



FirePro.

FPX103C

Dual Loop Auto/Manual Fire Control Panel

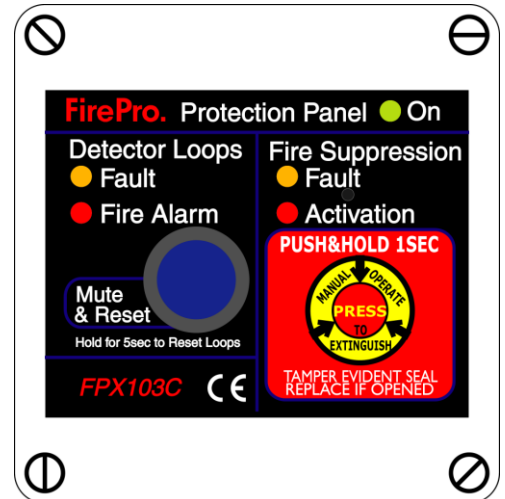
Technical Manual



Reinventing
Fire Suppression

SUMMARY:

- Dual detection loops with full fault monitoring.
- Automatic extinguisher operation after shutdown.
- “Double knock” automatic activation logic.
- Automatic Engine/fuel/fan shutoff capability.
- “Spindown” delay ensures extinguishant is not vented.
- Extinguisher activation button with anti-tamper tag.
- Universal 12 or 24Vdc electrical power.
- Low power consumption in “PARKED” mode.
- Full fault monitoring on all detector and firex circuits.
- Supports up to 6 aerosol fire extinguisher/generators.
- Very low false activation potential, tamper seal on ManOp
- The unit is reverse polarity, transient and EMC protected.
- Custom behavior logic available on request.



Shutdown and delayed firex activation improves effectiveness and saves cost of extra extinguishant. Most existing extinguishing systems release the agent into a high airflow environment which makes it almost completely ineffective. Given that a 7 Liter 4 stroke engine at 3000RPM (that’s 50revs/sec) aspirates 175 Liters or 0.175m³ of air *per second*, add to this ventilation fan flow and the necessity for a shutdown with engine/fan spindown delay before activation is obvious.

The FPX103C has effectively eliminated spurious activation warranty costs which are regularly caused by the inherent characteristics of microprocessors, semiconductor power switches and inquisitive fingers. Our tamper evident tag technology and our strict electronic design rules has proven highly effective. To eliminate the inherent hazards of microprocessor control the FPX103C uses a fully parallel path programmable logic device, which is coded using a language called VHDL, commissioned by US DOD and used for high reliability and safety critical applications.

FEATURES:

2-wire Smoke, thermal or Linear Heat Sensors up to 50M are continuously monitored for alarms, open circuit and chassis faults. LED flash codes indicate the location of an alarm or fault condition. An internal alarm sounder and relay to drive a loud external audible alarm unit up to 2Amps. Uncommitted relay change-over contacts are available for fuel shutoff, engine/fan shutdown. The delay option provides a selectable spin-down time so that the extinguishant is not wasted. “PARKED MODE” is entered when unit senses that ignition is turned off and provides automatic extinguisher operation should both loops alarm - switching off engine during a double alarm will also enter timed auto activation mode (aka driver “legging it” protection). There is an electrical input for an override keyswitch to circumvent shutdown circuits for restarting.

FUNCTIONAL NOTES:

Any loop alarm condition will operate audible and visual alarm indications as follows:

- Single loop alarm condition produces internal pulsed alarm (1 per sec) and fan shutdown.
- Dual loop alarm condition produces internal pulsed alarm (2 per sec) and automatic extinguisher and fuel solenoid operation after spindown delay (user set on dip switches), audible alarm goes continuous.
- Alarm LED flash code indicates which loop is in alarm (1=1blink, 2=2blinks, 1&2=3blinks).

The spindown delay allows time for fan and engine to stop before extinguisher is activated. This is to save extinguishing agent that would otherwise be wasted through venting. The timer tracks the

spindown of engine/fan(s) as a result of ignition switch-off or shutdown by FPX103C as a result of an alarm (from either detectors or manual operate switch). With the ignition off the unit enters low power mode and the ON LED will flash to conserve power. Single flash shows the spindown timer is still counting (fans still turning), then adopts a double flash “heartbeat” indicating that “parked mode” is active and extinguisher operation will be immediate on double alarm or manual operate. In “parked mode” (ignition off for longer than spindown delay) then the fuel solenoid will operate on first alarm and extinguisher immediately on second alarm.

