

Electric Reciprocating Compressor

Installation Guide

Notice: All air compressors must be installed by a qualified and trained technician. If you need a qualified technician, call 800-531-9656 or 972-352-6304. Improper installation may result in damage to the compressor, personal injury, and will void the warranty of the compressor package.

Warning: Read all installation steps, compressor package operation manual, notices and warnings prior to beginning compressor package installation. Failure to do so can result in personal injury or damage to compressor package.

Warning: Always wear proper protective eye wear, hearing protection, and other mandated safety clothing and devices when installing compressor packages

Notice: Compressor package should not be mounted to a moving piece of equipment that will be moving while the compressor package is in operation. The compressor package should not be mounted to a piece of equipment that adds additional vibration to the compressor package. The compressor package is only designed to handle its own organic vibration during operation. Failure to follow either one of these guidelines may result in pre-mature failure of compressor package, components and/or personal injury.

ATTENTION: All incoming electrical power connections are to be made on the main motor contactor(s) DO NOT attach incoming power wires to package pressure switch. This will result in electrical component damage not covered under warranty.

NOTICE: To ensure full compressor tank warranty all tank mounted compressor packages must be mounted on factory supplied vibration isolation pads.

Warning: Before beginning steps 6-17 verify power supply is off to compressor disconnect, and compressor package

Notice: All compressor air receivers should be inspected by a certified pressure vessel technician at least once per year, to check for leaks, weak points in the metal or any other deformity of the air receiver. If at any time a receiver appears out of conformance with ASME/CRN certification or a deformity is believed to have developed no matter how minor it may appear the tank should be locked out of service immediately

**PTO Heavy-Duty
Equipment**

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Warning: Always wear proper protective eye ware, hearing protection and safety clothing when working around the compressor package. No loose or baggy clothing should be worn around compressor package at any time.



Warning: On electric motor powered air compressors make sure electrical system is up to National Electric Code (NEC) prior to installing compressor system. Failure to install a compressor with a proper NEC electrical system can cause personal injury, compressor package damage and void compressor package warranty.



Notice: To ensure full compressor tank warranty all tank mounted compressor packages must be mounted on factory approved vibration isolation pads. A compressor should NEVER be installed while still on or in its original packaging. Failure to properly install the compressor system with approved vibration isolation pads will result in the compressor tank warranty being void.



Notice: PTO Heavy-Duty Equipment compressors can operate at pressures from 0-250 PSI depending on the compressor package design and build specifications. Always verify that the system the compressor is installed into can handle the maximum operational pressure of the compressor. NEVER install a compressor in a system that can not handle the compressors maximum operating pressure.



Notice: Compressed air is extremely dangerous when not properly used or installed. Always make sure a trained compressed air professional has looked over the air system prior to use. Improper installation or use of compressed air can cause bodily injury or death. NEVER pressurize an object that was not designed to be pressurized. Pressurizing objects not properly engineered for the maximum operating pressure of the compressor system can cause bodily injury or death.

Step 1

Verify compressor package install site can handle weight load of compressor package.

Note: this should have been done prior to the sale of the compressor package.

Notice: Installing compressors on the roof, mezzanine, 2nd story or higher of a building can result in higher DBA readings for the compressor package as well as additional vibration.

Step 2

Make sure compressor installation area is clear of debris and has adequate space around where the compressor will sit for service (minimum of 24") and ventilation (must be able to get clean fresh air through oil/air cooler during operation, without recirculating cooler hot air discharge). If site is excessively dusty or dirty due to grinding, sanding, or due to the nature of the selected application site a new site should be sought out.

Step 3

Make sure site voltage for compressor installation is correct.

When reading voltage read across the lines to get an exact voltage. On single phase units, read across L1 (Line 1) and L2 (Line 2) to get the operational voltage. On 3 phase units, read across L1 to L2, then L2 to L3 (Line 3), then from L1 to L3 this gives the most accurate reading of the voltage. It is also recommended to read the voltage at both the main electrical panel and at the compressor disconnect to check for voltage drops prior to installation.

