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Pattern Approval Specifications for Beverage Dispensers

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SECTION I — GENERAL

1. SCOPE

This document specifies the metrological and technical requirements for the pattern approval and verification of instruments used for dispensing alcoholic and non-alcoholic beverages. It does not cover alcoholic beverage measures which are covered by General Certificate 4/1/0C.

Instruments may be dispensers mounted on bottles or may be devices for dispensing from bulk storage containers either by a fixed or hand held nozzle.

Examples of beverages dispensed are as follows:

- (a) spirits, e.g. whisky, rum, vodka, brandy, gin and bourbon;
- (b) alcoholic beverages, e.g. beer and wine;
- (c) non-alcoholic beverages, e.g. purified water.

2. TERMINOLOGY

The following terminology includes terms applicable to those instruments covered by this document and some general terms included in the *International Vocabulary of Basic and General Terms in Metrology* (VIM, 1993). For an alphabetical cross-reference to these terms see Annex B.

GENERAL TERMS

2.1 Beverage Dispenser

A measuring instrument which dispenses a predetermined volume of a beverage (spirits, beer, wine etc).

2.2 Measuring Device

A device which determines the volume to be delivered.

2.3 Indicator

A device which displays the quantity delivered and the beverage dispensed.

2.4 Electronic Beverage Dispenser

A beverage dispenser fitted with electronic devices.

2.5 Adjustment Device

A device normally incorporated in the measuring device which allows the adjustment of the volume dispensed to a volume within the maximum permissible errors.

2.6 Gas Elimination Device

A device used for ensuring that air intake or gas release does not affect the measured volume by more than the permitted quantity.

PERFORMANCE TERMS

2.7 Error of Indication

The indication of a measuring instrument minus the (conventional) true value of the measurand (adapted from VIM 5.20).

2.8 Intrinsic Error

The error of a measuring instrument used under reference conditions (adapted from VIM 5.24).

2.9 Initial Intrinsic Error

The intrinsic error of a measuring instrument as determined prior to performance tests.

2.10 Maximum Permissible Error

The extreme values (positive and negative) of the error of measurement permitted by regulation. The absolute value of the maximum permissible error is the same value without sign (adapted from VIM 5.21).

2.11 Fault

The difference between the error of measurement and the intrinsic error of a measuring instrument.

Note: Principally a fault is the result of an undesired change of data contained in, or flowing through, an electronic measuring instrument.

2.12 Significant Fault

A fault greater than the absolute value of the maximum permissible error for the quantity delivered.

The following faults are not considered to be significant, even when they exceed the value defined above:

- (a) faults implying the impossibility to perform any measurement; and
- (b) faults giving rise to variations in the measurement result so serious that they are bound to be noticed by all those interested in the result of the measurement.

2.13 Influence Quantity

A quantity which is not the subject of the measurement but which influences the value of the measurand of the measuring instrument (adapted from VIM 2.7).

2.13.1 Influence Factor

An influence quantity having a value within the rated operating conditions of the measuring instrument, specified in this document.

2.13.2 Disturbance

An influence quantity having a value within the limits specified in this document, but outside the specified rated operating conditions of the measuring instrument.

Note: An influence quantity is a disturbance if for that influence quantity the rated operating conditions are not specified.

2.14 Rated Operating Conditions

Conditions of use giving the range of values of influence quantities for which the metrological characteristics are intended to lie within the specified maximum permissible errors.

2.15 Reference Conditions

A set of specified values of influence factors fixed to ensure valid intercomparison of results of measurements (adapted from VIM 5.7).

2.16 Performance

The ability of the measuring instrument to accomplish its intended functions.

TESTING TERMS

2.17 Test

A series of operations intended to verify the compliance of the equipment under test with certain requirements.

2.17.1 Test Procedure

A detailed description of the tests.

2.17.2 Test Program

A description of a series of tests for certain type of equipment.

2.17.3 Performance Test

A test intended to verify whether the equipment under test is able to accomplish its intended functions.

SECTION II — METROLOGICAL REQUIREMENTS

3. UNITS OF MEASUREMENT

The following units of measurement and their symbols shall be used:

Unit of measurement	Symbol
Millilitre	mL
Litre	L

4. QUANTITIES AND MAXIMUM PERMISSIBLE ERRORS

4.1 Quantities

For quantities equal to or less than 60 mL, only the following values shall be dispensed: 10 mL, 15 mL, 30 mL and 60 mL.

