



SCROLL

Enclosed Oil-less Scroll Air Compressors with Dryers

Maintenance Manual and Parts List



AES300-V10-RD-(HP)

AES500-V10-RD-(HP)

For proper and safe use of the compressor, please follow all instructions and safety precautions as identified in this manual, along with general safety regulations and practices.

OHIO MEDICAL CORPORATION

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1. QUOTATIONS: All prices quoted shall be effective for ninety-days only and are subject to change thereafter without notice. The Buyer's issuance of an order in response to Company's quotation shall be deemed an acceptance of the terms and conditions of sale herein. All orders subject to acceptance by our Office

2. TERMS: Payment terms for custom fabricated equipment unless otherwise expressly agreed shall be 1/3 down with order and the balance payable net 30 days from the date of invoice. All other purchases are subject to terms of net 30. Invoices shall be dated on the day of shipment and are payable on the face of invoice on approved credit payable in U.S. Dollars. All orders are subject to credit approval. Ohio Medical Corporation shall have the right to collect reasonable expenses, including attorneys fees incurred in enforcing the collection of any amount due. No retention allowed. There will be a \$50.00 charge incurred for all NSF checks returned. No final lien release given until payment in full is received, nor partial lien release without a payment.

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5. Delays: Seller will not be liable for any delay in the performance of orders or contracts, or in the delivery or shipment of goods, or for any damages suffered by Buyer by reason of such delay, if such delay is directly or indirectly, caused by, or in any manner arises from fires, floods, accidents, civil unrest, acts of God, war, strikes, labor difficulties, shortage of labor, fuel, power, materials, or supplies, transportation delays, or any other causes beyond its control.

6. SHIPPING CLAIMS & BREAKAGE We do not assume responsibility for loss, damage or breakage in transit. Carriers are responsible for goods lost or damaged in transit; therefore as requires in rule 3 of Uniform Bill of Lading, in case of loss or damage enroute, consignee must immediately notify the transportation agent of destination, in writing, in order to substantiate formal claim when presented.

7. Defective Goods Claims: Claims for shortages or defects must be made within 10 days of receipt of shipment. All our products are carefully inspected, and where possible, tested before shipment. If goods appear to be defective advise us immediately and the matter will be investigated promptly. If we find the defect to be due to faulty material or workmanship, the goods will, at our option be credited, repaired or replaced. We assume no responsibility for damages occasioned by defective goods. We will also not assume any expense in repairing defective goods unless our written consent has first been obtained.

8. WARRANTY: Please refer to the appropriate warranty issued with and for the specific product purchased. **NO WARRANTY MADE AS TO THE PRODUCT PURCHASED, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY AS TO THE MERCHANTABILITY OR FITNESS FOR ANY PURPOSE IS MADE UNLESS THE SAME IS SET FORTH IN THE WARRANTY STATEMENTS HEREIN ABOVE REFERRED TO AND WHICH ARE MADE AND RELATE TO THE SPECIFIC PRODUCT PURCHASED.**

9. CORRECTIONS: In all cases, clerical and or typographical errors are subject to correction.

10. Delivery: Unless otherwise expressly agreed, all shipments are made strictly F.O.B. Manufacturer's Factory COLLECT. Since prices are quoted Manufacturer's Factory a pro-rated bulk charge from their factory to our warehouse may be added to the freight charge. Unless route and carrier are specifically stated, we reserve the right to route shipments at our discretion.

11. TAX: The amount of any sales, processing, or other tax, federal or state, now in effect or hereafter imposed, which the manufacturer (seller) is or shall become obligated to pay, either on his own behalf or on the behalf of the purchaser, or otherwise with respect to material covered by this quotation (order) (contract) and any increase in the manufacturer's (seller's) cost attributed to compliance with any code, agreement or license approved, prescribed or issued pursuant to the terms of any Federal, State or local acts, shall (unless such prices are expressly stated to be inclusive of such tax or increased costs) be added to the prices contained herein and paid by the purchaser in the same manner and with the same effects as if originally added hereto.

12. SALES TAX: The Company's charges do not include sales, use, excise or similar taxes. Consequently, in addition to the charges specified herein, the amount of any present or future sales, use, excise or other similar tax applicable to the sale, repair, inspection, maintenance, modification, or use of the equipment shall be paid by the Buyer, or in lieu thereof the Buyer shall provide the Company with a tax exemption certificate acceptable to the taxing authorities.

13. Start-up Assistance: Ohio Medical Corporation will provide start-up assistance as specified in the quotation. Four weeks notification is required. Start-ups are scheduled during normal business hours (Monday through Friday from 8:00am till 4:30pm). Start-up outside of these parameters will incur additional charges.

14. Equal Opportunity: We hereby certify that with the respect to the production of the article, and/or performance of the services covered by this order or invoice, the Seller has fully complied with all applicable requirements of Sections 6,7 and 12 of the Fair Labor Standards Act, as amended, and all requirements of the U.S Department of Labor issued under Section 14 thereof.

15. General: Buyer's obligation shall be governed by, and construed in accordance with, the internal laws of the State of Illinois, without regard to principle of conflicts of law. Buyer hereby irrevocably agree that all disputes arising out of or relating to these terms and conditions or the goods sold hereunder that cannot be resolved by the parties shall be resolved only by the State or Federal courts located in Lake County, Illinois. Buyer hereby consents and submits to the exclusive jurisdiction and venue of such State and Federal courts and waives any objection or right to contest said jurisdiction or venue or that any such action or proceeding was brought in an inconvenient court. It is agreed that either party may communicate with the other by electronic means. Each party agrees when electronic communications are used, they are deemed to be the equivalent of written and signed documents.

16. Minimum Billing: A minimum billing charge of \$50.00 will apply to all orders.

17. Controlling Provisions: These terms and conditions shall take the place of as well as supersede any provisions, terms, and conditions contained on any confirmation order, purchase order, or any other writing Buyer may give or receive, and the rights of the parties shall be governed exclusively by the provisions, terms, and conditions hereof. **THE SELLER WILL NOT ACCEPT ANY TERMS OR CONDITIONS ATTACHED TO ANY CONFIRMATION ORDER, PURCHASE ORDER, OR ANY OTHER WRITING THAT BUYER MAY GIVE EXCEPT THOSE THAT SELLER EXPRESSLY AGREES TO IN WRITING.** The issuance of any such order by the seller shall be deemed to note Buyers assent not only to this paragraph but also to each and every paragraph of this document and this order may not be changed or modified orally

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2.0 Safety and Warning

2-1 General

- 1) The air compressor shall only be operated by a person who has been trained in a safe operation.
- 2) Please read and be familiar with the user's manual and the safety instructions before using the air compressor.
- 3) The scroll air compressor alone cannot be used for a respiratory system, food and medical equipment under any circumstance.
- 4) Do not leave inflammables and explosives near the air compressor.
- 5) **Make sure to use only the genuine OMC parts. Other types of replacement may cause serious failure.**
- 6) The equipment shall safely be operated in compliance with all safety requirements and regulations.

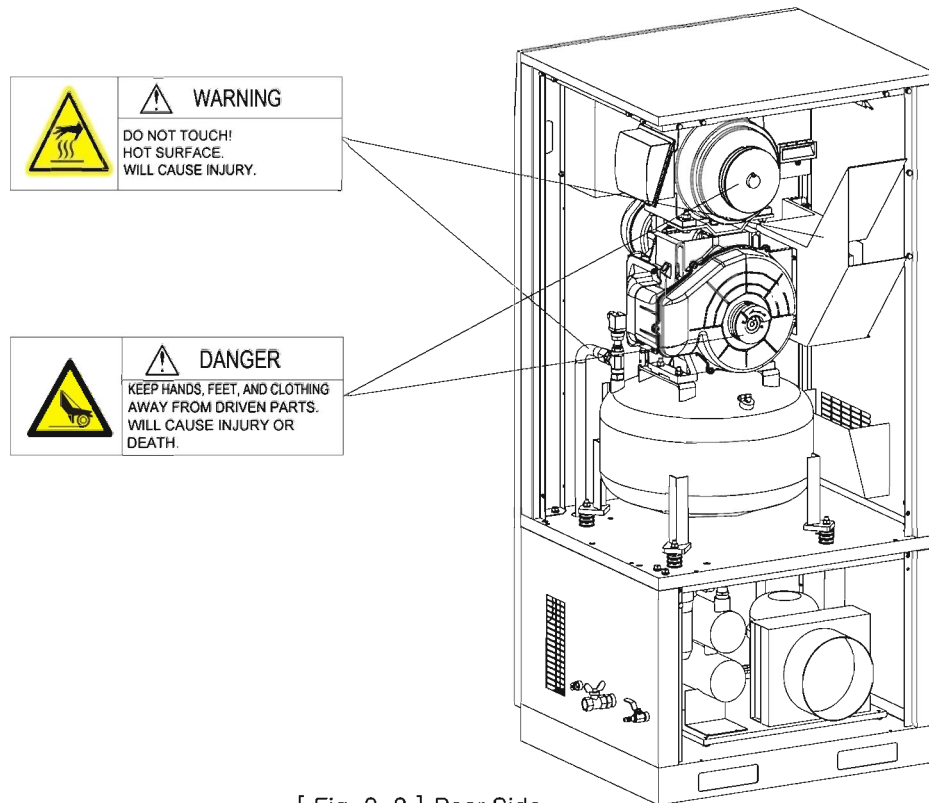
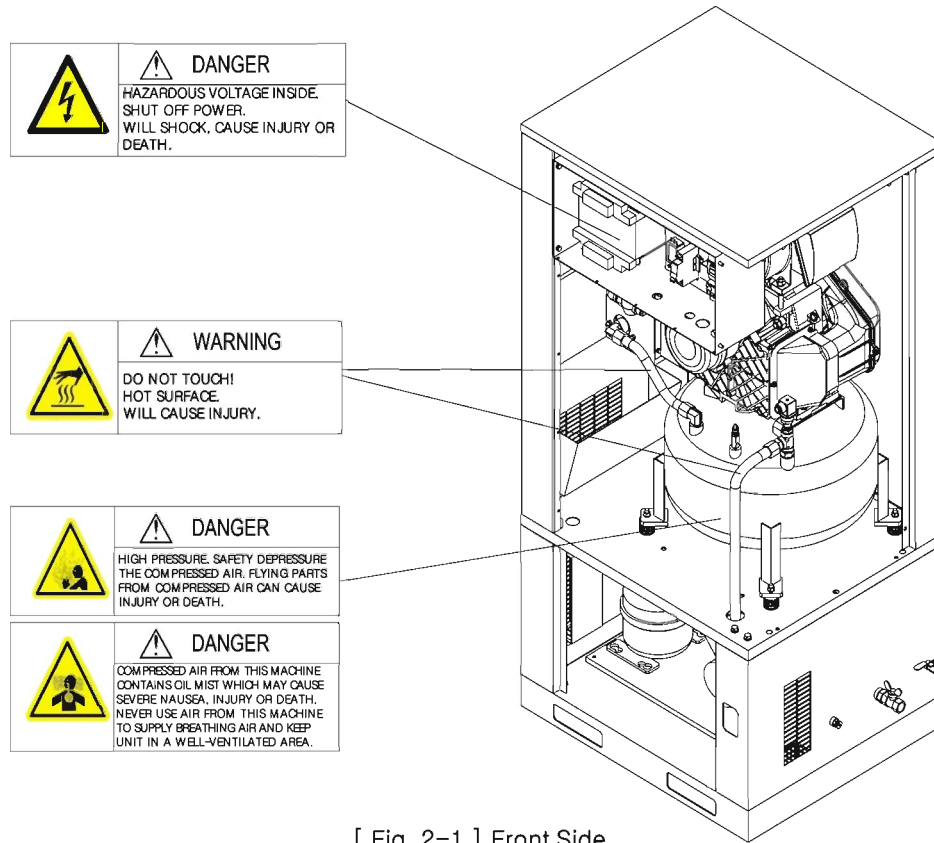
※ The user assumes full responsibility for any problem associated with the non-compliance with the instructions in the user's manual.

2-2 Safety Caution

 CAUTION	Caution is used to indicate the presence of a hazard which will or can cause minor personal injury or property damage if the warning is ignored.
 WARNING	Warning is used to indicate the presence of a hazard which can cause severe personal injury, death, or substantial property damage if the warning is ignored.
 DANGER	Danger is used to indicate the presence of a hazard which will cause severe personal injury, death, or substantial property damage if the warning is ignored.
	Hazardous voltage. Can cause severe injury or death. Only use factory supplied for incoming power. See Operators/Instruction manual.
	Moving parts. Can cause severe injury. Do not operate with covers removed. Service only with machine blocked to prevent turn over.
	High pressure air. Can cause severe injury or death. Relieve pressure before removing filter plugs/caps, fitting or covers.
	Please install the product in areas free of explosives (acetylene, propane gas, etc) or flammable substances. In case of operating the product in flammable environment, fire or explosion could be caused.
	Hot surface. Can cause severe injury. Do not touch. Allow to cool before servicing.

