## 7.10 Limits of error due to influence quantities

The limits of variation in percentage error due to influence quantities are specified in the relevant particular requirements (accuracy class) standards.

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#### 7.11 Time-keeping accuracy

Meter clock(s), if fitted, shall meet the relevant timekeeping accuracy requirements specified in IEC 62054-21:2004, 7.5.

## 8 Climatic requirements

## 8.1 General

The environmental conditions and tests for electricity meters and their accessories are defined assuming that the meters are mounted for stationary use at weather protected locations under use conditions, including periods of erection work, down time, maintenance and repair.

Meters shall be designed to operate and to be stored and transported in the climatic conditions determined by the climatic classes shown in Table 12.

## 8.2 Environmental conditions

The rated temperature range of meters shall be as shown in Table 12.

The rated humidity conditions shall be as specified in the IEC 60721-1:1990 environmental classes corresponding to the temperature ranges shown in Table 12, but without condensation, dew, formation of ice, hoar-frost, percolating water, rain, etc.

	Indoor use	Outdoor use
Specified operating range	-10 °C to 45 °C	-25 °C to 55 °C
Limit range of operation	-25 °C to 55 °C	-40 °C to 70 °C
Limit range for storage and transport	-25 °C to 70 °C	-40 °C to 70 °C

#### Table 12 – Environmental conditions

For special applications, other temperature values can be used according to purchase contract, for example, for cold environment for indoor meters, -40  $^{\circ}$ C to +40  $^{\circ}$ C.

The exposure to the extremes of temperature in each category is 72 h, as specified in the dry heat test and in the cold test.

The specified operating range and the limit range of operation for the indicating display may be different than that of the meter. The indicating display should function correctly once the temperature returns to its specified operating range.

## 8.3 Tests of the effects of the climatic environments

## 8.3.1 General test requirements

If an electricity meter is designed to be installed with a detached indicating display, then the climatic requirements apply to, and the tests shall be performed on, the meter with its detached indicating display connected, unless specified otherwise.

If an electricity meter is designed to be installed with specified LPITs, then the climatic requirements apply to, and the tests shall be performed on, the meter with its specified LPITs connected.

#### 8.3.2 Acceptance criteria

After each of the climatic tests in 8.3.3, 8.3.4, 8.3.5, 8.3.6, and after the specified recovery time in reference temperature and humidity conditions, the acceptance criteria B defined in 9.2, Table 15 shall be applied.

In addition, after each of the climatic tests the meter shall be visually inspected.

The appearance and, in particular, the legibility of markings shall not be altered.

#### 8.3.3 Dry heat test

The test shall be carried out according to IEC 60068-2-2: 2007, under the following conditions:

- a) meter in non-operating condition;
- b) temperature:  $+70 \degree C \pm 2 \degree C$ ;
- c) duration of the test: 72 h;
- d) recovery time: 2 h.

#### 8.3.4 Cold test

The test shall be carried out according to IEC 60068-2-1: 2007, under the following conditions:

a) meter in non-operating condition;

b) temperature:  $-25 \degree C \pm 3 \degree C$  for indoor meters;

-40 °C ± 3 °C for outdoor meters;

- c) duration of the test: 72 h;
- d) recovery time: 2 h.

## 8.3.5 Damp heat cyclic test

The test shall be carried out according to IEC 60068-2-30: 2005, under the following conditions:

- a) voltage and auxiliary power circuits energized with nominal voltage; if a meter is rated for more than one value of nominal voltage, the highest value shall be used;
- b) without any current in the current circuits;
- c) variant 1;
  d) upper temperature: +40 °C ± 2 °C for indoor meters;
  +55 °C ± 2 °C for outdoor meters;
- e) no special precautions shall be taken regarding the removal of surface moisture;
- f) duration of the test: 6 cycles;
- g) recovery time: 24 h.

In addition to the acceptance criteria in 8.3.2, the meter shall pass the insulation test according to IEC 62052-31:2015, 6.10.4.3.3 and 6.10.4.3.4, except that the impulse voltage shall be multiplied by a factor of 0,8; if the test on complete equipment is not possible, the test on sub-assemblies may be performed according to IEC 62052-31:2015, 6.10.4.4.2.1 and 6.10.4.4.2.2.

During visual inspection, no traces of corrosion likely to affect the functional properties of the meter shall be apparent.

## 8.3.6 Protection against solar radiation

Meters for outdoor use shall withstand solar radiation.

