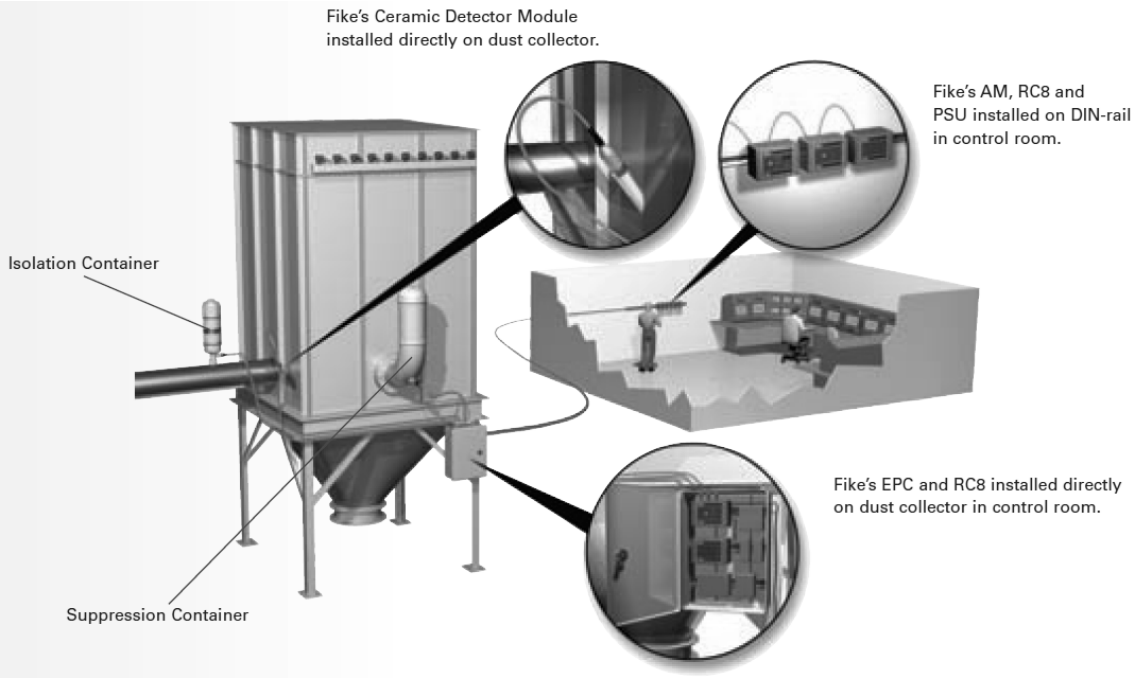
User's Manual

EPACO

EXPLOSION PROTECTION (ACTIVE) CONTROL SYSTEM



Fike®

P/N E06-091, Rev. 0
January 2010

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REVISION HISTORY

Document Name: EPACO USER'S MANUAL

Original Release Date: .....January, 2010

Revision / Description of Change	Revision Date

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1.0 INTRODUCTION

This manual is intended for those individuals who are responsible for the interfacing with Fike's EPACO explosion protection system. The first-time operator should thoroughly read and understand the instructions contained within this manual before interfacing with the EPACO system components.

1.1 PRODUCT SUPPORT

If you have any questions or encounter a problem not covered in this manual, you should first try to contact the Fike Explosion Protection distributor that installed the system as noted below.

For technical support, please contact:

Company Name: _____

Phone Number: _____

Fax Number: _____

E-Mail Address: _____

If you can not locate the distributor, please call Fike Customer Service using the numbers indicated bellow for assistance in locating your nearest distributor, or go to our web-site at www.fike.com.

Fike Blue Springs, USA
Phone: +1-816-229-3405
+1-800-979-FIKE (3453)
Option 23 Explosion Protection Support
Fax: +1-816-229-0314

Or

Fike Europe
Phone: +32-14-21-00-31
Fax: +32-14-21-07-43

1.2 SAFETY INFORMATION

Important safety admonishments are used throughout this manual to warn of possible hazards to persons or equipment.

WARNING

Warnings are used to indicate the presence of a hazard which will or may cause personal injury or death, or loss of service if safety instructions are not followed or if the hazard is not avoided.

Caution

Cautions are used to indicate the presence of a hazard which will or may case damage to the equipment if safety instructions are not followed or if the hazard is not avoided.

Notes: Notes indicate the message is important, but is not of a Warning or Caution category. These notes can be of great benefit to the user and should be read.

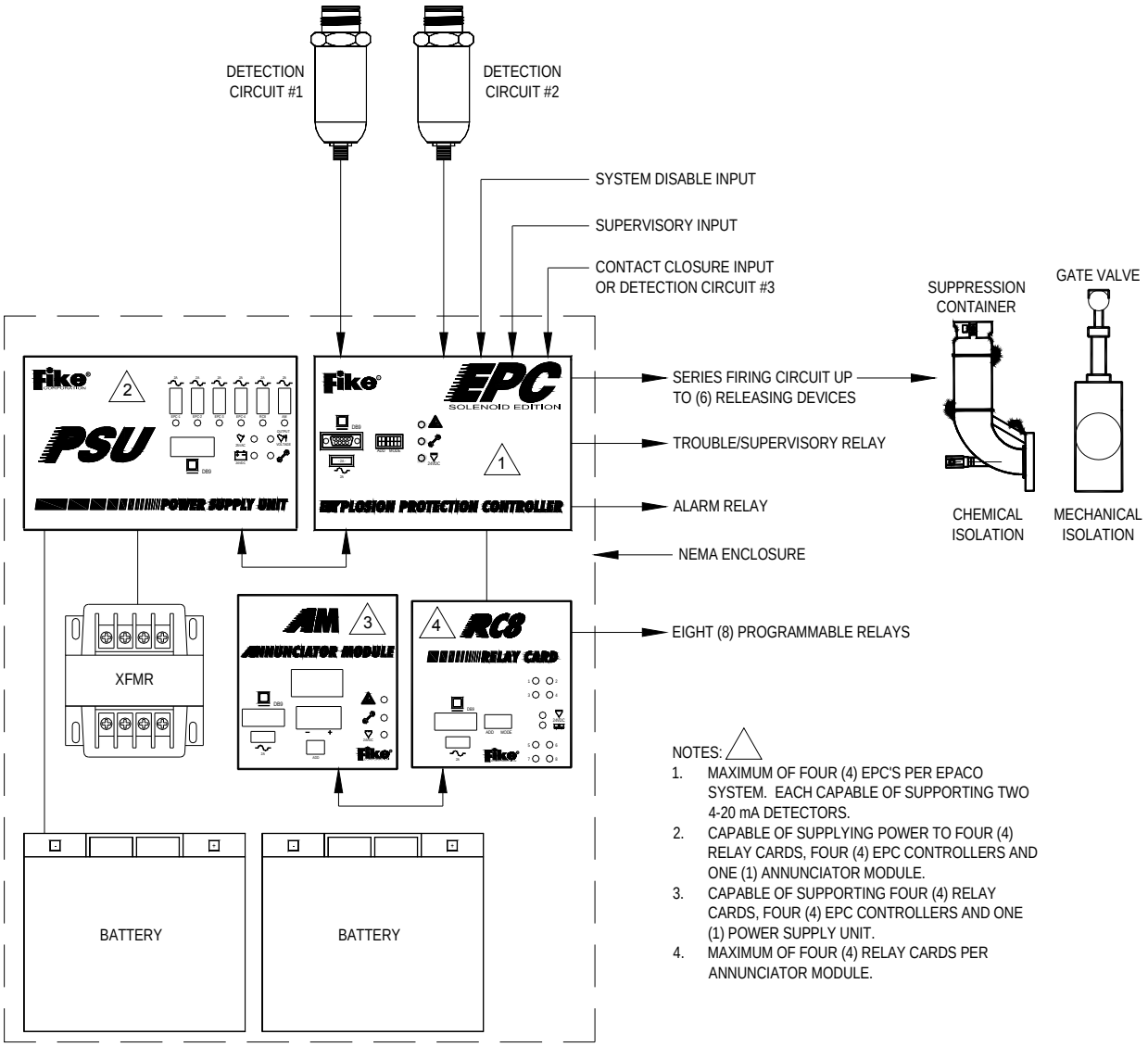
1.3 RELATED DOCUMENTATION

Document Title	Part Number
EPACO System, Explosion Protection Controller (EPC) Installation and Operation Manual	E06-051
EPACO System, Explosion Protection Controller (EPC) Solenoid Installation and Operation Manual	E06-090
EPACO System, Power Supply Unit (PSU) Installation and Operation Manual	E06-052
EPACO System, Annunciator Module (AM) Installation and Operation Manual	E06-053
EPACO System, Relay Card (RC8) Installation and Operation Manual	E06-054

2.0 EPACO™ SYSTEM OVERVIEW

The EPACO™ explosion detection and control system is comprised of explosion detectors, control unit (EPC), power supply unit (PSU), optional annunciator module (AM) and relay cards (RC8). EPACO™ combines the latest in addressable technology with simplicity of installation and maintenance. All system modules are DIN rail mounted to allow for a variety of installation options. Three (3) bus type communication circuits tie the various system modules into one easy to operate protection system. A non-volatile history buffer allows for enhanced diagnostic ability to troubleshoot process situations. The optional Annunciator Module (AM), the customer has the ability to step through a menu format to retrieve process history without having to wait for a service agency to arrive on site.