- A. 208-230 volt compressors can operate on voltages from 207-253 volts.
- B. 460-480 volt compressor can operate on voltage from 420-505 volts.
- C. On either 208-230 or 460-480 volt compressor packages; the lower the site voltage, the more amps the compressor motor will draw. (See electric motor MFG. website for amp draw at 208 volt if applicable)
- D. If voltage is lower than 207 on 208-230 or higher than 505 on 460-480 volt package, then a special low or high voltage motor is required as well as a different motor contactor and controls (this should be confirmed prior to compressor sale).
- E. If compressor package is being powered by a generator, verify generator has enough power to start the compressor package. An easy calculation for the amount of power require to start a compressor is below.

Max running amps X operating voltage = running kilowatts (then) Running Kilowatts x 4= Starting Kilowatts required to start the compressors drive motor.

Step 4

Verify that main power wires leading to compressor disconnect are properly size per National Electric Code (NEC) and local applicable standards. Failure to have properly sized wire can cause damage to the electrical components of the compressor package. Incorrect wire size for the compressor package may also result in the loss of electric component warranty.

Step 5

Verify that the breaker for the compressor is properly sized for the compressor total full load amps. NEC and local applicable standards should be followed. Failure to do so will result in damage to electrical components. Incorrect breaker size for the compressor package may also result in the loss of electric component warranty.

STOP

Warning: Before beginning Steps 6 -17, verify power supply is off to compressor disconnect, and compressor package

Step 6

Uncrate compressor package (verify package is intact and not missing parts).

Step 7

Remove compressor shipping pallet.

Warning: Only use forklift or approved lifting device to remove compressor from shipping pallet.

Step 8

Set compressor into place on vibration isolation pads.

Step 9

Drill holes in floor through vibration pads and mounting location on compressor package to set compressor package anchors in place.

Step 10

Tighten compressor package anchor nuts to set anchors in floor.

Step 11

Back anchor nuts off to ½ to ¾ turn past hand tight.

Step 12

Connect airline to compressor package air discharge.

Note: It is recommended to use a flexible line between the compressor package and the system piping to avoid damage due to compressor vibration.

Step 13

Remove knock out on compressor operation panel or drill/cut hole for main electrical power wires for compressor. No connections are to be made on the pressure switch during standard installation. Pressure switches are preset from the factory.

Step 14

Attach incoming compressor package wire conduit to compressor operation panel.

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Step 15

Install compressor package incoming power wires to proper terminal on main motor contactor.

- A. On single phase compressor packages ports L1 (line 1) and L2 (line 2).
- B. On 3 phase compressor packages ports L1 L2 L3 (line 3).

Note: Make sure incoming power wires are properly torqued into place. This is also a good time to verify all electrical power wires are torqued properly.

Step 16

Install ground wire in compressor panel.

Step 17

Verify all wire terminal connections in compressor package are torqued to proper specs.

Step 18

Turn power on to the compressor package.

Step 19

Verify voltage of incoming power on the main drive motor starter.

Step 20

Turn compressor package on for 1-3 seconds to verify for proper compressor rotation. When facing the front of the compressor pump opposite the motor shaft, the compressor should turn clockwise.

Notice: Do not allow compressor to run for more than 3 seconds on this step. Doing so may cause damage to compressor.

If rotation is incorrect: turn power off to compressor package.

- A. On 3 phase compressors; once power is confirmed to be off, switch incoming power wire from L1 to L3 position and place L3 incoming power wire in L1 position.
- B. On single phase compressor packages, check motor wiring diagram for proper rotation wiring diagram.

Step 21

Close ball valve on compressor storage tank discharge.

Step 22

Turn power back on to compressor package.

If rotation was incorrect: turn compressor back on for 1-3 seconds to verify that rotation is now correct if needed.

Step 23

Notice: Read 23A, 23B, 23C prior to starting Step 23

Turn compressor package on with correct rotation and allow package to build to maximum operating pressure, and unload.

