

Duct Air Heater With Built-in Controls

Installation and Wiring Instructions



Stock Ref

105 31 100 T1 (TC3 Control)
105 31 125 T1 (TC3 Control)
105 31 150 T1 (TC3 Control)

105 31 200 T1 (TC8 Control)
105 31 250 T1 (TC8 Control)
105 31 315 T1 (TC8 Control)

105 31 315 T3 (TC8C Control)
105 31 400 T3 (TC8C Control)
105 31 500 T3 (TC8C Control)

Vent-Axia[®]

**PLEASE READ ALL INSTRUCTIONS CAREFULLY BEFORE STARTING
INSTALLATION.
THESE INSTRUCTIONS SHOULD BE LEFT WITH THE END USER.**

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READ AND SAVE THESE INSTRUCTIONS

PLEASE READ ALL INSTRUCTIONS CAREFULLY BEFORE STARTING INSTALLATION. INSTALLATION AND WIRING INSTRUCTIONS SHOULD BE LEFT WITH END USER.

Installation work, both mechanical and electrical, must be undertaken in accordance with the safety and installation instructions before switching on the unit.

Maintenance work should not be attempted before first switching off and isolating the fan and its control from the electrical supply and ensuring that it cannot be accidentally turned back on again.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities or lack of experience and knowledge unless they have been given supervision or instruction concerning use of this appliance by a person responsible for their safety.

Young children should be supervised to ensure that they do not play with the appliance.

Installation Instructions

For Models:- 105 31 100 T1 105 31 125 T1 105 31 150 T1
Fitted with TC3 Controls

Specifically designed to act as pre or re-heaters in small branch ducts from a main AHU or on systems where the supply fan is controlled from elsewhere. The TC3 thyristor controller is designed for use with heaters upto and including 3kW single phase. There is no fan run-on timer so the heater relies on a volt-free or 230V start signal and stays off until airflow is detected by the combined DTFS airflow and temperature sensor.

The Controller has a temperature set-point control on the front facia and Indicator lamps to show the status. The heater units come with a pre-wired high temperature manual reset cut-out, a pre-wired duct mount combined DTFS airflow proving and temperature sensor on a 1.8 metre fixed lead. This should be mounted a minimum of 1M after the heater in the supply air duct.

Designed for simple installation into standard spiral ductwork systems the heater operates automatically via the temperature setting and duct mounted temperature sensor to pulse the heater on and off to maintain a constant supply air temperature.

The temperature set-point is adjustable 0-40 degrees C.



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INTERNAL PCB

INDICATOR LAMPS and OPERATION
POWER - YELLOW
AIRFLOW FAILED - RED
HEATER ON - RED

With the unit powered but not yet enabled via the volt-free ON/OFF or 230V RUN terminals, the yellow POWER lamp will be lit. The red AIRFLOW FAILED lamp will also be lit if the supply air fan is not running.

Under normal working conditions with the volt-free ON/OFF or 230V RUN terminals connected, the unit will display the yellow lamp with the red HEATER ON lamp either on or pulsing according to the heat demand.

If the red AIRFLOW FAILED lamp is lit, there is either insufficient airflow or the combined DTFS sensor has not been fixed into the ductwork correctly. Check if the white plug on the PCB is still in place. There is an Air-flow direction Indicator arrow on the DTFS and the unit will only operate when this is correctly installed.

Unpack the heater taking care to ensure items and paperwork are removed from the centre of the heater duct.
The terminal box may also contain wiring instructions. If you are only installing the heater in the air duct, leave these instructions for the electrician!

The heater can be installed in the duct run, with either horizontal or vertical flow. With vertical ducts consideration must be given to items in the run above the heater which could be damaged by heat rising when the fan is switched off. All heaters should be kept away from plastic conduits or materials easily damaged by heat. Allow for casing temperature of 100°C (ideal minimum air velocity = 2m/s). These heaters must not be installed outside unprotected or in areas that are washed down!

Do not use flexible connectors directly onto the heater. The best position for the terminal box is on the side of a horizontal duct. Ensure access to the terminal box is possible! Make sure lagging etc. does not cover the terminal box.

A DTFS2 combined temperature and airflow sensor is supplied as standard. This will be found attached to the heater on a coiled lead. This should be mounted in the duct 1 to 2m downstream from the heater where the sensor cannot be damaged by heat.

