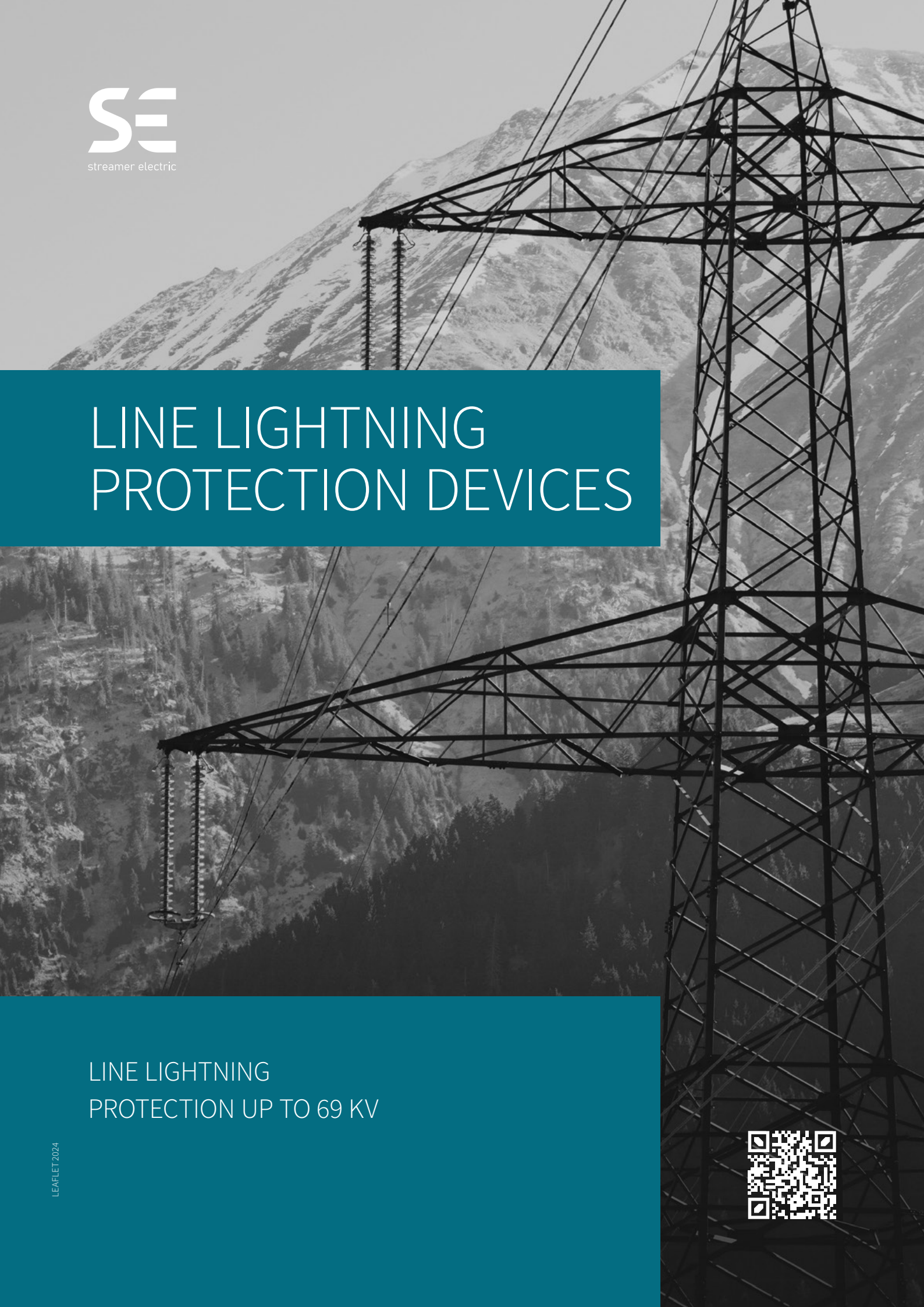


streamer electric

LINE LIGHTNING PROTECTION DEVICES

LINE LIGHTNING PROTECTION UP TO 69 KV

LEAFLET 2024

LINE LIGHTNING PROTECTION DEVICES

A UNIQUE LIGHTNING PROTECTION SOLUTION FOR OVERHEAD LINES: LINE LIGHTNING PROTECTION DEVICES (LLPDS) WITH EASYQUENCH (EQ) TECHNOLOGY HAVE BEEN INVENTED AND PATENTED BY STREAMER

MORE THAN 2 MILLION LLPDS HAVE BEEN INSTALLED WORLDWIDE

- China
- Indonesia
- Malaysia
- Brazil
- UAE
- Vietnam
- Switzerland
- Germany
- and elsewhere

INTRODUCTION

THE ISSUES

Lightning poses a severe threat to the safety and productivity for various industries.

