

## WarmFlo Make-Up Air Sensor Temperature Settings

The electric elements are modulated based upon the warm air temperature sensor and the temperature value is selectable by an internal screwdriver switch, 8 positions (Ø to 7).

Each model series or program chip number has a specific temperature range.

Each of the Ø to 7 positions represent a specific temperature value and relate to the table below. The identifying letter is on the chip decal.

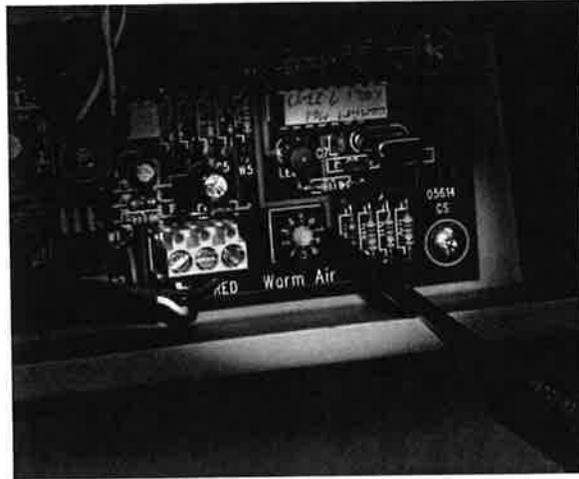


Photo shows small screwdriver for adjusting this step switch.

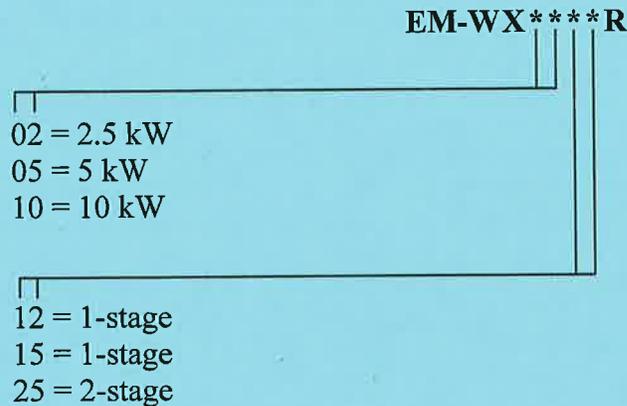
Switch Position	B	C	E	H	D	WFMU	UB
0	96	20	60	88	40	30	0
1	100	25	65	90	52	38	6
2	104	30	70	92	64	46	12
3	108	35	75	94	76	54	18
4	112	40	80	96	88	62	88
5	116	45	85	98	100	80	100
6	120	50	90	100	112	88	112
7	124	55	95	102	124	96	124

Factory default – unless noted at the time of order, the various model series are shipped with temperature group codes shown.

Product Series	Type	Chip P/N	Chip Version	Product Std. Temp. Group
EM-WX0111R	716	9769	11.33	D
EM-WC0*	716	9769	11.32	D
EM-WX0*	716	9769	11.32	D
EM-WC10/WX10	716	9769	12.31	D
EM-WH**	716	9769	12.31	C
EM-WM** (old)	57	9268	5.01	C
EM-WM**	74	9266	3.22	D
WF-CM1	716	9769	11.32	H
HE-A-**	74	9266	2.36	WFMU

# ELECTRIC MAKE-UP AIR

## WITH WARMFLO CONTROLLER



### Specific Application

- Air exchanger, temperature boost
- Make-up air
- Temperature comfort boost

### Comment

This module is a heating element and controller to “temper” the inlet air and bring it to a comfortable level. This unit contains a built in controller with duct sensor to modulate the electric element (part of this unit) using only the required electric energy to reach comfort level. This is more than basic on/off duct heater.