A 20mm hole saw and 2 PK fixing screws will be required for the following 3 units
105 31 100 T1, 105 31 125 T1 & 105 31 150 T1 (Fitted with TC3 Controls).

IMPORTANT

The DTFS2 has an Airflow direction label attached and will only operate if installed with the arrow pointing in the direction of the airflow.

WIRING

All wiring must be carried out by a qualified electrician in compliance with the latest regulations. These units are internally pre-wired and require only a suitable supply feed connection to operate (see rating label).
See wiring diagram for connection details

SAFETY

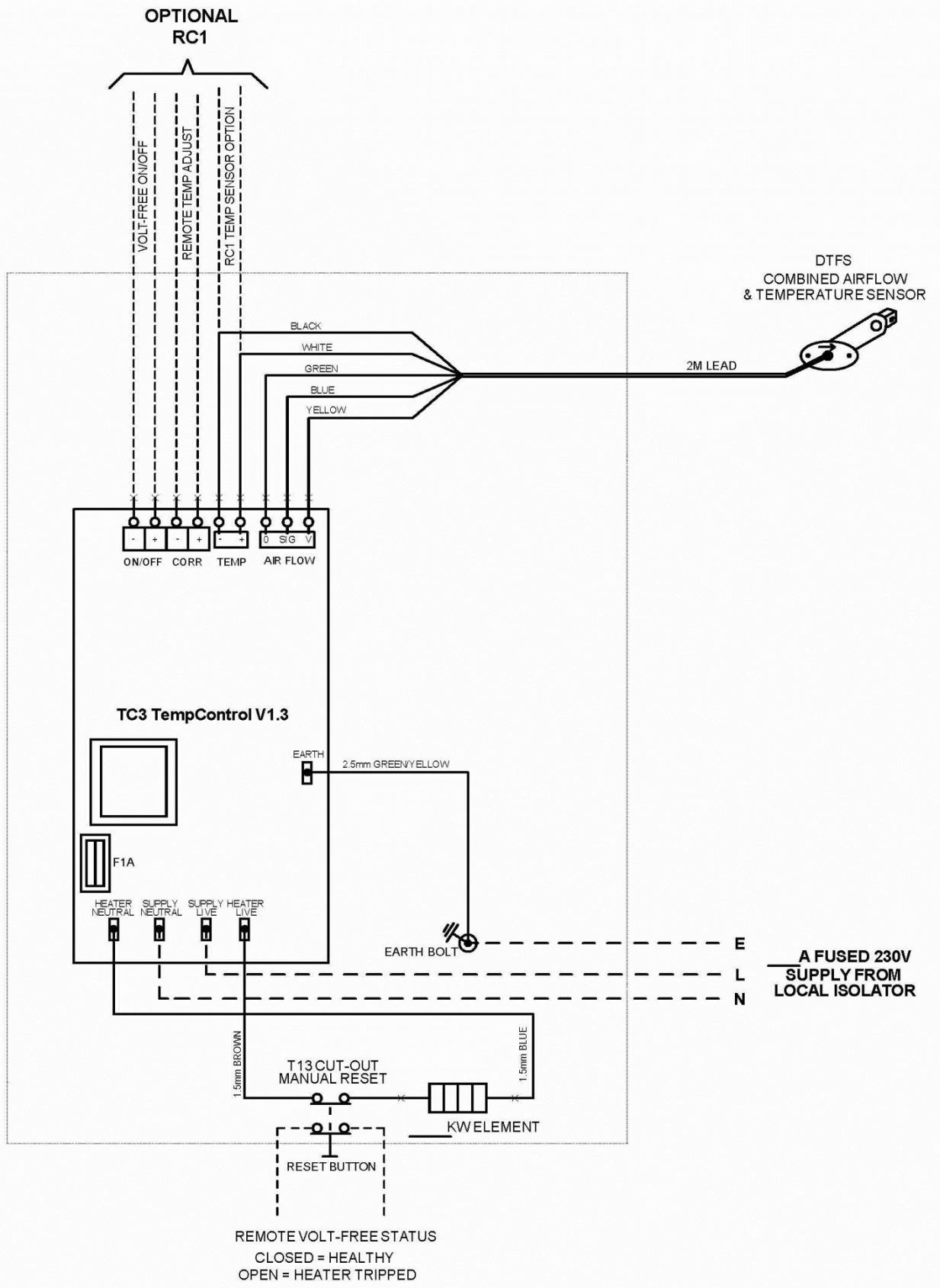
Every system should have an isolator switch which can be locked in the off position to prevent accidental reconnection during maintenance. When resetting the thermal cutout, the heater may suddenly switch on and element terminals, etc. will become live.

