MICROCHILL (MCL01) CONTROLLER

USER MANUAL

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MICROCHILL (MCL01) - Coldroom and Freezer Room Control

INDEX

SELECTING COLDROOM OR FREEZER ROOM CONTROL

1. When Power is applied to the controller for the first time, the temperature will be displayed, and the **"Light"** pushbutton will be the only button operable.

2. Press and hold the **"On/Off"** and **"Service"** pushbuttons for 5 seconds. When the screen goes blank, release the buttons. **"COLD"** will be displayed. Use the **"Up"** and **"Down"** arrows to select Coldroom **(COLD)** or Freezer **(FREZ)** operation.

3. Press and hold the **"On/Off"** button again until the screen goes blank. You have now selected how your controller will operate. The controller will now function under the Default Parameters.

\# Selecting the control mode will only be required on the controllers initial power up, however if you require to change it again, repeat step 2. If you do reselect the control mode, the Parameters will revert to the Default settings once again. Please note that the controller must be **"OFF".**

PROGRAMMING YOUR CONTROLLER

1. To **ENTER** the programming mode, press and hold the **"On/Off"** and then the **"UP"** arrow for 5 seconds. When the screen becomes blank, stop holding down the buttons.

2. When you have entered the programming mode, **"P 00"** will be displayed.
   (P=Paramter, 00=Parameter 0)

3. In the programming mode, the **"Up"** and **"Down"** buttons select which Parameter is to be edited. (From Parameter 00 to 16 for Coldroom, 0-21 for Freezers) Not all Parameters are required to be used.

4. When you have selected the correct Parameter, Press the **"On/Off"** button. The value of that Parameter may then be altered by pressing the **"Up"** or **"Down"** buttons. When you have adjusted that Parameter to the desired setting, press the **"On/Off"** button to confirm the changes.

5. After Step 4, you will be back at the Parameter selection stage once again. Repeat steps 3 & 4, until you have adjusted all Parameters you require.

6. To **EXIT** the programming mode and **SAVE** your new settings, press and hold the **"On/Off"** button for 5 seconds. When the screen becomes blank, stop holding down the buttons.

IMPORTANT NOTES FOR PROGRAMMING

1. If you do not save your alterations, by holding the **"On/Off"** button, as stated in Clause 6 above, the controller will revert to the previous settings, before the programming mode was entered.

2. If you are in the process of adjusting a Parameter (Using the **"Up"** and **"Down"** buttons), and do not press any buttons for 30 seconds, the controller will revert back to the Parameter selection screen. **(Eg. P 00)**

3. If the Parameter selection screen **(Eg. P 00)** is left unaltered for 60 seconds, the controller will revert to the last saved setting, and exit the programming mode. The temperature will be displayed.

ADJUSTING THE SETPOINT

To adjust the Setpoint temperature, simply press and hold the **"UP"** or **"Down"** arrow for 5 seconds. Release the button when the display goes blank. Adjust the setpoint temperature to the desired setting, and release the pushbutton. After 5 seconds the display will revert to the actual temperature and the setpoint will be saved.

FAULT REPRESENTATION

1. If the Control Station display reads **HELP**, this is due to a communications error between the Controller and the Control Station. Check the interconnecting 4 core screened cable for continuity or short circuits. (The Comms terminal is for Communications faults) (<u>RESULT FROM FAILURE</u>: The controller will shut down)

2. If the Control Station reads **Sen1 FAIL**, this is due to an open circuit room temperature detector. **(Must be the Innotech SENP3)** To test the detector, disconnect it from the room and connect it directly to **Input 3** & **Common** on the Control Station. (<u>RESULT FROM FAILURE</u>: The controller will initiate the ALARM & BUZZER outputs. Mute will terminate the BUZZER.)

    "Also with this failure, the controller will initiate cooling for the run time set in the TEMPERATURE FAIL RUN TIME parameter, and then switch off for ½ of the set run time."

