



THERMOLEC

***INSTALLATION
INSTRUCTIONS
FOR FANLESS
MAKE-UP AIR
MODEL NER (USA)***

Please read instructions carefully before installation.

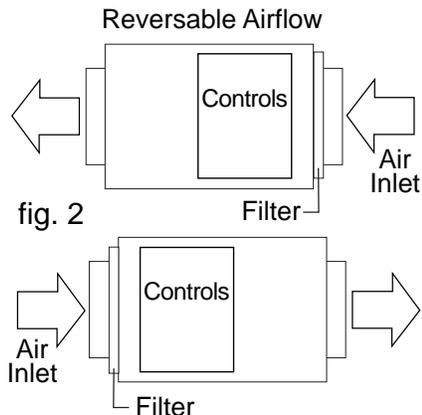
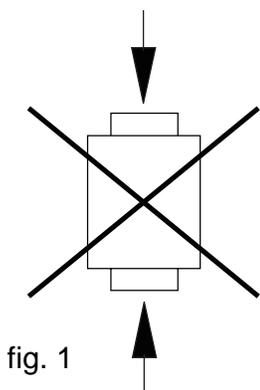
This NER unit is a packaged fan-less fresh air make-up unit with a washable filter, back draft damper and a modulating electric heating section with duct stat and fan relay. One power connection is required to power the unit and another is required to power the separate fan. Please follow the wiring diagram included behind the cover for specific electrical wiring. Thermolec NER make up air units are available in standard sizes up to 42 kW of heat at voltages ranging from 120V single phase to 600V three phase, custom sizes are available upon request. Collar sizes range from 10" to 14". Fan-less make up air models are specified as follows: **NER-collar-kW-voltage/phase**, e.g. a 20kW, 240V (single phase) unit with a 12" collar would be **NER-12-20-240/1**.

NOTE: There is no fan included with this unit. A dry contact is provided to energize a separate fan when there is a call for makeup air.

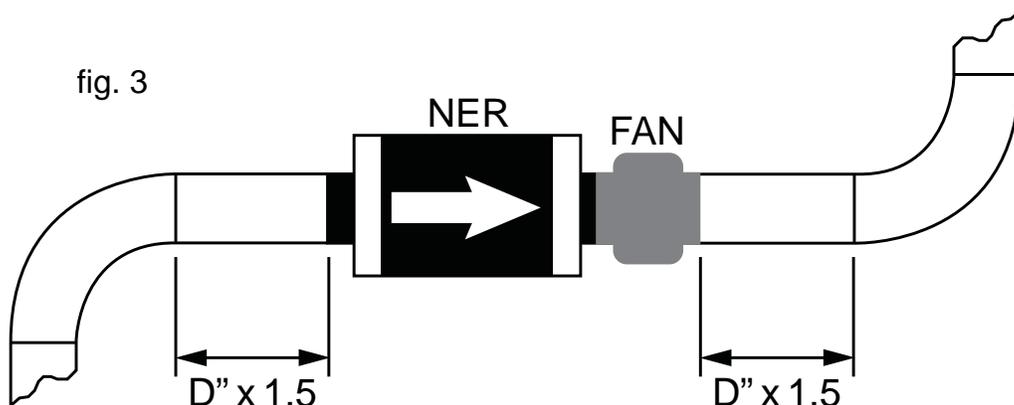
Mechanical installation

Thermolec NER heaters are designed to be installed for horizontal airflow only. The control panel must be on either side of the cabinet and cannot be installed on the top or bottom. **DO NOT install unit vertically** (Fig. 1). This unit is equipped with thermal cutouts on both the top and bottom of the unit which allows it to simply be rotated 180° to change the direction of airflow, as seen in Fig. 2. Before mounting the unit, determine the direction of airflow required and rotate the unit accordingly, as seen in Fig.2.

