

INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS



Horizontal BPS with



Siemens Control



BOXER PACKAGED SOLUTIONS



FOR THE COMPLETE VENTILATION SOLUTION



BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

CONTENTS - INSTALLATION, OPERATING & MAINTENANCE INSTRUCTIONS

| | PAGE |
|---------------------------------------|------|
| • 1.0 UNIT INTRODUCTION | 3 |
| • 2.0 HEALTH & SAFETY | 5 |
| • 3.0 DELIVERY & RECEIPT OF EQUIPMENT | 6 |
| • 4.0 ERECTION & ASSEMBLY | 8 |
| • 5.0 ACCESS TO UNITS | 11 |
| • 6.0 INTERNAL CONNECTIONS | 13 |
| • 7.0 CONTROL STRATEGY | 14 |
| • 8.0 ELECTRICAL DETAILS | 17 |
| • 9.0 CONNECTION & WIRING DIAGRAMS | 21 |
| • 10.0 FROST COIL | 52 |
| • 11.0 COMMISSIONING | 54 |
| • 12.0 MAINTENANCE | 54 |
| • 13.0 WARRANTY | 56 |
| • 14.0 SPARES & SERVICE | 56 |
| • 15.0 CERTIFICATION | 57 |



SUPPLY & EXTRACT VENTILATION UNIT

INSTALLATION, OPERATING & MAINTENANCE INSTRUCTIONS



1.0 UNIT INTRODUCTION

XBOXER BPS HORIZONTAL MODELS

The information contained in this document provides details of installation, operation and maintenance for installers and users of the BPS packaged AHU units with heat recovery.

BOXER PACKAGED SOLUTION supply and extract unit range. Manufactured from Aluzinc corrosion resistant steel, with 50mm double skinned panels and anodized aluminium frame of a totally thermally-broken design, complying with the following specification in accordance with BS EN 1886: Mechanical strength, D1; Leakage class, L1; Thermal transmittance, T2; Thermal bridging, TB1.

BPS range has high efficiency centrifugal fans with EC motors. High efficiency thermal wheel or plate heat exchanger, Supply G4 pre-filter and F7 main filters as standard with M5 filtration of the extract air. BPS range includes optional heating (LPHW or Electric) and cooling (Chilled water, DX or Reverse Cycle). The Reverse Cycle coil is supplied as standard with Mitsubishi Mr Slim Condenser(s) and inbuilt PAC Control. Note: control wiring and piping by others, thermistor wiring (included). Installation must be carried out by F-Gas approved installer.

A range of ancillaries include – attenuators, weather terminals, recirculation & frost modules.

BPS range is complimented by Ecosmart Control Platform which includes Basic, Classic, Connect & Adapt as standard with a 5 year warranty.

General information regarding performance and specification for the equipment can be obtained from our technical literature, and/or project specific documentation.

CODE DESCRIPTION:

B 8 15 H / L R / AS - L

1 2 3 4 5 6 7 8

1. **BOXER Package Solution Range**
2. **ERP year:** 8 = 2018
3. **Unit Size:** 05, 10, 15 and 20
4. **Heat Exchanger:** H = Horizontal Plate
5. **Heater:** L = LPHW
E = Electric
N = No Heating
6. **Cooling:** R = Reverse Cycle**
X = DX*
C = Chilled Water
N = No Cooling
7. **Control type:** AS = Ecosmart Adapt (Siemens)
CO = Ecosmart Connect
ES = Ecosmart Classic
BC = Basic control
8. **Handing:** L = Left, R = Right

*Condenser Unit and control by others.

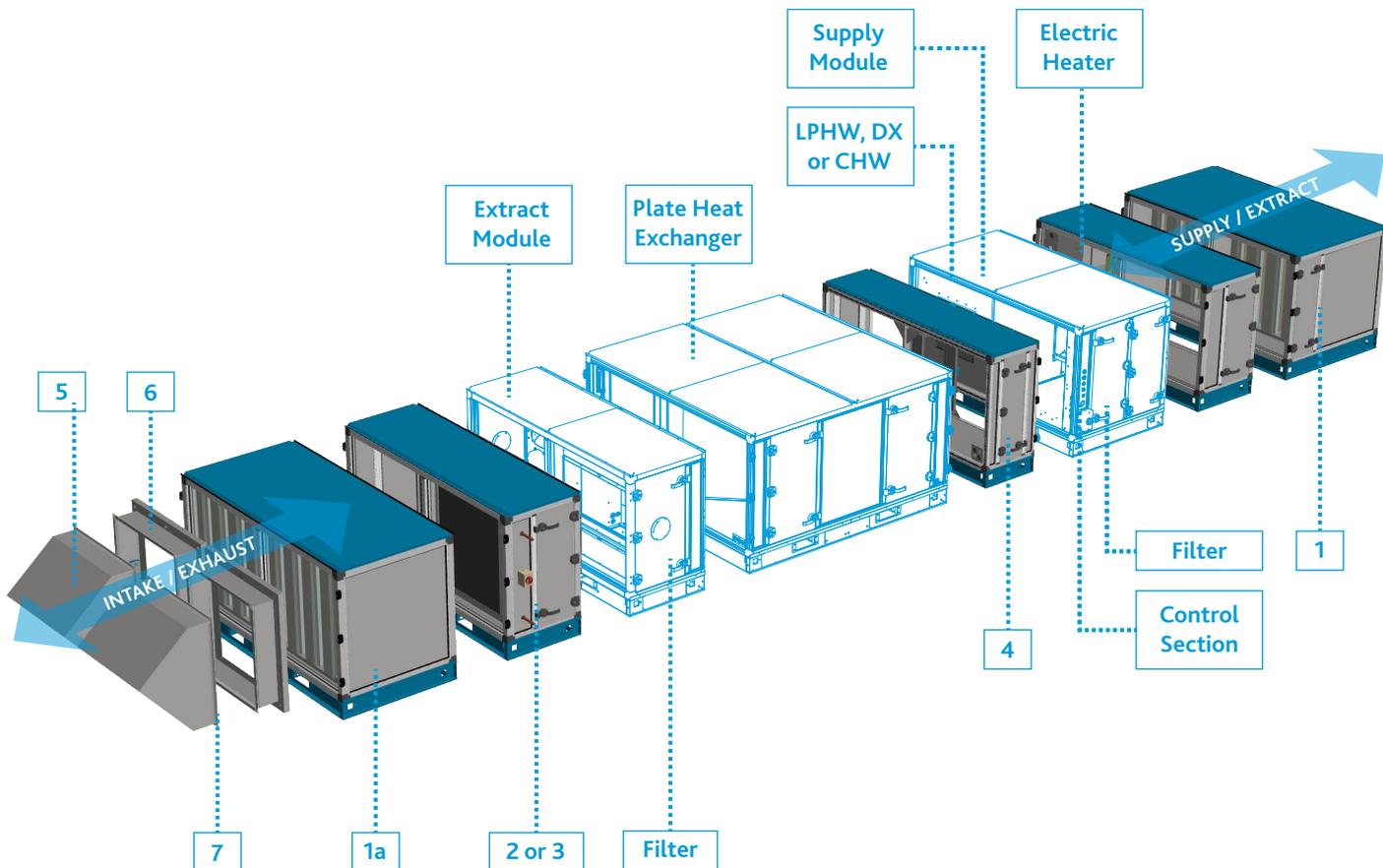
**Ecosmart Connect & Adapt models only.

Figure 1: Horizontal Plate Heat Exchanger unit.



BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

1.1 ANCILLARY OPTIONS (Based on right hand version)



Quick Selection Guide BPS BOXER PACKAGED AHU's - ANCILLARIES

| BPS Unit Module | Part Number | Description |
|----------------------------------------------------|---------------|-------------------------------------------------------------------------------------------|
| Attenuator 1 | B**AH/AR900-R | BPS size **. Attenuator for Supply/Extract, Right Handed, for Horizontal PHX Units. |
| | B**AH/AR900-L | BPS size **. Attenuator for Supply/Extract, Left Handed, for Horizontal PHX Units. |
| Attenuator 1a | B**AH/AA900-R | BPS size **. Attenuator for Intake/Exhaust, Right Handed, for Horizontal PHX Units. |
| | B**AH/AA900-L | BPS size **. Attenuator for Intake/Exhaust, Right Handed, for Horizontal PHX Units. |
| Frost Coil - Electric 2 | B**AH/FE-R | BPS size **. Frost Coil Electric, 36kW, Right Handed, for Horizontal PHX Units. |
| | B**AH/FE-L | BPS size **. Frost Coil Electric, 36kW, Left Handed, for Horizontal PHX Units. |
| Frost Coil - LPHW 3 | B**AH/FL-R | BPS size **. Frost Coil LPHW, Right Handed, for Horizontal PHX Units. |
| | B**AH/FL-L | BPS size **. Frost Coil LPHW, Left Handed, for Horizontal PHX Units. |
| Recirculation Module 4 | B**AH/RM-R | BPS size **. Recirculation Module, Right Handed, for Horizontal PHX Units. |
| | B**AH/RM-L | BPS size **. Recirculation Module, Left Handed, for Horizontal PHX Units. |
| Weather Terminal 5 | B**AH/RT | BPS size **. Weather Terminal, for Horizontal PHX Units. |
| Inlet/Outlet Damper 6 | B**AH/D | BPS size **. Inlet/Outlet Dampers suitable for right or left handed Horizontal PHX Units. |
| Weather Terminal & Inlet/Outlet Damper 7 | B**AH/RTD-R | BPS size **. Weather Terminal & Damper, Right Handed, for Horizontal PHX Units. |
| | B**AH/RTD-L | BPS size **. Weather Terminal & Damper, Left Handed, for Horizontal PHX Units. |

** Insert relevant BPS unit size for the matching ancillary.

2.0 HEALTH & SAFETY

Nuaire intend that this manual and any other supportive documents that may be mentioned should be read and understood by authorised operating and service personnel before performing any task related to the installation, commissioning and maintenance of Nuaire BPS Air handling units and any associated components.

The operative / service personnel should comply with good industry practice, the appropriate authority and conformance with all statutory and governing regulations.

The unit must be manually isolated from the electrical supply and a period of five minutes allowed to elapse before any access door is opened for the purpose of general maintenance.

Sharp edges need to be handled with caution; most of the air handling equipment will contain sharp edges on the internal and external surfaces. Care should be taken to ensure that all personnel are aware of this and precautions are implemented to ensure that no injuries are caused.

To help operating and service personnel perform tasks safely, please pay attention to the notes throughout this document (see below for example).

All notes are designed to alert the reader to potential hazards.

IMPORTANT

Information contained in this format is designed to outline important Notes, Dangers, Cautions and Warnings.

Please ensure that prior to commencing any activity, the following guide lines are adhered to:

- During installation, commissioning, operation and maintenance of an air handling unit, operatives may be exposed to hazards including, rotating components, refrigerants and high voltage electricity. If misused or handled improperly, each of these items has the potential to cause bodily injury or death.
- Identification and recognition of inherent hazards is the obligation of responsible personnel. They must protect themselves and others by proceeding with care and consideration to health and safety measures.
- All risk assessments have been carried out and are in place prior to carrying out any activity.
- The relevant protective equipment and attire is worn by each relevant member of staff.
- That the unit Nuaire have supplied meets the standards written in the technical specification.
- The necessary lifting gear and site plant is available to lift and position the unit in accordance to the technical drawings.
- All electrical equipment is connected and earthed in accordance with I.E.E. Regulations.
- The Plant is fully isolated from the mains supply and allowed to run down for a minimum of five to ten minutes before opening any access door prior to the commencement of any maintenance work.
- When maintenance work is finished, please ensure that the unit is left in a clean state, and all access doors /panels are fastened and locked correctly (Locked handle returned to holder).
- At no point should a unit be used for the storage of tools or working equipment.

IMPORTANT

Component parts are usually not fitted with safety guards i.e. fan inlet. The casing of the unit acts as a protective guard for all component parts.

BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

3.0 DELIVERY & RECEIPT OF EQUIPMENT

All equipment is inspected prior to despatch and leaves the factory in good condition. Upon receipt of the equipment an inspection should be made and any damage indicated on the delivery note.

Particulars of damage and/or incomplete delivery should be endorsed by the driver delivering the goods before offloading by the purchaser.

No responsibility will be accepted for damage sustained during the offloading from the vehicle or on the site thereafter.

All claims for damage and/or incomplete delivery must be reported to Nuaire within two days of receipt of the equipment.

3.1 OFF LOADING AND HANDLING FROM THE DELIVERY VEHICLE

The weight of the unit modules and palletised items are displayed on the packaging.

Some of the modules have an uneven weight distribution, and this will be indicated by labelling where appropriate.

Offloading and positioning of the equipment is the responsibility of the purchaser. Items should only be lifted by competent personnel following appropriate risk assessment.

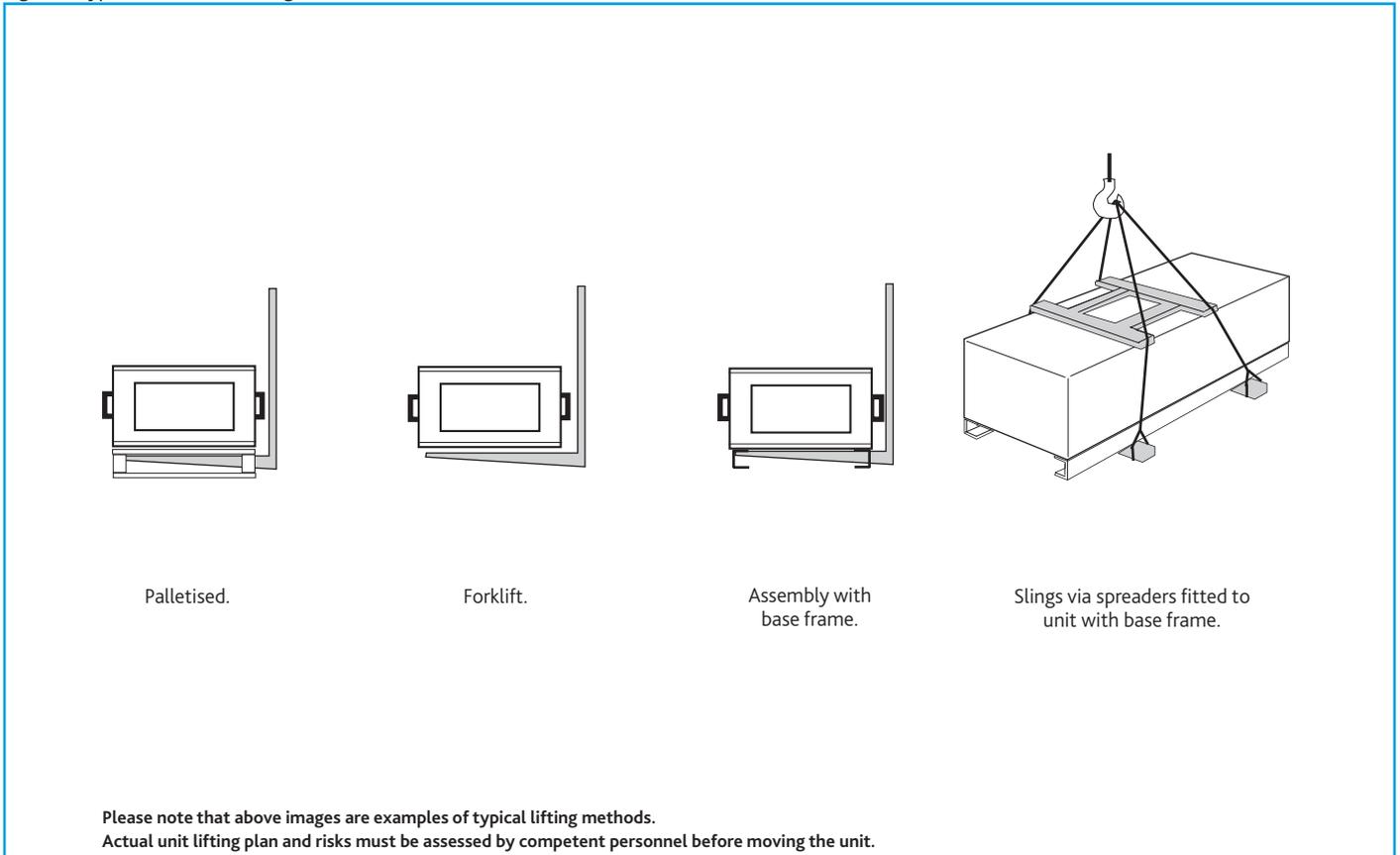
IMPORTANT

To ensure that the delivery vehicle is loaded according to the planned method of offloading, Nuaire should be notified, to ensure coordination.
NOTE: When offloading, care must be taken to ensure that the AHU is kept level at all times.

IMPORTANT

To ensure that no roof damage occurs additional timber packaging must be used.

Figure 2: Typical methods of lifting.



For Base Frame Lifting Points (see 1.2 page 6)

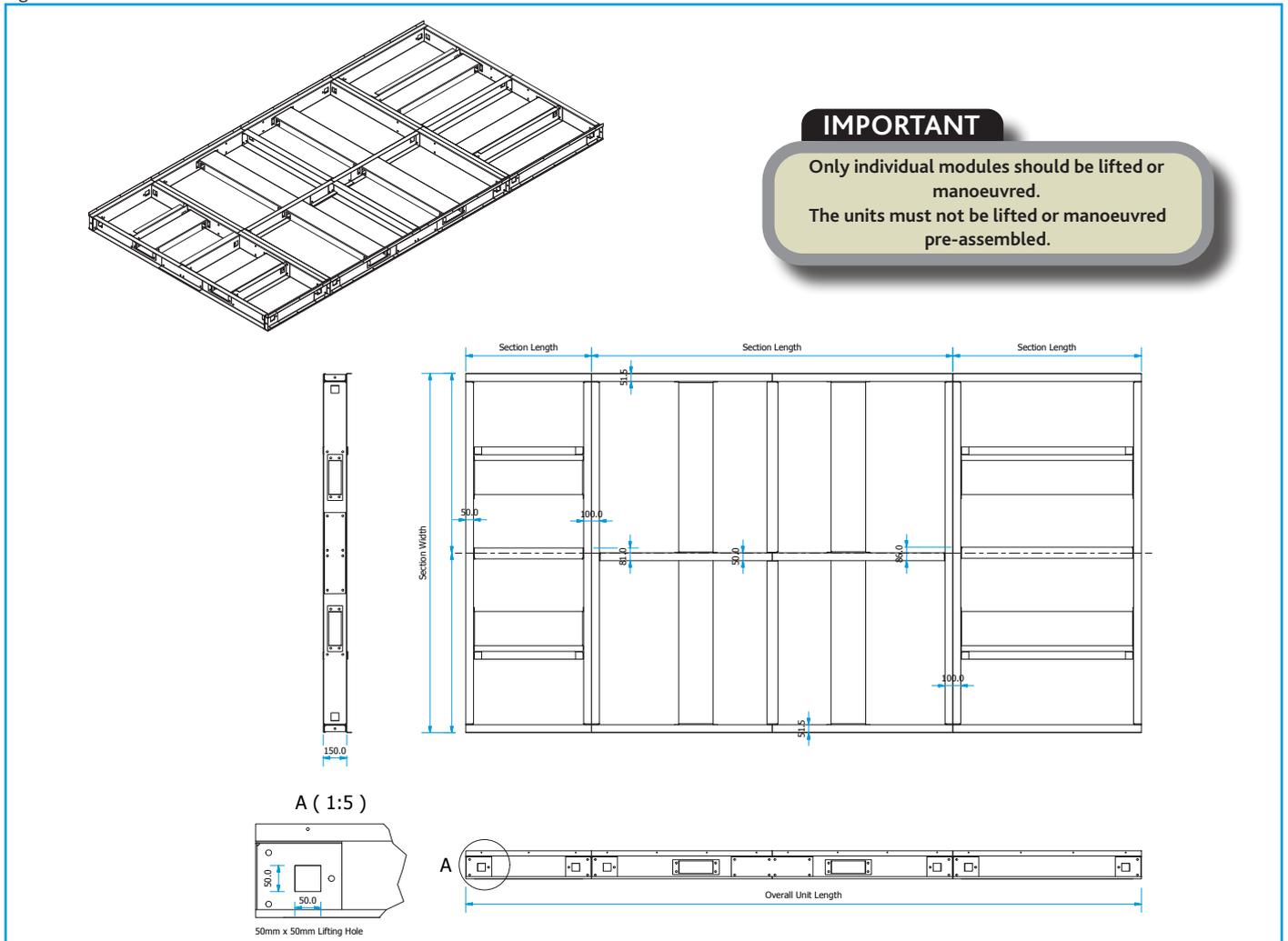
Please refer to figure 3.

3.2 BASE FRAME LIFTING POINTS

When units are constructed of multiple modules each module will have its own individual base frame, which is then connected to the next to assemble the full system.

All base frame sections will have 50mm square lifting holes at the end of each side to enable lifting. In addition to this, covered fork lifting channels are located across the width of the base frame, if the module length is sufficient to allow this. For shorter modules the fork lifting points will be along the length of the section, without a covered channel. Please refer to figure 3.

Figure 3: Base Frame Detail



BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

3.3 UNIT PROTECTION

Unless otherwise specified, unit sections will be delivered to site covered in "shrink wrap" polythene, which should provide a more than adequate level of protection against inclement weather.

Should alternative methods of unit protection be required (i.e. timber, Corex, or flame retardant materials), Nuair Limited should be notified of the specific requirements at the pre- contract stage. Waste must be disposed of by a registered waste carrier in accordance to national regulations.

3.4 UNIT STORAGE

The equipment must be stored in a dry, internal location. Ductwork connection apertures should be sealed against the ingress of dust, water and vermin. Note that units that are intended for external locations are generally not fully weatherproofed until their installation, including ductwork connections, is complete.

If the storage period is to exceed two months, contact Nuair for guidance on the appropriate 'mothballing' procedures. Do not stack units, modules or components.

3.5 LUBRICATION

Motors are fitted with 'sealed for life' bearings and do not require any lubrication. All dampers should be rotated and lubricated as necessary.

4.0 ERECTION & ASSEMBLY

Installation must be carried out by competent personnel, in accordance with good industry practice, with the appropriate authority and in conformance with all statutory and governing regulations.

The unit should stand upright and level on the floor, foundation or supporting steelwork which should be rigid, flat and level and should be capable of supporting the weight of the unit including water or refrigerant in the coils.

Nuair Limited takes no responsibility for the coordination of support.

4.1 UNIT LOCATION

To prevent possible reintroduction of contaminated air through the outside air intake, the unit should be located away from building flue stacks or exhaust ventilators.

Once assembled and in position, sufficient free space must be available adjacent to the unit for future inspection, maintenance, component service, repair and replacement and connection of services.

It is recommended that at least half the unit width (horizontally arranged units) + 100mm be allowed. A minimum of 600mm is required for regular maintenance.

IMPORTANT

Sufficient clearance for U-traps on condensate drain and overflow connections should also be considered by the purchaser.

4.2 AIR LEAKAGE

Loading, transportation, off loading and site positioning can cause the air handling unit structures to move, therefore panel seals will not always remain fully intact.

It is inevitable that in such cases, re-sealing of the units panels and joints may have to be carried out on site for the air-handling units to achieve the required leakage classification.

Door locking mechanisms may also have to be adjusted.

Nuair cannot be held responsible for the units failing a site leakage test if the above have not been carried out correctly.

nuair.co.uk 029 2085 8200

4.3 UNIT JOINTS

After unwrapping, temporarily remove the rubber weatherproof cover strip and M10 base frame bolts from any modules and store in a safe location for later use.

Apply the sealing gasket as necessary to the mating faces of the unit frames. Typically the sealing gaskets are pre-fitted to the heat exchanger module; ancillary modules will be provided with a roll of sealing gasket for on-site fitting.

IMPORTANT

Prior to making the unit joints, you must ensure the base frames of adjoining modules are contiguous (fully touching) along the width of the unit. Failure to do so can result in deformation of the unit frame when using the three axis alignment clamps.

Make the unit joints in the following order:

- Left and right hand side M10 bolts between the modules' base frames (See figure 4a).
- Left and right hand side M6 Lower 3 axis alignment clamps (See figure 4b).
- Left and right hand side M6 Middle 3 axis alignment clamps.
- Left and right hand side M6 Upper 3 axis alignment clamps.

Finally, where the roofs of the two sections meet, the rubber weatherproof cover strip removed earlier must be applied to seal the seam (See figure 5).

Air leakage, air blow marks to the unit casings and unacceptable noise levels could result if the correct installation procedures are not employed.

Figure 4a: M10 baseframe bolt.

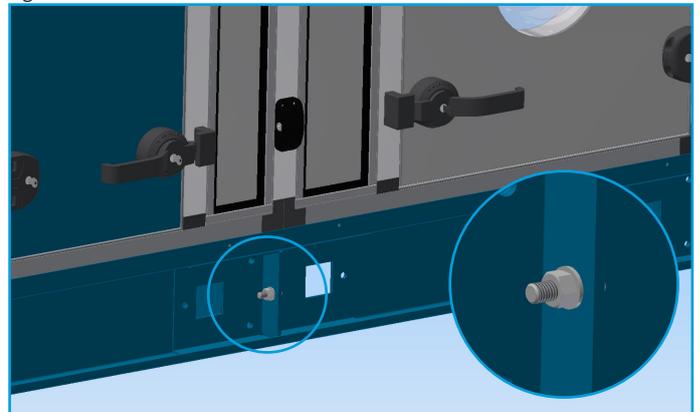
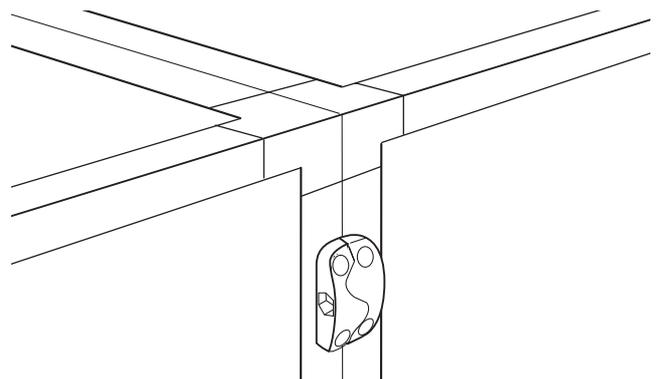


Figure 4b: Three axis alignment clamp.



BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)



4.4 CONDENSATE DRAIN

Plate heat exchanger components and modules that incorporate cooling coils may produce condensation during use. An insulated drip tray and condensate pump is provided where necessary. The drain connection must be connected to a suitable drainage point.

Condensate pump specification

Maximum flow rate = 50 L/H

Maximum head = 20m Vertical, 100m Horizontal

Pipe Connection size (Low Pressure Condensate connection) = 8 mm

4.5 THERMAL WHEEL TRANSPORT PACKAGING

Please note: Thermal wheel transport packing blocks must be removed prior to operation of the thermal wheel module.

4.6 WEATHER RESISTANT UNITS

BPS units are supplied in multiple sections and have weather resistant roof components that must be fitted and sealed after the unit sections are bolted together. All necessary fixings are supplied with each unit and are normally bagged and located within the fan section. Suitable mastic sealant is to be provided by others.

Where the weatherproof roof assembly of two sections meet, the metal hinged weatherproof cover strip must be closed to seal the seam between unit sections and fixed with the bolts provided.

The equipment must not be exposed to the weather in an unassembled or partially assembled state. All roof terminal, ductwork, sealing and assembly work must be completed before the unit can be considered weather resistant.

4.7 CONNECTIONS

4.7.1 DUCTWORK

Nuaire do not provide ductwork connections with units, instead the open ended framework should be utilised. Spigots are available as an option, refer to technical documents for information relating specifically to the manufactured unit.

4.7.2 COILS

When connecting coils, special care is needed to allow for expansion and contractions. Prior to any equalising connection, ensure that the thermostatic expansion valve for the DX coil is securely fitted.

Additional care must be taken when using R32 or other flammable refrigerants: your commissioned system must comply with the requirements of BS EN 378. Units must be fitted with gas detection systems (or deploy other suitable control method) to ensure that, in the event of a refrigerant leak, the Lower Flammability Limit is not exceeded.

Each coil section should be trapped and special care should be taken to ensure that there are no vertical rising condense lines, unless pumped.

Wet pipe connection sizes are listed in the table below.

