










## SAFETY

-  Please read and understand this instruction manual before using **The *Phoenix* Auto ID Electrofusion Processor**.
-  Gas company safety standards and precautions should be followed at all times.
-  Do not use or store **The *Phoenix* Auto ID Electrofusion Processor** where gas may be present.
-  Only properly trained and qualified personnel should operate **The *Phoenix* Auto ID Electrofusion Processor**.
-  Treat electrical equipment as a potential source of ignition and follow proper practices for working in an explosive atmosphere.
-  Power source and Fusion Processor must be located out of the trench.
-  For protection against the risk of electric shock, connect **The *Phoenix* Auto ID Electrofusion Processor** to properly grounded outlets only.
-  Use only up-to-date fusion information supplied by the manufacturer of the fitting.
-  Under no circumstances should **The *Phoenix* Auto ID Electrofusion Processor** enclosure be opened in the field. All warranties are void if the factory seal has been broken.

## **PROCEDURES TO FOLLOW TO MAINTAIN THE WARRANTY**

- **DO NOT** plug the processor in unless the generator is running in high-speed manual mode.
- **DO NOT** pull on the input or the output cables.
- **DO NOT** place the processor in water.
- **DO NOT** store the unit outside.
- **DO NOT** leave the processor in the rain.
- **DO NOT** wash with a hose.
- **DO NOT** use DC power source.

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# **INTRODUCTION**

## **Features of The *Phoenix* Electrofusion Processor**

The ***Phoenix* Electrofusion Processor** is a reliable, easy-to-use, rugged tool designed to withstand conditions found at construction sites in North America. **EF Technologies, Inc.**, in Newark, Delaware, manufactures and services these processors. To obtain service or additional products, please contact **EF Technologies, Inc.** at (302) 451-1088 or visit us on the world wide web at [www.eft-inc.com](http://www.eft-inc.com).

The ***Phoenix*** processor can be operated from any AC power source meeting the input power requirements listed in the *Guidelines for Selecting a Generator* section on page 28. It can operate continuously at 150 volts and unlike any other fusion processor in the U.S. or Canada, can withstand voltage spikes of over 200 volts for a short period of time.

The ***Phoenix* Electrofusion Processor** is splash proof and highly shock resistant. The processor can fuse all manufacturers' fittings at voltages ranging from 8 to 48 volts. The fitting connectors are the quick-disconnect type.

The ***Phoenix* Electrofusion Processor** can be operated in either the barcode or manual modes and requires minimal operator training. The following page provides a table that list general specifications for **The *Phoenix* Electrofusion Processor**.

