Controllable Electric Heater Battery Installation & Operation Guide

Issue 1

SPC

Contents

Installation & Operation Guide

This guide will help you diagnose and resolve issues with your SPC Controllable Electric Heater Battery.

By following this guide, you should be able to troubleshoot and fix most issues on-site. If you still need assistance, our Technical Team's contact details are at the end of this document.

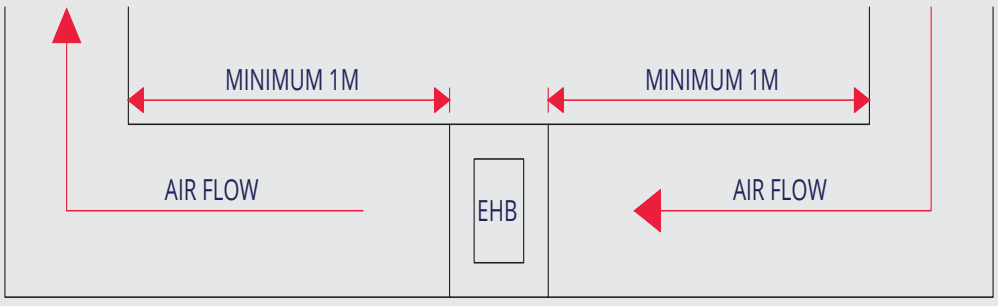
Visit our Literature page on our website to view the Installation, Operation & Maintenance Manuals (IOMs) for the specific product you are working on. The references are listed below:

- IOM 93 - Controllable Electric Heater Batteries

SCAN TO VISIT OUR LITERATURE PAGE

1. Storage & Mounting

- **Do not store** the heater battery:
  - With any weight on the **front/control panel**.
  - **Directly on the floor**.
- **Mounting:**
  - Designed primarily for **internal installation**.
  - If installed **externally**, must be **adequately protected** from weather & damage.
  - Must be **mounted to ductwork** following **standard procedures**.
- **Ductwork Requirements:**
  - Maintain **at least 5 duct diameters** of straight ducting **before and after** the heater battery.
  - **OR a minimum of 1 metre** of straight ducting **on both sides** before any bends.
  - Install the heater **in line with the airflow arrow** for accurate sensor readings.



Minimum distance installation diagram

2. Wiring

- Refer to **IOM 93 (pages 6–9) before** wiring the unit.
- **Understand the wiring diagram fully** before proceeding.

Voltage Information:

- Terminals on the front panel include:
  - **High Voltage**: 400V / 230V AC
  - **Low Voltage**: 0–10V DC
    (Refer to the correct wiring diagram before connecting.)

The terminals on the PCB inside the front panel include both high voltage (400V, 230V ac) and low voltage (0-10V dc). Ensure that high voltage is not connected to the low voltage terminals; do not attempt to wire up the units without the correct wiring diagram to refer to

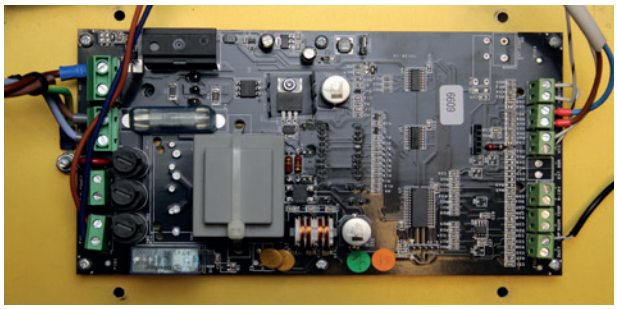
Wiring Diagrams:

Page	Description
6	Single phase units – up to **4.5 kW**
7	Single phase units – up to **9.0 kW**
7	Three phase units – up to **24 kW (single step)**
8	Three phase units – up to **134 kW (multi-step)**

3. Controls

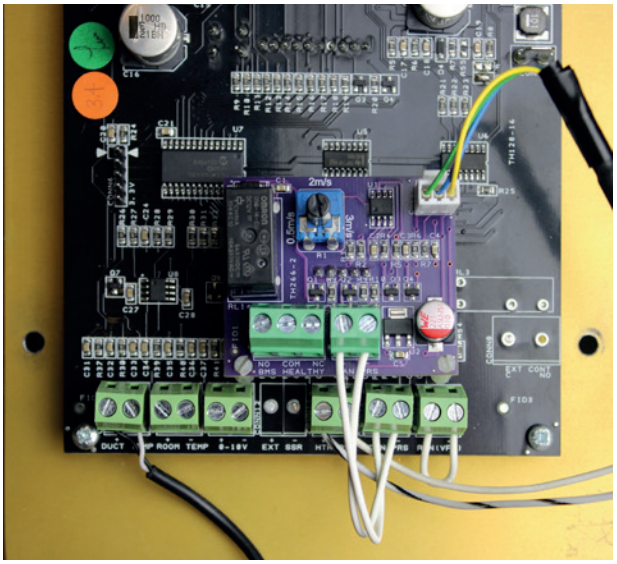
The **front panel** includes:
- Flow switch
- Overheat cut-out
- Duct temperature sensor
- Display with push buttons

Install all components as shown in **IOM 93**.



