

## Thermino® xPlus with Heat Pumps – Wiring & Settings (D0086)



### NOTICE

Please read & understand all these instructions before commencing installation.

Failure to install and operate this system in accordance with these instructions will invalidate the manufacturer's warranty. Please leave this manual with the customer for future reference.



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## 1. INTRODUCTION

### 1.1 GENERAL

The following instructions provide guidance for the installer and end-user of Thermino® xPlus Heat Batteries when used with compatible Heat Pumps.

These instructions must be read in conjunction with the Installation and User Instructions Manual for the Thermino xPlus (D0084) product.

All installations must be carried out by a competent installer in accordance with local codes and regulations for plumbing, electrical installations and potable water supply.

### 1.2 SYMBOLS USED

In these instructions the following symbols are being used to draw the user's attention to information of particular importance.



#### **WARNING**

Indicates a hazardous situation that, if not avoided, could result in death or serious injury.



#### **CAUTION**

Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury or material damage.



#### **NOTICE**

**Signals information that is considered important but not hazard related.**

### **1.3 ABBREVIATIONS**

The following abbreviations are used throughout the manual:

- AC – Alternating Current
- dT – delta T (change in Temperature)
- DHW – Domestic Hot Water
- HP – Heat Pump
- kW – Kilo Watt
- PCB – Printed Circuit Board
- PVC – Polyvinyl Chloride



## 2. SAFETY

### 2.1 GENERAL SAFETY NOTICES



#### **WARNING**

Only competent persons suitably qualified to carry out plumbing and electrical work may undertake installations, repairs or relocations of the appliance.

Product training on the full range of Thermino Heat Batteries is available from Sunamp or authorised training partners.



#### **WARNING**

Risk of electric shock – potential dual supply. Always isolate the power supplies to the Heat Battery controller before working on the Heat Battery.



#### **CAUTION**

These instructions must be read in conjunction with the Installation and User Instructions for the Thermino xPlus (D0084) products.



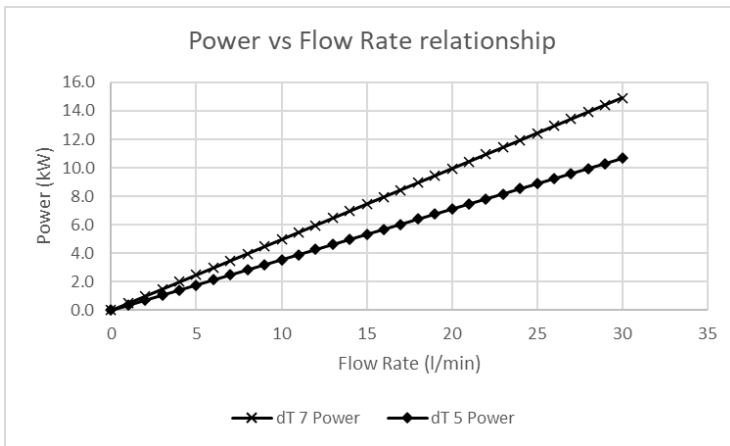
#### **CAUTION**

Do not operate the immersion heater until all heat exchanger circuits have been filled and the plumbing has been appropriately commissioned.

### 3. HEAT PUMP SIZING GUIDELINE

This section details the sizing guidance for the Thermino xPlus range of products with Heat Pumps. Its purpose is to assist and offer a guideline for choosing the correct size of Thermino xPlus Heat Battery to Heat Pump Capacity and promote sizing.

The graph below details the relationship between Flow Rate (l/min) and Power (kW) at dT's of 5 and 7, which are the most common range of operation for heat pumps used in Domestic Hot Water (DHW) mode.



**Figure 1 – Power vs Flow Rate relationship**

The Thermino xPlus Heat Batteries work to an ideal recommended flow rate for charging via Heat Pumps as detailed in the Installation Manual (D0084 – Table 1). Therefore, the following compatibility table can be used as a sizing guide between Heat Pump Capacity and Heat Battery size:



Heat Battery Size	Heat Pump Capacity Range (kW)			
	(3 to 5)	(5.5 to 7.5)	(8 to 10.5)	(11 to 14)
Thermino 150 xPlus	o	o	o	Δ
Thermino 210 xPlus	!	o	o	Δ
Thermino 300 xPlus	!	!	o	o
<p>! – Caution: Special consideration must be given to heat up and reheat times when combining low powered heat pumps with high capacity heat batteries.</p> <p>o – fully compatible sizing.</p> <p>Δ – compatible with the use of an Autobypass valve to ensure the flow rate of the heat pump is within the recommended flow rate for the Heat Battery sizing.</p>				

**Table 1: Heat Battery size and Heat Pump capacity compatibility**

The Autobypass valve is always recommended in installations with Thermino xPlus Heat Batteries as it also assists in the Heat Pump's defrost condition requirements.





## DN – DAIKIN 3H HT R32 HEAT PUMP

### WARNING



All Electrical wiring must be carried out by a competent person and be in accordance with the latest local wiring codes and regulations.

Risk of electric shock – potential dual-supply. Always isolate the power supply/ies to the Heat Battery, Heat Pump & Solar Diverter controller (if used) before working on the appliances.

When installing the Thermino xPlus with the heat pump, the steps below should be followed.

