

**Guidance
Note**



Fire Industry Association

Leading Excellence in Fire Since 1916

**Guidance on installation of vibrating
tactile devices**

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1. INTRODUCTION

1.1 General

Vibrating alarm devices are normally used to alert people who are Deaf or hard of hearing in case of a fire alarm or an evacuation alert signal.

Vibrating alarm devices for the Deaf and hard of hearing that are monitored for faults by a BS 5839-1 or BS 5839-6 (Grade A) fire alarm system might be used as fire alarm devices and provide a primary means of warning of fire, possibly in conjunction with visual alarm devices (VADs).

Devices that are not monitored for faults can only be used to supplement fire alarm or evacuation alert devices.

2. TYPES OF VIBRATING ALARM DEVICE

2.1 Vibrating pads – used for people who are sleeping.

Vibrating pads are designed to be located under the mattress or pillow of a bed so that, when energized, they vibrate with sufficient intensity to wake a Deaf or hard of hearing person.

Vibrating pads are normally connected to a moveable controller as defined in BS 5839-1 clause 18 or to a fixed wall outlet connected to a fire alarm system, in which case they should comply with BS 5839-1 clause 12, fault monitoring.

When vibrating pads are connected to a fire alarm or evacuation alert system, consideration should be given to the use of visual alarm devices to alert Deaf or hard of hearing people who are awake.

2.2 Vibrating alerters – used for people who are awake.

Vibrating alerters (commonly called pagers) are radio-linked portable devices intended to alert a Deaf or hard of hearing person, while awake, by subjecting the person to vibrations.

They are normally triggered via a BS 5839-1 fire alarm via a radio transmitter.

3. COMPLIANCE

3.1 Vibrating pads

Vibrating pads should comply with BS 5446-3:2015, clause 6.4, which describes the frequency range, the intermittent pulse pattern, the acceleration, and the duty cycle.

Radio-linked vibrating pads should also comply with BS 5446-3:2015 clause 6.7, which describes the requirements for radio-linked systems.

Vibrating pads are normally connected by a flexible lead to either a wall mounted outlet, or to a moveable controller that may comprise other functions such as a visual alarm device.

Where the vibrating pad is monitored for faults the plug should incorporate a mechanical latch to reduce the chance of accidental disconnection.

In both cases, it is essential that the lead is long enough but that it does not cause a trip hazard and that disconnection or damage to the cable will signal a fault.

3.2 Vibrating alerters

Vibrating alerters should comply with BS 5446-3:2015 clause 6.5, which describes the frequency range, the intermittent pulse pattern, the acceleration, and the duty cycle and with relevant parts of clause 6.7, which describes the requirements for radio-linked systems.

Vibrating alerters that meet the vibration requirements for vibrating pads as well as those for alerters may also act as vibrating pads when not being worn.

Vibrating alerters should include both a vibrating function and a light-emitting indicator.

If a vibrating alerter is fitted with an off switch, or a switch to disable the vibrate function, the design of the switch shall be such as to avoid inadvertent operation.

3.3 Radio transmitters

Radio transmitters are fixed devices and should be monitored for faults.

Cables of antennas, and the associated antennas, shall under transmission be continuously monitored by one of the following means:

- I. for their voltage standing wave ratio (VSWR) at the system's operating frequency; or
- II. by bit rate error (digital systems).

If the VSWR or bit rate error exceed a threshold set by the manufacturer for resilient communication, a fault shall be indicated at the fire alarm CIE or at the evacuation alert system EACIE within 100 s of occurrence.

Antennae shall be arranged such that they cannot be disconnected or removed without the use of special tools.

After 30 s of continuous broadband or on frequency interference to the transmitted signal that can compromise the performance of the system, a fault indication shall be given at the master station within a further 100 s. The threshold for detecting an interfering transmission shall be not less than 6 dB below the transmitted signal.

3.4 Product assessment

There is currently no requirement for vibrating devices to be assessed for performance and durability. However, a full suite of tests is described in BS 5446-3: 2015 (Detection and alarm devices for dwellings – Part 3: Specification for fire alarm and carbon monoxide alarm systems for deaf and hard of hearing people).

The tests are listed below:

- Vibration frequency, pulse pattern and vibration intensity
- Reproducibility
- Durability
- Dry heat
- Cold
- Damp heat
- Corrosion
- Impact
- Vibration – external (endurance) Shock
- Drop

Annex G describes tests for vibrating pads.

Annex H describes tests for vibrating alerters.

