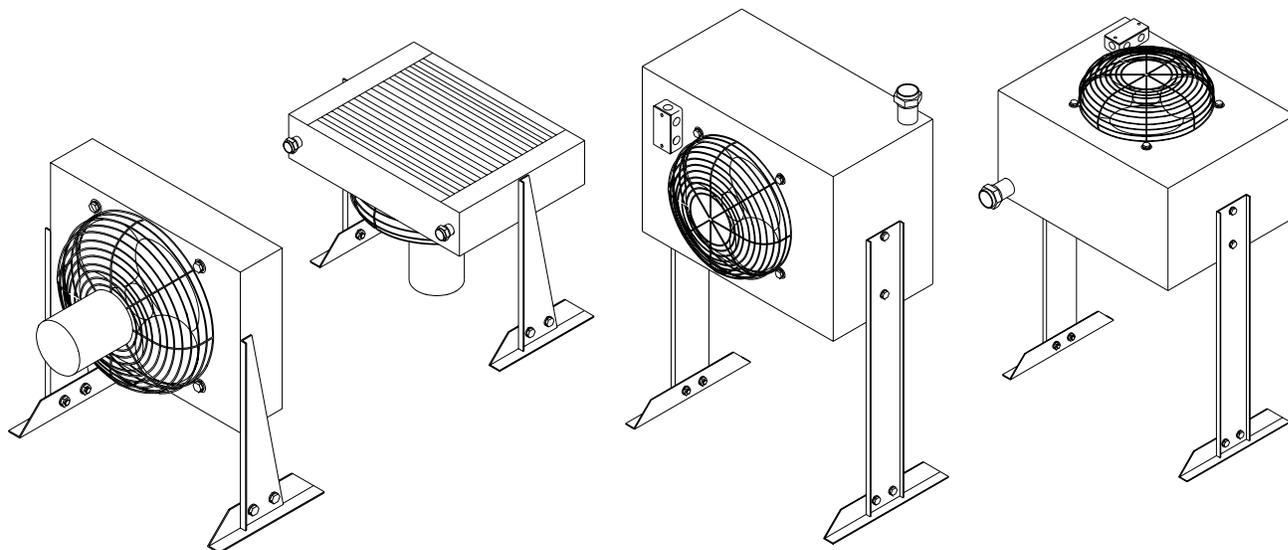


INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS

AIR-COOLED AFTERCOOLER

FOR COMPRESSED AIR SYSTEMS

MODELS AC-10-1 thru AC-40-1



WARNING

BEFORE STARTING INSTALLATION OR MAINTENANCE PROCEDURES, TURN OFF ELECTRICAL POWER AND COMPLETELY DEPRESSURIZE THE UNIT. FAILURE TO HEED THIS WARNING MAY RESULT IN SERIOUS PERSONAL INJURY AND/OR DAMAGE TO THE UNIT.

NEVER REMOVE, REPAIR, OR REPLACE ANY ITEM ON THIS UNIT WHILE IT IS UNDER PRESSURE.

WHEN INSTALLING THIS UNIT, ALWAYS COMPLY WITH THE NATIONAL ELECTRICAL CODE AND ALL OTHER APPLICABLE FEDERAL, STATE AND LOCAL CODES.

NEVER OPERATE THIS AFTERCOOLER IF THERE IS A LEAK IN THE CORE. IMMEDIATELY TAKE THE UNIT OUT OF SERVICE AND FIX OR REPLACE THE CORE.

NEVER OPERATE THE AFTERCOOLER ABOVE THE MAXIMUM RATED OPERATING CONDITIONS, AS OUTLINED IN SECTION 3.1.

NEVER REMOVE THE FAN GUARD WHILE THE AFTERCOOLER IS OPERATING. CONTACT WITH THE ROTATING FAN BLADE(S) MAY RESULT IN SERIOUS PERSONAL INJURY.

DURING NORMAL OPERATION, THE INLET PIPING MAY REACH TEMPERATURES OF 150°F TO 400°F. CONTACT WITH THE PIPING MAY RESULT IN SERIOUS PERSONAL INJURY.

HANDLING INSTRUCTIONS

SECTION 1

1.1 HANDLING THE AFTERCOOLER

CAUTION

NEVER LIFT THE AFTERCOOLER BY THE CORE OR INLET AND OUTLET..

WHEN MOVING OR LIFTING THE UNIT, PROTECT THE CORE FROM ACCIDENTAL DAMAGE.

Take extreme care when unpacking, moving or installing. The core is exposed. Damage to the core or fins may render the unit inoperable.

1.2 EQUIPMENT CHECK

Inspect the aftercooler for any damage that may have occurred during shipment. Inspect all items shipped with the unit.

IF THE UNIT HAS BEEN DAMAGED DURING SHIPMENT:

- (1) Notify carrier immediately
- (2) DO NOT operate the unit before consulting factory