Figure 5: Coil connection sizes.

| Unit Size | Frost Coil (LPHW) | | Heating Coil (LPHW) | | Cooling Coil (CHW) | |
|-----------|-------------------|--------|---------------------|--------|--------------------|--------|
| | Flow | Return | Flow | Return | Flow | Return |
| 05 | 15 mm | 15 mm | 15 mm | 15 mm | 22 mm | 22 mm |
| 10 | 22 mm | 22 mm | 22 mm | 22 mm | 22 mm | 22 mm |
| 15 | 22 mm | 22 mm | 22 mm | 22 mm | 28 mm | 28 mm |
| 20 | 28 mm | 28 mm | 28 mm | 28 mm | 35 mm | 35 mm |

IMPORTANT

If a frost coil is not fitted then appropriate control methods must be taken to prevent the coils, filters and other equipment from freezing (by others).

4.7.3 CONSTANT PRESSURE

When constant pressure mode control is to be used Constant pressure extract fans are supplied to control the static pressure at the fan inlet. This standard unit set up is suitable for the majority of applications. However, when high pressure ancillaries are fitted to the fan's inlet side, the low pressure tapping must be moved from the fan chamber, to a location upstream of the ancillaries. Failure to do this will result in excessive pressure being applied to the dampers at the rooms when the system is running in trickle mode.

4.7.4 PIPEWORK

Care should be taken to ensure that all pipework is adequately supported, therefore ensuring that no additional weight is added to the unit. Extra precaution should be taken to prevent pipe damage on site, as the fragile pipework will protrude from the side of the unit.

4.8 FILTERS

Filters will be provided in banks on suitable slide rails, so that they can be withdrawn.

Magnehelic gauges are available as optional extras.

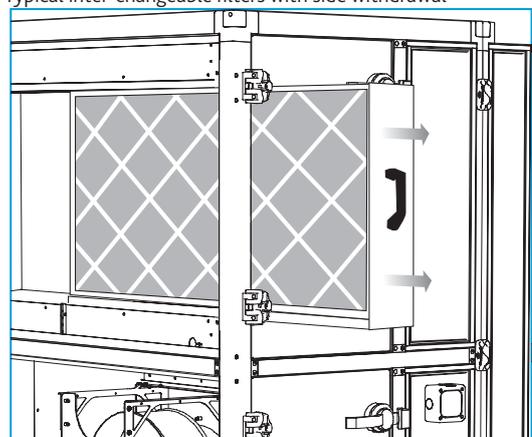
4.8.1 SPARE FILTERS

If specified with order, spare sets of filters will be provided and should be stored in a clean, dry environment. Should you require spare filter media, please contact Nuaire.

4.9.2 PANEL & BAG FILTERS WITH SIDE WITHDRAWAL

If specified with order, spare sets of filters will be provided and should be stored in a clean, dry environment. Should you require spare filter media, please contact Nuaire.

Figure 6: Typical inter-changeable filters with side withdrawal



BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

4.10 CONTROL DAMPERS

Care should be taken to ensure that all spring return actuators have stopped running and completed their stroke. If not, the connection needs to be loosened and the actuator should be left to drive until the motor stops running.

When the unit is powered, dampers should be checked to ensure that they operate freely and close tightly.

Where dampers are protected with a roof terminal, the roof terminal can be removed for access to the main damper. Access to the actuator can be from the side of the roof terminal without the requirement of removing the roof terminal (see figure 7).

Figure 7a: Removing the roof terminal.

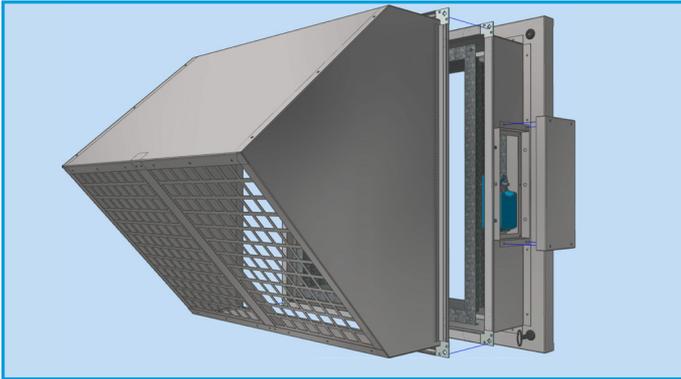
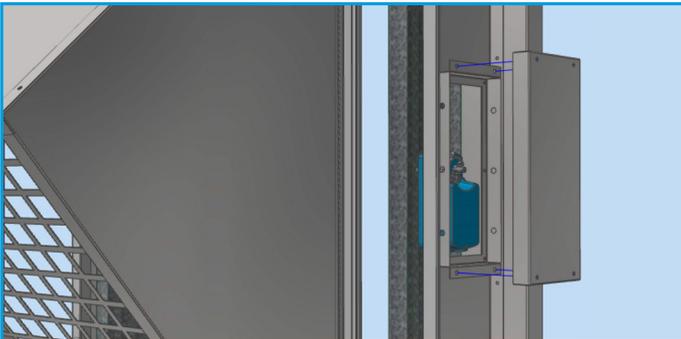


Figure 7b: Actuator Access



4.11 DAMPER/ROOF TERMINAL ASSEMBLY

The inlet/outlet dampers and roof terminals are pre-assembled on a single skinned and insulated panel. The panel is easily fitted to the unit with a series of quarter turns (provided with a locking key) (See fig 8a below).

For the larger size BPS units the pre-assembled dampers and terminals are provided with lifting eyes for on-site hoisting into position (see fig 8b below).

Figure 8a: Inlet/outlet damper/terminal quarter turn fixings.

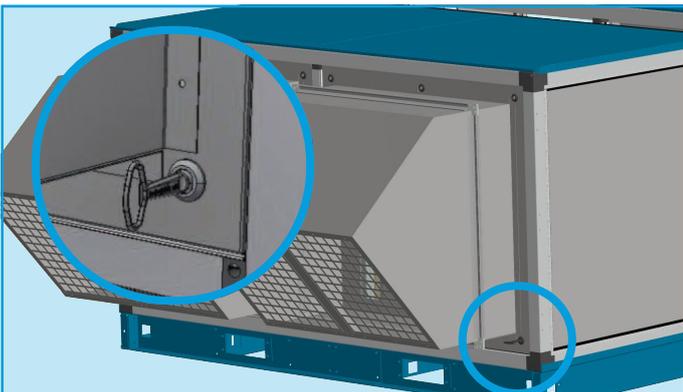
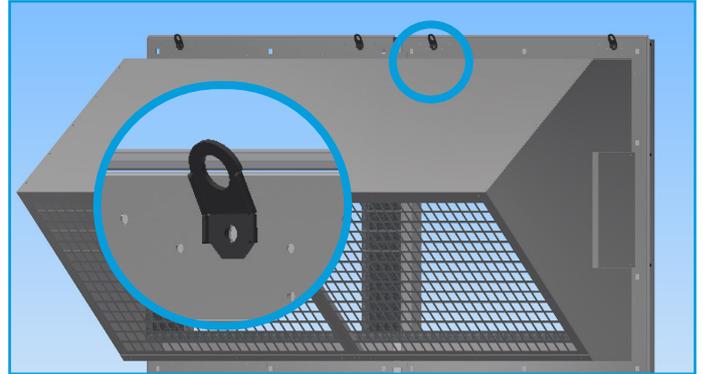


Figure 8b: Typical Inlet/outlet damper/terminal lifting eyes for large BPS units.



4.12 ANCILLARY SUPPORT

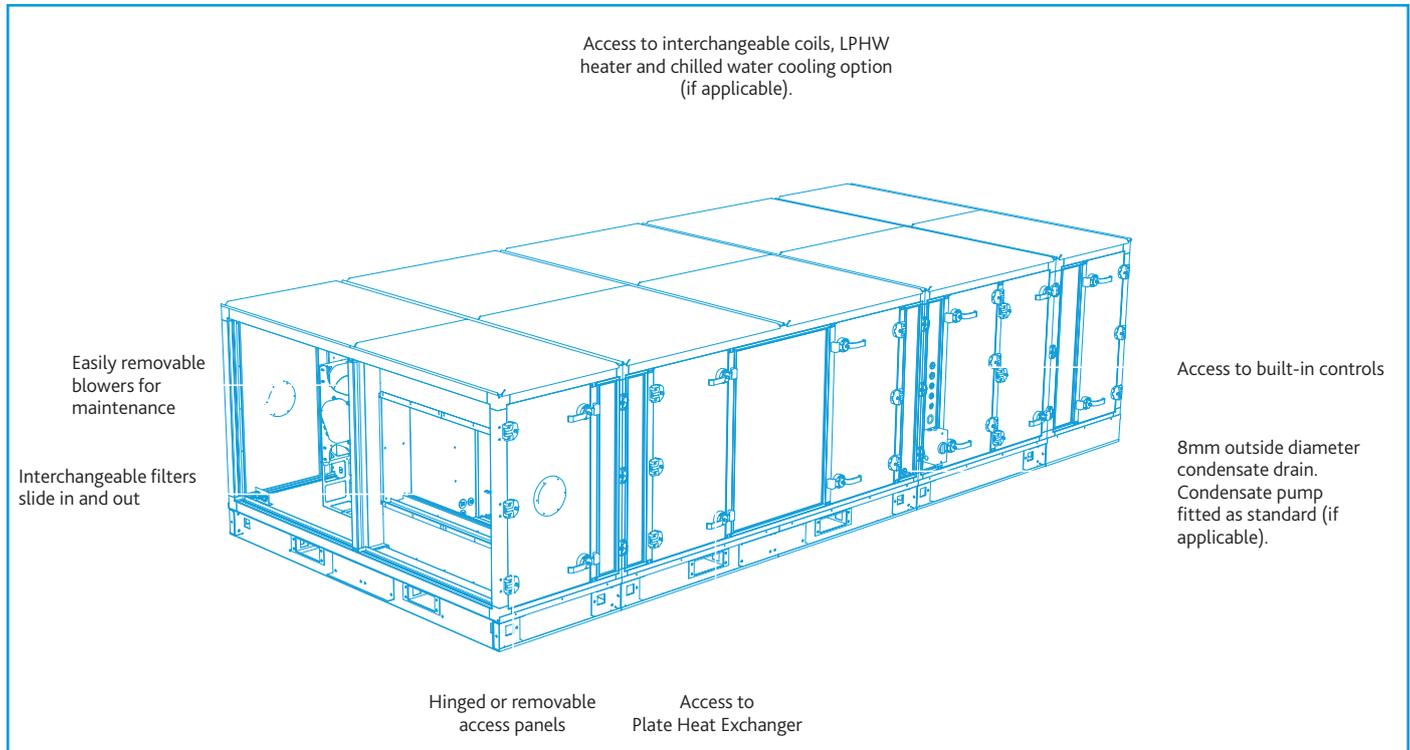
All ancillary items that are supplied without individual base frames require safe suitable support (supplied by others). This includes but is not limited to single attenuators, terminals and dampers etc.

4.13 FINAL INSPECTION

- Thoroughly inspect the unit after installation is complete.
- The inside of the unit should be checked; any objects which may have been left should be cleared.
- Check fan impellers, scrolls and outlets.
- Remove any transit protection fittings that may be attached to the fan or motor base frame, and that all traps are primed.
- Close all access door seals for damage, and replace any panels that have been removed.

5.0 ACCESS TO UNITS

Figure 4: The unit must be installed with at least 600mm clearance from a wall / barrier to gain access from the side. **Isolate before removing panels.**



In this product range, several unique concepts have been implemented with a view to simplifying the installation design.

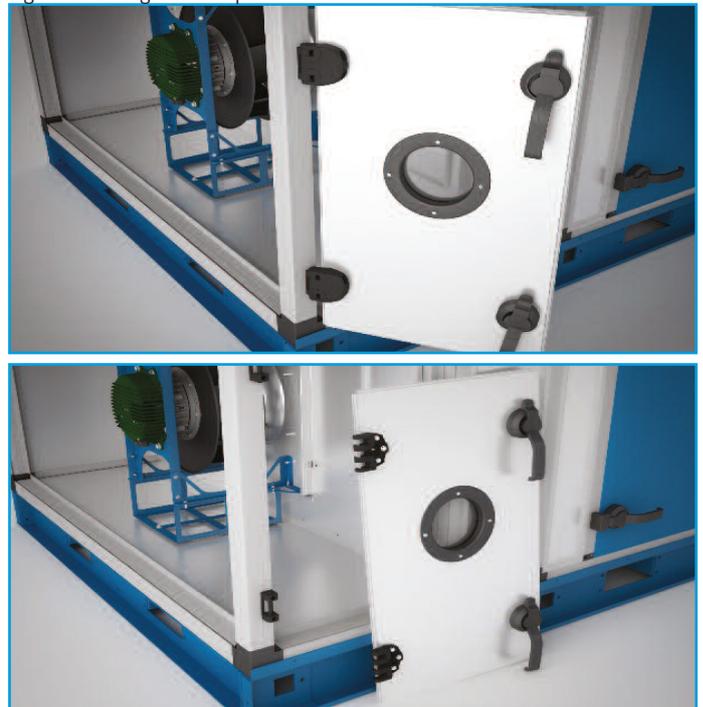
1. The unit must be installed with at least 600mm clearance from a wall/ barrier. With this absolute minimum clearance, the unit may be connected to the power supply and control connection.
2. With this clearance, unit filters may be changed, and the fans coils, heat exchanger and condensate tray may be inspected and cleaned if necessary.
3. The LPHW and Electrical heater settings, coil bleed and drain, and all other control adjustments are similarly accessible.
4. Side access, where possible, is preferred in all cases in terms of safe working access to the equipment under the CDM regulations.
5. Where these arrangements are not suitable, the Consultant's and Contractor's project specific requirements will always be accommodated where possible.

5.1 HINGED OR REMOVABLE ACCESS PANELS

All hinged access panels will be lockable and removable via locked hinges which can be opened for panel removal. All keys are identical and will open any handle or hinge.

The hinges do not need to be unlocked in normal operation of opening and closing.

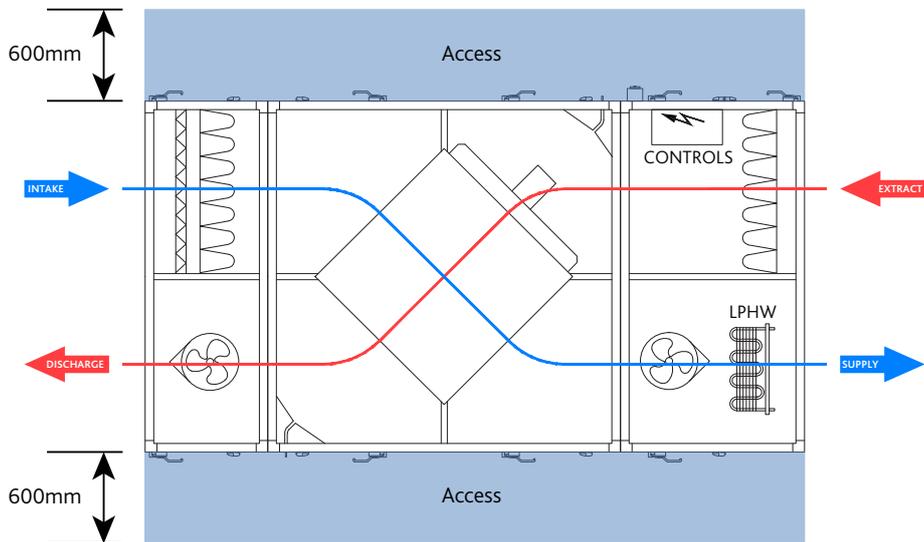
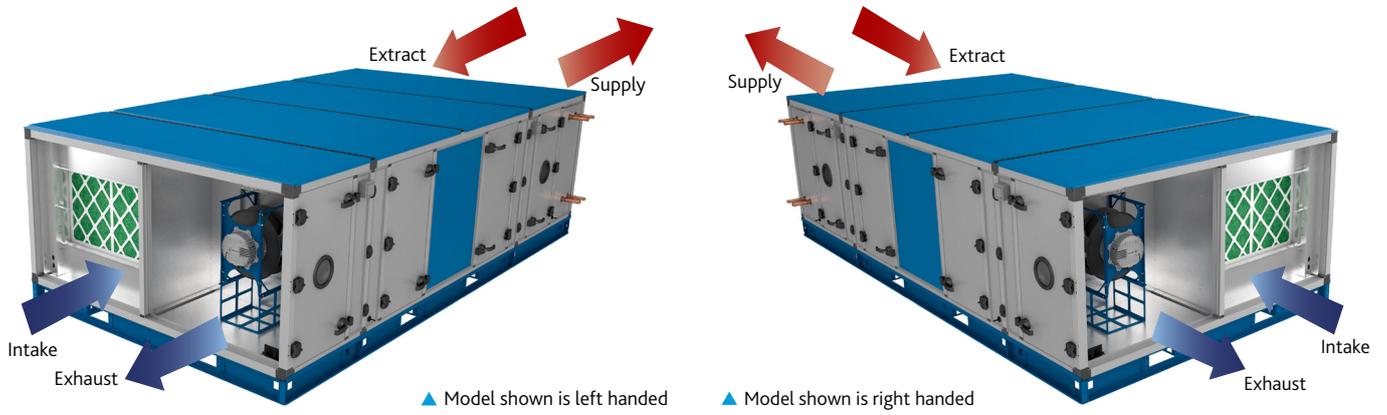
Figure 5: All hinged access panels will be lockable and removable.



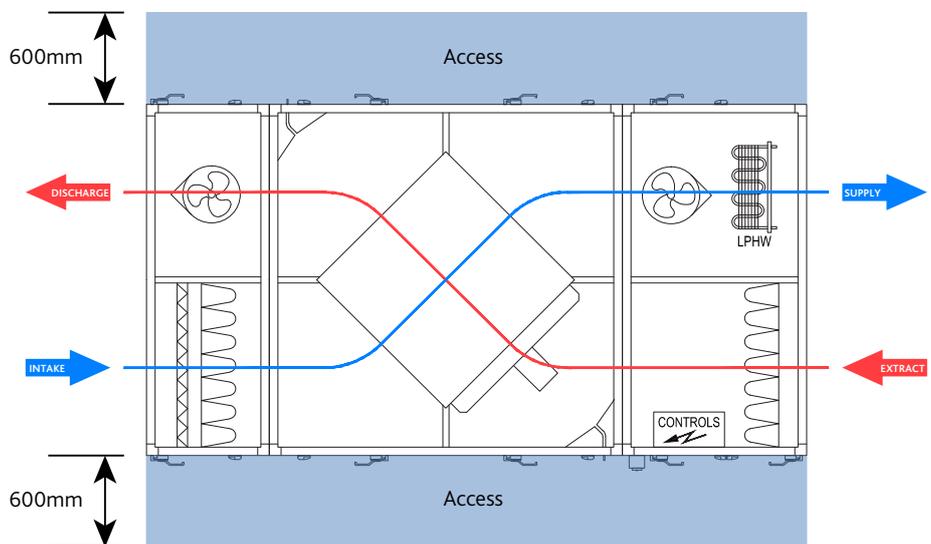
BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

5.2 ACCESS TO UNITS cont.

Figure 12: Access for horizontal plate heat exchanger units (Right and Left handed).



Shown from top (Left hand - L).



Shown from top (Right hand - R).

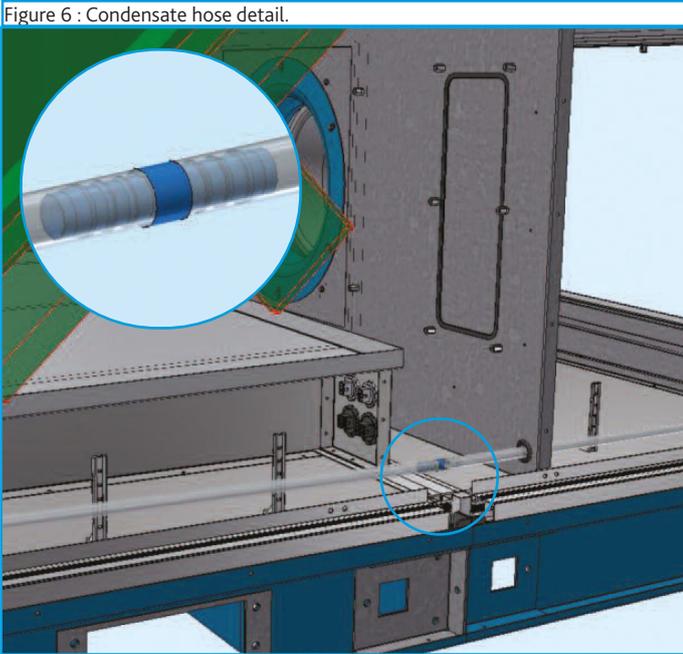
6.0 INTERNAL CONNECTIONS

There are a number of internal connections that need to be completed prior to starting/commissioning the unit. These consist of all the wiring connections and the condensate hose (plate heat exchanger option only).

6.1 CONDENSATE PUMP HOSE CONNECTION

Please ensure that the condensate hose is connected between modules. Care must be taken to ensure a constant fall in gradient is maintained and the hose is kept taut (see figure 12).

Figure 6 : Condensate hose detail.

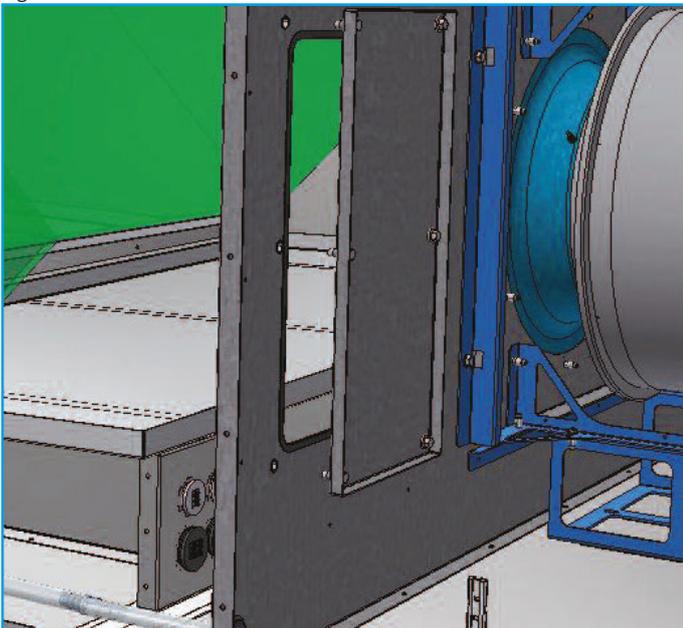


6.2 INTERNAL LOOM CONNECTIONS

Each section must be electrically connected via the supplied interconnecting looms. Each loom is made with a unique connector which can't be connected incorrectly. Every section of the unit is plug and play. Connect all interconnecting looms before commissioning.

Access is available in the fan plate to allow electrical/wiring connections to be made between modules (see figure 15).

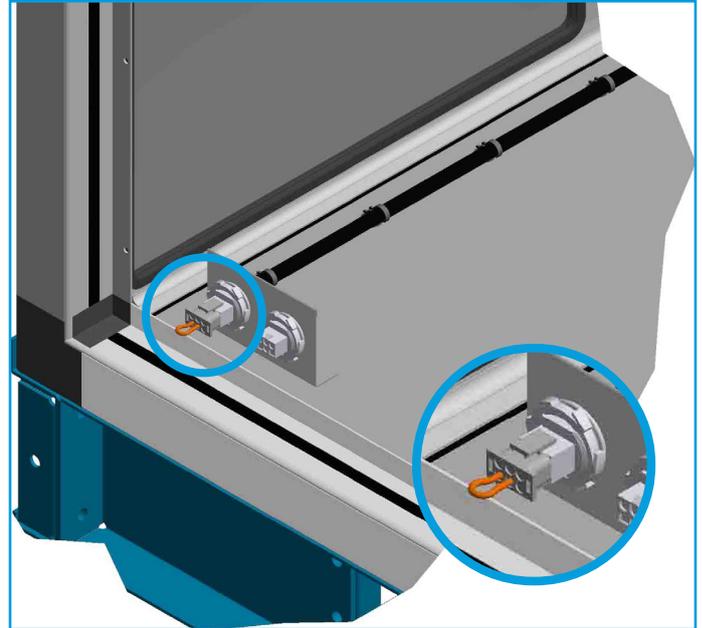
Figure 7: Fan Plate access door.



6.3 FROST COIL & ATTENUATOR CONNECTIONS

When making these wiring connections, the orange fault loop (Alarm Circuit 2) connector (see figure 16) must be removed and relocated to the end of the unit. This loop is used to monitor dP filter switches and IO damper status.

Figure 8: Sensor loop detail.



6.4 IO DAMPER LOOM CONNECTIONS

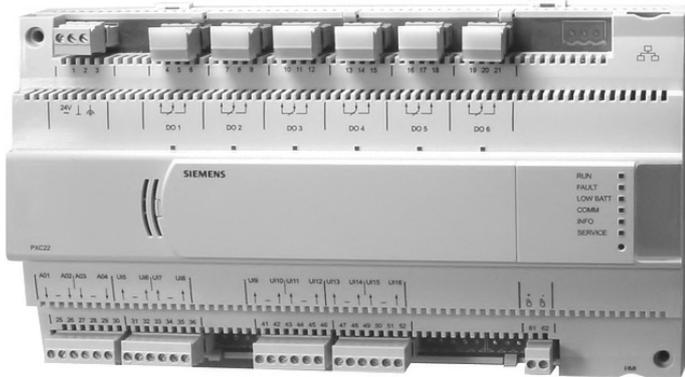
The IO damper is supplied with a connector for quick fitting to the unit. If IO damper fault monitoring is required, remove and discard the orange connector link from the end of the unit and fit the second damper lead to this alarm loop. See the control section for details on IO damper settings.

6.5 RECIRCULATION SECTION CONNECTIONS

The recirculation section fits between the Supply Module and the Heat exchanger module. The recirculation section is pre-fitted with all the relevant looms and is plug and play into the standard Supply and HX sections.

BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

7.0 DESCRIPTION OF CONTROL - SOFTWARE STRATEGY



7.1 UNIT CONTAINS THE FOLLOWING CONTROLLABLE ITEMS:

- Supply fan.
- Extract fan.
- Heat recovery bypass damper (if applicable).
- Thermal Wheel (if fitted).
- Heating coil (if fitted).
- Cooling coil (if fitted).
- DX Coil (if fitted).
- Inlet damper (if fitted).
- Exhaust Damper (if fitted).
- Recirculation damper (if fitted).

7.2 ENABLE SIGNAL

The unit can be enabled via the following methods:

- Software switch via strategy.
- Switched live (230VAC) input, PIR etc. via digital input
- Low voltage contacts via digital input.
- Night cooling / summer free-cooling strategy.

When the enable signal is removed, the unit will run on for a time defined by the run-on setpoint. If an electric heater is fitted, the fans will automatically run-on for an extra 2 minutes, without heating, in order to dissipate residual heat.

7.3 BOOST

When the control receives a boost signal the fans will run at boost speed. Once the signal is removed the fans will run on for a time defined by the boost run-on setpoint.

7.4 TRICKLE MODE

When trickle mode is active, the fans will run at their minimum speed even when there is no enable signal. Heating and cooling will also function in this mode if available.

7.5 PRESSURE SENSOR

An extract air pressure sensor is fitted as standard. This is disabled in the Trend strategy by default but can be enabled by the software switch "Enable Constant Pressure".

When enabled, the unit will increase the fans speeds as required until the pressure differential between the extract air and atmosphere reaches the constant pressure setpoint. The pressure sensor is a 0-10v 0-1000Pa sensor.

7.6 FILTER DP SWITCH

3 filter differential pressure switches are fitted as standard. These monitor the Extract filter, and Supply filter and Supply pre-filters. These are connected in series with Alarm Circuit 2 (orange wires) and will break the circuit on overpressure. The adjustable range is 0.5 to 4 mbar and is set by default to 2mbar.

7.7 THERMAL WHEEL / PLATE HEAT EXCHANGER BYPASS

The plate heat exchanger bypass damper and thermal wheel both run on the same Relay DO1. Energised = Bypass. The bypass strategy is as follows.

If the fresh air temperature is equal to the setpoint within the deadband, then the heat exchanger will be forced into bypass mode.

The 24vac bypass signal from the Siemens relay is converted by relay logic for each of the following options:

- Thermal Wheel
Runs on a volt free enable signal, which is produced using a combination of the HX bypass relay and fan run relay to close the circuit if fans are running and the unit is not in bypass.
- Plate Heat Exchanger
The HX bypass damper opens on a 24 Vac signal which is produced from the bypass damper relay.