Ensure the heater is correctly earth bonded. Terminal covers must be secured after inspection and should be labelled

“DISCONNECT SUPPLY BEFORE REMOVING THIS COVER”. It is the installer’s responsibility to ensure the installation meets all current Health & Safety Regulations.

Wiring Details for the following Duct heaters

- 105 31 100 T1**
- 105 31 125 T1**
- 105 31 150 T1.**



Installation Instructions

For Models:- 105 31 200 T1 105 31 250 T1 105 31 315 T1

Fitted with TC8 Controls

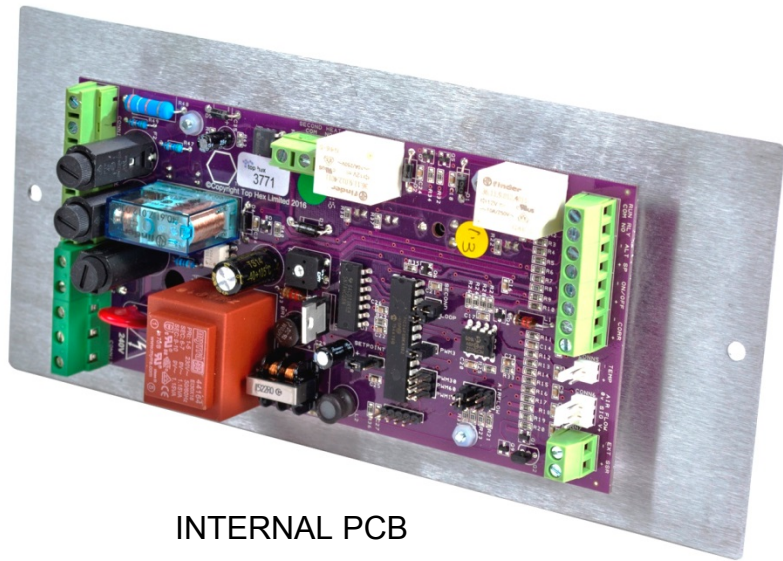
Specifically designed to act as pre or re-heaters in small branch ducts from a main AHU.

The control unit acts as a thyristor temperature control panel to control a 220/250V single phase 2 step heater up to 2 X 19A (9.0kW) with an additional relay and has 5A fused outputs for single phase supply and extract fans up to a maximum of 4.5A each.

Although the unit has been designed primarily for single phase heater loads up to 9.0kW, it has a SSR (Solid State Relay) output which can be used to control larger three phase (380/430V) heater loads up to 42.0kW.



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INTERNAL PCB

SPECIFICATION

Supply voltage	220/250Vac 50/60Hz. +/-10%
Output current (maximum)	19A @ 40°C (Ambient)
Temperature sensor	5k ohms @ 25°C (Table 502 IT) combined with air velocity sensor
Temperature control range	0 to 40°C / (0-10V 0-100%)
Supply Fan outputs (5A fused)	4.5A max FLC.
Extract Fan outputs (5A fused)	4.5A max FLC.
Run on timer	adjustable from 1 to 2 minutes (factory set at 1.5 minutes)
Control fuse	20 x 5mm 250mA
LED Indicators	Power On – Yellow Supply Fan On – Green Extract Fan On – Green Heater On – Red (solid or flashing, indicating pulsed control) Airflow Fault – Red
Start Signal	Volt free pair or 230V pair (run HV)
Alternative	0-10V input setpoint via jumper setting, BMS signal output status
Dimensions	Front Panel 114mm x 197mm x 2mm thick aluminium Heat Sink 55mm x 100mm x 20mm thick aluminium PCB 85mm x 165mm

Unpack the heater taking care to ensure items and paperwork are removed from the centre of the heater duct.
The terminal box may also contain wiring instructions. If you are only installing the heater in the air duct, leave these instructions for the electrician!

The heater can be installed in the duct run, with either horizontal or vertical flow. With vertical ducts consideration must be given to items in the run above the heater which could be damaged by heat rising when the fan is switched off. All heaters should be kept away from plastic conduits or materials easily damaged by heat. Allow for casing temperature of 100°C (ideal minimum air velocity = 2m/s). These heaters must not be installed outside unprotected or in areas that are washed down!

