

PHT Pressurisation unit

Installation and Operating Instructions

Models: PHT-N/D/F/T/V

GB Residential and Commercial



[ORIGINAL INSTRUCTIONS](#)

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EC/EU Declaration of Conformity

Name of manufacturer: Grundfos Manufacturing Limited.

Address: Ferryboat Lane,
Castletown,
Sunderland.
SR5 3JL.
United Kingdom

We, Grundfos, declare under sole responsibility that the product **PHT-***, to which the declaration below relates, are in conformity with the Council Directives listed below on the approximation of the laws if the EC/EU member states.

- **Machinery Directive (2006/42/EC).**
Standards used: EN ISO 12100:2010
- **Low Voltage Directive (2014/35/EU).**
Standard used: EN 60335-1:2012 +A11:2014
- **EMC Directive (2014/30/EU)**
Standard used: EN 61000-6-1:2007 and EN 61000-6-3:2007+A1:2011
Standard used: EN 60730-1:2016

This EC/EU declaration of conformity is only valid when published as part of the Grundfos Installation and Operating instructions (publication number **99354499**).

Authorised signature:

John Austin – Engineering Manager
(Name) (Position)

Date of issue: 11/12/2017

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1.0 About this manual.

This manual contains all the necessary information to install, commission, operate, maintain and fault find on the Grundfos **PHT** range of pressurization products. It is strongly recommended that this manual should be fully read before undertaking any work on this equipment.

It is highly recommended that this equipment is commissioned by a Grundfos engineer.

Contact details for Grundfos Service can be found below.

Grundfos Pumps Ltd.,

Telephone: +44 (0) 1525 850 000

NOTE

*** It is advisable that the Installation and Operating manual remains with the product for the duration of the product lifecycle.*

2.0 Symbols used in this document

WARNING(S)



If these safety instructions are **not** observed, it may result in personal injury or damage to property.



If these instructions are **not** observed, it may lead to electric shock with consequent risk of serious personal injury or death.



Static sensitive components, observe static sensitive handling procedures.

Product damage may occur

CAUTION

CAUTION

If these safety instructions are **not** observed, it may result in malfunction or damage to the equipment.

NOTE

NOTE

Notes or instructions that make the job easier and ensure safe operation.

3.0 Scope of these Instructions.

These Installation and Operating instructions apply to the:

Grundfos PHT range of Pressurisation products

For all other Technical Information consult the **PHT** Datasheet and sales brochure.

All the above documents can also be found on the Grundfos Product Center website at:

www.grundfos.co.uk

4.0 Product Identification.

The **PHT** unit has a silver label attached to the cabinet.

This label gives the following key information.

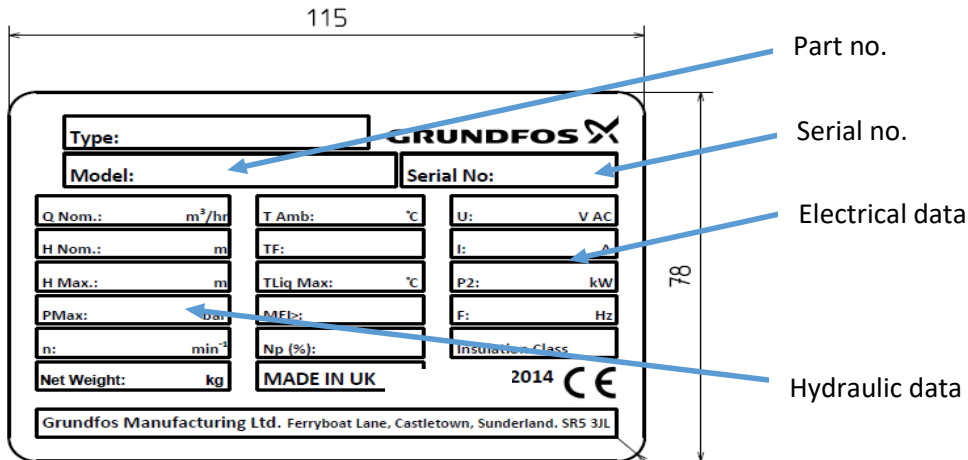


Fig. 1 – Product Nameplate

5.0 Operating Principles.

The function of the **PHT** pressurization equipment is to continuously monitor the pressure within hydronic pressurized heating and chilled water systems, maintaining the optimum operating pressure through providing automatic pressurised water top when required to compensate for system losses. (e.g. slow leaks, air venting, etc.).

The **PHT** equipment will also provide signals and alarms for connection to building management systems.



The **PHT** equipment will **not** fill systems



The **PHT** equipment will **not** cope with major water loss.
(e.g. System drain down, burst pipe)



The **PHT** equipment is **not** intended to be used for water boosting applications

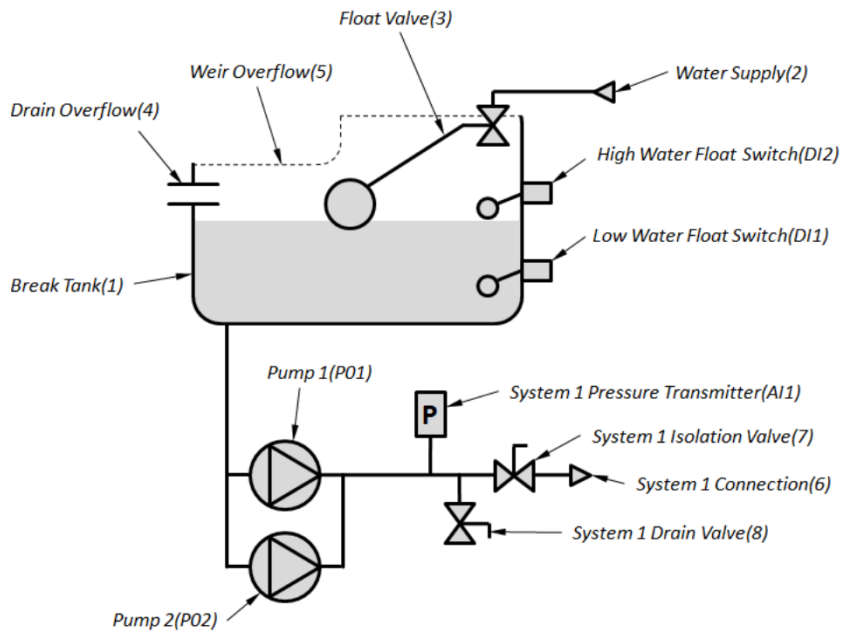
Please consult the appropriate datasheets for product selection

Three distinct types of unit are described in this document:

1. Standard Pressurisation Unit – Single and twin pump configurations
 - Delivers water into a single system
2. Twin System Pressurisation Unit – Twin pump only
 - Delivers water into two different systems
3. Glycol Pressurisation Unit - Twin pump only
 - Delivers a mix of water and glycol into a single system

5.1 Standard Pressurisation Unit (PHT-N/D/F models).

The following schematic shows the arrangement of the **PHT-N/D/F** pressurisation models:



The pressurisation unit is fitted with a *Break Tank(1)* which is filled from the *Water Supply(2)*, via a *Float Valve(3)*. The break tank is fitted with a *Drain Overflow(4)* in case the *Break Tank* overfills, and a *Weir Overflow(5)* in case the *Drain Overflow* becomes blocked.

A *Low Water Float Switch(DI1)* is fitted to detect a low water condition.

A *High Water Float Switch(DI2)* (optional extra) is fitted to detect overfilling of the tank.

Fig. 2 – PHT-N/D/F Schematic

The pressurisation unit is connected into the sealed system (System 1) through the *System 1 Connection(6)*.

The *System 1 Isolation Valve(7)* provides a point to isolate the unit from the system.

The *System 1 Drain Valve(8)* provides a point to drain down the unit and/or system and for commissioning purposes.

The *System 1 Pressure Transmitter(AI1)* measures the pressure in System 1.

The PHT unit can be configured with one or two pumps (*P01 and P02*) which when energised, will transfer water from the *Break Tank* into System 1 to increase the pressure as required.

The pumps run in a duty/standby configuration where only one pump runs at a time (the duty pump). The duty pump will always be the pump with the least accumulated total run time. This is a measure to spread the wear evenly between the two pumps.

In single pump units *Pump 1(P01)* permanently acts as the duty pump.

A *Current Sensor(AI5)* (**not** shown on schematic), measures the electrical current consumption of *Pump 1(P01)* and *Pump 2(P02)* to detect faults in the pumps.

A *System 1 Fault Output(DO1)* (**not** shown on schematic) is used to interlock the boiler or chiller on System 1 to disable it if the system pressure falls outside of safe operating limits.

A *General Fault Output(DO2)* is provided to signal any fault presented by the unit.

Three additional outputs are provided which can be customised to signal a range of specific faults or functions, *Programmable Output 1(DO6)*, *Programmable Output 2(DO7)* and *Programmable Output 3(DO8)*.

5.2 Twin System Pressurisation Unit (PHT-T models).

A variation of the design allows a single pressurisation unit to provide top-up for two systems, referred to as a Twin System Pressurisation Unit.

The following schematic shows the arrangement of a twin system pressurisation unit:

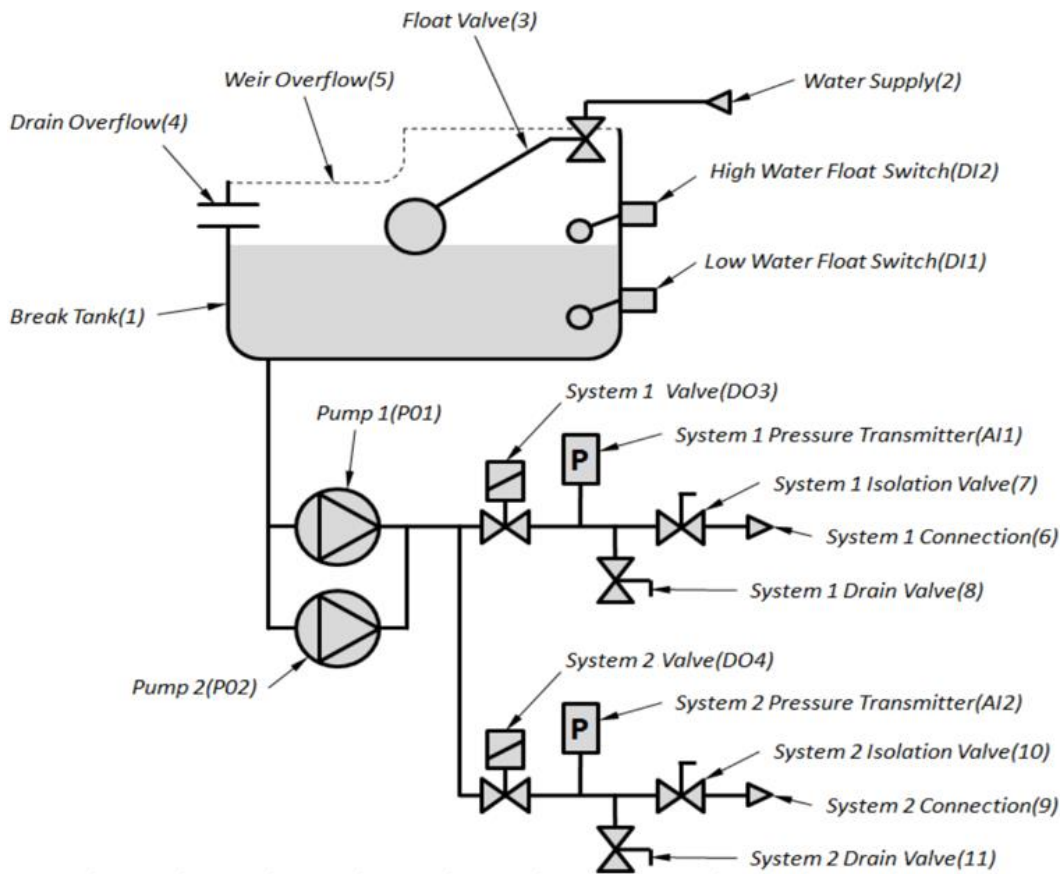


Fig. 3 – PHT-T Schematic

This design allows the pressurisation unit to provide top up to two systems independently, with different parameters, using the same two pumps.

In addition to the features described for a standard pressurisation unit, the following additional features are provided:

The pressurisation unit is connected into the second system (System 2) through the *System 2 Connection(9)* via the *System 2 Isolation Valve(10)*, a manual valve provided for isolating the unit from the system. The *System 2 Drain Valve(11)* is provided for draining down the unit and/or system and for commissioning purposes.

The *System 2 Pressure Transmitter(AI2)* measures the pressure in System 2.

The *System 1 Valve(DO3)* directs flow from the pumps into System 1.

The *System 2 Valve(DO4)* directs flow from the pumps into System 2.

When used in twin system mode the *Programmable Output 3(DO8)* is set to function as a critical fault output for system 2 by default and **cannot** be changed.

5.3 Glycol Pressurisation Unit (PHT-V model).

Another variation of the design allows the unit to deliver a predetermined mix of water and glycol into a single system.

