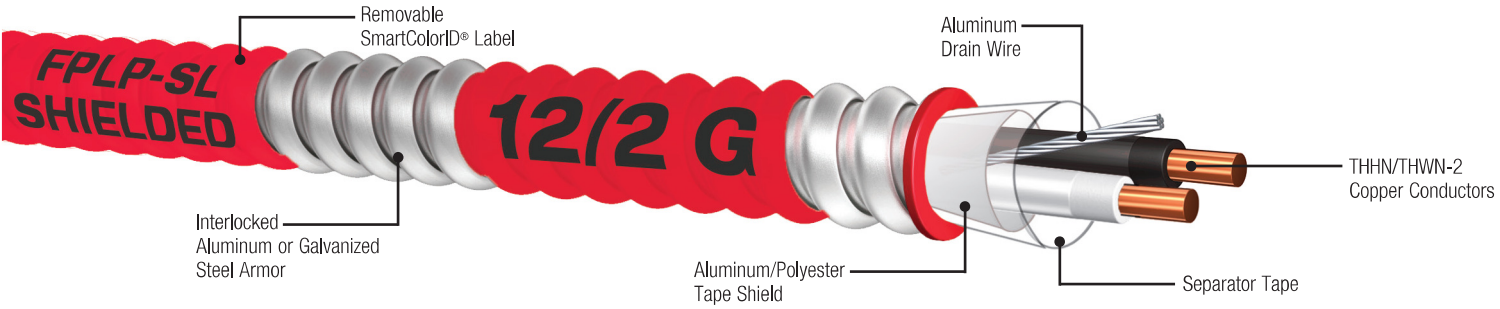
Underwriters Laboratories Standards UL-83, UL-1424, UL-1569 for Type MC, Federal Specification A-A59544, IEEE 1202 (70,000 Btu/hr) Vertical Cable Tray Flame Test, NFPA 262 Flame Test, and the National Electrical Code (NEC), and ARRA 2009; Section 1605 "Buy American" Compliant

Applications: Type FPLP cable shall be permitted as follows:

- Permitted use for Non-Power Limited Fire Alarm (NPLFA) and Power Limited Fire Alarm Circuits (PLFA) including alarms, horns, detecting devices, and overall signaling devices
- Acceptable for power, lighting, control, and signal circuits
- Allowable in concealed or exposed systems
- Permitted use in dry locations and embedded in plaster finish on brick or other masonry except in damp or wet locations
- Utilized for environmental air-handling spaces NEC 300.22(B), 300.22 (C), and 760.71(D)
- Allowable in assembly occupancies (NEC 518.4)
- Permissible in theaters, audience areas of motion pictures, television studios, and similar locations (NEC 520.5)
- Allowable installations in approved raceways and cable trays (NEC 392)
- Suitable for installation under raised floors for IT equipment (NEC 645.5)
- Permitted in Class I, Class II, and Class III remote control signaling, and power limited circuits
- Listed for use in UL 1, 2, and 3 Hour Through-Penetration Firestop Systems
- Available in colors per State of Rhode Island Fire Systems

CONSTRUCTION:

Available in sizes 18 AWG through 12 AWG. Encore's Fire Alarm and Control Cable is constructed with soft-drawn copper and classified as type TFN (Sizes 18 & 16 AWG) conductors. Sizes with 14 AWG through 12 AWG conductors are classified as type THHN/THWN-2 conductors. Each Fire Alarm and Control Cable contains a green insulated grounding conductor. All conductors are cabled together with separator tape containing the identification print legend to form the cable core. Interlocked aluminum or galvanized steel armor is applied over the entire assembly.



Type MC-FPLP Plenum Rated Limited Power Type Fire Alarm and Control Cable 300V Shielded

Conductors			Overall Diameter (in)		Approximate Net Weight (lbs/1000 ft)		Allowable Ampacity (Amps)*		Standard Packaging (ft)	
AWG/No.	Type	Drain Wire	Aluminum	Steel	Aluminum	Steel	75°C	90°C	Coil	Reel
18/2	Solid	18 AWG	0.369	0.359	53.94	95.90	5.6	5.6	250'	1000'
18/4	Solid	18 AWG	0.407	0.397	72.54	119.93	5.6	5.6	250'	1000'
16/2	Solid	16 AWG	0.390	0.380	65.58	110.53	8	8	250'	1000'
16/4	Solid	16 AWG	0.432	0.422	91.09	142.11	8	8	250'	1000'
14/2	Solid	16 AWG	0.415	0.405	78.24	126.78	15	15	250'	1000'
14/4	Solid	16 AWG	0.468	0.458	114.82	171.10	15	15	250'	1000'
12/2	Solid	16 AWG	0.448	0.438	97.42	150.77	20	20	250'	1000'
12/4	Solid	16 AWG	0.506	0.496	150.04	211.91	20	20	250'	1000'

Available with additional conductors on request.
Note: Ampacities are based on Table 310.15(B)(16) of the NEC. *Ampacities shown are for general use as specified by the NEC, Section 310.15.
For equipment marked for use at higher temperatures, the conductor ampacity shall be limited to the following per NEC 110.14(C):
60°C when terminated to equipment for circuits rated 100 amperes or less or marked for size 14 AWG through 1 AWG conductor.
75°C when terminated to equipment for circuits rated over 100 amperes or marked for conductors larger than 1 AWG.
90°C for ampacity derating purposes.
When the neutral is considered current-carrying conductor, the ampacity of 4/C cables shall be reduced by a factor of 0.80 per NEC 310.15(B)(2)(a).
The above data is approximate and subject to normal manufacturing tolerances.

Features:

Installation costs reduced up to 50% over conduit and wire. Weight of aluminum armor is as much as 45% less than steel. Insulating anti-short bushings are supplied with each reel or coil. SmartColorID® labels are spaced at regular intervals on the exterior of the metal sheathing and are removable. For ease of installation and pulling, cable is reverse wound on reels. Coils are designed to be pulled from the inside.

SmartColorID® Legend:

See page 104 for complete legend

Rhode Island Color Coding

Number of Conductors	120/208Y
2	Blue/White OR Black/Red

Standard Conductor Color Coding

Number of Conductors	120/208Y
2	Black/White
3	Black/White/Red
4	Black/White/Red/Blue

SmartColor ID® Manufactured under Patent No. 7,954,530 & 8,454,785

GARCIA•GALUSKA•DESOUSA
Consulting Engineers Inc.
375 Faunce Corner Road – Suite D
Dartmouth, MA 02747-1258
Phone: (508) 998-5700 **Fax: (508) 998-0883**
Email: info@g-g-d.com

LETTER OF TRANSMITTAL

Date: July 8, 2021
Job #: 850 114 00.00
Attention: Keith Mercy, AIA
Re: Needham Public Safety

To: Kaestle Boos Associates, Inc.
325 Foxborough Boulevard, Suite 10
Foxborough, MA 02035

We Are Sending You: **_x_ Attached** **_x_ The following items via: Procore**

_x_ Shop Drawings **__ Prints** **__ Plans** **__ Specifications**

__ Copy of Letter **__ Change Order** **__ Samples** **__ Drawings**

COPIES	DATE REC'D	GGD NUMBER	DESCRIPTION SUBMITTAL NUMBER	ACTION
1	07/06/2021	E-200	Fire Alarm Graphic Map (FS2) 260000-213-0	No Exception Taken

These are transmitted as checked below:

__ For Approval **__ Approved as submitted** **__ Resubmit ____ copies for approval**

_x_ For your use **__ Approved as noted** **__ Submit ____ copies for distribution**

_x_ As requested **__ Returned for corrections** **__ Return ____ corrected prints**

__ For review and comment **__ Forwarded _____**

__ For Bids Due _____, 20 **__ Prints Returned on Loan to Us**

REMARKS:

COPY (S) TO: Rene Croteau, Kaestle Boos Associates, Inc.
Seunghwan Lee, Kaestle Boos Associates, Inc.
Nick Sholtis, Kaestle Boos Associates, Inc.
File

SIGNED: David M. Pereira, P.E.; sms

Project: 1901 - Needham Public Safety
88 Chestnut Street
Needham, Massachusetts 02492

CONSIGLI
Est. 1905

Submittal #260000-213.0
260000 - Electrical

SD: Fire Alarm System (FS2)

APPROVERS:	Megan Collins **(Consigli Construction Co., Inc.)** Cody Foster **(Consigli Construction Co., Inc.)** Christopher Kyne **(Consigli Construction Co., Inc.)** CA GGD **(Garcia Galuska Desousa)** Rene Croteau **(Kaestle Boos Associates)** Margaret McKeon **(Kaestle Boos Associates)** Keith Mercy **(Kaestle Boos Associates)** Lesya Toftul **(Kaestle Boos Associates)** Kevin Witzell **(Kaestle Boos Associates)**	**CREATED BY:**	RECEIVED July 6, 2021 Garcia Galuska & DeSousa
RESPONSIBLE CONTRACTOR:	Wayne J. Griffin Electric Inc. George Gray **(Wayne J. Griffin Electric Inc.)**	**STATUS:**	Pending
TYPE:	Construction	**SPEC SECTION:**	260000 - Electrical
COPIES TO:			
DESCRIPTION:			
ATTACHMENTS:			

ARCHITECT'S STAMP

CONTRACTOR'S STAMP

Consigli Construction Co., Inc.

X	Approved for A/E Review		Revise & Resubmit
	Approved as Noted for A/E Review		Rejected

Spec. Section: 260000	Submittal No.: 260000-213
Date:	By: Megan Collins Cody Foster Christopher Kyne Megan CollinsCody Foster Christopher Kyne

If so marked, approval is given for design only. It does not relieve the subcontractor from complying with the requirements of the contract, contract drawings and specifications. The subcontractor shall be responsible for all dimensions, quantities, schedules and field conditions.

SUBMITTAL WORKFLOW

#	NAME	SUBMITTER/ APPROVER	SENT DATE	DUE DATE	RETURNED DATE	RESPONSE	ATTACHMENTS	COMMENTS
1	Megan Collins	Submitter		7/2/2021		Pending		
2	Cody Foster	Submitter		7/2/2021	7/2/2021	Submitted	8. NPS - FS2 Fire Alarm Graphic Map.pdf	
3	Christopher Kyne	Submitter		7/2/2021		Pending		
4	Megan Collins	Approver		7/2/2021		Pending		
5	Cody Foster	Approver		7/2/2021	7/2/2021	Approved		
6	Christopher Kyne	Approver		7/2/2021		Pending		

72 Sumner Street
Milford, Massachusetts 01757

ENGINEERING
SHOP DRAWING REVIEW

GARCIA·GALUSKA·DESOUSA
Consulting Engineers Inc.
375 Faunce Corner Road Suite D, Dartmouth, MA 02747

DATE: July 8, 2021

PROJECT: Needham Public Safety
Needham, MA

850 114 00.00

SHOP DWG. NO.: E-200

TITLE: Fire Alarm Graphic Map (FS2)
260000-213-0

REVIEWED BY: David M. Pereira, P.E.

NO EXCEPTION TAKEN [X]

EXCEPTION TAKEN [ ]

Close-out review is for general conformance with the design concept and for compliance with the contract documents. Marking or comments made on the Close-out submittal do not relieve the contractor from compliance with the requirements of the contract documents.

Date 07/08/2021 By DMP

GARCIA, GALUSKA & DESOUSA, INC.
CONSULTING ENGINEERS

Review Notes:

READY FOR DISTRIBUTION KAESTLE BOOS
kmercy 3:38:15 PM 07/09/2021

CONSIGLI
Est. 1905

Submittal #260000-213.0
260000 - Electrical

#	NAME	SUBMITTER/ APPROVER	SENT DATE	DUE DATE	RETURNED DATE	RESPONSE	ATTACHMENTS	COMMENTS
7	CA GGD	Approver	7/2/2021	7/16/2021		Pending		
8	Rene Croteau	Approver		7/30/2021		Pending		
9	Margaret McKeon	Approver		7/30/2021		Pending		
10	Keith Mercy	Approver		7/30/2021		Pending		
11	Lesya Toftul	Approver		7/30/2021		Pending		
12	Kevin Witzell	Approver		7/30/2021		Pending		

BY **DATE** **COPIES TO**

72 Sumner Street
Milford, Massachusetts 01757

CONTRACTOR: Consigli Construction

PROJECT: Needham Public Safety

PARAGRAPH. NO.: _____ SUBMITTAL NO.: 260000-213

CONTRACTOR HAS DETERMINED AND VERIFIED MATERIALS, FIELD MEASUREMENTS AND FIELD CONSTRUCTION CRITERIA AND HAS CHECKED AND COORDINATED THE INFORMATION CONTAINED IN THIS SUBMITTAL WITH THE REQUIREMENTS OF THE WORK AND OF THE CONTRACT DOCUMENTS AND RECOMMENDS APPROVAL BY THE ARCHITECT/ENGINEER.

BY: CF DATE: 07/2/2021

KAESTLE BOOS ASSOC. PROJECT NO.: _____

ARCHITECTS/ENGINEERS DATE RECEIVED: _____

COMMENTS MADE ON THE SUBMITTALS DURING THIS REVIEW DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE CONTRACT DOCUMENTS. REVIEWING IS ONLY FOR CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS TO BE CONFIRMED AND CORRELATED AT THE SITE; FOR INFORMATION THAT PERTAINS SOLELY TO THE FABRICATION PROCESSES OR TO THE MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES OF CONSTRUCTION; AND FOR COORDINATION OF THIS WORK WITH THE WORK OF ALL TRADES.

☐ APPROVED ☐ APPROVED AS CORRECTED

IF CHECKED ABOVE, FABRICATION MAY BE UNDERTAKEN. APPROVAL DOES NOT AUTHORIZE CHANGES TO THE CONTRACT SUM OR CONTRACT TIME UNLESS STATED IN A SEPARATE LETTER.

☐ REVISE AND RESUBMIT ☐ NOT APPROVED

BY: _____ DATE: _____

WAYNE J. GRIFFIN ELECTRIC, INC.
116 Hopping Brook Road
HOLLISTON, MASSACHUSETTS, 01746
PHONE (508) 429-8830
FAX (508) 429-7825

LETTER OF TRANSMITTAL

DATE	**7/1/2021**	JOB NO:	**2464**
ATTENTION	Megan Collins		
RE:	NEEDHAM PUBLIC WORKS		

TO **Consigli Construction Co, Inc.**
75 Sumner Street
Milford, MA 02492

WE ARE SENDING YOU ☐ Attached ☐ Under Separate Cover Via _____ the following items:

☐ Shop Drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of Letter ☐ Change Order ☒ Submittal

COPIES	DATE	NO.	DESCRIPTION
1		1	Fire Station #2 Fire Alarm Graphic Map 26 00 00 - 2.18

THESE ARE TRANSMITTED as checked below:

☐ For record ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☒ For your approval ☐ Approved as noted ☐ Submit _____ copies for distribution

☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS Submittal uploaded to Procore.

COPY TO File To: 2464-6

SIGNED: *George Gray*
George Gray - Project Engineer

Licenses:

MA A8999	VT EM3303	NH 4223M	ME MC60017598	CT ELC.0123697-E1
AL 16318	RI AC-00165	GA EN213065	NC 16529U	

If enclosures are not as noted, kindly notify us at once.

WAYNE J.
GRIFFIN ELECTRIC
INC.

