



Heating & Cooling Products

INSTALLATION INSTRUCTIONS

MODEL: EDFM-5

ECONOMIZERS WITH EXHAUST

**FOR USE WITH BARD TCS20
and 3-1/2 THRU 6 TON
WALL MOUNT AIR CONDITIONERS**

BARD MANUFACTURING COMPANY
Bryan, Ohio 43506

Since 1914...Moving ahead, just as planned.

Manual:	2100-276 Rev.
Supersedes:	Rev.
File:	Volume III, Tab 19
Date:	January, 1997

Contents

	Figures
Economizer General Information.....1	Figure 1 Wall Mount Unit 2
Shipping Damage.....1	Figure 2 Wire Routing and Economizer Positioning 3
Description.....1	Figure 3 Economizer Motor and Controls Right Hand WA Unit..... 5
Basic Installation.....1	Figure 3a Economizer Motor and Controls Left Hand WL Unit 6
Economizer Checkout.....4	Figure 4 Wiring Diagram..... 7
Economizer Features.....4	Figure 5 Damper Position - Full Open 8
Economizer Sequence of Operation.....4	Figure 6 Damper Position - Full Closed 8

Manufactured under U.S. Patent Number 5,301,744.
Other patents pending.

COPYRIGHT JANUARY, 1997
BARD MANUFACTURING COMPANY
BRYAN, OHIO USA 43506

GENERAL INFORMATION

The economizer should only be installed by a trained heating and air conditioning technician. These instructions serve as a guide to the technician installing the economizer package. They are not intended as a step by step procedure with which the mechanically inclined owner can install the package.

The economizer housing is shipped in one carton which contains the electrical harness, miscellaneous hardware and installation instructions.

The EDFM-5 is specifically designed to be used with the Bard Telcom ClimateWatch system. *It is not suitable for use with typical thermostat installations.*

Any wall mount unit equipped with an economizer must also have a low ambient control installed. This control can be factory installed or field installed. If field installed, use kit CMA-6 (air conditioner models).

SHIPPING DAMAGE

Upon receipt of the equipment, be sure to compare the model number found on the shipping label with the accessory identification information on the ordering and shipping document to verify that the correct accessory has been shipped.

Inspect the carton housing of each economizer as it is received, and before signing the freight bill, verify that all items have been received and that there is no visible damage. Note any shortages or damage on all copies of the freight bill. The receiving party must contact the last carrier immediately, preferably in writing, requesting inspection by the carrier's agent. Concealed damage not discovered until after loading must be reported to the carrier within 15 day of its receipt.

DESCRIPTION

The EDFM-5 economizer is designed to be used with Bard 3-1/2 thru 6 ton wall mount series air conditioners equipped with low ambient fan cycling controls. It is an electromechanical economizer system designed to provide "free" cooling where the outdoor air temperature is cool enough to provide the needed cooling without running the compressor. When cooling is needed, the Telcom ClimateWatch system automatically takes advantage of the cold outdoor air when available and uses it for first stage cooling. This then reduces the need to run the air conditioning compressor providing lower operating costs and increasing the service life of the equipment. If the outdoor air gets to warm or humid to be helpful, the TCS20 detects the condition and automatically closes the damper and switches to the compressor operation. This is all done automatically to achieve maximum savings without attention from the user. The unit is equipped with a full modulation type damper motor which controls the damper position to a factory set minimum supply air temperature.

MODEL:

EDFM-5

For Use	WA421	WL421
With These	WA482	WL482
Models	WA602	WL602
	WA701	WA721

EDFM-5 models not suitable for use with hot gas bypass models.

BASIC INSTALLATION

Right Hand WA Units

1. Unpack the economizer assembly which includes the integral economizer with attached electrical harness, mixed air thermistor and miscellaneous hardware and installation instructions.

