



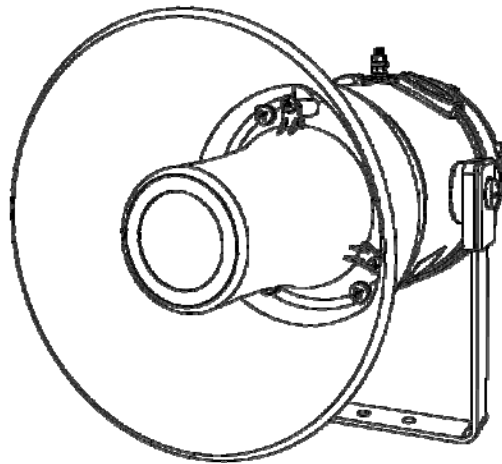
**GAI-TRONICS®**  
A HUBBELL COMPANY

# Model 13310-3xx Series Loudspeakers Instruction and Service Manual

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This manual covers the following loudspeaker models:

- Model 13310-311, 16-ohm, 25 watts, UL Class I Division 1
- Model 13310-312, 8-ohm, 25 watts, UL Class I Division 1
- Model 13310-313, 70 V line, 25 watts, UL Class I Division 1



# Warranty

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Equipment. GAI-Tronics warrants for a period of one (1) year from the date of shipment, that any GAI-Tronics equipment supplied hereunder shall be free of defects in material and workmanship, shall comply with the then-current product specifications and product literature, and if applicable, shall be fit for the purpose specified in the agreed-upon quotation or proposal document. If (a) Seller's goods prove to be defective in workmanship and/or material under normal and proper usage, or unfit for the purpose specified and agreed upon, and (b) Buyer's claim is made within the warranty period set forth above, Buyer may return such goods to GAI-Tronics' nearest depot repair facility, freight prepaid, at which time they will be repaired or replaced, at Seller's option, without charge to Buyer. Repair or replacement shall be Buyer's sole and exclusive remedy. The warranty period on any repaired or replacement equipment shall be the greater of the ninety (90) day repair warranty or one (1) year from the date the original equipment was shipped. In no event shall GAI-Tronics warranty obligations with respect to equipment exceed 100% of the total cost of the equipment supplied hereunder. Buyer may also be entitled to the manufacturer's warranty on any third-party goods supplied by GAI-Tronics hereunder. The applicability of any such third-party warranty will be determined by GAI-Tronics.

Services. Any services GAI-Tronics provides hereunder, whether directly or through subcontractors, shall be performed in accordance with the standard of care with which such services are normally provided in the industry. If the services fail to meet the applicable industry standard, GAI-Tronics will re-perform such services at no cost to buyer to correct said deficiency to Company's satisfaction provided any and all issues are identified prior to the demobilization of the Contractor's personnel from the work site. Re-performance of services shall be Buyer's sole and exclusive remedy, and in no event shall GAI-Tronics warranty obligations.

Warranty Periods. Every claim by Buyer alleging a defect in the goods and/or services provided hereunder shall be deemed waived unless such claim is made in writing within the applicable warranty periods as set forth above. Provided, however, that if the defect complained of is latent and not discoverable within the above warranty periods, every claim arising on account of such latent defect shall be deemed waived unless it is made in writing within a reasonable time after such latent defect is or should have been discovered by Buyer.

Limitations / Exclusions. The warranties herein shall not apply to, and GAI-Tronics shall not be responsible for, any damage to the goods or failure of the services supplied hereunder, to the extent caused by Buyer's neglect, failure to follow operational and maintenance procedures provided with the equipment, or the use of technicians not specifically authorized by GAI-Tronics to maintain or service the equipment. **THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE IN LIEU OF AND EXCLUDE ALL OTHER WARRANTIES AND REMEDIES, WHETHER EXPRESS OR IMPLIED BY OPERATION OF LAW OR OTHERWISE, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

## Return Policy

If the equipment requires service, contact your Regional Service Center for a return authorization number (RA#). Equipment should be shipped prepaid to GAI-Tronics with a return authorization number and a purchase order number. If the equipment is under warranty, repairs or a replacement will be made in accordance with the warranty policy set forth above. Please include a written explanation of all defects to assist our technicians in their troubleshooting efforts.

Call 800-492-1212 (inside the USA) or 610-777-1374 (outside the USA) for help identifying the Regional Service Center closest to you.

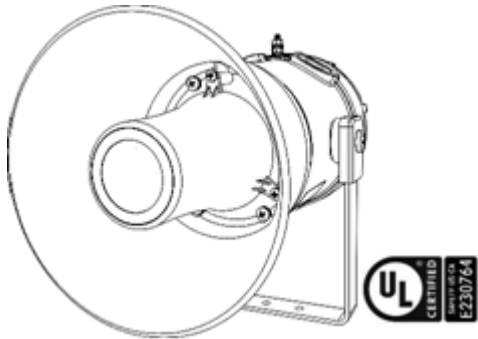


**GAI-TRONICS®**  
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# INSTRUCTION & SERVICE MANUAL

## 13310-3xx LOUDSPEAKERS

*For Use In Hazardous Locations - Gas*



**The 13310-3xx series Loudspeakers are certified by UL as Audible-signal Appliances for Use in Hazardous Locations**

### 1) Introduction

The 13310-3xx series are UL certified loudspeakers which produce a loud warning signal in a hazardous area. The loudspeakers are approved for use in Gas applications in Class I Division 1 & 2 as well as Class I Zone 0, 1 and 2.

### 2) Warnings

**CAUTION**

TO REDUCE THE RISK OF IGNITION OF HAZARDOUS ATMOSPHERES:  
DISCONNECT FROM SUPPLY BEFORE OPENING.  
KEEP TIGHTLY CLOSED WHEN IN OPERATION.

**WARNING**

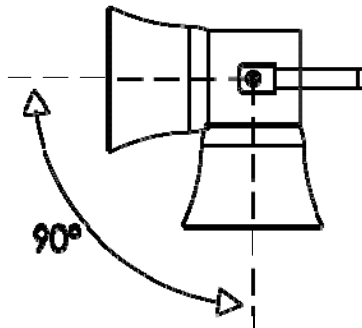
FIT SEALING FITTING IN CONDUIT RUNS WITHIN 18 INCHES FROM ENCLOSURE.  
EQUIPMENT MUST NOT BE INSTALLED WITH THE HORN FACING UPWARDS OF HORIZONTAL.

**ATTENTION**

POUR REDUIRE LE RISQUE D'INFLAMMATION DES ATMOSPHÈRES DANGEREUSES:  
COUPER L'ALIMENTATION AVANT OUVERTURE.  
CONSERVER FERMÉ PENDANT LE FONCTIONNEMENT.

**AVERTISSEMENT**

CONDUITS DOIVENT ÊTRE SCELLÉS EN MOINS DE 18 POUÇES.  
ÉQUIPEMENT NE DOIT PAS ÊTRE INSTALLÉ AVEC LE KLAXON TOURNÉE VERS LE HAUT DE HORIZONTAL.



### 3) Ratings and Markings

#### 3.1 Class / Division Ratings for US and Canada

The 13310-3xx Loudspeakers comply with the following standards for hazardous locations:

UL 1203  
CSA C22.2 NO. 30-M1986

The 13310-3xx Loudspeakers also comply with the following standards for signaling equipment:

UL 1480  
CSA C22.2 NO. 205-12

#### 3.2 Class / Division Ratings for US & Canada

Class I Div 1    ABCD    T6    Ta -40°C to +70°C

Installation must be carried out in compliance with the National Electric Code / Canadian Electric Code.

#### 3.3 Class / Zone ratings US and Canada

Class I Zone 1    IIC T6    Ta -40°C to +70°C

Installation must be carried out in compliance with the National Electric Code / Canadian Electric Code.

#### 3.4 Ambient Temperature Range

-40°C to +70°C

#### 3.5 Enclosure Ratings

The product is rated for ingress protection as follows:  
IP rating per EN60529:    IP66

Type rating per UL50E / NEMA250: 4 / 4X / 3R / 13

#### 3.6 Electrical Ratings

Model No.	Input	Power (Watts)	Max I/P Volts
13310-313	70V Line	25	70
13310-312	8 Ohm	25	14.14
13310-311	16 Ohm	25	20

#### 3.7 Frequency Range

All models: 400 Hz to 8000 Hz

### 4) Installation

#### 4.1 Safe Installation Requirements

The product must only be installed by suitably qualified personnel in accordance with the latest issues of the relevant standards.

The installation of the units must also be in accordance with the NEC / CEC and any local regulations and should only be carried out by a competent electrical engineer who has the necessary training.

The Equipment must not be installed with the horn facing upwards or horizontal.

To maintain the ingress protection rating and mode of protection, the cable entries must be fitted with suitably rated cable entry and/or blanking devices during installation. If conduit is used for installation, seal conduit within 18 inches from the enclosure.

If entries are fitted with adaptors they must be suitably rated for the application. Fitting of blanking elements into adaptors is not permitted.

If a high IP (Ingress Protection) rating is required then a suitable sealing washer or O-ring must be fitted under any cable gland or blanking device with metric threads.

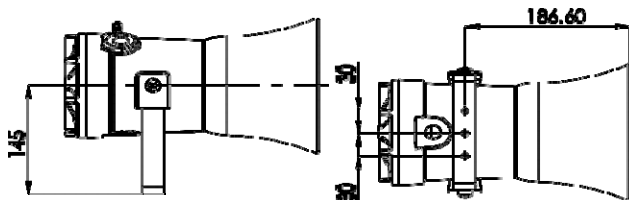
Only the explosionproof cover is to be used for access to the enclosure for installation, service and maintenance.

Connections are to be made into the terminal blocks using solid or stranded wire, sizes 0.5–2.5mm<sup>2</sup> / AWG 20–12. Wire insulation needs to be stripped 6–7mm. Wires may be fitted securely with crimped ferrules. Terminal screws need to be tightened down with a tightening torque of 0.4 Nm / 3.5 Lb-in.

Earthing connections should be made to the Internal Earth terminal in the explosionproof chamber or the external earth stud.

Check that the O-ring seal is in place before replacing the explosionproof cover.

**4.2 Mounting**



**Figure 1. Fixing locations**

13310-3xx Loudspeakers should only be installed by trained competent personnel.

The Loudspeakers may be secured to any flat surface using the three 7mm fixing holes. The enclosure provides IP66 protection and is suitable for indoor and outdoor use providing it is positioned so that water cannot collect in the horn, and the cable entry is sealed.

**4.3 Installation Procedure**

- a. Secure the Loudspeaker to a flat surface via the three 7mm fixing holes in the mounting bracket.
- b. Remove the explosionproof cover of the loudspeaker by unscrewing it, taking care not to damage the threads in the process. (Refer to Section 5.)
- c. Fit an M20x1.5 suitably certified cable gland or ½” NPT conduit into the corresponding entry in the enclosure and connect the field wiring to the appropriate loudspeaker terminals as shown in Section 6 / Figure 3 (70V Line In) or Section 7 / Figure 4 (Low Impedance) of this manual. The power supply terminals on the low impedance units are duplicated so that units may be connected in parallel. An end-of-line monitoring resistor may be fitted to either type of unit. Additional entries which are not used must always be fitted with suitably certified blanking elements.

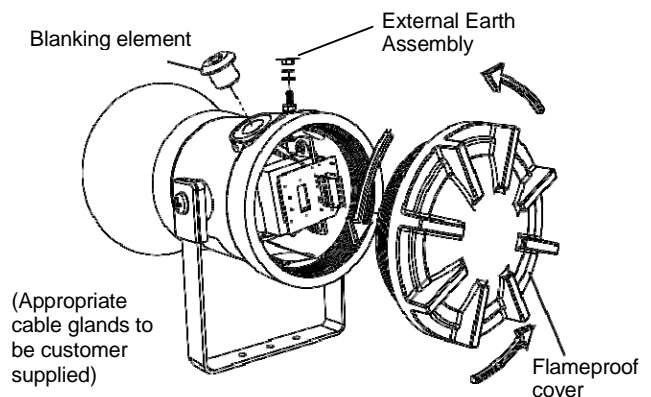
- d. Replace the explosionproof cover of the loudspeaker, taking care not to damage the explosionproof threads and checking that the O-ring seal is in place. Tighten the cover fully.

**4.4 Hornless Variants**

The 13310-3xx Loudspeaker is also available as a variant with no horn fitted in the factory. The Horn threaded nose portion has a fitment thread of 1-3/8” – 18 UNF (to BS1580 or ANSI B1.1). The customer is responsible for sourcing and correctly fitting a suitable horn that meets all of the relevant safety requirements.

**5) Access to the Explosionproof Enclosure**

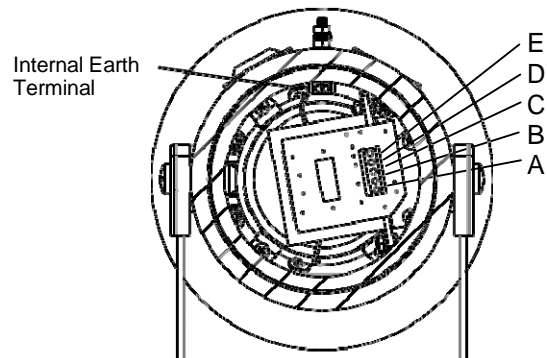
In order to connect the electrical supply cables to the loudspeaker, it is necessary to remove the explosionproof cover to gain access to the explosionproof chamber. This can be achieved by unscrewing the explosionproof cover, taking extreme care not to damage the explosionproof threads in the process.



