Elpro

Surge Protection Devices

SURGE PROTECTION SOLUTIONS

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Surge Protection for Communication System

Wireless base station is one of the most common victims of lightning. The iron tower attracts lightning and the equipments on the tower and in the machine room also endure huge secondary lightning impact. Multi-level power supply SPDs are needed for utility power. All copper cables and optical fibers need proper SPDs.

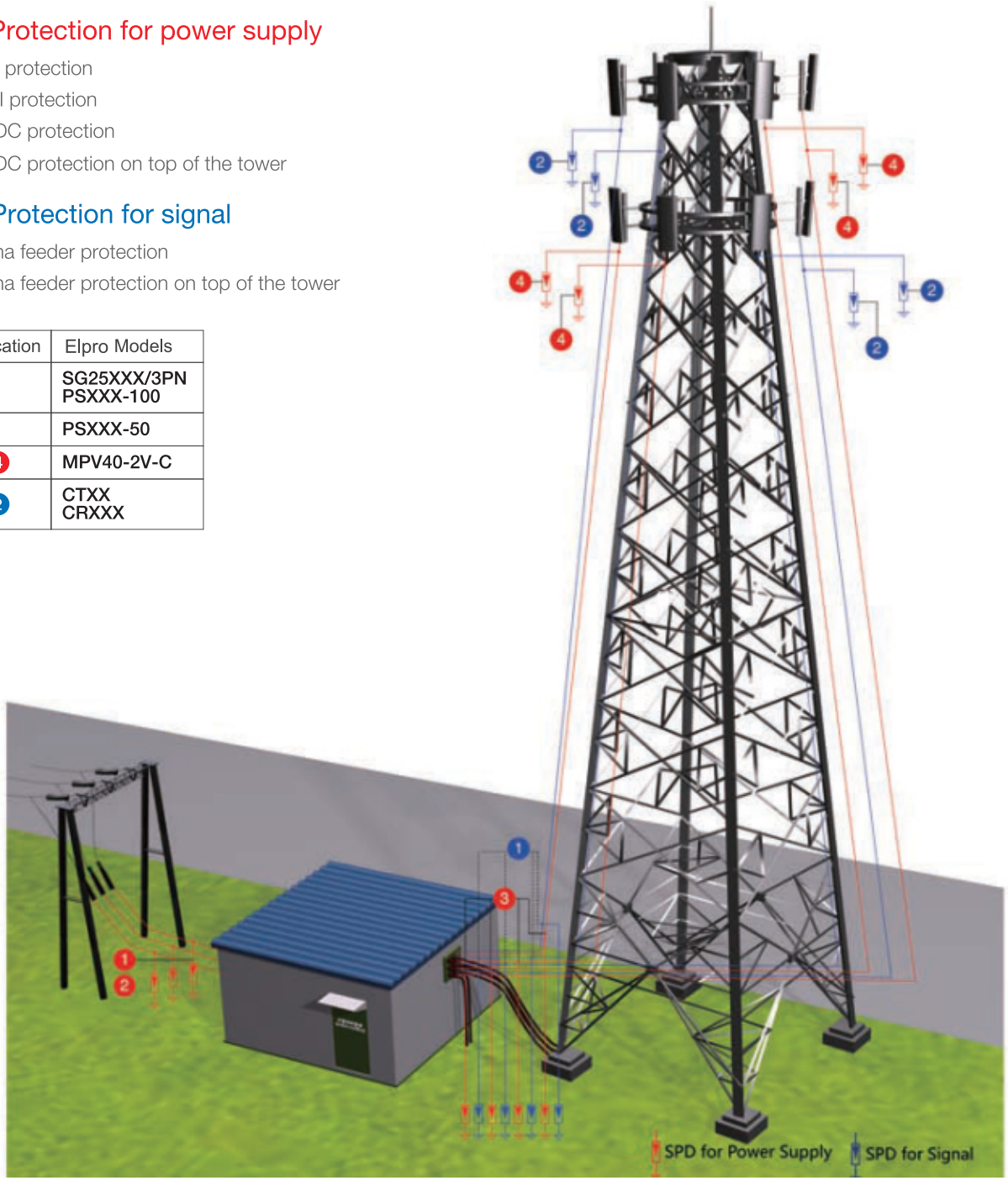
Surge Protection for power supply

1. Class I protection
2. Class II protection
3. ~48V DC protection
4. ~48V DC protection on top of the tower

Surge Protection for signal

1. Antenna feeder protection
2. Antenna feeder protection on top of the tower

SPD's Location	Elpro Models
1	SG25XXX/3PN PSXXX-100
2	PSXXX-50
3 4	MPV40-2V-C
1 2	CTXX CRXXX



