ADDENDUM NOTES AND MODIFICATIONS TO THE
TOWN OF BLOOMING GROVE
SPECIFICATIONS
IN CONJUNCTION WITH THE CONTRACT DOCUMENTS
FOR THE
CONTRACT NO. 2G, 2E – ENTRY PORCH, DECK,
AND SITEWORK
LASSER PARK SENIOR CENTER
ADDENDUM NO. 1
SEPTEMBER 18, 2023

Addendum No. 1 consisting of three (3) pages is hereby made part of the Contract Documents. Please note the following changes to the Contract Documents, submit bids and be otherwise governed accordingly. The attachment consists of eighty-four (84) pages.

All page numbers noted are referenced to the project specification book unless otherwise noted.

Acknowledgement or receipt of this addendum must be made by email acknowledgement, and by signing the accompanying acknowledgement form and stapling to the submitted bid pages.

I. Revisions, Additions, and Clarifications to the Project Manual

A. Bid Form; **DELETE** Bid Form Page B-1 through B-15 and **SUBSTITUTE THEREFOR** Bid Form B-1 through B-15 provided herein.

B. Bid Form; **CLARIFICATION** Item ALT-2 "Credit Deduct for not having to construct 8'0" wide walkway along side and rear of building (to be subtracted from base bid)". The limits for ALT-2 are from the connection to the concrete handicapped landing along the southside of the building to the southeast corner of the building (8.0' wide). Limits continue along the "rear" eastside of the building (6.0' wide) ending past FF rear entrance. The area is shown hatched on the Contract Drawings.

C. Bid Form Page B-1 through B-15 and **SUBSTITUTE THEREFOR** Bid Form B-1 through B-15 provided herein.

D. Technical Specification: **DELETE** Section 01150 "Measurement and Payment" and **SUBSTITUTE THEREFOR** Section 01150 "Measurement and Payment" provided herein.

E. Technical Specification; **ADD** Section 01650 "Testing and Startup" Specification to the Project Manual**.**

F. Attachment; **ADD** "Installation Instructions" Wall Mount Air Conditioner.

II. Revisions, Additions, and Clarifications to the Drawings

G. Reference: Drawing C1: **DELETE** Sheet C1 and **SUBSTITUTE THEREFOR** Sheet C1 provided herein.

H. Reference: Drawing C3: **DELETE** Sheet C3 and **SUBSTITUTE THEREFOR** Sheet C3 provided herein.

I. Reference Drawing C1; **CLARIFICATION** The Bollard Detail sketch is shown in the Project Manual, Appendix III "Orange and Rockland Utilities. See Page 1205 of PDF Project Manual Document, Figure 3, Sketch G.

J. Reference Drawing C1; **CLARIFICATION** See Detail A8/10 on Sheet A8 for thickness of the two concrete pads located on the eastside of the building.

**** END OF ADDENDUM No. 1 ****

ADDENDUM No.1

Contract No. 2 – Entry Porch, Deck and Sitework

September 18, 2023

Receipt Acknowledged

Bidders must acknowledge receipt of this addendum by stapling this page to the back of the Bid Sheet.

Bidder: _____
Legal Name or Person, Partnership, Joint Venture or Corporation

By:_____

Date:_____

Fax or scan copy of this receipt to Ms. Christine Bodecker, Town of Blooming Grove 845-496-1362 (fax). cbodecker@bloominggrove-ny.gov

NAME OF BIDDER

TELEPHONE NUMBER

EMAIL ADDRESS

BID

TOWN OF BLOOMING GROVE
CONTRACT 2G – GENERAL CONSTRUCTION
CONTRACT 2E – ELECTRICAL CONSTRUCTION
LASSER PARK SENIOR CENTER

1. The undersigned BIDDER warrants and represents, if awarded the Contract, that the work proposed herein will be substantially completed in accordance with Section 14 of the General Conditions within 90 consecutive calendar days after the date when the Contract Time commences to run as provided in Section 2 of the General Conditions, and finally completed and ready for final payment in accordance with Section 14 of the General Conditions within 120 consecutive calendar days after the date of Substantial Completion (Final Contract Time).

2. The undersigned and OWNER recognize that time is of the essence of the Agreement to be executed by the undersigned (if awarded the Contract) and that OWNER will suffer financial loss if the Work is not completed within the times specified in paragraph 1 above. The parties also recognize the delays, expense, and difficulties involved in proving in a legal proceeding the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and BIDDER agree that as liquidated damages for delay, but not as a penalty, BIDDER shall pay OWNER $1,500 for each consecutive calendar day that expires after the time specified in paragraph 1 above for Substantial Completion. If BIDDER shall neglect, refuse, or fail to complete the remaining Work within the Final Contract Time or any proper extension thereof granted by OWNER, BIDDER shall pay OWNER $1,500 for each consecutive calendar day that expires after the time specified in paragraph 1 above for Final Completion and readiness for final payment until the Work is completed and ready for final payment.

3. The undersigned BIDDER proposes and agrees, if awarded the Contract, to enter into an Agreement with OWNER in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

4. In submitting this Bid, BIDDER represents, as set forth in the Agreement, that:

   a. BIDDER has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda, receipt of all which is hereby acknowledged, but they agree that they are bound by all addenda whether or not listed herein.

Addendum No.	Addendum Date

b. BIDDER has visited the Site and become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, and performance of the Work.

c. BIDDER is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.

d. BIDDER has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in Section 4 of the General Conditions, and (2) reports and drawings of a Hazardous Environmental Condition, if any, which as been identified in the Supplementary Conditions as provided in Section 4 of the General Conditions.

e. BIDDER has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or of construction to be employed by the BIDDER, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by BIDDER, and safety precautions and programs incident thereto.

f. BIDDER does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.

g. BIDDER is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Bidding Documents.

h. BIDDER has correlated the information known to BIDDER, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.

i. BIDDER has given ENGINEER written notice of all conflicts, errors, ambiguities, or discrepancies that BIDDER has discovered in the Bidding Documents, and the written resolution thereof by ENGINEER is acceptable to BIDDER.

j. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

5. The undersigned further understands and agrees that they are to do, perform and complete all the work in accordance with the Contract Documents and to accept in full compensation therefor the following prices to wit:

BID SHEET

_____
Name of Bidder

TOWN OF BLOOMING GROVE
CONTRACT 2G – GENERAL CONSTRUCTION
LASSER PARK SENIOR CENTER

Lump Sum Bid Items					
Item	**Description**	**Unit of Measure**	**Estimated Quantity**	**Lump Sum Bid in Both Words and Figures**	**Total Price Bid in Figures**
1	Base Bid to furnish all labor, materials, equipment, and appurtenances to complete all work described in the Contract Documents excluding the value of work listed in other Bid Items 2 thru 6 and Alternates.	-	Lump Sum	_____ dollars and _____ cents $_____	$_____
2	All work associated with plumbing inclusive of the building. This work will include all equipment, and appurtenances to complete all plumbing work described in the Contract Documents excluding the value of work listed in other Bid Items.	-	Lump Sum	_____ dollars and _____ cents $_____	$_____
3	Furnish and install perimeter deck expansion to 15'0" wide as shown on the Contract Documents.	--	Lump Sum	_____ dollars and zero _____ cents _____	$_____
4	Furnish and install entry sidewalk, handicapped ramp and rear concrete walks (typ. for 2) as shown on the Contract Documents.	--	Lump Sum	_____ dollars and zero _____ cents _____	$_____
5	Furnish and install concrete porch and its foundation as shown on the Contract Documents.	--	Lump Sum	_____ dollars and zero _____ cents _____	$_____
Allowances					
6	Allowance for providing miscellaneous additional work at the site as directed by the Owner.	--	Lump Sum	Twenty-five-thousand dollars and zero _____ cents $25,000.00 _____	$25,000.00

BID SHEET

_____
Name of Bidder

TOWN OF BLOOMING GROVE
CONTRACT 2G – GENERAL CONSTRUCTION
LASSER PARK SENIOR CENTER

Lump Sum Bid Items					
Item	**Description**	**Unit of Measure**	**Estimated Quantity**	**Lump Sum Bid in Both Words and Figures**	**Total Price Bid in Figures**
ALT-1	Furnish and install extension of deck the full limits of the back of the building as shown on the Contract Drawings	--	Lump Sum	_____ dollars and _____ cents $_____	$_____
ALT 2	Credit Deduct for not having to construct 8'0" wide walkway along side and rear of building (to be subtracted from base bid).	-	Lump Sum	_____ dollars and _____ cents $_____	$_____
ALT 3	Furnish and Install stamped Concrete on Porch as shown on the Contract Drawings and Specification Section 03353.	-	Lump Sum	_____ dollars and _____ cents $_____	$_____

*For total price of unit price bid items multiply estimated quantity by unit price

BID SHEET

_____
Name of Bidder

TOWN OF BLOOMING GROVE
CONTRACT 2G – GENERAL CONSTRUCTION
LASSER PARK SENIOR CENTER

TOTAL AMOUNT OF BID – Items 1 through 6:

IN FIGURES $_____

IN WORDS _____

The bid price of each item on the form must be stated in words and numerals. Where the price in figures differs from the price in words, the price in words will take precedence and be accepted as the amount bid and individual and extended amounts computed and adjusted accordingly.

Bidders shall submit a Bid on a unit price basis for each item of work listed in the unit price section of the Bid Form. FAILURE TO ADHERE TO THIS UNIT PRICE PROTOCOL WILL BE DEEMED A MATERIAL DEFECT AND RESULT IN REJECTION OF THE BID AS NON-RESPONSIVE.

If a discrepancy exists in any bid between Bidder entered unit prices and extended totals, the Bidder entered unit prices shall govern. The total of the products of the estimated quantity of each item and the Bidder entered Unit Price Bid for that item will be adjusted accordingly by the District.

In either of the above cases, the extended totals of each item, and the total of all extensions, after correction by the District if necessary, after correction will be the TOTAL AMOUNT OF BID.

For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and Bidder entered unit price Bid for that item, together with any lump sum items that have been corrected and adjusted by the District.

The OWNER shall award the project based on the best interests of the project taking into consideration total cost and schedule to completion.

Estimated quantities, where given, are approximate and are for the purpose of evaluating the proposals only. Bidders are advised that the estimates of the quantities of the various items of work and materials as set forth in the proposal form are approximate only and are given solely to be used as a uniform basis for the comparison of bids. The quantities actually required to complete the contract and work may be less or more than so estimated, and, if so, no action for damages or for loss of overhead or profits shall accrue to the Contractor by reason thereof.

The OWNER reserves the right to omit or add to the construction or any portion or portions of the work heretofore enumerated or shown on the plans without forfeiture of Contract or claims for loss of anticipated overhead or profits, or any other claims by the BIDDER on account of such omissions or additions.

BID SHEET

_____
Name of Bidder

TOWN OF BLOOMING GROVE
CONTRACT 2G – GENERAL CONSTRUCTION
LASSER PARK SENIOR CENTER

6. The BIDDER proposes to use the following equipment vendors for the following principal items of equipment to be used in the Work, to wit:

Bid Item	Item	Ref. to Specification	Equipment Vendor's Name and Address
1	Concrete Subcontractor		
2	Carpentry Subcontractor		
3	Licensed Plumbing Contractor		

BID SHEET

_____
Name of Bidder

TOWN OF BLOOMING GROVE
CONTRACT 2E – ELECTRICAL CONSTRUCTION
LASSER PARK SENIOR CENTER – FY2022 GRANT NUMBER: B-22-UC-36-0105

Lump Sum Bid Items					
Item	**Description**	**Unit of Measure**	**Estimated Quantity**	**Lump Sum Bid in Both Words and Figures**	**Total Price Bid in Figures**
1	Base Bid to furnish all labor, materials, equipment, and appurtenances to complete all work described in the Contract Documents.	-	Lump Sum	_____ dollars and _____ cents $_____	$_____
Allowances					
2	Allowance for providing miscellaneous additional work at the site as directed by the Owner	--	Lump Sum	Fifteen-thousand dollars and zero cents $15,000.00	$15,000.00

TOTAL AMOUNT OF BID – Items 1 through 2:

IN FIGURES $_____

IN WORDS _____

The bid price of each item on the form must be stated in words and numerals. Where the price in figures differs from the price in words, the price in words will take precedence and be accepted as the amount bid and individual and extended amounts computed and adjusted accordingly.

Bidders shall submit a Bid on a unit price basis for each item of work listed in the unit price section of the Bid Form. FAILURE TO ADHERE TO THIS UNIT PRICE PROTOCOL WILL BE DEEMED A MATERIAL DEFECT AND RESULT IN REJECTION OF THE BID AS NON-RESPONSIVE.

If a discrepancy exists in any bid between Bidder entered unit prices and extended totals, the Bidder entered unit prices shall govern. The total of the products of the estimated quantity of each item and the Bidder entered Unit Price Bid for that item will be adjusted accordingly by the District.

In either of the above cases, the extended totals of each item, and the total of all extensions, after correction by the District if necessary, after correction will be the TOTAL AMOUNT OF BID.

BID SHEET

_____
Name of Bidder

TOWN OF BLOOMING GROVE
CONTRACT 2E – ELECTRICAL CONSTRUCTION
LASSER PARK SENIOR CENTER – FY2022 GRANT NUMBER: B-22-UC-36-0105

For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and Bidder entered unit price Bid for that item, together with any lump sum items that have been corrected and adjusted by the District.

The OWNER shall award the project based on the best interests of the project taking into consideration total cost and schedule to completion.

Estimated quantities, where given, are approximate and are for the purpose of evaluating the proposals only. Bidders are advised that the estimates of the quantities of the various items of work and materials as set forth in the proposal form are approximate only and are given solely to be used as a uniform basis for the comparison of bids. The quantities actually required to complete the contract and work may be less or more than so estimated, and, if so, no action for damages or for loss of overhead or profits shall accrue to the Contractor by reason thereof.

The OWNER reserves the right to omit or add to the construction or any portion or portions of the work heretofore enumerated or shown on the plans without forfeiture of Contract or claims for loss of anticipated overhead or profits, or any other claims by the BIDDER on account of such omissions or additions.

6. The BIDDER proposes to use the following equipment vendors for the following principal items of equipment to be used in the Work, to wit:

Bid Item	**Item**	**Ref. to Specification**	**Equipment Vendor's Name and Address**
1	Excavation Subcontractor		_____
2	Electrical Service and Distribution Gear Manufacturer		_____

7. By submission of this Bid, the BIDDER and each person signing on behalf of any BIDDER certifies, and in the case of a joint Bid each party thereto certifies as to its own organization, under penalty or perjury, that to the best of knowledge and belief:

7. By submission of this Bid, the BIDDER and each person signing on behalf of any BIDDER certifies, and in the case of a joint Bid each party thereto certifies as to its own organization, under penalty or perjury, that to the best of knowledge and belief:

a. The prices in this Bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other BIDDER or with any competitor, and BIDDER has not sought by collusion to obtain for itself any advantage over any other BIDDER or over OWNER; and

b. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; and

c. Unless otherwise required by law, the prices which have been quoted in this Bid have not been knowingly disclosed by the BIDDER and will not knowingly be disclosed by the BIDDER prior to opening, directly or indirectly, to any other BIDDER or to any competitor; and

d. No attempt has been made or will be made by the BIDDER, directly or indirectly, to induce any other individual or entity to submit or not to submit a Bid, or to submit a false or sham bid, for the purpose of restricting competition.

8. The undersigned submits herewith Bid Security in the amount of $____. In case this Bid is accepted by the OWNER, and the undersigned shall refuse or neglect, within fifteen (15) days after date of receipt of Notice of Award, to execute and deliver the Agreement in the form provided herein, or to execute and deliver a performance bond and a labor and material payment bond in the amounts required and in the form prescribed, the amount of Bid Security shall be forfeited and will be retained by the OWNER as liquidated damages, otherwise the total amount of the Bid Security will be returned to the depositor in accordance with provisions set forth in the Instructions to BIDDERS.

9. The undersigned acknowledges that a performance bond and a labor and material payment bond will be required of the BIDDER to whom the OWNER proposes to award the Contract. The undersigned agrees that if they are designated the apparent successful BIDDER and is issued a Notice of Award, simultaneously with delivery of the executed counterparts of the Agreement, they shall furnish to the OWNER such bonds equal to one hundred percent of the amount of the contract, conditioned for the faithful performance of all terms, covenants and conditions of same, with a surety company authorized to do business in the State of New York, as surety and named in the current list of "Companies Holding Certificates of Authority as Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury.

10. The undersigned submits herewith the Iranian Investment Activities Certification in compliance with General Municipal Law 103-g, Iranian Energy Sector Divestment.

11. The undersigned submits herewith the Certification of Compliance with New York State Labor Law Section Two Hundred One-G, Prevention of Sexual Harassment.

Dated _____, 20____

_____
Legal Name of Corporation

(If Corporation, affix
Corporation seal)

By _____
Name and Title of Signatory

THE P.O. ADDRESS OF THE BIDDER

_____ Street

_____ City and State

_____ FEIN Number

IF A CORPORATION

Name		Address
_____	President	_____
_____	Secretary	_____
_____	Treasurer	_____

IF A PARTNERSHIP

Names of Partners	Address
_____	_____
_____	_____
_____	_____

IF A JOINT VENTURE

Names of Members	Address
_____	_____
_____	_____
_____	_____

IF AN INDIVIDUAL

Name of Individual	Address
_____	_____
_____	_____

ACKNOWLEDGMENT OF BIDDER, IF A CORPORATION

STATE OF _____)
COUNTY OF _____) SS:

On this _____ day of _____ before me personally came and appeared _____ to me known, who being by me duly sworn did depose and say that they resides at _____ that they is the _____ of _____ the corporation described in and which executed the foregoing Bid; that they knows the seal of said corporation, that one of the impressions affixed to said instrument is an impression of such seal; that it was so affixed by order of the directors of said corporation; and that they signed his name thereto by like order.

SEAL _____

_____

ACKNOWLEDGMENT OF BIDDER, IF A PARTNERSHIP

STATE OF _____)
COUNTY OF _____) SS:

On this _____ day of _____ before me personally came and appeared _____ to me known and known to me to be one of the members of the firm of _____ described in and who executed the foregoing Bid and they acknowledged to me that they executed the same as for the act and deed of said firm.

SEAL _____

_____

ACKNOWLEDGMENT OF BIDDER, IF AN INDIVIDUAL

STATE OF _____)
COUNTY OF _____) SS:

On this _____ day of _____ before me personally came and appeared _____ to me known and known to me to be the person described in and who executed the foregoing Bid and acknowledged that they executed the same.

SEAL _____

_____

CERTIFICATION OF COMPLIANCE WITH
NEW YORK STATE LABOR LAW SECTION TWO HUNDRED ONE-G

(To be completed by the Bidder and submitted with the bid)

By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all of its employees. Such policy shall, at a minimum, meet the requirements of Section Two Hundred One-G of the New York State Labor Law.

CONTRACTOR: _____
(print)

Name: _____
(print)

Title: _____
(print)

By: _____
(signature)

Date: _____

QUALIFICATIONS OF BIDDERS

(To be completed by bidder)

Name and address of bidder: _____

_____

List of Projects completed within the last 3 years.

For Whom Performed	Amount of Contract	Date Completed

List of at least (5) Relevant Projects completed within the last 5 years. This includes building construction and site work of a similar size and magnitude as the proposed project. At a minimum include the following for each project: the client's name, the project name, a general scope of work, the amount of the contract and when completed. Also provide a contact name and phone number for each project listed. Attach additional pages as necessary. (**General Contract Only)**

List of at least (5) Relevant Projects completed for public or private water supply or wastewater utilities within the last 5 years. At a minimum include the following for each project: the client's name, the project name, a general scope of work, the amount of the contract and when completed. Also provide a contact name and phone number for each project listed. Attach additional pages as necessary. (**Electrical and Plumbing Contracts Only)**

Bidders will answer the following questions:

1. Have you submitted the low bid, but not awarded a contract within the past 5 years? ___

2. Have you ever failed to complete any work awarded to you or are you involved in litigation on any work? If yes, state where and why:

_____

_____

_____

3. Has any officer or partner of your organization ever been an officer or partner of some other organization that failed to complete a construction contract? _____ If yes, state name of individual, other organization and reason therefore:

_____

_____

_____

4. The work, if awarded to you, will have the personal supervision of whom? _____

_____

5. Do you have, or can you obtain, sufficient men and equipment to commence work when required and complete the work within the time allotted?

_____

_____

6. What Orange County units of government can you give as references?

_____

_____

_____

7. In emergencies, either day or night, what telephone or telephones should be called for immediate action?

Day _____

_____

Night _____

_____

8. With the submission of the bid, the Bidder shall identify all work under the contract that may require licensure by the Town of North Hempstead. The Bidder shall provide the appropriate proof of licensure by the Bidder or an appropriately licensed subcontractor for the associated work. Failure to identify any item of work which may require licensure does not preclude the Bidder from complying with the requirements during construction.

9. With the submission of the bid, the Bidder agrees that within five (5) days of OWNER's request, the bidder shall submit statements providing the following information:

a. A current detailed financial statement showing assets, liabilities and net worth.

b. A list of officers and principals of the bidder, and a list of all subsidiary or affiliated companies in which the bidder's principals have any financial interest.

c. A list of the number of full-time personnel of the bidder and a description of the construction experience of the bidder's principals and supervisory personnel.

d. Statements of the bidder's net total billings and average backlogs of uncompleted work on outstanding contracts for each of the previous three fiscal years.

Dated at: _____ this _____ day of _____, 20__.

_____
Name of Bidder

By: _____

_____
Title of Person Signing

SECTION 01150

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section describes the methods by which measurement will be made for quantities for which payment will be made for the project. It is the intention of this Specification that Payment will be made for those items listed in the Bid Sheet only. All items of work not specifically listed in the Bid Sheet shall be included in the various items listed in the Bid Sheet.

1.2 PAYMENT

A. There is no payment provision for this Section.

B. Payments to Contractor: Refer to Contract, General Conditions and Supplementary Conditions.

1.3 ESTIMATE OF QUANTITIES

A. The estimated quantities for the lump sum and select unit bid prices, as listed in the Bid Sheet, are approximate only and are included solely for the purpose of comparison of Bids. The Owner does not expressly or by implication agree that the nature of the materials encountered below the surface of the ground or the actual quantities of material encountered or required will correspond therewith and reserves the right to increase or decrease any quantity or to eliminate any quantity as the Owner may deem necessary. Contractor will not be entitled to any adjustment in a lump sum and select unit bid price as a result of any change in an estimated quantity and agrees to accept the aforesaid lump sum and select unit bid prices as complete and total compensation for any additions or deductions caused by a variation in quantities as a result of more accurate measurement, or by any changes or alterations in the Work approved by the Owner, and for use in the computation of the value of the Work performed for Partial Payments.

1.4 LUMP SUM

A. Payment under Lump Sum Contract Items included in the Bid Sheet will constitute full compensation for all labor, equipment and materials required to complete all Work under that item in accordance with the project manual, specifications, permits, local or state laws or regulations and a safe and workmanlike manner.

1.5 UNIT PRICE ITEMS

A. For any unit price item, the Contractor will be paid at the unit price bid for any quantity up to one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid sheets. If during the progress of the Work, the actual quantity of any unit price item, not included in other items required to complete the Work approaches the estimated quantity for that item, and for any reason it appears that the actual quantity of any unit price item necessary to complete the Work will exceed the estimated quantity for that item by twenty five (25%) percent, the Contractor shall immediately notify the Owner of such anticipated overrun. The Contractor shall not be compensated for any quantity of a unit price item provided which is in excess of one hundred twenty-five (125%) percent of the estimated quantity for that item set forth in the bid sheets without written authorization from the Owner.

B. If the actual quantity of any unit price item necessary to complete the Work will exceed one hundred twenty (125%) percent of the estimated quantity for that item set forth in the bid sheets, the Owner reserves the right and the Contractor agrees to negotiate a new until unit price for such item in accordance with the change order provisions of this Contract. In no event shall such negotiated new price exceed the unit bid price. If the Owner and the Contractor cannot agree on a new price, then the Contractor shall provide additional quantities of the item on a time and materials basis at the direction of the Owner for the actual and reasonable cost, but in no event at a unit price exceeding the unit price bid.

1.6 ALTERNATE BID ITEMS

A. There are three Alternate Bid Item under this Contract. These items will be bid as Lump sum. The Owner will have

choice to include these items in the contract or have them removed.

B. Alternate No.1 includes expanding the 15’-0” wide decking system from the limits shown in the base bid to the north wall of the building along with all substructure, decking, foundations, railings, and supports as shown and specified.

C. Alternate No. 2 includes a credit deduct to be applied to the Base Bid for 8’-0” wide decking walkway along the south side of the building and the 6.0’ wide walkway along the east side of the building Limits of this are shown on the Contract Drawings. Work for this alternate should include all additional materials and labor for this deck extension included within the base bid decking limits.

D. Alternate No 3 includes the costs associated with the labor, materials, equipment to apply stamped concrete to the front porch in compliance with Section 03353 in lieu of the base bid.

1.7 ALLOWANCES

A. Allowances are included in each Prime Contract in Compliance with Specification Section 01020.

B. Allowances will be paid:

1. That amount substantiated by invoices from the supplier of equipment, materials or services selected and ordered in writing by the Owner plus Contractor’s Labor based on Prevailing Wage Rate Classifications and Contractor’s overhead and profit for Miscellaneous Work.

1.8 CONTRACT – LASSER PARK SENIOR CENTER – CONTRACT 1

A. The items listed within this section, refer to and are the same pay items listed in the Bid Sheet. They constitute all of the pay items for the completion of the Work. No direct or separate payment will be made for work included, or required to complete the work as shown or called for in the Contract Documents, including, Drawings, Specifications or as directed to complete the work project manual, specifications, permits, local or

state laws or regulations, a safe and workmanlike manner and all other requirements of the Contract, General and Supplementary Conditions. Compensation for all such services, things and materials shall be included in the prices stipulated.

