

# INSTALLATION AND SERVICE MANUAL destratification fans

## Model DSU



## **⚠ WARNING**

**Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death, and could cause exposure to substances which have been determined by various state agencies to cause cancer, birth defects or other reproductive harm. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.**

## **IMPORTANT**

**The use of this manual is specifically intended for a qualified installation and service agency. A qualified installation and service agency must perform all installation and service of these appliances.**

## General Information

Installation and wiring of these destratification fans must conform to all applicable local codes and the National Electric Code. Wiring of these destratification fans should only be performed by a qualified electrician.

These destratification fans are listed by ETL as certified. Representative samples of this product have been evaluated by ETL and meet the applicable U.S. and Canada safety standards with components as furnished.

All replacement parts and controls are proprietary in that they have all been designed, tested, and approved for the particular application to insure both physical fit and electrical performance. Any substitution of parts or controls not approved by Modine will be at installer's risk. For replacement parts, submit the unit model number, CFM, and serial number shown on the rating plate attached to the unit.

Do not remove outlet fan guard from destratification fans except to service the unit.

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## Inspection On Arrival

1. Inspect unit upon arrival. In case of damage, report immediately to transportation company and your local Modine sales representative.
2. Check rating plate on unit and motor to verify that power supply and motor specification requirements meet available electric power at the point of installation.
3. Inspect unit received for conformance with description of product ordered (including specifications where applicable).

## SPECIAL PRECAUTIONS / IMPORTANT INSTRUCTIONS

### SPECIAL PRECAUTIONS / IMPORTANT INSTRUCTIONS

THE INSTALLATION AND MAINTENANCE INSTRUCTIONS IN THIS MANUAL MUST BE FOLLOWED TO PROVIDE SAFE, EFFICIENT AND TROUBLE-FREE OPERATION. IN ADDITION, PARTICULAR CARE MUST BE EXERCISED REGARDING THE SPECIAL PRECAUTIONS LISTED BELOW. FAILURE TO PROPERLY ADDRESS THESE CRITICAL AREAS COULD RESULT IN PROPERTY DAMAGE OR LOSS, PERSONAL INJURY, OR DEATH. THESE INSTRUCTIONS SUBJECT TO ANY MORE RESTRICTIVE LOCAL OR NATIONAL CODES.

#### HAZARD INTENSITY LEVELS

1. **DANGER:** Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.
2. **WARNING:** Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.
3. **CAUTION:** Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury.
4. **IMPORTANT:** Indicates a situation which, if not avoided, MAY result in a potential safety concern.

### WARNING

1. Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage.
2. All appliances must be wired strictly in accordance with wiring diagram furnished with the appliance. Any wiring different from the wiring diagram could result in a hazard to persons and property.
3. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% greater than the rated voltage.
4. Do not operate any destratification fan if it malfunctions. Disconnect power at service panel and have fan inspected by a qualified installation and service agency.
5. The fan must be installed properly before use.

### WARNING

1. Verify that the ceiling structure is capable of supporting the weight of the destratification fan(s).
2. Do not add additional weight to the suspended unit.

### WARNING

1. When servicing or repairing this equipment, use only Modine-approved service replacement parts. A complete replacement parts list may be obtained by contacting Modine Manufacturing Company. Refer to the rating plate on the unit for complete unit model number, serial number, and company address. Any substitution of parts or controls not approved by Modine will be at the owner's risk.
2. Do not operate fan if it malfunctions. Disconnect power at service panel and have the unit inspected by a qualified installation and service agency.

### WARNING

TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

1. Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.
2. Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
3. Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of fuel burning equipment to prevent back drafting. Follow the heating equipment manufacturer's guideline and safety standards such as those published by the National Fire Protection Association (NFPA), and the American Society for Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), and the local code authorities.
4. When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.
5. Ducted fans used to exhaust contaminants must always be vented to the outdoors.
6. If this unit is to be installed over a tub or shower, it must be marked as appropriate for the application and be connected to a GFCI (Ground Fault Circuit Interrupter) – protected branch circuit.
7. Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

### CAUTION

1. All literature shipped with this unit should be kept for future use for servicing or service diagnostics. Do not discard any literature shipped with this unit.
2. Be sure no obstructions block air intake or discharge of the appliance.
3. Do not install appliance outdoors or in a location that may expose the unit to direct moisture: mist, rain, water spray, or similar.
4. Do not locate the fan near sources of high temperatures.
5. Do not install DSU type unit fans less than 18 inches from ceiling.
6. The bottom of the fan must be at least 10 feet above the floor.
7. Do not attach duct work, air filters, or polytubes to any appliance.
8. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% less than the rated voltage.
9. Do not reuse any electrical component(s) which has been wet. Such component must be replaced.
10. **READ AND SAVE THESE INSTRUCTIONS**

## SPECIAL PRECAUTIONS / IMPORTANT INSTRUCTIONS

### **WARNING**

Make connections strictly in accordance with wiring diagram furnished with unit. Any wiring differing from this diagram may be hazardous to persons and property.

### **CAUTION**

Do not reuse any electrical component which has been wet. Such component(s) must be replaced.

### **IMPORTANT**

Refer to Table 4 on page 10 for possible remedies when trouble shooting operational issues.

### SI (METRIC) CONVERSION FACTORS

To Convert	Multiply By	To Obtain
Horsepower	746	W
inches	25.4	mm
pound	0.454	kg
°F	$(^{\circ}\text{F}-32) \times 5/9$	°C
CFH (ft <sup>3</sup> /hr)	0.000472	m <sup>3</sup> /min
CFH (ft <sup>3</sup> /hr)	0.00000787	m <sup>3</sup> /s
CFM (ft <sup>3</sup> /min)	0.0283	m <sup>3</sup> /min
CFM (ft <sup>3</sup> /min)	0.000472	m <sup>3</sup> /s
feet	0.305	m

For additional information on Modine destratification fans and other products or accessories, please visit:

[www.modinehvac.com](http://www.modinehvac.com)

## INSTALLATION - LOCATING

### Locating DSU Fans

In locating fans, interference of air streams by equipment, columns, beams, partitions or other obstructions should be avoided as much as possible. Refer to Figure 1 and Table 1 for the dimensions of the DSU fans.