7.8 INLET / OUTLET (OPTIONAL)

Inlet and outlet dampers are 24vac and controlled by the Relay DO6. When energised it gives a 24vac signal to both I/O dampers to open.

When installed, there is the option of connecting the internal damper close switch to the fault circuit alarm circuit 2 (orange wires).

When IO dampers are fitted the strategy Switch "IO Damper Fitted" must be set to "On". This will cause the software to delay the fans starting for the IO Damper delay period. It will also ignore faults on Alarm Circuit 2 if the fans are stopped and the dampers are closed intentionally.

See internal connection section for physical damper connections.

7.9 CO₂ CONTROL

When a CO₂ sensor is connected, CO₂ control is enabled via the CO₂ software switch and an enable signal is received, ventilation will increase to reduce CO₂ concentration the target CO₂ setpoint. The target CO₂ sensor setpoint can be changed as one of the commissioning setpoints.

7.10 SUPPLY TEMPERATURE CONTROL

While an enable signal is present, this mode modulates heating, cooling & heat exchanger bypass dampers with the aim of the supply air reaching the temperature setpoint. Please note that heating and cooling outputs will only function if the HeatingType or CoolingType software switches are set to heating or cooling options.

7.0 DESCRIPTION OF CONTROL - SOFTWARE STRATEGY

7.11 FROST PROTECTION

Should the internal temperature of the unit fall below a value defined in the commissioning variables, the control will override all heating/cooling logic to open the LPHW or CW control valves, if fitted. This is to allow any protective flow through the heating/cooling coils. The supply fan will also stop and the appropriate frost protection software module will enter an alarm state. This period will last for a minimum of 5 minutes by default. The fault relay will also open.

Please note that frost protection will only function if the HeatingType or CoolingType switches are set to LPHW or CW.

7.12 NIGHT COOLING / SUMMER FREE COOLING

Once enabled in software, this routine uses an individual time schedule to cool the fabric of the building at night using only the external air. This mode only functions if the daytime temperature is above the setpoint, cooling is possible and if the cooling air is not too cold.

7.13 MITSUBISHI REVERSE CYCLE DX (OPTIONAL)

For units for use with Mitsubishi reverse cycle condenser units, one or more PACIF012B-E Interface boards are fitted inside the control panel. The controller interacts with this board in the following ways:

- Digital Output Heat/Cool selection from PXC22 Relay DO4. Another relay is used to split output over multiple boards.
- 0-10v Heat/Cool demand from PXC22 U4.
- Faults are monitored via PXC22 U11 (Alarm circuit 2). A relay is fitted to reverse the fault action.
- The defrost status relay is connected to the enable input of the controller to start the fans when the condenser enters defrost mode.

When Mitsubishi Reverse Cycle DX is fitted, this is selected in software by setting the cooling type "Reverse Cycle". A heating type is not required unless another heating type is fitted (eg LPHW).

Once this is selected cooling and heating demand will share PXC22 U4 and heat/cool is decided on the state of PXC22 Relay DO4. (Energised = Cool Demand).

For the cases where Reverse Cycle DX and another heating type are both fitted, a schedule module is provided in the Siemens strategy. When the schedule is on, the heating output reverts to LPHW/Electric heating.

The enable run-on time must be set to 3 minutes for reverse cycle units. This is required in order to keep the compressor running for at least 3 minutes for each period.

Although the controller outputs a variable 0-10v heating/cooling voltage, the Mitsubishi condenser can only run at 7 discrete levels and so cannot supply an accurate supply air temperature.

The PAC boards are powered from the BPS control so the only connections required to the Outdoor condenser are S2 & S3. For the same reason, SW8-3 must be set to "ON" on the outdoor unit.

7.14 PARTIAL RECIRCULATION DAMPER (OPTIONAL)

If a partial recirculation module is fitted, the recirculation damper will open/close via PXC22 Relay DO5 according to the following strategy.

If the room temperature is more than 5°C (adjustable) from the set point and free-cooling or free-heating is not available then partially recirculate the air. This aids heating and cooling elements and also avoids thermal loss from the room. It is useful where a space becomes occupied and the space temperature is not close to the setpoint.

7.15 ALARMS

7.15.1 CRITICAL ALARM (LATCHING)

Once in critical alarm state the unit will drive all heating and cooling outputs to 0V. Other functions continue as normal. The critical alarm is latched and required reset to clear.

Causes of critical alarm:

- Fan fail via alarm circuit 1.
- Heater overtemp via alarm circuit 1.

7.15.2 MAINTENANCE ALARMS (NON-LATCHING)

Once in maintenance alarm state the only action taken is de-energising of the fault relay. Once the trigger is removed, the alarm will reset automatically.

Causes of maintenance alarm:

- Condensate pump fault via alarm circuit 2
- dp Filter fault via alarm circuit 2.
- IO damper fault via alarm circuit 2.
- Thermal Wheel fault via alarm circuit 2.
- Sensor failure
- Low supply temperature, default 8°C (Can be set to stop fans if required).
- Frost protection routine active, default 4°C (Only runs if water valves are selected as fitted).
- Excessively high supply temperature reading (Will stop heating).

If pump fault circuit is broken two additional events occur in order to stop condensate production.

- The heat exchanger will enter bypass mode.
- Alarm 2 circuit will break, stopping cooling functions.

All alarms have a hold off period set by the setpoint "Alarm delay".

7.15.3 THERMAL TRIP

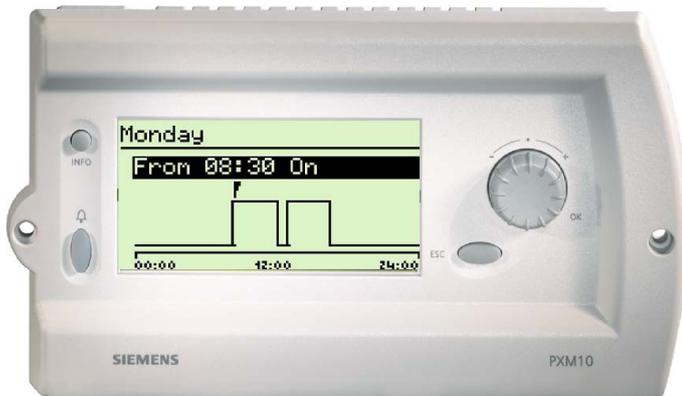
In case of software failure, as a final resort, the electric heater is protected by a fail-safe thermal overload switch. This switch disables the heater controller via a contactor once the temperature reaches 80°C. When this occurs, the critical alarm will latch in software and the supply contactor will latch in the off position.

Once the unit cools, the contactor will remain latched off until power cycle.

BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

7.0 DESCRIPTION OF CONTROL - TOUCH SCREEN ANCILLARY

7.16 PXM10 TOUCH SCREEN DISPLAY (9 x 5 inch).



The PXM10 is an optional control solution ancillary for your application for monitoring and operation of ONE PX compact or PX modular automation station. For the full range and technical details, please contact Nuair.

- High-grade display with adjustable contrast.
- Easy operation with a push-dial, giving direct access to the required plant information.
- Choice of generic view or "Favourites" view for operation and display of plant functions (alarm handling, time schedules, calendars, set point adjustments, display of measured values, etc.).
- System date and time setting.
- Optimized for use in a fixed location.

The PXM10 unit is suitable for mounting in control panel fronts or vertical panels (e.g. remote operating panels or similar units). The unit is also suitable for DIN rail snap mounting.



8.0 ELECTRICAL DETAILS

The electrical wiring must be carried out by competent persons, in accordance with good industry practice and should conform to all governing and statutory bodies i.e. IEE, CIBSE etc.

8.1 SUPPLY

The control is powered by a 400Vac 50Hz 3 phase & Neutral supply. This must be isolated local to the unit and fitted with appropriate overcurrent and fault protection.

ELECTRIC HEATER SUPPLY

For models with electric heating, the heating circuit is powered by 1 or 2 separate, higher current, 400Vac 50Hz 3 phase & Neutral supplies. This must be isolated to the unit and fitted with appropriate overcurrent protection. The main supply is still required. Electric heater elements are protected by a fail-safe over-temperature switch which will disconnect the heater supply if a temperature of 80°C is reached. Once the elements cool, the switch will reset but a power cycle is required to reset the heater supply contactor.

ELECTRICAL SUPPLY DETAILS - FLC

| Unit Size | Unit (FLC) | Unit with Electric Heater (Electric Heater Models Only) | Unit with Condenser(s) (Condenser(s) Models only) | Units with both Condenser and Electric Heater |
|------------|------------|------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------|
| B*05H/**AS | 4.3 A | 4.3 A + 17.5 A † | 8.8 A | 8.8 A + 17.5 A † |
| B*10H/**ES | 6.8 A | 6.8 A + 35 A † | 11.3 A | 11.3 A + 35 A † |
| B*15H/**ES | 9.5 A | 9.5 A + 52.5 A † | 14 A | 14 A + 52.5 A † |
| B*20H/**ES | 10 A | 10 A + 52.5 A † | 14.5 A | 14.5 A + 52.5 A † |

* Denotes any character.

These values do **NOT** include the condenser units, which are powered by a separate supply. See the table below or condenser manual.

† Single heater models require a separate supply for the heater section, with an appropriate overcurrent current protection device.

‡ Double electric heater models require separate supplies for two heater sections, each with an appropriate overcurrent current protection device.

| Unit Size | Condenser Units Required | Maximum Current | Power Supply | Mitsubishi Part Number |
|-----------|-----------------------------|-----------------|--------------------|------------------------|
| 05 | BPS-CU-MIT-14 x1 | 13A | 3phase, 50Hz, 400V | PUHZ-P140YHAR2 |
| 10 | BPS-CU-MIT-14 x1 | 13A | 3phase, 50Hz, 400V | PUHZ-P140YHAR2 |
| 15 | BPS-CU-MIT-20 x1 | 19A | 3phase, 50Hz, 400V | PUHZ-P200YKAR1 |
| 20 | BPS-CU-MIT-25 x1 | 21A | 3phase, 50Hz, 400V | PUHZ-P250YKAR1 |

See condenser manual for further information.

BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

8.0 ELECTRICAL DETAILS

8.2 VOLT FREE CONTACTS

Note that the volt free contacts are not fused. If these are used to power any external equipment, the installer must provide adequate fusing or other protections.

These contacts are rated at 2A resistive.

Fault connections - No fault = the relay is powered.

Fault = the relay is unpowered.

Heat demand - the relay is powered when heating is selected.

Cool demand - the relay is powered when cooling is selected.

8.3 SWITCHED LIVE

Switch Live (SL) terminal - A signal of 100-230V a.c. will activate the switched live signal.

Switch Live 2 Boost (SL2) terminal - A signal of 100-230V a.c. will activate the switched live 2 (Fan Boost) signal.

Volt free versions of the switched live signals are also available at terminals T33-T34 & T35-T36. Link two contacts to activate the signal.

8.5 CONNECTION CHART

| Description | TD | Short Name | Subsystem | Signal Address | Block Type | Signal Type | Unit | Min | Max |
|-------------------|------------------------|------------|-----------|----------------|------------|-------------|----------------|-----|------|
| Fresh Air Temp | AHU'2Sensors'1FreshAir | 1FreshAir | C | 1.1 | AI | R1K | °C | 0 | 50 |
| Supply Air Temp | AHU'2Sensors'2SupAlr | 2SupAlr | C | 1.2 | AI | R1K | °C | -50 | 80 |
| Extract Air Temp | AHU'2Sensors'3ExtAir | 3ExtAir | C | 1.3 | AI | R1K | °C | -50 | 80 |
| CO2 Sensor | AHU'2Sensors'4CO2 | 4CO2 | C | 1.4 | AI | U10 | ppm | 0 | 2000 |
| Fan Speed Cntrl | AHU'2Sensors'5FnSdCnt | 5FnSdCnt | C | 1.5 | AI | U10 | % | 0 | 10 |
| Alm Ccritical | AHU'3DigIns'AlmCritC1 | AlmCritC1 | C | 1.3 | BI | D20 | Nml/Alm | | |
| Alm Maintenance | AHU'3DigIns'AlmFitC2 | AlmFltC2 | C | 1.7 | BI | D20 | Nml/Alm | | |
| Enable Hware | AHU'3DigIns'EnaHW | EnaHW | C | 1.8 | BI | D20 | No, Yes | | |
| Boost Ena Hware | AHU'3DigIns'BoostHW | BoostHW | C | 1.9 | BI | D20 | No, Yes | | |
| OCC PIR Hware | AHU'3DigIns'OccPIR | OccPIR | C | 1.10 | BI | D20 | UnnOcc/Occ | | |
| SupFan AirFlo | AHU'3DigIns'SpFnDPS | SpFnDPS | C | 1.11 | BI | D20 | NoFlow/Flow | | |
| ExtFan AirFlo | AHU'3DigIns'ExtFnDPS | ExtFnDPS | C | 1.12 | BI | D20 | NoFlow/Flow | | |
| Extract Speed | AHU'6Outpts'4ExtFan | 4ExtFan | C | 4.1 | AO | Y10S | % | 0 | 100 |
| Supply Speed | AHU'6Outpts'3SupFan | 3SupFan | C | 4.2 | AO | Y10S | % | 0 | 100 |
| Heating Sig | AHU'6Outpts'7HtgSig | 7HtgSig | C | 4.3 | AO | Y10S | % | 0 | 100 |
| Cooling Sig | AHU'6Outpts'91ClgSig | 91ClgSig | C | 4.4 | AO | Y10S | % | 0 | 1000 |
| Bypass Dmp | AHU'6Outpts'5DmpCnt | 5DmpCnt | C | 5.1 | BO | Q250 | Reclaim/Bypass | | |
| Fault Relay | AHU'6Outpts'92FltRly | 92FltRly | C | 5.2 | BO | Q250 | Off, On | | |
| Fan Enabled Rly | AHU'6Outpts'2FanEna | 2FanEna | C | 5.3 | BO | Q250 | Off, On | | |
| Chilled Dmd Relay | AHU'6Outpts'8ClgDmd | 8ClgDmd | C | 5.4 | BO | Q250 | No, Yes | | |
| Heat Dmd Relay | AHU'6Outpts'6HtgDmd | 6HtgDmd | C | 5.5 | BO | Q250 | No, Yes | | |
| IO Damper | AHU'6Outpts'11IODmp | 11IODmp | C | 5.6 | BO | Q250 | Close, Open | | |

8.4 NETWORK SETTINGS

IP address: 192.168.11.12
Subnet mask: 255.255.255.0

A copy of the strategy is stored in the EDoS (Engineering Data on Site) portion of memory.

BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

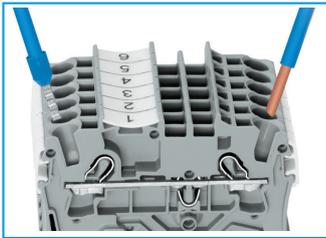


8.0 ELECTRICAL DETAILS

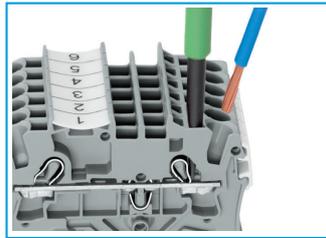
8.6 TERMINALS - WIRE CONNECTIONS

Figure 9: This Control Unit utilises WAGO's CAGE CLAMP®S terminals blocks, allowing for quick and easy connection.

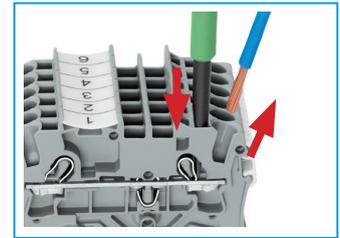
PUSH IN TERMINATION - Stripped solid conductors, fine-stranded conductors with ferrules, or ultrasonically "bonded" conductors are simply pushed in until they hit the backstop. No tool required.



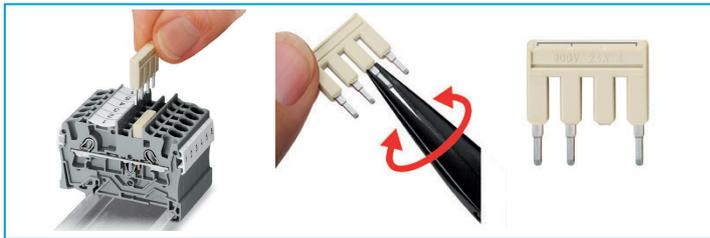
TERMINATION OF FINE-STANDED CONDUCTORS - Open the clamp by inserting an operating tool (as shown below) until it clicks into position. Then insert the conductor and remove the operating tool to complete the connection.



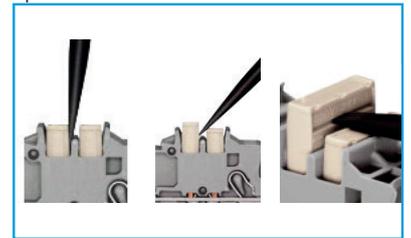
CONDUCTOR REMOVAL - Insert an operating tool in to the operating slot to remove the conductor, just like the original CAGE CLAMP® terminals blocks.



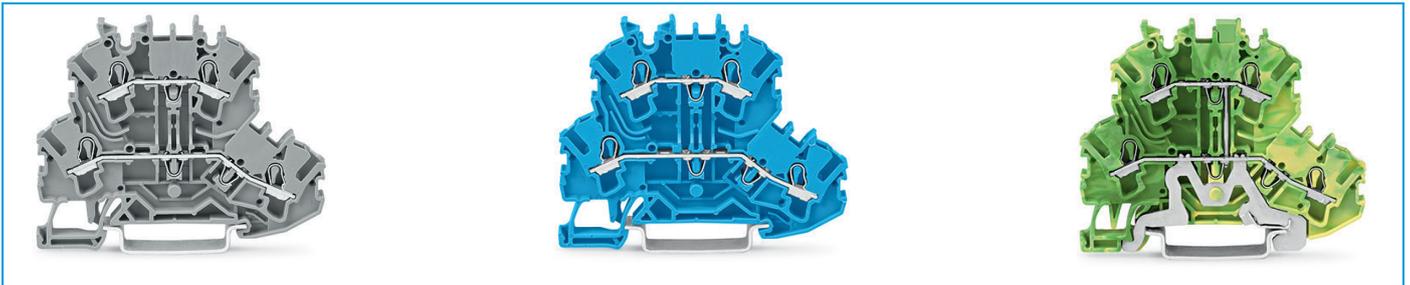
JUMPERS - Terminal blocks can be commoned together to increase the number of terminals at the same potential using push-in jumpers. In these cases the terminals are treated as one conductor.



JUMPER REMOVED - Insert the operating tool blade between the jumper and the partition wall of the dual jumper slots, then lift up the jumper.



DOUBLE DECK TERMINAL BLOCK - Each deck has a different potential (2-conductor), which creates a space saving on the rail. Decks can be commoned to adjacent terminal blocks and/or the top to the bottom deck.



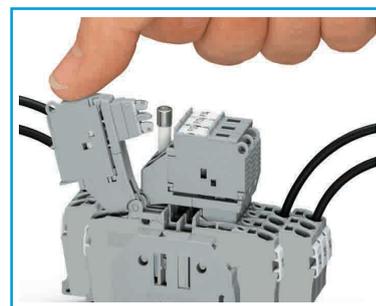
EARTH TERMINAL BLOCKS

The earth terminal block (green/yellow) has a direct electrical connection to the DIN rail, with the earthing foot (earth connection only).



FUSE TERMINALS

Replaceable cartridge fuses are housed in quick release fuse terminals.

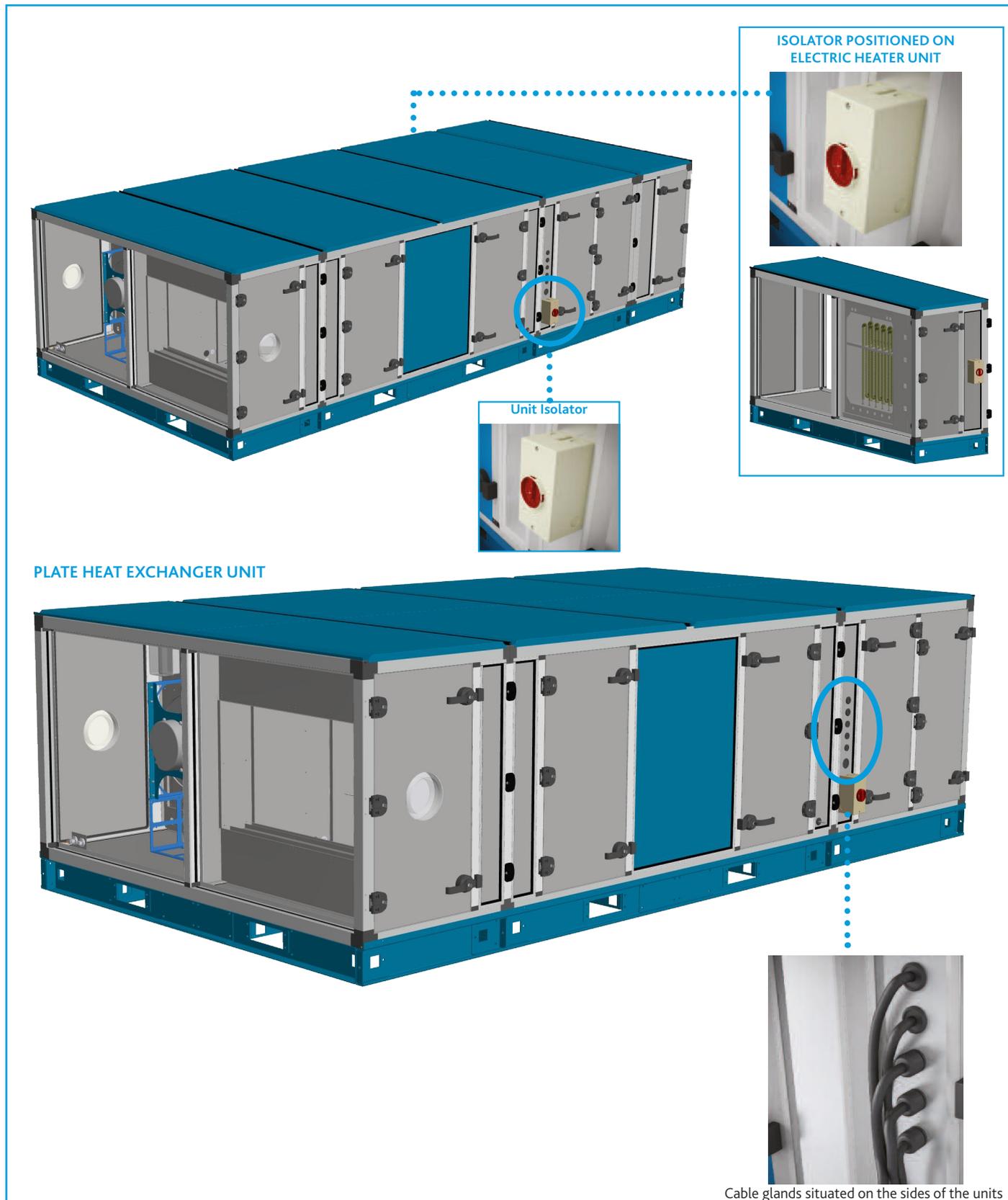


BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

8.0 ELECTRICAL DETAILS

8.7 ISOLATOR WIRING POINT

Figure 10: Main wiring points for the customer is to the isolators situated on the sides of the units as shown below.
Note: Cable glands for additional ancillary cabling.





9.0 CONNECTION & WIRING DIAGRAMS

9.1 CONNECTION DIAGRAM AND WIRING DIAGRAM REFERENCE TABLES

A series of basic connection and internal wiring diagrams have been provided to assist on-site wiring. In order to reference the relevant diagrams please use the code breakdown opposite to determine:

- Unit size
- If an electric heater is present
- If reverse cycle or DX cooling is present

The below tables can then be used to reference the required connection and wiring diagrams.

Example:
Unit onsite has code **B815H/ER/AS-L**. This indicates a size 15 unit with electric heating and reverse cycle cooling. Section 9.4 and 9.13 include the basic connection diagram and wiring diagram respectively.



CODE DESCRIPTION:

B 8 15 H / ER / AS - L
 | | | | | | | |
 1 2 3 4 5 6 7 8

- 1. BOXER Package Solution Range**
- 2. ERP year:** 8 = 2018
- 3. Unit Size:** 05, 10, 15 and 20
- 4. Heat Exchanger:** H = Horizontal Plate
- 5. Heater:** L = LPHW
E = Electric
N = No Heating
- 6. Cooling:** R = Reverse Cycle**
X = DX*
C = Chilled Water
N = No Cooling
- 7. Control type:** AS = Ecosmart Adapt (Siemens)
CO = Ecosmart Connect
ES = Ecosmart Classic
BC = Basic control
- 8. Handing:** L = Left, R = Right

*Condenser Unit and control by others.
**Ecosmart Connect & Adapt models only.