Switching on the ignition even for a short time will restart the spindown timer and it is also active on initial power-on.

Spindown timer is selectable: NoAUTO, IMMEDIATE, 5 to 30 seconds, 5 sec granularity.

A fault in one detector loop will cause the auto mode to fail (because of the double knock logic) however a manufacturing option can allow PARKED mode to auto operate the extinguisher after single loop alarm if the other loop is faulty.

Manual operate command must also wait for the engine/fan spindown before extinguisher activation. After 125ms filter time the unit will confirm activation request by flashing 2ALARM=AUTO LED and internal beeper, fan and fuel solenoid shutdown relays are activated immediately. After spindown timeout the extinguisher will operate and beeper will go continuous.

PANEL LED INDICATIONS:

The panel layout has two distinct areas for extinguisher and detector status with separate LED flash pattern indications for each detection loop (1 and 2).

- Power On (Green LED)
- Detector Alarm (Red LED) - inverse flash pattern indicating affected loop
- Detector Loop Fault (Red AMBER) - inverse flash pattern indicating affected loop
- 2 Alarms=Auto Active (Red LED)
- Extinguisher Fault (Red AMBER)

Internal sounder will operate on anything that requires user attention (alarm or fault).

CONTROLS:

Extinguisher manual operate button (behind tamper evidence tag)

Auto mode time delay selector DIP switch on panel rear (delay = binary_value * 5 seconds).

SW1-3 off-off-off = immediate, on-on-on = AutoDisabled, on-off-off=5sec, off-on-off=10sec, etc.

SW4 on = vfc operates on single alarm, off = vfc operates on double alarm

CONNECTIONS:

BLOCK 1 (6 way)

GND

External Alarm Output (Power via 2A N.O. relay contact)

GND

Ignition input (sets auto PARKED mode when off)

Power (11-32vdc via 4A fuse)

GND

BLOCK 2 (6 way)

Detector Loop1A

Detector Loop1B

Detector Loop2A

Detector Loop2B

GND

Aux input

BLOCK 3 (6 way)

FirexA

FirexB

GND

VFC (2Amps Max)

NO VFC (2Amps Max) COM

VFC (2Amps Max) NC

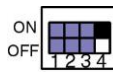
ELECTRICAL SPECIFICATION (at 24VDC supply unless otherwise stated):

Power Supply	Operating Voltage	11 to 32V DC
	Quescent Current Ign Off	8.5mA Typ (excluding external load currents)
	Ign On	16mA Typ (excluding external load currents)
	Maximum Alarm Current Draw	100mA (excluding external load currents)
	Max current draw	3A (including extinguisher operate current)
	Parked current draw	8.5mA Typ
	Suppressor Activation	Discharge Current
	Current/Time Limit	Output is Vin via switch with 6 Ohms in series. Constant I2T limit = 9 Amp2*Seconds
	Monitoring current	<4mA, Fault if loop R>300, 12Vmax o/c voltage
AuxIn (Override key)	Monitoring current	1.2mA Nominal
	Sense Logic	Norm S/C, >1K active typ.
Sensor Loop Inputs 1+2	Max Output voltage	12VDC regulated, filtered and transient protected
	Output current limit	25mA per loop
	Alarm condition threshold	<700 Ohms Nominal
	Fault condition threshold	Approximately 20K Ohms
	End Of Line Resistor	10K Ohms
	Fault monitoring	Open circuit or ground fault = fault indication
Alarm Output	Relay Contacts	2A @ VinDC (Vin thru NO relay circuit)
VFC Output	Relay Contacts (volt free)	2A @ 24VDC (relay changeover circuit)
Mechanical	Dimensions	H=82mm * W=83mm * D=25mm
	Mounting	75mm diameter round hole, retained by four #6*25 self tapping screws
	Connections	Via 3 * 6 way terminal block accepting <1mm ² wires with ferrules

DIP SWITCH SETTINGS (Black = switch tab)



DIP switches 1.2.3 set a delay time between shutdown (VFC) and subsequent extinguisher automatic activation. Delay can be set 0 to 30 seconds in 5 second steps. Manual only mode can be set with ON.ON.ON.OPT



DIP switch 4 defines critical alarm OPTion.

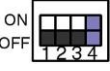
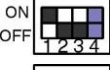
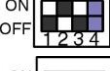




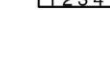
The default setting is OFF which requires 2 loops to be in alarm (OPT=“double knock”) before shutdown and time delayed extinguisher activation.