The height at which destratification fans are installed is critical in order to ensure that temperature destratification is optimized. The recommended minimum and maximum mounting heights for DSU fans are listed in Table 2.

It is recommended that the destratification fan bottom be mounted at least 2 ft. above any doorway and at least 10 ft. above the floor.

Additionally, it is recommended that the exterior perimeter of the fan be a minimum of 5 ft. away from any wall, partition, or structure. A minimum of 10 ft. should exist between a destratification fan and any radiant heating or HVAC equipment. The fan should also not be located directly above or below any heating equipment.

When multiple destratification fans are being used, a minimum separation of 10 ft. should be utilized.

The destratification fans should be mounted as close to the ceiling as possible but allow for at least 18 inches of clearance above the top of the fan for servicing purposes. Refer to Figure 1 and Table 1 for the dimensional data.

The number of fans that are recommended is determined by dividing the interior volume of the facility by the CFM rating of the appropriate fan multiplied by 60. As an example, for a medium sized warehouse with a floor space of 450 ft. x 250 ft. and ceiling height of 31 ft., the volume of this space is 3,487,500 ft.<sup>3</sup>. From Table 2, the appropriate size fan for this ceiling height is the DSU 310 that delivers 3100 CFM. The recommended number of fans required for this space to achieve one air turn per hour is equal to 18.75 (3,487,500 ft.<sup>3</sup> ÷ (3100 ft<sup>3</sup>/min x 60 min/hr)), or 19 fans. Figure 2 illustrates a suggested arrangement of destratification fans in this open space along with unit heaters around the perimeter of the building.

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3. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% greater than the rated voltage.
4. Do not operate any destratification fan if it malfunctions. Disconnect power at service panel and have fan inspected by a qualified installation and service agency.
5. The fan must be installed properly before use.

### WARNING

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2. Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
3. Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of fuel burning equipment to prevent back drafting. Follow the heating equipment manufacturer's guideline and safety standards such as those published by the National Fire Protection Association (NFPA), and the American Society for Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), and the local code authorities.
4. When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.
5. Ducted fans used to exhaust contaminants must always be vented to the outdoors.
6. If this unit is to be installed over a tub or shower, it must be marked as appropriate for the application and be connected to a GFCI (Ground Fault Circuit Interrupter) – protected branch circuit.
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### CAUTION

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3. Do not install appliance outdoors or in a location that may expose the unit to direct moisture: mist, rain, water spray, or similar.
4. Do not locate the fan near sources of high temperatures.
5. Do not install DSU type unit fans less than 18 inches from ceiling.
6. The bottom of the fan must be at least 10 feet above the floor.
7. Do not attach duct work, air filters, or polytubes to any appliance.
8. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% less than the rated voltage.
9. Do not reuse any electrical component(s) which has been wet. Such component must be replaced.

### 10. READ AND SAVE THESE INSTRUCTIONS

INSTALLATION - DIMENSIONAL DATA / PLACEMENT / REMOTE STATION

Figure 1 - DSU Fan Dimensions

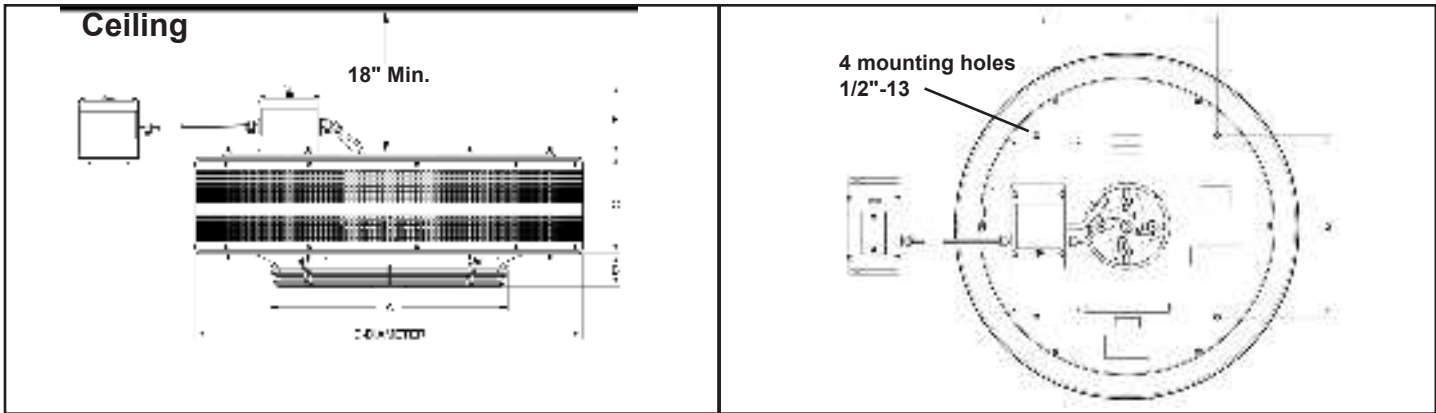
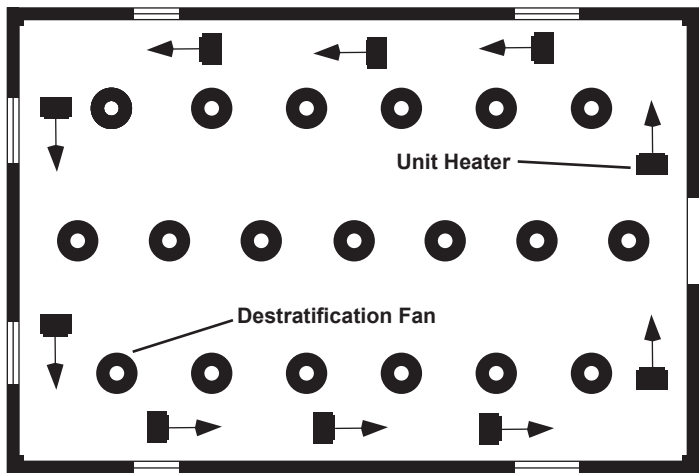