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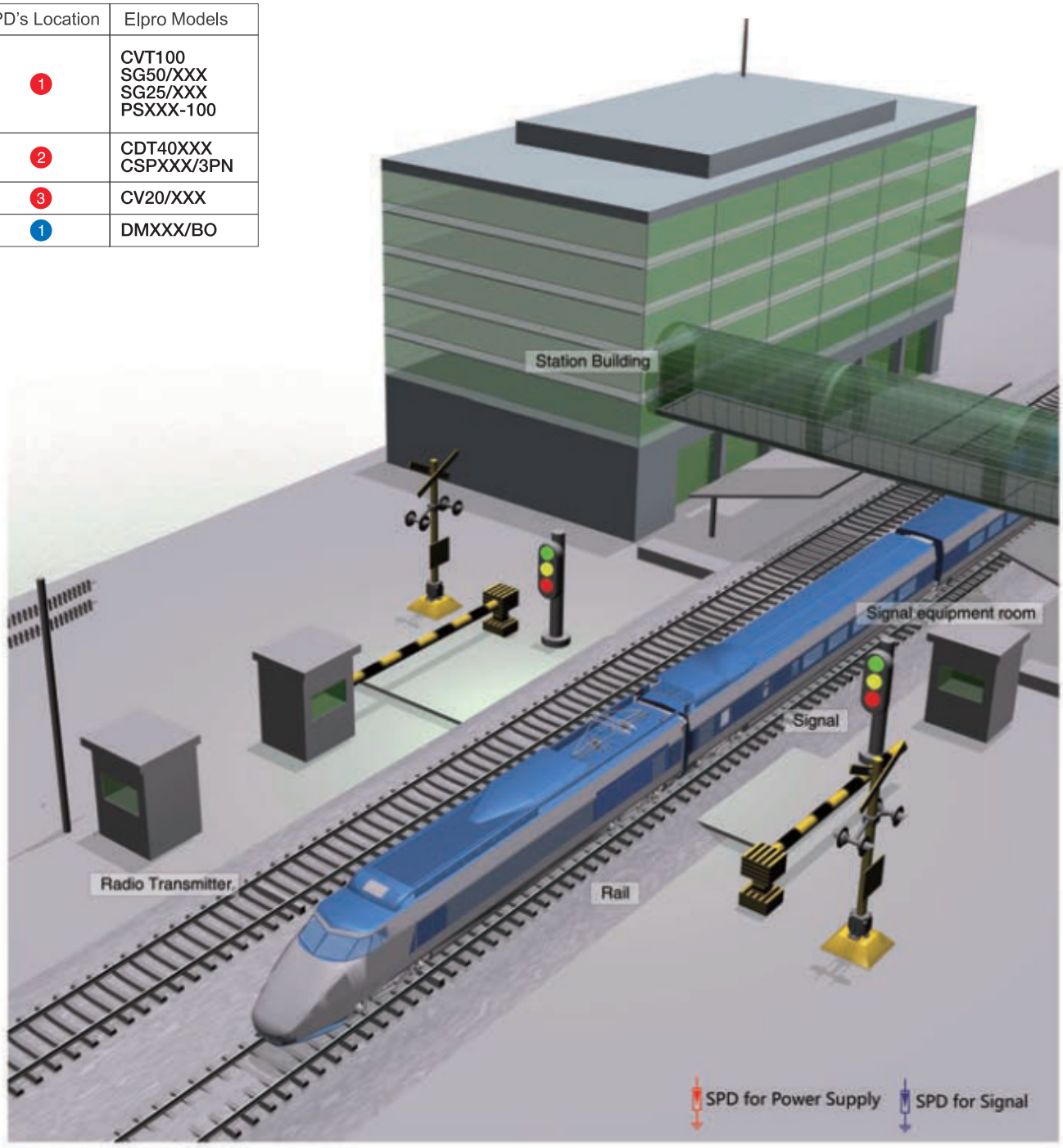
Surge Protection for Railway System

Railway system are highly sensitive and thus over voltage and over current induced by lightning stroke will damage all kinds of equipments via power supply and signal transmission channels and threat the safety and normal operation of railway system. Power supply cables and all kinds of electronic and signal equipments must be with proper SPDs.

SPD's Location	Elpro Models
1	CVT100 SG50/XXX SG25/XXX PSXXX-100
2	CDT40XXX CSPXXX/3PN
3	CV20/XXX
1	DMXXX/BO



Surge Protection for Industrial Control System

In industriall control area, all sorts of equipments need data / signal connection to the control center. Lightning can paralyze the whole system and thus it is essential to install proper SPDs on various channels to protect the equipments and control center as well.