Drawings: **ES907**  
**ES908**  
**ES909**  
**XX017**



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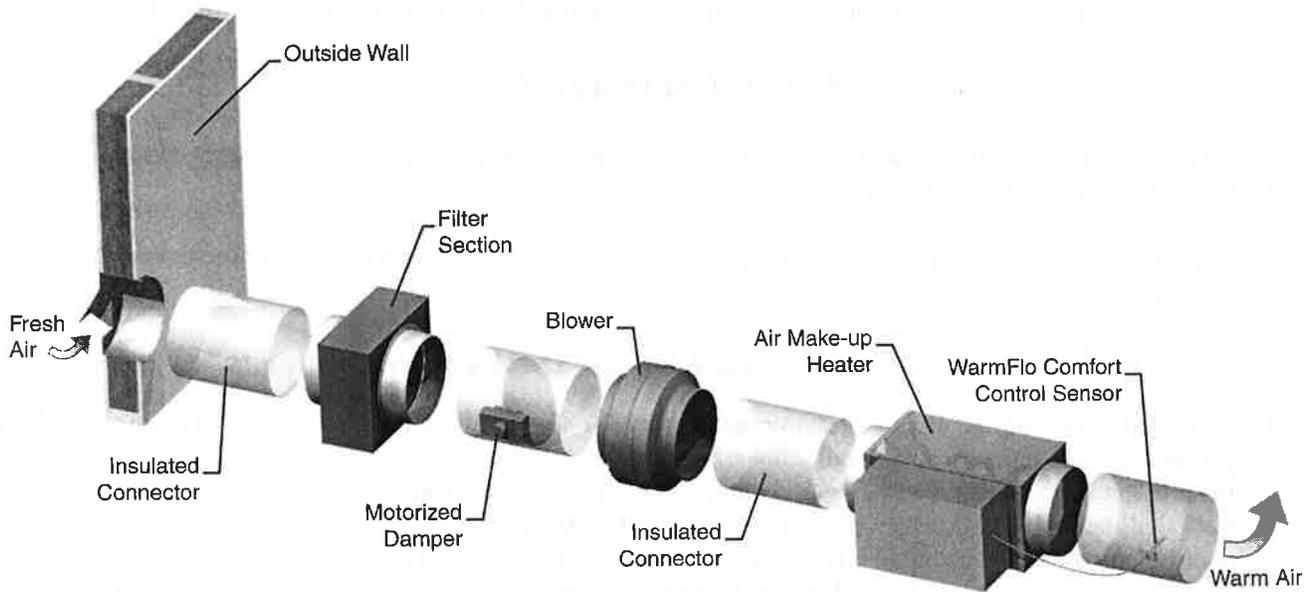
## General

This is a packaged electric element section, using finned rod elements, with a remote sensing control package for modulating the electric elements.

The typical installation arrangement is shown in FIGURE 1.

The element power is standard 240-volt, single phase. Control is simply supplying the two control wires with 24 volts to turn the unit on.

**Caution:** The control contact mechanism for supplying 24 volts to the yellow and black wires must have interlocking devices to assure airflow and the proper opening of any motorized dampers. This unit depends upon an external blower or air moving device providing minimal airflow across the electric elements before “turning the unit on”. Minimum airflow relates to temperature rise needs or design, Table 2 – CFM Chart, provides these CFM numbers.



**FIGURE 1**

**Table 1 Electrical Requirements**

Model	kW*	Btu/h	Nameplate Current*	Duct Collar
EM-WX0212R	2.5	8,500	10.5	8"
EM-WX0515R	5	17,000	21	8"
EM-WX1025R	10	34,000	42	10"

\* Based upon full turn-on or 100% modulation.

**Table 2 CFM Chart**

Temperature Rise Needed		80	70	60	50	40	30
<u>Model number</u>	<u>Watts</u>	<u>CFM</u>	<u>CFM</u>	<u>CFM</u>	<u>CFM</u>	<u>CFM</u>	<u>CFM</u>
EM-WX0212R	2500	99	113	132	158	198	263
EM-WX0515R	5000	198	226	263	316	395	527
EM-WX1025R	10000	395	452	527	632	790	1054

## Installation Requirements

1. All installation work must be performed by trained, qualified contractors or technicians. Electro Industries, Inc., sponsors installation and service schools to assist the installer.  
**Visit our web site at [electromn.com](http://electromn.com) for upcoming service schools.**
2. All electrical wiring must be in accordance with national electric codes and local electric codes, ordinances, and regulations.
3. Observe electric polarity and wiring colors. Failure to observe could cause electric shock and/or damage to the equipment.
4. This unit can only be used for its intended design as described in this manual. Any internal wiring changes, modifications to the circuit board, modifications or bypass of any controls, or installation practices not according to the details of this manual will void the product warranty, the ARL certification label, and manufacturer product liability. Electro Industries, Inc., cannot be held responsible for field modifications, incorrect installation, and conditions which may bypass or compromise the built-in safety features and controls.

## Mechanical Installation

Insert this unit in a round duct arrangement. The air filtering and air moving devices are external to this unit. FIGURE 1 shows a typical arrangement.

**Note:** A minimum of a 24" duct section is required at the outlet for installation of the temperature sensing probe.

### Clearance – Duct Surface Areas, Duct Installation, Etc.

When installed in an "inline" duct or round pipe adapter for a general distribution boost heater or air make-up application, observe the following guidelines:

1. This product must be installed in a metal duct, size of the element rack.
2. There shall be no insulation on the inside of this sheet metal duct section.
3. Any flex-pipe or other insulated pipe must be at least 24" from the electric element.
4. The control box must be positioned so it will not receive water dripping or collection of moisture.
5. See next section on duct sensor installation.

