

DIN EN 13485:2024-10 (E)

Thermometers for measuring the ambient or internal temperature for the transport, storage and distribution of temperature sensitive goods - Tests, performance, suitability

Contents		Page
European foreword		4
1	Scope	6
2	Normative references	6
3	Terms and definitions	7
4	Requirements	8
4.1	General	8
4.2	Measuring range	8
4.3	Locking of settings	8
4.4	Load indicator	8
4.5	Degree of protection provided by the enclosure	9
4.6	Electrical safety (if applicable)	9
4.7	Operating characteristics linked to external electrical influences	10
4.7.1	External supply voltage (if applicable)	10
4.7.2	Autonomous power supply (if applicable)	10
4.7.3	Frequency (AC) (if applicable)	10
4.7.4	Electrical power disturbances and susceptibility to radiated electromagnetic field 10 4.8	
	Metrological characteristics	10
4.8.1	General	10
4.8.2	Maximum permissible errors and resolution	10
4.8.3	Response time	11
4.9	Usage profiles	11
4.9.1	Climatic environment	11
4.9.2	Mechanical vibrations	11
4.9.3	Shock resistance	11
5	Test methods	11
5.1	Test list	11
5.2	General conditions for tests	12
5.2.1	Pre-tests adjustments	12
5.2.2	Normal atmospheric conditions	12
5.2.3	Reference conditions	12
5.3	Determination of temperature measurement error	13
5.3.1	Test method	13
5.3.2	Expression of results	14
5.4	Determination of response time	15
5.4.1	General	15
5.4.2	Purpose of the test	15
5.4.3	Test methods	15
5.5	Action of influence quantities	16
5.5.1	General	16
5.5.2	Variation in external supply voltage (if applicable)	16
5.5.3	Influence of ambient temperature	16
5.5.4	Temperature testing under storage and transport conditions for the thermometer17 5.5.5	
	Shock resistance test (if applicable)	17
5.5.6	Mechanical vibrations (if applicable)	17

5.5.7	Degree of protection provided by enclosure (IP code)	18
5.5.8	Electrical safety (if applicable)	18
5.5.9	Dielectric strength (if applicable)	18
6	Conditions of acceptance	18
6.1	Requirements	18
6.2	Maximum permissible errors	18
7	Designation	18
8	Marking	19
9	Periodic verification	19
Annex A (informative) Example of data form describing suitability for use of equipment of a specific series (to be filled in by the manufacturer)		20
Annex B (normative) Expected operation time and storage capacity		21
B.1	Battery lifetime dependent on usage	21
B.2	Minimum power supply voltage	21
Annex C (informative) Examples for temperature conditions		22
Annex D (informative) Life cycle sheet		23
Annex E (informative) Guidance to determine accordance with this document		24
Annex F (informative) Guidance to determine the expanded uncertainty		25
Bibliography		27