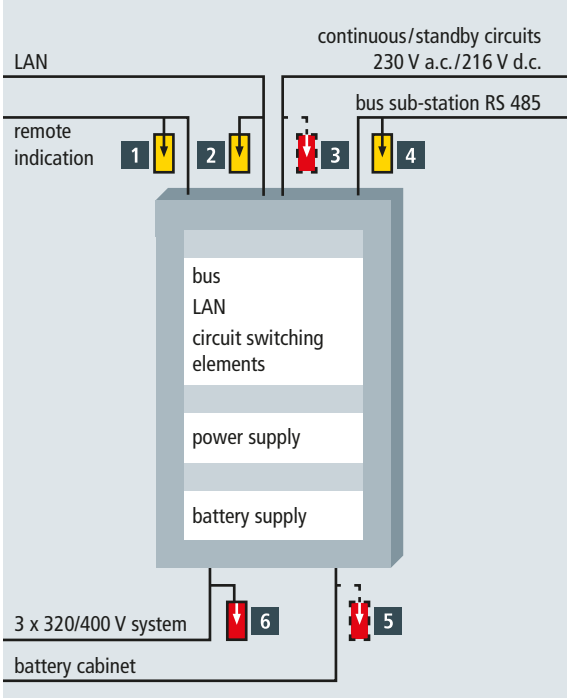
Surge protection for safety lighting systems

The main functions of safety lighting systems are the designation and lighting of escape routes, lighting of work stations with a special risk until work is safely finished and lighting to prevent panic.

In the following, surge protective devices for central power supply systems (CPS) (central battery systems) are described.



No.	Surge protective device	Part No.
1	BLITZDUCTOR BXT ML4 BE 24 * + BXT BAS base part	920 324 920 300
2	DEHNpatch DPA M CLE RJ45B 48	929 121
3	DEHNguard DG M TN 275	952 200
4	BLITZDUCTOR BXT ML2 BD HFS 5 * + BXT BAS base part	920 271 920 300
5	DEHNguard DG M TN 275	952 200
6	DEHNguard M TNS 275 * DEHNguard M TT 275 *	952 400 952 310

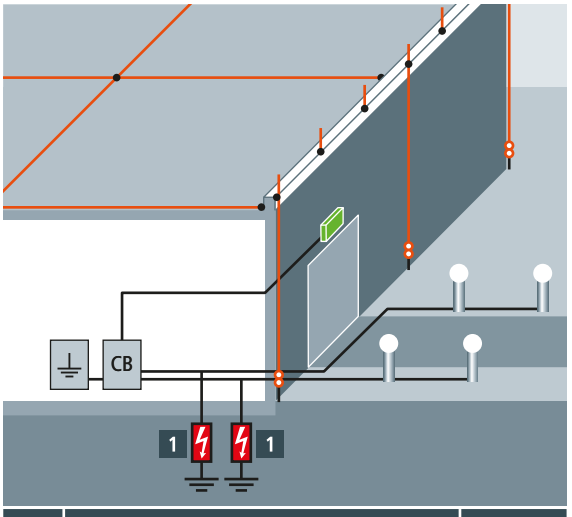
* Observe individual interfaces/system configurations

Figure 9.31.1 Central battery system, feeder cable, battery cabinet feeder cable, bus line, remote indication line, LAN line as well as continuous/standby circuit lines in LPZ 1 and in the same fire compartment

These systems feature the following interfaces:

- Power supply system;
- Battery cabinet;
- Circuit switching elements which, in combination with the system-specific electronic ballasts of the luminaires, ensure continuous/standby operation (individually assigned) and a switched permanent light in the circuit. These elements allow to perform the required test and to monitor the individual lighting systems. Moreover, they incorporate the required overcurrent protective devices which protect the circuit;
- Bus communication with the central battery system/subpanels;
- LAN;
- Remote indication;
- Freely programmable inputs and outputs.