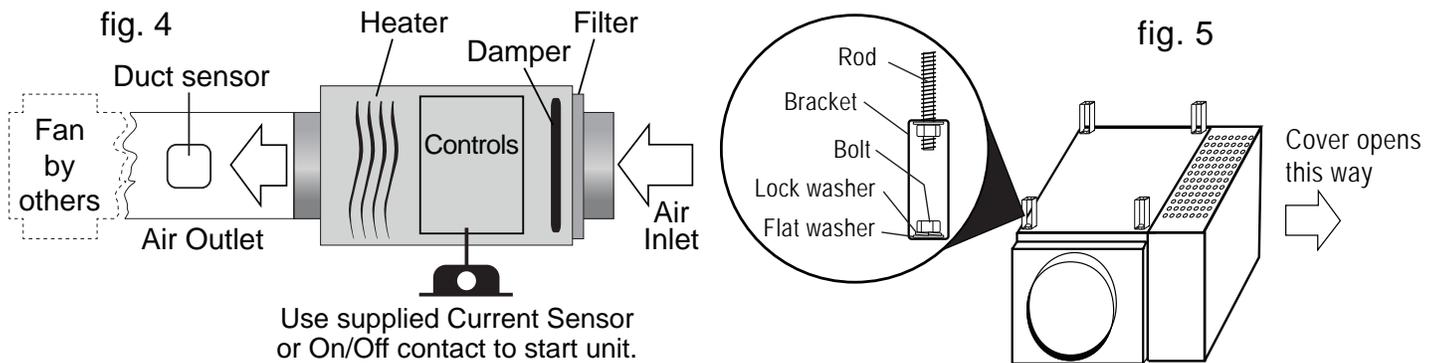
NOTE: This unit is designed to preheat outdoor air and not reheat ambient air.



For proper airflow, a minimum distance between the unit and any elbow must be observed. This distance increases as the duct size increases. To determine the proper distance, multiply the collar size of the unit by a factor of 1.5. For example, a unit with a 12" collar would require elbows to be installed at a distance of not less than 18" (Fig. 3). Use round insulated duct for the inlet connection and uninsulated metal pipe for the outlet while minimizing the use of elbows. When taking air directly from outside, install the inlet duct with a slope away from unit so that condensation or melted snow will not flow into the unit..



Attach the unit to a suitable support allowing a minimum 1/2" clearance above the unit. Always install the unit such that there is sufficient space to remove the cover and the damper assembly if necessary as well as to remove washable filter for cleaning (Fig. 4). The hanger brackets provided (Fig. 5) are designed to be used with threaded rods (not included). Springs may be added to the rods as an option to reduce vibration (not included).



The minimum amount of air required (in cubic feet per minute) to operate the unit is 30 CFM per kW. A 10 kW unit will require 300 CFM. Actual CFM is based on the static pressure in the duct, for best results measure the static pressure and then refer to the documentation from the separate fan.

The unit is shipped with a current sensing relay. The hot leg of the exhaust fan is passed through the current sensor and the contacts are wired with 18-2 AWG wire to L1 and T1 on the unit. When the exhaust fan is running, the current draw signals the current sensor to close L1 and T1 on the NER unit controller. When there is a demand from the current sensor (or any dry contact), the electronic controller will signal the fan relay dry contact to close and start the separate fan. The duct sensor must be installed in the duct downstream from the mini make up air unit for proper operation. Adjust the blue square potentiometer on the D23-TF electronic controller with a small screwdriver to control the output temperature. Use the chart below the potentiometer to convert the temperature from Celsius to Fahrenheit.

If the unit is equipped with an anti-freeze feature a temperature sensor will be connected to the AA terminals. This feature will occasionally cycle the unit at cold temperatures to prevent freezing and the buildup of condensation. Simply remove the wires to disable this feature.

The duct sensor must be be wired to the 'S' 'S' terminals on the D23-TF. The controller monitors the outlet temperature and alerts of abnormal conditions with a flashing light (W) that can be seen on the D23-TF controller, see Table A below. In the event of a unit failure, such as a tripped manual cutout, the controller will shut-down the unit to avoid circulating unheated outside air and the warning LED will start flashing. If for some reason the output temperature is too hot, to avoid a potentially dangerous situation, the controller will also shut-down the unit and flash the warning LED accordingly.