## Duct Sensor

This unit is equipped with a remote temperature-sensing probe. This is a solid state probe (actually mini-micro computer chip at the end of the probe), handle with care.

Suggested installation is in the main warm air stream approximately 20 to 24 airflow inches away from the electric element. Simply drill a ½" hole in the duct, insert probe, and screw in place.

**Comment:** The sensor tip within the tube should be at the end of the tube or slightly extending beyond the tube. If this is not the case, very carefully push the cable (do not grab the sensor tip with pliers) until the sensor tip can effectively sample the warm air.

Coil and tie excess cable. It should be connected to the Red, ST, and COM screw terminals.

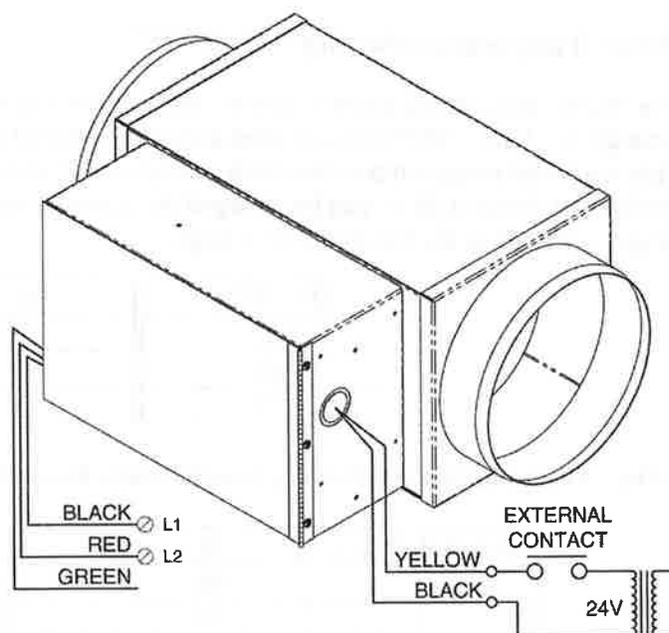
**WARNING** - If the black and red sensor wires are crossed or incorrectly installed at the terminal block and power is turned on, burnout damage can result within the sensor probe.

## Electrical Hookup

**240-volt source** – from the model number and nameplate determine KW size and amp draw. According to local codes, building type, wiring length, etc. use appropriate wiring conductor size and source circuit breaker. Connect to the terminal block.

**Grounding** – route and install appropriate size ground conductor between the ground lug and the building service panel ground bus. This must be a conductor size according to the total amp rating of the appropriate unit. Conduit is not an adequate ground conductor.

**Operation** – this unit “turns on” or heats when 24 volts are applied to the yellow and black wires. Via an external 24-volt transformer or an external transformer applying 24 volts through an interlocking contact (airflow switch, danger end switch, etc., which is necessary to prevent unsafe operation) arrange your control circuit to apply 24VAC power when you want boost heat.



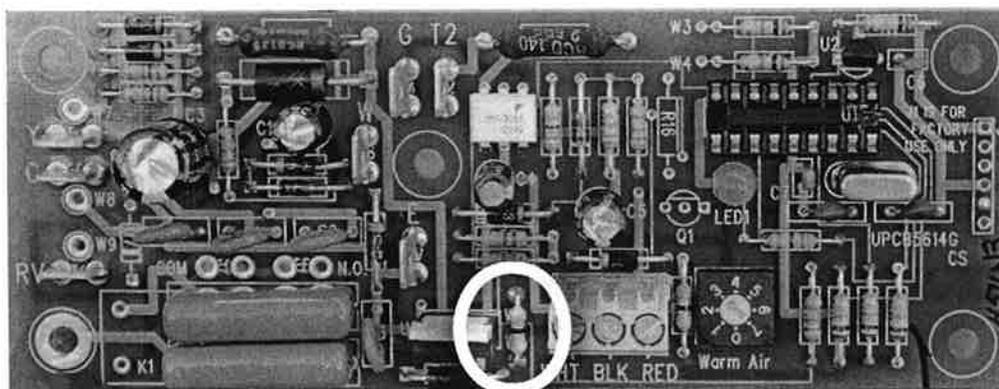
### SUMMER OR COOLING DISABLE

This module must be disabled during the cooling cycle to prevent adding heat to the air conditioning operation.

