

# Call Systems according to DIN VDE 0834



Safety and Security Division

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#### Imprint

#### Call Systems according to DIN VDE 0834

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July 2017



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# Foreword

Sixteen years after the last major revision, a new version of the standard DIN VDE "Call systems in hospitals, nursing homes and similar institutions – Part 1: Requirements for equipment, planning, erection and operation" from the DKE German Commission for Electrical, Electronic & Information Technologies has come into force with the agreement of the European Standards Organisation.

Revision of the standards was necessary, in order to update references to out-of-date standards, to take account of increasing technical possibilities of communication and to define the often to be found connections between call systems and medical devices.

With this brochure, the Expert Group for call systems in accordance with DIN VDE 0834 at ZVEI-Safety and Security Division has been associated with and interpreted this standard for a long time and has explained the practicability of the requirements therein.

Basically, the new edition confirms all previous regulations. Through precise definitions, previous weak points have been removed, which in practice had lead to discussions and different interpretations.

Important changes are the extension of the scope of application, the removal of the fields of application, the combining of the previous protection areas, requirements for the use of standardised transmission paths and the use of call systems as distributed information or alarm systems.

To guarantee electrical safety, the safe electrical separation has been newly defined and comprehensively explained by means of diagrams. Irrespective of the size of the call system, all the requirements of DIN VDE 0834 must be adhered to within the defined scope. The standard does not require any specific technology but is technology neutral. However, the use of a specific technology must fulfil the defined requirements.

The use of the transmission paths of other systems is also not permitted under the new standard. These may be used for the connection between autonomous organisation groups and to external products, but only when a risk assessment has ascertained that the conditions of the standard (see VDE 0834, 6.2.3) are complied with.

In future, the manufacturer shall specify the purpose of the call system and thereby define the possible areas of application and the associated fields of application. Hereby, one main focus is on the type of safe electrical separation, the use as information or alarm system and the possible connection to medical electrical systems. The new version includes the particular responsibility of the planner.

This brochure is not a summary of DIN VDE 0834, but serves primarily as an aid when planning, installing and operating the call systems. In addition to standardised terminology, terms commonly used in the marketplace are also defined.

# **1. Introduction**

Call systems – previously known as "Nurse Call Systems" – are systems with the help of which persons can be summoned or sought or information can be forwarded. They are designed especially to help people in emergency situations, to save lives and to avert dangers. The scope of these systems ranges from simple call functionality to complex systems, which are oriented to the requirements of modern care services.



They are all subject to DIN VDE 0834, irrespective of their location, where a greater or lesser degree of danger for the caller or others can occur, if calls are not indicated as a result of a fault or if faults are not recognised in time.

These requirements often exist in:

- Hospitals
- Care homes, care wards
- Homes for the elderly and senior citizens
- Retirement homes, rehabilitation facilities
- Psychiatric and forensic institutions
- Prisons
- Homes for the disabled
- Accessible toilets for the disabled in public facilities

and similar establishments

DIN VDE 0834 applies to an environment, in which a person seeking help summons assistance and is, therefore, always applicable in the areas listed above – with the exception of domestic areas. The Standard sets the framework conditions for technical boundary limits, for timing and function procedures and for the interface between humans and the system. Call systems are independent systems. They possess their own supply or transmission network, independently of third-party systems, that must be controlled and monitored by the devices of the call systems themselves. Call system devices may include telecommunications, media technology and information technology functions, in order to be able to offer the user (e.g. the patient) a complete, easy-to-use and perfectly matched service package. These functions are, for instance, light control, radio reception, remote control of TV equipment, multi-media, telephone connection and debt collection functions.

In accordance with DIN VDE 0834, call functions must always have unlimited priority over all other services and emergency operation must be guaranteed.

The system must be protected by means of secure separation points against the transmission of impermissible higher voltages and must be functionally completely independent of third-party systems that are attached to the call system.

The exchange of data with other security and communication systems must only take place via interfaces that are approved and specified by the manufacturer of the call system. So, for example, the switching off of the auxiliary telephone system, the failure of a TV or short-circuiting of a bed light must under no circumstances have an effect on the functional capability of the call system or on its functional characteristics.

#### **Distributed information system**

The coupling of call systems to electrical medical equipment does not affect the application of the regulations for the personnel and the duty of care when operating such devices. The system can, however, additionally transmit messages to accelerate observance of calls and alarms. Technical documentation and risk management are required.

#### Distributed alarm system

The use of a distributed alarm system for electrical medical devices is subject to special regulations with regard to alarm transmission and monitoring. Technical documentation and risk management are also required.

## **1.1** Aims and Application Areas

DIN VDE 0834 is the central standard for the realisation of call systems. Non-compliance to this standard can endanger patients, those requiring protection and, in particular, the elderly. Where facilities to which the standard applies (see above) are fitted with communications systems whose essential characteristics of secure call indication or system separation are missing, it is pointed out that "the compliance or non-compliance to technical regulations (can) play a role in the evaluation of whether one can be accused of a negligent violation of the duty of care". (see ZVEI leaflet 82025:2017-02 "Rechtliche Bedeutung technischer Standards und technischer Regelwerke" - ("Legal Meaning of Technical Standards and Technical Regulations" in German only).

The Expert Group for Call Systems at ZVEI represents manufacturers of call systems, who are associated with this standard. This, the 5th edition of the brochure, should assist all interested parties in the application of DIN VDE 0834, thereby achieving a manufacturer-independent understanding of the procedures and terminology. Investors, planning offices, installation companies and operators gain a comprehensive overview for project planning, installation, extension, modification, operation and maintenance of call systems. The brochure does not replace the personal examination of the standards – not all detailed topics can be taken into account here.

## **1.2 Regulatory framework**

#### 1.2.1 Standards

Standards are normally not necessarily binding for planners and installers, unless their use is stipulated by law, regulation or other me ans (e.g. European harmonised standards). The implementation of a standard lies initially at the discretion of those responsible. However, if there is a standard in which the protection of safety, health and life are regulated in advance, it is normally to be regarded as a binding, generally accepted code of practice (BGH Az.(German Federal Supreme Court File No.): I ZR 234/89 from 06.06.1991). It is used as the basis for the clarification of claims and for the assessment of the question of guilt.



Standards reflect the current state of technology

Standards are not just fulfilled in that technically the correct devices have been connected together. If the system has not been organisationally installed and operated as intended by the standard, then the standard has not been adhered to and the question of liability is also raised here.

#### **DIN VDE 0834**

Call systems in hospitals, care homes and similar institutions

Part 1: Requirements for equipment, planning, erection and operation

Part 2: Environmental conditions and electromagnetic compatibility

#### **DIN EN ISO 11197**

Medical supply units

#### DIN EN 60601-1

Medical electrical equipment Part 1: General requirements for basic safety and essential performance

#### DIN EN 60601-1-8

Medical electrical equipment Part 8: General requirements for safety. Supplementary standard: Alarm systems

#### **DIN EN 61000-6-1**

Electromagnetic compatibility (EMC) Part 6-1: Generic standards - Immunity standard for residential, commercial and light-industrial environments

#### DIN EN 61000-6-3

Electromagnetic compatibility (EMC) Part 6-3: Generic standards – Emission standard for residential, commercial and light-industrial environments

#### **DIN VDE 0100-710**

Low-voltage electrical installations, Requirements for medical locations

#### **DIN VDE 0100-410**

Low-voltage electrical installations, Protection for safety Part 4-41: Protection for safety – Protection against electric shock

#### **DIN EN 50468**

Resistibility requirements to overvoltages and overcurrents due to lightening for equipment having telecommunications ports

#### DIN EN 60950-1

#### (Replaced by DIN EN 62368)

Audio/video, information and communication technology equipment

#### **DIN EN 50134**

Alarm systems – Social alarm systems for domestic situations

#### DIN EN 80001-1

Application of risk management for IT-networks incorporating medical devices Part 1: Roles, responsibilities and activities

#### **1.2.2 Regulations and Guidelines** Heimmindestbauverordnung (Minimum Building Ordinance for Homes)

This regulation makes the installation of a call system mandatory. The system must fulfil the requirements of DIN VDE 0834.

