

In compliance with:

CEN ISO 13849-1:2023

Safety of machinery, safety related parts of control systems

Part 1: general principles of design

MTTFd BD Series

B10d rating based on the calculated assumptions below is:-

= 1,000,000 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)**

t_{cycle} , mean time between two successive cycles	3600 seconds (1 cycle per hour)
h_{op} , mean operation in hours per day	1 shift x 8 hours.
d_{op} , mean operation in days per year	220 days.
$n_{\text{op}} = (d_{\text{op}} \times h_{\text{op}} \times 3600) / t_{\text{cycle}}$	1760 mean annual operations
B10d no. cycles until 10% of components fail dangerously	1,000,000 cycles
$MTTFd = B10d / (0.1 \times n_{\text{op}})$	5,682 years
$\lambda_d = (0.1 \times n_{\text{op}}) / (B10d)$	2.01 E-08 per operating hour

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