



MarCo Manufacturing Company, LLC

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March 2, 2009

MOD Damper Control (2009-) Operating & Installation Instructions

This Wet Bulb Control, when installed and used properly, will be a great assist in the efficient curing of tobacco. Be sure to follow the operating instructions below and the installation instructions located in the rear of this booklet.

The MarCo MOD Modulating Damper Control utilizes a Honeywell brand solid-state control and a matching Belimo modulating damper motor. It is important that these two components be used together and that neither of them be used with non-MarCo controls. The voltage signal produced by the control is matched to the operating parameters of the motor and neither may work with other components. Use only MarCo supplied replacements should service on either unit be necessary.

Operating Instructions

To operate the control, it is important to understand the display that will appear on the screen. There are display values that are not used and should not be confused with the ones that are used. The Honeywell controller is capable of doing more than we require it to do, thus the display values that are not used. The displays and their uses are listed below.

1. Power the control on.
2. The display will show the actual temperature at the sensor.
3. To show both the set point and the actual temperature on the screen, press \Rightarrow on the control face. Note: the values displayed will not change on this screen, even if the temperature in the barn do change. Do not leave the control on this screen, as it will mislead you by not reflecting a change in temperature. To leave this screen, press "HOME".
4. To change the set point, do the following:
 - a. Press "MENU" \Rightarrow
 - b. Select "PROGRAM" \Rightarrow
 - c. Select "MOD 1" \Rightarrow
 - d. Select "SETPOINT" \Rightarrow
 - e. Use \uparrow or \downarrow to change setpoint value
 - f. Press \Rightarrow to set temperature



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- g. Press “HOME” to return to main screen.
- h. To verify setpoint value, press \Rightarrow to display setpoint and actual temperatures.
- i. Press “HOME” to return to main screen or leave alone. The screen will automatically return to the “HOME” screen in approximately 4 minutes.

The MarCo MOD Modulating Damper Control panel has a toggle switch on the left side that is labeled “Damper, Off, Automatic”. This switch should be in the “Automatic” position at all times that you want the control to operate the dampers. Should you want to operate the dampers manually, simply move the toggle switch to the “Off” position and use the clutch on the damper motor to release the dampers for setting at your desired position. When you desire the control to resume operating the dampers, just return the toggle switch to the “Automatic” position. The control will move the damper to the proper location to achieve your WB setting.

Note: Proper operation of this control requires that the water level in the WB reservoir be maintained and that a good wick be used. A 20 oz “Coke” bottle of clean water should be adequate for a full cure, but the water level in the bottle should be checked daily until usage rate is verified. The wick should be either cleaned or replaced for each cure. If the water level is low or the wick is “dirty”, the dampers will open more than they should and adversely affect the curing process.

Installation Instructions

1. Open the shipping box and make sure that all components needed are present and in good condition. The parts included should be:
 - A. MOD Damper Control panel with three leads.
 - B. Damper motor mounted to base.
 - C. 5/16” diameter actuator rod (approximately 15” long).
 - D. Two damper rod ball joint linkages.
 - E. Mounting Bracket for Damper Motor
 - F. Brace for Mounting Bracket



