

# Fire Extinguishing Control Panel FPX104C



## OPERATION & INSTALLATION MANUAL

## **Product Description**

The FPX104C panel is used to monitor and control multiple fire detectors and FirePro generators as part of a marine engine fire protection system. It can support multiple combinations of up to four flame/smoke/overheat/linear heat detectors for 24V panel supply and up to two with a 12V panel supply. The maximum number of FirePro generators, which can be fitted per panel is four for a 24V panel supply and two for 12V panel supply.

The fire protection system meets the requirements of the SOLAS and the Recreational Craft Directive/ISO9094 Parts 1 and 2.

This compact unit is self-contained, operates on universal voltage (10 – 32V DC electrical systems) and is designed for easy installation providing long-term reliable operation in a marine environment.

The detector electrical interface port supports conventional MCA approved smoke, thermal or flame sensors with up to 4 sensors on a two-wire loop.

Any detector alarm condition will cause the main external audible alarm to sound.

Operating the MUTE button will cause this to cease but an LED indication and internal audible warning will persist until a Reset by cycling power to the unit.

The FirePro generators can be operated by the Manual Operate button, which is protected by a waterproof tamper-evident seal.

The detector loop and FirePro generator line is continuously monitored for wiring faults, which will cause LED fault indication and internal audible response.

Comprehensive self-test and continuous fault monitoring circuitry provides complete health checking and prevents false alarms due to wire faults. The same unit will operate on both 12V and 24V electrical systems.

## **Features**

- Supplies a regulated power and indicates status of smoke/overheat/flame detector chain (up to 4) via 2 wire loop for 24V panel supply & (up to 2) for 12V panel supply.
- Two 8A changeover relay circuits for external warning/shutdown circuits.
- Monitors status and manually operates up to 4 installed FirePro generators for 24V panel supply & up to 2 FirePro generators with a 12V panel supply.
- Visual and audible warning of detector alarm event.
- Alarm Mute button (mutes external alarm circuits only).
- Push button for manual operation of fire extinguishers has tamper evident seal.
- Continuous fault monitoring detects wire faults (a detector wiring fault will not result in false alarm).
- Visual and audible warning of detector and extinguisher line faults.
- Separate fault indication for detector and extinguisher line faults.
- Rugged construction with 100,000hour lifetime LED indicator lamps.
- Universal 12V or 24V electrical system operation.
- Front of panel is sealed to IP67
- Mounts into 3" diameter round hole with connections on rear of unit, electrical connections via terminal strip on rear.
- Supports multiple remote audio/visual alarm units (FPA101-12V, FPA101-24V both 122dBA at 30cm).

## **Applications**

The FPX104C was designed and developed as a marine panel. However, the panel can also be used in other types of applications as listed below:

- Buses and Transportation Vehicles
- Automobiles and Trucks
- Agricultural/Harvesting machines
- Locomotive engines/generators (railway)
- Military vehicles

## **Installation of the FPX104C panel and detectors (general)**

Ensure that the FPX104C panel has been supplied with the “tamper” evident tag fixed in position to the face of the panel. If it has been supplied without the tamper tag fitted, please contact your supplier before proceeding with the installation.

Find a suitable position for mounting the panel, taking in to consideration the clearance required for the wiring at the back of the panel. Also considering the wiring run to the panel and ensuring at the same time that the panel will not be in a position where it may get knocked or accidentally damaged, but easily accessible if required.

The FPX104C panel is for use as a single zone detection system.

The positive supply to the FPX104C panel requires a single pole thermal breaker: 5amp for 12vDC or 10amp for 24vDC supplies.

