

HOTPACK

AN EXTRA DEGREE OF CONTROL

Hotpack Series 989 Controller Operation and Setup Guide

This guide is intended for use as a guide only.
If you are not experienced with the controller you should NOT
attempt adjustments to the controllers operating parameters.
It will likely result in loss of control of the unit.

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I. How to Use the Keys and Displays

Upper Display

Normally indicates chamber temperature, humidity or CO2 condition. May also indicate the operating parameter value when working in PID menus or the presence of error code. During power up the display will be blank for about 3 to 5 seconds.

Lower Display

Normally indicates the temperature, humidity or CO2 setpoint. May also indicate the operating parameter being changed when working in PID menus or the applicable alarm code when in an alarm condition.

L1 Light

When lit, this LED indicates the temperature or humidity heaters are being fired or the CO2 valve is being opened. This light may not be visible on some models.

L2 Light

In most applications when lit, this LED indicates when the coarse CO2 valve is being opened. This light may not be visible on some models. It is generally not used except on the CO2 controller.

L3 Light

In most applications when lit, this LED indicates when the high limit has been exceeded for temperature, humidity or CO2. This light may not be visible on some models.

L4 Light

In most applications when lit, this LED indicates an alarm condition due to the ALO or AHI condition being exceeded. This light may not be visible on some models.

Home Key

When pressed, returns the display from any menu item to the actual condition in the Upper Display and Setpoint in the Lower Display

Mute Light

Flashes for 5 seconds after Mute (A/M) key is pressed to silence audible alarm. May not be visible on some models.

Mute(A/M) Key When pressed one time, it silences the audible alarm.

MODE Key

Used to step the controller through the Setup menus.

UP Key

Increases the value of the displayed parameter. A light touch increases the value by one. Holding the key down increases the value at a rapid rate. New data is self-entering in 5 seconds.

DOWN Key

Decreases the value of the displayed parameter. A light touch decreases the value by one. Holding the key down decreases the value at a rapid rate. New data is self-entering in 5 seconds.

UP/DOWN Keys

When pressed simultaneously for 3 to 5 seconds, the InPt, OtPt and gLbL menus are displayed. If held down an additional 5 to 7 seconds, the PLOC and CAL and DIAG menus will appear.

They are also used in conjunction with the Mode Key to select options when choosing the settings for a given parameter in the PID menus.

II. Error Codes

Four Dashes

(- - - -)

When visible in the Upper Display this indicates a controller error. The error code is visible in the Lower Display. The control goes into manual and controls at the percent output selected under the gLbL menu, FAIL prompt. (Factory default is 0 for all applications.) To view the error code, press the Mute Key once. The error code will appear for 5 seconds in the Upper Display and then return to four dashes.

EX 1

A/D

Underflow

Error

The input circuit is underrange. An open or reversed polarity sensor is the most likely cause. Check the sensor; if the connection is good, and functions properly, call the factory. Make sure the In value matches your sensor.

EX 2

Sensor

Underrange

Error

The input sensor generated a value lower than that allowed for the range of the sensor, or the A/D circuitry malfunctioned. Enter a valid input. The unit's A/D circuitry may be faulty. The value is below the range limits but within the A/D conversion limits. Make sure the InX prompt matches your sensor.

EX 3

Sensor

Oveerrange

Error

The input sensor generated a value higher than that allowed for the range of the sensor, or the A/D circuitry malfunctioned. Enter a valid input. The unit's A/D circuitry may be faulty. The value is above the range limits but within the A/D conversion limits. Make sure the InX prompt matches your sensor.

EX 4

Overflow

Error

The input X A/D circuit is overrange. An open or reversed polarity sensor is the most likely cause. Check the sensor; if the connection is good, and functions properly, call the factory. The A/D is too high to convert an A/D signal. Make sure the InX prompt matches your sensor.

Er 3

Ambient

Temperature

Error

The ambient temperature of the controller has dropped below 32EF/0EC or risen above E149F/65EC. Calibration error can also cause the error code. A calibration restore should be tried to clear this alarm.

ER 4

RAM

Verification

Error

Displayed when an internal RAM failure has occurred. Call the factory

ER 5

Non-volatile

Checksum

Error

The non-volatile memory checksum discovered a checksum error. Turn the power OFF then back ON again. If the error has not cleared, call the factory. Unless a momentary power interruption occurred while the unit was storing data, the non-volatile memory is bad. Call the factory.

NOTE:

An alarm display will be masked by an error condition or when the control is in the Calibration or Setup Menus.