The test shall be carried out according to IEC 60068-2-5: 2018, under the following conditions:

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- a) meter in non-operating condition;
- b) test procedure A (8 h irradiation and 16 h darkness);
- c) upper temperature: +55 °C;
- d) duration of the test: 3 cycles or 3 days.

#### 8.4 Durability

The meter shall be subjected to the metrological stability testing as per IEC 62059-32-1: 2011 and meet the limits of change in percentage error specified therein.

NOTE Metrological stability is considered to be an aspect of meter durability.

#### 9 The effects of external influence quantities and disturbances

#### 9.1 General

These general test conditions apply to all tests specified in 9.3 and 9.4, unless therein specified otherwise.

For the electromagnetic compatibility tests, the meter – including its detached indicating display and LPITs, if applicable – shall be tested as table top equipment, in its normal working position with the meter cover and terminal covers in place.

If an electricity meter is designed to be installed in a specified matching socket or a rack, then the requirements apply to, and the tests shall be performed on, the meter installed in its specified matching socket or rack, as per the manufacturer's instructions.

If an electricity meter is designed to operate with a detached indicating display, then the effects of external influences apply to, and the tests shall be performed on, the meter with its detached indicating display connected, unless specified otherwise.

The meter port(s) intended for connection of a detached indicating display(s) shall be treated as ELV port(s).

If an electricity meter is designed to be installed with specified LPITs, then the external influence requirements apply to, and the tests shall be performed on, the meter with its specified LPITs connected.

The meter port(s) intended for connection of LPIT(s) shall be treated as ELV port(s).

Accessories (e.g. communication modules, I/O modules, etc.) shall be installed to create a test configuration representative of the typical meter configuration in service.

All cables shall be connected according to the manufacturer's instructions (e.g. voltage and current measurement cables, communication cables, auxiliary power supply cables, I/O cables, accessory cables, etc.).

The length of the cables, connection of signal ports or termination loads shall be as specified in the referenced basic electromagnetic compatibility standards, unless otherwise specified in a test clause. An effort shall be made to maximize emissions and/or susceptibility effects, by varying cabling lay-out and rotation of the set-up, as permitted by the relevant basic electromagnetic compatibility standards.

The temperature and humidity during the electromagnetic compatibility test shall be as per the basic electromagnetic compatibility standards; all other reference conditions shall be as specified in 7.1.

If a meter is rated for more than one nominal voltage, a test at one nominal voltage is deemed sufficient, as specified in the relevant test description.

All meter parts intended to be earthed shall be earthed.

Continuous (long duration) phenomena: influence quantities	Basic standard	Acceptance criteria as per 9.2
Radiated, radio-frequency, electromagnetic field immunity	IEC 61000-4-3: 2006 or	
test – test with current	IEC 61000-4-20: 2010	А
Immunity to conducted disturbances, induced by radio- frequency fields	IEC 61000-4-6: 2013	A
Test for immunity to conducted, differential mode disturbances and signalling in the frequency range 2 kHz to 150 kHz at AC power ports	IEC 61000-4-19: 2014	A
Power frequency magnetic field immunity test	IEC 61000-4-8: 2009	А
External static magnetic fields	n/a	А
Harmonics in the current and voltage circuits	n/a	А
Interharmonics in the current circuit – burst fired waveform test	n/a	A
Odd harmonics in the current circuit	n/a	A
DC and even harmonics	n/a	A
Voltage variation	n/a	A
Frequency variation	n/a	A
Ambient temperature variation	n/a	А
Interruption of phase voltage	n/a	A
Reversed phase sequence	n/a	А
Auxiliary voltage variation	n/a	А
Operation of auxiliary devices	n/a	А
Self-heating	n/a	A
Fast load current variations	n/a	A

Table 13 – Summary of the tests of immunity to influence quantities

Transient (short duration) phenomena with high occurrence: disturbances	Basic standard	Acceptance criteria as per 9.2		
Electrostatic discharge immunity test	IEC 61000-4-2:2008	B <sup>1</sup>		
Voltage dips, short interruptions and voltage variations immunity tests	IEC 61000-4-11:2020	B <sup>1</sup>		
Voltage dips, short interruptions and voltage variations on DC input power port immunity tests	IEC 61000-4-29:2000	B <sup>1</sup>		
Electrical fast transient/burst immunity test	IEC 61000-4-4:2012	A <sup>2</sup>		
Damped oscillatory wave immunity test	IEC 61000-4-18:2019	A <sup>2</sup>		
Transient (short duration) phenomena with low occurrence: disturbances	Basic standard	Acceptance criteria as per 9.2		
Radiated, radio-frequency, electromagnetic field immunity	IEC 61000-4-3:2006 or	B <sup>1</sup>		
test – test without current	IEC 61000-4-20:2010			
Surge immunity test	IEC 61000-4-5:2017	B <sup>1</sup>		
Ring wave immunity test	IEC 61000-4-12:2017	B <sup>1</sup>		
Short-time overcurrents	n/a	B <sup>2, 3</sup>		
Earth fault	n/a	B <sup>2, 3</sup>		
<sup>1</sup> Test without current in the current circuits.				