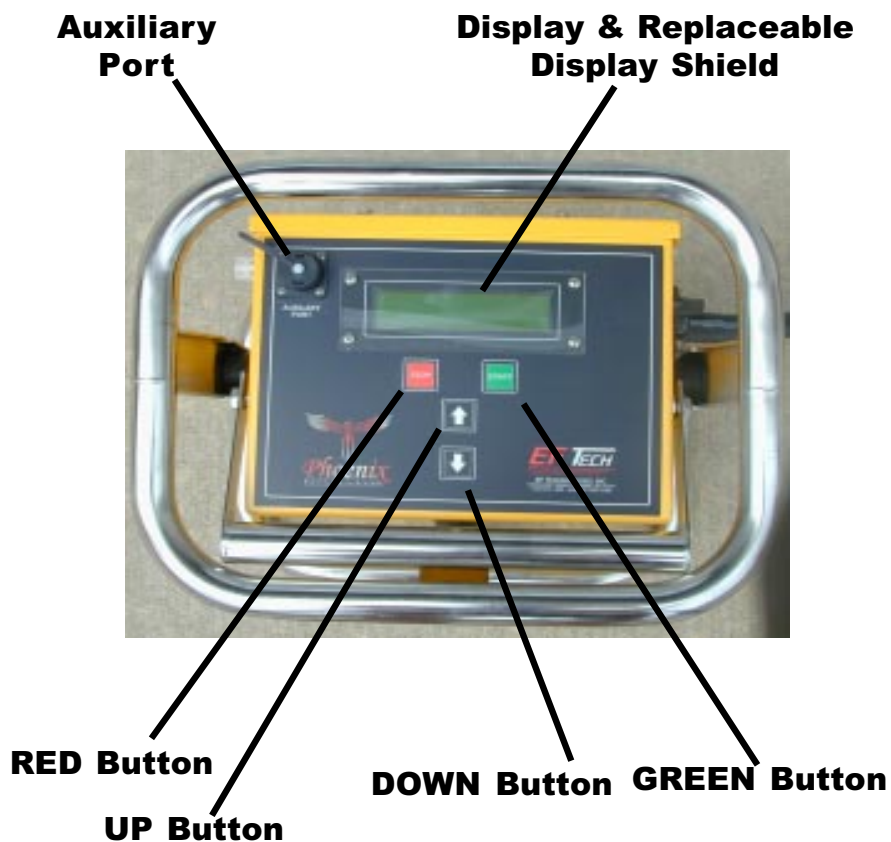
## Specifications

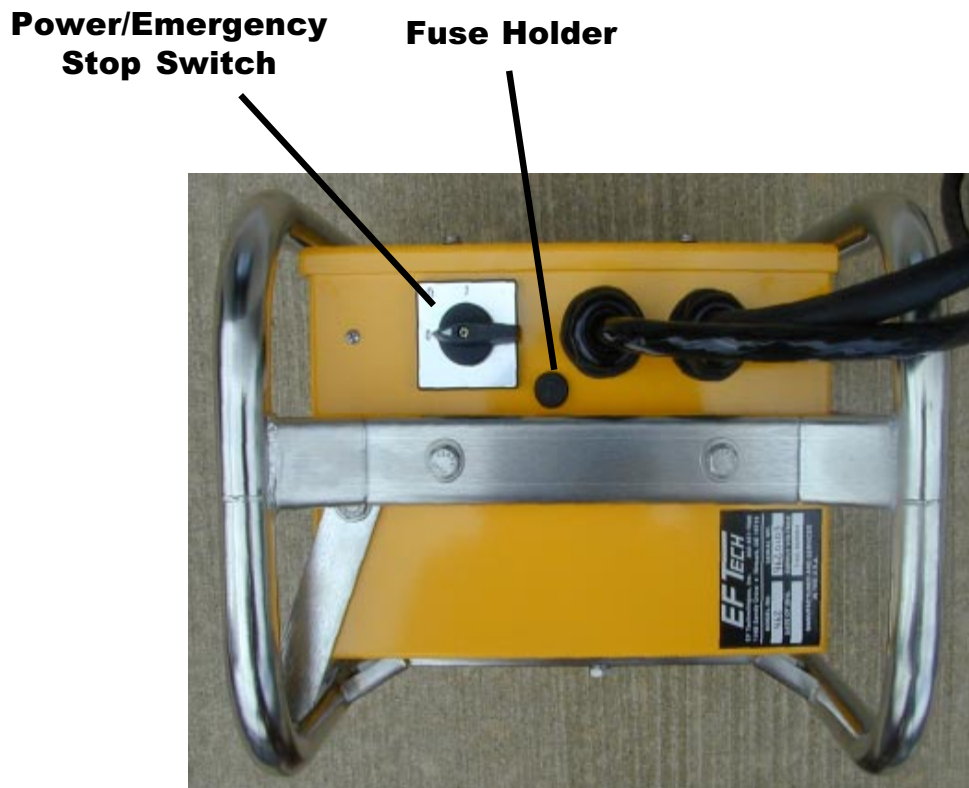
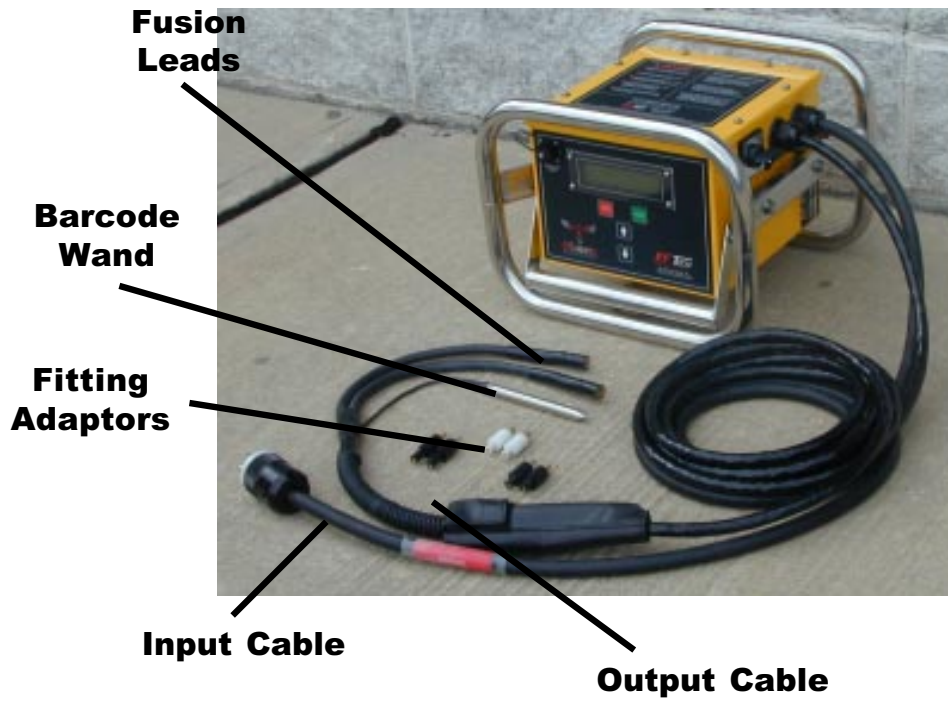
Supply Voltage .....	97 VAC to 150 VAC
Supply Frequency .....	47 Hz to 70 Hz
Supply Waveform .....	Sine Wave or Square Wave
Maximum Supply Current .....	42 Amps at 80 Amps Output
Output Voltage .....	8 VAC to 48 VAC
Operating Temperature Range .....	0°F to 120°F
Operating Modes .....	Barcode and Manual
Fusion Information Storage .....	2700 Fusions
Download Port .....	Serial
Serial Port Specifications .....	9600 Baud, 8 Data Bits 1 Stop Bit, No Parity
Languages .....	English
Fitting Adapters (one set included) .....	Uponor, Central, Friatec, Innogaz
Environmental Protection .....	IP54 Splash-Proof
Calibration Interval .....	1 Year
Warranty .....	1 Year

## Control Descriptions

### NOTES:

- 1 References to controls in this section are displayed exactly as they appear throughout the remainder of this document.
- 2 The **GREEN button** may mean **START** or **CONTINUE** depending upon the context of the operation being performed at the time.
- 3 The **RED button** may mean **STOP** or **RESET** depending upon the context of the operation being performed at the time.
- 4 The **UP button** and **DOWN button** are used to scroll through the various menus. These buttons should be used when the processor menu displays +/- selection options. (**UP button** for "+"; **DOWN button** for "-")



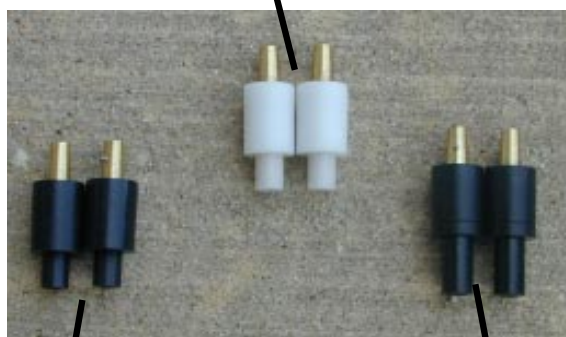




**Storage Bag**

**Temperature Sensor**

**INNOGAZ  
FRIATEC  
4.0mm  
Adaptors  
(White Body)**



**CENTRAL PLASTICS  
Adaptors  
(Black Body)**

**UPONOR Adaptor  
4.7mm  
(Black with Groove)**

## Customer Responsibilities

The ***Phoenix* Electrofusion Processor** is a reliable, easy-to-use, rugged tool designed to withstand the conditions found at construction sites in North America. With proper care, the unit will perform for many years.

There are, however, some general guidelines that should be followed to extend the life of the unit and keep it in warranty.

1. The ***Phoenix* Electrofusion Processor** is splash resistant, NOT WATERPROOF. It should be stored in a clean, dry environment at a temperature between 0-120°F. DO NOT STORE THE UNIT OUTSIDE. DO NOT WASH THE UNIT WITH A HOSE.
2. The enclosure is very durable and shock resistant; however, do not subject the processor to any unnecessary shocks or stresses including but not limited to:
  - Tossing the processor into or out of a vehicle
  - Dropping the processor
  - Dragging the processor by the leads
3. Under no circumstances should the ***Phoenix* Auto ID Electrofusion Processor** control panel be opened. There are no user serviceable parts in the Processor.
4. Subscribe to the yearly calibration service offered by EF Technologies, Inc.

The ***Phoenix* Auto ID Electrofusion Processor** will provide the proper outputs for a complete fusion based on the inputs received from the stored fitting data (in the Auto ID mode) or from the operator (in the Manual mode). Whenever possible, the Auto ID mode should be used.

When using the Auto ID mode make sure that **ALL** fitting information (i.e.: Manufacturer, Description, etc.) identified by the Processor is identical to the information from the fitting that you intend to fuse.

If circumstances necessitate the use of Manual Mode, be sure the fusion data (voltage and time) are correct for the temperature at which the fitting is to be fused. This information should be obtained from the fitting manufacturer. **Contact the fitting manufacturer for manual mode fusion charts.**

**DO NOT, UNDER ANY CIRCUMSTANCES FUSE AN INCORRECTLY IDENTIFIED FITTING!!!**

**Service Recommendations**

**Customer Maintenance**

There are a few simple services that can be performed by the user that will ensure proper operation.

