In compliance with:

**CEN ISO 13849-1:2015**

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

**MTTFd K & KL Series**

B10d rating based on the calculated assumptions below is:

\[
\text{B10d} = 2,500,000 \text{ cycles}
\]

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

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

\[
\begin{align*}
t_{\text{cycle}} & = \text{mean time between two successive cycles} \\
\ell_{\text{op}} & = \text{mean operation in hours per day} \\
d_{\text{op}} & = \text{mean operation in days per year} \\
\eta_{\text{op}} & = (d_{\text{op}} \times \ell_{\text{op}} \times 3600) / t_{\text{cycle}} \\
B10d & = \text{no. cycles until 10% of components fail dangerously} \\
\text{MTTFd} & = B10d / (0.1 \times \eta_{\text{op}}) \\
\lambda_d & = (0.1 \times \eta_{\text{op}}) / (B10d \times 220 \times 8)
\end{align*}
\]

3600 seconds (1 cycle per hour)

1 shift x 8 hours.

220 days.

1760 mean annual operations

2,500,000 cycles

14,204.55 years

4.00 E-08 per operating hour

**Neal Partridge**

Head of Compliance