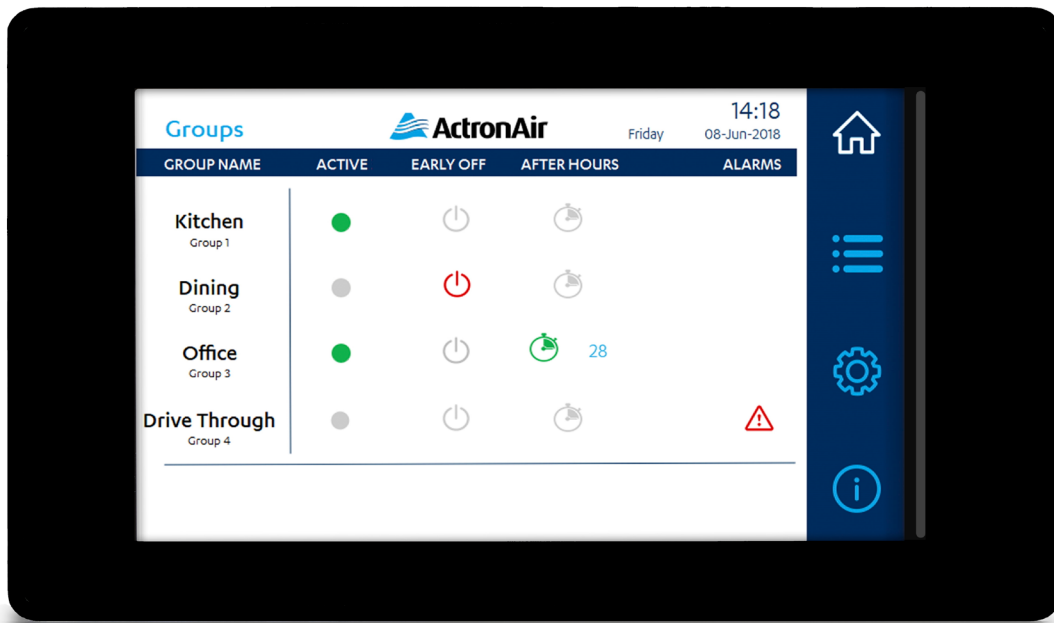# GROUP CONTROL
## Installation and Commissioning Guide



**CGT1000K**

**The single brand solution making group control simple and easy**

**IMPORTANT NOTE:**
Please read this manual carefully before installing the module on to the air conditioning unit.

**ActronAir**

# Table of Contents

ActronAir is constantly seeking ways to improve the design of its products, therefore specifications are subject to change without notice.        9590-3014

Copyright © 2018 Actron Engineering Pty. Ltd.        **Page 3 of 68**        Group Control Installation and Commissioning Guide Ver. 13  241022

# 01. Introduction

**CONGRATULATIONS** on your purchase of an ActronAir Group Control kit. This kit has been designed and engineered to give you a complete solution to control up to 15 A/C units from a single controller and user interface via touch screen and web access. The CGT100 provides central control and monitoring of your air conditioning system for optimum comfort, efficient operation and energy savings.

The procedures outlined in this manual are provided to correctly and safely install the ActronAir Group Control kit to control appropriate ActronAir A/C units.

Failure to follow these procedures may result in personal injury, damage to the control kit or incorrect operation of the A/C unit. Such failure could render your warranty null and void.

## 01.01.     Items to Consider

Carefully unpack the ActronAir Group Control kit from its packaging and ensure that all parts are included.

Fully check the contents of your kit against the content list upon receiving your shipment. Inspect the components and accessories for any sign of shipping damage. If there is any damage to the contents, contact ActronAir Customer Care Department immediately on: **1300 522 722.**

Take time to thoroughly read the installation and commissioning instructions before proceeding with the installation.

## 01.02.     Safety Instructions

Safety instructions and warnings provided in this installation manual are non-exhaustive and given as a guide only. Prevailing WH&S regulations should be observed and will take precedence to the safety instructions contained in this manual. Safe work practices and environment should be of paramount importance in the performance of all service procedures.

- Read all instructions in this manual before operating the system. Failure to do so may result in damage to the unit and controllers that may void your warranty.
- Turn-Off power from mains supply by removing the fuse or switching the circuit breaker to the OFF position before performing the installation procedures.
- Follow sound LOCK-OUT/TAG-OUT (LOTO) procedures to ensure that power supply is not re-energized accidentally.
- Ensure that all safety work procedures and instructions are adhered to at all times in order to prevent personal injury or damage to the equipment.
- Only licensed technicians are allowed to perform the procedures described in this guide.
- The ActronAir Group Control kit is NOT FOR OUTDOOR USE. Install the kit away from excessive dust, heat and moisture.
- The air conditioning electrical panel and the ActronAir Group Control kit contain static sensitive electronic components. Careful handling and correct anti-static procedures should be followed to prevent damage of the equipment. Failure to protect the electronic components from static electricity may cause unrepairable damage, that is NOT COVERED for replacement under Warranty.
- The instructions herein refer to work involving a Computer CPU Chip and Electronic CPU Board. Please ensure all Instructions are followed accurately so as to prevent damage to these fragile and delicate components.

## 01.03.     Codes, Regulations and Standards

The installer and/or contractor assumes responsibility to ensure that ActronAir Group Control kit installation and commissioning comply with the relevant council, state / federal codes, regulations and building code standards. All electrical wiring should be in accordance with current electrical authority regulations and all wiring connections to be as per electrical diagram provided with the unit.
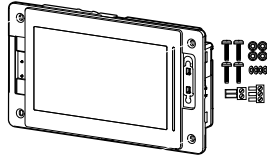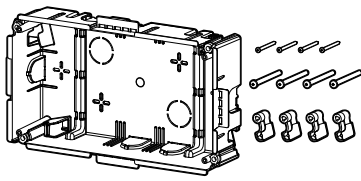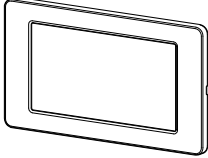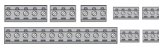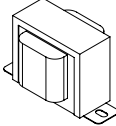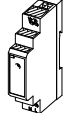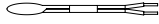
## 01.04.     Waste Electrical and Electronic Equipment Disposal Guidelines

- Do not dispose of the waste electrical and electronic equipment with local council waste. These should be disposed through the appropriate council designated waste disposal facilities.
- The equipment may contain hazardous substances. Improper or incorrect disposal may have a negative effect on human health and on the environment.
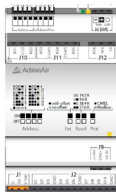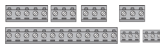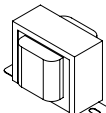
## 02. Parts Included In the Group Control kit (CGT1000K)

| Part Number | Items | Images | Quantity |
|---|---|---|---|
| CGT100 | Touch Screen Wall Control (Mounting brackets and Connectors are included) |  | 1 |
| CG100 | Main Controller |  | 1 |
| 26145-1 | Recess Mount |  | 1 |
| 26145-1 | Black Frame |  | 1 |
| 2020-164 | Main Controller Connector |  | 1 |
| 2045-184 | Transformer 240VAC/24VAC 20VA (with two spare 250VAC 2A fuses) |  | 1 |
| 20245-1 | Switched-Mode Power Supply (SMPS) (240VAC/24VDC 15W) |  | 1 |
| 2060-036 | Ambient Temperature Sensors |  | 1 |
| 2020-143 | Resistor 1/2 Watt 120Ω |  | 2 |

**Note:**

Expansion Module kit (CG10K) needs to be purchased separately. One CG10K is required for every unit.

**CG10K Parts List**

| Part Number | Items | Images | Quantity |
|---|---|---|---|
| CG10 | Expansion Module |  | 1 |
| 2020-166 | Expansion Module Connectors |  | 1 |
| 2045-184 | Transformer 240VAC/24VAC 20VA (with two spare 250VAC 2A fuses) |  | 1 |

## 03. Touch Screen Wall Control (CGT100)

### 03.01.   Structure

The terminal's front panel houses the display, notification bar, temperature and humidity probe and front Micro USB Port. During normal operation, users can manage and supervise the various processes, browse screens and enter values by touching the keys on the screen keypad that is displayed for this purpose. On top and bottom are the mounting slots. The gasket is around the perimeter of the back of the screen. The product identification label can be found on the bottom and on the rear are the RS485 port and power supply connector. See drawing for locations.
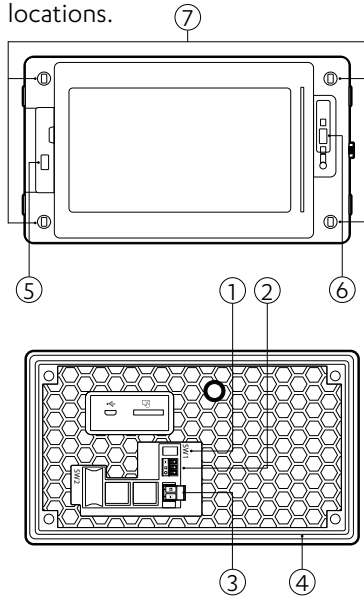
| Items | Description |
|-------|-------------|
| 1 | SW1 (Switch -manufacturer use only) |
| 2 | RS485 port COM1 |
| 3 | Power supply connector |
| 4 | Gasket |
| 5 | Temperature and humidity probe |
| 6 | Micro USB Port |
| 7 | Mounting slots x 4 |

## 04. Communication and Power Ports (CGT100)

The Touch Screen terminal features the following:
- RS485 serial port with 3-pin plug-in connector
- Micro USB port
- Power Supply port

The hardware features of the serial ports are shown below:
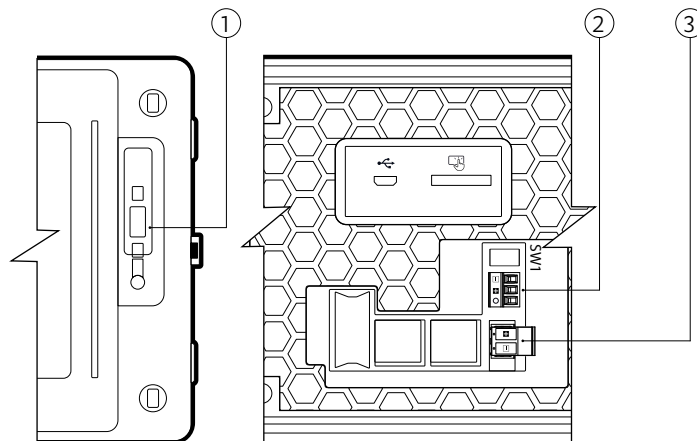
| Items | Ports | Description |
|-------|-------|-------------|
| 1 | Micro USB Port | Micro USB female (Manufacturer Use Only) |
| 2 | RS485 port COM1 | Driver HW: RS485 slave<br>Optically-isolated<br>Connector: 3-pin plug-in screw terminal, pitch 5.08 mm<br>Bit rate: max 115 Kb/s |
| 3 | Power supply | 24VDC |

# 05. Installation (CGT100)

### 05.01. Dimensions (mm)
### 05.01.01. Display
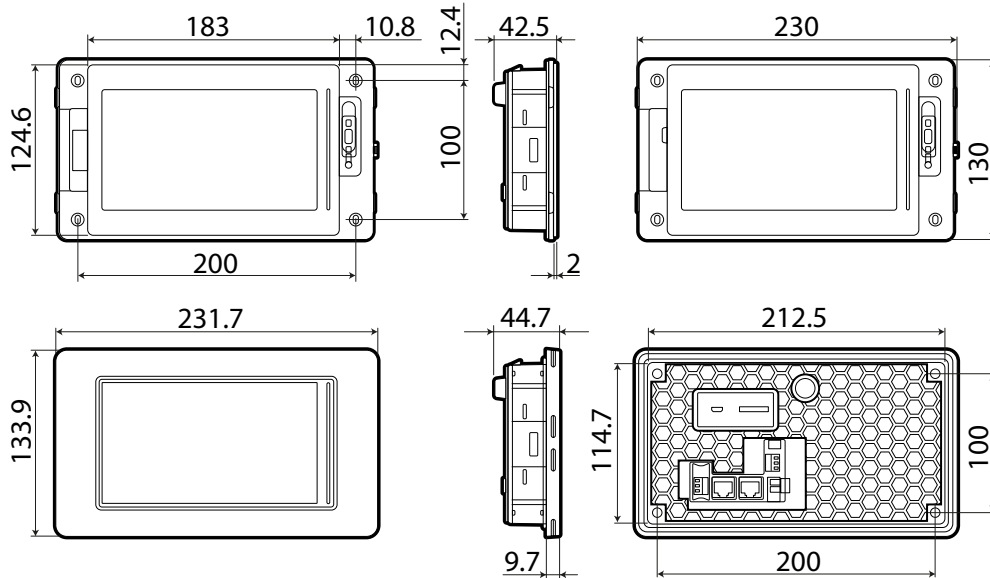


### 05.01.02. Recess Mount
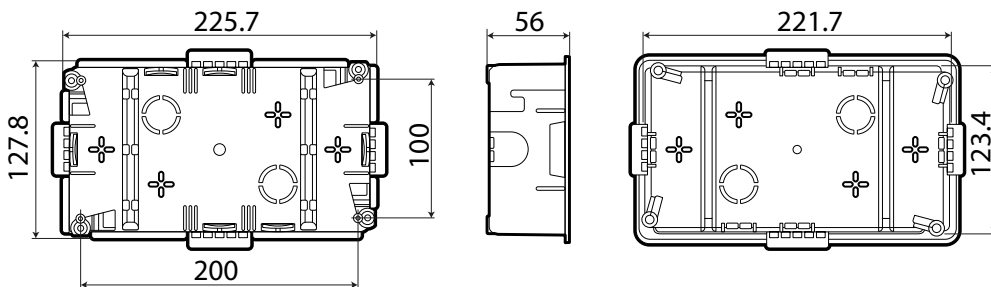


### 05.01.03. Wall Surface Installation (Option purchased separately: 26139-1)
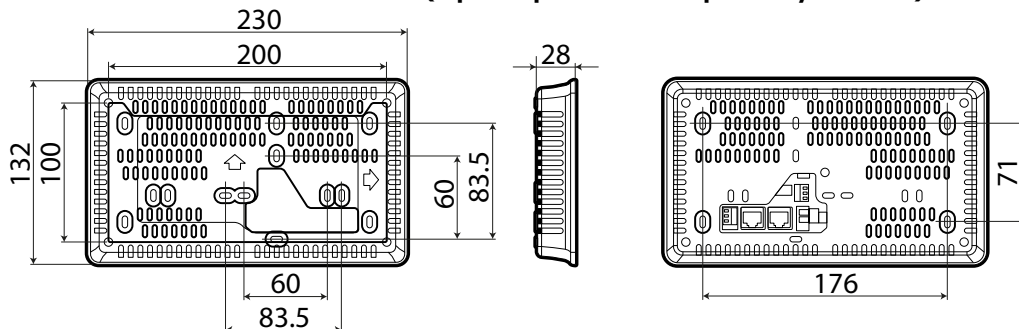


### 05.02. Installation Environment

The CGT100 is not designed to be continuously exposed to direct light. This may accelerate the ageing process of the front protection film.

The device should not be installed near corrosive chemicals. Make sure the front protection film can withstand a specific compound before installation. Do not use tools (e.g. screwdrivers) to operate the touchscreen terminal.

**Environmental Conditions**

Avoid assembling the controller and terminal in rooms with the following characteristics:

- Exposure to direct sunlight or the elements in general.
- Temperature and humidity that do not conform to rated operating data. The temperature range for operation is -20°C to 60°C, 5 to 85% RH (non-condensing).

- Large and rapid fluctuations in the room temperature.
- Strong magnetic and/or radio frequency interference (avoid installation near transmitting antenna).
- Strong vibrations or knocks.
- Environments where explosives or mixes of flammable gases are present.
- Exposure to aggressive and polluting atmospheres (e.g.: sulphur and ammonia fumes, saline mist, smoke) that cause corrosion and/or oxidation.
- Exposure to dust (tracking of corrosive patina with possible oxidation and reduction of insulation).
- Exposure to water.

## 05.03.    Preparing for Assembly

### 05.03.01.    Positioning

Do not install the controlling devices in a particularly hot environment as extreme temperatures may damage the electronic equipment.

⚠️ **Important:** Ensure there is sufficient airflow around CGT100 to avoid damage from excessive heat. Otherwise, the terminal may be damaged and the warranty will be void.

## 05.04.    Installation Detail

The Control can be installed either using the frontal screws or with a recess mount box. The drilling template used for assembly should have the dimensions shown in the diagram below:

### 05.04.01.    Frontal Installation

**Mounting Hole Detail (mm)**



M3 self-blocking inserts
or Ø 4.2 for screw
+ counter-screw
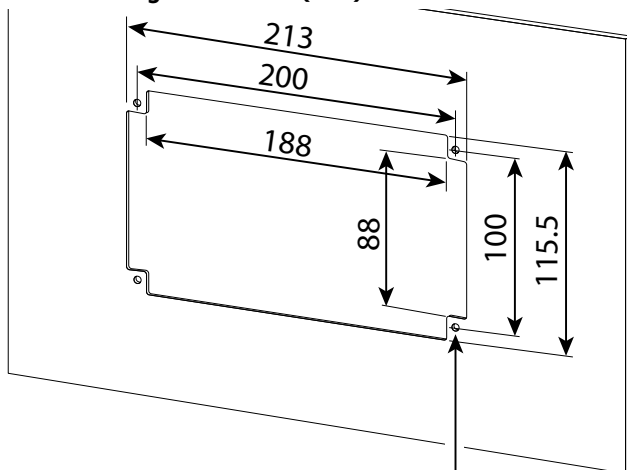
**NOTE**

Leave minimum of 40 mm clearance at the back of the terminal to allow;
i.   Adequate ventilation.
ii.  Adequate space for wiring and wiring terminals.

**Assembly**

**NOTE**

**IP66:** with gasket and sheet thickness from 1.2 - 6 mm.
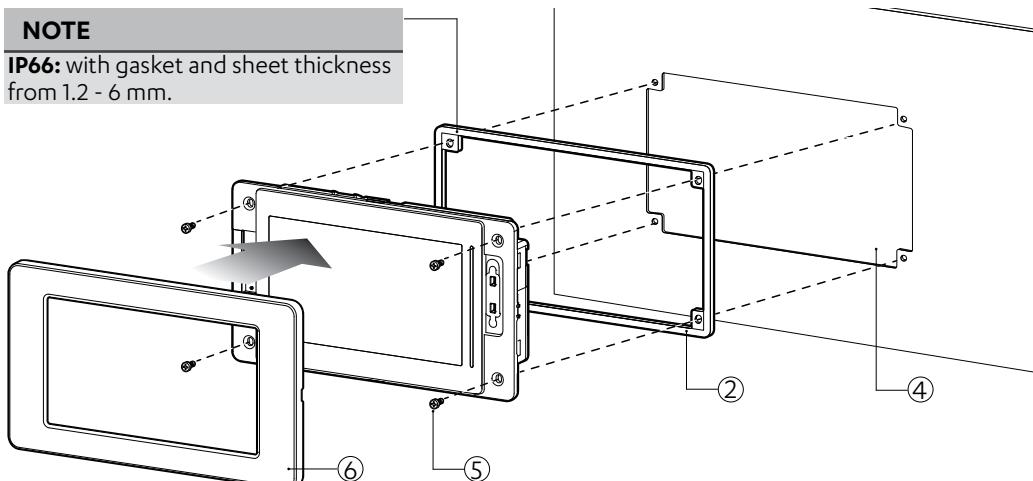
**Procedure:**

Step 1. Connect the provided terminals : black to the data and orange to the power supply cables.

Step 2. Ensure gasket is inserted.