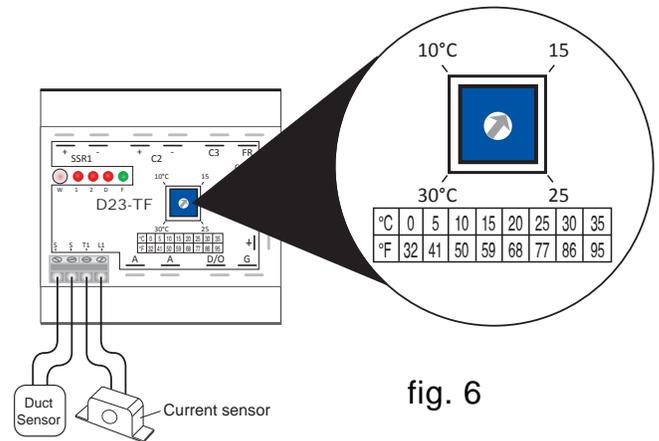


Table A

Number of Flashes	Problem
one	no heat or output temperature too low
two	output temperature too hot

NOTE: Maximum discharge temperature for NER models is 90 °F (32 °C).

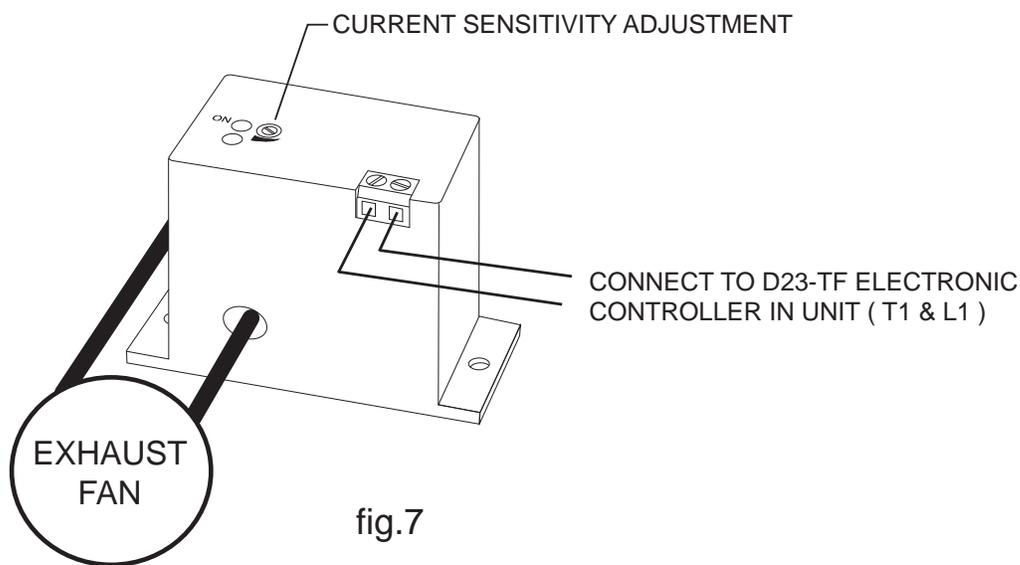
Electrical installation

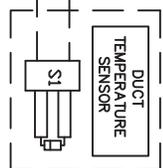
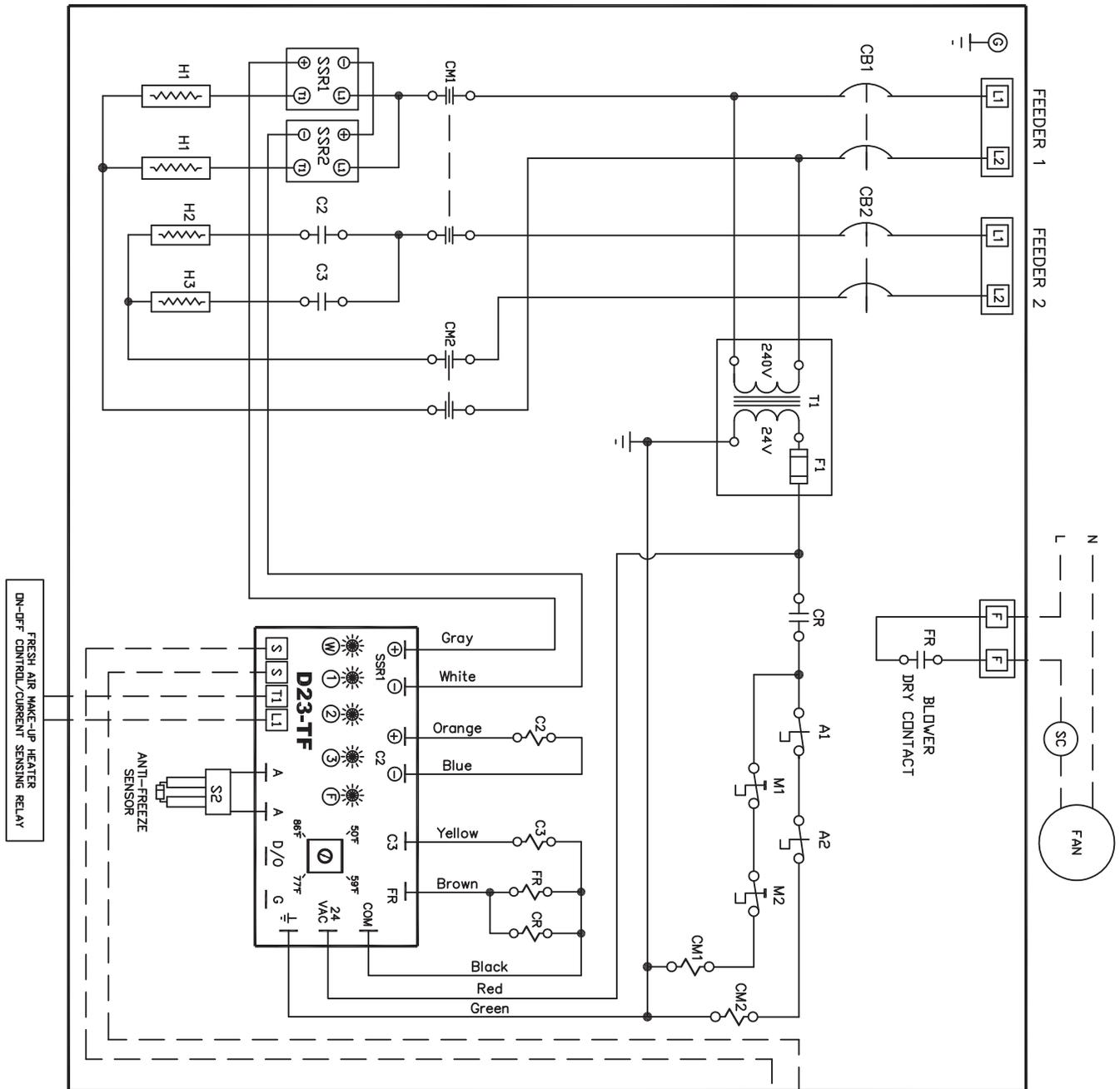
Disconnect all power sources before opening the control box and working within. Please conform to all local and national electrical codes for wiring. The NER unit should be supplied by a separate cable, of appropriate gauge, and with appropriate protection. Use only wires suitable for 75°C. Wires shall be sized accordingly to the Canadian Electrical Code or N.E.C. requirements. All wires must be brought through knock-outs. This unit is equipped with a dry contact to switch on the separate makeup air fan. A separate power supply for the fan must be supplied from the electrical panel.

The MUA fan speed should be adjusted to match the CFM of the exhaust fan.

Current sensor instructions

Use the included current sensor to interlock the mini make up air with an exhaust fan. Simply run one of the power wires of the exhaust fan through the hole in the current sensor (Fig. 7). The lower the setting, the less amperage required to switch the unit on. To avoid excessive running of the NER installed with kitchen hoods equipped with lights, first turn on the lights only and turn the adjustment screw higher until the NER turns off. If the exhaust fan does not turn on the NER, simply turn the adjustment screw lower until the heater starts. For information on connections refer to the wiring diagram included with the mini make-up air.





