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Analog Economizer Kit for Bard Wall Mount Air Conditioners Telco Envirotrols part number TEI AEK

Application

Bard wall mount air conditioners may be ordered with a factory installed economizer. The same economizer section may be field installed in units already in service. In most cases, the economizer is regulated by a built-in control. This kit was produced to shift control of the economizer to the ASI Telco Panel. The benefits of this change include adjustable setpoints, more accurate mixed air temp and the ability to remotely override the damper open and fan on for emergency ventilation.

Kit Contents

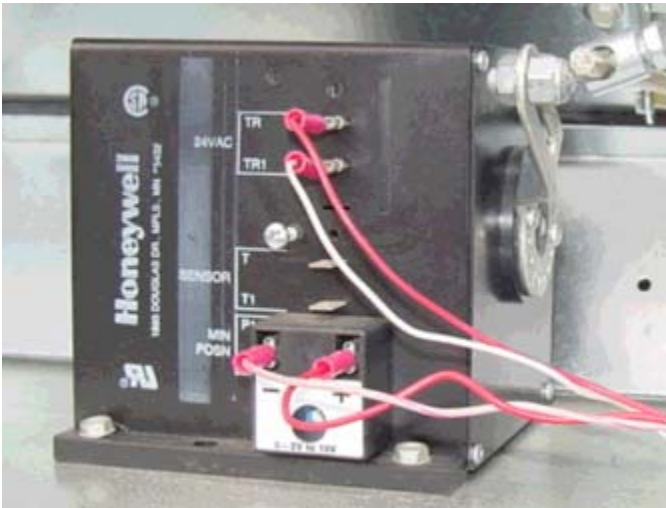
Quan	Description
1	24V-24V isolation transformer, 20 VA
1	Damper Actuator position signal adapter, Honeywell Q769A1009
4	self drilling hex head fasteners (for mounting controller)
4	¼ inch female push-on connectors
1	instruction sheet

Installer will need to supply position signal wire from ASI Panel to damper motor. Twisted 18-2 is recommended. Avoid routing close to high voltage or other sources of interference, if possible. In extreme situations, shielded cable with the shield grounded on one end only may be required.

Installation Instructions

- 1 Disconnect main power to unit and remove service door (mid panel on front/out side).
- 2 Locate damper actuator and identify terminals. The bottom two should be labeled P1 and P. Push the supplied adapter onto these terminals with + contacting P1 and – on P.
- 3 Locate a suitable mounting location for the supplied isolation transformer, close enough for the blue wires to reach the damper actuator and existing supply wires to plug into the red wires. A ¼ inch female hex driver may be used with the self-drilling sheet metal screws or other mounting methods may be used. Once mounted, remove the wires on damper actuator terminals TR and TR1. These are plugged into the connectors on the white and orange/white wires to supply 24VAC to the transformer. Polarity is not critical. Insulate these connections if there is any chance they may contact a conductive surface. The brown and orange wires from the transformer are pushed onto actuator terminals TR and TR1. Do not make any other connections to this transformer; its purpose is to isolate the damper actuator from 24VAC in order to prevent feedback to the controller's analog output and potential controller damage.

Note: If economizer is supplied without on-board control, power for isolation transformer/damper actuator may need to be connected directly to low voltage terminals C and G behind side panel.



- 4 Remove and insulate wires from terminals T1 and T on actuator. These are not used with direct control from ASI panel.
- 5 Connect a position signal wire from damper actuator to controller (typically Analog Output 1 or 2). The positive controller output connects to positive adapter contact (P1), on the right side when viewing the adapter in place on terminals P and P1. Negative connection goes on the left side of adapter. Crimp-on terminals are supplied in this kit.
- 6 Secure all wires, keeping damper and actuator arm movement in mind.
- 7 Leave cabinet open until proper operation has been verified.

