CAA
COMMAIR
AUSTRALIA

Installation, Start-up & Service Manual

Units with:
Splat LT2 Controllers

I. Safety Considerations

Before installation, please read carefully these precautions and warnings for safety.

The unit is designed to provide safe and reliable service when operated within design specifications. To avoid injury to personnel and damage to equipment or property when operating the equipment, the following safe practices should be observed as a minimum.

• Check the unit weight to be sure the lifting equipment is adequate.

• Disconnect power to the unit before working on it.

• Do not remove access panels or doors until fans have completely stopped.

• Do not enter an enclosed fan cabinet or into the unit while a fan is running.

• Protect materials when welding or flame cutting. Use suitable cloth to contain sparks. Have a fire extinguisher at hand and ready for immediate use.

• To be installed by qualified persons only.

• Turn off main power supply before attempting any electrical work. Make sure all power switches are off. Failure to do so may cause electric shock.

• Connect the connecting cable correctly. If the connecting cable is connected wrongly, electric parts may be damaged. Check the earth wire for continuity.

• Do not install near concentrations of combustible gas or gas vapours to avoid possible explosion.

• Never modify this unit by removing any of the safety guards or bypassing any of the safety switches.

• Make sure to conduct a trial operation after the installation work, and explain how to use and maintain the unit to the customer in accordance with the manual.Ask the customer to keep the installation manual safe with the unit.

II. Pre-installation

Check items received against delivery note. Examine unit for damage which may have occurred in transit. Notify

the manufacturer's sales representative of any damage. Remove packaging from unit and any protective foam

packing from coils and pipes. Each air-conditioning unit has a Product Identification Plate mounted externally

and a second one mounted inside the electrical compartment. A typical identification plate is shown below. Refer to the Product Identification Plate mounted on the unit for generalized technical information.

MODEL No.	VPA012C3AA
CONFIG No.	VPA012C3AA
Date of Manufacture:	9/02/2011
Serial No.	000001

CAA COMM AIR AUSTRALIA AIR CONDITIONING MANUFACTURERS (00) 3 0000018

Cooling Capacity	12.09	kW	Refrigerant	410A / 5.0	kg/stg
Sensible Capacity	9.5	kW	Voltage	415	V
Power Input Cool	3.95	kW	Phase	3	-
EER	3.06	-	Frequency	50	Hz
Heating Capacity	N/A	kW	RLA	15.4	A
Power Input Heat	N/A	kW	FLA	16.8	A
COP	N/A	-	Application Type	T1	-
SAQ	600	l/s	Net Weight	325	kg

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Product Identification Plate

III. Installation

1. Location

The equipment must be installed in accordance with relevant authority requirements. Position the unit on a solid, level mounting pad ensuring adequate service access as outlined on the Installation Drawing attached. Level and fasten the units, making sure that access panels close easily and are able to be removed. Connect all necessary ducting.

2. Drains

An adequate drain line trap must be provided outside the indoor coil for condensate run-off. The drain pipe should be installed with a continuous downward grade away from the unit. The gradient should not be less than 1:50. Outdoor units operating on reverse cycle will release water from the outdoor coil as well, particularly during defrost. Where appropriate, water should be drained to waste.

3. Refrigerant

Check superheat during cooling operation.

• Superheat to be approximately 5 to 8 K.

• Check product name plate for refrigerant charge amount.

> **WARNING:** To minimise oxidation inside copper tubing, all brazing operations must be completed with a small steady stream of nitrogen passing through the pipework to be welded.
>
> **VERY IMPORTANT:** Never use the compressor as a vacuum pump. Do not overcharge with refrigerant.

4. Electrical

All electrical work must be carried out by a qualified and licensed electrician. The installation must comply with the current relevant standards wiring rules and local authority requirements. Wire sizing is the responsibility of the installer, as it depends on the conditions and regulations applicable to each installation site. Refer to the electrical drawing and specification of the unit for the electrical data. The electrical installation requirements are generally as follows

• The air-conditioning unit shall be supplied directly from a distribution board through a mains lockable isolating switch.

• Ensure that power supply phase rotation is correct.

• Control circuit has been designed to be powered from a low voltage 24VAC supply.

IV. Start-up

1. Make sure all wiring has been completed correctly, and that any doors with cut-out sensors on them have been properly closed.

2. Turn on the indoor fan circuit breaker only, and run the fan to adjust its airflow to that desired.

3. Now, ensure all circuit breakers have been turned on.

4. Turn power on and wait for the controller to boot up and complete a self test. The unit is ready when the idle screen has been displayed.

5. Check for system faults. See sections on faults and trouble-shooting later in this document for assistance.

6. Resolve fault issues, if any, making sure all fault messages have been cleared.

7. The system is now ready to run. Turn it on at the thermostat and ensure the compressor and fans all start and run in the correct direction.

V. Splat LT2 Controller

General description

The LT2 controller is an advanced microprocessor based controller for two stage air conditioning units utilizing 1 or 2 compressors per stage. It incorporates reverse acting head pressure (RAHP) control of the outdoor fans, with separate outputs to control the star/delta operating mode of the outdoor fans. This has resulted in a highly integrated design utilising fewer components, improving reliability.