CAUTION:

Electrical noise or a noise event, vibration or excess environmental moisture or temperature

may cause errors to occur. If the cause of the error is not otherwise apparent, check for these.

III. General Operation and Startup

General Operation

If installed, the L1 light on the controller is ON when the heater is energized. When the light is on steadily, the heater is energized continuously. When the light is pulsing ON, the heater is energized intermittently.

As you get close to the setpoint, this is normal. Where no L1 light is installed, operation can be checked by a technician using a voltmeter or amprobe on the wires for the appropriate heater or control valve.

Startup

Power ON

Place the power switch in the ON position. The controller displays will light, and the chamber fan will energize.

NOTE:

Under normal operating conditions, the actual chamber temperature or humidity condition is shown on the upper display; the chamber temperature or humidity setpoint is shown on the controller's lower display.

At startup and when changing operating conditions, an audible and visual alarm may occur. Pressing the "MUTE" button on each controller will silence the audible alarm until the chamber is within the programmed operating conditions. This alarm automatically resets itself once the proper operating conditions have been met.

CAUTION:

Care should be taken to press the "MUTE" button only ONCE. If the controller is not in security level 2 or 3, pressing the "MUTE" button more than once will put the controller into manual mode freezing the output at the last power level. This will result in loss of control in the chamber.

IV. Changing the Setpoint Value

Using this step you may change the temperature or humidity setpoint.

To change either the temperature or humidity setpoint, press either the UP or the DOWN key until the desired setpoint value appears in the Lower Display. Take care to enter only values within the designed operating range of the unit the controller is installed in.

NOTE:

Changing the Setpoint to a value outside the alarm band will activate the audible alarm and L4 Alarm Pilot Light. The output contacts for the heating circuits will also open, de-energizing the heaters. Pressing the MUTE Key once will close the output contacts and silence the audible alarm. The L4 Alarm Pilot Light will stay ON until actual conditions return to within the factory set alarm band.

V. Locking and Unlocking the Controller

In order to change most of the controllers factory pre-set values, you must first unlock it's security protection.

WARNING:

Changing factory pre-sets is not recommended and may result in operational failure. Chamber mal-function due to user misconfiguring of the controller is not covered under the warranty.

Unlocking

To unlock, proceed as follows:

1. Press and hold the UP and DOWN Keys at the same time, the SET Menu will appear. Continue to hold the UP and DOWN Keys until the FCTY Menu appears in the Lower Display. You should see PLOC in the Upper Display.
2. Release the UP and DOWN Key.
3. Use the MODE Key to step through the lock out menu choices and the UP or DOWN key to change each setting.
4. Change the PLOC Menu variables as follows:

LOC	0
SYS	None
PIDA	None
PIDB	None
INPT	None
OTPT	None
GLBL	None
CAL	Full
DIAG	Full

The controller is now fully unlocked and all parameters can be changed. These menus contain user or technician programmable parameters (Calibration Offset, Deviation Alarms) as well as factory pre-set parameters (proportional band, reset/integral, etc.).

Only those parameters outlined in the attached tables should be altered by the user or a person not thoroughly familiar with the unit.

Operational malfunctions may result from changes in factory set parameters.

Locking

To relock, proceed as follows:

1. Press and hold the UP and DOWN Keys at the same time, the SET Menu will appear. Continue to hold the UP and DOWN Keys until the FCTY Menu appears in the Lower Display. You should see PLOC in the Upper Display.
2. Release the UP and DOWN Key.
3. Use the MODE Key to step through the lock out menu choices and the UP or DOWN key to change each setting.
4. Change the PLOC Menu variables as follows:

LOC	2
SYS	Full
PIDA	Full
PIDB	Full
INPT	Read
OTPT	Read
GLBL	Read
CAL	Full
DIAG	Full

WARNING:

If you do not go back to LOC value 2, the security of the controller will be compromised. Factory set parameters can be inadvertently changed and operation mal-function can occur. If this happens, repairs are not covered by the warranty.

VI. General Programming

Note:

When programming the Model 89 controller it is important to change the values in the various menu levels in the following order, this is to ensure that PID values in the higher level menus which affect the lower levels are changed first.

LOC
GLBL
INPT
OTPT
SYS
PIDA

PIDB, CAL and DIAG may not be visible and should NOT be unlocked or changed for any reason.

The menus are structured in a three tiered manner, Operation, Setup and Factory.