Moving to ON position requires only one loop to be in alarm (OPT=“single knock”) before shutdown and time delayed extinguisher activation.

Note that the unit dispenses activation delay following depowering of ignition input. The instant mode is indicated by flashing green PWR LED which gives double flash whilst moving through the delay and single flash on reaching zero delay instant mode.

Fan/Engine “Spindown” delay time before automatic release.

Note: Spindown delay only when ignition is ON

OFF.OFF.OFF.OPT		0 Sec = Immediate
ON.OFF.OFF.OPT		5 Sec
OFF.ON.OFF.OPT		10 Sec
ON.ON.OFF.OPT		15 Sec
OFF.OFF.ON.OPT		20 Sec
ON.OFF.ON.OPT		25 Sec
OFF.ON.ON.OPT		30 Sec
ON.ON.ON.OPT		No Automatic Operation

Installation Notes:

Ensure that Linear Heat Detectors are suitably mounted for the vehicle vibration levels.

Front of panel is splash proof but it must be located to prevent excessive moisture or water getting to the unit, especially the rear connections.

Locate to avoid excessive direct solar exposure.

WARNING! (And some common sense.....) Refer to the installation manual.

System installation must be verified by a competent technician familiar with regulations governing such installations.

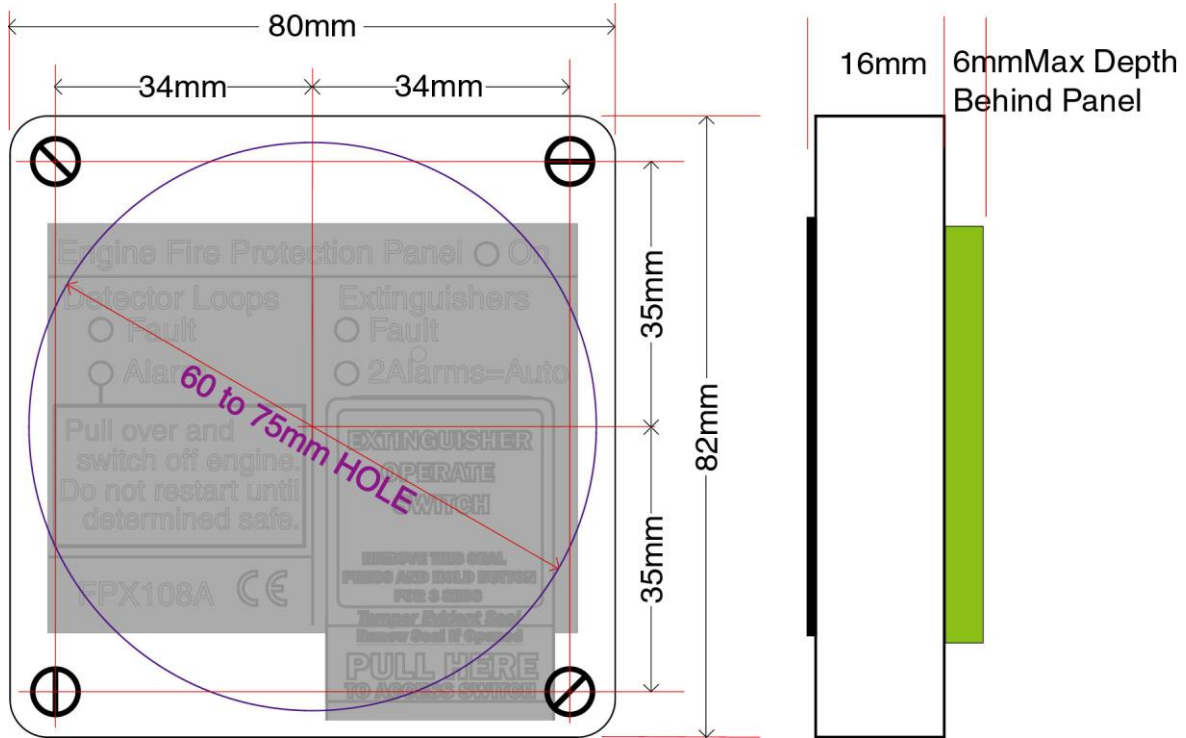
Do not install in Engine, bilge, fuel or gas storage compartments (see RCD and ISO9094).

In the event of an alarm shutdown the engines and ventilation immediately.

The cause of the activation must be found and corrected before restarting.