2-3 Safety and Warnings

2-3-1 AES300-V10-RD(HP), AES500-V10-RD(HP)



3.0 General

3-1 Specification

Model			AES300-V10-RD(HP)	AES500-V10-RD(HP)
UNIT	Type		Single Stage Oil Free Scroll Air Compressor	
	Air Delivery (ℓ/min)	115 psi	8.5	14.1
		140 psi	7.2	12
	Driving Method	Belt	3V-360 x2EA	3V-380 x2EA
	High temp. stop (°F)		176	
MOTOR	Output (kW/HP)		2.2/3	3.7/5
	Voltage (V)		208-230, 460	
	Frequency (Hz)		60	
	Poles		4	
	Starting Method		DIRECT ON LINE	
GENERAL	Air Outlet (Inch)		1/2"	
	Receiver Tank (gal)		10	
	Cooling Type		Air Cooled	
	Service air temp. (°F)		Intake air temperature +5.4	
	Ambient temp. (°F)		Max. 104	
	Noise Level [dB(A)]		49±5	50±5
AIR DYER	Output (kW/HP)		0.24	
	Refrigerant gas		R-134	
	Dew point (°F)		50	
DIMENSION	Length (Inch)		27.56"	
	Width (Inch)		24.72"	
	Height (Inch)		58.5"	
	Weight (Lbs)		408	430

※ Note.

1. Noise level is the measurement from acoustic room.

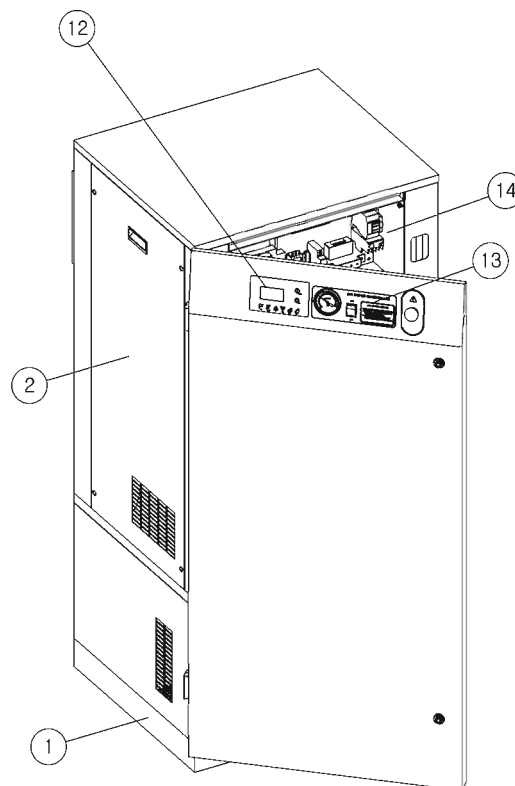
2. The size is the size of the external design of the package. Protruding areas such as discharge ball valve have been excluded in the measurement.

3-2 Major Component

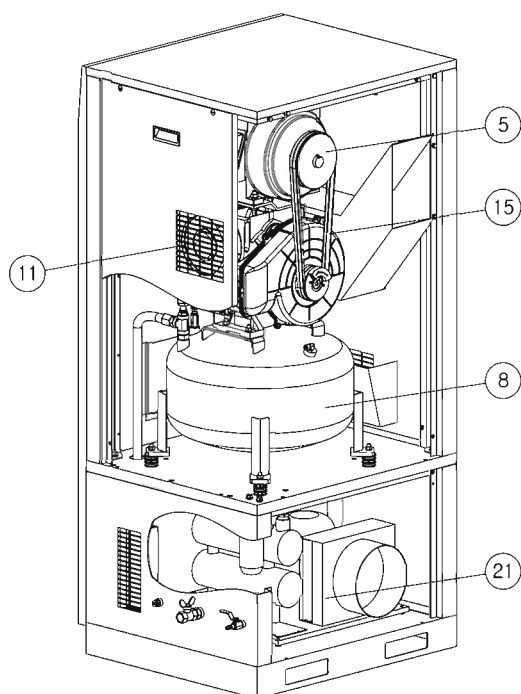
3-2-1 AES300-V10-RD(HP), AES500-V10-RD(HP)

#. DESCRIPTION

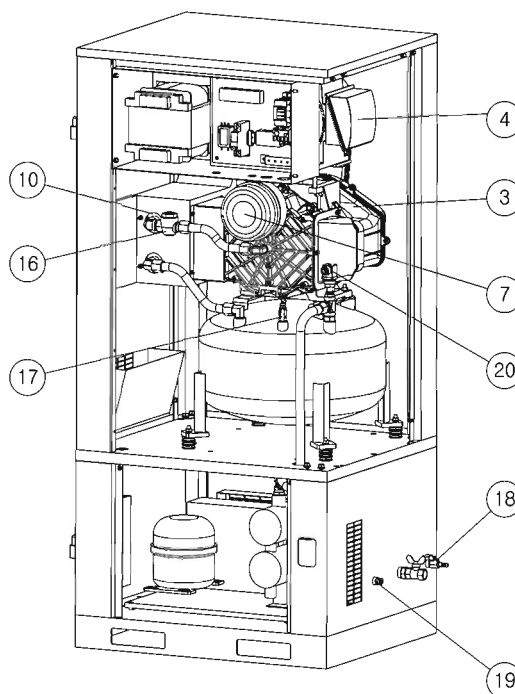
1. COMMON BASE
2. COVER & FRAME
3. AIREND
4. MOTOR
5. MOTOR PULLEY
6. AIREND PULLEY
7. INTAKE FILTER
8. AIR RECEIVER TANK
9. AIR DELIVERY PIPE
10. AIR COOLER
11. COOLING FAN
12. CONTROLLER
13. DRYER CONTROL PANNEL
14. CONTROL BOX
15. V-BELT
16. CHECK VALVE
17. SAFETY VALVE
18. TANK DRAIN VALVE
19. FILTER DRAIN OUTLET
20. PRESSURE SENSOR
21. DRYER ASSEMBLY



[Fig.3-1] Outline View



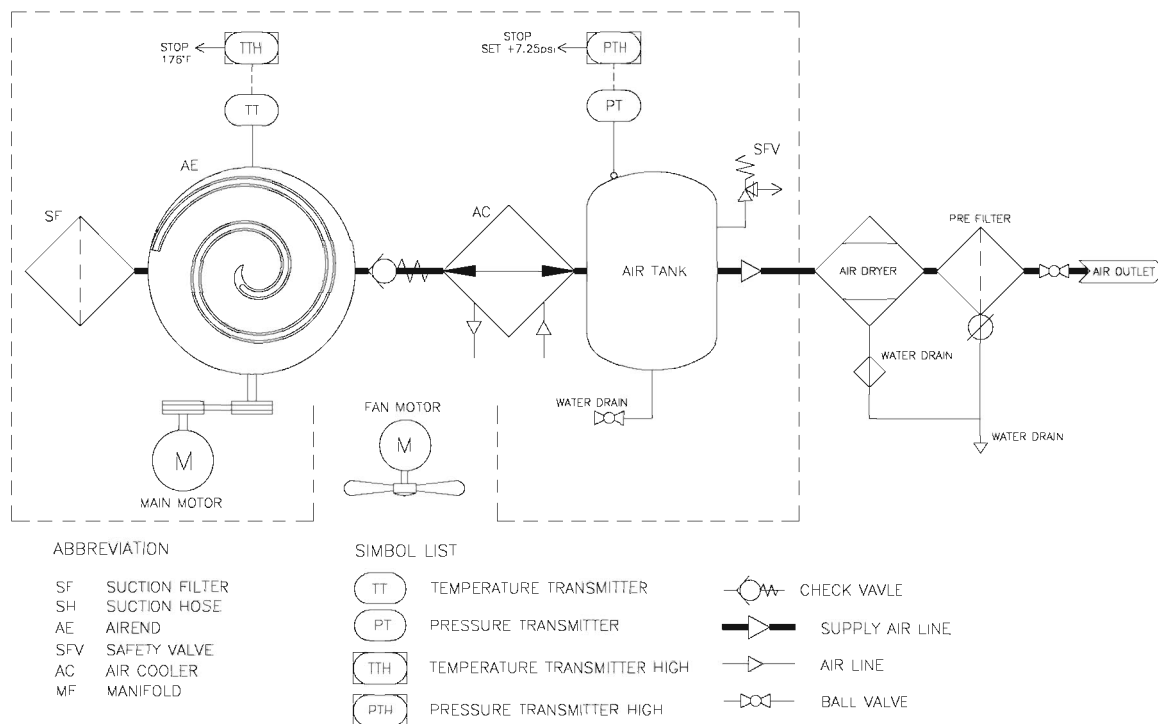
[Fig.3-2] Front View



[Fig.3-3] Rear View

3-3 System Diagram

3-3-1 AES300-V10-RD(HP), AES500-V10-RD(HP)



[Fig.3-8] System Diagram

The OMC D Series are an oil-free scroll air compressor. In an operation, a main motor is run to initiate the compression at an airend. The external air is filtered through a suction filter before entering into the airend. The compressed air is stored into an air tank via a check valve (non-return valve). The temperature of the compressed air discharged from the airend is at least 392°F. The air is primarily cooled in an air tank, and secondarily via an air cooler before being discharged. The saturated vapor phase compressed air condenses into a water that can manually be discharged via a drain valve in the air tank.

There are following four safeguards in AES300-V10-RD(HP), and AES500-V10-RD(HP) models:

- 1) Over Current Relay (OCR) for Motor – Detects the over current of the motor to stop the compressor.
- 2) Mechanical Safety Valve – Mechanically discharges the compressed air in the air tank to the air, if the air pressure exceeds the set value. The compressor shall manually be stopped.
- 3) Temperature Sensor (Temperature Transmitter) – Detects the temperature exceeding the set value (176°F) at the bottom of the airend to stop the compressor.
- 4) Pressure Sensor (Pressure Transmitter) – Detects the pressure in the air tank and sends the value to the controller to stop the compressor, if the air pressure exceeds the set value.

4.0 Installation

4-1 Inspection

When you receive the compressor please inspect it closely. Upon delivery, carefully check the compressor for damage during transportation.

If goods are received in damaged condition, it is important that you notify the carrier and insist on a notation of loss or damage across the freight bill.



[Fig.4-1] Name plate

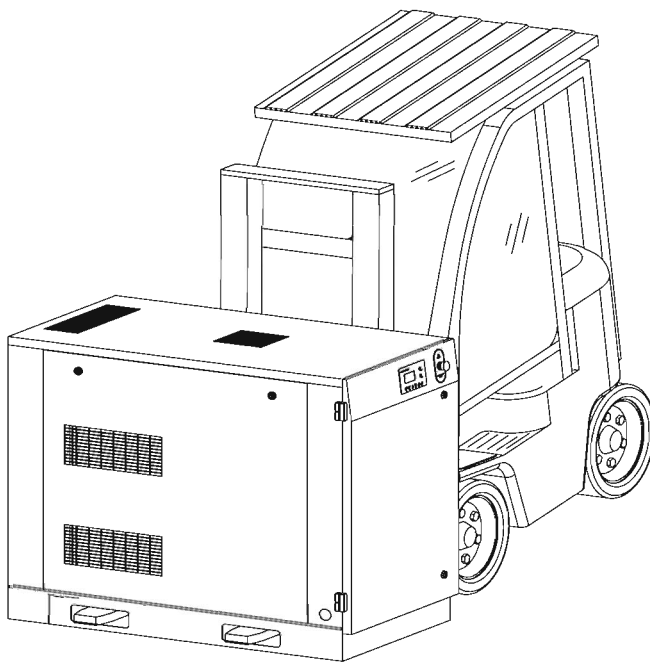
4-2 Handling

4-2-1 Handling by a forklift

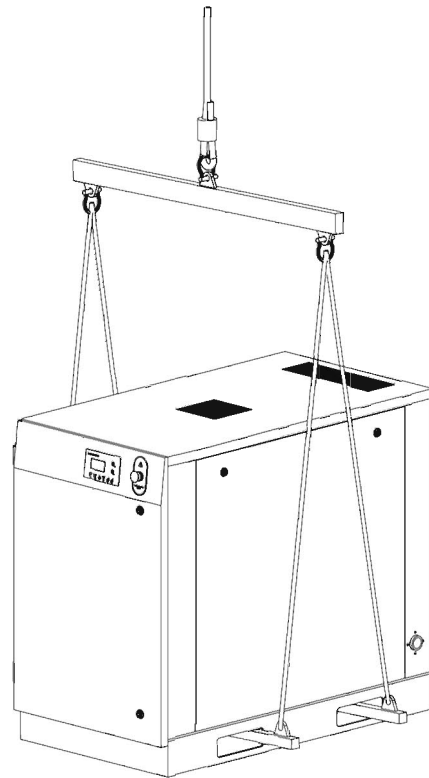
When handling by a forklift, make sure that forks completely extend through the width of the unit. (Fig.4-2)

