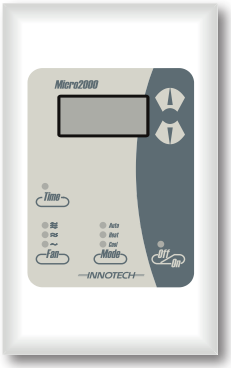
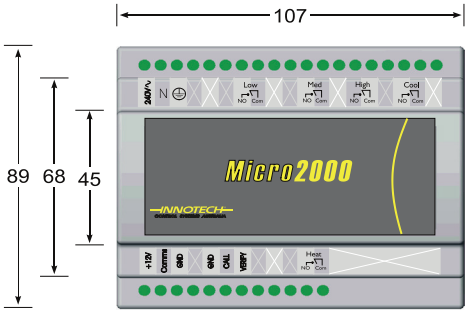
Models:

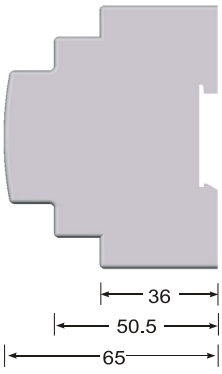
M2K08 3 Speed FAN, 1 COOL, 1 HEAT Controller, 7 day - 4 Event Time Clock or Timer, with Condenser Water Pump Interlock

M2K08
Micro2000 Controller

The Clock is not battery backed. Time and Date will need to be set every time power is cycled if the Time Clock function is enabled. Schedules and Parameters are saved even if power is lost.







Specifications

Power Supply

- Voltage: 240VAC ±10% @ 50/60Hz
- Power Consumption: 7VA max

Inputs

- 10kΩ Thermistor temperature sensor
- Digital Input for Switched contact

Outputs

Relay # 1, 2, 3, 4:	Voltage free relay contacts:	
	Normally Open	10A resistive
		6A inductive
Relay # 5	Voltage free relay contacts:	
	Normally Open	2A resistive
		0.5A inductive

Connection Between Controller and Control Station

- 4 way connection via 4 core plus screen cable

Control Station Terminal Identification

- IN 1 Temperature Sensor Input
- IN 2 Digital Input for Switched Contact
- IN 3 Verify Signal Feedback Input
- GND Common for Inputs and Cable Shield
- +12V Power from Controller
- Comms Comms to Controller
- GND Ground from Controller

Controller Terminal Identification

240 Volt Power connection to Control Unit:

- ⏚ Earth
- N Neutral Supply
- 240V~ Mains 240VAC Supply

Output Relays

- NO Normally Open Contact
- COM Common Contact

Comms Terminals

- +12V Power to Control Station
- Comms Comms from Control Station
- GND Ground to Control Station

Temperature Ratings

- Storage: 0 to 50°C non-condensing
- Operating: 0 to 40°C non-condensing
- Sensor Input: 5 to 35°C

Application

The Innotech M2K08 Controller is designed to provide complete control of air conditioning systems for commercial applications. Specifically for applications where a Condenser Pump Interlock System is required.

Features

- Condenser Water Pump Interlock Control
- LED Display of Temperature and Program functions
- Control Station fits standard electrical wall plates
- Four core screened cable simplifies connection between the Control Station and Controller
- Adjustable Proportional Band, Dead Zone, Compressor Restart Time and Setpoint Range
- Able to operate as 1 cool, 1 electric heating or as reverse cycle heating or cooling
- Three Speed Fan Control
- 7 Day 24hr Real Time Clock or Adjustable Timer function
- Programmable Schedules, 4 events per day
- All adjustments from the Control Station

Approvals

The *Micro2000* series controllers conform to the to the requirements per European Consortium Standards EN55011:1998 (Emissions), Class B, Group 1, EN50082-1:1997, EN61000-4-2 (Electrostatic Discharge), EN61000-4-3 (Radiated RF Immunity), ENV50204 (Radiated RF Immunity-Keyed Carrier), EN61000-4-4 (Electrically Fast Transients 1kV), EN61000-4-5 (Surge), EN61000-4-6 (Conducted RF Immunity), ICE1000-4-11 (Main Variations) for purposes of CE certification and also the requirements of the Australian/ New Zealand standard AS/NZS 2064 1/2:1992 Class B Group 1 for purposes of C-Tick certification.