BPS Trend - Basic Connection Diagram Reference Table

| Unit Size | Unit Does Not Contain Reverse Cycle DX | Unit Contains Reverse Cycle DX |
|-----------|----------------------------------------|--------------------------------|
| 05 | see section 9.2 | see section 9.3 |
| 10 | see section 9.2 | see section 9.3 |
| 15 | see section 9.2 | see section 9.4 |
| 20 | see section 9.2 | see section 9.4 |

BPS Trend - Internal Wiring Diagram Reference Table

| Unit Size | Unit DOES NOT Contain Electric Heater or Reverse Cycle DX | Unit Contains Electric Heater | Unit Contains Reverse Cycle or DX | Unit Contains Electric Heater & Reverse Cycle or DX |
|-----------|-----------------------------------------------------------|-------------------------------|-----------------------------------|-----------------------------------------------------|
| 05 | see section 9.5 | see section 9.6 | see section 9.7 | see section 9.9 |
| 10 | see section 9.5 | see section 9.6 | see section 9.7 | see section 9.9 |
| 15 | see section 9.5 | see section 9.6 | see section 9.8 | see section 9.10 |
| 20 | see section 9.5 | see section 9.6 | see section 9.8 | see section 9.10 |

BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

9.0 CONNECTION & WIRING DIAGRAMS

9.2 BASIC CONNECTION DIAGRAM - BPS Sizes 05, 10, 15 & 20 (No Condenser Control)

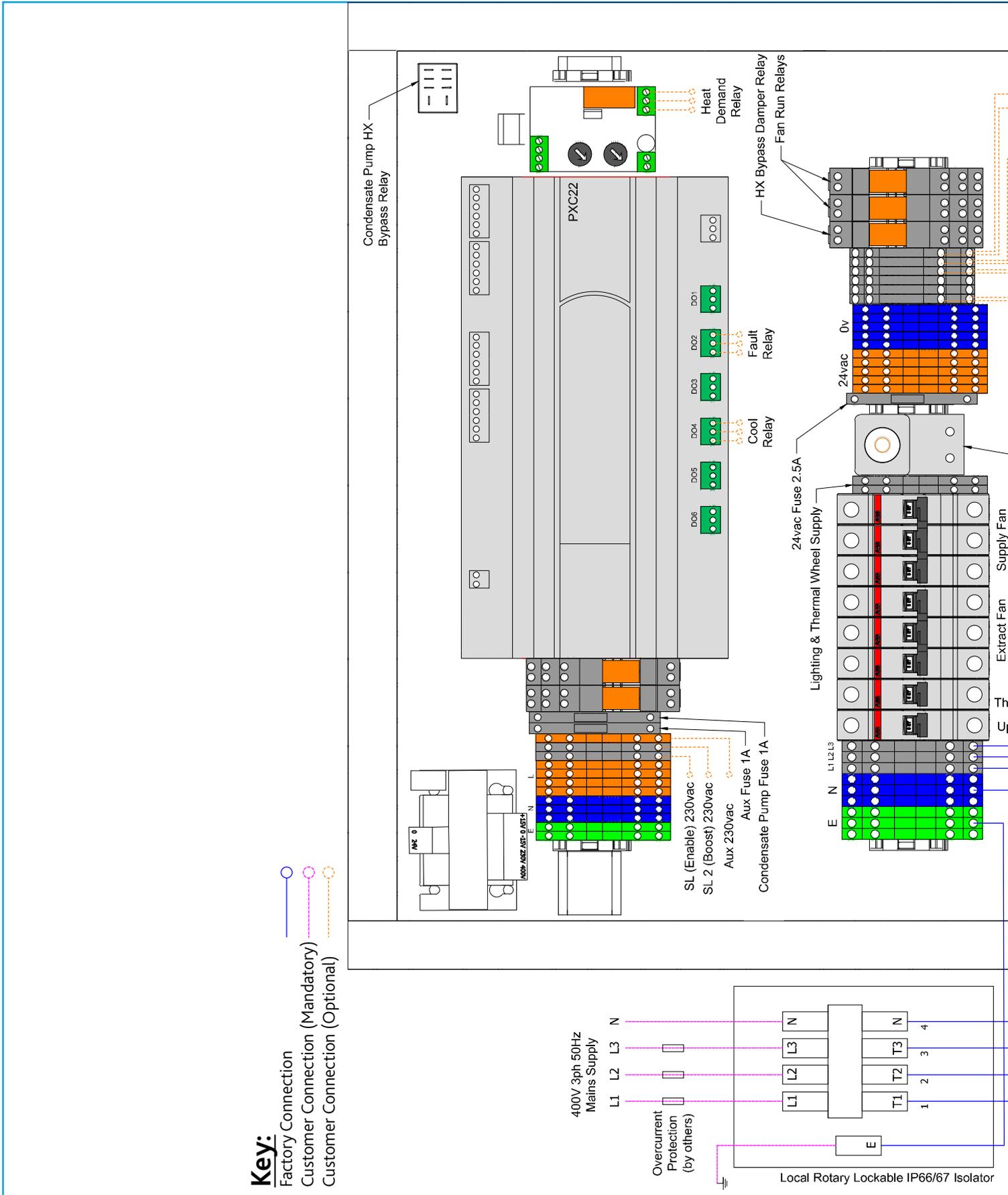
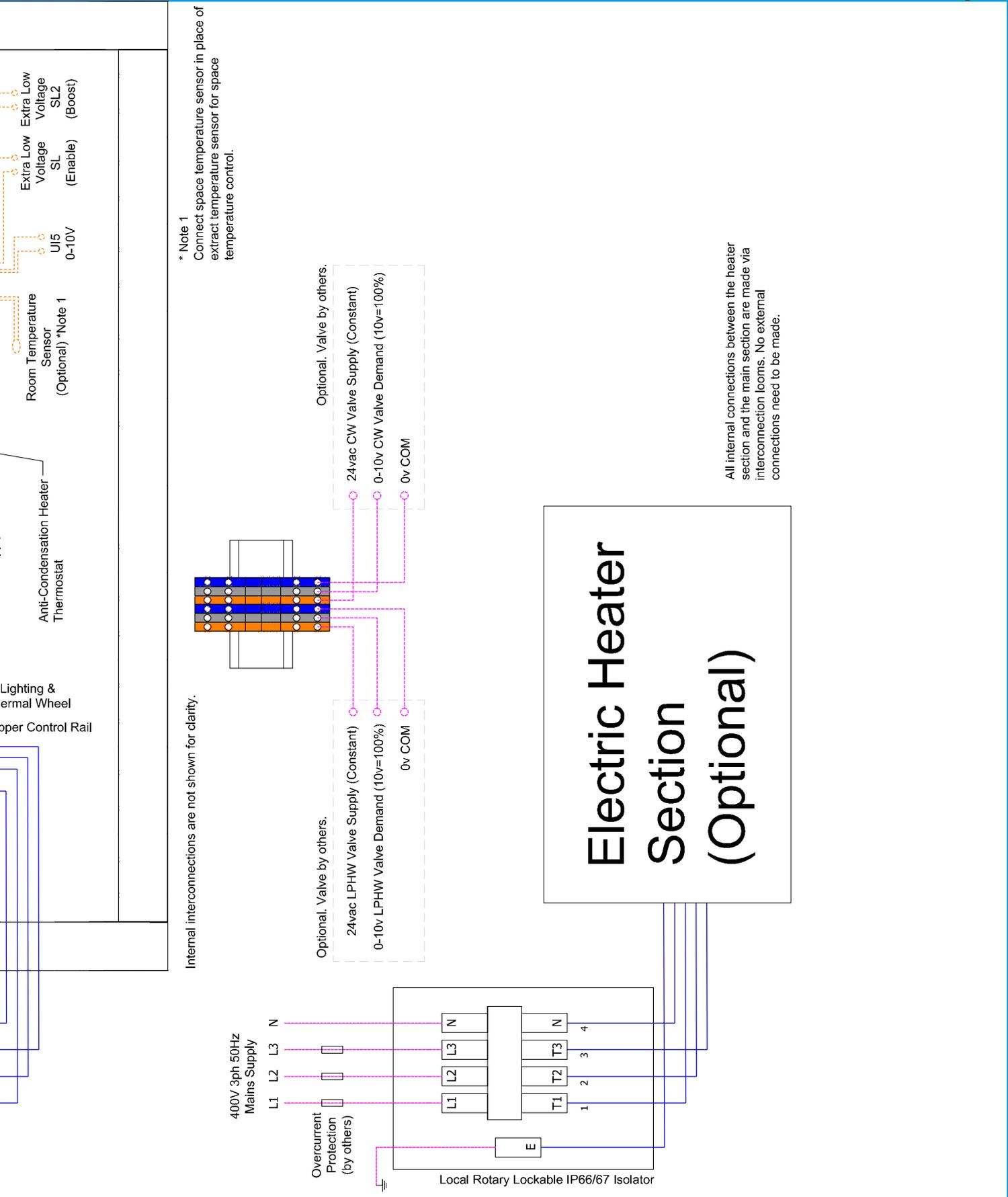


Figure 11:



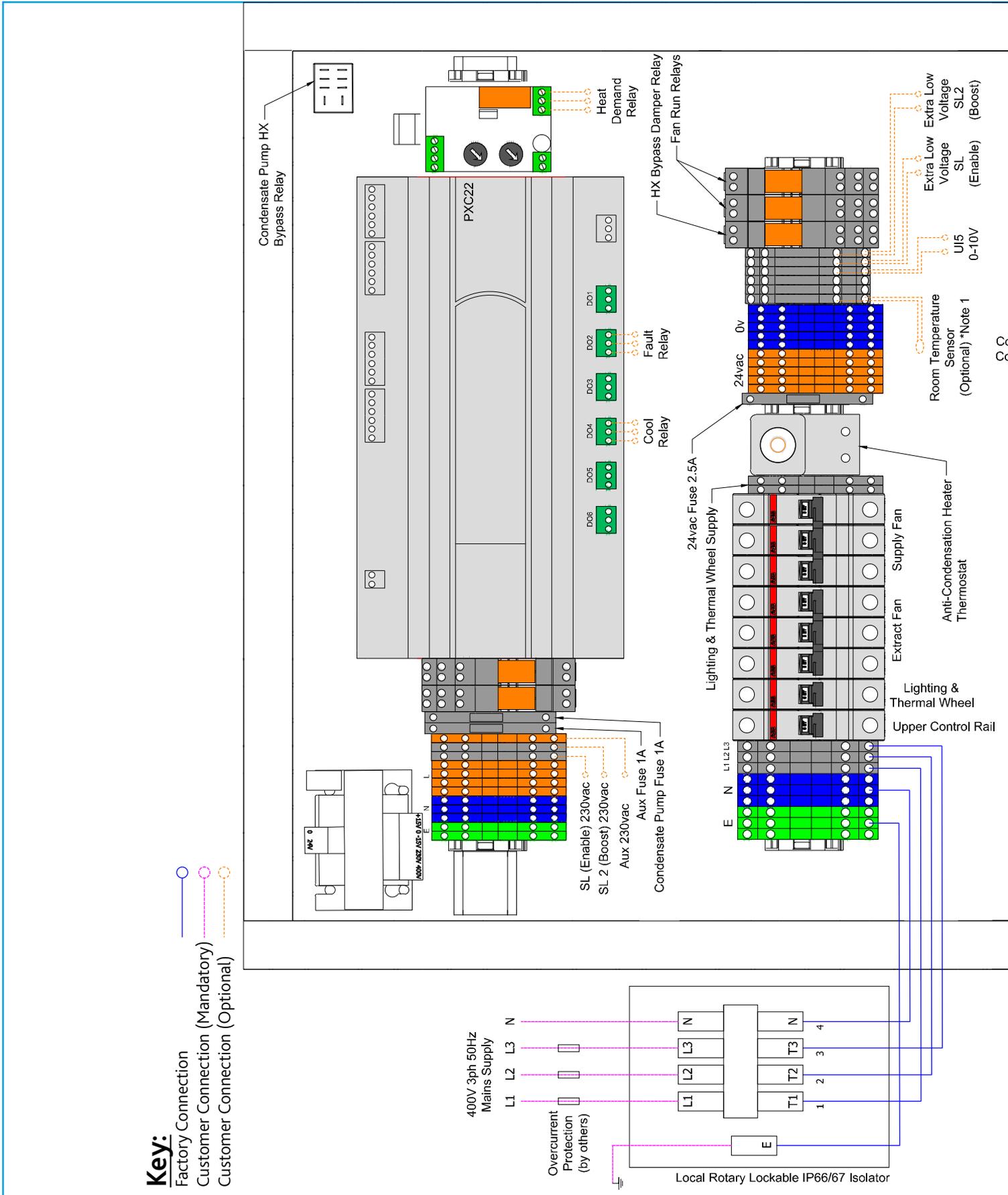
All internal connections between the heater section and the main section are made via interconnection looms. No external connections need to be made.

Electric Heater Section (Optional)

BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

9.0 CONNECTION & WIRING DIAGRAMS

9.3 BASIC CONNECTION DIAGRAM - BPS RC Sizes 05 & 10 with Mitsubishi Reverse Cycle DX Control



BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

9.0 CONNECTION & WIRING DIAGRAMS

9.4 BASIC CONNECTION DIAGRAM - BPS RC Sizes 15 & 20 with Mitsubishi Reverse Cycle DX Control

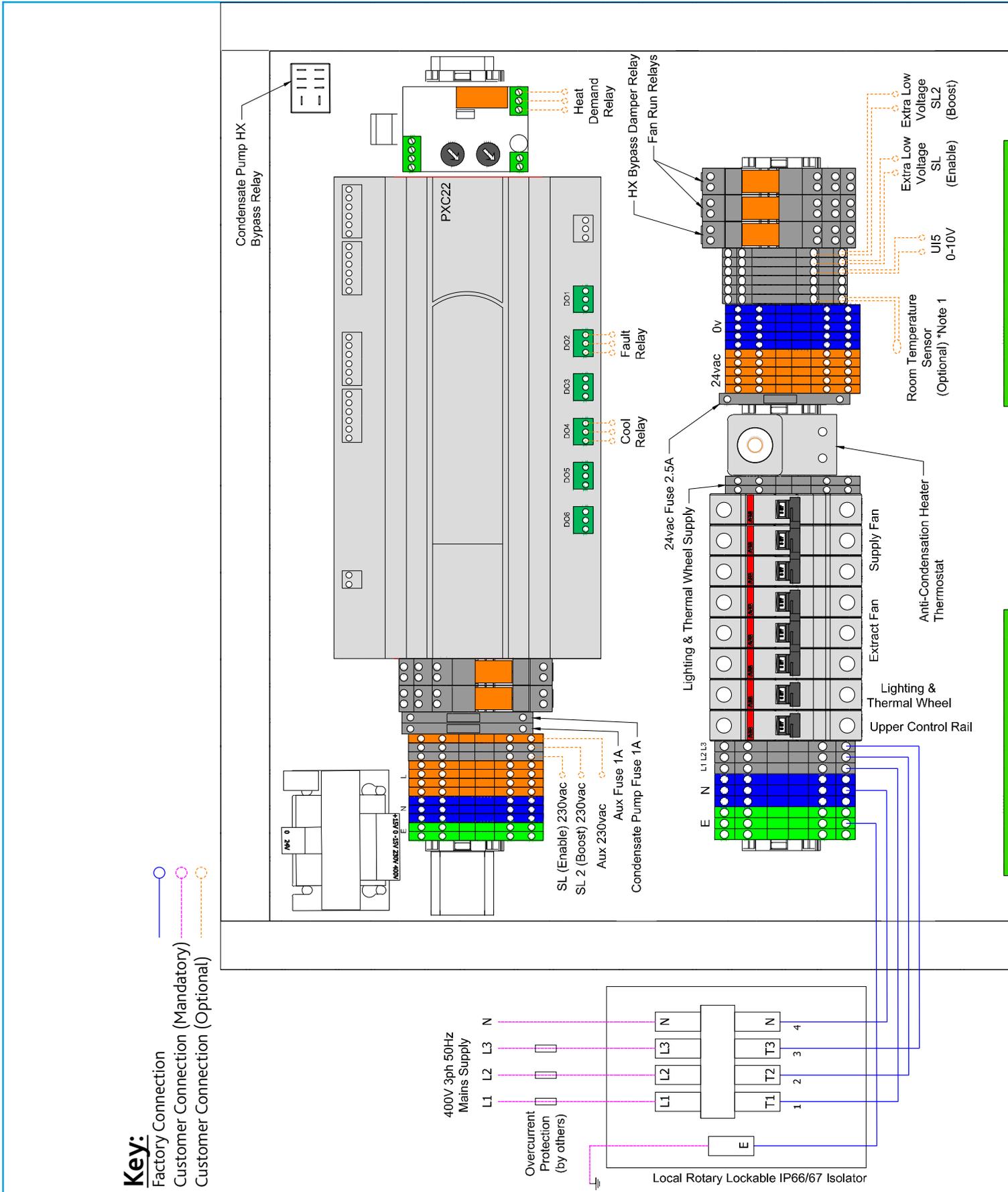
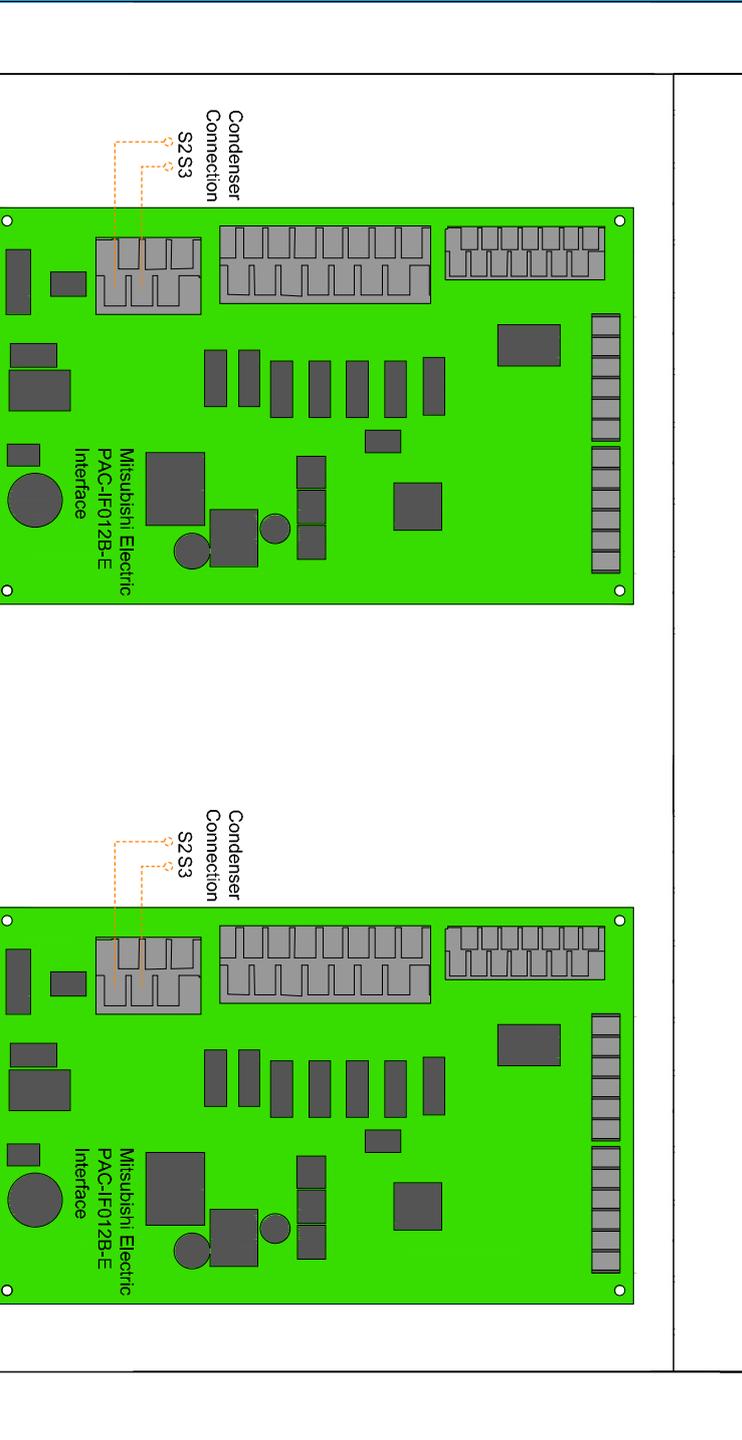
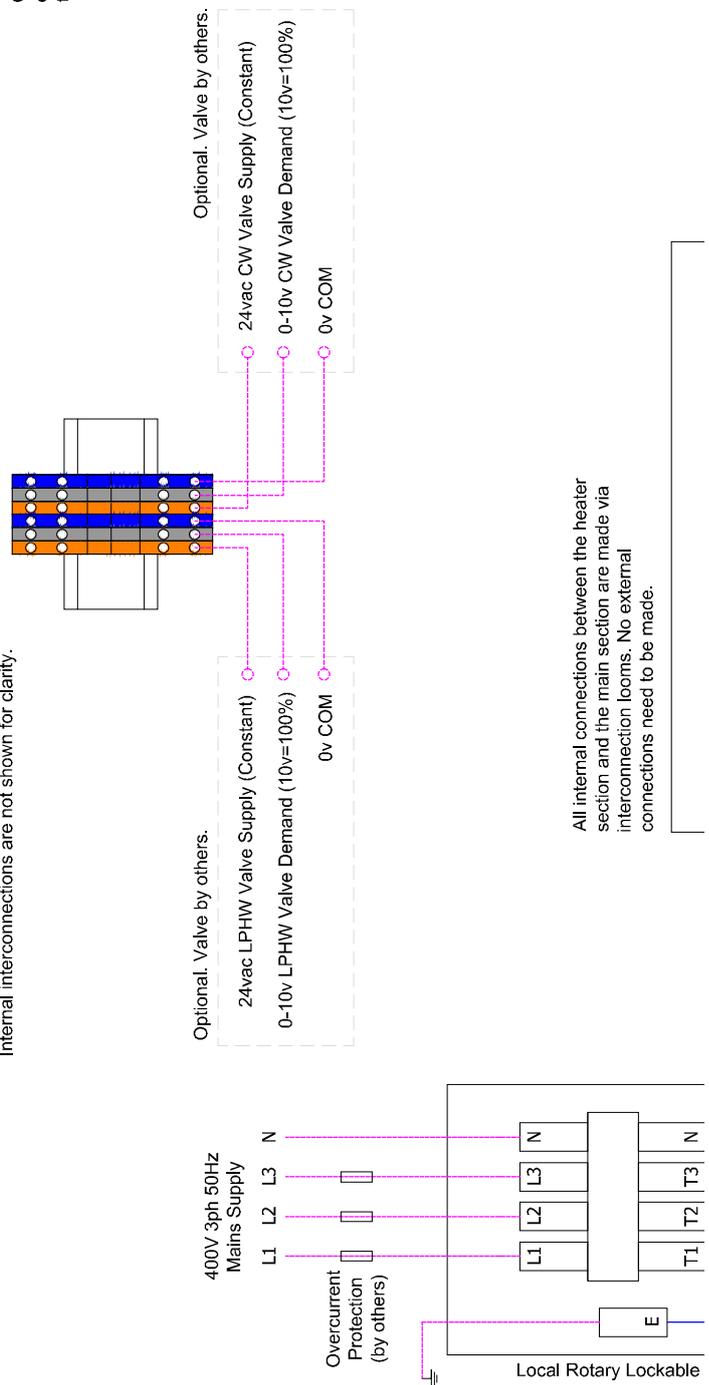


Figure 13:



* Note 1
Connect space temperature sensor in place of extract temperature sensor for space temperature control.

Internal interconnections are not shown for clarity.



All internal connections between the heater section and the main section are made via interconnection looms. No external connections need to be made.

BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

9.0 DIAGRAMS

9.5 BPS INTERNAL WIRING - Sizes 05 - 20 No Heating (or LPHW) (Sheet 1)

Key:

Internal Factory Connection 
 Customer Connection 
 <XXXXX> Link to page 2

- A1 : 24VAC Bypass Damper Actuator (Optional)
- A2 : 24VAC IO Damper Actuator (Optional)
- A3 : 24VAC IO Damper Actuator (Optional)
- A4 : 24VAC Recirc Damper Actuator (Optional)
- A5 : LPHW Actuator (Optional)
- A6 : Thermal Wheel (Optional)
- A9 : Chilled Water Actuator (Optional)

- F1 : Aux Fuse 1A 5x20mm
- F2 : Condensate Pump Fuse 1A 5x20mm
- F3 : N/A
- F4 : Transformer Fuse 2.5A 5x20mm

- R1 : 230VAC Switched Live Relay
- R2 : 230VAC Switched Live 2 Relay
- R3 : 24VAC Condensate Pump Fault Relay
- R42 : 24VAC HX Bypass Relay
- R43 : 24VAC Fan Run Relay 1
- R44 : 24VAC Fan Run Relay 2

- S1 : Fresh Air Temp. Sensor
- S2 : Supply Air Temp. Sensor
- S3 : Extract Air Temp. Sensor
- S4 : Room Air Temp. Sensor (Optional)
- S5 : 0-10v 0-1000Pa Pressure Sensor

TR : Isolating Transformer 240VAC - 24VAC 63VA

- W1: Supply Fan Fault NO
- W2: Extract Fan Fault NO
- W3: Condensate Pump Fault NO
- W4: Extract Filter dP Switch
- W5: Supply Main-Filter dP Switch
- W6: Supply Pre-Filter dP Switch
- W7: I/O Damper Switch (Damper Shut=Open)
- W8: I/O Damper Switch (Damper Shut=Open)
- W10: Supply Fan Light Switch
- W11: Extract Fan Light Switch
- W12: Anti-condensation Heater Thermostat

- M1: Controlling MCB
- M2: Lighting & Thermal Wheel MCB
- M3: Supply Fan MCB
- M4: Extract Fan MCB

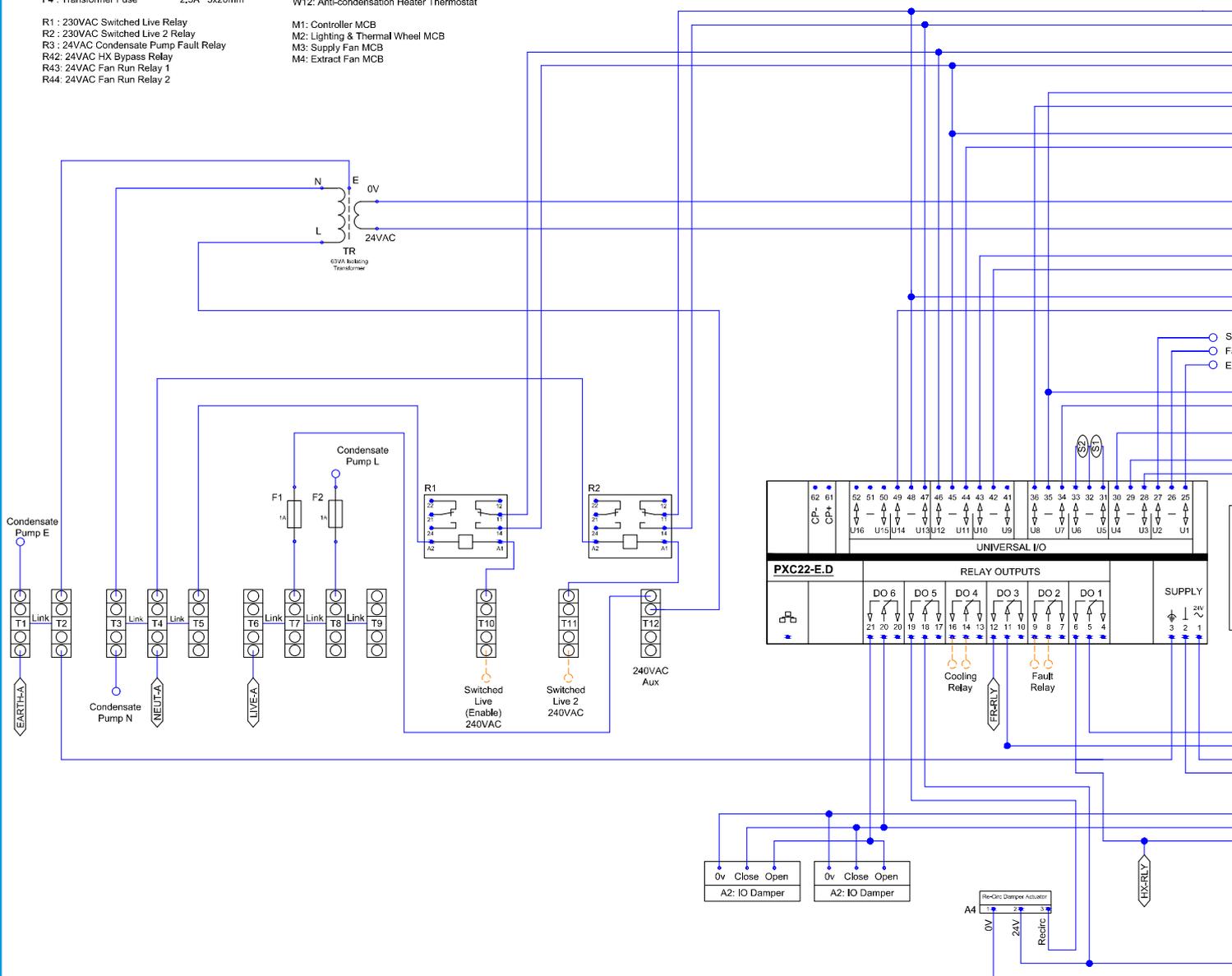
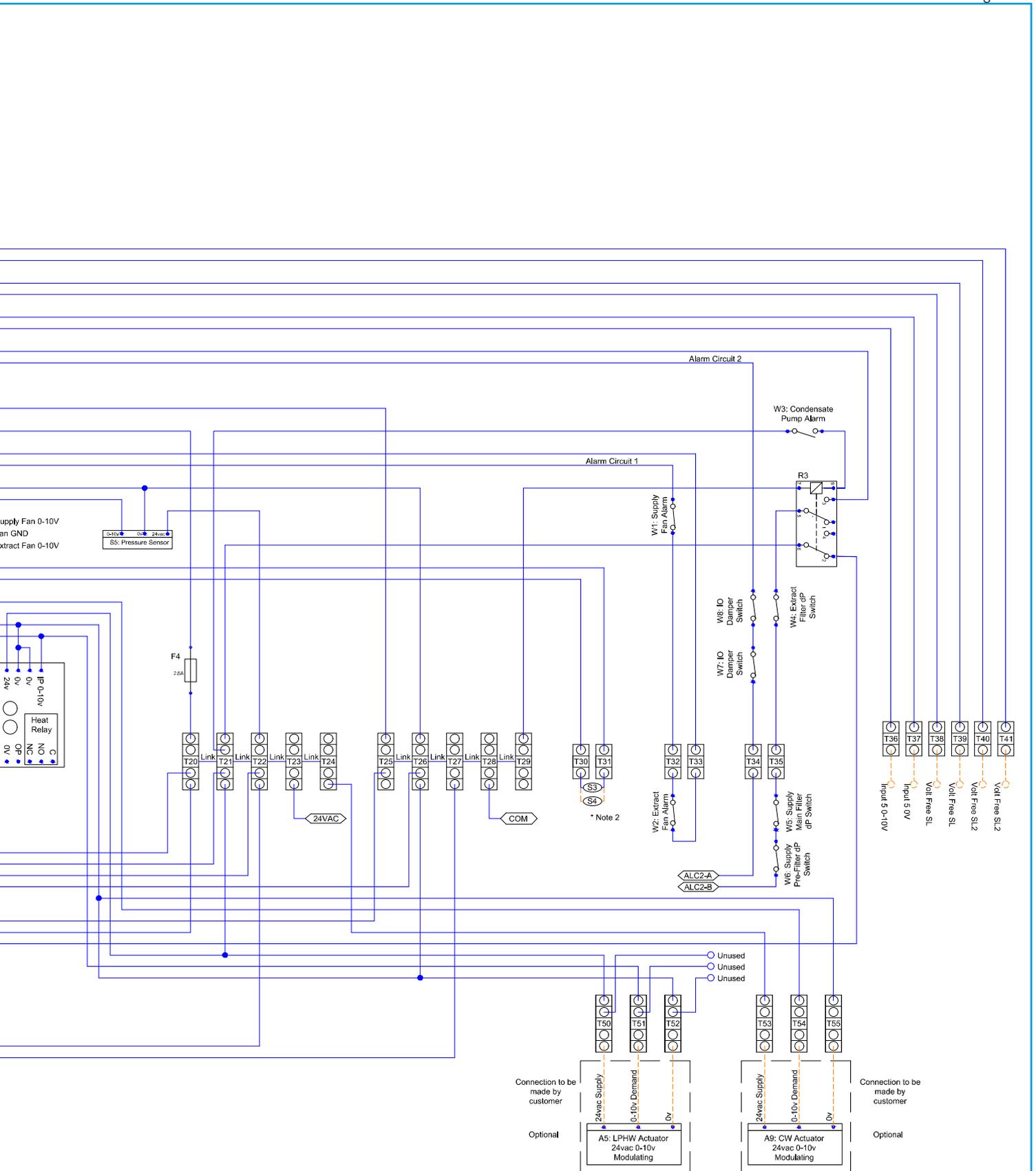


