

NOTE! READ AND SAVE THIS MANUAL — IMPORTANT SAFETY INSTRUCTIONS

USE AND CARE INFORMATION FOR CUSTOM-AIR AIR HANDLING UNITS

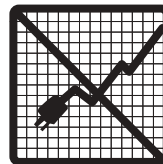
The following information includes sections on installation, start-up and regular maintenance.

INSTALLATION AND START-UP SAFETY

- Before installation it is important to be certain the mounting surface will bear the operating weight of the unit. For proper unit operation it is also important that it be operated in a completely level position.
- Electrical wiring must be installed a safe distance away from any sharp or moving parts (blower wheels, pulleys, sheaves, belts, etc.).
- Either an open drip proof or totally enclosed fan cooled motor may be used. Check the electrical supply to see that it matches the requirements shown on the motor name plate.
- Guards should be installed when blower is within seven feet (7') of working level or when deemed advisable for safety.
- When units are mounted in the down discharge position, fan guards must be installed at discharge of the unit or duct.
- All safety devices and panels of unit must be reinstalled and remounted as previously mounted before start-up, servicing or cleaning.

PRE-START CHECK LIST

- Check for leaks.
- Check belt tension.
- Remove shipping blocks.
- Check all piping connections for a tight fitting.



SAFETY

Caution: DISCONNECT ALL ELECTRICAL POWER TO THE UNIT BEFORE ATTEMPTING TO INSTALL, OPEN, OR SERVICE YOUR UNIT. IF THE UNIT IS THERMOSTATICALLY CONTROLLED, THE THERMOSTAT IS NOT TO BE USED AS A DISCONNECT AS IT MAY RESET AND START THE UNIT UNEXPECTEDLY.

For future reference, record Model and Serial Numbers of your unit here:
(Numbers are located on the outside of the unit.)

Model No. _____ Serial No. _____

REGULAR MAINTENANCE AND ANNUAL START-UP

The commercial/industrial air handling unit you selected may be either horizontal discharge, down discharge or up discharge. The down discharge unit is designed for either flat or pitched roofs. The side discharge unit is designed for either the side of a building or on a flat or pitched roof. The up discharge unit is primarily designed for ground mount application. In all applications, care must be taken that the fan or blower is facing an unoccupied space only. Guards must be installed when operating within seven feet (7') of personnel or when deemed advisable for safety.



SAFETY

Caution: DISCONNECT ALL ELECTRICAL POWER TO THE UNIT BEFORE ATTEMPTING TO INSTALL, OPEN, OR SERVICE YOUR UNIT. IF THE UNIT IS THERMOSTATICALLY CONTROLLED, THE THERMOSTAT IS NOT TO BE USED AS A DISCONNECT AS IT MAY RESET AND START THE UNIT UNEXPECTEDLY.

For efficient operation it is crucial that your air handler be properly maintained each year. The capabilities of



FIGURE 1

any unit will be severely limited if regular maintenance is neglected for even one year. Therefore, the following maintenance information must be applied at the recommended intervals in order to receive maximum benefit from the cooler.

1. CHECK BELT TENSION

With each cooler inspection be sure to check for proper belt tension. Proper belt tension is approximately $\frac{1}{2}$ " movement of the belt when pressed at mid-span under normal thumb pressure. Do not overtighten belt. However, a new belt should be tighter than a used belt. (FIGURE 1)

