



Surge protection for churches

Churches are buildings of high cultural value and places of public assembly. Therefore, they must be equipped with permanently effective lightning protection systems as described in chapter 18 of Supplement 2 of the German DIN EN 62305-3 lightning protection standard. The IEC 62305-4 (EN 62305-4) lightning protection standard describes how to implement surge protection measures. Moreover, the IEC 60364-1 (HD 60364-1) standard requires that "property shall be protected against damage as a consequence of overvoltages such as those originating from atmospheric events or from switching" (section 131.6.2).

Figure 9.24.1 shows an example of the standard equipment of a church. The circuit of the control line of the bell controller is illustrated in detail in **Figure 9.24.2**.

If the separation distance s is maintained between the down conductors/lightning current carrying parts and the cables installed in the steeple, flashover is not to be expected, however electromagnetic coupling may occur. The following measures can be taken to minimise electromagnetic coupling:

- ➔ Short cable lengths
- ➔ No/little loop formation

If these measures are not feasible, surge protective devices must be installed.

Lightning equipotential bonding

A lightning protection system requires lightning equipotential bonding for metallic systems and all buried cables entering the building. In case of churches, equipotential bonding must always be established for the low-voltage supply and other cables, if any (e.g. escape lighting).

Surge protection

The cables in the bell tower and nave such as the cables of the electric clock mechanism and the bell controller are frequently long and/or form loops. These two systems are time synchronised via the DCF 77 signal.

If the electrical hymn board is not radio controlled, electromagnetic coupling is to be expected.

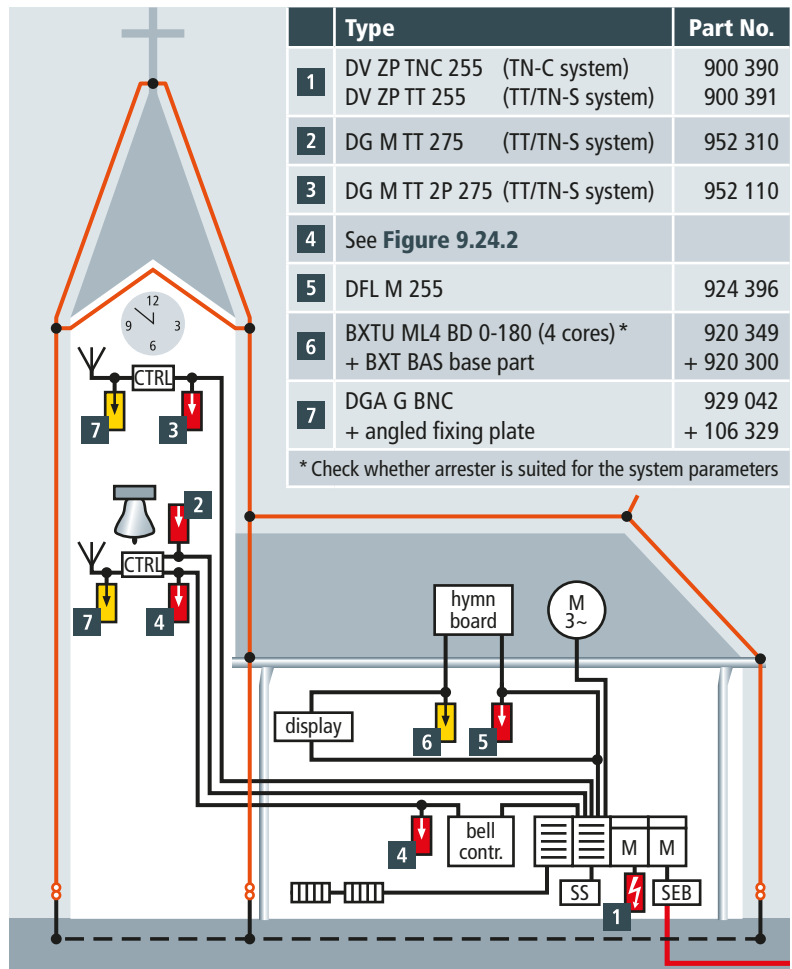


Figure 9.24.1 Principle of external and internal lightning protection for a church with steeple

In addition to the systems described before, the pipe heating system, electronic organ and sound system are also highly susceptible to electromagnetic coupling.

In the example shown, a separate earthing conductor to the main earthing busbar is not required for type 2 surge protective devices (230 V or 230/400 V) for power supply systems since the first surge protective device is already earthed.

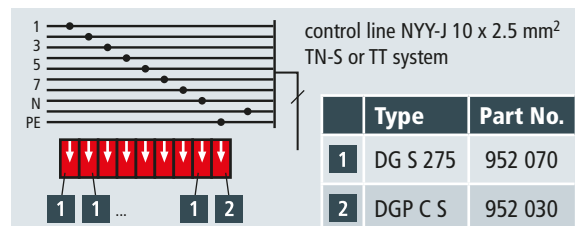


Figure 9.24.2 Example of surge protective devices for the bell controller