July 1, 2021

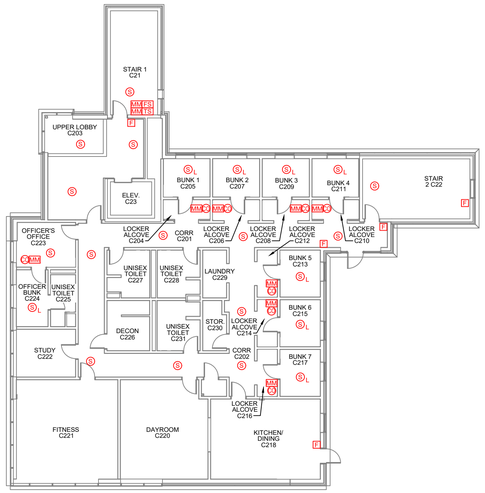
PROJECT:	Needham Public Safety Building and Fire Station 2 1471 Highland Avenue Needham, MA 02492
OWNER:	Town of Needham 1471 Highland Avenue Needham, MA 02492
GENERAL CONTRACTOR:	Consigli 72 Sumner Street Milford, MA 01757
ARCHITECT:	Kaestle Boos Associates, Inc. 16 Chestnut Street, Suite 301 Foxborough, MA 02035
ELECTRICAL ENGINEER:	Garcia Galuska Desousa 370 Faunce Corner Road Dartmouth, MA 02747
ELECTRICAL CONTRACTOR:	Wayne J. Griffin Electric, Inc. 116 Hopping Brook Road Holliston, MA 01746

We herein submit the following electrical equipment on the **Needham Public Safety Building** Project for approval:

Fire Station #2 Fire Alarm Graphic Map 26 00 00 – 2.18

RELEASED BY:	DATE OF RELEASE:	REFERENCE:	APPROVED BY:	DATE OF APPROVAL:	LOCATION OF DRAWING:
N/A	N/A	NEW	N/A	N/A	N/A

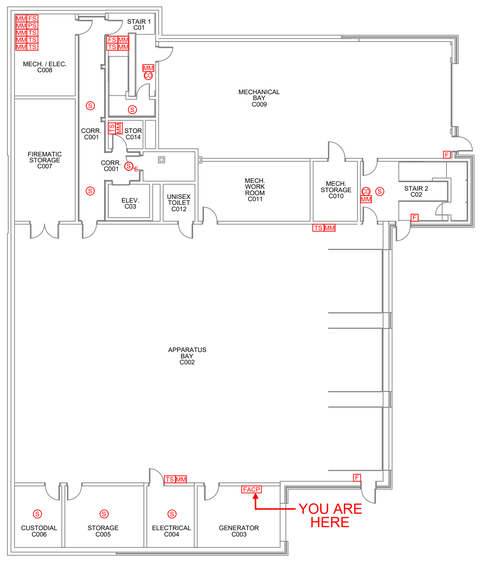
21.81



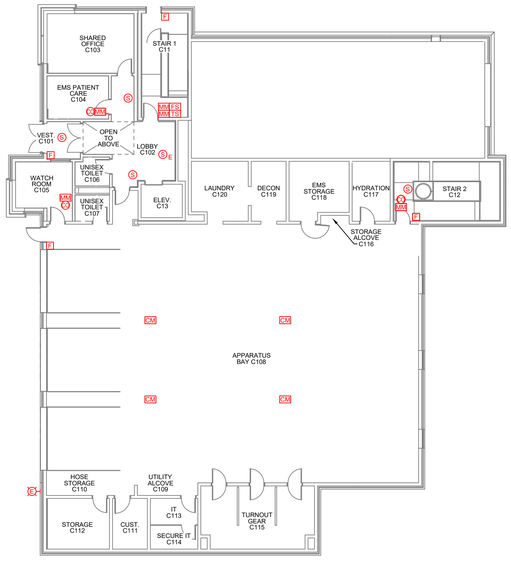
UPPER LEVEL

FIRE ALARM GRAPHIC DISPLAY MAP
Needham Public Safety
Fire Station #2
Needham, Massachusetts

LEGEND			
FACP	FIRE ALARM CONTROL PANEL	TS	TAMPER SWITCH
ANN	FIRE ALARM ANNUNCIATOR	F	MANUAL PULL STATION
CM	CONTROL MONITOR	S	SMOKE DETECTOR
MM	MONITOR MODULE	S_E	SMOKE DETECTOR ELEVATOR RECALL
FS	FLOW SWITCH	S_L	SMOKE DETECTOR LOCAL
PS	PRESSURE SWITCH	D	DUCT DETECTOR
			SPRINKLER SYSTEM ELECTRIC BELL



LOWER LEVEL



MAIN LEVEL

21.81

R.B. Allen Co., Inc.

GRAPHIC LIMITS

(OVERALL DISPLAY DIMENSIONS 24" X 24")

ALL CHANGES ON ANY DRAWING (E-MAILED) MUST BE CLOUDED.

SUBMITTAL COPY
Uncontrolled Document
NOT FOR PRODUCTION

Please check appropriate boxes and sign before returning.
CLICK TO EDIT

☐ APPROVED AS IS

☐ APPROVED (with changes as noted)

☐ NOT APPROVED
SEND REVISED PRINTS (with changes as noted)

☐ Y ☐ N Point assignment schedule supplied by customer.

Signed: _____

Date: _____

ARTWORK DETAILS	GD8 SPECIFICATIONS
All lines and lettering will be BLACK on a WHITE background, except as noted below.	SIZE: D
ADDITIONAL COLORS: 3	TRIM COLOR: RED
GRAPHIC STYLE: DL-PLOT	

CUSTOMER #: ORB044	SPACE AGE ELECTRONICS INC
SCALE: .8:1	
SAE/OWNER: 352464	TITLE: NEEDHAM PUBLIC SAFETY - FIRE STATION #2
DRAFTER: MP/BR	PAPER SIZE: D; FILE LOCATION: CD; SHEET: 1/1; DWG: CD352464; REV: 1
DATE: 06/14/21	CODE: GD8-ZR CUSTOM
CHECKER:	

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS
Prevailing Wage Rates

MAURA HEALY
Governor
KIM DRISCOLL
Lt. Governor

As determined by the Director under the provisions of the Massachusetts General Laws, Chapter 149, Sections 26 to 27H

LAUREN JONES
Secretary
MICHAEL FLANAGAN
Director

Awarding Authority:	Needham - Department of Public Works	**City/Town:**	NEEDHAM
Contract Number:	26DPW167B		
Description of Work:	Preventative service and on-call repair of fire alarms and sprinklers in schools and public buildings.		
Job Location:	Various		

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, the awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. The updated wage schedule must be provided to all contractors, including general and sub-contractors, working on the construction project.
- This annual update requirement is generally not applicable to 27F “rental of equipment” contracts. For such contracts, the prevailing wage rates issued by DLS shall remain in effect for the duration of the contract term. However, if the prevailing wage rate sheet issued does not contain wage rates for each year covered by the contract term, the Awarding Authority must request updated rate sheets from DLS and provide them to the contractor to ensure the correct rates are being paid throughout the duration of the contract. Additionally, if an Awarding Authority exercises an option to renew or extend the contract term, they must request updated rate sheets form DLS and provide them to the contractor.
- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the “Wage Request Number” on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or a sub-contractor.
- Apprentices working on the project are required to be registered with the Massachusetts Division of Apprentice Standards (DAS). Apprentices must keep their apprentice identification card on their persons during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DAS regardless of whether they are registered with another federal, state, local, or private agency must be paid the journeyworker's rate.**
- Every contractor or subcontractor working on the construction project must submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee’s name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. For a sample payroll reporting form go to http://www.mass.gov/dols/pw.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Contractors must obtain the wage schedules from awarding authorities. Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may file a complaint with the Fair Labor Division of the office of the Attorney General at (617) 727-3465.

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
(2 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2025	$42.05	$15.41	$20.17	$0.00	$0.00	$77.63
	12/1/2025	$42.05	$15.41	$21.78	$0.00	$0.00	$79.24
	6/1/2026	$43.05	$15.41	$21.78	$0.00	$0.00	$80.24
	8/1/2026	$43.05	$15.91	$21.78	$0.00	$0.00	$80.74
	12/1/2026	$43.05	$15.91	$23.52	$0.00	$0.00	$82.48
(3 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2025	$41.12	$15.41	$20.17	$0.00	$0.00	$76.70
	12/1/2025	$41.12	$15.41	$21.78	$0.00	$0.00	$78.31
	6/1/2026	$43.12	$15.41	$21.78	$0.00	$0.00	$80.31
	8/1/2026	$43.12	$15.91	$21.78	$0.00	$0.00	$80.81
	12/1/2026	$43.12	$15.91	$23.52	$0.00	$0.00	$82.55
(4 & 5 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2025	$42.24	$15.41	$20.17	$0.00	$0.00	$77.82
	12/1/2025	$42.24	$15.41	$21.78	$0.00	$0.00	$79.43
	6/1/2026	$43.24	$15.41	$21.78	$0.00	$0.00	$80.43
	8/1/2026	$43.24	$15.91	$21.78	$0.00	$0.00	$80.93
	12/1/2026	$43.24	$15.91	$23.52	$0.00	$0.00	$82.67
ADS/SUBMERSIBLE PILOT PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	1/1/2024	$117.16	$10.08	$11.62	$12.67	$0.00	$151.53
For apprentice rates see "Apprentice- PILE DRIVER"							
AIR TRACK OPERATOR LABORERS LABORERS - ZONE 2	6/1/2025	$40.59	$10.15	$9.50	$9.11	$0.00	$69.35
	12/1/2025	$41.97	$10.15	$9.50	$9.11	$0.00	$70.73
	6/1/2026	$43.41	$10.15	$9.50	$9.11	$0.00	$72.17
	12/1/2026	$44.85	$10.15	$9.50	$9.11	$0.00	$73.61
	6/1/2027	$46.30	$10.15	$9.50	$9.11	$0.00	$75.06
	12/1/2027	$47.75	$10.15	$9.50	$9.11	$0.00	$76.51
	6/1/2028	$49.25	$10.15	$9.50	$9.11	$0.00	$78.01
	12/1/2028	$50.75	$10.15	$9.50	$9.11	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"							
AIR TRACK OPERATOR (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2025	$40.59	$10.15	$9.50	$9.21	$0.00	$69.45
	12/1/2025	$41.97	$10.15	$9.50	$9.21	$0.00	$70.83
	6/1/2026	$43.41	$10.15	$9.50	$9.21	$0.00	$72.27
	12/1/2026	$44.85	$10.15	$9.50	$9.21	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. HEAT & FROST INSULATORS LOCAL 6 HEAT & FROST INSULATORS LOCAL 6 (BOSTON)	6/1/2025	$43.80	$14.50	$4.30	$6.75	$0.00	$69.35
	12/1/2025	$44.80	$14.50	$4.30	$6.75	$0.00	$70.35
ASPHALT RAKER LABORERS LABORERS - ZONE 2	6/1/2025	$40.09	$10.15	$9.50	$9.11	$0.00	$68.85
	12/1/2025	$41.47	$10.15	$9.50	$9.11	$0.00	$70.23
	6/1/2026	$42.91	$10.15	$9.50	$9.11	$0.00	$71.67
	12/1/2026	$44.35	$10.15	$9.50	$9.11	$0.00	$73.11
	6/1/2027	$45.80	$10.15	$9.50	$9.11	$0.00	$74.56
	12/1/2027	$47.25	$10.15	$9.50	$9.11	$0.00	$76.01
	6/1/2028	$48.75	$10.15	$9.50	$9.11	$0.00	$77.51

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	12/1/2028	$50.25	$10.15	$9.50	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							
ASPHALT RAKER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2025	$40.09	$10.15	$9.50	$9.21	$0.00	$68.95
	12/1/2025	$41.47	$10.15	$9.50	$9.21	$0.00	$70.33
	6/1/2026	$42.91	$10.15	$9.50	$9.21	$0.00	$71.77
	12/1/2026	$44.35	$10.15	$9.50	$9.21	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$58.33	$15.55	$13.25	$3.25	$0.00	$90.38
	12/1/2025	$59.78	$15.55	$13.25	$3.25	$0.00	$91.83
	6/1/2026	$61.08	$15.55	$13.25	$3.25	$0.00	$93.13
	12/1/2026	$62.53	$15.55	$13.25	$3.25	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
BACKHOE/FRONT-END LOADER OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$58.33	$15.55	$13.25	$3.25	$0.00	$90.38
	12/1/2025	$59.78	$15.55	$13.25	$3.25	$0.00	$91.83
	6/1/2026	$61.08	$15.55	$13.25	$3.25	$0.00	$93.13
	12/1/2026	$62.53	$15.55	$13.25	$3.25	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
BARCO-TYPE JUMPING TAMPER LABORERS LABORERS - ZONE 2	6/1/2025	$40.09	$10.15	$9.50	$9.11	$0.00	$68.85
	12/1/2025	$41.47	$10.15	$9.50	$9.11	$0.00	$70.23
	6/1/2026	$42.91	$10.15	$9.50	$9.11	$0.00	$71.67
	12/1/2026	$44.35	$10.15	$9.50	$9.11	$0.00	$73.11
	6/1/2027	$45.80	$10.15	$9.50	$9.11	$0.00	$74.56
	12/1/2027	$47.25	$10.15	$9.50	$9.11	$0.00	$76.01
	6/1/2028	$48.75	$10.15	$9.50	$9.11	$0.00	$77.51
	12/1/2028	$50.25	$10.15	$9.50	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							
BLOCK PAVER, RAMMER / CURB SETTER LABORERS LABORERS - ZONE 2	6/1/2025	$40.59	$10.15	$9.50	$9.11	$0.00	$69.35
	12/1/2025	$41.97	$10.15	$9.50	$9.11	$0.00	$70.73
	6/1/2026	$43.41	$10.15	$9.50	$9.11	$0.00	$72.17
	12/1/2026	$44.85	$10.15	$9.50	$9.11	$0.00	$73.61
	6/1/2027	$46.30	$10.15	$9.50	$9.11	$0.00	$75.06
	12/1/2027	$47.75	$10.15	$9.50	$9.11	$0.00	$76.51
	6/1/2028	$49.25	$10.15	$9.50	$9.11	$0.00	$78.01
	12/1/2028	$50.75	$10.15	$9.50	$9.11	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"							
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2025	$40.59	$10.15	$9.50	$9.21	$0.00	$69.45
	12/1/2025	$41.97	$10.15	$9.50	$9.21	$0.00	$70.83
	6/1/2026	$43.41	$10.15	$9.50	$9.21	$0.00	$72.27
	12/1/2026	$44.85	$10.15	$9.50	$9.21	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
BOILER MAKER BOILERMAKERS LOCAL 29 BOILERMAKERS LOCAL 29	1/1/2024	$48.12	$7.07	$14.60	$6.00	$0.00	$75.79

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: BOILER MAKER

Effective Date: 1/1/2024

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	65.00	$31.28	$7.07	$9.32	$3.90	$0.00	$51.57
2	65.00	$31.28	$7.07	$9.32	$3.90	$0.00	$51.57
3	70.00	$33.68	$7.07	$10.03	$4.20	$0.00	$54.98
4	75.00	$36.09	$7.07	$10.74	$4.50	$0.00	$58.40
5	80.00	$38.50	$7.07	$11.45	$4.80	$0.00	$61.82
6	85.00	$40.90	$7.07	$12.18	$5.10	$0.00	$65.25
7	90.00	$43.31	$7.07	$12.88	$5.40	$0.00	$68.66
8	95.00	$45.71	$7.07	$13.62	$5.70	$0.00	$72.10

Apprentice to Journeyworker Ratio: 1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) BRICKLAYERS LOCAL 3 BRICKLAYERS LOCAL 3 (NEWTON)	8/1/2025	$67.95	$11.49	$15.57	$8.02	$0.00	$103.03
	2/1/2026	$69.30	$11.49	$15.57	$8.02	$0.00	$104.38
	8/1/2026	$71.50	$11.49	$15.57	$8.02	$0.00	$106.58
	2/1/2027	$72.90	$11.49	$15.57	$8.02	$0.00	$107.98

Apprentice: BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$33.98	$11.49	$15.57	$8.02	$0.00	$69.06
2	60.00	$40.77	$11.49	$15.57	$8.02	$0.00	$75.85
3	70.00	$47.57	$11.49	$15.57	$8.02	$0.00	$82.65
4	80.00	$54.36	$11.49	$15.57	$8.02	$0.00	$89.44
5	90.00	$61.16	$11.49	$15.57	$8.02	$0.00	$96.24

