

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 | |
| - 2 - | 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 |