c.pCO mini Controller

User Guide

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Introduction

The New "Brain" for DG Units

Precise Control. Advanced Diagnostics. Total Connectivity.

The c.pCO mini is an advanced, integrated programmable controller designed to serve as the central "brain" for DG-12 and DG-6 models. Unlike simple thermostats that monitor only basic conditions, the c.pCO mini actively manages the entire climate control process.

Key Capabilities

Total System Control: Monitors temperature, relative humidity (RH), dew point, and vapor pressure deficit (VPD) in real-time.

Dual Operation Modes: Seamlessly switches between Local Control (at the unit) and Remote Control (via external systems).

Advanced Connectivity: Features Modbus and CANbus integration for connection to facility control systems (BMS).

Safety & Diagnostics: Continuously monitors high/low pressures, coil temperatures, and electrical phases. It logs faults automatically to ensure safe operation and rapid troubleshooting.

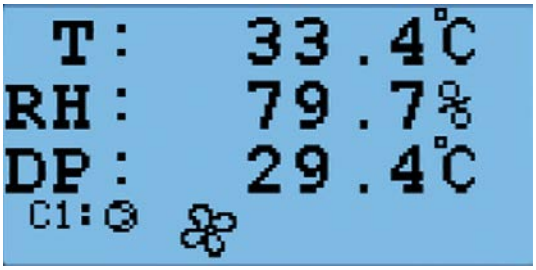
Screen Buttons

The controller interface features a backlit LCD screen and six navigation buttons.
The buttons are used to browse between screens and adjust values.

KEY	DESC.	FUNCTION
⚠	**ALARM**	Press to enter the Fault/Alarm menu.
◎	**PRG**	Press to enter the Main Menu.
↩	**ESC**	Press to return to the previous screen or the main menu (Screen A01).
↑	**UP**	Press to browse between screens, scroll through menus, and change value settings.
↵	**ENTER**	Used to select a menu option, move between lines on the same screen, and save a value after changing it.
↓	**DOWN**	Used to browse between screens, scroll through menus, and change value settings.

Note: Upon power-up, the DryGair logo appears briefly before the main screen loads.

Display Screens



This screen allows you to view system data. Pressing the **ESC** button returns you to this screen from any menu. Pressing the **UP/DOWN** arrows allows you to scroll and view basic system data further down the screen.

This screen displays **Temperature** (Celsius or Fahrenheit, depending on settings – see page 13), **Humidity**, **Dew Point**, and status icons for the **Fans**, **Compressor**, and **Cooling/Heating** (if available).

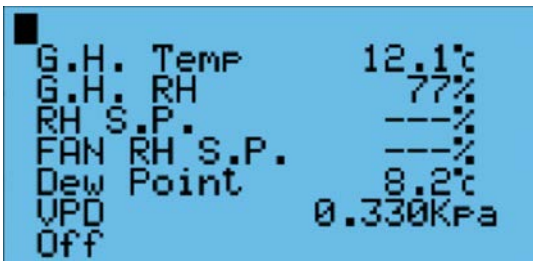
Stopped State: When the system is idle, the icons appear empty (hollow).

Active State: The Fan icon rotates during operation. If there is a demand for drying, the Compressor icon turns solid black.

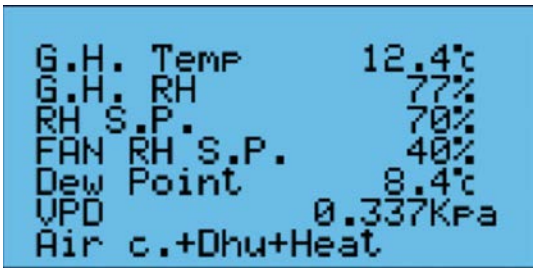
Cold/Hot Icon: If the unit is equipped with a water battery, a specific icon will appear to indicate if it is in Cooling or Heating mode.

Flame: Appears if the unit has a heating element/water battery active.

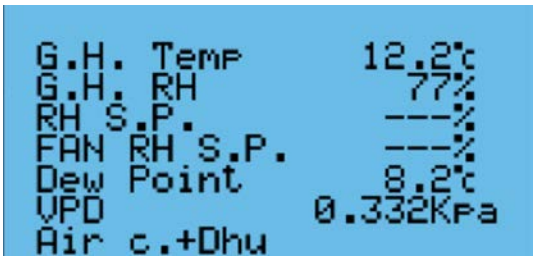
DEF: Flashes when the system is in Defrost mode.