Apprentice: BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$34.65	$11.49	$15.57	$8.02	$0.00	$69.73
2	60.00	$41.58	$11.49	$15.57	$8.02	$0.00	$76.66
3	70.00	$48.51	$11.49	$15.57	$8.02	$0.00	$83.59
4	80.00	$55.44	$11.49	$15.57	$8.02	$0.00	$90.52
5	90.00	$62.37	$11.49	$15.57	$8.02	$0.00	$97.45

Apprentice to Journeyworker Ratio: 1:5

BULLDOZER/GRADER/SCRAPER OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
CAISSON & UNDERPINNING BOTTOM MAN	6/1/2025	$48.35	$10.15	$9.50	$9.80	$0.00	$77.80
LABORERS	12/1/2025	$49.85	$10.15	$9.50	$9.80	$0.00	$79.30
LABORERS - FOUNDATION AND MARINE	6/1/2026	$51.40	$10.15	$9.50	$9.80	$0.00	$80.85
	12/1/2026	$52.90	$10.15	$9.50	$9.80	$0.00	$82.35
For apprentice rates see "Apprentice- LABORER"							
CAISSON & UNDERPINNING LABORER	6/1/2025	$47.20	$10.15	$9.50	$9.80	$0.00	$76.65
LABORERS	12/1/2025	$48.70	$10.15	$9.50	$9.80	$0.00	$78.15
LABORERS - FOUNDATION AND MARINE	6/1/2026	$50.25	$10.15	$9.50	$9.80	$0.00	$79.70
	12/1/2026	$51.75	$10.15	$9.50	$9.80	$0.00	$81.20
For apprentice rates see "Apprentice- LABORER"							
CAISSON & UNDERPINNING TOP MAN	6/1/2025	$47.53	$10.15	$9.50	$9.80	$0.00	$76.98
LABORERS	12/1/2025	$49.03	$10.15	$9.50	$9.80	$0.00	$78.48
LABORERS - FOUNDATION AND MARINE	6/1/2026	$50.58	$10.15	$9.50	$9.80	$0.00	$80.03
	12/1/2026	$52.08	$10.15	$9.50	$9.80	$0.00	$81.53
For apprentice rates see "Apprentice- LABORER"							
CARBIDE CORE DRILL OPERATOR	6/1/2025	$40.09	$10.15	$9.50	$9.11	$0.00	$68.85
LABORERS	12/1/2025	$41.47	$10.15	$9.50	$9.11	$0.00	$70.23
LABORERS - ZONE 2	6/1/2026	$42.91	$10.15	$9.50	$9.11	$0.00	$71.67
	12/1/2026	$44.35	$10.15	$9.50	$9.11	$0.00	$73.11
	6/1/2027	$45.80	$10.15	$9.50	$9.11	$0.00	$74.56
	12/1/2027	$47.25	$10.15	$9.50	$9.11	$0.00	$76.01
	6/1/2028	$48.75	$10.15	$9.50	$9.11	$0.00	$77.51
	12/1/2028	$50.25	$10.15	$9.50	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							
CARPENTER	9/1/2025	$50.35	$10.33	$11.47	$8.50	$0.00	$80.65
CARPENTERS	3/1/2026	$51.60	$10.33	$11.47	$8.50	$0.00	$81.90
CARPENTERS -ZONE 2 (Eastern Massachusetts)	9/1/2026	$52.85	$10.33	$11.47	$8.50	$0.00	$83.15
	3/1/2027	$54.10	$10.33	$11.47	$8.50	$0.00	$84.40

Apprentice: CARPENTER

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$22.66	$10.33	$0.00	$1.73	$0.00	$34.72
2	45.00	$22.66	$10.33	$0.00	$1.73	$0.00	$34.72
3	55.00	$27.69	$10.33	$0.00	$3.40	$0.00	$41.42
4	55.00	$27.69	$10.33	$0.00	$3.40	$0.00	$41.42
5	70.00	$35.25	$10.33	$11.41	$5.10	$0.00	$62.09
6	70.00	$35.25	$10.33	$11.41	$5.10	$0.00	$62.09
7	80.00	$40.28	$10.33	$11.44	$6.80	$0.00	$68.85
8	80.00	$40.28	$10.33	$11.44	$6.80	$0.00	$68.85

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: CARPENTER

Effective Date: 3/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$23.22	$10.33	$0.00	$1.73	$0.00	$35.28
2	45.00	$23.22	$10.33	$0.00	$1.73	$0.00	$35.28
3	55.00	$28.38	$10.33	$0.00	$3.40	$0.00	$42.11
4	55.00	$28.38	$10.33	$0.00	$3.40	$0.00	$42.11
5	70.00	$36.12	$10.33	$11.41	$5.10	$0.00	$62.96
6	70.00	$36.12	$10.33	$11.41	$5.10	$0.00	$62.96
7	80.00	$41.28	$10.33	$11.44	$6.80	$0.00	$69.85
8	80.00	$41.28	$10.33	$11.44	$6.80	$0.00	$69.85

Apprentice to Journeyworker Ratio: 1:5

CARPENTER WOOD FRAME	10/1/2025	$27.75	$7.02	$3.80	$1.00	$0.00	$39.57
CARPENTERS CARPENTERS-ZONE 3 (Wood Frame)	10/1/2026	$28.85	$7.02	$3.80	$1.00	$0.00	$40.67

All Aspects of New Wood Frame Work

Apprentice: CARPENTER WOOD FRAME

Effective Date: 10/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$16.65	$7.02	$0.00	$0.00	$0.00	$23.67
2	60.00	$16.65	$7.02	$0.00	$0.00	$0.00	$23.67
3	65.00	$18.04	$7.02	$0.00	$1.00	$0.00	$26.06
4	70.00	$19.43	$7.02	$0.00	$1.00	$0.00	$27.45
5	75.00	$20.81	$7.02	$3.80	$1.00	$0.00	$32.63
6	80.00	$22.20	$7.02	$3.80	$1.00	$0.00	$34.02
7	85.00	$23.59	$7.02	$3.80	$1.00	$0.00	$35.41
8	90.00	$24.98	$7.02	$3.80	$1.00	$0.00	$36.80

Apprentice: CARPENTER WOOD FRAME

Effective Date: 10/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$17.31	$7.02	$0.00	$0.00	$0.00	$24.33
2	60.00	$17.31	$7.02	$0.00	$0.00	$0.00	$24.33
3	65.00	$18.75	$7.02	$0.00	$1.00	$0.00	$26.77
4	70.00	$20.20	$7.02	$0.00	$1.00	$0.00	$28.22
5	75.00	$21.64	$7.02	$3.80	$1.00	$0.00	$33.46
6	80.00	$23.08	$7.02	$3.80	$1.00	$0.00	$34.90
7	85.00	$24.52	$7.02	$3.80	$1.00	$0.00	$36.34
8	90.00	$25.97	$7.02	$3.80	$1.00	$0.00	$37.79

Apprentice to Journeyworker Ratio: 1:5

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
CEMENT MASONRY/PLASTERING BRICKLAYERS LOCAL 3 BRICKLAYERS LOCAL 3 (NEWTON)	7/1/2024	$49.19	$13.35	$16.43	$7.78	$1.80	$88.55

Apprentice: CEMENT MASONRY/PLASTERING

Effective Date: 7/1/2024

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$24.60	$13.35	$16.43	$0.00	$0.00	$54.38
2	60.00	$29.51	$13.35	$16.43	$2.78	$1.80	$63.87
3	65.00	$31.97	$13.35	$16.43	$3.78	$1.80	$67.33
4	70.00	$34.43	$13.35	$16.43	$4.78	$1.80	$70.79
5	75.00	$36.89	$13.35	$16.43	$5.78	$1.80	$74.25
6	80.00	$39.35	$13.35	$16.43	$6.78	$1.80	$77.71
7	90.00	$44.27	$13.35	$16.43	$7.78	$1.80	$83.63

Apprentice to Journeyworker Ratio: 1:3

CHAIN SAW OPERATOR LABORERS LABORERS - ZONE 2	6/1/2025	$40.09	$10.15	$9.50	$9.11	$0.00	$68.85
	12/1/2025	$41.47	$10.15	$9.50	$9.11	$0.00	$70.23
	6/1/2026	$42.91	$10.15	$9.50	$9.11	$0.00	$71.67
	12/1/2026	$44.35	$10.15	$9.50	$9.11	$0.00	$73.11
	6/1/2027	$45.80	$10.15	$9.50	$9.11	$0.00	$74.56
	12/1/2027	$47.25	$10.15	$9.50	$9.11	$0.00	$76.01
	6/1/2028	$48.75	$10.15	$9.50	$9.11	$0.00	$77.51
	12/1/2028	$50.25	$10.15	$9.50	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$59.51	$15.55	$13.25	$3.25	$0.00	$91.56
	12/1/2025	$60.98	$15.55	$13.25	$3.25	$0.00	$93.03
	6/1/2026	$62.31	$15.55	$13.25	$3.25	$0.00	$94.36
	12/1/2026	$63.79	$15.55	$13.25	$3.25	$0.00	$95.84
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
COMPRESSOR OPERATOR OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$37.52	$15.55	$13.25	$3.25	$0.00	$69.57
	12/1/2025	$38.47	$15.55	$13.25	$3.25	$0.00	$70.52
	6/1/2026	$39.33	$15.55	$13.25	$3.25	$0.00	$71.38
	12/1/2026	$40.28	$15.55	$13.25	$3.25	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
DELEADER (BRIDGE) PAINTERS LOCAL 35 PAINTERS LOCAL 35 - ZONE 2	7/1/2025	$58.51	$10.30	$11.95	$12.50	$0.00	$93.26
	1/1/2026	$59.56	$10.35	$12.00	$12.60	$0.00	$94.51

Apprentice: DELEADER (BRIDGE)

Effective Date: 7/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$29.26	$10.30	$0.00	$0.00	$0.00	$39.56

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: DELEADER (BRIDGE)

Effective Date: 7/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
2	55.00	$32.18	$10.30	$0.00	$6.88	$0.00	$49.36
3	60.00	$35.11	$10.30	$0.00	$7.50	$0.00	$52.91
4	65.00	$38.03	$10.30	$0.00	$8.13	$0.00	$56.46
5	70.00	$40.96	$10.30	$11.95	$8.75	$0.00	$71.96
6	75.00	$43.88	$10.30	$11.95	$9.38	$0.00	$75.51
7	80.00	$46.81	$10.30	$11.95	$10.00	$0.00	$79.06
8	90.00	$52.66	$10.30	$11.95	$11.25	$0.00	$86.16

Apprentice: DELEADER (BRIDGE)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$29.78	$10.35	$0.00	$0.00	$0.00	$40.13
2	55.00	$32.76	$10.35	$0.00	$6.93	$0.00	$50.04
3	60.00	$35.74	$10.35	$0.00	$7.56	$0.00	$53.65
4	65.00	$38.71	$10.35	$0.00	$8.19	$0.00	$57.25
5	70.00	$41.69	$10.35	$12.00	$8.82	$0.00	$72.86
6	75.00	$44.67	$10.35	$12.00	$9.45	$0.00	$76.47
7	80.00	$47.65	$10.35	$12.00	$10.08	$0.00	$80.08
8	90.00	$53.60	$10.35	$12.00	$11.34	$0.00	$87.29

Apprentice to Journeyworker Ratio: 1:1

DEMO: ADZEMAN LABORERS LABORERS - ZONE 2	6/2/2025	$47.25	$10.15	$9.50	$9.65	$0.00	$76.55
	12/1/2025	$48.75	$10.15	$9.50	$9.65	$0.00	$78.05
	6/1/2026	$50.30	$10.15	$9.50	$9.65	$0.00	$79.60
	12/7/2026	$51.80	$10.15	$9.50	$9.65	$0.00	$81.10
	6/7/2027	$53.40	$10.15	$9.50	$9.65	$0.00	$82.70
	12/6/2027	$55.00	$10.15	$9.50	$9.65	$0.00	$84.30
	6/5/2028	$56.68	$10.15	$9.50	$9.65	$0.00	$85.98
	12/4/2028	$58.35	$10.15	$9.50	$9.65	$0.00	$87.65
For apprentice rates see "Apprentice- LABORER"							
DEMO: BACKHOE/LOADER/HAMMER OPERATOR LABORERS LABORERS - ZONE 2	6/2/2025	$48.25	$10.15	$9.50	$9.65	$0.00	$77.55
	12/1/2025	$49.75	$10.15	$9.50	$9.65	$0.00	$79.05
	6/1/2026	$51.30	$10.15	$9.50	$9.65	$0.00	$80.60
	12/7/2026	$52.80	$10.15	$9.50	$9.65	$0.00	$82.10
	6/7/2027	$54.40	$10.15	$9.50	$9.65	$0.00	$83.70
	12/6/2027	$56.00	$10.15	$9.50	$9.65	$0.00	$85.30
	6/5/2028	$57.68	$10.15	$9.50	$9.65	$0.00	$86.98
	12/4/2028	$59.35	$10.15	$9.50	$9.65	$0.00	$88.65
For apprentice rates see "Apprentice- LABORER"							
DEMO: BURNERS	6/2/2025	$48.00	$10.15	$9.50	$9.65	$0.00	$77.30

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
LABORERS LABORERS - ZONE 2	12/1/2025	$49.50	$10.15	$9.50	$9.65	$0.00	$78.80
	6/1/2026	$51.05	$10.15	$9.50	$9.65	$0.00	$80.35
	12/7/2026	$52.55	$10.15	$9.50	$9.65	$0.00	$81.85
	6/7/2027	$54.15	$10.15	$9.50	$9.65	$0.00	$83.45
	12/6/2027	$55.75	$10.15	$9.50	$9.65	$0.00	$85.05
	6/5/2028	$57.43	$10.15	$9.50	$9.65	$0.00	$86.73
	12/4/2028	$59.10	$10.15	$9.50	$9.65	$0.00	$88.40
For apprentice rates see "Apprentice- LABORER"							
DEMO: CONCRETE CUTTER/SAWYER LABORERS LABORERS - ZONE 2	6/2/2025	$48.25	$10.15	$9.50	$9.65	$0.00	$77.55
	12/1/2025	$49.75	$10.15	$9.50	$9.65	$0.00	$79.05
	6/1/2026	$51.30	$10.15	$9.50	$9.65	$0.00	$80.60
	12/7/2026	$52.80	$10.15	$9.50	$9.65	$0.00	$82.10
	6/7/2027	$54.40	$10.15	$9.50	$9.65	$0.00	$83.70
	12/6/2027	$56.00	$10.15	$9.50	$9.65	$0.00	$85.30
	6/5/2028	$57.68	$10.15	$9.50	$9.65	$0.00	$86.98
	12/4/2028	$59.35	$10.15	$9.50	$9.65	$0.00	$88.65
For apprentice rates see "Apprentice- LABORER"							
DEMO: JACKHAMMER OPERATOR LABORERS LABORERS - ZONE 2	6/2/2025	$48.00	$10.15	$9.50	$9.65	$0.00	$77.30
	12/1/2025	$49.50	$10.15	$9.50	$9.65	$0.00	$78.80
	6/1/2026	$51.05	$10.15	$9.50	$9.65	$0.00	$80.35
	12/7/2026	$52.55	$10.15	$9.50	$9.65	$0.00	$81.85
	6/7/2027	$54.15	$10.15	$9.50	$9.65	$0.00	$83.45
	12/6/2027	$55.75	$10.15	$9.50	$9.65	$0.00	$85.05
	6/5/2028	$57.43	$10.15	$9.50	$9.65	$0.00	$86.73
	12/4/2028	$59.10	$10.15	$9.50	$9.65	$0.00	$88.40
For apprentice rates see "Apprentice- LABORER"							
DEMO: WRECKING LABORER LABORERS LABORERS - ZONE 2	6/2/2025	$47.25	$10.15	$9.50	$9.65	$0.00	$76.55
	12/1/2025	$48.75	$10.15	$9.50	$9.65	$0.00	$78.05
	6/1/2026	$50.30	$10.15	$9.50	$9.65	$0.00	$79.60
	12/7/2026	$51.80	$10.15	$9.50	$9.65	$0.00	$81.10
	6/7/2027	$53.40	$10.15	$9.50	$9.65	$0.00	$82.70
	12/6/2027	$55.00	$10.15	$9.50	$9.65	$0.00	$84.30
	6/5/2028	$56.68	$10.15	$9.50	$9.65	$0.00	$85.98
	12/4/2028	$58.35	$10.15	$9.50	$9.65	$0.00	$87.65
For apprentice rates see "Apprentice- LABORER"							
DIRECTIONAL DRILL MACHINE OPERATOR OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
DIVER PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$78.11	$10.08	$11.62	$10.04	$0.00	$109.85
as of 8-1-24, Apprentices with diving licenses begin at second year. % of Diver wage 70/80/90 2A $69.83, 3A $91.79,4A $102.14 Total Rate							
DIVER TENDER	8/1/2024	$55.79	$10.08	$11.62	$12.67	$0.00	$90.16

