

## GUARDIAN AIR CURTAIN SIGNAL PRO CONTROLLER QUICK SET UP GUIDE



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### Note:

Sections 1 and 2 give useful information about the Guardian Air Curtain Signal Pro controller.

Sections 3 to 7 detail how to set up and use the Guardian Air Curtain Signal Pro controller.

Sections 9 and 10 detail how to access the advanced settings provided by the Guardian Air Curtain Signal Pro controller.

Sections 11 and 12 define “Outside Temperature Limit” for electric and LPHW heated air curtains .

## 1. Introduction

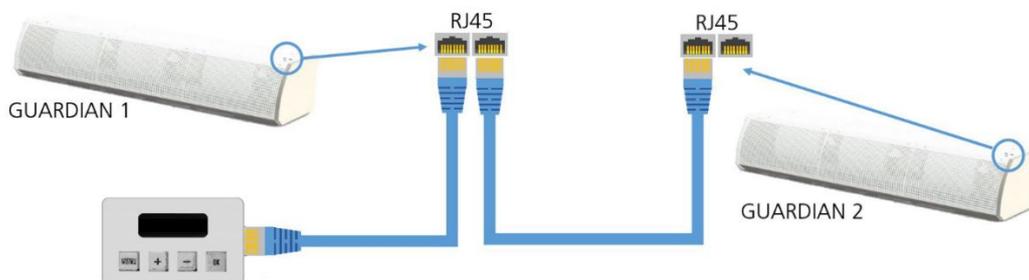
The function of the Signal Pro Display Panel is to control the Guardian Air Curtain fan and heating element (electric / LPHW) to maintain a set air outlet temperature from the unit as measured by a temperature sensor. The ambient version will have fan control only. The display panel has a microcontroller, a 16 character by 2 line display, 4 buttons and an RJ45 communication interface. It also has a clock with battery back-up (CR2032 3 Volt) to provide time based control functionality. To enable and maintain the battery back-up the yellow tab must be removed from the battery.

The buttons on the panel have the following functions:

- MENU enters the programme menu and will advance items as described in the following sections.
- + and - adjust the value.
- OK saves the modified value.
- It should be noted that if MENU is pressed during the programming sequence, programming will be stopped and the applicable value will revert to the existing value held in the controller.



The display panel will send commands to and receive status messages from up to 16 controllers (and hence air curtains) via an RJ45 network, thus forming a multi-air curtain network controlled from a single source. Each air curtain has an address set via a 4-way DIP switch at its controller. Each controller is a drone on the network and only transmits in response to a message from the panel which is the master.



Inbuilt supply air and return air temperature sensors provide feedback on the air curtain heater output and provide the panel with room temperature readings.

Three fan speeds are available from the air curtain, F1, F2 and F3. The desired fan speed can be set via the engineers menu.

With electrically heated models, the heat capacity can be changed by fitting jumpers E1, E2 and E3 in the installers terminal block (see the installation manual for details).

Additional external inputs can be connected to the controller which adjust the control behaviour: External Switch, Door switch and External Sensor input.

LPHW heated models have inputs for Flow and Return Temperature sensors, and an 230V output for a control valve.

## 2. To clear the controller of all user settings and reset to default

Note this action will completely reset the controller to the factory defaults. Care must be taken in the use of this action. IT CANNOT BE REVERSED

- Enter the Engineers menu by pressing and holding the + button and the pressing the MENU button
- Press the MENU button 9 times
- Factory Reset? will show and OK will flash
- Use the +/- buttons to select yes to reset the panel to the factory defaults
- The panel will then reset to the factory defaults, including clearing the connected air curtain list.
- The panel will then restart.
- The language must then be set.
- Once a language has been set, the controller will carry out a network address scan (to check if more than one air curtain is networked) then the display will revert to the Normal Operation Display (see section 7 following).

