FIREFORCE 8

NOTIFICATION APPLIANCE CIRCUIT EXPANDER

INSTALLATION & OPERATION MANUAL

THE GAMEWELL COMPANY
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PROPRIETARY MATERIAL

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GENERAL INFORMATION

The Gamewell Company thanks you for choosing the FIREFORCE 8 Notification Appliance Circuit Extender. As with all our products we have taken great care to insure that we have provided a quality product. To receive maximum benefit and many years of reliable service we would like to make the following recommendations:

1. **Read this manual carefully** and in it's entirety before proceeding with the installation of the FIREFORCE 8 panel.

2. **Never** make any connections **with the power connected.**

3. Gamewell spends many hours testing devices that are supplied by Gamewell to be used with it's control panels to verify compatibility. **To maximize system performance, and minimize risk of damage to the equipment, we suggest using all Gamewell Components.**

4. **There is no substitute for proper maintenance and testing** of this or any life safety product. Gamewell recommends testing and maintenance of your FIREFORCE 8 in accordance with the guidelines set forth by the National Fire Protection Association, to be done on a regular basis, as a minimum.

5. **This manual should be stored with the FIREFORCE 8 panel** for future reference, and should not be removed, providing reference to the operation and programming of the installed FIREFORCE 8

Thank you again for choosing Gamewell. If you have any comments regarding your FIREFORCE 8 panel or other Gamewell products, please contact us at:

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FIREFORCE 8 CIRCUIT NOTIFICATION APPLIANCE EXPANDER

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INTRODUCTION

General Description

The FIREFORCE 8 is a notification appliance circuit extender panel designed to extend the power capabilities of existing notification appliance circuits and provide power for other ancillary devices.

An FIREFORCE 8 panel consists of two notification appliance circuit inputs and four class B, style Y or two class A, style Z, notification appliance circuits. Two class B (1 class A) circuits will always be controlled by the 1st input, the other two class B (1 class A) circuits may be operated from either input. Each of these output circuits are capable of providing 2.5 amps of power limited notification appliance power and are supplied from an 8 Amp regulated 24 VDC power supply. Outputs may follow the inputs, or be programmed to provide temporal outputs for a steady input They can also be programmed to provide strobe and horn synchronizing signals when none are on the input. The internal sync. signals can permit horns and strobes to be connected to a single wire pair on each output, controlled by the two inputs, or they can be separated and operated on individual outputs. All inputs and outputs are supervised for open or shorted conditions. EOL resistor values can be changed by connecting a sample EOL resistor to the unit. This allows compatibility with existing NAC circuits. An internal battery charger is also provided with the FIREFORCE 8 to provide standby battery operation. The panel is mounted in a rigid sheet metal enclosure with the dimensions of (12 5/8"W x 18"H x 4 1/2"D).

FUNCTIONAL DESCRIPTION

Normal Quiescent Operation

In the normal quiescent condition the green Power On LED is illuminated indicating AC line operation. The yellow TRBL LED s are off indicating that all supervision circuits are normal.

Alarm Condition

Whenever an alarm condition occurs at the Main FACP the resultant 24V output from it's indicating circuit will energize the connected polarity sensing inputs. This input will then activate the notification appliance output circuits on the FIREFORCE 8 according to how they are programmed. Input 1 will always control Outputs 1 and 2. Input 2 normally controls Outputs 2, and 3 (Default) however this pair of outputs can be programmed to operate from Input 1. The FIREFORCE 8 notification appliance circuits will follow steady, march time, temporal or coded signals from the main control panel, and will pass on strobe and horn synchronization signals if they are present on the input.
When the unit is programmed to generate synchronization signals, combined horn and strobe synch. signals are placed on each selected output pair and turned on and off by the inputs in the manner described as default above. When the unit is programmed to generate synchronization signals and have all four outputs controlled by input 1, the strobe synch. signals are placed on all four outputs when input 1 is active. When input 1 and 2 are active, the horn synch. signals are combined with the strobe synch. signals on all four outputs. In this manner, horns and strobes can be connected to same pair of wires on any output, and be controlled individually

Reset

The FIREFORCE 8 will return to the quiescent condition automatically upon restoration of the Main FACP to normal operation

Trouble Condition

A trouble condition is indicated by a TRBL LED illuminating and the common Form "C" TROUBLE FAIL relay contacts transferring. The trouble signal will be transmitted to the Main FACPs by opening the Indicating Circuits which are used to control the FIREFORCE 8. An alarm from the main control panel will override a trouble condition.

