

Grant EP001X

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 EP001X wiring centre.

This document should be read alongside the installation instructions for the heat source being installed, for example a Grant Aeron3 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.



GRANT ENGINEERING (UK) LIMITED

Tel: +44 (0)1380 736920

Email: info@grantuk.com

www.grantuk.com

This manual is accurate at the date of printing but will be superseded and should be disregarded if specifications and/or appearances are changed in the interests of continued product improvement. However, no responsibility of any kind for any injury, death, loss, damage or delay however caused resulting from the use of this manual can be accepted by Grant Engineering (UK) Limited, the author or others involved in its publication.

All goods sold are subject to our official Conditions of Sale, a copy of which may be obtained on application.

© Grant Engineering (UK) Limited 2022. No part of this manual may be reproduced by any means without prior written consent.

Contents

1	Introduction	4
1.1	Description	4
1.2	Features	4
1.3	Connections	5
2	Operation	7
2.1	Space Heating Zones	7
2.2	DHW Zone	7
2.3	DHW Priority Operation	8
2.4	Pump Relay Operation	8
3	Electrical Wiring	9
3.1	Installation	9
3.2	Cable Entries	9
3.3	Wiring Connections	9
3.4	Fuses	9
3.5	Wiring Diagram	10

1 Introduction

1.1 DESCRIPTION

A simple and convenient means of making all system control connections for up to two 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 Aeronas³ heat pump installations).

1.2 FEATURES

Two space heating zones

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

Hot water zone

With options for time and/or temperature control with output to a pump and/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 Aeronas³ heat pumps.

Hot water relay

Double pole (DPST) relay

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

This relay provides volt free outputs for Grant Aeronas³ heat pumps.

DHW priority relay

Double pole (DPST) relay.

When a demand from the DHW controls is present the coil of the relay is energised, automatically interrupting any active space heating demands.

Pump relay

Single pole (SPDT) relay

The output to the pump is connected to the common terminal.

The normally closed contact is connected to the hot water demand, meaning when there is a hot water demand the circulator pump is energised.

The normally open contact and the coil of the relay are connected to a heating demand, meaning when there is a heating demand the contact is switched by the coil and the circulator pump is energised.