Do not use flexible connectors directly onto the heater. The best position for the terminal box is on the side of a horizontal duct. Ensure access to the terminal box is possible! Make sure lagging etc. does not cover the terminal box.

A DTFS2 combined temperature and airflow sensor is supplied as standard. This will be found attached to the heater on a coiled lead. This should be mounted in the duct 1 to 2m downstream from the heater where the sensor cannot be damaged by heat.

A 25mm hole saw and 2 PK fixing screws will be required for the following 3 units
105 31 200 T1, 105 31 250 T1 & 105 31 315 T1 (Fitted with TC8 Controls).

IMPORTANT

The DTFS2 has an Airflow direction label attached and will only operate if installed with the arrow pointing in the direction of the airflow.

WIRING

All wiring must be carried out by a qualified electrician in compliance with the latest regulations. These units are internally pre-wired and require only a suitable supply feed connection to operate (see rating label).

If the option to feed the fans is not used and the supply fan is not local to the heater, it is possible to use only the sensed airflow to switch on the heater. The output air temperature will be as set on the face of the panel. If you need to switch the heater off from a remote time clock, remove the link provided and wire from the clock.

The controller has two 1ph fan outputs (4.5A max) which, if used, run the fan on for 2 minutes after the time clock switches off the heater. Other features are available, please refer to the wiring diagram for connection details.

Note; take care when using remote fan speed controllers not to let the air velocity drop too low. Also try to avoid using the controller to switch the system off as this can lead to nuisance tripping of the high temperature cutout in the heater.

