

HX Series. Recessed Range



INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

English

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2 ELECTRICAL SAFETY

Electrical Supply and Wiring to the Air Curtain

All electrical wiring and connections MUST be carried out by a competent qualified electrician in accordance with the latest edition of the IEE wiring regulations and/or local statutory regulations.

- A single phase or 3 phase local isolator having a contact separation of at least 3mm on all poles must be fitted in the electrical supply to the air curtain and located in an accessible position adjacent to the unit.
- The appliance must be connected by cables having an appropriate heat resistant temperature rating.
- All supply cables, circuit breakers and other electrical installation equipment must be correctly sized for the air curtain model being installed; see section 3: Specifications.
- Models operating on 3 phase electrical supply - see section 3: Specifications - require a neutral connection (3N~).
- A 25mm size cable gland or conduit connector should be used for the Electrical Supply into the air curtain.
- The air curtain must be earthed.

3 SPECIFICATIONS

Air Curtain	Electrical Supply (V/ph/Hz)	Rated Electrical Power Input (kW)	Rated Current per phase (A)	Heat Output [Low/High] (kW)	Effective Width of Airstream (m)	Weight (kg)
HX1000AR	230/1/50	0.2	0.8	–	1.10	45
HX1500AR	230/1/50	0.3	1.2	–	1.63	66
HX2000AR	230/1/50	0.35	1.4	–	2.15	80
HX1000WR	230/1/50	0.2	0.8	6/12	1.10	52
HX1500WR	230/1/50	0.3	1.2	9/18	1.63	75
HX2000WR	230/1/50	0.35	1.4	12/24	2.15	93
HX1000ER	400/3/50	12.2	18.2	6/12	1.10	46
HX1500ER	400/3/50	18.3	27.3	12/18	1.63	67
HX2000ER	400/3/50	24.35	36.2	12/24	2.15	84

4. INTRODUCTION

Established in the 1960s, Thermoscreens is a leading air curtain manufacturer that exports to over 60 countries worldwide.

As with all our products, the HX range of air curtains is designed with energy efficiency in mind.

HX models suffixed ER, WR or AR are designed to be recess mounted inside a building and located horizontally over a doorway.

They must not be installed on the outside of a building.

Please complete the following details for your reference:

Date of Purchase
Place of Purchase
Serial Number

Proof of purchase is required to make a claim under warranty.



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5. DELIVERY CONTENTS

The following items are supplied in the box at delivery.

NOTE: If any parts are missing or damaged contact your place of purchase.

HX Recessed Air Curtain



Note: The recessed grille is packed separately.

Ecopower Remote Control



Supplied with 6m control cable

Outdoor Air Sensor (Optional)



Available for weather compensation control

6. TOOLS REQUIRED

The following tools are required for installation:

- Flat blade screwdrivers
- Pozi head screwdrivers
- 10mm spanner
- Adjustable spanner
- Electric drill
- Ladders
- Appropriate lifting equipment
- Appropriate tools for cutting ceiling aperture

7. INSTALLATION

The air curtain is designed to be recessed within ceiling voids or bulkheads within a building and located horizontally over a doorway. It must not be installed outside of the building.

7.1 Location

Mount the air curtain above and as close to the doorway as possible, with:

- the recessed grille not more than 3.5m above floor level
- the air discharge (see 1, Fig 1) section of the recessed grille nearest the doorway and the air inlet section (see 2, Fig 1) furthest from the doorway

Beware of doorway top edges, structural beams, door opening/closure devices, etc., which may interfere with the air stream and affect the location of the unit.

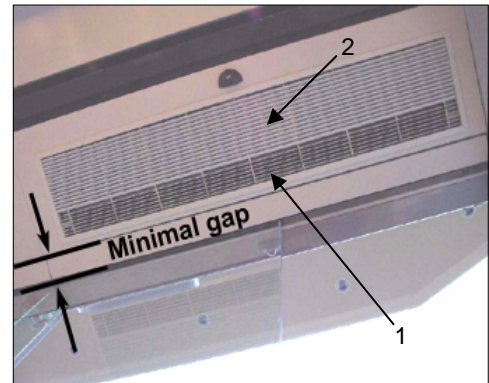


Fig 1

NOTE: For the air curtain to work well the doorway should be less than the width of the airstream.

7.2 Ceiling Suspension

Step 1 Cut an aperture in the ceiling to the dimensions in Appendix 1. Cut notches, if necessary, to clear screws in the air curtain casing.

NOTE: For LPHW models, pipework will need to be installed above the curtain. Allow sufficient access and height clearance within the ceiling void to do this.

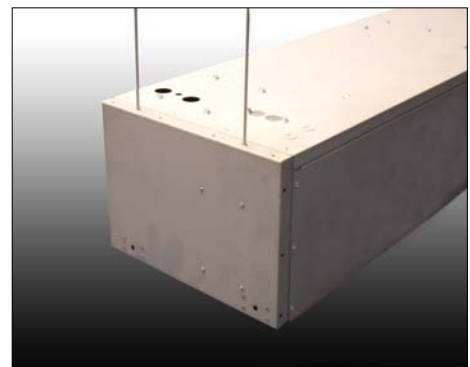


Fig 2

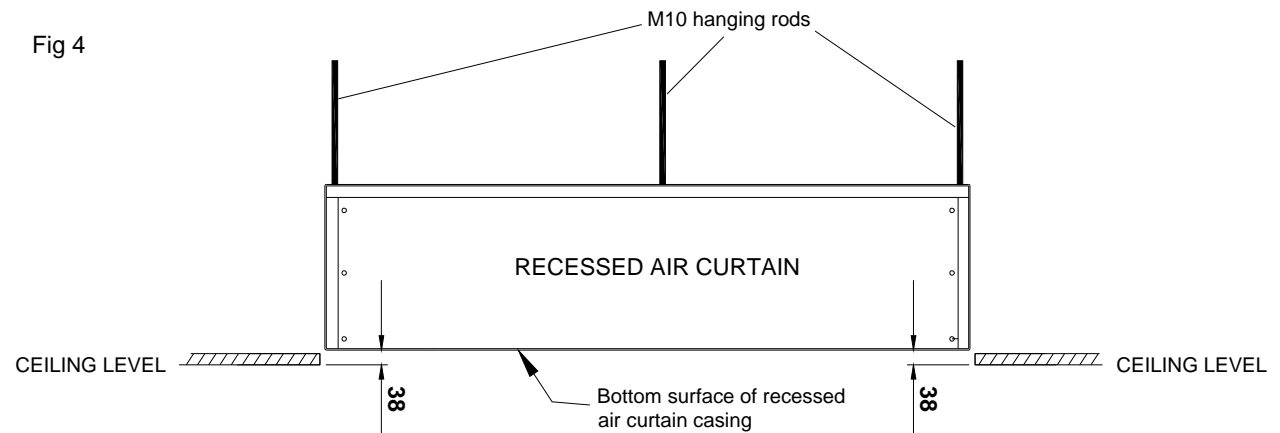
Step 2 Fix M10 threaded rods (not supplied) through the 2 holes at each end in the top casing (see Fig 2). Feed the rods through the casing and attach to fixing brackets near the bottom of the unit (see Fig 3, looking up into the air curtain). Use M10 lock-nuts either side of the fixing bracket to secure the hanging rod.