1.9 DAMAGES BY CONTRACTOR

A. No payments shall be made for reparation of damages caused by Contractor.

B. No Payments will be made for work completed by the Contractor for their own convenience.

1.10 CONTRACTOR PAY REQUISITIONS

A. The Contractor shall submit monthly payment requisitions, prepared as directed by the Engineer. A maximum of one payment requisition shall be submitted each month.

B. Monthly Requisitions shall be presented in triplicate and collated and shall include, at a minimum:

1. Owners Invoice or Voucher, if required

2. Contractors Payment Request on EJCDC Forms

3. All Certified Payroll reports

4. All required Labor Law Documentation

5. Updated Project Schedule

6. Updated Coordination Drawings

7. Partial Waiver and Release of Liens

8. Updated Utilization Plans, if necessary.

9. Other information as required.

C. The Contractor may, at the approval of the Engineer, submit payment for unit cost items based upon agreed upon estimated amounts each month prior to completion of as built surveys.

D. No Partial Payments will be made for materials stored off site.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 LUMP SUM BASE BID ITEM #1 - All work described in the contract documents except for the work described in Bid Item 2-4, and alternates.

A. Measurement

1. Measurement for this lump sum item which payment shall be made shall include the cost of all materials, equipment, labor, submittals, testing and all incidental work thereto, not covered by other items, as described in the Drawings, Specifications and as directed in an acceptable manner and to complete all work, not covered by other items, in accordance with the Contract Documents consisting of Technical Specifications and Contract Drawings , permits and as required by local or state law or regulation., as described in the Documents and as directed in an acceptable manner and to complete all work, not covered by other items, in accordance with the Contract Documents, System Manufacturer's recommendations and instructions, permits and as required by local or state law or regulation.

B. Payment

1. Under this item, the Contractor shall provide the necessary costs associated with labor, equipment, materials, not attributable to a specific pay item, including, but not necessarily limited to, providing all administration, supervision, coordination, scheduling, temporary systems, submittals, photographic documentation, procurement, furnishing, installing, transporting, managing, permitting, handling, completing the work, and necessary closeout of the contract including any warrantees and guarantees and incidental items not covered by other items, etc.

This item shall also include, but not necessarily be limited to, the mobilization and demobilization of the Contractor and all Subcontractors' work forces, supplies, equipment, and incidentals at the project site and other preconstruction costs incurred after award of the contract which are necessary costs to the project and are of a general nature rather than directly attributable to other pay items. Such materials as required for mobilization and that are not to be part of the completed contract shall be as determined by the Contractor, except that they shall conform to any pertinent local or State Law, regulation or code. The work site is defined in the contract documents as a definite location within the project limits. Payment shall also include restoration to pre-construction condition or better and all associated labor, materials and equipment. The work required shall be completed in a safe and workman like manner and shall conform with any pertinent local or State law, regulation or code. Good housekeeping consistent with safety shall be maintained.

2. Payment for this item will be made at the applicable lump sum price stated on the Bid Sheet on which this Agreement is based and shall include the cost of all the several detailed operations incidental to the completion of the work, not included in other unit or lump sum price items. Such payment in conjunction with all the other items is considered full compensation for all labor, material, equipment, and all other items necessary and incidental to the completion of the work and no separate payment will be made therefor.

3.2 LUMP SUM BID ITEM #2 - All plumbing work as described in the contract documents except for the work described in item 1,3, and 4. This includes the installation of all of the domestic hot and cold water supply lines and connections, and building sanitary drains and connections to the onsite SSDS including the furnishing and installing of the pumps and hot water heater and the interconnecting piping. The two storage tanks and hydropneumatics tanks shall be furnished by the Town to be installed complete as shown and specified within the contract documents. Connections shall be complete for the intended purpose.

A. Measurement

1. Measurement for this lump sum item which payment shall be made shall include the cost of all materials, equipment, labor, submittals, testing and all incidental work thereto, not covered by other items, as described in the Drawings, Specifications and as directed in an acceptable manner and to complete all work, not covered by other items, in accordance with the Contract Documents consisting of Technical Specifications and Contract Drawings , permits and as required by local or state law or regulation., as described in the Documents and as directed in an acceptable manner and to complete all work, not covered by other items, in accordance with the Contract Documents, System Manufacturer's recommendations and instructions, permits and as required by local or state law or regulation.

B. Payment

1. Under this item, the Contractor shall provide the necessary costs associated with labor, equipment, materials, not attributable to a specific pay item, including, but not necessarily limited to, furnishing, installing, transporting, managing, permitting, handling, completing the work, associated with work outlined on the contract plumbing drawings, and incidental items not covered by other items, etc.

2. Payment for this item will be made at the applicable lump sum price stated on the Bid Sheet on which this Agreement is based and shall include the cost of all the several detailed operations incidental to the completion of the work, not included in other unit or lump sum price items. Such payment in conjunction with all the other items is considered full compensation for all labor, material, equipment, and all other items necessary and incidental to the completion of the work and no separate payment will be made therefor.

3.3 LUMP SUM BID ITEM #3 – Furnish and install perimeter deck expansion from 6'0" wide along the east side of the building to 15'-0" wide as shown in the contract documents.

A. Measurement

1. Measurement for this unit price item which payment will be made for the extension of perimeter deck to 15’ wide, installed, and shall include the cost of providing all materials, equipment, labor, submittals, testing, managing, water disposal, and all work incidental as described in the Drawings, Specifications and as directed in an acceptable manner.

B. Payment

1. The basis for payment made under General Construction Item No. 3, will be the completion of the deck expansion.

3.4 LUMP SUM BID ITEM #4 – Furnish and install the front concrete sidewalk, handicapped ramp and the two rear concrete entrance walks.

C. Measurement

1. Measurement for this unit price item which payment will be made for the construction of the front concrete walk, handicapped ramp and two rear concrete entrance walks, installed, and shall include the cost of providing all materials, equipment, labor, submittals, testing, managing, water disposal, and all work incidental as described in the Drawings, Specifications and as directed in an acceptable manner.

D. Payment

1. The basis for payment made under General Construction Item No. 4, will be the completion of the concrete walks and ramps.

3.5 LUMP SUM BID ITEM #5 – Furnish and install the concrete porch deck and its foundation as shown in the contract documents.

E. Measurement

1. Measurement for this unit price item which payment will be made for the construction of the concrete

porch deck and its foundation, installed, and shall include the cost of providing all materials, equipment, labor, submittals, testing, managing, water disposal, and all work incidental as described in the Drawings, Specifications and as directed in an acceptable manner.

F. Payment

1. The basis for payment made under General Construction Item No. 5, will be the completion of the concrete porch deck and foundation.

3.6 LUMP SUM BID ITEM #6 – Allowance for providing miscellaneous additional work at the site as directed by the Owner and shall be paid as indicated in Section 01020 entitled Allowances.

3.7 ALTERNATE BID ITEM #1

A. Alternate No.1 includes expansion of the decking system to the north side of the building consisting of the full 25’-0”width above and beyond those shown in the base bid and included in bid item #3 to the end of the northeast corner of the building corner. Limits of this extension are shown on the Contract Drawings. Work for this alternate should include all additional materials and labor for this deck extension exclusive of the base bid decking limits.

3.8 ALTERNATE BID ITEM #2

A. Alternate No.2 includes a deduct amount for not having to install the 8’0” wide decking walkway along the southern side of the building from the concrete ramp to the 6’-0” wide walkway and substructure included in the base bid as specified and shown in the contract documents. Should this credit be obtained it shall include all costs associated with the decking and support foundations.

3.9 ALTERNATE BID ITEM #3

A. Alternate No. 3 includes all labor, materials, tools and equipment for the application of stamped concrete to the front porch of the building with limits as shown on the

contract documents in accordance with Specification Section 03353.

3.10 ELECTRICAL CONSTRUCTION UNIT BID ITEM #1 - All work described in the contract documents.

A. Measurement

1. Measurement for this lump sum item which payment shall be made shall include the cost of all materials, equipment, labor, submittals, testing and all incidental work thereto, not covered by other items, as described in the Drawings, Specifications and as directed in an acceptable manner and to complete all work, not covered by other items, in accordance with the Contract Documents consisting of Technical Specifications and Contract Drawings , permits and as required by local or state law or regulation., as described in the Documents and as directed in an acceptable manner and to complete all work, not covered by other items, in accordance with the Contract Documents, System Manufacturer's recommendations and instructions, permits and as required by local or state law or regulation.

B. Payment

1. Under this item, the Contractor shall provide the necessary costs associated with labor, equipment, materials, not attributable to a specific pay item, including, but not necessarily limited to, providing all administration, supervision, coordination, scheduling, temporary systems, submittals, procurement, furnishing, installing, transporting, managing, permitting, handling, completing the work, and necessary closeout of the contract including any warrantees and guarantees and incidental items not covered by other items, etc.

   This item shall also include, but not necessarily be limited to, the mobilization and demobilization of the Contractor and all Subcontractors' work forces, supplies, equipment, and incidentals at the project site and other preconstruction costs incurred after award of the contract which are

necessary costs to the project and are of a general nature rather than directly attributable to other pay items. Such materials as required for mobilization and that are not to be part of the completed contract shall be as determined by the Contractor, except that they shall conform to any pertinent local or State Law, regulation or code. The work site is defined in the contract documents as a definite location within the project limits. Payment shall also include restoration to preconstruction condition or better and all associated labor, materials and equipment. The work required shall be completed in a safe and workman like manner and shall conform with any pertinent local or State law, regulation or code. Good housekeeping consistent with safety shall be maintained.

2. Payment for this item will be made at the applicable lump sum price stated on the Bid Sheet on which this Agreement is based and shall include the cost of all the several detailed operations incidental to the completion of the work, not included in other unit or lump sum price items. Such payment in conjunction with all the other items is considered full compensation for all labor, material, equipment, and all other items necessary and incidental to the completion of the work and no separate payment will be made therefor.

3.9 ELECTRICAL CONSTRUCTION – ALLOWANCE BID ITEM #2 – Allowance for miscellaneous additional work as directed by the owner to be paid in accordance with Section 01020 entitled Allowances.

+ + END OF SECTION +

NO TEXT ON THIS PAGE

SECTION 01650

TESTING AND STARTING OF SYSTEMS

PART 1 – GENERAL

1.1 GENERAL

A. Each Contractor shall, after final inspection, submit written test procedures and the scheduled dates for the preliminary and final field testing of equipment to the Engineer for approval. The proposed procedures shall specify the duration and the parameter of the tests. Field testing of equipment shall conform to the requirements of the Manufacturer’s recommendations, Technical Specifications and as hereinafter specified.

B. Each Contractor shall initially startup and place all equipment installed into successful operation according to manufacturers' written instructions and as instructed by manufacturers' field representatives. Provide all material, labor, tools, equipment, and expendables required.

C. Each Contractor shall place all equipment and accessories installed by them into successful operation and test it to ensure full compliance with the specifications. Each piece of equipment shall pass a two-phase test - a preliminary and a final field test. The Contractor shall provide all material, labor, tools, instruments, and expendables required for the tests.

D. The Contractor shall furnish the services of factory trained representatives of equipment manufacturers to assist in the start-up and testing of equipment where specified in the technical specifications or requested by the Engineer.

E. The Contractor shall activate the necessary circuits in the influent building electrical system for all tests requiring electrical power.

F. General Activities Include:

1. Cleaning.

2. Removing temporary protective coatings.

3. Flushing and replacing greases and lubricants, where required by manufacturer.

4. Lubrication.

5. Check shaft and coupling alignments and reset where needed.

6. Check and set motor, pump and other equipment rotation, safety interlocks, and belt tensions.

7. Check and correct if necessary leveling plates, grout, bearing plates, anchor bolts, fasteners, and alignment of piping which may put stress on pumping equipment connected to it.

8. All adjustments required.

G. Provide initial filling of lubricants and all other required operating fluids.

H. Also provide filters, chemicals, and other expendables required for initial startup of equipment unless otherwise specified.

1.2 SUBMITTALS

A. Preliminary and Final Field Tests:

1. The Contractor shall submit written test procedures and the scheduled dates for the preliminary and final field testing of equipment to the Engineer for approval. The proposed procedures shall specify the duration and the parameters of the tests.

1.3 FIELD TESTING OF EQUIPMENT

A. General:

1. Field testing of equipment shall conform to the requirements of the General Conditions, the Technical Specifications and as hereinafter specified.

B. Hydrostatic Testing:

1. Water, air pipes, valves and any other essential components which are part of the tested system shall be tested in accordance with the specification for Pressure and Leakage Testing. Test duration shall be long enough to determine if there are any leaks. Any obvious leaks or ruptured piping disclosed by the tests should be repaired or replaced, and the test shall be repeated until the Engineer and/or Owner is satisfied.

2. The Contractor shall accomplish the required tests on the pipeline by individually testing each component section line designated by the Engineer. After successful completion of the test, the Contractor shall remove all liquid from the pipe system by draining and/or blowing and immediately clean any soiled areas resulting. The lines may then be connected to the system for additional flushing, disinfection and testing specified elsewhere in these documents.

3. Gravity systems shall be tested at maximum static head of for a 24-hour duration.

C. Preliminary Field Tests, Yellow Tag:

1. As soon as conditions permit, after the equipment has been secured in its permanent position, the Contractor shall check the equipment for alignment, direction of rotation and absence of defects.

2. Purpose of tests is to determine if equipment:

   a. Is properly installed.

   b. Is operational and free from overheating, overloading, vibration or other operating problems.
   c. Is completely ready for operation.

3. Contractor shall furnish all labor, materials, instruments, incidentals and expendables required.

4. The Contractor shall clean the equipment and remove all temporary coating.

5. The Contractor shall flush all bearings, gear housing, etc., in accordance with the manufacturer's recommendations, and remove any foreign matter accumulated during shipment, storage or erection.

6. The Contractor shall comply with the following additional procedures prior to start-up of equipment.

    a. Bearings and Shafting:

        1) Inspect for cleanliness, clean and remove foreign materials.

        2) Verify alignment.

        3) Replace defective bearings, and those which run rough or noisy.

        4) Lubricate as necessary, in accordance with manufacturer's recommendations.

    b. Drives:

        1) Adjust tension in V-belt drives, and adjust varipitch sheaves and drives for proper equipment speed.

        2) Adjust drives for alignment of sheaves and V-belts.

        3) Clean and remove foreign materials before starting operation.

    c. Motors:

        1) Check each motor for comparison to amperage nameplate value.

        2) Correct conditions which produce excessive current flow, and which exist due to equipment malfunction.

        3) Check each motor for proper rotation.

    d. Pumps:

1) Check glands and seals for cleanliness and adjustment before running pump.

2) Inspect shaft sleeves for scoring.

3) Inspect mechanical faces, chambers, and seal rings, and replace if defective.

4) Verify that piping system is free of dirt and scale before circulating liquid through the pump.

e. Valves:

1) Inspect both hand and automatic control valves, clean bonnets and stems.

2) Tighten packing glands to assure no leakage, but permit valve stems to operate without galling.

3) Replace packing in valves to retain maximum adjustment after system is judged complete.

4) Replace packing on any valve which continues to leak.

5) Remove and repair bonnets which leak.

6) Coat packing gland threads and valve stems with a surface preparation of "Moly-Cote" or "Fel-Pro", after cleaning.

f. Verify that control valve seats are free from foreign material, and are properly positioned for intended service.

g. Tighten all pipe joints after system has been tested.

1) Replace gaskets which show any sign of leakage after tightening.

h. Inspect all joints for leakage.

1) Promptly remake each joint which appears to be faulty, do not wait for rust to form.

2) Clean threads on both parts, apply compound and remake joints.

i. After system has been tested, clean strainers, dirt pockets, orifices, valve seats and headers in fluid system, to assure freedom from foreign materials.

j. Open steam traps and air vents where used, remove operating elements.

k. Clean thoroughly, replace internal parts and put back into operation.

l. Remove rust, scale and foreign materials from equipment and renew defaced surfaces.

m. Set and calibrate equipment.

n. Inspect fan wheels for clearance and balance.

o. Provide factory-authorized personnel for adjustment when needed.

p. Check each electrical control circuit to assure that operation complies with Specifications and requirements to provide desired performance.

q. Inspect each pressure gage and thermometer for calibration.

1) Replace items which are defaced, broken, or which read incorrectly.

r. Repair damaged insulation.

s. Vent gasses trapped in any part of systems.

1) Verify that liquids are drained from all parts of gas or air systems.

t. Install clean filters in all equipment requiring filters.

7. Contractor shall make all changes, adjustments and replacement required to place equipment in service and test it. The Owner and Engineer shall be given sufficient prior notice to witness tests.

8. When the Contractor has demonstrated to the Engineer that the equipment is ready for operation, they may submit notification of final field test to the Owner.

9. Preliminary field tests must be completed before equipment is subjected to final field tests.

D. Final Field Tests, Blue Tag:

1. Upon completion of the installation, and at a time approved by the Engineer, equipment will be tested by operating it as a unit with all related piping, duct work, electrical controls and mechanical operations. The Owner and the Engineer shall witness all tests.

2. Contractor shall notify Engineer at least 48 hours prior to beginning of tests. Contractor shall keep notes and data on tests and submit copies to Engineer.

The Contractor shall include with the notification a written statement that the equipment has been inspected, adjusted and is ready for sustained operation and the Final Field Testing.

3. Purpose of the tests is to demonstrate that equipment is:

a. Completely ready for operation by Owner’s personnel.

b. In compliance with design conditions, material specifications and all other requirements of the Contract Documents.

c. installed, completely ready for operation by the Owner, meet their operating cycles and are

free from defects such as overheating, overloading, and undue vibration and noise.

4. Contractor shall keep notes and data on tests and submit copies to the Engineer. Operational data and vibration readings shall be taken for each piece of equipment and submitted to the Engineer for approval. The vibration readings shall include the frequency and amplitude of the vibrations. All equipment must have acceptable vibration readings as defined by the appropriate standards. Equipment shall be tested for compliance with the design characteristics, material requirements, and all other requirements as specified for the item.

5. The equipment will be placed in continuous operations as prescribed or required and witnessed by the Engineer or their designated representative.

6. All equipment shall be tested to prove that its performance meets the requirements specified. The Contractor shall provide all required temporary instruments. The rated motor nameplate current and power shall not be exceeded at any point within the specified range. Vibrometer readings shall be taken when directed by the Engineer and the results recorded and compared with readings at shop tests.

7. Drive motors rated at less than five horsepower shall only be tested for excess current or power when overheating or other malfunction becomes evident in general testing.

8. Until final field tests are acceptable to the Engineer, the Contractor shall make all necessary changes, re-adjustments and replacements at no additional cost to the Owner.

9. Defects which cannot be corrected by installation adjustments will be sufficient grounds for rejection of any equipment.

10. Upon acceptance of the field tests a blue tag will be issued. The tag will be signed by the Engineer and attached to the unit. The tag shall not be removed and no further construction work will be performed on the unit, except as directed by the

Engineer.

11. All costs in connection with such tests including all materials, equipment, instruments, labor, etc. shall be borne by the Contractor.

1.4 INITIAL FACILITIES AND SYSTEMS STARTUP

A. Prior to startup of the new plant facilities, Contractor shall have prepared and pre-tested all equipment to check its ability for sustained operation, including inspections and adjustments by manufacturer's servicemen, as specified in this Section. Also, all training by vendors shall have begun and all O&M manual submittals shall be completed prior to startup.

B. After the new facilities and systems are sufficiently complete to permit startup, Contractor shall furnish competent personnel to startup the new plant facilities. Contractor will be responsible for startup of all facilities and systems constructed under this Contract. During the initial startup period Contractor shall check and provide for satisfactory mechanical operation of the new plant facilities. Prior to startup, Contractor shall prepare a schedule detailing the proposed startup and their plans for manpower and auxiliary facilities to be provided. The startup schedule is subject to approval of Engineer and Owner. Startup of the new facilities and systems by Contractor shall include the operation and maintenance of all mechanical facilities such as pumps, fans, and like equipment, and the ventilating, air conditioning (or heating), plumbing, and electrical systems. The startup period shall be a minimum of 10 consecutive 24-hour days of satisfactory operation of the facility or the number of days called for in the Technical Specifications. Startup of either the heating or air conditioning systems is dependent upon the time of year that the plant startup is initiated. Contractor will be required to return at the beginning of the next heating or air conditioning season (whichever is applicable) to start the appropriate system.

C. Contractor shall pay for the cost of all chemicals during the startup period. The Owner will assume responsibility for operation of the facilities once their personnel are adequately trained, O&M Manuals approved and the total system approved by Engineer and Owner.

D. When the startup period is completed, the Owner will assume responsibility for operation of the new facilities, provided that all major items of the Work are operating satisfactorily and operation and maintenance training has been completed satisfactorily. If any or all of the new facilities are not operating satisfactorily at the end of the startup period, Contractor shall continue to operate those facilities that are incomplete or not operating satisfactorily until they are complete and acceptable to the Owner.

E. Acceptance - When the Contractor has demonstrated to the Engineer that the equipment is ready for operation notice of facility start-up acceptance will be issued.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

+ + END OF SECTION + +

INSTALLATION INSTRUCTIONS

11EER WA Series
Wall Mount Air Conditioner

Models:

W18AB-A	W24AB-A	W30AB-A	W36AB-A
	W24AB-B	W30AB-B	W36AB-B
	W24AB-C	W30AB-C	W36AB-C

Bard® SINCE 1914
Climate Control Solutions

Bard Manufacturing Company, Inc.
Bryan, Ohio 43506
www.bardhvac.com

Manual: 2100-766
Supersedes: ***NEW***
Date: 2-25-22

CONTENTS

FIGURES

TABLES

GRAPHS

GETTING OTHER INFORMATION AND PUBLICATIONS

These publications can help when installing the air conditioner. They can usually be found at the local library or purchased directly from the publisher. Be sure to consult the current edition of each standard.

National Electrical Code.....ANSI/NFPA 70

Standard for the Installation of Air Conditioning and Ventilating Systems
.....ANSI/NFPA 90A

Standard for Warm Air Heating and Air Conditioning Systems
.....ANSI/NFPA 90B

Load Calculation for Winter and Summer Air Conditioning
..... ACCA Manual J Residential

Duct Design for Residential Winter and Summer Air Conditioning and Equipment Selection
..... ACCA Manual D

For more information, contact these publishers:

ACCA **Air Conditioning Contractors of America**
1712 New Hampshire Ave. N.W.
Washington, DC 20009
Telephone: (202) 483-9370
Fax: (202) 234-4721

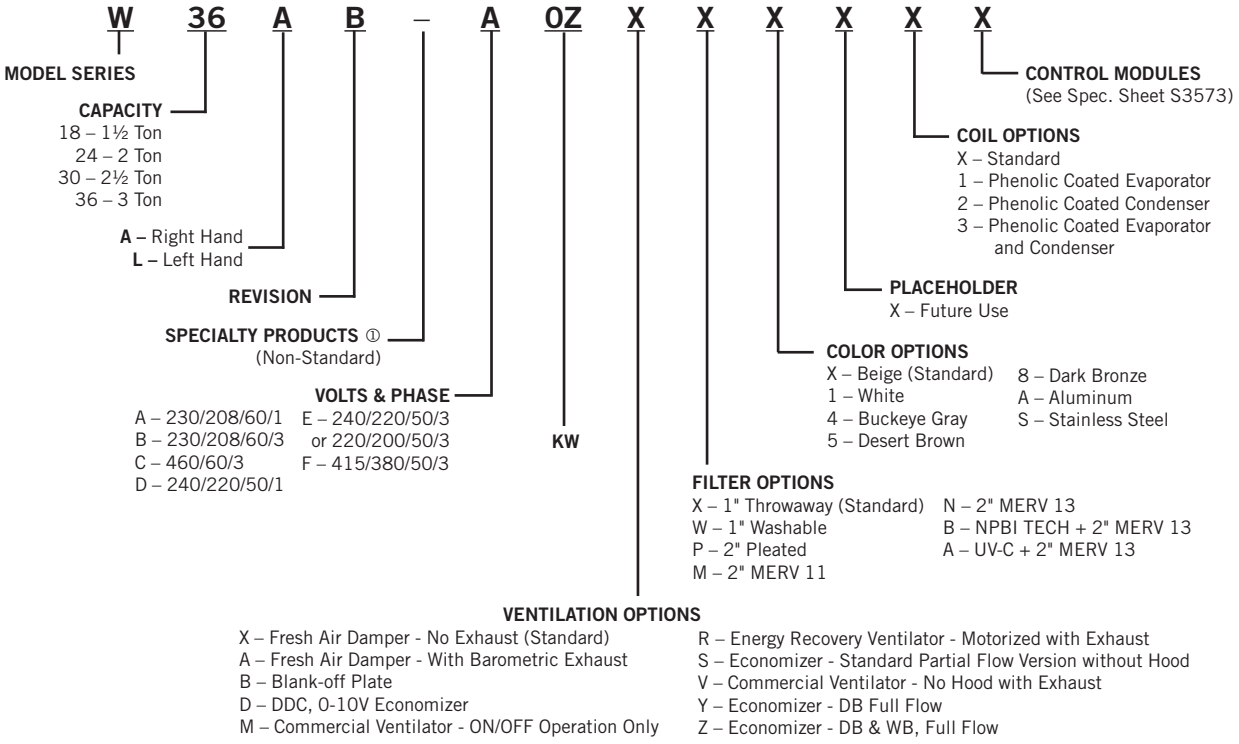
ANSI **American National Standards Institute**
11 West Street, 13th Floor
New York, NY 10036
Telephone: (212) 642-4900
Fax: (212) 302-1286

ASHRAE **American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc.**
1791 Tullie Circle, N.E.
Atlanta, GA 30329-2305
Telephone: (404) 636-8400
Fax: (404) 321-5478

NFPA **National Fire Protection Association**
Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9901
Telephone: (800) 344-3555
Fax: (617) 984-7057

WALL MOUNT GENERAL INFORMATION

AIR CONDITIONER WALL MOUNT MODEL NOMENCLATURE



NOTE: *Vent options X and B are without exhaust capability. May require separate field-supplied barometric relief in building.*

① Insert "D" for dehumidification with hot gas reheat. Reference Form 7960-811 for complete details. Insert "R" for units with isolation transformer for high resistance ground applications.