3. If the Control Station reads **SEn2 FAIL**, this is due to an out of range error with the Defrost Coil Temperature Detector. This could be caused by an open or closed circuit on the wiring to the detector, an incorrect temperature detector **(Must be the Innotech SENP3)**, or a failure with the detector. To test the detector, disconnect it from the room and connect it directly to the **Input #4 & Common** terminals at the Control Station. (<u>RESULT FROM FAILURE</u>: The controller will revert to the Defrost Duration. If there is no Defrost Duration programmed, the defrost will be ignored.)

    This Failure is only when the controller is being used for Freezer Room Operation. (Parameter 20 is on).

    IF THE DEFROST TEMPERATURE DETECTOR IS FAULTY, AND ANOTHER IS NOT READILY AVAILABLE, SET PARAMETER 20 TO OFF AND USE PARAMETER 2. THIS WILL ALLOW A TIMED DEFROST UNTIL A REPLACEMENT SENSOR BECOMES AVAILABLE.

LOGGING & MONITORING

The Micro-Chill controller has the capacity to record the Highest Temperature, Lowest Temperature, and whether there has been an alarm for every hour, up to 48 hours when the Microchill is **"ON"**.. The logging is for a Hi-Temp, Low- Temp, Power Failure and whether a Defrost has occurred. These may be viewed by following the steps below.

1. Press and Hold the **"On/Off"** pushbutton for 5 seconds**. "L 01"** will be displayed. This is the logging for the previous hour. By pressing the **"Up"** and **"Down"** arrows, you can select to view from the previous hour up to the last 48 hours. If no logs are available, the display will read **"none"**.

2. To view the Temperatures and logging status for that hour, press the **"On/Off"** pushbutton. The Highest Temperature is displayed. Press the **"Up"** arrow again and the Lowest Temperature is displayed. Press the **"Up"** arrow again and the alarm for that hour will be displayed as follows**: "Hi"**-High Temp Alarm, **"Lo"**-Low Temp Alarm, **"PO"**-Power Failure, **"DEF"**- Defrost.

3. To exit the logging, press and hold the **"On/Off"** pushbutton for 5 seconds.

INPUTS AND OUTPUTS

Inputs – Analogue & Digital

Input #1–External Enable. (Voltage Free Contact.) If using this input, enable it through Parameter 14. This disables the Off/On pushbutton on the Control Station.

Input #2– Door Switch. (Voltage Free Contact.) If using this input, enable it through Parameter 12.

Input #3 for Room Temperature – Thermistor (Innotech)

Input #4 for Defrost Temperature Termination For Freezers, enable it through Parameter 20. Thermistor (Innotech)

Input #5– Room Light Switch. (Voltage Free Contact, operating as a 2 way switch)

Input #6 (Enabled through Parameter 15)
-    External Defrost (Voltage Free Contact).
-    Trapped Person Alarm (Voltage Free Contact)

Digital Outputs – Items to be controlled.

DO #1 – Room Lights (16A Relay. Common and Normally Closed Contact)

 Under normal conditions, when the controller is powered and the lights are off, the Digital Output will be energised. (Normally Closed Contacts will be Open Circuit). To switch the lights on, press the "**LIGHT"** Pushbutton. The relay will de-energise, and the lights will be switched on. **(This is a failsafe operation)**

**DO #2** – Fan (16A Relay. Common and Normally Open Contact)

DO #3 - Cooling (16A Relay. Common and Normally Open Contact)

DO #4 – Defrost Heater (16A Relay. Common and Normally Open Contact)
    (FREEZER OPERATION ONLY)

DO #5 – Alarm Light (2A Relay. Common and Normally Open Contact)

DO #6 – Buzzer (2A Relay. Common and Normally Open Contact)

