

ECHO99

V4.2 BUF 0.1 180599



GENERAL FEATURES

- Microprocessor controlled Self-powered Siren with flasher, for external installation.
- Strong polycarbonate box, resistant to the most adverse weather conditions.
- Tropicalized-steel inner cover.
- 3 inputs for alarm signalling on siren sounder and flasher.
- 1 input for alarm signalling on flasher.
- Modulated frequency sound emission, with the possibility to assign different sounds to the alarm inputs.
- High performance magnetodynamic exponential horn.
- Protected against tamper, pull-off, damage to the flasher and wire cutting.
- Protected against foam injection.
- Protected against blow-torch tamper.
- Programmable maximum alarm-time.
- On-board battery level and efficiency check with flasher cutout on low battery.
- Drill pattern for easy installation.
- Complies to CEI 79-2/2nd Ed. 1993: Performance grade II.
- Standard inputs for all types of control panels.
- Compartment for 12V 7 Ah buffer battery.

DESCRIPTION

Bentel's new **ECHO99** siren represents a leap into the future of alarm signalling technology. The microprocessor (which manages all the siren functions), together with the four alarm inputs offer maximum flexibility to satisfy all installation needs.

Proper functioning of the siren is guaranteed by the continuous monitoring of the level and efficiency of the battery, which is signalled on the respective terminal.

The new features add to the already high security standard of the ECHO version.

TECHNICAL FEATURES

<i>Nominal Voltage</i>	12 V _{DC}
<i>Alarm current</i>	1,4A (max 2,8A)
<i>Voltage on terminal [+N]</i>	13,8 V +0,2 V
<i>Current on terminal [+N]</i>	max 0,6 A
<i>Battery required</i>	7 Ah (149x93x65 mm)
<i>Carrier frequency</i>	1475 Hz
<i>Sound level at 3 m.</i>	103 dB(A)
<i>Maximum alarm-time (programmable)</i>	3-7-10-25 minuti
<i>Protection grade</i>	IP34
<i>Temperature range</i>	-25 +55 C
<i>Dimensions (LxHxP)</i>	193x283x93 mm
<i>Weight (with 7Ah battery)</i>	5 Kg

In fact, alongside the consolidated protection **ECHO99** offers features such as: protection against foam injection and blow-torch tamper, resulting in a product of indisputable quality.

CONTAINER

The strong polycarbonate box is resistant to the most adverse weather conditions, and maintains its original aspect throughout time. The tropicalized steel inner cover offers further protection against tamper.

The grid is designed to maximize sound transmission, and also block the entrance of heavy rain.

TAMPER PROTECTION

The siren is protected against tamper by a magnetic contact and a microswitch: the first (CM) is on-board, and is activated when attempts to remove the inner cover are made; the second (MS) is placed between the wall and the siren, and is held in place by the screw which also secures the box.

Therefore, any attempt to pull-off or open the

PARTS IDENTIFICATION	
F1-F2-F3-F4	Fixing holes
F5	Bracket fixing hole
FS	Supplementary hole
PC	Cable passage
L	Flasher
MP	Battery support
S	Microswitch bracket
A	Tongues
C	Exponential horn
D	Foam-injection tamper device
E	Blow-torch tamper device
F	Two screw for securing the tropicalized-stell inner cover
G	One screw for securing the polycarbonate box
MS	Tamper switch
M	Terminal board
CMS	For MS connector
CM	Magnetic contact
CL	Flasher connector

siren by removing the polycarbonate box will be detected.

Damage to the flasher and pull-off can also be signalled (see Tab. B jumper **SL**).

A further protection is offered by the foam-injection device: this is an active infrared barrier, made particularly effective by the dual detector, it also has a protection against false alarms (caused by insects).

If the siren is programmed for automatic mode, **internal tamper** ends 40 seconds after the cause has ceased. **Internal tamper** is signalled by the opening of the [AS] contacts.

There is also an on-board device which offers protection against blow-torch tamper.

This device opens the [AS] contacts, when the temperature inside the siren exceeds 110 °C.

ACTIVATION

The alarm status may be activated by the tamper switches, and also by the signals coming from the [+N], [A1], [A2] and [L] terminals.

For example: the siren goes into alarm status when the voltage fails on terminal [+N], this also guarantees protection against wire cutting, as this input is also used to power the siren and to maintain the level of the buffer battery.

