

## The bench test [1]

# What a row!

## The Inferno internal sounder from Klaxon Signals Seriously disturbing noise for the intruder

### What our experts say ...

THE TERM "INTERNAL SOUNDER" IS OFTEN applied to a conventional loudspeaker, which responds to outputs from the control panel in an intruder alarm system for producing distinguishable audible signals for entry/exit and full alarm conditions. A dedicated internal sounder is usually connected to respond to full alarm outputs only. The Inferno is of the latter type.

It produces a seriously uncomfortable sound output of 125 dB(A) at 1m – more than the majority of external sounders and certainly enough to drive out the average intruder from a confined space.

The electric current demand on the intruder alarm control panel is quite modest, even under full alarm conditions, since the Inferno operates in a manner similar to a self-contained external sounder in that its sounder elements are powered from an internal 7.2v, 1.2 Ah Ni-MH (nickel metal hydride) battery.

The alarm control panel supplies battery charging current (130mA or less, depending on battery state of charge) and activation signal current (10 or 50mA, dependent on connecting method).

The Inferno enclosure is very neat, unobtrusive and shaped for wall or corner mounting – it could easily be passed off as a speaker unit or a space heater!

In order to maintain the shock effect at the perimeter of larger spaces, a number of units may be installed, using a separate 12v DC charging supply if necessary, to avoid overloading the alarm control panel. Also, either two or four Inferno units can be attached together to form either a semi-circular unit for wall mounting or a circular unit for hanging from the ceiling.

If a separate 12v charging supply is used then we would strongly recommend that a warning system be included so that in the event of supply failure, indication is given to the users that the Inferno battery is not being maintained in a fully charged state. The Inferno battery will provide up to 20 minutes of alarm output under these conditions.

Tamper protection is provided by two switches, one for each end cover. These can be connected to the control panel global tamper loop – they do not activate the Inferno sounder unit directly.

A test facility is included to enable the installer to check the outputs to the sounders without the need for ear defenders. The Inferno has a built-in optional 30-second delay.



### Construction

The Inferno enclosure consists of an extruded aluminium base with channels for holding the two printed circuit boards, battery carrier plate and perforated stainless steel grille. These all slide into the channels and are held in place by two plastic end covers which also operate the tamper switches.

The end covers are each secured by two self-tapping screws which engage in less than full threads in the ends of the battery carrier channels – passable if used infrequently with extreme care but since one cover will need to be removed at regular intervals in order to carry out battery checks, the fixings could become less reliable. Any lifting of a cover could result in a tamper alarm being generated.

The outer faces of the base are angled at 90 degrees for easy corner mounting and multiple unit attachment – simple, neat enclosure design.

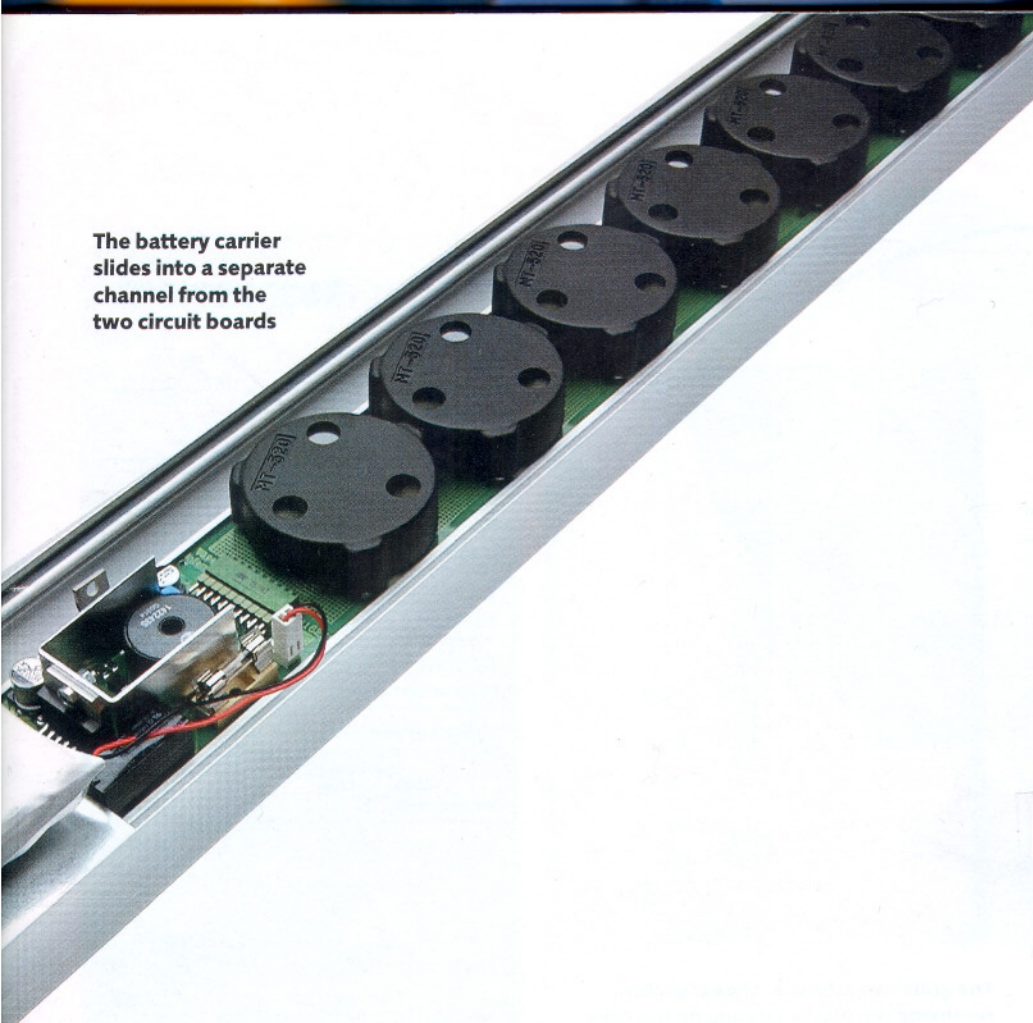
The CPU circuit board, 184 x 53 mm, carries the electronic components for generating the sounder tones, battery connecting pins and fuse, unpluggable connector block and tamper switch. Its outputs are fed through a 20-pin connector to the sounder's circuit board, 483 x 53mm, which has eight individual sounder elements and the other tamper switch.