NOTE: Do not let these four hanging rods come below the bottom of the unit casing or they may prevent the recessed grille fitting properly.



Fig 3

Step 3 If you are installing model HX1500R or HX2000R, fit a 5th M10 threaded rod into the hanging point in the middle of the unit. Refer to Appendix 1 and Fig 4.



Step 4 Secure each rod to a suitable structure that can support the weight of the unit (see section 3: Specifications for weights).

WARNING: It is the sole responsibility of the installer to ensure that the fixing locations and suspension system used are suitable for the air curtain being installed.

Step 5 Adjust the height of the unit on its hanging rods so the bottom surface of the casing goes 38mm up into the ceiling as shown in Fig 4. Ensure the unit is level.

7.3 Attaching the recessed grille to the air curtain

The recessed grille consists of:

- Metal frame
- Cellular discharge grille
- Hinged inlet grille

There are 4 fixing points on the HX1000R, 6 on the HX1500R and 7 on the HX2000R (see Fig 5).

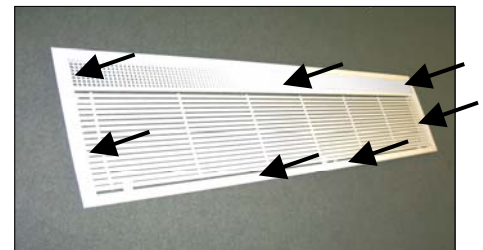


Fig 5 (HX2000R shown)

Fix the grille as follows:

Step 1 Open the hinged inlet grille using a flat bladed screwdriver to release the quarter turn fasteners (see Fig 6). There are two fasteners on the HX1000R unit and three fasteners on HX1500R and HX2000R units.

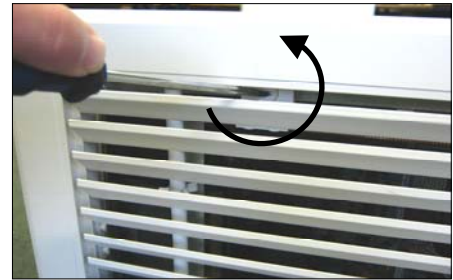


Fig 6

Step 2 Make sure the grille will go the correct way around (cellular discharge nearest to doorway). Offer the recessed grille up through the cut-out in the ceiling and attach it to the bottom of the air curtain casing using M4 pozi head screws supplied. Start with the screws shown in Fig 7 and then fit the two at each end of the discharge grille.



Fig 7

Step 3 If fitting model HX1500R or HX2000R units insert 1 or 2 screws towards the middle of the unit as shown in Fig 8.



Fig 8

Step 4 On model HX1500R or HX2000R units fit 1 screw in the middle of the discharge grille. This screw is easier to access if the hinged inlet grille is temporarily shut.

Step 5 With the hinged inlet grille open again adjust the hanging rods (see Fig 9) so the grille frame fits neatly against the ceiling. Ensure the grille frame is a snug fit against the ceiling with no gaps all the way around.



Fig 9

NOTE: Open the hinged grille core to gain access to electrical connections, and for servicing and maintenance.

8. REMOTE CONTROL INSTALLATION

Mount the remote control unit in a convenient position directly to the wall or onto a switch box.

8.1 Wall mounting

- Step 1** Using a screwdriver undo the screw on the top of the remote control case and pull the back case away (see Fig 10).
- Step 2** Feed one end of the RJ control cable through the back case, secure it, then screw the back case to the wall using suitable fixings (not supplied).
- Step 3** Connect the RJ plug to the RJ socket on the PCB.
- Step 4** Refit the front case.



Fig 10

8.2 Switch box mounting

- Step 1** Using a screwdriver undo the screw on the top of the remote control case and pull the back case away (see Fig 10).
- Step 2** Feed one end of the RJ control cable through the switch box, feed and secure the RJ control cable through the back case and secure back case to switch box using 2 x M3.5 screws (not supplied) (see Fig 11).
- Step 3** Connect the RJ plug to the RJ socket on the PCB.
- Step 4** Refit the front case.



Fig 11

NOTE: For optional remote control settings, see section 9.

9. REMOTE CONTROL SETTINGS

On the back of the remote controller PCB you will find four DIP switches that provide the following optional features.

DIP1 – Reset on power-up

On restoring power after an electrical interruption all remote control settings are retained. **DEFAULT SETTING ON**

Dip2 – Stop fan on cold

Fans are switched off when heating level is achieved (Automatic mode only). **DEFAULT SETTING OFF**

DIP3 – Never blow cold

Air curtain always heats in Automatic mode (i.e. will not go to ambient mode). **DEFAULT SETTING OFF**

DIP4 – Room air temperature control

Enabling the room air sensor in the remote control disables all other temperature sensors. **DEFAULT SETTING OFF**

10. EXTERNAL CONTROLS

10.1 BMS remote on/off

To enable the system to be used with BMS remote switching, an INHIBIT two way screw terminal is fitted on the air curtain motherboard (see 2, Fig 12).

To allow the unit to run, use 2 wires to link the terminal to a remote volt free contact.

To switch the unit off, leave terminals disconnected (open circuit).

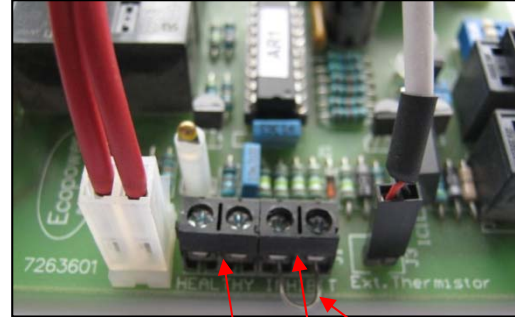


Fig 12

In a master/slave arrangement consisting of several air curtains, connect the remote contact to any one of the air curtains. All units will then turn on and off.

At factory setting a wire link is fitted to the INHIBIT terminal (see 3, Fig 12). For summer operation connect a 3.3k Ω resistance across the INHIBIT terminal and only the fans will run, without heat, even if the remote controller is calling for heat.

10.2 Overheat cut-out indication

The air curtain motherboard includes a HEALTHY two way screw terminal (see 1, Fig 12) to provide a fault signal indication if the electric heater overheat cut-out operates (electric heated air curtains only).

