COMMERCIAL FAN HEATER
INSTALLATION AND OPERATING MANUAL

CATALOGUE NUMBERS: CH06CSiRX, CH06CPiRX, CH09iRX, CH12iRX.

INSTALLATION AND OPERATING MANUAL

All electrical appliances produced by the Company are guaranteed for one year against faulty materials or workmanship. This applies only if the appliance has been used for purposes in accordance with the instructions provided and has not been connected to an unsuitable electricity supply, or subject to misuse, neglect, damage or modified or repaired by any person not authorised by us. This guarantee is offered to you as an extra benefit and does not affect your legal rights.

The correct electricity supply voltage is shown on the rating label attached to the appliance.

Reasonable care has been taken to ensure that this guide is accurate at the time of printing.
In the interest of progress the Company reserve the right to vary specifications from time to time without notice.

Contents

1. General Information

1.1 Warnings

All installations must be in accordance with the regulations. These instructions must be handed to the user on completion of the installation. Installers and service engineers must be able to demonstrate competence and be suitably qualified in accordance with the regulations. To ensure continued and safe operation it is recommended that the appliance is serviced annually. The heater's outlet/inlet grille must not be obstructed during use. Any modifications made to the unit not approved by Consort will void manufacturer's warranty and potentially create a hazard. The appliance is NOT intended for use by persons (including children) with reduced physical, sensory or mental capabilities or lack of experience or knowledge unless they have been given instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance. Parts of the heater can become very hot when in operation and cause burns. The heater is not suitable for spot heating in large rooms with a low ambient temperature.

1.2 Health and Safety

Please read these instructions thoroughly before installing the appliance. Sole liability rests with the installer to ensure that all site safety procedures are adhered to during installation. Sole liability rests with the installer to ensure that protective safety wear such as hand, eye, ear and head protection is used during installation of the product. Ensure that all anchoring points are suitable for the weight of the appliance.

1.3 Electrical Supply

This heater must be permanently connected to the electricity supply via an isolated switch. It must provide all-pole disconnection and have a 3mm gap on each pole.

There are no exceptions.

All units must be wired in accordance with I.E.T. regulations for the Electrical Equipment of Buildings.

BMS control, time switches and door interlocks can be installed at the discretion and responsibility of the installer.

Follow section 7 'technical specification' for more details.

1.4 Location

Ideal for large areas such as large offices, warehouses, factories, large workshops and many other commercial applications. Care must be taken to allow complete free air movement into the inlet grilles of the unit to ensure correct working operation of the heater. The discharge opening should be pointed towards the heated area. The heater must always be installed horizontally, using the mounting bracket provided. This ensures correct positioning and adequate clearance.

1.5 Clearance Distance

It is recommended that a minimum clearance of 50mm is allowed above the heater and minimum of 300mm on each side. The clearance allows for the air inlet. It also prevents surfaces overheating.

The minimum mounting height (floor to bottom of the heater) is 2m. The maximum mounting height is 3.4m.

1.6 Standards

The heater conforms to the following standards

Electrical Equipment (Safety) Regulations 2016 SI. 2016 1101

Electromagnetic Compatibility Regulations 2016 SI. 2016 No. 1091

Radio Equipment Regulations 2017   SI. 2017 No. 1206

The Ecodesign for Energy Related Products and Energy Information (Amendment) (EU Exit) Regulations 2019. SI. 2010 2617

The Restriction of use of Certain Hazardous Substances. SI. 2012 No. 3032

2. Introduction

2.1 Introduction

This instruction manual describes the commercial fan heater range from Consort. These heaters are robustly designed for use as space heating in large areas. With a maximum heat throw of up to 11m depending on the room temperature and selected fan speed, they are ideal for areas such as garages, workshops and warehouses.

Each heater is equipped with intelligent fan control, allowing the heater to adapt to the environment by automatically adjusting the fan speed. The heater provides instant directional warmth and has a fan-only setting for air circulation. The heaters are wall mounted with multi-directional brackets.

Heaters are available in 6kW, 9kW and 12kW rating. There are two versions of the 6kW heaters available, single and 3 phase. The heaters can be controlled by either CRXSL wireless controller or CHMC colour touch screen master controller. For larger areas, up to 8 heaters can be easily interconnected using CAT5/CAT6 RJ45 networking cable when used together with CHMC controller. The heaters can be also controlled by BMS using MODBUS control system.

It is recommended that this control cable is run separately within its own trunking to avoid external interference. The total length of RJ45 cable in the system should not exceed 50m. It may work beyond this length, however this would need to be tested.

The controllers aren't supplied with the heaters and have to be purchased separately.

> ⚠ **WARNING:**
>
> THIS HEATER SHOULD <u>NOT</u> BE INSTALLED WHERE THERE IS A **CORROSIVE ATMOSPHERE** OR **EXCESSIVE DUST**.

