TC8t
Thyristor Temperature Controller

TC8t-V1/10-2022

Specifically designed to mount onto a Neatafan electric air heater, either duct mounted or built into an Air Handling Unit.

The TC8t 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.

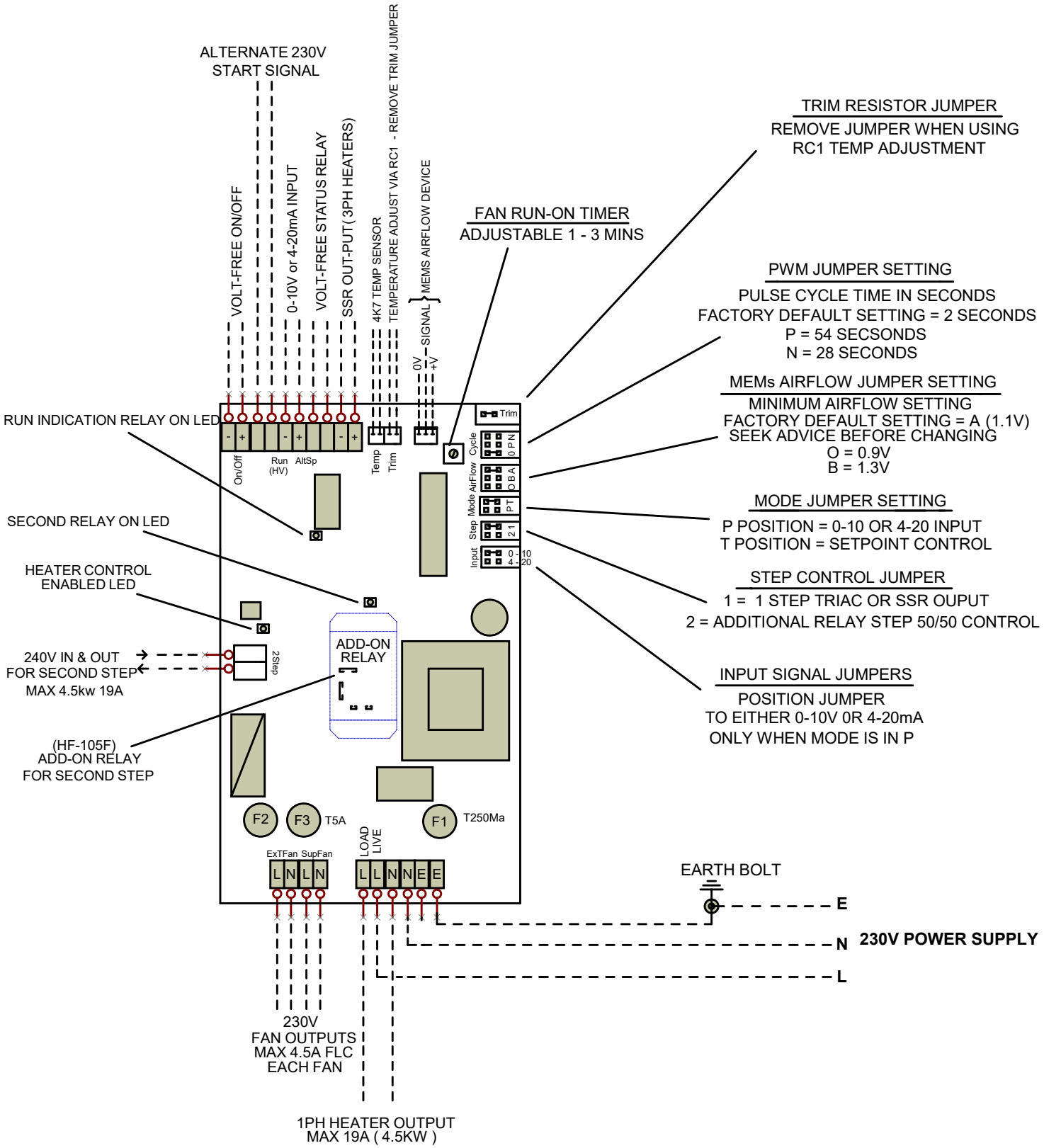
Although the unit has been designed primarily for single phase heater loads up to 9.0kW, it has a SSR (Solid State Relay) output which can be used to control larger three phase (380/430V) heater loads up to 42.0kW.