For quantities greater than 60 mL, any quantity may be dispensed.

4.2 Maximum Permissible Errors

The maximum permissible errors applicable to the dispensed quantity for

verification/certification and reverification are given in Table 1.

Table 1

Quantity delivered	Maximum permissible error	
	Verification/certification	Reverification
10 mL	±0.5 mL	+1.0, -0.5 mL
15 mL	±0.6 mL	+1.2, -0.6 mL
30 mL	±1.0 mL	+2.0, -1.0 mL
60–100 mL	±1.5 mL	+3.0, -1.5 mL
Greater than 100 mL	±1.5% of quantity dispensed	+3.0%, -1.5% of quantity dispensed

4.3 Rules for the Determination of Errors

- The value of the standard used for the determination of the maximum permissible errors shall be known to an expanded uncertainty (coverage factor two) of not greater than one-third of the maximum permissible error specified for that value.
- The maximum permissible errors apply to all instruments irrespective of their principles of operation.
- The initial intrinsic error is found at ambient reference conditions of $20\pm 5^{\circ}\text{C}$, atmospheric pressure, $60\pm 5\%$ relative humidity and with a nominal supply voltage if applicable.

5. ELIMINATION OR PREVENTION OF AIR OR GAS

5.1 Provision

Instruments shall be constructed and installed so that during normal operation, neither air intake or gas release will occur in the liquid upstream of the measuring device.

Alternatively a gas separation or purging device, a low-level cut-out device or some other means shall be provided to prevent the measurement of air or gas.

5.2 Testing

Where a gas-separation or other device is fitted, means shall be provided for testing the effectiveness of the devices in normal conditions of use, and provision shall be made for sealing such a device against unauthorised use.

5.3 Performance

When testing such a device, the difference in the dispensed quantity without air intake or gas release and with air intake or gas release shall not exceed the absolute value of the maximum permissible error.

6. PERFORMANCE WITH VARIOUS BEVERAGES

6.1 Spirits

A dispenser used to dispense spirits, once adjusted using any adjustment device fitted, shall be capable of measuring rum, whisky, gin, vodka and brandy within the maximum permissible errors without further adjustment of any adjustment device fitted. Other spirits may also be able to be measured without adjustment.

6.2 Other Beverages

A dispenser used to measure other beverages for which it is marked, once adjusted using any adjustment device fitted, shall be capable of measuring those beverages, within the maximum permissible errors without further adjustment of any adjustment device fitted.

7. INFLUENCE FACTORS AND DISTURBANCES

The following rules apply to instruments which are fitted with electronic components.

Rule 7.1(b) applies to instruments not fitted with electronic components.

7.1 Rated Operating Conditions for Influence Factors

Instruments shall be designed and manufactured so that all functions continue to operate as designed and that they do not exceed the maximum permissible errors when tested over the following ranges of influence factors:

- (a) mains power voltage variations: -15% to +10% of nominal voltage; and
- (b) air temperature variations: 5°C to 40°C.

A battery operated instrument shall either continue to function correctly or not dispense any quantity when the voltage is below the battery manufacturer's specified nominal voltage.

7.2 Humidity

Instruments shall be designed and manufactured so that all functions continue to operate as designed and that they do not exceed the maximum permissible errors when subjected to a damp heat, steady state test as described in Annex A.3.3.

7.3 Disturbances

Instruments shall be designed and manufactured such that when exposed to the disturbances listed in Annex A during the delivery or filling cycle, the following apply:

- (a) all functions continue to operate as designed and significant faults do not occur, that is the difference in the dispensed quantity without the disturbance applied and with the disturbance applied shall not exceed the absolute value of the maximum permissible error; or
- (b) significant faults are detected and the instrument made inoperative automatically or a visual or audible indication is provided automatically and shall continue until such time as the user takes action or the fault disappears.

The choice whether (a) or (b) is applied is left to the manufacturer.

7.4 Tests

A pattern of an instrument is presumed to comply with the requirements of clause 7 if it has passed the examination and tests specified in Annex A.

