



# EWS4P ELECTRONIC WARNING SIGNAL

## High power multi-mode electronic warning signal Optional 100V line output (EWS4PL)

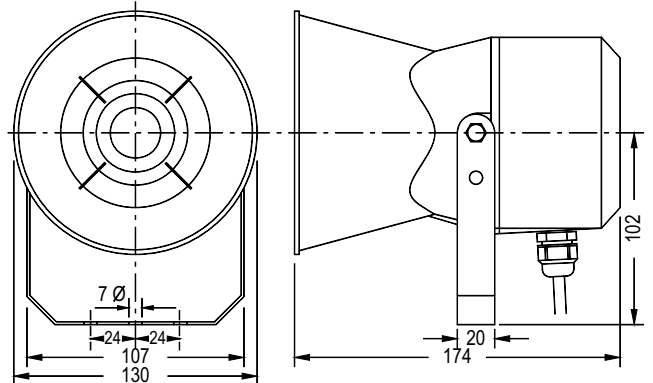
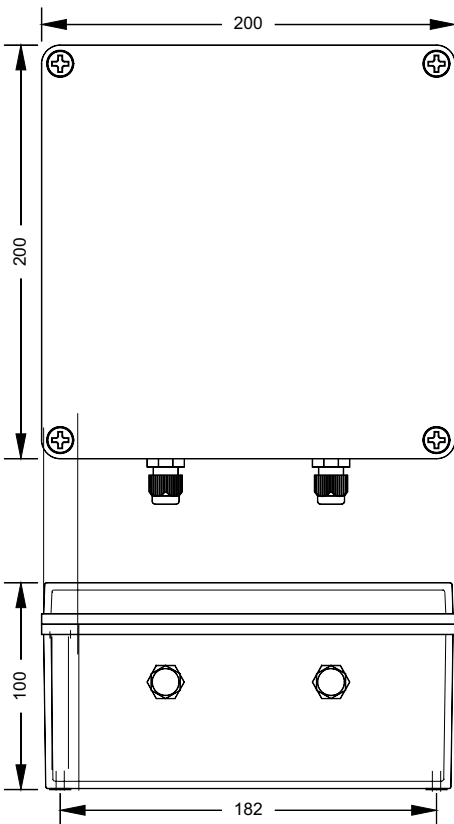
### Specifications

Tones	: 15 pre-selectable by internal DIP switch : Provision for external switching - remote control
Volume	: Internal adjustment from zero to full power
Output max.	: 8 Ohm load or optional 100V line (EWS4PL), 20 Watts  : 117dB at 1m with MPH-5308 horn speaker
Rating	: Continuously rated
Enclosure	: IP66 rated : Material ABS : Flammability 94-HB
Voltage	: 24V ac/0.7A, 48V ac/0.5A, 110V ac/0.2A, 230V ac/0.1A : 12V dc/1.5A, 24V dc/0.7A
External Speaker (purchased separately)	: 8 Ohm >20W : 100V line <20W maximum load



### MPH-530x Horn Loudspeaker

Impedance	: MPH-5308 8 Ohm : MPH-5300 100V line : taps 30W, 15W, 7.5W, 3.75W
Rating	: 30W rms
Environment	: IP66
Frequency Range	: 500Hz to 7kHz (-10dB)
Efficiency	: SPL (1W/1m) 106dB
Material	: High impact ABS UV resistant
Mounting	: U type stainless steel bracket
Weight	: 1.4kg



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## Installation and Operating Instructions

### Supply Voltage

Connect supply voltage to terminals marked P N E

### Loud Speaker

8 Ohm speaker load or optional 100V line system (EWS4PL).

Connect the speaker load to terminals marked SPEAKER  
N.B. Do not use a speaker impedance presenting a load resulting in a greater output power than the EWS4P can deliver as damage may result.

### Control - On/Off

The warning signal can be switched on and off by either of the two following methods.

