

## Certificate MTTF and MTTFD / B10d

06.03.2021

Order code

**BES02WN**

Part number

**BES M12MF1-NSC10F-S04G**

MTTF (40 °C)	MTTF <sub>D</sub>	B10d	Mission Time	Diagnostic Coverage
625 a	1250 a	-	20 years	-

Calculation formulas

$$MTTF = \frac{1}{\sum_{n=1}^n \frac{1}{MTTF_n}}$$

$$MTTF_D = MTTF \cdot 2$$

### Norm

DIN EN ISO 13849-1:2016 und SN29500, T = 40 °C.

### Section of standards

C.5: MTTF, MTTF<sub>D</sub> data of electrical components  
(typical case scenario)  
D.1: Parts count process

### General explanations

We calculate the MTTF value of our electronic products using special software and the parts count process as per EN ISO 13849-1 Appendix C.5.

The procedure specified in EN ISO 13849-1 Appendix C.5.1 is used to assess dangerous failures: MTTF<sub>D</sub> = MTTF x 2.

8760 operating hours per year are assumed here. For our electromechanical sensors, we specify the B10d value derived from the results of fatigue testing. We determine the degree of diagnostic coverage using FMEA according to EN ISO 13849-1. The mission time is the result of constant long-term testing and years of market observation.

The specification for the MTTF value, MTTF<sub>D</sub> value, B10d value, mission time and/or the degree of diagnostic coverage do not present binding statements about quality and/or mission time; they are only empirical values with no binding character. These declared values do not extend the limitation period for claims arising from defects or influence them in any other way.

We cannot accept responsibility for the correctness and completeness of this information because errors can never be completely avoided despite all due diligence.

We would like to point out that the products listed here are not safety components as specified in Machinery Directive 2006/42/EC Article 2c and were not developed according to the relevant standards. Under specific conditions, it is possible to use products without a performed safety assessment to develop corresponding structures as per EN ISO 13849-1 with performance levels.  
(see e.g. EN ISO 13849-1, point 4.6.2)

A superordinate control or other suitable measures must guarantee the degree of diagnostic coverage for reaching the required performance level.

We reserve the rights to make changes.

Balluff GmbH  
Schurwaldstraße 9  
73765 Neuhausen a.d.F.  
Deutschland  
Tel. +49 7158 173-0  
Fax +49 7158 5010  
balluff@balluff.de