SECTION III — TECHNICAL REQUIREMENTS

8. OPERATIONAL REQUIREMENTS

8.1 Suitability

8.1.1 Suitability for Purposes

An instrument shall be designed to be suitable for the purpose for which it is intended to be used and shall be constructed to be suitable for service in normal conditions of use.

8.1.2 Suitability for Verification

An instrument shall be designed to enable the performance requirements of these rules to be applied.

8.2 Operational Safeguards

8.2.1 Fraudulent Use

Instruments shall not facilitate fraudulent use by either accidental means or by deliberate means when using the instrument in the normal manner.

8.2.2 Operation

Under normal operating conditions a delivery, once started, shall not be able to be stopped until delivery is complete, and a new delivery shall not be possible unless there is sufficient beverage for the measuring device to complete the next delivery.

8.2.3 Operational Controls

The control for initiating a delivery shall, when it is operated, produce one delivery only.

9. INDICATIONS

9.1 Quantity and Type of Beverage

The quantity and type of beverage dispensed shall be indicated. For a bottle top dispenser,

the label on the bottle is considered as an indication of the beverage dispensed.

If there are multiple displays of quantity and beverage or a single indicator that can display multiple indications, then each indication shall be clearly identifiable with its delivery.

9.2 Form of Indication

The quantity display shall contain the name or symbol of the unit of volume.

The figures forming the display shall be of a size, shape and clarity for easy reading under normal conditions of use.

9.3 Visibility

The display, if not permanent, shall remain visible until the next delivery is selected.

9.4 Style

The display of the quantity and unit symbol shall be in a font whose capitals are not less than 10 mm high. Numbers and symbols of units shall be presented in accordance with *AS ISO 1000–1998. The International System of Units (SI) and its Application*.

10. MARKING

10.1 Information to be Marked

Instruments shall be clearly and permanently marked with the following:

- (a) manufacturer's name or mark;
- (b) model designation;
- (c) serial number;
- (d) NMI approval number;
- (e) quantity;
- (f) approved beverage(s) if not a bottle-mounted dispenser; and
- (g) year of manufacture.

10.2 Location of Markings

Markings shall be grouped together in a clearly visible location, either on a permanently attached nameplate or on part of the instrument.

10.3 Style of Markings

The letters and numbers shall be marked in a font whose capitals are not less than 2 mm high.

Numbers and symbols of units shall be presented in accordance with *AS ISO 1000–1998. The International System of Units (SI) and its Application*.

10.4 Identification of Parts

Any parts of an instrument which affect the accuracy of measurement and which have to be disassembled for cleaning, shall be constructed so that they cannot be incorrectly assembled. Such parts shall be identified with the instrument, for example, with its serial number.

11. VERIFICATION/CERTIFICATION MARKS AND SEALING

11.1 General

Provision shall be made for the application of a verification/certification mark and for sealing any adjustment device or control device which could affect the measurement.

Sealing shall be by lead plug and sealing wire, a destructive label, a stamping plug or any other acceptable means.

11.2 Position

A verification/certification mark shall be easily accessible and situated such that:

- (a) the part on which it is located cannot be removed from the instrument without damaging the mark;
- (b) it can be easily affixed without affecting the metrological properties of the instrument; and
- (c) it is visible without moving the instrument when it is in use.

11.3 Mounting

The area provided for the verification/certification mark shall be at least 200 mm².

11.4 Electronic Sealing

If the adjustment or control of any function which affects the measurement is provided by electronic means (e.g. computer software) access to the electronic means shall be prohibited by mechanical sealing (see clause 11.1) or the following shall apply:

- (a) access by authorised persons shall be protected by some form of physical key, a password or access code (e.g. a four digit code);
- (b) access to alter protected parameters shall be automatically recorded (e.g. by means of a counter which automatically increments when access is initiated);
- (c) the record shall be readily accessible by a simple action (e.g. by display of the counter when a button identified as being for this purpose is pressed, or during the indication check);
- (d) the record shall be readily identifiable as such and shall not be easily confused with other indications of the instrument;
- (e) a reference record in the same form as the incremental record shall be permanently marked on the instrument to indicate that the parameters have been accessed since the last verification (e.g. the reference record could be associated with the verification mark); and
- (f) the record shall not repeat in a sequence of less than 999 alterations, it shall persist reliably for a period of at least two years (unless it is overwritten by a further alteration) and it shall persist through tests for influence factors and disturbances specified in this document.