These settings are applicable to the following products:

- Thermino xPlus with the “DN01” & “DN02” Optimino Keys (D0084 – Section 6.3.2 for wiring instructions & Figure DN.1 below)
- Heat Pumps from the Daikin Altherma 3H HT range (R32)

### DN.1 WIRING

Using the Daikin Tank sensor part (C2294) supplied in optional kit A1135, the cable (C2294) will act as a hot water heating tank sensor from the Sunamp Optimino key baseboard (OPTB) – terminal J3 into the Heat Pump Interface controller PCB Terminal – (DHW Tank sensor – X9A) terminal (please refer to HP installation manual). Please run the wire into the heat battery appliance via the appliance case cabling grommets and then into the control box housing through the hole available. Secure the cables in terminals J3 on the



Optimino Board J3, please see Figures DN.1 & DN.2 below for reference.

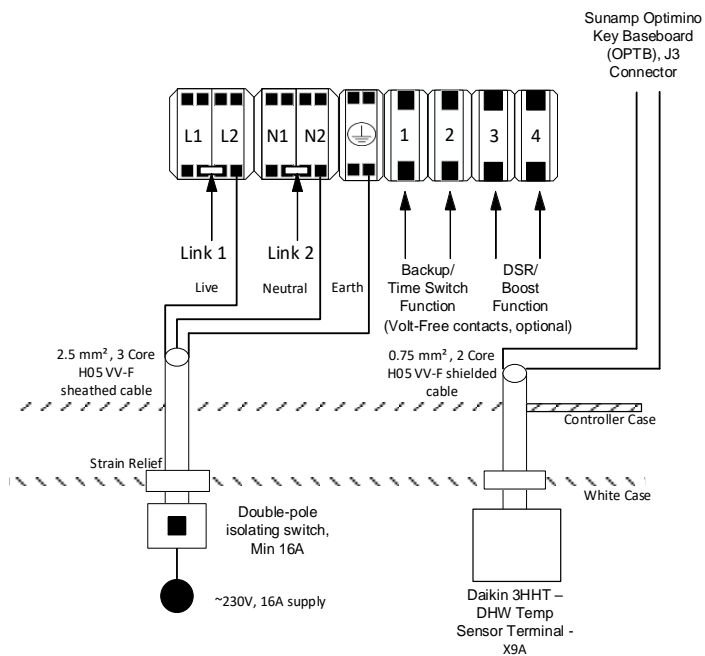


Figure DN.1 - Thermino xPlus with DN01 Optimino Key

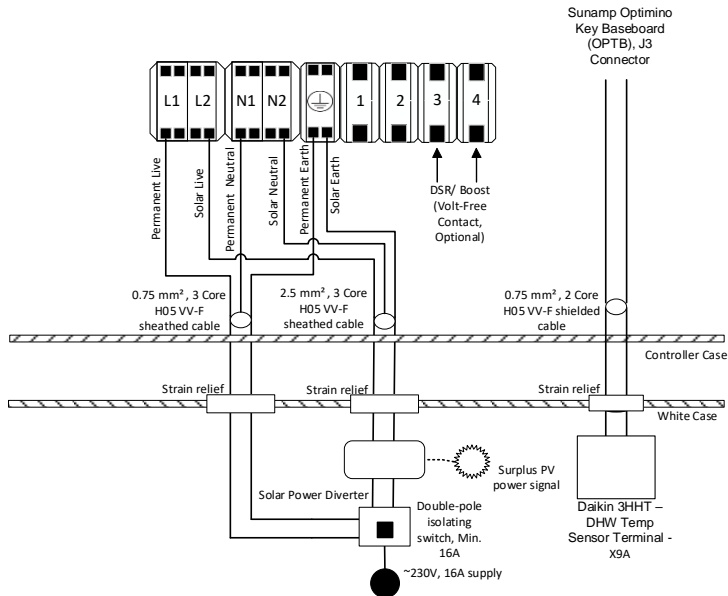


Figure DN.2 - Thermino xPlus with DN02 Optimino Key



#### NOTICE

For other hydraulic connections and wiring instructions, please follow the Instructions of the Sunamp Thermino xPlus Installation Manual D0084:

<https://www.sunamp.com/downloads>



## DN.2 DAIKIN 3H HT HEAT PUMP CONTROLLER SETTINGS

In the Main menu on of the Hydromodule Controller, apply the following settings to the functions listed below:

Function	Setting
Tank mode:	On
DHW:	EKHWS/E Tank with booster heater installed at the side of the tank.
Emergency:	Auto SH reduced/ DHW off
Setpoint mode:	Fixed
Disinfection:	Disabled
Heat up mode:	Schedule Plus reheat (define this with end user, it is important to allocate a daily time window of 2 hours minimum if using schedule only)
Comfort setpoint:	69°C
Reheat setpoint:	50°C
DHW Hysteresis:	5°C
Target dT (Flow/ Return)	5°C

**Table DN.1: Daikin 3H HT HP Hydromodule controller Main settings to apply**

In the Field setting Menu on the Hydromodule controller, apply the following settings to the functions listed below:

Function	Setting
DHW Maximum setpoint [6-0E]	70°C

**Table DN.2: Daikin 3H HT HP Hydromodule controller Field settings to apply**



### DN.3 WIRING APPLIED TO DAIKIN HYDROMODULE

- Jumper Terminal 10 to 11a on terminal bed X2M, using a 0.75mm<sup>2</sup> wire

### DN.4 USING DAIKIN KIT A1135

Wire the 2-core PVC insulated cable provided (C2293) from the Daikin Altherma 3H HT Hydromodule Controller Booster Heater terminal connectors "X13A" (please refer to Heat Pump manual), run the wire into the relay box (C2291) provided into "TRIGGER INPUT AC" terminals (please refer to relay box instruction sheet). Then wire another 2-core PVC insulated cable provided (C2295) from the relay box terminals "NO1" & "C1" to the Heat Battery, into the control box housing through the opening available. Secure the cables in Terminal 1 & 2 independently. Please note that the polarity of the wires is not important in this wiring setup. Please ensure to use the provided relay backbox (C2292) & 2 x cable grommets (C2296) when running the wires into the relay box.



