JOSÉ MARQUES

ISO-SIGMA

Rua de Trás, 421
4455-500 NOGUEIRA - MAIA
Tel +351 225074590

Fax +351 225024895
www.iso-sigma.pt
tecnica@iso-sigma.pt

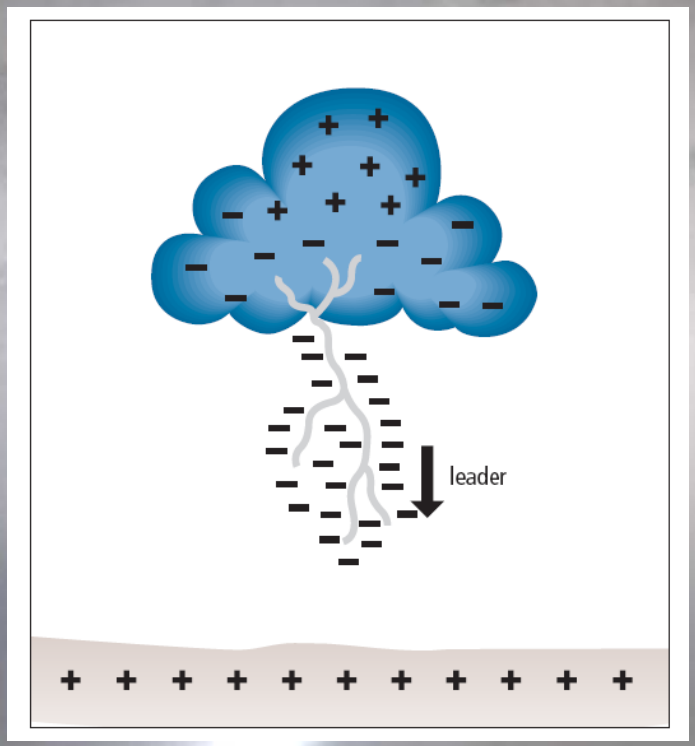
Normas – Guias Técnicos - Legislação

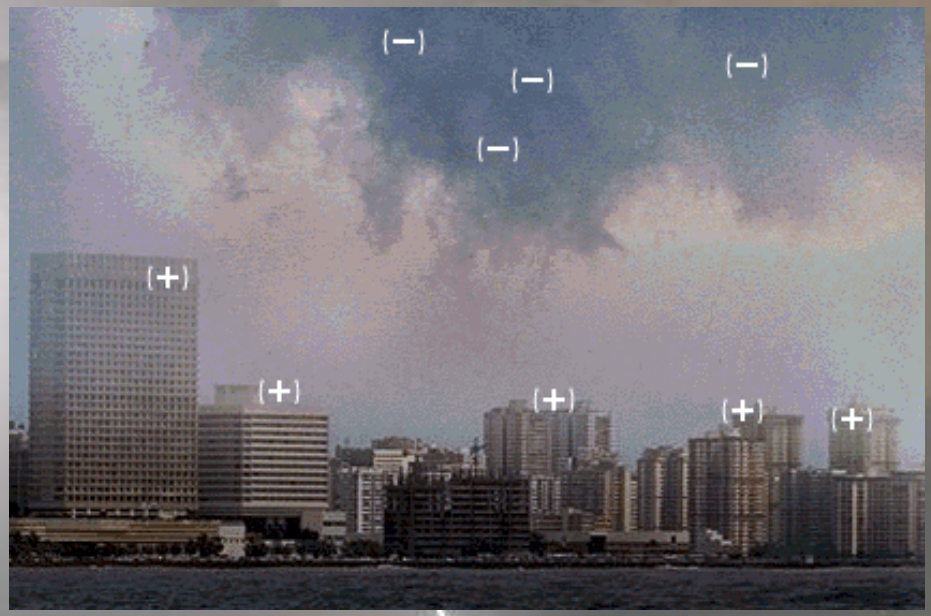
- IEC / EN 62305;
- Protecção Exterior contra Descargas Atmosféricas;

- Descarregadores de Sobretensões (energia);

- Descarregadores de Sobretensões (sinal);

DESCARGA ATMOSFÉRICA
Formação do raio

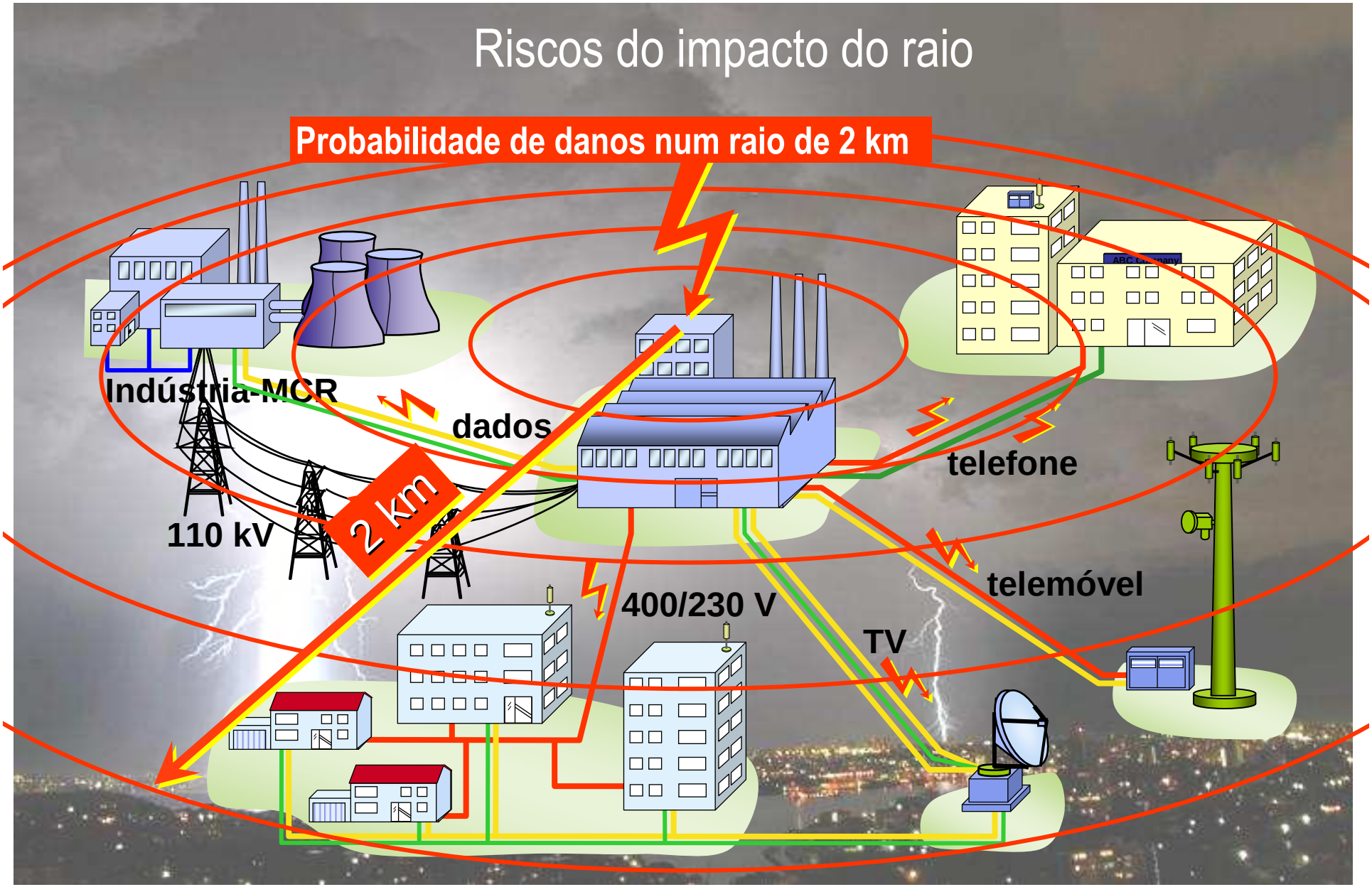




Formação do raio

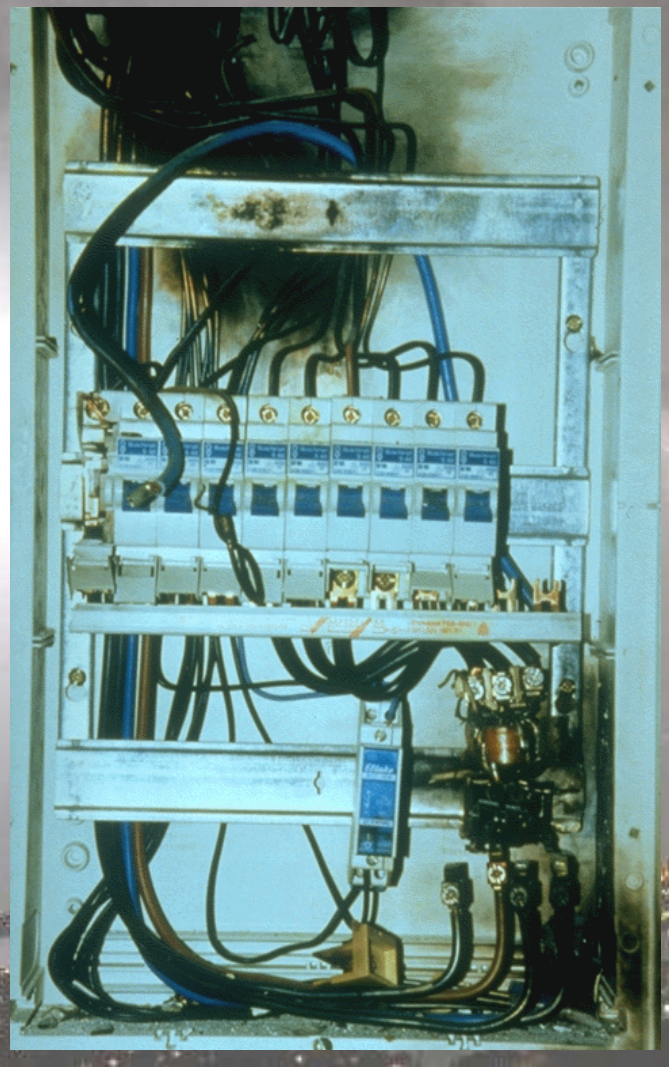
Formação do raio

Formação do raio

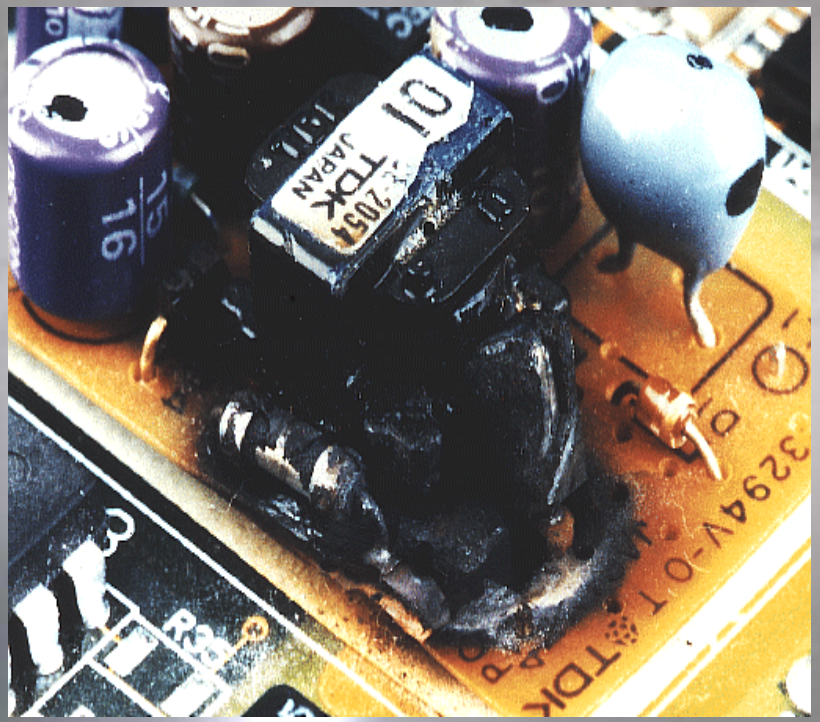

Riscos do impacto do raio
Probabilidade de danos num raio de 2 km
Indústria-MCR
dados
2 km
110 kV
400/230 V
telefone
telemóvel
TV

Danos em habitação

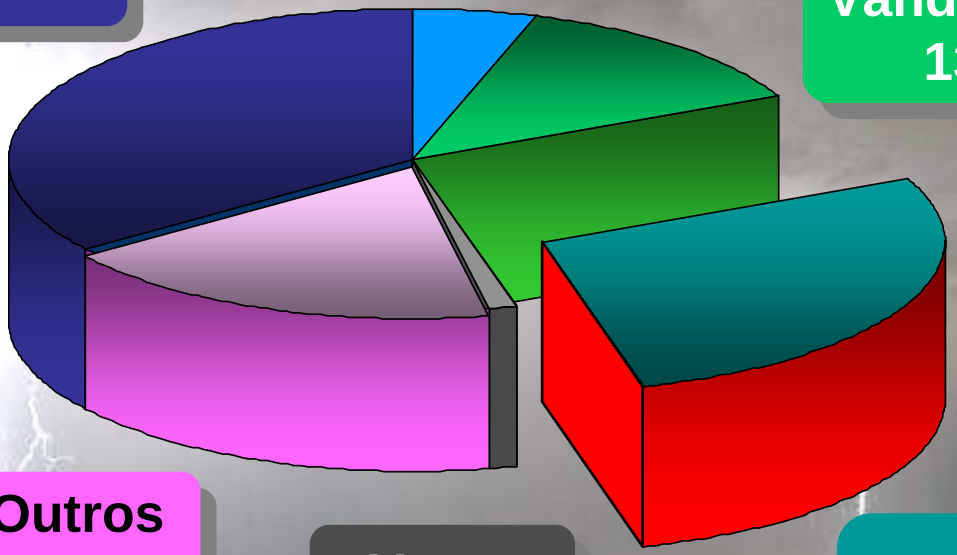
Danos em quadro eléctrico



Danos em equipamentos electrónicos



Danos em equipamento electrónico durante 2005
Análise de mais de 8400 sinistros



Agua
6%

Roubo
Vandalismo
13%

Sobretensões
28%
Descargas atmosféricas
e/ou
comutações eléctricas

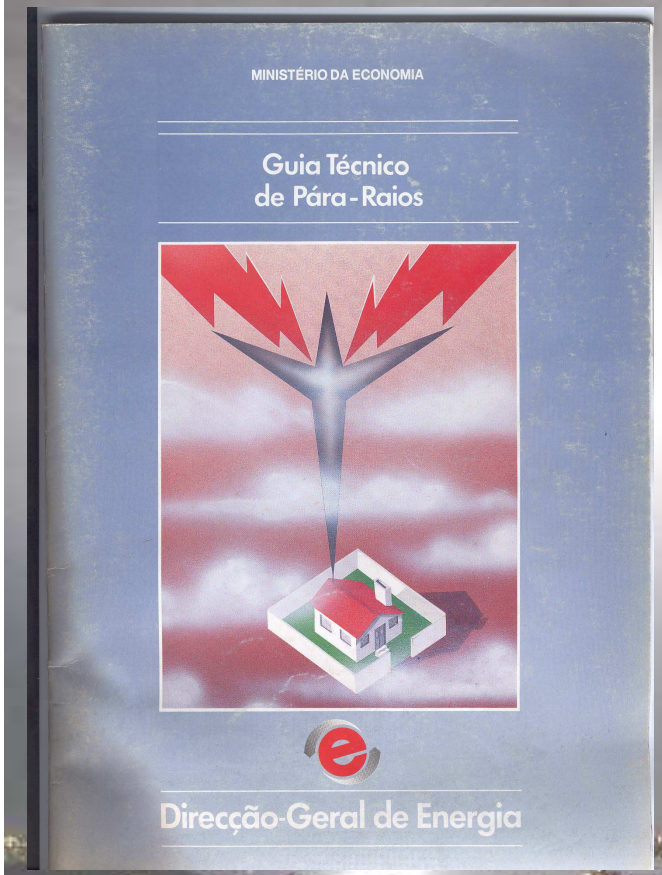
Vento
1%

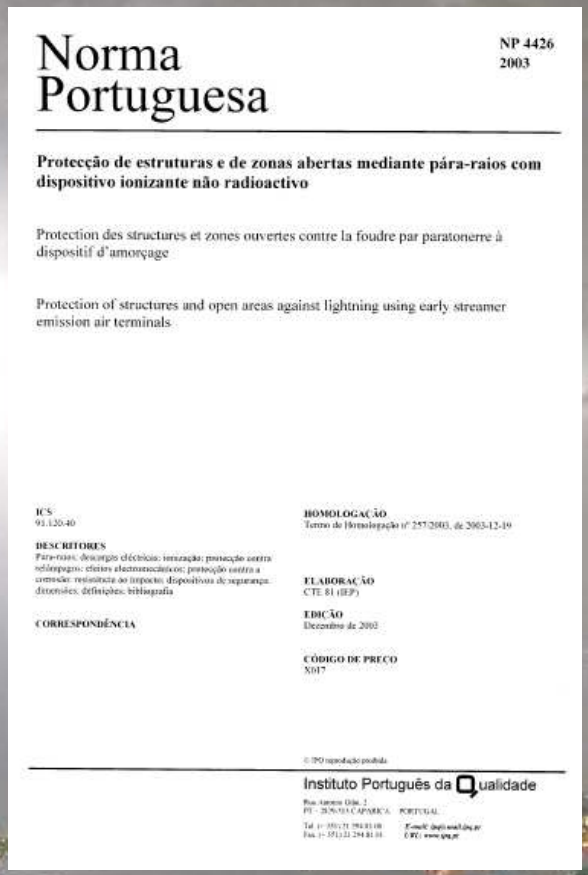
Outros
16%

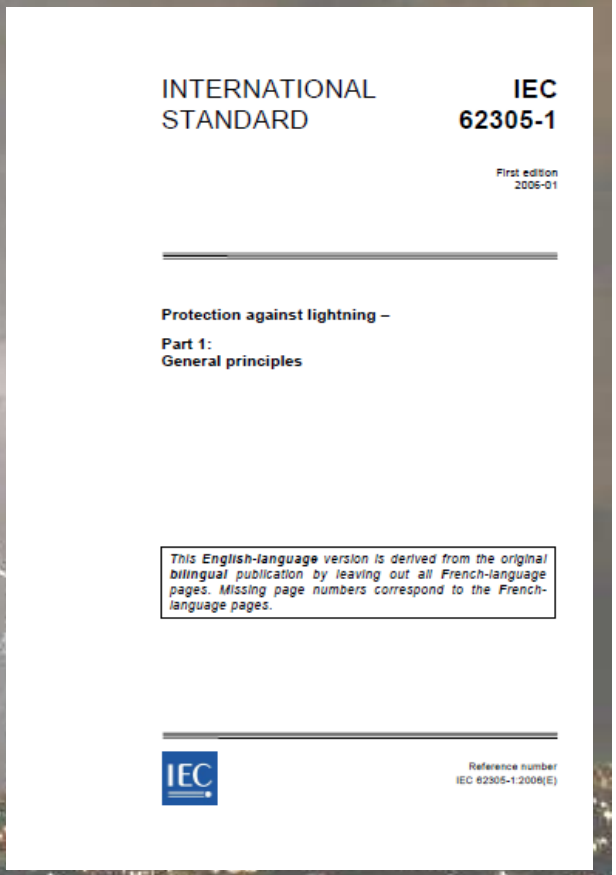
Negligência
36%

Fonte: Württembergische Versicherung AG, Stuttgart (gerundete Werte)

Normas – Guias Técnicos - Legislação







Normas – Guias Técnicos - Legislação

- ## Guia Técnico de Pára-raios – DGEG

- Baseado na antiga IEC 1024-1 de 1990 e na EN 61024 de 1995 tem por objectivo fornecer informação para a concepção, instalação, inspecção e conservação dos pára-raios em edifícios e outra estruturas até 60 m de altura;
- Este guia aplica-se apenas à implementação de sistemas ditos convencionais (Gaiolas de Faraday e hastes de Franklin convencionais);
- Os pára-raios ionizantes não estão contemplados;

- ## NP 4426

- Baseada na norma francesa NF C 17-102:1995P e na e na norma espanhola UNE21186:1996
- Esta norma apresenta as medidas a adoptar para desenhar com os conhecimentos e tecnologia actuais, um sistema de protecção contra o raio em estruturas edifícios ou zonas abertas como zonas de armazenamento, áreas de lazer. desportivas, etc. mediante pára-raios com dispositivo de **ionização** não radioactivo e dá as directrizes para a realização do sistema de protecção.

- ## IEC EN 62305

- Vem substituir a antiga IEC 1024, alargando a seu âmbito, à protecção contra sobretensões de equipamentos eléctricos e electrónicos.
- Os pára-raios ionizantes não estão contemplados;

Normas – Guias Técnicos - Legislação

„Protecção contra Descargas Atmosféricas"
IEC 62 305 (Janeiro 2006)
EN 62 305 (Fevereiro 2006)

- **Parte 1** Principios gerais
- **Parte 2** Análise do risco
- **Parte 3** Dano nas estruturas e risco para as pessoas
- **Parte 4** Sistemas eléctricos e eléctronicos em estruturas

Análise de RISCO um MUST, YES or NO

IEC 62305-2:2006

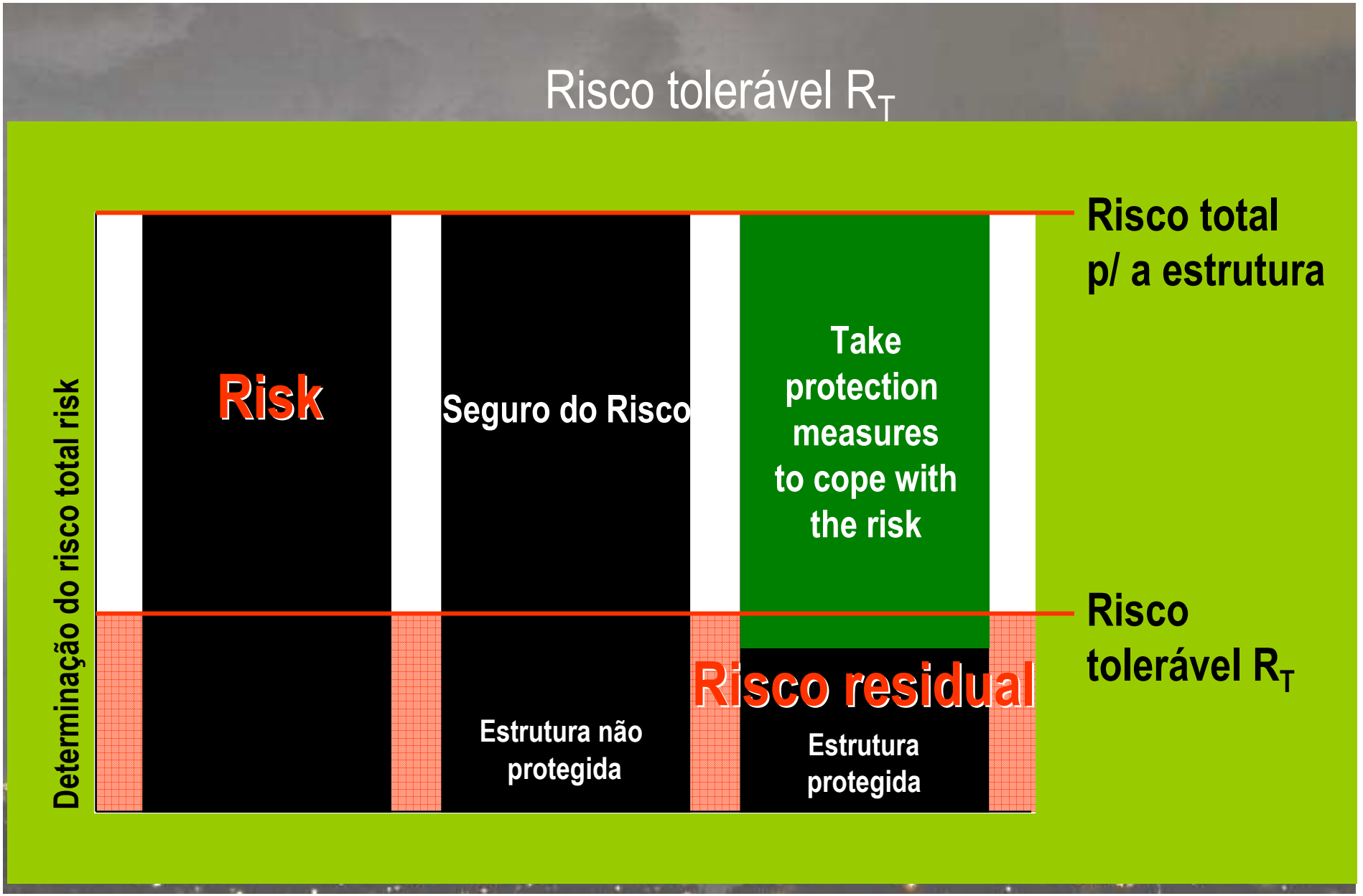
Há uma declaração clara na parte 3,

Secção *4. Lightning protection system*
4.1 Class of LPS
da norma IEC 62305 partes 1 a 4, publicadas a 01 de Novembro 2006:

Que diz:

"The class of required LPS shall be selected on the basis of a risk assessment (see IEC 62305-2)."

Risco tolerável R_T



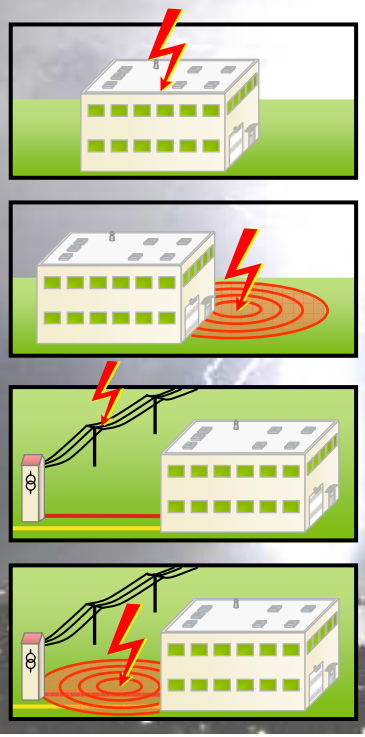
Determinação do risco p/ uma estrutura

Fonte de estragos

IEC 62305-2 :2006

"A corrente da descarga atmosférica é a principal fonte de estragos.

Há diferenças, conforme o local / ponto de impacto:



S1: Impacto na estrutura do edifício;

S2: Impacto nas proximidades do edifício;

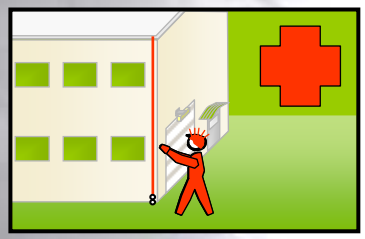
S3: Impacto num sistema de fornecimento de serviços;

S4: Impacto nas proximidades de um sistema de serviços."

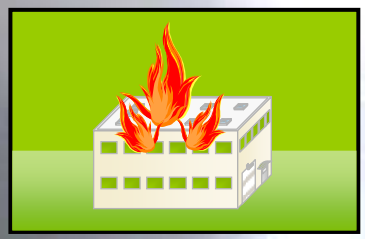
Tipo de estragos

IEC 62305-2 :2006

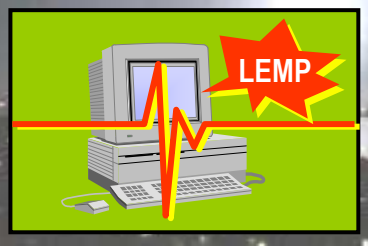
Tipos de estragos que podem ocorrer como resultado de uma descarga atmosférica:



D1: **Ferimentos em seres vivos devido ao toque e à tensão de passo**



D2: **Danos físicos nas estruturas (fogo, explosão, destruições mecânicas, fuga de químicos)**



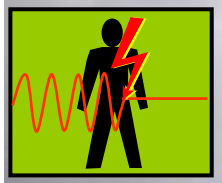
D3: **Avarias de sistemas internos devido ao LEMP**

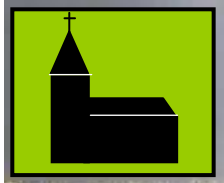
Tipos de perdas

IEC 62305-2 :2006

"Cada tipo de estrago, sózinho ou em combinação c/ outros, pode como consequência, provocar uma perda diferente no objeto a proteger. O tipo de perda, depende das características do objeto e do seu conteúdo.

Devem ser tidos em conta, os seguintes tipos de perda:





L1: perda de vidas humanas;

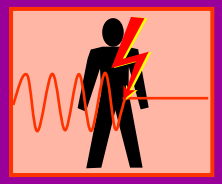
L2: perda de fornecimento de serviços;

L3: perda de património cultural;

L4: perda de valor económico (estrutura, seu conteúdo e perda de atividade)."

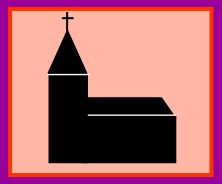
As perdas L1, L2 e L3 podem ser vistas como perdas de valores sociais, as perdas L4 podem ser vistas como económicas.

