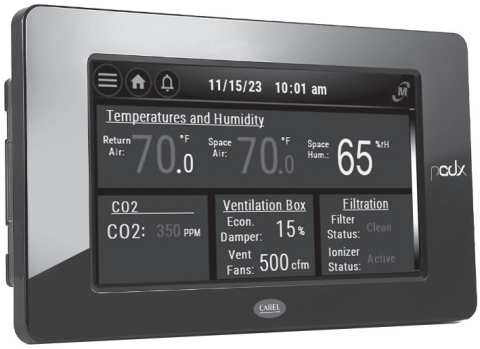
December, 2023

INSTALLATION AND OPERATING INSTRUCTIONS
Carel pGDx Digital Wall Sensor/Control Interface model series CMD, CMP, CMS, SMG, SMW
(equipped with Modine Control System)

Carel pGDx Digital Wall Sensor/Control Interface



(shown with optional IAQ screen enabled)

⚠ WARNING

1. Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage.
2. All units must be wired strictly in accordance with wiring diagram furnished with the unit. Any wiring different from the wiring diagram could result in a hazard to persons and property.
3. All wiring must be done with a wiring material having a temperature rating of at least 105°C.

IMPORTANT

1. The use of this manual is specifically intended for a qualified installation and service agency. All installation and service of these kits must be performed by a qualified installation and service agency.
2. These instructions must also be used in conjunction with the Installation and Service Manual originally shipped with the unit, in addition to any other accompanying component supplier literature.

Application

The Carel pGDx Digital Wall Sensor/Control Interface is used in conjunction with the Carel pCO series controller used in ClassMate® and SchoolMate® Single Package Vertical Unit Ventilators with model numbers indicated above that include the Carel based Modine Control System (Model Digit 8=M).

Functions of the pGDx include:

- Full Touchscreen Functionality
- 4.3” Color Graphical Screen that Includes:
  - Temperature Setpoints and Temperature Readings
  - Unit Operating Status
  - Clock Display
  - Alarm Indication and Description
  - Access to the pCO Controller through pGD Emulation
- Change Cooling and Heating Temperature Setpoints
- Change Humidity Setpoints (requires the unit be equipped with Hot Gas Reheat)
- Occupancy Override
- Advanced User Settings (refer to page 4)

Specifications

Model Number:	PGR04000WBA00
Power Supply Input:	24Vdc ①
Operating Conditions:	• 32°F to 122°F • 10 to 85% Relative Humidity (non-condensing)
Index of Protection:	IP65 (NEMA Type 1)
Maximum Wired Distance:	100 feet using RJ12 cable

① Power is supplied from a 24Vdc DIN rail mounted power supply mounted in the Vertical Unit Ventilator.

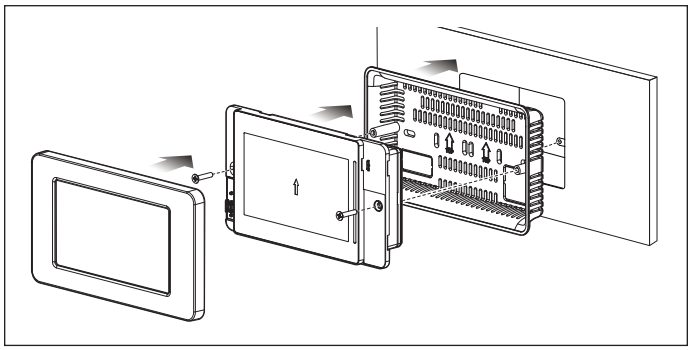
THIS MANUAL IS THE PROPERTY OF THE OWNER.
PLEASE LEAVE IT WITH THE OWNER WHEN YOU LEAVE THE JOB.

Installation

This section applies to field installing the pGDx either on the unit (if equipped with mounting provisions) or on an interior wall. The device is installed as follows:

1. Remove the frame from the front of the screen by pulling from the left side cut out tab. Refer to Figure 2.1.
2. If attached, remove the screws connecting the screen and sensor base.

