

TECHNICAL REFERENCE
FOR
CAREL CONTROLLERS
ACC(E)

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Retain instructions with unit and maintain in a legible condition.
Please give model number and serial number when contacting
Engineered Air for information and/or parts.

www.engineeredair.com

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YOU HAVE RESPONSIBILITIES TOO

This installation, operation and maintenance manual cannot cover every possibility, situation or eventuality. Regular service, cleaning and maintaining the equipment is necessary. If you are not capable of performing these tasks, hire a qualified service specialist. Failure to perform these duties can cause property damage and/or harm to the building occupants and will void the manufacturers' warranty.

This technical manual is intended to be used as an operating guide, and shall be used with the Installation, Operation and Maintenance Manual(s) supplied with the equipment.

INTRODUCTION

The CAREL chiller controller for ACC(E) equipment stages compressors to maintain the required water temperature. The controller is generic to Engineered Air equipment and allows for a variety of system configurations. Refer to the equipment function sheet(s). A slave controller may be added for additional stages of cooling beyond the 2x2 tandem stage master controller.

Once enabled to operate and flow has been proven, compressor circuits are staged on to achieve the required water demand setpoint. As the chilled water temperature demand increases the isolation valve associated with the required stage will open. Once the valve is proven open, the compressor will start. After the compressor is started the controller will go through its internal timers and safeties before attempting to bring on the next stage of cooling. As the chilled water temperature demand drops, the chiller will begin staging off compressors and its corresponding isolation valve.

Freeze prevention is always active, sensing the leaving fluid temperature. Freezing is a serious alarm, and the controller will disable cooling to that particular water circuit immediately. If the controlled unit only has one circuit, the entire unit will shut down.

SAFETY PRECAUTIONS

Read, understand and follow the complete manual before beginning the installation, including all safety precautions and warnings.

Warning:

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

Warning:

This unit is connected to high voltages. Electrical shock or death could occur if instructions are not followed. This equipment contains moving parts that can start unexpectedly. Injury or death could occur if instructions are not followed. All work should be performed by a qualified technician. Always disconnect and lock out power before servicing. DO NOT bypass any interlock or safety switches under any circumstances.

TERMINALS

Designation	Description
G	24Vac Hot
G0	24Vac Neutral (grounded)
GND	Control Chassis Ground
NO1	Compressor 1 Circuit 1 Enable
NO2	Compressor 2 Circuit 1 Enable (Tandem)
NO3	Compressor 3 Circuit 2 Enable
NO4	Compressor 4 Circuit 2 Enable (Tandem)
NO5	Condenser Fan 1 Enable
NO6	Condenser Fan 2 Enable
NO8	Alarm
NO9	System Pump Enable
NO10	Circuit 1 Liquid Solenoid
NO11	Circuit 2 Liquid Solenoid
NO15	Evaporator 1 Isolation Valve
NO16	Evaporator 2 Isolation Valve
C#	24Vac power supply to digital contact outputs.
ID1	HPC Circuit 1 Input
ID2	LPC Circuit 1 Input
ID3	Remote On / Off Input
ID6	Compressor 1 Circuit 1 Overload / CPM
ID7	Compressor 2 Circuit 1 Overload / CPM
ID8	Alarm Output
ID9	HPC Circuit 2 Input
ID10	LPC Circuit 2 Input
ID11	Compressor 1 Circuit 2 Overload / CPM
ID12	Compressor 2 Circuit 2 Overload / CPM
DI15	Evaporator Proof of Flow Circuit 1
ID16	Evaporator Proof of Flow Circuit 2
U1	Compressor 1 Discharge Pressure Transducer
U2	Compressor 1 Suction Pressure Transducer
U3	Control Water Outlet Temperature
U4	Control Water Inlet Temperature
U5	Circuit 1 Evaporator Outlet Water Temperature
U6	Compressor 2 Discharge Pressure Transducer
U7	Compressor 2 Suction Pressure Transducer
U8	Evaporator 2 Outlet Temperature
U9	Outdoor Ambient Temperature
Y1	Condenser Fan 1 Speed Control
Y2	Condenser Fan 2 Speed Control

MASKS

SLAVE DISPLAY

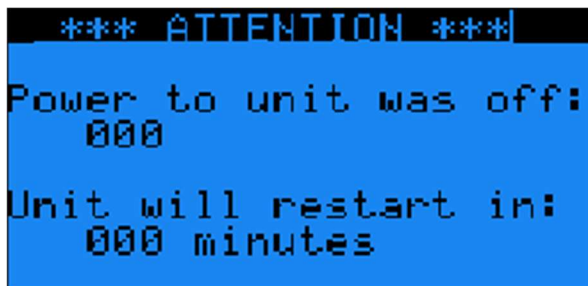


This indicates that the controller is a slave to a master controller, for additional stages of cooling. All information and settings reside in the main ACC controller.

MAIN DISPLAY



The main default display indicates the version number of the software. Any technical assistance will require this number.



On initial power up, the unit will delay operation to give the compressor heaters time to warm up and ensure no liquid refrigerant is present inside the compressor at startup.



The main operational mask indicates the inlet and outlet fluid temperatures from the evaporator. A small arrow indicates the selected control sensing type (return water = In, leaving water = Out).

Pressing the up/down arrows will cycle through each circuit (compressor) stage.

```
Circuit 1 M01
HP1000.0 Psi9→000.0 °F
LP1000.0-Psi9→000.0-°F
Comp1A: Off      000
         Off      000
         Off      000
```

Each circuit (compressor) status, high (discharge) and low (suction) pressure. In addition, the conversion of pressure to temperature is noted. Compressor status is noted near the bottom.