EPACO™ is designed to detect and control any of Fike's Active explosion suppression and isolation systems; which range from chemical suppression, mechanical isolation (gate and pinch valve), chemical isolation or any combination thereof. Detection is achieved by either pressure and/or flame radiation detectors designed to sense the incipient explosion and trigger the explosion suppression and/or isolation systems.



EPACO System Block Diagram

2.1 EXPLOSION PROTECTION CONTROLLER

The Explosion Protection Controller (**EPC**) is the cornerstone of the EPACO™ system. The EPC is an addressable panel that has the ability to retain an event history for enhanced system diagnostics. The EPC is DIN rail mounted which allows mounting of the controller in close proximity to the protected environment, thereby minimizing field wiring. Shorter wire runs greatly reduce the interference from electrical and radio frequency sources, allowing for a much more reliable protection system.

The EPC's detection inputs can be programmed for pressure warning, threshold detection, and rate of rise detection. It also has a contact closure detection circuit to support thermal, infrared, or other switch-closure type detection devices. A supervisory input circuit is provided to monitor suppression container pressure or other similar system status safeguards. The EPC has a remote disable input contact to allow for disabling the EPC from a customer PLC or other remote device during product loading, cleaning, or maintenance. An RS232 connection is available at each module for connection to a PC. Using the EP Works™ software, an authorized user can access system diagnostics and perform complex programming by PC.

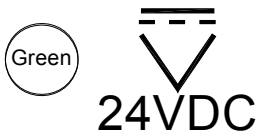
The following tasks are accomplished by the EPC:

- Monitors all supervised circuits for wiring faults (Open, Short, or Activation)
- Two detection circuits are monitored on a 250 micro second (0.25 msec) rate and examined for rate of rise and threshold levels
- When activation requirements are met by the detection circuit, it activates the series firing output within 2 milli-seconds
- Communicates system status to other EPC's connected locally so that they can respond within 4 milli-seconds
- Communicates system status to Annunciators and Relay Control Modules for user interface

2.1.1 OPERATION

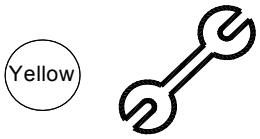
The EPC is equipped with three (3) colored LEDs that provide instant visual indication of system status. EPC operation can be classified into three main states: Normal, Trouble and Alarm. A general description of each state is described below.

EPC Normal State



When power is applied to the EPC, it performs a 4 second initialization. At the end of the initialization, the trouble LED blinks slow and the local piezo beeps in long recurring sound. It can then enter the "NORMAL" state if the power is of an appropriate voltage and there are no troubles or alarms. In the Normal State the green Power LED is 'ON', the local piezo is 'OFF', the trouble and alarm relays are energized. All other LED's are 'OFF'.

EPC Trouble State



A trouble occurs on the EPC if any one of the supervised circuits experiences a wiring fault open or short condition, if the EPC configuration is invalid, if the system is disabled, if a process pressure warning level is exceeded, or if the input voltage drops below 18VDC. In the Trouble State the yellow Trouble LED is 'ON', the local piezo is 'ON', and the P6 trouble relay is de-energized. Depending on the cause of the trouble, the system may or may NOT be completely functional. Each trouble should be investigated to determine the cause and promptly fixed. Each trouble, except for remote disable, will latch at the EPC. If the trouble is resolved, the EPC trouble can be cleared by disabling and re-enabling via the remote disable input, by cycling of the power input to the EPC, or by disabling and re-enabling the EPC via the Annunciator Module. If the remote disable is active, the EPC will enter the trouble state. When the remote disable is returned to normal, the EPC will automatically clear to the normal state, if no other troubles are present, without cycling the power.

EPC Alarm State

When the detection circuits have exceeded the alarm conditions required by the configuration, the EPC enters the Alarm State. In the Alarm State the red Alarm LED is 'ON', the local piezo 'ON', the Alarm relay is de-energized, and the series firing output is activated. The alarm state is latching. If the alarm is cleared, the EPC requires cycling of the power input to clear the alarm.

2.1.2 EPC DIAGNOSTICS

In addition to the EPC's three system status LEDs, an integral buzzer is provided to assist in diagnosing problems with the system. The following table identifies how the LEDs and buzzer will operate in response to expected system events.

Condition	Alarm LED	Alarm Relay	Trouble Relay	Trouble LED	Piezo	Power LED
Initial power up [first 4 seconds]	off	De-energized	De-energized	on	off	on
Power up in an alarm state	slow blink	De-energized	De-energized	on	long-short pulse	on
Invalid configuration or Prevent restart after activation	off	De-energized	De-energized	on	short-short pulse	on
Initializing [follows initial power up]	off	Energized	De-energized	blink slow	long pulse	on
Normal State	off	Energized	Energized	off	off	on
Trouble State	off	Energized	De-energized latched	on latched	on not latched	on
Disabled State	off	Energized	De-energized	on	off	on
Alarm State	on	De-energized	De-energized (1)	on (1)	on	on
Disabled State & alarm	on	Energized	De-energized	on	off	on
Return to Armed from previous state	on	Energized	De-energized	on	on	on
1st alarm in AND configuration [cross zoned]	fast blink	Energized	Energized	off	off	on
Warning pressure level	off	Energized	De-energized latched	on latched	on not latched	on
PC mode	off	no change	no change	no change	off	on

(1) Trouble relay and LED following trouble condition on series firing output due to release action.

2.1.3 EPC SPECIFICATIONS

Part Number:	E10-0066
Input Power:	18 to 30 VDC; 300mA
Max. Noise Ripple:	500mV peak at 24 VDC
Fuse:	2A Mini Automotive Type
Lower Limit for Input Power Shut-down:	16 VDC
Power Consumption:	275mA in Normal State 300mA in Trouble State 200mA in Alarm State
Terminal Block Capacity:	1.5 to 0.14 mm^2 (16 to 28 AWG)
Input Circuits:	
4-20mA:	Two detection circuits with maximum resistance of 30 Ω. Minimum 2 x 0.5 mm^2 (20 AWG) twisted shielded pair cable with drain wire. If the 4-20mA pressure detectors are placed in a hazardous atmosphere a Fike approved transmitter power supply shall be used on each detection circuit.
Switch Closure:	One detection circuit, 24 VDC at 0.10A with a maximum resistance of 30 Ω. Minimum 2 x 0.5 mm^2 (20 AWG) twisted shielded pair cable with drain wire, class A or class B wiring.
Supervisory Input:	One switch closure 24 VDC at 0.10A with a maximum resistance of 30 Ω. Minimum 2 x 0.5 mm^2 (20 AWG) twisted shielded pair cable with drain wire, class B wiring.
Disable Input:	One switch closure 24 VDC at 0.10A with a maximum resistance of 30 Ω. Minimum 2 x 0.5 mm^2 (20 AWG) twisted shielded pair cable with drain wire, class B wiring.
Series Firing Output Circuit:	Voltage and current rating 50 VDC, 3.5A. Maximum loop resistance including actuator(s) is 10 Ω. Each actuator is typically 0.7 Ω. Minimum wire size 2 x 0.75 mm^2 (18 AWG). Maximum number of actuators: Six (6).
	⚠CAUTION Do not measure the resistance of the actuator(s) with a meter. The meter may provide a current that will activate the actuator.
Relay Output:	One SPDT Form C for Trouble; One SPDT Form C for Alarm. Both rated DC operation: 2 amps @ 30VDC (pf=0.35) AC operation: 0.5 amps @ 250VAC (pf=0.35)
Fire Bus:	Wire specification Alpha wire or RE-Y2Y or Belden 9841, maximum resistance of 50 Ω, inductance L=100uH, capacitance C=0.02uF, maximum length 1,000 ft (300 m) total.
Status Bus:	Wire specification Alpha wire or RE-Y2Y or Belden 9841, maximum resistance of 50 Ω, inductance L=100uH, capacitance C=0.02uF, maximum length 1,000 ft (300 m) total.
Temperature Rating:	-18°C to 60°C (0°F to 140°F). If EPC is located inside auxiliary housing, maximum temperature is 43.3°C (110°F).
Humidity:	80% relative, maximum (non-condensing).
Size:	200 m L x 130 mm H x 60 mm D (7.7" L x 5.2" H x 2.3" D).
Weight:	0.68 kg (1.5 lbs.).
System Pressure Tolerance:	0.9% of transducer span, 600 mbar (8.7 psi), using the Ceramic pressure transducer, P/N 29945022-S, and EPC, P/N E10-0066, i.e. 5 mbar (0.08 psi).
Hazardous Area:	The EPC is not rated for hazardous atmospheres. The EPC must be located in an auxiliary housing that is rated for the hazardous atmosphere in which it is located. For FM installations the EPC must be located in a non-hazardous atmosphere. To maintain the systems ATEX Approval the housing shall be an ATEX approved housing supplied by Fike.
Current Firmware Version:	Can be verified using EPWorks™ Software.

