In compliance with:

**CEN ISO 13849-1:2015**

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

**MTTFd TDI and TDR Series**

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

= 2,000,000 cycles

Calculation data assumptions (CEN ISO 13849-1:2015, Annex C):

≡ 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)

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\begin{align*}
t_{cycle}, \text{mean time between two successive cycles} & \quad 3600 \text{ seconds (1 cycle per hour)} \\
h_{op}, \text{mean operation in hours per day} & \quad 1 \text{ shift x 8 hours.} \\
d_{op}, \text{mean operation in days per year} & \quad 220 \text{ days.} \\
\Pi_{op} = \left( \frac{d_{op} \times h_{op} \times 3600}{t_{cycle}} \right) & \quad 1760 \text{ mean annual operations} \\
B10d \text{ no. cycles until 10\% of components fail dangerously} & \quad 2,000,000 \text{ cycles} \\
MTTFd = B10d / (0.1 \times \Pi_{op}) & \quad 11,363.64 \text{ years} \\
\lambda_{d} = (0.1 \times \Pi_{op}) / (B10d \times 220 \times 8) & \quad 5.00 \times 10^{-8} \text{ per operating hour}
\end{align*}
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**Neal Partridge**

Head of Compliance