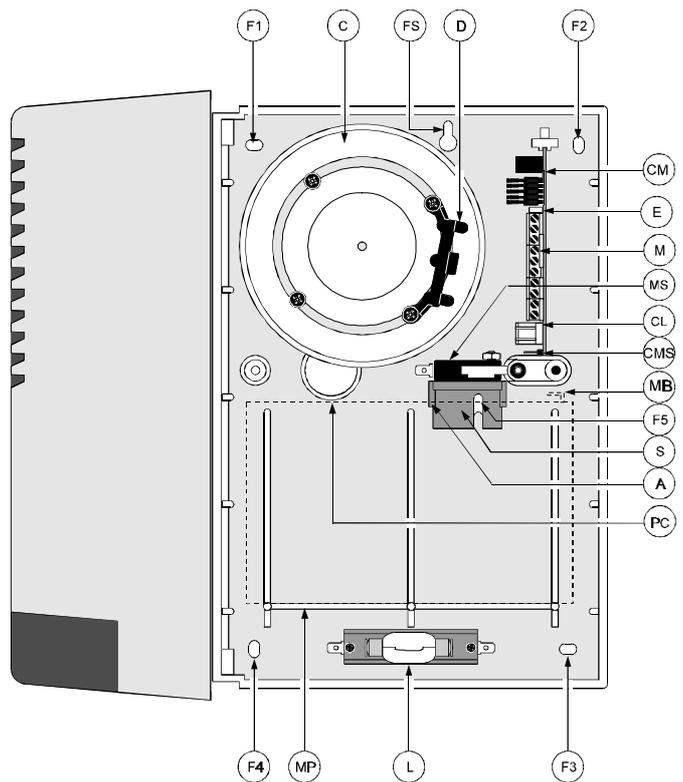


Fig. 1 - Parts identification.

The other three alarm inputs, terminals [A1], [A2] and [L], each with programmable polarity, are for the connection of other devices. Polarity programming of terminals [A2] and [L] is common.

SIGNALLING

When the "ECHO99" siren is in alarm status it activates the flasher and emits a high level of modulated frequency sound; depending on the alarm type and programming.

The extremes of the sound modulation generate a high note, which is extremely bothersome to the hearing, and a low note that can be heard at a considerable distance.

It is possible to choose two types of sound for each alarm input; except for internal tamper, which has one sound level only (up-scale modulation with modulated frequency between 1200 and 2000 Hz).

The sounds that can be assigned to the various alarm inputs, and the modulated frequency range can be found in the "PROGRAMMING" chapter.

There are two possible frequency ranges:

1200/2000 Hz and 1300/2300 Hz.

If an alarm signal is present for more than the programmed maximum alarm-time, the sound emission is interrupted, whilst the flasher con-

tinues signalling for as long as the alarm status is held. In this type of situation the “Memory flashing” will be different from the “Alarm flashing” sequence. Therefore, “Memory flashing” occurs when the cause generating the alarm is still present after the maximum alarm-time. The respective times for the two sequences are shown in the following table.

	ON (ms)	OFF (ms)
Alarm flashing	250	750
Memory flashing	250	1500

If the buffer battery is low or inefficient, the flasher is cutout, and the remaining power is used for acoustic signalling; this status is signalled on terminal [BS].

During normal functioning, this terminal (open collector) is connected to ground, whereas, it is disconnected in the event of low battery.

ALARM PRIORITY

The alarm signal priority for signalling activation goes in decreasing order:

- | | | |
|-----------------|---------------|---|
| Internal tamper | max priority | ↓ |
| [+N] | | |
| [A1] | | |
| [A2] | | |
| [L] | min. priority | |

The priority permits management of several alarms simultaneously, in the following way:

- A higher priority alarm always interrupts a lower priority alarm, and this causes a variation in the alarm sounds.
- The alarm time starts from the moment the signalling device is activated. When the maximum alarm-time expires or when the alarm ends, a lower priority alarm can then activate the alarm devices, according to its configuration.
- If a lower priority alarm activates an alarm procedure for more than 30 seconds, and is interrupted by a higher priority alarm, the respective alarm-time of the previous alarm continues to tick away. If the second alarm returns to standby status, and the maximum alarm-time for the first alarm has not expired, the sequence for the first alarm is once again activated for the remaining time.