4-2-2 Handling by a shop crane

When handling by a shop crane, use the openings provided on common base where slings or steel wire ropes can be used for lifting. (Fig. 4-3)



[Fig.4-2]

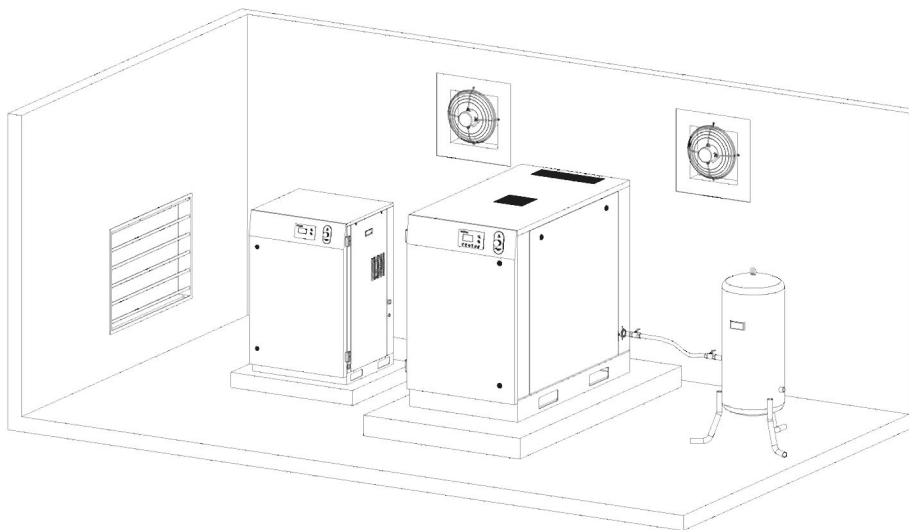


[Fig.4-3]

4-3 Installation

4-3-1 Where to Install

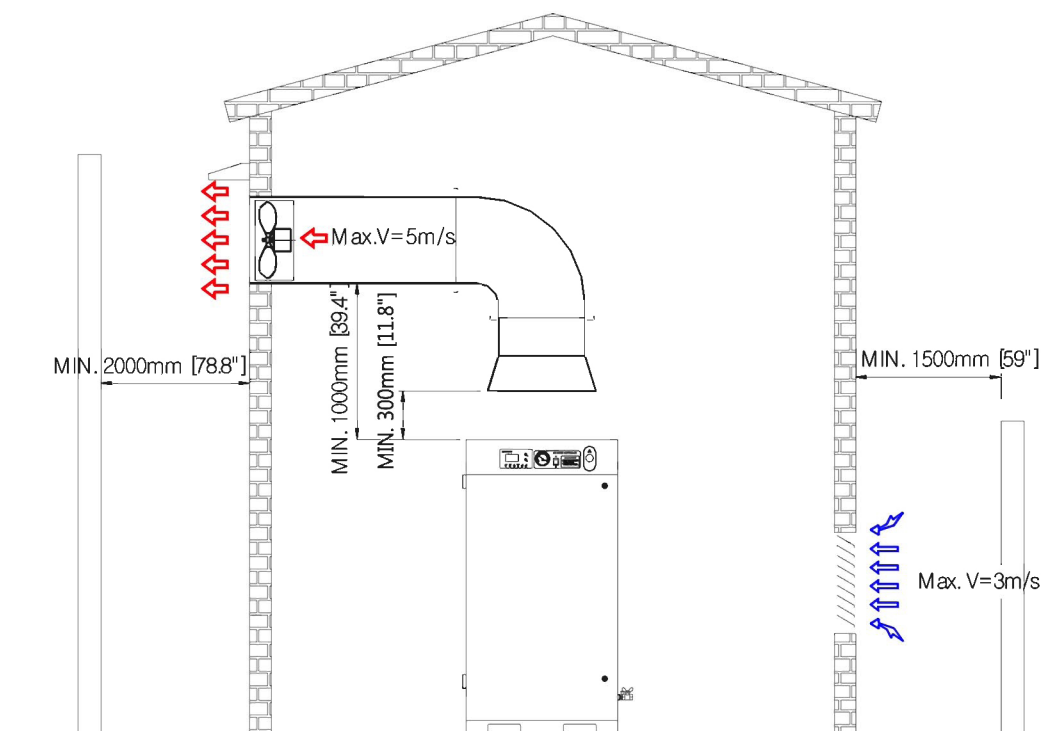
OMC air compressors are designed for the indoor use. The ventilation of the facility and piping affect the performance and the service life of the compressor. Please follow the instructions in the user's manual.



[Fig.4-4] Installation of the Air Compressor

4-3-2 Ventilation

Poor ventilation in the compressor room may raise the temperature of the air discharged. If the room temperature exceeds 18°F more than the outside temperature, sufficiently ventilate the air in the room(see Table 4-1), and install the exhaust duct, if necessary.



[Fig.4-5] Installation of the Exhaust Duct

[Table 4-1] Ventilation Fan Capacity

Model	Air Volume [ft ³ /min = CFM]	Hood Size [Inch x Inch]
AES300-V10-RD(HP) AES500-V10-RD(HP)	1060	11.8" x 23.6"

4-3-3 Selection of Where to Install

[table 4-2] Requirements for Where to Install

Item	Description
Place	<ul style="list-style-type: none"> - Do not install the compressor unit on the outside. - Please keep warm during the winter season, if you have to install on the outside.
Space	<ul style="list-style-type: none"> - Keep the space of more than 31.5inch from the wall to facilitate the repair and maintenance of the compressor - Do not place any object in front of the door.
Floor and Foundation	<ul style="list-style-type: none"> - The floor shall sufficiently holds the weight of the compressor. - The floor surface shall be flat with a gradient less than 1 degree to minimize the vibration. - It is recommended to install the compressor 4inch above the floor, though Coaire air compressor generates an insignificant amount of vibration.
Room Temperature	<ul style="list-style-type: none"> - Optimal ambient temperature is 32~104°F during the operation. - Install the compressor at low temperature and moisture, if possible. ※ Each 18°F increase of the inlet temperature reduces the efficiency of the compressor by 3-4%.
Hazardous Substances	<ul style="list-style-type: none"> - Install the compressor at the place where there is the least noxious gas, hazardous substance and dust. Those foreign substances may cause the damage of the air compressor.
Electricity	<ul style="list-style-type: none"> - The electric power shall have at least 150% of the reference margin. - The range of fluctuation in voltage shall be within ±10%.
Ventilation	<ul style="list-style-type: none"> - A ventilation fan shall be installed to forcedly ventilate the room, if the room temperature exceeds 18°F more than the outside temperature in the summer. - For an exhaust duct, set the velocity at 5 m/s, and the static pressure at less than 5 mmAq. - Install a protective net on the exhaust outlet to prevent birds, rodents and foreign substances from entering.. - Place the inlet as low as possible.

4-4 Requirements for the Piping

- 1) Use a larger diameter and install the pipe without an excessive bending to reduce the pressure drop.
- 2) Always place a branch pipe on the top of a main pipe to reduce the discharge of oil or water.
- 3) For the compressed air pipes, reduce the number of sections bending and connecting, and the number of valves installed to reduce the pressure loss.
- 4) The increased pressure loss requires a high discharge pressure of the air compressor. Consequently, it causes the power loss. The water stays wherever the pipe is sagging to increase the pipe resistance, which may cause winter-sowing. Thus, consider the pipe straightness when installing the pipes.
- 5) Install a bypass piping on each equipment for a maintenance.
- 6) A scroll air compressor has a check valve in the system. Installing more check valves between the compressor and the air receiver tank may cause a malfunction of the compressor.
- 7) Always install a drain valve on the bottom of a vertical pipe for the prevention of a winter-sowing.

4-5 Wiring

- 1) Extremely low or high voltage power supply may cause the failure of the compressor. Low power capacity also causes significant voltage drop when starting up the compressor. The compressor requires at least 85% of the rated voltage for a start-up, which shall be maintained within $\pm 10\%$ of the rated voltage during the operation. The inter-phase voltage imbalance shall be within 2%, not exceeding 3% even in a special case.
- 2) Features and Capacity
See Table 4-4 Electrical Specification for an appropriate electric power, an operating current and a starting current. Considering that the discharge air pressure abnormally exceeding the rated operating pressure increases the operating current, wiring shall allow about 120% of the rated capacity of a main transformer.
- 3) See Table 4-4 Electrical Specification for the electric power [kW] and the power factor [%].
- 4) Minimum Capacity of Transformer [kVA] = {Electric Power [kW] / Power Factor [%]} x 100 x 1.2
- 5) Longer lead-in wiring of the main power may cause the compressor failed or tripped during the start-up due to the voltage drop in the line. Select the thickness of the cable so that it maintains at least minimum starting voltage.
- 6) The calculation of the voltage drop based on the line length is as follows:

3-Phase 3-Line Type Connection:

$$e = \frac{30.8 \times L \times I}{1000 \times A}$$

Where,

I = Current [A] A = Cross Section of Cable [mm²] e = Voltage Drop [V] L = Length of Cable [M]

- 7) It is recommended that the thickness of the cable shall allow more than the minimum requirement specified for a power condenser, and the length of the cable shall be within 1.5 m. No wiring is necessary if there is a power condenser with a sufficient capacity in the bus conductor.
- 8) Leave intact the factory specification of the overcurrent protection device. If the change is unavoidable, keep the set values within the range specified in the user's manual. The cable shall allow more than the minimum requirement specified.
- 9) As the operating current varies depending on a given condition, it is recommended to allow about 20% extra.
- 10) Install a circuit breaker in the main power to protect the motor. The circuit breaker shall have a built-in electric leak breaker.
- 11) Use the ground terminal on a motor or a control box to earth the equipment.

[Table4-3] Type of Grounding

Type	Ground Resistance	Thickness of Grounding Conductor	Application
1st-Class Grounding	10Ω	2.6 mm ² or above	High Voltage Equipment
2nd-Class Grounding	150Ω/1-Line Ground Current or below	2.6 mm ² or above	Neutral Point of Transformer
3rd-Class Grounding	100Ω	1.6 mm ² or above	Equipment with Low Voltage Less than 400 V
Special 3rd-Class Grounding	10Ω	1.6 mm ² or above	Equipment with Low Voltage More than 400V



Caution

- 1) As the grounding on a steel structure of the building may cause the failure of the operation, always earth on the ground. The maximum allowable length of the grounding conductor is 20 m.
- 2) If there is a risk of inductive interference on an electronic calculator or a telecommunication equipment, install a surge protector on the magnetic switch used.
- 3) The compressor has a complete wiring inside, and no separate wiring or maintenance is necessary. If any maintenance is needed, see the circuit diagram in the user's manual provided with the compressor.