The Operation menu contains the following sublevels:

- IDSP
- SYS
- PIDA

The Setu menu contains the following sublevels:

- GLBL
- INPT
- OTPT

The Factory menu contains the following sublevels:

- PLOC
- CAL (DO NOT CHANGE)
- DIAG (DO NOT CHANGE)

To access the Operation menu, press the MODE key once, IDSP will appear.

Use the arrow keys to raise or lower the IDSP. This is the setting used when a unit goes into decontamination. When changing the IDSP care should be taken to change the high limit as well.

Pressing the MODE key once more, OPER will appear in the Lower Display and SYS will appear in the Upper Display. Press the MODE key as required to step through the SYS menu choices. Each setting may be changed using the UP or DOWN arrow key.

When the SYS appears in the Upper Display again, press the UP or DOWN arrow keys once and PIDA will appear in the upper display. Use the MODE key to step through the PIDA menu choices. Each setting may be changed using the UP or DOWN arrow keys.

To access the Setup menu, press the UP and DOWN arrow keys together for about three seconds, SET will appear in the Lower Display and INPT will appear in the Upper Display. In the setup menu always make changes to the GLBL menu first.

With SET in the Lower Display, press the UP or DOWN arrow key until GLBL appears in the Upper Display. Use the MODE key to step through the GLBL menu choices. Each setting may be changed using the UP or DOWN arrow key.

With SET in the Lower Display, press the UP or DOWN arrow key until INPT appears in the Upper Display. Use the MODE key to step through the INPT menu choices. Each setting may be changed using the UP or DOWN arrow key.

With SET in the Lower Display, press the UP or DOWN arrow key until OTPT appears in the Upper Display. Use the MODE key to step through the OTPT menu choices. Each setting may be changed using the UP or DOWN arrow key.

To access the Factory menu, press the UP and DOWN arrow keys together and hold for about six to eight seconds, SET will appear briefly in the Lower Display and then FCTY will appear

with PLOC in the Upper Display.

With FCTY in the Lower Display, press the UP or DOWN arrow key until PLOC appears in the Upper Display. Use the MODE key to step through the PLOC menu choices. Each setting may be changed using the UP or DOWN arrow key.

The CAL and DIAG menu's in the Factory menu should NEVER be unlocked or changed.

Use the arrow keys to raise or lower the IDSP. This is the setting used when a unit goes into decontamination. When changing the IDSP care should be taken to change the high limit as well.

Pressing the Mode key once more, OPER will appear in the Lower Display and SYS will appear in the Upper Display. Press the Mode key as required to step through the SYS menu choices. Each setting may be changed using the UP or DOWN arrow key.

When the SYS appears in the Upper Display again, press the UP or DOWN arrow keys once and PIDA will appear in the upper display. Use the mode key to step through the PIDA menu choices. Each setting may be changed using the UP or DOWN arrow keys.

VII. Changing Deviation Alarm Values

NOTE:

For users attempting to change the pre-set alarm band, it is not recommended however if you must, the value entered is in the form of a deviation from setpoint such as +1 and -5 degrees. Do not attempt to enter a low and high alarm value using the actual low and high numerical values.

The controller permits the use of both Low and High Deviation Alarms. These are programmed via the SYS Menu.

CAUTION:

Pressing the UP and DOWN Keys simultaneously provides access to the all menus. The values contained in this menus are factory set and should not be changed or operational failure may result.

Change the LOW and HIGH Alarm

1. Unlock the controller using the instructions in the previous section, setting the following values:

LOC	0
SYS	None

2. Press the MODE Key until Oper appears in the Lower Display and SYS will be in the Upper Display.
3. To change the Low Alarm, press the MODE Key scroll through this menu until A4LO appears in the Lower Display. The number in the Upper Display should be a negative number. This is the number of degrees below setpoint that will initiate an alarm condition if exceeded. Use the UP or DOWN ARROW Keys to set the Low Deviation Alarm at the desired value.
4. To change the High Alarm, press the MODE Key scroll through this menu until A4HI appears in the Lower Display. The number in the Upper Display should be a negative number. This is the number of degrees above setpoint that will initiate an alarm condition if exceeded. Use the UP or DOWN ARROW Keys to set the High Deviation Alarm at the desired value.

NOTE:

The alarm value should be the number or percent above or below setpoint, not the actual alarm value. For instance, if the setpoint is 60 degrees C and you desire the low alarm to sound at 55 degrees, the deviation alarm value should be set at -5 degrees not 55 degrees.