In general, a risk analysis must be performed to determine whether surge protective devices (SPDs) must be installed for the interfaces. To protect the central battery system (e.g.) almost without risk, surge protective devices are required for all interfaces listed above (**Figure 9.31.1**). In **Figures 9.31.1 to 9.31.4** the SPDs, which are normally required to protect the interfaces, are represented with a solid line. Surge protective devices which are installed following a risk analysis are dotted.



No.	Surge protective device	Part No.
1	DEHNsecure DSE M 1 242 (2 x) MVS 1 3 busbar	971 122 900 615

Figure 9.31.2 Lightning equipotential bonding for the circuits of the safety lighting system at the zone transition from the building to the ground

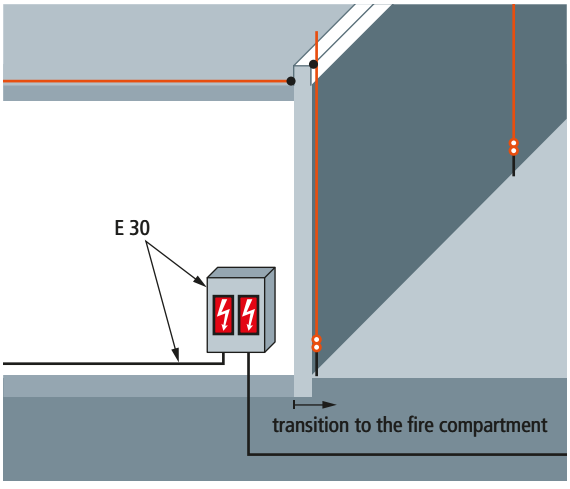


Figure 9.31.3 Lightning equipotential bonding at an E 30 line in an E 30 distribution board (inside of the outer wall)

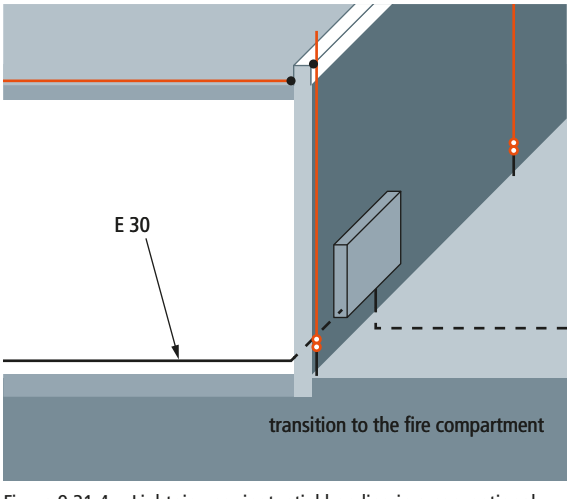


Figure 9.31.4 Lightning equipotential bonding in a conventional distribution board (outside of the outer wall)

While in **Figure 9.31.1** it is assumed that a coordinated type 1 lightning current arrester is installed in the power supply and information technology system of the building, a type 1 SPD is required for the outgoing circuits of the safety lighting system since lightning equipotential bonding is required (**Figure 9.31.2**). Since these circuits are both supplied during a.c. and d.c. operation, the type 1 arrester installed at the zone transition from LPZ 0_A to LPZ 1 (entry point to the building) must be suitable for this purpose. In this case, standard spark-gap-based arresters designed and tested for use in a.c. systems cannot be used due to the lacking zero crossing during d.c. operation which extinguishes the spark gap. DEHNsecure M 1 242, which is both designed for d.c. and a.c. operation (max. backup fuse 10 gl/gG), is ideally suited for this purpose.

The function of the cable network must not only be ensured in case of failure, but also if surge protective devices are used. This means that the surge protective device provided in the cable must be installed in an E 30 distribution board (**Figure 9.31.3**). To this end, the E 30 distribution board must be dimensioned in such a way that the maximum ambient temperature of the surge protective device is not exceeded. To ensure this, the datasheet of the surge protective device must be made available to the manufacturer of the E 30 distribution board.

However, if the cable is led through the outer wall and a surge protective device is installed outside the outer wall, a conventional distribution board, which must be selected according to IP criteria, is sufficient (**Figure 9.31.4**).