Shipping Damage

Upon receipt of equipment, the carton should be checked for external signs of shipping damage. If damage is found, the receiving party must contact the last carrier immediately, preferably in writing, requesting inspection by the carrier's agent.

General

The equipment covered in this manual is to be installed by trained, experienced service and installation technicians.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

The refrigerant system is completely assembled and charged. All internal wiring is complete.

The unit is designed for use with or without duct work. Flanges are provided for attaching the supply and return ducts.

These instructions explain the recommended method to install the air cooled self-contained unit and the electrical wiring connections to the unit.

These instructions and any instructions packaged with any separate equipment required to make up the entire air conditioning system should be carefully read before beginning the installation. Note particularly "Starting Procedure" and any tags and/or labels attached to the equipment.

While these instructions are intended as a general recommended guide, they do not supersede any national and/or local codes in any way. Authorities having jurisdiction should be consulted before the installation is made. See page 3 for information on codes and standards.

Size of unit for a proposed installation should be based on heat loss calculation made according to methods of Air Conditioning Contractors of America (ACCA). The air duct should be installed in accordance with the

Standards of the National Fire Protection Association for the Installation of Air Conditioning and Ventilating Systems of Other Than Residence Type, NFPA No. 90A, and Residence Type Warm Air Heating and Air Conditioning Systems, NFPA No. 90B. Where local regulations are at a variance with instructions, installer should adhere to local codes.

Duct Work

All duct work, supply and return, must be properly sized for the design airflow requirement of the equipment. Air Conditioning Contractors of America (ACCA) is an excellent guide to proper sizing. All duct work or portions thereof not in the conditioned space should be properly insulated in order to both conserve energy and prevent condensation or moisture damage.

Refer to Maximum ESP of Operation Electric Heat Table 18 on page 37.

Design the duct work according to methods given by the Air Conditioning Contractors of America (ACCA). When duct runs through unheated spaces, it should be insulated with a minimum of 1" of insulation. Use insulation with a vapor barrier on the outside of the insulation. Flexible joints should be used to connect the duct work to the equipment in order to keep the noise transmission to a minimum.

Model series W18 and W24 are approved for 0" clearance to the supply duct. For model series W30 and W36, a 1/4" clearance to combustible material for the first 3' of duct attached to the outlet air frame is required. See wall mount installation instructions beginning on page 6 and Figures 3 – 7 (pages 11 – 15) for further details.

Ducts through the walls must be insulated and all joints taped or sealed to prevent air or moisture entering the wall cavity.

Some installations may not require a return air duct. A metallic return air grille is required with installations not requiring a return air duct. The spacing between louvers on the grille shall not be larger than 5/8".

Any grille that meets with 5/8" louver criteria may be used. It is recommended that Bard Return Air Grille Kits RG2 through RG3 or RFG2 through RFG3 be installed when no return duct is used. Contact distributor or factory for ordering information. If using a return air filter grille, filters must be of sufficient size to allow a maximum velocity of 400 fpm.

NOTE: *If no return air duct is used, applicable installation codes may limit this cabinet to installation only in a single story structure.*

Filters

A 1" throwaway filter is standard with each unit. The filter slides into position making it easy to service. This filter can be serviced from the outside by removing the filter access panel. Additional 1" and 2" filters are also available as optional accessories. The internal filter brackets are adjustable to accommodate the 2" filter by bending two tabs down on each side of the filter support bracket.

Fresh Air Intake

All units are built with fresh air inlet slots punched in the service door.

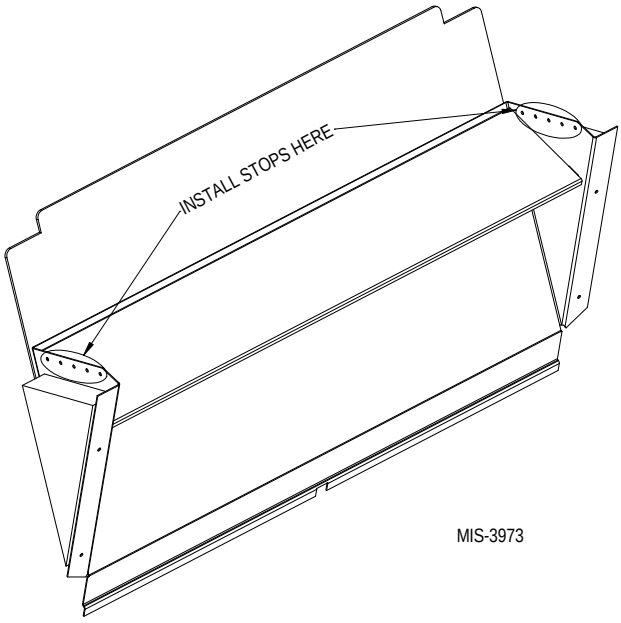
If the unit is equipped with a fresh air damper assembly, the assembly is shipped already attached to the unit. The damper blade is locked in the closed position. To allow the damper to operate, the maximum and minimum blade position stops must be installed (see Figure 1).

Graphs found on pages 41 and 42 give approximate fresh air amounts based on the blade position stop location.

All capacity, efficiency and cost of operation information is based upon the fresh air blank-off plate in place and is recommended for maximum energy efficiency.

The blank-off plate is available upon request from the factory and is installed in place of the fresh air damper shipped with each unit.

FIGURE 1
Fresh Air Damper



Basic Installation Design and Application Planning

Successful unit installations require proper planning and site inspection before installation begins. Before installing the wall mount unit, make sure that all service and airflow clearances are met and that the unit can meet all applicable code and regulation requirements. Provide an inspection of both the inside and outside of the structure by reviewing floorplans and/or visiting the installation site.

Wall Construction

The wall must be inspected to ensure that the weight of the unit can be supported. Be sure to review all applicable construction codes and regulations including seismic requirements. When inspecting wood frame walls, the wall construction must be strong and rigid enough to carry the weight of the unit without transmitting any unit vibration. It is important that the side unit wall mounting lags and optional bottom bracket are supported by structural members inside the wall cavity. Concrete block and brick walls must be thoroughly inspected to ensure that they are capable of carrying the weight of the installed unit. Metal buildings must contain structural components to support the unit weight. If heavily corrugated siding is present, it may need to be trimmed and flashed similar to a window to provide a flat, even surface to attach and seal the unit to the wall. Heavy gauge corrugations that would be present on shipping containers and blast-proof structures may require the installation of a metal plate over the corrugated area. It is important that the unit area is weatherized and sealed to avoid air and water infiltration into the area between the unit and the wall.

Outdoor Area Inspection

Inspect the outdoor area of the jobsite or review construction plans and locate the area where the wall mount is to be installed. The outdoor area must be free from obstructions including fences, bushes and walls that will hinder unit operation regarding outdoor condenser airflow and unit serviceability. Do not install units in enclosed areas that limit the amount of ambient temperature airflow. Warm air will exit the front condenser section of the unit, and outdoor ambient temperature air must be able to enter side intake condenser openings of the unit. Portable or modular building placement must be in a way that the wall mount units have a constant supply of outdoor air for proper unit operation. Make sure that the service panels of the unit are accessible. Inspect wall surfaces for obstructions that could hinder unit installation and servicing including outdoor electrical conduits, junction boxes, wall drains, vent hoods, windows, doors, overhangs and posts.

Condensate Water Drainage

Review all codes and requirements for unit condensate drainage. A clear, flexible PVC drain hose (3/4" ID, 1" OD) extends from the drain pan in the upper section of the unit and extends down to the unit base. An opening is supplied towards the back of the unit base for the drain hose to pass through, and the hose extends 1" to 2" below the unit base. Water removed from the indoor air (condensate) will be expelled from the unit in large amounts during cooling operation through the hose. Units running in cooling operation in cold outdoor below freezing conditions can cause the condensate to freeze after leaving the drain hose. In the event the drain hose is connected to a drain system of some type, it must be an open or vented type system to ensure proper drainage throughout seasonal use.

Indoor Ducted and Non-Ducted Applications

Air distribution inside the structure being conditioned plays an important role in making sure the area is a consistent temperature. Improper air distribution can result in areas being cooler or warmer, electrical equipment not receiving sufficient airflow or occupancy discomfort felt inside an area. Thermostat or indoor temperature sensor placement inside the area being conditioned also plays an important role in indoor climate control.

Indoor Supply Airflow

Indoor installation areas must provide a non-restrictive path for the conditioned supply air to leave supply grilles and registers. Inspect the area to ensure that all indoor portions of the room or rooms will have access to supply air. Ductwork may be used to ensure proper air circulation and all provided ductwork guidelines and clearances must be followed. Non-ducted applications must use a supply louver grille installed over the supply opening inside the room. Be sure to adjust supply deflectors to properly disperse the conditioned supply air to all parts of the room. Avoid closing sections of the supply grilles which would cause unneeded supply duct pressurization.

Indoor Return Airflow

A non-restrictive path for room air returning to the center section of the unit must be provided inside the room. Avoid placing objects including furniture, electronics equipment, equipment racks and cabinets directly in front of the unit return grilles and registers. Bard recommends at least 2' between solid objects and return grilles or registers. Ductwork may be used to ensure proper air circulation and all provided ductwork guidelines and clearances must be followed. Non-ducted applications must use a return louver grille installed over the return opening inside the room.

Ducted Applications

Field fabricated supply and return duct work may be installed inside the structure being conditioned. A short supply and/or return stub duct may be connected to the unit supply and return flanges before unit installation to help with duct connections inside the structure. Supply and return ducts must be properly sized for the design airflow requirement of the equipment. Air Conditioning Contractors of America (ACCA) is an excellent guide to proper sizing. All duct work or portions thereof not in the conditioned space should be properly insulated in order to conserve energy, reduce heat conductivity, and prevent condensation or moisture damage. Refer to Maximum External Static Pressure (ESP) of Operation Table 18 on page 37. Design the duct work according to methods given by the Air Conditioning Contractors of America (ACCA). When duct work is installed in unheated spaces, it should be insulated with a minimum of 1" of insulation. Use insulation with a vapor barrier on the outside of the insulation. Flexible joints should be used to connect the duct work to the equipment in order to keep the noise transmission to a minimum. Ducts through the walls must be insulated and all joints taped or sealed to prevent air or moisture from entering the wall cavity.

Model series W18 and W24 are approved for 0" clearance to the supply duct. For model series W30 and W36, a 1/4" clearance to combustible material for the first 3' of duct attached to the outlet air frame is required. See instructions on page 8 and Figures 3 – 7 (pages 11 – 15) for further details.

⚠ WARNING

Fire hazard.

Maintain minimum 1/4" clearance between the supply air duct and combustible materials in the first 3' of ducting.

Failure to do so could result in fire causing damage, injury or death.

Free Blow Applications

Some installations may not require extensive supply duct work throughout the structure and are referred to as free blow applications. A short field-fabricated supply duct must be used in the wall cavity to transition between the supply collar on the unit and the supply louver grille in the room. The duct must be properly insulated in order to conserve energy, reduce heat conductivity and prevent condensation or moisture damage. All joints must be taped or sealed to prevent air or moisture entering the wall cavity. Follow all clearances including distances to combustible materials and all instructions provided in this manual.

A non-restrictive metallic supply air grille with deflectors is required for free blow applications. Contact the local Bard distributor or visit www.bardhvac.com for ordering information.

A metallic return air grille is required for non-ducted applications. The spacing between louvers on the grille shall not be larger than 5/8". It is recommended that a Bard Return Air Grille Kit is installed that is designed specifically for the wall mount product. Contact the local Bard distributor or visit www.bardhvac.com for ordering information. A field-supplied return grille that meets the 5/8" louver criteria and does not cause the unit to exceed the maximum specified external static pressure (ESP) may be used. If using a return air filter grille, filters must be of sufficient size to allow a maximum velocity of 400 fpm. Filter return air grilles do not filter air being brought into the structure through ventilation options including fresh air dampers, ventilators, economizers and energy recovery ventilators. Be sure to install the return grille with the louvers pointed downward towards the floor. This will help ensure return air is drawn upward from the floor and improve air circulation in the room.

NOTE: *If no return air duct is used, applicable installation codes may limit this cabinet to installation only in a single story structure.*

Thermostat or Indoor Temperature Sensor Placement

The location and installation of the thermostat or temperature sensor that monitors indoor temperature is very important regarding unit operation. Avoid placing the thermostat in an area exposed to direct sunlight or air from doorways leading outdoors. Use a piece of insulating material to close off conduit openings or holes in the wall surface for wire entry into the thermostat or temperature sensor. This will help avoid non-conditioned air from entering the thermostat and effecting temperature and/or humidity readings. As common practice, the thermostat or temperature sensor should measure the temperature of the air being returned to the unit, and not the conditioned air being supplied by the unit. Placing the thermostat or temperature sensor near a return air opening will normally result in optimal unit performance.

Unit Installation

Make sure to have the proper tools at the work site that are needed for unit installation. The following steps are provided to ensure the unit is installed properly to the wall surface, and that the unit will provide years of service with minimal service requirements.

Materials/Tools List

Additional hardware and miscellaneous supplies are needed for installation. These items are field supplied and must be sourced before installation. The following list also includes tools needed for installation.

- Appropriate safety gear including gloves and safety glasses
- 5/16" hex bit with drill driver
- Phillips head screwdriver
- Small straight (thermostat) screwdriver
- Tape measure
- Leveling device
- Two (2) tubes of caulk and caulk gun
- Utility knife
- Tools for cutting holes in the wall surface (if needed)
- Electrical components and wiring along with electrical tools
- Multimeter
- Wall fasteners for side flanges, bottom mounting bracket and top rain flashing.
- Duct tape and/or other duct sealing materials.

Wall Preparation

1. Two holes for the supply and return air openings must be cut through the wall as shown in Figures 3A and 3B on pages 11 and 12. Be sure the openings are square and level. Follow all clearances including distances to combustible materials and all instructions provided in this manual.
2. Review all electrical requirements provided in this manual and plan out electrical entrances into the building. Also plan electrical conduit routing and thermostat placement, if necessary.
3. Install necessary duct work and prepare the openings for unit installation.
4. Clean the exterior wall where the unit is to be installed and make sure it is able to provide a smooth, level, debris-free surface. Remove all construction debris from the supply, return and electrical hole cutting process.

Wall Mount Installation to Wall Surface

1. Remove packaging from unit and make sure the unit is not damaged before installation. A top rain flashing is supplied for field use and is mounted to the back of the unit for shipping. Remove the rain flashing before locating the unit against the wall. Top rain flashing is required to avoid water entering the area behind the unit that is against the wall. A bottom mounting bracket, attached to the skid for shipping, is provided for ease of installation but is not required. Review all requirements listed on unit labels and on serial plate located on the side of the unit.
2. Locate and mark bolt hole locations and bottom mounting bracket location. Install bottom mounting bracket with field-supplied fasteners to wall if it is to be used (optional). Bracket must be level and installed in the correct location to help support the unit during the installation process (see Figures 3A and 3B).
3. Position the wall mount unit close to the wall surface where it will be installed. Install rain flashing at the top of the unit facing the wall by hooking the hem bend into the rear bend of the unit top (see Figures 3A and 3B).
4. Apply a liberal amount of caulk on left and right cabinet side wall mount brackets and back of top rain flashing. Place unit back surface flush against wall. Unit must be level to ensure proper condensate drainage. Optional bottom bracket may be used to help support the unit.
5. Units are secured to the wall by using field-supplied fasteners along each side of the wall mount through the built-in wall mounting brackets. It is the responsibility of the installer to select the proper fastener to secure the unit to the wall based on wall construction and applicable building codes. Typical installations may include 5/16" fasteners with 7/8" diameter flat washers. Be sure unit is securely mounted and all weight-bearing fasteners are attached to the weight supporting structural members of the wall.
6. Apply a bead of caulk between the back of the unit top and the front surface of the top rain flashing (see Figures 3A and 3B).
7. Connect unit duct work from the inside of the building following all clearances and instructions provided. For additional mounting rigidity, the return air and supply air frames or collars can be drilled and screwed or welded to the structural wall itself (depending upon wall construction). Be sure to use code approved duct tape or other sealing materials to seal the duct work to the unit.
8. On side-by-side installations, maintain a minimum of 20" clearance on right side (on W**A units) to allow access to control panel and heat strips and proper airflow to the outdoor coil (20" clearance on left side on W**L units). Additional clearance may be required to meet local or national codes.

TABLE 1
Clearance Required for Service Access and Adequate Condenser Airflow

Model	Left Side	Right Side	Discharge Side
W18A W24A W30A W36A	15"	20"	10'
W18L W24L W30L W36L	20"	15"	10'

NOTE: *For side-by-side installation of two W**A models, there must be 20" between units. This can be reduced to 15" by using a W**L model (left side compressor and controls) for the left unit and W**A (right side compressor and controls) for right unit.*

See Specifications Sheet S3573.

TABLE 2
Minimum Clearances Required to Combustible Materials

Model	Supply Air Duct (1st 3')	Cabinet
W18A, L W24A, L	0"	0"
W30A, L W36A, L	1/4"	0"

FIGURE 2
Unit Dimensions

	Width (W)	Depth (D)	Height (H)	Supply		Return																
				A	B	C	B	E	F	G	I	J	K	L	M	N	O	P	Q	R	S	T
W18*B W24*B	33.300	17.125	74.563	7.88	19.88	11.88	19.88	35.00	10.88	29.75	20.56	30.75	32.06	33.25	31.00	2.63	34.13	26.06	10.55	3.94	12.00	9.00
W30*B W36*B	38.200	17.125	74.563	7.88	27.88	13.88	27.88	40.00	10.88	29.75	17.93	30.75	32.75	33.25	31.00	2.75	39.13	26.75	9.14	3.94	12.00	9.00

All dimensions are in inches. Dimensional drawings are not to scale.

WA* RIGHT UNIT**

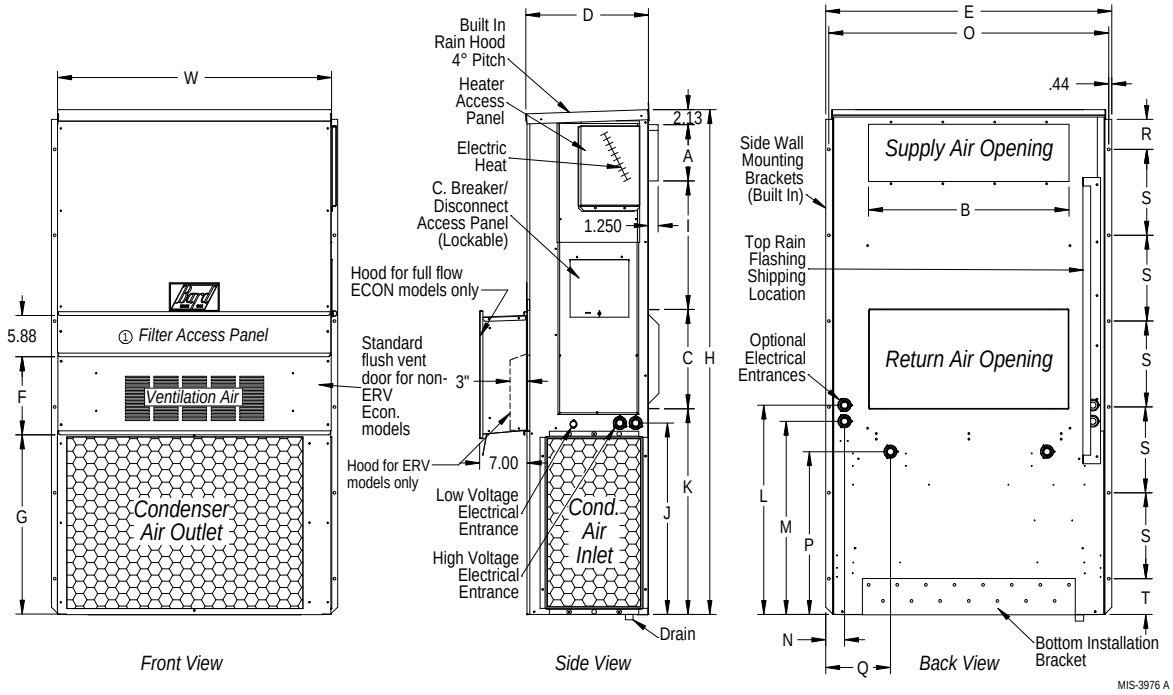
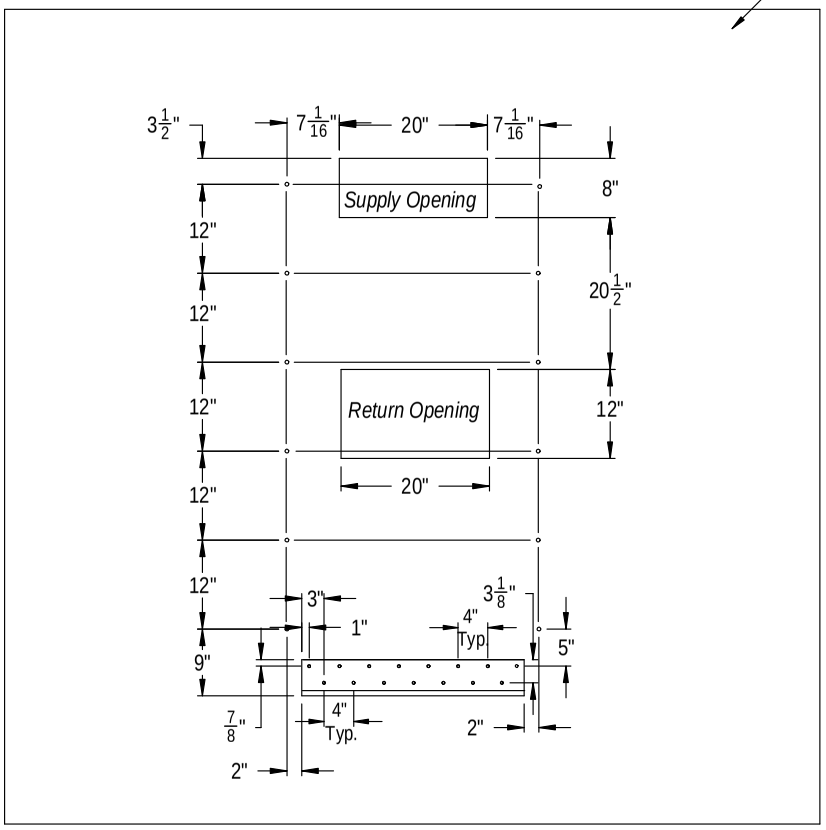
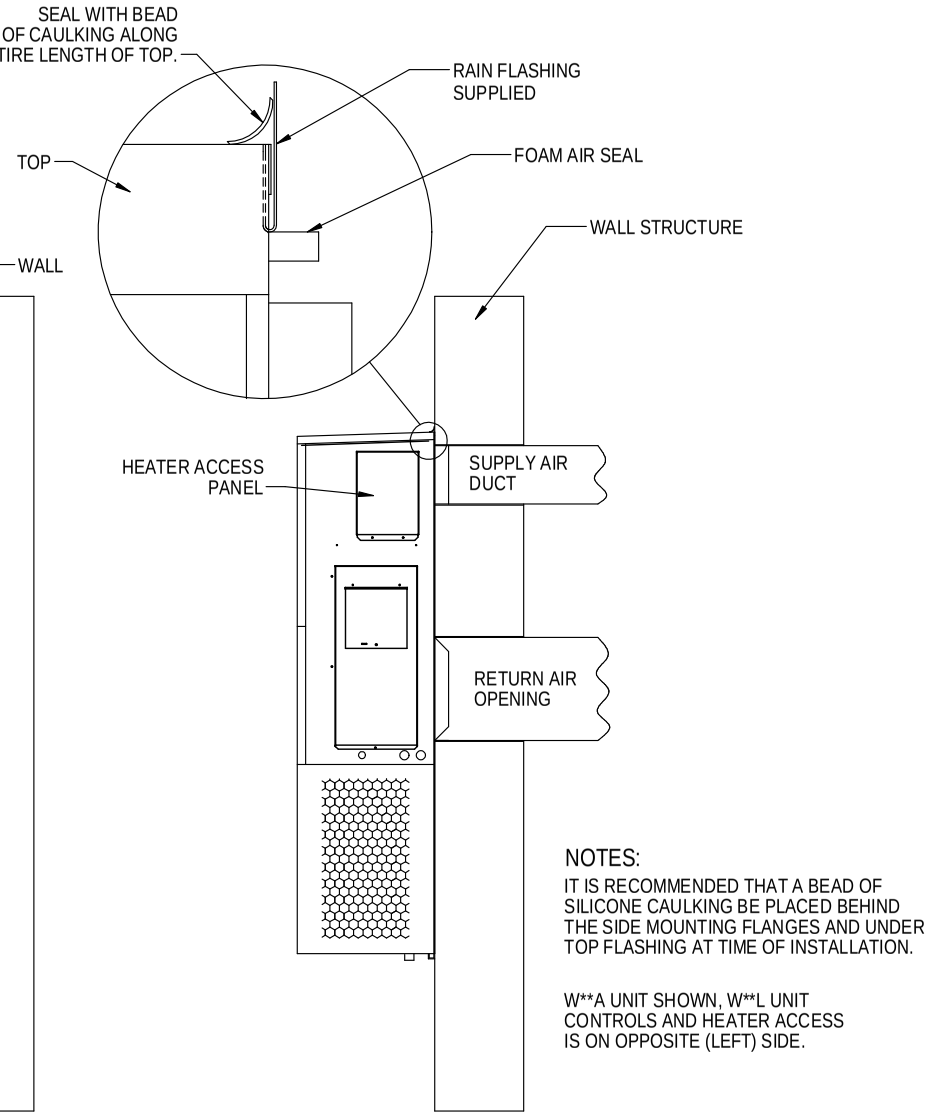


FIGURE 3A
W18AB, W18LB, W24AB, W24LB
Mounting Instructions



Wall Opening and Hole Location View



Right Side View

NOTES:

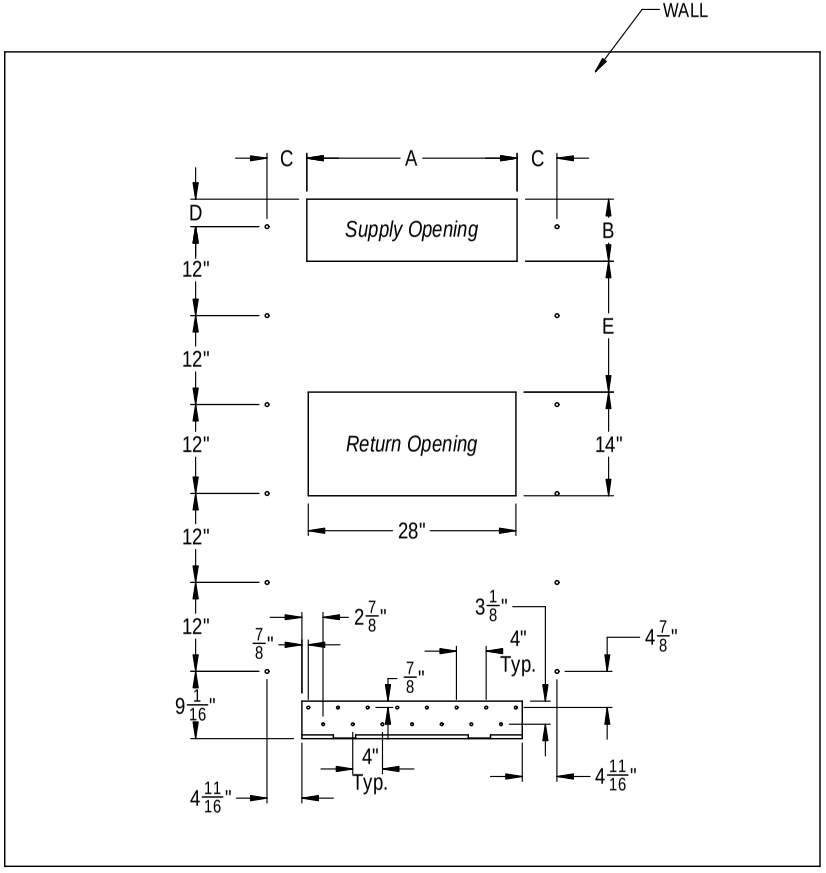
IT IS RECOMMENDED THAT A BEAD OF SILICONE CAULKING BE PLACED BEHIND THE SIDE MOUNTING FLANGES AND UNDER TOP FLASHING AT TIME OF INSTALLATION.

