

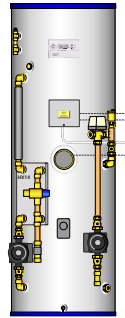
# PANDORA INSTALLATION AND USER INSTRUCTIONS

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CPC-150-ABIAB

## Pandora Heat Bank thermal store [CPC-150-ABIAB] 150 litres, 530mm diameter x 1300mm high

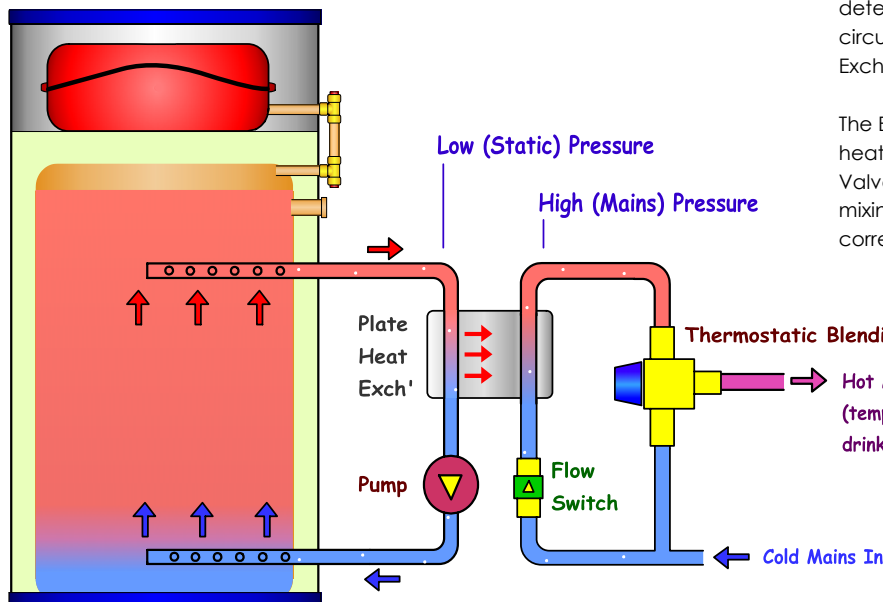
L18-14 plate heat exchanger for mains pressure hot water (30 l/min), Heatguard 22mm thermostatic mixing valve. Boost immersion heater 3kW. Overheat and dry-fire protection integral to heater(s). Indirectly heated with high duty 9 turn 310x28mm primary coil, immersed cylinder thermostat, primary pump (Grundfos UPS15-50), automatic air vent and balancing valve on flow to coil, three port motorised valve (hot water & heating). Danfoss FP715 programmer (independent hot water & heating), with RMT230 room thermostat supplied loose. Two metre cables provided, controls power (3A) .



A Heat Bank is an Advanced Thermal Store providing very high flow rates of Mains Pressure Potable (drinkable) Hot Water for domestic properties. The Heat Bank stores Heat Energy which can be utilised to provide domestic hot water. This heat energy is retained within the Heat Bank by the use of 'HCFC free' foam insulation. The unit is further protected by steel casing with an attractive white finish.

A plate heat exchanger separates the pressurised mains water from the stored water, while allowing rapid transfer of heat. While the mains water pressure can be anything from 0.5 to 5 bar, the stored water is not pressurised. The mains hot water is not stored and is therefore drinkable, and removes the need for a cold water storage tank. There is no chance of the introduction of Legionnaires' Bacteria into the domestic supply.

The stored water does not change. The build up of scale within the cylinder is therefore eliminated and extra system protection is achieved by the factory addition of inhibitor. The stored water can be heated to a maximum of 80°C thereby increasing the amount of heat energy available for use, while the use of HCFC Free Foam Insulation (to British Standards 699, 1566 & 4735) keeps the heat within the stored water.



When a hot water tap is opened, the Flow Switch detects this and switches the Pump on. This in turn circulates the hot stored water through the Heat Exchanger.

The Exchanger uses the heat in the stored water to heat up the mains water. A Thermostatic Blending Valve controls the final hot water temperature by mixing hot and cold mains water to obtain the correct output temperature.

