

E5_C-600 Factory Mutual Temperature High/Low Limit Controller Setup Guide

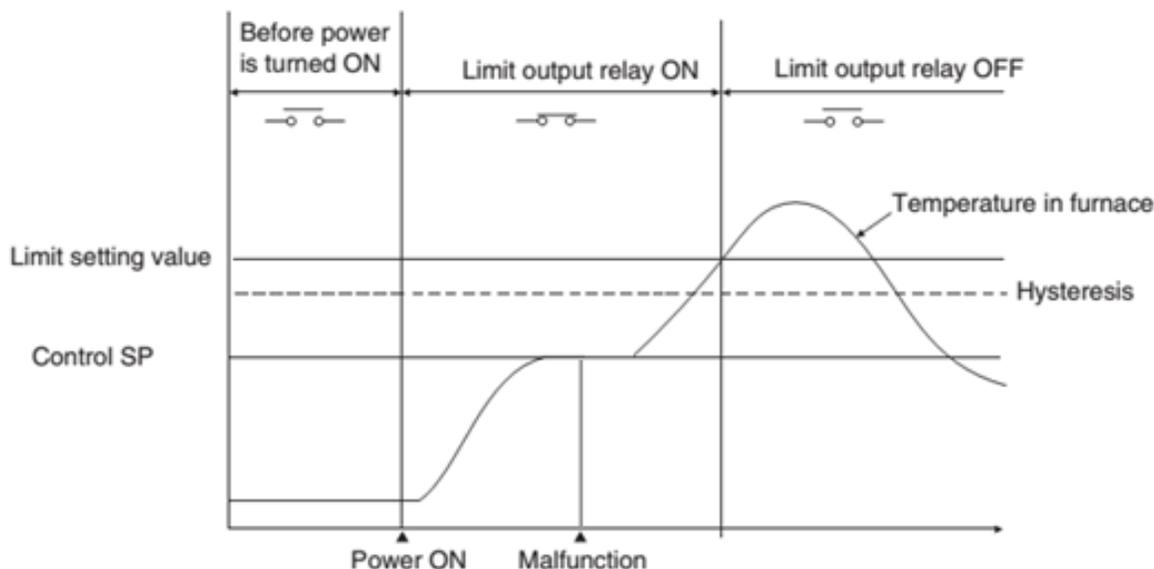
This document is an addendum to the E5□C User's Manual (H174-E1-xx). Please refer to this Setup Guide for installation, specifications, wiring, etc. The purpose of this document is to show the programming steps to set up the specified controllers for FM temperature high limit monitoring. This setup will assign Alarm 1 output as the limit output for all dedicated FM approved units. If the unit is equipped with an event input this can be used to cancel the alarm latched condition. If it is not so equipped, the "PF" key on the front of the unit can also be used for this purpose. Some of the controllers also have the option for a transfer output which can be used to transfer the process value to a chart recorder for recording purposes.

Limit Control Function (Limit Output)

When a Temperature Controller is controlling the temperature of a furnace or other heating device, a malfunction in the Temperature Controller may cause the furnace temperature to rise, resulting in damage to the heated product or the furnace itself. When this situation occurs with the Limit Controller and the temperature rises above the preset limit temperature, the Alarm limit output will OPEN ("SUB1" LED indication ON) and the heater system circuit can be shut down to stop the heat source. In addition, the limit output will remain OPEN even when the temperature returns to the normal range. A safer system can be constructed because the limit output will remain OPEN until it is reset manually. With the Limit Controllers, it is possible to establish a lower limit instead of an upper limit so that the limit function operates when the temperature falls below the limit setting value (Cooling Application). When an input error occurs, the Limit output will OPEN ("SUB1" LED indication ON) and will remain in this condition until the sensor error is fixed and a reset is provided.

Using the Limit Controller Function

When the measured temperature (PV) exceeds the limit setting value, the limit output relay OPENS and the SUB1 operation indicator turns ON. If the limit output relay OPENS (limit alarm is ON), the limit output relay will remain OPEN until the operator checks operation (performs resetting operation).