2. LUBRICATION

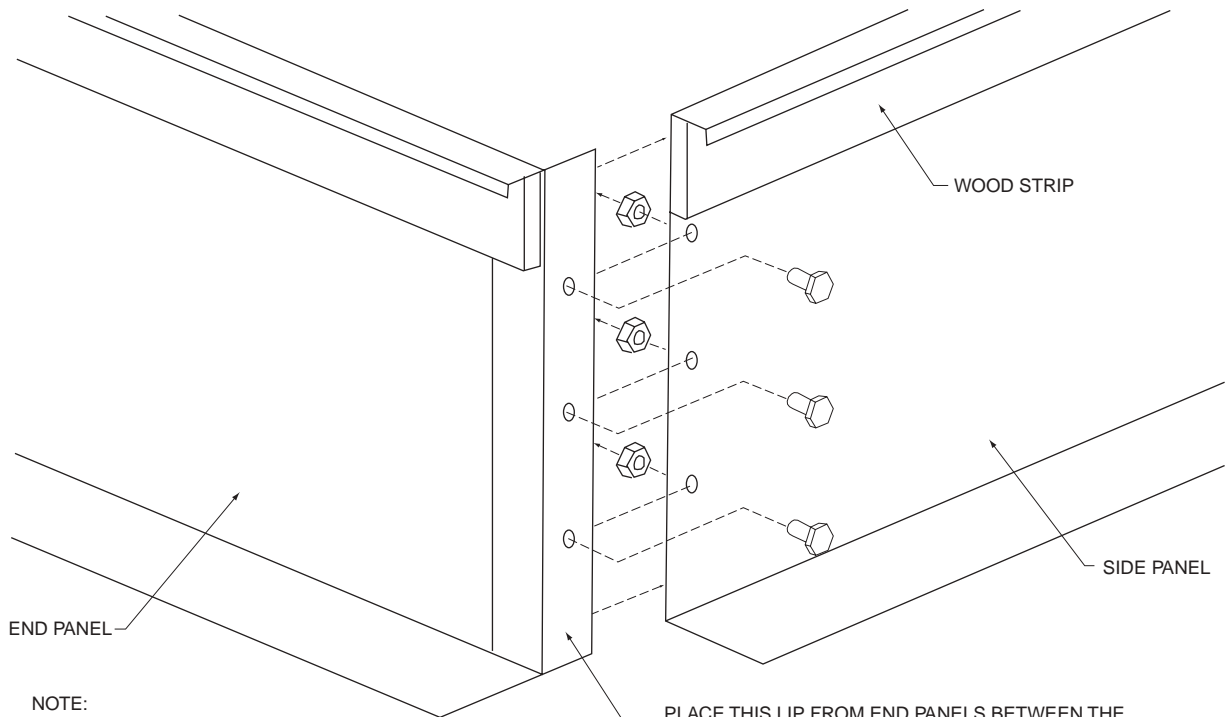
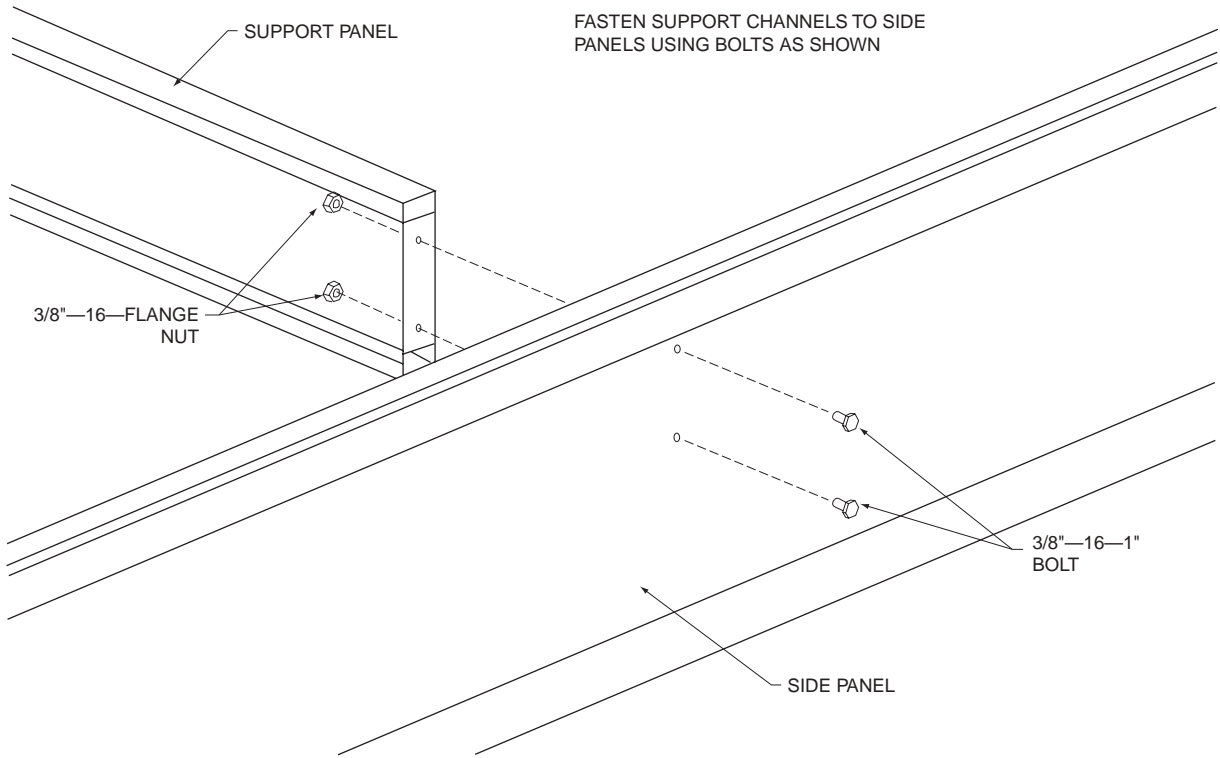
Motor and fan blower shaft bearings on the CF units will require relubrication with a #2 consistency Lithium Base grease. (EXAMPLES: Shell Alvania #2, Mobil Mobilux #2, Texaco Multifax #2.) NOTE: Do not overgrease. The major cause for bearing failure is overgreasing. (FIGURE 2)



FIGURE 2

DO NOT USE MACHINE OIL AND DO NOT OVERGREASE BEARINGS.