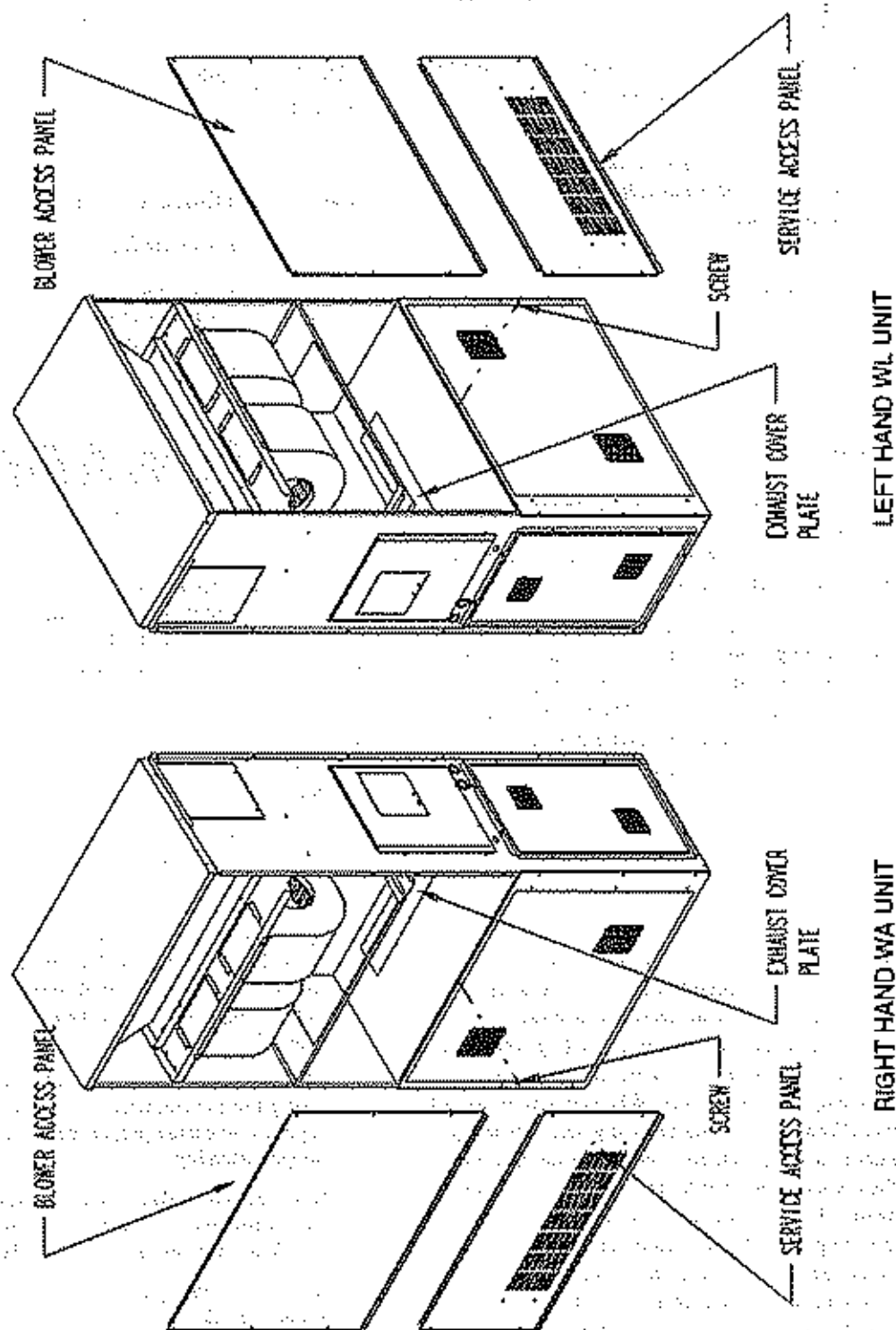


WARNING

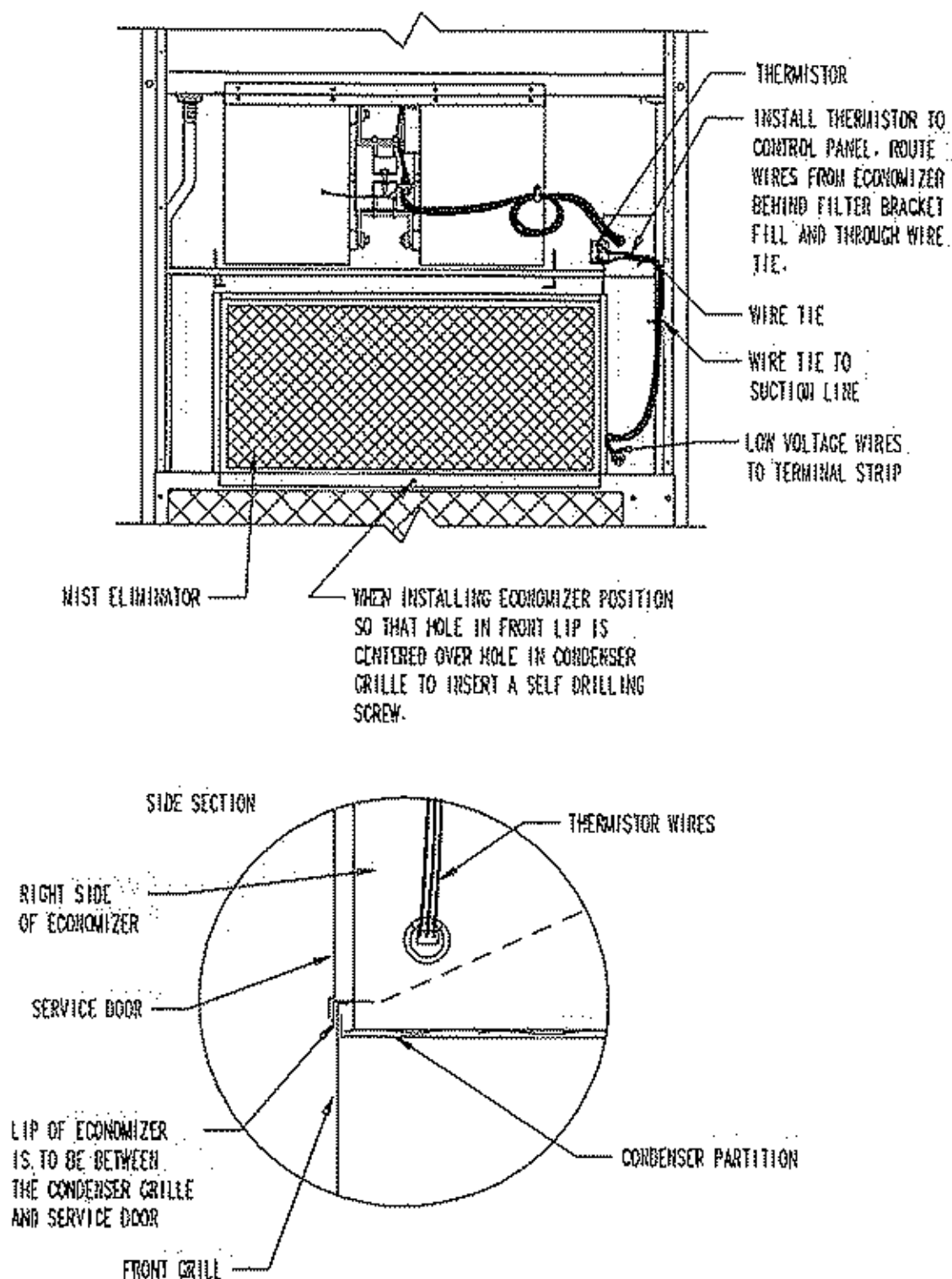
Open and lock unit Disconnect Switch before installing this accessory to prevent injury or death due to electrical shock or contact with moving parts. Turn thermostat to OFF.

2. Remove and save the existing exterior blower access and service access panels on the Bard wall mount units. See Figure 1.
3. Remove and save existing unit return air filter and center screw in front grille. See Figure 1.
4. Remove and discard the exhaust cover plate. See Figure 1.
5. Install economizer by inserting the economizer into the unit to the far left side clearing the right filter bracket. Once the economizer is fully inserted, slide the economizer to the right until it is tight against the back of the control panel. See Figure 2.
IMPORTANT: Position front lip of economizer on top of front grille and condenser partition. See Figure 2. This is important to ensure proper drainage of any water entering damper assembly.
6. Mount mixed air thermistor to control panel as shown with screws provided. Route wires as shown and secure with wire tie. Connect wires to thermistor. See Figure 2.
7. Open unit control panel to gain access to unit low voltage terminal block.
8. Route electrical harness leads through the 7/8" bushing in control panel into low voltage box. See Figure 2.