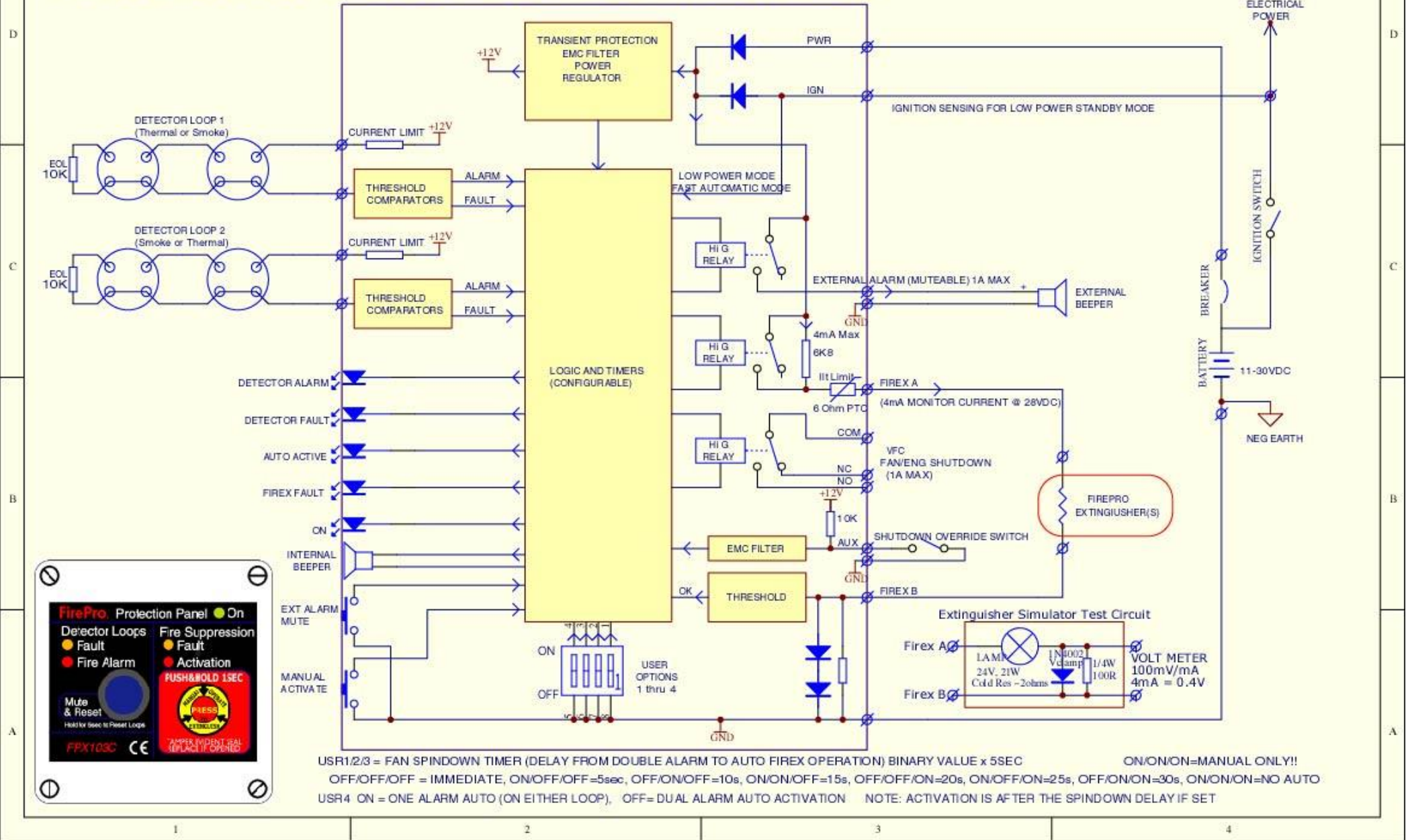
DO NOT PROCEED TO OVERRIDE UNLESS IT HAS BEEN DETERMINED SAFE TO DO SO.