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1) as of 8-1-24, Apprentices with diving licenses begin at second year. % of Piledriver wage 70/80/90 2A $54.20, 3A $73.93,4A $82.05 Total Rate							
DIVER TENDER (EFFLUENT) PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1) For apprentice rates see "Apprentice- PILE DRIVER"	8/1/2024	$83.69	$10.08	$11.62	$12.67	$0.00	$118.06
DIVER/SLURRY (EFFLUENT) PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1) For apprentice rates see "Apprentice- PILE DRIVER"	8/1/2024	$117.16	$10.08	$11.62	$12.67	$0.00	$151.53
DRAWBRIDGE OPERATOR (Construction) DRAWBRIDGE - SEIU LOCAL 888 DRAWBRIDGE - SEIU LOCAL 888	7/1/2020	$26.77	$6.67	$3.93	$0.00	$0.16	$37.53
ELECTRICIAN ELECTRICIANS LOCAL 103 ELECTRICIANS LOCAL 103	9/1/2025	$66.17	$13.00	$14.37	$8.72	$0.00	$102.26
	3/1/2026	$66.86	$13.00	$14.64	$9.00	$0.00	$103.50
	9/1/2026	$68.78	$13.00	$14.69	$9.00	$0.00	$105.47
	3/1/2027	$69.97	$13.00	$14.73	$9.00	$0.00	$106.70
	9/1/2027	$71.88	$13.00	$14.79	$9.00	$0.00	$108.67
	3/1/2028	$73.08	$13.00	$14.82	$9.00	$0.00	$109.90

Apprentice: ELECTRICIAN

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	$26.47	$13.00	$0.79	$0.00	$0.00	$40.26
2	40.00	$26.47	$13.00	$0.79	$0.00	$0.00	$40.26
3	45.00	$29.78	$13.00	$13.27	$3.92	$0.00	$59.97
4	45.00	$29.78	$13.00	$13.27	$3.92	$0.00	$59.97
5	50.00	$33.09	$13.00	$13.37	$4.36	$0.00	$63.82
6	55.00	$36.39	$13.00	$13.47	$4.80	$0.00	$67.66
7	60.00	$39.70	$13.00	$13.57	$5.23	$0.00	$71.50
8	65.00	$43.01	$13.00	$13.67	$5.67	$0.00	$75.35
9	70.00	$46.32	$13.00	$13.77	$6.10	$0.00	$79.19
10	75.00	$49.63	$13.00	$13.87	$6.54	$0.00	$83.04

Apprentice: ELECTRICIAN

Effective Date: 3/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	$26.74	$13.00	$0.80	$0.00	$0.00	$40.54
2	40.00	$26.74	$13.00	$0.80	$0.00	$0.00	$40.54
3	45.00	$30.09	$13.00	$13.53	$4.05	$0.00	$60.67
4	45.00	$30.09	$13.00	$13.53	$4.05	$0.00	$60.67

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
ELEVATOR CONSTRUCTOR ELEVATOR CONSTRUCTORS LOCAL 4 ELEVATOR CONSTRUCTORS LOCAL 4	1/1/2025	$74.17	$16.28	$10.96	$10.40	$0.00	$111.81
	1/1/2026	$77.26	$16.38	$11.06	$10.70	$0.00	$115.40
	1/1/2027	$80.55	$16.48	$11.16	$11.00	$0.00	$119.19

Apprentice: ELECTRICIAN

Effective Date: 3/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
5	50.00	$33.43	$13.00	$13.63	$4.50	$0.00	$64.56
6	55.00	$36.77	$13.00	$13.73	$4.95	$0.00	$68.45
7	60.00	$40.12	$13.00	$13.83	$5.40	$0.00	$72.35
8	65.00	$43.46	$13.00	$13.93	$5.85	$0.00	$76.24
9	70.00	$46.80	$13.00	$14.03	$6.30	$0.00	$80.13
10	75.00	$50.15	$13.00	$14.13	$6.75	$0.00	$84.03

Apprentice Notes

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Apprentice to Journeyworker Ratio: 2:3

Apprentice: ELEVATOR CONSTRUCTOR

Effective Date: 1/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$37.09	$0.00	$0.00	$0.00	$0.00	$37.09
2	55.00	$40.79	$16.28	$10.96	$10.40	$0.00	$78.43
3	65.00	$48.21	$16.28	$10.96	$10.40	$0.00	$85.85
4	70.00	$51.92	$16.28	$10.96	$10.40	$0.00	$89.56
5	80.00	$59.34	$16.28	$10.96	$10.40	$0.00	$96.98

Apprentice: ELEVATOR CONSTRUCTOR

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$38.63	$0.00	$0.00	$0.00	$0.00	$38.63
2	55.00	$42.49	$16.38	$11.06	$10.70	$0.00	$80.63
3	65.00	$50.22	$16.38	$11.06	$10.70	$0.00	$88.36
4	70.00	$54.08	$16.38	$11.06	$10.70	$0.00	$92.22
5	80.00	$61.81	$16.38	$11.06	$10.70	$0.00	$99.95

Apprentice to Journeyworker Ratio: 1:1

ELEVATOR CONSTRUCTOR HELPER ELEVATOR CONSTRUCTORS LOCAL 4 ELEVATOR CONSTRUCTORS LOCAL 4	1/1/2025	$51.92	$16.28	$10.96	$10.40	$0.00	$89.56
	1/1/2026	$54.08	$16.38	$11.06	$10.07	$0.00	$91.59
	1/1/2027	$56.39	$16.48	$11.16	$11.00	$0.00	$95.03

For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY)	6/1/2025	$40.09	$10.15	$9.50	$9.21	$0.00	$68.95
LABORERS	12/1/2025	$41.47	$10.15	$9.50	$9.21	$0.00	$70.33
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2026	$42.91	$10.15	$9.50	$9.21	$0.00	$71.77
	12/1/2026	$44.35	$10.15	$9.50	$9.21	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY	5/1/2025	$52.47	$15.85	$13.15	$3.25	$0.00	$84.72
OPERATING ENGINEERS LOCAL 4	11/1/2025	$53.76	$15.85	$13.15	$3.25	$0.00	$86.01
OPERATING ENGINEERS LOCAL 4	5/1/2026	$55.20	$15.85	$13.15	$3.25	$0.00	$87.45
	11/1/2026	$56.49	$15.85	$13.15	$3.25	$0.00	$88.74
	5/1/2027	$57.92	$15.85	$13.15	$3.25	$0.00	$90.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY	5/1/2025	$54.07	$15.85	$13.15	$3.25	$0.00	$86.32
OPERATING ENGINEERS LOCAL 4	11/1/2025	$55.37	$15.85	$13.15	$3.25	$0.00	$87.62
OPERATING ENGINEERS LOCAL 4	5/1/2026	$56.82	$15.85	$13.15	$3.25	$0.00	$89.07
	11/1/2026	$58.12	$15.85	$13.15	$3.25	$0.00	$90.37
	5/1/2027	$59.57	$15.85	$13.15	$3.25	$0.00	$91.82
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY	5/1/2025	$25.47	$15.85	$13.15	$3.25	$0.00	$57.72
OPERATING ENGINEERS LOCAL 4	11/1/2025	$26.23	$15.85	$13.15	$3.25	$0.00	$58.48
OPERATING ENGINEERS LOCAL 4	5/1/2026	$27.08	$15.85	$13.15	$3.25	$0.00	$59.33
	11/1/2026	$27.84	$15.85	$13.15	$3.25	$0.00	$60.09
	5/1/2027	$28.69	$15.85	$13.15	$3.25	$0.00	$60.94
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FIRE ALARM INSTALLER	9/1/2025	$66.17	$13.00	$14.37	$9.00	$0.00	$102.54
ELECTRICIANS LOCAL 103	3/1/2026	$66.86	$13.00	$14.64	$9.00	$0.00	$103.50
ELECTRICIANS LOCAL 103	9/1/2026	$68.78	$13.00	$14.69	$9.00	$0.00	$105.47
	3/1/2027	$69.97	$13.00	$14.73	$9.00	$0.00	$106.70
	9/1/2027	$71.88	$13.00	$14.79	$9.00	$0.00	$108.67
	3/1/2028	$73.08	$13.00	$14.82	$9.00	$0.00	$109.90
For apprentice rates see "Apprentice- ELECTRICIAN"							
FIRE ALARM REPAIR / MAINTENANCE	9/1/2025	$52.94	$13.00	$13.97	$6.98	$0.00	$86.89
/ COMMISSIONING	3/1/2026	$53.49	$13.00	$14.23	$7.20	$0.00	$87.92
ELECTRICIANS LOCAL 103	9/1/2026	$55.02	$13.00	$14.28	$7.20	$0.00	$89.50
ELECTRICIANS LOCAL 103	3/1/2027	$55.98	$13.00	$14.31	$7.20	$0.00	$90.49
	9/1/2027	$57.50	$13.00	$14.36	$7.20	$0.00	$92.06
	3/1/2028	$58.46	$13.00	$14.38	$7.20	$0.00	$93.04
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"							
FIREMAN (ASST. ENGINEER)	6/1/2025	$47.02	$15.55	$13.25	$3.25	$0.00	$79.07
OPERATING ENGINEERS LOCAL 4	12/1/2025	$48.19	$15.55	$13.25	$3.25	$0.00	$80.24
OPERATING ENGINEERS LOCAL 4	6/1/2026	$49.25	$15.55	$13.25	$3.25	$0.00	$81.30
	12/1/2026	$50.43	$15.55	$13.25	$3.25	$0.00	$82.48
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
FLAGGER & SIGNALER (HEAVY & HIGHWAY)	6/1/2025	$28.09	$10.15	$9.50	$9.21	$0.00	$56.95

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
LABORERS	12/1/2025	$28.09	$10.15	$9.50	$9.21	$0.00	$56.95
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2026	$29.21	$10.15	$9.50	$9.21	$0.00	$58.07
	12/1/2026	$29.21	$10.15	$9.50	$9.21	$0.00	$58.07

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)

FLOORCOVERER	9/1/2025	$57.74	$10.33	$11.47	$8.80	$0.00	$88.34
FLOORCOVERERS LOCAL 2168	3/1/2026	$59.24	$10.33	$11.47	$8.80	$0.00	$89.84
FLOORCOVERERS LOCAL 2168 ZONE I	9/1/2026	$60.74	$10.33	$11.47	$8.80	$0.00	$91.34
	3/1/2027	$62.24	$10.33	$11.47	$8.80	$0.00	$92.84

Apprentice: FLOORCOVERER

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$25.98	$10.33	$0.00	$1.76	$0.00	$38.07
2	45.00	$25.98	$10.33	$0.00	$1.76	$0.00	$38.07
3	55.00	$31.76	$10.33	$0.00	$3.52	$0.00	$45.61
4	55.00	$31.76	$10.33	$0.00	$3.52	$0.00	$45.61
5	70.00	$40.42	$10.33	$11.47	$5.28	$0.00	$67.50
6	70.00	$40.42	$10.33	$11.47	$5.28	$0.00	$67.50
7	80.00	$46.19	$10.33	$11.47	$7.04	$0.00	$75.03
8	80.00	$46.19	$10.33	$11.47	$7.04	$0.00	$75.03

Apprentice: FLOORCOVERER

Effective Date: 3/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$26.66	$10.33	$0.00	$1.76	$0.00	$38.75
2	45.00	$26.66	$10.33	$0.00	$1.76	$0.00	$38.75
3	55.00	$32.58	$10.33	$0.00	$3.52	$0.00	$46.43
4	55.00	$32.58	$10.33	$0.00	$3.52	$0.00	$46.43
5	70.00	$41.47	$10.33	$11.47	$5.28	$0.00	$68.55
6	70.00	$41.47	$10.33	$11.47	$5.28	$0.00	$68.55
7	80.00	$47.39	$10.33	$11.47	$7.04	$0.00	$76.23
8	80.00	$47.39	$10.33	$11.47	$7.04	$0.00	$76.23

Apprentice Notes

Steps are 750 hrs.

Apprentice to Journeyworker Ratio: 1:1

FORK LIFT/CHERRY PICKER	6/1/2025	$58.33	$15.55	$13.25	$3.25	$0.00	$90.38
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.78	$15.55	$13.25	$3.25	$0.00	$91.83
OPERATING ENGINEERS LOCAL 4	6/1/2026	$61.08	$15.55	$13.25	$3.25	$0.00	$93.13
	12/1/2026	$62.53	$15.55	$13.25	$3.25	$0.00	$94.58

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

GENERATOR/LIGHTING PLANT/HEATERS	6/1/2025	$37.52	$15.55	$13.25	$3.25	$0.00	$69.57

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
OPERATING ENGINEERS LOCAL 4	12/1/2025	$38.47	$15.55	$13.25	$3.25	$0.00	$70.52
OPERATING ENGINEERS LOCAL 4	6/1/2026	$39.33	$15.55	$13.25	$3.25	$0.00	$71.38
	12/1/2026	$40.28	$15.55	$13.25	$3.25	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)	7/1/2025	$48.01	$10.30	$11.95	$12.50	$0.00	$82.76
GLAZIERS LOCAL 35	1/1/2026	$49.06	$10.35	$12.00	$12.60	$0.00	$84.01
GLAZIERS LOCAL 35 (ZONE 2)							

Apprentice: GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)

Effective Date: 7/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$24.01	$10.30	$0.00	$0.00	$0.00	$34.31
2	55.00	$26.41	$10.30	$0.00	$6.88	$0.00	$43.59
3	60.00	$28.81	$10.30	$0.00	$7.50	$0.00	$46.61
4	65.00	$31.21	$10.30	$0.00	$8.13	$0.00	$49.64
5	70.00	$33.61	$10.30	$11.95	$8.75	$0.00	$64.61
6	75.00	$36.01	$10.30	$11.95	$9.38	$0.00	$67.64
7	80.00	$38.41	$10.30	$11.95	$10.00	$0.00	$70.66
8	90.00	$43.21	$10.30	$11.95	$11.25	$0.00	$76.71

Apprentice: GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$24.53	$10.30	$0.00	$0.00	$0.00	$34.83
2	55.00	$26.98	$10.30	$0.00	$6.88	$0.00	$44.16
3	60.00	$29.44	$10.30	$0.00	$7.50	$0.00	$47.24
4	65.00	$31.89	$10.30	$0.00	$8.13	$0.00	$50.32
5	70.00	$34.34	$10.30	$11.95	$8.75	$0.00	$65.34
6	75.00	$36.80	$10.30	$11.95	$9.38	$0.00	$68.43
7	80.00	$39.25	$10.30	$11.95	$10.00	$0.00	$71.50
8	90.00	$44.15	$10.30	$11.95	$11.25	$0.00	$77.65

