INTERNATIONAL STANDARD

ISO 15763

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Road vehicles — Alarm systems for buses and commercial vehicles of maximum authorized total mass greater than 3,5 t

Véhicules routiers — Systèmes d'alarme pour autobus et véhicules utilitaires de masses totales maximales autorisées supérieures à 3,5 t

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 15763 was prepared by Technical Committee ISO/TC 22, *Road vehicles*.

Annex A of this International Standard is for information only.

Road vehicles — Alarm systems for buses and commercial vehicles of maximum authorized total mass greater than 3,5 t

1 Scope

This International Standard defines terms and specifies requirements and tests for vehicle alarm systems (VAS) intended for installation within buses and commercial vehicles (as defined in ISO 3833) having a maximum authorized total mass (code ISO-M08 as defined in ISO 1176) of greater than 3,5 t.

It is applicable to VAS designed to detect or sense, and to indicate, the unauthorized opening of a vehicle's doors, luggage-compartment lids, bonnet/hood and emergency exits, as well as the tilting of the driver's cabin and the disconnection of a trailer or of the power supply. It covers both VAS intended for installation as original equipment, and those intended to be installed after delivery of the vehicle.

NOTE Systems for volumetric protection, which are optional, have to be tested individually and — as a consequence and in accordance with this International Standard — against their own specifications. Examples of tests that can be performed are given in annex A.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 512:1979, *Road vehicles — Sound signalling devices — Technical specifications*

ISO 1176, *Road vehicles — Masses — Vocabulary and codes*

ISO 3833, *Road vehicles — Types — Terms and definitions*

ISO 7637-1, *Road vehicles — Electrical disturbances from conduction and coupling — Part 1: Definitions and general considerations*

ISO 7637-2:—[1)], *Road vehicles — Electrical disturbances from conduction and coupling — Part 2: Electrical transient conduction along supply lines only*

ISO 7637-3:1995, *Road vehicles — Electrical disturbance by conduction and coupling — Part 3: Vehicles with nominal 12 V or 24 V supply voltage — Electrical transient transmission by capacitive and inductive coupling via lines other than supply lines*

ISO 10605, *Road vehicles — Test methods for electrical disturbances from electrostatic discharge*

1) To be published. (Revision of ISO 7637-2:1990)

ISO 11451 (all parts), *Road vehicles — Vehicle test methods for electrical disturbances from narrowband radiated electromagnetic energy*

ISO 11452 (all parts), *Road vehicles — Component test methods for electrical disturbances from narrowband radiated electromagnetic energy*

IEC 60529:2001, *Degrees of protection provided by enclosures (IP Code)*

IEC 60068-2-11:1981, *Environmental testing — Part 2: Tests. Test Ka: Salt mist*

IEC 60068-2-29:1987, *Environmental testing — Part 2: Tests. Test Eb and guidance: Bump*

CISPR[2] 12:2001, *Vehicles, boats and internal combustion engine driven devices — Radio disturbance characteristics — Limits and methods of measurement for the protection of receivers except those installed in the vehicle/boat/device itself or in adjacent vehicles/boats/devices*

70/388/EEC, *Audible warning devices for motor vehicles*

3 Terms and definitions

For the purposes of this International Standard, the following terms and definitions apply.

3.1
vehicle alarm system
VAS
system intended for installation on vehicles that when set will indicate actions such as attempted intrusion into, or interference with, the vehicle

3.2
control equipment
component of the VAS which processes the setting and unset commands, and which accepts the signals from the detector/sensors that allow an alarm condition to be indicated

3.3
detector [sensor]
device which detects [senses] that a predetermined limit or situation has been met and then generates an alarm condition signal

3.4
alarm condition
condition generated when an abnormal situation has been detected or sensed

3.5
set
state of the system in which an alarm condition can be indicated

3.6
unset
state of the system in which an alarm condition cannot be indicated

3.7
setting–unsetting device
device or component of the VAS used to set or unset the VAS

2) CISPR, the international special committee on radio interference, is a subcommittee of the IEC.