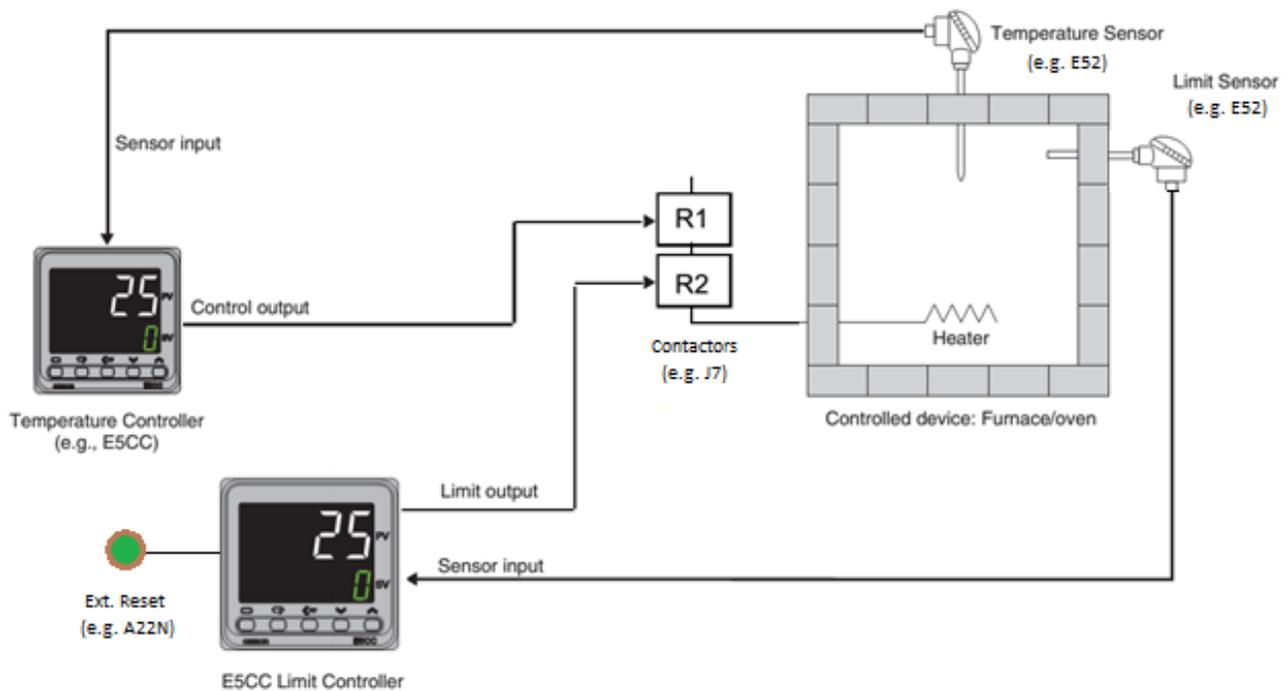
Selecting Upper/Lower Limit:

The upper/lower limit selection setting enables switching between upper limit and lower limit operation.

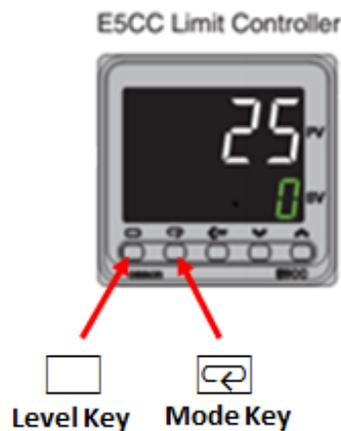
Resetting Limit Outputs:

Depending on how the unit is configured the limit outputs can be reset by pressing the PF key for 1 second min. or providing a switched input to an event input.

Example of Typical Use:



Appearance:



Setting Procedure:

Once the unit is powered up, Press and hold both the  Level Key and the  Mode key for three seconds. This will get the unit to Protect Level.

