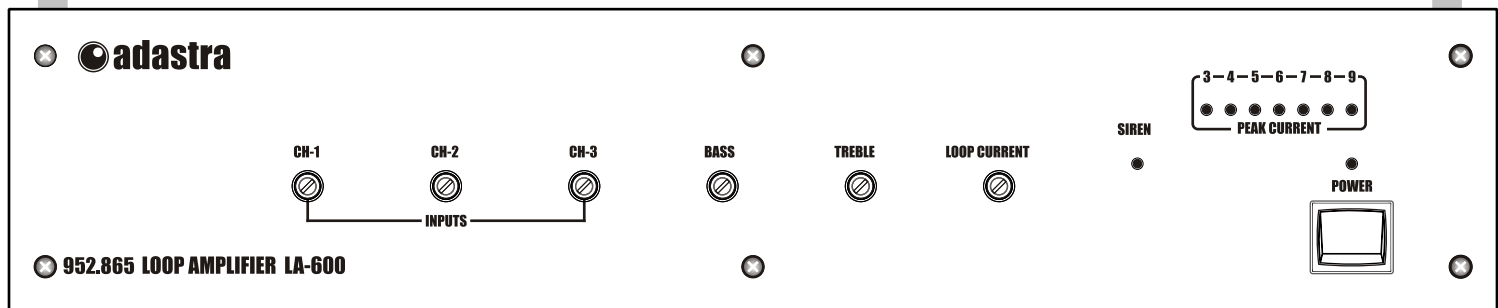
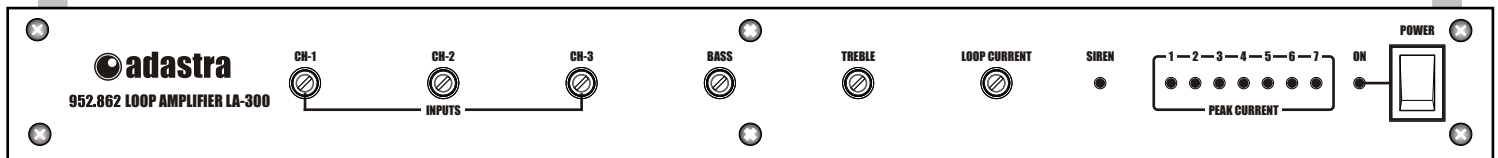


adastra LA Series

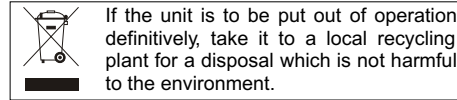
Loop Amplifier

Models: LA 300
LA 600



Operation Manual

OPERATION MANUAL - LOOP AMPLIFIERS



WARNING: THIS APPLIANCE MUST BE EARTHED

IMPORTANT

Then wires in the mains lead are coloured in accordance with the following code:

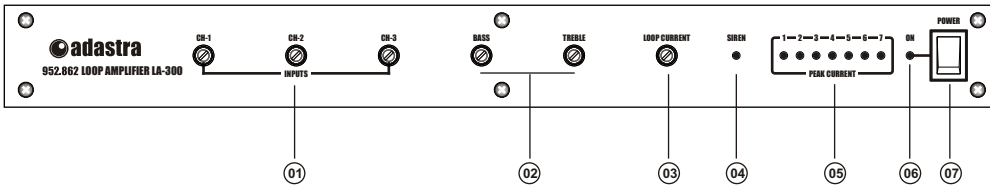
Green & Yellow: Earth (E)
Blue: Neutral (N)
Brown: Live (L)

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

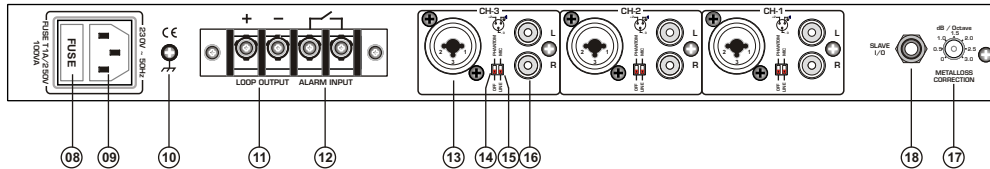
The wire which is coloured green and yellow must be connected to the terminal which is marked by the letter E or by the safety earth symbol or coloured green and yellow. The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black. The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured Red. If a 13Amp (BS1363) plug or any other type of plug is used, a 5 Amp fuse must be fitted in the plug or at the distribution board.