The FIREFORCE 8 monitors it's output notification appliance circuits for an open or shorted condition. Notification appliance circuits with a short circuit trouble can not be activated.

A trouble is indicated by any one of the following conditions:

INDICATOR	NAME	TROUBLE CONDITION
LED 8	PWR ON	-a brown-out or black-out AC line condition
LED 7	AUX TRBL	A low or missing output, or a short circuit on the AUXilliary output
LED 6	BATT TRBL	-a low or missing battery
LED 5	GF TRBL	-an earth fault on external wiring
LED 4,3,2,1	SIG(4,3,2,1) TRBL	-a short circuit or an open on a supervised notification appliance circuit

Normal AC Power Failure

When the AC fails or falls below 95VAC (Brown out), the FIREFORCE 8 will go into the Trouble condition. It will switch to Battery Operation, deactivate the *Trouble* and *Power Fail* relays, extinguish the AC On LED (LED 8), and transmit the trouble over the input Signal Circuits.

Delayed AC Power Failure

When S7 *AC 6HR* is set (Dialer Operation) An AC failure will be handled in the same manner as above EXCEPT the *TROUBLE* relay will not transfer, and the failure notification will not be transmitted over the input Signal Circuits until the failure has existed for 6 hours. The *POWER FAIL* relay will transfer in order to provide an external trouble indication.

Battery Operation

Indicated by the extinguishing of the green Power On LED.
Standby operation occurs whenever the main power source fails or falls below 95VAC. In this situation the FIREFORCE 8 will automatically transfer system operation to the standby battery set without the loss of any alarm condition present prior to the transfer. The FIREFORCE 8 panel will transfer back to the main power source when the operating voltage returns to 105VAC. Should the battery become disconnected, have a blown fuse, or develop low voltage, the FIREFORCE 8 will indicate a Battery fault and light LED 2. Replace batteries when required.

ELECTRICAL OPERATING CHARACTERISTICS

Input Voltage

120 to 240 VAC (Jumper selected)50/60 Hz @ 5 Amps.

Output Voltage

24 Volt DC regulated @ 8Amps-system power.

NAC outputs 1-4

2.5 Amps Maximum per output.

AUX Power

0.15 Amps under all conditions. 2 Amps if load is removed during operation from battery.

Total System Current

Total loading on all outputs shall not exceed 8 Amps.

INSTALLATION

Mounting Instructions

The standard mounting is a surface mount cabinet. The unit must be securely attached to a permanent partition using suitable fasteners. Four mounting holes are provided to accept 1/4 inch dia. screws max. There are nine combination knockouts provided, located three on the top and three on each side of the cabinet. Knockouts can accept 1/2, or 3/4 inch conduit.

Electrical Connections

See Inter-equipment Wiring DWG. No. B-W479 for field wiring connections.

Function of Input/Output Connections

AC Connections

120 – 240VAC connects to the AC Terminal Block on the Power Supply

CONNECTIONS FOR THE A.C MAINS		
J1 TERMINALS		
L1 (Hot)	GND	L2 (Neutral)

WARNING! WHEN INSTALLING TO OPERATE FROM 200VAC-240VAC IT IS NECESSARY TO REMOVE THE JUMPER E1-E2 ON THE POWER SUPPLY PRINTED CIRCUIT BOARD. FAILURE TO DO SO WILL RESULT IN DAMAGE TO THE POWER SUPPLY WHEN AC VOLTAGE IS APPLIED.

Battery Connections

Batteries connect to the BATT+, BATT- terminals. Sealed Lead Acid Batteries are required to provide 24 Volts DC @ 8 Amps max., The maximum battery size allowable is 24AH. Connect ONLY with the provided cable and a 15A fuse.