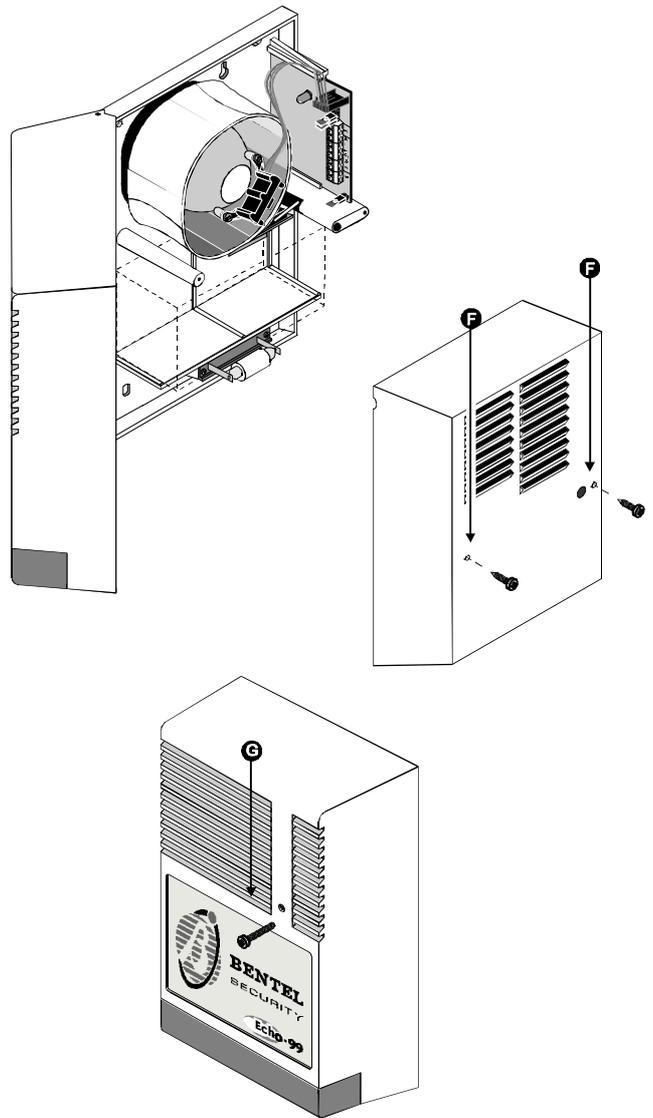


Fig. 2 -Parts identification

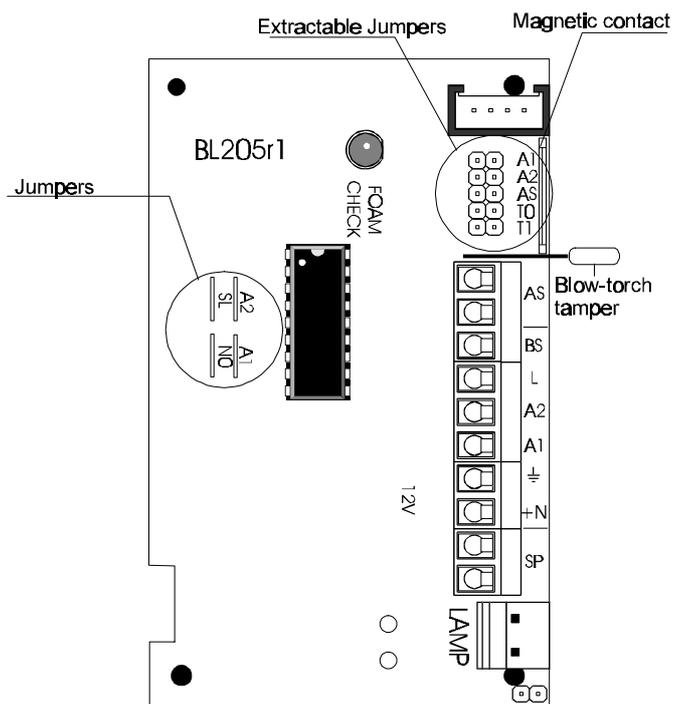


Fig. 3 -PCB parts

- If a lower priority alarm is “masked” by a higher priority alarm, the lower priority alarm is considered “served” when it has activated the signalling devices for at least 30 seconds. Otherwise, it can activate the devices at the end of the alarm or when the maximum alarm-time of the higher priority alarm expires. For example, in **Tab. -1-** the alarm status of the [A2] signal can activate the signalling devices when the [+N] signal returns to standby, and the maximum alarm-time of the [A1] signal expires.
- Once the maximum alarm-time has expired, it is necessary that all the signals, which activated an alarm sequence and have reached the maximum alarm-time, return to standby status for the reset time (5 seconds), in order for the memory status to be cleared. In the event of internal tamper reset occurs after 40 sec..The example in the following diagram shows how a sequence of alarms acts on the signalling devices (flasher and siren).