1 Operating Elements & Connections

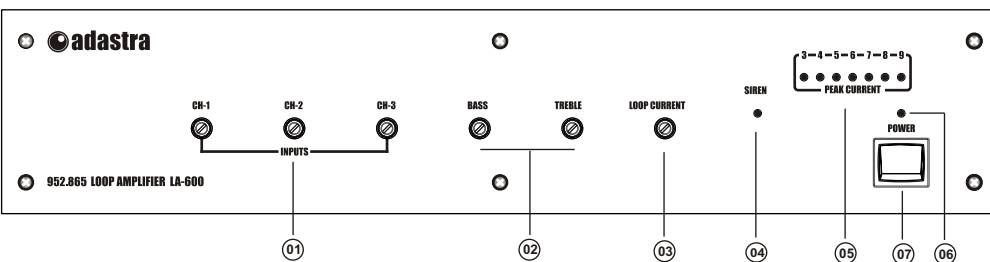
Front Panel (LA 300)



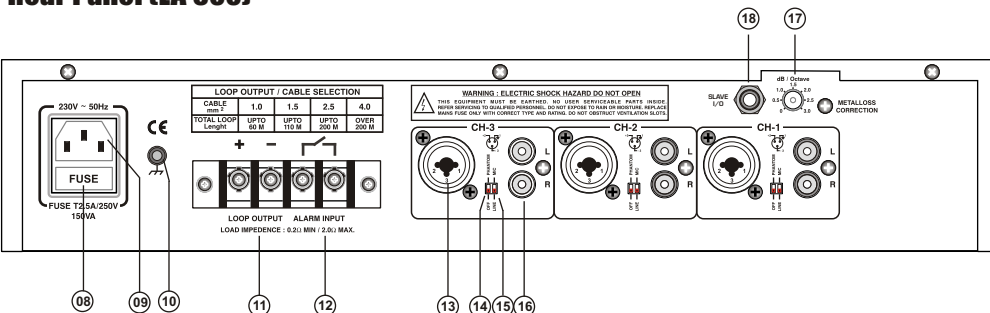
Rear Panel (LA 300)



Front Panel (LA 600)



Rear Panel (LA 600)



1. Controls for adjusting the preamplification for the mono channels CH1 to CH3
2. Tone controls
BASS = Bass control
TREBLE = Treble control
3. Control LOOP CURRENT for adjusting loop current.
4. LED siren : lights up when siren signal sounds.
5. Level indication for the loop current.
6. POWER LED
7. POWER switch
8. Support for the mains fuse :
Only replace a blown fuse by one of the same type.
9. Mains jack for connection to a socket (230V ~ / 50Hz) via the supplied mains cable.
10. Clamping screw for a possible ground connection
11. Screw terminals for connection of the Inductive loop.
12. Screw terminals for an external momentary Push button (closing contact) or switch for triggering an alarm siren. The siren sound as long as button is pressed.
13. Input jacks (combined XLR/6.3 mm Jacks, bal.) channels 1 to 3 for connection of microphones or Mono units with line level ; the connection of each signal source is alternatively possible via an XLR or a 6.3 mm plug
14. DIP switch PHANTOM POWER for switching the phantom voltage to the XLR connections of the jacks INPUT; required when connecting capacitor or electret microphones operating with phantom power.
15. DIP switch for INPUT SENSITIVITY Selector
switch position MIC: microphone level
switch position LINE: line level

- 16 RCA phono INPUT 1 to 3 for units with line output (e. g. CD player, cassette recorder, etc.); the signals of the stereo channels L and R are internally mixed to a mono signal
- 17 Control METAL LOSS CORRECTION (only active if the jumper J8 is placed to the ON position)
- 18 Jack SLAVE I/O for connection of another loop amplifier.
Connections at the plug :- tip = output , ring = input , body = ground

2 Safety Notes

This unit corresponds to all required directives of the EU and is therefore marked with **CE**

WARNING :- The unit is supplied with hazardous mains voltage (230 V~). Leave servicing to skilled personnel only and do not insert anything through the air vents! This may cause an electric shock hazard. Only make or change all connections with the sound reproduction system switched off.