2.1 INSTALLING THE LEGS

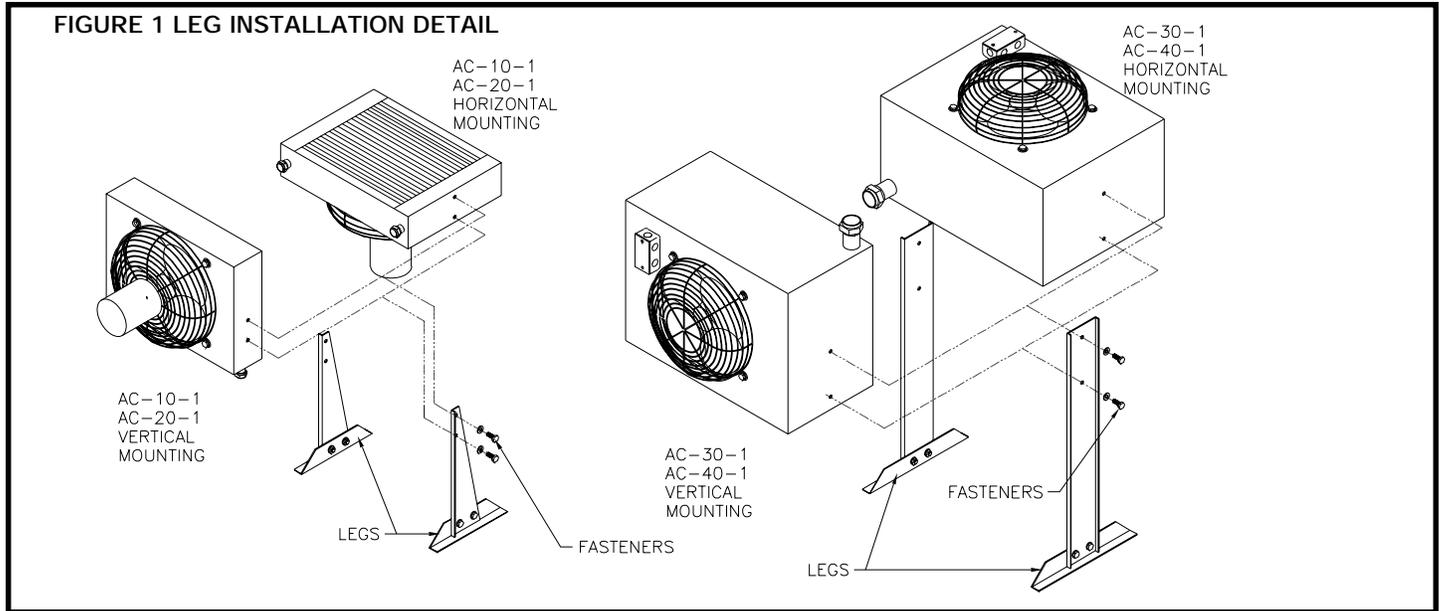
This unit was shipped without the legs installed. The legs should be installed before placing the aftercooler in the piping system.

The legs can be mounted two ways:

1. Core mounted horizontally
2. Core mounted vertically

Determine the desired position for your installation. Place the aftercooler in that position (horizontal or vertical). Carefully lift and support the unit approximately 1 to 2 feet from the floor.

Position the legs against the unit and fasten them in place using the fasteners provided. Make sure the fasteners are tightened in place.



SPECIFICATIONS AND DIMENSIONS

SECTION 3

3.1 SPECIFICATIONS

WEIGHT

AC-10-1	25 LBS	AC-20-1	27 LBS
AC-30-1	61 LBS	AC-40-1	67 LBS

DIMENSIONS See Section 3.2

INLET/OUTLET CONNECTIONS

AC-10-1	1/2" NPT (F)	AC-20-1	1/2" NPT (F)
AC-30-1	1" NPT (F)	AC-40-1	1-1/2" NPT (F)

MAXIMUM WORKING PRESSURE

ALL MODELS 250 PSIG

MAXIMUM WORKING TEMPERATURE

ALL MODELS 350°F

MAXIMUM CAPACITY (SCFM)

Rated capacities are based on the following conditions: Inlet and approach temperature at inlet pressures 80 to 125 PSIG.

Approach Temperature: The number of degrees above the temperature of the cooling medium (in this case ambient air) to which the aftercooler reduces the compressed air. A higher approach does **not** mean better performance.

ELECTRICAL REQUIREMENTS

ALL MODELS 115V-1PH-60Hz, w/ ODP motor

MATERIALS OF CONSTRUCTION

- CABINET Steel with baked enamel finish
- FAN GUARD Steel, zinc chromate plated
- FAN Heavy gauge aluminum with steel hub
- CORE Aluminum fins on copper tubes
- MOTOR Open vented

MOTOR SPECIFICATIONS AND DATA

See Wiring Diagram, Figure 5 on page 6.

FAN DATA (AMBIENT AIR FLOW)

- AC-10-1 & AC-20-1 615 SCFM
- AC-30-1 & AC-40-1 945 SCFM

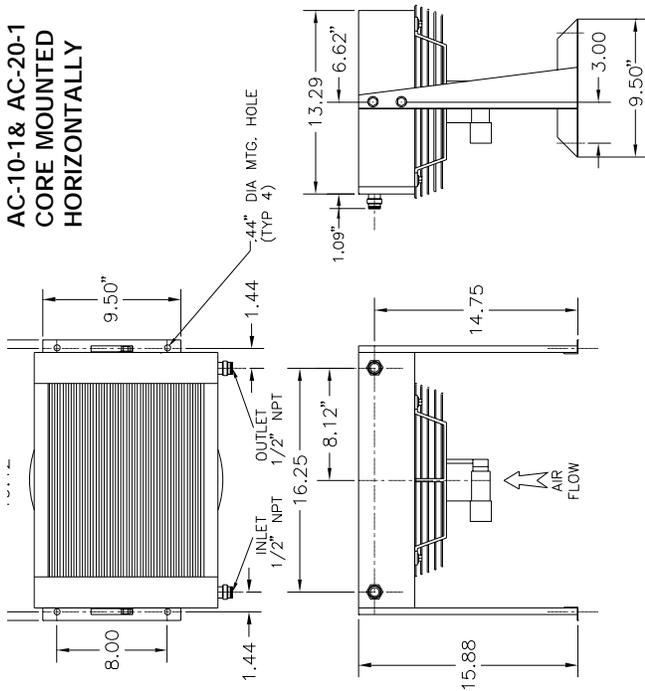
INLET TEMP.	150°F				200°F				250°F				300°F				350°F			
	5	10	15	20	5	10	15	20	5	10	15	20	5	10	15	20	5	10	15	20
MODEL																				
AC-10-1	17	35*	35*	35*	11	22	35	35*	8	16	20	35	6	12	19	26	5	10	15	21
AC-20-1	29	43*	43*	43*	17	36	43*	43*	12	27	35	43*	10	20	31	42*	8	16	26	35
AC-30-1	43	72	72*	72*	28	50	70	72*	22	35	50	70	18	32	45	57	15	28	39	50
AC-40-1	95	125*	125*	125*	66	111	125*	125*	52	88	100	125*	44	74	100	125	38	64	86	108

MAXIMUM PRESSURE DROP LESS THAN 3 PSI.