Installation

1. The *Micro2000* should be mounted on DIN rail in cabinets approved for switchgear or industrial control equipment. It should be mounted in a dry and clean location, free of excess vibration. Maximum terminal cable entry is 1.5mm^2 wire.
2. Wire in accordance with INNOTECH connection diagrams and local bylaws or refer to your local distributor.
3. Connect the 240VAC supply to the correct terminals on the Controller, observing the correct polarity of the connections. Connect the EARTH to the correct terminals on all units.
4. The maximum wire length between the Control Station and the Controller should not exceed 50 metres. The wiring between these devices should not be run in parallel with conductors carrying high current.

This product should only be installed by qualified personnel.

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 cable for continuity or short circuits. As a result of this failure the Controller will shutdown after 1 minute.
2. If the Control Station reads "SEN FAIL", this is due to an open circuit room Temperature Detector. The fault occurs if an open circuit has been detected for more than 20 seconds. As a result of the failure, the Controller will shut down.
3. If the Control Station reads "no FLO", there has been no Flow Verify Signal feedback from the Pump Interlock Module. The fault will occur if a flow signal is not received within 30 seconds of a Call signal.

Inputs

1. INPUT 1 Temperature Sensor Input: (Range 5 - 35°C.) This input is used to read the current temperature.
2. INPUT 2 - Selectable Dry Contact Digital Input:
   Using Parameter 12, Input 2 can be either be a Door Switch Input, AC Fault Input, a External Disable Input, or External Enable Input.

   Door Switch
   If "Door" is selected in Parameter 12 and Input 2 is "ON" for the time set in Parameter 13 (Door Open Time), the *Micro2000* will display "Door" and will go into Standby Mode. In Standby mode the Dead Band is increased by the adjustable value in Parameter 14 (Door Reset Dead Band). If Parameter 14 reads 10°C, there is a 5°C dead band either side of the setpoint. However if Parameter 14 is set to 0 (Off) then the *Micro2000* will shutdown all outputs. After the door is closed the *Micro2000* will continue to operate in is previous state.

   AC Fault
   If "AC" is selected in Parameter 12 and Input 2 is "ON" the *Micro2000* will display "AC FAIL" and continue to operate in it's current mode. After the fault is rectified, the display will revert back to its previous state.

   External Disable
   If "dIS" is selected in Parameter 12 and Input 2 is "ON" the *Micro2000* will shut down all outputs and display "OFF". After the disable input is removed, the *Micro2000* will continue to operate in its previous state.

   External Enable
   If "EnAb" is selected in Parameter 12 then Input 2 is used as an External Enable Switch. It's operation is the same as the On/ Off button on the front panel. See the Push Buttons section for more details.
3. INPUT 3 - Pump Interlock Verify Signal. See Pump Interlock Section for more details.

All Digital Inputs have a 5 second delay before they are registered.

Outputs

Relay #1	Fan Low (10A Relay. Common and Normally Open Contact)
Relay #2	Fan Mid (10A Relay. Common and Normally Open Contact)
Relay #3	Fan High (10A Relay. Common and Normally Open Contact)
Relay #4	Cool (10A Relay. Common and Normally Open Contact)
Relay #5	Heat (2A Relay. Common and Normally Open Contact)

Pump Interlock Operation

The M2K08 is equipped with a 3 wire pump interlock system. This system should be used with a Micro2000 Pump Interlock Module (M2KPI see datasheet DS9.19).