Step 3. Connect the data and power supply cables to the control (see section Communication Ports for the location).

Step 4. Place the control in the opening.

Step 5. Tighten the M3 screws (x4 provided) with washer and nut to secure the control in the wall

Step 6. Press and close the black frame to the front of the control.

### 05.04.02.    Flush-mounted Wall Installation - Plasterboards

**Mounting Hole Detail (mm)**
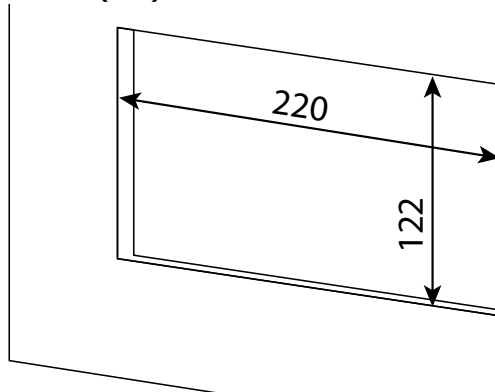


**Assembly**

> ⚠ **Caution**
>
> Recess mount box is not to be used as a junction box with mains power running in it. It is designed to use only the low voltage to power the display.
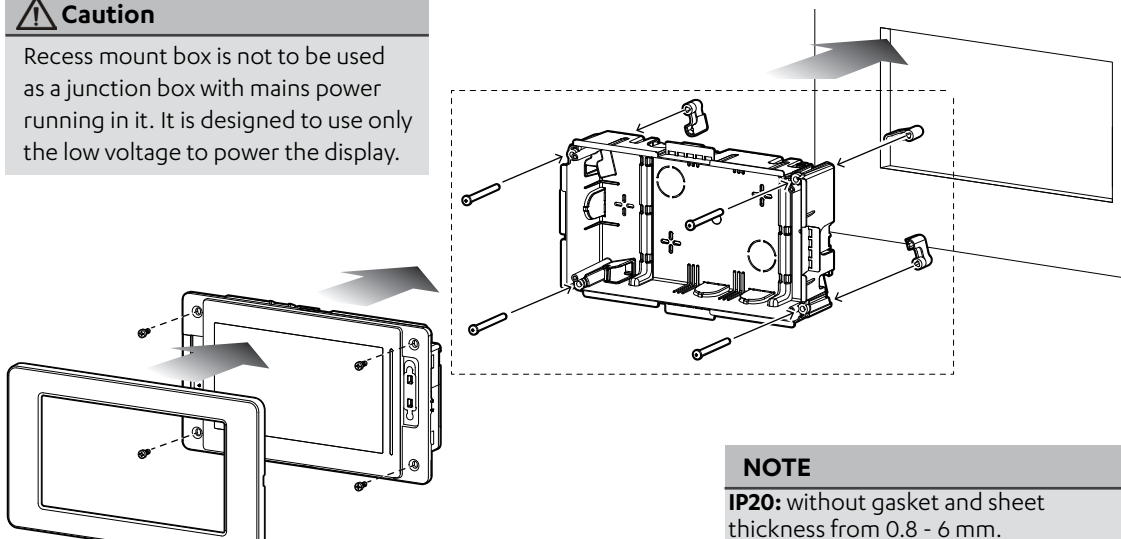


**NOTE**

**IP20:** without gasket and sheet thickness from 0.8 - 6 mm.

**Procedure:**

Step 1. Connect the screws and the wing clamps (x4 each provided) through the required screw holes. It should be loose enough to open and close the wing clamps.

Step 2. Close the wing clamps towards the recess mount box to fit the recess mount box through the wall cut-out.



Wing Clamp
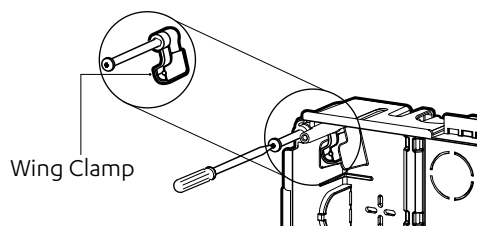
Step 3. Bring the data and power supply cable through any of the knockouts of the recess mount box.
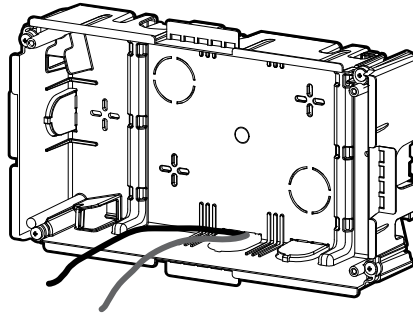
Step 4. Connect the provided terminals : black to the data and orange to the power supply cables.
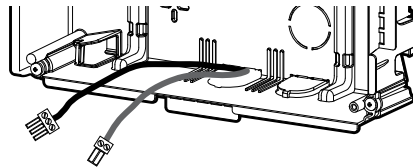
Step 5. Once the box is inside the cut-out, the snap-off plastic tabs will hold the box in place.
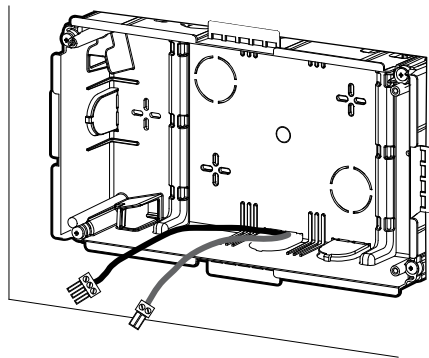
Step 6. Hold on to the box and use a screwdriver to push open the wing clamps towards the outside.

Step 7. Tighten the four screws, the snap-off tab will bend and snap off and the box will fit flush to the wall.
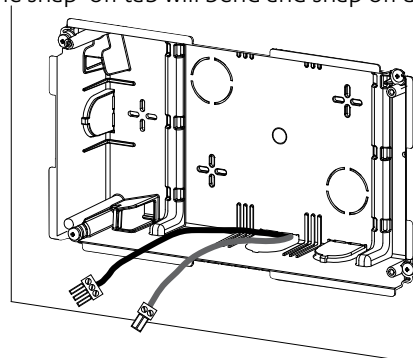
Step 8. Remove the rubber gasket behind the controller.

Step 9. Connect the data and power supply cables to the control (see section Communication Ports for the location).

Step 10. Fit the control to the recess mount box using the screws (x4) provided.
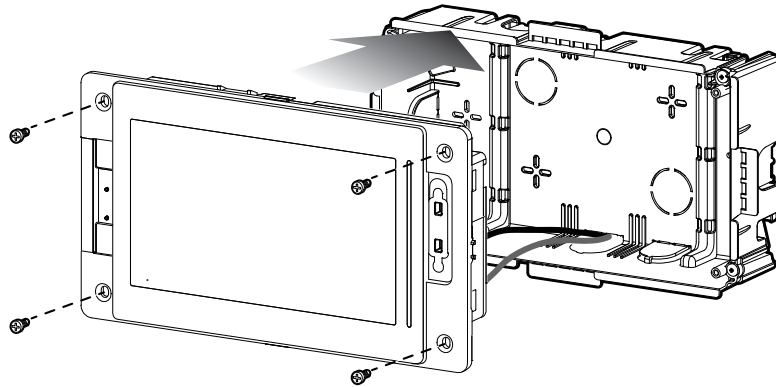


Step 11. Press and close the black frame to the front of the control.
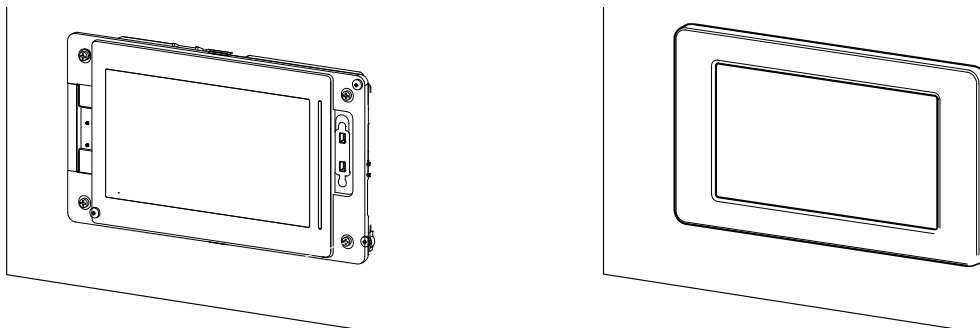


## 05.04.03.   Wall Surface Installation

**Assembly**
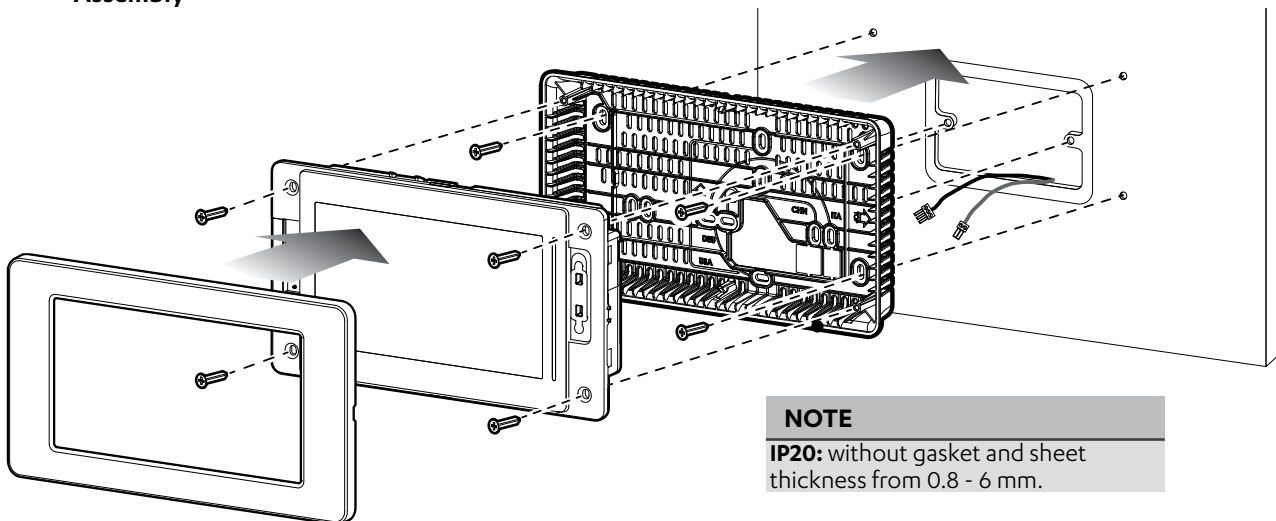


**NOTE**

**IP20:** without gasket and sheet thickness from 0.8 - 6 mm.

**Procedure:**

Step 1. Remove the black honey comb back grill and the rubber gasket from the control.

Step 2. Take out the data and power supply cable through the cutout of the wall box and connect the provided terminals : black to the data and orange to the power supply cables.

Step 3. Fix wall box securely using screws (x4) provided.

Step 4. Connect the data and power supply cables to the control (see section Communication Ports for the location)

Step 5. Press the control to the wall box until it clicks and secure it by the screws (x4) provided.

Step 6. Press and close the black frame to the front of the control.

### 05.05.  Electrical and Network Connections

Use the power supply provided in the kit , 24VDC SMPS 240VAC/24VDC 15W (20245-1).

### 05.05.01.  Mounting the SMPS (20245-1)

**Dimensions:** DIN rail modules, 90 x 18 x 58 mm (in accordance with DIN 43880 CEI EN 50022).
**Mounting:** fitted on DIN rail. Place the controller on the DIN rail and press it down gently. The tabs at the back will snap into place and lock the controller.

**Removing:** lift the tabs using a screwdriver applied to their release slots. The tabs are kept in place by springs.
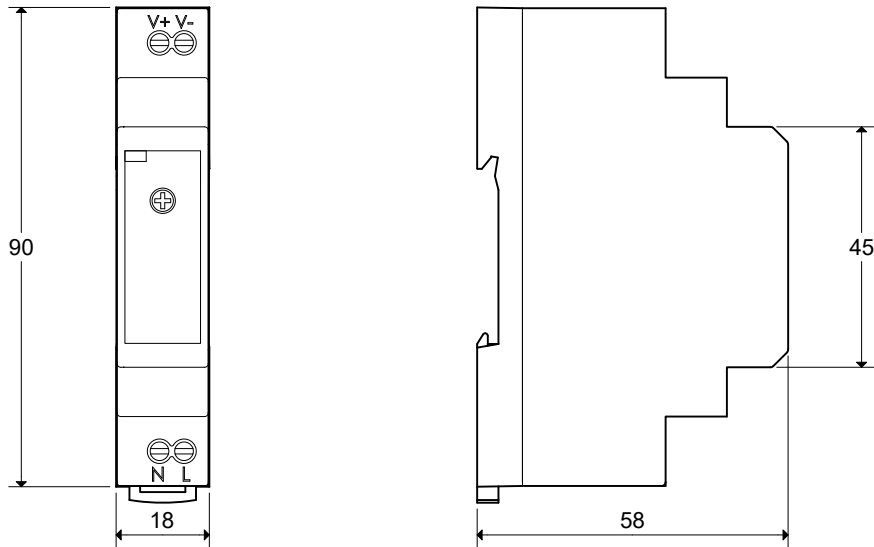
### 05.05.02.  Earth Connection
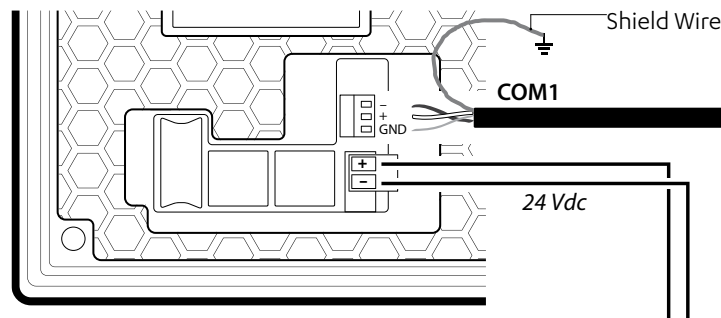
The shield wire of the COM1 data cable should be earthed. This helps limit the effects of control system disturbance due to electromagnetic interference. The earth connection should be made to an earthing point located near the controller. Ensure the shield wire is kept as short as possible.

⚠ Do not connect the earth to the power terminal.
Ensure that the polarity is correct when connecting the power supply. Refer to WD1002 wiring diagram for connection.

## 05.05.03. Wiring the Network

⚠ Do not exceed maximum recommended length in wiring the components.
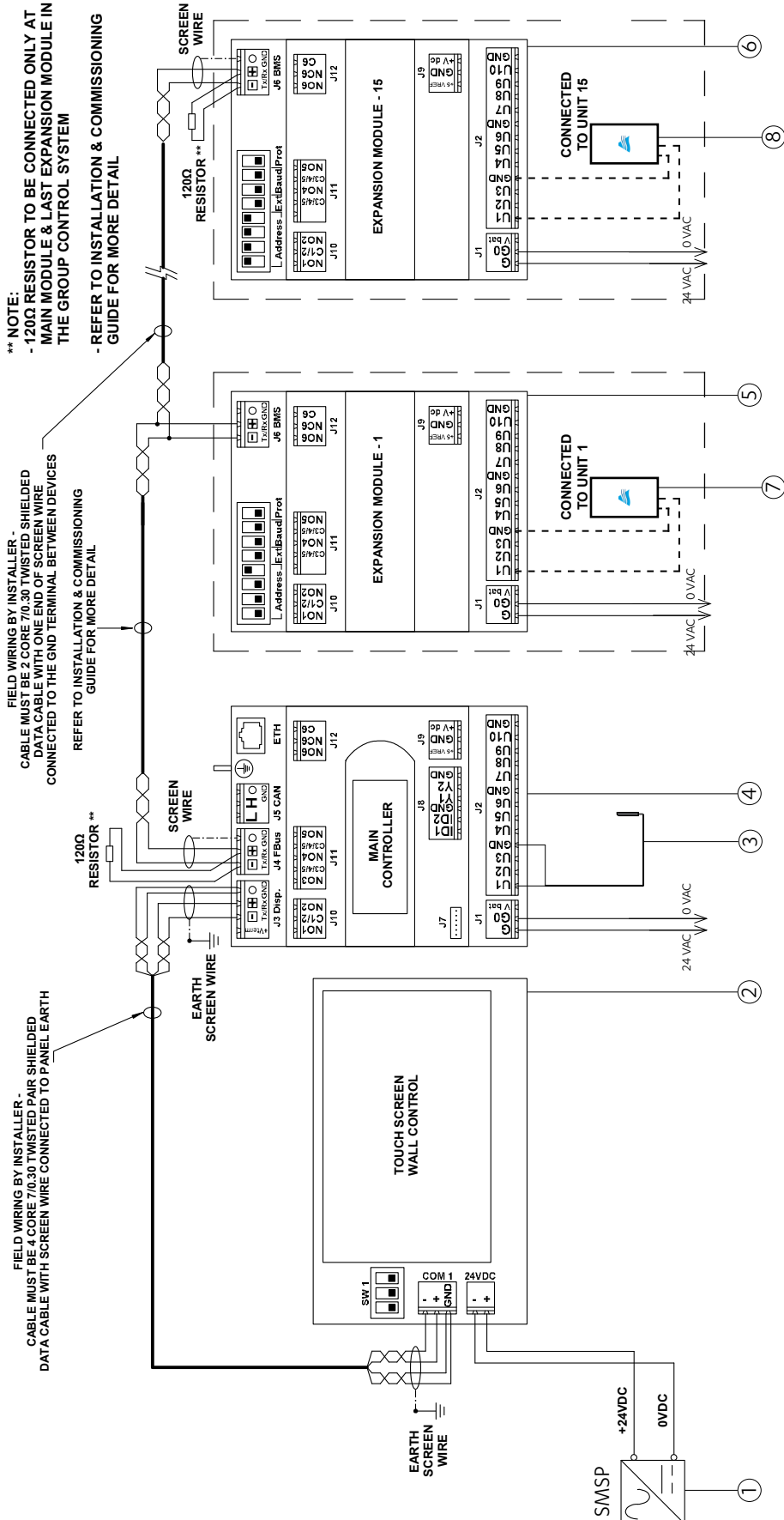


**MAXIMUM CABLE LENGTH BETWEEN DEVICES**

| Connection | Cable Type | Maximum Length |
|---|---|---|
| 1 to 2 | Power Cable | 12m for 1.5mm² / 8m for 1.0mm² |
| 2 to 4 | Data Cable | 500m |
| 3 to 4 | Signal Cable | 50m for 0.5mm² |
| 4 to 5 to 6 (Maximum 15 x CGIO) | Data Cable | 500m total cummulative length |
| 5 to 7 / 6 to 8 | Signal Cable | 50m for 0.5mm² |

| | Device |
|---|---|
| 1 | 20245-1 |
| 2 | CGTIOO |
| 3 | 2060-036 |
| 4 | CGIOO |
| 5 | CGIO |
| 6 | CGIO |
| 7 | LM-RS (optional) |
| 8 | LM-RS (optional) |

## 06. Main Controller (CG100)

The Main Controller (CG100) is a microprocessor-based, programmable electronic controller, featuring a multitasking operating system, which includes programmable controllers, user terminals, gateways, communication devices and remote management devices.

These devices represent a powerful control system that can be easily interfaced with the Touch Screen Wall Control (CGT100) and Expansion Module (CG10).

