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Specification for

Classification of degrees of protection provided by enclosures

Spécification pour la classification des degrés de protection procurés par les enveloppes

Spezifikation für die Klassifizierung von den von Mänteln vorgesehenen Schutzgraden

British Standards Institution

Foreword

This British Standard has been prepared under the direction of the General Electrotechnical Engineering Standards Committee.

It is identical with IEC Publication 529 'Classification of degrees of protection provided by enclosures' as amended by Amendments Nos. 1 and 2.

In a few places in connection with the figures the comma has been used as a decimal marker. This has the same significance as a full point (a full stop on the baseline) used as the decimal marker in British Standards.

Attention is drawn to the following British Standards.

BS 4999	General requirements for rotating electrical machines Part 20 Classification of types of enclosure
BS 5420	Degrees of protection of enclosures of switchgear and controlgear for voltages up to and including 1000 V a.c. and 1200 V d.c.

CONTENTS

[IEC page 3]

CLASSIFICATION OF DEGREES OF PROTECTION PROVIDED BY ENCLOSURES

Introduction

This standard provides a system for classifying the degrees of protection provided by the enclosures of electrical equipment. Whilst this system is suitable for use with most types of electrical equipment, it should not be assumed that all the listed degrees of protection are applicable to a particular type of equipment. The manufacturer of the equipment should be consulted to determine the types of protection available and the parts of the equipment to which the stated degree of protection applies.

The adoption of this classification system, wherever possible, will promote uniformity in methods of describing the protection provided by the enclosure and of the tests to prove the various types of protection. It should also reduce the number of types of test apparatus necessary to test a wide range of products.

It will remain the responsibility of individual Technical Committees to decide on the extent and manner in which the classification is used in their standards and to define enclosure as it applies to their equipment. However, it is important that for a given classification the tests should not differ from those specified in this standard, although additional requirements may be included if necessary. Precise details should be given of how the test results are to be interpreted.

1. Scope

This standard provides a system for specifying the enclosures of electrical equipment on the basis of the degree of protection provided by the enclosure. It is applicable to enclosures where the rated voltage of the equipment inside the enclosure does not exceed 72.5 kV.

It also specifies type tests to check the performance of the various classes of enclosure.

The type of protection covered by this system of classification is as follows:

a) Protection of persons against contact with or approach to live parts and against contact with moving parts (other than smooth rotating shafts and the like) inside the enclosure and protection of the equipment against ingress of solid foreign bodies.

b) Protection of the equipment inside the enclosure against harmful ingress of water.

Notes 1. — The protection of moving parts external to the enclosure, such as fans, is a matter for the relevant Technical Committee.

2. — In this standard, the tests are conducted with fresh water.

This standard deals only with enclosures that are in all other respects suitable for their intended use and which, from the point of view of materials and workmanship, ensure that the properties dealt with in this standard are maintained under the normal conditions of use.

The standard does not specify degrees of protection against mechanical damage of the equipment, risk of explosions, or conditions such as moisture (produced for example by condensation), corrosive vapours, fungus or vermin.

Fences or guards external to the enclosure which have to be provided solely for the safety of personnel are not considered part of the enclosure and are not dealt with.

[IEC page 7]

2. Designation (classification system)

The designation to indicate the degrees of protection consists of the characteristic letters IP followed by two numerals (the "characteristic numerals") indicating conformity with the conditions stated in Tables I and II respectively. The first numeral indicates the degree of protection described under item *a)* above and the second numeral the degree of protection described under item *b)* above.

Where the mounting of the equipment has an influence on the degree of protection, this must be indicated by the manufacturer in his instructions for mounting or the like.

2.1 *Single characteristic numeral*

When it is required to indicate a class of protection by only one characteristic numeral, the omitted numeral shall be replaced by the letter X. For example IPX5 or IP2X.

2.2 *Supplementary letters*

If permitted in the standard for the particular type of equipment, additional information may be indicated by a supplementary letter following the numerals in the classification. In such cases, the standard shall state clearly the additional procedure to be carried out during tests for such a classification.

The absence of the letters S and M shall imply that the intended degree of protection will be provided under all normal conditions of use.

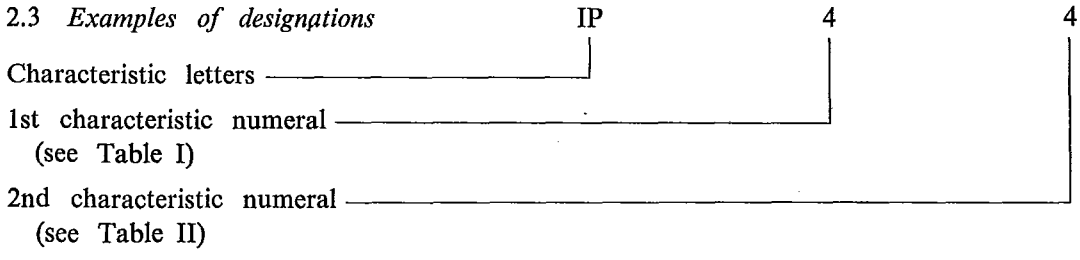
The letters S, M or W, which have already been used for rotating machines, shall only be used with the following meaning:

S — Tested against harmful ingress of water when the equipment is not in operation (e.g. machine stationary).