2.2 POWER SUPPLY UNIT

The Power Supply Unit (PSU) is the primary power source for the EPACO™ system. The PSU can operate with AC power using selected transformers with 100V, 120V, or 240V 50/60Hz input (ordered separately).

The PSU has six (6) separate fused 24 VDC, 1 amp power output circuits capable of powering up to four EPCs in addition to an Annunciator Module (AM) and four (4) Relay Card Modules (RC8). Each output is protected with a 2 Amp fuse and supervised for high and low voltage. Power to the Annunciator Module can not be shut off; all other power circuits can be shut off for service on the various system components.

The PSU has the flexibility of containing its own battery backup supply or the customer has the option of supplying a backup power source. The PSU has an imbedded power shutdown procedure in the event of AC power failure, which prevents the backup batteries from being completely depleted. The PSU may be eliminated if battery backed, uninterrupted 24VDC, 2 amps power can be provided by others.

The PSU is equipped with an internal cooling fan that is supervised for normal operation.

2.2.1 OPERATION

Startup

Upon startup, the AC power is measured for a normal level. If the AC power is too high or too low, the PSU is held until a normal level is reached. The AC LED is updated accordingly. Once normal AC power is verified, the output voltage is measured. Output voltage must be within normal boundaries to enable the PSU to continue.

The PSU then detects if batteries are connected with an appropriate voltage level for battery backup operation. When the battery level is found normal or low, the battery charging circuit is enabled. In cases where the back-up battery voltage exceeds 29.5 VDC, the charging circuit is switched off and the battery will not be switched in line with the output power.

The five switch-able output circuits are measured (while in the OFF state) through a supervision circuit to determine the load connected to the lines. In case the load is too high, the corresponding output is left disabled. If the load is found to be appropriate, the output circuit is switched ON to power up the connected devices. The output lines are routinely measured for high loads or excessive voltages. The normal output voltage must be between 18VDC and 30VDC.

The complete startup sequence typically is completed within 10 seconds; otherwise a problem has occurred and should be resolved prior restarting the PSU

Normal Operation

After the startup sequence, normal operation is entered. During this operation, the AC and DC power LED's are both Green; the output voltage and trouble LED's are OFF. This operation can only be stopped in case of total shutdown of the PSU or when a PC is connected and PC mode becomes active. In this mode of operation, AC power, output voltage, charge power, output lines and battery are continuously measured. Upon meeting these systems' parameters, the LED's are updated and history is created. When the parameters are not met, the trouble relay de-energizes and the trouble LED is lit.

2.2.2 PSU DIAGNOSTICS

The PSU is equipped with four (4) diagnostic LEDs. The following table identifies how the LEDs will operate in response to expected system events.

Status	25VAC	Output Voltage	24VDC Battery	Trouble
Normal Status	GREEN	GREEN	GREEN	OFF
Normal AC Power	GREEN	n/a	n/a	n/a
No AC Power	OFF	n/a	n/a	ON
Low AC Power	RED	n/a	n/a	ON
High AC Power	RED BLINK	n/a	n/a	ON
Normal Battery Power	n/a	n/a	GREEN	n/a
No Battery	n/a	n/a	OFF	ON
Battery off	n/a	n/a	RED	ON
Battery Shutdown	n/a	n/a	RED	ON
Battery Low	n/a	n/a	GREEN BLINK	ON
Battery High	n/a	n/a	RED BLINK	ON
Normal Charge Power	n/a	n/a	n/a	n/a
Charger Power Fail	n/a	n/a	RED	ON
Normal Output Power	n/a	GREEN	n/a	n/a
Low Output Power	n/a	GREEN BLINK	n/a	ON
High Output Power	n/a	RED	n/a	ON
Fan Trouble	n/a	n/a	n/a	BLINK
Ground Fault	n/a	n/a	n/a	ON

Note: Trouble Relay is energized when Trouble LED is OFF, except when Trouble LED is blinking.

Note: LED status for items marked "n/a" are not critical to defining that operation status.

2.2.3 PSU SPECIFICATIONS

PSU Part Number:	E10-0067
Transformer Part Number:	02-10644 120/240VAC; 02-10879 100VAC
Transformer Input Power:	100/120/240VAC -15/+10% 50/60Hz , 2A maximum load
Power Consumption:	Calculated with EPWorks™ Software
Input Terminal Block Capacity:	3.3 to 0.14 mm^2 (12 to 28 AWG)
Output Terminal Block Capacity	1.5 to 0.14 mm^2 (16 to 28 AWG)
Input Power:	24VAC at 0.043A no load; 13.0A max load, fused with 15A mini automotive blade type. **Note:** Transformer shall be mounted within 3 meters (10 feet) of PSU using minimum 2.08mm^2 (14AWG) cabling.
Battery Back-up:	75 AH sealed lead-acid, fused at 15A mini automotive blade type **Note:** Size of sealed, lead-acid batteries required will depend on the number and type of modules used. The designer shall perform a Power Calculation using the EPWorks™ software or Annex A. Batteries shall be mounted within 3 meters (10 feet) of PSU using minimum 2.08 mm^2 (14AWG) cabling. Batteries require a VENTED enclosure. **Note:** When replacing batteries use the same size, type and number. Proper disposal of old batteries is required; refer to local codes.
PSU Output Power:	24VDC at 1A per output circuit fused with 2A mini automotive blade type. Total output current from all output circuits 5 Amp max. for CSA approval.
PSU Relay Output:	One SPDT Form C for Trouble Rated DC operation: 2 amps @ 30VDC (pf=.35) AC operation: 0.5 amps @ 250VAC (pf=.35)
Status Bus:	Belden 9841 or RE-Y2Y cabling recommended. Maximum resistance: R=50 ohms, inductance L=100uH, capacitance C=0.02uF, maximum length 300 m (1,000 ft) total.
Temperature Rating:	-20°C to 60°C (0°F to 140°F)
Humidity:	80% relative, maximum (non-condensing)
Size:	210 mm L x 130 mm H x 70 mm D (8.2" L x 5.2" H x 2.9" D)
Weight:	1 kg (2 lbs.)
Hazardous Area:	The PSU is not rated for hazardous atmospheres. For FM or ATEX installations the PSU must be located in a non-hazardous atmosphere.
Current Firmware Version:	Can be verified using EPWorks™ Software.

2.2.4 PSU VOLTAGE CHART

	MINIMUM	TYPICAL	MAXIMUM
AC Power Input			
100V Transformer	85V	100V	110V
120V Transformer	102V	120V	132V
240V Transformer	204V	240V	264V
25VAC (P3)	21V	25V	30V
Battery Charge Power			
Charge, P4 (V)	24V	27.6V	29V
Battery Backup			
Battery Range	18V	27V	29.5V
Low Battery Trouble	24V		
Battery Shut-down	18V		
Battery Disconnect	17V		
Output Power (single out)			
Out (V)	18V	24V	30V
Out (A)		1A	2A
Output Power Overall			6A

2.3 ANNUNCIATOR MODULE

The Annunciator Module (**AM**) is the primary system status indication point for the EPACO™ system. It provides a single point for retrieving history as well as system status information for all EPACO™ modules attached to the remote bus. This module is typically installed in an area removed from the process environment such as a control room that is constantly attended.

