

Overvoltage protection classification:

- T1 = B = 1. protection stage
- T2 = C = 2. protection stage
- T1+T2 = B+C = 1. and 2. protection stage
- T3 = D = 3. protection stage

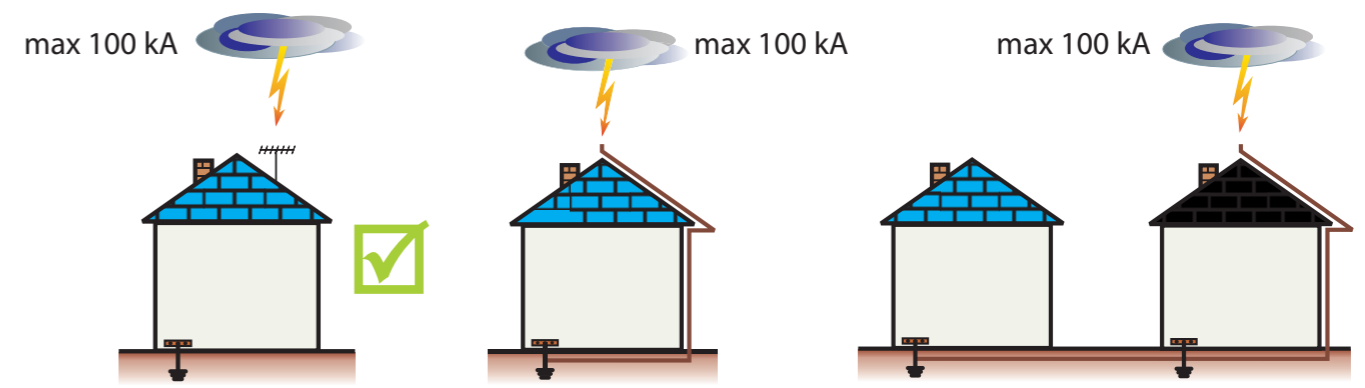
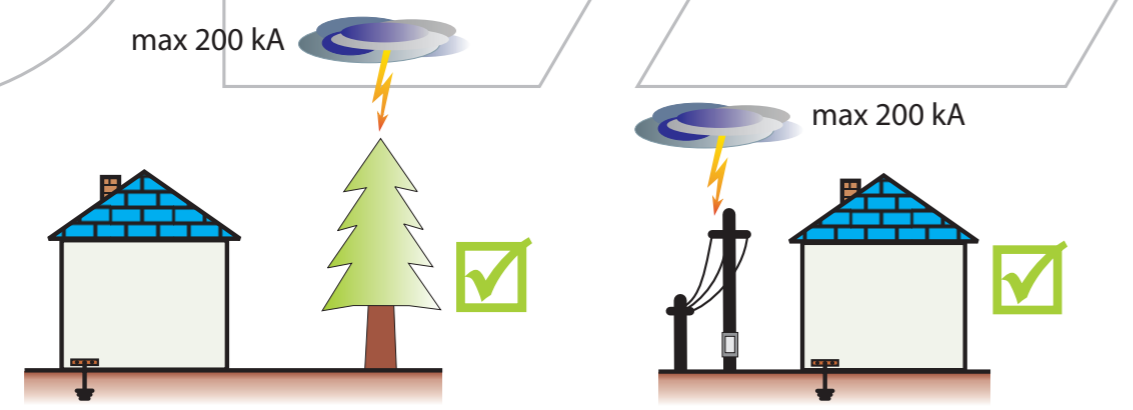
- a) family houses without lightning conductor and without external conductive parts
 - with buried cable power lead
 - where there is no threat of direct lightning stroke to close building with lightning conductor that is connected galvanically with the protected building
- b) block of flats with installed T1 in the service box or in the main switchboard

Required back-up protection and conductors' cross-section:

Standard solution				Economical solution			
F1	F2	S _L	S _{PEN}	F1	F2	S _L	S _{PEN}
A gL/gG	A gL/gG	mm ²	mm ²	A gL/gG	A gL/gG	mm ²	mm ²
≤50		6	6	≤50		6	6
63		10	10	63		10	10
80		13	13	80		13	13
100		25	25	100		25	25
125		25	25	125		25	25
>125	125	25	25	>125	125	25	25

Type of network	Buried power lead, without lightning conductor	Separation of lightning current	Standard solution	Economical solution
TN-C				
TN-C-S				
TN-S				

Application part – Medium installation threat



a) family houses without lightning conductor and without external conductive parts

- where there is a threat of direct lightning stroke to close building with lightning conductor that is connected galvanically with the protected building - placed in protection level against lightning LPL III or LPL IV
- with outside power lead

b) block of flats without installed T1 in the service box or in the main switchboard

