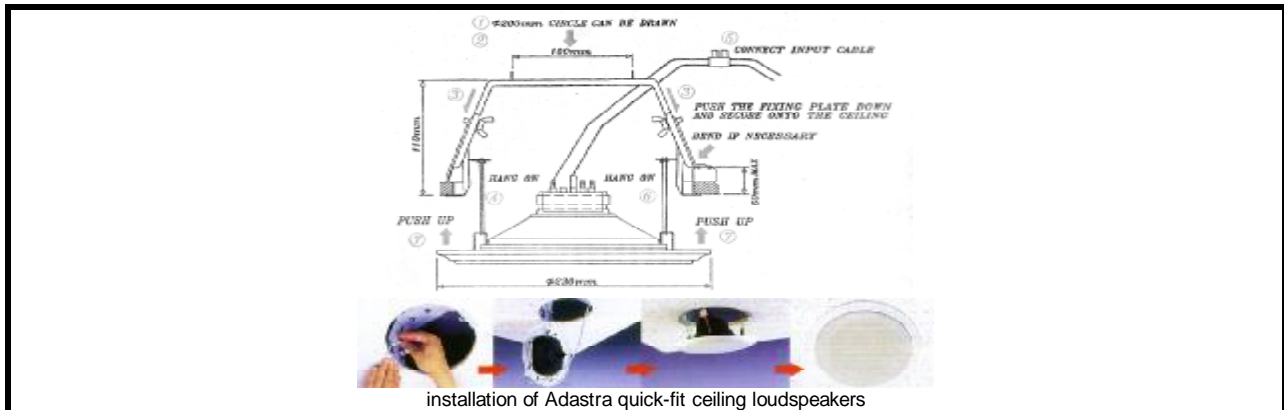


## adastra from sound services knowledge base

### Installation of adastra 952.185 & 187 quick-fit ceiling speakers



- Draw a 200mm circle (for 952.187) and cut this hole out of the ceiling or ceiling tile (**160mm for 952.185**)
- Place the mounting bracket into the hole and secure it with the two wing bolts provided
- Hang the speaker from the bracket by clipping one of the suspension springs on to the hook of the bracket
- Connect the 'tapping' tag to the wattage required on the transformer
- Connect the 100v line audio feed from the amplifier to the connector terminal on the speaker
- Hang the other suspension spring on to the opposite hook of the bracket
- Push the speaker up to the ceiling so that it has a flush fitting

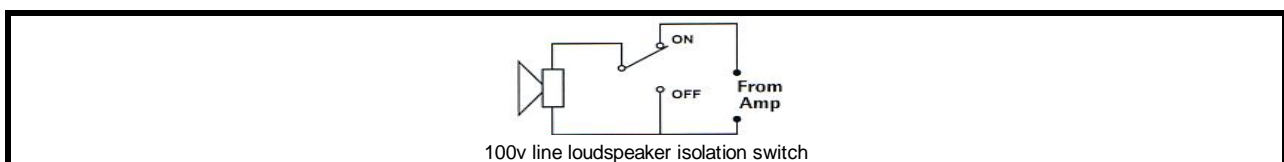
### adastra 100v Line Information

The reason for using 100v line is to minimise power losses in the cable. For example if a 30 watt, 8 ohm speaker is connected to a 30w amplifier by 100m of 6a cable (which over the 100m would have a resistance of about 4 ohms) a third of the power will be lost in heating up the cable because the power consumption is proportional to the cable resistance.

However - if a 100v line system is used, the output of the 30w amplifier would be at 330 ohms, which renders the 4 ohm resistance of the cable to a negligible amount. The power used is still the same ( $P = V \times I$ ) but as the current is lower more of the power from the amplifier is successfully transferred to the speakers.

### adastra 100v Line Speaker Isolation

In order to ensure complete isolation of a loudspeaker with absolutely no audio breakthrough it is necessary to use the circuit shown below. The loudspeaker will not only be isolated from the amplifier output but will also be shorted to itself when in the 'off' condition thus excluding any possibility of breakthrough.



### adastra General Installation Considerations

- DO NOT run microphone cables near mains, data, telephone or 100v line cables.
- DO NOT run 100V line cables near data, telephone or other low voltage cables.
- DO NOT exceed 90% of the amplifiers output power when using 100V line (speech only).
- DO NOT exceed 70% of the amplifiers output power when using 100V line (high level background music).
- DO NOT use re-entrant horn loudspeakers for background music unless the loudspeaker has been specifically designed for this purpose.
- AVOID Jointing the microphone cable, when this is unavoidable make sure a good screened connector is used, e.g. XLR.
- ALWAYS use a balanced or floating low impedance microphone terminating into a balanced input on long microphone cable runs.
- ENSURE that all loudspeakers are in-phase.
- ENSURE that there are no short circuits on the loudspeaker line before connection to the amplifier.

## adastra Connectors

### 1. RCA phono plug

A popular audio connector used on auxiliary inputs & booster in/out connections, also commonly used on mixers, CD & tape players. They are wired using single core screened cable.



