REZNOR®

AMBIENT, LPHW AND ELECTRIC HEATED

GUARDIAN GR AND GS COMMERCIAL AIR CURTAIN RANGE WITH SIGNAL PRO CONTROLLER



INSTALLATION MANUAL

BS EN ISO 12100:2010 Safety of machinery.

BS EN 60204-1:2018 Safety of machinery. Electrical equipment of machines.

BS EN 55014-1:2017 Electromagnetic compatibility.

BS EN 60335-2-30:2009+A11:2012 Safety.

Electrical Equipment (Safety) Regulations 2016

Electromagnetic Compatibility Regulations 2016

Please read this document carefully before commencing installation, commissioning and/or servicing.
Leave it with the end user/site agent to be placed in their premises technical file after installation.

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death.
All work must be carried out by appropriately qualified persons.
The manufacturer does not take any responsibility in the event of non-observance of the regulations concerning the connection of the apparatus causing a dangerous operation possibly resulting in damage to the apparatus and/or environment in which the unit is installed.

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NGH NORTEK GLOBAL HVAC™

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G

Guardian air curtain range

General product information

Two models

- GS Surface mounted model
- GR Recessed mounted model

Three sizes

- 1000mm
- 1500mm
- 2000mm

Three variations

- Ambient (not heated)
- Electrically heated
- LPHW (low pressure hot water)

The new design allows for quick and easy access to the control panel and the installers terminal block, the GS range has two access panels on the 1000, three on the 1500 and four on the 2000. The GR has hinged access panels which can be removed with ease

Electric heated versions require a three phase (415v) electrical supply, whilst all other versions need a single phase (230v) supply

All units have fans capable of providing standard & high capacity air duties. Electric and LPHW also offer standard & high capacity heating outputs.

Units are designed for versatile installation, options of wall mounted, recessed within a false ceiling, fitted in a bulkhead, or on drop rods in front of glass fronted entrances.

A wall mounting bracket is available as an optional extra. Units can be mounted adjacent to each other to cover the full door opening across wider entrances.

All models are supplied with a Signal Pro display / program panel and 10m length of RJ45 communication cable. The panel allows the user to control either a single air curtain, or a network of up to 16 air curtains.

Easy programming for end users to select the required fan speed setting, heat setting, the outlet temperature setting, etc. Built in ModBus protocol allows communication with site BMS.

Health and safety

Before installing, carefully read the instructions and follow the processes explained by the manufacturer

Check that the temperature ranges given and those of the location match. The appliance must be powered with a voltage corresponding to the value shown on the rating plate.

Ensure that anchoring points are suitable for the weight and loading of the product and if required, add suitable reinforcement to the anchoring points area.

Installing, programming, commissioning, and maintenance of these products must only be carried out by suitably qualified and trained technicians and in full compliance of all applicable regulations and current best practices.

Due consideration should be taken for workplace safety, risk assessments and waste disposal.

Any modification of the product may be hazardous and the manufacturer is not liable for any damage or injury caused by improper use

Requirements

Clearance distances

For installation and maintenance clearances, please see the information on page 8 for the GS models and page 9 for the GR models.

Electrical

For full electrical loadings, please refer to the technical data section on page 6 of this manual.

It is recommended that the electrical supply to the base unit in the air curtain is via an appropriate switched isolator, fitted in accordance with the regulations in force in the country of use and must be via a fused isolator having a contact separation of greater than 3mm in all poles.



For safety reasons a good earth connection must ALWAYS be made to the heater and control box.

Signal Pro controller

Electric heated models have a supply requirement of 415V 3 phase, neutral and earth. Maximum cable inlet size is 10mm^2.

The display panel is wired to the control base unit via a RJ45 pre-wired cable.

Networked air curtains interconnect via a RJ45 pre-wired cable

Important notice to installers



Before installation, check that the local distribution conditions and supply voltage are compatible with the unit. Additionally with LPHW heated air curtains, check that the flow / return temperature and pressure of the LPHW system are compatible.



Installation, assembly, commissioning, service and maintenance procedures must be carried out only by suitable competent qualified persons. Unauthorised modifications to the appliance, or departure from the manufacturer's guidance on intended use, or installation contrary to the manufacturer's recommendations may constitute a hazard.

Note

To ignore the warning and caution notices, and to ignore the advice from the manufacturer on installation, commissioning, servicing, or use, will jeopardise any applicable warranty, such a situation could also compromise the safe and efficient running of the appliance itself, and thereby constitute a hazard.

Using this manual

Contained within the text of the manual, the symbols for 'Caution' and 'Warning' these are used to highlight certain points.



Caution is used when failure to follow or implement the instruction(s) can lead to premature failure or damage to the unit or its component parts.



Warning is used when failure to heed or implement the instruction(s) can lead to not only component damage, but also to a hazardous situation being created where there is a risk of personal injury.

Technical data

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Data	Fan speed	Unit	1000	1500	2000
All models					
Maximum door width	L, M, H	m	1.0	1.5	2.0
Maximum mounting height standard capacity	L, M	m		3.0	
Maximum mounting height high capacity	H	m		4.0	
Maximum air volume	L	m^3/h	1150	1730	2300
	M	m^3/h	1440	2270	2880
	H	m^3/h	1800	2700	3600
Maximum velocity at 0 metre	L	m/s		6.4	
	M	m/s	8	8.4	8
	H	m/s	10	10.1	10
Maximum velocity at 1 metre	H	m/s	5.6	5.2	5.4
Maximum velocity at 2 metre	H	m/s	3.8	3.5	3.7
Maximum velocity at 3 metre	H	m/s	2.8	2.5	2.8
Motor power	L, M, H	W	365	530	730
Noise level @ 3m free field	L	dB(A)		52	
	M	dB(A)		55	
	H	dB(A)		59	
Display panel control wiring				RJ45 (pre-wired cable required)	
Cable terminal size				$1.5mm^2$ MAX	
Electric Heated Models					
Electrical supply	L, M, H			415V 3 phase 50Hz and Neutral	
Heating capacity - standard	L, M, H	kW	9	12	18
Heating capacity - high	L, M, H	kW	12	18	24
Total electrical load -per phase standard	L	A	13.7	18.3	27.4
	M	A	13.8	18.4	27.7
	H	A	13.8	18.5	27.8
Heat current per phase standard	L	A	12.53	16.78	25.08
	M	A	12.51	16.66	25.05
	H	A	12.44	16.53	25.00
Total electrical load -per phase high	L	A	17.9	26.6	35.7
	M	A	18.0	26.8	36.0
	H	A	18.0	27.0	36.2
Heat current per phase high	L	A	16.73	25.08	33.38
	M	A	16.71	25.06	33.35
	H	A	16.64	25.03	33.40
Temperature rise - Standard (No Jumpers 9/12/18kW)	L	°C	28	27	27
	M	°C	23	24	23
	H	°C	18	17	19
Temperature rise - High (Jumpers in 12/18/24kW)	L	°C	34	33	33
	M	°C	29	28	29
	H	°C	24	22	24
Weight	L, M, H	kg	34.5	52	64.5
External fuse size (D type MCB)	H	A	20	32	40

Ambient Models					
Electrical supply	L, M, H		230V single phase 50Hz		
Total electrical load	L	A	1.17	1.52	2.32
	M	A	1.29	1.74	2.65
	H	A	1.36	1.97	2.8
Weight	L, M, H	kg	32	48.5	60
External fuse size (D type MCB)	H	A	6		
LPHW Heated Models					
Electrical supply	L, M, H		230V single phase 50Hz		
Maximum heating capacity standard	L, M, H	kW	9	12	18
Maximum heating capacity high	L, M, H	kW	12	18	24
Total electrical load	L	A	1.17	1.52	2.32
	M	A	1.29	1.74	2.65
	H	A	1.36	1.97	2.8
Temperature Rise - Standard (9/12/18kW)	L	°C	28	27	27
	M	°C	23	24	23
	H	°C	18	17	19
Temperature Rise - High (12/18/24kW)	L	°C	34	33	33
	M	°C	29	28	29
	H	°C	24	22	24
Weight (incl water)	L, M, H	kg	38.5	58	72
External fuse size (D type MCB)	H	A	6		

Table 1 Technical data

Standard Capacity is the factory default. High Capacity is achieved by using the Jumpers provided in the installation pack, (see parts table on page 38) and additional information on standard and high capacity fan and heat settings on page 18, Standard = default heating capacity.
High = jumpers fitted in terminals 1a to 6a selectable by installer
LPHW kW ratings based upon a flow / return water temperature of 82 / 72°C

Fuses

All of the circuit boards in the Guardian air curtain range have a control fuse F1 which covers the fans. The electric model with the Signal Pro board has two additional large fuses to protect the heating elements (F2 and F3).



Figure 1 Fuse location electric model board shown

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LPHW Models - Water Coil Technical information

GS & GR 1000 Models		Flow/Return Temperature				
		82/71	80/70	70/60	60/50	50/40
Rating	kW	12.02	11.75	9.4	7.03	4.61
Temp. Rise	°C	14.2	13.9	11.1	8.3	5.4
Volumetric Fluid Flow	m^3/h	1.0	1.0	0.8	0.6	0.4
Mass Fluid Flow	kg/h	938	1009	808	605	397
Fluid Velocity	m/s	1.66	1.79	1.42	1.06	0.69
Fluid Pressure Drop	kPa	13.13	14.99	10.41	6.46	3.19
Manifold Pressure Drop	kPa	1.39	1.6	1.04	0.6	0.27
Total Pressure Drop Fluid Side	kPa	14.52	16.58	11.45	7.05	3.45

GS & GR1500 Models		Flow/Return Temperature				
		82/71	80/70	70/60	60/50	50/40
Rating	kW	18.93	18.48	14.9	11.3	7.67
Temp. Rise	°C	14.9	14.5	11.7	8.9	6
Volumetric Fluid Flow	m^3/h	1.5	1.6	1.3	1	0.7
Mass Fluid Flow	kg/h	1477	1587	1281	973	661
Fluid Velocity	m/s	2.62	2.81	2.26	1.7	1.15
Fluid Pressure Drop	kPa	43.55	49.58	34.91	22.21	11.65
Manifold Pressure Drop	kPa	3.35	3.85	2.54	1.49	0.71
Total Pressure Drop Fluid Side	kPa	46.91	53.43	37.51	23.71	12.36

GS & GR2000 Models		Flow/Return Temperature				
		82/71	80/70	70/60	60/50	50/40
Rating	kW	24.32	23.73	19.2	14.66	10.09
Temp. Rise	°C	14.4	14	11.3	8.7	6
Volumetric Fluid Flow	m^3/h	1.9	2.1	1.7	1.3	0.9
Mass Fluid Flow	kg/h	1898	2037	1651	1262	869
Fluid Velocity	m/s	3.37	3.61	2.91	2.21	1.51
Fluid Pressure Drop	kPa	90.86	103.3	73.33	47.12	25.31
Manifold Pressure Drop	kPa	5.46	6.27	4.17	2.48	1.21
Total Pressure Drop Fluid Side	kPa	96.32	109.57	77.5	49.6	26.52

