MTC-4C user manual

The Modulating Temperature Control (MTC-4C) allows you to automatically control ventilation fans according to the ambient temperature.

When the temperature is at the temperature set point, the MTC-4C operates the fans at the idle speed setting. When the temperature exceeds the set point, the MTC-4C increases the speed. When the temperature increases 6°F above the set point, the MTC-4C increases the speed to maximum. When the temperature drops below the set point, the MTC-4C shuts off the fans (in shut-off mode) or operates the fans at the idle speed (idle mode).

The MTC-4C is ideal for poultry, livestock, greenhouse, or light-industrial buildings.

Electrical ratings

◆ Input: 120/230 VAC, 60 Hz

◆ Variable stage: 10 A at 120/230 VAC, general-purpose (resistive)
                    7 FLA at 120/230 VAC, PSC motor
                    1/2 HP at 120 VAC, 1 HP at 230 VAC, PSC motor

◆ Fuse: 15 A, 250 VAC ABC-type ceramic

Features

◆ One variable speed output

◆ Adjustable 40-90°F temperature set point

◆ Fixed 6°F temperature differential

◆ Automatic shut-off and idle modes

◆ Fixed 2°F off set-back for shut-off mode

◆ Adjustable idle speed for idle mode

◆ One-foot temperature probe, extendable to 500 feet

◆ Overload protection fuse

◆ Rugged enclosure (corrosion resistant, water resistant, and fire retardant)

◆ CSA approval

◆ Two-year limited warranty

Installing the MTC-4C

> ⚡ ◇ The MTC-4C must be installed by a qualified electrician.
> ◇ Before installing or servicing the MTC-4C, switch OFF the power supply at the source.
> ◇ Install the MTC-4C and all equipment connected to it according to local electrical codes.

> ⚠ ◇ Mount the unit on a sheltered, vertical surface, with the electrical knockouts facing down.
> ◇ Use a screwdriver to tighten the screws in the enclosure. Do not use a drill or over tighten the screws; this can crack the enclosure and ruin the watertight seal.
> ◇ Use the electrical knockouts for bringing wires or cables into or out of the enclosure. Use watertight strain reliefs or conduit connectors at all cable-entry points.
> ◇ Before removing electrical knockouts, remove the cover to prevent damaging the control. Do not make additional holes in the enclosure; this can damage the watertight seal or components and void the warranty.
> ◇ **Only permanent split capacitor motors appropriate for variable speed control, or shaded pole motors, can be used on the variable stage.**

Fill out the information below to help configure your control and verify that you do not exceed the electrical ratings of the MTC-4C.

Fans	A Maximum current draw per fan	B Number of fans	A × B Total current draw
Make			
Model			
Voltage rating			
Power factor			

Mounting the MTC-4C

When selecting a mounting location, follow the guidelines below.

◆ Select a location that is away from sources of heat.

◆ Mount the control on a solid, vertical surface, with the electrical knockouts facing down.

> ⚠ Failure to follow the mounting guidelines can allow moisture into the control and will void the warranty.

Wiring the MTC-4C

1. Before wiring the control, set the voltage switch to the correct line voltage used (120 or 230 VAC).

2. Before removing electrical knockouts, remove the cover to prevent damaging the control.

3. Use watertight strain reliefs or conduit connectors at all cable entry points.

4. Connect the wires as shown below.

Wiring for 120 VAC

1. Connect LINE to terminal 1

2. Connect NEUTRAL to terminal 2.

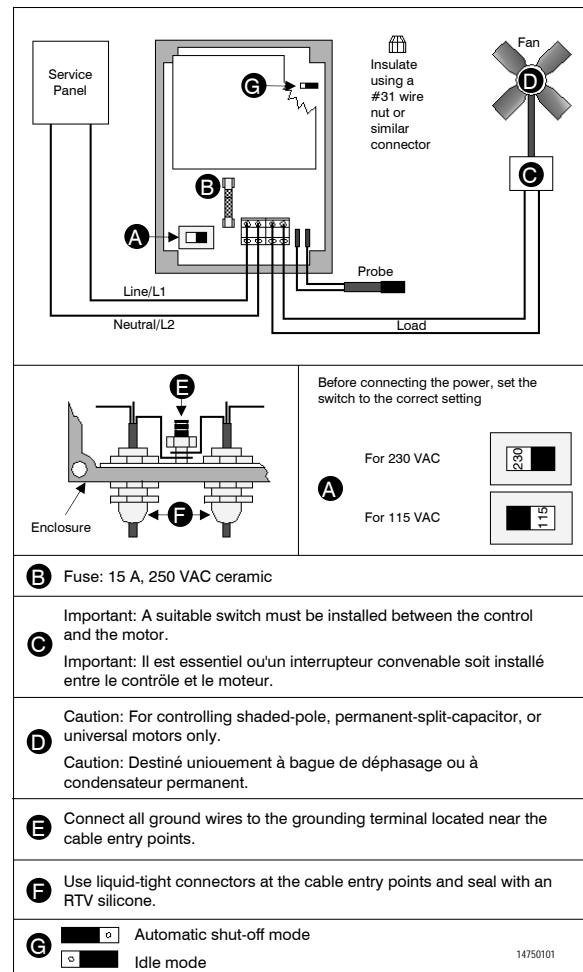3. Connect the fan to terminals 3 and 4.