- (a) making or breaking of the supply voltage.
- (b) Making or breaking of a pair of switch or relay contacts across the terminals marked CONTROL. Contacts open, signal "on", contacts closed, signal "off". (contact rating 100 $\mu$ A/12Vdc)

### Volume Control

Turn clockwise to increase, anti-clockwise to reduce.

### Fuse

The unit is protected by a 1A fuse, do not replace with a higher rating as damage may result.

### Tone Selection

Signal tone selection is made by positioning the DIP switches as shown in the tone selection chart.

### External/Remote Tone Selection

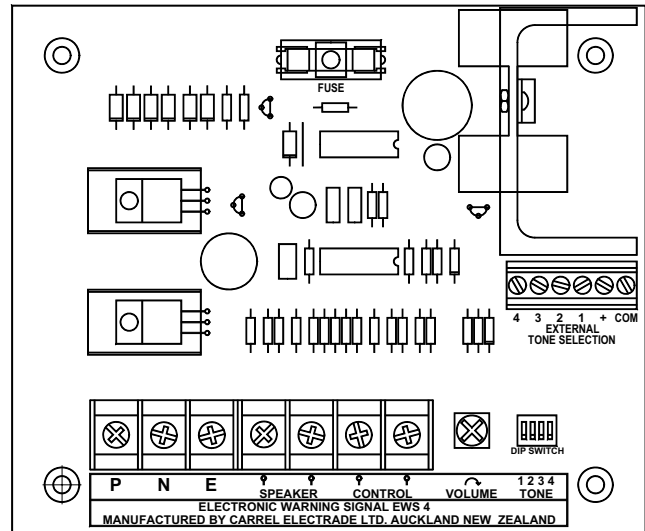
- (1) Place each of the tone DIP switches marked 1 2 3 4 in the down position as shown in the first line of the tone selection chart.
- (2) Select the tone or tones required from the tone selection chart.
- (3) Arrange relay or switch connections to the EXTERNAL TONE SELECTION connection block marked 4 3 2 1 + COM so the corresponding DIP switch numbers shown in the up or top position on the TONE SELECTION CHART are switched to COM.

e.g. an alternating two tone unequal phase ratio requires terminals 4 and 3 to be switched to COM.

N.B. Wiring between EXTERNAL TONE SELECTION terminal block 4 3 2 1 + COM and the switch or relay should be kept as short as possible, preferably less than 1 metre.

A relay may be powered from the 30Vdc/50mA unregulated auxiliary supply voltage at the + and COM terminals of the connection block.

### EWS4P Printed Circuit Board Showing Connection Terminals and Tone Switch



### Tone Selection Chart

Tone Selection	Phase Ratio	Frequency Modulation	Switch
			1 2 3 4
Fast rising high tone pulses	Unequal		↓ ↓ ↓ ↓
Alternating sliding two tone	Unequal		↓ ↓ ↓ ↓
Fast pulses high tone	Unequal		↓ ↓ ↓ ↓
Alternating two tone	Unequal		↓ ↓ ↓ ↓
Fast rising low tone pulses	Unequal		↓ ↓ ↓ ↓
Rise and fall high/low tone	Unequal		↓ ↓ ↓ ↓
Fast pulses low tone	Unequal		↓ ↓ ↓ ↓
Continuous low tone			↓ ↓ ↓ ↓
Slow rising high tone pulses	Equal		↑ ↓ ↓ ↓
Alternating sliding two tone	Equal		↑ ↓ ↓ ↓
Slow pulsing high tone	Equal		↑ ↓ ↓ ↓
Alternating two tone	Equal		↑ ↓ ↓ ↓
Slow rising low tone pulses	Equal		↑ ↓ ↓ ↓
Rise and fall high/low tone	Equal		↑ ↓ ↓ ↓
Slow pulsing low tone	Equal		↑ ↓ ↓ ↓
Continuous low tone			↑ ↓ ↓ ↓



# EWS4P ELECTRONIC WARNING SIGNAL

## 100V line system, EWS4PL.

Where the speaker or speakers are mounted some distance from the power amplifier, a 100V line system is recommended to reduce power losses in the speaker cables.

