

**All Public Work Projects are required to use the Louisiana Uniform Public Work Bid Form**

All prices must be held firm unless an escalation provision is requested in this bid. Jefferson Parish will allow one escalation during the term of the contract, which may not exceed the U.S. Bureau of Labor Statistics National Index for all Urban Consumers, unadjusted 12 month figure. The most recently published figure issued at the time an adjustment is requested will be used. A request must be made in writing by the vendor, and the escalation will only be applied to purchases made after the request is made.

Are you requesting an escalation provision?

YES \_\_\_\_\_ NO  X

MAXIMUM ESCALATION PERCENTAGE REQUESTED \_\_\_\_\_%

INITIAL BID PRICES WILL REMAIN FIRM THROUGH THE DATE OF  7/27/18

For the purposes of comparison of bids when an escalation provision is requested, Jefferson Parish will apply the maximum escalation percentage quoted by the bidder to the period to which it is applied in the bid. The initial price and the escalation will be used to calculate the total bid price. It will be assumed, for comparison of prices only, that an equal amount of material or labor is purchased each month throughout the entire contract.

**DELIVERY: FOB JEFFERSON PARISH**

INDICATE DELIVERY DATE ON EQUIPMENT AND SUPPLIES  56 DAYS

LOUISIANA CONTRACTOR'S LICENSE NO.: (if applicable)  N/A

**THIS SECTION MUST BE COMPLETED BY BIDDER:**

FIRM NAME:  PREMIER EQUIPMENT CORPORATION, INC.

ADDRESS:  13918 AIRLINE HWY

CITY, STATE:  BATON ROUGE, LA  ZIP:  70817

TELEPHONE:  ( 225 ) 755-2240  FAX:  ( 225 ) 755-2271

EMAIL ADDRESS:  MBULLOCH@PREMIEREQUIPLA.COM

In the event that addenda are issued with this bid, bidders MUST acknowledge all addenda on the bid form. Bidder must acknowledge receipt of an addendum on the bid form as indicated. Failure to acknowledge any addendum on the bid form will result in bid rejection.

Acknowledge Receipt of Addenda: NUMBER:  1

NUMBER: \_\_\_\_\_

NUMBER: \_\_\_\_\_

NUMBER: \_\_\_\_\_

TOTAL PRICE OF ALL BID ITEMS: \$  50,286.00

AUTHORIZED SIGNATURE:  

MAC G. BULLOCH III

Printed Name

TITLE:  SALES MANAGER

SIGNING INDICATES YOU HAVE READ AND COMPLY WITH THE INSTRUCTIONS AND CONDITIONS.

NOTE: All bids should be returned with the BID NUMBER and BID OPENING DATE indicated on the outside of the envelope submitted to the Purchasing Department.

DATE: 4/25/2017

INVITATION TO BID FROM JEFFERSON PARISH - continued

Page 6

BID NO.: 50-00119337

SEALED BID

ITEM NUMBER	QUANTITY	U/M	DESCRIPTION OF ARTICLES	UNIT PRICE QUOTED	TOTALS
1	3.00	EA	ONE TIME PURCHASE:  0010 - Roots EasyAir X2 Standard Factory Designed Package Universal RAI DSL  Blowers, Manufacturer Howden Roots Model No. 74881EAX2-100-56-25HP  SEE ATTACHED SPECIFICATIONS	\$15,712.00	\$47,136.00
2	1.00	EA	0020 - Triplex Control Panel, Model No. GS3EG-25	\$1,050.00	\$3,150.00

REVISED AS PER ADDENDUM # 1

**CORPORATE RESOLUTION**

EXCERPT FROM MINUTES OF MEETING OF THE BOARD OF DIRECTORS OF  
PREMIER EQUIPMENT CORPORATION, INC.

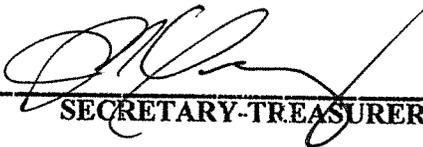
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INCORPORATED.

AT THE MEETING OF DIRECTORS OF DIRECTORS  
INCORPORATED, DULY NOTICED AND HELD ON APRIL 24, 2017,  
A QUORUM BEING THERE PRESENT, ON MOTION DULY MADE AND SECONDED. IT  
WAS:

RESOLVED THAT MAC G. BULLOCH III, BE AND IS HEREBY  
APPOINTED, CONSTITUTED AND DESIGNATED AS AGENT AND ATTORNEY-IN-  
FACT OF THE CORPORATION WITH FULL POWER AND AUTHORITY TO ACT ON  
BEHALF OF THIS CORPORATION IN ALL NEGOTIATIONS, BIDDING, CONCERNS  
AND TRANSACTIONS WITH THE PARISH OF JEFFERSON OR ANY OF ITS AGENCIES,  
DEPARTMENTS, EMPLOYEES OR AGENTS, INCLUDING BUT NOT LIMITED TO, THE  
EXECUTION OF ALL BIDS, PAPERS, DOCUMENTS, AFFIDAVITS, BONDS, SURETIES,  
CONTRACTS AND ACTS AND TO RECEIVE ALL PURCHASE ORDERS AND NOTICES  
ISSUED PURSUANT TO THE PROVISIONS OF ANY SUCH BID OR CONTRACT, THIS  
CORPORATION HEREBY RATIFYING, APPROVING, CONFIRMING, AND ACCEPTING  
EACH AND EVERY SUCH ACT PERFORMED BY SAID AGENT AND ATTORNEY-IN-  
FACT.

I HEREBY CERTIFY THE FOREGOING TO BE  
A TRUE AND CORRECT COPY OF AN  
EXCERPT OF THE MINUTES OF THE ABOVE  
DATED MEETING OF THE BOARD OF  
DIRECTORS OF SAID CORPORATION, AND  
THE SAME HAS NOT BEEN REVOKED OR  
RESCINDED.

  
\_\_\_\_\_  
SECRETARY-TREASURER

4/26/17  
\_\_\_\_\_  
DATE

Non-Public Works Bid

AFFIDAVIT

STATE OF LOUISIANA

PARISH/COUNTY OF EAST BATON ROUGE

BEFORE ME, the undersigned authority, personally came and appeared: MAC G. BULLOCH III, (Affiant) who after being by me duly sworn, deposed and said that he/she is the fully authorized AGENT of PREMIER EQUIPMENT (Entity), the party who submitted a bid in response to Bid Number 50-119337, to the Parish of Jefferson.

Affiant further said:

Campaign Contribution Disclosures

**(Choose A or B, if option A is indicated please include the required attachment):**

Choice A \_\_\_\_\_ Attached hereto is a list of all campaign contributions, including the date and amount of each contribution, made to current or former elected officials of the Parish of Jefferson by Entity, Affiant, and/or officers, directors and owners, including employees, owning 25% or more of the Entity during the two-year period immediately preceding the date of this affidavit or the current term of the elected official, whichever is greater. Further, Entity, Affiant, and/or Entity Owners have not made any contributions to or in support of current or former members of the Jefferson Parish Council or the Jefferson Parish President through or in the name of another person or legal entity, either directly or indirectly.

Choice B  there are NO campaign contributions made which would require disclosure under Choice A of this section.

Debt Disclosures

**(Choose A or B, if option A is indicated please include the required attachment):**

Choice A \_\_\_\_\_ Attached hereto is a list of all debts owed by the affiant to any elected or appointed official of the Parish of Jefferson, and any and all debts owed by any elected or appointed official of the Parish to the Affiant.

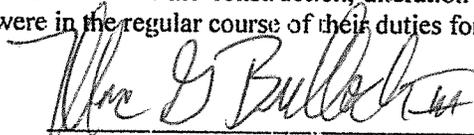
Choice B X There are NO debts which would require disclosure under Choice A of this section.

Affiant further said:

That Affiant has employed no person, corporation, firm, association, or other organization, either directly or indirectly, to secure the public contract under which he received payment, other than persons regularly employed by the Affiant whose services in connection with the construction, alteration or demolition of the public building or project or in securing the public contract were in the regular course of their duties for Affiant; and

*[The remainder of this page is intentionally left blank.]*

That no part of the contract price received by Affiant was paid or will be paid to any person, corporation, firm, association, or other organization for soliciting the contract, other than the payment of their normal compensation to persons regularly employed by the Affiant whose services in connection with the construction, alteration or demolition of the public building or project were in the regular course of their duties for Affiant.



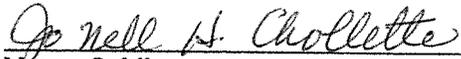
\_\_\_\_\_  
Signature of Affiant

MAC G. BULLOCH III

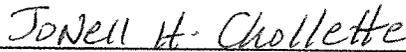
\_\_\_\_\_  
Printed Name of Affiant

SWORN AND SUBSCRIBED TO BEFORE ME

ON THE 26 DAY OF April, 2017.



\_\_\_\_\_  
Notary Public



\_\_\_\_\_  
Printed Name of Notary



\_\_\_\_\_  
Notary/Bar Roll Number

My commission expires upon Death.

Print

Notary Search - Detail

**Name:** MS. JO NELL H. CHOLLETTE  
**Address:** 7044 MORGAN RD.  
GREENWELL SPRINGS, LA 70739  
**Phone:** (225) 261-5233  
**Notary ID Number:** 9018  
**Parish:** EAST BATON ROUGE with authority in the following parishes:  
ASCENSION, EAST FELICIANA, IBERVILLE, LIVINGSTON, POINTE COUPEE, WEST BATON ROUGE, WEST FELICIANA  
**Agency:** N/A  
**Notary Type:** Non Attorney  
**Status:** Active  
**Commission Date:** 10/28/1986  
**Oath Date:** 10/27/1986  
**Surety Expiration Date:** 09/24/2021  
**Annual Report Current:** Yes

[Back to Search Results](#) [New Search](#)

## Request for Taxpayer Identification Number and Certification

Give Form to the  
 requester. Do not  
 send to the IRS.

Print or type See Specific Instructions on page 2.	1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank. <b>PREMIER EQUIPMENT CORPORATION INC</b>	
	2 Business name/disregarded entity name, if different from above	
	3 Check appropriate box for federal tax classification; check only one of the following seven boxes: <input type="checkbox"/> Individual/sole proprietor or single-member LLC <input type="checkbox"/> C Corporation <input checked="" type="checkbox"/> S Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Trust/estate <input type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ _____ <small>Note. For a single-member LLC that is disregarded, do not check LLC; check the appropriate box in the line above for the tax classification of the single-member owner.</small> <input type="checkbox"/> Other (see instructions) ▶ _____	
	4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3): Exempt payee code (if any) _____ Exemption from FATCA reporting code (if any) _____ <small>(Applies to accounts maintained outside the U.S.)</small>	
	5 Address (number, street, and apt. or suite no.) <b>13918 AIRLINE HWY</b>	Requester's name and address (optional)
	6 City, state, and ZIP code <b>BATON ROUGE, LOUISIANA 70817</b>	
	7 List account number(s) here (optional)	

**Part I Taxpayer Identification Number (TIN)**

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I Instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the instructions for line 1 and the chart on page 4 for guidelines on whose number to enter.

Social security number																					
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or																					
Employer identification number																					
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7	2	-	1	2	2	1	3	4	5												

**Part II Certification**

Under penalties of perjury, I certify that:

- The number shown on this form is my correct taxpayer identification number (~~or~~ I am waiting for a number to be issued to me); and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
- I am a U.S. citizen or other U.S. person (defined below); and
- The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

**Certification instructions.** You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

Sign Here	Signature of U.S. person ▶	Date ▶ <b>January 20, 2017</b>
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**General Instructions**

Section references are to the Internal Revenue Code unless otherwise noted.

**Future developments.** Information about developments affecting Form W-9 (such as legislation enacted after we release it) is at [www.irs.gov/fw9](http://www.irs.gov/fw9).

**Purpose of Form**

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)

- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See *What is backup withholding?* on page 2.

By signing the filled-out form, you:

- Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
- Certify that you are not subject to backup withholding, or
- Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and
- Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting?* on page 2 for further information.



# JEFFERSON PARISH

## Department of Purchasing

Michael S. Yenni  
Parish President

Brenda C. Patel  
Director

April 25, 2017

ADDENDUM # 1

Bid No.: 50-00119337

Bid Opening Date: 04/27/2017

For: One time purchase of 3 Roots Easyair X2 DSL Blowers & Triplex Control Panels for Jefferson Parish Sewerage Department.

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Remove page six (6) replace with revised page six to correct the quantity of item number two.

Sincerely,

Donna Reamey

Donna Reamey, Buyer II  
Jefferson Parish Purchasing Department

**Bidders must acknowledge all addenda on the bid form. Bidder acknowledges receipt of this addendum on the bid form as indicated. Failure to do so will result in bid rejection.**

This addendum is a part of the contract documents and modifies the original bidding documents and specifications. The contents of this addendum shall be included in the contract documents. Changes made by this addendum shall take precedence over the documents of earlier date.

This addendum is a part of the contract documents and modifies the original bidding documents and specifications. The contents of this addendum shall be included in the contra

Prebid - 4-20-17

10 AM



**Bid Number 50 - 119337**

One time purchase of three Roots EasyAir X2 DSL blowers & Triplex Control Panels for Jefferson Parish Sewerage Department.

**April 27, 2017 AT 2:00 PM**

**ATTENTION VENDORS!!!**

**Please review all pages and respond accordingly, complying with all provisions in the technical specifications and Jefferson Parish Instructions for Bidders and General Terms and Conditions. All bids must be received in the Purchasing Department by the bid due date and time.**

**Jefferson Parish Purchasing Department  
200 Derbigny Street  
General Government Building, Suite 4400  
Gretna, LA 70053  
Donna Reamey  
Dreamey@Jeffparish.net  
504-364-2684**

DATE: 4/12/2017  
BID NO.: 50-00119337

INVITATION TO BID  
THIS IS NOT AN ORDER

Page: 1

## JEFFERSON PARISH

PURCHASING DEPARTMENT  
P.O. BOX 9  
GRETNA, LA. 70054-0009  
504-364-2678

BUYER: DREAMY@jeffparish.net

**BIDS WILL BE RECEIVED IN THE WEST BANK PURCHASING DEPT, SUITE 4400, JEFFERSON PARISH GENERAL GOVERNMENT BUILDING, 200 DERBIGNY STREET, GRETNA, LA 70053 UNTIL 2:00 PM, 4/27/2017 AND PUBLICLY OPENED THEREAFTER.**

For convenience, bidders may also submit bids in the East Bank Purchasing Department, Suite 404, Jefferson Parish Joseph S. Yenni Building, 1221 Elmwood Park Blvd., Jefferson LA 70123. However, if submitting bids on the day of bid opening, bidders must submit at the West Bank location only. All bids will be publicly opened at the West Bank location.

At no charge, bidders may also submit via Jefferson Parish's electronic procurement page by visiting [www.jeffparishbids.net](http://www.jeffparishbids.net) to register for this free site. Additional instructions are included in the text box highlighting electronic procurement.

### LATE BIDS WILL NOT BE ACCEPTED

Unless submitting via online (see Page 3), each bid must be submitted in a sealed envelope bearing on the outside; the name of the Bidder, his address, and the name of the project for which the bid is submitted and the bid number.

**NOTE: ONLY BIDS WRITTEN IN INK OR TYPEWRITTEN, AND PROPERLY SIGNED BY A MEMBER OF THE FIRM OR AUTHORIZED REPRESENTATIVE, WILL BE ACCEPTED. PENCIL AND/OR PHOTOSTATIC FIGURES OR SIGNATURES SHALL RESULT IN BID REJECTION.**

### INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS

#### THE FOLLOWING INSTRUCTIONS APPLY TO ALL BIDS

All bids submitted are subject to these instructions and general conditions and any special conditions and specifications contained herein, all of which are made part of this bid proposal reference. By submitting a bid, vendor agrees to comply with all provisions of Louisiana Law as well be in compliance with the Jefferson Parish Code of Ordinances, Louisiana Code of Ethics, applicable Jefferson Parish ethical standards and Jefferson Parish Resolution No. 113646 and/or Resolution No. 113647.

All vendors submitting bids should register as a Jefferson Parish vendor if not already yet registered. Registration forms may be downloaded from <http://purchasing.jeffparish.net> and by clicking on Vendor Information. Current W-9 forms with respective Tax Identification numbers and vendor applications may be submitted at any time; however, if your company is not registered and/or a current W-9 form is not on file, vendor registration is mandatory. Further, a current W-9 form and respective Tax Identification number must be supplied upon contract execution, should you be awarded a contract and/or issued purchase order. Failure to do so may result in delay of payment.

All quotations shall be based on F.O.B. Agency warehouse or job site, anywhere within the Parish as designated by the Purchasing Department. This provision does not apply to public works projects

JEFFERSON PARISH requires all products to be new (current) and all work must be performed according to standard practices for the project. Unless otherwise specified, no aftermarket parts will be accepted. Unless otherwise specified, all workmanship and materials must have at least one (1) year guaranty, in writing, from the date of delivery and/or acceptance of the project. Any deviations or alterations from the specifications must be indicated and/or supporting documentation supplied with bid submission.

Bidders should submit all questions in writing and fax them to the Purchasing Department at (504) 364-2693 no later than FIVE (5) working days prior to bid opening. Bid numbers should be mentioned in all requests. Questions may also be emailed to the buyer for this bid at the email address listed above. If submitting online, vendors may send questions via the E-Procurement site no later than Five (5) working days prior to the bid opening.

If this bid requires a pre-bid conference (see Additional Requirements section), bidders are advised that such conference will be held to allow bidders the opportunity to identify any discrepancies in the bid specifications and seek further clarification regarding instructions. The Purchasing Department will issue a written response to bidders' questions in the form of an Addendum. Please note that all official communication will be expressed in the form of an addendum.

All formal Addenda require written acknowledgement on the bid form by the bidder. Failure to acknowledge an Addendum on the bid form shall cause the bid to be rejected. JEFFERSON PARISH reserves the right to award bid to next lowest responsive and responsible bidder in this event.

The purpose and intention of this invitation to bid is to afford all suppliers an equal opportunity to bid on all construction, maintenance, repair, operating supplies and/or equipment listed in this bid proposal. JEFFERSON PARISH WILL ACCEPT ONE BID ONLY FROM EACH VENDOR. Items bid must meet specifications.

**Visit our website at [HTTP://PURCHASING.JEFFPARISH.NET](http://PURCHASING.JEFFPARISH.NET)**

JEFFERSON PARISH will accept one price for each item unless otherwise indicated. Two or more prices for one item will result in bid rejection. Bidders are required to complete, sign and return the bid form and/or complete and return the associated line item pricing forms as indicated. Vendors must not alter the bid forms. Doing so will cause the bid to be rejected.

A corporate resolution or written evidence of the individual signing the bid having such authority must be submitted with the bid. Failure to comply will cause bid to be rejected. For corporate entities, such written evidence may be a printout of the Louisiana Secretary of State's website listing the signatory as an officer. Such printout shall be included with the bid submission. Bids submitted by Owners or Sole Proprietorships must include certification that he or she owns the entity for which the bid is signed. This documentation must be submitted with the bid. Failure to do so will result in bid rejection.

NOTE: A sample corporate resolution can be downloaded from our website <http://purchasing.jeffparish.net> or you may provide your own document. A sample certification of sole proprietorship can also be downloaded from our website <http://purchasing.jeffparish.net> or you may provide your own document.

## INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS

**A. AWARD OF CONTRACT:** JEFFERSON PARISH reserves the right to award contracts or place orders on a lump sum or individual item basis, or such combination, as shall in its judgment be in the best interest of JEFFERSON PARISH. Every contract or order shall be awarded to the LOWEST RESPONSIVE and RESPONSIBLE BIDDER, taking into consideration the CONFORMITY WITH THE SPECIFICATIONS and the DELIVERY AND/OR COMPLETION DATE. SPLIT AWARDS MADE TO SEVERAL VENDORS WILL ONLY BE GRANTED TO THOSE DEEMED RESPONSIVE AND RESPONSIBLE.

All bid prices shall remain valid for 45 days. Jefferson Parish and the lowest responsive and responsible bidder(s) by mutual written consent may mutually agree to extend the deadline for award by one (1) or more extensions of thirty (30) calendar days.

**PROTESTS:** Only those vendors that submitted a bid in response to this solicitation may submit a protest in writing to the Director of the Purchasing within 48 hours of bid opening. The Purchasing Director will review it in connection with the Parish Attorney's Office which will then respond in writing as soon as possible.

**PREFERENCE:** Unless federal funding is directly spent by Jefferson Parish for this purchase, preference is hereby given to materials, supplies, and provisions produced, manufactured or grown in Louisiana, quality being equal to articles offered by competitors outside the state. "LSA – R.S. 38:2251-2261"

**B. USE OF BRAND NAMES AND STOCK NUMBERS:** Where brand names and stock numbers are specified, it is for the purpose of establishing certain minimum standards of quality. Bids may be submitted for products of equal quality, provided brand names and stock numbers are specified. Complete product data may be required prior to award.

**C. CANCELLATION OF CONTRACT:** JEFFERSON PARISH reserves the right to cancel all or any part if not shipped promptly. No charges will be allowed for parking or cartage unless specified in quotation. The order must not be filled at a higher price than quoted. JEFFERSON PARISH reserves the right to cancel any contract at anytime and for any reason by issuing a THIRTY (30) day written notice to the contractor.

For good cause and as consideration for executing a contract with Jefferson Parish, vendor conveys, sells, assigns and transfers to Jefferson Parish or its assigns all rights, title and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of Louisiana, relating to the particular good or services purchased or acquired by Jefferson Parish.

**D. PRICES:** Jefferson Parish is exempt from paying sales tax under LSA-R.S. 47:301 (8)(c). All prices for purchases by Jefferson Parish of supplies and materials shall be quoted in the unit of measure specified and unless otherwise specified, shall be exclusive of state and Parish taxes. The price quoted for work shall be stated in figures. In the event there is a difference in unit prices and totals, the unit price shall prevail.

Quantities listed are for bidding purposes only. Actual requirements may be more or less than quantities listed.

Bidders are not to exclude from participation in, deny the benefits of, or subject to discrimination under any program or activity, any person in the United States on the grounds of race, color, national origin, or sex; nor discriminate on the basis of age under the Age Discrimination Act of 1975, or with respect to an otherwise qualified handicapped individual as provided in Section 504 of the Rehabilitation Act of 1973, or on the basis of religion, except that any exemption from such prohibition against discrimination on the basis of religion as provided in the Civil Rights Act of 1964, or Title VI and VII of the Act of April 11, 1968, shall also apply. This assurance includes compliance with the administrative requirements of the Revenue Sharing final handicapped discrimination provisions contained in Section 51.55 (c), (d), (e), and (k)(5) of the Regulations. New construction or renovation projects must comply with Section 504 of the 1973 Rehabilitation Act, as amended, in accordance with the American National Standard Institute's specifications (ANSI A17.1-1961).

Jefferson Parish and its partners as the recipients of federal funds are fully committed to awarding a contract(s) to firm(s) that will provide high quality services and that are dedicated to diversity and to containing costs. Thus, Jefferson Parish strongly encourages the involvement of minority and/or woman-owned business enterprises (DBE's, including MBE's, WBE's and SBE's) to stimulate participation in procurement and assistance programs.

Advertised bids will be tabulated and a copy of the tabulation will be forwarded to each responding bidder.

**IN ACCORDANCE WITH STATE REGULATIONS JEFFERSON PARISH OFFERS ELECTRONIC PROCUREMENT TO ALL VENDORS**

This electronic procurement system allows vendors the convenience of reviewing and submitting bids online. This is a secure site and authorized personnel have limited read access only. Bidders are encouraged to submit electronically using this free service; while the website accepts various file types, one single PDF file containing all appropriate and required bid documents is preferred. Bidders submitting uploaded images of bid responses are solely responsible for clarity. If uploaded images/documents are not legible, then bidder's submission will be rejected. Please note all requirements contained in this bid package for electronic bid submission.

Please visit our E-Procurement Page at [www.jeffparishbids.net](http://www.jeffparishbids.net) to register and view Jefferson Parish solicitations. For more information, please visit the Purchasing Department page at <http://purchasing.jeffparish.net>.

The general specifications for construction projects and the purchase of materials, services and/or supplies are those adopted by the JEFFERSON PARISH Council by Resolution No. 113646 or 113647 dated 12/09/09. The general conditions adopted by this resolution shall be considered as much a part of this document as if they were written wholly herein. A copy may be obtained from the Office of the Parish Clerk, Suite 6700, Jefferson Parish General Government Building, 200 Derbigny Street, Gretna, LA 70053. You may also obtain a copy by visiting the Purchasing Department webpage at <http://purchasing.jeffparish.net> and clicking on Online Forms.

**ADDITIONAL REQUIREMENTS FOR THIS BID**

PLEASE MATCH THE NUMBERS PRINTED IN THIS BOX WITH THE CORRESPONDING INSTRUCTIONS BELOW.

**13, 15**

**PRE-BID CONFERENCE TO BE HELD AT: MARRERO WASTEWATER PLANT, 6250 LAPALCO MARRERO, @ 10:00AM ON 4/20/2017**

1. All bidders must attend the MANDATORY pre-bid conference and will be required to sign in and out as evidence of attendance. In accordance with LSA R.S. 38:2212(l), all prospective bidders shall be present at the beginning of the MANDATORY pre-bid conference and shall remain in attendance for the duration of the conference. Any prospective bidder who fails to attend the conference or remain for the duration shall be prohibited from submitting a bid for the project.
2. Attendance to this pre-bid conference is optional. However, failure to attend the pre-bid conference shall not relieve the bidder of responsibility for information discussed at the conference. Furthermore, failure to attend the pre-bid conference and inspection does not relieve the successful bidder from the necessity of furnishing materials or performing any work that may be required to complete the work in accordance with the specification with no additional cost to the owner.
3. Contractor must hold current applicable JEFFERSON PARISH licenses with the Department of Inspection and Code Enforcement. Contractor shall obtain any and all permits required by the JEFFERSON PARISH Department of Inspection and Code Enforcement. The contractor shall be responsible for the payment of these permits. All permits must be obtained prior to the start of the project. Contractor must also hold any and all applicable Federal and State licenses. Contractor shall be responsible for the payment of these permits and shall obtain them prior to the start of the project.
4. A LA State Contractor's License will be required in accordance with LSA R.S. 37-2150 et. seq. and such license number will be shown on the outside of the bid envelope. Failure to comply will cause the bid to be rejected. Additionally if submitting the bid electronically, then the license number must be entered in the appropriate field in the Electronic Procurement system. Failure to comply will cause the bid to be rejected.
5. It is the bidder's responsibility to visit the job site and evaluate the job before submitting a bid.
6. Job site must be clean and free of all litter and debris daily and upon completion of the contract. Passageways must be kept clean and free of material, equipment, and debris at all times. Flammable material must be removed from the job site daily because storage will not be permitted on the premises. Precautions must be exercised at all times to safeguard the welfare of JEFFERSON PARISH and the general public.

**INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS**

7. **PUBLIC WORKS BIDS:** All awards for public works in excess of \$5,000.00 will be reduced to a formal contract which shall be recorded at the contractor's expense with the Clerk of Court and Ex-Officio Recorder of Mortgages for the Parish of Jefferson. A price list of recordation costs may be obtained from the Clerk of Court and Ex-Officio Recorder of Mortgages for the Parish of Jefferson. All awards in excess of \$25,000.00 will require both a performance and a payment bond. Unless otherwise stated in the bid specifications, the performance bond requirements shall be 100% of the contract price. Unless otherwise state in the bid specifications, the payment bond requirements shall be 100% of the contract price. Both bonds shall be supplied at the signing of the contract.
8. **NON-PUBLIC WORKS BIDS:** A performance bond will be required for this bid. The amount of the bond will be 100% of the contract price unless otherwise indicated in the specifications. The performance bond shall be supplied at the signing of the contract.
9. **NON-PUBLIC WORKS BIDS:** A payment bond will be required for this bid. The amount of the bond will be 100% of the contract price unless otherwise indicated in the specifications. The payment bond shall be supplied at the signing of the contract.
10. Unless otherwise stated in the bid specifications, the successful bidder will be required to procure standard insurance policies evidencing Parish-mandated insurance requirements as indicated on the attached "insurance requirements" sheet. All bidders must comply with the instructions in this sheet. Failure to comply will cause bid to be rejected.
11. A bid bond will be required with bid submission in the amount of 5% of the total bid, unless otherwise stated in the bid specifications. Acceptable forms shall be limited to cashier's check, certified check, or surety bid bond. All sureties must be in original format (no copies) If submitting a bid online, vendors must submit an electronic bid bond through the respective online clearinghouse bond management system(s) as indicated in the electronic bid solicitation on Central Auction House. No scanned paper copies of any bid bond will be accepted as part of the electronic bid submission.
12. This is a requirements contract to be provided on an as needed basis. JEFFERSON PARISH makes no representations on warranties with regard to minimum guaranteed quantities unless otherwise stated in the bid specifications.
13. Freight charges should be included in total cost when quoting. If not quoted FOB DELIVERED, freight must be quoted as a separate item. Bid may be rejected if not quoted FOB DELIVERED or if freight charges are not indicated on bid form.
14. **PUBLIC WORKS BIDS - Completed, Signed and Properly Notarized Affidavits Required;** This applies to all solicitations for construction, alteration or demolition of public buildings or projects, in conformity with the provisions contained in LSA-RS 38:2212.9, LSA-RS 38:2212.10, LSA-RS 38:2224, and Sec 2-923.1 of the Jefferson Parish Code of Ordinances. For bidding purposes, all bidders must submit with bid submission COMPLETED, SIGNED and PROPERLY NOTARIZED Affidavits, including: Non-Conviction Affidavit, Non-Collusion Affidavit, Campaign Contribution Affidavit, Debt Disclosures Affidavit and E-Verify Affidavit. For the convenience of vendors, all affidavits have been combined into one form entitled PUBLIC WORKS BID AFFIDAVIT. This affidavit must be submitted in its original format, and without material alteration, in order to be compliant and for the bid to be considered responsive. A scanned copy of the completed, signed and properly notarized affidavit may be submitted with the bid, however, the successful bidder must submit the original affidavit in its original format and without material alteration upon contract execution. Failure to comply will result in the bid submission being rejected as non-responsive. The Parish reserves the right to award bid to the next lowest responsive and responsible bidder in this event.
15. **NON PUBLIC WORK BIDS - Completed, Signed and Properly Notarized Affidavits Required** in conformity with the provisions contained in LSA – RS 38:2224 and Sec 2-923.1 of the Jefferson Parish Code of Ordinances. For bidding purposes, all bidders must submit with bid submission COMPLETED, SIGNED and PROPERLY NOTARIZED Affidavits, including: Non-Collusion Affidavit, Debt Disclosures Affidavit and Campaign Contribution Affidavit. For the convenience of vendors, all affidavits have been combined into one form entitled NON PUBLIC WORKS BID AFFIDAVIT. This affidavit must be submitted in its original format, and without material alteration, in order to be compliant and for the bid to be considered responsive. A scanned copy of the completed, signed and properly notarized affidavit may be submitted with the bid, however, the successful bidder must submit the original affidavit in its original format and without material alteration upon contract execution. Failure to comply will result in the bid submission being rejected as non-responsive. The Parish reserves the right to award bid to the next lowest responsive and responsible bidder in this event.
16. The ensuing contract for this bid solicitation may be eligible for FEMA reimbursement and/or Federal funding/reimbursement. As such, the referenced appendix will be applicable accordingly and shall be considered a part of the bid documents. All applicable certifications must be duly completed, signed and submitted with bid submission. Failure to submit applicable certifications with bid submission will result in bid rejection.
17. For this project, the Contractor shall not pay any state or local sales or use taxes on materials and equipment which are affixed and made part of the immovable property of the project or which permanently incorporated in the project (hereinafter referred to as "applicable materials and equipment"). All purchases of applicable materials or equipment shall be made by the contractor on behalf of and as the agent of Jefferson Parish (Owner), a political subdivision of the State of Louisiana. No state and local sales and use taxes are owned on applicable materials and equipment under the provisions of Act 1029 of the 1991 Regular Session – Louisiana Revised Statute 47:301(8)(c). Owner will furnish contractor a certificate form which certifies that Owner is not required to pay such state or local sales and use taxes, and contractor shall furnish a copy of such certificate to all vendors or suppliers of the applicable materials and equipment

**It shall be the duty of every parish officer, employee, department, agency, special district, board, and commission: and the duty of every contractor, subcontractor, and licensee of the parish, and the duty of every applicant for certification of eligibility for a parish contract or program, to cooperate with the Inspector General in any investigation, audit, inspection, performance review, or hearing pursuant to Jefferson Parish Code of Ordinances Section 2-155.10(19). By submitting a bid, vendor acknowledges this and will abide by all provisions of the referenced Jefferson Parish Code of Ordinances.**

**All Public Work Projects are required to use the Louisiana Uniform Public Work Bid Form**

All prices must be held firm unless an escalation provision is requested in this bid. Jefferson Parish will allow one escalation during the term of the contract, which may not exceed the U.S. Bureau of Labor Statistics National Index for all Urban Consumers, unadjusted 12 month figure. The most recently published figure issued at the time an adjustment is requested will be used. A request must be made in writing by the vendor, and the escalation will only be applied to purchases made after the request is made.