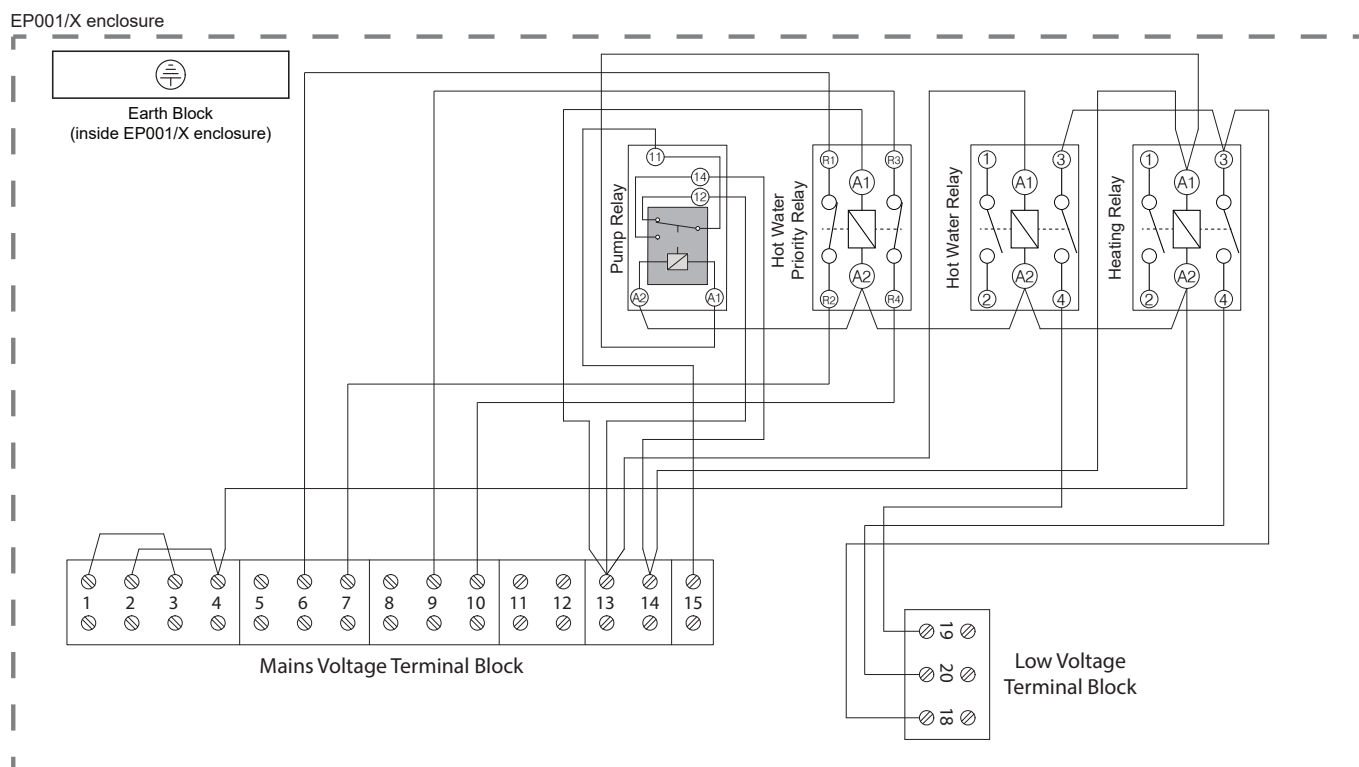


Figure 1-1: EP001/X Wiring Centre

1.3 CONNECTIONS

Terminal blocks

Screw terminals

Wire capacity:

Terminals 1 to 4: up to 6mm²

Terminals 5 to 15: up to 4mm²

Terminals 18 to 20: up to 4mm²

1.3.1 EARTH CONNECTIONS

All earth connections should be made to the earth block on the inside of the EP001/X wiring centre enclosure (refer to Figure 1-1).

1.3.2 CONNECTIONS ON MAINS VOLTAGE TERMINAL BLOCK (LEFT TO RIGHT)

! NOTE !

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

Power supplies:

Refer to Figure 1-2.

- Mains input to be 230V AC, 50Hz and fused at 5A.
Connect the live to terminal 1 and the neutral to terminal 2.
- Permanent live outputs for clocks, programmers, switch wires for 2-Port motorised valves, etc... to be connected to terminals 1 and 3.
- Neutral connections to be made to terminals 2 and 4.

SH Zone 1:

Refer to Figure 1-3.

- Space heating zone
- T1 (timer) - terminal 5 - output from timer or programmer.
- SL1 (switched live) - terminal 6 - output from zone thermostat.
- Z1 (zone valve) - terminal 7 - output to zone valve.

SH Zone 2:

- Space heating zone.
- As Zone 1 (only the terminal numbers change).

DHW:

Refer to Figure 1-4.

- DHW zone.
- TW (timer) - terminal 11 - output from timer or programmer and output to DHW cylinder thermostat.
- SLW (switched live) - terminal 12 - output from DHW cylinder thermostat and output to zone valve.

Switched Lives:

Refer to Figure 1-5.

- For Orange switched live wires from 2-Port zone valves.
- OrW (Hot Water) - terminal 13 - for orange wire from DHW zone valve.
- OrS (Space Heating) - terminal 14 - for orange wire from space heating zone valve/s.

Pump:

Refer to Figure 1-6.

- Output to system circulator to be connected to terminal 15.

1	2	3	4
⊗	⊗	⊗	⊗
⊗	⊗	⊗	⊗
L	N	L	N
Power Supplies			

Figure 1-2: Power Supplies

5	6	7
⊗	⊗	⊗
⊗	⊗	⊗
T1	SL1	Z1
SH Zone 1		

Figure 1-3: SH Zone 1 Terminals

11	12
⊗	⊗
⊗	⊗
TW	SLW
DHW	

Figure 1-4: DHW Terminals

13	14
⊗	⊗
⊗	⊗
OrW	OrS
Switched Lives	

Figure 1-5: Switched Live Terminals

15
⊗
⊗
P
Pump

Figure 1-6: Pump Terminal

1.3.3 CONNECTIONS ON VOLT FREE TERMINAL BLOCK (LEFT TO RIGHT)

Aerona³ ASHP connections:

Refer to Figure 1-7.

