



## Specialist Control Panels HEATING & VENTILATION

# THYRISTOR ELECTRIC HEATER CONTROL PANEL

### FEATURES

- Door interlocking isolator
- Indication for Panel Live, and individual Run and Trip indicators for the Heater and Supply Fan
- Thermal overload and MCB protection for the Supply fan
- Individual On - Off switches for the Heater, and Supply Fan
- Fire alarm contacts for shutdown in fire situation
- Digital thermostat on panel facia for Heater control
- 2 minute Supply Fan run on timer

### CONNECTIONS

- 1 or 3 Phase Supply fan
- 1 or 3 Phase Electric Heater
- Heater cut-out and Airflow switch
- Fire alarm circuit
- Duct sensor

### DESCRIPTION OF CONTROLS

Panel is designed to control an electric heater battery single or three phase and a single or 3 phase supply fan. The supply fan has an on/off switch on the panel facia, and individual run and trip indicators, the supply fan also has a two minute run on timer. The heater is interlocked with the supply fan, and can only be on when the supply fan is running. Airflow switch and heater cut-out contacts are to be wired in the heater circuit to prevent the heater from running when there is no airflow, or the heater has gone over temperature. The temperature is controlled by the digital thermostat on the panel facia (see separate page for set point adjustment), this monitors the supply air via a duct sensor fitted in the duct at least 2M from the heater battery (see sensor positioning page). The heater can be switched on and off by the facia mounted heater switch, and has run and trip indicator lamps on the panel facia. The control panel is designed to be wired into the buildings fire alarm circuit, this will shut the panel down in the case of a fire.

### RATINGS

Required supply: depends on requirements  
Supply fan: depends on requirements  
Heater battery: depends on requirements

### ENCLOSURE DETAILS

Dimensions: depends on requirements  
Finish: RAL 7035 textured  
Cable entry: Top as standard, state requirements if different  
Weatherproof: No as standard, state requirements if different

### LOOSE SUPPLY ITEMS

Duct sensor

### INSTALLATION INSTRUCTIONS

The control panel is designed for wall mounting in a clean, dry environment where the ambient temperature does not exceed 30°C. A space approximately 50mm should be left around the enclosure to allow for heat dissipation.

Fix the enclosure to the wall using proprietary fixings. Remove the gland plate then drill and gland for necessary cable entry and exits. Replace the gland plate and wire panel in accordance with the wiring diagram.

All wiring must comply with current regulations and be in compliance with the Health and Safety at Work Act.

The information provided in the literature is believed to be accurate (subject to change without notice), however, use of such information shall be entirely at user's own risk.

## ENQUIRIES

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## FAULT FINDING

### CONTROL PANEL NOT WORKING?

The following should only be carried out by a skilled person as defined in bs7671 - wiring regulations

#### ARE THERE ANY LIGHTS ILLUMINATED ON THE CONTROL PANEL?

NO

Check electrical supply to panel and ensure isolator and switches are on. Ensure all M.C.B.S are on and any fuses are not blown.

#### YES, ONLY PANEL LIVE / CONTROL CIRCUIT LIVE

Check switches are on and fire alarm circuit is healthy.

Note: if no fire alarm circuit fitted, a written fire assessment from the responsible person must be obtained and kept with the panel allowing the circuit to be linked out. The fire alarm circuit allows the panel to work and shutdown in a controlled manner.

If there is still no lights on the panel check the time clock, BMS or external switches are all on.

#### WHERE SHOULD THE SENSOR BE POSITIONED?

Check with the system designer

#### FOR SUPPLY AIR TEMP

The sensor should be mounted in the duct at least 2 metres from the heater and as close to the supply grille into the supplied area as possible.

#### FOR HEAT RECOVERY

I.E. Face & bypass damper, heat wheel, recovery damper

The sensor should be mounted in the incoming fresh air supply duct.

#### FOR SPACE TEMP

The sensor should be fitted in a return air duct or use a room sensor.