W**A UNIT SHOWN, W**L UNIT CONTROLS AND HEATER ACCESS IS ON OPPOSITE (LEFT) SIDE.

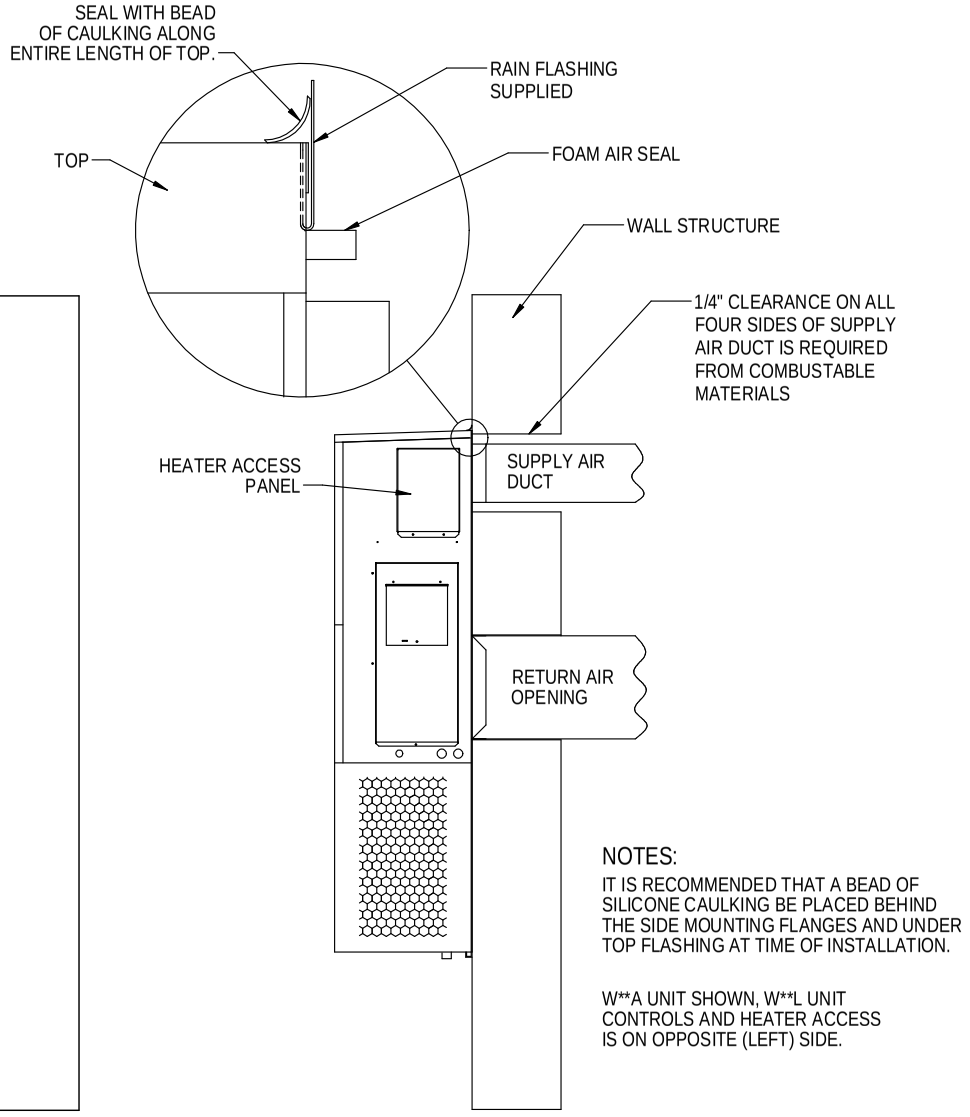
MIS-4036 A

FIGURE 3B
W30AB, W30LB, W36AB, W36LB
Mounting Instructions

	A	B	C	D	E
REQUIRED DIMENSIONS TO MAINTAIN 1/4" MIN. CLEARANCE FROM COMBUSTIBLE MATERIALS	28 3/8	8 3/8	5 3/8	3 3/4	17 5/8
REQUIRED DIMENSIONS TO MAINTAIN RECOMMENDED 1" CLEARANCE FROM COMBUSTIBLE MATERIALS	29 7/8	9 7/8	4 5/8	4 1/2	16 7/8



Wall Opening and Hole Location View



Right Side View

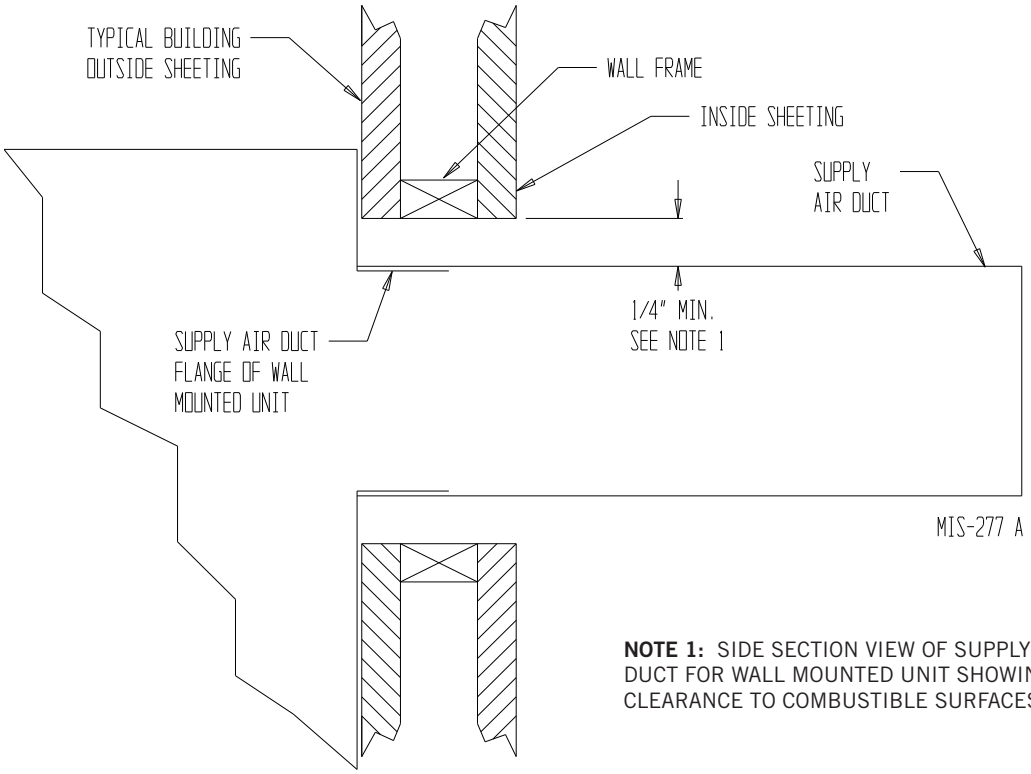
NOTES:

IT IS RECOMMENDED THAT A BEAD OF SILICONE CAULKING BE PLACED BEHIND THE SIDE MOUNTING FLANGES AND UNDER TOP FLASHING AT TIME OF INSTALLATION.

W**A UNIT SHOWN, W**L UNIT CONTROLS AND HEATER ACCESS IS ON OPPOSITE (LEFT) SIDE.

MIS-3820 A

FIGURE 4
Electric Heat Clearance
W30AB, W30LB, W36AB, W36LB



NOTE 1: SIDE SECTION VIEW OF SUPPLY AIR DUCT FOR WALL MOUNTED UNIT SHOWING 1/4" CLEARANCE TO COMBUSTIBLE SURFACES.

⚠ WARNING

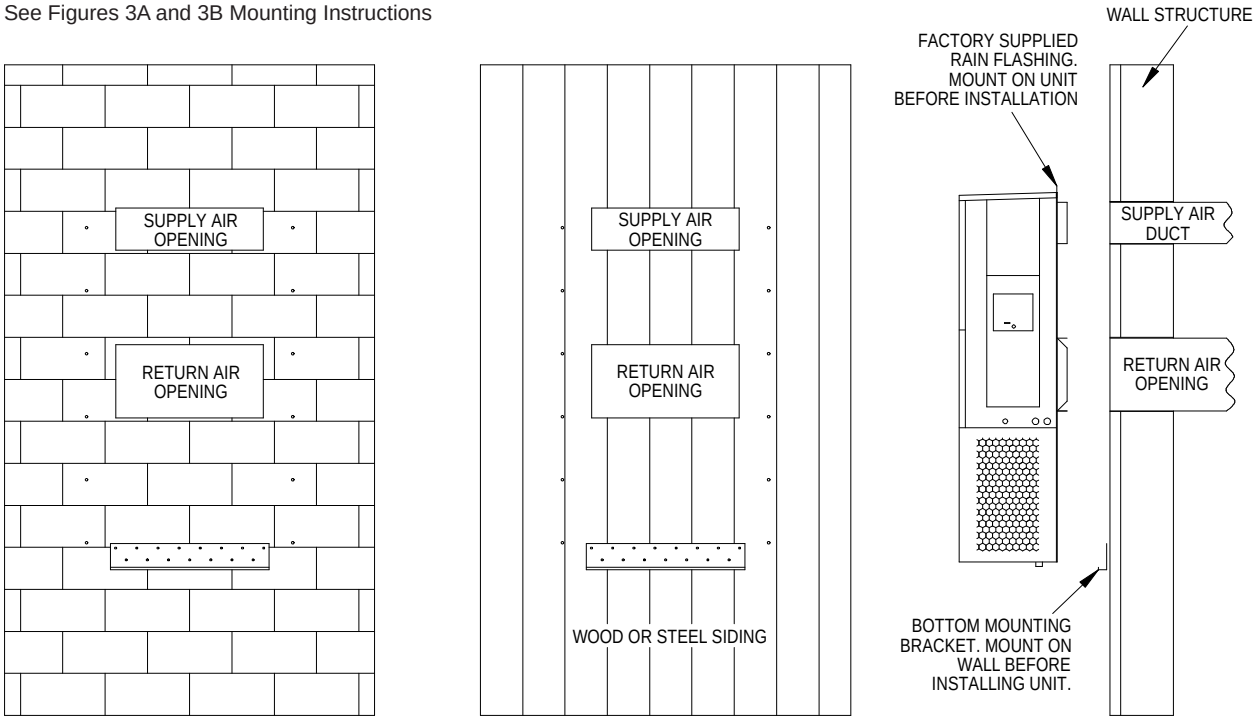
Fire hazard.

Maintain minimum 1/4" clearance between the supply air duct and combustible materials in the first 3' of ducting.

Failure to do so could result in fire causing damage, injury or death.

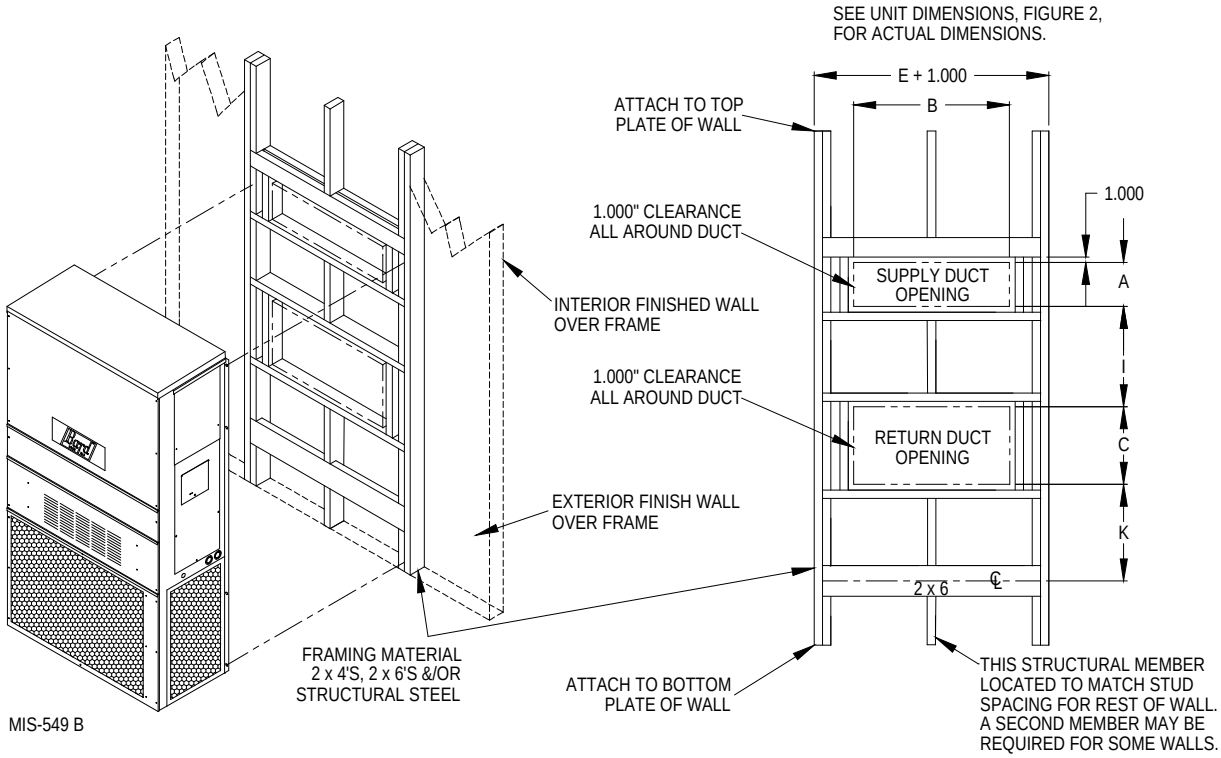
FIGURE 5
Wall Mounting Instructions

See Figures 3A and 3B Mounting Instructions



CONCRETE BLOCK WALL INSTALLATION *WOOD FRAME WALL INSTALLATION* *SIDE VIEW* MIS-548 A

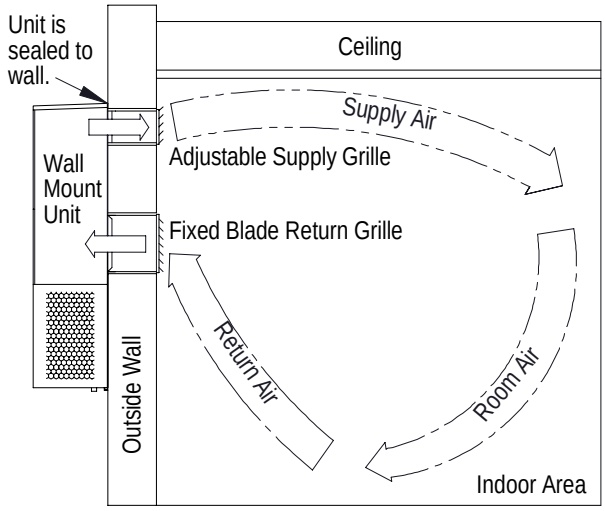
FIGURE 6
Wall Mounting Instructions



MIS-549 B

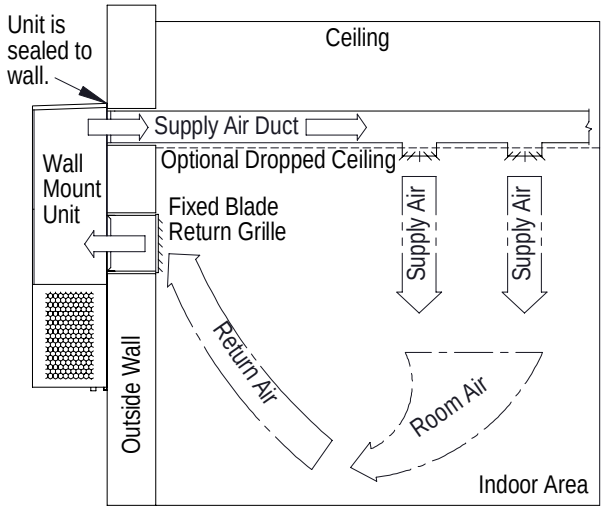
FIGURE 7
Common Wall Mounting Installations

Non-Ducted Installations



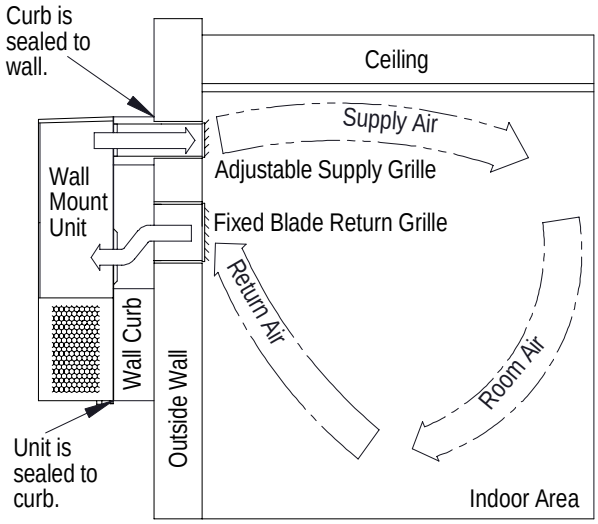
Non-ducted installations supply conditioned air into indoor room areas without extensive duct work. The supply airstream is directed by adjusting the 4-way supply grille to reach areas being conditioned. The supply air mixes with the room air and cools or heats occupants and/or equipment in the area. Unconditioned room air is returned to the unit through the return grille. Avoid supply air leaving supply grille and re-entering the unit return grille without mixing with room air.

Ducted Installations



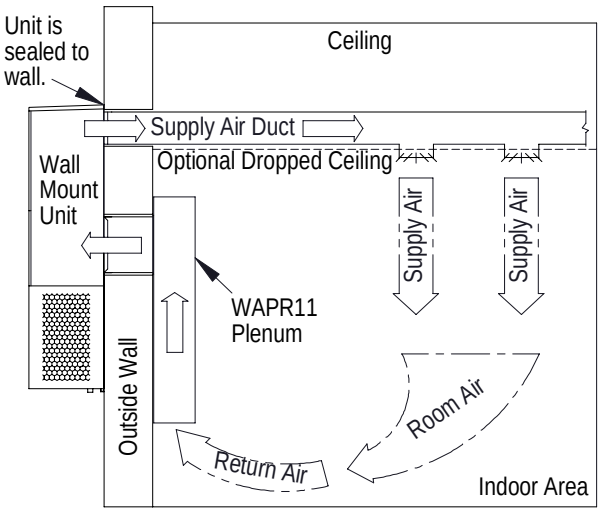
Ducted installations supply conditioned air into indoor room areas using solid or flexible ducts. The supply air is distributed throughout a single area or multiple areas. The supply air mixes with the room air and cools or heats occupants and/or equipment. Unconditioned room air is returned to the unit through a return grille or return duct work. Avoid using restrictive duct work to provide the best unit performance and efficiency. Review duct static pressure requirements provided in this manual.

Outdoor Wall Curb Installations



Outdoor Wall curbs are installed between the wall mount unit and the outer wall surface. Wall curb use may avoid resizing supply and return openings that are currently in an existing wall. Wall curbs may also provide sound isolation and indoor area sound reduction. Various curb options are available, and it is important to select a curb that will meet the application requirements and also be the correct size for the unit. Unit duct static requirements cannot be exceeded when using a wall curb. Follow all instructions provided with the wall curb when installing the product.

WAPR11 Indoor Sound Plenum Installations



Indoor sound plenums are installed inside the room over the unit return air opening. Plenum use can provide sound isolation and indoor area sound reduction. The WAPR11 sound plenum provides a single solution for all unit tonnage sizes. The WAPR11 may be installed horizontally or vertically in the room. Unit duct static requirements cannot be exceeded when using a sound plenum. Follow all instructions provided with the sound plenum when installing the product.

MIS-550 D

Wiring – Main Power

⚠ WARNING

Electrical shock hazard.

Do not operate this equipment without an earth ground attached and always disconnect the remote electric power supplies before servicing.

Electrical shock can result in serious injury or death.

Main electrical power must be supplied to the unit from a clean, reliable power source. Verify voltage being supplied to the unit is consistent during all times of the day and within the range specified for the unit in the unit specifications and on the unit serial plate. Voltage must be measured at the field power connection point in the unit and while the unit is operating at full load (maximum amperage operating condition).

NOTE: *In applications where a field-supplied transformer is used to step down a higher incoming voltage, the center leg must be grounded when high resistance grounding is used.*

Refer to the unit rating plate for wire sizing information and maximum fuse or circuit breaker size. Each outdoor unit is marked with a "Minimum Circuit Ampacity". This means that the field wiring used must be sized to carry that amount of current. Depending on the installed KW of electric heat, there may be two field power circuits required. If this is the case, the unit serial plate will so indicate. All models are suitable only for connection with copper wire. Each unit and/or wiring diagram will be marked "Use Copper Conductors Only". These instructions ***must be*** adhered to. Refer to the National Electrical Code (NEC) for complete current carrying capacity data on the various insulation grades of wiring material. All wiring must conform to NEC and all local codes.

The electrical data lists fuse and wire sizes (75°C copper) for all models including the most commonly used heater sizes. Also shown are the number of field power circuits required for the various models with heaters.

The unit rating plate lists a "Maximum Time Delay Relay Fuse" or circuit breaker that is to be used with the equipment. The correct size must be used for proper circuit protection and also to ensure that there will be no nuisance tripping due to the momentary high starting current of the compressor motor.

The disconnect access door on this unit may be locked to prevent unauthorized access to the disconnect. To convert for the locking capability, bend the tab located in the bottom left-hand corner of the disconnect opening under the disconnect access panel straight out. This tab will now line up with the slot in the door. When shut, a padlock may be placed through the hole in the tab preventing entry.

See "Start Up" section for important information on three phase scroll compressor start ups.

See Tables 13 and 14 on pages 30 and 31 for electrical specifications.

Wiring – Low Voltage

All 230/208V 1 phase and 3 phase equipment have dual primary voltage transformers. All equipment leaves the factory wired on 240V tap. For 208V operation, reconnect from 240V to 208V tap. The acceptable operating voltage range for the 240 and 208V taps are:

Tap: 240 Range: 253 – 216
Tap: 208 Range: 220 – 187

NOTE: *The voltage should be measured at the field power connection point in the unit and while the unit is operating at full load (maximum amperage operating condition).*

For low voltage wiring, an 18 gauge copper, color-coded cable is recommended. See Table 6 on page 19 for more information.

Low Voltage (24VAC) Connections

These units use a 24-volt AC low voltage circuit.

C terminal is the *24VAC common and is grounded.*

G terminal is the *indoor blower input*.

Y1 terminal is the *1st Stage input for cooling*.

Y2 terminal is the *2nd Stage compressor input for cooling* (if equipped with an economizer) or *Y2 disables Balanced Climate mode if the Y1-Y2 jumper is removed* (see page 22).

B/W1 terminal is the *1st stage electric heat*.

W2 terminal is the *2nd stage heat* (if equipped).

A terminal is the *ventilation input*. This terminal energizes any factory-installed ventilation option and indoor blower.

D terminal is the *dehumidification input*. If installed, this terminal energizes any factory-installed dehumidification option.

