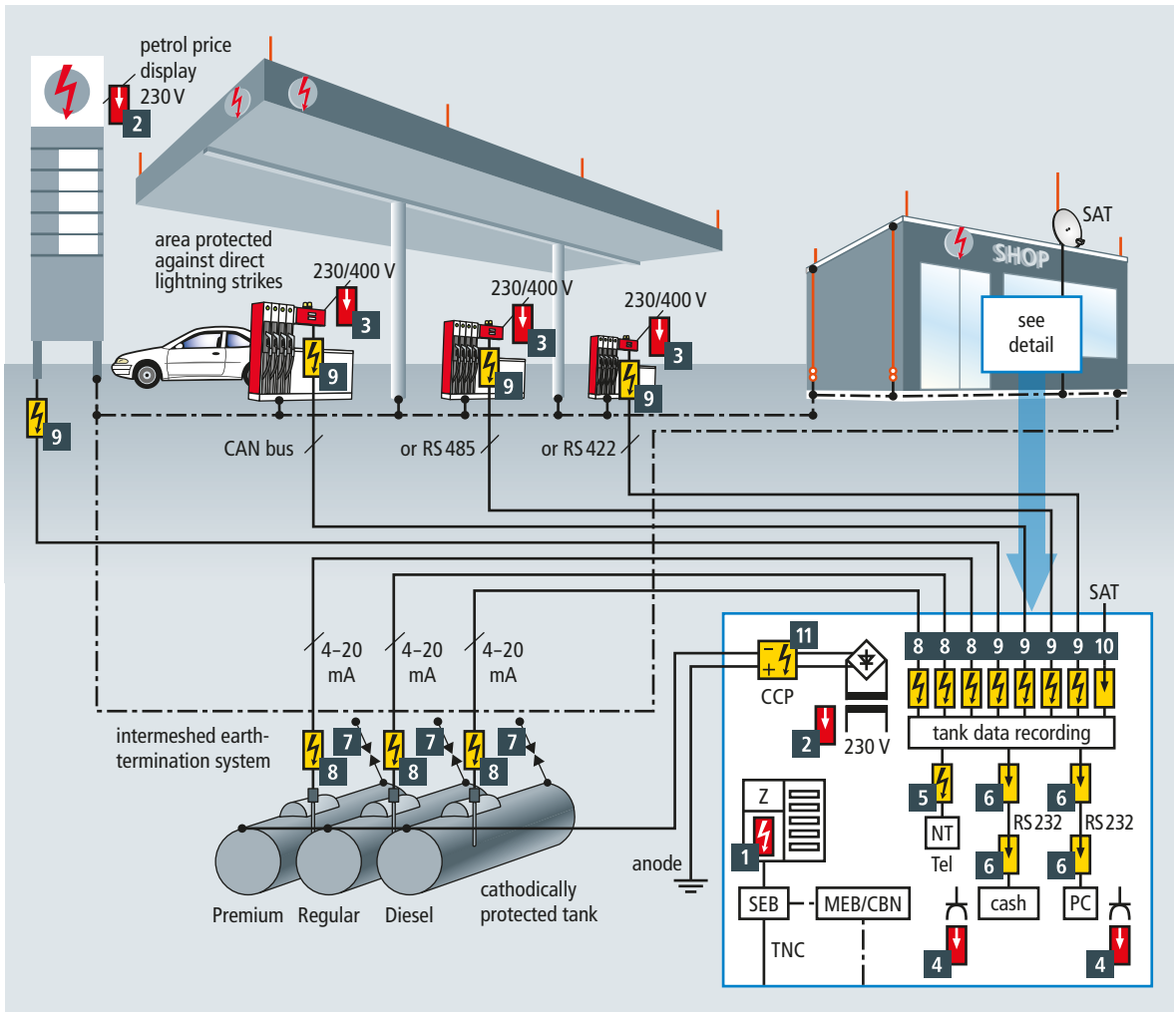




Surge protection for petrol stations



Use	Type	Part No.	Use	Type	Part No.
1 T... system, 3~ T... system	DV M T... 255 alternative: DV ZP T...	951... 900 3...	7 Zone 1 or 2	EXFS 100	923 100
2 TN system, 1~ TT system, 1~	DG M TN 275 DG M TT 2P 275	952 200 952 110	8 4-20 mA: 2 single cores 4-20 mA: 4 single cores	BXT ML2 BE S 24 BXT ML4 BE 24 + BXT BAS	920 224 920 324 920 300
3 TN-S system, 3~ TT system, 3~	DG M TNS 275 DG M TT 275	952 400 952 310	9 CAN, RS 485, RS 422: 2 single cores CAN, RS 485, RS 422: 2 single cores	BXT ML2 BE HFS 5 BXT ML4 BE HF 5 + BXT BAS	920 270 920 370 920 300
4 1~	DPRO 230	909 230	10 Satellite antenna	DGA FF TV	909 703
5 Telephone	BXT ML2 BD 180 + BXT BAS	920 247 920 300	11 Protective circuit	BVT KKS ALD 75	918 420
6 25-pin D-Sub	FS 25E HS 12	924 018			

Figure 9.21.1 Petrol station with lightning protection system, intermeshed earth-termination system, protective and functional equipotential bonding and surge protective devices

Petrol stations are highly vulnerable to lightning strikes and surges due to their extremely sensitive control and display systems.

In Germany, the necessity of a lightning protection system for petrol stations must be determined amongst others based on a risk analysis according to the German Ordinance on Industrial Safety and Health (BetrSichV), the German technical rules for operating safety (TRBS 2152 Part 3), VDE standards and fire protection requirements of the relevant building regulations. The German Ordinance on Industrial Safety and Health (BetrSichV) requires to avoid all sources of ignition. Some building regulations specify that structures where a lightning strike can easily occur or can have serious consequences due to their location, type of construction or use must be equipped with permanently effective lightning protection systems.

The risk analysis described in the IEC 62305-2 (EN 62305-2) lightning protection standard can be used to determine possible risks. The system-specific parameters define the existing risk of a structure. If the risk values determined are higher than the tolerable risks listed in the standard, measures (external lightning protection, surge protection, fire alarm systems, etc.) must be taken which reduce the inadmissibly high risks to an acceptable level.