The following schematic shows the arrangement of a glycol pressurisation unit:

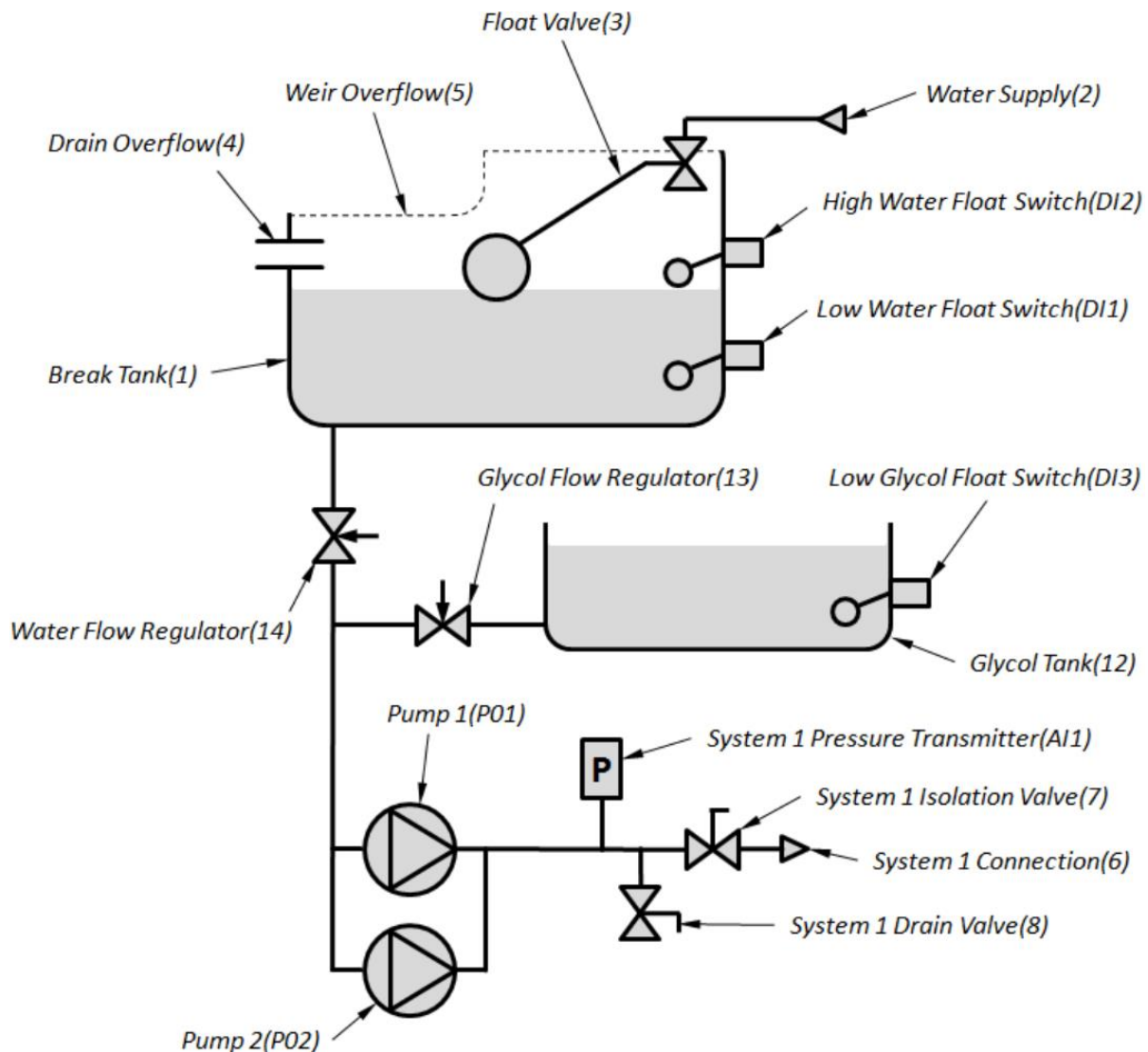


Fig. 4 – PHT-V Schematic

In addition to the features described for a standard pressurisation unit, the following additional features are provided:

Glycol is held in the *Glycol Tank (12)*. The *Low Glycol Switch (DI3)* detects when the glycol has run out and requires refilling.

When the pumps run, they draw a predetermined mix of water and glycol out of the two break tanks.

The ratio of water to glycol is set by manually adjusting the *Glycol Flow Regulator (13)* with respect to the *Water Flow Regulator (14)*.

6.0 General information.

6.1 Delivery and handling.



The **PHT** unit is supplied from the factory in either a cardboard box (**PHT-N**) or a plastic bag (All other models) which will be strapped to a wooden pallet suitable for handling by forklift equipment or similar.

The weight and size of the **PHT** unit may require the use of proprietary lifting equipment to be handled safely. Please observe the weight indicated on the box label before selecting lifting method.



Do **not** stack items on top of the box.



Do **not** drop the pallet/unit

6.2 Delivery inspection upon receipt.

The **PHT** should be immediately unpacked and inspected.

Any damage must be reported to the supplier within seven days in writing or sooner.

It is important that this Installation and Operating manual is studied carefully before any installation takes place. The installation and operation should also be in accordance with local regulations and accepted codes of practice.



Under no circumstances should the unit be operated until correctly installed in the system pipework and ensure that the controller cover and product cover are secured in their appropriate positions.

6.3 Warranty.

1. The Grundfos warranty covers all defects within the **PHT** originating from faulty workmanship and/or materials for a period of two years from the date of installation or thirty months from the date of dispatch from the factory, whichever is the shorter.
2. The warranty covers the replacement of any faulty parts and our labour cost to replace the faulty parts. It does **not** cover the cost of removing, returning and refitting the **PHT** unit or any secondary losses arising from the failure.
3. Under no circumstances should faulty equipment be dismantled. Failure to comply with this instruction could invalidate the warranty.
4. Defects arising from incorrect installation, water containing debris, or harmful chemicals, inadequate electrical protection, faulty ancillary equipment, lightning or other circumstances beyond our control, are **not** covered by the warranty.

6.4 Site storage on receipt.

It is strongly recommended once the **PHT** unit has been delivered to site, that it is placed immediately into a dust, moisture and frost-free area which has been secured to prevent unauthorised interference. If this is **not** possible then the unit should be stored in an area which is as near as possible to the ideal storage conditions as described above.

6.5 Weather, Temperature and long term storage.

The **PHT** unit needs to be protected against the weather and extremes of temperature during summer and winter. Provision to maintain the **PHT's** operating conditions needs to be made within the overall system design and location setting.

The **PHT** unit must be protected from freezing conditions. Should the unit be placed outside then the unit needs to be protected against the weather and consideration must be made for trace heating and/or lagging.

The **PHT** unit must be protected from heat. Should the unit be placed in an environment that could potentially become hotter than the operational recommendations then air venting and circulation must be considered.



If the **PHT** unit is being stored during periods of frost the whole unit should be drained to avoid damage. Remove all drain and vent plugs and allow the unit to drain.

Do **not** replace the plugs until the **PHT** unit is to be used again.



The pump must be vented/primed before it is started again.
Refer to the commissioning section.

6.6 Operating Environment.



The **PHT** unit must **not** be used in an environment which has been classified as hazardous where it could provide a source of ignition and therefore cause an explosion by flame path.

Grundfos do **not** accept any responsibility for the use of the **PHT** unit to pump liquids which could be construed as being hazardous to health either by touch, ingestion or inhalation of fumes or gases given off by the liquid.

6.7 Installation Location.

Careful consideration must be given to the location of the **PHT** unit.

The following are minimum requirements:

The **PHT** unit should ideally be placed in a location where the control panel and status LED can readily be seen and the internal buzzer heard without obstruction.

These are primary warning and alarm events and should be available to be observed and heard.



The **PHT** may be located outdoors in a weather, frost and rodent proof enclosure with adequate ventilation especially during hot weather. All pipe work subject to freezing **conditions must be adequately protected. Alternative system provision must be made for** alerting the inhabitants to the **PHT** warnings and alarms.

To enable maintenance and service of the **PHT** unit to be carried out satisfactorily, the area should have adequate lighting for this work to be carried out safely.



Ensure that the **PHT** is positioned to allow access for examination and service.

Allow the following:

A minimum of **50 cm** should be left above all units.

A minimum of **50 cm** should be left to the system connection side of all units.

A minimum of **100 cm** should be left at the front of the unit.

Adequate drainage facilities and protection from water damage in the immediate vicinity of the **PHT** unit must be provided.



If the **PHT** unit is installed into a roof spaces, then provisions should be made for the small level of vibration associated with any rotating equipment in case it causes disturbance. Provision should also be made for drainage of the unit, leakage and any loss of water during commissioning and service.



The **PHT** unit should **not** be installed in an unventilated small space, ensure adequate ventilation for the motor.

6.8 General requirements.



The installation pipework may need to be properly supported **before** being connected to the **PHT** unit so that the **PHT** unit is **not** stressed.



The pipework installation to and from the **PHT** unit should be in accordance with local water authority regulations, best industry practice and according to any design recommendation



The electrical installation of the **PHT** unit should be in accordance with the latest issue of the I.E.E. regulations and performed by a competent installer.

[The equipment **must** be Earthed](#)

6.9 Operating Conditions.

Electrical supply: 230 V +10 /-6%, 50 Hz

Electrical load:

| Model | Power (Watts) | Full Load current (Amps) |
|----------------------|---------------|--------------------------|
| PHT-N130/PHT-N230 | 28 W | 0.12 A |
| PHT-D125/PHT-D225 | 410 W | 1.83 A |
| PHT-D150/PHT-D250 | 900 W | 3.94 A |
| PHT-F125/PHT-F225 | 410 W | 1.83 A |
| PHT-F150/PHT-F250 | 900 W | 3.94 A |
| PHT-F180/PHT-F280 | 1150 W | 5.2 A |
| PHT-T225/PHT-V225 | 410 W | 1.83 A |
| PHT-T250/PHT-V250 | 900 W | 3.94 A |
| Quiescent All models | 15 W | 0.07 A |

Pollution Degree: 3

Noise level: <70 dB(A) at full speed

Liquid temperature range: +1°C to +60°C

Ambient temperature: From +1°C to 40°C

Relative humidity: 95% (non-condensing)

Usage: Indoor (Outdoor, subject to restrictions found)

Type of protection: Class 1 (earthed) equipment

Equipment type: Stationary, fixed equipment

Construction type: Fixed construction, no moveable parts

EMC Environment: B (light industrial, commercial and residential)

Inlet pressure max: 3 bar

6.10 Wall Fixings.

All units must be mounted/stood in the vertical position.

The **PHT-N** and **PHT-D** units are suitable for wall fixing.

The wall fixing dimensions are given below.

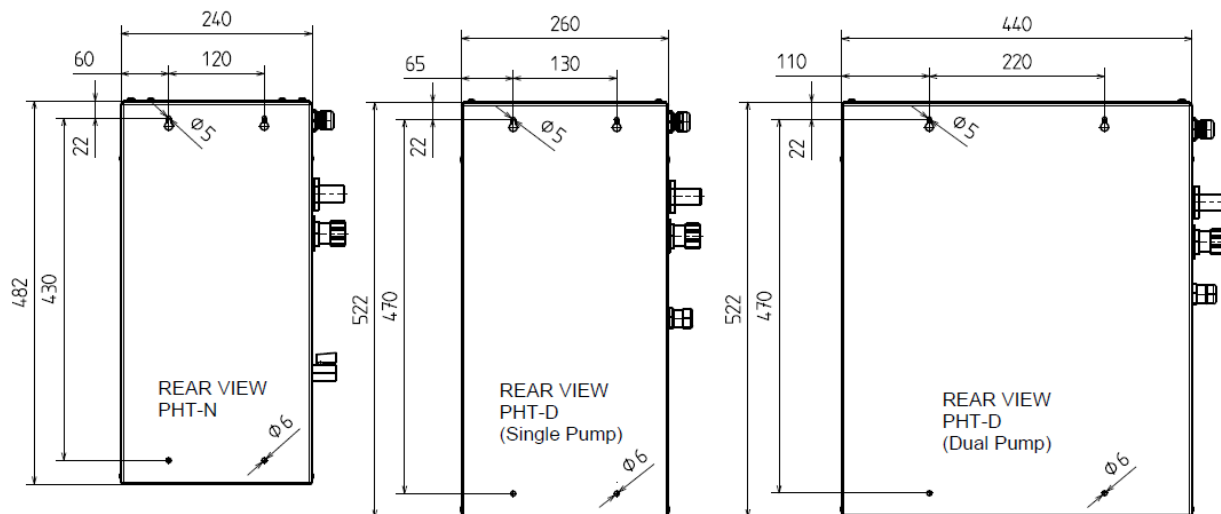


Fig 5. – Wall fixing dimensions



Refer to the Product weight table also.

7.0 System Controller overview.

The front face of the **PHT** controller has the following items.

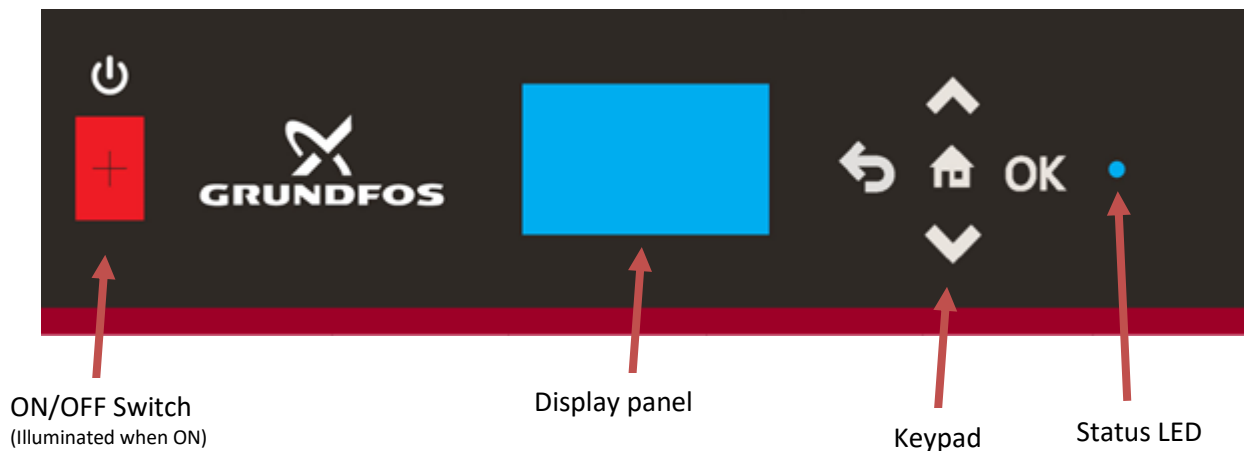


Fig 6. - Controller front screen

The **ON/OFF Switch** is an illuminated switch indicating that the unit is powered ON/OFF.