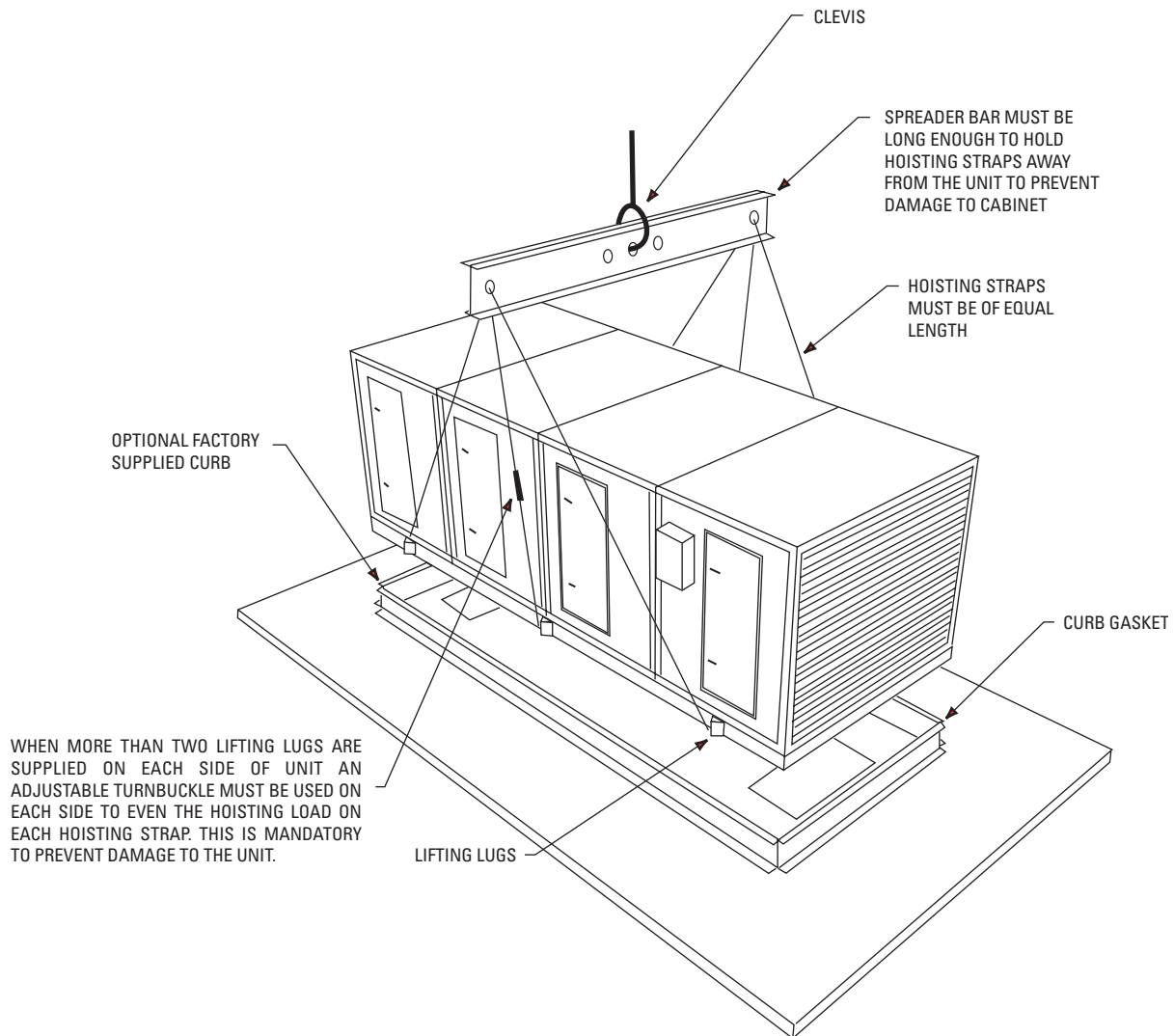
KNOCK DOWN CURB ASSEMBLY



NOTE:
USE 3/8"–16–1" BOLTS
USE 3/8"–16–FLANGE NUTS

PLACE THIS LIP FROM END PANELS BETWEEN THE OUTER FACE OF SIDE PANELS AND INNER FACE OF WOOD STRIPS, THEN SNUG TOGETHER AND CLAMP. PLACE BOLTS AS SHOWN

RIGGING INSTRUCTIONS



1. Avoid unnecessary jarring or rough handling.
2. Spreader bars must be used to prevent damage to the unit casing.
3. Care must be taken to keep the unit in the upright position during rigging.
4. Units will have lifting lugs welded and/or bolted to the base when specified.
5. Care must be taken to not damage the watertight seams in the unit casing.
6. Avoid damage to the curb and curb gasket when rigging onto a curb.
7. Only use trained professional riggers when moving equipment.

RIGGING

Proper handling of the equipment is mandatory during unloading and setting it into position.

NOTE: If equipment is not set in its permanent position and is stored on the ground or other unlevel area, proper provisions must be taken for supporting and protecting the equipment. See Long-Term Storage section on the other side.

It is mandatory that the proper spreader bars and hoisting straps be used when rigging. It is also mandatory that an experienced and reliable rigger be selected to handle unloading and final placement of the equipment. Your rigger must be advised that the unit contains delicate components and that it be handled in an upright position. Care must be exercised to avoid twisting the structure.

START-UP PROCEDURE

RECEIVING

Inspect the complete unit for shipping damage. If damage is present, you have the right to either accept or reject the shipment. If the receiving contractor or the receiving agent for the contractor elects to receive the equipment in a damage condition, it then becomes the contractor's responsibility to note the extent of the damage on the delivering freight bill of lading in the presence of the delivering agent (driver) of the delivering freight carrier in accordance with the ICC regulations. It also then becomes the responsibility of the receiving contractor to work with the delivering carrier to have the equipment repaired to the satisfaction of United Metal Products, Inc., so the warranty may remain valid. United Metal Products must also be notified of shipping damage immediately. Be sure to read warranty for further information. United Metal Products will in no way be responsible for any unauthorized back charges due to events or circumstances out of their control which may cause shipping delays.

INSPECTION OF EQUIPMENT—VISUAL

The equipment type and arrangement should be verified as ordered at once when it arrives at the jobsite. When a discrepancy is found, the local United Metal Products Sales Representative must be notified immediately so that corrective action may be investigated, also verify electrical conformance to specifications. Unauthorized alterations and unauthorized back charges will not be recognized by United Metal Products, Inc.

LONG-TERM STORAGE

There is a time limit of one year from date of shipment that any unit may be kept in long-term storage. At the end of the one year period, the unit must be in operation. Rotate the wheel by hand every two weeks to redistribute grease on internal bearing parts.

NOTE: Failure to perform the long-term storage requirements past 60 days from shipment and properly log these required procedures will void the warranty.

CURB INSTALLATION

NOTE: If the unit is installed on grillage, this section will not apply.

The curb will be shipped unassembled. It necessary to assemble it on the jobsite. Each part of the curb is identified with the proper tags and/or markings. It is important the curb be installed level and square.

NOTE: See section under receiving instructions when receiving curbs and inspecting for freight damage and filing of freight damage claims. Any freight damage is the responsibility of the receiving contractor and/or his authorized receiving agent and the delivering carrier.

When installing the curb, obtain a copy of the approved submittal, as each unit and actual curb installation may not be identical.

INSTALLATION AND START-UP SAFETY

- Before installation it is important to be certain the mounting surface will bear the operating weight of the unit. For proper unit operation, it is also important that it be operated in a completely level position.
- Electrical wiring must be installed a safe distance away from any sharp or moving parts (blower wheels, pulleys, sheaves, belts, etc.).
- All guards and/or interlocks, mechanical or electrical, provided by manufacturer must always remain in place to provide needed protection against moving parts.
- Guards must be installed when fan or discharge is within personnel or within seven (7) feet of working level or when deemed advisable for safety.
- All safety devices, panels, and doors of the unit must be installed and remounted as previously mounted before start-up, servicing, or cleaning. **NOTE:** A 5/16" allen key is needed for fan cabinet access.

- Check for leaks.
- Check belt tension.
- Remove shipping blocks.



