CommStat 3™ Controller

Marvair®
ISO 9001:2008 REGISTERED COMPANY
AIRXCEL™, Inc.

CommStat 3™ Lead/Lag Controller

The CommStat 3™ Controller by Marvair® is a solid state control package designed to operate a fully or partially redundant air conditioning system for a telecommunication cabinet or shelter. The CommStat 3 Controller is factory programmed with standard industry set points to facilitate installation. If desired, each of the set points can be quickly and easily changed in the field by the installer. It can be used with Marvair's ComPac® I or ComPac® II unique vertical packaged wall mount air conditioners or Marvair's environmental control units.

The CommStat 3™ Controller provides environmental control and the security demanded by the communications industry for a back-up unit. The lead/lag controller insures equal wear on both air conditioners while allowing the lag unit to assist upon demand. The lead/lag changeover is factory set at 7 days, but is programmable in half-day increments from 1/2 to 7 days.

Specification/Features

Thermostat
- Thermostat Range:
  - cooling is 65 - 95°F (18 - 35°C); default, 75°F (24°C).
  - heating is 50 - 80°F (10 - 27°C); default, 68°F (20°C).
- Programmable and display in °F (default) or °C.
- Thermostat provides two stages of cooling and two stages of heating.
- Changeover differential between cooling and heating is a minimum of 4°F (2.2°C).

Differential
- On-Off differential of each stage is adjustable from 2 - 5°F (1 - 3°C); default, 3°F (2°C).
- Interstage differential (stage 1 cooling to stage 2 cooling) adjustable from 2 - 12°F (1 - 7°C); default, 2°F (1°C).

Ease of Installation
- Wiring connections insensitive to phasing of units.
- 24 VAC with 24 VDC or 48 VDC backup power.
- Easy terminal connection for thermostat wire.
- No additional power source required for operation.
- Temperature sensor built into unit. Optional remote sensors available for measuring temperatures, up to 24 ft. from the CommStat 3™ Controller, in up to 3 locations in the shelter. P/N 80503
- Easy attachment to wall.

Ease of Operation
- Extremely easy to program or to change factory settings.
- Push button on front to swap lead and lag unit.
- LEDs indicate:
  - control power from each air conditioner.
  - function (heating or cooling) of each unit.
  - lead unit.
  - high or low refrigerant pressure lockout.
- Digital display shows temperature.
- Comfort override push button temporarily overrides set points for 90 minutes. Select either 72°F (22°C) or 77°F (25°C). Display blinks to indicate Comfort Mode.
- If one air conditioner loses power, the other air conditioner automatically advances to lead control.
- Indefinite program retention on power loss.

Alarm Relays
Dry contacts can be used for remote alarm or notification. Relays can be wired for either Normally Open or Normally Closed.

- Power - activated if 24 VAC is not provided to the CommStat 3™ Controller.
- Low temperature alarm - activated if temperature in building drops below set point. Default is 41°F (5°C).
- High temperature alarm - activated if temperature in building exceeds set point. Default is 95°F (35°C).
- Refrigerant pressure lockout - activated if either air conditioner is off due to a high or low refrigerant pressure.
- Smoke detector input - when a signal is received from an external smoke detector, both air conditioners are immediately shut down.
- Smoke alarm output - activated if a signal is received from the building's smoke detector.

DC Power Back up
- In the event of a loss of 24 VAC power, a user provided 24 VDC or a 48 VDC can be used to operate the CommStat 3. When operating on DC power, the display, the user interface and the alarm outputs are functional.

Enclosure
- Dimensions: 7-1/2" x 6" x 2" (190mm x 150mm x 50mm).
- Doubles as junction box for control wiring to air conditioner.
- Designed for use with conduit.
- Corrosion resistant polycarbonate material.

Programming Instructions

CommStat 3™ Controller Control Buttons and Function

Off/On Button
1. Push and hold the <u>Off/On</u> button for 5 seconds to turn Off CommStat 3™ Controller and the cooling/heating for both units.
   - Lockout(s) are cleared if the lockout problem(s) have been remedied.
   - Alarm Relays are reset if the alarm problem(s) have been remedied.
2. <u>Off/On</u> button interrupts (Off) or allows (On) 24 VAC "Y" signal for cooling to both units.
3. <u>Off/On</u> button interrupts (Off) or allows (On) 24 VAC "W" signal for heating to both units.
4. Push the <u>Off/On</u> button to turn the CommStat 3™ Controller On.