## Table 14 – Summary of the tests of immunity to disturbances

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<sup>2</sup> Test with current in the current circuits.

<sup>3</sup> Criteria A apply for energy registration after recovery time.

## 9.2 Acceptance criteria

The acceptance criteria in Table 15 shall apply to the tests described in 9.3 and 9.4, unless therein specified otherwise.

Primary functions of electricity meters include:

- a) energy registration;
- b) indicating display;
- c) operation of the supply control and load control switches.

These primary functions shall be observed during testing.

Acceptance criteria	Description			
Criteria A	During the test, a temporary degradation of primary functions is acceptable only within defined limits:			
	<ul> <li>energy registration: the variation in percentage error due to an influence quantity or a disturbance shall not exceed the limits specified in the relevant particular requirements (accuracy class) standards;</li> </ul>			
	b) indicating display: degradation of display quality (colour, brightness, contrast, sharpness, geometry, etc.) during the test is acceptable; the indication of the content of energy registers shall remain unambiguously readable during the test;			
	c) supply and load control switches: unexpected operation of the switch during the test shall not occur.			
	During the test a temporary degradation or loss of other meter functions within the scope of this document is acceptable, except for a reset of embedded software (firmware);			
	After the test, when the influence quantity or disturbance is removed, and the reference test conditions are restored, the meter shall show no damage and shall operate with no degradation of its metrological performance. All meter functions within the scope of this document shall be restored without any intervention of the operator, and without removal of the mains supply or the auxiliary power supply.			
	During the test, a temporary degradation or loss of primary functions is acceptable:			
Criteria B	<ul> <li>energy registration: at any time during the test, and immediately after, the value of energy registers shall not change by more than the critical change value;</li> </ul>			
	b) indicating display: degradation of display quality (colour, brightness, contrast, sharpness, geometry, etc.) during the test is acceptable; the indication of the content of energy registers may become unreadable during the test;			
	c) supply and load control switches: unexpected operation of the switch during the test shall not occur.			
	During the test, a temporary degradation or loss of other meter functions within the scope of this document is acceptable, including a self-recovering reset of embedded software (firmware).			
	After the test when the disturbance is removed, and the reference test conditions are restored, the meter shall show no damage and shall operate with additional percentage error not exceeding the limits specified in the relevant particular requirements (accuracy class) standards. All meter functions within the scope of this document shall be restored without any intervention of the operator, and without removal of the mains supply or the auxiliary power supply.			

#### Table 15 – Acceptance criteria

NOTE For tests of effects of external influence quantities or disturbances (9.3 and 9.4), constant monitoring of the indicating display during the whole duration of a test is not always feasible. In such cases it is sufficient to monitor the indicating display only when there is a reasonable doubt that the indicating display of the EUT may be susceptible to a particular influence quantity. The determination of such conditions is left to the expertise of the testing laboratory.

#### 9.3 Electromagnetic compatibility (EMC)

## 9.3.1 General

#### 9.3.1.1 Electromagnetic phenomena covered by EMC tests

Meters (electromechanical with electronic functional devices or fully static meters) shall be designed in a way that prevents external electromagnetic phenomena from damaging the meter, corrupting the meter's energy registers or substantially influencing the result of measurements.

The meter under test (EUT) shall be subjected to two types of electromagnetic phenomena:

- a) Continuous or long duration electromagnetic phenomena, which are considered as influence quantities in accordance with 3.6.1; generally, acceptance criteria A apply to these tests, see Table 13.
- b) Short duration electromagnetic phenomena, which are considered as electromagnetic disturbances in accordance with 3.6.2; generally, acceptance criteria B apply to these tests, see Table 14.

The meter under test (EUT) shall be subjected to the tests of influence quantities summarized in Table 13 and disturbances summarized in Table 14. However, not all electromagnetic phenomena are covered in this document, but only those considered as relevant for the electricity metering equipment operated under normal conditions of use.