1. Keep the area around the Temperature Sensor clean and free of obstructions by wiping with a soft dry towel. This is a critical area to keep clean, as dirt will affect the ambient temperature reading and thus, fusion times.
2. When making a fusion, make sure the fitting adapters are clean and properly attached to the output cable. Failure to do so may result in a lower voltage applied to the fitting.
3. Proper care of the Processor and output cables will greatly extend the life of the ***Phoenix* Auto ID Electrofusion Processor** and will help reduce service times and costs.

**Factory Service:**

It is strongly recommended that each unit be returned once a year for factory calibration. This will ensure that **The *Phoenix* Electrofusion Processor** is in proper calibration and will enable any potential problems to be identified.

When the calibration period has expired the unit will display the message, **Calibration Required**, informing the user that calibration is required. This will not prevent the Processor from performing fusions, however, the unit should be returned as soon as possible for calibration.

**Call (302) 451-1088 to make arrangements for service and to obtain an RMA number for the return.** Every effort will be made to return Processors within 2 business days.

Repair and calibration returns should be sent to:

**E.F. Technologies  
119B Sandy Drive  
Newark, DE 19713**

The correct output voltage cannot be assured if the Processor is not calibrated at least once a year.

## Service Contract Options

Contact EF Technologies at (302) 451-1088 for details regarding service contracts.

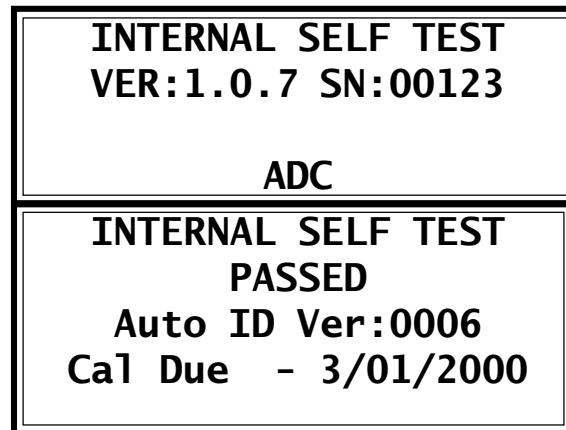
## GENERAL OPERATION

### Fusing a Fitting

The **Phoenix Auto ID Electrofusion Processor** is designed to provide the energy necessary to complete a fusion based on the information contained in memory in the Auto ID mode or the information entered by the operator in the Manual mode. EF Technologies strongly recommends that the Auto ID mode be used whenever possible.

1. Turn the **Power/Emergency Stop Switch** counter clockwise from the **OFF** to **ON**.

After the Processor has been turned on, start-up screens similar to the following will be displayed one after another.



After SELF TEST, the WELCOME, PRG.CHECK, and DATE/TIME screens will be displayed, if the Processor is equipped for Operator traceability, the Operator, Location, and Information screen will appear next. If this screen appears see page 25 for instructions on how to enter the data.

2. After the above data is entered the Processor will then display a screen similar to the following:

## CONNECT FITTING

**Temperature: +72°F**  
**Genn: 120V 60.0Hz**

The second line indicates the ambient temperature the Processor is measuring and will be used to modify the fusion time if required by the fitting manufacturer. If the External Temperature sensor is attached (*see page 33*), the display text will indicate such. Check to make sure that the temperature is reasonable. If the Processor has been in direct sunlight or has been moved from a hot or cold environment the temperature may not be correct. If the temperature indicated is not correct, allow the Processor time to adapt to the correct temperature. The last line indicates the generator status. The voltage and the frequency are displayed. It is important that the voltage measurement is within the allowable range (97-150) and the frequency is stable.

Pressing and holding down the **UP button** while the Processor is at the connect fitting screen will show a unit information screen similar to the following.

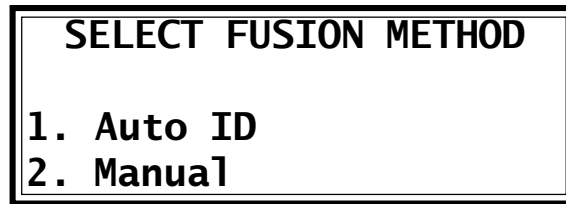
**VER:1.0.7 SN:00123**  
**Fusion Number:01024**  
**04/03/1999 15:30**  
**Cal: 02/24/2000**

This screen shows the following information:

- Software version of the Processor (In this case version 1.0.7).
- Processor serial number (In this case, 00123).
- The number of fusions the Processor has performed (In this case, 1024).
- The Date and time (In this case April 3<sup>rd</sup>, 1999 at 3:30 PM)
- The date the Processor will be due for calibration (In this case it is due February 24<sup>th</sup>, 2000)

Releasing the **UP button** returns the user to the Connect Fitting screen.

3. When the output cables are connected to a fitting the following screen will be displayed and a blinking cursor will be on the number 1:



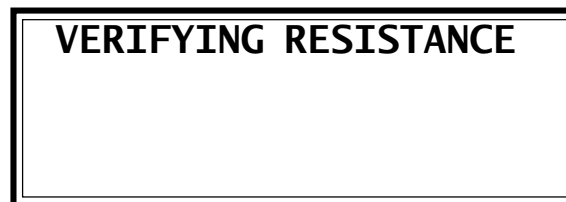
Use the **UP** or **DOWN** buttons to move between 1 and 2. When the mode that you want to use is selected press the **START** button.

NOTE: If the OPERATOR identification option is enabled and required, one or more of the fusion methods shown above may not appear depending on the encoded skill level of the Operator.

The **Phoenix Auto ID Electrofusion Processor** is designed to run in either the Auto ID fusion mode or the Manual fusion mode.

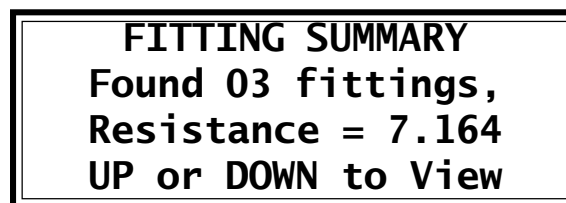
### **Auto ID Fusion**

1. When fusion method 1 (Auto ID) is selected, the following screen will be displayed:



At this point the Processor is checking the resistance of the fitting and comparing it to the fittings stored in the Auto ID memory.

2. After the comparison is made the Processor will display a screen indicating the number of fittings in memory that match the resistance measured by the Processor. The screen will be similar to the following:



If there are no fittings found the screen will indicate (“Found 00 fittings”).

If this happens you must press the **STOP button** to move back to the **SELECT FUSION METHOD** screen and then connect a fitting that is in the Auto ID data base or update the data base with the fitting parameters.