L terminal is *24 volt alarm active output*.

For units equipped with an alarm relay:

1 terminal is the *normally closed contact on the relay.*
2 terminal is the *normally open contact on the relay.*
3 terminal is the *common contact on the relay.*

See Table 3 for additional low voltage connections on auxiliary terminal strip.

TABLE 3
Additional Low Voltage Connections (if applicable)

Terminal	Unit	Description
9	V Control Option Only	Discharge Air Sensor, 10K Ohm
10	V Control Option Only	Discharge Air Sensor, 10K Ohm
11	F, V Control Options	Filter Switch, Normally Open Contact
12	F, V Control Options	Filter Switch, Normally Open Contact
13	V Control Option Only	Blower Airflow Switch, Normally Open Contact
14	V Control Option Only	Blower Airflow Switch, Normally Open Contact
15	V Control Option Only	Compressor Current Sensor, Normally Open Contact
16	V Control Option Only	Compressor Current Sensor, Normally Open Contact

Unit Shutdown Feature (Standard on All Models)

The RT terminal is the 24VAC transformer output, and the R terminal is the 24VAC hot terminal for the operation of the equipment. RT and R are connected with a brass jumper bar which can be removed and RT and R connected to an external NC (normally closed) contact such as a fire/smoke detector that will cause shutdown of the equipment upon activation.

Balanced Climate™ Feature (Standard on All Models)

All units are equipped with the capability of running in Balanced Climate mode. This mode is designed to enhance the comfort level by reducing the indoor airflow amount and extending the run time to help extract more humidity during cooling operation. The Y1 terminal is the 24VAC input for Balanced Climate compressor cooling operation. The Y2 terminal is the 24VAC input for compressor cooling standard operation. Y1 and Y2 are connected with a brass jumper bar which can be removed to enable Balanced Climate mode. Units with an economizer will not have the brass jumper installed. Refer to vent manuals for instructions on how Balanced Climate works with each vent.

NOTE: *Units with mechanical dehumidification require an additional connection to be made when enabling Balanced Climate. Refer to dehumidification supplemental instructions for this step.*

To operate in Balanced Climate mode, a 2-stage cooling thermostat is required. The lower indoor airflow operation is overridden by utilizing a 2-stage thermostat. If the call for cooling is not satisfied within a given time frame or temperature differential (specified by the thermostat), the thermostat will send a signal to Y2 which then increases the blower speed back to the selected speed. See pages 32 – 34 for blower speed selection options.

Refer to page 22 for additional Balanced Climate requirements and limitations.

Dehumidification Feature (Optional)

The D terminal is the 24VAC input for dehumidification operation on dehumidification hot gas reheat equipped units. When 24VAC is applied to the D terminal, a 3-way valve solenoid is energized. The reheat coil located behind the evaporator coil is then active to reheat the supply air during cooling mode. This allows humidity to be removed from the air entering the unit without a large amount of sensible cooling capacity. During dehumidification, the indoor blower speed is reduced to help with the humidity removal. A humidity sensing thermostat or humidistat is required to control dehumidification operation.

Ventilation Features (Optional)

See ventilation instructions provided with unit for low voltage wiring.

Low Ambient Control (LAC)

The low ambient control is a pressure switch that is attached to the liquid line of the system and monitors high side pressure. Operation of the LAC occurs as outdoor temperatures drop below 60°F. On/Off and modulating controls are used which operate based on pressure changes caused by outdoor temperature changes. On/Off LAC operation cycles the condenser fan on/off to maintain desired liquid pressure while modulating LAC operation is factory adjusted and slows the condenser fan speed (rpm).

Outdoor Temperature Switch and Freeze Protection Thermostat

An outdoor temperature switch and an evaporator freeze protection thermostat is supplied with all units that have a low ambient control. The outdoor switch disables Balanced Climate mode (if enabled) when the temperature drops below 50°F. This prevents potential evaporator coil freeze up issues. For units with mechanical dehumidification, this switch must remain disconnected when Balanced Climate mode is not being used. Refer to unit wiring diagram. The freeze thermostat cuts out compressor operation if the evaporator begins to freeze up.

Alarm Relay Feature (Controls Option)

The alarm relay provides a set of NO (normally open) and NC (normally closed) pilot duty contacts that operate when the compressor control module locks out compressor operation because of a high or low system refrigerant pressure event.

DDC Controls Feature (Controls Option)

The DDC controls option provides additional sensors that can be used with a field-supplied advanced logic

controller. The DDC controls option contains the following installed components:

Dirty Filter Switch Indicator (DFS)

The switch is adjustable and measures pressure drop across the unit filter surface. When pressure drop is higher than the switch setting, NO contacts are provided to indicate the filter needs to be serviced. Refer to page 34 for instructions on making switch adjustments.

Discharge Air Sensor

The discharge air sensor provides a temperature reading of the supply air leaving the unit. The sensor is a 10K OHM @ 77°F measuring device. It is installed in the supply airstream in the heater bracket.

Airflow Switch

The airflow switch measures the pressure differential between the blower inlet and outlet. It is located directly above the blower partition. Relay contacts (NO) are provided for the DDC controls option that indicates the indoor blower assembly needs to be serviced.

Compressor Current Sensor

The compressor current sensor indicates when the compressor is operational by measuring amp draw. It is located inside the unit control panel. Relay contacts (NO) are provided to indicate the compressor is not operating See Table 4 for low voltage connections for DDC control.

TABLE 4
Low Voltage Connections for DDC Control

	Standard Units	Units w/ Economizers
Fan Only	Energize G	Energize G
1st Stage Cooling Mode/ Balanced Climate	Energize Y1, G	Energize Y1, G
2nd Stage Cooling Mode	Energize Y2 to overide Balanced Climate mode when Y1-Y2 jumper is removed	Energize Y1, Y2, G
1st Stage Heating	Energize B/W1	Energize B/W1
2nd Stage Heating (if employed)	Energize B/W1, W2	Energize B/W1, W2
Ventilation	Energize A	Energize A
Dehumidification (if employed)	Energize D	Energize D

TABLE 5
Wall Thermostats

Part Number	Predominate Features
8403-060 (1120-445)	3 stage Cool; 3 stage Heat; Electronic Programmable/Non-Programmable; HP or Conventional; Auto or Manual changeover; Dehumidification Output
CS9B-THOA	3 stage Cool, 3 stage Heat; Programmable/Non-Programmable; HP or Conventional; Auto or Manual Changeover; Humidity Sensor w/ dehumidification; Motion Sensor w/Intelligent Learning Control; BACnet-compatible
CS9B-THOCA	3 stage Cool, 3 stage Heat; Programmable/Non-Programmable; HP or Conventional; Auto or Manual Changeover; Humidity Sensor w/ dehumidification; CO_2 Sensor; Motion Sensor w/Intelligent Learning Control; BACnet-compatible
CS9BE-THOA	3 stage Cool, 3 stage Heat; Programmable/Non-Programmable; HP or Conventional; Auto or Manual Changeover; Humidity Sensor w/ dehumidification; Motion Sensor w/Intelligent Learning Control; BACnet-compatible; Ethernet-compatible
CS9BE-THOCA	3 stage Cool, 3 stage Heat; Programmable/Non-Programmable; HP or Conventional; Auto or Manual Changeover; Humidity Sensor w/dehumidification; CO_2 Sensor; Motion Sensor w/Intelligent Learning Control; BACnet-compatible; Ethernet-compatible
8403-089 (T4 Pro)	1 stage Cool, 1 stage Heat – Heat Pump; 1 stage Cool, 1 stage Heat – Conventional; Programmable/Non-Programmable Electronic; Auto or Manual changeover
8403-090 (T6 Pro)	2 stage Cool, 3 stage Heat – Heat Pump; 2 stage Cool, 2 stage Heat – Conventional; Programmable/Non-Programmable Electronic; Auto or Manual changeover
8403-091	1 stage Cool, 1 stage Heat; Non-Programmable; FEMA use
8403-092 (T6 Pro Wi-Fi)	2 stage Cool, 3 stage Heat – Heat Pump; 2 stage Cool, 2 stage Heat – Conventional; Programmable/Non-Programmable Electronic; Auto or Manual changeover; Wi-Fi

TABLE 6
Thermostat Wire Size

Transformer VA	FLA	Wire Gauge	Maximum Distance In Feet
55	2.3	18 gauge 16 gauge 14 gauge 12 gauge	60 100 160 250

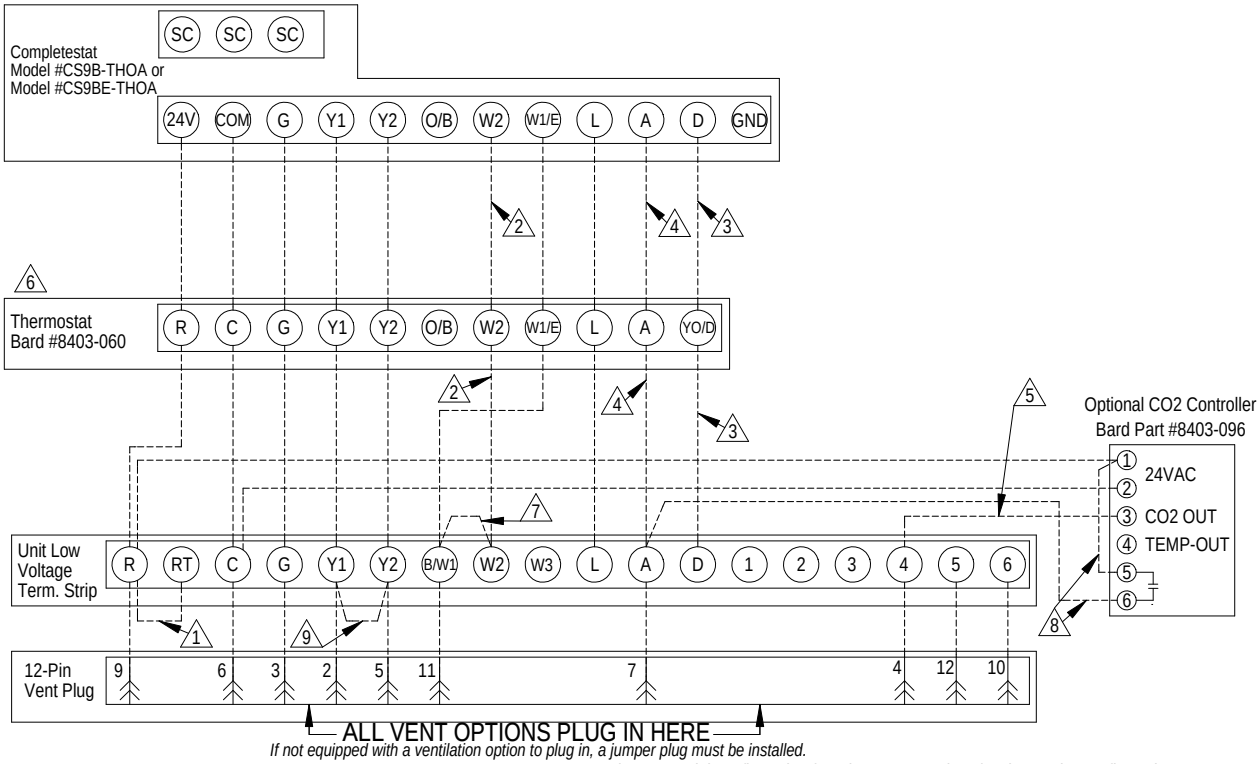
TABLE 7
Humidity Controls

Part Number	Predominate Features
8403-038 (H600A1014)	SPDT switching, pilot duty 50VA @ 24V; Humidity range 20-80% RH
8403-047 (H200-10-21-10)	Electronic dehumidstat SPST closes-on-rise; Humidity range 10-90% with adjustable stops

TABLE 8
CO_2 Controllers

Part Number	Predominate Features
8403-056	CO_2 ventilation control with digital display. Normally Open SPST (Default: Close at 800ppm)
8403-096	Normally Open SPST relay closes-on-rise 24V dual wave length sensor. Default setting 950ppm, adjustable to 0-2000ppm Default off setting 1000ppm, adjustable to 0-200 ppm can be calibrated

FIGURE 8
Programmable Thermostat Connections



If not equipped with a ventilation option to plug in, a jumper plug must be installed.

1. Factory installed jumper. Remove jumper and connect to N.C fire alarm circuit if emergency shutdown required.
2. Wire not needed below 15KW.
3. Wire required for dehumidification models only.
4. Do not connect "A" from thermostat if optional CO2 controller is used
5. 0-10 VDC modulating C02 control signal for modulating ventilation control (optional for ECON only - see vent instruction manuals)
6. Change model configuration from heat pump to heat/cool. Must be configured to programmable and fan set to be programmed fan for the "A" output to function during scheduled occupied periods. Must be configured for multi-stage for Y1 output to be active 1st stage cooling. For dehumidification, must be configured for "No Economizer" for YO/D to be active for humidity control.
7. Install jumper for 1 stage electric heat on units with more than 10KW
8. Do not add these wires if setting up for modulating control. See note 5.
9. Factory installed jumper. Remove jumper to activate Balanced Climate™ mode. A 2-stage thermostat is recommended for Balanced Climate mode.Y1 Y2 jumper not present if economizer is factory installed. Units with economizers have balanced climate jumper in economizer, refer to economizer manual.

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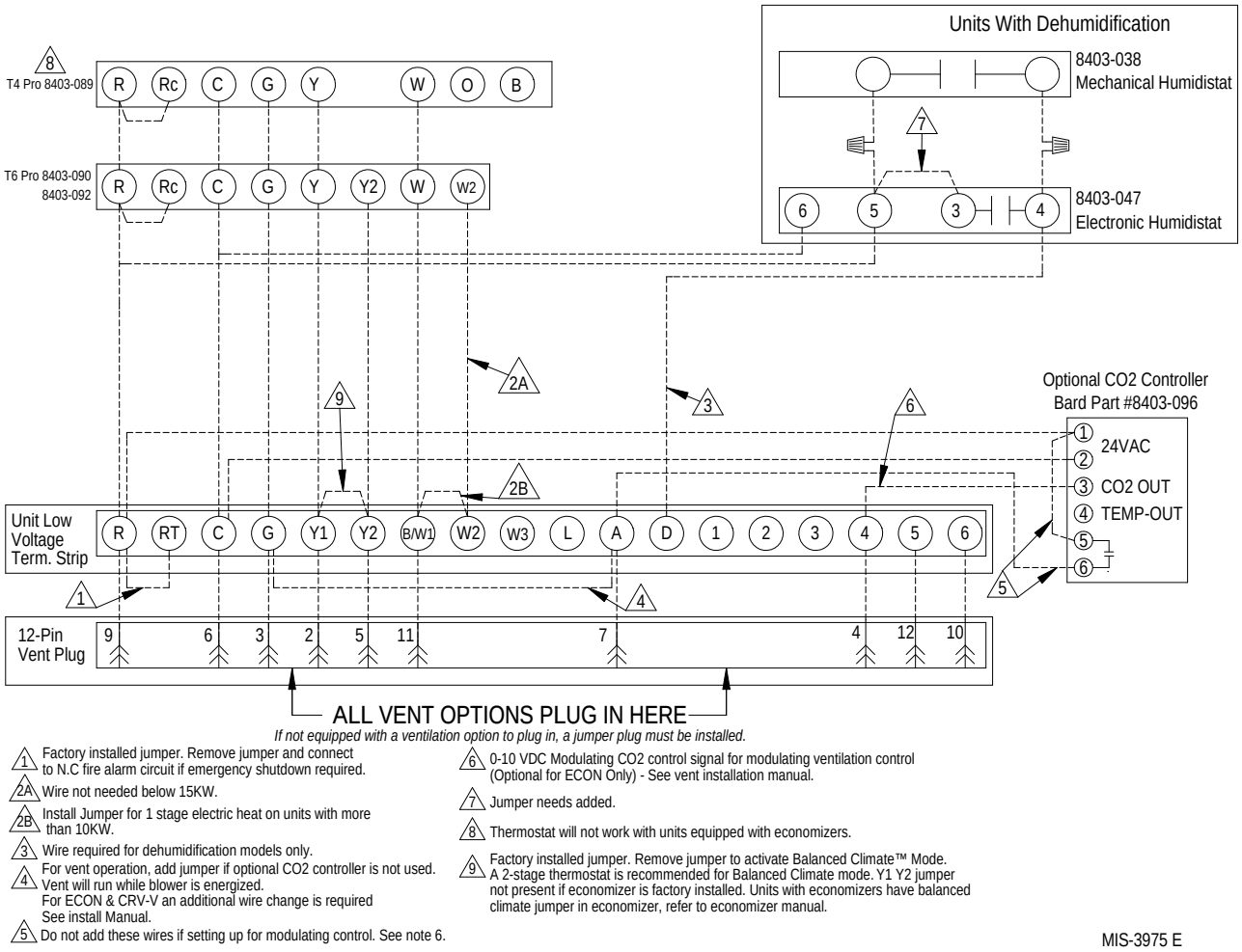
FIGURE 9
Thermostat Connections



If not equipped with a ventilation option to plug in, a jumper plug must be installed.

1. Factory installed jumper. Remove jumper and connect to N.C fire alarm circuit if emergency shutdown required.
2A. Wire not needed below 15KW.
2B. Install Jumper for 1 stage electric heat on units with more than 10KW.
3. Wire required for dehumidification models only.
4. For vent operation, add jumper if optional CO2 controller is not used. Vent will run while blower is energized. For ECON & CRV-V an additional wire change is required See install Manual.
5. Do not add these wires if setting up for modulating control. See note 6.
6. 0-10 VDC Modulating CO2 control signal for modulating ventilation control (Optional for ECON Only) - See vent installation manual.
7. Jumper needs added.
8. Thermostat will not work with units equipped with economizers.
9. Factory installed jumper. Remove jumper to activate Balanced Climate™ Mode. A 2-stage thermostat is recommended for Balanced Climate mode. Y1 Y2 jumper not present if economizer is factory installed. Units with economizers have balanced climate jumper in economizer, refer to economizer manual.

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NOTICE

These units require R-410A refrigerant and polyol ester oil.

General

1. Use separate service equipment to avoid cross contamination of oil and refrigerants.
2. Use recovery equipment rated for R-410A refrigerant.
3. Use manifold gauges rated for R-410A (800 psi/250 psi low).
4. R-410A is a binary blend of HFC-32 and HFC-125.
5. R-410A is nearly azeotropic—similar to R-22 and R-12. Although nearly azeotropic, charge with liquid refrigerant.
6. R-410A operates at 40-70% higher pressure than R-22 and systems designed for R-22 cannot withstand this higher pressure.
7. R-410A has an ozone depletion potential of zero, but must be reclaimed due to its global warming potential.
8. R-410A compressors use polyol ester oil.
9. Polyol ester oil is hygroscopic; it will rapidly absorb moisture and strongly hold this moisture in the oil.
10. A liquid line dryer must be used—even a deep vacuum will not separate moisture from the oil.
11. Limit atmospheric exposure to 15 minutes.
12. If compressor removal is necessary, always plug compressor immediately after removal. Purge with small amount of nitrogen when inserting plugs.

Topping Off System Charge

If a leak has occurred in the system, Bard Manufacturing recommends reclaiming, evacuating (see criteria above) and charging to the nameplate charge. If done correctly, topping off the system charge can be done without problems.

With R-410A, there are no significant changes in the refrigerant composition during multiple leaks and recharges. R-410A refrigerant is close to being an azeotropic blend (it behaves like a pure compound or single component refrigerant). The remaining refrigerant charge, in the system, may be used after leaks have occurred and then "top-off" the charge by utilizing the pressure charts on the inner control panel cover as a guideline.

REMEMBER: *When adding R-410A refrigerant, it must come out of the charging cylinder/tank as a liquid to avoid any fractionation, and to ensure optimal system performance. Refer to instructions for the cylinder that is being utilized for proper method of liquid extraction.*

Safety Practices

1. Never mix R-410A with other refrigerants.
2. Use gloves and safety glasses. Polyol ester oils can be irritating to the skin, and liquid refrigerant will freeze the skin.
3. Never use air and R-410A to leak check; the mixture may become flammable.
4. Do not inhale R-410A—the vapor attacks the nervous system, creating dizziness, loss of coordination and slurred speech. Cardiac irregularities, unconsciousness and ultimate death can result from breathing this concentration.
5. Do not burn R-410A. This decomposition produces hazardous vapors. Evacuate the area if exposed.
6. Use only cylinders rated DOT4BA/4BW 400.
7. Never fill cylinders over 80% of total capacity.
8. Store cylinders in a cool area, out of direct sunlight.
9. Never heat cylinders above 125°F.
10. Never trap liquid R-410A in manifold sets, gauge lines or cylinders. R-410A expands significantly at warmer temperatures. Once a cylinder or line is full of liquid, any further rise in temperature will cause it to burst.

Important Installer Note

For improved start up performance, wash the indoor coil with a dishwashing detergent.

High Pressure Switch

All W**A/W**L wall-mounted air conditioner series models are supplied with a remote reset for the high and low pressure switch. If tripped, the pressure switch may be reset by turning the thermostat off then back on again. High pressure switch settings: Opens 650 +/– 15 PSI, Closes 520 +/– 15 PSI.

Three Phase Scroll Compresser Start Up Information

Scroll compressors, like several other types of compressors, will only compress in one rotational direction. Direction of rotation is not an issue with single phase compressors since they will always start and run in the proper direction.

However, three phase compressors will rotate in either direction depending upon phasing of the power. Since there is a 50-50 chance of connecting power in such a way as to cause rotation in the reverse direction, verification of proper rotation must be made. Verification of proper rotation direction is made by observing that suction pressure drops and discharge pressure rises when the compressor is energized. Reverse rotation also results in an elevated sound level over that with correct rotation, as well as substantially reduced current draw compared to tabulated values.

Verification of ***proper rotation*** must be made at the time the equipment is put into service. If improper rotation is corrected at this time, there will be no negative impact on the durability of the compressor. However, reverse operation for over 1 hour may have a negative impact on the bearing due to oil pump out.

NOTE: *If compressor is allowed to run in reverse rotation for an extended period of time, the compressor's internal protector will trip.*

All three phase compressors are wired identically internally. As a result, once the correct phasing is determined for a specific system or installation, connecting properly phased power leads to the same Fusite terminal should maintain proper rotation direction.

The direction of rotation of the compressor may be changed by reversing any two line connections to the unit.

Phase Monitor

All units with three phase scroll compressors are equipped with a three phase line monitor to prevent compressor damage due to phase reversal.

The phase monitor in this unit is equipped with two LEDs. If the Y signal (call for cooling) is present at the phase monitor and phases are correct, the green LED will light.

If phases are reversed, the red fault LED will be lit and compressor operation is inhibited.

If a fault condition occurs, reverse two of the supply leads to the unit. ***Do not reverse any of the unit factory wires as damage may occur.***

Condenser Fan Operation

NOTE: *Certain models may be equipped with a low ambient control (LAC), and if so, the condenser fan motor will have a delayed start until system refrigerant operating pressure builds up. After starting, the fan motor may or may not cycle depending upon ambient conditions. This is normal operation.*

50 Hz models must have fan wired on low speed. These models are factory wired on low speed.

Service Hints

1. Caution owner/operator to maintain clean air filters at all times and also not to needlessly close off supply and return air registers. This reduces airflow through the system, which shortens equipment service life as well as increasing operating costs.
2. Check all power fuses or circuit breakers to be sure they are the correct rating.
3. Periodic cleaning of the outdoor coil to permit full and unrestricted airflow circulation is essential.

Sequence of Operation

Circuit R-Y1 makes at thermostat pulling in compressor contactor, starting the compressor and outdoor motor. (See ***NOTE*** under **CONDENSER FAN OPERATION** concerning models equipped with low ambient control.) The G (indoor motor) circuit is automatically completed by the thermostat on any call for cooling operation or can be energized by manual fan switch on subbase for constant air circulation. On a call for heating, circuit R-W1 makes at the thermostat pulling in heat contactor for the strip heat and blower operation. On a call for second stage heat, R-W2 makes bringing on second heat contactor, if so equipped.

Balanced Climate™ Mode

Balanced Climate™ is a great comfort feature that can easily be applied under any normal circumstances. If the Bard air conditioning system is being set up in a typical environment where 72°F is the lowest cooling setpoint, remove the Y1/Y2 jumper and install a 2-stage cooling thermostat. This will increase the humidity removal up to 35% and provide a much more comfortable environment.

NOTE: *Units with mechanical dehumidification require an additional connection to be made when enabling Balanced Climate. Refer to dehumidification supplemental instructions for this step.*

If the application is likely to require air conditioning operation below 60°F outdoor conditions, a low ambient control (LAC) kit must be installed. The LAC kit is equipped with an outdoor temperature switch that disables Balanced Climate mode when the outdoor temperature drops below 50°F. This prevents potential evaporator coil freeze up issues. The LAC kit also comes with an evaporator freeze protection thermostat that cuts out the compressor if the evaporator begins to freeze up.

If the unit is being installed with any ventilation package, a Bard LAC kit must be installed. Failure to utilize an LAC with any air conditioner can cause coil freeze up.

Balanced Climate can readily be applied to duct-free (supply and return air grille) applications. It may also be applied to ducted applications with **limited static**

of 0.20" ESP (total including both supply and return statics). Consult Bard Application Engineering for details prior to implementation.

CAUTION: *Balanced Climate is not a replacement for a dehumidification (hot gas reheat) unit for extreme applications, but rather an enhancement feature for limited climates and applications.*

Vent Connection Plug

All units are equipped with a vent connection plug in the side of the control panel for the different ventilation packages to plug in to. If the compressor will not start and there is no "Y1" at the compressor control module, first check to make sure that either the optional vent is plugged into the vent connection plug or the supplied jumper plug is in place. **The unit will not operate without anything plugged in.** This plug is located on the side of the control panel behind the front vent door (behind the filter access door). If the unit is supplied with a factory-installed vent package, it will be plugged in but the jumper plug will also be tethered next to the connection for troubleshooting purposes, if necessary.

