Test report

as supplement for the isCon® lightning protection system

according to IEC/EN 62305-3 (VDE 0185-305-3)

General information on the testing object	
Project designation	
Project no.	
Contact	
Street	
Postcode/town	
Telephone	
E-mail	
Test report no.	
Building designation	
Use	
Year of construction	
Extension (year)	
Building height	
Building dimension	
Construction type	
Roof form	
Type of roofing	
Notes/comments	

Customer details/client		
Company		
Contact		
Street/postcode/location		
Telephone		
E-mail		

Lightning protection system installation company		
Company		
Contact		
Street/postcode/location		
Telephone		
E-mail		

Report created by		
Company		
Contact		
Street/postcode/location		
Telephone		
E-mail		

OBO BETTERMANN

1. Testing type			
	Standard	Ex system	Paragraphs to be edited
Acceptance test	☐	☐	1–14
Visual inspection	☐ (2 years)	☐ (1 year)	1–8, 12–14
Comprehensive test	☐ (4 years)	☐ (2 years)	1–14
Individual test	☐	☐	

2. Basic principles of the test (project documentation)				
Lightning protection standards and regulations on the date of erection				
Date of erection				
Reference to standards	☐ DIN EN 62305-3 (VDE (0185-305-3):2006; EN 62305-3:2006			
	☐ DIN EN 62305-3 (VDE 0185-305-3):2011; EN 62305-3			
	☐ DIN EN 62305-3 (VDE 0185-305-3) Supplement 1-5			
	☐ ______			
Notes				
Project documentation				
Lightning protection class of the LPS	☐ I	☐ II	☐ III	☐ IV
Change to the type of use/structural change to the building compared to the date of erection	☐ Yes (protection of existing building possibly removed: Checking of the protection class of the LPS system)		☐ No	
Complete drawing documentation of the lightning protection system available	☐ Yes		☐ No	
Drawing number				
Separation distance calculation available	☐ Yes		☐ No	
Deviating installation compared to planning (e.g. positioning of the air-termination system):	☐ Yes (Deviations must be documented)		☐ No	
Wind load parameters available	☐ Yes		☐ No	
Notes				

OBO BETTERMANN

3. General data on the isCon® lightning protection system

Used isCon® conductor

Note! *The criteria for the selection are the calculated separation distance and the lightning protection class. Correct use of the isCon® lightning protection system is only guaranteed when the calculated separation distance s is ≤ the equivalent separation distance of the isCon® conductor.*

☐	isCon Professional + 75 SW ($s_e \leq 75$ cm)
☐	isCon Professional + 75 GR ($s_e \leq 75$ cm)
☐	isCon Premium ($s_e \leq 90$ cm)
☐	isCon Professional 75 SW ($s_e \leq 75$ cm)
☐	isCon Basic ($s_e \leq 45$ cm)

Max. calculated separation distance s_{Air}	

4. Checking of air-termination masts and accessories

Air-termination mast/location designation:

Visible damage on the air-termination mast	☐ Yes (defect)	☐ No
Bracket spacings – air-termination rod fastening – according to mounting specifications (e.g. wall mounting)	☐ Yes	☐ No (defect)
Coloured coating in the GFK area of the air-termination mast	☐ Yes (not permitted; system does not function)	☐ No
Connection of the air-termination mast/tripod to the nearest equipotential bonding of the system (≥ 6 mm² CU or equivalent conduction value)	☐ Yes	☐ No (defect)
Correct number of concrete bases according to mounting specifications	☐ Yes	☐ No (defect)
Use of approved components (terminals, holders) in Ex zone 1/21	☐ Yes	☐ No (defect)
Continuation of the mounting materials of make OBO Bettermann	☐ Yes	☐ No (defect)
Structure according to wind speed data	☐ Yes	☐ No (defect)