## **1.3 Technologies**

DIN VDE 0834 does not stipulate or promote any specific technology but is technology neutral. The use of particular technologies is only measured by whether all the requirements can be fulfilled.

#### **IT networks**

Internet, fixed line network, mobile network, television and many other products and systems are also growing ever closer together in hospitals and form technology units with numerous decentralised components that communicate with each other.

The electronic components used in the IT networks, however, are not necessarily compatible with the functional and safeguarding against failure requirements of a call system and close attention must be paid to the risks and reliability of a connection between call systems, IT components and networks. Systems with IP technology are, like every other system, to be designed as independent systems with their own transmission paths and safe separation. PCs that are used in a network must, as in medical technology, have a power supply system in accordance with DIN EN 60601-1. Alternatively, all data cables to the call system from these PCs or other system equipment without devices for safe separation must be supplied with an appropriate safe galvanic separation in accordance with DIN EN 60601-1. Alternatively, there must be a local separation at the call location in accordance with DIN EN 60601-1.

#### **Radio technology**

Radio technology systems are only permitted if they conform to the safety requirements of the standard. Calls and faults must be recognised, registered and saved within the predefined time slot here as well; the activity of the radio transmission path must be checked in a cycle of max. 30 seconds. The specifications for internal transmission paths (here radio channels) must be adhered to.

# **1.4 Short Overview of Minimum Requirements According** to DIN VDE 0834

DIN VDE 0834 takes into account rapid technological advances, in that it does not specify which technologies should be used. However, it sets the framework conditions for technical boundary limits, time and functional procedures and for the interface between people and system.

For a quick initial orientation, the most important design parameters are summarised here. Functions and terminology from the area of hospitals/care facilities are used for this. They can be used analogously for all call situations and all persons, who are exposed to danger, e.g. also for staff in a prison.



Standard conform systems and innovative technologies result in a user-friendly concept

In all rooms and zones within a building in which patients or people at risk could be found, a facility for call release must be available. These are, e.g. patient rooms, recreation rooms, treatment rooms or waiting areas.

Every bed must have a call release assigned to it, which can be easily reached by bed-ridden patients. Call buttons are normally red, have a clear call symbol and must be easily recognisable in darkness (orientation light). The call release must be indicated optically in close proximity to the call element (reassurance lamp).

Manual or automatic presence buttons and acoustic noise generators for call forwarding must be fitted in all rooms in which the personnel to be contacted can be found. An emergency call by a person providing assistance in order to fetch further persons providing assistance must be released automatically by means of pressing the available call buttons. This release must be prepared through the marking of presence for this location.

Outside every room it is essential to install a corridor indicator lamp, which indicates the call (red) and the presence (green) as a minimum. These indicators must still be clearly recognisable with an ambient luminous intensity of 500 lux. A call release must be indicated within one second.

Additional text displays in the corridors must still be clearly readable with a luminosity of between 5 lux and 500 lux at a distance of 20 m.

Optical and acoustic signals must be unambiguously specified so that response personnel can operate the call systems of different manufacturers. Permanent lights, slowly flashing lights and fast flashing lights are the fundamental optical signal features. Likewise, for call forwarding, three acoustic signals are defined for normal calls, emergency calls and alarm calls. Additional signal types must be clearly distinguishable from the central signals.

The time period between the call release and information reaching the personnel responsible must be no longer than five seconds.

The marking of the presence of personnel in the call area may be used for deleting the call.

Rooms, which cannot be looked into from the installation location of the presence recognition, such as bathrooms, must be provided with a separate call cancellation.

Call and operational equipment must not be mounted under a common cover plate together with devices that are part of a low voltage system and must be clearly distinguishable from these on the outside. The exception is if after removal of the cover the insulation and the electric shock protection are preserved. For call systems with speech communication, remote cancellation of the call must only take place if a speech connection has actually been established. For calls without speech possibility, remote cancellation must not be possible. These calls may, however, be acknowledged, in order to suppress acoustic call forwarding, as long as an optical indication still occurs and the call processing is monitored.

All devices and transmission media that affect the release, monitoring and indication of calls in the case of a breakdown, must be continuously monitored independently. An occurring fault must be reported after 30 seconds.



Standard conforming operation of the call system gives a feeling of security

The power supply of the system must not exceed 30 V effective value or 60 V direct current. This low voltage must not be used for other systems or devices as well. Exceptions are electronic latching relays e.g. for reading light control and manufacturer certified call system interfaces to other products. They must be securely connected and must be provided with their own overload protection. On the installer side suitable protective measures against impermissible voltage peaks must be provided. All call systems must be supplied with emergency power, which takes over within 15 seconds of the failure of the normal current supply and maintains the operation for a minimum of one hour. With a power failure, existing calls must remain stored as an interim measure for at least 30 seconds.

The caller must be protected by protection measure 2 x MOPP, through centralised or decentralised measures, against damaging voltages and currents in accordance with DIN EN 60601-1.

Transmission paths of other systems must not be used for the call system. For connections between organisational groups, third-party transmission paths can be used if the specified requirements for system security are adhered to and a risk analysis for evaluation of the safety has been carried out.

Conversely, transmission paths of the call system may be used by other systems if all input and output signals are used via their own interfaces or approved interfaces of the manufacturer of the call system and malfunctions of the third-party system do not affect the call system, i.e. are noninteracting. The corresponding separation points must be configured with reference to the electrical safety and the chosen procedure, system separation or local separation.

All earth wires connected to the call system must be connected to the same main potential equalisation in accordance with DIN VDE 0100-410. If this is not possible, then the individual areas must be electrically isolated from each other. Cables that interconnect buildings must be provided with standard conforming overvoltage protection or be electrically isolated at the exit points.

# 2. Terminology, Basic Functions, Characteristics, Requirements

Some terms, devices and basic functions are explained below and their characteristics and requirements are commented upon.

# 2.1 Planning

The call system must be planned as a standalone system based on DIN VDE 0834. Where applicable, local building regulations must also be taken into account. Attention must be paid to the intended purpose of the call system by the manufacturer.

The planning of a call system must be carried out by a "specialist planner for call systems", who, in addition to the knowledge of a specialist for call systems, also has trained specialist knowledge in order to plan and check a call system according to the currently valid standards as well as to certify the correct functioning of the call system. This regulation is new.

Prior to the planning of a call system, all safetyrelevant details must be specified between the operator and the specialist planner of the call system. As a minimum, these are the function characteristics (e.g. speech communication) of the call system, the power source for safety services and the responsibility for the indication of malfunctions. In addition, the planner must define the safe separation (see below). Since call systems are often operated in areas in which there is an increased danger to people through electric conducting connections with earth potential, medical electric devices (ME) or other system parts, the standard for medical equipment DIN EN 60601-1 is used for the safe electrical separation of the call system. As protection measure, 2 x MOPP is specified. (Means of Patient Protection).