Figure 1 — Wall Mount Unit

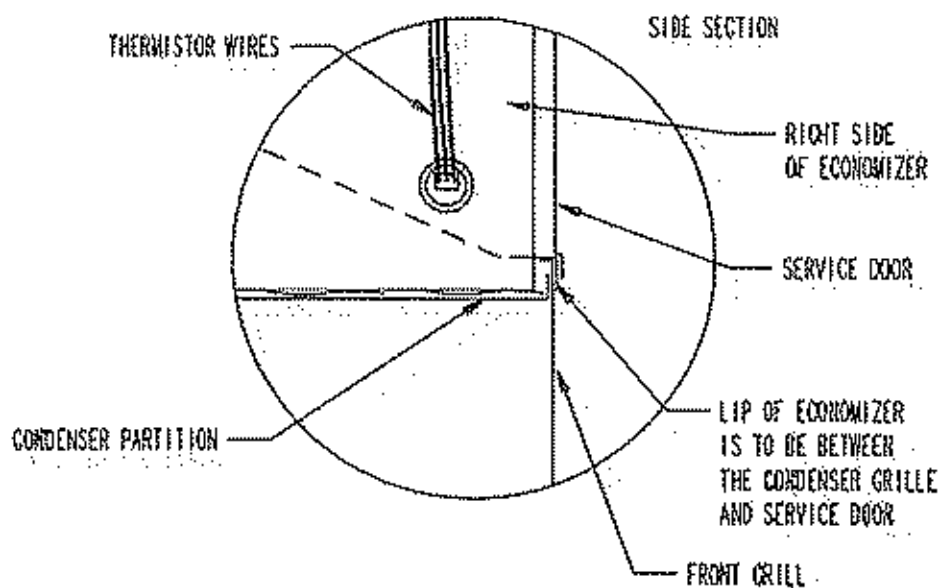
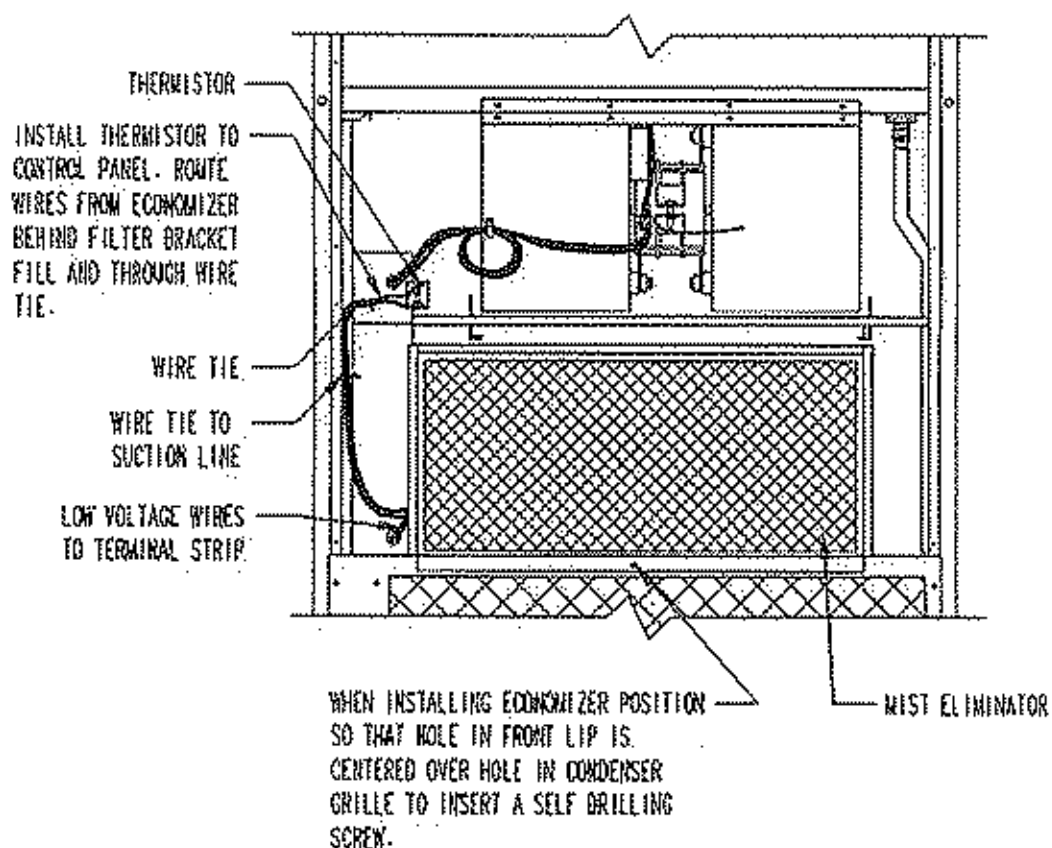


**Figure 2 – Wire Routing and Economizer Positioning
Right Hand WA Unit**



44S-1054

**Figure 2 – Wire Routing and Economizer Positioning
Left Hand WL Unit**



203-1064

9. Connect leads with fork terminal to corresponding points on terminal strip; e.g.: C G E F. See Wiring Diagram on Page 6.
10. Close control panel cover.
11. Reinstall the blower access panel at top of unit and secure with sheet metal screws.
12. Replace left filter support, filter and four (4) screws in front condenser grille.

