Heating & Cooling Products

INSTALLATION INSTRUCTIONS

TEC20
ELECTRONIC CONTROLLER

BARD MANUFACTURING COMPANY
Bryan, Ohio 43506

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

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** IMPORTANT **

The equipment covered in this manual is to be installed by trained, experienced service and installation technicians. Please read entire manual before proceeding.

SHIPPING DAMAGE

Upon receipt of equipment, the carton should be checked for external signs of shipping damage. If damage is found, the receiving party must contact the last carrier immediately, preferably in writing, requesting inspection by the carrier's agent.

GENERAL

These instructions explain the operation, installation and troubleshooting of the TEC20 controller.

All internal wiring is complete. Only attach low voltage field wiring to designated terminal strips.

The controller is for use with Bard air conditioning wall mount series units only. The TEC20 is for use with units with or without economizers.

Each unit should be sized to handle the total load of the structure.

It is recommended that a five (5) minute compressor time delay relay be installed in each unit.

THEORY OF OPERATION

The controller is used to control two wall mount air conditioners from one thermostat It provides total redundancy for the structure and equal wear on both units. It can be used with units with economizers but both units must be equipped alike. That is, both must have economizers or both must be without economizers. See Figure 1 for component locations.

TIMER

The timer is a 24 hour or 7 day on/off timer. The change over period is user selectable. Once every period the timer contacts switch positions This determines which unit will be the primary unit and which will be the secondary unit for the next period. At the end of this period, the contacts switch again and the primary unit becomes the secondary unit and vice versa. Every 1,2,7,14 or 28 days the primary and secondary units switch providing equal wear on the units. For timer speed up, push and hold timer speedup switch. See Figure 1. Release switch after controller has switched. Timer speed up is supplied for ease of troubleshooting.

In the event of a unit failure, the changeover time jumper may be set to 0 days. This will prevent the TEC20 from switching lead and lag units. Push the push-button to make the good unit the lead unit if necessary. If power is lost the controller will remember which unit was the lead unit when power is reapplied.

SEQUENCE OF OPERATION

COOLING - TEC20

1. On a call for first stage cooling, the blower and either the economizer or compressor of the primary unit is energized. The enthalpy control on the economizer, if equipped, will make the decision as to which is energized. If not equipped with economizers, the compressor will energize. First stage cooling LED will light.
2. On a call for second stage cooling, the blower and either the economizer or compressor of the secondary unit is energized. The enthalpy control on the economizer, if so equipped, will make the decision as to which is energized. If not equipped with economizers, the compressor will energize. Second stage cooling LED will Light. There is a built-in 10 second delay before Stage 2 is energized.

HEATING

1. On a call for first stage heat, the electric heat in the primary unit will be energized. First stage heating LED will light
2. On a call by the thermostat for second stage heat, the electric heat of the secondary unit will be energized. Second stage heating LED will light. There is a built-in 10 second delay before Stage 2 is energized.

INSTALLATION INSTRUCTIONS

MOUNTING

Included in the controller carton is the controller and installation instructions..

The controller should be installed on a vertical wall approximately four (4) feet above the floor away from drafts and outside doors or windows. Four (4) mounting holes are provided for mounting to the wall and holes for conduit connections are provided in both the base, side and top of the controller. The controller should not be mounted directly to a block wall; space away from wall with insulation or plywood.

Once mounted, slide the termistor sensor up into the fitting on the top of the TEC20. Position the sensor so that 15/16 inch is protruding from the top of the fitting. Tighten the fitting to hold the sensor in position.

LOW VOLTAGE FIELD WIRING

The TEC20 is powered from the air conditioners that it is controlling, low voltage only.

Circuitry in the TEC20 isolate the power supplies of the two air conditioners so that no back feeds or phasing problems can occur. Additionally if one air conditioner looses power the TEC20 and the other air conditioner are unaffected and will continue to operate normally.