CONNECTIONS FOR THE BATTERY	
TB1 TERMINALS	
BATT +	BATT -

24 VDC OUT Terminals

Auxiliary Power Output @ 24 Volts DC, regulated 150 mA, (2 Amps maximum if an external disconnect is used during periods of power failure). Two terminals are provided (+,-). Power limited output of 2 amps. (Deduct the current used from the 8 Amps total system load)

CONNECTIONS FOR AUXILIARY 24 VDC	
TB4 TERMINALS	
A+	A-

Earth Ground

Connect to Earth Ground on the Power Supply module.

EARTH GROUND CONNECTION
J1 TERMINAL
GND

Trouble Relay

The common trouble relay is a normally energized Form C relay that transfers when the FIREFORCE 8 detects a trouble condition. The contacts are rated for 2 amps @ 30VDC.

TROUBLE FAIL		
TB2 TERMINALS		
NC	COMM	NO

POWER FAIL

The Power Fail relay is a normally energized Form C relay that transfers when a power failure or brown out condition exists. The contacts are rated for 2 amps @ 30VDC.

POWER FAIL		
TB2 TERMINALS		
NC	COMM	NO

Extender Output Circuit Wiring

The FIREFORCE 8 Notification Appliance Circuit outputs can provide up to 2.5 Amps (power limited) of regulated 24 VDC each (total panel output is limited to 8 Amps). The outputs can be arranged as 4 Style Y (Class B), 2 Style Z (Class A) or 1 Style Z and 2 Style Y circuits. The EOL resistor value for Style Y wiring is 3.9K ohms unless a reference resistor of a different value is used. Terminals (n)L1 and (n)L2 are connections for style Y (Class B) wiring These designations are preceded by the circuit number (n). When Style Z (Class A) wiring is used, terminal 1L1 will return to terminal 2L1 and terminal 1L2 will return to terminal 2L2, likewise, terminal 3L1 will return to terminal 4L1 and terminal 3L2 will return to terminal 4L2 for the second Class A circuit. **Terminal L1 switches negative and terminal L2 switches positive during alarm condition.** Either pair of circuits can be designated Class A or Class B independently of the other pair.

Style Z - Class A						Style Y - Class B	
NOTIFICATION APPLIANCE CIRCUIT CONNECTIONS					Circuit	NOTIFICATION APPLIANCE CIRCUIT CONNECTIONS	
TERMINALS						TERMINALS	
1L1	2L1		1L2	2L2	1	1L1	1L2
-	-		-	-	2	2L1	2L2
3L1	4L1		3L2	4L2	3	3L1	3L2
-	-		-	-	4	4L1	4L2

Reference EOL Resistor

To accommodate existing Notification Appliance circuits that have EOL resistors of values different from the 3.9K ohm normally used with the NAC outputs of this panel, provisions are made to attach a reference EOL resistor within the range of 2.0K to 25.0K ohms. When the reference resistor is used,, all Style Y (Class b) outputs must have EOL resistors of the same value as the reference resistor. EOL values outside of the 2.0K – 25.0 K range will cause all of the Style Y NAC output Trouble LEDs to light steady.

REF	
TB3 TERMINALS	
REF+	REF-

Input signal wiring

The main FACP notification appliance circuit inputs are +IN, -IN. When polarity is reversed on the main FACP notification appliance circuit, the output circuits on the FIREFORCE 8 will activate according to their programming. These inputs restore when the Main FACP circuit is restored. +IN and -IN are internally connected to +OUT and -OUT for connection to devices beyond the FIREFORCE 8. Should a trouble condition occur, the circuit is opened. If an alarm is received during trouble the circuit is restored to allow devices beyond the FIREFORCE 8 to be operated. Signal 1 always activates output Signal Circuits 1 and 2., and depending on the position of switch SW1-8 can also control output Signal Circuits 3 and 4. Otherwise, Signal 2 controls output Signal Circuits 3 and 4.

SIGNAL 1			
TERMINALS			
1+IN	1-IN	1+OUT	1-OUT

SIGNAL 2			
TERMINALS			
2+IN	2-IN	2+OUT	2-OUT

Function of Switches, Diodes and Jumpers

Programming Switches

Outputs 1 & 2

SW-1 1	SW-1 2	Function
SIG1/2A	SIG1/2B	
Open	Open	Output follows the Input
Closed	Open	Steady Input, Temporal Output
Open	Close	Steady Input, Steady Output, Strobe Sync. added
Closed	Closed	Steady input, steady output, noise eliminated.