## Installation of the FPX104C panel and detectors (technical).

Follow this sequence of Installation (strictly):-

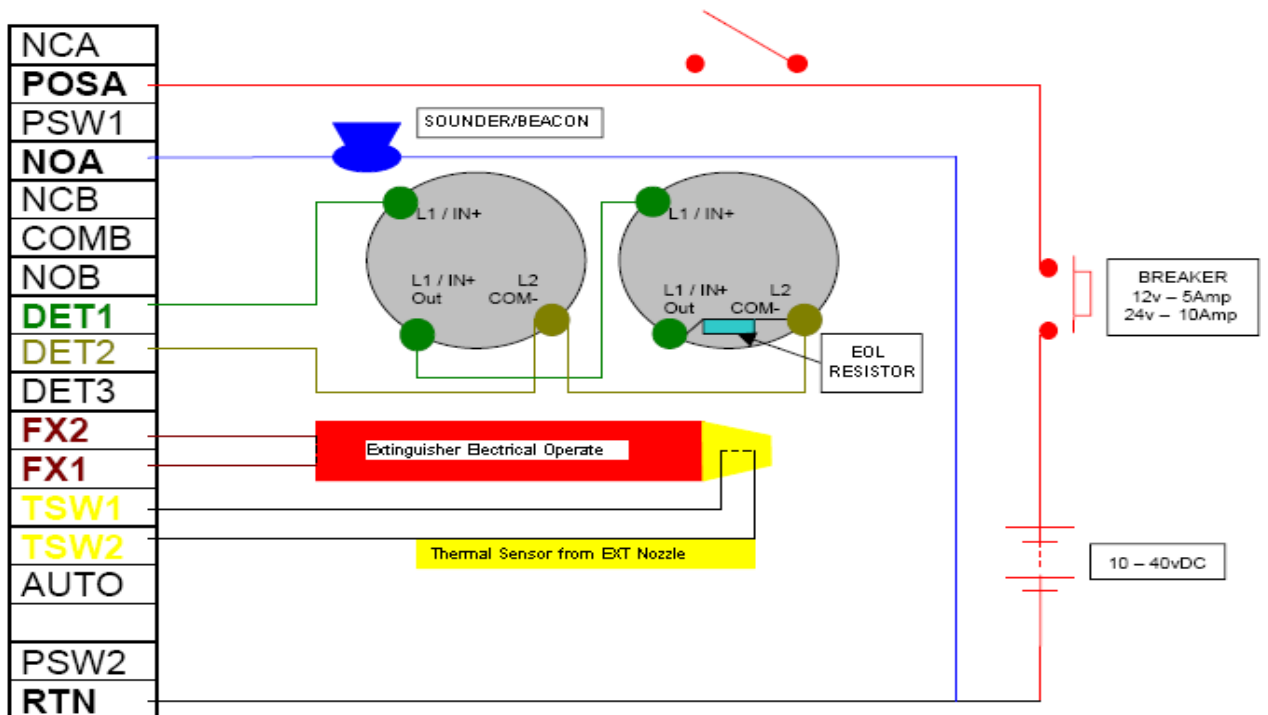
- i. Install the FirePro generators as set out in the wiring diagrams.
- ii. Install the heat and smoke detector bases within the protected area, on the deck head/roof of the engine/machinery space. The detectors should be installed with a minimum clearance (gap) from the bulkhead/wall of 500mm (0.5m) and at a maximum height of 4m.
- iii. Ensure the “end of line” detector base with the resistor fitted is installed at the end of the wiring run for the detectors, as this base is used for monitoring the complete detector circuit.
- iv. Cut a 75mm (approximately 3 inch) hole for mounting panel in.
- v. Run cables/wires and make the following connections to the back of the FPX104c panel only: -

NCA	
POSA	Positive feed through relevant breaker (can be wired through ignition switch*)
PSW1	
NOA	Positive feed for external sounder/beacon (negative feed also required)
NCB	
COMB	
NOB	
DET1	Positive feed to detector (L1 or IN+ connection on detector base)
DET2	Negative feed to detector (L2 or COM- connection on detector base)
DET3	
FX2	Feed to the FirePro Generator/s (not pole sensitive)
FX1	Feed to the FirePro Generator/s (not pole sensitive)
TSW1	Feed to Thermal sensor fitted to the FirePro generator nozzle or outlet plate (yellow sensor wire, not pole sensitive)
TSW2	Feed to Thermal sensor fitted to the FirePro generator nozzle or outlet plate (yellow sensor wire, not pole sensitive)
AUTO	
PSW2	
RTN	Negative feed

\* If ignition switch is in the off position there will be no power to panel for activation.