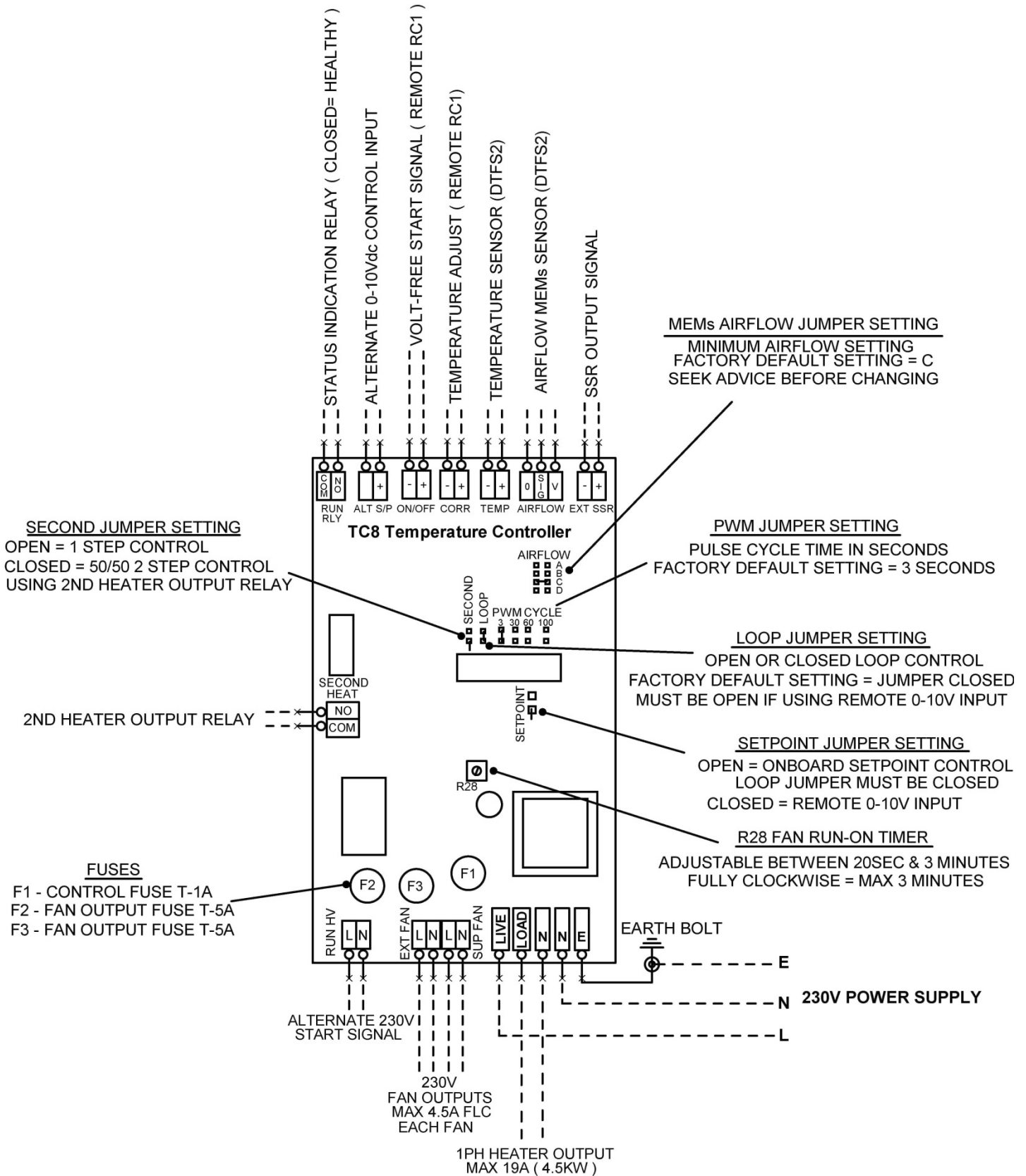
SAFETY

Every system should have an isolator switch which can be locked in the off position to prevent accidental reconnection during maintenance. When resetting the thermal cutout, the heater may suddenly switch on and element terminals, etc. will become live.

Ensure the heater is correctly earth bonded. Terminal covers must be secured after inspection and should be labelled

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Connections & Settings Diagram