Dimensions. GS Surface mounted models

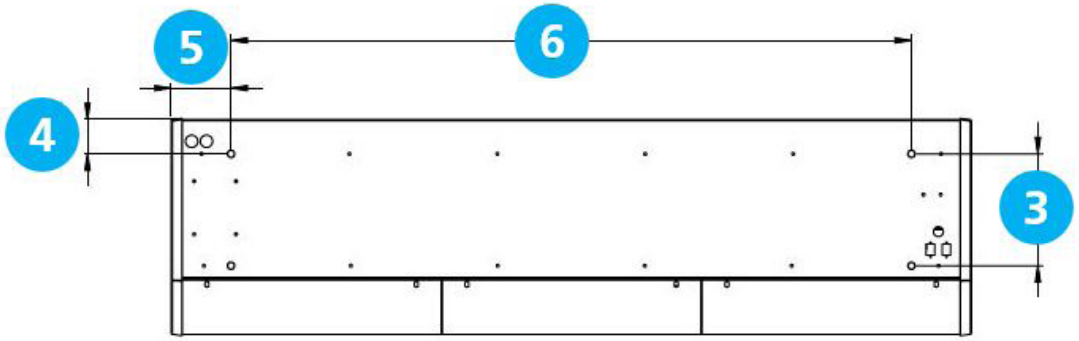


Figure 2 GS Top view

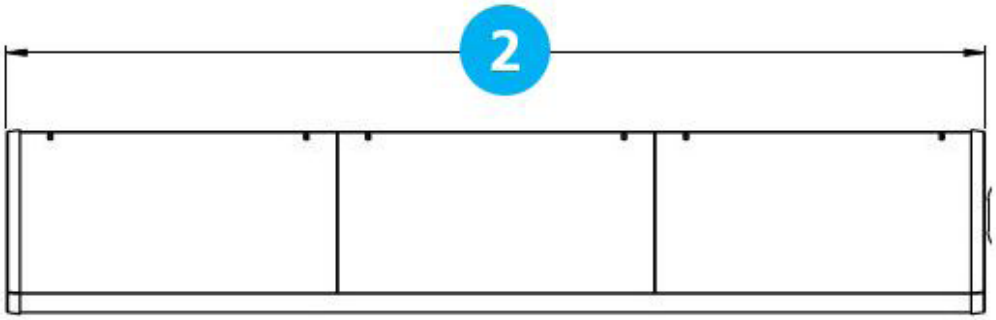


Figure 2.1 GS Front view



Figure 2.2 GS Bottom view

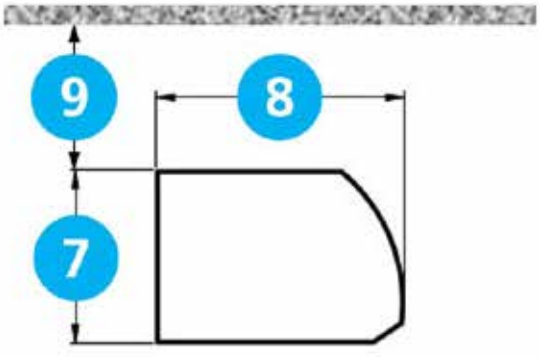


Figure 2.3 GS Side view

Reference	GS 1000	GS 1500	GS 2000
1	440		
2	1094	1620	2148
3	227		
4	70		
5	132	130	132
6	830	1360	1884
7	306		
8	440		
9	>100		

Table 2 GS dimensions

Clearance distances

It is recommended that a minimum clearance of 100mm is allowed around the top and front of the unit. The clearance allows for cable entry and prevents combustible surfaces overheating.

The minimum mounting height (floor to grille outlet) is 1.8m. The recommended maximum mounting height is 3m for standard fan setting & 4m for high

Dimensions. GR Recessed models

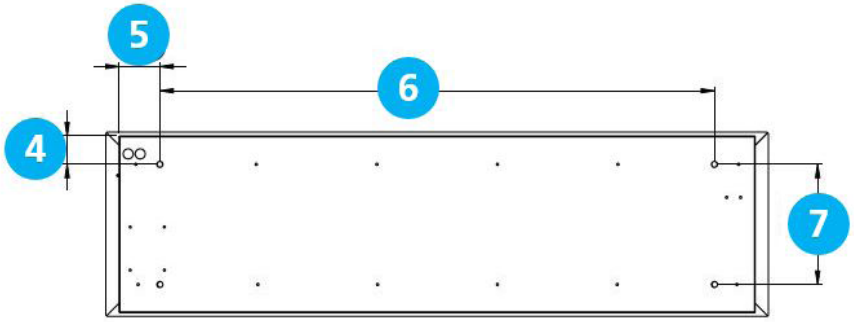


Figure 3 GR Top view

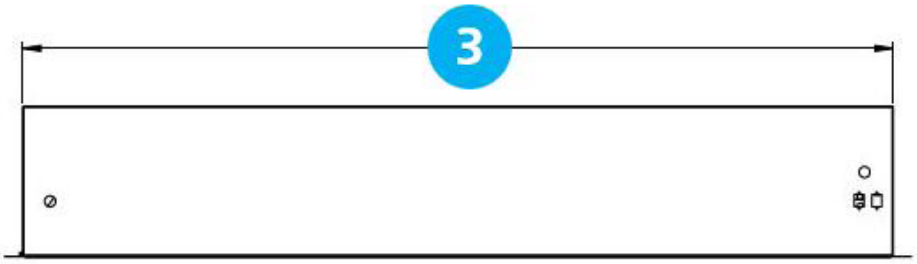


Figure 3.1 GR Front view

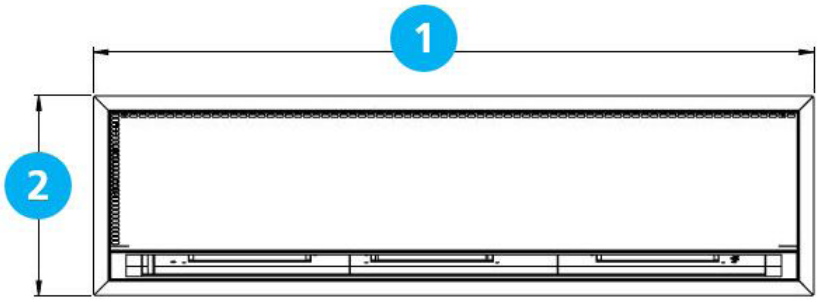


Figure 3.2 GR Bottom view

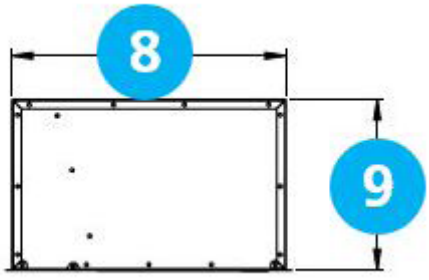


Figure 3.3 GR Side view

Reference	GR 1000	GR 1500	GR 2000
1	1125	1650	2177
2	457		
3	1060	1584	2111
4	70		
5	114	112	114
6	830	1360	1884
7	298		
8	438		
9	273		

Table 3 GR dimensions

Clearance distances

It is recommended that a minimum clearance of 100mm is allowed around the case. The clearance allows for cable entry and prevents combustible surfaces overheating.

The minimum mounting height (floor to grille outlet) is 1.8m. The recommended maximum mounting height is 3m for standard fan setting & 4m for high.

Signal Pro display panel dimensions

The Signal Pro display panel is supplied with an industry standard plastic double surface mounted socket box. Alternatively, the display panel can be flush mounted using a customer supplied metal flush conduit box as shown in Figure 5.2

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Figure 5 Surface mount box



Figure 5.1 Flush mounting plastic conduit box (by others)

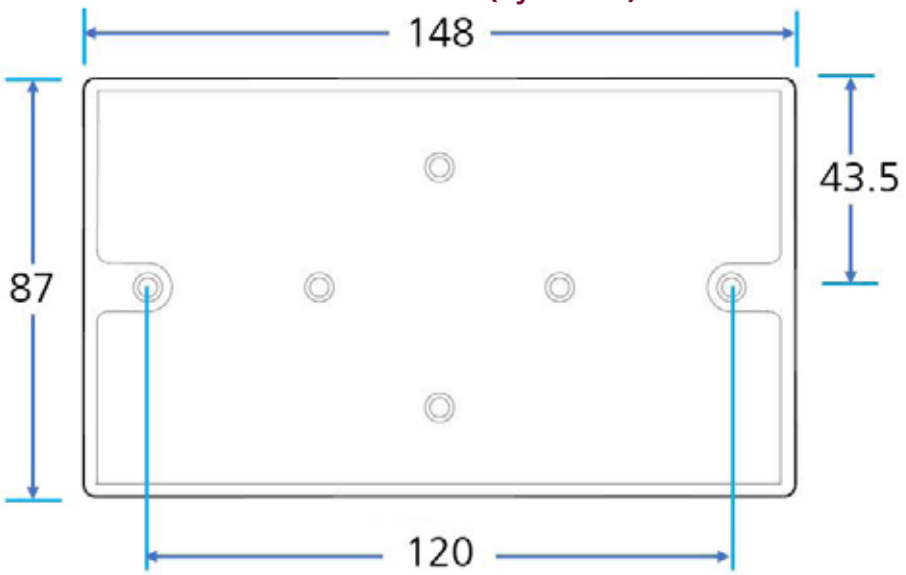


Figure 5.2 Surface mounting back box dimensions

Component layout

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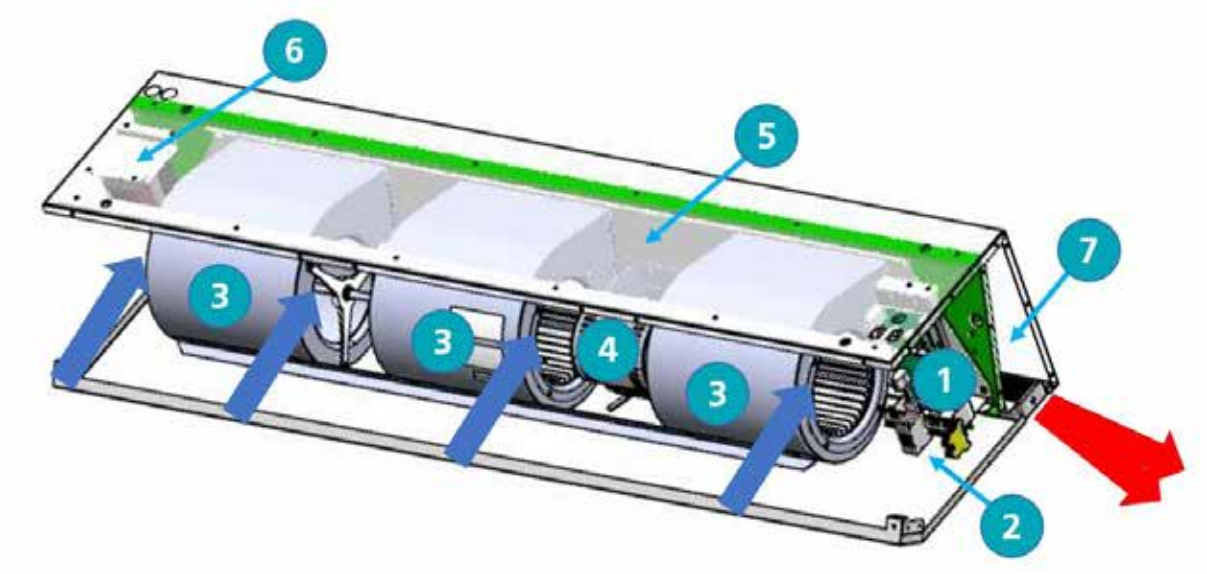


Figure 6 Component layout GS

Location	Component
1	Control panel
2	Installer terminal block
3	Fan
4	Fan motor
5	Fan deck
6	Resistor (1500 only)
7	Heating element