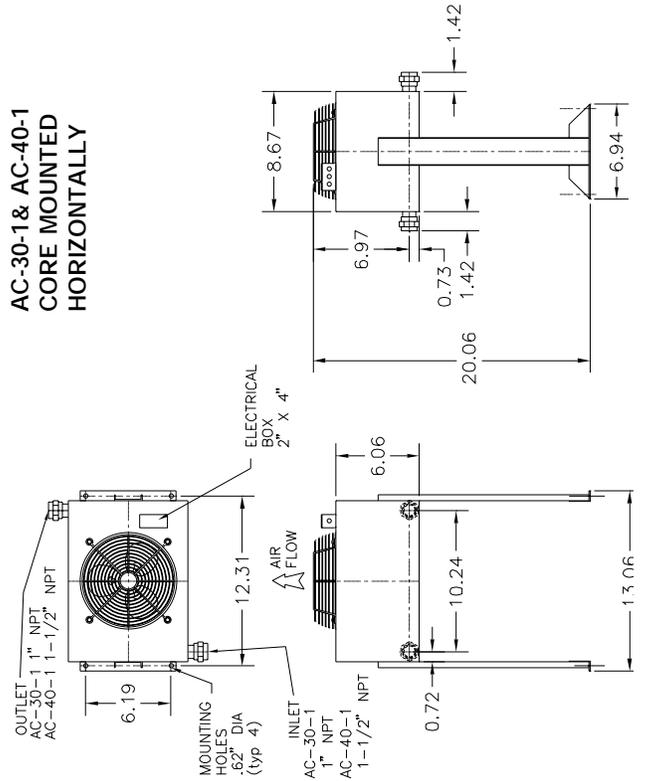
* Maximum ratings restricted by pressure drop: actual thermal capacities are higher.

3.2 DIMENSIONS AND COMPONENT LOCATIONS

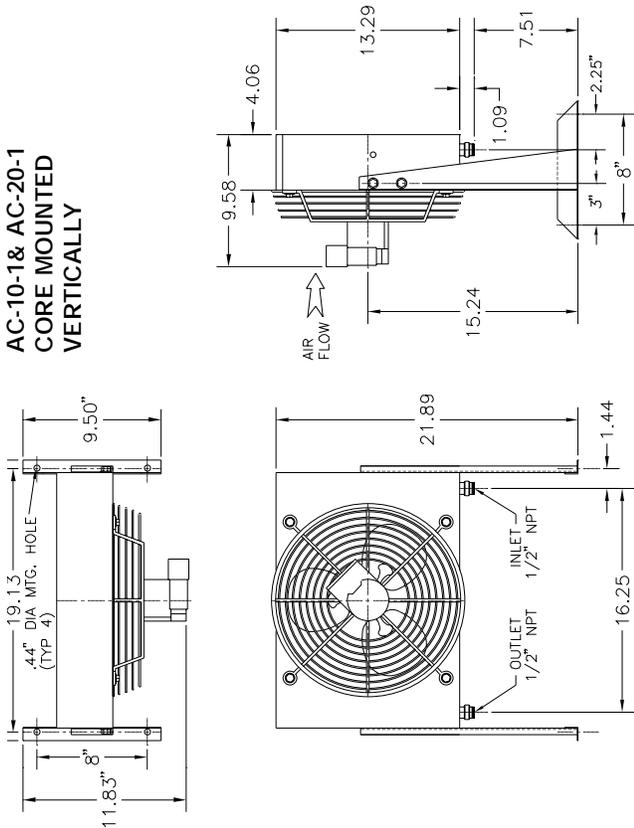
AC-10-1& AC-20-1
CORE MOUNTED
HORIZONTALLY



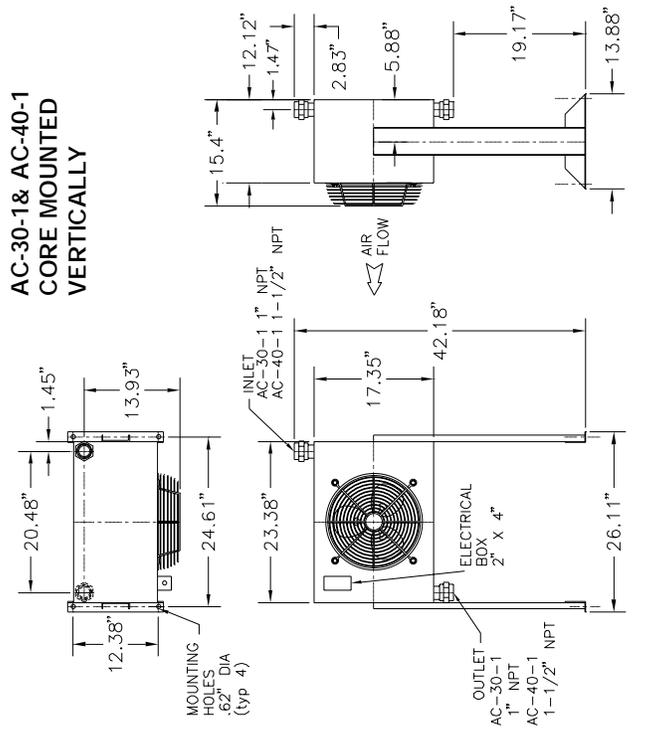
AC-30-1& AC-40-1
CORE MOUNTED
HORIZONTALLY



AC-10-1& AC-20-1
CORE MOUNTED
VERTICALLY



AC-30-1& AC-40-1
CORE MOUNTED
VERTICALLY



4.1 LOCATION

CAUTION

DO NOT LOCATE THIS AFTERCOOLER WHERE PERSONNEL MAY CONTACT THE INLET PIPING UNLESS THE UNIT IS PROTECTED BY WARNING SIGNS AND/OR A BARRIER. DURING NORMAL OPERATION, THE INLET PIPING MAY BECOME EXTREMELY HOT (150°F TO 400°F). CONTACT MAY RESULT IN SERIOUS PERSONAL INJURY.