The **Display panel** gives the Status of the unit, the current pressure, the Date and time when operating without a fault. When operating with a fault the Status will indicate the fault detected. The **Display panel** will auto-dim to save energy after a predefined period without operation.

The **Keypad** has:

- **UP/DOWN** arrow keys used to move between pages and increase/decrease values.
- **Home** Key to return to the Home page
- **OK** key to confirm a value entered/Access the password protected menu's
- **Return** key to step back in the program

The **Status LED** gives a quick and easy Status for the unit.

Green – Status Healthy

Red – Status Fault

The system status is also supported by an audible buzzer.

The buzzer activates with Critical faults and can be silenced by pressing and holding the OK key.

7.1 Programming the PHT Controller.

The **PHT** controller has a simple, intuitive and ergonomic design that is easy to pick up.

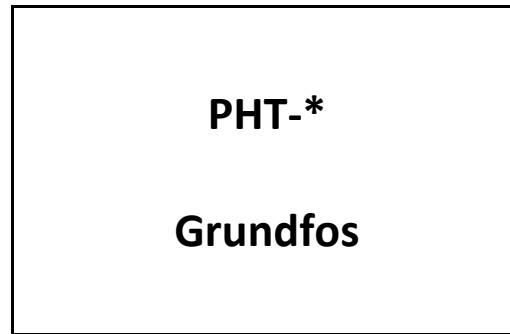
Fixed combination volt free outputs that allow critical and general fault monitoring.

Programmable outputs provide complete flexibility.

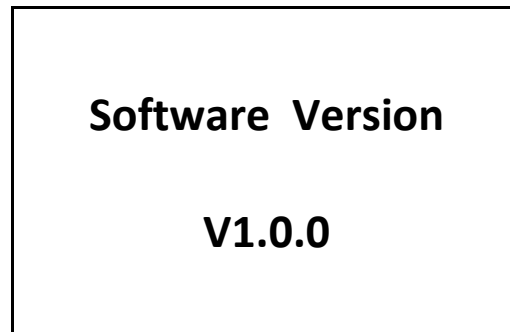
The controller can communicate with the Grundfos range of CIM modules providing protocol support for BACnet, Modbus and others.

7.2 Start-Up Sequence.

Upon powering up the unit, the controller shall display the below for 3 seconds:



The screen will then show the software version of the unit for a further 3 seconds:

**7.3 Main Operating Screen.**

When the unit is operating normally and the status is healthy the display will include:
Status: OK / System 1 Pressure and value / Current Date and Current Time:

| | |
|--------------------------|----------------|
| Status: OK | |
| System 1 Pressure | 1.5 Bar |
| 23/08/2017 | 14.25 |

With the **PHT-T** configuration, the display will also show System 2 Pressure and value:

| | |
|--------------------------|----------------|
| Status: OK | |
| System 1 Pressure | 1.5 Bar |
| System 2 Pressure | 2.0 Bar |
| 23/08/2017 | 14.25 |

If a fault condition is active, then the Status will show **FAULT** and the line below will carry a message indicating the fault. If more than one fault exists then the first detected fault is shown until cleared. The next fault is then displayed:

| | |
|--------------------------|----------------|
| Status: FAULT | |
| Low Water | |
| System 1 Pressure | 1.5 Bar |
| 23/08/2017 | 14.25 |

If a pressure sensor fault has been registered, then no pressure reading will be shown:

| | |
|--------------------------|--------------|
| Status: FAULT | |
| Sensor | |
| System 1 Pressure | Bar |
| 23/08/2017 | 14.25 |

If the unit requires servicing, then the Status will show SERVICE:

| | |
|--------------------------|----------------|
| Status: SERVICE | |
| System 1 Pressure | 1.5 Bar |
| 23/08/2017 | 14.25 |

If a fault is present and a service is required, then the Status will show FAULT - SERVICE:

| | |
|--------------------------------|--------------|
| Status: FAULT - SERVICE | |
| Sensor | |
| System 1 Pressure | Bar |
| 23/08/2017 | 14.25 |

7.4 Menu Entry.

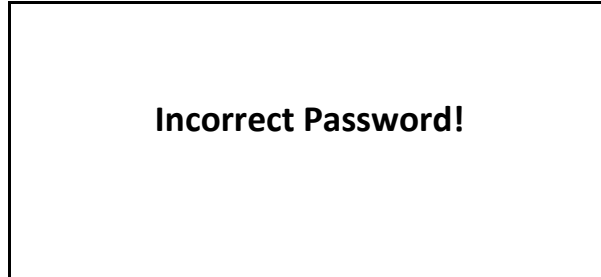
To enter the password protected menus press and hold down the **OK** button for three seconds
The screen will prompt for a 4-digit numeric password:

User Password: 4321

| |
|--|
| <p>Enter Password</p> <p>----</p> |
|--|

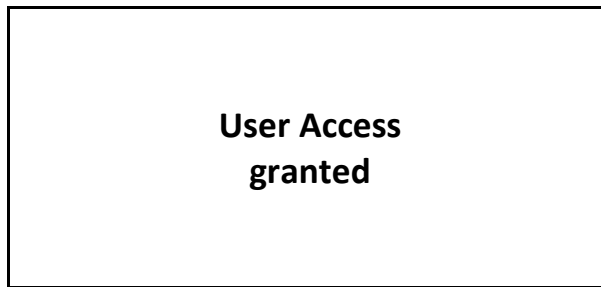
Use the **UP/DOWN arrow keys** to get to the required number before pressing the **OK key** to confirm. When the **OK key** is pressed the cursor moves onto the next character.

If the user enters an incorrect password the following screen is displayed for 3 seconds before returning to the main screen:



If the user enters a correct password, then the relevant access granted message will be shown for 2 seconds before progressing into the menu system:

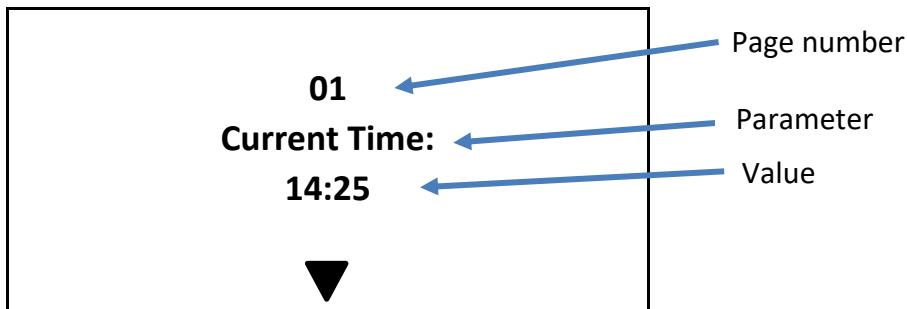
Example:



7.5 Menu System.

The menu system opens at the first page in navigate mode.

The arrow at the bottom of the screen indicates that there are further pages.



To enter the edit mode and edit the value press the **OK key**, the cursor will appear, use the **UP/DOWN keys** to change the value. Confirm the new value by pressing **OK key**.

If the value has two fields then the cursor will automatically move to the next field.

If the page has an arrow at the top, this indicates that there are preceding pages

Once the value of the last field has been confirmed the menu system will return to the navigation mode. Repeat these operations for all parameters requiring change.

The final screens in the menu allow for the manual operation of the pump(s) via pressing and holding the **OK button**. This will activate the pump(s) while the button is held down and is only active in the Engineering menu.

The parameters will **not** come into effect until the Menu system has been exited.

To exit the menu system, press the **Home key**.

If no buttons are pressed for 5 minutes, then the system will automatically return to the operating screen. If there are any pending edits (value changed but **not** confirmed) then the change will be discarded.

NOTE Not all parameters are available for Edit in the User menu.
Please see the table below.

7.6 Fault Indication.

The presence of an active fault condition will be shown on the operating screen:

| | |
|--------------------------|--------------|
| Status: FAULT | |
| Sensor | |
| System 1 Pressure | Bar |
| 23/08/2017 | 14.25 |

Pressing the **Down key** will take the operator straight into the list of current faults. The fault number is displayed, along with the name of the fault, relevant value (if applicable), date and time. The presence of the arrow indicates further fault pages.

| |
|-------------------------|
| 01 |
| SENSOR |
| 23/08/2017 14:25 |
| ▼ |

| |
|------------------------------|
| ▲ |
| 02 |
| HIGH PRESSURE 2.9 Bar |
| 14/07/2017 11:30 |
| ▼ |

The operator can scroll through the list of faults, clearing them with the **OK key**. Once a fault has been acknowledged it will disappear from the list. Once all faults have been acknowledged (or a timeout period of 3 minutes has elapsed) then the controller will return to the operating screen. If the fault is cleared but still detected as present then the fault message and status return, with a new date and time stamp.

7.7 Fault Log.

The controller will log a minimum of 30 historic fault conditions in non-volatile memory. This includes faults that have been acknowledged via the operating screen. Access to the list of stored faults is through the Engineers menu. Faults can be cleared from the list.

7.8 Uploading the Fault Log.

The Fault log can be upload to a memory stick at any time by simply inserting a standard size USB memory stick into the USB port found on the reverse of the display unit.

Wait approximately 5 seconds, observe the Status LED on the front panel changing colour and returning to its previous state, then remove the USB stick. The Fault log outputs a simple text file. Example below:

*Fault 41 of 43
 Fault Type - System1 Low Pressure
 Date - 09/06/2017
 Time - 08:13*

7.9 Programmable Outputs.

The PHT controller has three programable digital outputs.

These outputs are designated

Programable output 1 – Physical naming **D06**
 Programable output 2 - Physical naming **D07**
 Programable output 3 - Physical naming **D08** } Refer to Fig. 7

These outputs can be programmed with one or as many of the fault options as needed.

Programmable Output 1(D06), Output 2 (D07) and Output 3 (D08).

With PHT-N/D/F/V units the above outputs can programmed to be activated by any combination of the following faults:

- Pump 1 Over Current
- Pump 1 Under Current
- Pump 2 Over Current
- Pump 2 Under Current
- Low Water
- High Water
- Low Glycol
- Service Required
- System 1 Flood Protection
- System 1 Excessive Consumption
- System 1 Low Pressure
- System 1 High Pressure
- System 1 Sensor Fault
- Pump 1(P01) running
- Pump 2(P02) running
- Pump 1(P01) or Pump 2(P02) running

With the **PHT-T** unit, the following eleven faults are added to the above list for **Output 1(DO6)** and **Output 2 (DO7)**

- System 2 Flood Protection
- System 2 Excessive Consumption
- System 2 Low Pressure
- System 2 High Pressure
- System 2 Sensor Fault
- Topping up System 1
- Topping up System 2
- Valve 1 Over Current
- Valve 1 Under Current
- Valve 2 Over Current
- Valve 2 Under Current

With the **PHT-T** unit, **Output 3(DO8)** becomes **System 2 Interlock** reporting the following:

- System 2 Low Pressure Alarm
- System 2 High Pressure Alarm
- System 2 Sensor Fault
- Mains Power failure

These are the conditions under which the boiler or chiller on System 2 **must** be disabled.

The fault buzzer will cycle between ON for 5 seconds and OFF for 10 seconds continuously until muted by pressing and holding the OK button for 2 seconds.

To program these outputs:

- 1 - Enter the Engineers menu and navigate to Programmable output pages.
- 2 - Enter the edit mode by pressing the OK button.
- 3 - Use the UP and DOWN keys to navigate the list of faults that can be programmed
- 4 - When the desired fault is at the top of the stack press OK, this will select the fault.
- 5 - Select any further fault outputs as required.
- 6 – Exit the menu by pressing the Home key.

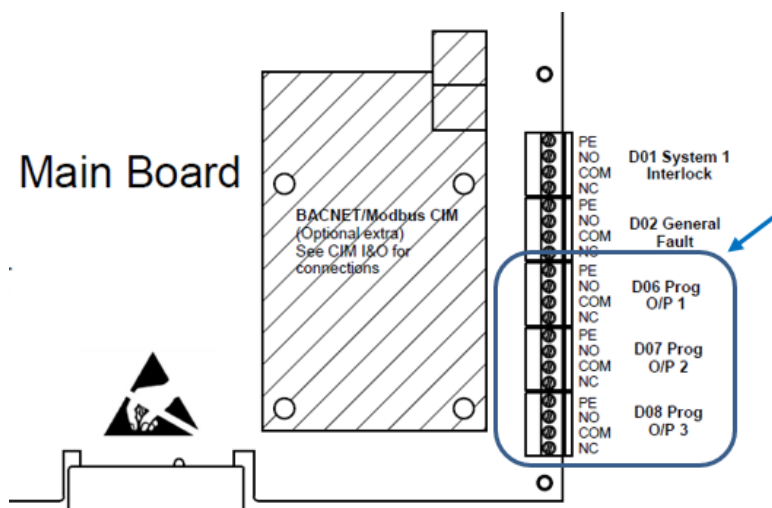


Fig. 7 – Location of programmable outputs

7.10 Digital Outputs.

All of the fault outputs can be wired as **Normally Closed** or **Normally Open**.
(refer to Connection diagram)

7.11 System 1 Interlock Output(DO1) is activated by all/any of the following alarms:

- System 1 Low Pressure
- System 1 High Pressure
- System 1 Sensor Fault
- Mains Power failure

These are the conditions under which the boiler or chiller on System 1 **must** be disabled.
The fault buzzer will cycle between ON for 5 seconds and OFF for 10 seconds continuously until muted by pressing and holding the OK button for 2 seconds.