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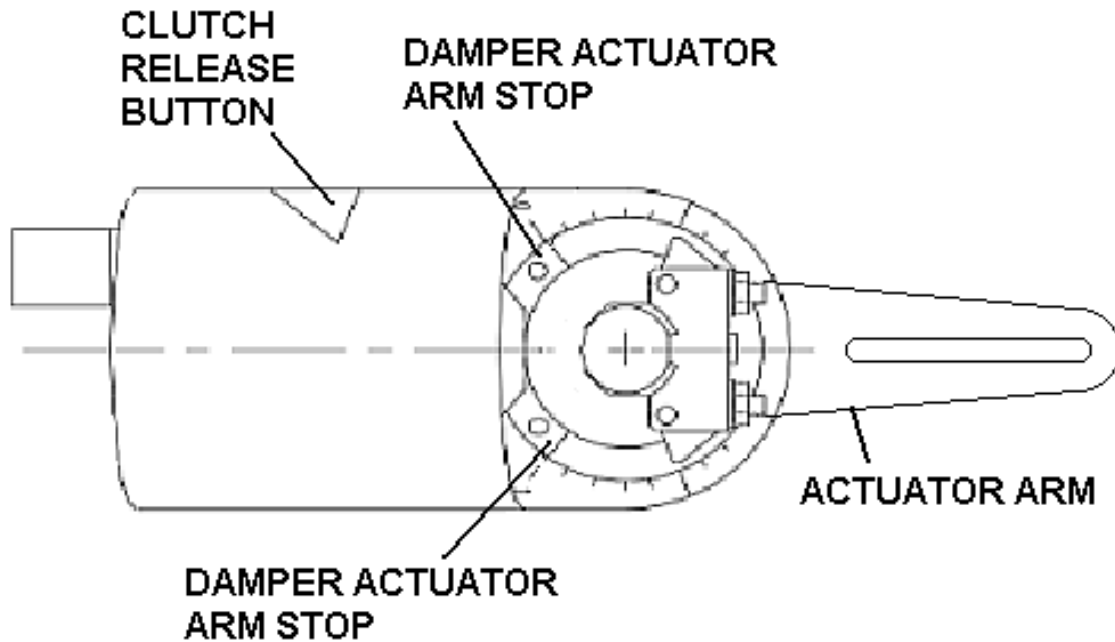
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2. Determine the location that you want to mount the control panel. **We recommend a location that is not subject to direct moisture from outside or from condensation dropping from the furnace room ceiling.** If direct moisture is a problem, mount a shield such that it will protect the control from direct moisture. The high humidity normally associated with curing is not a problem, but direct moisture on the control is a problem that should be avoided.
3. Mount the control panel to the barn wall securely and at a height that makes it easy to read without undue bending or stretching.
4. Mount the damper motor in a secure manner such that the damper motor actuator arm is aligned with the damper bracket and is 6" or more from the damper when it is in a closed position. This will allow the damper motor to properly actuate the damper through its entire operating range. Some barns will require an additional bracket for securing the damper motor to the barn or furnace structure.
5. Attaching and adjusting the damper motor linkage:
 - A. Depress the clutch release button (black triangular shaped button on the face of the motor), move the actuator arm to the midpoint of travel and release the button
 - B. Mount the damper rod ball joint linkage on both the damper motor actuator arm and on the damper.
 - C. Install the damper rod (supplied) and secure it in the linkage on the damper.
 - D. Move the damper to the midpoint of travel that you want to achieve and secure the damper rod in the linkage on the damper motor actuator arm.
 - E. Now depress the clutch release button, move the damper to the full closed position and release the button.
 - F. With a Phillips screwdriver, move the damper actuating arm stop for the closed limit such that it rests against the actuating arm mechanism. Tighten the stop screw securely.
 - G. Now depress the clutch release button, move the damper to the maximum open position that you want and release the button.
 - H. Move the damper actuating arm stop for the open limit until it rests against the actuating arm mechanism. Tighten the stop screw securely.
 - I. This completes the installation and adjustment of the damper motor linkage.



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6. **Wet bulb sensor:** locate the sensor with the wet bulb reservoir in its current location, if the barn is equipped with a wet bulb reservoir. If the barn does not currently have a wet bulb reservoir, locate one a minimum of 24" from the furnace opening and at a place where airflow is about normal for the particular barn. Do not locate it in a corner where the airflow may be very low. The reservoir may be located on the floor of the curing area, but is normally located above the tobacco. Be sure to locate it where access to the wick is relatively easy because the wick must be changed regularly for the control to operate properly. A poor location or an old wick generally causes the wet bulb reading to be higher than it actually is, which makes the dampers open too much and allows the top of the barn to get too cool. This condition slows the cure and can result in bacteria growth in the tobacco.

Caution: Before proceeding, make sure that power to the barn controls is off by either moving all circuit breakers to the off position or moving the disconnect handle to the off position.

7. Wiring the control into the barn's electrical circuit:
 - A. **Incoming power:** run 3-wire 110v power (hot, neutral and ground) from the barn's existing control panel to the MOD Damper Control panel, making sure



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that the hot wire comes from the control switch on the existing control panel so that turning that switch off can interrupt power to the MOD Damper Control. .

- B. **Damper motor:** connect the cable from the damper motor to the cable from the MOD Damper Control, using the 3-pin plug/socket to join them. If the cable provided with the damper motor is too long for your application, coil the excess and attach it to the barn wall.
 - C. **Retrace all wiring to insure that it is done properly and the connections are secure.**
8. Check the damper switch on the MOD Damper Control panel to make sure it is in the ON position.
 9. Energize the circuits by turning the breakers to the ON position.
 10. Energize the MOD Damper Control panel by moving the control switch on the original barn control panel to the ON position. The MOD Damper Control display should now show numbers.
 11. Wet Bulb reservoir installation location for various brands of barns.
 - A. Powell all-steel-----98" from furnace end and at center of first major rib down from top of sidewall.
 - B. Long all-steel-----98" from furnace end and 101 ½" up from pad.
 - C. Long wood barn-----100" from furnace end and 101 ½" up from pad.
 - D. Tharrington-----100" from furnace end and 107" up from pad
 - E. Taylor all-steel-----98" from furnace end and 103 ½" up from pad.
 - F. Roanoke-----100" from furnace end and 111" up from pad.