PERTRONIC INDUSTRIES PTY LTD

EVAC20W24V and EVAC20W24V-T3
AMPLIFIER INSTALLATION NOTE

Overview:

The 20W 24V Amplifier is one of a range of Amplifiers manufactured by Pertronic Industries. The 20W 24V Amplifier generates the Evacuate tone and verbal message as per AS2220 or ISO8201 (T3) dependent on firmware version fitted.

The 20W 24V Amplifier has a monitored 100Vrms output that can provide up to 20W of power (27.4V supply) to connected PA loud speakers. The output is short circuit protected.

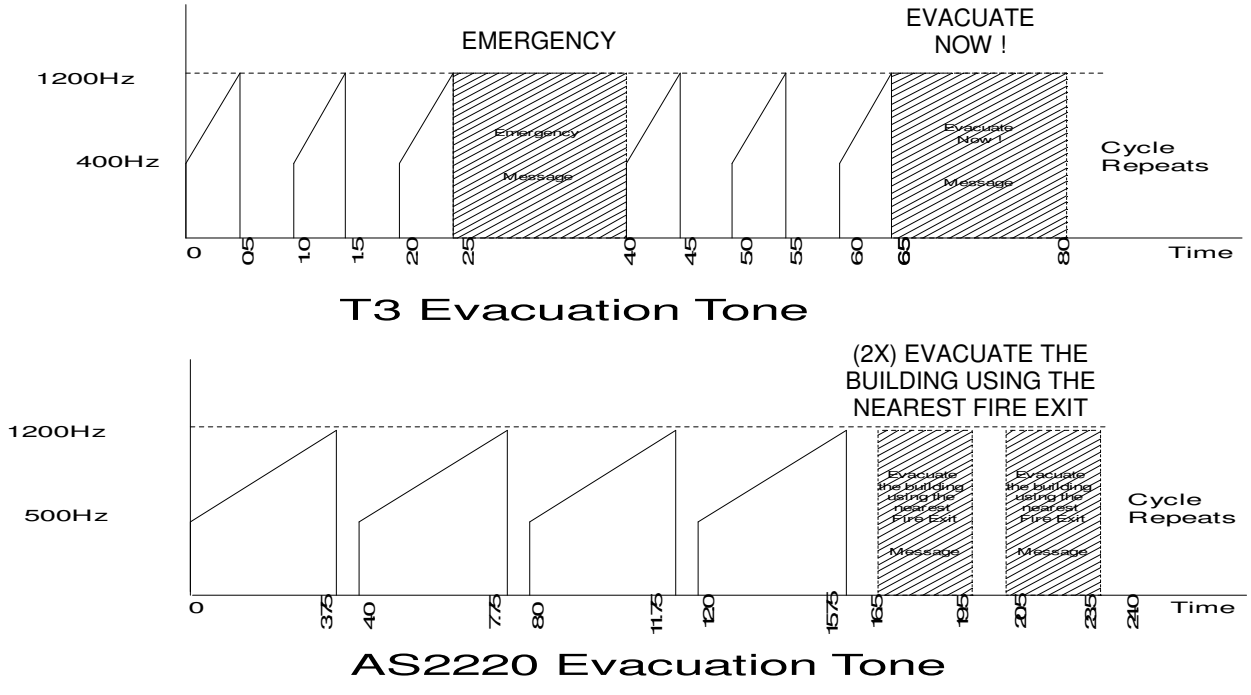
The 20W 24V Amplifier is designed for connection to the monitored Warning System output of an F16e, F100 or F120 Fire Alarm Panel, and is activated when the sounder circuit voltage polarity is changed to the alarm state.

In the normal state the amplifier 100Vrms line is internally connected to the to the panel Warning System circuit. The amplifier draws virtually no current (less than 0.2uA), and appears transparent to the panel. If there is a wiring fault on the 100Vrms line, or between the amplifier and the panel bell circuit, the Fire Alarm Panel goes into fault.