3. If one or more fittings are found, press the **UP** or **DOWN button** to scroll through the fittings. After pressing the **UP** or **DOWN button** a screen similar to the following will be displayed.

<b>VERIFY AUTO ID 001</b>
<b>UP        COUPLR 40.0V</b>
<b>002__"I 060s 2.8Ω</b>

The screen example above indicates that the fitting found:

1. Is an Uponor (UP) fitting.
  2. Is a Coupler (Couplr)
  3. Is to be fused at 40.0 volts.
  4. Is a 2" IPS Coupler.
  5. Has a standard fusion time of 60 seconds.
  6. Has a resistance of 2.8 ohms.
4. The Processor is asking the operator if this information is correct. If this is the fitting that you intend to fuse press the **START button**. If this is not the correct fitting, use the **UP** or **DOWN button** to scroll through the other fittings identified. If you can not find the correct fitting you **MUST** press the **STOP button** to move back to the **SELECT FUSION METHOD** screen. Then connect a fitting that is in the Auto ID data base or update the data base with the most current fitting information.

**DO NOT, UNDER ANY CIRCUMSTANCES, FUSE AN INCORRECTLY IDENTIFIED FITTING!!!**

### **Verify Fitting Data**

After the proper fitting has been identified, the following screen will be displayed which gives you another chance to check the fitting identification before fusing.

<b>VERIFY Auto ID 001</b>
<b>UP        COUPLR 40.0V</b>
<b>002    "I 060s 2.8Ω</b>
<b>PRESS START</b>

**DO NOT FUSE A FITTING THAT DOES NOT MATCH ALL OF THE INDICATED INFORMATION ON THIS SCREEN!!!**

5. The PRESS START line will be blinking and the Processor will beep. Press the **START button** to begin fusing. The following screen will be displayed indicating that the **Phoenix Auto ID Electrofusion Processor** is performing a resistance test on the fitting currently connected to the leads and measuring the ambient temperature. If the resistance is within the error limits programmed for the particular fitting, the fusion will progress. If the measured resistance is outside of these limits, the fusion will be aborted and an error message will be displayed.

**VERIFYING FUSION  
PARAMETERS**

The Processor will now fuse the fitting. See *Finishing a Fusion* on page 18.

### **Manual Fusion**

NOTE : In the MANUAL mode of operation there is no fitting identification or cross check to see if the correct fitting is connected. The Processor will supply the voltage selected for the time selected.

When the Manual fusion method is selected the following screen will be displayed:

**ENTER FITTING DATA**  
**Mfg. : Uponor**  
**Type :**  
**Size :**

The unit is now ready to receive the information necessary to complete a manual fusion.

NOTE: The **Phoenix Auto ID Electrofusion Processor** will provide the appropriate outputs for a complete fusion based on the inputs entered by the operator. Therefore, if the Manual mode is used, be sure to enter **EXACTLY**, the fitting manufacturers recommended

fusion voltage and time at the current ambient temperature.

**NOTE : Steps 1-3 in this section provide information used in the download only.** The information entered in these steps has no effect on the fusion. The only pieces of information that have a direct effect on the fusion parameters are the voltage and time.

1. Use the **UP** and **DOWN buttons** to scroll through the different fitting manufacturers. When the manufacturer of the fitting you intend to fuse is shown, press **START**.
2. Use the **UP** and **DOWN buttons** to scroll through the list of fitting types. (See page 27 for a list of Fitting Types and the associated fitting symbols.) When the type of fitting you intend to fuse is shown, press **START**.

<b>ENTER FITTING DATA</b>
<b>Mfg. : Uponor</b>
<b>Type: <u>C</u>OUPLR I</b>
<b>Size:</b>

3. Data is entered in one of two possible ways depending on the number of dimensions the selected Fitting Type has.

### **One Dimension Fittings**

For fittings with only one dimension the operator will first need to enter the dimensioning units of the fitting to be fused. Use the **UP** and **DOWN buttons** to scroll through the three available dimensioning units: “I (IPS Inches), “C (CTS Inches), or MM (Millimeters). When the desired dimensioning units are shown, press **START**. The desired dimensioning units will be entered and the size line will appear: { Size: 00 “I }. At this point the operator needs to enter the whole number portion of the dimension using the **UP** and **DOWN buttons**. For example, if the fitting were a 1 1/4” IPS Uponor coupling, the operator would enter 01 as the whole number portion of the dimension. When the whole number portion of the dimension is entered press **START** the fitting size line should now look similar to this: { Size: 01\_ “I }. Use the **UP** and **DOWN buttons** to scroll through the available fractional dimensions (none (*blank*), 1/4, 3/8, 1/2, and 3/4) until the desired “1/4” is shown. Press **START**.

Example: The following screen is what would be shown if the user selected a 1 1/4” IPS Uponor Coupling:

**ENTER FITTING DATA**  
**Mfg. : Uponor**  
**Type: COUPLR I**  
**Size: 01¼”I**

### Two Dimension Fittings

For fitting types with 2 dimensions, such as reducers and tapping tees, the operator does not need to enter any data at all, but merely has to scroll through the available dimensions. For the first dimension use the **UP** and **DOWN buttons** to scroll through the available CTS, IPS and MM sizes. When the desired dimension is shown, press **START** to advance to the next dimension. Again use the **UP** and **DOWN buttons** to scroll through the available CTS, IPS and MM dimension sizes until the desired one is shown. Press **START**.

*Example:* The following screen is what would be shown if the user selected a ¾” IPS x ½” CTS Uponor Reducer:

**ENTER FITTING DATA**  
**Mfg. : Uponor**  
**Type: REDUC. Y**  
**Size: 0¾”Ix0½”C**

4. After the fitting manufacture, type and size are entered the following screen will appear.

**ENTER FUSION VOLTAGE**  
**40.0 Volts**  
**Min:10.0V Max:40.0V**

5. Enter the voltage (see page 27 *Entering Data with the Keypad*) and then press the **START button**. The following screen will be displayed:

**ENTER FUSION TIME**  
**000 Seconds**  
**Temperature:+75°F**

6. Enter the correct time (see page 27 *Entering Data with the Keypad*) and then press the **START button**. Contact the manufacturer of the fitting that you are using for the manual mode fusion charts for their electrofusion fittings. The following screen will be displayed:

**ENTER COOLING TIME**  
**00 Minutes**  
**UP-DOWN to Enter**  
**Press START to Cont.**

7. The Processor is asking for the fitting manufacturers recommended cooling time. Select the cooling time by using the **UP** and **DOWN buttons** to scroll through the available times until the manufacturers recommended cooling time for the fitting you are about to fuse is shown. Press the **START button** to accept the data and move to the next screen.
8. After the proper fitting has been entered in the manual mode the following screen will be displayed which gives you another chance to check the fitting identification before fusing.