## 3. Default Settings

The following default values have been factory set in the controller:

Time program On 1	=	09:00
Off 1	=	17:00
Days	=	Monday to Sunday
Heater air temperature	=	H2
Fan speed	=	F1
Optimum start see 7k)	=	OFF (0)
Door open temp	=	20
Door open fan speed	=	1
Door closed fan	=	Off
Door closed temp	=	10
Outside temp	=	Off
Temp limits low	=	10
Temp limits high	=	30
Set Int/Ext Timer	=	Internal Time Clock

## 4. Initial start up

On first start up after installation, the control panel will ask for a language to be set:

- The options are EN - English, FR - French, ES - Spanish, NL - Netherlands and PL - Polish.
- Press the + button to scroll through the languages.
- Once the required language shows, press the OK button

Once a language has been set, the controller will carry out a network address scan (to check if more than one air curtain is networked) then the display will revert to the Normal Operation Display (see section 7 following).

## 5. Setting up the controller (programming menu)

To set up the controller once the language has been set:

- a) TIME / DAY:
  - Press the MENU button eight times at the normal operation screen
  - Press OK to set and adjust the current time and day
  - Use +/- to select the required day, then press OK
  - Use +/- to select the required time (hours and minutes), then press OK
- b) TIME PROGRAM:
  - Once the current time and day has been set, "Time Program" will show. Alternatively, press the MENU button nine times
  - Press OK to select and adjust the time program
  - Use +/- to select the first day i.e. Monday, then press OK
  - Set the first ON time using the +/- buttons and press OK
  - Set the first OFF time using the +/- buttons and press OK
  - Set the second ON time using the +/- buttons (if required) and press OK
  - Set the second OFF time using the +/- buttons (if required) and press OK
  - Once Monday has been set, the controller will give the option to copy the ON / OFF times to Tuesday and once set, to Wednesday and so on.
  - To adjust specific days, select the required day and make changes
  - To turn the air curtain off on a specific day, for example Saturday or Sunday, hold the + button until the time shows --:-- indicating that the time clock is removed for that day
  - Once the Time Program has been set, "MENU EXIT?" will show. Press MENU for no and OK for yes
- c) OPERATING MODE ON/OFF/AUTO/HEAT OFF:

For a single air curtain:

- Press the MENU button once. If the air curtain is in operation, OFF MODE? will be displayed. Press OK to manually switch the air curtain OFF. Alternatively, if the air curtain is not in operation (OFF), ON MODE? will be displayed. Press OK to manually switch the air curtain on.

- Press the MENU button twice and AUTO MODE? will be displayed. Press OK to operate the air curtain in AUTO (time clock) mode. The air curtain(s) will operate under automatic control, that is fully automatic control of the heating and fan to the time program [see b) above] using the set temperature / On time period and Off time period.
- Press the MENU button three times and HEAT OFF? will be displayed. Press OK to operate the air curtain in fan only mode (for ventilation). Alternatively, if the air curtain is operating in heat off mode, HEAT ON? will be displayed. Press OK to operate the air curtain in heating and ventilation mode.

If a number of air curtains are networked:

- Press the MENU button once and "OPERATING MODE?" will display. Press OK and the option to select ALL or individual air curtains will be given. In this case, use the +/- buttons to select ALL or a single air curtain address.
- The MODE will then start flashing. Use the +/- buttons to select ON, OFF, AUTO or HEAT OFF/ON. The modes are as described previously,
- If OK is pressed, the settings will be saved and the screen will revert to the normal operation view.
- If MENU is pressed, no settings will be saved and the screen will revert to the normal operation view.

Note that HEAT ON/OFF does not apply to ambient air curtains.

- d) OVERTIME. If the air curtain is required to operate for a short term ON period, such as overtime working:
- Press MENU four times and then OK to display the set overtime menu
  - Press the +/- buttons to increment the on period by 30 minutes per press up to a maximum of 12 hours
  - Press the OK button once the required overtime period has been set
  - In overtime mode, the unit heats to On (day) temperature, no fan-only, for the number of hours and minutes set.
  - From the normal operating display, if MENU is pressed in overtime mode, the overtime is cleared immediately.
- e) OPERATING MODE. The air curtain can be switched between OFF / ON and AUTO operation here:
- Press MENU five times and then OK to display OPERATING MODE? Use the +/- buttons to select the operating mode as described in section 5c above.
- f) HEAT ON / OFF. The air curtain can be switched between HEAT ON and HEAT OFF operation here:
- Press MENU six times and then OK to display HEAT ON/OFF? Use the +/- buttons to select heating on or off as described in section 5c above.
- g) DOOR OPEN TEMP. Set the outlet temperature off the air curtain (door open temp):
- Press MENU seven times and then OK
  - Set the desired outlet temperature (maximum 30°C) using the +/- buttons and the air curtain will modulate to achieve this setpoint
  - If a door switch is installed, specific temperatures and fan speeds can be adjusted within the Engineer Settings menu