PROGRAMMING

There are two types of jumpers on the siren board, see Fig.3: extractable and wire (the board is supplied with both types connected).

The setup of wire jumpers is particularly useful, as it permits identification of the siren signalling alarm, when two sirens are installed close together.

It is also possible to assign different sounds to different alarm types (gas leak, burglary, flood-

ing etc.), or places (office, warehouse, garage etc.).

In this way, by means of the different sounds, it is possible to recognize the type of alarm and also the place.

Furthermore, when the jumper **A2** is disconnected, the sound assigned to input [A2] is a low sound.

This sound may be used when an alarm-delay signal is required, or when a particular event requires acoustic confirmation.

The sounds assigned to inputs [+N], [A1] and [A2] are those programmed by means of the wire jumpers **N0**, **A1** e **A2**.

The **SL** jumper determines whether damage to the flasher should generate internal tamper status.

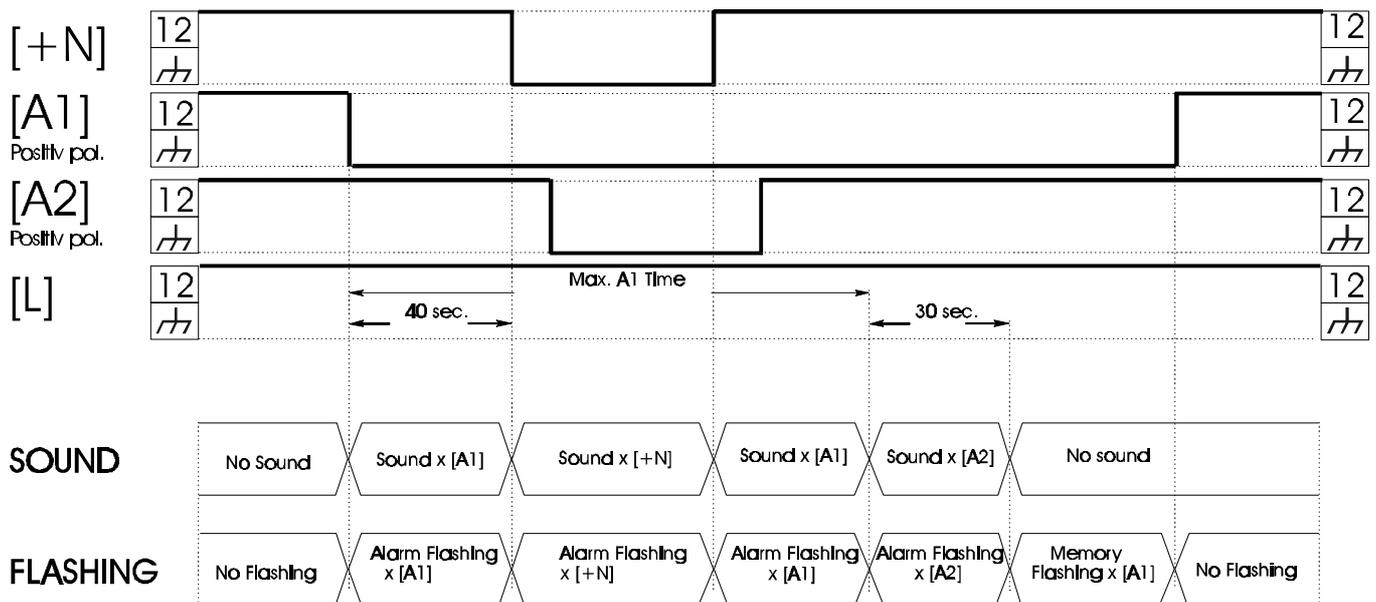
The extractable jumpers are easy to use and permit polarity programming on inputs [A1], and [A2] ([L]), the maximum alarm-time, and whether or not the alarm should be signalled when internal tamper occurs.

Programming of **wire jumpers and extractable jumpers** is shown in **Tab. -2-**, whilst the frequency profile of the available sounds is shown in **Tab.-3-**.