2.2 CRXSL/HRXSL wireless controller

The wireless controllers (not supplied with the heater) can control any number of CH heaters within its range. It has a large easy-to-read backlit LCD display and offers up to six temperature settings a day, seven days a week. The controllers can also provide three levels of heat and 3 fan speeds in manual control mode. Follow CRXSL or HRXSL user guide for more details.

2.3 CHMC Controller

The CHMC colour touch screen controller (not supplied with the heater) gives options for 8 fan and 8 heat settings together with accurate temperature control.

The electronic touch screen controller (shown on the picture below) allows the user to control either a single heater, or a network of up to 8 heaters with individual settings. It is compatible with Consort Connect app allowing for remote control and monitoring of the heating.

The controller is designed to be mounted on a surface double gang back box, and is powered by an RJ45 connection. **The controller will not fit metal or dry lining back box.**

Up to two environmental sensors CHES or 1 MCBMS + 1 CHES device can be connected to the heaters when used together with CHMC controller.
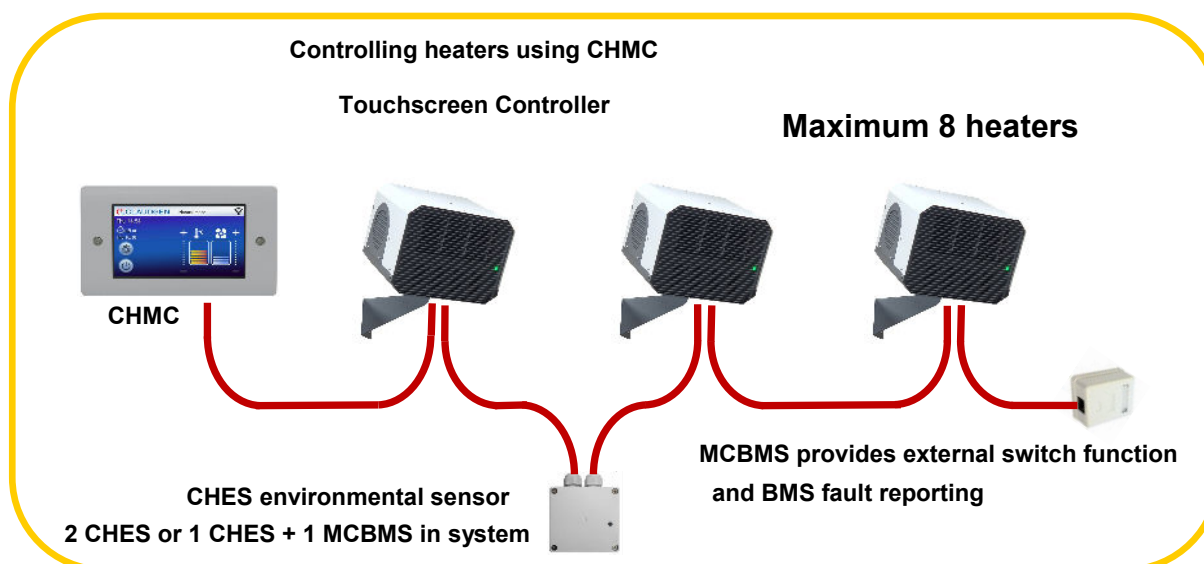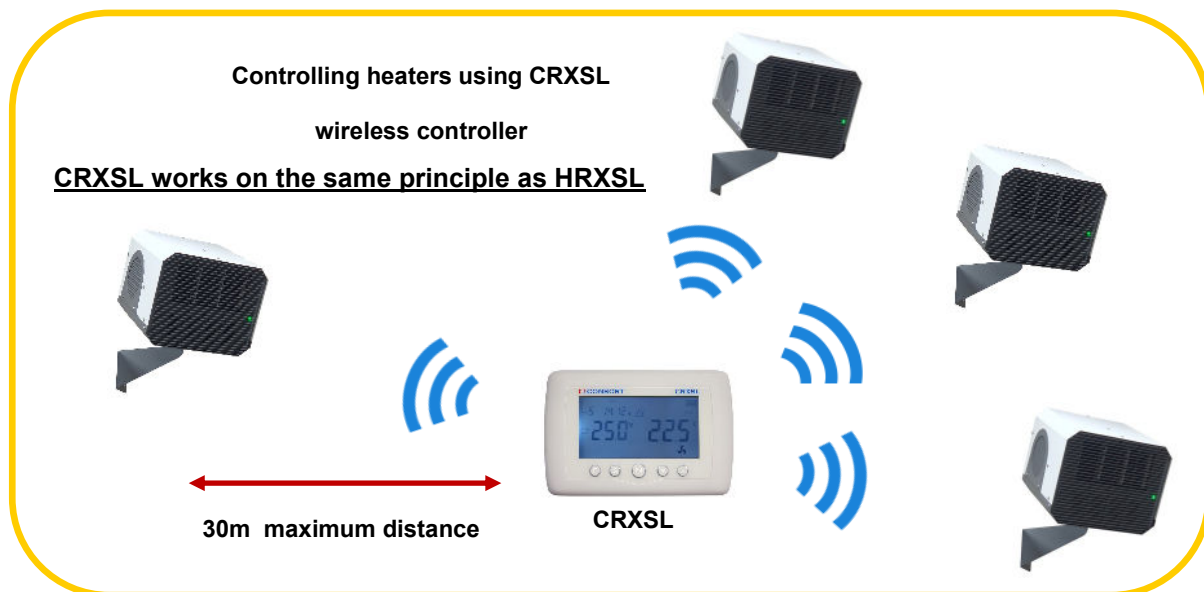
Environmental sensors offer 4 functions; remote temperature measuring, motion detection, error reporting and an external remote or boost switch connection. All functions are fully programmable and can be associated with any heaters in the system.