Left Hand WL Units. Use above steps substituting "left" for right and "right" for left in all text.

13. Economizer Checkout

- A. Remove mist eliminator. See Figure 2. Locate the minimum position potentiometer. See Figure 3.
- B. Energize the evaporator blower by putting a temporary jumper between R and G on the low voltage terminal strip of the unit.
- C. Cycle the minimum position potentiometer (factory set for 0% fresh air) 0 to full open. See Figure 4. Throughout checkout procedure observe operation of damper to ensure there is free, unobstructed operation through the entire angle of damper travel. Then adjust the damper minimum open position to meet local codes or application requirements. See example following:

Example:

1. Measure return air temperature (RAT) (assume 75° for example).
2. Measure outdoor air temperature (OAT) (assume 60° for example).
3. Calculate the mixed air temperature (MAT) which will result from the desired combination of OAT (10 percent) and RAT (90 percent).

$$.1 \text{ OAT} + .9 \text{ RAT} = \text{MAT}$$
 or substituting example values:

$$.1 (60^{\circ}\text{F}) + .9 (75^{\circ}\text{F}) = 73.75^{\circ}\text{F}$$
4. Adjust the minimum position potentiometer knob until proper mixed air temperature as calculated above is reached. Care should be taken to ensure thermometer is sensing air that is well mixed.

5. Mark correct setting on dial of minimum position potentiometer for future reference.

14. Replace control access panel and mist eliminator.
15. Remove blank off plate or barometric fresh air damper if installed on the service access panel. Plug the (4) holes used to mount the BOP or BFAD with the plastic plugs supplied with the economizer.
16. Replace service access panel.
17. Economizer is now ready for operation.

Economizer Features

- One piece construction – easy to install with no mechanical linkage adjustment required.
- Exhaust air damper built in with positive closed position. Provides exhaust air capability to prevent pressurization of tight buildings.
- Actuator motor – 24 volt, power open, spring return with built in torque limiting switch.
- Proportioning type control for maximum 'Free Cooling' economy and comfort with up to 100% outside air.
- Moisture eliminator and prefilter – permanent, washable aluminum construction.
- Minimum position potentiometer – adjustable to control minimum damper blade position.
- Mixed air sensor to monitor outdoor and return air to automatically modulate damper position.

ECONOMIZER SEQUENCE OF OPERATION

See TCS20 Operation Manual for sequence of operation.