INSTALLATION

In order to discourage tamper attempts, the installation point of the siren should be out of reach.

The wall chosen for installation should be even, as any holes or bumps may jeopardize the proper functioning of the “pull-off” protec-



Tab. 1 - Graphic illustration: allarm priority

tion.

The drill pattern makes installation easy, as it clearly indicates the exact position of the 5 holes on the back of the siren.

The back of the siren must be mounted on the points marked **F1**, **F2**, **F3**, and **F4**, whilst, **F5** is for the bracket **S** (fig.1).

Do not screw the bracket on too tightly as this may damage the small tongues **A** (fig.1).

The cable passage **PC** is for the control panel cable.

Once the siren is mounted, the necessary connections should be made on the terminal board **M**, according to the instructions in the relevant paragraph.

The battery should then be positioned on the battery support **MP** (fig.1). and connected. At this point the flasher will start "installation flashing", which corresponds to "memory flash-

ing".

This status is held until internal tamper is no longer present.

When internal tamper returns to standby, a 20 second start phase will begin (signalled by fast flashing).

If internal tamper is generated again during the start phase the siren will return to the installation phase.

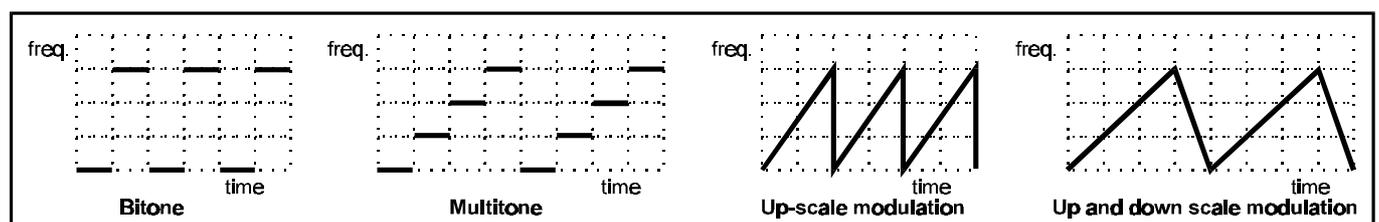
The siren will be ready for testing when the 20 second start phase elapses, and there is a 13.8 V on terminal [+N].

Otherwise, the siren will go into the wait phase, which will be held until there is a 13.8 V on terminal [+N], or whilst internal tamper is present. In the latter case the siren will return into the installation phase.

The 20 second start phase begins when the wait phase ends, after which the siren will be in

WIRE JUMPERS		
Jumper	Connected	Disconnected
A1	Multitone (HF)	Bitone (LF)
A2	Up scale Modulation (HF)	Up and down scale Modulation (LF) Press.Lev. 86 dB(A) at 3 m.
N0	Up and down scale Modulation (LF)	Up and down scale Modulation (HF)
SL	Burnt wire corresponds to internal tamper	Burnt wire does not correspond to internal tamper
EXTRACTABLE JUMPERS		
Jumper	Connected	Disconnected
A1	Alarm if connected to ground (Positive Polarity)	Alarm if connected to 12 V (Negative Polarity)
A2	Alarm if connected to ground (Positive Polarity)	Alarm if connected to 12 V (Negative Polarity)
AS	Activation of Siren and flasher signalling and opening of the AS contacts on internal tamper (automatic mode)	Opening of the AS contacts without siren or flasher signalling of internal tamper (normal mode)
T0	If both jumpers result Disconnected the maximum alarm-time is 3 minutes; if only T0 is Connected the maximum alarm-time is 10 minutes;	
T1	if only T1 is Connected the maximum alarm time is 25 minutes; with both jumpers Connected the maximum alarm-time is 7 minutes.	

Tab. 2 -;NB: HF and LF indicate the sound frequency range HF= (1300/2300 Hz),LF= (1200/2000 Hz).



Tab. 3 - Frequency profile of the generated sounds.

working order.

If internal tamper is generated during the start phase, the siren will return to the installation phase, whereas, if the 13.8 V fails on terminal [+N] the siren will return to the wait phase.

N.B. This procedure allows installation of the siren whilst, at the same time, permits functioning only when terminal [+N] is connected to the 13.8 V of the control panel.

Please note that the flasher does not work during the wait phase, and consequently use of the battery is reduced to the minimum.

CONNECTIONS

Always use shielded cable, with one end connected to ground, and the other left free.