Compressor Logic Control

The compressor logic control (CLC) is standard on all models covered by this manual.

Features

Delay-on-Make Timer
Short Cycle Protection/Delay-on-Break
Low Pressure Detection
High Pressure Detection
LPC and HPC Status LEDs
Test Mode

Delay-on-Make Timer

A delay-on-make timer is included to be able to delay startup of the compressor upon shore power disruption. The delay-on-make time period is 5 minutes plus 1% of the delay-on-break time period.

Short Cycle Protection/Delay-on-Break

An anti-short cycle timer is included to prevent short cycling the compressor. Once a compressor call is lost, the compressor logic control requires 5 minutes prior to re-energizing the compressor.

Low Pressure Detection

Low pressure switch monitoring allows for a lockout condition in a situation where the switch is open. If the low pressure switch remains open for more than 30 seconds, the CLC will de-energize the compressor for the delay-on-break time, flash the status LED light one (1) blink to indicate a trip and lockout the unit operation until the "Y" call to the CLC is cycled to the control or a loss of voltage is present at Y terminal for more than ½ second.

High Pressure Detection

High pressure switch monitoring allows for a lockout condition in a situation where the switch is open. If the high pressure switch opens, the CLC will de-energize the compressor and flash the LED light on the CLC two (2) blinks to indicate a soft lockout condition. If the high pressure switch closes again, it will then restart the compressor after the delay-on-break setting has expired on the device. If the switch trips again during the same thermostat call, the compressor will be de-energized, the LED will give four (4) blink indication of a hard lockout and the alarm terminal will be energized indicating an alarm. The unit operation can then be restored by cycling the "Y" call to the CLC off for more than ½ second to reset the lockout condition.

TABLE 9
LED Blink Codes

Blink	Function
Slow	Normal Function (1.0 sec on/1.0 sec off)
Fast	Compressor Delay Timer Active (0.1 sec on/0.1 sec off)
1	Low Pressure Switch Failure
2	High Pressure Switch Failure/ "Soft" Lockout
3	Defrost Mode Active
4	High Pressure Switch Failure/ "Hard" Lockout

Test Mode (Speedup)

For testing purposes, the delay-on-make and delay-on-break functions can be accelerated instead of waiting on the 5-minute delay. This can be accomplished by shorting across the speedup terminals on the compressor logic control (approx. 5 seconds). See Figure 10 on page 24.

Pressure Service Ports

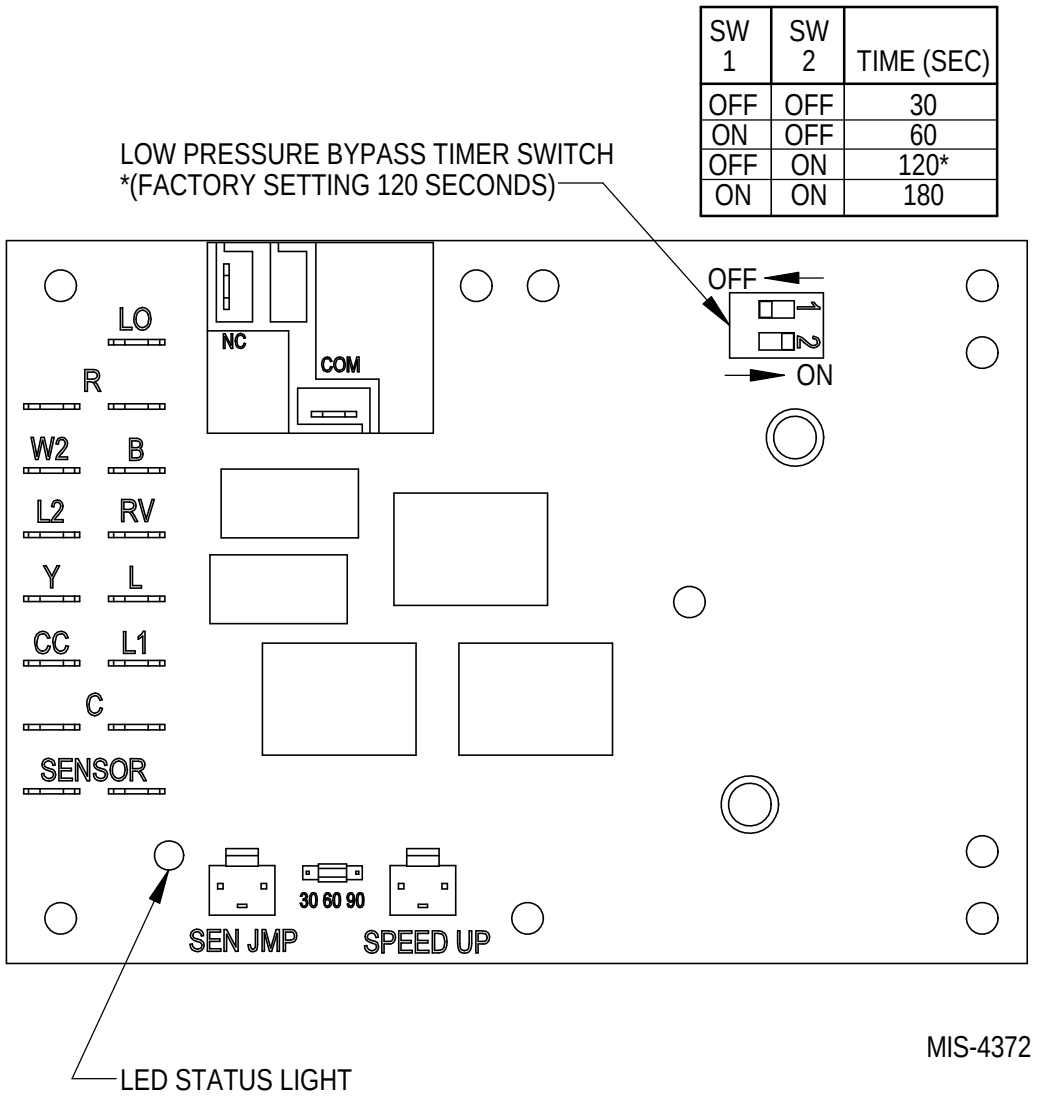
High and low pressure service ports are installed on all units so that the system operating pressures can be observed. Pressure tables covering all models can be found on pages 28 and 29. It is imperative to match the correct pressure table to the unit by model number.

This unit employs high-flow Coremax valves instead of the typical Shrader type valves.

WARNING! Do NOT use a Schrader valve core removal tool with these valves. Use of such a tool could result in eye injuries or refrigerant burns!

To change a Coremax valve without first removing the refrigerant, a special tool is required which can be

FIGURE 10
8201-129 Compressor Logic Control



obtained at www.fastestinc.com/en/SCCA07H. See the replacement parts manual for replacement core part numbers.

Troubleshooting NIDEC SELECTECH Series ECM Motors

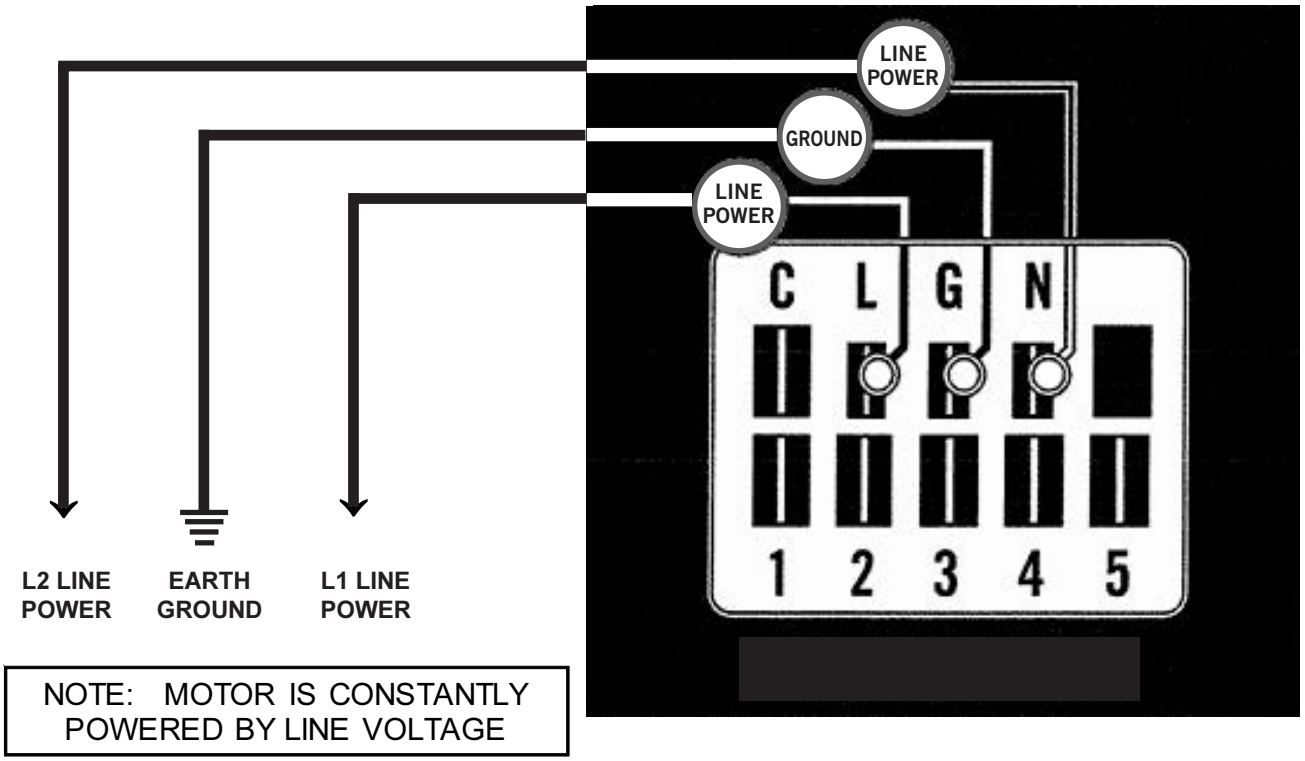
If the Motor Is Running

1. It is normal for the motor to rock back and forth on start up. Do not replace the motor if this is the only problem identified.
2. If the system is excessively noisy, does not appear to change speeds in response to a demand (Heat, Cool, Other) or is having symptoms during the cycle such as tripping limit or freezing coil, check the following:
   A. Wait for programmed delays to time out.
   B. Ensure that the motors control inputs are wired as shown in the factory-supplied wiring diagram to ensure motor is getting proper control signals and sequencing.
   C. Remove the filter and check that all dampers, registers and grilles are open and free flowing. If removing the filters corrects the problem, clean or replace with a less restrictive filter. Also check and clean the blower wheel or coil as necessary.
   D. Check the external static pressure (total of both supply and return) to ensure it is within the range as listed on the unit serial plate. If higher than allowed, additional duct work is needed.
   E. If the motor does not shut off at the end of the cycle, wait for any programmed delays to time out (no more than 90 seconds). Also make sure that there is no call for "Continuous Fan" on the G terminal.
   F. If the above diagnostics do not solve the problem, confirm the voltage checks in the next section below, then continue with the **Model SelecTech Communication Diagnostics**.

If the Motor Is Not Running

1. Check for proper high voltage and ground at the L/L1, G, N/L2 connections at the motor (see Figure 11). Correct any voltage issues before proceeding to the next step. The SelecTech motor is voltage specific. Only the correct voltage should be applied to the proper motor. Input voltage within plus or minus 10% of the nominal line power VAC is acceptable.

FIGURE 11
Motor Connections



2. If the motor has proper high voltage and ground at the L/L1, G, N/L2 connections, then continue with the **Model SelecTech Communication Diagnostics**.

Model SelecTech Communication Diagnostics

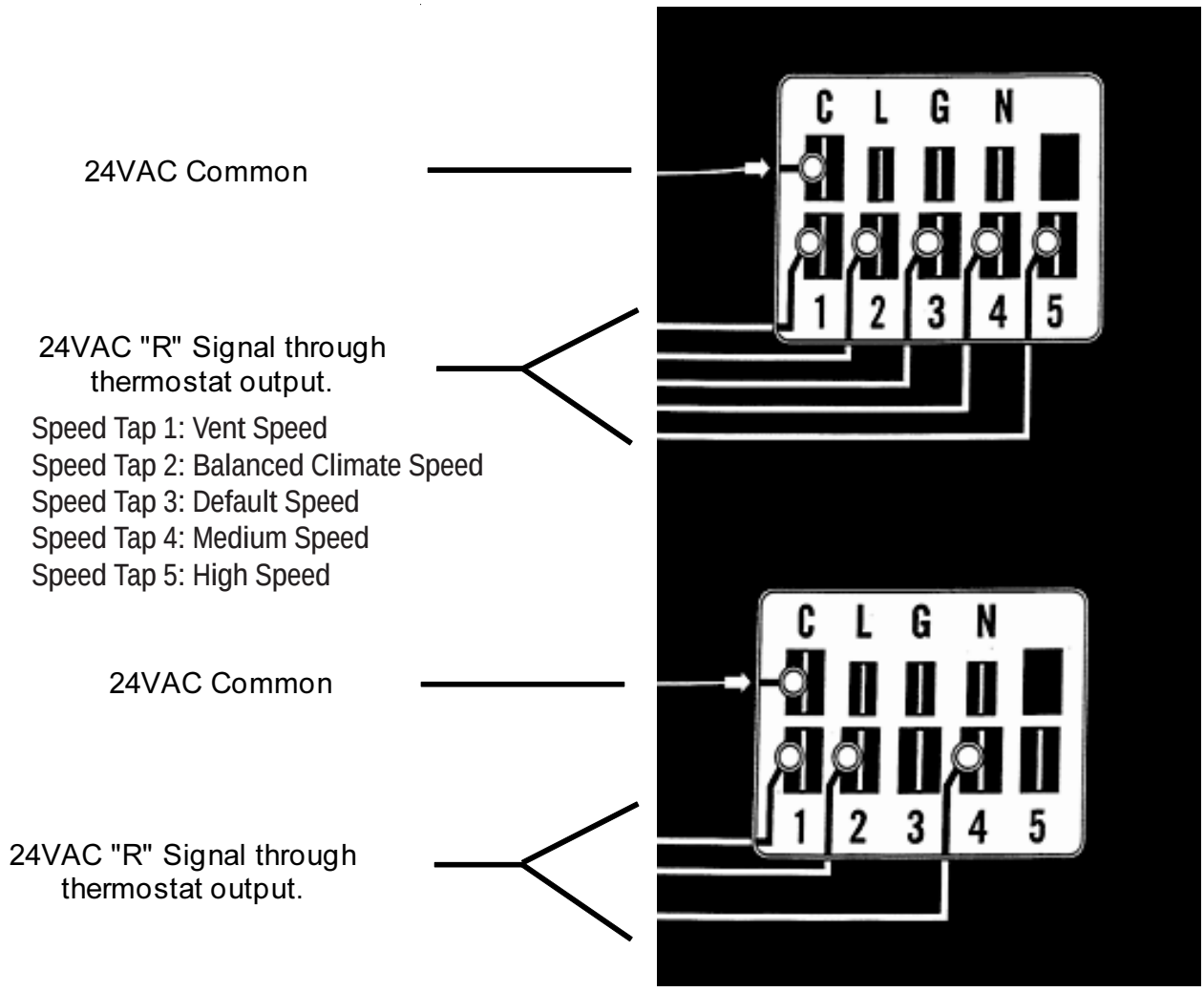
The SelecTech motor is communicated through 24 VAC low voltage (thermostat control circuit wiring).

1. Start with unit wiring diagram to confirm proper connections and voltage (see Figure 12).
2. Initiate a demand from the thermostat and check the voltage between the common and the appropriate motor terminal (1-5). (G input is typically on terminal #1, but always refer to wiring diagram.)

A. If the low voltage communication is not present, check the demand from the thermostat. Also check the output terminal and wire(s) from the terminal strip or control relay(s) to the motor.

B. If the motor has proper high voltage (verified in Step 1 of **If the Motor Is Not Running** on page 21), proper low voltage to a programmed terminal and is not operating, the motor is failed and will require replacement.

FIGURE 12
Motor Connections



Fan Blade Setting Dimensions

Shown in Figure 13 is the correct fan blade setting for proper air delivery across the outdoor coil. Refer to Table 10 for unit specific dimension.

Any service work requiring removal or adjustment in the fan and/or motor area will require that the dimensions below be checked and blade adjusted in or out on the motor shaft accordingly.

FIGURE 13
Fan Blade Setting

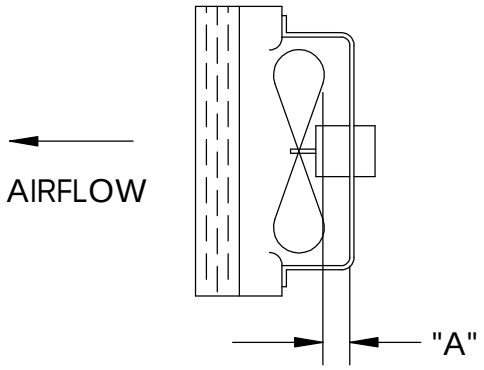


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TABLE 10
Fan Blade Dimensions

Model	Dimension A
W18AB/W18LB W24AB/W24LB	1.00"
W30AB/W30LB W36AB/W36LB	1.25"

R-410A Refrigerant Charge

This unit was charged at the factory with the quantity of refrigerant listed on the serial plate. AHRI capacity and efficiency ratings were determined by testing with this refrigerant charge quantity.

The pressure tables on the following pages show nominal pressures for the units. Since many installation specific situations can affect the pressure readings, this information should only be used by certified technicians as a guide for evaluating proper system performance. They shall not be used to adjust charge. If charge is in doubt, reclaim, evacuate and recharge the unit to the serial plate charge.

Removal of Fan Shroud

1. Disconnect all power to the unit.
2. Remove the screws holding both grilles, one on each side of unit, and remove grilles.
3. Remove nine screws holding fan shroud to condenser and bottom.
4. Unwire condenser fan motor.
5. Slide complete motor, fan blade and shroud assembly out the left side of the unit.
6. Service motor/fan as needed.
7. Reverse steps to reinstall.

TABLE 11
Cooling Pressure – Standard Airflow

Air Temperature Entering Outdoor Coil °F

Model	Return Air Temp (DB/WB)	Pressure	75	80	85	90	95	100	105	110	115	120	125	131
W18A/L	75/62	Low Side	120	122	126	129	132	134	137	138	139	141	142	144
		High Side	296	318	340	364	388	413	440	466	494	524	553	590
	80/67	Low Side	128	131	135	138	141	143	146	148	149	151	152	154
		High Side	304	326	349	373	398	424	451	478	507	537	567	605
	85/72	Low Side	132	136	140	143	146	148	151	153	154	156	157	159
		High Side	315	337	361	386	412	439	467	495	525	556	587	626
W24A/L	75/62	Low Side	123	125	127	129	132	134	136	137	139	141	143	146
		High Side	302	323	344	367	391	415	441	467	494	523	552	589
	80/67	Low Side	132	134	136	138	141	143	145	147	149	151	153	156
		High Side	310	331	353	376	401	426	452	479	507	536	566	604
	85/72	Low Side	137	139	141	143	146	148	150	152	154	156	158	161
		High Side	321	343	365	389	415	441	468	496	525	555	586	625
W30A/L	75/62	Low Side	122	124	126	129	131	133	135	137	138	140	142	143
		High Side	317	337	360	383	409	435	462	490	520	551	583	622
	80/67	Low Side	130	133	135	138	140	142	144	146	148	150	152	153
		High Side	325	346	369	393	419	446	474	503	533	565	598	638
	85/72	Low Side	135	138	140	143	145	147	149	151	153	155	157	--*
		High Side	336	358	382	407	434	462	491	521	552	585	619	
W36A/L	75/62	Low Side	128	130	132	133	135	137	138	140	142	144	146	148
		High Side	318	339	362	385	410	436	463	491	521	552	583	623
	80/67	Low Side	137	139	141	142	144	146	148	150	152	154	156	158
		High Side	326	348	371	395	421	447	475	504	534	566	598	639
	85/72	Low Side	142	144	146	147	149	151	153	155	157	159	161	--*
		High Side	337	360	384	409	436	463	492	522	553	586	619	

Low side pressure ± 4 PSIG
High side pressure ± 10 PSIG

Tables are based upon rated CFM (airflow) across the evaporator coil. If there is any doubt as to correct operating charge being in the system, the charge should be removed and system evacuated and recharged to serial plate charge weight.

NOTE: *Pressure table based on high speed condenser fan operation. If condensing pressures appear elevated check condenser fan wiring. See* **Condenser Fan Operation** *on page 22.*

** Operating at these conditions would be outside the compressor operating envelope and is not recommended.*

TABLE 12
Cooling Pressure – Balanced Climate Airflow

Air Temperature Entering Outdoor Coil °F

Model	Return Air Temp (DB/WB)	Pressure	75	80	85	90	95	100	105	110	115	120	125	131
W18A/L	75/62	Low Side	117	119	121	122	124	126	129	131	133	135	137	139
		High Side	295	317	338	362	385	410	436	463	491	520	550	587
	80/67	Low Side	125	127	129	131	133	135	138	140	142	144	146	149
		High Side	303	325	347	371	395	421	447	475	504	533	564	602
	85/72	Low Side	129	131	134	136	138	140	143	145	147	149	151	154
		High Side	314	336	359	384	409	436	463	492	522	552	584	623
W24A/L	75/62	Low Side	116	118	120	122	123	125	128	130	132	135	137	139
		High Side	296	318	339	362	385	410	434	460	488	515	544	579
	80/67	Low Side	124	126	128	130	132	134	137	139	141	144	146	149
		High Side	304	326	348	371	395	420	445	472	500	528	558	594
	85/72	Low Side	128	130	132	135	137	139	142	144	146	149	151	154
		High Side	315	337	360	384	409	435	461	489	518	546	578	615
W30A/L	75/62	Low Side	117	120	122	124	126	128	130	132	134	135	137	138
		High Side	312	334	357	381	406	432	458	486	514	543	572	609
	80/67	Low Side	125	128	130	133	135	137	139	141	143	144	146	148
		High Side	320	343	366	391	416	443	470	498	527	557	587	625
	85/72	Low Side	129	132	135	138	140	142	144	146	148	149	151	153
		High Side	331	355	379	405	431	459	486	515	545	576	608	647
W36A/L	75/62	Low Side	120	122	123	124	126	128	130	132	135	137	138	141
		High Side	312	332	354	377	402	427	454	483	513	543	576	616
	80/67	Low Side	128	130	132	133	135	137	139	141	144	146	148	151
		High Side	320	341	363	387	412	438	466	495	526	557	591	632
	85/72	Low Side	132	135	137	138	140	142	144	146	149	151	153	156
		High Side	331	353	376	401	426	453	482	512	544	576	612	654

Low side pressure ± 4 PSIG
High side pressure ± 10 PSIG

Tables are based upon Balanced Climate CFM (airflow) across the evaporator coil. If there is any doubt as to correct operating charge being in the system, the charge should be removed and system evacuated and recharged to serial plate charge weight.

NOTE: *Pressure table based on high speed condenser fan operation. If condensing pressures appear elevated check condenser fan wiring. See* **Condenser Fan Operation** *on page 22.*

TABLE 13
Electrical Specifications – W**AB Series

Model	Rated Volts & Phase	No. Field Power Circuits	Single Circuit				Multiple Circuit							
			① Minimum Circuit Ampacity	② Maximum External Fuse or Ckt. Brkr.	③ Field Power Wire Size	③ Ground Wire	① Minimum Circuit Ampacity		② Maximum External Fuse or Ckt. Breaker		③ Field Power Wire Size		③ Ground Wire Size	
							Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B
W18AB-A00, A0Z	230/208-1	1	16	20	12	12								
A05		1	30	30	10	10								
A08		1	45	45	8	10								
A10		1	56	60	6	10								
W24AB-A00, A0Z	230/208-1	1	21	25	10	10								
A05		1	30	30	10	10								
A08		1	46	50	8	10								
A10		1	57	60	6	10								
W24AB-B00, B0Z	230/208-3	1	15	20	12	12								
B06		1	23	25	10	10								
W24AB-C00, C0Z	460-3	1	8	15	14	14								
C06		1	12	15	14	14								
W30AB-A00, A0Z	230/208-1	1	23	35	8	10								
A05		1	31	35	8	10								
A08		1	47	50	8	10								
A10		1	57	60	6	10								
A15		1 or 2	83	90	4	8	57	26	60	30	6	10	10	10
W30AB-B00, B0Z	230/208-3	1	17	20	12	12								
B06		1	23	25	10	10								
B09		1	32	35	8	10								
B15		1	50	50	8	10								
W30AB-C00, C0Z	460-3	1	9	15	14	14								
C06		1	12	15	14	14								
C09		1	16	20	12	12								
C12		1	21	25	10	10								
C15		1	25	25	10	10								
W36AB-A00, A0Z	230/208-1	1	27	35	8	10								
A05		1	32	35	8	10								
A08		1	48	50	8	10								
A10		1	58	60	6	10								
A15		1 or 2	84	90	4	8	58	26	60	30	6	10	10	10
W36AB-B00, B0Z	230/208-3	1	20	25	10	10								
B06		1	24	25	10	10								
B09		1	33	35	8	10								
B15		1	51	60	6	10								
W36AB-C00, C0Z	460-3	1	11	15	14	14								
C06		1	12	15	14	14								
C09		1	17	20	12	12								
C15		1	26	30	10	10								
W36ABRC00, RC0Z	460-3	1	12	15	14	14								
RC06		1	12	15	14	14								
RC09		1	18	20	12	12								
RC15		1	27	30	10	10								

① These "Minimum Circuit Ampacity" values are to be used for sizing the field power conductors. Refer to the National Electrical code (latest version), Article 310 for power conductor sizing. ***CAUTION:*** *When more than one field power circuit is run through one conduit, the conductors must be derated. Pay special attention to note 8 of Table 310 regarding Ampacity Adjustment Factors when more than three (3) current carrying conductors are in a raceway.*

② Maximum size of the time delay fuse or circuit breaker for protection of field wiring conductors.