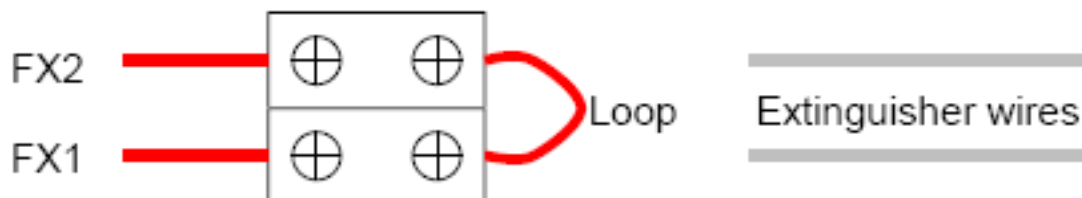
- vi. When fitting more than one FirePro generator, you only need to install one thermal sensor at the 1<sup>st</sup> generators nozzle or outlet plate.
- vii. **Do not** connect the wires from the panel (POSA & RTN) to the power supply at this stage. Ensure the thermal breaker is in the off position
- viii. **Do not** connect the wires from the panel (FX2 & FX1) to the FirePro Generator/s (white) wires at this stage

ix. Connect all other wires as shown below in the diagram: -



**When the following components have been connected to the panel: sounder/beacon, heat and smoke detectors, thermal sensor, the following sequences can be carried out to commission the system: -**

- i. Fit the detector heads to the detector bases.
- ii. Make a connection between wires FX2 & FX1 to create a loop\*\* (Do Not connect to the FirePro generator wires at this stage).
- iii. Connect the panel to the power supply (positive and negative feed).



**Carry out the following system commissioning procedures: -**

TEST	ACTION	RESULT	FINDINGS
1	(At Panel) Switch on BREAKER to make panel "live".	(At Panel) Green "On" light should be on	
2	(At extinguisher) Disconnect wire forming closed circuit between FX1 & FX2 wires	(At Panel display) Red Extinguisher "Fault" light should be on and panels internal sounder should be on	
2A	(At Extinguisher) Disconnect the LOOP wire creating the closed circuit between wires FX1 & FX2. With a good quality multi-meter that can measure down to 1 milli-amp DC, Measure the milli-amp reading between the two wires	(At Panel display) Red Extinguisher "Fault" light should be on and the panels internal sounder should be on. Meter should read approximately 1 - 2mA	
2B	(At Extinguisher) Re-connect LOOP wire forming closed circuit between FX1 & FX2 wires	(At Panel display) Red Extinguisher "Fault" light should be off and panels internal sounder should be off	
3	(At Extinguisher) Disconnect sensor wire	(At Panel display) Red Extinguisher "Discharged" light should be on and panels internal sounder should be on	
3A	(At Extinguisher) Disconnect the sensor wire. With a good quality multi-meter that can measure down to 1 milli-amp DC, Measure the milli-amp reading between the two wires	(At Panel) Red Extinguisher "Discharged" light should be on and panels internal sounder should be on. Meter should read approximately 5+mA	
3B	(At Extinguisher) Re-connect sensor wire	(At Panel display) Red Extinguisher "Discharged" light should be off and panels internal sounder should be off	
4	(At Detectors) Disconnect Heat detector from its base	(At Panel display) Red Detectors "Fault" light should be on and panels internal sounder should be on	
4A	(At Detectors) Re-connect Heat detector to its base	(At Panel display) Red Detectors "Fault" light should be off and panels internal sounder should be off	
5	(At Detectors) Disconnect Smoke detector from its base	(At Panel display) Red Detectors "Fault" light should be on and panels internal sounder should be on	
5A	(At Detectors) Re-connect Smoke detector to its base	(At Panel display) Red Detectors "Fault" light should be off and panels internal sounder should be off	
6	(At Detectors) Spray "SMOKE" at Smoke detector	(At Panel display) Red Detectors "Alarm" light should be on and panels internal sounder should be on. External Sounder Beacon should give visual and audible alarm	
6A	(At Panel) Press "Mute" button	External Sounder Beacon visual and audible alarm should go off. (At Panel display) Red Detectors "Alarm" light should be on and panels internal sounder should be on	
6B	(At Detectors) Switch breaker off to reset panel. Wait for 2 minutes, then switch breaker back on	(At Panel display) Green light should go off and then Green "On" light should be on when power is recycled	

**The Final connection to be made is to connect the FX1 & FX2 wires to the FirePro generator/s. Follow these steps when carrying out this procedure: -**

- ix. **Switch off breaker** and ensure there is no power to the panel or to the FirePro generator/s.
- x. Remove all personnel from the engine room where the FirePro generator/s are installed.
- xi. Remove the “LOOP” wire and connect the two wires from the FirePro generator/s to the two wires from the panel FX1 & FX2 in any order, ensuring that you are not in the way of the exit nozzle or outlet plate of the FirePro generator.
- xii. Switch on the breaker. The power light should be “On” and the system is now powered up and ready for use if required.

