APPLICATION EXAMPLE

FOR PETROL STATIONS

No. 5

BL 5/E/0701

We offer industry-oriented application examples

Petrol stations are specially at risk of being affected by overvoltages because they are large and exposed facilities.

When building new petrol stations, high safety requirements for watercourses, explosion and lightning protection do apply.

Standards must be taken into consideration, e. g.

- national provisions for flammable liquids
- national technical regulations for flammable liquids, e.g. German TRBF 112/212
- national stipulations made by the technical supervisory institute, e.g. TÜV-leaflet
- national standards for establishing electrical systems in explosive areas, e.g. German standard DIN VDE 0165
- national general standards for the installation of lightning protection systems, e.g.German standard DIN VDE 0185 Part 1
- national standards for installing special lightning protection systems, e.g. German standard DIN VDE 0185 Part 2
- national standards stating the basic principles of the installation of lightning protection systems, e.g. German standard DIN VDE 0185 Part 100)

Regarding the example of a modern highway petrol station (cover picture) the protective measures realised are introduced and explained.

The installations located outside of the building, e.g. indication of fuel prices, lighting masts for traffic zones as well as advertising banners are at risk of being hit by direct lightning strikes and are therefore circuited with lightning current arresters DEHNbloc/3 at the entry of the building. This does also apply to the power supply line coming from outside.

The petrol pumps are located under a metal canopy, i.e. in a zone protected against direct lightning strikes. Therefore, surge arresters were used at the line entry going into the building and at the line entry of the petrol pump for a protective circuiting of the lines led to the electronic assembly of the petrol pumps.

Laboratory tests confirm the effectiveness and system compatibility of DEHN protective devices for the electronic fueling systems of the most important manufacturers. These are e.g. **Schwelm, Scheidt & Bachmann and Dresser Wayne.**

A basic pre-condition for the protection against direct lightning strikes is an appropriately installed external lightning protection system in combination with consequent lightning protection equipotential bonding and additional surge protection measures in accordance with national standards.

For the transmission of data from the petrol pumps to the fuel data center, usual interfaces are used, such as RS 485, RS 422, 20 mA as well as 2-wire and 4-wire bus systems. The following protection proposal shows the types of protective devices which are suitable for circuiting the different interfaces and system components.