1. The first parameter is the Operation Level Protect/Adjustment Level Protect ($\bar{0}APL$). Verify that this is set to 0. Use the Up/Down arrow keys to adjust the value.
2. Tap on the  Mode key to get to the next parameter Initial Setting/Communication Level Protect ($\bar{1}LPL$). This needs to be changed to 0. Use the Up/Down arrow keys to adjust the value.

Press and hold both the  Level Key and the  Mode key for three seconds to get back to the Operation Level.

Press and hold the  Level key for three seconds. This will get the unit into the Initial Setting level.

1. Tap on the  Mode key several times until the ($AM\bar{0}V$) parameter is displayed. Enter -169 using the down arrow key. Allow the unit to sit for a couple of seconds and it will automatically switch to the Advanced Function Level. The first parameter shown should be ($\bar{1}N\bar{1}L$).
2. Tap on the  Mode key several times until the ($5b\ IN$) parameter is displayed. This needs to be changed from ($N-\bar{0}$) to ($N-L$). Use the Up/Down arrow keys to adjust the value. This changes the output from normally open to normally close.
3. Tap on the  Mode key several times until the ($\bar{0}UL\ I$) parameter is displayed. This needs to be changed from ($\bar{0}$) to ($N\bar{0}NE$). Use the Up/Down arrow keys to adjust the value. This will reassign the control output to no function.
4. Tap on the  Mode key once to get to the next parameter ($5ub\ I$). This needs to be changed to ($ALM\ I$). Use the Up/Down arrow keys to adjust the value. This will assign the sub1 output for the Limit Alarm.
5. Tap on the  Mode key several times until the ($R\ IL\ L$) parameter is displayed. This needs to be changed from ($\bar{0}FF$) to ($\bar{0}N$). Use the Up/Down arrow keys to adjust the value. This will latch the alarm if an alarm condition is reached.
6. **Note:** If the PF key will be used to reset the alarm condition set this next parameter:
Tap on the  Mode key several times until the (PF) parameter is displayed. This needs to be changed from ($5HFL$) to (LAL). Use the Up/Down arrow keys to adjust the value. This will reassign the PF key to Alarm Latch Cancel.

Press and hold the  Level key for three seconds. This will get the unit back to the Initial Setting level.

1. The first parameter in the initial setting level is the ($\bar{1}N-L$). This is the input type parameter use the instruction sheet or user manual to determine the correct setting based on the input type is applied to the unit for the application. Use the Up/Down arrow keys to adjust the value.

2. Tap on the  Mode key once to get to the next parameter (*d-U*). Select the units to be displayed either °C or °F. Use the Up/Down arrow keys to adjust the value.
3. Tap on the  Mode key once to get to the next parameter (*SL-H*). This is used to determine the upper set point limit. Use the Up/Down arrow keys to adjust the value. The value set here will be the highest value of the set point in the operation level.
4. Tap on the  Mode key once to get to the next parameter (*SL-L*). This is used to determine the lower set point limit. Use the Up/Down arrow keys to adjust the value. The value set here will be the lowest value of the set point in the operation level.
5. Tap on the  Mode key several times to get to the (*ALt-I*) parameter. This is used to determine if the unit is set up for High Limit control (Heating) or Low Limit control (Cooling). Use the Up/Down arrow keys to adjust the value. A selection of (*2*) will set the unit for High Limit control and a selection of (*3*) will set the unit for Low Limit control.
6. **Note:** If the unit is equipped with more than 1 alarm and these are not being used by the application setting additional alarms (*ALt2*) and (*ALt3*) to a value of (*0*) will disable these output indications on the front display. To disable these tap on the  Mode key until (*ALt2*) and (*ALt3*) appear and adjust them using the Up/Down arrow keys to a value of (*0*).
7. **Note:** If the Event Input will be used to reset the alarm condition set this next parameter: Tap on the  Mode key several times to get to the (*EV-I*) parameter. This needs to be changed from (*MSP0*) to (*LAL*). Use the Up/Down arrow keys to adjust the value. This will reassign the Event Input to Alarm Latch Cancel.

Press and hold the  Level key for three seconds. This will return the unit to Operation Setting level.