## Important Installation Notes.

Installation must be carried out by a competent person in accordance with the Water Regulations Guide, the local Building Regulations, Water Undertaking Bye-laws, the I.E.E. Wiring Regulations, Treatment Regulations (BS7593) and all relevant installation instructions. Qualifications for pressurised/unvented storage cylinders are not required.

In areas of hard water a Hydroflo Electronic Scale Conditioner must be fitted. If required this can be factory fitted.

The correct dosage of Scale/Corrosion Inhibitor has already been factory added to the store. If the store is drained then fresh inhibitor will be required, in the correct dosage. Only the boiler system (indirect models only) will require cold/hot flushing and inhibiting.

For warranty service backup to be provided, correct commissioning and hot water tests at outlets MUST be carried out by the installer. If you have any queries, please phone DPS on 01372 803 675/643 for further information.

# INSTALLATION INSTRUCTIONS

## COMPONENTS & CONNECTIONS

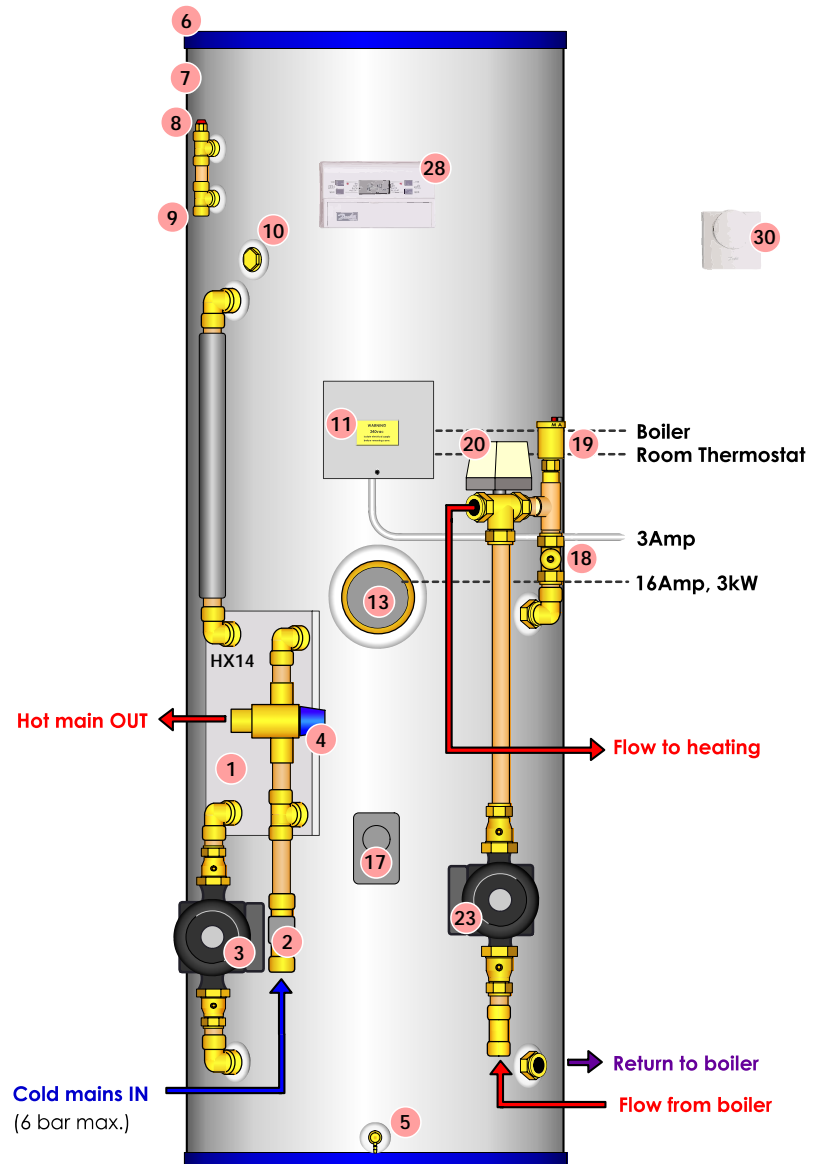
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The following diagram details the components that are supplied with the Pandora Heat Bank, as well as the connections (mechanical and electrical) to the unit.