Specifications:

Targeted Panel:	F16e, F100 and F120 Fire Alarm Panels.
Board Dimensions:	100mm x 77mm. Height 35mm from bottom of PCB.
Mounting Dimensions:	93mm x 69mm
Operating Voltage:	19.2-30Vdc, nominal 27.4V
Operating Current:	1.2A @ 27.4V nominal with 20Wrms load
Power Output:	27.4Vdc Supply: 20Wrms @ 100V line at nominal voltage
Tone:	Evacuation tone and verbal message, compliant to AS2220 or ISO 8201 T3 – see fig 1.
Monitoring:	10K 1W EOL resistor

(Fig 1) AS2220 and T3 Tone Characteristics:



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Operation:

The Amplifier is connected to the panel Warning System circuit output as shown in the connection diagrams. Warning System terminals '+' and '-' are connected to the corresponding '+' and '-' terminals on the amplifier.

In the normal state, the Panel monitors the 100V line 10K 1W EOL resistor by applying a reversed voltage to the amplifier input terminals. In this state the amplifier connects the 10K 1W EOL line resistor to the Warning System output. A 10K 1W resistor must be used across the 100Vrms line for correct operation of the amplifiers monitoring circuit.

In the alarm state, the panel reverses the bell voltage causing the amplifier to activate and to put a 100Vrms evacuation tone and voice message on the loudspeaker circuit. During the Alarm state, monitoring of the amplifier ceases.

If the amplifiers output is overloaded, or the supply voltage becomes off normal, the amplifier will signal a defect by turning on its defect led, see table 1.

Table 1. LED Decoding

Fault LED	ON LED	Defect Description
Off	Off	Amplifier inactive
Off	Steady	Amplifier active
Steady	Flashing	Supply Voltage either <19.2V >30V, or output overloaded
Flashing	Steady	Amplifier output is shorted

The 100Vrms Line may be spurred as long as the total number of system spurs does not exceed three. In these configurations the EOL resistor value must be changed to provide the correct monitoring to the panel (see table 2).

Table 2. Spurring

NUMBER OF SPURS	EOL RESISTOR VALUE FOR EACH SPUR
1	1x 10K 1W
2	1x 22K 1W on each spur
3	1x 33K 1W on each spur

Capacitively coupled 100Vrms PA Speakers must be used with the 50W Amplifier. The capacitor must be bipolar and able to withstand 200V peak line voltage. The value should be around 1uF per watt of power for each speaker.

A common problem of 100Vrms PA installations is the coupling of unwanted noise into the 100V line. Although the 20W Amplifier has been designed to reduce the effects of coupled noise, it is recommended practice that all 100V line wiring be separated from all other wiring by at least 1m. This includes mains wiring, ELV wiring, loop wiring and telephone wiring.

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Loading of the 100Vrms line must not exceed 20W. Maximum cable capacitance must remain below 80nF (when supply is less than 28V). Excessive load or cable capacitance may cause the amplifier to current limit and shutdown.

It is recommended that suitable Cable is used when installing 100Vrms Speaker lines.
See Table 3 for the cable specification.

Table 3. Evac Cable

Resistance	0.032ohms/m(return)
Capacitance	80pF/m
Maximum cable run	0.5Km

Design Example:

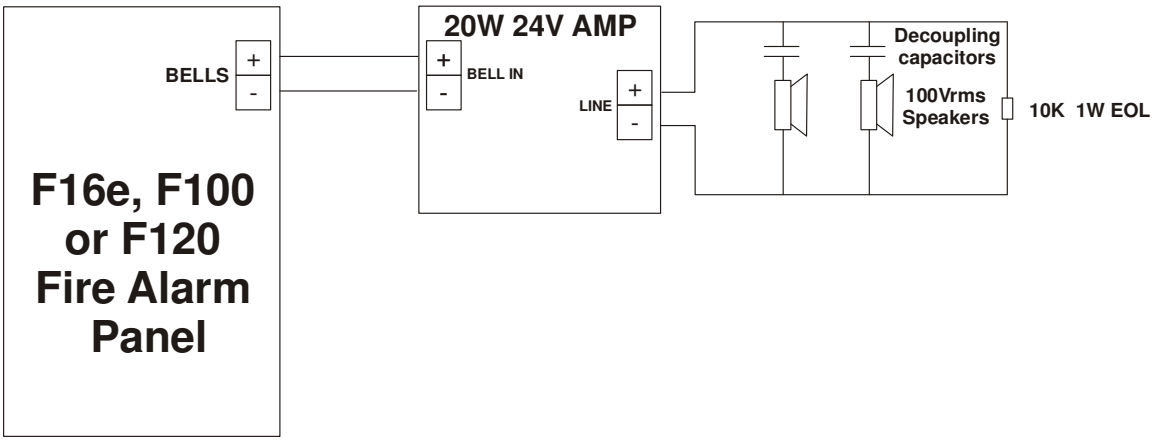
An Installation requires an amplifier to supply 20 1W speakers located at the end of a 0.5Km length of evac cable:

- Resistance using 0.5Km of evac cable 16ohms
- Volt drop at end of cable (V = IR) 3.2Vrms
- Power reduction across speaker (PdB = 10Log(Vout/Vin) 0.1dB
- Cable capacitance (80pF/m) 40nF

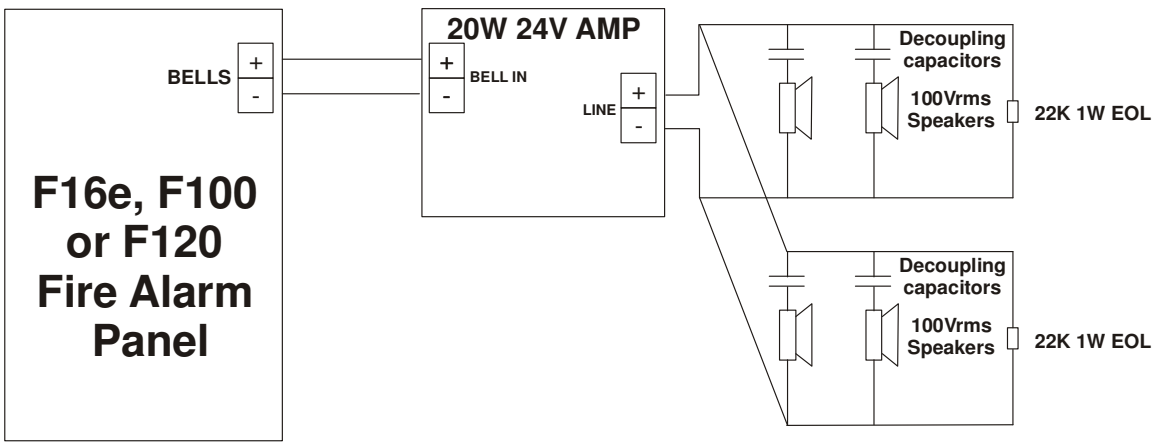
In this case, all specifications are met for correct operation of the amplifier.

Connection Diagrams:

Basic Connection Diagram



Spurred Speaker Wiring Connection



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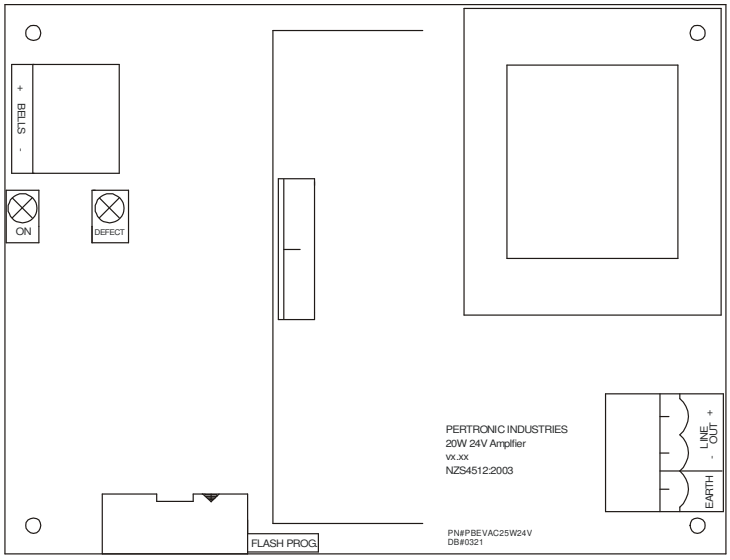
Circuit Board Layout



Order codes

20W 24V Amplifier with AS2220 tone	EVAC20W24V
20W 24V Amplifier with T3 tone	EVAC20W24V-T3