The consequences of lightning can be production losses for companies and industries (estimate to millions of USD per year).

Losses are caused by lack of electricity for some period of time.

THE SOLUTION

For lightning protection of overhead lines we offer Line Lightning Protection Devices (LLPD) that will drastically reduce lightning outages by preventing flashovers of insulator caused by direct and indirect lightning strikes and will then break the following short circuit in less than 10ms. These LLPDs are easily retrofitted on any line shape. Moreover, special grounding and low soil resistivity are not required for this type of device, hence it can be implemented literally everywhere.

THE RESULT

As result of installing LLPDs on overhead lines, the lightning trips are avoided which means:

- no production loss;
- no safety hazard.

LINE LIGHTNING PROTECTION DEVICES

EASYQUENCH

A UNIQUE & EFFICIENT TECHNOLOGY FOR LINE LIGHTNING PROTECTION

EasyQuench is a unique technology, developed and being improved since 1996 by Streamer. Products featuring the EasyQuench technology protect overhead lines against direct and indirect lightning strikes, thus helping to prevent breakage of conductors, insulators and power outages. Due to their operating principle, line lightning protection devices (LLPDs) do not require any special grounding (e.g. a ground lead). Therefore, these devices are especially efficient in areas with high soil resistivity.

The Operating principle of LLPDs with the EasyQuench system is based on the following concepts:

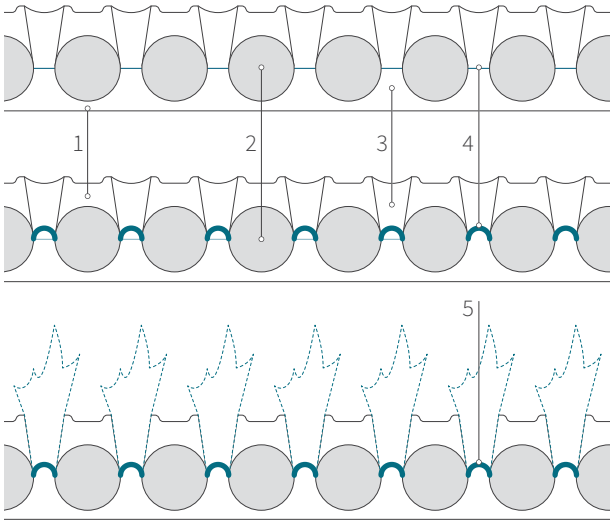
1. Insulation coordination. Coordination of lightning protection devices with line insulation is necessary to ensure proper operation and is achieved by adjusting basic Insulation level (critical flashover voltage) of LLPD so that it is lower than those of the protected insulator. By fulfilling this requirement, it can be guaranteed that in case of a direct or an indirect lightning strike, the LLPD will operate correctly and prevent flashovers of the protected insulator.
2. Follow current interruption. Since all power lines are connected to transformers, when there's a flashover of LLPD somewhere on the line, a power frequency short-circuit current (or follow current) starts flowing immediately through it. Thanks to the EasyQuench system, LLPD can interrupt the fault current within one half of the period.

The EasyQuench system consists of a series of small discharge/arcing chambers, being formed by two adjacent metal electrodes placed in a silicone rubber body. Electrodes are separated from each other with tiny air gaps, that break down as soon as the LLPD is subjected to lightning overvoltage.

When a follow current starts flowing through the EasyQuench system, it immediately gets split into a series of small power arcs located inside the device. Each of the miniature arcs is then quenched individually.

When power frequency follow current crosses zero, it is eliminated. The line then immediately gets back to normal operation, therefore no short circuit will be sensed by protection relays and there will be no outage or power supply interruption.

Diagram of discharge initiation:



1. Silicone rubber body
2. Intermediate electrodes
3. Arc quenching chamber
4. Arc
5. Plasma jet

EASYQUENCH BENEFITS

- Prevents outages on the line;
- protects overhead lines from direct lightning strike and induced overvoltage;
- no dedicated grounding to be arranged;
- no maintenance required;
- works perfectly in areas with high soil resistivity;
- works under extreme climatic conditions and high-altitude landscape;
- quenches follow current (short circuit current) in less than one semiperiod of industrial power frequency;
- 20 years life expectancy;
- fix and forget.

