



## Solarium Pro Controller & Keypad Installation information

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**WARNING**

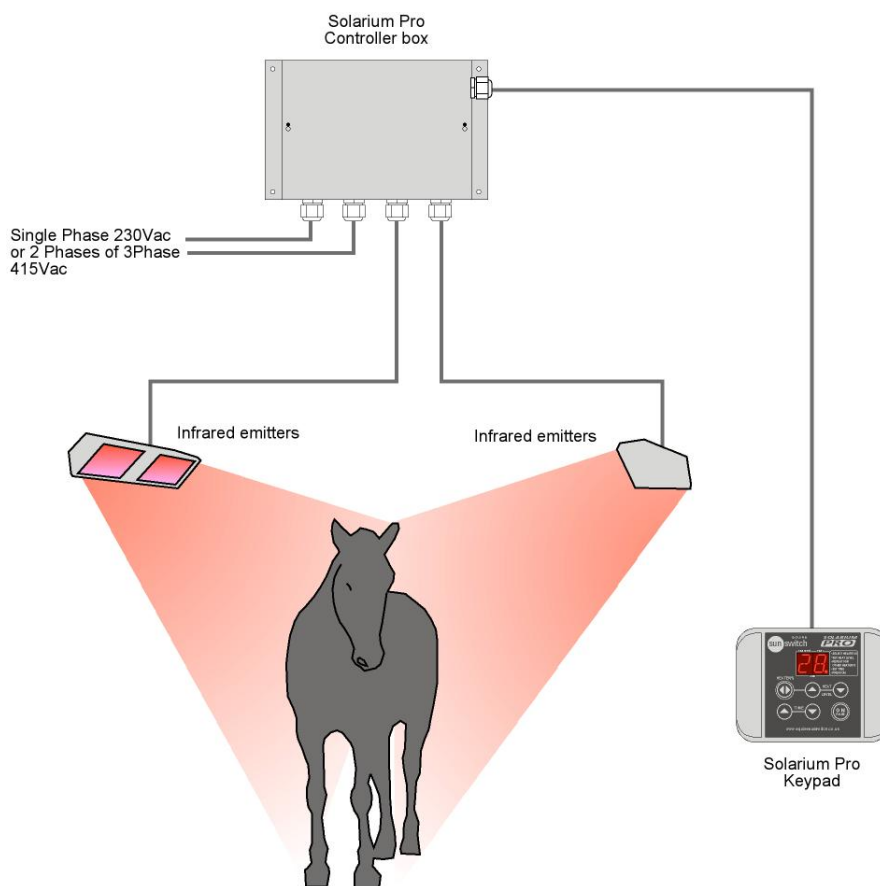
This equipment must be installed in accordance with the current edition of the IEE wiring regulations (BS7671) by suitably qualified personnel. These regulations contain important requirements regarding the safety of electrical equipment. For International Standards refer to I.E.C. Directive IEC950

## 1.0 Overview

The Equine SunSwitch Solarium Pro controller has been designed specifically for use with the Equine SunSwitch ASCOT and GOODWOOD Pro Range infrared solariums. Integral phase-cut thyristor circuits allow the heat output of the left and right sides of the solarium to be set independently. One side can be turned off altogether if required. An integral timer allows the solarium to be on for any duration up to 99 minutes. A timer override enables the Solarium Pro to run continuously until turned off manually.

The Solarium Pro controller box has no user interface and is designed to be mounted away from the solarium, for example in a roof void. A separate water-safe keypad is connected to the controller box by 4 core low-voltage cable, and should be mounted near the solarium for convenient access by the user.

The controller box can be powered either from single phase 230Vac or from two adjacent phases of a 3 Phase 415Vac supply. Comprehensive EMC filtering is included, and the product is CE compliant.



**Figure 1.** Typical solarium layout (ASCOT model)

### 1.1 Economic operation

Whenever the infrared emitters (heaters) are turned down, energy consumption is reduced. Energy usage on half power is slightly over half that of full power.