Figure 2.1 - Exploded View of pGDx Wall Mounting



3. For mounting location, consider the following:
   A. If unit mounting (only applies to unit ventilator Model Digit 12=X), note the location for mounting is 48” from the bottom of the unit on the front of the door.
   B. If mounting on an interior wall in the conditioned space, consider the following:
      - Mount in a location representative of the space temperature. Do not locate on an outside wall or near supply grills, windows, or other devices that could cause incorrect temperature readings.
      - Mounting height will depend on personal preferences and may be limited by applicable building code requirements.
      - If required, the sensor can be mounted in a well ventilated thermostat cover.
      - The sensor base mounts on a 3.5” x 6” wall box.
4. The wiring connection to the unit is made as follows:
   A. If unit mounted (Model Digit 12=X), the unit is equipped with a wire harness located at the mounting location with a plug that mates to the wire to be wired on the back of the pGDx.
   B. If wall mounted, pull the control wiring through the bottom left hole of the wall box. The recommended control cable is 18-22 AWG 4-Core Twisted Pairs. Connect one end of the control wiring to the terminals on the pGDx and the other end to the terminals on the main unit terminal strip as indicated in Table 2.2.

Table 2.2 - Terminal to Terminal Wiring Connection

pGDx Terminal	Main Unit Terminal Strip
G (24 Vdc)	882
G0 (ground)	880
Rx/Tx+ (positive pLAN)	894
Rx/Tx- (negative pLAN)	893
GND (ground pLAN)	895

5. Without touching the components on the back of the screen, replace the screen into the wall box and the screws on either side of the screen.
6. For the pGDx to function correctly, the pGDx setting must be enabled in the pCO microprocessor controller. Refer to the next section.

Programming the Sensor

The pGDx device ships from Modine fully programmed and is specific to the connected equipment. No changes in the field are required and connecting a pGDx not purchased from Modine will not function. The pGDx is also enabled in the pCO microprocessor controller at the factory.

If a pGDx from Modine is added later, then the device will need to be enabled in the pCO controller. This requires the use of a pGD1 Handheld Remote User Interface and navigating to Service -> Service Settings - > Controls Settings ->CS4 Screen and changing the Stat Type to pGDx. This does require entry of the Service level password. Refer to the literature for the pGD1 for more detail.

pGDx LED Mode Indicator

The screens of the pGDx are information rich to communicate operational status, temperature readings, setpoints, etc. While these screens will be discussed in the following sections and are best viewed when close to the pGDx, it does also have an LED Mode Indicator bar on the right side of the screen that can provide a visual indication of unit operating status that can be seen from across a room. Refer to Figure 2.2.

Figure 2.2 - Main Screen LED Mode Indicator

The LED Mode Indicator will illuminate in different colors to provide a visual indication of the unit status as follows:

Solid Colors

- Green No Heating or Cooling Active
- Red Heating Mode Active
- Blue Cooling Mode Active
- Teal Occupancy Override Active
- White Unit Off
- Yellow Non-Critical Alarm

Blinking Colors

- Red Critical Alarm

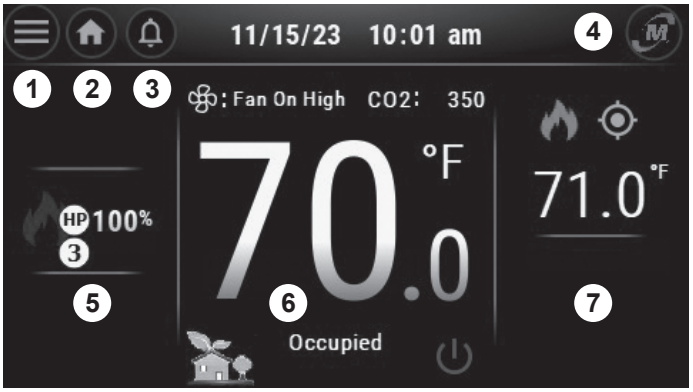
Display Screens

With the pGDx touchscreen display, basic unit control and monitoring can be performed. There are a number of screens available to the user, which will be discussed in this section.

Main Screen

The Main Screen (see Figure 3.1) is the default screen. If the user navigates to a different screen, after a timed period, the screen will revert back to this Main Screen.