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The electromagnetic compatibility requirements specified in this document do not cover extreme cases, which may occur with a very low probability in some installations. In unlikely situations where the levels of electromagnetic disturbances or influences may exceed the levels given in this document, special precautions and procedures may have to be employed by the installer or the operator.

NOTE 1 Any immunity levels higher than those given in this document, intended to provide additional protection (e.g. for specific anti-tampering requirements) are negotiated between the manufacturer and the purchaser.

NOTE 2 It is the responsibility of the installer or the operator to ensure electromagnetic compatibility of the meter installation, and to mitigate against phenomena for which no immunity requirements are specified in this document.

## 9.3.1.2 Dwell time for EMC tests with frequency sweeping

#### 9.3.1.2.1 General

The dwell time is the period during which a disturbance or an influence quantity is applied at a specific frequency. When the EUT is exposed to the electromagnetic influences or disturbances by sweeping through the frequency band, the dwell time at each frequency step shall not be less than 3 s.

#### 9.3.1.2.2 Dwell time for EMC tests with current

The dwell time shall be extended as necessary to perform a stable verification of the meter accuracy. The manufacturer shall specify the number of test pulses necessary for the verification of accuracy, or an alternative and equivalent method of verification of accuracy.

During dwell times the percentage error of the meter is determined at each frequency step, while using the specified number of test pulses from the test optical output. If necessary, further investigation may be conducted by exposing the meter to the disturbance or influence quantity for a longer dwell time per frequency step at frequencies where indication of susceptibility is discovered.

NOTE Alternative and equivalent methods of accuracy verification include, for example, using electrical pulse outputs or reading meter's energy registers via data communication ports. See 7.2.

#### 9.3.1.2.3 Dwell time for EMC tests without current

During tests without current no pulses should be generated on the test outputs and no change which is more than the critical change value, should occur in the corresponding register. Consequently, the meter's accuracy cannot be verified at each frequency step. Therefore, the frequency sweep shall be completed with the dwell time of 3 s. The content of the meter's energy registers shall be examined before and after the frequency sweep to determine if any change has occurred.

At the frequency steps where indication of susceptibility is discovered, further investigation may be conducted by exposing the meter to the disturbance or influence quantity for a minimum of 1 min per frequency step and determining the change in the energy registers. This change, extrapolated over a period of one hour, shall not exceed the critical change value.

NOTE 1 The critical change value induced by short duration / low occurrence disturbances corresponds to an energy register change deemed to be acceptable after the occurrence of similar disturbances in the field. During field operation of meters, however, the exposure to such frequencies may be longer; 1 h is a reasonably practical value (e.g. equipment operated nearby occasionally). Also, there are physical phenomena caused by such disturbances that may lead to an energy register change, depending on the exposure time (e.g. influence on analogue circuit elements such as a bandgap references). Therefore, at frequencies, where there exists a susceptibility, the dwell time is extended, and the measured register change is further extrapolated to closer approximate field conditions.

NOTE 2 For example, a polyphase meter, with 3x230/400 V and 100 A maximum current, has a critical change value of 3x230x100x10e-6 = 0,069 kWh. At a certain frequency during 1 min an energy registration of 0,004 kWh is recorded, which is equal to 0,004 x 60 = 0,24 kWh for a period of 1 h. This exceeds the critical change value and therefore the requirements are not fulfilled.

NOTE 3 A method of "discovering indication of susceptibility" is left to the expertise of the testing laboratory. Generally, it is not necessary to know the exact frequency where the susceptibility occurs; it is sufficient to identify the range of frequencies. It is assumed that the test is stopped at the first failure.

#### 9.3.2 Voltage dips and short interruptions

#### 9.3.2.1 Voltage dips, short interruptions and voltage variations immunity tests

The intent of these tests is to ensure that the meter is not susceptible to dips and short interruptions that commonly occur on the mains or auxiliary AC power supply. This test applies to meters for AC energy, powered from AC mains supply either via voltage circuits or auxiliary supply circuits, or both; also applies to meters for DC energy, powered from AC mains supply via auxiliary supply circuit.

The test shall be carried out according to IEC 61000-4-11: 2020, under the conditions specified in 7.1, and the following conditions:

The meter shall be in operating condition:

- a) Voltage circuits and auxiliary power supply circuits energized with their lowest specified nominal voltages.
- b) Without any current in the current circuits; the SCS if fitted shall be closed; the external current circuit shall be open-circuit.