### 06.01. Structure/Terminal Connections

The front panel contains a display and a keypad with 6 backlit buttons that, when pressed individually or in combination, allow the following operations:
- Uploading an application program.
- Turn ON/OFF the whole group control system.
- Set the TCP/IP network parameter.
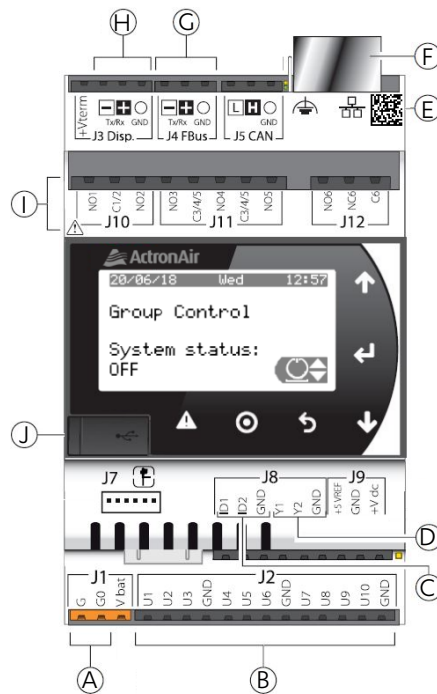


| Items | Label | Description | | Items | Label | Description |
|-------|-------|-------------|---|-------|-------|-------------|
| A | J1 | Power connector [G(+), G0(-)] | | F | Ethernet port symbol | Ethernet port |
| B | J2 | Universal inputs/outputs | | G | J4 FBus | Expansion Modules network |
| C | J8 | Digital inputs (Reserved) | | H | J3 Disp | Display port CGT100 |
| D | J8 | Analogue outputs (Reserved) | | I | J10 | Relay digital outputs |
| E | 000A5C 4B138B (MAC label) | MAC address label | | J | Micro USB symbol | Micro USB (Manufacturer Use Only) |

### 06.02.    Mounting and Dimensions

**Dimensions:** DIN rail modules, 70 x 110 x 60 mm (in accordance with DIN 43880 CEI EN 50022).
 Mounting: fitted on DIN rail. Place the controller on the DIN rail and press it down gently. The tabs at the back will snap into place and lock the controller.

**Removing:** lift the tabs using a screwdriver applied to their release slots. The tabs are kept in place by springs.
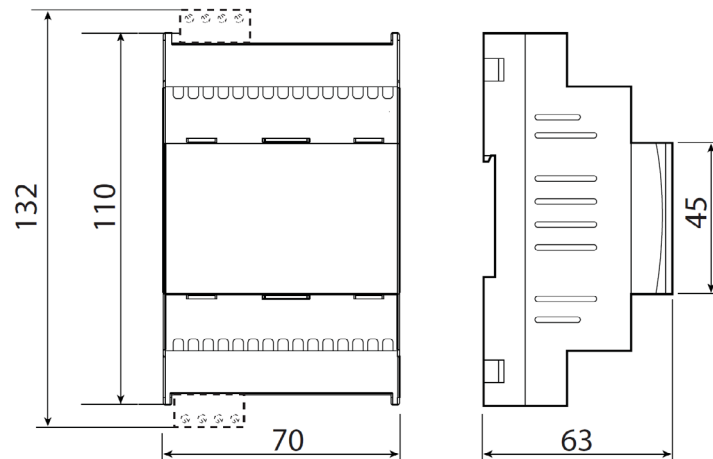


### 06.03.    Electrical Installation

⚠ **Important:** before servicing the equipment, isolate the controller from mains power.

Ensure the system is installed with a power disconnector conforming to regulations. Use cable lugs that are suitable for the terminals used. Loosen each screw and insert the cable lugs, then tighten the screws.  When tightening the terminal screws apply a tightening torque no greater than 0.6 N·m. The maximum allowable length of the connections to the analogue/digital inputs and to the analogue outputs is 100 m other than temperature sensor; temperature sensor maximum length is only 50 m. After making the connection, gently pull on the cables to ensure they are sufficiently tight.

**Note:**
- Secure the cables connected to the controller with clamps placed at 3 cm from the connectors.
- Earth the 0VAC of the power transformer secondary winding. Ensure the earth conductor is bonded to the conductor that is connected to the terminal G0 of CG100.

⚠ **Important:**
- To avoid damage to CG100, terminate wires to all connectors prior to plugging connectors to controller.
- Using a supply voltage other than specified can seriously damage the system and void the  warranty.
- The controller should only be installed, serviced and inspected by qualified personnel and in  compliance with national and local regulations.
- All the extra low voltage connections should have reinforced or double insulation from the power mains.
- Avoid touching the electronic components mounted on the boards to avoid electrostatic discharges from the operator to the components, which may cause considerable damage.
- Do not press the screwdriver on the connectors with excessive force, to avoid damaging the controller.
- Using the device in any way other than specified by the manufacturer can compromise its protection.
- Only connectors supplied with the kit shall be used.

Refer to WD0991 in Section **Group Control System Server Controller** for wiring of CG100.

### 06.04. Power Supply

Only use the transformer that is supplied with the kit. See the Wiring Diagram for details.

The figure below shows the power supply connection diagram.
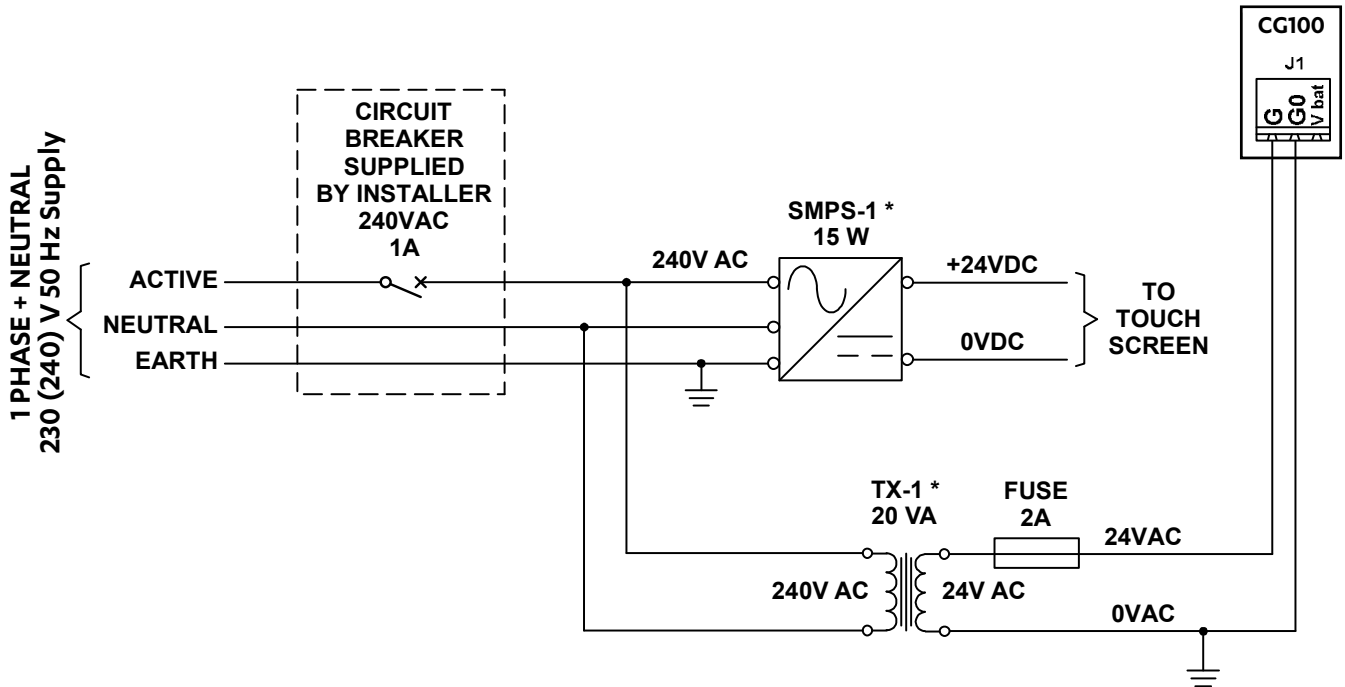


**\*Note:**
SMPS-1 240VAC/24VDC 15W Switch Mode Power Supply will power 1 x CGT100 only.
TX-1 240VAC/24VAC 20VAC 20VA Transformer will power 1 x CG100 only.

⚠️ **Important:**
- Power CG100 with the transformer provided in the kit with the 0VAC of the secondary winding earthed.
- Using a supply voltage other than specified can seriously damage the controller.
- Make sure that the earth conductor is connected to terminal G0. This applies to all the devices connected to the CG100 through a serial network.
- The power supply to CG100 should be kept separate from the power supply to the other electrical devices (contactors and other electromechanical components) inside the electrical panel.

**Note:** When the controller is powered, the yellow LED lights up.

### 06.05. Operating Conditions

Storage: -30 To 70 °C, 90% RH non-condensing

Operation: -20 To 60 °C, 90% RH non-condensing

### 06.06. Network Communications

### 06.06.01. Ethernet Network Connections and Connectors

It is recommend to use Cat5e UTP or above Ethernet Cable (IEC11801 and EIA/TIA 568 Compliant).

The maximum length of an Ethernet connection is 100 m between consecutive devices.

### 06.06.02. RS-485 Network

To improve the controller immunity against electromagnetic interference, the serial connection cable should be a shielded twisted pair cable, 2 core twisted pair shielded or 4 core two twisted pair shielded depending on the isolation of the serial connection. The following rule applies:

The serial port (J3 Disp) is isolated (functionally) from the power supply. A third wire is required in the serial cable to act as a common reference for the controllers. The serial port (J4 FBus) is not optically isolated and the common reference is already present, no third wire is required.

For the RS-485 network, use a shielded twisted pair cable. The maximum allowable total cumulative data cable length between all devices is 500 m.

**Note:** Apply 120Ω, 1/2W terminating resistors to the first and last devices in the network. Use the 120Ω resistor as provided in the kit.

⚠ **Important:** Any Earth connections made to any controllers shall be from a common main earth point.

### 06.06.03. Procedure for Earthing the Shield

The shield of the serial cable is earthed according figure shown below where:
J4 FBus terminal on the Main Controller (CG100) and J6 terminal on the Expansion module.

Earth only one end of the serial cable shield (shield connected to every second device).
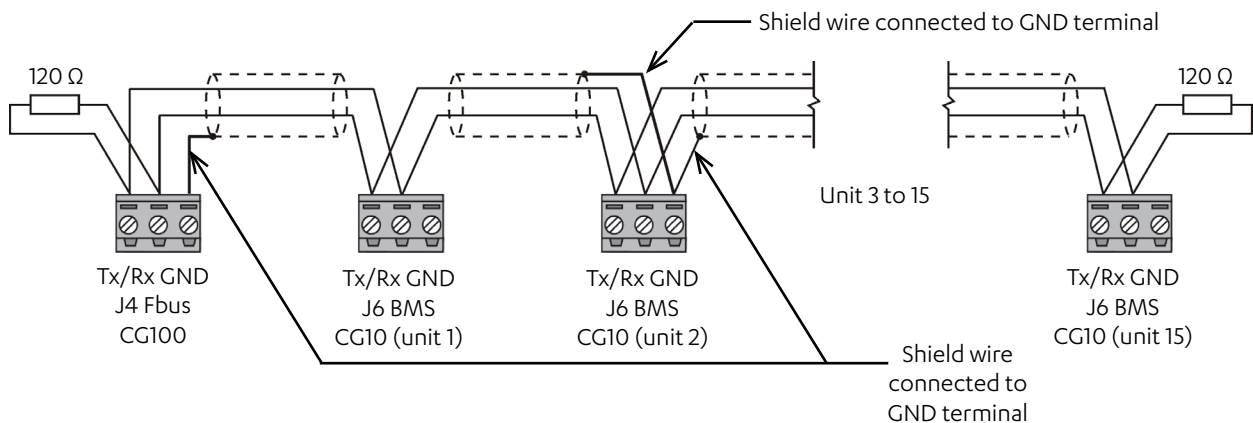


### 06.07. Digital and Analogue Input/Output Connection

Recommended cable sizes to be used for the remote connection of the Digital and Analogue Inputs/Output is 1.0 mm.

⚠ **Important:**
- Connections should be less than 10 m long if the controller is installed in an industrial environment with potentially high EMC interference; do not exceed this length to avoid measurement errors.
- To avoid electromagnetic interference, keep the probe and digital input cables separate from the power cables as much as possible (at least 3 cm). Never run power cables and probe signal cables in the same conduits (including the ones in the electrical panels).

### 06.07.01.    Input/Output Table

The table below describes the Input/Output terminals and functions:

| Terminal Designator | Pin | Used for | Function of Terminal | Specification |
|---|---|---|---|---|
| J2 | U1 | Ambient Temperature sensor | Ambient Temperature sensor; range of -50.0°C to 99.9°C | 10k NTC |
| | U2 | Group1 After Hours button | N/O push button for group 1 time scheduler (2 sec hold time) | Voltage free contacts (pullup 2 kOhm) |
| | U3 | Group2 After Hours button | N/O push button for group 2 time scheduler (2 sec hold time) | |
| | U4 | Group3 After Hours button | N/O push button for group 3 time scheduler (2 sec hold time) | |
| | U5 | Group4 After Hours button | N/O push button for group 4 time scheduler (2 sec hold time) | |
| | U6 | Reserved/Not used | | |
| | U7 | | | |
| | U8 | | | |
| | U9 | | | |
| | U10 | | | |
| J10[2] | NO1 | Output 1-6 configurable for the following functions: Filter Dirty Notification, Alarm, Used for Range Hood, Internal Lighting, Outside Lighting, Signal,    Function, Schedule based, Manual operation | N/O programmable relay output 1 | NO EN 60730-1 Maximum Switchable Load: 250VAC/2A resistive |
| | NO2[1] | | N/O programmable relay output 2 | |
| J11[2] | NO3 | | N/O programmable relay output 3 | |
| | NO4 | | N/O programmable relay output 4 | |
| | NO5[1] | | N/O programmable relay output 5 | |
| J12[3] | NO6 | | N/O programmable relay output 6 | NO EN 60730-1 Maximum Switchable Load: 250VAC/1A resistive |

1. NO2 and NO5 with Solid State Relay assembly can be used to switch 15VA 110/230VAC or 15VA 24VAC.

2. Between J10 and J11 terminals there is basic insulation.

3. J12 has reinforced insulation from the two other terminals (J10 and 11). Consequently a different power supply can be usd.

### 06.07.02.    Universal Inputs

Universal inputs are distinguished by the letter U. They are configured to accept the following:

• NTC temperature sensor
• Voltage-free contact digital inputs and fast digital inputs.

⚠ **Important:**

• The universal inputs/outputs should be pre-configured to handle their respective signals from the application program.

• The universal inputs/outputs cannot be used as digital outputs.

### 06.07.03.    Digital Outputs

Digital Outputs are distinguished by the letter NO/NC and NO. Available signals that can be assigned to each output signal. Each output source may be configured as:

- Alarm
- Manual
- Filter Notification
- Scheduled Output (Group 1-4 see Operation Manual for application)

## 06.08.    Functions

### 06.08.01.    Turn ON and OFF

Step 1. Press the Up(↑) or Down(↓) arrows until power button (⊙) appears as below:
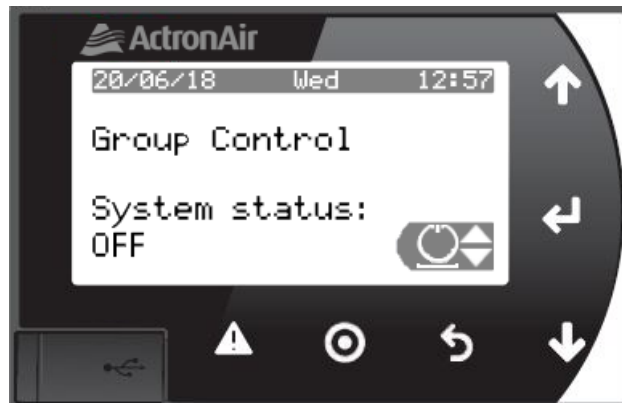


Step 2. Press the Enter button(↵) untill the screen below appears:



Step 3. Use the Up(↑) or Down(↓) arrows to set the system to ON, as shown below:

### 06.08.02.    Activating the Alarm in the CG100

Step 1. Press the Up( ↑ ) or Down( ↓ ) arrow until set button ( Set⇕ ) appears as shown below:
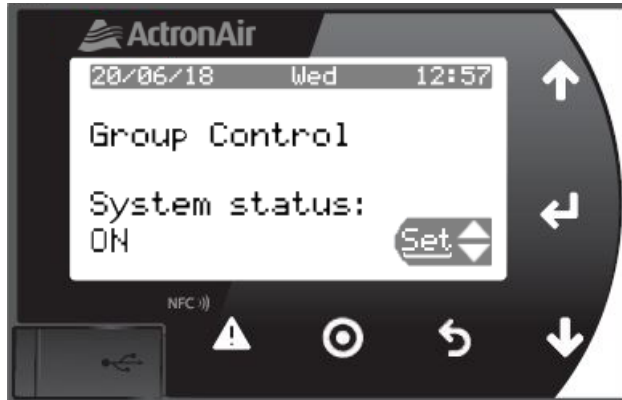


Step 2. Press the Enter button( ↵ ), the following screen will appear on the display screen: By default, all units are set to NO.
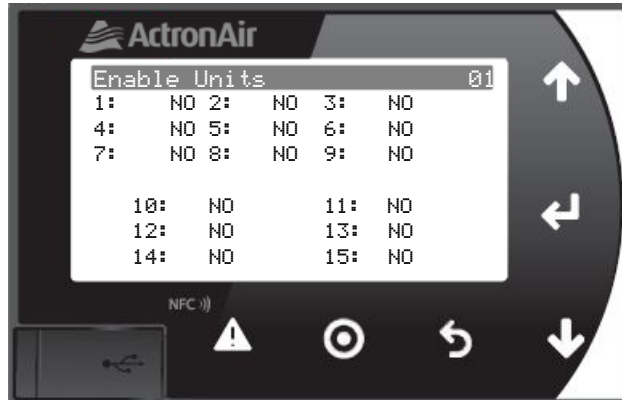


Step 3. Press Enter button( ↵ ) to select the first Unit. Unit 1 will be blinking.
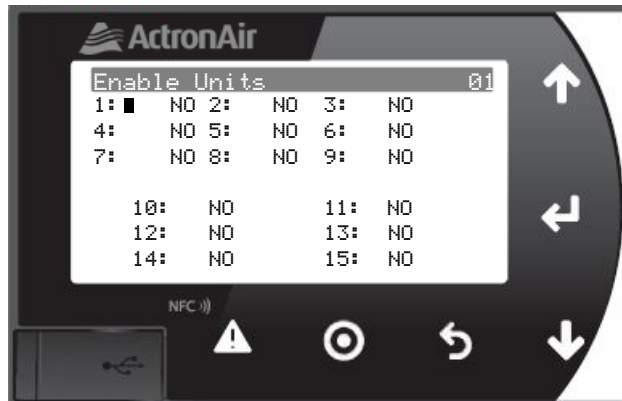