Risco



Human life

Services



Cultural heritage

Economic value

R_1 R_2 R_3 R_4

Cada risco é composto de vários componentes

=

$R_1 = R_A + R_B + R_C + R_M + R_U + R_V + R_W + R_Z$

=

$R_2 = R_B + R_C + R_M + R_V + R_W + R_Z$

=

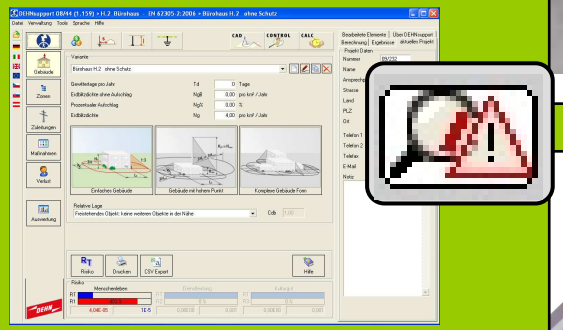
$R_3 = R_B + R_V$

=

$R_4 = R_A + R_B + R_C + R_M + R_U + R_V + R_W + R_Z$

Ferramenta informática de suporte a projetistas
DEHNsupport Toolbox

DEHN Risk Tool

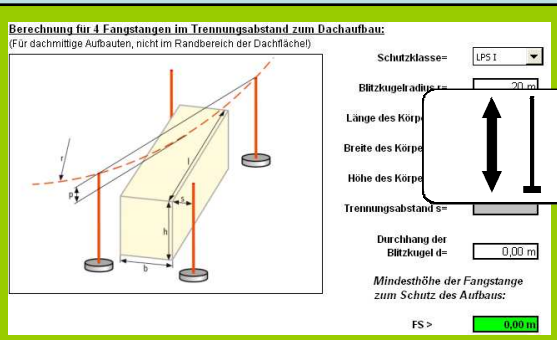


Risk analysis in accordance with IEC 62305-2

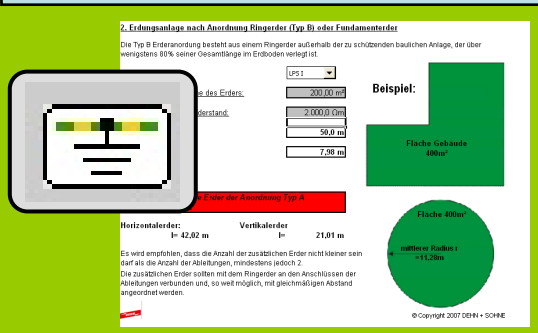
DEHN Distance Tool

Separation distance in accordance with IEC 62305-3

DEHN Air-Termination Tool



DEHN Earthing Tool



SISTEMA DE PROTEÇÃO CONTRA DESCARGAS ATMOFÉRICAS (SPDA) - Classe de SPDA

IEC 62305-3:2006, 4.1

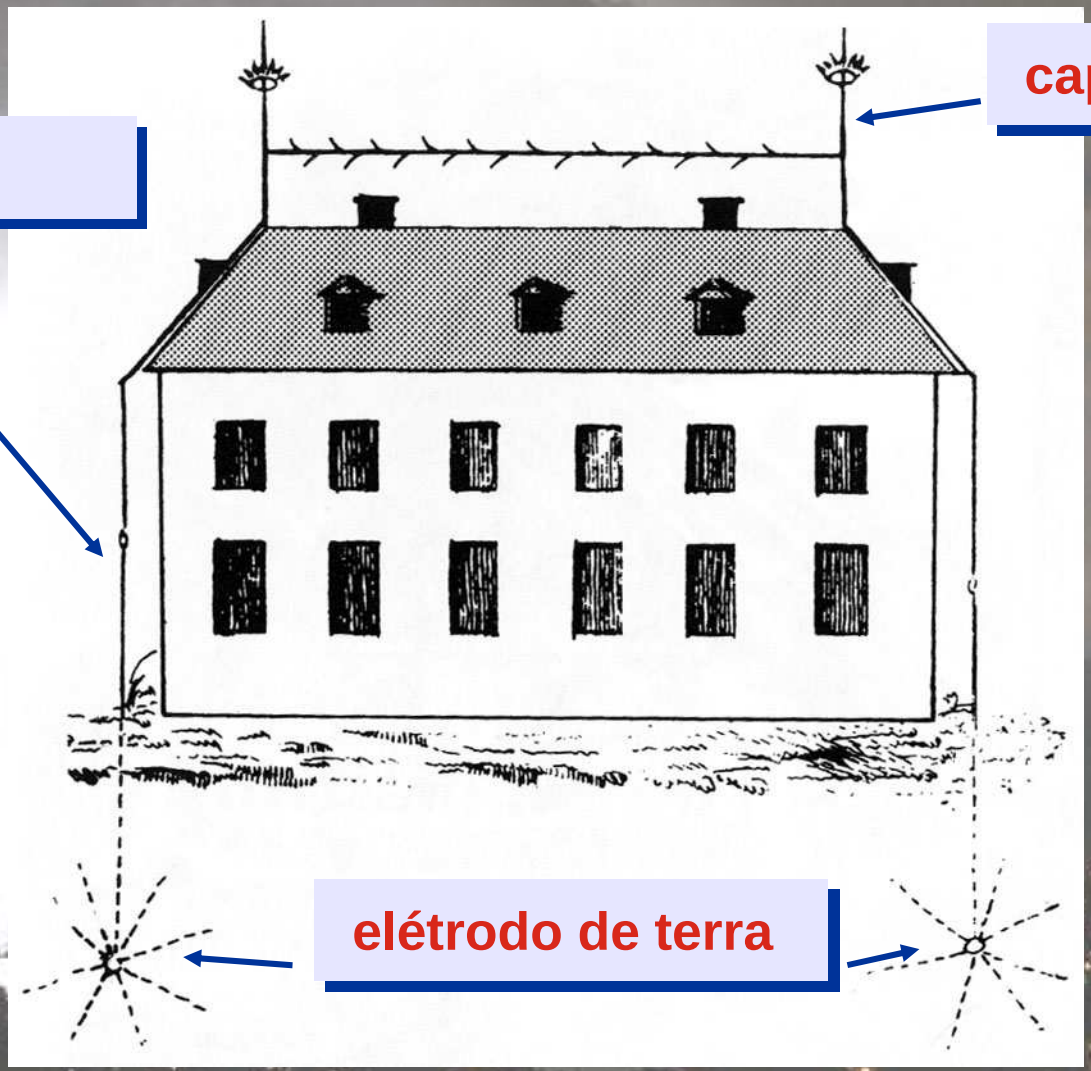
"As características de um SPDA são determinadas pelas características da estrutura a ser protegida, considerando o nível de proteção determinado na Análise de Risco.

4 classes de SPDA (I a IV) são definidas na norma correspondendo aos 4 níveis de proteção definidos na IEC 62305-1 (ver Tabela 1).

Níveis de proteção	Classe do SPDA
I	I
II	II
III	III
IV	IV

Tabela 1:

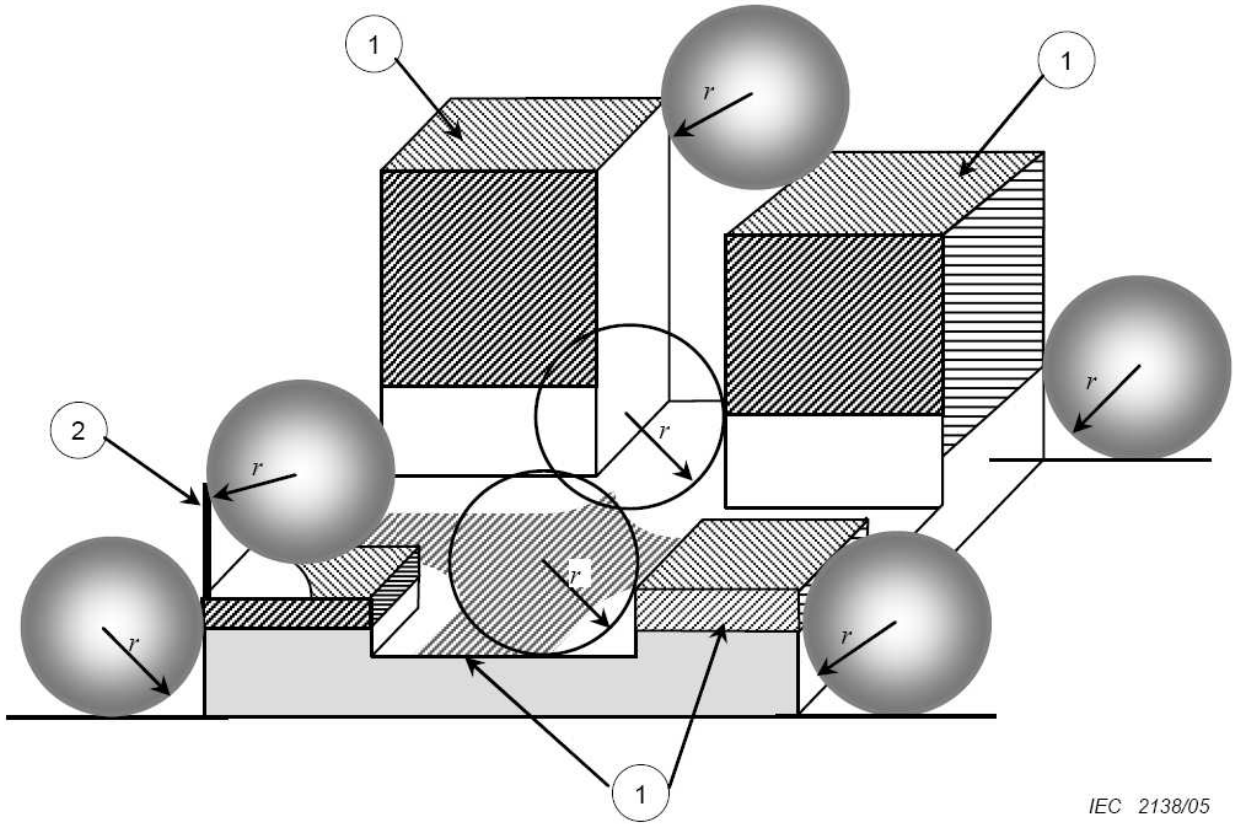
Sistema de Proteção contra Descargas Atmosféricas em 1778 de acordo c/ G. Ch. Lichtenberg



Parâmetros da corrente de raio

Corrente de raio Parámetros	Nivel de protecção LPL		
	I	II	III-IV
I (kA)	200	150	100
W/R (MJ/Ω)	10	5,6	2,5
Q short (C) (As)	100	75	50
T1/T2 (µs/µs)	10/350		

Esfera fictícia



Key

1 Shaded areas, are exposed to lightning interception and need protection according Table 2

2 Mast on the structure

r Radius of rolling sphere according to Table 2

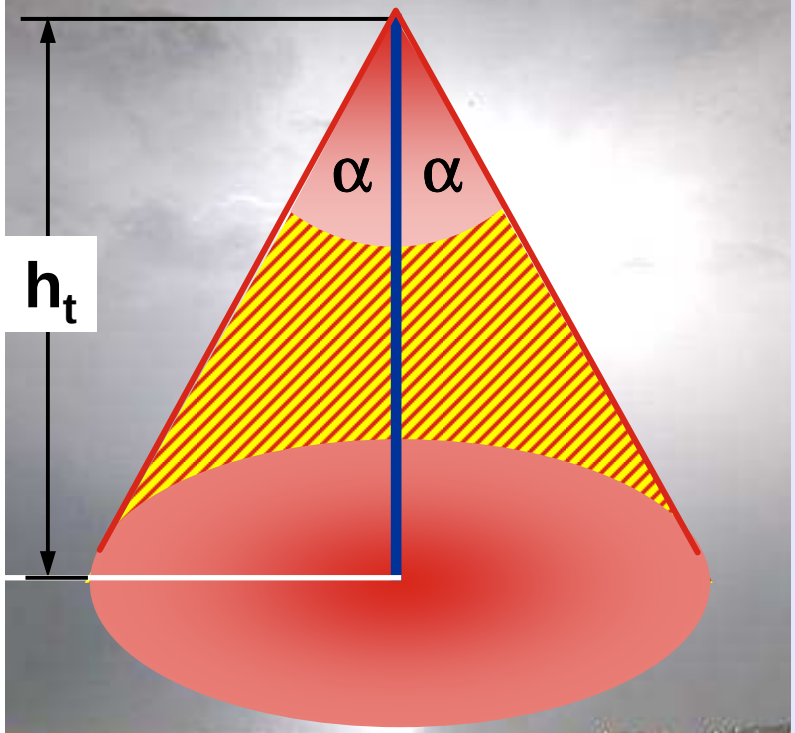
NOTE Protection against side flashes is required according to 5.2.3 and A.2.

Figure E.19 – Design of an LPS air-termination conductor network on a structure with complicated shape

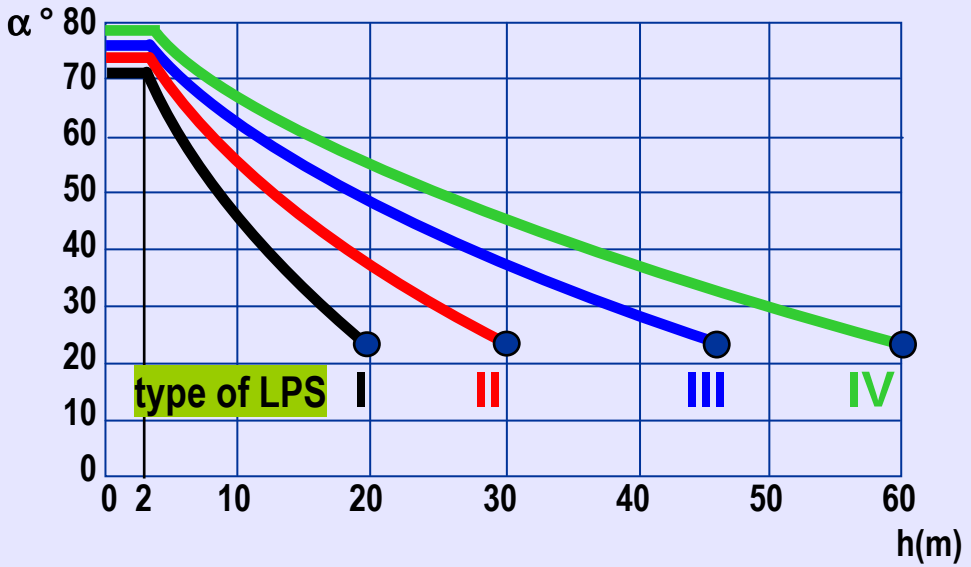
Table 2 – Maximum values of rolling sphere radius, mesh size and protection angle corresponding to the class of LPS

	Protection method		
Class of LPS	**Rolling sphere radius r** m	**Mesh size W** m	**Protection angle** $\alpha°$
I	20	5 × 5	See figure below
II	30	10 × 10	
III	45	15 × 15	
IV	60	20 × 20	

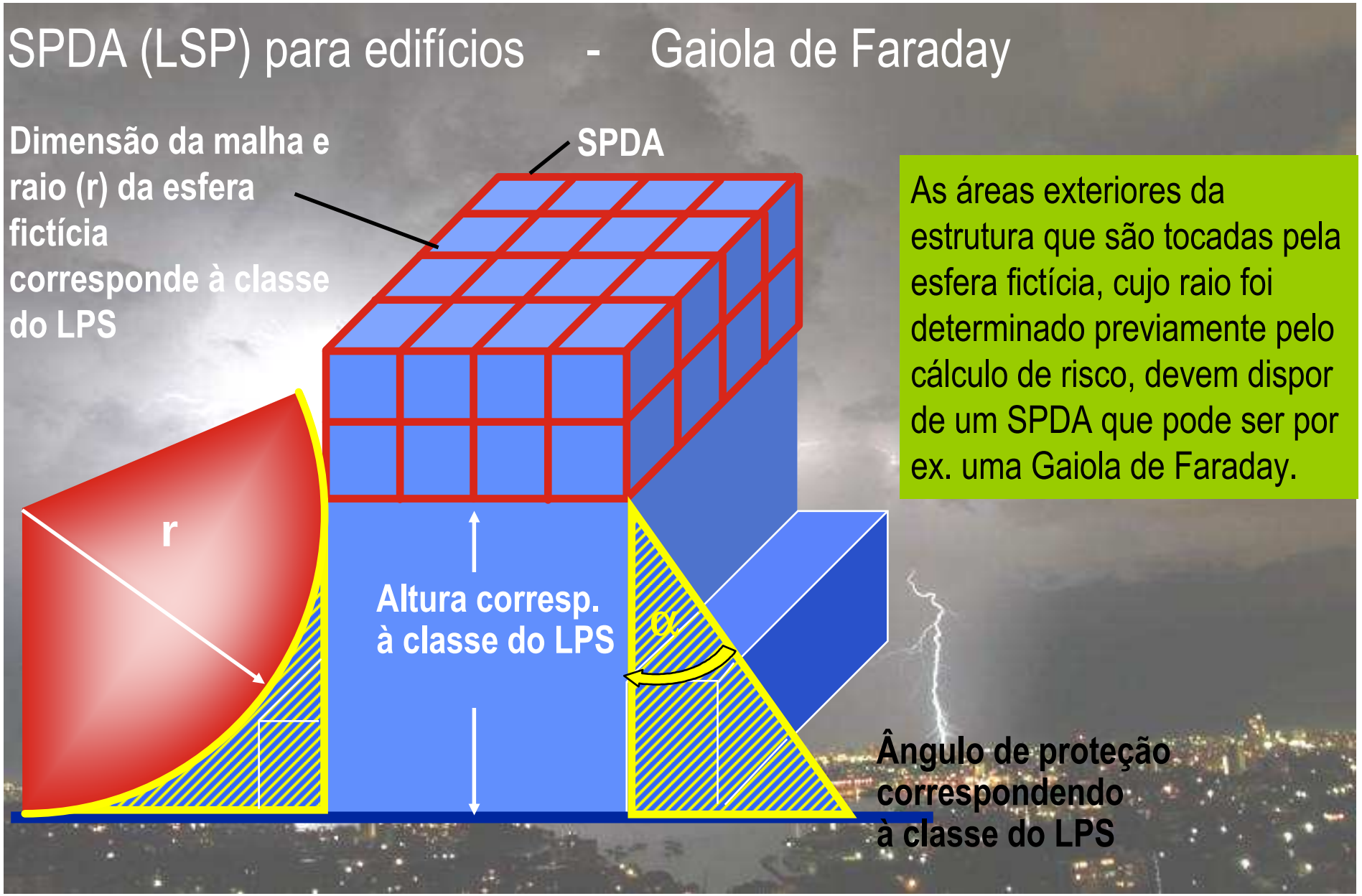
Attribution of the types of lightning protection systems to the air-termination systems



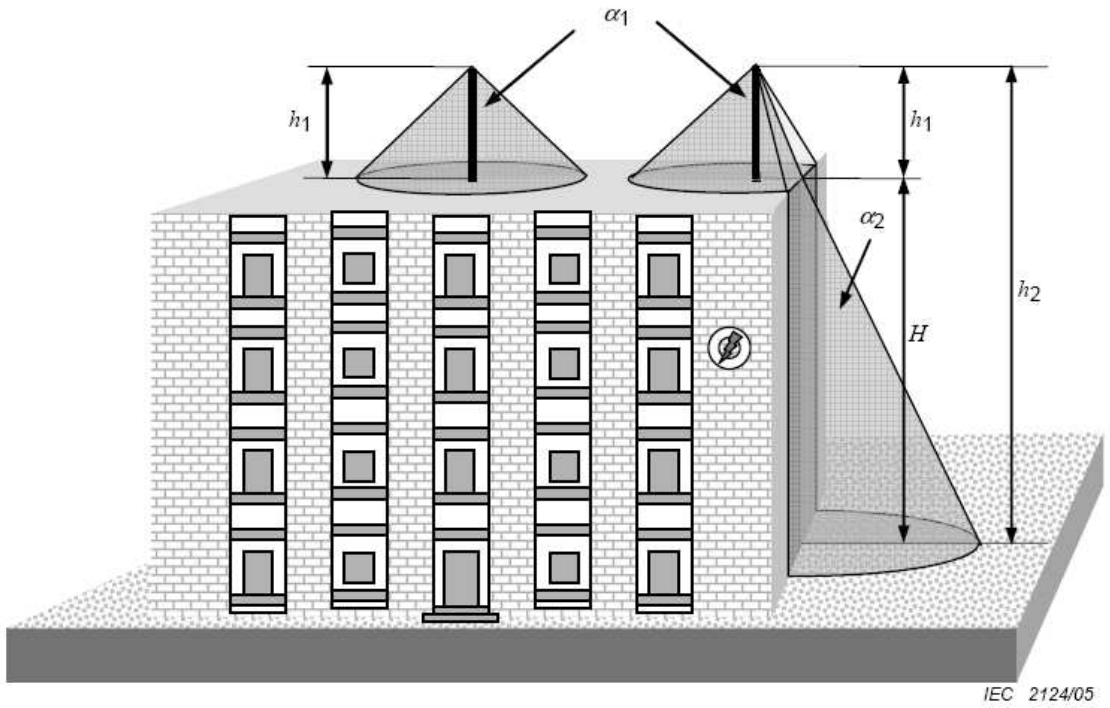
Angle α depends on the type of lightning protection system and on the height of the air-termination rod



SPDA (LSP) para edifícios - Gaiola de Faraday



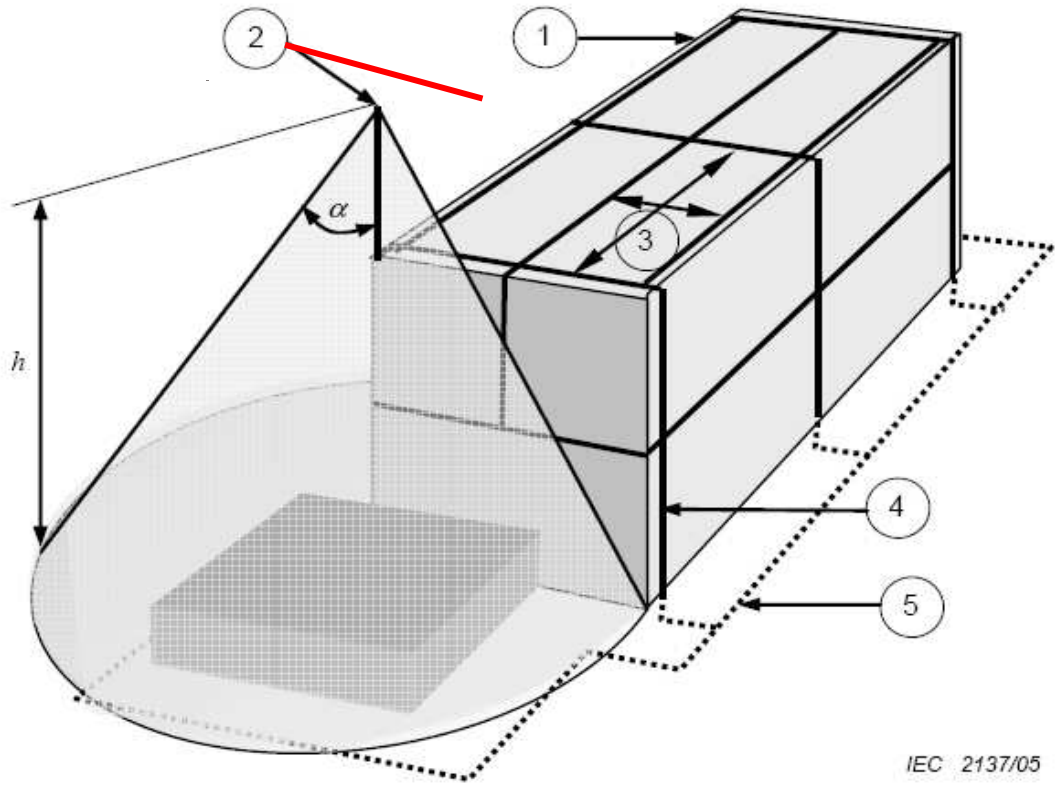
As áreas exteriores da estrutura que são tocadas pela esfera fictícia, cujo raio foi determinado previamente pelo cálculo de risco, devem dispor de um SPDA que pode ser por ex. uma Gaiola de Faraday.



Key

H	Height of the building over the ground reference plane
h_1	Physical height of an air-termination rod
h_2	$h_1 + H$, being the height of the air-termination rod over the ground
α_1	The protective angle corresponding to the air-termination height $h = h_1$, being the height above the roof surface to be measured (reference plane)
α_2	The protective angle corresponds to the height h_2

Figure E.12 – Protective angle method air-termination design for different heights according to Table 2



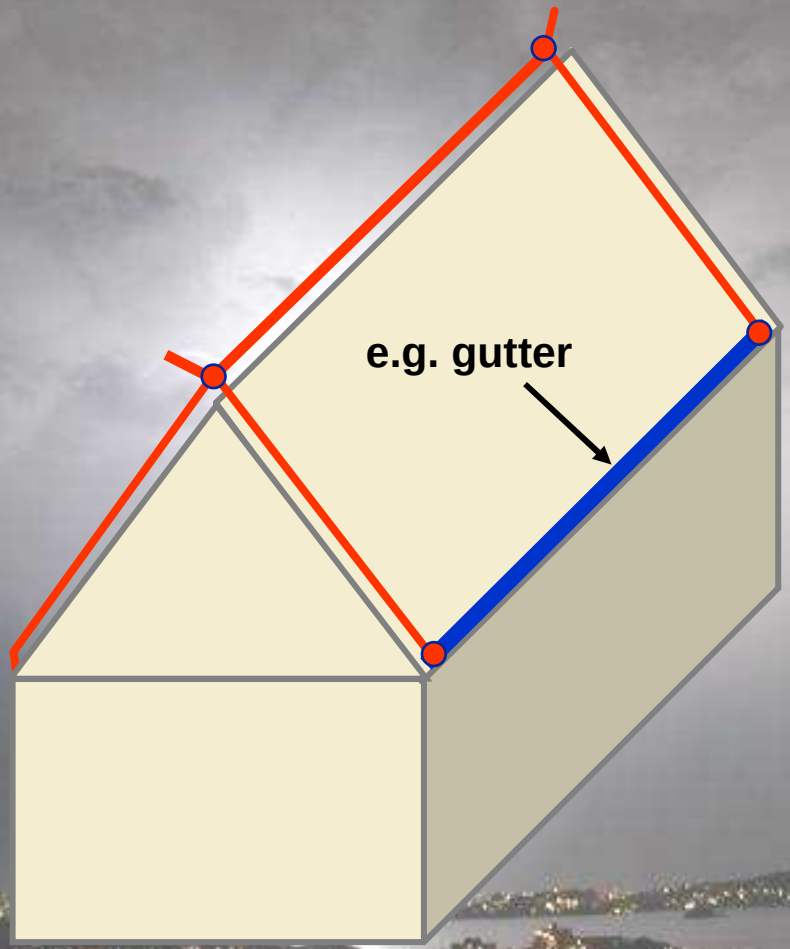
Key

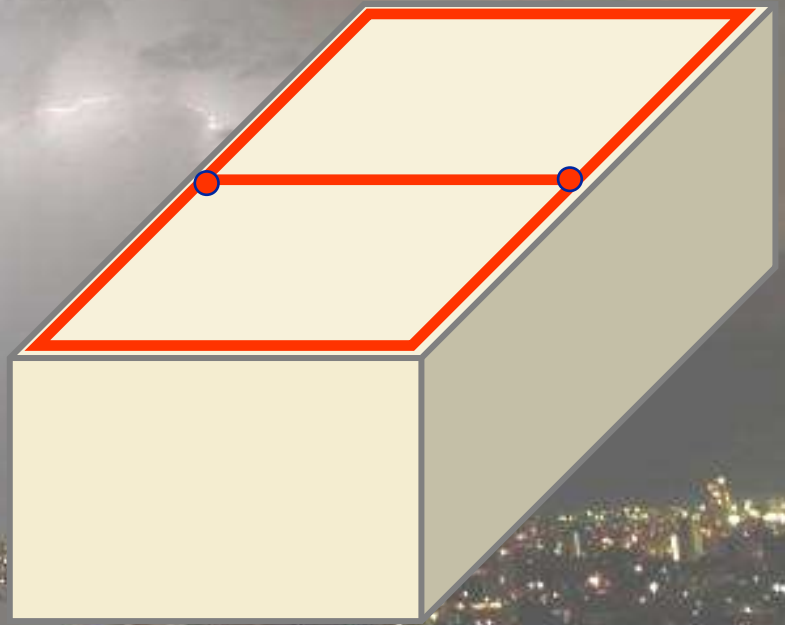
1 Air-termination conductor
2 Air-termination rod
3 Mesh size
4 Down-conductor
5 Earthing system with ring conductor
h Height of the air-terminal above ground level
α Protective angle

Figure E.18b – General arrangement of air-termination elements

SPDA - emalhado

Type of LPS	Mesh size
I	5 x 5
II	10 x 10
III	15 x 15
IV	20 x 20



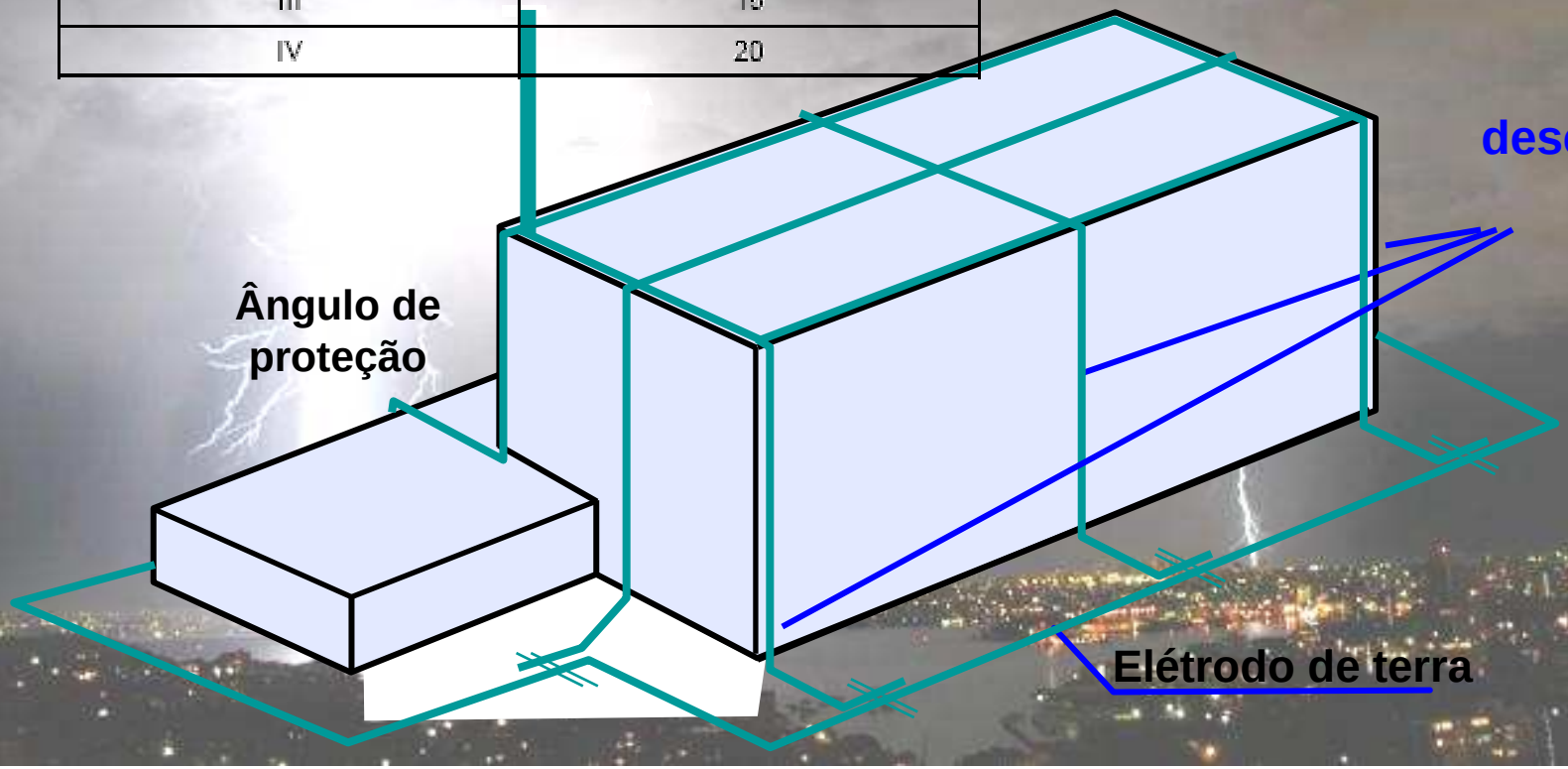


DIN V VDE 0185-3:2002-11 Table 3

Número de descidas

Table 4 – Typical values of the distance between down-conductors and between ring conductors according to the class of LPS

Class of LPS	Typical distances m
I	10
II	10
III	15
IV	20

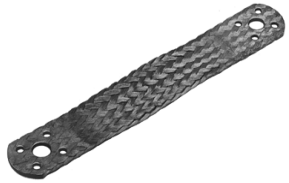


Gaiola de Faraday
Instalação captora em cobertura plana.