The voltage shall be interrupted for either the auxiliary power port, or the mains port, or both in sequence, depending on which one is used to power the meter.

For meters powered from 3-phase power supplies:

- c) Voltage interruption tests shall be applied to all three phases simultaneously.
- d) Voltage dips test for three-phase systems with neutral shall be applied to each individual phase-to-neutral voltage, one at a time, leaving the other phases connected to the supply voltage.
- e) Voltage dips test for three-phase systems without neutral shall be applied to each individual phase-to-phase voltage, one at a time, leaving the other phases connected to the supply voltage.

Event	∆ <i>U</i> (voltage reduction)	Duration	Number of events	Inception angle	Time between events
	%	cycles 1		0	cycles 1
Voltage interruption Test 1	100	5/6	3	0	3/3
Voltage interruption Test 2	100	50/60	3	0	3/3
Voltage interruption Test 3	100	1/1	1	0	n/a
Voltage interruption Test 4	95	250/300	3	0	500/600
Voltage dip Test 5	60	5/6	3	0	500/600
Voltage dip Test 6	60	50/60	3	0	500/600

## Table 16 – Voltage dips, short interruptions and voltage variations immunity tests

Event	∆ <i>U</i> (voltage reduction)	Duration	Number of events	Inception angle	Time between events
	%	cycles 1		o	cycles 1
Voltage dip Test 7	30	0,5/0,5	3 3	0 180	500/600
Voltage dip Test 8	30	1/1	3	0	500/600
Voltage dip Test 9	50	3 000/3 600	1	0	n/a
NOTE "Cycles" means a number of nominal power line frequency cycles at either 50 Hz or 60 Hz, e.g. "50/60" means "50 cycles for 50 Hz test" and "60 cycles for 60 Hz test".					

Acceptance criteria: B, applied separately to each test in Table 16.

# 9.3.2.2 Voltage dips, short interruptions and voltage variations on DC input power port immunity tests

The intent of these tests is to ensure the meter is not susceptible to common dips and short interruptions on the mains or auxiliary DC power supply. This test applies to meters for DC energy, powered from DC mains supply either via voltage circuits or auxiliary supply circuits, or both; also applies to meters for AC energy, powered from DC mains supply via auxiliary supply circuit.

The test shall be carried out according to IEC 61000-4-29: 2000, under the conditions specified in 7.1, and the following conditions:

The meter shall be in operating condition:

- a) Voltage circuits and auxiliary power supply circuits energized with their lowest specified nominal voltages.
- b) Without any current in the current circuits and the current terminals shall be open circuit.
- c) The voltage shall be interrupted for either the auxiliary power port, or the mains port, or both in sequence, depending on which one is used to power the meter.

# Table 17 – Voltage dips, short interruptions and voltage variations on DC input power port immunity tests

Event	Δ <i>U</i> (voltage reduction)	Duration	Number of events	Time between events
	[%]	[s]		[s]
Voltage interruptions Test 1	100	1	3	10
Voltage interruptions Test 2	100	0,01	3	10
Voltage interruptions Test 3	100	0,001	3	10
Voltage dip Test 4	60	0,3	3	10
Voltage dip Test 5	60	0,03	3	10
Voltage dip Test 6	30	0,3	3	10
Voltage dip Test 7	30	0,03	3	10

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Acceptance criteria: B, applied separately to each test in Table 17.

#### 9.3.3 Electrostatic discharge immunity test

The test shall be carried out according to IEC 61000-4-2: 2008, under the conditions specified in 7.1, and the following conditions:

The meter shall be in operating condition:

- a) Voltage circuits and auxiliary power supply circuits energized with their highest specified nominal voltages;
- b) Without any current in the current circuits and the current terminals shall be open circuit;

The following tests shall be applied to the meter's enclosure port:

- c) Indirect discharge: the test voltage of 8 kV shall be applied to both vertical and horizontal coupling planes in contact mode. In both vertical and horizontal plane, all faces of meter shall be exposed to the discharge;
- d) Contact discharge: the test voltage of 8 kV shall be applied to metallic parts accessible in normal operation;
- e) Air discharge: the test voltage of 15 kV shall be applied to non-metallic parts accessible in normal operation;
- f) Number of discharges: 10 discharges at each test point and in the most sensitive polarity; if sensitivity is not known then 10 shall be applied in both polarities with at least 1s between discharges, unless a longer interval is necessary to determine whether the EUT failure has occurred.