FIGURE 3

TOP VIEW OF CONTROL PANEL

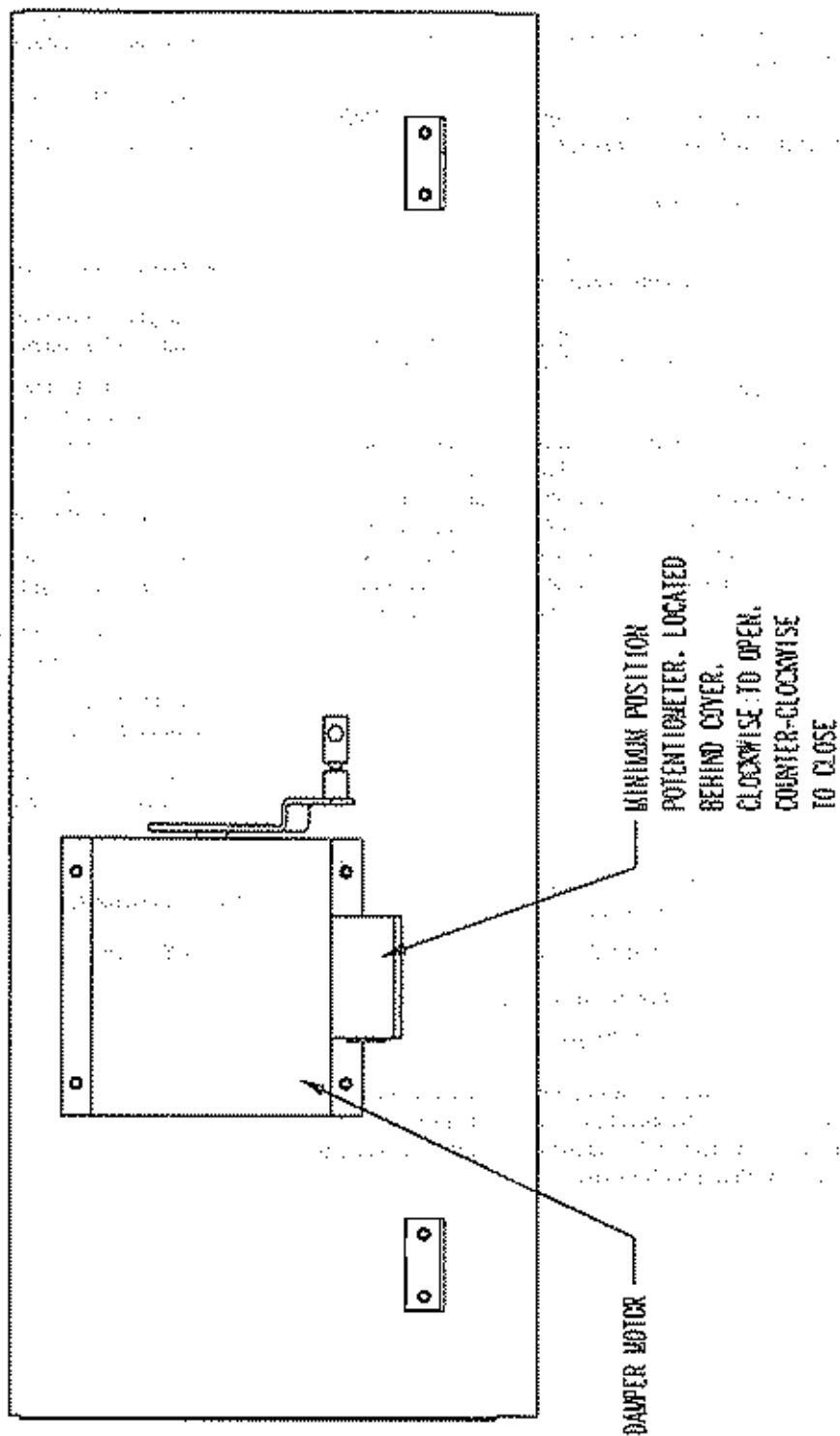


Figure 4 – Wiring Diagram