Figure 3.1 - Main Screen



The typical sections of the Main Screen are as follows:

1. **Hamburger Menu icon**: When the user touches that icon, they will be taken to the Hamburger Menu screen.
2. **Home icon**: When the user touches that icon from any screen, they will be taken back to the Main Screen.
3. **Alarm History icon**: When the user touches that icon, they will be taken to the Alarm History screen.
4. **Modine icon**: This icon serves two purposes:
   a. Icon Help Index: Tapping the Modine icon will bring up a screen that shows all icons used and their meanings.
   b. Screen Lock: Holding the Modine icon for 5 seconds will toggle locking or unlocking the screen. When locked, the user will have no access to other screens.
5. **Demand Status**: This section displays the demands of each mode as well specific information on what mechanical devices are active and what cooling/heating stages the unit is in. The modes displayed are:
   a. Cooling Mode: The screen will show a blue snowflake which will light up when the unit is in cooling mode, a percentage demand, the cooling stage based on demand, and a symbol showing which type of cooling is active.
   b. Heating Mode: The screen will show a red flame which will light up when the unit is in heating mode, a percentage demand, the heating stage based on demand, and a symbol showing which type of heating is active. In the example above, the unit is in heating mode, there is 100% demand, it is using heat pump heating, and is operating at stage 3.
   c. Dehumidification Mode: The screen will show green droplets which will light up when the unit is in dehumidification mode, as well as a notice saying the same.
6. **Current Status**: This section displays the current readings and conditions, including:
   - Fan speed
   - CO2 readings (if equipped with CO2 sensing)
   - Temperature
   - Humidity (if equipped with Hot Gas Reheat)
   - Occupied or Unoccupied status
   - Power status
   - IAQ status, which is indicated by the house icon in the lower left of that screen section.

   Note: The IAQ status, indicated by the house icon will change color (green, yellow, or red) based on a combination of factors to give the user an overall indication on the room IAQ. Touching the house icon will bring the user to the IAQ screen, if enabled. That screen is detailed on the next page.
7. **Setpoints**: This section displays the active setpoints for temperature and humidity for heating and cooling.
   - This section of screen will rotate through the setpoints every 10 seconds to show individual setpoints.
   - The setpoints are differentiated by color-coded symbols showing heating, cooling, and dehumidification.
   - If the user presses on the area showing the setpoints, they will be brought to the occupied setpoints screen.

   Additionally, this section will display status for temporary conditions, including (if applicable):
   - The warm-up transition time.
   - The occupied override time, after the warm-up time is finished (if applicable).

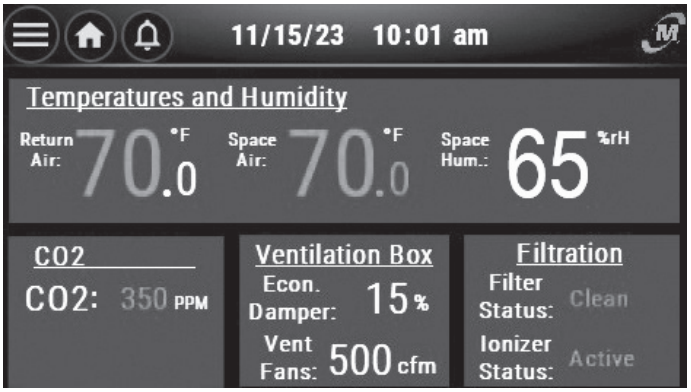
A screen saver will appear after five minutes and the screen will sleep after seven minutes.

The screens detailed on the following pages are all accessible from the Main Screen.

IAQ (Indoor Air Quality) Screen

This screen is accessible by touching the house icon (see ⑥ in Figure 3.1). This screen is a status only screen but provides more information on space IAQ than shown on the Main screen. An example of the IAQ screen is shown in Figure 4.1.

Figure 4.1 - IAQ Screen



This screen provides a detailed summary of current state IAQ related readings and are color coded as detailed on the previous page for the Main screen.

The data presented in the bottom half of the screen are present only if devices providing data are present as follows:

- CO2: Shown if the unit includes a space CO2 sensor. Data is displayed in PPM (parts per million).
- Economizer Damper: Shows the damper position in terms of outside air percentage.
- Vent Fans: Shown if the unit includes a powered relief fan Data is displayed in CFM (cubic feet per minute).
- Filter Status: Shown if the unit is equipped with a dirty filter switch. The screen will display either Clean or Dirty.
- Ionizer Status: Shown if the unit is equipped with a Needlepoint Bipolar Ionizer (NPBI). The screen will display either Active or Off.