**VERIFY FITTING DATA**  
**Uponor REDUC. 40.0V**  
**0¾" I x 0½" C 032s 13.4Ω**  
**PRESS START**

The screen example above indicates that the fitting entered:

1. Is an Uponor (UP) fitting.
2. Is a Reducer
3. Is to be fused at 40.0 volts.
4. Is a ¾" IPS by ½" CTS fitting.
5. Is to be fused for 32 seconds.
6. Has a resistance of 13.4 ohms.

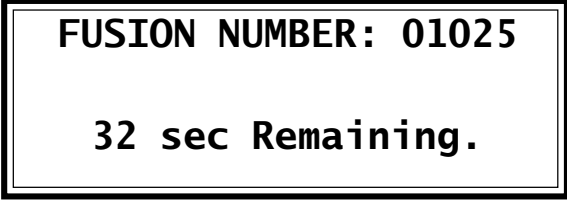
**DO NOT FUSE A FITTING THAT DOES NOT MATCH ALL OF THE  
INDICATED INFORMATION ON THIS SCREEN!!!**

9. The **PRESS START** line will be blinking and the Processor will beep. Press **START** to begin fusing the fitting.

## **Finishing a Fusion**

While the fusion is in progress a screen similar to the following will be shown.

**NOTE: AT ANY TIME DURING THE FUSION PRESS THE STOP  
BUTTON TO ABORT!!!**

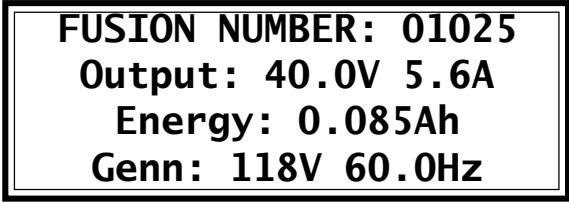


**FUSION NUMBER: 01025**

**32 sec Remaining.**

This screen displays the fusion number, in this case number 1025, and the time left to complete the fusion, in this case 32 seconds. The seconds will count down as the fusion progresses.

Note: Pressing and holding the **UP button** while a fusion is in progress will show an information screen similar to the following.



**FUSION NUMBER: 01025**  
**Output: 40.0V 5.6A**  
**Energy: 0.085Ah**  
**Genn: 118V 60.0Hz**

This screen shows the following information:

- The number of fusions the Processor has performed (In this case, 1025).
- Measured output voltage of the Processor (In this case 40.0 volts).
- Measured output current of the Processor (In this case 5.6 amps).
- The energy expended by the batteries, in amp-hours, for the fusion in progress. (In this case 0.085 amp-hours.) Note: This number increases during the fusion as energy is expended.
- The present measured voltage of the generator (In this case 118 volts).
- The current generator frequency. This number should remain relatively constant throughout the fusion.

When the fusion is complete a screen similar to the following will be displayed.

**FUSION COMPLETE**  
**#01205 Cool 05 min**  
**Req. 032s Act. 032s**  
**Press START to Cont.**

This is useful in determining whether or not the fusion was completed successfully. In addition to the fusion number and the fitting manufacturers recommended cooling time, in this case 5 minutes, there are two additional pieces of information. The Requested fusion time and the Actual fusion time

The Requested fusion time is the time that the processor was supposed to fuse for (including temperature compensation). The actual fusion time is the time that the processor actually fused. When the two numbers are equal, the processor fused for the proper time. If the numbers are not equal, more than likely, some error will have occurred to cause the fusion to stop prematurely. Note the error code and the actual fusion time and contact the fitting manufacturer to determine if the fitting can be re-used or must be discarded.

If both numbers are equal, simply note the cooling time and press the **START button**. The following screen will appear:

**DISCONNECT**  
**OUTPUT LEADS**

The Processor prompts the user to disconnect the leads and will not recognize any inputs until this task is complete (This safeguard ensures that the same fitting will not be mistakenly fused twice). Once the leads have been disconnected the unit is ready to fuse another fitting.

After the output leads are disconnected the Processor will return to the **CONNECT FITTING** screen shown on page 12 of this manual.

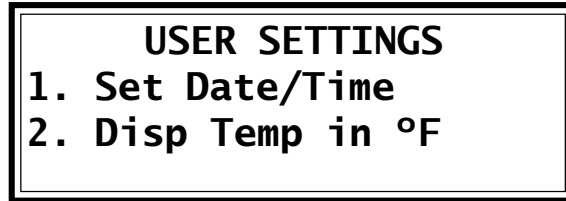
**NOTE:** Remember that any Operator ID Codes, Location and/or Information Fields entered previously will remain attached to any additional fusions until the power is shut off or until the information is changed by the operator.

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# USER MENUS

## Basic Users Menu

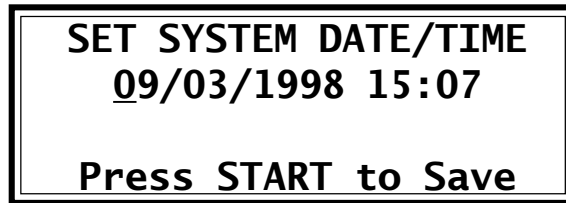
To set the time/date and default temperature units (F° or C°) turn the **Power/Emergency Stop Switch** counter clockwise from **OFF** to **ON INT** while holding down the **UP button**. The following screen will appear.



Use the **UP** and **DOWN buttons** to highlight the number of the setting you would like to change.

### Setting Date/Time

When the setting “SET DATE/TIME” is highlighted pressing the **START button** will advance the user to a screen similar to the following.



Enter the correct date (*see Entering data with the keypad on page 27*) using the MM/DD/YYYY format and the correct time using the 24 hour (military) format. Pressing the **START button** to save the information entered and return to the User Settings screen shown above.

### Setting Temperature Units

When Disp Temp in °F is highlighted, pressing the **START button** will toggle the **Phoenix Auto ID Electrofusion Processor** default temperature units setting between °F and °C.

Press the **STOP button** to return to normal unit operation.

## Advanced Users Menu

The Advanced Users Menu will allow an owner or supervisor with the proper codes, to set the default values for the OPERATOR, LOCATION, INFORMATION fields and for the default temperature compensation field.

To access the Advanced Users Menu, turn the **Power/Emergency Stop Switch** counterclockwise to the **ON INT** position while holding the **Down Button** control on the Processor. The following screen will appear.

<p style="text-align: center;"><b>ADVANCED USER MENU</b> <b>0000</b>  <b>Enter Code</b></p>
---------------------------------------------------------------------------------------------------------

Enter the 4 digit access code (see *Entering data with the keypad* on page 27 for instructions on how to enter this information) then press the **START button**. A screen similar to the following will appear.