TYPICAL CONTROL STATION WIRING

Input 3	Input 4	GND	Input 5	Input 6	GND

Room Temp Defrost Temp Light Switch External Defrost Person Trapped

Input 1	Input 2	GND	+12V	Comms	GND

External Enable Door Switch

TO CONTROLLER

CONTROLLER

FROM CONTROL STATION

GND	240v	240V AC SUPPLY
Comms	N	NEUTRAL
+12V	E	EARTH
	NC	Lights — N
	C	AC SUPPLY

Alarm — NO
AC SUPPLY — C

Buzzer — NO
N — C

NO — Fans
C

NO — Cooling
C

NO — Defrost
C

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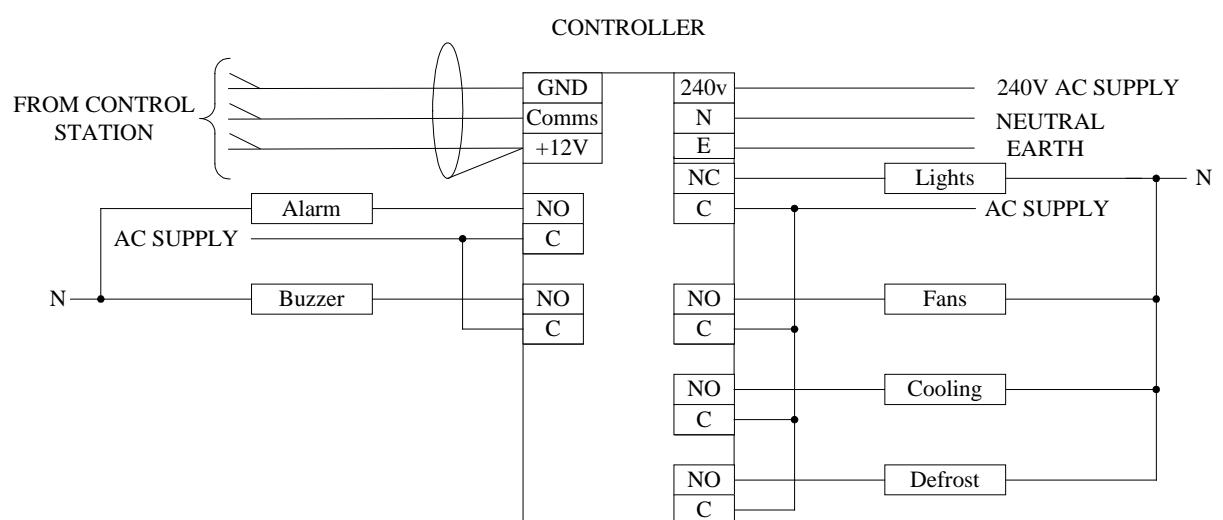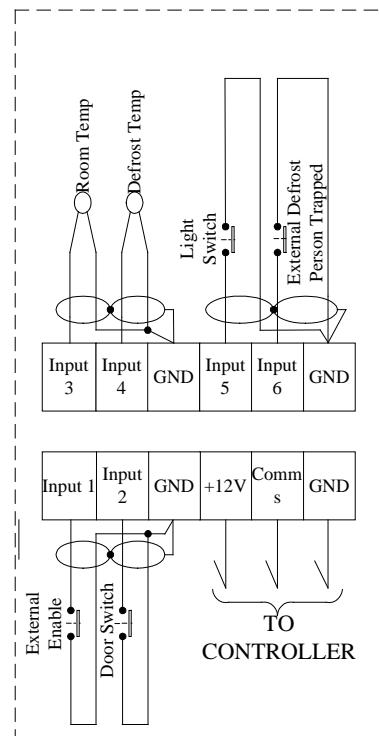
COLDROOM CONTROL

PARAMETERS FOR COLDROOM SELECTION

Setpoint = 3ºC

0 – Differential (0.0ºC to 10.0ºC), *Default 1.0C*

1 – Number of Defrosts (0-24) per Day *Default 4*

2 – Defrost Duration (0-120) Minutes *Default 30 Minutes*

3 – Cooling Restart (0-120) Minutes *Default 3 Minutes*

4 - Service Time Out (0-120) Minutes *Default 10 Minutes*

5 – Mute Time Out. (0-120) Minutes (10 Minute Increments) *Default 10 Minutes*

6 – Temperature Fail Run Time (0-100) Minutes, *Default 20 Minutes*

7 - Hi Temp Alarm Time Delay (0-120) Minutes *Default 10*

8 – Lo Temp Alarm Time Delay (0-120) Minutes *Default 10*

9 – Hi Temp Alarm Setpoint (-30.0ºC to +30ºC) *Default Off*

10 – Lo Temp Alarm Setpoint (-30.0ºC to +30ºC) *Default Off*

11 – Calibration in ºC (Actual Temperature, -10 to +10ºC)