It is essential to observe the following items:

- The unit is suitable for indoor use only. Protect it against dripping water and splash water, high air humidity, and heat (admissible ambient temperature range 0–40 °C).
- Do not place any vessels filled with liquid, e. g. drinking glasses, on the unit. The heat being generated in the unit must be carried off by air circulation. Therefore, the air vents at the housing must not be covered.
- Do not set the unit into operation, or immediately disconnect the mains plug from the mains socket if
 1. there is visible damage to the unit or to the mains cable,
 2. a defect might have occurred after a drop or similar accident,
 3. malfunctions occur.

The unit must be repaired by skilled personnel.

- Never pull the mains cable to disconnect the mains plug from the mains socket, always seize the plug!
- For cleaning only use a dry, soft cloth, by no means chemicals or water.
- No guarantee claims for the unit and no liability for any resulting personal damage or material damage will be accepted if the unit is used for other purposes than originally intended, if it is not correctly connected, operated, or not repaired in an expert way.

3 Applications

The LA-300/600 are the active loop amplifiers in constant current technique with dynamic compressor for creating an inductive sound reproduction system. It allows transmission of audio signals to hearing aids with a “telephone coil” and to inductive receivers. The wireless transmission is an advantage of inductive sound reproduction systems. Thus, the user is able to move freely within the loop.

Inductive sound reproduction systems are used for various applications, e. g. as an aid for persons hard of hearing in churches, theatres, cinemas, waiting rooms, meeting rooms, as interpreting installation, for lectures in museums, exhibitions, etc.

In inductive sound reproduction systems, an induction loop is triggered with a constant current amplifier. An induction loop consists of a wire winding laid into the floor, into the wall, or into the ceiling. Within this loop, a magnetic field is generated which will induce a voltage in the induction receiver. The receiver will reconvert this voltage into an audio signal. Any number of receivers can be operated within an induction loop.

The maximum size (600 m² for LA 600 & 300m² for LA300) of an induction loop may be reduced due to field strength losses which are caused by metal in ceilings and floors. Small losses can be compensated with the function METAL LOSS CORRECTION.

The LA-300/600 has three channels to which units with a line output (e. g. CD player, tape deck, tuner) and microphones phantom-powered) may be connected. The channel INPUT 1 is equipped with a talkover function which attenuates the volumes of the other two channels by approx. 40 dB in case of an announcement. The loop amplifier may be used as a mixing amplifier or be integrated into a PA system.

4 Installation

1. Install the loop.
2. Before connecting a loop to the amplifier use a multimeter to check the loop is not shorted to ground at any point, (it will almost certainly damage the amplifier if it is).
3. Prior to installing the sound reproduction system check for any magnetic interference at the place provided for it. This may impair the operation or even make the operation impossible. Interference is caused e. g. by transformers, high power cables, fluorescent lamps with a standard choke, and data cables.
4. Besides magnetic noise fields, interference in inductive sound reproduction system may also occur due to reinforced concrete floors or floor heating with copper cables. In this case, too, the magnetic field does not spread equally and in the extreme case the use of an inductive sound reproduction system is not possible. If the interference caused by the reinforced concrete is not too extensive, the frequency response may be adapted accordingly by means of the function METAL LOSS CORRECTION.
5. When laying the induction loop in tubes, these must be made of plastic as metal tubes may strongly impair the magnetic field of the loop.
6. Connect music or speech input signal to the amplifier. The peak line level of this signal should be approximately 1V. Ensure level controls and drive control are fully anticlockwise.
7. Increase the input levels controls until the ‘limit’ led is just flashing. This indicates that the dynamic range processor is receiving a signal of the correct level. If you are using both inputs the level controls acts as a simple mixer.
8. Adjust the drive control until the required current peak is produced. Care should be taken when doing this to ensure the current is within the recommended rating of the cable. The average current output should be approximately one quarter of the maximum peak.
9. Using an induction loop receiver listen to the signal inside the loop. It is advisable to check the system with a field strength meter. Please note that the orientation of the field strength meter may influence the reading.