7.12 General Fault Output(DO2) is activated by all/any of the following alarms:

- Pump 1 Over Current
- Pump 1 Under Current
- Pump 2 Over Current
- Pump 2 Under Current
- Low Water
- High Water
- Low Glycol
- System 1 Flood Protection
- System 2 Flood Protection
- System 1 Excessive Consumption
- System 2 Excessive Consumption
- System 1 Low Pressure
- System 1 High Pressure
- System 1 Sensor Fault
- System 2 Low Pressure
- System 2 High Pressure
- System 2 Sensor Fault

The user may choose to disable the boiler or chiller on System 1.

8.0 Installation and commissioning – General.

The **PHT** unit has been designed to minimize and simplify the number of installation and commissioning activities required to bring the system on line.



All electrical connections should be carried out by a qualified and authorised electrician in accordance with the wiring diagram supplied within this manual and the latest I.E.E. regulations.

The **PHT** unit **MUST** be Earthed.



All mechanical connections should be carried out by a by a qualified and authorised person in accordance with this manual and the latest codes of practice.



Do **not** attempt to start the pump even to check the direction of rotation until the system has been filled with water and both the pump and the system have been primed/vented. Running the pump dry may permanently damage it. This will **not** be covered by warranty. *See the Pump Priming section.*



Do **not** remove the controller enclosures, controller components, motor terminal box cover, electrical cables or any other electrical protective covering without first ensuring that the electrical supply is suitably isolated and cannot be switched back on.



Do **not** attempt to supply electricity to the **PHT** unit and run the pump electric motor without ensuring that all electrical fittings, cables and enclosures are intact and suitably electrically isolated from human touch during operation.



Do **not** attempt to supply electricity to the electric motor or re-pressure the pipe work system without first ensuring that all protective coverings are held securely in their correct positions.

NOTE

The **PHT** unit and any expansion vessel should be connected on the system return. Non-return valves and RPZ valves should **not** be connected between the **PHT** unit and the system.

It is strongly recommended that all **PHT** units are connected to a lockable isolator.



Ensure that the **PHT** unit is electrically isolated before removing any covers. Any cables supplied to the volt free contacts may be supplied from another source and may remain live after the **PHT** unit is isolated. These must be isolated elsewhere.



The **PHT** controller has static sensitive components and standard static precautions must be taken when working with the controller

NOTE

Backup fuse/MCB protection should be sized at 20 Amps

8.1 PHT-N/D/V unit – Float valve adjustment.



The PHT-N unit must be fitted with a filter and depending on the site mains water pressure a flow restrictor. This filter and flow restrictor are inserted into the mains water fill valve, filter section first as shown below.

Failure to do so may result in damage to the PHT-N unit

Two different flow restrictors are supplied, to be used as per the table below:

| Mains Water Pressure | Requirements |
|----------------------|---|
| Below 1 Bar | Filter only |
| Between 1 and 4 Bar | Filter and Low Pressure Restrictor (Blue) |
| Above 4 Bar | Filter and High Pressure Restrictor (White) |

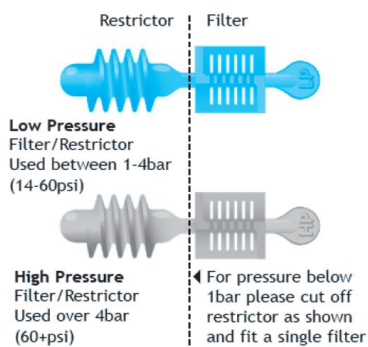


Fig. 8 PHT-N/D/V – Float valve filter and flow restrictor

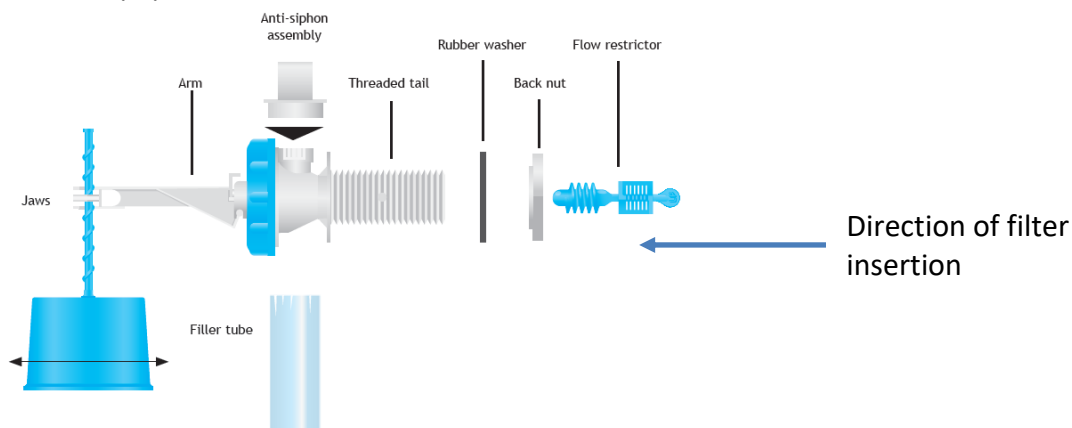
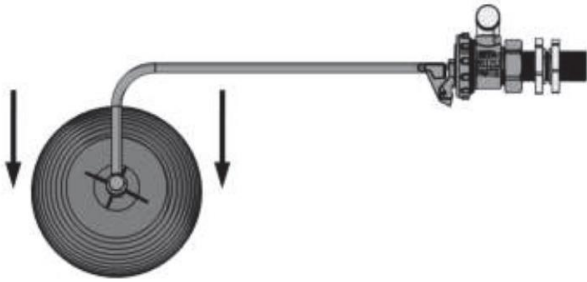


Fig. 9 PHT-N/D/V – Float valve filter and flow restrictor and level adjustment

Adjusting the water shut off level.

- Insert the float spiral stem horizontally between the two lower jaws and twist to engage upper jaw.
- Turn on the water supply.
- Allow the break tank to fill.
- Adjust water fill level, twisting float up or down until the water shut off level is just below the Overflow.

8.2 PHT-F/T unit – Float valve adjustment.



Set the ball float valve to its lowest position on the valve arm.

Allow the tank to fill from the mains water supply and check that the stop fill level does **not** exceed the Overflow and sit just below the Overflow.

Adjust as necessary.

Fig. 10 PHT-F/T – Float valve level adjustment

8.3 Priming of the Pumps and System.

All PHT-D/F/T/V pumps **must** be primed before the PHT unit is switched ON.



Permanent damage can occur from dry running the pumps.

To Prime:

- Loosen the priming screw(s) located on the pump housing, system manifold(s) until water flows through the priming screw.
- Tighten the priming screw back up.
- Dry off any water.

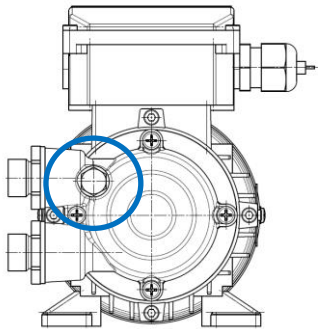


Fig. 11 – PHT-*25 and PHT-*50 Models

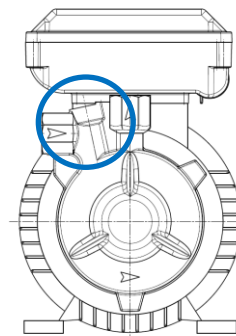


Fig. 12 – PHT-*80 Model

Priming Screws Locations

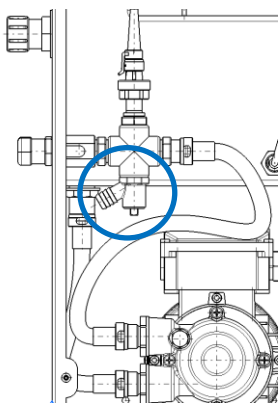




Fig. 13 System priming

8.4 Installation checklist.

During the installation phase:




DO NOT apply mains power to the unit. **DO NOT** apply water to the unit.

| Step | Done | Activity | Action/Check/Note |
|------|--------------------------|--|--|
| 1 | <input type="checkbox"/> | Fully read and study this manual. | |
| 2 | <input type="checkbox"/> | Unpack, inspect for completeness and any damage. | <i>Report to supplier/customer</i> |
| 3 | <input type="checkbox"/> | Ensure that the installation location meets all of the requirements in this manual. | |
| 4 | <input type="checkbox"/> | Transport the unit to the chosen location. | <i>Caution - handling</i> |
| 5 | <input type="checkbox"/> | Test location of unit for fit and access, remove unit. | |
| 6 | <input type="checkbox"/> | Make wall/floor fixings. | <i>If required</i> |
| 7 | <input type="checkbox"/> | Remove the screws retaining front cover. Remove front cover. Place to one side. | |
| 8 | <input type="checkbox"/> | Locate unit and fasten down unit as required. | |
| 9 | <input type="checkbox"/> | Make the mains water supply connection to the float valve. | <i>Do not turn on water. Isolation valve</i> |
| 10 | <input type="checkbox"/> | Make the PHT to system connections. | <i>Do not turn on water. Isolation valve</i> |
| 11 | <input type="checkbox"/> | Make the overflow connection to drain. | |
| 12 | <input type="checkbox"/> | Remove the screws retaining the top cover of the controller and open.  Observe static sensitive precautions! | <i>Wiring diagram found in this manual</i> |
| 13 | <input type="checkbox"/> | Wire mains supply from isolator to connector block through side wall M20 cable gland. | <i>Perform continuity check. Label wires. System must be</i> |
| 14 | <input type="checkbox"/> | Wire digital outputs through side wall grommet, through side wall gromit and to connector blocks on PCB (as required). Do not apply any voltages.  Observe static sensitive precautions! | <i>Wiring diagram found in this manual. Perform continuity check Label wires</i> |
| 15 | <input type="checkbox"/> | Re-fit the controller front panel | |
| 16 | <input type="checkbox"/> | Review all of the above actions, if the commissioning phase does not follow immediately after, replace the covers and screws. Leave the unit in a safe condition | <i>Leave Isolated electrically and hydraulically</i> |
| 17 | <input type="checkbox"/> | System is ready to commissioning | |

8.5 Commissioning checklist.

Before the commissioning phase starts ensure that the **Installation checklist** has been completed and check the state of the mains power and water supplied to the unit.

| Step | Done | Activity | Action/Check/Notes |
|------|--------------------------|--|---|
| 1 | <input type="checkbox"/> | Fully read and study this manual. | |
| 2 | <input type="checkbox"/> | Ensure that the installation location meets all of the requirements in this manual. | |
| 3 | <input type="checkbox"/> | Check mains power and water to the unit are both OFF | <i>Ensure both are OFF and cannot be accidentally turned ON.</i> |
| 4 | <input type="checkbox"/> | If necessary, remove the screws retaining front and top covers. Place to one side. | |
| 5 | <input type="checkbox"/> | Inspect the Installation, check everything in the Installation checklist has been completed. | |
| 6 | <input type="checkbox"/> | Close the system isolating valve on the discharge side of unit. Open the mains water isolating valve. Apply water to the unit and check the filling of the header tank. | <i>Refer to the Float valve adjustment section</i> |
| 7 | <input type="checkbox"/> | Check the fill level in the header tank does not exceed the overflow height. Make any adjustments as required. | <i>Refer to the Float valve adjustment section</i> |
| 8 | <input type="checkbox"/> | Prime the pump and the whole system as necessary. Inspect for any leaks. | <i>Refer Priming pump section of this manual.</i> |
| 9 | <input type="checkbox"/> | Refit the controller cover and review all of the above actions. Apply the mains power. Switch ON the unit.  Observe static sensitive precautions! | |
| 10 | <input type="checkbox"/> | Allow the unit to boot up. | <i>Ignore any Warnings/Alarms. The PHT-T model will need one minute to close all motorized valves before you can begin to program the unit.</i> |
| 11 | <input type="checkbox"/> | Access the Engineers menu. | <i>Refer System Controller overview section</i> |
| 12 | <input type="checkbox"/> | Set the unit up according to the desired customer parameters. Record the parameters in the Commissioning log . | |
| 13 | <input type="checkbox"/> | Test the pumps, using the Pump test function in the engineering menu. Open the system isolating valve. | <i>Press and hold down the OK but for the duration of the pump run.</i> |
| | | Check the system for any faults. Observe correct system operation. | |
| 13 | <input type="checkbox"/> | Replace all covers and re-fit the screws | |

GRUNDFOS INSTRUCTIONS

| | | | |
|----|--------------------------|---|--|
| 15 | <input type="checkbox"/> | Clean up area and ensure safe for user, All Isolating valves are in the OPEN position Clear any faults/system run time history | |
| 16 | <input type="checkbox"/> | System is ready for operation | <i>Update the history log at back of this manual</i> |

8.6 Commissioning Record.

| | |
|------------|-------------|
| Site Ref: | Date: |
| PU Ref: | Company: |
| Model: | Engineer: |
| Serial no: | Contact no: |