12 – Door Switch Control (Off or On) *Default Off*

13 – Door Switch Time Delay (0-500) Seconds *Default 30 seconds* (Only when Parameter 12 is On)

14 – External Enable Input (Off or On) *Default Off*

15 – External Defrost or Person Trapped Alarm (DEF or PERS) *Default PERS*

16 - Automatic Defrost After Power Failure (Off or On) *Default Off*

Note 1: Parameters 9 & 10 have an "OFF" state to disable the functionality of each Parameter. Each of the Parameters has a range of –30.0 to +30.0. The Off state can be reached by pressing the "UP" key after the display has reached +30. The display will then read "OFF"

Note 2: Parameter 6 has an "OFF" state and an "ON" state to enable the system to not function at all, or to run continuously if the Room Temperature Detector Fails. The "OFF" state is at 0, and the "ON" state is at 100. (If Parameter 6 was set to 20, this would enable the system to run for 20 minutes and then stay off for 10 minutes. The "OFF" time is always ½ of the "ON" time.

COLDROOM CONTROL STATION DESCRIPTION

The Control Plate has the following functions when used in the Coldroom applications:

The **"On/Off"** Pushbutton with LED indication. If pressed, the fan and the temperature control are enabled. (Except if Parameter 14 is set to On – External Enable Input)

The **"Service"** Pushbutton with LED indication. If pressed, the fan and the temperature controls are disabled for a timed period. **(Parameter 4)** If pressed again, the timed period will be reset, and the system restarted. The **"Service"** LED will flash in this mode. (If the control station is located in an accessible location to the public, set this Parameter 4 to 0. This disables this mode)

NOTE 1: In "Service" mode the high and low temperature alarm settings are still operable. Therefore if the temperatures drift out to unacceptable levels, the Alarm Light relay will initiate and stay on, however the buzzer relay will not be energised.

NOTE 2:If a Defrost is required during "SERVICE" mode, the system will ignore the "SERVICE" function and initiate the defrost.

The **"Light"** Pushbutton. with LED indication. This switches the Coldroom lights on and off. (This pushbutton operates as a 2-way switch with the Light Switch located inside the Coldroom (Using Input 5)

The **"Mute"** Pushbutton, with LED indication. A Hi or Low temperature alarm initiates the buzzer relay, and pulses the alarm light relay every 2 seconds. If the **"Mute"** button is pressed, the buzzer relay will de-energised, and the alarm light relay will stay on (Not Flash) until the temperature is back in the acceptable range. **(Parameter 9 & 10).**

If the temperature does go back within the acceptable limits, the alarm light relay and buzzer relay will de-energise. The **"MUTE"** light will flash to show that it has had an alarm. To acknowledge that there has been an alarm, press the **"MUTE"** pushbutton, and the LED will cease to flash.

If after the preset timeout **(Parameter 5),** the fault has not been rectified, the buzzer relay will re-initiate, and the alarm light relay will pulse once again. The display will continue to flash between the **"HI"** or **"LO"** and the temperature until rectified. **The "Mute" pushbutton will not operate when the Person Trapped Alarm is initiated.**

FORCING A DEFROST

To force a defrost, press and hold the **"Service"** button for *5 seconds*. **(dEF will be displayed)** To terminate the forced defrost, press and hold the **"Service"** button for another *5 seconds*. If you do not press the **"Service"** button to cancel the defrost, it will continue to operate until the defrost terminates from the time in Parameter 2. **(P 02)**

PLEASE NOTE IF PARAMETER 2 IS AT "0" THE FORCED DEFROST WILL NOT OPERATE.