Are you requesting an escalation provision?

YES \_\_\_\_\_ NO \_\_\_\_\_

MAXIMUM ESCALATION PERCENTAGE REQUESTED \_\_\_\_\_%

INITIAL BID PRICES WILL REMAIN FIRM THROUGH THE DATE OF \_\_\_\_\_.

For the purposes of comparison of bids when an escalation provision is requested, Jefferson Parish will apply the maximum escalation percentage quoted by the bidder to the period to which it is applied in the bid. The initial price and the escalation will be used to calculate the total bid price. It will be assumed, for comparison of prices only, that an equal amount of material or labor is purchased each month throughout the entire contract.

**DELIVERY: FOB JEFFERSON PARISH**

INDICATE DELIVERY DATE ON EQUIPMENT AND SUPPLIES \_\_\_\_\_

LOUISIANA CONTRACTOR'S LICENSE NO.: (if applicable) \_\_\_\_\_

**THIS SECTION MUST BE COMPLETED BY BIDDER:**

FIRM NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY, STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

TELEPHONE: ( ) \_\_\_\_\_ FAX: ( ) \_\_\_\_\_

EMAIL ADDRESS: \_\_\_\_\_

In the event that addenda are issued with this bid, bidders MUST acknowledge all addenda on the bid form. Bidder must acknowledge receipt of an addendum on the bid form as indicated. Failure to acknowledge any addendum on the bid form will result in bid rejection.

Acknowledge Receipt of Addenda: NUMBER: \_\_\_\_\_

NUMBER: \_\_\_\_\_

NUMBER: \_\_\_\_\_

NUMBER: \_\_\_\_\_

TOTAL PRICE OF ALL BID ITEMS: \$ \_\_\_\_\_

AUTHORIZED SIGNATURE: \_\_\_\_\_

Printed Name

TITLE: \_\_\_\_\_

SIGNING INDICATES YOU HAVE READ AND COMPLY WITH THE INSTRUCTIONS AND CONDITIONS.

**NOTE: All bids should be returned with the BID NUMBER and BID OPENING DATE indicated on the outside of the envelope submitted to the Purchasing Department.**

**Bid # 50-119337**  
**SPECIFICATIONS FOR JEFFERSON PARISH DEPT. OF SEWERAGE**  
**MARRERO WASTEWATER TREATMENT PLANT**  
**ROOTS™ EasyAir®X2 STANDARD FACTORY DESIGNED PACKAGE**  
**UNIVERSAL RAI® DSL BLOWERS**

**Pre-bid Meeting:**

All prospective bidders are invited to attend this non-mandatory pre-bid conference which will be held at the Marrero Wastewater Treatment Plant, 6250 Lapalco Boulevard, Marrero, LA 70072, on April 20, 2017, 2017 at 10:00 AM. However, failure to attend the pre-bid conference shall not relieve the bidder of responsibility for information discussed at the conference. Furthermore, failure to attend the pre-bid conference and inspection does not relieve the successful bidder from the necessity of furnishing materials or performing any work that may be required to complete the work in accordance with the specification with no additional cost to the owner.

**Part I – GENERAL**

**1.01**

- A: The manufacturer's distributor shall furnish, test, and commission the supplied units, EasyAir®X2 blower package with a Universal RAI® DSL frame size 56 two lobe rotary positive displacement air blower(s) as manufactured by Howden Roots, or approved equal.
- B: All equipment specified in this section shall be designed and furnished by the blower manufacturer, Howden Roots, who shall be responsible for the suitability and compatibility of all included equipment.

**1.02 RELATED WORK SPECIFIED ELSEWHERE**

- A: Division 1 (all sections)
- B: Equipment general provisions.
- C: Acoustical insulation for air piping.
- D: Electric motors.
- E: Starters for main drive motors.
- F: Instrumentation.

### 1.03 MANUFACTURER

- A: The ROOTS™ blower/motor assemblies, or approved equal; all accessories, controls, and other accessories shall be supplied by a single manufacturer who is fully experienced, reputable, and qualified in the supply of the equipment specified.

### 1.04 SUBMITTALS and O & M MANUALS

- A: Submittals shall be provided prior to construction and shall include, but not be limited to the following:

- 1: Package data sheet.
- 2: Blower data sheet.
- 3: V-belt drive data.
- 4: General arrangement drawing.
- 5: Motor data sheet.
- 6: PRV sizing data sheet.
- 7: Instrumentation data sheets.

### 1.05 START-UP AND TRAINING

- A: The manufacturer or their representative shall furnish experienced start-up/service personnel to inspect the final installation and, if needed, supervise the field start-up of the equipment.

## PART 2 -- PRODUCTS

### 2.01 CONFIGURATION

The air blower(s) shall be of the two lobe rotary positive displacement type, and shall be constructed with inlet and discharge connections oriented as shown on the drawings. Each blower shall be equipped with detachable rugged steel mounting feet for mounting in horizontal configuration.

### 2.02 DESIGN CONDITIONS

- Minimum inlet volume 384 ACFM (at blower inlet connection) +/-5%.
- Inlet temperature 100 degrees Fahrenheit
- Relative humidity 80%
- Barometer 14.7 PSIA
- Inlet pressure 14.7 PSIA (at blower inlet connection)
- Discharge pressure 23.8 PSIA (at blower discharge connection)
- Maximum rated pressure rise 9.5 PSI
- Maximum blower speed 2188 RPM
- Maximum BHP at blower shaft 21
- Minimum motor HP 25
- Maximum discharge temperature 230 degrees Fahrenheit

- Maximum free field noise level 76 dba at 1 meter with noise enclosure

### 2.03 CONSTRUCTION

- A: Casing: The blower casing shall be one piece, with separate head plates, and shall be made of ASTM A48 Class 30B close-grained cast iron. Each head plate shall incorporate a vent to atmosphere. In a pressure application this vent prevents pressurization of the oil chambers. In a vacuum application the vent prevents potential oil carry over to the air stream.
- B: Impellers: Each impeller shall be made from high-strength cast iron, ASTM A48 Class 30B. The impellers shall be of the straight, two-lobe involute type, and shall operate without rubbing, liquid seals, or lubrication. The assembly shall be dynamically balanced by removing metal from the impeller body, and shall be center-timed to permit rotation in either direction.
- C: Shafts: The blower shafts shall be ASTM 108-90 and 311-90 or equal. The shafts shall be pressed through the impeller body with an interference fit, and pinned in place.
- D: Bearings: Each impeller and shaft assembly shall be supported by oversized anti-friction bearings, engineered for long service life and fixed to control the axial location of the impeller/shaft in the unit. A cylindrical roller bearing shall be provided at the drive shaft, designed to handle the load of v-belt drive, while single-row ball bearings shall be used at all other locations
- E: Timing Gears: The impellers shall be timed by a pair of SAE 8620 carburized and ground steel spur gears. The gears shall be hardened to 58-62 Rockwell hardness and mounted on the shafts with a tapered fit, and secured by a locknut.
- F: Fasteners: High strength fasteners shall be used
- G: Lubrication: Each bearing housing shall include a positive radial lip type Viton oil seal. A Buna N lip seal shall be installed on the drive end of the drive shaft. The drive end bearings shall be splash oil lubricated. The timing gears and the gear end bearings shall be lubricated by splash from the gears clipping into the oil.
- H: The blower will be a ROOTS™ UNIVERSAL RA1<sup>®</sup>-DSL as manufactured by Howden Roots, or approved equal.

### 2.04 INLET FILTER/SILENCER

System shall include an inlet filter silencer for pressure applications. An inlet flexible connector with clamps shall be used to mount the inlet filter silencer to the blower inlet connection. The inlet filter silencer shall be carbon steel with paper filter elements. Inlet filters shall have front access for element access. Filter shall provide 99% removal efficiency of 2 micron particle size and larger. Vacuum filters, if required, to be installed inside of the noise enclosure. Howden Roots shall supply the inlet filter silencer.

## 2.05 COMBINATION BASE

Base shall have combination type discharge silencer. A discharge flexible connector with clamps shall be used between the blower discharge connection and the discharge silencer inlet connection. The base/discharge silencer shall be manufactured using carbon steel, have plain pipe stub connections and incorporate an oil pan in the design. The base/discharge silencer will have connections for a pressure relief valve, pressure gauge, discharge temperature gauge, mechanical unloading valve, and ½ inch drain built into the silencer. Packed/absorptive type silencers will not be accepted. The base/discharge silencer will be supplied by Howden Roots. Vacuum filters, if required, to be installed outside of the noise enclosure. Howden Roots shall supply the inlet filter silencer.

## 2.06 DRIVE SYSTEM

A v-belt drive will be provided. The v-belt drive system must incorporate a ROOTS™ v-belt tension system, or approved equal. The belt tension device must be designed to allow maintenance personnel to replace the belts without exerting or lifting over 40 pounds (OSHA Limitation) without the use of lifting, jacking, or pulling tools. A minimum service factor of 1.4 shall be applied on all v-belt systems. Drive selection calculations program shall be supplied to verify 1.4 minimum drive service factor. For v-belt drives with more than two belts, banded belts are required. Drive shall be selected to insure overhung load limits of motor and blower is not exceeded.

## 2.07 BELT GUARD

Guard shall be designed into the noise enclosure and meet OSHA standards.

## 2.08 DRIVE MOTOR

The motor shall be sized for appropriate horsepower, RPM, and other appropriate electrical characteristics determined for the application. The brake horsepower requirement with relief valve fully open shall not exceed the motor nameplate horsepower. Motors operating in the service factor at design and/or relief setting will not be accepted. Motors to be horizontal foot mounted ball bearings, heavy-duty steel, or cast iron frame, gasketed conduit boxes, and manufactured to NEMA or IP standards. Motors shall be as manufactured by Baldor, or approved equal. IEC motors will not be accepted.

- Motor Horsepower 25.
- Motor RPM 1800.
- Motor Type TEFC.
- Motor Electrical 3 Phase, 60 Hertz, 230-460 or 480V only.
- Motor Service Factor 1.15.
- Motor Full Load Efficiency per NEMA Premium standards.

## 2.09 STANDARD ACCESSORIES

- A: Oil fill container with a blower oil drain manifold.
- B: The blower package shall include pressure/vacuum gauges on either the suction or discharge of the blower. Gauges shall be mounted on the noise enclosure. All gauges shall be supplied by Howden Roots, as manufactured by Ashcroft model 1009SW, with 2.5 inch dial.
- C: The blower package will include a discharge temperature gauge mounted on the noise enclosure. The discharge temperature gauge shall be supplied by Howden Roots, as manufactured by Weiss model 25UB3-5131 with 2.5 inch dial.
- D: Blower package shall include an inlet filter differential pressure gauge mounted on the noise enclosure to indicate filter change requirement. The inlet filter gauge shall be supplied by Howden Roots, as manufactured by Dwyer model 2-5040 Minihelic II with 2.5 inch dial.
- E: A spring type large nozzle design bronze relief valve shall be included. The relief valve shall be mounted in the discharge silencer for pressure applications, and in the suction piping on blowers for vacuum application. The relief valve shall be supplied by Howden Roots, as manufactured by Kunkle model 337 for pressure service and 215V for vacuum service.
- F: Check valves shall be supplied for pressure and vacuum applications. The check valve shall have plain end connections for 5 inch diameter and below. 6 inch through 10 inch diameters are MNPT, and 12 inch diameter will be wafer. Check valve shall be split disc type, and valve body shall be cast iron or carbon steel, with silicone seal. Check valve ratings shall be 200 PSIG and 500 degrees Fahrenheit. The blower manufacturer must insure the valve is suitable for the application. Check valve to be supplied by Howden Roots, as manufactured by Flexi-Hinge.
- G: Vibration mounts shall be supplied and capable of leveling the blower package, to insure proper oil level, and to increase service and longevity of the equipment. Vibration mounts to be supplied by Howden Roots. The blower manufacturer must insure proper selection for the specific blower system offered.
- H: An 85 dBA or less free field guaranteed noise enclosure should be provided for each blower system. The enclosure outer material must be zinc coated steel with a surface preparation and paint as follows: Powder coat with texture finish 40-100 microns (65 microns average) RAL 5015 blue powder coat process to be proven to pass 500 hour salt spray test satisfactory with no rust evidence. The enclosure must be suitable for outdoor installation, 20 lb per square foot snow load and 70 MPH wind speed. The enclosure shall include a vent system and (3) removable panels for easy access and maintenance. The ventilation fan shall be mounted on blower drive shaft. Separately wired electric enclosure fans will not be accepted. The noise enclosure shall be provided with 1 inch foam, and the foam shall comply with UL94-HF 1 for flammability. The noise enclosure to be supplied by Howden Roots.

## 2.10 OPTIONAL ACCESSORIES

- A: For outdoor installation, the enclosure shall incorporate inlet and discharge weather hoods.

### PART 3 EQUIPMENT

- 3.1 All equipment will be factory painted in accordance with the manufacturer's standard procedures.
- 3.2 Jefferson Parish Department of Sewerage personnel will install specified equipment, in accordance with manufacturer's recommendations.

### PART 4 WARRANTIES AND SERVICE

- 4.1 The Manufacturer shall have an authorized factory service center capable of completely servicing the proposed equipment available to Jefferson Parish.

#### 4.2 Warranties

Applicable Series or Model	Designation or Gear Diameter	Warranty period months from date of original unit start-up / months from date of original shipment, whichever occurs first.		
<b>Bare Shaft Unit</b>				
URAI <sup>®</sup> & URAI-J <sup>®</sup> <i>Including DSL</i>	2½ - 7-inch			24 / 30
RAM <sup>™</sup> & RAM-J <sup>™</sup> Tri-RAM <sup>™</sup>	4½ - 6-inch			24 / 30
Tri-RAM <sup>™</sup>	7 & 8-inch			24 / 30
RAM-X	155, 225, 280, 400 & 500			24 / 30
RAM-X	600, 770, 800 & 1000	12 / 18		
RCS & RCS-J	7 & 8 inch	12 / 18		
<b>Standard Factory Package</b> (Note that Bare Shaft Blower is covered separately above. Explicitly not included in Standard Factory Package warranty are drive belts, filter elements, hoses & fittings, gauges & switches)				
EasyAir <sup>®</sup> 8000	All sizes		18/24	
EasyAir <sup>®</sup> X2	50, 65, 100, 150 & 200		18/24	
EasyAir <sup>®</sup> X2	250 & 300		18/24	



**Gardner Denver Bid Specification**  
**IQ Medium Blower Packages Specification**  
**Utilizing**  
**HeliFlow<sup>®</sup>, Sutorbilt<sup>®</sup> Legend<sup>®</sup>, and DuroFlow<sup>®</sup> Blowers**



**PART I – GENERAL**

The blower or vacuum package shall be of the positive displacement type, dual splash lubricated, with the blower assembly, accessories, controls and other components packaged and supplied by a single manufacturer, who shall be responsible for the compatibility of all included equipment. Depending on performance requirements, the blower package shall include one of the blowers described in more detail below of 2 lobe or helical 3 lobe type. The package to be fully enclosed or unenclosed, horizontal blower configuration, and factory tested prior to shipment. Each blower shall deliver **Select ICFM** ICFM of free air when operating at **Select HP** hp and against **Select PSIG** psig/ **Select inHg** “Hg<sub>v</sub> discharge/inlet pressure/vacuum.

**PART II – PRODUCT**

**1. DESIGN CONDITIONS**

- 1.1 Minimum inlet volume flow rate **384** ICFM (at blower inlet connection)
- 1.2 Inlet temperature **60** °F
- 1.3 Relative humidity **60** %
- 1.4 Inlet pressure psig (at blower inlet connection) or inlet vacuum “Hg<sub>v</sub>
- 1.5 Discharge pressure psig (at blower discharge connection)
- 1.6 Maximum rated pressure rise psig
- 1.7 Maximum blower speed RPM
- 1.8 Maximum BHP at blower shaft
- 1.9 Maximum discharge temperature °F
- 1.10 Maximum free field noise level dBA at 1 meter with sound enclosure

**2. BLOWER CONSTRUCTION**

- 2.1 HeliFlow<sup>®</sup> 4” gear diameter
  - a. Impeller Case  
High-strength impeller case shall be one piece ASTM A48 Class 30 close-grained cast iron with one separate and one integral head plate incorporating large external fins for strength and heat dissipation. Venting chambers vented to the atmosphere shall be located between the air and oil seals. This assures no oil enters the impeller housing or system air stream. The unique Helical 3 lobe rotors, triangular tuned ports and extra casing mass shall aid in reducing noise levels.
  - b. Impellers-Shaft Assembly  
Impellers shall be solid 3 lobe helical design to reduce pulsations and noise, with integral shafting, produced from close grain ASTM A536, grade 65-45-12 ductile iron. Impellers shall be machined on all exterior surfaces to a precise contour for operating at close clearances and high efficiency operation. Impellers shall be dynamically balanced to minimize vibration. End plates shall be high strength cast iron with precision machined bearing fits to assure exact positioning of impellers in the main body housing. Air seals of controlled flow design, shall be piston ring type seals precision fitted to each impeller shaft to minimize air leakage and maximize efficiency.
  - c. Bearings  
Oversized, precision fit, 3 (three) anti-friction bearings shall be heavy-duty deep groove ball bearings with the exception of the expansion end of the drive impeller for exact

positioning of the impellers and to control thrust. Heavy-duty cylindrical 1 (one) roller bearing shall be provided at the expansion end of the drive impeller to provide increased overhung load capacity.

d. Timing Gears

The impellers shall be timed by a pair of high strength ASTM A322-91 Grade 8620 UNS G86200 alloy steel timing gears. The gears shall be spur design, case hardened equal to or above 60 Rockwell C hardness and machined from for precision timing, quiet operation and long life.

e. Fasteners

All fasteners shall be SAE Grade 5, high strength material as a minimum.

f. Lubrication

Lubrication of timing gears and bearings shall be a splash lubrication system. Formed steel splash plates shall be directly fastened to the impeller shafts to provide positive oil lubrication at all operating speeds. Oil seals of piston ring and oil flinger design, shall be provided on each internal impeller shaft to prevent leakage from the oil reservoirs. The drive seal shall be a high temperature elastomer lip type seal to prevent oil leakage from the oil reservoir.

## ~~2.2 Suterbilt® Legend® 4" gear diameter~~

a. Impeller Case

The blower impeller casing shall be one piece ASTM A48 Class 30 close-grained cast iron. Impeller case shall be strongly ribbed to prevent distortion when operating at rated pressure. Head plates, machined from cast iron, shall be ground on the interior surface to precise operating tolerances. Air vents shall be located between the seals and the impeller chamber to relieve excessive pressure on the seals. Air gaps shall be provided between the cylinder and bearing housing to reduce the amount of heat exposed to the bearings and lubrication. The case shall have oversized dowel pins for precise mounting and alignment of head plates resulting in low noise and stable, vibration-free operation.

b. Impellers-Shaft Assembly

Impellers shall be machined from ASTM A536, grade 65-45-12 ductile iron on all exterior surfaces to an exact profile and are permanently fastened to alloy steel shafts. Impellers shall be dynamically balanced for smooth operation in any assembled position to provide extra strength and rigidity to handle continuous maximum loads without fatigue. One piece machined alloy steel shafts shall pass completely through the impellers for proper support.

c. Bearings

Dual Splash Lubricated units shall be equipped with 3 heavy duty anti-friction bearings, and 1 spherical roller bearing on the drive end to improve overhung load capacity, and greater misalignment tolerance.

d. Timing Gears

The unit shall have 2 timing gears, accurately machined from high strength ASTM A434, Class BD ANSI 4100 alloy steel forgings and held to the shafts using grip rings, to position the impellers. The gears shall be spur design, hardened to equal to or above 30 Rockwell C hardness to ensure non-slip timing even under the most strenuous loading conditions.

e. Fasteners

All fasteners shall be SAE Grade 5, high strength material as a minimum.

f. Lubrication

Gears shall be enclosed in a lubrication tight housing and shall be splash lubricated from lubrication maintained in the gear housing. Gear end bearings shall be splash lubricated from the same lubrication reservoir. Drive end bearings shall be splash lubricated from lubrication maintained in the drive housing. Seals shall be high temperature Viton® oil

seals to maximize the seal life in continuous, severe-duty applications to provide leak-free operation.

### 2.3 ~~DuroFlow® 4.5" gear diameter~~

- a. **Impeller Case**  
Impeller case shall be strongly ribbed one-piece design to prevent case distortion when operating at rated pressures. The case shall be of high strength ASTM A48 Class 30 close-grained cast iron and precision machined for close clearance operation. End plates shall be high strength cast iron with precision machined bearing fits to assure exact positioning of impellers in the main body housing. Venting chambers vented to the atmosphere shall be located between the air and oil seals. This assures no oil enters the impeller housing or system air stream. The oil reservoirs shall be vented to atmosphere to improve effectiveness of oil seal.
- b. **Impellers-Shaft Assembly**  
Impellers shall be closed end design, produced from ASTM A536, grade 65-45-12 close grain cast ductile iron. Impellers shall be machined on all exterior surfaces to a precise contour for operating at close clearances and high efficiency operation. Impellers and shafts shall be dynamically balanced to minimize vibration. Air seals of controlled flow design, shall be piston ring type seals precision fitted to each impeller shaft to minimize air leakage and maximize efficiency.
- c. **Bearings**  
Bearings shall be heavy-duty double row angular contact ball bearings on the drive end of the impeller shafts for exact positioning of the impellers and to control thrust. Heavy-duty cylindrical roller bearings shall be provided on the gear ends of the impeller shaft to allow for thermal expansion without binding.
- d. **Timing Gears**  
Timing gears shall be helical design and machined from high strength ASTM322, Grade 4140 alloy steel forgings for precision timing, quiet operation and long life. The gears shall be hardened to equal to or above 30 Rockwell C hardness to ensure non-slip timing even under the most strenuous loading conditions.
- e. **Fasteners**  
All fasteners shall be SAE Grade 5, high strength material as a minimum.
- f. **Lubrication**  
Lubrication of timing gears and bearings shall be a splash lubrication system. Formed steel splash plates shall be directly fastened to the impeller shafts to provide positive oil lubrication at all operating speeds. Oil seals of piston ring and oil flinger design shall be provided on each internal impeller shaft to prevent leakage from the oil reservoirs. The drive seal shall be a high temperature elastomer lip type seal to prevent oil leakage from the oil reservoir.

## 3. PACKAGE COMPONENTS

- INCLUDED* →
- 3.1 **AirSmart Controller (on enclosed packages)**  
AirSmart Controller shall be included for intelligent digital monitoring with features, such as:
    - a. Inlet/Discharge Temperature Indication and Protection
    - b. Excessive Filter Differential Indication and Protection
    - c. Differential Temperature Protection
    - d. Inlet/Discharge Pressure/Vacuum Indication and Protection
    - e. Excessive Enclosure Temperature Protection
    - f. Service Information (air filter, oil change, hour meter)
    - g. Multiple Languages (English, Spanish, French, Italian, Portuguese, German, Czech and Russian)

### 3.2 Base

Base shall include motor auto-tension device for ease of drive installation. Forklift provisions to be integral with the base. The base shall have open end for easy fork lifting of package with fork slots for easy maneuverability and fork slot covers as standard.

3.3 Inlet Filter/Silencer

The filter element shall be readily accessible for easy maintenance through lift off top panel or removable hinged covers. Filter efficiency shall be 99 percent with particles of 2 (two) micron diameter and larger. The inlet filter/silencer shall be carbon steel with paper filter elements. The silencer is integral with filter and able to provide the necessary acoustic silencing of the package.

3.4 Removable Discharge Silencer

A reactive, multiple chamber, silencer shall be used and be able to provide acoustic silencing of critical octave band dB levels. Discharge silencer shall be removable with 4 (four) vibration isolators. Silencer to be separate from base frame to reduce stresses and vibration in base caused by thermal expansion and sound attenuation of the silencer. The discharge silencer shall be ASME coded for all applications utilizing relief valve set pressures at or above 15 psig.

3.5 Pressure/Vacuum Relief Valve

Relief valve shall be a spring type valve. Pressure Relief Valve is to be set to 3 psi above maximum operating pressure, not to exceed 2 psi above maximum pressure rating of the blower.

3.6 V-belt Drive with Belt Guard

Belt Guard shall be designed separate from the sound enclosure and meet OSHA standards. Lightweight removable polymer guard shall ensure ease of maintenance and operator protection. The basic blower package shall be designed as a fixed speed belt drive. The motor base shall incorporate auto tensioning capability to eliminate the need for regular field maintenance tensioning of the drive system. Belt tension status indicator shall advise when belt replacement is required.

3.7 Drive Motor

TEFC EPACK NEMA standard motor with 1.15 service factor shall be supplied according to specifications within the parameters of enclosure, speed, temperature rating and efficiency level. Motor shall be mounted and aligned prior to shipment to allow for rapid on-site check of alignment and tensioning prior to start-up. Motor shall be designed for inverter duty. Motor shall be suitable for 200/3/60, 230/3/60, 380/3/50, 415/3/50, 460/3/60 and 575/3/60 applications. Premium Efficiency option shall be available.

3.8 Enclosure cooling Fan

An enclosure cooling fan shall be supplied on enclosed packages to adequately control the temperature within the enclosure in order to eliminate overheating of components. Fan to include safety guard.

3.9 Connections

Process connections to be NPT up to and including 4" and flanged above 4". All process connections and electrical service connections will enter/exit through the back of the package. Maintenance points to be accessed through removable panels on top, front, right and left side of the package when facing package.

3.10 Vibration Isolation Pads.

Vibration Isolation Pads shall be provided to minimize transmitted vibration from the blower package base to the support level or surrounding structures where the blower is situated. Isolating bellows/piping expansion joints or hoses required at inlet/discharge of the blower for same purpose.

### 3.11 Sound Attenuating Enclosure

The sound attenuating enclosure rigidly fabricated of 16 gauge formed sheet powder coated with additional foam padding, providing sound levels of 60-77 dBA, tested per CAGI adopted ISO 2151 specifications, shall be provided as standard. Enclosure will include one-piece removable panels for full access to all components and ease of maintenance.

### 3.12 Check Valve

Check valve shall be installed down stream of the discharge silencer and supplied with the package.

3.13 UL/NEMA Type 1 Electrical Box Less starter shall be supplied as standard.

3.14 Oil Fill Reservoirs shall be supplied as standard

3.15 Local Visual Inlet Filter Restriction Indicator shall be supplied as standard for unenclosed packages.

3.16 Local Discharge Pressure Gauge or Inlet Vacuum Gauge shall be supplied on unenclosed packages.

3.17 Local Air Discharge Thermometer shall be supplied on unenclosed packages.

3.18 An oil drain system shall be supplied that allows easy servicing of the blower installed in the package.

3.19 AEON PD Lubricant shall be supplied as standard

## 4. OPTIONAL ACCESSORIES

### 4.1 AirSmart Optional Features:

- a. Oil level monitoring using ultrasonic level sensors shall be available as an option for intelligent oil level monitoring.
- b. Oil sump temperature monitoring shall be available as an option.
- c. Remote monitoring shall be available to allow remote monitoring via modbus protocol over serial or ethernet.
- d. Blower package sequencing shall be available as an option, allowing the blower package to communicate to other same brand blower packages to optimize system efficiency. AirSmart Controller shall recognize the capabilities of other machines and coordinate their operation to minimize energy consumption.
- e. Speed control for VFD option
- f. KW readout (VFD option only)

~~4.2 Integral full-voltage starter shall be available as an option. All starters shall fit within the package.~~

~~4.3 Integrated Variable Frequency Drive (VFD) shall be available as an option. All VFDs shall fit within the package.~~

4.4 An unloader valve is available as an option to provide reduced motor amps during start ups for standard starter units.

4.5 An ASME Coded Silencer can be supplied as an option.

4.6 Premium Efficiency TEFC motor can be supplied as an option

4.7 Premium Inlet Filter/Silencer can be supplied as an option for unenclosed packages only.

## 5. ENVIRONMENT AND OPERATING CONDITIONS

- 5.1 Environment
  - a. Suitable for indoor and outdoor installations (outdoor installations are recommended to have a canopy).
  - b. Altitude range up to 6,000 feet
  - c. Ambient temperature range 20° F to 100° F
  - d. 0 – 100% relative humidity
  - e. Air service only
- 5.2 Operating parameters
  - a. Pressure: 5 – 15 PSIG
  - b. Vacuum: 6 – 16" Hg
  - c. Air flow: 200 – 600 ICFM
  - d. Inlet temperature: 20° F minimum
  - e. Maximum discharge temperature: 350° F

## **6. AESTHETICS AND DECALS**

All equipment shall be factory painted. Unenclosed package painting shall be aesthetically pleasing painted per factory standards. Enclosure shall be painted white with red corners. Warning and danger decals shall be standard ISO symbols. Product decals shall be the current standard product decal and package logo.

## **PART III – INSTALLATION / WARRANTY**

### **1. INSTALLATION**

The contractor, in accordance with the manufacture's instructions, shall install the blower package.

### **2. WARRANTY**

Gardner Denver equipment supplier shall also be a factory authorized warranty and repair center. The blower package shall come with a full 24 month factory warranty. The motor, AirSmart controller and VFD or Full-voltage starter (if sold with the package) shall come with the five year warranty.