#### FOR FROST HEATER

The mounting is often limited to the space between the frost and main heater. This sensor may need a cover to protect it from radiated heat and so prevent rapid changes in response.

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## FAULT FINDING

### TRIP OR FAULT LIGHT IS ON

#### FROST STAT OPERATED

Check wiring of frost stat is correct to the circuit diagram

#### HEATER TRIP

Check wiring of airflow switch and heater cutouts

Check fan is running correctly

#### AIRFLOW FAIL FILTER DIRTY

Check wiring of airflow switch is correct to the circuit diagram

Check duct is free from obstructions and fan is running correctly

Check filter is clear

#### FAN TRIP

Check fan size matches overload, then reset overload

Check fan wiring

All faults must be cleared for the controls to function correctly

Fans interlocked with electric heaters will run on after being switched off

### VALVE OR ACTUATOR NOT WORKING

1. Check correct voltage actuator is fitted
2. Double check wiring from panel to actuator

3. Check if actuator operates without valve or damper connected
4. Check ant variable 0-10V signal varies when temperature set point adjusted

### NO CHANGE TO HEAT OR COOL OUTPUT WHEN SET POINT IS ADJUSTED

Check that the correct factory supplied sensors are fitted and are not shorted or open

### OTHER OR UNRESOLVED PROBLEMS

Ensure all wiring is correct and compliant with wiring regulations

Ensure that the panel wiring diagram number is noted and call your supplier

Please note that a skilled person with a test meter must be available when calling

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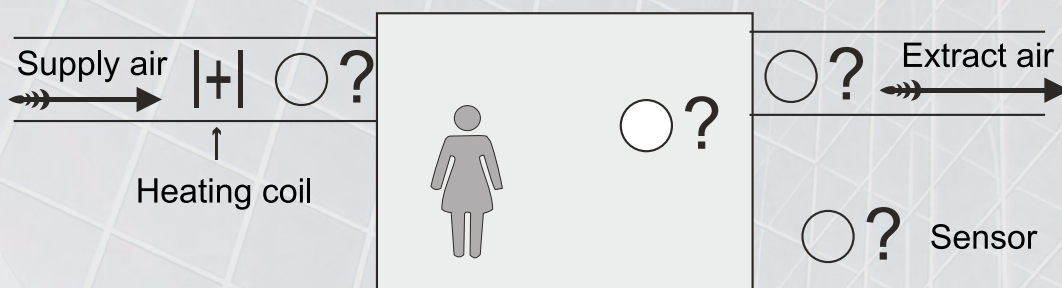
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# THYRISTOR ELECTRIC HEATER CONTROL PANEL

## SENSOR POSITIONING

### DUCT OR SENSOR ROOM



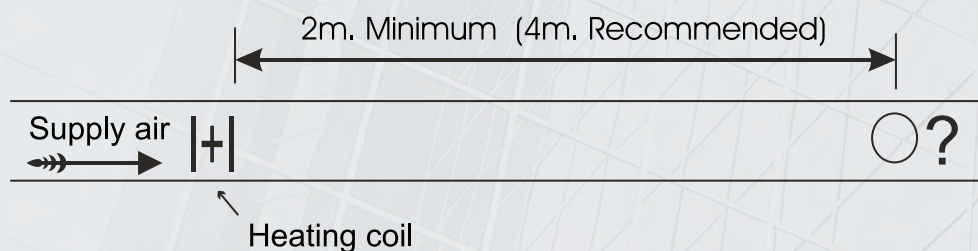
If the supply is for "make up" air, with background heating in the area being served, then a duct sensor should be used. The sensor must be mounted in the supply duct away from direct radiated heat.

The control panel will then maintain a constant duct air temperature by modulating the voltage feed to the heating valve.

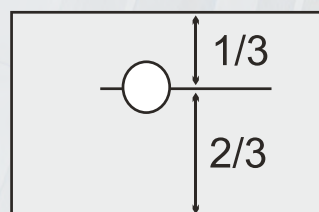
If the supply is for total area heating then a room sensor should be used. In some installations a duct sensor mounted in the extract / recirculation air duct may also be needed.