REAR (PCB)

FRONT

SPECIFICATION

Supply voltage	220/250Vac 50/60Hz. +/-10%
Output current (maximum)	19A @ 40ºC (Ambient)
Temperature sensor	5k ohms @ 25ºC (Table 502 IT) combined with air velocity sensor
Temperature control range	0 to 40ºC / (0-10V/4-20mA 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 3 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 or 4-20mA 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 95mm x 156mm
Weight	575 grams (approx.)



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TITLE: **TC8t CONNECTIONS & SETTINGS**

DATE: 10/10/22

PAGE: 1/1

BY: **NFE** REV:

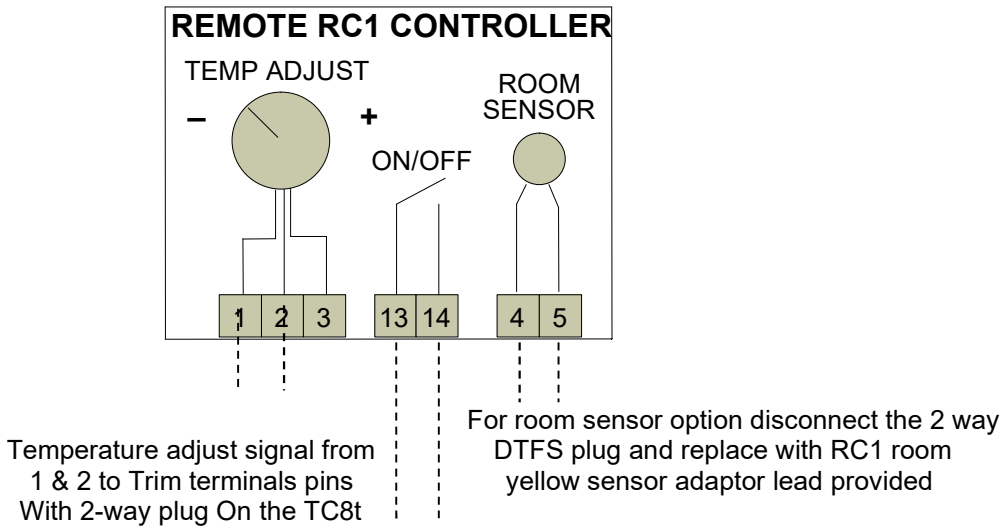
RC1 TC8t
Remote Control Unit

The RC1 is designed as a remote-control unit to work in conjunction with Neatafan control systems and can be wall mounted.

An on-off switch is incorporated so that the user can turn off the system, allowing the timer to cool the elements. The temperature adjustment feature is designed to give an adjustment of – or + 3°C of the pre-set temperature on the main temperature controller, i.e., if the main controller is set to 20°C, the RC unit will adjust between a minimum of 17°C and a maximum of 23°C. With the control knob adjusted to the midpoint on the dial the preset temperature will be achieved. The Trim jumper on the TC8t board must be removed when using the remote Temperature adjust.

A duct temperature sensor is provided within the DTFS on Neatafan TC8t control systems; however, this can be replaced with the room temperature sensor provided in the RC1. This is done by unplugging the 2-way black and white cable of the DTFS and using the 2-way yellow lead provided.

Wiring: Four or Six cores of 0.75mm² cable are ideal and can be run for 20m without difficulty. Do not, however use fine “data type” cables.
N.B – 2 X KK Leads supplied with RC1.



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DTFS
Dual Temperature and Airflow Sensor

APPLICATION
The DTFS is designed for use in H&V applications where it is necessary to detect airflow and temperature for controlling electric heater batteries. It is especially suited for ductwork systems with low air velocities where a pressure switch would not operate. Designed for use specifically with the Neatafan TC3, TC7, TC8 and TC8t temperature controllers.
Having both temperature and airflow measurement in one package reduces the installation time. The sensor utilizes “state of the art” MEMS technology to give outstanding performance over a wide range of air flows.