### **3. DOCUMENTATION**

Units shall ship with operator's manuals, Air Smart Controller manual, Quick Start Guide and parts list in hard copy and/or CD ROM format. PowerPoint sales and training presentation, brochures and performance curves shall be available upon request.

### **4. TESTING**

Package shall have a mechanical run validation test done prior to shipment. Each blower shall have a slip and hot test performed prior to shipment.

### **5. INSPECTION**

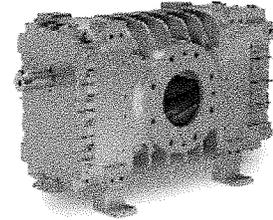
Gardner Denver or their distributor shall furnish, if needed, knowledgeable technicians to review the inspection. The staff shall be available, if needed, to inspect the field start up of the equipment.

# QuickPik™

## HeliFlow - 408

### Product Information

CORRECTED VALUES	ORIGINAL UNITS	ENGLISH UNITS	METRIC UNITS
Ambient Pressure	14.696 PSIA	14.696 PSIA	1.013 bar a
Elevation	0 ALTI-FT	0 ALTI-FT	0 alti-m
Inlet Pressure	14.696 PSIA	0 PSIG	0 bar g
Inlet Pressure Loss	0.3 PSIG	0.300 PSIG	0.021 bar g
Inlet Temp	68 F	68 °F	20 °C
Inlet Flow	384 ICFM	384 ICFM	652 m³/h
Discharge Pressure	9.5 PSIG	9.500 PSIG	0.655 bar g
Discharge Pressure Loss	0.2 PSIG	0.200 PSIG	0.014 bar g
MEASURED VALUES	ORIGINAL UNITS	ENGLISH UNITS	METRIC UNITS
Speed	2913 RPM	2913 RPM	2913 RPM
RPM % Of Max	73	73	73
Power	23.8 HP	23.8 HP	17.7 kW
Discharge Temp	207 °F	207 °F	97 °C
Temp % of Max	59	59	59
Noise	83 dBa	83 dBa	83 dBa
Pressure % of Max	67	67	67
RELIEF VALVES		PRESSURE	
Pressure		10.5 PSIG	
Pressure % of Max		73	
Discharge Temp		222 °F	
Temp % of Max		63	



### PHYSICAL

Weight	201 lbs.
Gear Diameter / Center Distance	4 in.
Connection Size	4i/4d in.
Case Length	8 in.
WR <sup>2</sup>	lb-ft <sup>2</sup>
Orientation	horizontal

### PERFORMANCE

Max Delta P	15 PSI
Max Temp	350 °F
Max Speed	4000 RPM
Min Speed	955 RPM
Max Case Pressure	25 PSIG
Max Delta T	250 °F

# QuickPik™

AMBIENT GAS PARAMETERS	ENGLISH UNITS	METRIC UNITS
Molecular Weight	28.867 lbm/lbmol	28.867 kg/kgmol
R Value	53.522 ft.lbf/lbm.R	0.288 kJ/kg.K
Density	0.075 lbm/ft <sup>3</sup>	1.200 kg/m <sup>3</sup>

GAS MIX:	VOL
Air	100%

## Performance Curves

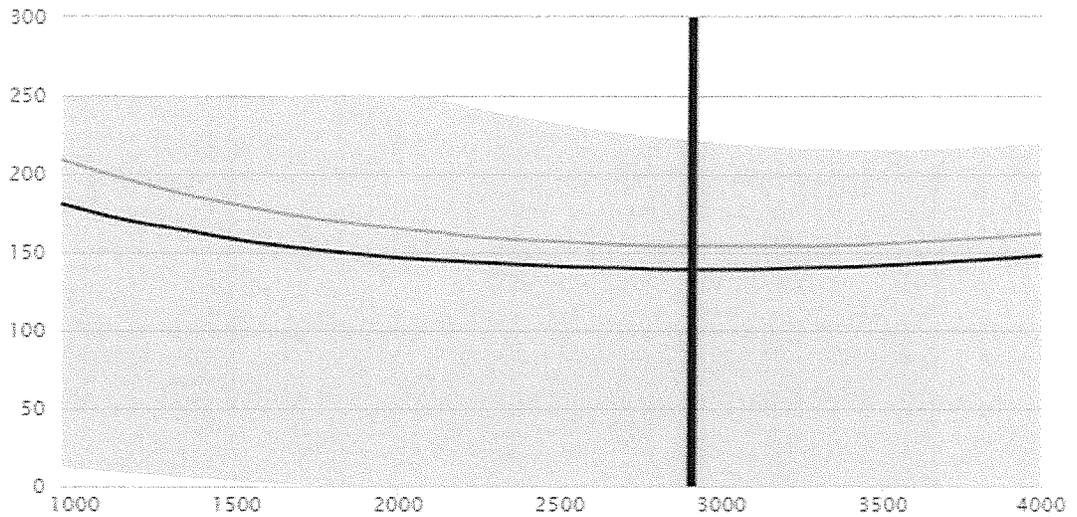
### Temperature Rise

**DEFINED CONDITIONS**  
**139 F**

**RELIEF VALVE**  
**154 F**

**RPM**  
**2913**

Published Data  
Defined Conditions  
Relief Valve



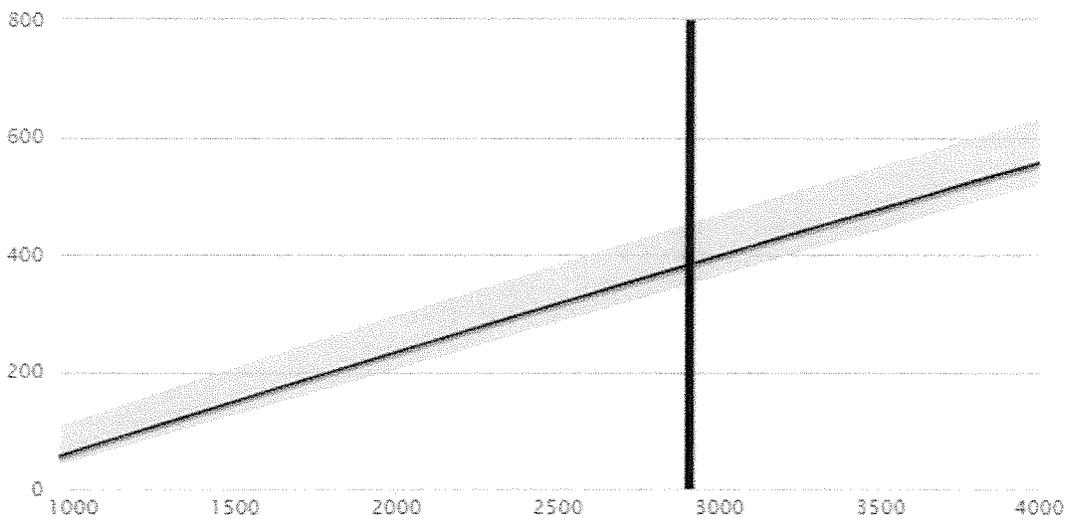
### Flow

**DEFINED CONDITIONS**  
**383 ICFM**

**RELIEF VALVE**  
**377 ICFM**

**RPM**  
**2913**

Published Data  
Defined Conditions  
Relief Valve



# QuickPik™

## Performance Curves

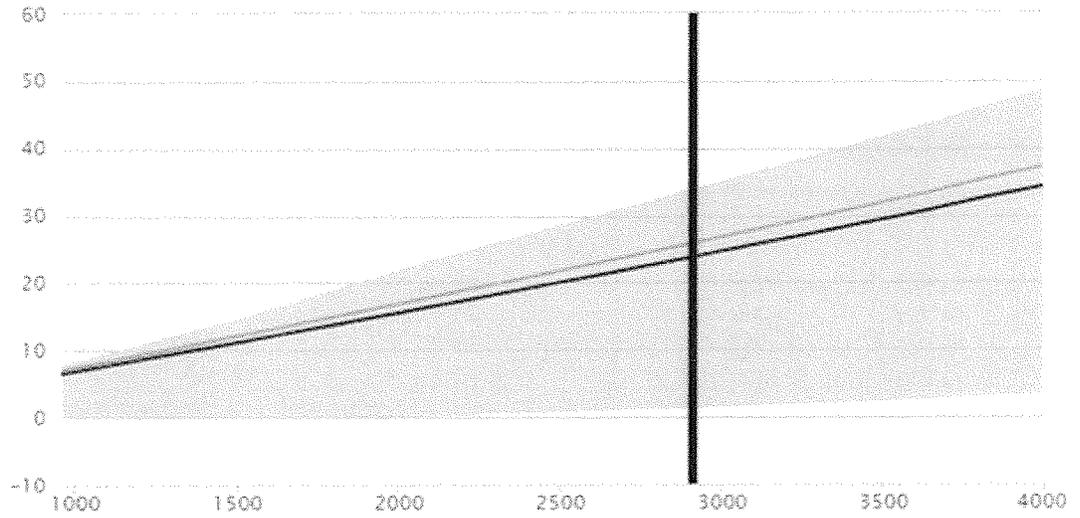
Power

**DEFINED CONDITIONS**  
**23.8 HP**

**RELIEF VALVE**  
**25.9 HP**

**RPM**  
**2913**

Published Data  
Defined Conditions  
Relief Valve



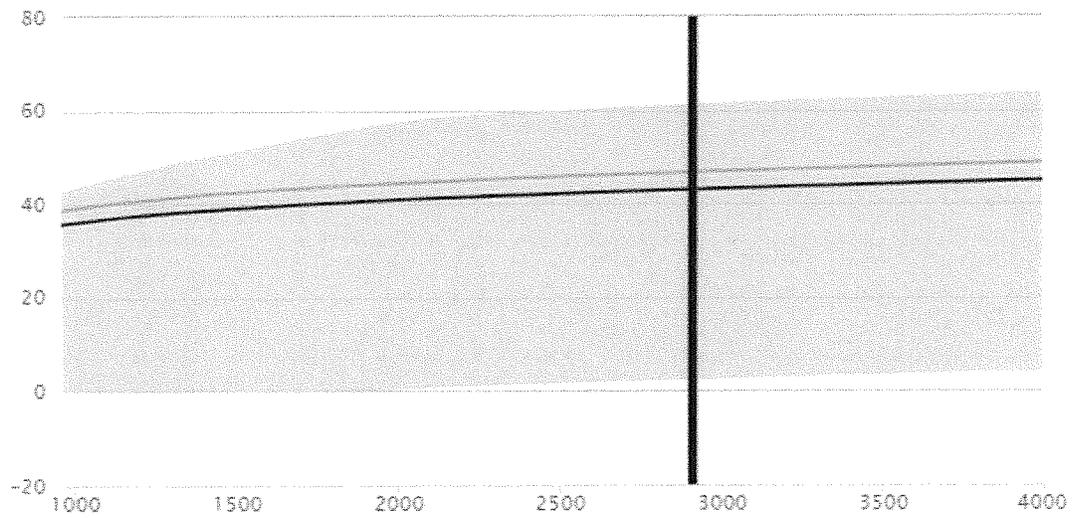
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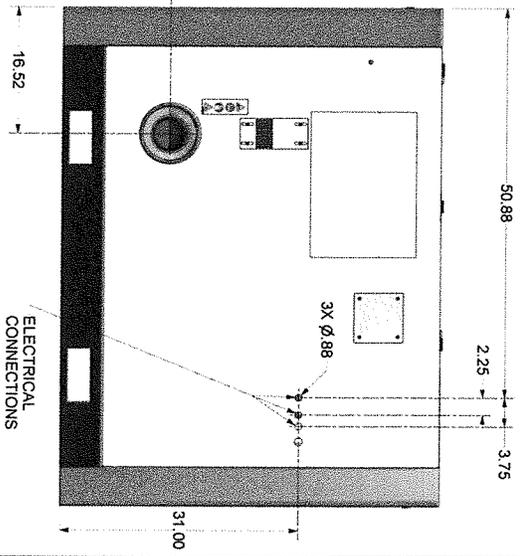
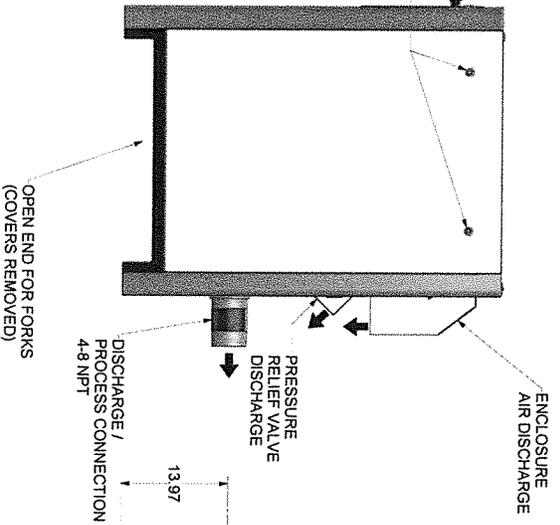
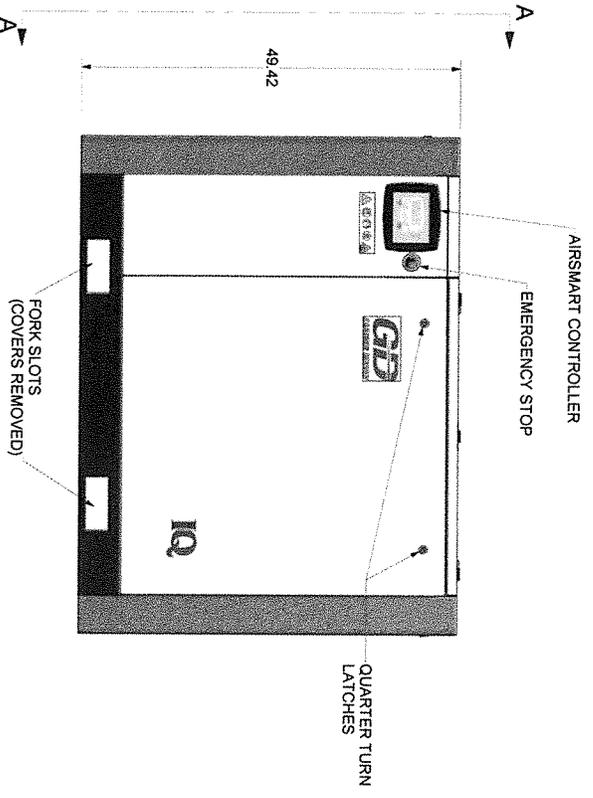
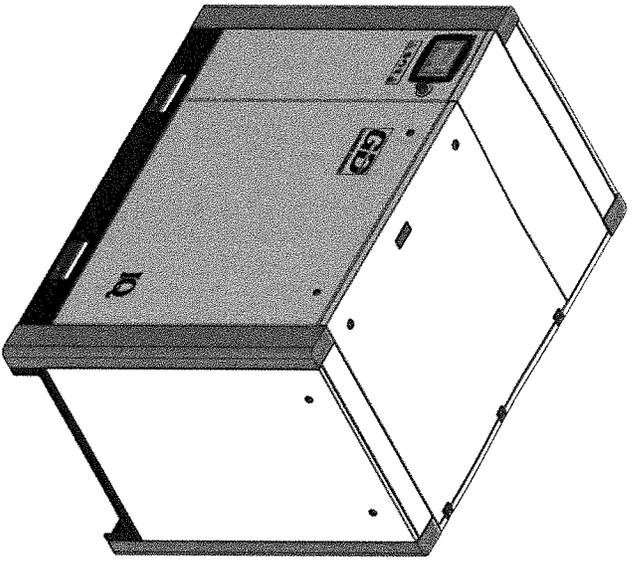
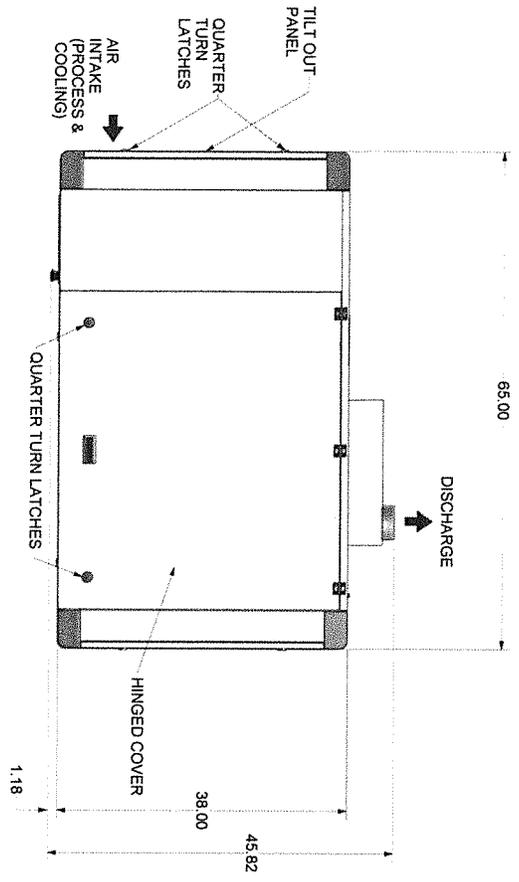
**DEFINED CONDITIONS**  
**42.9 ft-lb**

**RELIEF VALVE**  
**46.7 ft-lb**

**RPM**  
**2913**

Published Data  
Defined Conditions  
Relief Valve





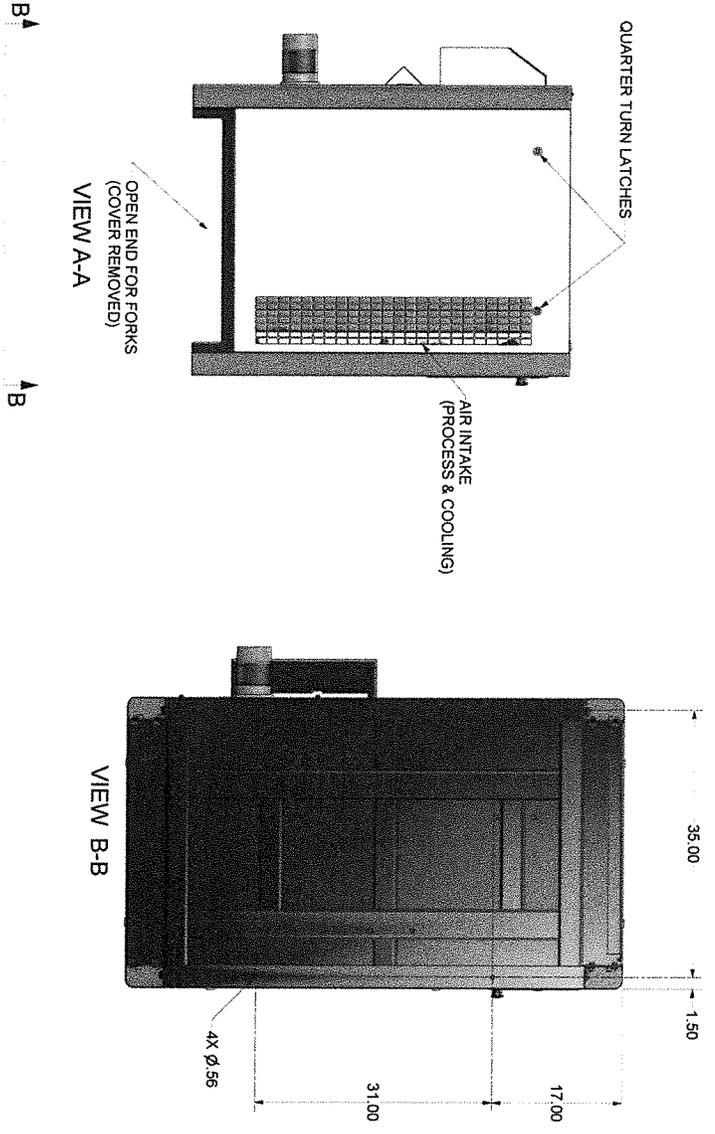
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Garber Power Inc.  
 305898904

OUTLINE UNIT/PKG  
 DATE: 10/20/21  
 DRAWN: CFB  
 CHECKED: CFB  
 PROJECT: 305898904

ZONE / REV	DESCRIPTION	DATE	DWGN/CHK
A	SEE SHEET 1 FOR REVISIONS		

REVISION HISTORY



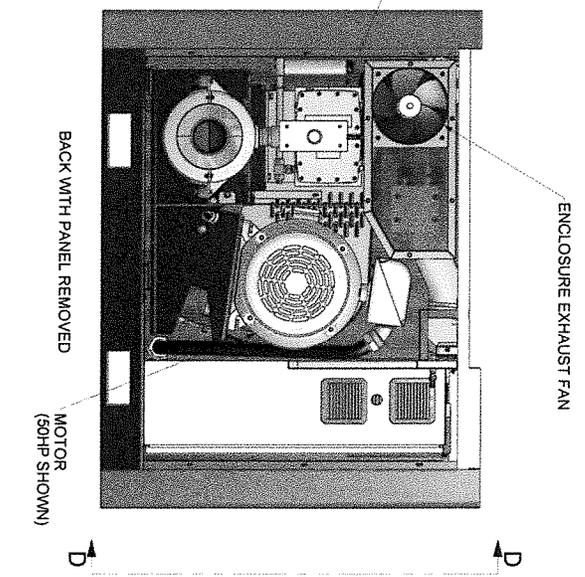
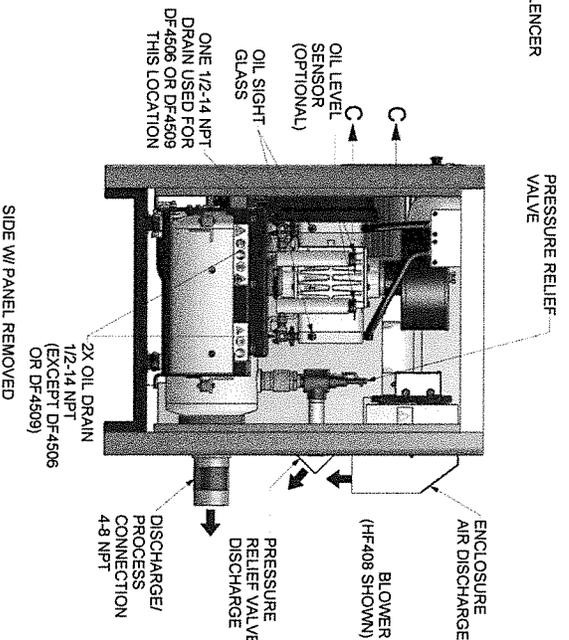
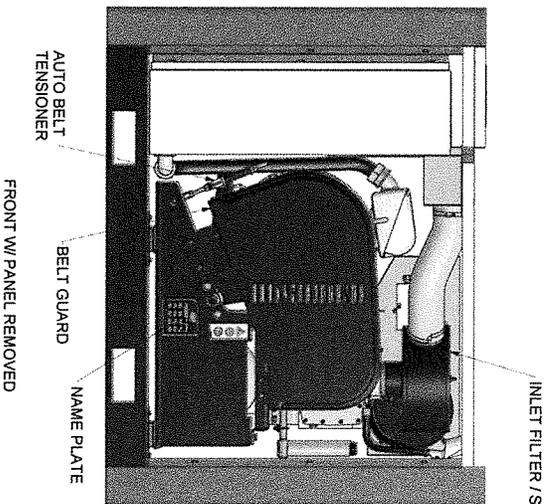
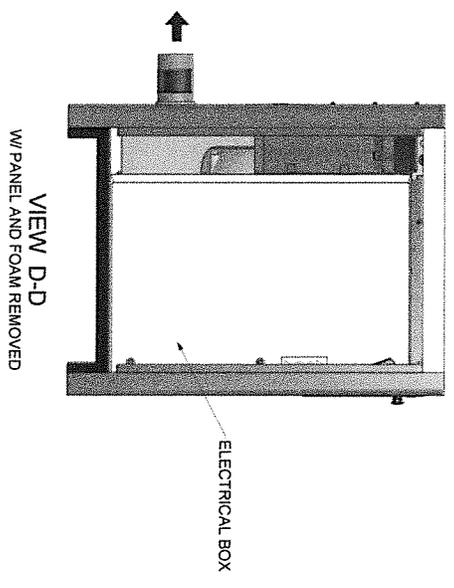
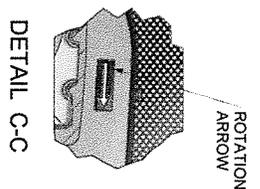
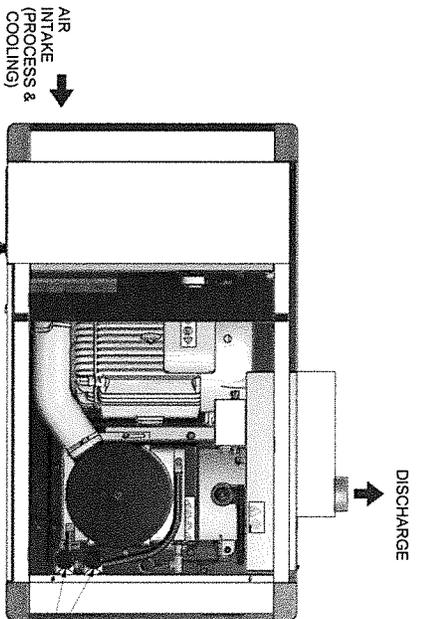
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 DRAWING NO.: 3055PBR04  
 PROJECT: 3055PBR04  
 SHEET: 1 OF 1  
 TITLE: HEAT TREATMENT UNIT OUTLINE - UNIT FRG

COMPANY: Gardner Denver  
 ADDRESS: 10000 W. 10th Ave., Suite 1000, Denver, CO 80202  
 PHONE: 303.440.1000  
 FAX: 303.440.1001  
 WWW: www.gardnerdenver.com

DRAWN BY: [Name]  
 CHECKED BY: [Name]  
 APPROVED BY: [Name]

THIRD ANGLE PROJECTION

REVISION HISTORY		DATE	DMW/CHK
ZONE / REV	DESCRIPTION		
A	SEE SHEET 1 FOR REVISIONS		

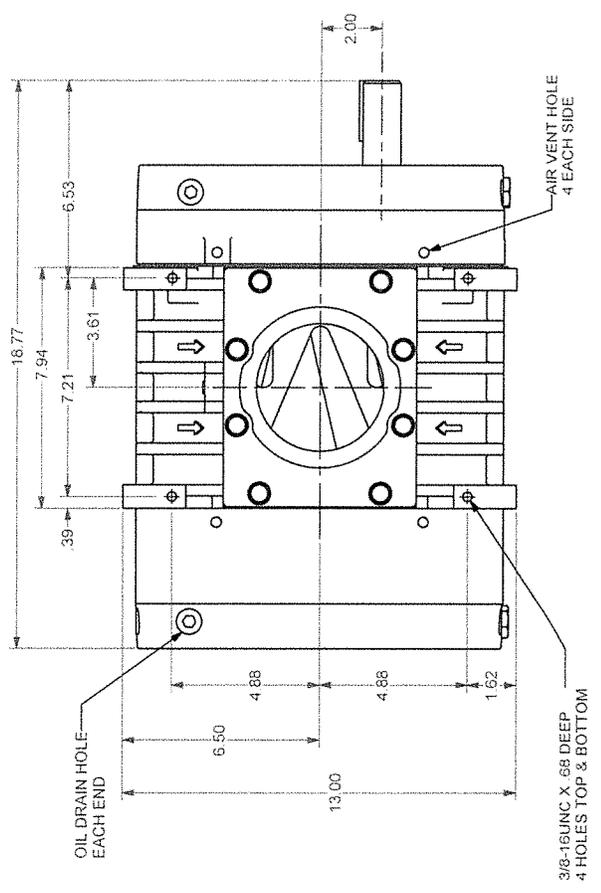
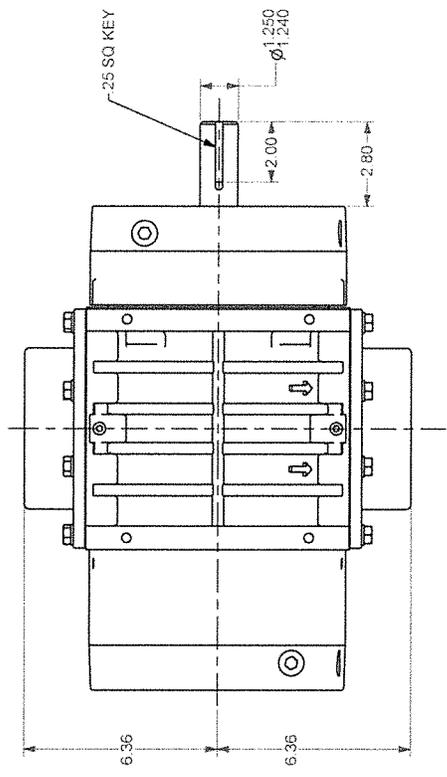
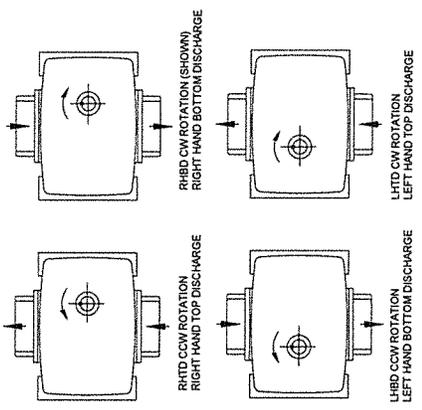
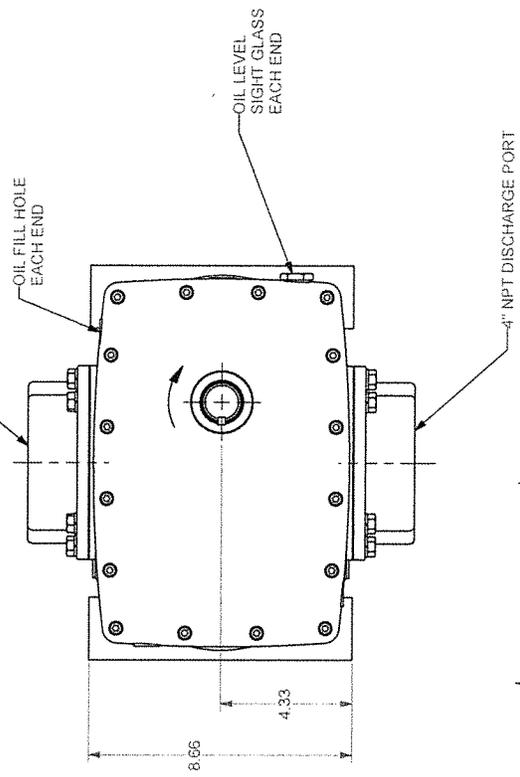


MODEL OF POWER/VEHICLE TO BE CONSULTED TO  
 DETERMINE THE EXACT LOCATION OF THE MOTOR OR  
 BLOWER. THE MOTOR OR BLOWER IS NOT TO BE  
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 OR BLOWER IS TO BE LOCATED IN THE REAR OF THE  
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**Gardner Denver**  
 Denver Powerline  
 10000 E. 10th Avenue  
 Denver, CO 80231  
 303.978.8904  
 303.978.8904

