



Caron Products & Services  
**OPERATIONS MANUAL**



**CLASS II ENCLOSURE RANGE**  
*MODELS: RC180P, RC220Q, RC260R, RC300S*

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PO7 7XU / [caronproducts.com](http://caronproducts.com)

Dear Valued Customer:

Thank you for purchasing CARON Products & Services equipment. We appreciate your business and look forward to being your preferred supplier of controlled environment equipment products in the future.

At CARON, we are committed to continuous quality improvement. Our goal is to supply our customers with highly reliable equipment at a fair price. In order to openly monitor our performance, we would appreciate your feedback on our products and services.

If you have questions, or any suggestions for improvement based on the installation or operation of the equipment you have purchased, please contact our service department at [www.caronproducts.com](http://www.caronproducts.com) or USA Tel 740-373-6809 – UK Tel +44-2392-266400.

Thanks again for your business!

# REVISION LOG

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Version	Date	Description
1	DEC 20, 2022	Production Released
2	DEC 20, 2022	Update to the Product specification
3	NOV 15, 2023	Electrical Schematics and Declaration of Conformity updated.
4	DEC 21, 2023	Added Cable Trunking Option
5	JAN 4, 2024	Added Airflow Safety Warning to Cable Trunking Option

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## **EQUIPMENT LIMITED WARRANTY**

Please review this section before requesting warranty service. At CARON, one of our primary goals is to provide customers with high levels of personal service and top quality products, delivered on time, backed by technical service and supported for the life of the product.

**Before contacting us for warranty service, please be aware that there are repairs that are not covered under warranty.**

### **WARRANTY DEFINED**

Caron Products & Services, Inc. (herein after CARON) hereby warrants that equipment manufactured by CARON is free from defects in materials and workmanship when the equipment is used under normal operating conditions in accordance with the instructions provided by CARON.

### **COVERED:**

- Parts and labor for a period of two (2) years from date of shipment.
- Any part found defective will be either repaired or replaced at CARON's discretion, free of charge, by CARON in Marietta, OH. Parts that are replaced will become the property of CARON.
- If CARON factory service personnel determine that the customer's unit requires further service CARON may, at its sole discretion, provide a service technician to correct the problem, or require the return of the equipment to the factory or authorized service depot.
- CARON will have the right to inspect the equipment and determine the repairs or replacement parts necessary. The customer will be notified, within a reasonable time after inspection, of any costs incurred that are not covered by this warranty prior to initiation of any such repairs.

### **NOT COVERED:**

- Calibration of control parameters.
- Improper installation; including electrical service, gas and water supply tubing, gas supplies, room ventilation, unit levelling, facility structural inadequacies or ambient conditions that are out of specification.
- Cost of express shipment of equipment or parts.
- Any customer modifications of this equipment, or any repairs undertaken without the prior written consent of CARON, will render this limited warranty void.
- CARON is not responsible for consequential, incidental, or special damages; whether shipping damage or damages that may occur during transfer to the customer's point of use. When the equipment is signed for at the customer's site, ownership is transferred to the customer. Any damage claims against the shipping company become the responsibility of the customer.
- Repairs necessary because of the equipment being used under other than normal operating conditions or for other than its intended use.
- Repair due to the customer's failure to follow normal maintenance instructions.
- Parts considered consumable; including: light bulbs, filters, gases, etc.
- Damage from use of improper water quality.
- Damage from chemicals or cleaning agents detrimental to equipment materials.
- Force Majeure or Acts of God.

This writing is a final and complete integration of the agreement between CARON and the customer. CARON makes no other warranties, express or implied, of merchantability, fitness for a particular purpose or otherwise, with respect to the goods sold under this agreement. This warranty cannot be altered unless CARON agrees to an alteration in writing and expressly stated herein shall be recognized to vary or modify this contract.

Ohio Law governs this warranty.

**Caron Products & Services, Inc.**  
PO Box 715 · Marietta, OH 45750  
740-373-6809

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## ABOUT THIS MANUAL

This User Manual is intended to provide guidance for the **Installation, Commissioning, Operation and Servicing** of the Class II Enclosures.

This manual's descriptions do not describe the functionality or processing of the final system into which this product may be incorporated. Reference should be made to other applicable documentation.



## SAFETY INFORMATION

### HAZARDS

During servicing and maintenance, this equipment can potentially cause danger through exposure to used (contaminated) filters, the employment of high voltages<sup>1</sup> and high-speed rotating fans where access panels are opened.

Failure to observe the recommendations in this manual will constitute a SAFETY OR ELECTRICAL SHOCK HAZARD

### INSTALLATION, COMMISSIONING, OPERATION AND SERVICING

The equipment must be operated and serviced as recommended in this manual, otherwise the electrical protection and/or the airflow integrity of the enclosure could be compromised. Any such installation or use may affect the terms and conditions of any guarantees and warranties.

### PRODUCT GUARANTEE

Caron guarantees that this product is free from defects in materials and workmanship when shipped from the factory and will replace or repair the unit if it proves defective in normal use or during service for a period of 12 months from delivery and commissioning. This guarantee is invalidated if the unit is used incorrectly, poorly serviced, misused or accidentally damaged.

### ENVIRONMENT

- This product is intended for indoor use;
- It is not designed or certified for use in a potentially explosive environment as defined in Atex Directive 94/9/EC.
- Temperature range: 15°C to 32°C
- Humidity: Max RH 80% for temperatures up to 31°C.
- Mains supply voltage fluctuations up to  $\pm 10\%$  of nominal voltage 220V to 240V AC
- Mains supply voltage: 110V to 120V AC
- Containment & Operator Protection

Safe, acceptable levels of hazardous substances containment, for operator protection can only be assured whilst the enclosure is fully operating, developing correct airflow face velocity under normal conditions. In the event of a power failure, all substances under process should be removed from the enclosure (to a separate safe environment), or separately sealed whilst within the enclosure, with all doors remaining closed.

### FIRE OR EXPLOSION RISK

There are no direct sources of ignition within the working zone of the enclosure and no intrinsic risk of fire or explosion during normal use. The acrylic enclosure may only provide initial containment should a fire occur, caused by flammable materials and an ignition source introduced during a process by the end-user. Adequate risk assessment must be applied to determine the potential hazards posed by all processes to be undertaken.

<sup>1</sup> Defined in LV Directive 2006/95/EC as voltages of 50VAC-1000VAC, 75VDC-1500

## INTERNATIONAL SYMBOLS AND DEFINITIONS

The equipment is fitted with identification and ISO/ANSI safety hazard warning labels shown below, which uniquely identifies the product, validation, and safety information. These labels must not be removed or defaced, as evidence of compliance to Quality Assurance Tests, and CE Mark may be lost.



Warning of hazardous area



Warning of dangerous electric voltage



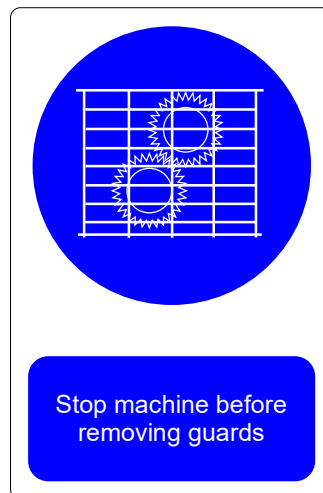
UV-C Radiation from The Biocidal Lamp is Harmful to Both Eyes and Skin



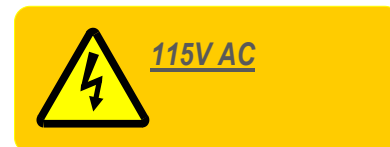
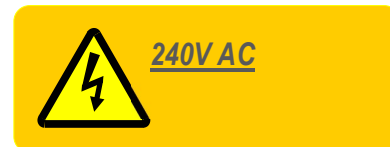
Earth (ground) protective conductor



Tested For  
Electrical Safety

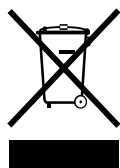


Warning Label Fan  
Label Guard



Warning Label  
Operating Voltage

## WARNINGS



The use of the WEEE Symbol indicates that this product cannot be treated as household waste at end-of-life.

By ensuring that this product is disposed of correctly, you will help protect the environment.

For more detailed information about the recycling of this product, please contact your supplier,

Restriction of the use of certain Hazardous Substances (RoHS) 2011/65/EU as amended

## 1.0 INTRODUCTION

---

This Manual is applicable to the following powder weighing products:

### Class II Enclosure: RC180P, RC220Q, RC260R, RC300S

## 1.1 INTRODUCTION AND OPERATING PRINCIPLES

---

The Class II-type enclosure has been custom designed to provide user protection and product sterility for a range of systems and sectors.

The fundamental design provides protection from potential exposure to hazardous substances aerosols and physical harm to laboratory personnel during any automation movement during an assay.

Operator and product protection are assured when the enclosure is operating with lower front bi-folding door closed and two sliding doors open.

The enclosure utilises a percentage recirculation airflow system. Initially, unfiltered air is drawn through the lower-half of the open visor aperture and down via the inflow grille from where the air enters the rear plenum providing the downflow HEPA filters (approximately 80% flow) and exhausted via the exhaust filter (approximately 20% flow). Both downflow and exhaust airflows are fully balanced to provide the following:

Product Protection fan blowers create the downflow airstream, which descends into the interior of the enclosure after filtration by the incorporated HEPA filters.

This airstream enters the interior volume of the enclosure under positive pressure, via a diffuser grille spaced 50mm from the actual HEPA filter face and continuously 'flushes' the whole volume of the interior of airborne contaminants to provide a sterile environment and prevent product contamination. This downflow airstream ultimately divides, entering the stainless-steel intake grilles at the front of the work surface and at the rear panel under the influence of negative pressure to ultimately combine with the inflow airstream below the work surface.

Operator protection is achieved by the application of high velocity inflow-air created by fan blowers located in the exhaust box, which pulls the surrounding room air under negative pressure airflow via the sliding doors in the lower front hinged bi-fold door. This airflow is rapidly drawn down into the stainless-steel intake grille in the frontal working zone of the enclosure, creating a virtual 'air curtain' when combined with the downflow airflow to enhance operator protection.

All airstreams combine below the work surface then guided to the common plenum in the roof mounted fan-filter housing where the exhaust fan extracts a proportion of the airflow, which passes through the exhaust filters and out through the post-filtered exhaust grille box.

High-level operator and product protection is afforded by the enclosure with the bi-folding visor set to provide normal operating airflow opening is closed and secured. The enclosure will contain a hazard source but must be used as part of a comprehensive laboratory safety routine.

The Class II type enclosure is designed; built and tested to comply with the product-specific essential airflow and containment requirements of BS EN 12469:2000 and CE mark safety requirements of Machinery Directive 2006/42/EC. Models destined for the US are designed, built, and tested to the requirements of NSF/ANSI 49, also making sure to comply with UL regulations for electrical components.

## **2.0 GENERAL CONSTRUCTION**

The section will detail the main features on the enclosure along with the optional features that can be added to the construction of the enclosure.

### **2.1 MAIN FEATURES**

The LAC2 is one of Caron's Laboratory Automation enclosures, fabricated to produce a frame-mounted assembly using modular steel frame-construction.

Bolted, frame-separation points are employed during manufacturing and to allow for shipment and re-assembly on site. All frame edges are sealed during site re-assembly using double-sided cellular foam tape.

#### **2.1.1 FRAME MODULES**

Individual frame modules are manufactured from high-grade box-section steel. The external steelwork is finished in chemical-resistant oven-baked textured epoxy paint, Light Grey apart from the control panel which is Dark Grey.

#### **2.1.2 WORK SURFACE**

A 16mm thick HPL composite laboratory grade surface is fitted internally on top of the lower framework for placement of the automation equipment. A waste chute with corresponding waste box below is positioned within the work surface.

#### **2.1.3 WINDOWS**

Optical quality clear-acrylic viewing windows are fitted on all sides of the enclosure.

#### **2.1.4 MAIN ACCESS DOORS**

The front facing main access doors are constructed from welded steel and fitted with a neoprene seal around the periphery to ensure airtight sealing when fully closed. The upper steel door is hinged from the top and is fitted with gas filled struts to provide assistance when opening. A full width clear-acrylic viewing panel is incorporated. The lower steel door is hinged from the bottom and has three sliding doors in the aperture for the inflow air, which are tested to provide operator protection with two sliding doors open. Both upper and lower front doors are secured by lockable 'T' handle latches.

The front top & bottom hinged steel doors are physically 'interlocked' with each other, with the lower door edge profile preventing the larger upper door from being opened. Reed switches proximity are option that can be employed to detect an open-door condition.

#### **2.1.5 SERVICE DOORS**

The service doors can be customised to have the addition of a transfer tunnel. *More information found in section 2.2*

Hinged clear acrylic doors fitted with T-handle closing latches are fitted to both sides of the enclosure. This is provided for 'out of process' access only.

#### **2.1.6 FAN FILTER HOUSING - DOWNFLOW**

The top mounted assembly is fabricated from box-section mild steel and mild steel sheet. The housing contains multiple high-efficiency HEPA filters which provide filtered downflow air for product protection during normal operation of the enclosure. They are located on the filter framework within the top fan/filter housing.

- RC180P – Has 4 Down Flow Fans and 4 Downflow Filters
- RC220Q – Has 4 Down Flow Fans and 5 Downflow Filters
- RC260R – Has 4 Down Flow Fans and 6 Downflow Filters
- RC300S – Has 4 Down Flow Fans and 7 Downflow Filters



### **2.1.7 FAN FILTER HOUSING AND OUTLET GRILLE - EXHAUST**

The top mounted assembly is fabricated from box-section mild steel and mild steel sheet. The housing contains multiple high-efficiency HEPA filters which provide filtered exhaust air. They are located on the filter framework within the top fan/filter housing.

The exhaust filters are a HEPA and a spacer filter as standard but has the option to be fit with a various combination of HEPA or Carbon type Filters. Each Exhaust Fan filter housing comes fitted with two fan blowers.

### **2.1.8 LIGHTING**

The enclosures are fitted with white LED lamps as standard to illuminate the enclosure adequately and effectively.

### **2.1.9 ELECTRICAL**

The electrical supply, control panel and indicator circuits for the exhaust fan blowers, Class II airflow system, alarms and lighting terminate at the DIN rail mounted terminals within the electrical control panel at the RH or LH side of the enclosure frame.

### **2.1.10 AIRFLOW CONTROL AND ALARM SYSTEM**

This enclosure incorporates Caron's MMI touch screen airflow and alarm system to control the blower motors and monitor and enunciate low and high airflow alarm signals during operation. The user-interface comprising a MMI screen portrait format display and keypad enables a selection of various pre-programmed menu options during settings and calibration.

The airflow control unit is mounted at the front of the electrical panel at the RH side of the enclosure. Access to the internal components is gained by removal of the panel cover for maintenance only.

## **2.2 OPTIONAL FEATURES**

This section will detail optional extras that can be fit to or bought alongside this enclosure.

### **2.2.1 FILTER SATURATION ALARMS**

FSA's can be added to an enclosure when used in conjunction with Carbon Filters the FSA's are used to monitor any breakthrough from the carbon filters that may occur over time. If these sensors detect any breakthrough exceeding the set limits it will trigger the unit to announce an alarm audibly and visually.

### **2.2.2 TIP BOX**

An enclosure can be modified to allow for an easy access tip box to be added into designated areas on the HPL base, to collect waste generated by processes completed within the enclosure. The Tip Box opening is placed in four easy access locations and can be used in process depending on the customer requirement. The position and area the tip box can be placed is dependent on the size of the enclosure. The Tip box is used in conjunction with a tip box sleeve to guide any waste into a dedicated bin held within the Tip Box. Furthermore, an accessory Tip Box Chute Bin can be added to collect any waste.

### **2.2.3 TRANSFER TUNNEL**

The side access doors can be modified to allow the addition of a transfer port in the designated areas, allowing for product created in process to be transferred to an adjacent machine for further processing or storage.

### **2.2.4 INCUBATOR STAND**

The incubator stand is height adjustable with a maximum height of 923mm and a minimum height of 755mm, this stand can be used alongside the transfer port, to allow product to be transferred to a wide range of incubators whilst still providing operator protection.

### **2.2.5 UNDERBENCH DRAW**

The under bench draw units can be used to store any equipment materials relevant to the process going on within the Enclosure, the under bench draw units can be mounted in 4 locations around the unit.

### **2.2.6 HPL SHELF**

HPL shelves can be mounted at locations within the supporting frame of the enclosure, to provide storage for larger equipment's such as computer tower to be used in process with the enclosure.



### **2.2.7 COMPUTER MONITOR ARM**

The computer monitor arm can be mounted in 1 of 4 locations, a lower or upper positions on the left- and right-hand side of the enclosure.

### **2.2.8 E-STOP**

An E-Stop can be included to provide an emergency stop for machinery within the enclosure.

### **2.2.9 ENCLOSURE STATUS LIGHTING OPTION**

The Enclosure Status Lighting can be added when an enclosure is surrounded by many others and a clear indication is needed to whether a Enclosure is alarming. Green is used for all systems running ok, Yellow is used for Service due notification and Red is used for all other alarms.

### **2.2.10 UV LIGHTING**

UVc germicidal sterilisation is provided by the inclusion UVc lamps mounted under the diffuser grille. The lamp produces UVC wavelength of 254nm @ Photometric power of 12.4W, Electrical power: 30W. Rated life is 8,000 hours, effective 6,000 hours, after which the UVc output will fall to less than 80% power relative to a new lamp.

### **2.2.11 SLIDE OUT CONTROL BOX DOOR**

This style control box is a perfect option for situations where access to the enclosure is limited. Where the control plate is mounted to slides and when not secured in position can easily be slid out to gain access, to the control box

### **2.2.12 CABLE TRUNKING**

The cable trunking option provides organized cable management inside and out of the enclosure. The longer section mounts to the HPL (interior) worksurface toward the back of the enclosure. The two shorter sections mount along the back of the enclosure (exterior).



**DO NOT MOUNT CABLE TRUNKING ON INTERIOR REAR WALL.**  
DOING SO COULD CAUSE A DISTURBANCE IN AIRFLOW  
RESULTING IN HARM TO PRODUCTS AND/OR OPERATOR!

## **3.0 INSTALLATION GUIDELINES**

Follow the below guidelines to ensure safe use and unpacking along with optimum operation of the unit.

### **3.0.1 UNPACKING**

Where supplied 'flat-packed' the enclosure will require re-assembling on site by trained installation personnel. All component parts must be carefully unpacked, and the protective film should remain on the acrylic panels intact until the enclosure is fully assembled and ready for commissioning.

### **3.0.2 SITE SELECTION**

For operator safety and reliable function, the Enclosure should be placed in an easily accessible area, allowing for full movement of the main access doors and full access to the side doors where required.

### **3.0.3 AIRFLOWS AND PRESSURE REGIMES**

To avoid air currents and pressure fluctuations in the room affecting the overall performance of the enclosure, it should be positioned well away from direct sources of disruptive air changes such as open windows, doors etc. Room air velocity should not exceed 0.25m/s.

### **3.0.4 GENERAL INSTALLATION RECOMMENDATIONS**

The following environment requirements should be considered during installation:

- Ambient temperature: from 15°C to 32°C
- Relative humidity: RH < 80% at 30°C
- Recommendations as detailed in BS 14175:4 2003.
- Refer to HSG 258 guide to local exhaust ventilation for your requirements

### **3.0.5 NOISE LEVELS**

The noise generated by the fan and resulting air movement will not rise above measured limits during normal operation, with the bi-folding access door closed and secured.

### **3.0.6 CLEANLINESS STANDARD**

The site should be maintained as clean and dust free as possible, since the cleaner the environment the more efficient the filtration will be and help to reduce pre-filter maintenance costs. Use a damp cloth, to clean the exterior surfaces of the enclosure, regularly, particularly the front and side surfaces, to remove accumulated dust.

**NOTE:**

*Do not use solvent-based chemicals to clean the acrylic panels, particularly on a regular basis as this may promote stress cracking of the acrylic material.*

### **3.0.7 ELECTRICAL CONNECTION**

Connect the Enclosure to an adjacent, earthed and switched supply of:

220-240 Volts, single phase, ~ 50/60Hz Outlet

110-120 Volts, single phase, ~ 60Hz outlet

In accordance with local guidelines.

# PART 1 - COMMISSIONING

## 4.0 COMMISSIONING

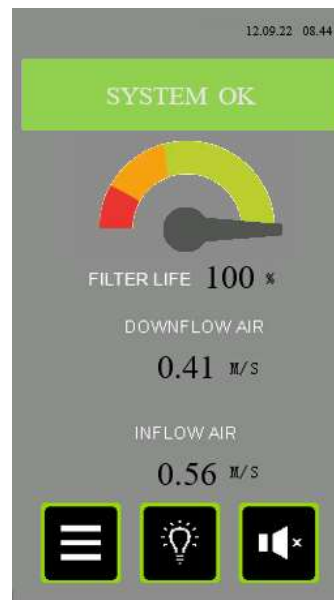
### 4.1 COMMISSIONING GUIDELINES

After connecting to the electrical supply, operate the enclosure by switching the enclosure on at the isolator switch mounted on the control box.

After the 'splash screen' appears on power-up for 10 secs. it will be replaced by the 'home screen' from where all menus / sub-menus can be selected.



SPLASH SCREEN



HOME SCREEN

#### 4.1.1 SETTING NORMAL AIRFLOW VELOCITY AND CALIBRATING THE TFT ALARM:

##### GENERAL

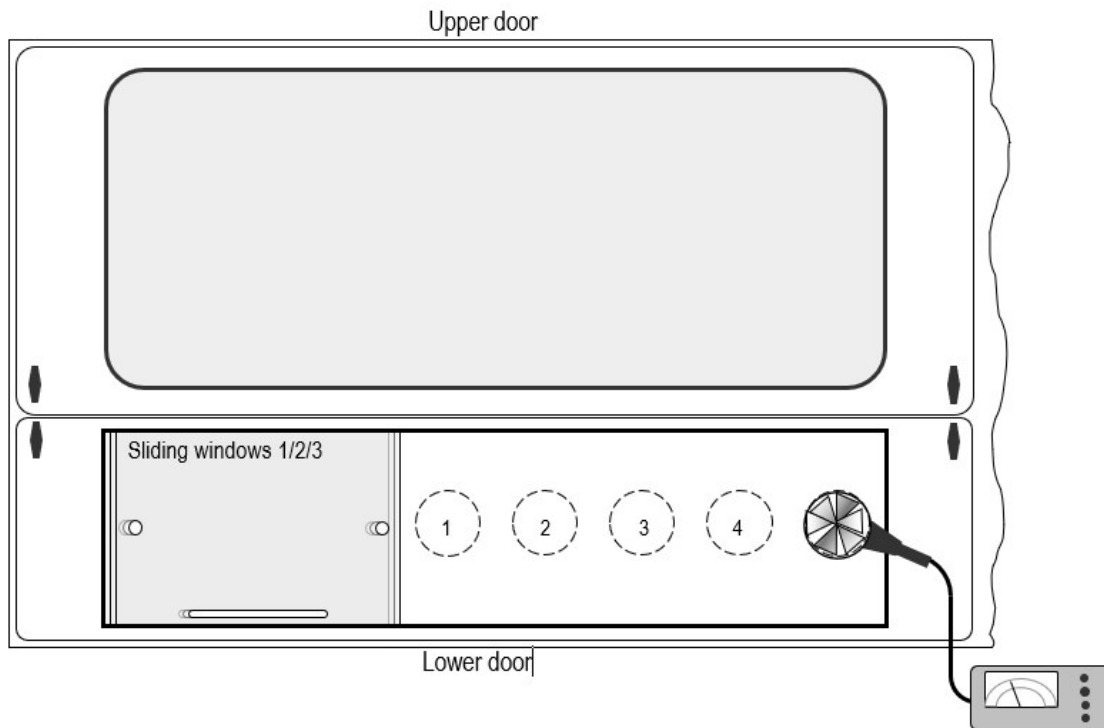
- For the following commissioning procedures, the enclosure should already be fitted with new filters of the type suitable for capturing the harmful substances, which will be encountered when using this enclosure and must be emptied of all labware. The bi-folding door must also be closed with both side access doors closed. The internal fans should be allowed to run for several minutes to stabilise, after which measurements and adjustments may be made as follows:
- The inflow and downflow measurements are used to establish that the enclosure continues to meet both design and industry compliance standards and that no significant deterioration in performance has occurred since previous factory acceptance tests or future servicing. It forms the basis of all subsequent testing and thorough examination protocol.
- The fan speed and alarm calibration set point have been pre-set during factory acceptance testing the downflow set between >0.25 to 0.50m/s and the inflow is set at >0.4m/s for UK and Europe markets The North American market has the downflow set at >0.25 to 0.40m/s and the inflow set at >0.51m/s for the North American Market.
- When calibrating the inflow face velocity, take measurements at the access aperture using a rotary-vane type anemometer; when calibrating the downflow velocity, take measurements along the downflow grille using a rotary vane type anemometer positioned 50mm from the grille. Readings should be taken over a 60 second interval noting the highest and lowest values at multiple notional 'grid points' at the apertures of the acrylic front door. (Refer to Figures 1a and 1b as appropriate)
- When measurements have been taken and the average found look to section 4.10 for the correct procedure on how to input this information into the unit.

**4.1. FIGURES 1a & 1b**

**Figure 1a**

Sampling points for INFLOW velocity- measurements  
(with all three doors overlapping at one end to provide a 2-door wide aperture)

Record all results in appropriate tables included in FAT, SAT, PMTR and IQ /OQ documentation as appropriate

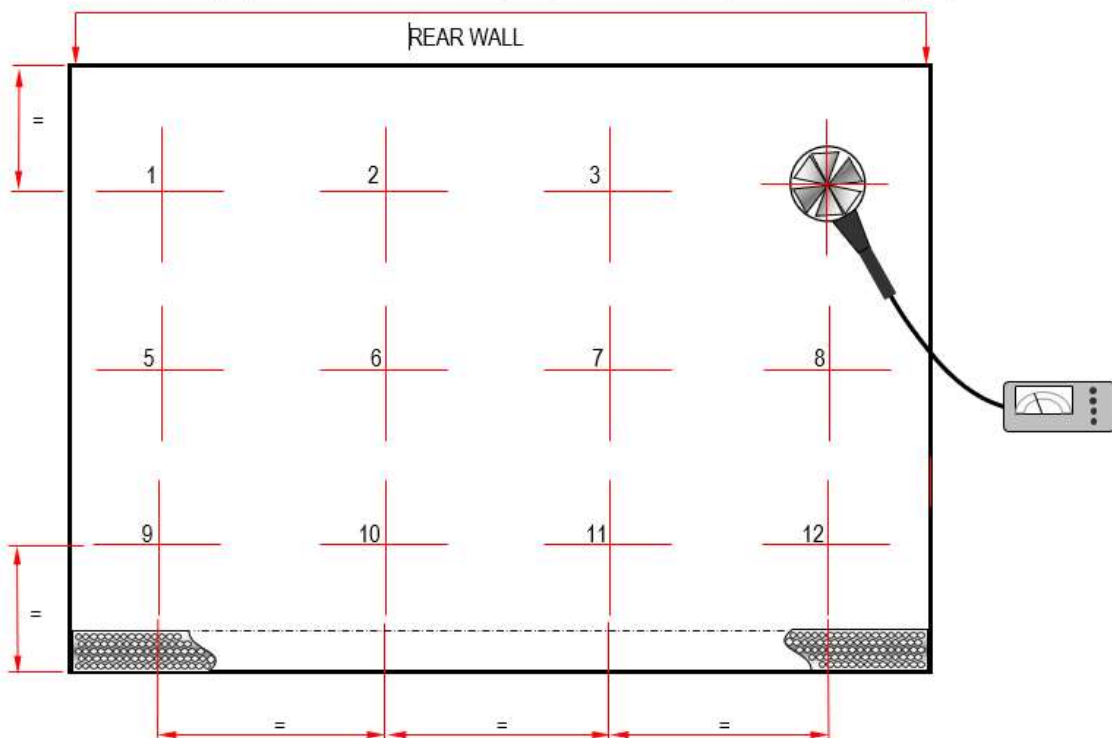


**Figure 1b**

Downflow Anemometer measurement positions

Top down view of uniformly spaced measurement points to be taken in horizontal plane  
50mm below the filter diffuser grille to determine mean DOWNFLOW velocity (NTS)

Record all results obtained in appropriate tables included in FAT, SAT, PMTR and IQ /OQ documentation as appropriate



## **4.2 FILTER INTEGRITY TEST**

There are two forms of Filter Integrity testing for these units, Typically, Class 2 enclosures are fitted with HEPA filters only, therefore HEPA filter and Seal Integrity testing is required. Where optional Carbon Filters are added to the enclosure, additional Carbon Filter Integrity Testing is required.

### **4.2.1 HEPA FILTER AND SEAL INTEGRITY (LEAK TEST)**

The integrity of the HEPA filter and seal is established during factory acceptance testing in accordance with Caron Quality Standard (SOP 9.0) using the D.O.P. aerosol test method.

After installation the system should be re-tested by the installation engineer to re-confirm filter and seal integrity as follows:

The HEPA filter should be tested at normal operating airflow velocity  $\pm$  10% using calibrated test equipment.

#### **4.2.1.1 METHOD**

Ensuring the enclosure is set up in normal working condition. The aerosol generator pipe is to be placed inside the enclosure's interior through an intake aperture, in such a way that the aerosol can be introduced into the upstream side of the filter as far from the filter as is practical to ensure adequate mixing and minimal interruption to the airflow velocity through the intake aperture.

Use the scanning probe positioned over the exhaust grille of the fan housing to determine downstream aerosol concentration levels, with separate passes made around the entire periphery of the exhaust grille, to confirm integrity of the seal of the filters.

Again, using the scanning probe, positioned under the downflow diffuser grille, determine the downstream aerosol concentration levels, with separate passes made around the diffuser grille to covering all aspects of the grille.

Tests should be applied in accordance with SOP 9.0 and results should confirm the following:

- The photometer reading should indicate < [0.01%] penetration for leakage value
- The photometer reading should indicate < [0.005%] penetration for efficiency value

If a steady and repeatable reading on the photometer at any point exceeds the stated maximum permitted concentration, then a leak must be assumed.

Readings on the test set can be set to indicate direct percent penetration using [0.01%], [0.1%] scales as appropriate.

The average downstream concentration value shall not exceed (0.01%) of the upstream concentration measurement.

### **4.2.2 CARBON FILTER INTEGRITY TESTING**

During servicing, carbon filter integrity testing can be performed with gas detection tubes such as the Draeger™ or Gastec™. The filter is challenged with a known chemical, and the concentration of this chemical in the exhaust air is measured with a suitable detection tube.

#### **4.2.2.1 METHOD**

Ensure the enclosure is switched on and confirm airflow is correct by direct measurement and/or examination of the TFT alarm status indicators.

Introduce the chemical challenge inside the enclosure that is appropriate to that normally in use within the unit (or a less toxic equivalent Iso Propyl Alcohol IPA for test purposes)

Test the exhaust filter to confirm there is no evidence of the chemical and at the inflow aperture to check if a breach has been made

If the challenge chemical is detected then the follow actions should be taken:

1. Ensure that the filter seal is undamaged and free of gaps
2. Check that the filter is fitted correctly with the seal seated and evenly compressed
3. Replace the filter and retest the enclosure

The result should be recorded in a logbook, a legal requirement under section 9 of the Control of Substances hazardous to Health (COSHH) regulations.

### **4.3 CONTAINMENT TEST**

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#### **4.3.1 Smoke Pencil Test**

It is not practical to apply containment testing to BS EN 14175-4:2003 using SF6 gas to this type of recirculatory enclosure on site, due to the safety requirement to include specific exhaust ducting and where restrictions on introducing sulphur hexafluoride in particular laboratories exist. This may prevent the application of any quantitative containment integrity testing, however, qualitative measurement of the airflow profile at the face of the enclosure, operating at the correct face velocity and in a specific room environment can be evaluated by smoke visualisation testing.

In accordance with BS EN 14175-4:2003, a smoke pencil generating a trace should be placed approx. 400mm in front of the enclosure with smoke released upwards to the ceiling. The tracer should be moved across the frontal region of the enclosure not faster than 0.2 m/s.

The airflow profile should show no evidence of escape of the tracer 'smoke' from the enclosure and a smooth and a continuous airflow pattern should exist.

There should be no evidence at any point of smoke being significantly disrupted or otherwise deflected counter to the inflow or indications of a delay in entering the aperture.

If tests show significant disturbance to the airflow profile, then room air velocity must also be checked to ensure it is not greater than 0.2m/s.

#### **4.3.2 Particle Count Test**

Clean rooms/Clean zones and associated controlled environments provide for the control of airborne particulate contamination to levels appropriate for accomplishing contamination-sensitive activities. This pertains to units/models that are used for product protection ensuring that no contamination makes it to the product. The method of determining the concentration of considered airborne particle sizes to ensure

compliance with the classification of specified class of environmental cleanliness in accordance with the requirements of:

- BS EN ISO 14644-1:2015 (Classification of air cleanliness by particle measurement-UK/EU)
- ANSI/EST/ISO 14644-1:2015 (Classification of air cleanliness by particle measurement-USA)
- EU GGMP Annexe 1-2008 Clean room classifications

Interpretation of the test results for verification of the classification of a clean room/ clean zone shall be in accordance with the above national standards.

It is required that the particle counter used for this test is calibrated and meets the requirements set out by ISO21501-4.

**4.3.2.1 Procedure**

1. Make sure the particle counter is in calibration and set up in accordance with SOP 6.0 and the “Particle counter setup and run procedure” documents.
2. Place the particle counter into position as shown below in Figure 2.
3. Set the particle counter to run. Once the particle counter has run make note of the results.
4. Repeat step 2 and 3 for the remaining locations.
5. Compare the results against the compliances. If the results are below the values required for ISO Class 5 (shown in table 1), then the unit has passed and if the units are above the required values for ISO Class 5, then it has failed.
6. If the unit has failed test, then a fault or leak must be assumed. This could be through inadequate airflow, a faulty filter, incorrect alignment of the seals or incorrect assembly of the enclosure. The root cause must be found.

**Table 1**

Table representing the maximum concentration limits of particles for each classification number

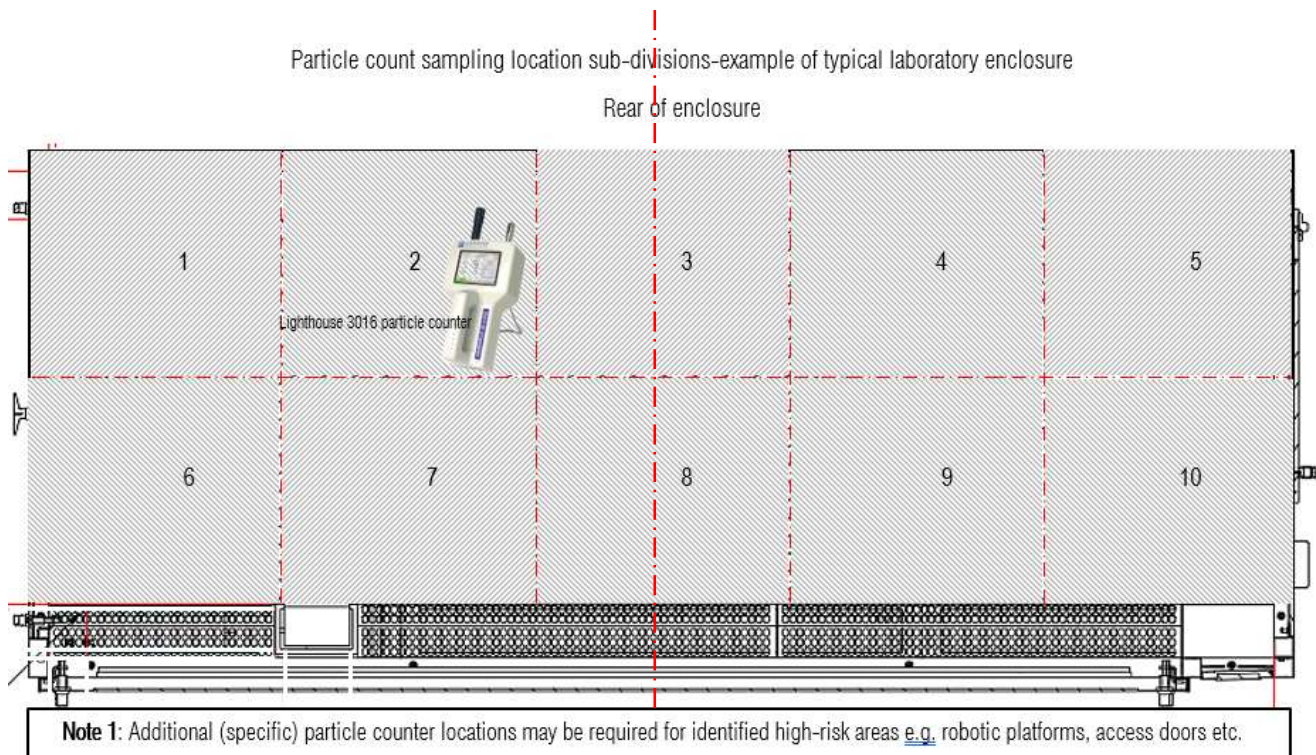
Classification	
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Number (N)	Maximum concentration limits (particles/m <sup>3</sup> of air) for particles equal to and larger than the considered size shown below. Shaded area particle sizes not measured by Lighthouse instruments but are shown here for completeness.					
Particle size	0.1 µm	0.2 µm	0.3 µm	0.5µm	1.0µm	5.0 µm
ISO 14644-1:2015 for UK & EU based products						
ANSI/IEST/ISO 14644-1:2015 for US based products						
ISO Class 1	10	2				
ISO Class 2	100	24	10	(4)		
ISO Class 3	1 000	237	102	35	(8)	
ISO Class 4	10 000	2 370	1 020	352	83	
ISO Class 5	100 000	23 700	10 200	3 520	832	(29)
ISO Class 6	1 000 000	237 000	102 000	35 200	8 320	293
ISO Class 7				352 000	83 200	2 930
ISO Class 8				3 520 000	832 000	29 300
ISO Class 9				35 200 000	8 320 000	293 000

**Figure 2**

Positioning of the particle counter.



#### 4.3.3 KI-Discus Test

The KI-Discus test is a potassium iodide test method use to evaluate the level of containment of contaminants when operating Class II enclosures, this test gives the operator protection factor (OPF) of the unit.

Acceptable OPF values and the criteria for determination are described in BS EN12469:2000.

To carry out this test procedure refer to SOP 2.0 and the KI-Discuss containment testing system manual. For the set-up of the KI-Discuss and Test Procedures, along with calculating results.

The KI-Discuss works by generating a fine mist of potassium iodide inside the enclosure with four collectors positioned outside of the enclosure sampling the air trying to capture any escaped potassium iodide onto the filter membranes held within the collectors. If the potassium iodide makes it onto the filter membrane it will quickly evaporate and leave visible brown/grey dots. Upon completion of the first of five tests, remove the filter membranes, and place them one at a time into a solution of palladium chloride and then distilled water to develop. Remove membranes allow each membrane to dry and develop further. Once filter membranes have completely dried, count the dots which have formed, this number must be <62 dots for a pass result to this test.