8.7 Settings Record.

| Common Settings | | |
|-------------------------------------|--------|--|
| 1 Current Time | | HH:MM (24 hr) |
| 2 Current Date | | DD/MM/YYYY |
| 3 Service Reminder | ON/OFF | |
| 4 No. of Pumps | 1 / 2 | |
| 5 Pump Anti-seize | ON/OFF | |
| 6 Pump Anti-seize Period | | Days |
| 10 Pump Trip delay | | Seconds |
| 11 Pressure Alarm delay | | Seconds |
| 12 Low Water Reset Time | | Seconds |
| 13 System 1 Set Pressure | | Bar |
| 14 System 1 Differential Pressure | | Bar |
| 15 Common Differential | YES/NO | |
| 16 System 1 Low Pressure Alarm ON | | Bar |
| 17 System 1 Low Pressure Alarm OFF | | Bar (Only if Common Differential = NO) |
| 18 System 1 High Pressure Alarm ON | | Bar |
| 19 System 1 High Pressure Alarm OFF | | Bar (Only if Common Differential = NO) |
| 20 System 1 Pump Hold OFF Time | | Seconds |
| 21 System 1 Pump Run ON Time | | Seconds |
| 22 System 1 Flood Protection | | Mins/Hour |
| 23 System 1 Excessive Consumption | | Starts/Month |
| Additional PHT-T Settings | | |
| 24 System 2 Set Pressure | | Bar |
| 25 System 2 Differential Pressure | | Bar |
| 26 System 2 Low Pressure Alarm ON | | Bar |
| 27 System 2 Low Pressure Alarm OFF | | Bar (Only if Common Differential = NO) |
| 28 System 2 High Pressure Alarm ON | | Bar |
| 29 System 2 High Pressure Alarm OFF | | Bar (Only if Common Differential = NO) |
| 30 System 2 Pump Hold OFF Time | | Seconds |
| 31 System 2 Pump Run ON Time | | Seconds |
| 32 System 2 Flood Protection | | Mins/Hour |
| 33 System 2 Excessive Consumption | | Starts/Month |
| 44 Software Version | | |
| 47 Programmable output 1 | | |
| 48 Programmable output 2 | | |
| 49 Programmable output 3 | | |
| CIM Card Installed | YES/NO | |

Notes:

Engineers Signature:

Date:

Customers Signature:

Date:

9.0 User maintenance.

There are **NO** user serviceable parts in the **PHT** unit.

9.1 Planned Preventative Maintenance.

It is highly recommended that the **PHT** equipment is maintained in line with the Grundfos Services Planned Preventive Maintenance regime for this equipment. A Grundfos Service contract can be taken out to cover this.

For a copy of the regime and to discuss a Grundfos Service contract, contact:

Grundfos Pumps Ltd.,
Telephone: +44 (0) 1525 850 000

9.2 Annual Service.

Along with the Preventative Maintenance regime Grundfos recommends that the **PHT** unit is serviced, inspected and tested every twelve months.

For a copy of the Annual Service regime and to discuss a Grundfos Service contract, contact:

Grundfos Pumps Ltd.,
Telephone: +44 (0) 1525 850 000

This ensures that the system remains in first class working order.

The **PHT** unit should be serviced and tested annually by a suitably qualified and competent person.



Should any maintenance work be required then the water and electricity supply may require isolating prior to commencing work.

The building will be without the protection that the **PHT** unit gives during this period and alternative measures should be considered.

NOTE

Ensure any outgoing signals from the **PHT** unit are **not** going to cause activation of:

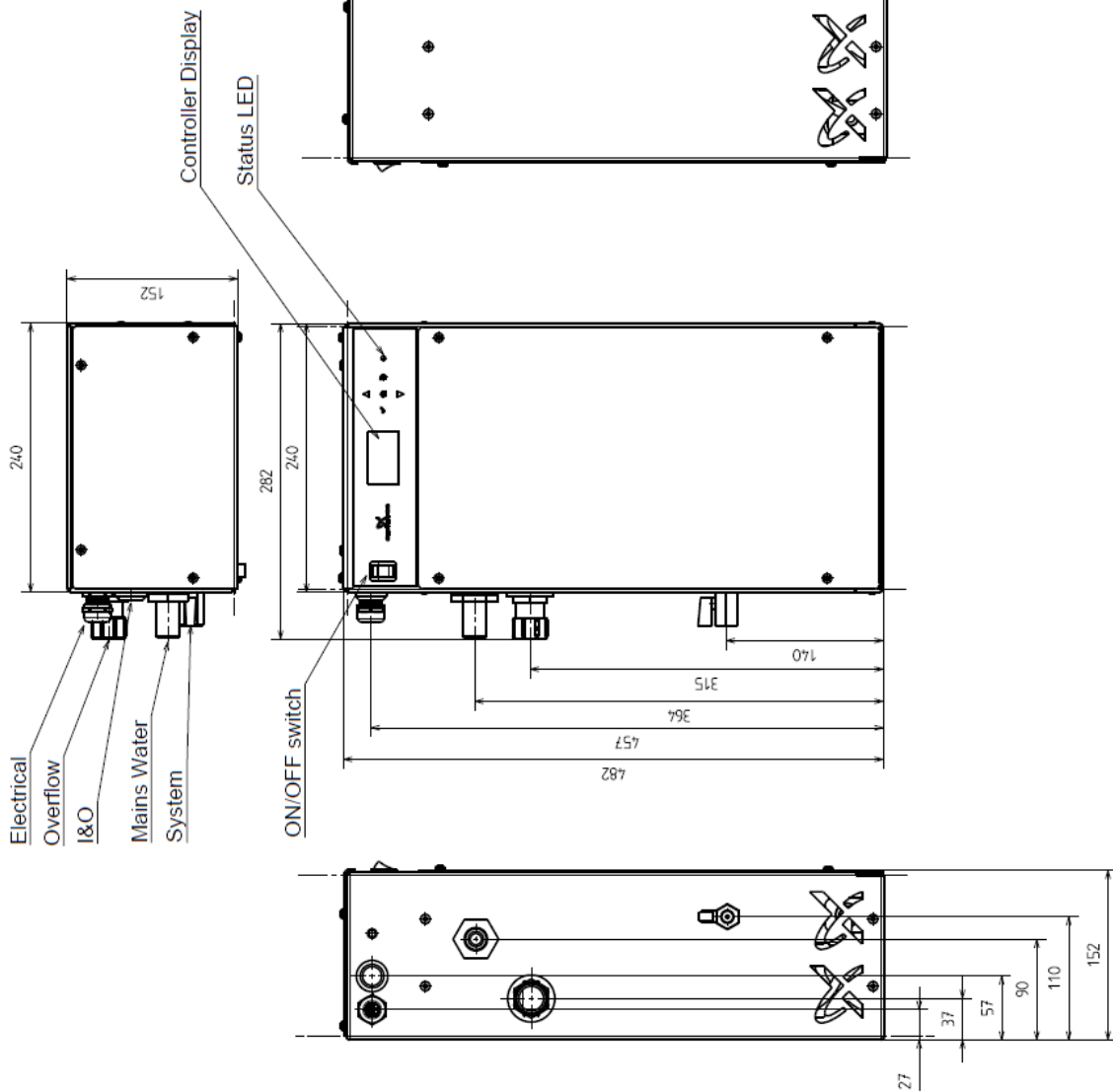
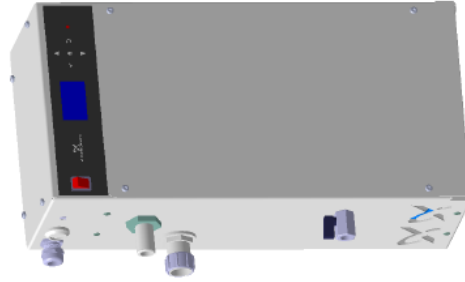
- Alarms/beacons/BMS Control panel or Boiler shut down
- Any other warning/monitoring devices installed (eg. SMS to mobile device)
- External voltages may be present on Digital inputs.
(these must be isolated before commencing work on them)

10.0 Technical drawings.

10.1 Product Drawing – PHT-N.

| Model | Mains Water | System | Overflow |
|----------|-------------|-----------|-----------|
| PHT-N130 | 1/2" MBSP | 1/4" MBSP | 3/4" MBSP |
| PHT-N230 | 1/2" MBSP | 1/4" MBSP | 3/4" MBSP |

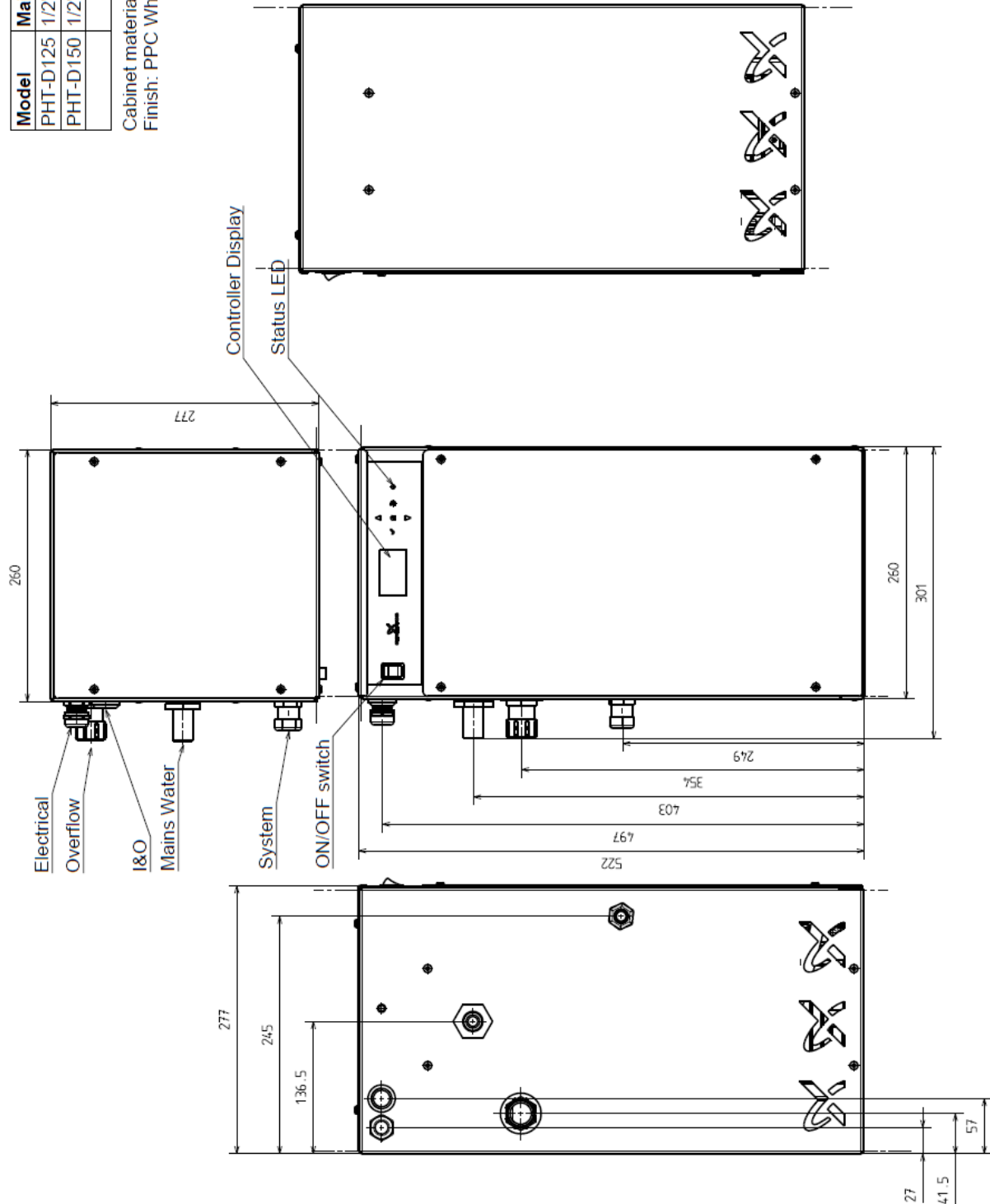
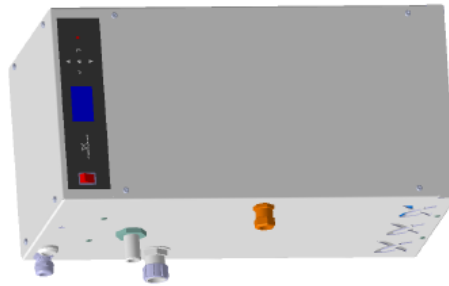
Cabinet material: 1.5 mm Mild steel,
Finish: PPC White RAL 9003 Gloss



10.2 Product Drawing – PHT-D (Single pump).

| Model | Mains Water | System | Overflow |
|----------|-------------|-----------|-----------|
| PHT-D125 | 1/2" MBSP | 1/2" MBSP | 3/4" MBSP |
| PHT-D150 | 1/2" MBSP | 1/2" MBSP | 3/4" MBSP |