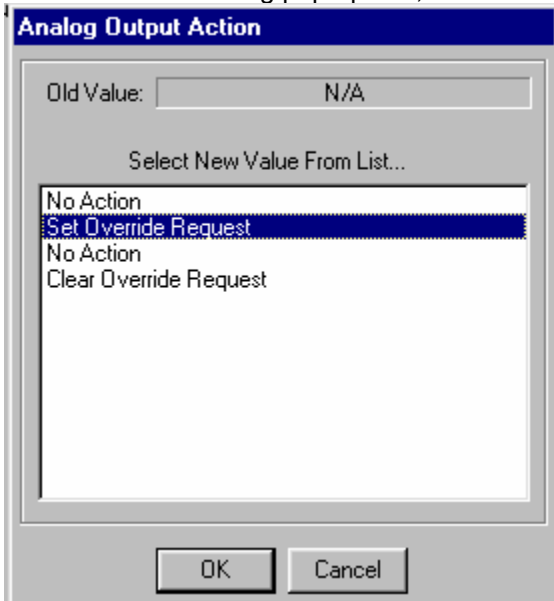
Steps 1 to 7 above are all that is required for most new installations. Unless any of the following apply, continue with Checkout below. If economizer was an existing unit operating off an internal control or if checkout reveals a need to adjust the range of motion, see Supplemental Instructions at the end of this document.

Checkout

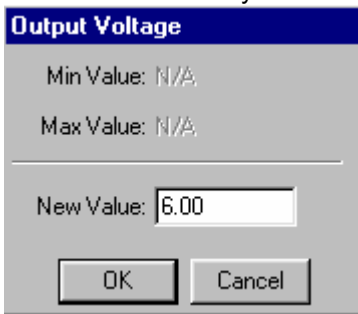
- 1 Connect to controller and move to Analog Override user screen.
- 2 Click on Analog Output Action for selected unit.

Analog Outputs		Switch View		
Analog Output	Output Percent	Output Voltage	Override Action	Override Status
AH1 Econ	<input type="text" value="0"/>	<input type="text" value="0.00"/>	Analog Output Action	<input type="text" value="No"/>
AH2 Econ	<input type="text" value="0"/>	<input type="text" value="0.00"/>	Analog Output Action	<input type="text" value="No"/>
Relief	<input type="text" value="0"/>	<input type="text" value="0.00"/>	Analog Output Action	<input type="text" value="No"/>

- 3 In the resulting pop-up box, select Set Override Request and click OK button.



- 4 If not already at 6.00 V, click on Output Voltage for that unit and change to 6.00 V



Observe damper position. It should move to approx. middle of operating range. Change voltage to 2 and again observe damper. It should move to the closed position. Change voltage to 2.5; damper should just start to open. If not, adjustment needs to be made by changing this voltage until the voltage that equates to closed damper is discovered. If adjusting here, this voltage is then entered as the Min Output Voltage on the Analog Output screen (see Configuration Modification above).

- 5 Change output voltage to 10.00. Damper should be fully open. If not, experiment to find the voltage that equates to fully open position and enter it as the Max Output Volts on Analog Output screen (see Configuration Modification above).
- 6 If damper is not fully closed at 2.0 V or fully open at 10 V, adjustment of the mechanical linkage may be required.
- 7 Repeat for second air handler, if economizer equipped.

- 8 Decide if a minimum damper position is required. Remember that the ASI Telco Panel includes a “purge routine” which opens damper 10% at a user-adjustable timed interval. If a continuous minimum damper position is still desired, it may also be accomplished either at the potentiometer on adapter (see Supplemental Instructions) or with voltage adjustments here. If adjusted with the potentiometer, the % Open display on Points screen will never go below the minimum position. If adjusted by voltages sent from the controller, % Open display will read 0 at minimum position. To adjust with voltage from controller, experiment to find the desired position by changing override voltage. Once the desired minimum position is found, enter that voltage as the Min Output Volts on Analog Output screen.
- 9 Relax overrides by clicking on Analog Output Action button then Clear Override Request and OK. Before leaving site, confirm that yellow Override LED on controller or matching indicator on Points screen is Off.
- 10 Click on Device in top menu bar and Save to update backup copy of the configuration.
- 11 Although not directly impacting economizer operation, low voltage connections to start compressor should have been changed if economizer was previously in service with an ASI panel (see Supplemental Instructions). Proper operation of compressor should be verified through use of Binary Overrides or temporarily changing setpoints to start the compressor. Be sure to remove overrides or restore correct setpoints afterwards.

Supplemental Instructions

These procedures are not usually required for typical new installations or retrofits of economizers. If economizer was previously in service with an internal control, the potentiometer on adaptor is used or if position signal from controller needs to be substantially different from 2-10V, the instructions below should be reviewed.