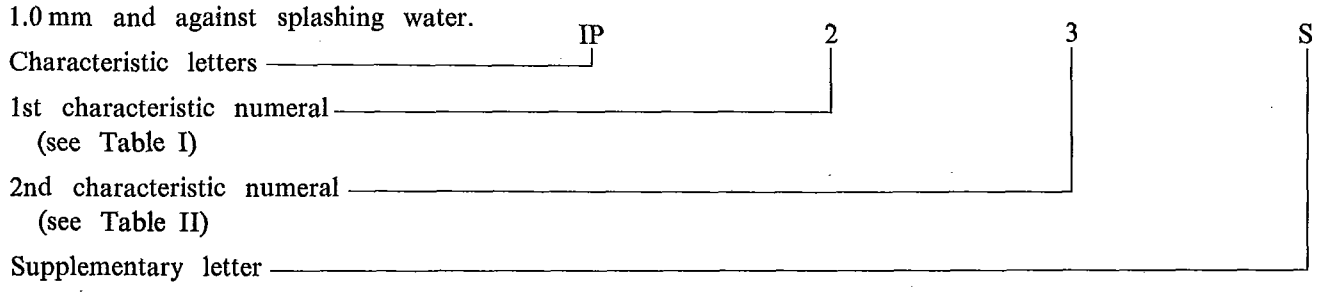
M — Tested against harmful ingress of water when the equipment is in operation (i.e. in mechanical operation).

W — (Placed immediately after the letters IP).
Equipment so designated is suitable for use under specified weather conditions and has been provided with additional protective features or processes.
Both the specified weather conditions and the additional features or processes shall be agreed between the manufacturer and user.

2.3 *Examples of designations*



An enclosure with this designation is protected against the penetration of solid objects greater than 1.0 mm and against splashing water.



An enclosure with this designation is protected against the penetration of solid objects greater than 12 mm and against spraying water, the spray test being made when the equipment is not in operation.

3. Degrees of protection—first characteristic numeral

The first characteristic numeral indicates the degree of protection provided by the enclosure with respect to persons, also to the equipment inside the enclosure.

Table I gives, in column 3, brief details of objects which will be "excluded" from the enclosure for each of the degrees of protection represented by the first characteristic numeral.

The term "excluded" implies that a part of the body, or a tool or a wire held by a person, either will not enter the enclosure or, if it enters, that adequate clearance will be maintained between it and the live parts or dangerous moving parts (smooth rotating shafts and the like are not considered dangerous).

Column 3 of Table I also indicates the minimum size of solid foreign bodies which will be excluded.

Note. — Equipment assigned a first characteristic numeral of 1 to 4 will exclude both regularly and irregularly shaped solid objects provided that three mutually perpendicular dimensions of the object exceed the appropriate figure in column 3.

Compliance of an enclosure with a stated degree of protection implies that the enclosure will also comply with all lower degrees of protection in Table I. In consequence, the tests establishing these lower degrees of protection need not necessarily be carried out.

TABLE I

Degrees of protection indicated by the first characteristic numeral

First characteristic numeral	Degree of protection		Test conditions, see Sub-clause
	Short description	Definition (see Clause 3)	
0	Non-protected	No special protection	No tests
1	Protected against solid objects greater than 50 mm	A large surface of the body, such as a hand (but no protection against deliberate access). Solid objects exceeding 50 mm in diameter	7.1
2	Protected against solid objects greater than 12 mm	Fingers or similar objects not exceeding 80 mm in length. Solid objects exceeding 12 mm in diameter	7.2
3	Protected against solid objects greater than 2.5 mm	Tools, wires, etc., of diameter or thickness greater than 2.5 mm. Solid objects exceeding 2.5 mm in diameter	7.3
4	Protected against solid objects greater than 1.0 mm	Wires or strips of thickness greater than 1.0 mm. Solid objects exceeding 1.0 mm in diameter	7.4
5	Dust-protected	Ingress of dust is not totally prevented but dust does not enter in sufficient quantity to interfere with satisfactory operation of the equipment	7.5
6	Dust-tight	No ingress of dust	7.6

Notes 1. — The short description given in column 2 of this table should not be used to *specify* the form of protection. It should only be used as a brief description.