DO NOT INSTALL THIS UNIT IN AN ENVIRONMENT OF CORROSIVE GASES OR CHEMICALS. MAKE SURE THAT THE MATERIALS USED IN THIS UNIT (listed on page 2) ARE COMPATIBLE WITH THE ATMOSPHERIC CONDITIONS.

The aftercooler should be located far enough away from the compressor so that there are no vibrations transmitted from the compressor. **A FLEXIBLE HOSE MUST BE INSTALLED IN THE PIPING TO VALIDATE THE WARRANTY AND TO PREVENT DAMAGE TO THE AFTERCOOLER FROM VIBRATION IN THE PIPING!** REFERENCE Section 4.3 for instructions.

The location should be level and capable of supporting the aftercooler and all components and piping to be installed. The aftercooler must be level to allow proper drainage of fluids from the outlet manifold.

The aftercooler must be installed at least 1 foot from walls or obstructions. It is important for the unit to have an adequate air supply for cooling at all times. If more than one unit is to be installed in the same area, allow at least 1 foot between them.

This unit must be installed indoors. If the unit is to be installed in an area where ambient temperatures can fall below 35°F, precautions must be taken to prevent freeze-up and damage to the unit. The drain lines and separator must be heat traced and/or insulated and the unit should be protected from the wind. REFERENCE Section 4.5 for details.

4.2 MOUNTING THE UNIT

After selecting the proper location as outlined above, the aftercooler should be mounted to the installation surface. Mounting holes are provided on the leg support braces. Reference Section 3.2, on page 3 for mounting hole locations and dimensions.

Mount the unit using hardware (not supplied) sized for the mounting holes.

4.3 FLEXIBLE HOSE INSTALLATION

IMPORTANT

A FLEXIBLE HOSE MUST BE INSTALLED BETWEEN THE COMPRESSOR AND AFTERCOOLER TO VALIDATE THE WARRANTY ON THE AFTERCOOLER.

The flexible hose must be installed perpendicular to the direction of vibration from the compressor.

If a flexible hose was not ordered with the aftercooler, one can be ordered from your Van Air distributor. Figure 2 lists the hose required for each aftercooler model.

4.4 PIPING INSTALLATION

CAUTION

ALL PIPING MUST BE ADEQUATELY SUPPORTED AND ISOLATED FROM VIBRATION. EXCESSIVE STRESS OR VIBRATION IN THE PIPING WILL CAUSE DAMAGE TO THE AFTERCOOLER CORE.

TO ENSURE PROPER OPERATION, MAKE SURE THAT THE INLET AND OUTLET PIPING ARE CORRECTLY CONNECTED TO THE UNIT. REFERENCE FIGURE 3.

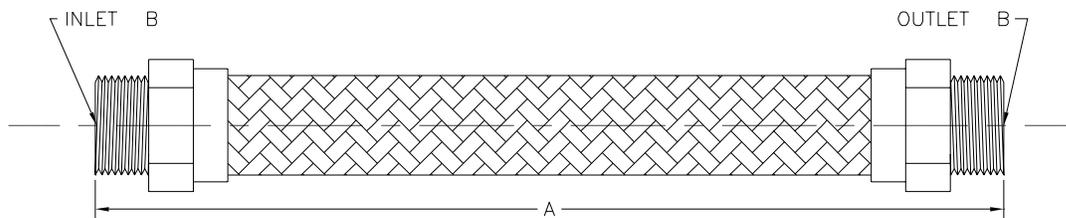
If the aftercooler is to be installed in an existing piping system, clean the piping to remove accumulated dirt, pipe scale, oil, and other contaminants before installing the unit.

A properly sized pressure relief valve should be installed after the compressor and before any block valves. The relief valve should be installed in compliance with any applicable federal, state, or local codes.

To isolate the aftercooler for maintenance, install bypass piping around the aftercooler and separator (if installed). Reference Figure 3.

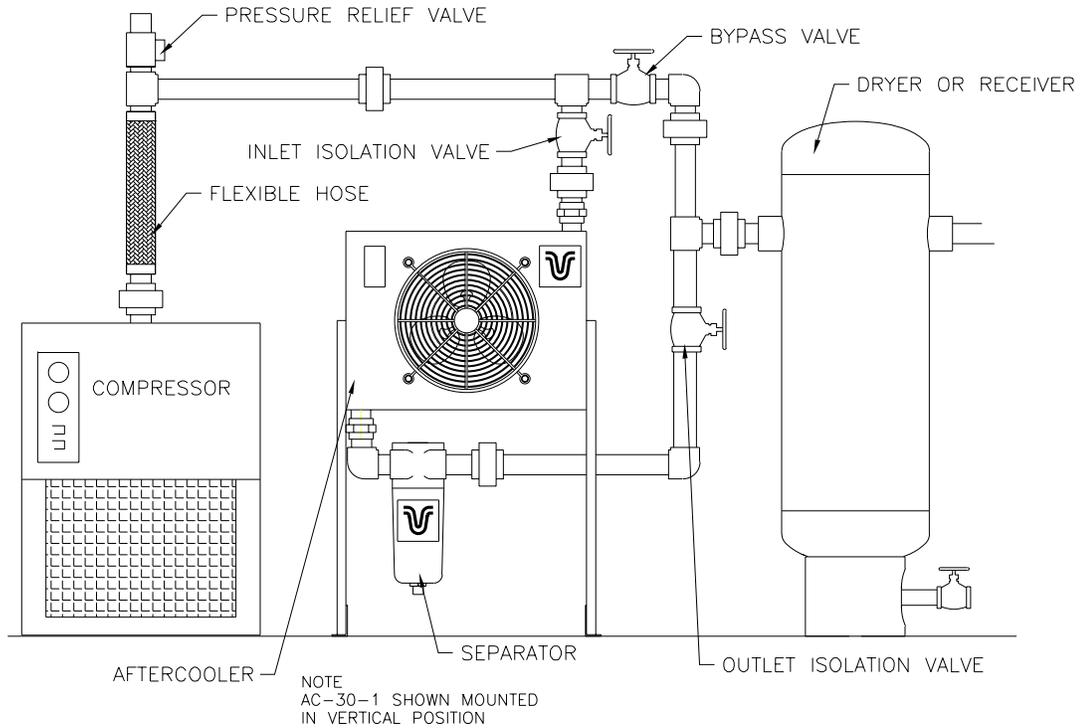
Connect the inlet piping to the inlet of the aftercooler, reference Section 3.2 for location. Make sure that the flexible hose is properly installed before the aftercooler inlet. Provide supports wherever necessary to prevent stress on the aftercooler. Supports should be installed close to the inlet and outlet manifolds. Use either overhead or stiff-leg type supports.