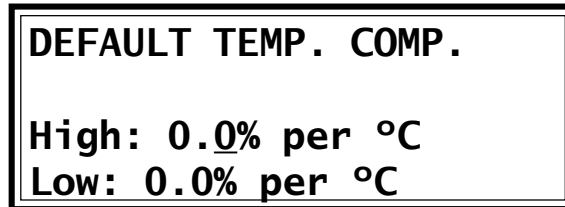
<p style="text-align: center;"><b>ADVANCED OPTIONS</b></p> <table><tr><td><b>1. Opr ID Req</b></td><td><b>Yes</b></td></tr><tr><td><b>2. Location Req</b></td><td><b>No</b></td></tr><tr><td><b>3. Info Req</b></td><td><b>No</b></td></tr></table>	<b>1. Opr ID Req</b>	<b>Yes</b>	<b>2. Location Req</b>	<b>No</b>	<b>3. Info Req</b>	<b>No</b>
<b>1. Opr ID Req</b>	<b>Yes</b>					
<b>2. Location Req</b>	<b>No</b>					
<b>3. Info Req</b>	<b>No</b>					

This is the option menu for enabling any or all of the OPERATOR, LOCATION, and INFORMATION fields. An option is enabled when the word *Yes* appears. To enable an option, move the blinking cursor to the option you wish to enable then press start until the word *Yes* appears denoting that the option is enabled. To turn an option off, repeat the procedure until the word *No* appears.

Pressing the **DOWN button** when the cursor is on menu option 3 will advance the Processor to menu option 4, Default Temp Comp as shown in the screen below.

<p style="text-align: center;"><b>ADVANCED OPTIONS</b> <b>4. Default Temp Comp</b></p>
--------------------------------------------------------------------------------------------

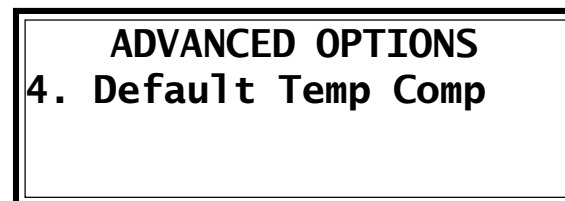
Pressing the **START button** will advance the user to a screen similar to the following.



This screen is where the default temperature compensation for MANUAL fusions is set. The default settings for the Processor are  $\pm 0.0\%$ . If the settings are changed, the quality of Manual Mode fusions could potentially be compromised. Please contact the fitting manufacturer of the fittings that you are currently using before changing the default temperature compensation settings.

NOTE: The temperature compensations set in this menu will have no effect on Auto ID fusions. The temperature compensation information for Auto ID fusions comes from the individual fitting parameters already programmed into the Processor's memory.

Enter the default High compensation (*see Entering data with the keypad on page 27 for instructions on how to enter this information*). When the **START button** is pressed the cursor will automatically advance to the Low temperature compensation setting. Enter the default Low compensation, then press the **START button**. The Processor will return to the Advanced options menu screen shown below.



Pressing the **STOP button** will take the Processor out of the Advanced User Menu and return it to standard operating mode.

## Options

### Traceability

NOTE: The traceability codes are an option that can be enabled only at the factory. If the option is enabled, the

following screen will be displayed after the Processor has passed its internal self test. This data will not affect the fusion but will be associated with the fusion in the download data.

ENTER OR SCAN DATA	
<b>Operator:</b>	.
<b>Location:</b>	.
<b>Info:</b>	.

Data may be entered into these fields and will be attached to all fusions done by this Processor until the power is turned off or the data is manually changed. Enter data by scanning a valid Operator ID barcode or by using the keypad. If you do not wish to enter any data in a particular field simply press the **START button** to bypass.

### **Operator ID**

NOTE: Gas company policy may require valid operator information be entered into the Operator Field. If an operator ID is required (*see page 11*), the Processor will not allow the operator to proceed unless valid data is scanned (Data can not be entered through the keypad if the Operator ID is required by the Gas Company).

When an Operator ID barcode is scanned with the barcode wand (*see page 29*), the following information will be recorded and utilized:

- **Operator ID Code:** This code is a 6 digit alphanumeric code used to identify the individual operator.
- **Operator Skill Level:** The skill field will allow supervisors to prevent operators from utilizing fusion methods for which they are untrained. For example, if operator A has been trained to complete both Auto ID and manual fusions, his ID Card will enable both menu options on the Processor. However, if operator B has only received training for Auto ID fusions his ID Card will only enable that menu option on the Processor. Operator B will be unable to access the manual fusion method option on the Processor.
- **Language that the operator speaks:** This option automatically sets the language of the Processor to the native language of the operator.

- **Expiration Date of the Card:** This field allows supervisors to set an expiration date on the ID Card. When this date has passed, the Processor will display the following screen when the ID Card is scanned and will not recognize this card as valid. The operator will not be permitted to continue until a valid ID Card has been scanned.

<b>ENTER OR SCAN DATA</b>	
<b>Operator:</b>	<b>Expired.</b>
<b>Location:</b>	.
<b>Info:</b>	.

When the Operator ID number is entered via the keypad only the 6 digit Operator ID Code is recorded.

The operator ID information will be associated to any fusion performed until the Processor is turned off or a new operator code is entered.

### **Location and Information Fields**

NOTE: Gas company policy may require valid information be entered into any one of these fields. If information is required (*see page 11*), the Processor will not allow the operator to proceed unless valid data is scanned or entered through the keypad.

- **Location Code:** This code is a 10 digit alphanumeric code used to identify the place that the fusion was performed.
- **Information Code:** This code is a 6 digit alphanumeric code used to identify any additional information pertinent to the fusion.

# APPENDIX



## Entering Data with the Keypad

To enter data in any field manually, press the **UP button** or the **DOWN button** to scroll through the list of valid characters. When you find the one you wish to use press the **START button** to move to the next character. If an invalid character is entered, press the **STOP button** to back the cursor up to the previous character and change it (if the **STOP button** is pressed while on the first character the Processor will back up to the previous screen). Repeat this procedure until all data is displayed. When the **START button** is pressed after the last character the Processor will accept the data and move to the next screen (if the **START button** is pressed when a blank character is displayed, the Processor will skip the rest of the field and move to the next screen).

### NOTES:

- The Processor will not allow an operator to enter invalid or out of range data. Example: If the maximum number allowed in a field is 40.0 the Processor will not allow the user to enter a number greater than 40.0.
- When entering data, the Processor will acknowledge valid data with one beep and continue. If there is an error encountered the Processor will beep twice and not continue.

## Fitting Types

Symbol	Fitting Description	Processor Abbreviation	Number of Dimensions
<b>I</b>	Coupler	<b>COUPLR</b>	1
<b>[</b>	Socket	<b>SOCKET</b>	1
<b>T</b>	Tee	<b>TEES</b>	1
	Tapping Tee or Saddle	<b>TAP. T</b>	2
<b>Y</b>	Reducer	<b>REDUC.</b>	2
<b>C</b>	Elbow	<b>ELBOW</b>	1
<b>&lt;</b>	Ray Trans	<b>RAYTRN</b>	1
	TDW Tapping Tee	<b>TDW TT</b>	1

## Guidelines for Selecting a Generator

It is important that the power source is sized properly for the fittings to be fused. Any power source that will provide a stable voltage between 97 VAC and 150 VAC at a frequency between 47 Hz and 70 Hz with clean zero crossings and enough current may be used. The maximum power source necessary for a fusion can be calculated by using the following formula:

*Current Required to Fuse Fitting*

---

1.90

For example, if the largest fitting to be fused required 80 Amps, then the maximum generator current is:

$$\frac{80}{1.90} = 42.2 \text{ Amp Supply Current}$$

A 5000 Watt/ 120 Volt generator will allow the processor to supply 80 Amps of current. This is the maximum rated output current of the processor.

