



*P/N: 026-2605-001*

*Date of Release: August 19, 1999*

# TECHNICAL BULLETIN

## ESR8 Software Setup for Einstein

### **Scope**

To show how ESR8 evaporator stepper regulator boards are configured in CPC's Einstein RX software.

### **Description**

The ESR8 evaporator stepper regulator board controls suction-side evaporator pressure regulators for refrigerated case circuits. A single board may control as many as eight different valves.

Hardware wiring instructions for the ESR8 are given both in the Einstein RX Installation Guide (*P/N 026-1601 Rev 1*) and in the ESR8 Installation Instructions (*P/N 026-2903-001*). The ESR8 also requires configuration within the Einstein software to tie the ESR8 output points to their respective Standard Circuit applications, as well as to specify the physical characteristics of the stepper valves themselves.

### **Software Setup**

Successful installation of an ESR8 will require you to perform two main programming tasks in the Einstein software:

1. **Case Circuit Setup** - A Standard Circuit application must be set up as normal (with all case types, set points, and other parameters defined) EXCEPT the Temperature Control Strategy must be set up as "LINEUP/DEFROST." Also, the physical address of the EEPR valve must be specified in the Standard Circuit application.
2. **ESR8 Setup** - Physical properties of the valves connected to the ESR8 will need to be specified in the ESR8 Controller application in the Einstein software.

## **Step 1: Case Circuit Software Setup**

An ESR8 works in conjunction with a Standard Circuit application in Einstein to control case circuit temperature. Each Standard Circuit application should be programmed as documented in *P/N 026-1601, Einstein RX Installation Guide*.

To specify that the case circuit is going to be controlled by a valve on an ESR8 board, there is one important parameter in the Standard Circuit application that you will need to set.

In **Screen 1: General**, there will be a field called **Temp Ctrl Strat**. This field tells Einstein what method of control will be used. This field should be set to "LINE UP(ESR)/DEFROST" to indicate an ESR8 will control temperature.

## **Step 2: ESR8 Setup**

Before setting up your ESR8 evaporator stepper regulator, you must have all Standard Circuit applications created and set to use "LINE UP(ESR)/DEFROST" control strategy (see Step 1). You must also have the number of ESR8s specified in the Network Setup screen (this is typically done during Einstein initialization, or you may press

**F8** **Y** **4** **2** from the Actions Menu to access the Network Setup screen).

It is important to note most of the more advanced functions of ESR8 applications (especially valve parameters) can only be accessed when Einstein is operating in Full Options display mode. You may toggle on the Full Options display mode by pressing **F8** followed by **?Q**. If the word "FULL" appears highlighted at the top of the screen, you are in Full Options mode.

To begin set up, press **F5** -- MORE from the Main Status Screen to call up the Existing Applications menu, and press **>S** to select "ESR Controller" from the menu. If a menu appears showing a list of ESR8s, choose the one you wish to program and press **Enter**. The status screen for the ESR8 should appear.

### **Screen 1: General**

The General screen is where general properties of the ESR8 application are specified. The only field on this screen you need to concern yourself with is the Name field; if you want to assign a name to this ESR8 application, enter it in this field.

### **Screen 3: Set Points**

*Note: You will only see this screen if Full Options Mode is ON. Press **F8** **?Q** to toggle between regular and full options.*

This screen is where you will enter specifics about the valves that are connected to the ESR8. All fields on this screen are listed in eight rows numbered one through eight. The number on each row corresponds to the similarly numbered point on the ESR8. For each ESR8 point that has a valve attached to it, define the following fields:

**Rate** The Rate field corresponds to the maximum step change rate of the valve (in steps per second). The default, 50 steps/second, is the correct maximum step change rate for the Alco ESR-12 and Alco ESR-20 valves. If using different types of valves, consult the valve documentation or the valve manufacturer.

**Ovr%** The Over Close Percentage is the percentage of the total number of valve steps the valve will attempt to travel past its "0%" threshold to ensure the valve is fully closed when the valve is called to be fully closed.

Take for example a valve with an Over Close Percentage of 5% and a Maximum Steps value of 500. When this valve is called upon to close (i.e. move to 0%), the valve will travel to the step that it counts as 0% and then attempt to close 25 more steps. By doing this, any error that may cause the valve to be slightly open at 0% will be avoided.

It is recommended that this value be set to 5% for all valve installations, **especially if hot gas defrost is being used.** In a circuit with hot gas defrost, the Over Close Percentage is essential to keeping hot gas from returning to the suction header.

**Hyst** The Hysteresis is the number of steps the valve will continue to travel when the valve changes direction. That is, when the valve is opening and is suddenly called to close, or when the valve is closing and is suddenly called to open, the valve will continue to move for a few steps in the direction it was moving before changing direction. This is a physical property of the valve, and when the correct hysteresis for the valve is entered in this field, the Einstein will be able to compensate for the hysteresis and modify the valve operation accordingly.

Consult the valve manufacturer's documentation for the hysteresis value, and enter it in this field. Alco ESR-12 and ESR-20 valves have a hysteresis of zero (0).

**Max Number of Steps** The MaxStp field is where you must enter the total number of steps the valve travels between fully closed (0%) and fully open (100%). This is a physical property of the valve. Consult the valve manufacturer's documentation to determine the total number of valve steps.

If using an Alco ESR-12, enter 500 in this field. If using an Alco ESR-20, enter 800 in this field.

**Use Stand-Alone** By default, when the ESR8 loses communication with its parent Einstein, it will remain open and fixed at the percentage last ordered by the Einstein before communication loss occurred. However, in certain control strategies (such as

hot gas defrost), it may be more appropriate to fix the valve to a user-specified "safety" percentage when communications loss occurs. If you wish to do this, enter "Yes" in this field. **It is recommended that if using hot gas defrost, this field should be set to Yes.**

**Stand Alone %** If the Use Stand Alone field is set to "Yes," the Stand Alone % is the percentage to which the valve will be fixed when communications are lost between the ESR8 and the Einstein. **It is recommended that if using hot gas defrost, this field should be set to 0%.**

## **Screen 4: Inputs**

Screen 4 is where you must tie each ESR8 output slot to the "EEPR VALVE" output of a standard circuit application.

The eight fields labeled **VALVE CMD1** through **VALVE CMD8** correspond to points 1 through 8 on the ESR8 board. To tie a point to a standard circuit application, define the input as follows:

- Enter the name of the controller you are logged into in the Controller field. You may use the ( **F7** ) Look-Up Table to select.
- Enter the name of the circuit that will be controlling the EEPR valve in the Application field. You may use the ( **F7** ) Look-Up Table to select.
- Enter "EEPR VALVE" in the Output field.

Repeat these instructions for each ESR8 point that will control a valve.