A healthy system provides a 24V DC signal at the terminals. An overheat cut-out fault will be 0V DC at the terminals.

WARNING: Do not apply any other voltage to the INHIBIT and HEALTHY terminals as damage to the Ecopower motherboard will occur.

10.3 Weather compensation

For Weather Compensation Heat Control, fit an outside air temperature sensor (Specification - 10k NTC sensing element, time constant 14 minutes and IP54 protection, or optional Siemens QAC2030).

Use a 2-core cable to connect the outdoor air temperature sensor to air curtain terminals 1 and 2 on the connector terminal block on electric heated units (see wiring diagrams, Appendix 2A, 2B, 2C), or terminals 5 and 6 on water heated units (see wiring diagram, Appendix 2D).

Set DIP switches 2 and 4 to the ON position on the Ecopower motherboard (see section 11: System Configuration). For Master/Slave multiple installations, this must be the Thermostat Master unit.

11. SYSTEM CONFIGURATION

11.1 Optional features

WARNING: Isolate and disconnect air curtain from the power source before making any changes.

DIP switches fitted to the air curtain motherboard (see Fig 13) provide the following optional features, as explained below:

- Fan heat interlock
- Disable fan run-on
- Thermostat master for master/slave installations
- Weather compensation heat control



Fig 13

Function	Control	Comments	Factory Setting
<p>Fan heat interlock Allows fan speed to govern heat output on electric heated units.</p> <p>If low or medium fan speed is selected, a lower heat output results. High heat operates only on high fan speed.</p>	<p>DIP1</p>	<p>This function applies to electric heated air curtains only to limit high air temperatures.</p> <p>Set DIP1 to OFF if unit is water heated or ambient.</p>	<p>ON</p> <p>Heat output is governed by fan speed.</p>
<p>Disable fan run-on The 2 minute fan run-on after switch off is enabled or disabled on electric heated air curtains.</p>	<p>DIP2</p>	<p>Must only be used for LPHW and Ambient air curtains. Each air curtain must have DIP2 set to ON for no fan run-on.</p>	<p>OFF</p> <p>Run-on enabled.</p>
<p>Thermostat master For master/slave installations. Only the air sensor thermistor in the thermostat master air curtain will be used for measuring air temperature.</p> <p>Set DIP switch 1 to ON in the air curtain that will be the master unit.</p>	<p>DIP3</p>	<p>Air sensor thermistors in all slave air curtains will be ignored.</p> <p>Avoids some units blowing cold air and others blowing warm air in master/slave arrangements on larger doorways.</p>	<p>OFF</p> <p>Air sensors on multiple installations measure and act independently</p>
<p>Weather compensation heat control Enables heat output of air curtain to vary with outside temperature.</p> <p>Set DIP switches 2 and 4 to ON to enable.</p> <p>See Note 1 below.</p>	<p>DIP2 & 4</p> <p>DIP1 shown ON for fan heat interlock.</p> <p>Set DIP3 to ON in master/slave installations.</p>	<p>If enabled, connect a suitable outside air temperature sensor (e.g. Siemens QAC2030) to the air curtain terminal block (see section 10.3: Weather compensation).</p> <p>See Note 2 below for weather compensation heat control strategy.</p>	<p>OFF</p> <p>Weather compensation not active.</p>

Note 1

See section 10.3: Weather compensation for details of outside air temperature sensor and wiring to the air curtain.

Set DIP switch 2 and 4 to the ON position in the air curtain that has the outdoor air temperature sensor wired into it. For Master/Slave multiple installations this must be the Thermostat Master unit.

Note 2

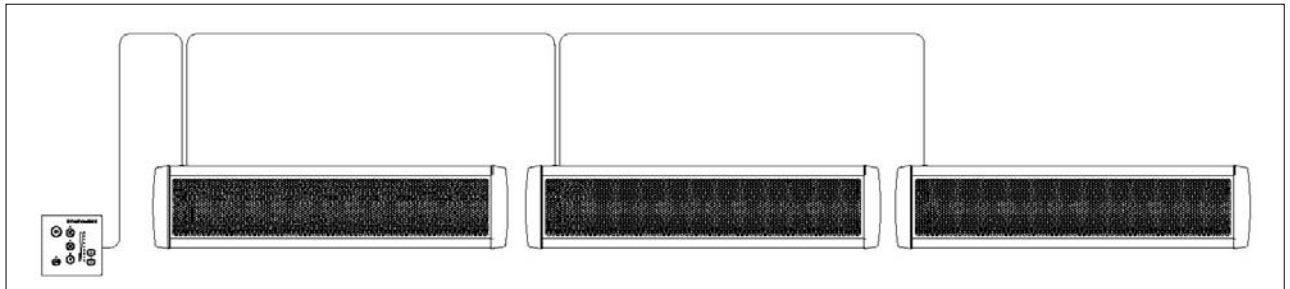
When remote controller is set to automatic the outdoor air temperature determines the heat output as follows:

- Less than 10°C, full heat operates.
- Between 10 and 15°C, half-heat operates.
- More than 15°C, no heat operates

12. MULTIPLE AIR CURTAINS

When controlling multiple air curtains in a master/slave arrangement, plug the remote controller into any one of the units.

Connect this unit to other unit(s) with a Thermoscreen RJ extension lead (not supplied), as per the diagram below. Each air curtain must have its own electrical supply.

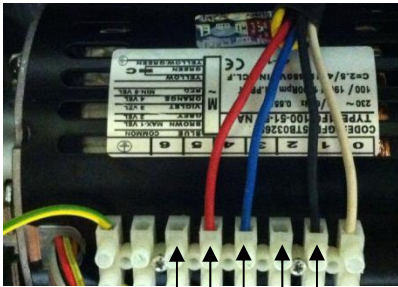


13. FAN SPEED SELECTION

If required, select fan speed at commissioning to suit outdoor environmental conditions and indoor noise levels.

Factory settings for the 3 fan speeds are as follows:

- HIGH fan speed (black wire) is wired into motor tapping 1 (highest motor speed tapping)
- MEDIUM fan speed (blue wire) is wired into motor tapping 3
- LOW fan speed (red wire) is wired into motor tapping 4



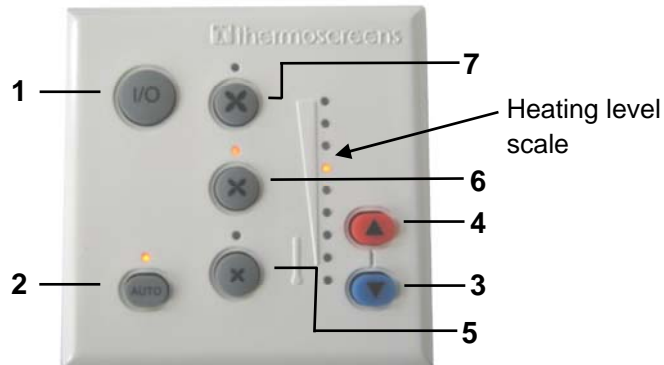
motor tapping: 5 4 3 2 1

Set fan speeds according to the following table.