In this type of installation the system response time is very large and may cause the supply air to enter at very low or very high temperatures for some length of time. In some installations a duct sensor mounted in the extract or recirculation air may be used.

### DUCT SENSOR



### ROOM SENSOR



Position sensor away from direct sunlight, computers and other heat sources.

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# THYRISTOR ELECTRIC HEATER CONTROL PANEL

## AIRFLOW PRESSURE SWITCH INSTALLATION INSTRUCTIONS

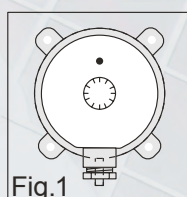


Fig.1

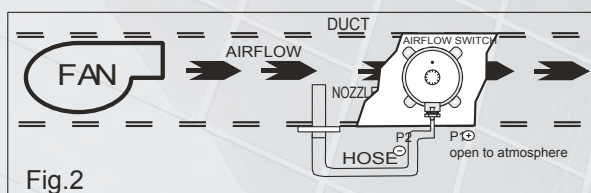


Fig.2

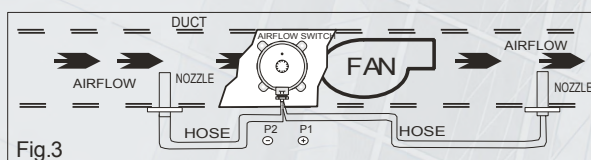
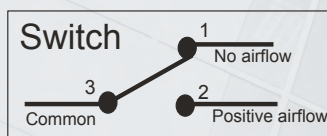


Fig.3

1. Mount the airflow switch on a flat surface ideally in a clean dry environment, but can be mounted externally. Mount the switch in vertical plane so that the nozzles are pointing down (as shown in fig.1).
2. Remove plastic cover from P2 - nozzle of airflow switch, both P1 + and P2 - are now open to atmosphere.
3. Mount nozzle in duct where positive air pressure is to be monitored, and well away from the fan to prevent turbulence (as shown in fig.2).
4. Connect the plastic tube between the nozzle and P2 - nozzle of the airflow switch. Please note this is because air flowing across the nozzle will suck air from the nozzle as a pitot tube.
5. Using a meter check the continuity between terminals 1 and 3 of the airflow switch with no airflow in the duct.
6. Turn the fan on and measure between terminals 1 and 3 of the airflow switch, adjust the switch until continuity is broken. If no switching action is obtained, try repositioning the nozzle to a position where a higher pressure is in the duct, and check the tube is not kinked. Avoid areas where turbulence may occur, ensure the nozzle is at a right angle to the airflow.
7. With the fan still on, check continuity between terminals 2 and 3 of airflow switch.
8. Turn off the fan and measure between terminals 2 and 3, there should be no continuity.
9. If unable to obtain a proper switch operation it may be necessary to fit a nozzle to the negative side of the duct as well, in which case P1 + connects to the fan outlet and P2 - to the fan inlet (as in fig.3).
10. To wire up switch for continuity when airflow is proven, use terminals 2 and 3.
11. Replace cover on airflow switch and use appropriate safety labels if mains voltage is switched.

**N.B. MAXIMUM VOLTAGE 250 VAC MAXIMUM CURRENT 1.5 A RESISTIVE**

**WARNING: SWITCH OFF POWER BEFORE REMOVING PLASTIC COVER.**

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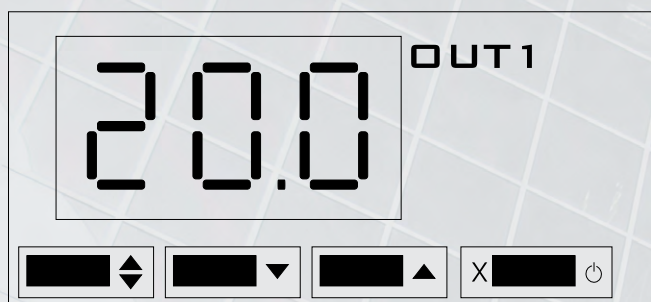




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## 1 STAGE ELECTRONIC CONTROLLER HEATER



### CHANGING THE SET POINT

To change the set point press and hold the  button to display the set point value.