Suporte de cimento

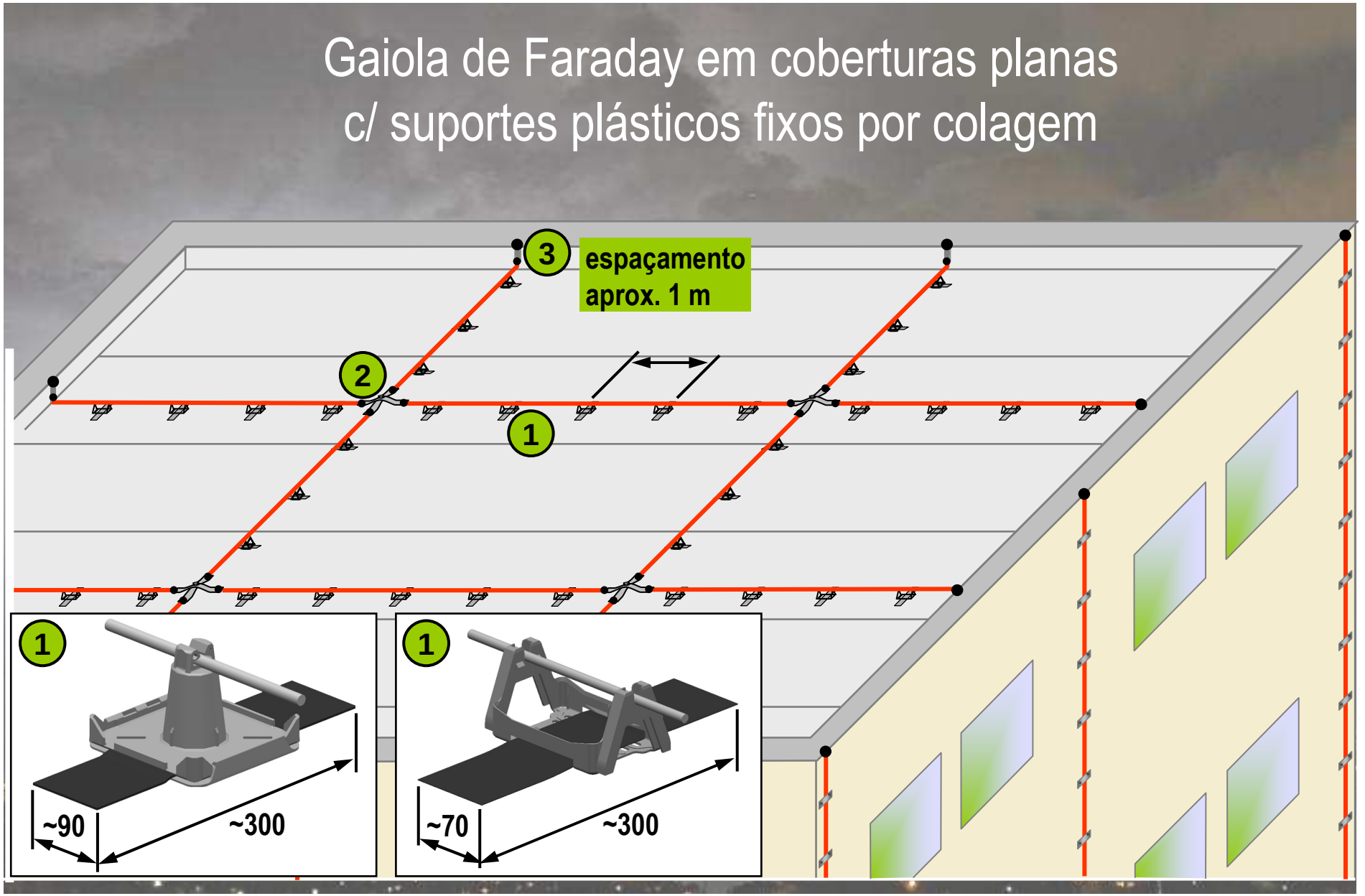
Distância entre suportes aproximadamente 1m

Ligação flexível



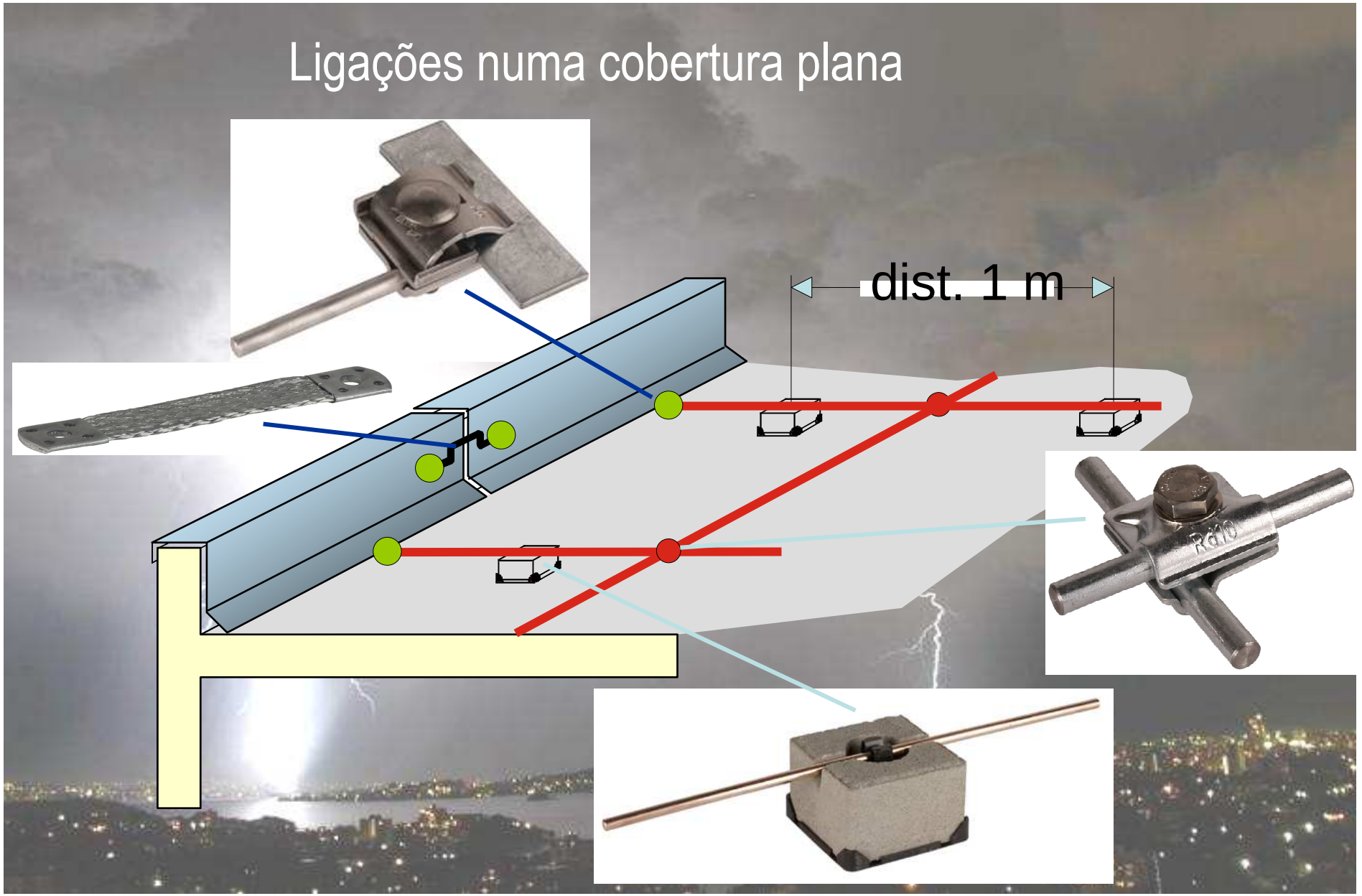
Suporte de cimento

Gaiola de Faraday em coberturas planas c/ suportes plásticos fixos por colagem

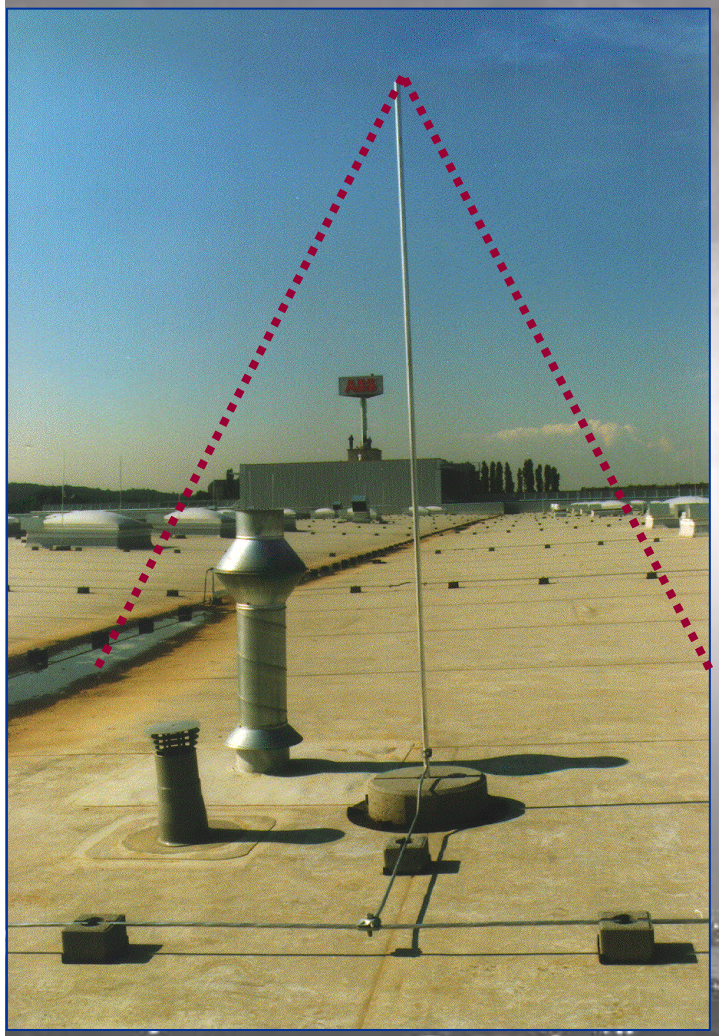


Gaiola de Faraday
Malha captora com hastes de Franklim

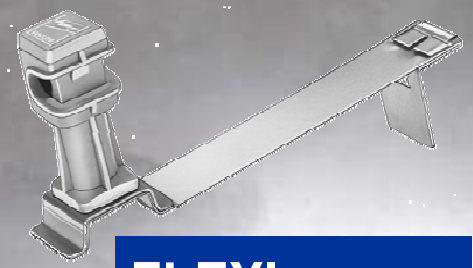
Ligações numa cobertura plana



Aplicação de hastes de Franklin - convencionais



Fixadores para telhas



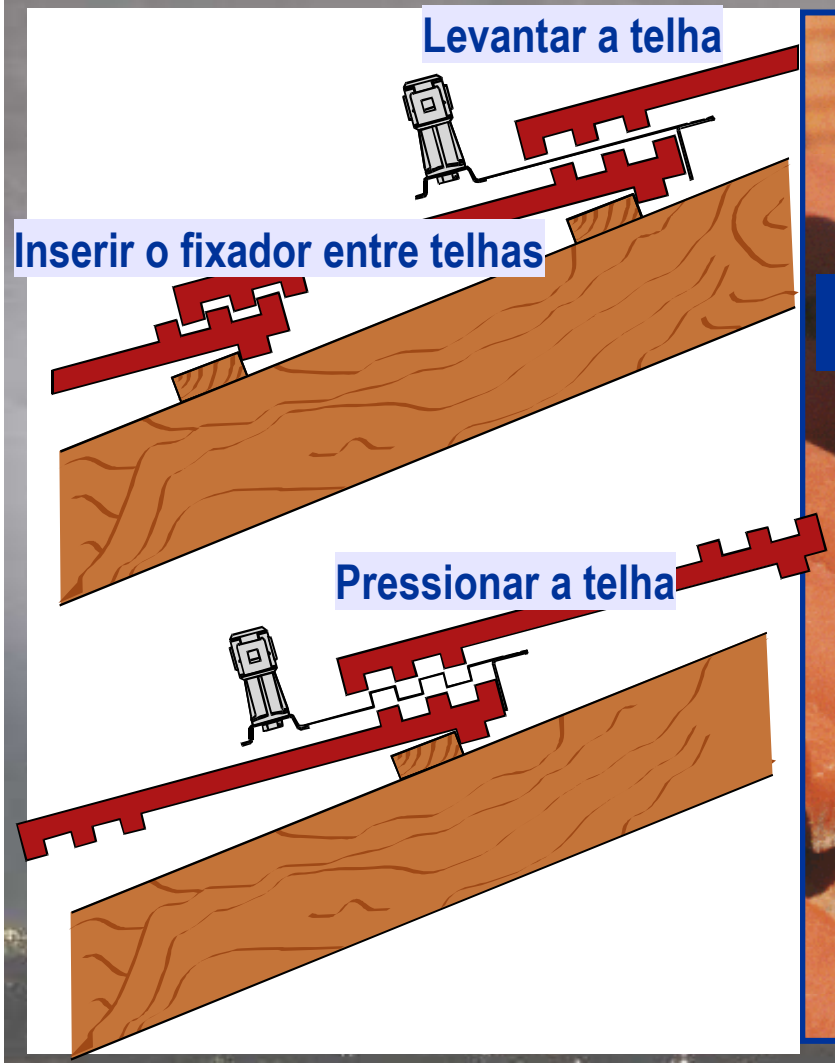
FLEXIsnap
Refª: 204 938

UNIsnap
Refª.: 204 924

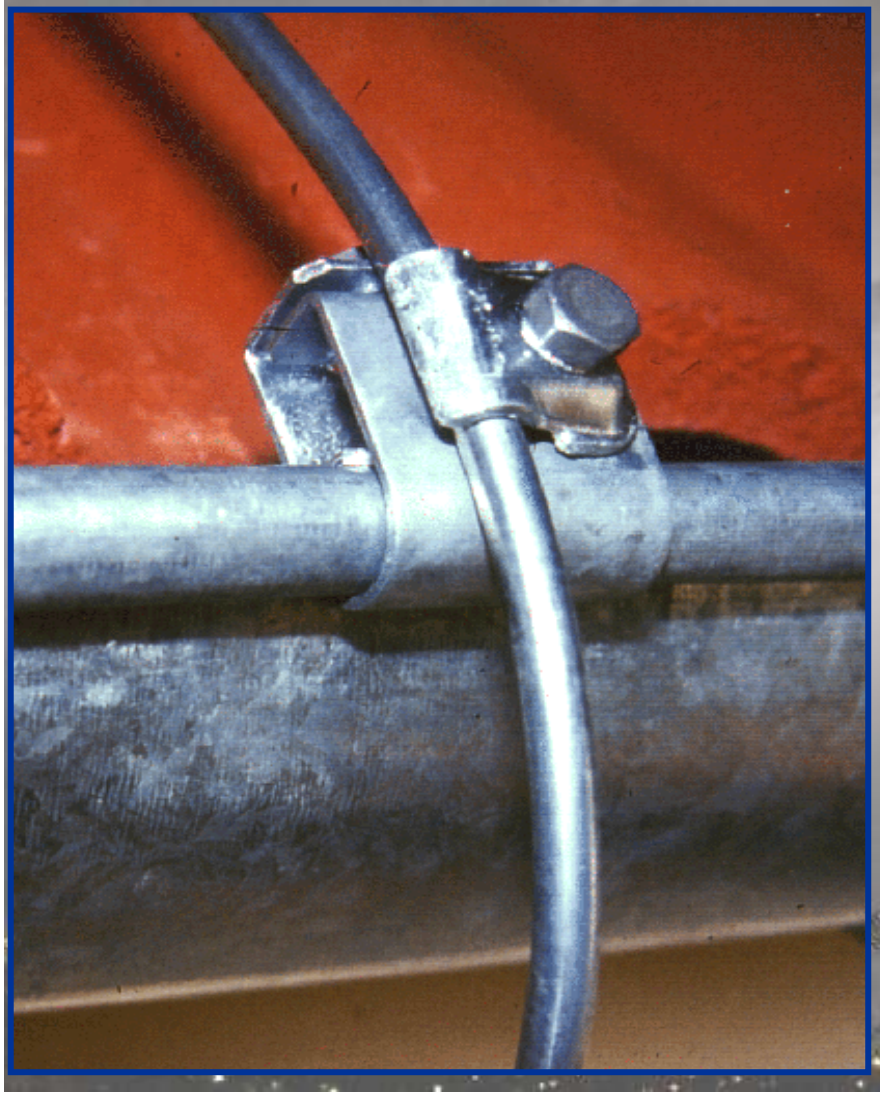
Refª.: 204 171

UNIgrip
Refª.: 206 309

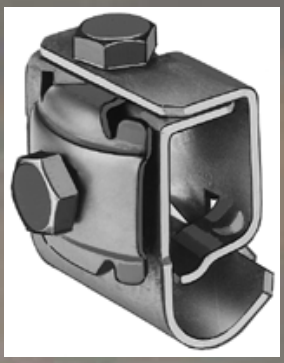
Fixadores para telhas



Ligadores de caleira



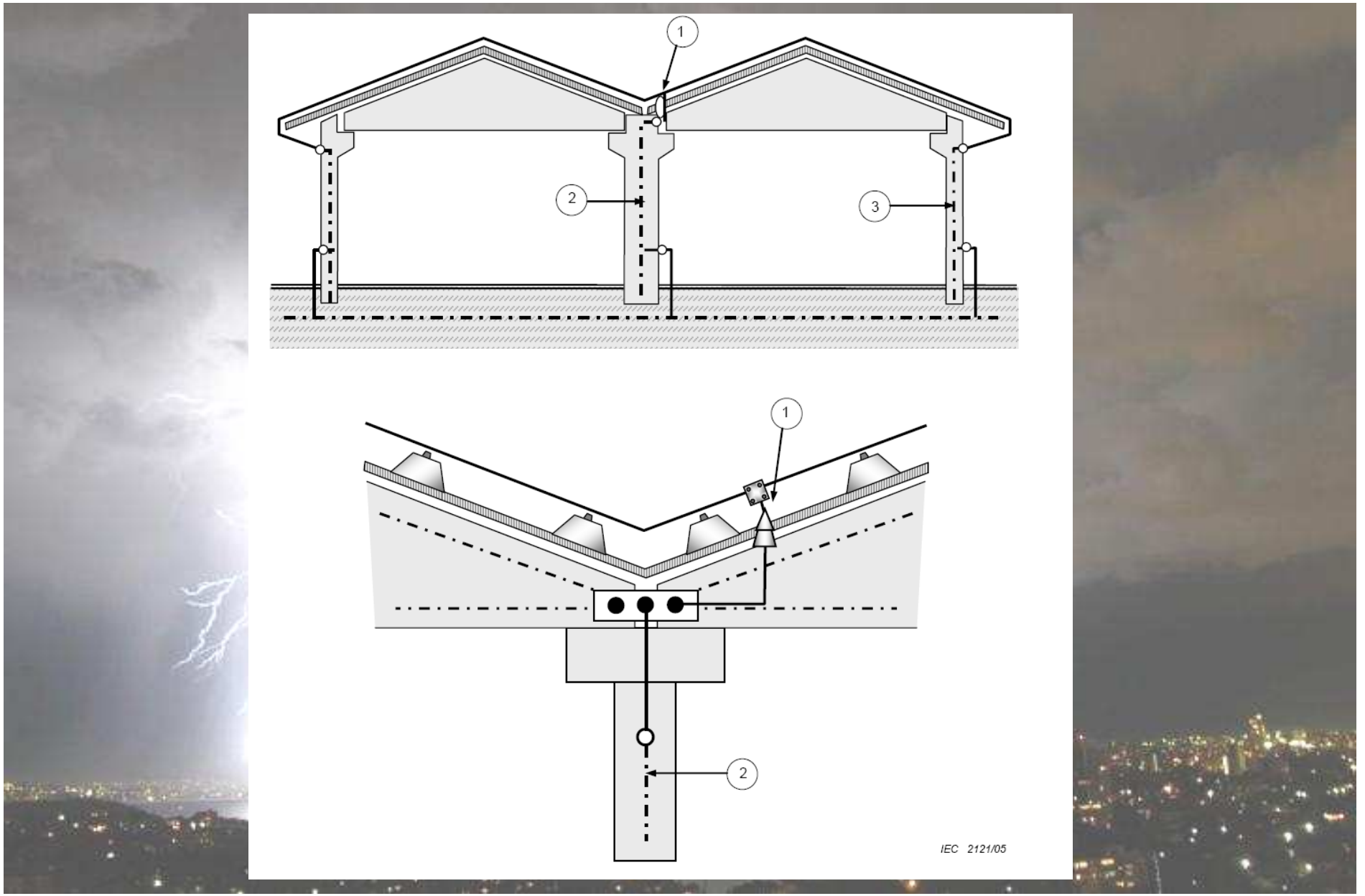
Refª.: 339 060

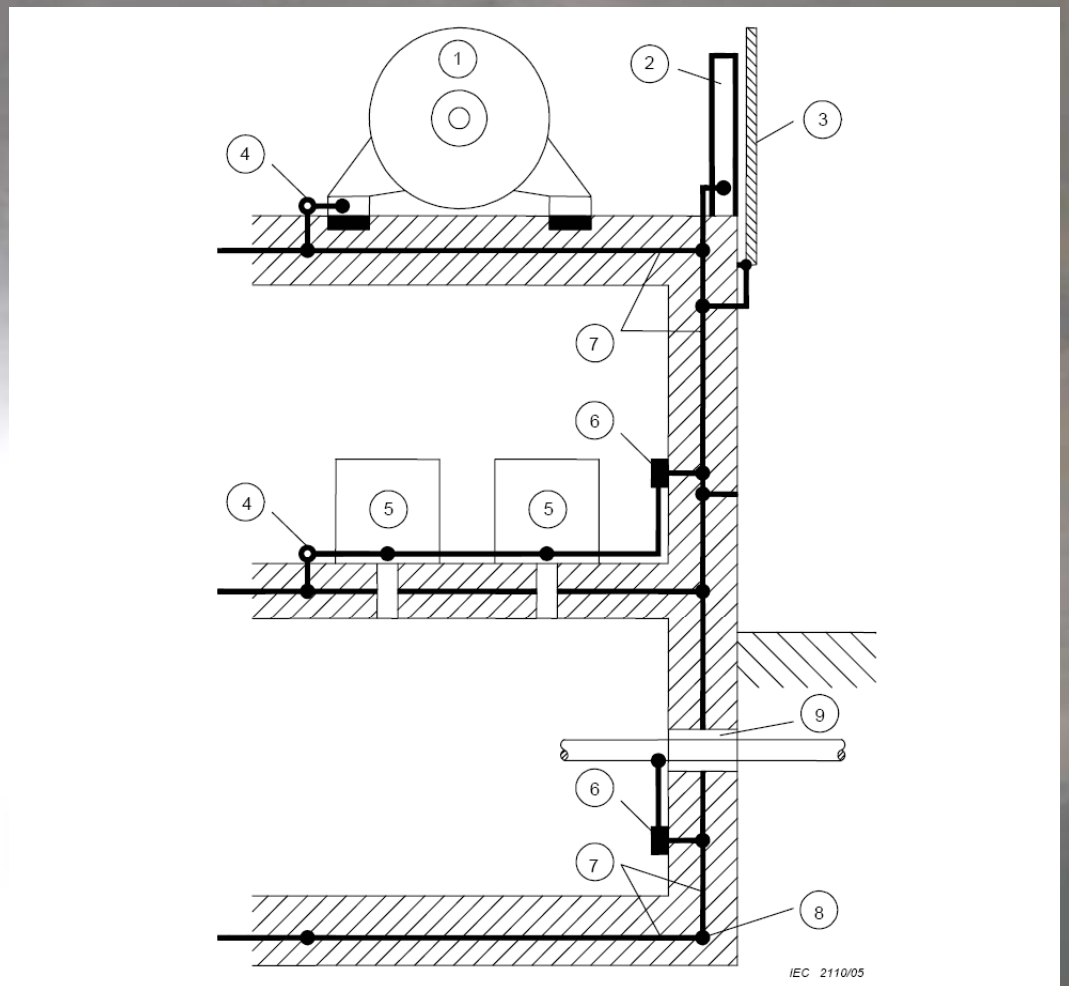


Refª.: 339 050

Refª.: 339 107

Refª.: 339 119


1
2
3
1
2
IEC 2121/05



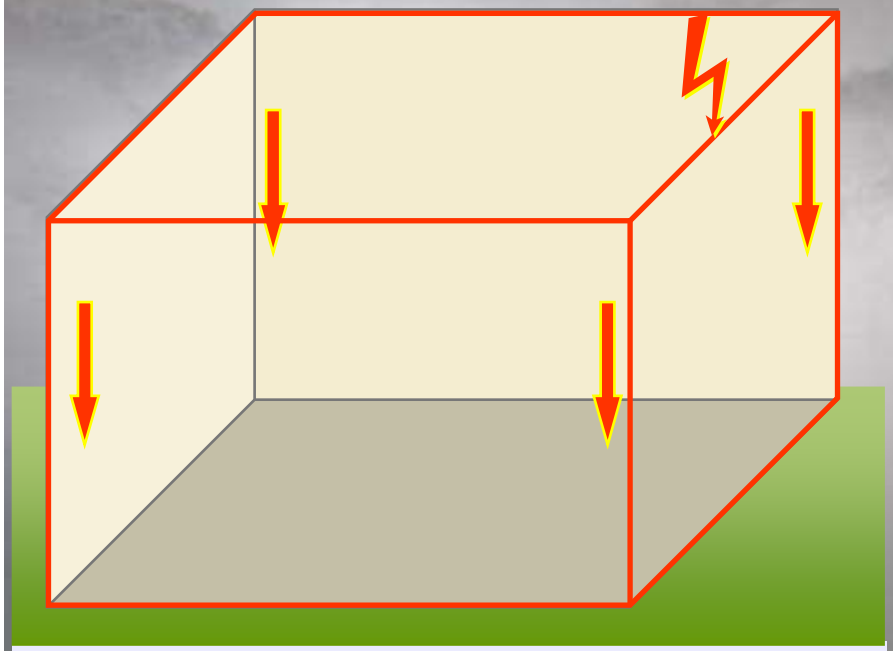
Key

1 Electrical power equipment	6 Bonding bar
2 Steel girder	7 Steel reinforcement in concrete (with superimposed mesh conductors)
3 Metal covering of the facade	8 Foundation earth electrode
4 Bonding joint	9 Common inlet for different services
5 Electrical or electronic equipment	

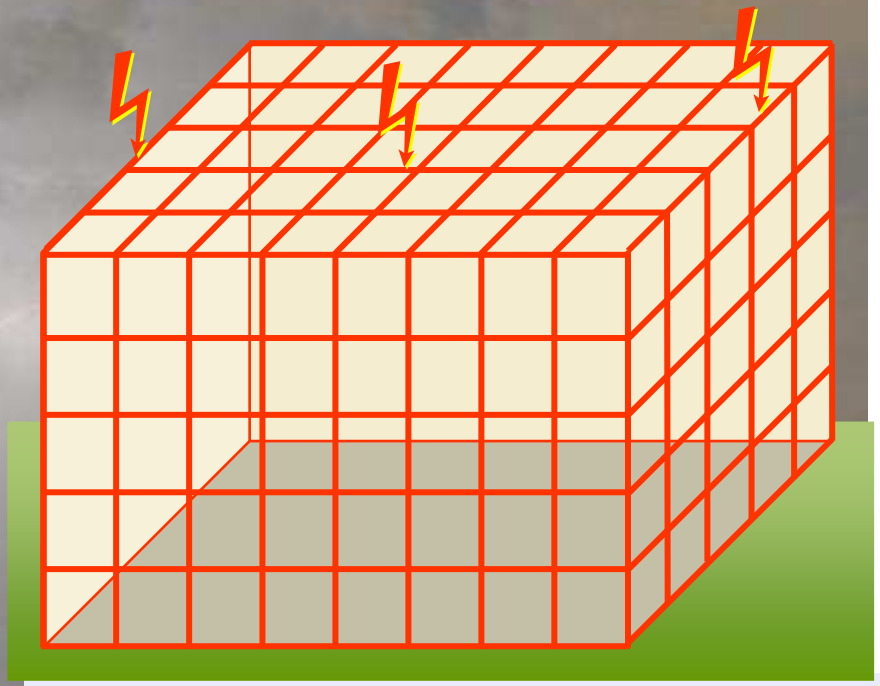
Figure E.4 – Equipotential bonding in a structure with a steel reinforcement

Redução do campo eletromagnético por incremento da rede emalhada

Redução do campo eletromagnético através da divisão da corrente da descarga atmosférica, em várias descidas.