#### **NOTICE**

This function allows the backup heating element inside the Heat Battery to be activated. Please note that this will stop the Heat Battery being charged in Heat Pump mode. This can lead to increased electricity consumption, resulting in higher energy costs. This should be explained to the end user.



## ET- ECOFOREST ecoAIR & ecoGEO PRO R290 HEAT PUMP

### WARNING



All Electrical wiring must be carried out by a competent person and be in accordance with the latest local wiring codes and regulations.

Risk of electric shock – potential dual-supply. Always isolate the power supply/ies to the Heat Battery, Heat Pump & Solar Diverter controller (if used) before working on the appliances.

When installing the Thermino xPlus with the heat pump, the steps below should be followed.

These settings are applicable to the following products:

- Thermino xPlus with the “ET01” & “ET02” Optimino Keys (D0084 – Section 6.3.2 for wiring instructions & Figure ET.1 below)
- Heat Pumps from the Ecoforest ecoGEO & ecoAIR PRO range (R290)

### ET.1 WIRING

Using a 2-core shielded cable 0.75mm<sup>2</sup>, the cable will act as a hot water heating tank sensor from the Sunamp Optimino Board (OPTB) – terminal J3 into the Heat Pump controller PCB Terminal – (A11 – DHW Storage Temperature) (please refer to HP installation manual). Please run the wire into the heat battery appliance via the appliance case cabling grommets and then into the control box

housing through the hole available. Secure the cables in terminals J3 on the Optimino Board J3; please see Figures ET.1 & ET.2 below for reference.

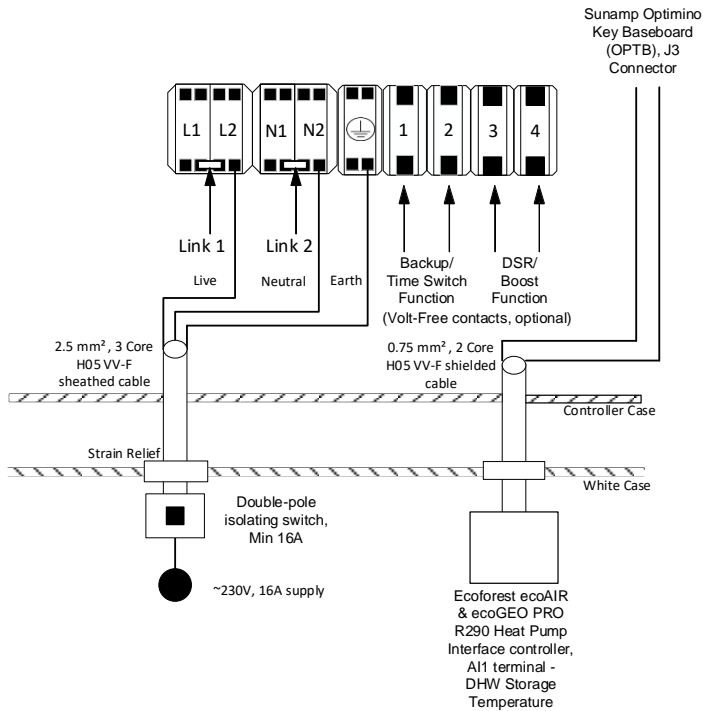


Figure ET.1 - Thermino xPlus with ET01 Optimino Key

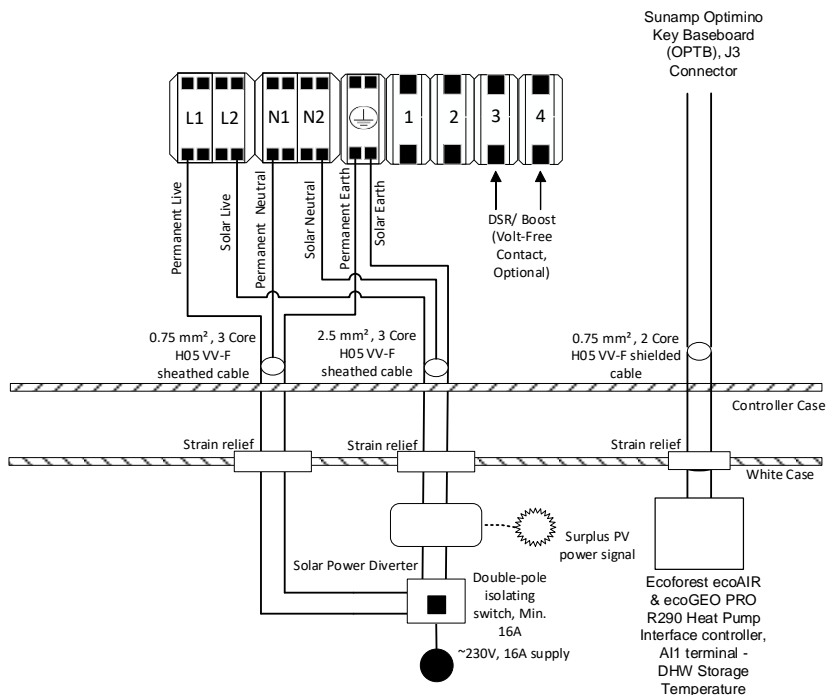


Figure ET.2 - Thermino xPlus with ET02 Optimino Key



#### NOTICE

For other hydraulic connections and wiring instructions, please follow the Instructions of the Sunamp Thermino xPlus Installation Manual D0084:

<https://www.sunamp.com/downloads>





## ET.2 ECOFOREST ecoAIR & ecoGEO PRO (R290) CONTROLLER SETTINGS

On the Main Menu select “DHW/Legionella Protection Menu”, then apply the following settings to the parameters detailed below:

Parameter	Setting
DHW	Enable
SetT	60°C
DTstart	5°C
Legionella	Disable

Table ET.1: Ecoforest DHW and Legionella settings to apply



### NOTICE

If following a DHW daily\_timed schedule, please ensure that a minimum time window inline with the installed Heat Battery and Heat Pump capacities is chosen, and that potential defrost cycles during this window are accounted for.



## PX – PHNIX GREENTHERM R290 HEAT PUMP

### WARNING



All Electrical wiring must be carried out by a competent person and be in accordance with the latest local wiring codes and regulations.

Risk of electric shock – potential dual-supply. Always isolate the power supply/ies to the Heat Battery, Heat Pump & Solar Diverter controller (if used) before working on the appliances.

When installing the Thermino xPlus with the heat pump, the steps below should be followed.

These settings are applicable to the following products:

- Thermino xPlus with the “PX01” & “PX02” Optimino Keys (D0084 – Section 6.3.2 for wiring instructions & Figure PX.1 below)
- Heat pump from the Phnix Greentherm range (R290)

### PX.1 WIRING

Using a 2-core shielded cable 0.75mm<sup>2</sup>, the cable will act as a hot water heating tank sensor from the Sunamp Optimino Board (OPTB) – terminal J3 into the Heat Pump Interface controller PCB Terminal – (TT – DHW Temp Sensor) (please refer to HP installation manual). Please run the wire into the heat battery appliance via the appliance case cabling grommets and then into the control box housing through the hole available. Secure the cables in terminals



J3 on the Optimino Board J3, please see Figures PX.1 & PX.2 below for reference.