### KEY:

- 1 Plate heat exchanger, L18-14 (100kw)
- 2 Flow switch
- 3 Heat exchanger pump
- 4 Thermostatic mixing valve, RWC Heatguard 22mm
- 5 Drain off cock
- 6 Removable lid
- 7 White plastic coated steel casing
- 8 Anti-vacuum valve
- 9 Anti-pressure valve
- 10 Filling Point
- 11 Wiring Centre
- 13 Boost Immersion Heater
- 17 Cylinder Thermostat, Immersed [75°C]
- 18 Lockshield Balancing Valve, 22mm
- 19 Automatic Air Vent with Manual Vent
- 20 Three Port Motorised Valve, 22mm
- 23 Primary pump, Grundfos UPS15-50
- 28 Danfoss FP715 Two Channel Programmer
- 30 Danfoss RMT230 Room Thermostat



Not to Scale

Connections onto the unit are compression or Tectite push-fit. When connecting into a push-fit fitting, ensure that a wheel-type pipe citter is used and that there are no burrs that may damage the o-rings. A disconnecting tool is supplied to enable release of pipes from push-fit connections.

Please ensure that the cold mains supply to the unit is fitted with a drain cock to both assist in filling, and to allow pipework to be drained.

# INSTALLATION INSTRUCTIONS

## WIRING

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The Pandora Heat Bank, and all connected equipment, must be installed by a competent person. Correct function and operation must be checked.

It is important that the incoming mains power supply has sufficient current and voltage, taking into account the supply requirements of the rest of the property.

A double pole RCD (30mAtrip) capable of breaking the full load to BSEN 61008:1994 must be used on power supplies. All power supplies must also be fitted with double pole isolation within the cylinder cupboard, as well as suitably rated MCB protection.

It is important that power supplies to a separate gas/oil boiler (indirect systems only) are taken from the unit wiring centre. It is unacceptable to have two independent power supplies/spurs.

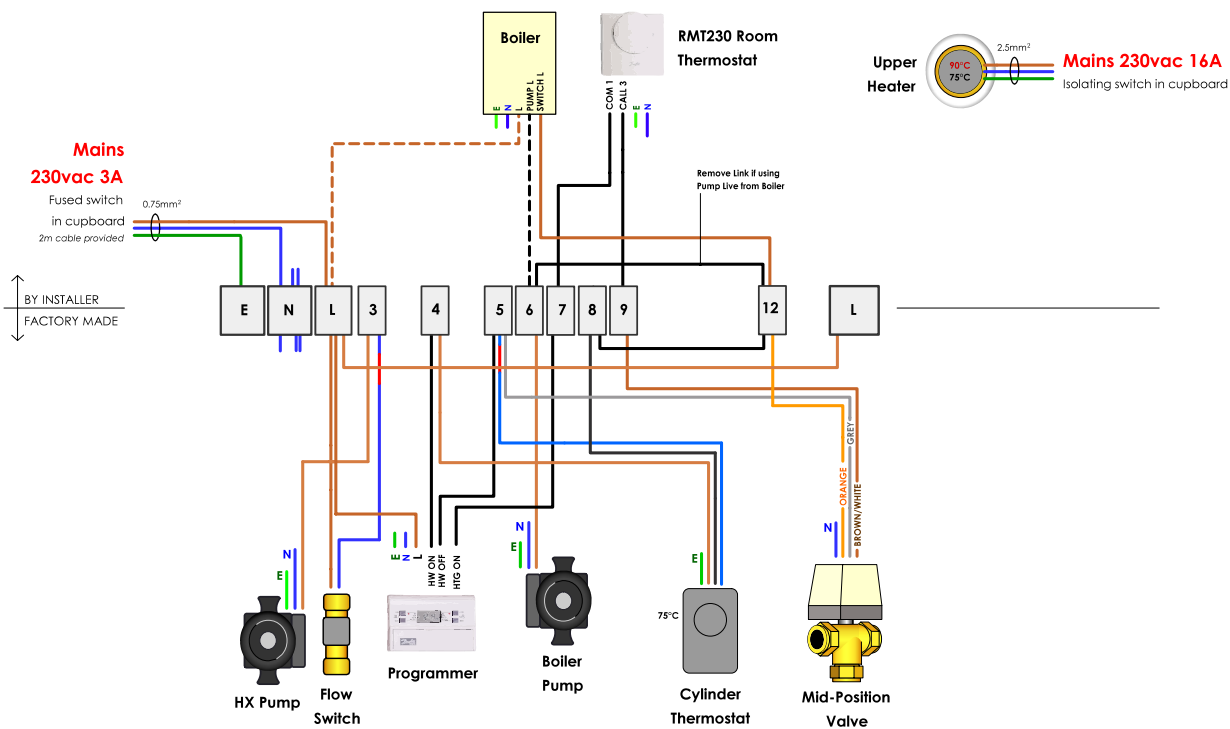
Ensure earth continuity throughout.