## 6. Operating the air curtain

- a) Choose operating mode (see 5c) by selecting whether you want the unit to run in:
  - Auto (Time Clock)
  - On (Manual Mode)
- b) Auto Mode (Time Clock):
  - To turn ON, select Auto Mode from the menu
  - To turn OFF, select Off Mode from the menu
  - The air curtain will run in Auto mode and switch on / off based on the time clock settings (see 5b)
- c) Manual Mode (No Time Clock):
  - To turn ON, select On Mode from the menu
  - To turn OFF, select Off Mode from the menu
  - The air curtain will run in manual mode until manually switched off
- d) Controlling Heat:
  - To turn heat ON, select Heat On from the menu
  - To turn heat OFF, select Heat Off from the menu
  - The heating function will be switched on / off.
  - The fans will remain running whatever the heat setting until the air curtain is turned off
- e) Set overtime operation. If the air curtain is required to operate for a short-term period, such as an overtime period. When overtime is set the system operates for the set number of minutes. The overtime operation can be adjusted by following 5d) previously.
- f) The current time and day can be adjusted by following 5a) previously.
- g) The time program can be adjusted by following 5b) previously.

## 7. Display overview in normal operation

The display panel alternates between two screens:

### *Screen 1*

The top line shows the day and time. If the panel is set to AUTO, the program status (ON1, OFF1 etc.) will also show. If overtime is active, the overtime count down will be shown in place of the program status.

The bottom line shows the outside temperature (an average of all connected outside sensors). If the panel battery is low, LOW BATT will also be displayed.

## Screen 2

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

The bottom line shows the 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, the interlock status "INTERLOCK DOOR", "INTERLOCK TIMER", "INTERLOCK FILTER" or "INTERLOCK STAT" will show in the bottom line.

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

"COMMS ERROR"  
"SENSOR ERROR"  
"OS SENSOR ERROR"  
"PCB TEMP ERROR"  
"BLOCKED FILTER"  
"TEMP SENSOR ERROR"  
"STAT TEMP ERROR".

It should be noted that if more than one air curtain is networked, the status will cycle through each air curtain, displaying the above details.

## 8. Network Address Scan

A network address scan will be automatically carried out every time the panel is powered up to check if more than one air curtain is networked.

## 9. Engineer settings

- a) Open Engineer Setting Menu:
  - Hold + and press Menu to enter Engineer Setting menu
- b) SET DOOR OPEN FAN SPEED:
  - Press OK
  - The unit address will flash, press OK
  - Use the +/- buttons to select fan speed 1 / 2/ 3 / off then press ok to set
  - If a number of units are networked, OK starts flashing with ALL, use +/- to select all or a single address, then follow the steps above
- c) SET DOOR CLOSED FAN SPEED:
  - Press OK
  - The unit address will flash, press OK
  - Use the +/- buttons to select fan speed OFF / 1 / 2/ 3 / off then press ok to set
  - If a number of units are networked, OK starts flashing with ALL, use +/- to select all or a single address, then follow the steps above