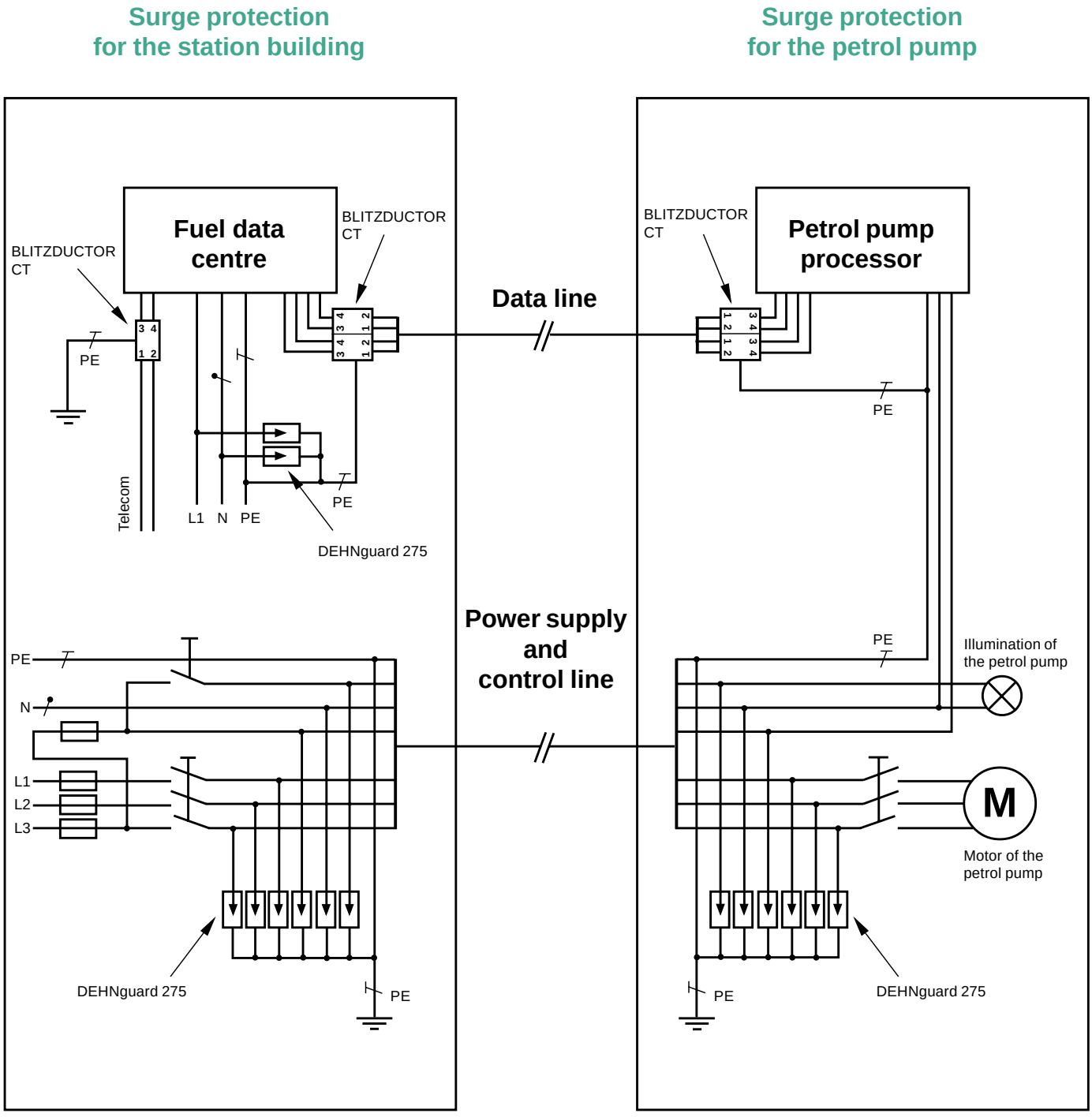
In the circuit diagram, the effective use of arresters is shown for the power and IT-network of a petrol facility.

It is important that all metal structures, conduits, petrol pump enclosures as well as tanks are combined and connected with the earth-termination system of the building. The earth-termination system must have an earth resistance which is less than 10 Ohm in accordance with DIN VDE 0185 Part 2, subclause 6.3.4.5 .

Tank facilities with cathodic corrosion protection may only be connected with the earth-termination system via Ex-spark gaps.

Circuit Diagram

Example for protective circuiting a fuel data line, the 230/400 V-supply line and control line in the station building and the petrol pump



(For further information please also see our imprint No. DS 649)