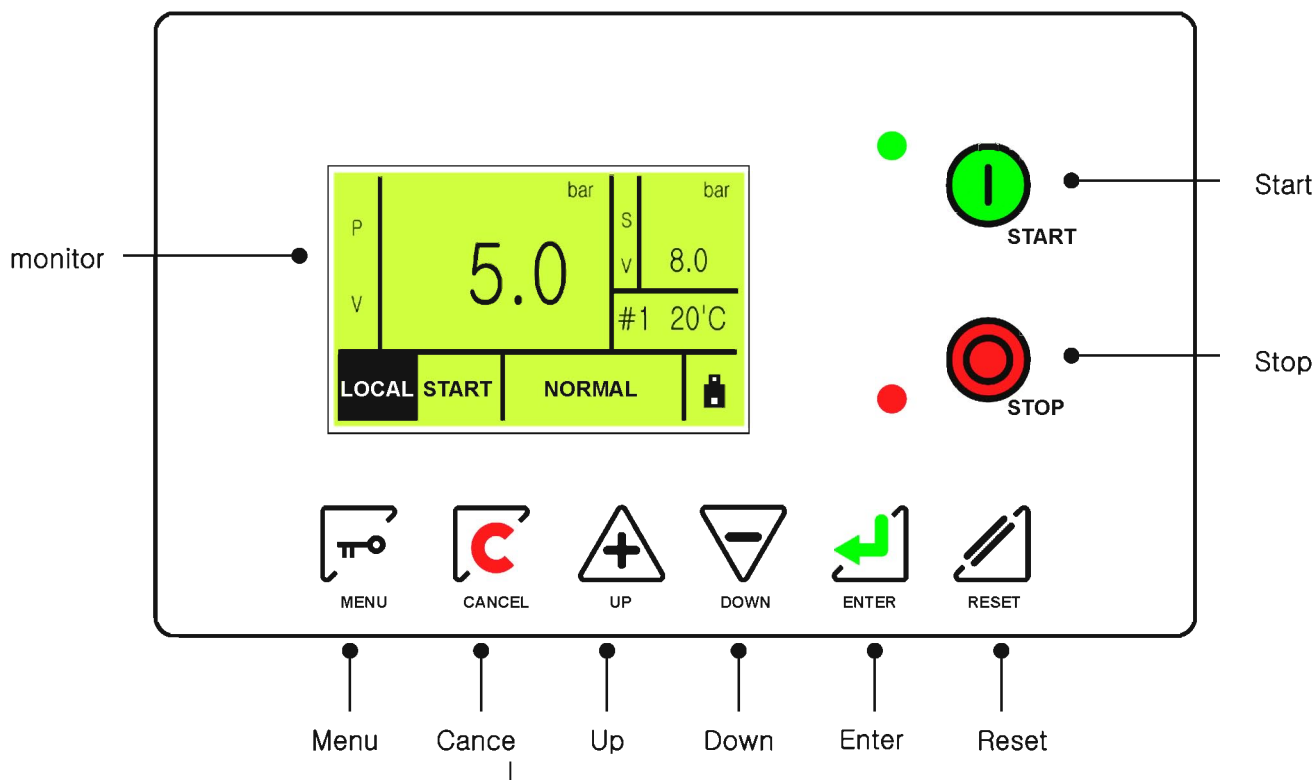
[Table 4-4] Electrical Specification

Model (Poles)	Voltage	Output	Input	Driving Current	Starting Current	MCCB		OCR	Main Power Cable	Ground
	[V]	[kW]	[kW]	[A]	[A]	AF [A]	TRIP [A]	SET [A]	AGW	GV [mm ²]
AES300-V10 -RD(HP)	208-230	2.2	2.84	8.4	63.8	30	15	10	15	2.5
	460			4.2	32.3	30	10	5	15	2.5
AES500-V10 -RD(HP)	208-230	3.7	4.53	14.2	93.8	30	20	15.8	15	2.5
	460			6.6	44.8	30	15	7.9	15	2.5

5.0 Operation

5-1 Commissioning (Initial Operation)

5-1-1 Structure of the Controller



[Fig 5-1] Control Button

5-1-2 Checklists before the Commissioning

- 1) Check if the voltage of the main power is within a normal range specified.
- 2) Cut the main power to connect the power line to the control panel.
- 3) Check the connection of pipes, a power supply and a grounding.
- 4) Fully open a stop valve on the discharge pipe of the compressed air.

5-1-3 Commissioning

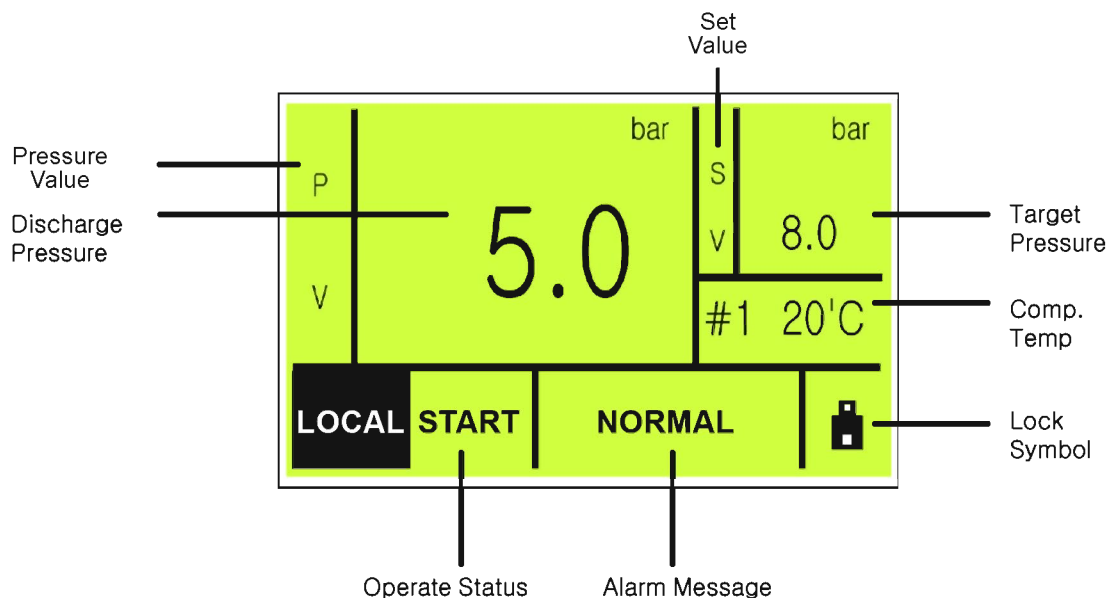
- 1) Push the "START" button on the controller to check the direction of rotation. If it is operated in a negative phase, immediately push the emergency stop button, turn the main power off, and then convert "R" into "T" before restarting. When the compressor starts, the pressure is increased in the air end to start the compression.
- 2) With the discharge valve closed on the discharge side of the air tank, check if the compressor is automatically stopped, when the pressure reaches the set value.
- 3) Check if there is any abnormal vibration, noise and leakage.
- 4) Push the "STOP" button on the controller.

5-2 Routine Operation

5-2-1 Checklists before the Operation

Check the following conditions before starting the operation.

- 1) Connect the main power to check the display on the monitor.
- 2) Push the “START” button on the controller to check if the compressor is well started up, and the indicator lamps are normally on.
- 3) Check if there is any abnormal vibration, noise and leakage.
- 4) Check if the operation is in good condition at the maximum load.



[Fig 5-2] Display of the Controller

[Table 5-1] Operation Parameters

Section	Model	AES300-V10-RD(HP) AES500-V10-RD(HP)
Setting Pressure	psi	115(Low pressure) / 140(High pressure)
Difference Pressure	psi	Stop : 115(Low pressure) / 140(High pressure) Re-start : 93(Low pressure) / 120(High pressure)
High temp. stop	°F	176 (@ Airend)
Starting Method		D.O.L

5-2-2 Start-Up

- 1) Check if the tank pressure is 0 MPa.
- 2) Check if the monitor indicates a normal condition for the operation, and then push the “RUN” button.
- 3) Fully open the valve on the discharge side before starting the compressor.
- 4) Check if there is any abnormal noise, and the operation is in good condition.

5-2-3 During the Operation

- 1) With a full load, check the values indicated by the instruments. Also check if the indicator lamps are normally on in the control panel.
- 2) Pull the ring on the safety valve every 500 hours to check if the operation is normal.

[Table 5-2] Checklists During the Operation

Section	Regulation	Re-mark
Airend Temp.	Max. 176°F (@Airend)	
Amb. Temp.	32~104°F	
Lamp on during the operation	Sart	
Input voltage	±10% of rated voltage	
Pressure gap of unit and discharge	Max. 7.25 psi	

5-2-4 Stop

- 1) Push the “STOP” button.
- 2) Turn the main power off.
- 3) Check if the internal pressure is completely discharged from the compressor.

5-2-5 Operation Log

Regularly record the information about the operation events in the operation log to early find the failure of the compressor and to prevent the accident before happens. The information includes the discharge pressure, operating time, maintenance items and the time to replace the parts. There is a sample operation log attached in the user’s manual.



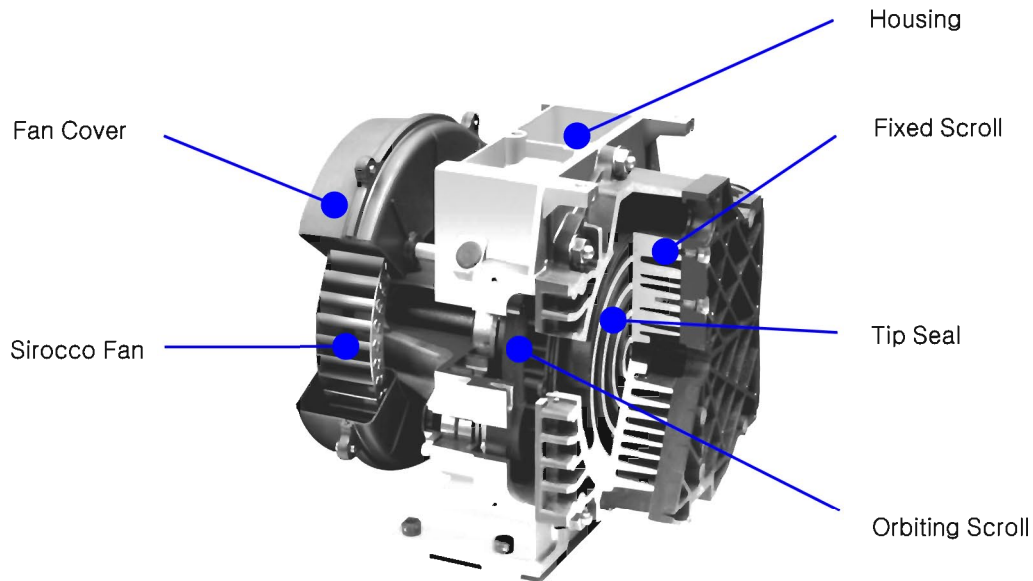
Warning

- 1) It is extremely hazardous to disassemble the valves or pipes from the compressor system during the operation.
- 2) Always check if the pressure is 0 psi in the tank before disconnecting the valves or pipes.
- 3) Since the tank is still hot for a certain time even after the operation is stopped, there is a danger of burns if you are not careful.
- 4) The rotating parts in the compressor is extremely dangerous during the operation.
Do not come near the parts until the compressor is stopped and the main power is turned off.

6.0 Functional Descriptions

6-1 Airend

An oil free scroll airend is the most important part in the compressor. In any case, the oil is not entered into the compression chamber. As the inside of the compression chamber is delicate, entering the dusts or foreign substances results in a serious damage to the compressor. The airend consists of precision parts, and needs a special jig for a repair and maintenance. It shall only be disassembled by our qualified engineer or a comparable person.



[Fig.6-1] Airend parts

6-2 Motor

Some models of the scroll air compressor are equipped with several motors for an automatic operation based on the amount of air used. The motor is a 3-phase induction motor that has a service factor higher than a general motor, and is designed to generate a high efficiency suitable for an air compressor.

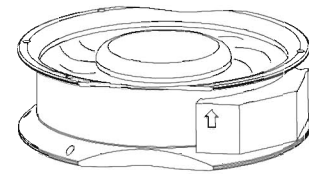
The motor plays an important role for the operation of the air compressor, and needs maintenance on a regular basis.



[Fig.6-2] Motor

6-3 Fan

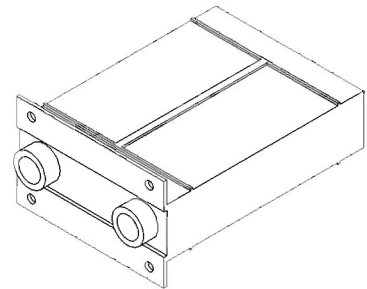
Fan is key part to keep proper temperature of airend, please keep clean and periodically remove dust and foreign object not to dysfunction.



[Fig.6-3] FAN

6-4 Cooler

A cooler element is an aluminum cooler that is designed to be used up to 217.5 psi. Dust may increase the temperature in the cooler pin, which needs to be cleaned with the compressed air or a detergent on a regular basis. When cleaning, cover the electric parts to keep the water out.

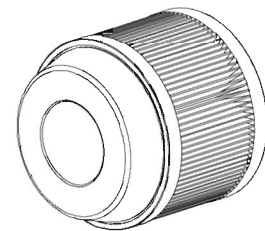


[Fig.6-4] COOLER

6-5 Inlet Filter

An airend consists of precision parts that need a clean air to be used for an optimal service life. OMC air compressor is equipped with a paper suction filter that has 99.9% of the dedusting efficiency. The filter needs to be replaced every 2000–3000 hrs. If it is unavoidable circumstance, the reuse is only allowed once after cleaning.

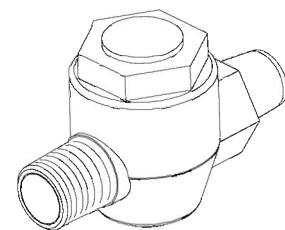
Make sure to use only the genuine OMC inlet filter



[Fig.6-5] Inlet Filter

6-6 Check Valve

A check valve plays an important role in the scroll air compressor. The valve prevents the backflow of the compressed air when the compressor is stopped to protect the compressor from damaging due to a back-lashing. The valve also protects the wrap of the compressor from damaging due to foreign substances back flown from the pipe to the compressor. The valve is designed to stand against a repetitive pulse motion of scroll at a high temperature 392°F or above.