Continue pressing down to view the condenser fan settings.

```
Unit M05
Cond.fan set:000.0Psi9
Condenser fan 1: 000%
                  000
```

Condenser fan status and setpoints, including information for optional variable speed condenser fans.

```
Unit M06
Current set: 000.0 °F
Regul.temp.: 000.0 °F
Steps required: 00/00
```

Shows the current fluid temperature, and the controlled (regulated) temperature setpoint. As well, the calculated number of cooling stages expected to achieve setpoint is also shown.

MAIN LOOP

Pressing the program button will display the main loop which includes On/Off control, setpoint, clock, input/outputs, Data logger, board switch, service and manufacturer sections. Some sections are password protected. Press the up and down arrows to cycle through the selections, then the enter button to select.

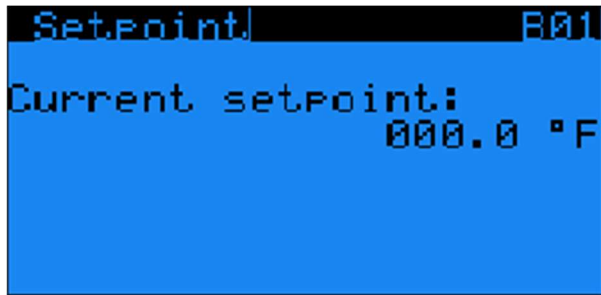
ON/OFF UNIT

```
On/Off Unit A01
Unit address: 00
Actual state:
Change to: SWITCH OFF
```

Indicates the controller address. This must vary if multiple master controllers are being used.

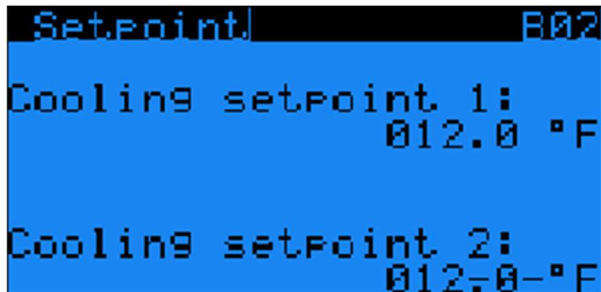
The actual unit status is also displayed and may be enabled or disabled by override.

SETPOINT



```
Setpoint| B01
Current setpoint:
      000.0 °F
```

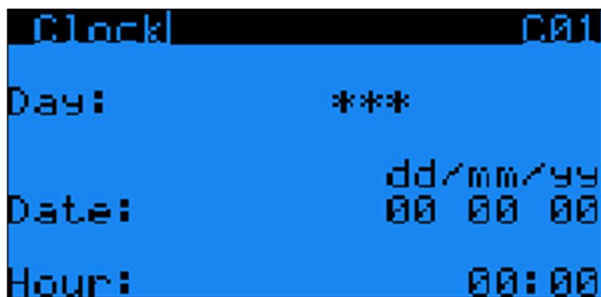
Current fluid temperature setpoint.



```
Setpoint| B02
Cooling setpoint 1:
      012.0 °F
Cooling setpoint 2:
      012.0 °F
```

The setpoint(s) may be adjusted on this screen.
Setpoint 2 is typically used for unoccupied times.

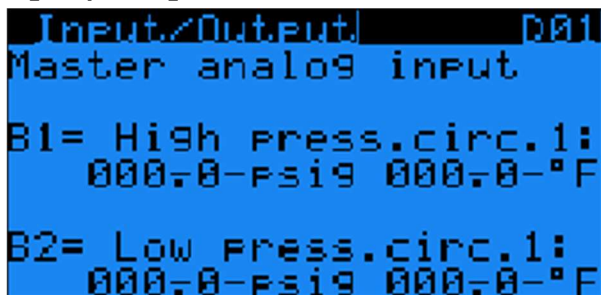
CLOCK



```
Clock| C01
Day: ***
dd/mm/yy
Date: 00 00 00
Hour: 00:00
```

Sets the present date and time.

Input/Output



```
Input/Output| D01
Master analog input
B1= High Press.circ.1:
    000.0-psi 000.0-°F
B2= Low Press.circ.1:
    000.0-psi 000.0-°F
```

Describes the present operating conditions of all inputs and outputs.

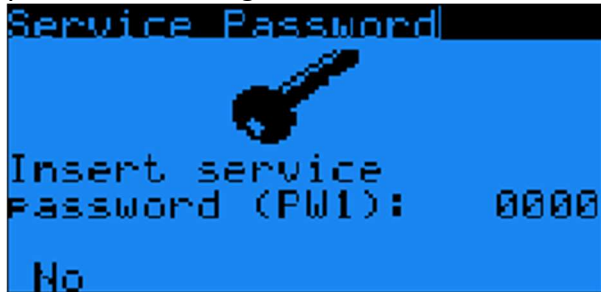
Cycle Up and Down to view additional stages.

Data Logger

A service tool, this shows a list of past faults and alarms, including the event date and time.

Service

Access to the service menu is intended for technicians who are familiar with the controller, chiller and system. Contact Engineered Air for assistance.



Enter the service password (7263) to access.

Manufacturer

Factory setup menu.



Enter the manufacturer password to access.
Contact Engineered Air service department.