Table 1 - DSU Fan Dimensions (in)

Dimension	DSU310	DSU650
A	21.49	29.51
B	2.97	4.01
C	8.91	13.52
D	35.01	43.59
E	6.36	6.36
F	18.38	18.19
G	18.38	31.51

Figure 2 - DSU Fan Placement



# INSTALLATION - CEILING SUSPENSION / REMOTE STATION

## Ceiling Suspension

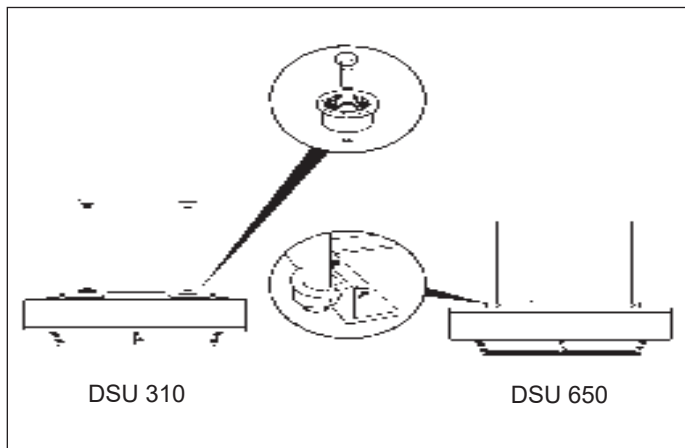
**DSU 310** has four tapped holes (1/2"-13) in the top of the unit for unit suspension. A four-point unit suspension can be made with threaded rods, pipes, or ceiling hanger brackets furnished by others, see Figure 3. For proper operation, the unit must be installed in a level horizontal position. Alternatively, the fans may also be suspended with chains, as shown in Figure 4.

**DSU 650** is equipped with an angle-iron mounting bracket that has eight 5/8" diameter hanger holes permitting hook-hoisting and suspension with cables, if desired. A 1/2" x 3" center U-bolt can be inserted in the two holes at each end of the bracket to accommodate a four-point suspension with four threaded rods, pipes or hanger brackets. It is recommended that a Grade 3 chain be used with a Working Load Limit (WLL) that is at least 2.5 times the unit weight of the fan. The installation must ensure that the chains are suspended vertically and are not angled. Refer to Figures 3 and 4.

## ⚠ WARNING

1. Verify that the ceiling structure is capable of supporting the weight of the destratification fan(s).
2. Do not add additional weight to the suspended unit.

**Figure 3 - Pipe and Threaded Rod Suspension**



**NOTE:** A pipe hanger adapter kit is available as an accessory from Modine. The kit consists of two drilled 3/4" I.P.S. pipe caps and two 1/2"-13 x 1 3/4" cap screws to facilitate threaded-pipe suspension. Two kits are required to pipe-mount a vertical unit.

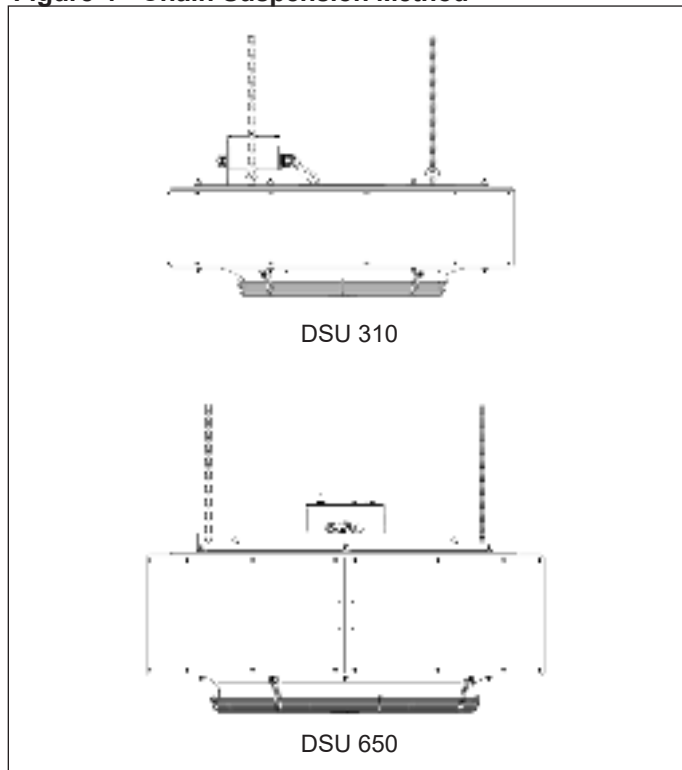
## Remote Station

The Remote Station allows for speed adjustment of up to 10 destratification fans and is powered by 24V supplied through the attached 100 ft Remote Station Cable (see Figure 6). Fan speed is controlled by an industry-standard 0–10V signal or manual adjust knob.

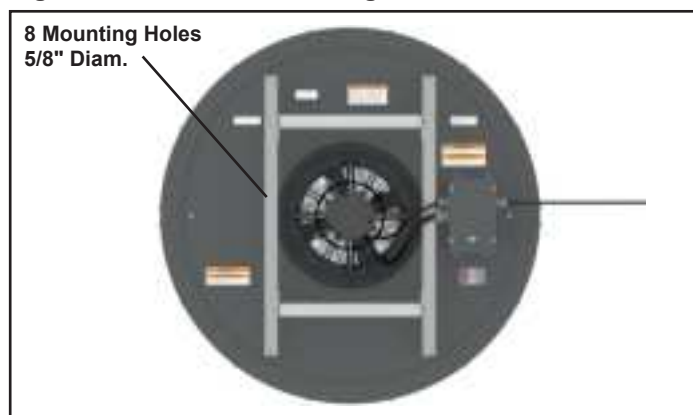
A rocker switch on the left side of the Remote Station controls power to the unit and can be used to stop fan rotation when switched off (refer to Figure 7).