Outline & Mounting drawing:



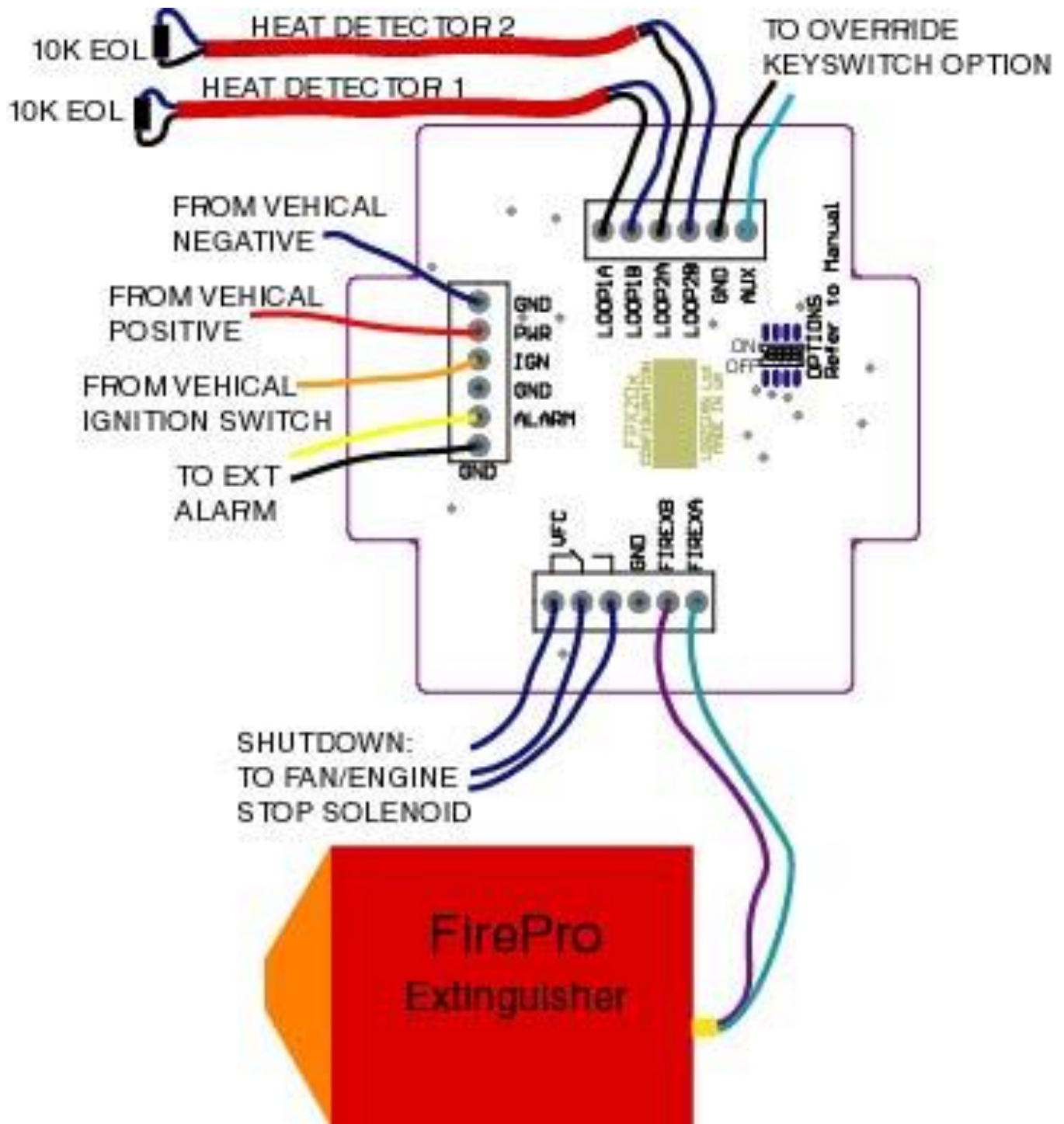
APPLICATION ILLUSTRATION, REFER TO MANUAL

FPX103C_AUTO FIRE PROTECTION PANEL - NEG EARTH SYSTEMS ONLY



USR1/2/3 = FAN SPINDOWN TIMER (DELAY FROM DOUBLE ALARM TO AUTO FIREX OPERATION) BINARY VALUE x 5SEC
 ON/ON/ON=MANUAL ONLY!!
 OFF/OFF/OFF = IMMEDIATE, ON/OFF/OFF=5sec, OFF/ON/OFF=10s, ON/ON/OFF=15s, OFF/OFF/ON=20s, ON/OFF/ON=25s, OFF/ON/ON=30s, ON/ON/ON=NO AUTO
 USR4 ON = ONE ALARM AUTO (ON EITHER LOOP), OFF=DUAL ALARM AUTO ACTIVATION NOTE: ACTIVATION IS AFTER THE SPINDOWN DELAY IF SET

Typical Application wiring (Linear Heat Detector sensors)



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