SECTION IV — METROLOGICAL CONTROL

12. LIABILITY

All beverage dispensers to be used for trade shall be submitted to NMI for pattern approval to ensure they comply with these requirements. General submission requirements are given in *NMI P 106. Approval and Certification Procedures for Measuring Instruments for Trade Use*.

13. APPLICATION FOR PATTERN APPROVAL

The application for pattern approval shall be accompanied by:

- (a) at least one sample instrument of each quantity and representative of the submitted pattern; and
- (b) descriptive documents and drawings.

13.1 Sample Instrument

The sample instrument shall be in full working order and shall include all functions to be examined for pattern approval.

Note: If the measuring instrument is part of a system which includes other than metrological functions, only that part which controls the metrological functions may be submitted for evaluation. NMI provides a consultation service prior to submission to determine those parts required for evaluation.

13.2 Descriptive Documents

Descriptive documents shall include:

- (a) drawings of the general arrangement and details of metrological interest including details of any interlocks, safeguards, auxiliary devices etc.;
- (b) a short functional description of the instrument;

- (c) a short technical description including, if necessary, schematic diagrams of the method of operation; and
- (d) list of beverages for which approval is required.

14. PATTERN EVALUATION

The submitted documents shall be examined to verify compliance with the requirements of this document.

The instrument shall be tested in accordance with these procedures and of Annex A if applicable. If testing of a complete instrument is not possible, tests may, as agreed by NMI and the applicant, be performed on a simulated set-up or on modules or main devices separately.

NMI may, in special cases, require the applicant to supply test equipment to perform the tests.

15. LABORATORY TESTS

15.1 General

All instruments shall be tested for maximum permissible errors (see clause 4.2), air temperature variations (see clause 7.1(b)), elimination or prevention of air or gas (see clause 5) and operational requirements (see clause 8).

15.2 Electronic Instruments

In addition, electronic instruments shall be tested for influence factors (see clause 7.1), humidity effects (see clause 7.2) and disturbances (see clause 7.3). Annex A specifies the performance tests.

15.3 Test Standards

Volumetric standards with the required uncertainty (see clause 4.3) for the measurement shall be used. They shall be graduated so that the maximum permissible errors can be determined.

15.4 Test Beverages

For testing the five spirits rum, whisky, gin, vodka and brandy, a test liquid consisting of a solution of methylated spirits or ethyl alcohol in water may be used provided preliminary tests indicate similarity in results for the five spirits and the test liquid.

For all other cases the actual beverage shall be used to carry out the tests.

Tests for different beverages shall be carried out at reference conditions and for the air temperature variations specified in clause 7.1(b).

Tests for other influence factors and disturbances shall be carried out with one beverage only.

15.5 Number of Tests

For each test carry out at least 10 deliveries. Each delivery shall be within the maximum permissible error.

For tests which specify a permissible difference in performance, then the difference between the means of the 10 deliveries with and without the effect for which the instrument is being tested shall be used.

ANNEX A. PERFORMANCE TESTS FOR ELECTRONIC MEASURING SYSTEMS

A.1 General

This annex is mandatory. It defines the program of performance tests intended to ensure that electronic dispensers perform and function as intended in a specified environment and under specified conditions. Each test indicates, where appropriate, the reference conditions under which the intrinsic error is determined.

Performance tests A.3.1 — Dry Heat and A.3.2 — Cold also apply to dispensers not fitted with electronic devices.

When the effect of one influence quantity or disturbance is being evaluated, all other influence quantities and disturbances are to be held relatively constant, at values close to reference conditions.

A.2 Reference Conditions

Ambient temperature: $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$.

Relative humidity: $60\% \pm 15\%$.

Atmospheric pressure: 86 kPa to 106 kPa.

Power voltage: nominal voltage, V_{nom} .

Power frequency: nominal frequency, F_{nom} .

During each test the temperature and relative humidity shall not vary by more than 5°C and 10% respectively within the reference ranges.