**FPX104c Electrical Specification (24VDC unless stated)**

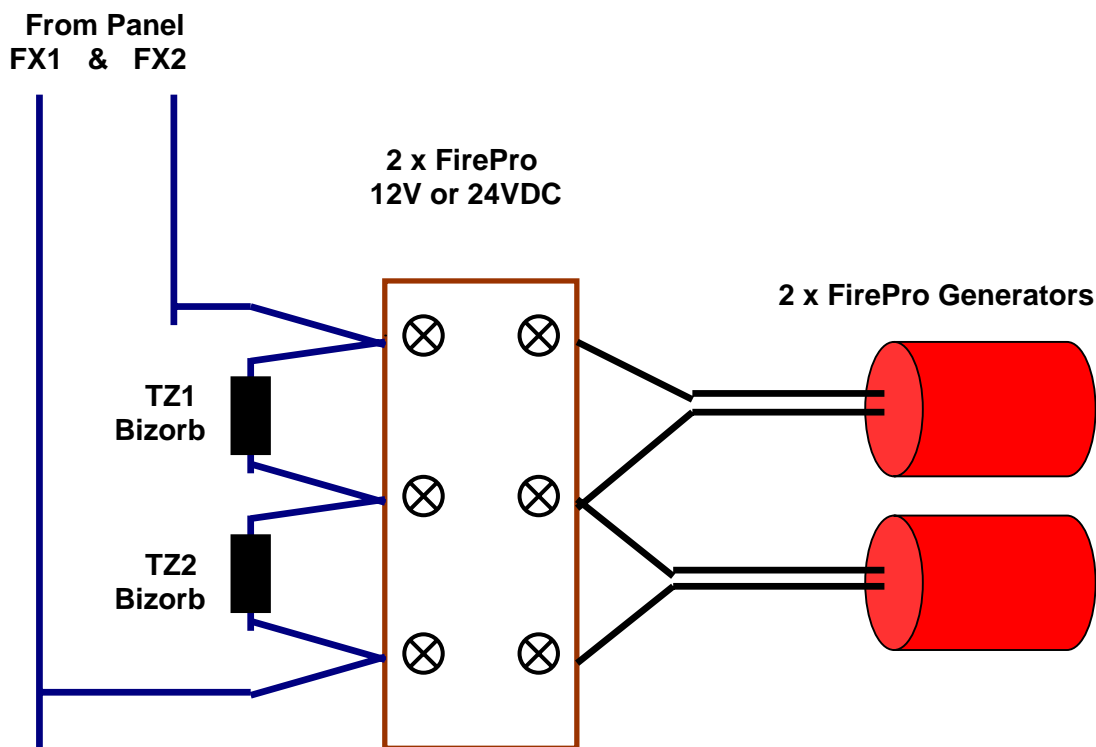
Power Supply	Operating Voltage	10 to 35V DC
	Quiescent Current	20mA Type (excluding engine, blower and solenoid currents)
	Maximum Alarm Current Draw	120mA (excluding engine, blower and solenoid currents)
	Max current draw	4A (excluding engine, blower and solenoid currents)
Suppressor Activation	Discharge Current	<b>1A to 4A depending on voltage and number of suppressors (FirePro = 2 Ohms each unit)</b> Up to 2 units on 12V, 4 units max on 24V Connect in series with 1.5KE 6V8 bidirectional catch diodes across each element (as per diagrams).
	Current/Time Limit	Output is $V_{in}$ via switch with 6 Ohms in series. Constant $I^2T$ limit = 9 Amp <sup>2</sup> *Seconds
	Monitoring current	<2mA, Fault if loop R>560R, 5Vmax o/c voltage
Discharge Monitor 1	Monitoring current	5mA
	Sense Logic Polarity	Norm S/C, >1K after discharge
Discharge Monitor 2	Monitoring current	N/A
	Sense Logic Polarity	Norm O/C, Contact close on discharge Multi Firex “All Fire” Option on term block
Sensor Loop Input	Max Output voltage	20VDC regulated, filtered and surge protected
	Output current limit	48mA
	Alarm condition	470 Ohms Nominal (standard 2-wire interface)
	Alarm Threshold	Approximately 1.8K Ohms
	End Of Line Resistor	10K Ohms
	Fault monitoring	Short circuit or ground fault = fault indication
Alarm Output	Relay Contact Rating	8A @ 24VDC (2 relay changeover circuits)
Mechanical	Dimensions	H=82mm * W=83mm * D=70mm
	Mounting	75mm diameter round hole, retained by four #6*25 self tapping screws
	Connections	Via 18 way terminal block accepting wires with ferrules