Induction loop

The LA-600 allows to realize inductive sound reproduction systems for an area of up to 600 m² (300 m² for LA 300). The loop is laid at the edge of the sound reproduction area. The distance to the ear level should be approx. 1 m. It should be avoided to lay the loop at different heights. A basic cable serves as an induction loop.

If the local conditions do not allow to lay the loop as a rectangle, a special loop design is required which must be calculated by an expert.

After the dimensions of the induction loop have been defined, calculate the cross section of the cable and the required loop current:

Cable cross section

The resistance of the loop must be in a range between 0.2 and 2 Ω. After the length of the loop has been measured, determine cable cross section. The required cross section for the defined cable length can be taken from figs. 1 and 2:

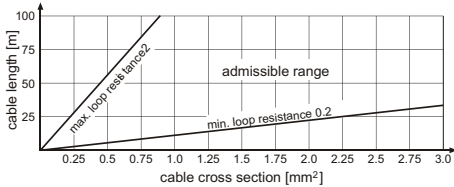


Fig. 1 Required cable cross section for the induction loop

		Cable cross section in mm ²				
		0.5	0.75	1.0	1.5	2.5
Loop length	min. at 0.2	6 m	9 m	12 m	17 m	28 m
	max. at 2.0	56 m	84 m	110 m	168 m	280 m

Fig. 2 Minimum and maximum loop lengths at certain cable cross section.

For the calculation of the loop resistance (R) [material: copper] also the following formula may be used:

$$R = \frac{l}{A} \times \rho_{Cu} = \frac{l}{A} \times 0.01786 \frac{\Omega \cdot \text{mm}^2}{\text{m}}$$

A = cable cross section in mm²

l = loop length in m

ρ_{Cu} = specific resistance of copper
0.01786 Ω · mm²/m

Loop current

The value of the loop current depends on the size and the width-length ratio of the loop. With these values the required loop current can be taken from fig.3

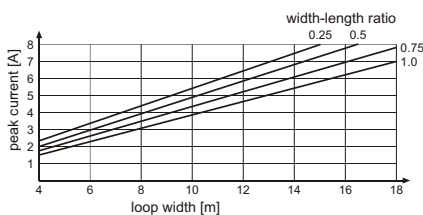


Fig. 3 Peak current in the induction loop

Example

loop width A = 10 m

loop length B = 20 m

$$\text{width-length ratio} = \frac{\text{loop width}}{\text{loop length}} = \frac{10 \text{ m}}{20 \text{ m}} = 0.5$$

With a loop width of 10 m and a width-length ratio of 0.5, a peak current of 4.9 A results in the loop.

Connection of the induction loop

The loop amplifier must be outside the loop

- 1) Twist the cable section between the amplifier and the loop.
- 2) Before the induction loop is connected to the amplifier, check with an ohmmeter to ensure that the loop is not earthed.
- 3) Connect the cable ends of the loop to the terminals LOOP OUTPUT (11)

Microphones

Up to three microphones may be connected to the combined XLR/6.3 mm jacks CH 1 to CH 3 (13). For CH1 the microphone (13) priority circuit may be activated

- 1) When connecting a microphone, set the corresponding DIP switch INPUT SENSITIVITY (15) to position MIC.
- 2) When using phantom-powered microphones, switch on the phantom power with the DIP switch PHANTOM (14) [position ON].

NOTE

It is recommended to use electret condenser microphones for loop systems. Dynamic microphones may cause feedback and distortion.

CAUTION

If the phantom power is connected, no microphone with unbalanced output must be connected to the corresponding input jack (13), as the microphone may be damaged.

Units with line level

Up to three audio units with line output (e. g. CD player, cassette recorder) may be connected to the combined XLR/6.3 mm jacks (13) or to the phono jacks (16) of the channels INPUT 1 to INPUT 3.