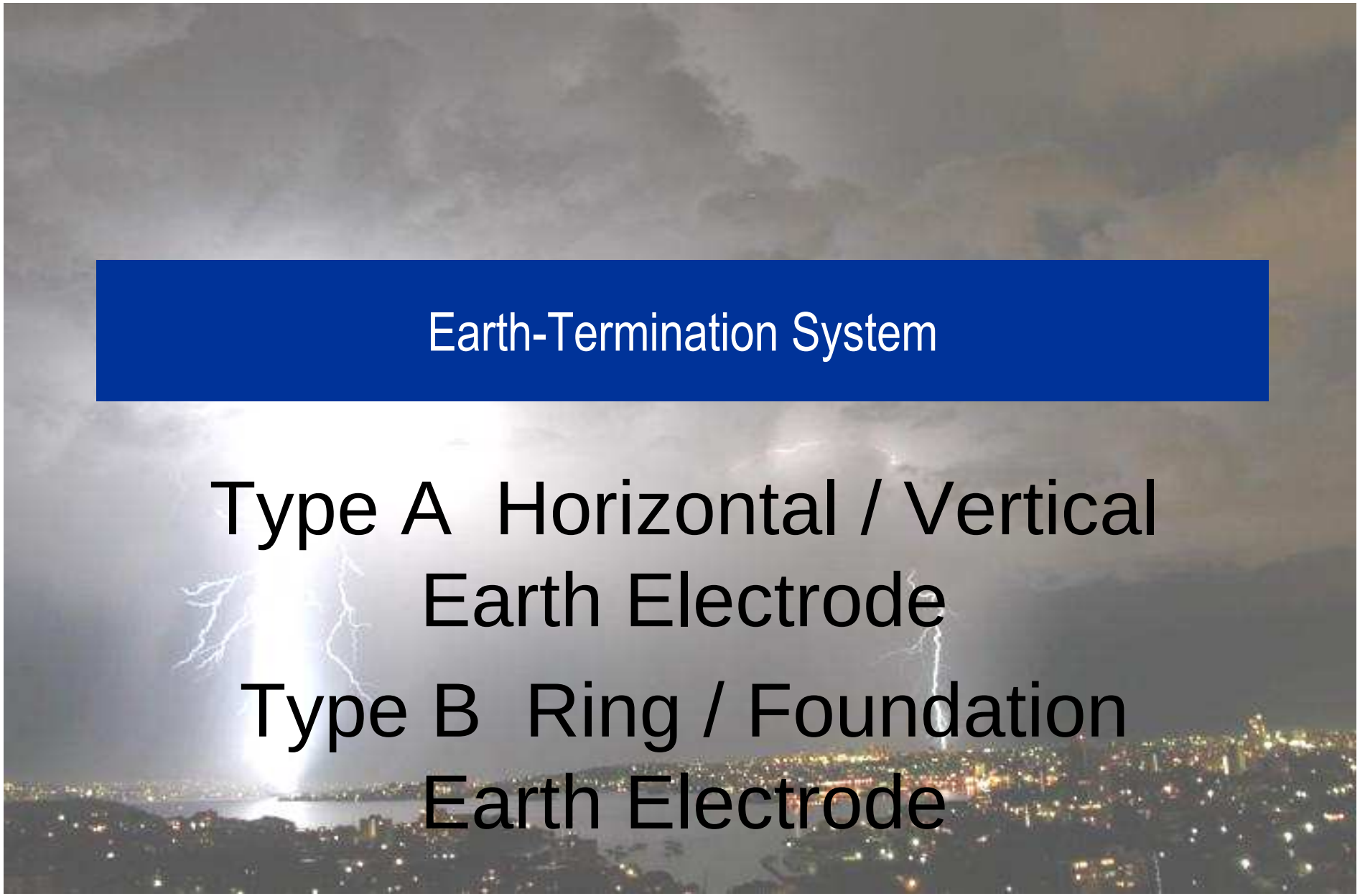


Valor elevado de campo eletromagnético / tensões induzidas elevadas, nas proximidades do condutor de baixada



Correntes parciais inferiores
Valor de campo eletromagnético inferior / tensões induzidas reduzidas, nas proximidades do condutor de baixada

- ELÉTRODOS DE TERRA



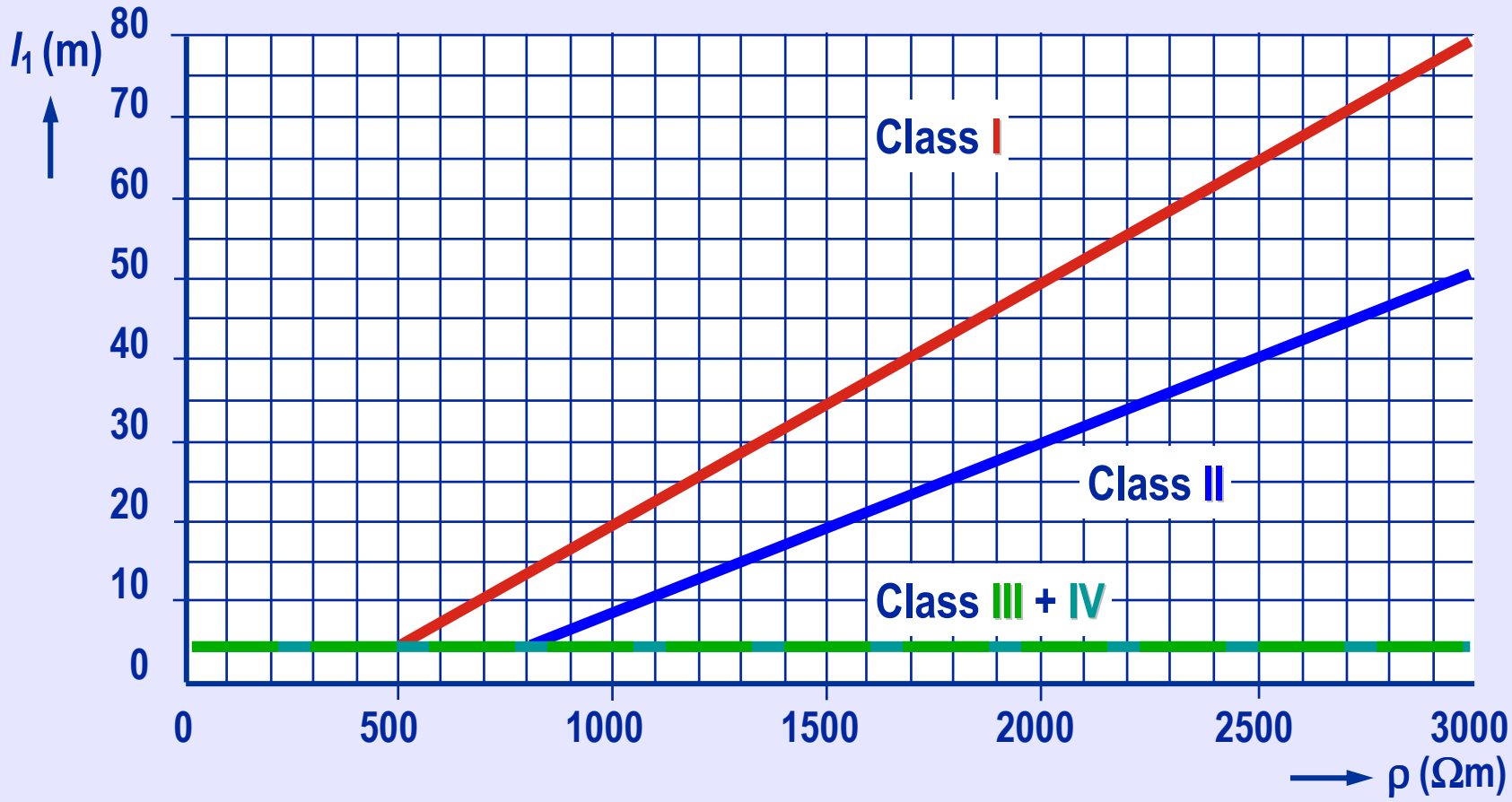
Earth-Termination System

Type A Horizontal / Vertical Earth Electrode

Type B Ring / Foundation Earth Electrode

Minimum length of each earth electrode according to the class of LPS

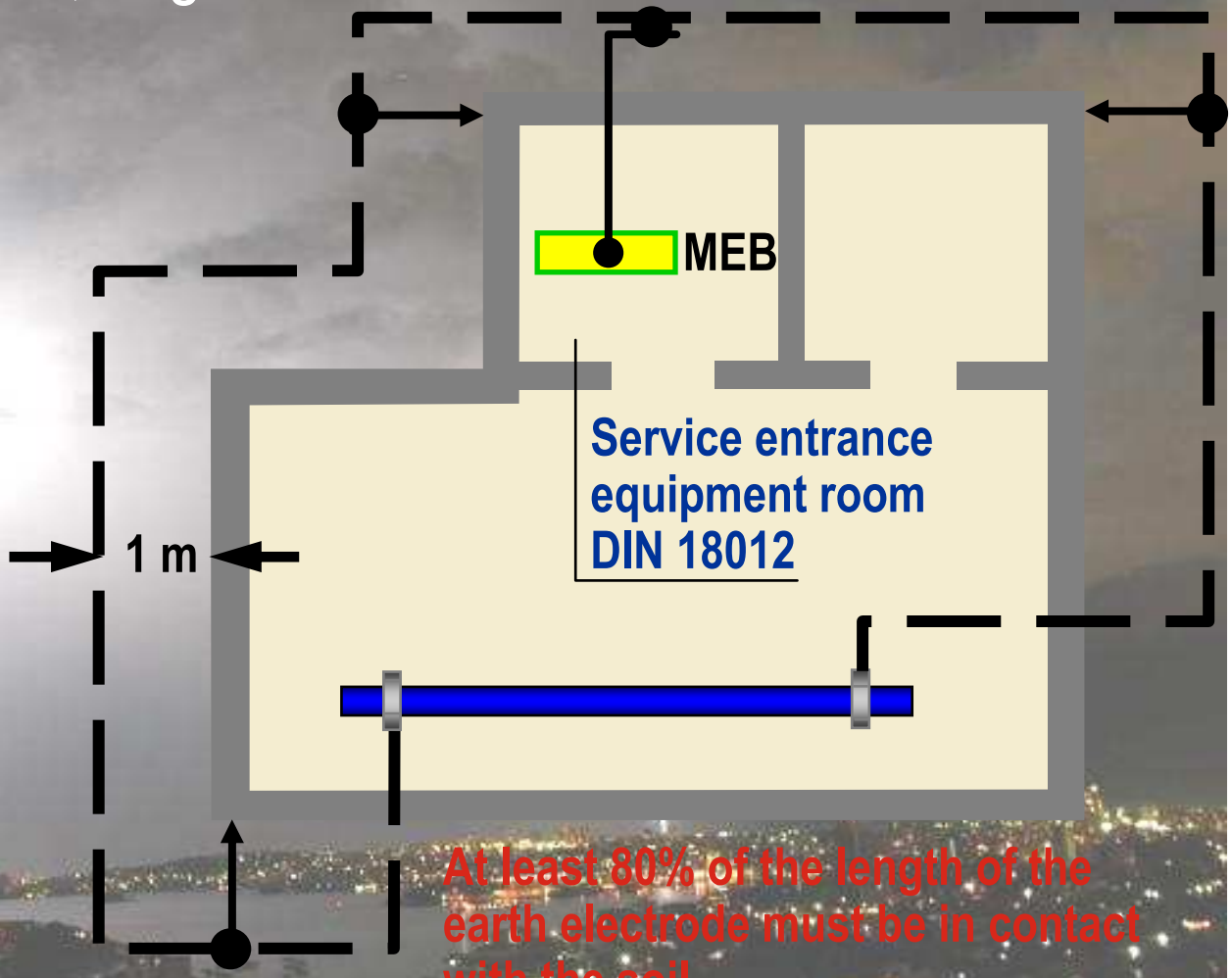
Classes III and IV are independent of soil resistivity ρ



Ref.: IEC 62305-3:2006, 5.4.2.1 Figure 2

Earth-termination systems
Type B arrangement, ring or foundation earth electrode

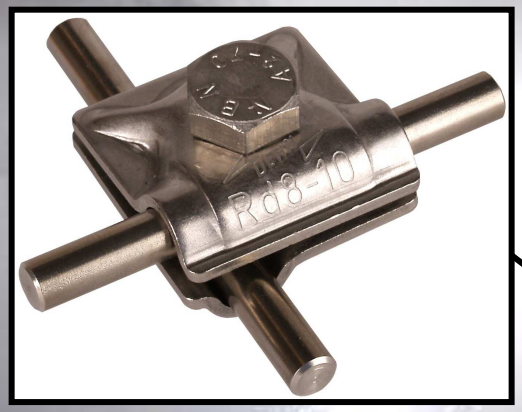
"This type of arrangement comprises either a ring conductor external to the structure to be protected, in contact with the soil for at least 80 % of its total length, or a foundation earth electrode. Such earth electrodes may also be meshed."



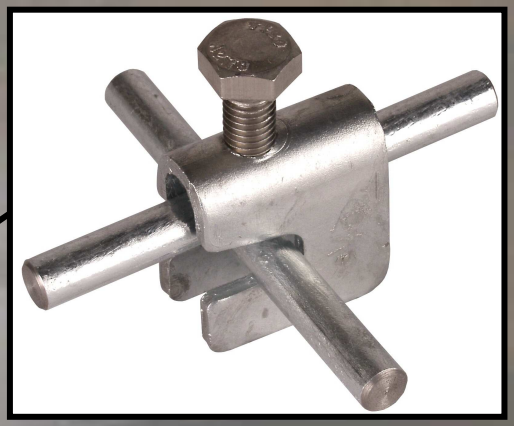
Ref.: IEC 62305-3:2006, 5.4.2.2

MEB = main earthing busbar

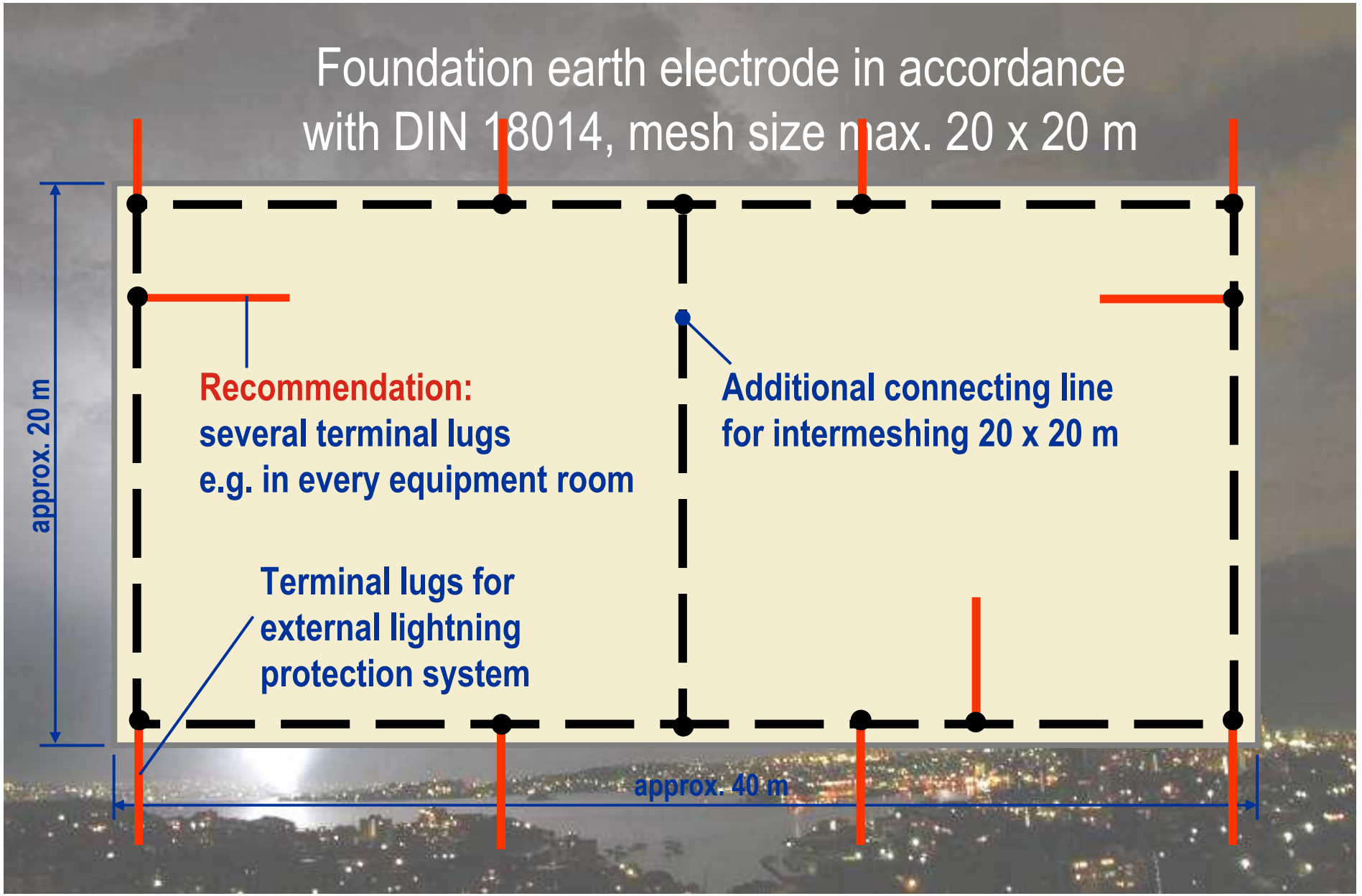
Connection of round wire (10 mm) to foundation earth electrode



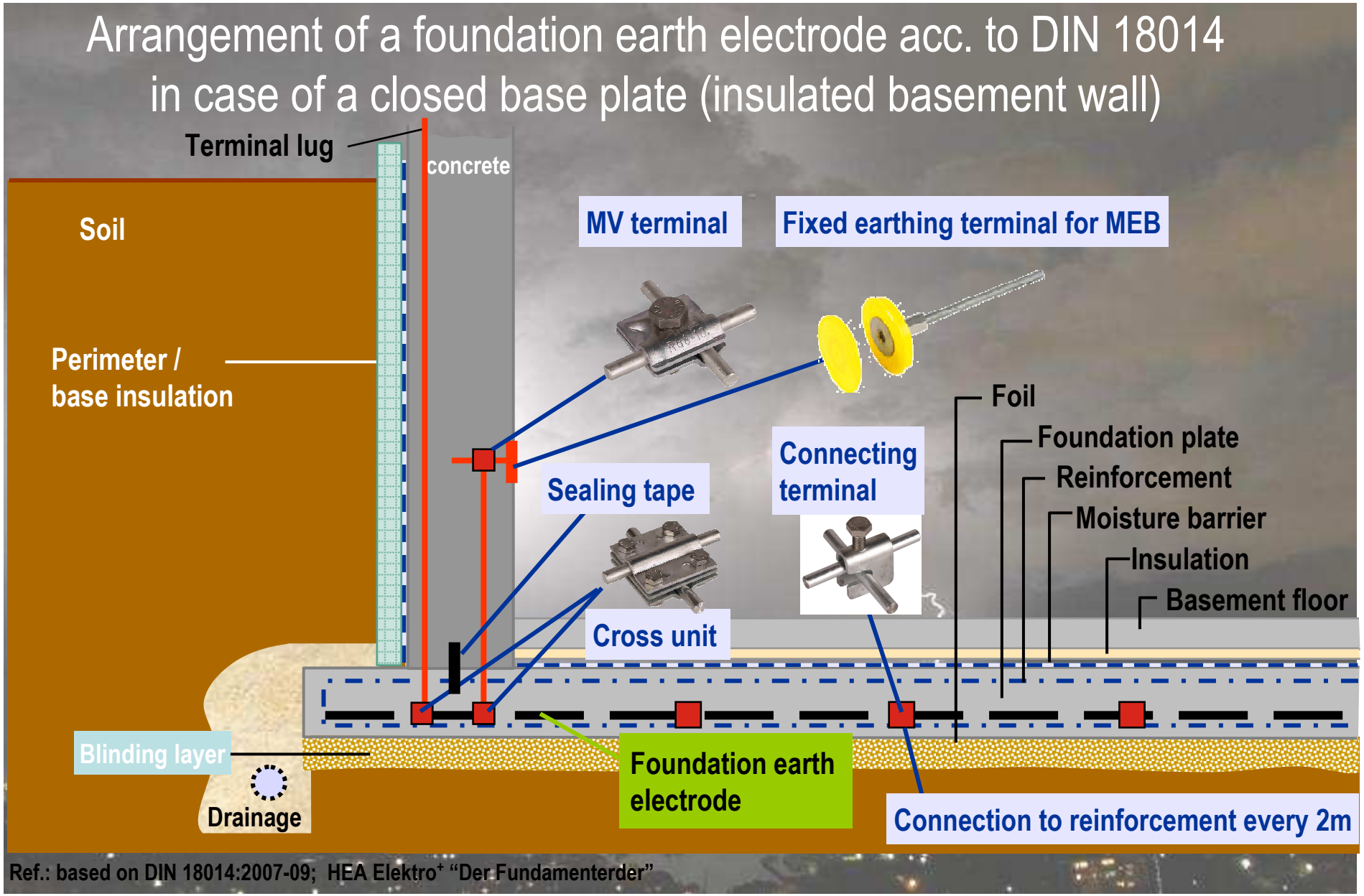
Part No. 390 059

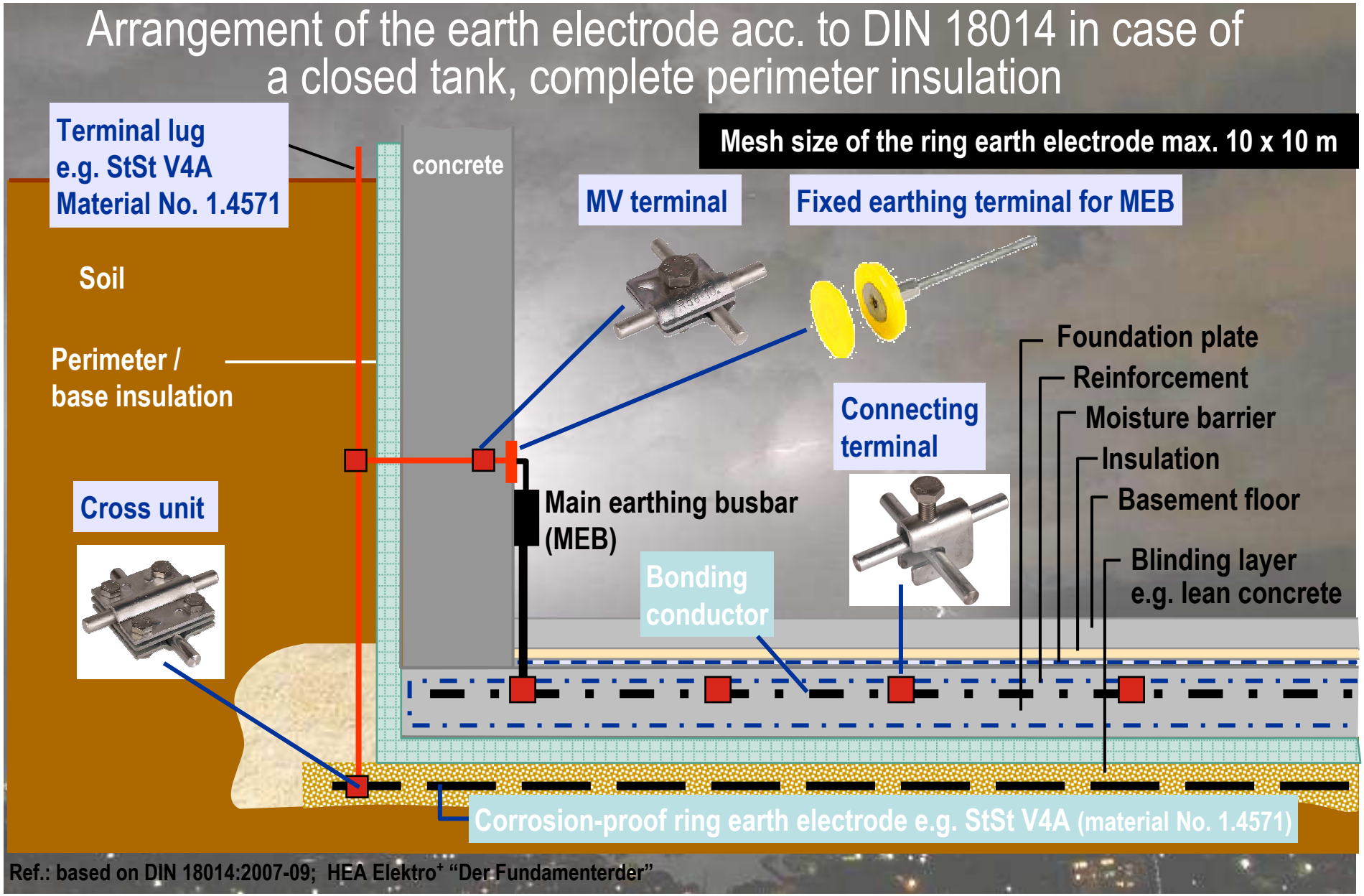


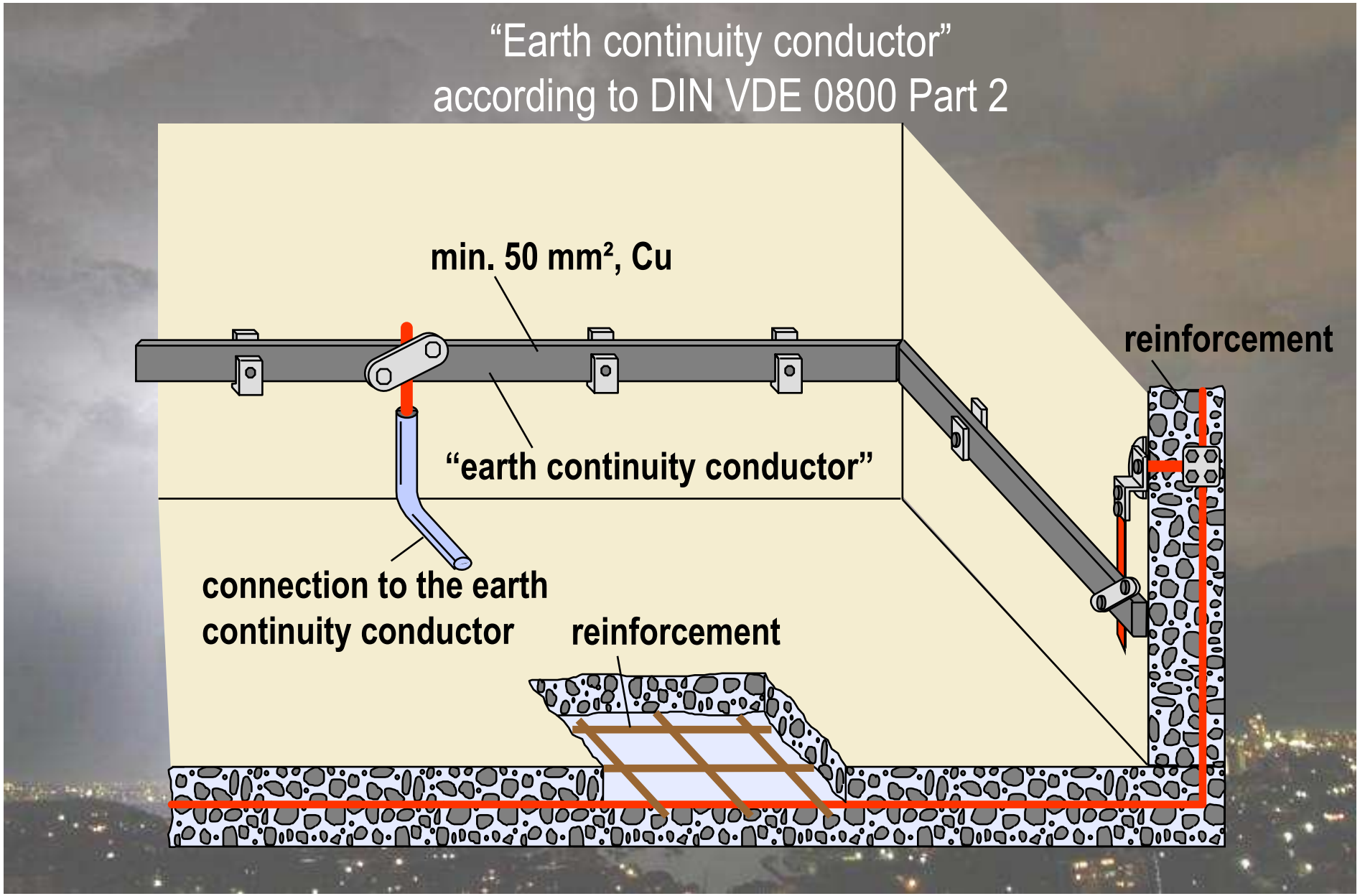
Part No. 308 025

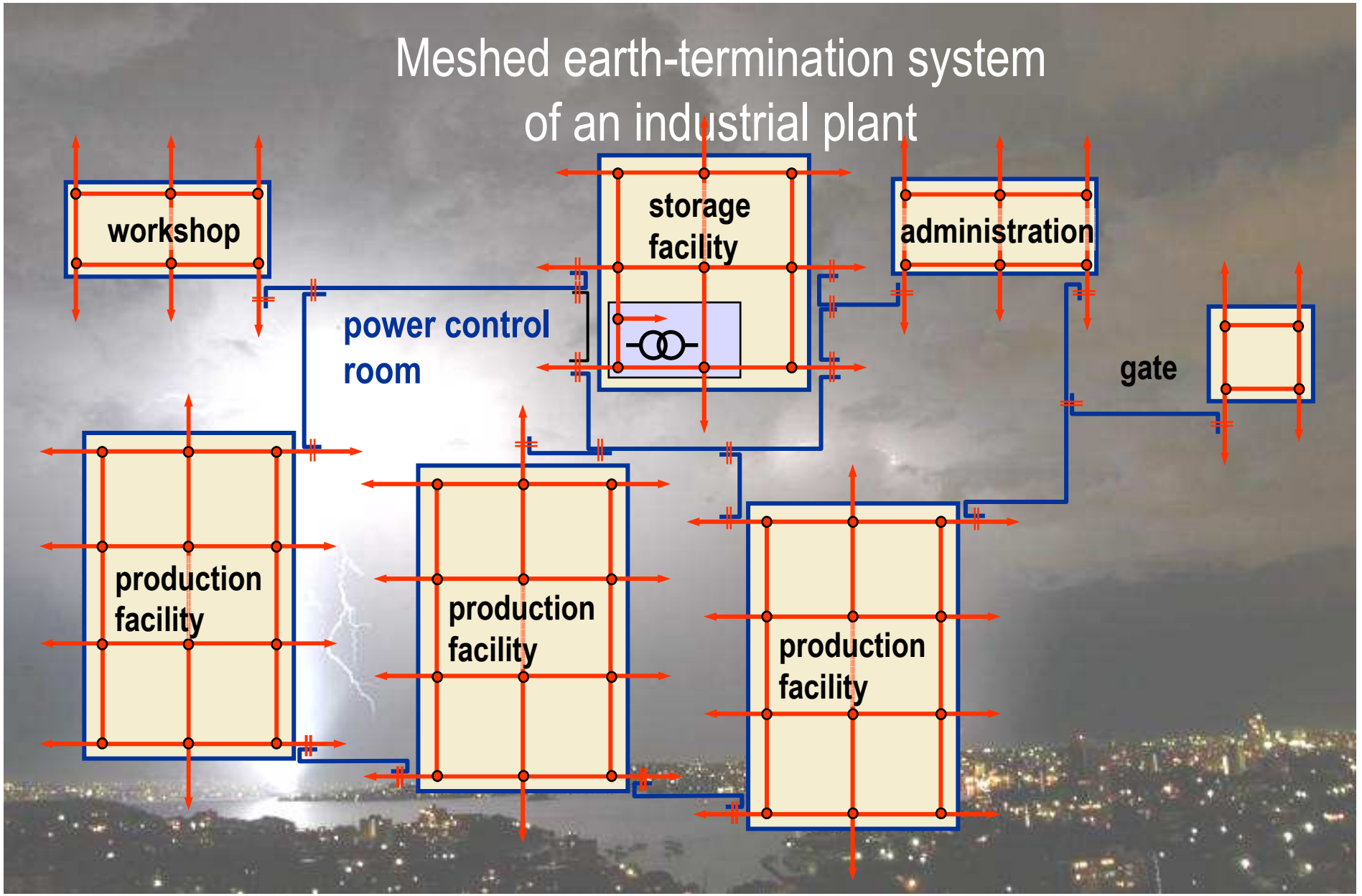

Foundation earth electrode in accordance with DIN 18014, mesh size max. 20 x 20 m
approx. 20 m
Recommendation:
several terminal lugs
e.g. in every equipment room
Additional connecting line
for intermeshing 20 x 20 m
Terminal lugs for
external lightning
protection system
approx. 40 m