The theory behind the 100V line speaker distribution system is the same as that of the main electricity grid, higher voltages mean reduced currents for the same energy transfer, reduced currents result in lower losses. Energy losses in cables is proportional to the current<sup>2</sup> therefore reducing the current in long cable runs greatly reduces the power losses in the system. Halving the current reduces the losses to a quarter.

An 8 Ohm load requires 1.58A for 20W, a 100V line requires 0.2A for 20W. Given the same speaker cable resistance the losses in an 8 Ohm system would be 62.4 times greater than the losses in a 100V line system.

A transformer at the power amplifier output steps the voltage up to a nominal 100V at full power output. At each speaker a transformer steps the voltage back down to the desired level. The speaker transformers usually have multiple taps enabling a selection of power levels at each speaker.

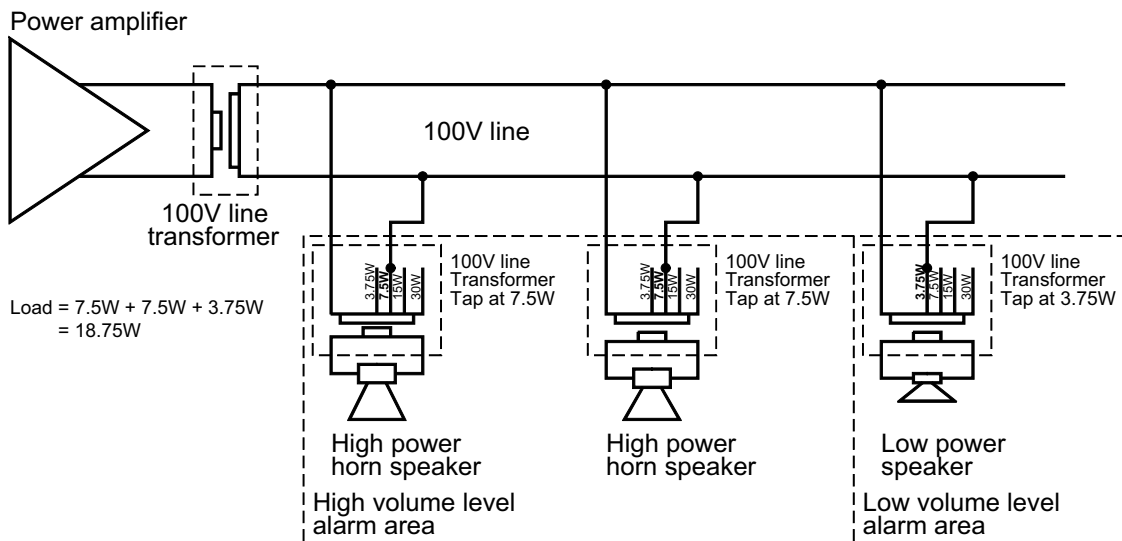
The main benefits of a 100V line system are:

- Reduced power losses in long speaker cables.
- Reduced copper costs from using smaller cable sizes.
- Flexible speaker distribution, adding extra speakers is much easier compared to a low impedance system.
- Individual speaker power/volume selection, utilising the multiple taps on the speaker transformers.

A typical 100V line system is shown below.

Note there are three speakers, two tapped at 7.5W and one tapped at 3.75W giving a total of 18.75W.

A number of speakers can be connected to the 100V line using a variety of power output taps. The sum of all the loads connected to the 100V line must be less than or equal to the maximum amplifier power output, otherwise damage to the amplifier may result.



## 8 Ohm speaker configurations

When using one or more speakers connected to the EWS4P, the total impedance of the load should be 8 Ohms or greater. Using a load of less than 8 Ohms may damage the EWS4P.

Two 8 Ohm speakers in series will give a load impedance of 16 Ohms resulting in 1/4 power in each speaker, 1/2 power total output.

A combination of series and parallel connections with four 8 Ohm speakers results in 1/4 power in each speaker, full power total output.

**The parallel connection of two 8 Ohm speakers will give a load impedance of 4 Ohms, this should not be used with the EWS4P.**

