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# ILD60

## INDUCTION LOOP DRIVER

### 1. INTRODUCTION

The ILD60 Induction Loop Driver has been designed as a very high quality power driver for small size induction loops in semi-domestic and semi-professional locations such as TV rooms in nursing/residential homes, and small/medium size meeting/interview rooms. Ease of installation and use have been major factors in the design, combined with optimised performance, and freedom from generation of R.F.I. to meet all future technical requirements.

To ensure compliance with all technical standards, it is essential that the equipment shall be installed by an individual who is technically competent in professional audio, and who has the necessary installation skills.

#### Warranty Information

This product carries a 5 year parts and labour warranty which could be invalidated if these instructions are not followed correctly, or if the unit is tampered with in any way.

The 5 year warranty is dated from the time the the equipment leaves Ampetronic and NOT when it is installed.

### 2. PRELIMINARY INSTALLATION DATA.

2.1 Inspect the equipment upon unpacking, to ensure that the contents of the shipping carton are not damaged.

2.2 Install the unit in the place where it will be used. Care must be taken that this location provides satisfactory ventilation for the equipment. In order to ensure this, the unit should not be installed in a tightly enclosed space. Enough room must be available to permit free airflow across the equipment. If the unit is installed in an enclosed environment, sufficient air flow must be provided through vents, fans or other means. The amount of heat generated depends on the loop size, and wire gauge, but can be such that the reliability of the equipment will be reduced if the ventilation is poor.

The unit can be placed freestanding, or fixed to a wall surface by means of two roundheaded No. 8 wood screws fitted to suit the rear hole pattern. The screws are positioned at 160mm separation in a vertical line. The drilling template will assist in correct positioning.

2.3 Prepare the input signal connection as described in section 3.

2.4 Connect the loop cable to the rear Loop Terminals. Ensure that no stray wire ends protrude from the terminal. The polarity of the loop is not

important. For the sizing of the loop, see the chapter on Loop Design. It is important that the loop cable ends will form a twisted pair in the area of the amplifier, to reduce the magnetic field near the amplifier position.

### **3. INPUT SIGNAL SOURCES**

3.1 The equipment can be driven from various sources, such as a microphone, a direct connection to a TV set via a SCART style connection, or a connection to a HiFi system.

3.2 Microphone Inputs.

Both inputs are designed to be used with the single-ended microphone as supplied with the equipment. Power for the microphone is supplied from the equipment. Some single-ended electret microphones with internal battery can be externally powered if this internal battery is removed. Many microphones of this type are adversely affected by the external DC power, even when using their internal batteries. In all these instances, careful investigation will indicate whether a microphone is suitable.

Dynamic microphones cannot normally be used with the equipment, because of the much lower signal level, and the DC bias which seriously impairs the performance of the microphone. Ampetronic can supply a special adaptor which permits the use of dynamic microphones (and electrets which are affected by the DC bias).

The cable length on this input must not exceed 3 metres, as single-ended microphone lines are susceptible to interference. EMC compliance is only available for this cable length. The above mentioned adaptor converts the input to a balanced line, which can be extended to longer distances.

3.3 Line Input.

This input to the equipment is a twin phono input, allowing a direct connection to the Left and Right channels of the SCART signal, or the output from a HiFi system. It is also possible to connect the line-level output of another sound system to this input.

Again, the maximum cable length on this input should be less than 3 metres to ensure EMC compliance.

#### 4. Voice-Controlled switching (VOX)

Switch Position 1    2    3	Effect when Microphone 1 signal is higher than VOX threshold	Effect when Microphone 1 signal is lower than VOX threshold for > 5 seconds.
off off off	Vox switching disabled - all inputs operate normally	
off off on	Microphone 1 input on.	Microphone 1 input off.
off on off	All inputs attenuated by 15dB except Microphone 1	All inputs at normal levels
off on on	All inputs attenuated by 15dB except Microphone 1	All inputs at normal levels except Microphone 1 input off
on X X	Reserved for future use.	

There are 3 mode select switches for the VOX switching features of the ILD60. These switches are located on the top edge of the unit alongside the input connectors. See drawing of unit.

The mode select switches enable their respective functions when in the 'on' position (the switch is down, towards the base of the unit).