5. Checking of the isCon® conductor within/outside the air-termination mast as well as the accessories
☐ Maintenance of separation distance in the area of termination
Note regarding interior routing! *The area of termination (free of earthed metallic and electrically conductive parts) runs from the connection element through to the potential connection element installed in the air-termination mast and can be viewed from outside along the entire route of the GFK pipe. Around the termination, the calculated separation distance "s" to electrically conductive or earthed parts must be maintained. Observe the details in the current system instructions.*
Note regarding exterior routing! *Up to 4 isCon® conductors can be attached to the exterior of the air-termination mast. The area of the termination (free of earthed metallic and electrically conductive parts) runs from the connection element up to the 927 2 6-K potential connection clip mounted on the air-termination mast. In the case of isCon Pro + conductors in light grey, the light grey jacketing must be removed in the area of the 927 2 6-K potential connection clip. Around the termination, the calculated separation distance "s" to electrically conductive or earthed parts must be maintained. Observe the details in the current system instructions.*
Notes

Designation/ location			**Designation/ location**		
Separation distance	Calculation		**Separation distance**	Calculation	
	Actual			Actual	
Notes			Notes		
Designation/ location			**Designation/ location**		
Separation distance	Calculation		**Separation distance**	Calculation	
	Actual			Actual	
Notes			Notes		
Designation/ location			**Designation/ location**		
Separation distance	Calculation		**Separation distance**	Calculation	
	Actual			Actual	
Notes			Notes		

OBO BETTERMANN

6. isCon® conductor routing within/outside the air-termination mast and in the further cable route		
Is there clear labelling of the connection element and conductor?	☐ Yes	☐ No (defect)
isCon® conductor, light grey – internal air-termination mast Removal of the additional light grey jacketing in the area of the termination (potential connection element)	☐ Yes	☐ No (defect)
isCon® conductor – external air-termination mast Shrinking of the connection elements – glue escape at both ends of the heat-shrinkable sleeve	☐ Yes	☐ No (defect)
isCon® conductor, grey – external air-termination mast Removal of the additional light grey jacketing in the area of the 927 2 6-K potential connection clip	☐ Yes	☐ No (defect)
isCon® conductor – external air-termination mast Correct fixing of the OBO plastic cable ties	☐ Yes	☐ No (defect)
Bend radii of the isCon® conductor maintained according to the mounting specifications (minimum bend radius: 10 x external diameter)	☐ Yes	☐ No (defect)
No pressure/cut injuries to the isCon® conductor ***Note!*** *Checking in the wall area (permanent position fixing) only required during acceptance checks.*	☐ Yes	☐ No (defect)
isCon® conductor – routing in Ex zone 1/21 Compliance with the mounting specifications (regular termination of the semi-conductive jacketing according to the mounting instructions)	☐ Yes	☐ No (defect)
Maintenance of the minimum spacing of the isCon® conductor after the air-termination mast (distance < 200 mm)	☐ Yes	☐ No (defect)
Cable routing only in impact-protected areas (LPZ 0_B)	☐ Yes	☐ No (defect)
Spacings of cable brackets in flat roof area (spacing a < 1.0 m)	☐ Yes	☐ No (defect)
Spacings of cable brackets in wall area (spacing a < 1.0 m) ***Note!*** *Only required during acceptance test.*	☐ Yes	☐ No (defect)
Coloured coating of the isCon® conductor ***Note!*** *Coloured adjustment only with isCon® conductor with light grey jacket after termination according to mounting specifications.*	☐ Yes (defect)	☐ No
Routing of isCon® conductors in a metal pipe after air-termination mast (if relevant)		
Routing within a metallic pipe is permitted beneath the termination.		
Routing of the isCon® conductor in a metallic pipe below the termination?	☐ Yes (subsequent question)	☐ No
Is the metallic pipe connected and to the earthing system?	☐ Yes (see note)	☐ No