Economizer Previously in Service with Internal Control

If the economizer was already in service with an ASI Telco Panel, it is probably connected like a two stage thermostat (stage one calls for economizer if outdoor air is suitable, stage two causes econo to close and compressor to start regardless of outdoor air). Now that the economizer is being controlled by an analog output from the panel, “Cool 1” should call directly for compressor operation. Locate the Bard unit’s low voltage connections behind side panel. G, R and W1 (if equipped with electric heat) should already be connected to ASI panel. Cool 1 from ASI Panel is most likely wire nutted to a purple wire leading to Bard economizer control. Cool 2 is most likely wire nutted to a pink wire, also to Bard economizer control. There should also be three wires from the Bard economizer control connected to the low voltage terminals: black to C, brown to G and yellow to Y. The black and brown supply 24VAC to the damper motor so they should be left in place.

- 1 The yellow wire from Bard econo control to low voltage connection Y should be disconnected and insulated.
- 2 The wire leading from ASI panel “Cool 1” (relays 2 and 6 for AH1 and AH2) should be disconnected from wire nut connection to purple wire and landed on Y contact of Bard unit. Purple wire from Bard economizer control should be insulated.
- 3 The wire leading from ASI panel “Cool 2” (relays 3 and 7 for AH1 and AH2) is no longer used. In order to avoid future confusion, it should be disconnected from pink wire leading to Bard econo control, insulated and labeled.

Use of Adapter Potentiometer to Adjust Damper Range

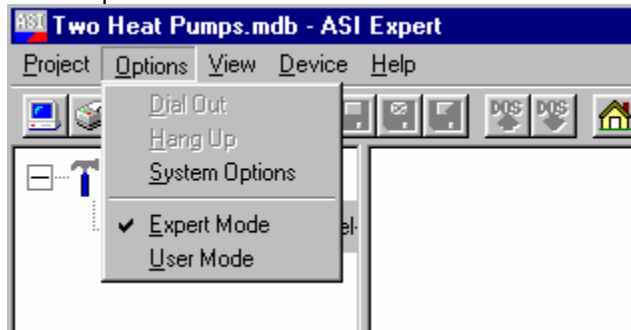
If checkout reveals the need for damper adjustment or if a minimum position is desired, it can be accomplished by either changing the controller output voltage limits (suggested) or by adjusting a potentiometer on the position signal adapter. If adjustment at the potentiometer is preferred, continue with these steps. If using this kit with a controller of fixed output range, the potentiometer adjustment may be the only available method of matching damper response to the signal. This example uses 6-9V.

- 1 Apply 24VAC to transformer/actuator, connect a jumper between adapter terminals P and P1, turn potentiometer fully CW, turn potentiometer CCW until the damper just starts to open, turn potentiometer CW until damper closes, remove jumper and connect DC source (set to minimum of 6V), check actuator; if not fully closed, turn potentiometer slowly CW until fully closed.
- 2 Change controller output voltage to 9.00 V (see Checkout below). If damper is not approx in full open position, some compromise setting of potentiometer or adjustment in controller may be required.
- 3 If potentiometer-set minimum position is desired, set controller to minimum output voltage and adjust potentiometer on adapter to desired minimum damper position.