The IEC 60364-1 (HD 60364-1) standard specifies that "property shall be protected against damage as a consequence of overvoltages such as those originating from atmospheric events or from switching".

The surge protective devices recommended in this standard must not be installed in Ex zones (zone 0, 1 and 2), if any. If surge protective devices are located in hazardous zones, adequate measures (e.g. approved enclosures and/or approved surge protective devices) must be taken to avoid ignition.

Equipment located in the forecourt (e.g. petrol price display) and the incoming utility line are vulnerable to direct lightning strikes. Therefore, lightning current arresters are installed at the entrance point into the building.

The fuel dispensers are located underneath a projecting metal roof and are thus protected against direct lightning strikes. For this reason and due to the intermeshed earth-termination system (**Figure 9.21.1**), surge arresters are installed at the entrance point of the lines into the petrol station building and at the entrance point of the lines into the fuel dispenser to protect the lines leading to the fuel dispenser electronics.

A professional external lightning protection system as per IEC 62305 (EN 62305), consistent lightning equipotential bonding and additional surge protection measures are required to protect petrol stations from direct lightning strikes. The table in **Figure 9.21.1** shows which types of surge protective devices can be used to protect the different interfaces and system components.

It is important to interconnect all metal constructions (e.g. pipes, fuel dispenser enclosures, tanks) and to connect them to the earth-termination system of the petrol station building. According to IEC 62305-3 (EN 62305-3), the earth-termination system should have an earth resistance of $< 10 \Omega$ (recommendation). Spark gaps for use in hazardous areas must be used to connect petrol stations with cathodic corrosion protection to the earth-termination system.

The bus systems, sensors and information technology connections listed in **Figure 9.21.1** are by no means complete and merely serve as examples. They may only be installed based on the information provided in the detailed planning and the requirements and notes of the acceptance body.

