

Grant EP001

Wiring Centre

Installation Instructions and Technical Information



IMPORTANT NOTE FOR INSTALLERS

This document has been produced to provide the installer with detailed information on the operation of the Grant EP001 wiring centre.

This document should be read alongside the installation instructions for the heat source being installed, for example a Grant Aerona³ ASHP.

SPECIAL TEXT FORMATS

The following special text formats are used in these instructions for the purposes listed below:

! WARNING !

Warning of possible human injury as a consequence of not following the instructions in the warning.

! CAUTION !

Caution concerning likely damage to equipment or tools as a consequence of not following the instructions in the caution.

! NOTE !

Used for emphasis or information not directly concerned with the surrounding text but of importance to the reader.

SERVICING

The EP001 wiring centre should be inspected at least every twelve months, when the heat source and/or heating system is serviced.



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1 Introduction

1.1 DESCRIPTION

A simple and convenient means of making all system control connections for up to four space heating zones, plus one hot water zone, in one wiring centre, with optional capability to provide both volt free outputs and automatic DHW priority (for Grant Aerona³ heat pump installations).

1.2 FEATURES

Four space heating zones

Each with options for time and/or temperature control with output to a pump and/or zone valve.

1A fused 230V output

LED (Red) indicating that the heating zone in question is 'active', i.e. when there is a 230V output to the zone pump or zone valve.

Hot water/Auxiliary zone

With options for time and/or temperature control with output to a pump and/or zone valve.

1A fused 230V output

LED (Red) indicating that the hot water zone is 'active', i.e. when there is a 230V output to the hot water zone pump or zone valve.

Space heating relay

Double pole (DPST) relay

Automatically activated when one (or more) of the space heating zones are 'active'.

This relay provides volt free outputs for Grant Aerona³ heat pumps.

Hot water relay

Double pole (DPDT) relay

Automatically activated when the hot water zone is 'active'.

This relay provides volt free outputs for Grant Aerona³ heat pumps.

DHW priority function

Operated by 2-position (on/off) switch on PCB.

With priority switch set to ON (left hand position) - any active space heating zones will be automatically overridden as soon as there is a DHW demand.