A red power lamp illuminates when the Remote Station's rocker switch is in the ON position (see Figure 8). A green signal lamp provides a visual indication of the current fan speed setting,

**Figure 4 - Chain Suspension Method**



**Figure 5 - DSU 650 Mounting Brackets**



based on a range from 0% to 100%. After a brief pause, the green lamp will flash a sequence: long flashes represent the tens digit, followed by short flashes to represent the ones digit.

For example:

- A motor output of 75% is indicated by seven long flashes followed by five short flashes.
- 100% output is shown as one extra-long flash followed by ten short flashes.
- 0% output is indicated by two extra-long flashes if 0-10V signal is not available.

Fan speed can be manually adjusted using the blue Adjust knob, which is turned with a slotted (flat-head) screwdriver.

The Remote Station enclosure includes four mounting holes at its perimeter, allowing for convenient placement near the fan(s).



# INSTALLATION - DSU FAN TECHNICAL DATA / REMOTE STATION

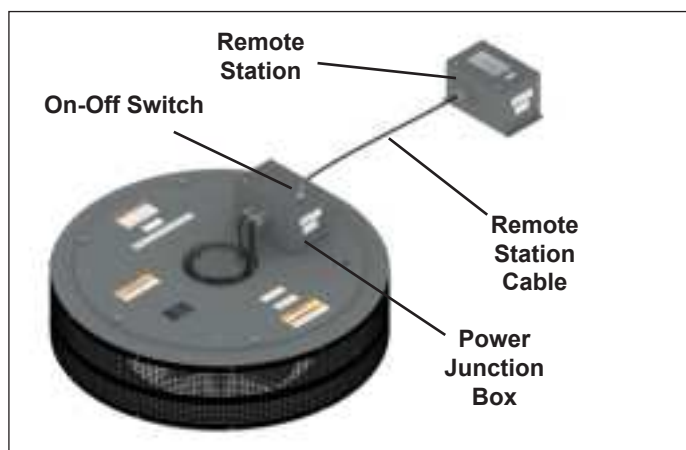
**Table 2 - DSU Destratification Fan Technical Data**

Parameter	Units	DSU 310	DSU 650
Recommended Maximum Ceiling Height	Ft.	72	90
Recommended Minimum Ceiling Height	Ft.	28**	38**
Recommended Minimum Mounting Height*	Ft.	25**	35**
Maximum Air Flow	CFM	3,100	6,500
Discharge Output Velocity	FPM	1,445	1,888
Air Throw Distance at 50 fpm	Ft.	69	87
Air Spread Distance at 50 fpm	Ft.	42	104
Fan Blade Diameter	In.	19	27
Electric Motor, AC DF	HP	1/3	3/4
Maximum Fan Speed	RPM	1,250	1,150
Input Power, Single Phase	V	115/208/230/277	115/208/230/277
Current	A	4.7/3.0/2.8/2.4	9.4/5.9/5.6/4.8
Sound Level @ 15 ft.	dB	61.6	71.0
Unit Weight	Lbs.	47	96

\*Recommended distance between floor and bottom of fan.

\*\*Lower ceiling heights can be accommodated by reducing the fan speed, see Table 3 as a reference for lower CFM settings.

**Figure 6 - Remote Station and Fan Connection**



**Figure 8 - Remote Station Signal Lamps**



**Figure 7 - Remote Station**



# INSTALLATION - WIRING INSTRUCTIONS

## Wiring Instructions

### **⚠ WARNING**

1. Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage.
2. All appliances must be wired strictly in accordance with wiring diagram furnished with the appliance. Any wiring different from the wiring diagram could result in a hazard to persons and property.
3. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% greater than the rated voltage.
4. Do not operate any destratification fan if it malfunctions. Disconnect power at service panel and have fan inspected by a qualified installation and service agency.
5. The fan must be installed properly before use.

All wiring must be done in accordance with the National Electric Code, latest edition, (ANSI/NFPA No. 70) and local codes. Canadian electrical code C22.1 applies in Canada. Provide electric service from a fused disconnect switch to the power junction box on the fan. Appliance wiring diagrams are located outside the power junction box cover.

**Fan:** Each fan must have its own dedicated power supply circuit protected by a fuse or circuit breaker. Refer to Figure 9 for wiring details at the fan's Power Junction Box. A On-Off switch is located on the cover of the Power Junction Box.