LEGEND

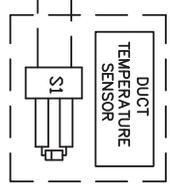
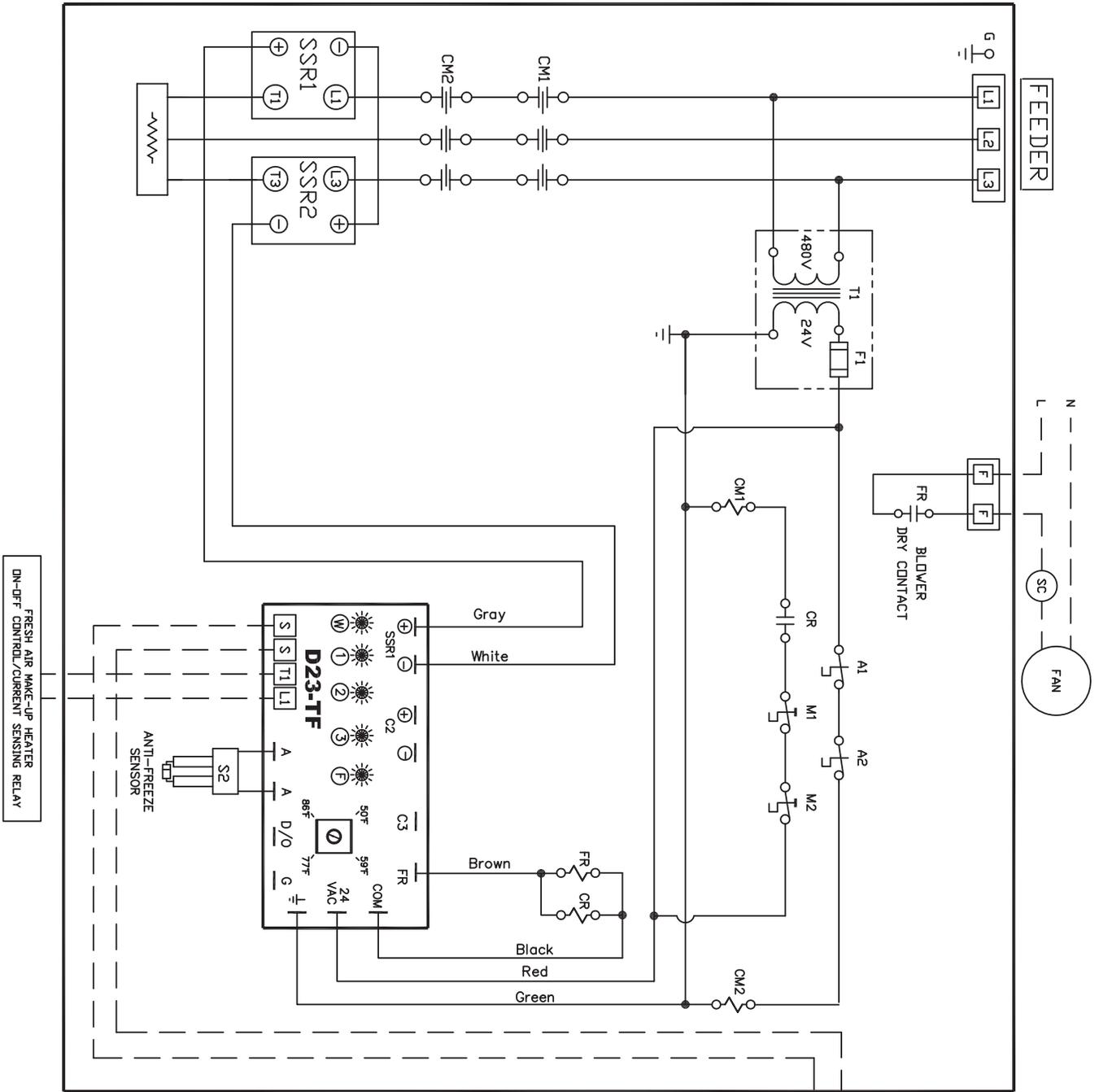
- CM1 Back-up Contactor to Manual
- CM2 Operating Contactor
- C11, C12 Staged Contactors
- D23-TF Solid State Controller
- F Fuse Or Fuse Link
- A1, A2 Automatic Reset Cut Out
- M1, M2 Manual Reset Cut Out
- FR Fan Relay
- SSR Solid State Relay
- T1 Control Circuit Transformer
- S1 Duct Temperature Sensor
- S2 Anti-Freeze Sensor
- CSR Backup Relay
- CR Current Sensing Relay
- C2, C3 Pilot Relay
- CB1, CB2 Circuit Breakers
- SC Speed Controller

IMPORTANT

Wire in accordance with Local Electrical codes. Read instructions carefully before wiring and operating. Frame shown in heavy line represents Thermolec Electric Coil. All wiring outside this frame are "typical external wiring by others."