Comfort Button
1. Pushing the <u>Comfort</u> button twice, while in normal operation, will provide temperature selections for the comfort mode. Use the <u>Up</u> or <u>Down</u> buttons to select either 72°F (22°C) or 77°F (25°C) as the comfort temperature.
2. Push the <u>Comfort</u> button once to begin comfort mode operation.
3. CommStat 3™ Controller will revert back to normal operation after running for 90 minutes in the comfort mode or after the <u>Comfort</u> button has been pushed again.

Up Button
1. Functional only when in the programming mode or when used in conjunction with the Down or Mode buttons while in the normal operating mode.
2. The <u>Up</u> button can be used to set values when in the programming mode.
3. Simultaneously pushing and holding the <u>Up</u> and <u>Down</u> buttons for 4 seconds, while in normal operation, will reset the Alarm Relays if the alarm condition(s) have been cleared.
4. Simultaneously pushing and holding the <u>Up</u> and <u>Mode</u> buttons for 4 seconds, while in normal operation, will change all settings to the default values.

Down Button
1. Functional only when in the programming mode or when used in conjunction with the Up button while in the normal operating mode.
2. The <u>Down</u> button can be used to set values when in the programming mode.
3. Simultaneously pushing and holding the <u>Up</u> and <u>Down</u> buttons for 4 seconds, while in normal operation, will reset the Alarm Relays if the alarm condition(s) have been cleared.

Mode Button
1. Functional only when in the normal operating mode.
2. Simultaneously pushing and holding the <u>Up</u> and <u>Mode</u> buttons for 4 seconds, while in normal operation, will change all settings to the default values.
3. Pushing and holding the <u>Mode</u> button for 4 seconds while in the normal operating mode will activate the CommStat 3™ Controller's programming mode.

Lead Swap Button
1. Functional only when in the normal or comfort operating modes.
2. Pushing the <u>Lead Swap</u> button will alternate the lead unit if both units are operational.

Programmable Settings

(The <u>Up</u> and <u>Down</u> buttons are utilized to set values and the <u>Mode</u> button is pushed to accept values and to go to the next setting.) To begin programming, push & hold the <u>Mode</u> button in for 4 seconds.

Setting 1: °F or °C   (If programmed in Fahrenheit, defaults to Fahrenheit)
                         (If programmed in Centigrade, defaults to Centigrade)

Setting 2: Changeover in days (1/2 through 7 in 1/2 day increments)   Default = 7 days

Setting 3: Cooling Set Point (65°F through 95°F in 1° increments)   Default = 75°F
            Cooling Set Point (18°C through 35°C in 1° increments)   Default = 24°C
            Note: A cooling set point of 65°F (18°C) will require that a heating set point of 61°F (16°C) or lower is programmed in before the 65°F (18°C) cooling set point programming is possible.

Setting 4: Heating Set Point (50°F through 80°F in 1° increments)   Default = 68°F
            Heating Set Point (10°C through 27°C in 1° increments)   Default = 20°C

Setting 5: High Temperature Alarm Set Point (75°F through 150°F in 1° increments)   Default = 95°F
            High Temperature Alarm Set Point (24°C through 66°C in 1° increments)   Default = 35°C

Setting 6: Low Temperature Alarm Set Point (41°F through 70°F in 1° increments)   Default = 41°F
            Low Temperature Alarm Set Point (5°C through 21°C in 1° increments)   Default = 5°C

Setting 7: Continuous blower on Lead Unit   Default = Off

Setting 8: Alarms On or Off   Default = 1

            0 = No alarm outputs. Smoke alarm requires a manual reset. All other alarms are auto-reset.

Programming Instructions (cont'd)

        1 = Alarm outputs. Smoke alarm requires a manual reset. All other alarms are auto-reset.

        2 = Alarms output. All alarms, including the smoke alarm, are auto-reset.