DESCRIPTION
A black HIGH TEMPERATURE glass filled plastic moulded assembly with a 20mm diameter sampling tube (98mm long) with 2M 5 core white lead with a 2way and 3 way kk plugs for connection to to TC3, 7 or 8 PCB. 2 X 4.5mm holes are provided, on the mounting bracket for securely fixing the sensor to the duct.

INSTALLATION
Mount the unit in the duct (circular or rectangular) at least 1.5 metres downstream from the heater bank. The two fixing holes must be parallel with the duct so the sampling tube is in the correct position and air passes through the hole for both the MEMS and temperature sensors. The airflow direction Arrow on the sensor denotes the correct orientation of the sensor and must be compatible with the direction of airflow.

To install drill a 20mm hole centrally in the duct, insert the airflow monitor and using PK screws fix firmly in position. A neoprene gasket supplied with the unit will give a good seal between the duct and the unit.

SPECIFICATION

Part code	DTFS
Supply voltage	0 to 3V DC
Minimum operating range	1m/s
Enclosure	IP65
Probe	116mm long (max) Inserted length 98mm x 20mm diameter max.

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Installation Instructions for NEATAFAN TC8t electric duct heaters:

The enclosed heater has built-in pulse control. This system delivers a constant air temperature to the room using the minimum electricity. An air velocity sensor is combined with the duct mounted temperature sensor, it will permit reduced airflow but cut off the heater when the airflow stops.

Fitting heater to the duct

Firstly, decide where to locate the heater, avoiding close proximity to bends and materials sensitive to heat. Mount the heater using suitable mastic and screws. (Not provided.) Airflow direction is unimportant.

Drill a 20/22mm hole in the duct downstream of the heater (about 1 – 2 metres) and fit the DTFS duct sensor (small self-drilling screws are ideal.) Ensure the arrow moulded on the flange of the sensor points in the direction of flow. Keep the sensor away from objects inside the duct that may cause turbulence.

Wiring

TC8t controllers have single phase fan output available (up to 4.5A running current). If larger or 3 phase fans are used a separate contactor/overload will be required. Using this output will enable the fan to run on after the heater is switched off. (See wiring diagram.)

You will need a suitable single phase or 3 phase electricity supply and an isolator switch about 2 metres from the heater. E.g., 9kW 1 phase will draw 38 Amps, 9kW 3 phase will draw 12.6 Amps/phase from a typical UK supply. Connect the supply to the terminals provided in the heater terminal box. (This should be done by a competent electrician.)

The heater will operate when you switch on the isolator providing air is flowing along the duct. If it's a small heater without fan connections, you can leave it to work by just detecting airflow only. If you are using the remote on/off & setpoint unit RC1, see separate diagram.

Operation

When you power up the heater the power LED will come on and if the remote on/off contact is made (linked to come on as standard) the fan LED will come on.

Adjust the set point to about 30 degrees c and the heater pulse LED should come on (this will pulse in proportion to the heat output), if it does not or the fault LED is showing (on some versions) it is likely no airflow is being detected, check airflow and position of sensor.

When you have confirmed the heater is working, reset the temperature as required, normally 18 – 22 degrees c.

If you need external control (say a time clock) volt free or separate 230v on/off terminals are provided – see wiring diagram. If you have an external control signal from your BMS, this can be done with TC8t controllers dip-switch settings – see further instructions.

ELECTRIC HEATERS
Maintenance Instructions

1. Before carrying out any maintenance ensure the electricity supply has been isolated.
2. Check all electrical connections for tightness and broken terminations.
3. Check all wiring for deterioration or overheating.
4. Check unit for dirt or dust and wipe clean (except elements).
5. Check the element section for obstructions or debris.
6. Check all components for wear and physical damage.
7. Check all safety devices for proper operation.
8. Check temperature controls for proper operation as per the installation instructions.
9. Check all inlet filters and replace where necessary.
10. Ensure unit has been installed as per the installation instructions.

