

Models:

M2K11: 3 Speed FAN, 1 COOL and 1 HEAT Controller with selectable Pump Interlock

M2K11

Micro2000 Controller

Specifications

Power Supply

- Voltage: 240 Volts AC $\pm 10\%$ @ 50/60Hz
- Power Consumption: 7VA max.

Inputs

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

Outputs

Relay # 1: Voltage free relay contacts:
Normally Open 16A resistive
6A inductive

Relay # 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

Control Station

- 3 way connection via 2 core plus screen cable

Control Station Terminal Identification

- IN 1 Temperature Sensor Input
- IN 2 Digital Input for Switched Contact
- GND Common for Inputs & 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

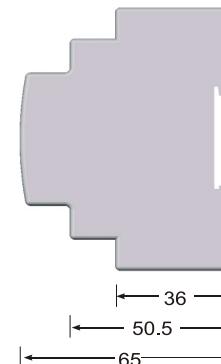
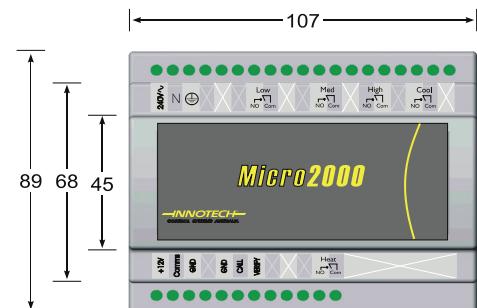
- N Normally open contact
- COM Common contact

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 M2K11 Controller is designed to provide complete control of air conditioning systems for commercial applications. The unit can be configured for air cooled or water cooled condenser applications where a condenser water pump interlock system is required.

Features

- 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
- Enable or Disable Pump Interlock operation
- All adjustments from the control station

Approvals

The Micro2000 series controllers conform to:

- Electromagnetic emission and immunity requirements according to standards EN55011 (CISPR11) and EN50082 for CE Marking and C-Tick Labelling.

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 1.5mm² 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 screened cable for continuity or short circuits. As a result of this failure, the controller will shutdown.
2. If the Control Station reads "SEN FAIL", this is due to an open circuit room Temperature Detector. To test the detector, disconnect it from the room and connect it directly to the controller.
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.

Pump Interlock Operation

The M2K11 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 M2K11 controllers can be used in parallel and use the same 3 wire Pump Interlock system, connected to the one Pump Interlock Module (M2KPI). For further information, refer to the M2KPI datasheet.

The Pump Interlock operation can be disabled by using Parameter 11 (Disable Pump Interlock).

Pump Interlock Terminals on Controller

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

Inputs

1. INPUT 1 Temperature Sensor Input: (Range 5 - 35°C.) This input is used to read the current temperature.
2. INPUT 2 - Pump Interlock Verify Signal. See the Pump Interlock Operation Section for more details.

Outputs

Relay #1 Fan Low (16A 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)

Push Buttons

The normal control button use is described below:

1.  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.  This button is used to turn the controller on and off.

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 12).
- 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 all parameters requiring adjustment.
- 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. (e.g. P 00)
- If the Parameter selection screen (e.g. 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 offset is $\pm 10^{\circ}\text{C}$
- 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°C to 9.9°C
- The factory default setting is 1.0°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°C 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

 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: Setpoint Display Only

The display will show either On or Off. This is used to display the set point only.

- On: The setpoint is displayed
- Off: The current temperature is displayed
- The factory default setting is Off

Parameter 11: Disable Pump Interlock

The display will show either On or Off. This is used to display the Pump Interlock Functionality.

- On: Pump Interlock is Disabled
- Off: Pump Interlock is Enabled
- The factory default setting is Off

Parameter 12: CW Pump Run On Time

The Display will show the Pump Run On Time. This is the period of time the Pump runs for after it has received a request to turn off.

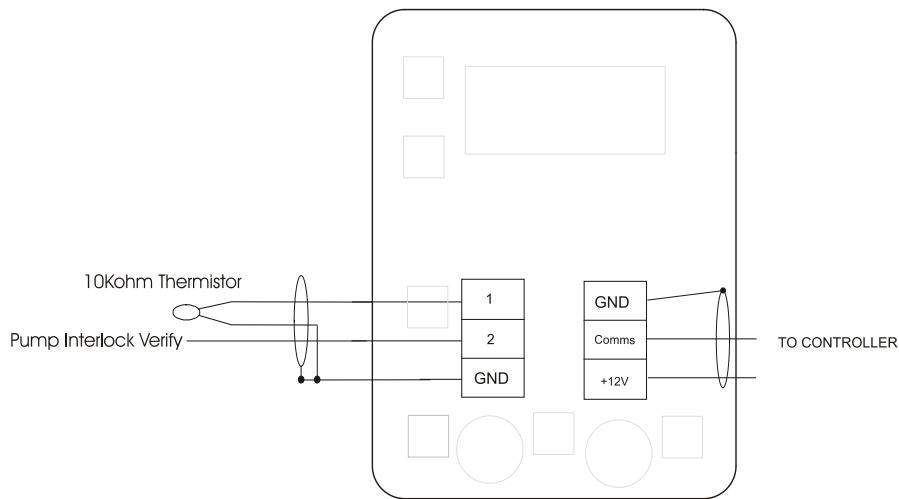
- The range of the Run On Time is from 0 to 500 seconds
- The factory default setting is 120 seconds