Step 4. Press the Up( ↑ ) or Down( ↓ ) arrow to change the setting to YES on Unit 1
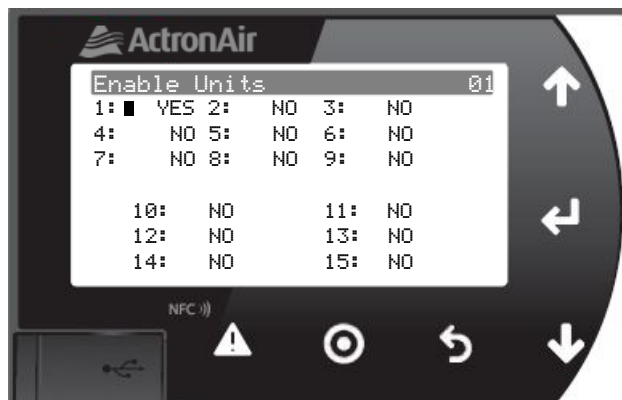
Step 5. Press Enter button ( ↵ ) to select next unit. Repeat the step 4 until all the unit required are changed to YES.
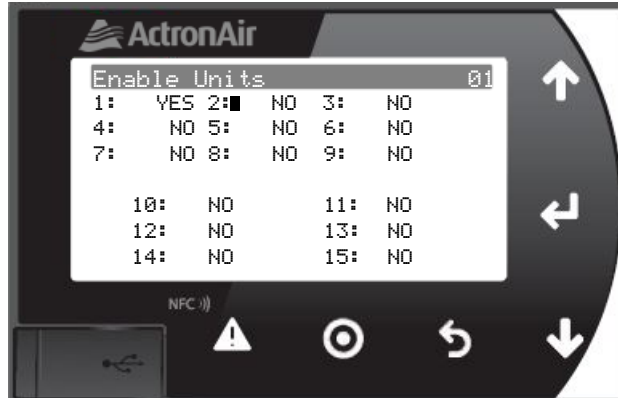


Step 6. Press Esc ( ↩ ) to go main menu screen.
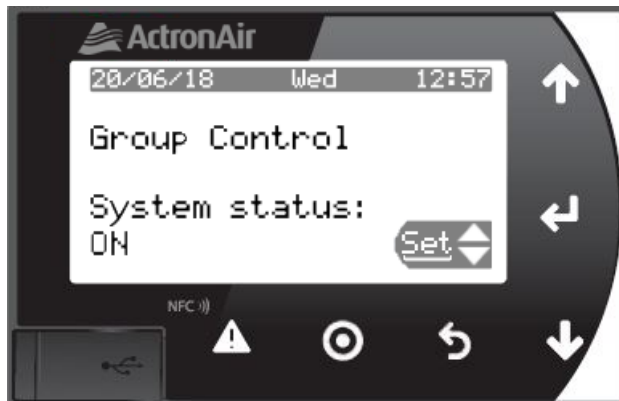


Step 7. With Up ( ↑ ) or Down( ↓ ) arrow Set menu is selected, press enter ( ↵ ). The following screen will appear on the display screen.
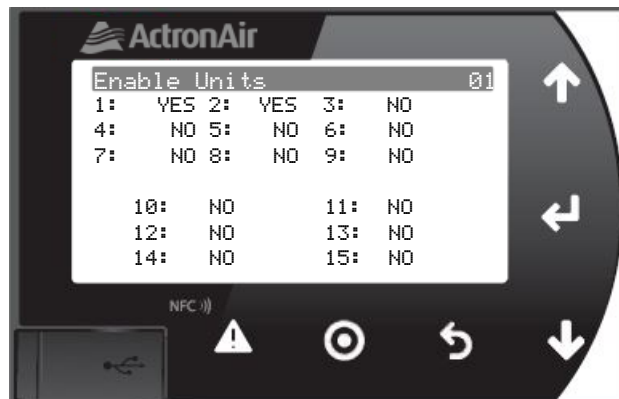


| NOTE |
| --- |

**IP20:** Check the wiring connection of the Fault Signal Output on the Outdoor Board. If it is connected to N/O, skip Step 8 to 11, proceed to Step 12.

Step 8. Press the Up( ↑ ) or Down( ↓ ) arrow to go to Menu 2 Units Alarm input. By default all units are set to N/O
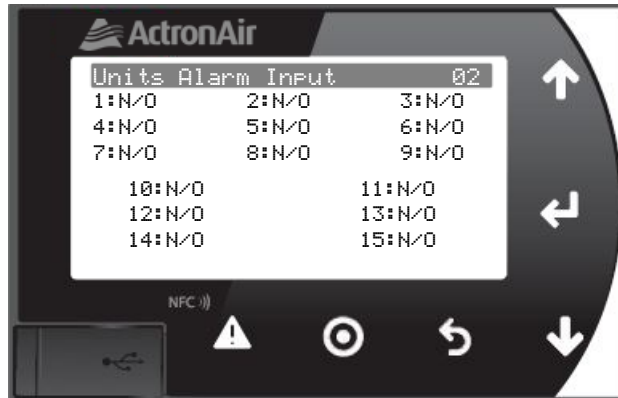


Step 9. Press Enter button( ↵ ) to select the first Unit. Unit 1 will be blinking.
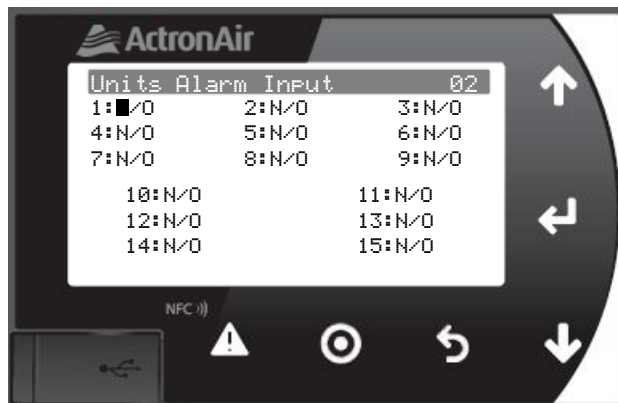


Step 10. Press the Up( ↑ ) or Down( ↓ ) arrow to change the setting to N/C on Unit 1.
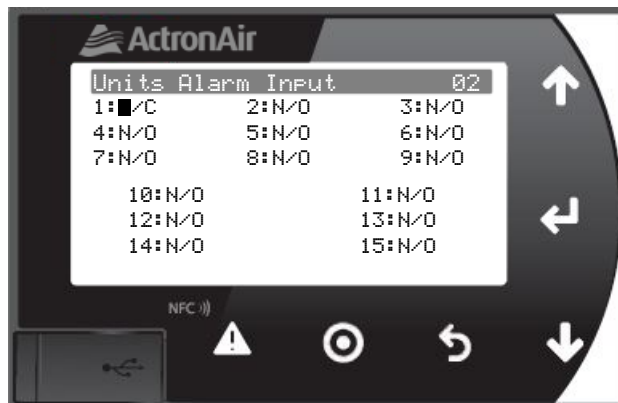


Step 11. Press Enter button ( ↵ ) to select next unit. Repeat the step 10 until all the unit required are changed to N/C.
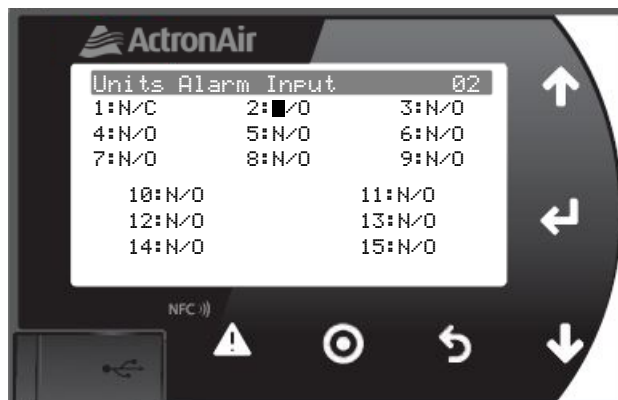


Step 12. Press Esc ( ↩ ) to go back to main screen.

### 06.08.03. View Software Version Installed in the CG100

Step 1. Press the Up( ⬆ ) or Down( ⬇ ) arrow until information button ( i⬍ ) appears as shown below:



Step 2. Press the Enter button( ↵ ), the following screen will appear on the display screen:
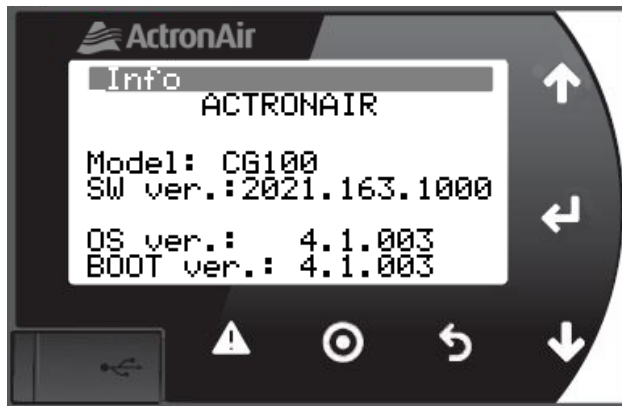


Step 3. Press Esc ( ↩ ) to go back to main screen.

### 06.08.04. Set-up WebServer TCP/IP Address
(Optional, this will require information from network administrator)

Step 1. Press and hold the Enter button( ↵ ) and Alarm button ( ⚠ ) until the screen shown below appears:
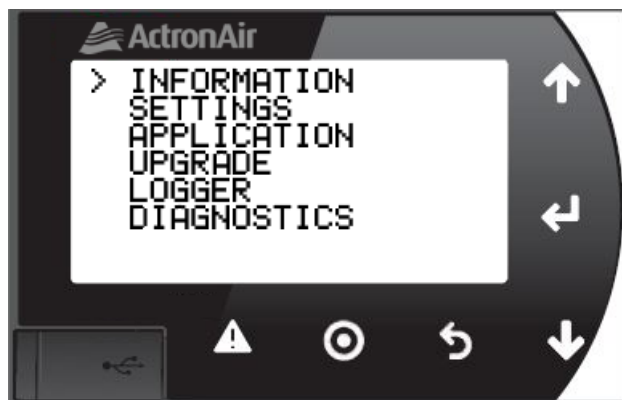
**Note:** If screen changed twice and show as below, press the Esc ( ↰ ) button to go to previous screen.
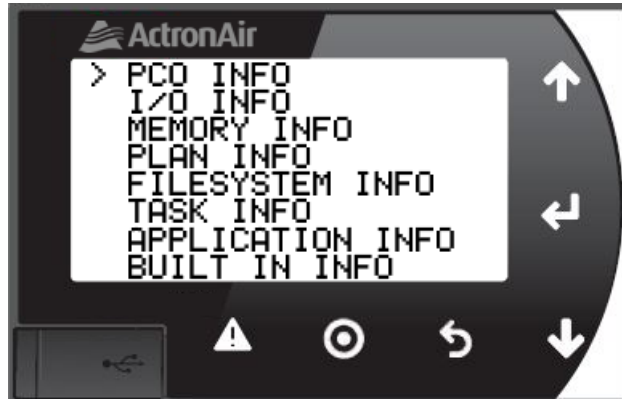


Step 2. Press the Down( ↓ ) arrow to select **SETTINGS**.
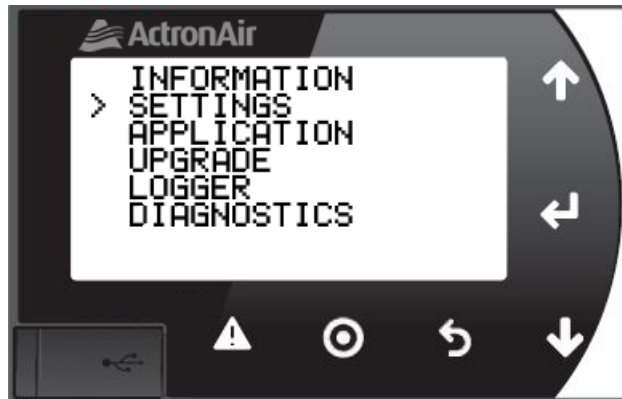


Step 3. Press the Enter button( ↵ ) to enter Settings:
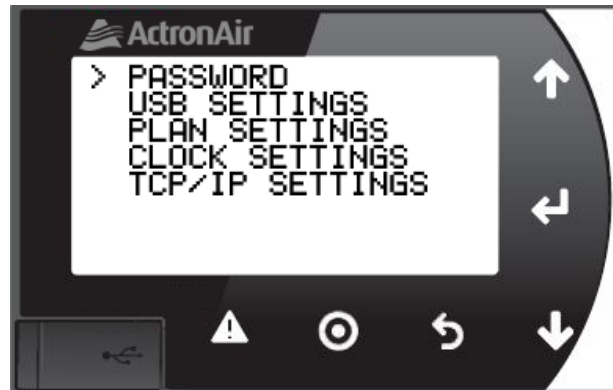


Step 4. Press Down( ↓ ) until **TCP/IP SETTINGS** is selected.

Step 5. Press the Enter button( ↵ ):
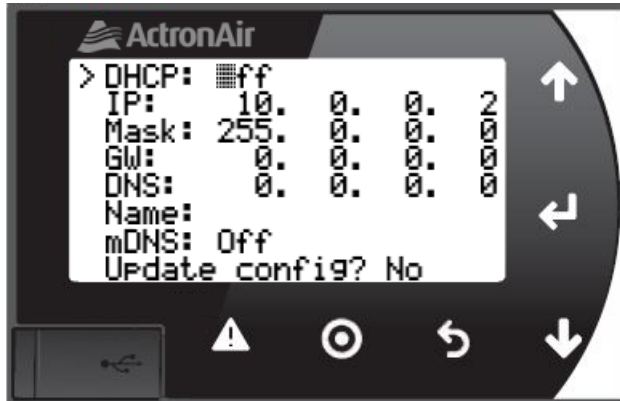


Note:
Data in Screen is
only sample
(not actual setting)

**Note:** DHCP should be Off to set the static IP address.

Step 6. Press the Up( ↑ ) or Down( ↓ ) buttons to adjust the value of the field.
Press the Enter button( ↵ ) to save setting and go the next field or next line.
Repeat first two steps until the last line **Update config** appears on the display screen.
Press the Up ( ↑ ) or Down ( ↓ ) to Change **No** to **Yes**.
Press the Enter button( ↵ ) to accept setting and then press Esc ( ↩ ) until it shows on the main screen.
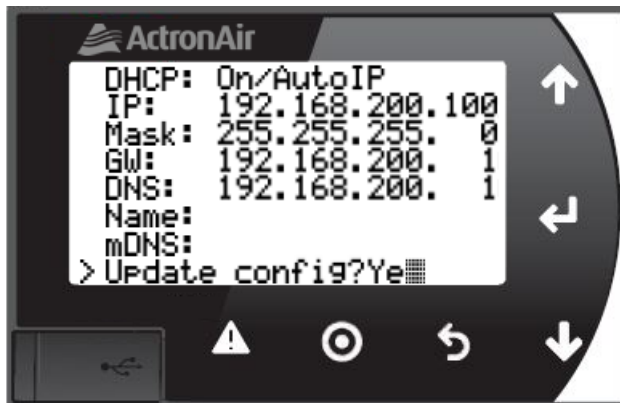


Note:
Data in Screen is
only sample
(not actual setting)

## 07. Expansion Module Kit (CG10K)

### 07.01.    General Description

The Expansion Module  Kit (CG10K) comes with the  I/O Expansion Module, connector set and Transformer 240VAC/24VAC 20VA. Each Unit connected to the CG100 will require one CG10K.

The Expansion module (CG10) is an Input/Output expansion board used to interface CG100 with the unit, configurable inputs (NTC, 0 to 10V and ON/OFF) and output (0-10VAC).
It features a total of 16 I/Os, 10 of which universal inputs on I/O chip, 6 of which output relays.

Universal inputs/outputs are distinguished by the letter U. They can be configured in the application program on the CG100 for many different uses, such as the following:
   •   Controlling the expansion,
   •   To connect active and passive probes,
   •   Digital inputs, and
   •   Analogue outputs

This allows additional input/output configurations, increasing the flexibility of the corresponding controller in different applications.  See Section 05.06.03 for recommended maximum cable length connection.

### 07.02.    Dimensions (CG10)
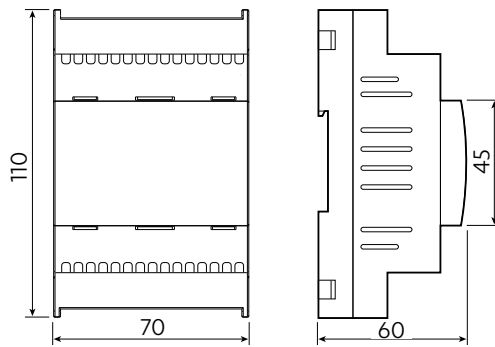


### 07.03.    Connector's Description
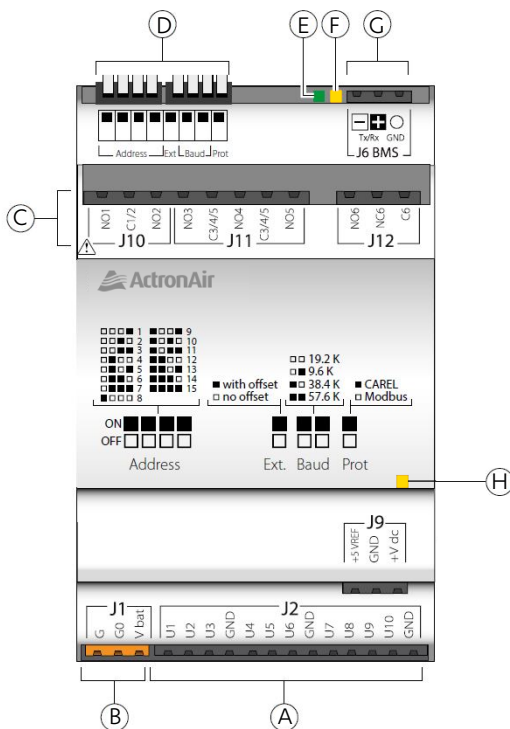


| Items | Description |
|-------|-------------|
| A | Universal input/outputs |
| B | Power supply connectors [G, G0] |
| C | Relay digital outputs |
| D | Configuration Dip-switch |
| E | Configuration LED |
| F | Communication LED |
| G | J6 BMS connector |
| H | Power LED |

### 07.04. Controller Electrical and Physical Specification

**Power Supply**

| | |
|---|---|
| Power supply to the product between G and G0 (J1) | 24 VAC +10%/-15% 50/60 Hz |
| Basic model maximum power consumption | 15 VA |
| Insulation | Reinforced insulation between main power supply and controller guaranteed by the safety power transformer (IEC61558-2-6) |
| Protection against short-circuits | Fuse (250VAC 2A) |
| Maximum connector voltage (NO1...C6) | 250 VAC |
| Minimum size of digital output wires | 1.5 mm$^2$ |
| Minimum size of all other connector wires | 0.5 mm$^2$ |

**Removable Connectors Kit**

| | |
|---|---|
| Connector kit code | 2020-166 |
| Tightening torque | 0.2 N·m for 3.81 mm connectors |
| Tightening torque | 0.4 N·m for 5.08 mm connectors |
| **Important:** Power supply to the product should only be connected between G and G0. | |

### 07.05. I/O Specification

| Terminal Designator | Pin | Used for | Function of Terminal | Specification |
|---|---|---|---|---|
| J2 | U1 | Room Temperature sensor | Room Temperature sensor; range of -50.0°C to 99.9°C | 10k NTC |
| | U2 | Supply fan speed demand | 0-10VDC output | 0-10VDC (max 2 mA) |
| | U3 | Compressor variable capacity | 0-10VDC output | 0-10VDC (max 2 mA) |
| | U4 | Fault from unit | N/C digital input | Voltage free contacts digital input (pullup 2 kOhm) |
| | U5 | Supply air filter pressure switch or transducer See Operation Manual Section 08.03 (Filter Type) | N/O pressure switch[4] | Voltage free contacts digital input (pullup 2 kOhm) |
| | | | 0-10VDC pressure sensor[4] | 0-10VDC input |
| | U6 | Outside Air Economy damper | 0-10VDC output | 0-10VDC (max 2 mA) |
| | U7 | Outside $CO_2$ sensor [5] | 0-10VDC input[4] | 0-10VDC input ($CO_2$ range:0-2000PPM) |
| | U8 | Reserved/Not used | | |
| | U9 | | | |
| | U10 | | | |
| J10[2] | NO1 | Unit ON/OFF | N/O digital output | NO EN 60730-1 Maximum Switchable Load: 250VAC/2A resistive |
| | NO2[1] | Compressor Stage 2 | N/O digital output | |
| J11[2] | NO3 | Heat/Cool (Reversing Valve) | N/O digital output | |
| | NO4 | Compressor Stage 1 | N/O digital output | |
| | NO5[1] | Supply fan ON/OFF | N/O digital output | |
| J12[3] | NO6 | Reserved/Not used | | NO EN 60730-1 Maximum Switchable Load: 250VAC/1A resistive |

1. NO2 and NO5 with Solid State Relay assembly can be used to switch 15VA 110/230VAC or 15VA 24VAC.

2. Between J10 and J11 terminals there is basic insulation.

3. J12 has reinforced insulation from the two other terminals (J10 and 11). Consequently a different power supply can be used.