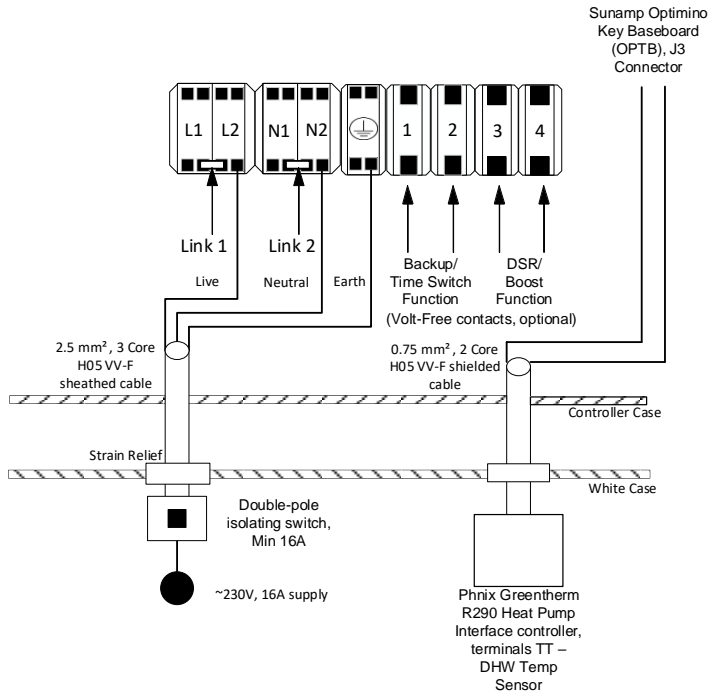


Figure PX.1 – Thermino xPlus with PX01 Optimino Key

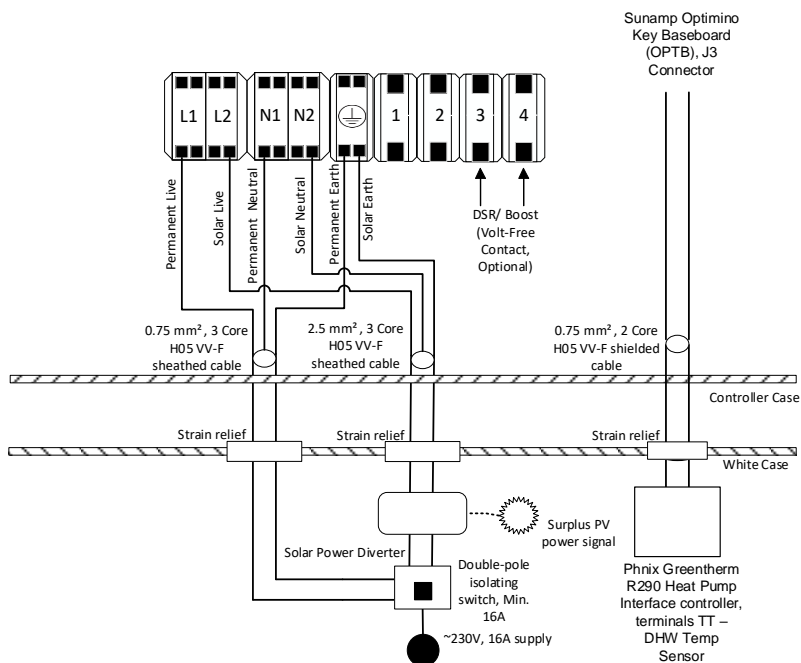


Figure PX.2 - Thermino xPlus with PX02 Optimino Key



#### NOTICE

For other hydraulic connections and wiring instructions, please follow the Instructions of the Sunamp Thermino xPlus Installation Manual D0084:

<https://www.sunamp.com/downloads>



## PX.2 PHNIX GREENTHERM HEAT PUMP (R290) CONTROLLER SETTINGS

- On the Main Menu select “Mode”. Select DHW from the Mode menu.
- Jumper the DHW terminals on the Heat Pump wiring terminals “5 & 6”, “DHW ON/OFF”.
- Unlock the screen to access the “Parameter” Menu. Please apply the following changes to the parameters:

Parameter Reference & Description	Parameter Values
H01 - AutoStart	YES
R01 – Hot Water Setpoint	55°C
R16 - Power-on Return Difference of Tank Water	5°C
R17 – Standby Temp Difference of Tank Water	5°C
R37 – Max Hot Water Setpoint	70°C

Table PX.1: Phnix Greentherm HP controller settings



### NOTICE

If following a DHW daily timed schedule, please ensure that a minimum time window in line with the installed Heat Battery and Heat Pump capacities is chosen, and that potential defrost cycles during this window are accounted for.



## SG – SAMSUNG HTQ R32 HEAT PUMP

### WARNING



All Electrical wiring must be carried out by a competent person and be in accordance with the latest local wiring codes and regulations.

Risk of electric shock – potential dual-supply. Always isolate the power supply/ies to the Heat Battery, Heat Pump & Solar Diverter controller (if used) before working on the appliances.

When installing the Thermino xPlus with the heat pump, the steps below should be followed.

These settings are applicable to the following products:

- Thermino xPlus with the “SG01” & “SG02” Optimino Keys (D0084 – Section 6.3.2 for wiring instructions & Figure SG.1 below)
- Heat Pumps from the Samsung HTQ range (R32)

### SG.1 WIRING

Using the Samsung Tank sensor part supplied with the heat pump, remove the sensor end by cutting off the copper cylinder, and strip the wire as required. The cable will act as a hot water heating tank sensor from the Sunamp Optimino key baseboard (OPTB) – terminal J3 into the Heat Pump Interface controller PCB Terminal – (DHW Tank sensor – CNS042) terminal (please refer to HP installation manual). Please run the wire into the Heat Battery appliance via the appliance case cabling grommets and then into the control box housing through the hole available. Secure the

cables in terminals J3 on the Optimino Board J3, please see Figures SG.1 & SG.2 below for reference.