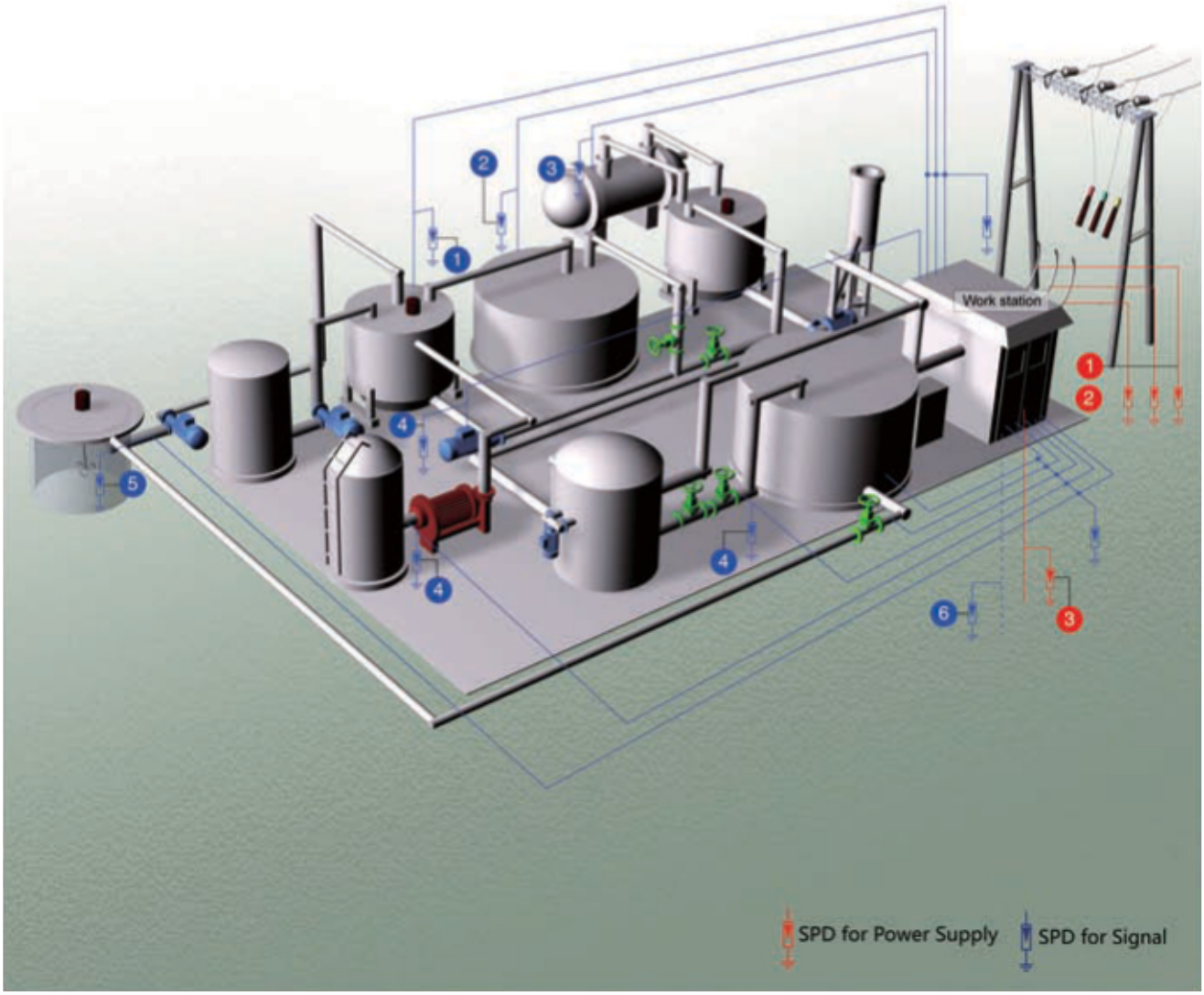
Surge Protection for power supply

1. AC Class I protection
2. AC Class II protection
3. DC 24V protection

Surge Protection for signal

1. Pressure signal protection
2. Flow signal protection
3. Temperature signal protection
4. Location signal protection
5. Liquid level signal protection
6. Communication signal protection

SPD's Location	Elpro Models
1	SG25XXX/3PN PSXXX-100
2	PSXXX-50
1 2 3 4 5	DMXXX
6	D-XXX/RJ45 D-XXX/RJ11



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Surge Protection for Building

There are many electromechanical systems inside a building which will be damaged if lightning hit the building or nearby the building. Installing SPDs is part of a comprehensive lightning protection solution for buildings. Power supply system need multi-level lightning protection at main power distribution / secondary power distribution / end users. Proper SPDs are also needed at systems like elevator / security / fire control / brodcasting etc.