FIGURE 2 FLEXIBLE HOSE DETAILS



			DIMENSIONS		MAXIMUM WORKING PRESSURE			
MODEL	HOSE	PART NO.	A	B	WEIGHT	70°F	300°F	400°F
AC-10-1 & AC-20-1	FH-1/2	83-0734	10"	1/2" NPT	2.0 LBS	1000 PSIG	900 PSIG	863 PSIG
AC-30-1	FH-1	83-0735	12"	1" NPT	2.0 LBS	525 PSIG	460 PSIG	435 PSIG
AC-40-1	FH-1-1/2	83-0736	16"	1-1/2" NPT	3.0 LBS	450 PSIG	395 PSIG	370 PSIG

FIGURE 3 RECOMMENDED INSTALLATION DETAIL



4.5 FREEZE PROTECTION

If the aftercooler is to be installed in a location where ambient temperatures may fall below 35°F, heat tracing and/or insulation must be used on the outlet piping to the separator, the separator, and the drain piping. The aftercooler must be protected from the direct wind, i.e. a roof and/or walls.

The aftercooler should be turned off when ambient temperatures fall below 35°F.

4.6 SEPARATOR INSTALLATION

CAUTION

WHEN INSTALLING THE SEPARATOR, NEVER REDUCE THE PIPING SIZE BETWEEN THE AFTERCOOLER AND SEPARATOR. THIS MAY CAUSE INADEQUATE DRAINING OF THE AFTERCOOLER AND POSSIBLE BACK PRESSURE OR INCREASED PRESSURE DROP.

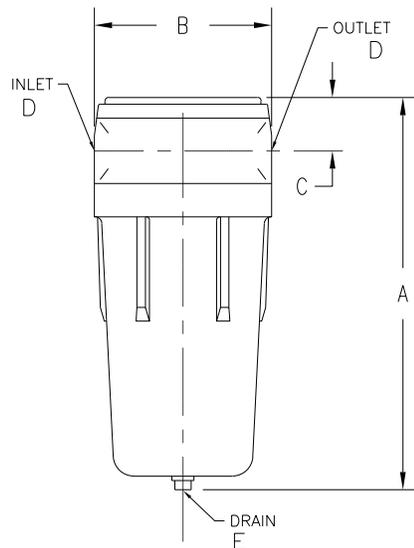
IF THE SEPARATOR DRAIN IS TO BE CONNECTED INTO A REMOTE OR COMMON DRAIN LINE, MAKE SURE THAT IT IS VENTED.

THE DISCHARGE FROM THE SEPARATOR MAY CONTAIN COMPRESSOR LUBRICANTS. COMPLY WITH ALL REGULATIONS CONCERNING DISPOSAL OF SUCH FLUIDS.

When the system air is cooled by the aftercooler, moisture in the compressed air condenses and accumulates in the outlet of the aftercooler. To efficiently remove this liquid from the air system, a separator with a FD-1 float drain must be installed immediately downstream of the aftercooler.

Install the separator as outlined in the Installation, Operation, and Maintenance Instructions supplied with the component. If a separator was not ordered with the aftercooler, one can be ordered from your VAN AIR distributor.

FIGURE 4 SEPARATOR DETAILS



AFTERCOOLER	SEPARATOR	PART NO.	DRAIN	PART NO.
AC-10-1	S-5-AD	83-0742	FD-1	83-0751
AC-20-1	S-5-AD	83-0742	FD-1	83-0751
AC-30-1	S-10-AD	83-0744	FD-1	83-0751
AC-40-1	S-20-M	83-0745	FD-1	83-0751

MODEL	A	B	C	D	E	MWP (PSIG)	FLOW (SCFM)	
							MIN	MAX
S-5-AD	7.35"	3.25"	0.98"	1/2" NPT	1/8" NPT	200	5	50
S-10-AD	10.00"	4.75"	1.00"	1" NPT	1/8" NPT	200	11	120
S-30-M	12.10"	4.38"	2.30"	1" NPT	1/4" NPT	200	60	400

4.7 ELECTRICAL CONNECTIONS

CAUTION

TURN OFF MAIN POWER SUPPLY BEFORE WIRING TO THE AFTERCOOLER.

MAKE SURE THAT ALL USER SUPPLIED WIRING IS PROPERLY SIZED TO HANDLE THE AMPERAGE REQUIRED BY THE AFTERCOOLER AND ANY ADDITIONAL EQUIPMENT.