**Note:**

**If the lower bifold door open aperture has a width greater than 1.5m multiple tests will need to take place, typically this would be a test done on the LHS and RHS of the open aperture. Where another test is required, this will require the 5 individual tests to be done again.**

To calculate OPF value follow below formula.

$$\text{Operator Protection Factor} = \frac{62 \times 10^5}{n}$$

where *n* = number of dots recovered on filter membrane

In the unlikely event of a failure due to a higher than acceptable OPF value, an investigation must be carried out to ascertain the route cause. A high OPF value is likely the result of an inadequate setup of the airflow.

## 4.4 NEXTION TFT SYSTEM-OPERATOR CONTROLS

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### **4.4.1 POWER ON/OFF**

An isolator switch normally mounted on the control box turn mains power ON/OFF to the control system.

### **4.4.2 MMI INTERFACE DISPLAY**

A Portrait 4.3" TFT display is the user interface to the system. It displays the value of airflow to the enclosure, indicates alarm conditions & is used to calibrate the airflow.

The MMI display is a 4.3" TFT colour graphic display with touch screen control operation. It connects to the system controller PCB, and functions as a means for configuring the airflow control system, alarm indication mechanism, and status display.

### **4.4.3 SPLASHSCREEN**

The splash screen, or power up screen, is the initial display on power up & merely displays the Caron logo. The splash screen remains for approximately 10 seconds, at which point the display should change to the HOME (Main) screen.



## 4.5 OPERATION, SEQUENCE

Caron engineers will commission the normal operating condition of the enclosure, setting the parameters to suit the application. Once commissioned, the operator can safely use the enclosure. Typically, the sequence of operations is as follows:

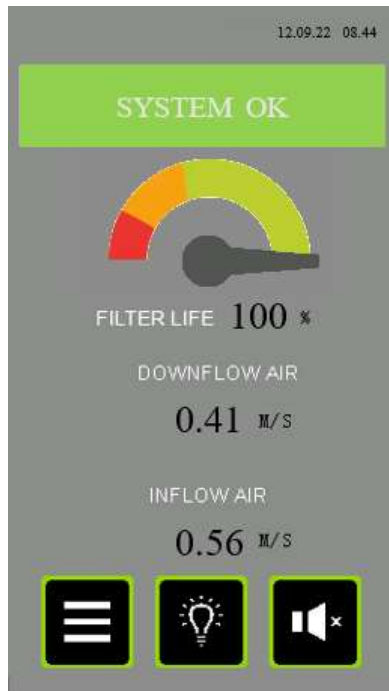
1. Apply power to the control system via main power supply & operate the isolator switch on the control box.
2. Observe that TFT display illuminates to the MAIN (aka HOME) display.
3. The fans are ON by default at power up.
4. Once all operating conditions are correct, the message “System OK” appears on the status object at the bottom of the MAIN screen. The airflow disc anemometer monitors the airflow (for alarm indication).
5. The airflow audible/visual alarm will annunciate if the airflow deviates above the high alarm level or below the Low alarm level parameterized in the MMI display menu system
6. Touch the MENU button to navigate to the main menu.
7. In the MENU screen, touch the FAN ON/OFF button to navigate into the fan on/off control screen. In here touch the “Fan ON” button to run the fans at setpoint speed. Touch the “Fan OFF” button to stop the fans running. Touch the “Night-mode” button to run the fans in Night-mode speed.

**NOTE:**

*On power up of the unit the audible alarm will not annunciate for the first FIVE minutes to allow the airflow to stabilise. The visual alarm on the TFT display will still be visible till the airflow has stabilised.*

## 4.6 MAIN SCREEN

The main screen is the default display on power up, after the splash screen has been displayed for approx. 10 seconds. It is the normal operating display being presented to the user. Access to other screens is usually only for configuration.



Version with 'm/s' airflow display.



Version with air changes/hr ('AChr') airflow display.

### **4.6.1 DOWNFLOW AIR & INFLOW AIR DISPLAY VALUES**

The downflow airflow movement is detected by an air speed sensor anemometer mounted in the enclosure, the inflow airflow movement. The reading is scaled and indicated here in "m/s" to 2 decimal places. The indication, scaling, and fan speed (airflow) is setup in the CALIBRATION menu. The display can also be presented in "air changes per hour" (AC/hr). The choice of 'm/s' or 'AC/hr' is made in the System Configuration screen.

### **4.6.2 FILTER LIFE**

This gauge/dial is used as a simple way to advise the user of the time left before the next recommended service interval. It is based on calendar time from the previous service engineer visit to change filters. After the filters are freshly changed, and the engineer resets the service dates, the pointer is in the MAX green position. When the pointer is in the red zone it indicates an impending requirement for the next service visit.



### **4.6.3 FILTER LIFE INDICATION**

The gauge graphic display is further clarified by the % of lifespan remaining before a filter change is recommended.

### **4.6.4 SYSTEM STATUS & ALARMS**

This status text object gives the status of the system using both descriptive text & colour. It will report on any critical status affecting the normal & healthy running of the enclosure airflows. The list of status texts is as follows.



#### 4.6.5 LIST OF STATUS TEXT

Item	Message Text	Event Description
1	SYSTEM OK	System operating within parameters
2	AIRFLOW LOW	The measured airflow is below the Low alarm level programmed in the System Configuration.
3	AIRFLOW HIGH	The measured airflow is above the High alarm level programmed in the System Configuration.
4	AIRFLOW SENSOR FAULT	The system detects a fault with the airflow sensor elements.
5	DOOR(S) OPEN	A door that is normally left closed is now open.
6	FILTER SENSOR.1 SOLVENT ALARM	Filter Saturation alarm #1 sensor is detecting solvent breakthrough.
7	FILTER SENSOR.2 SOLVENT ALARM	Filter Saturation alarm #2 sensor is detecting solvent breakthrough.
8	FILTER SENSOR.3 SOLVENT ALARM	Filter Saturation alarm #3 sensor is detecting solvent breakthrough.
9	FILTER SENSOR.4 SOLVENT ALARM	Filter Saturation alarm #4 sensor is detecting solvent breakthrough.
10	ENCLOSURE IN NIGHTMODE	The system is not running in normal mode & has been placed in night-mode (standby). The user should resume normal mode before operating the enclosure again.
11	FAN TURNED OFF	The Fan has been turned off & there is no airflow
12	FAN/FILTER TIMER EXPIRED	Self-explanatory
13	UV LAMP TIMER EXPIRED	Self-explanatory
14	ANNUAL SERVICE NOW DUE	More than 11 months have expired since the enclosure was last serviced. This status message brings this fact to the user's attention.
15	ANNUAL SERVICE NOW OVERDUE	More than 12 months have expired since the enclosure was last serviced. This status message brings this fact to the user's attention.
16	COMMUNICATION FAULT...!!!	The main control board is not communicating with the display module. Any status indication is invalid.

The status object is green when the system is OK & without any exceptions. It is amber when there is a warning and is red when there is a critical alarm present. When more than one message needs to be displayed, then they are sequentially displayed on the status banner.

#### 4.6.6 Touch Button Functions



**WHITE LIGHTING** – Touch this light button to toggle the white light on and off.



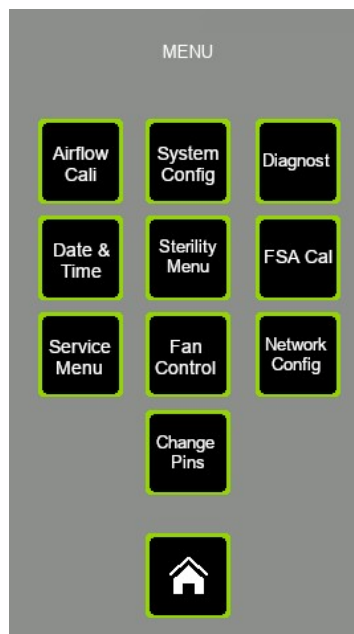
**MUTE** – If an alarm is active & the audible is pulsing, you can touch this button to MUTE this audible sound. The audible alarm will resume after 5 minutes if the alarm is still present. Once alarms clear (they are self-clearing), the mute condition is automatically cancelled so that a new alarm occurring will again result in an audible indication of an alarms' presence.



**MENU** – Press the MENU touch screen button object to exit this default (Main) display screen to the MENU list of screens.

#### 4.7 MENU SCREEN

The menu screen consists of a list of touch buttons giving the user access to the ancillary setup & information screens on the MMI. The user accesses all screens (with the exception of the MAIN screen) via the MENU screen.



**HOME**– Press the Home button object to exit this display screen and return to the Main (Home) screen.

**AIRFLOW CAL** – Touch this touch screen button to enter the airflow CALIBRATION screen where the airflow is setup by the Caron engineer to suit the application. This screen is password protected. The password level required is ENGINEER level.

**SYSTEM CONFIGURATION** – Touching this touch screen button takes the user to the CONFIGURATION setup screen where the Airflow High alarm, Airflow Low alarm & Filter/UV service intervals are set by the Caron engineer to suit the application. This screen is password protected. The password level required is ENGINEER level.



**DATE & TIME** – Touching this touch screen button takes the user to the screen for setting the current Time & Date values that are shown on the Main screen. This screen is password protected. The password level required is SUPERVISOR level.

**SERVICE MENU** – Touching this touch screen button takes the user to the Service menu screen where the user has access to the service screen buttons for UV Lamp service hour counter, Filter Service hour counter, & General system service date check & reset. This screen is not password protected.

**FSA CAL** – Touching this touch button takes the user to the calibration screen for the system filter saturation alarm probes, if any are enabled in the Configuration screen. This screen is password protected. This screen is password protected. The password level required is ENGINEER level.

**FAN CONTROL** – Touching this touch screen button takes the user to the FAN on/off controls. This screen is not password protected.

**DIAGNOSTIC** – Touching this touch screen button takes the user to the DIAGNOSTIC screens where software data points can be viewed. This screen is really for use by a Caron engineer. This screen is not password protected.

**STERILIZATION MENU** – Pressing this object button takes the user to the Sterilization Menu screen where the user has access to the three fumigation options (H<sub>2</sub>O<sub>2</sub>, UVc & Formalin) for the enclosure. This screen is not password protected and its function is detailed in this manual.

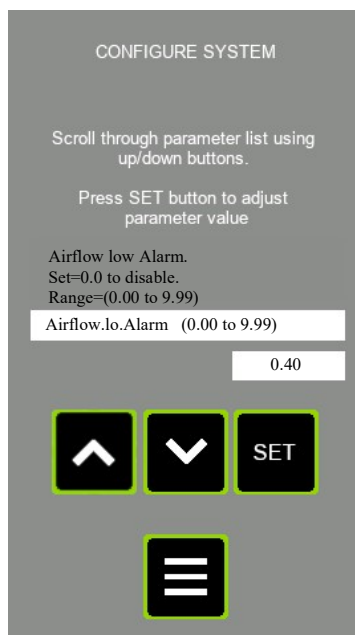
**NETWORK CONFIGURATION** – Touching this touch screen button takes the user to the CONFIGURATION setup screen where the WIFI connections for Caron enclosures in one area. The WIFI operation is not yet implemented. This screen is password protected. The password level required is ENGINEER level.

**CHANGE PINS** – Touching this touch screen button takes the operator to the screen allowing him to alter the Supervisor & User levels passwords. This screen is password protected. The password level required is SUPERVISOR level.



## 4.8 SYSTEM CONFIGURATION SCREEN

The CONFIG screen is where the control system features are configured by the Caron engineer to suit the application. Access to this screen is password protected. The password level required is ENGINEER level.



Using the scroll buttons on this page, the user can inspect & alter the value of any of the configuration parameters. You use the UP & DOWN buttons to scroll through the parameter list, and their value of each parameter is shown as you do so. Press the Set button to cause the keypad to be displayed where the parameter value can be altered.



Touch the DOWN button to move down to the next parameter in the parameter list.



Touch the UP button to move up to the previous parameter in the parameter list.



Touch this button to edit/alter the value of the currently displayed configuration parameter. You are taken to the keypad with the current value of the parameter shown. You can edit the value here & store the new value to permanent memory.



Touch the MENU to return to the Main Menu.

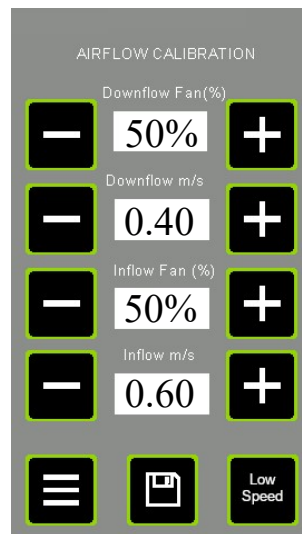
### 4.8.1 CONFIGURATION PARAMETER LIST

- **D/F AIRFLOW LO ALARM**  
Enter the low airflow value below which an audible & visual alarm indication is given via the TFT if the airflow drops below this value. Enter a value of 0.00 to deactivate this alarm. Range 0.00 – 9.99
- **D/F IRFLOW HI ALARM**  
Enter the high airflow value above which an audible & visual alarm indication is given via the TFT if the airflow rises above this value. Enter a value of 0.00 to deactivate this alarm. Range 0.00 – 9.99

- **I/F AIRFLOW LO ALARM**  
Enter the low airflow value below which an audible & visual alarm indication is given via the TFT if the airflow drops below this value. Enter a value of 0.00 to deactivate this alarm. Range 0.00 – 9.99
- **I/F AIRFLOW HI ALARM**  
Enter the high airflow value above which an audible & visual alarm indication is given via the TFT if the airflow rises above this value. Enter a value of 0.00 to deactivate this alarm. Range 0.00 – 9.99
- **UV MAX HOURS**  
Enter the number of hours of UV lamp ON time above which a visual indication is given via the TFT if the number of UV lamp running hours exceeds this value since the timer was last reset. Enter a value of 0 to deactivate this visual indication. Range 0 – 20000.
- **FILTER MAX HOURS**  
Enter the number of hours of fan run time above which a visual indication is given via the TFT if the number of fan running hours exceeds this value since the timer was last reset. Enter a value of 0 to deactivate this visual indication. Range 0 – 20000.
- **D/F PROPORTIONAL GAIN**  
For use by the commissioning engineer. Adjust in conjunction with 'Igain' & 'Dgain' to alter the dynamic response of the fan if it needs to be adjusted. Range 0 – 9999.
- **D/F INTEGRAL GAIN**  
For use by commissioning engineer. Adjust in conjunction with 'Pgain' & 'Dgain' to alter the dynamic response of the fan if it needs to be adjusted. Range 0 – 9999.
- **D/F DERIVATIVE GAIN**  
For use by commissioning engineer. Adjust in conjunction with 'Pgain' & 'Igain' to alter the dynamic response of the fan if it needs to be adjusted. Range 0 – 9999.
- **I/F PROPORTIONAL GAIN**  
For use by the commissioning engineer. Adjust in conjunction with 'Igain' & 'Dgain' to alter the dynamic response of the fan if it needs to be adjusted. Range 0 – 9999.
- **I/F INTEGRAL GAIN**  
For use by commissioning engineer. Adjust in conjunction with 'Pgain' & 'Dgain' to alter the dynamic response of the fan if it needs to be adjusted. Range 0 – 9999.
- **I/F DERIVATIVE GAIN**  
For use by commissioning engineer. Adjust in conjunction with 'Pgain' & 'Igain' to alter the dynamic response of the fan if it needs to be adjusted. Range 0 – 9999.
- **AC/HR OR (M/S)**  
Set this parameter =0 if the main display airflow indication is to be in linear air speed of m/s).  
Set this parameter =1 if the main display airflow indication is to be in volumetric air changes per hour (AC/hr). Range 0 – 1.
- **AC/HR SCALER**  
This parameter becomes relevant of the display mode is set for AC/Hr indication.  
This is a commissioning parameter. It acts as a multiplier on the airflow indication in (m/s) to produce the display value in AC/Hr. Range 0 – 9999.
- **D/F SENSOR OFFSET**  
This parameter holds the zero offset for the airflow anemometer zero airflow offset. To set this value, turn off the fan on the FAN ON/OFF display. Wait 2 minutes. Navigate to the DIAGNOSTIC display #1. Read off the value of the diagnostic point "CompdaNC3". Enter this value into the 'A/F sensor offset' parameter in the Configuration parameter list.
- **I/F SENSOR OFFSET**  
This parameter holds the zero offset for the airflow anemometer zero airflow offset. To set this value, turn off the fan on the FAN ON/OFF display. Wait 2 minutes. Navigate to the DIAGNOSTIC display #1. From here, go to DIAGNOSTIC display #5. Read off the value of the diagnostic point "CompdAND1". Enter this value into the 'A/F sensor offset' parameter in the Configuration parameter list.
- **HOW MANY FSA SENSORS IN USE (0-4)**  
This parameter "How many FSA sensors in use (0-4)" allows the user to set the number of FSA sensors for the system. Set to '0' if no sensors are in use. Range 0 – 4.
- **ENABLE I/F FAN MAX RPM**  
"0" Disables the Fan from ramping up when front doors or tip chute is open. "1" Enables the I/F fan to ramp up when the front doors and or tip chute is opened to allow for maximum operator protection.

## 4.9 AIRFLOW CALIBRATION SCREEN AND FUNCTIONS

The CALIBRATION screen is where the airflow is setup by the Caron engineer to suit the application. Access to this screen is password protected.



In the Calibration display, we can set the normal running airflow (fan speed) for the system when the fans(s) are started up. We can also set up the Low Speed for certain running conditions of the unit



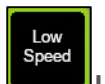
Touch the (+) button to increase the value of the relevant parameter (Fan speed% or Airflow m/s).



Touch the (-) button to decrease the value of the relevant parameter (Fan speed% or Airflow m/s).



**SAVE**– Touch this button to save both values (Airflow fan speed & Airflow in m/s) as running setpoint values to permanent store memory.



**LOW SPEED** – Touch this button to set the down flow low speed Fan speed (%) value at 17.5%. This low speed is in use when the unit is under any of the servicing modes and in these modes the Airflow (m/s) value is ignored.



Touch the “MENU” button to return to the MENU screen without saving any parameters if you wish to do so. So, you may have adjusted the on-screen airflow or fan speed. But if you do not touch one of the ‘Save’ buttons, then no effect is made on calibration parameters.

## **4.10 NORMAL AIRFLOW CALIBRATION PROCEDURE**

These steps apply to both inflow and downflow calibration procedures.

1. Ensure system is powered up.
2. Close all doors.
3. From the Main (HOME) screen navigate to the MENU screen.
4. If calibrating the airflow for the 1<sup>st</sup> time, then you should set the “I/F sensor offset” and “D/F sensor offset” parameter in the System Configuration before continuing here. Refer to the ‘Config Screen’ section for that procedure.

### **4.10.1 Downflow Airflow Calibration Procedure**

1. The anemometer should be set in the horizontal plane with the direction arrow facing downwards inside the enclosure, set at 50 mm below the downflow diffuser grille at the first chosen grid position an example of grid positions are shown in Figure 1b.
2. You will require the Airflow Calibration Screen, this is accessed by Navigating to the MENU screen, touch the ‘Airflow Cal’ button. You will be presented with a password entry screen. Enter the user access password to enter the Airflow Calibration screen. If you enter the correct password, you will be taken to the AIRFLOW CALIBRATION screen shown above.
3. Take a ‘spot’ measurement averaged over a 1-minute interval moving the anemometer to each of the grid points as shown in the matrix [Figure 1b] determining the lowest and highest mean velocity levels.
4. Add the mean totals together and divide by eight to calculate the grand mean value. If this mean value is not close to the desired values, then continue to step four; if the desired airflow has been achieved and jump to step eight.
5. If the desired value has not been achieved the fan output will need changing this is done by, using the +/- touch buttons on display corresponding to the “D/F Fan Speed (%)”, adjust the fan speed up or down to achieve the desired airflow indication on the vane anemometer measuring airflow through the D/F diffuser grille. You can hold your finger down on the + or – button to cause the fan speed to continue to change speed over time. Allow time for the fan speed to settle. Take a grid array of measurements again across downflow roof grilles area to determine an average value indication.
6. Now that you have taken the airflow values across the grid the values need to be added together and divide by eight to calculate the grand mean value if this value meets the required criteria, then continue to step, if the value still is not in the required criteria repeat step five again.
7. Now you have the calculated mean value input this into the AIRFLOW CALIBRATION screen using the +/- touch buttons on display corresponding to “I/F Airflow (m/s)”, adjust the airflow indication (m/s) to match the aperture average reading from the anemometer measurements. You can hold your finger down on the + or – button to cause the airflow (m/s) value to continue to change over time. Allow time for the display value to settle. Allow time for the display value to stabilize.
8. Once the final desired velocity is achieved, then push the save button now the initial ‘DOWNFLOW’ calibration is now complete.

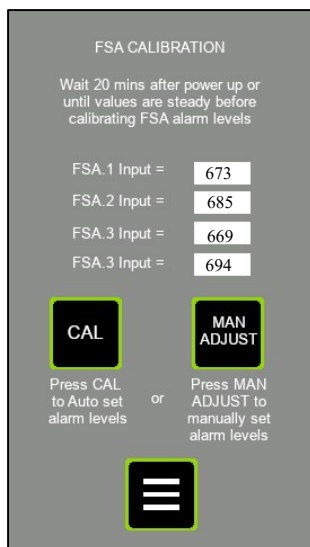
#### **4.10.2 Inflow Airflow Calibration Procedure**

1. In the MENU screen, touch the 'Airflow Cal' button. You will be presented with a password entry screen.
2. Enter the user access password to enter the Airflow Calibration screen. If you enter the correct password, you will be taken to the AIRFLOW CALIBRATION screen shown above.
3. Set the enclosure door system to normal running condition and locate a vane anemometer in positions shown in Figure 1a.
4. Using the +/- touch buttons on display corresponding to the "Fan Speed (%)", adjust the fan speed up or down to achieve the desired airflow indication on the vane anemometer measuring airflow through the front open door's aperture. You can hold your finger down on the + or – button to cause the fan speed to continue to change speed over time. Allow time for the fan speed to settle. Take a grid array [Figure 1a] of measurements across open doors area to determine an average value indication.
5. If the average value indication is within the required airflow value, then continue to step 6. If the average value indication is not within the required value, then repeat step 4.
6. Then, using the +/- touch buttons on display corresponding to "Airflow (m/s)", adjust the airflow indication (m/s) to match the aperture average reading from the hotwire probe anemometer measurements. You can hold your finger down on the + or – button to cause the airflow (m/s) value to continue to change over time. Allow time for the display value to settle. Allow time for the display value to stabilize.
7. Touch the Save button to save all calibration point parameters to permanent store memory. Also, by touching this button the system takes you out to the MENU screen.
8. Power off, and then on, system. Observe in the main display that the system eventually reaches a steady state condition where the AIRFLOW in (m/s) is the same as the value set during the calibration procedure.

## 4.11 FSA ALARMS

### 4.11.1 FSA CALIBRATION SCREEN

The FSA CALIBRATION screen is where the alarm levels for the Filter Saturation alarm sensors are setup by the Caron engineer to suit the application. Access to this screen is password protected.



The screen shows the current sensor input of each configured FSA sensor (a maximum of 4). If there is only one enabled FSA sensor from the Configuration screen, then only one value will be shown on this display for FSA.1. The value shown next to each FSA input is the binary input to the microcontroller (range 0 to 1023). The value is shown for comparative & diagnostic purposes.



Press the MENU touch screen button object to return to the MENU list of screens.



Touch this button to take you to a Manual Adjustment screen where you can manually enter a specific alarm level value for each of up to 4-off FSA sensors.



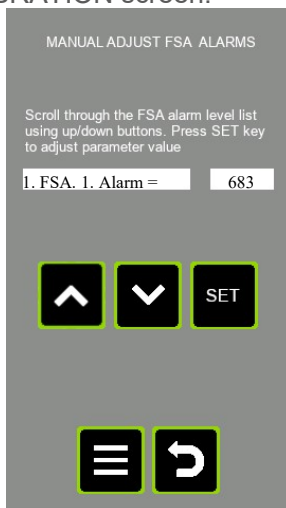
Touch this button to cause the system to calculate 50% of each sensor input reading of the configured list of FSA sensors, and store in memory as the alarm threshold for that sensor.

### 4.11.2 FSA CALIBRATION PROCEDURE

1. Ensure system is powered up.
2. Navigate from HOME screen → MENU screen, and press the “FSA Cal” button.
3. Enter the required password when asked to do so, and you will be brought to the screen shown here above.
4. Allow 20 minutes for the FSA sensors to warm up, or until the values cease climbing slowly.
5. When the sensor input values finally stabilize, press the CAL button.
6. You will hear a long audible beep, and the display will revert to the MENU screen, having saved the alarm thresholds for the FSA sensors.

### **4.11.3 FSA ALARMS ADJUST SCREEN**

The FSA ALARMS ADJUST screen is where the alarm levels for the Filter Saturation alarm sensors can have the individual sensor alarm threshold manually set to any value by the user. This is useful in cases where the automatic 50% threshold set in the FSA CALIBRATION screen needs refinement. You enter this screen via the “Man Adjust2 button in the FSA CALIBRATION screen.



Touch the DOWN button to move down to the next parameter in the parameter list.



Touch the UP button to move up to the previous parameter in the parameter list.



Touch this button to edit/alter the value of the currently displayed configuration parameter. You are taken to the keypad with the current value of the parameter shown. You can edit the value here & store the new value to permanent memory.



Press this button to return to the FSA CALIBRATION screen.



Press this button to return to the main MENU screen. This screen shows the current sensor input of each of 4-off FSA sensor, whether they are enabled (in configuration) or not

### **4.11.4 FSA ALARMS ADJUST PROCEDURE**

1. Ensure system is powered up.
2. Navigate to MAIN SCREEN → MENU SCREEN → FSA CAL.
3. Enter the required password when asked to do so, and you will be brought to the screen shown here above.
4. Inside the FSA CAL screen, touch the man adjust button.
5. This takes you to the FSA ALARMS ADJUST (Manual FSA Alarm levels adjustment).
6. Scroll up/down using the arrow buttons to select the desired FSA number (1 to 4)
7. Press the set button to edit/alter the value of the currently displayed FSA alarm threshold value. You are taken to the keypad with the current value of the parameter shown. You can edit the value here & store the new value to permanent memory.
8. When finished press the return button to return to the FSA calibration screen, or the menu button to return direct to the MENU screen.

## 4.12 PASSWORDS

There are 3 password options to gain access to different levels of controlled screens:

ENGINEER (Caron personnel).  
SUPERVISOR (Principal laboratory person).  
USER (General enclosure operator).

The following screens are access controlled via password:

- Airflow Cal (ENGINEER level access required).
- System Config (ENGINEER level access required).
- FSA cal. (ENGINEER level access required).
- Network Config (ENGINEER level access required).
- Service Dates, in the 'Service Menu' sub menu screen. (ENGINEER level access required).
- Date & Time (SUPERVISOR level access required).
- Change Pins. (SUPERVISOR level access required).
- UV Light (USER level access required).

The system will present the password keyboard below when the password is required. Simply enter the password. A correct entry will result in passage to the destination parameter screen. The screen gives no response to an incorrect entry. It remains displaying the password keypad. As you enter the 4 characters, each digit is represented on screen by an asterisk, so the password is not shown on display.



You do not have to backspace (BS) over the 4 asterisks 1<sup>st</sup> before entering the 4 digits, you simply start by pressing the 1<sup>st</sup> numerical digit in the password sequence.

**DEL** – “Delete”. Pressing this button deletes the character to the LHS of the cursor.

**ESC** – “Escape”. Pressing this button takes the data entry out of edit mode, and so the displayed value reverts to the current value of the parameter.

**ENT** – “Enter”. Pressing this button causes the system to evaluate the entered value for this parameter. Limits are checked. Data type is checked. If the entered value is valid then the parameter value is changed in the control system, and the non-volatile memory is updated.

**[0-9 &.]** – numerical & decimal point characters.

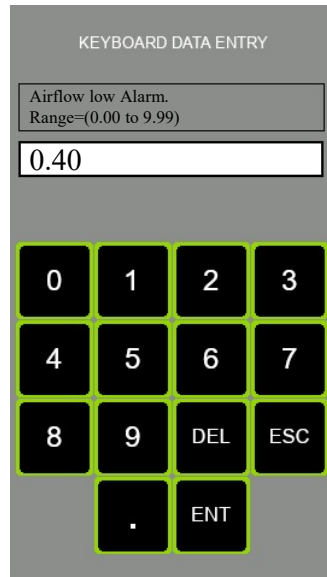


## 4.13 DATA ENTRY SCREEN

Several screens have within them the feature to alter parameter values. The data entry keypad screen is used for this purpose. It is the same keypad display as the password keypad display, with the exception that entered parameter characters are shown on display as you enter them.

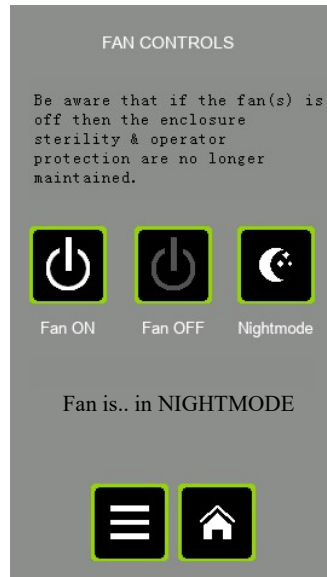
In the data entry keypad screen, the parameter description & valid range of the parameter are shown above the data entry text box.

When you enter the parameter value, if the entered value is valid, and you press the ENT key to enter the value, then the keypad display will close & the display returns to the parameter screen (in the Config or UV light screen). If the value being entered is invalid, then when you press the ENT key, there will be no response, the keypad screen will remain on the display.



## 4.14 FAN ON-OFF

The FAN ON-OFF screen is where the fans can be turned on and off. At power up, the fans are default to the OFF state. You must access this screen to turn the fans on or off, or, simply touch the fan icon in the centre of the Home screen. The screen is not password protected.



Press this button to Turn the fans ON, and run at normal setpoint. Observe the status message changes to “Fan is..ON”.



Press this button to Turn the fans OFF. Observe the status message changes to “Fan is OFF”.



Press this button to Turn the fans to Nightmode speed. Observe the status message changes to “Fan is: in NIGHTMODE”. See the chapter on Airflow Calibration for a description of what Nightmode means, and how it is setup.



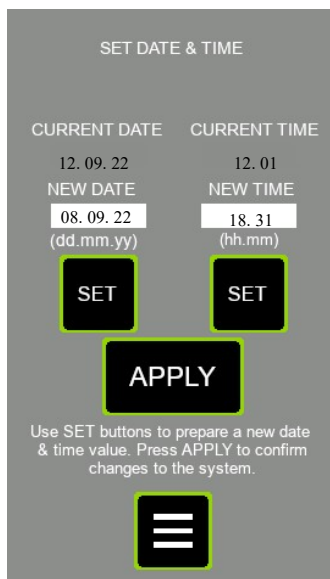
Press this button to return to the main MENU screen.



Press the Home button to return to the Main (Home) screen.

## 4.15 DATE AND TIME

The DATE & TIME screen is where you can set the current Time & Date used for display on the Main screen. It is also used for tracking the general Service intervals & indicating this on the Main screen.



**SET (New Date)** – Touch this button to edit/alter the value of the preparation value for “New Date.” You are taken to the keypad with the current value of the parameter shown. You can edit the value here. The value is only temporarily stored. It is only when you press the “Apply New Date/Time” button that the prepared new date & new time are stored to permanent memory.



**SET (New Time)** – Touch this button to edit/alter the value of the preparation value for “New Time.” You are taken to the keypad with the current value of the parameter shown. You can edit the value here. The value is only temporarily stored. It is only when you press the “Apply New Date/Time” button that the prepared new date & new time are stored to permanent memory.



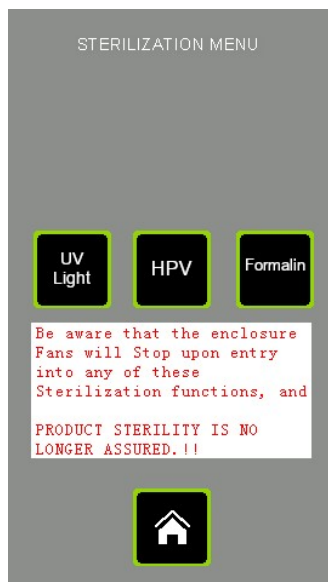
**APPLY NEW DATE/TIME** – Touch this button to store the prepared new date & new time to permanent memory. You should first prepare a new date & time for the next ‘minute’ value rollover. Then press the apply new date/time button as soon as the time reference rolls over.



Press this button to return to the main MENU screen.

## 4.16 STERILITY MENU

It is from this screen that you can choose the appropriate fumigation method for the enclosure that has been implemented by design. The options shown below are UV light, HPV and Formalin. Access to this screen is not password protected.



**AS A REMINDER OF THE WARNING SHOWN ON THE SCREEN GRAPHIC, BE AWARE THAT THE ENCLOSURE FANS WILL STOP UPON ENTRY INTO ANY OF THESE FUMIGATION MODES, AND THEREFORE PRODUCT STERILITY OR PERSONNEL PROTECTION IS NO LONGER ASSURED.**

**UV LIGHT** – Pressing this screen button takes the user to the UV light control screen where the UV light ON timer value is set & the UV light is turned ON or OFF. This screen is password protected. The password level required is USER level.

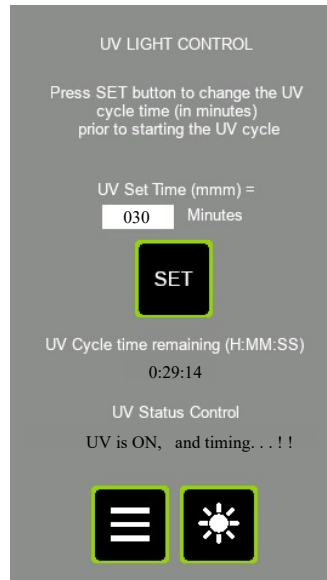
**HPV** – Pressing this screen button takes the user to the HPV (Hydrogen Peroxide) control screen following which the exhaust fan is turned off & the Downflow will run at the calibrated 'Low Speed' setpoint once HPV mode is activated & turned on. This screen is password protected. The password level required is USER level.

**Formalin** - Pressing this screen button takes the user to the Formalin control screen following which the exhaust fan is turned off & the Downflow will run at the calibrated 'Low Speed' setpoint once Formalin mode is activated & turned on. This screen is password protected. The password level required is USER level.

## 4.17 UV

### 4.17.1 UV CONTROL SCREEN

The UV Control screen allows the user to turn the UV light on/off & decide the time for which the light should be energized.



Press this button to return to the main MENU screen. If the UV light is on, then it will turn off, and the white lighting will resume previous status (on or off) at the point the UV was activated.



Touch this button to set the UV “on” time duration. If you press it, you are taken to the data entry keypad where you can enter a UV on time duration range of 0-120 minutes. The entered value is retained in permanent memory & so is still retained even after a power cycle.



This touch screen object is used by the operator to turn the enclosure UV lights on or off. It is a toggle button so the UV lights will alternate on & off as the button is repeatedly touched. When the UV turns on, the white lights will turn off.

**UV CYCLE TIME REMAINING** - This indicator shows the time left in the activated UV cycle in the format, HH:MM:SS.

**UV Control Status Message** - This text object gives the status of the UV light control cycle, and information regarding the door switch if relevant. The display texts are as follows:

**UV OFF, Door Open** - This means the UV lamp is off and is not ready to be turned on, as the door is open.

**UV OFF, Ready** - This shows the UV lamp is off and is ready to be turned on, as the door is properly closed.

**UV ON, Timing** - This tells us that the UV cycle is running, and it is timing down. The door is clearly closed as otherwise, the cycle would be interrupted.

**UV ON, Cycle Ending** - This tells us that the UV cycle is running, and it is timing down. Also, as it is in the ‘Cycle Ending’ phase it means there is less than 10 seconds to go before the UV cycle is completed. During this phase also, the audible buzzer is pulsed once per second. The door is clearly closed as otherwise, the cycle would be interrupted.

If the UV cycle is interrupted either by the door opening or the user toggling the UV button, then the system remains on the UV control screen & the fans come back up. If on the other hand a UV cycle is allowed to complete naturally, then the display reverts to the MAIN screen & the fans come up. The white lights will resume previous state of on or off.

### **4.17.2 PROCEDURE FOR ACTIVATING THE UV CYCLE**

Sequence to activate the UV control...

1. Ensure system is powered up.
2. Close all hinged doors.
3. Navigate to the UV LIGHT control screen via the Main MENU screen.
4. Check the value of the UV.SET.TIME in minutes. If the value is OK then go to step 6, else press the SET button.
5. This takes you to the keypad display. Enter the required UV on time in minutes (range = 0-120 minutes). If the entered value is OK, the system takes you back to the UV control screen.
6. Inspect the UV status text at the bottom of the UV CONTROL screen. it must read "UV OFF, Ready!!" before the UV is ready to start. Rectify any issue with the door switch if it reads "UV OFF, Door Open!!"
7. Touch the UV button to start the UV cycle.
8. Notice the white lights turn OFF (if they were on), the fan turns off (if it was on) & the UV lights turn on.

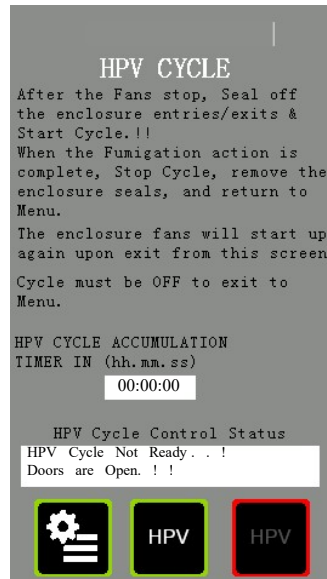
### **4.17.3 UV SWITCH OFF MODES**

1. The UV lights will remain on until either...
  - a) The preselected UV timer has expired.
  - b) The front horizontal hinged door is opened.
  - c) The user touches the UV button on the TFT display
2. If the UV cycle has not yet completed but you want to interrupt it, then touch the UV button on the UV CONTROL display (or open the door to break the door switch sensing). You should notice that the white come back on (if they were energized prior to engaging the UV lights). Also, the fans come back on (if they were energized prior to engaging the UV lights). You can navigate back to the MAIN display via MENU→ HOME.

If the UV cycle is allowed to complete, the UV lights switch off. You should notice that the MMI display reverts to the Main screen & the fans start back up on if they were on before UV cycle was started. Also, the white come back on (if they were energized prior to engaging the UV lights).

## 4.18 HPV CONTROL SCREEN

The HPV Control screen allows the user to set the Downflow & Inflow fans into a condition that suits a HPV fumigation process. A timer indicates the running time on screen so the user can time the process. The password level required is USER level.



Press this button to return to the Service Menu screen. If the HPV mode is active, then the button will not respond, so HPV mode must be turned off before you can leave this screen. This prevents inadvertent return when HPV mode is active & the fans returning to setpoint during fumigation.

**DO ENSURE THAT THE FUMIGATION PROCESS HAS FULLY COMPLETED, THE FUMIGANT IS REMOVED & ALL FUMIGATION COVERS (NIGHT DOORS) ARE REMOVED BEFORE LEAVING THIS SCREEN, AS THE FANS WILL RETURN TO THE DEFAULT SETPOINT UPON LEAVING IT.**



Press this button to start the HPV fumigation mode. The effect of this will be to set the Downflow fans running at the 'Low Speed' setpoint, (set during Airflow Calibration), and to set the HPV cycle timer accumulating.