3.8
warning device
system component that gives an indication of an alarm condition

3.9
deliberately operated device [panic alarm]
facility that can cause the warning device to operate, irrespective of whether the VAS is in a set or unset state

3.10
status display
component of the VAS which indicates the condition of the VAS

3.11
immobilizer
device for preventing the use of the vehicle with its own engine

3.12
perimeter protection
function of a device designed to detect and indicate the unauthorized opening of doors, luggage compartment lids, the bonnet/hood and emergency exits, the tilting of the driver's cabin, and the disconnection of a trailer or of the power supply

3.13
volumetric protection
function of a device designed to detect the intrusion into, and movement within, the driver/passenger compartment

3.14
key
device designed and constructed to provide a method of operating a system which is itself designed and constructed to be operated only by that device

3.15
scanner
device designed to detect the intrusion into, and movement within, a defined area around a vehicle

4 Requirements

4.1 System description

The VAS shall include a detector/sensor, or more than one, control equipment that includes a setting–unsetting device and indicating functions, a power supply, and a warning device or devices. All related legal requirements shall be complied with.

The VAS shall include at least one acoustic warning device and, additionally, may include optical warning devices or remote wireless signalling devices, or any combination of these, comprising

— optical indications providing information on the status of the VAS, or a change in that status,

— an immobilizer, and

— other facilities, provided such facilities comply with the provisions of this International Standard.

Figure 1 shows, schematically, the system components and the connections between them that are either required (solid lines) or recommended (broken lines) for the system.