Arrangement of a foundation earth electrode acc. to DIN 18014 in case of a closed base plate (insulated basement wall)

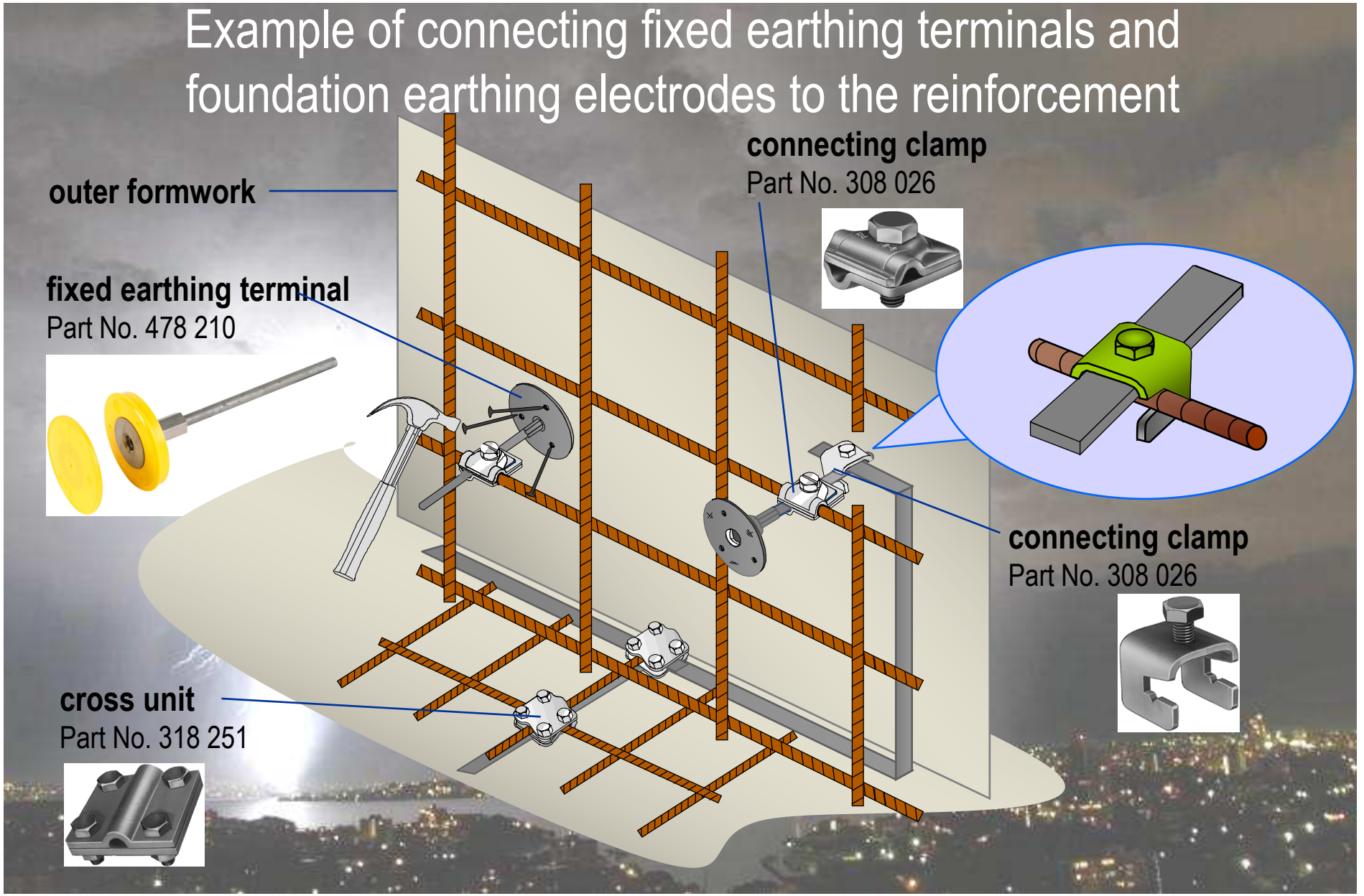



Arrangement of the earth electrode acc. to DIN 18014 in case of a closed tank, complete perimeter insulation
Terminal lug e.g. StSt V4A Material No. 1.4571
Mesh size of the ring earth electrode max. 10 x 10 m
concrete
MV terminal
Fixed earthing terminal for MEB
Soil
Perimeter / base insulation
Foundation plate
Reinforcement
Moisture barrier
Insulation
Basement floor
Blinding layer e.g. lean concrete
Connecting terminal
Cross unit
Main earthing busbar (MEB)
Bonding conductor
Corrosion-proof ring earth electrode e.g. StSt V4A (material No. 1.4571)
Ref.: based on DIN 18014:2007-09; HEA Elektro+ "Der Fundamenterder"


"Earth continuity conductor"
according to DIN VDE 0800 Part 2
min. 50 mm², Cu
reinforcement
"earth continuity conductor"
connection to the earth
continuity conductor
reinforcement


Meshed earth-termination system
of an industrial plant
workshop
storage
facility
administration
power control
room
gate
production
facility
production
facility
production
facility

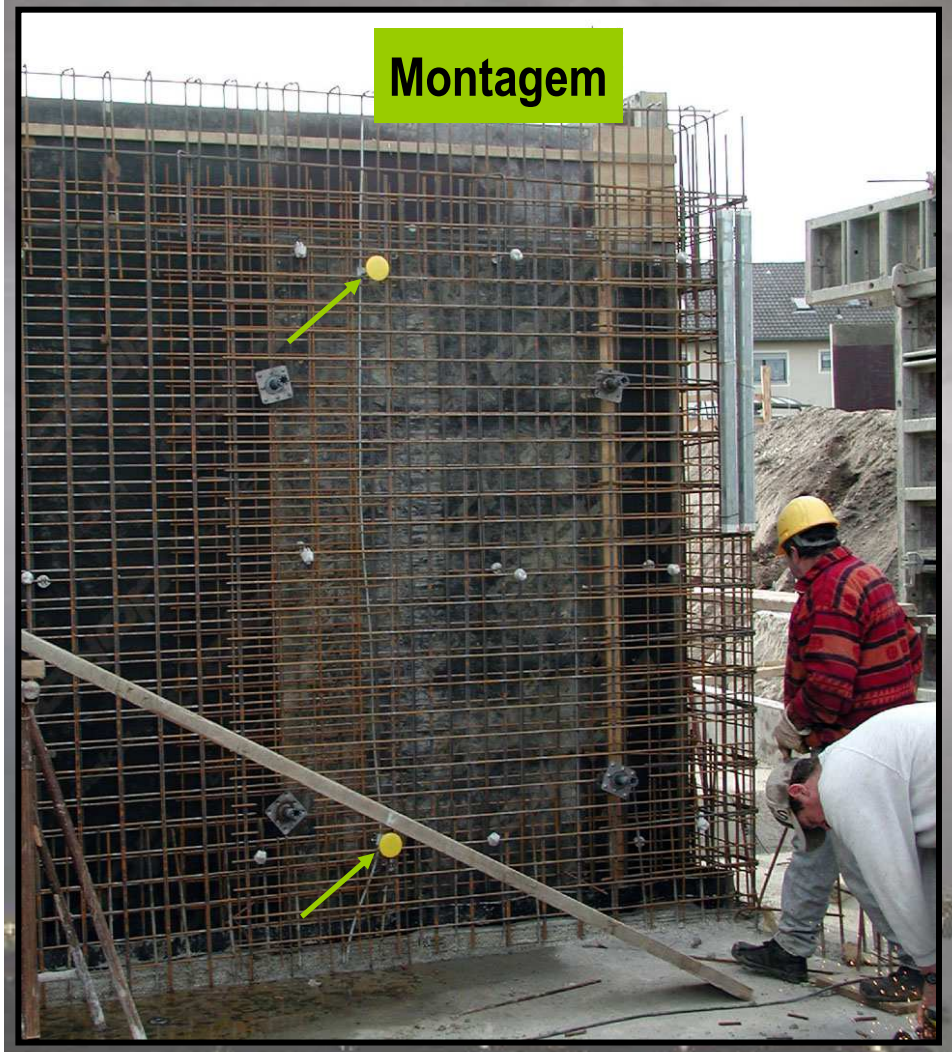
Example of connecting fixed earthing terminals and foundation earthing electrodes to the reinforcement

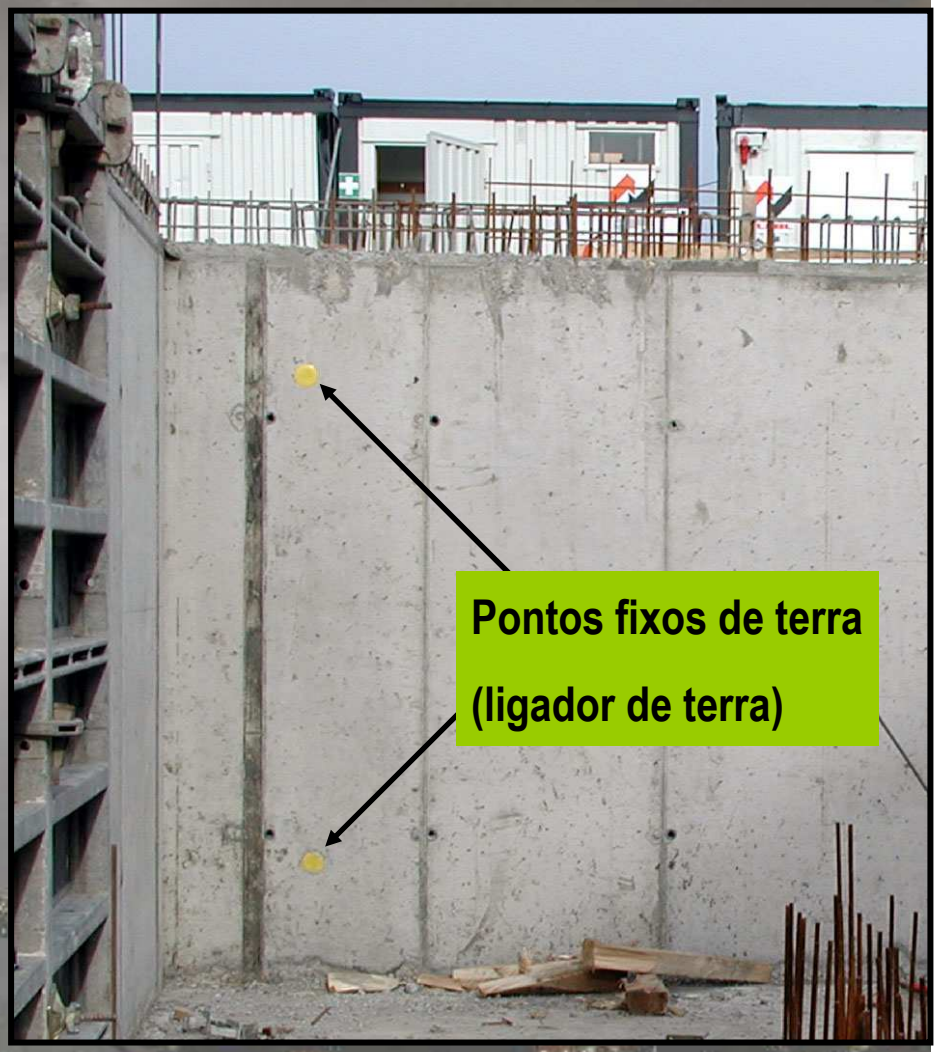


Ponto fixo de terra – ligador amovível

Ligação do ponto fixo de terra à estrutura metálica do edifício

Ligações do ponto fixo de terra



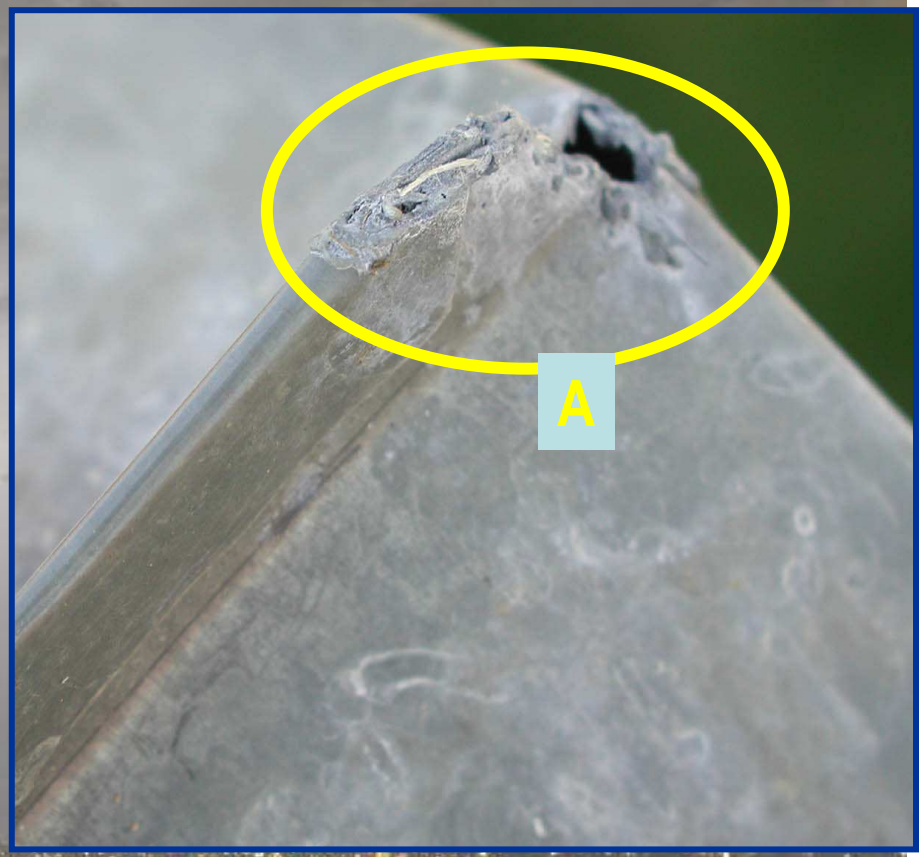


Aproveitamento da estrutura metálica do edifício para reforço do elétrodo de terra


• Coberturas metálicas

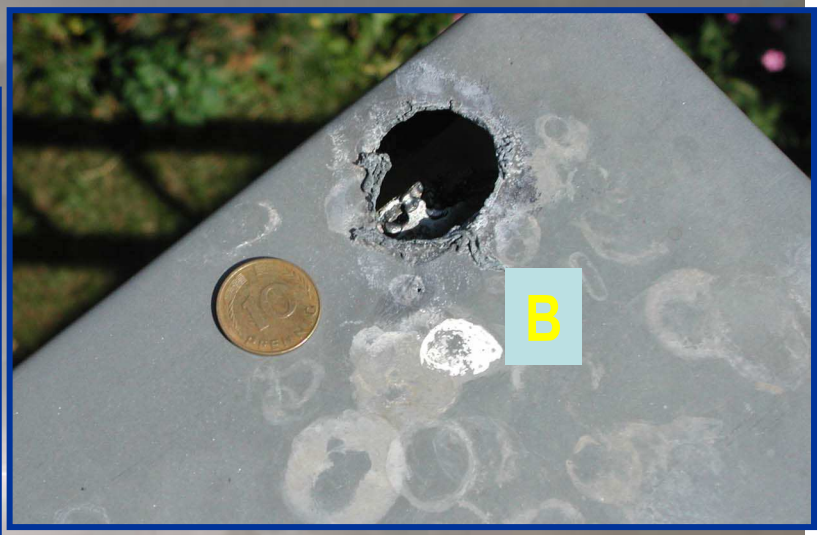
Coberturas metálicas

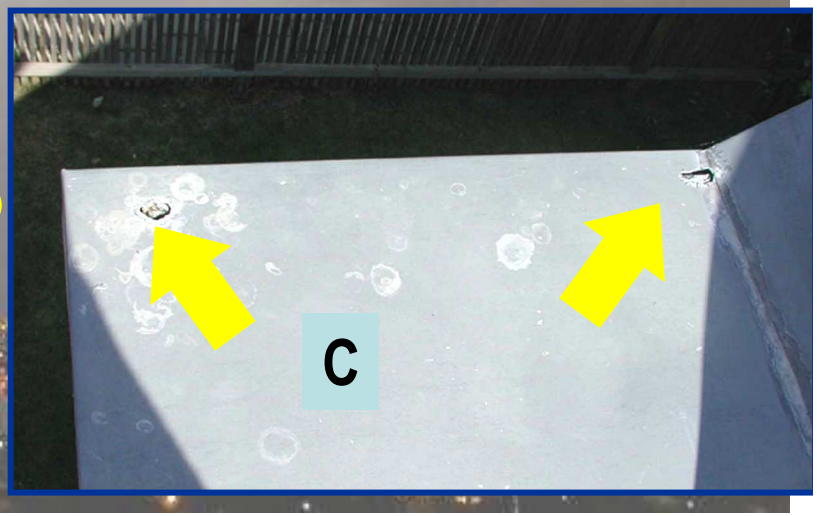
Consequências do impacto



Evaluation: BLIDS - SIEMENS Neumarkt i.d.OPf. 07.07.2001, 17:34
I = 20400 A

Consequências do impacto





Evaluation: BLIDS - SIEMENS
Neumarkt i.d.OPf.07.07.2001, 17:34
I = 20400 A

SPDA para coberturas metálicas
comprimentos das ponteiras

Para todas as classes de SPDA

Espaçamento dos condutores	comprimento das ponteiras *
3 m	0.15 m
4 m	0.25 m
5 m	0.35 m
6 m	0.45 m

* Valores recomendados

Fixadores para coberturas metálicas s/ perfurar

Part No. 297 110

Art.-Nr. 297 117

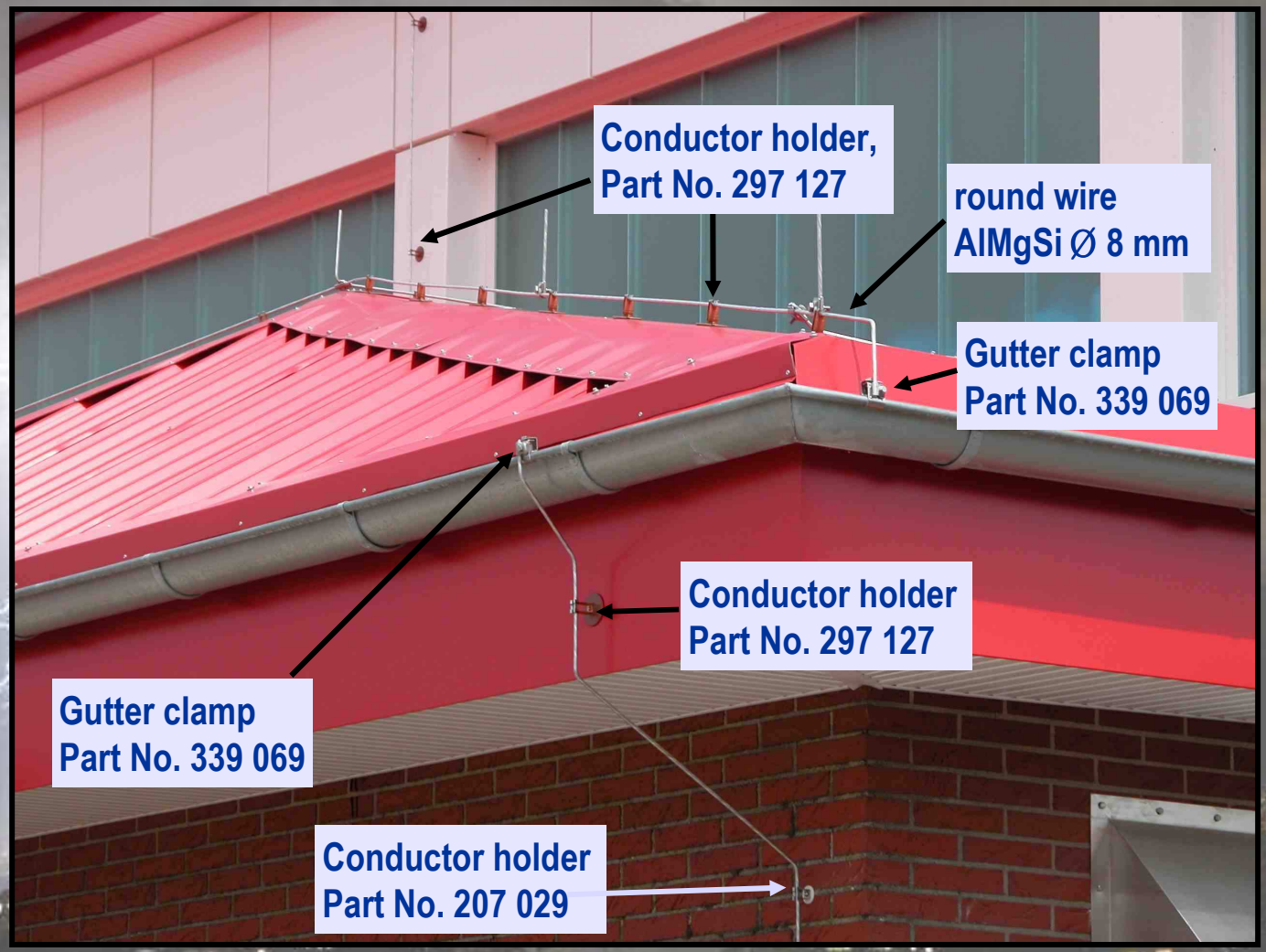
Art.-Nr. 297 120

Part No. 297 127

Nota: Ver instruções de montagem MO 1473 !

Material	Conductor holder	Colour	LH Height	∅ Plate	Part No.
synthetic	DEHNsnap	grau	36 mm	67 mm	297 110
synthetic	DEHNsnap	braun	36 mm	67 mm	297 117
synthetic	DEHNgrip	grau	32 mm	67 mm	297 120
	DEHNgrip	braun	32 mm	67 mm	297 127

Water union Bersenbrück
Waterworks Ahausen / Control room with



Ref.: H. Bartels GmbH, Oldenburg

Water union Bersenbrück
Waterworks Ahausen / Control room with

Ref.: H. Bartels GmbH, Oldenburg

Water union Bersenbrück
Waterworks Ahausen / Control room with

Ref.: H. Bartels GmbH, Oldenburg

Water union Bersenbrück
Waterworks Ahausen / Control room with

Detail conductor holder
Part No. 297 127
on metal façade

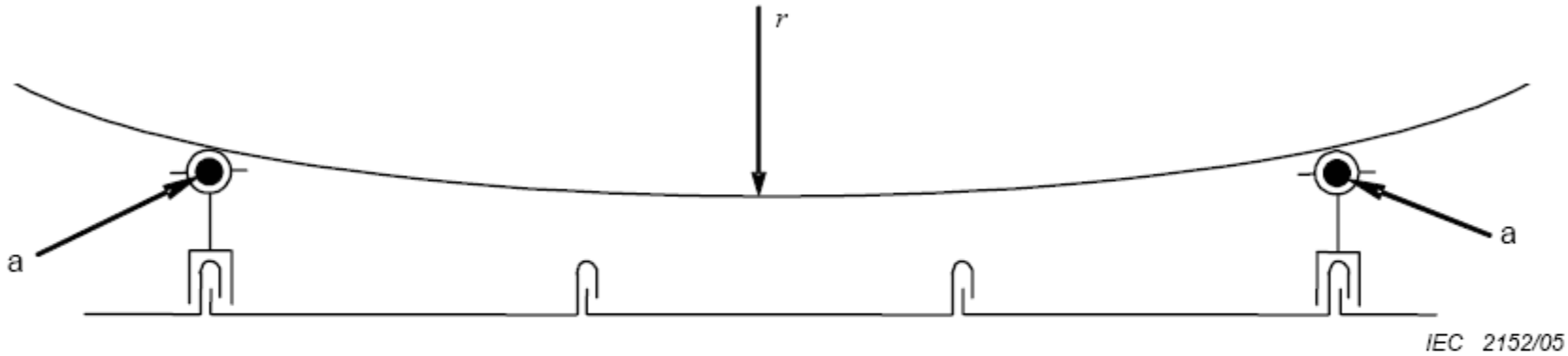
Ref.: H. Bartels GmbH, Oldenburg

Table 3 – Minimum thickness of metal sheets or metal pipes in air-termination systems

Class of LPS	Material	Thickness [a] t mm	Thickness [b] t' mm
I to IV	Lead	–	2,0
	Steel (stainless, galvanized)	4	0,5
	Titanium	4	0,5
	Copper	5	0,5
	Aluminium	7	0,65
	Zinc	–	0,7

[a] t prevents puncture, hot spot or ignition.

[b] t' only for metal sheets if it is not important to prevent puncture, hot spot or ignition problems.



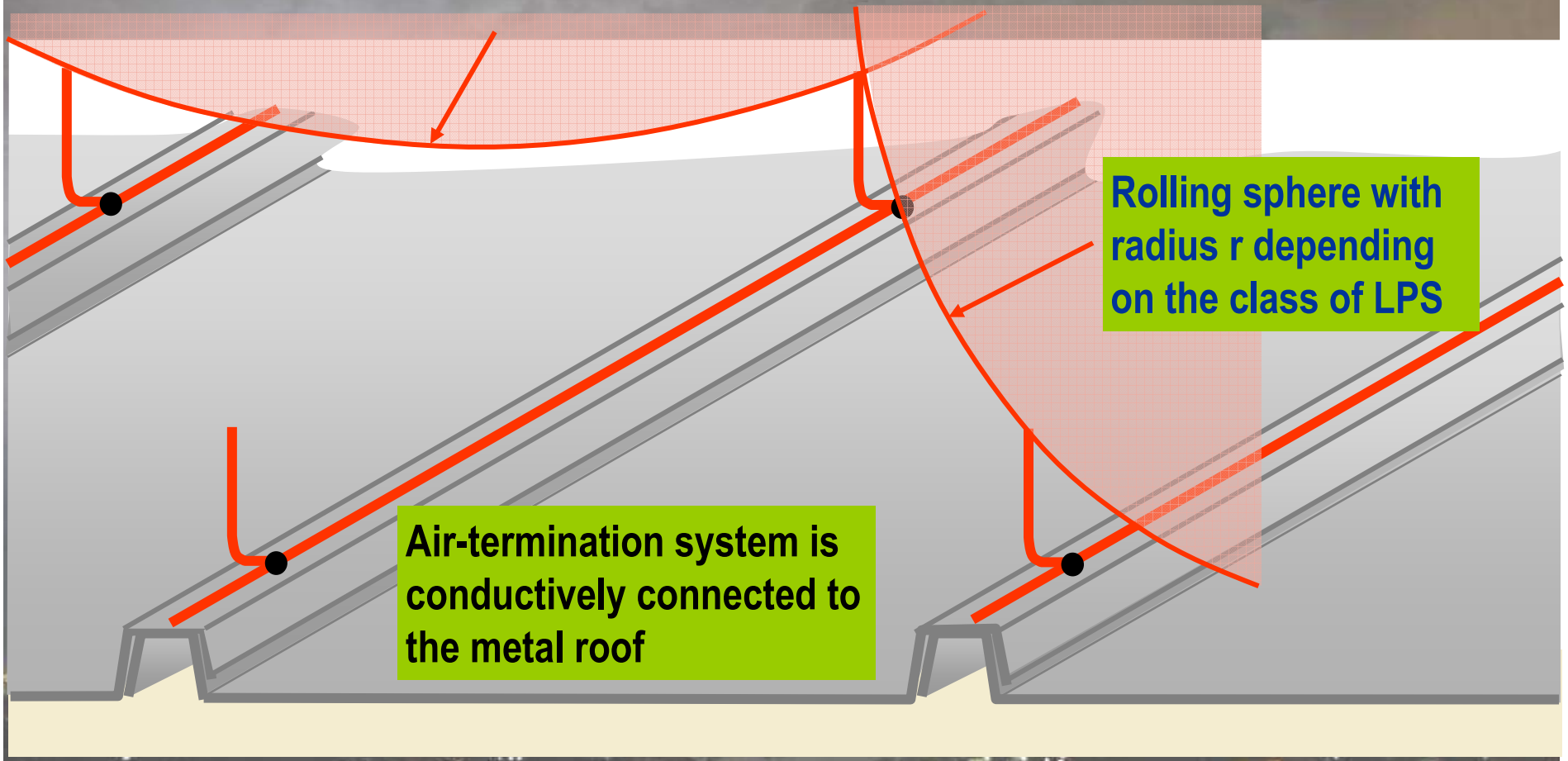
Key
r Radius of the rolling sphere, Table 2
a Air-termination conductors

NOTE The rolling sphere should not touch any part of the metallic roof including the standing seams.