[Fig 6-6] CHECK VALVE

7.0 Control

7-1 Controller

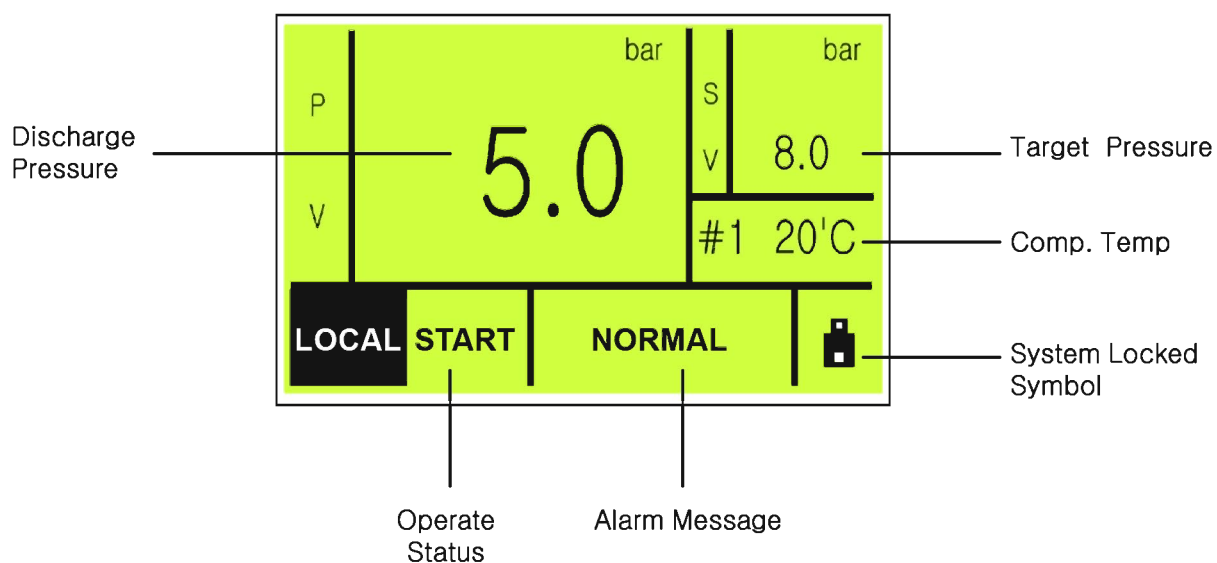
OMC air compressor uses a controller based on a microprocessor for an optimal operation of the compressor. The controller is a system that precisely determines the time to adjust the capacity to save the energy, gives an alarm to prevent the accident before happens, and notifies the information necessary for repair and maintenance. The system ensures the best automatic operation optimized by the set conditions and the machine conditions.

7-1-1 Operating Conditions

- 1) Power Supply : AC24V \pm 15% 50/60Hz 40W
- 2) Transformer Capacity : Min. 50[VA]
- 3) Operating Temperature : 14°F ~ 140°F
- 4) Operating Moisture : 95% @104°F
- 5) Storage Temperature : -22°F ~ 176°F

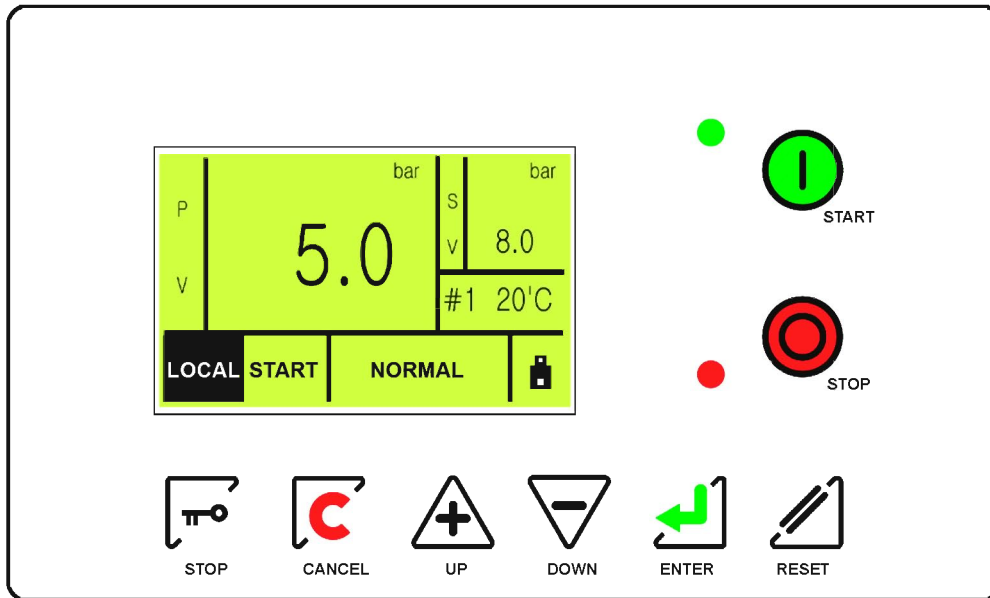
7-2 Major Functions

7-2-1 Display











[Fig.7-1] Display of the Controller

7-3 Configuration of functions





[Fig.7-2] Keypad of Controller

[Table 7-1] Description of Keypad



STRAT / STOP	 	Enter started condition/Exit started condition
RESET		Reset and clear fault condition
MENU		Enter to Menu table
ENTER		Confirm selection of value adjustment
UP / DOWN	 	Scroll up/down through menu, menu item options or increment/decrement value
CANCEL		Step back one menu navigation level

7-3-1 Status Display Ramp

STATUS LED	Green 	Display working status along ON / OFF
FAULT, ALARM LED	Red 	Display fault or alarm status along ON / OFF

※ NOTE


- 1) ON : illuminated continuously
- 2) SF : slow flash on/off once per second
- 3) FF : fast flash on/off five times per second
- 4) IF : Intermittent Flash on/off every four seconds
- 5) OFF : Extinguished continuously

Machine state Number	Machine state	Status(Green) 	Fault (Red) 
00	Initialization	OFF	Normal: OFF Trip: FF Alarm: SF Maintenance: IF Start Inhibit: IF
01	Start Inhibit Check	OFF	
02	Ready to Start	OFF	
03	Start Delay	IF	
		if load request : FF	
04	Standby	IF	
06	Start Motor in star Delta	IF	
		if load request : FF	
07	Load Delay	IF	
		if load request : FF	
08	Load	ON	
09	Reload Delay	IF	
		if load request : FF	
10	Auto stop delay	IF	
11	Manual stop delay	SF	
99	Shut down	OFF	

7-3-3 Equipment Status Display

<p>1. START/STOP REQUEST SOURCE DISPLAY</p> <p>LOC : Controller keyboard</p> <p>NET : Communication request</p> <p>REM : Digital inputs</p>
<p>2. LOAD REQUEST SOURCE DISPLAY</p> <p>PRE : Pressure sensor</p> <p>NET : Communication request (Option)</p> <p>REM : Digital inputs</p>
<p>3. STOP STATUS DISPLAY</p> <p>Display while compressor stopped.</p> <p>LOC STP : Stopped by controller keyboard</p> <p>REM STP : Stopped by digital inputs</p> <p>NET STP : Stopped by communication request (Option)</p> <p>S.D STP : Stopped by fault condition</p>
<p>4. START STATUS DISPLAY</p> <p>Display while compressor started.</p> <p>LOC RUN : Started by controller keyboard</p> <p>REM RUN : Started by digital inputs</p> <p>NET RUN : Started by communication request (Option)</p>
<p>5. COMPRESSOR STATUS DISPLAY</p> <p>GOOD : Normal condition</p> <p>MAINTEN : Maintenance required</p> <p>ALARM : Alarm condition</p> <p>S-DOWN : Trip condition</p> <p>INHIBIT : Start inhibit condition</p>

7-3-4 System Locked

	SYSTEM LOCKED SYMBOL
---	----------------------

7-3-5 Digital Input Symbols

Symbol	Description	Remark
DI1	Over-load Main Motor #1	fault (open)
DI2	Over-load Main Motor #2	fault (open)
DI4	Emergency Switch	fault (open)
DI5	Remote Start/Stop Control	Run (closed)
DCM	INPUT	fault (open)

7-3-6 Digital Output Symbols

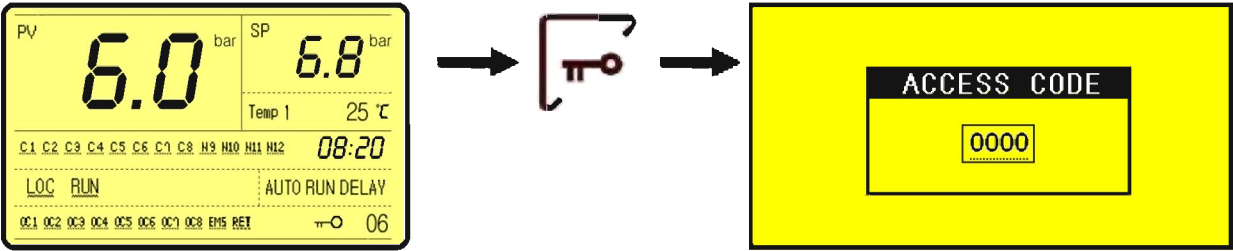
Symbol	Description	Description
N1	Compressor #1 Main Magnetic Contactor	On
N2	Compressor #2 Main Magnetic Contactor	On
NC1	N1, N2	
N4	Run	On
N5	Alarm	On
NC2	N4, N5	

7-3-8 Menu level



ACCESS LEVEL	USER (CODE = 0000)	SERVICE 1 (CODE = 0100)
ACCESS-ABLE MENU	00. STATUS MODE 01. PRESSURE MODE 02. SCHEDULE MODE 03. TRIP LOG MODE 04. TRIP SET 05. OPERATION SET 06. COMP SET 07. CONFIG MODE	00. STATUS MODE 01. PRESSURE MODE 02. SCHEDULE MODE 03. TRIP LOG MODE 04. TRIP SET 05. OPERATION SET 06. COMP SET 07. CONFIG MODE 08. FACTORY SET
TIMEOUT PERIOD	1 MINUTE	10 MINUTE

Press "MENU" button for a seconds in status mode, an access code entry display (Fig. 7-4) is shown. Use "PLUS" button to adjust value then press "ENTER" button. If the access code have been entered to authorized, menu page will be displayed. An invalid code will return the display to normal operation mode.



[Fig.7-4] ACCESS CODE ENTRY DISPLAY



- 1) When access level is “SERVICE 1”, [Equipment Environment Setup] menu cannot be adjusted.
- 2) Press “CANCEL” button for three seconds at any time to return to the system locked condition.

7-3-9 Digital output

ACCESS CODE (0100)		Editable
M E N U S T R U C T U R E	1. . STATUS MODE	×
	2. . PRESSURE MODE	
	– TARGET PRESSURE	○
	– STEP#1~STEP#2 RUNPRESS	×
	– STEP#1~STEP#2 STOPPRESS	×
	– LCD LIGHT MODE	×
	3. SCHEDULE MODE	×
	4. TRIP LOG MODE	×
	5. TRIP SET	×
	6. OPERATION SET	×
	7. COMP SET	×
	8. CONFIG MODE	×

7-4 Error messages

7-4-1 TRIP / ALARM MESSAGE

Item	Description	Detect condition
1	System Error	Parameter Error
2	Emergency stop	Push the emergency stop switch
3	Press. Sensor Fault	Low Resistance, Short Circuit, Short Circuit to Earth
4	Delivery Pressure High	Detection Pressure \geq [DIS. PRESS LIMIT] Reset Pressure $<$ [DIS. PRESS LIMIT - 7.25psi]
5	Comp #1 Fault	Detection [Digital Input :ID1] OPEN Reset [Digital Input : ID1] CLOSE
6	Comp #2 Fault	Detection [Digital Input :ID2] OPEN Reset [Digital Input : ID2] CLOSE
7	Comp #1 Temp.	Detection Comp#1 Temp. \geq [COMP TEMP LIMIT] Reset Comp#1 Temp. \geq [COMP TEMP LIMIT] - 9°F
8	Comp #2 Temp.	Detection Comp#2 Temp. \geq [COMP TEMP LIMIT] Reset Comp#2 Temp. \geq [COMP TEMP LIMIT] - 9°F

※ An trip message is displayed that must be manually reset to clear once the condition has been resolved or no longer exists.

7-4-2 Alarm condition

Item	Description	Detect condition
1	RTC(Real Time Clock) Alarm	Detection RTC Disable (When Schedule Mode Operation) Reset RTC Enable

※ An trip message is displayed that will be automatically reset to clear once the condition has been resolved.