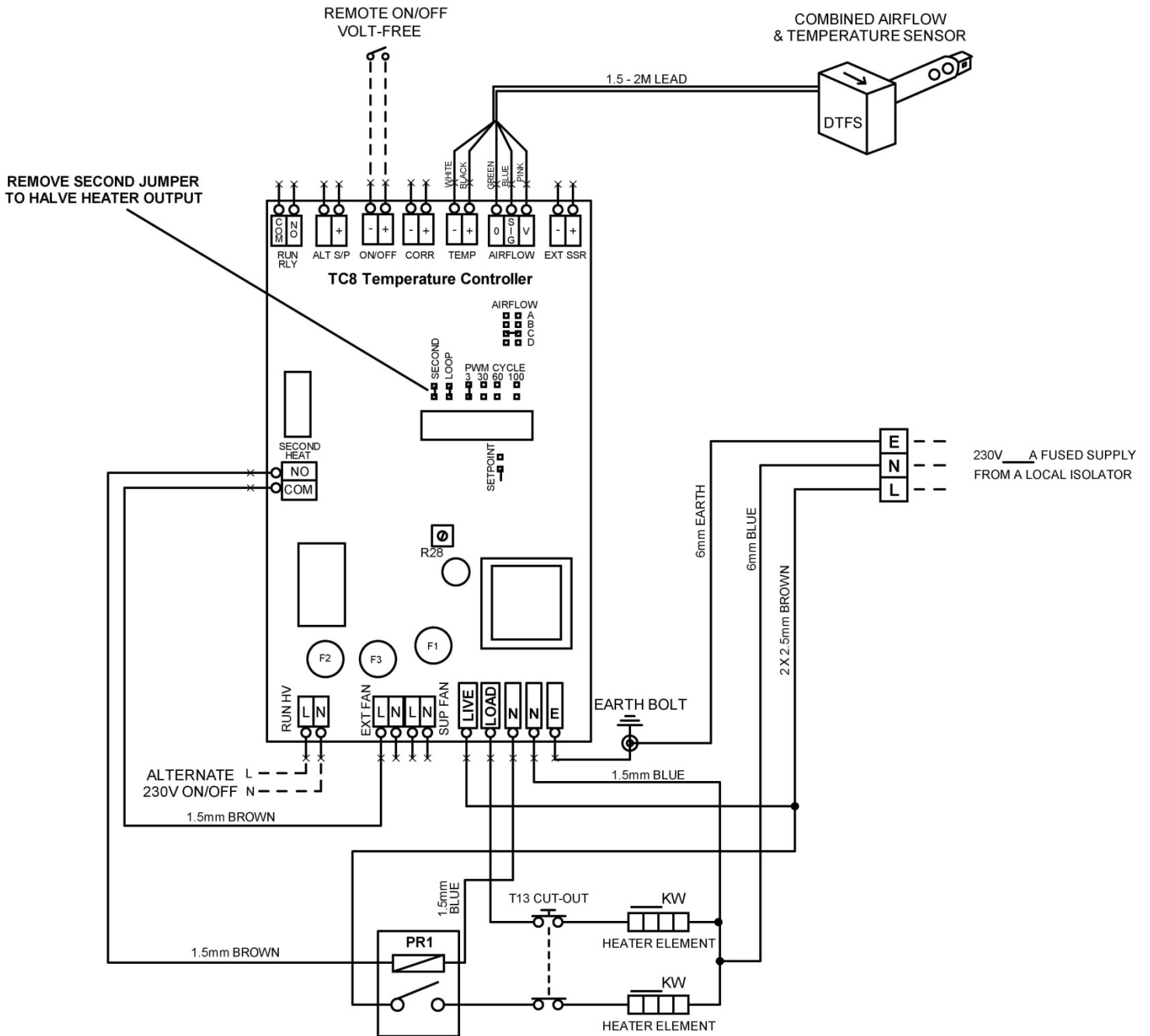


Wiring Details for the following Duct heaters

105 31 200 T1

105 31 250 T1

105 31 315 T1



Installation Instructions

For Models:- 105 31 315 T3 105 31 400 T3 105 31 500 T3

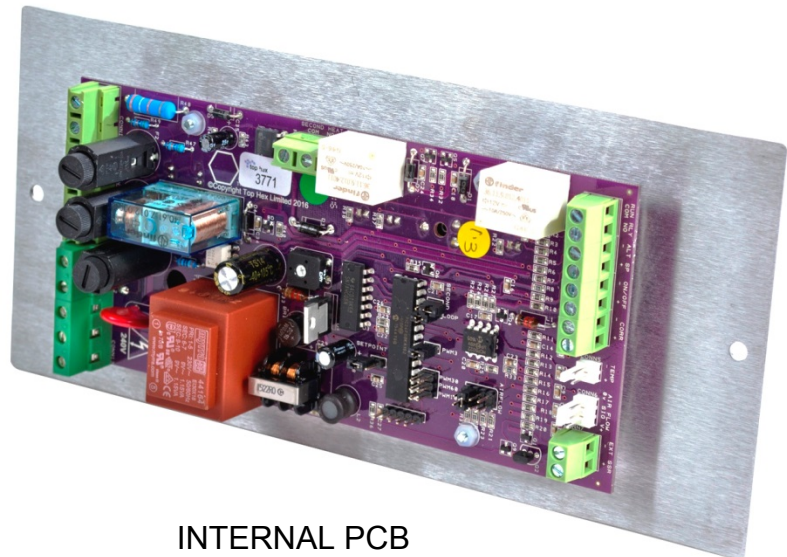
Fitted with TC8 & SSR Controls

Specifically designed to act as pre or re-heaters in small branch ducts from a main AHU.

These models incorporate a SSR (Solid State Relay) output which can be used to control larger three phase (380/430V) heater loads up to 21.0kW.



FRONT FACIA



INTERNAL PCB

SPECIFICATION

Supply voltage	380/430Vac 50/60Hz. +/-10%
Output current (maximum)	19A @ 40°C (Ambient)
Temperature sensor	5k ohms @ 25°C (Table 502 IT) combined with air velocity sensor
Temperature control range	0 to 40°C / (0-10V 0-100%)
Supply Fan outputs (5A fused)	4.5A max FLC.
Extract Fan outputs (5A fused)	4.5A max FLC.
Run on timer	adjustable from 1 to 2 minutes (factory set at 1.5 minutes)
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Start Signal	Volt free pair or 230V pair (run HV)
Alternative	0-10V input setpoint via jumper setting, BMS signal output status
Dimensions	Front Panel 114mm x 197mm x 2mm thick aluminium Heat Sink 55mm x 100mm x 20mm thick aluminium PCB 85mm x 165mm

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A 25mm hole saw and 2 PK fixing screws will be required for the following 3 units
105 31 315 T3, 105 31 400 T3 & 105 31 500 T3 (Fitted with TC8 & SSR Controls).

IMPORTANT

The DTFS2 has an Airflow direction label attached and will only operate if installed with the arrow pointing in the direction of the airflow.

