DIN EN ISO 4064-2:2025-07 (E)

Water meters for cold potable water and hot water - Part 2: Test methods (ISO 4064-2:2024)

Contents

Page

Foreword ..... **vii**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **2**

4 Reference conditions **2**

5 Symbols, units and equations **3**

6 External examination **3**
6.1 General 3
6.2 Object of the examination 3
6.3 Preparation 3
6.4 Examination procedures 4
6.4.1 General 4
6.4.2 Marks and inscriptions (ISO 4064-1:2024|OIML R 49-1:2024, 6.6) 4
6.4.3 Indicating device (ISO 4064-1:2024|OIML R 49-1:2024, 6.7) 4
6.4.4 Protection devices (ISO 4064-1:2024|OIML R 49-1:2024, 6.8) 8

7 Performance tests for all water meters **8**
7.1 General 8
7.2 Required conditions for all tests 8
7.2.1 Water quality 8
7.2.2 General rules concerning test installation and location 8
7.3 Static pressure test (ISO 4064-1:2024|OIML R 49-1:2024, 4.2.10) 9
7.3.1 Object of the test 9
7.3.2 Preparation 9
7.3.3 Test procedure 9
7.3.4 Acceptance criteria 10
7.4 Determination of intrinsic errors (of indication) (ISO 4064-1:2024|OIML R 49-1:2024, 7.2.3) 10
7.4.1 Object of the test 10
7.4.2 Preparation 10
7.4.3 Combination meters 15
7.4.4 Test procedure 16
7.4.5 Acceptance criteria 16
7.4.6 Interchange test on all types of cartridge meters and meters with exchangeable metrological modules (ISO 4064-1:2024|OIML R 49-1:2024, 7.2.7) 17
7.5 Water temperature test (ISO 4064-1:2024|OIML R 49-1:2024, 4.2.8) 18
7.5.1 Object of the test 18
7.5.2 Preparation 18
7.5.3 Test procedure 18
7.5.4 Acceptance criteria 18
7.6 Overload water temperature test (ISO 4064-1:2024|OIML R 49-1:2024, 7.2.5) 18
7.6.1 Object of the test 18
7.6.2 Preparation 18
7.6.3 Test procedure 18
7.6.4 Acceptance criteria 18
7.7 Water pressure test (ISO 4064-1:2024|OIML R 49-1:2024, 4.2.8) 19
7.7.1 Object of the test 19
7.7.2 Preparation 19

7.7.3 Test procedure 19
7.7.4 Acceptance criteria 19
7.8 Reverse flow test (ISO 4064-1:2024|OIML R 49-1:2024, 4.2.7) 19
7.8.1 Object of the test 19
7.8.2 Preparation 19
7.8.3 Test procedure 19
7.8.4 Acceptance criteria 20
7.9 Pressure loss test (ISO 4064-1:2024|OIML R 49-1:2024, 6.5) 20
7.9.1 Object of the test 20
7.9.2 Equipment for pressure loss test 21
7.9.3 Test procedure 22
7.9.4 Calculation of the actual Δp of a water meter 24
7.9.5 Acceptability criteria 24
7.10 Flow disturbance tests (ISO 4064-1:2024|OIML R 49-1:2024, 6.3.4) 24
7.10.1 Object of the tests 24
7.10.2 Preparation 24
7.10.3 Test procedure 25
7.10.4 Acceptance criteria 25
7.11 Durability tests (ISO 4064-1:2024|OIML R 49-1:2024, 7.2.6) 25
7.11.1 General 25
7.11.2 Discontinuous flow test 25
7.11.3 Continuous flow test 29
7.12 Magnetic field testing 31
7.13 Tests on ancillary devices of a water meter 31
7.13.1 Object of the test 31
7.13.2 Preparation 31
7.13.3 Test procedure 31
7.13.4 Acceptance criteria 32
7.14 Environmental testing 32
7.15 Software evaluation 32

8 Performance tests related to influence factors and disturbances 32
8.1 General requirements (ISO 4064-1:2024|OIML R 49-1:2024, A.1) 32
8.1.1 Overview 32
8.1.2 Environmental classification 32
8.1.3 Electromagnetic classification 32
8.1.4 Reference conditions (ISO 4064-1:2024|OIML R 49-1:2024, 7.1) 32
8.1.5 Test volumes for measuring error (of indication) of a water meter 33
8.1.6 Influence of the water temperature (ISO 4064-1:2024|OIML R 49-1:2024, A.5) 33
8.1.7 Requirements for environmental tests 33
8.1.8 Equipment under test (ISO 4064-1:2024|OIML R 49-1:2024, 7.2.12.3) 34
8.1.9 Determination of required tests 35
8.2 Dry heat (non-condensing) (ISO 4064-1:2024|OIML R 49-1:2024, A.5) 36
8.2.1 Object of the test 36
8.2.2 Preparation 36
8.2.3 Test procedure (in brief) 36
8.2.4 Acceptance criteria 37
8.3 Cold (ISO 4064-1:2024|OIML R 49-1:2024, A.5) 37
8.3.1 Object of the test 37
8.3.2 Preparation 37
8.3.3 Test procedure (in brief) 37
8.3.4 Acceptance criteria 38
8.4 Damp heat, cyclic (condensing) (ISO 4064-1:2024|OIML R 49-1:2024, A.5) 38
8.4.1 Object of the test 38
8.4.2 Preparation 38
8.4.3 Test procedure (in brief) 38
8.4.4 Acceptance criteria 39
8.5 Power supply variation (ISO 4064-1:2024|OIML R 49-1:2024, A.5) 39
8.5.1 Water meters powered by direct AC or by AC/DC converters (ISO 4064-1:2024|OIML R 49-1:2024, A.5) 39
8.5.2 Water meters powered by external DC voltage or by primary DC batteries (ISO 4064-1:2024|OIML R 49-1:2024, A.5) 40
8.5.3 Interruption in battery supply 41
8.6 Vibration (random) (ISO 4064-1:2024|OIML R 49-1:2024, A.5) 41
8.6.1 Object of the test 41