- A. Check voltage on main motor contactor prior to starting.
- B. Continue to check voltage on motor contactor as compressor package starts.
- C. If voltage drops more than 5% or below 207 on 208-230 volt packages or below 420 on 460-480 volt packages; and does not immediately return to original voltage, then check power supply.

A drop of 5% or more; or below the minimum operating voltage of the electric motor can cause damage to the electrical components of the compressor package resulting in loss of electrical component warranty. If drop occurs, contact electrician and compressor package owner to notify them of power issues that need to be corrected for proper operation.

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Step 24

Allow compressor package to run and reach maximum operating pressure then shut down (Compressor package will shut down automatically at maximum operating pressure. Compressor package pressure switch has been preset at factory during testing. Do not adjust compressor package pressure switch without consulting the factory.)

Step 25

Open tank ball valve to pressurize air piping system.

Note: This is a good time to listen and check for leaks in the piping system.

Step 26

Using either compressor tank safety relief valve or tank discharge drain, release air pressure until compressor package restarts.

Note: In most cases, pressurizing the air piping system releases enough air from the system to re-start the compressor.

Warning: When releasing air from compressor safety relief valve or tank drain, DO NOT look at valve or drain.

Step 27

Perform function test on compressor package operating system. Using STEP 26 allow the compressor package to build up to maximum operating pressure and shut down or unload (dual control units only).

Once shut down or unloaded (dual control units only), release air from the system to cause the compressor package to restart or reload (dual control units only) and compress air. Repeat this process a minimum of 6 times.

Step 28

Check all compressor air lines for leaks, tighten fittings as needed.

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Step 29

Check compressor tank drain for proper function. If drain has a timer feature, set timer to appropriate setting. Timer operated drains have a test button, use this to check for proper function.

Warning: Never look directly at compressor drain when testing or during drain operation.

Step 30

Make sure compressor installation sheet is properly filled out to be sent in for warranty registration.

Step 31

Go over general operation and maintenance instructions of compressor package with owner and other personnel that work around the compressor package. Verify if a maintenance agreement has already been set up or if one needs to be established.

Step 32

Turn compressor back on wipe down surfaces and make sure installation sheet is complete.

Compressor is now ready for full operation.

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NEC (National Electric Code) Guidelines

1 Phase Motor Requirements (Copper wire must be THW, THHN-THWN, XHHW) No solid core wire

NOTE: Wire size is based on being within 30' of main electrical panel. Installation further away would need a qualified electrician to properly size the wire to account for voltage drop

Horse Power	Voltage	Instantaneous Trip	Circuit Breaker Rating	Circuit Breaker Trip Rating	Minimum Wire Size
1.5	115	30		40	12
1.5	230	15		20	14
2	115	50		50	10
2	230	30		30	14
3	115	50		70	8
3	230	30		40	12
5	230	50		60	10
7.5	230	70		80	8
10	230	90		100	4

NOTE: Some rotary screw compressors have additional drive motors for the cooling fans these need to be taken into account when sizing the electrical system

3 Phase Motor Requirements (Copper wire must be THW, THHN-THWN, XHHW) No solid core wire

NOTE: Wire size is based on being within 30' of main electrical panel. Installation further away would need a qualified electrician to properly size the wire to account for voltage drop

Horse Power	Voltage	Circuit Breaker Trip Rating	Minimum Wire Size		Horse Power	Voltage	Circuit Breaker Trip Rating	Minimum Wire Size
3	200	20	14		30	200	150	2
3	230	20	14		30	230	125	3
3	460	15	14		30	460	80	8
3	575	15	14		30	575	60	8
5	200	35	12		40	200	200	1/O
5	230	30	14		40	230	175	1
5	460	15	14		40	460	100	6
5	575	15	14		40	575	80	6
7.5	200	50	10		50	200	200	3/O
7.5	230	45	10		50	230	200	2/O
7.5	460	20	14		50	460	125	4
7.5	575	20	14		50	575	100	6
10	200	60	8		60	200	250	4/O
10	230	60	10		60	230	225	3/O
10	460	35	14		60	460	125	3
10	575	25	14		60	575	125	4
15	200	90	6		75	200	300	300
15	230	80	6		75	230	300	250
15	460	45	10		75	460	150	1
15	575	40	12		75	575	125	3
20	200	100	4		100	200	400	500
20	230	90	4		100	230	400	350
20	460	60	10		100	460	200	2/O
20	575	50	10		100	575	175	1
25	200	125	3					
25	230	125	4					
25	460	70	8					
25	575	60	10					