### 2. XLR Plug

These are the industry standard microphone connectors, robust and relatively simple to install. There are a number of ways in which they can be wired.

(i) BALANCED operation

Pin 1 connects to screen (Signal earth)

Pin 2 connects to signal + (Live)

Pin 3 connects to signal - (Return)

(ii) UNBALANCED operation

Pins 1 & 3 connect to the screen of the cable

Pin 2 connects to signal conductor.



XLR PIN numbers are easily remembered by: **X** = Earth (Pin 1) - **L** = Live (Pin 2) - **R** = Return (Pin 3)

An unbalanced microphone can only be used up to a maximum of 10 meters away from the amplifier. Any more than this and noise problems become apparent whereas a balanced microphone will allow cable runs of up to 100m without any loss of performance.

For unbalanced operation, a single core screened microphone cable can be used, but for a balanced line a twin core screened cable is required.

### 3. 6.3mm (.25") Jack plug.

These connectors are often referred to as tip, ring & sleeve jacks. There are two versions of this connector in common use, MONO (2 pole) & STEREO (3 pole).

(i) The stereo plug is used for balanced operation and is wired as follows:

TIP - Signal +

RING - Signal -

SLEEVE - Screen

For unbalanced operation the RING & SLEEVE should be joined.

(ii) The mono version can only be wired for unbalanced use as follows:

TIP - Signal +

SLEEVE - Screen



### 4. DIN Plugs

These are mainly used for microphone priority access on some of the Adastra amplifiers and as there are a number of different ways they can be wired for various functions, it is best to refer to the installation guide for specific models.

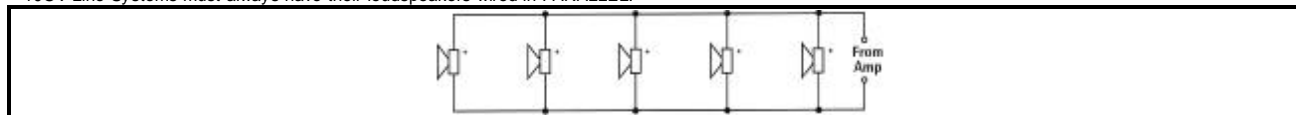
## adastra Loudspeakers, cable sizes and voltages – 100v line

When installing a 100V line system, it is important that the correct size of cable is used to connect the speakers to the amplifier. The following chart gives an indication of what should be used:

100V Amp	0.75mm <sup>2</sup>	1.0mm <sup>2</sup>	1.5mm <sup>2</sup>	2.5mm <sup>2</sup>	4.0mm <sup>2</sup>	6.0mm <sup>2</sup>
30W	800m	1066m	1600m	2666m	4266m	6400m
60W	400m	533m	800m	1333m	2133m	3200m
120W	200m	266m	400m	666m	1066m	1600m
240W	100m	133m	200m	333m	533m	800m

As the voltage on the line can approach 100 volts, installation must follow best practice with double insulated cable being used. Cable runs should be kept away from any potential source of interference such as 3 phase mains, data, telecom cables etc.

100V Line Systems must always have their loudspeakers wired in PARALLEL:



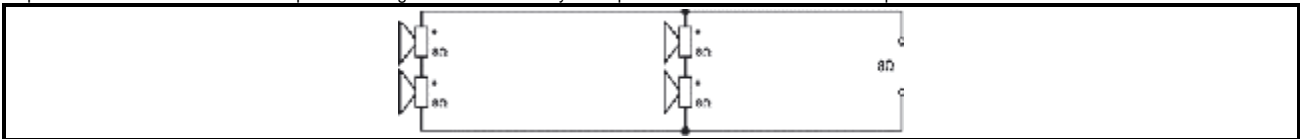
PLEASE NOTE: The total load presented to the amplifier must not exceed the rated output of the amplifier or damage can result.

## 100v Line Attenuators

100v line volume attenuators MUST be wired correctly - the 'in' terminal is the hot from the amplifier (usually the brown cable) with the terminal adjacent marked with an arrow the return to the amplifier (usually the blue cable). The 'out' terminal is the 'hot' to the 100v line loudspeaker (usually the brown cable) with the terminal adjacent marked with an arrow the return to the loudspeaker (usually the blue cable). For most purposes you can ignore the + & - 24v connections (if fitted).

## adastra Loudspeakers, cable sizes and voltages – Low Impedance

Some amplifiers in the Adastra range have the facility for connection of low impedance loudspeakers. Low impedance installations require heavy cable feeding the loudspeakers to minimise losses and short cable runs are recommended. Where it is intended to use multiple low impedance speakers to cover an area, the speakers must be wired in a series/parallel arrangement in such a way as to present the correct load to the amplifier.



PLEASE NOTE: The total load impedance presented to the amplifier must never be below the rated amplifier impedance, otherwise damage can result. To avoid damage to the speakers the total wattage of the driver units should be at least 30% higher than the rated power output of the amplifier.

## You must NEVER mix 100v line and low impedance speakers on the same system

Horn speakers are typically only used in noisy environments, outdoors or areas that are quite large in size. The main disadvantage with this type of speakers they cannot acceptably reproduce music.

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