4. CO2, Pressure switch and Pressure sensor are the responsibility of the installer and are not provided with the CGT1000K nor CG10K kit.

5. If ActronAir CO2 Sensor (P. N. CCO2-S) is to be used, then set the DIP switch to 0-10VDC instead of the usual 4-20mA.

DIP switch setting for 0-10VDC is shown below.
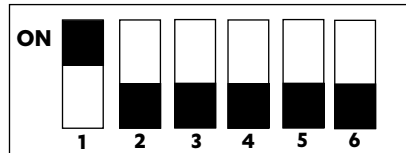
ActronAir $CO_2$ Sensor (CCO2-S)
0-10VDC DIP switch setting

## 07.06.    Communication Lines Available

1 RS485 Slave line, not opto-isolated for BMS port. Support Modbus protocol.

## 07.07.    Operating Conditions

Storage: -40 To 70 °C, 90% RH non-condensing

Operation: -40 To 70 °C, 90% RH non-condensing

## 07.08.    Physical Specifications

Dimensions: 4 DIN rail modules, 70 x 110 x 60 mm.

Mounting: fitted on DIN rail in accordance with DIN 43880 CEI EN 50022.

## 07.09.    Other Specifications

| | |
|---|---|
| Environmental pollution | Level 3 |
| Type of output selectable from application program | 0 to 10 V analogue output |
| Ingress protection | IP40 front panel, IP10 remaining parts |
| Class of protection against electric shock | To be integrated into Class I and/or II appliances |
| Material | Technopolymer |
| Flammability | V2 (UL94) and 850 °C (in accordance with IEC 60695-2-11) |
| PTI of the PCB insulating materials | PTI 250 |
| Insulating material | PTI 175 |
| Colour | White RAL 9016 |
| Ball pressure test temperature | 125 °C |
| Period of stress across the insulating parts | Long |
| Type of action digital output | 1C |
| Type of disconnection or microswitching | Microswitching |
| Heat and fire resistance category | Category D (UL94 - V2) |
| Overvoltage category | Category III |
| Software class and structure | Class A |
| Do not touch or tamper with the device when powered. | |

### 07.10. Assigning Address for System Configuration

The modules are used to connect the individual A/C unit (system) into the Group Control System. End user has the option to assign particular unit into one of the 15 systems shown on the touch screen. For this purpose, the DIP switches on the individual module should be set according to the unit (system) number during site commissioning and installation. Image below depicts the DIP switches for the module indicates the DIP switch is ON. The CGT100 will automatically recognise the address set in this module.

The DIP switch setting in this Expansion Modules will determine which System the unit should be assigned. DIP switch address setting 1 for System 1 at CGT100 (Configuration).
ActronAir recommends Start-up and Commissioning Table on Section 12 be filled out while setting the DIP switch.

## EXPANSION MODULE
## DIP SWITCH SETTINGS
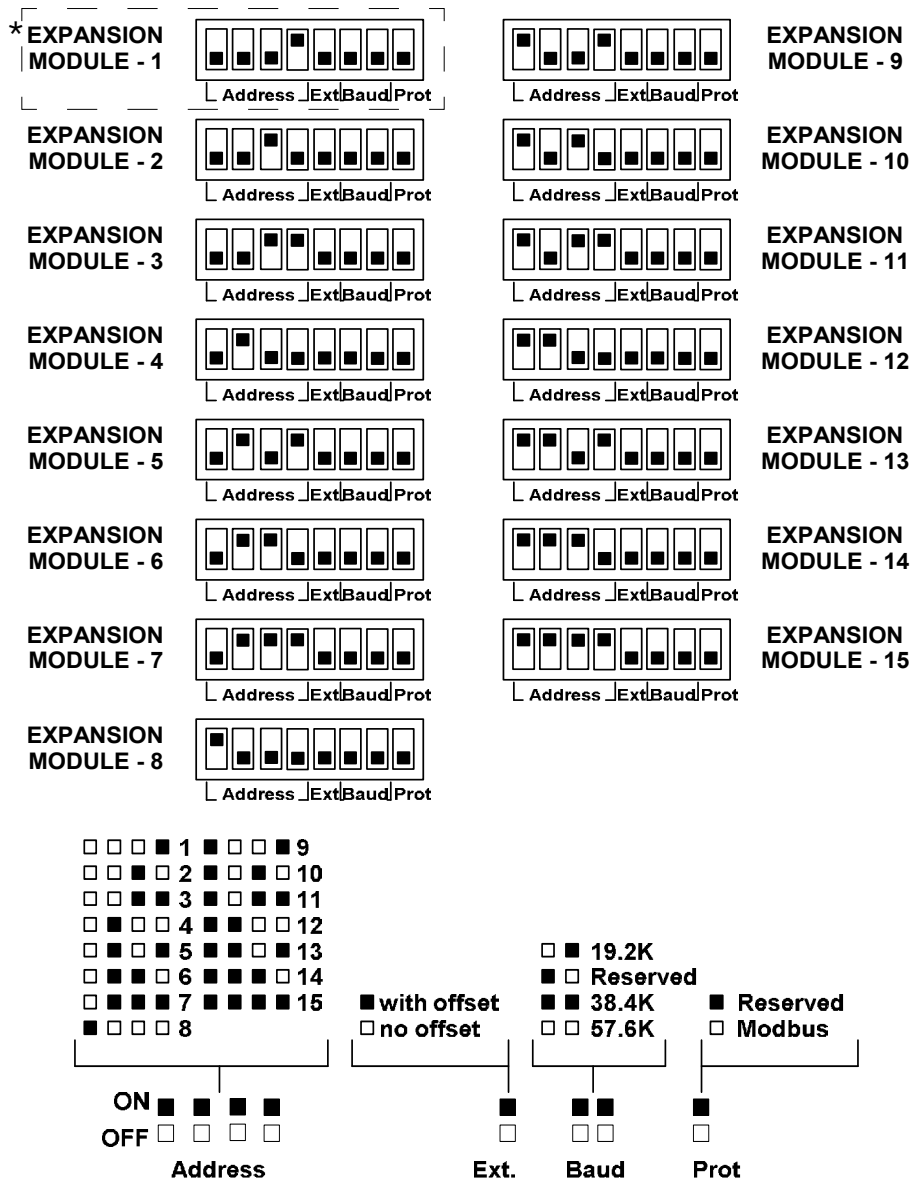


**When Scheduling is expected NOT to be used**, Address 1/System 1 should be skipped and the first system should be set to Address 2 / System 2.

## 08. Wiring Diagram

The complete **Installation and Commissioning Guide** can be accessed by visiting https://docs.actronair.com.au/

### 08.01. Wiring Diagram Reference Table

| | Control Profile | On/Off Only[1] |
|---|---|---|
| | | WD0995 |
| | | Basic On/Off |
| **SERENE** Wall Hung Split | WRC-026AS / WRE-026AS | ✓ |
| | WRC-035AS / WRE-035AS | ✓ |
| | WRC-050AS / WRE-050AS | ✓ |
| | WRC-071AS / WRE-071AS | ✓ |
| | WRC-080AS / WRE-080AS | ✓ |
| **SERENE 2** Wall Hung Split | WRC-026CS / WRE-026CS | ✓ |
| | WRC-035CS / WRE-035CS | ✓ |
| | WRC-050CS / WRE-050CS | ✓ |
| | WRC-072CS / WRE-072CS | ✓ |
| | WRC-085CS / WRE-085CS | ✓ |
| **CASCADE** Cassette | URC-053AS / CRE-053AS | ✓ |
| | URC-071AS / CRE-071AS | ✓ |
| | URC-100AS / CRE-100AS | ✓ |
| | URC-125AS / CRE-125AS | ✓ |
| | URC-140AS / CRE-140AS | ✓ |
| **CASCADE 2** Cassette | URC-100CS / CRE-100CS | ✓ |
| | URC-125CS / CRE-125CS | ✓ |
| | URC-125CS / CRE-140CS | ✓ |
| **ULTRASLIM** Low Profile | URC-071AS / LRE-071AS | ✓ |
| | URC-100AS / LRE-100AS | ✓ |
| | URC-125AS / LRE-130AS | ✓ |
| | URC-140AS / LRE-130AS | ✓ |
| | URC-170AS / LRE-170AS | ✓ |
| **ULTRASLIM 2** | LRC-071CS / LRE-071CS | ✓ |
| | LRC-100CS / LRE-100CS | ✓ |
| | URC-125CS / LRE-125CS | ✓ |
| | URC-140CS / LRE-140CS | ✓ |
| | LRC-170CS / LRE-170CS | ✓ |
| **MULTIELITE** Mutli-Split | MRC-052AS-2 | ✓ |
| | MRC-071AS-3 | ✓ |
| | MRC-100AS-4 | ✓ |
| | MRC-110AS-5 | ✓ |
| | MRC-135AS-5 | ✓ |
| **MULTIELITE 2** Mutli-Split | MRE-035CS | ✓ |
| | MRE-053CS | ✓ |
| | MRC-075CS-3 | ✓ |
| | MRC-100CS-4 | ✓ |
| | MRC-120CS-5 | ✓ |

**Note:**
On/Off Only - The Group Control System ONLY provides On/Off Schedule operation. Set Temperature and Mode of Operation changes are required to be performed separately from the unit's individual Wall Control or Remote Control (as applicable).

| | | | Temperature Regulation[1] | | | | | | | | | | | | | | On/Off Only[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | WD0986 | WD0987 | WD0989 | WD0992 | WD0993 | WD0994 | WD0996 | WD0997 | WD0998 | WD0985 | 0515-1020 | WD1021 | WD1021-TV | 0515-1022 | WD1051 | WD2010 |
| | Control Profile | | Profile-1 | Profile-1 | Profile-1 | Profile-1 | Profile-2 | Profile-3 | Profile-1 | Profile-3 | Profile-1 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Basic On/Off |
| System Setting (CGT100) | Compatible Mode | Auto | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | n/a |
| | | Cool | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | Heat | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | Fan | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Classic Series 1[6] | SRE091C / SRG091E | | | | | | | | | | | | | | | | | ✓ |
| | SRA101C / SRG101E | | | | | | | | | | | | | | | | | ✓ |
| | SRA131C / SRG131E | | | | | | | | | | | | | | | | | ✓ |
| | SRA151C / SRG151E | | | | | | | | | | | | | | | | | ✓ |
| | SRA171C / SRG171E | | | | | | | | | | | | | | | | | ✓ |
| | SRA133C / SRG131E | | | | | | | | | | | | | | | | | ✓ |
| | SRA153C / SRG151E | | | | | | | | | | | | | | | | | ✓ |
| | SRA173C / SRG171E | | | | | | | | | | | | | | | | | ✓ |
| | SRA203C / SRG201E | | | | | | | | | | | | | | | | | ✓ |
| | SRA233C / SRG231E | | | | | | | | | | | | | | | | | ✓ |
| | SRE091C / SRG091E-B | | | | | ✓3 | | | | | | | | | | | | |
| | SRA101C / SRG101E-B | | | | | ✓3 | | | | | | | | | | | | |
| | SRA131C / SRG131E-B | | | | | ✓3 | | | | | | | | | | | | |
| | SRA151C / SRG151E-B | | | | | ✓3 | | | | | | | | | | | | |
| | SRA171C / SRG171E-B | | | | | ✓3 | | | | | | | | | | | | |
| | SRA133C / SRG131E-B | | | | | ✓3 | | | | | | | | | | | | |
| | SRA153C / SRG151E-B | | | | | ✓3 | | | | | | | | | | | | |
| | SRA173C / SRG171E-B | | | | | ✓3 | | | | | | | | | | | | |
| | SRA203C / SRG201E-B | | | | | ✓3 | | | | | | | | | | | | |
| | SRA233C / SRG231E-B | | | | | ✓ | | | | | | | | | | | | |
| | SRA260C / SRA260E-B | | | | | | | | | | ✓4,5 | | | | | | | ✓5 |

**Notes:**

1. The temperature setpoint, Mode of Operation and Schedule Operation Time can be changed at the CGT100. The units DO NOT have individual Wall Controls or Remote Controls.
2. On/Off Only - The Group Control System ONLY provides On/Off Schedule operation. Set Temperature and Mode of Operation changes are required to be performed separately from the unit's individual Wall Control or Remote Control (as applicable).
3. Requires the order of the -B option to be compatible with the Group Control System Temperature Regulation. (Requires unit's 3rd Party Control inputs)
4. Requires the order of the -B option in order to allow for Group Control System Schedule Operation. (Requires unit's Remote On/Off function)
5. No Fault Output Available on unit.
6. Wiring Diagram is also applicable for Split Fan Coil version.

| System Setting (CGT100) | | | Temperature Regulation¹ | | | | | | | | | | | | | | On/Off Only² |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | WD0986 | WD0987 | WD0989 | WD0992 | WD0993 | WD0994 | WD0996 | WD0997 | WD0998 | WD0985 | 0515-1020 | WD1021 | WD1021-TV | 0515-1022 | WD1051 | WD2010 |
| | Control Profile | | Profile-1 | Profile-1 | Profile-1 | Profile-1 | Profile-2 | Profile-3 | Profile-1 | Profile-3 | Profile-1 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Basic On/Off |
| | Compatible Mode | Auto | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | n/a |
| | | Cool | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | Heat | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | Fan | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Classic Series 2³ | CRA100S / EVA100S | | ✓ | | | | | | | | | | | | | | | |
| | CRA130S / EVA130S | | ✓ | | | | | | | | | | | | | | | |
| | CRA150S / EVA150S | | ✓ | | | | | | | | | | | | | | | |
| | CRA170S / EVA170S | | ✓ | | | | | | | | | | | | | | | |
| | CRA130T / EVA130S | | ✓ | | | | | | | | | | | | | | | |
| | CRA150T / EVA150S | | ✓ | | | | | | | | | | | | | | | |
| | CRA170T / EVA170S | | ✓ | | | | | | | | | | | | | | | |
| | CRA200T / EVA200S | | ✓ | | | | | | | | | | | | | | | |
| | CRA230T / EVA230S | | ✓ | | | | | | | | | | | | | | | |
| Aires | CRS10AS / EVA10AS | | | | | | | | | | | ✓ | | | | | | |
| | CRS13AS / EVA13AS | | | | | | | | | | | ✓ | | | | | | |
| | CRS15AS / EVA15AS | | | | | | | | | | | ✓ | | | | | | |
| | CRS17AS / EVA17AS | | | | | | | | | | | ✓ | | | | | | |
| | CRS20AS / EVA20AS | | | | | | | | | | | ✓ | | | | | | |
| | CRS23AS / EVA23AS | | | | | | | | | | | ✓ | | | | | | |
| | CRS13AT / EVA13AS | | | | | | | | | | | ✓ | | | | | | |
| | CRS15AT / EVA15AS | | | | | | | | | | | ✓ | | | | | | |
| | CRS17AT / EVA17AS | | | | | | | | | | | ✓ | | | | | | |
| | CRS20AT / EVA20AS | | | | | | | | | | | ✓ | | | | | | |
| | CRS23AT / EVA23AS | | | | | | | | | | | ✓ | | | | | | |
| Advance (R-410A) | CRV140S / EVV140S | | | | | | | | | | | ✓ | | | | | | |
| | CRV160S / EVV160S | | | | | | | | | | | ✓ | | | | | | |
| | CRV180S / EVV180S | | | | | | | | | | | ✓ | | | | | | |
| | CRV160T / EVV160S | | | | | | | | | | | ✓ | | | | | | |
| | CRV180T / EVV180S | | | | | | | | | | | ✓ | | | | | | |
| | CRV210T / EVV210S | | | | | | | | | | | ✓ | | | | | | |
| | CRV240T / EVV240S | | | | | | | | | | | ✓ | | | | | | |

**Notes:**
1. The temperature setpoint, Mode of Operation and Schedule Operation Time can be changed at the CGT100. The units DO NOT have individual Wall Controls or Remote Controls.
2. On/Off Only - The Group Control System ONLY provides On/Off Schedule operation. Set Temperature and Mode of Operation changes are required to be performed separately from the unit's individual Wall Control or Remote Control (as applicable).
3. Wiring Diagram is also applicable for Split Fan Coil version.

| | | Temperature Regulation[1] | | | | | | | | | | | | | | | On/Off Only[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | WD0986 | WD0987 | WD0989 | WD0992 | WD0993 | WD0994 | WD0996 | WD0997 | WD0998 | WD0985 | 0515-1020 | WD1021 | WD1021-TV | 0515-1022 | WD1051 | WD2010 |
| System Setting (CGT100) | Control Profile | Profile-1 | Profile-1 | Profile-1 | Profile-1 | Profile-2 | Profile-3 | Profile-1 | Profile-3 | Profile-1 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Basic On/Off |
| | Compatible Mode — Auto | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | n/a |
| | Compatible Mode — Cool | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Compatible Mode — Heat | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Compatible Mode — Fan | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Advance A (R-32) | CRV13AS / EVV13AS | | | | | | | | | | | ✓ | | | | | |
| | CRV15AS / EVV15AS | | | | | | | | | | | ✓ | | | | | |
| | CRV17AS / EVV17AS | | | | | | | | | | | ✓ | | | | | |
| | CRV13AT / EVV13AS | | | | | | | | | | | ✓ | | | | | |
| | CRV15AT / EVV15AS | | | | | | | | | | | ✓ | | | | | |
| | CRV17AT / EVV17AS | | | | | | | | | | | ✓ | | | | | |
| Advance B (R-32) | CRV13BS / EVV13BS | | | | | | | | | | | ✓ | | | | | |
| | CRV15BS / EVV15BS | | | | | | | | | | | ✓ | | | | | |
| | CRV17BS / EVV17BS | | | | | | | | | | | ✓ | | | | | |
| | CRV17BS / EVV17BS | | | | | | | | | | | ✓ | | | | | |
| | CRV13BT / EVV13BT | | | | | | | | | | | ✓ | | | | | |
| | CRV15BT / EVV15BT | | | | | | | | | | | ✓ | | | | | |
| | CRV17BT/ EVV17BT | | | | | | | | | | | ✓ | | | | | |
| | CRV19BT / EVV19BT | | | | | | | | | | | ✓ | | | | | |
| Add On Air Conditioning | SRC131C / SRA131A | | | | | | | ✓ | | | | | | | | | |
| | SRC151C / SRA151A | | | | | | | ✓ | | | | | | | | | |
| | SRC171C / SRA171A | | | | | | | ✓ | | | | | | | | | |
| | SRC133C / SRA131A | | | | | | | ✓ | | | | | | | | | |
| | SRC153C / SRA151A | | | | | | | ✓ | | | | | | | | | |
| | SRC173C / SRA171A | | | | | | | ✓ | | | | | | | | | |
| | SRC203C / SRA201A | | | | | | | ✓ | | | | | | | | | |
| | SRC233C / SRA231A | | | | | | | ✓ | | | | | | | | | |
| Add On Air Conditioning | CCA130S / EAA130S | | ✓ | | | | | | | | | | | | | | |
| | CCA150S / EAA150S | | ✓ | | | | | | | | | | | | | | |
| | CCA170S / EAA170S | | ✓ | | | | | | | | | | | | | | |
| | CCA170T / EAA170S | | ✓ | | | | | | | | | | | | | | |
| | CCA200T / EAA200S | | ✓ | | | | | | | | | | | | | | |
| | CCA230T / EAA230S | | ✓ | | | | | | | | | | | | | | |