TO VALIDATE WARRANTY FOR UNITS SHIPPED, THIS FORM MUST BE FILLED OUT FOR EACH UNIT AND RETURNED TO UNITED METAL PRODUCTS, INC. by fax #: (480) 968-9555 or mail, Attn: Ron Dase.

PRE-START CHECKLIST

(Responsibility of Installing Contractor)

NOTE: Please complete & return fax to United Metal Products within 30 days of start-up for warranty validation.
Fax: 480-968-9555

INSTALLER _____ COMPANY _____ DATE _____
MODEL NUMBER _____ SERIAL NUMBER _____ TAG NUMBER _____

- | | |
|---|---|
| <p>Y N NA BLOWER(S)</p> <p>1. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> bearing blocks tight and aligned</p> <p>2. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> bearing concentrics tight</p> <p>3. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> driven pulley and hub tight</p> <p>4. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> remove shipping blocks under isolator and adjust for deflection</p> <p>5. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> set screws in blower hub tight and secure
(NOTE: after two weeks of operation - retighten)</p> <p>MOTOR(S)</p> <p>6. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> mounting bolts tight</p> <p>7. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> electrical connections and cover tight</p> <p>8. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> pulley and hub tight</p> <p>BELTS</p> <p>9. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> guard in place and secure</p> <p>10. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> belts tight and aligned</p> <p>WET SECTION</p> <p>11. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> media clean & in place</p> <p>12. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> pump flow rate adjusted</p> <p>13. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> pump cooling circuit adjusted</p> <p>14. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> flush/bleed tubing secure in overflow</p> <p>15. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> float valve adjusted properly</p> <p>16. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> media with 60° to air entering side</p> <p>17. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> fill and drain actuators operating properly</p> <p>18. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> flush and drain media and sump a minimum of twice before oper. (prevents water carry-over)</p> | <p>Y N NA COILS</p> <p>19. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> secure and sealed tight to wall frame</p> <p>20. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> tighten all coil connections and check for leaks</p> <p>21. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> fins are combed straight after shipping</p> <p>22. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> internal piping and connections insulated</p> <p>ELECTRICAL CONNECTIONS</p> <p>23. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> all electrical connections tight</p> <p>24. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> prove out all door safety switches</p> <p>CABINET</p> <p>25. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> check caulked seams & seals</p> <p>26. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> check door latches for a tight seal and fan access doors secured with provided allen head (5/16") latch</p> <p>27. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> remove isolator tie downs if provided</p> <p>28. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> tighten any bolts or screws that may be loose</p> <p>29. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> all safety devices, panels and doors of unit must be installed and remounted as previously mounted before start-up, servicing or cleaning</p> <p>OPERATION</p> <p>30. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> amps</p> <p>31. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> fan noise</p> <p>32. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> rotation correct</p> <p>33. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> air capacity</p> <p>34. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> vibration</p> <p>35. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> door safety locks closed</p> <p>36. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> all safety devices installed and secure</p> <p>37. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> thermal overloads set properly</p> |
|---|---|

COMMISSIONING RECORD

SUPPLY FAN			AMPS	VOLTS		
A.	L1 _____	L2 _____	L3 _____	L1 - L2 _____	L1 - L3 _____	L3 - L2 _____
B.	L1 _____	L2 _____	L3 _____	L1 - L2 _____	L1 - L3 _____	L3 - L2 _____
Final Overload Setting _____						
Nameplate: Model # _____ Volts _____ Amps _____ HP _____						
RETURN FAN						
A.	L1 _____	L2 _____	L3 _____	L1 - L2 _____	L1 - L3 _____	L3 - L2 _____
B.	L1 _____	L2 _____	L3 _____	L1 - L2 _____	L1 - L3 _____	L3 - L2 _____
Final Overload Setting _____						
Nameplate: Model # _____ Volts _____ Amps _____ HP _____						
OTHER FAN						
A.	L1 _____	L2 _____	L3 _____	L1 - L2 _____	L1 - L3 _____	L3 - L2 _____
B.	L1 _____	L2 _____	L3 _____	L1 - L2 _____	L1 - L3 _____	L3 - L2 _____
Final Overload Setting _____						
Nameplate: Model # _____ Volts _____ Amps _____ HP _____						
PUMPS						
A.	L1 _____	L2 _____	L3 _____	L1 - L2 _____	L1 - L3 _____	L3 - L2 _____
B.	L1 _____	L2 _____	L3 _____	L1 - L2 _____	L1 - L3 _____	L3 - L2 _____
Final Overload Setting _____						
Nameplate: Model # _____ Volts _____ Amps _____ HP _____						

Verify all Amp and Volt readings meet nameplate data

Installer's Acceptance Signature X _____ Date _____

NOTES: _____

United Metal Products, Inc.
1920 E. Encanto Dr., Tempe, AZ 85281
Rev. 5/02

IMPORTANT!