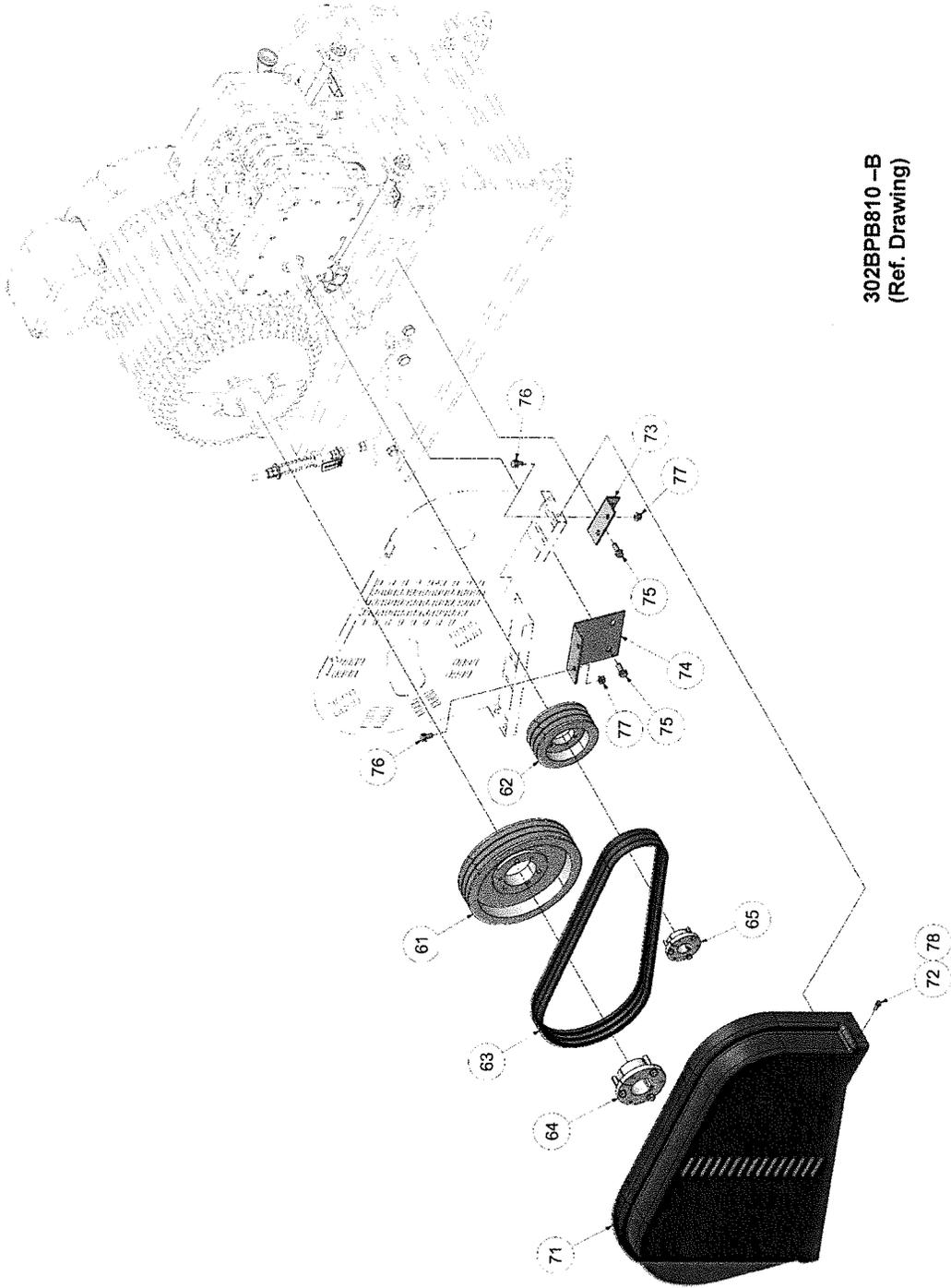
MODEL: OUTLINE UNIT/PKG  
 DATE: 10/20/2011  
 DRAWN BY: CMB  
 CHECKED BY: CMB  
 10/20/2011

REV	DATE	BY	CHK
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<b>Gariboldi Denver</b> Gariboldi Denver Inc. 2240 E. SLIM 80504 COLO SPRING, CO 80504		HEAT TREATMENT TITN OUTLINE-BARE UNIT HF409 HCRD W/ SHORT COILS	
DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994		DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994	
TOL ON DECIMALS: ± 0.005 TOL ON DECIMALS: 20X ± 0.01 TOL ON ANGLES: ± 0.30		THIRD ANGLE PROJECTION	
301HYC800		301HYC800	

# DRIVE GROUP

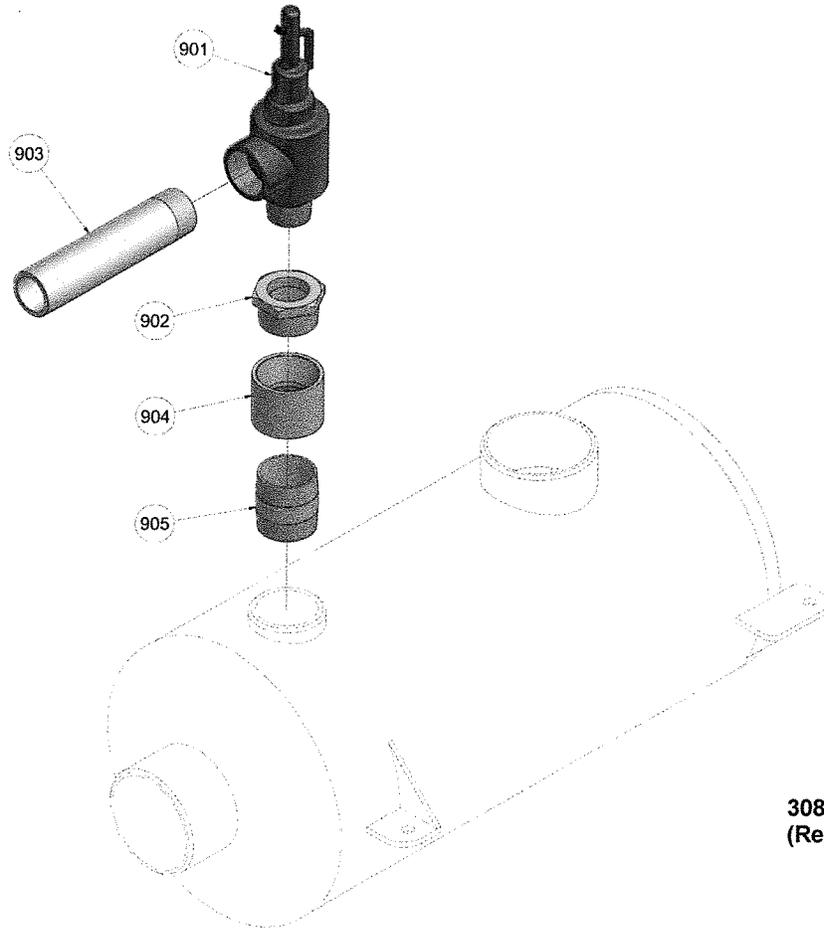


302BPB810 -B  
(Ref. Drawing)

See Page 14 for Parts List.

Order by Part Number and Description. Reference Numbers are for your convenience only.

**ENCLOSED PRESSURE PACKAGE – PRESSURE RELIEF GROUP**



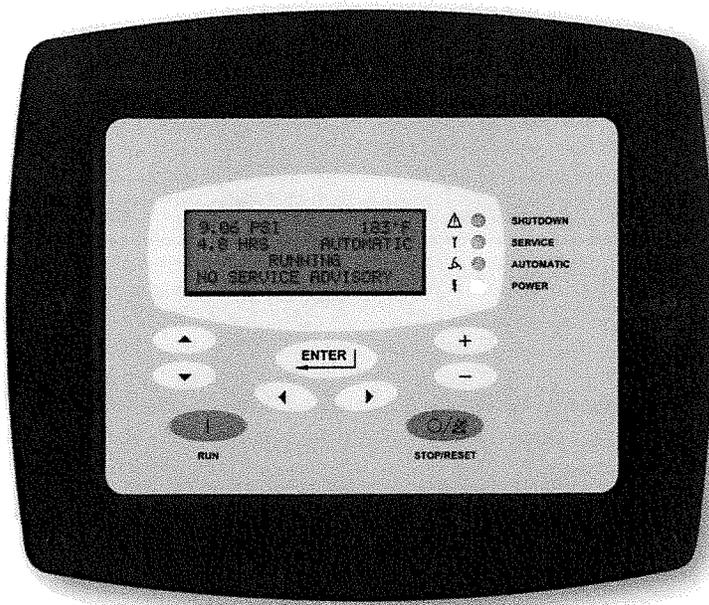
**308BPB810 -A  
(Ref. Drawing)**

Ref. No.	Description	Qty.	Part No.
			309BPB4013 – 311BPB4013 300BPB4074 – 327BPB4074
901	CALL CUSTOMER SERVICE WITH SERIAL NUMBER FOR #901	1	-----
902	CALL CUSTOMER SERVICE WITH SERIAL NUMBER FOR #902	1	-----
903	CALL CUSTOMER SERVICE WITH SERIAL NUMBER FOR #903	1	-----
904	COUPLING-PIPE.....	1	64BK9G
905	NIPPLE-PIPE .....	1	63L9G



*Experience Proven Results™*

IQ-7-200  
Version: 02  
November 30, 2010



## AIRSMART™ CONTROLLER

## USER'S MANUAL

(Blower  
Application)

## WARNING – PROHIBITION – MANDATORY LABEL INFORMATION

Gardner Denver positive displacement blowers are the result of advanced engineering and skilled manufacturing. To be assured of receiving maximum service from this machine, the owner must exercise care in its operation and maintenance. This book is written to give the operator and maintenance department essential information for day-to-day operation, maintenance and adjustment. Careful adherence to these instructions will result in economical operation and minimum downtime.

**Boxed text formats are used, within this manual, to alert users of the following conditions:**

**Safety Labels are used, within this manual and affixed to the appropriate areas of the blower package, to alert users of the following conditions:**

### **DANGER**

Indicates a hazard with a high level of risk, which if not avoided, WILL result in death or serious injury.



**Equipment Starts Automatically**



**Health Hazard – Explosive Release of Pressure**



**Cutting of Finger or Hand Hazard – Rotating Impeller Blade**



**High Voltage – Hazard of Shock, Burn or Death Present Until Electrical Power is Removed**



**Cutting of Finger or Hand Hazard – Rotating Fan Blade**



**Entanglement of Fingers or Hand – Rotating Shaft**

**⚠ WARNING**

Indicates a hazard with a medium level of risk, which if not avoided, COULD result in death or serious injury.



Asphyxiation Hazard – Poisonous Fumes or Toxic Gas in Compressed Air

**⚠ CAUTION**

Indicates a hazard with a low level of risk, which if not avoided, MAY result in a minor or moderate injury.



Burn Hazard – Hot Surface

**PROHIBITION - MANDATORY ACTION REQUIREMENTS**



Do Not Operate Blower with Guard Removed



Lockout Electrical Equipment in De-Energized State



Do Not Lift Equipment with Hook – No Lift Point



Loud Noise Hazard – Wear Hearing Protection



Handle Package at Forklift Points Only



Read the Operator's Manual Before Proceeding with Task

## SAFETY PRECAUTIONS

Safety is everybody's business and is based on your use of good common sense. All situations or circumstances cannot always be predicted and covered by established rules. Therefore, use your past experience, watch out for safety hazards and be cautious. Some general safety precautions are given below:



Failure to observe these notices could result in injury to or death of personnel.

- Keep fingers and clothing away from rotating fan, belt drive, etc.
- Disconnect the blower unit from its power source, lockout and tagout before working on the unit – this machine is automatically controlled and may start at any time.
- Do not loosen or remove the oil filler plug, drain plugs, covers, the thermostatic mixing valve or break any connections, etc., in the blower air or oil system until the unit is shut down and the air pressure has been relieved.
- Electrical shock can and may be fatal.
- Perform all wiring in accordance with the National Electrical Code (NFPA-70) and any applicable local electrical codes. Wiring and electrical service must be performed only by qualified electricians.
- Open main disconnect switch, lockout and tagout before working on the control, wait 10 minutes and check for voltage.



Failure to observe these notices could result in damage to equipment.

- Stop the unit if any repairs or adjustments on or around the blower are required.
- Do not use the air discharge from this unit for breathing – not suitable for human consumption.
- An Excess Flow Valve should be on all compressed air supply hoses exceeding 1/2 inch inside diameter (OSHA Regulation, Section 1926.302).
- Do not exceed the rated maximum pressure values shown on the nameplate.
- Do not operate unit if safety devices are not operating properly. Check periodically. Never bypass safety devices.

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# 1 General Information

The AirSmart™ Controller was designed for use in the Gardner Denver Global Line of positive displacement blowers. The AirSmart™ Controller is capable of controlling both variable speed and fixed speed blowers which use traditional motor starters. The microprocessor-based unit can easily control a Variable Frequency motor Drive (VFD) while at the same time monitoring all necessary temperature and pressure points within the blower in order to safely operate the machine and satisfy user air demand. The Control Panel displays a comprehensive overview of the blower status and allows easy access to operational parameters such as pressure set points, alarm set points and language selection.

## 1.1 AirSmart Controller Features

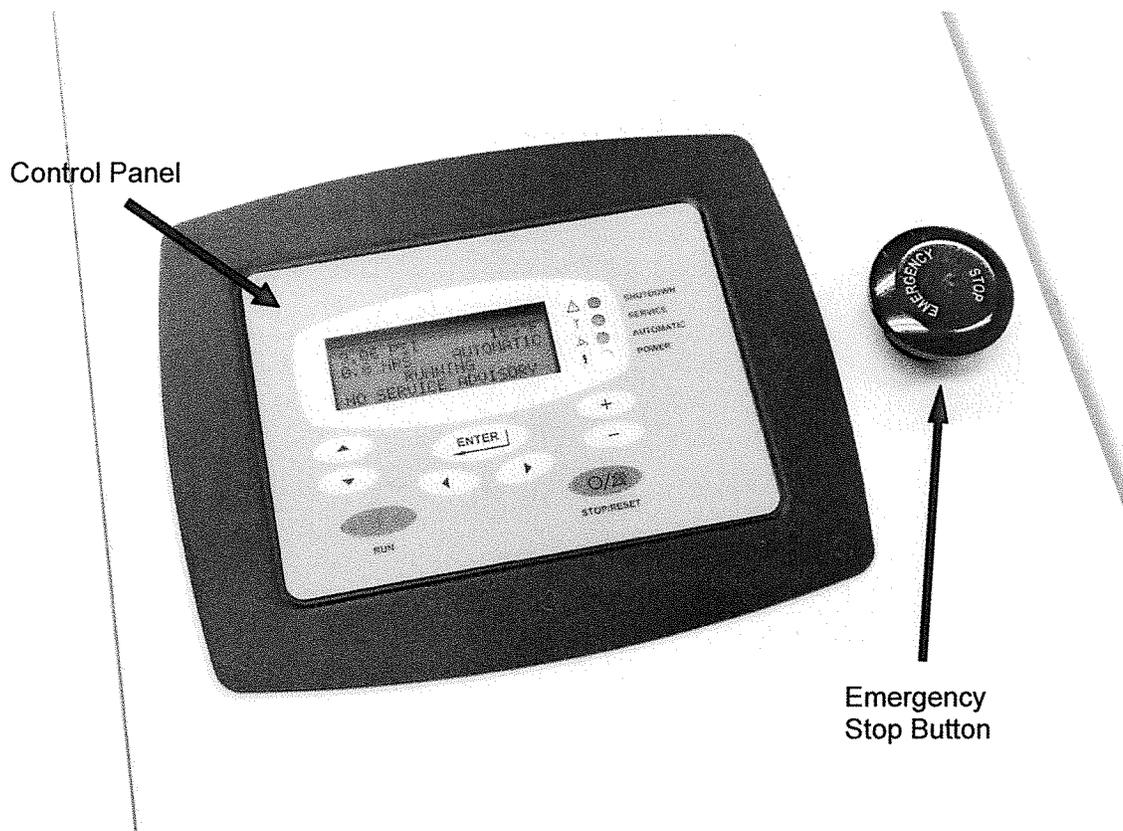
- ✓ Microprocessor controlled
- ✓ Low voltage 24 VDC operation
- ✓ Supports VFD via Modbus link
- ✓ Blower air regulation via PID control
- ✓ Can control variable speed or fixed speed blower.
- ✓ Intelligent limiting for operation in extreme environmental conditions
- ✓ Feature rich error handling for safe machine operation
- ✓ Expandable to meet the I/O needs of large blower packages
- ✓ Up to five pressure transducer inputs
- ✓ Up to five temperature transducer inputs
- ✓ Up to three discrete inputs for user control
- ✓ Up to two discrete outputs for user status
- ✓ Sequence capability for control of up to eight blowers (w/ opt. Communications Module)
- ✓ RS-232 Serial communications for local monitoring (w/ opt. Communications Module)
- ✓ Ethernet communications for remote monitoring (w/ opt. Communications Module)

## 1.2 Control Panel Features

- ✓ 4 x 20 Character LCD display with LED back lighting is easy to read in all lighting conditions.
- ✓ 9 Buttons for easy blower control and menu navigation
- ✓ 4 status LEDs for "at-a-glance" blower status
- ✓ Password protection of setup parameter menus
- ✓ Multiple language support

## 2 Controller Operation

### 2.1 Example Blower Control Panel



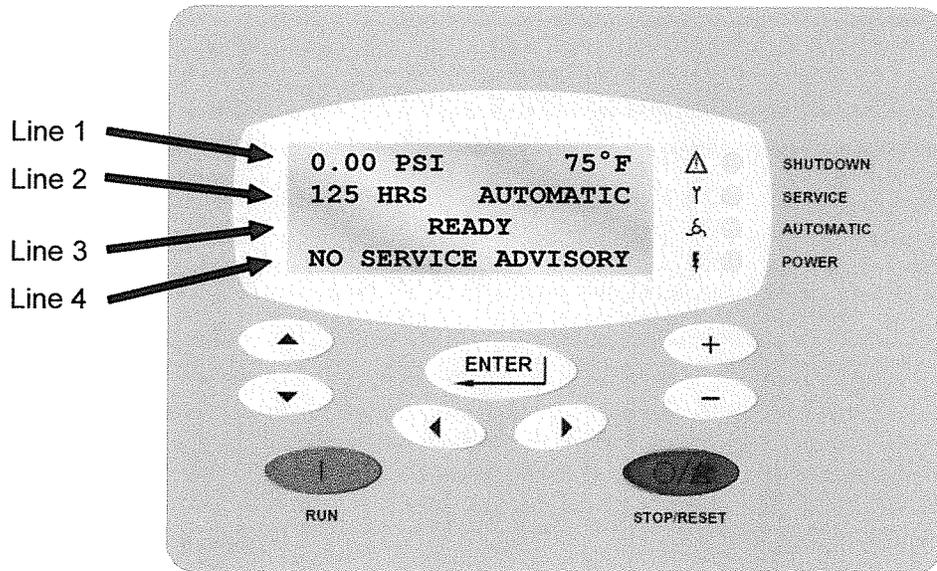
#### 1. AirSmart Controller Control Panel

The Control Panel is mounted on the front panel of the blower and is used to operate the blower and observe system status using its four-line LCD display, four status LED indicators and nine buttons.

#### 2. Emergency Stop Button

The Emergency Stop button, when pressed, will immediately shut down the blower. To reset the blower after an Emergency Stop, pull the Emergency Stop button out and then press the STOP/RESET button on the Control/Display Panel to clear the Emergency Stop fault.

## 2.2 Control Panel Four-Line Display



### 1. Line 1

The first line of the display is used to show the package pressure or inlet vacuum and discharge temperature while the blower is operating. When editing parameters in the Adjustment Menus, the first line is used to show the menu heading.

### 2. Line 2

The second line of the display is used to show the total operating hours and operating mode while the blower is running. The second line is also used to show Shutdown fault information. When editing parameters in the Adjustment Menus, the second line is used to show the parameter heading.

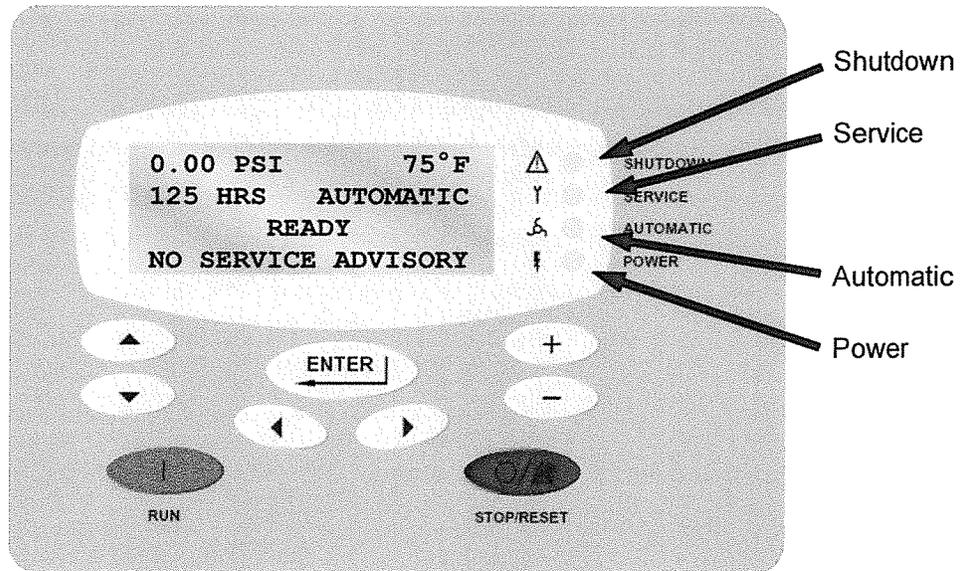
### 3. Line 3

The third line of the display is used to show the state of the blower while it is operating. The third line is also used to show additional Shutdown fault information. When editing parameters in the Adjustment Menus, the third line is used to show the parameter value.

### 4. Line 4

The fourth line of the display is used to show Service Advisory fault information and the Operational Menus. When editing parameters under the Adjustment Menus, the fourth line is used to show the editing mode.

## 2.3 Control Panel Indicator Functions



### 1. Shutdown LED Indicator (red)

The Shutdown LED indicates a shutdown fault in the blower. The type of shutdown fault will be shown in the four-line display. When the Shutdown LED is flashing, the shutdown fault condition is active. When the Shutdown LED is on steady, the shutdown fault condition no longer exists, but the fault has not been acknowledged. To acknowledge a shutdown fault and reset the blower, press the STOP/RESET button on the Control Panel.

Pressing the STOP/RESET button will not clear an active shutdown fault. The shutdown fault condition must be removed before it can be reset.

### 2. Service LED Indicator (yellow)

The Service LED indicates a service advisory fault in the blower. The type of service advisory fault will be shown in the four-line display. When the Service LED is on steady, the advisory fault condition is active, but the fault has not been acknowledged. To acknowledge an advisory fault, press the ENTER button on the Control Panel.

If the service advisory fault condition has not been cleared before it is acknowledged, the advisory fault indication will occur again in a short period of time.

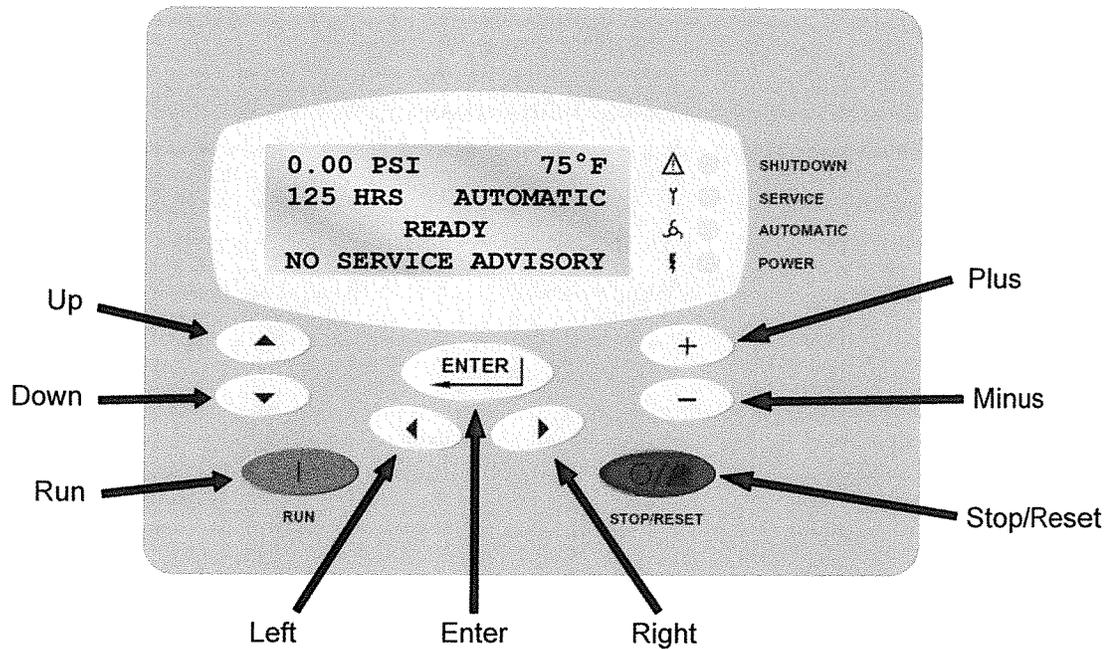
### 3. Automatic LED Indicator (green)

The Automatic LED indicates that the blower is capable starting automatically.

### 4. Power LED Indicator (white)

The Power LED indicates that power has been applied to the blower package.

## 2.4 Control Panel Button Functions



### 1. RUN Button



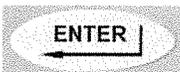
The RUN button is used to start the blower.

### 2. STOP/RESET Button



The STOP/RESET button is used to stop the blower. The STOP/RESET button is also used to acknowledge and reset shutdown faults or exit from the Adjustment Menu tree.

### 3. ENTER Button



The ENTER button is used to acknowledge a service advisory fault. The ENTER button is also used to enter the Adjustment Menu tree, select a parameter for editing or save an edited parameter.

### 4. Left Arrow Button



The Left Arrow button is used to navigate horizontally to the next Operational or Adjustment menu.

**5. Right Arrow Button**



The Right Arrow button is used to navigate horizontally to the next Operational or Adjustment menu.

**6. Up Arrow Button**



The Up Arrow button is used to navigate vertically to the next item inside a menu.

**7. Down Arrow Button**



The Down Arrow button is used to navigate vertically to the next item inside a menu.

**8. Plus Button**



The Plus button is used to increment the value of a selected parameter while in the edit mode.

**9. Minus Button**



The Minus button is used to decrement the value of a selected parameter while in the edit mode.

### 3 Quick Start Guide Fixed Speed Packages

Operation of the AirSmart controller is easy. If the controller display does not show any alarms or faults (display should read "READY" on line 3 as shown below), simply press the Run  button to start the blower. All settings are preset at the factory, no other settings are required.

0.00 PSI	75°F
10 HRS	AUTOMATIC
READY	
NO SERVICE ADVISORY	

If different alarm and fault settings are desired, see the appropriate sections of this manual.

### 4 Quick Start Guide for Variable Speed Drive Packages

Operation of the AirSmart controller is easy. Simply select a Target Pressure (or inlet vacuum) and then press the Run  button to start the blower, no other settings are required. The Target Pressure/Vacuum comes preset from the factory. If a different pressure or vacuum setting is desired, the following steps can be used as a guide. If different alarm and fault settings are also desired, see the appropriate sections of this manual.

#### 4.1 Setting the Target Pressure/Vacuum

The Target Pressure/Vacuum setting is used to set the operating point of the blower. To make any adjustments in the operation of the blower, the machine must be stopped and in the Ready mode.

Stop the blower by pressing the Stop/Reset  button. The front panel display should read "READY" on line 3.

0.00 PSI	75°F
10 HRS	AUTOMATIC
READY	
NO SERVICE ADVISORY	

Next, press the Enter  button to access the Adjustment Menu tree

ADJUSTMENT MENU
OPERATION ADJUSTMENT
(SELECT SUB MENU)

Since the Target Pressure/Vacuum setting is under the Operation Adjustment menu, press Enter  again to access that sub-menu

OPERATION ADJUSTMENT  
LANGUAGE-LANGUAGE  
ENGLISH (US)  
(SELECT PARAMETER)

The Target Pressure is the second item in the Operation Adjustment sub-menu so press the Down  button to navigate to the Target Pressure/Vacuum setting.

OPERATION ADJUSTMENT  
TARGET PRES/VAC  
9.0 PSI  
(SELECT PARAMETER)

To change the Target Pressure/Vacuum, press the Enter  button to edit the value.

OPERATION ADJUSTMENT  
TARGET PRES/VAC  
9.0 PSI  
(EDIT PARAMETER)

A flashing cursor will appear covering the least significant digit in the Target Pressure/Vacuum value, use the Plus  and Minus  buttons to change its value. Use the Right  and Left  buttons to move the cursor to other digits in the Target Pressure value. When the desired Target Pressure value is displayed, press the Enter  button to save the new value. Pressing the Stop/Reset  button will abort the change and restore the previous value.

In order to save the changes made to parameters, press the Stop/Reset button to go back to the heading of the current menu and then press the Stop/Reset button again. If parameter changes have been made, the following screen will appear.

STORE MODIFIED  
PARAMETERS?  
STOP = NO  
ENTER = YES

To permanently save the changes that were made, press the Enter  button. If the Stop/Reset button is pressed, the parameter changes will be lost the next time the blower power is turned off.

## 5 AirSmart Controller Menus

The AirSmart Controller has two sets of menus that serve as a window into the operation of the blower. The first set is the Operational Menus, which allow the user to observe the current status of various parts of the blower like the discharge temperature or the motor current. The second set of menus are the Adjustment Menus, which allow the user to change the operating parameters of the blower such as the target pressure set point and the discharge temperature alarm limit. The default values for the adjustable parameters are determined by the Controller Model Table stored in the controller's memory.

### 5.1 Operational Menus

The Operational Menus are available at all times - while the blower is running, stopped or even while in a fault condition. To enter the Operational Menu trees press the Right  or Left  buttons to access one of four different menus. Once the desired menu heading is shown in the fourth line of the display, use the Up  and Down  buttons to access the individual items in the selected menu, which are also shown in the fourth line of the display. If the Up or Down buttons are not pressed within five seconds of pressing the Right or Left buttons, the fourth line of the display will return to its previous state.