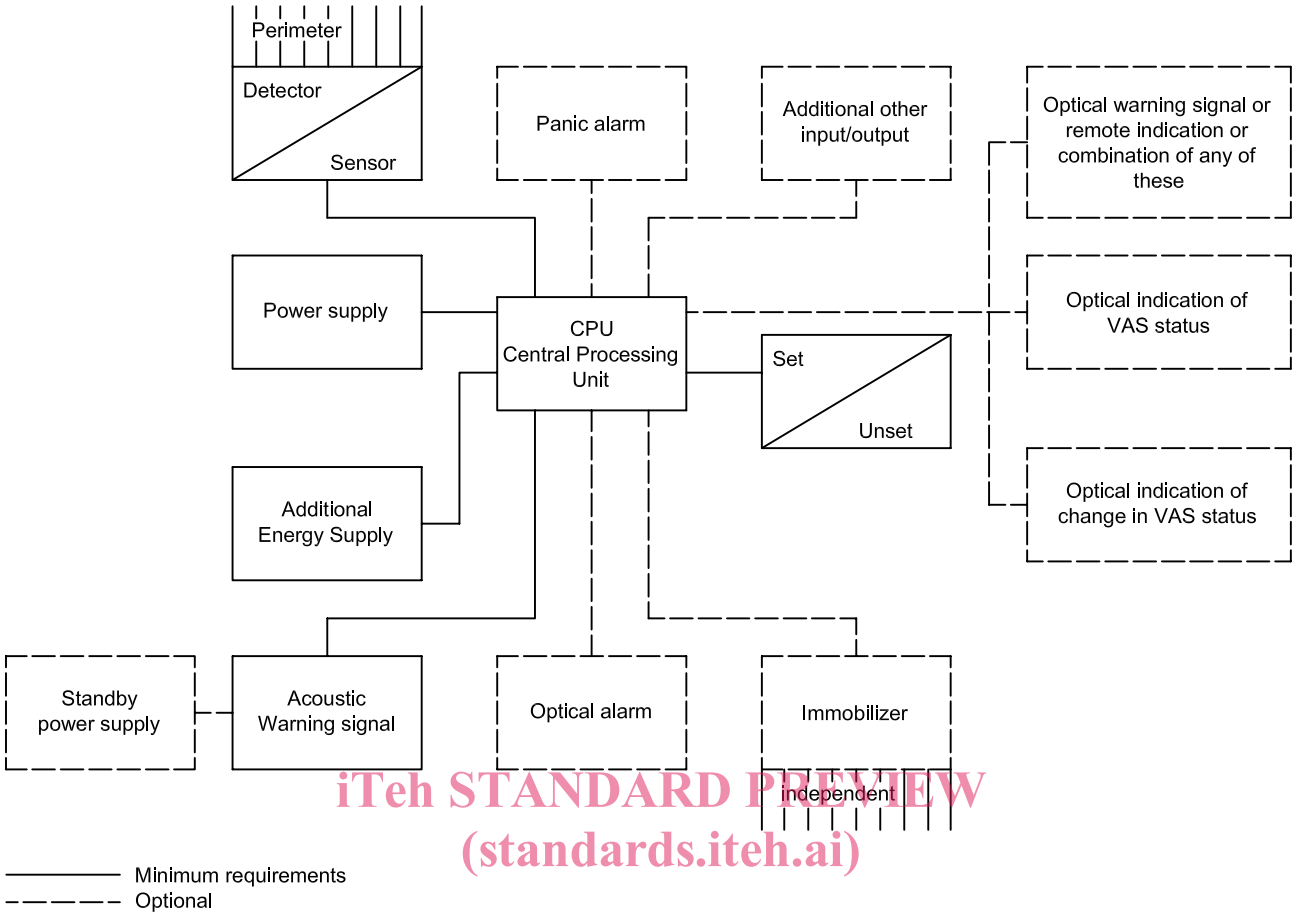

Figure 1 — VAS components and their connections

4.2 System design

4.2.1 General

In its set state, the VAS shall detect/sense and indicate any unauthorized

a) opening of vehicle doors,

b) opening of luggage compartment lids,

c) opening of emergency exits,

d) opening of the bonnet/hood,

e) tilting of the driver's cabin,

f) disconnection of the trailer, and

g) disconnection of the power supply.

All components of the VAS shall be compatible with one another and, when installed, shall not affect the performance of the vehicle in the unset state.

Whether it is set or unset, the VAS shall not be able to have its state inadvertently changed nor shall any warning device be caused to operate or cease operation.

In the event of a power interruption, the VAS shall not change state on resumption of power.

The failure of any optical device or devices shall not affect the correct operation of the other parts of the VAS.

The VAS, its components and the parts controlled by them shall be designed, built and installed so as to minimize the possibility of false alarms.

All VAS shall be protected against easy and rapid access or tampering by any unauthorized person.

4.2.2 Detection

The VAS shall provide perimeter protection, and may include additional sensors for detecting other interference with, or intrusion into, the vehicle. The operation of such additional sensors may be disabled intentionally by the user. However, this disablement shall only be effective for one setting period of the VAS.

The VAS may include a deliberately operated device/panic alarm, which shall be activated from within the vehicle. Regardless of whether the VAS is set or unset, this device shall, at a minimum, operate the acoustic alarm, but may also operate an optical or radio alarm or both types of alarm. It shall be possible for the vehicle user to cancel the alarm or alarms. The operation of the panic alarm shall not affect the starting or running of the vehicle's engine, and the alarm's duration per activation shall not be restricted.

4.2.3 Control

Control equipment shall provide for the connection of circuits capable of accepting the detector(s)/sensor(s).

When the VAS is set, the control equipment shall monitor the detector(s)/sensor(s) and, in the event of an alarm condition being presented, shall provide outputs to the warning devices within 1 s maximum.

Unsetting the VAS by the normal means shall cancel the alarm condition and the warning signals within 1 s maximum.

4.2.4 Setting/unsetting

4.2.4.1 General

The VAS may include optical indications that provide

— information on the set/unset status of the VAS, and

— information on any change in the set/unset status of the VAS.

An optical signal for the indication of a change in the set/unset status of the VAS may also be produced by the direction indicators, the passenger compartment lamp or lamps, or the vehicle position lamps (including all lamps in the same circuit), or any combination of these. The duration of the signal shall not exceed 3 s.

4.2.4.2 Setting

Setting of the VAS may be achieved by any suitable means.

The perimeter protection shall be in the set condition within 10 s after completion of the VAS's setting procedure. Optional sensors shall be in the set condition within 60 s after completion of the setting procedure.

4.2.4.3 Unsetting

The code, or any instructions to unset the VAS, shall not be visible on any VAS component.

Unsetting of the VAS shall be achieved by any one, or a combination, of the following.

a) A mechanical key switch, which may be either

   1) an integrated key mechanism or switch or both, or

   2) the door-locking mechanism coupled to a separate switch, in which case it shall be impossible to unset the VAS using the internal door-locking mechanism.

   The cylinder of this key switch shall not protrude by more than 1 mm from the cowling; the protruding part shall be conical or convex.

