



Specialist Control Panels HEATING & VENTILATION

1 STEP HEATER CONTROL PANEL

INTRODUCTION

The control panel is designed to give a fast and easy installation. External wiring is kept to a minimum.

On site a main supply is connected to the control, then outputs to the fan, heater, safety circuits (heater over temperature, airflow switch) are wired in.

The sensor supplied with the panel can be mounted into the extract or return air duct or, if ordered as a room sensor, in the room itself. It should never be positioned near the heater.

Switches on the panel then allow control of the fan and heater. The heater is interlocked with the fan circuit and can only run with the fan switched on.

All outputs to the fan and each heater element are protected by MCB's.

The whole panel can be controlled via a 7 day time clock to turn on or off in a controlled manner.

SWITCH ON AND TEST PROCEDURE

1. Ensure panel is securely fixed in a safe position.
2. Check all wiring especially cable sizes and in heater terminal box (High Temperature Sleeved).
3. Carry out electrical safety tests including earth loop impedance and insulation resistance and record results.
4. Check all safety switches and interlocks are correctly set.
5. Check sensor is correctly positioned.
6. Switch fan on. 'Fan Run' indicator will illuminate.
7. Check fan rotation and airflow.
8. Switch fan off. Fan will stop.
9. Switch fan on then switch heater on. Fan and heater run indicators will illuminate. Check heater is giving correct output.
10. Select temperature required.
11. Switch fan off. Heater and fan should turn off.
12. Ensure end user is familiar with controls.

INSTALLATION INSTRUCTIONS

The panel is designed for wall mounting in a clean, dry environment where the ambient temperature does not exceed 30 C.

A space of approximately 50mm should be left around the enclosure to allow for heat dissipation.

Fix enclosure to the wall using proprietary fixings.

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.

When cables are connected to the heater elements special high temperature cable or high temperature sleeving must be used.

Temperatures in heater terminal boxes may exceed the safe limits of even high temperature p.v.c. (105 C).

The sensor should be positioned in the return or extract air duct or if a room sensor is used it should be mounted out of direct sunlight or other heat sources approximately 2/3 of the way up the wall.

PROBLEM SOLVING

PROBLEM	SOLUTION
No Fan Run indicator illuminated	Check: power supply and fan MCB
No Heater Run indicator illuminated	Check: fan is running - check heater switch is in 'on' position Check heater MCB. Airflow pressure switch not operated or heater high temperature cut-out operated. Switch off and reset heater high temperature cut-out and investigate reason for failure

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.

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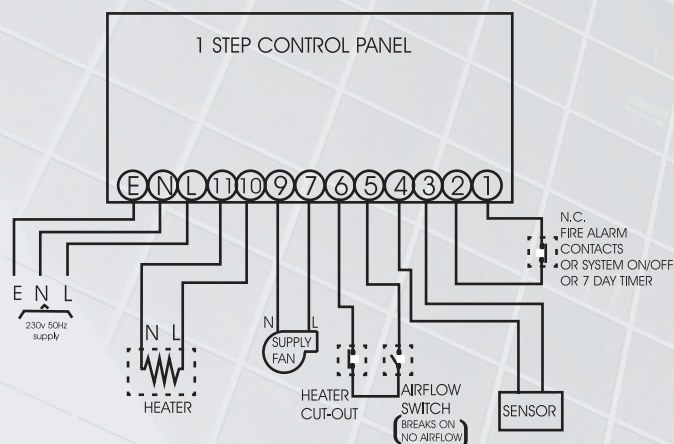
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WIRING DIAGRAM



SPECIFICATION

Epoxy painted steel enclosure - dimensions 160 x 250 x 125mm

Individual switches for fan and heater

Individual indicators for fan and heater

Individual MCB'S for fan and each heater element

Mains input: 230v 50Hz 1 phase

Maximum output: Heater 1 x 3Kw 1 phase elements

Fan 1 x 1 phase 2A MCB fitted as standard.

Number of steps
of heater control: 1

Sensor P.T.C. Thermistor type with 10 metres of cable
suitable for duct mounting

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.

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FAULT FINDING

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 SPACE TEMP

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

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 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.

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

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

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

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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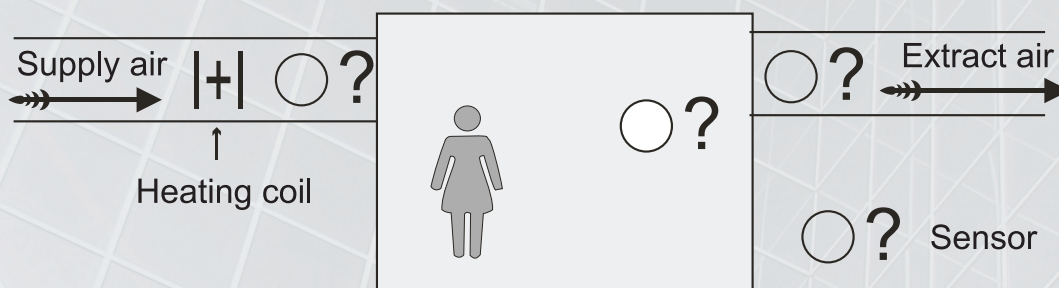
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SENSOR POSITIONING