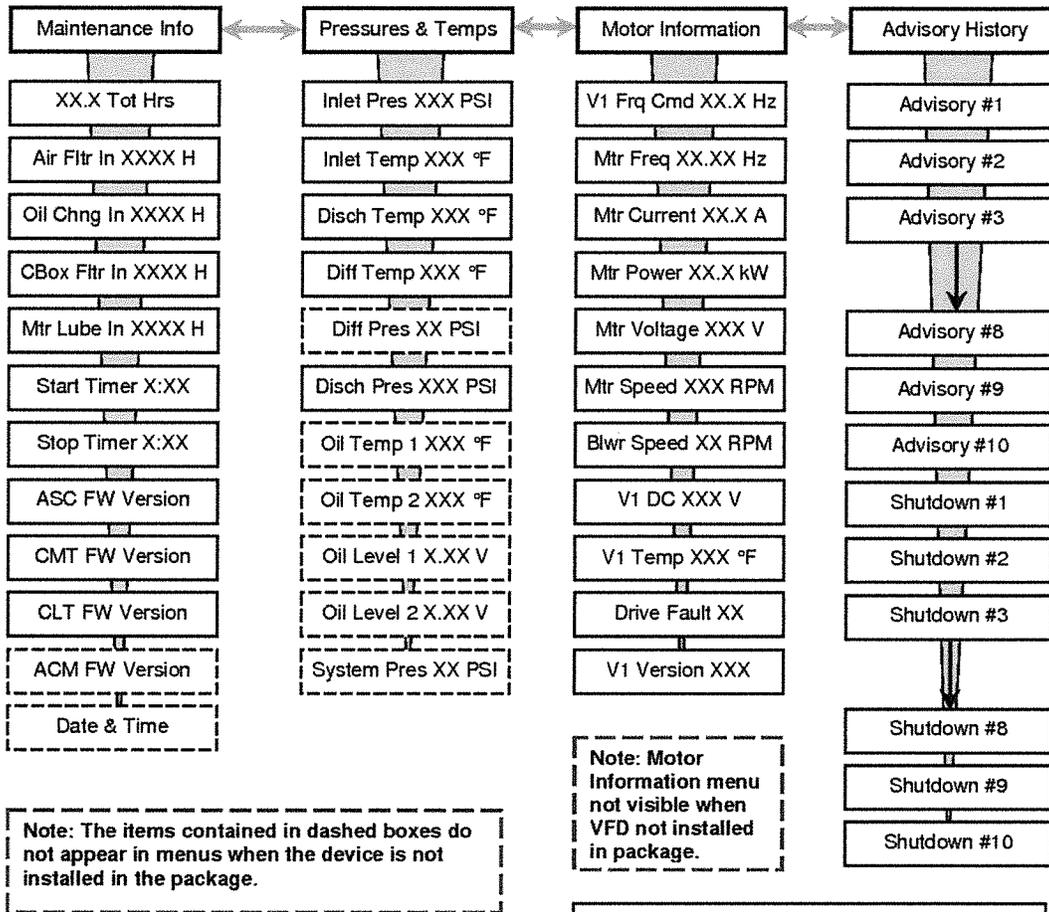
It is not necessary to navigate back to the top of a particular menu in order to enter another menu. Simply press the Right  or Left  buttons to go back to the heading of the current menu and then use the Right or Left buttons again to find the desired menu heading as described above.

- *Note: Advisory fault information is also shown in the fourth line of the display. If an advisory is active and the fault condition has not been cleared, the Operational Menu text will be periodically replaced by the advisory text.*

# AirSmart Controller Operational Menus (Blower Application)

Use the   keys to navigate through the horizontal main menus. These keys are also used to exit the vertical menu items.

Use the   keys to navigate through the vertical menu items.



### 4.1.1 Maintenance Info Menu

The Maintenance Menu gives the user access to the current status of all the maintenance counters and system timers.

```
0.00 PSI      75°F
125 HRS      AUTOMATIC
      READY
MAINTENANCE INFO
```

#### 1. Total Hours

The first item in the Maintenance Info menu is the total number of hours the blower has been in operation. This information is also available in the second line of the display during normal blower operation.

```
0.00 PSI      75°F
125 HRS      AUTOMATIC
      READY
      125 TOT HRS
```

#### 2. Time To Next Air Filter Change

The next item in the Maintenance Info menu is the number of hours before the next air filter change is needed. The Air Filter Change Interval Timer can be reset under the Maintenance Adjust menu. The Air Filter Change Interval Time can be changed under the Unit Setup Adjust menu.

```
0.00 PSI      75°F
125 HRS      AUTOMATIC
      READY
AIR FLTR IN 2200 H
```

#### 3. Time To Next Oil Change

The next item in the Maintenance Info menu is the number of hours before the next oil change is needed. The Oil Change Interval Timer can be reset under the Maintenance Adjust menu. The Oil Change Interval Time can be changed under the Unit Setup Adjust menu.

```
0.00 PSI      75°F
125 HRS      AUTOMATIC
      READY
OIL CHNG IN 6000 H
```

#### 4. Time To Control Box Filter Change

The next item in the Maintenance Info menu is the number of hours before the next control box filter change is needed. The Control Box Filter Change Interval Timer can be reset under the Maintenance Adjust menu. The Control Box Filter Change Interval Time can be changed under the Unit Setup Adjust menu.

0.00 PSI	75°F
125 HRS	AUTOMATIC
READY	
CBOX FLTR IN 1000 H	

➤ **Note: This parameter is only available packages with a variable frequency drive.**

#### 5. Time To Next Motor Lubrication

The next item in the Maintenance Info menu is the number of hours before motor lubrication is needed. The Motor Lubrication Interval Timer can be reset under the Maintenance Adjust menu. The Motor Lubrication Interval Time can be changed under the Unit Setup Adjust menu.

0.00 PSI	75°F
125 HRS	AUTOMATIC
READY	
MTR LUBE IN 2000 H	

#### 6. Start Timer

The next item in the Maintenance Info menu is the current value of the Start Timer. The Start Timer is used to control the amount of time the blower will run before moving on to the modulation phase after the RUN button has been pressed. The Start Timer Interval is set under the Operation Adjust menu in the Adjustment menu tree.

0.00 PSI	75°F
125 HRS	AUTOMATIC
READY	
START TIMER 0:00	

#### 7. Stop Timer

The next item in the Maintenance Info menu is the current value of the Stop Timer. The Stop Timer is used to control the amount of time the blower will continue running after the STOP/RESET button has been pressed. The Stop Timer Interval is set under the Operation Adjust menu in the Adjustment menu tree.

0.00 PSI	75°F
125 HRS	AUTOMATIC
READY	
STOP TIMER 0:00	

## 8. Firmware Version

The next four items in the Maintenance Info Menu show the current versions of the AirSmart Controller Firmware, the Controller Model Table, the Controller Language Table and the Communications Module firmware (if installed) that are loaded into the AirSmart Controller.

```
0.00 PSI          75°F
125 HRS    AUTOMATIC
          READY
V1.14 ASC 27 Mar 07
```

```
0.00 PSI          75°F
125 HRS    AUTOMATIC
          READY
V1.09 VCVS 22 Mar 07
```

```
0.00 PSI          75°F
125 HRS    AUTOMATIC
          READY
V1.12 LTUS 20 Mar 07
```

```
0.00 PSI          75°F
125 HRS    AUTOMATIC
          READY
V1.02                      ACM
```

➤ **Note: This parameter is only available when Communications Module is installed.**

## 9. Time and Date

The last item in the Maintenance Info Menu is the current time and date kept by the battery backed, real time clock on the Communications Module. The time and date can be changed under the Time Adjust menu. This menu item is not displayed if the optional Communications Module is not installed.

```
0.00 PSI          75°F
125 HRS    AUTOMATIC
          READY
07/04/10 12:59 MON
```

➤ **Note: This parameter is only available when Communications Module is installed.**

The date & time format reads as follows:

YY/MM/DD HH:MM DOW

Where:

YY = Year

MM = Month

DD = Date

HH = Hour (using 24 hour clock)

MM = Minute

DOW = Day of week

## 4.1.2 Pressures and Temps Menu

The Pressures and Temps menu gives the user access to the current status of all pressure and temperature values in the blower package as well as the status of any optional sensors installed in the blower package.

```
9.00 PSI      185°F
125 HRS      AUTOMATIC
              RUNNING
PRESSURES AND TEMPS
```

### 1. Inlet Pressure/Vacuum

The first item in the Pressures and Temps menu is the Inlet Pressure, which reflects the current air pressure at the inlet of the blower package. In the case of a vacuum package, the Inlet Vacuum is also shown in the first line of the display.

```
10.0 inHgV   185°F
125 HRS      AUTOMATIC
              RUNNING
INLT P 10.0 inHgV
```

### 2. Inlet Temperature

The next item in the Pressures and Temps menu is the Inlet Temperature, which reflects the current temperature at the inlet of the blower package.

```
9.00 PSI      185°F
125 HRS      AUTOMATIC
              RUNNING
INLET TEMP 80°F
```

### 3. Discharge Temperature

The next item in the Pressures and Temps menu is the Discharge Temperature, which reflects the current temperature at the discharge of the aircnd. The Discharge Temperature value is also seen in the first line of the display.

```
9.00 PSI      185°F
125 HRS      AUTOMATIC
              RUNNING
DSCHRG TMP 185°F
```

#### 4. Differential Temperature

The next item in the Pressures and Temps menu is the Differential Temperature, which reflects the current temperature difference across inlet and the discharge of the airend.

```
9.00 PSI      185°F
125 HRS      AUTOMATIC
              RUNNING
DIFF TEMP 115°F
```

#### 5. Discharge Pressure

The next item in the Pressures and Temps menu is the Discharge Pressure, which reflects the current air pressure value at the discharge of the airend. In the case of a pressure package, the Discharge Pressure is also shown in the first line of the display.

```
9.00 PSI      185°F
125 HRS      AUTOMATIC
              RUNNING
DIS PRES 9.00 PSI
```

#### 6. Oil Temperature

The next item in the Pressures and Temps menu is the Oil Temperature, which reflects the current temperature in the oil sump of the blower when the optional temperature sensors are installed. "OIL TEMP 1" (drive end) is followed by "OIL TEMP 2" (gear end) depending on which sump temperature is being observed.

```
9.00 PSI      185°F
125 HRS      AUTOMATIC
              RUNNING
OIL TEMP 1 165°F
```

➤ **Note: This parameter is not available in all blower packages.**

#### 7. Oil Level

The next item in the Pressures and Temps menu is the Oil Level, which reflects the current oil level in the oil sump of the blower when the optional oil level sensors are installed. The voltage value displayed represents the change in oil level from the zero point when the blower is at rest. "OIL LVL 1" (drive end) is followed by "OIL LVL 2" (gear end) depending on which oil level is being observed. Note: add conversion to in or mm formula.

```
9.00 PSI      185°F
125 HRS      AUTOMATIC
              RUNNING
OIL LVL 1 0.10 VOLT
```

➤ **Note: This parameter is not available in all blower packages.**

## 8. System Pressure

The next item in the Pressures and Temps menu is the System Pressure, which reflects the current pressure at the system manifold. This parameter is only available when the Communications Module is installed and the blower is set up for sequencing. The System Pressure value is used to control blower modulation in the Sequence mode. While in the sequence mode, the System Pressure is shown in the fourth line of the display when the unit is running.

```
9.00 PSI      185°F  
125 HRS      AUTOMATIC  
              RUNNING%  
SYSTEM PRES 9.00 PSI
```

➤ **Note: This parameter is only available when Communications Module is installed.**

```
9.00 PSI      185°F  
125 HRS      SEQUENCE  
              RUNNING 100%  
SYSTEM PRES 9.00 PSI
```

### 4.1.3 Motor Information Menu

The Motor Information menu gives the user access to the current status of all the Variable Frequency Drive (VFD) controlled motor that is installed in the blower. The Motor Information menu is not visible if a VFD is not installed in the system.

```
9.00 PSI      185°F
125 HRS      AUTOMATIC
              RUNNING
MOTOR INFORMATION
```

#### 1. Commanded Motor Frequency

The first item in the Motor Information menu is the Commanded Motor Frequency value the drive in the system. This value indicates the speed at which each VFD has been commanded to run by the AirSmart Controller.

```
9.00 PSI      185°F
125 HRS      AUTOMATIC
              RUNNING
V1 FRQ CMD 71.7 HZ
```

#### 2. Motor Frequency

The next item in the Motor Information menu is the Motor operating Frequency value of the main motor in the system.

```
9.00 PSI      185°F
125 HRS      AUTOMATIC
              RUNNING
MTR FREQ 71.7 HZ
```

#### 3. Motor Current

The next item in the Motor Information menu is the Motor Current consumption value of the main motor in the system.

```
9.00 PSI      185°F
125 HRS      AUTOMATIC
              RUNNING
MTR CURRENT 42.0 A
```

#### 4. Motor Power

The next item in the Motor Information menu is the Motor Power consumption of the main motor in the system.

9.00 PSI	185°F
125 HRS	AUTOMATIC
RUNNING	
MTR POWER 42.0 KW	

#### 5. Motor Voltage

The next item in the Motor Information menu is the AC Voltage level being delivered by the VFD to the main motor in the system.

9.00 PSI	185°F
125 HRS	AUTOMATIC
RUNNING	
MTR VOLTAGE 460	

#### 6. Motor Speed

The next item in the Motor Information menu is the Motor Speed value of the main motor in the system.

9.00 PSI	185°F
125 HRS	AUTOMATIC
RUNNING	
MTR SPEED 1000 RPM	

#### 7. Blower Speed

The next item in the Motor Information menu is the Blower Speed value which is calculated using the Motor Speed value above and the Belt Drive Ratio parameter value in the Unit Setup menu.

9.00 PSI	185°F
125 HRS	AUTOMATIC
RUNNING	
BLWR SPEED 1400 RPM	

## 8. Drive DC Bus Voltage

The next item in the Motor Information menu is the DC Bus Voltage value of the main motor drive in the system.

```
9.00 PSI      185°F
125 HRS      AUTOMATIC
             RUNNING
             V1 DC 645 V
```

## 9. Drive Temperature

The next item in the Motor Information menu is the VFD Heat Sink Temperature the main motor drive in the system.

```
9.00 PSI      185°F
125 HRS      AUTOMATIC
             RUNNING
             V1 TEMP 128°F
```

## 10. Drive Fault

The next item in the Motor Information menu is the fault value of the main motor drive in the system.

```
9.00 PSI      185°F
125 HRS      AUTOMATIC
             RUNNING
             DRIVE 1 FAULT 0
```

Note: Consult the appropriate VFD user's manual for a listing of fault values and their meaning depending on which drive have been installed in the blower.

## 11. Firmware Version

The next item in the Motor Information menu is the Firmware Version of the main motor drive in the system.

```
9.00 PSI      185°F
125 HRS      AUTOMATIC
             RUNNING
             V1 VERSION 5.01
```

#### 4.1.4 Advisory and Shutdown History Menu

The Advisory and Shutdown History menu gives the user immediate access to the system status during the last ten (10) advisory and shutdown faults in the blower.

```
0.00 PSI      75°F
125 HRS      AUTOMATIC
              READY
ADVISORY HISTORY
```

##### 1. Advisory #1 through #10

By using the Up  and Down  buttons, each of the advisories (up to ten) is shown in the fourth line of the display.

```
0.00 PSI      75°F
125 HRS      AUTOMATIC
              READY
1 = HIGH DISCH TEMP
```

If less than ten advisories are stored in the controller, the display will indicate the end of the list as shown below.

```
0.00 PSI      75°F
125 HRS      AUTOMATIC
              READY
NO MORE HISTORY
```

##### 2. System Status

When the desired advisory is shown in the fourth line of the display, use the Plus  and Minus  buttons to access the system status that was stored at the time of the advisory. The status values will also be shown in the fourth line of the display.

```
0.00 PSI      75°F
125 HRS      AUTOMATIC
              READY
ADVISORY # 3
```

### 3. System Status List

The following is the list of the status items that are stored at the time of an Advisory or Shutdown fault.

- Advisory/Shutdown code
- Inlet pressure
- Discharge pressure
- Inlet temperature
- Discharge temperature
- Total Hours
- Time and date\*
- Drive status\*
- Drive commanded frequency\*
- Motor frequency\*
- Motor current\*
- Drive temperature\*
- Drive 1 DC bus voltage\*

Note: \* Appears only if parameter is available in blower package

## 5.2 Adjustment Menus

The Adjustment Menus are only available when the blower is stopped. To enter the Adjustment Menu tree, press the Enter  button and then press the Right  or Left  buttons to access one of four different menus. Once the desired menu heading is shown in the second line of the display, press the Enter  button again to access that menu. Use the Up  and Down  buttons to access the individual items in the selected menu, which are also shown in the second line of the display.

It is not necessary to navigate back to the top of a particular menu in order to enter another menu.

Simply press the Stop/Reset  button to go back to the heading of the current menu and then use the Right  or Left  buttons again to find the desired menu heading as described above.

To completely exit from the Adjustment menus, press the Stop/Reset  button again. If parameter changes have been made, the following screen will appear.

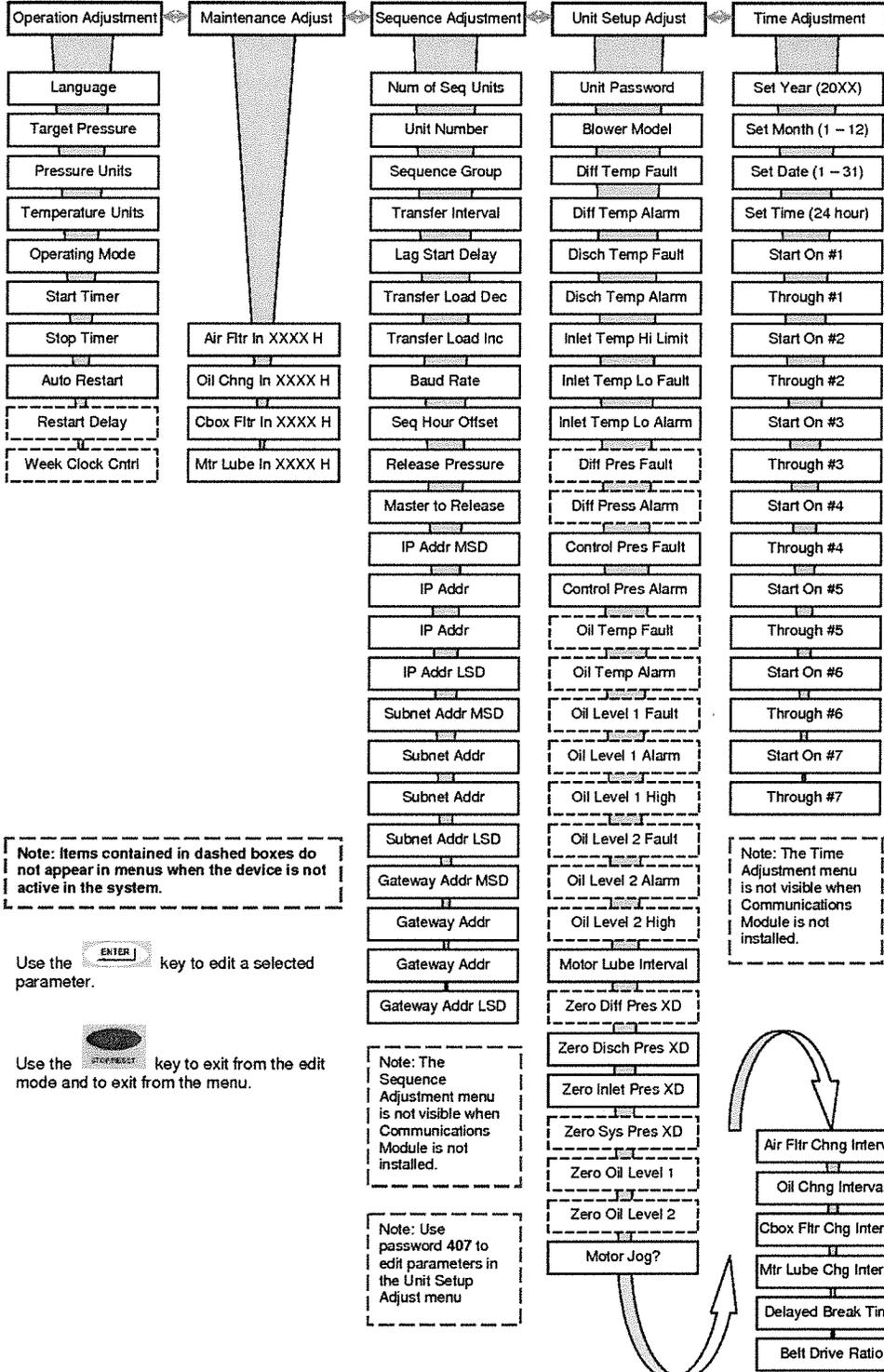
STORE MODIFIED  
PARAMETERS?  
STOP = NO  
ENTER = YES

To permanently save the changes that were made, press the Enter  button. If the Stop/Reset  button is pressed, the parameter changes that have been made are still valid but will be lost the next time the blower is disconnected from main power.

# AirSmart Controller Adjustment Menus (Blower Application)

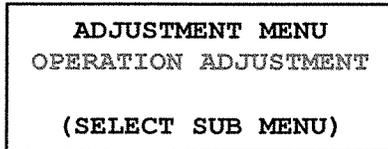
Use the  key to enter the Adjustment menus (compressor must be stopped). Use the   keys to navigate through the horizontal main menus.

Use the  key again to select the horizontal menu item. Use the   keys to navigate through the vertical menu items.



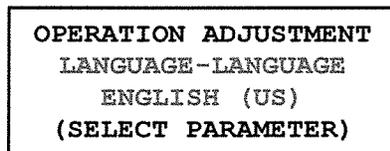
## 4.2.1 Operation Adjustment Menu

The Operation Adjustment menu provides access to the parameters that control the basic operation of the blower



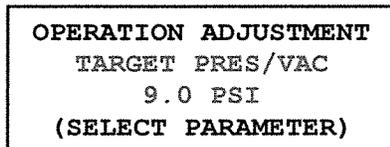
### 1. Language

The first item in the Operation Adjustment menu is language selection. The language selection can also be entered directly by holding down the Stop/Reset button for five seconds when the blower is stopped. The AirSmart Controller can have up to eight different language translations available at one time in the Controller Language Table, which is stored in the controller's memory.



### 2. Target Pressure/Vacuum

The next item in the Operation Adjustment menu is the Target Pressure/Vacuum. This value is the control set point of the blower. The Target Pressure/Vacuum parameter is ignored in fixed speed blowers.



Min Value: 0.0 PSI (0.0 bar)

Max Value: 20.0 PSI (1.4 bar) for pressure and 20.0 inHgV (508 mmHgV) for vacuum.

Default Value: Set at factory.



**Operation at excessive discharge air pressure can cause personal injury or damage to equipment. Do not adjust the discharge air pressure above the maximum pressure stamped on the unit nameplate.**

### 3. Pressure Units

The next item in the Operation Adjustment menu is the Pressure Units, which will determine how all pressure values will be displayed on the control panel. For a pressure machine, the pressure can be displayed in pounds per square inch (PSI), Bar (BAR), kilopascals (KPA) or kilograms per square centimeter (KGC). For a vacuum machine, the pressure can be displayed in inches of mercury (inHgV), inches of water (inH2OV), millimeters of mercury (mmHgV) or millimeters of water (mmH2OV)

```
OPERATION ADJUSTMENT
PRESSURE UNITS
PSI
(SELECT PARAMETER)
```

### 4. Temperature Units

The next item in the Operation Adjustment menu is the Temperature Units, which will determine how all temperature values will be displayed on the control panel. Temperature can be displayed in English/Fahrenheit (°F) or Metric/Celsius (°C).

```
OPERATION ADJUSTMENT
TEMPERATURE UNITS
ENGLISH
(SELECT PARAMETER)
```

### 5. Operating Mode

The next item in the Operation Adjustment menu is the operating mode. The controller can be set to one of four operational modes.

AUTOMATIC: (Default mode) the blower uses its internal modulation algorithms and will regulate motor speed in the case of a variable speed machine.

```
OPERATION ADJUSTMENT
OPERATING MODE
AUTOMATIC
(SELECT PARAMETER)
```

SEQUENCE: The blower is part of a sequenced group of machines. Refer to Gardner Denver document 13-17-604 for further details about sequencing with the AirSmart Controller.

```
OPERATION ADJUSTMENT
OPERATING MODE
SEQUENCE
(SELECT PARAMETER)
```

**MANUAL:** This mode of operation is only available in variable speed blower models. The manual mode allows the user to adjust the speed of the blower manually from the keypad. Use the Plus  and Minus  buttons to adjust the blower speed between minimum speed (0%) and maximum speed (100%). The last speed setting is preserved when the Stop/Reset is pressed or if there is a loss of power to the blower.

Note: The minimum and maximum speed settings of the blower are model dependant.

Note: The fourth line of the display must read **NO SERVICE ADVISORY** for the speed control buttons to function.

<b>OPERATION ADJUSTMENT</b>
OPERATING MODE
MANUAL
(SELECT PARAMETER)

When running in the MANUAL mode, the display will appear as shown below.

9.00 PSI	185°F
125 HRS	MANUAL
RUNNING	57%
NO SERVICE ADVISORY	

**REMOTE:** This mode of operation is only available in variable speed blower model. In the remote mode, the speed of the blower is determined by an analog input signal from an external source such as a Dissolved Oxygen Controller. See Section 7.5 of this manual for information about connecting an external signal for remote operation.

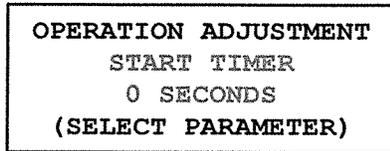
<b>OPERATION ADJUSTMENT</b>
OPERATING MODE
REMOTE
(SELECT PARAMETER)

When running in the REMOTE mode, the display will appear as shown below.

9.00 PSI	185°F
125 HRS	REMOTE
RUNNING	45%
NO SERVICE ADVISORY	

## 6. Start Timer

The next item in the Operation Adjustment menu is the Start Timer. The Start Timer is used to extend how long the blower will run in the "Pause" state before it is allowed to start modulating.



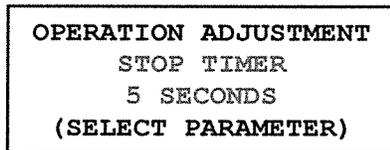
Min Value: 0 seconds

Max Value: 600 seconds

Default Value: 0 seconds (variable speed units), 5 seconds (fixed speed units)

## 7. Stop Timer

The next item in the Operation Adjustment menu is the Stop Timer. When the Stop/Reset button is pressed or a remote stop is activated, the blower will continue to run until this timer expires.



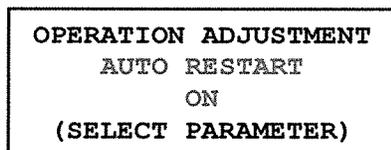
Min Value: 0 seconds

Max Value: 120 seconds

Default Value: 5 seconds

## 8. Auto Restart

The next item in the Operation Adjustment menu is the Auto Restart function. If Auto Restart is turned on, the blower will resume operation in the mode it was in prior to the power interruption when power is restored.



Default Value: OFF

**⚠ DANGER**



Automatic restarting of the blower can cause injury or death

## 9. Restart Delay

The next item in the Operation Adjustment menu is the Restart Delay Timer, which controls how long the blower will wait to start after power has been restored.

OPERATION ADJUSTMENT  
RESTART DELAY  
10 SECONDS  
(SELECT PARAMETER)

➤ Note: This parameter is only visible if Auto Restart is ON.

Min Value: 5 seconds  
Max Value: 30 seconds  
Default Value: 10 seconds

## 10. Week Clock Control

The last item in the Operation Adjustment menu is the Week Clock Control function. When the Week Clock Control is turned on, the blower can be started and stopped using the seven programmable timers under the Time Adjust menu. This menu item is not displayed if the optional Communications Module is not installed. Consult Gardner Denver document 13-17-604 for more information about timed start/stop or secondary pressures operation.

OPERATION ADJUSTMENT  
WEEK CLOCK CONTROL  
ON  
(SELECT PARAMETER)

➤ Note: This parameter is only available when Communications Module is installed.

Default Value: OFF

**⚠ DANGER**



Automatic starting of the blower can cause injury or death

## 4.2.2 Maintenance Adjust Menu

The Maintenance Adjust menu provides a means for resetting the maintenance timers after servicing the blower.

```
ADJUSTMENT MENU
MAINTENANCE ADJUST

(SELECT SUB MENU)
```

### 1. Maintenance Timers

The four timers under the Maintenance Adjust menu are:

Air Filter Change Timer  
Oil Change Timer  
Control Box Filter Change Timer (only on variable speed units)  
Motor Lubrication Timer

After service has been performed, navigate to the appropriate timer and press the Enter  button to select timer reset. The default timer intervals can be set in the Unit Setup Adjust menu.

```
MAINTENANCE ADJUST
OIL CHNG IN
230 HRS
(SELECT PARAMETER)
```

Pressing the Enter  button again will reset the timer to the default value. The Stop/Reset  button will abort the timer reset.

```
MAINTENANCE ADJUST
OIL CHNG IN
6000 HRS
(ACCEPT OR REJECT)
```

## 4.2.3 Sequence Adjustment Menu

The Sequence Adjustment menu provides access to the parameters that control the sequencing operation of the blower. This menu is only visible if the optional AirSmart Communications Module, Gardner Denver P/N 301ETK1173, is installed. Refer to Gardner Denver document 13-17-604 (AirSmart Communications Module User's Manual) for operation of the blower in Sequence Mode.

```
ADJUSTMENT MENU
SEQUENCE ADJUSTMENT

(SELECT SUB MENU)
```

## 4.2.4 Unit Setup Adjust Menu

The Unit Setup Adjust menu provides access to the parameters that control advanced operation of the blower. The parameters in the Unit Setup adjust menu can only be changed if the correct value has been entered into the Unit Password menu item.

```
ADJUSTMENT MENU
UNIT SETUP ADJUST

(SELCT SUB MENU)
```

### 1. Unit Password

The first item in the Unit Setup Adjust menu is the Unit Password. The correct value entered here will allow the items in Unit Setup Adjust menu and the I/O Adjust menu to be changed.