Fan Speed (air curtain as delivered)	Motor Speed Tapping	Maximum air curtain mounting height (m)	Sound Pressure Level of air curtain [dB(A) at 3m]	Air Volume Flow Rate (m ³ /h)
HIGH (black wire)	1 – (highest speed)	3.5	HX1000 - 58 HX1500 - 58 HX2000 - 58	1370 2000 2640
	2	3.2	HX1000 - 57 HX1500 - 55 HX2000 - 57	1315 1810 2545
MEDIUM (blue wire)	3	2.8	HX1000 - 55 HX1500 - 54 HX2000 - 55	1220 1700 2390
LOW (red wire)	4	2.3	HX1000 - 51 HX1500 - 50 HX2000 - 51	1060 1395 2095
	5 – (lowest speed)	2.0	HX1000 - 48 HX1500 - 45 HX2000 - 48	930 1135 1890

Sound pressure levels dB(A) at 3m distance are for a single air curtain mounted at its maximum mounting height, operating in a room with average acoustic characteristics as defined in CIBSE Guide B5 (reverberation time 0.7s at 1kHz) and a room size equivalent to 8 air changes per hour (ac/h). Care needs to be taken when selecting air curtains for an installation as noise levels can be several dB higher if the mounting height is reduced, if the room is more 'live' (i.e. hard surfaces, no furnishings or absorbent materials), if the room is smaller than 8 ac/h equivalent or a combination of these factors. Noise levels will also increase if more than one air curtain is installed at the same doorway (e.g. +3dB(A) for 2 equal point sources: direct field).

14. REMOTE CONTROL OPERATION



Use the remote control to operate the air curtain as follows:

1 On/Off

Turns the air curtain On or Off.

NOTE: If an electric heated air curtain is heating when switched off the fan will run-on for approximately 2 minutes to dissipate excess heat.

2 Manual/Automatic

Switches between Manual and Automatic modes.

The Auto On indicator LED is lit for "Auto Mode" and unlit for "Manual Mode".

3 & 4 Heating level controls

Manual mode

Select heating level from zero, to half heat, to full heat by stepping up or down with the heating level controls. The heating level scale shows the level selected.

Automatic mode

Heat output is controlled automatically according to:

- Room air temperature
- Incoming air temperature, or
- External air temperature

This is dependent on the settings made in Section 11: System Configuration (DIP switches 2 and 4), and Section 8: Remote Control Settings (DIP switch 4).

5, 6 & 7 Fan speed

Switch fan speed between Low, Medium and High respectively. The appropriate LED illuminates.

15. COMMISSIONING THE SYSTEM

15.1 Verify system operation

To commission the system, verify the following conditions are met:

- All fans are working.
- Fans operate at Low, Medium and High speeds.
- There is no excessive mechanical noise coming from the fans.
- When heating is selected, the air stream from the discharge grille warms up across the whole length of the air curtain.
- When set to manual with fans set to high speed, heating increases as higher heat is selected.
- Warm air reaches across the doorway with door open or closed.
- Ecopower remote controller operates correctly in both manual and auto modes.

15.2 Instruct operator and hand over

Before leaving site, hand over the installation to the end user or their representative.

Recommend that any person operating the air curtain be given adequate instruction and supervision by a person responsible for their safety. Children and those with reduced physical, sensory or mental capabilities should not operate the air curtain.

Recommend that the doorway should be closed whenever possible.

Recommend that during times of high pedestrian use it will become an 'open doorway'. The air curtain then serves an essential purpose by saving energy and providing comfort to occupants.

Explain that the inlet grilles and air filters (if fitted) must be cleaned regularly and the unit serviced at schedule intervals – see section 18: Service & Maintenance.

16. SIGN OFF

Complete the following once commissioning is completed.

Installer signature: _____

Installer name: _____

Company name: _____

Date: _____

17. FAULT CONDITIONS

17.1 Thermal cut-out

An overheat fault in electric heated units may cause the thermal cut-out trip(s) to operate.

This is indicated by flashing LEDs on the remote control and a red status LED on the air curtain motherboard.

Before resetting ensure there is adequate air flow from the air curtain and the unit has been commissioned as per section 15.

To reset a thermal cut-out trip:

- Step 1** Switch off the electrical supply to the air curtain.
- Step 2** Allow time for the air curtain to cool down, typically 10 minutes.
- Step 3** Switch on the electrical supply to the air curtain.
- Step 4** Press the Auto button on the remote control 4 times.

Air curtain heaters will then operate and after 30 seconds the LEDs on the remote control will stop flashing and the status LED will flash green.

17.2 Fuses

In the event of an electrical fault internal electrical fuses may operate.

There are two internal fuses located on the motherboard inside the air curtain:

- Fuse 6.3A (T) supplies the fan motors within the air curtain
- Fuse 125mA (F) controls the operation of the motherboard

17.3 PCB status indication

LED1 on the air curtain motherboard is a status LED (See LED1 on Appendices, Wiring Diagrams).

This indicates the status of the Ecopower Control system as follows:

1. LED flashing green – operation normal
2. LED flashing red – low supply voltage or controller not plugged into motherboard
3. LED permanently red – thermal cut-outs open circuit from an overheat situation (see Section 17, Fault Conditions for how to reset)
4. LED flashing alternate red/green – air curtain configured for Weather Compensation Control (DIP 2 and 4 ON) but no outdoor air sensor is connected to Ecopower PCB. Remote Control LEDs will also flash to indicate a connection error.

18. SERVICE & MAINTENANCE

WARNING: Failure to adequately maintain the unit and provide a suitable cleaning schedule will result in performance degradation, reduction in life expectancy of the air-curtain and possible overheating and fire risk with electric heated units

18.1 Every week

NOTE: Weekly maintenance can be carried out by the Cleaner or Janitor from floor level.

Turn off the air curtain to prevent dust entry, then clean the face of the air inlet grille and air filter inside the grille using a vacuum cleaner with an extension tube and brush.

18.2 Every 3 months

WARNING: Before servicing, isolate and disconnect the air curtain from the power source.

WARNING: The following servicing, maintenance must be carried out by a competent electrician or a Thermoscreens appointed technician.

Clean and inspect the inside of the air curtain as follows:

- Step 1** Open the hinged inlet grille using a flat bladed screwdriver to release the quarter turn fasteners (see Fig 6, Section 7.3).
- Step 2** Clean and remove any build-up of dust and dirt within the air-curtain (inlet/outlet grilles, fan impellers, housings and motors) using a vacuum cleaner and soft brush.