DUCT OR SENSOR ROOM



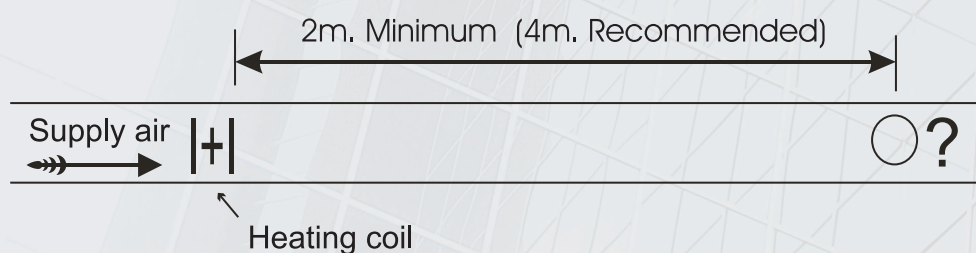
If the supply is for "make up" air, with background heating in the area being served, then a duct sensor should be used. The sensor must be mounted in the supply duct away from direct radiated heat.

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

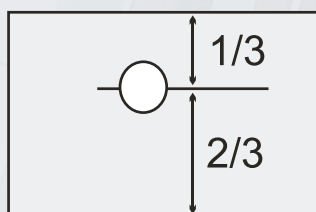
If the supply is for total area heating then a room sensor should be used. In some installations a duct sensor mounted in the extract / recirculation air duct may also be needed.

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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AIRFLOW PRESSURE SWITCH INSTALLATION INSTRUCTIONS

DUCT OR SENSOR ROOM

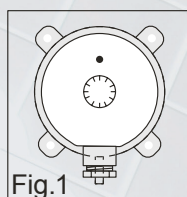


Fig.1

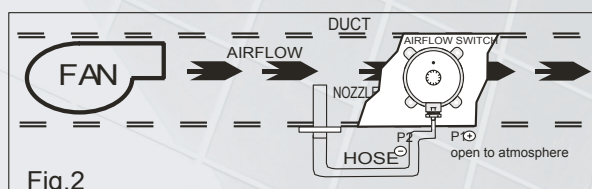


Fig.2

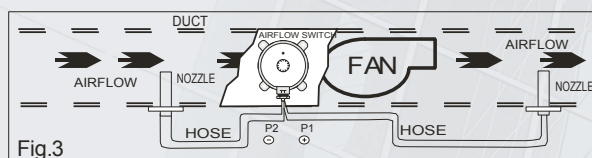
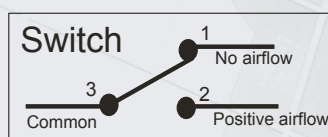


Fig.3

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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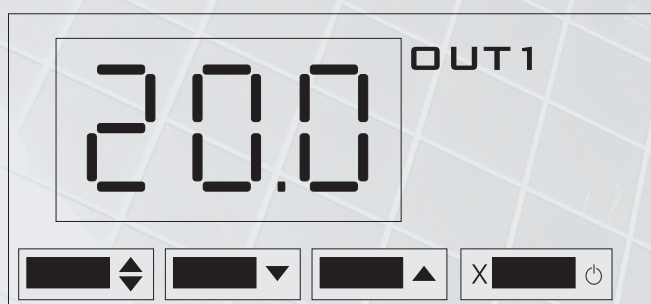
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1 STAGE ELECTRONIC CONTROLLER HEATER



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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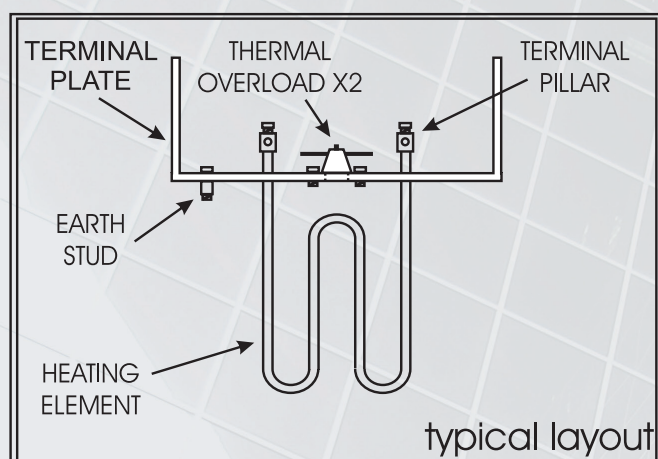
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ELECTRIC HEATER ELEMENT



CONTROLS

The 1 Step Heater control is suitable to control a 1 stage heater up to 3Kw

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 DIAGRAM & INSTRUCTIONS.

1. The electrical supply to the heater should be 1phase, 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 for maintenance of the heater.

IF IN DOUBT ASK ADVICE FROM YOUR HEATER SUPPLIER

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