2. — For first characteristic numerals 3 and 4, the application of this table to equipment containing drain holes or ventilating openings is the responsibility of the relevant Technical Committee.

3. — For first characteristic numeral 5, the application of this table to equipment containing drain holes is the responsibility of the relevant Technical Committee.

4. Degrees of protection—second characteristic numeral

The second characteristic numeral indicates the degree of protection provided by the enclosure with respect to harmful ingress of water.

Table II gives, in column 3, details of the type of protection provided by the enclosure for each of the degrees of protection represented by the second characteristic numeral.

Compliance of an enclosure with a stated degree of protection implies that the enclosure will also comply with all lower degrees of protection in Table II. In consequence, the tests establishing these lower degrees of protection need not necessarily be carried out.

TABLE II

Degrees of protection indicated by the second characteristic numeral

Second characteristic numeral	Degree of protection		Test conditions, see Sub-clause
	Short description	Definition (see Clause 4)	
0	Non-protected	No special protection	No tests
1	Protected against dripping water	Dripping water (vertically falling drops) shall have no harmful effect	8.1
2	Protected against dripping water when tilted up to 15°	Vertically dripping water shall have no harmful effect when the enclosure is tilted at any angle up to 15° from its normal position	8.2
3	Protected against spraying water	Water falling as a spray at an angle up to 60° from the vertical shall have no harmful effect	8.3
4	Protected against splashing water	Water splashed against the enclosure from any direction shall have no harmful effect	8.4
5	Protected against water jets	Water projected by a nozzle against the enclosure from any direction shall have no harmful effect	8.5
6	Protected against heavy seas	Water from heavy seas or water projected in powerful jets shall not enter the enclosure in harmful quantities	8.6
7	Protected against the effects of immersion	Ingress of water in a harmful quantity shall not be possible when the enclosure is immersed in water under defined conditions of pressure and time	8.7
8	Protected against submersion	The equipment is suitable for continuous submersion in water under conditions which shall be specified by the manufacturer *Note.* Normally, this will mean that the equipment is hermetically sealed. However with certain types of equipment it can mean that water can enter but only in such a manner that it produces no harmful effects	8.8

Note. — The short description given in column 2 should not be used to *specify* the form of protection. It should only be used as a brief description.

5. Marking

The requirements for marking shall be specified in the standard for the particular type of equipment.

Where appropriate, such a standard should also specify the method of marking which is to be used when one part of an enclosure has a different degree of protection to that of another stated part, or when the use of supplementary letters (see Sub-clause 2.2) results in a different degree of protection.

6. General requirements for tests

The tests specified in this standard are type tests.

Unless otherwise specified, the samples of equipment for each test shall be in clean and new condition, with all the parts in place and mounted in the manner stated by the manufacturer.

The standard for the particular type of equipment shall specify details such as:

— the number of samples to be tested;
— the mounting and installation of the samples, for example by the use of an artificial roof, ceiling or wall;
— the preconditioning, if any, which is to be used;
— the test procedure with regard to drain holes and ventilation openings;
— whether tested energized or not, in operation or not.

In the absence of such specification, the manufacturer's instructions shall apply.

In the case of first characteristic numerals 1 and 2, and second characteristic numerals 1, 2, 3 and 4, a visual inspection may, in certain obvious cases, show that the intended degree of protection is obtained. In such cases, if permitted by the relevant product specification, no test need be made. However, in case of doubt, tests are to be made as prescribed in Clauses 7 and 8.

The interpretation of test results is the responsibility of the relevant Technical Committee.

6.1 *Adequate clearance*

For the purpose of the following test clauses in this standard, the term "adequate clearance" has the following meaning:

6.1.1 *Low-voltage equipment (rated voltages not exceeding a.c.: 1000 V and d.c.: 1200 V)*

The test device (sphere, finger, wire, etc.) does not touch the live parts or moving parts other than non-dangerous parts such as smooth rotating shafts.

6.1.2 *High-voltage equipment (rated voltages exceeding a.c.: 1000 V and d.c.: 1200 V)*

When the test devices are placed in the most unfavourable position(s), the equipment shall be capable of withstanding the dielectric test applicable to the equipment.

This dielectric test requirement may be replaced by a specified clearance dimension in air which would ensure that this test would be satisfactory under the most unfavourable electrical field configuration.

7. Test for first characteristic numeral

For first characteristic numeral 0, no test is required.

7.1 *Test for first numeral 1*

The test is made with a rigid sphere of $50\ ^{+0.05}_{-0}$ mm diameter applied against the opening(s) in the enclosure with a force of 50 N ± 10%.

The protection is satisfactory if the sphere does not pass through any opening and adequate clearance is maintained to parts which are normally alive in service or moving parts inside the enclosure.

