

Product Field Reliability - MTBF Calculation

23 February 2017

Re: Product Family 3809G Mechanical devices without Transmitter

This document contains the estimated Mean Time Before Failure (MTBF) analysis results for Product Family 3809G without Transmitter. MTBF describes the average time to failure for a device after it has been shipped from our factory.

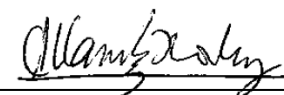
The analysis has been performed based on below criteria:

- Time-censored failure data method has been used in calculating the estimated failure rate.
- The data used for the calculation was obtained from our Production and Field Service database for the period April 2013 to Dec 2015. Product warranty failures from the date of shipment have been used to determine the failure rate. The devices that were not reported as failed have been considered as operating satisfactorily.
- The average time a meter runs before failure occurs is a function of the failure rate. The failure rate (λ) has been determined by the general relationship:
 - $\lambda = \text{number of failures} / \text{total time in field}$.
- The calculated failure rate does not consider any increase in failure rates over time during the wear-out-mode but it includes any infant mortality failures.
- Zero failures were reported for the above population of devices. Since no failures were reported, “zero failures” factor from chi-square distribution (90% confidence) table was used to estimate MTBF.

Below is the failure rate and estimated MTBF for 3809G Mechanical devices without Transmitter:

Product Model	Failure Rate (λ)	MTBF
3809G	0.00001537 failures/day	178 years

Thank you for your interest in our company, and please feel free to contact me if you need further information.



Charles Koshy
Quality Manager