③ Based on 75°copper wire. All wiring must conform to the National Electrical Code and all local codes.

NOTE: *The Maximum Overcurrent Protection (MOCP) value listed is the maximum value as per UL 1995 calculations for MOCP (branch-circuit conductor sizes in this chart are based on this MOCP). The actual factory-installed overcurrent protective device (circuit breaker) in this model may be lower than the maximum UL 1995 allowable MOCP value, but still above the UL 1995 minimum calculated value or Minimum Circuit Ampacity (MCA) listed.*

IMPORTANT: *While this electrical data is presented as a guide, it is important to electrically connect properly sized fuses and conductor wires in accordance with the National Electrical Code and all local codes.*

TABLE 14
Electrical Specifications – W**LB Series

Model	Rated Volts & Phase	No. Field Power Circuits	Single Circuit				Multiple Circuit							
			① Minimum Circuit Ampacity	② Maximum External Fuse or Ckt. Brkr.	③ Field Power Wire Size	③ Ground Wire	① Minimum Circuit Ampacity		② Maximum External Fuse or Ckt. Breaker		③ Field Power Wire Size		③ Ground Wire Size	
							Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B
W18LB-A00, A0Z	230/208-1	1	16	20	12	12								
A05		1	30	30	10	10								
A08		1	46	50	8	10								
A10		1	56	60	6	10								
W24LB-A00, A0Z	230/208-1	1	21	25	10	10								
A05		1	30	35	8	10								
A08		1	46	50	8	10								
A10		1	57	60	6	10								
W24LB-B00, B0Z	230/208-3	1	15	20	12	14								
B06		1	23	25	10	10								
W30LB-A00, A0Z	230/208-1	1	23	35	8	10								
A05		1	31	35	8	10								
A08		1	46	50	8	10								
A10		1	57	60	6	10								
A15		1 or 2	83	90	4	8	57	26	60	30	6	10	10	10
W30LB-B00, B0Z	230/208-3	1	17	20	12	12								
B09		1	32	35	8	10								
B15		1	50	50	8	10								
W30LB-C00, C0Z	460-3	1	9	15	14	14								
C09		1	16	20	12	12								
C15		1	26	30	10	10								
W36LB-A00, A0Z	230/208-1	1	27	35	8	10								
A05		1	32	35	8	10								
A10		1	58	60	6	10								
A15		1 or 2	84	90	4	8	58	26	60	30	6	10	10	10
W36LB-B00, B0Z	230/208-3	1	20	25	10	10								
B09		1	33	35	8	10								
B15		1	51	60	6	10								
W36LB-C00, C0Z	460-3	1	11	15	14	14								
C09		1	18	20	12	12								
C15		1	26	30	10	10								
W36LBRC00, RC0Z	460-3	1	12	15	14	14								
RC09		1	18	20	12	12								
RC15		1	27	30	10	10								

① These "Minimum Circuit Ampacity" values are to be used for sizing the field power conductors. Refer to the National Electrical code (latest version), Article 310 for power conductor sizing. ***CAUTION:*** *When more than one field power circuit is run through one conduit, the conductors must be derated. Pay special attention to note 8 of Table 310 regarding Ampacity Adjustment Factors when more than three (3) current carrying conductors are in a raceway.*

② Maximum size of the time delay fuse or circuit breaker for protection of field wiring conductors.

③ Based on 75°copper wire. All wiring must conform to the National Electrical Code and all local codes.

NOTE: *The Maximum Overcurrent Protection (MOCP) value listed is the maximum value as per UL 1995 calculations for MOCP (branch-circuit conductor sizes in this chart are based on this MOCP). The actual factory-installed overcurrent protective device (circuit breaker) in this model may be lower than the maximum UL 1995 allowable MOCP value, but still above the UL 1995 minimum calculated value or Minimum Circuit Ampacity (MCA) listed.*

IMPORTANT: *While this electrical data is presented as a guide, it is important to electrically connect properly sized fuses and conductor wires in accordance with the National Electrical Code and all local codes.*

Setting Unit Airflow

The unit is set from the factory at the default speed. Most units have three selectable cooling speed taps that can be utilized. The default speed is the lowest cooling speed. The two higher speed taps can be used for higher duct static applications so that the unit can maintain the recommended airflow as shown in Table 15. The higher speeds can also be used when higher sensible cooling is desired. To change to the higher speed taps, move the orange/black wire on the blower speed terminal block to either MED or HI. Refer to Table 17 on page 36 for the corresponding airflow of each tap. Set the unit duct static based on the highest airflow that the unit will run at.

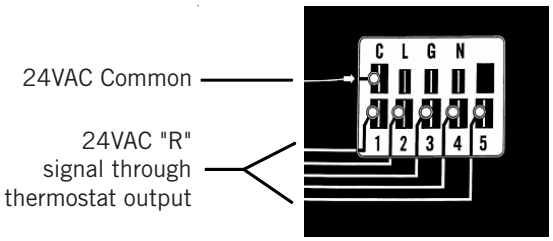
NOTE: *Be sure to adjust the system static or blower speed to maintain airflows above the minimum recommendations to prevent freeze up conditions if Balanced Climate mode is activated.*

Do not operate the unit in Balanced Climate mode if running high static applications as indicated in the blower performance table. If Balanced Climate mode is activated as described on page 17, the unit will run in this mode at all times unless there is a call for ventilation, electric heat or 2nd stage cooling from a 2-stage thermostat. At that time, the unit will automatically activate a higher speed tap.

Blower Speeds

Five factory programmed speed taps (torque settings) are available for the motor, and are selected through different unit modes of operation. These modes are energized by 24VAC signals from the low voltage terminal block located inside the control panel by a thermostat or other controlling device. Each speed tap is programmed by Bard at the factory to different motor torque settings (see Figure 14).

FIGURE 14
Speed Taps



Speed Tap 1: Vent Speed
Speed Tap 2: Balanced Climate Speed
Speed Tap 3: Default Speed
Speed Tap 4: Medium Speed
Speed Tap 5: High Speed

Multiple motor speed taps may be energized simultaneously by 24VAC power during different modes of operation. The highest number speed tap energized takes priority with 5 being the highest and 1 being the lowest. See Table 16 for the corresponding blower speeds with the different modes of operation.

Programmed blower speed taps are as follows (see also Figure 15):

Speed Tap 1: **Vent/blower only** speed

Speed Tap 2: **Balanced Climate** speed

Speed Tap 3: **Default LO cooling & heating** speed. Energized by default for cooling operation through the blower speed tap selection and is labeled as LO.

Speed Tap 4: **Optional MED Cooling & heating** speed. Selected manually through the blower speed tap selection and is labeled as MED.

Speed Tap 5: **Optional HI cooling & heating** speed. Selected manually through the blower speed tap selection and is labeled as HI.

TABLE 15
Recommended Airflow

Model	Nominal Rated CFM*	Nominal Rated ESP*	Recommended Airflow Range	Factory Speed Connection
W18A W18L	600	.10	550 - 725	Default
W24A W24L	800	.10	700 - 950	
W30A W30L	950	.15	900 - 1125	
W36A W36L	1150	.15	1000 - 1200	

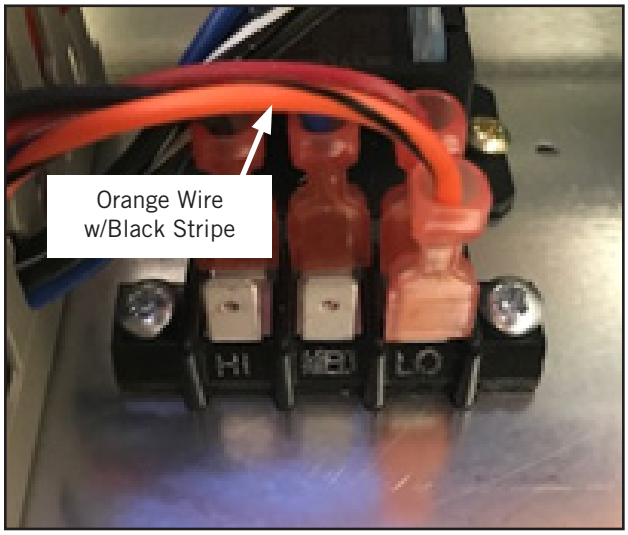
* Rated CFM and ESP on factory speed connection.

TABLE 16
Blower Speeds for Unit Operational Modes

Unit Operation	Thermostat Inputs – 24VAC							Speed Taps			Blower Speed	Compressor Operation
	G	Y1	Y2	W1	W2	A	D	1	2	3-4-5[1]		
Blower Only	X							X			Vent/Blower Only	Off
Balanced Climate Cooling	X	X						X	X		Balanced Climate	On
Full Load Cool	X	X	X					X	X	X	Lo/Med/Hi	On
1st Stage Heat				X						X	Lo/Med/Hi	Off
2nd Stage Heat				X	X					X	Lo/Med/Hi	Off
Dehumidify[2]							X	X	X		Balanced Climate	On

[1] Fan speed is selectable through the blower speed control terminal block. LO (default), MED or HI speeds can be used.
[2] Dehumidification operation is disabled when a call for heating or cooling occurs. Unit runs at Balanced Climate speed during dehumidification operation.

FIGURE 15
Speed Taps



Speed Tap 1 – Vent/Blower Only

Speed taps 1 and 3 are programmed to identical torque settings in the ECM motor. This means that if speed tap 1 is energized, the airflow amount will be the same as default airflow. Tap 1 is used when a vent is installed and ventilation is called for by energizing the A terminal of the low voltage terminal block with 24VAC. Speed tap 1 is the lowest priority; if any of the other speed taps are energized, they will override speed tap 1.

Speed Tap 2 – Balanced Climate

Speed tap 2 is programmed to a lower than rated speed in the ECM motor. In order for Balanced Climate speed to be used during compressor cooling mode, the jumper between Y1 and Y2 must be removed. This means that if speed tap 2 is energized, the airflow amount will be lower than default airflow. Tap 2 is used when Balanced Climate is called for by energizing the Y1 terminal of the low voltage terminal block with 24VAC. Speed tap 2 is overridden if taps 3, 4, or 5 are energized.

Speed Tap 3 – Default LO Cooling & Heating

Speed tap 3 is programmed for rated speed in the SelecTech motor. This means that if speed tap 3 is energized, the airflow amount will be the default airflow. Tap 3 is used by default when cooling is called for by energizing the Y1 terminal of the low voltage terminal block with 24VAC. The unit is shipped with the jumper between Y1 and Y2 installed and it must be removed to use Balanced Climate mode. The unit is shipped with the orange/black wire connected to terminal LO (rated speed) on the blower selection speed terminal block. Speed tap 3 can be overridden if taps 4 or 5 are energized by changing the position of the orange/black wire on the blower selection speed terminal block to MED (4) or HI (5) positions.

Speed Tap 4 – Optional MED Cooling & Heating

Speed tap 4 is programmed to a higher than rated speed in the ECM motor. This is a user-selectable airflow amount that will be higher than rated airflow. Tap 4 is used for cooling operation if the orange/black wire on the blower speed selection terminal block is moved to MED. Speed tap 4 can be overridden if tap 5 is energized.

Speed Tap 5 – Optional HI Cooling & Heating

Speed tap 5 is programmed to the highest speed in the ECM motor. This is a user-selectable airflow amount that will provide the highest rated airflow. Tap 5 is used for cooling operation if the orange/black wire on the blower speed selection terminal block is moved to HI.

Dirty Filter Switch

1. Disconnect all power to the unit. Remove control panel outer cover and upper front panel.
2. The dirty filter switch is located on top of the filter partition to the right of the blower wheels on W**AB units and to the left of the blower wheels on W**LB units (see Figure 16). The dirty filter indicator light and reset switch is attached to the side of the control panel on the right side of the filter access opening on W**AB units and on the left side of the filter access opening on W**LB units. Remove the cover on the dirty filter switch and ensure the knob is set at 0.4" W.C. (see Figure 17). This is only a recommended starting point prior to making switch adjustments. Switch setting is highly dependent on filter type used, blower speed, unit ducting and other unit installation characteristics. See **Dirty Filter Switch Adjustment** for instructions on how to make proper switch adjustments.
3. Re-install upper front panel.

Dirty Filter Switch Adjustment

1. Apply power to the unit.
2. Turn the unit indoor blower on (energize R-G on low voltage terminal board).
3. With air filters installed and switch initially set at 0.4" W.C. (see Step 2 under **Dirty Filter Switch**), begin restricting the air filter of the unit using a piece of cardboard under the filters until the switch trips and the light comes on. If the filter is restricted by 75% (or desired restriction amount), skip to Step 6.
4. If switch setting adjustment is required, disconnect power to the unit. Remove the upper front panel and the cover on the airflow switch so that adjustment can be made. If the switch tripped before 75% restriction was reached, turn the knob slightly clockwise. If the switch tripped after 75%, turn the knob counter-clockwise (see Figure 17).
5. Replace the upper front panel and repeat Steps 1-3. Continue to make adjustments described in Step 4 until the desired restriction is obtained.
6. Remove the restriction and reset the filter switch. Replace the switch cover once adjustment is complete.
7. Install the outer control panel cover. This completes the adjustment.

FIGURE 16
Dirty Filter Switch Location

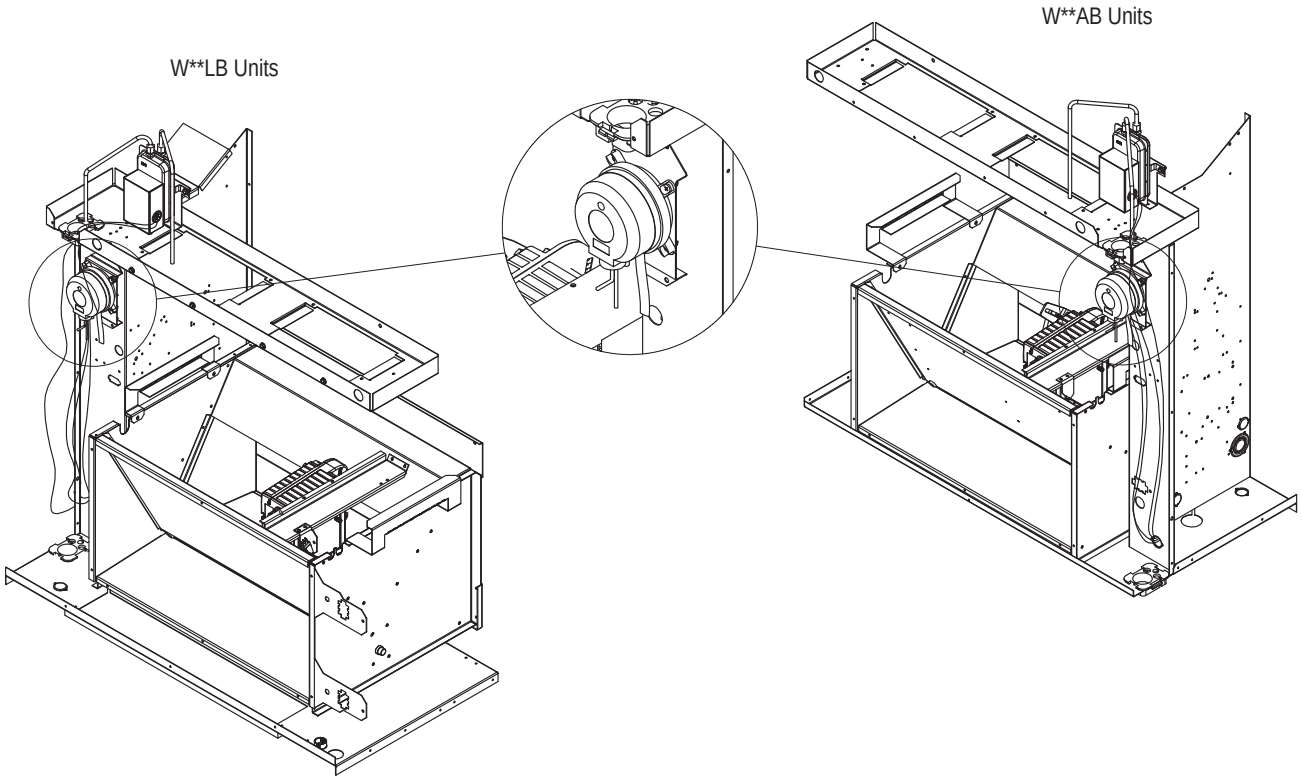
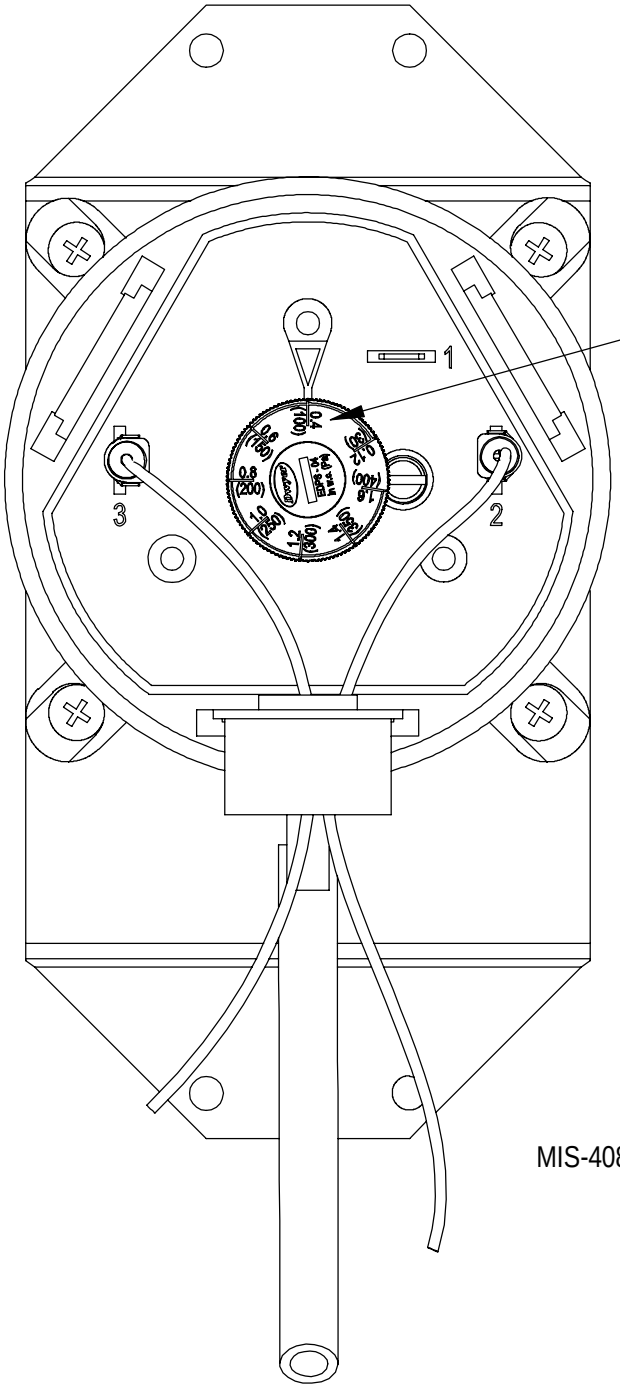


FIGURE 17
Adjusting Dirty Filter Switch



TURN CLOCKWISE TO INCREASE RESTRICTION AMOUNT REQUIRED TO ACTIVATE THE SWITCH AND COUNTER-CLOCKWISE TO DECREASE RESTRICTION AMOUNT

MIS-4086 B

TABLE 17
Indoor Blower Performance

	E.S.P.[1] (In. H_2O)	Balanced Climate™ Speed		Default LO Cooling & Heating/ Ventilation Speed[2]		Optional MED Cooling & Heating Speed		Optional HI Cooling & Heating Speed	
		Dry Coil	Wet Coil	Dry Coil	Wet Coil	Dry Coil	Wet Coil	Dry Coil	Wet Coil
W18AB/W18LB	0.00	520	510	680	665	Dedicated electric heat speed (same airflows as W24AB/LB default airflows)		865	855
	0.10	435	420	615	600			810	800
	0.15	395	380	585	565			785	770
	0.20			555	535			760	745
	0.25			525	510			735	720
	0.30			495	480			710	695
	0.40			440	425			665	650
	0.50			385	375			620	605
W24AB/W24LB	0.00	630	625	890	835	1005	980	1025	1035
	0.10	580	565	825	800	960	930	990	980
	0.15	550	535	795	780	935	910	975	955
	0.20	525	500	770	755	910	885	955	930
	0.25			740	730	890	865	935	910
	0.30			715	705	870	840	915	885
	0.40			670	650	825	805	870	845
	0.50			630	585	785	765	825	805
W30AB/W30LB	0.00	830	825	1050	1020	1170	1135	1200	1205
	0.10	765	745	1000	975	1120	1105	1170	1155
	0.15	730	705	975	950	1095	1085	1150	1130
	0.20	700	670	950	925	1070	1060	1130	1105
	0.25			920	900	1050	1040	1110	1080
	0.30			890	870	1025	1015	1085	1055
	0.40			830	815	975	955	1040	1000
	0.50			770	755	930	890	985	945
W36AB/W36LB	0.00	925	900	1255	1225	1365	1345	1495	1480
	0.10	850	825	1205	1175	1320	1300	1445	1425
	0.15	815	790	1180	1150	1295	1275	1415	1395
	0.20	780	755	1155	1125	1275	1250	1385	1360
	0.25			1130	1100	1250	1220	1350	1320
	0.30			1100	1070	1225	1195	1310	1280
	0.40			1050	1015	1180	1140	1225	1185
	0.50			1000	960	1130	1075	1130	1075

[1] E.S.P. is the total combined external static pressure of both the supply and return ducts or grills.
[2] This is the speed set at the factory.

TABLE 18
Maximum ESP of Operation
Electric Heat Only

Model	W18A/L, W24A/L	W30A/L, W36A/L	
Outlet	FRONT	FRONT	
Speed	Single	High	Low
-A0Z	.50	.50	.50
-A05	.50	.50	.50
-A08	.50	.50	.50
-A10	.30	.40	.35
-A15		.40	.35
-B0Z	.50	.50	.50
-B06	.40	.50	.40
-B09		.50	.50
-B15		.35	.30
-C0Z	.50	.50	.50
-C06	.50	.50	.50
-C09		.50	.40
-C15		.45	.35

Values shown are for units equipped with standard 1" throwaway filter or 1" washable filter.

Derate ESP by .15 for 2" pleated filters.