- HW (hot water) - terminal 19 - to be connected to terminal 19 of the Aerona³ ASHP terminal PCB.
- SH (space heating) - terminal 20 - to be connected to terminal 20 on the Aerona³ ASHP terminal PCB.
- C (common) - terminal 18 - to be connected to terminal 18 on the Aerona³ ASHP terminal PCB.

19	20	18
⊗	⊗	⊗
⊗	⊗	⊗
HW	SH	C
ASHP		

Figure 1-7: Aerona³ ASHP connections

2 Operation

2.1 SPACE HEATING ZONES

Zone 1:

Terminal 5 of the EP001X wiring centre is intended for the connection of a switched live from a programmer/timer and for connection to a common terminal of a room thermostat (refer to Figure 3-1). If a programmable room thermostat is to be used in place of a traditional programmer and room thermostat arrangement, this terminal can be left disconnected (refer to Figure 3-2).

Terminal 6 is intended for connection to a switched live from a room thermostat. Whenever 230V is present on terminal 6:

- Zone 1 is calling, i.e., there is a space heating demand from this zone.
- The 230V signal then passes through one of the normally closed contacts in the DHW priority relay (refer to Sections 1.2 and 2.3) and is internally linked to terminal 7.

Whenever 230V is present on terminal 7:

- Zone 1 is calling AND there is no active DHW demand.
- The brown wire from a 2-Port zone valve (such as a EPH V222P) should be connected to terminal 7 of the EP001/X wiring centre.
- The valve will motor into a hydraulically open position and close the end switch of the 2-Port valve, energising terminal 14.

Whenever 230V is present on terminal 14:

- The coil of the heating relay is energised, providing the volt-free switching the Aeronas³ heat pump requires to operate in space heating mode.

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

1. There is an active switched live output from a timer/programmer present on terminal 5 and the common terminal of a room thermostat is connected to terminal 5.

AND

The room thermostat demand contact (connected to terminal 6) is closed, i.e., the room thermostat is calling for heat.

Refer to wiring diagram Figure 3-1.

2. There is permanent live connection from terminal 1 or 3 connected to the designated terminal of a programmable room thermostat (such as a Grant UFLEX Neostat).

AND

The switched live terminal from the programmable room thermostat (connected to terminal 6) is active, i.e., the programmable room thermostat is calling for heat.

Refer to wiring diagram Figure 3-2.

When the space heating relay is energised:

A 230V signal from terminal 14 of the EP001X wiring centre energises the coil of the space heating relay, closing the relay contacts and providing volt free switching for operation of the Aeronas³ heat pump space heating function.

When the 230V supply to terminal 7 is interrupted:

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

- Zone 1 is no longer calling, i.e., there is no space heating demand from this zone.
- 230V output from terminal 7 stops, i.e., no power to operate a zone valve.
- The space heating relay is de-energised and the relay contact opens.

With the space heating relay contact open, the volt free switching ceases and the Aeronas³ heat pump space heating function will stop.

Space heating Zone 2:

This Zone functions in exactly the same manner as Zone 1. Only the terminal numbers are different.

2.2 DHW ZONE

Similarly to the space heating zones, terminal 11 is intended for the connection of a switched live from a programmer/timer and for connection to a common terminal of a cylinder thermostat (refer to Figures 3-1 and 3-2).

Whenever 230V is present on terminal 12:

- DHW Zone is calling, i.e., there is a DHW demand from this zone.
- The brown wire from a 2-Port zone valve should be connected to terminal 12 of the EP001/X wiring centre.
- The valve will motor into a hydraulically open position and close the end switch of the 2-Port valve, energising terminal 13.

Whenever 230V is present on terminal 13:

- The coil of the DHW priority relay is energised, breaking any space heating demand that may be present.
- The coil of the hot water relay is energised, providing the volt-free switching the Aeronas³ heat pump requires to operate in DHW production mode.

The HW controls will create a demand on the DHW zone when:

There is an active switched live output from a timer/programmer present on terminal 11 and the common terminal of a cylinder thermostat is also connected to terminal 11.

AND

The cylinder thermostat demand contact (connected to terminal 12) is closed, i.e., the cylinder thermostat is calling for heat.

Refer to the wiring diagrams in Figures 3-1 and 3-2.