**Basic wiring diagram for connecting multiple FirePro generators to FPX104c panel**

**Please Note:**

When only using a single generator, this will connect directly to the panel FX1 & FX2 connections. There is no requirement for multiple connector block

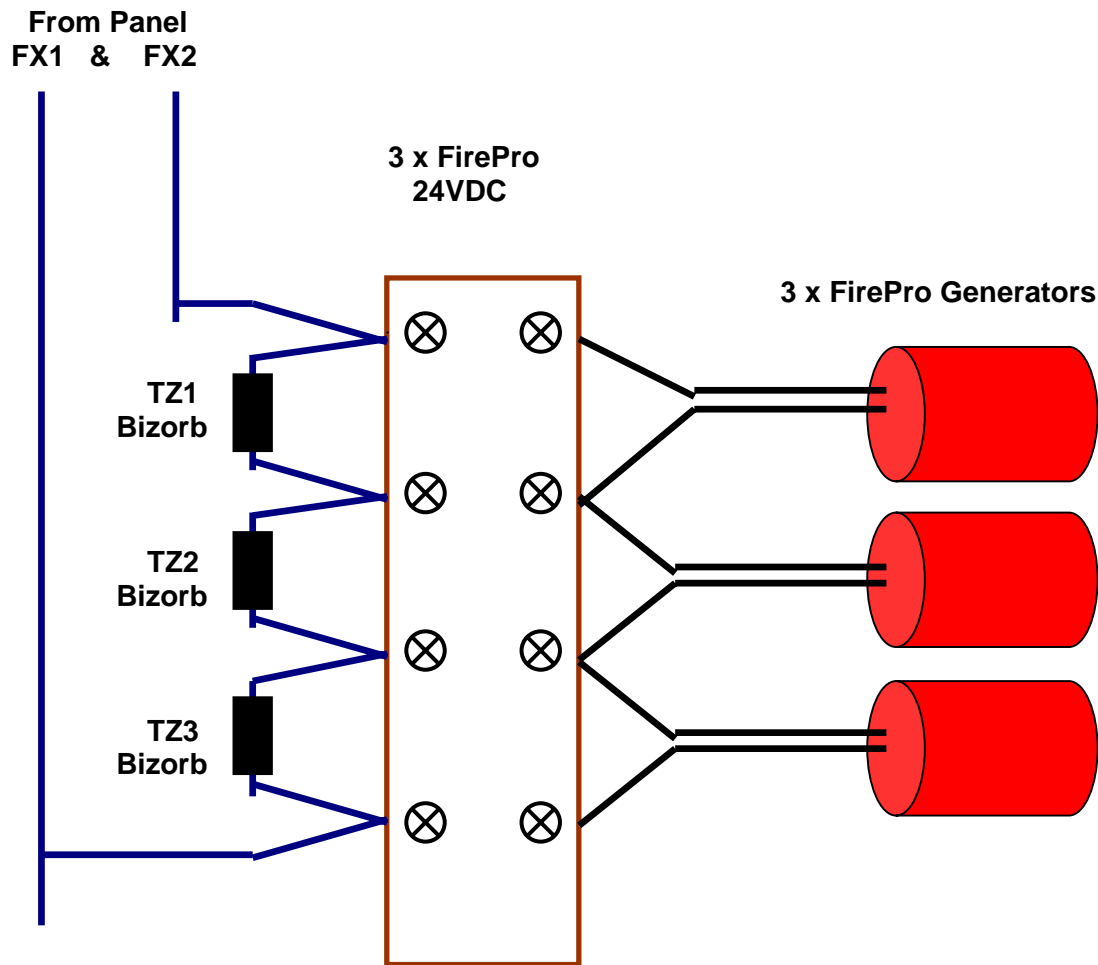
**(12VDC Maximum 2 x FirePro generators)**