Connect the low voltage field wiring from each unit per the low voltage field wiring diagrams in Figure 2.

For continuous blower operation, jumper R to G at the low voltage terminal block of the unit, instead of from Y to G.

ADJUSTMENTS

COOLING SETPOINT – Front of TEC20

Set the cooling setpoint in degrees C° or F° as indicated on the front of the TEC20.

DEAD BAND – Back of Front Cover

The dead band is the span between heating setpoint and cooling setpoint where no heating of cooling takes place. The cooling setpoint minus the dead band equals the heating setpoint.

ON/OFF SWITCH – Back of Front Cover

This disables the TEC20. This switch must be ON for any heating or cooling to operate.

CHANGEOVER TIME JUMPER – Back of Front Cover

The changeover period for the lead and lag units can be adjusted to 0, 1, 3, 7 or 28 days.

If the jumper is set to 7 days, the lag unit will become the lead unit in 7 days.

The 0 day position is supplied in the event of a unit failure. If the good unit needs to run for a time and not switch to the lag unit, set the jumper to "0" and push the lead change push-button to make the good unit the lead unit. When the jumper is in the 0 position the lead and lag units will never switch.

LEAD CHANGE PUSH-BUTTON – Back of Front Cover

Pushing the lead change push-button will immediately change the lead unit to the lag unit. It also resets the lead/lag changeover timer.

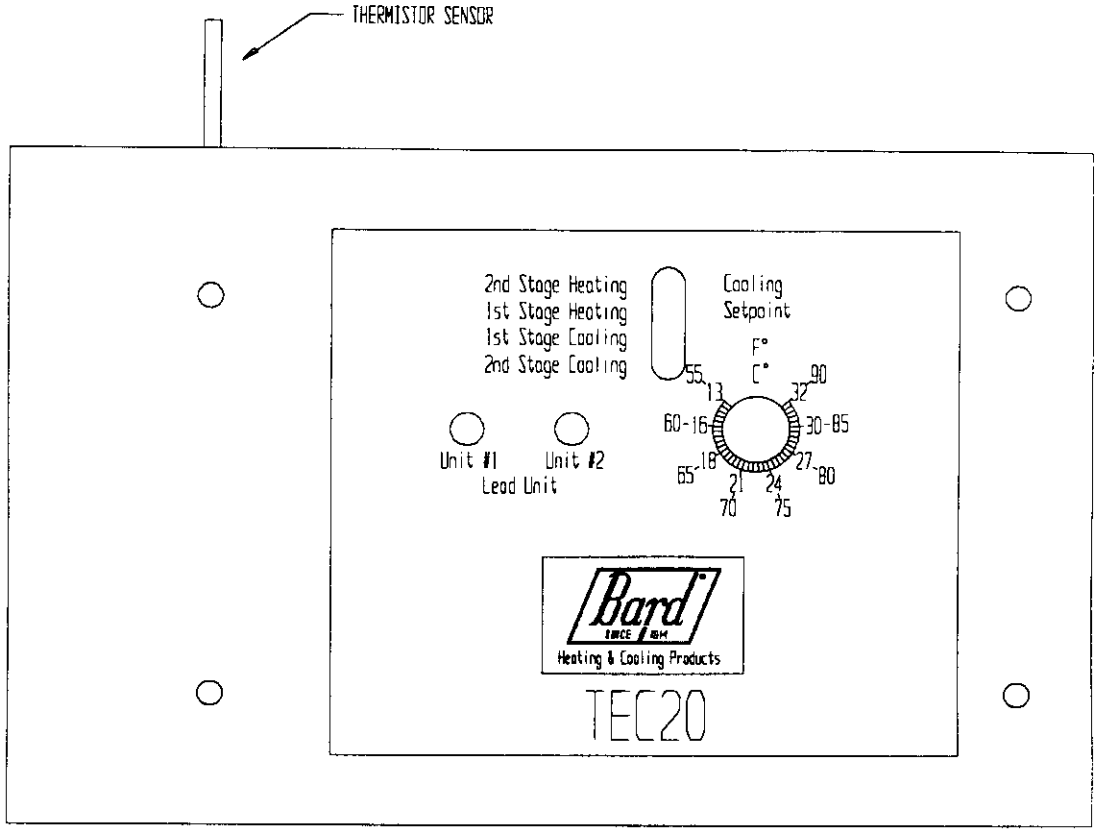
TEST MODE JUMPER – Back of Front Cover (lower left)