External lightning protection and surge protection of a petrol station

with electronic transmission of fuel data

L1 L2 L3

PEN

Foundation earth electrode in accordance with DIN 18014
Mesh size max. 20 x 20 m

DEHNguard TNS 230/400
Part No. 900 530

N

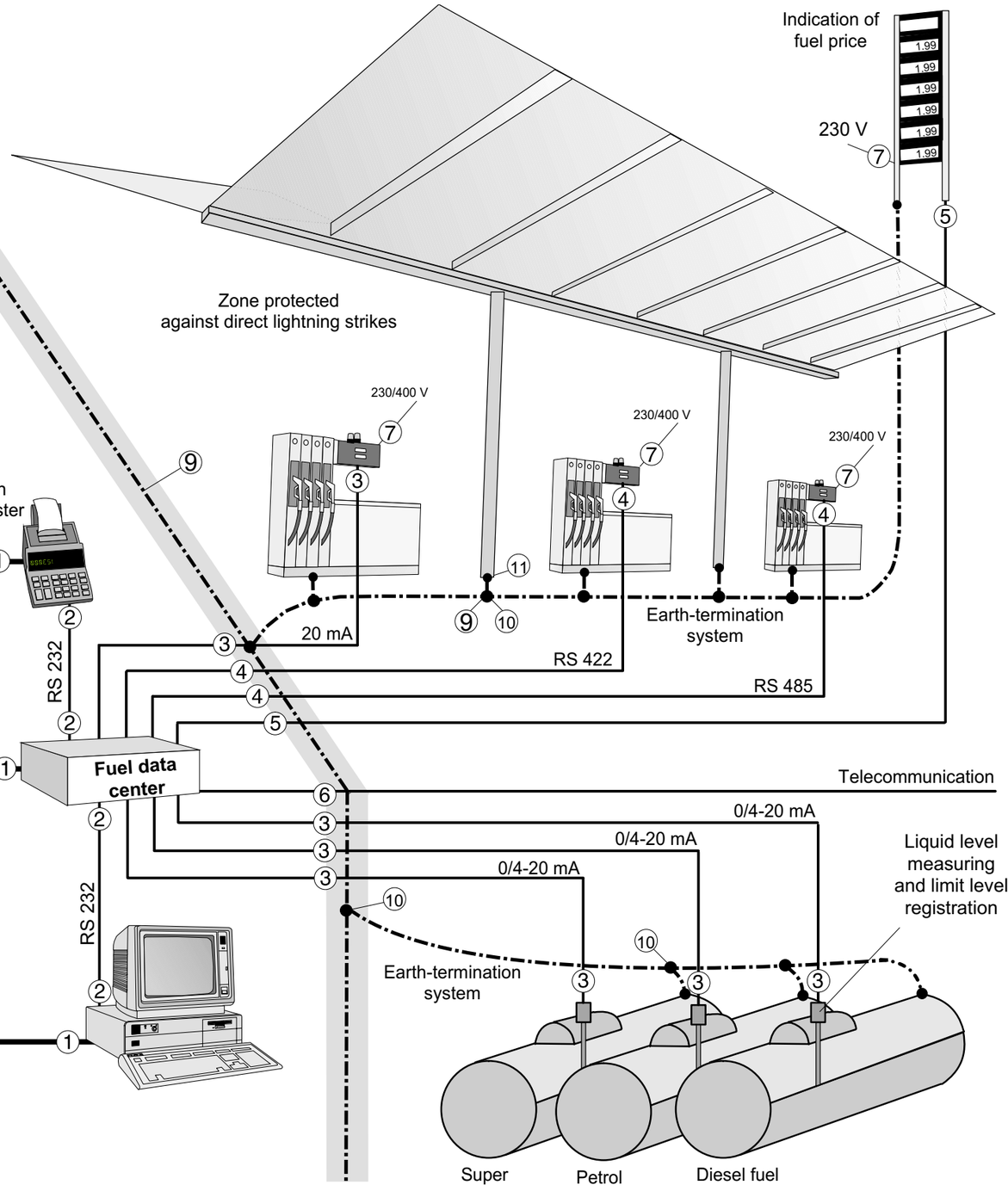
PE

DEHNbloc/3
Part No. 900 110

Line length 5 - 15 m
corresponding to the kind of laying
(Print No. 649/E and 702/E Chapter D2-01)