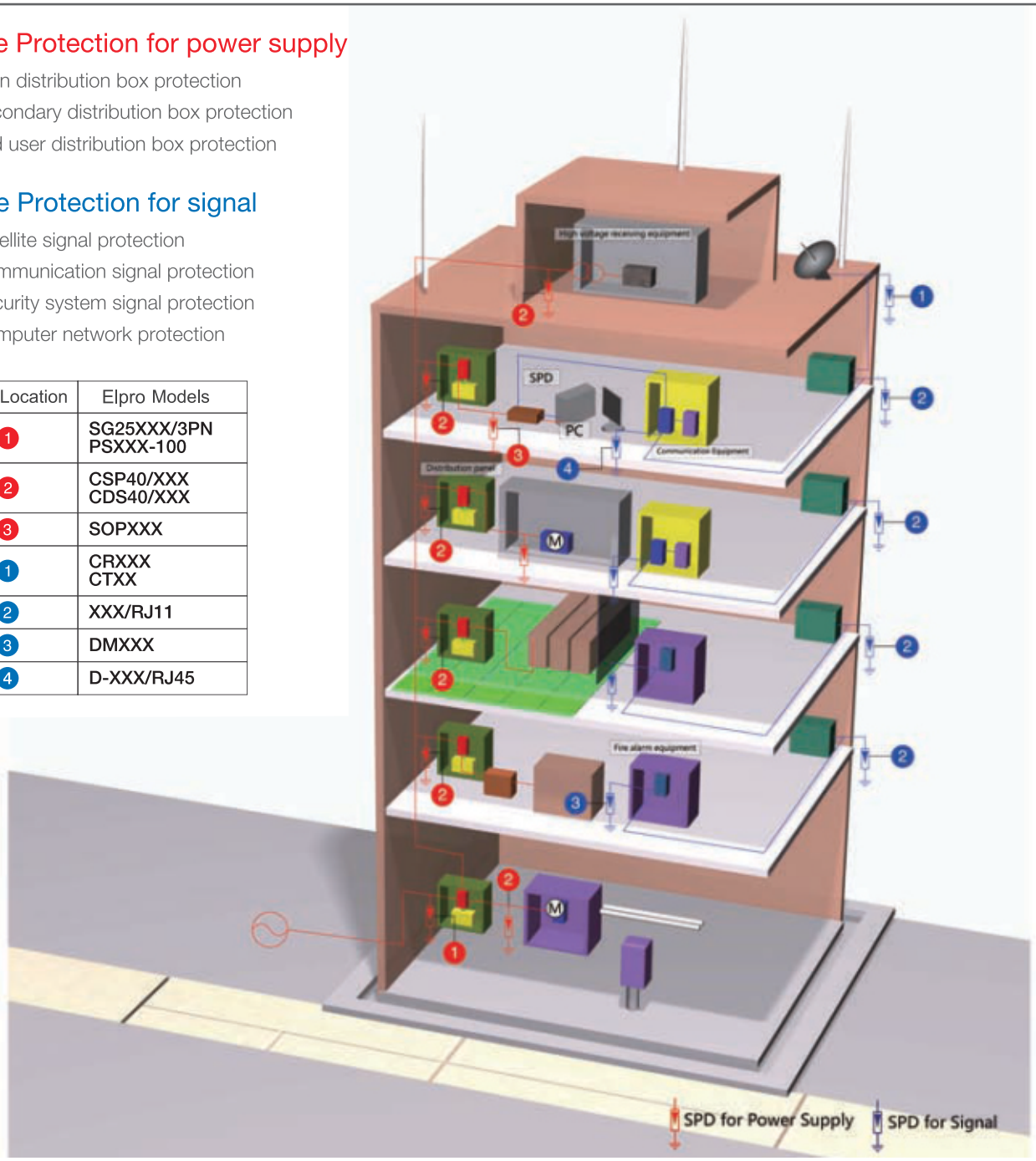
Surge Protection for power supply

1. Main distribution box protection
2. Secondary distribution box protection
3. End user distribution box protection

Surge Protection for signal

1. Satellite signal protection
2. Communication signal protection
3. Security system signal protection
4. Computer network protection

SPD's Location	Elpro Models
1	SG25XXX/3PN PSXXX-100
2	CSP40/XXX CDS40/XXX
3	SOPXXX
1	CRXXX CTXX
2	XXX/RJ11
3	DMXXX
4	D-XXX/RJ45



Surge Protection for Wind Farms

Wind Farms are in open and exposed environment and the tall windmill is highly prone to lightning damage and thus must be well-protected against it. After lightning receiving / down conducting / grounding, it is necessary to install SPDs on: • stator/rotor of the generator • transformers of different levels • control and communication cables