Press this button to Stop the HPV fumigation mode. The effect of this is to stop the Downflow fans, and to stop the HPV cycle timer accumulating.

### 4.18.1 HPV Cycle Control Status Message

This text object shows the status of the HPV control cycle, and information regarding the door switch if relevant. The display texts are:

1. **HPV Cycle Not Ready.. Doors are Open.!!**  
This tells us that HPV mode is inactive, but cannot be started as the monitored doors are open.
2. **HPV Cycle Ready to Start.. Doors Closed OK.!!**  
This tells us that HPV mode is inactive, but can be started as the monitored doors are closed OK.
3. **HPV Cycle Running.. But Doors are Open.!!**  
This tells us that HPV mode is active & timing, but the monitored doors are open.
4. **HPV Cycle Running OK.. Doors Closed OK.!!**  
This tells us that HPV mode is active & timing and the monitored doors are closed OK.

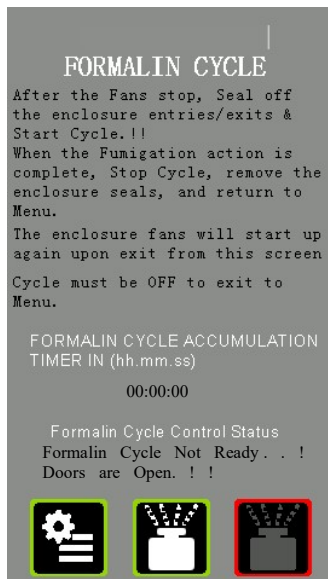
#### **4.18.2 PROCEDURE FOR ACTIVATING THE HPV CYCLE**

1. Ensure enclosure is powered up.
2. Close all hinged doors.
3. Before proceeding further, ensure that processes requiring full containment & sterility are stopped, as during HPV cycle the fans will no longer be operating normally.
4. Navigate to the “STERILITY MENU” screen via the Main MENU screen.
5. Press the HPV button to enter the HPV control screen. You should hear the fans all stop upon entry to this screen.
6. Now fit the supplied fumigation cover plates (Night doors) to the enclosure doors & exhaust grille then attach the 3<sup>rd</sup> party HPV control equipment for injection & extraction of the HPV vapour using the hose kit and couplings provided and initiate the HPV injection.
7. On the “HPV CYCLE” screen, press the  button to start the Downflow fan running at the ‘Low Speed’ setpoint & start the display timer. The fan running at a low speed aids the process by pushing the fumigant through the filters.
8. When the fumigation is complete, extract the fumigant using the proprietary 3<sup>rd</sup> party HPV control equipment.
9. When the post cycle trace fumigant has been extracted, disconnect the HPV control equipment & remove the fumigation covers.
10. On the TFT, Press the  button to stop the Downflow fans and the accumulation timer.
11. Now Press the service menu button to return to the Sterilization Menu. You should now hear all fans running and returning to their setpoint.
12. From here, return to the Main Screen via the home button.



## 4.19 FORMALIN CYCLE

The Formalin Control screen allows the user to set the Downflow & Inflow fans into a condition that suits a Formalin fumigation process. A timer indicates the running time on screen so the user can time the process. The password level required is USER level.



Press this button to return to the Service Menu screen. If the Formalin mode is active, then the button will not respond, so Formalin mode must be turned off before you can leave this screen. This prevents inadvertent return when Formalin mode is active & the fans returning to setpoint during fumigation.

**DO ENSURE THAT THE FUMIGATION PROCESS HAS FULLY COMPLETED, THE FUMIGANT IS REMOVED & ALL FUMIGATION COVERS (NIGHT DOORS) ARE REMOVED BEFORE LEAVING THIS SCREEN, AS THE FANS WILL RETURN TO THE DEFAULT SETPOINT UPON LEAVING IT.**



Press this button to start the Formalin fumigation mode. The effect of this will be to set the Downflow fans running at the 'Low Speed' setpoint, (set during Airflow Calibration), and to set the Formalin cycle timer accumulating.



Press this button to Stop the Formalin fumigation mode. The effect of this is to stop the Downflow fans, and to stop the Formalin cycle timer accumulating.

### 4.19.1 Formalin Cycle Control Status Message

This text object shows the status of the Formalin control cycle, and information regarding the door switch if relevant. The display texts are:

**1. Formalin Cycle Not Ready.. Doors are Open.!!**

This tells us that Formalin mode is inactive, but cannot be started as the monitored doors are open.

**2. Formalin Cycle Ready to Start.. Doors Closed OK..!!**

This tells us that FORMALIN mode is inactive, but can be started as the monitored doors are closed OK.

**3. Formalin Cycle Running.. But Doors are Open..!!**

This tells us that FORMALIN mode is active & timing, but the monitored doors are open.

**4. Formalin Cycle Running OK.. Doors Closed OK..!!**

This tells us that FORMALIN mode is active & timing and the monitored doors are closed OK.

#### **4.19.2 PROCEDURE FOR ACTIVATING THE FORMALIN CYCLE**

1. Ensure enclosure is powered up.
2. Close all hinged doors.
3. Before proceeding further, ensure that processes requiring full containment & sterility are stopped, as during FORMALIN cycle the fans will no longer be operating normally.
4. Navigate to the “STERILITY MENU” screen via the Main MENU screen.
5. Press the FORMALIN button to enter the FORMALIN control screen. You should hear the fans all stop upon entry to this screen.
6. Now fit the supplied fumigation cover plates (Night doors) to the enclosure doors & exhaust grille then attach the 3<sup>rd</sup> party FORMALIN control equipment for injection & extraction of the FORMALIN vapour using the hose kit and couplings provided and initiate the FORMALIN injection.
7. On the “FORMALIN CYCLE” screen, press the  button to start the Downflow fan running at the 'Low Speed' setpoint & start the display timer. The fan running at a low speed aids the process by pushing the fumigant through the filters.
8. When the fumigation is complete, extract the fumigant using the proprietary 3<sup>rd</sup> party FORMALIN control equipment.
9. When the post cycle trace fumigant has been extracted, disconnect the FORMALIN control equipment & remove the fumigation covers.
10. On the TFT, Press the  button to stop the Downflow fans and the accumulation timer.
11. Now Press the service menu button to return to the Sterilization Menu. You should now hear all fans running and returning to their setpoint.
12. From here, return to the Main Screen via the home button.

# **PART 2 - OPERATING THE CLASS II ENCLOSURE**

## 5.0 OPERATING THE CLASS II ENCLOSURE

The Class II Enclosure must have been installed and commissioned in accordance with 4.0 Commissioning of this manual before attempting to operate.

### 5.1 TO OPERATE THE ENCLOSURE:

- 1) With the mains supply on, turn the isolator switch on, positioned on the control box.
- 2) Observe that TFT display illuminates to the MAIN (aka HOME) display.
- 3) Once all operating conditions are correct, the message "System OK" appears on the status object at the bottom of the MAIN screen.

The fan speed will quickly stabilise at the level pre-set during commissioning, however, during this period the control system will visually alarm until the airflow velocity has reached the calibrated setting. Allow sufficient time for the airflow velocity to stabilise throughout the interior before carrying out any processing.

The level of containment protection afforded by the enclosure is affected by the manner in which it is used. The enclosure provides the primary barrier and will contain the hazard source but must be used as part of a comprehensive laboratory safety routine.

### 5.2 GOOD LABORATORY PRACTICE

- Adequate planning and understanding the function of the enclosure.
- Keep the front aperture free from obstruction by apparatus or containers.
- Limit amount of chemicals and labware within the acrylic enclosure during procedures when possible
- Close and secure the bi-folding front panels during operation.
- Do not lift the bi-folding front panels except where necessary for apparatus set up. The front panels should always be closed and secured by the catches during use of the enclosure. This ensures the airflow velocity remains at the pre-set safe level. In addition, it serves as a protective shield and helps protect the user from hazardous or highly reactive materials.

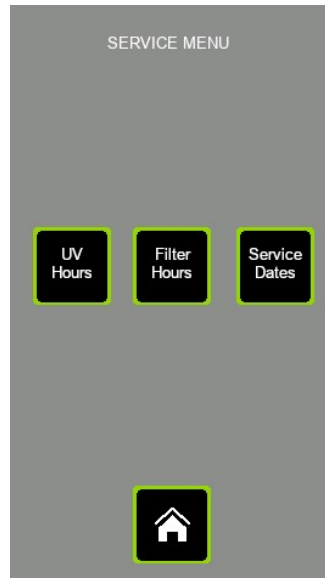
**NOTE:**

- *The product is not designed or certified to Directive 2014/34/EU (Atex) 240V models, or Directive 94/9/EC (Atex) 115V models, or use in a potentially explosive atmosphere.*
- *It is not designed for use where toxic substances above OHC3 category may be used.*
- *There are no direct sources of ignition within the working zone of the enclosure and no risk of fire or explosion during what is considered normal use. However, in the event of fire caused by the actual process atmosphere and where the end-user may introduce an ignition source, it will provide only short-term initial containment.*
- *It should not be relied upon to provide absolute protection and you should evacuate the laboratory/room according to your current fire regulations.*
- *If it is safe to do so, switch the fan off promptly; this may help to prevent fan-assisted airflow aiding further combustion.*
- Access to the enclosure interior during processing should be confined to the aperture in the hinged front panel; otherwise, the airflow and containment integrity will be affected.
- In the event of a significant disturbance to the incoming airflow during use the airflow alarm monitor will activate, however, this will cease as soon as the airflow velocity is allowed to return to pre-set levels.
- When installing or removing labware, the complete front bi-folding acrylic panel can be hinged upwards for full access to the enclosure. This panel should be secured for safety and convenience by aligning the access aperture in the panel and 'hooking' over the retaining tabs fitted on top of the fan housing
- Do not switch the enclosure off during processing operations and allow 15 minutes *after* operations cease before switching off the fan.

# PART 3 - SERVICE MENUS

## 6.0 SERVICE MENUS (sub menu)

This screen is a menu of service-related functions for the enclosure. The UV lamp & Filter Timer check operations are observed in here. The annual service interval can be reset & adjusted in here by the Service engineer.



**UV HOURS** – Touch this button to inspect the duration of operation of the UV Lamps, and reset the timer if desired. The button takes you to the screen titled “UV SERVICE CHECK.”

**FILTER HOURS** – Touch this button to inspect the duration of operation of the Filters, and reset the timer if desired. The button takes you to the screen titled “FILTER SERVICE CHECK.”

**SERVICE DATES** – Touch this button to inspect the next general service date, and reset to the next date if the service engineer has just completed a service operation. This screen is password protected. The password level required is ENGINEER level.



Press the Home button to return to the Main (Home) screen.

## 6.1 FILTER HOURS RUN SCREEN

This screen gives the values of Filter actual running hours & maximum allowed (before visual alarm indication) running time (in hours) to the user. This information can be used to determine whether the filters need changing. The value 'Filter hours usage alarm setpoint' is set in the CONFIG menu where the parameters are access restricted using a password. There the parameter is called "filter Max Hours".



### 6.1.1 Filter Hours Run

This register indicates the accumulated running time of the enclosure as an indication of when the Filter should be considered for testing or replacement. The accumulated 'Filter hours run' value is compared with the setup 'Filter hours usage alarm setpoint' time. If the 'Filter hours run' exceeds the setpoint time, then a visual alarm condition is generated & is displayed in the status message area on the MAIN display. There is no audible alarm for this exception, but the message is clearly displayed like any other alarm on the system status object on the MAIN display. It does not prevent use of the enclosure. You can clear the accumulated hours to stop the nuisance of the alarm as follows:

- 1) Navigate to this "Filter Hours run check" screen using the path:  
MENU → SERVICE MENU → FILTER HOURS
- 2) Touch the RESET button underneath the text "Filter Hours Run."
- 3) Observe that the Filter Hours Run resets to 00000.



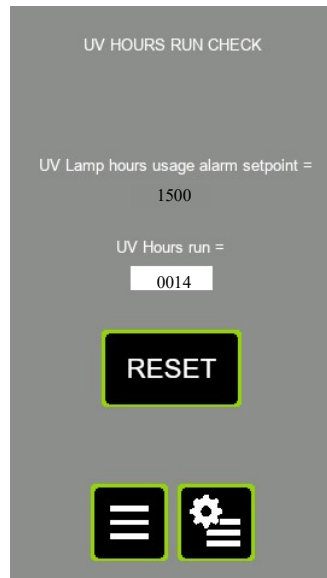
Press this button to return to the main MENU screen.



Touch this button to return to the Service Menu screen

## 6.2 UV HOURS SCREEN

This screen gives the values of UV Lamp actual running hours & maximum allowed (before visual alarm indication) running time (in hours) to the user. This information is used to determine whether the efficacy of the UV lamp is likely to be reduced because of its age & running time. The value 'UV Lamp hours usage alarm setpoint' is set in the CONFIG menu where the parameters are access restricted using a password. There it is called 'UV Max Hours'.



### 6.2.1 UV HOURS RUN

This register indicates the accumulated running time of the UV lamps in the enclosure as an indication of when the lamps should be considered for testing or replacement. The accumulated 'UV hours run' value is compared with the setup 'UV Lamp hours usage alarm setpoint' time. If the UV lamp run hours (UV hours run) exceeds the setpoint time, then a visual alarm condition is generated & is displayed in the status message area on the MAIN display. There is no audible alarm for this exception, but the message is clearly displayed like any other alarm on the system status object on the MAIN display. It does not prevent use of the enclosure. You can clear the accumulated hours to stop the nuisance of the alarm as follows:

- 1) Navigate to this "UV Hours run check" screen using the path:  
MENU → SERVICE MENU → UV HOURS
- 2) Touch the RESET button underneath the text "UV.HRS.RUN".
- 3) Observe that the UV Hours Run resets to 00000.



Press this button to return to the main MENU screen.



Touch this button to return to the Service Menu screen.



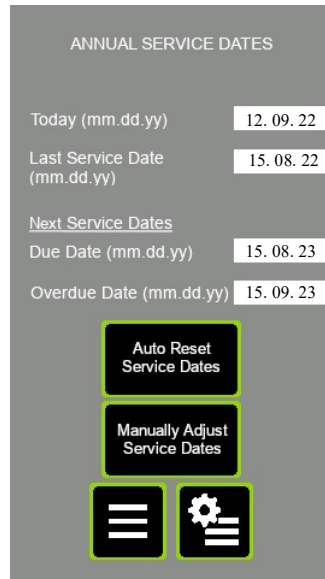
## 6.3 ANNUAL SERVICE DATES

This screen allows you to reset the service due & overdue dates for next year's general service. The Auto Reset function always sets the dates for one year ahead of today's current date.

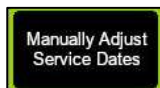
The warning date is 11 months from the current date and the overdue date is 12 months from the current date.

When the warning date is reached then a visual alarm is generated on the main screen with a message to "Annual Service Now Due!". No audible alarm is produced as a result of this event.

When the overdue date is reached then a visual alarm is generated on the main screen with a message to "Annual Service Overdue!". No audible alarm is produced as a result of this event.




Touch this button to advance the Service Due & overdue dates one year ahead of today's date. The warning date is 11 months from the current date & the overdue date is 12 months from the current date. The new Service Overdue date & Due Date are both updated into permanent memory.



Touch this button to navigate to the 'Manual Service Date Adjustment' screen, where you can decide on what date the next 'overdue' service date lies. The system calculates the 'service due' date as one month less than that.



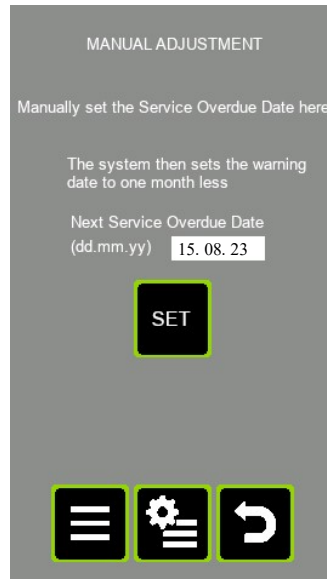
Press this button to return to the main MENU screen.



Touch this button to return to the Service Menu screen.

### **6.3.1 MANUAL SERVICE DATE ADJUSTMENT**

This screen allows you to manually decide when the next service due & overdue dates occur. The Auto reset function in the preceding screen always sets the dates for one year ahead of today's current date. The warning date is 11 months from the current date & the overdue date is 12 months from the current date.



Touch this button to edit/alter the value of the preparation value for “Next Service Overdue Date.” You are taken to the keypad with the current value of the parameter shown. You can edit the value here. The new Service Overdue date & Due Date are both stored to permanent memory.



Press this button to return to the main MENU screen.



Touch this button to return to the Service Menu screen.

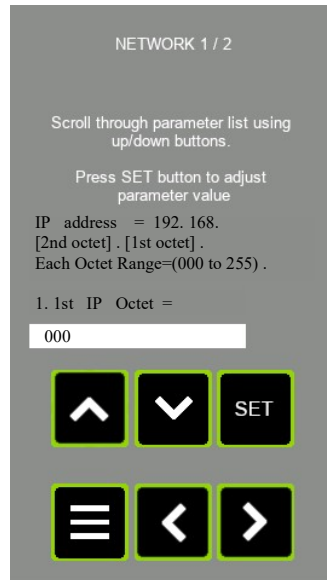


Press this button to return to the previous screen (Annual Service Dates).

## 6.4 NETWORK SCREEN

### 6.4.1 NETWORK SCREEN 1

This screen allows you to set the 1<sup>st</sup> & 2<sup>nd</sup> IP address octet for the IP address of this Enclosure on the Wi-Fi addressing system.



### 6.4.2 NETWORK #2 SCREEN

This screen allows you to set ...

- The email address for alarm alters.
- The Wi-Fi SSID address.
- The Wi-Fi password.



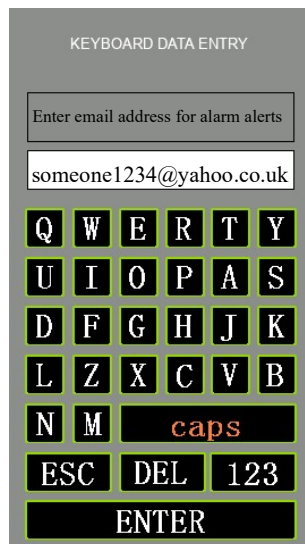
## 6.5 Alpha Numeric Keyboard screen

This screen is used when entering data requiring alphanumeric input. For this TFT, that is some of the Wi-Fi Network parameters.

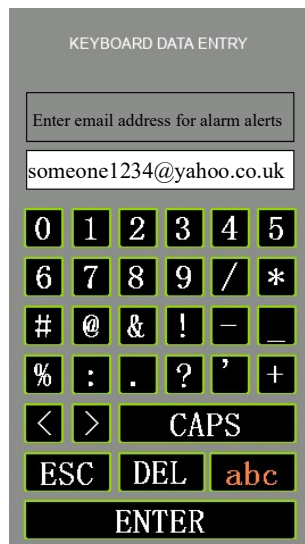
Normal alphanumeric screen:



Touch the CAPS button & you get this...



Touch the 123 button and you get this...




## 6.6 DIAGNOSTIC SCREENS

The diagnostic screens are for use by Caron engineers in inspecting the operation of the system. However, the screens are not password protected, and so can be accessed by anyone.

### 6.6.1 DIAGNOSTIC SCREEN #1

DIAGNOSTIC DATA #1	
ANC3_IN =	578
AND0_IN =	339
AmbTempC =	23.8
TempScaler =	2489
AirFlow =	0.51
FBScaler =	2133
ANIN1 (PL4) =	450
ANIN2 (PL5) =	478
Digital In =	00000001
Digital Out =	00000001



**ANC3 IN** This is the uncompensated analogue signal input value from the airflow anemometer 'hotwire' thermistor. It can be used to determine what value to enter for the 'A/f sensor offset' in the CONFIGURATION parameters.

**AND0 IN** This is the analogue signal input value from the ambient temperature thermistor inside the airflow anemometer.

**AmbTempC** This is the ambient temperature as measured using the thermistor inside the airflow anemometer.

**TempScaler** This is an internal scaler used in airflow calculations generated from the ambient temperature signal.

**Airflow** The airflow in m/s. it is the same value that is shown on main display.

**FBScaler** The value of the scaler generated in the Calibration screen when setting the airflow display value using +/- buttons.

**ANIN.1 (PL4)** This is the analogue input signal value into PL4 connector of the main control board. The signal is a 0 to 10V input.

**ANIN.2 (PL5)** This is the analogue input signal value into PL5 connector of the main control board. The signal is a 0 to 10V input.

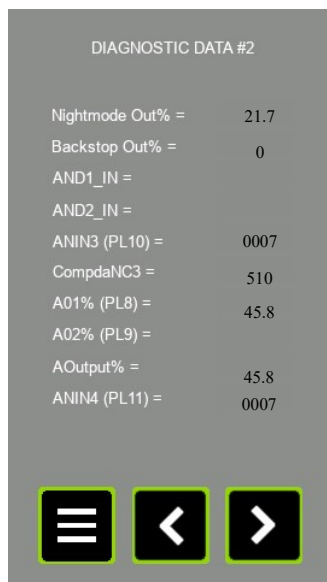
**DIGITAL IN** This is the binary expression of all 5 digital inputs to the PL3 connector of the main control board.

1. Bit.0 status (1 or 0) = input #1 on PL3-pin.3.
2. Bit.1 status (1 or 0) = input #2 on PL3-pin.4.
3. Bit.2 status (1 or 0) = input #3 on PL3-pin.5.
4. Bit.3 status (1 or 0) = input #4 on PL3-pin.6.
5. Bit.4 status (1 or 0) = input #5 on PL3-pin.7.
6. All other bits are not used.

**DIGITAL OUT** This is the binary expression of all 5 digital outputs from the MCU in the main control board.

1. Bit.0 status (1 or 0) = WhiteLightOutput, output on PL2-pin.3.
2. Bit.1 status (1 or 0) = UVLightOutput, output on PL2-pin.4.
3. Bit.2 status (1 or 0) = AlarmStatusOutput, output on PL2-pin.5.
4. Bit.3 status (1 or 0) = Aux\_Relay1 (unassigned), output on PL2-pin.6.
5. Bit.4 status (1 or 0) = Aux\_Relay2 (unassigned), output on PL2-pin.7.
6. Bit.5 status (1 or 0) = Output to Buzzer on PCB.
7. All other bits are not used

### **6.6.2 DIAGNOSTIC SCREEN #2**



**Nightmode Out%** This is the % of maximum speed that will be output to the fan, when running in Nightmode (standby mode). The setpoint is configured in the Airflow Calibration screen.

**Backstop Out%** This is the % of maximum speed that will act as a lower limit speed to the fan, when in VAV mode, and the fan wants to reduce speed to achieve the setpoint airflow. The setpoint is configured in the Airflow Calibration screen.

**AND1 IN** This is the hotwire input to the 2<sup>nd</sup> unused airflow sensor interface. Observe no data is displayed here.

**AND2 IN** This is the ambient temperature input to the 2<sup>nd</sup> unused airflow sensor interface. Observe no data is displayed here.

**ANIN3 (PL10)** This is the analogue input signal value to the a general purpose 0..10VDC analogue input port on PL10 on the main control board.

**CompdaNC3** This is the compensated version of the hotwire signal. It can be used to set the “A/F sensor offset” in the system Configuration.

**A01%** This is the % of maximum 10V analogue output appearing now on PL8.


**A02%** This is the % of maximum 10V analogue output appearing now on PL9.

**AOutput%** This is the % of maximum 10V analogue output to the fan or fan speed controller.

**ANIN4 (PL11)** This is the analogue input signal value to the a general purpose 0..10VDC analogue input port on PL11 on the main control board.

### 6.6.3 DIAGNOSTIC SCREEN #3

DIAGNOSTIC DATA #3	
FSA. 1. IN (PL10)	0499
FSA. 2. IN (PL11)	0457
FSA. 3. IN (PL4)	0007
FSA. 4. IN (PL5)	0007
FSA. 1 ALARM. LEVEL	0250
FSA. 2 ALARM. LEVEL	0250
FSA. 3 ALARM. LEVEL	0007
FSA. 4 ALARM. LEVEL	0007



**FSA.1.IN (PL10)** This is the analogue input signal value from the Filter Saturation sensor connected to PL10 of the main control board.

**FSA.2.IN (PL11)** This is the analogue input signal value from the Filter Saturation sensor connected to PL11 of the main control board.

**FSA.3.IN (PL4)** This is the analogue input signal value from the Filter Saturation sensor connected to PL4 of the main control board. A Filter Saturation Alarm sensor connected to PL4 requires the use of a BN5001 interface module.

**FSA.4.IN (PL5)** This is the analogue input signal value from the Filter Saturation sensor connected to PL5 of the main control board. A Filter Saturation Alarm sensor connected to PL5 requires the use of a BN5001 interface module.

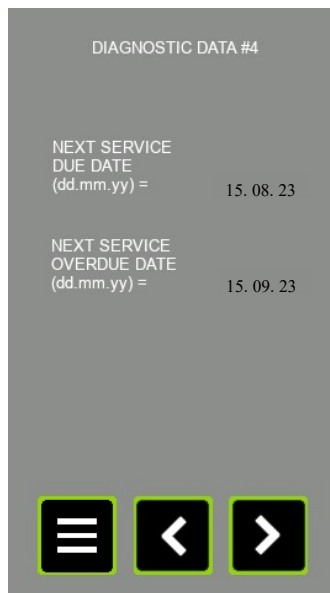
**FSA.1.Alarm Level** This is the currently operating alarm threshold for the FSA #1 input sensor. It only applies if the alarm is enables. When the FSA.1.IN value drops below this value an audible & visual alarm is triggered.

**FSA.2.Alarm Level** This is the currently operating alarm threshold for the FSA #2 input sensor. It only applies if the alarm is enables. When the FSA.2.IN value drops below this value an audible & visual alarm is triggered.

**FSA.3.Alarm Level** This is the currently operating alarm threshold for the FSA #3 input sensor. It only applies if the alarm is enables. When the FSA.3.IN value drops below this value an audible & visual alarm is triggered.

**FSA.4.Alarm Level** This is the currently operating alarm threshold for the FSA #4 input sensor. It only applies if the alarm is enables. When the FSA.4.IN value drops below this value an audible & visual alarm is triggered.

## 6.6.4 DIAGNOSTIC SCREEN #4

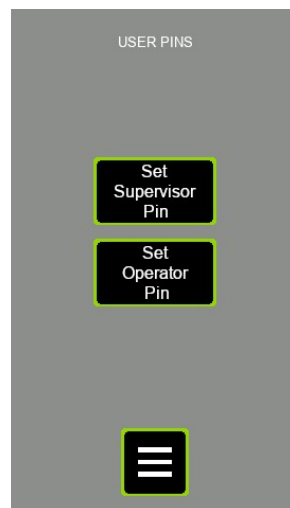


**Next Service Due Date** This is the next date that a “service now due” warning message will be issued on the MAIN screen to the user.

**Next Service Overdue Date** This is the next date that a “service overdue” warning message will be issued on the MAIN screen to the user.

## 6.7 USER PINS SCREEN

The User PINS screen can be used to alter the access password for the SUPERVISOR and the USER. However, only the ENGINEER & SUPERVISOR can access this screen to change the passwords. The SUPERVISOR & ENGINEER can change both the SUPERVISOR & the USER passwords. The USER has no access in here.



Touch this button to alter the SUPERVISOR password.



Touch this button to alter the USER (operator) password.



Press this button to return to the main MENU screen.



# **PART 4 -PREVENTIVE MAINTENANCE**


## 7.0 EXAMINATION & TESTING

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### 7.1 Statutory Examination, Testing and Preventative Maintenance-General

These enclosures are subject to statutory examination and testing under current COSHH 2002 and OSHA regulations for LEV systems-the interval between examinations must not exceed 14 months.

This requirement, placed upon all employers who install enclosures in their workplace, is fully supported throughout the intervening period by the automatic detection (for units supplied with the Nextion TFT) and recording of the following parameters:

- a) Filter life dial-indicator, based on calendar time set by the service engineer during the previous visit. It also shows remaining filter lifespan as a % value. 
- b) "Annual Service Now Due" and "Annual Service Overdue" screens/alarms are presented.
- c) Filter saturation alarm (FSA) monitoring and annunciation.
- d) After each examination and service filter replacement, the dates should be recorded in a suitable Log Book maintained by the end-user. Caron can provide an appropriate log book to end-users on request.
- e) A 'PASSED' test label must be affixed by the examiner to the exterior of the enclosure to clearly indicate that the enclosure has passed test and inspection. Otherwise, in the event of a fault where the repair required cannot be completed at the time of the test a 'FAILED' test label must be affixed to clearly indicate to operators and supervisors that the enclosure cannot be used until remedied.

After each examination and service filter replacement, the dates should be recorded in a Log Book maintained by the end-user.

The Logbook should include record of:

- Identified daily, monthly checks for each item in the system,
- Maintenance carried out,
- Replacements made,
- Planned and unplanned repairs,
- Faults observed (information for next operator where appropriate)
- Operators daily correct use of the enclosure,
- Fan increased noise or vibration

### 7.2 FACE VELOCITY

The Nextion TFT alarm system will continuously monitor the face inflow and downflow velocity the control system will both audibly and visually annunciate an alarm when the value falls below the present level. This will also occur if any of the doors are opened causing the airflow to drop; along with the airflow low alarm there will also be a doors open alarm.

### 7.3 FILTER CONTAINMENT BREAKTHROUGH

When measurement of the sampling port reveals a breakthrough of contaminant, the installed filter(s) must be replaced. This filter must be replaced as soon as possible as further breakthrough could take place allowing for harmful gases to break through.

## **7.4 ELECTRICAL SAFETY**

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### **7.4.1 For 230V Units:**

This enclosure must continue to meet the requirements of the Electricity at Work Regulations 1989 and conformity assessment to BS EN 61010 Safety Requirements-Electrical equipment for laboratories

The correct fuse must be fitted to the mains plug at all times and the mains lead should be examined frequently for signs of damage.

There should be regular formal inspections carried out by a 'competent person' and must include earth bonding and insulation tests. All inspections carried out should be recorded.

### **7.4.2 For 115V Units:**

The product must continue to meet the requirements of NEC 2008 with the correct fuse fitted -the mains lead should be examined frequently for signs of damage.

There should be regular formal inspections carried out by a 'competent person' and must include earth bonding and insulation tests. All inspections carried out should be recorded.

## **7.5 UV SAFETY**

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UV Safety is for units fitted with the UV light option.

UVc wavelength penetration can cause damage to eyes and skin where exposure to UVc radiation is prolonged. Reflective capabilities are high.

It should also be recognised that UV light can damage plastics and rubber-based materials which may be used within the enclosure and this may lead to secondary hazards such as leaking tubing or containers, over continuous periods.

Due to the employment of special glass, the lamp does not generate ozone.

### **7.5.1 UV Lamp Life Expectancy-general**

The lamp has a rated life of 8,000 hours maintaining an effective intensity for 6,000 hours, after which the UVc output will fall to less than 80% power relative to a new lamp.

Irradiation time will need to be increased to achieve same levels of UVc sterilisation.

A record of UVc usage is recorded by the Nextion TFT system so that accumulated hours can be determined and the point from which an increase in UVC duration or lamp replacement may be required.

## 8.0 PREVENTATIVE MAINTENANCE

Regular maintenance and statutory testing are essential to the proper functioning of this enclosure and we strongly advise entrusting this to trained personnel who are technically competent and equipped with suitable calibrated instruments.

### 8.1 CLEANING AND CLEANLINESS STANDARD

**Daily:**

Using a damp cloth, clean the exterior surfaces of the enclosure, regularly, particularly the front and side surfaces, to remove accumulated dust

**Weekly:**

Thoroughly surface-decontaminate the work surface using ethanol/propan-2-ol such as Micronclean (or other approved disinfectant).

The recommended method of cleaning the acrylic surfaces is by damp wiping with diluted detergent and water.

**IMPORTANT: DO NOT USE SOLVENT-BASED CLEANING SOLUTIONS, AS THIS MAY PROMOTE STRESS CRACKING OF THE ACRYLIC MATERIAL.**

### 8.2 MAIN FILTER REMOVAL AND REPLACEMENT

#### 8.2.1 PREPARATION



Safety Warning!

**ENSURE THAT THE ENCLOSURE IS SWITCHED OFF AND ISOLATED FROM THE MAINS SUPPLY BEFORE OPENING THE ROOF SECTION TO GAIN ACCESS TO THE FAN FILTER MODULES!**

It is recommended that a trained service engineer should carry out the replacement of the main filter(s).

Wear appropriate PPE when handling contaminated filters.



- Place a hazardous waste sack close to the enclosure in preparation.
- Ensure that a HEPA filtered vacuum cleaner is available.
- Unpack new filters *just prior* to installing.
- Remove cabinet fascia panels and safely stow these close to the enclosure

## **8.2.2 REPLACING CONTAMINATED DOWNFLOW FILTERS**

The downflow filters are typically HEPA Filters

1. Raise up the downflow fan filter housing, to gain access to the filters. Raise the filter housing equally so that all the weight from the Fan filter housing isn't resting on one of the filters, potentially damaging it.

**Note: Ensure internal components do not strike roof when raising the downflow fan filter housing.**

2. Now there is access to the HEPA Filters remove the filter that is failing. Be careful not to rip the filter as overtime the seal may have stuck firmly to the metal frame.
3. Place the filter promptly inside a waste sack and seal.
4. Vacuum clean the inside of the filter frame and surrounding area, along with wiping clean the filter frame with a damp lint-free cloth.
5. Remove the new HEPA filter from its packaging and install the new filter in reverse order to removal; make sure it is pushed to the very back of the locating tray,
6. Lower the fan housing atop of the new HEPA filter(s), Lower the Fan Filter housing equally to make sure the filter seals are evenly compressed to the Fan Filter Housing frame and to not damage the filter by resting the Filter housings weight onto one Filter.
7. Replace and secure removed fascia panels.
8. Carry out airflow velocity checks and adjust fan speed as necessary.
9. Recalibrate the Nextion TFT alarm (*Refer to "8.2.2 Resetting Airflow Velocity"*)
10. Next check the integrity of the filters (*Refer to 8.4 Filter Integrity Testing*)

### **8.2.3 REPLACING CONTAMINATED INFLOW FILTERS**

The Inflow filters is typically a single HEPA filter and a spacer frame. An extra HEPA or Carbon filter can be fitted as an option in place of the spacer frame.

1. Having gained access to the roof area, loosen off fixings that secure the Exhaust box to the Downflow Fan Filter housing, so that you can remove the Exhaust box from the unit to gain access to the Exhaust filters.
2. Having removed the exhaust box, remove the Filter spacer frame (typically brushed aluminium) or optional HEPA or Carbon Filter from the exhaust and immediately place the contaminated filter into a waste sack and seal.
3. Remove the space frame (typically painted and houses the inflow anemometer), to gain access to the lower HEPA filter, then remove it and immediately place in to a waste sack and seal it.
4. Vacuum clean the inside of the filter frame and surrounding area-also wipe clean with a damp lint-free cloth. Making sure to wipe down spacer frame and the filter spacer frame also.
5. Remove the new HEPA filter from its packaging and locate it into position making sure it is pushed to the very back of its locating bracket.
6. Now the lower filter is fit, re-fit the spacer frame. Or if second filter is used remove the packaging from the filter and locate the filter into position atop of the spacer ensuring it is pushed to the locating bracket.
7. Remove the seal from the roof, used to seal the roof against the top of the exhaust box and replace with new seal.
8. Then refit the exhaust box and securing it back into position evenly ensuring not to overtighten fixing positions which could cause the filters to seal incorrectly.

**Note: Remember to connect the power and control plugs from the enclosure back to the exhaust box**

9. Refit and secure the fascia panels for the top roof section
10. Carry out airflow velocity checks and adjust fan speed as necessary.
11. Recalibrate the Nextion TFT alarm (*Refer to "8.2.2 Resetting Airflow Velocity"*)
12. Next check the integrity of the filters (*Refer to 8.4 Filter Integrity Testing*)

### **8.3 RESETTING AIRFLOW VELOCITY**

Carry out airflow measurements and adjust fan speed as necessary.

Recalibrate the 'Nextion TFT' airflow alarm. If further assistance is required to re-set the airflow velocity please refer to "4.8 Normal Airflow Calibration Procedure".

### **8.4 FILTER INTEGRITY TESTING**

Please Refer to section "4.2 Filter Integrity Testing" for a guide on how to test the HEPA filters and if the unit has the optional Carbon filters fitted.

## 8.5 GUIDELINES TO SELECTING THE CORRECT FILTER TYPE-CHANGE OF USE

It is important that the type of substance intended for use in this enclosure is identified in order to determine the correct choice of filters. This is particularly important if a change of use is intended. The risk assessment, classification, labelling and subsequent disposal of used filters is the responsibility of the end-user.

If a change of use of the enclosure is intended, then it is important to carry out a suitable risk assessment to identify the predominant vapour and /or particulate that is to be filtered.

**NOTE:**

*The separate label fitted at the front of the fan housing identifies the actual filter type/filter combination fitted by Caron at first installation. It should be referred to in order to identify the correct filter replacement during planned maintenance, subject to any planned new usage and risk assessment.*

## 8.6 TROUBLESHOOTING

The following fault symptoms and remedies are intended as a first level approach only and should be carried out by trained service personnel to isolate and rectify faults at this level.

Escalation and appropriate fault reporting should be made to Caron otherwise.