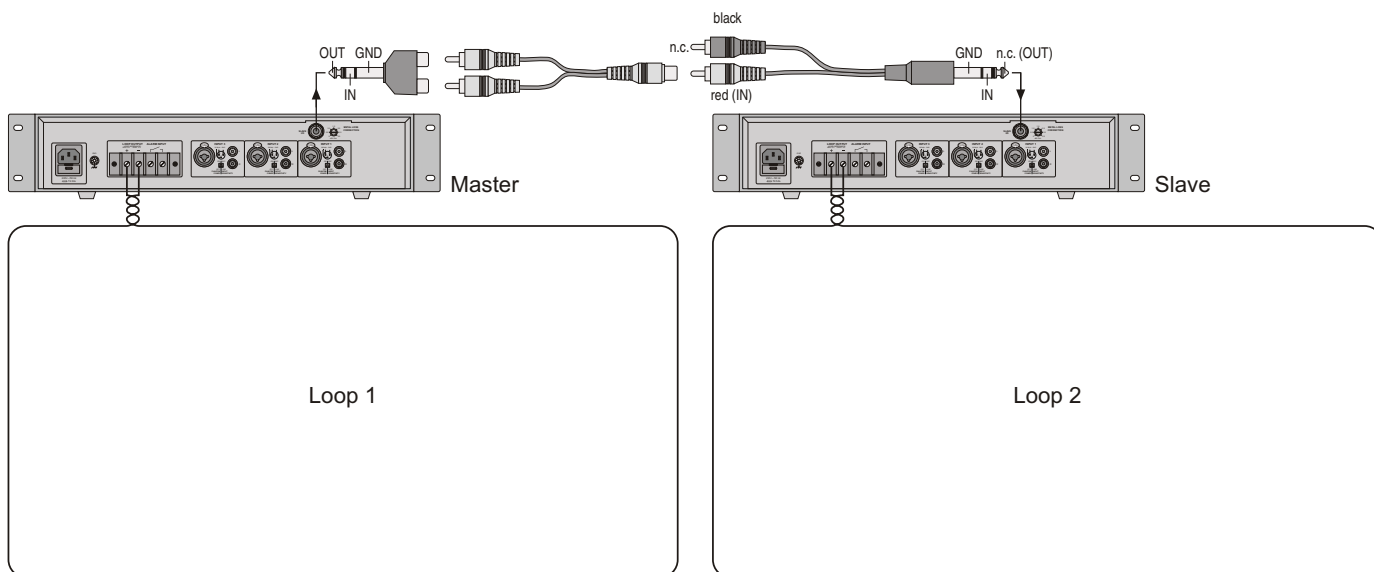
- 1) When connecting a unit with line output, set the corresponding DIP switch INPUT SENSITIVITY (15) to position LINE.
- 2) Set the corresponding DIP switch PHANTOM (14) to position OFF, otherwise the connected unit may be damaged.

Alarm siren

The internal siren may be activated via a switch or momentary pushbutton connected to the terminals ALARM INPUT (12). While the siren sounds, the LED SIREN (4) lights up and the volumes of all other audio signals are automatically attenuated.

Application as a loop amplifier in a PA system

- 1) Feed the audio signal from the PA system to one of the jacks INPUT 1 to INPUT 3 (13). The signal should be balanced, have line level (0.2–1 V), and be independent of the volume control of the PA amplifier.
- 2) Set the corresponding DIP switch INPUT SENSITIVITY (15) to position LINE.
- 3) Set the corresponding DIP switch PHANTOM (14) to position OFF, otherwise the connected unit may be damaged.



Operation with two loop amplifiers.

If one loop amplifier is not sufficient to supply the entire area, two loops may be installed which are driven by one 'LA 600 or LA 300' each. In this case one amplifier operates as a master (to which all signal sources are connected) and the second as a slave. Feed the audio signal from the master amplifier to the slave amplifier.

- 1) Connect the adaptor 6.3 mm stereo jack / 2 x phono in line jack to the jack 'SLAVE I/O (18) of the master unit. The output signal to be fed to the second loop amplifier is present at the tip of the 6.3 mm plug.
- 2) By the connection of the jack SLAVE I/O, the signal way in the master amplifier between the mixing part and the power amplifier part is opened up. Therefore, this signal way must be closed again with a 'Y' cable.
- 3) From the 'Y' cable feed the output signal via an adaptor cable 2 x phono/6.3 mm stereo jack to the jack SLAVE I/O of the slave amplifier. The signal must be present at the ring of the 6.3 mm stereo plug. Therefore, connect the red phono plug of the cable to the 'Y' cable.