NOTE: Build-up of dirt on fan impellers can cause vibration, noise and excessive wear on the motor bearings.

- Step 3** Check within the unit to ensure all electrical connections and crimped terminals are tight.
- Step 4** On electric heated air curtains, remove the fan deck(s) as follows to inspect electric heaters, electrical wiring and connections and to remove dust, dirt and debris:
- Unclip the fan motor electrical connector.
 - Unfasten 4 x M6 nuts/bolts on each fan deck.
 - Unfasten M4 screws at bottom edge of fan deck.
 - Carefully lift the fan deck away from the air curtain.

Refit fan deck(s) and close the hinged air inlet grille after servicing. Reconnect electrical supply and test to ensure correct operation (see Section 15: Commissioning).

19. WARRANTY

All units are covered by a two year warranty.

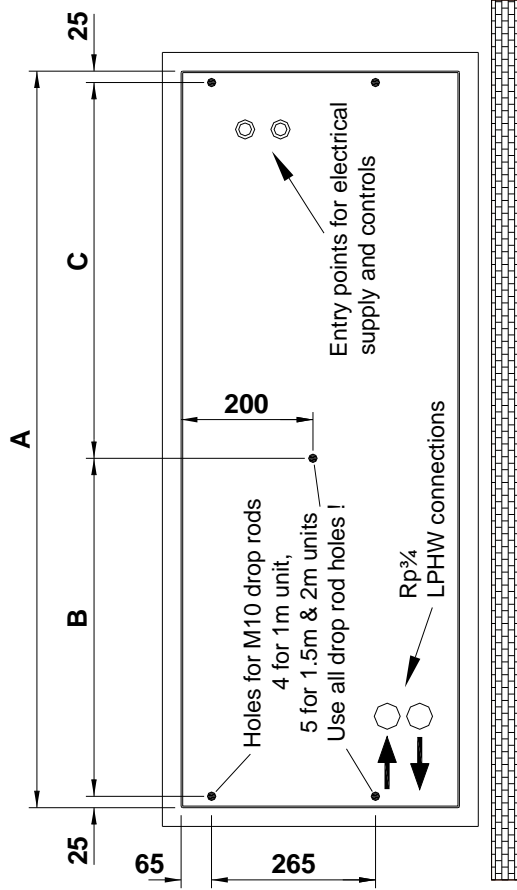
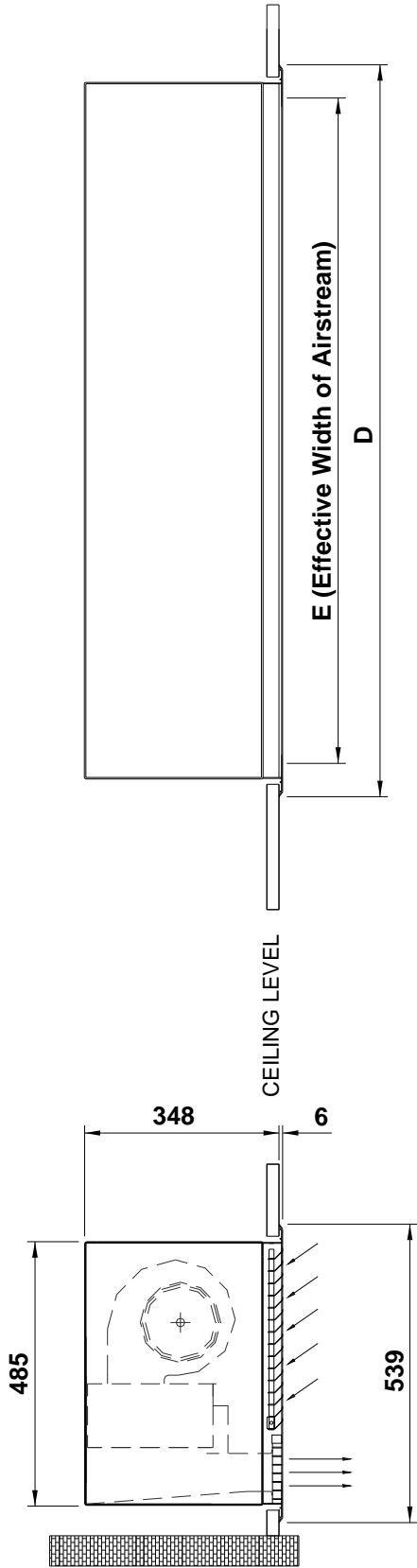
If any problems are encountered, please contact your installer/supplier.

Failing this please contact the Thermoscreens warranty department.

Care has been taken in compiling these instructions to ensure they are correct. Thermoscreens Ltd. disclaims all liability for damage resulting from any inaccuracies and/or deficiencies in this documentation. Thermoscreens Ltd. retain the right to change the specifications stated in these instructions.