NOTE: Some rotary screw compressors have additional drive motors for the cooling fans these need to be taken into account when sizing the electrical system

Certificate of Limited Warranty Reciprocating Compressors and Parts

All component parts on this compressor, installed by the manufacturer, are warranted to be free of defects in workmanship and material for a period of one year. Transportation charges are the responsibility of the purchaser. This warranty extends to the original purchaser of the compressor only. The purchaser must use Synthetic Reciprocating Compressor Oil, Part Number 30100, in the compressor for the duration of the compressor warranty. There are NO express warranties other than those contained in this limited warranty statement. Covered in the one year period of the warranty are defective parts and labor only. Part defects are limited to original parts only. The compressor warranty is void in the case of abuse, lack of proper service, incorrect application, incorrect installation, and neglect. Industrial Electric stationary compressors may be repaired on site as long as the compressor is not located further than 50 miles from the service center. The purchaser is responsible for any additional travel expense beyond 50 miles from the service center. Gas/Diesel Engine Driven, Single Stage Stationary, and Contractor Series compressors must be repaired at the closest service center to the compressor. The purchaser is responsible for any travel expense if they do not wish to bring the compressor to the service center. ALL "SPECIALTY COMPRESSOR" WARRANTY SERVICE MUST BE PERFORMED AT THE CLOSEST SERVICE CENTER TO THE COMPRESSOR. A "SPECIALTY COMPRESSOR" is any compressor packaged with options other than those that apply to the standard models in the catalog. Warranty labor for the first year is only covered for work performed Monday-Friday 8am-5pm excluding all major US holidays. BEFORE WARRANTY SERVICE IS PERFORMED, CONTACT THE MANUFACTURER TECH SUPPORT FOR FASTEST SOLUTION AND APPROVAL (800-531-9656 or 972-352-6304). Warranty repairs must be authorized by the manufacturer prior to work being performed. Unauthorized work may void the package warranty. The warranty claim form MUST be submitted for any potential warranty claim to be reviewed. A copy of the original invoice must be sent in with the warranty claim form.

The limited warranty is not active until the installation sheet, included with the compressor manual, is properly filled out and returned. Failure to return the installation sheet will prevent the warranty from being active.

Certificate of Limited Warranty Parts Warranty

New parts purchased are warranted to be free from defects for a period of 1 year. Parts warranty is repair or replace only. Parts warranty is limited to the repair or replacement of the defective part only. No labor allowed for parts warranty. The defective part will be repaired or replaced. Freight and labor are not covered under the parts warranty. FOR A DEFECTIVE PART, CONTACT THE WARRANTY SERVICE CENTER (800-531-9656 or 972-352-6304).