7.2 *Test for first numeral 2*

The test comprises two parts as follows:

a) Finger test

The test is made with a metallic test finger as shown in Figure 1, page 24. Both joints of this finger may be bent through an angle of 90° with respect to the axis of the finger, but in one and the same direction only. The finger is pushed without undue force (not more than 10 N) against any openings in the enclosure and, if it enters, it is placed in every possible position.

[IEC page 15]

The protection is satisfactory if adequate clearance is maintained between the test finger and live or moving parts inside the enclosure. However, it is permissible to touch smooth rotating shafts and similar non-dangerous parts.

For this test, the internal parts may be operated slowly, where this is possible.

For tests on low-voltage equipment, a low-voltage supply (of not less than 40 V) in series with a suitable lamp may be connected between the test finger and the live parts inside the enclosure. Conducting parts covered only with varnish or paint, or protected by oxidation or by a similar process, shall be covered with a metal foil electrically connected to those parts which are normally alive in service.

The protection is satisfactory if the lamp does not light.

For high-voltage equipment, adequate clearance is verified by a dielectric test, or by a measurement of clearance distance in accordance with the principles of Sub-clause 6.1.2.

b) Sphere test

The test is made with a rigid sphere of $12.0\ ^{+0.05}_{0}$ mm diameter applied to the openings of the enclosure with a force of 30 N ± 10%.

The protection is satisfactory if the sphere does not pass through any opening and adequate clearance is maintained to live or moving parts inside the enclosure.

7.3 *Test for first numeral 3*

The test is made with a straight rigid steel wire or rod of $2.5\ ^{+0.05}_{0}$ mm diameter applied with a force of 3 N ± 10%. The end of the wire or rod shall be free from burrs and at right angles to its length.

The protection is satisfactory if the wire or rod cannot enter the enclosure.

The manner of interpreting this requirement for equipment provided with ventilating openings or drain holes is the responsibility of the relevant Technical Committee.

7.4 *Test for first numeral 4*

The test is made with a straight rigid steel wire of $1\ ^{+0.05}_{0}$ mm diameter applied with a force of 1 N ± 10%. The end of the wire shall be free from burrs and at right angles to its length.

The protection is satisfactory if the wire cannot enter the enclosure.

The manner of interpreting this requirement for equipment provided with ventilating openings or drain holes is the responsibility of the relevant Technical Committee.

7.5 *Test for first numeral 5*

a) Dust test

The test is made using equipment incorporating the basic principles shown in Figure 2, page 25, in which talcum powder is maintained in suspension in a suitable closed test chamber. The talcum powder used shall be able to pass through a square-meshed sieve whose nominal wire diameter is 50 μm and the nominal width between wires is 75 μm. The amount of talcum powder to be used is 2 kg per cubic metre of the test chamber volume. It shall not have been used for more than 20 tests.

Enclosures are of necessity in one of two categories:

1) Enclosures where the normal working cycle of the equipment causes reductions in air pressure within the enclosure below the surrounding atmospheric pressure, e.g. thermal cycling effects.

2) Enclosures where reductions in pressure below the surrounding atmospheric pressure are not present.

Note.— The relevant Technical Committee for a particular type of equipment is responsible for deciding in which category the equipment is placed.

For enclosures under category 1), the equipment under test is supported inside the test chamber and the pressure inside the equipment is maintained below atmospheric pressure by a vacuum pump. If the enclosure has a single drain hole, the suction connection shall be made to this hole and not to one specially provided for the purpose of the test. If there is more than one drain hole, the others shall be sealed for the test.

The object of the test is to draw into the equipment, if possible, a minimum of 80 times the volume of air in the enclosure without exceeding an extraction rate of 60 volumes per hour with a suitable depression. In no event shall the depression exceed 200 mm of water on the manometer shown in Figure 2.

If an extraction rate of 40 to 60 volumes per hour is obtained the test is stopped after 2 h.

If, with a maximum depression of 200 mm of water, the extraction rate is less than 40 volumes per hour, the test is continued until 80 volumes have been drawn through, or a period of 8 h has elapsed.

For enclosures under category 2), the equipment under test is supported in its normal operating position inside the test chamber, but is not connected to a vacuum pump. Any drain hole normally open shall be left open for the duration of the test. The test shall be continued for a period of 8 h.

If it is impracticable to test the complete equipment in the test chamber, one of the following procedures shall be applied.

— testing of individually enclosed sections of the equipment;

— testing of representative parts of the equipment, comprising components such as doors, ventilating openings, joints, shaft seals, etc. with the vulnerable parts of the equipment, such as terminals, slip rings, etc., in position at the time of testing;

— testing of smaller equipment having the same full scale design details.

In the last two cases, the volume of air to be drawn through the equipment under test is as specified for the whole equipment in full scale.