Figure 14:



BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

9.0 DIAGRAMS

9.5 BPS INTERNAL WIRING - Sizes 05 - 20 No Heating (or LPHW) (Sheet 2)

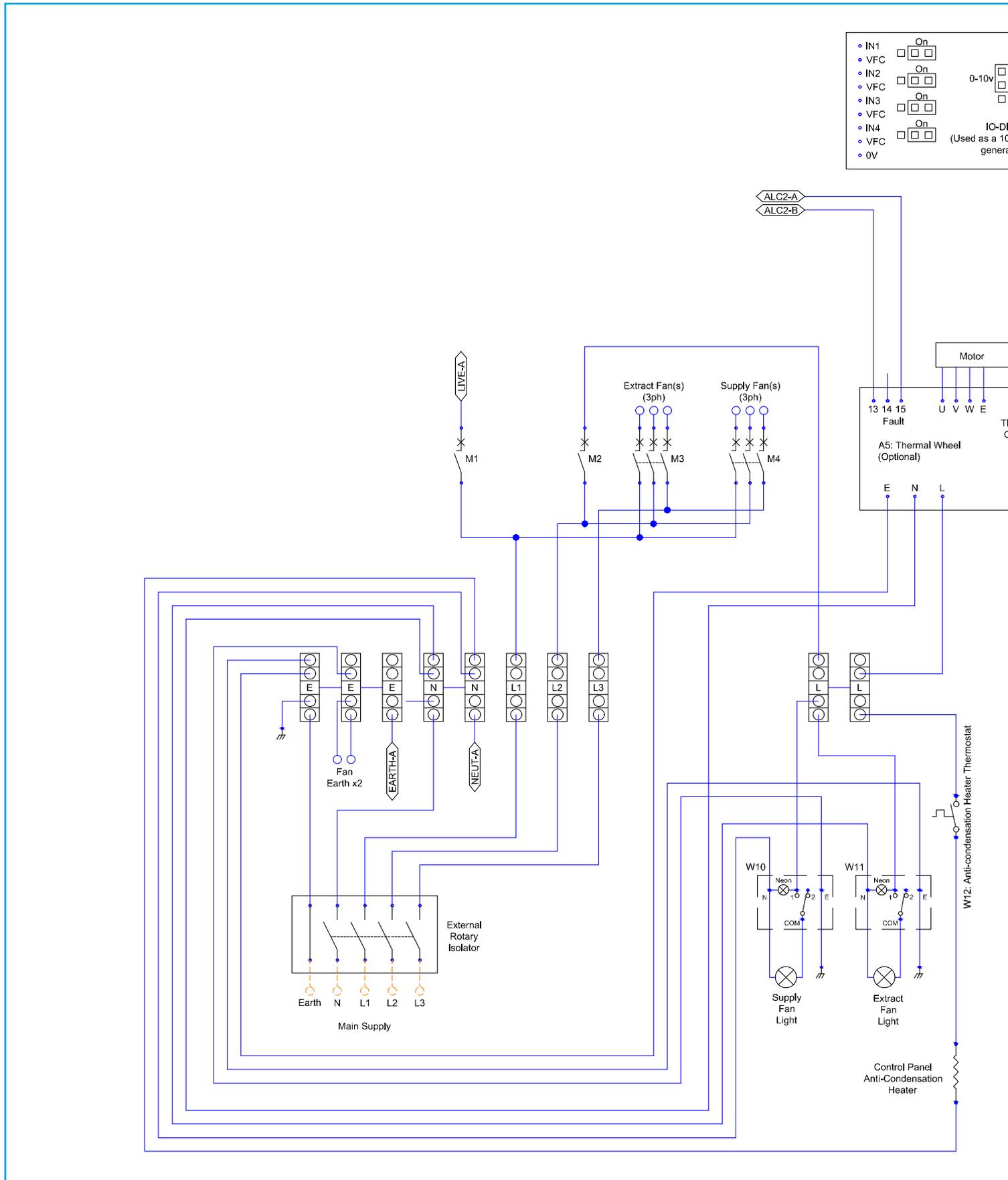
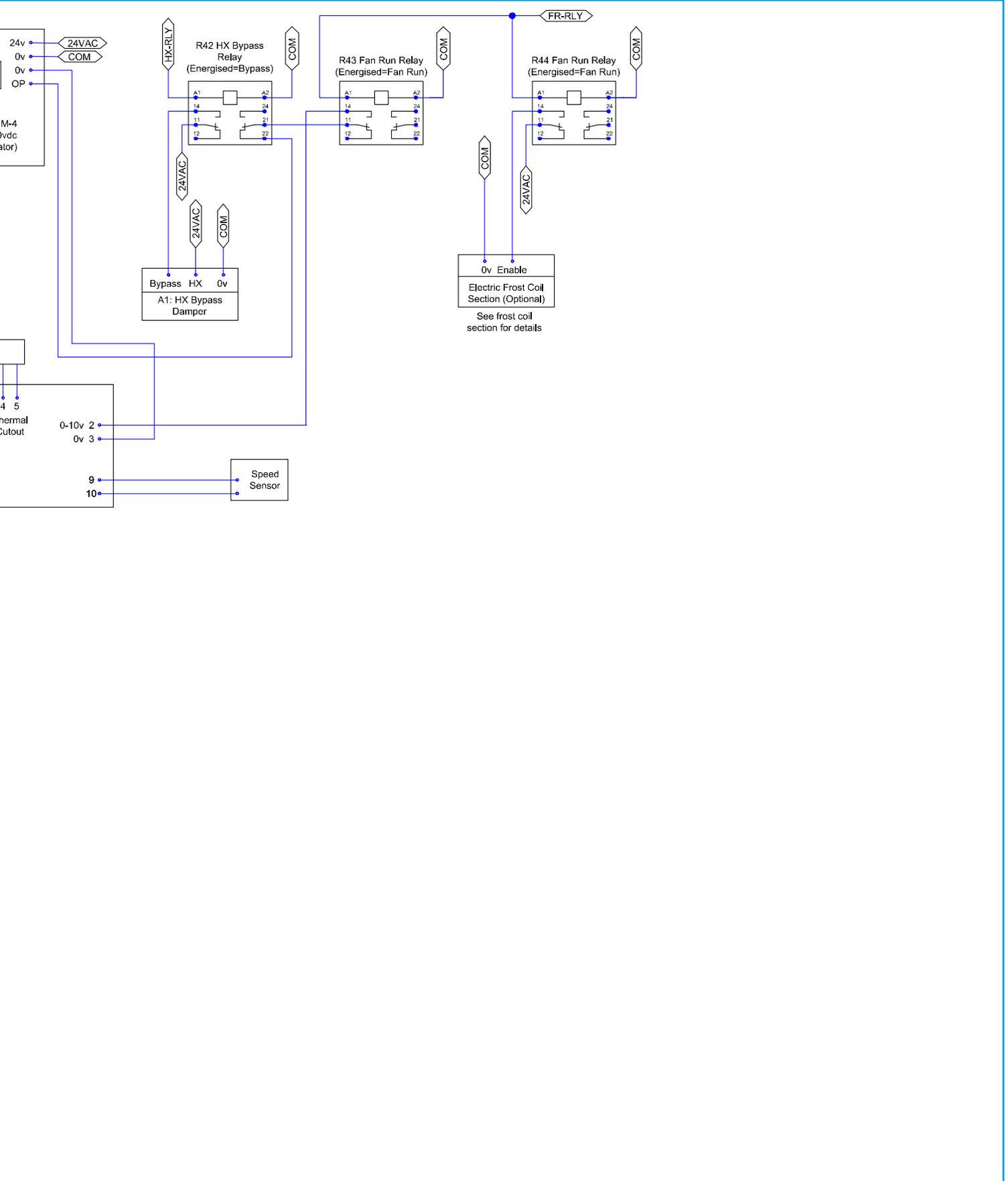


Figure 15:



BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

9.0 DIAGRAMS

9.6 BPS INTERNAL WIRING - Sizes 05 - 20 Electric Heating (Sheet 1)

Key:

- Internal Factory Connection
- Customer Connection
- Link to page 2

- A1 : 24VAC Bypass Damper Actuator (Optional)
- A2 : 24VAC IO Damper Actuator (Optional)
- A3 : 24VAC IO Damper Actuator (Optional)
- A4 : 24VAC Recirc Damper Actuator (Optional)
- A5 : LPHW Actuator (Optional)
- A6 : Thermal Wheel (Optional)
- A7 : Electric Heater Contactor
- A8 : Electric Heater Controller
- A9 : Chilled Water Actuator (Optional)

- F1 : Aux Fuse 1A 5x20mm
- F2 : Condensate Pump Fuse 1A 5x20mm
- F3 : N/A
- F4 : Transformer Fuse 2.5A 5x20mm

- R1 : 230VAC Switched Live Relay
- R2 : 230VAC Switched Live 2 Relay
- R3 : 24VAC Condensate Pump Fault Relay
- R42 : 24VAC HX Bypass Relay
- R43 : 24VAC Fan Run Relay 1
- R44 : 24VAC Fan Run Relay 2

- S1 : Fresh Air Temp. Sensor
- S2 : Supply Air Temp. Sensor
- S3 : Extract Air Temp. Sensor
- S4 : Room Air Temp. Sensor (Optional)
- S5 : 0-10v 0-1000Pa Pressure Sensor

TR : Isolating Transformer 240VAC - 24VAC 63VA

- W1: Supply Fan Fault NO
- W2: Extract Fan Fault NO
- W3: Condensate Pump Fault NO
- W4: Extract Filter dP Switch
- W5: Supply Main-Filter dP Switch
- W6: Supply Pre-Filter dP Switch
- W7: IO Damper Switch (Damper Shut=Open)
- W8: IO Damper Switch (Damper Shut=Open)
- W9: Electric Heater Thermal Trip
- W10: Supply Fan Light Switch
- W11: Extract Fan Light Switch
- W12: Anti-condensation Heater Thermostat

- M1: Controller MCB
- M2: Lighting & Thermal Wheel MCB
- M3: Supply Fan MCB
- M4: Extract Fan MCB
- M7: Electric Heater Control Circuit MCB

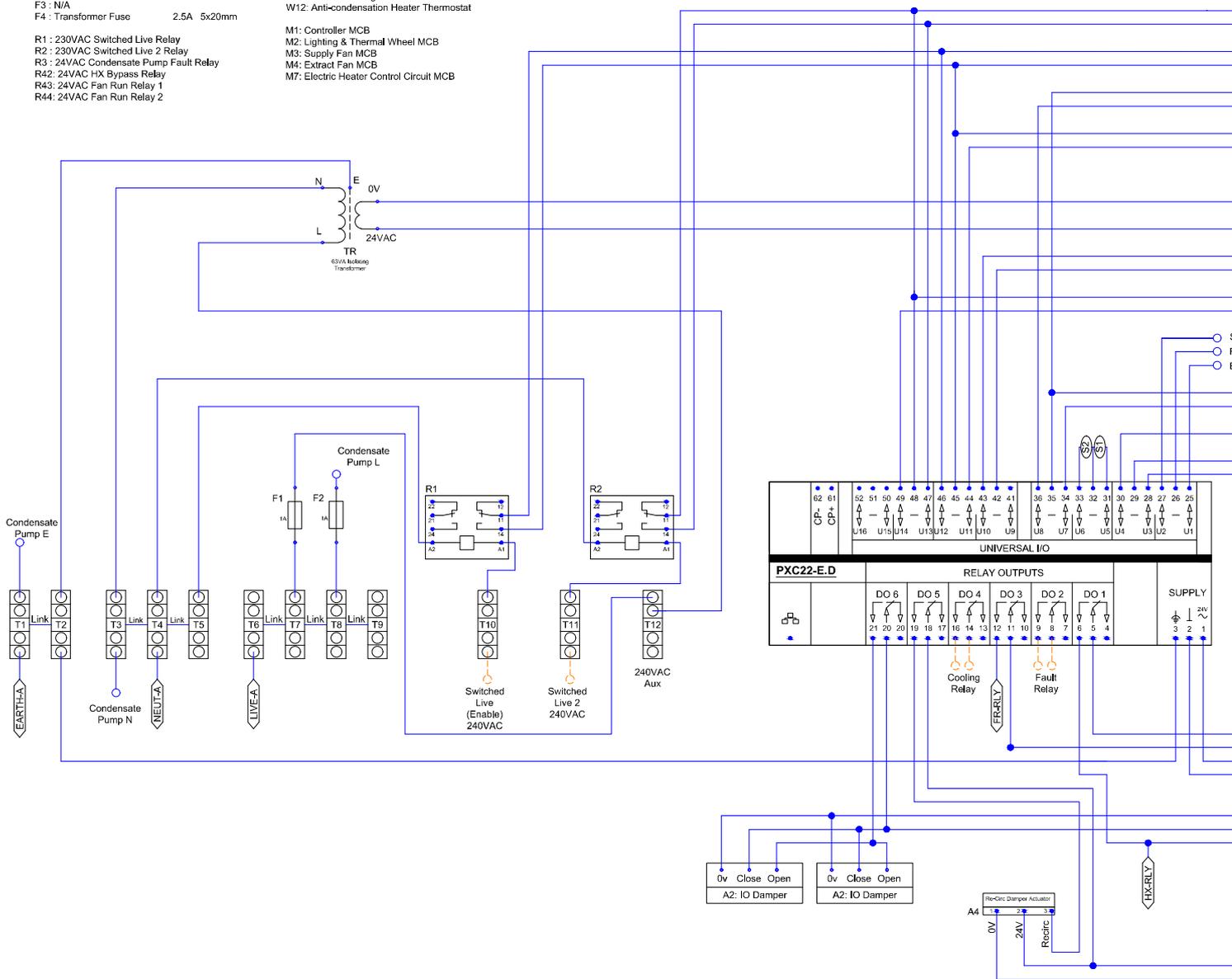
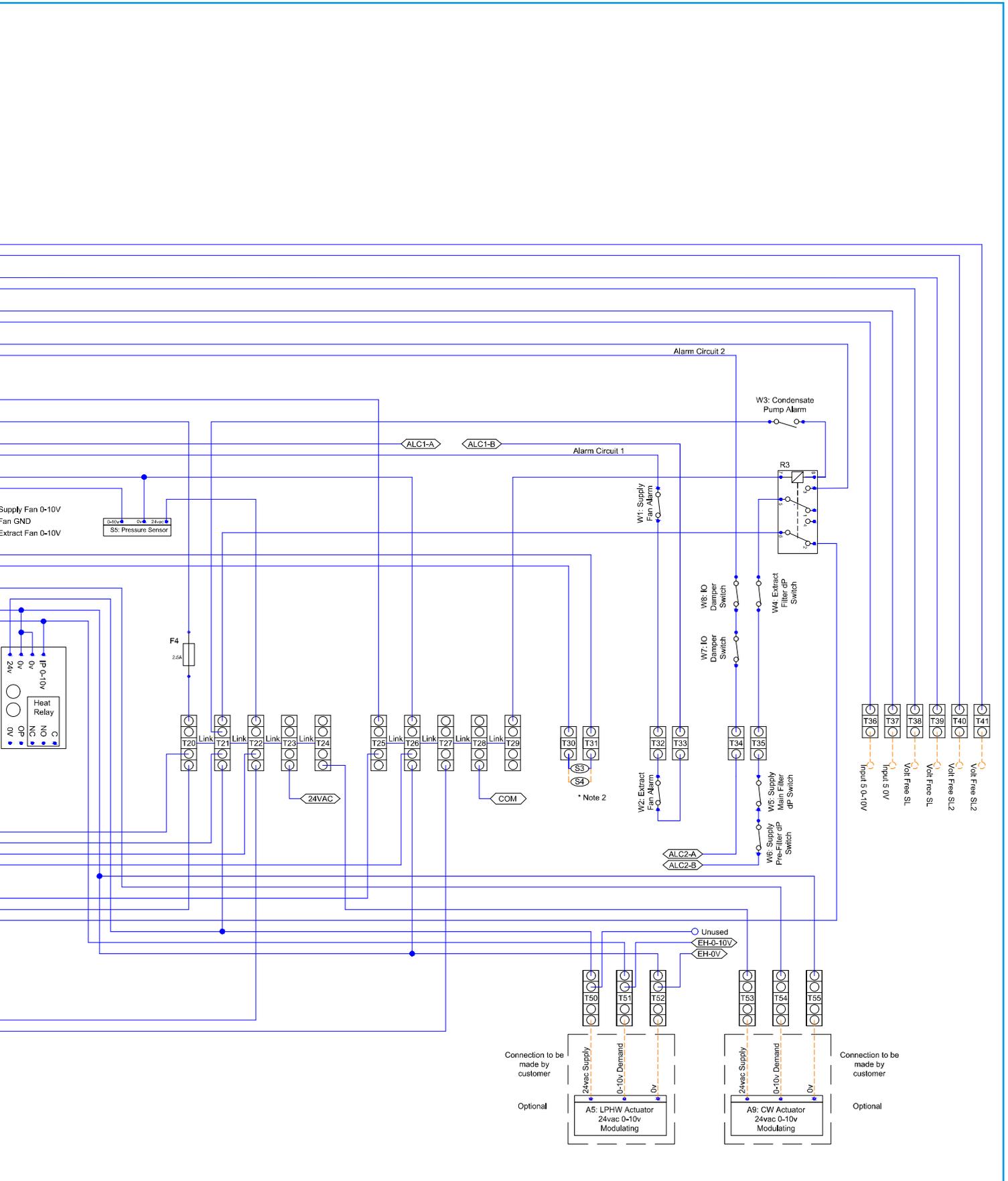


Figure 16:



BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

9.0 DIAGRAMS

9.6 BPS INTERNAL WIRING - Sizes 05 - 20 Electric Heating (Sheet 2)

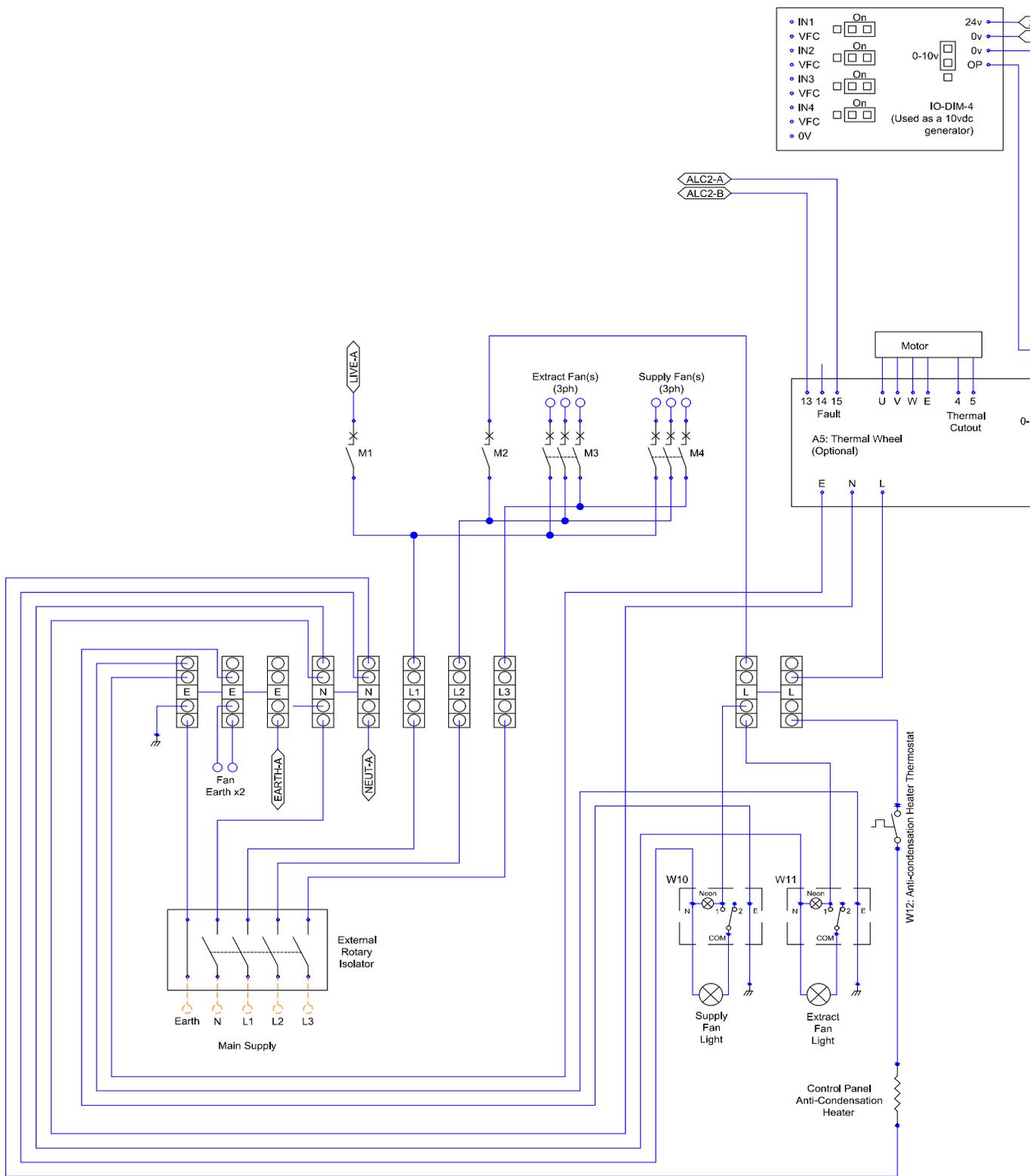
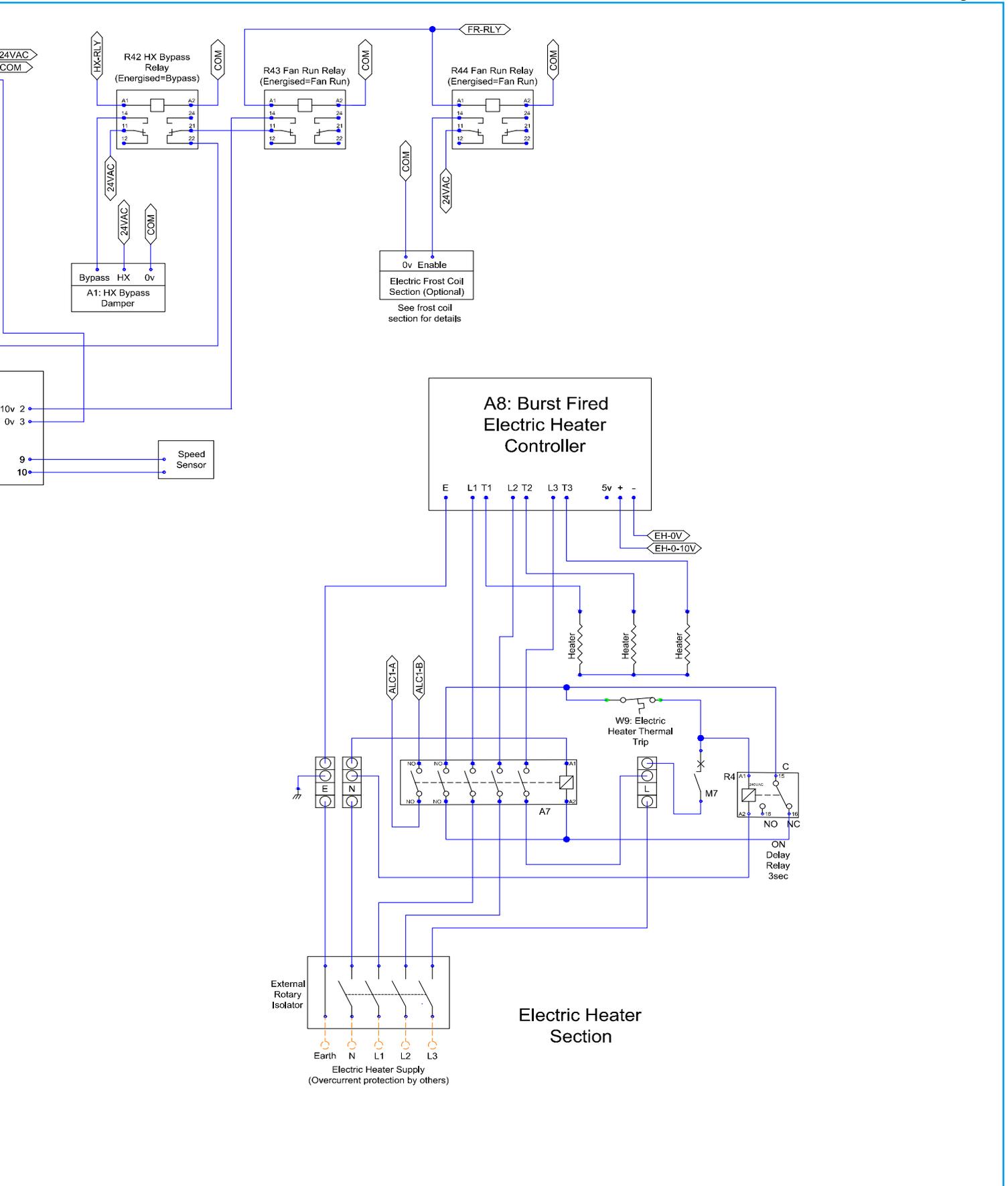


Figure 17:



BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

9.0 DIAGRAMS

9.7 BPS INTERNAL WIRING - Sizes 05 - 10 No Heating (or LPHW) with Mitsubishi Reverse Cycle DX (Sheet 1)

Key:

Internal Factory Connection 
 Customer Connection 
 <XXXXX> Link to page 2

- A1 : 24VAC Bypass Damper Actuator (Optional)
- A2 : 24VAC IO Damper Actuator (Optional)
- A3 : 24VAC IO Damper Actuator (Optional)
- A4 : 24VAC Recirc Damper Actuator (Optional)
- A5 : LPHW Actuator (Optional)
- A6 : Thermal Wheel (Optional)
- A9 : Chilled Water Actuator (Optional)

- F1 : Aux Fuse 1A 5x20mm
- F2 : Condensate Pump Fuse 1A 5x20mm
- F3 : N/A
- F4 : Transformer Fuse 2.5A 5x20mm

- R1 : 230VAC Switched Live Relay
- R2 : 230VAC Switched Live 2 Relay
- R3 : 24VAC Condensate Pump Fault Relay
- R44: 24VAC PAC Heat/Cool Relay
- R45: 24VAC PAC Fault Relay
- R46: 24VAC HX Bypass Relay
- R47: 24VAC Fan Run Relay 1
- R48: 24VAC Fan Run Relay 2

- S1 : Fresh Air Temp. Sensor
- S2 : Supply Air Temp. Sensor
- S3 : Extract Air Temp. Sensor
- S4 : Room Air Temp. Sensor (Optional)
- S5 : 0-10v 0-1000Pa Pressure Sensor

TR : Isolating Transformer 240VAC - 24VAC 63VA

- W1: Supply Fan Fault NO
- W2: Extract Fan Fault NO
- W3: Condensate Pump Fault NO
- W4: Extract Filter dP Switch
- W5: Supply Main-Filter dP Switch
- W6: Supply Pre-Filter dP Switch
- W7: IO Damper Switch (Damper Shut=Open)
- W8: IO Damper Switch (Damper Shut=Open)
- W10: Supply Fan Light Switch
- W11: Extract Fan Light Switch
- W12: Anti-condensation Heater Thermostat

