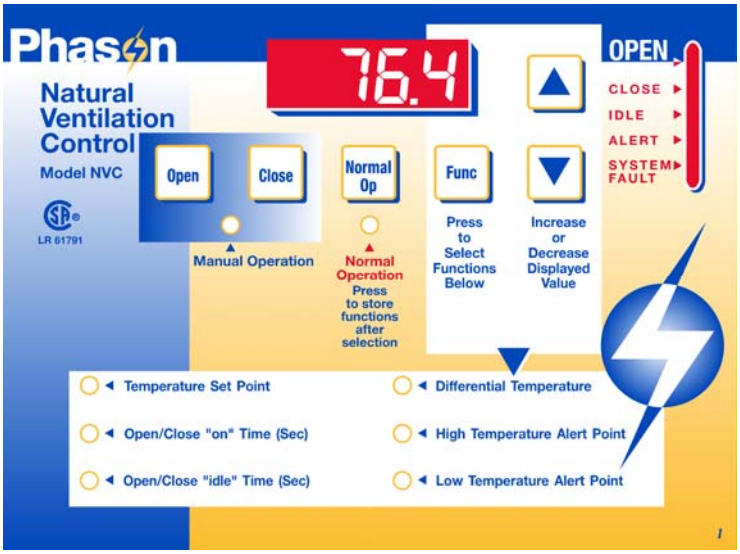
Natural Ventilation Control user manual

The Natural Ventilation Control (NVC) monitors the temperature in a room and maintains it by positioning an air inlet, baffle, or curtain.



Control and operation overview

LED display

The LED display shows the ambient temperature and parameter settings.

Buttons

- **Open** – manually opens the inlet. When pressed, the inlet opens and the Manual Operation and Normal Operation LEDs blink. The Manual Operation LED blinks until **Normal Op** is pressed. Pressing **Open** once causes the open operation to begin; pressing it again stops the open operation, but keeps the control in manual mode.
- **Close** – manually closes the inlet. When pressed, the inlet closes and the Manual Operation and Normal Operation LEDs blink. The Manual Operation LED blinks until **Normal Op** is pressed. Pressing **Close** once causes the close operation to begin; pressing it again stops the close operation, but keeps the control in manual mode.
- **Normal Op** – switches the control between manual and normal operation and saves program changes. The Normal Operation LED is on when the control is in normal mode.
- **Func** – changes the control's settings. Pressing **Func** once switches the Temperature Set Point LED on and displays the setting; pressing it again displays the next parameter. After making changes, press **Normal Op** to save the changes and return to normal mode.
- **Down** – decreases a parameter setting while programming the control.
- **Up** – increases a parameter setting while programming the control.

Status LEDs

- **OPEN** – is on when the control is opening the inlet.
- **CLOSE** – is on when the control is closing the inlet.
- **IDLE** – is on when the inlet is in idle mode. When an open or close cycle starts, the idle portion is completed or first. This minimizes unnecessary opening or closing on windy days.
- **ALERT** – is on when the control senses a high or low temperature alert condition.

- **SYSTEM FAULT** – is on when the internal control voltage is below an acceptable level. If the LED is on, the Normal Operation LED will be off. Check the input voltage to make sure it is the same (115 or 230 VAC) as the voltage selection switch. If the input voltage and the selection switch are set the same and there is still a system fault, the control requires servicing.
- **Manual Operation** – is on when the control is in manual mode. In manual mode, the inlet opens or closes only by pressing **Open** or **Close**.
- **Normal Operation** – is on when the control is in normal mode. In normal mode, the control automatically opens or closes the inlet based on the program to settings.
- **Temperature Set Point** – is on when the **Func** button has been pressed to select the temperature set parameter. The display shows the set point, which you can adjust by pressing **Up** or **Down**. The range is 0.0 to 99.8°F or -17.8 to 37.7°C.
- **Open/Close "on" Time** – is on when the **Func** button has been pressed to select the open/close "on" time parameter. The display shows the set point, which you can adjust by pressing **Up** or **Down**. The "on" time is the duration the inlet takes to either open or close. The range is 1 to 900 seconds.
- **Open/Close "idle" Time** – is on when the **Func** button has been pressed to select the open/close "idle" time parameter. The display shows the set point, which you can adjust by pressing **Up** or **Down**. The "idle" time is the duration the inlet pauses before opening or closing. The range is 1 to 900 seconds.
- **Differential Temperature** – is on when the **Func** button has been pressed to select the differential temperature parameter. The display shows the set point, which you can adjust by pressing **Up** or **Down**. The ambient temperature must be higher or lower than the temperature set point by this amount before the open or close cycle will start. The range is 0.0 to 67.8°F or 0.0 to 37.7°C.
- **High Temperature Alert Point** – is on when the **Func** button has been pressed to select the high temperature alert parameter. The display shows the set point, which you can adjust by pressing **Up** or **Down**. The alert activates when the ambient temperature rises above this setting. The range is 0.0 to 99.8°F or -17.8 to 37.7°C, but must be higher than the temperature set point. To disable the alert, set it to the maximum (99.8°F or 37.7°C).
- **Low Temperature Alert Point** – is on when the **Func** button has been pressed to select the low temperature alert parameter. The display shows the set point, which you can adjust by pressing **Up** or **Down**. The alert activates when the ambient temperature falls below this setting. The range is, 0.0 to 99.8°F or -17.8 to 37.7°C, but must be lower than the temperature set point. To disable the alert, set it to the minimum (-17.8°C or 0.0°F).