### 8.6.1 CONTROL SYSTEM FORMAT

The Powder weighing models use the Nextion TFT Controller unit which consists of:

- Control Pcb Bn4001.
- 12vdc Powers Supply
- 24vdc Power Supply
- Panel Mounted Sockets

Symptom	Remedial action
Fans Do Not Start:	<ul style="list-style-type: none"> <li>• Check that electrical supply to the enclosure is available</li> <li>• Check that Fan rocker switch is on and illuminated</li> <li>• Contact Caron otherwise</li> </ul>
Airflow Indication Low: Audible Alarm:	<ul style="list-style-type: none"> <li>• Check that the fan is operational</li> <li>• Check that the bi-folding door is closed securely</li> <li>• Check pre-filter condition-replace in accordance with this manual</li> <li>• Check Main filter for saturation-replace in accordance with this manual</li> <li>• Check and re-adjust fan speed controller after filter change</li> <li>• Check calibration of the Nextion TFT alarm</li> <li>• Check fault status of Nextion alarm</li> </ul>
Airflow Indication Too High:	<ul style="list-style-type: none"> <li>• Fan speed controller requires re-calibration</li> </ul>
Airflow Noise or Fan Vibration Excessive:	<ul style="list-style-type: none"> <li>• Check for foreign objects in intake access apertures-remove</li> <li>• Fan bearing faulty [Contact Caron]</li> </ul>

## 8.7 SPARE PARTS LIST

Part Number	Description
EF0089/01	Downflow Fan (230V)
EF0079/01	Inflow (230V)
EF0094/01	Downflow Fan (115V)
EF0093/01	Inflow Fan (115V)
EC0097/01	PCB Control Board
EC0116/01	TFT Display
EP0060/02	12VDC PSU
EP0060/03	24VDC PSU
EL0164/01	900MM LED Light Strip
EL0003/03	3ft UV Tube



# PRODUCT SPECIFICATIONS LAC2

MODEL	RC180P	RC220Q	RC260R	RC300S
MAIN- FILTER DOWNFLOW	SEE FILTER SELECTION			
MAIN- FILTER EXHAUST	SEE FILTER SELECTION			
AIRFLOW VELOCITIES DOWNFLOW	North America: $>0.25\text{ms}^{-1}$ to $0.4\text{ms}^{-1}$ (Measured 50mm below diffuser face)			
	Europe: $>0.25\text{ms}^{-1}$ to $0.5\text{ms}^{-1}$ (Measured 50mm below diffuser face)			
AIRFLOW VELOCITIES INFLOW	North America: $>0.51\text{ms}^{-1}$ mean inflow through the front open aperture			
	Europe: $>0.40\text{ms}^{-1}$ mean inflow through the front open aperture			
INFLOW FAN TYPE	BC-B250-EC-01 FAN EC MOTOR 115V 50/60HZ Qty: 2			
	EC FAN R3G250-RE07-07 230V 50/60Hz Qty: 2			
DOWNFLOW FAN TYPE	GKHR 280-CIE.065.4EA IE HP 115V 50/60HZ Qty:4			
	FAN GKHM315-CIE.088.4EA, 230V 50HZ Qty: 4			
FAN CONTROL	Automatic, Programmable Nextion TFT Fan & Alarm Control System			
ALARM SYSTEM	Automatic, Programmable Nextion TFT Fan & Alarm Control System			
SOUND LEVEL	< 65dBA at 1 meter			
LIGHTNING	Integrated LED Lighting			
UV (optional)	UVc Germicidal type: Wavelength 253.7 nm			
FINISH EXT	Light Grey, Gloss Finish, Plastic Coating			
COMPLIANCE STANDARDS	BS7989:2001 Specification For Recirculatory Filtration Fume Cupboards			
	AFNOR NFX 15-211 Class 1 For Filter Retention Capacity			
	AFNOR NFX 15-203 For Containment			
	Bs EN 61010:2010 Safety Requirements for Electrical Equipment For Measurement, Control And Laboratory Use			
	BS EN 61326:2013 Electrical Equipment for Measurement, Control And Laboratory Use. EMC Requirements.			
	HEPA Filter: EN1822:2009			
	2015/863/EU Restriction of use of certain Hazardous Substances (RoHS3) Directive			

# PRODUCT SPECIFICATIONS – POWER AND WEIGHT FOR LAC2

MODEL	RC180P	RC220Q	RC260R	RC300S	RC180P	RC220Q	RC260R	RC300S
	-1				-4			
ELECTRICAL	110V – 120V 60 Hz,				230V +10% -6% 50 Hz			
POWER CONSUMPTION <small>WITH ALL OPTIONS ADDED</small>	2186W				2646W			
LOAD AMPS <small>WITH ALL OPTIONS ADDED</small>	22.0A				14.0A			

MODEL	RC180P	RC220Q	RC260R	RC300S
NET WEIGHT				

## FILTER SELECTION

Stock No.	Description	RC180P	RC220Q	RC260R	RC300S
ACF05/01	Acid Filter, size #5, Qty 1	Ⓔ	Ⓔ	Ⓔ	Ⓔ
AMF05/01	Ammonia Filter, size #5, Qty 1	Ⓔ	Ⓔ	Ⓔ	Ⓔ
FHF05/01	Formaldehyde Filter, size #5, Qty 1	Ⓔ	Ⓔ	Ⓔ	Ⓔ
HPF05/01	HEPA Filter, size #5, Qty 1	Ⓔ	Ⓔ	Ⓔ	Ⓔ
HPF06/04	HEPA Filter, size #6, Qty 4	Ⓓ			
HPF06/05	HEPA Filter, size #6, Qty 5		Ⓓ		
HPF06/06	HEPA Filter, size #6, Qty 6			Ⓓ	
HPF06/07	HEPA Filter, size #6, Qty 7				Ⓓ
MPF05/01	Multi-Purpose Filter, size #5, Qty 1	Ⓔ	Ⓔ	Ⓔ	Ⓔ
OSF05/01	Organic Solvent Filter, size #5, Qty 1	Ⓔ	Ⓔ	Ⓔ	Ⓔ
PRF05/01	Prefilter, size #5, Qty 1	Ⓟ	Ⓟ	Ⓟ	Ⓟ
ULF05/01	ULPA Filter, size #5, Qty 1	Ⓔ	Ⓔ	Ⓔ	Ⓔ
ULF06/04	ULPA Filter, size #6, Qty 4	Ⓓ			
ULF06/05	ULPA Filter, size #6, Qty 5		Ⓓ		
ULF06/06	ULPA Filter, size #6, Qty 6			Ⓓ	
ULF06/07	ULPA Filter, size #6, Qty 7				Ⓓ

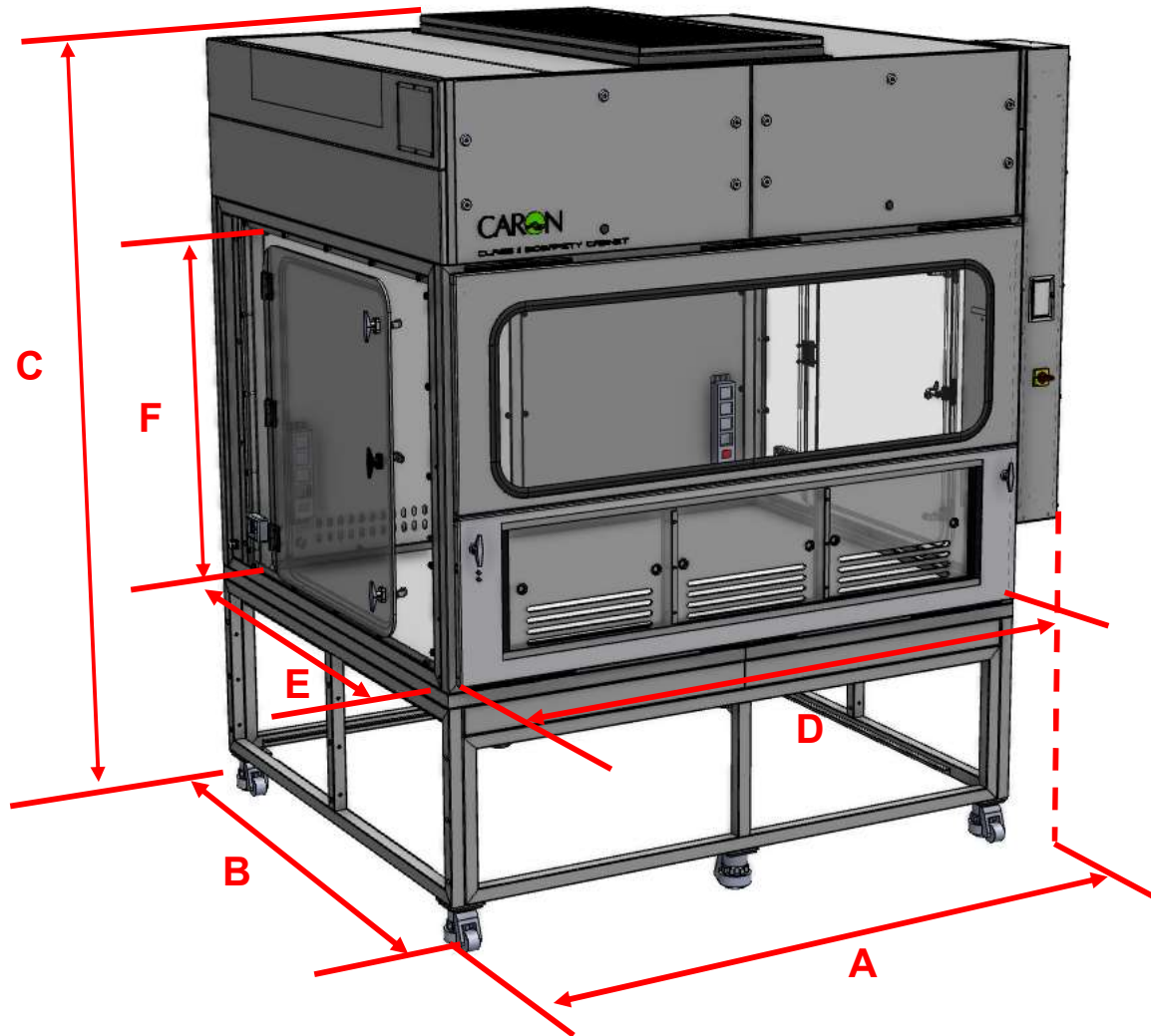
KEY:

Ⓔ – Exhaust Filters

Ⓓ - Downflow Filters

Ⓟ - Prefilter

## DIMENSIONAL REFERENCES FOR LAC2



<b>MODEL</b>	<b>'A'</b> EXTERNAL WIDTH	<b>'B'</b> EXTERNAL DEPTH	<b>'C'</b> EXTERNAL HEIGHT	<b>'D'</b> INTERNAL WIDTH	<b>'E'</b> INTERNAL DEPTH	<b>'F'</b> INTERNAL HEIGHT
<b>RC180P</b>	1948mm	1550mm	2344mm	1716mm	1196mm	1063mm
<b>RC220Q</b>	2330mm	1550mm	2344mm	2115mm	1196mm	1063mm
<b>RC260R</b>	2743mm	1550mm	2344mm	2516mm	1196mm	1063mm
<b>RC300S</b>	3147mm	1550mm	2344mm	2916mm	1196mm	1063mm

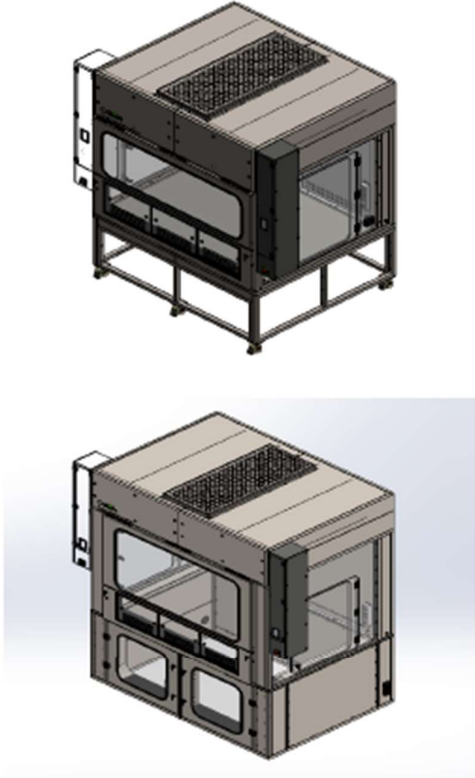
# EU DECLARATION OF CONFORMITY

QA Doc 92-0013 Rev 1



## EU Declaration of Conformity

1. Product Model / Type:

Product Name:	OPERATOR & PRODUCT PROTECTION ROBOTIC ENCLOSURES
Model:	RC180P, RC220Q, RC260R, QC220Q, QC260R, QC300S
Serial No.:	N/A
Operating Voltage and Frequency:	230V + 10% -6%, 50Hz, Single Phase 115V + 10% -6%, 60Hz, Single Phase (Harmonised Voltage)
Description/ Specifications:	<p>Photo</p> 

QA Doc 92-0013 Rev 1

2. Manufacturer:

Bigneat Ltd t/a Caron Products, 4&5 Piper's Wood Industrial Park, Waterberry Drive, Waterlooville, Hampshire PO7 7XU, United Kingdom.

Tel +44-2392-266400.

[Info@bigneat.com](mailto:Info@bigneat.com)

[www.bigneat.com](http://www.bigneat.com)

3. This declaration is issued under the sole responsibility of the product manufacturer.

4. The object of the declaration described above is in conformity with the relevant Union harmonisation legislation and their amendments:

2006/42/EC	Machinery Directive
2014/30/EU	Electromagnetic Compatibility Directive
2011/65/EU	Restriction of Hazardous Substances in Electrical and Electronic Directive

5. We hereby declare that following harmonised standards have been applied to the product described above, to which this declaration of conformity refers to.

2006/42/EC:

EN ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN ISO 13849-1:2015	Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design
EN 60204-1:2018	Safety of machinery - Electrical equipment of machines - Part 1: General requirements

2014/30/EU:

EN 61326-1:2013	Electrical Equipment for measurement, control, and laboratory use – EMC requirements
EN 63000-3-2:2018	Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

2011/65/EU

EN 63000:2018	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
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QA Doc 92-0013 Rev 1


Other Applicable Standards:

a) BS EN 12469:2000, b) BS EN 14644-1:2015 (ISO Class 5)	Specification for microbiological safety cabinets
EN 61010-1:2010+A1:2019	Safety requirements for electrical equipment for measurement control, and laboratory use
EN 62311:2020	EMF Standard
a) BS7989:2001 elements b) AFNOR NFX 15-211 Class 1 For Filter Retention Capacity	Specification For Recirculatory Filtration Fume Cupboards (when carbon filtration installed)
ASHRAE 110-199 12-203 Containment NSF/ANSI 49 – 2022	American Standard

The following authorised representative is authorised by the manufacture to compile the technical file:

Name:	Casus Europe B.V.
Address (Authorised Representative):	Lange Viestraat 2b 3511 BK Utrecht The Netherlands.

Signed for & behalf of Bigneat Ltd t/a Caron:

Place of issue:	UK
Date of Issue:	14 November 2023
Name:	Iain Howes
Function:	Quality Manager
Signature:	



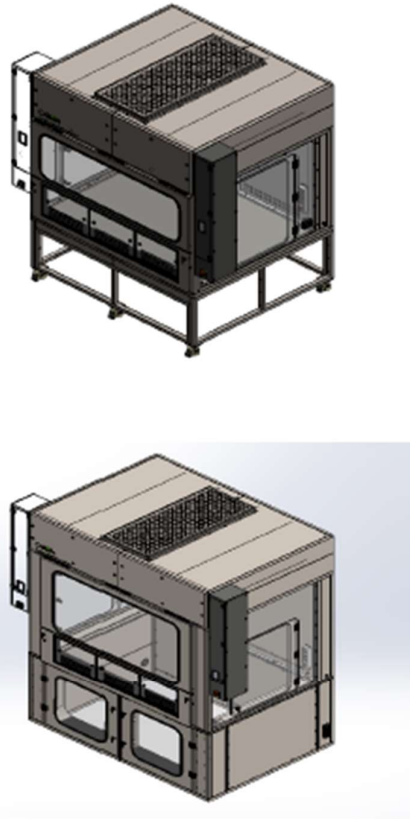
# UKCA DECLARATION OF CONFORMITY

QA Doc 93-0013 Rev 1



## Declaration of Conformity

1. Product Model / Type:

Product Name:	OPERATOR & PRODUCT PROTECTION ROBOTIC ENCLOSURES
Model:	RC180P, RC220Q, RC260R, QC220Q, QC260R, QC300S
Serial No:	N/A
Operating Voltage and Frequency:	230V + 10% -6%, 50Hz, Single Phase 115V + 10% -6%, 60Hz, Single Phase (Harmonised Voltage)
Description/ Specifications:	<p>Photo</p> 



QA Doc 93-0013 Rev 1

**2. Manufacturer (and Technical Documentation source):**

Bigneat Ltd t/a Caron Products, 4&5 Piper's Wood Industrial Park, Waterberry Drive, Waterlooville, Hampshire PO7 7XU, UK.

Tel 02392-266400.

[Info@bigneat.com](mailto:Info@bigneat.com)

[www.bigneat.com](http://www.bigneat.com)

3. This declaration is issued under the sole responsibility of the product manufacturer.
4. The object of the declaration described above is in conformity with the relevant UK Statutory Instruments and their amendments:

SI 2008 No. 1597	The Supply of Machinery (Safety) Regulations 2008
SI 2016 No. 1091	Electromagnetic Compatibility Regulations 2016
SI 2012 No. 3032	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

5. We hereby declare that the product described above, to which this declaration of conformity refers to, is in conformity with the essential requirements of the following designated standards:

SI 2008 No. 1597:

EN ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN ISO 13849-1:2015	Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design
EN 60204-1:2018	Safety of machinery - Electrical equipment of machines - Part 1: General requirements

SI 2016 No. 1091

EN 61326-1:2013	Electrical Equipment for measurement, control and laboratory use – EMC requirements
EN 63000-3-2:2018	Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic

QA Doc 93-0013 Rev 1

	current emissions (equipment input current $\leq 16$ A per phase)
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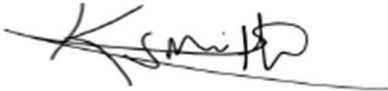
SI 2012 No. 3032

EN 63000:2018	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
---------------	--

Other Applicable Standards:

a) BS EN 12469:2000, b) BS EN 14644-1:2015 (ISO Class 5)	Specification for microbiological safety cabinets
EN 61010-1:2010+A1:2019	Safety requirements for electrical equipment for measurement control, and laboratory use
EN 62311:2020	EMF Standard
a) BS7989:2001 elements b) AFNOR NFX 15-211 Class 1 For Filter Retention Capacity	Specification For Recirculatory Filtration Fume Cupboards (when carbon filtration installed)
ASHRAE 110-199 12-203 Containment NSF/ANSI 49 – 2022	American Standard

Signed for & behalf of Bigneat Ltd t/a Caron:

Place of issue:	4-5 pipers wood industrial park, Waterlooville, Hampshire, PO7 7XU
Date of Issue:	25/09/2023
Name:	Kelvin Robins-Smith
Function:	Engineering Manager (UK)
Signature:	

## APPENDIX 1 –RC SCHEMATIC

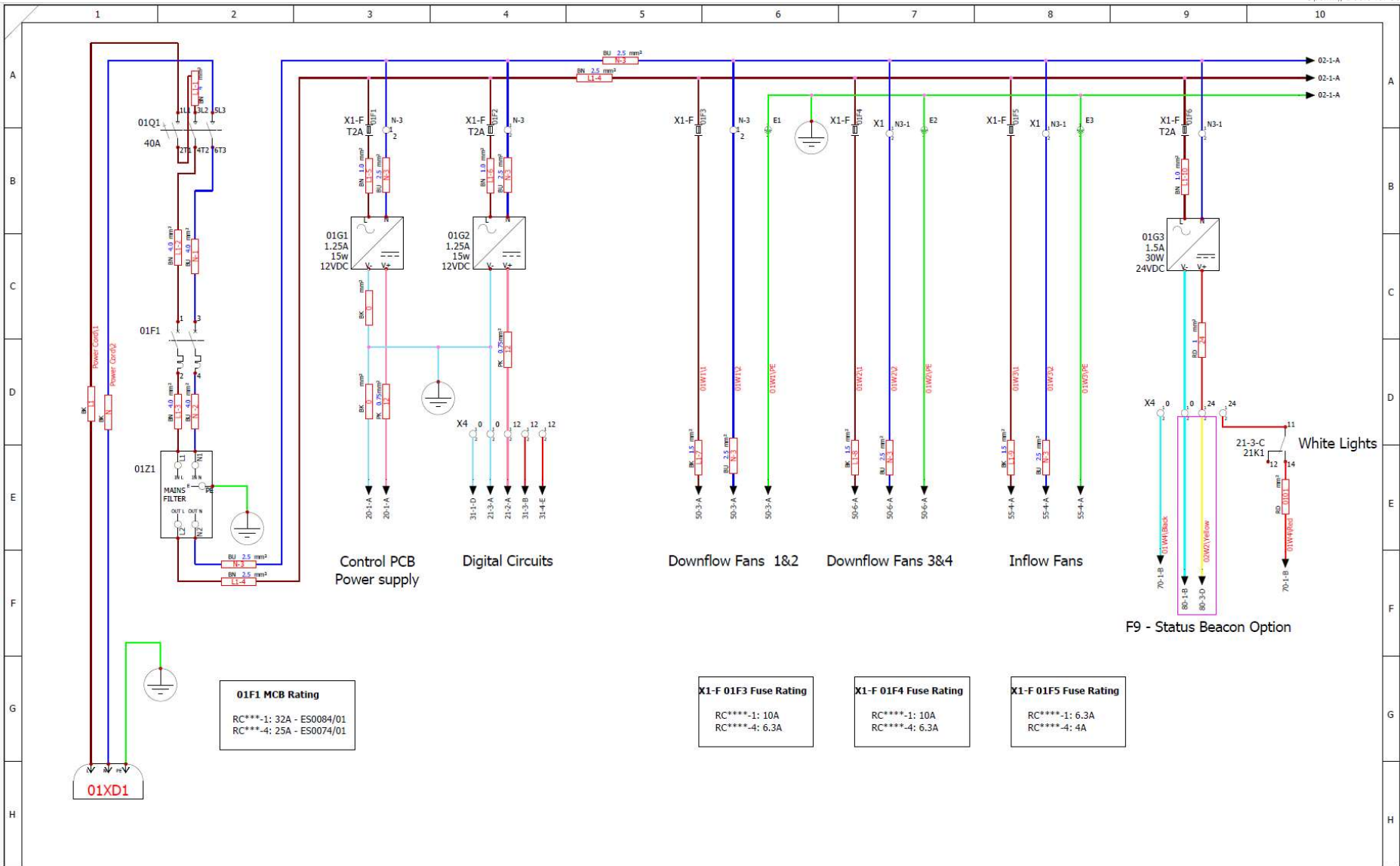
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**RC Product range**

RC\*\*\*\*-1: 115V, 1Φ, 60Hz, FLC 21A

RC\*\*\*\*-4: 230V, 1Φ, 50/60Hz, FLC 14A

	1	2	3	4	5	6	7	8	9	10											
A	<div style="border: 1px solid black; padding: 20px; margin: 0 auto; width: 80%;"> <p><b>RC Product range</b></p> <p>RC****-1: 115V, 1Φ, 60Hz, FLC 21A</p> <p>RC****-4: 230V, 1Φ, 50/60Hz, FLC 14A</p> </div>										A										
B											B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g	<small>PROPRIETARY AND CONFIDENTIAL. THE INFORMATION CONTAIN IN THIS DRAWING IS THE SOLE PROPERTY OF BIGEAT LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIGEAT LTD IS PROHIBITED.</small>				B
C											A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g					SHEET TITLE: <b>Cover page</b>
D											0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g	DRAWING NO: <b>RC Schematics</b>				D
E											REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:	<small>PCB PROGRAMME: Class2_260822_Rev1.X_production.hex TFT PROGRAMME: CN_CLASS2_PORT_R01.tft</small>				E
F																	<small>DRAWN BY: richmond.t    CHECKED BY:    SHEET: 00    NEXT: 0,1 of 309 DATE DRAWN: 23/01/2023    APPROVED BY:</small>				F
G																					G
H																					H
I	B					<b>PRODUCT: RC Schematics Complete</b> Supply Voltage: FLC: Plug Type:				<small>PROPRIETARY AND CONFIDENTIAL. THE INFORMATION CONTAIN IN THIS DRAWING IS THE SOLE PROPERTY OF BIGEAT LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIGEAT LTD IS PROHIBITED.</small>		I									
	1	2	3	4	5	6	7	8	9	10											



**01F1 MCB Rating**  
RC\*\*\*-1: 32A - ES0084/01  
RC\*\*\*-4: 25A - ES0074/01

**X1-F 01F3 Fuse Rating**  
RC\*\*\*-1: 10A  
RC\*\*\*-4: 6.3A

**X1-F 01F4 Fuse Rating**  
RC\*\*\*-1: 10A  
RC\*\*\*-4: 6.3A

**X1-F 01F5 Fuse Rating**  
RC\*\*\*-1: 6.3A  
RC\*\*\*-4: 4A

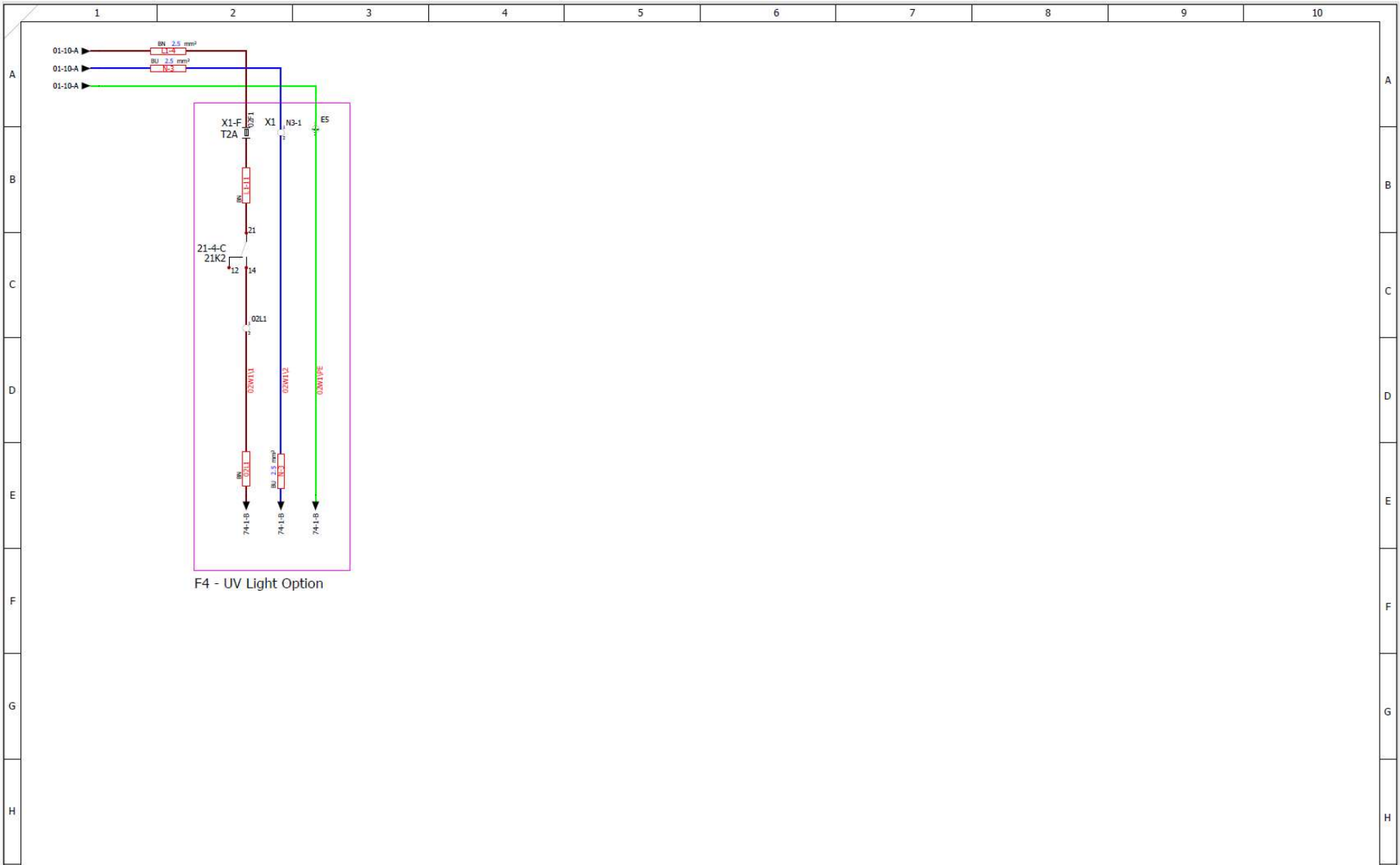
F9 - Status Beacon Option

White Lights

B	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g
	REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:

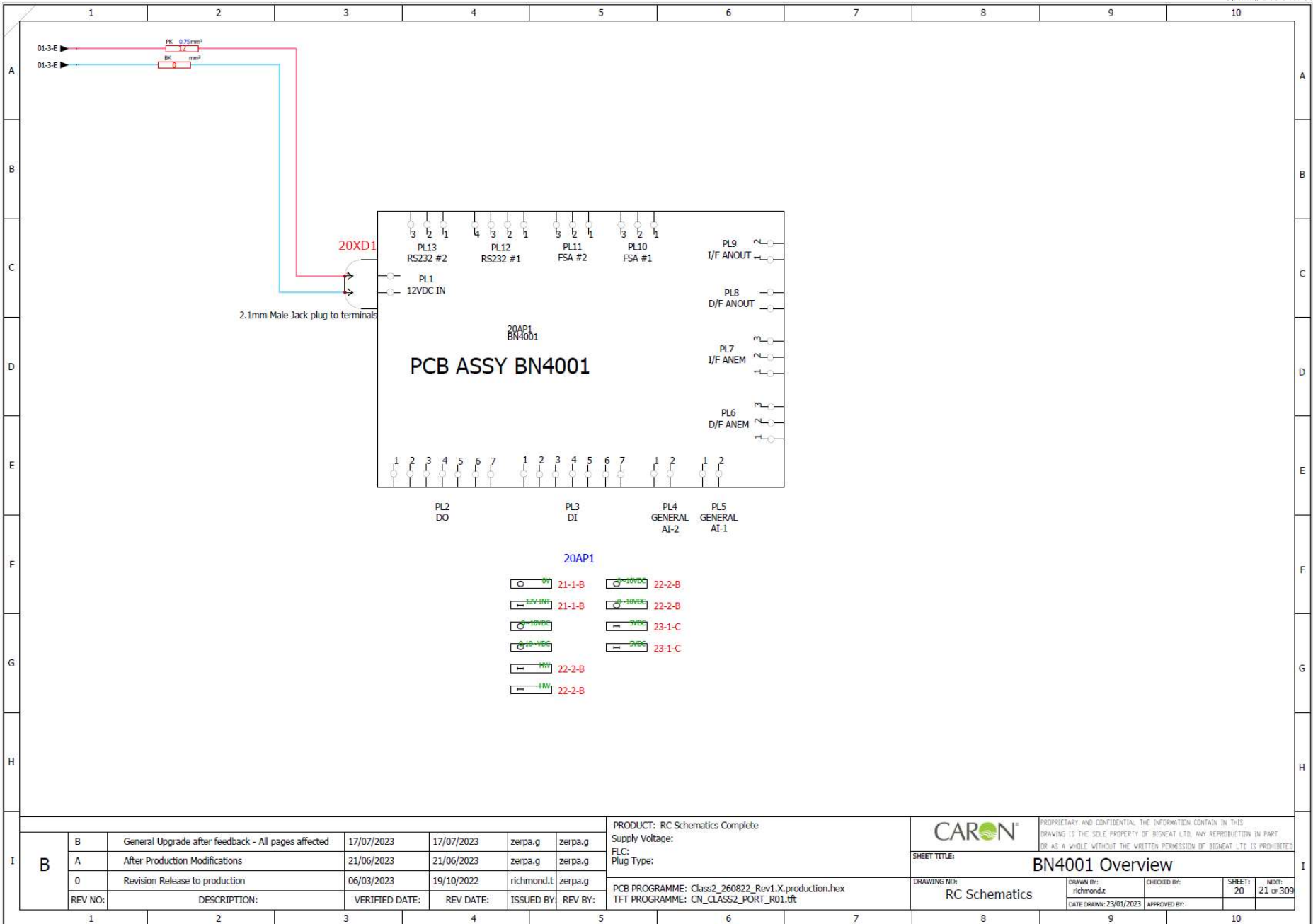
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Supply Voltage:  
FLC:  
Plug Type:  
PCB PROGRAMME: Cclass2\_260822\_Rev1.X\_production.hex  
TFT PROGRAMME: CN\_CLASS2\_PORT\_R01.tft

		<small>PROPRIETARY AND CONFIDENTIAL. THE INFORMATION CONTAIN IN THIS DRAWING IS THE SOLE PROPERTY OF BIONEAT LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIONEAT LTD IS PROHIBITED</small>	
SHEET TITLE:		Power Distribution	
DRAWING NO:	RC Schematics	DRAWN BY:	richmond.t
		CHECKED BY:	
		DATE DRAWN: 23/01/2023	APPROVED BY:
		SHEET: 01	NEXT: 02 of 309



F4 - UV Light Option

I	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g	PRODUCT: RC Schematics Complete Supply Voltage: FLC: Plug Type:	PROPRIETARY AND CONFIDENTIAL. THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BIODAC LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIODAC LTD IS PROHIBITED.				
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g			SHEET TITLE: <b>Power Distribution 2</b>			
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g	PCB PROGRAMME: Class2_260822_Rev1.X.production.hex TFT PROGRAMME: CN_CLASS2_PORT_R01.ft	DRAWING NO: RC Schematics	DRAWN BY: richmond.t	CHECKED BY:	SHEETS: 02	NEXT: 20 of 309
	REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:		DATE DRAWN: 23/01/2023	APPROVED BY:			



I	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g
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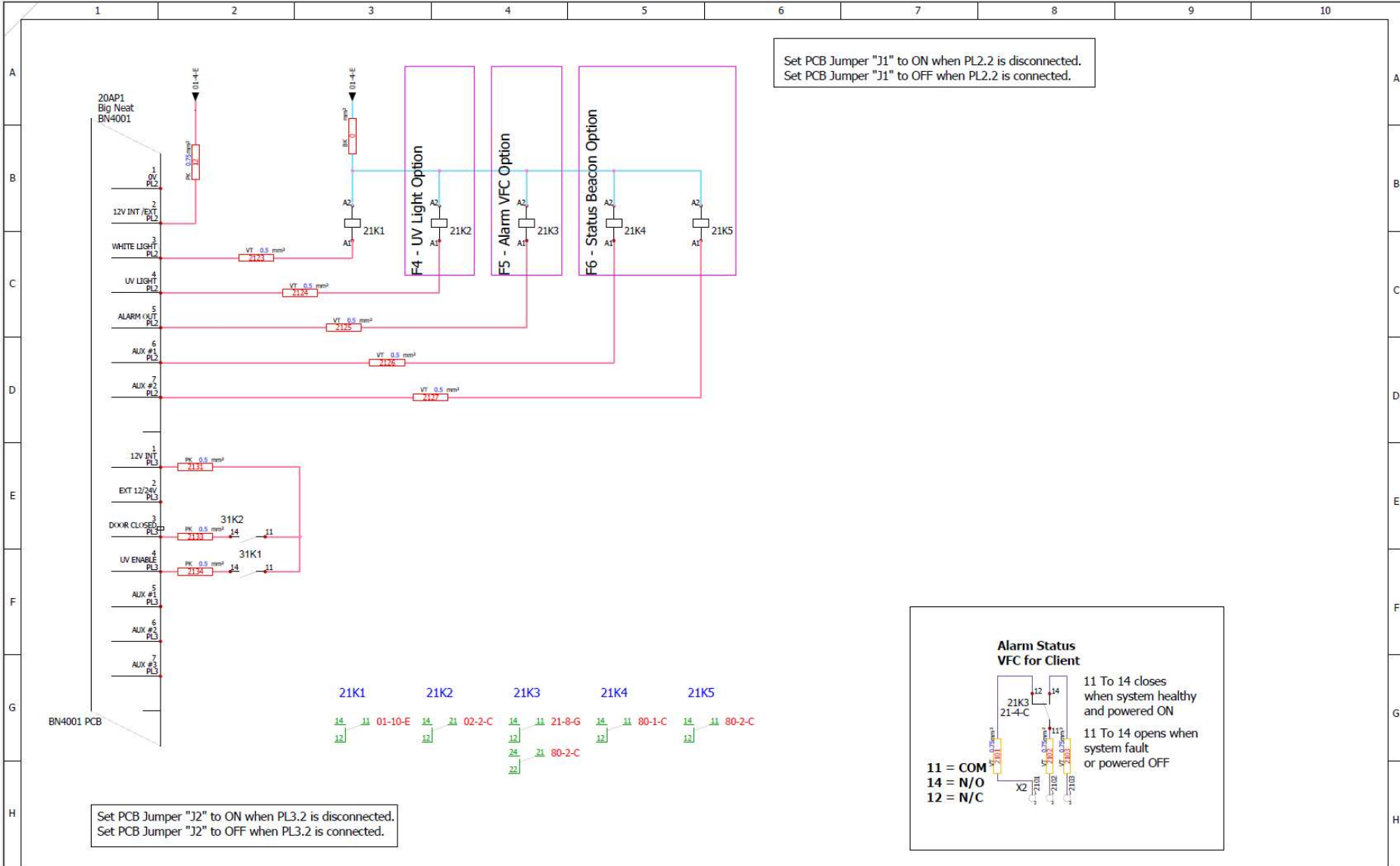
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 Supply Voltage:  
 FLC:  
 Plug Type:

PCB PROGRAMME: Class2\_260822\_Rev1.X.production.hex  
 TFT PROGRAMME: CN\_CLASS2\_PORT\_R01.ft

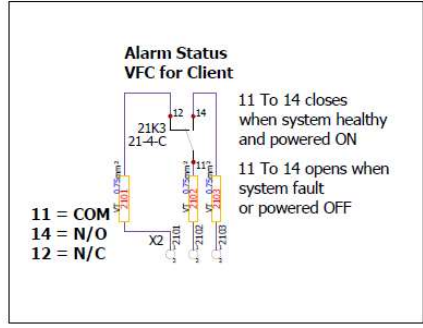
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SHEET TITLE:		BN4001 Overview	
DRAWING NO:	RC Schematics	DRAWN BY:	richmond.t
CHECKED BY:		DATE DRAWN:	23/01/2023
SHEET:	20	APPROVED BY:	
NEXT:	21 of 309		



Set PCB Jumper "J1" to ON when PL2.2 is disconnected.  
Set PCB Jumper "J1" to OFF when PL2.2 is connected.