Features include:

• High performance FLASH memory.

• Built in continuous self checking ensures controller is running correctly and will reset the system if an error is detected.

• Low cost thermistor sensor input for defrost detection with short and open circuit fault Detection.

• Built in user interface with back lit LCD and 4 on board push buttons allow the system configuration to be changed and status information to be viewed.

• Speed up button with indication LED.

• On board 240 VAC 20 Amp rated relay for direct outdoor fan control when RAHP mode is not used.

• RAHP control of outdoor fan with interlocked and time sequenced star and delta relay outputs.

• On board fusing of thermostat and control gear 24 VAC power.

• Four levels of heating/cooling possible due to the use of 2 compressors per stage and 4 stage calls provided at the thermostat connection terminals.

• High speed RS485 expansion interface for connecting a wide range of auxiliary functions to the controller (Xwire).

• Optically isolated RS485 communications interface running protocols such as MODBUS RTU for remote control/sensing via touch screen, computer and BMS systems.

• PC application available (CommAir MODBUS Diagnostic Tool) allows unit to be monitored and controlled remotely.

• Low power design.

• Built in run hour counters for all compressors.

• Non volatile fault logging allows up to the last 20 faults to be viewed. Fault history can also be cleared.

• Real time status display including faults, running status and readout of outdoor coil temperature (when defrost sensors are fitted).

• Safety interlock sensors/switches act directly by interrupting the 24 VAC power to the various control outputs, regardless of the microprocessor control.

• Fault relay output (low voltage dry contact).

Notes about use of multiple LT2 controllers in a common unit

• When 2 or more LT controllers are used to control a unit ie 4 stage and 6 stage designs, there is no communication between the controllers themselves. This means there is no hierarchy to the way in which a BMS is able to start compressors. It means that a BMS could call for the starting of the 1st compressor from each LT board with no time delay between starts. Timed starting of successive compressors on a given LT board is still provided, but not between successive LT boards.

• While the LT boards themselves do not communicate with each other, each controller will still be looking for a signal to confirm that there is correct operation of the indoor fan before the controller(s) will allow the starting of any compressors. This has been taken care of by Comm Air through the interlocking of relays external to the boards. Hence, the indoor fan is only wired to one of the controllers (Normally Stage 1 and stage 2 controller), but if stages 3 or higher calls for the starting of a compressor, prior to the starting of compressors on board 1, there is no issue as the indoor fan operational signal is being provided to all the LT boards.

• It is assumed that only 1 indoor fan is provided for each self-contained unit. However, in some designs, multiple fans (normally plug fans) have been used to achieve the required fan performance called for. In this instance, unless arranged at quoting stage, the collection of fans will treated by the control system as a single large fan. This implies that if 1 fan should fail, all fans will cycle off, as will the rest of the system.

VI. LT2 Controller Layout & Functions

There are four buttons located below the LCD display screen which are: SPEED UP, SETUP, TRIP VIEW and TRIP STEP.

a. SPEED UP:

Press and release the <SPEED UP> button quickly to turn on or turn off the speed up mode. The LED next to it will light up if the speed up is active. The LED is off if the speed up is inactive. As a failsafe, speed up mode will automatically turn off 1 hour after activation. The Speed Up is for testing and trouble shooting, with normally functioning delays being decreased per the table below. Speed up can only be toggled via the speed up button while the controller is displaying any one of it's idle screens. The table below outlines normal vs speed up times:

| Normal time	Speed Up Time	Description
1 second	1 second	Time to wait before reporting a new stable RAHP change
5 minutes	15 seconds	Minimum ODF run time before a STAR/DELTA change is permitted
5 minutes	1 minute	Compressor anti cycle time
10 seconds	10 seconds	Defrost sensor must be continuously low for this period before unit commit to defrost
30 minutes	70 seconds	Minimum time delay between defrost cycles
10 minutes	2 minutes	Maximum defrost run time
90 seconds	10 seconds	Minimum compressor run time before activating defrost
5 minutes	5 seconds	Low pressure relay override timer, LP bypassed time after defrost
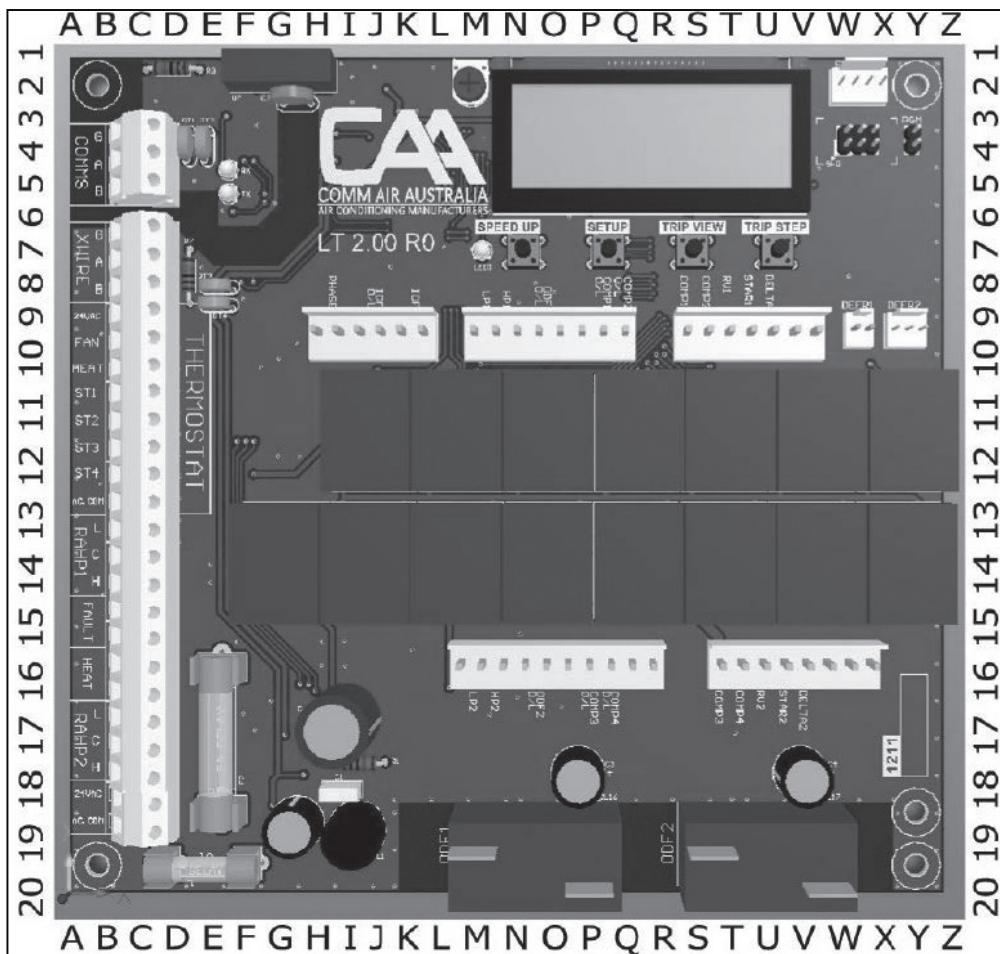
Safety Considerations

b. SETUP Menu:

The setup menu can only be activated from an idle screen (See d below). Once the setup menu is active, the buttons possess the following functions:

<SPEEDUP>   Scroll to previous menu item.
<SETUP>   Scroll to next menu item.
<TRIP VIEW> Softkey – The text above the key explains the function.
**<TRIP STEP>** Softkey – The text above the key explains the function.

The setup menu will remain visible for 1 minute after the last button has been pressed. After this time, the system will return to the idle screen and any changes made will be lost unless already saved. The board provides an opportunity to save at completion of setup choices.

```
        Setup
        Menu
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
   ○   ○   ○   ○
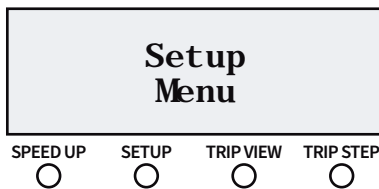
Press and hold the **<SETUP>** button until the **<Setup Menu>** is displayed on the screen then release it to enable scrolling through the menu.

```
S1 Comp1 runtime
    11.9hr    CLR
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
   ○   ○   ○   ○
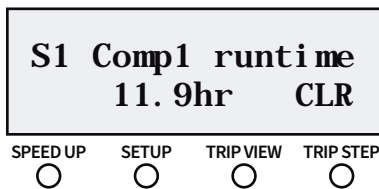
As soon as the **<SETUP>** button is released, Stage 1 compressor 1 runtime hours is displayed:

Press **<TRIPSTEP>** to clear this compressor's runtime hour count (if needed).

```
S1 Comp2 runtime
    10.5hr    CLR
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
   ○   ○   ○   ○
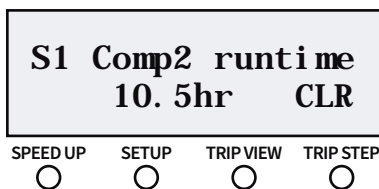
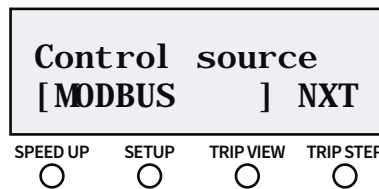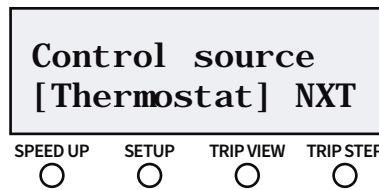Now press the **<SETUP>** button again. Stage 1 compressor 2 runtime hour is displayed:

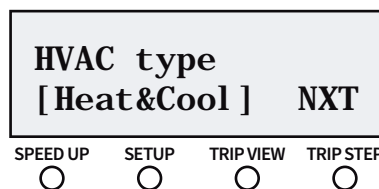Again, press **<TRIPSTEP>** to clear this compressor's runtime hour count (if needed).