The AM is powered with 24VDC from the PSU. A single AM can be connected to the power supply. The AM is capable of communicating on the Status Bus for exchanging status information and remote control of the outputs.

The AM is equipped with two push buttons that allows you to access the various menus and three seven segment LEDs for identification of the system status within the menus.

The AM is the customer interface for the EPACO system. The following tasks are accomplished by the AM:

- Monitors all EPC's, RC8's and PSU connected to the Status Bus and displays general status
- Provides a central location for history response
- Provides central location to connect computer and monitor history for entire EPACO system
- Communicates system status via trouble relay for user interface
- Real time pressure reading of the EPC's CERExx pressure transducers

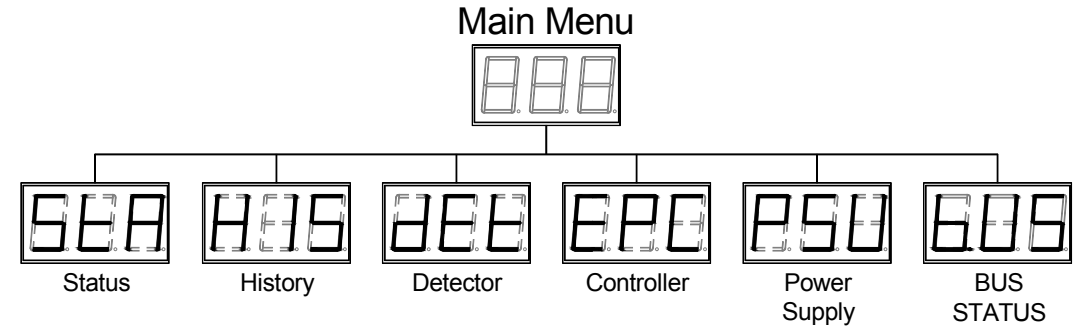
2.3.1 OPERATION

There are six operating modes that the AM utilizes:

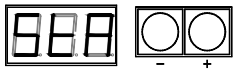
- Status
- History
- Pressure Reading
- EPC Enable/Disable
- PSU Output On/Off
- Bus Status

During normal operating conditions, the Annunciator Module will default into the *Status* mode. A complete listing of all of the operating modes available on the Annunciator Module is provided on the following page for your reference.

ANNUNCIATOR MODULE OPERATING MODES



Navigation
Display current Operating Mode:
Momentarily press both switches
Menu Mode:
Press and hold both switches for 5 seconds
Left Button (-): Scroll menu options
Right Button (+): Select desired option
Menu Mode Timeout: 20 seconds of inactivity



Status
Left Button (-): scrolls to next module
Right Button (+): scrolls to previous module
Annunciator Module

0	0	1	Normal Status Bus
0	0	2	Module Trouble on Status Bus
0	0	3	EP System on Status Bus Activated
0	0	4	Communication Failure on Status Bus
0	0	5	PC Mode

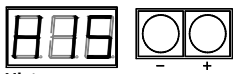
Explosion Protection Controller (EPC) X = EPC 1 to 4

X	-	-	No EPC or EPC Shutdown
X	0	1	Normal Operation Mode
X	0	2	Trouble on one of the Input Circuits
X	0	3	Pressure Warning Level Exceeded
X	0	4	Trouble on one of the Output Circuits
X	0	5	Trouble on the Fire Bus
X	0	6	Predischarge Condition Satisfied
X	0	7	Supervisory Input Active
X	0	8	EPC has Activated Releasing Outputs
X	0	9	EPC has been Disabled
X	1	0	Failure during Arming

Relay Card (RC8) X = RC8 5 to 8
X Y Y Y = Relay status
Refer to Appendix A for relay card status codes.

Power Supply Unit (PSU)

9	-	-	No PSU or No Communications
9	0	1	Normal Operation
9	0	2	Fan Trouble
9	0	3	Ground Fault Trouble
9	0	4	Battery or Charge Trouble
9	0	5	AC Trouble
9	0	6	Battery Backup being Utilized
9	0	7	Output Trouble
9	0	8	Outputs Disabled
9	0	9	Shutdown Mode



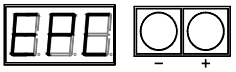
History
Displays 40 most recent events
Refer to Appendix B for listing of History Codes
Left Button (-): scrolls to older events
Right Button (+): scrolls to newer events
Pressing both buttons moves to the top of the file
Three lines across top of LEDs indicates Top of File (most recent)
Three lines across bottom of LEDs indicates Bottom of File

Pressure Detector
X X = Pressure Reading in Hex
Left Button (-): scrolls backward
Right Button (+): scrolls forward

1	X	X	EPC #1, Detection Circuit #1
2	X	X	EPC #1, Detection Circuit #2
3	X	X	EPC #2, Detection Circuit #1
4	X	X	EPC #2, Detection Circuit #2
5	X	X	EPC #3, Detection Circuit #1
6	X	X	EPC #3, Detection Circuit #2
7	X	X	EPC #4, Detection Circuit #1
8	X	X	EPC #4, Detection Circuit #2
	6	2	-1.00 psig (-69 mbarg)
	7	F	0.00 psig (0 mbarg)
	8	D	0.49 psig (33 mbarg)
	9	4	0.72 psig (50 mbarg)
	9	C	0.99 psig (68 mbarg)

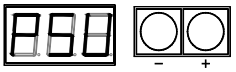
Refer to Appendix C for additional values.

Enabled/On **Disabled/Off**



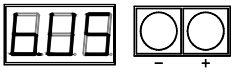
Explosion Protection Controller (EPC) X X = Enabled/Disabled
Left Button (-): scroll EPC selection
Right Button (+): toggle EPC state

1	X	X	EPC #1
2	X	X	EPC #2
3	X	X	EPC #3
4	X	X	EPC #4



Power Supply Unit (PSU) X X = On/Off
Left Button (-): scroll PSU device selection
Right Button (+): toggle PSU state

1	X	X	Output #1
2	X	X	Output #2
3	X	X	Output #3
4	X	X	Output #4
5	X	X	Output #5



Bus Status
Used for engineering diagnostics.
Call Fike for support.

2.3.2 AM SPECIFICATIONS

Part Number:	E10-0068
Input Power:	18 to 30 VDC; 300mA
Max. Noise Ripple:	500mV peak at 24 VDC
Fuse:	2A Mini Automotive Type
Lower Limit for Input Power Shut-down:	16 VDC
Power Consumption:	130mA in Normal State
Terminal Block Capacity:	1.5 to 0.14 mm^2 (16 to 28 AWG)
Relay Output:	One SPDT Form C for Trouble; One SPDT Form C for Alarm. Both rated: DC operation: 2 amps @ 30VDC (pf=0.35) AC operation: 0.5 amps @ 250VAC (pf=0.35)
Status Bus:	Wire specification Alpha wire or RE-Y2Y or Belden 9841, maximum resistance of 50 Ω, inductance L=100uH, capacitance C=0.02uF, maximum length 300 m (1,000 ft) total.
Remote Bus:	Wire specification Alpha wire or RE-Y2Y or Belden 9841, maximum resistance of 50 Ω, inductance L=100uH, capacitance C=0.02uF, maximum length 300 m (1,000 ft) total.
Temperature Rating:	-18°C to 60°C (0°F to 140°F). If AM is not located inside auxiliary housing, maximum temperature is 43.3°C (110°F).
Humidity:	80% relative, maximum (non-condensing).
Size:	120 mm L x 130 mm H x 60 mm D (4.8" L x 5.2" H x 2.3" D).
Weight:	0.5 kg (1 lbs.).
Hazardous Area:	The AM is not rated for hazardous atmospheres. For FM or ATEX installations the AM must be located in a non-hazardous atmosphere.
Current Firmware Version:	Can be verified using EPWorks™ Software.

2.4 RELAY CARD MODULE

The Relay Card Module (**RC8**) provides the user with a block of eight (8) fully programmable Form "C" relays. DIP switches are provided for configuring the relay's operation. These relays facilitate process shutdowns or other actions in response to conditions recognized by the EPACO™ system. Each relay is equipped with a green LED to provide visual indication of the relay state.