There are two methods of fulfilling this requirement:

#### A. System separation

The entire call system is designed in accordance with DIN EN 60601-1 (2 x MOPP). This affects not only the voltage supply but also all other interfaces and connections to external devices and system parts.



#### Electrical Safety DIN VDE 0834, Figure 5.1, A – System isolation



# Electrical Safety DIN VDE 0834, Figure 5.1, B – Local isolation

#### **B.** Local isolation

All devices in areas where there are endangered persons are connected individually or via a separator in accordance with DIN EN 60601-1 (2 x MOPP) to the rest of the call system.

It is recommended that automatic logging is set up, in order to enable the later analysis of the events.

Larger call systems should be divided into independent subzones. A subzone may only stretch over a maximum of one organisational zone.

The previous differentiations according to the application areas and protection areas no longer apply in this revision of the standard. In general, call systems are subject to the regulations of the former application areas B and the protection areas B.

Use	Description	Project notes
Systems without speech	Calls are indicated optically and acoustically and can only be cancelled by seeking out the location of the call.	When project planning it should be specified which types of call should be included and registered.
Systems with speech	Calls are indicated optically and acoustically; specific calls may be cancelled remotely after a conversation with the caller.	It should be specified which rooms of the call system should be fitted with or without speech connection.
Centralised operation	Type of organisation by which all calls from all wards are exclu- sively directed to one higher ranking central location (central switchboard), are answered and evaluated there and from where all further measures are put into operation.	It should be specified whether wards should also be operated locally as a temporary measu- re. It makes sense to integrate further function areas (adminis- tration, X-rays, op preparation, recovery room, physiotherapy, dispensary etc.) in an efficient complete system.
De-centralised operation	Type of organisation by which all calls within the ward or the duty area reach the care personnel responsible directly in the duty room or at the respective current location of the personnel (call forwarding).	In addition to the patient rooms and function rooms, all rooms in which the care personnel and patients could pass time, must be included in the system.
Centralised/de-centralised operation	Type of organisation by which, depending on the time of day and frequency of calls, the cen- tralised or de-centralised mode of operation can be activated separately ward-by-ward.	The call system must be capable of being switched ward-by-ward, e.g. by pressing a button or automatically, to the other mode of operation.
Group care	Type of organisation by which the ward-by-ward organisation is overlaid by the forming of care groups. Thereby, specific rooms or beds are linked to an individual duty area. This can also take place across wards.	It should be ensured that all rooms and beds are assigned. In new duty areas, rooms and beds that have not been taken into account remain in their respective wards.
Call forwarding mode	Mode of operation by which the calls are not only reported in the duty room but also in every other changeable location where the personnel can be found.	This mode of operation is part of the de-centralised operation. When a duty support point is not occupied, the operation mode "automatic" must be activated.
Ward/zone linking	Temporary extension of the call forwarding operation over several wards (groups) in quieter times or in emergencies.	The scope and the location of the zone linking should be specified. Optical indicators should be included in the planning.

Use	Description	Project notes
Ward/groups	Smallest self-contained organi- sational and care area with the same responsibilities, whose messages can be collated and which should also be reflected in the technological realisation, (e.g. supply area of a power supply or through a closed loop system).	This area results from the struc- ture of the institution. It should be planned so that it can be operated independently and can be integrated into the organisa- tional areas of the institution.
Duty area	Periodic organisationally requi- red linking of wards, whose calls should reach the same personnel -> zone linking.	The wards should also be close to each other physically, in order to be linked sensibly.
Duty room	Location where the care person- nel can regularly be found.	The duty room normally has a main answering unit installed in it.
Patient room	Room in which one or more patients are cared for.	Equipment for calls, call can- cellation and the marking of pre- sence (call forwarding) should be planned.
Function room	Room in which personnel are temporarily and during which time they must be contactable, in which however no patients are to be found.	As a minimum, call forwarding must be provided for each function room; where appropri- ate, displays can offer important additional information.
General areas	Areas where patients are tem- porarily e.g. recreation rooms, treatment rooms, waiting areas.	The equipment for calls, call cancellation and presence mar- king (call forwarding) should be planned for.
Organisational groups	Group of rooms, which have been combined to form an orga- nisational unit. A self-sufficient organisational group including all rooms, which can be looked after by one person when a reduced number of personnel are available.	In cases of malfunctions or failures of the call system, the organisational group is the smal- lest unit that may be affected by the failure, without an impact on the other organisational groups. The size of an autarkic organisa- tional group, i.e. the minimum area, in which its own transmissi- on channels must exclusively be used, results from the intended mode of operation.





# 2.2 Functions

Use	Description	Project notes
Call	Call from person requiring assistance, with the aim of being visited or spoken to by a carer.	Each bed must have a device for call release assigned to it, which can be easily and safely reached by the patient. The call button must be red with a clear pictogram and must be illumi- nated when dark. This applies correspondingly to all other rooms in which patients could be found. The call release must be indicated optically in the call button or in the immediate vicinity by means of a reas- surance lamp. Call buttons in bathrooms must be specially designed for this environment.
Presence	Marking of the presence of care personnel by means of a pre- sence button when entering a room connected to the call system.	In all rooms in which the per- sonnel should be contactable by calls, the presence marking must be switched on through opera- tion of the presence button or through automatic logging. The presence button must be green; the state of the switch must be indicated optically within the button or next to it. The button should be positioned near the door. The presence button – if there is one – for a second group of personnel may be yellow.
Emergency call	Call by a carer, with which assistance from another carer is summoned.	The release of an emergency call is prepared by switching on presence. The call in the room becomes an emergency call.
Answerable calls	Call from a device with speech possibility by the bed or in the room.	In systems with speech commu- nication, calls with speech that have been answered may be remotely cancelled at the place where they were answered.
Non-answerable calls	Call from a device without speech possibility. The call loca- tion must be visited.	Calls without speech commu- nication must not be cancelled remotely. Only call acknowled- gement is permissible if the call response is monitored by the system.
Bed call	Call by a patient from the call equipment by the bed that can be selectively recognised.	Malfunctions that can affect the release, transmission and indi- cation of calls must be reported. Pluggable devices must also be permanently monitored.

Use	Description	Project notes
Bathroom/WC call	Call from a bathroom or toilet that cannot be answered, or from other rooms that cannot be looked into from the outside.	The call must not be deleted by the marking of presence if the call release location cannot be looked into from the outside.
Monitoring / diagnostic call	Automatically released emergen- cy call from a monitoring device.	The number of sockets per bed should be specified with the operator.
Telephone call	A call released from a telephone extension in the case of absence.	Normally, a call to the duty room telephone is forwarded via the call system in the case of absence.
Call forwarding	Forwarding of a call to the loca- tion where presence has been marked by the care personnel. The call is acoustically indicated as a minimum. In addition, the call location and the call type can be indicated. Answerable calls may be cancelled after a speech connection (auxiliary answering).	Call forwarding is required when the call system is used in de-centralised mode and the duty location is not occupied. Activation occurs automatically as soon as the duty place is not occupied.
Call cancellation	Termination of the call state by setting of marked presence by means of a cancel button or by remote answering within the framework of the permissible options.	The installation locations of the equipment with presence button and the cancel button must be specified.
Call answering	Reaction to a call through the setting up of speech communica-tion with the caller.	Call answering can take place via different answering locations.
Auxiliary answering	Call answering within the framework of call forwarding from locations with set presence marking in patient rooms or function rooms.	It should be planned whether and where auxiliary answering is sensible, taking into account the possible forming of care groups.
Room-by-room speech	The patient room has a central speech device for general announcements and call ans- wering.	At the planning stage the appropriate equipment and devices should be selected with the operator.
Bed-by-bed speech	Each bed is supplied with a speech device and can be addressed individually.	