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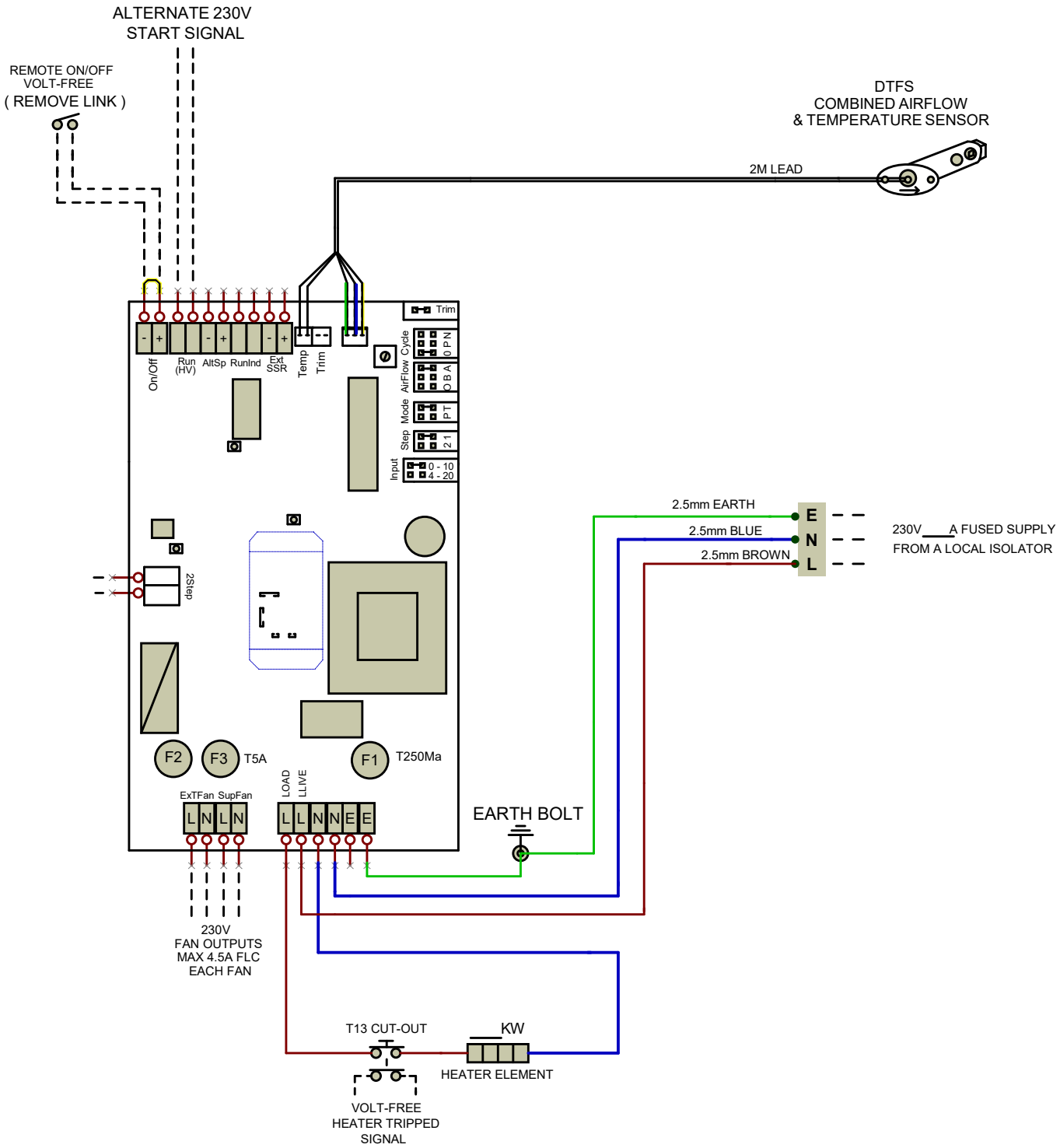