This data is color coded based on where the current condition falls within limits set in the program. The color coding displayed is defaulted as oulined in Table 4.1 (field adjustable):

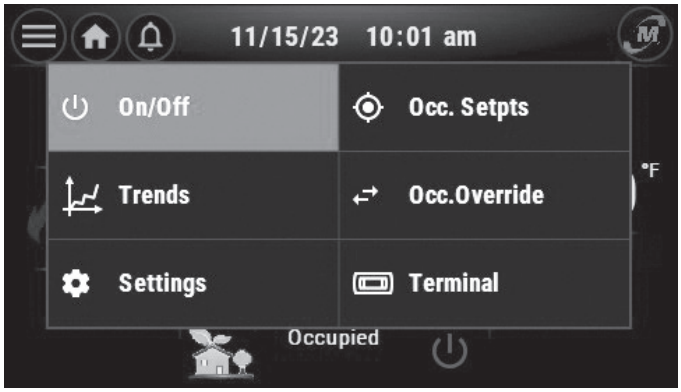
Table 4.1 - IAQ Screen Current Status Color Logic

Reading	Logic	Status
Space Temp	+ or - 2F from Setpoint	Green
	+ or - 4F from Setpoint	Yellow
	+ or - 6F from Setpoint	Red
Return Air Temp	+ or - 2F from Setpoint	Green
	+ or - 4F from Setpoint	Yellow
	+ or - 6F from Setpoint	Red
Space Humidity	0% to 2% above Setpoint	Green
	2% to 4% above Setpoint	Yellow
	4% to 6% above Setpoint	Red
CO2 PPM	0-800PPM	Green
	>800-1000 PPM	Yellow
	>1000 PPM	Red
Dirty Filter	Dirty Switch = 0	Green
	Dirty Switch = 1	Red
Ionizer	Ionizer Running	Green
	Ionizer Alarm	Red

Hamburger Menu Screen

This screen is accessible by touching the Hamburger icon (see ① in Figure 3.1), the Hamburger Menu screen (Figure 5.1) is a means of navigating to other screens from this menu.

Figure 5.1 - Hamburger Menu Screen



The navigable screens are as follows:

- Unit On/Off (If enabled, the user will be able to turn the unit on and off from this page in the menu selection.)
- Trends
- Settings
- Occupied Setpoints
- Occupancy Override
- pGD Terminal Emulator

Several of these screens can also be accessed by swiping left or right on the Main screen and will be discussed in the applicable section for screens with this accessibility.

Unit On/Off Screen

This screen is available from the Hamburger Menu screen. The screen is not shown here but simply allows the user (if the screen is enabled in Settings) to turn the unit on and off from this screen.

Occupancy Override Screen

This screen is available either from the Hamburger Menu screen or by swiping left on the Main screen. The screen is shown in Figure 5.2.

The user can manually force the unit from Unoccupied mode to Occupied. The scroll wheel icon or + / - icons are used to set how many hours the unit is to run in Occupied Override mode.

Figure 5.2 - Occupancy Override Screen

Once the time period is selected, pressing the Timer icon starts the timer and brings the user back to the Main screen.

If the user returns to the screen before the end of the Occupancy Override, there is an option for cancelling the override which will bring the unit back into Unoccupied mode.

Occupied Setpoints Screen

This screen is available either from the Hamburger Menu screen or from the setpoint icon on the right side of the Main screen. There are screens for Cooling, Heating, and Humidity setpoints. Two of the screens are shown in Figures 6.1 and 6.2.