Select one of the following 3 installation techniques or methods:

- Extend HP reversing valve wire to the designated “RV” tab. If the heat pump logic is “logic high” for heating, cut the W1/W2 resistor on the control board with a side cutter. The location of this resistor is shown below. Review your heat pump’s installation manual to make certain of your heat pump’s reversing valve logic.
- Add a manual (summer) disable toggle switch between “R” and “RV” tab.
- Simply turn off 24ØV breaker during the cooling season.

Method B or C should be used for boost heater applications.



The location of the W1/W2 resistor is circled above.

## Operational Tips

### Outlet Temperature Setting – Code “D”

The inside circuit board contains a screwdriver switch setting marked Ø through 9. This is usable only for Ø through 7. Unless otherwise specified during the time of order, this unit is equipped with a default “D” chip. This is a broad range temperature with settings at 12° steps. If you would like a more precise temperature setting, the “plug-in chip” can be changed for a temperature range selection. Order a specific temperature range chip code as shown on the next page.

Ø = 40°	4 = 88°
1 = 52°	5 = 100°
2 = 64°	6 = 112°
3 = 76°	7 = 124°

**Other Available (Special Order) Temperature Range Chips are as follows:**

Switch Position	B	C	E	H
0	96	20	68	88
1	100	25	72	90
2	104	30	76	92
3	108	35	80	94
4	112	40	84	96
5	116	45	88	98
6	120	50	92	100
7	124	55	96	102

### Sequence (3 or 5KW)

- A. Electric element is on for 20 seconds at the start of each “Y” start call.
- B. Electric element turns off if the temperature is above warm air selected point.
- C. If the temperature drops, the electric element modulates to bring it back to the desired temperature level.
- D. If the electric element is fully on (LED constant), this unit cannot make up the air temperature required between heat pump output and comfort level temperature setting.

### Sequence (10KW)

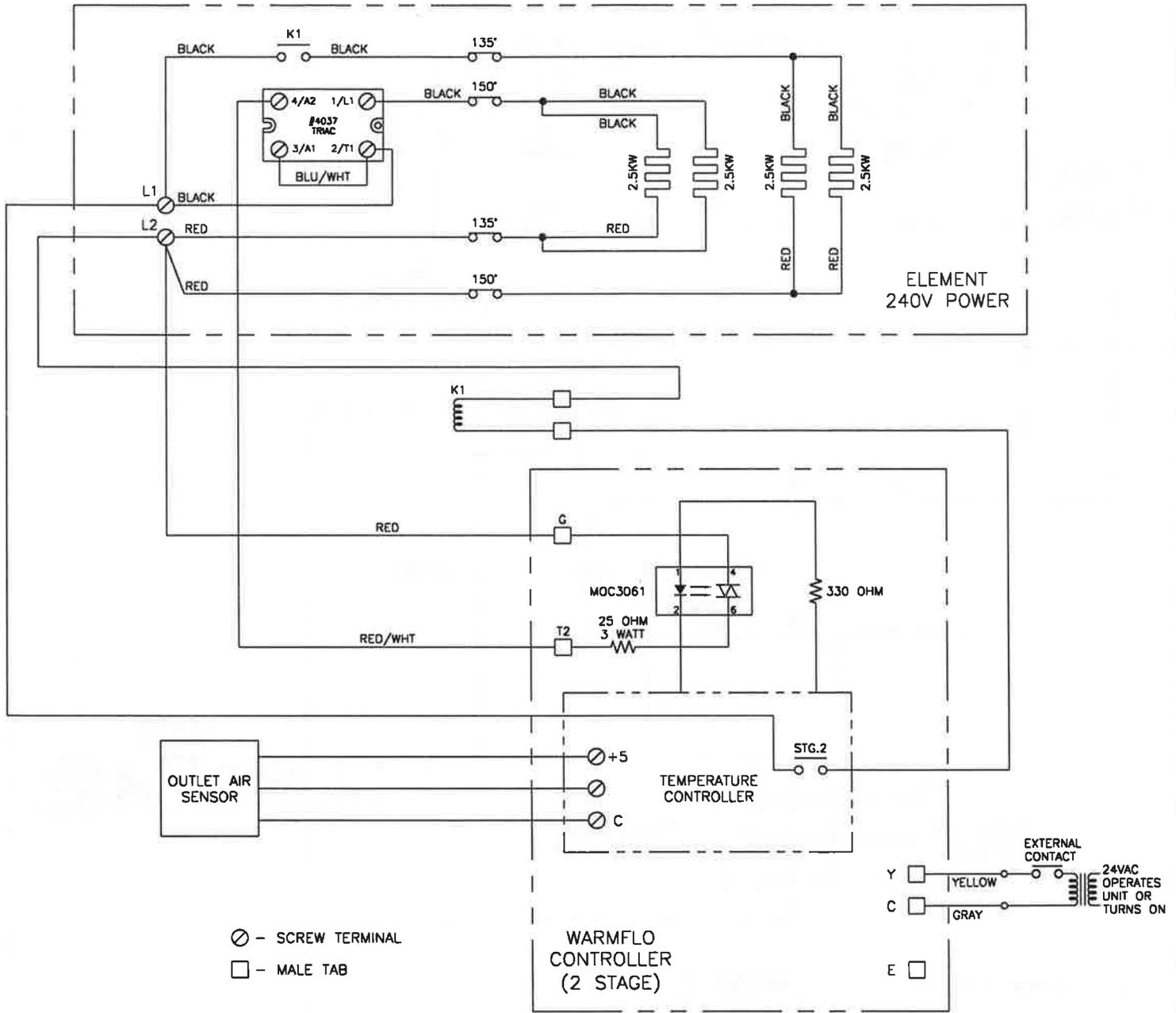
- A - D. Same as above.
- E. If element #1 is on for 10 min. (LED constant), element #2 turns on.