```
MODBUS address
[   1]      +    -
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
   ○   ○   ○   ○
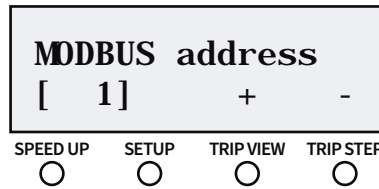
Now press the **<SETUP>** button again. The MODBUS address is displayed:

This allows the MODBUS address to be set. Press **<TRIPVIEW>** to increment the address, or **<TRIPSTEP>** to decrement. Holding either button will start automatic counting.

```
Control source
[Thermostat] NXT
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
   ○   ○   ○   ○

```
Control source
[MODBUS     ] NXT
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
   ○   ○   ○   ○

Pressing the **<SETUP>** button again gives a choice of "Control source". Possible choices are either "thermostat" or "MODBUS" control. Pressing the **<TRIPSTEP>** button toggles between "Thermostat" or "MODBUS" control.

(Choosing Thermostat control does not remove the ability to display MODBUS available outputs.)

```
HVAC type
[Cool Only]  NXT
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
   ○   ○   ○   ○

```
HVAC type
[Heat&Cool]  NXT
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
   ○   ○   ○   ○
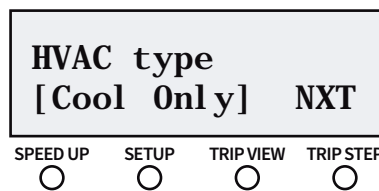
Press the **<SETUP>** button again. "HVAC type" is displayed allowing the user to choose between a "Cool Only" or "Heat pump" (Reverse cycle) system.

Press **<TRIP STEP>** to toggle between "Cool Only" or "Heat & Cool".

```
Comp selection
[Direct    ] NXT
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
  ○   ○   ○   ○

```
Comp selection
[Balanced  ] NXT
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
  ○   ○   ○   ○

```
Comp fault mode
[Individual] NXT
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
  ○   ○   ○   ○

```
Comp fault mode
[Paired    ] NXT
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
  ○   ○   ○   ○

Press the **<SETUP>** button again for "Comp selection" screen. This allows the user to choose a simple load balancing behaviour, called lead/lag, if desired.

Press **<TRIPSTEP>** to toggle between "Direct" and "Balanced". Direct allows each compressor to be controlled directly from the compressor call inputs. Balanced allows the controller to toggle between compressors used for each successive compressor call input. It is provided to help balance out the wear on all compressors.

Pressing the **<SETUP>** button again selects "Comp fault mode". This feature provides compressor fault pairing if desired. Press **<TRIPSTEP>** to toggle between "Paired"and "Individual". "Paired" means any single compressor electrical fault will shut down both compressors in the tandem pair. "Individual" means a single electrical fault only shuts down the offending compressor. Note that with tandem compressor arrangements, because of common pipework between the compressors in a tandem arrangement, an HP or LP fault will automatically shut down both compressors.

```
Comp paired run
[Individual] NXT
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
  ○   ○   ○   ○

```
Comp paired run
[Paired    ] NXT
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
  ○   ○   ○   ○

```
Defrost IDF
[OFF]        NXT
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
  ○   ○   ○   ○

```
Defrost IDF
[ON]         NXT
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
  ○   ○   ○   ○

Press the **<SETUP>** button again for "Comp paired run" window. This allows the compressors to be run as a pair only with a 10 second interval between lead and lag compressor start, or as individual only. If "paired" is chosen, connect thermostat to st 1 connection on control board. Press **<TRIPSTEP>** to toggle between "Individual" and "Paired".

Press the **<SETUP>** button again. The "Defrost IDF" is displayed giving choice of control of Indoor Fan behaviour during defrost. Press **<TRIPSTEP>** to toggle between "ON" and "OFF". Choosing "ON" means the IDF will run continuously during defrost resulting in cold air being blown into the conditioned space. Choosing "OFF" allows the IDF to cycle off during defrost, reducing the incidence of cold air being blown into the conditioned space. However, defrost efficiency is lowered in this mode, leading to longer defrost periods.

Further notes on "Comp paired run" above:

1. For single compressor installations, "Paired" or "Individual" mode can be selected. Make sure the 1 stage thermostat is connected to St 1 output on control board.

2. For tandem compressors, see separate window above left for setup choices.

```
RAHP  sensor
[Not Fitted]  NXT
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
   ○   ○   ○   ○

```
RAHP  sensor
[Fitted      ]  NXT
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
   ○   ○   ○   ○

Press the **<SETUP>** button again. The "RAHP sensor" window is displayed providing control of Outdoor Fan speed. Press **<TRIPSTEP>** to toggle between "Not Fitted" and "Fitted". "Not Fitted" means the Outdoor fan runs at one speed only. "Fitted" means with RAHP inputs, the Outdoor fan can operate with LOW or HIGH speed based on the measured Outdoor coil pressure during Cooling mode only. RAHP will be ignored during Heating hence the outdoor fan will be forced to run in HIGH speed.

```
Defrost  sensor
[Not Fitted]  NXT
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
   ○   ○   ○   ○

```
Defrost  sensor
[Fitted      ]  NXT
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
   ○   ○   ○   ○