Table 5 GS & GR components

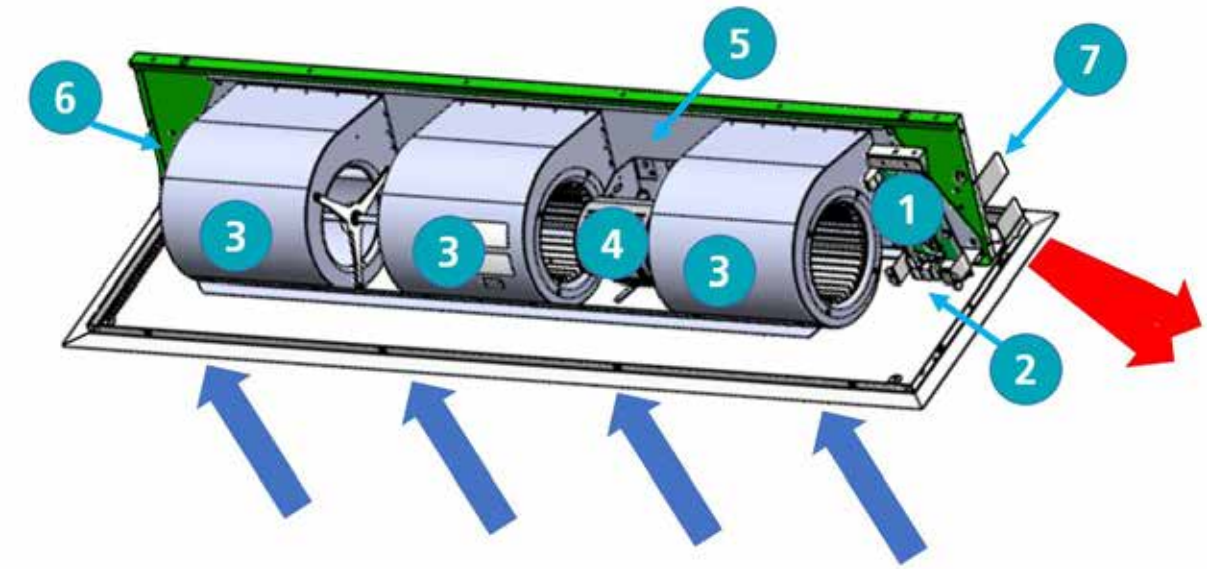


Figure 7 Component layout GR

Installation

Mounting

Guardian GS and GR air curtain units are designed to be installed horizontally directly over the door opening on the inside of the building, against a wall or ceiling.

Care must be taken to allow complete free air movement into the inlet grilles of the unit to ensure the correct working operation of the air curtain. The honeycomb outlet should be as close to the top of the door as possible and can be angled towards the door from 0° to -5°. Ensure to cover the entire door width. See figure 8

Units can be mounted adjacent to each other to cover the full door opening across wider entrances.

The GS units are designed for surface mounting and should not be placed into a ceiling void, due to possible obstruction of airflow and difficulty in routine cleaning and maintenance. Use the GR for these types of applications

It is the sole responsibility of the installer to ensure that the points of attachment to the building are sound.

Verification with the consultant/ architect or owner of the building is recommended to ensure that a sound, stable installation can be achieved.

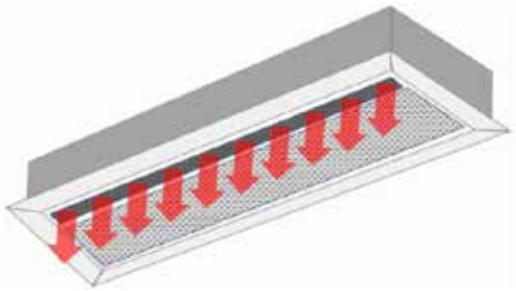


Figure 8 Honeycomb outlet position near to the door adjustable angle of 0 to -5°

Electrical supply.

Electrically heated units require a connection to 3 phase 415V and neutral power supply only. Ambient and LPHW models require a connection to single phase 230/240V supply only.

Electrically heated models consume 9kW, 12kW, 18kW & 24kW at 415 Volts when switched to the full heat position depending on the model and capacity setting.

The appliance MUST be connected to the supply via an appropriate a switched fused isolator, having a contact separation of greater than 3mm. See technical data for fuse rating on page 6

Once the covers have been removed, the installation engineers terminal block is located to the right hand side of the unit. This terminal block is used for the connection of the mains supply and additional controls, for example door switch. Wire in accordance to the appropriate unit diagrams in the wiring section, starting on page 19

For safety reasons, a sound earth connection must always be made to the unit before it is put in to use. The unit should be wired in accordance with IEE Regulations for the Electrical Equipment of Buildings.

The display panel is connected to the control panel (base unit) via a pre-wired RJ45 cable maximum length of 100m. (10m supplied as standard). It is recommended that this cable is run separately within its own trunking to avoid external interference.

Installation process

1. Remove all packaging and covers

Note All outer metal surfaces are covered by a protective plastic film, which must be removed before final fixing and operation of the unit.

I

2. GS units, Loosen (DO NOT REMOVE) the screws in the top of each front inlet cover [1] (see figure 9.1and 10 dog bone slot) then slide the left cover to the left [2] which will allow the cover to slide under the end cap. This will allow the next cover to be pushed to the left [3] (see figure 9.1) allowing it to be released from the screw slot [4] by pulling forward and lifted upwards out of the lower grove in the case.

3. The first cover can then be pushed to the right to release it from the screw slot, (see figure 10) then pull forward and lift upwards to be removed. For additional covers fitted on the 1500 or 2000 units loosen the fixing screws and remove as with the previous covers.

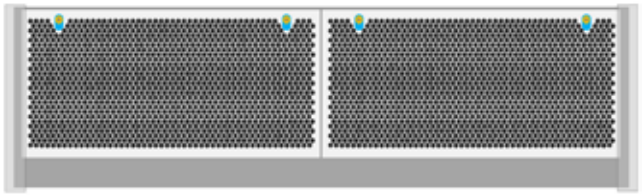


Figure 9 GS cover fixing point

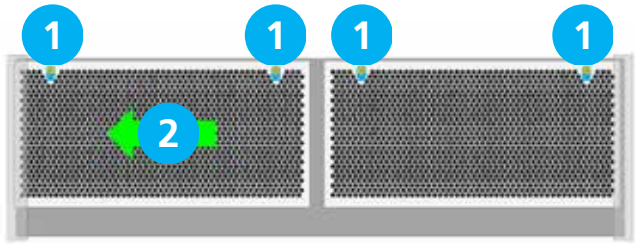


Figure 9.1 GS cover fixing point

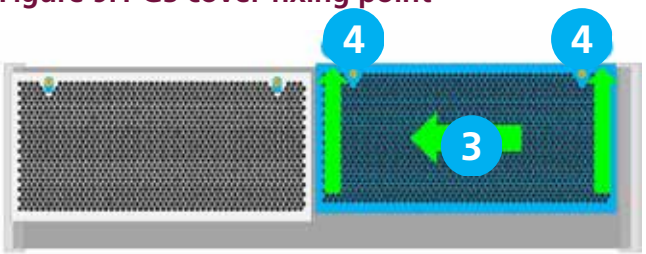


Figure 9.2 GS cover fixing point

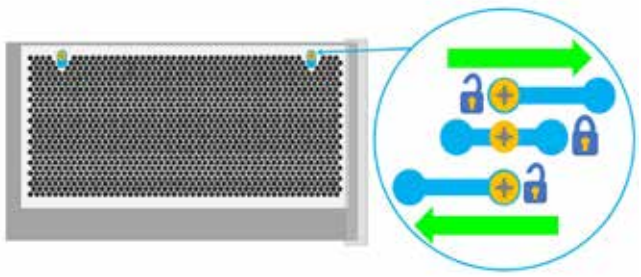


Figure 10 Dog bone screw fixing slot

4. On the GS units the lower cover can be removed by removing the two screws at the top of this cover and then pulled out of the tabs from the main case

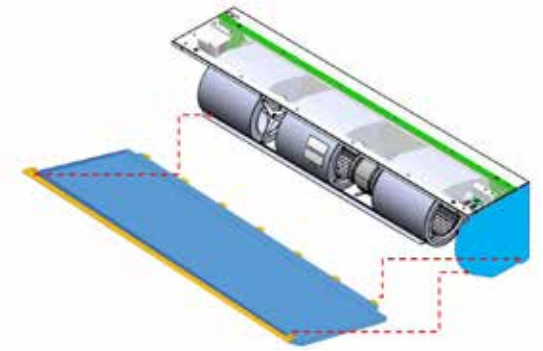


Figure 11 GS lower access panel

1. The GR has two captive screws in each panel, loosen these and hinge the panel down.

2. The panel can be removed completely by releasing the bolt hinges on either side of the panel (see figure 13).



Figure 12 GR cover fixing point



Figure 13 GR bolt hinge

Suspending on threaded rods

1. The product is installed using 4 x M10 threaded rods fitted into the fixing points in the top of casing.
2. The threaded rods must completely pass through the fixing points in the case without being too long to cause damage to products inside the case.
3. Ensure that the secure mounting point in the ceiling is capable of supporting the weight of the unit.
4. Lift the unit (using lifting equipment) onto threaded rods ceiling fixing point.

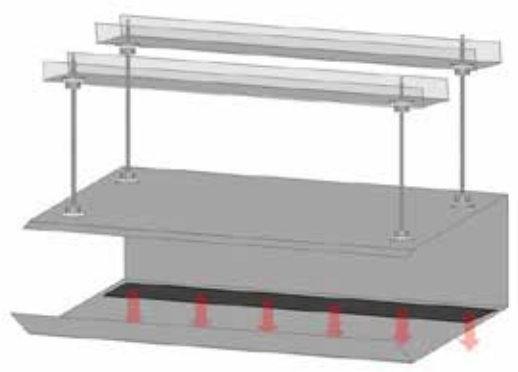


Figure 14 Suspending from threaded rods

5. Level the unit and tighten the fixing points. Carryout a final check to ensure the unit remains level
6. Holes are provided in the casing for cable entry. Choose the appropriate hole to suit the installation. Note the terminal connection block is located to the right of the unit.
7. Install the cable into the case using a suitable cable gland for size of cable
8. Two RJ45 ports are located in the case to connect the display panel and any other air curtains to be controlled
9. Adjust outlet to required angle to give desired performance and tighten outlet grille.
10. Fit the Display panel and commission the unit

Wall mounting bracket



Figure 15 Wall mounting bracket

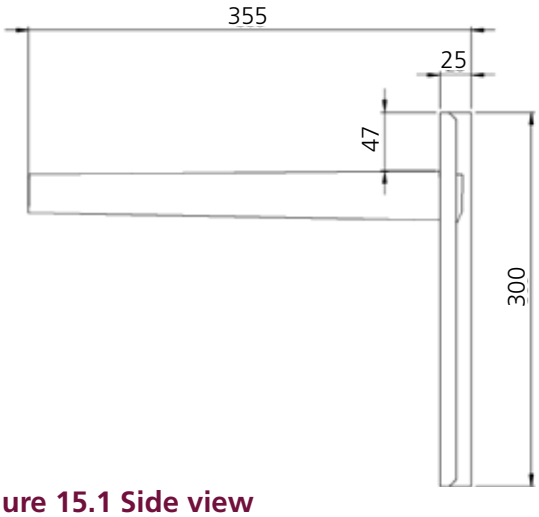


Figure 15.1 Side view

Figure 15.1 shows the overall dimensions of the wall bracket assembly.