# 2.3 Devices

Use	Description	Project notes
Room terminal	Operating and communications unit in patient rooms and functi- on rooms.	Room terminals are usually provided for all sickrooms and function rooms. They can contain the operational elements and indicator displays as well as the auxiliary call answering for systems with speech. In many cases, they also form the installation centre with connections for the beds, en-sui- te bathrooms and the optical indicator elements (corridor indicator lamps).
Call button	Device for releasing a call, with reassurance lamp and orien- tation lamp for control of call release. Types: call button, call switch, pneumatic call transmit- ter, call transmitter for special applications.	The call button must be red with a clear pictogram and must be illuminated when dark.
Presence button	Device for marking presence, preparation of emergency calls, call forwarding and call cancel- lation in the rooms in which the calls were released. Call loca- tions in WC's or other auxiliary rooms, which cannot be seen into, must have their own cancel button allocated to them.	The presence push-button can be planned as a separate device or as an operational element in the room terminal.
Cancel button	Device for cancelling calls.	The cancel button, where requi- red for the WC, only cancels the call. It does not carry out any other functions.
Patient terminal / patient handset	Device meant for the patient, with call button, reassurance lamp, light buttons and, where applicable, other operatio- nal elements. It is used as an integrated unit or handset for the reception of radio and TV programmes and all elements for speech connection to care personnel.	For handsets, a bracket (cradle) should be planned for the wall and/or bedside table.
Pear push-button	Simple type of patient terminal with simple call release and light buttons.	When planning, account must be taken of a suitable plug connection.
Plug connection	Multi-pin socket by the patient bed for attachment of mobile call devices.	The plug connection can be designed for wall mounting or for installation in the medical supply unit (bed service rail).

Use	Description	Project notes
Bed connection unit	Comprehensive operating and installation unit by the patient bed for attachment of mobile call and monitoring devices.	The bed connection unit can be designed for wall mounting or for installation in the medical supply unit (bed service rail).
Corridor indicator lamp	A light with call lamp (red) and presence indicator (green) allocated to and in close proxi- mity to the room (usually near or above the entrance to the room).	A corridor indicator lamp with a red luminous field (calls) and green luminous field (presen- ce) must be provided in the corridor area above or next to the entrance to each room. Addi- tional illuminated fields (white, yellow) for further presences and for additional information are permissible.
Direction lamp	Lamps, which combine the displays of several corridor indicator lamps, in order to direct personnel to parts of the building that are not immedia- tely visible.	The call information of several rooms can additionally be indi- cated collectively in zone, care groups and direction lamps.
Zone indicator lamp	Lamp allocated to a ward for collective indication of calls from this ward.	The indication occurs thereby taking into account the call prio- rities in the same way as with the corridor indicator lamps. Instead of zone, care group and direction lamps, numerical or alpha-numerical displays can be used.
Display	Indicator board with alpha- numerically or numerically displayed call indication, usable as a rule instead of zone indica- tor lamps .	All optical displays and acoustic signals must conform to the standard DIN VDE 0834.
Answering/Main answering unit	Device in the staff duty room for showing each call location and for differentiating between call types within a ward. As a rule, every room and every bed can be spoken to and answered calls can be cancelled from one answering unit. General announ- cements, zone linking and other operational procedures are most- ly organised from here.	For each ward unit, a main ans- wering unit shall be provided in the duty room. Usually, calls to the telephone in the duty room are forwarded in the call system.
Area answering unit	Device similar to main answe- ring unit, however, higher-ran- king and responsible for several wards.	Area answering may be necessary for specific types of organisation (e.g. prisons)

Use	Description	Project notes
Central answering unit	Central workplace for centralised operation.	When planning, the fact that the central answering unit may have to be manned 24 hours a day should be taken into account. The number of operator positions should be specified. It also makes sense to connect in function areas.
Power supply	Voltage supply with power supply approved by call system manufacturer for creation of a safe low voltage. It serves exclusively for the supply of devices in the call system from the low-voltage network with standby electric supply.	The planning and installation of power supplies must be car- ried out properly and professi- onally. The power supply must be securely connected to the general current supply without a plug.

# 2.4 Technical

Use	Description	Project notes
Voltage supply	Equipment for safe and failure- protected supply of all call system devices.	Power supply units of the call system that are supplied from the low-voltage network must have their own ring circuits with their own protection measures. The connection of external resources to this ring circuit is not permitted. In the case of a system concept with safe sepa- ration of the entire system, the power supply must conform to DIN EN 60601-1 (2 x MOPP), or at the least to DIN EN 60950-1.
Standby supply	Equipment for maintaining the internal low-voltage network or buffering the power supply.	An auxiliary current supply is mandatory. This auxiliary current supply must meet the requirements on a safe current supply and take over the supply of the call system not later than 15 seconds after failure of the general current supply and must guarantee the operation for at least 1 hour. If no replacement power supply system is available, comparable provisions must be made (batteries).
Fault and failure monitoring	Equipment for logging of line faults and device failures, which can result in danger for the caller. It must be ensured that faults in the call lines and device failures can be recognised immediately by care personnel or other qualified positions and measures to rectify the faults triggered.	Automatic forwarding of faults and failures directly to the technical department is sensible and should be provided for.
Ward circuit	Cable connection within a ward, which combines all connections necessary for operation of a call system and, for example, connects all room terminals of a ward.	The structure of the line network is manufacturer-specific. By the conceptual design, the configu- ration of the call system must also be taken into account.
Zone circuit	Cable connection, which combines several wards with all necessary connections for forming a zone.	For the line network the stan- dard DIN VDE 0834 applies. The possibility of a mix-up with lines of the low-voltage network or interference shall be excluded through pre-defined measures.

Use	Description	Project notes
Central circuit	<ul> <li>a) Cable connection, which combines all wards with all connections necessary for centralised operation.</li> <li>b) Cable connection, which connects all wards with central control electronics (central control unit).</li> </ul>	
Control unit	Manufacturer-specific centralised or de-centralised control device that administers and controls the processes of a call system and in which, as a rule, control programs are stored.	As with power supplies, control units may only be placed in rooms or function rooms that are dry. They must be easily acces- sible. Adequate heat dissipation must be provided for. If necessa- ry, forced ventilation should be provided. Functions should be maintained in emergency mode.
Communication interface	Manufacturer-specific interface between call system, pager, DECT or telecommunications systems.	Messages released in the call system (calls, emergency calls, alarm calls, diagnostic calls, faults) can be forwarded additi- onally to external communica- tion systems, in order to fulfil organisational requirements, taking into account DIN VDE 0834. From experience, timely clarification of the responsibi- lities with mutual agreement about the type and scope of the forwarding is needed. Warning: With technical faults of these third-party systems, there is an unacceptable significant danger to the caller when such faults are not intercepted organi- sationally and technically.
Protocol interface	Manufacturer-specific interface between call system, and exter- nal systems for recording and logging of system events, e.g. faults or operational states.	Logging of events for external evaluation, e.g. accounting or statistics. Use should be agreed with the operators.