Press and hold the  button whilst pressing either the  or  button to increase or decrease the set point until the desired value is shown on the display.

Release the  button and the new value is stored.

The X button has no function.

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## ELECTRIC HEATER ELEMENT

### CONTROLS

A suitable control system should be installed which must include a timer to **keep the fan running for a period of 2 minutes after the heater has been switched off**, This is incorporated within the control panel.

If a speed controller is being fitted, it **MUST NOT** allow the fan to be turned off independently of the control, nor must it allow the airflow volume to **FALL BELOW** that stated on the heater nameplate.

### TESTING

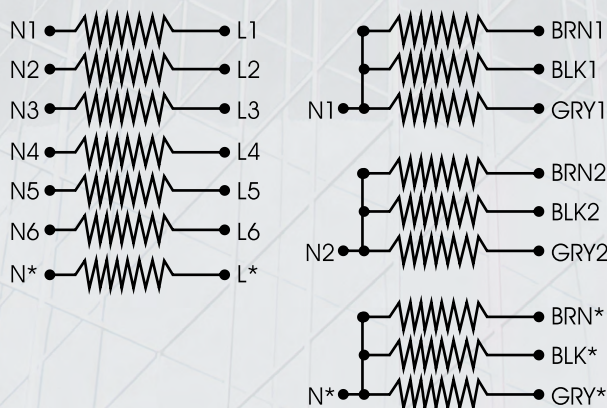
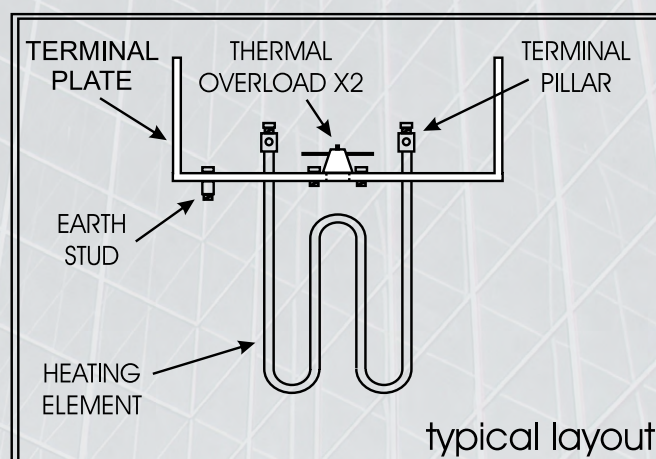
Elements should be tested prior to connecting.

Elements stored in damp conditions may require drying out to achieve the correct insulation levels. Contact the supplier in case of any uncertainty.

### CONNECTION DETAILS

ELECTRIC HEATERS MUST BE WIRED AND INSTALLED IN ACCORDANCE WITH THE FOLLOWING DIAGRAMS AND INSTRUCTIONS.

1. The electrical supply to the heater should be either 1phase or 3phase (with separate neutral), refer to nameplate for clarification.
2. Electrical cables should be of a high temperature, insulated type (i.e. Silicone rubber or fibreglass) and be installed in accordance with current IEE regulations.
3. The heater should be fitted with a manual reset, thermal overload which will break the contacts when the duct temperature exceeds 130°, this should be wired in series with an airflow switch and the operating coil of the heater control circuit.
4. Ensure a suitable earth connection is made to the terminal provided.
5. The element studs are fitted with terminal pillars and care should be taken not to over tighten and cause damage to the elements.
6. Always fit an isolator maintenance of the heater.



Where \* = any number of additional steps

**IMPORTANT: 3PHASE THYRISTOR CONTROLLED HEATER DOES NOT REQUIRE A NEUTRAL CABLE TO BE FITTED.**



**IF IN DOUBT ASK ADVICE FROM YOUR HEATER SUPPLIER**

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