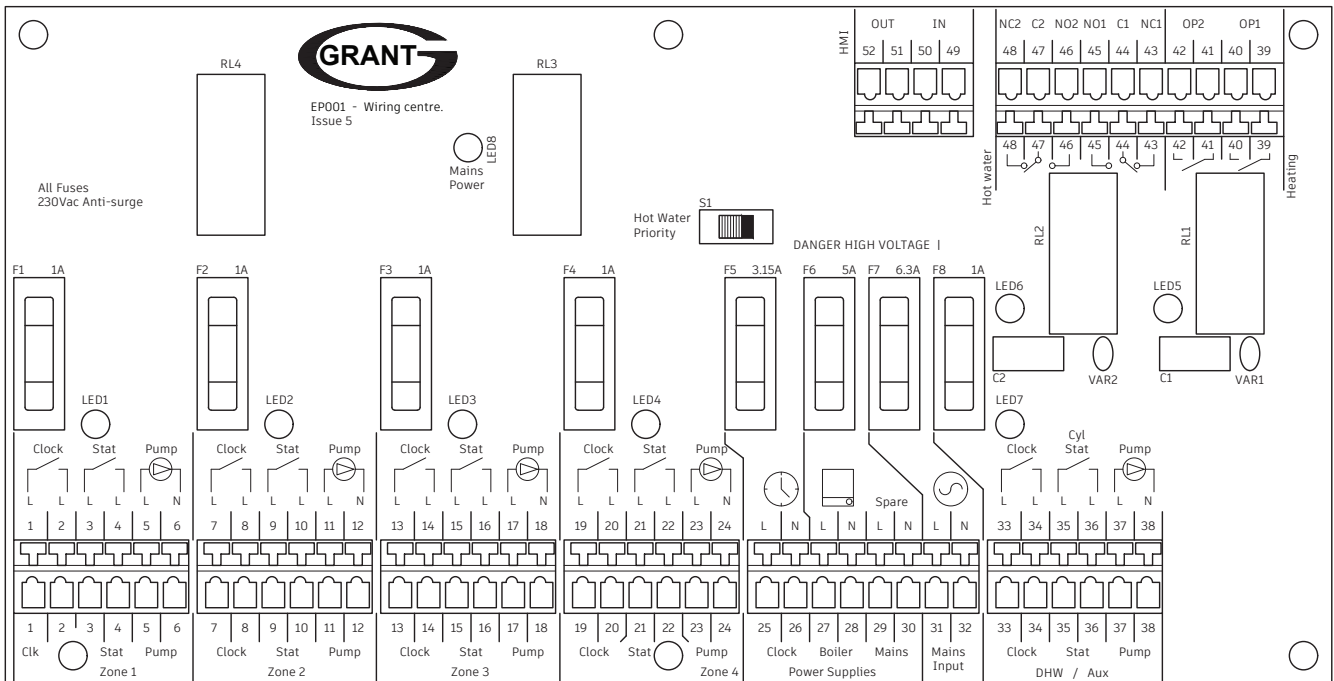


Figure 1-1: EP001 PCB

1.3 CONNECTIONS

Terminal blocks

Screwless (lever operated) terminals

Wire capacity 0.08mm² to 2.5mm²

1.3.1 CONNECTIONS ON LOWER EDGE OF PCB (LEFT TO RIGHT)

Zone 1:

Refer to Figure 1-2.

- Space heating zone
- 1A fuse
- Clock - terminals 1 and 2 - for timer or programmer
- Stat - terminals 3 and 4 - for zone thermostat
- Pump - terminals 5 and 6 - output to zone pump and/or zone valve
- LED1 (red) - illuminated when this space heating zone is 'active' and there is a 230V output to the zone pump or zone valve.

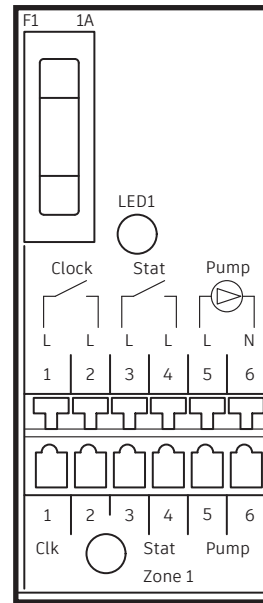


Figure 1-2: Zone 1 Terminals

! NOTE !

These are only suggested uses. Refer to Section 2 for more detailed information on the operation of the PCB.

Zones 2, 3 and 4:

- Space heating zones
- Each as Zone 1 (only the terminal numbers change)

Power supplies:

Refer to Figure 1-3.

- Clock - 230V 3.15A fused supply to drive a time switch or programmer
- Boiler - 230V 5A fused supply for a boiler
- Mains - 230V 5A fused supply (spare)
- Mains input - 230V 6.3A fused input for connection to mains supply

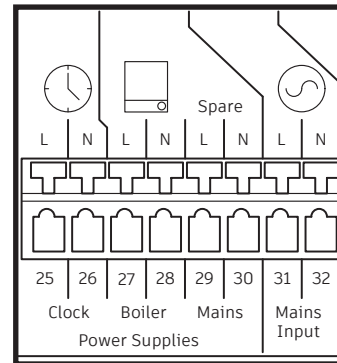


Figure 1-3: Power Supply Terminals

DHW/Aux:

Refer to Figure 1-4.

- 1A fuse
- Clock - terminals 33 and 34 - for timer or programmer
- Stat - terminals 35 and 36 - for DHW cylinder thermostat
- Pump - terminals 37 and 38 - output to DHW zone pump and/or zone valve
- LED 7 (red) - illuminated when this hot water zone is 'active' and there is a 230V output to the hot water zone pump or zone valve

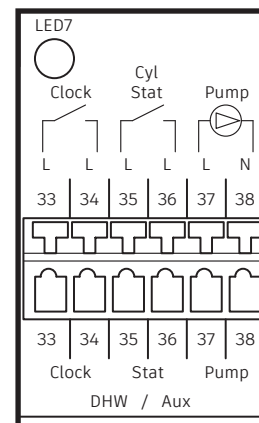


Figure 1-4: DHW/Aux Zone Terminals

1.3.2 CONNECTIONS ON UPPER EDGE OF PCB (RIGHT TO LEFT)

Space heating relay:

Refer to Figure 1-5.

- Relay RL1 - DPST relay
- LED 5 (red) - illuminated when this relay is energised i.e., when one or more space heating zones are 'active'.
- OP1 - output 1 - terminals 39 and 40
- OP2 - output 2 - terminals 41 and 42

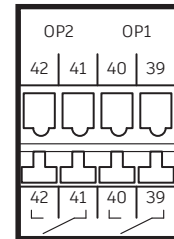


Figure 1-5: Space heating relay RL1

Hot water relay:

Refer to Figure 1-6.