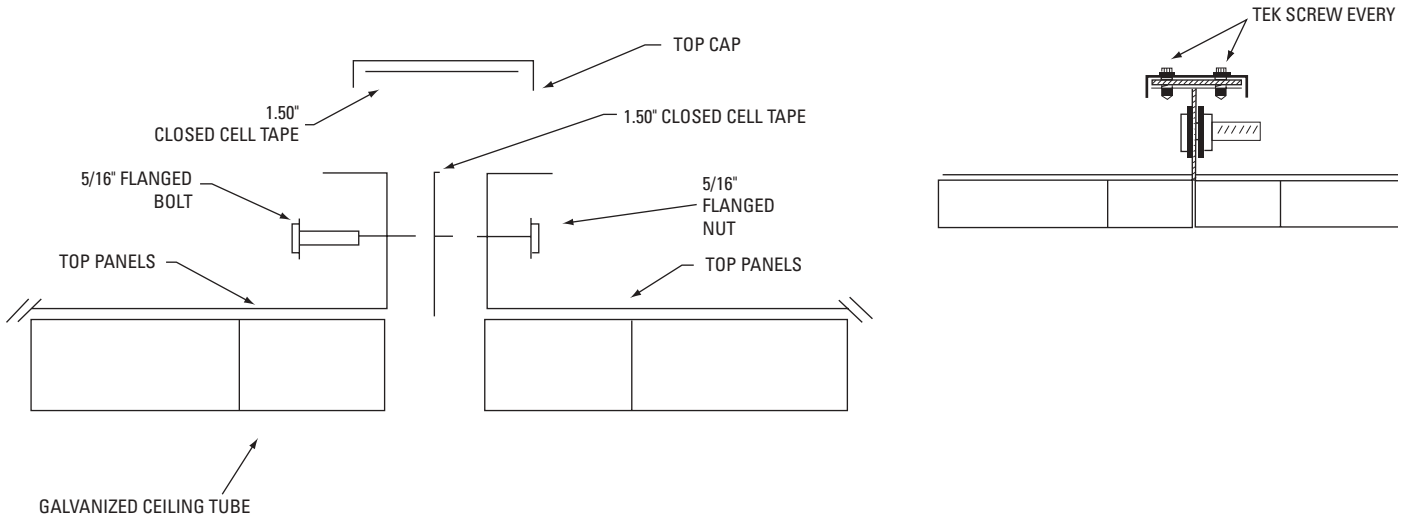
There may be other start-up and safety information included with other components not addressed in this manual.

Please read and follow all start-up and maintenance information carefully.

See Separate Start-Up & Safety Information Regarding:

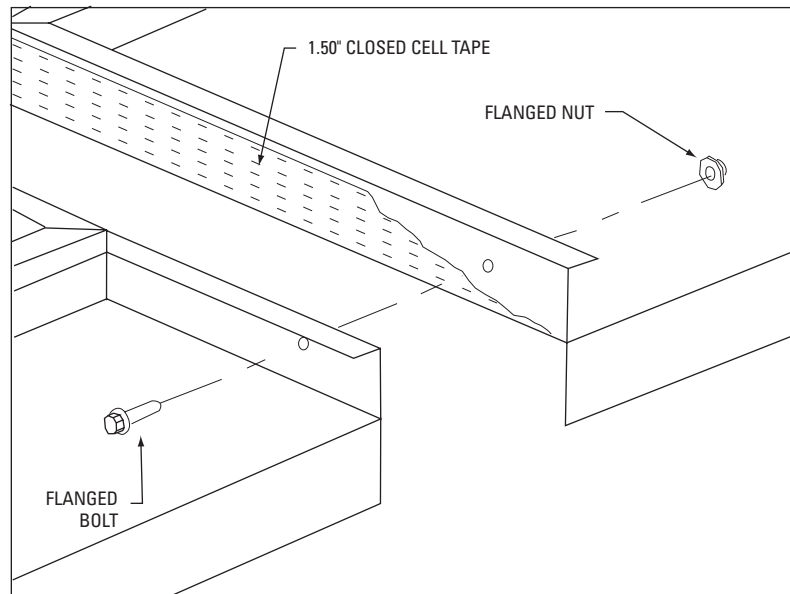
- Furnace
- Compressor
- Condensor
- Pump
- Actuators
- Coils
- Fans
- Filters

DIVIDED MOUNT UNIT ASSEMBLY DETAIL

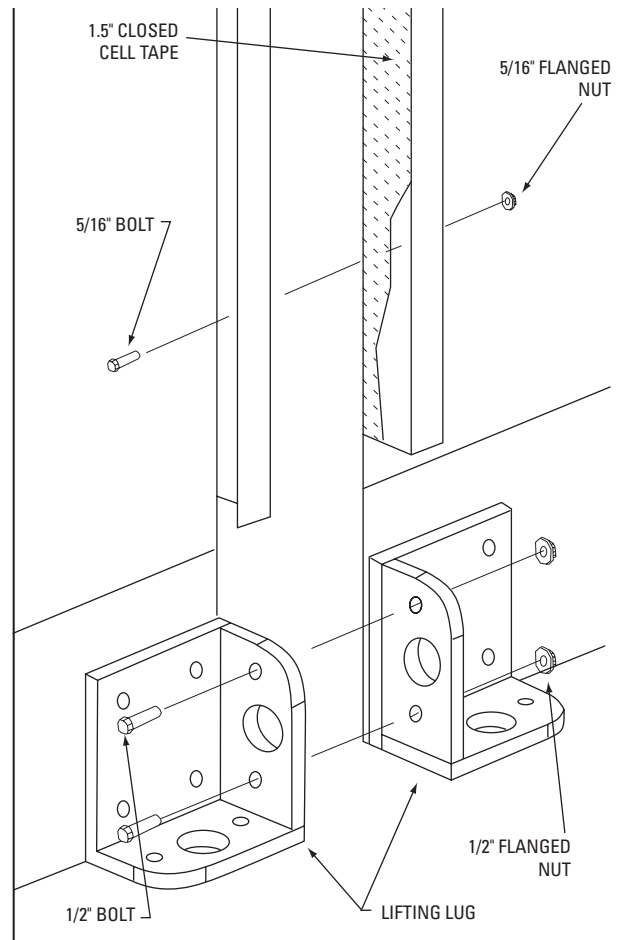
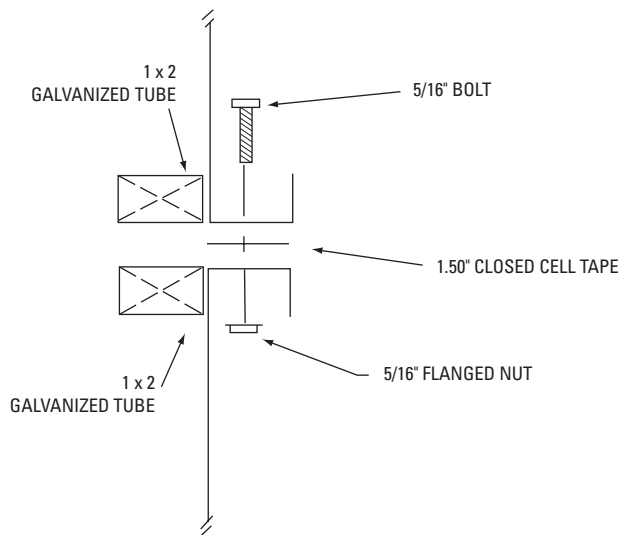


NOTES:

1. 1.50" closed cell tape (supplied by UMP) **MUST** be used between the units to insure a watertight seal.
2. 1.50" closed cell tape (supplied by UMP) **MUST** be used under the top cap(s) to insure a watertight seal.
3. Before applying tape, make sure surface is clean, dry, and free of loose debris (metal filings, paint chips, etc.).
4. Make sure ALL bolts are as tight as possible and that tape is compressed along entire seam.
5. Caulk and seal all remaining holes and gaps.