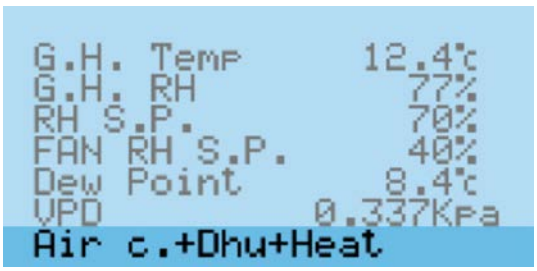
This screen displays the same data as the previous screen, plus the **VPD** value and the **unit's control status**.



In **LOCAL** mode, a **humidity setpoint** appears, as well as a **setpoint** for stopping the fans.



In **REMOTE** mode, lines appear instead of a setpoint for stopping the fans.



The bottom line of this screen lists the functions that are currently active in the machine (in both **LOCAL** and **REMOTE** modes).

Air c. - Fan at work: Indicates the fan is running.

Dhu - Control of drying function: Shows if dehumidification is active (unrelated to the drying requirement).

Heat - Control Temp. Activated: Shows if Cooling or Heating is currently active.

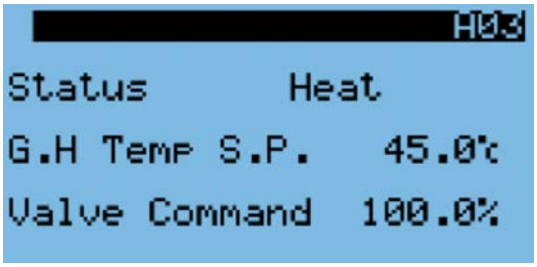
System Scheduler (Screen A02)

This screen allows the user to automate start and stop times for specific functions.

Mode Requirement: This schedule operates only when the **switch is in the LOCAL position**.

Activation: To activate a schedule, you must both set the function to **EN** (Enable) and configure the desired hours.

Note: The Temperature function appears only if the specific hardware is available on the machine.



Heating/Cooling Coil (Screen A03)

This screen appears only if the machine is equipped with a cold or hot water coil (see definitions on page 11).

It displays the following:

System Status: Shows the current mode (Cooling or Heating), as defined in the parameters.
G.H Temp S.P. (Desired Temperature): The target temperature, which can be adjusted by the user.

Valve Command: Displays the command sent to the control valve (shown as a percentage).

Pressing ◎ button opens the **Main Menu**. On this screen, you can navigate between menus to view and change data related to system operation.

Settings Screens

These screens are used for configuration and are password-protected.

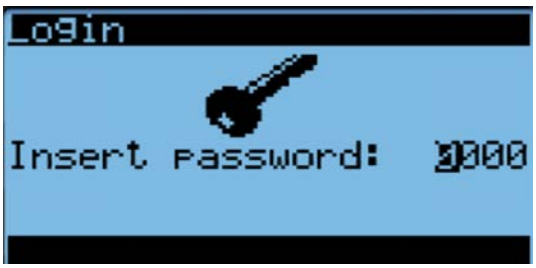
To prevent potential damage, it is recommended to stop the unit before modifying settings while the system is running.

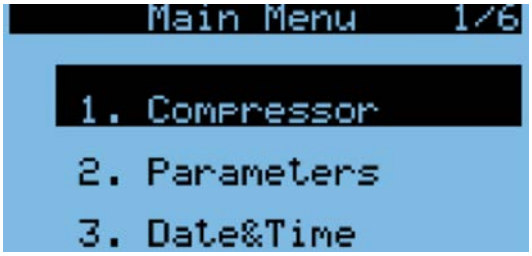
To enter a code, press **ENTER** and use the arrow keys to adjust the value.

Note: Each press of ENTER moves the cursor one digit to the right.

Alert: If the correct code is not entered, an "Incorrect code" alert will appear.

The code for all menus is: 2010





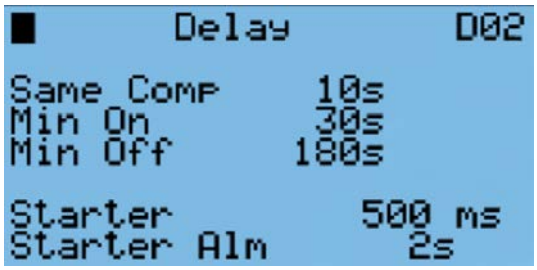
On this screen, you can navigate the menus to view and adjust system operation data.