The alarm command of the control panel may be assigned to terminal [+N], or to terminals [A1] and [A2], each with programmable polarity.

However, there must be a 13.8 V (min. 0.6 A) between terminal [+N] and the siren ground, as this maintains the buffer battery level, and guarantees protection against wire cutting.

For this purpose BENTEL control panels have a terminal marked [+N], which can be connected directly to the [+N] terminal of the siren, see fig. 4.

In fact, when in standby status, a 13.8 V is present on the [+N] terminal of BENTEL control panels; this voltage fails when the control panel goes into alarm status.

If there is no such terminal on the control panel

in use, use the free exchanges of the alarm relay in its place, as shown in fig. 5.

The presence of the [AS] jumper is shown in fig. 4 and 5; this function mode is considered **automatic**.

Therefore, when internal tamper occurs, the siren will generate an alarm, independent of the status of terminals [A1], [A2] and [+N].

The alarm will end 40 seconds after all tamper devices are restored or when the maximum alarm-time expires.

However, in the latter case, flasher signalling continues.

In this functioning mode the control panel, connected as illustrated in fig. 4, does not detect the tamper event and therefore, does not signal it on the control panel, nor does it activate other connected signalling-devices (telephone dialler, supplementary siren etc.).

If a programmable polarity terminal [A1] or [A2] is to be used for alarm command, the selected terminal should be connected to a terminal on the control panel which closes with compatible polarity in the event of alarm (fig. 7 illustrates the connection of [A2]).

Figure 6 illustrates a connection using the [AS] terminals of the siren.

These terminals, during normal functioning, are short-circuited, as is the [A.S.] terminal of the sensor.

In the event of tamper or opening of the [AS] terminals of the sensor, alarm signalling oc-

TERMINALS DESCRIPTION	
[SP]	<i>The terminals of the magnetodynamic exponential horn are connected to these terminals</i>
[+N]	<i>Voltage terminal (positive) and alarm. A 13.8 V should be applied to this terminal, to maintain the buffer battery level. If for any reason (wire cutting or alarm) this voltage fails, the siren will go into alarm status</i>
[	<i>Negative supply terminal and ground of the internal circuit</i>
[A1]	<i>Alarm activation terminal with programmable polarity</i>
[A2]	<i>Alarm activation terminal with programmable polarity</i>
[L]	<i>Flasher activation terminal with programmable polarity (the same as A2)</i>
[BS]	<i>Terminal for connection to the control panel for low battery</i>
[AS]	<i>Tamper: these terminals open in the event of removal of the siren box or the metal inner cover, for pull-off, damage to the flasher (see SL), foam injection and blow-torch tamper.</i>