- Relay RL2 - DPDT relay
- LED 6 - illuminated when this relay is energised i.e., when the hot water zone is 'active'.
- NC1 - normally closed contact - terminal 43
- C1 - common - terminal 44
- NO1 - normally open contact - terminal 45
- NO2 - normally open contact - terminal 46
- C2 - common terminal 47
- NC2 - normally closed contact - terminal 48

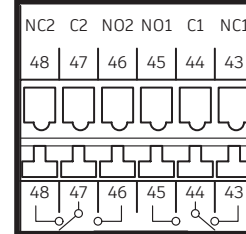


Figure 1-6: DHW relay RL2

HMI:

Refer to Figure 1-7.

- Two pairs of link terminals - 2 IN and 2 OUT
- Terminal 49 (IN) connects to terminal 52 (OUT)
- Terminal 50 (IN) connects to terminal 51 (OUT)

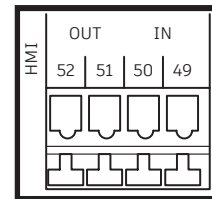


Figure 1-7: HMI Terminals

! NOTE !

Only use for low voltage if connections to RL1 and RL2 are also low voltage.

Earth connector:

Attached to the inside of the upper face of the enclosure (not on the PCB)

2 Operation

! NOTE !

The following description of the operation of the EP001 wiring centre is based on the DHW Priority being set to ON. Refer to Section 2.3 for further details.

2.1 SPACE HEATING ZONES

Zone 1:

Terminals 2 and 3 and terminals 4 and 5 are internally linked on the PCB.

A 230V 1A fused supply is present on terminal 1.

Whenever 230V is present on terminal 4:

- Zone 1 is calling, i.e., there is a space heating demand from this zone.
- Relay RL1 is energised. Contact OP1 (between terminals 39 and 40) is closed.
- 230V output from terminal 5 to operate a pump (or valve) if required.
- LED 1 is illuminated to indicate this heating zones is 'active'.

! NOTE !

LED 1 will NOT be illuminated when the HW zone is 'active' AND the HW priority switch is set to ON, even if there is a space heating demand from this zone. Refer to Section 2.3 for further details.

Two examples of how the space heating system controls will create a demand on the heating zone are as follows:

1. The space heating timer contact (connected between terminals 1 and 2) is closed, i.e., the timer is calling for heat.

AND

The room thermostat contact (connected between terminals 3 and 4) is closed, i.e., the room thermostat is calling for heat.

2. There is a space heating switched live output from a programmer (connected to terminal 2).

AND

The room thermostat (connected between terminals 3 and 4) is calling and the contact is closed.

Refer to wiring diagram Figure 3-1.

When space heating relay RL1 is energised:

Contact OP1 (between terminals 39 and 40) is closed, providing volt free switching for operation of the Aerona³ heat pump space heating function.

When the 230V supply from terminal 4 is interrupted:

(e.g., when the room thermostat is satisfied, or the programmer is in a space heating off period):

- Zone 1 is no longer calling, i.e., there is no space heating demand from this zone.
- Relay RL1 is de-energised. Contact OP1 (between terminals 39 and 40) opens.
- 230V output from terminal 5 stops, i.e., no power to operate a zone pump or zone valve.
- LED1 is no longer illuminated, indicating the space heating zone is no longer 'active'.

Unless there is a simultaneous DHW demand (see below), with relay contact OP1 open, the volt free switching (between terminals 39 and 40) ceases and the Aerona³ heat pump space heating function will stop.

Space heating Zones 2, 3 and 4:

These function in exactly the same manner as Zone 1. Only the terminal numbers are different.

2.2 DHW/AUX ZONE

As with the space heating zones, Terminals 34 and 35 and terminals 36 and 37 are internally linked on the PCB.

A 230V 1A fused supply is present on terminal 33.

Whenever 230V is present on terminal 36:

- DHW Zone is calling, i.e., there is a DHW demand from this zone.
- Relay RL2 is energised. Contact C1 to NO1 (between terminals 44 and 45) is closed.
- 230V output from terminal 37 to operate a pump (or valve) if required.
- LED 7 is illuminated, to indicate the DHW zone is 'active'.

Two examples of how the HW controls will create a demand on the DHW zone are as follows:

1. The DHW timer contact (connected between terminals 33 and 34) is closed, i.e., the DHW timer is calling for heat.

AND

The cylinder thermostat contact (connected between terminals 35 and 36) is closed, i.e., the cylinder thermostat is calling for heat.