Apprentice to Journeyworker Ratio: 1:1

HOISTING ENGINEER/CRANES/GRADALLS	6/1/2025	$58.33	$15.55	$13.25	$3.25	$0.00	$90.38
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.78	$15.55	$13.25	$3.25	$0.00	$91.83
OPERATING ENGINEERS LOCAL 4	6/1/2026	$61.08	$15.55	$13.25	$3.25	$0.00	$93.13
	12/1/2026	$62.53	$15.55	$13.25	$3.25	$0.00	$94.58

Apprentice: HOISTING ENGINEER/CRANES/GRADALLS

Effective Date: 6/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	55.00	$32.08	$0.00	$0.00	$0.00	$0.00	$32.08

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: HOISTING ENGINEER/CRANES/GRADALLS

Effective Date: 6/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
2	60.00	$35.00	$15.55	$13.25	$3.25	$0.00	$67.05
3	65.00	$37.91	$15.55	$13.25	$3.25	$0.00	$69.96
4	70.00	$40.83	$15.55	$13.25	$3.25	$0.00	$72.88
5	75.00	$43.75	$15.55	$13.25	$3.25	$0.00	$75.80
6	80.00	$46.66	$15.55	$13.25	$3.25	$0.00	$78.71
7	85.00	$49.58	$15.55	$13.25	$3.25	$0.00	$81.63
8	90.00	$52.50	$15.55	$13.25	$3.25	$0.00	$84.55

Apprentice: HOISTING ENGINEER/CRANES/GRADALLS

Effective Date: 12/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	55.00	$32.88	$0.00	$0.00	$0.00	$0.00	$32.88
2	60.00	$35.87	$15.55	$13.25	$3.25	$0.00	$67.92
3	65.00	$38.86	$15.55	$13.25	$3.25	$0.00	$70.91
4	70.00	$41.85	$15.55	$13.25	$3.25	$0.00	$73.90
5	75.00	$44.84	$15.55	$13.25	$3.25	$0.00	$76.89
6	80.00	$47.82	$15.55	$13.25	$3.25	$0.00	$79.87
7	85.00	$50.81	$15.55	$13.25	$3.25	$0.00	$82.86
8	90.00	$53.80	$15.55	$13.25	$3.25	$0.00	$85.85

Apprentice to Journeyworker Ratio: 1:6

HVAC (DUCTWORK) SHEETMETAL WORKERS LOCAL 17 SHEETMETAL WORKERS LOCAL 17 - A	8/1/2025	$60.98	$14.91	$18.74	$9.53	$2.98	$107.14
	2/1/2026	$62.93	$14.91	$18.74	$9.53	$2.98	$109.09
For apprentice rates see "Apprentice- SHEET METAL WORKER"							
HVAC (ELECTRICAL CONTROLS) ELECTRICIANS LOCAL 103 ELECTRICIANS LOCAL 103	9/1/2025	$66.17	$13.00	$14.37	$8.72	$0.00	$102.26
	3/1/2026	$66.86	$13.00	$14.64	$9.00	$0.00	$103.50
	9/1/2026	$68.78	$13.00	$14.69	$9.00	$0.00	$105.47
	3/1/2027	$69.97	$13.00	$14.73	$9.00	$0.00	$106.70
	9/1/2027	$71.88	$13.00	$14.79	$9.00	$0.00	$108.67
	3/1/2028	$73.08	$13.00	$14.82	$9.00	$0.00	$109.90
For apprentice rates see "Apprentice- ELECTRICIAN"							
HVAC (TESTING AND BALANCING - AIR) SHEETMETAL WORKERS LOCAL 17 SHEETMETAL WORKERS LOCAL 17 - A	8/1/2025	$60.98	$14.91	$18.74	$9.53	$2.98	$107.14
	2/1/2026	$62.93	$14.91	$18.74	$9.53	$2.98	$109.09
For apprentice rates see "Apprentice- SHEET METAL WORKER"							
HVAC (TESTING AND BALANCING -WATER) PIPEFITTERS LOCAL 537 PIPEFITTERS LOCAL 537	3/1/2025	$68.88	$12.70	$13.05	$8.75	$0.00	$103.38
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
HVAC MECHANIC PIPEFITTERS LOCAL 537 PIPEFITTERS LOCAL 537	3/1/2025	$68.88	$12.70	$13.05	$8.75	$0.00	$103.38
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"							
HYDRAULIC DRILLS LABORERS LABORERS - ZONE 2	6/1/2025	$40.59	$10.15	$9.50	$9.11	$0.00	$69.35
	12/1/2025	$41.97	$10.15	$9.50	$9.11	$0.00	$70.73
	6/1/2026	$43.41	$10.15	$9.50	$9.11	$0.00	$72.17
	12/1/2026	$44.85	$10.15	$9.50	$9.11	$0.00	$73.61
	6/1/2027	$46.30	$10.15	$9.50	$9.11	$0.00	$75.06
	12/1/2027	$47.75	$10.15	$9.50	$9.11	$0.00	$76.51
	6/1/2028	$49.25	$10.15	$9.50	$9.11	$0.00	$78.01
	12/1/2028	$50.75	$10.15	$9.50	$9.11	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"							
HYDRAULIC DRILLS (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2025	$40.59	$10.15	$9.50	$9.21	$0.00	$69.45
	12/1/2025	$41.97	$10.15	$9.50	$9.21	$0.00	$70.83
	6/1/2026	$43.41	$10.15	$9.50	$9.21	$0.00	$72.27
	12/1/2026	$44.85	$10.15	$9.50	$9.21	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
INSULATOR (PIPES & TANKS) HEAT & FROST INSULATORS LOCAL 6 HEAT & FROST INSULATORS LOCAL 6 (BOSTON)	9/1/2025	$60.34	$14.75	$9.52	$10.09	$0.00	$94.70
	9/1/2026	$63.76	$14.75	$9.52	$10.09	$0.00	$98.12

Apprentice: INSULATOR (PIPES & TANKS)

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$30.17	$14.75	$9.27	$5.05	$0.00	$59.24
2	60.00	$36.20	$14.75	$9.32	$6.05	$0.00	$66.32
3	70.00	$42.24	$14.75	$9.37	$7.06	$0.00	$73.42
4	80.00	$48.27	$14.75	$9.42	$8.07	$0.00	$80.51

Apprentice: INSULATOR (PIPES & TANKS)

Effective Date: 9/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$31.88	$14.75	$9.27	$5.05	$0.00	$60.95
2	60.00	$38.26	$14.75	$9.32	$6.05	$0.00	$68.38
3	70.00	$44.63	$14.75	$9.37	$7.06	$0.00	$75.81
4	80.00	$51.01	$14.75	$9.42	$8.07	$0.00	$83.25

Apprentice to Journeyworker Ratio: 1:4

IRONWORKER/WELDER IRONWORKERS LOCAL 7 IRONWORKERS LOCAL 7 (BOSTON AREA)	9/16/2025	$57.87	$9.05	$12.75	$14.50	$0.00	$94.17

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: IRONWORKER/WELDER

Effective Date: 9/16/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$34.72	$9.05	$12.75	$4.50	$0.00	$61.02
2	75.00	$43.40	$9.05	$12.75	$4.50	$0.00	$69.70
3	85.00	$49.19	$9.05	$12.75	$4.50	$0.00	$75.49
4	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
5	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
6	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

Apprentice to Journeyworker Ratio: 1:4

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
JACKHAMMER & PAVING BREAKER OPERATOR	6/1/2025	$40.09	$10.15	$9.50	$9.11	$0.00	$68.85
LABORERS	12/1/2025	$41.47	$10.15	$9.50	$9.11	$0.00	$70.23
LABORERS - ZONE 2	6/1/2026	$42.91	$10.15	$9.50	$9.11	$0.00	$71.67
	12/1/2026	$44.35	$10.15	$9.50	$9.11	$0.00	$73.11
	6/1/2027	$45.80	$10.15	$9.50	$9.11	$0.00	$74.56
	12/1/2027	$47.25	$10.15	$9.50	$9.11	$0.00	$76.01
	6/1/2028	$48.75	$10.15	$9.50	$9.11	$0.00	$77.51
	12/1/2028	$50.25	$10.15	$9.50	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							
LABORER	6/1/2025	$39.84	$10.15	$9.50	$9.11	$0.00	$68.60
LABORERS	12/1/2025	$41.22	$10.15	$9.50	$9.11	$0.00	$69.98
LABORERS - ZONE 2	6/1/2026	$42.66	$10.15	$9.50	$9.11	$0.00	$71.42
	12/1/2026	$44.10	$10.15	$9.50	$9.11	$0.00	$72.86
	6/1/2027	$45.55	$10.15	$9.50	$9.11	$0.00	$74.31
	12/1/2027	$47.00	$10.15	$9.50	$9.11	$0.00	$75.76
	6/1/2028	$48.50	$10.15	$9.50	$9.11	$0.00	$77.26
	12/1/2028	$50.00	$10.15	$9.50	$9.11	$0.00	$78.76

Apprentice: LABORER

Effective Date: 6/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$23.90	$10.15	$9.50	$9.11	$0.00	$52.66
2	70.00	$27.89	$10.15	$9.50	$9.11	$0.00	$56.65
3	80.00	$31.87	$10.15	$9.50	$9.11	$0.00	$60.63
4	90.00	$35.86	$10.15	$9.50	$9.11	$0.00	$64.62

Apprentice: LABORER

Effective Date: 12/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$25.03	$9.90	$9.25	$9.11	$0.00	$53.29

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: LABORER

Effective Date: 12/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
2	70.00	$29.20	$9.90	$9.25	$9.11	$0.00	$57.46
3	80.00	$33.38	$9.90	$9.25	$9.11	$0.00	$61.64
4	90.00	$37.55	$9.90	$9.25	$9.11	$0.00	$65.81

Apprentice to Journeyworker Ratio: 1:5

LABORER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2025	$39.84	$10.15	$9.50	$9.21	$0.00	$68.70
	12/1/2025	$41.22	$10.15	$9.50	$9.21	$0.00	$70.08
	6/1/2026	$42.66	$10.15	$9.50	$9.21	$0.00	$71.52
	12/1/2026	$44.10	$10.15	$9.50	$9.21	$0.00	$72.96

Apprentice: LABORER (HEAVY & HIGHWAY)

Effective Date: 6/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$23.90	$10.15	$9.50	$9.21	$0.00	$52.76
2	70.00	$27.89	$10.15	$9.50	$9.21	$0.00	$56.75
3	80.00	$31.87	$10.15	$9.50	$9.21	$0.00	$60.73
4	90.00	$35.86	$10.15	$9.50	$9.21	$0.00	$64.72

Apprentice: LABORER (HEAVY & HIGHWAY)

Effective Date: 12/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	60.00	$25.03	$9.90	$9.25	$9.21	$0.00	$53.39
2	70.00	$29.20	$9.90	$9.25	$9.21	$0.00	$57.56
3	80.00	$33.38	$9.90	$9.25	$9.21	$0.00	$61.74
4	90.00	$37.55	$9.90	$9.25	$9.21	$0.00	$65.91

Apprentice to Journeyworker Ratio: 1:5

LABORER: CARPENTER TENDER LABORERS LABORERS - ZONE 2	6/1/2025	$39.84	$10.15	$9.50	$9.11	$0.00	$68.60
	12/1/2025	$41.22	$10.15	$9.50	$9.11	$0.00	$69.98
	6/1/2026	$42.66	$10.15	$9.50	$9.11	$0.00	$71.42
	12/1/2026	$44.10	$10.15	$9.50	$9.11	$0.00	$72.86
	6/1/2027	$45.55	$10.15	$9.50	$9.11	$0.00	$74.31
	12/1/2027	$47.00	$10.15	$9.50	$9.11	$0.00	$75.76
	6/1/2028	$48.50	$10.15	$9.50	$9.11	$0.00	$77.26
	12/1/2028	$50.00	$10.15	$9.50	$9.11	$0.00	$78.76

For apprentice rates see "Apprentice- LABORER"

LABORER: CEMENT FINISHER TENDER LABORERS	6/1/2025	$39.84	$10.15	$9.50	$9.11	$0.00	$68.60
	12/1/2025	$41.22	$10.15	$9.50	$9.11	$0.00	$69.98

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
LABORERS - ZONE 2	6/1/2026	$42.66	$10.15	$9.50	$9.11	$0.00	$71.42
	12/1/2026	$44.10	$10.15	$9.50	$9.11	$0.00	$72.86
	6/1/2027	$45.55	$10.15	$9.50	$9.11	$0.00	$74.31
	12/1/2027	$47.00	$10.15	$9.50	$9.11	$0.00	$75.76
	6/1/2028	$48.50	$10.15	$9.50	$9.11	$0.00	$77.26
	12/1/2028	$50.00	$10.15	$9.50	$9.11	$0.00	$78.76
For apprentice rates see "Apprentice- LABORER"							
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER	6/2/2025	$39.93	$10.15	$9.50	$9.65	$0.00	$69.23
LABORERS	12/1/2025	$41.31	$10.15	$9.50	$9.65	$0.00	$70.61
LABORERS - ZONE 2	6/1/2026	$42.75	$10.15	$9.50	$9.65	$0.00	$72.05
	12/7/2026	$44.19	$10.15	$9.50	$9.65	$0.00	$73.49
	6/7/2027	$45.64	$10.15	$9.50	$9.65	$0.00	$74.94
	12/6/2027	$47.09	$10.15	$9.50	$9.65	$0.00	$76.39
	6/5/2028	$48.59	$10.15	$9.50	$9.65	$0.00	$77.89
	12/4/2028	$50.09	$10.15	$9.50	$9.65	$0.00	$79.39
For apprentice rates see "Apprentice- LABORER"							
LABORER: MASON TENDER	6/1/2025	$40.09	$10.15	$9.50	$9.11	$0.00	$68.85
LABORERS	12/1/2025	$41.47	$10.15	$9.50	$9.11	$0.00	$70.23
LABORERS - ZONE 2	6/1/2026	$42.91	$10.15	$9.50	$9.11	$0.00	$71.67
	12/1/2026	$44.35	$10.15	$9.50	$9.11	$0.00	$73.11
	6/1/2027	$45.80	$10.15	$9.50	$9.11	$0.00	$74.56
	12/1/2027	$47.25	$10.15	$9.50	$9.11	$0.00	$76.01
	6/1/2028	$48.75	$10.15	$9.50	$9.11	$0.00	$77.51
	12/1/2028	$50.25	$10.15	$9.50	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							
LABORER: MASON TENDER (HEAVY & HIGHWAY)	6/1/2025	$40.09	$10.15	$9.50	$9.21	$0.00	$68.95
LABORERS	12/1/2025	$41.47	$10.15	$9.50	$9.21	$0.00	$70.33
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2026	$42.91	$10.15	$9.50	$9.21	$0.00	$71.77
	12/1/2026	$44.35	$10.15	$9.50	$9.21	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
LABORER: MULTI-TRADE TENDER	6/1/2025	$39.84	$10.15	$9.50	$9.11	$0.00	$68.60
LABORERS	12/1/2025	$41.22	$10.15	$9.50	$9.11	$0.00	$69.98
LABORERS - ZONE 2	6/1/2026	$42.66	$10.15	$9.50	$9.11	$0.00	$71.42
	12/1/2026	$44.10	$10.15	$9.50	$9.11	$0.00	$72.86
	6/1/2027	$45.55	$10.15	$9.50	$9.11	$0.00	$74.31
	12/1/2027	$47.00	$10.15	$9.50	$9.11	$0.00	$75.76
	6/1/2028	$48.50	$10.15	$9.50	$9.11	$0.00	$77.26
	12/1/2028	$50.00	$10.15	$9.50	$9.11	$0.00	$78.76
For apprentice rates see "Apprentice- LABORER"							
LABORER: TREE REMOVER	6/1/2025	$39.84	$10.15	$9.50	$9.11	$0.00	$68.60
LABORERS	12/1/2025	$41.22	$10.15	$9.50	$9.11	$0.00	$69.98
LABORERS - ZONE 2	6/1/2026	$42.66	$10.15	$9.50	$9.11	$0.00	$71.42
	12/1/2026	$44.10	$10.15	$9.50	$9.11	$0.00	$72.86
	6/1/2027	$45.55	$10.15	$9.50	$9.11	$0.00	$74.31
	12/1/2027	$47.00	$10.15	$9.50	$9.11	$0.00	$75.76
	6/1/2028	$48.50	$10.15	$9.50	$9.11	$0.00	$77.26