The Following passwords unlock the listed menus for visibility and editing:

**407:** Unit Setup Adjust menu  
**8412:** Programmable I/O Adjust menu

```
UNIT SETUP ADJUST
UNIT PASSWORD
0
(SELECT PARAMETER)
```

### 2. Blower Model

The next item in the Unit Setup Adjust menu is the Blower Model selection. Up to 25 different blower models are available from the Controller Model Table that is stored in the controller's memory. Selecting a Blower model from the Model Table will configure the controller for the chosen machine and reset all of the adjustable parameters to their factory default value.

```
CONFIGURATION ADJUST
BLOWER MODEL
VSP40 460 1.9 HF408
(SELECT PARAMETER)
```



**Selection of a Model Type different from the installed unit could cause personal injury or damage to equipment.**

### 3. Total Run Hour Meter

The next item in the Configuration Adjust menu is the Total Run Hour Meter, which records the number of hours that the blower main motor has been running. The value of this hour meter is shown in line 2 of the normal display and in the Maintenance Info menu. This parameter can not be changed and will not appear in the menu tree unless the current value is zero. On a replacement controller, this value must be preset with the value from the replaced controller before the unit is started.

```
CONFIGURATION ADJUST
TOTAL RUN HOURMETER
  0 HOURS
(SELECT PARAMETER)
```

### 4. Differential Temperature Shutdown Limit

The next item in the Unit Setup Adjust menu is the Differential Temperature Shutdown Limit. This value sets the maximum differential temperature limit where the blower will shut down

```
UNIT SETUP ADJUST
DIFF TEMP FAULT LIM
  240°F
(SELECT PARAMETER)
```

Min Value: 0°F (0°C)  
Max Value: 250°F (121°C)  
Default Value: Airend or package dependant

**⚠ DANGER**



**Operation of the unit at excessive high temperatures can cause personal injury or damage to equipment. Do not adjust the Differential Temperature Shutdown Limit above 250°F (121°C).**

## 5. Differential Temperature Alarm Limit

The next item in the Unit Setup Adjust menu is the Differential Temperature Alarm Limit. This value sets the differential temperature limit at which the blower will give an advisory alarm.

```
UNIT SETUP ADJUST
DIFF TEMP ALARM LIM
  210 °F
(SELECT PARAMETER)
```

Min Value: 0°F (0°C)  
Max Value: 250°F (121°C)  
Default Value: Airend or package dependant

## 6. Discharge Temperature Shutdown Limit

The next item in the Unit Setup Adjust menu is the Discharge Temperature Shutdown Limit. This value sets the maximum airend discharge temperature limit where the blower will shut down

```
UNIT SETUP ADJUST
DIS TEMP FAULT LIM
  350 °F
(SELECT PARAMETER)
```

Min Value: 0°F (-18°C)  
Max Value: 350°F (177°C)  
Default Value: Airend or package dependant

**⚠ DANGER**



**Operation of the unit at excessive high temperatures can cause personal injury or damage to equipment. Do not adjust the Discharge Temperature Shutdown Limit above 350°F (177°C).**

## 7. Discharge Temperature Alarm Limit

The next item in the Unit Setup Adjust menu is the Discharge Temperature Alarm Limit. This value sets the aircend discharge temperature limit at which the blower will give an advisory alarm.

```
UNIT SETUP ADJUST
DIS TEMP ALARM LIM
  345°F
(SELECT PARAMETER)
```

Min Value: 0°F (-18°C)  
Max Value: 350°F (177°C)  
Default Value: Aircend or package dependant

## 8. Inlet Temperature High Limit

The next item in the Unit Setup Adjust menu is the Inlet Temperature High Limit. This value sets the maximum aircend inlet temperature limit at which the blower will activate the speed limiter function.

```
UNIT SETUP ADJUST
INLET TEMP HI LIMIT
  113°F
(SELECT PARAMETER)
```

Min Value: 15°F (-9°C)  
Max Value: 150°F (66°C)  
Default Value: 113°F (45°C)

## 9. Inlet Temperature Low Shutdown Limit

The next item in the Unit Setup Adjust menu is the Inlet Temperature Low Shutdown Limit. This value sets the minimum aircend inlet temperature limit at which the blower will shut down.

```
UNIT SETUP ADJUST
INLT TEMP LO FLT LIM
  0°F
(SELECT PARAMETER)
```

Min Value: 0°F (-18°C)  
Max Value: 50°F (10°C)  
Default Value: 0°F (-18°C)

## 10. Inlet Temperature Low Alarm Limit

The next item in the Unit Setup Adjust menu is the Inlet Temperature Low Alarm Limit. This value sets the aircend inlet temperature limit at which the blower will give an advisory alarm.

```
UNIT SETUP ADJUST
INLT TEMP LO ALM LIM
  113 °F
(SELECT PARAMETER)
```

Min Value: 0°F (-18°C)  
Max Value: 50°F (10°C)  
Default Value: 10°F (-12°C)

## 11. Control Pressure Shutdown Limit

The next item in the Unit Setup Adjust menu is the Control Pressure Shutdown Limit. This value sets the maximum control pressure limit where the blower will shut down. In a pressure machine, the control pressure is equivalent to the package discharge. In a vacuum machine, the control pressure is equivalent to the package inlet.

```
UNIT SETUP ADJUST
CNTL PRES FAULT LIM
  15.0 PSI
(SELECT PARAMETER)
```

Min Value: 0 PSI (0.0 bar)  
Max Value: 20 PSI (1.4 bar) for pressure and 20.0 inHgV (508 mmHgV) for vacuum  
Default Value: Set at factory.

**⚠ DANGER**



**Operation of the blower with improper Control Pressure Shutdown Limit setting can cause personal injury or damage to equipment. Do not adjust the Control Pressure Shutdown Limit above the level of the pressure relief valve or 15 PSI (1.0 bar).**

## 12. Control Pressure Alarm Limit

The next item in the Unit Setup Adjust menu is the Control Pressure Alarm Limit. This value sets the maximum control pressure limit where the blower will give an advisory alarm. In a pressure machine, the control pressure is equivalent to the package discharge. In a vacuum machine, the control pressure is equivalent to the package inlet.

```
UNIT SETUP ADJUST
CNTL PRES FAULT LIM
  14.0 PSI
(SELECT PARAMETER)
```

Min Value: 0 PSI (0.0 bar)

Max Value: 20 PSI (1.4 bar) for pressure and 20.0 inHgV (508 mmHgV) for vacuum

Default Value: Set at factory

## 13. Oil Temperature Shutdown Limit

The next item in the Unit Setup Adjust menu is the Oil Temperature Shutdown Limit. This value sets the maximum oil sump temperature limit where the blower will shut down. This menu item is not visible if there is no oil temperature sensor installed in the system.

```
UNIT SETUP ADJUST
OIL TEMP FAULT LIM
  260°F
(SELECT PARAMETER)
```

➤ **Note: This parameter is not visible in all blower packages.**

Min Value: 15°F (-9°C)

Max Value: 350°F (177°C)

Default Value: Airend or package dependant

## 14. Oil Temperature Alarm Limit

The next item in the Unit Setup Adjust menu is the Oil Temperature Alarm Limit. This value sets the package oil sump temperature limit at which the blower will give an advisory alarm. This menu item is not visible if there is no oil temperature sensor installed in the system.

```
UNIT SETUP ADJUST
OIL TEMP ALARM LIM
  250°F
(SELECT PARAMETER)
```

➤ **Note: This parameter is not visible in all blower packages.**

Min Value: 15°F (-9°C)

Max Value: 350°F (177°C)

Default Value: Airend or package dependant

### 15. Oil Level Low Shutdown Limit

The next item in the Unit Setup Adjust menu is the Oil Level Low Shutdown Limit. This value sets the minimum oil sensor voltage differential limit where the blower will shut down. This menu item is not visible if there is no oil level sensor installed in the system. As shown in the display below OIL LEVEL 1 (drive end) is followed by OIL LEVEL 2 (gear end) depending on the number of oil level sensors installed in the package.

```
UNIT SETUP ADJUST
OIL LEVEL 1 FLT DIF
  1.00 VOLT
(SELECT PARAMETER)
```

➤ **Note: This parameter is not visible in all blower packages.**

Min Value: 0.00 Volt  
Max Value: 5.00 Volt  
Default Value: Airend dependant

### 16. Oil Level Low Alarm Limit

The next item in the Unit Setup Adjust menu is the Oil Level Low Alarm Limit. This value sets the minimum oil sensor voltage differential limit where the blower will give an advisory alarm. This menu item is not visible if there is no oil level sensor installed in the system. As shown in the display below OIL LEVEL 1 (drive end) is followed by OIL LEVEL 2 (gear end) depending on the number of oil level sensors installed in the package.

```
UNIT SETUP ADJUST
OIL LVL 1 LO ALM DIF
  1.00 VOLT
(SELECT PARAMETER)
```

➤ **Note: This parameter is not visible in all blower packages.**

Min Value: 0.00 Volt  
Max Value: 5.00 Volt  
Default Value: Airend dependant

### 17. Oil Level High Alarm Limit

The next item in the Unit Setup Adjust menu is the Oil Level High Alarm Limit. This value sets the maximum oil sensor voltage differential limit where the blower will give an advisory alarm. This menu item is not visible if there is no oil level sensor installed in the system. As shown in the display below OIL LEVEL 1 (drive end) is followed by OIL LEVEL 2 (gear end) depending on the number of oil level sensors installed in the package.

```
UNIT SETUP ADJUST
OIL LVL 1 HI ALM DIF
  0.50 VOLT
(SELECT PARAMETER)
```

➤ **Note: This parameter is not visible in all blower packages.**

Min Value: 0.00 Volt  
Max Value: 5.00 Volt  
Default Value: Airend dependant

## 18. Pressure Transducer Zero Set

The next items in the Unit Setup Adjust menu are used for setting the zero point of the absolute pressure transducers in the blower. The following is a list of possible pressure transducers. Not all blower models will have all three transducers.

1. Discharge pressure transducer
2. Inlet pressure transducer
3. System pressure transducer

**After all pressure or vacuum has been removed from the system and the line to the transducer has been removed,** navigate to the appropriate transducer and press the Enter

 button to select the zero pressure point. With atmospheric pressure, the display should read around 0.00 Volts.

```
CONFIGURATION ADJUST
ZERO DIS PRES XD
      0.00 VOLT
(SELECT PARAMETER)
```

Pressing the Enter  button again will accept the displayed voltage as the zero pressure value. The Stop/Reset  button will abort the set point process.

```
CONFIGURATION ADJUST
ZERO DIS PRES XD
      0.00 VOLT
(ACCEPT OR REJECT)
```

## 19. Oil Level Sensor Zero Set

The next items in the Unit Setup Adjust menu are used for setting the zero point of the oil sump level sensors in the blower. The following is a list of possible oil level sensors. Not all blower models will have both sensors.

1. Drive side oil level sensor
2. Gear side oil level sensor

After the oil sump has been filled to the middle of the sight glass and the main motor is at rest, navigate to the appropriate sensor and press the Enter  button to select the zero level point.

```
CONFIGURATION ADJUST
ZERO OIL LEVEL 1
2.50 VOLT
(SELECT PARAMETER)
```

Pressing the Enter  button again will accept the displayed voltage as the normal oil level value. The Stop/Reset  button will abort the set point process.

```
CONFIGURATION ADJUST
ZERO OIL LEVEL 1
2.50 VOLT
(ACCEPT OR REJECT)
```

## 20. Motor Jog

The next item in the Unit Setup Adjust menu is the Motor Jog function, which will cause the main motor in the blower package to run for the programmed amount of time as soon as the Enter  button is pressed. The Motor Jog function is used to check the rotation of the main motor after the power has been connected during installation of the blower package or the power cables between the motor and the VFD are reconnected.

```
UNIT SETUP ADJUST
MOTOR JOG ?
0.0 SECONDS
(SELECT PARAMETER)
```

Min Value: 0.1 seconds

Max Value: 2.0 seconds (variable speed units), 0.5 seconds (fixed speed units)

**⚠ DANGER**



**Do not operate the blower with the fan or coupling guard removed. Exposed fan and coupling may cause personal injury.**

**⚠ CAUTION**

**Operation with incorrect motor rotation can cause severe damage to the equipment. When checking motor rotation, induce minimum rotation (less than one revolution if possible). Never allow motor to reach full speed.**

**⚠ CAUTION**

**The blower unit's direction of rotation must be checked every time the blower is reconnected to the power supply.**

## 21. Air Filter Change Interval

The next item in the Unit Setup Adjust menu is the Air Filter Change Interval. This value sets the default air filter change countdown timer value that gets set under the Maintenance Adjust menu. Setting this parameter to zero will disable the timer and its associated alarms.

```
UNIT SETUP ADJUST
AIR FILTER CHNG INT
2200 HRS
(SELECT PARAMETER)
```

Min Value: 0 hours  
Max Value: 4000 hours  
Default Value: 2200 hours

## 22. Oil Change Interval

The next item in the Unit Setup Adjust menu is the Oil Change Interval. This value sets the default oil change countdown timer value that gets set under the Maintenance Adjust menu. Setting this parameter to zero will disable the timer and its associated alarms.

```
UNIT SETUP ADJUST
OIL CHANGE INTERVAL
6000 HRS
(SELECT PARAMETER)
```

Min Value: 0 hours  
Max Value: 12000 hours  
Default Value: 6000 hours

## 23. Control Box Filter Change Interval

The next item in the Unit Setup Adjust menu is the Control Box Filter Change Interval. This value sets the default control box filter change countdown timer value that gets set under the Maintenance Adjust menu. Setting this parameter to zero will disable the timer and its associated alarms.

```
UNIT SETUP ADJUST
CTRL BOX FILTER INT
1000 HRS
(SELECT PARAMETER)
```

Min Value: 0 hours  
Max Value: 4000 hours  
Default Value: 1000 hours (variable speed units), 0 (fixed speed units)

#### 24. Motor Lubrication Interval

The next item in the Unit Setup Adjust menu is the Motor Lubrication Interval. This value sets the default motor lubrication countdown timer value that gets set under the Maintenance Adjust menu. Setting this parameter to zero will disable the timer and its associated alarms.

```
UNIT SETUP ADJUST
MOTOR LUBE INTERVAL
      8000 HRS
(SELECT PARAMETER)
```

Min Value: 0 hours  
Max Value: 10000 hours  
Default Value: Dependant on main motor installed in package.

#### 25. Delayed Break Time

The next item in the Unit Setup Adjust menu is the Delayed Break Time. This parameter sets the countdown timer that gets used in conjunction with the digital output function DELAYED BREAK RUN which is active while the main motor is running plus the Delayed Break Time period after the motor has stopped.

```
UNIT SETUP ADJUST
DELAYED BREAK TIME
      10 MINUTES
(SELECT PARAMETER)
```

Min Value: 0 minutes  
Max Value: 30 minutes  
Default Value: 10 minutes

#### 26. Belt Drive Ratio

The next item in the Unit Setup Adjust menu is the Belt Drive Ratio. This parameter is used along with the Motor Speed to calculate the Blower Speed value shown in the Motor Information menu.

```
UNIT SETUP ADJUST
BELT DRIVE RATIO
      1.45
(SELECT PARAMETER)
```

Min Value: 0.10  
Max Value: 3.00  
Default Value: Dependant on belt drive system installed in blower package.

## 4.2.5 Time Adjustment Menu

The Time Adjustment menu provides access to the parameters that control the real time clock operation of the blower. This menu is only visible if the optional AirSmart Communications Module, Gardner Denver P/N 301ETK1173, is installed. Refer to Gardner Denver document 13-17-604 (AirSmart Communications Module User's Manual) for operation of the blower real time clock functions.

<p>ADJUSTMENT MENU TIME ADJUST  (SELECT SUB MENU)</p>
---

## 6 Error Management

The AirSmart Controller, developed by Gardner Denver, represents the most current development in blower control systems. The AirSmart Controller has the ability to control a variable speed motor drive, read more than ten analog inputs (with expansion board) and control a host of digital I/O in order to achieve system objectives. To that end, there are numerous tests that are performed every second by the AirSmart Controller in order to determine the state of the blower system. Many of those tests are designed to check if certain parameters have been exceeded so that action can be taken to protect the machine.

### 6.1 Variable Speed Limiters

When the AirSmart Controller is installed in a variable speed blower, there are three limiting functions which will reduce the maximum speed of the blower by up to ten percent in order to prevent a nuisance shutdown during extreme environmental conditions.

#### 1. Current Limiter

The first limiter function is the Current Limiter which becomes active if the main motor current becomes greater than the Motor NP Current for more than 30 seconds. When the Current Limiter is active, the display will read as shown below. The Current Limiter may become active when the blower is running at peak capacity, filling an empty system or the air demand exceeds the blower capacity. If running at less than maximum capacity, the Current Limiter can indicate a problem with the airod or main motor which is drawing excess current.

9.00 PSI	185°F
125 HRS	AUTOMATIC
AMPS LIM SET	
NO SERVICE ADVISORY	

#### 2. VFD Heatsink Temperature Limiter

The second limiter function is the VFD Heatsink Temperature Limiter which becomes active if the VFD heatsink temperature becomes greater than the prescribed value for that blower model. When the VFD Heatsink Temperature Limiter is active, the display will read as shown below. The VFD Heatsink Temperature Limiter may become active when the blower is running at peak capacity while the ambient temperature is elevated.

9.00 PSI	185°F
125 HRS	AUTOMATIC
DRV TMP LIM SET	
NO SERVICE ADVISORY	

### 3. Ambient Temperature Limiter

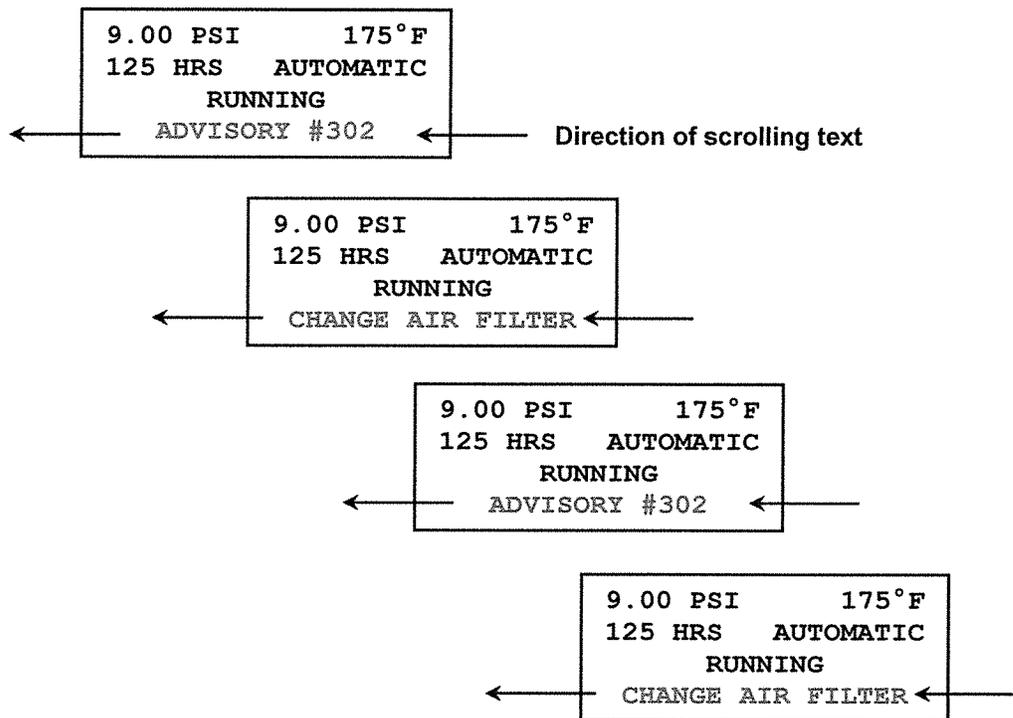
The third limiter function is the Ambient Temperature Limiter which becomes active if the ambient (inlet) temperature becomes greater than 113 °F (45. °C) When the Ambient Temperature Limiter is active, the display will read as shown below.

9.00 PSI	185°F
125 HRS	AUTOMATIC
AMB LIM SET	
NO SERVICE ADVISORY	

## 6.2 Advisory Faults

The advisory faults in the AirSmart Controller are designed to alert the user of needed service or that or that certain parameters may be approaching their shutdown level. Advisory faults can be reset while the blower is running or stopped by pressing the Enter  button. If the error condition still exists after resetting the advisory fault, the advisory fault will occur again. The status of the blower at the time of the last six advisories is stored in non-volatile memory, which can be accessed through the Advisory History menu.

Advisory fault information is shown in the fourth line of the control panel display in a scrolling fashion. The advisory number is shown first followed by a short description of the fault.



The following table is a list of advisory faults that can occur in the AirSmart Controller:

Advisory	Advisory Text	Description	Action
#301	OPTIONAL ALARM	Digital input programmed for Optional Alarm has tripped.	Check device connected to input.
#302	CHANGE AIR FILTER	Vacuum switch across inlet air filter has tripped.	Change air filter.
#303	CHNG CTRL BOX FLTR	Maintenance timer for control box filter change has expired.	Change control box filter and reset timer.
#304	CHANGE MOTOR LUBE	Maintenance timer for motor lube change has expired.	Change motor lube and reset timer.
#305	HIGH DISCH TEMP	Temperature at airend discharge > alarm set point.	Check system functionality or reduce package power.
#307	HIGH DIFF TEMP	Differential temperature across airend > alarm set point.	Check system functionality or reduce package power.
#308	HIGH ENCL TEMP	Enclosure temperature switch tripped at > 140°F (60°C).	Check enclosure ventilation fan for proper operation.
#309	HIGH DIFF PRES	Differential pressure > alarm set point.	Change air filter or check system functionality.
#310	HIGH CNTL PRES	Control pressure > alarm set point.	Check system functionality or reduce package power.
#311	INLET TEMP LOW	Inlet temperature < alarm set point	Operate package in warmer ambient temperature
#314	OIL LEVEL 1 LOW	Oil sump level 1 < alarm set point.	Oil level low; add oil to sump #1.
#315	OIL LEVEL 2 LOW	Oil sump level 2 < alarm set point.	Oil level low; add oil to sump #2.
#316	CHANGE OIL	Maintenance timer for oil change has expired.	Change oil and reset timer.
#317	OIL TEMP 1	Oil temperature #1 > alarm set point.	Check oil level or reduce package power.
#318	OIL TEMP 2	Oil temperature #2 > alarm set point.	Check oil level or reduce package power.
#319	CHK COMM PORT	Communications error in sequencing network.	Check sequencing network connections.

### 6.3 Shutdown Faults

The shutdown faults in the AirSmart Controller are designed to protect the blower from component failure or extreme environmental conditions. Shutdown faults can be reset after the blower has

stopped by pressing the Stop/Reset  button. If the error condition still exists as indicated by a blinking Shutdown LED on the control panel, the shutdown fault can not be reset. The status of the blower at the time of the last six shutdowns is stored in non-volatile memory, which can be accessed through the Advisory History menu.

Shutdown fault information is shown in the second and third lines of the control panel display. The shutdown number is shown in the second line followed by a short description of the fault in the third line.

0.00 PSI	75°F
SHUTDOWN # 128	
HIGH DISCH TEMP	
NO SERVICE ADVISORY	

The following table is a list of shutdown faults that can occur in the AirSmart Controller:

Shutdown	Shutdown Text	Description	Action
#101	INVALID MODEL	Valid blower model not selected during factory setup or controller replacement.	Select valid blower model in Unit Setup Adjust menu.
#102	CNTL PRES FAULT	Control pressure > shutdown set point.	Check system functionality or reduce package power.
#103	CONTROLLER ERROR	Controller internal failure.	Replace controller.
#104	DC POWER LOW	24 VDC input to controller < 20 VDC.	Check 24 VDC power supply.
#106	DIFF TEMP FAULT	Differential temperature across airend > shutdown set point.	Check system functionality or reduce package power.
#107	DISCH TEMP FAULT	Temperature at airend discharge > shutdown set point.	Check system functionality or reduce package power.
#108	DRIVE 1 COMM ERROR	Communications failure between controller and main motor VFD.	Check wiring or communications parameters in main motor VFD.
#109	DRIVE 1 FAULT	Main motor VFD has shut down.	Check main motor VFD operation.
#110	EMERGENCY STOP	Blower stopped using Emergency Stop button.	Pull out Emergency Stop button to its normal position.
#111	ENC TEMP FAULT	Enclosure temperature switch has tripped.	Check enclosure fan and ventilation..
#112	FAN FAULT	Cooler or vent fan over temp fault	Check fan motor and associated fuses and wiring
#113	FAN STARTER	Fan Aux input does not match Fan Starter digital output	Check fan contactor operation
#115	LOW VOLTAGE	Digital input programmed for Low Voltage has tripped	Check voltage relay
#118	OIL LEVEL 1 LOW	Oil level 1 (drive end) < shutdown set point.	Oil level low; add oil to drive end sump.
#119	OIL LEVEL 2 LOW	Oil level 2 (gear end) < shutdown set point.	Oil level low; add oil to gear end sump.

Shutdown	Shutdown Text	Description	Action
#120	PHASE SEQUENCE	Digital input programmed for Phase Sequence has tripped.	Check phase relay.
#121	OPTIONAL SHUTDOWN	Digital input programmed for Optional Shutdown has tripped.	Check device connected to input.
#122	INLET TEMP LOW	Inlet temperature < shutdown set point	Operate package in warmer ambient temperature
#123	MAIN STARTER	Motor Aux input does not match Main Contactor digital output.	Check main motor contactor operation.
#124	OIL LEVEL 1 HIGH	Oil level 1 (drive end) > shutdown set point.	Oil level high; drain oil from drive end sump.
#125	OIL LEVEL 2 HIGH	Oil level 2 (gear end) > shutdown set point.	Oil level high; drain oil from gear end sump.
#126	OIL TEMP 1 FAULT	Drive end oil temperature > shutdown set point.	Check drive end oil level or reduce package power.
#127	OIL TEMP 2 FAULT	Gear end oil temperature > shutdown set point.	Check gear end oil level or reduce package power.
#128	OPEN THERM T1	Connection to thermistor TT1 is open.	Check wiring between thermistor TT1 and controller.
#129	OPEN THERM T2	Connection to thermistor TT2 is open.	Check wiring between thermistor TT2 and controller.
#130	OPEN THERM T3	Connection to thermistor TT3 is open.	Check wiring between thermistor TT3 and controller.
#131	OPEN THERM T4	Connection to thermistor TT4 is open.	Check wiring between thermistor TT4 and controller.
#132	OPEN THERM T5	Connection to thermistor TT5 is open.	Check wiring between thermistor TT5 and controller.
#133	OPEN XDUCER XD1	Connection to pressure transducer PT1 is open.	Check wiring between pressure transducer PT1 and controller.
#134	OPEN XDUCER XD2	Connection to pressure transducer PT2 is open.	Check wiring between pressure transducer PT2 and controller.

Shutdown	Shutdown Text	Description	Action
#135	OPEN XDUCER XD3	Connection to pressure transducer PT3 is open.	Check wiring between pressure transducer PT3 and controller.
#136	OPEN XDUCER XD4	Connection to pressure transducer PT4 is open.	Check wiring between pressure transducer PT4 and controller.
#137	OPEN XDUCER XD5	Connection to pressure transducer PT5 is open.	Check wiring between pressure transducer PT5 and controller.
#138	POWER FAILURE	Loss of power to blower package	Check line voltage
#139	SEQ COMM FAULT	Communications fault in sequencing network.	Check sequencing network connections.
#140	SHORTED THERM T1	Connection to thermistor TT1 is shorted.	Check wiring between thermistor TT1 and controller.
#141	SHORTED THERM T2	Connection to thermistor TT2 is shorted.	Check wiring between thermistor TT2 and controller.
#142	SHORTED THERM T3	Connection to thermistor TT3 is shorted.	Check wiring between thermistor TT3 and controller.
#143	SHORTED THERM T4	Connection to thermistor TT4 is shorted.	Check wiring between thermistor TT4 and controller.
#144	SHORTED THERM T5	Connection to thermistor TT5 is shorted.	Check wiring between thermistor TT5 and controller.
#145	SHORTED XDUCER XD1	Connection to pressure transducer PT1 is shorted.	Check wiring between pressure transducer PT1 and controller.
#146	SHORTED XDUCER XD2	Connection to pressure transducer PT2 is shorted.	Check wiring between pressure transducer PT2 and controller.
#147	SHORTED XDUCER XD3	Connection to pressure transducer PT3 is shorted.	Check wiring between pressure transducer PT3 and controller.
#148	SHORTED XDUCER XD4	Connection to pressure transducer PT4 is shorted.	Check wiring between pressure transducer PT4 and controller.
#149	SHORTED XDUCER XD5	Connection to pressure transducer PT5 is shorted.	Check wiring between pressure transducer PT5 and controller.
#150	XB1 COMM ERROR	Controller internal communications failure	Replace controller

## 6.4 Transducer Locations

Gardner Denver blowers are equipped with a number of temperature and pressure transducers to monitor status and control the machine. The following table is a list of the various locations where these transducers are typically used depending on the AirSmart Controller installed in the unit.

<b>Transducer Reference</b>	<b>AirSmart Controller P/N: 89864799</b>	<b>AirSmart Controller with Expansion Board P/N: VP1017673</b>	<b>AirSmart Controller Communications Module P/N: 301ETK1173</b>
TT1	Inlet Temperature	Inlet Temperature	
TT2	Discharge Temperature	Discharge Temperature	
TT3		Optional Enclosure Temperature	
TT4		Optional Drive End Oil Temperature	
TT5		Optional Gear End Oil Temperature	
XD1	Inlet Pressure	Inlet Pressure	
XD2	Discharge Pressure	Discharge Pressure	
XD3			
XD4		Optional Drive End Oil Level	
XD5		Optional Gear End Oil Level	
XD6			System Pressure (sequencing)

## 7 Auxiliary Inputs and Outputs

As mentioned earlier in this manual, the AirSmart Controller has the ability to control a variable speed motor drive, read more than ten analog inputs and a control a host of digital I/O in order to achieve system objectives. The digital and analog I/O connect to the AirSmart Controller through a highly flexible mapping system which enables each input and output to perform a wide variety of functions. The following sections describe how to choose and configure the AirSmart's I/O for the correct task.



**Changing of inputs and outputs which have already been configured at the factory can cause personal injury or damage to equipment.**

### 7.1 Operating Device Addresses

There are four defined function sets, one each for digital inputs, digital outputs, analog inputs and analog outputs. Each function in each set has an address, which directs the corresponding function to the desired input or output. The functions and addresses are located in "PROG I/O ADJUST" menu, which becomes visible when 8412 is entered as the password parameter under the "UNIT SETUP ADJUST" menu.

The controller can map input and output functions to unique input and output ports. System inputs and outputs are addressed numerically. Each operating device in the system has a unique number as shown in the following table.

Operating Device	Unit Number
AirSmart Controller Core Board	1
AirSmart Controller Expansion Board	2
Drive 1	3
Drive 2	4
Drive 3	5
Modbus Registers	6
AirSmart Communications Module	7

A unit's base address is formed by multiplying the unit number by sixteen (16). A corresponding unit port address is formed by adding the device's port number to the unit base address. For example, the address for the AirSmart Controller's Expansion Board digital input #2 would be  $2 \times 16 + 2 = 34$ . Same addressing principal applies with all inputs and outputs, digital or analog.

## 7.2 Digital Input/Output Functions

The following tables are a list of the various digital input and output functions that are available in the AirSmart Controller. A digital input or output function is active only when a valid address is assigned to that function. Any function is disabled when the address is set to zero.

Note: Functions listed in **BOLD** print may be pre-programmed at the factory. **DO NOT** change the address of these I/O functions or the blower will not function correctly.

<b>Digital Input Function</b>	<b>Description</b>
<b>Air Filter</b>	Used to signal a dirty air filter.
<b>Remote Halt</b>	Used to remote start/stop blower.
<b>Motor Auxiliary</b>	Used to signal the failure of the main motor starter.
<b>Motor Fault</b>	Input used to signal a main motor fault.
<b>Fan Auxiliary</b>	Used to signal the failure of the fan motor starter.
<b>Fan Fault</b>	Input used to signal a fan motor over temperature fault.
Low Voltage Relay Alarm	Used to signal low line voltage detected by external device.
Low Voltage Relay Shutdown	
Phase Sequence	Used to signal incorrect connection of three phase power input detected by external device.
Enclosure Temp	Used to signal enclosure temperature switch trip.
Drive End Oil Level Alarm	Used to trigger low oil level from oil level sensor switch.
Drive End Oil Level Shutdown	
Gear End Oil Level Alarm	Used to trigger low oil level from oil level sensor switch.
Gear End Oil Level Shutdown	
Water Pressure Alarm	Used to signal high water pressure in water cooled systems.
Water Pressure Shutdown	
Reset Alarm	Used to control remote rest of alarms.
Advisory Alarm	Used to trigger a generic advisory alarm.
Shutdown Fault	Used to trigger a generic shutdown fault.