### Checkout and Calibration

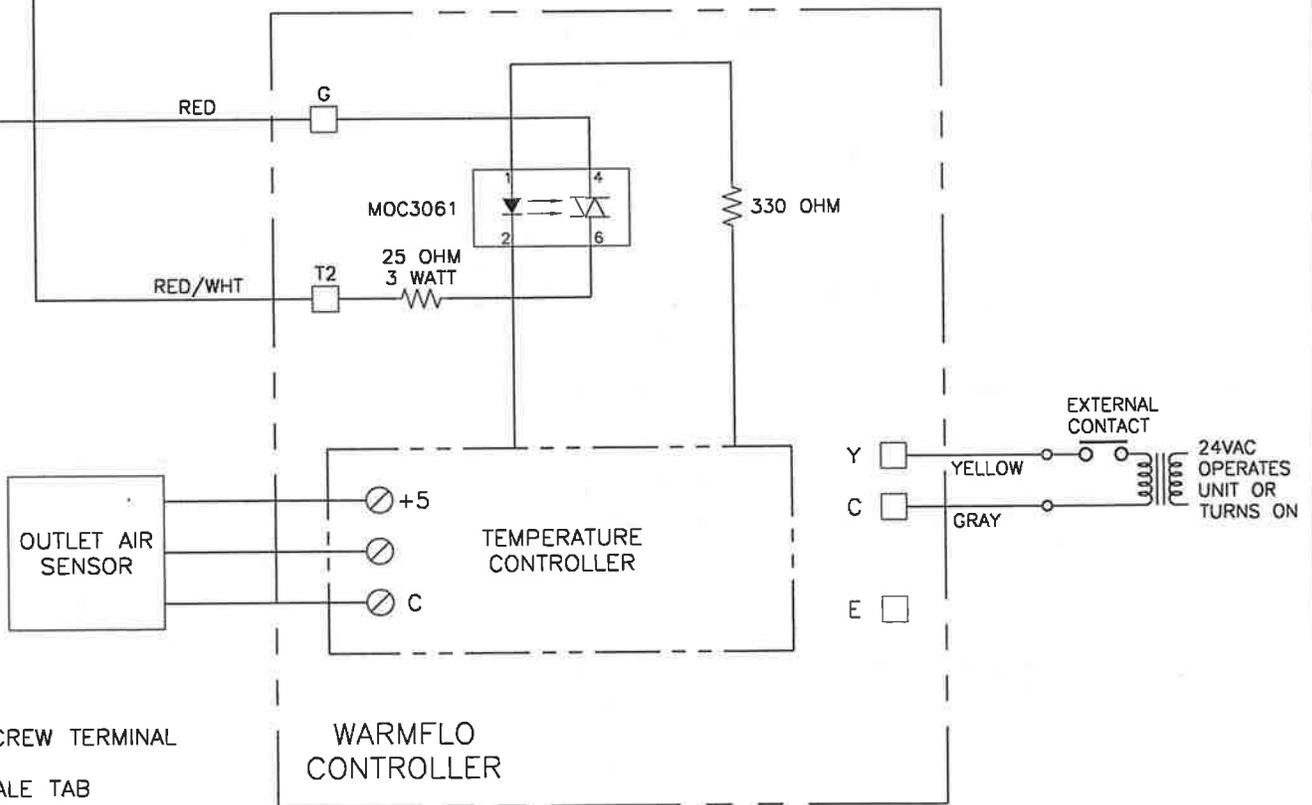
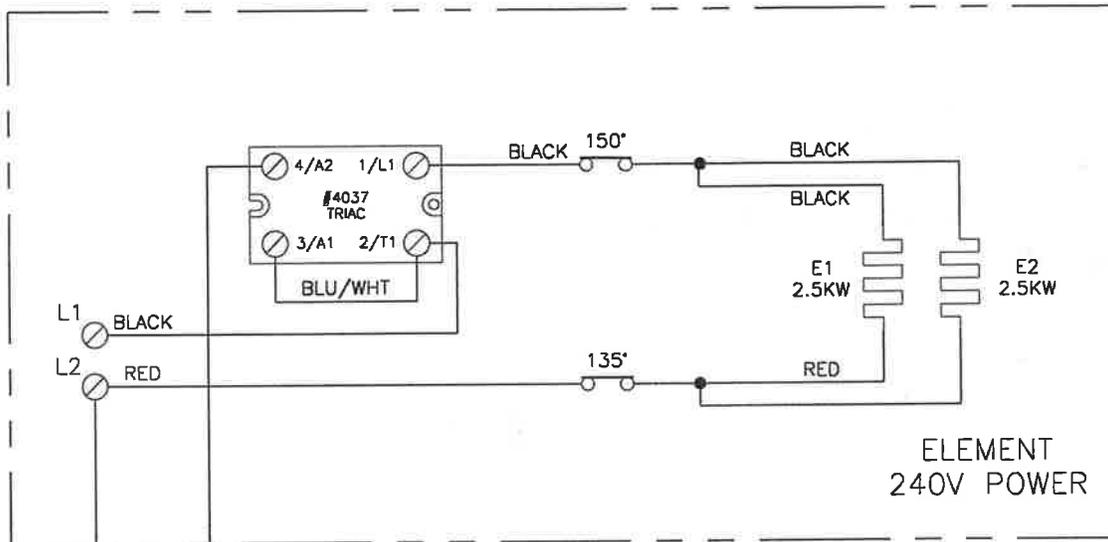
There is no field calibration or adjustments.