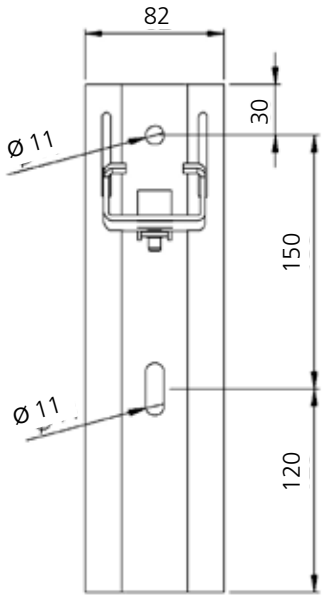


Figure 15.2 Front view

Figure 15.2 shows the dimensions of the bracket that is to be fixed to the wall, along with fixing positions. Please ensure that adequate fixings and wall structure are present to support the unit weight.

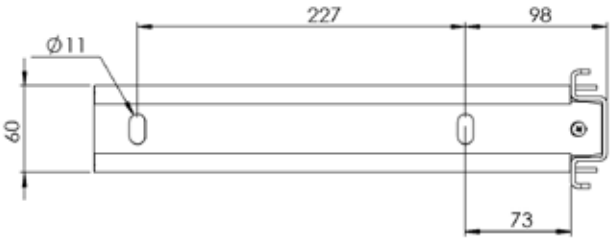


Figure 15.3 Mounting bracket top view

Figure 15.3 shows the dimensions of the bracket section that is to be fixed to the unit using 4 x M10 x 30mm 8.8 set screws, 4 x shake prove washers and 4 x flat washers. Use the four fixing points supplied in the casing

1. Using the details supplied with the bracket position the bracket against the wall at the desired mounting height and mark through the holes

2. Drill the wall then fix the brackets in position. Lift the chassis (using lifting gear if necessary) onto drop rods in the bracket

3. Ensure the unit is level and then tighten the fixing points with a final check to ensure the unit is level

4. Follow the instructions 6 to 10 of the drop rod mounting instructions grille.

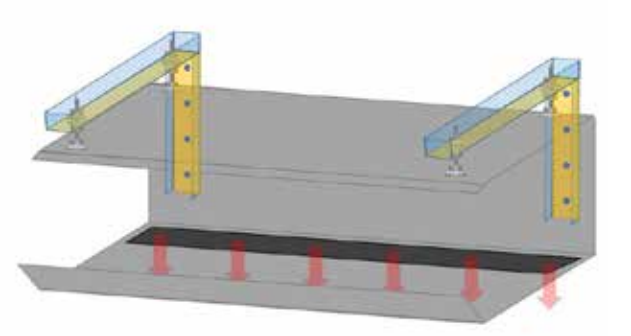


Figure 16 Mounting bracket option

Installation details - LPHW Only

Installation of the LPHW unit is as described earlier. Once situated, access to the heating coil and controller base unit is via removal of the case front.

The LPHW copper tubing connections are 22mm outside diameter. Ensure correct water seal fittings are used. It is recommend to use a suitable water mains isolation valve to ease any maintenance.

The unit is handed for right hand pipe connection.

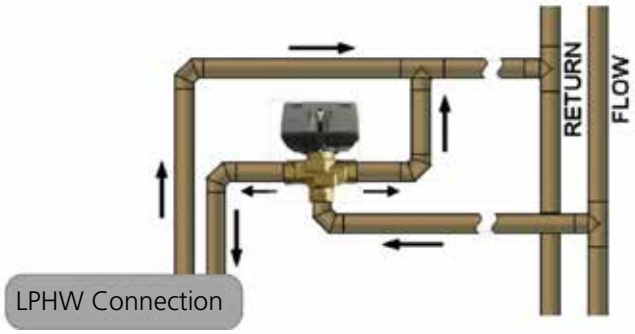


Figure 17 Typical schematic of a 3-port valve system.

Signal Pro display panel

The display panel can be installed using the standard double surface box supplied or recessed using a suitable flush mounted double conduit box. see “Figure 5.2 Surface mounting back box dimensions” on page 12 for details.



Figure 18 display panel

The display panel can be connected up to a maximum of 16 air curtains in one network.

For mains wiring refer to the wiring diagram relating to the model being used see “Wiring diagrams.” on pages 19 to 21

The display panel is connected to the base unit in the air curtain via a pre-wired RJ45 cable/plug. These cables are available in 2, 10, 20, 30, 50 and 100m lengths. It is recommended that this control cable is run separately within its own trunking to avoid external interference.

Maximum cable run in any network must not exceed 100m in total including display panel cable.

Note: All air curtains connected within the network system will operate under the settings of the single display panel. See “Installer initial setup” on page 24 to register all air curtains in the network with the display panel. Any air curtain within the network can be connected with and respond to the following optional circuits:

- External switch (ie BMS enable) where required, to be volt free and wired in PARALLEL via normally open contacts to each terminal pair ‘TIMER’. (Contacts closed to enable). Only air curtain(s) wired this way will respond to the enable signal.
- Door switches where required, to be volt free and wired to INDIVIDUAL base units via normally closed contacts to each terminal pair ‘DOOR’. (Contacts open to enable door mode). Only air curtain(s) wired this way will respond to the door mode.
- An external sensor, where required, can be wired to INDIVIDUAL base units to each terminal pair ‘EXT’. Only air curtain(s) wired this way will respond to the sensor setting.

I

Standard and high capacity fan and heat settings

All units are supplied as standard capacity.

All units have fans capable of providing standard and high capacity air duties (speeds Medium and High) which are controlled via the program panel supplied with every unit.

Electrically heated units provide standard and high capacity heating outputs. These settings can be quickly changed from standard to high capacity on site by the installation engineer.

Ensure the supply cables are adequate for the higher loading with the high capacity settings of the fans. See technical data on page 6

Fan speed setting

The fan speed setting can be modified via the display panel under the engineer set up program as described on page 28.

Ambient and LPHW model

The Ambient models have no heat elements, and the LPHW models have a coil which the capacity cannot be controlled by the internal circuit board, therefore only the fan capacity can be changed to suit site requirements. This is achieved by altering the fan speed setting in the program display.

Note: The LPHW heat output can be controlled via a 3rd party thermostat and valve connected to the heat network control system.

Electrically heated model

On the electrically heated models the fan capacity can be adjusted in the same manner as the ambient by setting the fan speed to F1, F2 or F3. The heat capacity can be changed by fitting the jumpers E1, E2 and E3 in to the installers terminal block 1a to 6a see wiring diagram on page 20

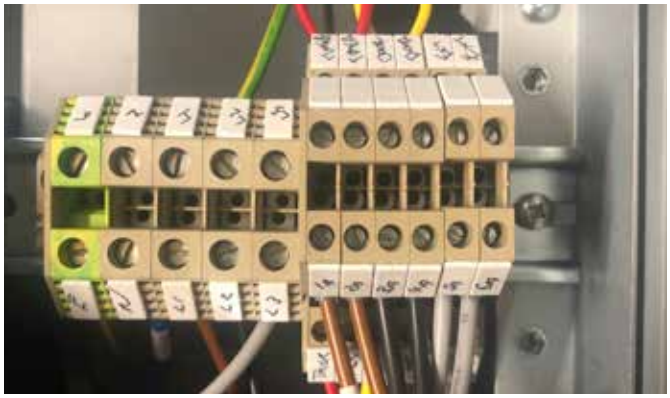


Figure 19 Heat capacity jumpers factory setting (no jumpers fitted)

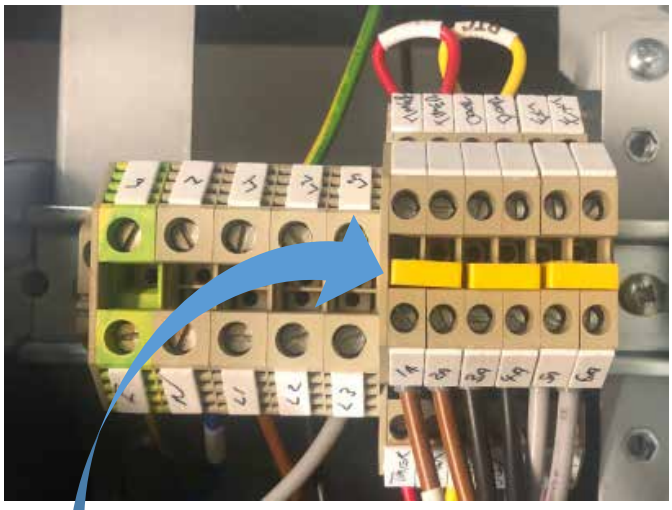


Figure 19.1 Heat capacity jumpers HIGH capacity (jumpers fitted)

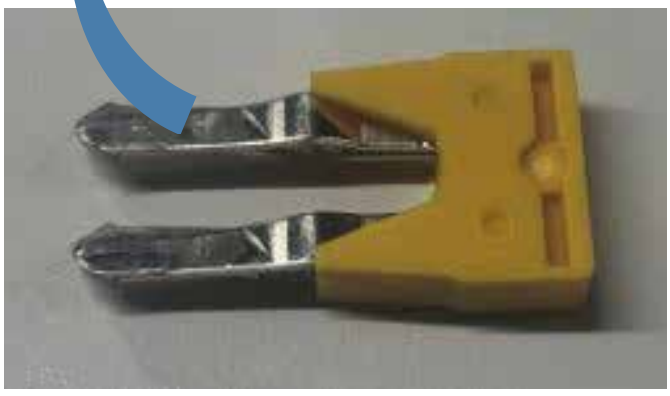
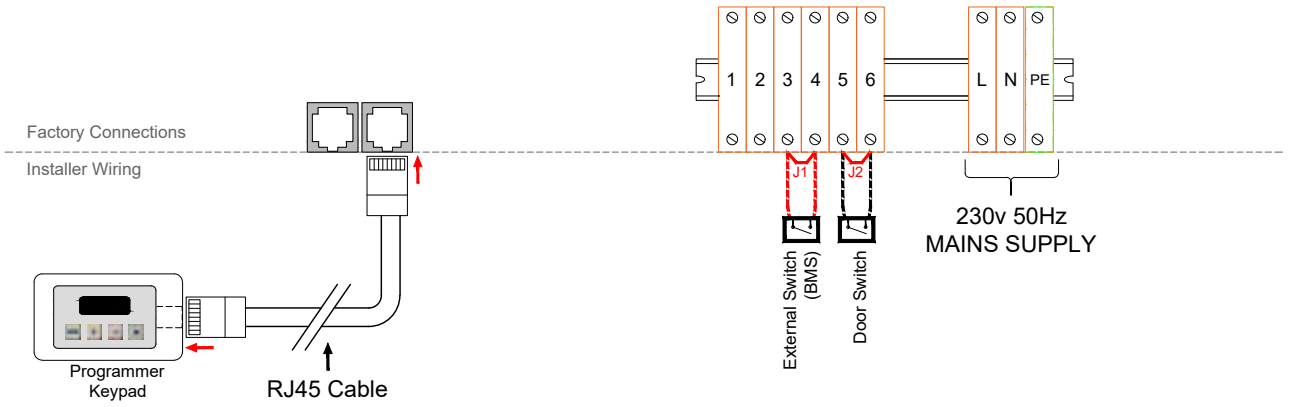


Figure 19.2 Heat capacity jumper pack part number 1026901

Wiring diagrams.