In the diagram below, earth and neutral wires are abbreviated for clarity.

### Wiring Diagram:

CPC-150-ABIAB

Ensure Earth continuity throughout.



# INSTALLATION INSTRUCTIONS

## COMMISSIONING

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### Filling the Pandora:

The unit is filled by the use of a hose pipe connected to the mains water supply, and will only need to be filled up once in this way. Note that inhibitor is factory added to the store already, and so is only required if the unit is drained after initial filling.

1. Remove the filling cap [No.10, page 2] to reveal the filling hole.
2. Feed hose pipe into store through the filling hole, and start to fill. It may help to tie the hose to pipework to stop it slipping out.
3. Fill the unit until up to the water level marker (within 1cm of hole), then stop.
4. Remove the hose, and replace the filling cap securely.

### Filling the Primary System:

The primary (boiler) system is filled separately to the Pandora.

The primary system must be properly cold/hot flushed prior to final filling. Always use the correct dose of a reputable corrosion inhibitor to protect the system.

Please ensure that all air is properly vented from primary pipework and radiators prior to turning on the boiler.

### Testing of Primary System:

The aim of testing is to ensure correct operation of boiler and controls, as well as TRVs and general operation of the heating. It also allows hot water to be tested.

1. Check balancing valve(s) on the primary flow the the coil is open, and all radiator valves are open or set to MAXIMUM.
2. Turn system power on, turn the Boiler to FULL ON, and the system controls to HOT WATER ON.
3. The boiler pump should start circulating water and the boiler should start firing.
4. The boiler flow and the flow to the store heating coil should start to heat up.
5. Turn the system controls to HEATING ON and any room thermostats to MAXIMUM.
6. The flow to the central heating should now start to get hot, and in turn radiators.
7. Check all radiators for heat, and bleed air as required. Adjust By-Pass if required.
8. Turn the system controls to HEATING OFF and allow the system to continue heating the Pandora.
9. Check that the Pandora fully heats up (75°C on stat) and that the boiler switches off and the primary pump stops.

### Recovery of Store using Immersion Heaters:

1. Check to see if overheat cut-out(s) needs re-setting (see below).
2. Turn on all power supplies .
3. Turn on any heater controllers to ON.
4. Check that the Pandora fully heats up (to 75°C), that the heaters switch off, and that the overheat does not need re-setting (see below).

Immersion Heater Overheat and Dry-Fire protection is provided within each heater by the use of an additional reset thermostat. If the heater power supplies are turned on before the unit is filled then there is a very good chance that the thermostat will need re-setting. Simply remove the immersion heater cap and push in the small black button on the thermostat - if it clicks it has reset.

### Testing of Hot Water Services:

Once the store has fully heated up, it is important to check that hot water is available at all hot water outlets, and with the required flow rates and temperatures.

The hot water supply temperature should be checked, and if required adjusted using the fitted thermostatic blending valve. Once set, the blending valve can be locked in position (see valve instruction sheet).

# INSTALLATION INSTRUCTIONS

## FAULT FINDING

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Faults are listed in order of probability, with most common faults towards top of list.

### POOR OR NO HOT WATER - CENTRAL HEATING WORKING

**Possible Cause:** Store not recovering to the required 75°C.

**Check:** Are immersion heater thermostats (electric units) or the cylinder thermostat (indirect units) set to 75°C. **Solution:** Set stat(s) to 75°C.

**Check (Indirect units):** Is the programmer set to heat up the cylinder for at least 60 minutes before use? **Solution:** Set.

**Check (Indirect units):** Is the boiler control thermostat set low (should be at or near maximum). **Solution:** Turn up.

**Possible Cause (Indirect units):** Boiler is not achieving design flow temperatures of 82°C (industry standard).

**Check:** Use a thermostat to measure the temperature of the flow from the boiler when firing. It should reach at least 80°C.