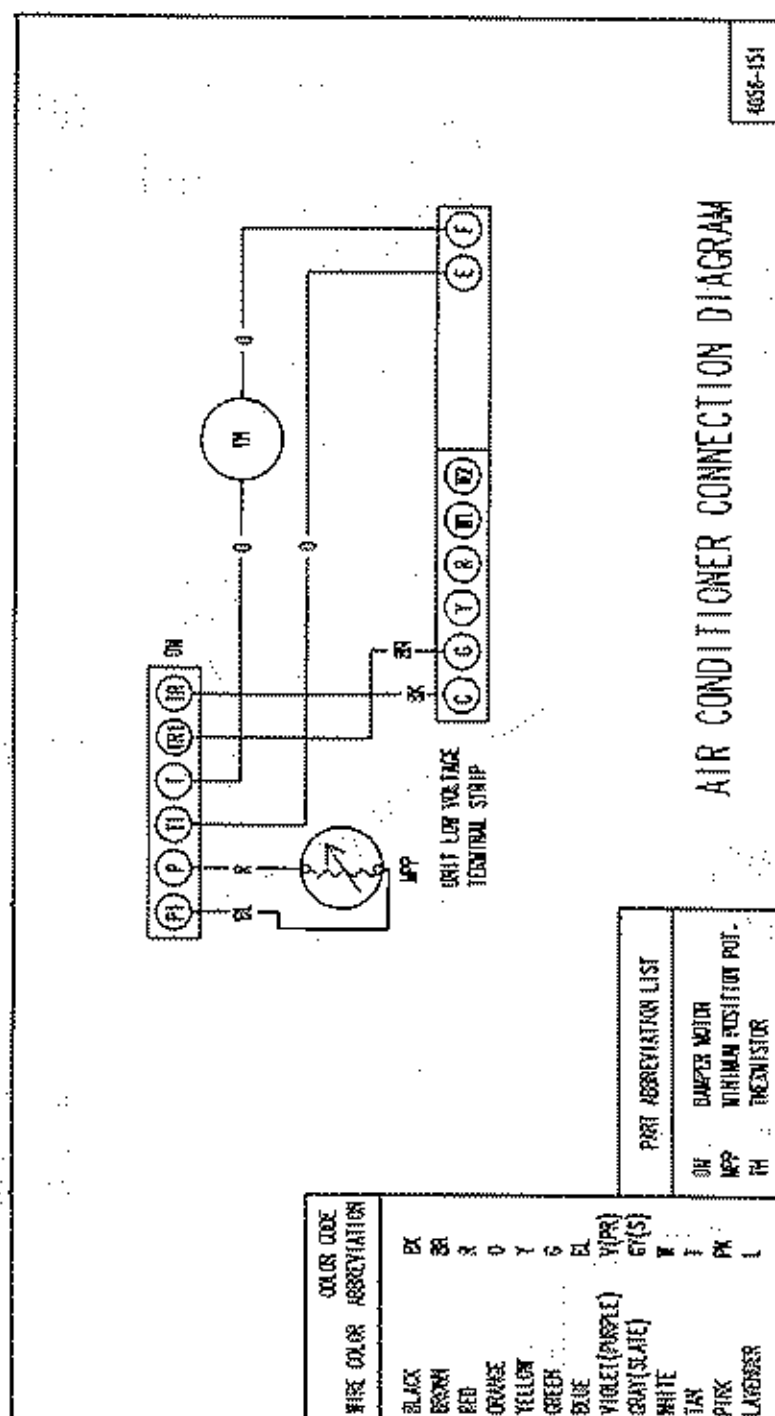
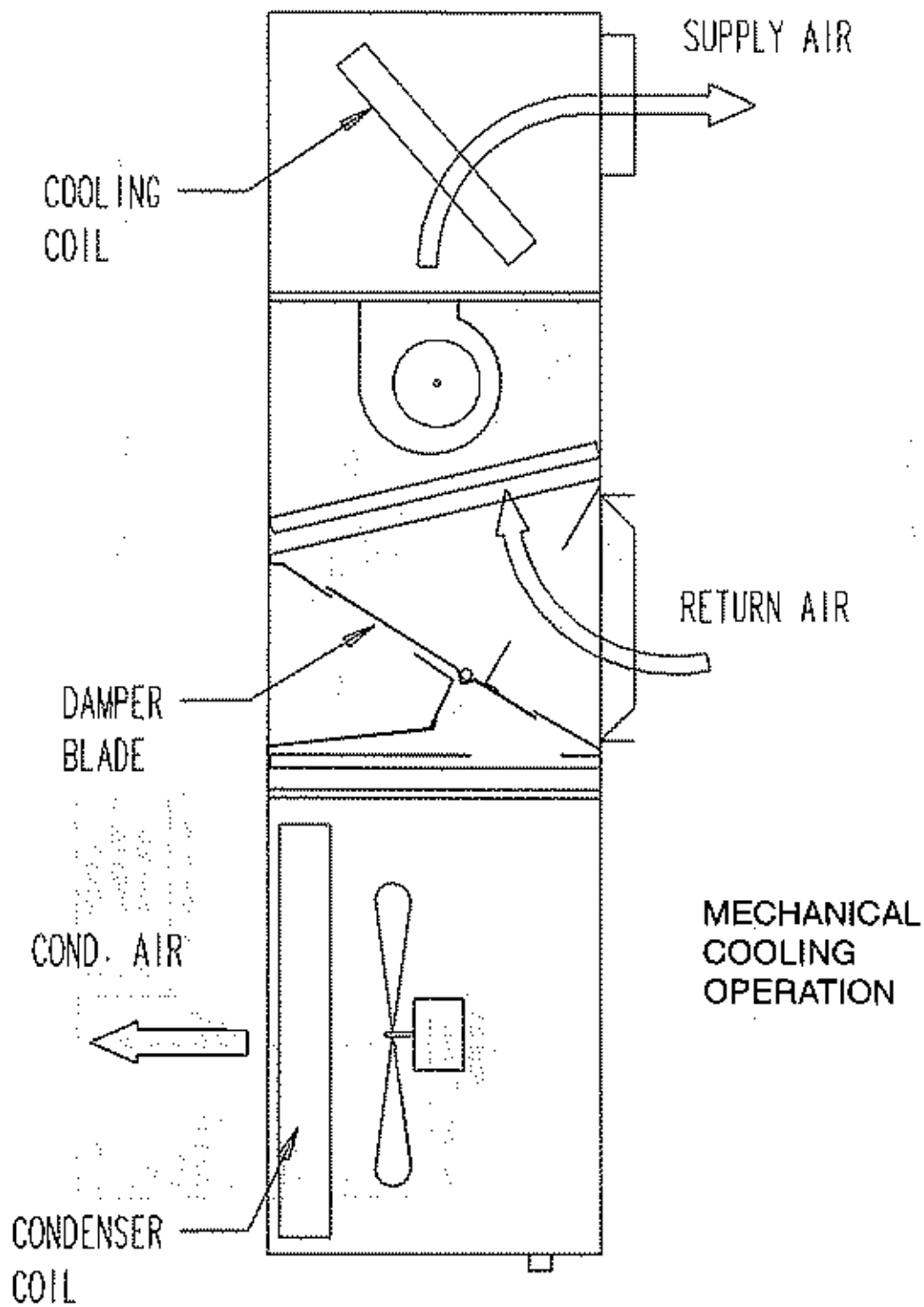
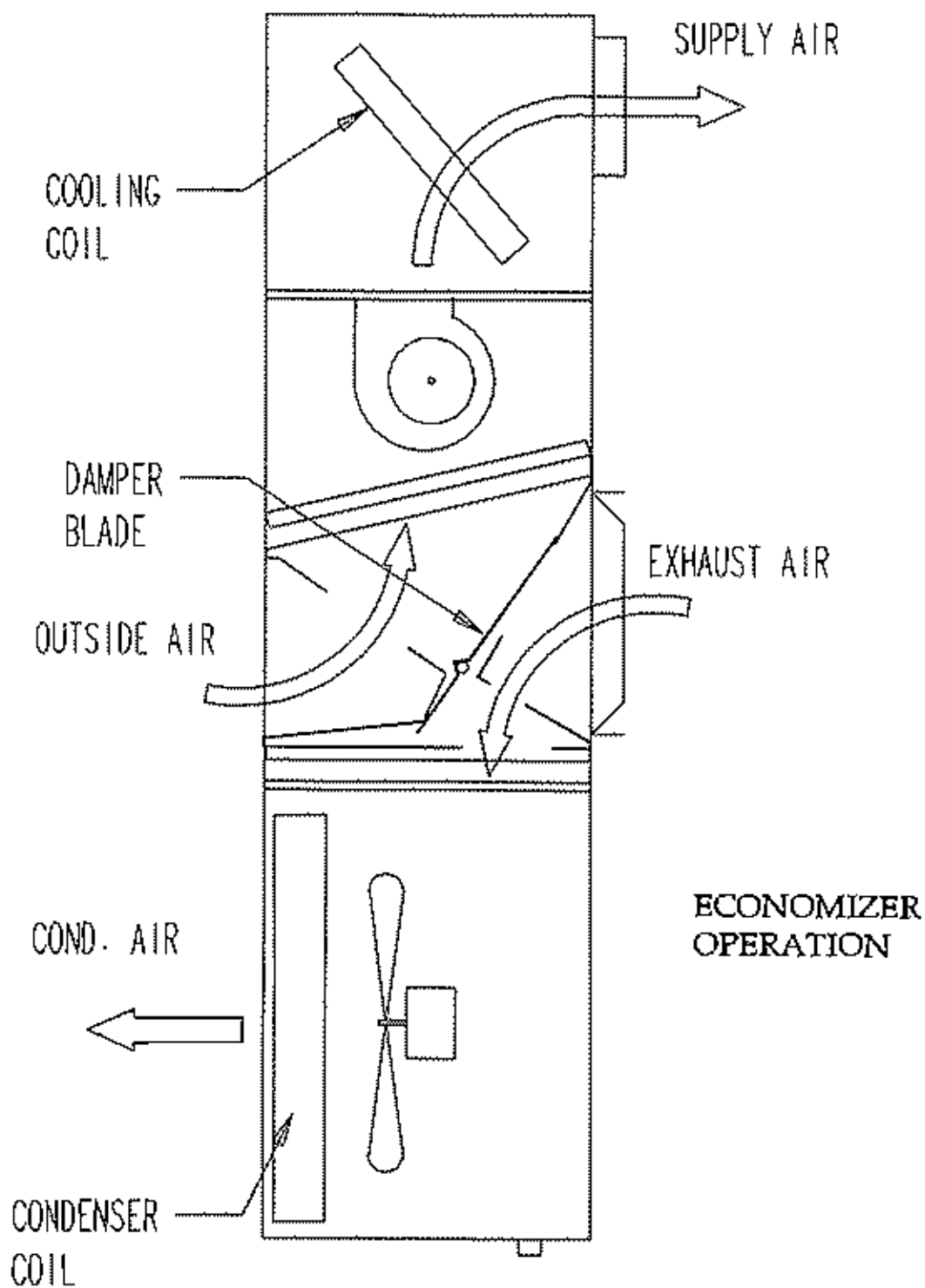


Figure 5 – Damper Position – Full Open



MS-248

Figure 6 – Damper Position – Full Closed



M12-347