The RC8 is powered with 24VDC from the PSU. Up to four (4) RC8s can be connected in parallel to the power supply. The RC8 is capable of communicating on the Status Bus for exchanging status information and remote control of the outputs. A history of the relay states is captured in the Annunciator Module

2.4.1 OPERATION

The RC8 is a fully programmable module. System configuration can be performed with DIP switches on these modules or by way of a DB9 serial port connection to a PC using EPWorks™ Software. RC8 addressing is done using the two ADD (address) DIP switches. The four MODE DIP switches are used for programming specific relay configurations. Expanded programming may be created via PC with Fike's EPWorks™ Software.

The RC8 is a process interface for the EPACO system. The following tasks are accomplished by the RC8:

- Communicates system status via relays for user interface
- Direct shut downs, slow downs, and remote notifications of system trouble and alarm conditions
- Remote location of interface, separate from the hazard zone

The RC8 operation can be classified into two main states of operation: Normal and Trouble / Alarm.

2.4.2 RC8 LED DIAGNOSTICS

Condition	Power LED	Status Bus LED	Relay LED(s) based on Configuration
Initial power up [first 15 seconds]	on	off	all off
Normal Sate (No troubles or alarms)	on	on	all on
Invalid configuration	on	fast pulse	all off
Trouble or Alarm	on	on	corresponding off (1)

(1) Relay follows LED condition.

2.4.4 RC8 SPECIFICATIONS

Part Number:	E10-0069
Input Power:	18 to 30 VDC; 300 mA
Max. Noise Ripple:	500 mV peak at 24 VDC
Fuse:	2A Mini Automotive Type
Lower Limit for Input Power Shut-down:	16 VDC
Power Consumption:	300 mA in Normal State
Terminal Block Capacity:	1.5 to 0.14 $mm^2$16 to 28 AWG (16 to 28 AWG)
Relay Output:	Eight SPDT Form C. Each rated DC operation: 2 amps @ 30VDC (pf=0.35) AC operation: 0.5 amps @ 250VAC (pf=0.35)
Status Bus:	Wire specification Alpha wire or RE-Y2Y or Belden 9841, maximum resistance of 50 Ω, inductance L=100uH, capacitance C=0.02uF, maximum length 300 m (1,000 ft) total.
Temperature Rating:	-18°C to 60°C (0°F to 140°F). If EPC is not located inside auxiliary housing, maximum temperature is 43.3°C 110°F (110°F).
Humidity:	80% relative, maximum (non-condensing).
Size:	120mm L x 125mm H x 54mm D (4.8" L x 4.9" H x 2.1" D).
Weight:	0.5 kg (1 lb.).
Hazardous Area:	The RC8 is not rated for hazardous atmospheres. For FM or ATEX installations the RC8 must be located in a non-hazardous atmosphere.
Current Firmware Version:	Can be verified using EPWorks™ Software.

3.0 MAINTENANCE

Routine system inspections shall be conducted in accordance with the requirements of the appropriate local authority having jurisdiction and National Fire Protection Association Standard Number 69, Explosion Prevention System, current edition.

The inspection schedule and procedure set forth below are provided as a minimum requirement for Fike Explosion Protection System Controllers, which operate in moderate environments. These control panel instructions are to be implemented in conjunction with complete system inspection instructions.

During initial system checkout or start-up, the Fike Factory Field Personnel, due to process operational characteristics and/or historical inspection data on the specific process, may determine that an additional inspection is required. If this occurs, it will be in addition to the following maintenance schedule.

It is extremely important to closely monitor the operational characteristics of your system during the first few days and weeks after the initial start-up.

3.1 ROUTINE INSPECTIONS

> **Important Note:** These inspections are to be performed by Fike Field Personnel or personnel trained and certified by Fike.

To perform an inspection, it is important to first obtain all pertinent data that relates to the specific system being inspected. The required information includes:

- System Engineered Drawings
- Component Location Drawing No._____
- Field Wiring Drawing No._____
- Copy of Manuals, Specifications or Documents Referenced on Fike System Engineered Drawings
- Inspection Equipment
- Operating Specifications on Each Component Being Inspected

Three-Year Replacement – Replace all system batteries.

Ten-Year Replacement – Replace all GCA actuators and suppressant agents, following all safe handling practices and recommendations.

> **Note:** The ten-year replacement is based upon a 20°C to 30°C (70°F to 80°F) actuator temperature. The replacement frequency may be more frequent when exposure to higher temperature or harsh environments is experienced.

4.0 DECOMMISSIONING PROCEDURE

The following procedure must only be performed by a Fike qualified Service Engineer, who has been assigned to prepare and complete the decommissioning of the above referenced Explosion Protection System. Each step in the listed procedure must be adhered to and completion/acceptance of this form is mandatory. The Service

Engineer must check off each of the following steps. In the case of non-compliance, the observed discrepancy must be corrected before completion of the system decommissioning.

Steps / Description			
1. Use Fike system/project component location diagram to record and verify the locations of all Fike system components for each zone and system.	□ pass	□ fail	□ Remark/ Note No.
2. Control panel to be disarmed/shutdown.	□ pass	□ fail	□ Remark/ Note No.
3. All suppressor/valve actuators to be shunted.	□ pass	□ fail	□ Remark/ Note No.
5. Each suppressor/valve container to be depressurized. Note: Do not ventilate nitrogen in a confined space.	□ pass	□ fail	□ Remark/ Note No.
5. Power supply to the control panel to be isolated by the customer and disconnected to prevent accidental reconnection. Fike to verify.	□ pass	□ fail	□ Remark/ Note No.
6. Control panel battery to be disconnected and removed for proper disposal.	□ pass	□ fail	□ Remark/ Note No.
7. Each actuator is to be removed and placed in a storage housing, to be either stored on site or removed for proper disposal.	□ pass	□ fail	□ Remark/ Note No.
8. Verify that all suppressor/valve gauges are reading zero, replace fill valve cap loosely.	□ pass	□ fail	□ Remark/ Note No.
ATTENTION: SYSTEM IS NOW DECOMMISSIONED AND READY FOR DISMOUNTING BY THE CUSTOMER.			

APPENDIX A

RC8 MODULE STATUS CODES

Digit Number			STATUS OF RELAY							
Designates Module	Designates Status of Selected Module		WITH CODE AT LEFT DISPLAYED ON ANNUNCIATOR MODULE							
5-8 = RC8	2	3	1	2	3	4	5	6	7	8
5	WRITE IN									
6	STATE									
7	PROGRAMMED									
8	TO RIGHT									
X	-	-	No RC8 or No Communications							
X	0	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
X	0	1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
X	0	2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
X	0	3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
X	0	4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
X	0	5	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
X	0	6	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
X	0	7	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
X	0	8	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
X	0	9	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
X	0	A	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
X	0	B	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
X	0	C	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
X	0	D	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
X	0	E	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
X	0	F	ON	ON	ON	ON	OFF	OFF	OFF	OFF
X	1	0	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
X	1	1	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
X	1	2	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
X	1	3	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
X	1	4	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
X	1	5	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
X	1	6	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
X	1	7	ON	ON	ON	OFF	ON	OFF	OFF	OFF
X	1	8	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
X	1	9	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
X	1	A	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
X	1	B	ON	ON	OFF	ON	ON	OFF	OFF	OFF
X	1	C	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
X	1	D	ON	OFF	ON	ON	ON	OFF	OFF	OFF
X	1	E	OFF	ON	ON	ON	ON	OFF	OFF	OFF
X	1	F	ON	ON	ON	ON	ON	OFF	OFF	OFF
X	2	0	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
X	2	1	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
X	2	2	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
X	2	3	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
X	2	4	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
X	2	5	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
X	2	6	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
X	2	7	ON	ON	ON	OFF	OFF	ON	OFF	OFF
X	2	8	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF
X	2	9	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
X	2	A	OFF	ON	OFF	ON	OFF	ON	OFF	OFF
X	2	B	ON	ON	OFF	ON	OFF	ON	OFF	OFF
X	2	C	OFF	OFF	ON	ON	OFF	ON	OFF	OFF
X	2	D	ON	OFF	ON	ON	OFF	ON	OFF	OFF
X	2	E	OFF	ON	ON	ON	OFF	ON	OFF	OFF
X	2	F	ON	ON	ON	ON	OFF	ON	OFF	OFF
X	3	0	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF
X	3	1	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
X	3	2	OFF	ON	OFF	OFF	ON	ON	OFF	OFF
X	3	3	ON	ON	OFF	OFF	ON	ON	OFF	OFF