When Compressor One is called for, the Controller will send a "Call" signal to the Pump Interlock Module. The Pump Interlock Module will enable the pump and send back a "Verify" signal when flow has been achieved. When the Controller receives the "Verify" signal, it can enable Compressor One.

Multiple M2K08 controllers connected in parallel use the same 3 wire Pump Interlock system and can be connected to the one Pump Interlock Module (M2KPI). For further information, refer to the M2KPI datasheet.

Pump Interlock Terminals on Controller

- Verify: Verify Signal
- Call: Call Signal
- Comm: Common Connection

Push Buttons

The normal control button use is described below:

1. Fan The "Fan" button is used to change the current fan speed. The fan speed is indicated by 3 LEDs above the button. If the Controller is not running (Off), the Fan button can be used to turn the Fan on only (Vent Mode).
2. Mode The "Mode" button allows you to change the mode of the Controller between Auto, Heat and Cool.
3. Time This button has two selectable modes of operation. The operation of the button can be changed by using Parameter 10 to either Time Clock mode or Timer mode.

Time Clock Mode
When Parameter 10 is set to "On", the Time button allows you to enable or disable the Time Clock. Any Schedules that have been programmed will not function unless the Time LED is On. When the Time button is pressed, the current time is displayed for 5 seconds and then reverts back to the current temperature.
Timer Mode
When Parameter 10 is set to "Off", the Time button is used as an adjustable On or Off timer. When pressed, the display will show the time in hours before the Controller will change state.

0.1 hours = 6 minutes.

If the unit is off, the Controller will display the time till the unit will turn on. If the unit is on, it will display the time it will turn off.
The time displayed may be adjusted by pressing the and buttons until you have adjusted to the time required. If no buttons are pressed for 5 seconds, the display will revert back to the current temperature. When the timer has been set, the Time LED will be lit.

4. The On / Off button is used to change the current state of the Controller. It can be used to override either the Time Clock or Timer depending on which mode is selected.

If the Controller has been turned on by the Time Clock Schedule, the is used to force the Controller off till the next scheduled "On" time. Similarly, if the Controller is Off, the can be used to force the Controller on until the next scheduled "Off" time.

5. The Up and Down buttons can be used to change the current Setpoint.

Programming Schedules / Clock

The function of the buttons while in programming mode is shown below.

Enter Back
Delete Copy

1. To enter the CLOCK / SCHEDULE programming mode, press and hold the Button for 5 seconds. When the screen becomes blank, stop holding down the button.
2. When you have entered the programming mode, "CLO" will be displayed.
   Use the and buttons to select a programming mode:

Programming Modes	
"CLO"	Clock
"SCH"	Schedules

   To Select press the button.

To exit out of Schedules / Clock programming mode at any time, press and hold the Button for 5 sec then release.

3. If "CLO" was selected, the Current Time will be displayed. Use the and buttons to adjust the current time and press . The day is then displayed, use the and buttons to select the required day. Day 1-7 = Monday-Sunday. Press the button to select or button to go back to programming mode selection.
4. If "SCH" was selected in step 2, you can now set / edit the schedules. The display will initially show "Day1". Use the and arrows to select which Day you wish to view. Press the button to select or button to go back.
5. After you have selected the day, the display will initially show "SCH1". Use the and buttons to select which schedule you wish to view. Press the button to select or button to go back to Step 2.
6. After selection, you can now set the On and Off times for selected Day and Schedule. Use the and buttons to set the time. Press the button to accept or the button to go back.
7. A Schedule can be deleted by pressing the button when viewing the "On" time for the particular schedule you wish to delete.
8. A copy function is available to copy a previous days schedule (Sch1 or Sch2). This can be done by pressing the button while viewing the "On" time for the Schedule you wish to set.

Programming Your Controller

To enter into the programming mode, press and hold the button and the arrow for 5 seconds. When the screen becomes blank, release the buttons.