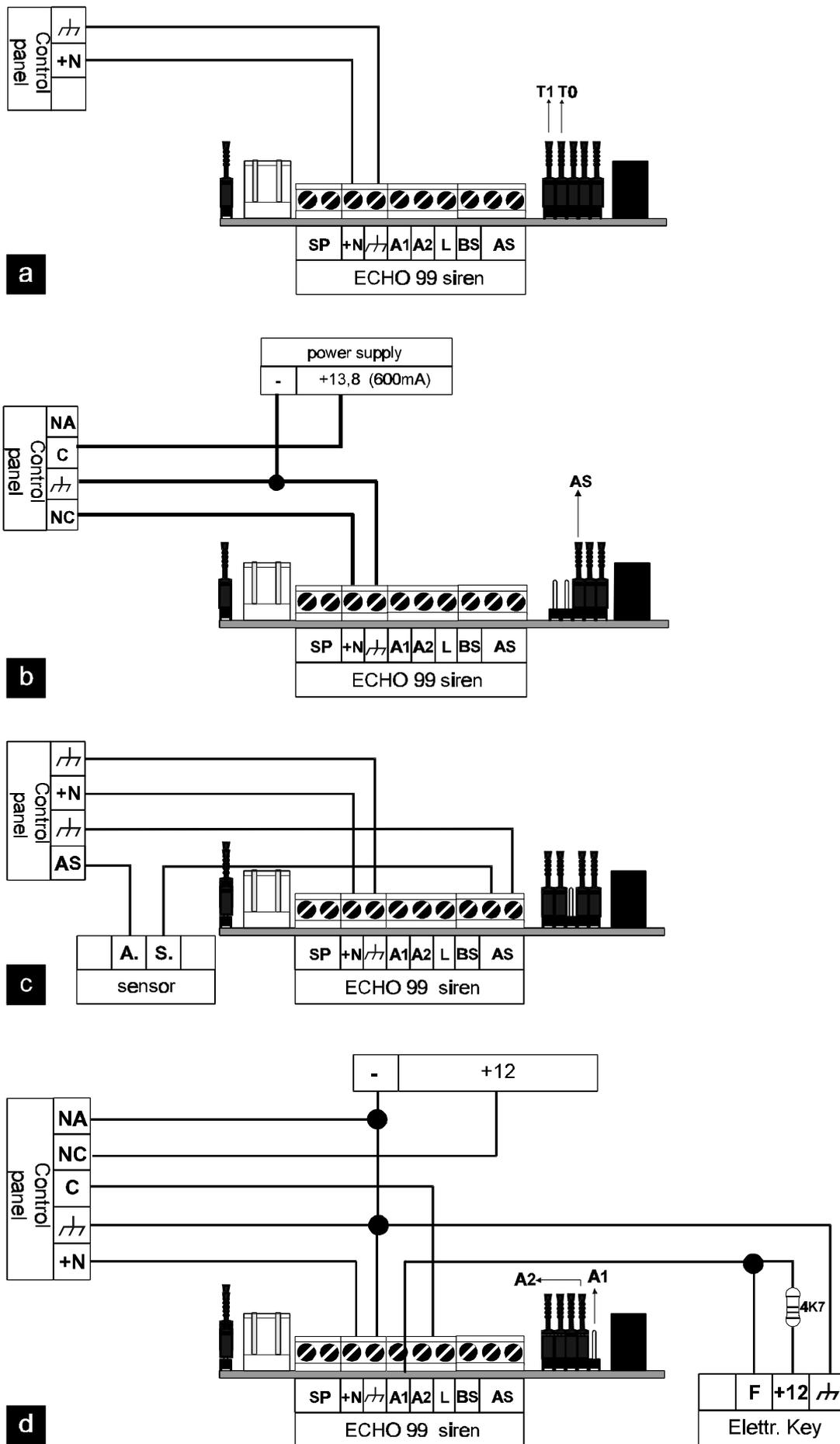


Fig. 4 -

a) Automatic mode with 7 min. max alarm-time; b) automatic mode with 3 min. max. alarm-time; c) normal mode; d) automatic mode with A1 with negative polarity and A2 with positive polarity

curs on the AS and ∇ terminals of the control panel, but no flasher or acoustic signalling occurs as the **AS** jumper is not connected. This functioning mode is **normal**.

Fig. 7 shows an application which uses the [A1] and [A2] inputs.

The [F] terminal of an electronic key is connected to the [A1] input, with negative polarity, as there is no jumper, see **Tab -2-**.

During normal functioning this terminal is connected to ground, when a false key is inserted it is disconnected.

This status, due to the resistance to the 12 V, causes a voltage equal to 12 V on the [A1] input of the siren, that will generate the siren alarm .

The common contact of a relay is connected to the [A2] terminal, with positive polarity programming.

In normal functioning status, this terminal is short-circuited with the [NC] terminal, and therefore, at +12V.

When in alarm status, the relay commutes the [C] switch on [NA] causing a ground on the A2 input of the siren.

This status will generate an alarm on the siren.

PROBLEMS AND SOLUTIONS		
Problem	Cause	Solution
The battery is connected but the flasher does not function	The battery may be low	-Wait several hours, until the battery is sufficiently charged
The flasher continues to flash	1)The pull-off device is not secured properly; the box or the inner cover is not closed properly; 2) the foam-injection device is not connected properly	-Eliminate the cause --Check that the Foam LED flashes
The siren sounds but the flasher does not function	1)The battery may be low 2)The flasher may be out-of-order	-Wait several hours, until the battery is sufficiently charged or replace it . -Change the lamp or call the installer
The flasher functions but the siren remains silent	1) More than the maximum alarm-time has expired, from the moment of starting to sound 2) The siren is out-of-order	-Eliminate the cause of alarm -Call the installer
It is impossible to activate the siren	1)The installation-time has not expired 2) The battery is low	-Wait 20 seconds -Wait several hours until the battery is sufficiently charged, or replace it
The siren continues to sound	The causes may be the same as the second problem: the flasher does not stop functioning	-Eliminate the cause
The technical features of this product may be modified without prior notice		