### 1.2 Background infrared in stables

Although its prime function is to control infrared horse solariums, the Solarium Pro controller can also be used to control heaters supplying background infrared in looseboxes or American barns. One Solarium Pro controller box will support up to 8 x 1.5kW infrared heaters. However, the keypad can be 'mapped' to two controller boxes if required (see Section 5.0) enabling independent control of four 6kW heater channels supporting up to 16 x 1.5kW heaters.

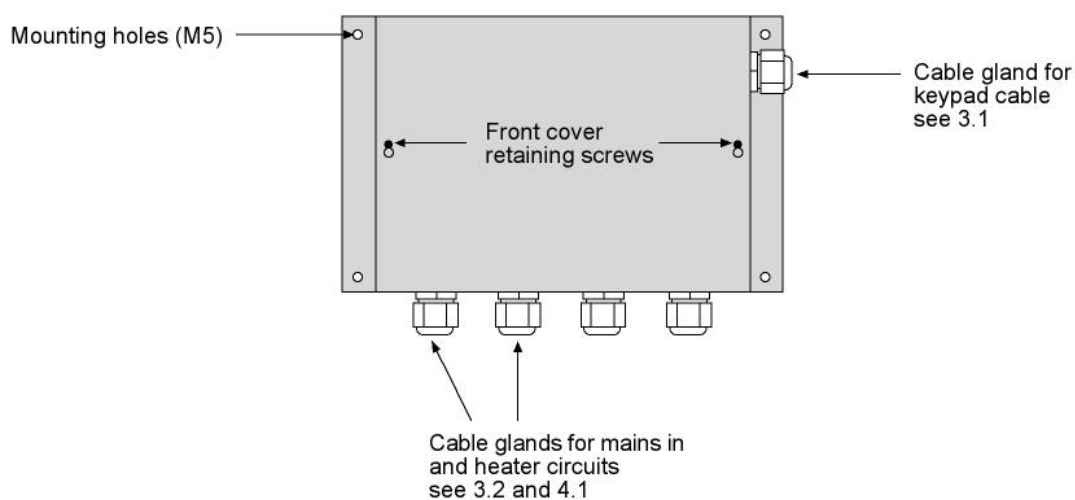
## 2.0 Installation

### 2.1 Siting the controller box

The controller box should be installed with the heatsink fins vertical in a well-ventilated location away from immediate sources of heat, where there is no risk of splashing. There must be a minimum free-air clearance behind the controller box of 25mm (e.g. fix on battens or suitable brackets). The heatsink must not be obscured or covered in any way. If the controller is to be mounted in a panel, mechanical ventilation may be required – please contact SunSwitch Limited for advice.

**Figure 2.** Solarium Pro controller box ventilation requirements

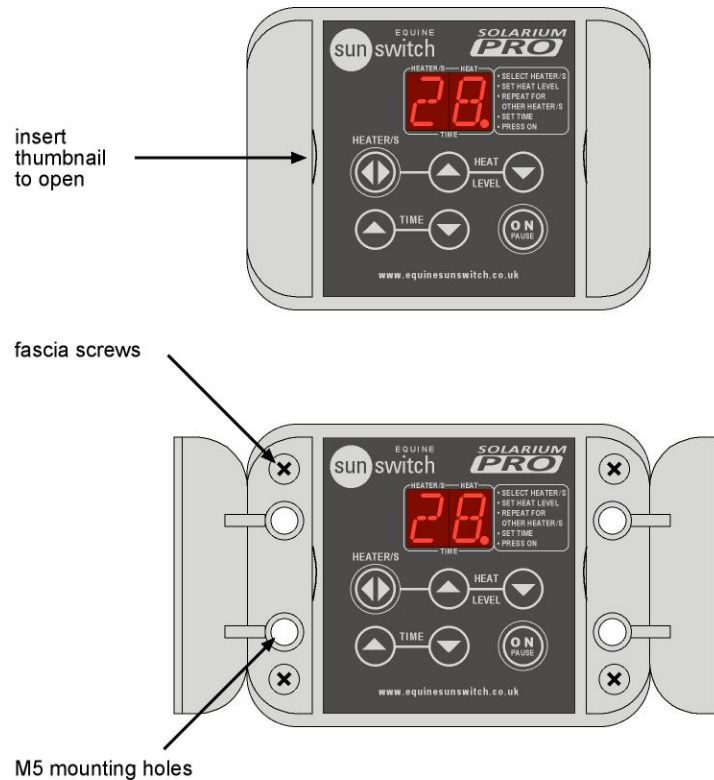
To gain access to the wiring terminals, loosen the two front cover screws a couple of turns and remove front cover. Please note the earthing strap must be retained.