**TZ = Bidirectional diode, 1.5KE6V8CA GenSemi oe STmicro**

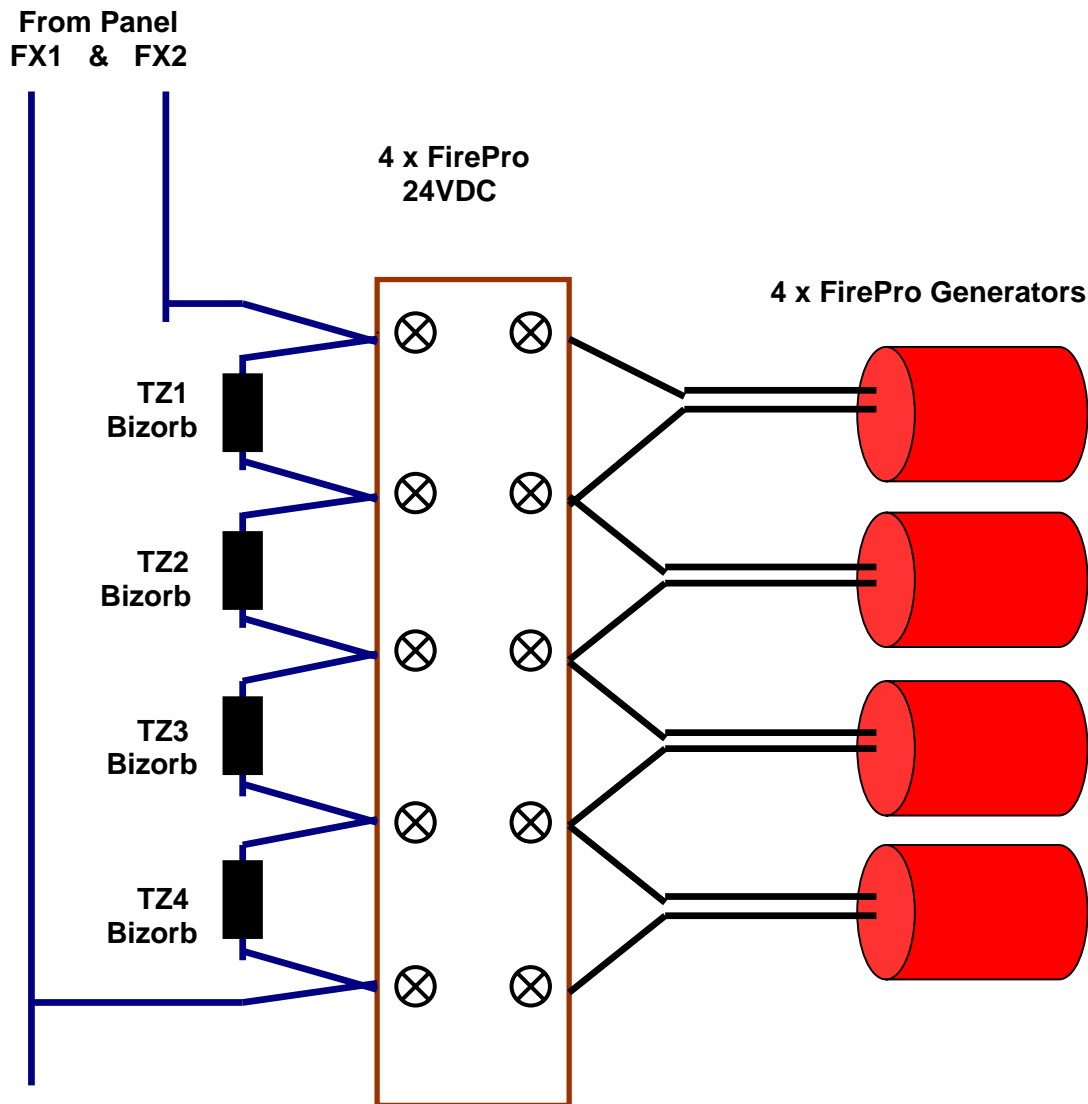


**Basic Wiring Diagram for Multiple FirePro generators**  
**(24VDC 3 x FirePro generators)**



**TZ = Bidirectional diode, 1.5KE6V8CA GenSemi oe STmicro**

**Basic Wiring Diagram for Multiple FirePro generators**  
**(24VDC Maximum 4 x FirePro generators)**



**TZ = Bidirectional diode, 1.5KE6V8CA GenSemi oe STmicro**