WHEN WIRING TO THIS UNIT AND ANY OTHER ELECTRICAL COMPONENTS, ALWAYS COMPLY WITH THE NATIONAL ELECTRICAL CODE AND ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES.

IF THE AFTERCOOLER IS TO BE INSTALLED OUTDOORS OR IN AN EXTREMELY HUMID ATMOSPHERE, MAKE SURE THAT ALL WIRING AND COMPONENTS ARE PROPERLY RATED.

VERIFY THAT THE POWER SOURCE MATCHES THE AFTERCOOLER ELECTRICAL REQUIREMENTS BEFORE MAKING ANY CONNECTIONS. REFERENCE EQUIPMENT DATA TAG AND FIGURE 4 FOR INFORMATION.

TO PREVENT POSSIBLE ELECTRICAL SHOCK, IT IS IMPORTANT THAT THIS UNIT IS GROUNDED. ALWAYS USE THE PROVIDED GROUNDING SCREW.

ancies between the data tag and Figure 5, use the information on the tag.

Remove the cover from the electrical junction box on the aftercooler motor. Using FIGURE 5 as reference, make the necessary wiring connections. Several ways to wire the unit are listed below. Make the connections for the pertinent application(s).

1. DEDICATED POWER SUPPLY AND DISCONNECT

Install a properly sized fused disconnect before the aftercooler.

Make the necessary wire connections and re-install the junction box cover.

2. INTERLOCKED WITH COMPRESSOR MOTOR STARTER

The aftercooler can be interlocked with the air compressor starter. This allows the aftercooler to operate only when the air compressor is operating.

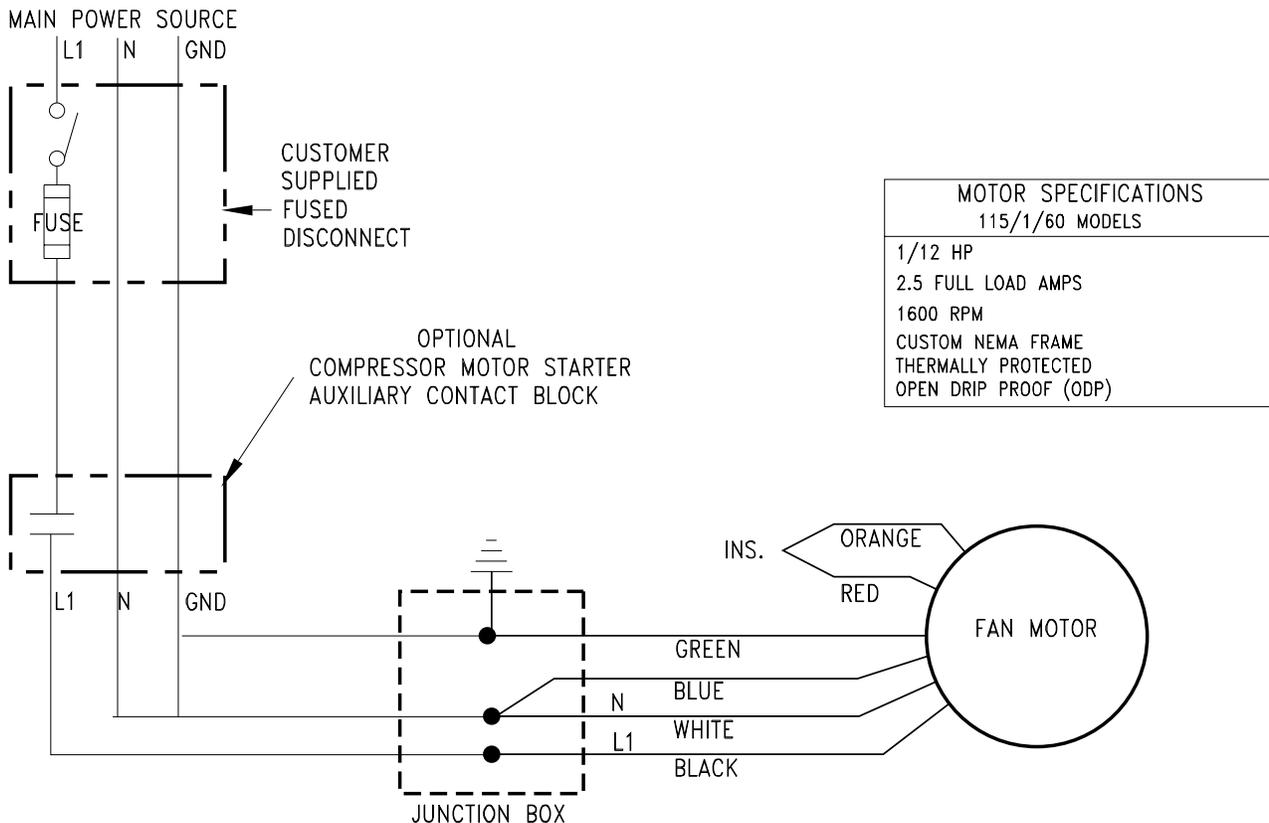
If a set of auxiliary, normally open contacts is available on the air compressor magnetic starter, make necessary wiring connections from the contacts to the aftercooler.

If a set of auxiliary contacts is not available, use a properly sized contactor. Wire the contactor's holding coil in parallel with the air compressor starter holding coil. Make the necessary wiring connections from the contactor to the aftercooler.

Re-install the junction box gasket and cover.

The aftercooler electrical requirements are listed on the equipment data tag and in Figure 5. If there are any discrep-

FIGURE 5 WIRING DIAGRAM



5.1 START UP INSTRUCTIONS

Pressurize the compressed air system. If the aftercooler was interlocked with the compressor, the aftercooler will begin to operate immediately. If the aftercooler was wired on a separate electrical source, turn on the source.

Open the inlet and outlet isolation valves on the aftercooler (if installed). Close the bypass valve. The aftercooler is ready for operation.