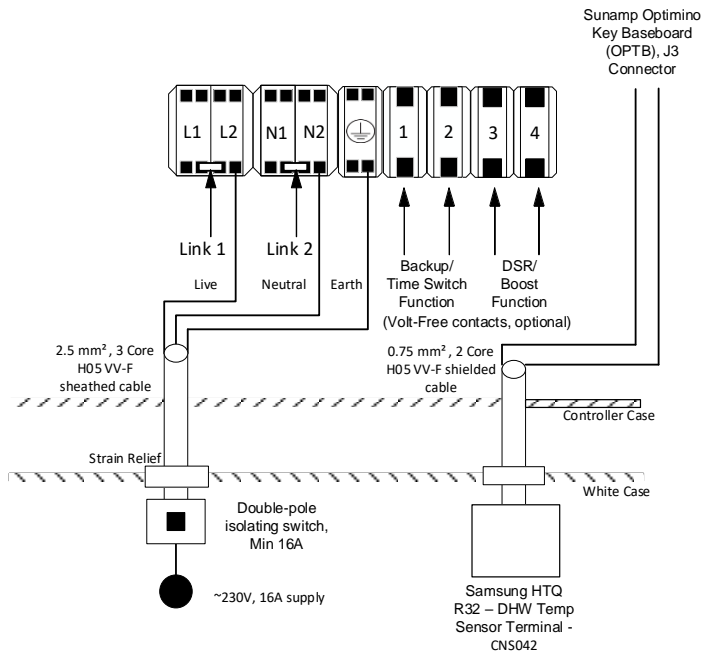


Figure SG.1 - Thermino xPlus with SG01 Optimino Key

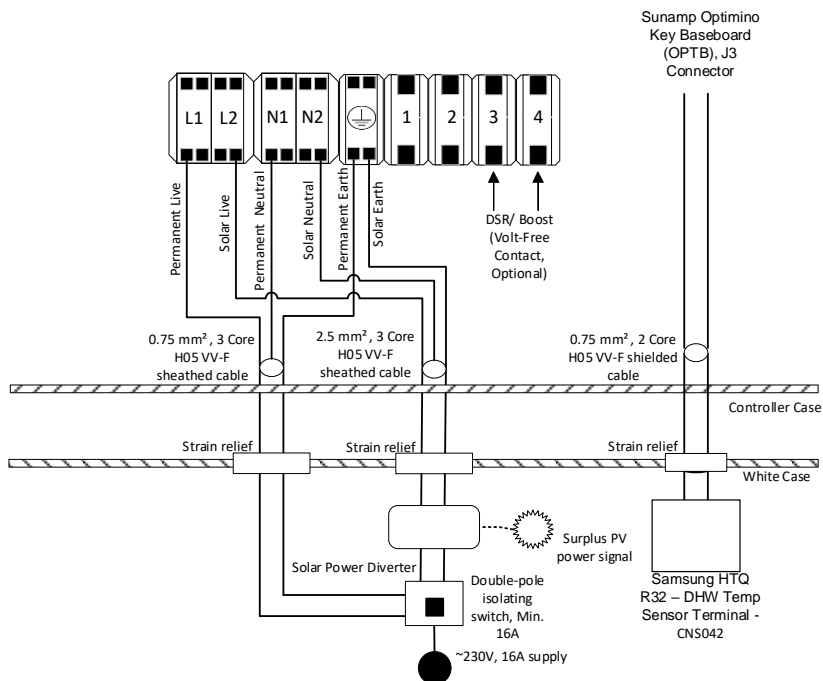


Figure SG.2 - Thermino xPlus with SG02 Optimino Key



#### NOTICE

For other hydraulic connections and wiring instructions, please follow the Instructions of the Sunamp Thermino xPlus Installation Manual D0084:

<https://www.sunamp.com/downloads>





## SG.2 SAMSUNG HTQ R32 HEAT PUMP CONTROLLER SETTINGS

On the Main Menu of the Heat Pump Controller, ensure “DHW Mode” setting “Standard” is applied.

The following can be accessed in the “FSV” Menu. Please enter the code detailed in the Samsung HTQ R32 manual if required to access the menu:

FSV	Setting
3011 - DHW Application	USE
3021 - Max Temp	55°C
3025 - Max DHW Operation Time	95 mins
1051 - DHW Tank Temperature	70°C

**Table SG.1: Samsung HTQ R32 HP controller settings**

## SG.3 USING SAMSUNG KIT A1136

Wire the 2-core PVC insulated cable provided (C2295) from the Samsung Controller Booster Heater terminal connectors “L” & “N” (please refer to Heat Pump manual), run the wire into the relay box (C2291) provided into “TRIGGER INPUT AC” terminals (please refer to relay box instruction sheet). Then wire another 2-core PVC insulated cable provided (C2295) from the relay box terminals “NO1” & “C1” to the Heat Battery, into the control box housing through the opening available. Secure the cables in Terminal 1 & 2 independently. Please note that the polarity of the wires is not important in this wiring setup. Please ensure to use the provided relay backbox (C2292) & 2 x cable grommets (C2296) when running the wires into the relay box.



#### **NOTICE**

This function allows the backup heating element inside the Heat Battery to be activated. Please note that this will stop the Heat Battery being charged in Heat Pump mode. This can lead to increased electricity consumption, resulting in higher energy costs. This should be explained to the end user.



## TO - TRIANCO ACTIVAIR HT R290 HEAT PUMP

### WARNING



All Electrical wiring must be carried out by a competent person and be in accordance with the latest local wiring codes and regulations.

Risk of electric shock – potential dual-supply. Always isolate the power supply/ies to the Heat Battery, Heat Pump & Solar Diverter controller (if used) before working on the appliances.

When installing the Thermino xPlus with the heat pump, the steps below should be followed.

These settings are applicable to the following products:

- Thermino xPlus with the “TO01” & “TO02” Optimino Keys (D0084 – Section 6.3.2 for wiring instructions & Figure TO.1 below)

### TO.1 WIRING

Using a 2-core shielded cable 0.75mm<sup>2</sup>, the cable will act as a hot water heating tank sensor from the Sunamp Optimino Board (OPTB) – terminal J3 into the Heat Pump Interface controller PCB Terminal – (TT – DHW Temp Sensor) (please refer to HP installation manual). Please run the wire into the Heat Battery appliance via the appliance case cabling grommets and then into the control box housing through the hole available. Secure the cables in terminals J3 on the Optimino Board J3; please see Figures TO.1 & TO.2 below for reference.