Now press the **<SETUP>** button again. "Defrost sensor" is displayed which allows the user to set the presence of a defrost sensor. If "Heat&Cool" has been selected in **<HVAC type>** window above, the choice of defrost sensor fitment is removed and the program forced to "Fitted"(ie: heatpump systems must have defrost sensors on the outdoor coils). Otherwise for cooling only systems, press **<TRIPSTEP>** to toggle between "Fitted" and "Not Fitted". If set to fitted for a cooling only system, thermistor faults will be logged, but the stage will not be shut down.

```
Current  transfmr
[Not Fitted]  NXT
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
   ○   ○   ○   ○

```
Current  transfmr
[Fitted      ]  NXT
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
   ○   ○   ○   ○

Press **<SETUP>** button again to give access to "Current transfmr". This enables the user to set the presence of a Current transformer (CT). The use of a CT is purely for information. It does not control anything in the system. Press **<TRIPSTEP>** to toggle between "Not Fitted" and "Fitted". "Not Fitted" means the Current Transformer is not used. "Fitted" means the Current Transformer is used and connected to the LT1 controller for measuring the current consumption of compressor(s).

```
Save  changes?
              Y      N
```
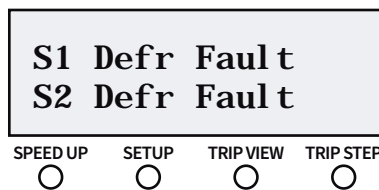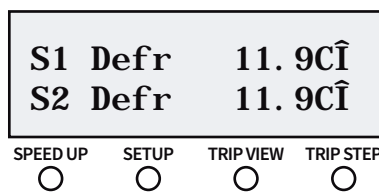SPEED UP   SETUP   TRIP VIEW   TRIP STEP
   ○   ○   ○   ○

Now press the **<SETUP>** button again. The "Save changes?" is displayed which allows to save the changed item(s), by selecting "Y" (pressing the **<TRIP VIEW>** button) or abandoning the changes by selecting "N" (pressing the **<TRIP STEP>** button) and returning to the idle screen.

b. DASH BOARD Screens:

```
CommAir 2 Stage
SW1.22 FW1.08
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
○   ○   ○   ○
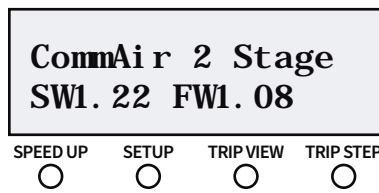
A collection of other readings are available on the dashboard screen. The dashboard can only be activated while one of the idle screens is visible. Press and hold the **<TRIPSTEP>** button to see the dashboard. Each press and hold of **<TRIPSTEP>** will display the next dashboard. Dashboards are displayed in the following order:

```
S1 Defr      11.9CÎ
S2 Defr      11.9CÎ
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
○   ○   ○   ○

```
S1 Defr Fault
S2 Defr Fault
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
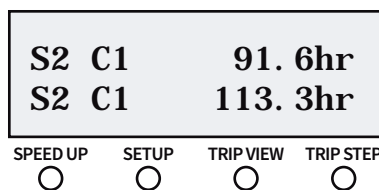○   ○   ○   ○

Defrost sensor temperature
This will appear as picture 1 if the unit has sensors fitted, good connection and LT1 controller configured with "Defrost sensor [Fitted]" or as picture 2 if the unit has sensors fitted, bad connection (or faulty sensor) and LT1 controller configured with "Defrost sensor [Fitted]".

```
S1 C1        159.2hr
S1 C1         86.8hr
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
○   ○   ○   ○
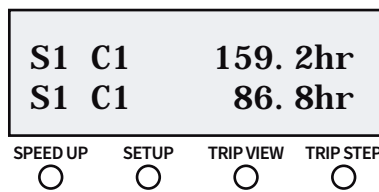
Stage 1: Compressor(s) runtime hours

```
S2 C1         91.6hr
S2 C1        113.3hr
```
SPEED UP   SETUP   TRIP VIEW   TRIP STEP
○   ○   ○   ○

Stage 2: Compressor(s) runtime hours

d. Idle Screen

When the controller is powered and no buttons are being pressed, the screen will read out the current operating status of the controller. Typically the screen will look like this:

$$S1 \quad C1 = xxx \quad C2 = xxx$$
$$S2 \quad C2 = xxx \quad C2 = xxx$$

"S1" indicates the state of the compressors for stage 1 and "S2" for stage 2. The marker "xxx" will be one of the following messages:

Off: The compressor is off and no calls are pending.

O/L: The compressor is currently in overload and has been shutdown.

Flt: The compressor had been in overload but isn't any longer. It is now waiting for the call to be removed to reset the fault and permit it to run again.

Icy: The compressor is running in Cool mode.

Hot: The compressor is running in Heat mode.

Tmr: The compressor is now off and the anti-cycle timer is running.

Rdy: A compressor call is present and this compressor is scheduled to start once other items, like the outdoor fan, have turned on.

Ast: The compressor is assisting with a defrost cycle. It is providing heat to compensate for the other stage that is defrosting.

Dfr: The compressor is running in defrost mode to remove ice from the coil.

A fault that affects the whole stage will appear on the whole line for that stage. The following errors are possible.

Low Pressure: The refrigeration gas pressure is too low.

High Pressure: The refrigeration gas pressure is too high.