Digit Number			STATUS OF RELAY							
Designates Module	Designates Status of Selected Module		WITH CODE AT LEFT DISPLAYED ON ANNUNCIATOR MODULE							
5-8 = RC8	2	3	1	2	3	4	5	6	7	8
X	3	4	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
X	3	5	ON	OFF	ON	OFF	ON	ON	OFF	OFF
X	3	6	OFF	ON	ON	OFF	ON	ON	OFF	OFF
X	3	7	ON	ON	ON	OFF	ON	ON	OFF	OFF
X	3	8	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
X	3	9	ON	OFF	OFF	ON	ON	ON	OFF	OFF
X	3	A	OFF	ON	OFF	ON	ON	ON	OFF	OFF
X	3	B	ON	ON	OFF	ON	ON	ON	OFF	OFF
X	3	C	OFF	OFF	ON	ON	ON	ON	OFF	OFF
X	3	D	ON	OFF	ON	ON	ON	ON	OFF	OFF
X	3	E	OFF	ON	ON	ON	ON	ON	OFF	OFF
X	3	F	ON	ON	ON	ON	ON	ON	OFF	OFF
X	4	0	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
X	4	1	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
X	4	2	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF
X	4	3	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
X	4	4	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF
X	4	5	ON	OFF	ON	OFF	OFF	OFF	ON	OFF
X	4	6	OFF	ON	ON	OFF	OFF	OFF	ON	OFF
X	4	7	ON	ON	ON	OFF	OFF	OFF	ON	OFF
X	4	8	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF
X	4	9	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
X	4	A	OFF	ON	OFF	ON	OFF	OFF	ON	OFF
X	4	B	ON	ON	OFF	ON	OFF	OFF	ON	OFF
X	4	C	OFF	OFF	ON	ON	OFF	OFF	ON	OFF
X	4	D	ON	OFF	ON	ON	OFF	OFF	ON	OFF
X	4	E	OFF	ON	ON	ON	OFF	OFF	ON	OFF
X	4	F	ON	ON	ON	ON	OFF	OFF	ON	OFF
X	5	0	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF
X	5	1	ON	OFF	OFF	OFF	ON	OFF	ON	OFF
X	5	2	OFF	ON	OFF	OFF	ON	OFF	ON	OFF
X	5	3	ON	ON	OFF	OFF	ON	OFF	ON	OFF
X	5	4	OFF	OFF	ON	OFF	ON	OFF	ON	OFF
X	5	5	ON	OFF	ON	OFF	ON	OFF	ON	OFF
X	5	6	OFF	ON	ON	OFF	ON	OFF	ON	OFF
X	5	7	ON	ON	ON	OFF	ON	OFF	ON	OFF
X	5	8	OFF	OFF	OFF	ON	ON	OFF	ON	OFF
X	5	9	ON	OFF	OFF	ON	ON	OFF	ON	OFF
X	5	A	OFF	ON	OFF	ON	ON	OFF	ON	OFF
X	5	B	ON	ON	OFF	ON	ON	OFF	ON	OFF
X	5	C	OFF	OFF	ON	ON	ON	OFF	ON	OFF
X	5	D	ON	OFF	ON	ON	ON	OFF	ON	OFF
X	5	E	OFF	ON	ON	ON	ON	OFF	ON	OFF
X	5	F	ON	ON	ON	ON	ON	OFF	ON	OFF
X	6	0	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF
X	6	1	ON	OFF	OFF	OFF	OFF	ON	ON	OFF
X	6	2	OFF	ON	OFF	OFF	OFF	ON	ON	OFF
X	6	3	ON	ON	OFF	OFF	OFF	ON	ON	OFF
X	6	4	OFF	OFF	ON	OFF	OFF	ON	ON	OFF
X	6	5	ON	OFF	ON	OFF	OFF	ON	ON	OFF
X	6	6	OFF	ON	ON	OFF	OFF	ON	ON	OFF
X	6	7	ON	ON	ON	OFF	OFF	ON	ON	OFF
X	6	8	OFF	OFF	OFF	ON	OFF	ON	ON	OFF
X	6	9	ON	OFF	OFF	ON	OFF	ON	ON	OFF
X	6	A	OFF	ON	OFF	ON	OFF	ON	ON	OFF
X	6	B	ON	ON	OFF	ON	OFF	ON	ON	OFF
X	6	C	OFF	OFF	ON	ON	OFF	ON	ON	OFF
X	6	D	ON	OFF	ON	ON	OFF	ON	ON	OFF
X	6	E	OFF	ON	ON	ON	OFF	ON	ON	OFF
X	6	F	ON	ON	ON	ON	OFF	ON	ON	OFF

Digit Number			STATUS OF RELAY							
Designates Module	Designates Status of Selected Module		WITH CODE AT LEFT DISPLAYED ON ANNUNCIATOR MODULE							
5-8 = RC8	2	3	1	2	3	4	5	6	7	8
X	7	0	OFF	OFF	OFF	OFF	ON	ON	ON	OFF
X	7	1	ON	OFF	OFF	OFF	ON	ON	ON	OFF
X	7	2	OFF	ON	OFF	OFF	ON	ON	ON	OFF
X	7	3	ON	ON	OFF	OFF	ON	ON	ON	OFF
X	7	4	OFF	OFF	ON	OFF	ON	ON	ON	OFF
X	7	5	ON	OFF	ON	OFF	ON	ON	ON	OFF
X	7	6	OFF	ON	ON	OFF	ON	ON	ON	OFF
X	7	7	ON	ON	ON	OFF	ON	ON	ON	OFF
X	7	8	OFF	OFF	OFF	ON	ON	ON	ON	OFF
X	7	9	ON	OFF	OFF	ON	ON	ON	ON	OFF
X	7	A	OFF	ON	OFF	ON	ON	ON	ON	OFF
X	7	B	ON	ON	OFF	ON	ON	ON	ON	OFF
X	7	C	OFF	OFF	ON	ON	ON	ON	ON	OFF
X	7	D	ON	OFF	ON	ON	ON	ON	ON	OFF
X	7	E	OFF	ON	ON	ON	ON	ON	ON	OFF
X	7	F	ON	ON	ON	ON	ON	ON	ON	OFF
X	8	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
X	8	1	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON
X	8	2	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON
X	8	3	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
X	8	4	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON
X	8	5	ON	OFF	ON	OFF	OFF	OFF	OFF	ON
X	8	6	OFF	ON	ON	OFF	OFF	OFF	OFF	ON
X	8	7	ON	ON	ON	OFF	OFF	OFF	OFF	ON
X	8	8	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
X	8	9	ON	OFF	OFF	ON	OFF	OFF	OFF	ON
X	8	A	OFF	ON	OFF	ON	OFF	OFF	OFF	ON
X	8	B	ON	ON	OFF	ON	OFF	OFF	OFF	ON
X	8	C	OFF	OFF	ON	ON	OFF	OFF	OFF	ON
X	8	D	ON	OFF	ON	ON	OFF	OFF	OFF	ON
X	8	E	OFF	ON	ON	ON	OFF	OFF	OFF	ON
X	8	F	ON	ON	ON	ON	OFF	OFF	OFF	ON
X	9	0	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON
X	9	1	ON	OFF	OFF	OFF	ON	OFF	OFF	ON
X	9	2	OFF	ON	OFF	OFF	ON	OFF	OFF	ON
X	9	3	ON	ON	OFF	OFF	ON	OFF	OFF	ON
X	9	4	OFF	OFF	ON	OFF	ON	OFF	OFF	ON
X	9	5	ON	OFF	ON	OFF	ON	OFF	OFF	ON
X	9	6	OFF	ON	ON	OFF	ON	OFF	OFF	ON
X	9	7	ON	ON	ON	OFF	ON	OFF	OFF	ON
X	9	8	OFF	OFF	OFF	ON	ON	OFF	OFF	ON
X	9	9	ON	OFF	OFF	ON	ON	OFF	OFF	ON
X	9	A	OFF	ON	OFF	ON	ON	OFF	OFF	ON
X	9	B	ON	ON	OFF	ON	ON	OFF	OFF	ON
X	9	C	OFF	OFF	ON	ON	ON	OFF	OFF	ON
X	9	D	ON	OFF	ON	ON	ON	OFF	OFF	ON
X	9	E	OFF	ON	ON	ON	ON	OFF	OFF	ON
X	9	F	ON	ON	ON	ON	ON	OFF	OFF	ON
X	A	0	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON
X	A	1	ON	OFF	OFF	OFF	OFF	ON	OFF	ON
X	A	2	OFF	ON	OFF	OFF	OFF	ON	OFF	ON
X	A	3	ON	ON	OFF	OFF	OFF	ON	OFF	ON
X	A	4	OFF	OFF	ON	OFF	OFF	ON	OFF	ON
X	A	5	ON	OFF	ON	OFF	OFF	ON	OFF	ON
X	A	6	OFF	ON	ON	OFF	OFF	ON	OFF	ON
X	A	7	ON	ON	ON	OFF	OFF	ON	OFF	ON
X	A	8	OFF	OFF	OFF	ON	OFF	ON	OFF	ON
X	A	9	ON	OFF	OFF	ON	OFF	ON	OFF	ON
X	A	A	OFF	ON	OFF	ON	OFF	ON	OFF	ON
X	A	B	ON	ON	OFF	ON	OFF	ON	OFF	ON