The mode select switches may be used in the combinations shown above to achieve the required effect.

The VOX threshold is at about 6db below the onset of compression, and as such is automatically set by the microphone and line sensitivity controls.

#### 5. LOOP DESIGN

The design of the actual loop is an important aspect of the satisfactory operation of the ILD60. A number of parameters must be taken into account, and the following design procedure will provide the correct loop in most installations. It must be stressed that there are sometimes very unusual circumstances which demand unusual solutions, and the installer should then take great care over the design and installation aspects. These instances are generally buildings with heavy metal reinforcement in their structure, which can seriously affect the magnetic field, buildings where several independent loops must be installed in close proximity such as multiple meeting rooms without interfering with each other, and rooms

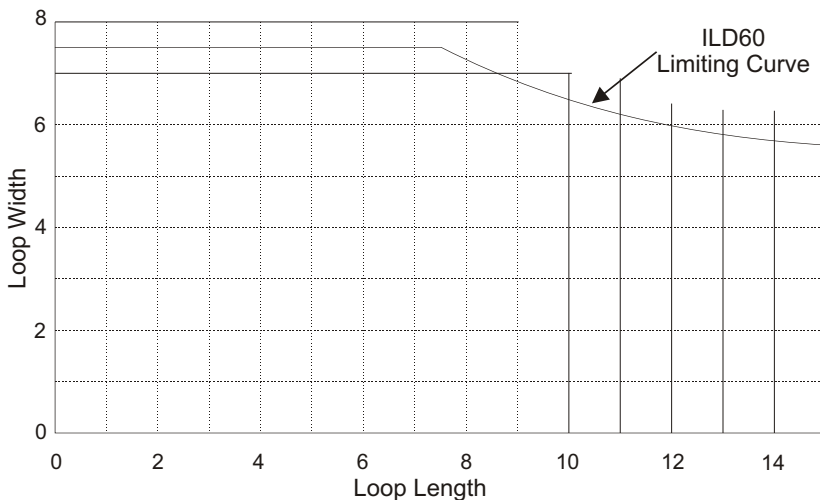
which are subject to heavy disturbing magnetic fields (close proximity of electricity supply transformer stations, etc.).

### 5.1 Loop Position

For optimum evenness of magnetic field, it is advisable that the loop plane should be displaced from the normal hearing (listening) plane by some 1-1.2 metres, and this is normally achieved by placing the loop at floor level or at ceiling level. Whenever possible, avoid the installation of the loop cable at or near listening level.

### 5.2 Loop Size

The limiting loop size is defined by the following graph.



Measure the length and width of the room, and check that this area is smaller than that defined by the limiting curve of the graph.

### 5.3 Choice of loop Cable

Please note that the Ampetronic Loop Drivers have been designed to operate into *single turn loops*, and *must not be used with old-fashioned multiturn loop layouts*. **Unusual or special loop layouts may only be used with the express approval of Ampetronic Ltd. to ensure compliance with all technical standards.**

The maximum DC resistance of the loop should be less than 1 Ohm for optimum performance, but should be greater than 0.25 Ohm. Maximum cable length (i.e. total length of cable, end to end, including feed / connecting cable) for this limiting resistance is as follows:

Cable size section	Minimum length (m)	Maximum length (m)
0.5 mm <sup>2</sup>	7	28
0.75 mm <sup>2</sup>	10.5	42
1 mm <sup>2</sup>	14	56
1.5 mm <sup>2</sup>	21	84
18 mm Flat Cable	25	100

Normal stranded, or solid–cored cable can be used. A suitable cable for most applications is standard 'Tri-rated' cable to BS6231, CSA, UL approval. Flat copper foil tape is available from Ampetronic for installation under carpets.

The cable from the loop to the ILD60 output terminals MUST be a twisted pair. If this is longer than 10 metre, contact Ampetronic.

## 6. LEVEL ADJUSTMENT

### 6.1 Initial setting up

During the initial commissioning of the equipment it is essential that the following procedure be used to ensure a satisfactory end result. Turn the Microphone, Line and Drive controls fully anti-clockwise, i.e. minimum signal, and set the Tone Control to mid-range position. Provide a continuous input signal, preferably from a small tape player with wideband music, connected to the line input.