- When you have entered the programming mode, "P 00" will be displayed (P=Parameter, 00=Parameter 0).
- In the programming mode, the and buttons select which Parameter is to be edited. (From Parameter 00 to 15).
- When you have selected the correct Parameter, press the button. The value of that Parameter may then be altered by pressing the or buttons. When you have adjusted the Parameter to the desired setting, press the button to confirm the changes.
- After confirming the changes (above), you will be back at the Parameter selection stage once again. Select and change parameters until have adjusted all Parameters you require.
- To EXIT the programming mode and SAVE your new settings, press and hold the button for 5 seconds. When the screen becomes blank, release the button.

Important Notes For Programming

- If you do not save your alterations, by holding the button for 5 seconds, the Controller will revert to the last saved settings.
- If you are in the process of adjusting a Parameter (Using the and buttons), and do not press any buttons for 30 seconds, the Controller will revert back to the Parameter selection screen. (Eg. P 00)
- 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.

Parameters

Parameter 0: Sensor Calibration
The display will show the Sensor Temperature. To offset the sensor temperature, adjust using the Up and Down buttons.
- The range of the offset is ±10°C
- The factory default setting is 0.0°C

Parameter 1: Minimum Setpoint
The display will show the Minimum Setpoint to which the Controller can be set.
- The range of Minimum Setpoint is 5 to 35°C
- The factory default setting is 15°C

Parameter 2: Maximum Setpoint
The display will show the Maximum Setpoint to which the Controller can be set.
- The range of Maximum Setpoint is 5 to 35°C
- The factory default setting is 30°C

Parameter 3: Dead Band
The display will show the Dead Band setting.
- The range of the Dead Band is 0 to 9.9°C
- The factory default setting is 0.5°C

Parameter 4: Proportional Band
The display will show the Proportional Band Setting. A Proportional Band setting of 2°C will result in a differential of 2°C for heating and 2°C for cooling.
- The range of Proportional Band is 0.5 to 9.9°C
- The factory default setting is 1.0°C

Parameter 5: Compressor Minimum Off Time
The display will show the Compressor Minimum Off Time.
This is the period the compressor must remain off before it can restart.
- The range of the Off Time is 0 to 99 minutes
- The factory default setting is 4 minutes

Parameter 6: Fan Run On Time
The display will show the Fan Run On Time. This is the period the fan will run for if it is operating in heating and the Controller is turned off. This is to remove any residual heat where electric heating is used.
- The range of the Run On Time is 0 to 99 seconds
- The factory default setting is 30 seconds

Parameter 7: EDH / REV
The display will show either EDH or REV to select which mode the Controller will operate.
- Electric Heat mode (EDH): the heat and cool relays operate independently of each other.
- Reverse Cycle mode (REV): the cool relay controls the compressor in both cooling and heating operations. The heat relay operates the reversing valve.
- The factory default setting is EDH.

Parameter 8: HEA / COOL
The Display will show either HEA or COOL to select if the reversing valve is energised for cooling or energised for heating.
- COOL: the heat relay will close during cooling
- HEA: the heat relay will close during heating
- The factory default setting is HEA

ℹ This parameter is only effective if Parameter 7 is set for Reverse Cycle Operation.

Parameter 9: Fan Cycle
The Display will show either On or Off to select continuous fan operation or fan cycles with heating.
- On: Fan cycles with heating
- Off: Fan runs continuously
- The factory default setting is Off

Parameter 10: Time Clock Function
The display will show either On or Off. This is used to enable or disable the Time Clock function.
- On: Time Clock function Enabled
- Off: Time Clock Disabled - Timer Function used
- The factory default setting is Off

See "Time" button functionality for more information.