The MCBMS provides external switch functionality and BMS fault reporting. It **MUST** be installed at the end of the system as shown on page 5.

2. Introduction

2.4 Controllers

Controlling heaters using CRXSL

wireless controller

CRXSL works on the same principle as HRXSL

30m maximum distance

CRXSL

Controlling heaters using CHMC

Touchscreen Controller

Maximum 8 heaters

CHMC

MCBMS provides external switch function and BMS fault reporting

CHES environmental sensor
2 CHES or 1 CHES + 1 MCBMS in system

3. Intelligent Fan Control

3.1 Automatic speed control

The intelligent fan control incorporates one of the latest low energy consumption EC motors. This allows the heater to operate quietly, whilst still providing the best possible levels of comfort.

The intelligent fan control is only activated when the heat is switched on. If the heater is running in fan/boost mode only (heat switched off), then the fan will operate at a fixed speed.

When activated, the intelligent fan control detects the temperature of the room and, depending on which heat mode is activated, it will calculate the best possible airflow and adjusts the fan speed accordingly.

In order to maintain a constant airflow temperature, the fan runs at a lower speed when the ambient temperature is low and will speed up as the room gets warmer. This will result in reduced throw at low room temperatures.

NOTE: When turning the heater on, or changing heat mode or fan speed mode, the fan will respond accordingly after a short time delay.

4. Selecting heater controls

4.1 CRXSL or HRXSL Controller

The heater has to be configured for a selected control method at the time of installation. Only 1 control method can be used at the same time. To control heater using the CRXSL or HRXSL controller the DIP switch 1 located under the electrical connections cover has to be set to '1' as on the picture below.
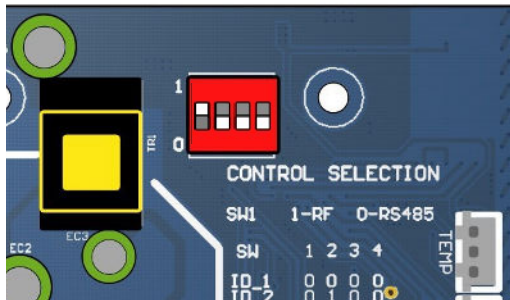
4.2 Pairing to wireless Controllers

This must be done, otherwise the heaters will not work.

Power up the CRXSL wireless controller (see user instructions for CRXSL for details).

Set heater into pairing mode as follows:

Locate the status light.
Turn power to the heater on. The light should be green. Now, the heater is ready for pairing for the next 20 seconds. After 20 seconds, it will return to normal operating mode and pairing will not be possible. (Heater must be powered off, and then back on again in this case)

To pair heater with CRXSL, Press and hold (P) and (M) buttons together until display shows CRXSL identification code.
Press the (P) button. This must be done within 20 seconds from powering up the heater. The screen on the controller should flash.

To pair the heater to HRXSL, press and hold 'PROG' and 'MODE' button together until the display shows a identification code.

The heater will turn on momentarily if pairing was successful.
For more information, please follow instructions provided with the controller.

4.3 Heater status indication

Light colour	Heater status
🟢	Heater is in stand-by mode/ not receiving signal from controller. Heater is ready for pairing with controller. See section 4 "Selecting heater controls" for details.
🟣	Heater paired successfully - Solid Purple light for 5 seconds
🟠	Reduced heat output
🔴	Full power heat output
🔵	Heater is in fan only mode
⚪⚪	If the LED is flashing white, there is a fault. The unit will continue to function in restricted mode. However, in specific circumstances, the unit will stop running. See section 9 for more details .

4.4 Operation of CRXSL

The CRXSL controller will come factory set in temperature control mode. This can be changed to manual operation mode which simulates a 4-switch box. In this mode, the temperature control is disabled and the controller doesn't have to be installed in the same location as the heaters, however they must still be within the wireless range.

To switch to manual mode, press and hold the (M) & (S) icons for 5 seconds to access the setup menu. Use (M) icon to navigate through the menu. Navigate to option 6, and change the value to 2, this will change your controller to manual/timer mode.

