In compliance with:

**CEN ISO 13849-1:2015**

Safety of machinery, safety related parts of control systems Part 1: general principles of design

**MTTFd BEMF Series**

B10d rating based on the calculated assumptions below is:-

\[ 2,000,000 \text{ cycles} \]


- Performance Level e (CEN ISO 13849-1. Table 2)
- Safety Integrity Level 3 (CEN ISO 13849-1. Table 3)
- MTTFd denotation HIGH (CEN ISO 13849-1. Table 4)

\[
\text{tcycle, mean time between two successive cycles} = 3600 \text{ seconds (1 cycle per hour)}
\]

\[
\text{hop, mean operation in hours per day} = 1 \text{ shift x 8 hours.}
\]

\[
\text{dop, mean operation in days per year} = 220 \text{ days.}
\]

\[
\text{nop} = \frac{\text{dop x hop x 3600}}{\text{tcycle}} = 1760 \text{ mean annual operations}
\]

\[
\text{B10d no. cycles until 10\% of components fail dangerously} = 2,000,000 \text{ cycles}
\]

\[
\text{MTTFd} = \frac{\text{B10d}}{0.1 \times \text{nop}} = 11,363.64 \text{ years}
\]

\[
\lambda_d = \frac{0.1 \times \text{nop}}{(\text{B10d} \times 220 \times 8)} = 5.00 \times 10^{-08} \text{ per operating hour}
\]

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