COLDROOM CONTROL WIRING

**External Defrost or Person Trapped**

External Enable

Door Switch

Room Temperature

Interior Light Switch

MICROCHILL

Alarm Light　**Room Lights**　**Alarm Buzzer**

Indoor Fans

Cooilng (Solenoid)

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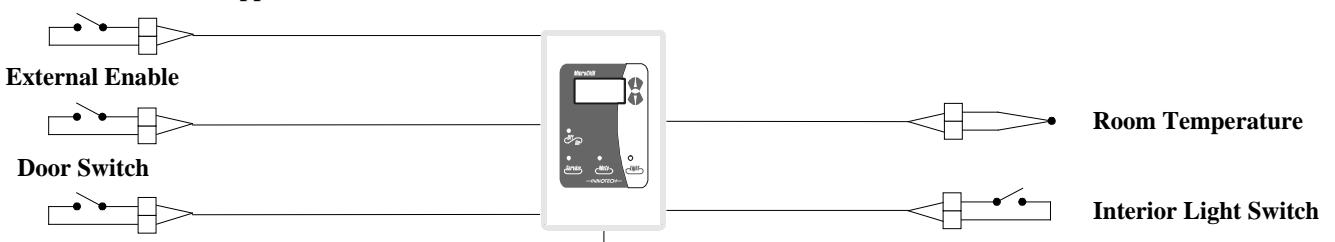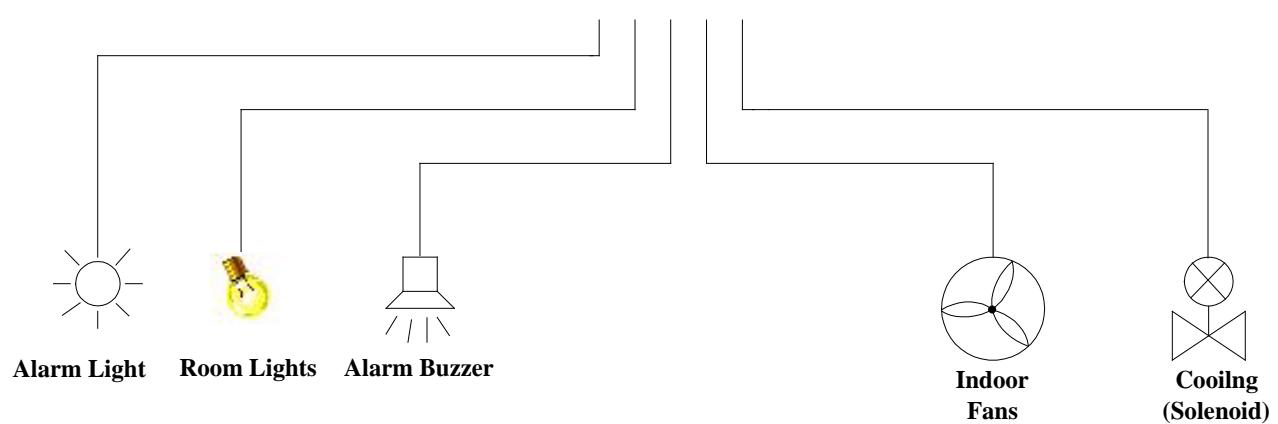
FREEZER ROOM

CONTROL

PARAMETERS FOR FREEZER ROOM SELECTION

Setpoint = -20ºC

0 – Differential (0.0ºC to 10.0ºC), *Default 1.0C*

1 – Number of Defrosts (0-24) per Day *Default 4*

2 – Defrost Duration (0-120) Minutes *Default 30 Minutes*

3 – Cooling Restart (0-120) Minutes *Default 3 Minutes*

4 - Service Time Out (0-120) Minutes *Default 10 Minutes*

5 – Mute Time Out. (0-120) Minutes (10 Minute Increments) *Default 10 Minutes*

6 – Temperature Fail Run Time (0-100) Minutes, *Default 20 Minutes*

7 - Hi Temp Alarm Time Delay (0-120) Minutes *Default 10*

8 – Lo Temp Alarm Time Delay (0-120) Minutes *Default 10*

9 – Hi Temp Alarm Setpoint (-30.0ºC to +30ºC) *Default Off*

10 – Lo Temp Alarm Setpoint (-30.0ºC to +30ºC) *Default Off*

11 – Calibration in ºC (Actual Temperature, -10 to +10ºC)

12 – Door Switch Control (Off or On) *Default Off*

13 – Door Switch Time Delay (0-500) Seconds *Default 30 seconds* (Only when Parameter 12 is On)