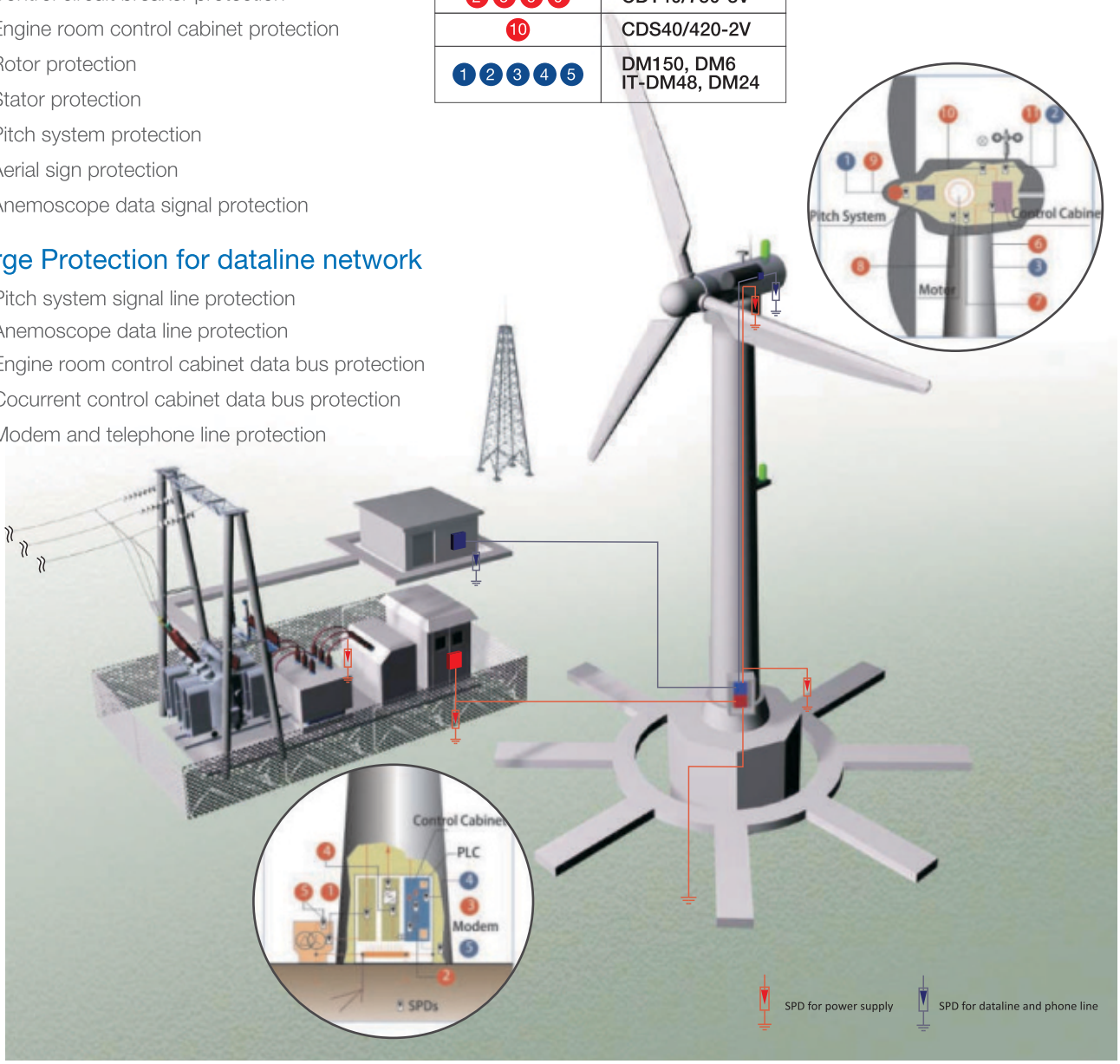
Surge Protection for power supply

1. Power distribution cabinet protection
2. Grid connection control protection
3. Grid connection control protection
4. Cocurrent device protection
5. Control circuit breaker protection
6. Engine room control cabinet protection
7. Rotor protection
8. Stator protection
9. Pitch system protection
10. Aerial sign protection
11. Anemoscope data signal protection

SPD's Location	Elpro Models
1 4 7 8	SG35-760/3P CDT40/750-3V CDT40/1000-3V
3 10 11	MPV20-24-2V
9	MPV20-48-2V
2 5 6 9	CDT40/750-3V
10	CDS40/420-2V
1 2 3 4 5	DM150, DM6 IT-DM48, DM24

Surge Protection for dataline network

1. Pitch system signal line protection
2. Anemoscope data line protection
3. Engine room control cabinet data bus protection
4. Cocurrent control cabinet data bus protection
5. Modem and telephone line protection



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Surge Protection for PV System

PV systems are set up outdoors and are prone to lightning damage. Lightning and surge protections are essential to their efficient operation. After the external lightning protection, the most crucial work is to protect the inverter.

SPDs are needed at the DC input end and AC output end of the Inverter. They are also needed at the two ends of long distance signal cable.