**Notes:**
1. The temperature setpoint, Mode of Operation and Schedule Operation Time can be changed at the CGT100. The units DO NOT have individual Wall Controls or Remote Controls.
2. On/Off Only - The Group Control System ONLY provides On/Off Schedule operation. Set Temperature and Mode of Operation changes are required to be performed separately from the unit's individual Wall Control or Remote Control (as applicable).

| System Setting (CGT100) | | | | Temperature Regulation[1] | | | | | | | | | | | | | | | On/Off Only[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | WD0986 | WD0987 | WD0989 | WD0992 | WD0993 | WD0994 | WD0996 | WD0997 | WD0998 | WD0985 | 0515-1020 | WD1021 | WD1021-TV | 0515-1022 | WD1051 | WD2010 |
| | Control Profile | | | Profile-1 | Profile-1 | Profile-1 | Profile-1 | Profile-2 | Profile-3 | Profile-1 | Profile-3 | Profile-1 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Basic On/Off |
| | Compatible Mode | Auto | | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | n/a |
| | | Cool | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | Heat | | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | Fan | | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| ESP Plus [3] | SRD131C / SRV131E | | | | | | | | | | | | | | | | | | ✓ |
| | SRD151C / SRV151E | | | | | | | | | | | | | | | | | | ✓ |
| | SRD191C / SRV191E | | | | | | | | | | | | | | | | | | ✓ |
| | SRD173C / SRV171E | | | | | | | | | | | | | | | | | | ✓ |
| | SRD203C / SRV201E | | | | | | | | | | | | | | | | | | ✓ |
| | SRD233C / SRV231E | | | | | | | | | | | | | | | | | | ✓ |
| ESP Ultima | SRD151C / SRM151E | | | | | | | | | | | | | | | | | | ✓ |
| | SRD191C / SRM191E | | | | | | | | | | | | | | | | | | ✓ |
| | SRD173C / SRM171E | | | | | | | | | | | | | | | | | | ✓ |
| | SRD203C / SRM201E | | | | | | | | | | | | | | | | | | ✓ |
| | SRD233C / SRM231E | | | | | | | | | | | | | | | | | | ✓ |
| Platinum ESP Plus [3] | CRV2-14AS/ERV2-14AS | | | | | | | | | | | | | | | | | | ✓ |
| | CRV3-17AS/ERV3-17AS | | | | | | | | | | | | | | | | | | ✓ |
| | CRV4-19AS/ERV4-19AS | | | | | | | | | | | | | | | | | | ✓ |
| Platinum ESP Ultima | CRV2-14AS/ERM2-14AS | | | | | | | | | | | | | | | | | | ✓ |
| | CRV3-17AS/ERM3-17AS | | | | | | | | | | | | | | | | | | ✓ |
| | CRV4-19AS/ERM4-19AS | | | | | | | | | | | | | | | | | | ✓ |
| Platinum ESP QUE | CRQ2-14AS | | | | | | | | | | | | | | | | | | ✓ |
| | CRQ3-17AS | | | | | | | | | | | | | | | | | | ✓ |
| | CRQ4-19AS | | | | | | | | | | | | | | | | | | ✓ |
| | CRQ2-16AT | | | | | | | | | | | | | ✓ | | | | | | |
| | CRQ3-18AT | | | | | | | | | | | | | ✓ | | | | | | |
| | CRQ5-21AT | | | | | | | | | | | | | ✓ | | | | | | |
| | CRQ5-24AT | | | | | | | | | | | | | ✓ | | | | | | |

**Notes:**
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2. On/Off Only - The Group Control System ONLY provides On/Off Schedule operation. Set Temperature and Mode of Operation changes are required to be performed separately from the unit's individual Wall Control or Remote Control (as applicable).
3. No Fault Output Available on unit.

| System Setting (CGT100) | | | WD0986 | WD0987 | WD0989 | WD0992 | WD0993 | WD0994 | WD0996 | WD0997 | WD0998 | WD0985 | 0515-1020 | WD1021 | WD1021-TV | 0515-1022 | WD1051 | WD2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Temperature Regulation[1] | | | | | | | | | | | | | | | On/Off Only[2] |
| | Control Profile | | Profile-1 | Profile-1 | Profile-1 | Profile-1 | Profile-2 | Profile-3 | Profile-1 | Profile-3 | Profile-1 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Basic On/Off |
| | Compatible Mode | Auto | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | n/a |
| | | Cool | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | Heat | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | Fan | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Standard Commercial Ducted Split | SCA260C / SCG260E | | | | | ✓³ | | | | | | | | | | | | |
| | SCA290C / SCG290E | | | | | ✓³ | | | | | | | | | | | | ✓³ |
| | SCA300C / SCA300E | | | | | | ✓³ | | | | | | | | | | | ✓³ |
| | SCA330C / SCA330E | | | | | ✓³ | | | | | | | | | | | | ✓³ |
| | SCA330C / SCG330E | | | | | ✓³ | | | | | | | | | | | | ✓³ |
| | SCA340C / SCA340E | | | | | | ✓³ | | | | | | | | | | | ✓³ |
| | SCA340C / SCG340E | | | | | | ✓³ | | | | | | | | | | | ✓³ |
| | SCA400C / SCG400E | | | | | | ✓³ | | | | | | | | | | | ✓³ |
| Standard Commercial Package | PCG153U/V | | | | | ✓ | | | | | | | | | | | | ✓ |
| | PCG173U/V | | | | | ✓ | | | | | | | | | | | | ✓ |
| | PCG203U/V | | | | | ✓ | | | | | | | | | | | | ✓ |
| | PCG233U/V | | | | | ✓ | | | | | | | | | | | | ✓ |
| | PCA260U/V | | | | | ✓³ | | | | | | | | | | | | ✓³ |
| | PCG260U/V | | | | | ✓³ | | | | | | | | | | | | |
| | PCG290U/V | | | | | ✓³ | | | | | | | | | | | | ✓³ |
| | PCG290L/R | | | | | ✓³ | | | | | | | | | | | | ✓³ |
| | PCA300U/V | | | | | | ✓³ | | | | | | | | | | | ✓³ |
| | PCG300L/R | | | | | | ✓³ | | | | | | | | | | | ✓³ |
| | PCA330U/V | | | | | ✓³ | | | | | | | | | | | | ✓³ |
| | PCG330U/V | | | | | ✓³ | | | | | | | | | | | | ✓³ |
| | PCG330L/R | | | | | ✓³ | | | | | | | | | | | | ✓³ |
| | PCA340U/V | | | | | | ✓³ | | | | | | | | | | | ✓³ |
| | PCG340U/V | | | | | | ✓³ | | | | | | | | | | | ✓³ |
| | PCG340L/R | | | | | | ✓³ | | | | | | | | | | | ✓³ |
| | PCG400U/V | | | | | | ✓³ | | | | | | | | | | | ✓³ |
| | PCG400L/R | | | | | | ✓³ | | | | | | | | | | | ✓³ |

**Notes:**
1. The temperature setpoint, Mode of Operation and Schedule Operation Time can be changed at the CGT100. The units DO NOT have individual Wall Controls or Remote Controls.
2. On/Off Only - The Group Control System ONLY provides On/Off Schedule operation. Set Temperature and Mode of Operation changes are required to be performed separately from the unit's individual Wall Control or Remote Control (as applicable).
3. No Fault Output Available on unit.

# GROUP CONTROL INSTALLATION AND COMMISSIONING GUIDE

| | | | Temperature Regulation[1] | | | | | | | | | | | | | | | On/Off Only[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | WD0986 | WD0987 | WD0989 | WD0992 | WD0993 | WD0994 | WD0996 | WD0997 | WD0998 | WD0985 | 0515-1020 | WD1021 | WD1021-TV | 0515-1022 | WD1051 | WD2010 |
| **System Setting (CGT100)** | Control Profile | | Profile-1 | Profile-1 | Profile-1 | Profile-1 | Profile-2 | Profile-3 | Profile-1 | Profile-3 | Profile-1 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Basic On/Off |
| | Compatible Mode | Auto | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | n/a |
| | | Cool | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | Heat | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | | Fan | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | n/a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| **Variable Commercial** — Split | CRV290T / EVA290T | | | | ✓ | | | | | | | | | | | | | |
| | CRV330T / EVA330T | | | | ✓ | | | | | | | | | | | | | |
| | CRV720T / EVA720T | | | | | | | | | | | | | | ✓ | ✓ | | |
| | CRV850T / EVA850T | | | | | | | | | | | | | | ✓ | ✓ | | |
| | CRV960T / EVA960T | | | | | | | | | | | | | | ✓ | ✓ | | |
| **Variable Commercial** — Package | PKV160T | | | | ✓ | | | | | | | | | | | | | |
| | PKV180T | | | | ✓ | | | | | | | | | | | | | |
| | PKV210T | | | | ✓ | | | | | | | | | | | | | |
| | PKV240T | | | | ✓ | | | | | | | | | | | | | |
| | PKV290T | | | | ✓ | | | | | | | | | | | | | |
| | PKV330T | | | | ✓ | | | | | | | | | | | | | |
| | PKV290T-L/R | | | | ✓ | | | | | | | | | | | | | |
| | PKV330T-L/R | | | | ✓ | | | | | | | | | | | | | |
| | PRV15AT | | | | | | | | | | | | | | | | ✓ | |
| | PRV17AT | | | | | | | | | | | | | | | | ✓ | |
| | PKV720T | | | | | | | | | | | | | | | ✓ | | |
| | PKV850T | | | | | | | | | | | | | | | ✓ | | |
| | PKV960T | | | | | | | | | | | | | | | ✓ | | |
| **Tri-Capacity 47-96kW** — Split | CAY470T / EVY470T | | | | | | | ✓ | | | | | | | | | | |
| | CAY500T / EVY500T | | | | | | | ✓ | | | | | | | | | | |
| | CAY540T / EVY540T | | | | | | | ✓ | | | | | | | | | | |
| | CAY620T / EVY620T | | | | | | | ✓ | | | | | | | | | | |
| | CAY700T / EVY700T | | | | | | | ✓ | | | | | | | | | | |
| | CAY470T / ELY470T | | | | | | | ✓ | | | | | | | | | | |
| | CAY500T / ELY500T | | | | | | | ✓ | | | | | | | | | | |
| | CAY540T / ELY540T | | | | | | | ✓ | | | | | | | | | | |
| | CAY620T / ELY620T | | | | | | | ✓ | | | | | | | | | | |
| | CAY700T / ELY700T | | | | | | | ✓ | | | | | | | | | | |

**Notes:**

1. The temperature setpoint, Mode of Operation and Schedule Operation Time can be changed at the CGT100. The units DO NOT have individual Wall Controls or Remote Controls.

2. On/Off Only - The Group Control System ONLY provides On/Off Schedule operation. Set Temperature and Mode of Operation changes are required to be performed separately from the unit's individual Wall Control or Remote Control (as applicable).

| | | | Temperature Regulation[1] | | | | | | | | | | | | | | | On/Off Only[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | WD0986 | WD0987 | WD0989 | WD0992 | WD0993 | WD0994 | WD0996 | WD0997 | WD0998 | WD0985 | 0515-1020 | WD1021 | WD1021-TV | 0515-1022 | WD1051 | WD2010 |
| System Setting (CGT100) | Control Profile | | Profile-1 | Profile-1 | Profile-1 | Profile-1 | Profile-2 | Profile-3 | Profile-1 | Profile-3 | Profile-1 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Profile-3 | Basic On/Off |
| | Compatible Mode | Auto | ✔ | n/a | ✔ | ✔ | ✔ | ✔ | n/a | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | n/a |
| | | Cool | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | |
| | | Heat | ✔ | n/a | ✔ | ✔ | ✔ | ✔ | n/a | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | |
| | | Fan | ✔ | n/a | ✔ | ✔ | ✔ | ✔ | n/a | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | |
| Tri-Capacity 47-96kW | Package | PKY470T | | | | | | ✔ | | | | | | | | | | |
| | | PKY500T | | | | | | ✔ | | | | | | | | | | |
| | | PKY540T | | | | | | ✔ | | | | | | | | | | |
| | | PKY620T | | | | | | ✔ | | | | | | | | | | |
| | | PKY700T | | | | | | ✔ | | | | | | | | | | |
| | | PKY820T | | | | | | ✔ | | | | | | | | | | |
| | | PKY960T | | | | | | ✔ | | | | | | | | | | |
| Hercules 140-196kW | | PKV1400 | | | | | | | | ✔ | | | | | | | | |
| | | PKV1700 | | | | | | | | ✔ | | | | | | | | |
| | | PKV2000 | | | | | | | | ✔ | | | | | | | | |

**Notes:**

1. The temperature setpoint, Mode of Operation and Schedule Operation Time can be changed at the CGT100. The units DO NOT have individual Wall Controls or Remote Controls.

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## 08.02.   Classic Series 1 (SRE/SRA/SCA) / Package System (PCA/PCG)

## 08.03. Classic Series 2 (CRA)



**1 STAGE SPLIT SYSTEM**

**CRA**

GROUP CONTROL EXPANSION MODULE CONNECTION FOR 1 STAGE SPLIT SYSTEMS (UNOJR SERIES)

Drawing No: **WD0986**

Revision: **A**  Size: **A4**

| | | Base Model No: | CRA | Variation Code: | Variation: |
|---|---|---|---|---|---|
| | | Description: | | | |
| Drawn: | RL | Date: 04-11-2019 | | | |
| Approved: | JL | Date: 18-12-2019 | | | |

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| Rev. | Description | PCR | By | Date |
|---|---|---|---|---|
| A | ORIGINAL | | | |

## 08.04.   Advance (R-410A) and Split System QUE (CRQ)



VARIABLE SPLIT SYSTEM

CRV...S
CRV...T
CRQ...AT

WIRING FOR GROUP CONTROL
INPUTS / OUTPUTS

## 08.05.   Aires / Advance (CRV/CRS) R-32

## 08.06. Add on Air Conditioning (SRC)

**1 STAGE SPLIT SYSTEM**

**SRC**

**WIRING FOR GROUP CONTROL INPUTS / OUTPUTS**

*** PLEASE SET ALL DIP SWITCH SETTINGS DOWN WHEN USING GROUP CONTROL.

DO NOT CONNECT ACTRONAIR WALL CONTROL WHEN USING GROUP CONTROL SYSTEM.

**CONDENSER D4 CPU BOARD STAGE 1**

DIP SWITCH SETTINGS ***
ON / OFF

- COOL ONLY ON
- STAGE 2
- BOOST HEAT ON
- WALL CONTROL
- AUTO FAN
- CONTINUOUS INDOOR FAN
- DUAL SPEED INDOOR FAN
- SINGLE SPEED

MANUAL INPUTS

EXTRA LOW VOLTAGE FAULT OUTPUT * IF APPLICABLE

FAULT
NEUT

STANDARD
7-DAY TIMECLOCK
SET TO 7-DAY

EXTRA LOW VOLTAGE MANUAL INPUTS AND OUTPUT

COMP
FAN
HEAT
15 V

EXTRA LOW VOLTAGE ELECTRONIC WALL CONTROL

DATA
COM

SCREEN WIRE

**SUPPLIED BY INSTALLERS:**
240VAC COIL NO CONTACT RELAY

**OPTIONAL:**
STAGE 1 COOL ONLY MANUAL OVERRIDE SWITCH

24VAC RLY-1 INSIDE SRC UNIT CAN BE REMOVED OR USED AS MANUAL OVERRIDE (SEPARATE 24VAC SOURCE REQUIRED IF USED)

FROM MAIN MODULE "J4 FBus" OR PREVIOUS EXPANSION MODULE "J6 BMS"

SCREEN WIRE

TO NEXT EXPANSION MODULE "J6 BMS"

J6 BMS
J12
J11
J10
J1
J2
J9

EXPANSION MODULE - #

*** NOTE:
- REFER TO GROUP CONTROL INSTALLATION & COMMISSIONING GUIDE IF USING ACTRON AIR CO2 SENSOR (CCO2-S) SET DIP SWITCHES TO 0-10VDC INSTEAD OF DEFAULT 4-20mA

CO2 SENSOR 0-10VDC ***
DAMPER OUTPUT 0-10VDC
AIR FILTER DIGITAL INPUT OR 0-10VDC
ROOM TEMP SENSOR

OPTIONAL DEVICES SUPPLIED BY INSTALLER

REFER TO INSTALLATION & COMMISSIONING GUIDE FOR MORE DETAILS

NOTE:
OPTIONAL DEVICES SHOULD BE PROVIDED WITH SEPARATE POWER SUPPLIES

DO NOT CONNECT OPTIONAL DEVICE POWER SUPPLY TO EXPANSION MODULE 20VA TX2-16

ENSURE G0/0VAC IS CONNECTED TO EARTH

**A/C UNIT CONTROL CIRCUIT BREAKER **

ACTIVE
NEUTRAL

TX-2 * TO TX-16 20 VA

240 AC
240V AC
24VAC
FUSE 2A
24VAC
0VAC

**1 PHASE + NEUTRAL**
230 (240) V 50Hz SUPPLY FROM CONDENSER A/C UNIT CONTROL CIRCUIT BREAKER

* NOTE:
- REFER TO INSTALLATION COMMISSIONING GUIDE FOR MORE DETAILS:

TX-2 TO TX-16 240VAC/24VAC 20VA TRANSFORMER WILL POWER:
- 1 x EXPANSION MODULE PER UNIT

** NOTE:
- REFER TO A/C UNIT INSTALLATION & COMMISSIONING GUIDE FOR UNIT CONTROL CIRCUIT BREAKER LOCATION & CURRENT RATING

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| Base Model No: | SRC | Variation Code: | | Variation: | |
|---|---|---|---|---|---|
| Description: | GROUP CONTROL EXPANSION MODULE CONNECTION FOR 1 STAGE COOL ONLY SPLIT SYSTEMS | | | | |
| Drawn: | RL | Date: | 17-08-2018 | Drawing No: | Revision | Size: |
| Approved: | MJH | Date: | 18-12-2019 | WD0996 | C | A4 |

| Rev. | Description | | By | Date |
|---|---|---|---|---|
| C | ADDED OPTIONAL DEVICE POWER NOTE | 3220 | RL | 18-12-2019 |
| B | FAULT RELAY CHANGED TO NO CONTACT | 2994 | MJH | 26-09-2018 |
| | Description | PCR | By | Date |
| A | ORIGINAL | | | |

## 08.07.  Add on Air Conditioning (CCA)

## 08.08.   Split System (WRC/URC/LRC/MRC)

## 08.09.    Split System (SRA260C)

## 08.10. Standard Split (SCA)/Package System (PCA/PCG)

## 08.11.   Variable Capacity Split (CRV) and Package System (PKV) - R410 A

## 08.12. VCC (R-32 Series) Inverter Package Ducted Units (PRV)

## 08.13. Variable Capacity Split (CRV720-960)

## 08.14.    Variable Capacity Split (CRV/PKV720-960) One Unit Connected to One GC

## 08.15. Package System (PKV720-960)

## 08.16. Tri-Cap System (CAY/PKY)

TRI-CAPACITY
VARIABLE SYSTEM

CAY/PKY

WIRING FOR GROUP CONTROL
INPUTS / OUTPUTS

**MULTI INPUT SELECTION TABLE**

| MULTI INPUT MATRIX | DESCRIPTION | TYPE |
|---|---|---|
| A | SUPPLY AIR TEMP | NOT USED |
| B | ECONOMY MODE | NOT USED |
| C | NIGHT MODE | NOT USED |
| D | COMP STAGE CONTROL | 0-10V ANALOGUE |
| E | IN-FAN SPEED CONTROL | 0-10V ANALOGUE |