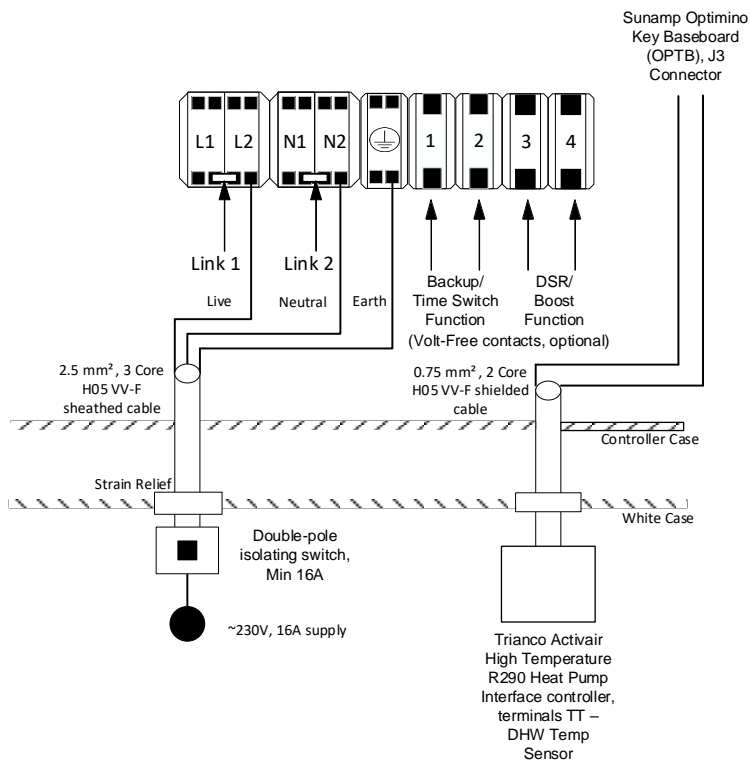


Figure TO.1 – Thermino xPlus with T001 Optimino Key

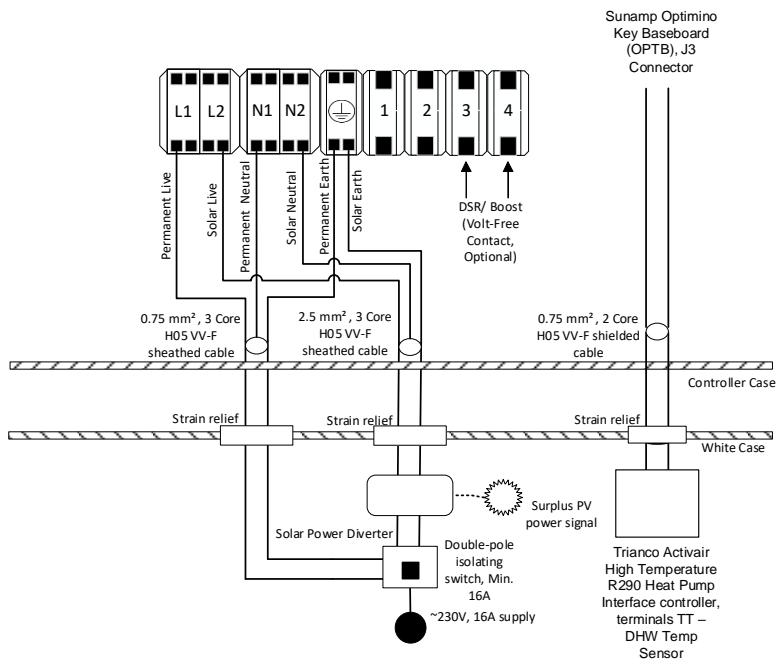


Figure TO.2 - Thermino xPlus with TO02 Optimino Key



#### NOTICE

For other hydraulic connections and wiring instructions, please follow the Instructions of the Sunamp Thermino xPlus Installation Manual D0084:

(<https://www.sunamp.com/downloads>)



## TO.2 TRIANCO ACTIVAIR HIGH TEMPERATURE HEAT PUMP (R290) CONTROLLER SETTINGS

- On the Main Menu select “Mode”. Select DHW from the Mode menu.
- Jumper the DHW terminals on the Heat Pump wiring terminals “5 & 6”, “DHW ON/OFF”.
- Unlock the screen to access the “Parameter” Menu. Please apply the following changes to the parameters:

Parameter Reference & Description	Parameter Values
H01 - AutoStart	YES
R01 – Hot Water Setpoint	55°C
R16 - Power-on Return Difference of Tank Water	5°C
R17 – Standby Temp Difference of Tank Water	5°C
R37 – Max Hot Water Setpoint	70°C

Table TO.1: Trianco Activair High Temperature HP (R290) controller settings



### NOTICE

This function allows the backup heating element inside the Heat Battery to be activated. Please note that this will stop the Heat Battery being charged in Heat Pump mode. This can lead to increased electricity consumption, resulting in higher energy costs. This should be explained to the end user.



## VT - VAILLANT AROTHERM + R290 HEAT PUMP

### WARNING



All Electrical wiring must be carried out by a competent person and be in accordance with the latest local wiring codes and regulations.

Risk of electric shock – potential dual-supply. Always isolate the power supply/ies to the Heat Battery, Heat Pump & Solar Diverter controller (if used) before working on the appliances.

When installing the Thermino xPlus with the heat pump, the steps below should be followed.

These settings are applicable to the following products:

- Thermino xPlus with the “VT01” & “VT02” Optimino Keys (D0084 – Section 6.3.2 for wiring instructions & Figure VT.1 below)
- Heat Pumps from the Vaillant Arotherm + range (R290)

### VT.1 WIRING

Using a 2-core shielded cable 0.75mm<sup>2</sup>. The cable will act as a hot water heating tank sensor from the Sunamp Optimino Board (OPTB) – terminal J3 into the Heat Pump Interface controller PCB Terminal – (SP1 – screw terminals 1 & 2) (please refer to HP installation manual). Please run the wire into the Heat Battery appliance via the appliance case cabling grommets and then into the control box housing through the hole available. Secure the



cables in terminals J3 on the Optimino Board J3, please see Figures VT.1 & VT.2 below for reference.