TC8t-A

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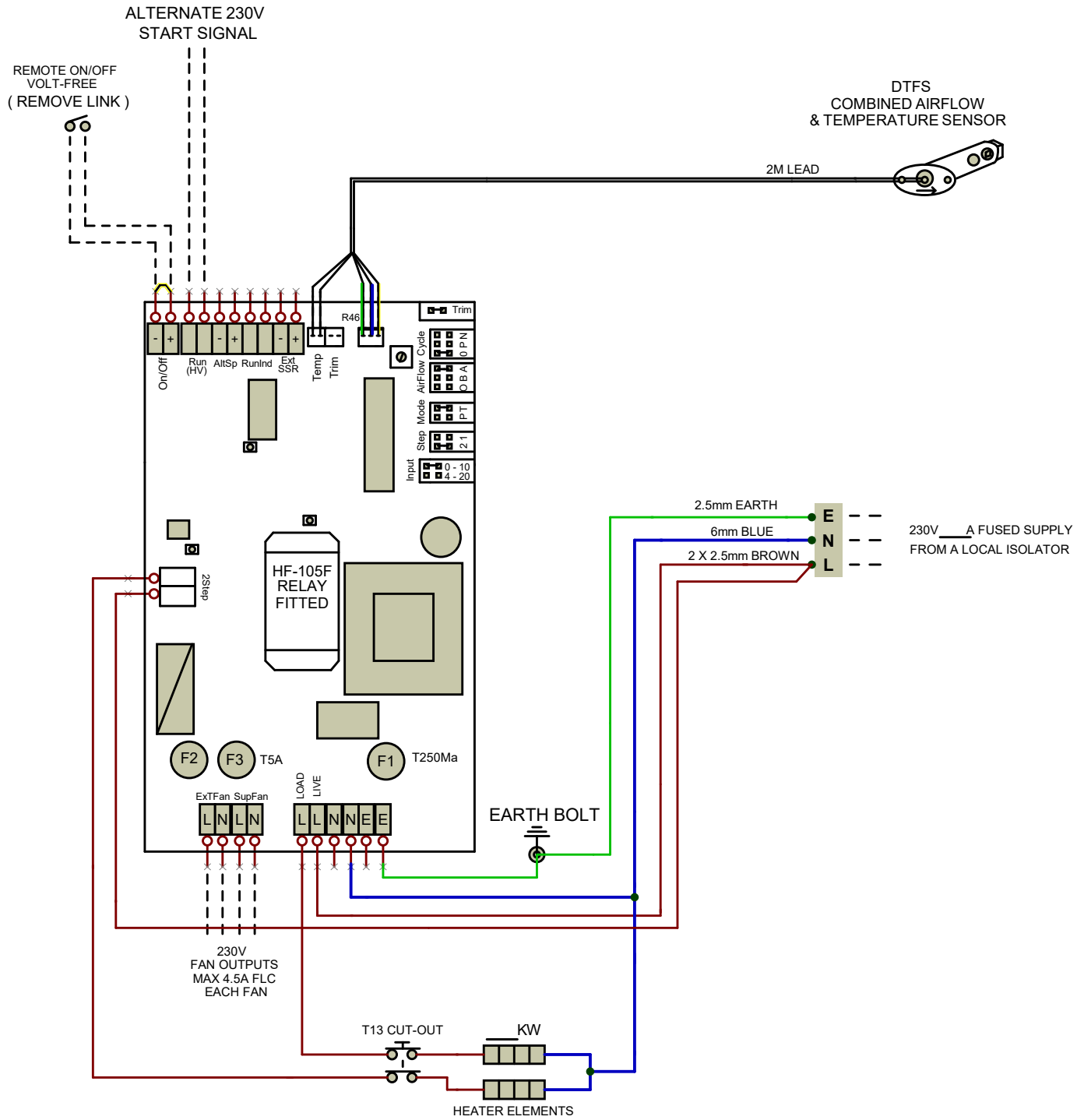
TITLE: **0.5kw TO 4.5kw 1ph TC8t CONTROLLED ELECTRIC HEATER WIRING.**

BY: **NFE** REV:

DATE: 10/10/22

PAGE: 1/1



TC8t-B

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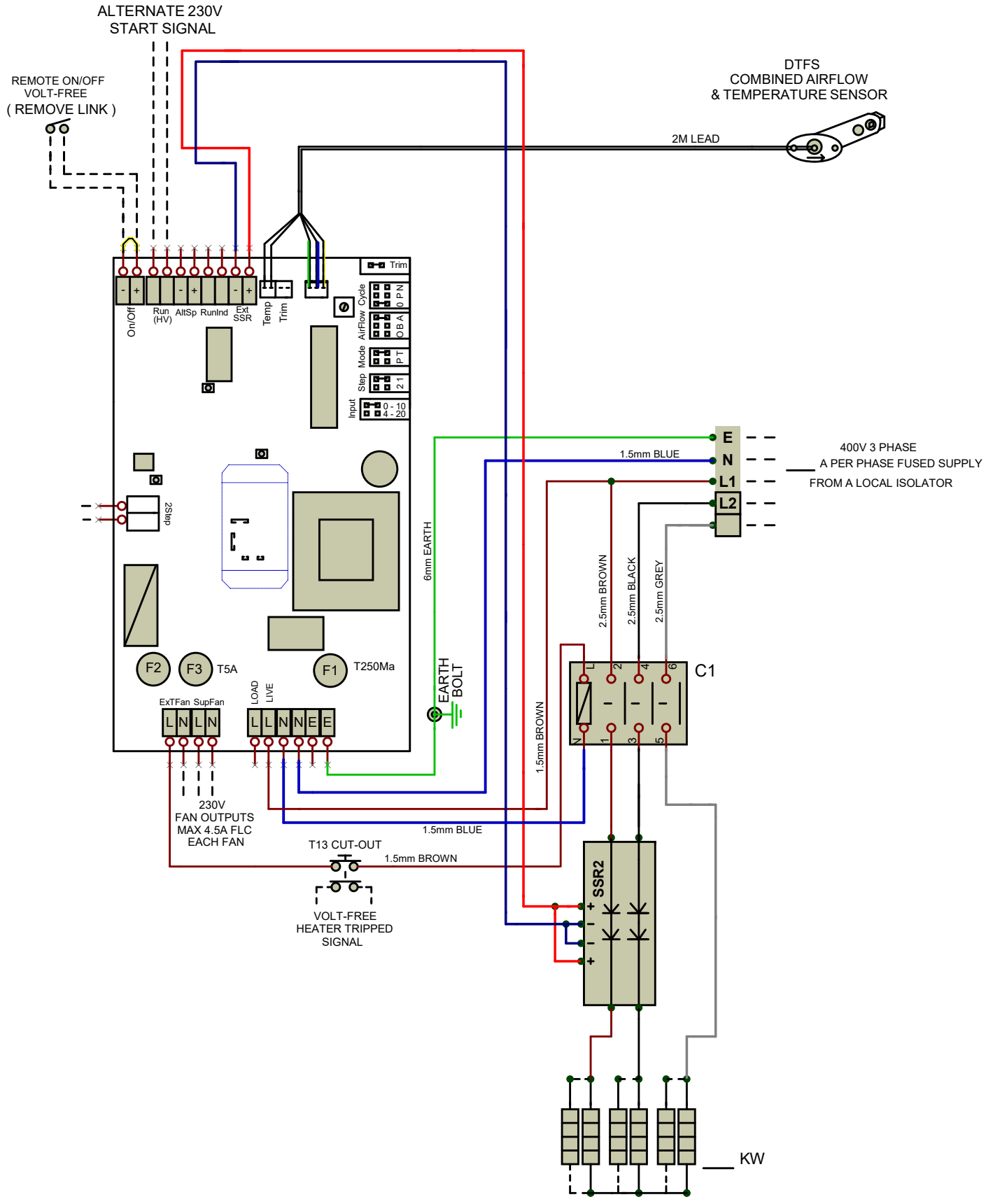
TITLE:	DATE:
5kw TO 9kw 1ph TC8t CONTROLLED ELECTRIC HEATER WIRING.	10/10/22
BY: **NFE** REV:	PAGE: 1/1