# 3. Installation

Modern call systems conforming to DIN VDE 0834 have a higher safety standard and form organisational units with other security systems. The technical advances and the merging of different systems to form complex functional units demand trained experts and extensive specialist knowledge.

The extent of activities ranges from the traditional pure call system to systems with integrated radio and television transmission to complex data networks.

The technology in this application area has reached a level today whereby in operation, when implemented according to the standards, only an extremely low frequency of faults is to be expected. However, problems that do occur can be traced back to:

- Call systems are incorrectly planned
- Call systems are incorrectly installed
- Call systems are insufficiently or never maintained
- Call systems are not used for their purpose by the operator or his/her personnel

the personnel have not been adequately trained.

Call systems described in this brochure serve primarily to protect human life and retain integrity. In order to achieve this responsibly and reliably, there is a particular duty to only use specialist planners, specialist companies and personnel, who have proven their competency, for planning, installation, commissioning and maintenance.

## 3.1 General Safety Rules/Directives

As well as the general regulations of DIN VDE 0100 / IEC 364-1, other directives must also be adhered to. The basis for the structure and the function of a call system is DIN VDE 0834. In addition, special conditions apply to rooms used for medical purposes and general regulations

for telecommunications. Within the framework of installation, depending on the installation or location, the observance of other directives may be required. Suitable planning for over-voltage protection must be taken into account.

## **3.2 Installing the System**

#### Specialists for call systems

A specialist for call systems is a specialist with trained expertise on installing a call system in accordance with the applicable standards, testing and certifying its functionality. As a result of the specialist training, knowledge and experience, as well as knowledge of the relevant standards, regulations and directives, the specialist is able to assess the assigned work and recognise possible dangers. Training within the spectrum of electrical engineering in the field of telecommunications engineering or general electrical engineering is required, and proof of experience in the other fields as well as system knowledge of communications technology must be provided. For evaluation of the specialist training, work in the relevant field of activity over several years can also be taken into account.

Before starting the installation as such, the installation location of the individual devices and the installation paths of the wiring must be determined.

or

# 3.2.1 Mounting Height, Mounting Location and Conditions

According to DIN VDE 0834, the devices of the call system must be mounted at the following heights above the floor:

# Operational devices (with or without indicator lamps)

0.7 m to 1.5 m (e.g. call or cancel push-buttons). For call switches in bathrooms the special requirements of "barrier-free living" should be taken into account. Pull cords must also be reachable here, for instance, by persons lying on the floor.

# Operational devices with text displays

1.5 m to 1.7 m (e.g. terminals with displays). The mounting locations should be chosen so that they do not receive any direct sunlight.

#### Devices in installation units

1.6 m to 1.8 m (e.g. medical supply units).

# Indicator lamps and large text displays

1.5 m to 2.5 m.

#### Control units, power supply devices

Central control devices, power supply devices and other parts without operational or indicator functions must only be placed in dry rooms (max. humidity 75 % at approx. 18°C), but not in patient rooms. They must always be accessible (maintenance access 60 cm wide minimum). The heat dissipation must not be impeded. When installed in switch cabinets or similar, the heat losses must be dissipated if necessary through forced ventilation.

For protection against electric shocks, in the rooms of Application Areas 1 and 2 – according to VDE 0100-710 - the required protection measures for these rooms must be used. The central control unit must only be operated within an environmental temperature range of  $0^{\circ}$ C to  $40^{\circ}$ C. Here an air-conditioned room must be given preference in individual cases.

On account of voltage drops, the power supply should be installed near the largest user where possible.

#### Others

Presence buttons and call devices must be mounted where they are easy to reach and where confusion with devices from other systems is not possible.



The feel is particularly important

Devices of the call system (presence buttons or call buttons) and devices of the low-voltage network (e.g. switches, sockets) must not be covered with a common cover plate. The exception is when after removal of the cover the insulation and contact protection are preserved. The devices must be unmistakeably different.

In WC's and bathrooms the special provisions of DIN VDE 0100 must be observed. In these rooms only those devices suitable for these rooms must be installed. For this the manufacturers' own notes must be taken into account, which particularly indicate the devices for installation in WC's and bathrooms. Call switches or similar in shower cubicles must be fitted a minimum of 20 cm above the highest possible position of the shower head. The pull cord should end 10-20 cm from the floor, so that persons lying on the floor can reach the pull cord. Terminals with displays must be placed well within the field of vision. Corridor indicator lamps are mandatory and must be clearly identifiable with the rooms (as near as possible to the door) and also clearly recognisable from a long distance. All optical indicator equipment must be mounted so that their recognisability is not influenced by extraneous light. It is left up to the user whether to also place these corridor indicator lamps in design-oriented modules (e.g. with door or nameplates), if the prescribed parameters are adhered to.



Standards conforming systems lead to the simplest, most intuitive operation

Corridor indicator lamps that are not fitted with light-emitting diodes can become warm. Therefore, care should be taken that they are far enough away from flammable materials. If too much heat develops, the lifespan of the lamps is shortened and the electronics destroyed. Therefore it must be ensured that any ventilation slots that may have been installed are not closed (e.g. through being painted). Corridor indicator lamps represent the last level of safety and contribute to the recognition of emergencies even when through technical or human failure or through organisational error of judgement calls are lost. The latter occurs increasingly in senior residences, in which contrary to standards the entire organisation is based on DECT systems without any other form of backup. The dispensing with corridor indicator lamps can lead to legal consequences.

#### Wiring

Wires of the call system must not be carried in the same cable, conduit or installation channels as other systems with hazardous voltage.

The wires of the call system and the low-voltage system must be laid at least 30 cm apart; for lengths under 10 m a distance of 10 cm apart is considered to be adequate. This must be clearly recorded in the revision documents of the installer company and must be verified with the appropriate control proof (e.g. through the specialist electrical planer). If it is not possible to conform to these requirements for constructional reasons, for nominal currents less than 250 Veff the groups of wires can be separated by means of a conductive screen. This must be included in the protection measures of the low-voltage system and must have a cross section typical of a protective earth conductor. As an alternative, separate cables can be carried in conduit or installation channels with double or increased insulation in accordance with DIN EN 60950 Thereby, the insulation must be capable of withstanding a testing voltage of 4000 V effective value for one minute, the complex leakage current must not exceed 0.5 mA.

Wires of the call system that leave the building must be provided with an overvoltage protection in accordance with DIN VDE 0845 at the point of exit. This can be dispensed with if a galvanic separation point safely prevents the transfer of dangerous voltages. With regard to the electromagnetic compatibility (EMC), as standard practice wiring should be avoided in the immediate vicinity of possible sources of interference. This applies in particular also for transmitting antennae (e.g. pagers) and therapy devices.

Despite conforming to all standards and directives regarding EMC, in individual cases mutual interference can occur, without it being possible to find the cause.

The screen or the bare screen wire should be laid insulated all the way to the connection point, otherwise short-circuits could occur. All screened wires for the transmission of music or speech should be stripped of insulation as little as possible, so that the screen function remains intact. The installation of the mains supply lines requires particular care. Here attention should be paid especially to short wiring routes, adequate wire cross-section and suitable protection where the wire cross-section is reduced, in order to prevent damage in the case of short-circuits.