The fan speed F0, F1, F2 or F3 is displayed on the left side of the display. Press (S) to cycle through the fan settings.

The heat setting H0, H1, H2 or H3 is displayed on the right side of the display. Press **UP** or **DOWN** buttons to adjust the heat setting.

In Manual Control Mode, many of the functions of the CRXSL are very similar to automatic mode, except that the fan and heat settings are adjusted instead of the set temperature.

4. Selecting heater controls

4.5 CHMC Controller

The heater has to be configured for a selected control method at the time of installation. To control the heater using a CHMC controller the DIP switch 1 located under the electrical connections cover has to be set to '**0**' as on the picture.

4.6 Connecting heaters to the CHMC

The CHMC is connected to the heater by CAT5/CAT6 RJ45 cable. The RJ45 connector is located under the terminals cover on the bottom of the heater. There are 2 equal RJ45 connectors in each heater. The controller can be connected to either one. The second connector is used If there are additional heaters in the system for a daisy chain connection. Controller is powered via the RJ45 connector.

⚠️ **Each heater in the system must be set to unique ID. This is selectable by DIP switches 2,3 and 4.** ⚠️

5. Dimensions & Fixing locations

Figure 1: Dimensions

6. Installation Details

6.1 Mounting

It is the sole responsibility of the installer to ensure that the points of attachment to the building are sound. Consultation with the consultant/architect or owner of the building is recommended to ensure that a sound, mechanically stable installation is achieved.

Before fitting or wiring the heater, ensure that the casing faces as shown in Figures 1&2, and follow these installation guidance notes.

The wall bracket is secured to one of the inner cardboard box corners. Cut the plastic bag to remove it. All fixing screws are attached to the side of the inner cardboard box.

The heater must always be installed horizontally, using the mounting bracket provided. This ensures correct positioning and adequate clearance.

Assemble the swivel bracket as shown on Figure 2. Use M8 and M5 bolts with locknuts and washers as supplied in bag. Attach the assembled bracket to the bottom of the heater by using 4 x M6 bolts with plain and spring washers as shown on Figure 3.

Secure the wall bracket to the wall with suitable fixings. Ensure the position of this bracket will allow suitable clearances between the heater, when fitted, and adjacent walls. Minimum of 3 fixings must be used to secure the wall bracket to the wall. Attach the heater to the wall bracket.

Finally, adjust the direction of the heater to the desired area and tighten up all clamping nuts and bolts.

Care should be taken when choosing a position (CRXSL only). Ideally there should be a clear line of sight between the heater and controller. If the signal has to travel around corners, walls or any metal objects it will decrease the range.

Ensure that the heater is fixed to a secure wall, within the mounting height limits stated in 'clearance distances'. Mount the heater as shown in Figure 1.
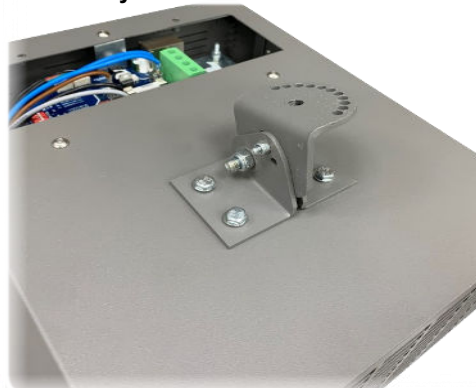
The angle of the heater can be adjusted in steps, 22.5 deg. vertically and 180 deg. horizontally.

The weight of the heaters is approximately 10kg

Figure 2: Swivel Bracket Assembly

Figure 3: Swivel Bracket to Heater Assembly

6.2 Electrical connections

(CH06CSiRX): The heater is suitable for connection to 230-240 Volts single phase 50Hz supply. The heater consumes approximately 6kW on the full heat setting. The maximum current draw is 25A.

(CH06CPiRX, CH09iRX/12iRX): The heaters are suitable for connection to a 400-415 volt 3 phase 50Hz supply only.

The maximum current draw for the 06CPiRX model is approximately 8.3A, per phase for a three phase connection.

The maximum current draw for the CH09/12 model is approximately 12.5A, 16.6A per phase.

The heater consumes approximately 6kW, 9kW, 12kW (CH06CPiRX, CH09iRX / 12iRX models respectively) on the full heat setting.