Acceptance criteria: B applied separately to each test c) to e).

## 9.3.4 Radiated, radio-frequency, electromagnetic field immunity test – test without current

This test is intended to verify meter's immunity to electromagnetic radio-frequency fields in various frequency bands. The test shall be carried out according to IEC 61000-4-3: 2006, or according to IEC 61000-4-20: 2010, under conditions specified in 7.1, and the following conditions, using TEM cells that allow cable lengths of at least 1 m. The meter shall be deemed to comply with the requirements if it meets the acceptance criteria when tested using one of the two test methods.

NOTE This consideration is supported by IEC TR 61000-4-1: 2016 (prepared by IEC technical committee TC77). IEC TR 61000-4-1: 2016 gives information about and guidance on the application of the EMC basic standards and other basic EMC documents published as the IEC 61000-4 series.

The meter shall be in operating condition:

- a) Voltage circuits and auxiliary power supply circuits energized with their highest specified nominal voltage;
- b) Without any current in the current circuits and the current terminals shall be open circuit;
- c) The length of cables exposed to the electromagnetic field shall be 1 m, arranged according to IEC 61000-4-3:2006, 7.3, or according to IEC 61000-4-20: 2010 Annex B;

This test shall be applied to the enclosure port:

- d) Frequency band: 80 MHz to 2,0 GHz; carrier modulated with 80 % AM at 1 kHz sine wave; unmodulated field strength of 30 V/m;
- e) Frequency band: 2,0 GHz MHz to 6,0 GHz; carrier modulated with 80 % AM at 1 kHz sine wave; unmodulated field strength of 10 V/m;
- f) The frequency step shall be 1 %;

g) The dwell time shall be as specified in 9.3.1.2.3.

Acceptance criteria: B.

## 9.3.5 Radiated, radio-frequency, electromagnetic field immunity test – test with current

This test is intended to verify meter's immunity to electromagnetic radio-frequency fields in various frequency bands. The test shall be carried out according to IEC 61000-4-3:2006, or according to IEC 61000-4-20:2010, under conditions specified in 7.1, and the following conditions, using TEM cells that allow cable lengths of at least 1 m. The meter shall be deemed to comply with the requirements if it meets the acceptance criteria when tested using one of the two test methods.

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NOTE This consideration is supported by IEC TR 61000-4-1: 2016 (prepared by IEC technical committee TC77). IEC TR 61000-4-1: 2016 gives information about and guidance on the application of the EMC basic standards and other basic EMC documents published as the IEC 61000-4 series.

The meter shall be in operating condition:

- a) Voltage circuits and auxiliary power supply circuits energized with their highest specified nominal voltages;
- b) The current circuits shall be carrying the value of the current given in the relevant particular requirements (accuracy class) standards;
- c) For AC meters, the power factor  $(\cos \varphi \text{ or } \sin \varphi)$  of the measured test signal shall be according to the values given in the relevant accuracy class standard;
- d) The length of cables exposed to the electromagnetic field shall be 1 m, arranged according to IEC 61000-4-3:2006, 7.3, or according to IEC 61000-4-20:2010, Annex B;

This test shall be applied to the enclosure port:

- e) Frequency band: 80 MHz-2,0 GHz: carrier modulated with 80 % AM, at 1 kHz sine wave; unmodulated field strength 10 V/m;
- f) Frequency band: 2,0 GHz 6,0 GHz: carrier modulated with 80 % AM, at 1 kHz sine wave; unmodulated field strength 3 V/m.
- g) The frequency step shall be 1 %;
- h) The dwell time shall be as specified in 9.3.1.2.2.

Acceptance criteria: A.

#### 9.3.6 Electrical fast transient/burst immunity test

The test shall be carried out according to IEC 61000-4-4: 2012, under the conditions specified in 7.1, and the following conditions:

The meter shall be in operating condition:

- a) Voltage circuits and auxiliary power supply circuits energized with their highest specified nominal voltages; if a meter is rated for more than one value of nominal voltage, the highest value shall be used;
- b) The current circuits shall be carrying the value of the current given in the relevant particular requirements (accuracy class) standards;
- c) For AC meters, the power factor  $(\cos \varphi \text{ or } \sin \varphi)$  of the measured test signal shall be according to the values given in the relevant accuracy class standard;
- d) The length of cables between the coupling device and the EUT shall be (0,5 0/+0,1) m, arranged according to IEC 61000-4-4:2012, 7.3.

The transients shall be applied in common mode to each port at a time: