

# Testing of lightning protection systems

according to DIN EN 62305-3 (VDE 0185-305-3)  
in explosion hazardous areas



Test report No.:	
Date:	

## 1. General information:

### Location of the building to be tested:

Name:			
Contact:			
Address:			
Telephone:			

### Proprietor of the building to be tested / customer :

Name:			
Contact:			
Address:			
Telephone:		E-Mail:	
Person in charge:		Phone:	

### Address of the tester:

Name:			
Contact:			
Address:			
Telephone:		E-Mail:	

Valid work permit

### Address of the lightning protection system designer:

Name:			
Contact:			
Address:			
Telephone:		E-Mail:	

## 2. Details on the building:

Name of the building/complex:	
Location:	
Use:	
Built in (year):	
Extension (year):	
Building height:	
Building dimensions (circumference):	
Type of construction:	
Roof shape:	
Type of roofing:	

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## 3. Prerequisites of testing:

Description and drawing of the lightning protection system:

### Lightning protection standards and regulations in effect at the time the building is constructed:

<input type="checkbox"/> DIN EN 62305-3 (2011-10)	<input type="checkbox"/> DIN V VDE V 0185-3 (2002-11)	<input type="checkbox"/> DIN VDE 0185-1 (1982-11)
<input type="checkbox"/> VDE 0185-305-3 (2006-10)	<input type="checkbox"/> DIN V VDE V 0185-4 (2002-11)	<input type="checkbox"/> DIN VDE 0185-2 (1982-11)
<input type="checkbox"/> VDE 0185-305-3: supplementary sheets 1-5	<input type="checkbox"/> TGL _____	
<input type="checkbox"/> VDE 0185-305-4 (2011-10)		
Class of <input type="checkbox"/> I <input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV	Determination acc. to:	
Explosion protection document <input type="checkbox"/>	As of:	
Plan of Ex zones/Drawing No.		

## 4. Test object:

<input type="checkbox"/> External LPS	<input type="checkbox"/> Internal LPS	<input type="checkbox"/> Complete documentation
<input type="checkbox"/> Existing documents (implementation and acceptance protocols)		

## 5. Type of testing:

<input type="checkbox"/> Technical inspection acc. to German TRBS Part 1 (Technical Regulations for Operational Safety)		
<input type="checkbox"/> Inspection of planning documents	<input type="checkbox"/> before implementation	<input type="checkbox"/> periodic
<input type="checkbox"/> Test during construction	<input type="checkbox"/> after modification	

## 6. Details upon lightning protection system:

### 6.1 Air-termination systems:

Drawing No.:				
Mesh size:	<input type="checkbox"/> ≤ 5 m x 5 m	<input type="checkbox"/> ≤ 10 m x 10 m	<input type="checkbox"/> ≤ 15 m x 15 m	<input type="checkbox"/> ≤ 20 m x 20 m
	<input type="checkbox"/> ≤ 10 m x 20 m	<input type="checkbox"/> ≤ ____ m x ____ m		
Protective angle:				
Rolling sphere method:	<input type="checkbox"/> r = 20 m	<input type="checkbox"/> r = 30 m	<input type="checkbox"/> r = 45 m	<input type="checkbox"/> r = 60 m
Air-termination system:				
Material:	<input type="checkbox"/> Aluminium	<input type="checkbox"/> Copper	<input type="checkbox"/> StSt (V2A)	<input type="checkbox"/>
Roof superstructures (dimensions):				
Other:				

### 6.2 Down-conductor systems:

Down-conductor (description)				
Material:	<input type="checkbox"/> Aluminium	<input type="checkbox"/> Copper	<input type="checkbox"/> StSt (V2A)	<input type="checkbox"/>
Cross-section (mm):				
Quantity/Test joint/No.:	Quantity:	Test joint:	No.:	
Number of down-conductors:				
Other:				

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## 6.3 Earth-termination system:

Material:	<input type="checkbox"/> Steel, hot-dip galvanised	<input type="checkbox"/> StSt (V4A)	<input type="checkbox"/> Copper	<input type="checkbox"/>
Type/Design:	Type A: <input type="checkbox"/> Horizontal earthing electrode		<input type="checkbox"/> Vertical earthing electrode	
	Type B: <input type="checkbox"/> Foundation earthing electrode according to DIN 18014		<input type="checkbox"/> Surface earthing electrode	
Other:	<input type="text"/>			

## 6.4 Separation distance:

Separation distance calculated:	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Separation distance kept:	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Calculating the separation distance of:	<input type="text"/>	
Date:	<input type="text"/>	

## 6.5 Lightning equipotential bonding structure connected to metal installations:

Piping:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> connected, location of connection:	<input type="text"/>	
<input type="checkbox"/>	Ex-Zone:				
	Non-ignition-sparking connection technology observed:			<input type="checkbox"/> Yes	<input type="checkbox"/> No
	Terminal cross section $\geq 16 \text{ mm}^2 \text{ Cu}$ :			<input type="checkbox"/> Yes	<input type="checkbox"/> No
	<input type="checkbox"/> Connection with Ex FS				
Any scaffolding:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Connection correct	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Any framework:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Connection correct	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Any cable racks:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Connection correct	<input type="checkbox"/> Yes	<input type="checkbox"/> No

## 6.6 Lightning equipotential bonding structure connected to metal installations:

Type of system:	<input type="checkbox"/> TT	<input type="checkbox"/> TN-C	<input type="checkbox"/> TN-S	<input type="checkbox"/> TN-C-S	<input type="checkbox"/> IT				
Lightning current arrester SPD Type 1:	exists:		<input type="checkbox"/> Yes			<input type="checkbox"/> No			
	Manufacturer:				Product name:				
	Place of installation:								
	Proper function:		<input type="checkbox"/> Yes						<input type="checkbox"/> No
Other:	<input type="text"/>								

## 6.7 Lightning equipotential bonding structure connected to IT installations:

Data communication and telecommunication:	<input type="text"/>									
Measuring and control technology:	<input type="text"/>									
Coaxial conductors:	<input type="text"/>									
Lightning current arrester SPD Type 1 (D1 category)	exists:		<input type="checkbox"/> Yes						<input type="checkbox"/> No	
	Manufacturer:				Product name:					
	Place of installation:									
	Proper function:		<input type="checkbox"/> Yes						<input type="checkbox"/> No	
Special terms of use observed [e.g. Ex(i)]	<input type="checkbox"/> Yes		<input type="checkbox"/> No							
Other:	<input type="text"/>									

## 7. Testing of technical documentation:

ok		
<input type="checkbox"/> Complete and in line with the lightning protection standard	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<input type="checkbox"/> Complete and in line with the Ex standards and regulations?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

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## 8. Testing on site:

ok

### Condition of the external LPS:

8.1	<input type="checkbox"/> Installation of all conductors and system components	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8.2	<input type="checkbox"/> Installation and condition of the air-termination system	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8.3	<input type="checkbox"/> Installation and condition of the down-conductors	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8.4	<input type="checkbox"/> Earth-termination system		
	– All earth connections	<input type="checkbox"/> Yes <input type="checkbox"/> No	
	– Components affected by corrosion	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8.5	<input type="checkbox"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8.6	<input type="checkbox"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No	

### Condition of the internal LPS:

8.7	<input type="checkbox"/> Correct installation of all lightning current (SPD Type 1) and surge arresters (SPD Type 2)		
	– Power supply system	<input type="checkbox"/> Yes <input type="checkbox"/> No	
	– Information technology system	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8.8	<input type="checkbox"/> Damage or activation of the lightning current arrester	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8.9	<input type="checkbox"/> Interruption of SPD back-up fuses	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8.10	<input type="checkbox"/> Ignition type of protection arrester or installation housing observed	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8.11	<input type="checkbox"/> Continuous lightning equipotential bonding for new supply connections inside the building which have been installed since the last inspection	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8.12	<input type="checkbox"/> Equipotential bonding connections inside the building	<input type="checkbox"/> Yes <input type="checkbox"/> No	

### Separation distance:

8.13	<input type="checkbox"/> Separation distance between LPS and installations	<input type="checkbox"/> Yes <input type="checkbox"/> No	
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### Complements:

8.14	<input type="checkbox"/> Changes which require additional protection measures	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8.15	<input type="checkbox"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8.16	<input type="checkbox"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8.17	<input type="checkbox"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8.18	<input type="checkbox"/> Non-ignition-sparking ensured	<input type="checkbox"/> Yes <input type="checkbox"/> No	

## 9. Measuring details:

Measuring method:	
Measuring devices:	
Inventory no.	
Weather conditions:	

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## 10. Measuring:

Electrical conductivity of connections which are not visibly installed (test current recommended  $\geq 200$  mA)

Recommended value  $< 1$  ohm)