Both circuit boards slide in the same channel so that connector alignment is not a problem; the pins are gold flashed and two pins are used for each line, so that voltage drops across the connector under alarm conditions, when it carries a total of 1.2A, will be minimal.

The battery carrier slides into a separate → P.23

**The enclosure is neat, unobtrusive and shaped for wall or corner mounting**

The battery carrier slides into a separate channel from the two circuit boards



channel. It is held in position by the relay and the terminal connector block on the CPU circuit board. The battery is held on its carrier plate by a 'velcro' strip and plugged into the CPU circuit board so that it is easily unplugged for checking or replacement as necessary. Battery state is very important since it is the only source of sounder power.

The battery fuse-holder is a convenient spot for checking charging current but installers should exercise great care when making connections, since it is sited very close to a heat sink, electrically at 0 volts potential!

The circuit board quality is up to the usual high standard; the quality of manufacture and finish is very good.

**Installation**

There were some shortcomings in our sample of the Inferno, concerning the enclosure. The manufacturer is aware of the problems and is currently considering possible solutions.

When the end covers and perforated grille are removed, there are no restraints on the circuit boards so that care is needed, to avoid gravitational accidents, when initially disassembling prior to installation and assembling when the base has been vertically installed. Horizontally installed units are obviously less of a problem.

The perforated grille does have some braking action on the circuit boards, via the battery, but it also acts as a 'cheese grater' when there is relative movement between them, removing the plastic coating on the edges of the cells, which could

eventually lead to battery shorts. It appears to be the thickness of the 'velcro' which is causing the problem!

Wiring should cause no problems – the holes not used for securing the base can be used for cable entry and there is ample space in the base for running cable along the entire length of the Inferno.

The unpluggable connector block can be wired before assembling the unit, making the process a bit more straightforward.

There are no special restrictions when wiring multiple units; cables can be run as convenient to the installation.

Before closing the unit, the sounders can be tested by operating an internal Dipswitch and triggering the Inferno.

The sounder elements are activated in pairs, and should sequentially produce four different-pitched sound outputs when the unit is working correctly. Ear defenders are not required!

A four-page A4 sized Installation Guide accompanies the Inferno. This includes technical specifications and adequate detail for connecting, assembling and testing the unit.