- where the lightning current value does not exceed 12.5 kA (10/350 μs) thanks to its separation in several branches

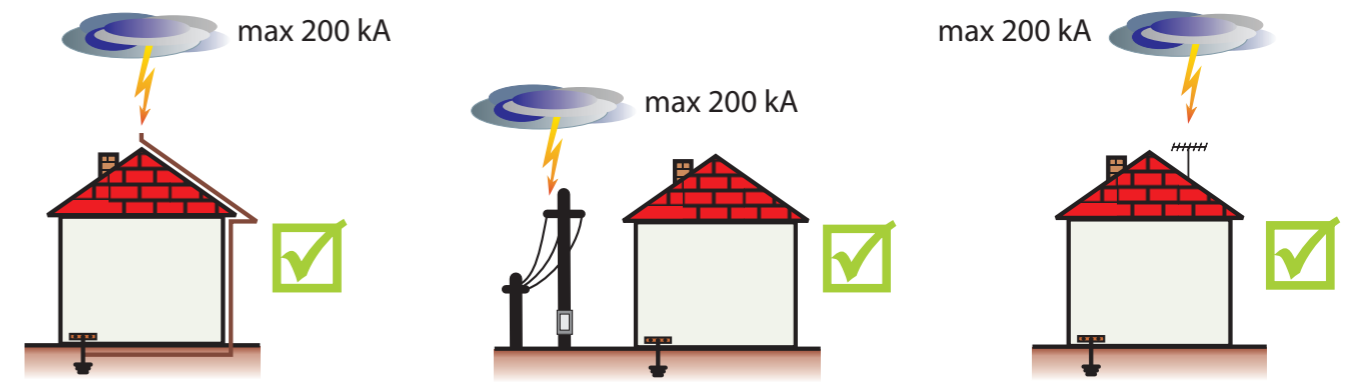
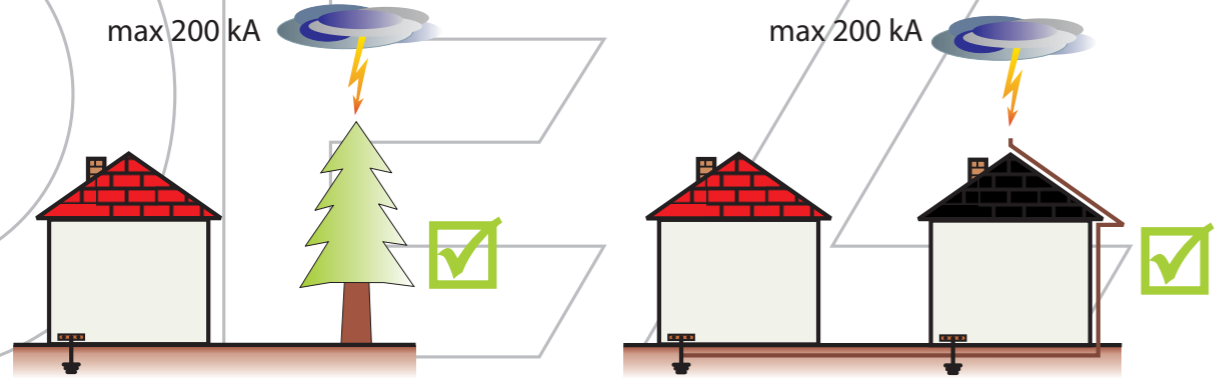
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Required back-up protection and conductors' cross-section:

Standard solution				T1 – separated				T2 – separated			
F1	F2	S _L	S _{PEN}	F1	F2	S _L	S _{PEN}	F1	F2	S _L	S _{PEN}
A gL/gG	A gL/gG	mm ²	mm ²	A gL/gG	A gL/gG	mm ²	mm ²	A gL/gG	A gL/gG	mm ²	mm ²
≤80		10	16	≤80		10	16	≤50		6	6
100		16	16	100		16	16	63		10	10
125		16	16	125		16	16	80		13	13
160		25	25	160		25	25	100		25	25
>160	160	25	25	200		35	35	125		25	25
				250		35	35	>125	125	25	25
				315		50	50				
				>315	160	50	50				

Type of network	Outside power lead, without lightning conductor	Separation of lightning current	Standard solution	Solution for necessary T1 and T2 separation
TN-C				
TN-C-S				
TN-S				

