DIN EN 1434-1:2019-08 (E)

Thermal energy meters - Part 1: General requirements (includes Amendment A1:2018)

Contents

Page

European foreword 4

1 Scope 6

2 Normative references 6

3 Terms and definitions 6

4 Types of instruments 11
4.1 General 11
4.2 Complete instrument 11
4.3 Combined instrument 11
4.4 Hybrid instrument 11
4.5 Sub-assemblies of a !thermal energy meter", which is a combined instrument 11
4.5.1 General 11
4.5.2 Flow sensor 12
4.5.3 Temperature sensor pair 12
4.5.4 Calculator 12
4.6 Equipment under test (EUT) 12

5 Rated operating conditions 12
5.1 Limits of temperature range 12
5.2 Limits of temperature differences 12
5.3 Limits of flow rate 12
5.4 Limit of thermal power 13
5.5 Limits of working pressure (PS and Pmin) 13
5.6 Nominal pressure (PN) 13
5.7 Limits in ambient temperature 13
5.8 Limits in deviations in supply voltage 13
5.9 Maximum pressure loss 13
5.10 Specific requirements on registration devices 13
5.10.1 General 13
5.10.2 Suitability 13
5.10.3 Rated operated conditions 14
5.10.4 Indication 14
5.10.5 MPE 15

6 Technical characteristics 15
6.1 Materials and construction 15
6.2 Requirements outside the limiting values of the flow rate 16
6.3 Display 16
6.4 Protection against fraud 17
6.5 Supply voltage 17
6.6 Qualifying immersion depth of a temperature sensor 17
6.7 The influence on a temperature sensor pair caused by mounting in pockets 17
6.8 Reproducibility 17
6.9 Repeatability 18
6.10 Software 18

7 Specified working range 18
7.1 General 18

7.2 Temperature difference 18
7.3 Flow rate 18

8 Heat transmission formula 18

9 Metrological characteristics (Maximum Permissible Error, MPE) 19
9.1 General 19
9.2 Values of maximum permissible errors 19
9.2.1 Maximum permissible relative errors of complete !thermal energy meters" 19
9.2.2 Maximum permissible relative error of sub-assemblies 20
9.3 Application of maximum permissible errors 20

10 Environmental classification 21
10.1 General 21
10.2 Environmental class A (Domestic use, indoor installations) 21
10.3 Environmental class B (Domestic use, outdoor installations) 21
10.4 Environmental class C (Industrial installations) 21
10.5 Mechanical classes M1 to M3 21

11 !Thermal energy meter" specification 22
11.1 General 22
11.2 Flow sensor 22
11.3 Temperature sensor pair 23
11.4 Calculator 24
11.5 Complete meters 25

12 Information to be made available by the manufacturer or supplier 27
12.1 Installation instructions 27
12.2 Parameter setting instructions 28
12.3 Adjustment instructions 28
12.4 Maintenance instructions 29
12.5 Hints for disposal instructions 29

Annex A (normative) Heat coefficient equations 30

Annex B (normative) Flow conditioner package 32

Annex C (normative) Fast response meters 34

Annex ZA (informative) Relationship between this European Standard and the essential requirements of Directive 2014/32/EU aimed to be covered 35

Bibliography 38