Navigation: Use the **UP** and **DOWN** arrows to select a menu. Press **ENTER** to open the selected line.
1.Compressor: Defines parameters related to compressor operation – see page 9.
2.Parameters: Defines general machine settings and installed components (e.g., Water Coil) – see page 11.
3.Date & Time: Updates the controller's date and time – see page 14.
4.Input/Output: Monitors I/O status and configures settings such as sensor type, range, and digital input polarity – see page 15.
5.Hour: Displays and resets the system's working hours – see page 16.
6.Log Out: – see page 17.
7.Troubleshooting: – see page 19.

Compressor control (D Screens)

To prevent potential damage, it is recommended to stop the unit before modifying any settings.

Screen D01 allows you to manually Enable or Disable the compressor.



Compressor Timers (Screen D02)
This screen configures the safety timers for compressor operation.

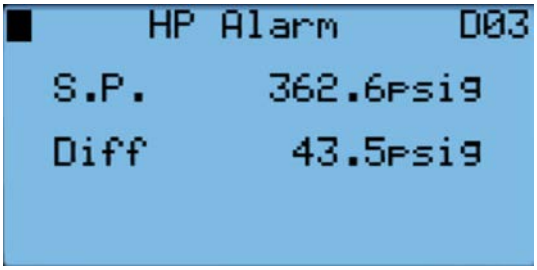
Same Comp: Sets the delay between starts of the same compressor (counted from the moment of the previous start).

Min On: Sets the minimum operating time required after start-up (to prevent short cycling).

Min Off: Sets the minimum break (rest) time required after the compressor stops.

Starter: Sets the delay time for the "Part Winding" starter sequence.

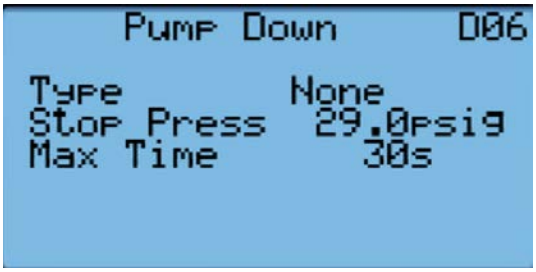
Starter Alm: Sets the delay for the "Part Winding" starter fault. This alarm triggers if no input is received within the specified time while both contacts are in operation.



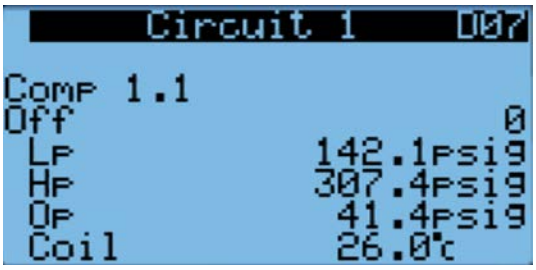
Screen D03 allows you to adjust the parameters related to high-pressure protection for the compressors.

Screen D04 allows you to adjust the parameters regarding low-pressure protection for the compressors.

V.LP (Very Low Pressure): Defines a safety threshold; if the pressure is lower than this value, the compressor will not start.



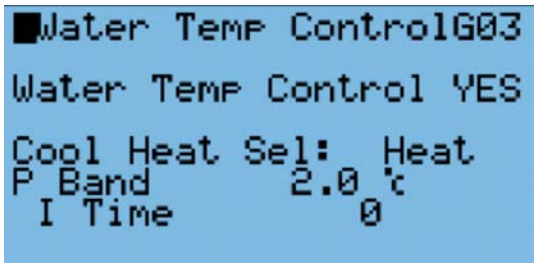
Refrigerant Suction: Option to activate compressor output for refrigerant suction (Pump Down) – currently not activated.



Screen D07 allows you to view the system's operating pressures

Parameters (G Screens)

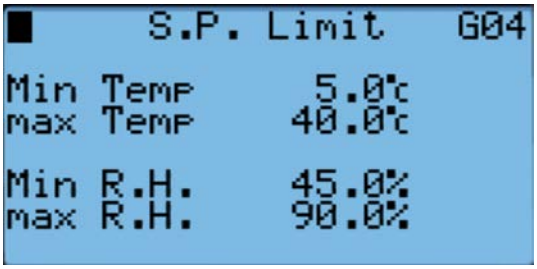
Screen G01 is used to configure the **Humidity Set Point** (same as on the Home Screen) and the Differential for humidity control.
It also sets the **minimum greenhouse temperature limit**; the machine will stop operating below this value, as proper operation is not possible.