7-4-3 Event message for operation information

Item	Description	Detect condition
1	1'ST POWER	The time when Initial Power UP to Controller.
2	POWER UP	The time when power up to controller System restoration by watchdog timer
3	START	The time when motor started.
4	STOP	The time when motor stopped.

8.0 Maintenance

8-1 Maintenance schedule

Low pressure (115 psi) and high pressure (140 psi) scroll enclosures

Item	action	Run Time (Hours)							Remarks
		Every Day	250 hours	500 hours	1,250 hours	2,500 hours or 1 year	5,000 hours or 2 years	10,000 hours or 4 years	
Condensate drain	drain	○							
Enclosure ventilation fan	check	○							Ensure after cooler and compressor fan are clear of debris
Control panel	check	○							Check the monitor for maintenance or alarms
Belt (consult factory for the correct belt)	Check, replace		○ (1" time)		○		●		Tighten or replace as needed
Safety relief valve	Check operation		○						
Inlet air filter #BC5KL-RK1	Clean, replace			○	●				Replace as needed based on filter condition
After cooler	Clean					○			Clean more often if necessary
Air end sirocco fan	Clean					○			
Discharge check valve #520-109-02	Check, Replace				○			●	
System piping	Check				○				Check for leaks / tightness
Temperature sensor #520-101-08	Check operation					○			Replace if not functioning properly
Pressure sensor #520-109-04	Check operation					○			Replace if not functioning properly
Motor (consult factory for motor part number and pricing)	Check insulation, bearing					○		●	
Motor pulley (consult factory for motor part number and pricing)	check						○		Check the pulley grooves for wear
Intake suction hose #520-139-00	Check, replace					○	●		
Grease bearings (3) crank bearings (1) main bearing #BC5KL-PK2	grease							●	** high pressure scrolls need grease every 5,000 hours
Tip seal Kit Kit #BC5KL(H)-06 - Tip seals - Back up tube - Dust seal	Replace							●	** high pressure scrolls need tip seal change every 5,000 hours

Check or Clean ○ Replace or Re-grease ●

Notes:

- 1.) The intervals suggested above are based on normal operating conditions - ambient temperature between 35° and 104°F and a clean environment. Maintenance intervals may need to be shortened depending on the operating environment.
- 2.) User, or a qualified technician, should carry out the maintenance based on the run hours or calendar time, whichever comes first

※ NOTE

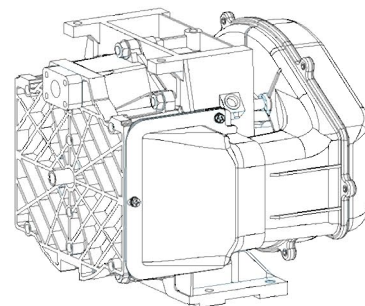
Maintenance schedule is instructed as above. The intervals are a guide based on normal operating conditions. If operated in a severe environment, necessary maintenance service should be performed on a more frequent basis. User should carry out the maintenance work, based on either the running hours or the calendar time whichever comes first.

8-2 (blank)

8-3 Maintenance

8-3-1 Regular Maintenance of the Airend

- 1) Check if there is any abnormal vibration or noise during a routine operation, and contact the nearest distributor, if necessary.
- 2) There are two types of the scroll airend: Low Pressure (115 psi) and High Pressure (140 psi). The maintenance period is different by type specified in the identification plate attached on an airend. The standard specification of OMC airend is a low pressure type.
- 3) Periodically lubricate an airend with grease. See the maintenance schedule for when the lubrication is needed.



[Fig.8-1] Scroll Airend

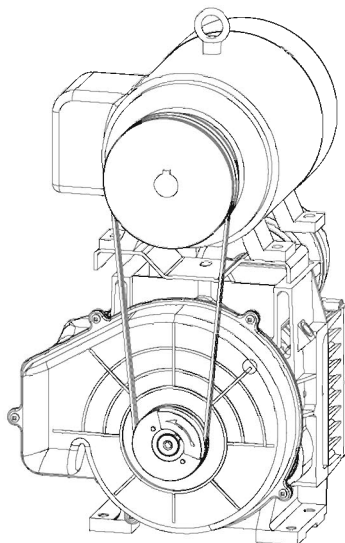


Caution

The airend consists of precision parts, and needs special tool and jig for a repair and maintenance. It shall only be disassembled by our qualified engineer. Contact Ohio Medical Corporation®.

8-3-2 Rotation of the Driving Part

If the motor is not started up or generates an abnormal noise, stop the compressor, turn the main power off, and then manually rotate the motor pulley. If it does not rotate smoothly, contact the nearest distributor for a service. It is mostly due to the damage on the motor bearing or when the airend is stuck.



[Fig.8-2] Scroll driving unit



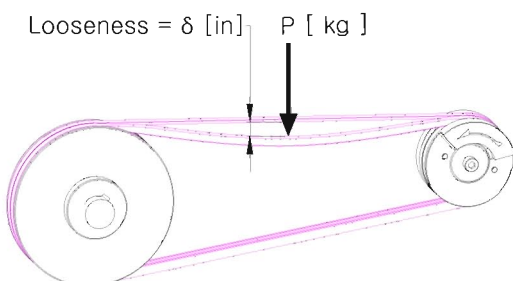
Warning

An air compressor is automatically operated. Do not come near the parts until the compressor is stopped and the main power is turned off. It may cause a serious personal injury, if hair or clothes is caught in the rotating parts.

8-3-3 Adjustment of the Belt Tension

Adjust the belt tension in first 500 hrs after the purchase, and every 3,000 hrs (6 months) thereafter in the following procedures.

- 1) Use a tensionmeter to measure the displacement of each belt.
- 2) Loose the anchor bolt on the motor base, and use the tension adjusting bolt to adjust the tension with reference to the [Table 8-1].
- 3) Align the motor, and tighten the anchor bolt on the motor base.



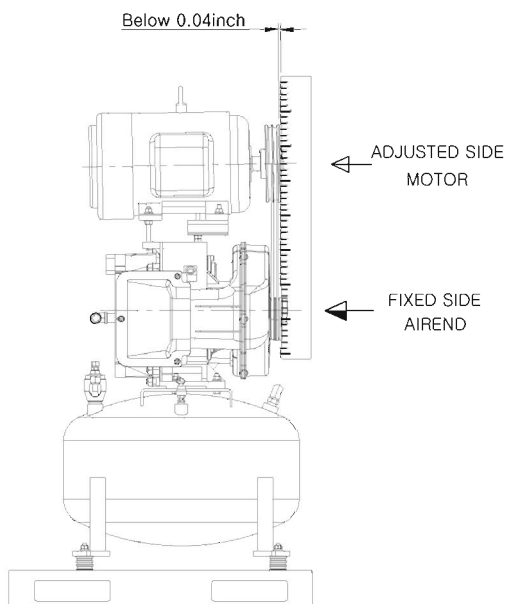
[Fig8-4] Belt tension check

Model	New		Displace	
	P kg	δ in	P kg	δ in
3HP Vertical	1.5	0.2	1.3	0.2
5HP Vertical	1.7	0.2	1.6	0.2

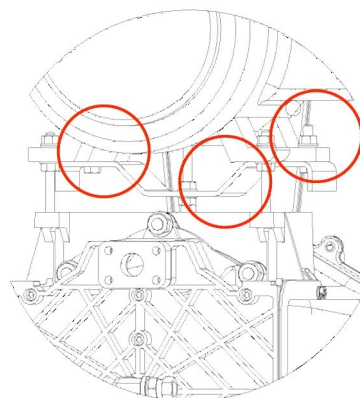
[Table 8-1] Belt tension

8-3-4 Alignment of the Belt

Off-centered pulleys generate the noise and vibration, and accelerate the process of wearing the belt and pulley to cause the damage to the belt. Align the center of the pulley during the replacement of a belt and the adjustment of the belt tension. With the compressor fixed, loose the anchor bolt on the motor, and place an iron rule between the pulleys as shown in the following fig. Gradually tighten the anchor bolt on the motor and check the center is aligned between the pulleys. Completely tighten the bolt, recheck the alignment, and then rotate the pulley to check if the belt moves smoothly.



[Fig.8-6] Belt Align



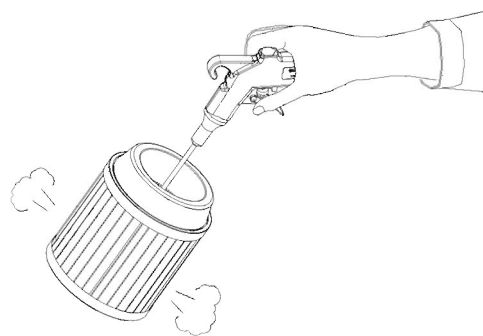
[Fig.8-7] Belt Tension Settle

Caution

- 1) An air compressor is automatically operated. Do not check and replace the belt until the compressor is stopped and the main power is turned off.
- 2) Only use the belt specified by OMC for a replacement. Do not use old and new belts mixed, and replace the entire set of belts all at once.
- 3) The shaft is damaged and the service life of the bearing is shorten at a high tension of the belt, while the belt is slippery at a low tension of the belt. Always keep the optimal tension value with reference to the [Table 8-1].

8-3-5 Cleaning the Suction Filter

- 1) Check the contamination level every 500 hrs.
- 2) Replace the heavily contaminated filter even before the replacement period.
- 3) Blow the element with the compressed air outward, and then by the side.
- 4) Keep dust and foreign substances out of the compressor during the assembly.



[Fig.8-8] Inlet Filter cleaning

Caution

A inlet filter significantly affects the service life of an airend. Make sure to use only genuine OMC inlet filter. OMC can not be responsible for any damage caused by an improper replacement.

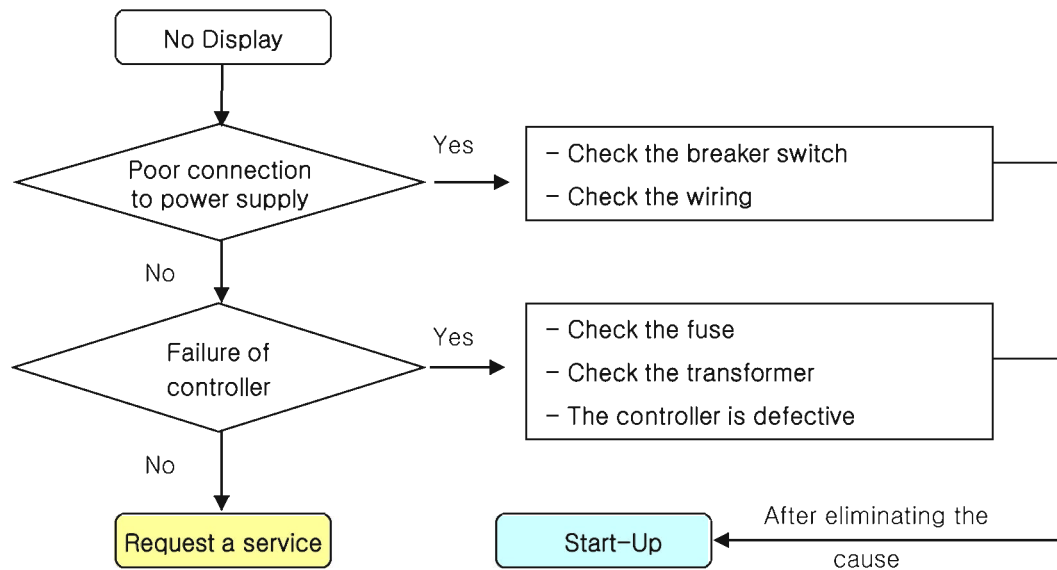
9.0 Troubleshooting

9-1 Overview

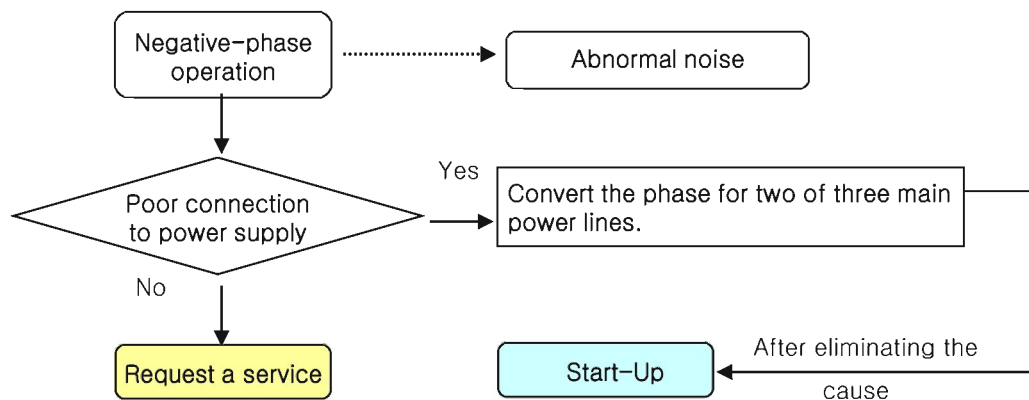
The following flow diagrams show the procedures to repair the typical failures. If the alarm is on and the compressor is stopped, do not restart the operation until the cause is clearly addressed and eliminated. Always turn the main power off, and remove the pressure from the compressor prior to a repair and maintenance.