DIVIDED MOUNT UNIT ASSEMBLY DETAIL



NOTES:

1. 1.50" closed cell tape (supplied by UMP) MUST be used between the units to insure a watertight seal.
2. Before applying tape, make sure surface is clean, dry, and free of loose debris (metal filings, paint chips, etc.).

3. Make sure ALL bolts are as tight as possible and that closed cell tape is compressed along entire seam.
4. Caulk floor water tight after unit is assembled. Tape is compressed along entire seam.

WIRING INSTRUCTIONS

All units come supplied with pre-wired weather tight electric enclosure mounted on the inside of the unit. When wiring the unit from the factory installed electrical box to the outside of the unit, ALL grounding, wiring and materials must be installed in accordance with all current N.E.C. and local codes, and must be performed by a qualified licensed technician. Consult the chart below for proper wire, circuit breaker and fuseable switch. **CAUTION:** Improper wiring, installation or maintenance of equipment may cause electric shock, fire or injury to persons.



SAFETY

Caution: DISCONNECT ALL ELECTRICAL POWER TO THE UNIT BEFORE ATTEMPTING TO INSTALL, OPEN, OR SERVICE YOUR UNIT. IF THE UNIT IS THERMOSTATICALLY CONTROLLED, THE THERMOSTAT IS NOT TO BE USED AS A DISCONNECT AS IT MAY RESET AND START THE UNIT UNEXPECTEDLY.

Caution: Do not exceed the maximum amperage output as stamped on the motor specification plate or motor can overload. Only qualified persons with proper electrical equipment and knowledge should adjust variable pitch sheaves. Do not allow water to get on the motor, as it will burn out the windings.

Caution: Disconnect all the electrical power to the unit and insure that belt is not rotating before adjusting belt tension. Do not adjust belt tension by changing diameter of adjustable sheave. Adjust belt tension only by adjusting motor bracket.

Even while routinely inspecting or servicing the inside, the unit can be accidentally started. Keep children and pets away from the unit and electrical supply when you are working on it.

Do not attempt to perform any part of the installation described in this booklet unless you are FULLY QUALIFIED to do so. All electrical work must meet local codes and must be performed by qualified personnel only.

Full load currents, wire sizes, and switch sizes are based on 1990 NEC. Fuse sizes and circuit breaker trip amperes are appropriate selections, suitable for most installations. Thermal unit selections are not based on NEC currents (see NEC 430-6), but are selected from average full load currents. Thermal units can be more accurately selected using table furnished with starter and full load current marked on motor nameplate.