#### 3.2.2 Handling

All devices must be protected from direct moisture. The system components of electronic devices are normally fitted with components that can be destroyed through electrostatic charge. Every direct contact with such components is therefore to be avoided. Devices and resources of the call system must not be installed in rooms with damaging effects on telecommunications equipment (e.g. bathrooms or chemical laboratories). If devices are installed in such rooms, they must be specially designed for these environmental conditions. Confusion with the wires of the low-voltage system must be excluded by the suitable selection of colours and system of wiring.

When exchanging fuses, only original fuses according to the specifications of the manufacturer must be used. The cause of the trigger must be ascertained.

When connecting the devices, the tool recommended by the manufacturer must be used, in order to avoid damage to the connection terminals.

Further notes about the installation and function checking can be found in the manufacturers' documentation and in DIN VDE 0834.

## 3.3 Recommended Installation Steps

# Installation sequence (manufacturer's instructions to be adhered to)

When a central control unit (central distributor) is installed, this should be done at the beginning of the installation work. After that, the installation of the call system takes place ward-by-ward. That is, each ward is installed and commissioned individually and successively.

# The installation steps for a ward in overview

- 1. Decide on the installation site
- 2. Position the flush-mounting boxes
- 3. Lay the cables
- 4. Connect up the plug and terminal connectors
- 5. Install power supply unit and check the current supply
- 6. Connect up the room terminals
- 7. Check the room installation
- 8. Connect up the control unit
- 9. Commission the main answering unit
- 10. Check the ward installation

## 3.4 Commissioning

Before commissioning of the call system, a final inspection according to the directives of DIN VDE 0834, Section Inspection, should be carried out by an expert for call systems. Acceptance inspections of sections of the call system may also be carried out in the course of the construction process.

## 3.5 Connections

The call system forms a self-contained and independent system and must not be routed over the transmission paths of other systems. The exception is the connection between organisational groups, if the specified regulations and requirements are adhered to. Conversely, external signals may be routed via the transmission paths. Faults in third-party systems must not affect the call system in any way. The coupling and decoupling must only occur thereby via system interfaces of the call system. These can be simple potential-free contacts, but also complex data interfaces. These interfaces must be delivered or specified by the manufacturer of the call system. Where used, a check must be made as to whether a local safe separation or system separation for the system has been selected. From this results the level of the protection regulations to be complied with for the interface.

# **3.6 Use of the call system as distributed alarm or information system**

Often, signal transmitters of medical electrical devices (ME devices) are connected to a call system, thereby making it a component of a distributed information system. In so doing, the call system should only speed up the distribution of information; the actual alarm system of the ME device must not be deactivated and the personnel must continue to be in acoustic and optical proximity to the ME device. The connected ME device must receive a warning in accordance with DIN EN 60601-1-8, that only transmits an information signal to the call system and it cannot be assumed that the alarm signal is transmitted.

As components of a distributed alarm system, interfaces and alarm transmission must be carried out in such a way that the secure transmission of alarms is guaranteed. All components that pertain to the alarm transmission or alarm indication must automatically be monitored.

The operator must, during the planning within the framework of project management with the project participants, clarify and set down in writing as obligatory whether it is intended to operate the system as a dedicated information system or as a distributed alarm system. With this specification, the users know how they have to use the system correctly. If the purpose of the planned system is as an "information system", the user must not leave the acoustic and optical coverage area of the ME device.

If the manufacturer of the ME device has specified in the intended purposes that the ME device may only be connected to a call system for the purpose of forwarding information (distributed information system), the operator is bound by this purpose.

In every case, the operator must ensure, through suitable technical, personnel and/or technical organisational measures that the monitoring of patients takes place in the case of failure of the transmission of information and/or alarms.

With the use of the call system in a distributed alarm system conforming to DIN EN 60601-1-8 or a distributed information system, the call system does not automatically become an ME product but a part of an ME system conforming to DIN EN 60601-1. Further regulations can be found in DIN VDE 0834.

# 3.7 Medical Supply Units (MSU)

Medical supply units are pieces of equipment that, as a rule, are assigned to a patient bed and that contain all devices and cable paths, from the reading lights to the connection of medical gases, which serve for the care and/or the comfort of the patient. These supply units, in contrast to the call systems, are subject to the rules and standards for medical electrical devices and DIN EN ISO 11197 (safety specifications for medical supply units).

Since call systems are usually contracted out and installed independently of the supply units but are spatially integrated in the MSU, the manufacturers of the supply units often receive the components of the call system from the installer or the operator of the system for installation, without however being able to take over the responsibility for these supplies. DIN VDE 0834 thus contains the obligation that DIN EN ISO 11197 must also be observed for the parts of the call system that are installed in the MSU.

In practice, there is occasionally uncertainty about the question of responsibility when functional faults occur. In order to meet the duty of care, all responsibilities should therefore be clarified and specified in advance, from connection of the device and its cable network to the support of the system in operation, maintenance and possible repair work. Suitably trained personnel should be used for all work.

# **3.8 Documentation**



Do not settle for less than a standards compliant call system!

The installer must compile detailed documentation for the system, with the help of the manufacturer's documentation. Thereby, all parameter setups must also be recorded. These documents must be kept by the operator for later maintenance and repairs and must be available at all times. Also the creation of the log book described below should be supplied by the installer.

# 4. System Operation

## 4.1 Preliminary Notes on Operation

The operator of a call system must be "a trained person" within the meaning of DIN VDE 0834 or must delegate a trained person.

The operator or the delegated person must autonomously take responsibility for ensuring that the personnel, in particular the care personnel, have adequate knowledge of the tasks, functions and operation of the call system. For this, regular training should be carried out and documented. The operator must also ensure that indications of interference with the permanent state of readiness or functional irregularities of the call system are reported by the personnel and inspections are carried out.

The connection of devices and operating resources foreign to the system (e.g. medical electrical devices) must only be carried out by personnel specially trained for this. Pluggable devices for call release, e.g. patient handsets, must be checked for correct functioning of the call release every time they are plugged in.

## 4.2 Fault Reporting

The personnel (in particular the care personnel) must report functional irregularities as well as failures and malfunctions of individual components of the call system to the operator or the person delegated by the operator without delay, in order that the problem can be resolved immediately. All incidents arising must be recorded successively by the operator or the person delegated by the operator in one of the log books available by the call system.

# 4.3 Rectification of Faults

When faults occur in a call system, these must be investigated and repaired without delay by a call system specialist. The repair work must start within 24 hours of reporting of the fault. The repair work must be carried out in such a way that the downtime for the functioning of the devices and system parts is kept as short as possible.

After completion of the work, a function test of the interference-suppressed, repaired or repla-

ced device or system part must be carried out by a specialist. All repair measures must be recorded in the log book of the call system by the specialist delegated to rectify the fault.

The timely and professionally carried out maintenance should be guaranteed through a service and maintenance contract between the operator of the call system and the maintenance contractor, in order to guarantee the fastest possible effective fault clearance.

## 4.4 Log Book

A log book that can always be found next to the call system must be kept, in which all cases of faults with details of the cause, the author and all necessary and carried out maintenance and modification measures are written down. A log book can be found at the end of this document. The log book enables the operator and the delegated person to prove that they have carried out their duty of care when operating the call system. Furthermore, the log book is an important pre-requisite for the proper maintenance of the system as well as for the prompt and efficient repair work when faults occur.