The protection is satisfactory if, on inspection, talcum powder has not accumulated in a quantity or location such that, as with any other kind of dust, it could interfere with the correct operation of the equipment.

b) Wire test

If the equipment is provided with a drain hole, this shall be tested in the same manner as the first characteristic numeral 4, i. e. using a 1.0 mm diameter wire (Sub-clause 7.4).

7.6 *Test for first numeral 6*

The test shall be made under the same conditions as those given above for degree of protection 5.

The protection is satisfactory if no deposit of dust is observable inside the enclosure at the end of the test.

8. Test for second characteristic numeral

The tests shall be conducted with fresh water.

For the condition of the equipment after the following tests, see Sub-clause 8.9.

For second characteristic numeral 0, no test is required.

8.1 *Test for second numeral 1*

The test is made by means of an equipment the principle of which is shown in Figure 3, page 26; the rate of discharge shall be reasonably uniform over the whole area of the apparatus and shall produce a rainfall of between 3 mm and 5 mm of water per minute. (In the case of equipment according to Figure 3, this corresponds to a fall in water level of 3 mm to 5 mm per minute.)

The equipment under test is placed in its normal operating position under the dripping equipment, the base of which shall be larger than that of the equipment under test. Except for equipment designed for wall or ceiling mounting, the support for the enclosure under test should be smaller than the base of the enclosure.

Equipment normally fixed to a wall or ceiling is fixed in its normal position of use to a wooden board having dimensions which are equal to those of that surface of the equipment which is in contact with the wall or ceiling when the equipment is mounted as in normal use.

The duration of the test shall be 10 min.

8.2 *Test for second numeral 2*

The dripping equipment is the same as that specified in Sub-clause 8.1 and is adjusted to give the same rate of discharge.

The equipment is tested for 2.5 min in each of four fixed positions of tilt. These positions are 15° either side of the vertical in two mutually perpendicular planes.

The total duration of the tests shall be 10 min.

8.3 *Test for second numeral 3*

The test shall be made using equipment such as is shown in Figure 4, page 27, provided that the dimensions and shape of the enclosure to be tested are such that the radius of the oscillating tube does not exceed 1 m. Where this condition cannot be fulfilled, a hand-held spray device, as shown in Figure 5, page 28, shall be used.

a) Conditions when using test equipment as in Figure 4

Water pressure: 80 kN/m² (0.8 bar) approx.

The water supply shall be capable of delivering at least 10 l/min.

Method: The oscillating tube shall be provided with spray holes over an arc of 60° either side of the centre point and shall be fixed in a vertical position; the test enclosure is mounted on a turntable with a vertical axis and is located at approximately the centre point of the semicircle. The turntable is rotated at a convenient speed so that all parts of the enclosure are wetted during the test.

The minimum test duration shall be 10 min.

When it is not practicable to rotate the enclosure on a turntable, it shall be placed at the centre of the semicircle and the tube shall be oscillated through an angle of 60° either side of the vertical position at a rate of approximately 60°/s for 5 min. The enclosure is then turned through a horizontal angle of 90° and the test continued for a further 5 min.

b) Conditions when using test equipment as in Figure 5

The counterbalanced shield shall be in place for this test.

The water pressure is adjusted to give a delivery rate of 10 ± 0.5 l/min (pressure approximately 80–100 kN/m² (0.8–1.0 bar)).

The test duration shall be 1 min per m² of calculated surface area of the enclosure (excluding any mounting surface) with a minimum duration of 5 min.

Notes 1. — For the purpose of this test, the surface area of the enclosure shall be calculated with an accuracy of ± 10%.

2. — Adequate safety precautions should be taken when testing equipment in the energized condition.

8.4 *Test for second numeral 4*

The conditions for deciding whether the apparatus of Figure 4, page 27, or that of Figure 5, page 28, should be used are the same as stated in Sub-clause 8.3.

a) Using the equipment of Figure 4

The oscillating tube shall have holes drilled over the whole 180° of the semicircle. The test duration, rate of oscillation and water pressure are as given in Sub-clause 8.3*a)*.

The support for the equipment under test shall be perforated so as to avoid acting as a baffle and the enclosure shall be sprayed from every direction by oscillating the tube to the limit of its travel in each direction.

b) Using the equipment of Figure 5

The counterbalanced shield is removed from the spray nozzle and the equipment is sprayed from all practicable directions.

The rate of water delivery and the spraying time per unit area are as specified in Sub-clause 8.3*b)*.

8.5 *Test for second numeral 5*

The test is made by spraying the enclosure from all practicable directions with a stream of water from a standard test nozzle as shown in Figure 6, page 29. The conditions to be observed are as follows:

— nozzle internal diameter: 6.3 mm
— delivery rate: 12.5 l/min ± 5%
— water pressure* at the nozzle: approximately 30 kN/m² (0.3 bar)

* The pressure should be adjusted to achieve the specified delivery rate. At 30 kN/m², the water should rise freely for a vertical distance of approximately 2.5 m above the nozzle.