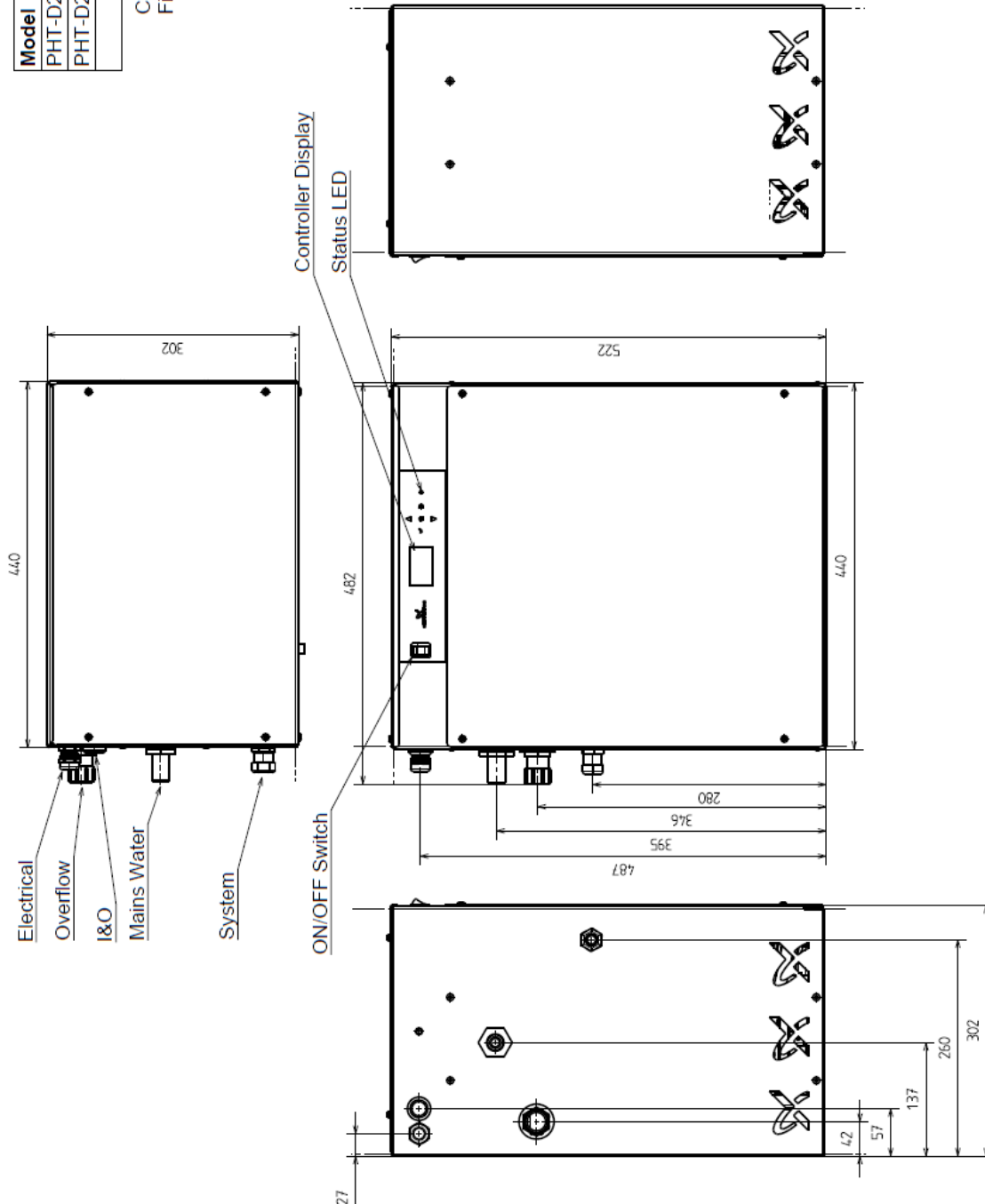
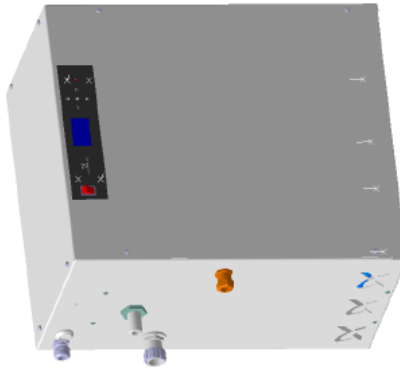
Cabinet material: 1.5 mm Mild steel,
Finish: PPC White RAL 9003 Gloss



10.3 Product Drawing – PHT-D (Dual pump).

| Model | Mains Water | System | Overflow |
|----------|-------------|-----------|-----------|
| PHT-D225 | 1/2" MBSP | 1/2" MBSP | 3/4" MBSP |
| PHT-D250 | 1/2" MBSP | 1/2" MBSP | 3/4" MBSP |

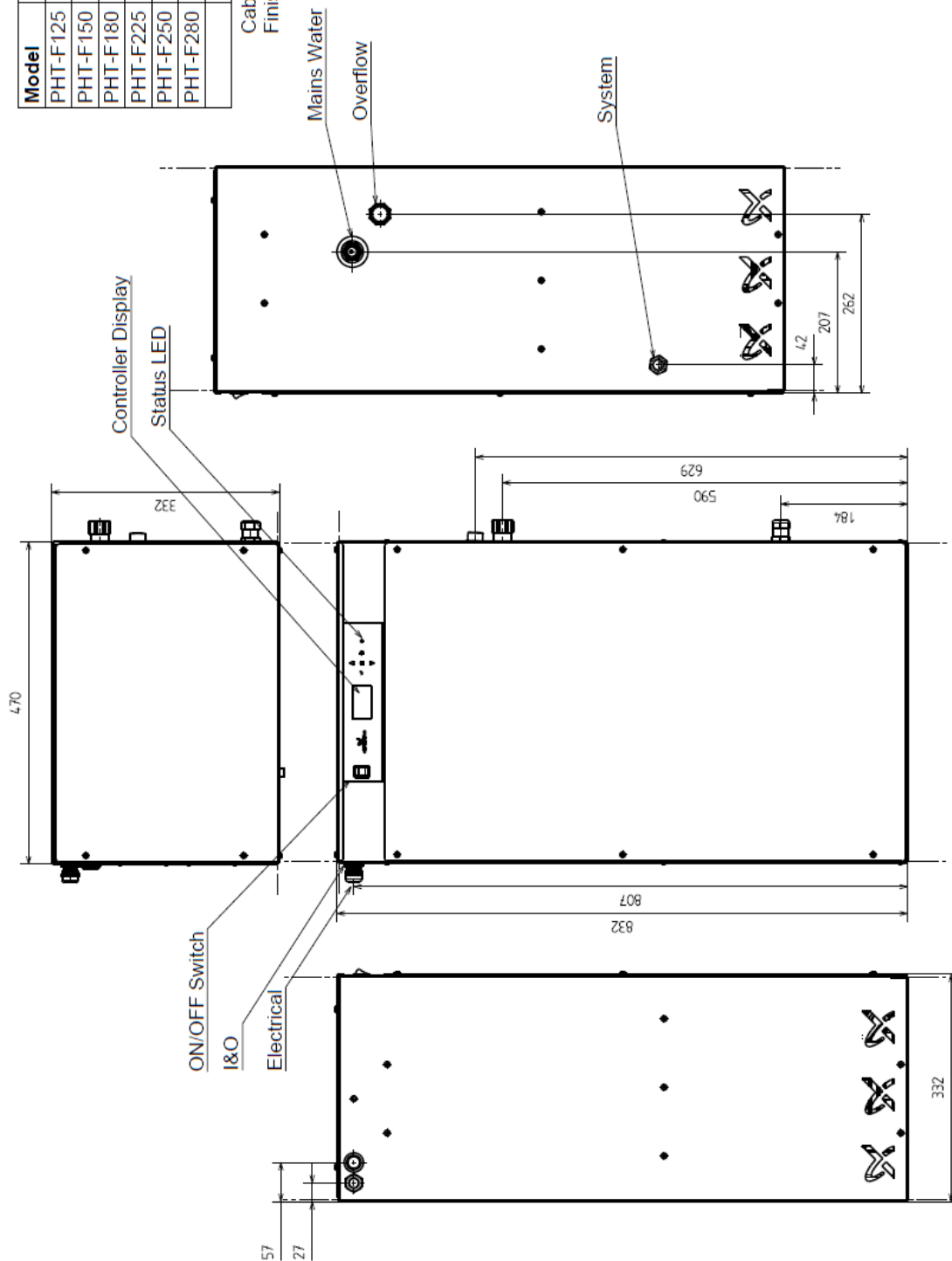
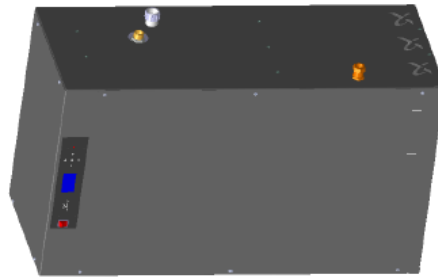
Cabinet material: 1.5 mm Mild steel,
Finish: PPC White RAL 9003 Gloss



10.4 Product Drawing – PHT-F.

| Model | Mains Water | System | Overflow |
|----------|-------------|-----------|-----------|
| PHT-F125 | 1/2" MBSP | 1/2" MBSP | 3/4" MBSP |
| PHT-F150 | 1/2" MBSP | 1/2" MBSP | 3/4" MBSP |
| PHT-F180 | 1/2" MBSP | 1/2" MBSP | 3/4" MBSP |
| PHT-F225 | 1/2" MBSP | 1/2" MBSP | 3/4" MBSP |
| PHT-F250 | 1/2" MBSP | 1/2" MBSP | 3/4" MBSP |
| PHT-F280 | 1/2" MBSP | 1/2" MBSP | 3/4" MBSP |

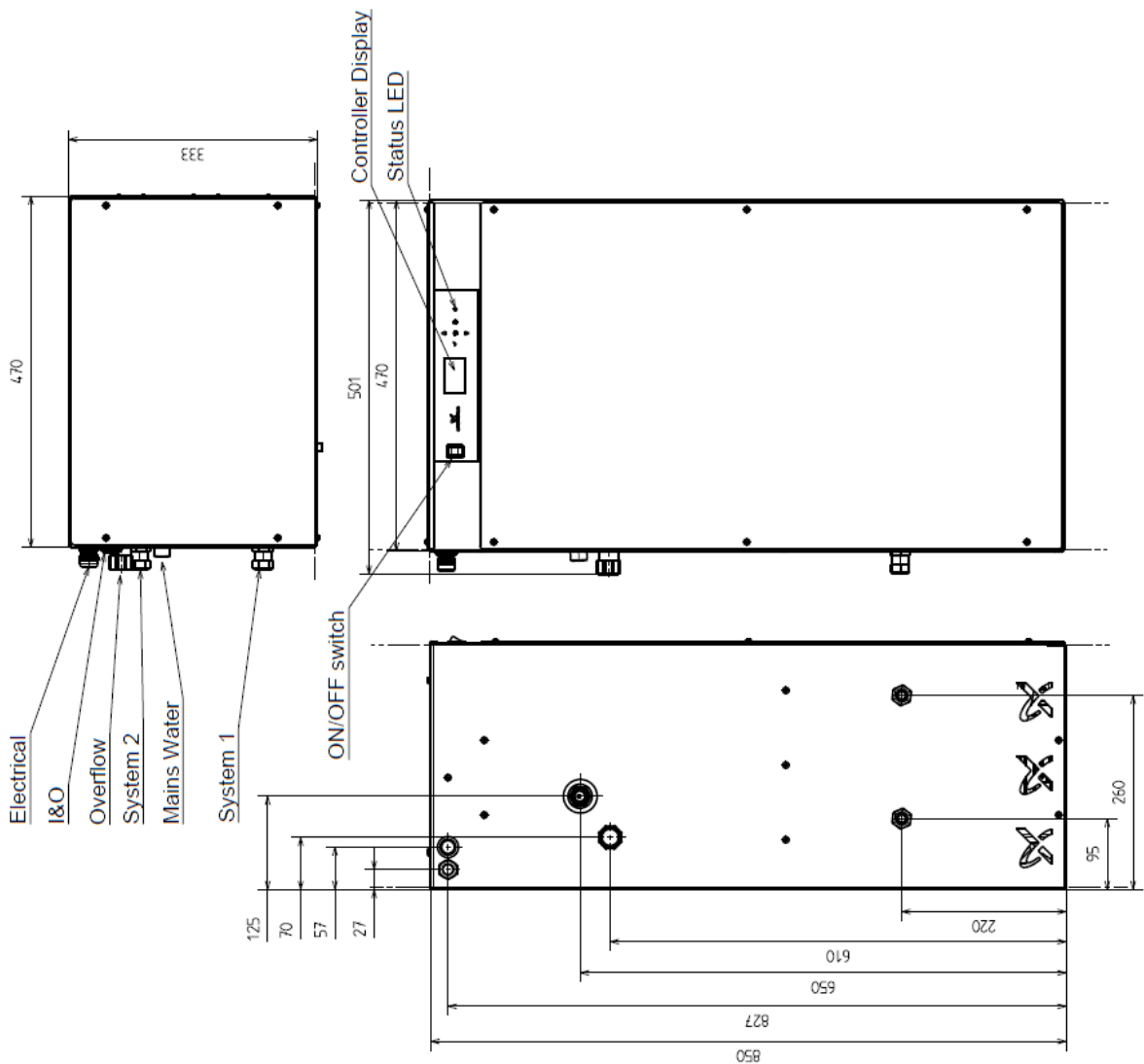
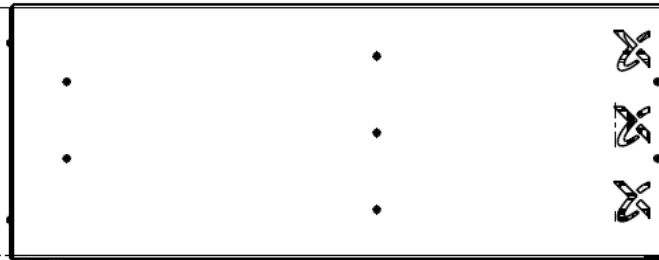
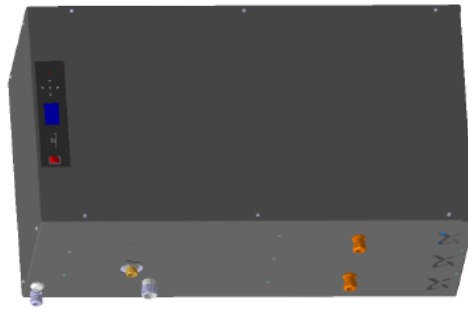
Cabinet material: 1.5 mm Mild steel,
Finish: PPC Black RAL 9005 Matt