To test the lead/lag timing, place the jumper across the two pins. The changeover time is accelerated to seconds instead of days.

For instance, if the changeover time jumper is set to 7 days the lead and lag units would switch in 7 seconds. Jumper must be vertical on 1 pin only for proper operation.

FIGURE 1

FRONT VIEW



BACK VIEW

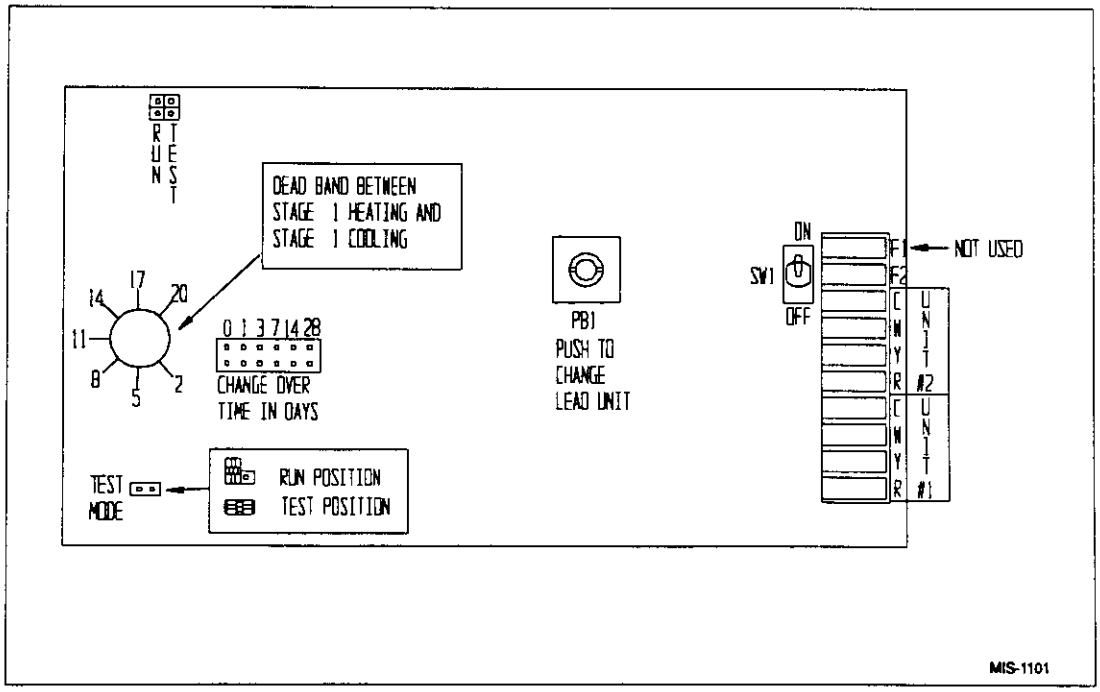
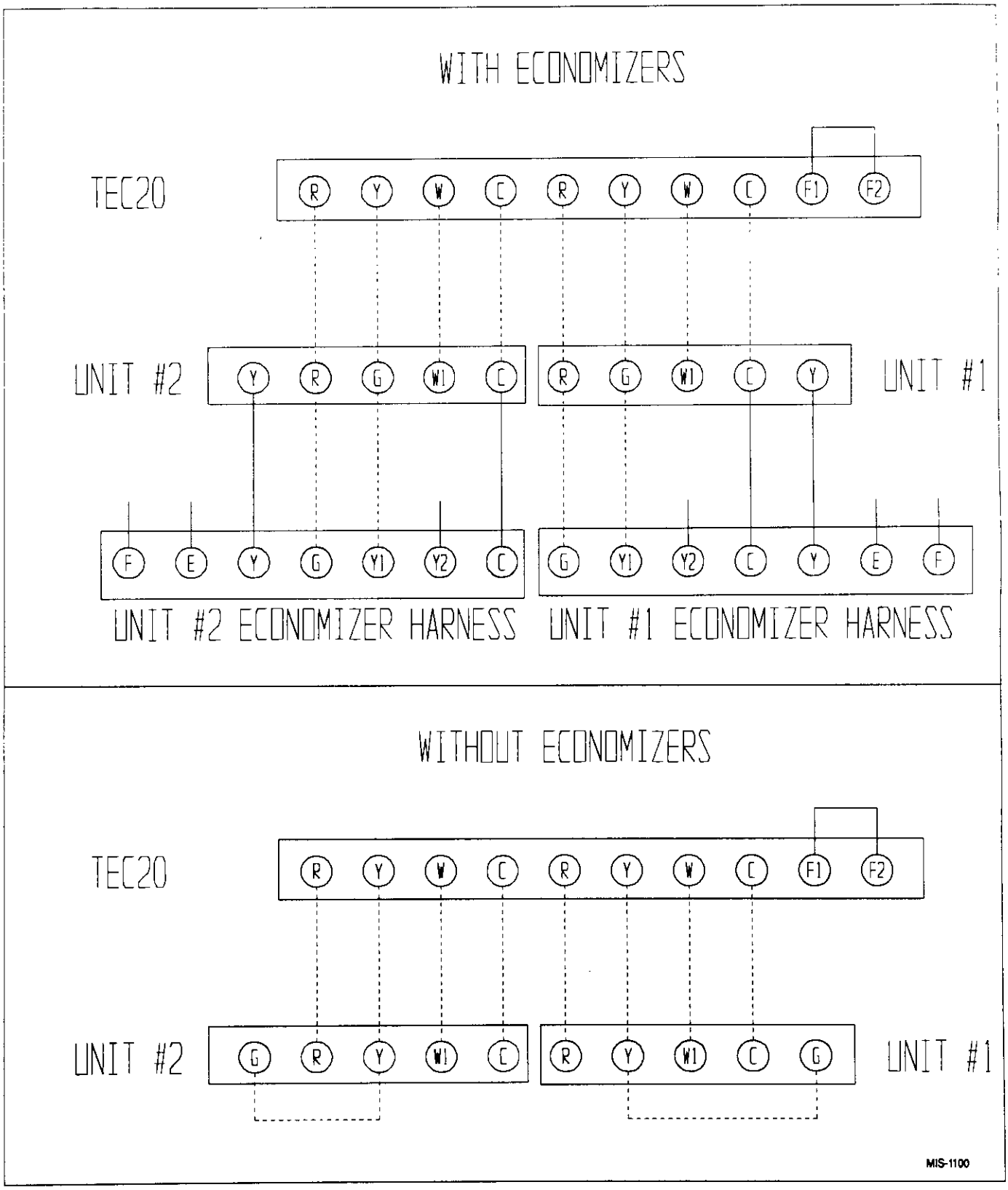


FIGURE 2


WITH ECONOMIZERS
TEC20
R Y W C R Y W C F1 F2
UNIT #2
Y R G W1 C
R G W1 C Y
UNIT #1
F E Y G Y1 Y2 C
G Y1 Y2 C Y E F
UNIT #2 ECONOMIZER HARNESS
UNIT #1 ECONOMIZER HARNESS
WITHOUT ECONOMIZERS
TEC20
R Y W C R Y W C F1 F2
UNIT #2
G R Y W1 C
R Y W1 C G
UNIT #1
MIS-1100