**Figure 3.** Solarium Pro controller box exterior features

## 2.2 Siting the keypad

The keypad can be installed on any convenient vertical surface near the solarium. It is completely splash proof and is low voltage. Maximum length for the keypad – controller box cable is 20m.



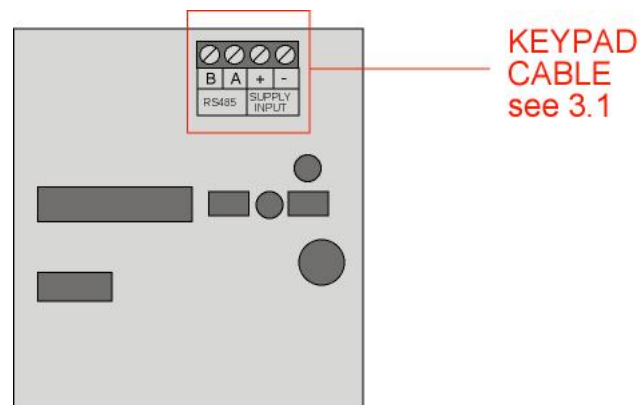
**Figure 4.** Solarium Pro keypad exterior

To mount the keypad, open the left and right cover panels. The four mounting points are now accessible.

## 3.0 Wiring

### 3.1 Controller box to keypad cable

To gain access to the wiring terminals, open the keypad left and right fascia covers as in 1.2 above and loosen the four fascia screws. The fascia will hinge downwards on two nylon retaining straps.



**Figure 5.** Keypad wiring

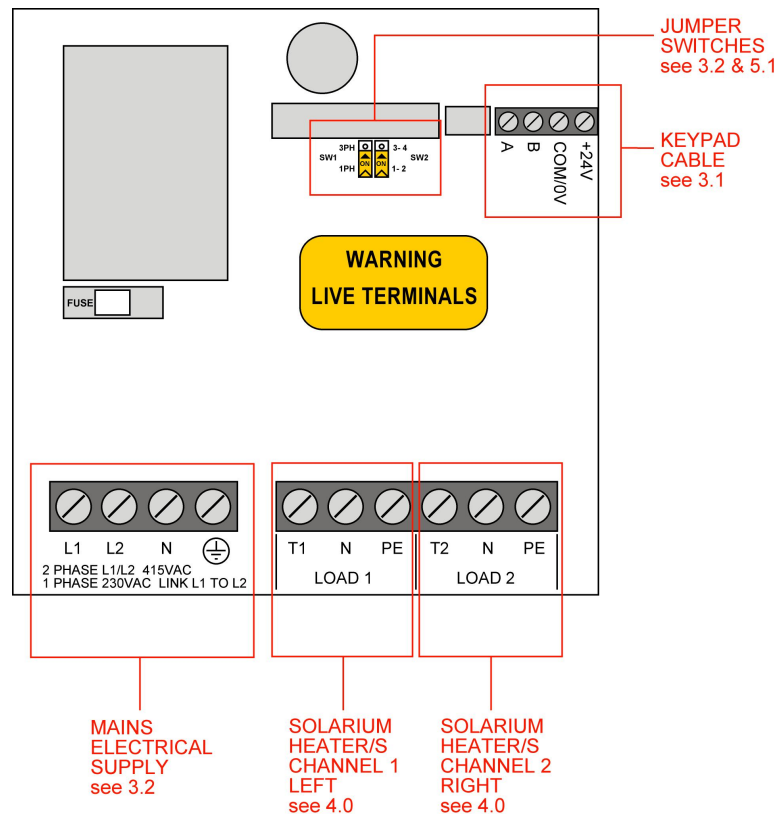
The controller box is connected to the keypad using a low-voltage data cable with two twisted pairs, with a characteristic impedance of approximately 120 Ω (e.g. UNITRONIC LiYY TP 2 x 2 x 0.14mm type). One twisted pair is used to provide a +24V dc supply. The other twisted pair passes serial data to and from the controller (terminals A and B). Maximum cable length is 20m.