Wiring for 230 VAC

1. Connect L1 to terminal 1.

2. Connect L2 to terminal 2.

3. Connect the fan to terminals 3 and 4.

Connecting the temperature probe

Follow the guidelines below and connect the temperature probe as shown in the diagram.
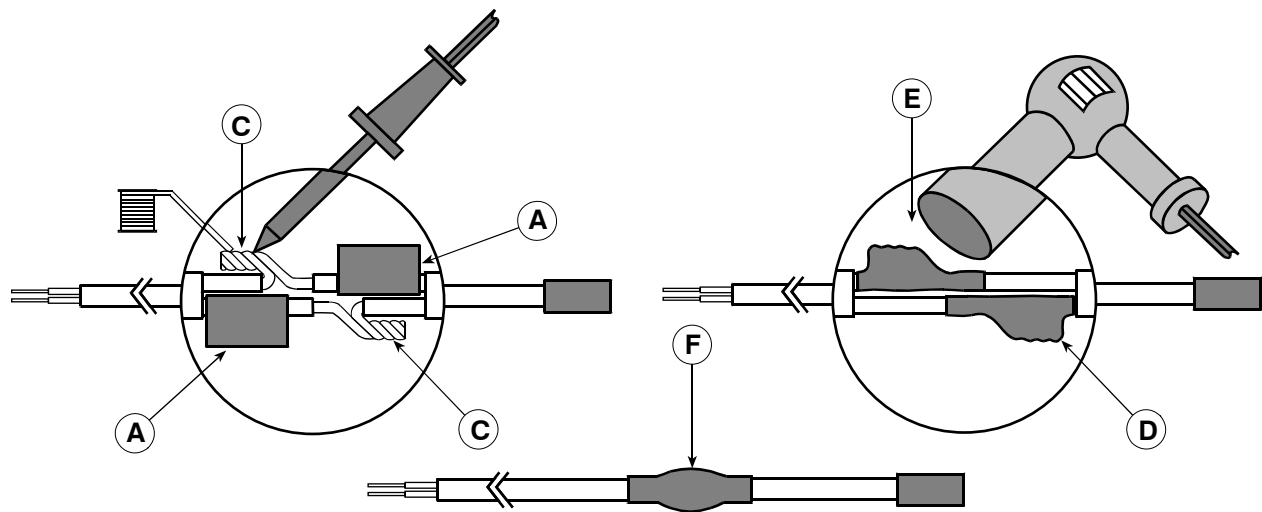
◆ Do not run the probe cable in the same conduit as AC power cables

◆ Do not run the sensor cable beside AC power cables or near electrical equipment.

◆ When crossing other cables or power lines, cross them at a 90 degree angle.

Extending probe cables

You can extend temperature probe cables to lengths of up to 500 feet. Follow the guidelines below and below when extending cables.

◆ Use two-wire 18 AWG jacketed cable. Phason recommends Belden # 9408, Alpha # 5052, or an equivalent. Extension cable is also available from Phason. For more information, contact your dealer or Phason.

◆ Join the extension cable to the temperature probe cable as shown on the next page.

◆ If the unit operates erratically with the extended probe, run the cable along a different path or shorten it.

A Slide three pieces of heat shrink tubing over the wires: one for the red wire, one for the black wire, and one for both.

B Strip the ends of the wires and then twist them together.

C Solder the wires together using rosin-core flux solder—DO NOT use acid core solder.

D Slide the heat shrink tubing over the solder joints.

E Shrink the tubing using a heat gun.

F Your connection should look like this.

Operation

The MTC-4C has two modes of operation: automatic shut-off mode and idle mode.

Automatic shut-off mode
In automatic shut-off mode, when the temperature drops below the set point, the MTC-4C shuts off the fans.

Idle mode
In idle mode, when the temperature drops below the set point, the MTC-4C operates the fans at the idle speed.