A.3 Performance Tests

The following performance tests can be carried out in any order:

- (a) dry heat (influence factor) — see clause A.3.1;
- (b) cold (influence factor) — see clause A.3.2;
- (c) damp heat, steady state (influence factor) — see clause A.3.3;
- (d) power voltage variation (influence factor) — see clause A.3.4;
- (e) short time power reductions (disturbance) — see clause A.3.5;
- (f) bursts (disturbance) — see clause A.3.6;

- (g) electrostatic discharge (disturbance) — see clause A.3.7;
- (h) electromagnetic susceptibility (disturbance) — see clause A.3.8; and
- (i) disturbances on d.c. voltage powered equipment — see clause A.3.9.

A.3.1 Dry heat

Test method

Dry heat (non-condensing).

Object of the test

To verify compliance with the provisions in clause 7.1 under conditions of high temperature.

References

IEC 60068-2-2 (1974). Background information concerning dry heat tests is given in IEC 60068-3-1 (1974) and first supplement IEC 60068-3-1A (1978). General background information on basic environmental testing procedures is given in IEC 60068-1 (1988) which is equivalent to AS 1099.1–1989.

Test procedure in brief

The test consists of exposure of the equipment under test to a temperature of 40°C under free air conditions for a 2 h period after the equipment under test has reached temperature stability. The equipment under test shall be tested for at least 10 deliveries:

- (a) at the reference temperature of 20°C following conditioning;
- (b) at the temperature of 40°C , 2 h after temperature stabilisation; and
- (c) after recovery of the equipment under test at the reference temperature of 20°C .

Test severities

Temperature: 40°C .

Duration: 2 h.

Number of test cycles

One cycle.

Maximum allowable variations

All operational functions shall operate as designed (e.g. indicators).

All errors shall be within the maximum permissible errors.

A.3.2 Cold

Test method

Cold.

Object of the test

To verify compliance with the provisions in clause 7.1 under conditions of low temperature.

References

IEC 60068-2-1 (1990). Background information concerning cold tests is given in IEC 60068-3-1 (1974) and first supplement IEC 60068-3-1A (1978). General background information on basic environmental testing procedures is given in IEC 60068-1 (1988) which is equivalent to AS 1099.1–1989.

Test procedure in brief

The test consists of exposure of the equipment under test to a temperature of 5°C under free air conditions for a 2 h period after the equipment under test has reached temperature stability. The equipment under test shall be tested for at least 10 deliveries:

- (a) at the reference temperature of 20°C following conditioning;
- (b) at the temperature of 5°C, 2 h after temperature stabilisation; and
- (c) after recovery of the equipment under test at the reference temperature of 20°C.

Test severities

Temperature: 5°C.

Duration: 2 h.

Number of test cycles

One cycle.

Maximum allowable variations

All operational functions shall operate as designed (e.g. indicators).

All errors shall be within the maximum permissible errors.

A.3.3 Damp heat, steady state

Test method

Damp heat, steady state (non-condensing).

Object of the test

To verify compliance of the electronic measuring instrument with the provisions in clause 7.2 under conditions of high humidity and high temperature.

References

IEC 60068-2-3 (1969) which is equivalent to AS 1099.2.3–1990. Background information is given in IEC 60068-3-4 (2001).

Test procedure in brief

The test consists of exposure to the specified high temperature and relative humidity for a period of two days. The handling of the equipment under test shall be so that no condensation of water occurs on the equipment.

The power supply is on when the influence factor is applied. The equipment under test shall be tested for at least 10 deliveries before and after the application of the damp heat and at the specified damp heat after two days at these conditions.

Test severities

Upper temperature: 40°C.

Humidity: 85%.

Duration: two days.

Number of test cycles

One cycle.

Maximum allowable variations

All operational functions shall operate as designed (e.g. indicators).

All errors shall be within the maximum permissible errors.

A.3.4 Power voltage variation

Test method

Variation in a.c. mains power supply (single phase).

Object of the test

To verify compliance with the provisions in clause 7.1 under conditions of varying a.c. mains power supply.

References

No reference to an international standard can be given at the present time.

Test procedure in brief

The test consists of exposure of the equipment under test to power voltage variations, while the equipment under test is operating under normal atmospheric conditions.

Test severities

Mains voltage: upper limit: $V_{\text{nom}} + 10\%$
and lower limit: $V_{\text{nom}} - 15\%$.

Number of test cycles

One cycle.

Maximum allowable variations

All operational functions shall operate as designed (e.g. indicators).

