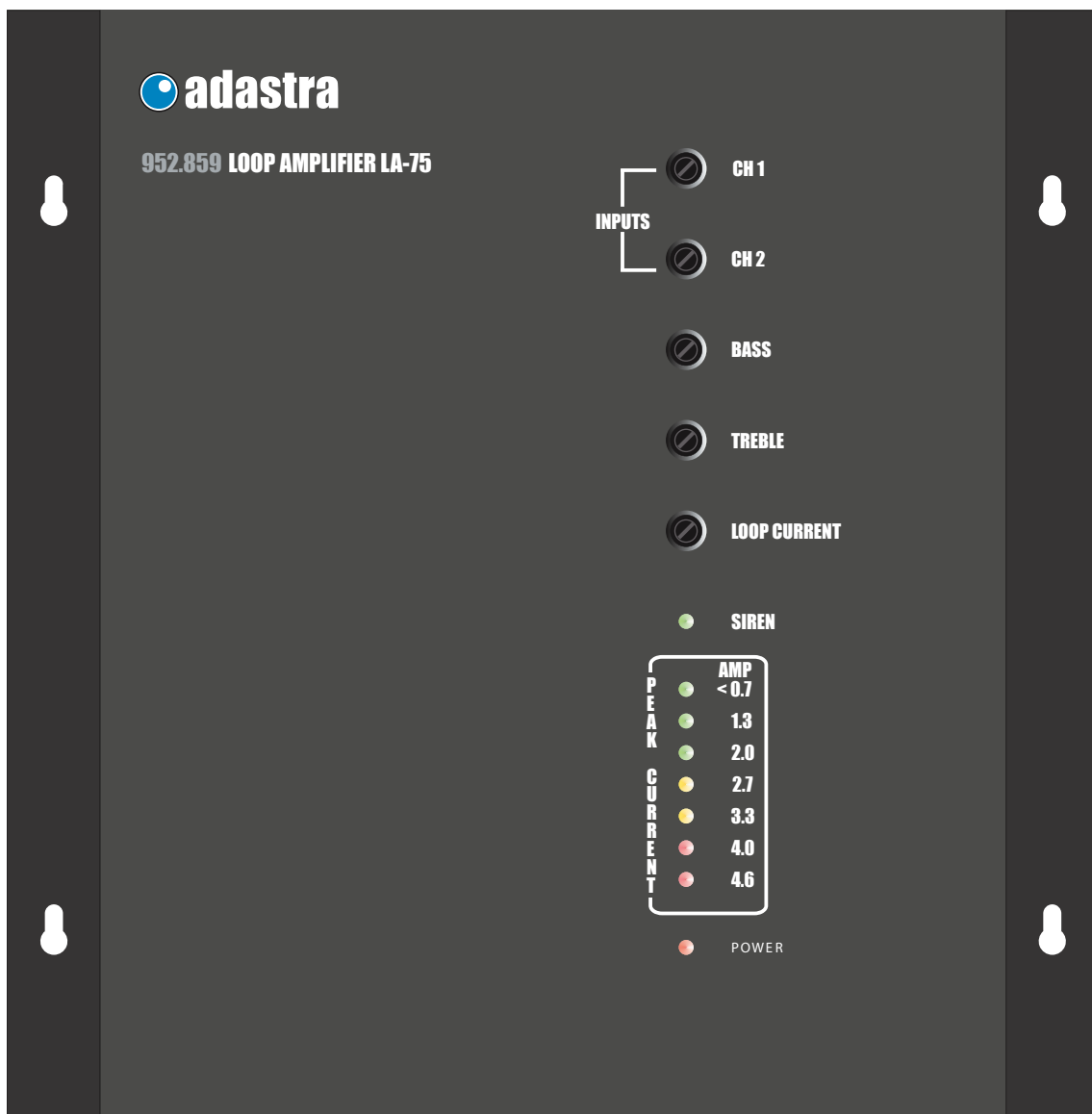


adastra LA Series

Loop Amplifier

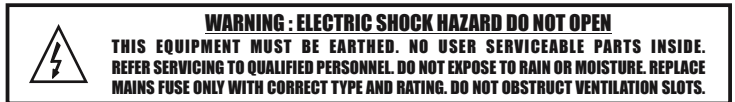
Ref. No. 952.859

Model: LA-75



Operation Manual

OPERATION MANUAL - LOOP AMPLIFIERS



IMPORTANT

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

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

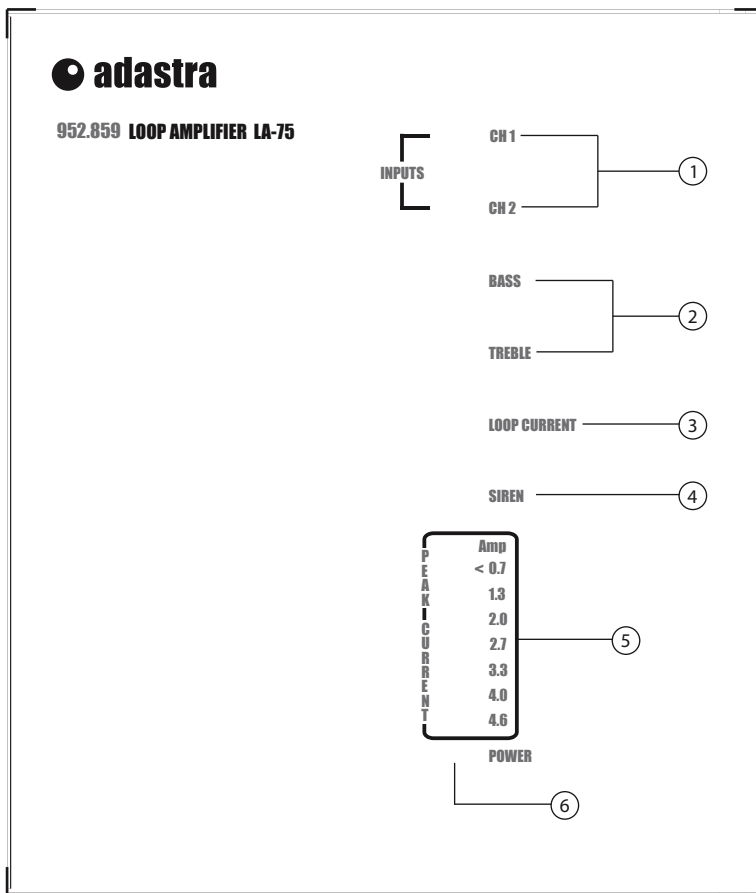
As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

WARNING: THIS APPLIANCE MUST BE EARTHED

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 two way block which is covered with safety cover with a Label marked with the letter N. The wire is coloured brown must be connected to the Terminal which is marked with the letter L.

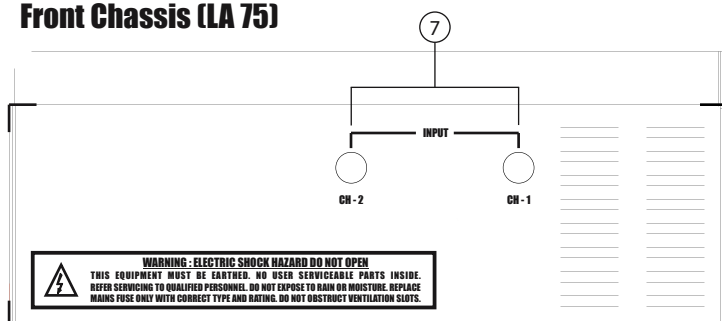
1 Operating Elements & Connections

Front Panel (LA 75)

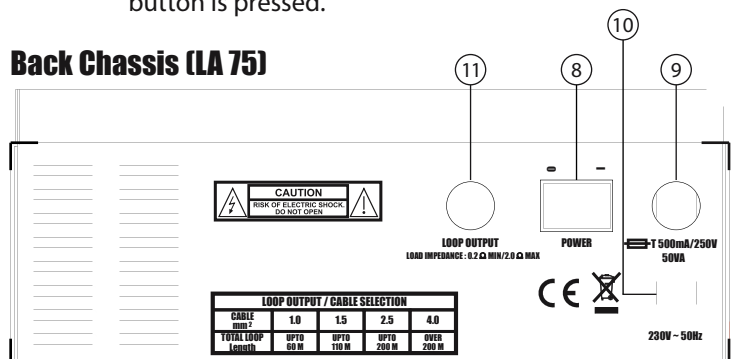


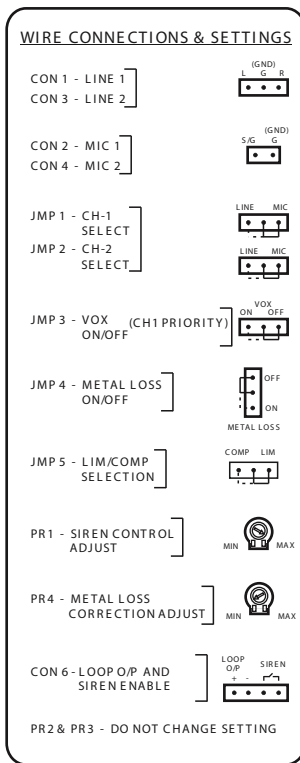
1. Controls for adjusting the preamplification for the channels CH1 & CH2
2. Tone Controls
 BASS = Bass Control
 TREBLE = Treble control
3. Control LOOP CURRENT for adjusting loop current
4. LED siren : Lights up when siren signal sounds
5. Level indication for the loop current
6. POWER LED
7. Provision to insert the INPUT wires for making connections with terminal blocks inside the unit marked as MIC / LINE
8. POWER switch
9. FUSE HOLDER for Mains Fuse only replace a blown fuse by one of the same type
10. MAINS INPUT for Mains Connection (230V ~ / 50Hz) via attached mains cable
11. LOOP OUTPUT hole is provision to take out wires from terminal block CON6 inside the unit on Main PCB for connection of the inductive loop & also to make the connection for an external momentary push button (closing contact) or switch for triggering an alarm siren. The siren sounds as long as the button is pressed.

Front Chassis (LA 75)



Back Chassis (LA 75)





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 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 on 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
- 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 personnel 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-75 are the active loop amplifier 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 installations, for lectures in museums, exhibitions, etc.

In inductive sound reproductions 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 ($75m \leq$ for LA-75) of an induction loop may be reduced due to field strength losses which are caused by metal in ceiling and floors. Small losses can be compensated with the function METAL LOSS CORRECTION.

The LA-75 has two channels to which units with a line output (e.g. CD player, tape deck, tuner) and microphones may be connected. The channel INPUT 1 is equipped with a talkover function which attenuates the volume of the other channel by approx. 40dB in case of an announcement. The loop amplifier may be used as a mixing amplifier or be integrated into a P A 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 transformer, high power cables, fluorescent lamps with a standard choke, and data cables.

4. Besides magnetic noise fields, interference 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 level controls until the 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-75 allows inductive sound reproduction for an area of up to 75m²

The loop is laid at the edge of the sound reproduction area. The distance to the ear level should be approx 1m.

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. & 2.

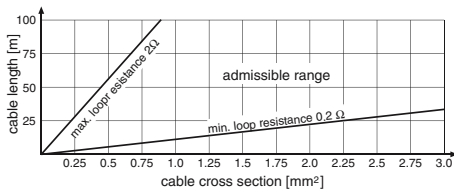


Fig. 1 Required cable cross section for the induction loop

		Cable cross section in mm				
		0.5	0.75	1.0	1.5	2.5
Loop length	min. at 0Ω	6 m	9 m	12 m	17 m	28 m
	max. at 2Ω	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.