ODF overload: The Outdoor Fan is currently in overload, or the door of the outdoor fan compartment is open, which has caused the Door safety switch to exhibit an open circuit. The outdoor fan circuit breaker might also be turned off, or the Internal thermal protection of outdoor fan motor is opened circuit and the motor has been switched off. No compressors for this stage are running.

Pending reset: The Outdoor Fan had been in overload but isn't any longer, or the defrost sensor was faulty and the fault has been corrected. It is now waiting for all the stage calls to be removed to reset the fault and permit this stage to run again.

A fault that affects both stages will occupy the whole screen. If any of these errors occur, neither stage will be able to run. The following errors are possible:

Mains Phase Fault: The mains phase error input has triggered.

Indoor Fan Overload: The indoor fan is in overload.

Indoor Fan Fault Reset IDF call: The indoor fan had been in overload but isn't any longer. The system is now waiting for the indoor fan call to clear to reset the fault and permit it to run again.

Mains Fuse Failure: The fault chain fuse blown. Thermostat Fuse Failure: Thermostat fuse blown.

e. Fault History

The system saves the last 20 faults and retains this information even during power failure. The fault history can only be activated whilst one of the idle screens are visible.

Press and hold the **<TRIPVIEW>** button to see the history. While keeping **<TRIP VIEW>** held, press and release **<TRIP STEP>** to step through the history.

The following faults are able to be reported:

Main fuse: Fault chain fuse blown
Phase failure: Phase failure
Indoor fan O/L: Indoor fan overload
S1 low press: Stage 1 low pressure
S1 high press: Stage 1 high pressure
S1 ODF O/L: Stage 1 outdoor fan overload
S1 Comp 1 O/L: Stage 1 compressor 1 overload
S1 Comp 2 O/L: Stage 1 compressor 2 overload
S1 RAHP fault: Stage 1 RAHP fault
Config chkfail: Config checksum corruption
Hr mtr chkfail: Hour meters checksum corruption
ErrLog chkfail: Error log checksum corruption
ThermostatFuse: Thermostat fuse blown
S2 low press: Stage 2 low pressure
S2 high press: Stage 2 high pressure
S2 ODF O/L: Stage 2 outdoor fan overload
S2 Comp 1 O/L: Stage 2 compressor 1 overload
S2 Comp 2 O/L: Stage 2 compressor 2 overload
S2 RAHP fault: Stage 2 RAHP fault
S1 defr sensor: Stage 1 defrost sensor (shorted or open circuit wires)
S2 defr sensor: Stage 2 defrost sensor (shorted or open circuit wires)
S1 CT CommsErr: Stage 1 current transformer lost comms
S2 CT CommsErr: Stage 2 current transformer lost comms
The fault history may be cleared while it is being viewed.

To clear it, keep **<TRIPVIEW>** held and hold **<TRIPSTEP>** for 6 seconds. The history will then be erased and cannot be recovered.

Please note that if faults "Config chkfail", "Hr mtr chkfail" and "ErrLog chkfail" occur in the field, the board should be replaced.

VII. Service / Maintenance

To ensure continuing high performance, and to minimise the possibility of premature equipment failure, periodic maintenance must be performed on the air conditioning equipment. The units should be inspected at least once each year by a qualified service person.

The minimum maintenance requirements for this equipment are as follows:

Monthly
• Inspect air filters.
• Replace throwaway type filters when they become clogged with dust and lint or clean cleanable type filters monthly.

Yearly
• Inspect indoor coil, drain pan and condensate drain. Clean when necessary.
• Inspect indoor fan motor and wheel for cleanliness and alignment. Clean, lubricate and align the motor assembly where applicable. Replace worn belts where applicable.
• Inspect outdoor coil. Clean when necessary.
• Inspect outdoor fans and motors. Ensure that fan blades are clean and adequately balanced.
• Inspect the unit cabinet and insulation for damage and corrosion. Repair where necessary. Check for vibration and excessive noise. Correct where necessary.
• Inspect refrigerant tubing for oil accumulation. If oil is detected, leak test refrigerant tubing using an electronic leak detector or liquid soap solution.
• Check refrigerant charge by measurement of superheat and subcooling. Where necessary, adjust charge to achieve optimum performance.