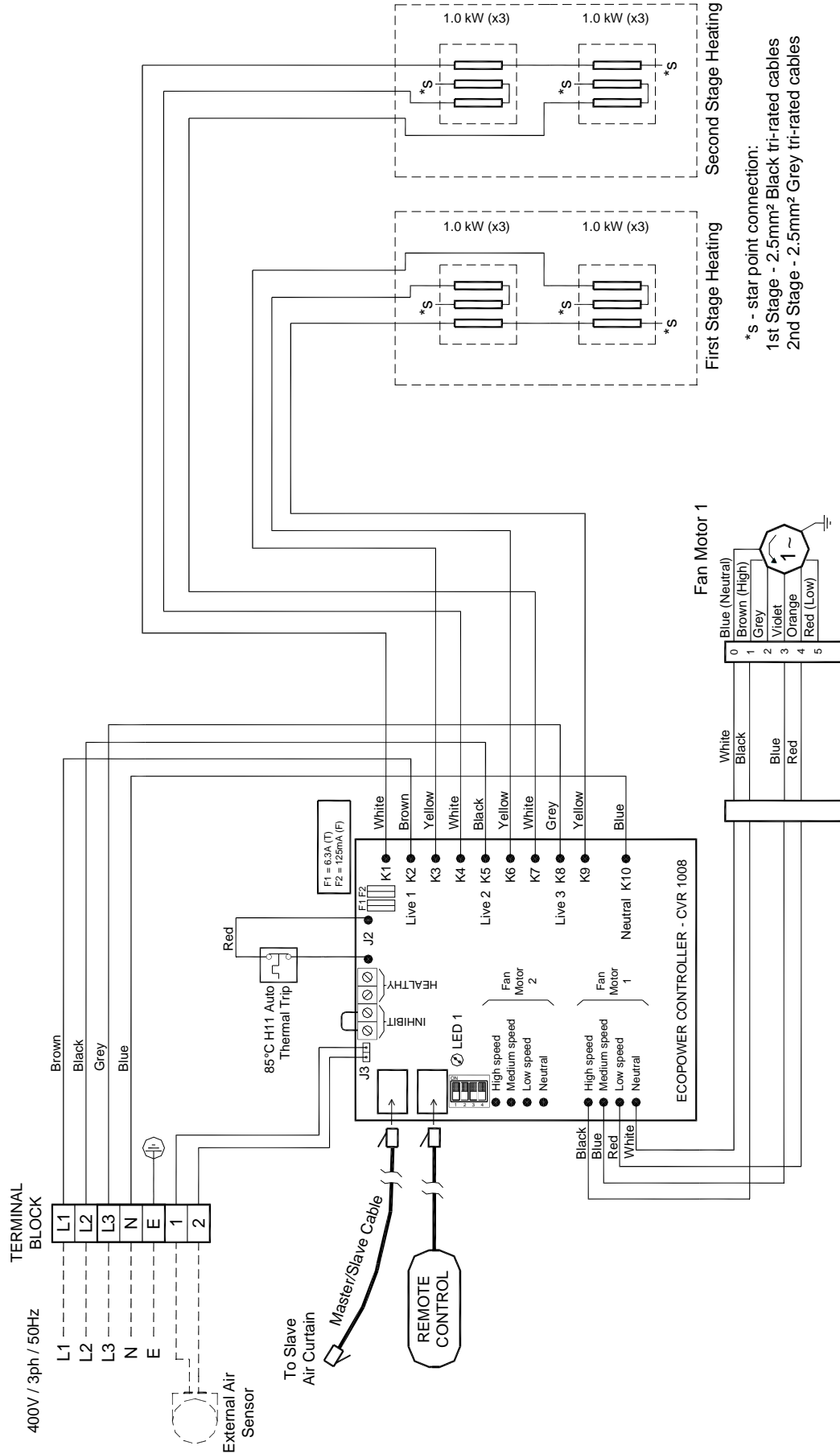
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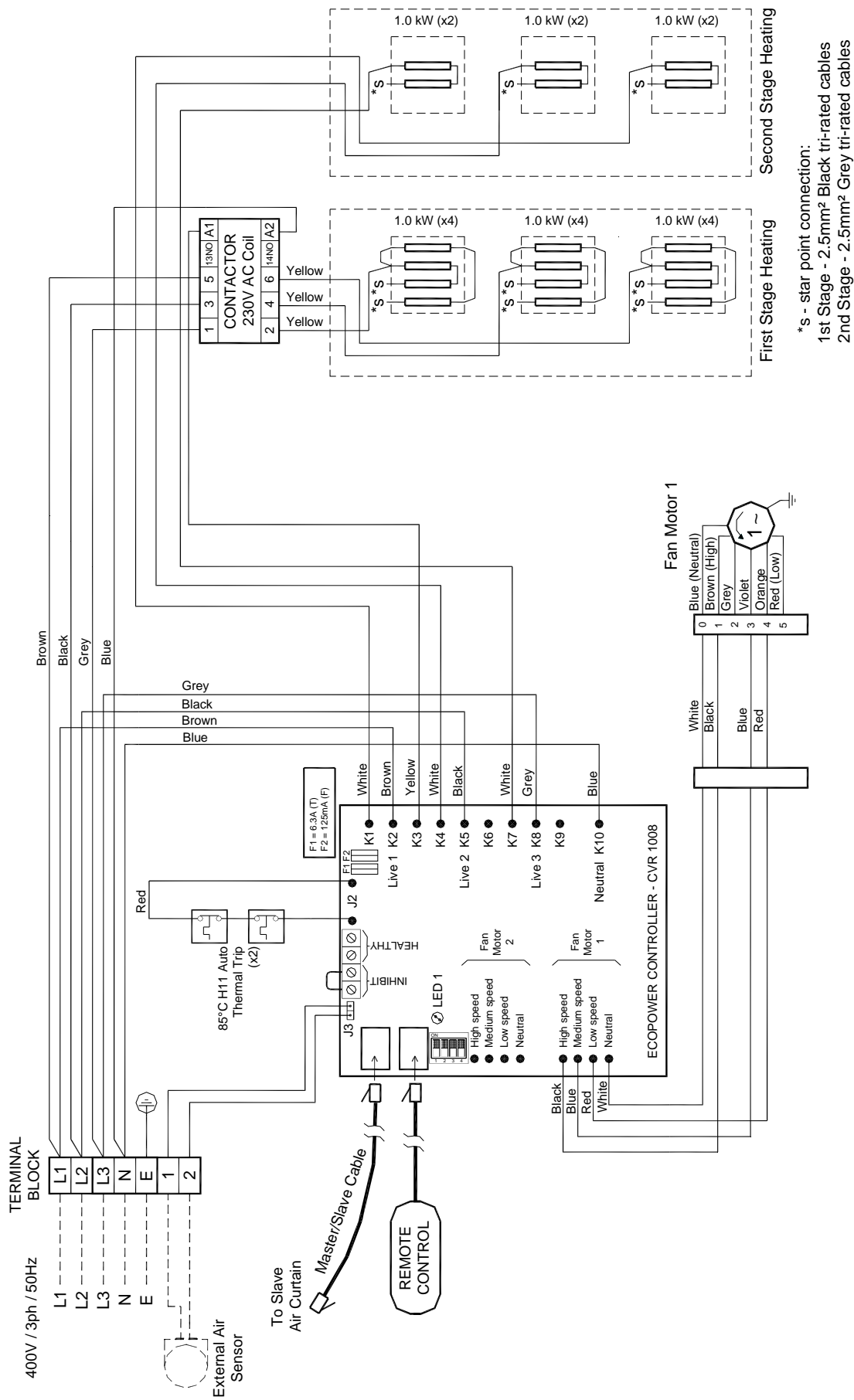


	HX1000R	HX1500R	HX2000R
A (mm)	1185	1710	2235
B (mm)	-	726	1077
C (mm)	-	933	1109
D (mm)	1238	1763	2290
E (mm)	1100	1630	2150
Length (mm)	1185	1710	2235
Width (mm)	485	485	485