Figure 6.1 - Cooling Setpoint Screen

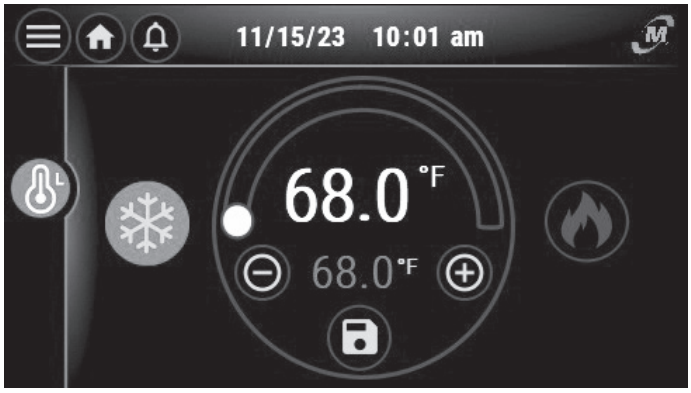
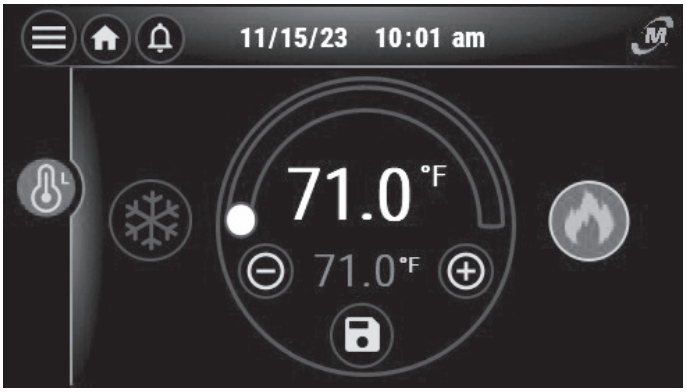


Figure 6.2 - Heating Setpoint Screen



The user can adjust Cooling, Heating, and Humidity setpoints individually. The scroll wheel icon or + / - icons are used to adjust the settings. Once the settings are selected, pressing the Save icon starts the timer and brings the user back to the Main screen.

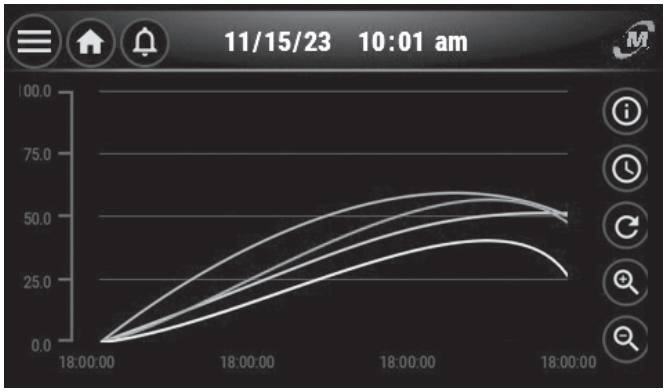
Trends Screen

This screen is available either from the Hamburger Menu screen or by swiping right on the Main screen.

Upon entering this screen, the user immediately sees a short term trend graph with the space temperature, space humidity, and outside air temperature are shown for the past hour.

There is also an icon that will take the user to the Long Term Trends screen, which is shown in Figure 6.3.

Figure 6.3 - Long Term Trends Screen



On the Long Term Trends screen, there are multiple options for viewing data from a period of time. The five buttons on the right side of the screen control how the graph is displayed. The button functions are as follows, from top to bottom:

- The first button displays a menu from which the user can select four different trends to display on the graph.
- The second button changes the range of time that is displayed on the graph.
- The third button refreshes the graph to the most recent readings.
- The last two buttons will either zoom in or zoom out the time frame displayed.

As noted above, there are up to four variables that can logged in the trending graphs. These long term trends store data for the last 24 hours. The variables that are available for trending are as follows:

- Space Temperature
- Space Humidity
- OA Temperature
- RA Temperature
- SA Temperature
- Liquid Line Pressure
- Space CO2
- MA Temperature
- HW Valve Position
- Econ. Damper Position
- Cooling Demand
- Heating Demand

Alarms Screen

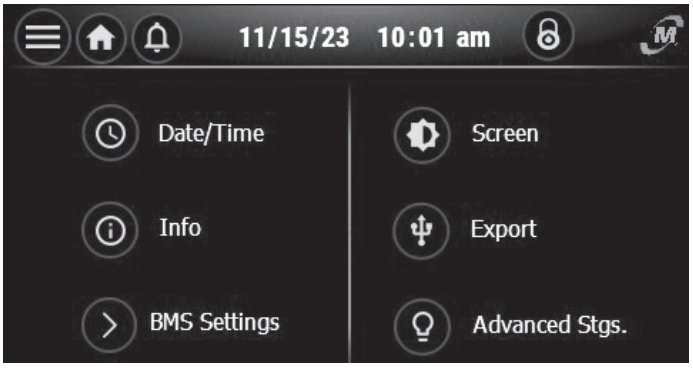
This screen is accessible by touching the bell icon (see ③ in Figure 3.1). This screen provides information on active alarms as well as alarm history. Information includes the alarm triggered and the time.