**Figure 2. Accessing the Explosionproof Enclosure**

On completion of the cable wiring installation the explosionproof threads should be inspected to ensure that they are clean and that they have not been damaged during installation. Also check that the O-ring seal is in place on the thread diameter in contact with the flat face of the explosionproof cover. When replacing the explosionproof cover ensure that it is tightened fully.

**6) 70V Line In Wiring**



**Figure 3. Line In Terminals**

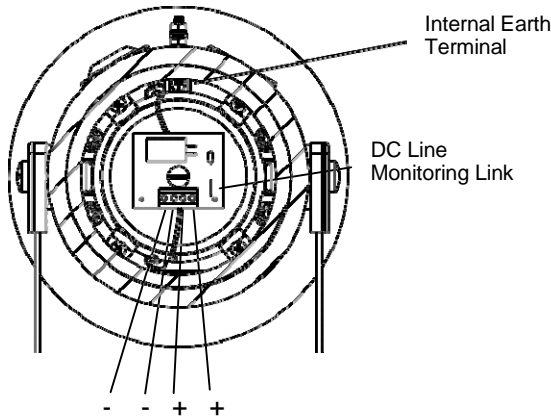
The cable connections are made into the terminal blocks on the PCB assembly located in the explosionproof enclosure.

See Section 5 of this manual for access to the explosionproof enclosure. The 70V Line loudspeakers are fitted with a five-way terminal block. Terminal A is common and one of the other terminals B, C, D or E should be selected depending on what output level is required. (See table below.)

Terminals	Watts
A - B	25W
A - C	12.5W
A - D	6W
A - E	2W

For 8-ohm and 16-ohm models a single conductor with a cross sectional area of up to 2.5mm<sup>2</sup> / ~13 AWG can be connected to each terminal. The 70V transformer model is supplied with two (2) sets of terminals (in and out), a single conductor with a cross sectional area of up to 2.5mm<sup>2</sup> / ~13 AWG can be connected to each terminal. If more than one wire is fitted into a terminal, a ferrule should be used to secure the wires. When connecting wires to the terminals, great care should be taken to dress the wire so that when the cover is inserted into the chamber the wires do not exert excess pressure on the terminal blocks.

**7) Low Impedance Wiring**



**Figure 4. Low Impedance Terminals**

The 8-ohm and 16-ohm low impedance models have dual input terminals on the PCB assembly for input and output wiring. A cable of up to 2.5mm<sup>2</sup> can be connected to each terminal. If DC line monitoring is used, cut the link on the board. (See Figure 4.)

**8) Earthing**

The unit has both a primary internal and secondary external earth fixing point.

Internal earth connections should be made to the internal Earth terminal. See Figure 3 and Figure 4. It should be fitted to the internal earth point using a ring crimp terminal to secure the earth conductor.

In addition, external earth connections can be made to the M5 earth stud (see Figure 2), using a ring crimp terminal to secure the earth conductor to the earth stud. The external earth crimp ring should be located between the two M5 plain washers provided and securely locked down with the M5 spring washer and M5 nut.

The earth conductor should be at least equal in size and

rating to the incoming power conductors but at least a minimum of 0.82mm<sup>2</sup> / 18 AWG in size.

**9) End-of-Line DC Monitoring**

On 13310-3xx Loudspeakers, DC line monitoring can be used if required. Both the 70V Line units and the Low Impedance units have blocking capacitors fitted. It should be noted that each loudspeaker has a 1M ohm bleed resistor connected across the blocking capacitor and this should be taken into account when selecting the value of the end-of-line monitoring resistance.

The end-of-line monitoring resistor can be connected across the terminals on the end-of-line unit.

On 70V line units, the end-of-line resistor used must have a minimum resistance value of 4k7 ohms and a minimum wattage of 2.5 watts.

On low impedance units, the end-of-line resistor used must have a minimum resistance value of 2k ohms and a minimum wattage of 0.5 watts or a minimum resistance value of 500 ohms and a minimum wattage of 2 watts. On the low impedance units, care must be taken with the polarity of the monitoring voltage. If an end-of-line resistor is fitted to a unit, the links on the printed circuit boards of all loudspeakers in the line must be cut for the dc blocking capacitors to be in circuit in order to dc monitor the line. (See Figure 4.)

**10) Maintenance, Repair and Overhaul**

Maintenance, repair and overhaul of the equipment should only be carried out by suitably qualified personnel in accordance with the current relevant standards and regulations.

Units must not be opened while an explosive atmosphere is present.

If opening the unit during maintenance operations, a clean environment must be maintained and any dust layer removed prior to opening the unit.

The threaded flame path joints are not intended to be repaired.

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