10.1 <input type="checkbox"/> Air-termination systems	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
10.2 <input type="checkbox"/> Down-conductors	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
10.3 <input type="checkbox"/> Earth conductors	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
10.4 <input type="checkbox"/> Equipotential bonding conductors	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
10.5 <input type="checkbox"/>	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
10.6 <input type="checkbox"/>	<input type="checkbox"/> Yes	<input type="checkbox"/> No	

## 10.7 Electrical conductivity of metal installations:

Piping:	Scaffolding:	Framework:	Cable racks:
$\Omega$	$\Omega$	$\Omega$	$\Omega$

## 10.8 Measuring the transition resistances R at all measuring points in order to determine the electrical conductivity of the earth conductors:

Test joint No.:	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10
Value in ohm:									
Test joint No.:	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19
Value in ohm:									
Test joint No.:	19-20	20-21	21-22	22-23	23-24	24-25	25-26	26-27	27-28
Value in ohm:									

## 10.9 Measuring the transition resistances R at all measuring points in order to determine the electrical conductivity of conductivity of down conductors and air-termination systems:

Test joint No.:	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10
Value in ohm:									
Test joint No.:	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19
Value in ohm:									
Test joint No.:	19-20	20-21	21-22	22-23	23-24	24-25	25-26	26-27	27-28
Value in ohm:									

## 10.10 Measuring the earthing electrode resistance $R_A$ of individual earthing electrodes when test joint is open:

Test joint No.:	1	2	3	4	5	6	7	8	9
Value in ohm:									
Test joint No.:	10	11	12	13	14	15	16	17	18
Value in ohm:									
Test joint No.:	19	20	21	22	23	24	25	26	27
Value in ohm:									

<b>Soil composition:</b>	<input type="checkbox"/> sandy soil	<input type="checkbox"/> gravel	<input type="checkbox"/> boggy soil, marshy ground, humus soil
	<input type="checkbox"/> stony	<input type="checkbox"/> concrete	<input type="checkbox"/> loamy soil, clay soil, farmland
<b>Soil state:</b>	<input type="checkbox"/> dry	<input type="checkbox"/> humid	<input type="checkbox"/> frozen

10.11 Measuring the earthing electrode resistance of the entire system when test joints are closed \_\_\_\_\_  $\Omega$

Visual inspection of the uncovered earthing electrode  Yes  No

Location of the uncovered earthing electrode:

Condition of earth-termination system  Yes  No

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## 11. Total earthing resistance of the system:

Type of measurement:	<input type="checkbox"/> without protective equipotential bonding conductor	$\Omega$
	<input type="checkbox"/> with protective equipotential bonding conductor	$\Omega$

## 12. Test report:

The LPS has no defects:  Yes  No

	see No.	Notes
The test revealed the following defects:		

Recommendation:

## 13. Time limits for required inspections:

According to German Health and Safety at Work Regulations BetrSichV § 3 (3), it is up to the employer (entrepreneur) to specify time limits for inspections. Based on relevant and objective arguments the inspector has to make suggestions for the time limit until next inspection.

### 13.1 Visual inspections:

Note:  
For a permanently effective lightning protection, the external lightning protection measures should be inspected at least every 6 months. So any changes, extensions or mechanical effects that might impair its protective effect can be detected early and can be removed as soon as possible.

Necessity of visual inspections was pointed out to the operator:  Yes  No

### 13.2 Complete inspection of the internal and external lightning protection measures:

Inspector suggests following date for the next complete inspection of internal and external lightning protection:

Note 1: According to the German Hazardous Substances Ordinance (article 7 (7)) and the German Ordinance on Industrial Safety and Health (section 3 (5.2)) a maximum time limit of 3 years must not be exceeded.

Note 2: Suggestions for periodical inspections are made in the information annex E of DIN EN 62305-3 (VDE 0185-305-3), section E.7 and in Table E.2

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Number of pages test report:		
Number of pages drawings:		
Number of photos for the test report:		
Number of pages in total assets:		
Enclosures of the test report / Drawing No.		

## Notes for the proprietor of the system:

- The proprietor has to remedy the defects.
- Check if additional internal lightning protection measures are necessary
- In case of structural alteration or lightning strike, immediately contact the revision service.
- 

\_\_\_\_\_ Place \_\_\_\_\_ Date

Signature of the tester

\_\_\_\_\_ Place \_\_\_\_\_ Date

Signature of the person in charge

Company

Company