THREE PHASE MOTOR DATA

FOR 60 Hz, 1800 RPM STANDARD SQUARE LAZE MOTORS (non Design E)	200	150	125	100	75	60	50	40	30	25	20	15	10	7 1/2	5	3	2	1 1/2	1	3/4	1/2	
MINI/COPPER WIRE SIZE (75) THW, THHN, THHW, XHHW-SIZE	552	414	359	285	221	177	150	120	92	78.2	62.1	48.3	32.2	25.3	17.5	11.0	7.8	6.9	4.8	4.4	3.7	2.5
CIRCUIT BREAKER	2-500	2-300	600	400	300	250	200	175	125	110	100	90	60	50	35	20	15	15	15	15	15	15
FUSEABLE SWITCH	—	H326	H326	H325	H325	H325	H324N	H324N	H323N	H322N	H322N	H322N	H322N	H322N	H321N	H321N	H321N	H321N	H321N	H321N	H321N	200
MAGNETIC STARTER	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(208)
MINI/COPPER WIRE SIZE (75) THW, THHN, THHW, XHHW-SIZE	480	360	312	248	192	154	120	104	80	68	54	42	28	22	15.2	9.6	6.8	6.0	4.2	3.2	2.2	1.5
CIRCUIT BREAKER	400	240	250	350	250	225	200	150	110	100	90	80	60	45	30	20	15	15	15	15	15	15
FUSEABLE SWITCH	—	H326	H325	H325	H325	H324N	H324N	H323N	H322N	H322N	H322N	H322N	H322N	H322N	H321N	H321N	H321N	H321N	H321N	H321N	H321N	230
MAGNETIC STARTER	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(240)
MINI/COPPER WIRE SIZE (75) THW, THHN, THHW, XHHW-SIZE	480	360	312	248	192	154	120	104	80	68	54	42	28	22	15.2	9.6	6.8	6.0	4.2	3.2	2.2	1.5
CIRCUIT BREAKER	400	240	250	350	250	225	200	150	110	100	90	80	60	45	30	20	15	15	15	15	15	15
FUSEABLE SWITCH	—	H326	H325	H325	H325	H324N	H324N	H323N	H322N	H322N	H322N	H322N	H322N	H322N	H321N	H321N	H321N	H321N	H321N	H321N	H321N	230
MAGNETIC STARTER	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(240)
MINI/COPPER WIRE SIZE (75) THW, THHN, THHW, XHHW-SIZE	240	180	156	124	96	77	65	52	40	34	27	21	14	11	7.6	4.8	3.4	3.0	2.1	1.6	1.1	0.9
CIRCUIT BREAKER	350	250	225	200	125	110	100	90	80	70	60	40	25	20	15	15	15	15	15	15	15	15
FUSEABLE SWITCH	H365	H365	H364	H364	H364	H363	H363	H363	H362	H362	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	460
MAGNETIC STARTER	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(480)
MINI/COPPER WIRE SIZE (75) THW, THHN, THHW, XHHW-SIZE	240	180	156	124	96	77	65	52	40	34	27	21	14	11	7.6	4.8	3.4	3.0	2.1	1.6	1.1	0.9
CIRCUIT BREAKER	350	250	225	200	125	110	100	90	80	70	60	40	25	20	15	15	15	15	15	15	15	15
FUSEABLE SWITCH	H365	H365	H364	H364	H364	H363	H363	H363	H362	H362	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	460
MAGNETIC STARTER	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(480)
MINI/COPPER WIRE SIZE (75) THW, THHN, THHW, XHHW-SIZE	240	180	156	124	96	77	65	52	40	34	27	21	14	11	7.6	4.8	3.4	3.0	2.1	1.6	1.1	0.9
CIRCUIT BREAKER	350	250	225	200	125	110	100	90	80	70	60	40	25	20	15	15	15	15	15	15	15	15
FUSEABLE SWITCH	H365	H365	H364	H364	H364	H363	H363	H363	H362	H362	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	460
MAGNETIC STARTER	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(480)
MINI/COPPER WIRE SIZE (75) THW, THHN, THHW, XHHW-SIZE	240	180	156	124	96	77	65	52	40	34	27	21	14	11	7.6	4.8	3.4	3.0	2.1	1.6	1.1	0.9
CIRCUIT BREAKER	350	250	225	200	125	110	100	90	80	70	60	40	25	20	15	15	15	15	15	15	15	15
FUSEABLE SWITCH	H365	H365	H364	H364	H364	H363	H363	H363	H362	H362	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	460
MAGNETIC STARTER	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(480)
MINI/COPPER WIRE SIZE (75) THW, THHN, THHW, XHHW-SIZE	240	180	156	124	96	77	65	52	40	34	27	21	14	11	7.6	4.8	3.4	3.0	2.1	1.6	1.1	0.9
CIRCUIT BREAKER	350	250	225	200	125	110	100	90	80	70	60	40	25	20	15	15	15	15	15	15	15	15
FUSEABLE SWITCH	H365	H365	H364	H364	H364	H363	H363	H363	H362	H362	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	460
MAGNETIC STARTER	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(480)
MINI/COPPER WIRE SIZE (75) THW, THHN, THHW, XHHW-SIZE	240	180	156	124	96	77	65	52	40	34	27	21	14	11	7.6	4.8	3.4	3.0	2.1	1.6	1.1	0.9
CIRCUIT BREAKER	350	250	225	200	125	110	100	90	80	70	60	40	25	20	15	15	15	15	15	15	15	15
FUSEABLE SWITCH	H365	H365	H364	H364	H364	H363	H363	H363	H362	H362	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	460
MAGNETIC STARTER	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(480)
MINI/COPPER WIRE SIZE (75) THW, THHN, THHW, XHHW-SIZE	240	180	156	124	96	77	65	52	40	34	27	21	14	11	7.6	4.8	3.4	3.0	2.1	1.6	1.1	0.9
CIRCUIT BREAKER	350	250	225	200	125	110	100	90	80	70	60	40	25	20	15	15	15	15	15	15	15	15
FUSEABLE SWITCH	H365	H365	H364	H364	H364	H363	H363	H363	H362	H362	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	460
MAGNETIC STARTER	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(480)
MINI/COPPER WIRE SIZE (75) THW, THHN, THHW, XHHW-SIZE	240	180	156	124	96	77	65	52	40	34	27	21	14	11	7.6	4.8	3.4	3.0	2.1	1.6	1.1	0.9
CIRCUIT BREAKER	350	250	225	200	125	110	100	90	80	70	60	40	25	20	15	15	15	15	15	15	15	15
FUSEABLE SWITCH	H365	H365	H364	H364	H364	H363	H363	H363	H362	H362	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	460
MAGNETIC STARTER	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(480)
MINI/COPPER WIRE SIZE (75) THW, THHN, THHW, XHHW-SIZE	240	180	156	124	96	77	65	52	40	34	27	21	14	11	7.6	4.8	3.4	3.0	2.1	1.6	1.1	0.9
CIRCUIT BREAKER	350	250	225	200	125	110	100	90	80	70	60	40	25	20	15	15	15	15	15	15	15	15
FUSEABLE SWITCH	H365	H365	H364	H364	H364	H363	H363	H363	H362	H362	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	460
MAGNETIC STARTER	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(480)
MINI/COPPER WIRE SIZE (75) THW, THHN, THHW, XHHW-SIZE	240	180	156	124	96	77	65	52	40	34	27	21	14	11	7.6	4.8	3.4	3.0	2.1	1.6	1.1	0.9
CIRCUIT BREAKER	350	250	225	200	125	110	100	90	80	70	60	40	25	20	15	15	15	15	15	15	15	15
FUSEABLE SWITCH	H365	H365	H364	H364	H364	H363	H363	H363	H362	H362	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	H361	460
MAGNETIC STARTER	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(480)
MINI/COPPER WIRE SIZE (75) THW, THHN, THHW, XHHW-SIZE	240	180	156	124	96	77	65	52	40	34	27	21	14	11	7.6	4.8	3.4	3.0	2.1	1.6	1.1	0.9
CIRCUIT BREAKER	350	250	225	200	125	110	100	90	80	70	60	40</										