Digital Output Function	Description
Advisory Alarm	Used to indicate an active advisory alarm.
Shutdown Fault	Used to indicate an active shutdown alarm.
Any Alarm	Used to indicate an active advisory or shutdown alarm.
<b>Main Contactor</b>	Used to control the main motor starter in fixed speed blower models.
<b>Start Contactor</b>	Used to control the start contactor in a Wye-Delta motor starter in fixed speed blower models.
<b>Fan Contactor</b>	Used to control the enclose ventilation fan.
<b>Unloader Valve</b>	Used to control unloader valve on the package discharge.
Run	Used to indicate the blower's main motor is running.
Delayed Break Run	Used to indicate the blower's main motor is running but stays active for ten minutes after the motor stops.

Digital I/O functions can be programmed to be either active high or active low by using the Plus  and Minus  keys to change the polarity of the input. A positive address value corresponds to an active high function and a negative address value likewise corresponds to an active low function.

### 7.3 Analog Input/Output Functions

The following tables are a list of the various analog input and output functions that are available in the AirSmart Controller. An analog input or output function is active only when a valid address is assigned to that function. Any function is disabled when the address is set to zero.

Note: Functions listed in **BOLD** print may be pre-programmed at the factory. **DO NOT** change the address of these I/O functions or the blower will not function correctly.

<b>Analog Input Function</b>	<b>Description</b>
<b>Inlet Temperature</b>	Used to indicate the blower air inlet temperature.
<b>Discharge Temperature</b>	Used to indicate the airend discharge temperature.
<b>Discharge Pressure</b>	Used to indicate the package discharge pressure. Also used as control pressure reference to AirSmart Controller in a pressure machine.
<b>Inlet Pressure</b>	Used to indicate the package inlet pressure. Also used as control pressure reference to AirSmart Controller in a vacuum machine.
<b>System Pressure</b>	Used to indicate the control pressure in a sequenced group of blowers.
Enclosure Temperature	Used to indicate the temperature inside the package enclosure.
Drive End Oil Temperature	Used to indicate the temperature in drive end oil sump.
Gear End Oil Temperature	Used to indicate the temperature in gear end oil sump.
Drive End Oil Level	Used to indicate the oil level in drive end oil sump.
Drive End Oil Level	Used to indicate the oil level in gear end oil sump.
Speed Control	Used to control the speed of a variable speed blower while operating in REMOTE mode.

<b>Analog Output Function</b>	<b>Description</b>
Discharge Temperature	Used to indicate the current discharge temperature value.
Discharge Pressure	Used to indicate the current discharge pressure value.
Inlet Pressure	Used to indicate the current inlet pressure value.

## 7.4 Example "RUN" Digital Output Signal

The following example shows how to provide a "RUN" output on a variable speed blower. This procedure can also be used on other machines; however the I/O addresses may need to be changed. There are as many as four outputs that can be programmed to serve as a "RUN" signal. There is a 24 VDC output on terminal blocks A9 or A10 (ground reference on B6 thru B10) and there are also two N.O relay contacts between terminal blocks A11 and B11 or A12 and B12. Any one of these contact points can be programmed to be active when the blower is running.

1. Press the Enter  key on the display to access the Adjustment menu tree.
2. Use Right  or Left  keys to navigate to the Unit Setup Adjust menu.
3. Press the Enter  key to enter the Unit Setup Adjust menu.
4. The Unit Password parameter will be the first item in the Unit Setup Adjust menu. Press the Enter  key to change the Password to **8412**.
5. Use the Plus  and Minus  keys the change the value of each digit.
6. Use the Right  or Left  keys to select individual password digits.
7. Press the Enter  key to confirm the password value.
8. Press the Stop/Reset  key to return to the Adjustment menu tree.
9. Press the Right  key twice to navigate to the Prog I/O Adjust menu.
10. Press the Enter  key to access the Prog I/O Adjust menu.
11. To use terminals A11/B11 (N.O. relay contact) for the "RUN" signal, skip to step #19 below.
12. To use terminal A10 for the "RUN" signal, continue with step #13.
13. Press the Down  key to navigate to the "RUN" Digital Output address. The controller display should read as below.

PROG I/O ADJUST  
RUN  
0 DIGITAL OUT  
(SELECT PARAMETER)

14. Press the Enter  key to edit the I/O address for the "RUN" signal. Use address **20** for terminal A10.
15. Use the Plus  and Minus  keys the change the value of each digit.
16. Use the Right  or Left  keys to select individual address digits.
17. Press the Enter  key to confirm the address value. The controller display should read as below.

PROG I/O ADJUST  
RUN  
20 DIGTIAL OUT  
(SELECT PARAMETER)

18. Skip now to step #28.

19. To use terminals A11/B11 (N.O. relay contact) for the "RUN" signal, continue with step #20 below.

20. Press the Down  key to navigate to the "ANY ALARM" Digital Output address. The controller display should read as below.

PROG I/O ADJUST  
ANY ALARM  
50 DIGTIAL OUT  
(SELECT PARAMETER)

21. We must first set this address to 0 in order to disable this function so that the relay output can be re-used for the "RUN" signal.

22. Press the Enter  key to edit the I/O address for the "ANY ALARM" signal.

23. Use the Plus  and Minus  keys the change the value of each digit.

24. Use the Right  or Left  keys to select individual address digits.

25. Press the Enter  key to confirm the address value. The controller display should read as below.

PROG I/O ADJUST  
ANY ALARM  
0 DIGTIAL OUT  
(SELECT PARAMETER)

26. Press the Up  key to navigate to the "RUN" Digital Output address.

27. Skip back to step #14 except that you need to use address 49 for the relay output instead of address 20 as stated in step #14.

28. Press the Stop/Reset  key twice. The controller display will read as below.

STORE MODIFIED  
PARAMETERS?  
STOP = NO  
ENTER = YES

29. Press the Enter  key to permanently save to changed parameters in the controller's memory.

## 7.5 Remote Mode Analog Input Signal

The following procedure explains how to program an analog input on a variable speed blower package for controlling the speed of the blower in REMOTE operating mode. Only an unused pressure transducer signal input can be used for this function. The pressure transducer connections are found on either connector P5 or P14 if the expansion I/O board is installed in the controller.

The analog signal range on the pressure transducer inputs is 0 – 5 VDC. If the available analog source is a 4 – 20 mA signal, an external 250 Ohm, 1 % resistor will need to be connected across the input. An example 4 – 20 mA connection is shown in the diagram below.

1. Press the Enter  key on the display to access the Adjustment menu tree.
2. Use Right  or Left  keys to navigate to the Unit Setup Adjust menu.
3. Press the Enter  key to enter the Unit Setup Adjust menu.
4. The Unit Password parameter will be the first item in the Unit Setup Adjust menu. Press the Enter  key to change the Password to **8412**.
5. Use the Plus  and Minus  keys the change the value of each digit.
6. Use the Right  or Left  keys to select individual password digits.
7. Press the Enter  key to confirm the password value.
8. Press the Stop/Reset  key to return to the Adjustment menu tree.
9. Press the Right  key twice to navigate to the Prog I/O Adjust menu.
10. Press the Enter  key to access the Prog I/O Adjust menu.
11. Press the Down  key to navigate to the "SPEED CONTROL" Analog Input address. The controller display should read as below.

PROG I/O ADJUST  
SPEED CONTROL  
0 ANALOG IN  
(SELECT PARAMETER)

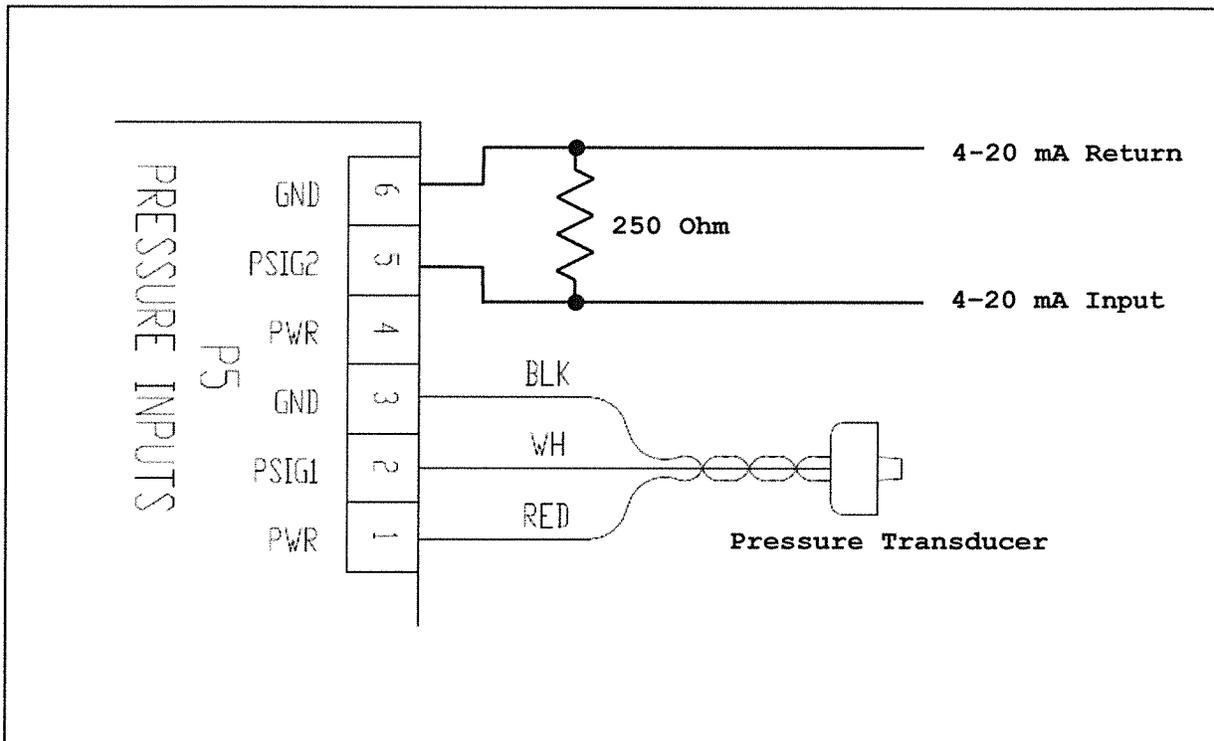
12. Press the Enter  key to edit the I/O address for the "SPEED CONTROL" signal. Use address **19** for pins 2 and 3 on connector P5 or address **20** for pins 5 and 6 on connector P5.
13. Use the Plus  and Minus  keys the change the value of each digit.
14. Use the Right  or Left  keys to select individual address digits.
15. Press the Enter  key to confirm the address value. The controller display should read as below.

PROG I/O ADJUST  
SPEED CONTROL  
19 ANALOG IN  
(SELECT PARAMETER)

16. Press the Stop/Reset  key twice. The controller display will read as below.

**STORE MODIFIED  
PARAMETERS?  
STOP = NO  
ENTER = YES**

17. Press the Enter  key to permanently save to changed parameters in the controller's memory.



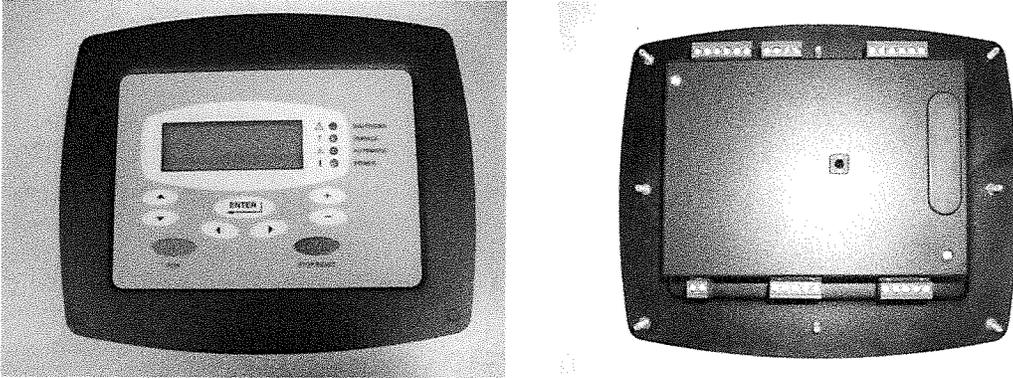
## 8 Technical Data

### 8.1 All-In-One AirSmart Controller

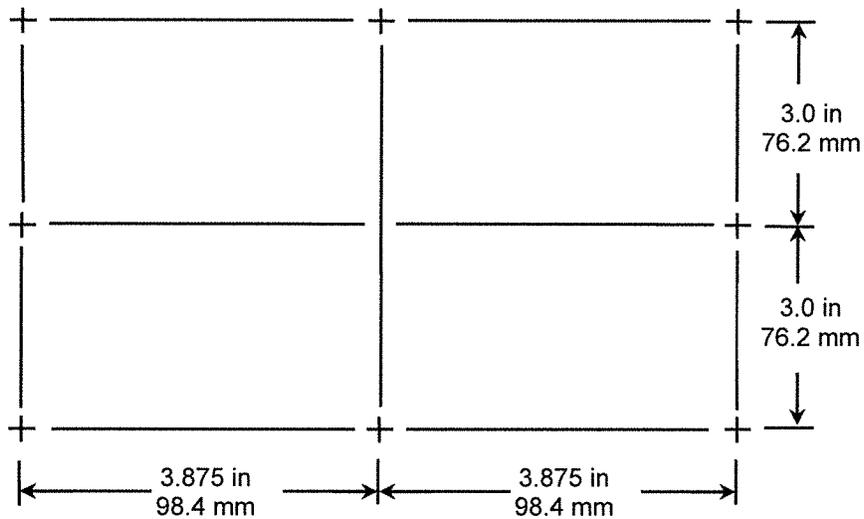
Outside dimensions for the All-In-One AirSmart Controller and Display Unit:

9.0 in x 7.5 in x 1.8 in

228.6 mm x 190.5 mm x 45.7 mm



Mounting arrangement for the All-In-One AirSmart Controller and Display Unit:



## 8.2 Environmental Ratings

Operating temperature range: -40°F to 185°F (-40°C to 85°C)

Storage temperature range: -67°F to 300°F (-55°C to 150°C)

Humidity: 0 to 95% non-condensing

## 8.3 Electrical Ratings

DC power input on P1: 24 VDC +/- 10% @ 150 mA

Digital Outputs (Core board):

24 VDC @ 2.6 A continuous

Digital Outputs (Expansion board):

24 VDC @ 800 mA continuous

Form-C relay output (Expansion board):

Relay contact rating: 125 mA @ 250 VAC, 2.0 A @ 30 VDC.

Digital Inputs (Core board): Four 0 - 24 VDC inputs -

Low = 0 to 4 VDC / High = 20 - 24 VDC.

Digital Inputs (Expansion board): Ten 0 to 24 VDC inputs -

Low = 0 to 4 VDC / High = 20 to 24 VDC.

Analog Inputs (Core Board): Four 0 – 5 VDC inputs.

Two configured for use with 3 kOhm NTC thermistors

Two configured for use with 0.5 – 4.5 VDC output pressure transducers.

Analog Inputs (Expansion Board): Six 0 – 5 VDC inputs.

Three configured for use with 3 kOhm NTC thermistors

Three configured for use with 0.5 – 4.5 VDC output pressure transducers.



[www.GardnerDenverProducts.com](http://www.GardnerDenverProducts.com) [pd.blowers@gardnerdenver.com](mailto:pd.blowers@gardnerdenver.com)

Gardner Denver, Inc. 1800 Gardner Expressway, Quincy, IL 62305  
Customer Service Department Telephone: (800) 682-9868 FAX: (217) 221-8780

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Member



# IQ

Positive Displacement Blower  
& Vacuum Pump Packages



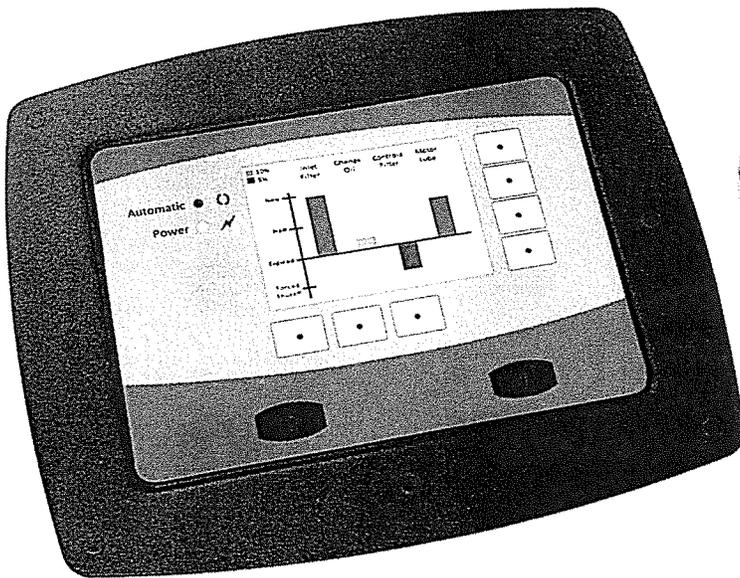
WHAT CAN  
IQ DO FOR  
YOU?

Smart made simple with total control at your fingertip

**GD**  
GARDNER DENVER

Experience Proven Results™

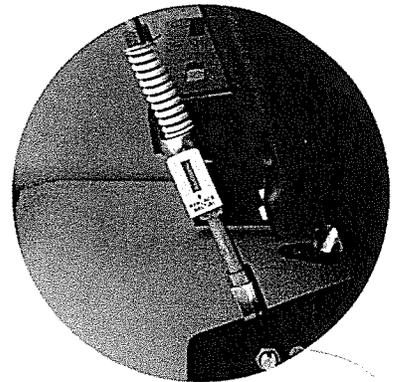
## SMART Maintenance



Predictive Maintenance can reduce maintenance costs by up to 30 percent and downtime up to 45 percent.

The AirSmart controller uses customizable timers to track maintenance schedules and notify the operator when routine service is required.

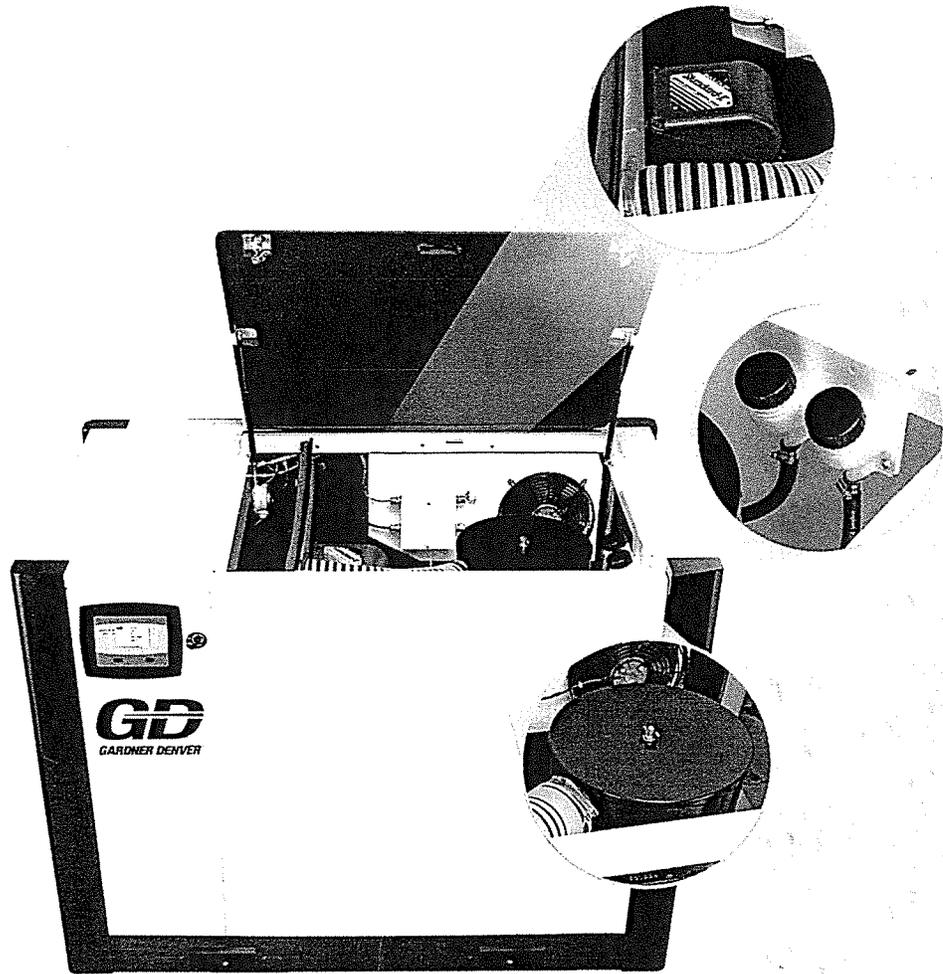
The belt tensioner keeps the drive belt at the specified tension and indicates when it needs to be changed.



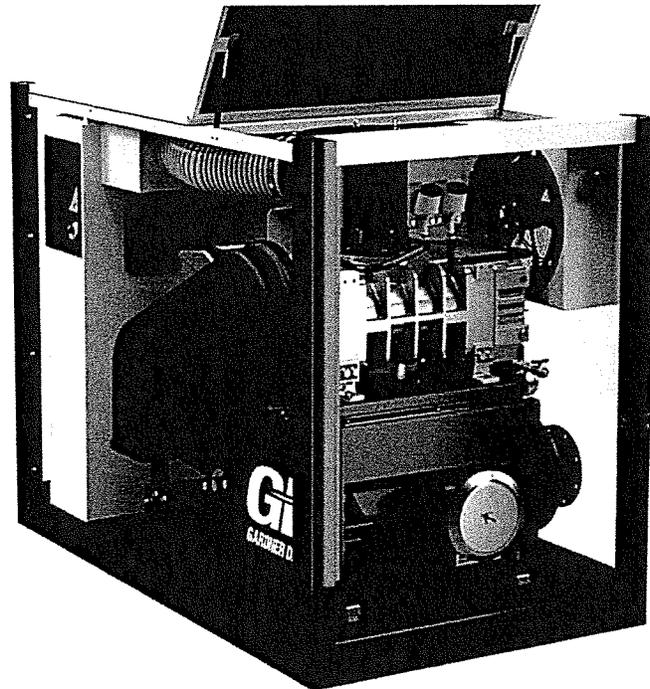
# IQ YOU

## Maintenance

- Reduces Downtime
- Helps Reduce Maintenance Costs



With just the top open,  
the air filter, conduit  
box, and oil fill are  
easily accessible.



Once all panels are removed,  
all major components and  
maintenance items are within  
easy access.

## SMART Operation



### Integrated System Controls

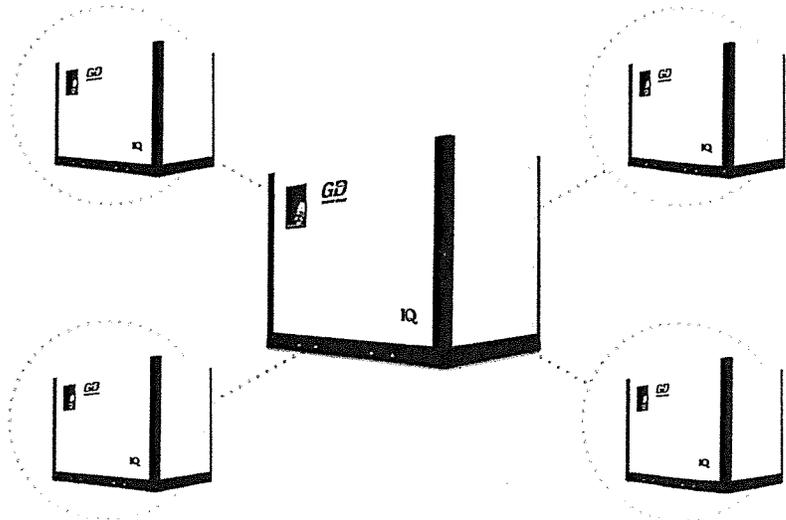
- SCADA compatibility allows for system reporting & monitoring
- External drivers help keep operating costs down by matching blower performance to plant needs

You know what's happening even when you aren't there.

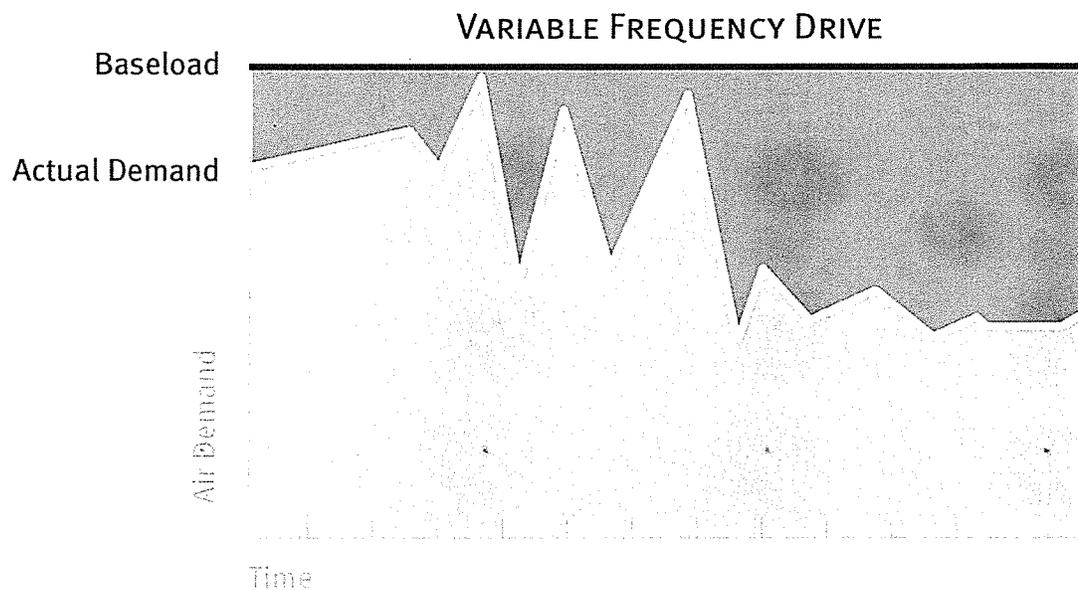
### Sequencing

The AirSmart controller allows you to sequence up to eight blower packages.

- Can be process or timer operated
- Allows distribution of operating hours
- Reduces downtime for maintenance



# Air when you need it... ...Savings when you don't



## Take Charge

Using external drivers, such as a dissolved oxygen sensor or tank level sensor, the AirSmart controller can adjust to the application demand.

**IQ YOU**

**Operations Manager**

- Reduced Operating Cost
- Reduced Downtime

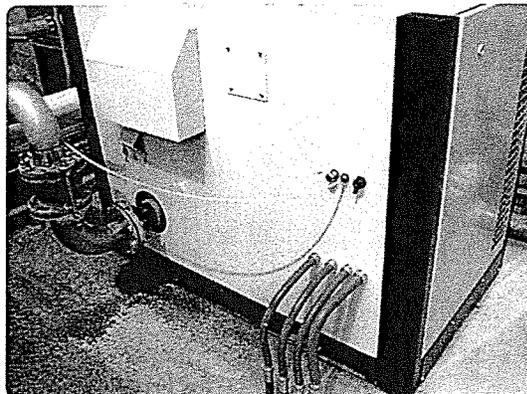
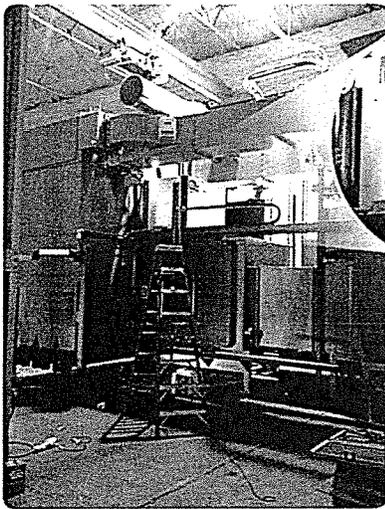
# SMART Design

## Improved Belt Life

Smart base design extends belt life, prolonging bearing life in the blower.

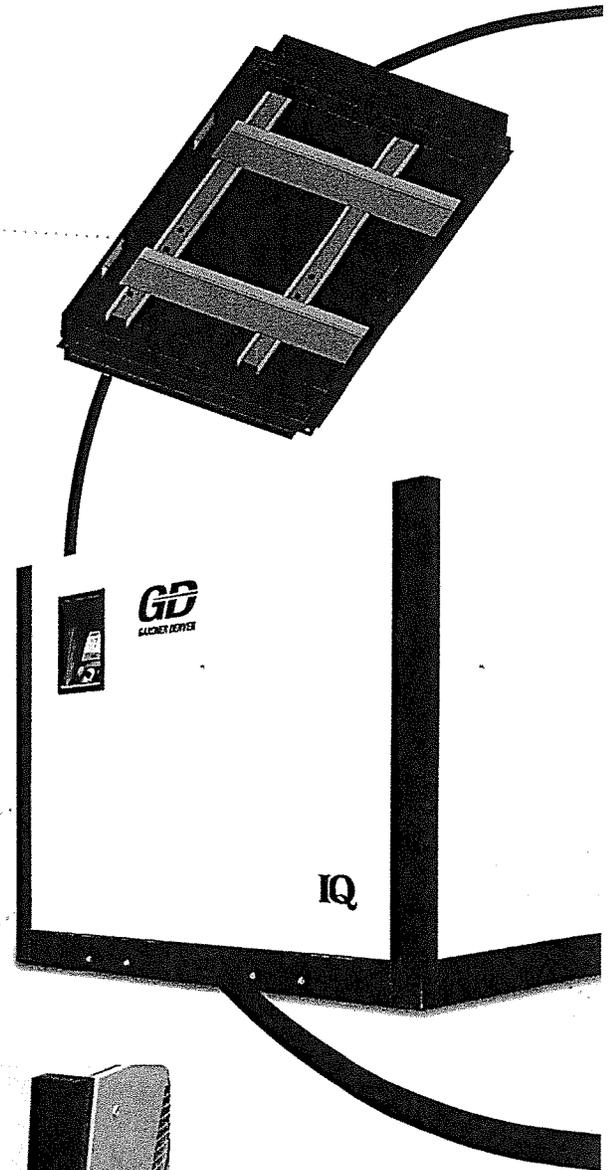
## Easy Installation

Rigid base design allows the IQ package to be placed on a level surface, with no need for special foundations.



## Simple Connections

Electrical and pipework connections are all that need to be made to get the IQ package installed in the system.

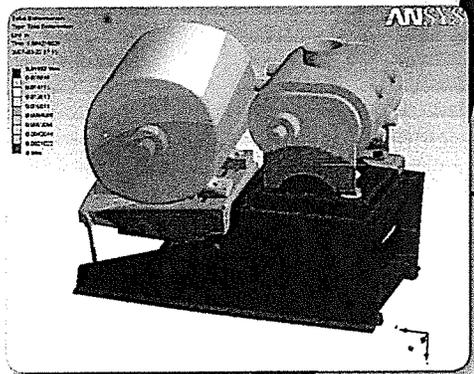


# SMART

From The  
Ground Up!