Total element turn on can be accomplished by jumpering system “R” (24 volts) to “W” internal terminal. In essence, this bypasses the temperature modulation function and causes the element to be full on.

However, see previous section “Summer or Cooling Disable”.

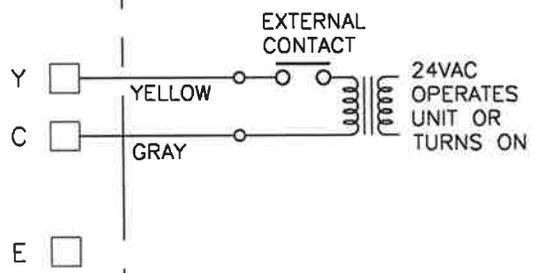
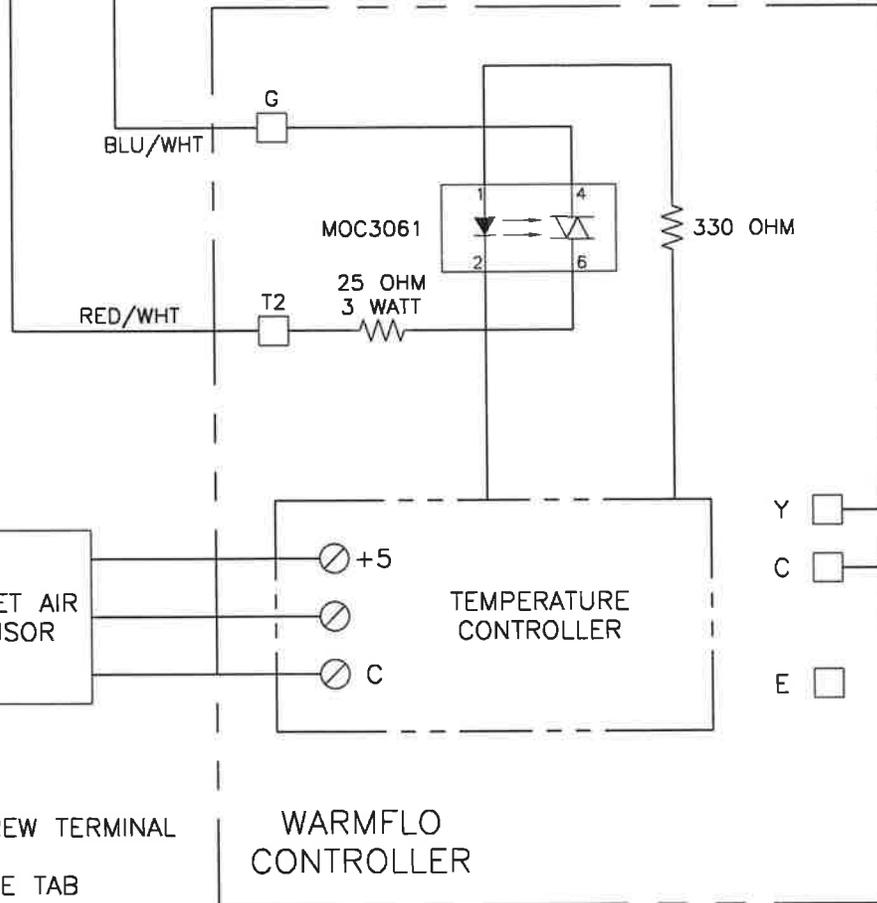
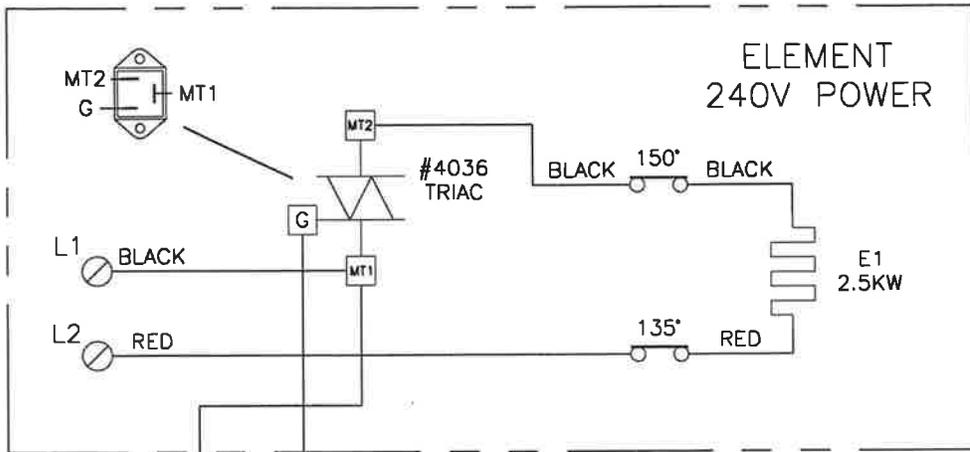