NOTE External switch inputs (e.g. Timer) to be volt free and wired via normally open contacts to terminal pair marked e.g. 'timer' (contacts closed to enable). Remove relevant factory fitted jumper for any optional input.

Installer wiring - Ambient models, single phase



900725 Guardian Signal Pro Series Ambient - Installer Connections

Figure 20 Wiring diagram ambient

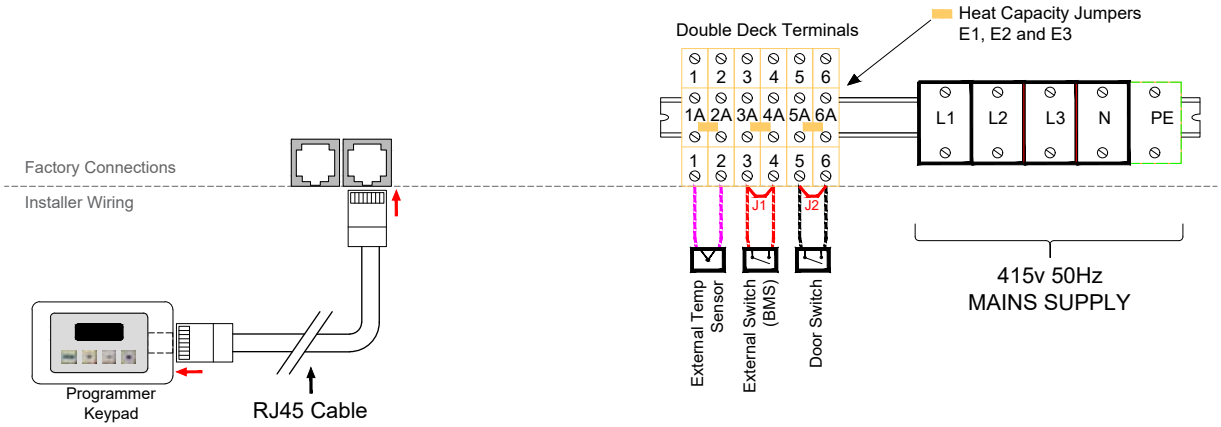
Terminal	Description	Cable
N	Neutral	1.5mm²
L	Phase 1 (or 1 Phase supply)	
PE	Mains earth	
3 & 4	Optional external switch	
5 & 6	Optional door contact	
1 & 2	Not used	
PCB Fuses	Rating (A)	
F1	T1H (slow blow)	

Table 6 Cable specification ambient

Protection

External circuit breaker with the appropriate rating should be installed for the protection of the installation.

Installer wiring - Electric heated models, three phase only



900724 Guardian Signal Pro Series Electric - Installer Connections

Figure 21 Wiring diagram electric heated

Terminal	Description	Cable
PE	Mains earth	10mm²
N	Neutral	
L1	Phase 1	
L2	Phase 2	
L3	Phase 3	
1a to 6a	Capacity jumpers see page 18	

Table 7 Cable specification electric heated

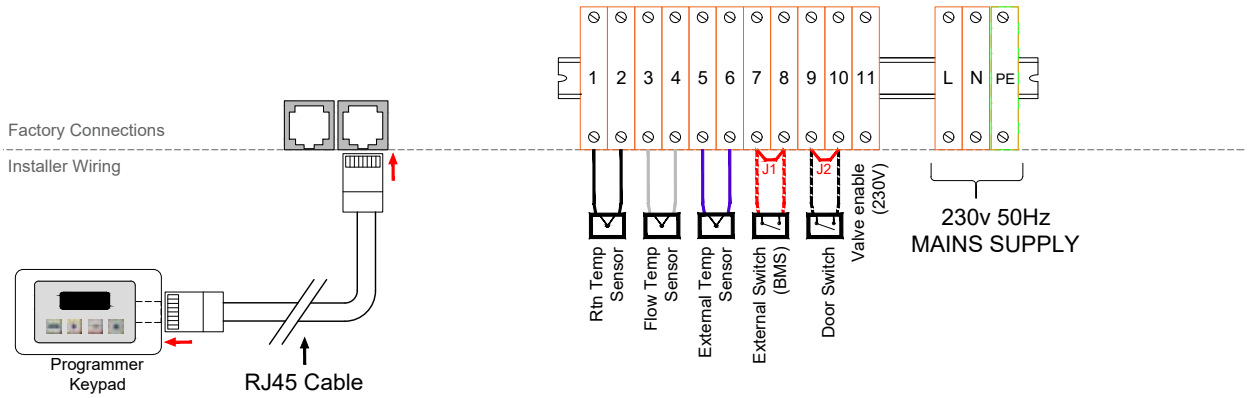
Terminal	Description	Cable
3 & 4	Optional external switch	1.5mm²
5 & 6	Optional door contact	
1 & 2	Optional external sensor	
PCB Fuses	Rating (A)	
F1	T1H (slow blow)	
F2 & F3	400v	

Table 7.1 Cable specification electric heated continued

Protection

There are two high speed fuses on the base unit to protect the switching thyristors for the heater. An external circuit breaker with the appropriate rating should be installed for the protection of the installation

Installer wiring LPHW heated models, single phase



900726 Guardian Signal Pro Series LPHW - Installer Connections

Figure 22 Wiring diagram LPHW heated

Terminal	Description	Cable
N	Neutral	1.5mm²
L	Live	
PE	Earth	

Table 8 Cable specification LPHW heated

Terminal	Description	Cable
7 & 8	Optional external switch	1.5mm² maximum
9 & 10	Optional door contact	
5 & 6	Optional external sensor	
1 & 2	Return temperature sensor	
3 & 4	Flow temp sensor	
11	230V valve output	
PCB fuses	Rating (A)	
F1	T1H (slow blow)	

Table 8.1 Cable specification LPHW heated

Protection

External circuit breaker with the appropriate rating should be installed for the protection of the installation.

CONTROLLER

C

Introduction

The function of the display panel is to send commands to and receive status messages from up to 16 controls in a multi heater system.

The display panel has a microcontroller, a 16 character by 2 line display, 4 buttons and a communication interface. It also has a clock with battery back-up to provide time based control functionality.

The display panel can be set to operate with different languages at the time of installation.

The display panel will work with all air curtains types: electric, legacy electric, LPHW/Ambient and legacy LPHW. Electric and legacy electric air curtains can operate in a mixed network. However due to differences in operation new LPHW and legacy LPHW air curtains cannot be mixed in a network but can be operated in separate networks.

Due to differences in operation, the new Electric / LPHW / Ambient air curtain control will not work under the control of a legacy 3 button display.



Networking

The display panel is connected to the first air curtain via pre-wired RJ45 cable to the socket in the first air curtain housing. See figure 25 on page 24.

Connect a second RJ45 cable in to the spare RJ45 socket of the first air curtain, and then take across to one of the RJ45 sockets in the second air curtain.

Further RJ45 cables can be used to connect more air curtains to the network, up to a maximum of 16 air curtains can be linked to one display panel.

The RJ45 cable is 10m as standard however it is available in 2m, 20m, 30m, 50m and 100m lengths.

Maximum length 100m. (Total length of cable used between display panel and last air curtain in network).

It is recommended that this control cable is run separately within its own trunking if possible, to avoid external interference.

Note: All air curtains connected within the network system can be controlled under the user settings of the single display panel. See "Installer initial setup" on page 24 to register all air curtains in the network with the display panel.

Air curtain addressing

All air curtains work on an address to communicate with the display panel and are supplied with an default address of '0'.

Where multiple air curtains exist in a network they must be re-addressed using a unique address (0-9/A-F). This is achieved using the 4 way DIP switch [2] mounted on the control panel base unit PCB.

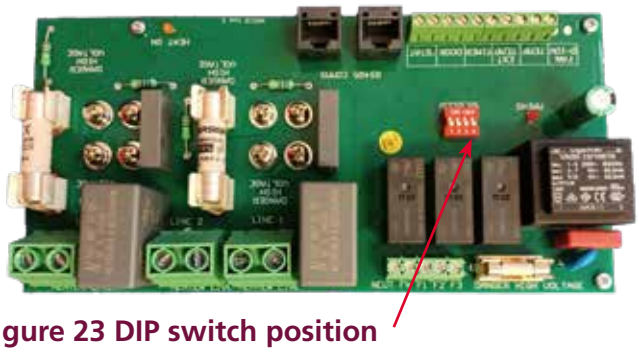


Figure 23 DIP switch position

The display panel will check all addresses on first power up and the result will be displayed. All addresses will be viewed in rotation.

Note: If any address is altered after initial power up or an air curtain removed after initial installation, the display panel will also retain the original address although unable to respond. To remove an unwanted address, rescan the whole network in the manner detailed in Engineers instructions (p27).

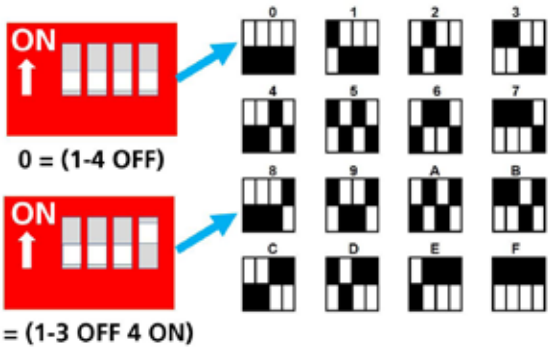


Figure 24 Air curtain address numbers

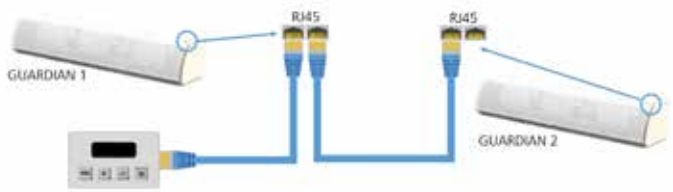


Figure 25 Wiring of 2 or more networked air curtains.

Keypad buttons

The buttons have the following functions:-



MENU enters the programming menu and advances item to program in order below.
OK starts programming of visible item, value flashes during programming.
PLUS and MINUS adjust the value.
OK saves the modified value or MENU stops programming with value reverting to old value.

If more than one air curtain is connected to the network then for some settings all controls can be set together or controls can be set individually. Only controls that are present on the system can be programmed, others are skipped over. Air curtains are addressed as 0 to 15 by the display, corresponding to bit switch settings 0 to F on the air curtain control.

Installer initial setup

Press '+' and MENU buttons to enter Engineers mode. Use the MENU button to scroll down to Reset connected air curtain address list:



OK starts flashing.



Use PLUS to select yes to scan connected air curtain addresses then select OK. The network is then scanned for connected air curtains and when finished returns to the engineers menu. This will cause the detected network type, electric/LPHW to be reset and rediscovered. Once done, exit the Engineers Mode and follow the instructions given under User operation on page 25.

Keypad display



AC:0 - denotes air curtain address '0'
22° - denotes internal temperature 22°C
H:OFF - denotes Heat off status
DOOR CLOSED - denotes door closed status



Th - denotes Day on Thursday
13:08 - denotes 1:08pm (24 hr clock)
ON1 - 'ON' denotes this air curtain is active, '1' denotes Internal Timer
OS:23° - denotes Outside temperature 23°C

Operation

In normal operation the home screen displays the status of the display panel and each connected air curtain in sequence. Each screen is displayed for two seconds.