! CAUTION

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

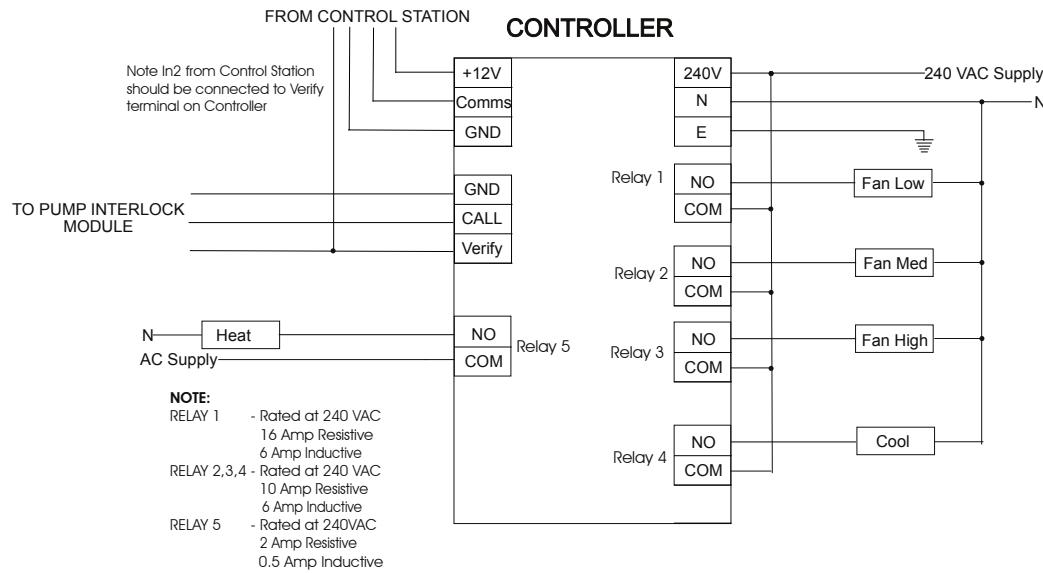
1. Never touch the I/O terminals while power is being supplied.
2. Never attempt to disassemble the unit while power is being supplied.
3. Emergency stop circuits, limit circuits, interlock circuits and similar safety measures must be provided.
4. The Micro2000 outputs may remain On or Off due to burning 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

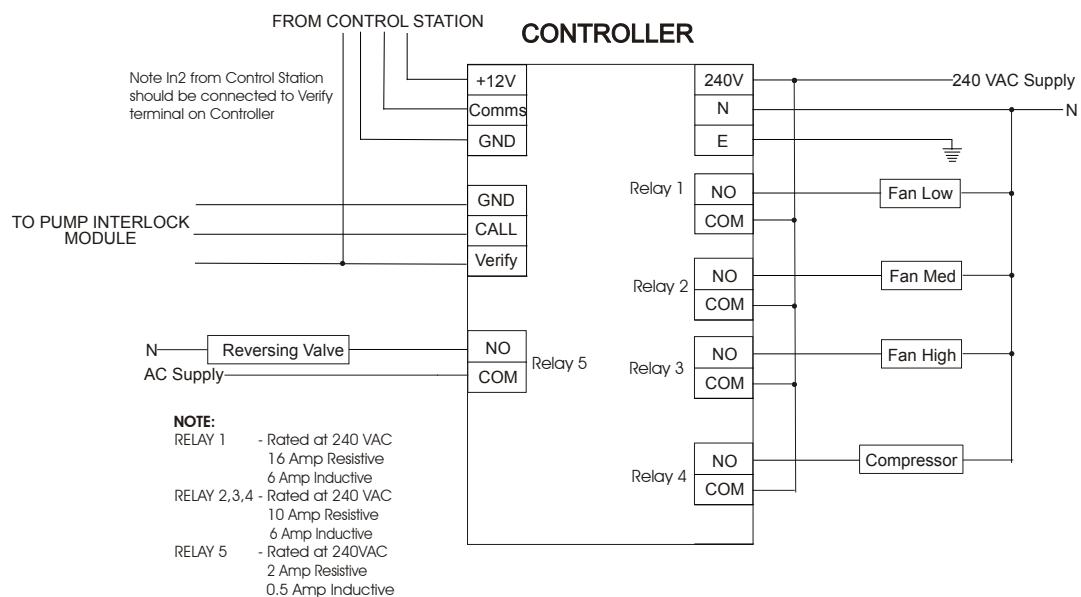


Rear View of Control Station

ELECTRIC HEAT CONNECTION



REVERSE CYCLE CONNECTION



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