TYPICAL WIRING DIAGRAMS:

up to 480/3



- LEGEND**
- CM1 Back-up Contactor to Manual Operating Contactor
 - CM2 Solid State Transformer
 - D23-TF Fuse Or Fuse Link
 - F Automatic Reset Cut Out
 - A1, A2 Manual Reset Cut Out
 - M1, M2 Fan Relay
 - FR Solid State Relay
 - SSR Solid State Transformer
 - T1 Control Circuit Transformer
 - S1 Duct Temperature Sensor
 - S2 Anti-Freeze Sensor
 - CR Backup Relay
 - CSR Current Sensing Relay
 - SC Speed Controller

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Maintenance

Even though Thermolec make up air units are designed to operate long term without problems, regular maintenance is needed. This precautionary step will help to keep your installation operating well. Signs of overheating on the heater frame, traces of water or rust on the control box, or other issues should be looked for.

A basic checklist would include:

- Check all fuses
- Check the resistance to ground for each circuit
- Check the resistance phase to phase for each circuit
- Check the tightening of connections at all contactors and heating elements
- Check all contactors

Any defective components should be replaced only with approved original parts.

Washable filter

Disconnect all power sources before doing any maintenance. This unit is equipped with a permanent filter that should be washed at regular intervals. Check the filter after a month of operation. To remove the filter, simply loosen the screw holding the retaining clip and pull on the plastic tab (Fig. 9). If the filter is extremely dirty, increase the frequency of inspection. **Make sure that the filter is dry before replacing.**

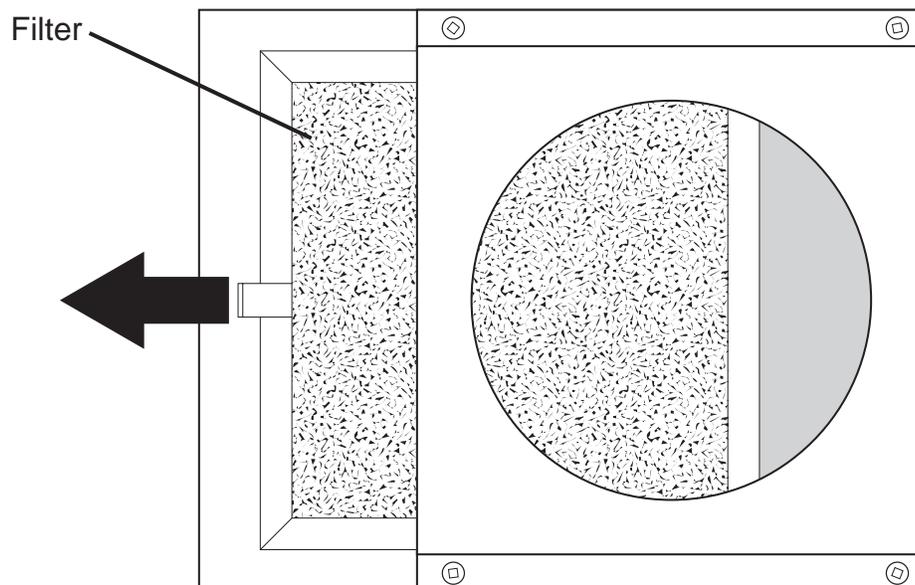


fig. 9

Warranty

1 - **THERMOLEC LTD** guarantees it's heater elements against any defect in workmanship and material for a period of two years and other built-in components for a period of one year, starting from the date of shipment from it's factory.

2 - **THERMOLEC LTD** will repair or replace without charge, in its factory or in the field at its own discretion, the unit or part, which upon manufacturer examination, is considered to be defective.

3 - Misuse of this product, or repairs made by others without **THERMOLEC LTD's** authorization, will void this warranty.

4 - **THERMOLEC LTD** shall not be held responsible for damage or delay and shall not be held liable for any charges resulting from the removal or replacement of the allegedly defective heater.

5 - **THERMOLEC LTD** shall not be held responsible for any incidental or consequential damage or delay due to workmanship or material. No additional charge will be accepted for repair, replacement or modification if prior written authorization was not obtained from **THERMOLEC LTD**.

6 - Any control device or accessory, supplied with the unit, to be mounted or connected remotely, will only be guaranteed by the manufacturer per conditions stated in paragraph 5.