Display Status

Top line shows day and time.

If the panel is using internal timer then the program time status, "ON1", "OFF1" etc will also show.

Bottom line shows the outside temperature which is an average of all connected outside sensors.

If the panel has low battery then "LOW BATT" is also displayed.

If Overtime is active then the panel status instead shows overtime countdown in the top line.

Top line shows air curtain address, measured temperature (air outlet temperature for electric AC or flow temperature for LPHW AC), heating on "H1" or off "H0", and fan speed "F0" for off or "F1", "F2", F3". Ambient AC shows "Ambient" in place of flow temperature and heat.

Bottom line shows operating mode: “ON MODE”, “OFF MODE” or “AUTO”. If the air curtain has an active input that will be shown in the bottom line as either “DOOR CLOSED” or “TIMER OFF”.
If the air curtain is off due to outside temperature limit then that will be shown in the bottom line as “OS TEMP LIMIT”.

If appropriate, interlock status “INTERLOCK DOOR”, “INTERLOCK TIMER”, “INTERLOCK FILTER” or “INTERLOCK STAT” will show in the bottom line.

C

If there is any error from the air curtain that will display in the bottom line. Errors are:

“COMMS ERROR”
“SENSOR ERROR”
“OS SENSOR ERROR”
“PCB TEMP ERROR”
“BLOCKED FILTER”
“STAT TEMP ERROR”.

Examples:-







User operation

Press MENU button to enter User mode

Order of programming menu:

1. Set operating mode On/Off/Auto, All or Individually.



OK starts address flashing with ALL.



Use PLUS and MINUS to select all or single address then OK. Operating mode starts flashing.







Use PLUS and MINUS to select On, Off or Auto then OK to set. If address was ALL the sequence finishes and returns to MENU. If address was individual then next address is flashing. Use PLUS and MINUS to set address, then OK to modify mode or Menu to exit.
2. All Off mode.



A single press of OK quickly starts OFF operation for all air curtains, no heat and no fan, and then returns to default display.

3. All Auto mode.



A single press of OK quickly starts Auto timed operation for all air curtains and then returns to default display.

When in Auto mode during an on time period the air curtain controls to the individually set temperatures and fan speeds.

When in Auto mode during an off time period the air curtain has no heat and no fan.

4. All On mode.



A single press of OK quickly starts On operation for all air curtains and then returns to default display.

5. All Heat Off.



A single press of OK quickly starts Heat operation for all air curtains and then returns to default display.

6. Set door open temperature, all or individually (not if LPHW system).



OK starts address flashing with ALL. Use PLUS and MINUS to select all or single address then OK.

Temperature starts flashing. Use PLUS and MINUS to select temperature, range is fixed by low and high limits, then OK to set.

If address was all the sequence then finishes and returns to MENU.

If address was individual then next address is flashing. Use PLUS and MINUS to set address, OK to modify temperature or MENU to exit.

7. Set HEAT ON/OFF, all or individually



Use PLUS and MINUS to select all or single address then OK.

HEAT ON starts flashing. Use PLUS and MINUS to select On or Off then OK to set.

If address was all then the sequence finishes and returns to menu.

If address was individual then next address is flashing. Use PLUS and MINUS to set address, then OK to modify mode or Menu to exit.

8. Set overtime.



OK starts overtime with HH:MM = 00:00



Use PLUS and MINUS to set overtime in 30 minute steps up to 12 hours then OK to start overtime.

Overtime causes air curtains to run as an on time period to the door open/door closed temperature and fan settings whilst running back to zero.

9. Set time and day.



OK starts Day flashing



Use PLUS and MINUS to adjust day (Mo to Su) then OK.

Hours starts flashing.



Use PLUS and MINUS to adjust hours (00 to 23) then OK.

Minutes starts flashing.



Use PLUS and MINUS to adjust minutes (00 to 59) then OK. After this OK the new Time and Day is stored.

If MENU is pressed at any time the original Time and Day is restored.

10. Set time program (not if BMS Timer).

Set time program is only displayed when the panel is set to internal time clock mode in engineers settings



OK starts Day flashing.



Use PLUS and MINUS to adjust the day (Mo to Su) which is to be programmed then OK.



ON 1 set time starts flashing. Use PLUS and MINUS to adjust ON 1 set time (00:00 to 23:59 or --:-- if on period is not needed) then OK.



OFF 1 set time starts flashing. Use PLUS and MINUS to adjust OFF 1 set time (ON 1 to 23:59) then OK.

Repeat for ON 2, OFF 2, ON 3, OFF 3. After OFF 3 OK display changes to Copy.



OK copies Monday times to Tuesday then offers "COPY TO We?" etc etc until Sunday. MENU continues programming of Tuesday differently to Monday etc.

11. Menu end.

When the user reaches the end of the menu they have a choice:



OK returns to home screen and MENU restarts the MENU at All On Mode.

C

Engineers instructions

Press '+' and MENU buttons to enter Engineers mode.

OK starts programming of visible item, value flashes during programming.

PLUS and MINUS adjust value.

OK saves modified value or MENU stops programming.

Order of programming menu:

1. Set door open fan speed, all or individually:



OK starts address flashing with ALL.



Use PLUS and MINUS to select all or single address then OK.

Fan speed starts flashing. Use PLUS and MINUS to select off, 1, 2, 3 then OK to set.

If address was all then the sequence finishes and returns to engineers menu.

If address was individual then next address is flashing. Use PLUS and MINUS to set address, OK to modify or Menu to exit.

2. Set door closed fan speed:



OK starts address flashing with ALL.



Use PLUS and MINUS to select all or single address then OK.

Fan speed starts flashing. Use PLUS and MINUS to select off, 1, 2, 3 then OK to set.

If address was all then the sequence finishes and returns to engineers menu.

If address was individual then next address is flashing. Use PLUS and MINUS to set address, OK to modify the fab speed or MENU to exit back to engineers menu.

3.Set door closed temperature:

Door closed temperature is only displayed if the system is detected as electric or legacy LPHW.



OK starts address flashing with ALL.



Use PLUS and MINUS to select all or single address then OK.

Door temperature starts flashing. Use PLUS and MINUS to select temperature, range is fixed by low and high limits, then OK to set.

If address was ALL then the sequence finishes and returns back to the engineers menu.

If address was individual then next address is flashing. Use PLUS and MINUS to set next address, OK to modify the temperature or MENU to exit back to engineers menu.

4. Set LPHW flow/return temperature:

Flow/return temperature is only displayed if the system is detected as LPHW/Ambient. Ambient air curtains will just ignore the setting. The flow/return setting is used for all LPHW air curtains on the network.

OK starts flow/return temperature flashing.Use PLUS and MINUS to select the correct flow/return temperature for the heat exchanger specification from the selection of: 82/71, 80/70, 70/60, 60/50, 50/40 then OK to set.

5. Set outside temperature operation:



OK starts outside temperature limit flashing.



Use PLUS and MINUS to select outside temperature limit, either Off or between 5 and 30, then OK. If outside temperature limit is set to OFF the sequence then finishes and returns to engineers menu.

If outside temperature limit is set to between 5 and 30 then an additional setting is displayed which is dependent on the detected system type, electric or LPHW. For electric and legacy LPHW systems elevate at zero temperature starts flashing.



Use PLUS and MINUS to select elevate at zero temperature, range is 0 to 9, then OK to set and return to engineers menu.

Elevate at zero temperature is a temperature boost at low outside temperatures and the scale is set using the boost at 0°C.

For new LPHW systems full flow/return at temp starts flashing. Use PLUS and MINUS to set full flow/return at temperature, range is 0 to outside temperature limit. Full flow/return at temperature is the outside temperature below which full target flow and return temperatures are used. Above this outside temperature flow and return target temperatures are scaled down to a minimum at outside temperature limit.

Note: All air curtains use the same outside temperature operation.

6. Set temperature limits:

Set temperature limits is only displayed if the system is detected as electric or legacy LPHW.



OK starts low temperature limit flashing.



Use PLUS and MINUS to select low temperature limit between 5 and current high temperature limit, then OK.

High temperature limit starts flashing.



Use PLUS and MINUS to select high temperature limit between current low temperature limit and 50, then OK to set and return to engineers menu.
Note: All air curtains use the same temperature limits.

7. Set int/ext time



OK starts INT/EXT Timer





Use PLUS and MINUS to set INT/EXT timer then OK to return to engineers menu.

8. Set group interlocks.



OK starts lead address flashing.



Use PLUS and MINUS to select lead air curtain address either to OFF or to one of the air curtains discovered then OK.

If lead air curtain address is set to OFF then the sequence finishes and returns to the engineers menu; interlocks will not be enabled.

If lead air curtain address is set to an air curtain then this becomes the lead for interlock inputs and then timer input interlock is flashing.



Use PLUS and MINUS to set timer input interlock off or on then OK.

Door input interlock is flashing.



Use PLUS and MINUS to set door input interlock off or on then OK.

Over temperature stat input interlock is flashing.



Use PLUS and MINUS to set over temperature stat input interlock off or on then OK to return to engineers menu.

Blocked filter input interlock is flashing.



Use PLUS and MINUS to set blocked filter input interlock off or on then OK and to return to engineers menu.

Note: The lead air curtain controls the interlocks for all other air curtains on the network.

Note: Not all interlocks are available on all air curtains. Any interlocks not present on an air curtain will be ignored. This is done so that future changes to inputs will not require updated panel operation.

9. Display hours run:



OK Shows lowest numbered air curtain's hours run. ## below is the air curtain address.



Use PLUS and MINUS to view next air curtain or Menu to exit back to engineers menu.

10. Set language:



OK starts language flashing.



Use PLUS and MINUS to select language from available options then OK and back to engineers menu.

11. Reset connected air curtain address list:



OK starts no flashing.



Use PLUS and MINUS to select yes or no to scan connected air curtain addresses then OK.

If scan YES then the list of connected air curtains is cleared and the network scanned for connected air curtains and when finished returns to engineers menu.

If scan NO then the sequence returns to the engineers menu.

Note: This will cause the detected network type, electric/LPHW to be reset and rediscovered.

12. Reset panel to factory defaults:



OK starts no flashing.



Use PLUS and MINUS to select YES or NO to reset panel to factory defaults then OK.

If reset YES then the panel is reset to factory defaults, including clearing the connected air curtains list, before restarting.

If reset NO then just returns to engineers menu.

Note: This will cause the detected network type, electric/LPHW to be reset and rediscovered.

13. Engineer's menu end:

When the user reaches the end of the engineers menu they have a choice:



OK returns to home screen and MENU restarts engineers menu.

Diagnostics

PLUS and MINUS with MENU enters diagnostics menu.

Initial display:



+ and - change the air curtain displayed.

MENU exits diagnostics back to normal display.

All air curtain addresses are shown even if there is no AC installed.

Display if no air curtain is installed on this address:



Display if the air curtain on this address is not responding to the panel:



Display for active air curtains. Electric/legacy LPHW system:



New LPHW system:

A	C	#	#	H	*	F	*						
O	*	*	*	F	*	*	R	*	*	S	F	T	D

Where:

AC##, is address of AC with diagnostics being displayed.

H*, 1 = heat on, 0 = heat off from AC flag.

F*, 0 to 3 fan level from AC flag, 0 is off.

O***, outside temperature, range -25 to 99 or "- -" if temperature range error or " " if no sensor.

T**, electric control temperature, 0 to 99 or "- -" if temperature range error.

P**, electric PCB temperature, 0 to 99 or "- -" if temperature range error.