When the hot water relay is energised:

A 230V signal from terminal 13 of the EP001X wiring centre energises the coil of the hot water relay, closing the relay contacts and providing volt free switching for operation of the AERONA³ heat pump DHW production function.

When the 230V supply to terminal 12 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.
- 230V output from terminal 12 stops, i.e., no power to operate a zone valve.
- The hot water relay is de-energised and the relay contact opens.
With the hot water relay contact open, the volt free switching ceases and the AERONA³ heat pump DHW production function will stop.
- The DHW priority relay is de-energised and the relay contact closes.

2.3 DHW PRIORITY OPERATION

The DHW Priority function is to ensure that a heat pump will not operate to simultaneously provide space heating and DHW.

When the DHW zone is 'active', the coil of the DHW priority relay is energised any space heating demand present will be immediately interrupted.

The space heating relay is immediately de-energised and the relay contact is opened, stopping the space heating operation of the ASHP.

At the same time, the hot water relay is energised and the hot water relay contact is closed, starting the DHW operation of the ASHP.

When the DHW demand is satisfied, i.e. if either the timer/programmer contact or cylinder thermostat contact opens, the hot water relay is de-energised and the hot water relay contact opens, stopping the DHW operation of the ASHP.

If there is still a space heating demand from one or more of the space heating zones, the space heating relay will be immediately energised and the space heating relay contact closes, starting the heating operation of the ASHP.

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

2.4 PUMP RELAY OPERATION

The pump relay ensures that a system circulating pump external to the appliance will operate when either a space heating demand or DHW demand is present.

When a DHW demand is present, a 230V signal passes through the "normally closed" contact of the relay and energises terminal 15 of the EP001X wiring centre.

When a heating demand is present, the pump relay coil is energised and a 230V signal passes through the now closed "normally open" contact of the relay; energising terminal 15.

The common contact of the relay is pre-wired to terminal 15 (see Figure 1-1), which will energise the additional circulating pump when wired as shown in Figures 3-1 and 3-2.

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:

- 6 x M16 5-10mm cable glands – suitable for cable ranging from 5 to 10mm diameter

And, either:

- 5 x M16 4.5-10mm cable glands – suitable for cable ranging from 4.5-10mm in diameter

OR

- 5 x M16 7mm cable glands – suitable for cable 7mm in diameter

! NOTE !

The cable glands supplied with the EP001X wiring centre have been selected for use with the following cable sizes:

- up to 3 x 1.5mm² cable for the larger M16 cable gland (6x supplied)
- 3 x 0.75mm² cable for the smaller M16 cable gland (5x supplied)

As these glands are required to securely clamp the cable and prevent it from being pulled out, they **MUST** only be used with the correct cable size, as above.

If other cable sizes are to be used, it is the responsibility of the installer to supply and fit the correct cable glands.

3.3 WIRING CONNECTIONS

3.3.1 EARTH CONNECTIONS

All earth connections should be made to the earth block on the inside of the EP001X wiring centre enclosure (refer to Figure 1-1).

3.3.2 CONTROL SYSTEM WIRING CONNECTIONS

The control system wiring connections should be made to the mains voltage terminal block inside the EP001X enclosure (refer to Section 1.3.2 and Figure 1-1) and fed with a 230V 50Hz AC electrical supply. Refer to Figures 3-1 and 3-2.

3.3.3 ASHP WIRING CONNECTIONS

The Grant AERONA³ heat pump terminal PCB connections 18, 19 and 20 should be wired to the low voltage terminal block inside the EP001X enclosure (refer to Section 1.3.3 and Figures 1-1, 3-1 and 3-2).

! WARNING !

Under no circumstances should mains voltage be connected to terminals 18, 19 and 20 of the Grant EP001X wiring centre.

For further information on the installation of the Grant AERONA heat pump, please refer to the instructions supplied with the unit.

If another make of heat pump is to be used with the EP001X wiring centre, please consult the appliance manufacturer for details.

3.4 FUSES

The 230V supply to the control system should be fused at 5 amps, unless otherwise stated by the manufacturer of any components used in the control system.

! NOTE !