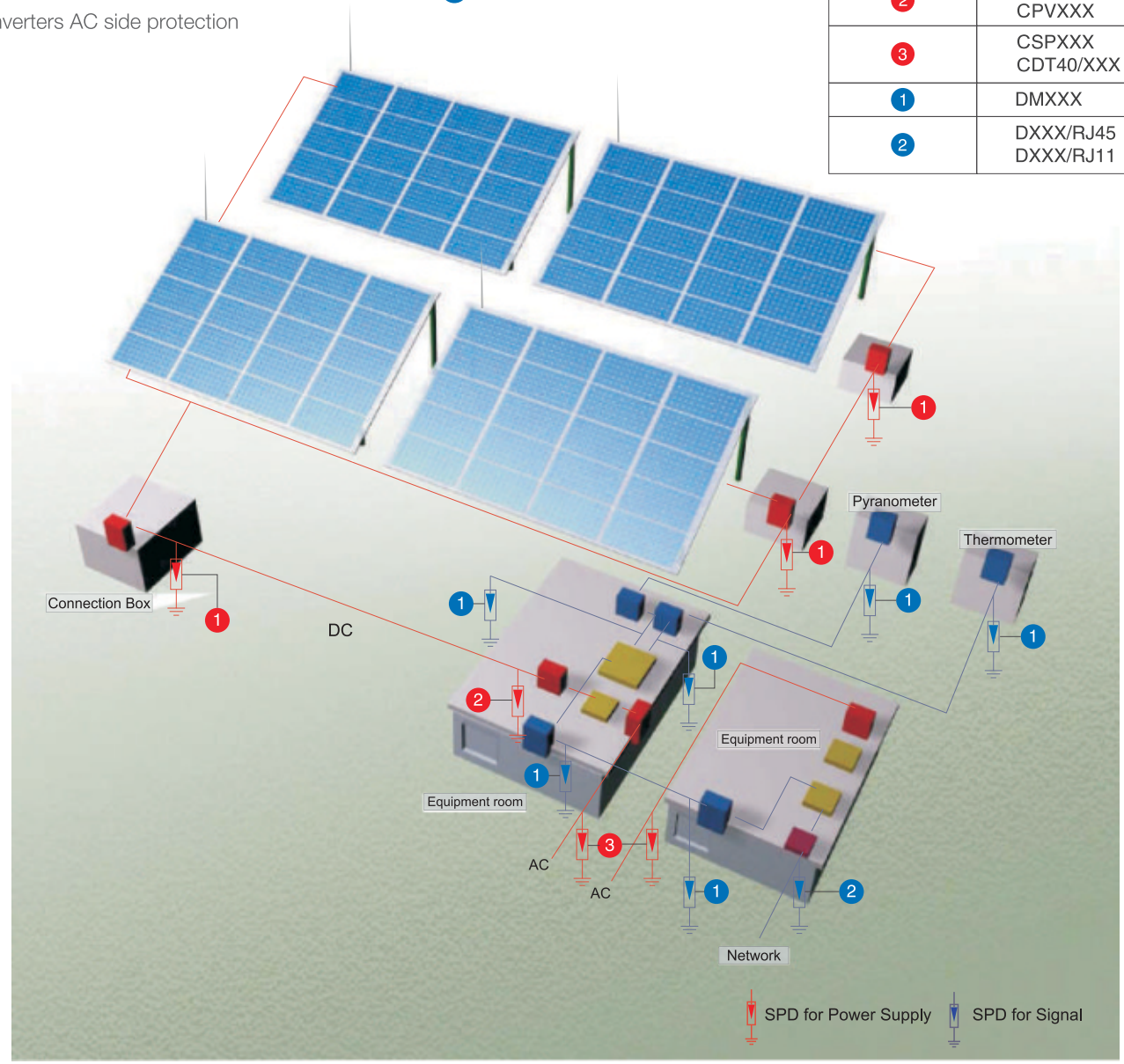
Surge Protection for power supply

1. DC connection box protection
2. Inverters DC side protection
3. Inverters AC side protection

Surge Protection for signal

1. Data Signal Protection
2. Communication Signal Protection

SPD's Location	Elpro Models
1	BPV/12.5XXX
2	CPV40-XXX CPVXXX
3	CSPXXX CDT40/XXX
1	DMXXX
2	DXXX/RJ45 DXXX/RJ11



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SPD for Power System

AC MODULES

Series	MCOV	In 8/20μS	Iimp 10/350μS	VPR 1.2/50μS
Type 1	VAC	kA	kA	kA
BC50G/275(-F)	275	50	50	<1.5
BC100G/275(-F)	275	100	100	<1.5

Series	MCOV	In 8/20μS	Imax 8/20μS	Iimp 10/350μS	VPR 1.2/50μS
Type 1+2	VAC	kA	kA	kA	kV
SG100/255NPE	255	100	200	100	<1.5
SG50/255NPE	255	50	100	50	
SG25/255NPE	255	25	50	25	

Series	MCOV	In 8/20μS	Imax 8/20μS	Iimp 10/350μS	VPR 1.2/50μS
Type 1+2	VAC	kA	kA	kA	kA
BC12.5V/420(-S)	420	12.5	80	12.5	<1.5
BC25V/275(-S)	320	25	120	25	<1.2
BCP12.5V/320(-S)	320	12.5	65	12.5	<1.4
BSP7V/275(-S)	275	25	60	7	<1.5
BSP12.5V/275(-S)	275	25	80	12.5	<1.5

Series	MCOV	In 8/20μS	Imax 8/20μS	Iimp 10/350μS	VPR 1.2/50μS
Type 1+2+3	VAC	kA	kA	kA	kV
BC12.5VT/420	420	12.5	65	12.5	<1.6
BC25VT/320(-S)	385	25	120	25	<1.5
BCP12.5VT/420	420	12.5	65	12.5	<1.6

Series	MCOV	In 8/20μS	Imax 8/20μS	VPR 1.2/50μS
Type 2	VAC	kA	kA	kV
CDS25/420-2V(-S)	420	10	25	<2.0
CDS40/420-2V(-S)	420	10	40	<2.0
CDS60/420-2V(-S)	385	30	60	<1.8
CDT60/440-4V-S	440	30	60	<2.2
CT60/255(-S)	255	30	60	< 1.5
CV60/385(-S)	385	30	60	<1.8
CDS80/420-2V(-S)	420	40	80	<2.0
CT80/255(-S)	255	40	80	<1.5
CDS100/420-2V(-S)	420	50	100	<2.0
CT100/255(-S)	255	50	100	<1.5
CDS120/420-2V(-S)	420	60	120	<2.0
CT120/255	255	60	120	<1.5
CV120P/255(-S)	420	60	120	<2.0
CDS150/420-2V(-S)	420	75	150	<2.0
CDT150/420-3V(-S)	420	75	150	<2.0
CV150/420(-S)	420	75	150	<2.0
CDS200/420-2V(-S)	420	100	200	<2.0
CDT200/420-3V(-S)	420	100	200	<2.0
CV200/420(-S)	420	100	200	<2.0