10.5 Product Drawing – PHT-T.

| Model | Mains Water | System 1&2 | Overflow |
|----------|-------------|------------|-----------|
| PHT-T225 | 1/2" MBSP | 1/2" MBSP | 3/4" MBSP |
| PHT-T250 | 1/2" MBSP | 1/2" MBSP | 3/4" MBSP |
| PHT-T280 | 1/2" MBSP | 1/2" MBSP | 3/4" MBSP |

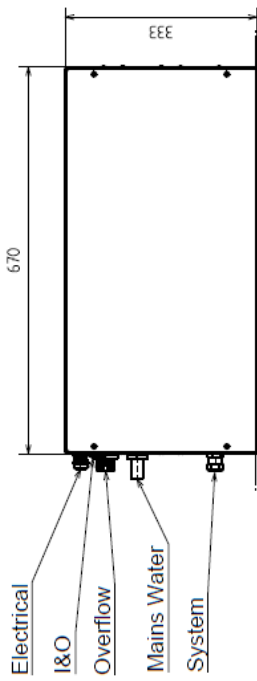
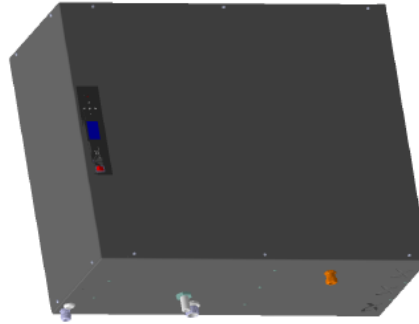
Cabinet material: 1.5 mm Mild steel,
Finish: PPC Black RAL 9005 Matt



10.6 Product Drawing – PHT-V.

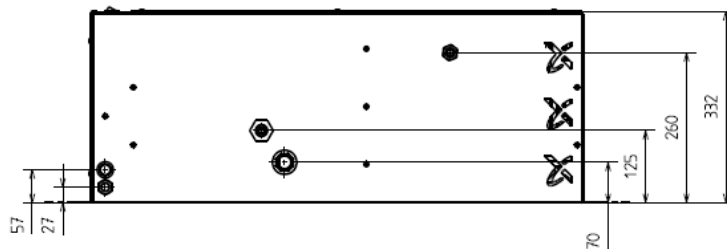
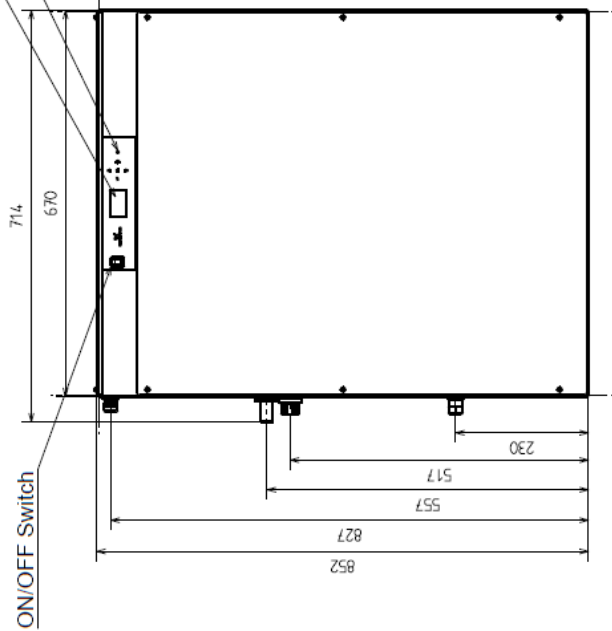
| Model | Mains Water | System | Overflow |
|----------|-------------|-----------|-----------|
| PHT-V225 | 1/2" MBSP | 1/2" MBSP | 3/4" MBSP |
| PHT-V250 | 1/2" MBSP | 1/2" MBSP | 3/4" MBSP |

Cabinet material: 1.5 mm Mild steel,
Finish: PPC Black RAL 9005 Matt

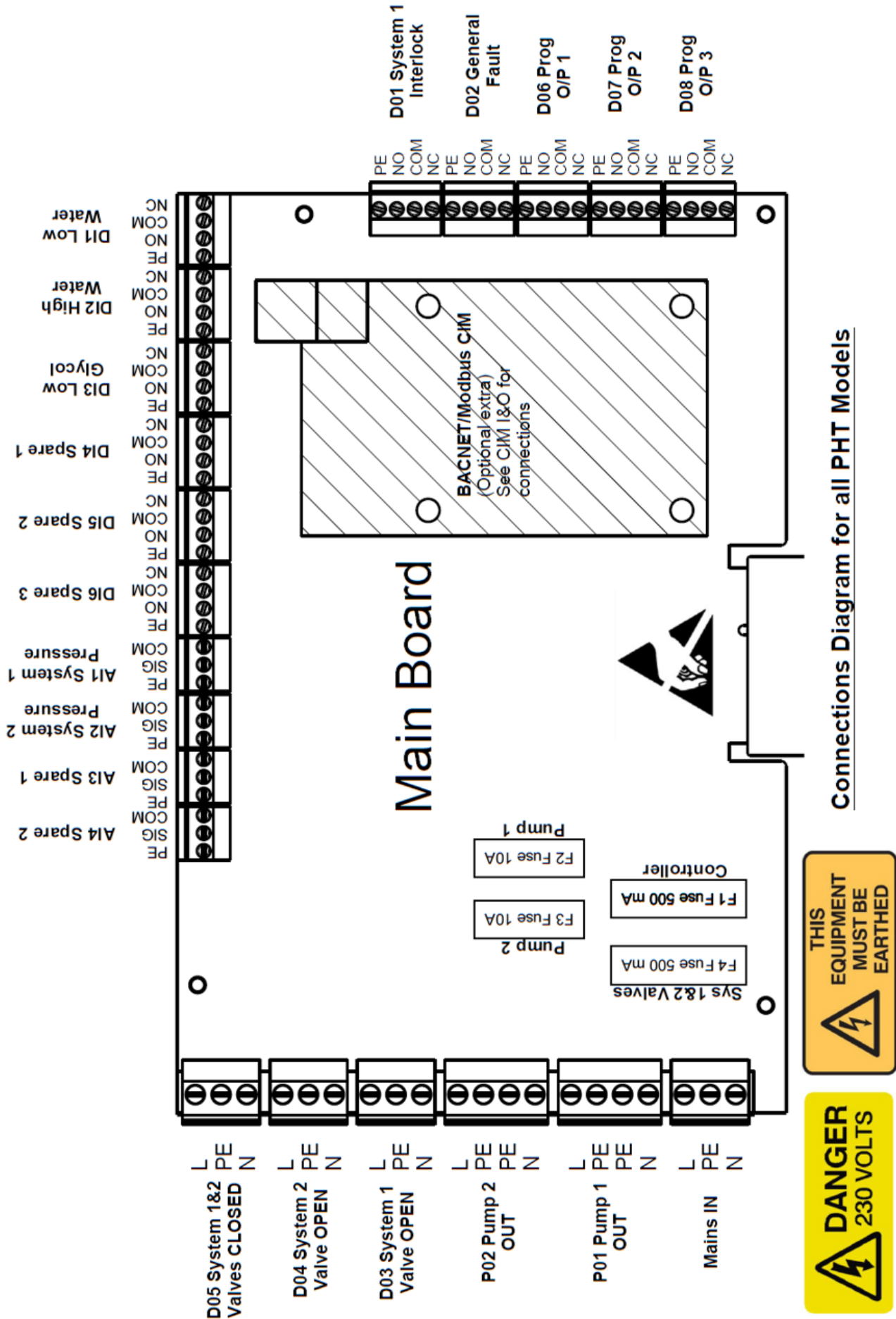


Controller Display

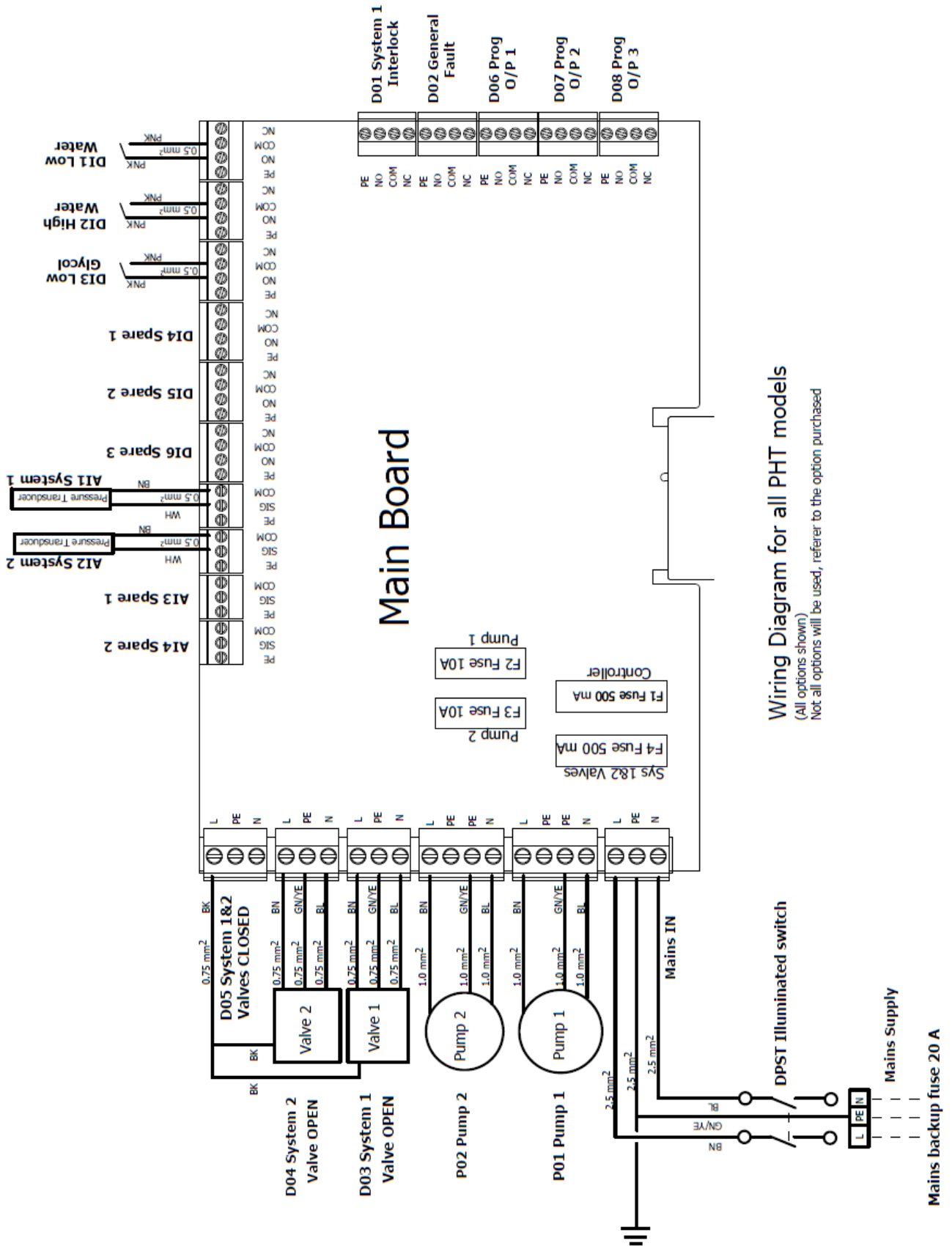
Status LED



10.7 Connection drawing.



10.8 Wiring Diagram.



Wiring Diagram for all PHT models

(All options shown)

Not all options will be used, refer to the option purchased

10.10 Pump Set Fill Pressures.

| Pump set | Closed Valve Head (Bar) | Cold Fill Pressure (Bar) |
|----------------|----------------------------|-----------------------------|
| PHT-N230 | 4.0 | 3.0 |
| PHT-D/F/T/V*25 | 3.80 | 2.5 |
| PHT-D/F/T/V*50 | 6.4 | 5.0 |
| PHT-F*80 | 10.0 | 8.0 |

10.11 PTH-V Glycol settings.

The PHT-V unit is factory set to dose Glycol @ 20 %, Water @ 80%.
This can be adjusted according to the below table.