5.2 OPERATING INSTRUCTIONS

The operation of the aftercooler is simple. The fan rotates, moving ambient air across the core. The ambient air flow cools the compressed air inside the core. The aftercooler will automatically operate as long as electrical power is supplied to the unit.

5.3 SHUT DOWN INSTRUCTIONS

To shut down the aftercooler, turn off the electrical power source. If the aftercooler was interlocked with the compressor, the aftercooler will automatically turn off with the compressor.

Open the bypass valve and close the inlet and outlet isolation valves (if installed).

6.0 MAINTENANCE INSTRUCTIONS

WARNING

BEFORE STARTING INSTALLATION OR MAINTENANCE PROCEDURES, TURN OFF ELECTRICAL POWER AND COMPLETELY DEPRESSURIZE THE UNIT. FAILURE TO HEED THIS WARNING MAY RESULT IN SERIOUS PERSONAL INJURY AND/OR DAMAGE TO THE UNIT.

NEVER REMOVE, REPAIR, OR REPLACE ANY ITEM ON THIS UNIT WHILE IT IS UNDER PRESSURE.

NEVER REMOVE THE FAN GUARD WHILE THE AFTERCOOLER IS OPERATING. PERSONAL CONTACT WITH THE ROTATING FAN BLADE MAY RESULT IN SERIOUS PERSONAL INJURY.

CAUTION

NEVER USE SOLVENTS CONTAINING STRONG ACID OR ALKALINE BASES TO CLEAN THE CORE. DAMAGE TO THE CORE MAY OCCUR.

6.1 CORE EXTERIOR CLEANING

The core should be regularly cleaned. Accumulation of dirt or other contaminants such as oils will greatly reduce the efficiency of the aftercooler.

Normal accumulation of dirt can be removed by blowing off the core with compressed air. If the core becomes contaminated with oil-laden particles, it can be steam cleaned. Clean with extreme care. The aluminum fins can be easily damaged.

6.2 CORE INTERIOR CLEANING

If the compressed air system contains excessive lubricating fluids, build-up may occur. The interior of the core may be cleaned to remove the deposits by circulating a mild cleaning solution through the core. For most conditions, a mild alkaline solution such as OAKITE or equal, is satisfactory. For extreme conditions, it might be necessary to use a weak solution of INHIBITED hydrochloric acid.

Turn off the electrical power supply, depressurize the unit, and disconnect it from the air system. Circulate the solution through the core until it is clean. Make sure that the core is rinsed out thoroughly before returning the unit to service.

When the core is cleaned, it is important that the full characteristics of the fouling material and cleaning agent be known. Proper care must be taken when handling and disposing of the solution. Always follow the instructions supplied with the material.

6.3 MOTOR LUBRICATION

This unit is equipped with a sleeve bearing motor. The sleeve bearings will require lubrication at least every 6 months. Add a few drops of S.A.E. 20 oil to each bearing.

6.4 REPLACEMENT PARTS

Replacement Cores

AC-10-1	P/N 34-0729
AC-20-1	P/N 34-0730
AC-30-1	P/N 34-0731
AC-40-1	P/N 34-0732

Replacement 12" Dia. Fan Blade

All models	P/N 26-5905
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Replacement Fan Guard

AC-10-1 & AC 20-1	P/N 41-0206
AC-30-1 & AC 40-1	P/N 41-0207

Replacement 1/12 HP 115v Motor

AC-10-1	P/N 34-0742
AC-20-1	P/N 34-0742
AC-30-1	P/N 34-0743
AC-40-1	P/N 34-0743

7.0 TROUBLESHOOTING

1. FAN MOTOR NOT OPERATING

Motor failure - Check electrical power source. If power supply is okay, check the motor. Replace if necessary.

Power supply failure - Check electrical power source. Check contactors, fuses, or disconnects. Check incoming wiring for damage. If aftercooler is interlocked with the compressor, check the compressor starter.

2. HIGH AFTERCOOLER OUTLET TEMPERATURES

Fan motor not operating - Reference Problem 1.

Plugged aftercooler core or restricted air flow - Inspect the core for deposits of dirt and/or oils. If the core is contaminated, clean it as outlined in Sections 6.1 thru 6.2. Check for obstructions around the aftercooler. Remove if present.

3. INCREASED LIQUID (WATER) CONTENT IN THE COMPRESSED AIR SYSTEM DOWNSTREAM OF THE AFTERCOOLER

Plugged or damaged separator - Check the separator for damage and proper operation.

Separator installed incorrectly - If a separator was installed, check to make sure that it was installed properly. If no separator was installed downstream of the aftercooler, one should be installed to remove the liquid from the air system.

Separator drain plugged or damaged - Check the drain for damage and proper operation.

4. EXCESSIVE PRESSURE DROP ACROSS THE AFTERCOOLER

Aftercooler core damaged or clogged - Inspect the core for damage or blockage. If the core is damaged, repair or replace. If the core is plugged, flush it out as outlined in Section 6.2.

WARRANTY

SECTION 8

8.0 WARRANTY

I. INSTALLATION.

Unless otherwise set forth in a quotation and/or acknowledgment, Seller shall not be responsible for installation. Cost of and all risks of damage to the equipment and/or components thereof caused by installation shall be the sole responsibility of Buyer. If supervision of installation and/or supervision of start up of the equipment is to be provided by Seller, Buyer shall assume all costs incurred by Seller in furnishing supervision. If supervision of installation and/or supervision of start up of the equipment is provided by Seller, Seller shall only be responsible for any loss or damage growing out of a direct negligent act or acts of Seller's supervisor.

SELLER SHALL NOT BE RESPONSIBLE FOR IMPROPER OPERATION OF THE EQUIPMENT DUE TO FAULTY ERECTION OR INSTALLATION.

II. PERFORMANCE.

Seller shall have no responsibility for the performance of its Goods when installed under conditions varying materially from those under which the product is usually tested or operated under existing industry standards.