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SPD for Power System

AC MODULES

Series	MCOV	In 8/20μS	Imax 8/20μS	VPR 1.2/50μS
Type 2+3	VAC	kA	kA	kV
CDT25/420-3VT(-S)	420	10	25	<1.6
CVT25/420(-S)	420	10	25	<1.6
CDT40/420-3VT(-S)	420	20	40	<1.6
CT40/420(-S)	420	20	40	<1.6
CDT50/420-3VT(-S)	420	25	50	<1.6
CVT50/420(-S)	420	25	50	<1.6
CDT80/420-3VT(-S)	420	40	80	<1.6
CVT80/420(-S)	420	40	80	<1.6
CDT100/420-3VT(-S)	420	50	100	<1.6
CVT100/420(-S)	420	50	100	<1.6
CDT120/420-3VT(-S)	420	60	120	<1.6
CVT120/420(-S)	420	60	120	<1.6

DC MODULES

Series	MCOV	In 8/20μS	Imax 8/20μS	Iimp 10/350μS	VPR 1.2/50μS
Type 1+2	VAC/VDC	kA	kA	kA	kV
WG35/760-S	760	35	120	35	≤ 4
BPV12.5-600-V-C(-S) / BPV12.5-600-VT-C(-S)	640	12.5	60	12.5	1.3
BPV12.5-1000-V-C(-S)	1060				2.6
BPV12.5-1000-VT-CD(-S)	1020				<2.6

Series	MCOV	In 8/20μS	Imax 8/20μS	VPR 1.2/50μS
Type 2	AC/DC	kA (L-N/N-PE)	kA (L-N/N-PE)	kV
CSP420/3PN (-S)	420/560	20/20	40/40	<1.5
CSP690/4P (-S)	690/895	20	40	<2.5
CSP320VT/3PN (-S)	320/420	20/20	40/40	<1.5
CSP320VT/4P (-S)	320/420	20	40	<1.0

Series	MCOV	In 8/20μS	Imax 8/20μS	VPR 1.2/50μS
Type 2	Un/Uc	kA	kA	kV
CPV50/600-V-C (-S)	600/710	20	50	<1.8
CPV50/1200-V-C (-S)	1200/1420	20	50	<3.6

Series	MCOV	In 8/20μS	Imax 8/20μS	VPR 1.2/50μS
Type 2	Un/Uc	kA	kA	kV
CPV20-V-C (-S)	48/56	10	20	<150
CPV40-V-C (-S)	1000/1060	20	40	<3.0
CPV40-V-CD (-S)	1500/1650	20	40	<4.0

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SPD for Power System

DC MODULES

Series	MCOV	In 8/20μS	Imax 8/20μS	VPR 1.2/50μS
Type 2	Un/Uc	kA	kA	kV
MPV40/48-C-LED (-S)	48/75	20	40	<300
MPV40/48-(V+T)-C-LED (-S)	48/75	20	40	<300

Series	MCOV	In 8/20μS	Imax 8/20μS	VPR 1.2/50μS
Type 3	AC/DC	kA	kA	kV
DDS10/320-(V+T)(-F)	420/560	5	10	<1.5
DV10/320(-S)	420/560	7.5	15	<2.0
DT10/420-4V(-S)	420/560	5	10	<2.0

Series	MCOV	In 8/20μS	Imax 8/20μS	VPR 1.2/50μS
Type 3	AC/DC	kA(L-L/L-G)	kA(L-L/L-G)	kV
DSF10/320-16A/3P	250/320	5	10	<1.2
DSF25/320-25A/3P/C(-S)	250/320	10/3	25/6	<1.2
CMDS10/320-2V-T(-F)	320/420	5/5	10/10	<1.5
CMDSS10/420-(2V+T)	420/560	5	10	<1.6

Series	MCOV	In 8/20μS	Imax 8/20μS	VPR 1.2/50μS
Type 3	AC/DC	kA	kA	kV
WSPN/550-20/x-L	550/745	10	20	<2.0
WS3/320-50/W	320/420	20	30	<1

BOX TYPE SPD

Series	System Voltage	Voltage Protection Ratings (VPR@6kV/3kA)	Surge Current Capability	MCOV
Type 1+2		L-G/L-L		
PSP600D100-6M	600D Three-phase delta	2400/2800	100kA/phase, 50kA/mode	690
PSP600D200-6M	600D Three-phase delta	2400/2800	200kA/phase, 100kA/mode	690
PSP600D400-6M	600D Three-phase delta	2400/2800	400kA/phase, 200kA/mode	690
PSP800D200-6M	600D Three-phase delta	2400/2800	800kA/phase, 400kA/mode	690