- M1: Controller MCB
- M2: PAC MCB
- M3: Lighting & Thermal Wheel MCB
- M4: Supply Fan MCB
- M5: Extract Fan MCB

B1: Mitsubishi PAC Controller

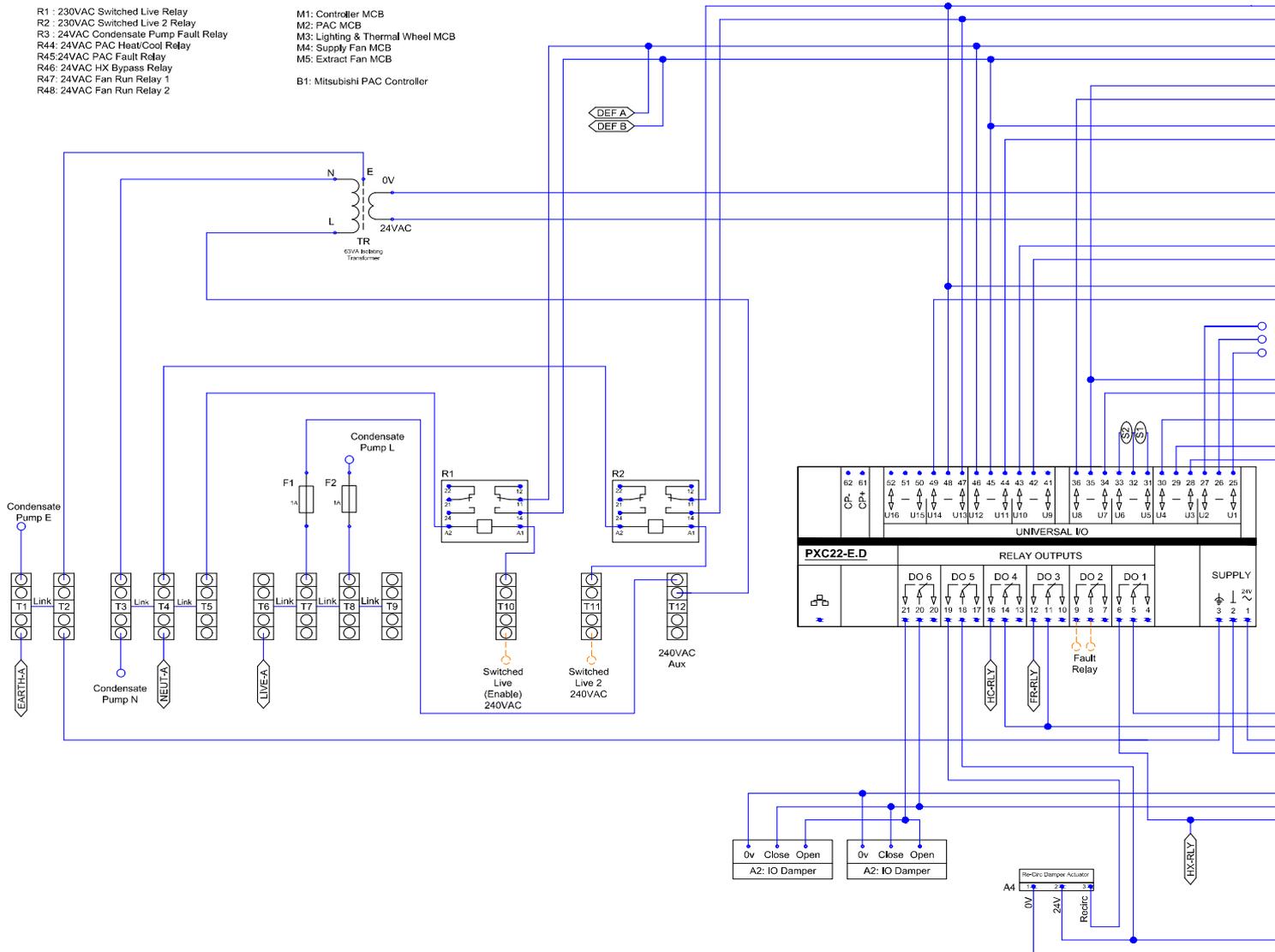
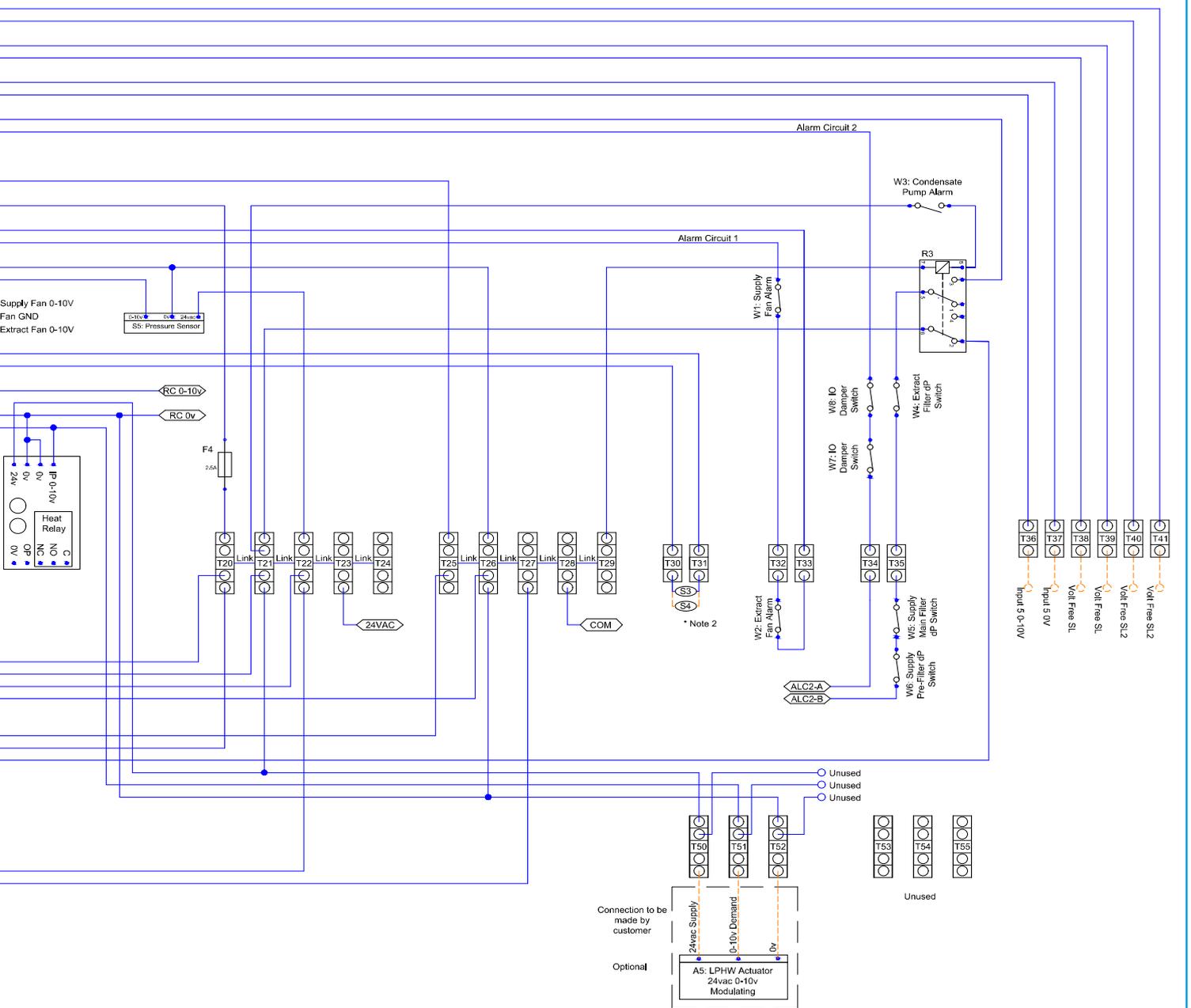


Figure 18:



BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

9.0 DIAGRAMS

9.7 BPS INTERNAL WIRING - Sizes 05 - 10 No Heating (or LPHW) with Mitsubishi Reverse Cycle DX (Sheet 2)

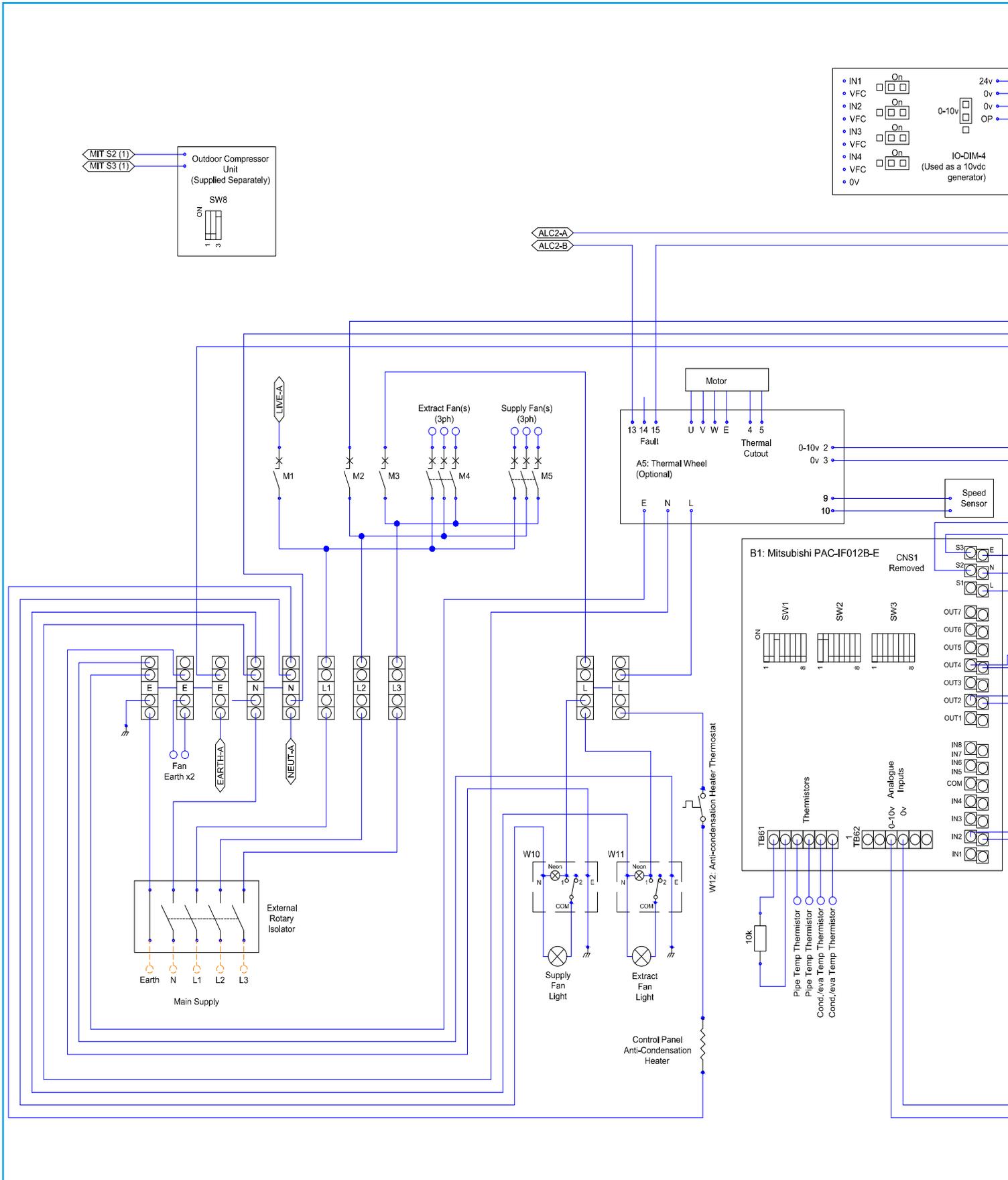
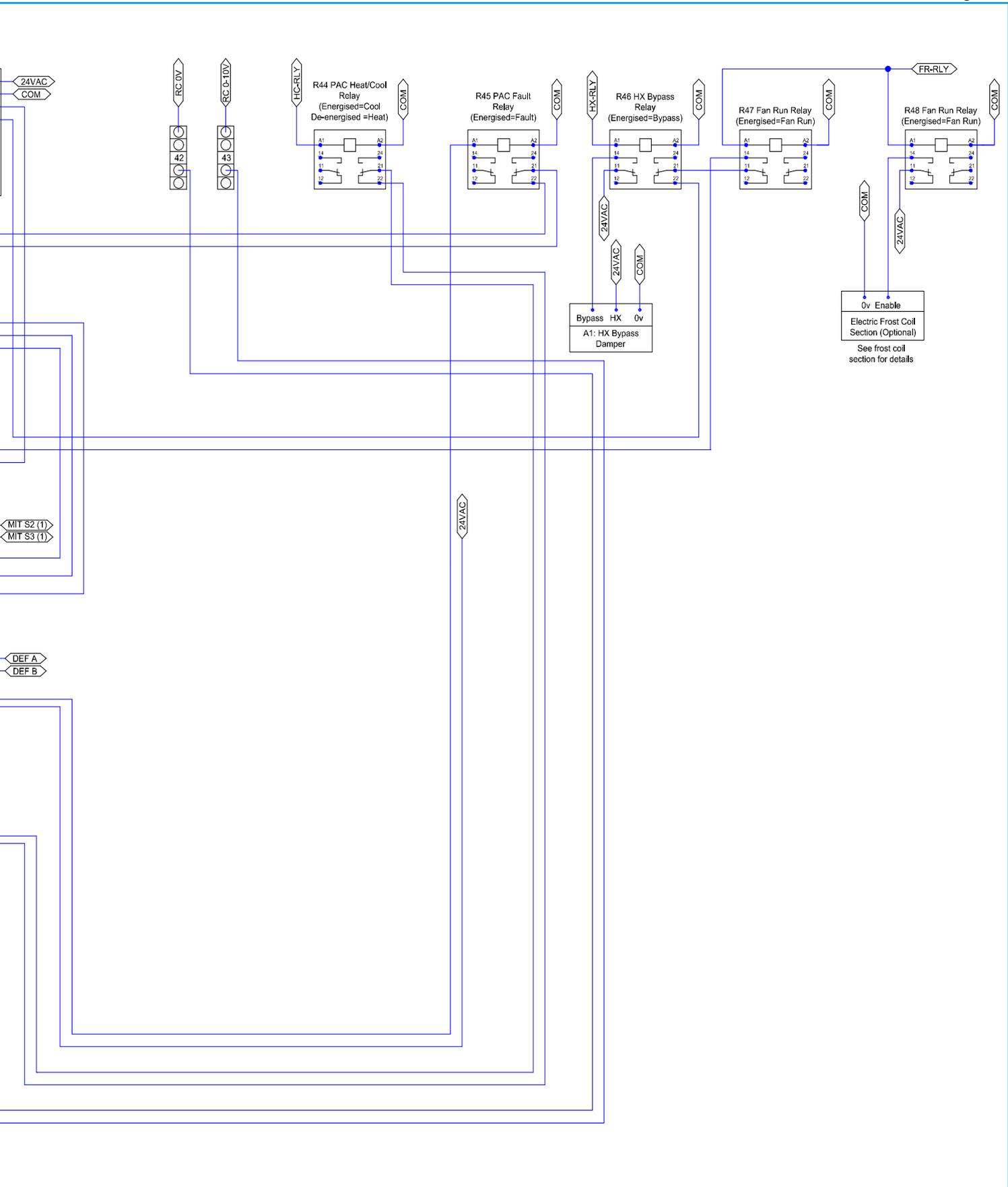


Figure 19:



BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

9.0 DIAGRAMS

9.8 BPS INTERNAL WIRING - Sizes 15 - 20 No Heating (or LPHW) with Mitsubishi Reverse Cycle DX (Sheet 1)

Key:

- Internal Factory Connection
- Customer Connection
- <XXXXX> Link to page 2

- A1 : 24VAC Bypass Damper Actuator (Optional)
- A2 : 24VAC IO Damper Actuator (Optional)
- A3 : 24VAC IO Damper Actuator (Optional)
- A4 : 24VAC Recirc Damper Actuator (Optional)
- A5 : LPHW Actuator (Optional)
- A6 : Thermal Wheel (Optional)
- A9 : Chilled Water Actuator (Optional)

- F1 : Aux Fuse 1A 5x20mm
- F2 : Condensate Pump Fuse 1A 5x20mm
- F3 : N/A
- F4 : Transformer Fuse 2.5A 5x20mm

- R1 : 230VAC Switched Live Relay
- R2 : 230VAC Switched Live 2 Relay
- R3 : 24VAC Condensate Pump Fault Relay
- R44 : 24VAC PAC Heat/Cool Relay
- R45 : 24VAC PAC Fault Relay
- R46 : 24VAC HX Bypass Relay
- R47 : 24VAC Fan Run Relay 1
- R48 : 24VAC Fan Run Relay 2

- S1 : Fresh Air Temp. Sensor
- S2 : Supply Air Temp. Sensor
- S3 : Extract Air Temp. Sensor
- S4 : Room Air Temp. Sensor (Optional)
- S5 : 0-10v 0-1000Pa Pressure Sensor

TR : Isolating Transformer 240VAC - 24VAC 63VA

- W1: Supply Fan Fault NO
- W2: Extract Fan Fault NO
- W3: Condensate Pump Fault NO
- W4: Extract Filter dP Switch
- W5: Supply Main-Filter dP Switch
- W6: Supply Pre-Filter dP Switch
- W7: I/O Damper Switch (Damper Shut=Open)
- W8: I/O Damper Switch (Damper Shut=Open)
- W10: Supply Fan Light Switch
- W11: Extract Fan Light Switch
- W12: Anti-condensation Heater Thermostat

- M1: Controller MCB
- M2: PAC MCB
- M3: PAC MCB
- M4: Lighting & Thermal Wheel MCB
- M5: Supply Fan MCB
- M6: Extract Fan MCB
- B1: Mitsubishi PAC Controller
- B2: Mitsubishi PAC Controller

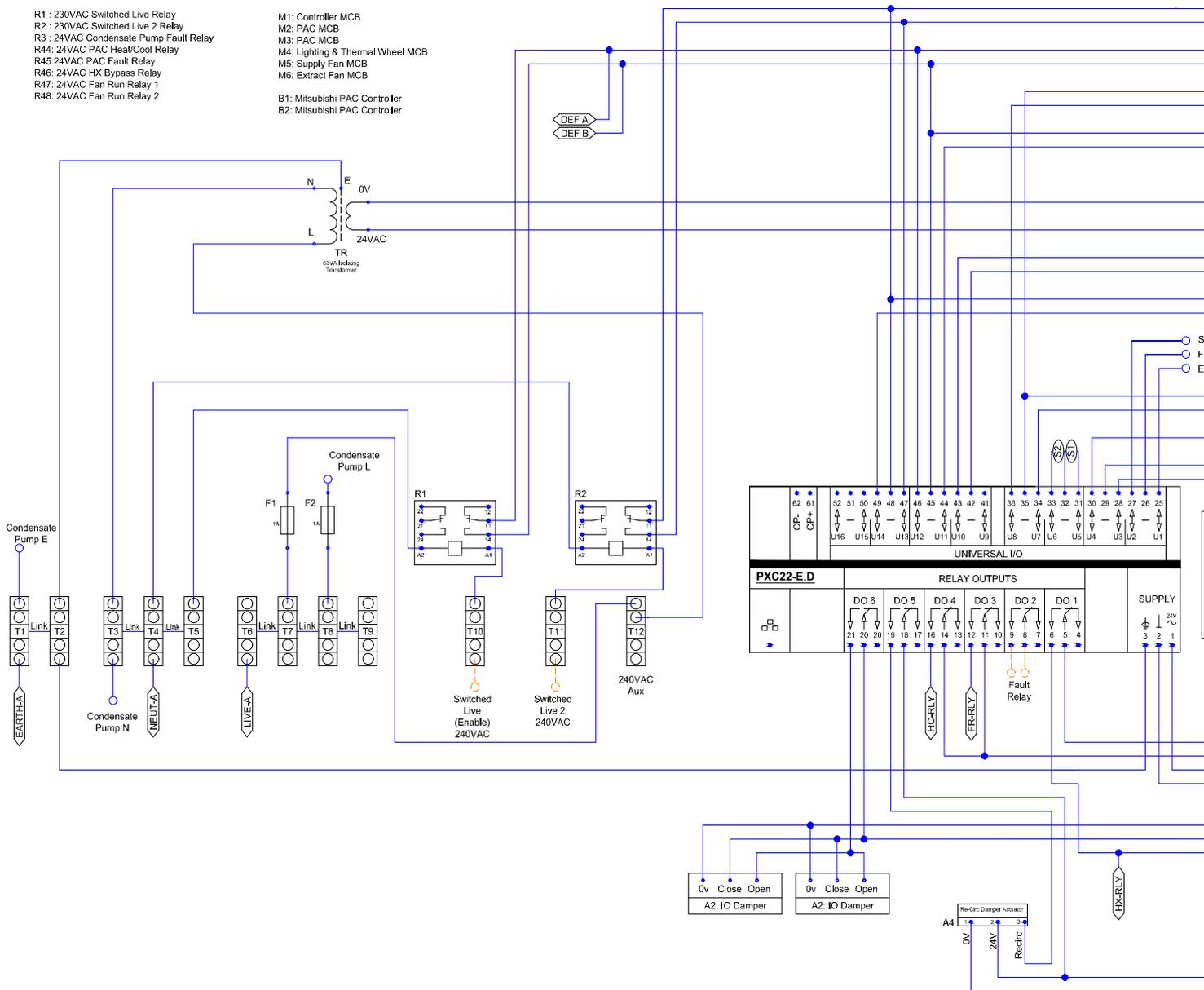
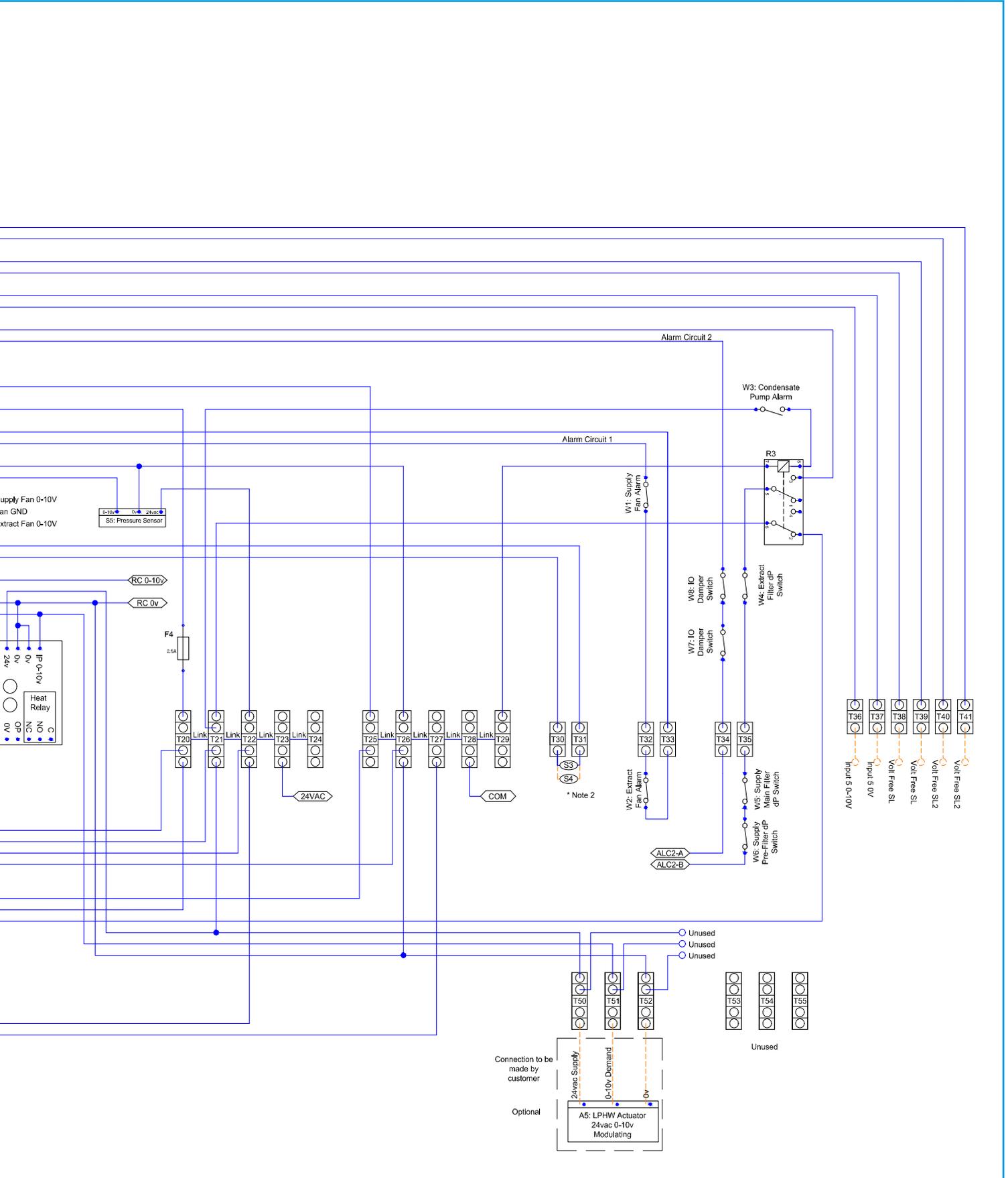


Figure 20:



BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

9.0 DIAGRAMS

9.8 BPS TREND INTERNAL WIRING - Sizes 15 - 20 No Heating (or LPHW) with Mitsubishi Reverse Cycle DX (Sheet 2)

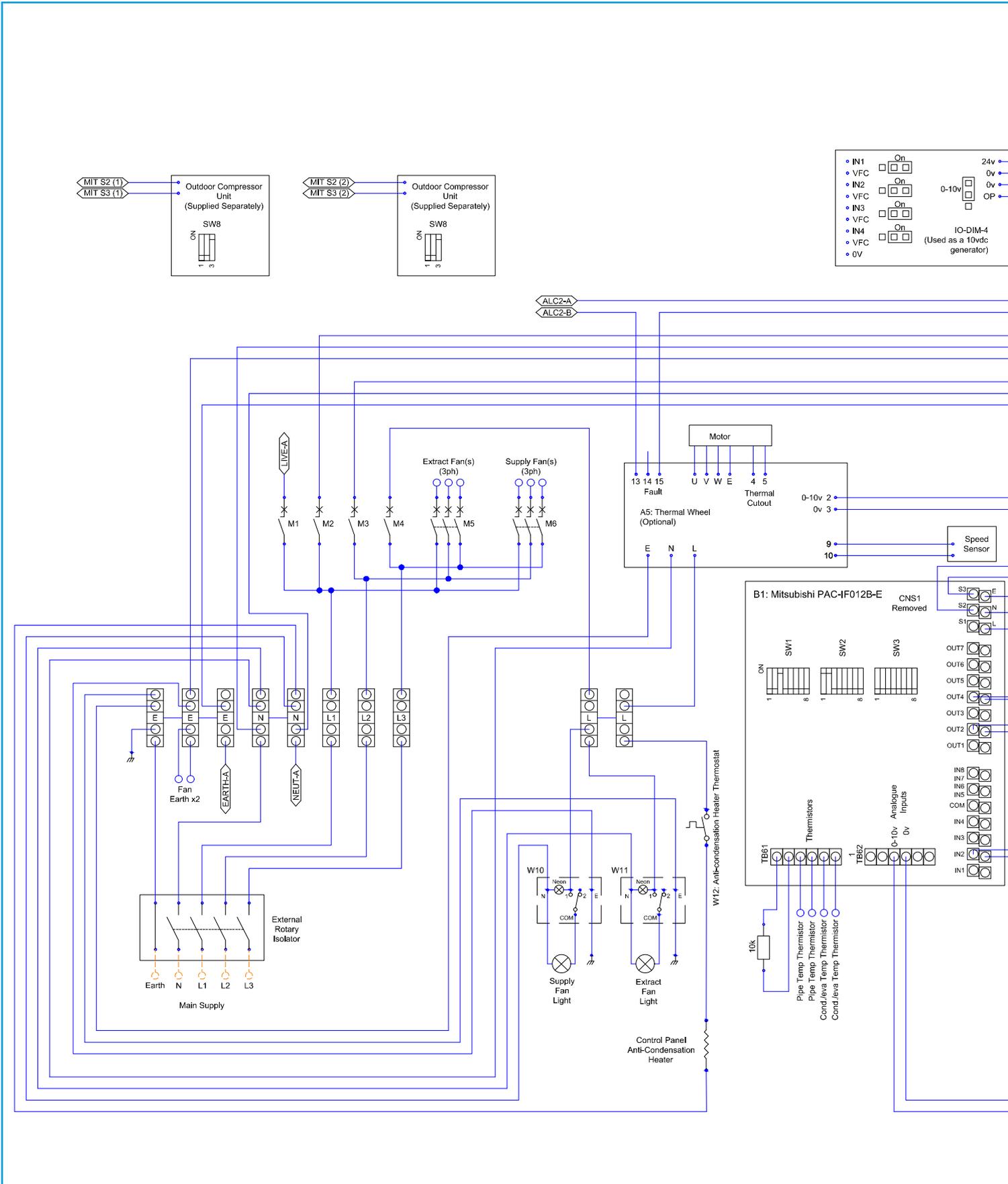
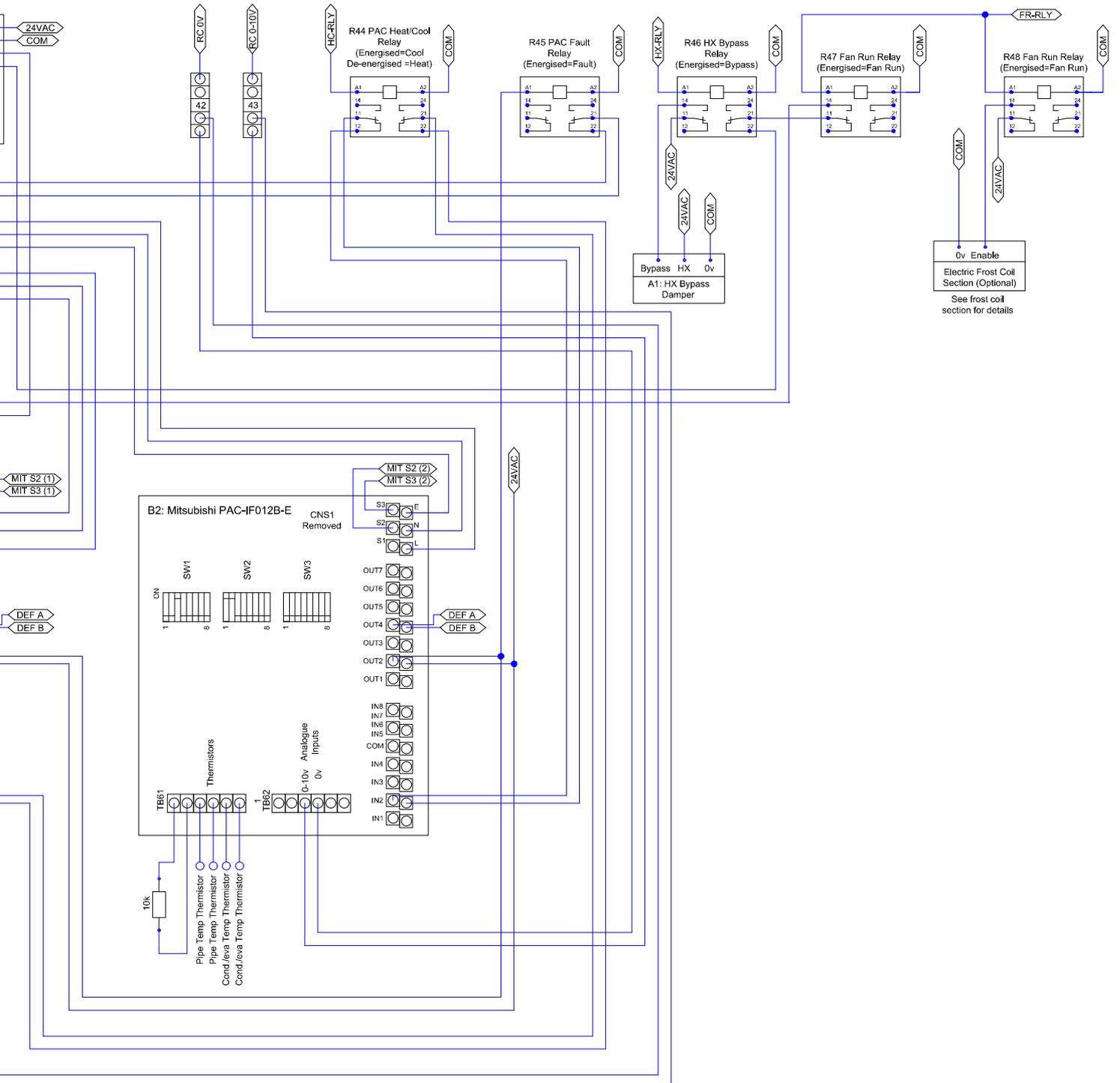


Figure 21:



BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

9.0 DIAGRAMS

9.9 BPS INTERNAL WIRING - Sizes 05 - 10 Electric Heating with Mitsubishi Reverse Cycle DX (Sheet 1)

Key:

Internal Factory Connection 
 Customer Connection 
 <XXXXX> Link to page 2

- A1 : 24VAC Bypass Damper Actuator (Optional)
- A2 : 24VAC IO Damper Actuator (Optional)
- A3 : 24VAC IO Damper Actuator (Optional)
- A4 : 24VAC Recirc Damper Actuator (Optional)
- A5 : LPHW Actuator (Optional)
- A6 : Thermal Wheel (Optional)
- A7 : Electric Heater Contactor
- A8 : Electric Heater Controller

- F1 : Aux Fuse 1A 5x20mm
- F2 : Condensate Pump Fuse 1A 5x20mm
- F3 : N/A
- F4 : Transformer Fuse 2.5A 5x20mm

- R1 : 230VAC Switched Live Relay
- R2 : 230VAC Switched Live 2 Relay
- R3 : 24VAC Condensate Pump Fault Relay
- R44: 24VAC PAC Heat/Cool Relay
- R45: 24VAC PAC Fault Relay
- R46: 24VAC HX Bypass Relay
- R47: 24VAC Fan Run Relay 1
- R48: 24VAC Fan Run Relay 2

- S1 : Fresh Air Temp. Sensor
- S2 : Supply Air Temp. Sensor
- S3 : Extract Air Temp. Sensor
- S4 : Room Air Temp. Sensor (Optional)
- S5 : 0-10v 0-1000Pa Pressure Sensor
- TR : Isolating Transformer 240VAC - 24VAC 63VA
- W1: Supply Fan Fault NO
- W2: Extract Fan Fault NO
- W3: Condensate Pump Fault NO
- W4: Extract Filter dP Switch
- W5: Supply Main-Filter dP Switch
- W6: Supply Pre-Filter dP Switch
- W7: IO Damper Switch (Damper Shut=Open)
- W8: IO Damper Switch (Damper Shut=Open)
- W9: Electric Heater Thermal Trip
- W10: Supply Fan Light Switch
- W11: Extract Fan Light Switch
- W12: Anti-condensation Heater Thermostat
- M1: Controller MCB
- M2: PAC MCB
- M3: Lighting & Thermal Wheel MCB
- M4: Supply Fan MCB
- M5: Extract Fan MCB
- M6: Electric Heater Control Circuit MCB
- B1: Mitsubishi PAC Controller

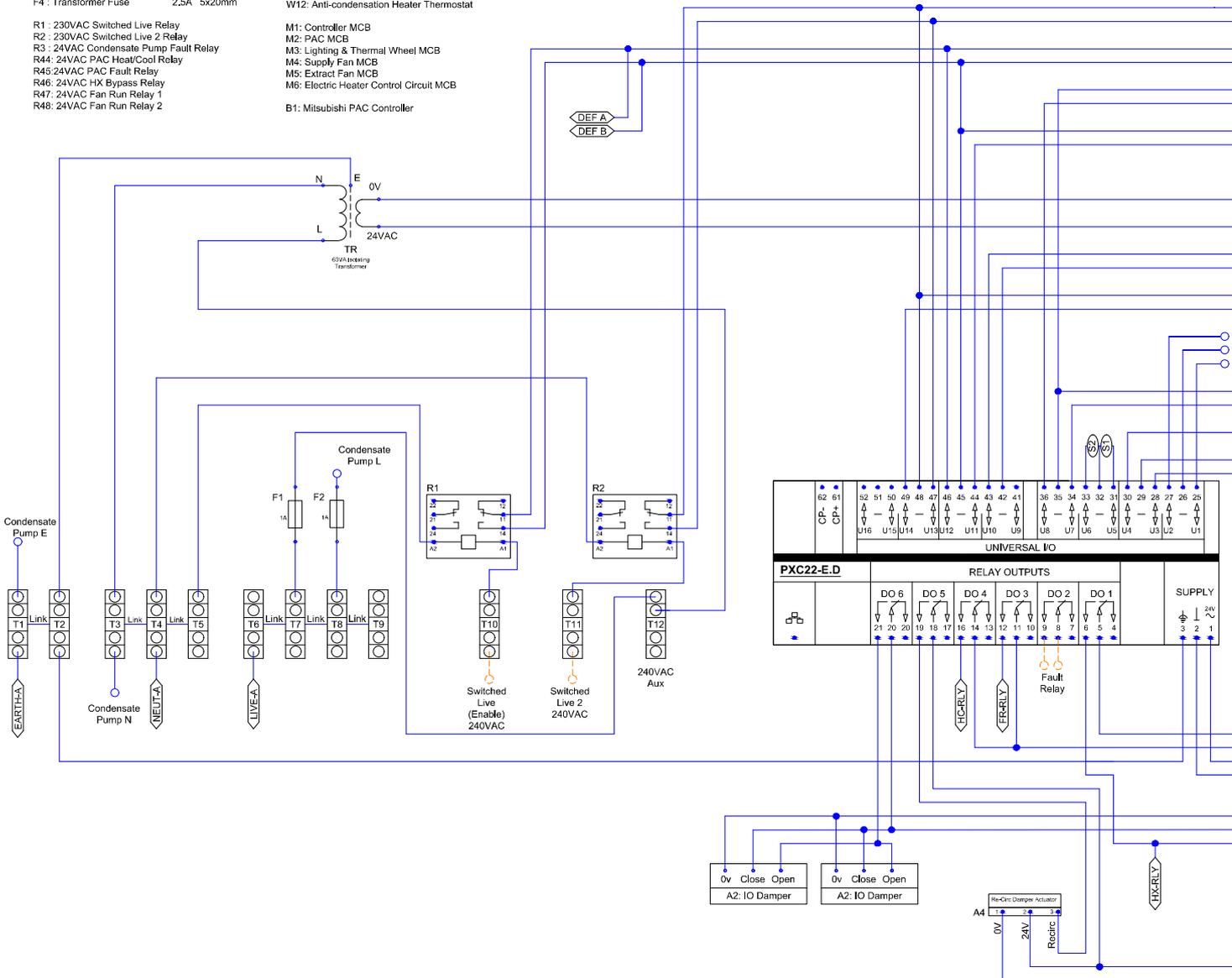
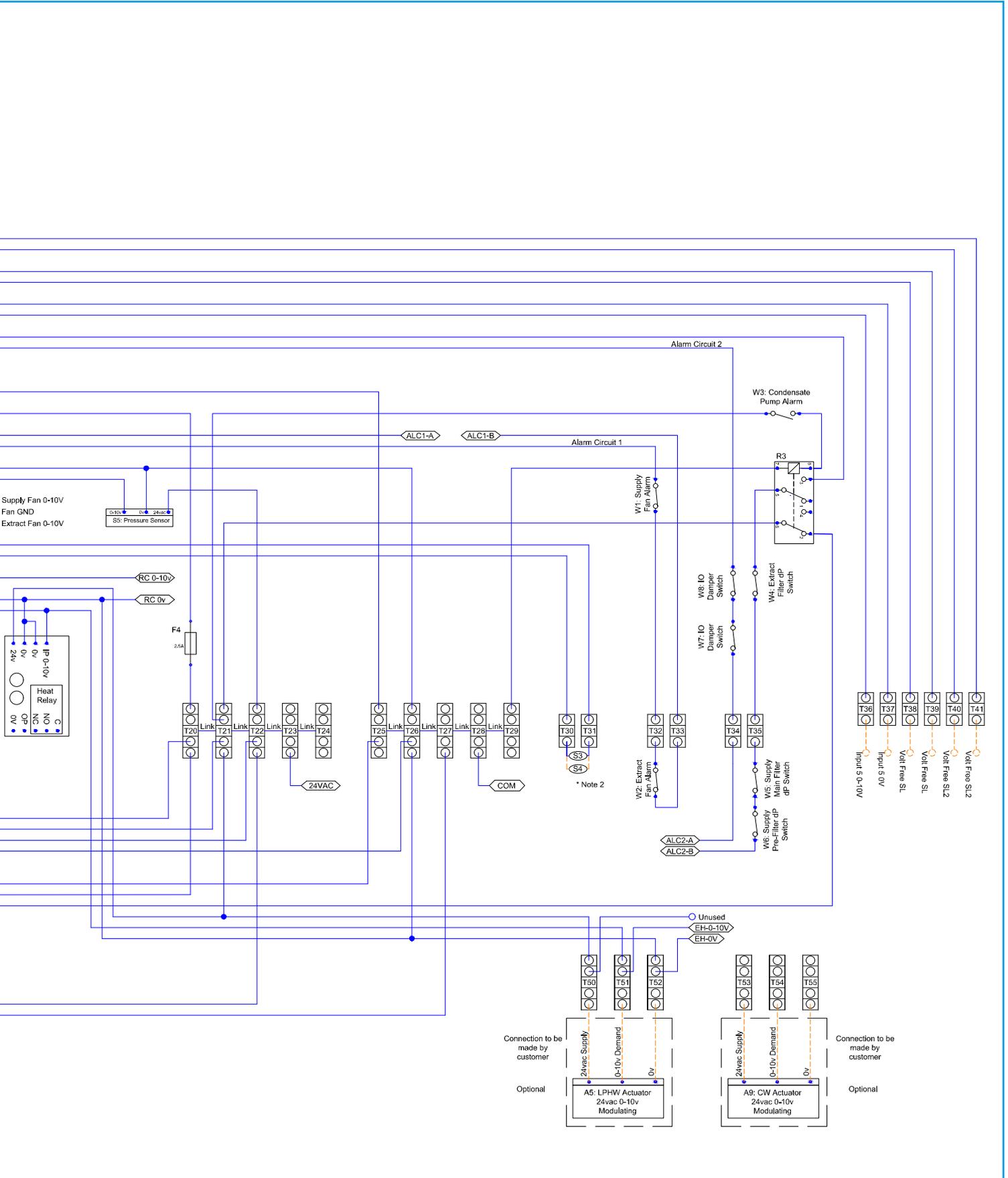


Figure 22:



BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

9.0 DIAGRAMS

9.9 BPS INTERNAL WIRING - Sizes 05 - 10 Electric Heating with Mitsubishi Reverse Cycle DX (Sheet 2)

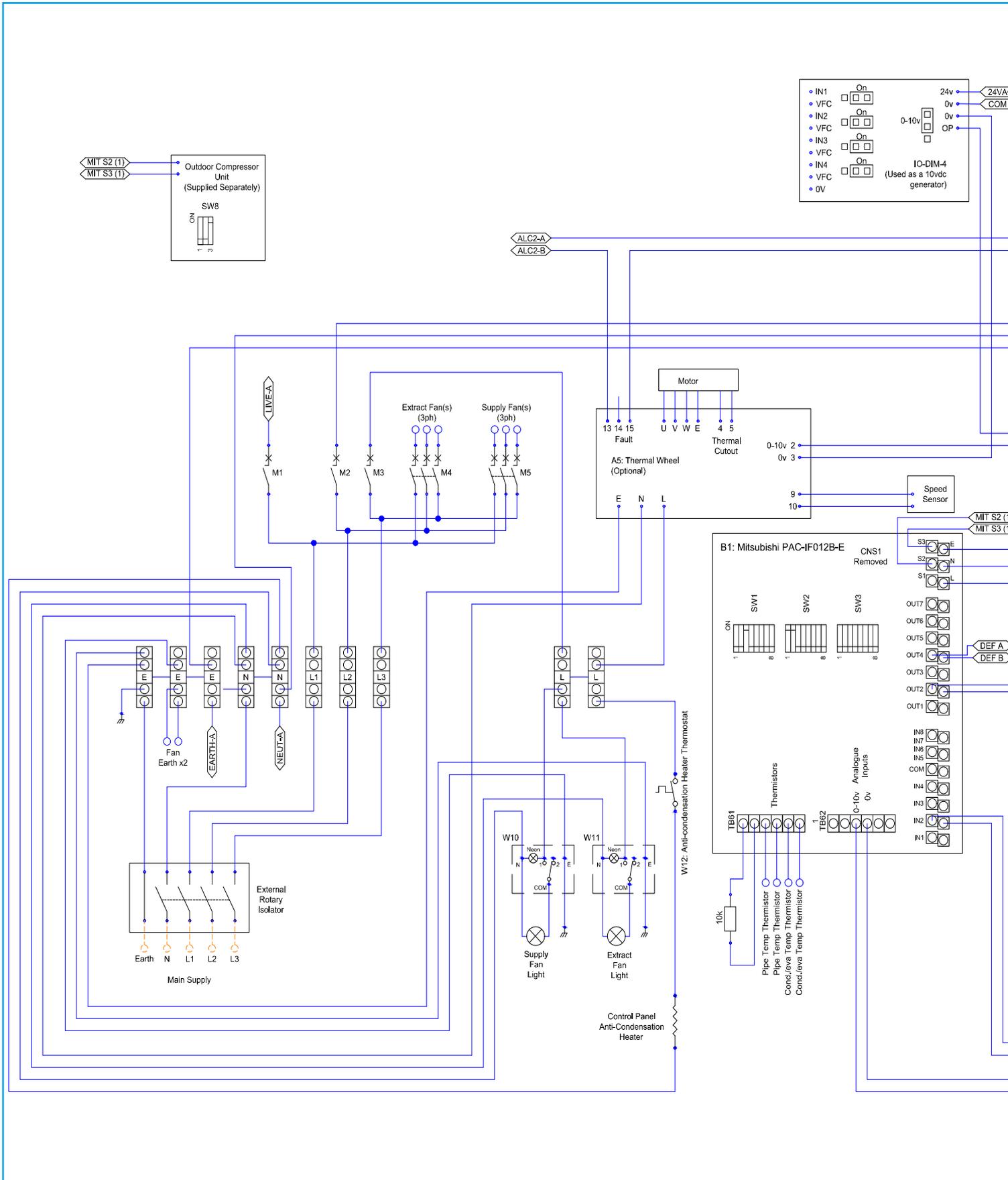
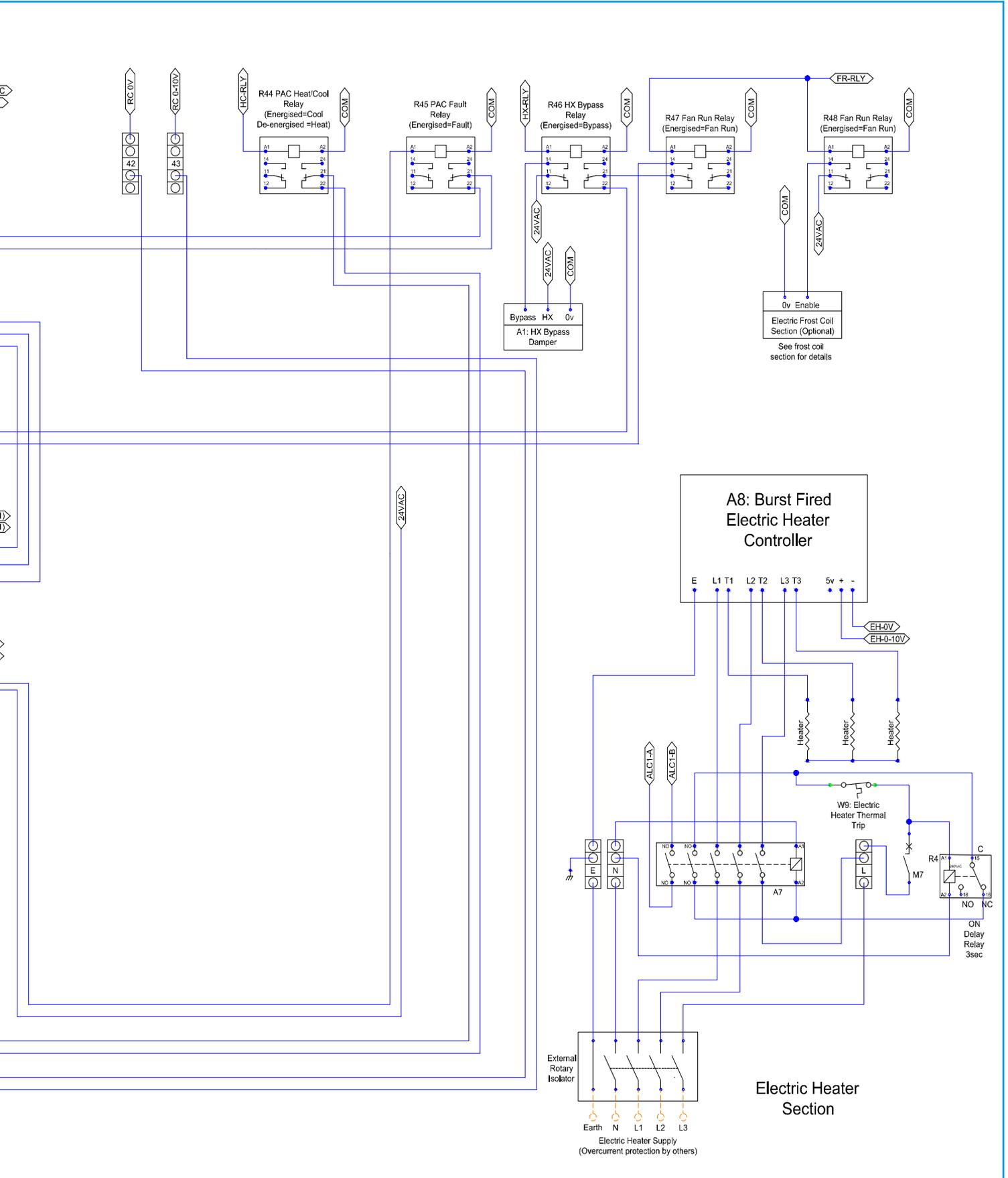


Figure 23:



BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

9.0 DIAGRAMS

9.10 BPS INTERNAL WIRING - Sizes 15 - 20 Electric Heating with Mitsubishi Reverse Cycle DX (Sheet 1)

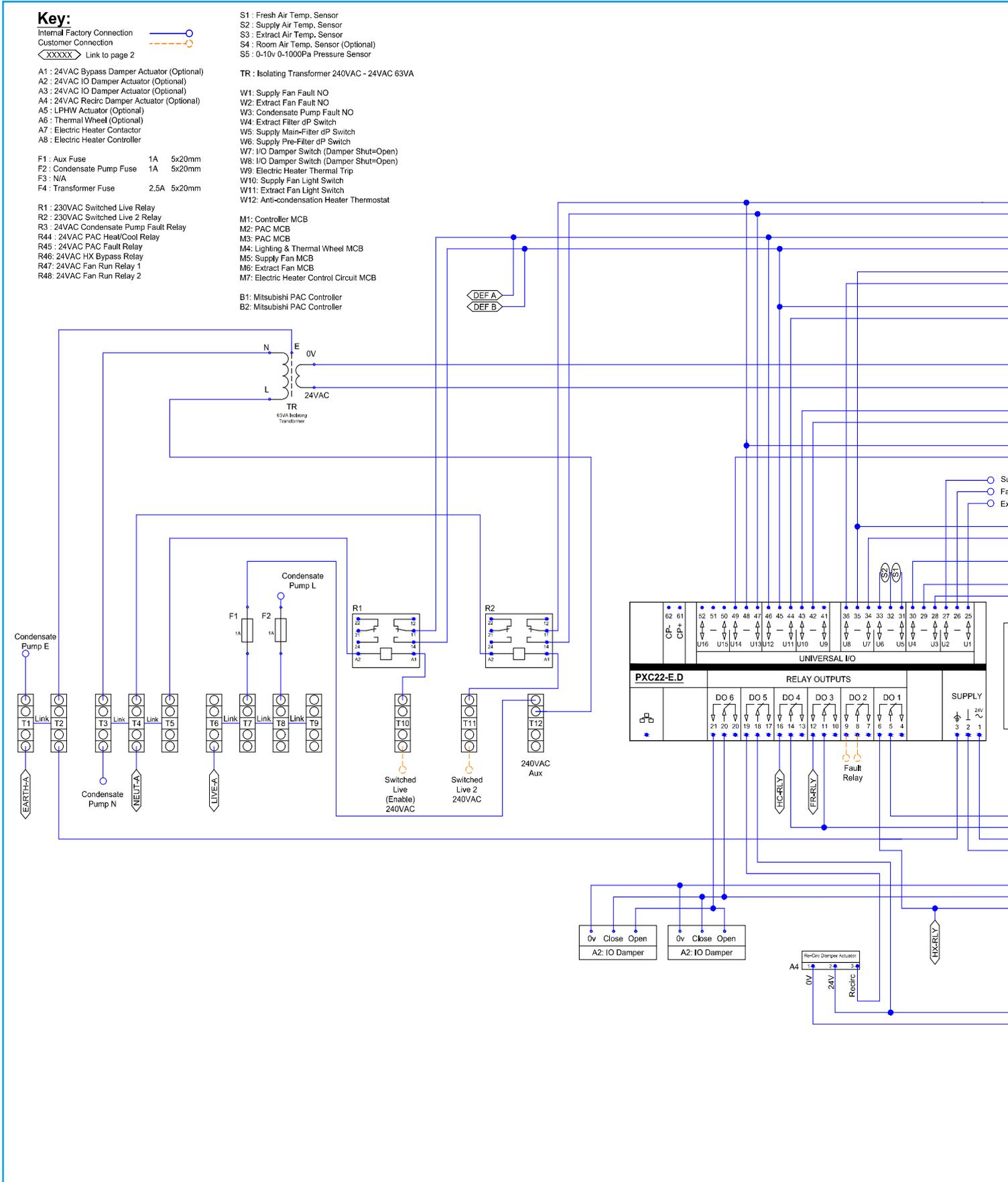
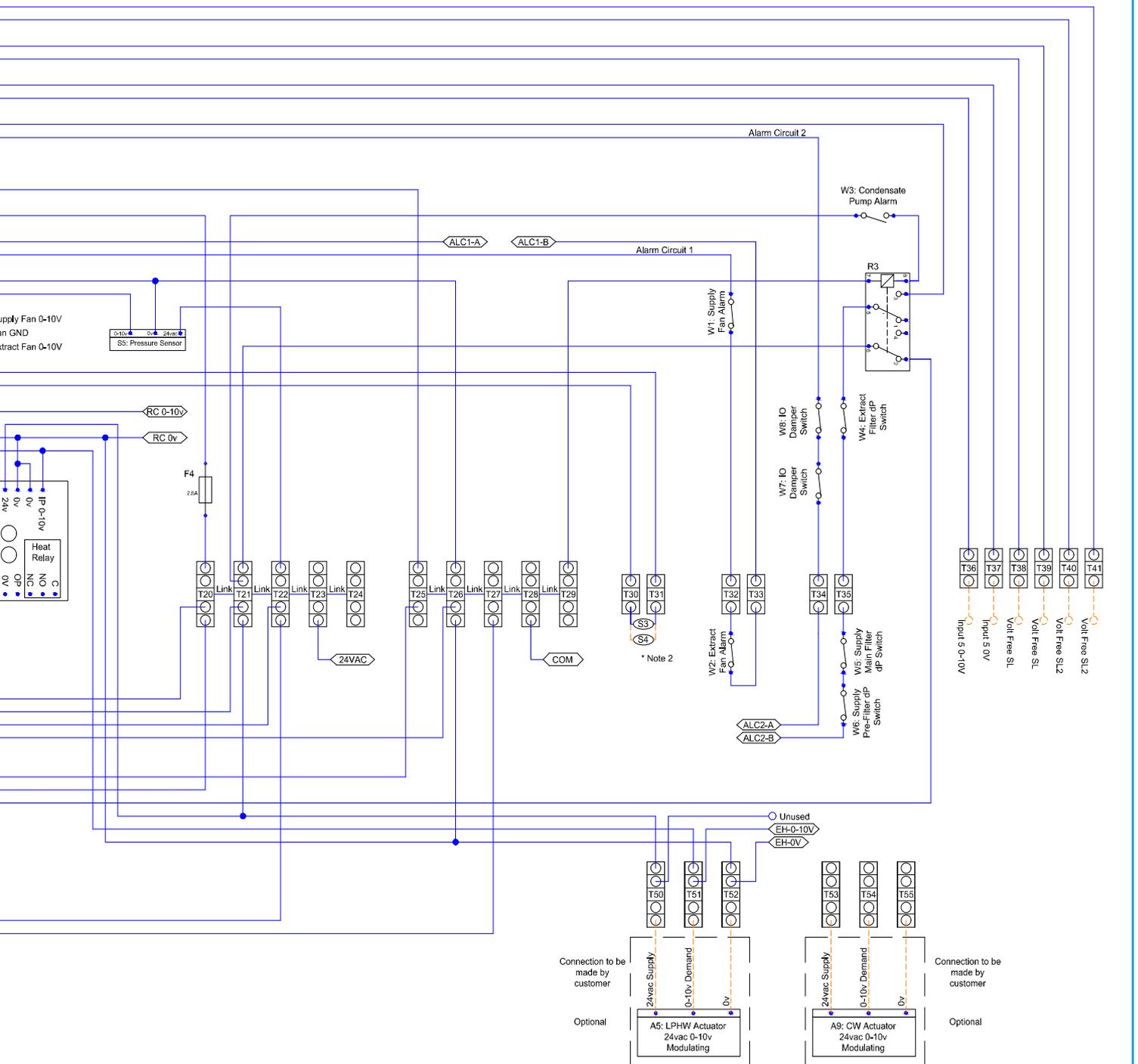