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	12/1/2028	$50.00	$10.15	$9.50	$9.11	$0.00	$78.76

This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"

LASER BEAM OPERATOR	6/1/2025	$40.09	$10.15	$9.50	$9.11	$0.00	$68.85
LABORERS LABORERS - ZONE 2	12/1/2025	$41.47	$10.15	$9.50	$9.11	$0.00	$70.23
	6/1/2026	$42.91	$10.15	$9.50	$9.11	$0.00	$71.67
	12/1/2026	$44.35	$10.15	$9.50	$9.11	$0.00	$73.11
	6/1/2027	$45.80	$10.15	$9.50	$9.11	$0.00	$74.56
	12/1/2027	$47.25	$10.15	$9.50	$9.11	$0.00	$76.01
	6/1/2028	$48.75	$10.15	$9.50	$9.11	$0.00	$77.51
	12/1/2028	$50.25	$10.15	$9.50	$9.11	$0.00	$79.01

For apprentice rates see "Apprentice- LABORER"

LASER BEAM OPERATOR (HEAVY & HIGHWAY)	6/1/2025	$40.09	$10.15	$9.50	$9.21	$0.00	$68.95
LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/1/2025	$41.47	$10.15	$9.50	$9.21	$0.00	$70.33
	6/1/2026	$42.91	$10.15	$9.50	$9.21	$0.00	$71.77
	12/1/2026	$44.35	$10.15	$9.50	$9.21	$0.00	$73.21

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)

MARBLE & TILE FINISHERS	8/1/2025	$52.08	$11.49	$15.57	$6.05	$0.00	$85.19
BRICKLAYERS LOCAL 3 BRICKLAYERS LOCAL 3 - MARBLE & TILE	2/1/2026	$53.16	$11.49	$15.57	$6.05	$0.00	$86.27
	8/1/2026	$54.92	$11.49	$15.57	$6.05	$0.00	$88.03
	2/1/2027	$56.04	$11.49	$15.57	$6.05	$0.00	$89.15

Apprentice: MARBLE & TILE FINISHERS

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$26.04	$11.49	$15.57	$6.05	$0.00	$59.15
2	60.00	$31.25	$11.49	$15.57	$6.05	$0.00	$64.36
3	70.00	$36.46	$11.49	$15.57	$6.05	$0.00	$69.57
4	80.00	$41.66	$11.49	$15.57	$6.05	$0.00	$74.77
5	90.00	$46.87	$11.49	$15.57	$6.05	$0.00	$79.98

Apprentice: MARBLE & TILE FINISHERS

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$26.58	$11.49	$15.57	$6.05	$0.00	$59.69
2	60.00	$31.90	$11.49	$15.57	$6.05	$0.00	$65.01
3	70.00	$37.21	$11.49	$15.57	$6.05	$0.00	$70.32
4	80.00	$42.53	$11.49	$15.57	$6.05	$0.00	$75.64
5	90.00	$47.84	$11.49	$15.57	$6.05	$0.00	$80.95

Apprentice to Journeyworker Ratio: 1:5

MARBLE MASONS,TILELAYERS & TERRAZZO MECH	8/1/2025	$67.97	$11.49	$15.57	$7.99	$0.00	$103.02

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
BRICKLAYERS LOCAL 3	2/1/2026	$69.32	$11.49	$15.57	$7.99	$0.00	$104.37
BRICKLAYERS LOCAL 3 - MARBLE & TILE	8/1/2026	$71.52	$11.49	$15.57	$7.99	$0.00	$106.57
	2/1/2027	$72.92	$11.49	$15.57	$7.99	$0.00	$107.97

Apprentice: MARBLE MASONS,TILELAYERS & TERRAZZO MECH

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$33.99	$11.49	$15.57	$7.99	$0.00	$69.04
2	60.00	$40.78	$11.49	$15.57	$7.99	$0.00	$75.83
3	70.00	$47.58	$11.49	$15.57	$7.99	$0.00	$82.63
4	80.00	$54.38	$11.49	$15.57	$7.99	$0.00	$89.43
5	90.00	$61.17	$11.49	$15.57	$7.99	$0.00	$96.22

Apprentice: MARBLE MASONS,TILELAYERS & TERRAZZO MECH

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$34.66	$11.49	$15.57	$7.99	$0.00	$69.71
2	60.00	$41.59	$11.49	$15.57	$7.99	$0.00	$76.64
3	70.00	$48.52	$11.49	$15.57	$7.99	$0.00	$83.57
4	80.00	$55.46	$11.49	$15.57	$7.99	$0.00	$90.51
5	90.00	$62.39	$11.49	$15.57	$7.99	$0.00	$97.44

Apprentice to Journeyworker Ratio: 1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES)	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MECHANICS MAINTENANCE	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MILLWRIGHT (Zone 1)	1/6/2025	$50.47	$10.08	$11.47	$10.25	$0.00	$82.27
MILLWRIGHTS LOCAL 1121	1/5/2026	$52.97	$10.08	$11.47	$10.25	$0.00	$84.77
MILLWRIGHTS LOCAL 1121 - Zone 1							

Apprentice: MILLWRIGHT (Zone 1)

Effective Date: 1/6/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	55.00	$27.76	$10.08	$0.00	$5.64	$0.00	$43.48

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: MILLWRIGHT (Zone 1)

Effective Date: 1/6/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
2	65.00	$32.81	$10.08	$0.00	$6.66	$0.00	$49.55
3	75.00	$37.85	$10.08	$11.47	$7.69	$0.00	$67.09
4	85.00	$42.90	$10.08	$11.47	$8.71	$0.00	$73.16

Apprentice: MILLWRIGHT (Zone 1)

Effective Date: 1/5/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	55.00	$29.13	$10.08	$0.00	$5.64	$0.00	$44.85
2	65.00	$34.43	$10.08	$0.00	$6.66	$0.00	$51.17
3	75.00	$39.73	$10.08	$11.47	$7.69	$0.00	$68.97
4	85.00	$45.02	$10.08	$11.47	$8.71	$0.00	$75.28

Apprentice Notes

Step 1&2 Appr. indentured after 1/6/2020 receive no pension,

Apprentice to Journeyworker Ratio: 1:4

MORTAR MIXER LABORERS LABORERS - ZONE 2	6/1/2025	$40.09	$10.15	$9.50	$9.11	$0.00	$68.85
	12/1/2025	$41.47	$10.15	$9.50	$9.11	$0.00	$70.23
	6/1/2026	$42.91	$10.15	$9.50	$9.11	$0.00	$71.67
	12/1/2026	$44.35	$10.15	$9.50	$9.11	$0.00	$73.11
	6/1/2027	$45.80	$10.15	$9.50	$9.11	$0.00	$74.56
	12/1/2027	$47.25	$10.15	$9.50	$9.11	$0.00	$76.01
	6/1/2028	$48.75	$10.15	$9.50	$9.11	$0.00	$77.51
	12/1/2028	$50.25	$10.15	$9.50	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							
OILER (OTHER THAN TRUCK CRANES,GRADALLS) OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$25.97	$15.30	$13.15	$3.25	$0.00	$57.67
	12/1/2025	$26.63	$15.30	$13.15	$3.25	$0.00	$58.33
	6/1/2026	$27.22	$15.30	$13.15	$3.25	$0.00	$58.92
	12/1/2026	$27.89	$15.30	$13.15	$3.25	$0.00	$59.59
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
OILER (TRUCK CRANES, GRADALLS) OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$31.80	$15.30	$13.15	$3.25	$0.00	$63.50
	12/1/2025	$32.60	$15.30	$13.15	$3.25	$0.00	$64.30
	6/1/2026	$33.32	$15.30	$13.15	$3.25	$0.00	$65.02
	12/1/2026	$34.12	$15.30	$13.15	$3.25	$0.00	$65.82
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
OTHER POWER DRIVEN EQUIPMENT - CLASS II OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
PAINTER (BRIDGES/TANKS) PAINTERS LOCAL 35 PAINTERS LOCAL 35 - ZONE 2	7/1/2025	$58.51	$10.30	$11.95	$12.50	$0.00	$93.26
	1/1/2026	$59.56	$10.35	$12.00	$12.50	$0.00	$94.41

Apprentice: PAINTER (BRIDGES/TANKS)

Effective Date: 7/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$29.26	$10.30	$0.00	$0.00	$0.00	$39.56
2	55.00	$32.18	$10.30	$0.00	$6.88	$0.00	$49.36
3	60.00	$35.11	$10.30	$0.00	$7.50	$0.00	$52.91
4	65.00	$38.03	$10.30	$0.00	$8.13	$0.00	$56.46
5	70.00	$40.96	$10.30	$11.95	$8.75	$0.00	$71.96
6	75.00	$43.88	$10.30	$11.95	$9.38	$0.00	$75.51
7	80.00	$46.81	$10.30	$11.95	$10.00	$0.00	$79.06
8	90.00	$52.66	$10.30	$11.95	$11.25	$0.00	$86.16

Apprentice: PAINTER (BRIDGES/TANKS)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$29.78	$10.35	$0.00	$0.00	$0.00	$40.13
2	55.00	$32.76	$10.35	$0.00	$6.93	$0.00	$50.04
3	60.00	$35.74	$10.35	$0.00	$7.56	$0.00	$53.65
4	65.00	$38.71	$10.35	$0.00	$8.19	$0.00	$57.25
5	70.00	$41.69	$10.35	$12.00	$8.82	$0.00	$72.86
6	75.00	$44.67	$10.35	$12.00	$9.45	$0.00	$76.47
7	80.00	$47.65	$10.35	$12.00	$10.08	$0.00	$80.08
8	90.00	$53.60	$10.35	$12.00	$11.34	$0.00	$87.29

Apprentice to Journeyworker Ratio: 1:1

PAINTER (SPRAY OR SANDBLAST, NEW) * * If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 PAINTERS LOCAL 35 - ZONE 2	7/1/2025	$49.41	$10.30	$11.95	$12.50	$0.00	$84.16
	1/1/2026	$50.46	$10.35	$12.00	$12.60	$0.00	$85.41

Apprentice: PAINTER (SPRAY OR SANDBLAST, NEW) *

Effective Date: 7/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$24.71	$10.30	$0.00	$0.00	$0.00	$35.01
2	55.00	$27.18	$10.30	$0.00	$6.88	$0.00	$44.36
3	60.00	$29.65	$10.30	$0.00	$7.50	$0.00	$47.45

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: PAINTER (SPRAY OR SANDBLAST, NEW) *

Effective Date: 7/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
4	65.00	$32.12	$10.30	$0.00	$8.13	$0.00	$50.55
5	70.00	$34.59	$10.30	$11.95	$8.75	$0.00	$65.59
6	75.00	$37.06	$10.30	$11.95	$9.38	$0.00	$68.69
7	80.00	$39.53	$10.30	$11.95	$10.00	$0.00	$71.78
8	90.00	$44.47	$10.30	$11.95	$11.25	$0.00	$77.97

Apprentice: PAINTER (SPRAY OR SANDBLAST, NEW) *

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$25.23	$10.35	$0.00	$0.00	$0.00	$35.58
2	55.00	$27.75	$10.35	$0.00	$6.93	$0.00	$45.03
3	60.00	$30.28	$10.35	$0.00	$7.56	$0.00	$48.19
4	65.00	$32.80	$10.35	$0.00	$8.19	$0.00	$51.34
5	70.00	$35.32	$10.35	$12.00	$8.82	$0.00	$66.49
6	75.00	$37.85	$10.35	$12.00	$9.45	$0.00	$69.65
7	80.00	$40.37	$10.35	$12.00	$10.08	$0.00	$72.80
8	90.00	$45.41	$10.35	$12.00	$11.34	$0.00	$79.10

Apprentice to Journeyworker Ratio: 1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT) PAINTERS LOCAL 35 PAINTERS LOCAL 35 - ZONE 2	7/1/2025	$47.47	$10.30	$11.95	$12.50	$0.00	$82.22
	1/1/2026	$48.52	$10.35	$12.00	$12.60	$0.00	$83.47

Apprentice: PAINTER (SPRAY OR SANDBLAST, REPAINT)

Effective Date: 7/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$23.74	$10.30	$0.00	$0.00	$0.00	$34.04
2	55.00	$26.11	$10.30	$0.00	$6.88	$0.00	$43.29
3	60.00	$28.48	$10.30	$0.00	$7.50	$0.00	$46.28
4	65.00	$30.86	$10.30	$0.00	$8.13	$0.00	$49.29
5	70.00	$33.23	$10.30	$11.95	$8.75	$0.00	$64.23
6	75.00	$35.60	$10.30	$11.95	$9.38	$0.00	$67.23
7	80.00	$37.98	$10.30	$11.95	$10.00	$0.00	$70.23
8	90.00	$42.72	$10.30	$11.95	$11.25	$0.00	$76.22

Apprentice: PAINTER (SPRAY OR SANDBLAST, REPAINT)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
PAINTER / TAPER (BRUSH, NEW) *	7/1/2025	$48.01	$10.30	$11.95	$12.50	$0.00	$82.76
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.	1/1/2026	$49.06	$10.35	$12.00	$12.60	$0.00	$84.01
PAINTERS LOCAL 35							
PAINTERS LOCAL 35 - ZONE 2							

Apprentice: PAINTER (SPRAY OR SANDBLAST, REPAINT)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$24.26	$10.35	$0.00	$0.00	$0.00	$34.61
2	55.00	$26.69	$10.35	$0.00	$6.93	$0.00	$43.97
3	60.00	$29.11	$10.35	$0.00	$7.56	$0.00	$47.02
4	65.00	$31.54	$10.35	$0.00	$8.19	$0.00	$50.08
5	70.00	$33.96	$10.35	$12.00	$8.82	$0.00	$65.13
6	75.00	$36.39	$10.35	$12.00	$9.45	$0.00	$68.19
7	80.00	$38.82	$10.35	$12.00	$10.08	$0.00	$71.25
8	90.00	$43.67	$10.35	$12.00	$11.34	$0.00	$77.36

Apprentice to Journeyworker Ratio: 1:1

Apprentice: PAINTER / TAPER (BRUSH, NEW) *

Effective Date: 7/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$24.01	$10.30	$0.00	$0.00	$0.00	$34.31
2	55.00	$26.41	$10.30	$0.00	$6.88	$0.00	$43.59
3	60.00	$28.81	$10.30	$0.00	$7.50	$0.00	$46.61
4	65.00	$31.21	$10.30	$0.00	$8.13	$0.00	$49.64
5	70.00	$33.61	$10.30	$11.95	$8.75	$0.00	$64.61
6	75.00	$36.01	$10.30	$11.95	$9.38	$0.00	$67.64
7	80.00	$38.41	$10.30	$11.95	$10.00	$0.00	$70.66
8	90.00	$43.21	$10.30	$11.95	$11.25	$0.00	$76.71

Apprentice: PAINTER / TAPER (BRUSH, NEW) *

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$24.53	$10.35	$0.00	$0.00	$0.00	$34.88
2	55.00	$26.98	$10.35	$0.00	$6.93	$0.00	$44.26
3	60.00	$29.44	$10.35	$0.00	$7.56	$0.00	$47.35
4	65.00	$31.89	$10.35	$0.00	$8.19	$0.00	$50.43
5	70.00	$34.34	$10.35	$12.00	$8.82	$0.00	$65.51
6	75.00	$36.80	$10.35	$12.00	$9.45	$0.00	$68.60
7	80.00	$39.25	$10.35	$12.00	$10.08	$0.00	$71.68
8	90.00	$44.15	$10.35	$12.00	$11.34	$0.00	$77.84