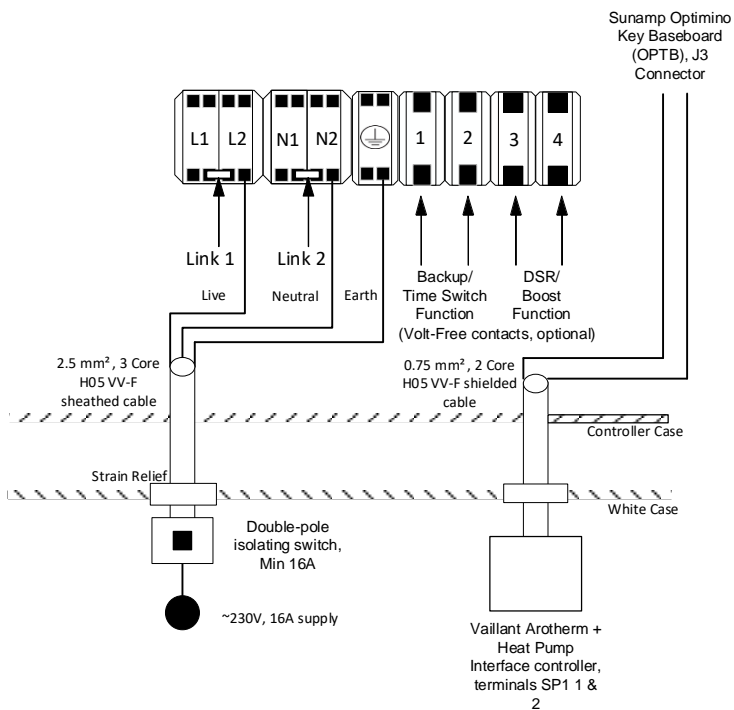


Figure VT.1 - Thermino xPlus with VT01 Optimino Key



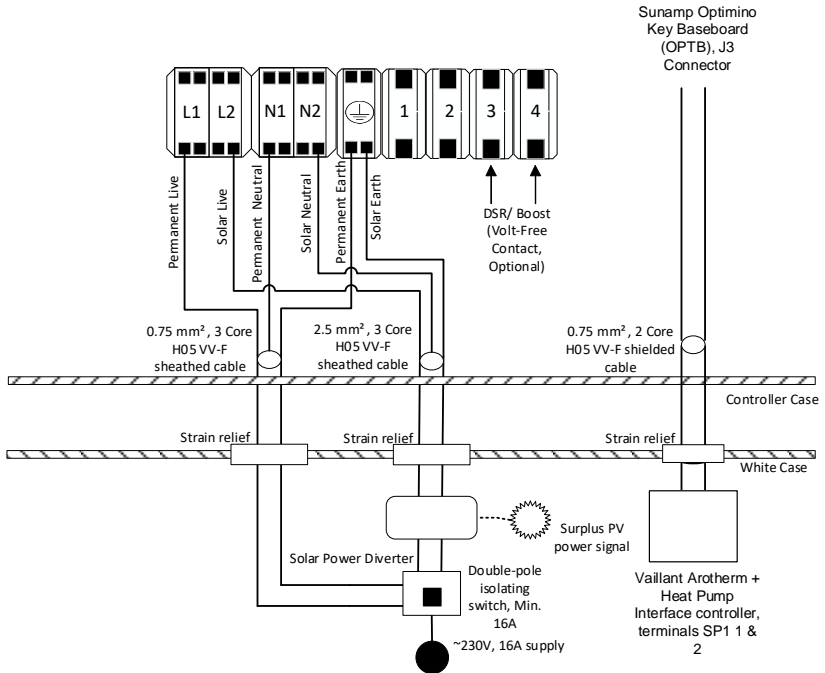


Figure VT.2 - Thermino xPlus with VT02 Optimino Key



#### NOTICE

For other hydraulic connections and wiring instructions, please follow the Instructions of the Sunamp Thermino xPlus Installation Manual D0084:

(<https://www.sunamp.com/downloads>)



## VT.2 VAILLANT AROTHERM + R290 HEAT PUMP SENSOCOMFORT CONTROLLER SETTINGS

In the Installer level menu on the Vaillant Sensocomfort controller, please apply the following settings for DHW settings ONLY (please check Vaillant Arotherm Plus Sensocomfort installation and user manual):

Setting	Value required
Max cylinder charging time	120 minutes
Cylinder charging anti-cycling time: min	Minimum setting
DHW target temperature	70°C
Cylinder charging hysteresis	5K
Cylinder charging offset	5K
Anti-legionella. Day & time	OFF

**Table VT.1: Vaillant Arotherm + R290 HP Sensocomfort controller settings**



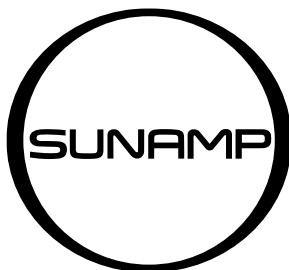
### NOTICE

If following a DHW daily timed schedule, please ensure that a minimum time window in line with the installed Heat Battery and Heat Pump capacities is chosen, and that potential defrost cycles during this window are accounted for.



### VT.3 VAILLANT AROTHERM + R290 HEAT PUMP INTERFACE SETTINGS

Change Heat pump Compressor output in DHW mode from Eco to Normal. This is available in the DHW settings of the Heat Pump Interface (please check Vaillant Arotherm Plus installation and user manual).



Manual Part Number: D0086

Version Number: 1.0

Publication Date: 20.12.2023

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