Certificate of Limited Warranty Rotary Screw Compressors

All component parts on this compressor, installed by the manufacturer, are warranted to be free of defects in workmanship and material for a period of one year. Transportation charges are the responsibility of the purchaser. This warranty extends to the original purchaser of the compressor only. The purchaser must use Synthetic Rotary Screw Oil, Part Number RS8000, in the compressor for the duration of the compressor warranty. There are NO express warranties other than those contained in this limited warranty statement. Covered in the one year period of warranty are defective parts and labor. Part defects are limited to original part only. The compressor warranty is void in the cases of abuse, lack of proper service, incorrect application, incorrect installation and neglect. Industrial Electric stationary compressors may be repaired on site as long as the compressor is not located further than 50 miles from the service center. The purchaser is responsible for any additional travel expense beyond 50 miles from the service center. Gas/Diesel Engine Driven compressors must be repaired at the closest service center to the compressor. The purchaser is responsible for any travel expense if they do not wish to bring the compressor to the service center. ALL "SPECIALTY COMPRESSOR" WARRANTY SERVICE MUST BE PERFORMED AT THE CLOSEST SERVICE CENTER TO THE COMPRESSOR. A "SPECIALTY COMPRESSOR" is any compressor packaged with options other than those that apply to the standard model in the catalog. The AIREND is covered by a 2 year warranty to be free from defects from manufacturing. This does not cover abuse, neglect, improper service, misapplication, or improper installation. An oil sample must be submitted with any AIREND warranty claim for verification. An "AIREND" is the rotors and bearings of the compressor. Warranty labor for the first year is only covered for work performed Monday-Friday 8am-5pm excluding all major US holidays. BEFORE WARRANTY SERVICE IS PERFORMED, PLEASE CONTACT MANUFACTURER TECH SUPPORT FOR FASTEST SOLUTION AND AUTHORIZATION (800-531-9656 or 972-352-6304). Warranty repairs must be authorized by the manufacturer prior to work being performed. Unauthorized work may void the package warranty. The warranty claim form MUST be submitted for any potential warranty claim to be reviewed. A copy of the original invoice must be sent in with the warranty claim form.

The limited warranty is not active until the installation sheet, included with the compressor manual, is properly filled out and returned. Failure to return the installation sheet will prevent the warranty from being active.

THIS POLICY IS LIMITED TO THE ITEMS ON THE INVOICE, WHICH IS ATTACHED WITH THIS DOCUMENT.

THIS INSTALLATION SHEET MUST BE FILLED OUT AND RETURNED FOR WARRANTY TO BEGIN

Electric Reciprocating Compressor Installation Sheet

Compressor & Installer

Compressor Model # _____ Compressor Serial # _____

Installation Company: _____ Installation Technician: _____

Technician Signature: _____ Date: _____

Electrical Information

Compressor Voltage: _____ V Site Electrical Phase: 1-Phase 3-Phase

Site Voltage: L1: _____ V L2: _____ V L3: _____ V Checked All Connections Before Start-Up: Yes No

Breaker Size (Amps): _____ A Wire Size: _____

Incoming Power Connected to Magnetic Starter: Yes No *If No:* Connected to Power Distribution Block: Yes No

Distance from Main Panel: _____ ft Disconnect Installed at Compressor Location: Yes No

If Duplex Unit: Separate Disconnects for Each Drive Motor: Yes No

Incoming Voltage at Motor Start-Up: L1: _____ V L2: _____ V L3: _____ V

Incoming Voltage at Max Operating Pressure: L1: _____ V L2: _____ V L3: _____ V

Motor Amps at Max Operating Pressure: L1: _____ A L2: _____ A L3: _____ A

Performance & Status

Compressor Rotation Correct: Yes No Max Operating Pressure: _____ PSI

Tank Drain Functional: Yes No Checked All Air Fittings for Leaks: Yes No

Checked Unit for Oil Leaks: Yes No Checked Belt Tension: Yes No

Vibration Pads Properly Installed: Yes No

Unit Location: Indoors Outdoors *If Outdoors:* Unit Is Covered by Roof: Yes No

Unit Has At Least 24" Of Space On All Sides Free Of Obstructions: Yes No

Tank Fill Time: 0-125 PSI: _____ *Write N/A if pressure not applicable to unit*

0-150 PSI: _____ *Write N/A if pressure not applicable to unit*

0-175 PSI: _____ *Write N/A if pressure not applicable to unit*

All Install Steps Completed: Yes No *If No, Explain:* _____

Send a copy of this completed installation sheet to manufacturer to begin warranty.

Include the following:

- 1 image of the control panel wired up
- 1 image of the full install
- 1 image from each end of the compressor

Sales@compressed-air-systems.com

Fax 972-352-6304

Or mail to

PTO Heavy-Duty Equipment

600 S. 2nd Ave Mansfield, TX, 76063



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