TECHNICAL DATA

	d10z	i20z	dC20z	d24z
				
Reference	LL.PD.D012.E0.WW	SAI.020.Z.WW/820	SAD.C20.Z.WW/920	LLPD.D024.B0.WW
Highest voltage of equipment, kV	12	24	24	24
Protection from	DLS*	IOV**	DLS*	DLS*
Maximum prospective fault current/effective current, kA	5/ 3.5	1.5/ 1.2	5/ 3.5	5/ 3.5
External air gap, mm	50–70	60–80	60–80	60–80
50% flashover voltage, kV	<115	<110	<185	<150
Power frequency withstand voltage, kV (wet/dry)	28/38	30/40	40/50	40/50
Lightning discharge capability (200 µs), C	2.8	2.4	2.8	2.8
High current impulse (4/10 µs), kA	65	65	65	65
Maximum quenching lightning current, kA	20 (8/50µs)	3 (1/50µs)	20 (8/50µs)	20 (8/50µs)
Minimum withstand amounts of operations	10	10	10	10
Average expected lifespan, years	30	30	30	30
Weight, kg	1.1	0.43	2.6	2.8
Maintenance	1 visual verification/ year	1 visual verification/ year	1 visual verification/ year	1 visual verification/ year

*DLS (Direct Lightning Strike) — lightning striking a component of the network such as the conductor, tower or substation equipment
**IOV (Induced Overvoltage) — an overvoltage in the network that is induced by a lightning strike that does not strike directly at any part of the network

TECHNICAL DATA

	dM35z	d45z	d69z
			
Reference	SAD.M35.Z.WW/920	SAD.045.Z.WW/930	SAD.069.Z.WW/920
Highest voltage of equipment, kV	40.5	52	72.2
Protection from	DLS*	DLS*	DLS*
Maximum prospective fault current, kA	5/ 3.5	5/ 3.5	5/ 3.5
External air gap, mm	115–180	80+80	80+80+120
50% flashover voltage, kV	<200	<280	<440
Power frequency withstand voltage, kV (wet/dry)	65/80	95/95	140/140
Lightning discharge capability (200 µs), C	2.8	2.8	2.8
High current impulse (4/10 µs), kA	65	65	65
Maximum quenching lightning current, kA	20 (8/50µs)	20 (8/50µs)	20 (8/50µs)
Minimum withstand amounts of operations	10	10	10
Average expected lifespan, years	30	30	30
Weight, kg	6.2	7	9.3
Maintenance	1 visual verification/ year	1 visual verification/ year	1 visual verification/ year

*DLS (Direct Lightning Strike) — lightning striking a component of the network such as the conductor, tower or substation equipment

INSTALLATION EXAMPLES: PHILIPPINES

National Grid Corporation of the Philippines (NGCP)	
Rated voltage	69 kV

Dagupan Electric Corporation (DECORP)	
Rated voltage	13,8 kV

LINE LIGHTNING PROTECTION DEVICES

TYPE TESTS

PRODUCTS ARE TESTED IN THE LEADING AND MOST RECOGNIZED HIGH VOLTAGE LABORATORIES WORLDWIDE:

CESI (Italy)

STRI (Sweden)

CPRI (India)

CEPRI (China)

TRANSEC ELECTRIC LTD.

51 Hollands Road, Haverhill, Suffolk CB9 8PL, UK

office@tr-electric.uk
www.tr-electric.uk

STREAMER ELECTRIC AG, HQ

Technopark Graubünden, Bahnhofstrasse 11,
7302 Landquart, Switzerland

+41 81 2500525
office@streamer-electric.com
www.streamer-electric.com

STREAMER INDONESIA

Wilson Walton Building,
Jl. Raya Tanjung Barat 155 Jagakarsa,
Jakarta, Indonesia

+62 21 7884 0737
office_jkt@streamer-electric.com

STREAMER CHINA

11th floor, Building A. Sanlitun SOHO, Workers
Stadium North Road No.8 Yard. Chaoyang District,
Beijing, China

+86 8565 1663
office_bjs@streamer-electric.com

LLPD_LEAFLET_ENG_2024