Outputs 3 & 4

SW-1 3	SW-1 4	Function
SIG3/4A	SIG3/4	
Open	Open	Output follows the Input
Closed	Open	Steady Input, Temporal Output
Open	Close	Steady Input, Steady Output, Strobe Sync. added
Closed	Closed	Steady input, steady output, noise eliminated.

Sync. Codes

SW-1 5	SW-1 6	Function
SYN/SELA	SYN/SELB	
Open	Open	Wheelock Sync
Closed	Open	System Sensor Sync
Open	Close	Faraday Sync
Closed	Closed	Reserved

Power Fail Reporting

SW-1 7	Function
AC 6HR	
Open	TROUBLE FAIL reported immediately on power failure
Closed	TROUBLE FAIL delayed for 6 hours on power failure

Input Select

SW-1 8	Function
SIG SEL	
Closed	Outputs 3 / 4 controlled by Input 2
Open	Outputs 3 / 4 controlled by Input 1, also in generate synchronization mode, Input 1 controls strobe synch. signals and, Input 2 controls horn synch. signals, both of which are combined on all 4 outputs.

Function of Indicators

INDICATOR	LED #	COLOR	DESCRIPTION
PWR ON	LED # 8	Green	Indicates AC line operation.
AUX TRBL	LED # 7	Yellow	Indicates a short or overloadon the Aux. Output.
BATT TRBL	LED # 6	Yellow	Indicates a low battery voltage or missing battery.
GF TRBL	LED # 5	Yellow	Indicates an external wiring connection is not adequately isolated from the earth ground.
Notification appliance Circuit 1	LED # 4	Yellow	Indicates a short or open circuit in the external wiring..
Notification appliance Circuit 2	LED # 3	Yellow	Indicates a short or open circuit in the external wiring.
Notification appliance Circuit 3	LED # 2	Yellow	Indicates a short or open circuit in the external wiring.
Notification appliance Circuit 4	LED # 1	Yellow	Indicates a short or open circuit in the external wiring.

OPERATION

Start-up Procedure

Connect A.C. first, then connect batteries

Operating Instructions

Alarm Condition

Alarm devices operate in unison with the Main FACP alarm devices. The alarm activated outputs are reset through operation of the Reset switch on the Main FACP.

Trouble Condition

The associated trouble LED (yellow) will illuminate.

Testing and Maintenance

System Testing should be performed periodically to insure proper operation.

1. Test the indicating circuits by initiating an alarm or test at the Main FACP.

2. Test for proper operation by actuating the notification appliance circuit the FIREFORCE 8 is monitoring.

3. Standby batteries and AC transfer are tested by interrupting the AC power line while an alarm test condition exists (see 1 above).

Battery Applications

Battery Capacity

Battery Capacities is 24 ampere-hours maximum for the FIREFORCE 8. The max. charging rate is . 75 amps.

Appendix A

Compatible Notification Devices

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Compatible Gamewell Notification Devices