**NOTE:** When selecting a generator, be certain that it can supply the needed current at 120V. Some generator vendors size their generators at 240V and can only source 1/2 that power at 120V.

## Auxiliary Port

The Auxiliary port is multifunctional. It accepts:

1. Barcode Wand
2. Download Cable/EMM
3. External Temperature Sensor

### Barcode Wand

Plug the Barcode Wand into the Auxiliary Port by pushing it in and turning clockwise. The tip on the Barcode Wand will light red when the Processor is turned on. While holding the wand at a slight angle, as you would a pencil, position the point slightly to one side of the label and move the wand rapidly across the barcode stopping at a point slightly off the label on the other side.

**NOTE:** The *Phoenix* Auto ID Processor WILL NOT SCAN A FITTING BARCODE.

**NOTE:** The barcode may be scanned left to right or from right to left as long as the scan speed is brisk and consistent. For example, do not change the speed of the wand as it travels across the barcode label.

**NOTE:** To attach a barcode wand to the Auxiliary Port, certain hardware must be installed in the processor. Unless you ordered this modification when you purchased the processor, the barcode functionality will not work.

### Downloading Processor Fusion Data/ Reprogramming

The fusion data stored in the *Phoenix* Auto ID Processor may be downloaded from the Processor with a personal computer or an EMM (External Memory Module) using the Download Manager software. The Download Manager software and EMM's are both available from EF Technologies, call (302) 451-1088 for price and availability.

#### **Downloading to a Personal Computer**

To download the fusion data to a PC using the Download Manager software refer to the Download Manager software documentation.

## Downloading to an EMM

To download the fusion data using an EMM follow these steps:

**Note:** Depending on the amount of free memory space available on the EMM it is possible that the *Phoenix Auto ID* will have more fusion data available for download than the EMM can store. The following instructions show the steps necessary to do multiple downloads. If only one EMM is available or multiple downloads are not feasible the *Phoenix Auto ID* “remembers” where the previous download left off and will start from that point during subsequent downloads. **At no point will data be lost from the Processor memory by not downloading all available data.** However it should also be noted that if the fusion data limit of 2700 fusions is reached before the data is downloaded the oldest data will be overwritten.

- 1) Connect the EMM to the auxilliary port of the Processor.
- 2) Turn on Processor.
- 3) The following screen will appear:

**SERIAL DEVICE FOUND!**  
**1. Download Data**  
**2. Program Processor**

- 4) Use the **UP and DOWN buttons** to position the blinking cursor over option 1, then press **START**.
- 5) The Processor will now check for available memory space on the EMM and attempt to download the fusion data.

**PRESS START TO  
START DOWNLOAD**

If there is available free space on the EMM the Processor will start downloading the fusion data and a screen similar to the following will appear:

**DOWNLOADING DATA**  
**50%**  
**Press STOP to Cancel**

The percentage shown increases until the counter reaches 100%, indicating that the Processor has completed the download or that the EMM memory is full (NOTE: If the EMM has no available memory, the previous screen will pass by very quickly). A screen similar to the following will then appear:

**DOWNLOAD FINISHED**  
**Fusions Sent: XXXXX**  
**Fusions Left: YYYYY**  
**Press START to Continue**

Where X is the number of fusion data records that the Processor had available for download and Y is the number of records actually downloaded from the Processor. If X and Y are equal than pressing the **START button** will return the user to the **CONNECT FITTING** screen and the Processor will be ready for normal use.

If Y is 0 then the EMM was full and the Processor was unable to download any records and pressing **START** will take the user to the **Ext Device Full** screen shown below.

If X is a value larger than Y than the Processor has more records to download than the EMM has available memory. Press **START** and the following screen will appear:

**SERIAL DEVICE FULL**  
**Disconnect Device**  
**STOP to Finish Later**

To finish the download at a later time, press the **STOP button** and the Processor will return to the **CONNECT FITTING** screen and ready for normal use.

To continue downloading fusion data you will need to have another EMM available with free memory space on it. Remove the full EMM and the following screen will appear:

**CONNECT EMPTY  
DEVICE**

An internal timer will count down until a new EMM is connected to the serial port, or the timer reaches 10 seconds. If a new EMM is detected, the Processor will proceed back to the DOWNLOADING screen and continue the downloading process. If a new EMM is not connected, the Processor will proceed to the CONNECT FITTING screen.

### **Programming with New Auto ID Data from an EMM**

1. Plug EMM into Auxilliary Port.
2. Turn Processor on

**SERIAL DEVICE FOUND!  
1. Download Data  
2. Program Processor**

3. Select #2: "Program Processor" and press **START**

**Press START to  
Start Re-Program**

4. Press **START**

**OLD: 0001 03/05/1999  
NEW: 0002 04/15/1999  
START to Overwrite  
STOP to Cancel**

Here **Old: 0001 03/05/1999** is the version and date of the Auto ID data in the Processor and **New: 002 04/15/1999** is the new Auto ID data that is going to be loaded onto the Processor. If you want to reprogram the Processor with the new data, press **START**. If the **STOP**

**button** is pressed, the Processor will go to the CONNECT FITTING screen.

When the **START button** is pressed, the following screens will be displayed in sequence:

**SAVING DATA!**

**00000000000000000000**  
**00000000000000000000**

**DECODING RESISTANCES**  
**FITTING: 001**  
**R Max    2.340**  
**R Min    3.150**

The Fittings will count up. When the transfer is complete the Processor will display the CONNECT FITTING screen.

You may now remove the EMM and operate the Processor normally.

### **External Temperature Sensor**

The external temperature sensor can be used to sense the temperature at the location of the fitting, which can be different from that of the Processor. It can also be used to speed up the equilibration of the Processor to ambient temperature. To use the external temperature sensor, just plug it into the Auxilliary Port, and the Processor will automatically detect it. The temperature display will be as follows:

**CONNECT FITTING**

**Ext Temp:        +72 ° F**  
**Genn: 120V 60.0Hz**

When using the External Temperature sensor , be sure that the sensor end is located as close to the fitting you are about to fuse as possible.