Apprentice to Journeyworker Ratio: 1:1

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
PAINTER / TAPER (BRUSH, REPAINT) PAINTERS LOCAL 35 PAINTERS LOCAL 35 - ZONE 2	7/1/2025	$46.07	$10.30	$11.95	$12.50	$0.00	$80.82
	1/1/2026	$47.12	$10.35	$12.00	$12.60	$0.00	$82.07

Apprentice: PAINTER / TAPER (BRUSH, REPAINT)

Effective Date: 7/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$23.04	$10.30	$0.00	$0.00	$0.00	$33.34
2	55.00	$25.34	$10.30	$0.00	$6.88	$0.00	$42.52
3	60.00	$27.64	$10.30	$0.00	$7.50	$0.00	$45.44
4	65.00	$29.95	$10.30	$0.00	$8.13	$0.00	$48.38
5	70.00	$32.25	$10.30	$11.95	$8.75	$0.00	$63.25
6	75.00	$34.55	$10.30	$11.95	$9.38	$0.00	$66.18
7	80.00	$36.86	$10.30	$11.95	$10.00	$0.00	$69.11
8	90.00	$41.46	$10.30	$11.95	$11.25	$0.00	$74.96

Apprentice: PAINTER / TAPER (BRUSH, REPAINT)

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$23.56	$10.35	$0.00	$0.00	$0.00	$33.91
2	55.00	$25.92	$10.35	$0.00	$6.93	$0.00	$43.20
3	60.00	$28.27	$10.35	$0.00	$7.56	$0.00	$46.18
4	65.00	$30.63	$10.35	$0.00	$8.19	$0.00	$49.17
5	70.00	$32.98	$10.35	$12.00	$8.82	$0.00	$64.15
6	75.00	$35.34	$10.35	$12.00	$9.45	$0.00	$67.14
7	80.00	$37.70	$10.35	$12.00	$10.08	$0.00	$70.13
8	90.00	$42.41	$10.35	$12.00	$11.34	$0.00	$76.10

Apprentice to Journeyworker Ratio: 1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY) LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2025	$39.84	$10.15	$9.50	$9.21	$0.00	$68.70
	12/1/2025	$41.22	$10.15	$9.50	$9.21	$0.00	$70.08
	6/1/2026	$42.66	$10.15	$9.50	$9.21	$0.00	$71.52
	12/1/2026	$44.10	$10.15	$9.50	$9.21	$0.00	$72.96
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)							
PANEL & PICKUP TRUCKS DRIVER TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2025	$41.88	$15.41	$20.17	$0.00	$0.00	$77.46
	12/1/2025	$41.88	$15.41	$21.78	$0.00	$0.00	$79.07
	6/1/2026	$42.88	$15.41	$21.78	$0.00	$0.00	$80.07
	8/1/2026	$42.88	$15.91	$21.78	$0.00	$0.00	$80.57
	12/1/2026	$42.88	$15.91	$23.52	$0.00	$0.00	$82.31
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$55.79	$10.08	$11.62	$12.67	$0.00	$90.16
For apprentice rates see "Apprentice- PILE DRIVER"							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
PILE DRIVER PILE DRIVER LOCAL 56 PILE DRIVER LOCAL 56 (ZONE 1)	8/1/2024	$55.79	$10.08	$11.62	$12.67	$0.00	$90.16

Apprentice: PILE DRIVER

Effective Date: 8/1/2024

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$25.11	$10.08	$0.00	$2.53	$0.00	$37.72
2	55.00	$30.68	$10.08	$0.00	$5.07	$0.00	$45.83
3	70.00	$39.05	$10.08	$11.62	$7.60	$0.00	$68.35
4	80.00	$44.63	$10.08	$11.62	$10.14	$0.00	$76.47

Apprentice to Journeyworker Ratio: 1:5

PIPEFITTER & STEAMFITTER PIPEFITTERS LOCAL 537 PIPEFITTERS LOCAL 537	3/1/2025	$68.88	$12.70	$13.05	$8.75	$0.00	$103.38

Apprentice: PIPEFITTER & STEAMFITTER

Effective Date: 3/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	40.00	$27.55	$12.70	$0.30	$8.75	$0.00	$49.30
2	45.00	$31.00	$12.70	$13.05	$8.75	$0.00	$65.50
3	60.00	$41.33	$12.70	$13.05	$8.75	$0.00	$75.83
4	70.00	$48.22	$12.70	$13.05	$8.75	$0.00	$82.72
5	80.00	$55.10	$12.70	$13.05	$8.75	$0.00	$89.60

Apprentice to Journeyworker Ratio: 1:3

PIPELAYER LABORERS LABORERS - ZONE 2	6/1/2025	$40.09	$10.15	$9.50	$9.11	$0.00	$68.85
	12/1/2025	$41.47	$10.15	$9.50	$9.11	$0.00	$70.23
	6/1/2026	$42.91	$10.15	$9.50	$9.11	$0.00	$71.67
	12/1/2026	$44.35	$10.15	$9.50	$9.11	$0.00	$73.11
	6/1/2027	$45.80	$10.15	$9.50	$9.11	$0.00	$74.56
	12/1/2027	$47.25	$10.15	$9.50	$9.11	$0.00	$76.01
	6/1/2028	$48.75	$10.15	$9.50	$9.11	$0.00	$77.51
	12/1/2028	$50.25	$10.15	$9.50	$9.11	$0.00	$79.01

For apprentice rates see "Apprentice- LABORER"

PIPELAYER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2025	$40.09	$10.15	$9.50	$9.21	$0.00	$68.95
	12/1/2025	$41.47	$10.15	$9.50	$9.21	$0.00	$70.33
	6/1/2026	$42.91	$10.15	$9.50	$9.21	$0.00	$71.77
	12/1/2026	$44.35	$10.15	$9.50	$9.21	$0.00	$73.21

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)

PLUMBERS & GASFITTERS PLUMBERS & GASFITTERS LOCAL 12 PLUMBERS & GASFITTERS LOCAL 12	3/2/2025	$69.84	$14.32	$12.31	$8.00	$0.00	$104.47

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: PLUMBERS & GASFITTERS

Effective Date: 3/2/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	35.00	$24.44	$14.32	$4.61	$2.80	$0.00	$46.17
2	40.00	$27.94	$14.32	$5.22	$3.20	$0.00	$50.68
3	55.00	$38.41	$14.32	$7.07	$4.40	$0.00	$64.20
4	65.00	$45.40	$14.32	$8.30	$5.20	$0.00	$73.22
5	75.00	$52.38	$14.32	$9.53	$6.00	$0.00	$82.23

Apprentice to Journeyworker Ratio: 1:2

PNEUMATIC CONTROLS (TEMP.) PIPEFITTERS LOCAL 537 PIPEFITTERS LOCAL 537	3/1/2025	$68.88	$12.70	$13.05	$8.75	$0.00	$103.38
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"							
PNEUMATIC DRILL/TOOL OPERATOR LABORERS LABORERS - ZONE 2	6/1/2025	$40.09	$10.15	$9.50	$9.11	$0.00	$68.85
	12/1/2025	$41.47	$10.15	$9.50	$9.11	$0.00	$70.23
	6/1/2026	$42.91	$10.15	$9.50	$9.11	$0.00	$71.67
	12/1/2026	$44.35	$10.15	$9.50	$9.11	$0.00	$73.11
	6/1/2027	$45.80	$10.15	$9.50	$9.11	$0.00	$74.56
	12/1/2027	$47.25	$10.15	$9.50	$9.11	$0.00	$76.01
	6/1/2028	$48.75	$10.15	$9.50	$9.11	$0.00	$77.51
	12/1/2028	$50.25	$10.15	$9.50	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2025	$40.09	$10.15	$9.50	$9.21	$0.00	$68.95
	12/1/2025	$41.47	$10.15	$9.50	$9.21	$0.00	$70.33
	6/1/2026	$42.91	$10.15	$9.50	$9.21	$0.00	$71.77
	12/1/2026	$44.35	$10.15	$9.50	$9.21	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
POWDERMAN & BLASTER LABORERS LABORERS - ZONE 2	6/1/2025	$40.84	$10.15	$9.50	$9.11	$0.00	$69.60
	12/1/2025	$42.22	$10.15	$9.50	$9.11	$0.00	$70.98
	6/1/2026	$43.66	$10.15	$9.50	$9.11	$0.00	$72.42
	12/1/2026	$45.10	$10.15	$9.50	$9.11	$0.00	$73.86
	6/1/2027	$46.55	$10.15	$9.50	$9.11	$0.00	$75.31
	12/1/2027	$48.00	$10.15	$9.50	$9.11	$0.00	$76.76
	6/1/2028	$49.50	$10.15	$9.50	$9.11	$0.00	$78.26
	12/1/2028	$51.00	$10.15	$9.50	$9.11	$0.00	$79.76
For apprentice rates see "Apprentice- LABORER"							
POWDERMAN & BLASTER (HEAVY & HIGHWAY) LABORERS LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2025	$40.84	$9.90	$9.50	$9.21	$0.00	$69.45
	12/1/2025	$42.22	$9.90	$9.50	$9.21	$0.00	$70.83
	6/1/2026	$43.66	$9.90	$9.50	$9.21	$0.00	$72.27
	12/1/2026	$45.10	$9.90	$9.50	$9.21	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
POWER SHOVEL/DERRICK/TRENCHING MACHINE	6/1/2025	$58.33	$15.55	$13.25	$3.25	$0.00	$90.38
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.78	$15.55	$13.25	$3.25	$0.00	$91.83
OPERATING ENGINEERS LOCAL 4	6/1/2026	$61.08	$15.55	$13.25	$3.25	$0.00	$93.13
	12/1/2026	$62.53	$15.55	$13.25	$3.25	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
PUMP OPERATOR (CONCRETE)	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
PUMP OPERATOR (DEWATERING, OTHER)	6/1/2025	$37.52	$15.55	$13.25	$3.25	$0.00	$69.57
OPERATING ENGINEERS LOCAL 4	12/1/2025	$38.47	$15.55	$13.25	$3.25	$0.00	$70.52
OPERATING ENGINEERS LOCAL 4	6/1/2026	$39.33	$15.55	$13.25	$3.25	$0.00	$71.38
	12/1/2026	$40.28	$15.55	$13.25	$3.25	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
READY-MIX CONCRETE DRIVER	5/1/2025	$30.90	$13.46	$8.25	$0.00	$0.00	$52.61
TEAMSTERS 170	1/1/2026	$30.90	$13.96	$8.25	$0.00	$0.00	$53.11
TEAMSTERS 170 - Rosenfeld (Walpole)	5/1/2026	$31.90	$13.96	$8.25	$0.00	$0.00	$54.11
	1/1/2027	$31.90	$14.46	$8.25	$0.00	$0.00	$54.61
	5/1/2027	$32.90	$14.46	$8.25	$0.00	$0.00	$55.61
RECLAIMERS	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
RIDE-ON MOTORIZED BUGGY OPERATOR	6/1/2025	$40.09	$10.15	$9.50	$9.11	$0.00	$68.85
LABORERS	12/1/2025	$41.47	$10.15	$9.50	$9.11	$0.00	$70.23
LABORERS - ZONE 2	6/1/2026	$42.91	$10.15	$9.50	$9.11	$0.00	$71.67
	12/1/2026	$44.35	$10.15	$9.50	$9.11	$0.00	$73.11
	6/1/2027	$45.80	$10.15	$9.50	$9.11	$0.00	$74.56
	12/1/2027	$47.25	$10.15	$9.50	$9.11	$0.00	$76.01
	6/1/2028	$48.75	$10.15	$9.50	$9.11	$0.00	$77.51
	12/1/2028	$50.25	$10.15	$9.50	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							
ROLLER/SPREADER/MULCHING MACHINE	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg)	8/1/2025	$53.53	$13.28	$12.67	$9.03	$0.00	$88.51
ROOFERS LOCAL 33	2/1/2026	$54.78	$13.28	$12.67	$9.03	$0.00	$89.76
ROOFERS LOCAL 33							

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
ROOFER SLATE / TILE / PRECAST CONCRETE ROOFERS LOCAL 33 ROOFERS LOCAL 33	8/1/2025	$53.78	$13.28	$12.67	$9.03	$0.00	$88.76
	2/1/2026	$55.03	$13.28	$12.67	$9.03	$0.00	$90.01
For apprentice rates see "Apprentice- ROOFER"							
SHEETMETAL WORKER SHEETMETAL WORKERS LOCAL 17 SHEETMETAL WORKERS LOCAL 17 - A	8/1/2025	$60.98	$14.91	$18.74	$9.53	$2.98	$107.14
	2/1/2026	$62.93	$14.91	$18.74	$9.53	$2.98	$109.09

Apprentice: ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg)

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$26.77	$13.28	$6.52	$9.03	$0.00	$55.60
2	60.00	$32.12	$13.28	$12.67	$9.03	$0.00	$67.10
3	65.00	$34.79	$13.28	$12.67	$9.03	$0.00	$69.77
4	75.00	$40.15	$13.28	$12.67	$9.03	$0.00	$75.13
5	85.00	$45.50	$13.28	$12.67	$9.03	$0.00	$80.48

Apprentice: ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg)

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$27.39	$13.28	$6.52	$9.03	$0.00	$56.22
2	60.00	$32.87	$13.28	$12.67	$9.03	$0.00	$67.85
3	65.00	$35.61	$13.28	$12.67	$9.03	$0.00	$70.59
4	75.00	$41.09	$13.28	$12.67	$9.03	$0.00	$76.07
5	85.00	$46.56	$13.28	$12.67	$9.03	$0.00	$81.54

Apprentice Notes

** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1

Apprentice to Journeyworker Ratio: 1:5

Apprentice: SHEETMETAL WORKER

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	42.00	$25.61	$14.91	$6.13	$0.00	$0.00	$46.65
2	42.00	$25.61	$14.91	$6.13	$0.00	$0.00	$46.65
3	47.00	$28.66	$14.91	$11.01	$1.25	$1.62	$57.45
4	47.00	$28.66	$14.91	$11.01	$1.25	$1.62	$57.45
5	52.00	$31.71	$14.91	$11.74	$1.50	$1.74	$61.60
6	52.00	$31.71	$14.91	$11.74	$1.75	$1.75	$61.86
7	60.00	$36.59	$14.91	$12.90	$2.00	$1.93	$68.33
8	65.00	$39.64	$14.91	$13.63	$2.25	$2.04	$72.47