Increase the LINE control until the compression LED illuminates under peak signal conditions. This establishes a reference level for the output power driver. Increase the DRIVE setting until the desired output current is achieved. If no reading is obtained, check for loop continuity. If a standard Field-strength measuring unit is available, then check that the field has the correct strength. From this point onwards, the DRIVE control will not need re-adjusting, as this only affects the peak field strength.

Connect the cable from the audio system to the line input, and readjust the input gain control for optimum compression. If only the microphone input is used directly, without another sound system, then set up the entire system from a normal sound source activating the microphone(s).

At this point the TONE control can be adjusted to give the most pleasing sound for the listener.

### 6.2 Setting of input controls - Optimising Compression - VOX levels.

In order to obtain the greatest possible dynamic control range from the compressor, it is now necessary to establish the highest level of input

signal which the equipment may receive in the operational installation. This will often be loud, close talking into a microphone. It should be pointed out here that background hum and noise from equipment earlier in the chain, such as a sound or TV system may sound very troublesome when subjected to some 20-36db extra amplification. When this occurs, the gain must be kept at a lower, acceptable level. Where the dominant signal is music, then it may be important to keep the compression level low, to prevent serious degradation of the music dynamics. Experience will indicate which level to use.

**REMEMBER:** once the DRIVE control has been set, only adjust the GAIN control, as otherwise the correct operation of the equipment is impaired.

To adjust the VOX switching level, set up the equipment with the switches in the desired configuration, with Microphone 1 control at minimum. Set up the equipment for correct signal levels on the other inputs. Increase the setting of Microphone 1 until the desired input signal level operates the VOX switching, and the output signal from this input is correct. A typical application for this could be with the microphone fixed to the side of a telephone, so that the ringing will trip the switching, while the normal background noise is suppressed.

## **7. GENERAL INFORMATION**

### **7.1 Difficulties**

If you have any difficulties in calculating the loop design, or experience difficulties with the operation of the equipment, then contact your supplier or Ampetronic Ltd. It is useful to have all the relevant data available when contacting our technical staff who will be pleased to help you. The following are known trouble areas:

- Strong hum field, mainly from fluorescent light fittings, or electrical wiring where current flow and return are not in the same cable or duct
- Loop cable installed in a manner where it is in close proximity to microphone (or other audio) cables for an appreciable length. Telephone cabling can also be very sensitive to this coupling.

## 8. TECHNICAL SPECIFICATION

- 8.1 Microphone Inputs: Suitable for use with externally powered electret microphones
- 8.2 Line Input: Impedance 60k $\Omega$  each side, 20k  $\Omega$  differential.  
Sensitivity: matched to normal SCART signal levels.
- 8.3 Loop Current: 4A Peak signal current into SINGLE TURN loop  
Monitoring via front panel LED, which indicates current peaks.
- 8.4 Loop Resistance: must be less than 1  $\Omega$ .
- 8.5 Compression: Compression range 36dB before overload. Front panel indication. Attack and Decay time constants optimised for speech.
- 8.6 Frequency response: 80Hz to 5kHz  $\pm 1.5$ dB at low level, measured as loop current. High frequency high signal level response is a dynamic variable and is a function of loop size, loop current and signal content to ensure that no RFI generation takes place. Internal time constants are very short.
- 8.7 AC Power input: 230V AC operation, 50-60Hz. Power consumption 18W. Max. Factory modifiable for 115V operation.
- 8.8 Dimensions : Length: 216mm Width: 124mm Height: 44mm
- 8.9 Weight: 1.3kg.

The ILD60 is designed and manufactured in England by Ampetronic Ltd.

## DECLARATION OF CONFORMITY

Manufacturer: Ampetronic Ltd.  
Address: Northern Road, Newark,  
Nottinghamshire, NG24 2ET.  
United Kingdom.

Declares that the product:

Description: Induction Loop Driver  
Type Name: ILD60

Conforms to the following Directive(s) and Norm(s):

Directive 89/336/EEC  
EMC: EN55103 (1 & 2) 1997  
Directive 73/23/EEC  
Safety: EN60065 (1995)

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L.A. Pieters  
Managing Director  
Ampetronic Ltd.