III. WARRANTY

All AC Series Aftercoolers manufactured by Seller are guaranteed to be free from defective materials and workmanship for a period of one (1) year from date of shipment.

The above warranties for all products described do not cover abuse, neglect, lack of normal maintenance, accidents or other exceptional circumstances.

Date of shipment will be defined as the date of departure from the factory or from distributor stock. A copy of the distributor invoice to the customer at time of shipment is required as verification of shipment from distributor stock. Equipment start up will be verified by receipt of the product registration card.

Seller's obligation under this warranty may, at its option, be discharged by refunding the price of, furnishing or repairing, without charge, FOB its factory, a similar part to replace any part of its own manufacture which within the above specified periods, proves to have been defective, provided that within a reasonable time for inspection after delivery, Seller is notified of such defects and the equipment, material or part claimed to be defective is delivered pre-paid to Seller at Lake City, Pennsylvania with evidence that it has been properly maintained and used in accordance with instructions. If, in connection with such warranties, repairs are performed by the Buyer with the written authorization of Seller, then the expense in connection with such repairs shall not exceed the cost of material and direct labor if such repairs are performed by Buyer without the written authorization of Seller. Seller will not assume any of the expenses in connection with such repairs and will immediately void any remaining warranty on the Goods.

THE REPAIR OR REPLACEMENT WARRANTY HEREIN SET FORTH IS THE EXCLUSIVE WARRANTY GIVEN BY SELLER FOR ITS GOODS. THIS WARRANTY IS GIVEN IN LIEU OF ANY OR ALL WARRANTIES, WHETHER WRITTEN OR ORAL, EXPRESSED OR IMPLIED. ANY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE ARE HEREBY EXPRESSLY EXCLUDED BY SELLER. SELLER NEITHER ASSUMES, NOR DOES IT AUTHORIZE ANY OTHER PERSON TO ASSUME ON ITS BEHALF ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF ITS GOODS.

IV. LIMITATIONS OF LIABILITIES AND INDEMNITIES.

IN NO CASE, WHETHER AS A RESULT OF BREACH OF CONTRACT, BREACH OF WARRANTY

OR TORT (INCLUDING SELLER'S OR BUYER'S NEGLIGENCE OR STRICT LIABILITY) SHALL SELLER BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES INCURRED BY BUYER, INCLUDING, BUT NOT LIMITED TO, LOSS OF SALES PROFIT, REVENUE, OR GOOD WILL; LOSS OF USE OF GOODS OR ANY ASSOCIATED EQUIPMENT OR MATERIAL; COST OF CAPITAL; COST OF SUBSTITUTE PRODUCTS, FACILITIES OR SERVICES; DOWNTIME COSTS; ATTORNEY'S FEES; OR LOSSES OR CLAIMS OF CUSTOMERS OF BUYER FOR SUCH DAMAGES BUYER HEREBY AGREES TO INDEMNIFY AND HOLD HARMLESS SELLER FROM ANY AND ALL SUCH DAMAGES BUYER FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD HARMLESS SELLER FROM ANY AND ALL CLAIMS, LIABILITY, DAMAGES OR EXPENSES (INCLUDING ATTORNEY'S FEES) DUE TO PERSONAL INJURIES OR DEATH, TO BUYER, ITS EMPLOYEES, AND THIRD PARTIES AND FROM PROPERTY DAMAGE RESULTING FROM THE NEGLIGENCE OR STRICT LIABILITY OF BUYER NOT WITHSTANDING THE PROVISIONS OF ANY WORKER COMPENSATION OR SIMILAR STATUTE

V. SERVICE, OPERATING PROCEDURE, WARNINGS.

Should Buyer request start up supervision by Seller, a maximum number of days required for this supervision may be included and specified in the quotation and/or acknowledgment as a separate price item. The specified days are only approximate, since start up. Supervision is contingent upon equipment and work supplied by others and beyond the control of Seller, and Seller shall be paid for any days actually worked in addition to those specified on a pro-rata basis.

Start up supervision and warranty supervision and warranty service time will include all elapsed time during the standard working hours, as defined by Seller, or Seller's representative from the time Seller's representative leaves his operating base or another customer's plant.

Where the service to be performed is start up supervision. Seller should be notified approximately 30 days prior to start up Seller's representatives may be required to have standard time verification sheets approved by Buyer's authorized representative, and the name and title of this representative should be furnished to Seller with the notification.

Unless set forth in the quotation and/or acknowledgment, Seller shall not be obligated to provide special operating manuals or operating procedures for the operation of its equipment or supply special warning placards to be affixed to the equipment. If such manuals, procedures or placards are provided by Seller, Buyer shall be responsible for payment of cost of furnishing such items, for instructing any operator of the equipment as to the contents of such manuals and/or procedures; for requiring that such procedures be abided by; for insuring that warning placards remain affixed to the equipment and for requiring operators to abide by warning placards.

Any safety equipment required to be worn by any operator or maintenance person shall be provided by Buyer, and the failure to provide such equipment or the failure to require the use thereof shall be the Buyer's sole responsibility. Buyer shall indemnify and hold Seller harmless for any liability with respect thereto.

Seller shall not be responsible for providing safety devices and/or guarding of the equipment except as provided for in the quotation and/or acknowledgment, and Buyer specifically assumes all responsibility for supplying such safety devices and/or guarding necessary for the safe operation of the equipment. If safety devices and/or guarding are specified in the quotation and/or acknowledgment, Buyer shall be solely responsible for making certain that any operator of the equipment uses such safety devices and/or guarding and Buyer shall indemnify and hold Seller harmless with respect to any property damage and/or personal injury, including death, occasioned by any person by reason of such failure on the part of Buyer and/or its operator.

VAN AIR SYSTEMS INC
MAKING COMPRESSED AIR AND GAS WORK BETTER SINCE 1944.

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