## 4.5 Changes

Changes to the call system must only be carried out by a specialist for call systems. With every change, an extensive function check of the actual state of the call system must follow. All changes must be recorded in the log book of the call system. This must be done by the expert delegated to carry out the changes.

## 4.6 Shutdown, Partial Shutdown

The operator or the trained person delegated by the operator must provide an alternative control of the affected rooms in all cases in which the system or system parts are shutdown, until the function of the call system has been restored to all system units. All (partial) shutdowns must be recorded in the log book of the call system with the reason, scope and length of time. This must be carried out by the personnel, the operator, the "trained person" or the specialist delegated to carry out the shutdown.

# 5. Maintenance

# 5.1 Preliminary Notes on Maintenance

The three components of maintenance: inspection – maintenance – repair, guarantee the availability, since wear and tear, errors and faults in the system can be recognised early and suitable counter-measures can be undertaken immediately.

# 5.2 Responsibility for Maintenance

The responsibility for maintenance lies with the operator of a call system. The operator should guarantee the proper maintenance of the call system in accordance with DIN VDE 0834 with respect to the time and expert fulfilment. The operator can transfer the responsibility to a specialist company. Hereby the necessary replacement parts logistics and the availability must be taken into account.

## **5.3 Inspection of the System**

The inspection of the system consists first of the inspection of the log book of the system to ascertain the inspection and maintenance history and possible existing defects. Then the functioning of the installed devices is checked, including a visual inspection for mechanical damage.

Inspections should be carried out at least four times a year at approximately regular intervals.

The following should be checked for the intended functionality:

- Call buttons and mobile devices for call release, which are provided for use by patients or prisoners
- Indicator lamps and acoustic noise
   generators
- Power supplies, adherence to parameters according to manufacturer information

At least once a year the following should also be checked for the intended functionality:

- All other devices for call release, call cancellation and presence indication
- All other indicator installations
- All installations for call answering including possible speech paths, volume, speech clarity

The inspections carried out as well as their results should be documented in the log book of the system by the expert delegated to carry out the inspections. They form the basis for possible necessary repairs.

# 5.4 Servicing the System

The servicing of the system should be carried out according to the manufacturer's instructions, but at least once a year. This includes where applicable:

- Maintenance and cleaning of system parts
- Cleaning of ventilation slots
- Exchange of components with limited lifespan (e.g. batteries)
- Resetting and adjustment of components and devices

Deviations from the nominal state should be corrected. For software-controlled systems, it is recommended that an update of the software is carried out as part of the servicing. Regular updates of the software according to the manufacturer's instructions are recommended, in order to guarantee the operational security of the entire system.

The servicing carried out as well as its results should be documented in detail in the log book of the system by the expert delegated to carry out the servicing.

# 5.5 Maintenance of the System

Maintenance of the system includes the repair or the exchange of the defective system parts with subsequent functionality checking of those parts, including their interaction with the entire call system.

# Master Data Call System

System location		
Name:		
Address:		
Telephone:		
Bufnummer Service modem:		
Operator		
Name:		
Address:		
Telephone:		
Trained person*		
Name:		
Address:		
Telephone:		
if other persons have been trained, pla	ease and them on a new sheet	
Installer		
Name:		
Address:		
Telephone:		
Maintenance eng <u>ineer</u>		

Name:	
Address:	
Telephone:	

Basic Data						
Manufacturer:						
Contact address:						
	1					
Eavi						
Fax.						
Contact person:						
Telephone:						
Hotline / Switchboard						
Name:						
Address:						
	]					
Telephone:						
Installed system						
System:						
Year of manufacture	1					
			Maintenance of call			
according to DIN /			system according to	1		
VDE 0834:			DIN / VDE 0834:			
Deviations:						
Type of service contract:				No.:		
Number of wards	1	Number			Number of	
		of rooms			beds:	
Extension						
System:						
Voor of monufactures						
Year of manufacture:						
Additions:						
Number of wards:	1	Number			Number of	
		of rooms			beds:	

# Commissioning log of the call system

1. The followi	ng system parts have been checked	according to the service documen	tation of the manufacturer:						
Call buttons	<ul> <li>Call buttons and mobile devices for call release</li> <li>All other operational devices such as presence buttons, cancel buttons etc.</li> <li>Indicator lamps and acoustic noise generators</li> <li>All other display units</li> </ul>								
All installati	<ul> <li>All installations for call answering including possible speech paths, volume, speech clarity</li> <li>Interfaces to systems that are not part of the call system</li> <li>Power supplies</li> </ul>								
2. The following system documentation has been given to the operator:									
Location of documentation:									
System doo	System documentation with cable plan, distributor wiring, device list etc.								
Installation     Installation     User manua     Service inst	Installation and commissioning instructions User manuals Service instructions								
Configuratio	Configuration of the system								
3. Training of th	e operator in the operation of the c	all system:							
Date:		Repeated:							
4. Acceptance of	carried out on:								
Date:									
	Company	Name	Signature						
Planer:									
Installer:									
Operator:									

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Dealt with on Entered by											
Forwarded on											
System part											
What are the symptoms? Type of fault											
Time											
Date											

Report plan	_					
Event – System	Report organised	When Yes, who is dealing with it?	What needs doing	Replacement devices	Repair arranged	Service partner

Entered by											
Which fault was rectified?											
System part											
Work carried out – determined cause											
Time											
Date											

# Service Work Carried Out – Inspection – Service – Repairs

# **Brochures of the ZVEI Safety/Security Division:**

#### Evakuierung und Fluchtweglenkung (Evacuation and Escape Route Guidance)

- Sicherheit in Schulen ("Safety in schools" only in German)
- Amok und Sicherheitsalarme ("Amok and safety alarms" only in German)
- Effektive Gebäudeevakuierung ("Effective building evacuation" only in German)
- Anlage zu Broschüre Effektive Gebäudeevakuierung ("Annex to brochure: Effective building evacuation" only in German)
- · Adaptive Fluchtweglenkung / Adaptive escape route guidance (German and English)

#### Beschallungstechnik (Acoustics Technology)

- Elektroakustische Alarmierung ("Electro-acoustic alerting Image brochure" in German only
- ZVEI-Merkblatt 33014-2017-08 Auswahl und Planung von Anlagen zur Alarmierung im Gefahrenfall mittels Sprachdurchsagen ("ZVEI-leaflet 33014 Selection and planning of systems for alerting in the event of danger, by means of voice announcements" only in German)
- ELA-Info ("ELA-Info" only in German)
- ZVEI-Merkblatt 33001:2016-07 Verkabelung von Sprachalarmanlagen (SAA) auf Basis der DIN VDE 0833-4 unter Berücksichtigung der Muster-Leitungsanlagenrichtlinie MLAR ("ZVEI leaflet 33001:2016-07 – Wiring of voice alarm systems (SAA) based on DIN VDE 0833-4 under consideration of MLAR (Pattern-Line System Directive)" only in German)
- ZVEI-Merkblatt 33004-2010-12 Elektroakustische Alarmierungseinrichtungen ("ZVEI-leaflet 33004:2010-12 – Electro-acoustic alarm systems" only in German)
- Protokoll zur Prüfung und Abnahme von Sprachalarmanlagen und Elektroakustischen Notfallwarnsystemen ("Protocol for testing and acceptance of voice alarm systems and electro-acoustic emergency warning systems" only in German)
- Betriebsbuch f
  ür Sprachalarmanlagen und Elektroakustische Notfallwarnsysteme ("Operating manual for voice alarm systems and electro-acoustic emergency warning system" only in German) \*
- Alarmierungstexte in deutsch/englisch/französich/Alarmierungssignale auf USB-Stick ("Alarm texts in German / English / French / Alarm signals on USB stick ) \*\*
- Induktive Höranlagen ("Inductive sound systems" only in German)