**Solution:** Service boiler - may be possible to update control thermostats.

**Possible Cause:** Store not completely full.

**Check:** Carefully loosen filling cap. If unit is full water will start dribbling out - take care as store water is hot.

**Solution:** Top up as described under commissioning section.

**Possible Cause:** Thermostatic blending valve set too low, stuck or faulty, or fitted up-side-down.

**Check:** Ensure hot inlet is upwards, cold down (indicators on valve body). With a hot tap open, the hot inlet to the valve should be hot, as well as the outlet. If the inlet is hot but the outlet is cold, then the valve needs turning up, or failing that servicing.

**Solution:** Isolate mains water supply and drain mains pipework (not store). Valve can then be easily removed, then disassembled and checked or flushed out. Note that new washers may be required when re-fitting valve. If valve continues to fail then replace.

**Possible Cause:** Heat exchanger pump not circulating /stuck. Flow switch faulty or blocked.

**Check:** Unscrew shaft access cap in pump. Turn on a hot tap and using a screw driver carefully check that the pump shaft is spinning. Also check that the pump is receiving a live from terminal 3 with hot tap running.

**Solution (live to pump):** Using a screw driver free the pump shaft or try running on a higher pump speed. If this does not easily work then change the pump - direction of flow should be down. Corrosion inhibitor should be refreshed as the most likely cause of pump failure is lack of adequate corrosion inhibitor.

**Solution (no live to pump):** Pump receives live feed from the flow switch. If there is no live to terminal 3 with a hot tap open then either the hot and cold pipes are crossed (should be obvious), the flow switch may be blocked, or the flow switch is faulty and will require replacing. Isolate mains water supply and drain mains pipework (not store). Switch can then be easily checked.

**Possible Cause (Indirect units):** Programmer not functioning.

**Check:** Does the programmer send out a hot water live (terminal 4). **Solution:** If not then replace check settings or programmer.

**Possible Cause (Indirect units):** Cylinder thermostat not functioning.

**Check:** Is thermostat fitted into cylinder correctly. With a live from the programmer (terminal 4), does the stat send out a live (terminal 8). **Solution:** If not then replace thermostat.

**Possible Cause (Indirect units):** Motorised valve actuator not functioning.

**Check:** Remove the actuator from the body. Set controls to heating on with hot water off. Check that as program is changed to heating off and hot water on that actuator spindle revolves. **Solution:** If not then replace actuator.

**Possible Cause (Indirect units):** Motorised valve not turning freely, blocked.

**Check:** Does the spindle turn freely - relocate to original position. **Solution:** If not then drain primary system and check/replace valve body.

### POOR OR NO HOT WATER AND CENTRAL HEATING (Indirect units)

**Possible Cause:** Controls power supplies turned off or fuse blown.

**Check:** Control power supplies should be on, and a live to the wiring centre and boiler. **Solution:** Turn on / change fuse.

**Possible Cause:** Boiler tripped on overheat.

**Check:** Reset the boiler. Also check primary system pressure greater than 1 bar.

**Solution:** Primary system should be vented of air, possibly topped up. Check boiler pump as described below. Otherwise service boiler.

**Possible Cause:** Programmer or boiler not set to on, or thermostats set down/off.

**Check:** Try running system with hot water and heating on constant, boiler on maximum, cylinder thermostat at 75°C, room thermostat(s) and radiator thermostats set to maximum. **Solution:** Set up as described in *Commissioning*.

**Possible Cause:** Primary by-pass open too far, short-circuiting flow to unit and heating.

**Check:** Valve should typically be open one full turn from completely closed. Automatic by-pass valves set to 4m. **Solution:** Set.

**Possible Cause:** Boiler pump not circulating/stuck.

**Check:** Unscrew shaft access cap in pump. Turn on a hot tap and using a screw driver carefully check that the pump shaft is spinning. Also check that the pump is receiving a live from wiring centre.

**Solution (live to pump):** Using a screw driver free the pump shaft or try running on a higher pump speed. If this does not easily work then change the pump. Corrosion inhibitor should be refreshed as the most likely cause of pump failure is lack of adequate corrosion inhibitor.

**Solution (no live to pump):** With pump-overrun boilers, the pump receives live feed from the boiler. Trace live and service boiler if required.