- d) SET DOOR CLOSED TEMPERATURE:
- This is only displayed for electric heating
  - Press OK
  - Use the +/- buttons to select the required door closed temperature
  - If a number of units are networked, OK starts flashing with ALL, use +/- to select all or a single address, then follow the steps above
- e) SET LPHW FLOW / RETURN TEMPERATURE:
- This is only displayed for air curtains with an LPHW heater or ambient version. Ambient air curtains will ignore the setting.
  - Press OK.
  - Use the +/- buttons 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.
  - If a number of air curtains are networked, the LPHW flow / return temperature setting is used for all units on the network.
- f) SET OUTSIDE TEMPERATURE:
- Press OK
  - Use the +/- buttons to select the outside temperature limit, either Off or between 5 and 30
  - Press OK.
  - If the outside temperature limit is set to OFF the sequence then finishes and returns to the engineers menu.
  - If the 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.
  - 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 LPHW systems, full flow/return at temperature starts flashing.
  - Use the +/- buttons to set full flow / return at temperature. The range is 0 to the outside temperature limit.
  - Press OK
  - 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.
  - If a number of air curtains are networked, the same setting is used for all units on the network.

- g) SET TEMPERATURE LIMITS:
- Set temperature limits is only displayed if the system is detected as electric or legacy LPHW.
  - Press OK.
  - Low temperature limit starts flashing
  - Use the +/- buttons to select low temperature limit between 5 and current high temperature limit
  - Press OK.
  - High temperature limit starts flashing.
  - Use the +/- buttons to select high temperature limit between current low temperature limit and 50,
  - Press OK to set and return to engineers menu.
  - If a number of air curtains are networked, the same settings are used for all units on the network.
- h) SET INT / EXT TIMER:
- This setting allows a choice between the Internal Time Clock (default) as set in 4b) previously or an External BMS Timer
  - Press OK
  - Use the +/- buttons to select INT PANEL TIMER or EXT/BMS TIMER
  - Press OK
  - Note: if External BMS Timer is selected, the program times cannot be set in the Set Up menu (detailed in 1. above)
- i) SET INTERLOCKS (**ONLY FOR NETWORKED AIR CURTAINS**):
- If a number of air curtains are networked, the set lead air curtain address becomes the lead for interlock inputs (i.e. "INTERLOCK DOOR", "INTERLOCK TIMER", "INTERLOCK FILTER" or "INTERLOCK STAT")
  - Press OK
  - Use the +/- buttons to select the lead air curtain address
  - Press OK
  - TIMER INPUT will show
  - Use the +/- buttons to set the timer interlock input on or off
  - Press OK
  - DOOR INPUT will show
  - Use the +/- buttons to set the door interlock input on or off
  - Press OK
  - Use the +/- buttons to set the stat interlock input on or off
  - Press OK
  - Use the +/- buttons to set the filter interlock input on or off
  - Press OK
  - The set lead air curtain controls the interlocks for all other air curtains on the network
  - Not all interlocks are available on all air curtains – any interlocks not present on an air curtain will be ignored
  - It should be noted that if the lead curtain address is set to OFF, interlocks will not be enabled.

- j) DISPLAY HOURS RUN:
  - Press OK to show how many hours the air curtain has run
  - If a number of air curtains are networked, the lowest numbered air curtain will be shown initially. The +/- buttons can be used to view other air curtains
  - Press Menu
  
- k) SET LANGUAGE:
  - Press OK to set the language
  - The options are EN - English, FR - French, ES - Spanish, NL - Netherlands and PL - Polish.
  - Press the +/- buttons to scroll through the languages.
  - Once the required language shows, press the OK button
  
- l) RESET CONNECTED AIR CURTAIN ADDRESS LIST:
  - This will carry out a network scan even if there is only one air curtain connected.
  - OK will flash.
  - Press the +/- buttons to select yes or no to scan the connected air curtains.
  - If yes is selected, the list of connected air curtains held within the controller is cleared and the network will be scanned for connected air curtains and when finished will return to the engineers menu.
  - If no is selected, the screen will return to the engineers menu
  - Note that a network scan will cause the detected network to be reset and rediscovered.
  
- m) RESET PANEL TO FACTORY DEFAULTS:
  - This will completely reset the controller to the factory defaults. Care must be taken in the use of this action. IT CANNOT BE REVERSED
  - OK will flash
  - Use the +/- buttons to select yes or no to reset the panel to the factory defaults
  - If yes is selected, the panel is reset to the factory defaults, including clearing the connected air curtain list.
  - The panel will then restart
  - If no is selected, the screen will return to the engineers menu
  
- n) ENGINEERS MENU END:
  - Once the end of the engineers menu is reached, there is a choice to exit the menu or restart it.
  - Press OK to save all settings made above
  - Press MENU to return to the start of the engineers menu.