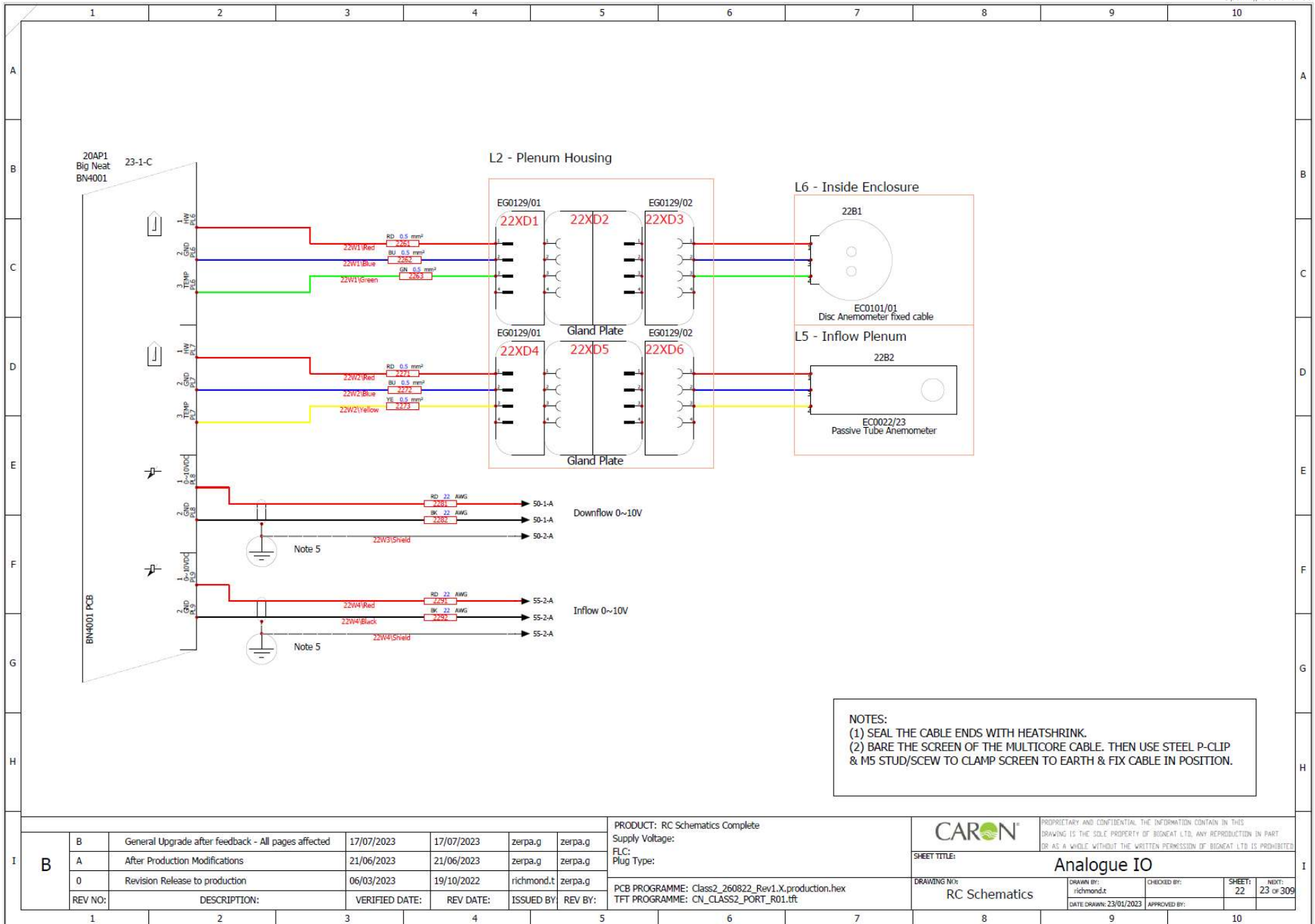


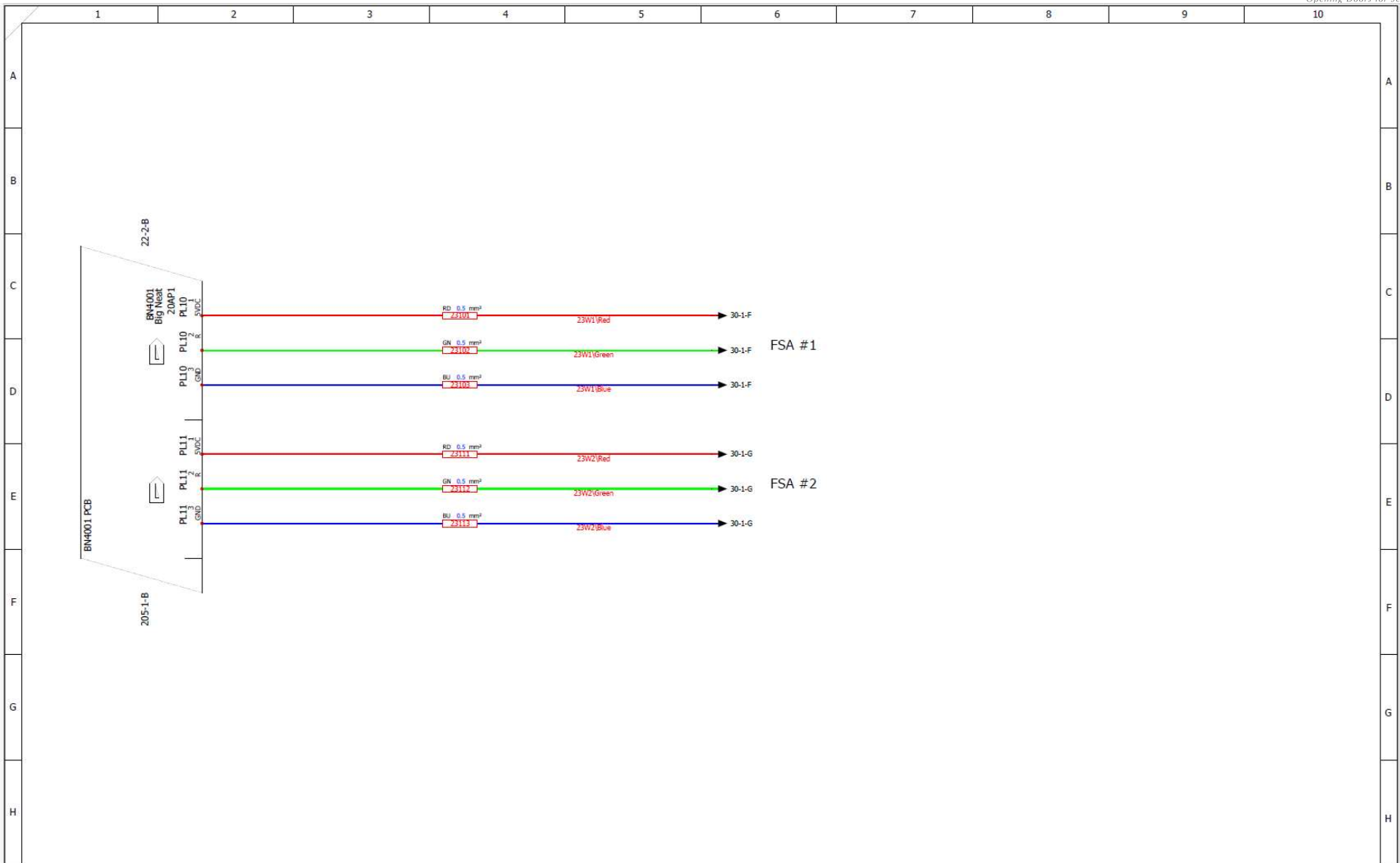
Set PCB Jumper "J2" to ON when PL3.2 is disconnected.  
Set PCB Jumper "J2" to OFF when PL3.2 is connected.



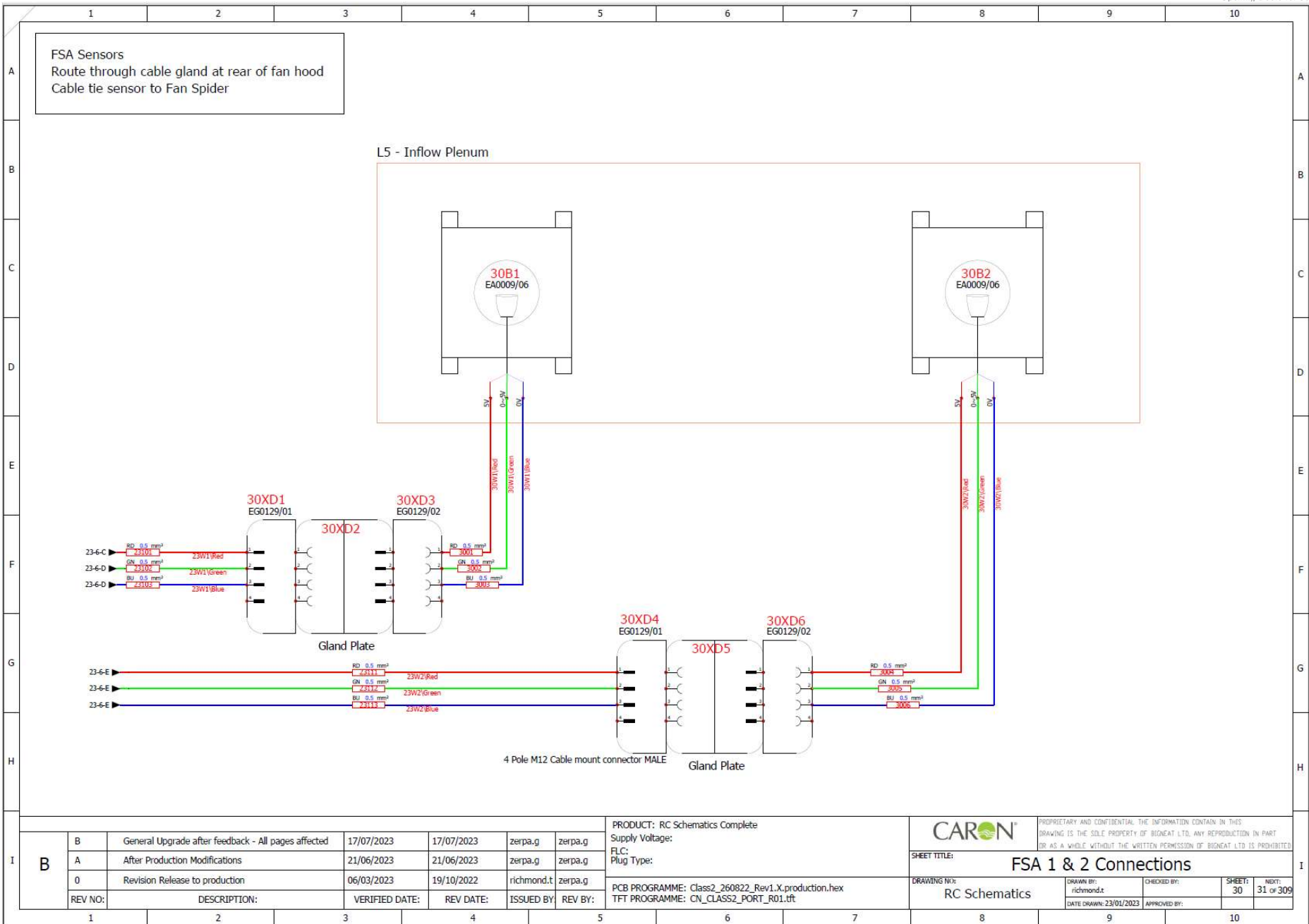
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	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g			DRAWING NO: RC Schematics	DRAWN BY: richmond.t	CHECKED BY:	SHEET: 21	NEXT: 22 of 309
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g			DATE DRAWN: 23/01/2023	APPROVED BY:			
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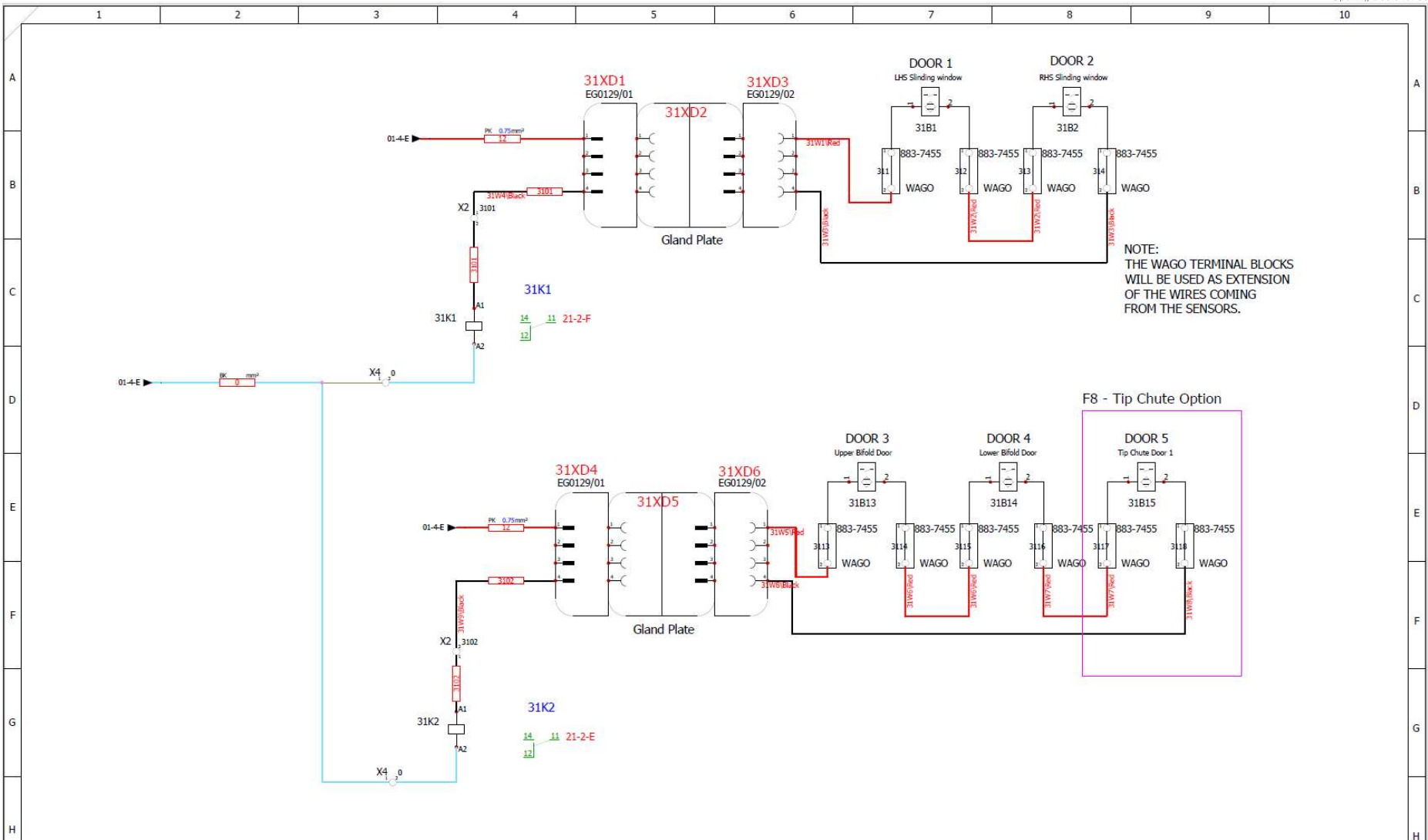






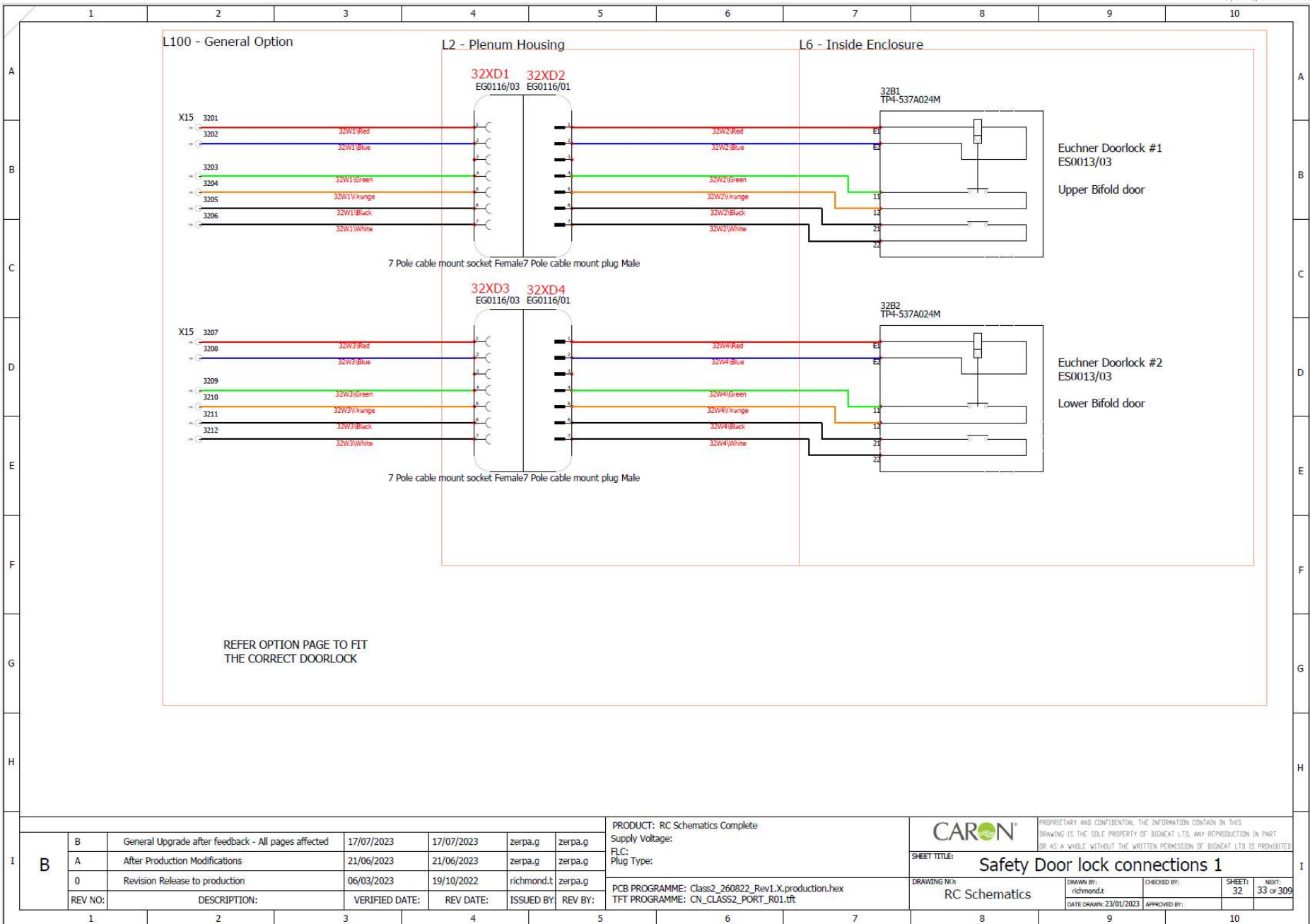
I	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g	PRODUCT: RC Schematics Complete Supply Voltage: FLC: Plug Type:	CARON PROPRIETARY AND CONFIDENTIAL. THE INFORMATION CONTAIN IN THIS DRAWING IS THE SOLE PROPERTY OF BISACAT LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BISACAT LTD IS PROHIBITED.	
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g			SHEET TITLE: <b>BN4001 FSA Input</b>
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g	PCB PROGRAMME: Class2_260822_Rev1.X_production.hex TFT PROGRAMME: CN_CLASS2_PORT_R01.ft	DRAWING NO: RC Schematics DRAWN BY: richmond.t CHECKED BY: DATE DRAWN: 23/01/2023 APPROVED BY:	SHEET: 23 NEXT: 30 of 309
	REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:			





Omit sheet if Safety Lock option installed.

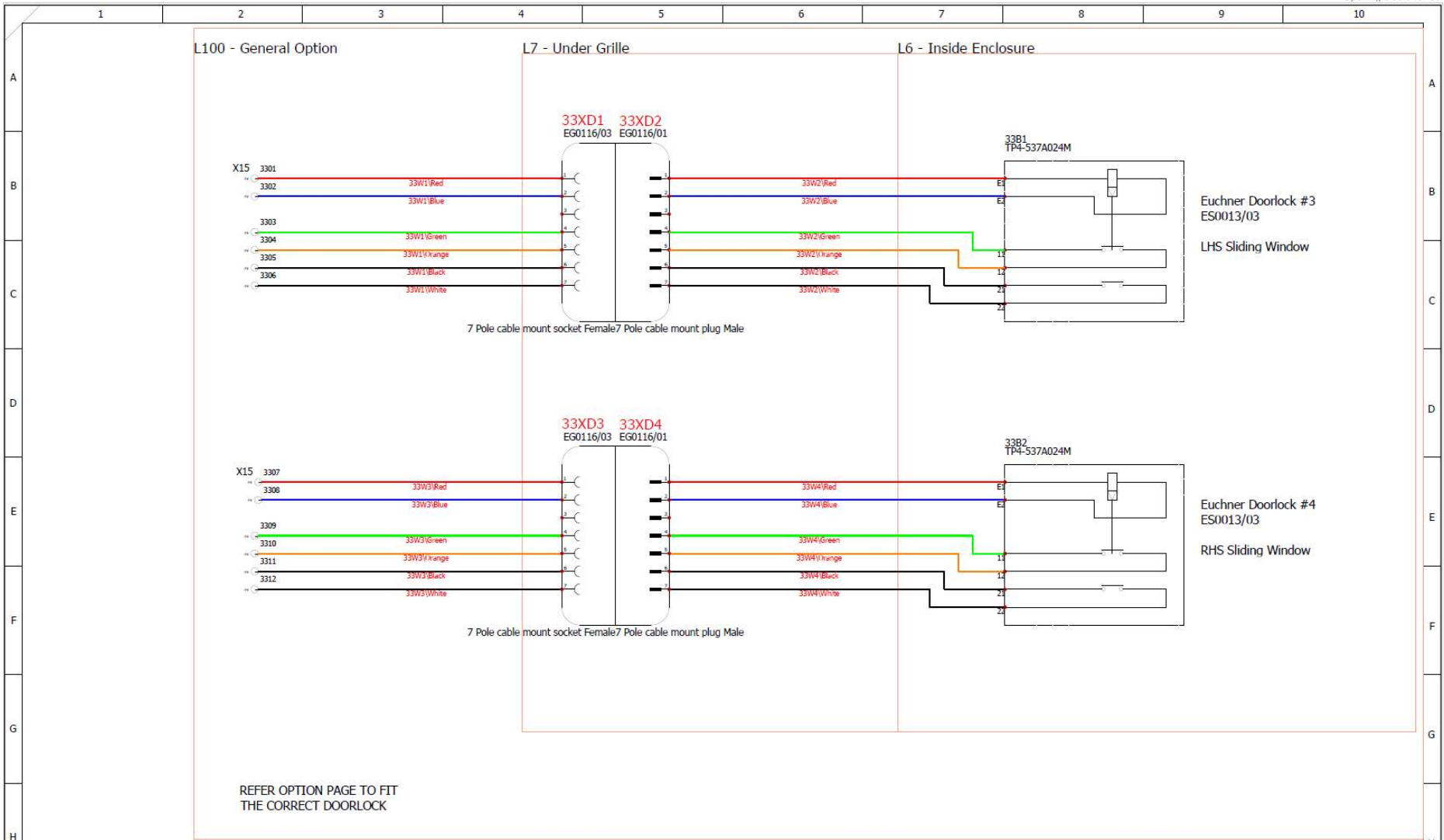
I	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g	PRODUCT: RC Schematics Complete Supply Voltage: FLC: Plug Type:  PCB PROGRAMME: Class2_260822_Rev1.X.production.hex TFT PROGRAMME: CN_CLASS2_PORT_R01.tft	PROPRIETARY AND CONFIDENTIAL. THE INFORMATION CONTAIN IN THIS DRAWING IS THE SOLE PROPERTY OF BIGEAT LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIGEAT LTD IS PROHIBITED.	
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g			SHEET TITLE: <b>Reed Switch</b>
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g			DRAWING NO: RC Schematics
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I	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g
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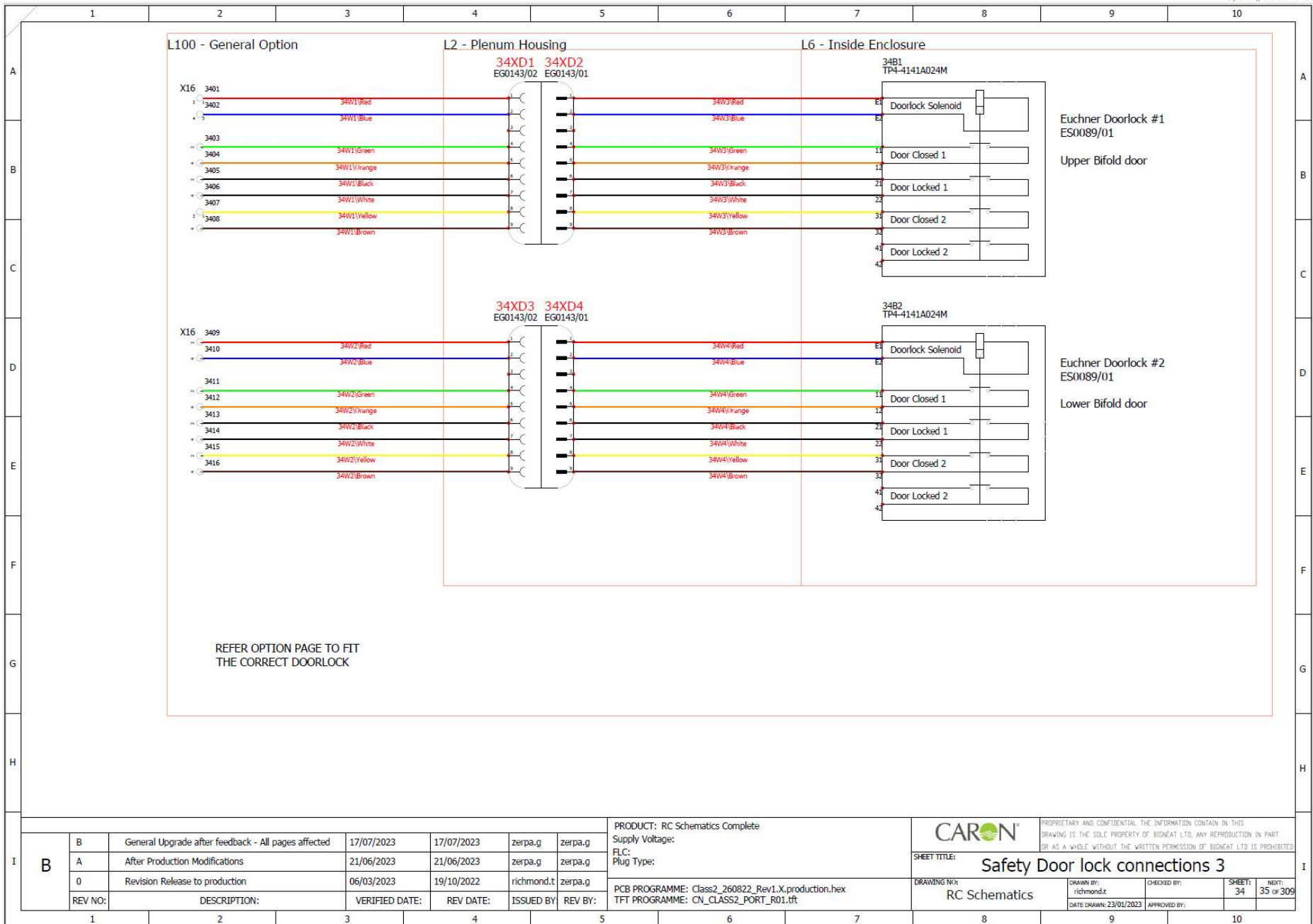
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SHEET TITLE: <b>Safety Door lock connections 1</b>					
DRAWING NO:	RC Schematics	DRAWN BY:	richmond.t	CHECKED BY:	
		DATE DRAWN:	23/01/2023	APPROVED BY:	
		SHEET:	32	NEXT:	33 of 309



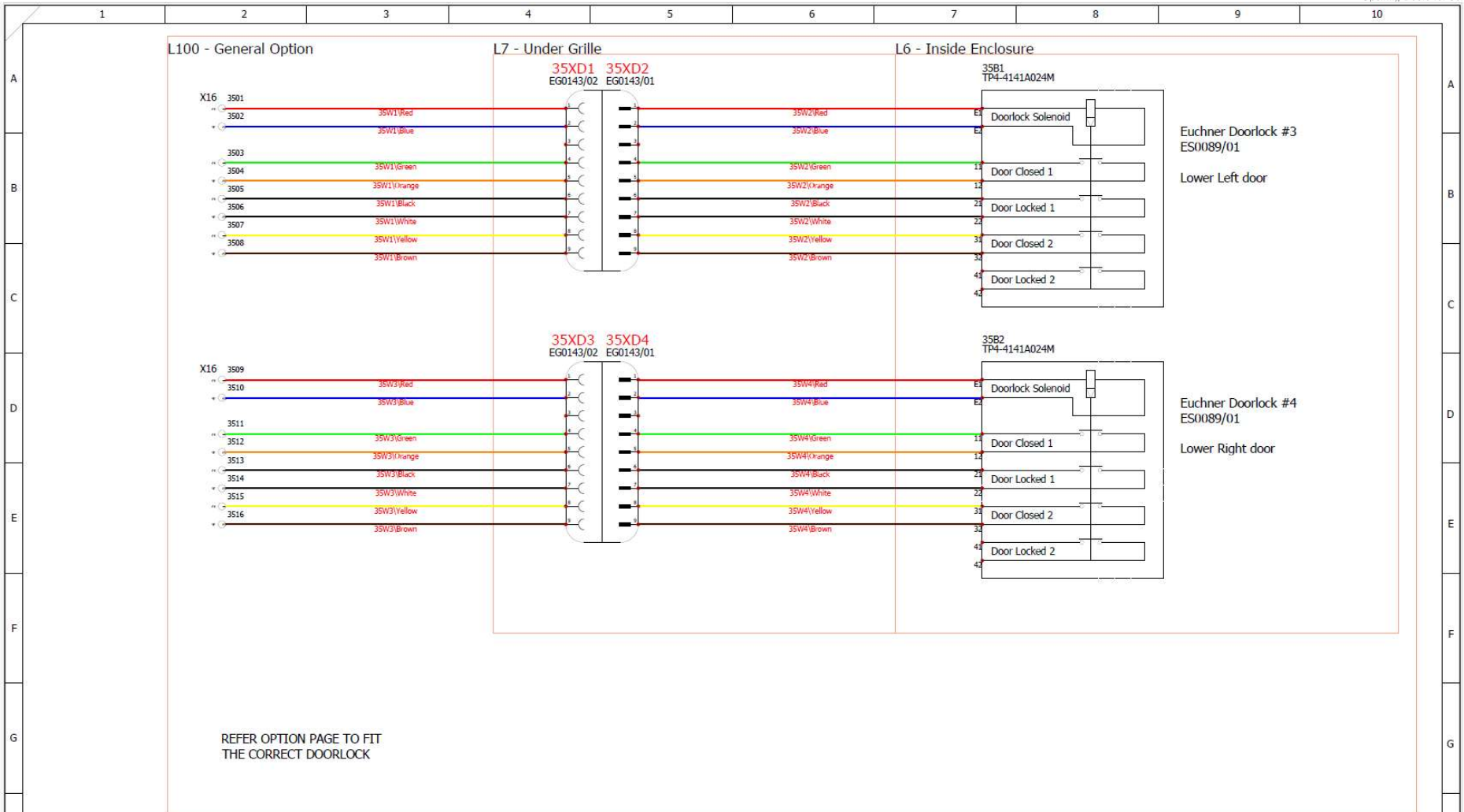
REFER OPTION PAGE TO FIT THE CORRECT DOORLOCK

I	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g	PRODUCT: RC Schematics Complete Supply Voltage: FLC: Plug Type:	CARON PROPRIETARY AND CONFIDENTIAL. THE INFORMATION CONTAIN IN THIS DRAWING IS THE SOLE PROPERTY OF BIONEAT LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIONEAT LTD IS PROHIBITED.	SHEET TITLE: Safety Door lock connections 2		
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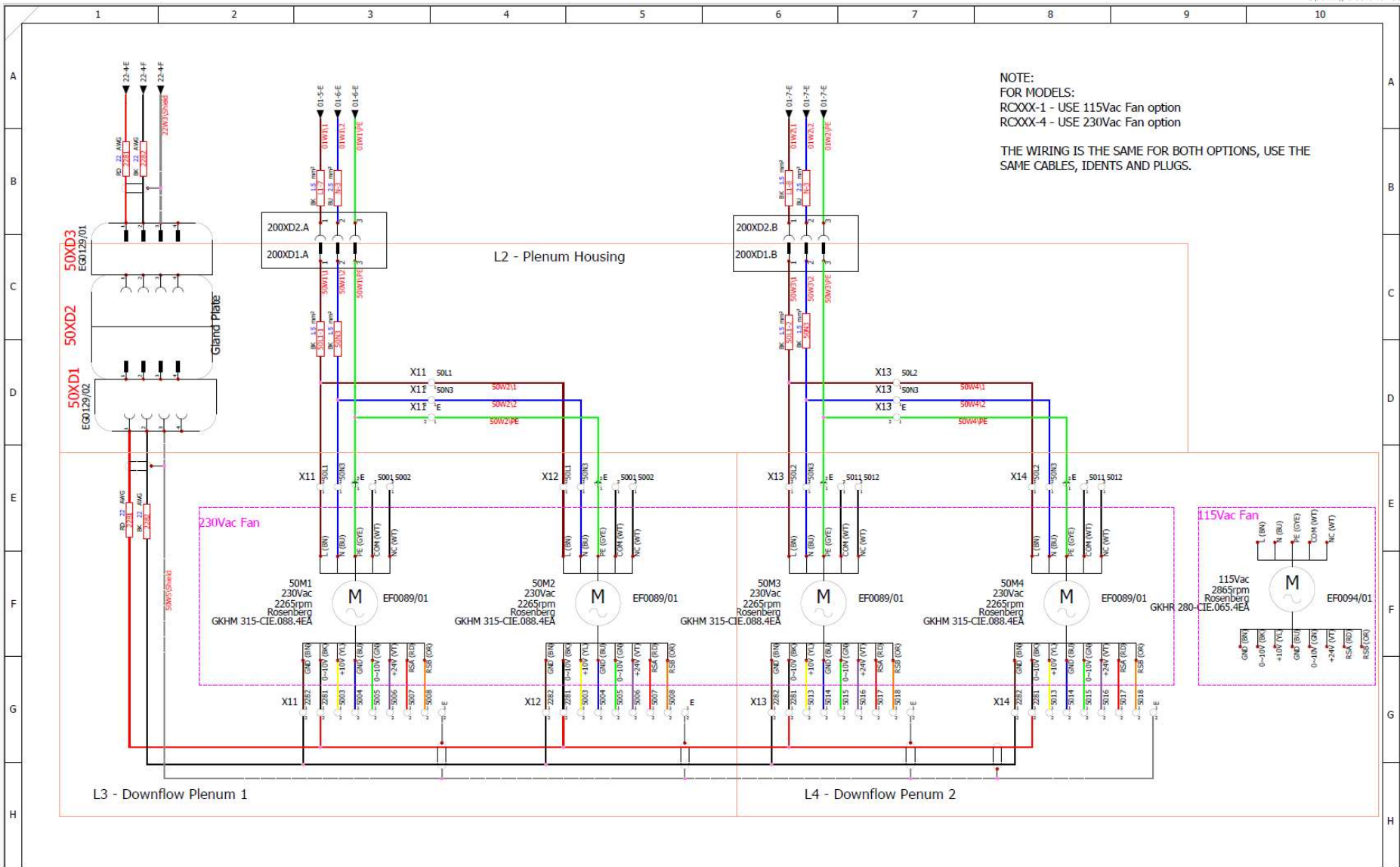


I	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g	PRODUCT: RC Schematics Complete Supply Voltage: FLC: Plug Type:  PCB PROGRAMME: Class2_260822_Rev1_X.production.hex TFT PROGRAMME: CN_CLASS2_PORT_R01.tft	PROPRIETARY AND CONFIDENTIAL. THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BIODCAT LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIODCAT LTD IS PROHIBITED.	SHEET TITLE: Safety Door lock connections 3				
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g			DRAWING NO: RC Schematics	DRAWN BY: richmond.t	CHECKED BY:	SHEETS: 34	NEXT: 35 of 309
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g			DATE DRAWN: 23/01/2023	APPROVED BY:			
	REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:							



I	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g	<b>PRODUCT:</b> RC Schematics Complete <b>Supply Voltage:</b> <b>FLC:</b> <b>Plug Type:</b>		<small>PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAIN IN THIS DRAWING IS THE SOLE PROPERTY OF BIONEAT LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIONEAT LTD IS PROHIBITED</small>			
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g						
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g						
	REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:						
							<b>PCB PROGRAMME:</b> Class2_260822_Rev1.X.production.hex <b>TFT PROGRAMME:</b> CN_CLASS2_PORT_R01.tft	<b>SHEET TITLE:</b> Safety Door lock connections 4	<b>DRAWING NO:</b> RC Schematics	<b>DRAWN BY:</b> richmond.t <small>DATE DRAWN: 23/01/2023</small>	<b>CHECKED BY:</b> <small>APPROVED BY:</small>	<b>SHEET:</b> 35 <b>NEXT:</b> 50 of 309





NOTE:  
FOR MODELS:  
RCXXX-1 - USE 115Vac Fan option  
RCXXX-4 - USE 230Vac Fan option

THE WIRING IS THE SAME FOR BOTH OPTIONS, USE THE SAME CABLES, IDENTs AND PLUGS.