Figure E.26 – Construction of air-termination network on a roof with conductive covering where puncturing of the covering is not acceptable

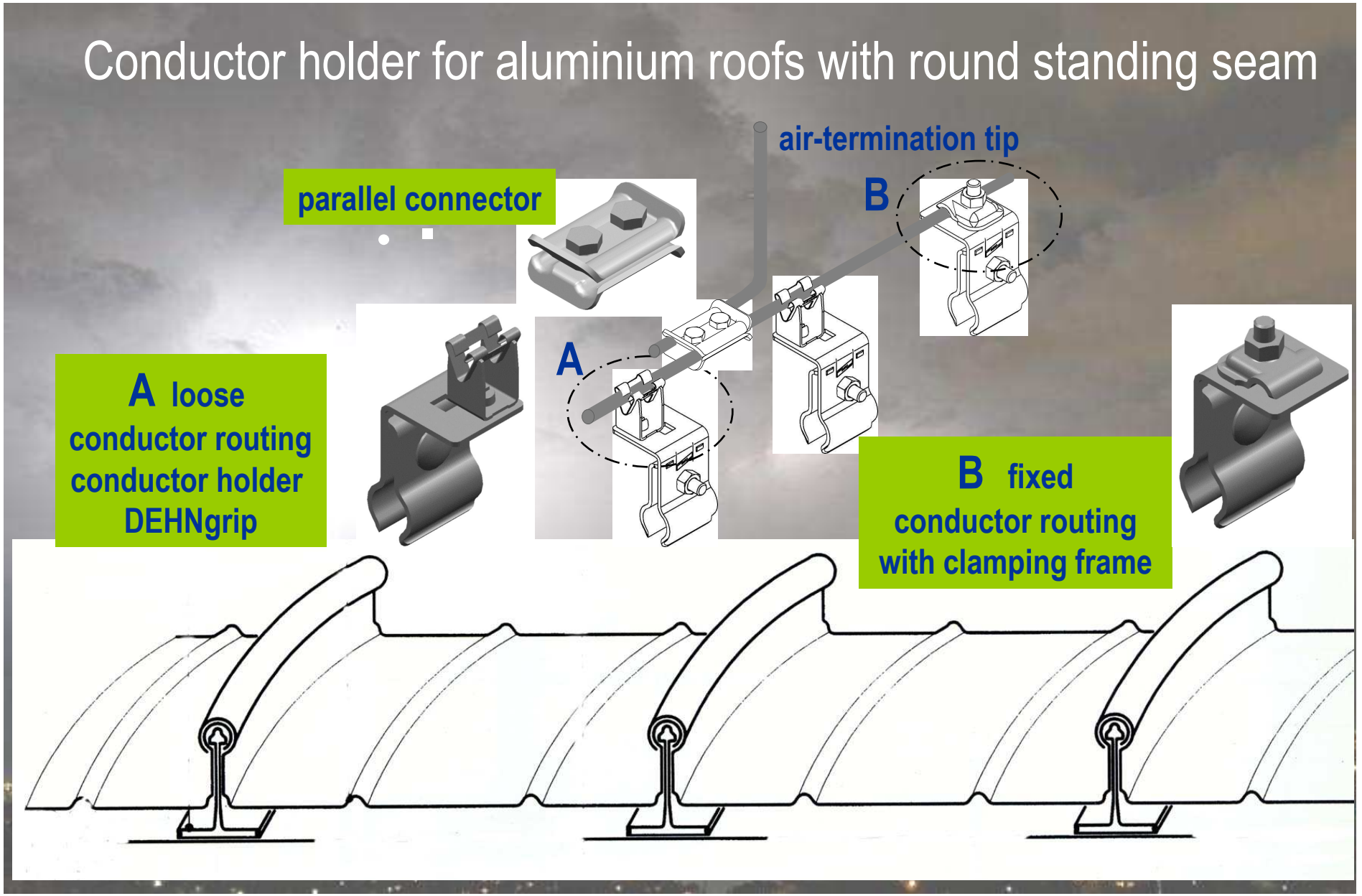
Air-termination system on a metal roof
Protection against holing

Metal roof with additional air-termination system



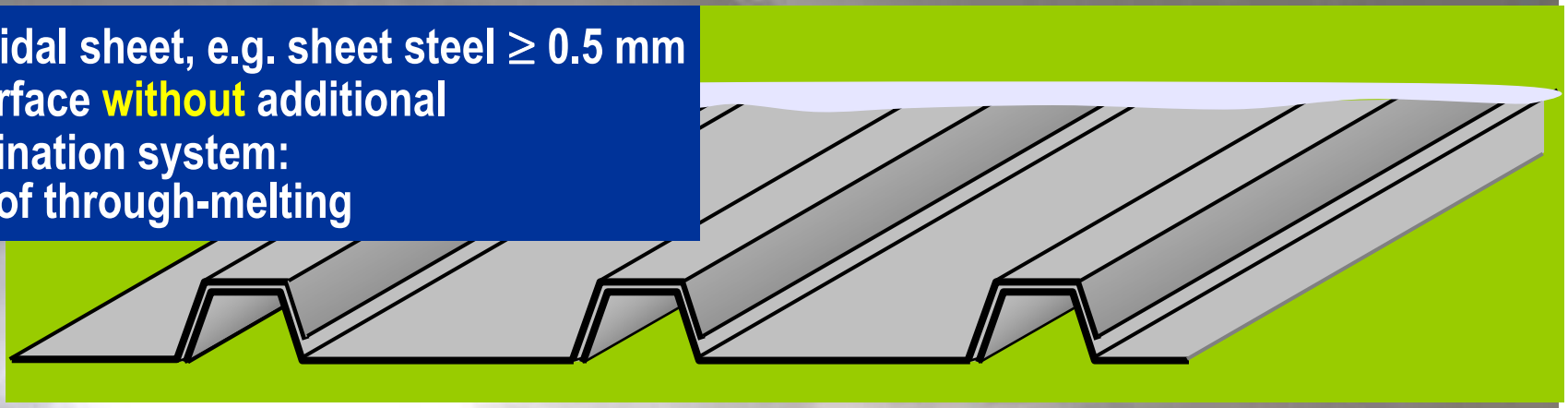
Ref.: IEC 62305-3: 2006, Figure E.26

Conductor holder for aluminium roofs with round standing seam

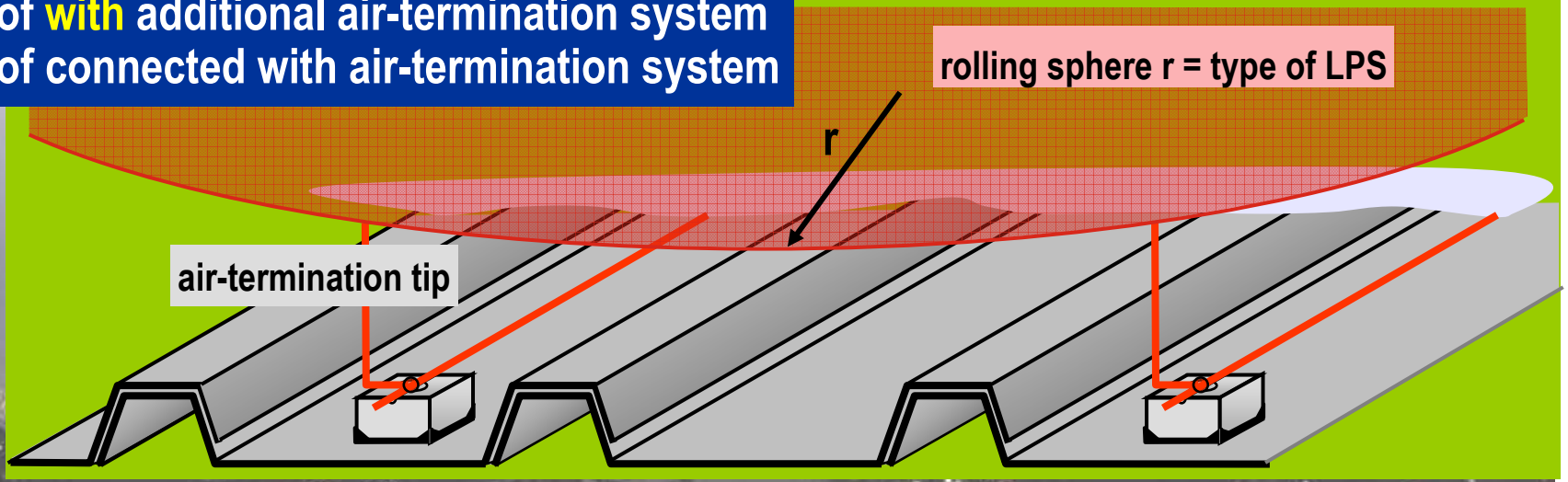


Air-termination system on a metal roof

Trapezoidal sheet, e.g. sheet steel ≥ 0.5 mm
Roof surface without additional air-termination system:
Danger of through-melting

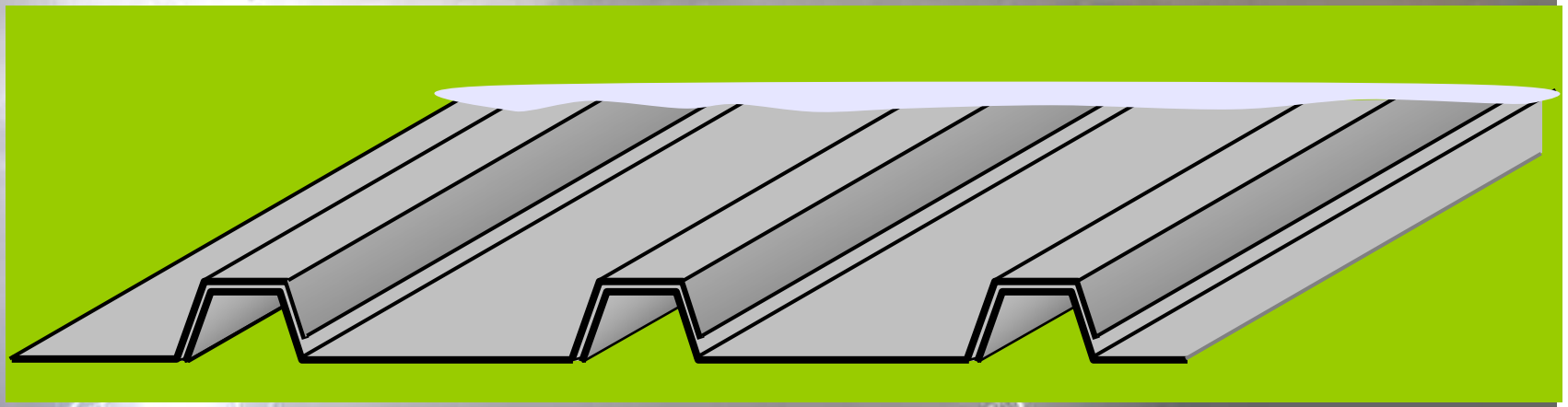


Metal roof with additional air-termination system
Metal roof connected with air-termination system



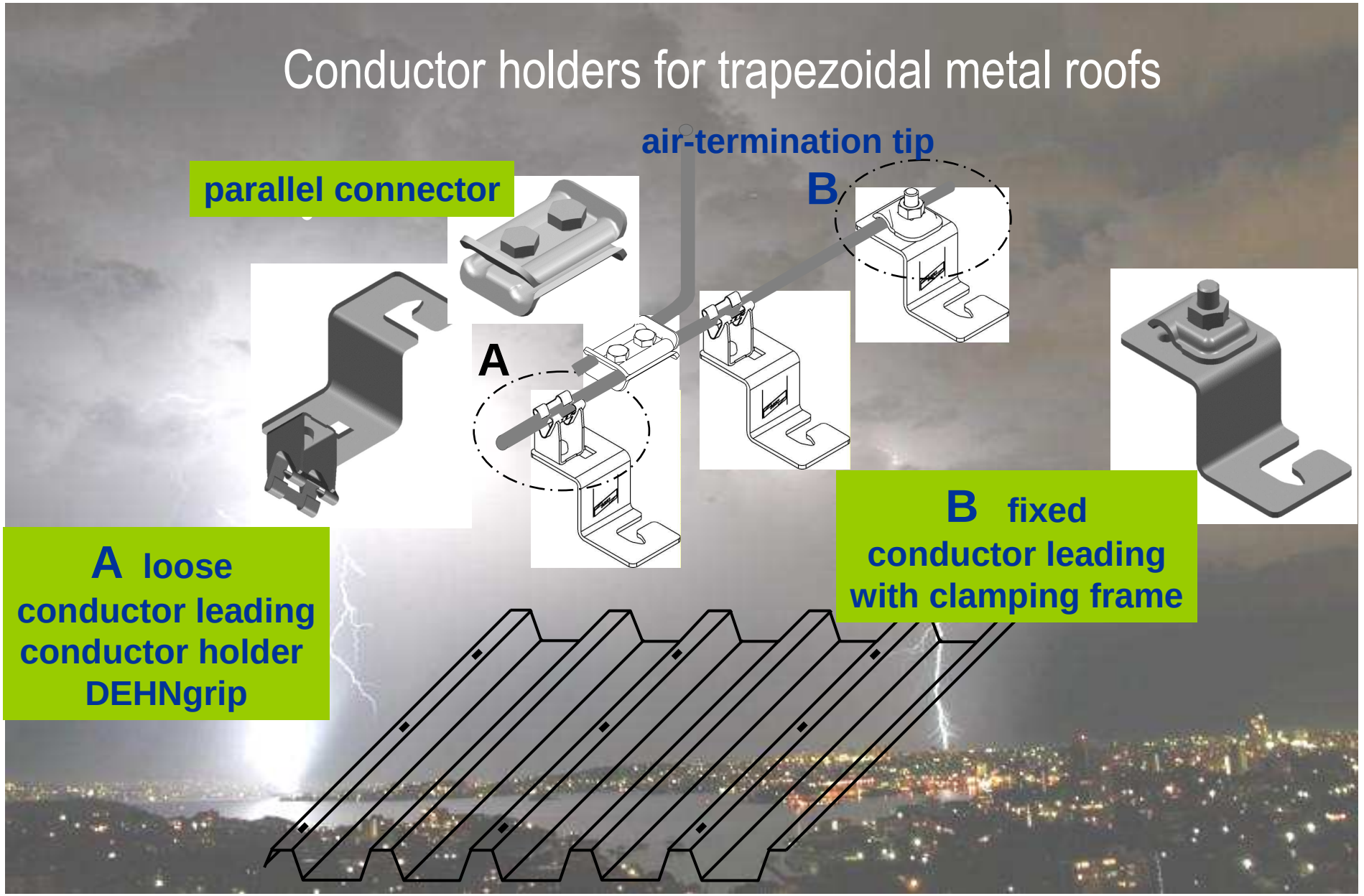
Air-termination system metal roof

Trapezoidal sheet, e.g. sheet steel ≥ 0.5 mm
Roof surface without additional air-termination system:
Danger of through-melting



DIN V VDE V 0185-3 (VDE V 0185 Teil 3):2002-11

Conductor holders for trapezoidal metal roofs



Aluminium roof
Air-termination system with air-termination tips

Highly polymeric flat roof sheeting
Application of air-temination rod / conductor holder KF


DISTÂNCIA DE SEPARAÇÃO
S = ?

Instalações elétricas salientes do espaço a proteger

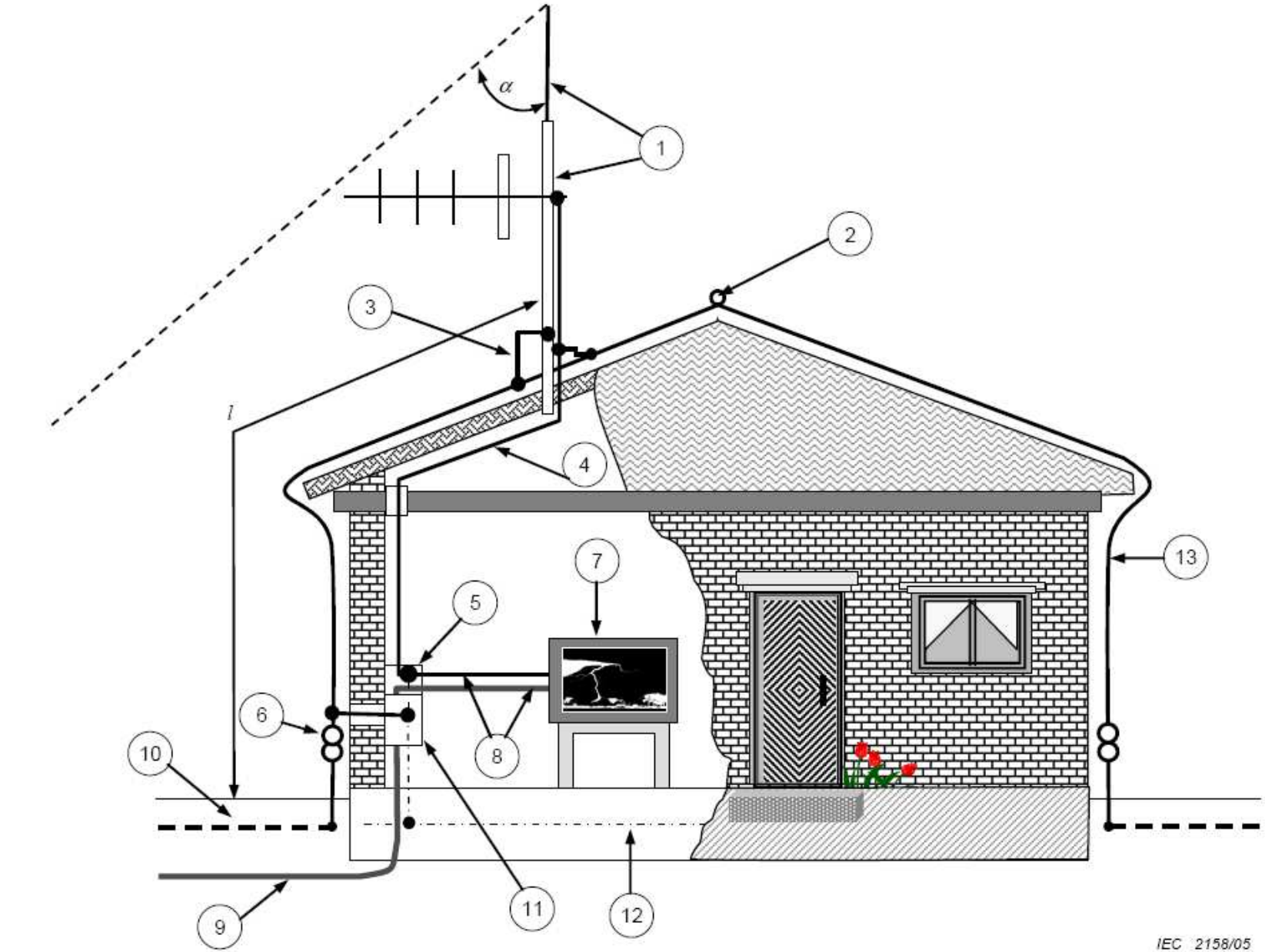
DIN EN 62305-3 (VDE 0185-305-3):2006

E.5.2.4.2.6 Electrical installation protruding from the space to be protected

Antenna masts on the roof of a structure should be protected against direct lightning flashes by installing the antenna mast in an already protected volume or by installing an isolated external LPS.

If this is not possible, the antenna mast should be bonded to the air-termination system. Then partial lightning currents will be treated inside the structure to be protected.

The antenna cable should enter the structure preferably at the common entrance for all services or near the main LPS bonding bar. The antenna cable conductive sheath should be bonded to the air-termination system on roof level and to the main bonding bar (see Figure E.32).


α
1
2
3
l
4
5
6
7
8
10
11
12
13
9
IEC 2158/05

Key

1 Metallic mast
2 Horizontal air-termination conductor on the ridge of the roof
3 Joint between the roof down-conductor and the metallic antenna mast
4 Antenna cable
5 The main bonding bar; metallic shield on the antenna cable is connected to the bonding bar
6 Test joint
7 TV
8 Parallel routing of the antenna cable and the electric power cable
9 Electric power cable
10 Earth termination system
11 The main electric power distribution box with SPD
12 Foundation earth electrode
13 LPS conductor
l Length for separation distance
α Protective angle

NOTE For small structures only two down-conductors may be sufficient, according to 5.3.3.

Figure E.32 – Example of construction of lightning protection of a house with a TV antenna using the mast as an air-termination rod

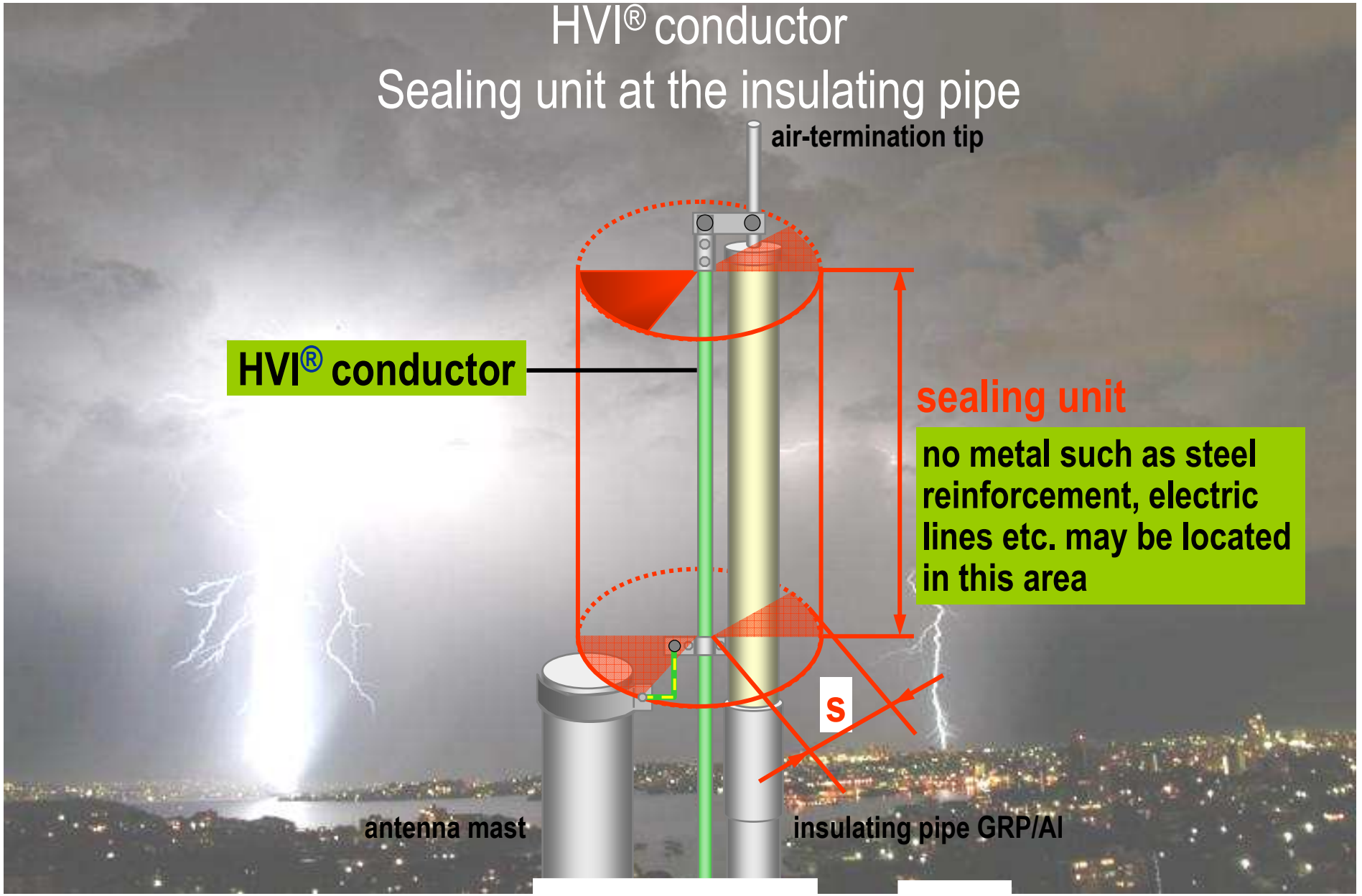
Correct use of conductive installations on the roof

- **Conductive installations on the roof, e.g. metal ventilation pipes and air-conditioning systems, should not be connected to the air-termination system. These installations should be protected against direct lightning strokes by air-termination rods or air-termination cables / air-termination meshes installed above the air-termination rods.**

- **Conductive installations on the roof should not be connected directly to metal roof superstructures.**

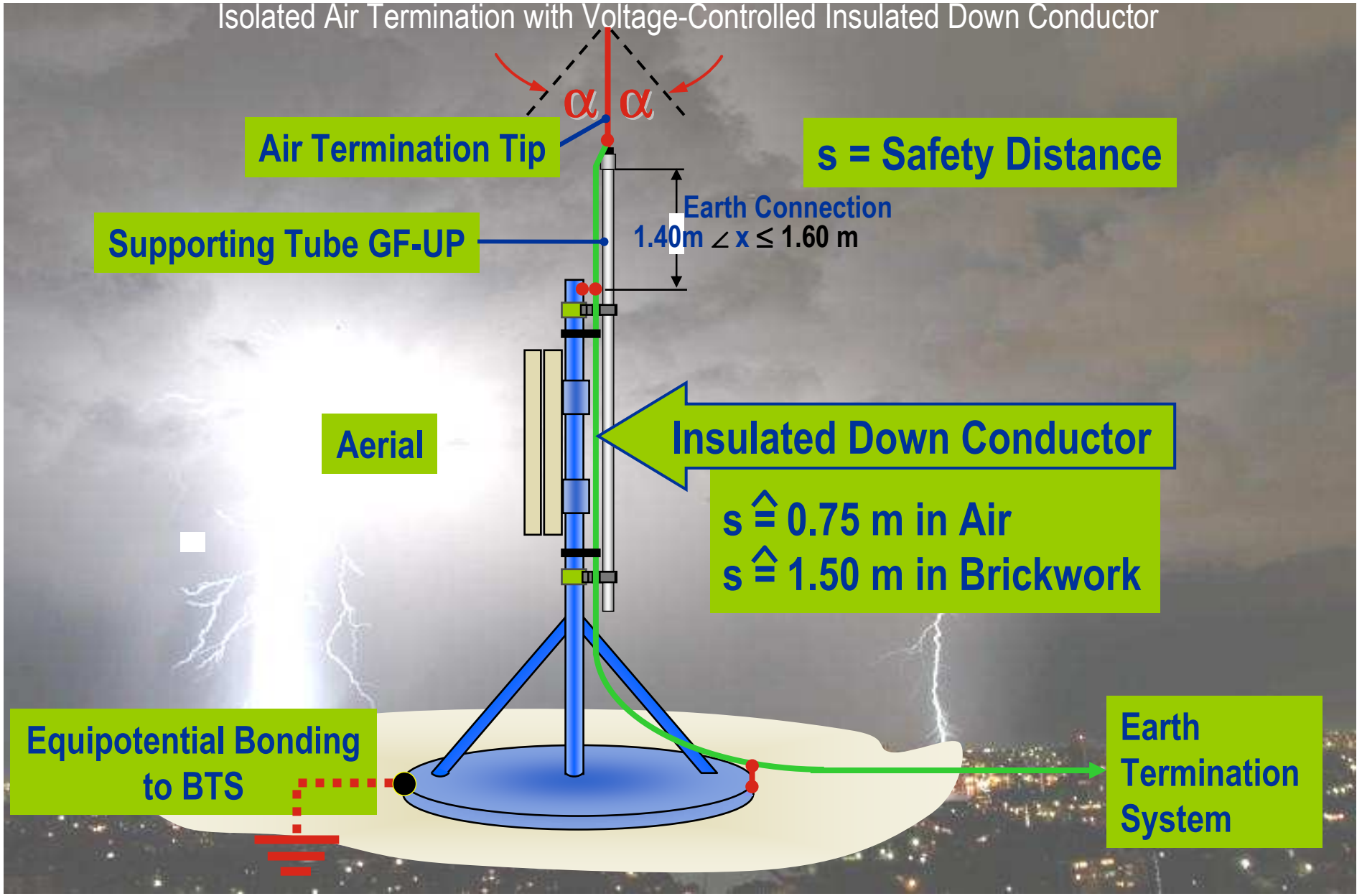
- **If a direct connection cannot be avoided, the effect of the partial lightning current coupled into the building has to be observed.**