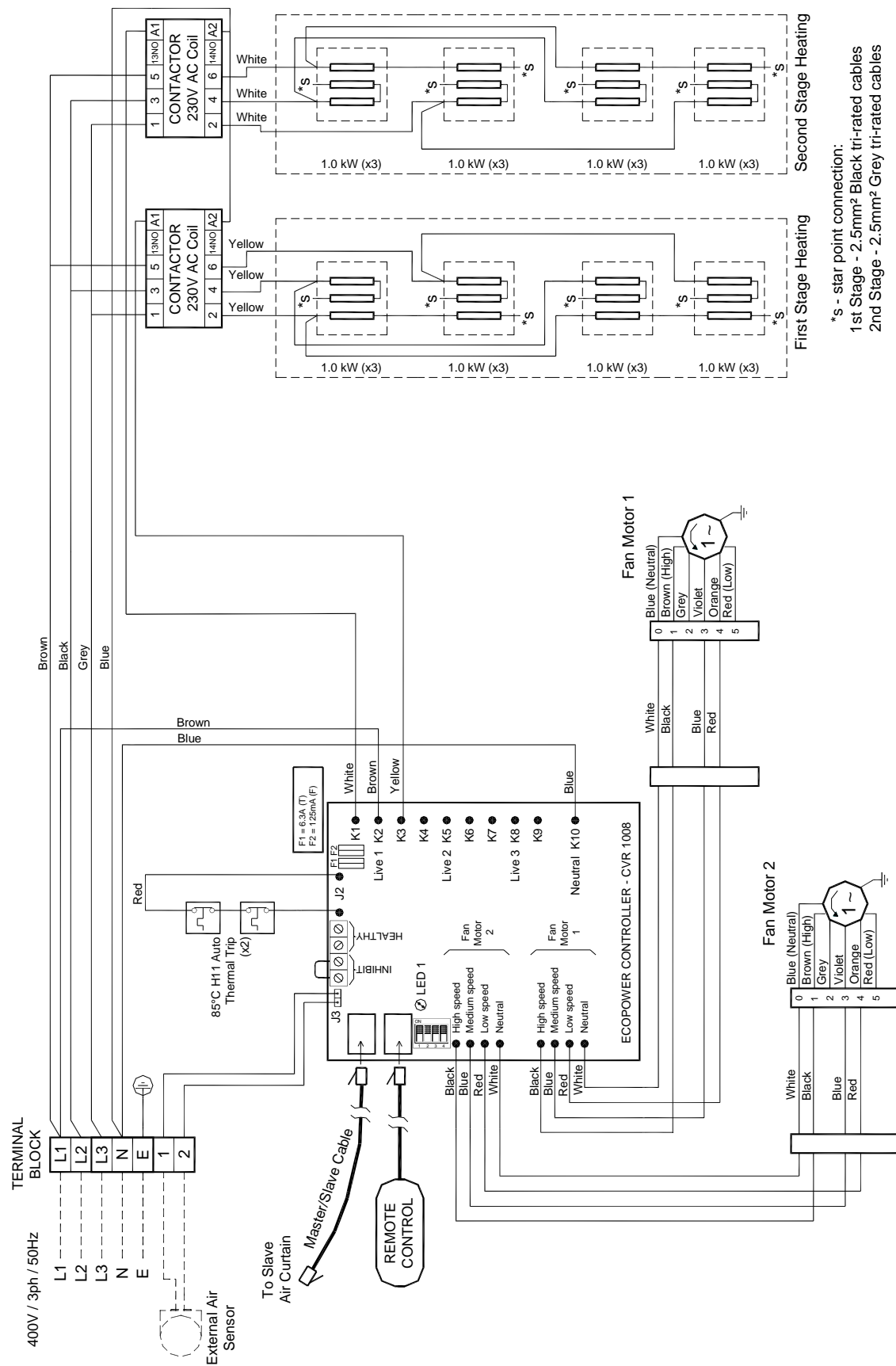
APPENDIX 1 — DIMENSIONS OF HX RECESSED AIR CURTAIN