TC8t-C

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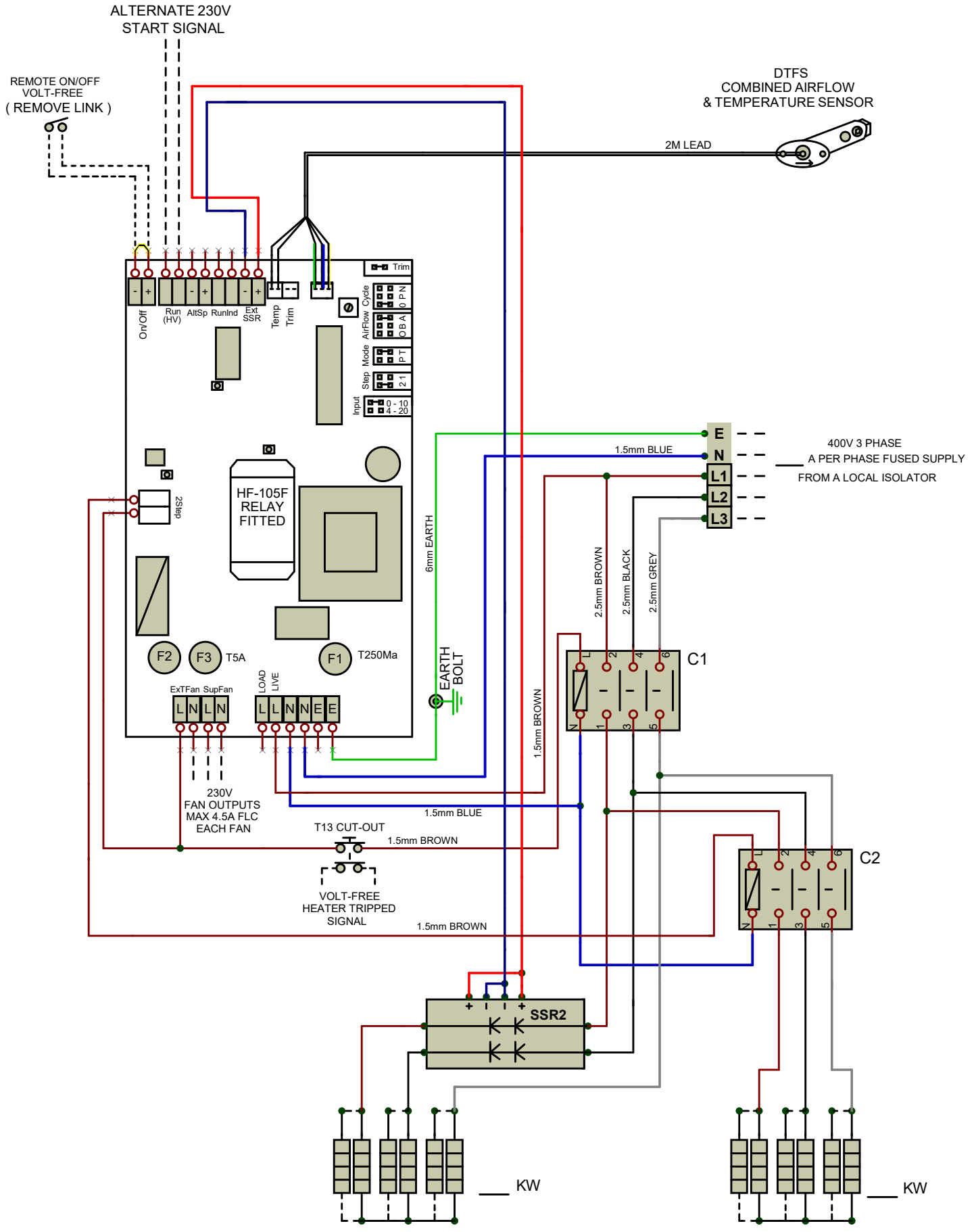
TITLE: **3kw TO 21kw 1 STEP 3ph TC8t CONTROLLED ELECTRIC HEATER WIRING.**

BY: **NFE** REV:

DATE: 10/10/22

PAGE: 1/1



TC8t-D

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TITLE: **24kw TO 42kw 2 STEP 3ph TC8t CONTROLLED ELECTRIC HEATER WIRING.**

BY: **NFE** REV:

DATE: 10/10/22

PAGE: 1/1