Digit Number			STATUS OF RELAY							
Designates Module	Designates Status of Selected Module		WITH CODE AT LEFT DISPLAYED ON ANNUNCIATOR MODULE							
5-8 = RC8	2	3	1	2	3	4	5	6	7	8
X	A	C	OFF	OFF	ON	ON	OFF	ON	OFF	ON
X	A	D	ON	OFF	ON	ON	OFF	ON	OFF	ON
X	A	E	OFF	ON	ON	ON	OFF	ON	OFF	ON
X	A	F	ON	ON	ON	ON	OFF	ON	OFF	ON
X	B	0	OFF	OFF	OFF	OFF	ON	ON	OFF	ON
X	B	1	ON	OFF	OFF	OFF	ON	ON	OFF	ON
X	B	2	OFF	ON	OFF	OFF	ON	ON	OFF	ON
X	B	3	ON	ON	OFF	OFF	ON	ON	OFF	ON
X	B	4	OFF	OFF	ON	OFF	ON	ON	OFF	ON
X	B	5	ON	OFF	ON	OFF	ON	ON	OFF	ON
X	B	6	OFF	ON	ON	OFF	ON	ON	OFF	ON
X	B	7	ON	ON	ON	OFF	ON	ON	OFF	ON
X	B	8	OFF	OFF	OFF	ON	ON	ON	OFF	ON
X	B	9	ON	OFF	OFF	ON	ON	ON	OFF	ON
X	B	A	OFF	ON	OFF	ON	ON	ON	OFF	ON
X	B	B	ON	ON	OFF	ON	ON	ON	OFF	ON
X	B	C	OFF	OFF	ON	ON	ON	ON	OFF	ON
X	B	D	ON	OFF	ON	ON	ON	ON	OFF	ON
X	B	E	OFF	ON	ON	ON	ON	ON	OFF	ON
X	B	F	ON	ON	ON	ON	ON	ON	OFF	ON
X	C	0	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON
X	C	1	ON	OFF	OFF	OFF	OFF	OFF	ON	ON
X	C	2	OFF	ON	OFF	OFF	OFF	OFF	ON	ON
X	C	3	ON	ON	OFF	OFF	OFF	OFF	ON	ON
X	C	4	OFF	OFF	ON	OFF	OFF	OFF	ON	ON
X	C	5	ON	OFF	ON	OFF	OFF	OFF	ON	ON
X	C	6	OFF	ON	ON	OFF	OFF	OFF	ON	ON
X	C	7	ON	ON	ON	OFF	OFF	OFF	ON	ON
X	C	8	OFF	OFF	OFF	ON	OFF	OFF	ON	ON
X	C	9	ON	OFF	OFF	ON	OFF	OFF	ON	ON
X	C	A	OFF	ON	OFF	ON	OFF	OFF	ON	ON
X	C	B	ON	ON	OFF	ON	OFF	OFF	ON	ON
X	C	C	OFF	OFF	ON	ON	OFF	OFF	ON	ON
X	C	D	ON	OFF	ON	ON	OFF	OFF	ON	ON
X	C	E	OFF	ON	ON	ON	OFF	OFF	ON	ON
X	C	F	ON	ON	ON	ON	OFF	OFF	ON	ON
X	D	0	OFF	OFF	OFF	OFF	ON	OFF	ON	ON
X	D	1	ON	OFF	OFF	OFF	ON	OFF	ON	ON
X	D	2	OFF	ON	OFF	OFF	ON	OFF	ON	ON
X	D	3	ON	ON	OFF	OFF	ON	OFF	ON	ON
X	D	4	OFF	OFF	ON	OFF	ON	OFF	ON	ON
X	D	5	ON	OFF	ON	OFF	ON	OFF	ON	ON
X	D	6	OFF	ON	ON	OFF	ON	OFF	ON	ON
X	D	7	ON	ON	ON	OFF	ON	OFF	ON	ON
X	D	8	OFF	OFF	OFF	ON	ON	OFF	ON	ON
X	D	9	ON	OFF	OFF	ON	ON	OFF	ON	ON
X	D	A	OFF	ON	OFF	ON	ON	OFF	ON	ON
X	D	B	ON	ON	OFF	ON	ON	OFF	ON	ON
X	D	C	OFF	OFF	ON	ON	ON	OFF	ON	ON
X	D	D	ON	OFF	ON	ON	ON	OFF	ON	ON
X	D	E	OFF	ON	ON	ON	ON	OFF	ON	ON
X	D	F	ON	ON	ON	ON	ON	OFF	ON	ON
X	E	0	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
X	E	1	ON	OFF	OFF	OFF	OFF	ON	ON	ON
X	E	2	OFF	ON	OFF	OFF	OFF	ON	ON	ON
X	E	3	ON	ON	OFF	OFF	OFF	ON	ON	ON
X	E	4	OFF	OFF	ON	OFF	OFF	ON	ON	ON
X	E	5	ON	OFF	ON	OFF	OFF	ON	ON	ON
X	E	6	OFF	ON	ON	OFF	OFF	ON	ON	ON
X	E	7	ON	ON	ON	OFF	OFF	ON	ON	ON

Digit Number			STATUS OF RELAY							
Designates Module	Designates Status of Selected Module		WITH CODE AT LEFT DISPLAYED ON ANNUNCIATOR MODULE							
5-8 = RC8	2	3	1	2	3	4	5	6	7	8
X	E	8	OFF	OFF	OFF	ON	OFF	ON	ON	ON
X	E	9	ON	OFF	OFF	ON	OFF	ON	ON	ON
X	E	A	OFF	ON	OFF	ON	OFF	ON	ON	ON
X	E	B	ON	ON	OFF	ON	OFF	ON	ON	ON
X	E	C	OFF	OFF	ON	ON	OFF	ON	ON	ON
X	E	D	ON	OFF	ON	ON	OFF	ON	ON	ON
X	E	E	OFF	ON	ON	ON	OFF	ON	ON	ON
X	E	F	ON	ON	ON	ON	OFF	ON	ON	ON
X	F	0	OFF	OFF	OFF	OFF	ON	ON	ON	ON
X	F	1	ON	OFF	OFF	OFF	ON	ON	ON	ON
X	F	2	OFF	ON	OFF	OFF	ON	ON	ON	ON
X	F	3	ON	ON	OFF	OFF	ON	ON	ON	ON
X	F	4	OFF	OFF	ON	OFF	ON	ON	ON	ON
X	F	5	ON	OFF	ON	OFF	ON	ON	ON	ON
X	F	6	OFF	ON	ON	OFF	ON	ON	ON	ON
X	F	7	ON	ON	ON	OFF	ON	ON	ON	ON
X	F	8	OFF	OFF	OFF	ON	ON	ON	ON	ON
X	F	9	ON	OFF	OFF	ON	ON	ON	ON	ON
X	F	A	OFF	ON	OFF	ON	ON	ON	ON	ON
X	F	B	ON	ON	OFF	ON	ON	ON	ON	ON
X	F	C	OFF	OFF	ON	ON	ON	ON	ON	ON
X	F	D	ON	OFF	ON	ON	ON	ON	ON	ON
X	F	E	OFF	ON	ON	ON	ON	ON	ON	ON
X	F	F	ON	ON	ON	ON	ON	ON	ON	ON

Example Status Displays:

"500" – The first RC8, #5, has all relays OFF.

"7A2" – The third RC8, #7, has Relay 1 OFF; Relay2 ON; Relay 3 OFF; Relay 4 OFF; Relay 5 OFF; Relay 6 ON; Relay 7 OFF; Relay 8 ON

X A 2 OFF ON OFF OFF OFF ON OFF ON

"813" – The fourth RC8, #8, has Relay 1 ON; Relay 2 ON; Relay 3 OFF; Relay 4 OFF; Relay 5 ON; Relay 6 OFF; Relay 7 OFF; Relay 8 OFF

X 1 3 ON ON OFF OFF ON OFF OFF OFF

Note: Specific trouble types per module can be accessed via the Fike EP Works™ software.