F**, new LPHW flow temperature, 0 to 99 or "- -" if temperature range error.

P**, new LPHW return temperature, 0 to 99 or "- -" if temperature range error.

S, Stat input (S = open, blank = closed).

F, Filter blocked input (F = open, blank = closed).

T, Timer input (T = closed, blank = open).

D, Door input (D = closed, blank = open).

C

Function narrative of the unit:

electric air outlet temperature when “outside limit” is set

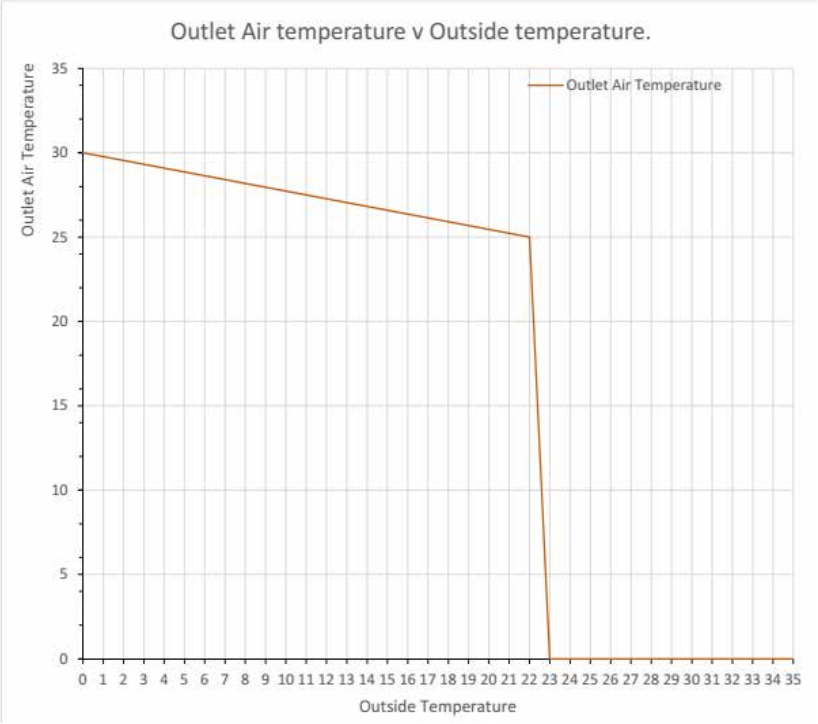
When ‘Outside Limit’ is set for an electric control the installer can set the outside limit temperature and the elevate at zero temperature.

When the outside temperature is above the outside limit the fan will continue to run but the heat output will be off.

C When the outside temperature is below 0°C the air outlet temperature will be the set temperature plus the elevate at zero temperature.

When the outside temperature is in between these two points the outlet air temperature are scaled between the two points as shown in the graph below.

In this example the outside limit temperature has been set to 22°C, the outlet air temperature (eg Door Open or Door Closed temperature) has been set to 25°C and the elevate at zero temperature has been set to 5°C.



Function narrative of the unit:

LPHW flow and return temperature when “outside limit” is set

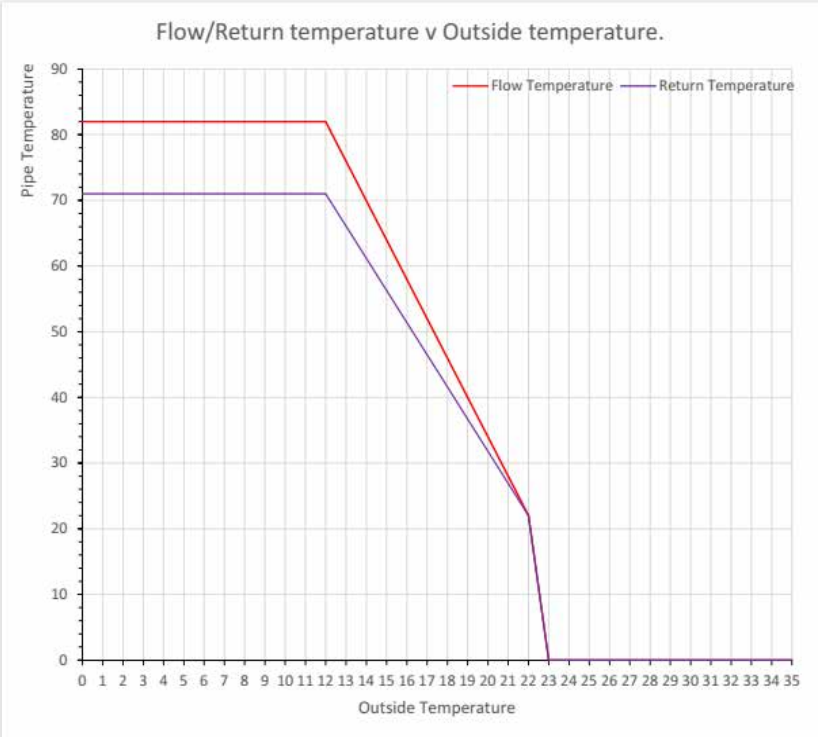
When ‘Outside Limit’ is set for an LPHW control the installer can set the outside limit temperature and the full flow/return at temperature.

When the outside temperature is above the outside limit the fan will continue to run but the heat valve output will be off.

When the outside temperature is below the full flow/return at temperature the target flow and return temperatures set for the air curtain are used.

When the outside temperature is in between these two points the target flow and return temperatures are scaled between the two points as shown in the graph below.

In this example the outside limit temperature has been set to 22°C, the full flow/return at temperature has been set to 12°C and the characteristic flow and return temperature has been set to 82/71°C.



MODBUS Protocol

The modbus hardware is configured as follows:

- RS485 serial half-duplex interface
- 9600 baud
- 8 bits
- even parity / no parity (see below)
- 1 start bit
- 1 stop bit
- RTU mode

C

It should be noted that the software will either run in a standard panel driven display OR in modbus mode, but NOT both together. In a modbus installation only 8 maximum controllers may be supported.

Modbus address – the unit will respond to it's own coded address as set by the bitswitches as follows: It will also respond to 'broadcast' mode 0.

Even parity settings (Bitswitch3 OFF)		No parity settings (Bitswitch3 ON)	
Modbus Address	**Switch Setting**	**Modbus Address**	**Switch Setting**
16	0	24	8
17	1	25	9
18	2	26	A
19	3	27	B
20	4	28	C
21	5	29	D
22	6	30	E
23	7	31	F

Modbus function codes supported

Codes	Descriptions	Range of arguments
01, 02	Read coils, read discrete inputs (equivalent)	Coils 1 to 24
03, 04	Read Holding registers, input registers (equivalent)	Registers 121 to 126
05	Write single coil	Coils 13 to 24
06	Write single register	Registers 125, 126

All other MODBUS function codes will generate exception code 01, function not recognised.

Function arguments — Registers			
0	Controller type	Read only	(undefined)
122	System control temperature	Read only	
123	Outside air temperature	Read only	
124	Power ratio	Read only	
125	Set point temperature	Read/write	
126	Set point temperature on door down	Read/write	(always to nearest 5°C)
127	Hours run	Read only	(16 bit result)

Function arguments — Coils Arguments which are outside the ranges for registers and coils in the lists below will cause exception code 02 error address out of range			
	Fan1	Read only	Set if fan 1 actually running
	Fan2	Read only	Set if fan 2 actually running
	Fan3	Read only	Set if fan 3 actually running
	Timer_link	Read only	Set if timer link open circuit
	Phase rotation	Read only	Arbitary indication of phase
	Stat_link	Read only	Set if thermostat link open circuit
	Door_link	Read only	Set if door link open circuit
	Status_heat	Read only	Set if heating elements on
	Status_ temp	Read only	Set if system temperature measurement fail
	Status_ext	Read only	Set if external temperature measurement fail
	Ext_exists	Read only	Set if external thermistor not fitted
	Set_fan1	Read/write	Switch fan 1
	Set_fan 2	Read/write	Switch fan 2
	Set_fan 3	Read/write	Switch fan 3
	Heat	Read/write	Switch heat demand on/ off
	Timer_link_ mask	Read/write	Set to force timer link open circuit operation
	0	Read/write	May indicate fault condition if read returns '1'
	Stat_link_ mask	Read/write	Set to force thermostat link open circuit operation
	Door_link_ mask	Read/write	Set to force door link open circuit operation
	Set_ doorfan 1	Read/write	Switch fan 1 when door link open circuit
	Set_ doorfan 2	Read/write	Switch fan 2 when door link open circuit
	Set_ doorfan 3	Read/write	Switch fan 3 when door link open circuit
	0		System reset (*)

(*) A read or write to this coil causes the addressed controller to execute a restart as if being powered up.

There is no response and the unit will not respond to further commands until approximately 1 second has elapsed.

Arguments which are outside the ranges for registers and coils in the lists above will cause exception code 02 error - address out of range.

C

Maintenance and servicing

Always ensure that the main external electricity supply is switched off and lock the switch (if fitted) before commencing any maintenance on this heater

To obtain the best results from the heater, it is essential to avoid the accumulation of dust and dirt within the unit on the air inlet and discharge grilles. For this reason, regular cleaning isnecessary, paying particular attention to the removal of dirt build up on the fan assembly.

MS

Cleaning of the fan is best carried out with a soft brush and vacuum cleaner

The product should be serviced annually, by a competent person.

1. **GS units.** Loosen the two screws securing the inlet cover and slide towards the end cover, now loosen the two screws in the next panel and slide towards the first panel which will then allow this panel to be released and lifted out of the dog bone slot This panel can then be lifted out of the tabs at the bottom to fully release. see figure 9 on page 14
2. **GR units** loosen the screws securing the inlet grille and hinge down, the grille can be removed by releasing the spring loaded bolt to either side. See figure 12 and 13 on page 14



Figure 26 GR Inlet cover

3. With a soft brush clean away any dust from the motor and elements.
4. Check the security of all the components
5. Check for any signs of deterioration and replace components as necessary
6. Inspect the wiring for damage, chaffing of the outer case, damage cut or crushed and security in the terminals
7. Check that the fuses are rated correctly.
8. Clean the honeycomb outlet

Inlet foam filter replacement GS

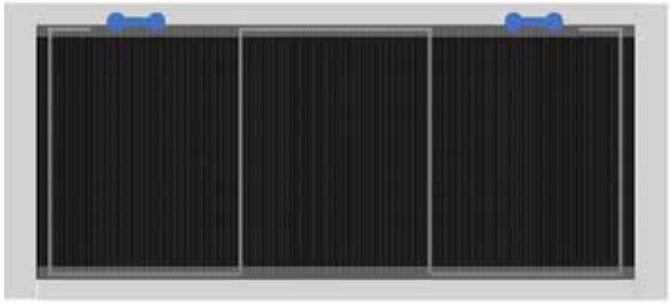


Figure 27 GS inlet foam retaining clip 1

1. Remove and replace the foam inlet filter, by unhooking the leg of the clip and passing it through the dog bone hole in the frame, then release the remaining parts of the clip to allow the foam filter to be removed and replaced. Carefully refit the clip and ensure the foam is not creased and secure.