— test duration per m² of surface area of enclosure: 1 min
— minimum test duration: 3 min
— distance from nozzle to enclosure surface: approximately 3 m

(This distance may be reduced if necessary to ensure proper wetting when spraying upwards.)

8.6 *Test for second numeral 6*

The test is made by spraying the enclosure from all practicable directions with a stream of water from a standard test nozzle as shown in Figure 6. The conditions to be observed are as follows:

— internal diameter of the nozzle: 12.5 mm
— delivery rate: 100 l/min ± 5%
— water pressure* at the nozzle: approximately 100 kN/m² (1 bar)
— test duration per m² of surface area of enclosure: 1 min
— minimum test duration: 3 min
— distance from the nozzle to the enclosure surface: approximately 3 m

* The pressure should be adjusted to achieve the specified delivery rate. At 100 kN/m², the water should rise freely for a vertical distance of approximately 8 m above the nozzle.

8.7 *Test for second numeral 7*

The test is made by completely immersing the enclosure in water so that the following conditions are satisfied:

a) the surface of the water shall be at least 150 mm above the highest point of the enclosure.

b) the lowest portion of the enclosure shall be at least 1 m below the surface of the water.

c) the duration of the test shall be at least 30 min.

d) the water temperature shall not differ from that of the equipment by more than 5 °C. However, this requirement may be modified by the relevant Technical Committee if the tests are to be made when the equipment is energized or running.

8.8 *Test for second numeral 8*

The test conditions are subject to agreement between manufacturer and user, but they shall not be less severe than those prescribed in Sub-clause 8.7.

8.9 *State of the equipment after the tests*

After testing in accordance with the appropriate requirements of Sub-clauses 8.1 to 8.8, the enclosures shall be inspected for ingress of water.

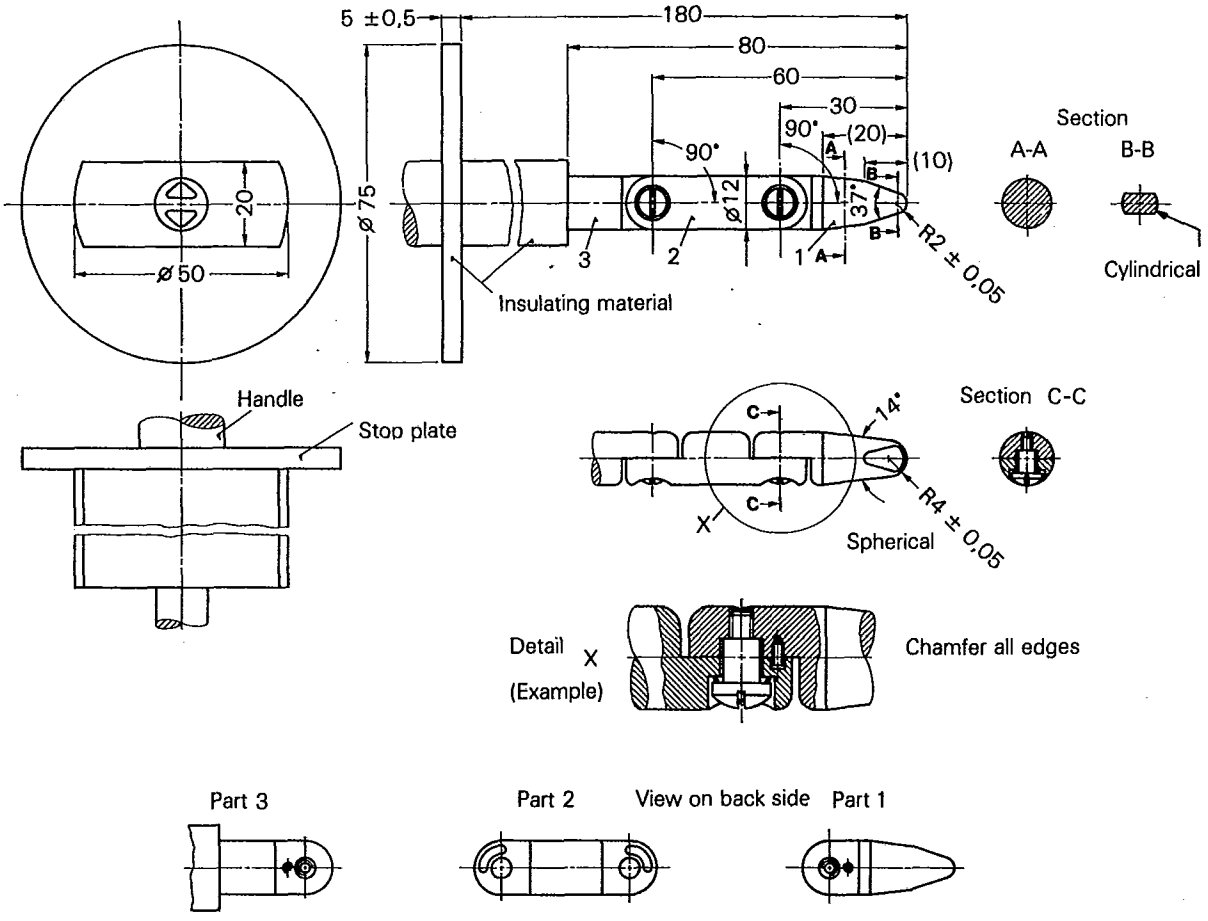
It is the responsibility of the relevant Technical Committee to specify, if possible, the amount of water which may be allowed to enter the enclosure.