VIII. Trouble shooting

Fault Code Displaying	Symptom(s)	Part(s) to check and How to correct the fault(s)
S1 C1=Off C2=Off S2 C1=Off C2=Off	The compressors and Outdoor Fans are off. Indoor fan is running.	The compressors are off and no calls are pending
S1 C1=Off C2=Off S2 C1=Off C2=Off	The compressors and Outdoor Fans are off. Indoor fan is running.	The compressors are off and the anti-cycle timers are running.
S1 C1=O/L C2=Off S2 C1=Off C2=Off	The compressors and Outdoor Fans are off. Indoor fan is running.	**Compressor 1 Overload Relay of the stage 1 is tripped.** Reset it. The compressor 2 of stage 1 and compressor 1 & 2 of stage 2 are off and no calls are pending for those.
S1 C1=O/L C2=Tmr S2 C1=Tmr C2=Tmr	The compressors and Outdoor Fans are off. Indoor fan is running.	**Compressor 1 Overload Relay of the stage 1 is tripped.** Reset it. The compressor 2 of stage 1 and compressor 1 & 2 of stage 2 are off and the anti-cycle timers for those are running.
S1 C1=Off C2=O/L S2 C1=Off C2=Off	The compressors and Outdoor Fans are off. Indoor fan is running.	**Compressor 2 Overload Relay of the stage 1 is tripped.** Reset it. The compressor 1 of stage 1 and compressor 1 & 2 of stage 2 are off and no calls are pending for those.
S1 C1=Tmr C2=O/L S2 C1=Tmr C2=Tmr	The compressors and Outdoor Fans are off. Indoor fan is running.	**Compressor 2 Overload Relay of the stage 1 is tripped.** Reset it. The compressor 1 of stage 1 and compressor 1 & 2 of stage 2 are off and the anti-cycle timers for those are running.
S1 C1=Flt C2=Off S2 C1=Off C2=Off	The compressors and Outdoor Fans are off. Indoor fan is running.	The compressor 1 of stage 1 has been in overload but isn't any longer. It is now waiting for the call to be removed to reset the fault and permit it to run again.
S1 C1=Flt C2=Tmr S2 C1=Tmr C2=Tmr	The compressors and Outdoor Fans are off. Indoor fan is running.	The compressor 1 of stage 1 has been in overload but isn't any longer. It is now waiting for the call to be removed to reset the fault and permit it to run again.
S1 C1=Off C2=Flt S2 C1=Off C2=Off	The compressors and Outdoor Fans are off. Indoor fan is running.	The compressor 2 of stage 1 has been in overload but isn't any longer. It is now waiting for the call to be removed to reset the fault and permit it to run again.
S1 C1=Tmr C2=Flt S2 C1=Tmr C2=Tmr	The compressors and Outdoor Fans are off. Indoor fan is running.	The compressor 2 of stage 1 has been in overload but isn't any longer. It is now waiting for the call to be removed to reset the fault and permit it to run again.
S1 C1=Off C2=Off S2 C1=O/L C2=Off	The compressors and Outdoor Fans are off. Indoor fan is running.	**Compressor 1 Overload Relay of the stage 2 is tripped.** Reset it. The compressor 1 & 2 of stage 1 and compressor 2 of stage 2 are off and no calls are pending for those.
S1 C1=Tmr C2=Tmr S2 C1=O/L C2=Tmr	The compressors and Outdoor Fans are off. Indoor fan is running.	**Compressor 1 Overload Relay of the stage 2 is tripped.** Reset it. The compressor 1 & 2 of stage 1 and compressor 2 of stage 2 are off and the anti-cycle timers for those are running.
S1 C1=Off C2=Off S2 C1=Off C2=O/L	The compressors and Outdoor Fans are off. Indoor fan is running.	**Compressor 2 Overload Relay of the stage 2 is tripped.** Reset it. The compressor 1 & 2 of stage 1 and compressor 1 of stage 2 are off and no calls are pending for those.
S1 C1=Tmr C2=Tmr S2 C1=Tmr C2=O/L	The compressors and Outdoor Fans are off. Indoor fan is running.	**Compressor 2 Overload Relay of the stage 1 is tripped.** Reset it. The compressor 1 & 2 of stage 1 and compressor 1 of stage 2 are off and the anti-cycle timers for those are running.
S1 C1=Off C2=Off S2 C1=Flt C2=Off	The compressors and Outdoor Fans are off. Indoor fan is running.	The compressor 1 of stage 2 has been in overload but isn't any longer. It is now waiting for the call to be removed to reset the fault and permit it to run again.
S1 C1=Tmr C2=Tmr S2 C1=Flt C2=Tmr	The compressors and Outdoor Fans are off. Indoor fan is running.	The compressor 1 of stage 2 has been in overload but isn't any longer. It is now waiting for the call to be removed to reset the fault and permit it to run again.
S1 C1=Off C2=Off S2 C1=Off C2=Flt	The compressors and Outdoor Fans are off. Indoor fan is running.	The compressor 2 of stage 2 has been in overload but isn't any longer. It is now waiting for the call to be removed to reset the fault and permit it to run again.
S1 C1=Tmr C2=Tmr S2 C1=Tmr C2=Flt	The compressors and Outdoor Fans are off. Indoor fan is running.	The compressor 2 of stage 2 has been in overload but isn't any longer. It is now waiting for the call to be removed to reset the fault and permit it to run again.
S1 Low pressure S2 C1=Off C2=Off	The compressors and Outdoor Fans are off.	Check LP circuit of Stage 1. Check continuity of LP switch of Stage 1. The LP
S1 High pressure S2 C1=Off C2=Off	The compressors and Outdoor Fans are off. Indoor fan is running.	Check HP circuit of stage 1. Check continuity of HP switch of Stage 1. The HP switch is opened circuit when it cut out. Check Outdoor fan is operational.
S1 ODF overload S2 C1=Off C2=Off	The compressors and Outdoor Fans are off. Indoor fan is running.	Check the Outdoor fan 1 Circuit breaker has not tripped. Check continuity of the Door safety switch and ensure that the door of outdoor fan compartment is closed properly where the door switch is fitted. Check continuity of the Internal thermal protection of outdoor fan 1 motor to ensure it has not tripped. Check continuity of outdoor fan thermal overload relay (if fitted) and reset if it was tripped.
S1 Pending reset S2 C1=Off C2=Off	The compressors and Outdoor Fans are off. Indoor fan is running.	The Out Door Fan of Stage 1 had been in overload but isn't any longer. Or the Defrost sensor of stage 1 was faulty and the fault has been corrected. It is now waiting for all the stage calls to be removed to reset the fault and permit this stage to run again.