TROUBLESHOOTING GUIDE

SYMPTOM	POSSIBLE CAUSES	CORRECTIVE ACTION
EXCESSIVE NOISE AND/OR VIBRATION	<ol style="list-style-type: none"> 1. Defective bearing. 2. Locking collar loose on shaft. 3. Foreign material inside sealed bearing. 4. Sheave not tightened on shaft: (motor or blower). 5. Loose blower. 6. Loose belt. 7. Belts are worn, oily, or dirty. 8. Improper drive selection. 9. Misaligned sheaves. 10. Blower out of balance. 11. Motor or motor base not securely anchored. 12. Bent blower shaft. 13. Bearings dry. 14. Wheel rubbing blower housing. 	<ol style="list-style-type: none"> 1. Replace. 2. Tighten set screw. 3. Replace. 4. Tighten set screw and check alignment. 5. Tighten set screws. 6. Adjust tension. 7. Clean or replace. 8. See individual Model Name Plate for correct drive selection. 9. Realign. 10. Straighten or replace. 11. Secure properly. 12. Replace. 13. Lubricate blower bearings. 14. Inspect blower shaft collars, belt, pulley alignment, and motor mounting.
BLOWER INOPERATIVE	<ol style="list-style-type: none"> 1. Blown fuse or open circuit breaker. 2. Broken belt. 3. Loose sheaves. 4. Electricity turned off. 5. Defective motor. 	<ol style="list-style-type: none"> 1. Replace fuse or reset circuit breaker. 2. Replace. 3. Tighten and check alignment. 4. Contact local power company. 5. Repair or replace.
INSUFFICIENT AIR FLOW	<ol style="list-style-type: none"> 1. Lack of sufficient air exhaust. 2. Blower speed too slow. 3. Belt slippage. 	<ol style="list-style-type: none"> 1. Open window or doors to increase ventilation. 2. Check for proper drive combination. 3. Tighten and check alignment.
ELECTRIC MOTOR CYCLES ON AND OFF	<ol style="list-style-type: none"> 1. Excessive belt tension. 2. Blower shaft tight or frozen. 3. Motor overloaded. 4. Improper pulley sizing on fan unit. 	<ol style="list-style-type: none"> 1. Adjust belt tension. 2. Lubricate blower bearings. 3. Adjust motor to name plate amps. 4. Refer to Individual Name Plate for proper sizes.



LIMITED WARRANTY

UNITED METAL PRODUCTS, INCORPORATED extends this limited warranty to the original buyer and warrants that products manufactured by United Metal Products shall be free from original defects in workmanship and materials for one year from start-up or 18 months from date of shipment (whichever is sooner), provided same have been properly stored, installed, serviced, maintained and operated with bleed-off system properly installed. This warranty shall not apply to products which have been altered or repaired without United Metal Product's express authorization, or altered or repaired in any way so as, in United Metal Product's judgment, to affect its performance or reliability, nor which have been improperly installed or subjected to misuse, negligence, or accident, or incorrectly used in combination with other substances. Warranties on purchased parts, such as electric motors, pumps and pads, are limited to the terms of warranty extended by our supplier (usually one year duration).

LIMITATION OF REMEDY AND DAMAGES: All claims under this warranty must be made in writing and delivered to United Metal Products, Inc., 1920 East Encanto Drive, Tempe, Arizona 85281, within 15 days after the date of shipment by United Metal Products of the product claimed defective, and Buyer shall be barred from any remedy if Buyer fails to make such claim within such period.

Within 30 days after receipt of a timely claim, United Metal Products shall have the option either to inspect the product while in Buyer's possession or to request Buyer to return the product to United Metal Products at Buyer's expense for inspection by United Metal Products. United Metal Products shall replace, or at its option repair, free of charge, any product it determines to be defective, and it shall ship the repaired or replacement product to Buyer FOB. point of shipment; provided, however, if circumstances are such as in United Metal Products judgment to prohibit repair or replacement to remedy the warranted defects, the Buyer's sole and exclusive remedy shall be a refund to the Buyer of any part of the invoice

price, paid to United Metal Products, for the defective product or part.

United Metal Products is not responsible for the cost of removal of the defective product or part, damages due to removal, or any expenses incurred in shipping the product or part to or from United Metal Products plant, or the installation of the repaired or replaced product or part.

Implied warranties, when applicable, shall commence upon the same date as the express warranty provided above, and shall, except for warranties of title, extend only for the duration of the express warranty. Some States do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. The only remedy provided to you under an applicable implied warranty and the express warranty shall be the remedy provided under the express warranty, subject to the terms and conditions contained therein, United Metal Products shall not be liable for incidental and consequential losses and damages under the express warranty, any applicable implied warranty, or claims for negligence, except to the extent that this limitation is found to be unenforceable under applicable state law. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from State to state.

No employee, agent, dealer, or other person is authorized to give any warranties on behalf of United Metal Products or to assume for United Metal Products any other liability in connection with any of its products except in writing and signed by an officer of United Metal Products. Liability shall in no case exceed the unit price of the defect product or part.

TECHNICAL ADVICE AND RECOMMENDATIONS, DISCLAIMER: Notwithstanding any past practice or dealings or any custom of the trade, sales shall not include the furnishing of technical advice or assistance or system design. Any such assistance shall be at United Metal Products' sole option.

WARNING

Our products are designed and manufactured to provide performance, but they are not guaranteed to be 100% free of defects. Even reliable products will experience occasional failure, and this possibility should be recognized by the User. If these products are used in a life support ventilation system where failure could result in loss or injury, the use should provide adequate back-up ventilation, supplementary natural ventilation or failure alarm system, or acknowledge willingness to accept the risk of such loss or injury.

DO NOT USE IN HAZARDOUS ENVIRONMENTS where fan's electrical system could provide ignition to combustible or flammable materials.

NOTE

If any assistance from the factory is needed to check, test, or start-up any UMP equipment, a prevalent rate per day, per

person plus travel, lodging, food, etc., will be paid by the buyer/contractor.

CAUTION

Guards must be installed when fan is within reach of personnel or within seven (7) feet of working level or when deemed advisable for safety.

DISCLAIMER

United Metal Products, Inc. had made a diligent effort to illustrate and describe the products in this literature accurately; however, such illustrations and descriptions are for the sole purpose of identification, and do not express or imply a warranty that the products are merchantable, or fit for a particular purpose, or that the products will necessarily conform to the illustrations or descriptions or dimension.

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