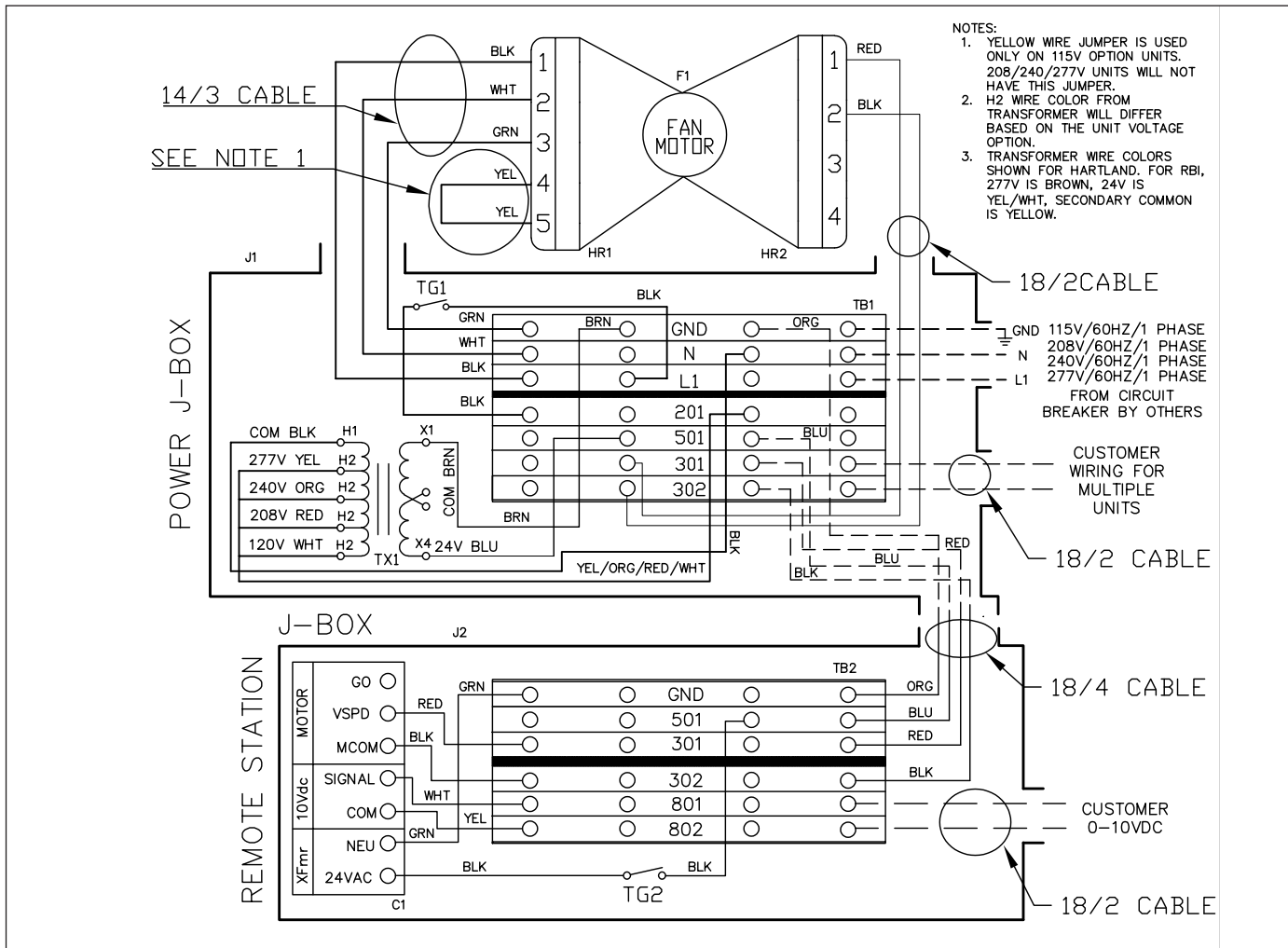
**Remote Station:** The Remote Station connects to each fan using the supplied 100 ft Remote Station Cable, which interfaces at the Power Junction Box located on top of the fan (see Figure 6 and Figure 9 for detailed wiring instructions).

- Connect the red and black wires from the Remote Station Cable to terminal strips 301 and 302, respectively.
- Connect the blue wire to terminal strip 501.
- Connect the orange wire to the ground (GND) terminal strip.

**Note:** it is possible to configure the Remote Station to be controlled by an externally supplied 0 -10V signal in lieu of the manually controlled Adjust.

**Daisy-Chaining (Optional):** The Remote Station can control up to 10 destratification fans. This is accomplished by daisy-chaining the fans in parallel at terminal strips 301 and 302 in each fan's Power Junction Box (see Figure 10). The installer must provide 18 AWG 2-wire cable to make the connections between fans at the time of installation.

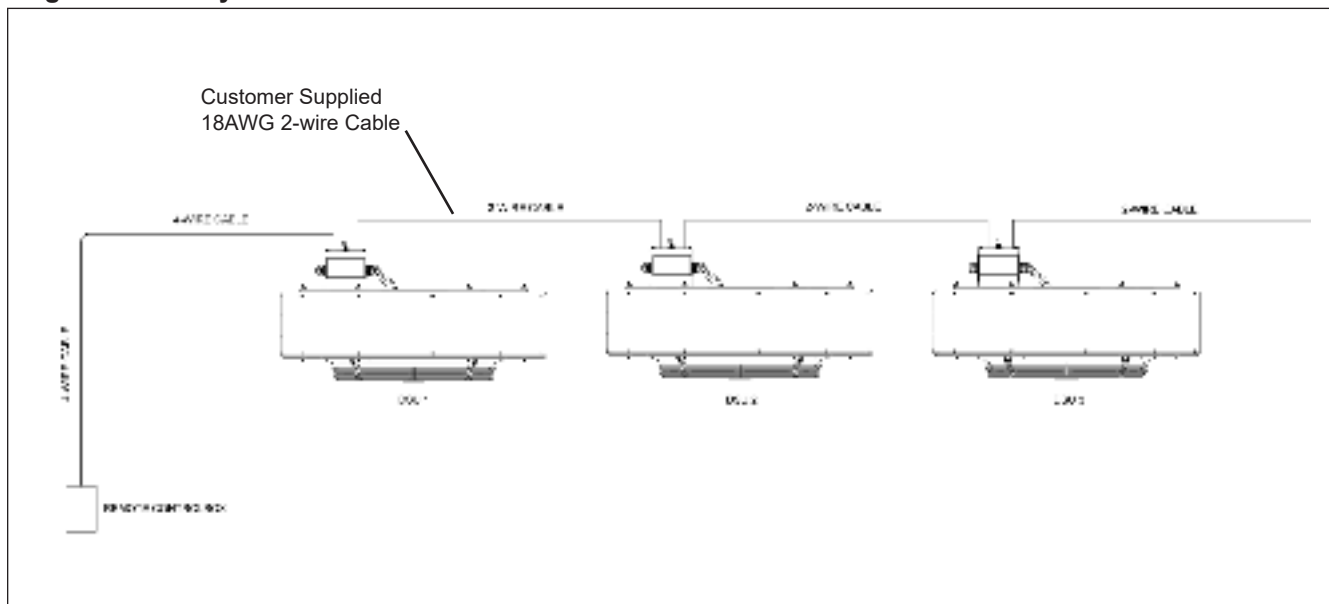
**Figure 9 - DSU Wiring Diagram for Fan and Remote Station**