Fault Code Displaying	Symptom(s)	Part(s) to check and How to correct the fault(s)
S1 C1=Off C2=Off S2 Low pressure	The compressors and Outdoor Fans are off. Indoor fan is running.	Check LP circuit of Stage 2. Check continuity of LP switch of Stage 2. The LP switch is opened circuit when it cut out.
S1 C1=Off C2=Off S2 High pressure	The compressors and Outdoor Fans are off. Indoor fan is running.	Check HP circuit of stage 2. Check continuity of HP switch of Stage 2. The HP switch is opened circuit when it cut out. Check Outdoor fan is operational.
S1 C1=Off C2=Off S2 ODF overload	The compressors and Outdoor Fans are off. Indoor fan is running.	Check the Outdoor fan 2 Circuit breaker has not tripped. Check continuity of the Door safety switch and ensure that the door of outdoor fan compartment is closed properly where the door switch is fitted. Check continuity of the Internal thermal protection of outdoor fan 2 motor to ensure it has not tripped. Check continuity of outdoor fan thermal overload relay (if fitted) and reset if it was tripped.
S1 C1=Off C2=Off S2 Pending reset	The compressors and Outdoor Fans are off. Indoor fan is running.	The Out Door Fan of Stage 2 had been in overload but isn't any longer. Or the Defrost sensor of stage 2 was faulty and the fault has been corrected. It is now waiting for all the stage calls to be removed to reset the fault and permit this stage to run again.
Mains Phase Fault	The compressors, Outdoor fans and Indoor Fan are off.	Check the error of supply such as voltage, phase sequence (Phase failure relay must be fitted to provide phase failure input to LT2 controller). Check for wiring connection of the input for "PHASE" to LT2 controller.
Mains Fuse Failure	The compressors, Outdoor fans and Indoor Fan are off.	F2 fuse - Fault chain fuse blown (5 Amp delay 3AG fuse). Replace the fuse
Thermostat Fuse Failure	The compressors, Outdoor fans and Indoor Fan are off.	F1 fuse - Thermostat fuse blown (M205 1 Amp delayed action fuse). Replace the fuse.
Indoor Fan Overload	The compressors, Outdoor fans and Indoor Fan are off.	Check wiring connection to the Indoor fan overload relay to ensure correct wiring. Check the Indoor fan Overload Relay, If it has been tripped. Reset it
Indoor Fan Fault Reset IDF call	The compressors, Outdoor fans and Indoor Fan are off.	The indoor fan had been in overload but isn't any longer. The system is now waiting for the indoor fan call to clear to reset the fault and permit it to run again.
S1 defr sensor S2 C1=Off C2=Off **(Displayed in Heat mode only)**	The compressors Outdoor Fans are off. Indoor fan running.	Check the defrost sensor of Stage 1. It may be shorted or open circuit wires. If the Defrost sensor is faulty, replace by new sensor supplied by Comm Air.
S1 defr sensor S2 C1=Off C2=Off **(When <TRIP VIEW> is pressed in Cool mode)**	The compressors, Outdoor Fan and Indoor fan are running O.K.	If defrost sensor is fitted for monitoring purpose then check the defrost sensor. It may be shorted or open circuit wires. If the Defrost sensor is faulty, replace by new sensor supplied by Comm Air. If defrost sensor is not fitted for monitoring purpose. Wrong Menu set up may cause. Go to Menu set up for CAA controller and change parameter setting of "Defrost sensor" as "Not Fitted" then save that change.
S1 CT CommsErr OR S2 CT CommsErr **(When <TRIP VIEW> is pressed)**	The compressors, Outdoor Fan and Indoor fan are running O.K.	If the CT (Current transformer) is fitted for monitoring purposes. Check the wiring connection of the CT. It may be opened circuit wires (LED indicators are off) or wrong Dip switch setting on the CT (the red LED light up) then see Electrical wiring diagram to correct it. If the CT (Current transformer) is NOT fitted. Wrong Menu set up. Go to Menu set up for CAA controller and change parameter setting of " Current transfmr" as "Not Fitted" then save that change.
RAHP fault OR S2 RAHP fault **(When <TRIP VIEW> is pressed in Cool mode or Heat mode)**	Outdoor fans are running O.K.	If the RA/HP Switch is fitted for control the speed of Outdoor fan. Check the wiring connection of the RA/HP SWITCH. It may be opened circuit wires. If the RA/HP SWITCH is NOT fitted. Wrong Menu set up. Go to Menu set up for CAA controller and change parameter setting of "RAHP sensor" as "Not Fitted" then save that change.

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