◇ If the control has been left in programming mode and no key has been pressed for two minutes, the control resets without saving any changes.

◇ If the ambient temperature reaches the high or low temperature alert setting, the control bypasses the idle range and goes to the open or close "on" time.

Factory presets

- Temperature set point 71.0°F/21 .7°C
- Differential temperature 0.9°F/0 .5°C
- Low temperature alert point 50.0°F/10 .0°C
- High temperature alert point 86.0°F/30 .0°C
- Open/close "on" time 10 seconds
- Open/close "idle" time 10 seconds

Control messages

- AP.S – a temperature probe has short-circuited or is damaged.
- AP.d – a temperature probe is disconnected or damaged. Checked the probe connection. The control will not function in this condition.
- --.- – followed by a number. The display temperature is below 0°. For example, -10.5°C would be shown as --.-, followed by 10.5.
- AEE – a system error has occurred. Switch off the power to the control, and then switch it back on while pressing the **Up** and **Down** buttons. You will need to re-program the functions to the desired set points.

Installing the NVC

◇ The NVC must be installed by a qualified electrician.
◇ Before installing or servicing the NVC, switch OFF the power at the source.
◇ Install the NVC and all equipment connected to it according to local electrical codes.
◇ Connect the ground wires to the ground studs.

◇ Mount the control 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; this will secure the ground plate to the enclosure.
◇ Do not make additional holes in the enclosure; this can damage the watertight seal or control components and void the warranty.

The actuator motor positioning the air inlets must have limit switches installed and set to prevent damage to the inlet device and actuator motor.

Routing data wires

Routing data wires in the same conduit as, or beside AC power cables, can cause electrical interference, erratic readings, and/or improper control. Data wires include **all** of the following:

- Temperature probe and humidity sensor cables
- Actuator feedback (potentiometer) wires
- Data communication wires, including RS-232/RS-485
- Any cable or wire that does not provide or switch AC power

Guidelines for routing data wires

- Do not run the wires in the same conduit as AC power cables.
- Do not run the wires beside AC power cables or near electrical equipment.
- When crossing other cables or power lines, cross them at a 90-degree angle.