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

A = cable cross section in mm²

l = loop length in m

ρ_{Cu} = specific resistance of copper
0.01786 Ω x 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

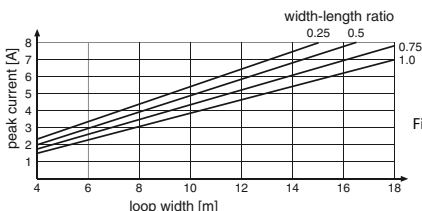


Fig. 3 Peak current in the induction loop

Example

loop width A = 6 m

loop length B = 12 m

$$\text{width-length ratio} = \frac{\text{loop width}}{\text{loop length}} = \frac{6 \text{ m}}{12 \text{ m}} = 0.5$$

With a loop width of 6m and a width-length 0.5, a peak current of 3A 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 two microphones may be connected to the terminal block as CON2 & CON4 on MAIN PCB. For Ch1 the microphone one priority circuit may be activated

- 1) When connecting a microphone, set the corresponding jumper JMP1 & JMP2. I/P SENSITIVITY to position MIC.

Units with line level

Up to two audio units with line output (e.g. CD Player, Cassette Recorder) may be connected to the CON1 & CON3 terminal block of Main Pcb, of the channels INPUT 1 to INPUT 2.

- 1) When connecting a unit with line output, set the corresponding jumpers (JMP1 & JMP2) to position line.

Alarm siren

The internal siren may be activated via a switch or momentary push button connected to the terminals block CON6 inside the units with pins shown in specification label, while the siren sounds, While the siren sounds, the LED SIREN (4) lights up and the volume of all the 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 Inputs CH1 TO Ch2. The signal should be unbalanced, have line level (0.2-1V), and be independent of the volume control of the PA amplifier.
2. Set the corresponding jumper JMP1 & JMP2 INPUT SENSITIVITY to position LINE.

Operation

First setting into operation

- 1) Prior to switching on, turn the controls INPUT 1 to 2 (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 POWER SWITCH (8). After switching on, the RED LED (6) light 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 EN60118-4 a field strength of 100m/A is recommended, and the maximum field strength should be exceed 400mA/m. Both values are related to the reference frequency of 1000Hz. 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 adjustment can be checked with an induction receiver for audio quality and receiving quality.
6. Adjust the optimum sound with the tone controls BASS & TREBLE (2)

Operation

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

1. The audio unit
2. The PA amplifier
3. The loop amplifier

To switch off the system, proceed in the reverse order.

Microphone priority circuit (talkover) and metal loss correction

1. If an announcement is made via the microphone channel INPUT 1, the volume for the channel INPUT 2 is automatically reduced by approx. 40dB if the talkover function has been activated by jumper JMP3 selection.
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 3dB/octave with a lower limit frequency between 0.01 Hz and 100 Hz. The function METAL LOSS CORRECTION counterbalances this by attenuating frequencies below 1kHz and boosting frequencies above this value up to 3dB/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 PR4 to 0dB for the time being and monitor the loop signal.
- B) Then adjust the control METAL LOSS CORRECTION PR4 to optimum audibility of speech.

Activating functions

WARNING: To switch on the talkover function or Metal loss correction & also to connect inputs & outputs, the unit must be opened. This must only be made by qualified personnel. This may cause an electric shock hazard.

- 1) Disconnect the mains cord from mains plug
- 2) Screw off the housing cover.
- 3) To activate the talkover function, place jumper JMP3 to position ON.
- 4) To activate the function METAL LOSS CORRECTION, place the jumper JMP4 to position ON.
- 5) Tightly screw the housing cover again
- 6) Connect Inputs & Outputs to respective terminals blocks as shown in the label as wire connection and settings.

Specifications

Loop current:.....	3 A rms @ 1 Ω load
Admissible loop resistance.....	0.2 - 2 Ω
Max. Hearing area:.....	75m \leq per LA-75
Inputs	
Terminal Block	MIC-56dBu / 2 K Ω
Unbalanced:.....	Switchable
	Line -6dBu / 8 K Ω
Tone control	
Bass:.....	100 Hz, \pm 8dB
Treble:.....	10kHz, \pm 10dB
Frequency response:.....	50Hz-5000Hz, \pm 3dB
THD:.....	<1% for Line
	<2% for Mic
S/N ratio.....	75dB in Line mode
	60dB in MIC mode
Power Supply	230 V~/50Hz/50VA.
Ambient temperature.....	0 - 40 $^{\circ}$ C
Dimensions (W x H x D).....	242 x 88 x 264mm
Weight.....	4kgs
Subject to technical modification	CE