## 10. Diagnostic display

- a) Open Diagnostic Display:
  - Hold + and – then press Menu to enter the Diagnostic Display
- b) The Diagnostic Display gives a per air curtain display of the following:

Electric heating / ambient air curtains

- Air curtain address
- Heat, "H" 0/1 is on/off (not ambient)
- Fan, "F" 0/1 is on/off
- % is percentage heating (not ambient)
- O\*\*, outside temperature
- T\*\*, control temperature
- P\*\*, electric PCB temperature
- S, stat input
- F, filter blocked input
- T, timer input
- D, door input

LPHW air curtains

- As above plus
- F\*\*, LPHW flow temperature
- R\*\*, LPHW return temperature

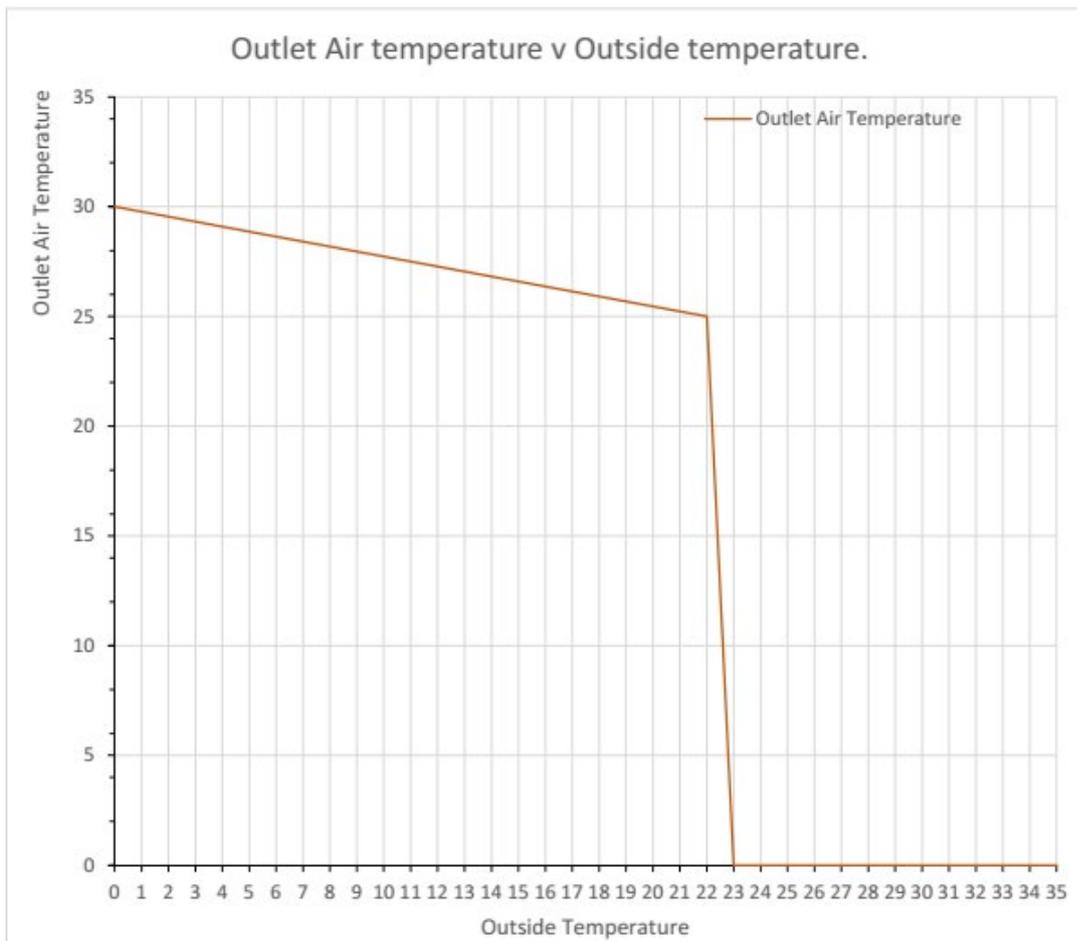
Note that the diagnostic display will cycle from air curtain addresses 0 to AC15 even if there is only one air curtain installed. If the air curtain is not responding, indication will be given on the panel.