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
Apprentice: SHEETMETAL WORKER							
Effective Date: 8/1/2025							
Step / Percent		**Apprentice Base Wage**					
9 / 75.00		$45.74	$14.91	$15.09	$2.75	$2.28	$80.77
10 / 85.00		$51.83	$14.91	$16.55	$2.75	$2.49	$88.53
Apprentice: SHEETMETAL WORKER							
Effective Date: 2/1/2026							
Step / Percent		**Apprentice Base Wage**					
1 / 42.00		$26.43	$14.91	$6.19	$0.00	$0.00	$47.53
2 / 42.00		$26.43	$14.91	$6.19	$0.00	$0.00	$47.53
3 / 47.00		$29.58	$14.91	$10.93	$1.25	$1.62	$58.29
4 / 47.00		$29.58	$14.91	$10.93	$1.25	$1.62	$58.29
5 / 52.00		$32.72	$14.91	$11.66	$1.50	$1.74	$62.53
6 / 52.00		$32.72	$14.91	$11.66	$1.75	$1.75	$62.79
7 / 60.00		$37.76	$14.91	$12.84	$2.00	$1.93	$69.44
8 / 65.00		$40.90	$14.91	$13.58	$2.25	$2.04	$73.68
9 / 75.00		$47.20	$14.91	$15.06	$2.75	$2.28	$82.20
10 / 85.00		$53.49	$14.91	$16.53	$2.75	$2.49	$90.17
Apprentice to Journeyworker Ratio: 1:4							
SPECIALIZED EARTH MOVING EQUIP < 35 TONS TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2025	$42.34	$15.41	$20.17	$0.00	$0.00	$77.92
	12/1/2025	$42.34	$15.41	$21.78	$0.00	$0.00	$79.53
	6/1/2026	$43.34	$15.41	$21.78	$0.00	$0.00	$80.53
	8/1/2026	$43.34	$15.91	$21.78	$0.00	$0.00	$81.03
	12/1/2026	$43.34	$15.91	$23.52	$0.00	$0.00	$82.77
SPECIALIZED EARTH MOVING EQUIP > 35 TONS TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2025	$42.63	$15.41	$20.17	$0.00	$0.00	$78.21
	12/1/2025	$42.63	$15.41	$21.78	$0.00	$0.00	$79.82
	6/1/2026	$43.63	$15.41	$21.78	$0.00	$0.00	$80.82
	8/1/2026	$43.63	$15.91	$21.78	$0.00	$0.00	$81.32
	12/1/2026	$43.63	$15.91	$23.52	$0.00	$0.00	$83.06
SPRINKLER FITTER SPRINKLER FITTERS LOCAL 550 SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1	10/1/2025	$72.05	$12.25	$7.40	$19.50	$0.00	$111.20
	1/1/2026	$72.05	$13.45	$7.45	$18.25	$0.00	$111.20
Apprentice: SPRINKLER FITTER							
Effective Date: 10/1/2025							
Step / Percent		**Apprentice Base Wage**					
1 / 0.00		$25.22	$12.25	$14.22	$19.50	$0.00	$71.19
2 / 0.00		$28.82	$12.25	$15.20	$19.50	$0.00	$75.77
3 / 0.00		$32.42	$12.25	$16.18	$19.50	$0.00	$80.35

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: SPRINKLER FITTER

Effective Date: 10/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
4	0.00	$36.03	$12.25	$17.15	$19.50	$0.00	$84.93
5	0.00	$39.63	$12.25	$18.12	$19.50	$0.00	$89.50
6	0.00	$43.23	$12.25	$19.10	$19.50	$0.00	$94.08
7	0.00	$46.83	$12.25	$20.08	$19.50	$0.00	$98.66
8	0.00	$50.40	$12.25	$21.04	$19.50	$0.00	$103.19
9	0.00	$54.04	$12.25	$22.02	$19.50	$0.00	$107.81
10	0.00	$57.64	$12.25	$23.00	$19.50	$0.00	$112.39

Apprentice: SPRINKLER FITTER

Effective Date: 1/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	0.00	$25.22	$13.45	$13.84	$18.25	$0.00	$70.76
2	0.00	$28.82	$13.45	$14.75	$18.25	$0.00	$75.27
3	0.00	$32.42	$13.45	$15.67	$18.25	$0.00	$79.79
4	0.00	$36.03	$13.45	$16.57	$18.25	$0.00	$84.30
5	0.00	$39.63	$13.45	$17.49	$18.25	$0.00	$88.82
6	0.00	$43.23	$13.45	$18.40	$18.25	$0.00	$93.33
7	0.00	$46.83	$13.45	$19.32	$18.25	$0.00	$97.85
8	0.00	$50.44	$13.45	$20.22	$18.25	$0.00	$102.36
9	0.00	$54.04	$13.45	$21.15	$18.25	$0.00	$106.89
10	0.00	$57.64	$13.45	$22.05	$18.25	$0.00	$111.39

Apprentice Notes

Apprentice entered prior 9/30/10:

Apprentice to Journeyworker Ratio: 1:3

STEAM BOILER OPERATOR	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
OPERATING ENGINEERS LOCAL 4	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

TELECOMMUNICATION TECHNICIAN	9/1/2025	$52.94	$13.00	$13.97	$6.98	$0.00	$86.89
ELECTRICIANS LOCAL 103	3/1/2026	$53.49	$13.00	$14.23	$7.20	$0.00	$87.92
ELECTRICIANS LOCAL 103	9/1/2026	$55.02	$13.00	$14.28	$7.20	$0.00	$89.50

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	3/1/2027	$55.98	$13.00	$14.31	$7.20	$0.00	$90.49
	9/1/2027	$57.50	$13.00	$14.36	$7.20	$0.00	$92.06
	3/1/2028	$58.46	$13.00	$14.38	$7.20	$0.00	$93.04

Apprentice: TELECOMMUNICATION TECHNICIAN

Effective Date: 9/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$23.82	$13.00	$0.71	$0.00	$0.00	$37.53
2	45.00	$23.82	$13.00	$0.71	$0.00	$0.00	$37.53
3	50.00	$26.47	$13.00	$13.17	$3.49	$0.00	$56.13
4	50.00	$26.47	$13.00	$13.17	$3.49	$0.00	$56.13
5	55.00	$29.12	$13.00	$13.25	$3.84	$0.00	$59.21
6	60.00	$31.76	$13.00	$13.33	$4.19	$0.00	$62.28
7	65.00	$34.41	$13.00	$13.41	$4.54	$0.00	$65.36
8	70.00	$37.06	$13.00	$13.49	$4.89	$0.00	$68.44
9	75.00	$39.71	$13.00	$13.57	$5.24	$0.00	$71.52
10	80.00	$42.35	$13.00	$13.65	$5.58	$0.00	$74.58

Apprentice: TELECOMMUNICATION TECHNICIAN

Effective Date: 3/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	45.00	$24.07	$13.00	$0.72	$0.00	$0.00	$37.79
2	45.00	$24.07	$13.00	$0.72	$0.00	$0.00	$37.79
3	50.00	$26.75	$13.00	$13.43	$3.60	$0.00	$56.78
4	50.00	$26.75	$13.00	$13.43	$3.60	$0.00	$56.78
5	55.00	$29.42	$13.00	$13.51	$3.96	$0.00	$59.89
6	60.00	$32.09	$13.00	$13.59	$4.32	$0.00	$63.00
7	65.00	$34.77	$13.00	$13.67	$4.68	$0.00	$66.12
8	70.00	$37.44	$13.00	$13.75	$5.04	$0.00	$69.23
9	75.00	$40.12	$13.00	$13.83	$5.40	$0.00	$72.35
10	80.00	$42.79	$13.00	$13.91	$5.76	$0.00	$75.46

Apprentice to Journeyworker Ratio: 1:1

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
TERRAZZO FINISHERS BRICKLAYERS LOCAL 3 BRICKLAYERS LOCAL 3 - MARBLE & TILE	8/1/2025	$66.89	$11.49	$15.57	$8.02	$0.00	$101.97
	2/1/2026	$68.24	$11.49	$15.57	$8.02	$0.00	$103.32
	8/1/2026	$70.44	$11.49	$15.57	$8.02	$0.00	$105.52
	2/1/2027	$71.84	$11.49	$15.57	$8.02	$0.00	$106.92

Apprentice: TERRAZZO FINISHERS

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$33.45	$11.49	$15.57	$8.02	$0.00	$68.53
2	60.00	$40.13	$11.49	$15.57	$8.02	$0.00	$75.21

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate

Apprentice: TERRAZZO FINISHERS

Effective Date: 8/1/2025

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
3	70.00	$46.82	$11.49	$15.57	$8.02	$0.00	$81.90
4	80.00	$53.51	$11.49	$15.57	$8.02	$0.00	$88.59
5	90.00	$60.20	$11.49	$15.57	$8.02	$0.00	$95.28

Apprentice: TERRAZZO FINISHERS

Effective Date: 2/1/2026

Step	Percent	Apprentice Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
1	50.00	$34.12	$11.49	$15.57	$8.02	$0.00	$69.20
2	60.00	$40.94	$11.49	$15.57	$8.02	$0.00	$76.02
3	70.00	$47.77	$11.49	$15.57	$8.02	$0.00	$82.85
4	80.00	$54.59	$11.49	$15.57	$8.02	$0.00	$89.67
5	90.00	$61.42	$11.49	$15.57	$8.02	$0.00	$96.50

Apprentice to Journeyworker Ratio: 1:5

TEST BORING DRILLER LABORERS LABORERS - FOUNDATION AND MARINE	6/1/2025	$51.20	$10.15	$9.50	$9.80	$0.00	$80.65
	12/1/2025	$52.70	$10.15	$9.50	$9.80	$0.00	$82.15
	6/1/2026	$54.25	$10.15	$9.50	$9.80	$0.00	$83.70
	12/1/2026	$55.75	$10.15	$9.50	$9.80	$0.00	$85.20
For apprentice rates see "Apprentice- LABORER"							
TEST BORING DRILLER HELPER LABORERS LABORERS - FOUNDATION AND MARINE	6/1/2025	$47.32	$10.15	$9.50	$9.80	$0.00	$76.77
	12/1/2025	$48.82	$10.15	$9.50	$9.80	$0.00	$78.27
	6/1/2026	$50.37	$10.15	$9.50	$9.80	$0.00	$79.82
	12/1/2026	$51.87	$10.15	$9.50	$9.80	$0.00	$81.32
For apprentice rates see "Apprentice- LABORER"							
TEST BORING LABORER LABORERS LABORERS - FOUNDATION AND MARINE	6/1/2025	$47.20	$10.15	$9.50	$9.80	$0.00	$76.65
	12/1/2025	$48.70	$10.15	$9.50	$9.80	$0.00	$78.15
	6/1/2026	$50.25	$10.15	$9.50	$9.80	$0.00	$79.70
	12/1/2026	$51.75	$10.15	$9.50	$9.80	$0.00	$81.20
For apprentice rates see "Apprentice- LABORER"							
TRACTORS/PORTABLE STEAM GENERATORS OPERATING ENGINEERS LOCAL 4 OPERATING ENGINEERS LOCAL 4	6/1/2025	$57.68	$15.55	$13.25	$3.25	$0.00	$89.73
	12/1/2025	$59.12	$15.55	$13.25	$3.25	$0.00	$91.17
	6/1/2026	$60.40	$15.55	$13.25	$3.25	$0.00	$92.45
	12/1/2026	$61.84	$15.55	$13.25	$3.25	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
TRAILERS FOR EARTH MOVING EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	8/1/2025	$42.92	$15.41	$20.17	$0.00	$0.00	$78.50
	12/1/2025	$42.92	$15.41	$21.78	$0.00	$0.00	$80.11
	6/1/2026	$43.92	$15.41	$21.78	$0.00	$0.00	$81.11
	8/1/2026	$43.92	$15.91	$21.78	$0.00	$0.00	$81.61

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
	12/1/2026	$43.92	$15.91	$23.52	$0.00	$0.00	$83.35
TUNNEL WORK - COMPRESSED AIR	6/1/2025	$59.43	$10.15	$9.50	$10.25	$0.00	$89.33
LABORERS	12/1/2025	$60.93	$10.15	$9.50	$10.25	$0.00	$90.83
LABORERS (COMPRESSED AIR)	6/1/2026	$62.48	$10.15	$9.50	$10.25	$0.00	$92.38
	12/1/2026	$63.98	$10.15	$9.50	$10.25	$0.00	$93.88
For apprentice rates see "Apprentice- LABORER"							
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE)	6/1/2025	$61.43	$10.15	$9.50	$10.25	$0.00	$91.33
LABORERS	12/1/2025	$62.93	$10.15	$9.50	$10.25	$0.00	$92.83
LABORERS (COMPRESSED AIR)	6/1/2026	$64.48	$10.15	$9.50	$10.25	$0.00	$94.38
	12/1/2026	$65.98	$10.15	$9.50	$10.25	$0.00	$95.88
For apprentice rates see "Apprentice- LABORER"							
TUNNEL WORK - FREE AIR	6/1/2025	$51.50	$10.15	$9.50	$10.25	$0.00	$81.40
LABORERS	12/1/2025	$53.00	$10.15	$9.50	$10.25	$0.00	$82.90
LABORERS (FREE AIR TUNNEL)	6/1/2026	$54.55	$10.15	$9.50	$10.25	$0.00	$84.45
	12/1/2026	$56.05	$10.15	$9.50	$10.25	$0.00	$85.95
For apprentice rates see "Apprentice- LABORER"							
TUNNEL WORK - FREE AIR (HAZ. WASTE)	6/1/2025	$53.50	$10.15	$9.50	$10.25	$0.00	$83.40
LABORERS	12/1/2025	$55.00	$10.15	$9.50	$10.25	$0.00	$84.90
LABORERS (FREE AIR TUNNEL)	6/1/2026	$56.55	$10.15	$9.50	$10.25	$0.00	$86.45
	12/1/2026	$58.05	$10.15	$9.50	$10.25	$0.00	$87.95
For apprentice rates see "Apprentice- LABORER"							
VAC-HAUL	8/1/2025	$42.34	$15.41	$20.17	$0.00	$0.00	$77.92
TEAMSTERS JOINT COUNCIL NO. 10	12/1/2025	$42.34	$15.41	$21.78	$0.00	$0.00	$79.53
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	6/1/2026	$43.34	$15.41	$21.78	$0.00	$0.00	$80.53
	8/1/2026	$43.34	$15.91	$21.78	$0.00	$0.00	$81.03
	12/1/2026	$43.34	$15.91	$23.52	$0.00	$0.00	$82.77
WAGON DRILL OPERATOR	6/1/2025	$40.09	$10.15	$9.50	$9.11	$0.00	$68.85
LABORERS	12/1/2025	$41.47	$10.15	$9.50	$9.11	$0.00	$70.23
LABORERS - ZONE 2	6/1/2026	$42.91	$10.15	$9.50	$9.11	$0.00	$71.67
	12/1/2026	$44.35	$10.15	$9.50	$9.11	$0.00	$73.11
	6/1/2027	$45.80	$10.15	$9.50	$9.11	$0.00	$74.56
	12/1/2027	$47.25	$10.15	$9.50	$9.11	$0.00	$76.01
	6/1/2028	$48.75	$10.15	$9.50	$9.11	$0.00	$77.51
	12/1/2028	$50.25	$10.15	$9.50	$9.11	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"							
WAGON DRILL OPERATOR (HEAVY & HIGHWAY)	6/1/2025	$40.09	$10.15	$9.50	$9.21	$0.00	$68.95
LABORERS	12/1/2025	$41.47	$10.15	$9.50	$9.21	$0.00	$70.33
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	6/1/2026	$42.91	$10.15	$9.50	$9.21	$0.00	$71.77
	12/1/2026	$44.35	$10.15	$9.50	$9.21	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"							
WASTE WATER PUMP OPERATOR	6/1/2025	$58.33	$15.55	$13.25	$3.25	$0.00	$90.38
OPERATING ENGINEERS LOCAL 4	12/1/2025	$59.78	$15.55	$13.25	$3.25	$0.00	$91.83

Construction

Classification	Effective Date	Base Wage	Health	Pension	Annuity	Supplemental Unemployment	Total Rate
OPERATING ENGINEERS LOCAL 4	6/1/2026	$61.08	$15.55	$13.25	$3.25	$0.00	$93.13
	12/1/2026	$62.53	$15.55	$13.25	$3.25	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"							
WATER METER INSTALLER PLUMBERS & GASFITTERS LOCAL 12 PLUMBERS & GASFITTERS LOCAL 12	3/2/2025	$69.84	$14.32	$12.31	$8.00	$0.00	$104.47
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"							

Additional Apprentice Information

All apprentices must be registered with the Division of Apprenticeship Training(DAS) in accordance with M.G.L.c. 23, §§ 11E-11L. Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the hourly prevailing wage rate established by the Commissioner under the provisions of M.G.L.c. 149, §§ 26-27D.

Apprentice ratios are established by DAS pursuant to M.G.L.c. 23, §§ 11E-11L. Ratios are expressed as the allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified. The ratios listed herein have been taken from relevant private collective bargaining agreements(CBAs) and are provided for illustrative purposes only. They have not been independently verified as being accurate or continuing to be accurate.

Parties having questions regarding what ratio to use should contact DAS.