**NOTE:**
REFER TO UNIT INSTALLATION & COMMISSIONING
GUIDE FOR MULTI INPUT CONFIGURATION

**TERM**

| TERM | |
|---|---|
| 18 | AFTER HOURS |
| 17 | RTN AIR SENSOR |
| 16 | RTN AIR SENSOR (GND) |
| 15 | "E" IN-FAN SPEED (0-10V) |
| 14 | COMMON (GND) |
| 13 | "D" - COMP DEMAND (0-10V) |
| 12 | N/A |
| 11 | COMMON (GND) |
| 10 | REMOTE ON/OFF |
| 9 | DRM 3 |
| 8 | DRM 2 |
| 7 | DRM 1 |
| 6 | IN-FAN (24VAC IN) |
| 5 | HEAT (24VAC IN) |
| 4 | STAGE 3 (24VAC IN) |
| 3 | STAGE 2 (24VAC IN) |
| 2 | STAGE 1 (24VAC IN) |
| 1 | 24VAC OUT |

NOT TO BE USED
FOR GROUP CONTROL
REFER TO WD0991
FOR AFTER HOURS CONNECTION

TERM 13 & 15 MULTI INPUT REQUIRES TO BE SELECTED

PRE-WIRED TO
COMPONENTS
IN ELECTRICAL
PANEL

REFER TO UNIT
WIRING DIAGRAM
FOR CONNECTION

OPTIONAL:
STAGE 1, 2 & 3 COOL ONLY
MANUAL OVERRIDE SWITCH

NC SWITCH TO "HEAT" NOT REQUIRED
IF NOT USING MANUAL OVERRIDE

PLEASE REFER TO TRI-CAP UNIT
INSTALLATION COMMISSIONING GUIDE
FOR OTHER STAGE CONNECTIONS

CM100 OUTDOOR BOARD
FAULT INDICATION
J16 CONNECTOR

| NO1 |
| NC1 |
| C1 |

A/C UNIT CONTROL
CIRCUIT BREAKER **

ACTIVE

NEUTRAL

1 PHASE + NEUTRAL
230 (240) V 50Hz SUPPLY
FROM CONDENSER / PACKAGE A/C
UNIT CONTROL CIRCUIT BREAKER

240V AC

24V AC

24V A/C

TX-2 *
TO
TX-16
20 VA

FUSE
2A

24VAC

0VAC

ENSURE G0/0VAC IS CONNECTED TO EARTH

FROM
MAIN MODULE
"J4 FBus"
OR
PREVIOUS EXPANSION
MODULE "J6 BMS"

SCREEN
WIRE

TO NEXT
EXPANSION MODULE
"J6 BMS"

EXPANSION MODULE - #

*** NOTE:
- REFER TO INSTALLATION & COMMISSIONING GUIDE
IF USING ACTRON AIR C02 SENSOR (CCO2-S)
SET DIP SWITCHES TO 0-10VDC INSTEAD OF
DEFAULT 4-20mA

CO2 SENSOR
0-10VDC ***

DAMPER OUTPUT
0-10VDC

AIR FILTER
DIGITAL INPUT
OR 0-10VDC

ROOM TEMP
SENSOR

OPTIONAL DEVICES
SUPPLIED BY INSTALLER

REFER TO INSTALLATION &
COMMISSIONING GUIDE FOR
MORE DETAILS

NOTE:
OPTIONAL DEVICES SHOULD BE
PROVIDED WITH SEPARATE POWER
SUPPLIES

DO NOT CONNECT OPTIONAL DEVICE
POWER SUPPLY TO EXPANSION
MODULE 20V AT TX2-16

* NOTE:
- REFER TO INSTALLATION COMMISSIONING GUIDE
FOR MORE DETAILS:

TX-2 TO TX-16 240VAC/24VAC 20VA TRANSFORMER WILL POWER:
- 1 x EXPANSION MODULE PER UNIT

** NOTE:
- REFER TO A/C UNIT INSTALLATION & COMMISSIONING GUIDE
FOR UNIT CONTROL CIRCUIT BREAKER LOCATION & CURRENT RATING

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| Rev. | Description | PCR | By | Date |
|---|---|---|---|---|
| C | ADDED OPTIONAL DEVICE POWER NOTE | 3220 | RL | 16-12-2019 |
| B | FAULT OUTPUT CHANGED TO NO CONTACT | 2994 | MJH | 26-09-2018 |
| A | ORIGINAL | | | |

Base Model/ No: **CAY/PKY**

Description: GROUP CONTROL EXPANSION MODULE CONNECTION
FOR TRI-CAPACITY SPLIT / PACKAGE SYSTEMS

Variation Code: Variation:

Drawn: RL  Date: 13-06-2018

Approved: JL  Date: 16-12-2019

Drawing No: **WD0994**

Revision: C

Size: A4

## 08.17. Hercules System (PKV)

HERCULES
VARIABLE SYSTEM

PKV

WIRING FOR GROUP CONTROL
INPUTS / OUTPUTS

* NOTE:
- REFER TO INSTALLATION COMMISSIONING GUIDE
FOR MORE DETAILS:

TX-2 TO TX-16 240VAC/24VAC 20VA TRANSFORMER WILL POWER:
- 1 x EXPANSION MODULE PER UNIT

** NOTE:
- REFER TO A/C UNIT INSTALLATION & COMMISSIONING GUIDE
FOR UNIT CONTROL CIRCUIT BREAKER LOCATION & CURRENT RATING

PRE-WIRED TO COMPONENTS
IN ELECTRICAL PANEL

REFER TO A/C UNIT WIRING DIAGRAM
FOR CONNECTION

3RD PARTY CONTROLS TERMINALS

| Terminal | Description |
|---|---|
| 24 | 24VAC OUT |
| 23 | HEAT ON (24VAC INPUT) |
| 22 | DEHUMIDIFY ON (24VAC INPUT) |
| 21 | REMOTE ON / OFF (DIGITAL INPUT) |
| 20 | GND |
| 19 | IN-FAN DEMAND 0-10V |
| 18 | COMP DEMAND 0-10V |
| 17 | FAULT NO |
| 16 | FAULT NC |
| 15 | FAULT COM |

TERM

NOTE:
WHEN USING 3RD PARTY CONTROLS
WITH CM100 CONTROLS, SEE UNIT
INSTALLATION & COMMISSIONING
GUIDE FOR CORRECT CONFIGURATIONS

FROM
MAIN MODULE
"J4 FBus"
OR
PREVIOUS EXPANSION
MODULE "J6 BMS"

SCREEN
WIRE

TO NEXT
EXPANSION MODULE
"J6 BMS"

EXPANSION MODULE - #

*** NOTE:
- REFER TO GROUP CONTROL INSTALLATION
& COMMISSIONING GUIDE
IF USING ACTRON AIR C02 SENSOR (CCO2-S)
SET DIP SWITCHES TO 0-10VDC INSTEAD OF
DEFAULT 4-20mA

C02 SENSOR
0-10VDC ***

DAMPER OUTPUT
0-10VDC

AIR FILTER
DIGITAL INPUT
OR 0-10VDC

ROOM TEMP
SENSOR

OPTIONAL DEVICES
SUPPLIED BY INSTALLER

REFER TO INSTALLATION &
COMMISSIONING GUIDE FOR
MORE DETAILS

NOTE:
OPTIONAL DEVICES SHOULD BE
PROVIDED WITH SEPARATE POWER
SUPPLIES

DO NOT CONNECT OPTIONAL DEVICE
POWER SUPPLY TO EXPANSION
MODULE 20VA TX2-16

ENSURE G0/0VAC IS CONNECTED TO EARTH

FUSE
2A

24VAC

0VAC

TX-2 *
TO
TX-16
20 VA

24V AC

240V AC

A/C UNIT CONTROL
CIRCUIT BREAKER **

ACTIVE

NEUTRAL

1 PHASE + NEUTRAL
230 (240) V 50Hz SUPPLY
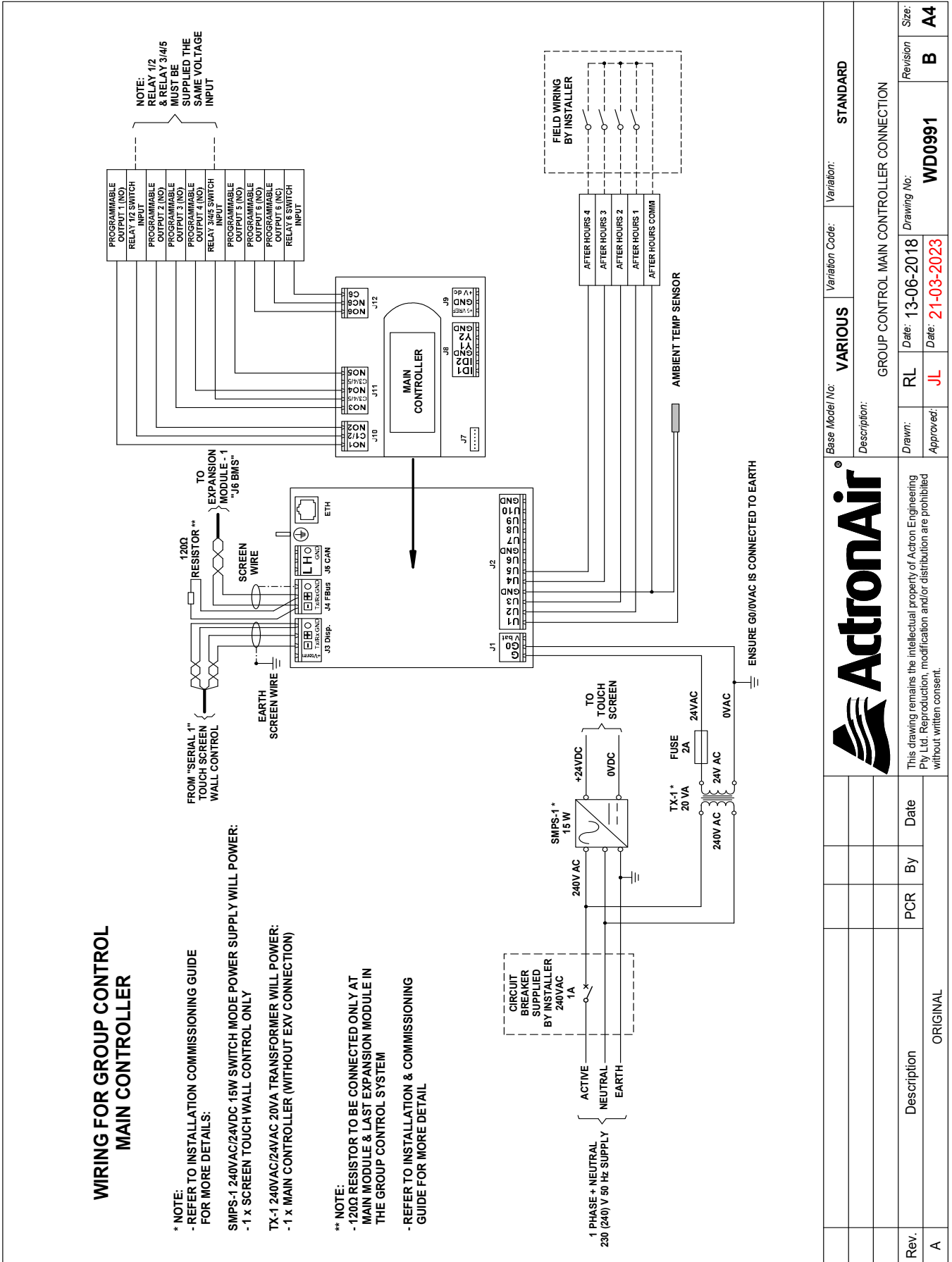FROM PACKAGE A/C UNIT
CONTROL CIRCUIT BREAKER

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| Base Model No: | PKV | | Variation Code: | | Variation: | |
|---|---|---|---|---|---|---|
| Description: | | GROUP CONTROL EXPANSION MODULE CONNECTION FOR HERCULES PACKAGE SYSTEMS | | | | |
| Drawn: | RL | Date: | 29-08-2018 | Drawing No: | WD0997 | Revision: C | Size: A4 |
| Approved: | JL | Date: | 18-12-2019 | | | |

| | Description | PCR | By | Date |
|---|---|---|---|---|
| C | ADDED OPTIONAL DEVICE POWER NOTE | 3220 | RL | 18-12-2019 |
| B | FAULT OUTPUT CHANGED TO NO CONTACT | 2994 | MJH | 26-09-2018 |
| Rev. | Description | PCR | By | Date |
| A | ORIGINAL | | | |

## 08.18. Group Control System Power and RS485 COM

**WIRING FOR GROUP CONTROL SYSTEM POWER AND RS485 NETWORK**

* NOTE:
- REFER TO INSTALLATION COMMISSIONING GUIDE FOR MORE DETAILS:

SMPS-1 240VAC/24VDC 15W SWITCH MODE POWER SUPPLY WILL POWER:
- 1 x SCREEN TOUCH WALL CONTROL ONLY

TX-1 240VAC/24VAC 20VA TRANSFORMER WILL POWER:
- 1 x MAIN CONTROLLER (WITHOUT EXV CONNECTION)

TX-2 TO TX-16 240VAC/24VAC 20VA TRANSFORMER WILL POWER:
- 1 x EXPANSION MODULE PER UNIT

**EXPANSION MODULE DIP SWITCH SETTINGS**

EXPANSION MODULE -1
EXPANSION MODULE -2
EXPANSION MODULE -3
EXPANSION MODULE -4
EXPANSION MODULE -5
EXPANSION MODULE -6
EXPANSION MODULE -7
EXPANSION MODULE -8
EXPANSION MODULE -9
EXPANSION MODULE -10
EXPANSION MODULE -11
EXPANSION MODULE -12
EXPANSION MODULE -13
EXPANSION MODULE -14
EXPANSION MODULE -15

1 PHASE + NEUTRAL 230 (240) V 50 Hz SUPPLY

CIRCUIT BREAKER SUPPLIED BY INSTALLER 240VAC 1A

TOUCH SCREEN WALL CONTROL

SMPS-1 15 W
+24VDC
0VDC
TX-1 * 20 VA
FUSE 2A
240V AC
24V AC
24VAC
0VAC

MAIN CONTROLLER

EXPANSION MODULE - 1
UNIT 1

EXPANSION MODULE - 15
UNIT 15

** NOTE:
- 120Ω RESISTOR TO BE CONNECTED ONLY AT MAIN MODULE & LAST EXPANSION MODULE IN THE GROUP CONTROL SYSTEM
- REFER TO INSTALLATION & COMMISSIONING GUIDE FOR MORE DETAIL

120Ω RESISTOR **

SCREEN WIRE

FIELD WIRING BY INSTALLER -
CABLE MUST BE 2 CORE 7/0.30 TWISTED SHIELDED DATA CABLE WITH ONE END OF SCREEN WIRE CONNECTED TO THE GND TERMINAL BETWEEN DEVICES
REFER TO INSTALLATION & COMMISSIONING GUIDE FOR MORE DETAIL

FIELD WIRING BY INSTALLER -
CABLE MUST BE 4 CORE 7/0.30 TWISTED PAIR SHIELDED DATA CABLE WITH SCREEN WIRE CONNECTED TO PANEL EARTH

EARTH SCREEN WIRE

ENSURE G0/0VAC IS CONNECTED TO EARTH

AC UNIT CONTROL CIRCUIT BREAKER ***
ACTIVE
NEUTRAL

1 PHASE + NEUTRAL 230 (240) V 50Hz SUPPLY FROM CONDENSER / PACKAGE A/C UNIT CONTROL CIRCUIT BREAKER

TX-2 * 20 VA
FUSE 2A
240V AC
24V AC
24VAC
0VAC

TX-16 * 20 VA
FUSE 2A
240V AC
24V AC
24VAC
0VAC

*** NOTE:
- REFER TO UNIT INSTALLATION & COMMISSIONING GUIDE FOR A/C UNIT CONTROL CIRCUIT BREAKER LOCATION & CURRENT RATING

Address
ON
OFF
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

with offset
no offset
19.2K
35.4K
57.6K
Reserved
Modbus
Reserved
Ext. Baud Prot

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| | | Base Model No: | VARIOUS | Variation Code: | Variation: | | | Size: A3 |
|---|---|---|---|---|---|---|---|---|
| | | Description: | GROUP CONTROL SYSTEM POWER AND RS485 NETWORK CONNECTIONS | | | | | Revision: A |
| | | Drawn: RL | Date: 10-02-2023 | | Drawing No: WD1002 | | | |
| | | Approved: JL | Date: 21-03-2023 | | | | | |

| Rev. | Description | PCR | By | Date |
|---|---|---|---|---|
| A | ORIGINAL | | | |

## 08.19.    Group Control System Server Controller

## 09. Configuration Unit Setup for CGT1000

Systems that are controlled other than remote on/off will require setup in the unit to allow control via Group Control. See below setup process depending on product:

### 09.01.   Split/Package System (SRE/SRA/SCA/PCA/PCG)

DIP switch on the unit must be set as below to allow control via Group Control:
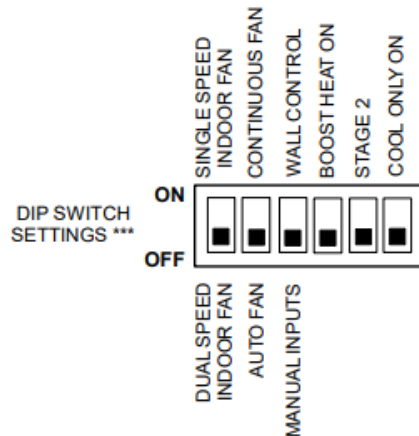


### 09.02.   UNO Jnr/UNO Connection (CCA/CRA/CRQ/CRV/PKV)

Step 1. Press MENU button to scroll to Set Menu and press the ENTER button.

Step 2. Press the MENU button to scroll through to CtrS and press the ENTER button.

Step 3. Press the MENU button to scroll through to number 0 to allow control via Group Control. Press the ENTER button to select.

Step 4. Press BACK button twice to exit.

### 09.03.   Tri-Capacity (PKY/CAY)

Tri-Cap systems require configuration in the CP05 to allow for group control. Service Settings is password protected, the password is 7378.

Menu  >  G. Service  >  Gf. Service Settings

Press Enter button( ↵ )  and enter the password as below:
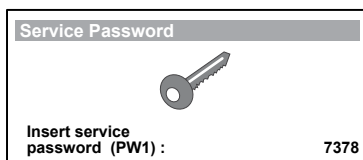


⚠ **WARNING**

Unauthorized access to Service Menu and inadvertent changes to the settings can cause damage to the air conditioning system which will render ActonAir warranty null and void.

Enable remote on/off via DIN 4

Menu  >  G. Service  >  Ge. Communicate Config.

Scroll down to screen Ge3 and setup as below:

```
Bms Config.                        Ge3

Enable Din 4 to turn

the unit On / Off :              Yes
```
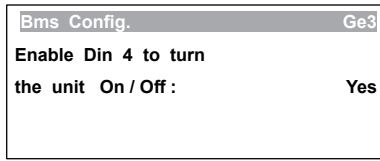
Set to **Yes** to enable Remote
ON/OFF digital input control

On screen Gfc8, set a multi input 1 & 2 to YES, *0-10v IN FAN SPD. * and 0-10V.