HVI® conductor
Sealing unit at the insulating pipe

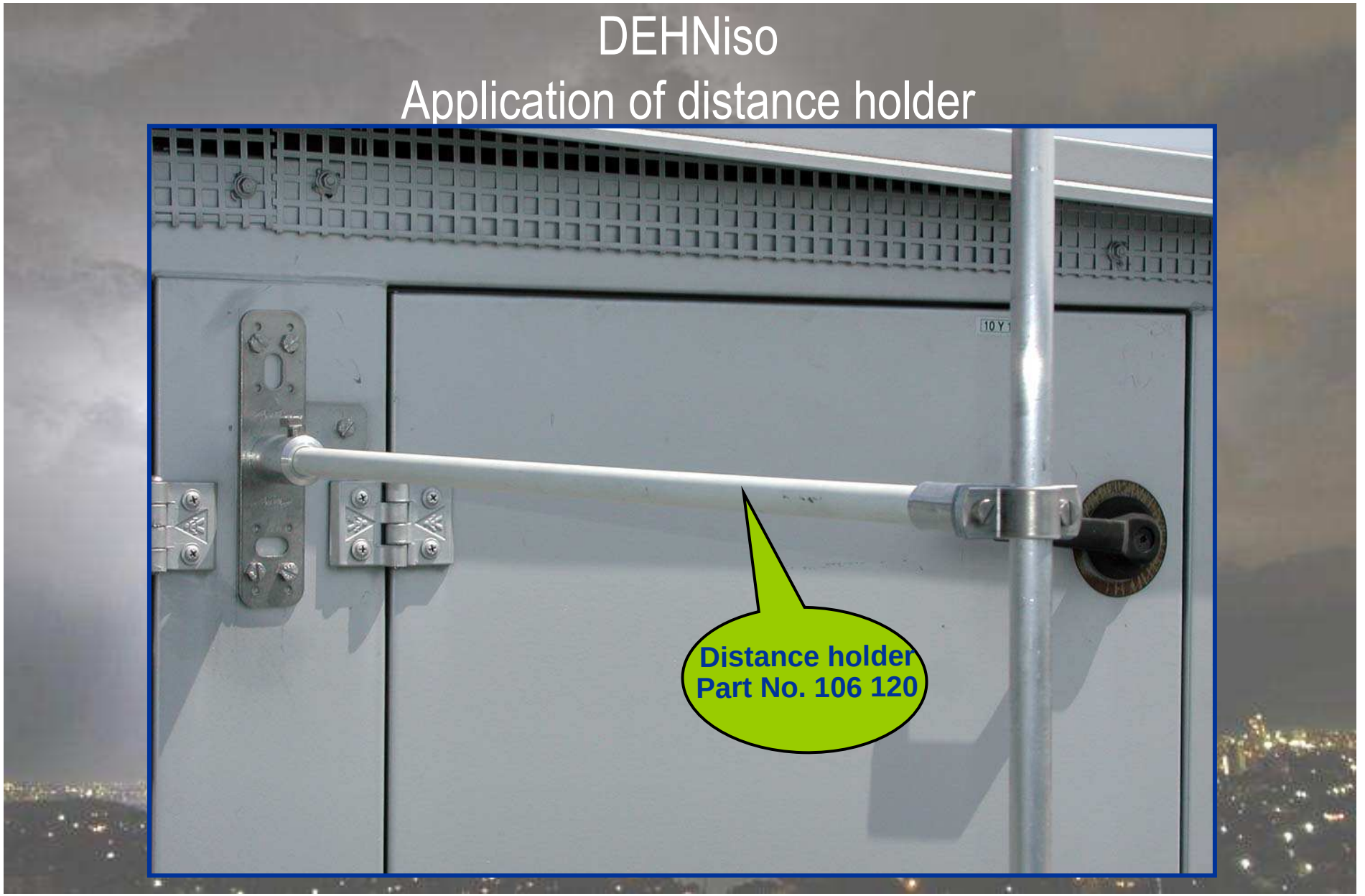


ISO-SIGMA

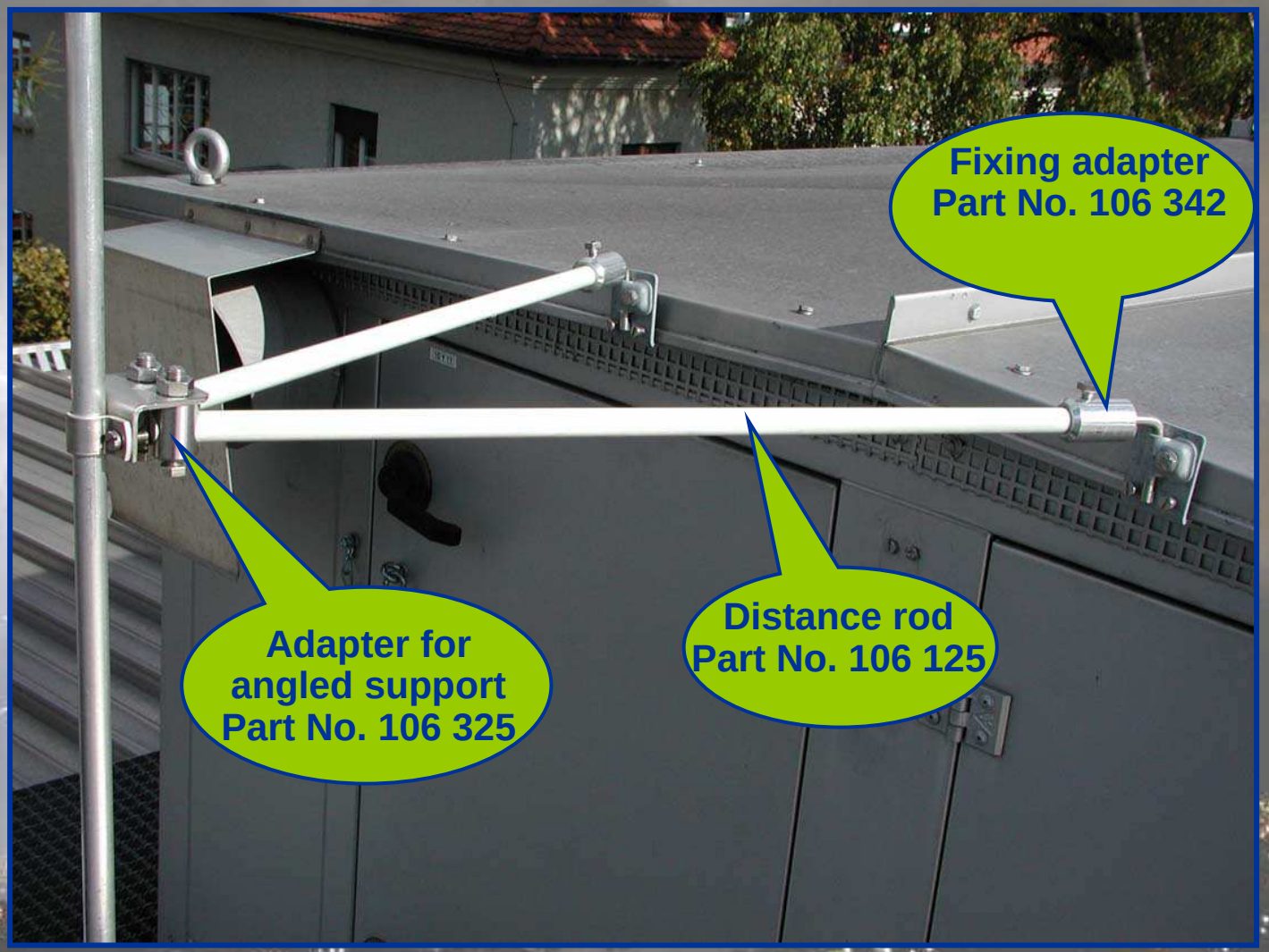
Isolated Air Termination with Voltage-Controlled Insulated Down Conductor



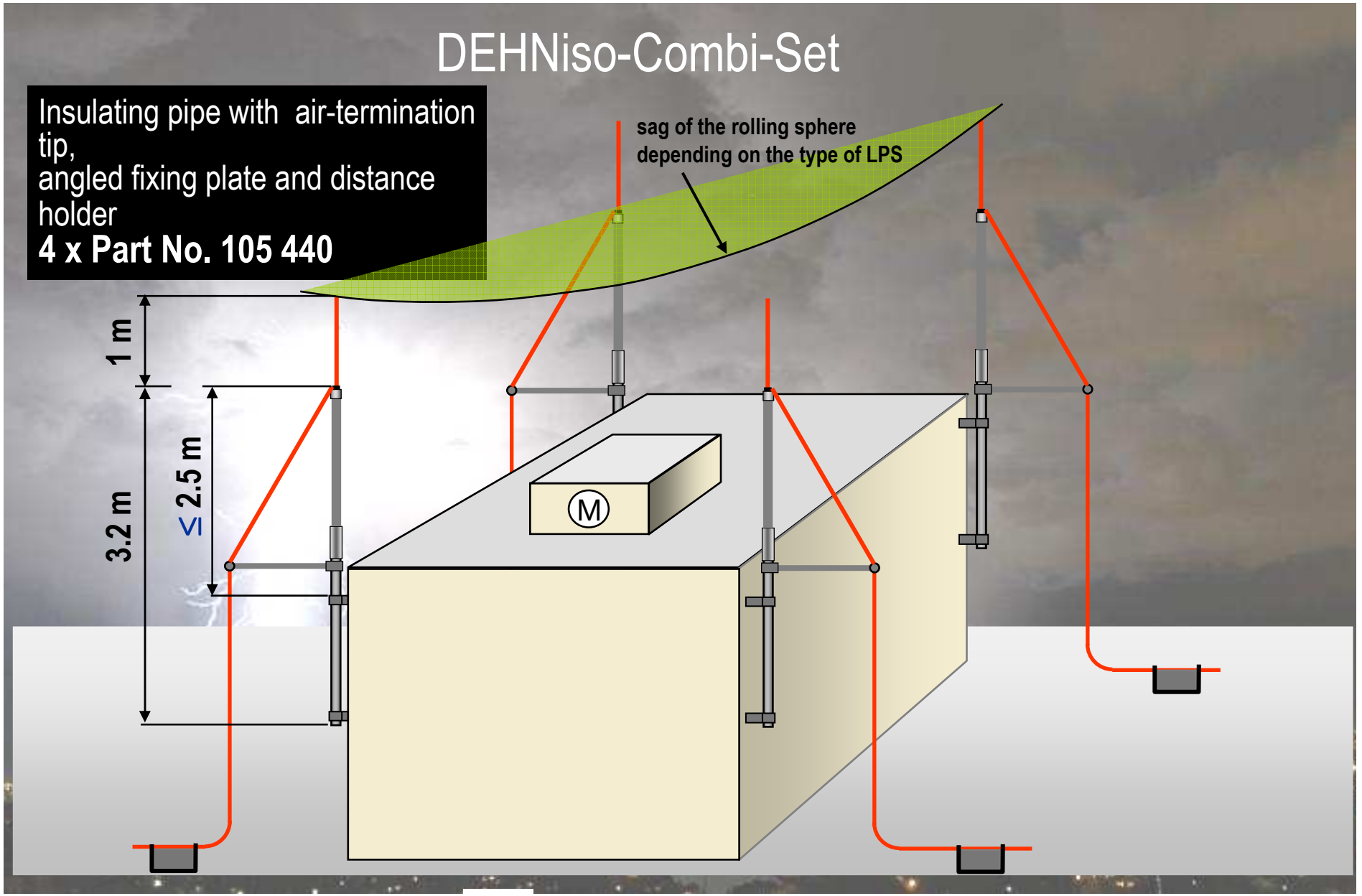
DEHNiso
Application of distance holder

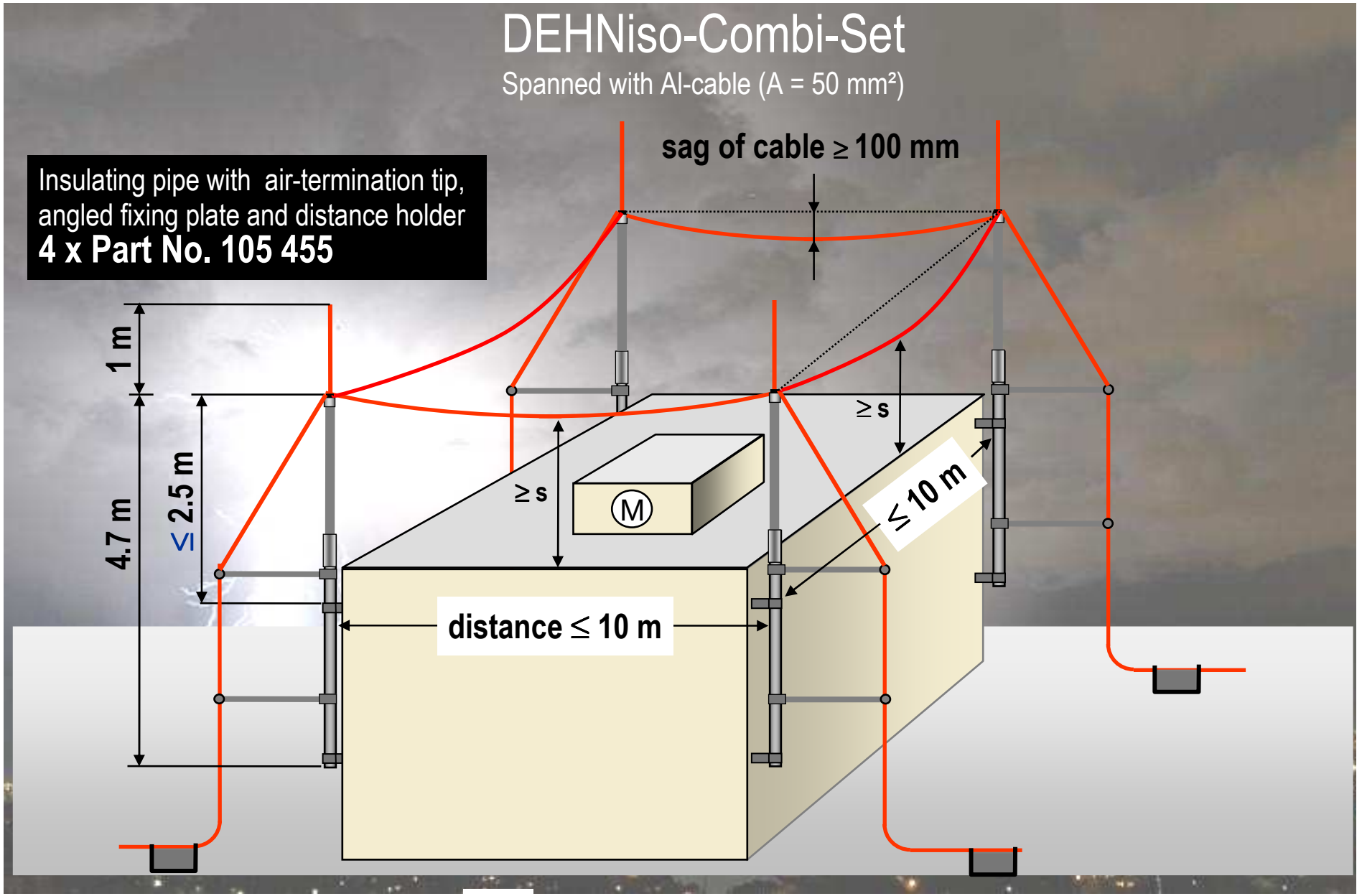


DEHNiso


Fixing adapter
Part No. 106 342
Adapter for
angled support
Part No. 106 325
Distance rod
Part No. 106 125

DEHNiso
Angled support with pipe clamp fixing


DEHNiso-Combi-Set
Insulating pipe with air-termination tip,
angled fixing plate and distance holder
4 x Part No. 105 440
sag of the rolling sphere
depending on the type of LPS
1 m
3.2 m
≤ 2.5 m
M


DEHNiso-Combi-Set
Spanned with Al-cable (A = 50 mm²)
Insulating pipe with air-termination tip, angled fixing plate and distance holder
4 x Part No. 105 455
sag of cable ≥ 100 mm
1 m
4.7 m
2.5 m
VI
≥ s
≥ s
M
≤ 10 m
distance ≤ 10 m

DEHNiso-Combi


17 6 2010
17 6 2010


17 6 2010


17 6 2010

Isolated down-conductor

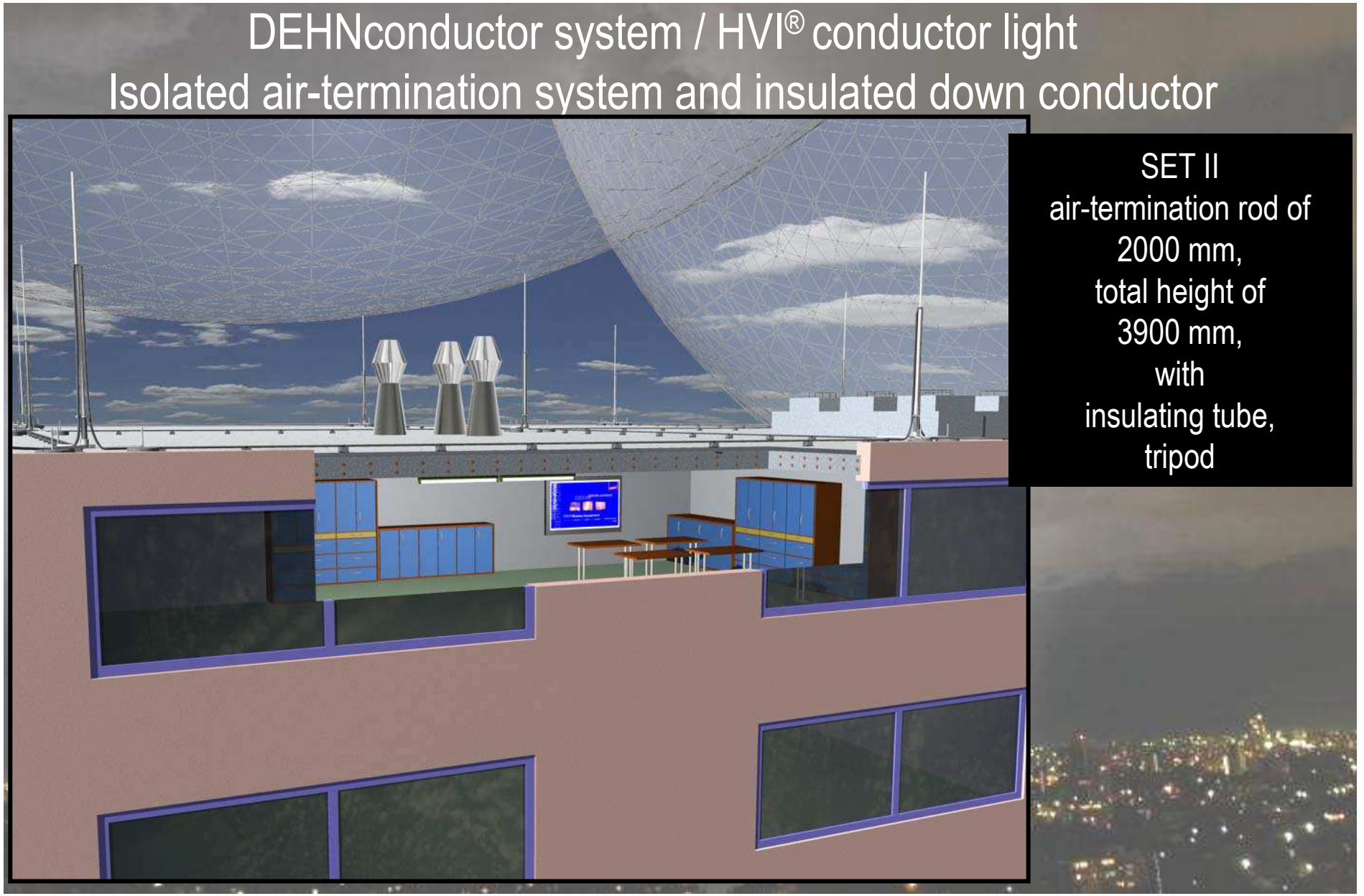
Installation of the distance holder

Ref.: Wettingfeld GmbH + Co.KG , Krefeld

HVI® installation on the facade

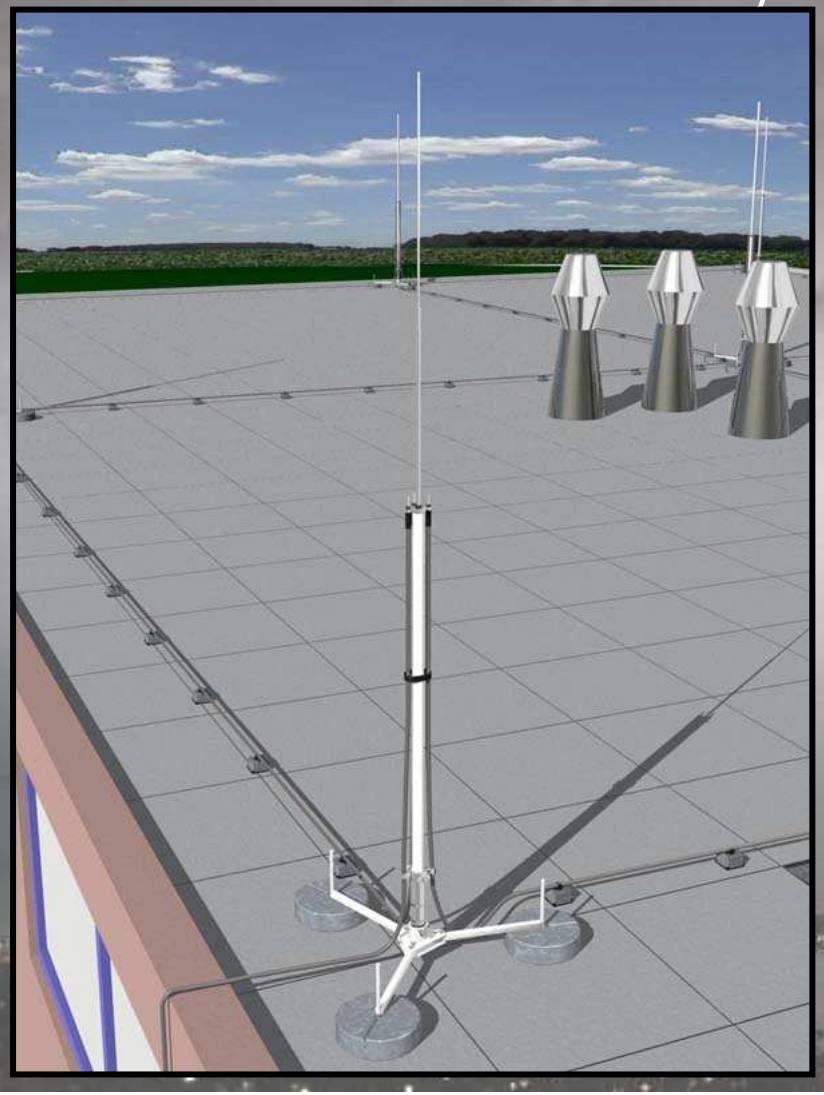
DEHNconductor system / HVI® conductor light
Isolated air-termination system and insulated down conductor

DEHNconductor system / HVI® conductor light
Isolated air-termination system and insulated down conductor



SET II
air-termination rod of
2000 mm,
total height of
3900 mm,
with
insulating tube,
tripod

DEHNconductor system / HVI® conductor light
Isolated air-termination system and insulated down conductor



DEHNconductor system / HVI® conductor light
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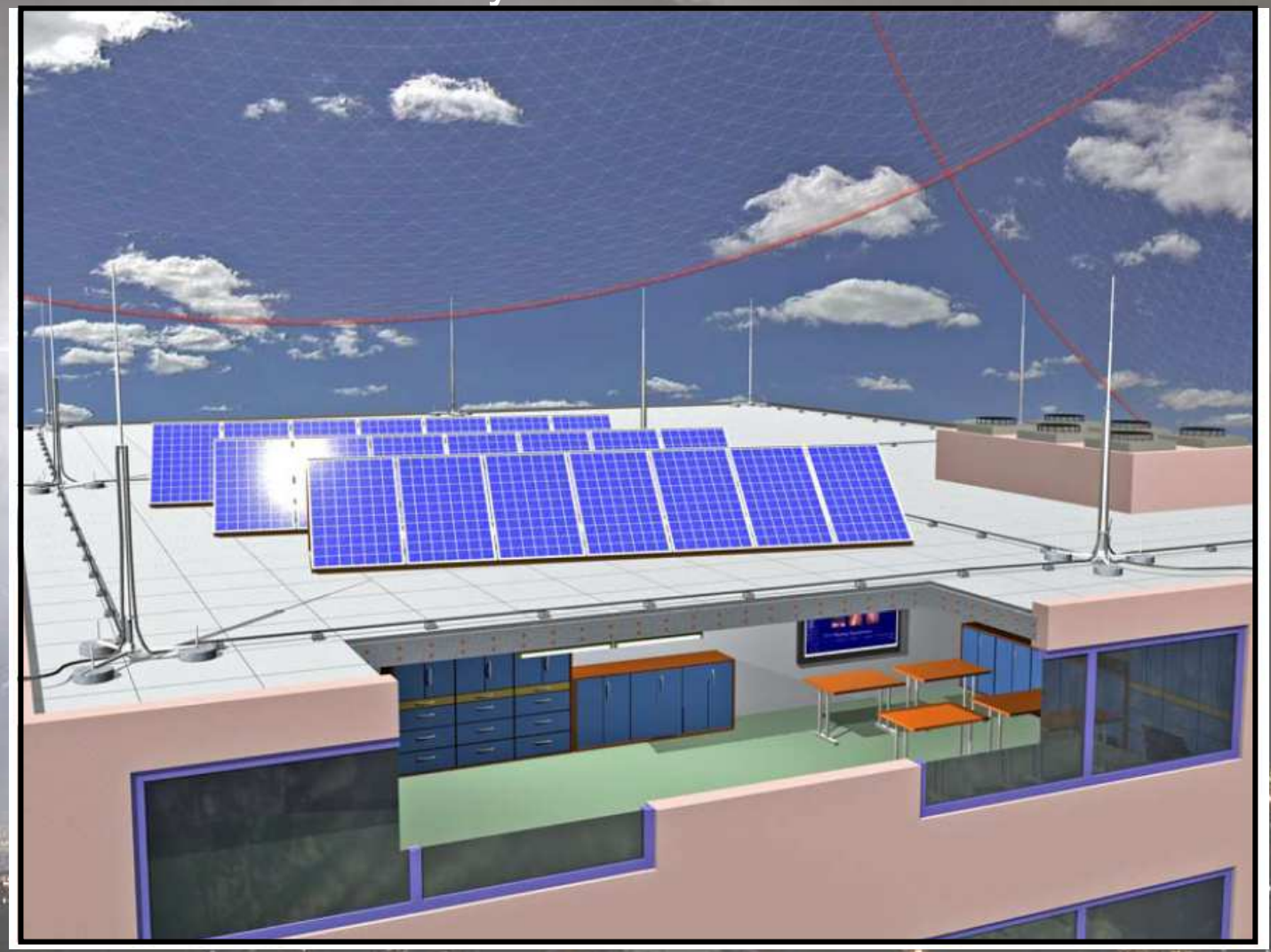


Industrial plant Henkel KGaA, Düsseldorf
Fan with air-termination rod and spanned

Source: Blitzschutzbau Wettingfeld, Krefeld

Industrial plant Henkel KGaA, Düsseldorf
Insulated down-conductor

HVI® conductor

Source: Blitzschutzbau Wettingfeld, Krefeld

IEC 62561
"Lightning Protection System Components"

Part 1 - Requirements for connection components

Part 2 - Requirements for conductors, earth electrodes and earth electrode accessories

Part 3 - Requirements for isolating spark gaps

Part 4 - Requirements for conductor fastener

IEC 62561
"Lightning Protection System Components"

Part 5 - Requirements for earth electrode inspection housings and earth electrode seals

Part 6 - Requirements for lightning strike counters

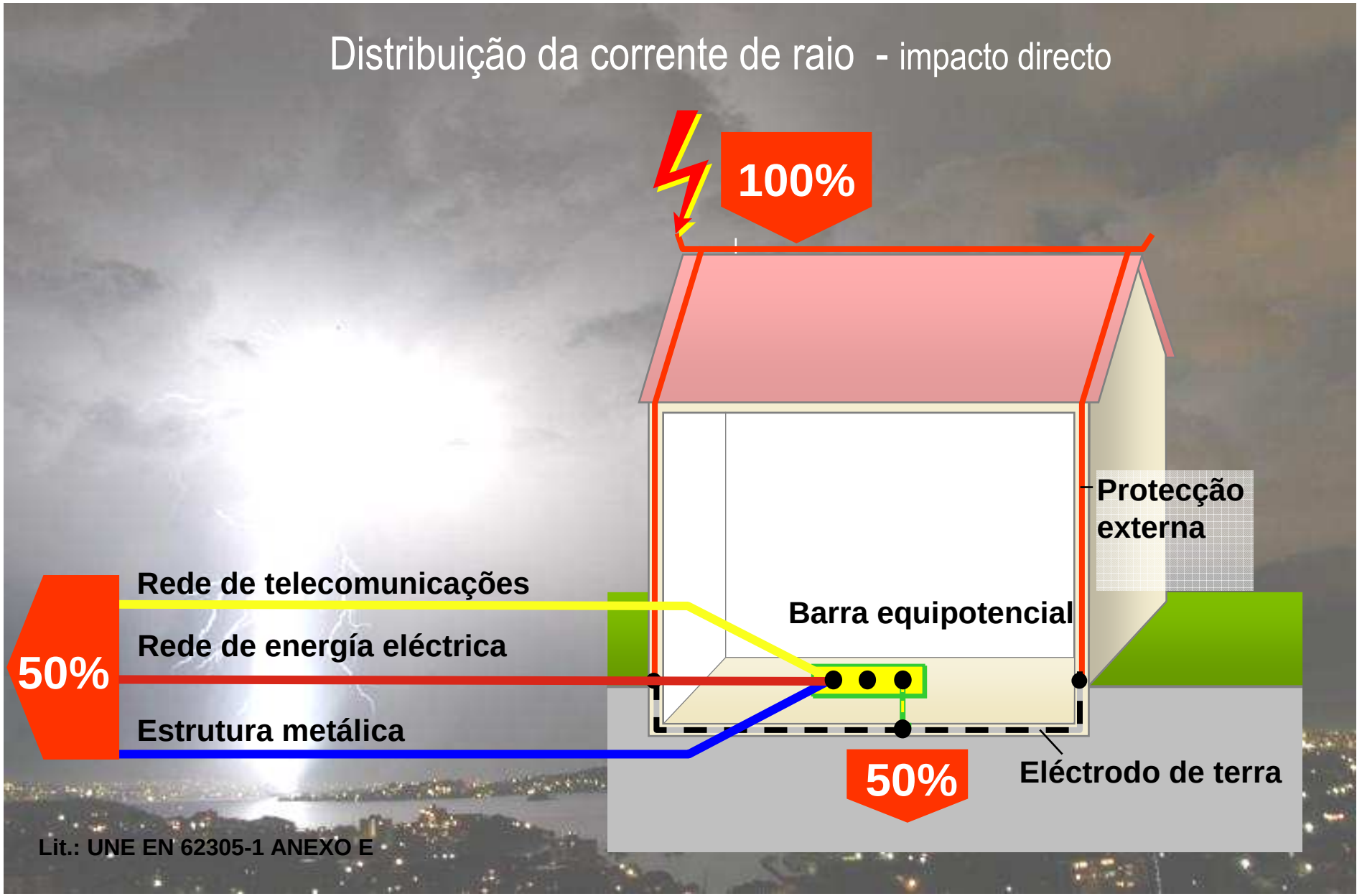
Part 7 - Requirements for earthing enhancing compounds