Parameter 11: Setpoint Display Only
The display will show either On or Off.
- On: The setpoint is displayed
- Off: The current temperature is displayed
- The factory default setting is Off

Parameter 12: Input 2 Function
The Display will show the current function of Input 2.
- door - Door Input
- AC - AC Fault Input
- dis - External Disable Input
- EnAb - External Enable Input
- The factory default setting is AC

Parameter 13: Door Open Time
The display will show the Door Open Time.
This is the period the Door must be open before it is registered.
- The range of the Run On Time is 0 to 500 seconds
- The factory default setting is 30

Parameter 14: Door Reset Dead Band
The display will show the Door Reset Dead Band Setting.
- The range of the Dead Band is OFF to 10.0°C
- See section 'Inputs' for more information
- The factory default setting is OFF

Parameter 15: CW Pump Run On Time
The Display will show the Pump Run On Time
- The range of the Run On Time is from 0 to 500 seconds
- The factory default setting is 30 seconds

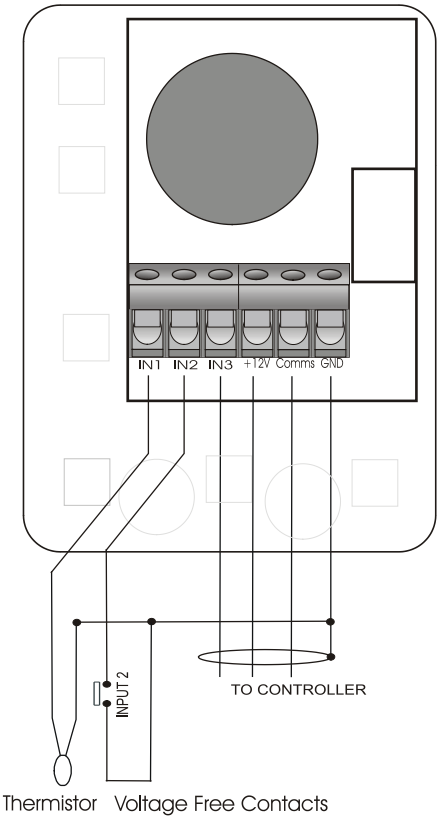
CAUTION **The following describes potentially hazardous situations which, if not avoided, could result in death, serious or minor injury, or property damage.**

1. Never touch the I/O terminals while power is being supplied.
2. Never attempt to disassemble the unit while power is being supplied.
3. Emergency stop circuits, limit circuits, interlock circuits and similar safety measures must be provided.
4. The Micro2000 outputs may remain On or Off due to burning or deposition of the output relays. External safety measures must be provided for such problems to ensure safety in the system.
5. Follow Innotech wiring diagrams and the installation / wiring instructions contained in this Datasheet.