Application part – Big installation threat



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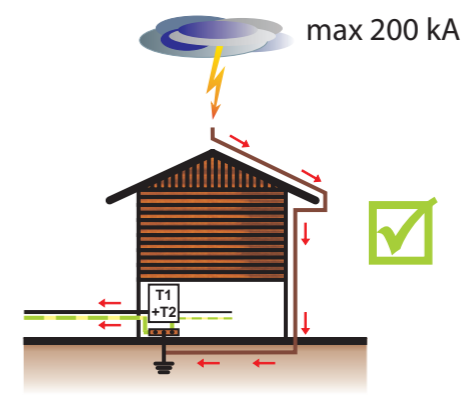
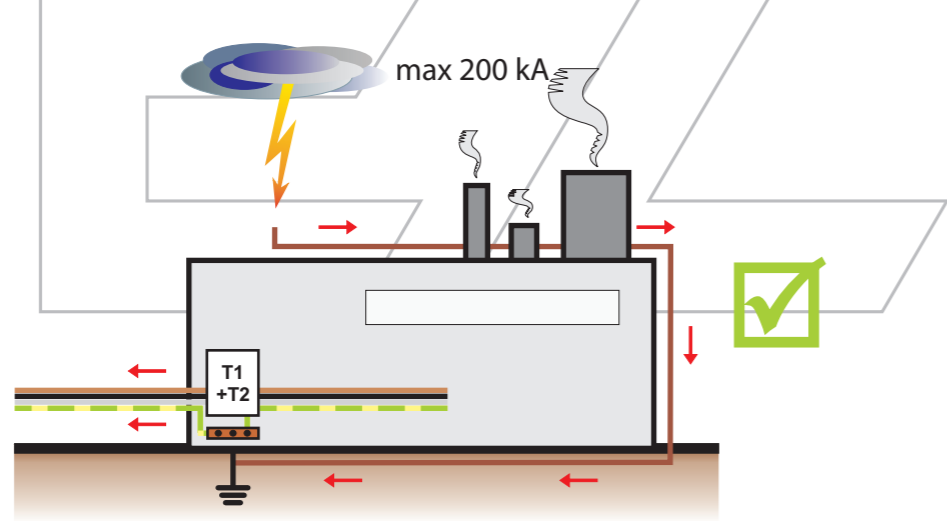
Required back-up protection and conductors' cross-section:

Standard solution				T1 – separated				T2 – separated			
F1 A gL/gG	F2 A gL/gG	S _L mm ²	S _{PEN} mm ²	F1 A gL/gG	F2 A gL/gG	S _L mm ²	S _{PEN} mm ²	F1 A gL/gG	F2 A gL/gG	S _L mm ²	S _{PEN} mm ²
≤80		10	16	≤80		10	16	≤50		6	6
100		16	16	100		16	16	63		10	10
125		16	16	125		16	16	80		13	13
160		25	25	160		25	25	100		25	25
200		35	35	200		35	35	125		25	25
250		35	35	250		35	35	>125	125	25	25
315		50	50	315		50	50				
>315	160	50	50	>315	160	50	50				

- a) family houses with lightning conductor or with external conductive parts
 - independent on type of power lead
 - where there is a threat of direct lightning stroke to close building with lightning conductor that is connected galvanically with the protected building - placed in protection level against lightning LPL I or LPL II
- b) block of flats without installed T1 in the service box or in the main switchboard
 - where the lightning current can exceed value 12.5 kA (10/350 μs)

Type of network	Arbitrary power lead, with lightning conductor	Separation of lightning current	Standard solution	Solution for necessary T1 and T2 separation
TN-C				
TN-C-S				
TN-S				

Application part – Industrial and special applications



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Required back-up protection and conductors' cross-section:

Standard solution				T1 – separated				T2 – separated			
F1	F2	S _L	S _{PEN}	F1	F2	S _L	S _{PEN}	F1	F2	S _L	S _{PEN}
A gL/gG	A gL/gG	mm ²	mm ²	A gL/gG	A gL/gG	mm ²	mm ²	A gL/gG	A gL/gG	mm ²	mm ²
≤50		6	6	≤80		10	16	≤50		6	6
63		10	10	100		16	16	63		10	10
80		13	13	125		16	16	80		13	13
100		25	25	160		25	25	100		25	25
125		25	25	200		35	35	125		25	25
>125	125	25	25	250		35	35	>125	125	25	25
				>250	250	50	50				

- a) industrial applications, where there are higher requirements due to big short-circuit current
 - the separation of lightning current is the same as in the case of big installation threat
- b) buildings that fulfil the criterions of big installation threat with two-conductor power lead

Type of network	Higher requirements or two-conductor power lead	Separation of lightning current	Standard solution	Solution necessary T1 and T2 separation
TN-C				
TN-C-S				
TN-C				