Maximum Glycol dose is 50 %.

| Glycol Concentration | Glycol valve setting | Water valve setting |
|----------------------|----------------------|---------------------|
| 1 % | 0.05 | 6.2 |
| 5 % | 0.1 | 6.1 |
| 10 % | 0.2 | 6.0 |
| 15 % | 0.3 | 5.9 |
| 20 % | 0.7 | 5.7 |
| 25 % | 1.0 | 3.1 |
| 30 % | 1.3 | 2.8 |

11.0 Spare Parts List.

| Part no. | Description | Parts included |
|----------|--------------------------------------|--|
| 99366896 | Kit, PHT-N*30 Pump | PHT-N*30 Pump, I&O manual |
| 99366897 | Kit, PHT-D/F/T/V*25 Pump | PHT-D/F/T/V*25 Pump, I&O manual |
| 99366898 | Kit, PHT-D/F/T/V*50 Pump | PHT-D/F/T/V*50 Pump, I&O manual |
| 99366899 | Kit, PHT-F*80 Pump | PHT-F*80, I&O manual |
| 99366900 | Kit, PHT- All Fuse kit | Full fuse set, I&O manual |
| 99366901 | Kit, PHT Front panel membrane | Front panel membrane, I&O manual |
| 99366902 | Kit, PHT ON/OFF Switch | ON/OFF Switch, I&O manual |
| 99366903 | Kit, PHT N/D/F/V Controller | PHT Controller, I&O manual |
| 99366904 | Kit, PHT Pressure transducer | Pressure transducer and cable, I&O manual |
| 99366905 | Kit, PHT Float switch | Float switch and cable, I&O manual |
| 99366906 | Kit, PHT-T Motorised ball valve cpl. | Motorised ball valve cpl., I&O manual |
| 99366907 | Kit, PHT BACNET card | BACNET Card, fixings and cover, I&O manual |
| 99366908 | Kit, PHT-V Manifold | PHT-V Manifold, I&O manual |
| 99366909 | Kit, PHT-T Manifold | PHT-T Manifold, I&O manual |
| 99366910 | Kit, PHT-T/V None-return valve | Non-return valve, I&O manual |
| 99366911 | Kit, PHT-D Hose kit | PHT-D Hoses, I&O manual |
| 99366912 | Kit, PHT-F Hose kit | PHT-F hoses, I&O manual |
| 99366913 | Kit, PHT-T Hose kit | PHT-T Hoses, I&O manual |
| 99366914 | Kit, PHT-V Hose kit | PHT-V Hoses, I&O manual |
| 99366915 | Kit, PHT-T Controller | PHT-T Controller, I&O manual |
| 99366916 | Kit, PHT N Float valve | PHT N Float valve, I&O manual |
| 99366917 | Kit, PHT Float valve & ball float | PHT Float valve & ball float, I&O manual |
| 99366918 | Kit, PHT I&O Manual | I&O Manual |
| 99366919 | Kit, PHT MODBUS card | MODBUS Card, fixings and cover, I&O manual |

12.0 De-commissioning, Dismantling and Disposal.

The Hydronic heating/chilling system in the building will be without the protection that the PHT unit gives once decommissioned and alternative measures to provide protection should be considered. The owner of the building should be informed of this beforehand.

12.1 De-commissioning.

De-commissioning is the process of taking out of service the PHT unit.

Reasons for this could be:

- Replacing with another unit
- Upgrading the unit
- Removing the system altogether

Ensure any outgoing signals from the **PHT** unit are **not** going to cause activation of:

NOTE

- Alarms/beacons
- BMS/Control panels/Boiler shut down
- Any other warning/monitoring devices installed (eg. SMS to mobile device).

NOTE

Consideration should be given to contacting any building services personal beforehand and informing them of the de-commissioning and dismantling of the **PHT** unit.

NOTE

Always make sure that adequate provision is made to capture any water drained from the system and the **PHT** unit when dismantling.

NOTE

Appropriate PPE must be worn. (including eye protection, footwear and gloves).

Ensure the following:

Electrical:

- Drain the **PHT** unit and system pipework from the point chosen to disconnect the
- Isolate the Mains electrical supply, ensure it cannot be turned back on.
- Isolate any electrical supply to the volt free contacts, ensure it cannot be turned back on
- Remove all of the electrical supply cable(s) to the **PHT** unit.

Hydraulic:

- Isolate the mains water input.
 - Isolate the **PHT** unit from the system by closing the **PHT** isolating valve or if another isolating device has been used to isolate the **PHT** from the system use that.
 - Prepare the area for any spillage and have a vessel to drain the water into ready.
 - Any system water may contain poisonous, and possibly corrosive chemicals.
- Always wear appropriate PPE***
- Drain off any pressure in the **PHT** unit via the draincock(s).
 - Drain off any remaining water in the header tank by removing the pump suction hoses at the pump suction connection.
 - Drain off any remaining water in the manifold by removing the pump discharge hoses at the pump discharge connection.
 - Clean up any water spillage.
 - Replace and cabinet panels removed.
 - Provide indication that the unit has been de-commissioned.

12.2 Dismantling.**NOTE**

Always make sure that adequate provision is made to capture any water drained from the system and the **PHT** unit when dismantling.

NOTE

Appropriate PPE must be worn. (including eye protection, footwear and gloves).

Ensure the following before Dismantling:



- The unit has been fully decommissioned as per the above.
- Remove any ground fixings.
- Dismantle the pipework and wall fixings.
- Remove the set with appropriate handling equipment and procedures.
- Any system connections will be subject to system pressure.

Take care when dismantling.

12.3 Disposal.

The **PHT** unit has valuable recyclable components.

Disposal of this product or parts of it must be carried out according to the following guidelines:

- Use the local public or private waste collection service.
- The materials/components used need to be segregated according to the disposal receivers requirements.
- In case such waste collection services do **not** exist or cannot handle the materials used in the product, please deliver the product or any hazardous materials from it to your nearest Grundfos company or service workshop.



Local and National environmental legislation must always be complied with.

13.0 Fault Finding Guide.

| Fault Message | Fault Condition | Remedy |
|--------------------|---|--|
| Service Required | It has been more than 12 months since the unit was last serviced. | Arrange for an engineer to service the unit. Once a full service has been performed, ensure that the service date is reset. |
| Low Water | The water in the break tank has fallen below the Low Water Float Switch(DI1). | Check the water supply to the unit and ensure that the float valve is operating/set up correctly. Once the water level has been restored, wait up to 2 minutes for the fault to reset. If the fault does not reset, check the function of the Low Water Float Switch (DI1). |
| High Water | The water in the break tank has risen above the High Water Float Switch(DI2). | Check the water level in the tank. Ensure that the float valve is operating/set up correctly. If the break tank is being back-filled from the system, the pump non return valves should be inspected for damage/debris. Once the water level has been restored, wait up to 2 minutes for the fault to reset. If the fault does not reset, check the function of the High Water Float Switch (DI2). |
| Low Glycol | The glycol in the glycol tank has fallen below the Low Glycol Float Switch(DI3). | Add more glycol to the glycol tank. If the fault does not reset, check the function of the Low Glycol Float Switch(DI3). |
| Low Pressure | The system pressure has fallen below the [System Low Pressure Alarm ON] set point. | Check that the isolation valve to the system is open. Check the pressure reading against a mechanical gauge if one is available. If the pressure needs to be increased substantially, add more water via a filling loop. |
| High Pressure | The system pressure has risen above the [System High Pressure Alarm ON] set point. | Check that the isolation valve to the system is open. Check the pressure reading against a mechanical gauge if one is available. Check if the filling loops have been left open. Drain water from the system via a suitable drain point until the correct pressure is restored. If the fault reoccurs, inspect the system expansion vessel and check its pre-charge pressure. |
| Pump Over Current | The pump current has risen above the pump full load current by the factor set in the Engineers menu. | Test the operation of the pump by manually operating the pump. Overcurrent can indicate a worn/seized motor. Service or replace the pump as required. Check that the voltage supply to the unit is within the specified limits. |
| Pump Under Current | The pump is not drawing sufficient current. | Test the operation of the pump by manually operating the pump. Undercurrent can indicate damaged motor windings (open circuit) or an air locked pump. Check the Pump fuse has not blown. Check that the voltage supply to the unit is within the specified limits. Service or replace pump as required. |
| Flood Protection | The allowable pump run time in the past hour has exceeded the [Flood Protection Limit] set point. (an excessive amount of water has been | Extreme water consumption can be caused by very large leaks (Burst pipes, open drain valves, etc.), work being done on the system (draining of large parts of the system), or bleeding of |

GRUNDFOS INSTRUCTIONS

| | | |
|-----------------------|---|---|
| | delivered in a short space of time) | radiators. Investigate the cause before clearing the fault. This value can be increased if required. |
| Excessive Consumption | The number of pump starts in the past month has exceeded the [Excessive Consumption Limit]. (water is being delivered to the system frequently) Pump operation will not be affected. | Excessive water consumption can be caused by small leaks on the system requiring frequent top-up. Inspect the system for leaks. This value can be increased if required. |
| Sensor Fault | No signal is being received from the system pressure transmitter. | Check the signal from the pressure transmitter and replace if necessary. (the pressure transmitter can be damaged by excessive pressure, extreme temperatures, water hammer and debris) |
| Valve Over Current | The Valve current has risen above the Valve full load current by the factor set in the Engineers menu. | Test the operation of the Valve by manually operating the Valve. Overcurrent can indicate a worn/seized Valve motor. Service Valve or replace the Valve motor as required. Check that the voltage supply to the unit is within the specified limits. |
| Valve Under Current | The Valve is not drawing sufficient current. | Test the operation of the Valve by manually operating the Valve. Undercurrent can indicate a damaged Valve motor windings (open circuit). Check the Valve fuse has not blown. Check that the voltage supply to the unit is within the specified limits. Service or replace the Valve motor as required. |

14.0 CIM Modules (Communication Protocols).

With the addition of an accessory card the communication functionality of the PHT unit can be extended to include **BACnet** or **Modbus** communications.

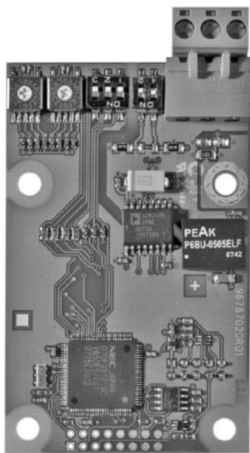
The following “Read only” outputs are available.

Fault Outputs available:

- | | |
|--------------------------------|--------------------------------|
| Pump 1 Over Current | Pump 2 Over Current |
| Pump 1 Under Current | Pump 2 Under Current |
| Low Water Alarm | High Water |
| Low Glycol | Service Required |
| System 1 Low Pressure | System 2 Low Pressure |
| System 1 High Pressure | System 2 High Pressure |
| System 1 Flood Protection | System 2 Flood Protection |
| System 1 Excessive Consumption | System 2 Excessive Consumption |

Data outputs available:

- | | |
|-------------------|-------------------|
| System 1 Pressure | System 2 Pressure |
|-------------------|-------------------|



The Grundfos CIM card is static sensitive and should be handled with care and due consideration for static sensitive devices.

Always follow the instructions in the CIM card Installation and Operation manual.

Any static damage to the CIM card is **not** covered under warranty.

Fig. 14 – CIM Module

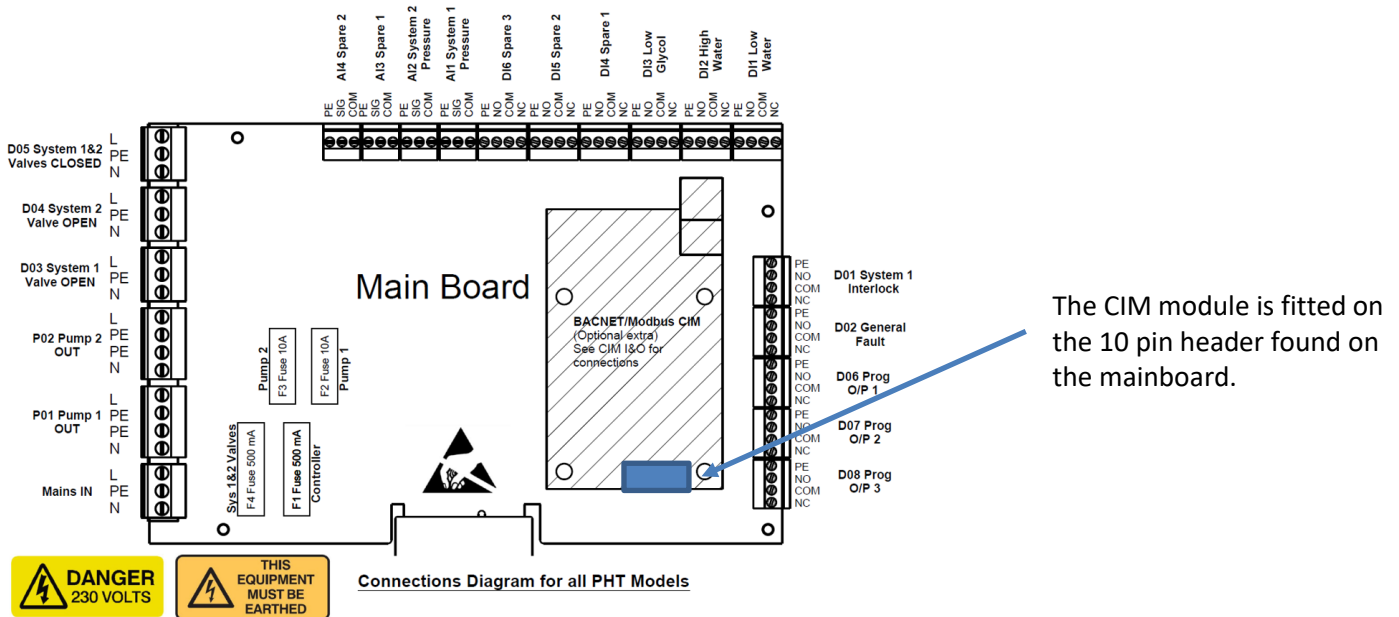


Fig. 15 - CIM Module location on main board

Installation, Service and Spare parts

Grundfos Pumps Ltd

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Leighton Buzzard.
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LU7 4TL.
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Telephone: +44 (0) 1525 850 000

Part number and description for this manual

Part no: 99354499 – Installation and Operating Instructions – PHT

ECM: 1225668 dd 15/01/2018 Rev. 1.1

GB REF: GB/PHT/CBS/0118

It is the continuing policy of Grundfos to develop and improve our products, and we reserve the right to amend prices and specification without prior notice.

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