TABLE 19
Electric Heat

Models	240V-1		208V-1		240V-3		208V-3		460V-3	
KW	Amps	BTUH	Amps	BTUH	Amps	BTUH	Amps	BTUH	Amps	BTUH
5	20.8	17065	18.1	12800						
6					14.4	20500	12.5	15360	7.2	20500
8	33.3	27300	28.8	20475						
9					21.7	30600	18.7	23030	10.8	30700
10	41.6	34130	36.2	25600						
15	62.5	51250	54.0	38400	36.2	51200	31.2	38400	18.0	51200

TABLE 20
Vent and Control Options

Part Number	Description	W18, W24	W30, W36
CMA-14	ODT	X	X
CMC-15	Start Kit (230V 1-Phase)	X	X
CMC-31	Dirty Filter Sensor Kit	X	X
CMC-34	Alarm Relay	X	X
CMC-36	Crankcase Heater (230V)	X	X
CMC-37	Crankcase Heater (460V	X	X
CMA-37	LAC - Modulating (230V)	X	
CMA-38	LAC - Modulating (460V)	X	
CMA-39	LAC - On/Off		X
CMA-40	DDC	X	X
BOP2	Blank Off Plate	X	
FAD-NE2	Fresh Air Damper - No Exhaust	X	
FAD-BE2	Fresh Air Damper - Barometric Exhaust	X	
CRV-F2-*	Commercial Ventilator - On/Off, Spring Return	X	
CRV-V2-*	Commercial Ventilator - 0-10V, Spring Return	X	
ECON-NC2-*	Economizer - Bldg. Equipment, 0-10V, No Controls	X	
ECON-S2-*	Economizer - School	X	
ECON-WD2-*	Economizer - Bldg. Equipment, Enthalpy	X	
ECON-DB2-*	Economizer - Bldg. Equipment, Temperature	X	
ERV-FA2-*	Energy Recovery Ventilator (230V)	X	
ERV-FC2-*	Energy Recovery Ventilator (460V)	X	
BOP3	Blank Off Plate		X
FAD-NE3	Fresh Air Damper - No Exhaust		X
FAD-BE3	Fresh Air Damper - Barometric Exhaust		X
CRV-F3-*	Commercial Ventilator - On/Off, Spring Return		X
CRV-V3-*	Commercial Ventilator - 0-10V, Spring Return		X
ECON-NC3-*	Economizer - Bldg. Equipment, 0-10V, No Controls		X
ECON-S3-*	Economizer - School		X
ECON-WD3-*	Economizer - Bldg. Equipment, Enthalpy		X
ECON-DB3-*	Economizer - Bldg. Equipment, Temperature		X
ERV-FA3-*	Energy Recovery Ventilator (230V)		X
ERV-FC3-*	Energy Recovery Ventilator (460V)		X

* Insert color to match unit (X = Beige, 1 = White, 4 = Buckeye Gray, 5 = Desert Brown, 8 = Dark Bronze, S = Stainless, A = Aluminum

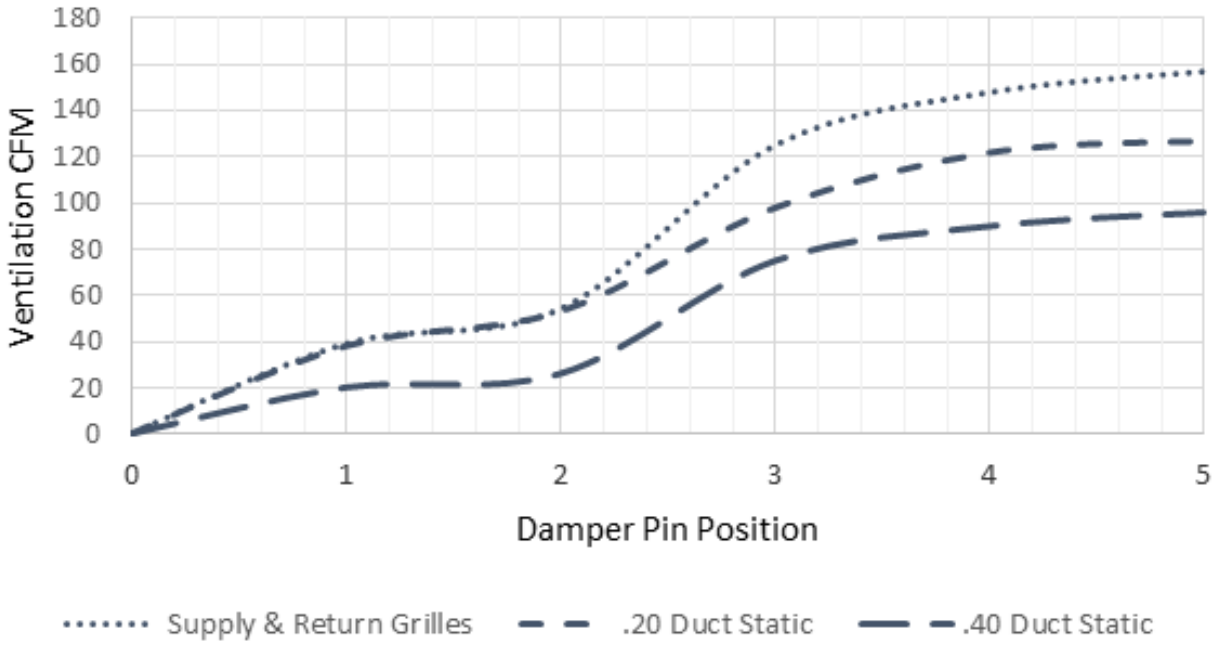
TABLE 21A
Optional Accessories – Right Hand

		W18AB-A	W24AB-A	W24AB-B	W24AB-C	W30AB-A	W30AB-B	W30AB-C	W36AB-A	W36AB-B	W36AB-C, RC
Heater Kits	EHW1TAB-A05	X									
	EHW1TAB-A08	X									
	EHW2TAB-A05		X								
	EHW2TAB-A08		X								
	EHW2TA-A10	X	X								
	EHW2TA-B06			X							
	EHWH24B-C06				X						
	EHW3TA-A05					X			X		
	EHW3TA-A08					X			X		
	EHW3TA-A10					X					
	EHW3TAB-A10								X		
	EHW3TA-A15								X		
	EHW3TAB-A15					X					
	EHW30A-B06						X				
	EHW3TA-B06									X	
	EHW3TA-B09						X				
	EHW3TAB-B09									X	
	EHW3TA-B15									X	
	EHW3TAB-B15						X				
	EHW3TA-C06							X			X
	EHW3TA-C09							X			X
	EHW3TA-C12							X			
	EHW3TA-C15										X
	EHW3TAB-C15							X			
Circuit Breaker (WMCB) and Pull Disconnect (WMPD)	WMCB-02A	X									
	WMCB-02B			X			X				
	WMCB-03A		X								
	WMCB-03B									X	
	WMCB-05A					X			X		
	WMPD-01C				X			X			X

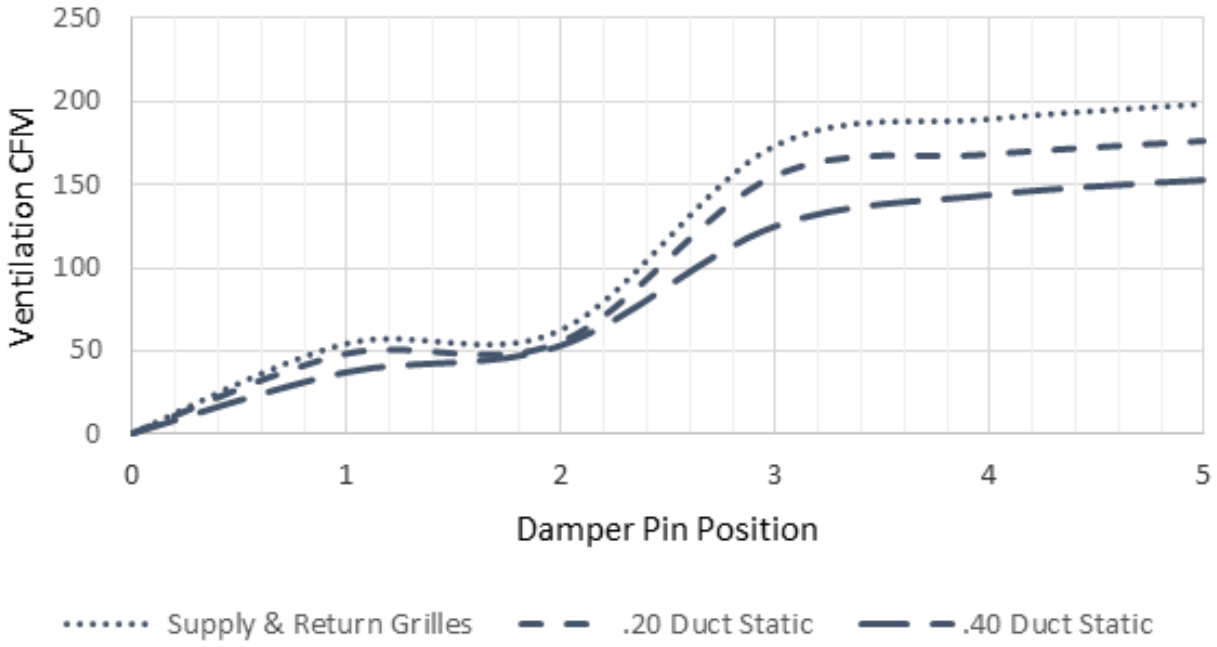
TABLE 21B
Optional Accessories – Left Hand

		W18LB-A	W24LB-A	W24LB-B	W30LB-A	W30LB-B	W30LB-C	W36LB-A	W36LB-B	W36LB-C, RC
Heater Kits	EHW1TAB-A05L	X								
	EHW1TAB-A08L	X								
	EHW2TAB-A05L		X							
	EHW2TAB-A08L		X							
	EHW2TA-A10L	X	X							
	EHW2TA-B06L			X						
	EHW3TA-A05L				X			X		
	EHW3TA-A08L				X					
	EHW3TA-A10L				X					
	EHW3TAB-A10L							X		
	EHW3TA-A15L				X			X		
	EHW3TA-B09L					X				
	EHW3TAB-B09L								X	
	EHW3TA-B15L								X	
	EHW3TAB-B15L					X				
	EHW3TA-C09L						X			X
	EHW3TA-C15L									X
	EHW3TAB-C15L						X			
Circuit Breaker (WMCB) and Pull Disconnect (WMPD)	WMCB-02AL	X								
	WMCB-02BL			X		X				
	WMCB-03AL		X							
	WMCB-03BL								X	
	WMCB-05AL				X			X		
	WMPD-01CL						X			X

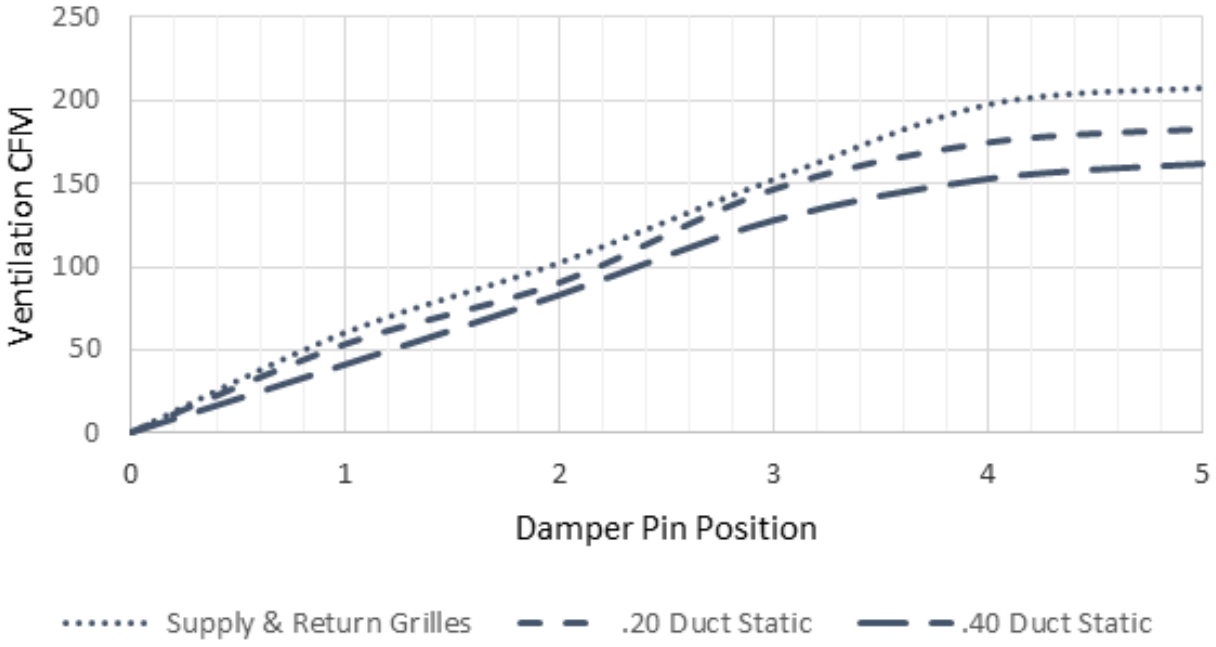
GRAPH 1
W18*B FAD-NE2, 3 W/O Exhaust Ventilation Delivery



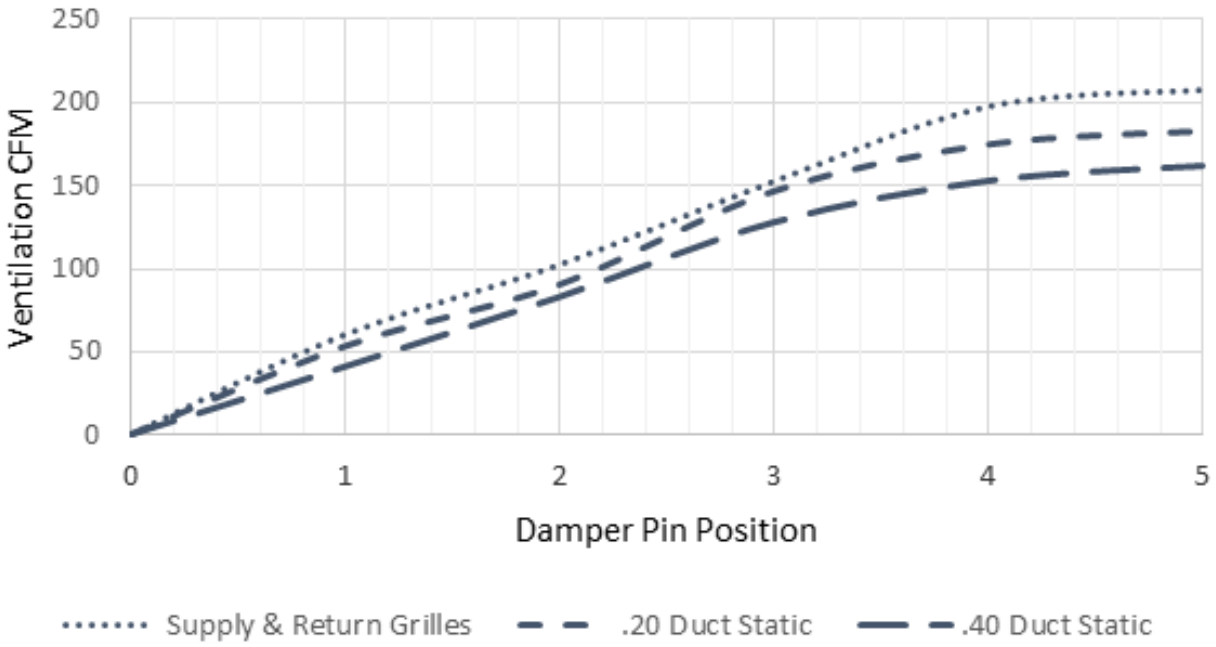
GRAPH 2
W24*B FAD-NE2, 3 W/O Exhaust Ventilation Delivery



GRAPH 3
W30*B FAD-NE2, 3 W/O Exhaust Ventilation Delivery



GRAPH 4
W36*B FAD-NE2, 3 W/O Exhaust Ventilation Delivery



LIGHT POLE , SEE ELECTRICAL DRAWINGS FOR DETAILS (TYP.)

OVERHEAD WIRE (SEE ELECTRICAL DRAWINGS FOR LAYOUT AND DETAILS)

GREASE TRAP (BY OTHERS)

SEPTIC TANK (BY OTHERS)

CONTINUATION AND PIPE CROSSING DESIGN OF SANITARY SEWER BY OTHERS

MEET EXISTING GRADE

CONNECT ELECTRIC SERVICE TO EXISTING UTILITY POLE SEE ELECTRICAL DRAWINGS

CONCRETE SPLASH PAD (TYP FOR 14 RD)

TRANSFORMER PAD, EL: 345.00 (SEE ELECTRICAL DRAWINGS FOR DETAILS)

CONCRETE CURB (BY OTHERS)

CONTRACTOR TO VERIFY CURB ELEVATIONS PRIOR TO WALK, RAMP, AND PORCH CONSTRUCTION

FRONT PORCH (SEE ARCHITECTURAL DRAWINGS FOR DETAIL)

SENIOR CENTER
FF EL. 354.83±
BASEMENT EL. 344.13±
(SEE NOTE No.7)

TOP STEP EL: 354.15
BOT. STEP EL:353.57

TWO (2) HANDICAPPED SPACES (MAX CROSS SLOPE 2%, SEE DETAIL)

MULCHED LANDSCAPE AREA (15 ANNUALS TO BE SELECTED BY OWNER)

ADA RAMP (MAX SLOPE 7.5%)

CONNECT TO EXISTING WATER SERVICE (BY OTHERS)

EDGE OF DRIVEWAY

BOLLARD (TYP. FOR 14)
SEE DETAIL FOR TRANSFORMER BOLLARD, SKETCH 'G' OF APPENDIX III.B

15' MAINTENANCE DRIVEWAY (BY OTHERS)

LIMIT OF DECK AND SUPPORTS FOR BID ALTERNATE 1

LIMIT OF ELEVATED DECK FRAMING FOR BASE BID AND LIMIT OF DECKING FOR 15'-0" WIDE DECK BID ITEM 3

8' WIDE CONCRETE ENTRANCE PAD, SEE SIDEWALK DETAIL, CIVIL AND DETAIL A8/10 FOR THICKNESS. (TYP. FOR 2)

APPROXIMATE LIMIT OF DISTURBANCE MEET EXISTING GRADES

15' WIDE ELEVATED DECK, FRAMING FOR FUTURE DECK EXPANSION, (SEE DWG A1 FOR BASE BID, ID ITEM 3 AND DECK ALTERNATE No.1)

6'-0" WIDE ELEVATED DECK (BASE BID AND DEDUCT ALTERNATE 2) (SEE ARCHITECTURAL DRAWINGS)

AIR HANDLER UNIT (TYP. FOR 2)
SEE MODULAR BUILDING DRAWINGS FOR DETAIL

8'-0" WIDE ELEVATED DECK (BASE BID AND DEDUCT ALTERNATE 2)

LIMIT OF STONE AND FABRIC VEGETATIVE BARRIER, 3" OF PEA GRAVEL AND LANDSCAPE FABRIC (LOCATED UNDERNEATH SECTION OF DECK)

CONNECT ROOF DRAINS TO EXISTING DRAINAGE (TYP.)

2" HDPE WATER SERVICE, CONTRACTOR TO BRING SERVICE 5' OUT THROUGH BUILDING FOUNDATION

LANDSCAPE RETAINING WALL, 2.33' HIGH (SEE DETAIL SHEET C5)

WATER SERVICE INSTALLED BY OTHERS

EDGE OF EXISTING PARKING AREA

EXISTING ASPHALT PAVEMENT MILLINGS AND GRADE ADJUSTMENT (BY OTHERS)

PARKING LOT RAISED AND GRADED BY TOWN

EDGE OF EXISTING DRIVEWAY

SEE ELECTRICAL DRAWINGS FOR CONTINUATION

GENERAL NOTES:

1. THE CONTRACTOR(S) SHALL PROTECT EXISTING SITE FEATURES, INCLUDING ALL PLANTINGS NOT SHOWN TO BE REMOVED, DURING THE WORK. REFER TO EROSION AND SEDIMENT CONTROL REQUIREMENTS.
2. ALL DISTURBED AREAS SHALL RECEIVE 4" OF TOP SOIL AND SEED.
3. CONTRACTORS(S) SHALL NOTIFY ALL UTILITY COMPANIES HAVING UNDERGROUND UTILITIES ON SITE OR IN RIGHT-OF-WAY PRIOR TO EXCAVATION. CONTRACTOR(S) SHALL CONTACT UTILITY LOCATING COMPANY AND LOCATE ALL UTILITIES PRIOR TO COMMENCEMENT OF SOIL DISTURBING ACTIVITIES. OVERHEAD UTILITIES TO BE PROTECTED DURING WORK.
4. SITE GRADING SHALL NOT PROCEED UNTIL APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES HAVE BEEN INSTALLED.
5. UTILITIES SHOWN ON THE PLANS ARE FOR INFORMATION ONLY AND HAVE BEEN OBTAINED FROM AVAILABLE SOURCES. THE EXISTENCE AND LOCATION OF ANY UTILITIES INDICATED ON THE PLANS ARE NOT GUARANTEED AND SHALL BE INVESTIGATED AND VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE STARTING WORK. THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE UTILITY COMPANY NO LATER THAN 48 HOURS PRIOR TO ANY EXCAVATION THAT MAY AFFECT THAT UTILITY. EXCAVATION IN THE VICINITY OF UNDERGROUND UTILITIES SHALL BE DUG BY HAND. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES.
6. THE CONTRACTOR SHALL ASSUME THAT ALL EXISTING WATER MAIN AND OTHER WATER PIPING ARE BURIED WITH A 4.5-FOOT COVER.
7. THIS CONTRACT DOES NOT INCLUDE THE CONSTRUCTION OF THE FOUNDATION, BUILDING, OR PERIMETER DRAINAGE SYSTEM. THESE ITEMS ARE EXISTING ON THE SITE.

NO.	DATE	REVISION	INT.
1	9/17/23	ADDENDUM NO.1	GEO

STATE OF NEW YORK · WILLIAM D. MERKLIN · LICENSED PROFESSIONAL ENGINEER · No. 072392

PROJECT ENGINEER:	DRAWN BY:
AE	GO
DESIGNED BY:	CHECKED BY:
GO	AC/WDM

D&B ENGINEERS AND ARCHITECTS

TOWN OF BLOOMING GROVE

ORANGE COUNTY — NEW YORK

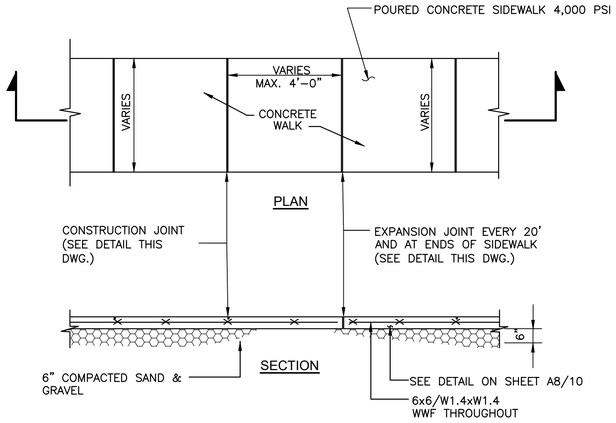
LASSER PARK SENIOR CENTER

CONTRACT 2

SITE PLAN

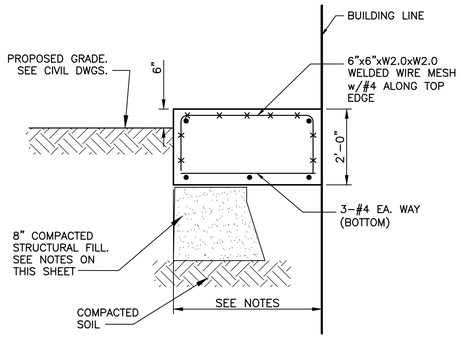
CIVIL

PROJECT NO.	DRAWING NO.
5708	C1
DATE: AUGUST 2023	
SCALE: 1" = 20'	



CONCRETE SIDEWALK DETAIL

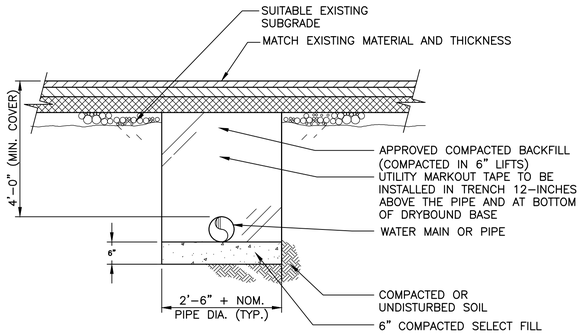
SCALE: N.T.S.



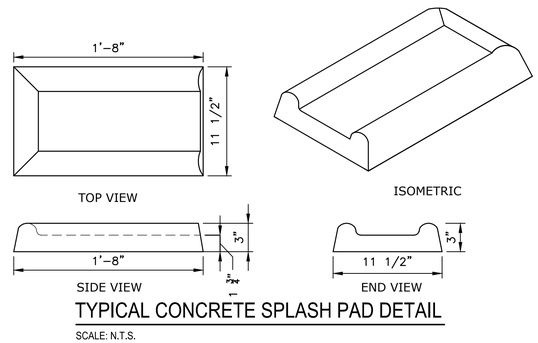
1) CONCRETE PAD FOR CT CABINET 42"X20" TOP EL:345.50
2) CONCRETE PAD FOR SWITCHBOARD "MDP" 30"X13" EL:345.50
3) GENERAL CONTRACTOR TO COORDINATE WITH ELECTRICAL CONTRACTOR FOR FINAL DIMENSIONS. GC TO SUBMIT SHOP DRAWINGS.

CONCRETE PAD FOR ELECTRICAL CABINETS

SCALE: N.T.S.



TYPICAL WATER PIPE TRENCH IN PAVED AREA

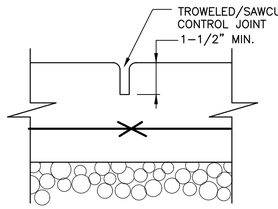


TYPICAL CONCRETE SPLASH PAD DETAIL

SCALE: N.T.S.

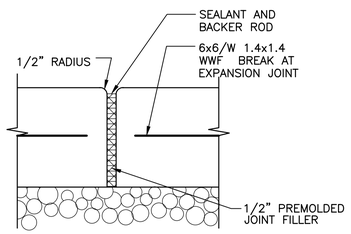
NOTE:

1) A SPLASH PAD SHOULD BE USED FOR ALL ROOF DOWNSPOUTS THAT ARE NOT TIED INTO THE SUBSURFACE DRAINAGE SYSTEM.



CONSTRUCTION CONTROL JOINT DETAIL

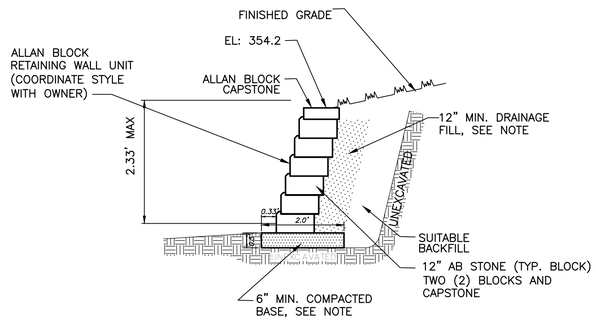
SCALE: N.T.S.



EXPANSION JOINT DETAIL

SCALE: N.T.S.

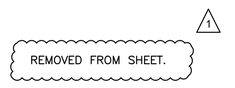
SEE CONCRETE SIDEWALK DETAIL THIS SHEET FOR NOTES AND DIMENSIONS OF JOINTS.



NOTE:
BASE AND DRAINAGE MATERIAL MUST BE WELL GRADED COMPACTIBLE AGGREGATE, 0.25 INCH TO 1.5 INCH, (5mm-38mm) WITH NO MORE THAN 10% PASSING THE #200 SIEVE.

LANDSCAPE RETAINING WALL

SCALE: N.T.S.



CONCRETE CURB DETAIL

SCALE: N.T.S.

NO.	DATE	REVISION	INT.
1	9/17/23	ADDENDUM NO.1	GEO

STATE OF NEW YORK · WILLIAM D. MERKLIN · NO. 072398 · LICENSED PROFESSIONAL ENGINEER

PROJECT ENGINEER:	DRAWN BY:
AE	GO
DESIGNED BY:	CHECKED BY:
GO	AC/WDM

D&B ENGINEERS AND ARCHITECTS

TOWN OF BLOOMING GROVE

ORANGE COUNTY — NEW YORK

LASSER PARK SENIOR CENTER

CONTRACT 2

DETAIL I

CIVIL

PROJECT NO.	DRAWING NO.
5708	C3
DATE: AUGUST 2023	
SCALE: AS SHOWN	