Part 8 - Requirements for components for isolated LPS

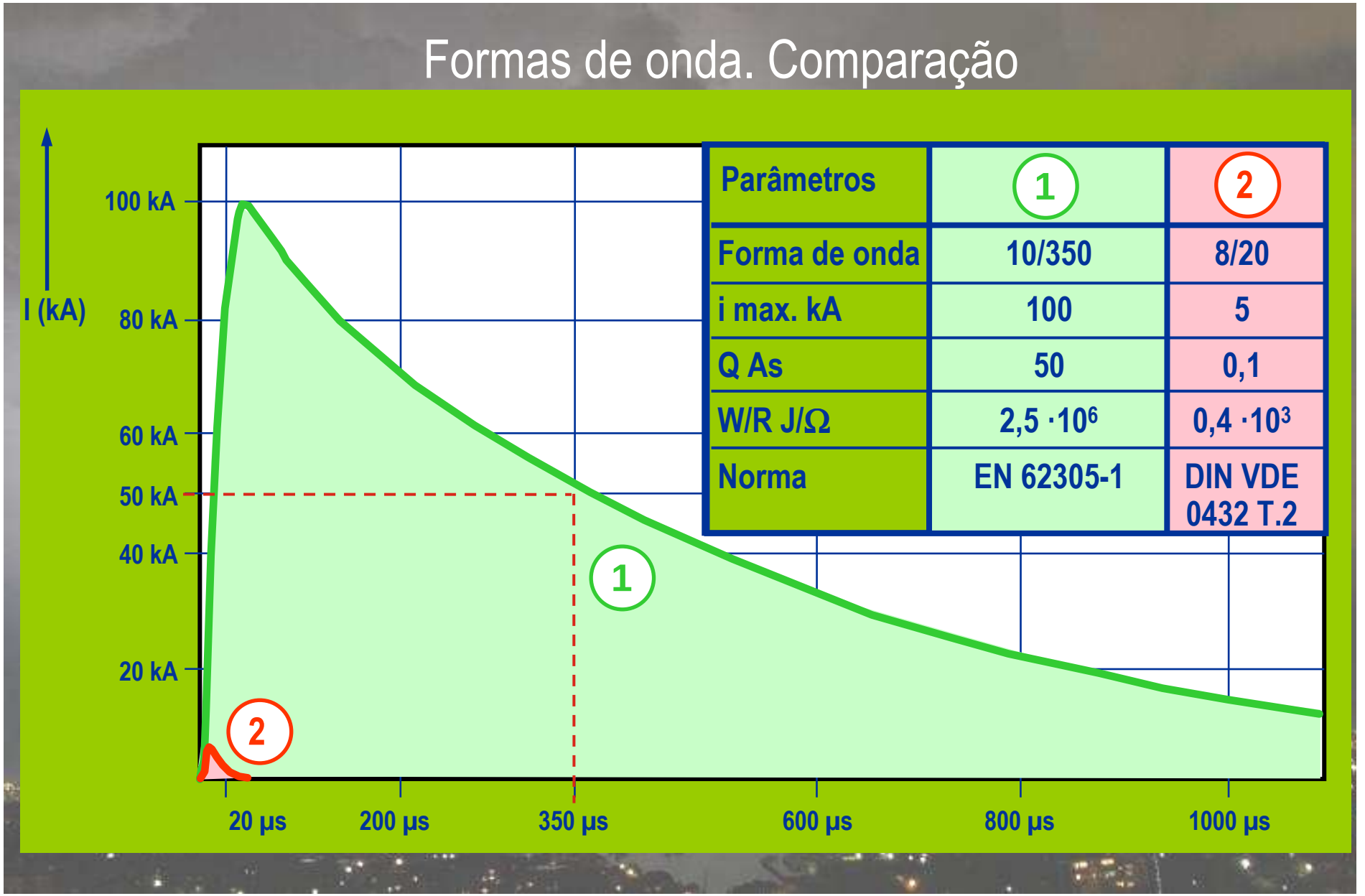
Part 8 will cover also DEHN Iso Combi and DEHN HVI …


• Proteção interior

Distribuição da corrente de raio - impacto directo

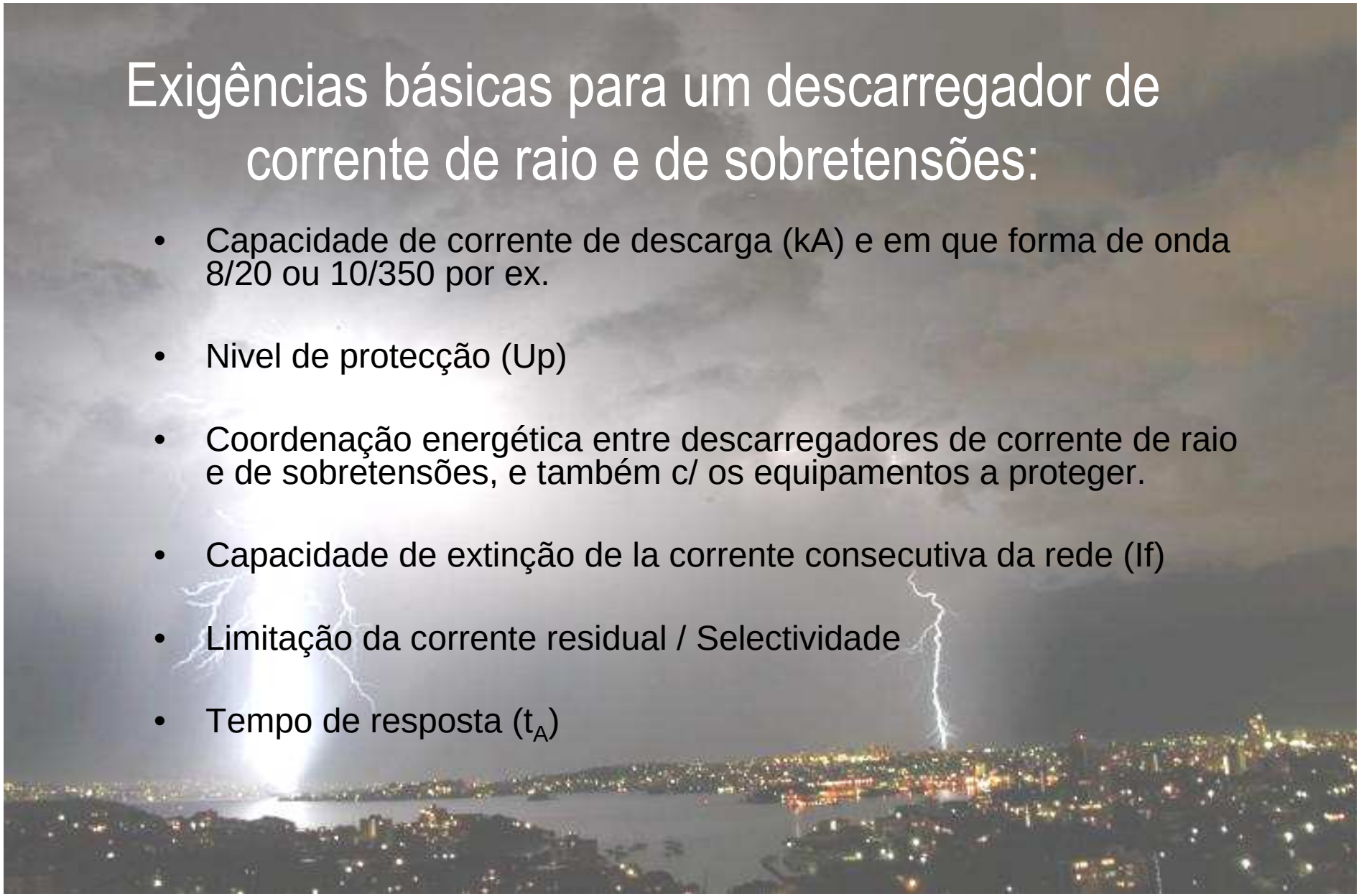


Formas de onda. Comparação



Parâmetros	1	2
Forma de onda	10/350	8/20
i max. kA	100	5
Q As	50	0,1
W/R J/Ω	$2,5 \cdot 10^6$	$0,4 \cdot 10^3$
Norma	EN 62305-1	DIN VDE 0432 T.2

Descarregadores de Corrente de Raio e de Sobretensões (energia);



Exigências básicas para um descarregador de corrente de raio e de sobretensões:

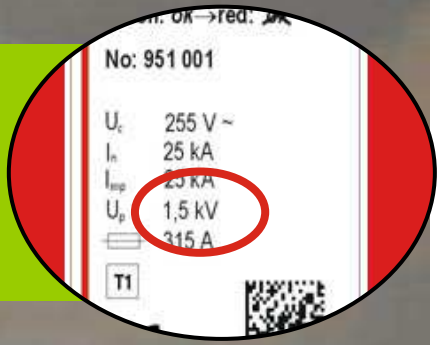
- Capacidade de corrente de descarga (kA) e em que forma de onda 8/20 ou 10/350 por ex.
- Nivel de protecção (Up)
- Coordenação energética entre descarregadores de corrente de raio e de sobretensões, e também c/ os equipamentos a proteger.
- Capacidade de extinção de la corrente consecutiva da rede (If)
- Limitação da corrente residual / Selectividade
- Tempo de resposta (t_A)

Quando é necessário instalar DST's Tipo 1?

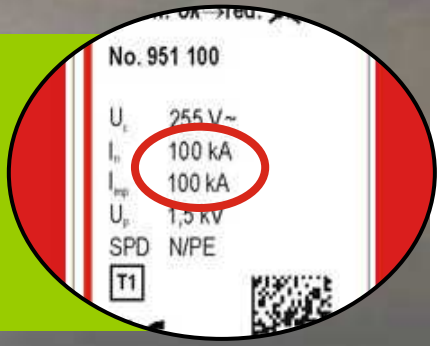
- Chegada aérea.

Tipo 1
DEHNventil® M

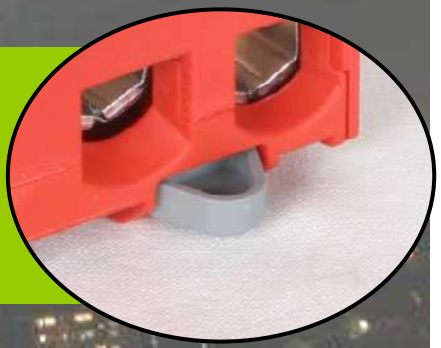
Low voltage protection level =>
Protection for terminal devices



Capable of carrying lightning currents =>
For use in lightning protection level I



Plastic snap-in device with “parking position“ => Quick installation



Tipo 2
DEHNguard® M

Descarregador de sobretensões de Tipo 2 (EN 61643-11)

- **Descarregador baseado em varistores de alta capacidade (Oxido de Zinco)**
  - **Corrente nominal de descarga I_n (20x) = 20 kA (8/20 µs)**
  - **Máxima corrente de descarga I_{max} (1x) = 40 kA (8/20 µs)**

DEHNguard® M TT
Part No. 952 315 - tipo 2

Power supply Network Protection

- Power supply network will be fully protected using class I, II, and III surge arresters (DEhnventil M, Dehnguard M, and DEhnrail M)

- Low current security and safety equipment including Fire Alarm, CCTV, Fire suppression, SMATV, and Access control systems will be also protected

Normas – Guias Técnicos - Legislação

- Descarregadores de Sobretensões (sinal):

BLITZDUCTOR® XTU

Combined Lightining Current & Surge Protective Device

– lightining current discharge capability 10 kA (10/350)

– optimised voltage protection level suitable for protecting terminal equipment

Plugable SPD consists of universal base element and protection module

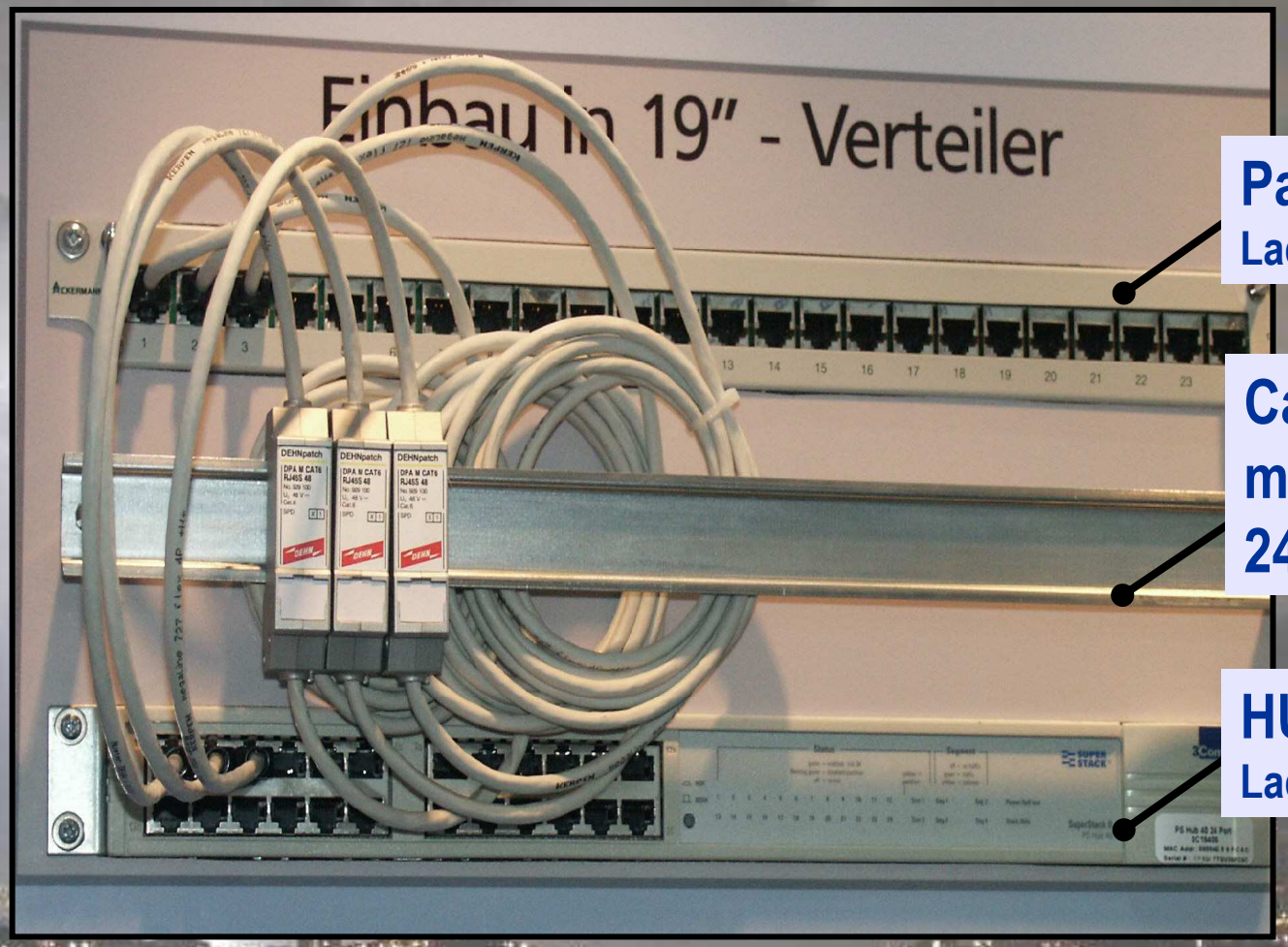
– allows for easy replacement

– make before break contacts in base

LifeCheck integrated

DEHNpatch

Cable patch com protecção contra sobretensões para Cat. 6



Patchpanel
Lado não protegido

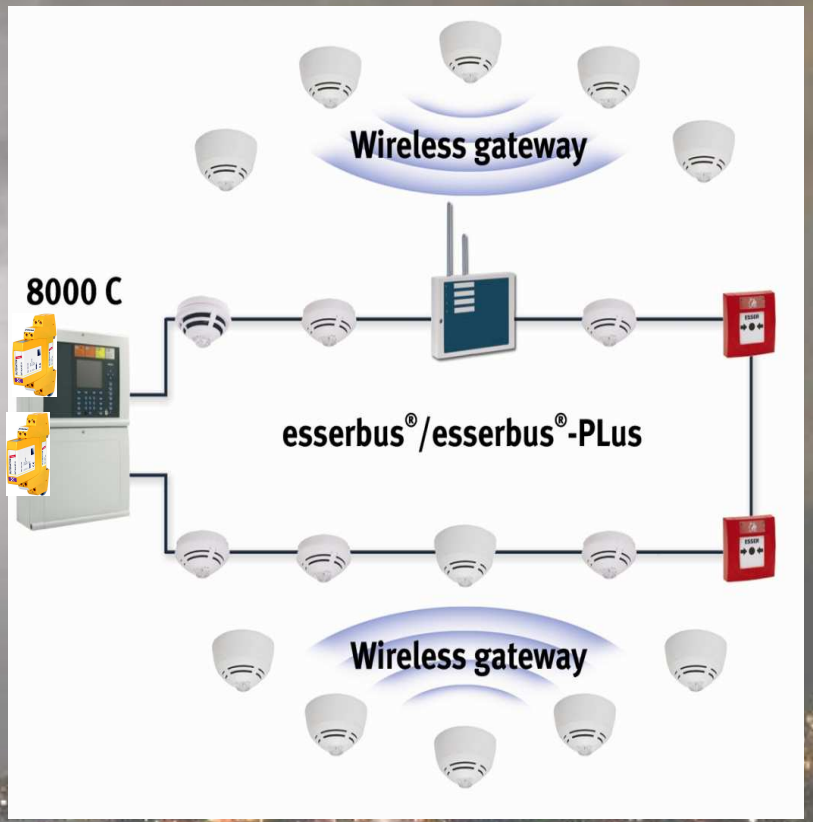
Calha de montagem para 24 DEHNpatch

HUB / Switch
Lado protegido

Low current devices
Fire Alarm protection

DEHNrail M shall be used to protect the power supply

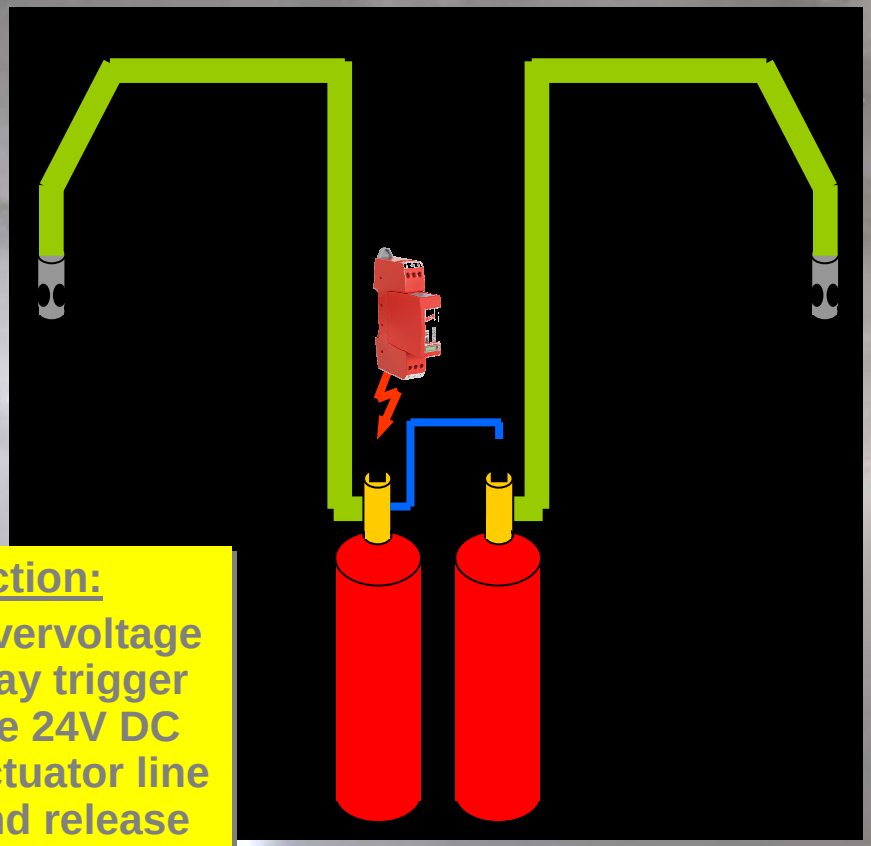
Blitzductor arrester shall be used the fire alarm loop in/out cables



Protection of the fire extinguishing systems

Protection of fire suppression systems

Protection of fire suppression equipment

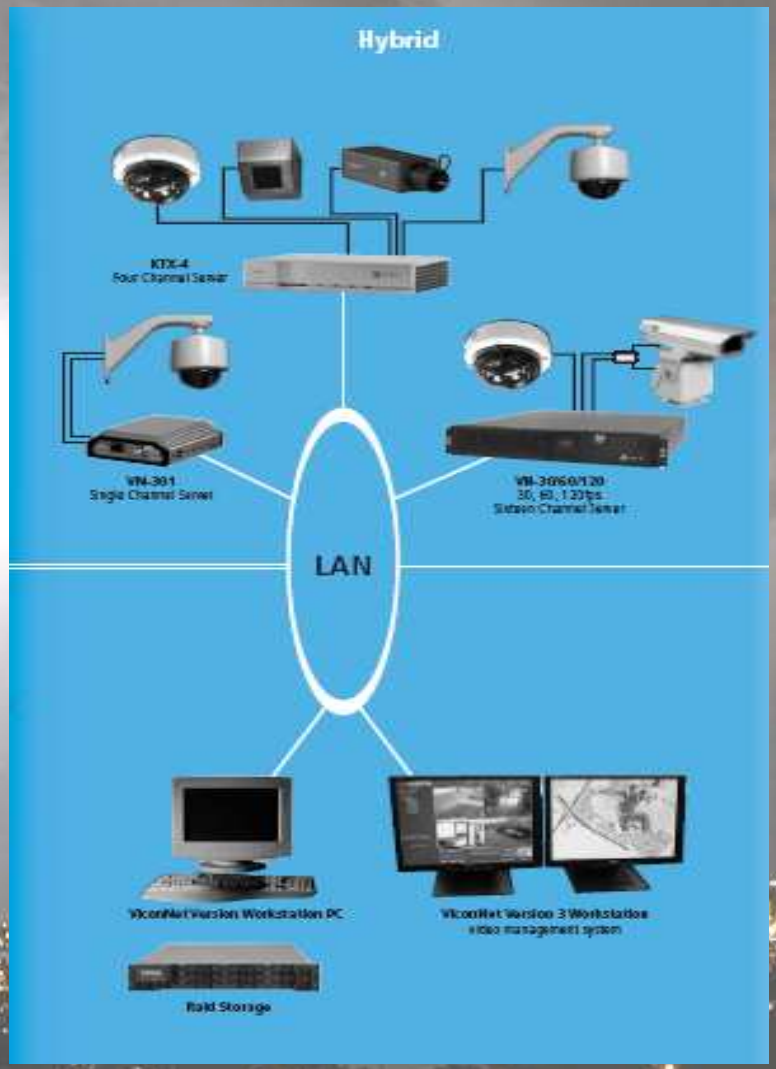


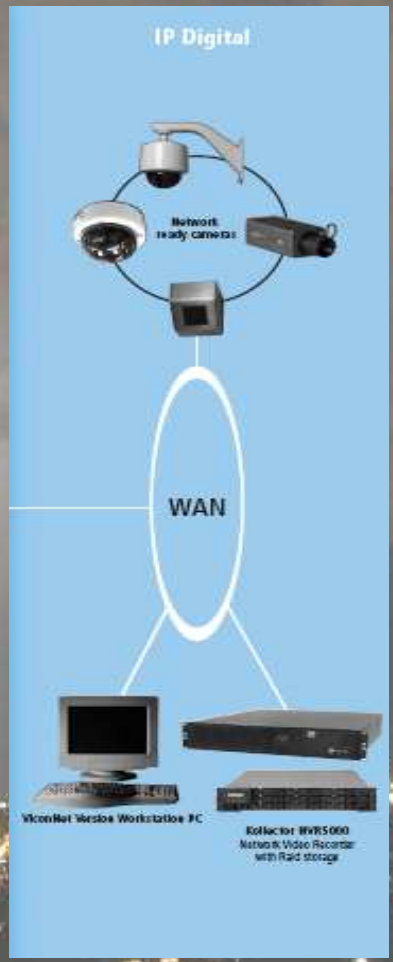
Action:
Overvoltage may trigger the 24V DC actuator line and release the gas inside the protected area.

DEHN Dehnrail M shall be used to protect the release line

Surge protection for CCTV systems

Blitzductor ML4 BE HF5 for RS485



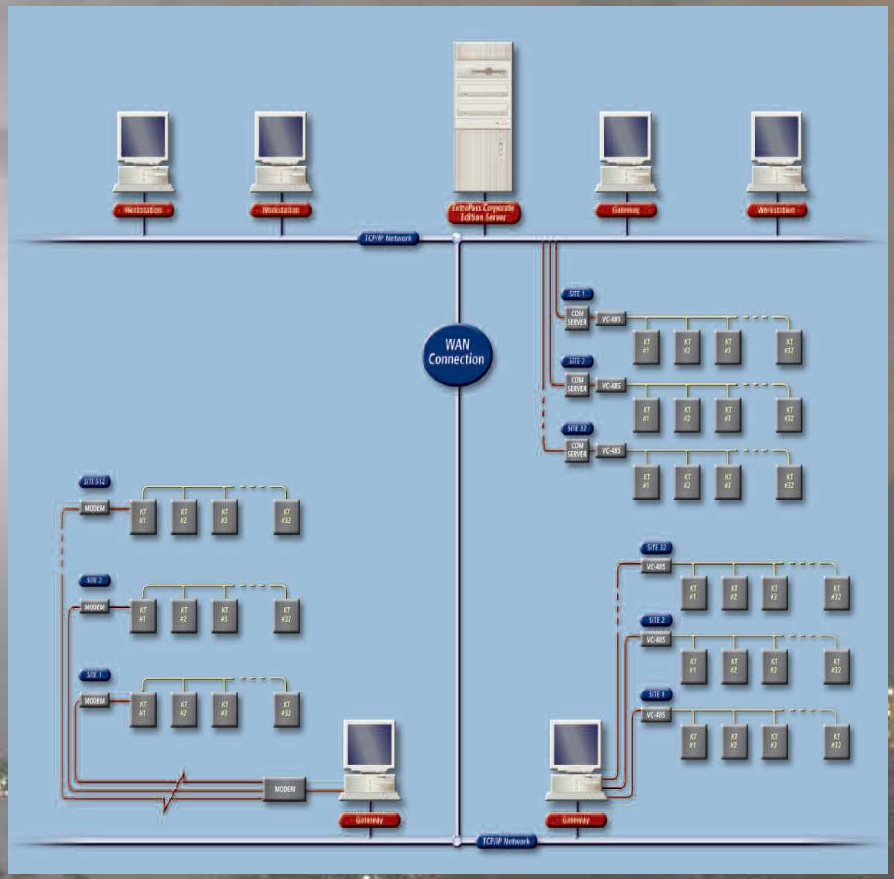


Surge protection for SMATV systems

1. **Dehnrail M to protect the power supply**
2. **Dehngate DGA TV to protect the 75Ohm coaxial cable**

Dehnpatch can be used for IP TV

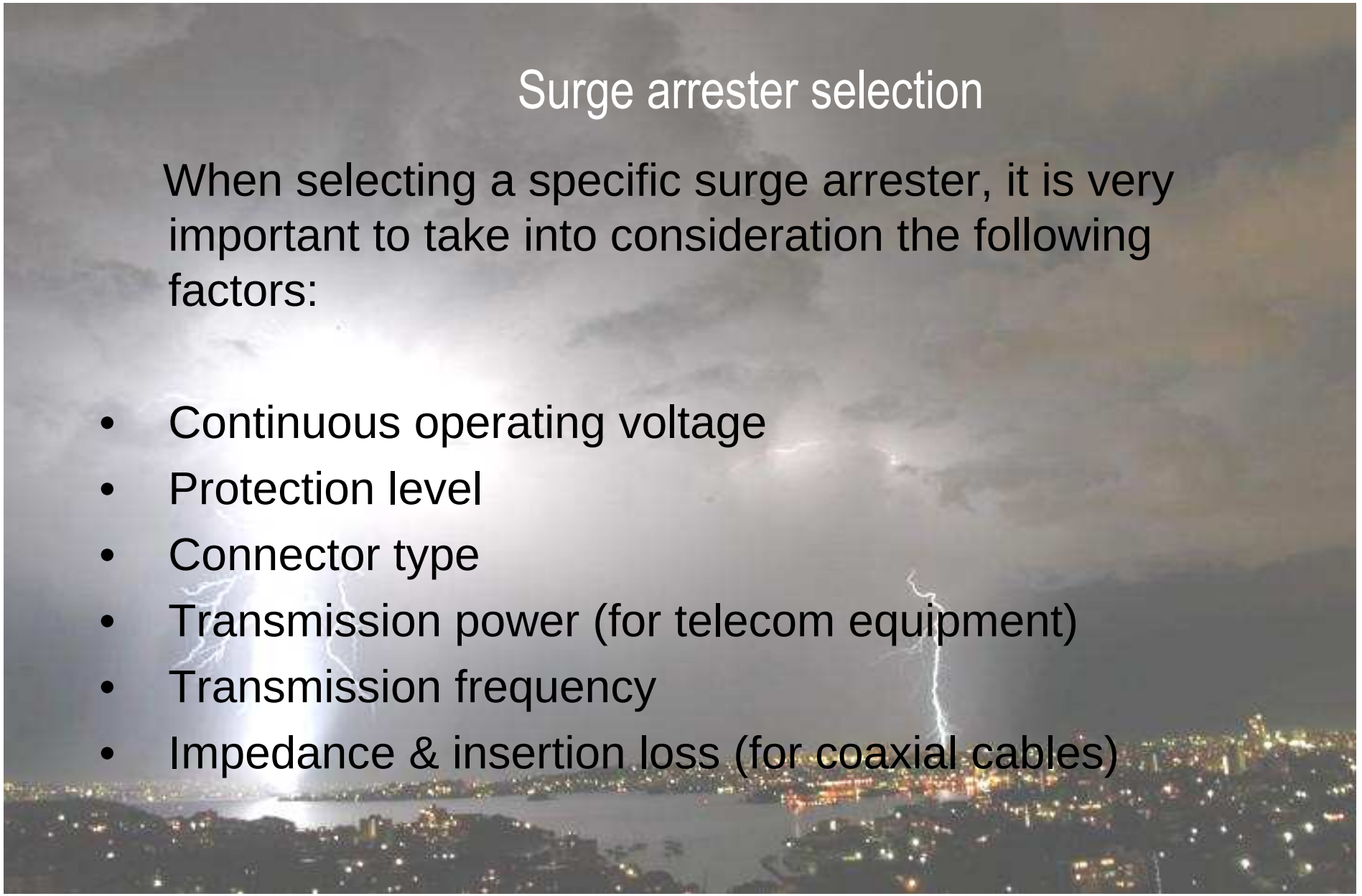
Access control System



Additional Protection

Additional protection measures will be taken also to protect the following system using DEHN surge arresters:

- Dehnrapid LSA lightning current and surge arrester will be used to protect the Telephone lines
- Dehnrail M with proper continuous operating voltage will be used to protect the building management system control modules power supply with possible use of interference filter NF10



Surge arrester selection

When selecting a specific surge arrester, it is very important to take into consideration the following factors:

- Continuous operating voltage
- Protection level
- Connector type
- Transmission power (for telecom equipment)
- Transmission frequency
- Impedance & insertion loss (for coaxial cables)

Agradeço a Vossa atenção

FIM

da apresentação