All errors shall be within the maximum permissible errors.

A.3.5 Short time power reduction

Test method

Short time interruptions and reductions in mains voltage.

Object of the test

To verify compliance with the provisions in clause 7.3 under conditions of short time mains voltage interruptions and reductions.

References

No reference to an international standard can be given at the present time.

Test procedure in brief

The test consists of subjecting the equipment under test to voltage interruptions from nominal voltage to zero voltage for a duration equal to half a cycle of line frequency, and from nominal voltage to 50% of nominal for a duration equal to one cycle of line frequency. The mains voltage interruptions and reductions shall be repeated with a time interval less than the time required for a single delivery so that at least one voltage interruption occurs per delivery.

Test severities

100% voltage interruption for a period equal to half a cycle.

50% voltage reduction for a period equal to one cycle.

Number of tests

At least 10 deliveries shall be made with the voltage interruptions applied.

Maximum allowable variations

All operational functions shall operate as designed (e.g. indicators).

The effect of the disturbance shall not exceed the significant fault or the instrument shall detect and react to the fault (see clause 7.3).

A.3.6 Bursts

Test method

Electrical bursts.

Object of the test

To verify compliance with the provisions in clause 7.3 under conditions where electrical bursts are superimposed on the mains voltage.

Reference

IEC 61000-4-4 (1995).

Test procedure in brief

The test consists of subjecting the equipment under test to bursts of double exponential waveform transient voltages. Each spike shall have a rise time of 5 ns and a half amplitude duration of 50 ns. The burst length shall be 15 ms, the burst period (repetition time interval) shall be 300 ms. All these bursts shall be applied during the same measurement in symmetrical mode and asymmetrical mode.

Test severities

Amplitude (peak value) 1 000 V.

Number of test cycles

At least 10 positive and 10 negative randomly phased bursts shall be applied at 1 000 V.

The burst are applied during all the time necessary to perform a delivery. At least 10 deliveries shall be made with the bursts applied.

Maximum allowable variations

All operational functions shall operate as designed (e.g. indicators).

The effect of the disturbance shall not exceed the significant fault or the instrument shall detect and react to the fault (see clause 7.3).

A.3.7 Electrostatic discharge

Test method

Electrostatic discharge.

Object of the test

To verify compliance with the provisions in clause 7.3 under conditions of direct and indirect electrostatic discharges.

Reference

IEC 61000-4-2 (2001).

Test procedure in brief

A capacitor of 150 pF is charged by a suitable d.c. voltage source. The capacitor is then discharged through the equipment under test by connecting one terminal to ground (chassis) and the other via 330 Ω to surfaces which are normally accessible to the operator.

The test includes the paint penetration method, if appropriate. For direct discharges the air discharge shall be used where the contact discharge method cannot be applied.

Test severities

8 kV for air discharges and 6 kV for contact discharges.

Number of test cycles

At least one direct discharge or one indirect discharge shall be applied during the one delivery. At least 10 deliveries shall be made with the discharges applied.

Maximum allowable variations

All operational functions shall operate as designed (e.g. indicators).

The effect of the disturbance shall not exceed the significant fault or the instrument shall detect and react to the fault (see clause 7.3).

A.3.8 Electromagnetic Susceptibility

Test method

Electromagnetic fields (radiated).

Object of the test

To verify compliance with the provisions in clause 7.3 under conditions of electromagnetic fields.

Reference

IEC 61000-4-3 (2002).

Test procedure in brief

The equipment under test shall be exposed to electromagnetic field strength as specified by the severity level.

The field strength can be generated in various ways:

- (a) the strip line is used at low frequencies (below 30 MHz or in some cases 150 MHz) for small equipment under test;
- (b) the long wire is used at low frequencies (below 30 MHz) for larger equipment under test;
- (c) dipole antennas or antennas with circular polarisation placed at least 1 m from the equipment under test are used at high frequencies.

The specified field strength shall be established prior to the actual testing (without equipment under test in the field).

The field shall be generated in two orthogonal polarisations and the frequency range shall be scanned slowly. If antennas with circular polarisation (i.e. log-spiral or helical antennas) are used to generate the electromagnetic field, a change in the position of the antennas is not required.