Route the cable into the controller box via the small cable gland (top right). Route the cable into the keypad via the cable gland (underside of keypad).

Connect as follows:

<b>Controller</b>	<b>Keypad</b>
A	A (RS485)
B	B (RS485)
COM/0V	- (power supply input)
+24V	+ (power supply input)

N.B. keypad will malfunction if wiring is not correct!



**Figure 6.** Solarium Pro controller wiring

### 3.2 Mains incoming

The Solarium Pro controller has two discrete channels (for left and right heaters). The controller can be wired to a 220-250Vac 50-60Hz single phase electricity supply or to two phases of a 3-phase supply (L1, L2 and Neutral). In the latter, each phase operates one of the two controller output channels. Convenient isolation from the mains must be included, both for servicing and to allow the controller to be switched off when not in use.

### 3.2.1 Connecting to a single phase electrical supply

Ensure cable is of sufficient capacity for the total load of all of connected heaters. An RCD should be employed, and earthing continuity from controller to heaters must be maintained. Use Type D MCBs rated slightly higher than the overall total load.

Link L1 & L2 together using suitable rated cable (two separate cables can be taken from a common Live supply into L1 and L2 via one or two MCBs in order to reduce cable sizes).

Switch SW1 sets the number of phases used for the two channels. In the OFF state marked 1PH (jumper on lower two pins - as supplied) the number of phases is one. For single phase wiring ensure SW1 jumper is on lower two pins:



Figure 7. Setting SW1 for single phase installation

#### Connections:

Live input	L1 or L2, or both connected to a common Live.
Neutral	N
Earth	E (symbol)

### 3.2.2 Connecting to two phases of a 3-phase electrical supply

Ensure cables are of sufficient capacity for the total load of all of connected heaters for each channel. An RCD should be employed, and earthing continuity from controller to heaters must be maintained. Use Type D MCBs rated slightly higher than the load of each channel.

Jumper switch SW1 sets the number of phases used for the two channels. In the OFF state (jumper on lower two pins - as supplied) the number of phases is one. For two phases the jumper must be set to the ON position (i.e. plugged onto the top two pins):



Figure 8. Setting SW1 for 2 phases of 3-Phase supply

#### Connections:

L1	L1
L2	L2; timing = next phase sequence, i.e. 120° phase shift from L1
Neutral	N
Earth	Earth

## 4.0 Connecting infrared emitters (heaters)

The controller has two channels. For a solarium application, allocate Channel 1 to the left bank of infrared emitters (heaters) and Channel 2 to the right. Maximum load per channel is 6kW. If multiple emitters are connected to a channel, they must be wired in parallel, not in series. Cable must be of high quality low impedance type to prevent undue voltage drop, and all terminations must be tight.