Note! *If cables, e.g. for power supply, are to be routed in parallel to the isCon® conductor (e.g. without a metallic duct), then inductive couplings into this system are possible. For this, the requirements and measures from VDE 0185-305-4 are to be observed. It is recommended to switch these cables with suitable surge protection devices. OBO isCon® can only prevent direct galvanic coupling through isolation (arcing).*

Notes

OBO BETTERMANN

7. Connection of the isCon® conductor to separated ring conductor/parapet; separation distance $s_{Air} \geq 17.5$ cm* or $s_{Air} \geq 20$ cm**
*isCon Pro, isCon Pro +, isCon Premium
**isCon Basic

Variable termination

If the isCon® conductor is not connected up to the earthing system but to parts subjected to lightning voltage (e.g. parapet, ring conductor), then the length of the variable termination is produced from the calculated separation distance in s_{Air} (exit point), multiplied by the factor 2.

Length of variable termination "L" = Separation distance in s_{Air} x 2

Note!

- *The additional light grey jacket of the isCon® conductor must be removed under the potential connection element. Observe the mounting details in the current system instructions.*
- *With the isCon® Basic conductor, there is no need for the termination if there are no earthed or electrically conductive elements located between the last insulated spacer and the connection element and before the last insulated spacer within the radius of the separation distance on a path of 2x s_{Air}.*

Designation/location			**Designation/location**		
Separation distance	Calculation		**Separation distance**	Calculation	
	Actual			Actual	
Notes			Notes		
Designation/location			**Designation/location**		
Separation distance	Calculation		**Separation distance**	Calculation	
	Actual			Actual	
Notes			Notes		
Designation/location			**Designation/location**		
Separation distance	Calculation		**Separation distance**	Calculation	
	Actual			Actual	
Notes			Notes		

8. Connection of the air-termination masts/tripods/EB elements to the nearest equipotential bonding of the system

Connection of the air-termination masts to the equipotential bonding using natural components (e.g. antenna bracket, air-conditioning devices, etc.)	☐ Yes (subsequent questions can be ignored)	☐ No
Connection via		
Connection of the air-termination rods/tripods via special PC cable (6 mm² CU or equally conductive)	☐ Yes	☐ No
Parallel routing of EB cable up to isCon® conductor	☐ Yes (observe note)	☐ No
Notes		

***Note!** The isCon® conductor is a component for maintaining the separation distance. This does not possess a magnetic shield effect on account of its construction. The induction effect in secondary cables/loops should be observed. If necessary, surge protection measures should be included.*

OBO BETTERMANN

9. Function testing Part 1: Continuity

The continuity of an isCon® conductor can be measured between the infeed/exit point and, in the case of a meshed isCon® system, between the exit points. A low-impedance pass < 1.0 Ω is recommended.

Measuring device		
Measuring current		
Measuring cable	Length	R
Measuring cable 1		
Measuring cable 2		
Measuring cable 3		
Measuring cable 4		
Measuring cable 5		

Measurement results	**Resistance R**			
Separator	Measured value (total)	Measuring cables	Measured value (isCon)	Length

Notes

Installation
electrotechnical expertise

10. Function testing Part 2: Insulation

The main task of a high-voltage-resistant, insulated conductor is insulation. The function testing Parts 2 + 3 can only be performed using the isCon® connection element with ASE technology (Adaptive Switching Element). If no appropriate OBO connection element is installed, we recommend exchanging the connection element, in order to be able to inspect the function of the isCon® conductor according to the standard. Perform the function testing according to the current isCon® system instructions.
The measured values must be in the GΩ range.

Measuring device	______________________ The tolerance data of the measuring device must be observed. If necessary, the actual measured voltage must be checked with a multimeter.