## ERROR CODES

Processor Displays:	Problem(s):	Solution(s):
Calibration Required	<ul style="list-style-type: none"> <li>• The <b>Phoenix Auto ID</b> has been in service for greater than one year since it's last calibration.</li> <li>• The date/time setting of the <b>Phoenix Auto ID</b> is not correct.</li> </ul>	<ul style="list-style-type: none"> <li>• Call <b>EF Technologies</b> (302-451-1088) to schedule calibration for the <b>Phoenix Auto ID</b> .</li> <li>• Set date/time of the <b>Phoenix Auto ID</b> to the correct date/time (see <b>Setting Time/Date and Temperature Units</b> portion of the <b>General Operation</b> section of the manual for how to set this information.</li> </ul>
No Valid Cal Data Return For Service	<ul style="list-style-type: none"> <li>• The <b>Phoenix Auto ID</b> has experienced an internal circuit board fault.</li> </ul>	<ul style="list-style-type: none"> <li>• The <b>Phoenix Auto ID</b> needs to be returned to <b>EF Technologies</b> for repair. Call (302-451-1088) for an RMA number, and to schedule the unit for repair</li> </ul>
Voltage Reference Return For Service	<ul style="list-style-type: none"> <li>• The <b>Phoenix Auto ID</b> has experienced an internal voltage reference problem.</li> </ul>	<ul style="list-style-type: none"> <li>• The <b>Phoenix Auto ID</b> needs to be returned to <b>EF Technologies</b> for repair. Call (302-451-1088) for an RMA number, and to schedule the unit for repair.</li> </ul>
Current offset Return For Service	<ul style="list-style-type: none"> <li>• The <b>Phoenix Auto ID</b> has experienced an internal offset error.</li> </ul>	<ul style="list-style-type: none"> <li>• The <b>Phoenix Auto ID</b> needs to be returned to <b>EF Technologies</b> for repair. Call (302-451-1088) for an RMA number, and to schedule the unit for repair.</li> </ul>
Fitt current Exceeds Maximum Rating  <i>or</i>  Fitt Voltage Exceeds Maximum Rating	<ul style="list-style-type: none"> <li>• The <b>Phoenix Auto ID</b> has been instructed to perform a fusion that exceeds the maximum output current or voltage of the processor.</li> </ul>	<ul style="list-style-type: none"> <li>• The <b>Phoenix Auto ID</b> has a maximum output current of 80 amps or voltage of 48 volts.</li> <li>• Verify that the fitting parameters are entered correctly. If the fitting parameters are incorrect, reenter the data correctly and try fusing the fitting again.</li> </ul>
Over Current	<ul style="list-style-type: none"> <li>• The <b>Phoenix Auto ID</b> has sensed an over current condition during the fusion.</li> </ul>	<ul style="list-style-type: none"> <li>• The pipe gap inside the fitting is too large creating a “short stab” condition.</li> </ul>
Fitting Disconnected While Fusing	<ul style="list-style-type: none"> <li>• One or both of the output connectors has become disconnected from the fitting.</li> </ul>	<ul style="list-style-type: none"> <li>• Check output cable connectors and fitting adapters for excessive wear and/or damage. If the output connectors and fitting adapters are in good condition, reattach the <b>Phoenix Auto ID</b> to another fitting and try fusing again.</li> </ul>

## ERROR CODES

Processor Displays:	Problem(s):	Solution(s):
Fusion Aborted By Operator	<ul style="list-style-type: none"> <li>The operator of the <b>Phoenix Auto ID</b> has stopped the fusion in progress by pressing the STOP (cancel) button.</li> </ul>	<ul style="list-style-type: none"> <li>Address the problem that caused the operator to stop the fusion in progress.</li> </ul>
Power Supply Cut Off During Last Fusion	<ul style="list-style-type: none"> <li>The Power Switch/Program Stop Switch was switched off by the operator during a fusion..</li> </ul>	<ul style="list-style-type: none"> <li>Address the problem that caused the operator to stop the fusion in progress.</li> </ul>
No Fitting Connected	<ul style="list-style-type: none"> <li>The <b>Phoenix Auto ID</b> has sensed that a fitting is not connected to the output cable.</li> <li>One or both of the output cable connectors have come unattached, or been removed from the fitting.</li> </ul>	<ul style="list-style-type: none"> <li>Attach the output cable to a fitting.</li> <li>Check output cable connectors and fitting adapters for excessive wear and/or damage. If the output connectors and fitting adapters are in good condition, reattach the <b>Phoenix Auto ID</b> to the fitting.</li> </ul>
Fitting Resistance Out of Range	<ul style="list-style-type: none"> <li>The <b>Phoenix Auto ID</b> has done a verification of the selected fitting resistance and found that it does not match the expected parameters.</li> </ul>	<ul style="list-style-type: none"> <li>Check to be sure the fitting matches the fitting selected in the <b>Phoenix Auto ID</b>.</li> <li>If the fitting matches the type selected in the <b>Phoenix Auto ID</b>, the fitting may be defective. Follow the manufacturer's recommendations for defective fittings.</li> </ul>
Cannot Maintain Output Voltage	<ul style="list-style-type: none"> <li>Generator capacity is not sufficient to complete fusion.</li> </ul>	<ul style="list-style-type: none"> <li>Try a more powerful unit.</li> <li>The <b>Phoenix Auto ID</b> needs to be returned to <b>EF Technologies</b> for repair. Call (302-451-1088) for an RMA number, and to schedule the unit for repair.</li> </ul>
Ambient Temp. Out of Range	<ul style="list-style-type: none"> <li>The ambient temperature is below 0°F or above 120°F.</li> </ul>	<ul style="list-style-type: none"> <li>The <b>Phoenix Auto ID</b> will only perform fusions between 0°F and 120°F.</li> </ul>

# GENERAL MAINTENANCE

## Changing the Fuse

### **Background Notes:**

- This fuse protects the internal electronic circuitry. Main power is protected by an auto-resetting circuit breaker. If the display lights up when power is turned on then you **DO NOT** need to replace the fuse.
- This procedure should be performed in a “shop” environment, not a “field” environment.
- The most probable cause of a fuse failure is a defective or mis-used generator. If you have a fuse problem, check your generator.

### **Tools Required:**

- 1/8” Flat Blade Screwdriver
- 5 X 20mm, ¼ Amp Slow Blow Fuse

### **Procedure;**

1. Insert a screwdriver into the slot in the fuse holder cap. Press in slightly, while turning counter-clockwise, then remove the cap. The fuse should come out when the cap is removed.
2. Remove the old fuse and replace it with the new one.
3. Replace the fuse cap by pushing down and turning it clockwise.

## Changing the Fitting Adaptors

### **Background Notes:**

- Fitting adaptors are available for all major U.S. electrofusion fitting suppliers. Adaptors must be changed when fusing a fitting from different suppliers.
- When the fitting adaptor is removed, it is crucial that no dirt or other contaminants be allowed into the socket. If the socket does become contaminated, it must be thoroughly cleaned with a wire brush. (A .30 caliber gun cleaning brush attached to a hand drill works well.)

**Procedure:**

1. Remove the fitting adaptor by firmly grasping the output cable.
2. Verify that the socket is free of dirt and other contaminants. Clean if necessary.
3. Insert the new fitting adaptor into the cleaned socket and tighten it by twisting clockwise.

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