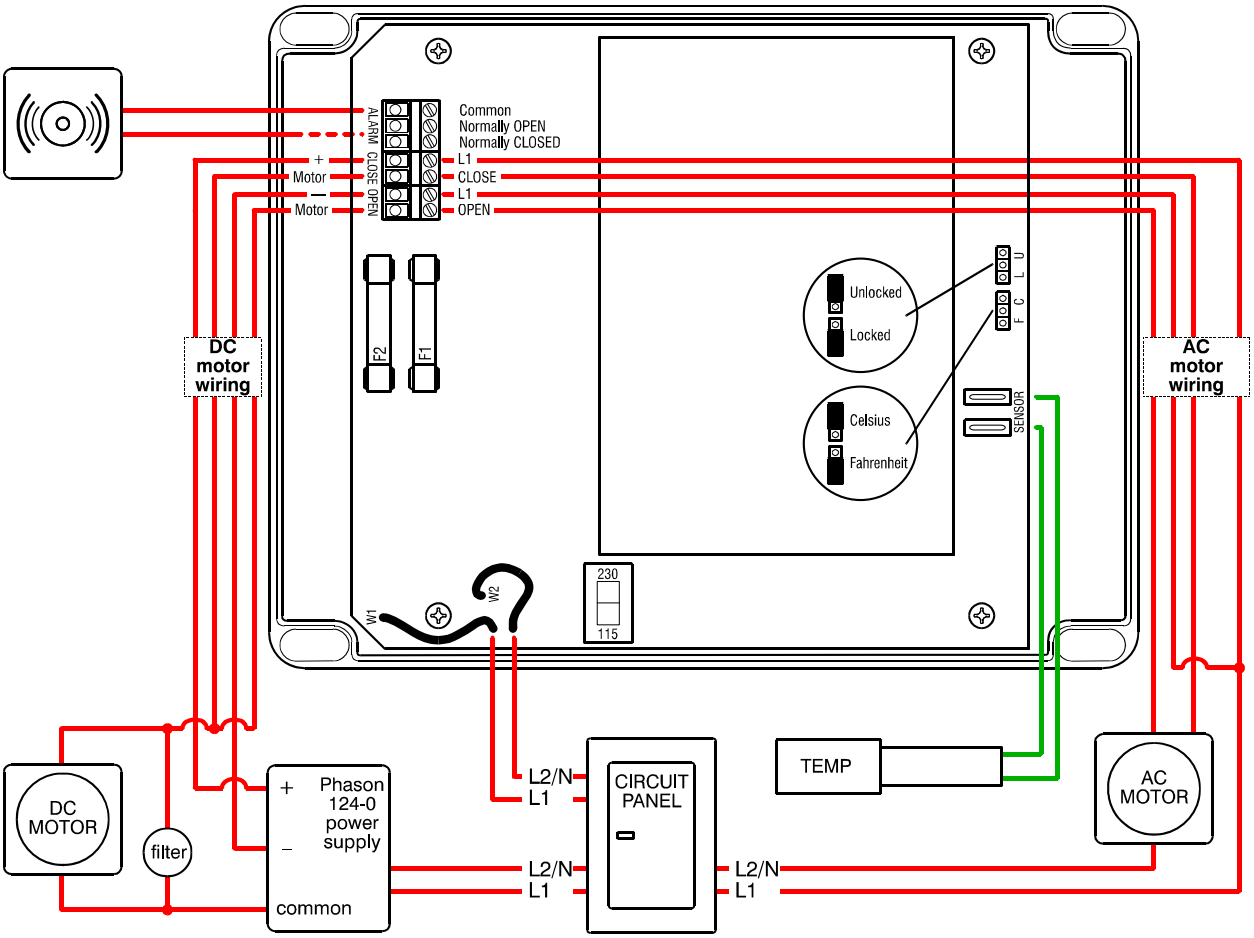
If in doubt, **do not run any wire or cable that is not an AC-power wire** inside the same conduit or beside other AC-power wires.

Electrical ratings

Incoming power	115/230 VAC; 50/60 Hz
Open/close relays	6 A at 120/230 VAC, general-purpose (resistive) 1/3 HP at 120 VAC, 1/2 HP at 230 VAC
Fuses	12 A, 250 VAC ABC-type ceramic
Alarm relay	0.4 A at 125 VAC; 2 A at 30 VDC, resistive load 0.2 A at 125 VAC; 1 A at 30 VDC, inductive load

◇ If you are connecting a load that exceeds the ratings of a relay, you must install a power contactor to switch the load.

Connecting equipment



Connecting the temperature probe

Insert the probe cable through the strain relief and then connect it to the tabs as shown in the diagram. When locating the temperature probe, follow the instructions under **Routing data wires** on page 4.

You can extend the cable up to 500 feet using extension cable. For more information, contact your dealer.

Connecting a curtain machine

- Connect a *DC-powered* curtain machine as shown in the left side of the diagram. Connect a snubber filter, Phason part 127-0, as shown.
- Connect an *AC-powered* curtain machine as shown in the right side of the diagram.

Connecting an alert device

Connect an alert device (for example, a siren) to the **COM** (common) and **N/O** (normally open) or **N/C** (normally closed) terminals, depending on the type of signal your alert device requires. The common and N/O contacts are closed during an alarm condition.

Placing the jumpers

- Place the LOCKED/UNLOCKED jumper on **L** to prevent people from changing the settings, or **U** to allow people to change the settings.
- Place the CELSIUS/FAHRENHEIT jumper on **C** to display degrees Celsius, or **F** to display degrees Fahrenheit.