Setting 9:	Anti Short Cycle time (1 through 10 minutes in 1 minute increments)	Default = Off
Setting 10:	Differential Between Stages (2°F through 12°F in 1° increments) Differential Between Stages (1°C through 7°C in 1° increments)	Default = 2°F Default = 1°C
Setting 11:	On-Off differential of Stage 1 (2°F through 5°F in 1° increments) On-Off differential of Stage 1 (1°C through 3°C in 1° increments)	Default = 3°F Default = 2°C
Setting 12:	On-Off differential of Stage 2 (2°F through 5°F in 1° increments) On-Off differential of Stage 2 (1°C through 3°C in 1 degree increments)	Default = 3°F Default = 2°C
Setting 13:	Blower Off Time Delay (0 through 90 seconds in 1 second increments)	Default = 90 seconds

    Pushing the Mode button, after programming Setting #13, or pushing and holding the Mode button for 4 seconds while in the programming mode will return CommStat 3™ Controller to normal operation.

Alarm Relays and Smoke Alarm Input Connections and Reset Procedures

1. Alarm Relays to have a connection for the Common side of the relay switch.
2. Alarm Relays to have a connection for the Normally Open side of the relay switch that becomes Normally Closed if the alarm detector is activated.
3. Alarm Relays to have a connection for the Normally Closed side of the relay switch that becomes Normally Open if the alarm detector is activated.
4. When connecting a smoke alarm to the smoke alarm input terminals, remove the factory installed jumper wire and install the smoke alarm leads.
5. Air Conditioner(s) locked out are reset as follows:
   The Lockout problem has been remedied on the unit(s) and if:
   - The high voltage power is turned off and then back on to the unit(s).
   - The 24 volt signal to the unit(s) is interrupted.
   - CommStat 3™ Controller is turned off and then back on.
6. Alarm Relays are reset as follows:
   The Alarm problem has been remedied and if:
   - The high voltage power is turned off and then back on to the unit(s).
   - The 24 volt signal to the unit(s) is interrupted.
   - The Up and Down buttons on CommStat 3™ Controller are simultaneously pushed for 4 seconds.
   - CommStat 3™ Controller is turned off and then back on.

Operation Features

1. Program settings are retained during indefinite power loss.
2. Lag unit automatically becomes lead unit if lead unit losses power.
3. CommStat 3™ Controller will shutdown if the Smoke Detector is activated (has an open circuit).
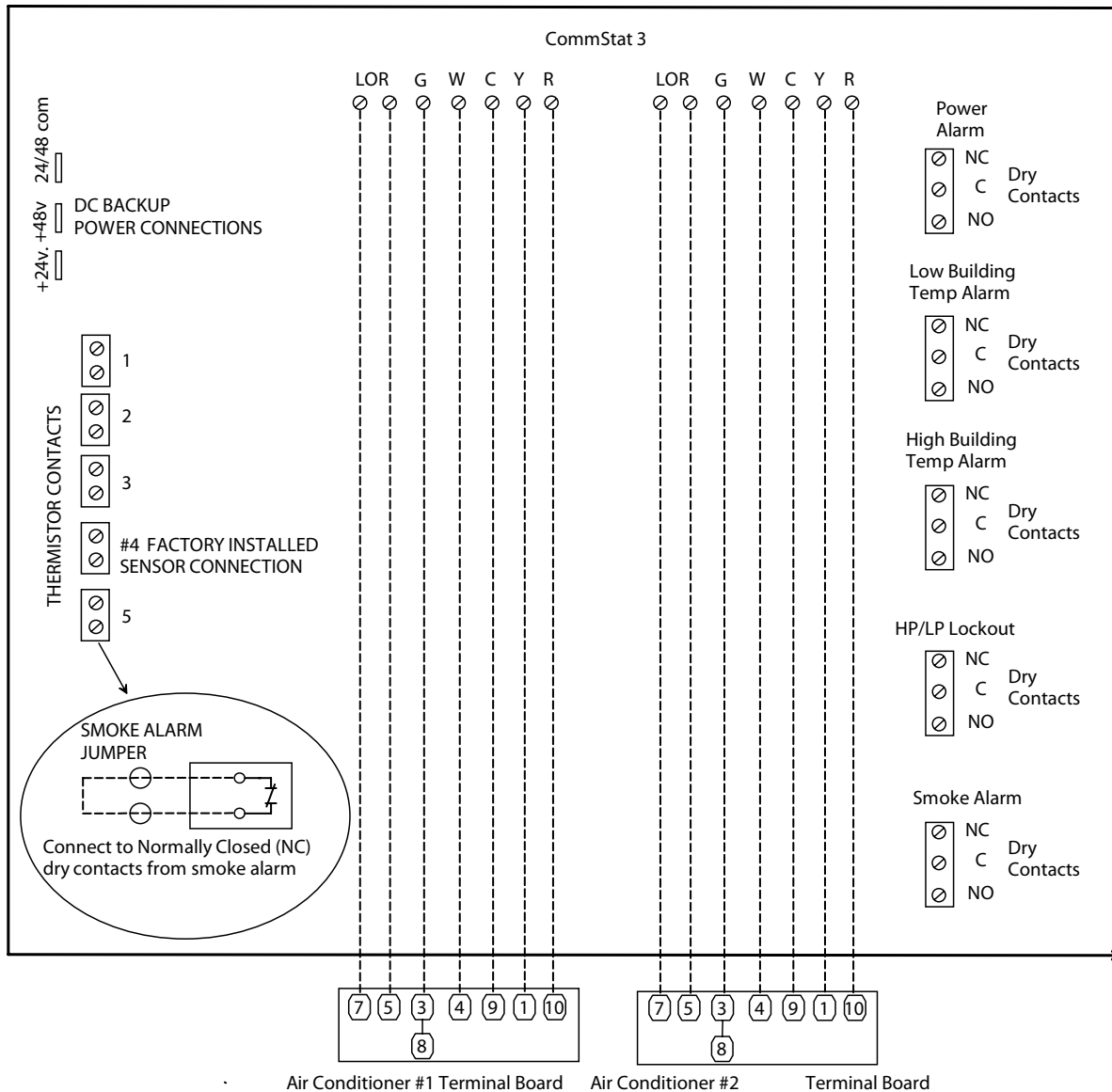