Measurement results

Measuring point/separation point	Notes	Insulation	Value ≥ GΩ (no defect)	Value < GΩ (defect)
		Measuring voltage up to 500 V DC	Measured value (3–5 sec. after the setting of a stable measured value)	

Notes

OBO
BETTERMANN

Installation electrotechnical expertise

11. Function testing Part 3: Testing of connection elements

Before final mounting and if a defect is detected after the 2nd function test (insulation), we recommend a measurement check of the connection elements. The connection elements are tested at a measured voltage ≥ 1,000 V DC and at a measured voltage < 500 V DC:

- Measured voltage ≥ 1,000 V DC: Varying value < GΩ* = function given, value GΩ = defect
- Measured voltage < 500 V DC: GΩ = function given, value < GΩ = defect

Measuring device	The tolerance data of the measuring device must be observed. If necessary, the actual measured voltage must be checked with a multimeter.

Measurement results:

Measuring point/separation point			Measured value (3–5 sec. after the setting of a stable measured value)	Defect?
	Connection element 1	Measuring voltage ≥ 1,000 V DC		☐ Yes ☐ No
		Measuring voltage < 500 V DC		☐ Yes ☐ No
	Connection element 2	Measuring voltage ≥ 1,000 V DC		☐ Yes ☐ No
		Measuring voltage < 500 V DC		☐ Yes ☐ No
	Connection element 1	Measuring voltage ≥ 1,000 V DC		☐ Yes ☐ No
		Measuring voltage < 500 V DC		☐ Yes ☐ No
	Connection element 2	Measuring voltage ≥ 1,000 V DC		☐ Yes ☐ No
		Measuring voltage < 500 V DC		☐ Yes ☐ No
	Connection element 1	Measuring voltage ≥ 1,000 V DC		☐ Yes ☐ No
		Measuring voltage < 500 V DC		☐ Yes ☐ No
	Connection element 2	Measuring voltage ≥ 1,000 V DC		☐ Yes ☐ No
		Measuring voltage < 500 V DC		☐ Yes ☐ No
	Connection element 1	Measuring voltage ≥ 1,000 V DC		☐ Yes ☐ No
		Measuring voltage < 500 V DC		☐ Yes ☐ No
	Connection element 2	Measuring voltage ≥ 1,000 V DC		☐ Yes ☐ No
		Measuring voltage < 500 V DC		☐ Yes ☐ No
	Connection element 1	Measuring voltage ≥ 1,000 V DC		☐ Yes ☐ No
		Measuring voltage < 500 V DC		☐ Yes ☐ No
	Connection element 2	Measuring voltage ≥ 1,000 V DC		☐ Yes ☐ No
		Measuring voltage < 500 V DC		☐ Yes ☐ No
	Connection element 1	Measuring voltage ≥ 1,000 V DC		☐ Yes ☐ No
		Measuring voltage < 500 V DC		☐ Yes ☐ No
	Connection element 2	Measuring voltage ≥ 1,000 V DC		☐ Yes ☐ No
		Measuring voltage < 500 V DC		☐ Yes ☐ No
	Connection element 1	Measuring voltage ≥ 1,000 V DC		☐ Yes ☐ No
		Measuring voltage < 500 V DC		☐ Yes ☐ No
	Connection element 2	Measuring voltage ≥ 1,000 V DC		☐ Yes ☐ No
		Measuring voltage < 500 V DC		☐ Yes ☐ No

*Due to the special ASE technology, the measured value may vary during the switching operation, depending on the measuring device.

BETTERMANN

12. Result of the inspection		
The isCon® lightning protection system does not present defects	☐ Yes	☐ No (see defects list)
Defects list		

13. Additional data/documentation	
Next inspection date	
Systems	

14. Notes for the system operator
The operator must ensure that any defects found are rectified.
The necessity of additional measures for internal lightning protection must be checked.
If structural changes are made or there is a lightning strike, then the lightning protection system must be maintained immediately by a specialist technician.
This test report does not represent comprehensive testing in the sense of the standard. Additional inspections are required, e.g. on the earthing system.

City/town

Date

Signature

Company/stamp