# INSTALLATION - WIRING INSTRUCTIONS

Figure 10 - Daisy-Chain Fans

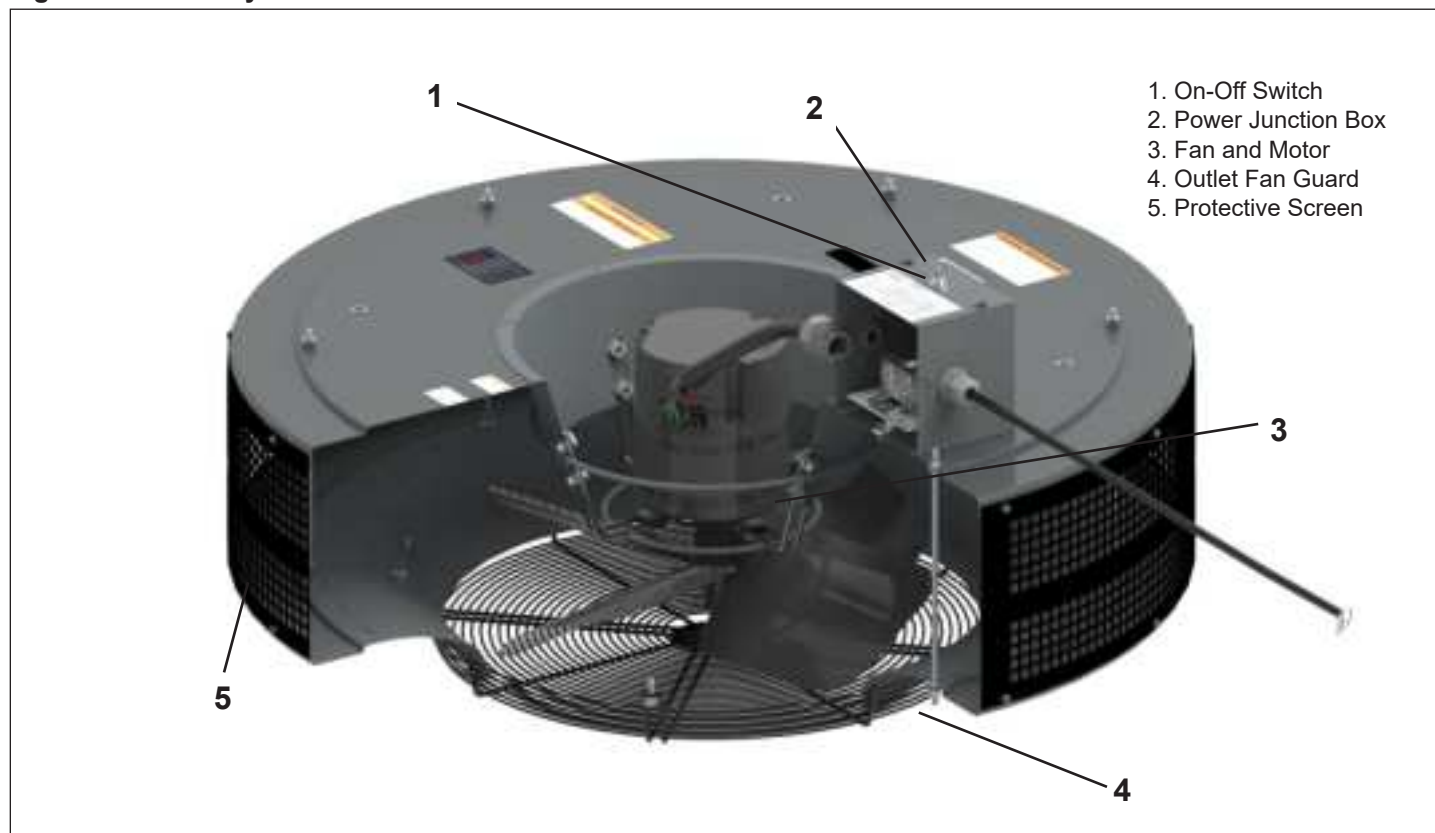


## ⚠ WARNING

Make connections strictly in accordance with wiring diagram furnished with unit. Any wiring differing from this diagram may be hazardous to persons and property.

Any damage to, or failure of Modine units caused by incorrect wiring of the units is not covered by Modine's standard warranty.

Figure 11 - Cutaway of Destratification Fan



# OPERATION

## Prior to Operation

Although this unit has been inspected and tested at the factory, the following procedures should be performed to assure proper on-site operation.

1. Check fan clearance. Fan should not contact casing or fan guard when spun by hand.
2. Check all electrical connections to be sure they are secure, and in accordance with the wiring diagram.
3. Check firmness of unit suspension. Tighten all fasteners, if necessary.

## Initial Start-Up

1. Turn on power to the fan.
2. Ensure Remote Station rocker switch is in the On position, the red Power signal lamp should be illuminated.
3. Adjust fan speed to maximum output: use slotted screw drive for manual Adjust knob and turn fully clockwise or set externally supplied signal to 10V. Confirm all fans connected to Remote Station are operating at maximum output.
4. Turn off power at Remote Station with rocker switch; confirm that all connected fans cease to rotate.
5. Turn rocker switch back to on position and adjust fan speeds to approximately 50% output to confirm speed reduction.

6. Return fan speeds to maximum output or reduce to desired speed if utilizing fans at a lower ceiling height than specified in Table 2. Refer to Table 3 for reference to performance control of fan speeds.

Note: when reducing the fan speed from its highest RPM down to the lowest RPM, the fan speed will not drop to 0 RPMs at the lowest setting with the adjustment knob. If adjusting the fan speed from the lowest setting on the adjustment knob, after powering off the fan(s) and allowing rotation to stop, fan rotation will not begin until the knob is increased above a threshold value.

## Safety Devices

The motor for the circulating air fan has internal thermal overload protection. If for any reason, the motor overheats, the thermal protector will shut it off. The motor will re-start automatically when it has cooled.

**Table 3 - DSU Destratification Performance**

Model	Input Voltage (dVC):	2	4	6	8	10
310	Air Flow (CFM)	1900	2250	2610	2885	3100
	Fan Speed (RPM)	775	920	1060	1150	1250
	Power (W)	161	253	345	449	530
	CFM/W	11.8	8.9	7.6	6.4	5.8
	Sound at 15 Ft. (dB)	50	54	59	61	62
650	Air Flow (CFM)	2980	4140	5100	5900	6500
	Fan Speed (RPM)	510	710	890	1030	1150
	Power (W)	125	310	540	815	1100
	CFM/W	23.8	13.4	9.4	7.2	5.9
	Sound at 15 Ft. (dB)	49	58	64	68	71

## GENERAL MAINTENANCE

### **WARNING**

1. Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage.
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2. Do not operate fan if it malfunctions. Disconnect power at service panel and have the unit inspected by a qualified installation and service agency.