Menu > G. Service > Gf. Service Settings > Gfc. Thermoregulation

Scroll down to screen Gfc8 and setup as below:

```
S. Configuration                   Gfc8
Sensor  present :
       Multi Input  1 :            YES
*0 - 10v STAGE  CONT.*
Probe type:                        0-10V
       Multi Input  2 :            YES
*0-10v IN FAN SPD.*
Probe type:                        0-10V
```
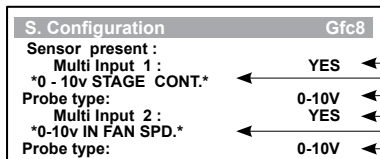
**YES**
Change to ·0-10v STAGE CONT.·
Change Probe type to **0-10V**
**YES**
Change to ·0-10v IN FAN SPD.·
Change Probe type to **0-10V**

On screen Gfc13, set the **Type of fans fitted  Supply:** to **A2FB in VARI** for CAY or **Vari Speed** for PKY

G. Service → Gf. Service settings → Gfc. Thermoregulation → Gfc13. S. Configuration

```
S. Configuration                   Gfc13

Type  of fans fitted :
   Supply   : A2FB In VARI
   Outdoor : 2 SPEED AC

   Econ. cycle fitted : Yes
   Econ.  type: MODULATE
```
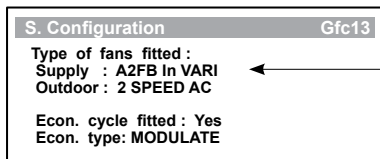
**PKY: Vari Speed**
**CAY: A2FB In Vari**

Unit control mode is set to **EXTERNAL INPUT** via screen Gfc11

G. Service → Gf. Service settings → Gfc. Thermoregulation → Gfc11. S. Configuration

```
S. Configuration                   Gfc11

   Unit  control  mode :
     EXTERNAL INPUT
   Supply Fan Control  :

   Select  Wall  Control :
     SINGLE  CL01
```
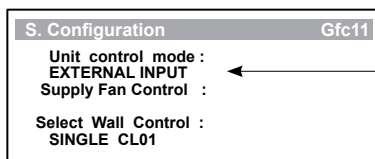
**EXTERNAL INPUT**

Set Supply Fan Control to **EXTERNAL** via screen Gfc11

G. Service → Gf. Service settings → Gfc. Thermoregulation → Gfc11. S. Configuration

```
S. Configuration                   Gfc11

   Unit  control  mode :
     EXTERNAL INPUT
   Supply Fan Control  :
     EXTERNAL
   Select  Wall  Control :
     SINGLE  CL01
```
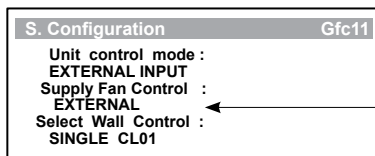
**EXTERNAL**

### 09.04. Hercules (PKV)

Hercules systems require configuration through the CP10 to allow control via the Group Control.

Service Settings is password protected, the password is 7378.

Menu > G. Service > Gf. Service Settings
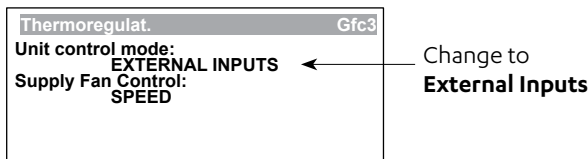
Press Enter button( ↵ ) and enter the password as below:

```
Service Password

           🔑

Insert service
password (PW1) :            7378
```
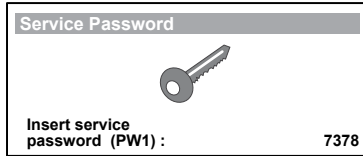
> ### ⚠ WARNING
>
> Unauthorized access to Service Menu and inadvertent changes to the settings can cause damage to the air conditioning system which will render ActonAir warranty null and void.

Go to the menu below to set Unit Control Mode to External Input

Menu > G. Service > Gf. Service Settings > Gfc. Thermoregulation

Scroll down to screen Gfc3 and setup as below:

```
Thermoregulat.                Gfc3
Unit control mode:
            EXTERNAL INPUTS       ◄──  Change to
Supply Fan Control:                    External Inputs
            SPEED
```

You also will need to enable remote on/off via DIN 4

Menu > G. Service > Ge. Communicate Config.

Scroll down to screen Ge3 and setup as below:

```
Bms Config.                    Ge3
Enable Din 4 to turn
the unit On / Off :          Yes  ◄──  Set to Yes to enable Remote
                                       ON/OFF digital input control
```
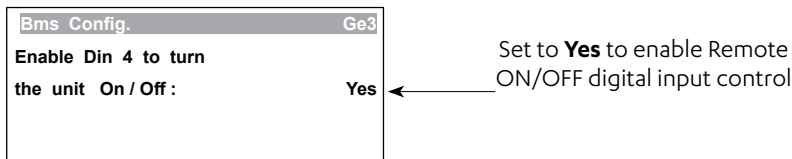
### 09.05. Economy Damper Option for Tri-Cap/Hercules

Control of the economy damper varies depending on whether this is controlled via the Group Control or via the Unit Control (CM100). The below table shows the abilities of both options:

|  | Group Control | CM100 |
|---|---|---|
| Temp Difference To Enable Cycle | Yes | Yes |
| Economy Cycle Offset co-efficient | No | Yes |
| Econ. Prop. Band | No | Yes |
| Min Outside Temp | No | Yes |
| Min Outside Position | Yes | Yes |

If an economiser variation is ordered but you would like to control the unit via the Group Control, take wire from Y4 on CM100 and connect to U6 on the CG10. See Wiring Diagram on the following page. **Wiring Diagram for Economy**

## Wiring Diagram Economy Damper Option for Tri-Cap (CAY/PKY/PKV)

## Wiring Diagram Economy Damper Option for Hercules
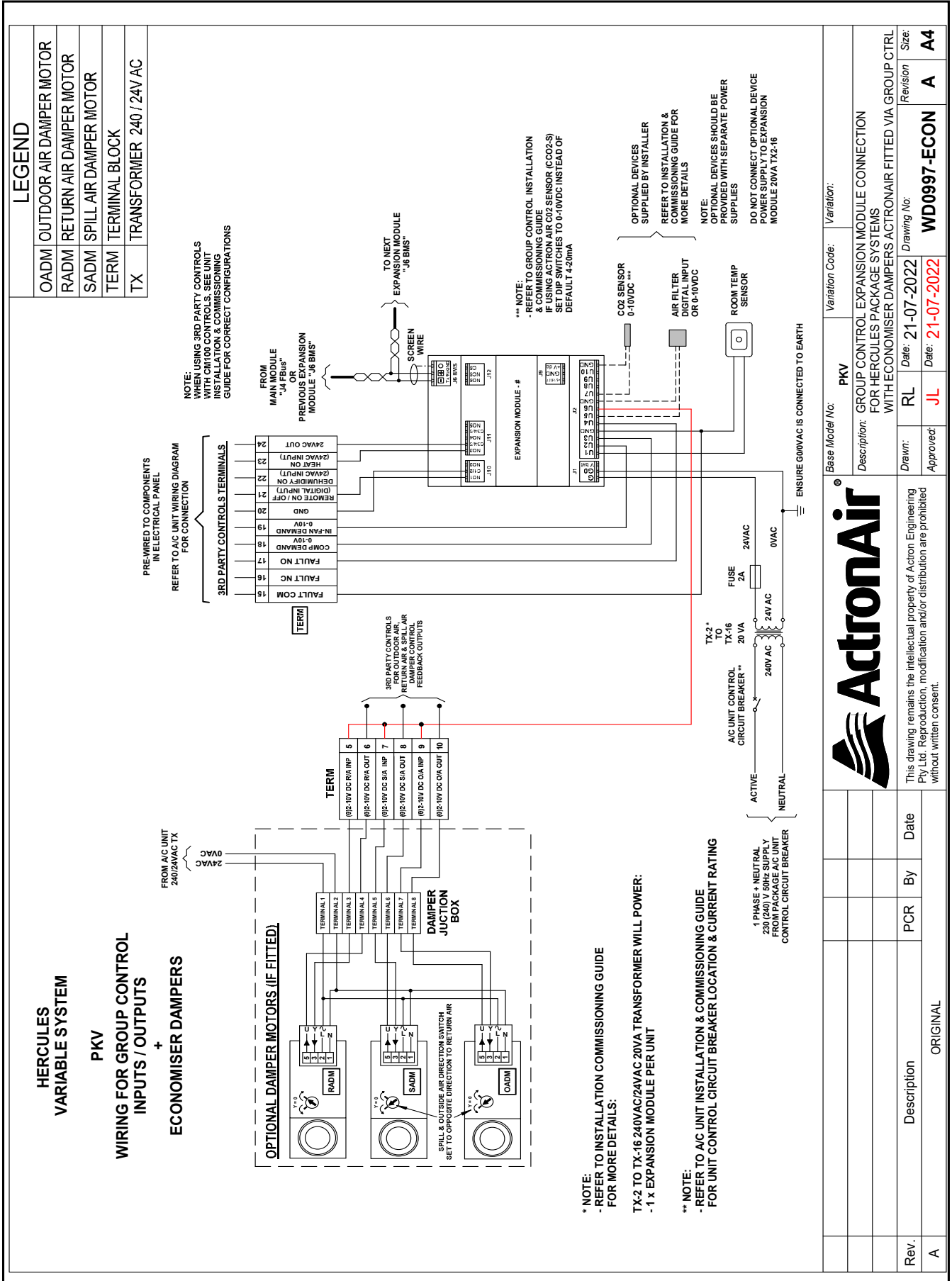
## 10. Configuration and Setup of Touch Screen Wall Control

After the Group Control System wiring is completed and checked, the system can now be powered up. Refer to the filled out Start-up and Commissioning Table (SCT) in Section 12. The SCT will be useful in configuring the Group Control System.

| Note |
| --- |
| For configuring a Group Control system to control a room damper to modulate the air volume in space, see Annex A |

| Step | Actions | Section in Operation Manual (9590-3015) |
| --- | --- | --- |
| 1 | Ensure that no Input/Output components are connected to the CG100 and CG10. Ensure that only the power and the RS485 network cables are connected as per the wiring diagrams and SCT | |
| 2 | Power ON the Group Control System | |
| 3 | Tap the screen to ensure the Touch Screen Wall Control is powered. Check that the Signal LED is green (not flashing). | 06. General Information |
| 4 | Log in as Administrator | 07.03. Configuration Page |
| 5 | Change Administrator password by tapping the User Config.button | 08.03. Configuration Page/ 08.03.04. User button |
| 6 | Assign Group Names | 08.01.01 Home Page |
| 7 | Set up Group Schedule/s | 08.01 Home Page/ 08.01.06 Schedule Button/ 08.01.07 Group Schedule Screen/ 08.01.08 Setting Seven Day Schedule |
| 8 | Set up Special Days Schedule/s | 08.01 Home Page/ 08.01.10 Special Days Button/ 08.01.11 Special Days Screen |
| 9 | Check and adjust Time and Day Setting/Time Zone as needed | 08.03. Configuration Page / 08.03.01 24 Hour Time and Date/ 08.03.02 Timezone |
| 10 | Assign After Hour duration | 08.03. Configuration Page 08.03.03  After Hours |
| 11 | Configure the  System The filled out copy of Start-up and Commissioning Table from Section 12. is required for configuring the System | 08.03. Configuration Page/ 08.03.06  System Button/ 08.03.07 Service Page |
| | -   Assign Unit Name Ensure that the Expansion Module number matches the System number on the SCT | 08.03.09 Unit Name |
| | -   Assign the Unit Name/Location of SCT to Group | 08.03.10 Group |
| | -   Select Air conditioning Model on SCT to Unit Type | 08.03.12 Unit Type |
| | -   Set the CGT100 Configuration on SCT to Control Profile | 08.03.13 Control Profile |
| | -   Configure the other parameters using the Wiring Diagram and the Wiring Diagram Reference Table (Section 08) is needed to determine the correct setting. | |
| 12 | Configure each Output Source as required. | 08.04. Information Page/ 08.04.03 Name/ 08.04.04 Source |
| 13 | After configuring the CGT100, Power OFF the network and connect the I/O components | |

## 11. Troubleshooting

| Issue no. | Symptoms | Troubleshoot |
|---|---|---|
| 0 | Screen blank | Step 1. Touch the screen to activate. |
| | | Step 2. Check the Signal LED (on the upper left hand corner of the screen) is ON. |
| 1 | Screen blank and No power on Signal LED | Step 1. Using a multimeter, check the 24VDC power supplied to the screen power port. If there is no power, proceed to step 2. |
| | | Step 2. Check the 240VAC/24VDC power supply and wiring for any short to ground, circuit breaker trip, replace power transformer if faulty. |
| | | Step 3. Power cycle to check if the screen will restart. |
| 2 | Screen On and Signal LED is flashing Green. | Step 1. Check CG100 LCD display is ON (press Esc button to illuminate) or that the CG100 Power LED (yellow) is ON. |
| | | Step 2. Check the 24VAC power supplied to the CG100 power port J1. If no power; then check the 240/24VAC power transformer, check the 24VAC fuse on the transformer output, any open or short circuit wire, 240VAC circuit breaker is not tripped. |
| | | Step 3. Check the network cables between the CGT100 and the CG100 for correct termination, wiring continuity, polarity and correct com ports are used (CG100 J3 Disp port connected to Serial 1 port on CGT100). |
| | | Step 4. If the checks performed in Steps 1-3 the fault is with either the CGT100 or CG100. Replace the CG100 then the CGT100. |
| 3 | Configuration LED on CG10 is ON (not flashing) | Step 1. Check the CG10 has power (yellow power LED). |
| | | Step 2. Using a multimeter, check the 24VAC power supplied to the CG10 port J1. If no power; then check the 240/24VAC power transformer, check the 24VAC fuse on the transformer output, any open or short circuit wire, 240VAC circuit breaker is not tripped. |
| | | Step 3. Check the CG10 DIP switch settings are correct (DIP switch setting matches the System assignment). |
| | | Step 4. Check the network cables for correct termination, wiring continuity, polarity and correct com ports are used (CG100 J4 FBUS port connected to CG10 J6 BMS Ports). |
| | | Step 5. Check that there is a 120Ω termination resistor fitted on the CG100 J6 BMS terminal and also the last CG10 module J4 Fbus terminal. |

| Issue no. | Symptoms | Troubleshoot |
|---|---|---|
| 4 | Temperature sensor out of range | Step 1. Check the sensor wiring (open circuit, short to ground). |
| | | Step 2. Check and/or replace the sensor. |
| | | Step 3. Replace CG100 or CG10 module. Ensure correct DIP switch settings. |
| 5 | CO2 sensor fault (Alarm icon displayed) | Step 1. Check the 24VAC power supplied to the CO2 sensor electronics is OK. |
| | | Step 2. Check the sensor wiring for any short or open circuit. |
| | | Step 3. Check the reading using a multimeter (0-10VDC). |
| | | Step 4. Replace the sensor if faulty. |
| 6 | After Hour (N/O) is not responding | Step 1. Check the wiring continuity between the After Hours button and the digital input. |
| | | Step 2. Troubleshoot the Main Controller and replace if faulty. |
| 7 | Remote ON/OFF is not responding | Step 1. Check the wiring continuity between the digital output and the related unit or auxiliary connected to, inspect if there are any short to ground, loose wire. |
| | | Step 2. Troubleshoot the Main Controller or I/O expansion board and replace if faulty. |
| 8 | Status Indicator displays OFFLINE on the Operation Page | Step 1. Check wiring, power, CG10 address and ensure System is enabled on the controller |
| 9 | Status Indicator displays COMM ERROR on the Operation Page | Step 1. Check wiring, ensure termination resistors are installed and cable run lengths are within specifications. |
| | | Step 2. Ensure all CG10s have unique addresses and that no other devices are connected to the network. |
| | | Step 3. Investigate external sources for electromagnetic interference. |
| 10 | Fan not running | Step 1. Check for any alarms displayed |
| | | Step 2. Check configuration of the unit on Service Screen (System setting). |
| | | Step 3. Check the unit is not disabled. |
| | | Step 4. Check the unit is included in a Schedule. |
| | | Step 5. Check the Schedule On/Off. |
| | | Step 6. Check the CG10 module I/O wiring. |
| 11 | Unit not cooling or heating | Step 1. Check for any alarms displayed |
| | | Step 2. Check configuration of the unit. |
| | | Step 3. Check the unit is not disabled. |
| | | Step 4. Check the Room Temperature sensor is enabled. |
| | | Step 5. Check the Mode of Operation. |
| | | Step 6. Check the Temperature setpoint. |
| | | Step 7. Check the CG10 module I/O wiring. |
| 12 | Economy Cycle Not Functioning | Step 1. Check the Economy Configuration. |
| | | Step 2. Check the Ambient Sensor is enabled. |
| | | Step 3. Check the Room Temperature is enabled. |
| | | Step 4. Check the unit is running in cooling. |

## 12. Start-up and Commissioning Table (SCT)

| Expansion Module # | Confirm DIP Switch Setting (See Section 07.10.) | Unit Name / Location | Air Conditioning Serial Number | Air Conditioning Model | Wiring Diagram (See Section 08.) | Control Profile | Filter Setting |
|---|---|---|---|---|---|---|---|
| Example | ✓ | Basement | 523914 | PCG203U-K | WD0992 | Profile-1 | Timer |
| 1 | ☐ | | | | | | |
| 2 | ☐ | | | | | | |
| 3 | ☐ | | | | | | |
| 4 | ☐ | | | | | | |
| 5 | ☐ | | | | | | |
| 6 | ☐ | | | | | | |
| 7 | ☐ | | | | | | |
| 8 | ☐ | | | | | | |
| 9 | ☐ | | | | | | |
| 10 | ☐ | | | | | | |
| 11 | ☐ | | | | | | |
| 12 | ☐ | | | | | | |
| 13 | ☐ | | | | | | |
| 14 | ☐ | | | | | | |
| 15 | ☐ | | | | | | |

ActronAir recommends this page to be photocopied and handed over for setting up CGT100 and commissioning.

## Annex A

### Configuring a Group Control System to control a room damper

The following sections details the steps to use the control profile Variable-1 (renamed Profile-3 from UI S/W ver. 2091-28-1003) to control a damper opening, ignore Air flow switch, and wiring the system.

### Wiring

Wiring Diagram for "Group Control Expansion Module Connection for Tri-Cap system with Economiser Damper Fitted Via CG10" is on the last section of this Annex A.

On the system Expansion module 2

1. Connect the damper control (01-10VDC) cable to U3 (Universal Input 3) and GND.
2. Add Jumper Wire between U5 and GND, if the function is not used in order to avoid a false alarm.

### Setting

Go to CONFIGURATION Page, set a system (system 2 as an example) control profile to Variable-1 (Profile-3) and then configure other parameters as shown below.



3. Enable System 2
4. Assign a name "Party Room" (as an example) to this system
5. Set the Air filter to "FILTER PRESSURE SWITCH".
6. Assign the system to a group (Group 3 as an example).
7. Set the system AC MODE Auto
8. Set the DEAD BAND to minimum (0.1) so that the (0-10VDC) output on U3 output has full scale of ~ 0 -10VDC.
9. Set the COOLING PB to a value (0.5 <->10) to fine tune proportional changes between room temp and setpoint.

### System ON/OFF

1. On HOME Page, the Party Room (which is assigned to Group 3) will be shown in OFF status

2. On HOME Page, test Group 3 operation by switching "AFTER HOURS" Button to ON (default is 120 minutes)



**Note**

The AFTER HOURS default value can be adjusted via CONFIGURATION Page

3. On CONFIGURATION Page, Verify that System 2 is ON, and monitor COMPRESSOR status bar (0-10VDC) output (used for damper control) is changing with reference to the ROOM TEMPERATURE value and SETPOINT.

## Wiring Diagram for Tri-Cap System (CAY/PKY) with Economiser Damper controlled by CG10

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