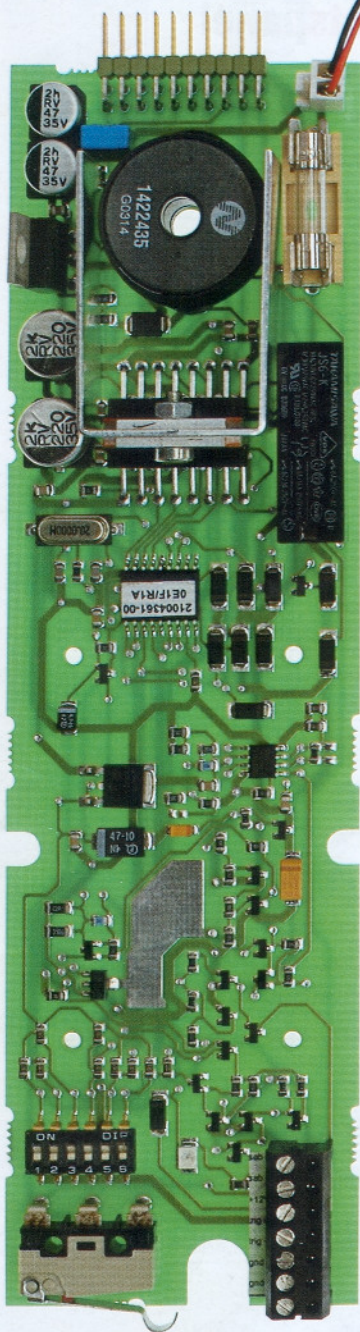
The Inferno is shown as being wired for both positive (10mA) and negative (50mA) trigger signals – perhaps it can be used in a dual role: as part of a system and as a standalone unit? \*

**\* Reader Service No 100 (or go to [www.security-installer.co.uk/enquiries](http://www.security-installer.co.uk/enquiries) and key in 100)**

**Factspanel**

<b>Equipment</b>	Inferno
<b>Product group</b>	Internal sounder
<b>Application</b>	Internal
<b>Manufacturer</b>	Klaxon Signals Ltd
<b>Address</b>	Wrigley St, Oldham, Lancs OL4 1HW
<b>Telephone</b>	0161 287 5555
<b>Fax</b>	0161 287 5511
<b>E-mail</b>	<a href="mailto:sales@klaxonsignals.com">sales@klaxonsignals.com</a>
<b>Available from</b>	Gardiner Security, Enterprise, A&A Security, Alarm Supplies (Scotland)

<b>CE Mark awarded</b>	Yes
<b>SAB module inclusive</b>	Yes
<b>Visual warning device inclusive</b>	No
<b>Frequency</b>	Multiple frequencies in the range 2000-5000Hz
<b>Acoustic output at 3 metres</b>	115db (A)
<b>Protection from drilling attempts</b>	None
<b>Protection from torch application</b>	None
<b>Tamper protected</b>	Yes
<b>Housing material</b>	Aluminium & stainless steel
<b>IP rating</b>	Indoor use only
<b>Power supply voltage</b>	12v DC
<b>Maximum current consumption</b>	55mA
<b>Warranty</b>	1 year



The grille can act as a 'cheese grater', removing the plastic coating on the cells

## What the manufacturer says ...

THE INFERNO IS A UNIQUE AND powerful internal security sounder that effectively stops intruders in their tracks by generating an intolerable noise. Installation of the Inferno cheats the intruder of the few minutes that could be used between alarm activation and arrival of security or police, protecting the secured area for that crucial period of time.

The spectrum of sound waves produced by the Inferno make it exceptionally difficult to locate the source of the sound, ensuring that the intruder cannot readily eliminate the cause of distress. Despite this, no long-term hearing problems are inflicted.

The unit is easily retrofitted and a number of units can be installed either in series or in parallel. It is suitable for offices, shops, commercial and residential premises, and significantly upgrades the effectiveness of existing security systems. Internal back-up by 1.1Ah battery gives up to 20 minutes of alarm in the event of power failure to the sounder.

Continuously rated, the sounder covers areas of up to 40sq m. Audibility is 125dB (A) ± 3dB at 1m, with a frequency range of 2000 – 5000Hz. Voltage is 11-18v DC. Weighing 1.7kg, the unit measures 686mm x 106 x 40. All cables and housing are protected against sabotage.

## Product assessment

Design and design features	***
Circuitry and components	****
Ease of installation	***
Range and variety of functions	***
Technical advice and backup	***
Accompanying instructions	***
Value for money	***

Grading Key: Outstanding \*\*\*\*\* Very good  
 \*\*\*\* Above average \*\*\* Average \*\*  
 Below average \*

## Overall assessment

THE KLAXON INFERNO IS A VERY NEAT, attractively designed internal sounder. It generates a seriously disturbing 125 dB.

Circuit board design and construction is generally good but the enclosure would benefit from some modifications to improve ease of installation and maintenance, also to ensure continued reliability.

The price tag is rather high for an internal sounder. We would consider it well worth offering to customers, stressing its likely effect on intruders.