## 11. Outside temperature limit – electric heating

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.

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 (e.g. Door Open or Door Closed temperature) has been set to 25°C and the elevate at zero temperature has been set to 5°C.

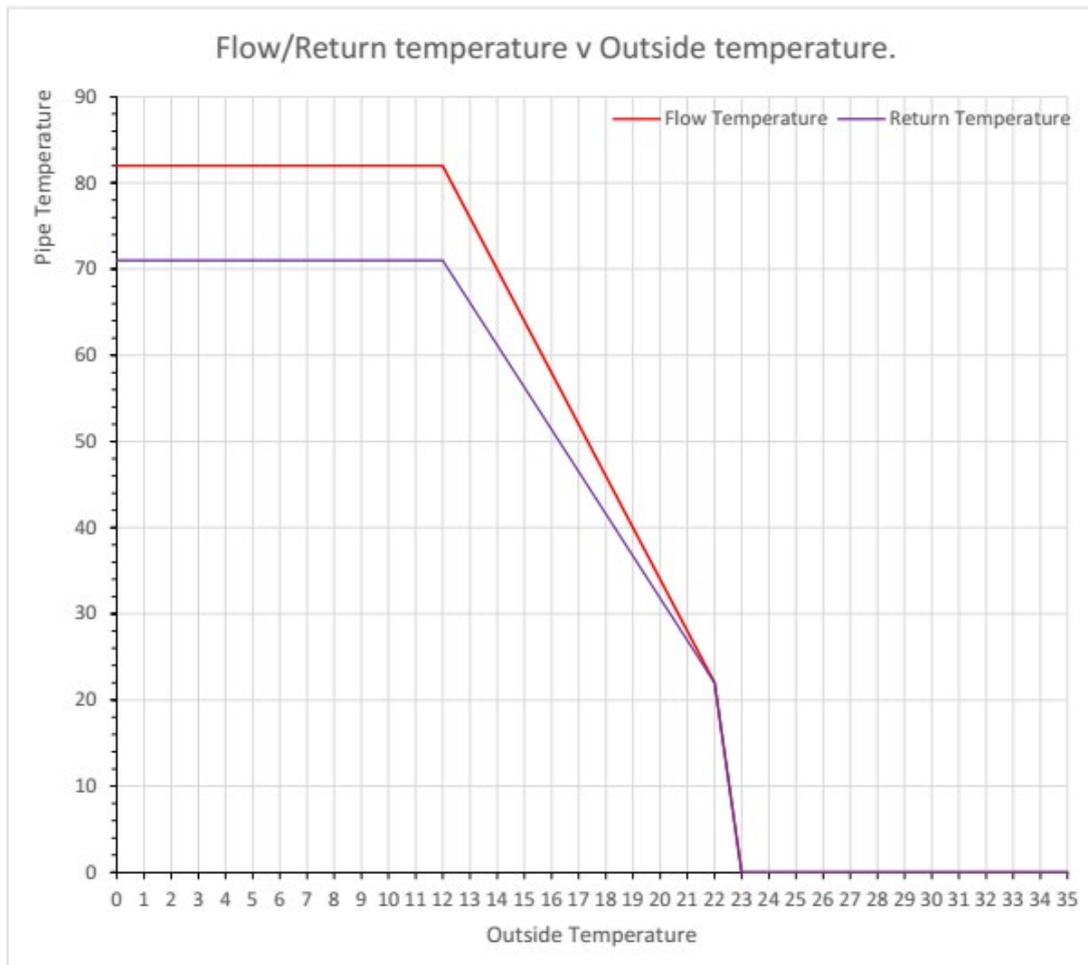


## 12. Outside temperature limit – LPHW heating

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.



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