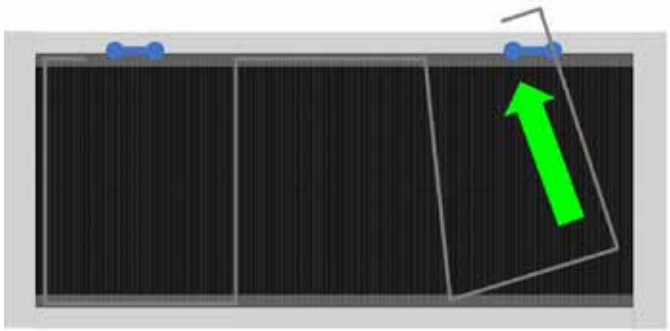


Figure 27.1 GS removing the inlet foam retaining clip

Inlet foam filter replacement GR

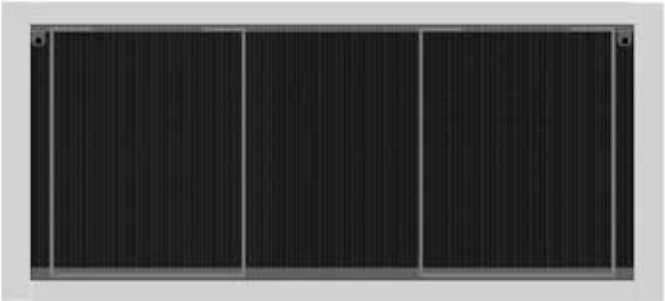


Figure 28 GR inlet foam retaining clip 1

1. To remove the filter element of the GR units, select the clip from either end of the panel, push the outside leg of the retaining clip towards the centre of the filter/inlet grille which will release the clip out of the inlet grille frame, work along the clip releasing until the clip is fully out of the frame.

2. The filter element can now be removed and replaced with a new element reverse the procedure to refit and re-secure

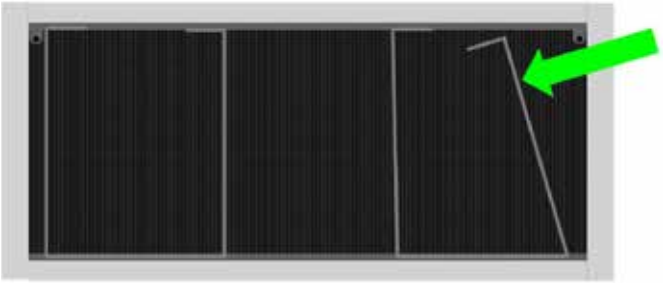


Figure 28.1 GR removing the inlet foam retaining clip

Honeycomb outlet replacement

To remove the honeycomb outlet, first remove the complete carrier. The carrier is secured at one end by a bolt and stud to the other end. Remove the end panel to access this fixing bolt and then release the carrier from the stud side, on the 2m models the centre support can be moved to one side to allow the stud side to be released

On the GS units peal back the tabs which retain the honeycomb outlet, remove the honeycomb media from the carrier and replace. Then fit the new honeycomb media into the carrier and push the tabs back over the honeycomb to secure

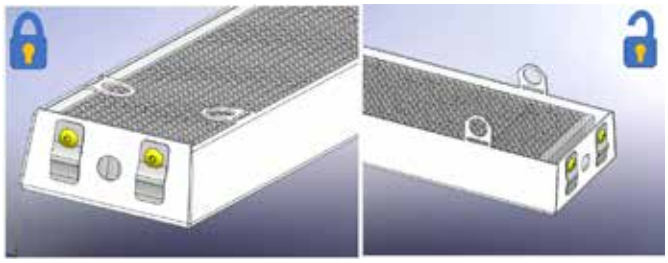


Figure 29 GS honeycomb retaining

On the GR units the tabs are part of a retaining plate, peal back the tabs which retain the honeycomb outlet remove the media from the carrier and replace. Then fit the new honeycomb media into the carrier and push the tabs back over the honeycomb to secure

MS

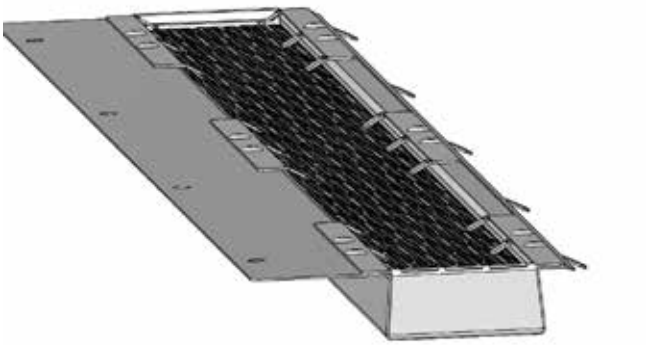


Figure 29.1 GR honeycomb retaining

Note the position of the temperature sensor from the right of the unit and ensure it does not get damaged, the cables will need to be disconnected from the control panel terminals TEMP, refit in the position given in figures 30 and table 9. (below)

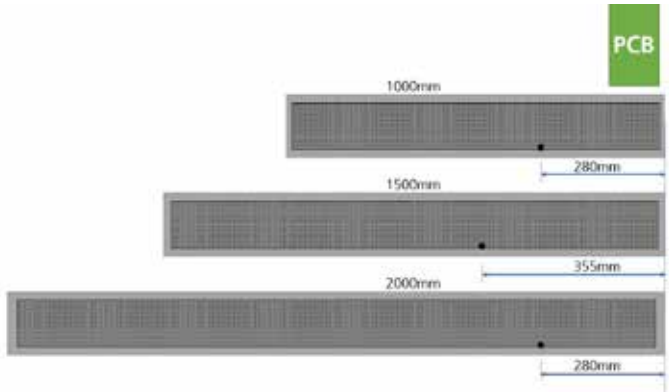


Figure 30 Temperature sensor position

Model length	Unit	Position from right
1metre	mm	280
1.5 metre	mm	355
2 metre	mm	280

Table 9 Temperature sensor position

Fault finding.

General

All Air Curtains are fitted with fuse protection and motor thermal protection.

Other faults in relation to the element, motor and wiring should be identified using conventional fault-finding techniques.

In the event that electrical components are replaced, please ensure that electrical safety checks in accordance with the regulations in force in the country of use are undertaken.

FF

Electric heated units only.

For the service engineer, please note that there is a thermal cut-out incorporated in the air curtain which needs to be manually reset. The cut-out is located near to the control panel, note 2m has two, with the second located near the centre of the fan deck.

Re-setting the thermal cut-out may help to identify the nature of the fault however we do not recommend re-setting without a thorough investigation into why the cut-out operated.



Figure 31 Thermal cut-out

Display panel.

Any fault will be described on the display panel until the fault has been cleared.

There are five basic checks to perform should a fault appear on the program panel display. These are as follows:

- **Continuity:** Use a multimeter to check continuity between each end of the cable cores.
- **Short circuit:** Use a multimeter to check that there are no short circuits between any of the cable cores.
- **Plugs:** Check that the plugs are firmly seated in the circuit board sockets in both the program panel and on the circuit board .
- **Addressing:** (Network versions only). If two or more air curtains are networked, check that each base unit has a unique address as described in air curtain addressing on page 23.
- **Network cables:** Ensure that the total run of all cables in the network does not exceed 100m including the cable to the program panel.

Signal Pro fault descriptions and remedies

Description	Symptom	Possible cause	Remedy
Communications failure	No control on unit	Bad data cable connection Damaged cable	Check data cables and plugs Replace damaged cable
Air sensor failed	Fan operating, no heat	Air sensor cable disconnected Air sensor broken	Check cable Replace air sensor
Air sensor temp too high	Fan operating, no heat	High ambient air temperature Incorrect motor or fan deck rotation Motor failure	Check ventilation Check rotation of the fan deck Check motor, replace if necessary
Ext. temp sensor failure	Unit runs but no external temperature control	External temperature sensor faulty	Repair faulty wiring Replace faulty sensor
Overheat stat open circuit	Fan operating, no heat	Overheat stat open circuit	Replace overheat thermostat

Table 10 Signal Pro faults and remedies

Spare parts.

Note Any spare part components that are not approved by the manufacturer could invalidate the approval of the appliance and validity of the warranty.

General

Right hand & left hand is when viewed from inside of the building, looking at the unit into the door opening.



Figure 32 Handing of the unit

SP

Component	1000	1500	2000
Generic components			
Fan deck assembly	1026174	1026175	1026174 x 2
Signal Pro Display panel	108221-RJ45-2		
Resistor	n/a	1037491	n/a
Honeycomb core	1026068	1026078	1026068
Inlet cover assembly GS	1026849		
Inlet cover assembly GR	1026662	1026163	1026829
Inlet cover filter only GS	1026664		
Filter securing clip GS	1026910		
Inlet cover filter only GR	1026665	1026835	1026665
Filter securing clip GR	1026962		
End cap GS left hand	1026505		
End cap GS right hand	1026506		
Control fuse T1H	100535		
Ambient Models			
Control panel (base unit)	LPHWBU45-1		
Electric Heat Models			
Electric heater element	1026146	1026145	1026146
Control panel (base unit)	SELEC3BU45-1		
Thermal cut out	900001		
Jumper pack (high and low capacity)	1026901		
Heating element fuse	900471		
LPHW Models			
Control panel (base unit)	LPHWBU45-1		
LPHW coil	1026692	1026693	1026694

Table 11 Spare parts

Parts replacement.



Warning
Ensure electrical power is isolated from the product.

For access follow steps as stated in Installation Section on page 14

1. GS units, remove all of the front covers, remove the cover plate to access the control panel, installers terminal block, resistor (1500 only) and fan deck (motor and fans).

2. GR units, completely remove the inlet panel

Control panel



Make a note of the wiring at the control panel. Make a note of the dip switch settings

Make a note of the installer terminal block wiring

1. Disconnect the wires from the control panel terminals including the earth connections which are bolted to the chassis.

2. Disconnect the installer terminal block assembly by removing the two screws securing the block bracket to the control panel mounting plate

3. Remove the control panel, this is secured by two screws in the control panel mounting bracket situated to the top of the bracket furthest away from the honey comb outlet grille.

4. Replace the control board.

5. Reverse the steps to install the new control panel

Set the dip switch for the location and follow the networking address settings. For more information see page 23.

Heating element

1. Follow steps to remove the covers

2. Remove the fixing bolts holding the honey comb outlet grill assembly and remove this.

3. Make a note of the wiring at the control panel for the heating element and the temperature sensor

4. Disconnect the wires at the heating element to the control panel

5. Remove the fixing bolts in the fan deck mounting plate which secures the heating element.

6. Remove the heating element

7. Make a note of the wiring to the heating element including all the jumper positions

8. Remove the wires and fit to the new element pass them through ready for connection to the control panel

9. Refit the heating element and reverse the steps to install the new heating element

10. Ensure the temperature sensor is refitted in the correct position and wired into the TEMP terminal of the control panel, see figure 30 and table 9 on page 35

Fan deck

1. Follow the steps to remove the covers and the control panel, complete with its mounting bracket as one of the fan deck securing nuts are under the control panel bracket.

2. With the control panel and bracket out of the unit disconnect the wire from the motor

3. Remove the wires to the thermal cut out sensor, (two sensors on the 2 metre units) and remove the thermal cut out.

4. Remove the four securing nuts, shake proof washer and flat washer that secure the fan deck.

5. Lift out the fan deck

6. Replace the deck and reverse the steps to install the new fan deck

SP

Notes

Notes

Notes

Previous full part no.: **R**eznor, Guardian GR and GS Signal Pro, Installation Manual, EN 2022-07, D301367 Iss 2
Current full Part No. **Reznor, Guardian GR and GS Signal Pro, Installation Manual, EN 2022-11, D301367 Iss 3**

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