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SPD for Signal

FOR INFORMATION SYSTEM

Series	MCOV	In 8/20µS	Total In 8/20µS	VPR 1.2/50µS
Type 2	VAC	kA	kA	kV
D-024/BNC(20kA)FM	24	10	20	<55
DB-12/DB25-7	12	250A/5kA	1750A/5kA	<45
C24T-V05BNC-P230T/F(AC)	320	5	10	<0.9
C24T-V05BNC-P230T/F(BNC)	6	5	10	<30
V12BNC-P230T/2F(AC)	320	5	10	<0.9
V12BNC-P230T/2F(BNC)	15	5	10	<45
D-170/RJ11-2	165	10	20	<590

DATA NETWORK PROTECTOR

Series	Nominal \ voltage Vdc	MCOV	Nominal Current	Iimp 10/350µS	In 8/20µS	Voltage protection level Up 8/20µS
	Un	DC/AC	A	kA	kA	kV(L-L/L-G)
DM 05/S4	6	6/4.2	1	2	5	26/40
DM 12/S4	12	15/12				55/50
DM 24/S4	24	28/24				110/65

Series	Nominal \ voltage Vdc	MCOV	Nominal Current	In 8/20µS	Total Max Nominal Discharge Current	Voltage protection level Up 8/20µS
	Un	VDC/AC	A	kA	kA	kV(L-L/L-G)
DM 05/M4	6	6/4.2	0.5	5	20	18/500
DM 12/M4	12	15/10.6				45/500
DM 24/M4	24	33/23.3				55/500
DM 48/M4	48	54/38.1				100/500

COAXIAL ANTENNA PROTECTOR

Series	Max. Peak Power	Impedance	Frequency Range	Insertion Losses	Imax 8/20µS	Residual Voltage
Type	W	Ohm	MHz	dB	kA	V
CR/xxx-N/FF	2500	320	800-1000	<0.15	50	<10
CR/1800E-7/16/MF	2500	6	1700-2200	<0.15	50	<10

FOR ONE PAIR LINE PROTECTION

Series	Nominal \ voltage Vdc	MCOV	In 8/20µS	Total Max Discharge Current	Voltage protection level Up 8/20µS
	Un	Uc	kA	kA	kV(L-L/L-G)
DM 05/BO	5	6/5	5	10	30/500
DM 12/BO	12	15/12			45/500
DM 24/BO	24	28/24			55/500
DM 48/BO	48	60/48			190/500

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SPD for Signal

FOR TWO PAIR LINE PROTECTION

Series	Nominal \ voltage Vdc	MCOV	In 8/20µS	Total Max Discharge Current	Voltage protection level Up 8/20µS
	Un	Uc	kA	kA	kV(L-L/L-G)
DM 06/CO	6	8/6	5	10	30/500
DM 12/CO	12	15/12			45/500
DM 24/CO	24	28/24			55/500
DM 48/CO	48	60/48			190/500

FOR ETHERNET, TWISTED PAIR

Series	Nominal \ voltage Vdc	MCOV	Nominal Current	In 8/20µS	Total Max Nominal Discharge Current	Voltage protection level Up 8/20µS
	Un	VDC/AC	mA	kA	kA	kV
D-05/RJ45-CAT6/II	5	6	200	2	8	<35
D-48/RJ45-CAT6/II	48	48				<190

FOR POWER OVER ETHERNET (POE)

Series	Nominal \ voltage Vdc	MCOV	Nominal Current	In 8/20µS	Total Max Nominal Discharge Current	Voltage protection level Up 8/20µS
	Un	VDC/AC	mA	kA(L-L/L-G)	kA(L-L/L-G)	kV(L-L/L-G)
D-05/RJ45-H-8	5	6/5	0.5	100A/2.5kA	300A/15kA	<30/600
	48	60/48				<190/600

Series	Nominal \ voltage Vdc	MCOV	Nominal Current	In 8/20µS	Total Max Nominal Discharge Current	Voltage protection level Up 8/20µS
	Un	VDC/AC	A	kA(L-L/L-G)	kA(L-L/L-G)	kV(L-L/L-G)
DSB-05/RJ45-H-24P	5	6/5	1	100A/2.5kA	400A/10kA	<30/600
DSB-12/RJ45-H-24P	12	15/12				<45/600
DSB-24/RJ45-H-24P	24	28/24				<55/600
DSB-48/RJ45-H-24P	48	60/48				<190/600

COMBINED PROTECTION FOR MAINS AND ETHERNET

Series	Nominal \ voltage Vdc	MCOV	Nominal Current	In 8/20µS	Imax 8/20µS	Total Max Nominal Discharge Current	Voltage protection level Up 8/20µS
	Un	VDC/AC	A	kA	kA(L-L/L-G)	kA	kV
D05RJ45-P230T/2F	230/440	320		5	10		<0.9
	5	6	1	250A		1	<30

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