When the test is carried out in a shielded enclosure to comply with international laws prohibiting interference to radio communications, care needs to be taken to handle reflections from the walls. Anechoic shielding might be necessary.

Test severities

Frequency range: 26 to 1 000 MHz, field strength 3 V/m.

Modulation: 80% AM, 1 kHz sine wave.

Number of tests

Carry out deliveries throughout the application of the electromagnetic field. The tests will have to be initiated by remote control.

Maximum allowable variations

All operational functions shall operate as designed (e.g. indicators).

The effect of the disturbance shall not exceed the significant fault or the instrument shall detect and react to the fault (see clause 7.3).

A.3.9 Disturbances on d.c. voltage powered instruments

Electronic measuring systems supplied with d.c. voltage shall fulfil the tests A.3.1 to A.3.8 with the exception of A.3.4 to A.3.6 which are replaced by the following provisions:

- (a) for under-voltages or over-voltages all errors shall be within maximum permissible errors when the instrument is still working; and
- (b) the under-voltage or over-voltage is applied for a complete measurement or part of a measurement.

ANNEX B. TERMINOLOGY CLASSIFIED BY ALPHABETICAL ORDER

Adjustment device	see clause 2.5
Beverage dispenser	see clause 2.1
Disturbance	see clause 2.13.2
Electronic beverage dispenser	see clause 2.4
Error of indication	see clause 2.7
Fault	see clause 2.11
Gas elimination device	see clause 2.6
Indicator.....	see clause 2.3
Influence factor	see clause 2.13.1
Influence quantity	see clause 2.13
Initial intrinsic error.....	see clause 2.9
Intrinsic error	see clause 2.8
Maximum permissible error	see clause 2.10
Measuring device.....	see clause 2.2
Performance	see clause 2.16
Performance test	see clause 2.17.3
Rated operating conditions	see clause 2.14
Reference conditions	see clause 2.15
Significant fault	see clause 2.12
Test	see clause 2.17
Test procedure	see clause 2.17.1
Test program.....	see clause 2.17.2

REFERENCES

Below are references to publications of the International Electrotechnical Commission (IEC). Where available, reference is also made to the corresponding Australian standards.

IEC 60068-1 (1988) Basic Environmental Testing Procedures. Part 1: General and Guidance. Also refer to amendment IEC 60068-1-am1 (1992). The equivalent Australian standard is AS 1099.1–1989.

IEC 60068-2-1 (1990) Basic Environmental Testing Procedures. Part 2: Tests. Test A: Cold. Section 3 — Test Ad: Cold for Heat-dissipating Specimen with Gradual Change of Temperature. Also refer to amendments IEC 60068-2-1-am1 (1993) and IEC 60068-2-1-am2 (1994).

IEC 60068-2-2 (1974) Basic Environmental Testing Procedures. Part 2: Tests. Test B: Dry Heat. Section 4 — Test Bd: Dry Heat for Heat-dissipating Specimen with Gradual Change of Temperature. Also refer to amendments IEC 60068-2-2-am1 (1993) and IEC 60068-2-2-am2 (1994).

IEC 60068-2-3 (1969) Basic Environmental Testing Procedures. Part 2: Tests. Test Ca: Damp Heat, Steady State. The equivalent Australian standard is AS 1099.2.3–1990.

IEC 60068-3-1 (1974) Basic Environmental Testing Procedures. Part 3: Background Information. Section 1 — Cold and Dry Heat Tests. Also refer to first supplement IEC 60068-3-1A (1978).

IEC 60068-3-4 (2001) Environmental Testing — Part 3 –4: Supporting Documentation and Guidance — Damp Heat Tests.

IEC 61000-4-2 (2001) Electromagnetic Compatibility (EMC). Part 4: Testing and Measurement Techniques. Section 2: Electrostatic Discharge Immunity Test.

IEC 61000-4-3 (2002) Electromagnetic Compatibility (EMC). Part 4: Testing and Measurement Techniques. Section 3: Radiated, Radio-frequency, Electromagnetic Field Immunity Test.

IEC 61000-4-4 (1995) Electromagnetic Compatibility (EMC). Part 4: Testing and Measurement Techniques. Section 4: Electrical Fast Transient/Burst Immunity Test. Also refer to amendments IEC 61000-4-4-am1 (2000) and IEC 61000-4-4-am2 (2001).