B	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g
	REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:

PRODUCT: RC Schematics Complete  
Supply Voltage:  
FLC:  
Plug Type:

PCB PROGRAMME: Class2\_260822\_Rev1.X\_production.hex  
TFT PROGRAMME: CN\_CLASS2\_PORT\_R01.tft

**CARON**

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SHEET TITLE: **Downflow Fan connections**

DRAWING NO: RC Schematics

DRAWN BY: richmond.t

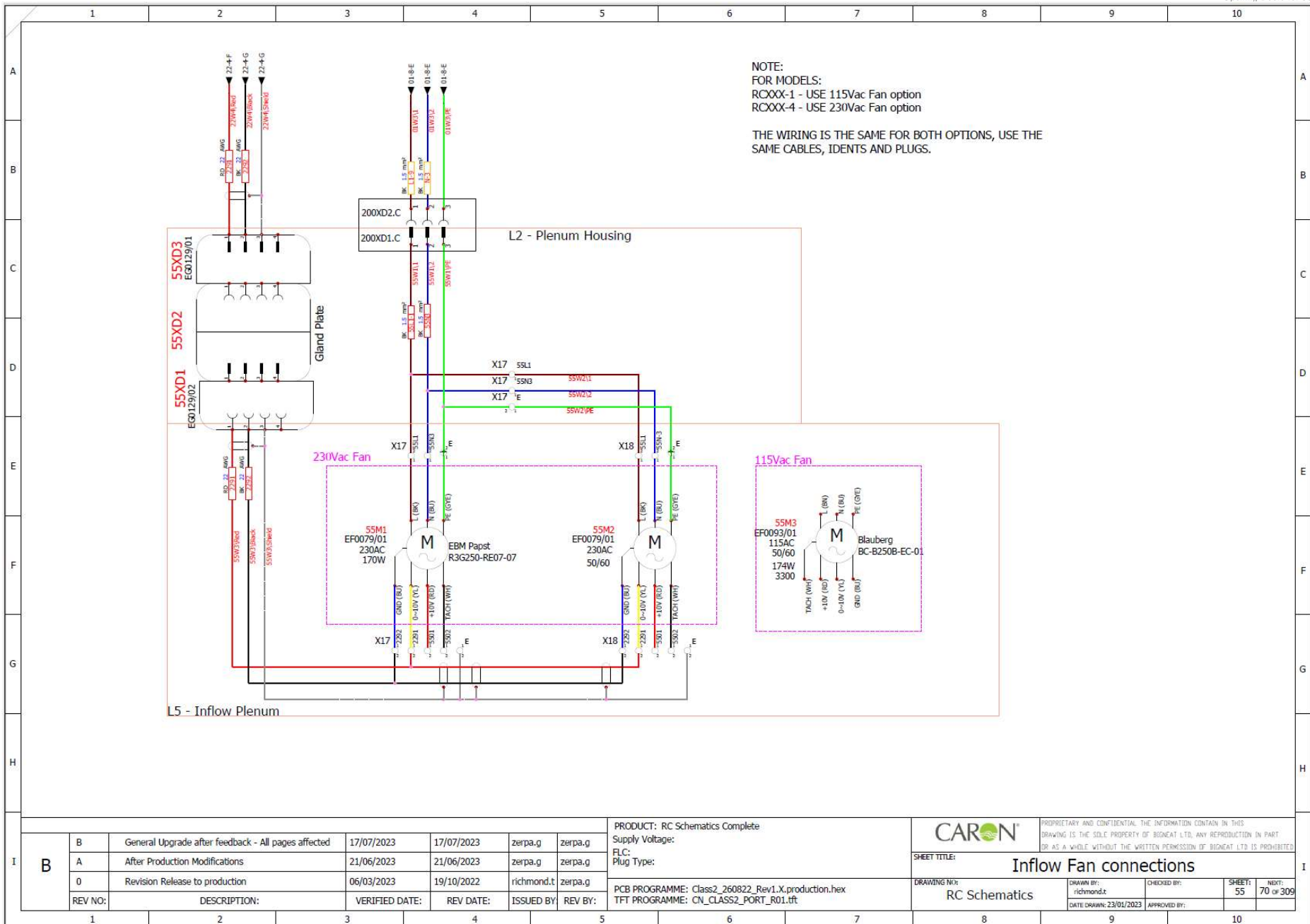
CHECKED BY:

DATE DRAWN: 23/01/2023

APPROVED BY:

SHEET: 50

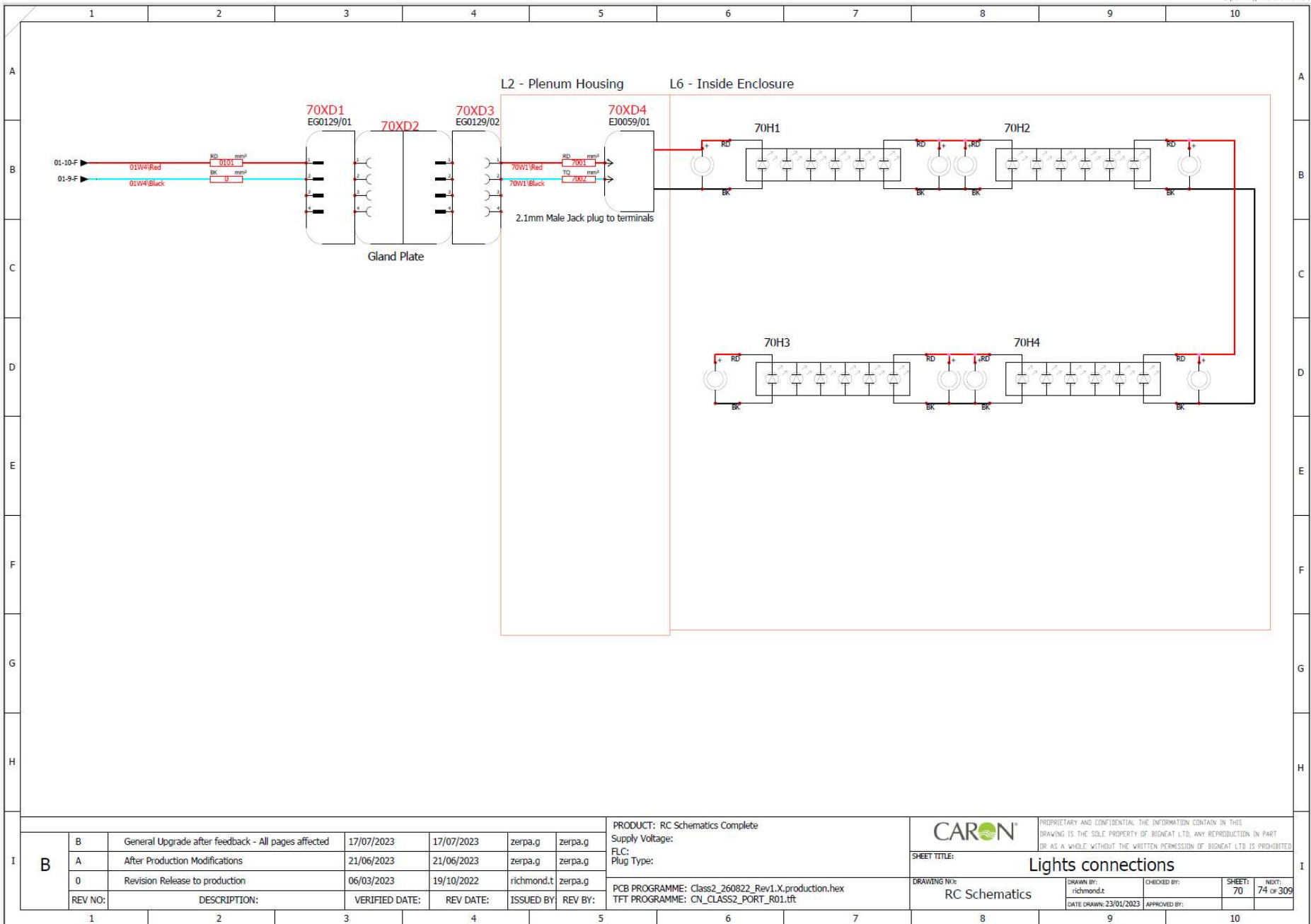
NEXT: 55 of 309



I	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g
	REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:

PRODUCT: RC Schematics Complete  
 Supply Voltage:  
 FLC:  
 Plug Type:  
 PCB PROGRAMME: Class2\_260822\_Rev1.X\_production.hex  
 TFT PROGRAMME: CN\_CLASS2\_PORT\_R01.tft

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SHEET TITLE:		Inflow Fan connections	
DRAWING NO:	RC Schematics	DRAWN BY:	richmond.t
		CHECKED BY:	
		DATE DRAWN:	23/01/2023
		APPROVED BY:	
		SHEET:	55
		NO. OF:	70 of 309



B	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g
	REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:

PRODUCT: RC Schematics Complete  
 Supply Voltage:  
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 Plug Type:  
 PCB PROGRAMME: Class2\_260822\_Rev1.X\_production.hex  
 TFT PROGRAMME: CN\_CLASS2\_PORT\_R01.tft

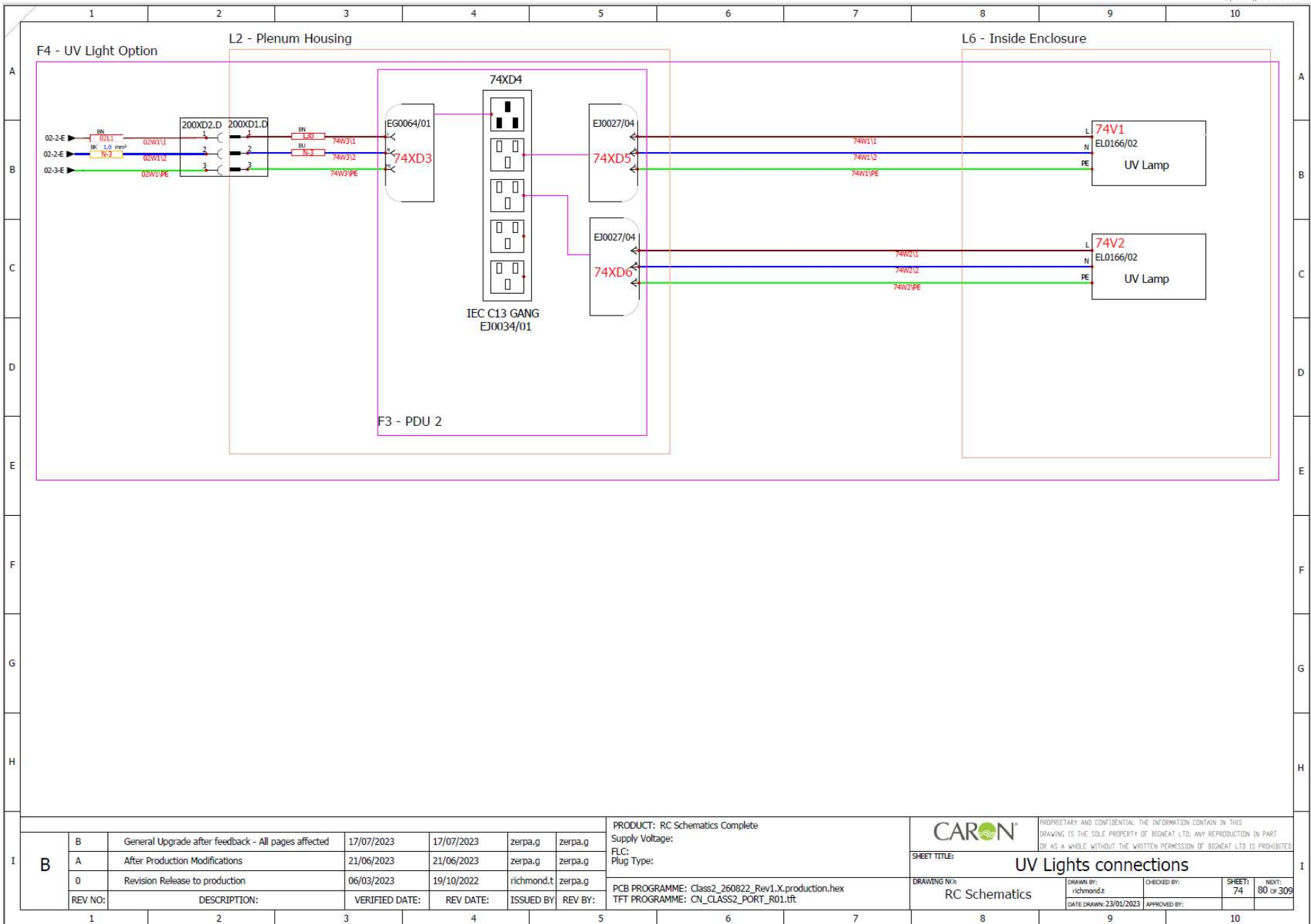
CARON  
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SHEET TITLE: Lights connections

DRAWING NO: RC Schematics

DRAWN BY: richmond.t  
 CHECKED BY:  
 DATE DRAWN: 23/01/2023  
 APPROVED BY:

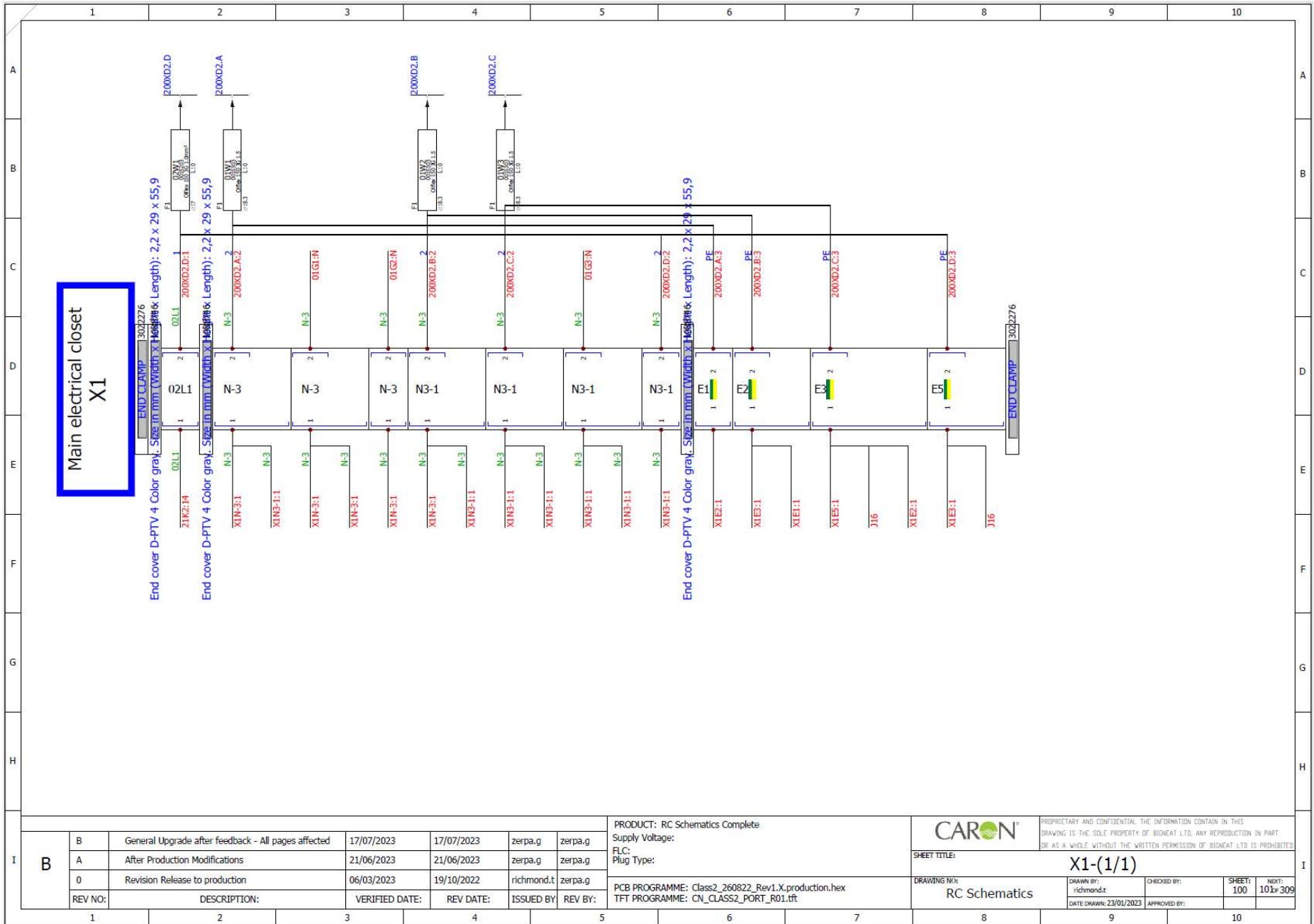
SHEET: 70  
 NO. OF: 74 of 309



I	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g
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	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g
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PRODUCT: RC Schematics Complete  
 Supply Voltage:  
 FLC:  
 Plug Type:  
 PCB PROGRAMME: Class2\_260822\_Rev1.X.production.hex  
 TFT PROGRAMME: CN\_CLASS2\_PORT\_R01.tft

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SHEET TITLE:		UV Lights connections			
DRAWING NO:	RC Schematics	DRAWN BY:	CHECKED BY:	SHEET:	NEXT:
		richmond.t		74	80 of 309
		DATE DRAWN: 23/01/2023	APPROVED BY:		

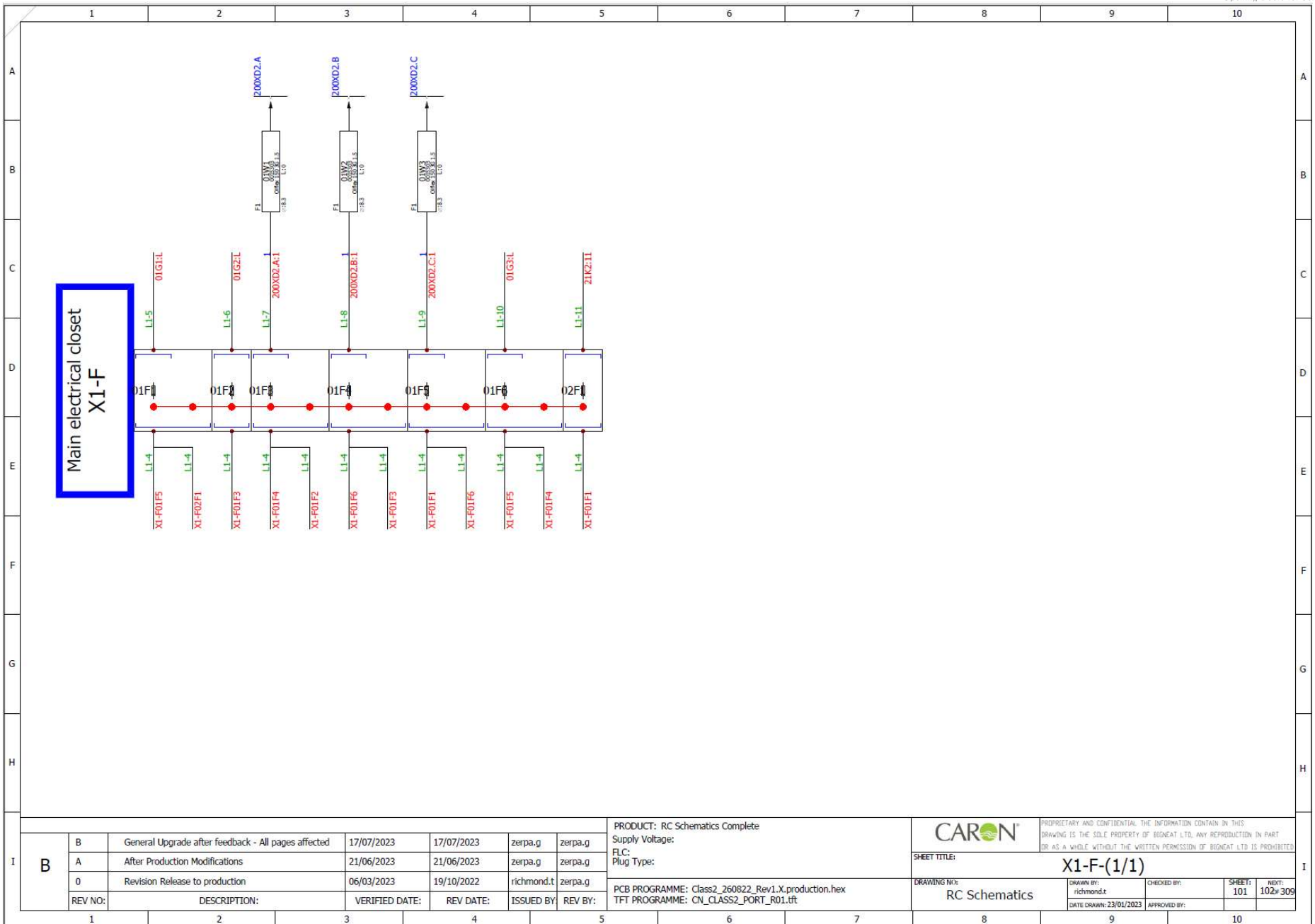


B	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g
	REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY	REV BY:

PRODUCT: RC Schematics Complete  
 Supply Voltage:  
 FLC:  
 Plug Type:  
 PCB PROGRAMME: Class2\_260822\_Rev1.X.production.hex  
 TFT PROGRAMME: CN\_CLASS2\_PORT\_R01.tft

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SHEET TITLE:		X1-(1/1)	
DRAWING NO:	RC Schematics	DRAWN BY:	richmond.t
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		DATE DRAWN:	23/01/2023
		APPROVED BY:	
		SHEET:	100
		NEXT:	101-309

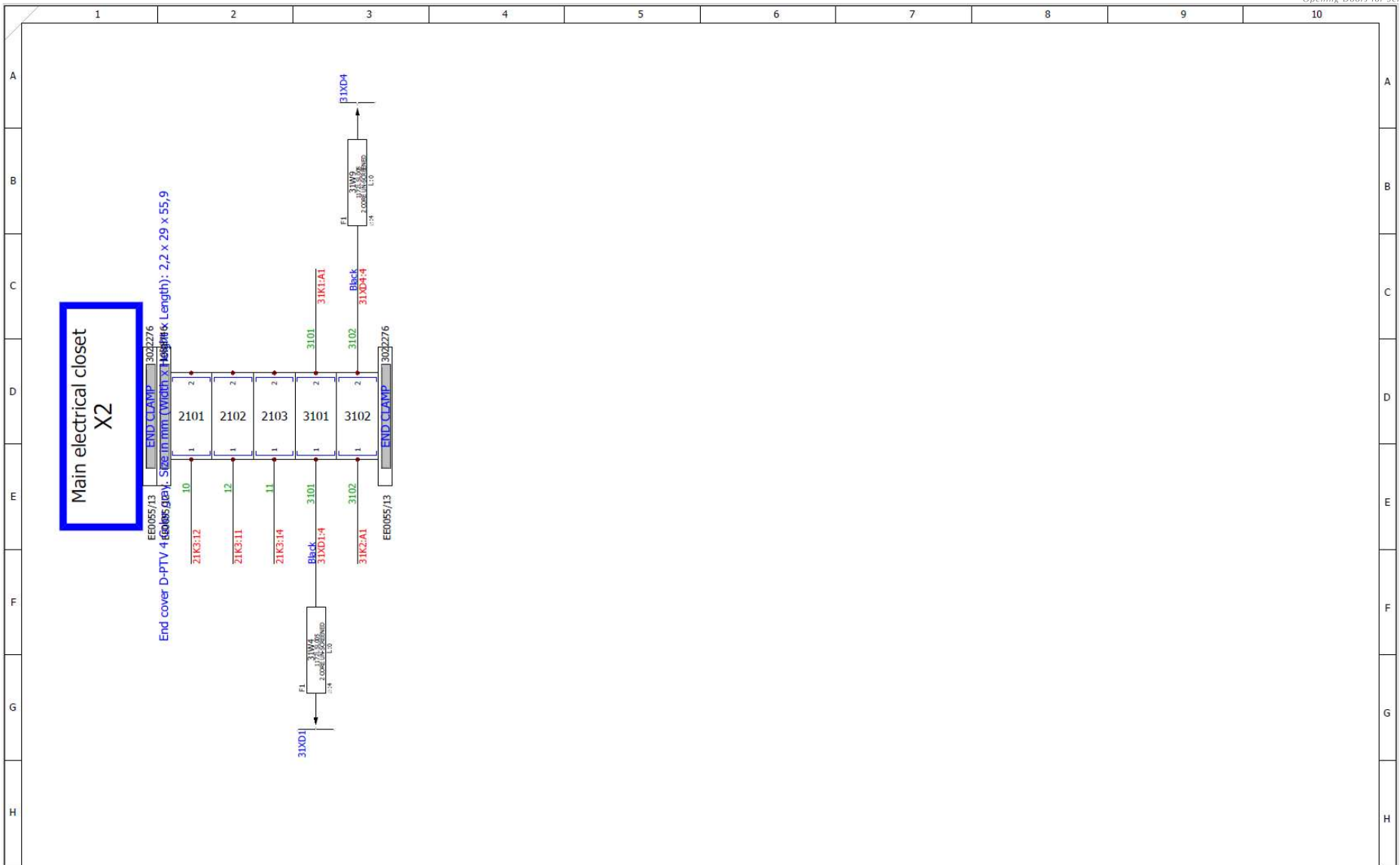




I	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g
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PRODUCT: RC Schematics Complete  
 Supply Voltage:  
 FLC:  
 Plug Type:  
 PCB PROGRAMME: Class2\_260822\_Rev1.X.production.hex  
 TFT PROGRAMME: CN\_CLASS2\_PORT\_R01.tft

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SHEET TITLE:		X1-F-(1/1)	
DRAWING NO:	RC Schematics	DRAWN BY:	richmond.t
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		DATE DRAWN:	23/01/2023
		APPROVED BY:	
		SHEET:	101
		INDIC:	102+309



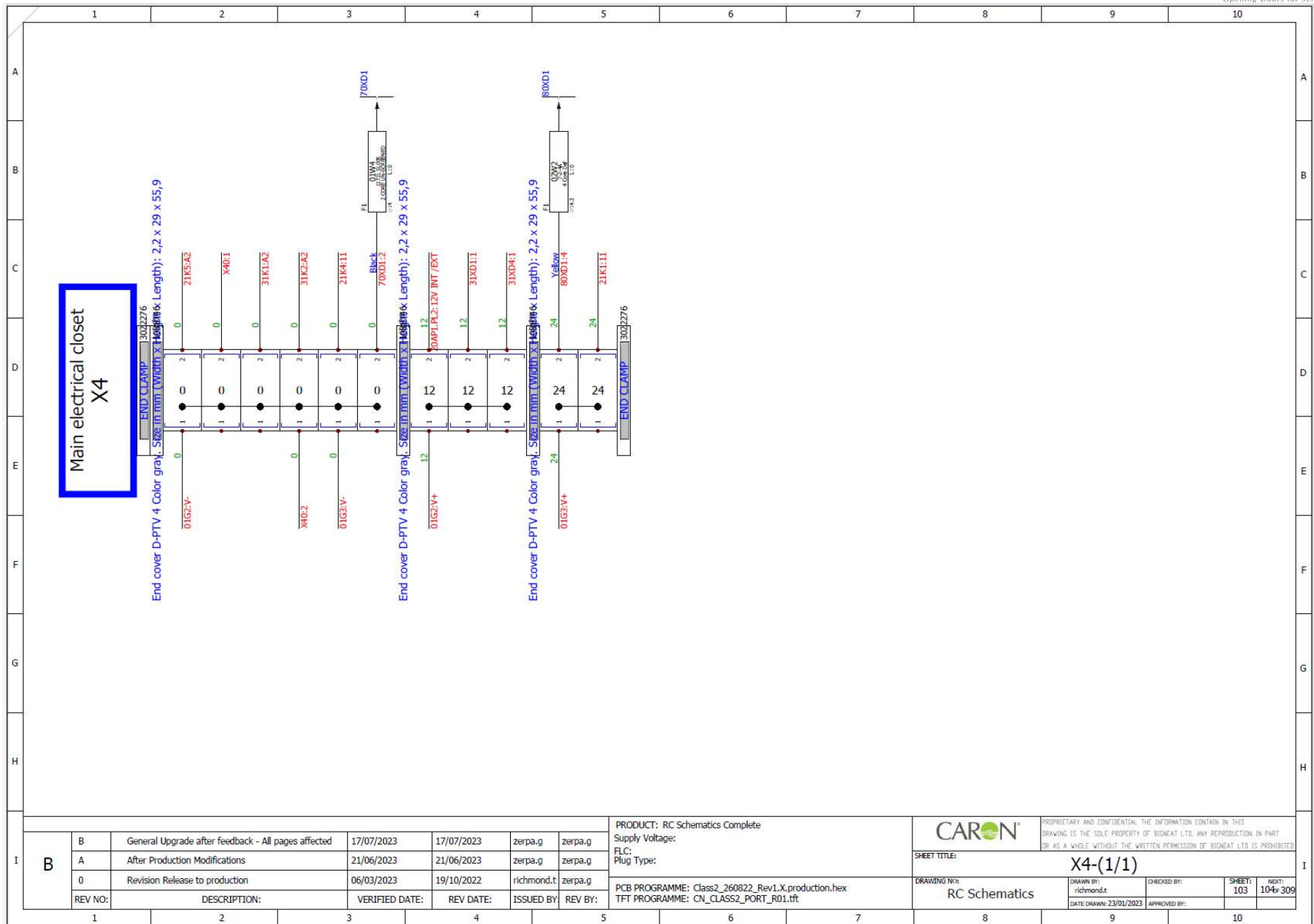
Main electrical closet  
X2

End cover D-PTV 4 (600x55,9) Height & Length): 2,2 x 29 x 55,9

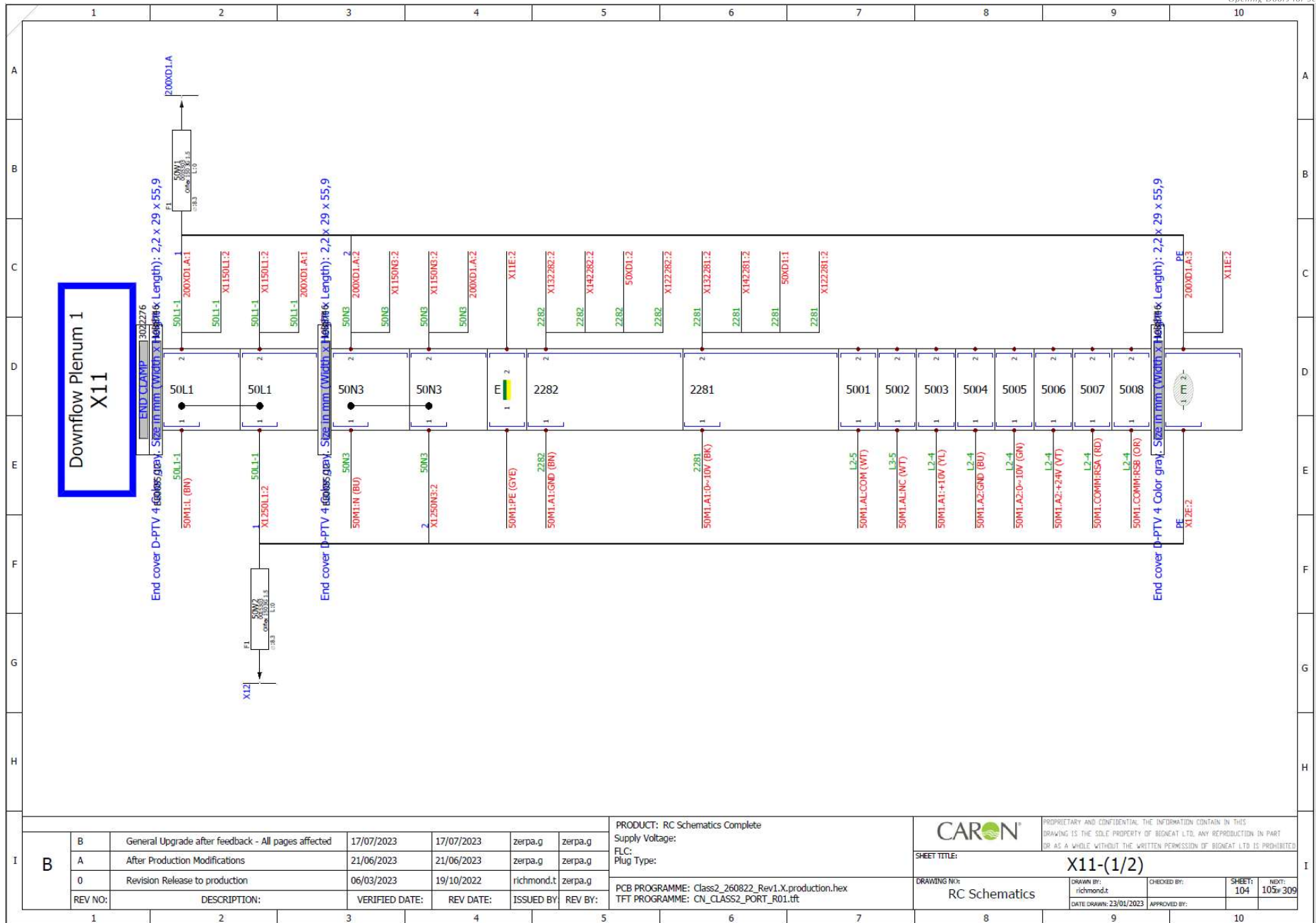
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PRODUCT: RC Schematics Complete  
Supply Voltage:  
FLC:  
Plug Type:  
PCB PROGRAMME: Class2\_260822\_Rev1.X.production.hex  
TFT PROGRAMME: CN\_CLASS2\_PORT\_R01.tft

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DRAWING NO:	RC Schematics	DRAWN BY:	richmond.t
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		DATE DRAWN:	23/01/2023
		APPROVED BY:	
SHEET:	102	INDIC:	103
			309

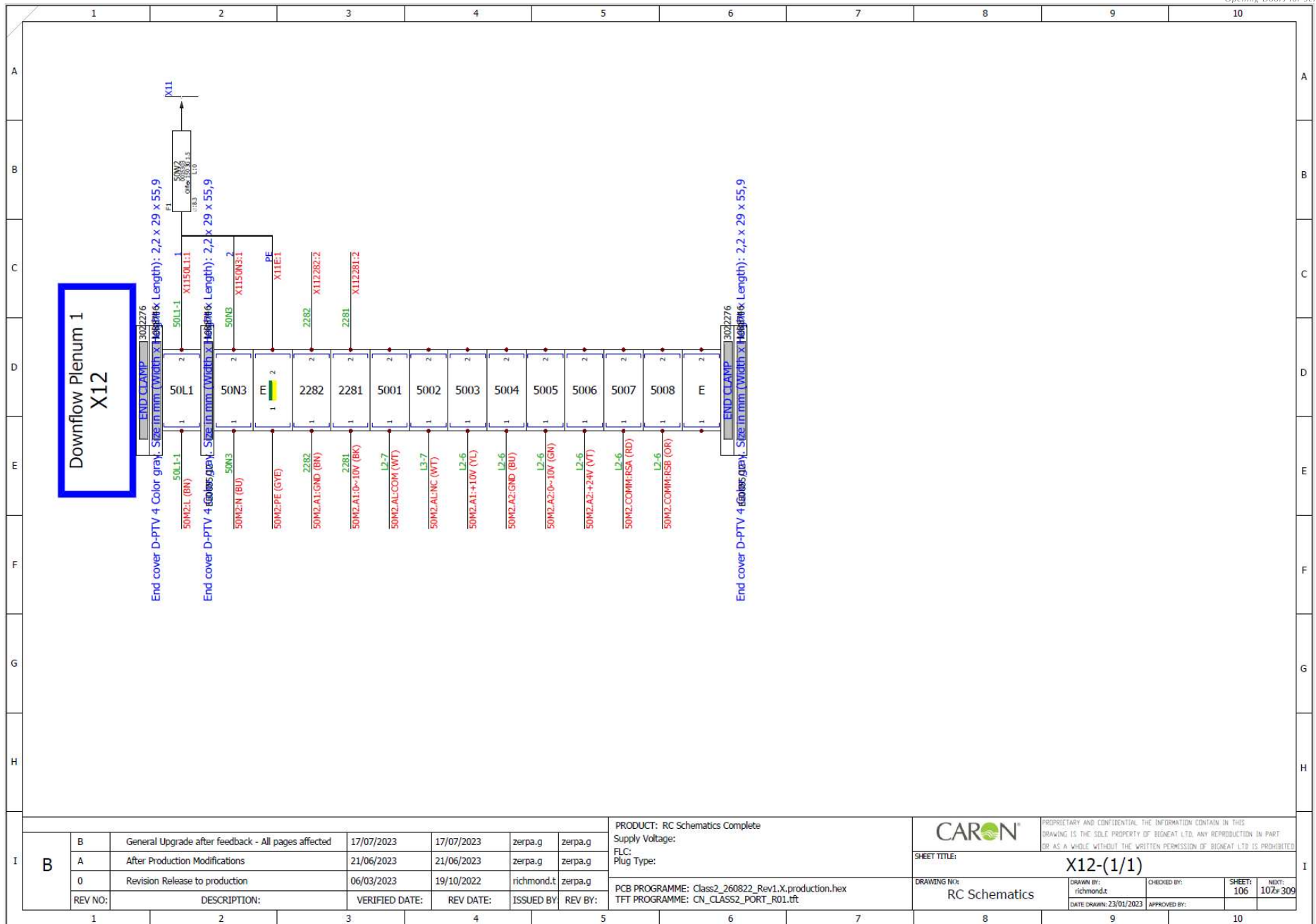








I	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g	<b>PRODUCT:</b> RC Schematics Complete <b>Supply Voltage:</b> <b>FLC:</b> <b>Plug Type:</b>		<small>PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAIN IN THIS DRAWING IS THE SOLE PROPERTY OF BIONEAT LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIONEAT LTD IS PROHIBITED</small>		
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g				<b>SHEET TITLE:</b> X11-(2/2)	
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g	<b>PCB PROGRAMME:</b> Class2_260822_Rev1_X.production.hex <b>TFT PROGRAMME:</b> CN_CLASS2_PORT_R01.tft	<b>DRAWING NO:</b> RC Schematics	<b>DRAWN BY:</b> richmond.t <small>DATE DRAWN: 23/01/2023</small>	<b>CHECKED BY:</b> <small>APPROVED BY:</small>	<b>SHEET:</b> 105 <b>NEXT:</b> 106 of 309
	REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:					

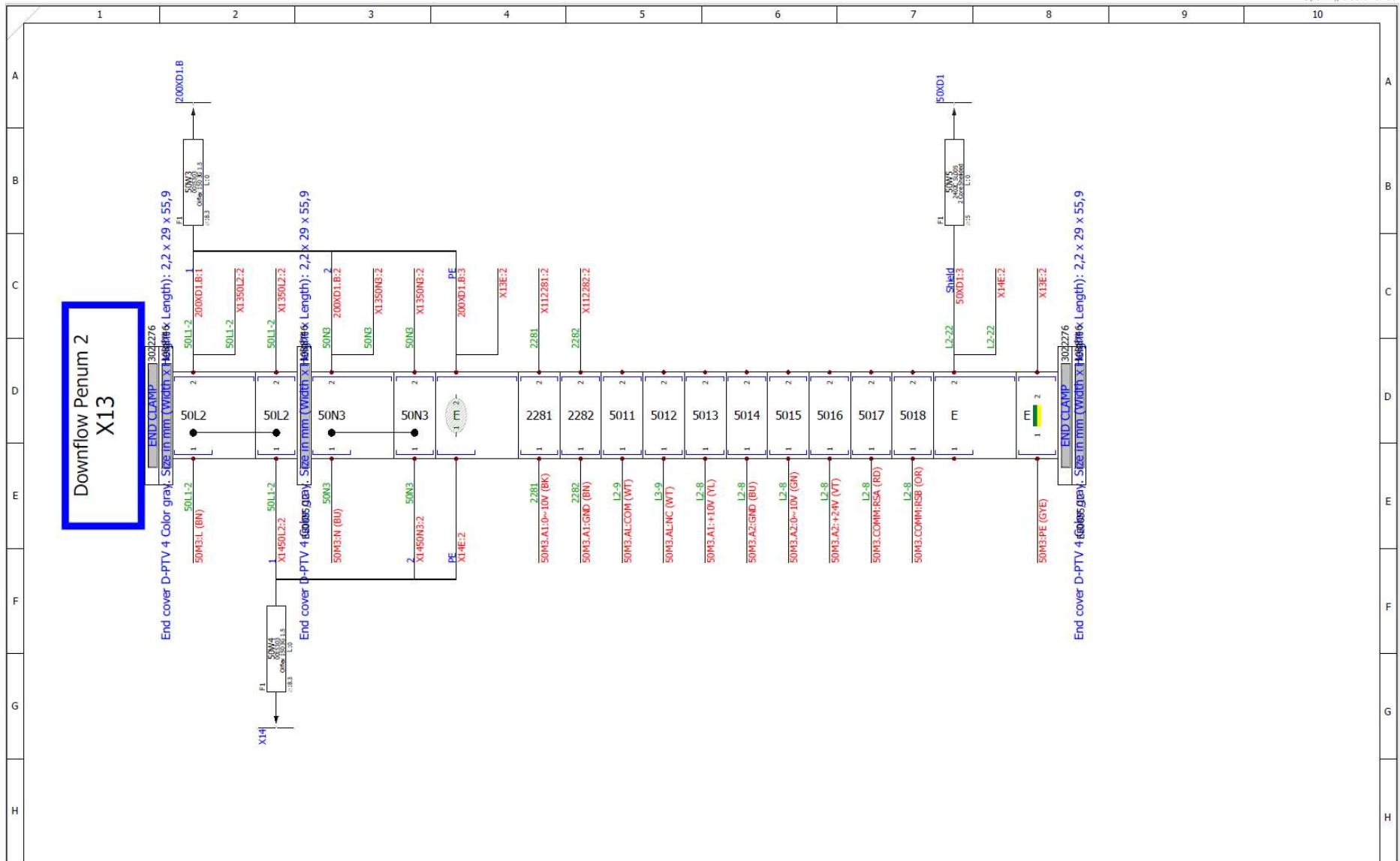


I	B	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g
		A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g
		0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g
		REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:

PRODUCT: RC Schematics Complete  
 Supply Voltage:  
 FLC:  
 Plug Type:

PCB PROGRAMME: Class2\_260822\_Rev1.X.production.hex  
 TFT PROGRAMME: CN\_CLASS2\_PORT\_R01.tft

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SHEET TITLE:		X12-(1/1)	
DRAWING NO:	RC Schematics	DRAWN BY:	richmond.t
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		DATE DRAWN: 23/01/2023	APPROVED BY:
		SHEET:	106
		NO:	107 of 309

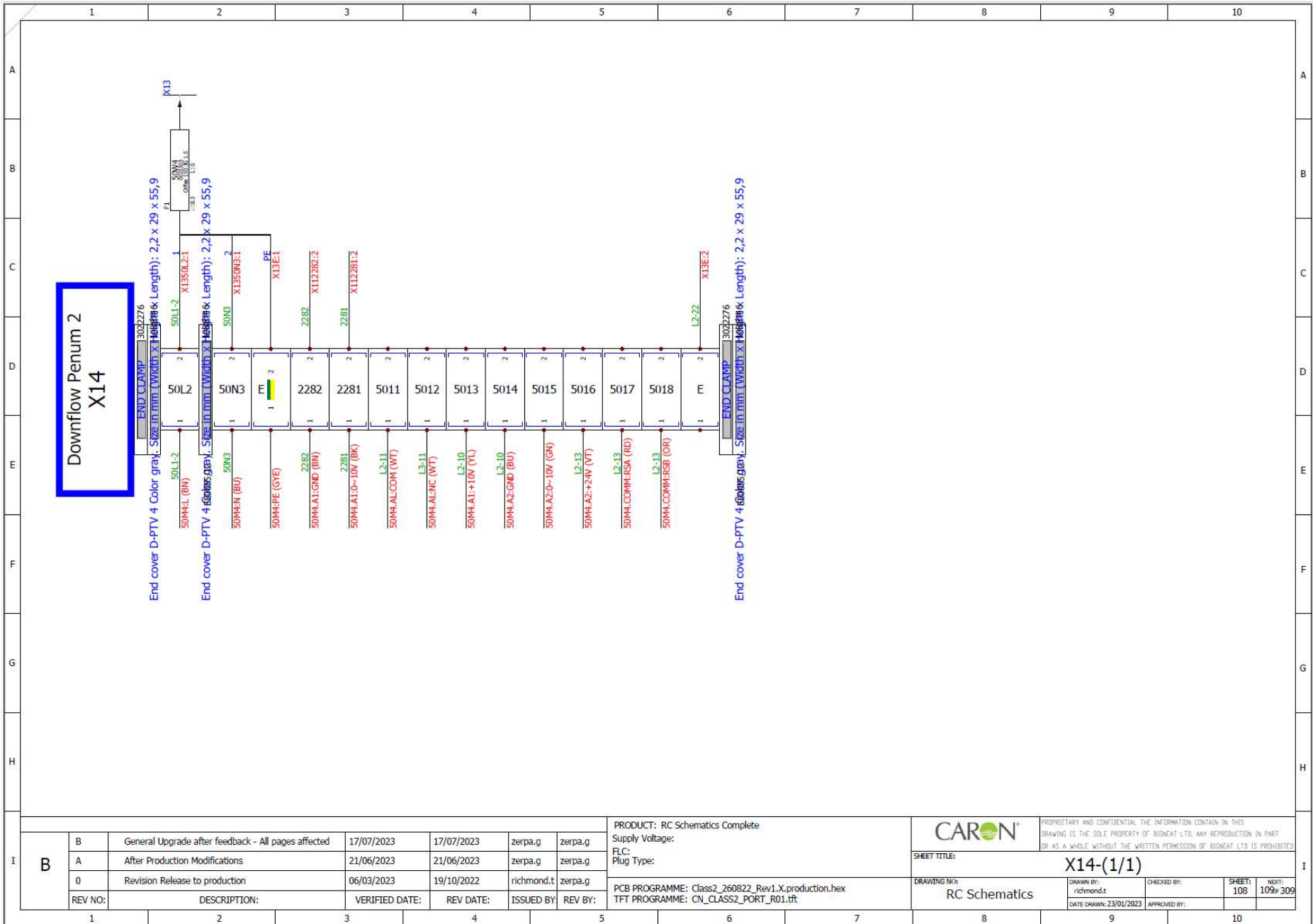


B	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g
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PRODUCT: RC Schematics Complete  
 Supply Voltage:  
 FLC:  
 Plug Type:

PCB PROGRAMME: Class2\_260822\_Rev1.X.production.hex  
 TFT PROGRAMME: CN\_CLASS2\_PORT\_R01.tft

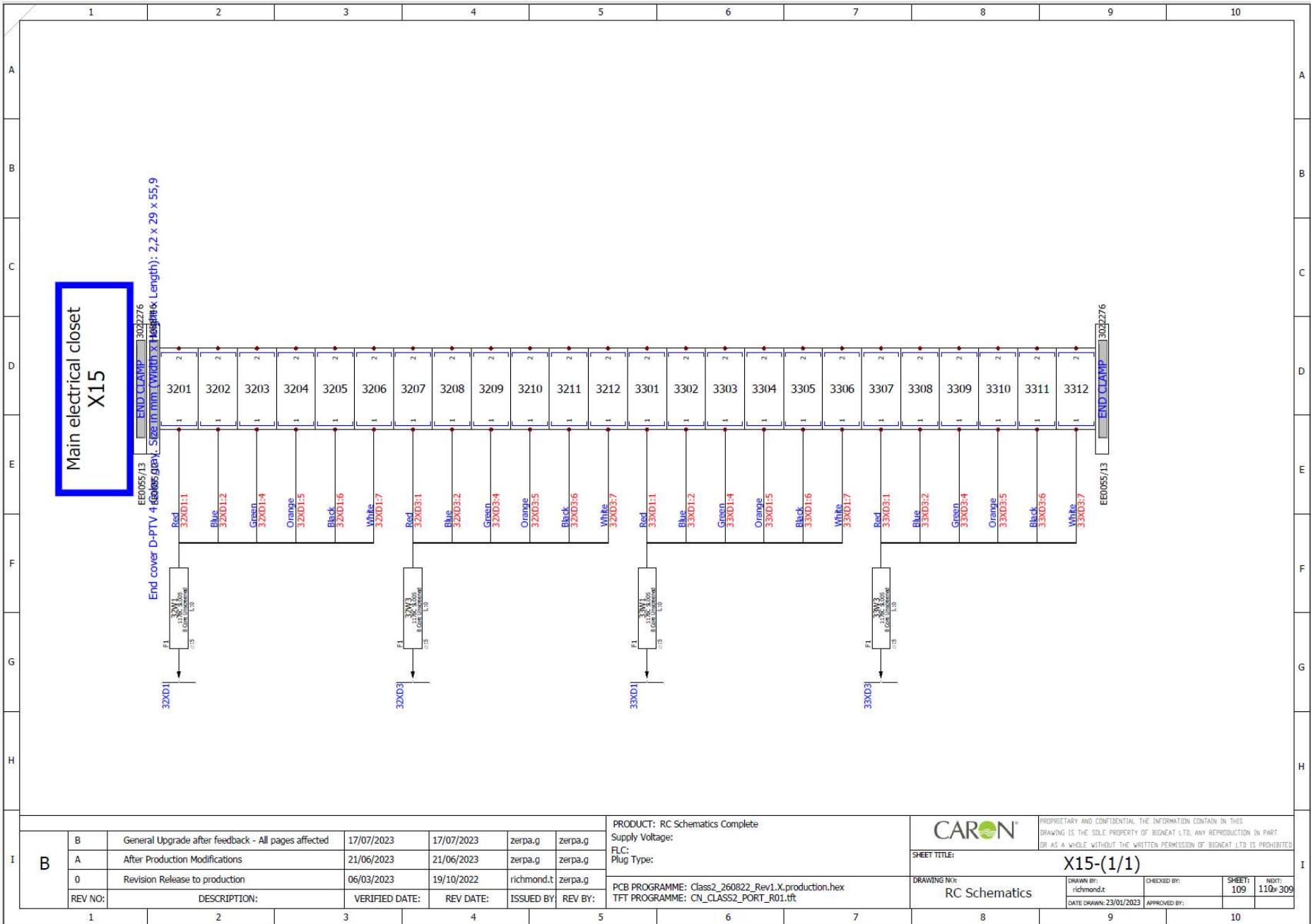
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SHEET TITLE:		X13-(1/1)	
DRAWING N°:	RC Schematics	DRAWN BY:	richmond.t
		CHECKED BY:	
		APPROVED BY:	
		DATE DRAWN: 23/01/2023	
		SHEET: 107	INDX: 109x309



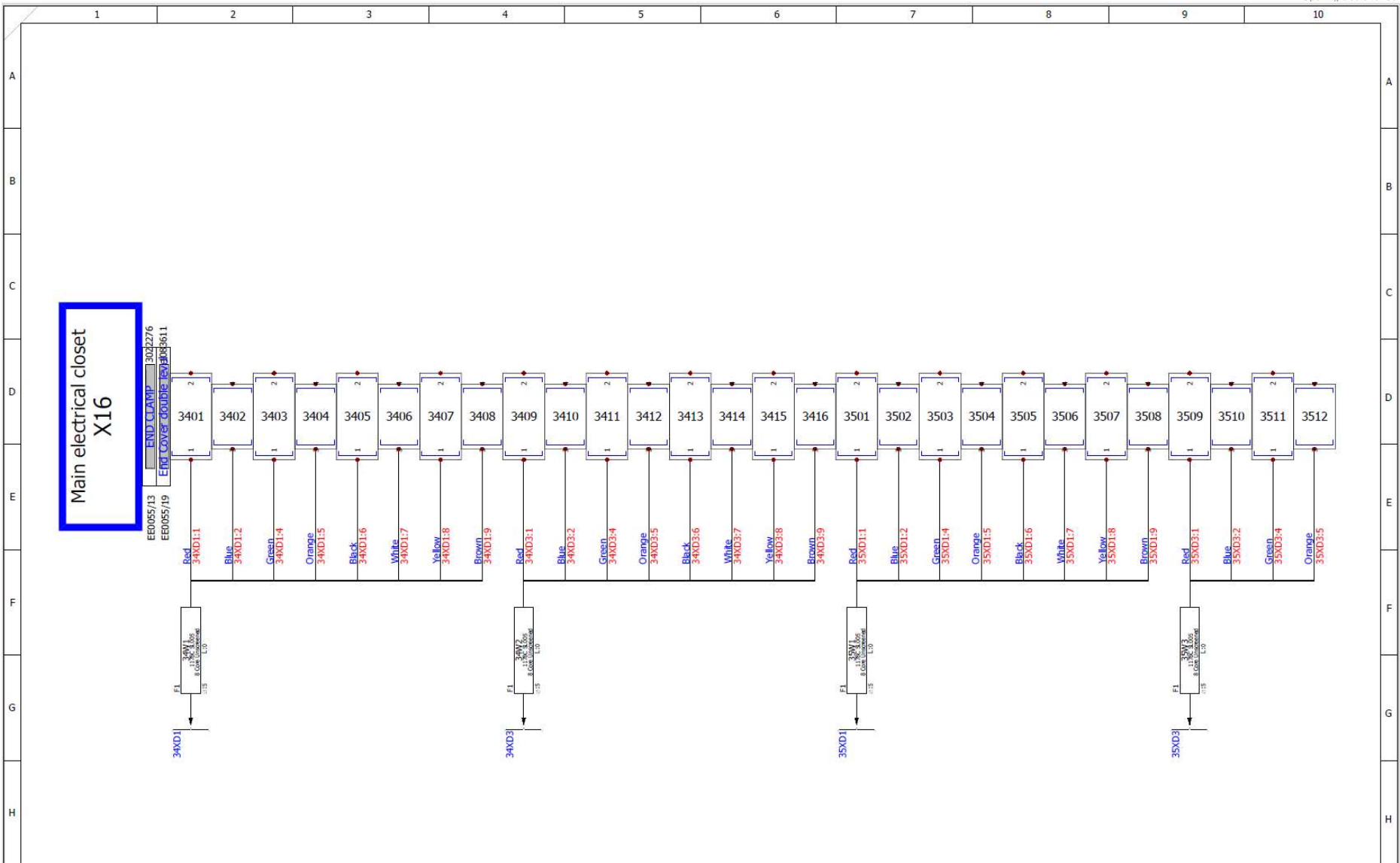
B	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g
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PRODUCT: RC Schematics Complete  
 Supply Voltage:  
 FLC:  
 Plug Type:  
 PCB PROGRAMME: Class2\_260822\_Rev1.X\_production.hex  
 TFT PROGRAMME: CN\_CLASS2\_PORT\_R01.tft

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SHEET TITLE:		X14-(1/1)	
DRAWING NO:	RC Schematics	DRAWN BY:	richmond.t
		CHECKED BY:	
		APPROVED BY:	
		SHEET:	108
		NOBT:	109 of 309



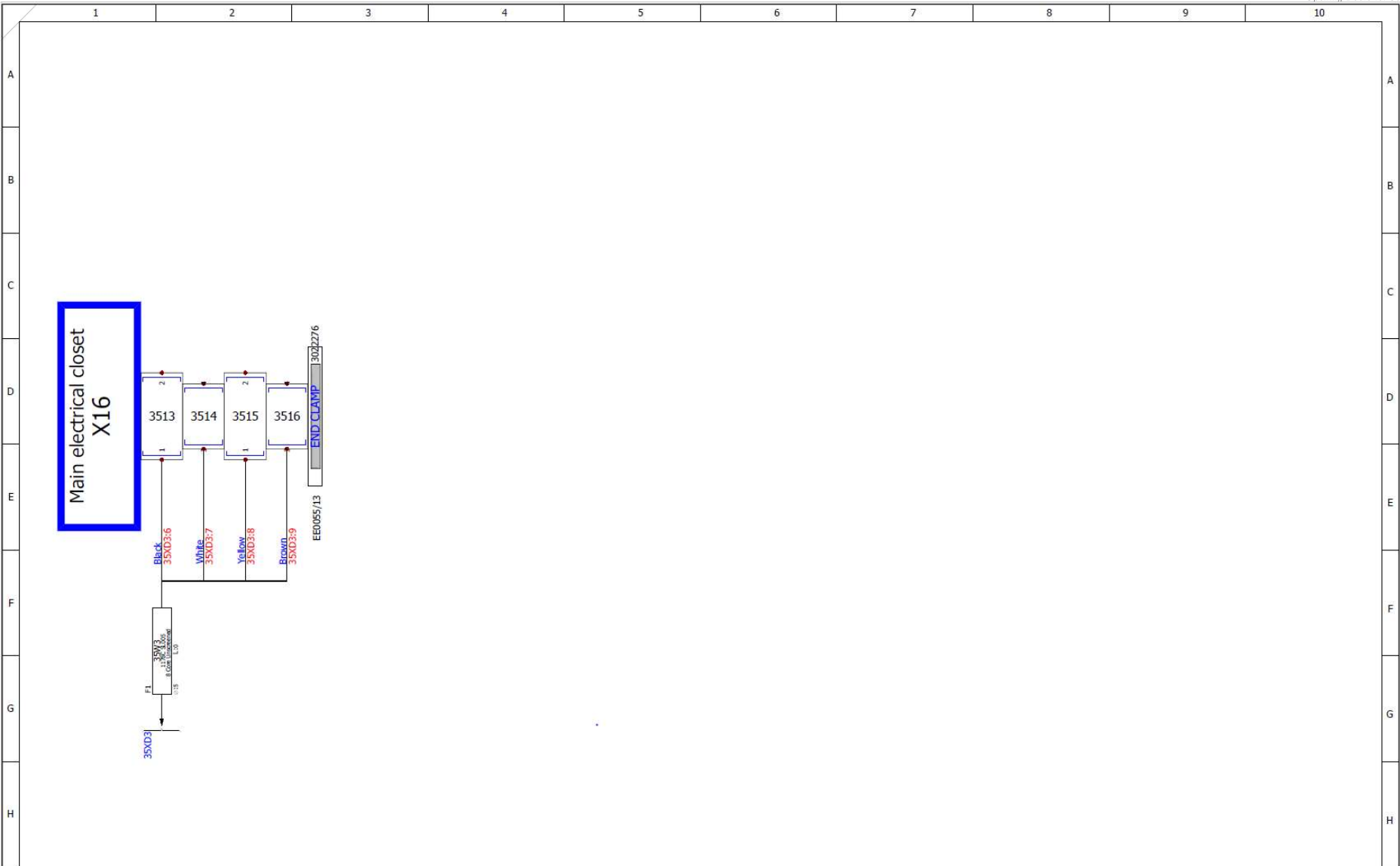




B	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g
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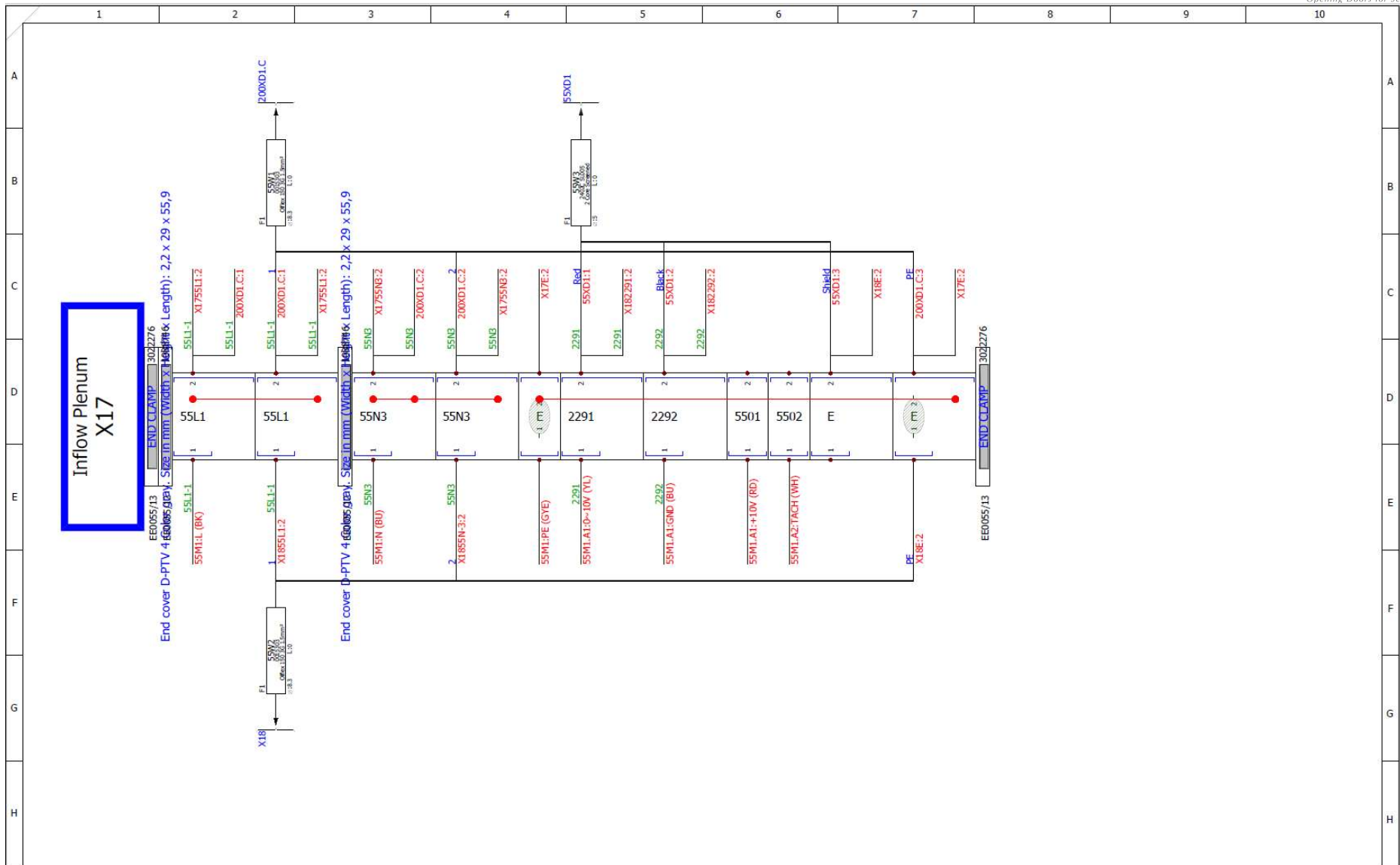
PRODUCT: RC Schematics Complete  
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 FLC:  
 Plug Type:  
 PCB PROGRAMME: Class2\_260822\_Rev1.X\_production.hex  
 TFT PROGRAMME: CN\_CLASS2\_PORT\_R01.tft

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SHEET TITLE:		X16-(1/2)	
DRAWING N°:	RC Schematics	DRAWN BY:	richmond.t
		CHECKED BY:	
		DATE DRAWN:	23/01/2023
		APPROVED BY:	
SHEET:	110	NEXT:	111w/309



I	B	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g	PRODUCT: RC Schematics Complete Supply Voltage: FLC: Plug Type:	CARON PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAIN IN THIS DRAWING IS THE SOLE PROPERTY OF BIONEAT LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIONEAT LTD IS PROHIBITED	
		A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g			SHEET TITLE: X16-(2/2)
		0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g	PCB PROGRAMME: Class2_260822_Rev1_X_production.hex TFT PROGRAMME: CN_CLASS2_PORT_R01.tft	DRAWING NO: RC Schematics DRAWN BY: richmond.t DATE DRAWN: 23/01/2023	CHECKED BY: SHEET: 111 NEXT: 112 of 309
		REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:	APPROVED BY:		

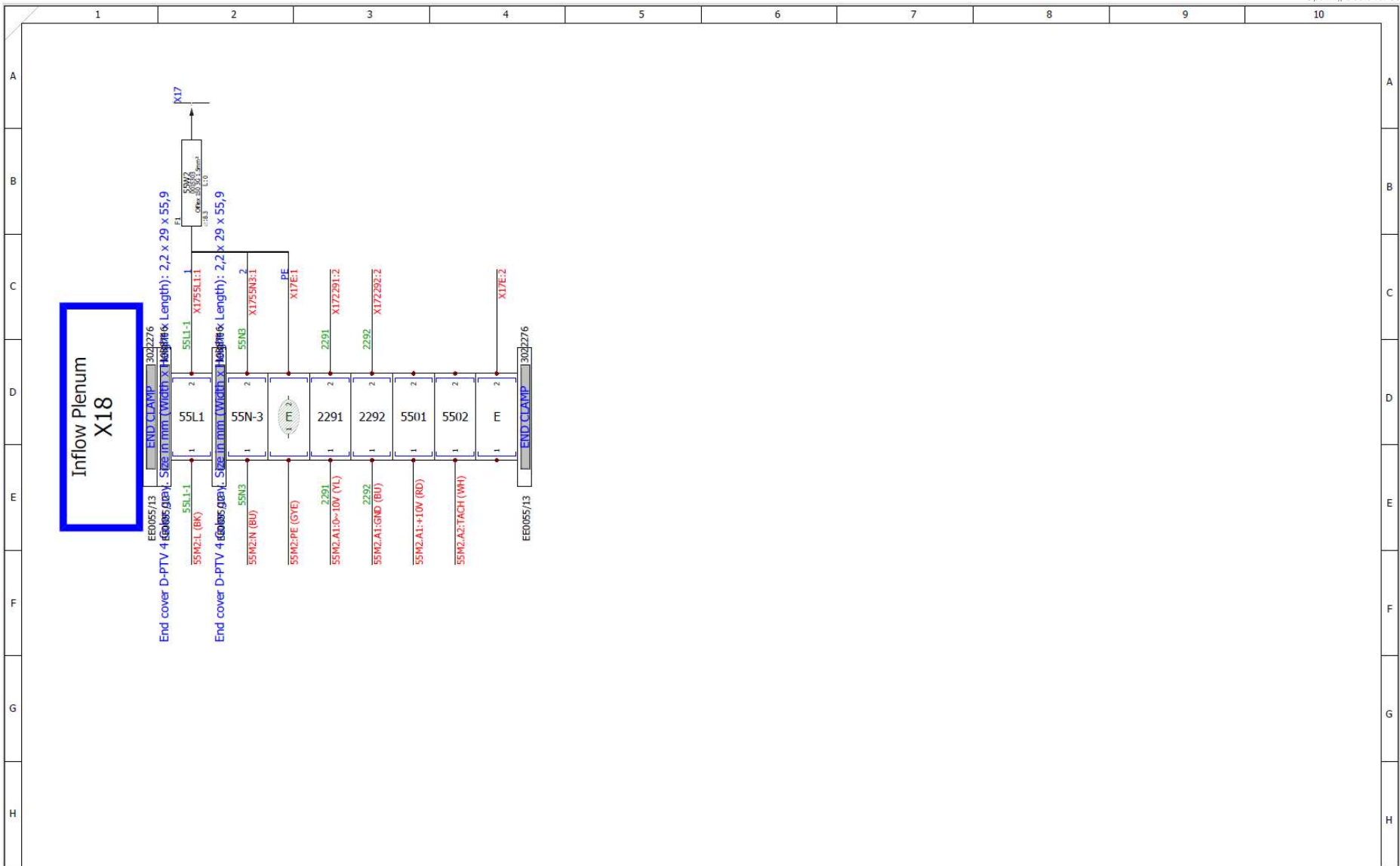




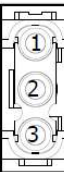



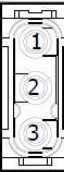
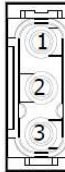


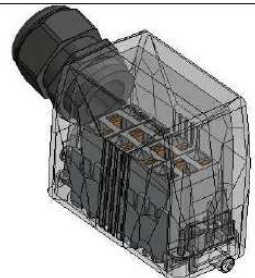
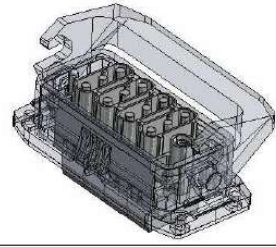
B	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g
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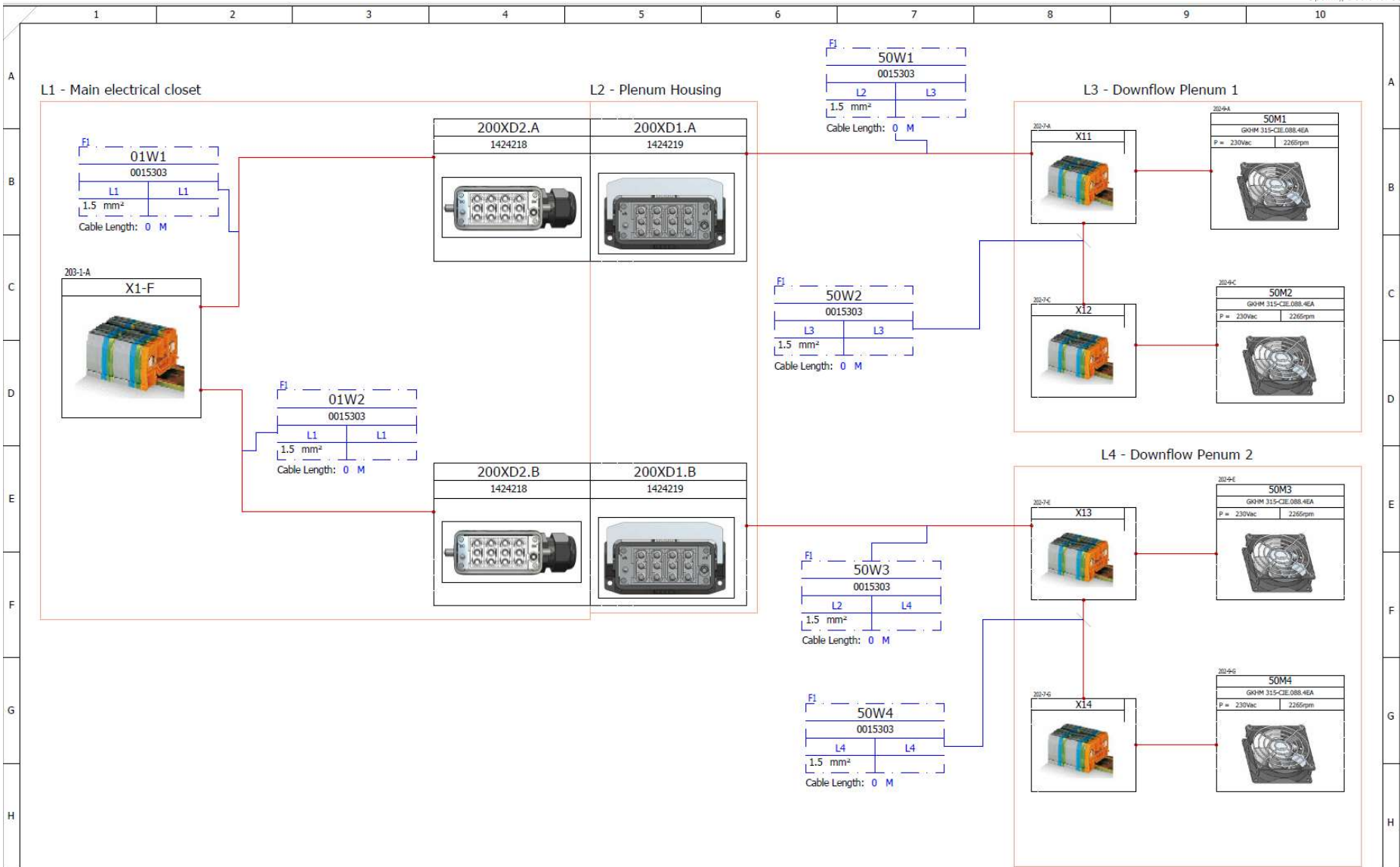
PRODUCT: RC Schematics Complete
Supply Voltage:
FLC:
Plug Type:
PCB PROGRAMME: Class2_260822_Rev1_X_production.hex
TFT PROGRAMME: CN_CLASS2_PORT_R01.tft

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SHEET TITLE:		X17-(1/1)	
DRAWING NO:	RC Schematics	DRAWN BY:	richmond.t
		CHECKED BY:	
		APPROVED BY:	
		SHEET:	112
		NO:	113 of 309

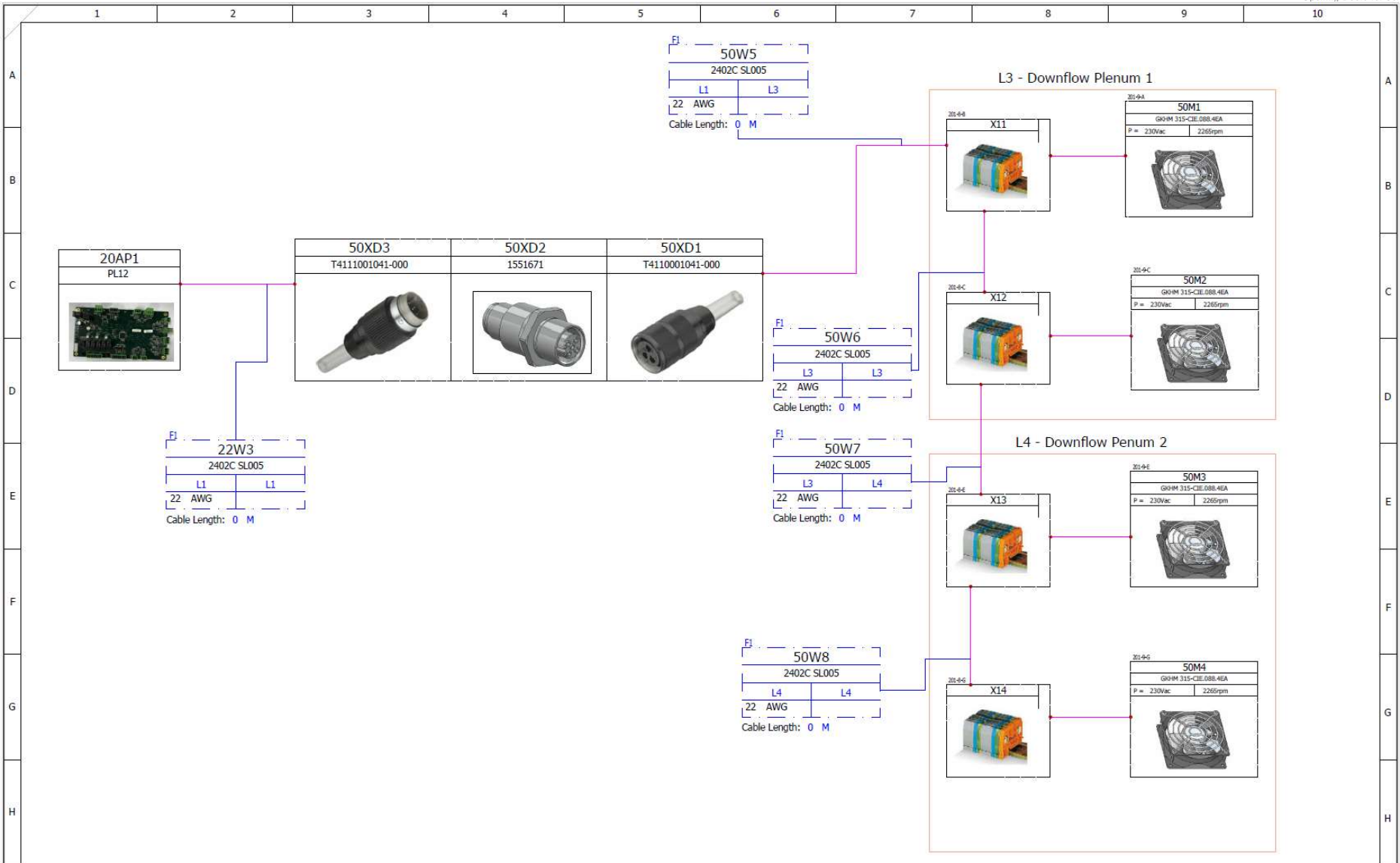


I	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g	PRODUCT: RC Schematics Complete Supply Voltage: FLC: Plug Type:  PCB PROGRAMME: Class2_260822_Rev1.X.production.hex TFT PROGRAMME: CN_CLASS2_PORT_R01.tft	CARON SHEET TITLE: X18-(1/1) DRAWING Nbr: RC Schematics	PROPRIETARY AND CONFIDENTIAL. THE INFORMATION CONTAIN IN THIS DRAWING IS THE SOLE PROPERTY OF BIONEAT LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIONEAT LTD IS PROHIBITED.		
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g			DRAWN BY: richmond.t DATE DRAWN: 23/01/2023	CHECKED BY: APPROVED BY:	SHEET: 113 Nbr: 200 of 309
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g					
	REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:					

	1	2	3	4	5	6	7	8	9	10																																																																										
A	<b>200XD1 - HOUSING - GLAND PLATE</b>																																																																																			
B	 <p><b>200XD1.A Male Insert</b></p> <table border="1"> <thead> <tr> <th>Pin</th> <th>Equipot</th> <th>Cable Ref</th> <th>Wire</th> <th>Cross-ref</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>50L1-1</td> <td>0015303</td> <td>50W1</td> <td>50-3-C</td> </tr> <tr> <td>2</td> <td>50N3</td> <td>0015303</td> <td>50W1</td> <td>50-3-C</td> </tr> <tr> <td>3</td> <td></td> <td>0015303</td> <td>50W1</td> <td>50-3-C</td> </tr> </tbody> </table>	Pin	Equipot	Cable Ref	Wire	Cross-ref	1	50L1-1	0015303	50W1	50-3-C	2	50N3	0015303	50W1	50-3-C	3		0015303	50W1	50-3-C	 <p><b>200XD1.B Male Insert</b></p> <table border="1"> <thead> <tr> <th>Pin</th> <th>Equipot</th> <th>Cable Ref</th> <th>Wire</th> <th>Cross-ref</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>50L1-2</td> <td>0015303</td> <td>50W3</td> <td>50-6-C</td> </tr> <tr> <td>2</td> <td>50N3</td> <td>0015303</td> <td>50W3</td> <td>50-6-C</td> </tr> <tr> <td>3</td> <td></td> <td>0015303</td> <td>50W3</td> <td>50-6-C</td> </tr> </tbody> </table>	Pin	Equipot	Cable Ref	Wire	Cross-ref	1	50L1-2	0015303	50W3	50-6-C	2	50N3	0015303	50W3	50-6-C	3		0015303	50W3	50-6-C	 <p><b>200XD1.C Male Insert</b></p> <table border="1"> <thead> <tr> <th>Pin</th> <th>Equipot</th> <th>Cable Ref</th> <th>Wire</th> <th>Cross-ref</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>55L1-1</td> <td>0015303</td> <td>55W1</td> <td>55-4-C</td> </tr> <tr> <td>2</td> <td>55N3</td> <td>0015303</td> <td>55W1</td> <td>55-4-C</td> </tr> <tr> <td>3</td> <td></td> <td>0015303</td> <td>55W1</td> <td>55-4-C</td> </tr> </tbody> </table>	Pin	Equipot	Cable Ref	Wire	Cross-ref	1	55L1-1	0015303	55W1	55-4-C	2	55N3	0015303	55W1	55-4-C	3		0015303	55W1	55-4-C	 <p><b>200XD1.D Male Insert</b></p> <table border="1"> <thead> <tr> <th>Pin</th> <th>Equipot</th> <th>Cable Ref</th> <th>Wire</th> <th>Cross-ref</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>L30</td> <td>0015203</td> <td>74W3</td> <td>74-2-B</td> </tr> <tr> <td>2</td> <td>N-3</td> <td>0015203</td> <td>74W3</td> <td>74-2-B</td> </tr> <tr> <td>3</td> <td></td> <td>0015203</td> <td>74W3</td> <td>74-2-B</td> </tr> </tbody> </table>	Pin	Equipot	Cable Ref	Wire	Cross-ref	1	L30	0015203	74W3	74-2-B	2	N-3	0015203	74W3	74-2-B	3		0015203	74W3	74-2-B
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H																																																																																				
I	<table border="1"> <tr> <td>B</td> <td>General Upgrade after feedback - All pages affected</td> <td>17/07/2023</td> <td>17/07/2023</td> <td>zerpa.g</td> <td>zerpa.g</td> </tr> <tr> <td>A</td> <td>After Production Modifications</td> <td>21/06/2023</td> <td>21/06/2023</td> <td>zerpa.g</td> <td>zerpa.g</td> </tr> <tr> <td>0</td> <td>Revision Release to production</td> <td>06/03/2023</td> <td>19/10/2022</td> <td>richmond.t</td> <td>zerpa.g</td> </tr> <tr> <td>REV NO:</td> <td>DESCRIPTION:</td> <td>VERIFIED DATE:</td> <td>REV DATE:</td> <td>ISSUED BY:</td> <td>REV BY:</td> </tr> </table>					B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g	REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:	<p>PRODUCT: RC Schematics Complete Supply Voltage: FLC: Plug Type:</p> <p>PCB PROGRAMME: Class2_260822_Rev1.X_production.hex TFT PROGRAMME: CN_CLASS2_PORT_R01.tft</p>					<p><b>CARON</b> PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAIN IN THIS DRAWING IS THE SOLE PROPERTY OF BIONEAT LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIONEAT LTD IS PROHIBITED</p> <p>SHEET TITLE: <b>Plug and Socket Layout</b></p> <p>DRAWING NO: RC Schematics DRAWN BY: richmond.t CHECKED BY: DATE DRAWN: 23/01/2023 APPROVED BY:</p> <p>SHEET: 200 NEXT: 309</p>																																																	
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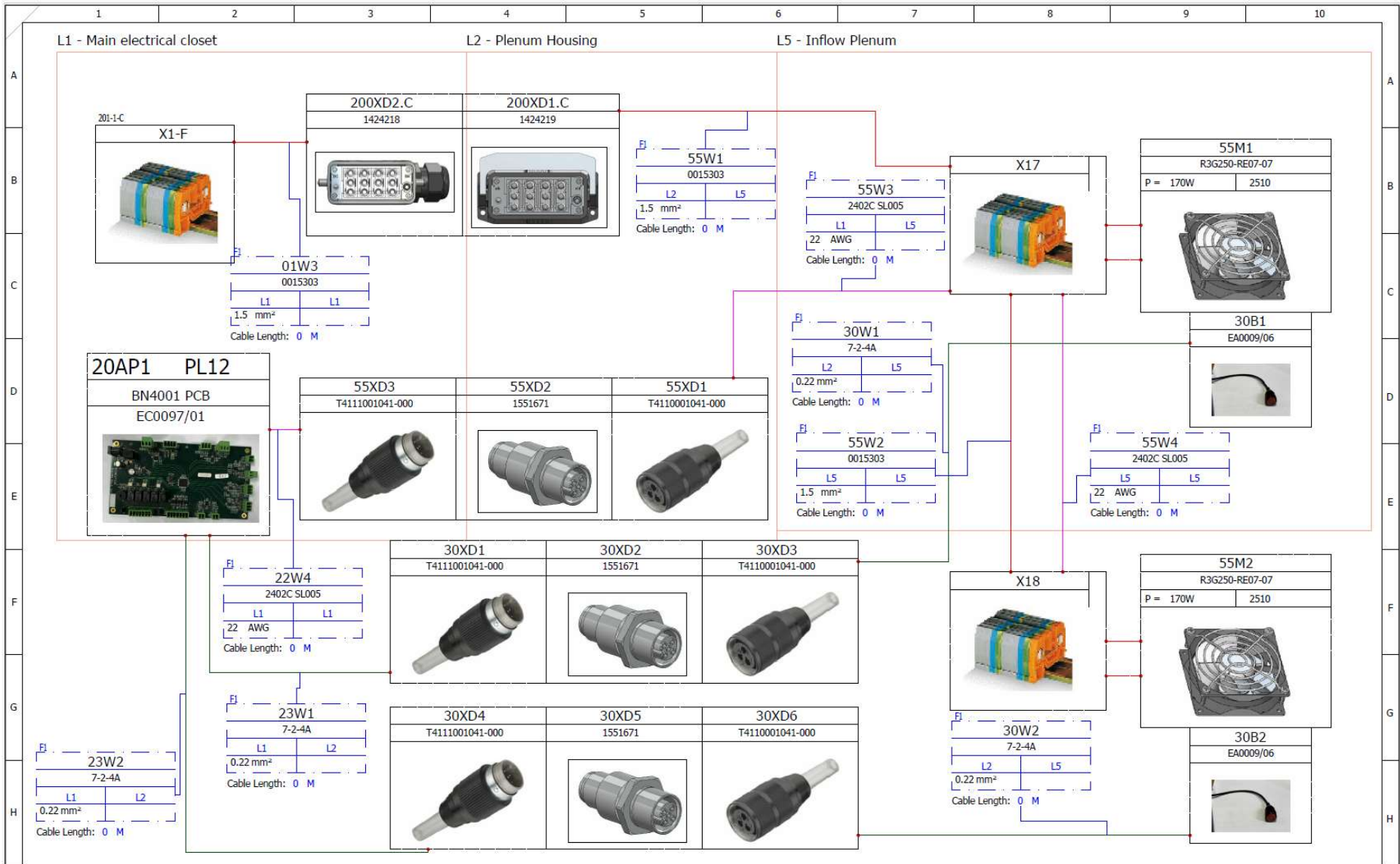