2. There is a DHW switched live output from a programmer (connected to terminal 34)

AND

The cylinder thermostat (connected between terminals 35 and 36) is calling for heat and the contact is closed.

Refer to wiring diagram Figure 3-1.

When hot water relay RL2 is energised:

Contact C1 to NO1 (between terminals 44 and 45) is closed, providing volt free switching for operation of the Aeronas³ heat pump DHW function.

When the 230V supply to terminal 36 is interrupted:

(e.g., when cylinder thermostat is satisfied, or the programmer is in a DHW off period):

- DHW zone is no longer calling, i.e., there is no DHW demand from this zone.
- Relay RL2 is de-energised. Contact C1 to NO1 (between terminals 44 and 45) opens.
- 230V output from terminal 37 stops, i.e., no power to operate pump (or valve).
- LED 7 is no longer illuminated, indicating the DHW zone is no longer 'active'.

Unless there is a simultaneous demand from one (or more) of the space heating zones, with relay contact C1 to NO1 open, the volt free switching (between terminals 44 and 45) ceases and the Aeronas³ heat pump DHW function will stop.

With relay contact C1 to NO1 open, if there is a space heating demand from one or more of the space heating zones; relay RL1 is energised, relay contact OP1 closes, providing volt free switching for operation of the Aeronas³ heat pump heating function.

2.3 DHW PRIORITY OPERATION

The DHW Priority function is to ensure that a heat pump will not operate to simultaneously to provide space heating and DHW. Thus, it is recommended that the DHW switch is set to ON (left hand position) for all ASHP applications.

With the DHW priority switch set to ON, any space heating demand (i.e. any 230V output to the zone pump or valve on zones 1, 2, 3 or 4) will be immediately interrupted when the DHW/Aux zone is 'active'.

Relay RL1 is immediately de-energised and contact OP1 (between terminals 39 and 40) opens, stopping the space heating operation of the ASHP.

At the same time, Relay RL2 is energised and contact C1 to NO1 (between terminals 44 and 45) is closed, starting the DHW operation of the ASHP.

! NOTE !

If the DHW priority switch is set to OFF (right hand position), relay RL1 will NOT be de-energised when the DHW/Aux zone is 'active' and the space heating will NOT be interrupted.

This condition will continue until the DHW demand is satisfied, i.e. If either the timer/programmer contact or cylinder thermostat contact opens.

When it does, Relay RL2 is de-energised and contact C1 to NO1 opens, stopping the DHW operation of the ASHP.

If there is still a space heating demand from one or more of zones 1,2,3 or 4, Relay RL1 will be immediately energised and contact OP1 closes, starting the heating operation of the ASHP.

If there is no space heating demand, Relay RL1 will remain de-energised and contact OP1 open, and there will be no operation of the ASHP.

3 Electrical Wiring

All electrical wiring must be carried out by a competent person and in accordance with the current edition of BS7671 (the I.E.T. Wiring Regulations), including any amendments.

All controls (programmers, thermostats, etc.) used must be wired as detailed in the manufacturer's Instructions supplied with them.

3.1 INSTALLATION

The wiring centre enclosure is designed to be fixed directly to a wall or similar fixed vertical surface. It is not designed for DIN rail mounting.

Suitable screws and wall fixings should be used, depending on the wall structure. These are not supplied with the wiring centre.

3.2 CABLE ENTRIES

The wiring centre enclosure is supplied with 11 cable entry holes in the lower face. These must be fitted with a suitable size of cable gland for the cable being used.

The following cable glands are supplied with the wiring centre for this purpose:

- 5 x M16 7mm cable glands – suitable for cable up to 6mm diameter
- 6 x M16 10mm cable glands – suitable for cable up to 10mm diameter

3.3 HMI

This is two pairs of terminals (on the top edge of the PCB). These can be used to link wires together.

- Terminal 49 (IN) connects to terminal 52 (OUT)
- Terminal 50 (IN) connects to terminal 51 (OUT)

! WARNING !

These terminals must only be used for low voltage if the connections to Relays RL1 and RL2 are low voltage, e.g., volt free switching for an ASHP.

3.4 FUSES

The 230V output from each of the four space heating zones and DHW/Aux zone are all individually fused.

The 230V clock output and boiler output (including spare output) are also individually fused.

The 230V main input is also fused on the PCB.

All fuses fitted on the PCB are anti-surge. Any replacement fuses must be of the same type and rating.