WIRING

All wiring must be carried out by a qualified electrician in compliance with the latest regulations. These units are internally pre-wired and require only a suitable supply feed connection to operate (see rating label).

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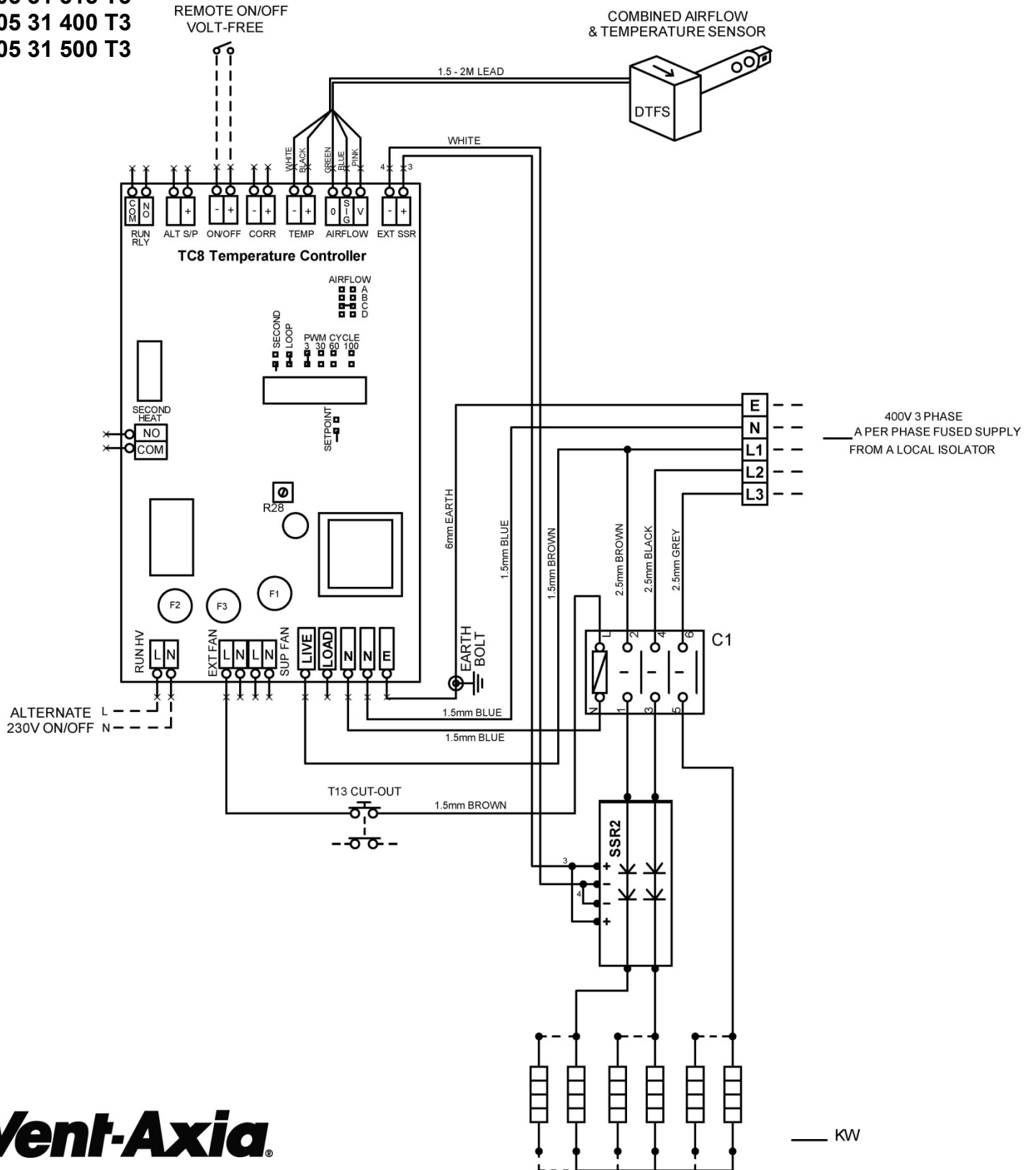
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Wiring Details for the following Duct heaters

105 31 315 T3

105 31 400 T3

105 31 500 T3



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For details of the warranty and returns procedure please refer to www.vent-axia.com or write to Vent-Axia Ltd, Fleming Way, Crawley, RH10 9YX