#### Brandmeldesysteme (Fire Alarm Systems)

- Kompetenz und Qualität DIN 14675 Vorteile f
  ür die Planung ("Competence and quality - DIN 14675 Advantages for planning" only in German)
- Rauchwarnmelder im Katastrophenfall ("Smoke alarms in catastrophe situations") in German and English)
- Flyer der Kampagne Rauchmelder retten Leben ("Flyer of the campaign "Smoke detectors save lives" D, GB, TK, P, RUS)
- Flyer Senioren /Flyer Migranten/Flyer Rauchwarnmelder (Download) ("Flyer Fire Protection for Seniors / Flyer Migrants / Flyer Smoke Alarm (Download)")
- Beraterbroschüre Rauchmelder retten Leben ("Advice brochure: Smoke detectors save lives" only in German)

#### Cyber Sicherheit (Cyber Security)

• Cyber-Sicherheit und Schutz vor Wirschaftsspionage – Ein Positionspapier ("Cyber security and protection against industrial espionage – a policy document" only in German)

<sup>\*</sup> Order from ZVEI-Services GmbH - zsg@zvei-services.de

<sup>\*\*</sup> Order from ZVEI-Services GmbH – zsg@zvei-services.de – Price 79,- Euro + postage/packing + VAT.

#### Einbruch- und Überfallmeldeanlagen (Burglar and Attack Alarm Systems)

- Kein Raum für ungebetene Gäste ("No room for uninvited guests" only in German)
- Flyer der Kampagne "Nicht bei mir! ("Flyer of the campaign "Not with me!" only in German)
- Informationsdokument in Ergänzung zur DIN VDE 0833-3
- ("Information document as supplement to DIN VDE 0833-3" only in German)
- Informationsdokument in Ergänzung zur DIN VDE 0833-3 Hinweise zum Einsatz von Bewegungsmeldern mit passiver Infrarottechnik ("Information document as supplement to DIN VDE 0833-3 – Notes on the use of motion detec-

tors with passive infra-red technology" only in German)

- Informationsdokument für Sicherheitsdienstleistungen "Alarmverifikation"
- ("Information document for security services "Alarm verification" only in German)
- Begehung und Instandhaltung von Gefahrenmekldeanlagen f
  ür Brand, Einbruch/
  Überfall und Sprachalarm gem
  ä
  ß DIN VDE 0833-1

("Site inspection and maintenance of hazard alert systems for fire, burglary/attack and speech alarm in accordance with DIN VDE 0833-1" only in German)

#### **Rufanlagen (Call Systems)**

- Rufanlagen nach DIN VDE 0834 ("Nurse call systems in accordance with DIN VDE 0834 (German/English)
- Rufanlagen und IP ("Call systems and IP" only in German)

#### Videosysteme (Video Systems)

- ZVEI-Positionspapier Video Mehrwert durch Standardisierung
   ("ZVEI Policy document video "Added value through standardisation" only in German)
- Was moderne Videosysteme im Alltag leisten
- ("What modern video systems do in everyday life" only in German)
- ZVEI-Merkblatt 33011:2016-02 Sicherer Aufbau und Nutzung von Videosystemen

("ZVEI leaflet 33011:2016-02 - Safe construction and use of video systems" only in German)

#### Rauch- und Wärmeabzugsanlagen und Natürliche Lüftung (Smoke and Heat Ventilation Systems and Natural Ventilation)

- Mehr Energieeffizienz durch natürliche Lüftung ("Energy efficiency with natural ventilation" only in German)
- Aufzugsschachtentrauchung ("Lift shaft smoke extraction common guidelines from VDMA and ZVEI" only in German)

# Leaflets of the ZVEI Safety/Security Division:

33001:2016-09	<ul> <li>ZVEI-Merkblatt 33001:2016-07 Verkabelung von Sprachalarmanlagen (SAA) auf Basis der DIN VDE 0833-4 unter Berücksichtigung der Muster-Leitungsanlagenrichtlinie MLAR ("ZVEI leaflet wiring of voice alarm systems (SAA) based on DIN VDE 0833-4 under conside-</li> </ul>
	ration of the MLAR" only in German)
33002:2012-07	• ZVEI-Merkblatt Muster-Leitungsanlagen-Richtlinie (MLAR) Kommentar des ad hoc AK
	("ZVEI leaflet sample line directive (MLAR) – comment of the ad hoc WP only in German) *
33003:2014-09	• ZVEI-Merkblatt Rauchwarnmelder (RWM) und Brandmeldeanlage (BMA) mit automatischen
	Brandmeldern ("ZVEI leaflet smoke alarm (RWM) and fire alarm system (FAS) with automatic fire alarms" only in German)
33004:2010-12	<ul> <li>ZVEI-Merkblatt 33004-2010-12 Elektroakustische Alarmierungseinrichtungen</li> </ul>
	("ZVEI leaflet electro-acoustic alarm devices systems" only in German)
33005:2010-06	<ul> <li>ZVEI-Merkblatt DIN 14675 Austausch von Brandmeldern</li> </ul>
	("ZVEI leaflet DIN 14675 replacement of fire alarms" only in German)
33006:2015-09	• ZVEI-Merkblatt Anforderungen an Personen im Umgang mit Brandmeldeanlagen (BMA)
	Neufassung DIN VDE 0833-1 ("ZVEI leaflet requirements for persons in the handling of fire alarm systems new edition DIN VDE 0833-1" only in German)
33007:2012-01	• ZVEI-Merkblatt Automatische Videobildanalyse – Anforderungsprofile und Qualitätskriterien
	("ZVEI leaflet automatic video image analysis – requirements profile and quality criteria" only in German)
33008:2012-07	• ZVEI-Merkblatt Normen und Richtlinien der Gefahrenmeldeanlage versus Betriebssicherheits-
	verordnung ("ZVEI leaflet standards and guidelines of the hazard alarm system versus operational safety regulations" only in German)
33009:2012-08	• ZVEI-Merkblatt Verfügbarkeit von Brandmeldeanlagen ("ZVEI leaflet Availability of fire alarm
	systems" only in German)
33010:2014-02	• ZVEI-Merkblatt für die Interaktion mobiler Endgeräte mit Brandmelderzentralen über IP Netze
	("ZVEI leaflet for the interaction of mobile devices with detection and fire alarm systems via IP" German/English)
33011:2016-02	<ul> <li>ZVEI-Merkblatt 33011:2016-02 Sicherer Aufbau und Nutzung von Videosystemen</li> </ul>
	("ZVEI leaflet safe installation and use of video systems" only in German)
33012:2016-03	ZVEI-Merkblatt Bauproduktenverordnung (BauPVO)
	("Construction products regulations" German/English)
33013:2016-05	• ZVEI-Merkblatt Fluchtweglenkung ("ZVEI leaflet adaptive escape routing" German/English)
33014:2017-08	• ZVEI-Merkblatt 33014-2017-08 Auswahl und Planung von Anlagen zur Alarmierung im Gefah- renfall mittels Sprachdurchsagen
	("ZVEI-leaflet selection and planning of alerting in dangerous situations by means of general
	announcements" only in German)

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