8.6.2 Preparation 41
8.6.3 Test procedure (in brief) 42
8.6.4 Acceptance criteria 42
8.7 Mechanical shock (ISO 4064-1:2024|OIML R 49-1:2024, A.5) 42
8.7.1 Object of the test 42
8.7.2 Preparation 42
8.7.3 Test procedure (in brief) 43
8.7.4 Acceptance criteria 43
8.8 AC mains voltage dips, short interruptions and voltage variations (ISO 4064-1:2024|OIML R 49-1:2024, A.5) 43
8.8.1 Object of the test 43
8.8.2 Preparation 43
8.8.3 Test procedure (in brief) 43
8.8.4 Acceptance criteria 45
8.9 Bursts on signal lines (ISO 4064-1:2024|OIML R 49-1:2024, A.5) 45
8.9.1 Object of the test 45
8.9.2 Preparation 46
8.9.3 Test procedure (in brief) 46
8.9.4 Acceptance criteria 46
8.10 Bursts (transients) on AC and DC mains (ISO 4064-1:2024|OIML R 49-1:2024, A.5) 47
8.10.1 Object of the test 47
8.10.2 Preparation 47
8.10.3 Test procedure (in brief) 47
8.10.4 Acceptance criteria 47
8.11 Electrostatic discharge (ISO 4064-1:2024|OIML R 49-1:2024, A.5) 48
8.11.1 Object of the test 48
8.11.2 Preparation 48
8.11.3 Test procedure (in brief) 48
8.11.4 Acceptance criteria 49
8.12 Radiated electromagnetic fields (ISO 4064-1:2024|OIML R 49-1:2024, A.5) 49
8.12.1 Object of the test 49
8.12.2 Preparation 49
8.12.3 Test procedure (in brief) 49
8.12.4 Acceptance criteria 50
8.13 Conducted electromagnetic fields (ISO 4064-1:2024|OIML R 49-1:2024, A.5) 51
8.13.1 Object of the test 51
8.13.2 Preparation 51
8.13.3 Test procedure (in brief) 51
8.13.4 Acceptance criteria 52
8.14 Surges on signal, data and control lines (ISO 4064-1|OIML R 49-1, A.5) 52
8.14.1 Object of the test 52
8.14.2 Preparation 52
8.14.3 Test procedure (in brief) 52
8.14.4 Acceptance criteria 53
8.15 Surges on AC and DC mains power lines (ISO 4064-1:2024|OIML R 49-1:2024, A.5) 53
8.15.1 Object of the test 53
8.15.2 Preparation 53
8.15.3 Test procedure (in brief) 53
8.15.4 Acceptance criteria 54
8.16 Static magnetic field (ISO 4064-1|OIML R 49-1, 7.2.8) 54
8.16.1 Test conditions 54
8.16.2 Object of the test 55
8.16.3 Preparation 55
8.16.4 Test procedure in brief 55
8.16.5 Acceptance criteria 55
8.17 Absence of flow test 56
8.17.1 Object of the test 56
8.17.2 Preparation 56
8.17.3 Test procedure 56

8.17.4 Acceptance criteria 56
8.18 Mains power frequency electromagnetic fields test 56
8.18.1 Object of the test 56
8.18.2 Preparation 56
8.18.3 Test procedure 56
8.18.4 Acceptance criteria 57

9 Test program for type evaluation 57
9.1 Number of samples required 57
9.2 Performance test applicable to all water meters 57
9.3 Performance tests applicable to electronic water meters, mechanical water meters fitted with electronic devices, and their separable parts 58
9.4 Type evaluation of separable parts of a water meter 59
9.5 Families of water meters 59

10 Tests for initial verification 59
10.1 Initial verification of complete and combined water meters 59
10.1.1 Object of the test 59
10.1.2 Preparation 60
10.1.3 Test procedure 60
10.1.4 Acceptance criteria 60
10.2 Initial verification of separable parts of a water meter 61
10.2.1 Object of the test 61
10.2.2 Preparation 61
10.2.3 Test procedure 61
10.2.4 Acceptance criteria 61

11 Presentation of results 62
11.1 Object of the reports 62
11.2 Identification and test data to be included in records 62
11.2.1 Type evaluation 62
11.2.2 Initial verification 62

Annex A (normative) **Type examination and testing of checking facilities of electronic devices 63**

Annex B (normative) **Calculating the relative error (of indication) of a water meter 69**

Annex C (normative) **Installation requirements for flow disturbance tests 74**

Annex D (normative) **Type evaluation of a family of water meters 75**

Annex E (informative) **Examples of methods and components used for testing concentric water meters 77**

Annex F (informative) **Maximum uncertainties in the measurement of influence factors and disturbances 80**

Annex G (informative) **Pressure loss test pressure tappings, hole and slot details 83**

Annex H (normative) **Flow disturbers 86**

Annex I (normative) **Software evaluation for software-controlled water meters 96**

Bibliography 97