#### Infrared emitter cable connections:

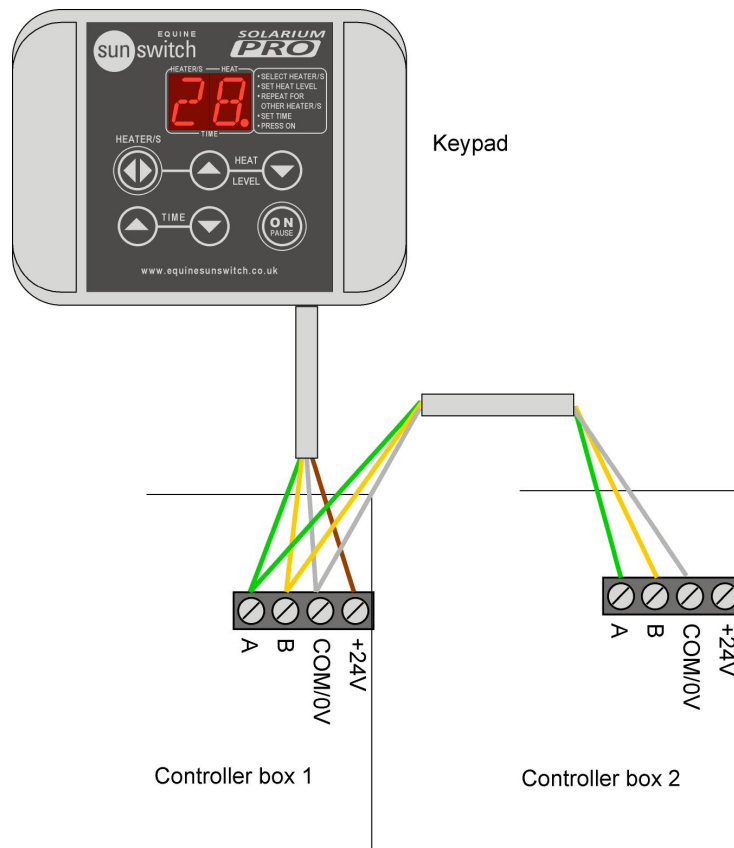
T1/T2	Live feed to heaters
N	Neutral to heaters
PE	Heaters earth

## 5.0 Advanced options

### 5.1 Mapping two controller boxes to one keypad

It is possible to map two controller boxes to one keypad, e.g. where two solariums are used simultaneously, or where heaters are installed in a series of looseboxes or an American barn.

The keypad is connected to the first controller box as described in 2.1 above. Another data cable is then connected to the second controller box:



**Figure 9.** Operating two Solarium Pro controllers from one keypad

As supplied, jumper switch SW2 is set to the lower two pins, meaning the output channels of the first controller box are 1 & 2. Setting SW2 to the ON position on the second controller box (upper two pins connected) allocates this controller output channels to 3 & 4.



**Figure 10.** Switch 2 with channels set to 1 & 2

The keypad will now display 1, 2, 3 or 4 under HEATER/S. Channels 1 and 2 are for heaters wired to the first controller, while 3 and 4 are for heaters connected to the second controller. Temperature output on all of the channels can be set independently as before (see Keypad User Instructions). The timer function will work globally across all channels.

## 6.0 Technical Specifications

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### 6.1 Controller box

Outputs	2 channels
Maximum load per channel	6kW (12kW total)
Supply voltage	220-250V ac 50 – 60 Hz single phase or 2 phases and neutral of 3-phase supply 120° apart
Quiescent current (Standby)	>5 Watts
Emissions	EN55022 Class A
Wiring	Power & load: screw terminal connectors accept cables up to 4.5mm <sup>2</sup> Keypad: screw terminal connectors accept cables up to 1.5mm <sup>2</sup>
Cable glands	4 M20 cable glands for supply and load accept cables of 5-13mm diameter 1 M16 cable gland for keypad cable accepts cables 3-9mm diameter
Enclosure	Mild steel powder coated white
Heatsink	Aluminium, anodised black
Protection	IP20
Dimensions	240 x 175 x 115 mm (whd)
Ambient limits	-10 to 40°C, 0-90% RH non-condensing
Mounting	4 x M5 holes
Weight	2.1 kg (nom.)

### 6.2 Keypad

Data cable	Low voltage 2 x twisted pair data cable e.g. type 2 x 2 x 0.14mm impedance 120 Ω
Supply voltage	+24V dc (via data cable)
Communications protocol	Modbus
Emissions	Logic level data signals
Enclosure	Cyclac KJBE
Protection	IP65
Dimensions	118 x 112 x 50 (mm)
Ambient limits	-10 to 40°C, 0-90% RH non-condensing
Mounting	4 x M5 holes



This product must be disposed of responsibly at the end of its operating life. Please take to a waste collection centre for electrical or electronic equipment.

### Warranty

This product is covered by a 12month warranty covering defective materials and manufacture. This does not affect your statutory rights.

Specifications may change without notice. No liability can be accepted for any errors or omissions, or for any loss or injury arising from the incorrect installation, use or disposal of this product.

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