STANDARD CONNECTION

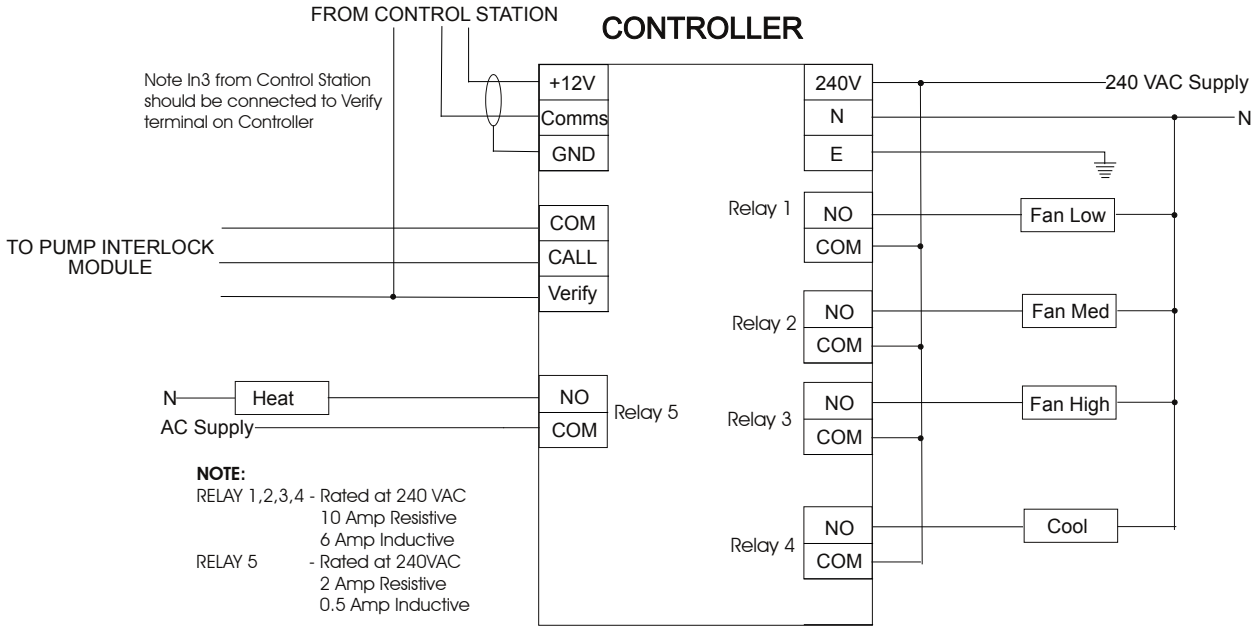
CONTROL STATION

Rear View of Control Station

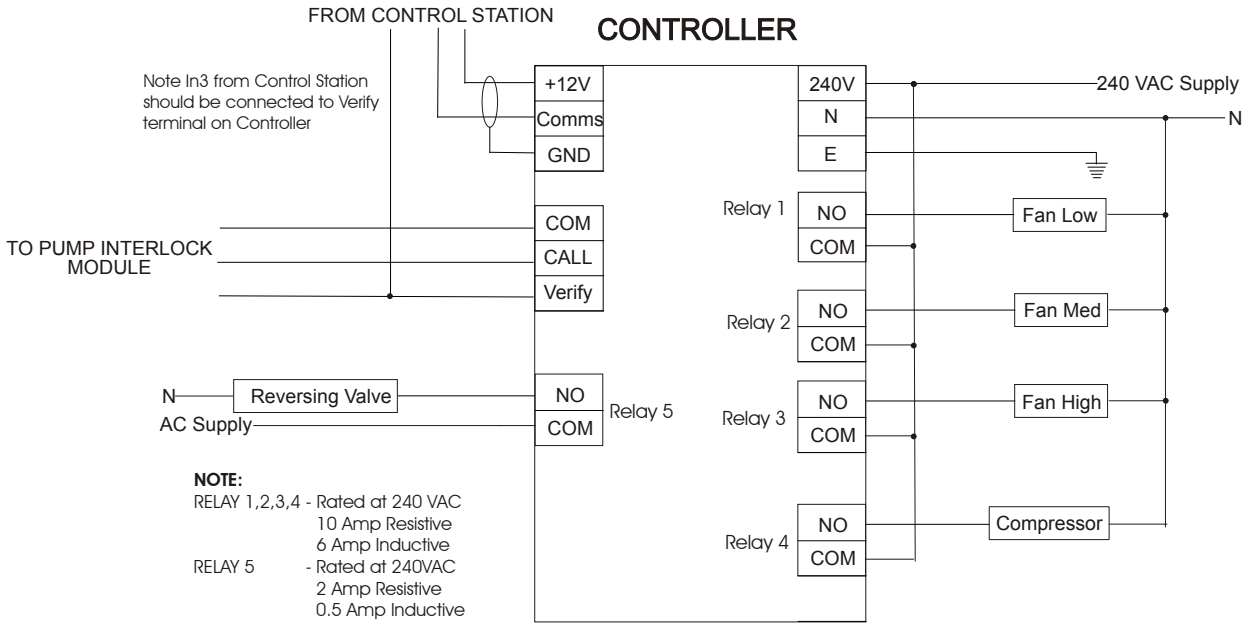


10Kohm Thermistor Voltage Free Contacts

ELECTRIC HEAT CONNECTION



REVERSE CYCLE CONNECTION



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