



Typical Failure Modes of Piezoelectric Audible Alarms

Component/Subsystem	Failure Mode	End Result	Occurrence
Circuit Components (Resistors, Capacitors, Diodes, IC's, etc.)	Over-voltage by customer's application	Unit ceases working.	Vast Majority of Returns
Transducer/Wire Solder Operation	Not enough wire strands in solder joint	Wire breaks after period of time & unit ceases sounding	Rare
Physical Assembly	Transducer wire pinched, adhesive/epoxy run down onto transducer, or RTV adhesive seal failure	Intermittent operation	Rare
Soldering Operation	Incorrect Solder Temperature or Time Causing Cold Solder Joint	Intermittent operation or unit ceases working after period of time	Very Rare
Circuit Components	Random Component Failure; Wrong Component Used; Missing Component	Unit ceases working under normal operating conditions	Very Rare
Transducer Wire	Defect in Wire; Wire Strands Damaged in Production	Wire breaks after period of time & unit ceases sounding	Very Rare
Piezo Transducer	Incorrect Polarization by Manufacturer; Glue Bonding Failure	Sound volume level decreases over time.	Exceedingly Rare

Notes:

1. Customer returns of Mallory audible alarms for failure to operate are very rare. Of the few parts returned each year, the vast majority of the root cause of failure is an over-voltage or voltage spike condition caused by the customer's application.
2. All Mallory alarms are, at a minimum, function tested 100% during production, and a final audit is performed. Mallory SC/SBM/SNP/LSC/VSB/MSR/MSO series of alarms are audited 100% at final test by checking that sound level, frequency, and current are within specification limits from 2 to 4 different voltage levels.