The latest alarms can be refreshed by touching the refresh icon. Alarms can also be cleared by touching the check mark icon. To clear alarms, the service level password must be entered.

Settings Screen

This screen is available from the Hamburger Menu screen on the Main screen. See Figure 7.1.

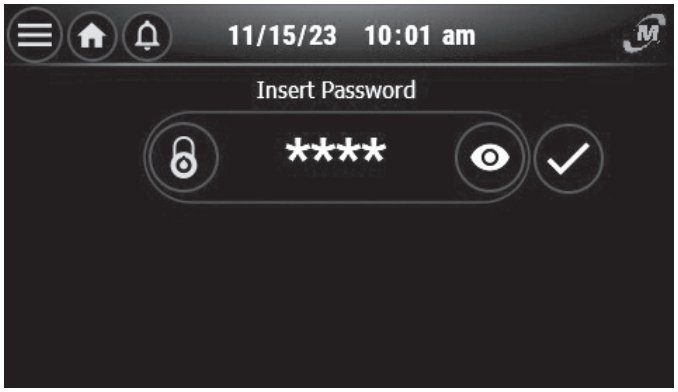
Figure 7.1 - Settings Screen



The Settings screen is an additional menu with six different options, some of which are only available with a service level password.

For selections requiring a service level password, a password screen will appear as shown in Figure 7.2.

Figure 7.2 - Password Entry Screen



The available options on the Settings screen are as follows:

Date/Time

This screen shows the format of the date and time format of the display at the top of the screen. It also allows the user to set the time on the unit by changing the values on the screen and pressing the save button.

Info

The information screen shows the unit model, program version, boot version, bios version, and pGDx display version.

BMS Settings (Service Level Password Required)

It mimics the BMS settings screen from the pGD which allows the user to setup the BMS.

Screen

This screen allows the user to change the brightness, backlight time, screensaver enable, and a lock for the screen for 20 seconds.

Export (Service Level Password Required)

This screen has three functions for exporting data to a USB drive. They are as follows:

- Short term trend data
- Log of all alarms that occurred
- Log of changes in variables used for service techs

Advanced Settings (Service Level Password Required)

It has a setting for changing the warm-up time when moving from unoccupied to occupied mode.

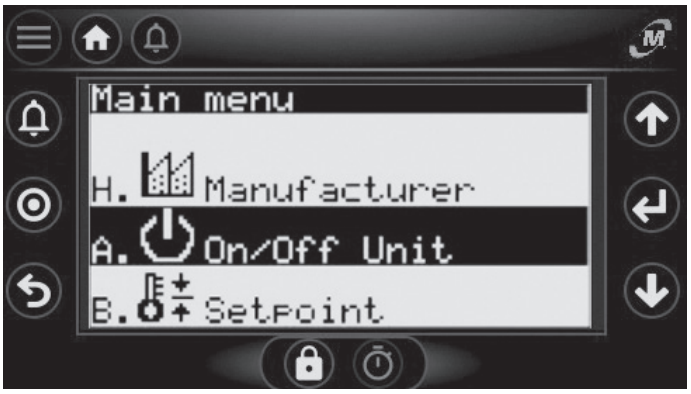
pGD Terminal Emulation Screen

The Modine Control System has several layers of screen/menu access. Many of the screens on the pGDx are meant for user level access. Where noted, there are certain screens that require service level password access. There are additional screens within the controller that are higher level screens meant specifically for advanced functions for commissioning and service, as well as manufacturer settings. These can be accessed two ways:

1. A pGD Handheld Remote User Interface can be used to access additional controller setup screens. These are purchased separately and not covered as part of this literature. For more information, refer to the latest literature for that device.
2. The pGD Terminal Emulator screen within the pGDx. This is a significant benefit of the pGDx in that it ties both the room sensor/thermostat functionality with the pGD functionality on one device. This eliminates the need for the separate pGD.

This screen is available from the Hamburger Menu screen on the Main screen. See Figure 8.1. A service level password is required to access this screen.

Figure 8.1 - pGD Terminal Emulation Screen



For full documentation of the menu options in this screen, refer to the latest revision of AIR74-525 - MODINE CONTROLS SYSTEM MANUAL, ClassMate® and SchoolMate® Units, Models CMD/CMP/CMS, and SMG/SMW.

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