In compliance with:

**CEN ISO 13849-1:2015**

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

**MTTFd MBV Series**

*B10d* rating based on the calculated assumptions below is:-

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

\[ \text{Calculation data assumptions (CEN ISO 13849-1:2015, Annex C):} \]

\[ = \text{Performance Level e (CEN ISO 13849-1, Table 2)} \]

\[ = \text{Safety Integrity Level 3 (CEN ISO 13849-1, Table 3)} \]

\[ = \text{MTTFd denotation HIGH (CEN ISO 13849-1, Table 4)} \]

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

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

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

\[ n_{\text{op}} = \left( d_{\text{op}} \times h_{\text{op}} \times 3600 \right) / t_{\text{cycle}} = 1760 \text{ mean annual operations} \]

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

\[ \text{MTTFd} = B10d / (0.1 \times n_{\text{op}}) = 11,363.64 \text{ years} \]

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

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