



POWER ISOLATOR : Lightning protector and noise reducer

RF Systems

The Power Isolator is a high frequency isolation transformer which protects transceivers, receivers and operators from static charges and lightning. It also reduces static atmospheric- and man-made noise. In contradiction to standard type lightning protectors, the Power Isolator ensures that there is no longer a conducting connection between the transceiver (or receiver) and antenna. This prevents the transport of a lightning bolt or static discharges to the trans- or receiver along the coaxial antenna cable. The Power Isolator is designed with financial support of the Dutch government in order to keep governmental- and military networks also in operation during thunderstorms.

FEATURES

- * Antenna and trans- or receiver are completely isolated from each other.
- * Antenna is directly connected to ground
- * Signal transfer only by a magnetic field
- * Prevents interference caused by earth-leakage currents flowing from safety- to lightning ground
- * Restores cathodic protection of antenna towers and ships
- * Frequency range : 500 kHz - 50 MHz
- * Max. transmitting power: 600 Watts p.e.p. SSB
- * Noise reduction by RF Systems' Magnetic Transfer technology
- * Ultra low loss: 0.3 dB typical, connectors included
- * Explosion-proof, built to withstand a 10,000 Amp lightning bolt without damage
- * Handles 10,000 Volts impulse peakvoltages between in-and output without sparking-over
- * Completely weatherproof

Many antennas are not protected against lightning. Even without a direct hit of the lightning, extremely high static voltages are induced in the antenna during any thunderstorm in the vicinity. Even when the lightning bolts are miles away, these induced voltages can reach values of thousands of volts. The same can happen during very dry weather or when static rain or -snow is falling. Although the power is not very high, these high voltages can damage the input circuitry of modern transceivers and receivers.

The principle of the Power Isolator is based on the theory that only full protection can be obtained if there is no connection at all between the antenna and the receiver. All induced charges or even a direct hit of the lightning are then forced to flow to the lightning ground outside the house.

The complete separation of antenna and receiver or transceiver became possible by RF Systems' Magnetic Transfer technology. Thanks to a specially developed ferrite it became possible to design an isolation transformer (50 Ohms to 50 Ohms) which transfers high frequency signals by means of only a magnetic field. Because the transformer must be able to handle extremely high impulse currents and -voltages it is wound with heavy hard-drawn massive silverwires, each covered with 3 mm pure Teflon. The special ferrite ensures extremely low losses. The Power Isolator works as follows: the antenna, for instance a dipole, is connected to the lightning ground. Not only the screening braid of the coaxial cable, but also the centre core of the coax is grounded! All parts of the antenna become grounded. The transceiver circuit is floating and there is a complete separation between the antenna and the trans- or receiver. This means that static discharges and the lightningbolt can only flow harmlessly to earth.

The Power Isolator converts the received signals into a high frequency magnetic field. The magnetic field is transferred by the special ferrite to the transceiver or receiver side, where it is converted back into the received signals. For transmitters it works the other way around: the transmitting power is converted into a magnetic field, which is converted back into transmitting power at the antenna side. So with the Power Isolator there is no conducting connection at all between the antenna and the receiver or transceiver! Only high frequency signals can pass through the Power Isolator. Lightningbolts and induced high voltages on the antenna flow to earth and cannot reach the trans- or receiver. The receiver or transceiver is therefore



protected. The safety ground of the house-wiring can be used again, without the risk that a lightning bolt comes into the house. The magnetic transfer technology ensures also rejection of static noise.

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