A12-11-12 -107-25-00	ELECTRO INDUSTRIES, INC. MONTICELLO, MN 55362		DESCRIPTION	
	DRAWN		MAKE-UP AIR MODULE 10KW	
	CHECKED		REFERENCE DOCUMENT	
	APPROVED		ES904	
VIEW/DRAWING TYPE		SCALE	PART/ASSY/MODEL NUMBER	
WIRING SCHEMATIC		NTS	EM-WX1025R	
DRAWING STATUS		DOCUMENT DATE	SHEET	DOCUMENT NUMBER
RELEASED		12-11-12	1/1	ES907



○ - SCREW TERMINAL  
 □ - MALE TAB

A112-11-12 -6-24-03	ELECTRO INDUSTRIES, INC. MONTICELLO, MN 55362		DESCRIPTION	
	DRAWN	REFERENCE DOCUMENT	MAKE-UP AIR MODULE (2.5KW, 5KW) EM-WXO(2.5)1(2.5)R	
	CHECKED	VIEW/DRAWING TYPE	SCALE	PART/ASSY/MODEL NUMBER
	APPROVED	DRAWING STATUS	DOCUMENT DATE	SHEET
	MEF	ES905	NTS	EM-WXO*1*R
	RELEASED	12-11-12	1/1	ES908



⊗ - SCREW TERMINAL  
 □ - MALE TAB

B12-11-12 A109-19-03 1-6-26-05	ELECTRO INDUSTRIES, INC. MONTICELLO, MN 55362		DESCRIPTION MAKE-UP AIR MODULE 2.5KW	
	DRAWN MEF	REFERENCE DOCUMENT ES906		PART/ASSY/MODEL NUMBER EM-WX0212R
	CHECKED	VIEW/DRAWING TYPE WIRING SCHEMATIC		SCALE NTS
	APPROVED	DRAWING STATUS RELEASED	DOCUMENT DATE 12-11-12	SHEET 1/1
		DOCUMENT NUMBER ES909		

# **Electro Industries, Inc.**

## **Limited Product Warranty**

**Effective February 5, 2009**

Electro Industries, Inc. warrants to the original owner, at the original installation site, for a period of two (2) years from date of installation, that the product and product parts manufactured by Electro Industries are free from manufacturing defects in materials and workmanship, when used under normal conditions and when such product has not been modified or changed in any manner after leaving the plant of Electro Industries. If any product or product parts manufactured by Electro Industries are found to have manufacturing defects in materials or workmanship, such will be repaired or replaced by Electro Industries. Electro Industries shall have the opportunity to directly, or through its authorized representative, examine and inspect the alleged defective product or product parts. Electro Industries may request that the materials be returned to Electro Industries at the owner's expense for factory inspection. The determination as to whether product or product parts shall be repaired, or in the alternative replaced, shall be made by Electro Industries or its authorized representative. Electro Industries will cover reasonable labor costs to repair defective product or product parts for ninety (90) days after installation.