I	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g	PRODUCT: RC Schematics Complete Supply Voltage: FLC: Plug Type:  PCB PROGRAMME: Class2_260822_Rev1.X_production.hex TFT PROGRAMME: CN_CLASS2_PORT_R01.tft	CARON SHEET TITLE: <b>Downflow Diagram - Power</b>	PROPRIETARY AND CONFIDENTIAL. THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BIGNCAT LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIGNCAT LTD IS PROHIBITED.	DRAWING NO: <b>RC Schematics</b>	DRAWN BY: richmond.t DATE DRAWN: 23/01/2023	CHECKED BY:  APPROVED BY:	SHEET: 201	NEXT: 202 > 309
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g								
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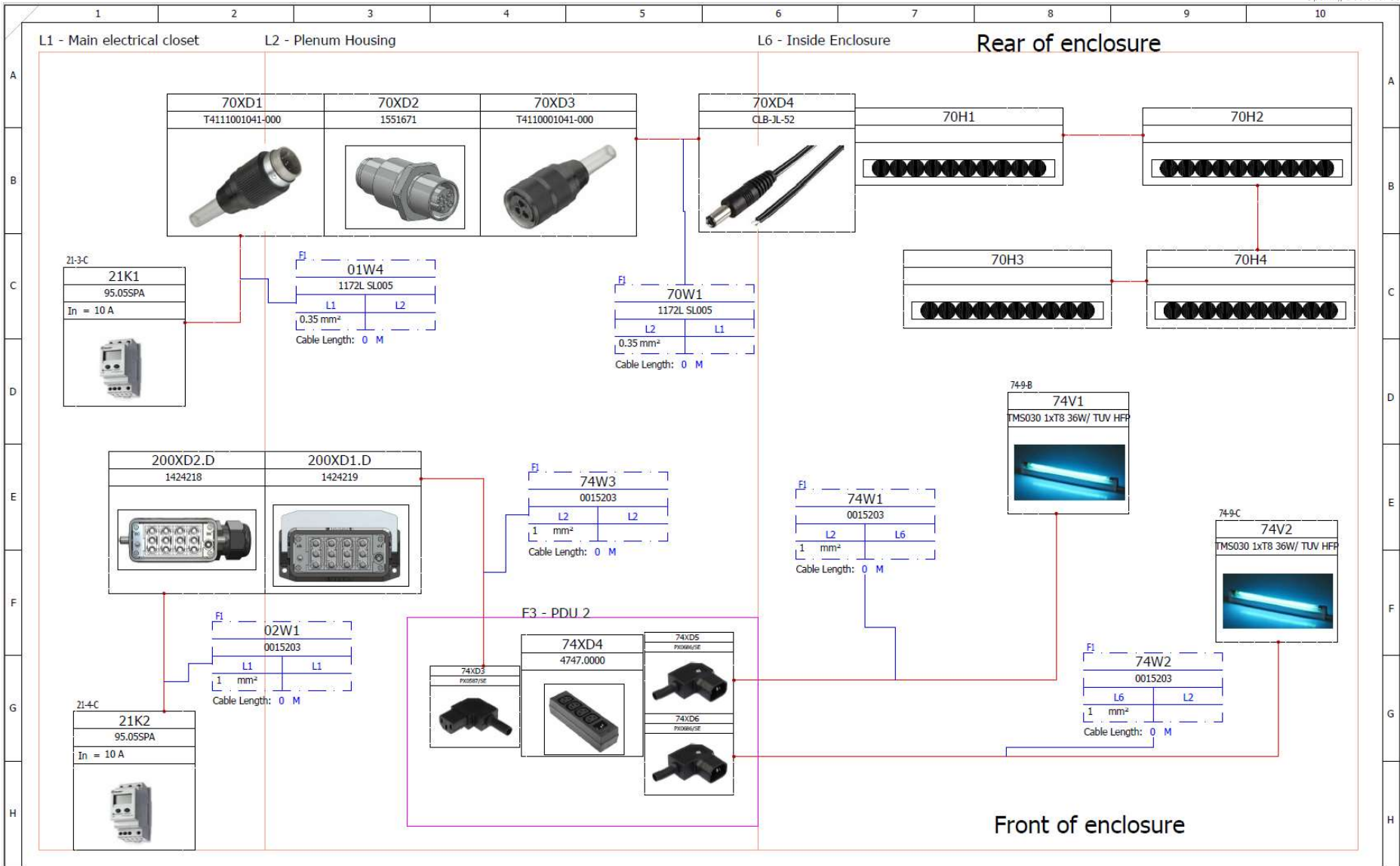


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		0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g			DATE DRAWN: 23/01/2023	APPROVED BY:			
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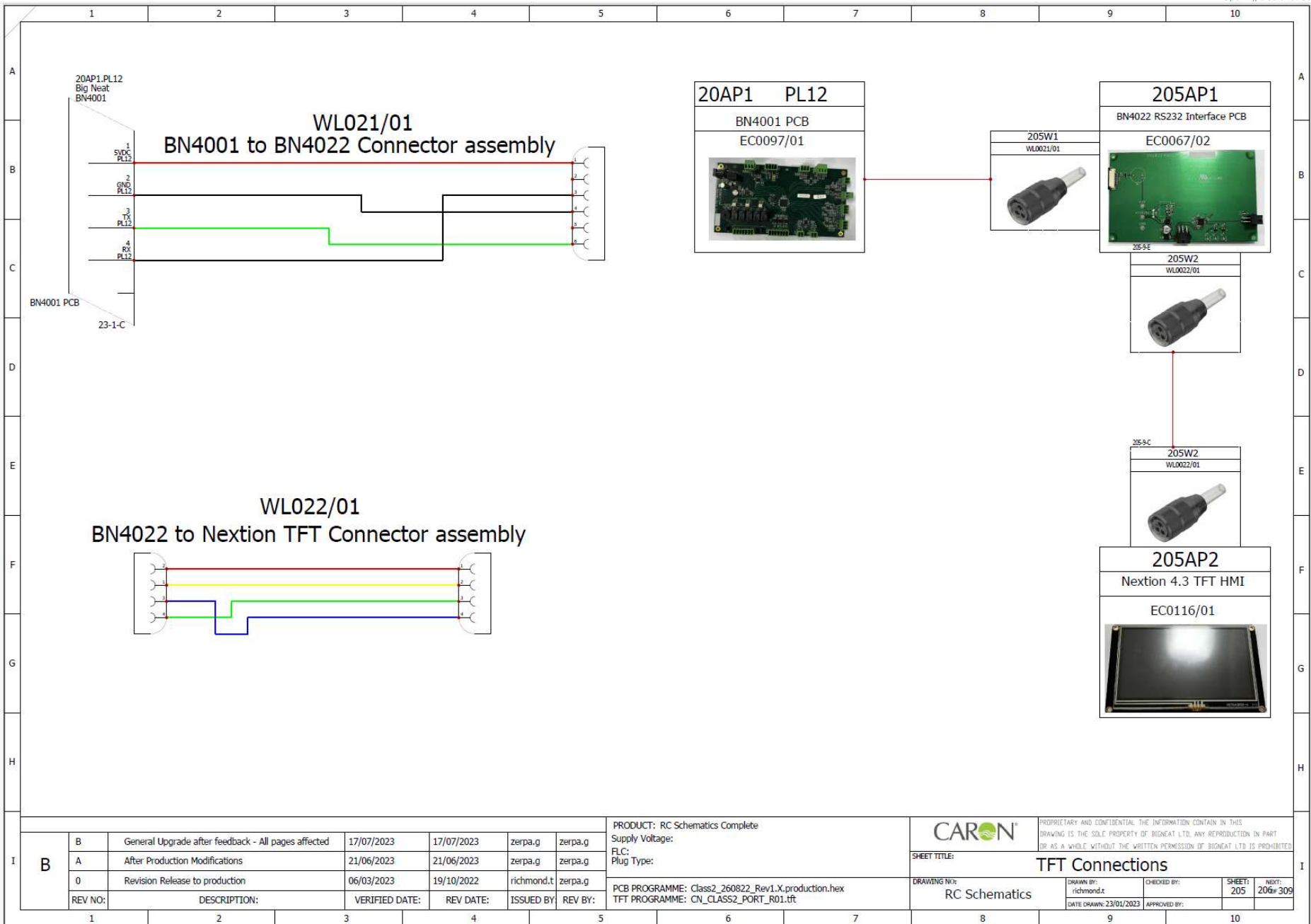




I	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g	PRODUCT: RC Schematics Complete Supply Voltage: FLC: Plug Type: PCB PROGRAMME: Class2_260822_Rev1.X_production.hex TFT PROGRAMME: CN_CLASS2_PORT_R01.tft	CARON SHEET TITLE: <b>Inflow Diagram</b>	PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAIN IN THIS DRAWING IS THE SOLE PROPERTY OF BIGNET LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIGNET LTD IS PROHIBITED				
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g			DRAWING NO: RC Schematics	DRAWN BY: richmond.t	CHECKED BY:	SHEET: 203	NOX: 204+ 309
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g			DATE DRAWN: 23/01/2023	APPROVED BY:			
	REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:							



I	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g	PRODUCT: RC Schematics Complete Supply Voltage: FLC: Plug Type: PCB PROGRAMME: Class2_260822_Rev1.X.production.hex TFT PROGRAMME: CN_CLASS2_PORT_R01.tft	CARON® SHEET TITLE: Lights Diagram	PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAIN IN THIS DRAWING IS THE SOLE PROPERTY OF BIONEAT LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIONEAT LTD IS PROHIBITED				
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	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g			DATE DRAWN: 23/01/2023	APPROVED BY:			
	REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:							



B	A	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g
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	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g
	REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:

PRODUCT: RC Schematics Complete  
Supply Voltage:  
FLC:  
Plug Type:

PCB PROGRAMME: Class2\_260822\_Rev1.X\_production.hex  
TFT PROGRAMME: CN\_CLASS2\_PORT\_R01.tft

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SHEET TITLE: **TFT Connections**

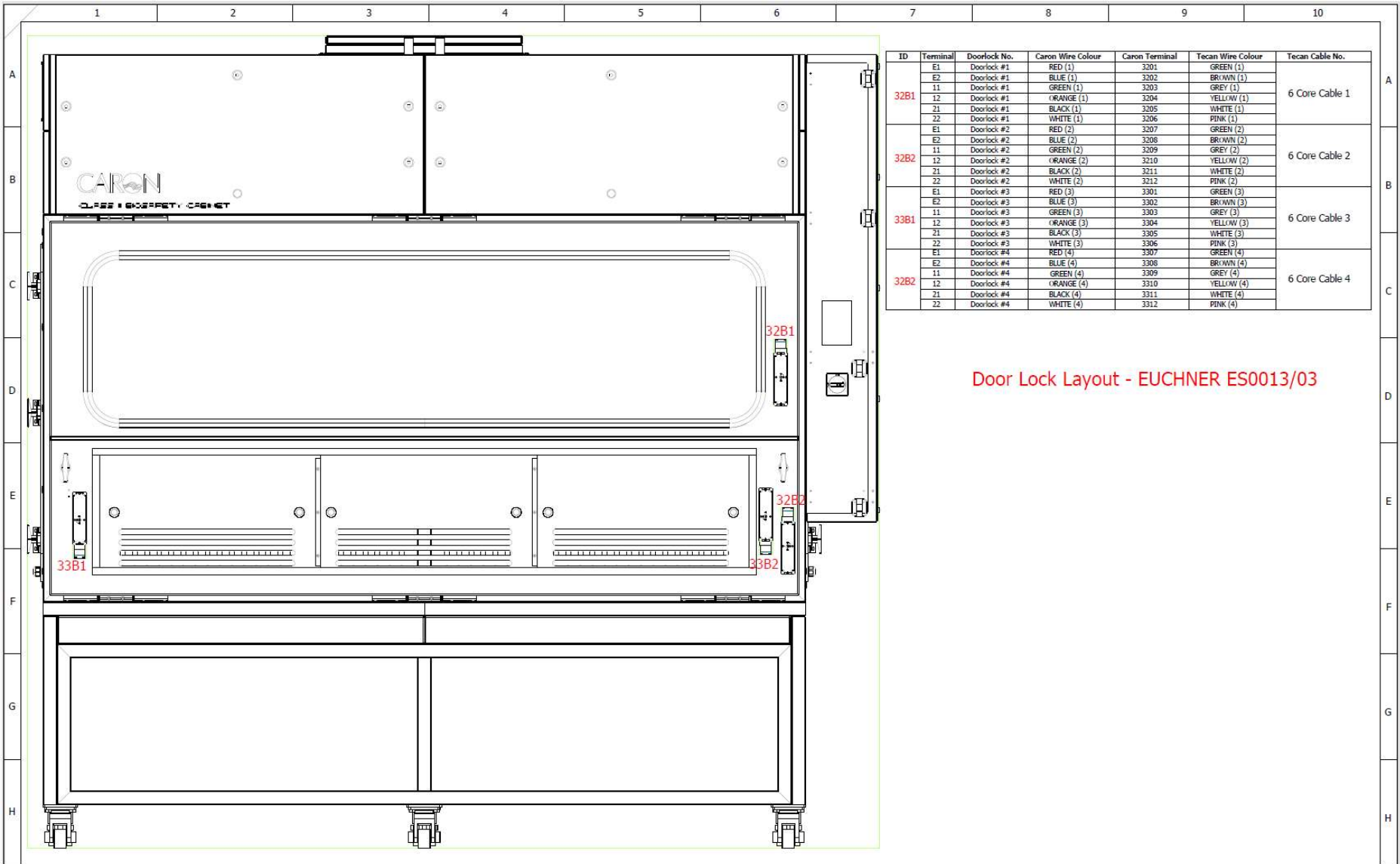
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DRAWN BY: richmond.t  
DATE DRAWN: 23/01/2023

CHECKED BY:  
APPROVED BY:

SHEET: 205  
NEXT: 206 of 309





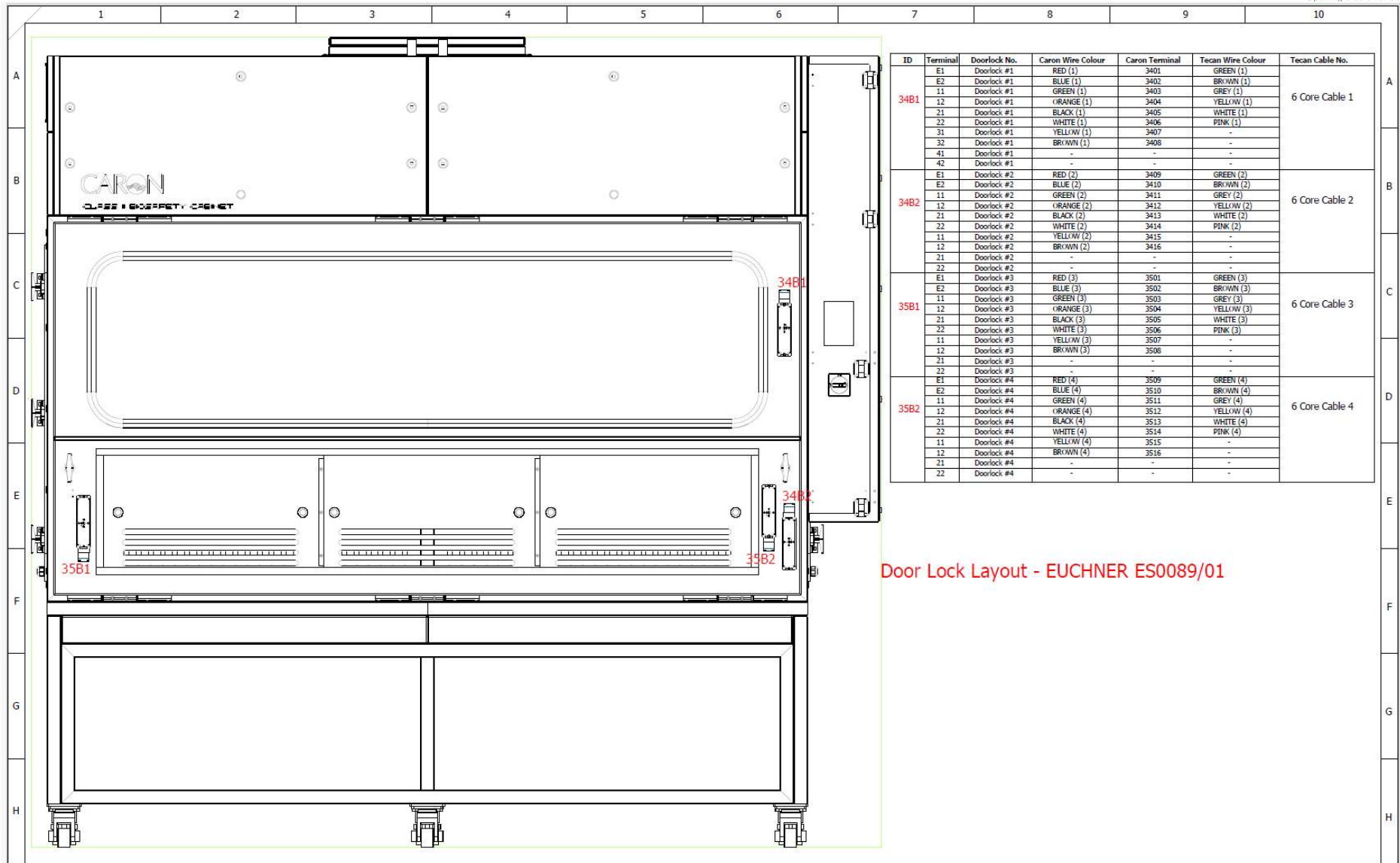
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32B1	E1	Doorlock #1	RED (1)	3201	GREEN (1)	6 Core Cable 1
	E2	Doorlock #1	BLUE (1)	3202	BROWN (1)	
	11	Doorlock #1	GREEN (1)	3203	GREY (1)	
	12	Doorlock #1	ORANGE (1)	3204	YELLOW (1)	
32B2	21	Doorlock #1	BLACK (1)	3205	WHITE (1)	6 Core Cable 2
	22	Doorlock #1	WHITE (1)	3206	PINK (1)	
	E1	Doorlock #2	RED (2)	3207	GREEN (2)	
	E2	Doorlock #2	BLUE (2)	3208	BROWN (2)	
33B1	11	Doorlock #2	GREEN (2)	3209	GREY (2)	6 Core Cable 3
	12	Doorlock #2	ORANGE (2)	3210	YELLOW (2)	
	21	Doorlock #2	BLACK (2)	3211	WHITE (2)	
	22	Doorlock #2	WHITE (2)	3212	PINK (2)	
33B2	E1	Doorlock #3	RED (3)	3301	GREEN (3)	6 Core Cable 4
	E2	Doorlock #3	BLUE (3)	3302	BROWN (3)	
	11	Doorlock #3	GREEN (3)	3303	GREY (3)	
	12	Doorlock #3	ORANGE (3)	3304	YELLOW (3)	
33B1	21	Doorlock #3	BLACK (3)	3305	WHITE (3)	6 Core Cable 4
	22	Doorlock #3	WHITE (3)	3306	PINK (3)	
	E1	Doorlock #4	RED (4)	3307	GREEN (4)	
	E2	Doorlock #4	BLUE (4)	3308	BROWN (4)	
33B2	11	Doorlock #4	GREEN (4)	3309	GREY (4)	6 Core Cable 4
	12	Doorlock #4	ORANGE (4)	3310	YELLOW (4)	
	21	Doorlock #4	BLACK (4)	3311	WHITE (4)	
	22	Doorlock #4	WHITE (4)	3312	PINK (4)	

Door Lock Layout - EUCHNER ES0013/03

REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:
B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g
A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g
0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g

PRODUCT: RC Schematics Complete
Supply Voltage:
FLC:
Plug Type:
PCB PROGRAMME: Class2_260822_Rev1.X_production.hex
TFT PROGRAMME: CN_CLASS2_PORT_R01.tft

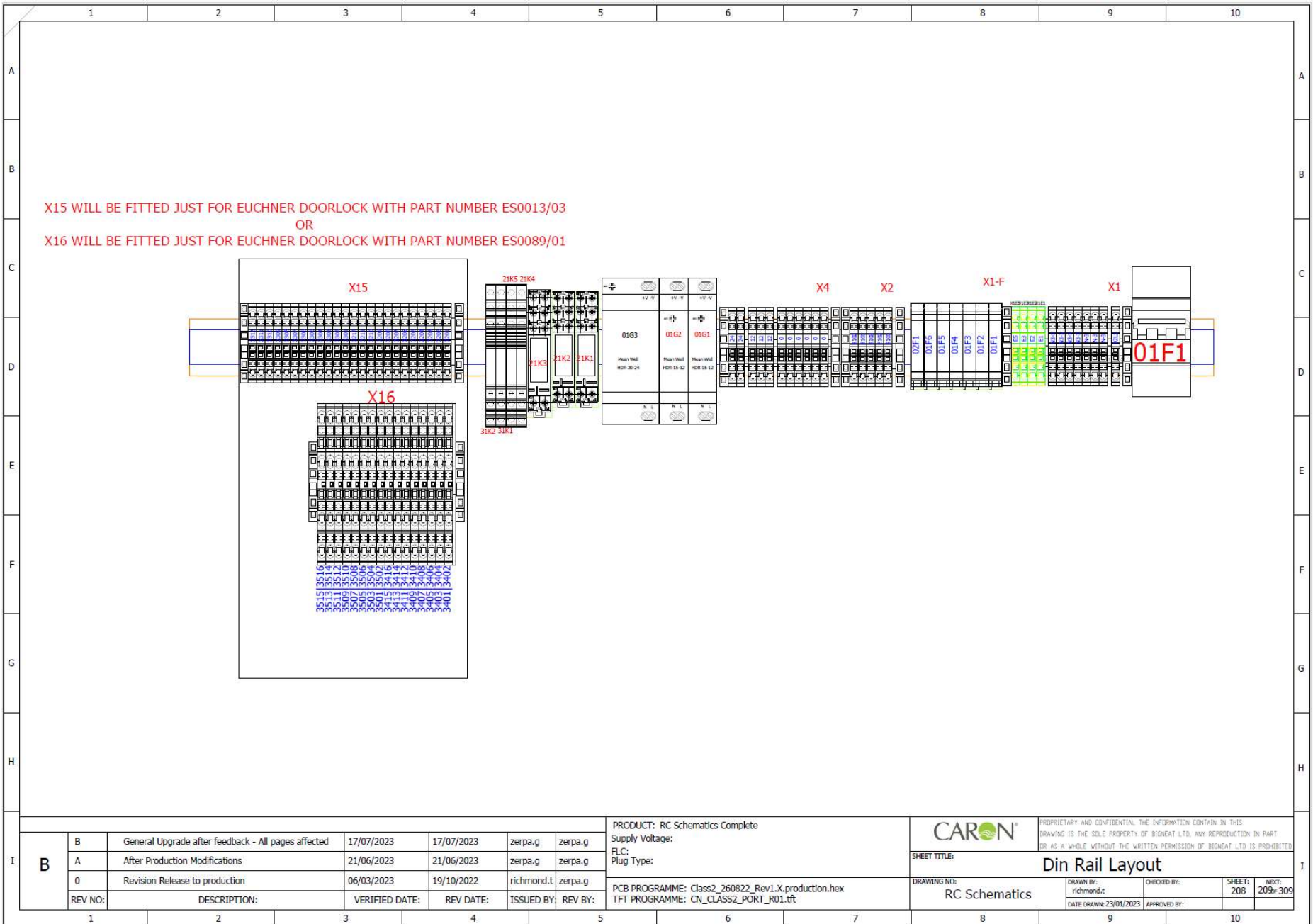
		<small>PROPRIETARY AND CONFIDENTIAL. THE INFORMATION CONTAIN IN THIS DRAWING IS THE SOLE PROPERTY OF BIOCAT LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIOCAT LTD IS PROHIBITED</small>	
SHEET TITLE:		Door lock layout 1	
DRAWING NO:	RC Schematics	DRAWN BY:	richmond.t
DATE DRAWN:	23/01/2023	CHECKED BY:	
		APPROVED BY:	
SHEET:	206	NEXT:	207 of 309



ID	Terminal	Doorlock No.	Caron Wire Colour	Caron Terminal	Tecan Wire Colour	Tecan Cable No.
34B1	E1	Doorlock #1	RED (1)	3401	GREEN (1)	6 Core Cable 1
	E2	Doorlock #1	BLUE (1)	3402	BR/WN (1)	
	11	Doorlock #1	GREEN (1)	3403	GREY (1)	
	12	Doorlock #1	ORANGE (1)	3404	YELLOW (1)	
	21	Doorlock #1	BLACK (1)	3405	WHITE (1)	
	22	Doorlock #1	WHITE (1)	3406	PINK (1)	
	31	Doorlock #1	YELLOW (1)	3407	-	
	32	Doorlock #1	BR/WN (1)	3408	-	
41	Doorlock #1	-	-	-	-	
42	Doorlock #1	-	-	-	-	
34B2	E1	Doorlock #2	RED (2)	3409	GREEN (2)	6 Core Cable 2
	E2	Doorlock #2	BLUE (2)	3410	BR/WN (2)	
	11	Doorlock #2	GREEN (2)	3411	GREY (2)	
	12	Doorlock #2	ORANGE (2)	3412	YELLOW (2)	
	21	Doorlock #2	BLACK (2)	3413	WHITE (2)	
	22	Doorlock #2	WHITE (2)	3414	PINK (2)	
	11	Doorlock #2	YELLOW (2)	3415	-	
	12	Doorlock #2	BR/WN (2)	3416	-	
21	Doorlock #2	-	-	-	-	
22	Doorlock #2	-	-	-	-	
35B1	E1	Doorlock #3	RED (3)	3501	GREEN (3)	6 Core Cable 3
	E2	Doorlock #3	BLUE (3)	3502	BR/WN (3)	
	11	Doorlock #3	GREEN (3)	3503	GREY (3)	
	12	Doorlock #3	ORANGE (3)	3504	YELLOW (3)	
	21	Doorlock #3	BLACK (3)	3505	WHITE (3)	
	22	Doorlock #3	WHITE (3)	3506	PINK (3)	
	11	Doorlock #3	YELLOW (3)	3507	-	
	12	Doorlock #3	BR/WN (3)	3508	-	
21	Doorlock #3	-	-	-	-	
22	Doorlock #3	-	-	-	-	
35B2	E1	Doorlock #4	RED (4)	3509	GREEN (4)	6 Core Cable 4
	E2	Doorlock #4	BLUE (4)	3510	BR/WN (4)	
	11	Doorlock #4	GREEN (4)	3511	GREY (4)	
	12	Doorlock #4	ORANGE (4)	3512	YELLOW (4)	
	21	Doorlock #4	BLACK (4)	3513	WHITE (4)	
	22	Doorlock #4	WHITE (4)	3514	PINK (4)	
	11	Doorlock #4	YELLOW (4)	3515	-	
	12	Doorlock #4	BR/WN (4)	3516	-	
21	Doorlock #4	-	-	-	-	
22	Doorlock #4	-	-	-	-	

Door Lock Layout - EUCHNER ES0089/01

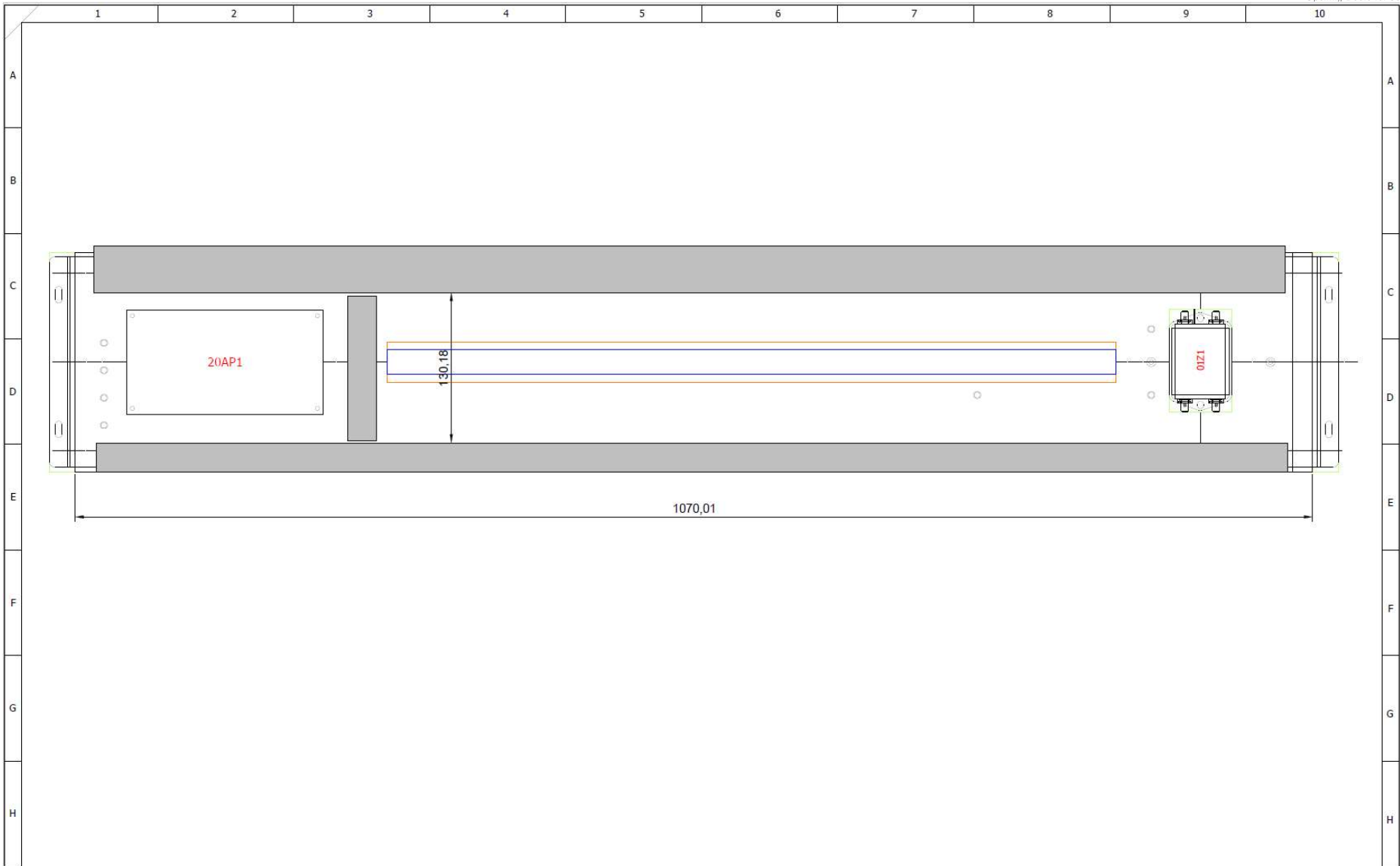
I	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g	PRODUCT: RC Schematics Complete Supply Voltage: FLC: Plug Type: PCB PROGRAMME: Class2_260822_Rev1.X_production.hex TFT PROGRAMME: CN_CLASS2_PORT_R01.tft	PROPRIETARY AND CONFIDENTIAL. THE INFORMATION CONTAIN IN THIS DRAWING IS THE SOLE PROPERTY OF BIOHEAT LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIOHEAT LTD IS PROHIBITED.	
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g			
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g			
	REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:			
SHEET TITLE: Door lock layout 2		DRAWING NO: RC Schematics		DRAWN BY: richmond.t		CHECKED BY:		SHEET: 207	NO. OF: 208 of 309
				DATE DRAWN: 23/01/2023		APPROVED BY:			



B	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g
	REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:

PRODUCT: RC Schematics Complete
Supply Voltage:
FLC:
Plug Type:
PCB PROGRAMME: Class2_260822_Rev1.X.production.hex
TFT PROGRAMME: CN_CLASS2_PORT_R01.tft

		<small>PROPRIETARY AND CONFIDENTIAL. THE INFORMATION CONTAIN IN THIS DRAWING IS THE SOLE PROPERTY OF BIODAC LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIODAC LTD IS PROHIBITED.</small>			
SHEET TITLE:		Din Rail Layout			
DRAWING NO:	RC Schematics	DRAWN BY:	CHECKED BY:	SHEETS:	NEXT:
		richmond.t		208	209# 309
		DATE DRAWN: 23/01/2023	APPROVED BY:		



I	B	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g	<b>PRODUCT:</b> RC Schematics Complete <b>Supply Voltage:</b> <b>FLC:</b> <b>Plug Type:</b>		<small>PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAIN IN THIS DRAWING IS THE SOLE PROPERTY OF BIGNEAUT LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIGNEAUT LTD IS PROHIBITED</small>			
		A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g						
		0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g	<b>PCB PROGRAMME:</b> Class2_260822_Rev1.X_production.hex <b>TFT PROGRAMME:</b> CN_CLASS2_PORT_R01.tft	<b>SHEET TITLE:</b> Back plate Layout	<b>DRAWING NO:</b> RC Schematics	<b>DRAWN BY:</b> richmond.t <small>DATE DRAWN: 23/01/2023</small>	<b>CHECKED BY:</b> <small>APPROVED BY:</small>	<b>SHEET:</b> 209 <b>NEXT:</b> 210 of 309
		REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:						

ITEM	PAGE	ID	FUNCTION
1	50	200XD1.A	Downflow Power 1
1	50	200XD1.B	Downflow Power 2
1	55	200XD1.C	Inflow Power
1	74	200XD1.D	UV Lights
2	-	-	-
3	50	50XD2	Downflow Signal
4	55	55XD2	Inflow Signal
5	22	22XD2	Downflow Annemometer
6	22	22XD5	Inflow Anemometer
7	30	30XD2	FSA Sensor 1
8	30	30XD5	FSA Sensor 2
9	31	31XD2	Reed Switch 1
10	31	31XD5	Reed Switch 2
11	70	70XD2	White Lights
12	-	-	Client VFC
13	-	-	Safety Lock 1
14	-	-	Safety Lock 2
15	-	-	Safety Lock 3
16	-	-	Safety Lock 4
17	-	-	Client 6 Core Door cable
18	-	-	Client 6 Core Door cable
19	-	-	Client 6 Core Door cable
20	-	-	Client 6 Core Door cable
21	-	-	Earth Bond wire
22	-	-	-
23	-	-	-

B	B	General Upgrade after feedback - All pages affected	17/07/2023	17/07/2023	zerpa.g	zerpa.g
	A	After Production Modifications	21/06/2023	21/06/2023	zerpa.g	zerpa.g
	0	Revision Release to production	06/03/2023	19/10/2022	richmond.t	zerpa.g
	REV NO:	DESCRIPTION:	VERIFIED DATE:	REV DATE:	ISSUED BY:	REV BY:

PRODUCT: RC Schematics Complete
Supply Voltage:
FLC:
Plug Type:
PCB PROGRAMME: Class2_260822_Rev1.X_production.hex
TFT PROGRAMME: CN_CLASS2_PORT_R01.ft

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SHEET TITLE:		Gland Plate Layout	
DRAWING NO:	RC Schematics	DRAWN BY:	richmond.t
CHECKED BY:		DATE DRAWN:	23/01/2023
SHEET:	210	APPROVED BY:	
NEXT:	300-309		