Part #	Catalog #	Part #	Catalog #	Part #	Catalog #
70871	MIZ-24-R	71562	SR-24110-HFR	71717	RSSP-24110W-FR
70873	MIZ-24-W	71569	RSP-241575-VFR	71727	AS-2415C-FW
71138	MT-12/24-R	71573	AMT-12/24-R	71728	AS-2430C-FW
71140	MT-24-WM-VFR	71574	AMT-24-LS-VFR	71729	AS-2475C-FW
71287	MIZ-24-LS-VFR	71575	AMT-24-IS-VFR	71730	RSS-2415C-FW
71288	MIZ-24-LSM-VFR	71576	AMT-24-LSM-VFR	71731	RSS-2430C-FW
71289	MIZ-24-MS-VFR	71614	MT4-12/24-R	71732	RSS-2475C-FW
71290	MIZ-24-IS-VFR	71616	SR-2475-VFR	71733	RSSP-2415W-FR
71292	MT-24 -LS-VFR	71679	AS-2415W-FR	71736	ET70-2415W-FR
71293	MT-24-LSM-VFR	71680	AS-241575W-FR	71737	ET70-241575W-FR
71294	MT-24-MS-VFR	71681	AS-2430W-FR	71738	ET70-2430W-FR
71295	MT-24-IS-VFR	71682	AS-2475W-FR	71739	ET70-2475W-FR
71426	MT-24 -SL-VFR	71683	AS-24110W-FR	71740	ET90-2415C-FW
71427	MT-24-SLM-VFR	71684	AS-24100C-FW	71741	ET90-2430C-FW
71543	AS-2415-VFR	71685	NH-12/24-R	71742	ET90-2475C-FW
71544	AS-241575-VFR	71686	NS-2415W-FR	71743	ET90-24100C-FW
71545	AS-2430-VFR	71687	NS-241575W-FR	71744	E70-2415W-FR
71546	AS-2475-VFR	71688	NS-2430W-FR	71745	E70-241575W-FR
71547	AS-24110-HFR	71689	NS-2475W-FR	71746	E70-2430W-FR
71548	SM-12/24-R	71690	NS-24110W-FR	71747	E70-2475W-FR
71549	DSM-12/24-R	71691	RSS-2415W-FR	71748	E70-24110W-FR
71550	RS-2415-VFR	71692	RSS-241575W-FR	71749	E90-2415C-FW
71551	SR-2415-VFR	71693	RSSP-241575W-FR	71750	E90-2430C-FW
71552	SRP-2415-VFR	71694	RSSP-2430W-FR	71751	E90-2475C-FW
71553	RS-241575-VFR	71695	RSS-2430W-FR	71752	E90-24100C-FW
71554	SRP-241575-VFR	71696	RSSP-2475W-FR	71758	CH90-24-W
71555	SR-241575-VFR	71697	RSS-2475W-FR	71759	CH70-24-R
71556	RS-2430-VFR	71698	RSS-24110W-FR	71760	CH70-2415W-FR
71557	RSP-2430-VFR	71699	RSS-24100C-FW	71761	CH70-241575W-FR
71558	RSP-2475-VFR	71711	AH-24WP-R	71762	CH70-2430W-FR
71559	RS-2475-VFR	71712	RS-2415W-FR	71763	CH70-2475W-FR
71560	RS-24110-HFR	71713	RS-241575W-FR	71764	CH70-24110W-FR
71561	SRP-24110-HFR	71714	W3MT-24-VFR		

Synchronized Horns and Strobes

System Sensor	Faraday	Wheelock
SC2415_	2700 Sync Series	AS-24MCW
SC241575_		RSS-24MCW
SC2430_		
SC2475_		
SC2495_		
SC24115_		
SC24177_		
PC2415_		
PC241575_		
PC2430_		
PC2475_		
PC2495_		
PC24115_		
PC24177_		

Appendix B
Drawings

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Drawings

Battery Calculation Chart

B-W479 Wiring, Notification Appliance Circuit Expander

FireForce 8 Battery Calculation Chart

Circuit	Normal Current	Alarm Current
Notification Appliance Ckt. 1 Notification Appliance Ckt. 2		Cl A, 050A + Device Load 1 or Cl B, 065A + Device Load 1 & 2
Notification Appliance Ckt. 3 Notification Appliance Ckt. 4		Cl A, 050A + Device Load 3 or Cl B, 065A + Device Load 3 & 4
External Load A+, A- +/- 24 VDC		
Common Control	.030 A	.055 A
Normal Current (Total of Center Column)		
	Alarm Current (Total of Right Column)	

HOURS OF STANDBY		TOTAL NORMAL CURRENT		
	X		=NORMAL Amp Hours	
HOURS OF ALARM		TOTAL ALARM CURRENT		
	X		=ALARM Amp Hours	
			TOTAL Amp Hours	
			Safety Factor	**X 1.25**
			BATTERY AH REQUIRED 24 AH Max	

NOTE:

Normal current times total number of standby hours = Total Normal Current

Alarm current times total number hours of alarm = Total Alarm Current

Total normal current + Total alarm current + 25% = Minimum Battery Size

Total Load Of Notification Appliance Ckt. And External Load Not To Exceed 8 Amps.