

Surge protection for Ethernet Twisted Pair (BaseT, Cat. 5 and Cat. 6)

Ethernet Twisted Pair has become the established system for computer networks in buildings. In this system, which is used mainly for in-house solutions, UTP5 RJ45 connectors are generally used. Precision surge protectors installed directly at the terminal equipment protect against capacitively and inductively coupled-in surges. If the surge protectors are installed at both ends of the copper lines – at the server, at the hub and at the network card – damage to the computer system by surges can in most cases be prevented. For networks that extend over more than one building, only suitably dimensioned surge protection devices installed where the lines enter the buildings provide complete protection.

Example 1: Where a building has no external lightning protection installation, a surge caused by a distant lightning strike, for example, may be coupled -in via the Ethernet cabling installation. Surge voltages may also be coupled inductively and capacitively on to internal wiring. However, since the partial lightning energy is likely to be relatively low, it is sufficient to install a surge protector for LPZ 1 → 3 (medium and precision surge protector RJ45S-E100/4-F).

Example 2: A building with an external lightning protection installation (LPZ 0) is also threatened by direct

lightning strikes to the lightning protection installation. Partial lightning energies are reliably diverted by using a combination device of type RJ45S-E100/4-C (basic and precision protection LPZ 0 → 3) at the terminal device. However, with this variant it is important to realise that partial lightning energies travel as far as just before the terminal device, and may therefore be coupled on to neighbouring wiring.

Example 3: A better solution is separate two-stage surge protection. Basic surge protector RJ45S-E100/4-B (LPZ 0 → 2) diverts the partial lightning currents directly at the infeed point. Precision protection device RJ45S-E100/4-F (LPZ 1 → 3) filters out the remaining surges.

Example 4: Ethernet cabling is usually used within building systems. In these cases, the necessary surge protection is limited to the elimination of inductively and/or capacitively coupled surges due to a lightning strike on the external lightning protection system or a nearby strike, on a tree for instance. Medium and precision surge protector RJ45S-E100/4-F is suitable for these applications.


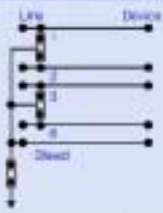

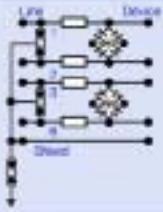

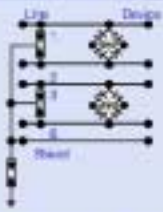

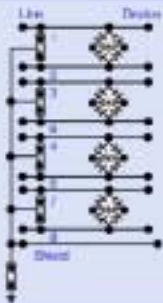
Note: in protector RJ45S-ATM/8-F, all eight cores are connected.



Technical data

Surge protectors for Ethernet BaseT systems		RJ45S-E100/4-B	RJ45S-E100/4-C	RJ45S-E100/4-F	RJ45S-ATM/8-F
LPZ		0 → 2	0 → 3	1 → 3	1 → 3
Connector/protected cores		RJ45/ STP 4 cores	RJ45/ STP 4 cores	RJ45/ STP 4 cores	RJ45/ STP 8 cores
Max. discharge current/core symmetrical asymmetrical	Basic protection 10/350	1.5 kA/1.5 kA	1.5 kA/1.5 kA	-/-	-/-
	Medium protection 8/20	7.5 kA/7.5 kA	7.5 kA/7.5 kA	7.5 kA/0.5 kA	5 kA/0.25 kA
	Precision protection 8/20	7.5 kA/7.5 kA	7.5 kA/7.5 kA	7.5 kA/0.5 kA	5 kA/0.25 kA
Nominal voltage	U_N	110 V	5 V	5 V	5 V
Residual voltage	U_{res}	180 V	6.5 V	6.5 V	6.2 V
Voltage protection level at I_N symmetrical/asymmetrical	U_p	<800/<500	<800/<50	<800/<50	<800/<50
Insertion loss at 100 MHz	dB	0.3	5	3	2.5
Cut-off frequency 3 dB	Hz	>155M	70M	100M	155M
Series resistance	Ω	-	4.7	-	-
Order no.		5081 72 6	5081 73 4	5081 74 2	5081 79 3

Protection devices for Ethernet BaseT systems

<p>Basic protection LPZ 0 > LPZ 2</p>  <p>RJ45S-E100/4-B</p>		<p>Basic protection device. Installed directly at the point where the data line is fed in (LPZ 0 > 2).</p> <p>Special features</p> <ul style="list-style-type: none"> • RJ45 modular connectors • Simple to install • Optional kit for mounting on wall or 35 mm top-hat rail (DLS-B5)
<p>Combined protection LPZ 0 > LPZ 3</p>  <p>RJ45S-E100/4-C</p>		<p>Combined protection device. Installed directly at the terminal device (LPZ 0 > 3).</p> <p>Special features</p> <ul style="list-style-type: none"> • RJ45 modular connectors • Simple to install • Optional kit for mounting on wall or 35 mm top-hat rail (DLS-B5)
<p>Medium/precision protection LPZ 1 > LPZ 3</p>  <p>RJ45S-E100/4-F</p>		<p>Medium and precision protection device. Installed directly at the terminal device (LPZ 1 > 3).</p> <p>Special features</p> <ul style="list-style-type: none"> • RJ45 modular connectors • Simple to install • Optional kit for mounting on wall or 35 mm top-hat rail (DLS-B5)
<p>Medium/precision protection LPZ 1 > LPZ 3</p>  <p>RJ45S-150N/4-C</p>		<p>Medium and precision protection device. Installed directly at the terminal device (LPZ 1 > 3).</p> <p>Special features</p> <ul style="list-style-type: none"> • RJ45 modular connectors • Simple to install • Optional kit for mounting on wall or 35 mm top-hat rail (DLS-B5)