Optional Components:

- **Fault PCB Board**: Adds a BMS fault signal output (see page 8, IOM 93).
- **Very Low Airflow Sensor**:
  - Connects to the Fault PCB Board.
  - Replaces the standard airflow switch.
  - Wiring must be updated as shown on **page 9, IOM 93**.
- **Room Temperature Controller (TRC-2)**:
  - Connect as shown on **page 9, IOM 93**.
  - Wire to **0–10V** and **Room Sensor** terminals.



Fault PCB board

Room temperature controller

Very Low Airflow Sensor

4. Control Modes

The heater battery is pre-set to:
- **Fan Mode: F1**
- **Control Mode: C1**

To change modes:

1. Hold **Up** and **Down** arrows for **5–8 seconds**.
2. Use arrows to select the desired mode. See Front Panel Display section below.

Fan Modes

- **F1 (Default)**: Fan runs only when heating is required.
- **F2**: Fan runs continuously for ventilation.

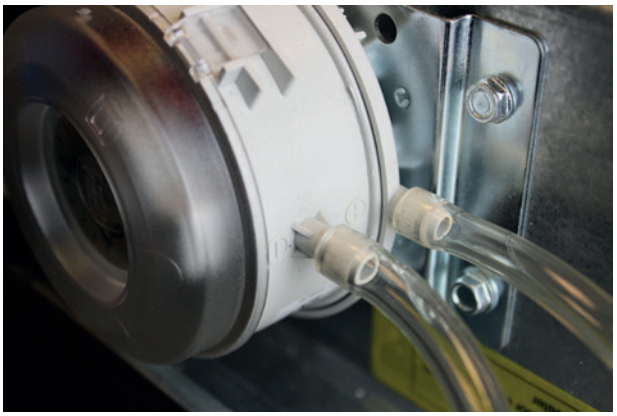
Note: A 1-minute fan run-on delay is built into the controller.

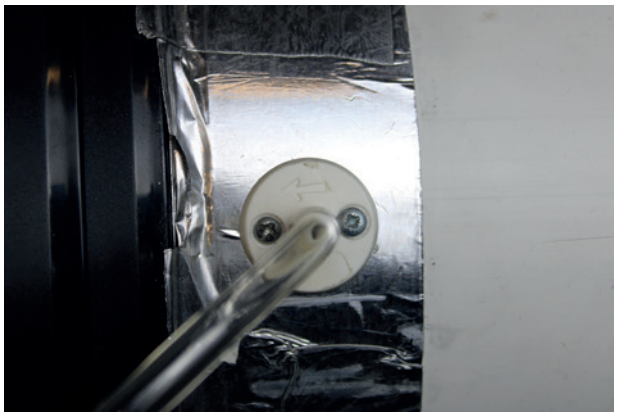
Control Modes

- **C1 (Default)**: Local control using panel buttons.
- **C2: BMS Closed Loop** – BMS sets the temperature via 0–10V input.
- **C3: BMS Open Loop** – BMS controls heat output directly (no temperature setpoint).
- **C4: Room Controller Mode** – Use only when TRC-2 is installed.

5. Airflow Switch

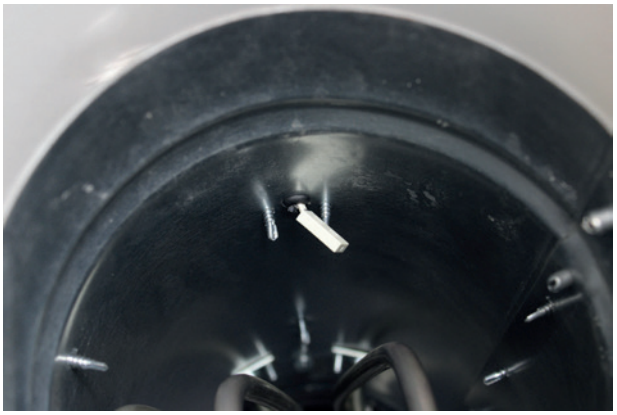
- Fitted as standard and set to **20 Pa** differential pressure.
- Connect air tubes to the **'+' and '–'** ports on the switch:
  - Tubes should be placed **either side of resistance** (e.g., fan or filter) which will offer minimum 20 Pa when there is airflow
  - You may use **only one tube**, leaving the other open to atmosphere.
- If **not required**, link terminals **'FAN'** and **'PRS'** on the front panel.
- If airflow is **below 20 Pa**, install the **very low airflow sensor** (see page 9, IOM 93).