5 Operation

First setting into operation

- 1) Prior to switching on, turn the controls INPUT 1 to 3 (1) and LOOP CURRENT (3) to the left stop.
- 2) Feed a signal (test signal, music piece, or microphone announcement) to all connected inputs.
- 3) Switch on the amplifier with the switch POWER(7). After switching on, the red LED (6) above the switch lights up.
- 4) Slightly turn up the control LOOP CURRENT (3) so that a signal can be received in the loop.
- 5) Control the level of the channels to be heard with the corresponding controls INPUT (1) and check the field strength in the loop with a field strength meter. According to the European standard EN 60118-4 a field strength of 100 mA/m is recommended, and the maximum field strength should not exceed 400 mA/m. Both values are related to the reference frequency of 1000 Hz. Adjust the field strength with the control LOOP CURRENT (3) accordingly. The 5-step LED row(5) shows the output current. If no field strength meter is available, the adjustments can be checked with an induction receiver for audio quality and receiving quality.
- 6) Adjust the optimum sound with the tone controls BASS and TREBLE (2).

Operation

The adjustments made under item 5 do not have to be changed any more. The loop amplifier must only be switched on for normal operation. The units of a PA system should be switched on in the following order:

1. the audio units
2. the PA amplifier
3. the loop amplifier

To switch off the system, proceed in reverse order.

Microphone priority circuit (talkover) and metal loss correction

1. If an announcement is made via the microphone channel INPUT 1, the volumes for the channels INPUT 2 and INPUT 3 are automatically reduced by approx. 40 dB if the talkover function has been activated.
2. Ceilings and floors in many buildings frequently have a high metal content. This metal may lead to a frequency-depending loss of the field strength. The loss is 3 dB/octave with a lower limit frequency between 0.01 Hz and 100 Hz. The function METAL LOSS CORRECTION counterbalances this by attenuating frequencies below 1 kHz and boosting frequencies above this value up to 3 dB/octave.

The effect of the metal on the frequency response can only be determined with special units requiring a lot of effort. However, it is also possible to only monitor the loop signal with an induction receiver

- a) After activating the function METAL LOSS CORRECTION, set the control METAL LOSS CORRECTION (17) to 0 dB for the time being and monitor the loop signal.
- b) Then adjust the control METAL LOSS CORRECTION (17) to optimum audibility of speech.

Activating functions

WARNING :- To switch on the talkover function or Metal Loss Correction, the unit must be opened. Therefore, this must only be made by qualified personnel. This may cause an electric shock hazard.

- 1) Disconnect the mains plug from the socket.
- 2) Screw off the housing cover.
- 3) To activate the talkover function, place the jumper J7 to position ON.
- 4) To activate the function METAL LOSS CORRECTION, place the jumper J8 to position ON.
- 5) Tightly screw the housing cover again.

6 Specifications

	LA 300	LA 600
Loop current:	5 A rms @ 1 load	6 A rms @ 1 load
Admissible loop resistance		
Max. hearing area:	300m ² per LA-300	600m ² per LA-600
Inputs		
XLR/6.3 mm jack, balanced:	MIC -56dBu / 2 K switchable to LINE -6dBu / 6 K	MIC -56dBu / 2 K switchable to LINE -6dBu / 6 K
Phono unbalanced	LINE -6dBu / 8 K	LINE -6dBu / 8 K
Phantom power:	36 V to be connected	40 V to be connected
Tone control		
bass:	100 Hz, ±8 dB	100 Hz, ±8 dB
treble:	10kHz, ±10 dB	10kHz, ±10 dB
Frequency range:	50Hz -5000 Hz, ±3 dB	50Hz -5000 Hz, ±3 dB
THD:	< 1%	< 1%
S/N ratio:	75dB in LINE mode 60dB in MIC mode	75dB in LINE mode 60dB in MIC mode
Power supply	230 V~/50 Hz/100 VA	230 V~/50 Hz/150 VA
Ambient temperature:	0 – 40°C	0 – 40°C
Dimensions (W x H x D):	482 x 44 x 266 mm, 1 rack spaces	482 x 88 x 280 mm, 2 rack spaces
Weight:	4.8 kg	8 kg

Subject to technical modification.