14 – External Enable Input (Off or On) *Default Off*

15 – External Defrost or Person Trapped Alarm (DEF or PERS) *Default PERS*

16 - Automatic Defrost After Power Failure (Off or On) *Default Off*

17 – Cooling Delay-**Drain Time** (0-500) Seconds, *Default 120 Seconds*

18 – Fan Delay Time (0-500) Seconds, *Default 60 Seconds*

19 – Fan Delay Temp (-30 to 30ºC) *Default Off*

20 - Defrost Temperature Terminate (-30.0ºC to +30ºC) *Default Off* **(Optional Sensor)**

21 – Defrost Coil Temperature Offset (-10 to +10ºC, (Actual Coil Temp) *Default 0ºC* **(Only when Parameter 20 is on)**

Note 1: Parameters 9, 10, and 19 have an "OFF" state to disable the functionality of each Parameter. Each of the Parameters has a range of –30.0 to +30.0. The Off state can be reached by pressing the "UP" key after the display has reached +30. The display will then read "OFF"

Note 2: Parameter 6 has an "OFF" state and an "ON" state to enable the system to not function, or to run continuously if the Room Temperature Detector Fails. The "OFF" state is at 0, and the "ON" at 100. (If Parameter 10 was 20, this would enable the system to run for 20 minutes and off for 10 minutes. The "OFF" time is always ½ of the "ON" time.

FREEZER ROOM CONTROL STATION DESCRIPTION

The Control Plate has the following functions when used in the Coldroom applications:

The **"On/Off"** Pushbutton with LED indication. If pressed, the fan and the temperature control are enabled. (Except if Parameter 14 is set to On – External Enable Input)

The **"Service"** Pushbutton with LED indication. If pressed, the fan and the temperature controls are disabled for a timed period. **(Parameter 4)** If pressed again, the timed period will be reset, and the system restarted. The **"Service"** LED will flash in this mode. (If the control station is located in an accessible location to the public, set this Parameter 4 to 0. This disables this mode)

NOTE 1: In "Service" mode the high and low temperature alarm settings are still operable. Therefore if the temperatures drift out to unacceptable levels, the Alarm Light relay will initiate and stay on, however the buzzer relay will not be energised.

NOTE 2:If a Defrost is required during "SERVICE" mode, the system will ignore the "SERVICE" function and initiate the defrost.

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If the temperature does go back within the acceptable limits, the alarm light relay and buzzer relayt will de-energise. The **"MUTE"** light will flash to show that it has had an alarm. To acknowledge that there has been an alarm, press the **"MUTE"** pushbutton, and the LED will cease to flash.

If after the preset timeout **(Parameter 5),** the fault has not been rectified, the buzzer relay will re-initiate, and the alarm light relay will pulse once again. The display will continue to flash between the **"HI"** or **"LO"** and the temperature until rectified. **The "Mute" pushbutton will not operate when the Person Trapped Alarm is initiated.**

FORCING A DEFROST

To force a defrost, press and hold the **"Service"** button for *5 seconds*. (**dEF will be displayed**) To terminate the forced defrost, press and hold the **"Service"** button for another *5 seconds*. If you do not press the **"Service"** button to cancel the defrost, it will continue to operate until the defrost terminates from the time in Parameter 2 **(P 02),** or Temperature Termination in Parameter 20 **(P 20)**

PLEASE NOTE IF PARAMETER 2 IS AT "0", AND PARAMETER 20 IS "OFF", THE FORCED DEFROST WILL NOT OPERATE

DEFROST TERMINATION

NOTE: If using the Defrost Coil Temperature termination **(Parameter 20),** and Coil temperature stated is not reached within the Deforst Duration Time **(Parameter 2)** the Deforst will be Terminated.

NOTE: If using the Fan Delay Temp **(Parameter 19)** to enable the fan after a defrost and the temperature stated is not reach within the Fan Delay Time **(Parameter 18)** the Fan will be enabled

FREEZER ROOM CONTROL WIRING

External Defrost or Person Trapped

External Enable

Door Switch

Defrost Coil Temperature

Room Temperature

Interior Light Switch

MICROCHILL

Alarm Light   **Room Lights** **Alarm Buzzer**

Indoor Fans

Cooling (Solenoid)

Defrost Heater