5. Relock the controller using the instructions in the previous section, setting the following values

LOC 2
SYS Full

WARNING:

If you do not go back to LOC value 2, the security of the controller will be compromised. Factory set parameters can be inadvertently changed and operation mal-function can occur. If this happens, repairs are not covered by the warranty.

VIII. Calibrating the Controller

It may sometimes be necessary to change the Calibration Offset Value.

To calibrate the controller, place an accurate standard in the geometric center of the chamber and allow the chamber to stabilize at the setpoint value for a minimum of 30 minutes.

1. Unlock the controller using the instructions in the previous section, setting the following values:

LOC	0
SYS	None

2. From the main menu, press the UP and DOWN Keys simultaneously until Set appears in the Lower Display. If the Upper Display does not read Inpt use the UP or DOWN Key until Inpt is displayed in the Upper Display.
3. Press the MODE key until Inpc is displayed . This is the PID for the temperature offset If the Setpoint is 50 degrees and the actual temperature is 45 degrees, use the UP or DOWN Key as required to enter the difference between the controller readout and the actual chamber temperature or humidity according to the standard. In this case a value of -5 will need to be entered. If the temperature is above the setpoint, a positive value will need to be entered.
4. Press the HOME Key until the Setpoint appears in the Lower Display and the chamber condition appears in the Upper Display.
5. Relock the controller using the instructions in the previous section, setting the following values

LOC	2
SYS	Full

WARNING:

If you do not go back to LOC value 2, the security of the controller will be compromised. Factory set parameters can be inadvertently changed and operation mal-function can occur. If this happens, repairs are not covered by the warranty.

IX. How to Set Up a Controller From Scratch

The occasion may arise when a user must set up a new controller or one which has lost its memory for some reason.

Using controller PID setup sheets from the factory or your manual, perform the steps as follows:

Unlock the controller using the instructions in the previous section.

Access the menus per the section on General Programming.

Controller PID Setup Sheets

Model: 3063D and 3103D		Setup Menus	
Input (InPt) Parameter	Temperature	Humidity	CO2
In1	Rt.d	0 - 5	0 - 5
dEC1		0.0	0.0
rL1	21.0	0.0	-10.0
rH1	121.0	100.0	90
CAL1	USER	USER	USER
rtd1	Ji5		
Ftr1	4	4	4
Lin1		no	no
Output (OtPt) Parameter	Temperature	Humidity	CO2
Ot1	Ht	Ht	Ht
Hys1	0.1	0.1	0.1
Ot2	No	no	Ht
Hys2			0.1
SP2c			dE
Ot3	AL3	AL3	AL3
AL3	DEL	dEL	dEL
A3Sd	Both	Both	Both
Hys3	4.9	9.9	1.9
LAt3	NLA	nLA	nLA
SIL3	OFF	OFF	OFF
Ot4	AL4n	AL4n	AL4n
AL4	DEL	dEL	dEL
A4Sd	Both	Both	Both
HYS4	0.4	4.9	1.9
LAt4	NLA	nLA	nLA
SIL4	On	on	on

Global (gLbL) Parameter	Temperature	Humidity	CO2
C_F	C		
FAIL	0	0	0
Err	NLA	nLA	nLA
Ei1	IdsP	IdsP	IdsP
Anun	OFF	OFF	OFF
LoP	0	0	0
HiP	100	100	100
AtSP	100	90	90
rP	OFF	OFF	OFF
System (SyS) Parameter	Temperature	Humidity	CO2
Ei1s	OPEN	OPEN	OPEN
A3LO	-99.9	-99.9	-99.9
A3HI	5.0	10.0	2.0
A4LO	-0.5	-5.0	-2.0
A4HI	0.5	5.0	2.0
AUt	OFF	OFF	OFF
PIDA (PIDA) Parameter	Temperature	Humidity	CO2
Pb1A	3.0	6.0	0.0
rE1A	0.10	0.10	
rA1A	0.01	0.08	
Ct1A	1.0	1.0	
Pb2A			0.0

PLOC (PLOC) Parameter	Temperature	Humidity	CO2	Unlocked All
LOC	2	2	2	0
SyS	FULL	FULL	FULL	None
PidA	FULL	FULL	FULL	None
PidB	FULL	FULL	FULL	FULL
InPt	Read	Read	Read	None
OtPt	Read	Read	Read	None
GIBI	Read	Read	Read	None
diAg	FULL	FULL	FULL	FULL
CAL	FULL	FULL	FULL	FULL