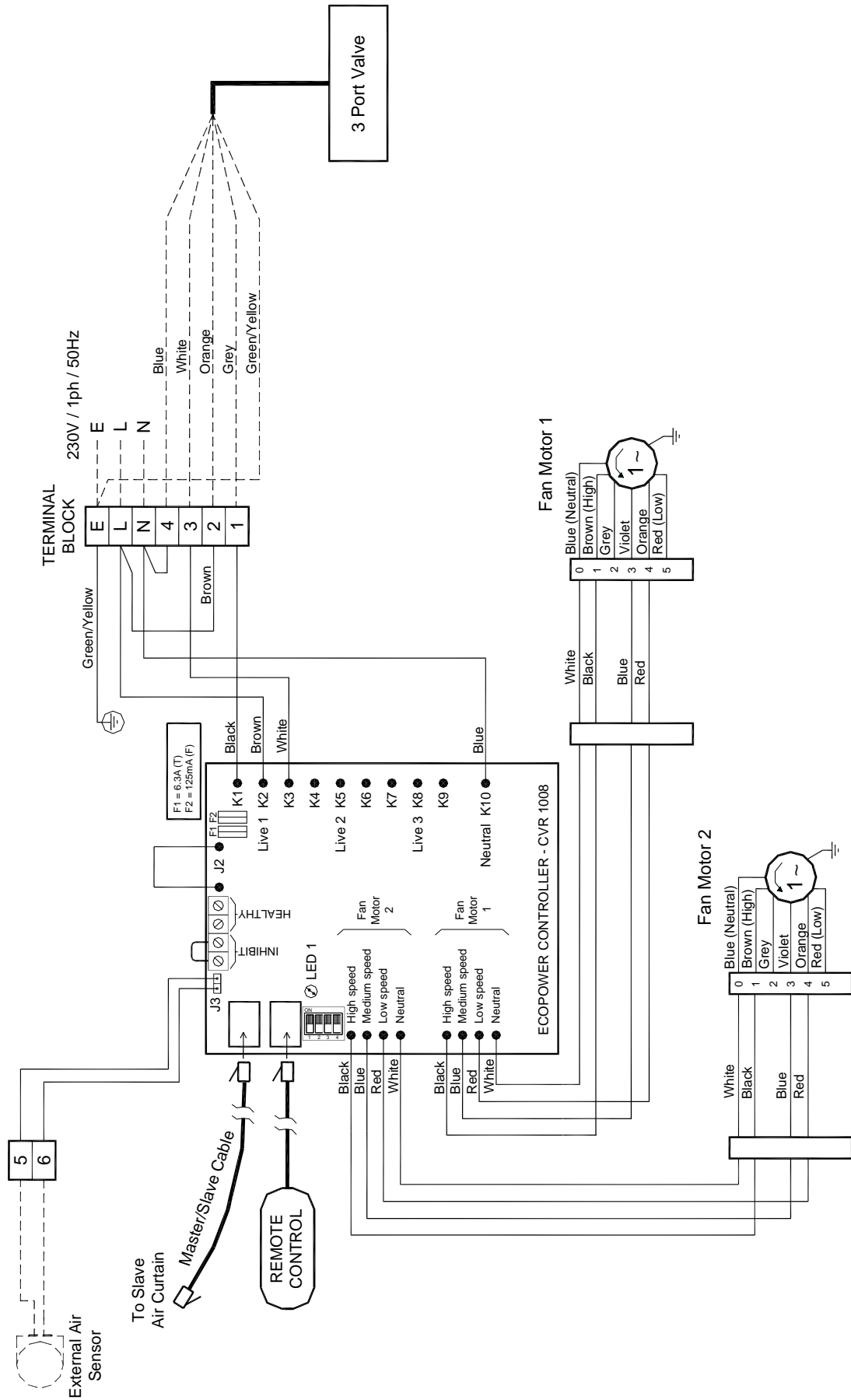
APPENDIX 2A — WIRING DIAGRAM -HX1000ER



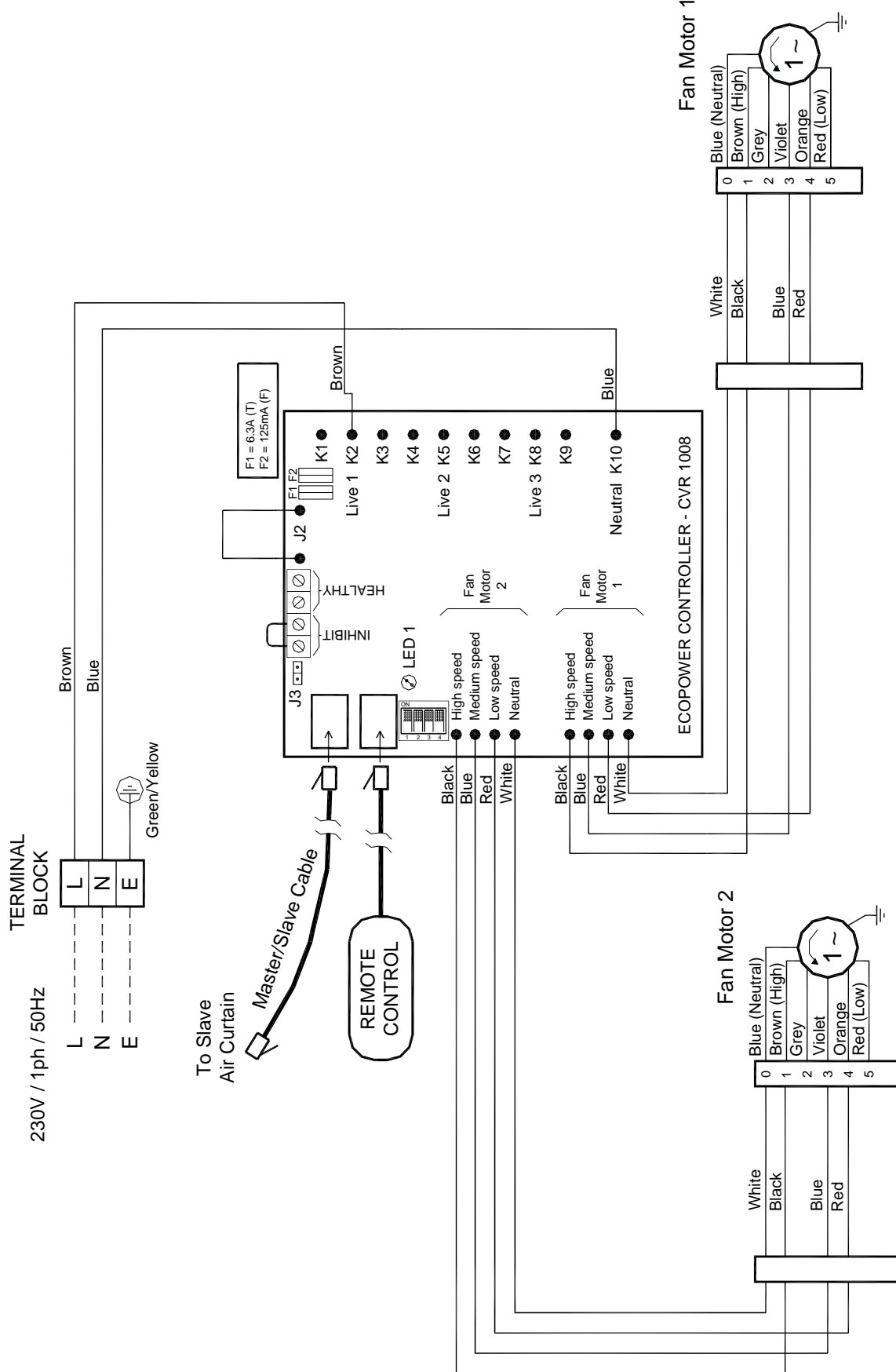
APPENDIX 2B — WIRING DIAGRAM HX1500ER



APPENDIX 2C — WIRING DIAGRAM HX2000ER



APPENDIX 2D — WIRING DIAGRAM HX1000WR, HX1500WR and HX2000WR



APPENDIX 2E — WIRING DIAGRAM HX1000AR, HX1500AR and HX2000AR

20. DECLARATION OF CONFORMITY

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EC DECLARATION OF CONFORMITY

as defined by the EC Council Directive on Machinery 2006/42/EC, the Low Voltage Directive 2006/95/EC, Electromagnetic Compatibility Directive 2004/108/EC, the Pressure Equipment Directive 97/23/EC, the Energy related Products Directive 2009/125/EC

Herewith we declare that the air movement equipment designated below, on the basis of its design and construction in the form brought onto the market by us in accordance with the relevant safety, health and performance requirements of the Machinery.

If alterations are made to the machinery without prior consultations with us, this declaration becomes invalid.

Designation of Equipment: AIR CURTAINS

Series Type: HX1000A; HX1000E; HX1000W; HX1500A; HX1500E; HX1500W;
HX2000A; HX2000E; HX2000W
(in Casing Styles: Surface Mount, Recessed, Concealed)

Relevant EC Council Directives: the Machinery Directive (2006/42/EC)
the Low Voltage Directive (2006/95/EC)
the Electromagnetic Compatibility Directive (2004/108/EC)
the Energy related Products Directive (2009/125/EC)

Applied Harmonised Standards: Machinery - EN ISO 14121-1:2007, EN 294:1992, EN 414:2000
LVD - EN 60335-1:2002, +A14 incorporating A1, A2, A11, A12 & A13, EN 60335-2-30:2009, EN 60335-2-40:2003,
EMC - EN 61000-6-1:2007, EN 61000-6-3:2007,
EN 61000-3-2:2006 + A2:2009, EN 61000-3-3:2008
ErP - ISO 5801:2007, ISO 12759:2010

Basis of Self Attestation: Quality Assurance to BS EN ISO 9001: 2008
B.S.I. Registered Firm Certificate Number FM 85224
SGS Test Report ELS150049/2/R/DC/11; GL Test Report TR/09/149;
SGS Test Report DUR43601/1/EMC/ST/05

Responsible Person: Mr. P. Casey, Site Managing Director, Thermoscreens Ltd.

Date: 1st January 2013

Signed:

A handwritten signature in blue ink that reads "Phil Casey".