9-2 Flow Diagram for Troubleshooting

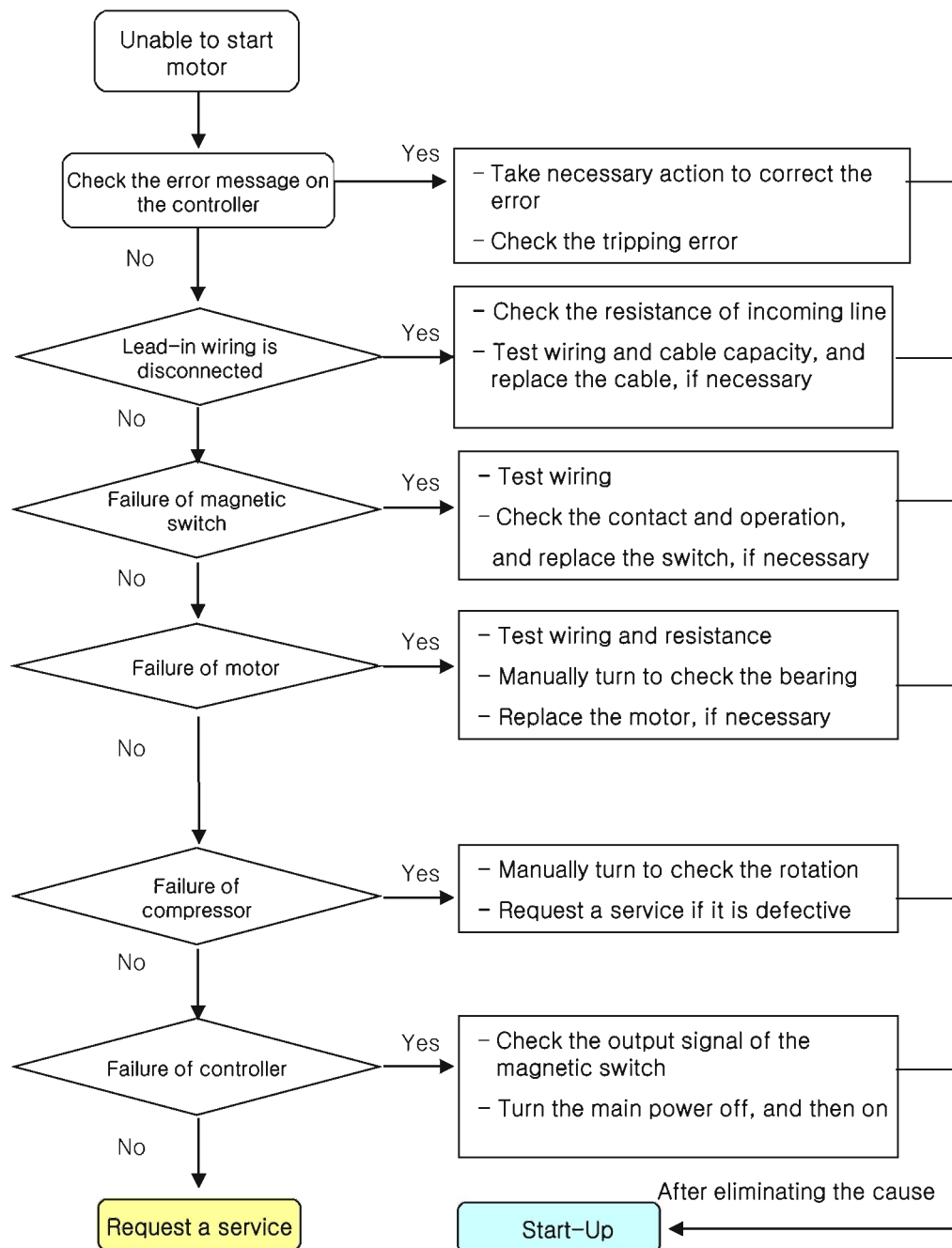
9-2-1 No Display



9-2- 2 Negative-Phase Operation

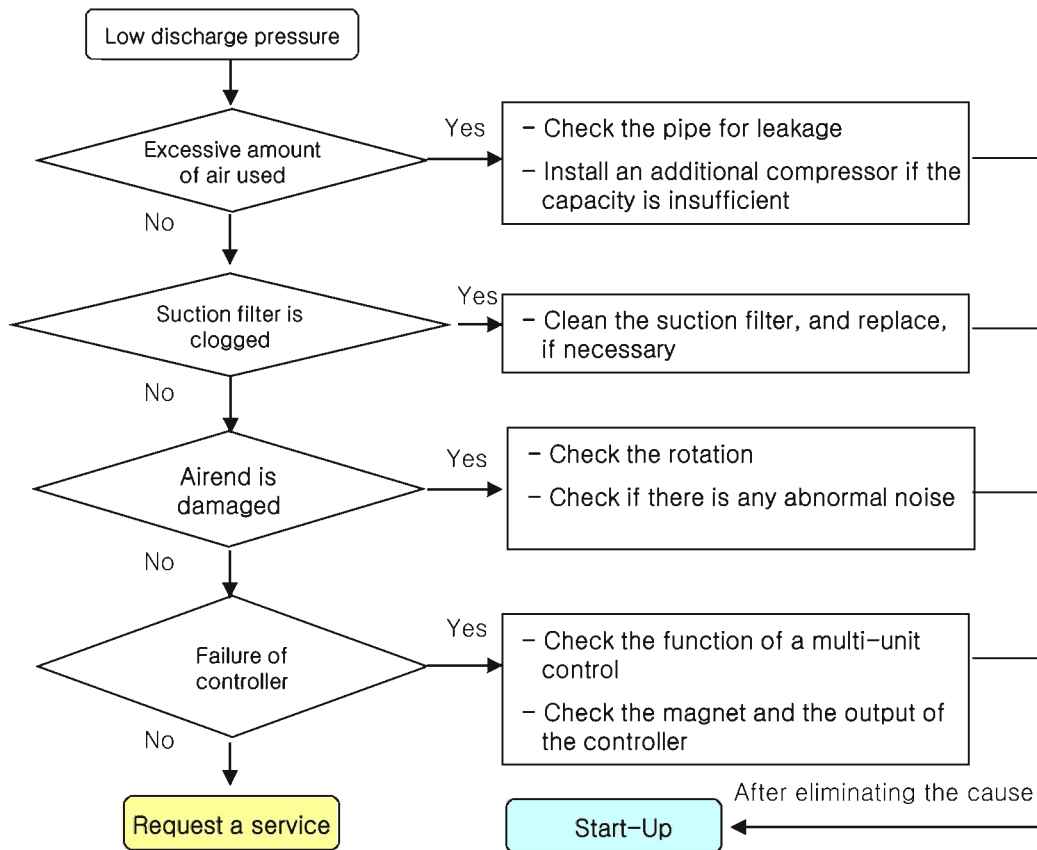


9-2-3 Unable to Start Motor

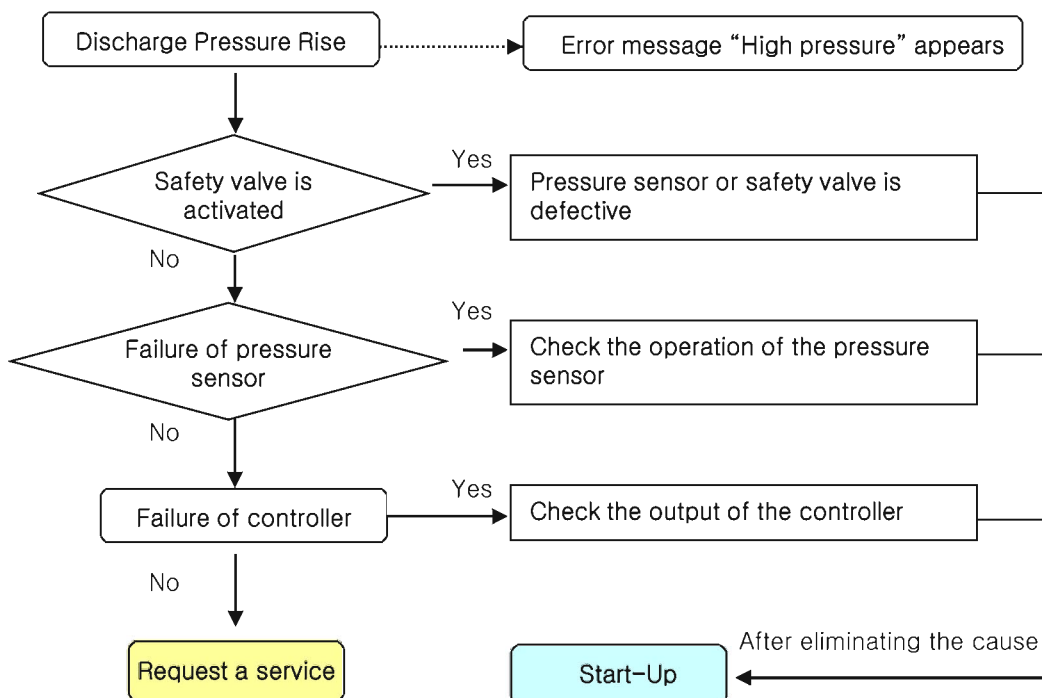


- 1) An air compressor is automatically operated. Take necessary safety precaution to ensure that the compressor is not unintentionally operated during the maintenance.
- 2) Make sure to turn the main power off prior to the rotation test.
- 3) Make sure to turn the main power off prior to the wiring test, except for the measurement of the voltage.

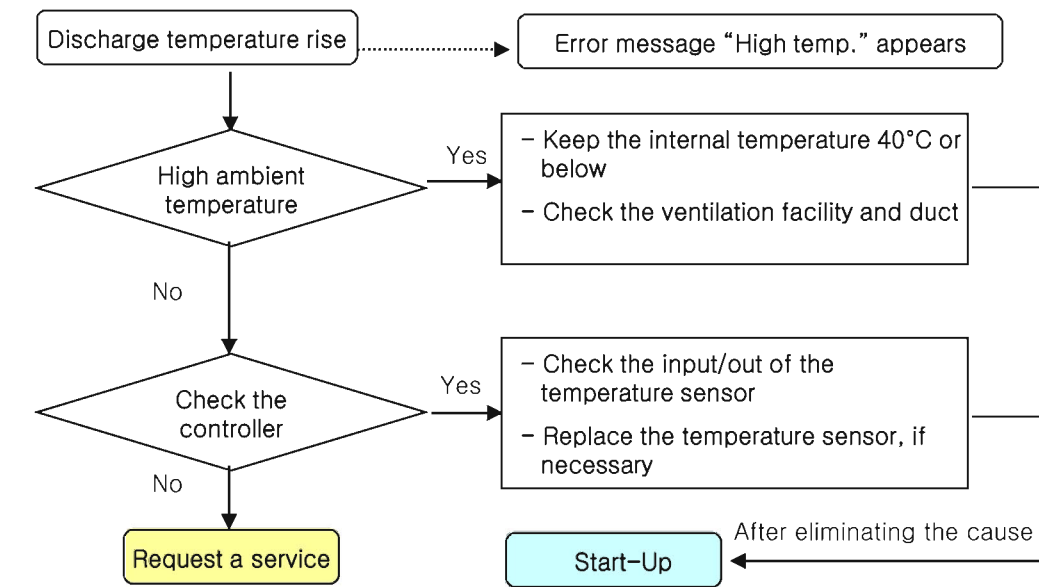
9-2-4 No Compression



9-2-5 Discharge Pressure Rise



9-2-6 Discharge Temperature Rise



Notes:

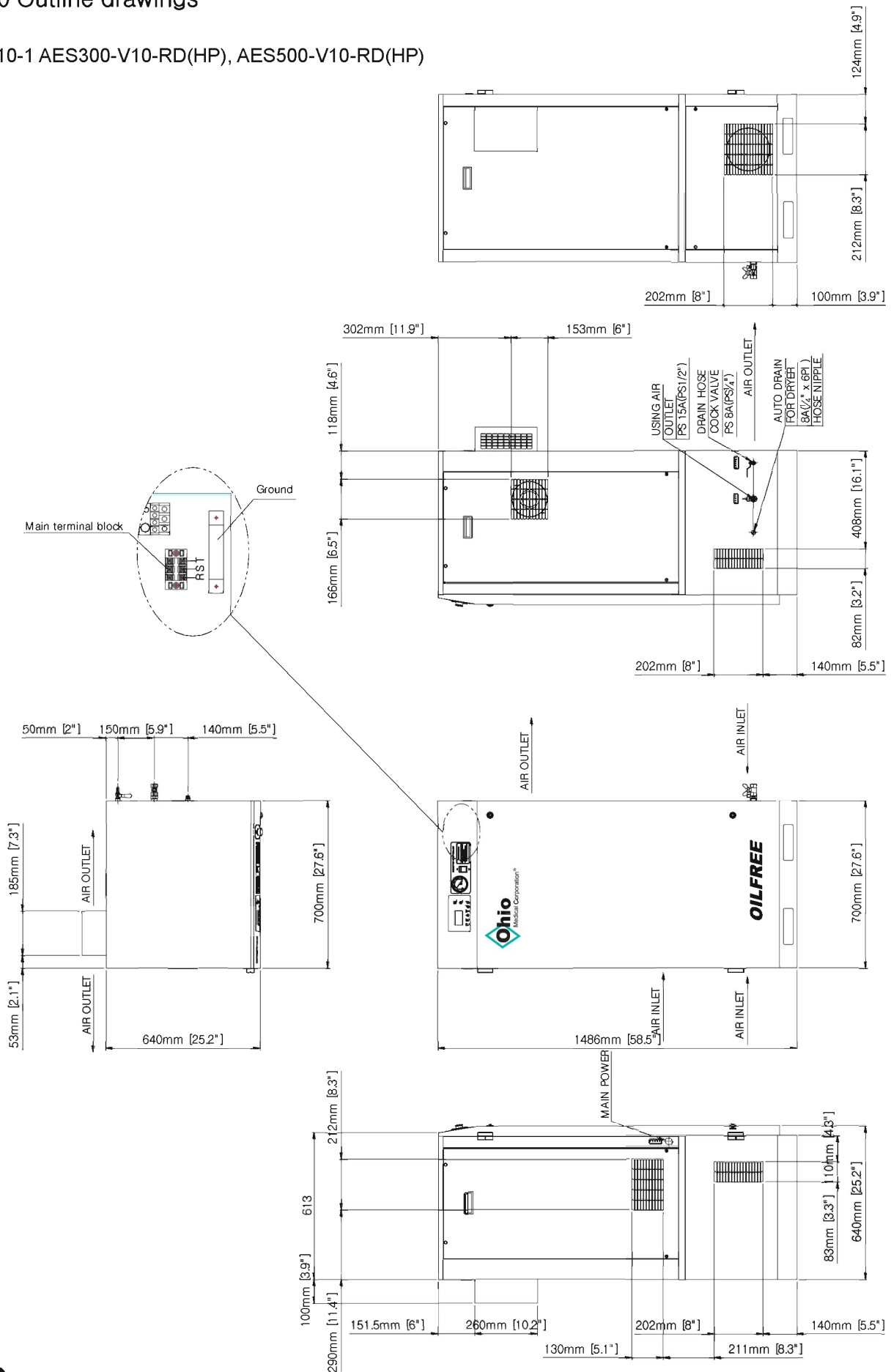
- 1) An appropriate temperature of an airend is 158°F or below at the operating temperature 104°F or below.
- 2) Always take necessary action if the temperature of the airend is sharply increased with no change in ambient temperature.

9-3 Other Troubleshooting

Trouble	Cause	Action
1. Tripped due to the over current in motor	1) Compressor is tripped. – Foreign substance in the compressor – Damage to the wrap of the compressor – Low voltage 2) Open-phase/Unbalanced power supply 3) Deteriorated coil in the motor 4) Failure of EOCR	1) Contact Ohio Medical Corporation®. – Improve the power supply. 2) Improve the power supply. 3) Check the motor. 4) Readjust or replace.
2. Noise and Vibration	1) Fixing bolts are loose. 2) Noise from the compressor – Bearing is worn out or damaged. – Foreign substance in the compressor 3) Improper belt tension and the damage to the parts 4) Inadequate installation of the compressor 5) Failure of cooling fan (dust or damaged)	1) Readjust. 2) Contact Ohio Medical Corporation®. 3) Realign or replace the belt. 4) Reinstall the compressor. 5) Clean or replace the fan.

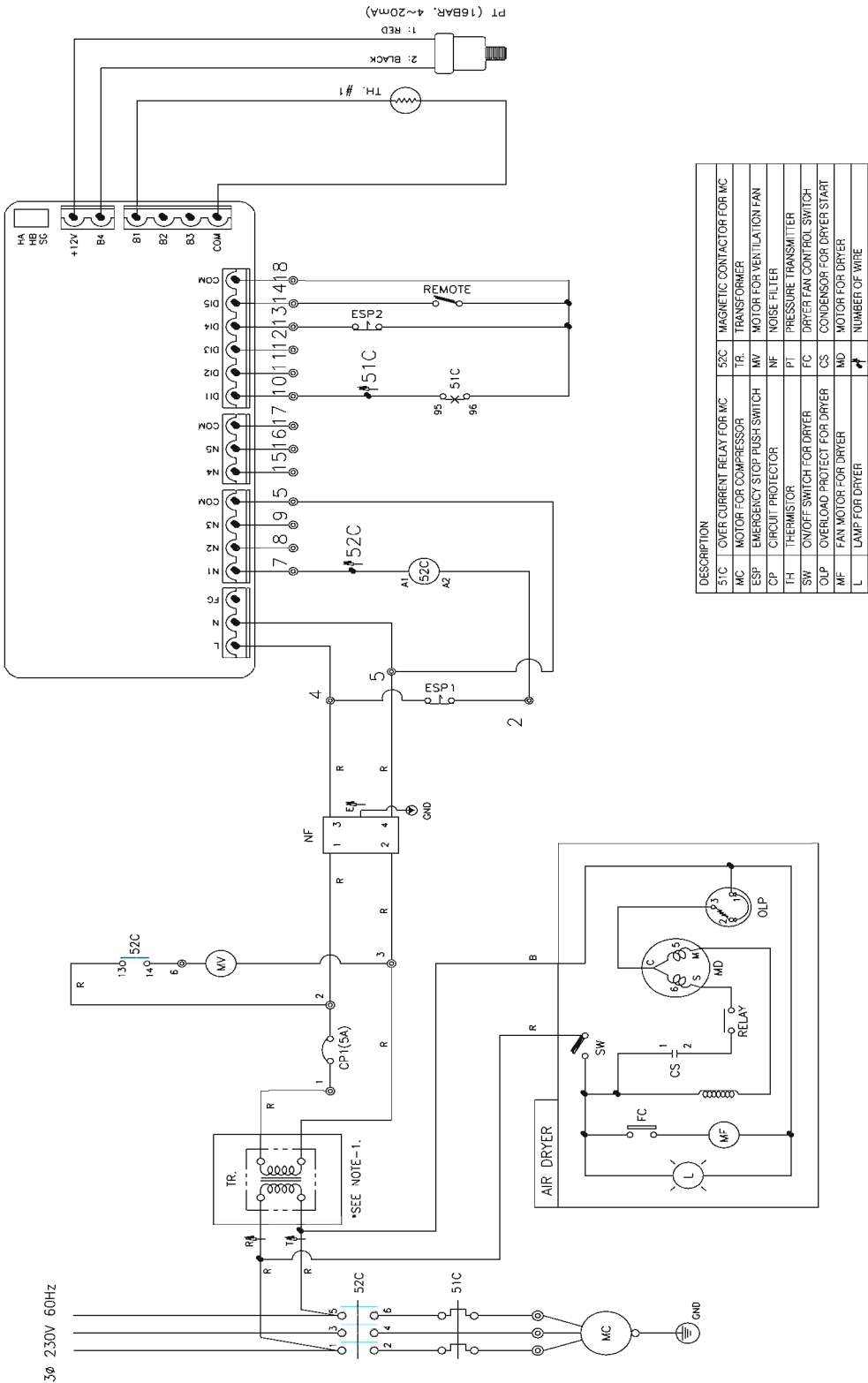
10.0 Outline drawings

10-1 AES300-V10-RD(HP), AES500-V10-RD(HP)



11.0 Electrical wiring drawings

11-1 AES300-V10-RD(HP), AES500-V10-RD(HP) [208 / 230]



NOTES
1. USE ONLY 230V POWER INPUT
PRIMARY : INPUT VOLTAGE, SECONDARY : 110V (100VA)
2. WIRING COLOR - B: BLACK, BL: BLUE, R: RED, Y: YELLOW

11-2 AES300-V10-RD(HP), AES500-V10-RD(HP) [460]



Pre-Start Up Check list

SO#:	Date:
Facility:	Contact Person:
Address:	Company:
City:	Signature:
State: Zip:	Phone:

Air & Vacuum System(s)

	System #1	#2	#3
Model#			
Serial#			
	Yes/No/NA	Yes/No/NA	Yes/No/NA
System is properly anchored to housekeeping pad:			
Electrical wiring is complete and power is available:			
Piping connections are complete with "flex connectors":			
Water connections are complete with "pressure reducing valves":			
Dew Point and/or CO Monitors are installed and ready for power:			

Gas Manifold System(s)

	System #1	#2	#3
Model#			
Serial#			
	Yes/No/NA	Yes/No/NA	Yes/No/NA
Manifold is properly anchored to floor and/or wall:			
Electrical wiring is complete and power is available:			
Gas cylinders are in place and installed on the manifold:			

Master & Area Alarms

All sensors & switches monitoring gas pressures are wired and piped.

Type	Location	Yes/No
Master		
Master		
Area		
Area		
Area		
Area		
Area		
Area		
Area		

Type	Location	Yes/No
Area		
Area		
Area		
Area		

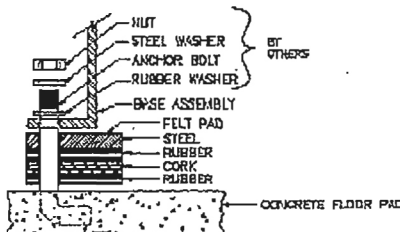
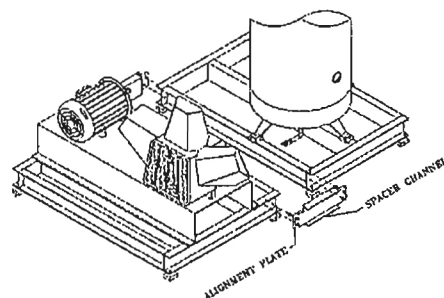
Note: Start-up & In-service Training of systems will be scheduled during normal business hours between 8:00am & 4:30pm. Incomplete installation or personnel not available for training will result in rescheduling and an additional charge will apply.

Signature Required _____ Sign & Date _____



INSTALLER'S INSTRUCTIONS

1. Spacer channel, alignment plates and pipe unions may be disconnected to provide access to existing doorways and hallways. Realign package on housekeeping pad or inertia pad using spacer channel and alignment plates.
2. Level base with vibration isolators provided with the system. Shim the mounting feet on bases and tanks as necessary, to provide consistent support. If anchored floor studs are used, leave the flange nuts loose and lock them in place with back-up nuts. Uneven feet drawn tightly to the concrete pad may cause severe vibrations resulting in cracked welds or fatigue failure.



Then remove the spacer channel and alignment plates after package is installed. Touch up paint has been provided to paint the area where the alignment plates were previous located.

3. Refer to N.E.C. for proper size power feed. Terminate power feed at the system control panel.
4. Flexible connectors are supplied with the package and should be installed between the package and hard pipe of the facility. For piping locations consult your manual located inside the system control panel.

Alarm Contacts Points are labeled:

(Alarm contacts points are located in the lower left hand corner inside the system control panel.)

- LA Lag Pump/Compressor or Vacuum Alarm
HT High Air Temperature Alarm (provided for each vacuum pump*/air compressor
(except water sealed liquid ring vacuum pumps)

LIQUID RING PACKAGES

1. A water pressure regulating valve must be installed on the make up service inlet of the liquid ring vacuum package. See dimension "M" on the mechanical drawing for the proper pipe size. The water pressure regulator should be set at 20 psig static water pressure. Consult state and local codes to ensure the proper pressure regulator is utilized.

*High air temperature switches are provided for lubricated rotary vane vacuum pumps, however NFPA 99, 1999 does not require these switches to be monitored at the master alarm panel.

For questions regarding installation, call 800-448-0770, ext. 6279



For 24/7 Technical Support,
Call 1-847-855-6234 for Assistance



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Ohio Medical Corporation
1111 Lakeside Drive, Gurnee, IL 60031
Phone 800-447-0770 or 847-855-0500
fax: 847-855-6300
www.ohiomedical.com