4. INSTALLATION, MAINTENANCE & OPERATION

4.1 Installation of monitored hard-wired vibrating pads

For vibrating pads to report a fault, it is likely to be necessary to connect them at the end of a conventional fire alarm circuit that can provide sufficient current, which is likely to be between 65 mA and 160 mA per device.

It is unlikely that vibrating pads can be powered directly from a fire detection loop, which typically provides up to 500 mA for all connected devices so, where vibrating pads are connected to an addressable sounder control unit it may be necessary to provide auxiliary power locally, in which case an EN 54 PSU and standby battery with sufficient capacity should be used (normally 24 hours standby plus 30 minutes in alarm for BS 5839-1 systems, 72 hours standby plus 4 minutes in alarm for BS 5839-6 Grade C systems¹ and 72 hours standby plus 30 minutes in alarm for BS 8629 systems.)

Where one or more vibrating devices are installed or added to comply with clause 11.2 of BS 8629, it is important to ensure that sufficient current is available to power them and that the integrity of the evacuation alert system is not adversely affected. This might require carrying out loop calculations and testing the complete system on completion of the works. If an additional power supply is needed, it should be clearly marked “evacuation alert system” and be accessible for maintenance, which may mean that it is best installed in a secure area outside the flat.

Where vibrating devices are added to wireless systems, a signal strength survey in all likely places of use should be carried out.

The wiring for the mains supply to the PSU and all tactile device circuits should be of at least standard fire-resisting cable, supported by fire resistant fixings installed at the correctly spaced intervals. However, where a fire could affect circuits in remote areas prior to a warning being raised, e.g. in unsprinklered buildings, or where the fire strategy involves four or more phases of evacuation, enhanced cable (PH120) should be considered.

Consideration may need to be given to electrical safety with the provision of an RCBO as per requirements of BS 7671.

If the mains supply to the equipment is such that it is able to be inadvertently switched off (e.g. via a 13A socket), this should be suitably labelled e.g. “FIRE ALARM. DO NOT SWITCH OFF”.

If the contract does not specify where outlets (typically wall mounted) are to be installed, a survey should be undertaken to determine the best location based on what is accessible or likely to be damaged or interfered with.

Consideration also needs to be given to the location of the outlet to ensure its installation introduces no additional hazards from the flexible lead on the vibrating pad.

Suitable locations may be just above the skirting board under the bed to avoid the plug being knocked or deliberately removed, or above bedside table height at ~750 mm above finished floor level.

¹ The time of 4 minutes in alarm also applies to Grade D systems. The time in alarm for Grade A systems should be 15 minutes.

It may be possible to install more than one socket in a room to provide a choice of locations. However, it is likely that such an arrangement will only provide fault monitoring for one vibrating pad.

On completion of the installation, the vibrating pad (and VADs if fitted) should be tested to ensure correct operation in line with the cause and effects program.

Each vibrating pad should be disconnected to prove fault monitoring operates correctly.

4.2 Regular servicing

At least every 11 to 13 months, the vibrating pad (and VADs if fitted) should be tested to ensure correct operation in line with the cause and effects program.

Each vibrating pad should be disconnected to prove the fault monitoring operates correctly.

Any associated PSU and batteries should be checked.

4.3 Operation

When an alarm condition is simulated:

- I. the alarm shall be given at the vibrating alerter within 5 s without the need to acknowledge or reset any other signal;
- II. the alarm given at the vibrating alerter shall continue while the alarm signal is transmitted by the control unit, and for at least a further 60 s after cessation of the alarm signal unless a specific alarm cancel signal has been received from the control unit.

NOTE This ensures that the alarm at the alerter is continuous even if the control unit transmits the alarm signal repeatedly at intervals up to 10 s.

If a vibrating alerter has an “acknowledge” (alarm cancel) control that can cancel the vibrating alerter alarm, and that control is operated during an alarm situation, the vibrating alerter alarm shall be automatically reinstated within 15 s of that operation unless the control unit has ceased to transmit an alarm signal.

5. REFERENCES

BS 5446-3:2015 for specifications and tests

BS 5839-1:2017 (under review) clause 18

BS 5839-6:2019+A1:2020 clause 14, for Grade A and C fire alarm systems

BS 8629:2019+A1:2023, for evacuation alert systems

DISCLAIMER

The information set out in this document is believed to be correct in the light of information currently available but it is not guaranteed and neither the Fire Industry Association nor its officers can accept any responsibility in respect of the contents or any events arising from use of the information contained within this document.



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