

Case study #	2.9
Title	Malfunction of circuit breaker due to lightning surges
Type of trouble	Abnormal operation.
Source of trouble	Lightning.
System affected	Access system.
Location	Outdoors.
Keywords	Safety, immunity, lightning, power transmission line, circuit breaker, MOV.
Version date	2004-01-01

System configuration

The circuit breakers in the power units of an access network system located outdoors malfunctioned due to lightning. The access network system had an optical fibre cable, which was connected to centre equipment, a metallic subscriber cable, and an AC mains line (Figure 2.9-1). The system had four power units. Each unit had a circuit breaker, with a capacitance of 5 A at the AC mains frequency. Figure 2.9-2 shows the system's protection circuits. The power units are produced by two manufacturers. Their circuits were almost the same, but they had different malfunction occurrence probabilities.

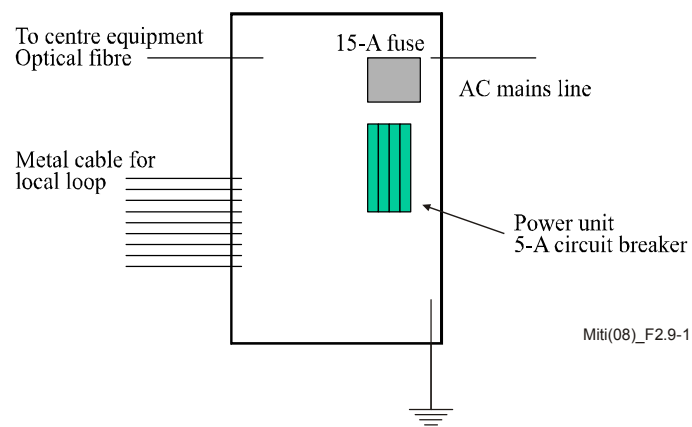


Figure 2.9-1 – Access network system

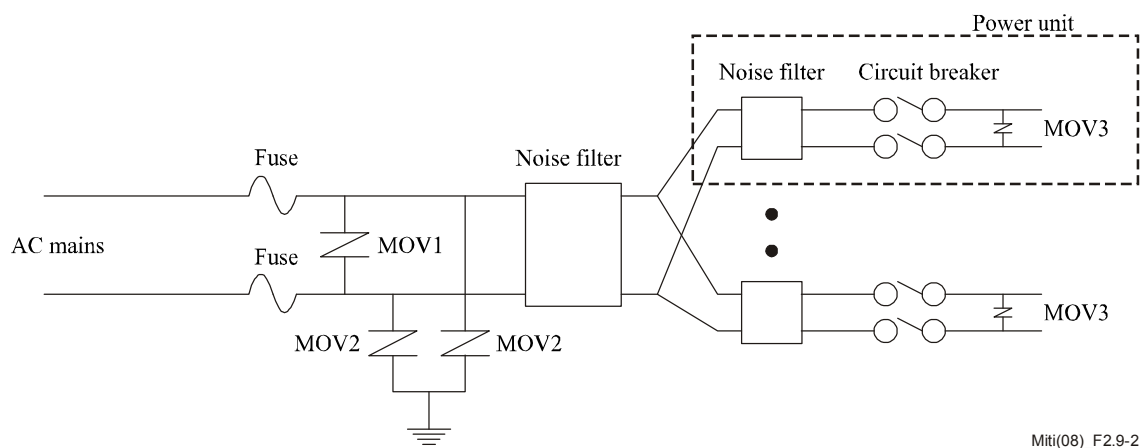


Figure 2.9-2 – Structure of overvoltage and overcurrent protection