Connecting the grounds and incoming power

1. Before connecting the incoming power, set the voltage selection switch to the correct incoming voltage (230 or 115 VAC).
2. Connect all grounds to the grounding terminal near the electrical knockouts.
3. Connect the incoming power as shown in the diagram.

Servicing and maintaining the controls

Servicing and maintaining the NVC will extend the life of the control and your equipment.

Before installing or servicing the NVC, switch OFF the power at the source.

Cleaning the NVC

- Use caution when washing the room with a high-pressure washer.
- To clean the surface of the control, wipe it with a damp cloth.

◇ DO NOT direct a high-pressure washer at the control.
◇ Do not use harsh or abrasive cleaners or rub the surface of the control with your bare hands.

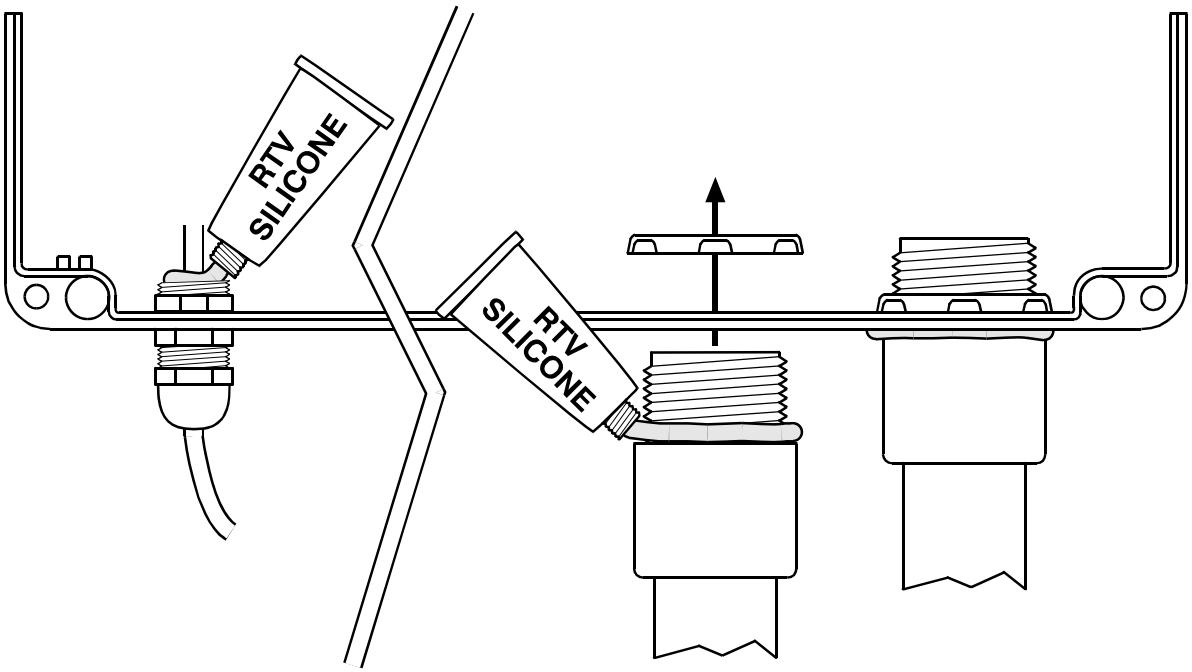
Preventing moisture

Moisture will not cause problems with the NVC if you take proper care when installing it.

1. After the first two weeks of operation, remove the cover from the unit and check inside for moisture. Be sure to switch off the power to the control before opening the cover.
2. If there is moisture present, wipe it out with a dry cloth and then check the cable entry points and rubber gasket for proper sealing.
3. If the cable connectors are not sealing, apply RTV or Silicon II (non acetic acid) sealant around the cable.

Some silicone sealants release acetic acid while curing. This can cause corrosion and damage the control. Let the silicone cure completely (one to three days) with the cover open and ensure no moisture enters the control. Failure to do this might damage the control and void the warranty.

4. Open and inspect the control again after two weeks to verify it is sealing properly.



Open and inspect the control for moisture once a year. Proper care and maintenance will extend the life of the control.

Limited warranty

This warranty applies only to the Natural Ventilation Control (NVC). If you need warranty service, return the product and original proof of purchase to your dealer.

Phason Inc. (Phason) warrants the NVC 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 the NVC 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 our 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 the NVC. Any implied warranties are excluded.

Phason is not liable for consequential damages caused by the NVC.

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 NVC 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.

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