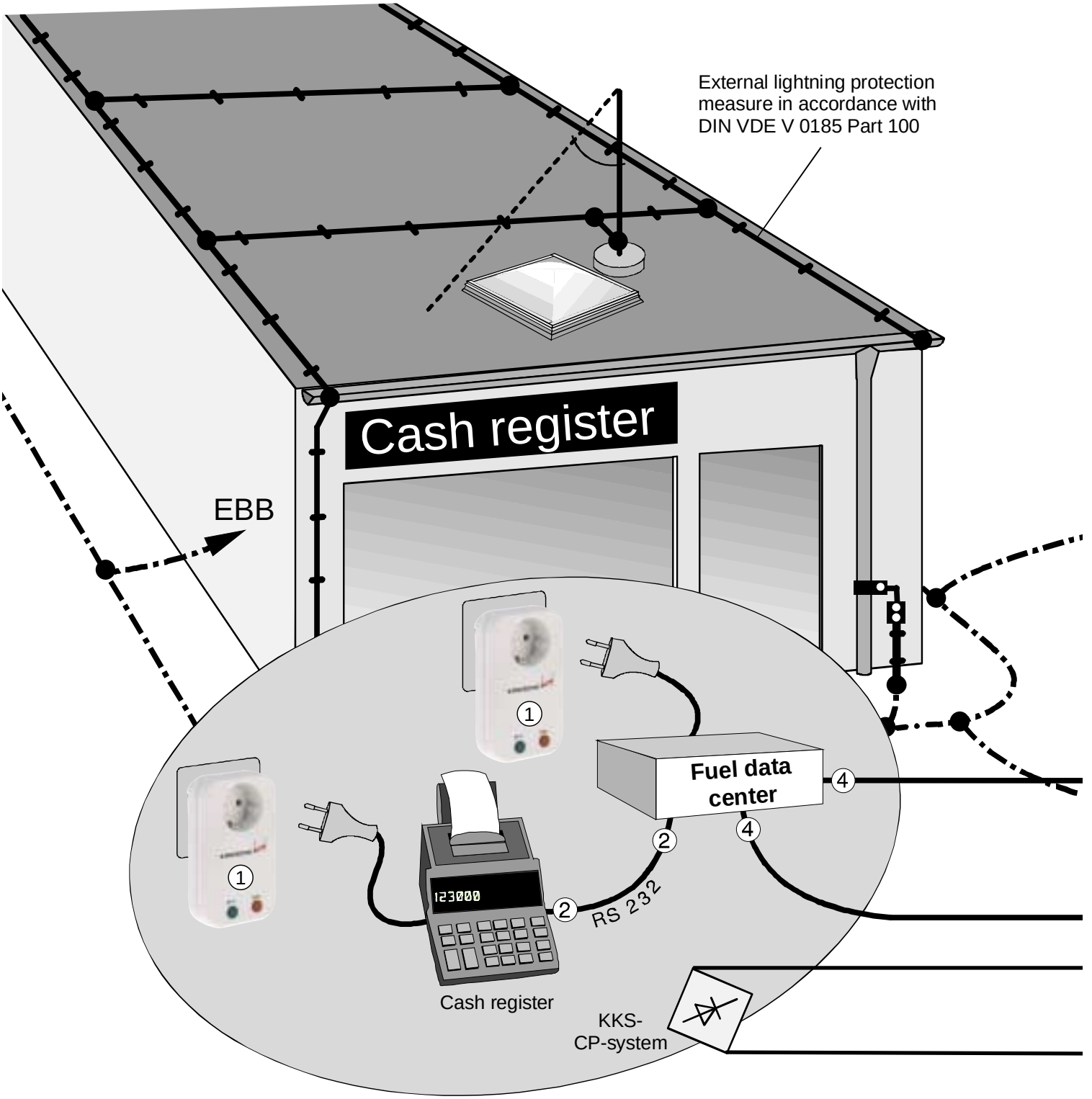
or
DEHNbridge Decoupling Coil

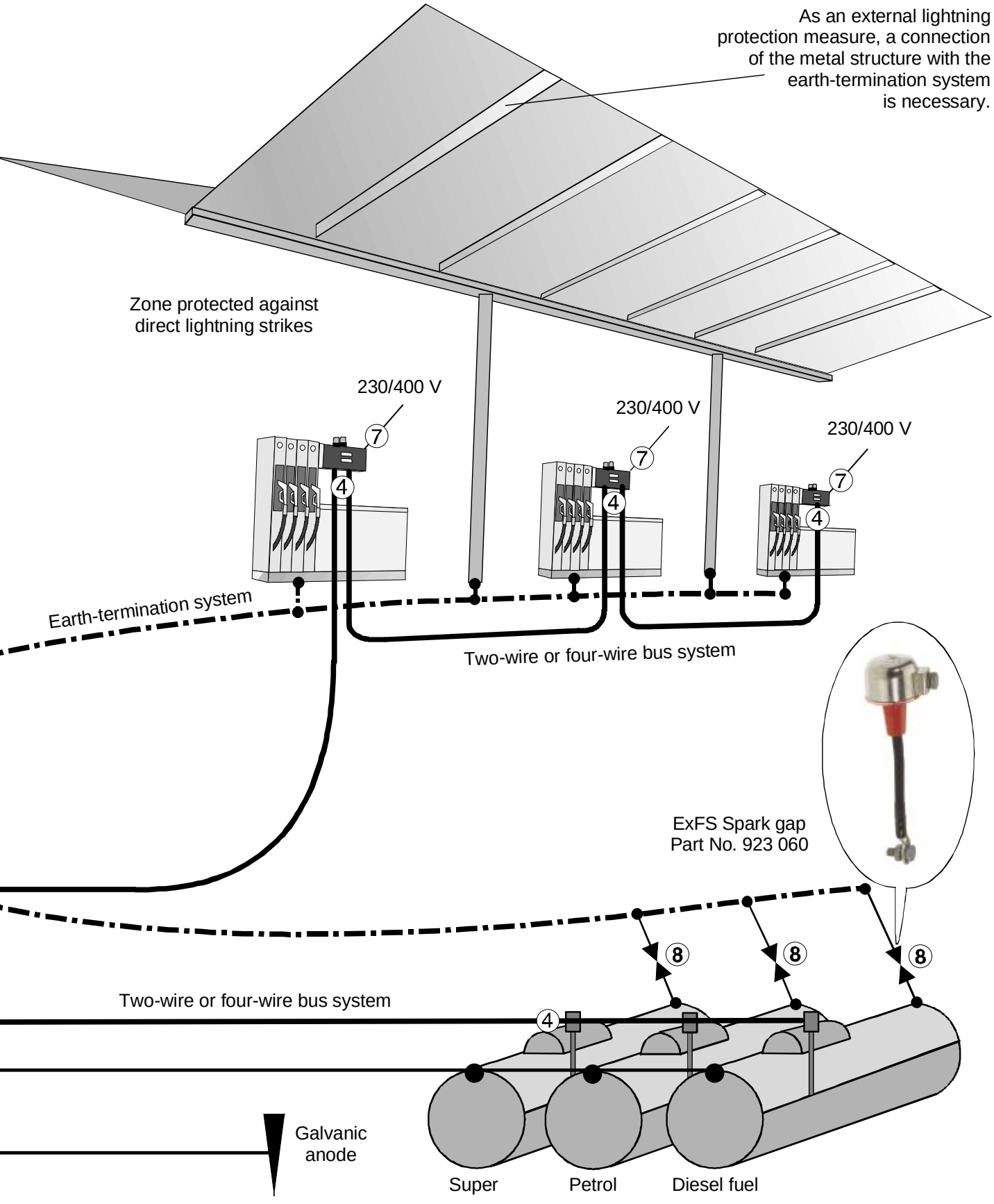
Station Building



External lightning protection and surge protection of a petrol station

with electronic transmission of fuel data




As an external lightning protection measure, a connection of the metal structure with the earth-termination system is necessary.
Zone protected against direct lightning strikes
230/400 V
230/400 V
230/400 V
7
4
Earth-termination system
Two-wire or four-wire bus system
ExFS Spark gap
Part No. 923 060
8
Two-wire or four-wire bus system
Galvanic anode
Super
Petrol
Diesel fuel

Products

Pos. **1**	S-Protector Surge protection adapter **Part No. 909 821**
Pos. **2**	FS 25E-HS Surge arrester **Part No. 924 018**
Pos. **3**	BLITZDUCTOR® CT Base part **Part No. 919 506** and module BE/C **Part No. 919 662**
Pos. **4**	BLITZDUCTOR® CT Base part **Part No. 919 506** and module BE/C **Part No. 919 660**
Pos. **5**	ÜSD 25-V24/S-KB Surge arrester **Part No. 924 040**
Pos. **6**	BLITZDUCTOR® CT Base part **Part No. 919 506** and module BD **Part No. 919 647**
Pos. **7**	DEHNguard® Surge arrester **Part No. 900 600**
Pos. **8**	ExFS Spark gap **Part No. 923 060**
Pos. **9**	Flat strip, stainless steel, 30 x 3.5 mm Material No. 1.4571/V4A **Part No. 860 335** for earth conductors and terminal lugs
Pos. **10**	Cross clamp, in acc. with DIN 48845 F, stainless steel, material No. 1.4571 for connections under ground **Part No. 318 209**
Pos. **11**	End piece with mit double cleat, stainless steel **Part No. 390 459**

S-Protector (Pos. 1)

FS 25E-HS (Pos. 2)

BLITZDUCTOR® CT (Pos. 3, 4 and 6)

ÜSD 25-V24/S-KB (Pos. 5)

DEHNguard® (Pos. 7)

ExFS (Pos. 8)

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