Screen G03 is used only if the machine is equipped with a cold or hot water coil.

Operation Mode: Defines whether the coil is used for Cooling or Heating.

Control Logic: Configures the nature of the control. If a value is entered for 'I Time', the control becomes differential.



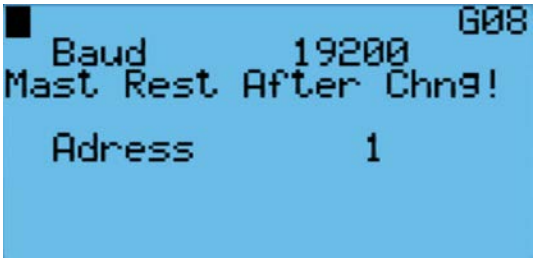
Screen G04 is used to configure the limits for the system setpoints.

Screen G05 configures the system's defrost parameters.

Start Condition: Defrosting initiates when the greenhouse temperature drops below 11°C (this value is adjustable).

Stop Conditions: The defrost cycle terminates when the coil temperature reaches 6°C, or after a maximum duration of 7 minutes.

Interval: There is a mandatory minimum delay of 50 minutes between consecutive defrost cycles.

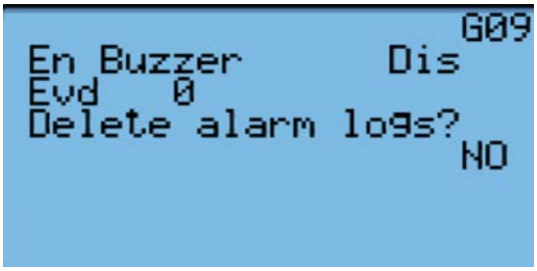


Screen G08 is used to configure the controller's network address and communication parameters.

Integration: These settings are essential when connecting the controller to an external management system (via Modbus protocol) or a BOSS system.

Hardware: Applicable for RS-485 connections (using a two-wire communication cable).

Addressing: You must assign a unique address to each unit to correctly identify its specific location and function within the network.



Screen G09 allows for alarm configuration and system maintenance operations.

Fault Buzzer: Configures the controller's internal buzzer to activate when a fault occurs.

Reset Valves: Resets the valves to their start position (this is mandatory after a software download).

Clear History: Deletes the stored fault history log.

Screen G10 allows you to configure the system's units of measurement.

Settings:

UNIT: Sets the units displayed locally on the controller screen.

MODBUS UNIT: Sets the unit format used for data transmission via communication protocols.

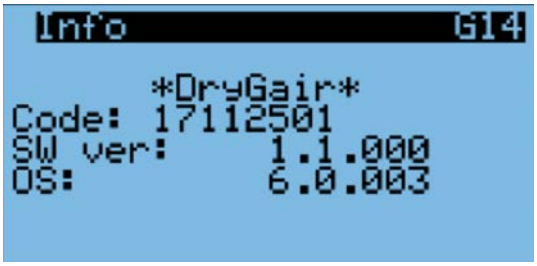
Available Standards:

CAN:
Temperature in Celsius (°C) / Pressure in PSI.

USA:
Temperature in Fahrenheit (°F) / Pressure in PSI.

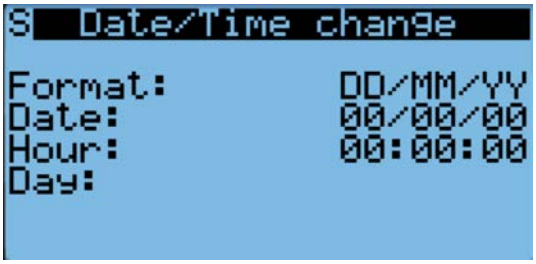
SI:
Temperature in Celsius (°C) / Pressure in Bar.

UK:
Not for use.

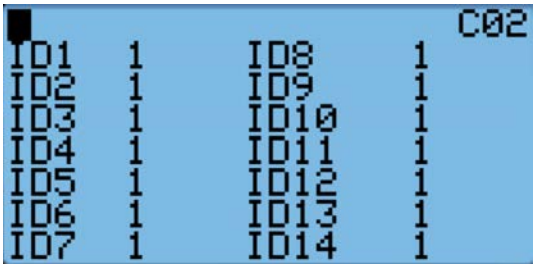


Screen G14
App Code: Identifies the specific software version currently installed, distinguishing it from other released versions.