### **CAUTION**

Do not reuse any electrical component which has been wet. Such component(s) must be replaced.

### **IMPORTANT**

Refer to Table 4 for possible remedies when trouble shooting operational issues.

## General Maintenance

Destratification fans, like other electrical and mechanical equipment, will give lasting trouble-free service if properly cared for. Observance of a few simple periodic procedures will insure their satisfactory operation.

Under average conditions, it is recommended that fans be inspected annually, more often in locations where air is contaminated with corrosive fumes, dust, soot, or oil spray. To perform routine maintenance:

1. Disconnect power supply to the unit.
2. Open junction box cover at top of unit and inspect wiring, and tighten connections if necessary.
3. Check motor mounting from bottom of unit. Check fan for proper clearance, free rotation, and firm connection to motor shaft.
4. Lubricate motor according to manufacturer's instructions on motor. When no instructions are on motor, oil every two thousand hours of operation with SAE20 oil for normal applications. Adjust oiling according to usage and atmosphere. Some motors do not have oil fitting. These are lubricated for long life and do not require further lubrication.
5. Routine cleaning of the outer unit casing and protective screen is recommended to remove dirt, grease, or corrosive material that may damage finish. Rusted or corroded spots on top or bottom casing should be sanded and repainted.
6. Clean fan blades and inside casing with either a detergent solution or compressed air.

# TROUBLESHOOTING

Table 4 – Troubleshooting

Problem	Possible Cause(s)	Remedy
Unit does not operate	1. No power to fan 2. No power at Remote Station 3. Incorrect wiring 4 Defective fan motor.	1. Check circuit breaker, On-Off switch. 2. Check rocker switch, On-Off switch, and wiring. 3. Check wiring connections. 4. Replace fan motor.

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# WARRANTY

This Warranty (the "Warranty") shall apply to Products (as defined below) sold by Modine Manufacturing Company, a Wisconsin corporation ("Seller") to you ("Buyer").

Seller hereby warrants that during the Applicable Warranty Period (as defined below) its Products shall be free from defects in material and factory workmanship under normal use and service, subject to the EXCLUSIONS described below and according to the terms outlined in this Warranty.

If Seller receives written notice of a breach of this Warranty prior to the end of the Applicable Warranty Period (which such notice shall include the model and serial numbers of the Product, as well as the date and a reasonably detailed description of the Product's alleged failure), Buyer shall with Seller's prior written approval, return the applicable Product or component thereof to Seller with shipping charges prepaid; if upon examination by Seller such Product or component thereof is disclosed to have been defective, then Seller will, without charge to Buyer, at Seller's option, either repair the Product, replace defective parts in the Product, or offer an entire replacement unit of the Product; provided that the warranty period for a Product that has been repaired or provided with replacement parts shall not extend beyond the original Applicable Warranty Period, nor shall any replacement parts provided for a Product be under any warranty beyond the original Applicable Warranty Period for the Product; similarly, if Seller provides an entire replacement unit of the Product, the warranty period for the replacement unit is limited to the remainder of the original Applicable Warranty Period. Seller shall have no responsibility for installation, service, field labor, shipping, handling, or other costs or charges, except as expressly provided in this Warranty. Buyer shall have no remedy hereunder for any defective part returned without proper written authorization from Seller, as described above.

For purposes of this Warranty and subject to the exclusions described below, the term "Products" shall mean parts or equipment manufactured by Seller, sold to Buyer pursuant to a purchase contract between Buyer and Seller (most often initiated by a purchase order issued by Buyer and accepted by Seller), and expressly described in such contract. The term "Products" shall not include third-party parts or equipment furnished by Seller, except that, to the extent assignable, Seller will assign to Buyer the benefits (together with all limitations and exclusions) of the third-party manufacturer's warranty for such parts or equipment. This Warranty extends only to the original purchase contract between Buyer and Seller and is nontransferable, except that this Warranty may be assigned to an Authorized End User (as defined below). All replaced parts or equipment shall become Seller's property. For purposes of this Warranty, the term "Applicable Warranty Period" shall mean the warranty period set forth in the table below for each type or class of Product described on the table; provided that, when the Product is to be used as a component part of equipment manufactured by Buyer, the Applicable Warranty Period shall be limited to one (1) year after the date of shipment from Seller, notwithstanding anything in the table below to the contrary. For purposes of this Warranty, the term "Authorized End User" shall mean any third-party that purchases the Product directly or indirectly from Buyer for the Authorized End User's own use upon the first installation of the Product and not for resale.

BUYER HEREBY ACKNOWLEDGES THAT ITS REMEDIES FOR BREACH OF THIS WARRANTY, EXCLUSIVE OF ALL OTHER REMEDIES PROVIDED BY LAW, ARE LIMITED AS DESCRIBED ABOVE.

EXCLUSIONS AND LIMITATIONS: This Warranty is subject to the following exclusions and limitations:

The term "Products" shall not include and this Warranty shall not apply to any of the following items: refrigerant gas, belts, filters, fuses and other items consumed or worn out by normal wear and tear.