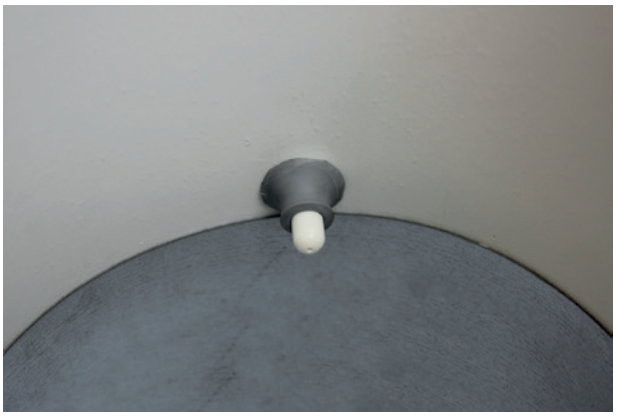
6. Overheat Cut-Out

- Factory-fitted above the heating elements, set at **125°C**.
- Must be mounted **at the top of the duct** (see page 4, IOM 93).
- For **circular ducts**, rotate the heater so the cut-out **is not at the bottom**.



7. Duct Temperature Sensor

- Install **at least 1 metre downstream** of the heater.
- Drill a **16 mm hole** in the duct for mounting.
- **IP-rated** sensor supplied.

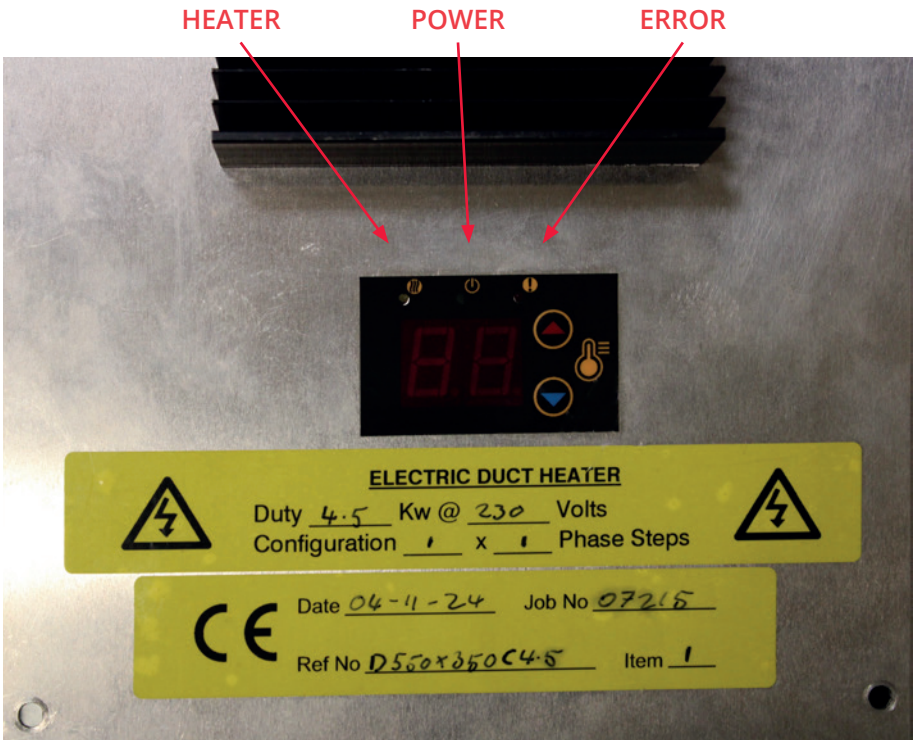


8. Front Panel Display

- **Up/Down arrows:** Adjust temperature or change modes.
- **To access settings:**
  1. Hold both buttons for **5–8 seconds** to select **Fan Mode (F1/F2)**.
  2. After 10 seconds, the display switches to **Control Mode (C1–C4)**.
  3. After another 10 seconds, it returns to normal operation.
  4. In **C2 mode**, an additional **"Maximum Setpoint"** menu appears—set as required.

Indicator Lights

Indicator	Light	Meaning
Heater (Yellow)	Solid	Calling for heat and significantly below the setpoint temperature
	Flashing	Modulating when setpoint is approached
	Off	Temperature reached
Power (Green)	Solid	Power ON
	Off	No power
Error (Red)	Solid	Fault detected – note error code and investigate
	Flashing	Fan run-on active
	Off	Normal operation



Error Codes & Troubleshooting

Code	Fault	Possible Cause / Action
E1	Heater 1 failed	Check element, wiring, and front-panel fuse.
E2	Heater 2 failed	Same checks as E1.
E3	Overheat Trip	Excessive temperature – ensure sufficient airflow, motor running. Reset by power cycling.
E4	Airflow Fault	Auto resets when airflow restored. Check fan, airflow, pressure tubes, and switch orientation.
E5	Duct Sensor Fault	Check sensor installation and wiring. Test by linking out sensor; if unit runs, replace sensor.

9. Contact SPC Technical Team for Further Support

If the unit remains faulty after **fault finding** and **voltage testing**, please contact the **SPC Technical Team** for assistance at **0116 249 0044 (Option 1)**.

To help us access the job details quickly, please have the **Order Number or Serial Number** ready before calling. These can be found on the labels fitted inside the units (see below).

S & P Coil Products Limited trading as SPC

Trading Address:
SPC House, Evington Valley Road, Leicester, LE5 5LU

Registered Office:
15 Northgate, Aldridge, Walsall, England, WS9 8QD

T: 0116 249 0044
E: spc@spc-hvac.co.uk
spc-hvac.co.uk