Earth terminals are adjacent to the terminal block and are clearly marked with the earth symbol. A good earth connection must ALWAYS be made to the heater.
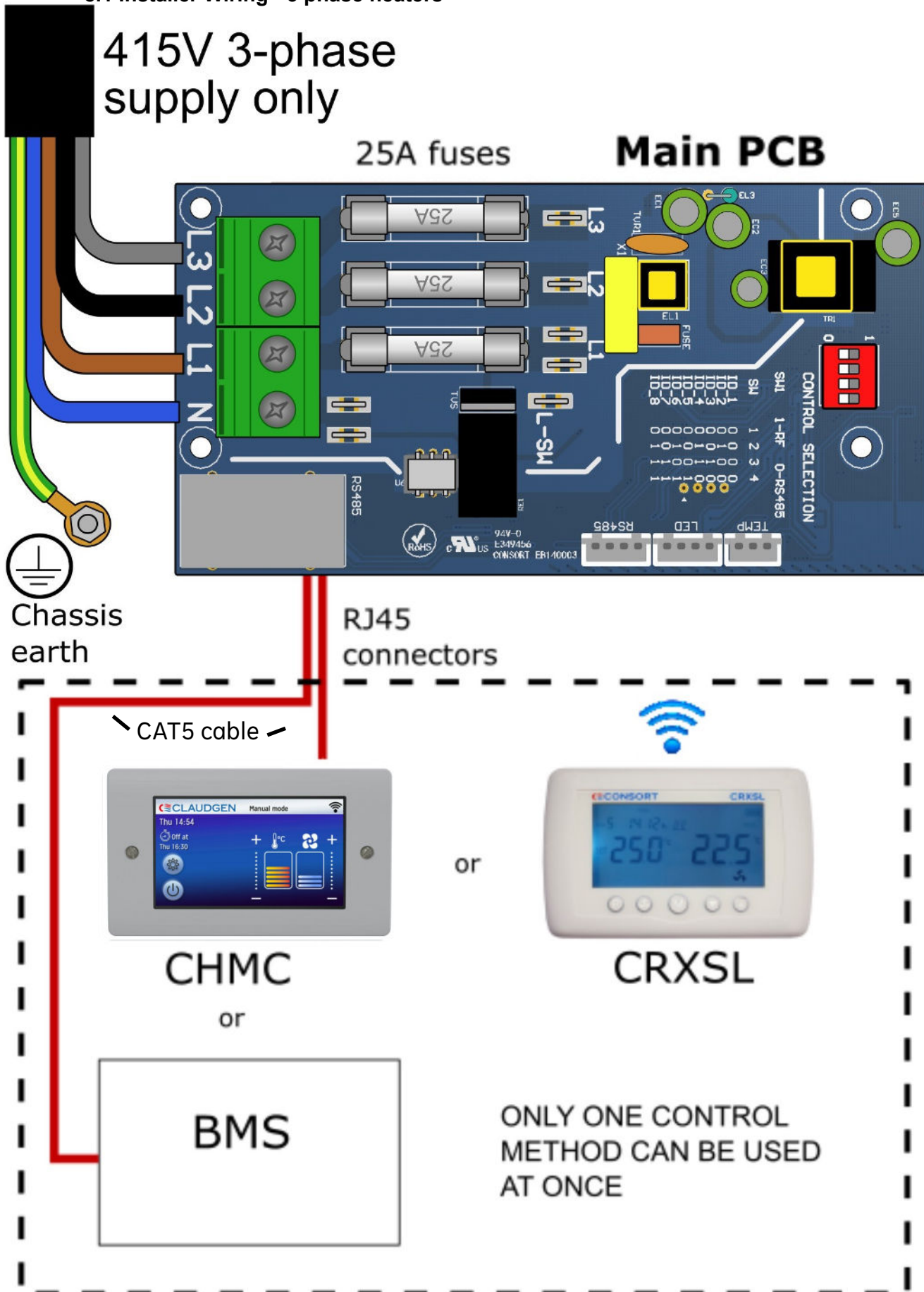
7. Technical Specifications

7.1 General Data			CH06CPi	CH09CPi	CH12CPi
Installation height	M		2 - 3.4		
Heat medium			Electric heating element		
Heat output	kW		6	9	12
Fan type			EC centrifugal fan 133-190		
Fan control			Electronic fan speed control		
Heat switching			Solid state electronic control		
Weight	kg		10	10	10
Electrical Data					
Supply voltage			415V ~ 3ph 50Hz only		
Total load	kW		6	9	12
Max current per phase	A/pha		8.5	13	16.5
Max motor power	W		120	120	120
External fuse size amps	A/pha		16	16	20
Controller			CRXSL wireless or CHMC Touch screen controller		
Controller wiring			CAT5 / CAT6 with RJ45 connectors		
Cable terminal size			10mm ²Max		
Mains terminal block position			Bottom of the heater. Terminals N; L1; L2 & L3		
Control terminal position			Centre of base unit		
Air Data					
Air volume	*Max speed*	m³/h	900	900	900
Air velocity	*Max speed @ 0M*	m/s	9.5		
Noise level @ 3m	*Max speed*	dBA	60		
	Min speed	dBA	50		
Dims Data					
Width	mm		332		
Depth	mm		338		
Height	mm		272		