The fuse ratings are as follows:

Table 3-1: EP001 PCB Fuse Ratings

	Fuse reference	Fuse rating	Fuse marking
Zone 1 230V output	F1	1A	T1AH250V
Zone 2 230V output	F2	1A	T1AH250V
Zone 3 230V output	F3	1A	T1AH250V
Zone 4 230V output	F4	1A	T1AH250V
Clock 230V output	F5	3.15A	T3.15AH250V
Boiler 230V output	F6	5A	T5AH250V
Mains 230V input	F7	6.3A	T6.3AH250V
DHW/Aux 230V output	F8	1A	T1AH250V

3.5 WIRING DIAGRAM

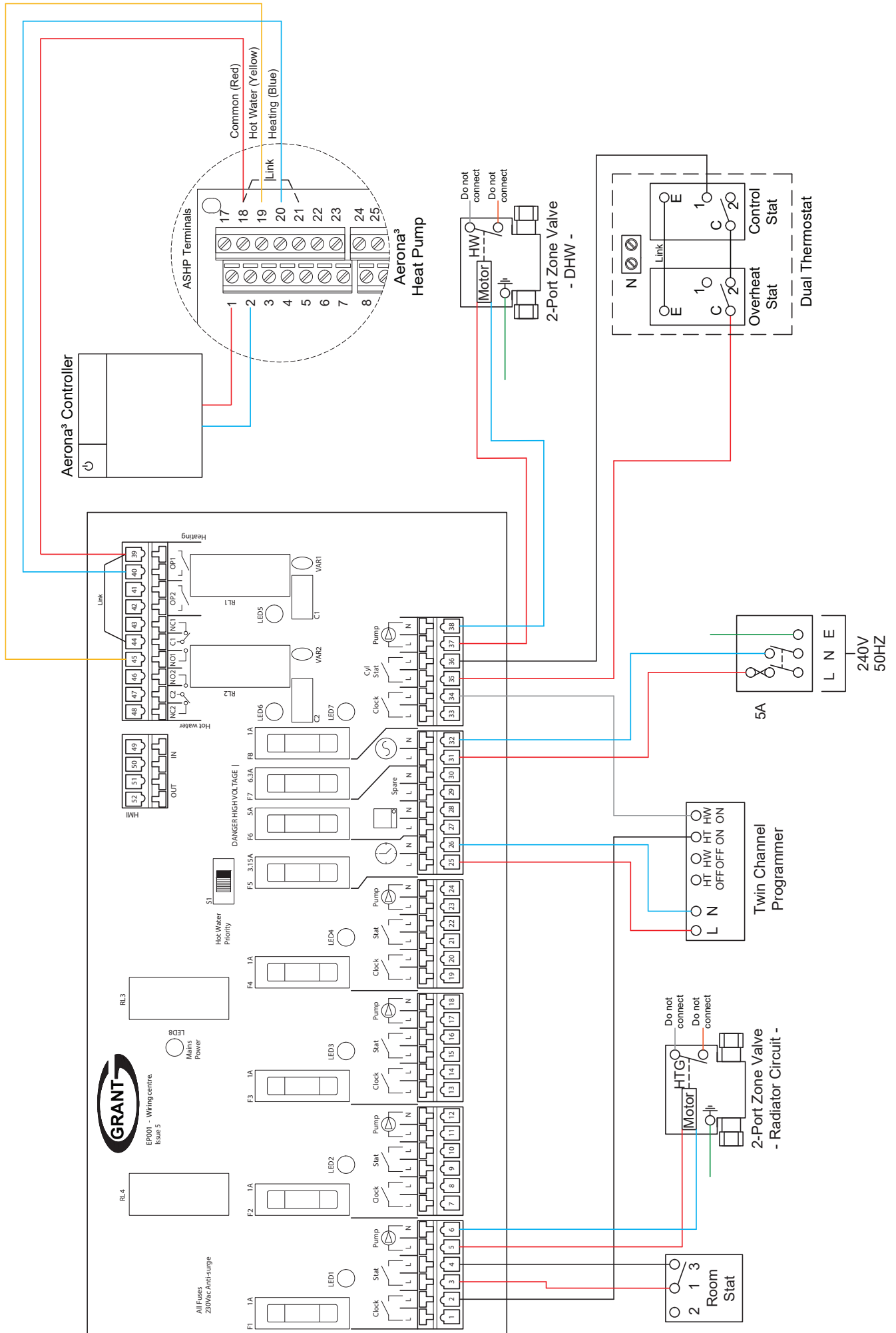


Figure 3-1: EP001 Wiring Centre connected to Aeronas ASHP - S-Plan System

Notes



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