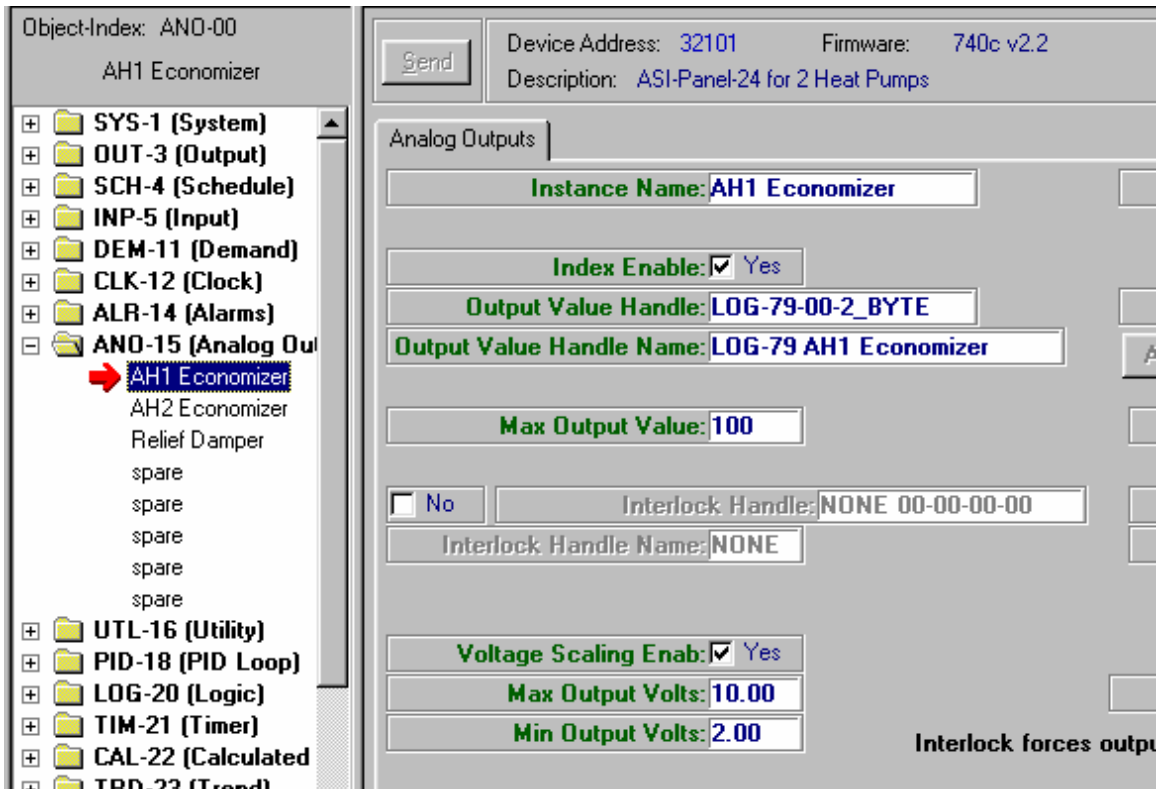
Position signal other than 2-10V

The analog output range of 2-10 V in ASI's Panel-24 (Telco Panel) should match the adapter supplied with this kit. If a substantially smaller range of operation is required, the steps below are an alternative to adjusting the mechanical linkage to use the actuator's full stroke. This example uses a range of 6-9 volts, but any span within 0-10 V is possible.

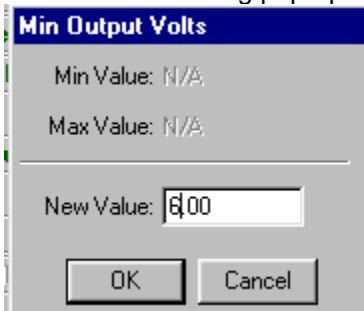
Start Expert and connect to the controller. Switch to Expert mode (from top menu bar).



Look down left column to find Analog Output object (ANO-15). Left mouse click on + at left to show all analog outputs. The first one should be AH1 Economizer. Left mouse click once to highlight and display details in large box to right.

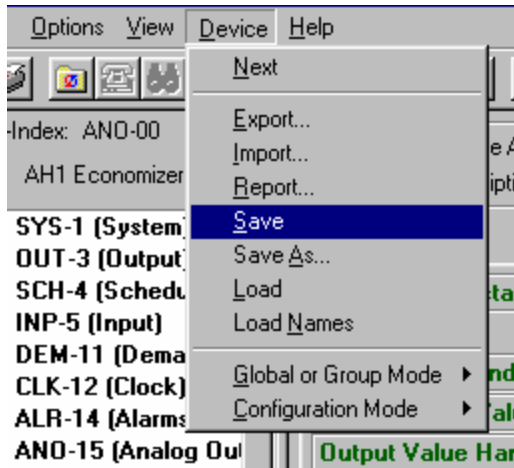


Locate Min Output Volts and left mouse click once on the blue number in box, which should be 2.00 . In the resulting pop-up box, change Min Output Volts to 6.00 and click OK.



Follow the same pattern to change Max Output Volts to 9.00 . Repeat for AH2 if it also is being fitted with an Analog Economizer Kit with part number AEK610.

Save the changes in the configuration backup file on your hard drive by clicking Device in top menu bar and Save in the resulting drop-down menu.



Notes:

- The damper position % display on Points screen will still read 0-100%.
- These changes are not required in most installations.