Some Neutral and Earth connections have been excluded for clarity

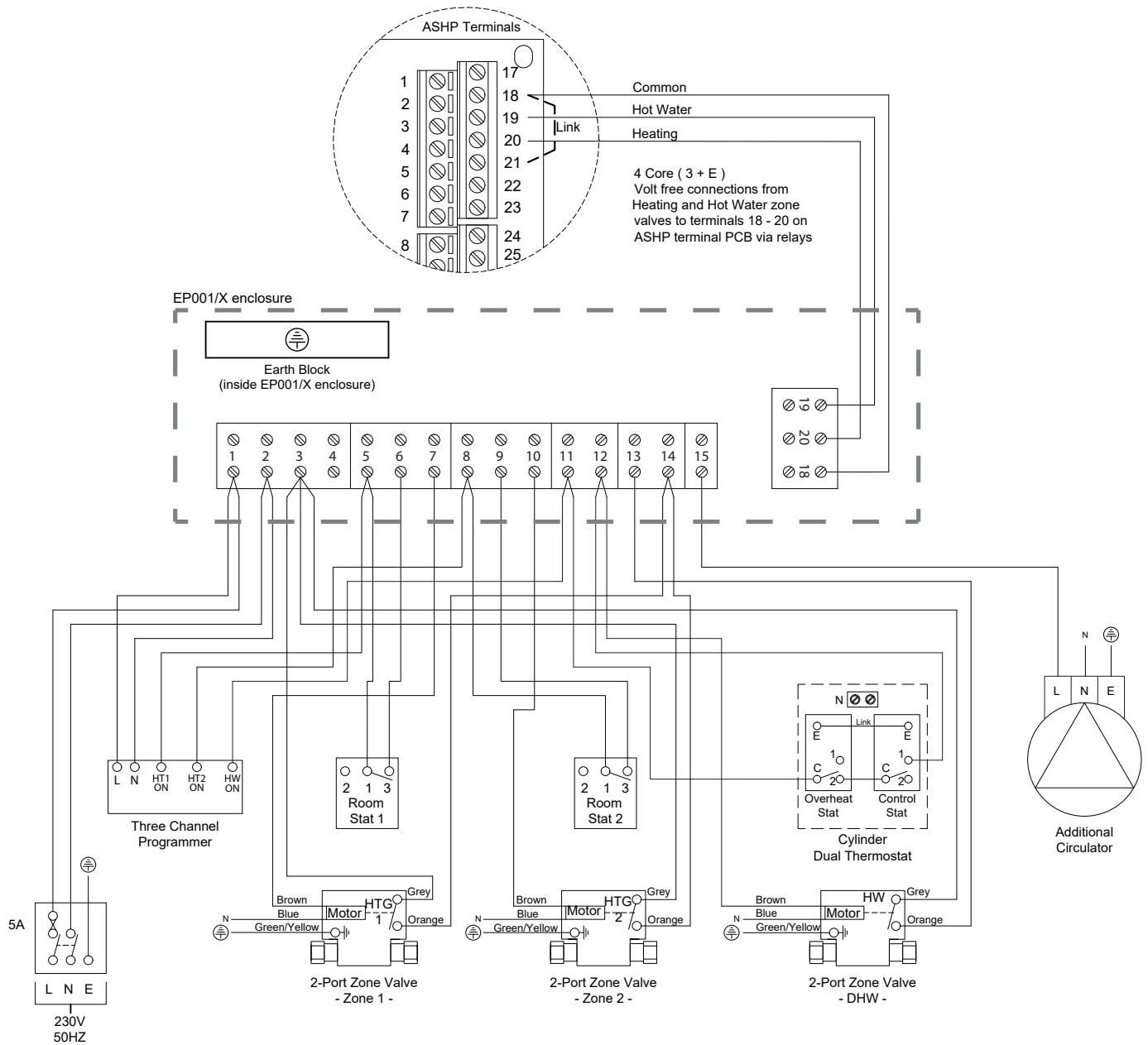
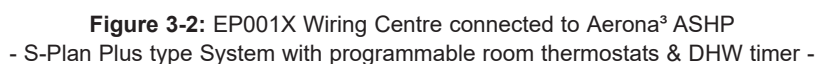


Figure 3-1: EP001X Wiring Centre connected to Aeronas³ ASHP
- S-Plan Plus type System with programmer and room thermostats -

Some Neutral and Earth connections have been excluded for clarity





GRANT ENGINEERING (UK) LIMITED

Tel: +44 (0)1380 736920

Email: info@grantuk.com

www.grantuk.com