



Safety and Reliability Information

DS Measurement Chain

(Contactless eddy current displacement measurement system)

Safety and reliability related values according to DIN EN ISO 13849-1

Safety and reliability related values MTTF, PL and Category according to DIN EN ISO 13849-1 have been evaluated for the DS measurement chain (DS–105x, EC–100x and OD–105x).

The oscillator / demodulator unit contributes substantially to the safety and reliability related values as it contains the electronics of the measurement system. There are two designs of the unit: OD-1051 for a measurement chain with nominal system length of 5 m and OD-1053 for a measurement chain with nominal system length of 10 m. In contrast to an OD-105x the sensor tip DS-105x is applicable at temperatures up to +180 °C. It includes the coil that builds up the alternating magnetic field. The contribution of the sensor tip to the determined values is quite small. Its ramifications are documented at maximum operating temperature for each OD-105x.

The evaluation is based on the assumption that the monitoring system the sensor system is connected to performs an OK-Monitoring. The OK-Limits of this system must be in the range of -2 V to -18 V.

The following table summarizes the results of the evaluation:

OD–1051

Parameter	Value		
MTTF	DS, EC and OD at +30 °C	DS, EC and OD at +65 °C	DS at +180 °C and EC and OD at +65 °C
	6,392E+06 ~ 730 years	1,587E+06 ~ 181 years	1,579E+06 ~ 180 years
PL	C		
Category	1		

OD–1053

Parameter	Value		
MTTF	DS, EC and OD at +30 °C	DS, EC and OD at +65 °C	DS at +180 °C and EC and OD at +65 °C
	6,325E+06 ~ 722 years	1,580E+06 ~ 180 years	1,573E+06 ~ 179 years
PL	C		
Category	1		

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Abbreviation:

MTTF	Mean Time To Failure
PL	Performance Level From PL "a" (highest failure probability) to PL "e" (lowest failure probability)
Category	Category (CAT) Classification of the safety related parts of a control system in relation to their resistance to faults and their subsequent behaviour in the event of a fault, which is achieved by the structural arrangement of the parts, fault detection and/or by their reliability

Note:

More detailed information about safety and reliability values can be provided on request from Brüel & Kjær Vibro (info@bkvibro.com).