At this point the controller is set up for commissioning:

1. Verify that the Process Value is reading correctly.
2. **Tap on the  Mode key to get to (*AL-I*) this must be set to a value of (*0*). If this is not set to (*0*) the controller will add this value to the set value and may cause damage to the system.**
3. Tap on the  Mode key until the controller is reading the process value and set point.

High Limit Control testing:

If the set point is adjusted below the actual process value the SUB1 LED should be ON and the system should not run. Raise the set point using the Up arrow key and set the high limit for the application. Verify that the SUB1 LED is still ON and that the system cannot be started. Apply a reset to the Limit controller via event input or PF key. The SUB1 LED should go off and the system should be able to be started.

At this time it is also recommended to verify that the set point upper and set point lower limits work correctly. Lower the set value by using the down arrow until the set point reaches the lower set point

limit. Assure the set point stops at this limit. Raise the set point value using the up arrow test that the set point stops at the upper limit. Assure the set point stops at this limit. If the above does not work correctly review the settings in the controller as well as the wiring of the system.

Low Limit Control testing:

If the set point is adjusted above the actual process value the SUB1 LED should be ON and the system should not run. Lower the set point using the Up arrow key and set the low limit for the application. Verify that the SUB1 LED is still ON and that the system cannot be started. Apply a reset to the Limit controller via event input or PF key. The SUB1 LED should go off and the system should be able to be started.

At this time it is also recommended to verify that the set point upper and set point lower limits work correctly. Lower the set value by using the down arrow until the set point reaches the lower set point limit. Assure the set point stops at this limit. Raise the set point value using the up arrow test that the set point stops at the upper limit. Assure the set point stops at this limit. If the above does not work correctly review the settings in the controller as well as the wiring of the system.

Limit controller Protection set up:

Since this is a monitoring device to protect the system from over or under temperature conditions it is highly recommended to add a level of protection on the unit to avoid accidental changing of settings. The unit has the ability to lock out various levels/settings by use of the protect level. Make sure the controller is set up correctly for the application before applying protection. Below is two typical ways to set protection on the unit. If different levels of protection are required please consult the User manual for further explanation:

Locking the unit completely so no changes can be made:

Press and hold both the  Level Key and the  Mode key for three seconds. This will get the unit to Protect Level.

1. The first parameter is the Operation Level Protect/Adjustment Level Protect ( **OLP**). This needs to be changed to (**3**). Use the Up/Down arrow keys to adjust the value.
2. Tap on the  Mode key to get to the next parameter Initial Setting/Communication Level Protect ( **ILP**). This needs to be changed to (**2**). Use the Up/Down arrow keys to adjust the value.

Press and hold both the  Level Key and the  Mode key for three seconds. This will get the unit back to the Operation Level. Verify that none of the keys work on the unit. The unit should not be able to go into any levels other than the Operation Level.

Locking the unit so only the Set Point can be changed:

Press and hold both the  Level Key and the  Mode key for three seconds. This will get the unit to Protect Level.

1. The first parameter is the Operation Level Protect/Adjustment Level Protect ( **OLP**). This needs to be changed to (**2**). Use the Up/Down arrow keys to adjust the value.

2. Tap on the  Mode key to get to the next parameter Initial Setting/Communication Level Protect (). This needs to be changed to (). Use the Up/Down arrow keys to adjust the value.

Press and hold both the  Level Key and the  Mode key for three seconds. This will get the unit back to the Operation Level. Verify that none of the keys work on the unit other than the Up/Down arrows and the set point can be changed. The unit should not be able to go into any levels other than the Operation Level.

A password can be entered into the unit for further protection but the password needs to be recorded. **If the password is lost the unit would need to be replaced.** Please consult the User Manual for further information on protection via password.

Transfer Output Option:

This option can be used to transfer the process value to a chart recorder. If the unit is so equipped please consult the user manual for setting this option.

Heater Burnout Option:

Since this unit is not being used for controlling the temperature of the system this option cannot be used when using the controller for “Temperature High/Low Limit Controller” applications.

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