⚠ WARNING

All Marvair® air conditioners (Models AVP) have an interlocking relay that turns on the indoor blower whenever there is a call for heating. If the CommStat 3™ Controller is used on air conditioners from other manufacturers, the indoor fan and electric heat must ALWAYS operate simultaneously. The CommStat 3 Controller only turns on the electric heat.

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4. Changeover differential between heating and cooling is a minimum of 4°F (2.2°C).
5. The power fail relay will be activated if 24 VAC power is not provided to the CommStat 3™ Controller. Since the controller can be energized from either air conditioner, loss of input power from only one air conditioner will not activate the power alarm relay.

Connection Diagram

(After jumper wires in both units have been removed from Terminals 8 & 10 and connected to Terminals 8 & 3. See Note 2 below.)

CommStat 3

LOR G W C Y R   LOR G W C Y R

24/48 com

+24v. +48v

DC BACKUP
POWER CONNECTIONS

THERMISTOR CONTACTS

1
2
3
#4 FACTORY INSTALLED SENSOR CONNECTION
5

SMOKE ALARM JUMPER

Connect to Normally Closed (NC) dry contacts from smoke alarm

Power Alarm
NC
C   Dry Contacts
NO

Low Building Temp Alarm
NC
C   Dry Contacts
NO

High Building Temp Alarm
NC
C   Dry Contacts
NO

HP/LP Lockout
NC
C   Dry Contacts
NO

Smoke Alarm
NC
C   Dry Contacts
NO

7 5 3 4 9 1 10   7 5 3 4 9 1 10
8   8

Air Conditioner #1 Terminal Board   Air Conditioner #2   Terminal Board

NOTE:
1. 24 VAC connections only.

2. For immediate shutdown of air conditioner upon a signal from the smoke alarm, the jumper between terminals 8 and 10 in the ComPac® I and ComPac® II units must be removed and a jumper placed from terminals 8 and 3.

3. When connecting a smoke alarm to the smoke alarm input terminals (normally closed), remove the factory installed jumper wire and install the smoke alarm leads.

IF LINE VOLTAGE IS BELOW 220 VAC, USE THE 208 TRANSFORMER TAP.

As part of the Marvair® continuous improvement program, specifications are subject to change without notice.