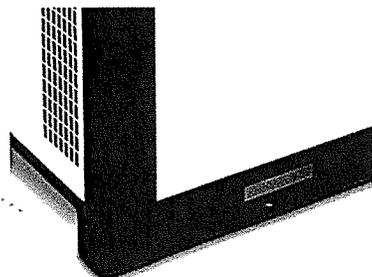
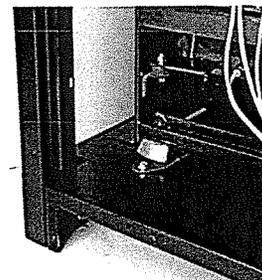
The easiest  
equipment installation  
we've ever had.

– Plant Superintendent,  
Municipal Wastewater Plant



## Premium Vibration Isolators

Reduce vibration, helping lower noise levels  
by up to 20 dBA

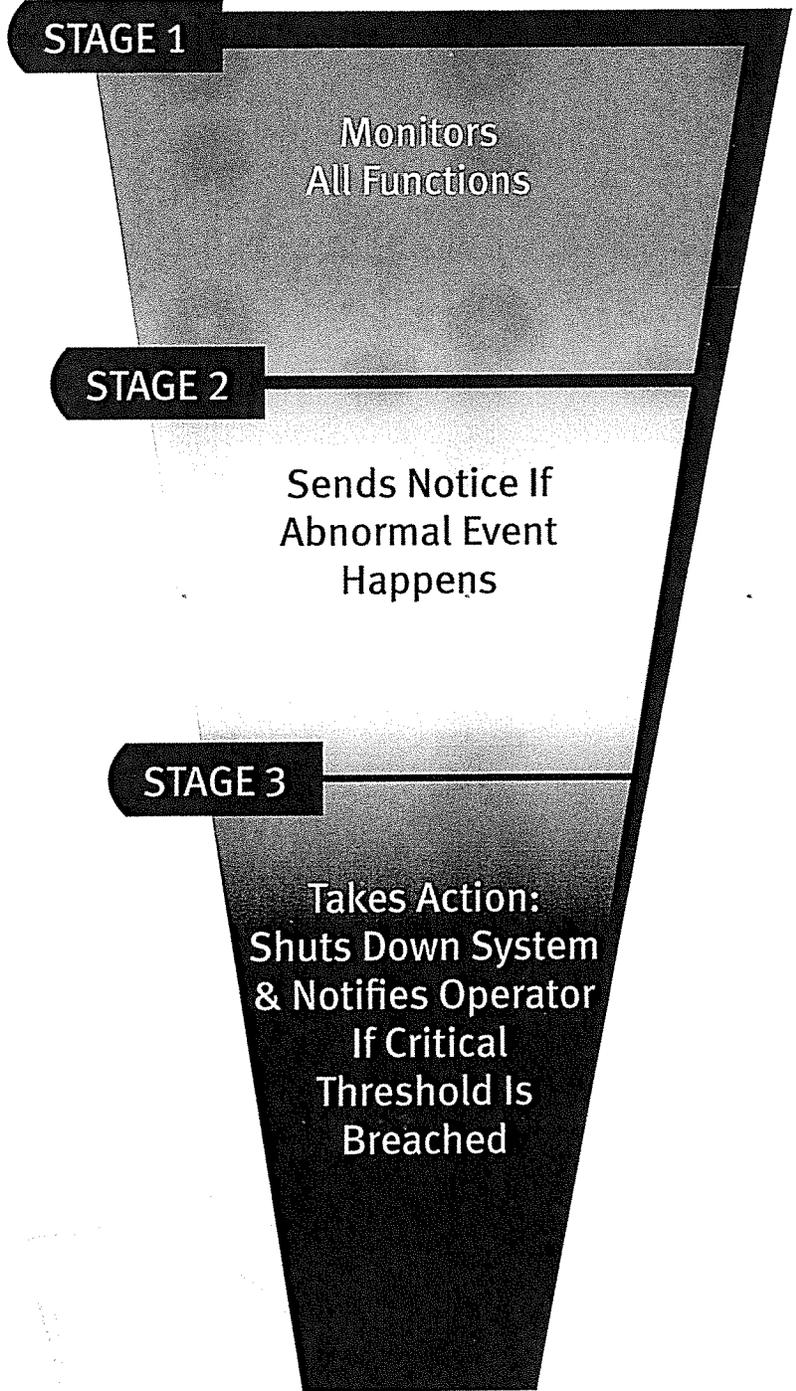


## Simple Transit

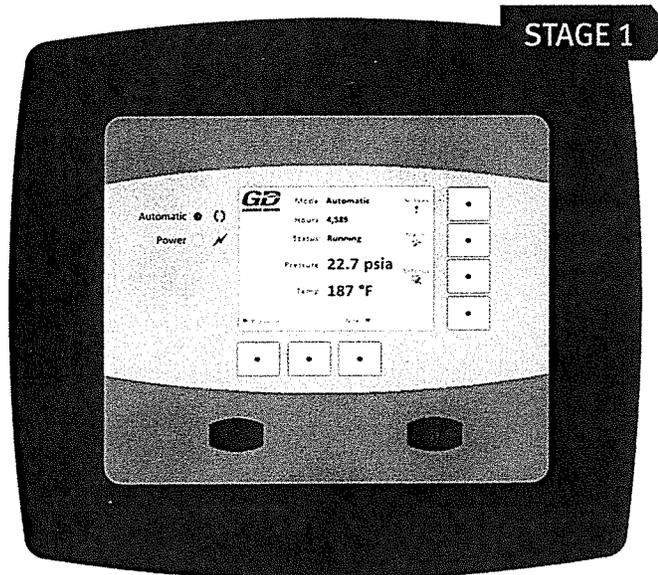
Forkable slots on enclosure provide easy  
unloading, movement, and setting into place

# SMART Controls

## 3 Stages of Protection



# It Never Sleeps

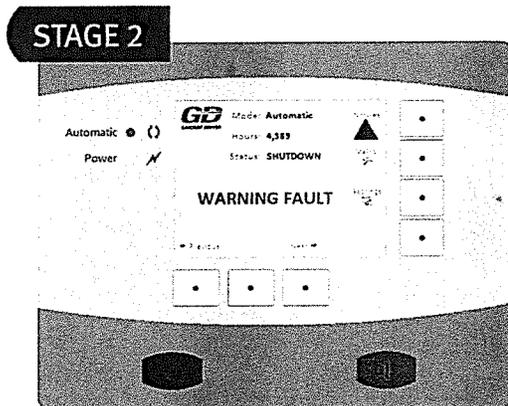


## What can a machine tell you about itself?

While operating, the AirSmart checks vital parameters 30 times per second and displays the current conditions.

## Can it know when it needs help or when it doesn't?

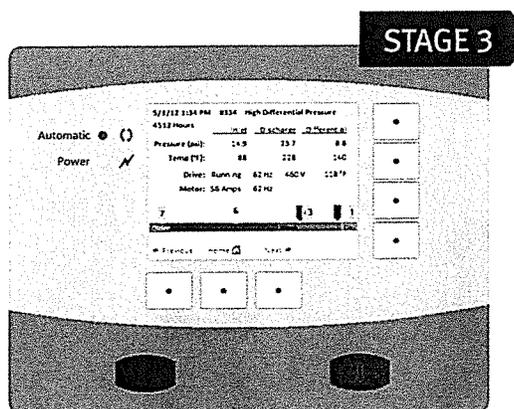
When one or more preset thresholds is exceeded, the AirSmart controller displays an advisory notice.



## Can a machine seek help before it is broken?

When a critical parameter is exceeded, the AirSmart will shut the blower down.

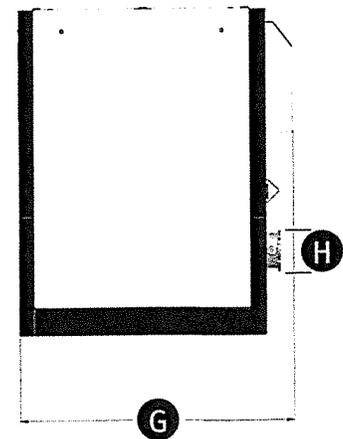
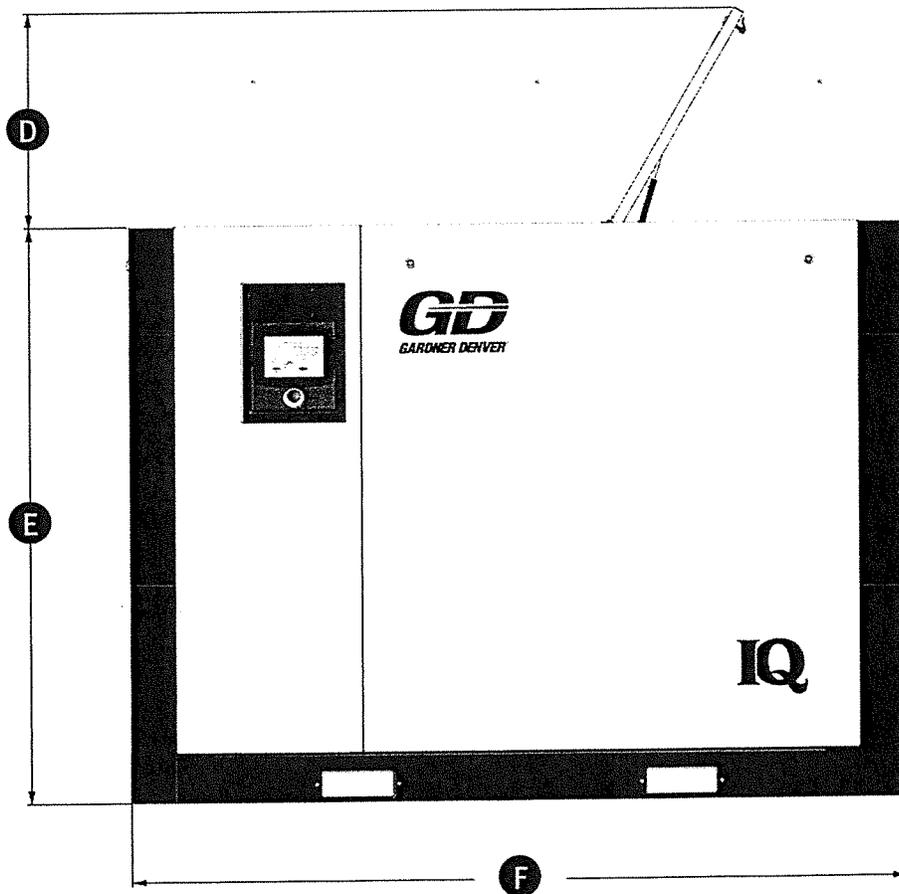
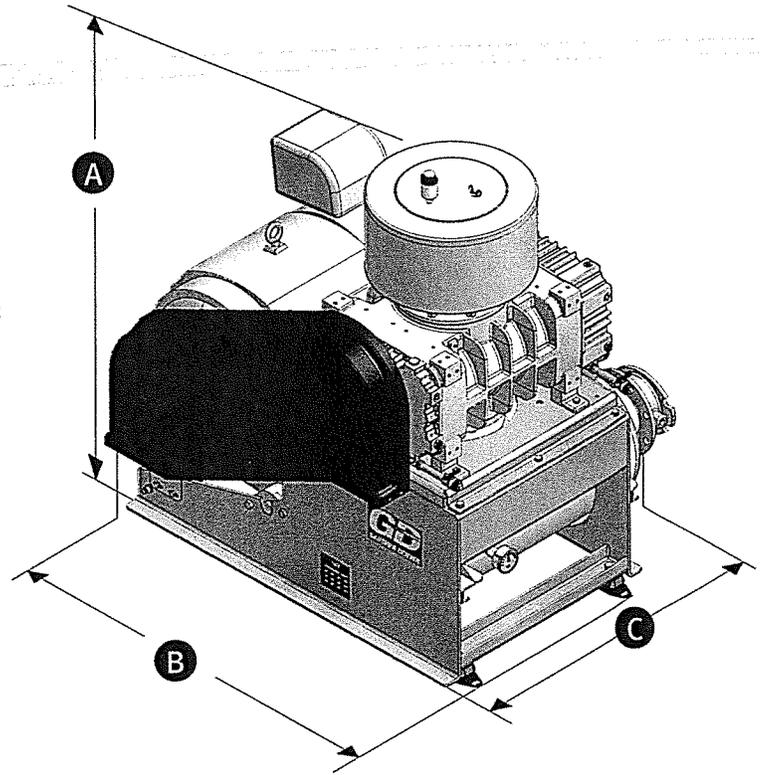
- Prevents damage and keeps repair costs down
- Once shutdown occurs the AirSmart controller can send a notice to the operator
- Records advisory and shutdown history to allow for reporting, troubleshooting and repair



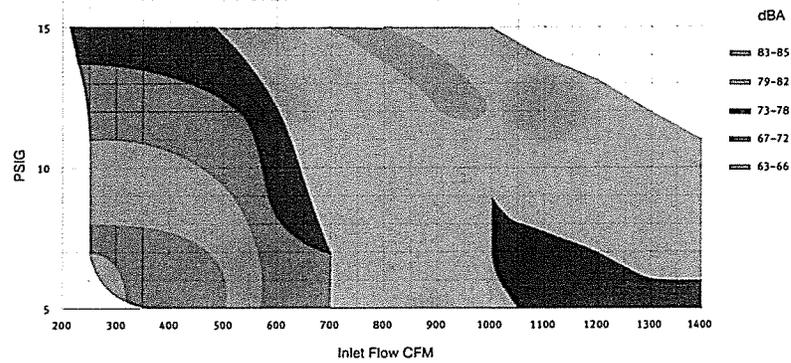
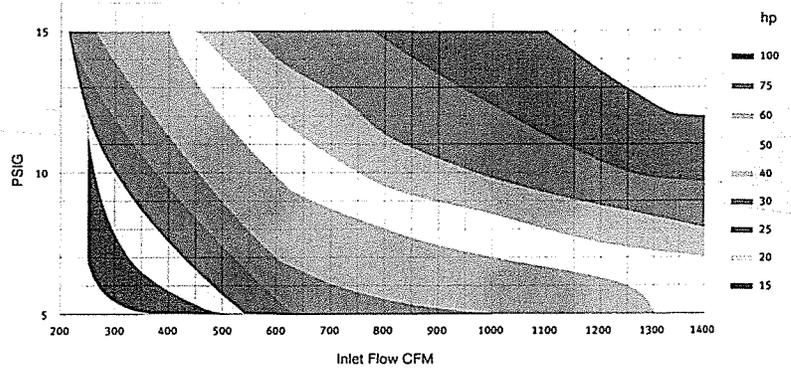
# By The Numbers

## IQ Blower Package Delivers

- Pressure to 15 psig 1034 mbarg
- Vacuum to 16" Hg 542 mbar
- 200-1,500 icfm 254.9 m<sup>3</sup>/h
- 7.5-100 hp 6-75 kW



**IQ Pressure Package**



**Performance & Sound**

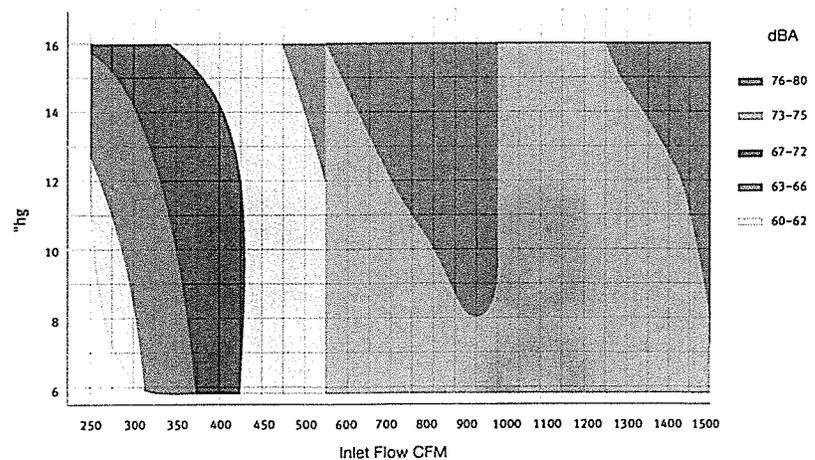
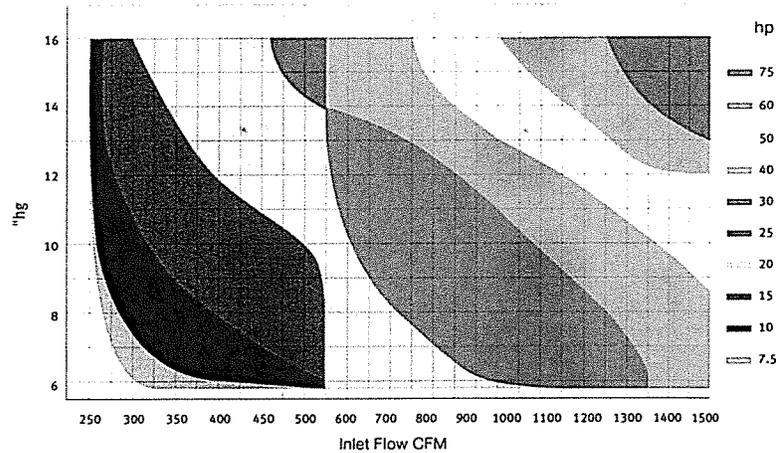
Performance based on inlet air at standard temperature of 68° F, an ambient pressure of 14.7 psia and 36% relative humidity. For performance at non-standard conditions, contact your authorized Gardner Denver representative.

Air and sound maps represent non-VFD IQ packages.

**Dimensions (in inches)**

Section	Medium IQ Package	Large IQ Package
A	47.5	60.91
B	39.57	55.69
C	32.38	49.94
D	29	24
E	51	64.52
F	65	86
G	41.76	53.99
H	4	6

**IQ Vacuum Package**



**Medium IQ Package Weight**

Type	Max. Weight	
	lbs	kg
Enclosed package	2100	953
Unenclosed package	1300	590

Weights are approximate.

**Large IQ Package Weight**

Type	Max. Weight	
	lbs	kg
Enclosed package	4200	1905
Unenclosed package	3000	1361

Weights are approximate.

# Features

## 1. Quiet Sound Enclosure

- Sound levels as low as 60 dBA
- Removable and hinged panels provide easy access for maintenance

## 2. TEFC EISA Motors

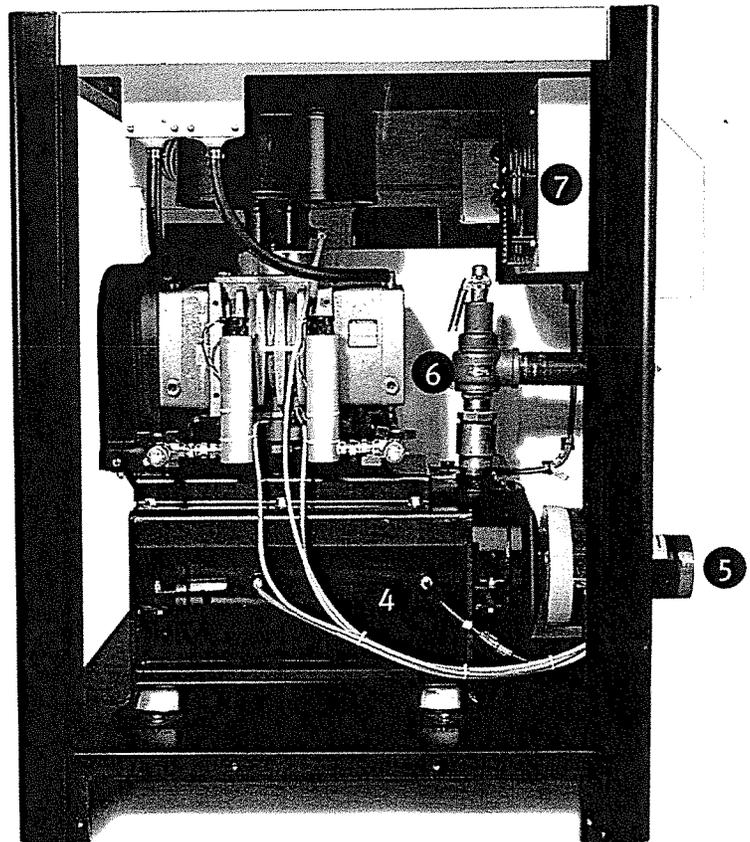
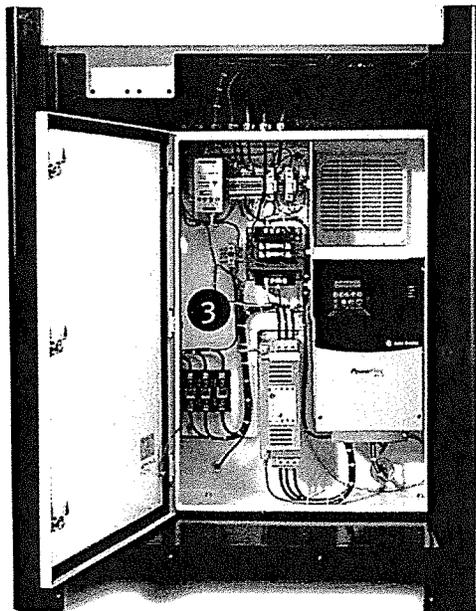
- EISA compliant Premium efficiency motors
- Standard 5-year warranty
- Available voltages: 200/3/60, 230/3/60, 460/3/60, 575/3/60, 380/3/50, and 415/3/50

## 3. Starter Options

- Standard less starter
- Full volt starter
- VFD

## 4. Removable Discharge Silencer

- Provides minimal pressure drop
- Significantly reduces sound and pulsation
- Available ASME coded silencer



## 5. Vacuum/Pressure Connections

### Medium:

- 4" NPT pressure discharge
- 4.5" ID hose vacuum inlet

### Large:

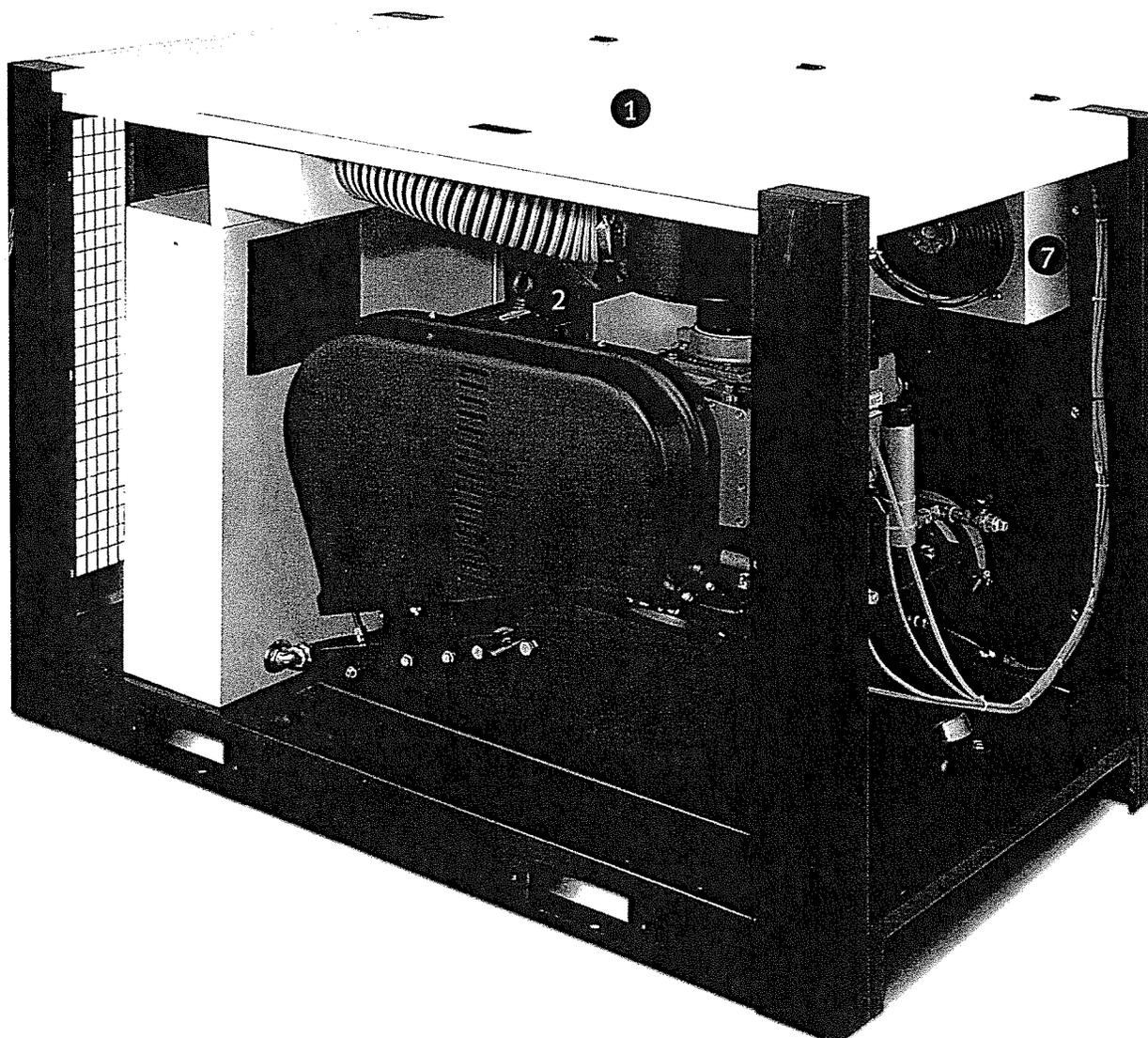
- 6" 150 lb. ANSI flange pressure discharge
- 6" or 8" ID hose vacuum inlet

## 6. Pre-Mounted Valves

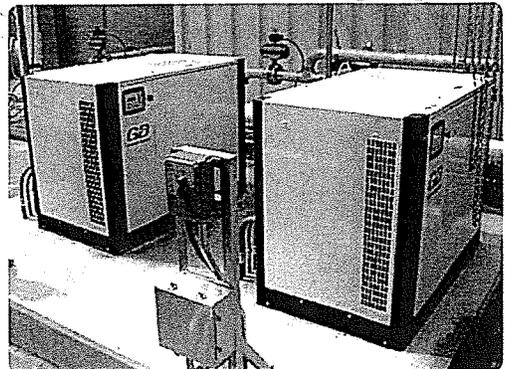
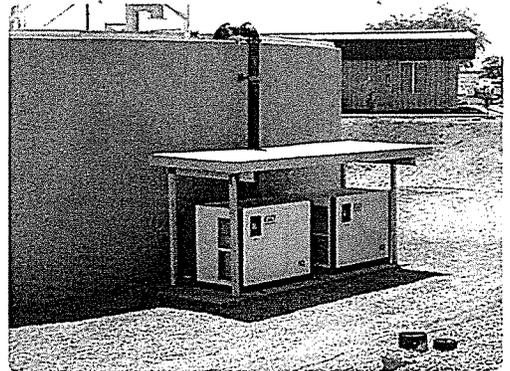
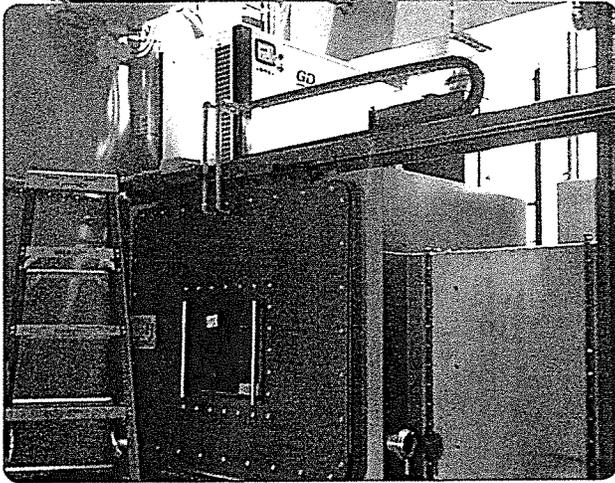
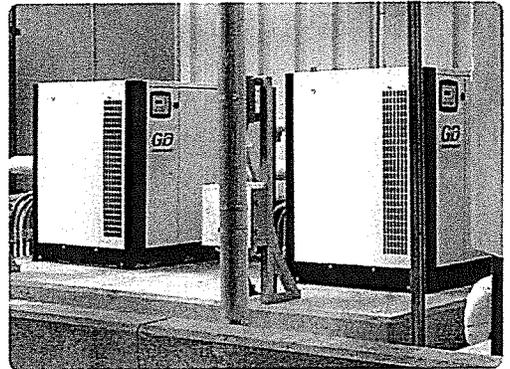
- Relief and check valves standard
- Unloaded start valve available

## 7. Enclosure Cooling Fan

- Removes hot air from enclosure
- Can operate even when blower is not

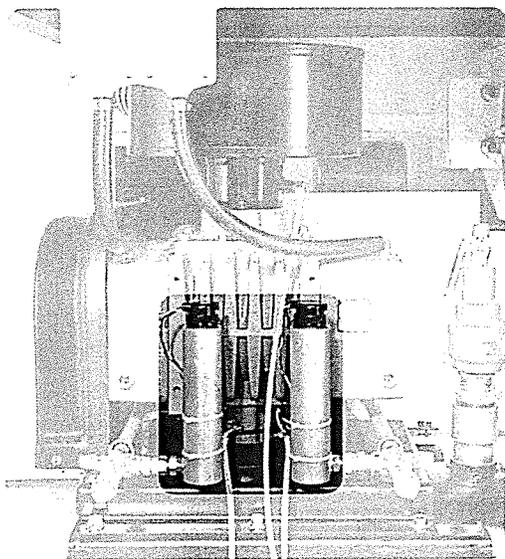


# Installations

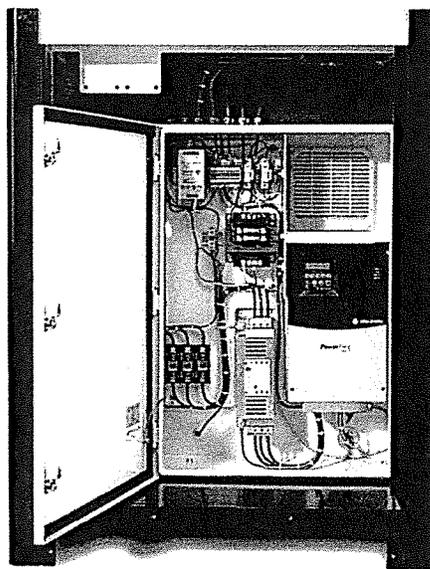


# Aftermarket Parts & Optional Equipment

## Optional Equipment



Oil level sensors and oil temp sensors



Variable frequency drive

### Additional Options:

- EMC Filter
- Line Reactors
- Full Voltage Starter
- AirSmart Controller Communication Module

## Genuine Gardner Denver Parts & Lubricants

All Gardner Denver IQ packages are initially shipped with AEON® PD-XD, the only lubricant specially formulated for all blowers in any environment.

Also available:

- AEON® PD-FG (Food Grade)
- AEON® PD

## Service & Support

Gardner Denver's extensive distributor network provides fast access to genuine Gardner Denver replacement parts and lubricants and 24 hour service support from factory certified technicians.



# WHAT CAN IQ DO FOR YOU?

Smart made simple with total control at your fingertip



For an interactive presentation on the IQ Blower Package,  
scan the QR code or visit:

<http://www.iqblower.com>

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