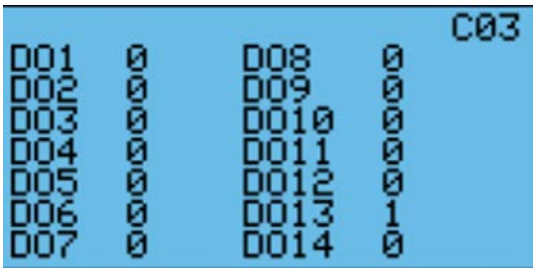
Date & Time (C Screens)



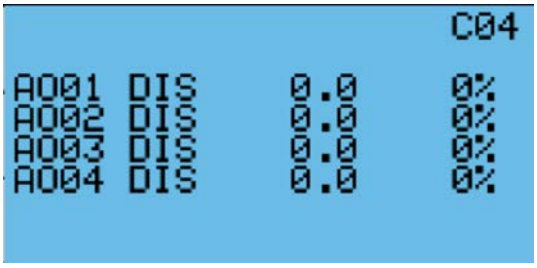
Screen C02 displays the current status of the digital inputs:



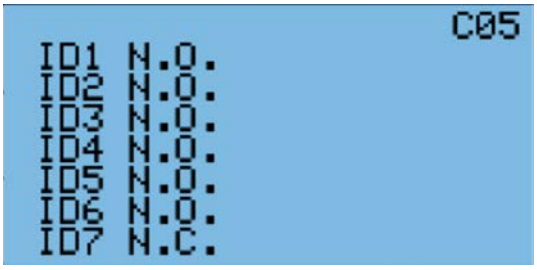
0 = Open
1 = Closed



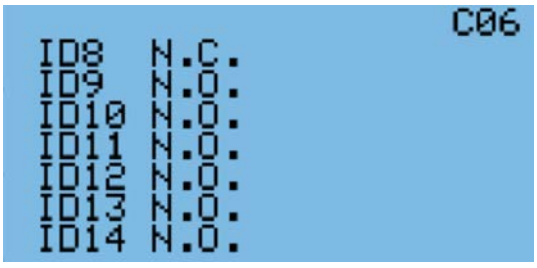
Screen C03 displays the status of the digital ports



Screen C04 displays the current status of the analog ports



Screen C05 allows you to configure the polarity of the digital inputs.
Configuration: Choose between NC (Normally Closed) or NO (Normally Open).
Note: While initial settings are established during system startup, they can be modified on this screen if necessary.



Screen C06 contains additional input polarity settings, continuing the list from Screen C05

Input/Output (C Screens)

Screens C07-C11 are used to configure all system sensors (excluding valve sensors).

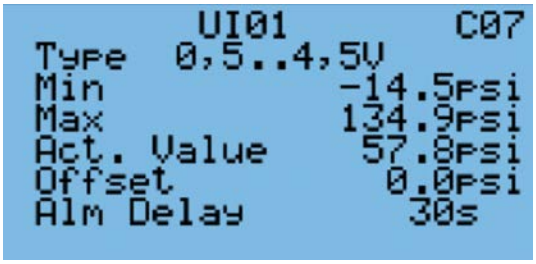
Settings:

Definition: Define the sensor type and operating range.

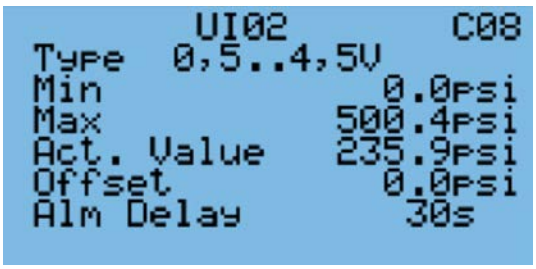
Protection: Set the delay time for sensor malfunction alerts.

Calibration: Option to calibrate the input reading.

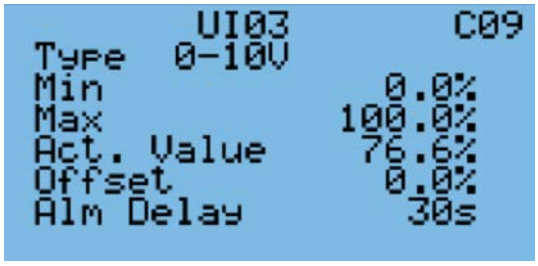
Input Assignment:



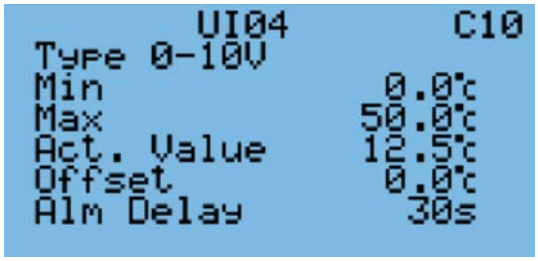
U1: Low Pressure Transmitter



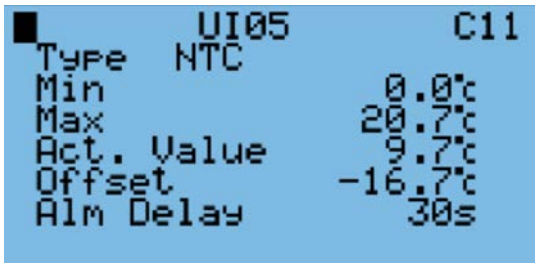
U2: Low Pressure Transmitter



U3 = Humidity sensor

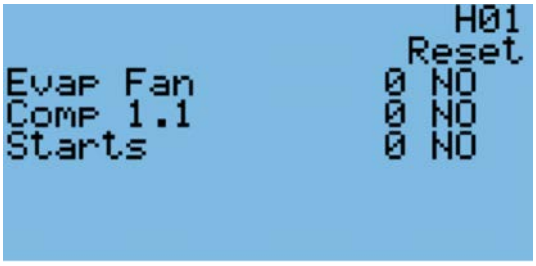


U4 = Humidity sensor



U5 = Coil temperature sensor

Operating Hours (H Screen)



Screen H01 monitors the accumulated operating hours for the fans and the compressor.

Total Hours & Reset: Displays total running time. The counters can be reset manually, for example, following a compressor replacement.

Daily Statistics: Tracks daily working hours (calculated on a cycle from 12:00 to 12:00).

Usage Data: Displays the specific operating hours per day and the number of compressor start cycles.

Log Out

This function is used to lock the menu interface.

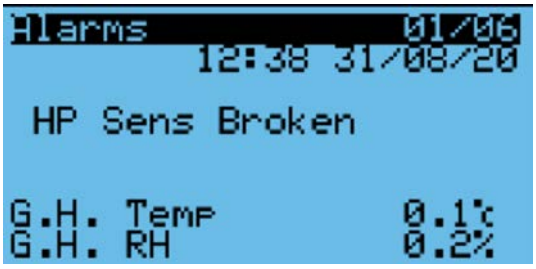
Faults and Reset

In accordance with system safety logic, the controller will halt the operation of components (such as compressors) during a fault condition.

Visual Alert: When a malfunction occurs, the ALM button LED will illuminate red.

Viewing Faults: Press the ALM button to open the Faults Screen and view active system alarms.

Navigation: Use the UP and DOWN arrows to scroll through the list of faults.



To reset manual faults, follow these steps:

Navigate: Scroll to the end of the fault list.

Reset: Press and hold the Fault/ ALM button for 3 seconds.

Resolved Faults: Any faults that have been fixed will disappear from the screen.

Active Faults: Faults that still exist (the condition has not been rectified) will remain or reappear.

Automatic Reset: Faults configured for Automatic Reset will disappear from the screen immediately once the issue is resolved (e.g., an Overload fault will clear automatically once the overload condition ends).

Fault History: All recent faults are recorded and saved in the Fault Log.

Fault Log / Troubleshooting

This section displays the system's fault log, storing the last 30 recorded faults.

Fault Details: Each entry includes the Date, Start Time, End Time, as well as the Temperature and Humidity levels recorded at the moment of the malfunction.

Navigation:

Browse: Use the arrow keys to scroll through the fault list.

View Details: Press **ENTER** on a specific fault to view the system pressures (gas pressures) recorded at the time of the event.

Return: Press **ENTER** again to return to the main faults screen.

Fault list

Displayed on Controller	Reset Type
Memory writes error	User reset
Al retain	Auto reset
Al Err retain write	Auto reset
Ret Temp Sens Broken	User reset
Hum Sens Broken	User reset
HP Sens Broken	User reset
LP Sens Broken	User reset
Comp1 HP (Sensor)	User reset
Comp1 LP (Sensor)	Auto reset (until counter)
Comp1 OL Alarm	Auto reset
Coil Temp Sens Broken	Auto reset
Comp1MpAlm	Auto reset
Phase Monitor Alarm Fan alarm Oil presostat Alarm	Auto reset

DryGair 15 Years of Leading Dehumidification Solutions

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