7. Technical Specifications

7.2 General Data			CH06CSi		
Installation height		M	2 - 3.4		
		M			
Heat medium			Electric heating element		
Heat output		kW	6		
Fan type			EC centrifugal fan 133-190		
Fan control			Electronic fan speed control		
Switching type			Solid state electronic control		
Weight		kg	10		
Electrical Data					
Supply voltage			240V ~ 50Hz single phase only		
Total load		kW	26		
Max current		A/pha			
Max motor power		W	120		
External fuse size amps		A/pha	32		
Controller			CRXSL wireless or CHMC Touch screen controller		
Controller wiring			CAT5 / CAT6 with RJ45 connectors		
Cable terminal size			10mm ²Max		
Mains terminal block position			Bottom of the heater. Terminals N; L		
Control terminal position			Bottom of the heater.		
Air Data					
Air volume	*Max speed*	m³/h	900		
Air velocity	*Max speed @ 0M*	m/s	9.5		
Noise level @ 3m	*Max speed*	dBA	60		
	Min speed	dBA	50		
Dims Data					
Width		mm	332		
Depth		mm	338		
Height		mm	272		

8. Wiring Details

8.1 Installer Wiring - 3 phase heaters

415V 3-phase supply only

25A fuses

Main PCB

Chassis earth

RJ45 connectors

CAT5 cable

CHMC

or

BMS

or

CRXSL

ONLY ONE CONTROL METHOD CAN BE USED AT ONCE

8. Wiring Details

8.2 Installer Wiring - single phase heaters

230 - 240V ~
single phase supply only

25A fuses **Main PCB**

L

N

Chassis earth

RJ45 connectors

CAT5 cable

CHMC

or

BMS

or

CRXSL

ONLY ONE CONTROL METHOD CAN BE USED AT ONCE
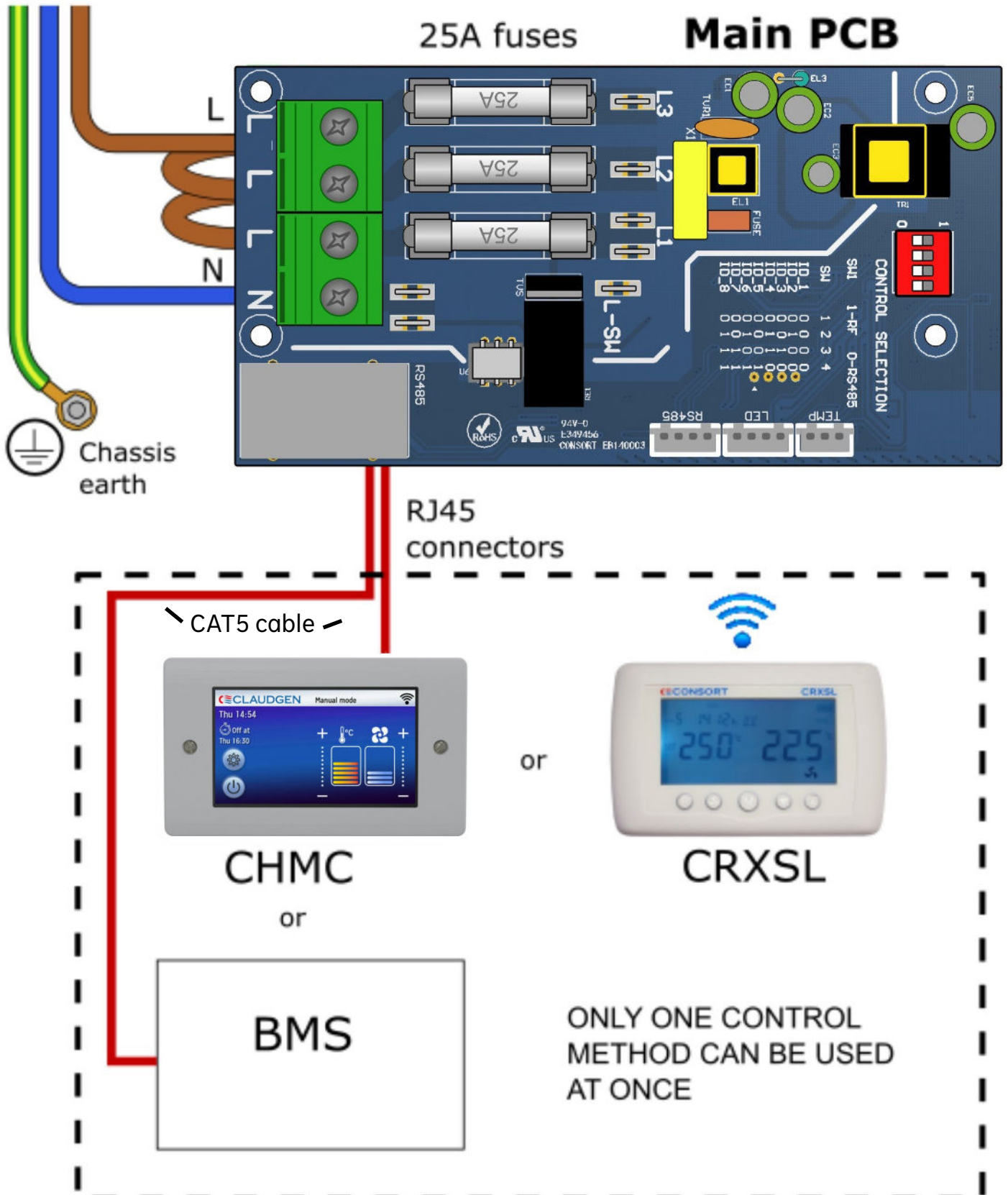
8.3   Factory Wiring - 3 phase heaters

Main PCB

LED

230-240V
single phase supply only

Temperature sensor

CONTROL SELECTION

TEMP   LED   RS485

25A

25A

25A

N L L L

Chassis earth

Secondary PCB

POWER

FAULT

OUT

OUT

- 24V +   MOT DC   N AC   TEMP   DATA1   DATA2

Fan motor

9. Fault detection / indication

9.1 Fault detection

Heaters are equipped with electronic fault detection. In the event of a fault being detected, heater will show the nature of the fault by flashing status LED located at the front of the heater. The LED will flash one of the sequences as shown in the table below. The sequence is repeated every 5 seconds.

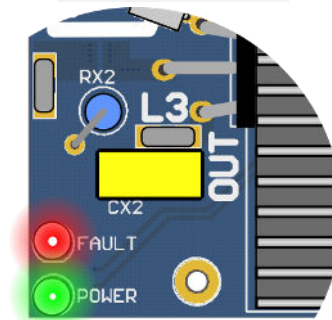| Number of flashes	Fault
1	Overheating detected Response: Power reduced until heater cools down
2	Temperature measurement fault Response: Intelligent speed control disabled, fan speed increased
3	Power not detected when heat switched ON Response: Fan operates as normal Possible causes: missing phase, blown fuse, faulty electronics
4	Problem with motor Response: Heater will not work
5	Power detected when not switched ON Response: Fan runs continuously
6	Internal communication error Response: Heater will not work

9.2 Status indication - main PCB

There are 2 LEDs on the RJ45 connectors indicating that the power is available. If the heater is in stand-by mode, the green LED is ON. If the heater is switched ON the orange LED is indicating that the auxiliary power is available for the electronic.

For fault diagnostic being carried out by a competent person there is an additional fault indication on the secondary PCB.

9.3 Status indication - secondary PCB

A green LED on secondary PCBs shows that there is power available. The red LED will flash one of the sequences as shown in the table below. The sequence is repeated every 5 seconds.

Number of flashes	Fault
1	Power measurement when triacs switched off: Response: Auto run motor
2	Motor fault Response: Disable heating
3	Triac heatsink overheat: Response: Reduce heating
4	Low power measurement when triacs switched on: Causes: Thermal cut-out operated, blown fuse, missing phase

9.4 Over heat protection reset

The heater is equipped with electronic over heat protection and also resettable over temperature cut-outs. There are two cut-outs located on the top of the heating element. In the unlikely event of electronic failure, the mechanical cut-outs will switch off power to the heating element. In order to reset cut-outs, isolate the heater from power and leave heater to cool down.

The cause of cut-outs operating should be investigated before resetting as the only time the mechanical cut-out operates is when electronics can't protect heater from overheating.

10.1 BMS Connection

There are 2 ways for connecting heaters to BMS.
1. Using CHES or MCBMS and external switch as a simple BMS on/off connection. Basic BMS fault reporting is also available with these devices.
2. Using MODBUS protocol.

The heater is compatible with BMS systems using MODBUS protocol.

The connection to BMS system can be made using one of the RJ45 connectors.

Only one means of control can be used at any time. If BMS is used to control the heater, the colour screen controller must not be used.

The BMS can control fan speed and heat output and also read and report the heater status.

Speed can be set in the range of 600 - 1700RPM in 1RPM steps. If the speed is set below 600RPM, the heating element is automatically disabled. Care has to be taken when selecting speed. The fan speed should be always correct for the selected heat output. If the speed is too low, the heater can overheat.

Heat output can be set in the range of 0 - 100% in 1% steps.

10.2 MODBUS Protocol

The DIP switch 1 must be set to OFF or 0 position for BMS control.

The DIP switches 2, 3 and 4 are used to configure each heater with a unique address.
RJ45 cable can be used to network up to 8 heaters in a daisy-chain configuration.

All possible addresses:

1	0000
2	0100
3	0010
4	0110
5	0001
6	0101
7	0011
8	0111

RS485 serial half-duplex interface
MODBUS RTU
9600 baud
8 bits
1 start bit
no parity + 2 stop bits
'mark' parity + 1 stop bit
Supported MODBUS function codes:
0x03 read multiple input registers
0x04 read multiple holding registers
0x06 write single holding register
0x10 write multiple holding registers

16 Bit Input Registers:
1 Status
2 Inlet air temperature/back of the heater
3 N/A
4 Heatsink temperature
5 N/A
6 N/A

Temperatures are formatted as 16 bit signed integers. Units are sixteenths of a degrees Celsius, as used by DS18B20 temperature sensors. The hex value 0xF000 is used to denote an invalid reading.

The status register uses bits to indicate faults:
Bit 0 - overheat
Bit 1 - heatsink overheat
Bit 2 - temp sensor 1
Bit 3 - temp sensor 2
Bit 4 - heatsink temp sensor
Bit 5 - remote temp sensor
Bit 6 - L2 on current low
Bit 7 - L2 off current high
Bit 8 - L3 on current low
Bit 9 - L3 off current high
Bit 10 - motor PSU
Bit 11 - motor
Bit 12 - MCU
Bit 13 - connection
Bit 14 - 12V auxiliary power
Bit 15 - main PCB relay

16 Bit Holding Registers:
1 RPM (units revolutions per minute)
2 Power (units percentage 0 –100)
RPM must be set to at least 600, otherwise heating is disabled.

RJ45 Pins

1. White Green
2. Green
3. White Orange
4. Blue
5. White Blue
6. Orange
7. White Brown
8. Brown
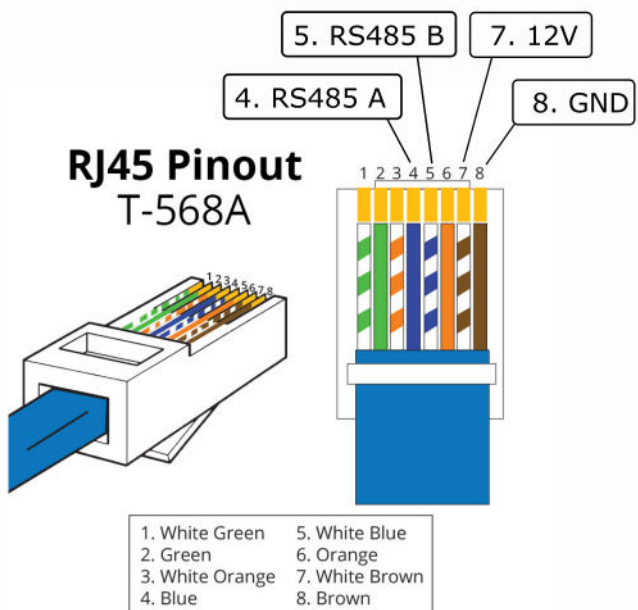
Declaration Of Conformity

In accordance with UK Government Guidance.
WE HEREBY CERTIFY THAT THE APPLIANCES DETAILED HEREON HAVE BEEN INSPECTED AND TESTED, AND CONFORM TO THE REQUIREMENTS OF THE FOLLOWING UK STATUTORY INSTRUMENTS WHERE APPLICABLE:

Electrical Equipment (Safety) Regulations 2016   SI. 2016 1101

Electromagnetic Compatibility Regulations 2016   SI. 2016 No. 1091

Radio Equipment Regulations 2017   SI. 2017 No. 1206

The Ecodesign for Energy Related Products and Energy Information (Amendment) (EU Exit) Regulations 2019.   SI. 2010 2617

The Restriction of use of Certain Hazardous Substances. SI. 2012 No. 3032

The Waste Electrical and Electronic Equipment Regulations 2013. SI. 2013 No. 3113

Security Requirements for 'Connectable Products' PTSI Act 2022

The Product Security and Telecommunications Infrastructure (Security Requirements for Relevant Connectable Products) Regulations 2023

Transposed standards used:

- **BS EN 55014 (2006)**
- **BS EN 301489.1 & .3**
- **BS EN 300220.1 & .2**
- **BS EN 60730.2.9**
- **BS EN 60335.1 (2012)**
- **BS EN 60335.2.30 (2009)**
- **ETSI BS EN 303645**

- **EN 50663 (2017)**
- **EN 60730-2-9 (2010)**
- **EN 60730-1 (2011)**
- **ETSI EN 300 220-1 V3.1.1 (2017-02)**
- **ETSI EN 300 220-2 V3.2.1 (2018-06)**
- **ETSI EN 301 489-1 V2.2.2 (2019)**
- **ETSI EN 301 489-3 V2.1.1 (2019)**

PART NUMBER AND DESCRIPTION OF APPLIANCE: **CH06CSIRX, CH06CPIRX, CH09IRX, CH12IRX**

NAME OF RESPONSIBLE PERSON: **DAVID O'SULLIVAN**
POSITION: **OPERATIONS MANAGER**
DATE: **24/06/24**

bsi
ISO 9001
Quality
Management
Systems
CERTIFIED
FM 12671

51000486 Iss 06