Using automatic shut-off mode

1. Position the jumper as shown in section G on page 3.
2. Turn the **Temperature** knob to the point where the fan turns on.
3. Turn the **Idle Speed** knob to the minimum idle speed desired.
4. Turn the **Temperature** knob to the desired temperature.

Using idle mode

1. Position the jumper as shown in section G on page 3.
2. Turn the **Temperature** knob fully clockwise.
3. Turn the **Idle Speed** knob to the minimum fan speed desired.
4. Turn the **Temperature** knob to the desired temperature.

Maintaining the MTC-4C

Proper care and maintenance will help your MTC-4C last longer. To prevent damage to the control, perform the following steps after the first two weeks of operation, and once a year after that.

1. Switch off the power to the control.
2. Remove the cover and check inside for moisture. If there is any moisture, wipe it away using a dry cloth.

3. Check all cable entry points to make sure they are properly sealed. If they are not properly sealed, apply silicone sealant around the entry points.

> ⚠️ If you need to seal the enclosure, use a sealant that is labelled as 'non-corrosive', 'electronics grade', or 'neutral cure', such as GE Silicone RTV6780B, RTV 142, or RTV 162.
>
> *Do not* use a sealant that is labelled as 'acetic acid cure' or 'acetoxy cure'. These sealants release acetic acid while curing, which can damage the control and will void the warranty.

4. Check all wires to make sure they are properly connected and that they are in good condition.
5. Fasten the cover to the enclosure and then switch on the power to the control.

Cleaning the MTC-4C

To clean the MTC-4C, wipe the surface with a damp cloth.

> ⚠️ Be careful when washing the room using a high-pressure washer. DO NOT spray the control using a high-pressure washer, this can damage the control and will void the warranty.
>
> Evidence of moisture damage inside the control will void the warranty.

Troubleshooting

The fan motor will not run

◆ Reset the thermal cutout on the fan motor and allow the motor to cool.

◆ Check the wiring.

◆ Use a test light or voltmeter to test the power at the control.

◆ Replace the fuse. If the fuse blows immediately, a problem exists with the wiring or the fan motor. If the fuse blows after a delay (minutes, days, or weeks), the load is exceeding the current rating of the control.

The fan motor growls

◆ To ensure the motor is working, disconnect the line at terminal 1 and terminal 4, and then connect these lines together. The fan should run at full speed.

◆ Use a short probe (stock probe length) on the MTC-4C to ensure excessive electrical noise is not being induced onto the probe.

The Temperature knob will not control the fan speed

◆ Check the probe wiring (see page 3.)

◆ Replace the temperature probe (part number MT-P3) if the motor runs at idle or full speed regardless of the temperature setting.

Contact your dealer if this guide fails to resolve your problem.

Limited warranty

This warranty applies only to the Phason Inc. (Phason) Modulating Temperature Control (MTC-4C). If you need warranty service, return the product and original proof of purchase to your dealer.

Phason warrants the MTC-4C subject to the following terms and conditions.

This warranty is valid only to the original purchaser of the product, for two years from the manufacturing date. The manufacturing date is stated in the first eight digits of the serial number in the form year-month-day.

Phason hereby warrants that should this product fail because of improper workmanship, Phason will repair the unit, effecting all necessary parts replacements without charge for either parts or labor.

Conditions

◆ Installation must be done according to Phason's enclosed installation instructions.
◆ The product must not have been previously altered, modified, or repaired by anyone other than Phason.
◆ The product must not have been involved in an accident, misused, abused, or operated or installed contrary to the instructions in our user and/or installation manuals. Phason's opinion about these items is final.
◆ The person requesting warranty service must be the original purchaser of the unit, and provide proof of purchase upon request.
◆ All transportation charges for products submitted for warranty must be paid by the purchaser.

Except to the extent prohibited by applicable law, no other warranties, whether expressed or implied, including warranties of merchantability and fitness for a particular purpose, shall apply to this product. Any implied warranties are excluded.

Phason is not liable for consequential damages caused by this product.

Phason does not assume or authorize any representatives, or other people, to assume any obligations or liabilities, other than those specifically stated in this warranty.

Phason reserves the right to improve or alter the MTC-4C without notice.

Phason controls are designed and manufactured to provide reliable performance, but they are not guaranteed to be 100 percent free of defects. Even reliable products can experience occasional failures and the user should recognize this possibility.

If Phason products are used in a life-support ventilation system where failure could result in loss or injury, the user should provide adequate back up ventilation, supplementary natural ventilation, or an independent failure-alarm system. The user's lack of such precautions acknowledges their willingness to accept the risk of such loss or injury.