   The joint between the cylinder core and the cylinder casing shall be able to withstand a tensile force of at least 600 N. It shall also, separately, be able to withstand a torque of at least 25 N·m.

   The key switch shall be provided with a cylinder drill obstruction.

   The key profile shall have at least 1 000 effective permutations, and the key switch shall be inoperable even by a key differing by only one permutation from the key matching the key switch.

   The key aperture to an external key switch shall be shuttered or otherwise protected against the ingress of dirt or water.

b) A coded key switch, which shall be fitted within the vehicle in conjunction with a timed entry period, and whose time period for unsetting shall be not be less than 5 s and not more than 15 s. It shall comply with the same provisions as those specified in a), or else the coded switch shall have no less than 10 000 effective combinations.

c) An electrical or electronic device [other than the switch specified in b)], for example, a remote-control switch, which shall have a coded transmitter signal with at least 50 000 effective combinations and a minimum scan time of 24 h per 5 000 variants, or else shall incorporate rolling codes such that the mathematical chance of obtaining the correct code within 24 h is less than 4 %.

d) A mechanical key switch or an electrical/electronic device located within the protected cabin/passenger compartment, which, if fitted within the vehicle in conjunction with a timed entry period, shall allow a time to unset the VAS after the opening of the door of not less than 5 s and not more than 15 s.

4.2.5 Alarm signal

4.2.5.1 General

The alarm condition shall be indicated by an acoustic warning signal produced by either

— an acoustic warning device, or

— a sound signalling device in accordance with ISO 512, or

— both of these, in which case interference with one of the devices shall not affect the operation of the other.

The acoustic warning signal shall not cause any confusion concerning the reason for the warning and shall not have the same audible sound as other road traffic signals (e.g. those of emergency services).

The alarm condition may be indicated, additionally, by an optical warning signal or signals, or by remote wireless signalling, or any combination of these.

The warning signal shall be activated once for every detection, without limitation of the number of detections. For additional equipment, for example, volumetric protection, the number of activations of a warning signal shall be limited to a maximum of 10.

4.2.5.2 Acoustic warning signal

The duration of the acoustic warning signal shall be (25^{+5}_{-0}) s per detection; the signal shall be within the frequency band 1 800 Hz to 3 550 Hz.

The maximum sound pressure level of the acoustic alarm device shall not exceed 118 dB(A), while the minimum shall be not less than 105 dB(A), measured in accordance with 70/388/EEC.

The acoustic warning signals shall have the following characteristics:

a) single frequency tone, intermittent, having

   — a frequency of 2 Hz ± 1 Hz, and

   — on-time equal to off-time ± 10 %;

b) modulating tone.

The acoustic signal may comprise two or more frequencies or sweeps between frequencies.

4.2.5.3 Optical warning signals — Optional

If optical warning signals are provided, they shall be emitted by all the vehicle's direction indicators or position lamps (including all lamps connected to them) or both. In addition, an optical warning signal may be emitted by the passenger compartment lamp or lamps.

Optical warning signals shall be in compliance with statutory limitations.

An optical warning signal shall be of a duration of between 25 s and 300 s per detection, intermittent, and have

— a frequency of 2 Hz ± 1 Hz, and

— on-time equal to off-time ± 10 %.

In relation to the acoustic warning signal, the optical warning signal may be synchronous or asynchronous. Any interference or damage to an optical warning device shall not affect the correct operation of the acoustic warning device and vice versa.

4.2.6 Immobilization — Optional

The vehicle shall be automatically immobilized within 1 s of setting the VAS, unless immobilization has already been implemented by an independent immobilizer.

If an existing immobilizer is already incorporated, it shall meet the requirements of this International Standard.

Immobilization shall not take place if the engine is running or if the ignition key is in the engine-running position.

The immobilizer shall include one independent means of preventing movement of the vehicle under its own power.

EXAMPLE Original mechanical protective device against unauthorized use, interruption of starter motor circuit, interruption of ignition, interruption of fuel supply.

The design, manufacture and installation of an immobilizer shall be such that any malfunction of that facility will not affect

— the safe function of the vehicle, regardless of whether the VAS is in the set or unset condition, and

— the performance of the vehicle or its components when the VAS is in the unset condition.