Figure 24:



BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

9.0 DIAGRAMS

9.10 BPS INTERNAL WIRING - Sizes 15 - 20 Electric Heating with Mitsubishi Reverse Cycle DX (Sheet 2)

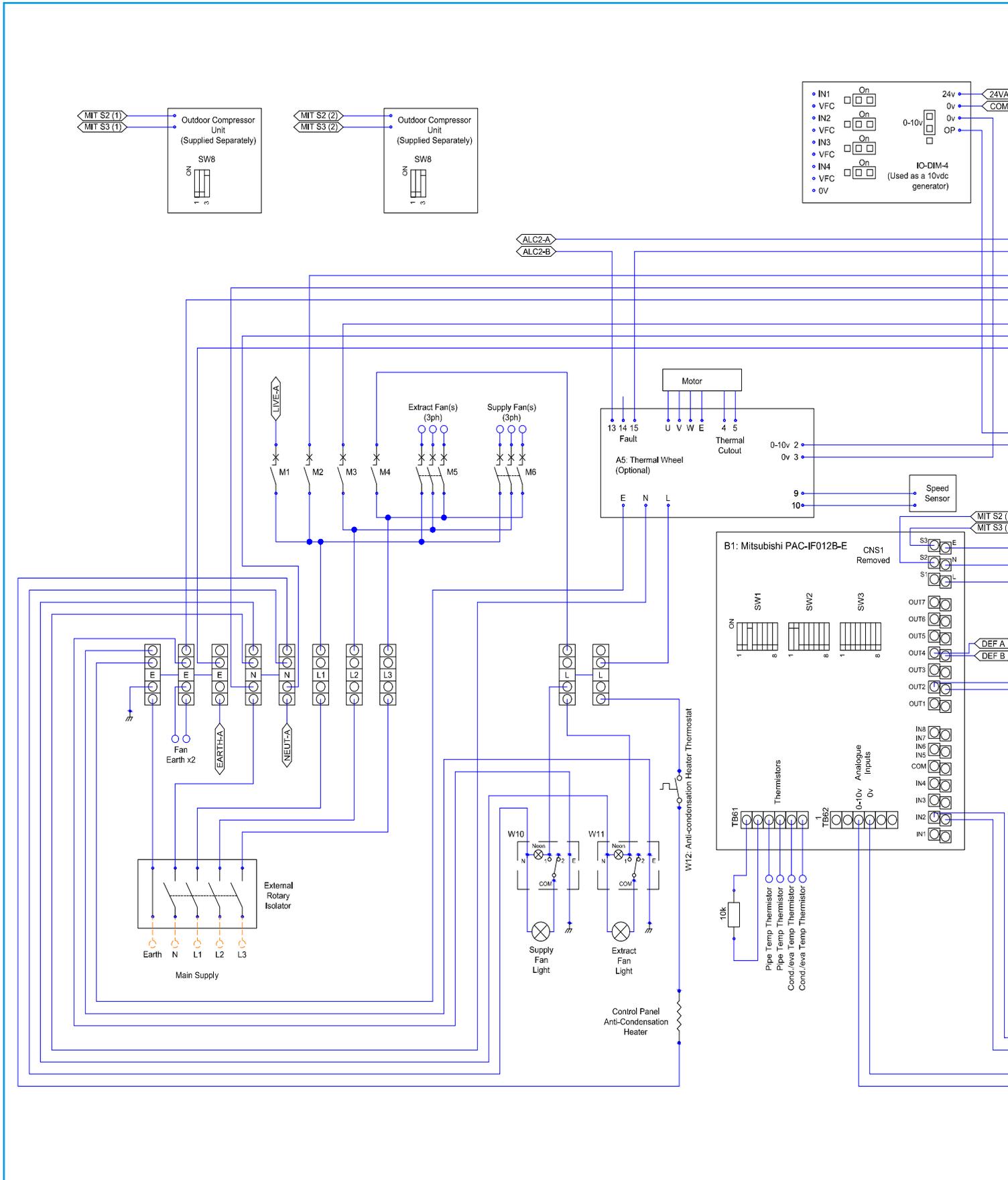
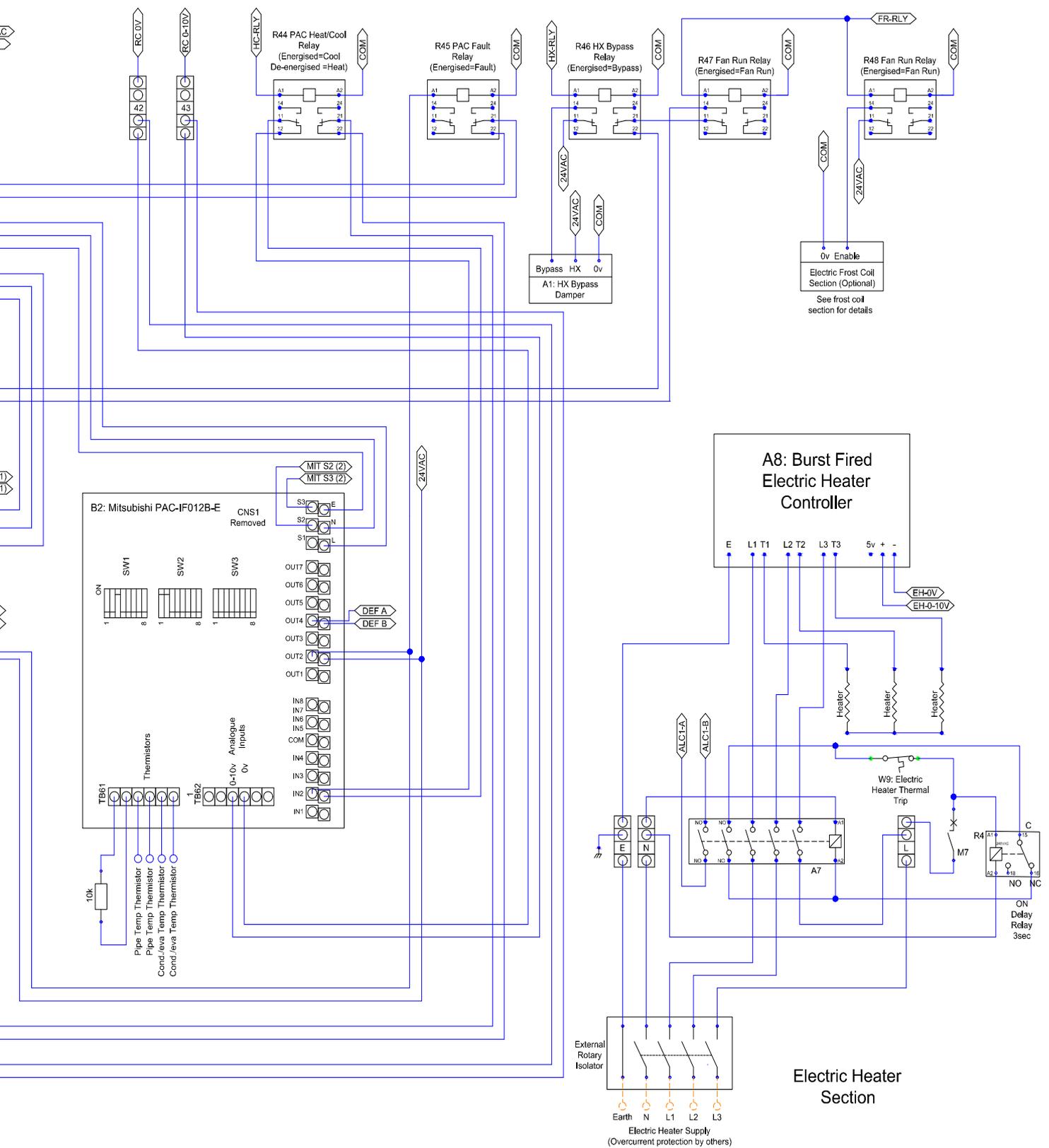


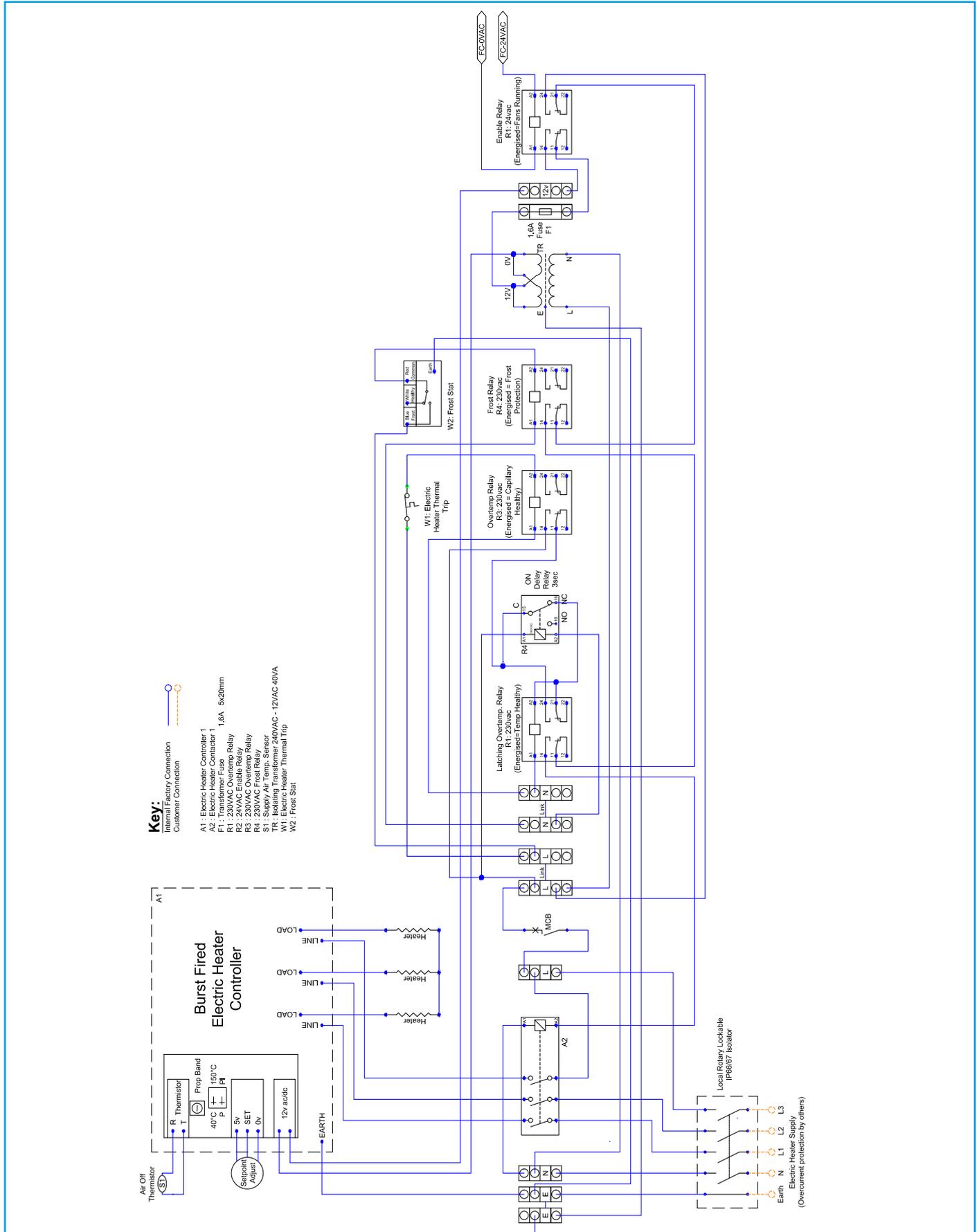
Figure 25:



10.0 FROST COIL

10.2.1 ELECTRIC HEATER FROST COIL WIRING - BPS Sizes 05, 10, 15 & 20

Figure 27:



BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

11.0 COMMISSIONING

Before commissioning the unit, ensure that all equipment has been assembled in accordance with the installation procedure all instances where the unit is in operation the access doors should remain closed; at no time, during maintenance or otherwise, should anyone be inside a unit whilst it is in operation.

11.1 COMMISSIONING CHECKLIST ✓

- All equipment received is according to specification/order.
- Any damage to unit identified.
- Fan base shipping restraints / Fixing Brace removed (if applicable).
- The correct installation procedure has been carried out in accordance to Nuaire's recommendations.
- Anti-vibration mounts are adjusted accordingly.
- Rotate fan impellers and motors to ensure they run freely.
- Check any additional bearings and couplings (where fitted manually).
- Condensate drain traps are checked/connected.
- Check all filters are correctly fitted.
- Ensure ductwork is complete.
- Check electrical supply voltage and tightness of all electrical connections.
- Ensure control damper operation.
- Ensure access panels and doors are fitted properly and secure.
- Check fan motor current draw.

11.2 FAN & MOTOR

Care should be taken to ensure that the fan and motor run freely and that the fan is rotating in the correct direction.

The electrical current being drawn by motors should not exceed the manufacturers recommendations (specified on the motor plate). If the current exceeds this, check the fan volume flow rate and the static resistance.

12.0 MAINTENANCE

It is the owner's responsibility to ensure that the air handling equipment is maintained accordingly. In doing so, regular and scheduled checks will decrease the possibility of unforeseen and possibly costly repairs. Maintenance tasks should be taken care of by a competent person, if system failure occurs due to improper maintenance, Nuaire will not be held liable for the costs of restoring a unit to its previous working condition.

It is recommended that PPE is always used during the maintenance of Air Handling Equipment – gloves, eye shields and respiratory mask.

IMPORTANT

Isolation - Before commencing work make sure that the unit is electrically isolated from the mains unit and sufficient time has passed to allow the fans to run down (5 minutes minimum).

12.1 FANS

Please refer to general arrangement drawings for details of the type of fan and drive that is fitted. Maintenance guidelines for all fans are beyond this manual, please contact Nuaire for specific documents.

Before any work is carried out, please ensure that:

- The power supply to the motor is switched off.
- The fan impeller is at rest.
- Measures are taken to ensure that the accidental, uncontrolled running of the fan is prevented during maintenance work.

In general, fans should be inspected twice a year, and care should be taken to ensure that any unusual vibration or sound is investigated as an urgent matter.

Access to the fan section is via hinged or lift-off panels. Cable entry must be made through the apertures provided. Screwed glands with cable restraint devices should be used.

12.2 GENERAL FAN MAINTENANCE

- Access to the fan is normally gained by opening the hinged access doors.
- Care should be taken to remove any build up of dust (a light vacuum or light brushing will normally take care of this) Do not use a steam or any other high pressure cleaners.
- Inspect the connection between the fan and unit for any damage or wear and tear.

12.3 BEARINGS

The bearings that are fitted will be (unless otherwise specified) "sealed for life", therefore consequence maintenance is not required.

Fan bearings are lifelong; up to 40,000 hours of operation. In cases of heavy duty operation, maintenance intervals are to be established by the operator.

12.4 FILTERS

When removing the filter access panels, pay attention to the airflow direction marked on the panel, this must be replaced to the exact position prior to being removed. Disposable filters should be checked, and changed when they become fully laden with dust. Washable filters should be removed and washed in a mild detergent, flushed with clean water and allowed to dry before refitting.

12.5 COILS

Coils should have their finned surface examined for accumulation of dirt, lint and biological contaminants or similar. If necessary, wash down affected areas with a mild detergent solution and a soft brush. Care should be taken not to damage the finned surface, and any cleaning fluids should be rinsed away with water.

A compressed air line may be used to blow out any solids between fins. Do not probe the coil fin block with metal objects as damage may cause leaks. Drain lines should be checked to ensure that they are unobstructed and free draining. Drain pans should be flushed out periodically to remove contamination.

Note: The unit application may require particular attention to this item – Check with Building Management personnel for details.

12.6 PLATE HEAT EXCHANGER

IMPORTANT

Isolation - Before commencing work make sure that the unit is electrically isolated from the mains unit and sufficient time has passed to allow the fans to run down (5 minutes minimum).

The recuperator block is normally protected from dust and contamination by upstream pre-filters. It is possible to clean the unit with compressed air in the case of dust deposits or by spraying with a mild detergent solution for grease deposits.

Solvents, strong alkaline, acidic or any products that may be aggressive to aluminium or plastics should not be used. Do not use cleaning water over 50 deg C.

Drain lines should be checked to ensure that they are unobstructed and free draining. Traps should be checked that they are fully primed and functioning.

Drain pans should be flushed out periodically to remove contamination, and chemical treatments may be used to provide protection between service visits.

Note: The unit application may require particular attention to this item – Check with Building Management personnel for details.

IMPORTANT

If the unit contains a thermal wheel heat exchanger, please ensure that the rotation sensor is aligned with the sensing studs, as this can become misaligned during transport/installation thus causing a fault signal.

12.7 THERMAL WHEEL

Maintenance is restricted to regular visual inspections. Inspections should be initially carried out about every 3 months and then after trouble-free operation can be extended to 12 months. The following must be checked:

- Tension of drive belt
- Sealing of gear motor
- Quality of bearings (assess by bearing noise)
- Function of slide seal
- Function of transverse seal
- Condition of casing
- Condition of wheel

Experience shows that clogging of heat exchangers is not expected in normal cooling and air-conditioning systems. However, if deposits accumulate on the exchanger when used for special applications, it can be cleaned as follows:

- Remove dust and fibres with a soft brush or vacuum cleaner. Use caution when blowing dirt out with compressed air to avoid damage to the wheel. Keep at a distance!
- Oils, solvents etc. can be removed with hot water (max. 70 °C) or grease-removing solvents or immersion.

12.8 LEGIONELLA CHECK

Legionella risk management should be undertaken by a competent person appointed by the duty holder in accordance with the latest edition of the HSE approved code of practice L8 Legionnaires' disease, the control of legionella bacteria in water systems. Particular attention should be given to:

- Cooling coil.
- Thermal Wheel.
- Drain trays.
- Water reservoirs.

12.9 ELECTRIC HEATERS

An Air handling unit would normally require no heater maintenance. However a periodic check is advised to ensure that the fasteners and electrical connections are operating correctly.

The electric heater unit is fitted with fail-safe thermal switches (self-resetting) which will isolate the electric heater supply if a temperature of 80°C is detected. This action is performed independently of any controls fitted. Nuair fitted controls will also stop heating if a fan or heater failure is detected.

12.10 BULKHEAD LIGHTS

Ensure that lights are switched off and isolated before checking or changing the lamp.

12.11 GENERAL

Inspect all internal and external surfaces to check for corrosion or peeling of painted surfaces.

Thoroughly clean affected areas with a wire brush, apply a coat of zinc rich primer or similar, and re-touch with suitable finishing paint. Ensure tightness of all nuts, bolts, and fixings.

Check all components for general condition.

12.12 SPECIALIST EQUIPMENT

Contact Nuair for maintenance of specialised equipment that would have been specified during design stage. A breakdown of the component parts can be found on the design specification documents, additional maintenance literature is available, please contact Nuair.

This applies to any components not specifically mentioned in this document.

BOXER BPS ECOSMART ADAPT (SIEMENS) CONTROL (AS)

12.13 MAINTENANCE SCHEDULE

It is important that maintenance checks are recorded and that the schedule is always adhered to, in all cases, the previous report should be referred to.

Particular attention to the items mentioned below should be considered:

- **Routine Maintenance.**
- **Any areas of corrosion should be treated and all areas of the unit should be cleaned.**
- **Any drain trays should be cleaned and repaired if necessary.**
- **Check all access doors for leakage and if necessary, locks should be adjusted and any replacement gasket materials should be replaced as required.**

Every 3 months

- Check filters and change/clean if required.
- Check fin coil banks and heat exchangers. If necessary clean with a soft brush or vacuum. Also check for signs of contamination.
- Ensure condensate drains are cleaned clear and that water can flow freely from unit.
- Clean unit casting and ensure that any corrosion is addressed by treating.

Every 6 months

- Ensure all locks and hinges are lubricated and adjusted as required.
- Check control dampers blades.
- Check operation of damper actuators and linkages and adjust as necessary.

Annually

- All electrical terminals within the unit should be tightened.
- Coil faces should be inspected and any dust removed.
- Thoroughly inspect the unit and its components for corrosion, acting immediately to treat/restore any damaged areas.
- Check all earth connections.
- Check thermal wheel belt, motor, bearings, seals and if necessary clean with a soft brush or vacuum cleaner.

13.0 WARRANTY

5 year warranty on ECOSMART models for peace of mind. The warranty starts from the day of delivery and includes parts and labour for the first year. The remaining period covers replacement parts only.

This warranty is void if the equipment is modified without authorisation, is incorrectly applied, misused, disassembled, or not installed, commissioned and maintained in accordance with the details contained in this manual and general good practice.

If control software is modified or removed

Nuaire will accept warranty on the hardware (unit) provided the replacement does not control the unit beyond its specified limits (refer to Nuaire testing standards and Application Guidance Notes document NA-QS-W029-3 which can be found on our website www.nuaire.co.uk)

14.0 AFTER SALES

For technical assistance or further product information, including spare parts and replacement components, please contact the After Sales Department.

Telephone 02920 858 400
TechnicalSupport@Nuaire.co.uk



15.0 CERTIFICATION

DECLARATION OF INCORPORATION AND INFORMATION FOR SAFE INSTALLATION, OPERATION AND MAINTENANCE

We declare that the machinery named below is intended to be assembled with other components to constitute a system of machinery. All parts except for moving parts requiring the correct installation of safety guards comply with the essential requirements of the Machinery Directive. The machinery shall not be put into service until the system has been declared to be in conformity with the provisions of the EC Machinery Directive.

Designation of machinery: XBOXER BPS models

Machinery Types: Supply & Extract fans with Heat Recovery

Relevant EC Council Directives: 2006/42/EC (Machinery Directive)

Applied Harmonised Standards: BS EN ISO 12100, BS EN ISO 13857 EN60204-1, BS EN ISO 9001

Applied National Standards: BS848 Parts 1, 2.2 and 5

Note: All standards used were current and valid at the date of signature.

Signature of manufacture representatives:

| Name: | Position: | Date: |
|------------------------------------------------------------------------------------------------|------------------------|------------|
| 1) C. Biggs  | Technical Director | 18. 04. 16 |
| 2) A. Jones  | Manufacturing Director | 18. 04. 16 |

INFORMATION FOR SAFE INSTALLATION, OPERATION AND MAINTENANCE OF NUAIRE VENTILATION EQUIPMENT

To comply with EC Council Directives 2006/42/EC Machinery Directive and 2014/30/EU (EMC).
To be read in conjunction with the relevant Product Documentation (see 2.1)

1.0 GENERAL

1.1 The equipment referred to in this Declaration of Incorporation is supplied by Nuairé to be assembled into a ventilation system which may or may not include additional components.
The entire system must be considered for safety purposes and it is the responsibility of the installer to ensure that all of the equipment is installed in compliance with the manufacturers recommendations and with due regard to current legislation and codes of practice.

2.0 INFORMATION SUPPLIED WITH THE EQUIPMENT

2.1 Each item of equipment is supplied with a set of documentation which provides the information required for the safe installation and maintenance of the equipment. This may be in the form of a Data sheet and/or Installation and Maintenance instruction.
2.2 Each unit has a rating plate attached to its outer casing. The rating plate provides essential data relating to the equipment such as serial number, unit code and electrical data. Any further data that may be required will be found in the documentation. If any item is unclear or more information is required, contact Nuairé.
2.3 Where warning labels or notices are attached to the unit the instructions given must be adhered to.

3.0 TRANSPORTATION, HANDLING AND STORAGE

3.1 Care must be taken at all times to prevent damage to the equipment. Note that shock to the unit may result in the balance of the impeller being affected.
3.2 When handling the equipment, care should be taken with corners and edges and that the weight distribution within the unit is considered. Lifting gear such as slings or ropes must be arranged so as not to bear on the casing.
3.3 Equipment stored on site prior to installation should be protected from the weather and steps taken to prevent ingress of contaminants.

4.0 OPERATIONAL LIMITS

4.1 It is important that the specified operational limits for the equipment are adhered to e.g. operational air temperature, air borne contaminants and unit orientation.
4.2 Where installation accessories are supplied with the specified equipment e.g. wall mounting brackets. They are to be used to support the equipment only. Other system components must have separate provision for support.
4.3 Flanges and connection spigots are provided for the purpose of joining to duct work systems. They must not be used to support the ductwork.
4.4 **Local Environment - Humidity.** Ambient humidity (the humidity at the unit's installed location) shall be within the range: 10 to 95% (for controls, non-condensing).
Air humidity (the humidity of the air passing through the unit) shall be within the range: 10 to 95% (for controls, non-condensing).

5.0 INSTALLATION REQUIREMENTS

In addition to the particular requirements given for the individual product, the following general requirements should be noted.
5.1 Where access to any part of equipment which moves, or can become electrically live are not prevented by the equipment panels or by fixed installation detail (e.g. ducting), then guarding to the appropriate standard must be fitted.
5.2 The electrical installation of the equipment must comply with the requirements of the relevant local electrical safety regulations.
5.3 For EMC all control and sensor cables should not be placed within 50mm or on the same metal cable tray as 230V switched live, lighting or power cables and any cables not intended for use with this product.

6.0 COMMISSIONING REQUIREMENTS

6.1 General pre-commissioning checks relevant to safe operation consist of the following: Ensure that no foreign bodies are present within the fan or casing. Check electrical safety. e.g. Insulation and earthing. Check guarding of system. Check operation of Isolators/Controls. Check fastenings for security.
6.2 Other commissioning requirements are given in the relevant product documentation.

7.0 OPERATIONAL REQUIREMENTS

7.1 Equipment access panels must be in place at all times during operation of the unit, and must be secured with the original fastenings.
7.2 If failure of the equipment occurs or is suspected then it should be taken out of service until a competent person can effect repair or examination. (Note that certain ranges of equipment are designed to detect and compensate for fan failure).

8.0 MAINTENANCE REQUIREMENTS

8.1 Specific maintenance requirements are given in the relevant product documentation.
8.2 It is important that the correct tools are used for the various tasks required.
8.3 If the access panels are to be removed for any reason the electrical supply to the unit must be isolated.
8.4 A minimum period of two minutes should be allowed after electrical disconnection before access panels are removed. This will allow the impeller to come to rest.
NB: Care should still be taken however since airflow generated at some other point in the system can cause the impeller to "windmill" even when power is not present.
8.5 Care should be taken when removing and storing access panels in windy conditions.

Technical or commercial considerations may, from time to time, make it necessary to alter the design, performance and dimensions of equipment and the right is reserved to make such changes without prior notice.



FOR MORE INFORMATION

www.nuaire.co.uk

COMMERCIAL

www.nuaire.co.uk/commercial



Nuaire: A Trading Version of Polypipe Limited

Western Industrial Estate | Caerphilly | CF83 1NA

t +44 (0)29 2085 8200 | f +44 (0)29 2085 8222 | e info@nuaire.co.uk

www.nuaire.co.uk

As part of our policy of continuous product development Nuaire reserves the right to alter specifications without prior notice.

Telephone calls may be recorded for quality and training purposes.