### **TWENTY YEAR (20) LIMITED WARRANTY ON BOILER ELEMENTS AND VESSELS**

Electro Industries, Inc. warrants that the boiler elements and vessels of its products are free from defects in materials and workmanship through the twentieth year following date of installation. If any boiler elements or vessels are found to have a manufacturing defect in materials or workmanship, Electro Industries will replace them.

### **TWENTY YEAR (20) LIMITED WARRANTY ON SPIN FIN ELEMENTS**

Electro Industries, Inc. warrants that the spin fin elements of its products are free from defects in materials and workmanship through the twentieth year following date of installation. If any spin fin elements are found to have a manufacturing defect in materials or workmanship, Electro Industries will replace them.

### **FIVE YEAR (5) LIMITED WARRANTY ON OPEN WIRE ELEMENTS**

Electro Industries, Inc. warrants that the open wire elements of its products are free from defects in materials and workmanship through the fifth year following date of installation. If any open wire elements are found to have a manufacturing defect in materials or workmanship, Electro Industries will replace them.



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## THESE WARRANTIES DO NOT COVER:

1. Costs for labor for removal and reinstallation of an alleged defective product or product parts, transportation to Electro Industries, and any other materials necessary to perform the exchange, except as stated in this warranty. Replacement material will be invoiced to the distributor in the usual manner and will be subject to adjustment upon verification of defect.
2. Any product that has been damaged as a result of being improperly serviced or operated, including, but not limited to, the following: operated with insufficient water or airflow, allowed to freeze, subjected to flood conditions, subjected to improper voltages or power supplies, operated with airflow or water conditions and/or fuels or additives which cause unusual deposits or corrosion in or on the product, chemical or galvanic erosion, improper maintenance or subject to any other abuse or negligence.
3. Any product that has been damaged as a result of natural disasters, including, but not limited to, the following: lightning, fire, earthquake, hurricanes, tornadoes or floods.
4. Any product that has been damaged as a result of shipment or handling by the freight carrier. It is the receiver's responsibility to claim and process freight damage with the carrier.
5. Any product that has been defaced, abused, or suffered unusual wear and tear as determined by Electro Industries or its authorized representative.
6. Workmanship of any installer of the product. This warranty does not assume any liability of any nature for unsatisfactory performance caused by improper installation.
7. Transportation charges for any replacement part or component, service calls, normal maintenance; replacement of fuses, filters, refrigerant, etc.

## CONDITIONS AND LIMITATIONS:

1. If at the time of a request for service the original owner cannot provide an original sales receipt or a warranty card registration then the warranty period for the product will have deemed to begin thirty (30) days after the date of manufacture and **NOT** the date of installation.
2. The product must have been sold and installed by a licensed electrical contractor, a licensed plumbing contractor, or a licensed heating contractor.
3. The application and installation of the product must be in compliance with Electro Industries' specifications as stated in the installation and instruction manual, and all state and federal codes and statutes. If not, the warranty will be null and void.
4. The purchaser shall have maintained the product in accordance with the manual that accompanies the unit. Annually, a qualified and licensed contractor must inspect the product to assure it is in proper working condition.
5. All related heating components must be maintained in good operating condition.
6. All lines must be checked to confirm that all condensation drains properly from the unit.
7. Replacement of a product or product part under this limited warranty does not extend the warranty term or period.
8. Replacement product parts are warranted to be free from defects in material and workmanship for ninety (90) days from the date of installation. All exclusions, conditions, and limitations expressed in this warranty apply.
9. Before warranty claims will be honored, Electro Industries shall have the opportunity to directly, or through its authorized representative, examine and inspect the alleged defective product or product parts. Remedies under this warranty are limited to repairing or replacing alleged defective product or product parts. The decision whether to repair or, in the alternative replace, products or product parts shall be made by Electro Industries or its authorized representative.

THESE WARRANTIES DO NOT EXTEND TO ANYONE EXCEPT THE ORIGINAL PURCHASER AT RETAIL AND ONLY WHEN THE PRODUCT IS IN THE ORIGINAL INSTALLATION SITE. THE REMEDIES SET FORTH HEREIN ARE EXCLUSIVE.

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