APPENIX B

ANNUNCIATOR MODULE DISPLAY HISTORY CODES

001	EPC #1 Not Connected	*x*02	EPC #*x* Trouble on Input Circuit
002	EPC #2 Not Connected	*x*03	EPC #*x* Pressure Warning Level Exceeded
003	EPC #3 Not Connected	*x*04	EPC #*x* Trouble on Output Circuit
004	EPC #4 Not Connected	*x*05	EPC #*x* Trouble on Fire Bus
005	RC8 #5 Not Connected	*x*06	EPC #*x* Predischarge Condition Satisfied
006	RC8 #6 Not Connected	*x*07	EPC #*x* Supervisory Input Active
007	RC8 #7 Not Connected	*x*08	EPC #*x* Activated Releasing Outputs
008	RC8 #8 Not Connected	*x*09	EPC #*x* Disabled
009	PSU Not Connected	*x*10	EPC # *x* Failure during Arming
011	EPC #1 Connected	502	RC8 #5 Relay Status
012	EPC #2 Connected	602	RC8 #6 Relay Status
013	EPC #3 Connected	702	RC8 #7 Relay Status
014	EPC #4 Connected	802	RC8 #8 Relay Status
015	RC8 #1 Connected	901	PSU Normal Operation
016	RC8 #2 Connected	902	PSU Fan Trouble
017	RC8 #3 Connected	903	PSU Ground Fault
018	RC8 #4 Connected	904	PSU Battery or Charge Trouble
019	PSU Connected	905	PSU AC Trouble
01A	AM Power Up	906	PSU Battery Backup Being Utilized
01B	AM Power Off	907	PSU Output Trouble
01C	AM Serviced by Engineer	908	PSU Outputs Disabled
*x*01	EPC #*x* Normal Operation	909	PSU Auto Shutdown Mode

"*x*" = EPC 1 through 4

APPENDIX C

PRESSURE DETECTOR - PRESSURE CORRELATION CHART

Hexadecimal Display (Digits 2 & 3)	Pressure at Detector (PSI)	Pressure at Detector (mbar)
00	-5.23	-361
01	-5.18	-357
02	-5.07	-349
03	-4.95	-341
04	-4.85	-334
05	-4.77	-329
06	-4.70	-324
07	-4.63	-319
08	-4.56	-315
09	-4.50	-310
0A	-4.44	-306
0B	-4.39	-303
0C	-4.34	-299
0D	-4.28	-295
0E	-4.23	-292
0F	-4.18	-288
10	-4.13	-285
11	-4.08	-281
12	-4.04	-278
13	-4.00	-275
14	-3.94	-272
15	-3.90	-269
16	-3.86	-266
17	-3.81	-263
18	-3.77	-260
19	-3.72	-257
1A	-3.68	-254
1B	-3.64	-251
1C	-3.60	-248
1D	-3.56	-245
1E	-3.52	-242
1F	-3.47	-239
20	-3.43	-237
21	-3.39	-234
22	-3.35	-231
23	-3.31	-228
24	-3.26	-225
25	-3.22	-222
26	-3.18	-220
27	-3.14	-217
28	-3.10	-214
29	-3.06	-211
2A	-3.02	-208
2B	-2.99	-206
2C	-2.95	-203
2D	-2.91	-201
2E	-2.88	-198
2F	-2.84	-196
30	-2.80	-193
31	-2.77	-191
32	-2.74	-189
33	-2.69	-185
34	-2.65	-183
35	-2.62	-180
36	-2.58	-178
37	-2.54	-175
38	-2.52	-173
39	-2.48	-171
3A	-2.43	-167
3B	-2.39	-165
3C	-2.36	-162
3D	-2.32	-160
3E	-2.28	-157
3F	-2.25	-155
40	-2.21	-152
41	-2.17	-150
42	-2.13	-147
43	-2.10	-145
44	-2.06	-142
45	-2.03	-140
46	-1.99	-137
47	-1.96	-135
48	-1.92	-132
49	-1.88	-130
4A	-1.85	-127
4B	-1.81	-125
4C	-1.77	-122
4D	-1.74	-120
4E	-1.71	-118
4F	-1.67	-115
50	-1.63	-112
51	-1.59	-110
52	-1.56	-107
53	-1.52	-105
54	-1.49	-102
55	-1.45	-100
56	-1.42	-98
57	-1.39	-95
58	-1.35	-93
59	-1.31	-90
5A	-1.28	-88
5B	-1.24	-86
5C	-1.21	-83
5D	-1.17	-81
5E	-1.14	-78
5F	-1.10	-76
60	-1.07	-74
61	-1.03	-71
62	-1.00	-69
63	-0.96	-66
64	-0.92	-64
65	-0.89	-61
66	-0.86	-59
67	-0.82	-57
68	-0.79	-54
69	-0.75	-52
6A	-0.72	-49
6B	-0.68	-47
6C	-0.65	-45
6D	-0.61	-42
6E	-0.58	-40
6F	-0.55	-38
70	-0.51	-35
71	-0.47	-33
72	-0.44	-30
73	-0.40	-28
74	-0.37	-25
75	-0.34	-23
76	-0.31	-21
77	-0.27	-19
78	-0.23	-16
79	-0.20	-14
7A	-0.16	-11
7B	-0.13	-9
7C	-0.10	-7
7D	-0.06	-4
7E	-0.03	-2
7F	0.00	0
80	0.03	2
81	0.07	4
82	0.10	7
83	0.13	9
84	0.17	12
85	0.21	14
86	0.24	17
87	0.28	19
88	0.31	22
89	0.35	24
8A	0.38	26
8B	0.41	28
8C	0.45	31
8D	0.49	33
8E	0.52	36
8F	0.55	38

PRESSURE CORRELATION CHART

Hexadecimal Display (Digits 2 & 3)	Pressure at Detector (PSI)	Pressure at Detector (mbar)
90	0.58	40
91	0.62	43
92	0.65	45
93	0.69	47
94	0.72	50
95	0.75	52
96	0.78	54
97	0.82	56
98	0.86	59
99	0.89	61
9A	0.92	63
9B	0.95	66
9C	0.99	68
9D	1.03	71
9E	1.06	73
9F	1.09	75
A0	1.13	78
A1	1.16	80
A2	1.19	82
A3	1.22	84
A4	1.26	87
A5	1.29	89
A6	1.33	91
A7	1.36	94
A8	1.40	96
A9	1.43	99
AA	1.46	101
AB	1.49	103
AC	1.53	105
AD	1.56	108
AE	1.59	110
AF	1.63	112
B0	1.66	115
B1	1.70	117
B2	1.73	119
B3	1.76	121
B4	1.80	124
B5	1.83	126
B6	1.86	128
B7	1.89	131
B8	1.93	133
B9	1.97	135
BA	2.00	138
BB	2.03	140
BC	2.06	142
BD	2.09	144
BE	2.13	147
BF	2.16	149
C0	2.20	151
C1	2.23	154
C2	2.26	156
C3	2.29	158
C4	2.33	161
C5	2.36	163
C6	2.40	165
C7	2.43	167
C8	2.46	170
C9	2.50	172
CA	2.53	174
CB	2.56	177
CC	2.60	179
CD	2.63	181
CE	2.66	183
CF	2.69	186
D0	2.73	188
D1	2.76	190
D2	2.80	193
D3	2.83	195
D4	2.86	197
D5	2.90	200
D6	2.93	202
D7	2.96	204
D8	3.00	206
D9	3.03	209
DA	3.06	211
DB	3.09	213
DC	3.13	215
DD	3.16	218
DE	3.19	220
DF	3.23	222
E0	3.26	225
E1	3.29	227
E2	3.33	229
E3	3.36	232
E4	3.39	234
E5	3.42	236
E6	3.46	238
E7	3.49	241
E8	3.52	243
E9	3.56	245
EA	3.59	248
EB	3.62	250
EC	3.65	252
ED	3.69	254
EE	3.72	256
EF	3.75	259
F0	3.79	261
F1	3.82	263
F2	3.85	266
F3	3.89	268
F4	3.92	270
F5	3.95	273
F6	3.98	275
F7	4.02	277
F8	4.05	279
F9	4.08	281
FA	4.12	284
FB	4.15	286
FC	4.18	288
FD	4.21	291
FE	4.25	293
FF	4.27	294

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