In addition, this Warranty shall not apply to:

- (1) Products or components thereof that are damaged or adversely affected by conditions beyond Seller's control, including but not limited to polluted or contaminated or foreign matter contained in the air or water utilized for heat exchanger (condenser) cooling or if the failure of the part is caused by improper air or water supply, or improper or incorrect sizing of power supply;
- (2) Any Products or components thereof which have been repaired or altered outside the factory of Seller in any way, or otherwise subject to unauthorized repairs or alterations, so as, in the judgment of Seller, to affect the Product's durability or performance;
- (3) Materials or labor of any kind not furnished by Seller, or any charges for any such labor or materials, whether such labor, materials or charges thereon are due to replacement of parts, adjustments, repairs, or any other work done by any party other than Seller;
- (4) Labor or other costs incurred for diagnosing, repairing, removing, installing, shipping, servicing, or handling of either defective or replacement parts;
- (5) Any Products removed from their original location for reinstallation in another location;
- (6) Any Products or components thereof which have been operated, maintained, or serviced contrary to Seller's written installation, operation, and/or servicing instructions or owner's manual;
- (7) Damages resulting from operation with an inadequate or interrupted supply of air or water;
- (8) Any Products or components thereof which have been subjected to misuse, negligence, faulty installation, improper servicing, accident, excessive thermal shock, excessive humidity, physical damage, impact, abrasion, improper operation, or other operating conditions in excess of or contrary to those for which such equipment was designed;
- (9) With respect to gas-fired or oil-fired units, any Products or components thereof if the input to the Product exceeds the rated input (as indicated on the Product's serial plate) by more than five percent (5%);
- (10) Any Products or components thereof which, in the judgment of Seller, have been installed in a corrosive atmosphere, marine, or coastal application, subjected to corrosive fluids or gases, or damaged or adversely affected by the effects of the physical or chemical properties of water or steam or other liquids or gases used in the Products or any component thereof;
- (11) Damage or failure to start resulting from improper voltage conditions, blown fuses, open circuit breakers, or other

inadequacy or interruption of electrical service or fuel supply; or  
 (12) Any Products or components thereof from which the serial number has been altered, defaced or removed.

BUYER AGREES THAT THE WARRANTIES AND REMEDIES DESCRIBED HEREIN ARE THE ONLY WARRANTIES AND REMEDIES PROVIDED BY SELLER WITH RESPECT TO THE PRODUCTS AND TO THE MAXIMUM EXTENT PERMITTED UNDER APPLICABLE LAW SHALL BE IN LIEU OF AND EXCLUSIVE OF ALL OTHER WARRANTIES AND REMEDIES WHATSOEVER, EITHER EXPRESS OR IMPLIED, WHETHER ARISING FROM LAW, COURSE OF DEALING, USAGE OF TRADE, OR OTHERWISE, **INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT, EACH OF WHICH SELLER HEREBY EXPRESSLY DISCLAIMS.** SELLER NEITHER ASSUMES (NOR HAS AUTHORIZED ANY PERSON TO ASSUME) ANY OTHER WARRANTY OR LIABILITY IN CONNECTION WITH ANY PRODUCTS. REPRESENTATIONS AND CONDITIONS, EXPRESS OR IMPLIED BY STATUTE, TRADE USAGE, OR OTHERWISE, ARE EXCLUDED AND WILL NOT APPLY TO THE PRODUCTS UNDER THIS WARRANTY, EXCEPT FOR WARRANTIES WHICH BY LAW CANNOT BE EXCLUDED

OR LIMITED. Without limiting the foregoing, Seller makes no and specifically disclaims all representations and/or warranties that the Products will detect the presence of, or eliminate, prevent, treat, or mitigate the spread, transmission, or outbreak of any pathogen, disease, virus, or other contagion, including but not limited to COVID 19.

BUYER AGREES THAT IN NO EVENT WILL SELLER BE LIABLE FOR COSTS OF PROCESSING, LOST REVENUES OR PROFITS, INJURY TO GOODWILL, OR ANY OTHER SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES OF ANY KIND RESULTING FROM THE PURCHASE OF THE PRODUCTS, OR FROM BUYER'S USE OF ANY PRODUCT, WHETHER ARISING FROM BREACH OF WARRANTY, NONCONFORMITY TO ORDERED SPECIFICATIONS, DELAY IN DELIVERY, OR ANY OTHER LOSS SUSTAINED BY THE BUYER.

#### OPTIONAL SUPPLEMENTAL WARRANTY

Buyer may purchase from Seller a supplemental warranty with respect to Products which shall extend the Applicable Warranty Period as set forth in the express terms and conditions described in the supplemental warranty agreement. Such supplemental warranty terms may include an additional four (4) years on certain compressors, an additional five (5) years "all parts" warranty, an additional four (4) or nine (9) years on certain heat exchangers, and/or such additional supplemental warranty terms as Seller chooses to make available to its customers from time to time.

COMPONENT	APPLICABLE MODELS		APPLICABLE WARRANTY PERIOD (WHICHEVER OCCURS FIRST)	
			Time from Date of First Beneficial Use by Buyer or Authorized End User	Time from Date of Shipment from Seller
Heat Exchangers and/or Coils	Gas Fired Unit Heaters with Tubular Style Heat Exchangers (e.g. HD, HDS, PTX, BTX, etc)	Aluminized or Stainless Steel	10 YEARS	126 MONTHS
	Gas Fired Unit Heaters with Clam-Shell Style Heat Exchangers (e.g. PDP, BDP, etc.)	Aluminized Steel (not in high-humidity applications)	10 YEARS (must be Stainless Steel in high-humidity applications)	126 MONTHS
		Aluminized Steel (in high-humidity applications)	1 YEAR	18 MONTHS
		Stainless Steel	10 YEARS	126 MONTHS
	Low Intensity Infrared Units		5 YEARS	66 MONTHS
	Indoor and Outdoor Duct Furnaces and System Units, Steam/Hot Water Units, Oil-Fired Units, Electric Units, Cassettes, Vertical Unit Ventilators, Geothermal Units		1 YEAR	18 MONTHS
Burners and Elements	Low Intensity Infrared Units		2 YEARS	30 MONTHS
	High Intensity Infrared and Electric Infrared Units		1 YEAR	18 MONTHS
Compressors	Condensing Units for Cassettes		5 YEARS	66 MONTHS
	Vertical Unit Ventilators, Geothermal Units		1 YEAR	18 MONTHS
Sheet Metal Parts	All Products		1 YEAR	18 MONTHS
Components, excluding Heat Exchangers, Coils, Condensers, Burners, Sheet Metal	All Products		2 YEARS	30 MONTHS

As Modine Manufacturing Company has a continuous product improvement program, it reserves the right to change design and specifications without notice.