In general, if any water has entered, it shall not:

— be sufficient to interfere with satisfactory operation of the equipment;
— reach live parts or windings not designed to operate when wet;
— accumulate near the cable end or enter the cable.

If the enclosure is provided with drain holes, it should be proved by inspection that any water which enters does not accumulate and that it drains away without doing any harm to the equipment.

If the enclosure is not provided with drain holes, consideration should be given to the possible build-up of water which may occur.



Linear dimensions in millimetres

Tolerances on dimensions without specific tolerance:

on angles: $^{0}_{-10'}$

on linear dimensions:

up to 25 mm: $^{+0}_{-0.05}$

over 25 mm: ±0.2

Material of finger: e.g. heat-treated steel

Both joints of this finger may be bent through an angle of $90\ ^{+10^\circ}_{0}$, but in one and the same direction only.

Using the pin and groove solution is only one of the possible approaches in order to limit the bending angle to 90°. For this reason dimensions and tolerances of these details are not given in the drawing. The actual design must ensure a 90° bending angle with a 0 to +10° tolerance.

FIG. 1. — Standard test finger.

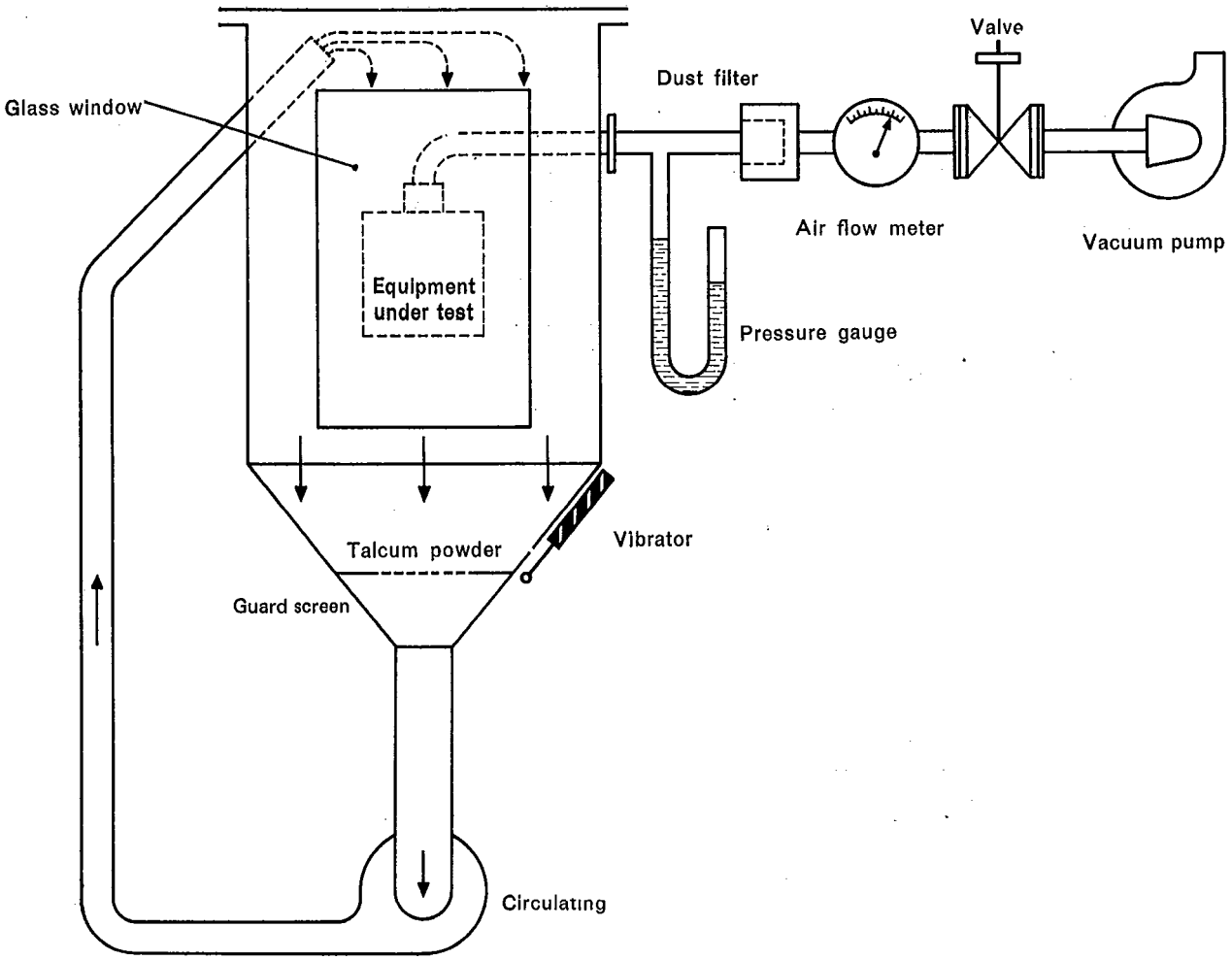
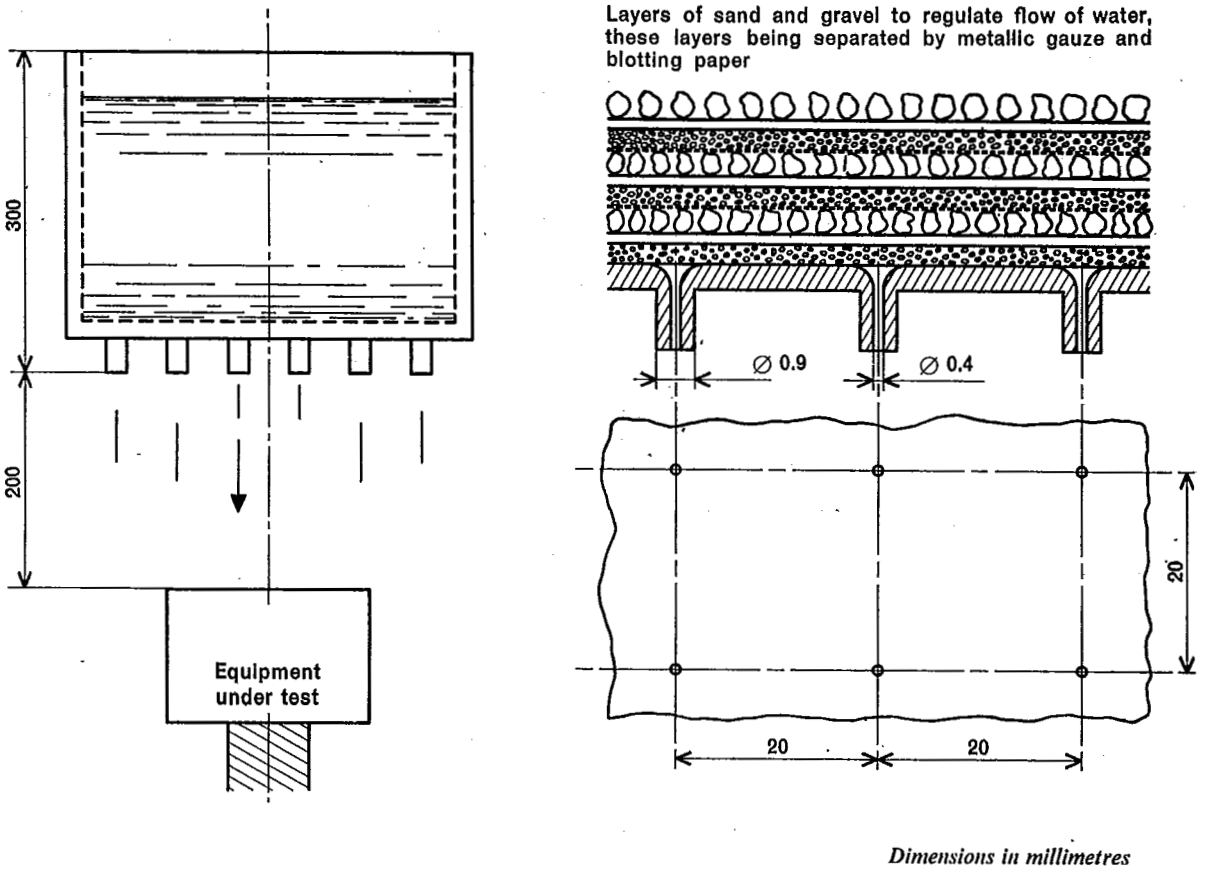


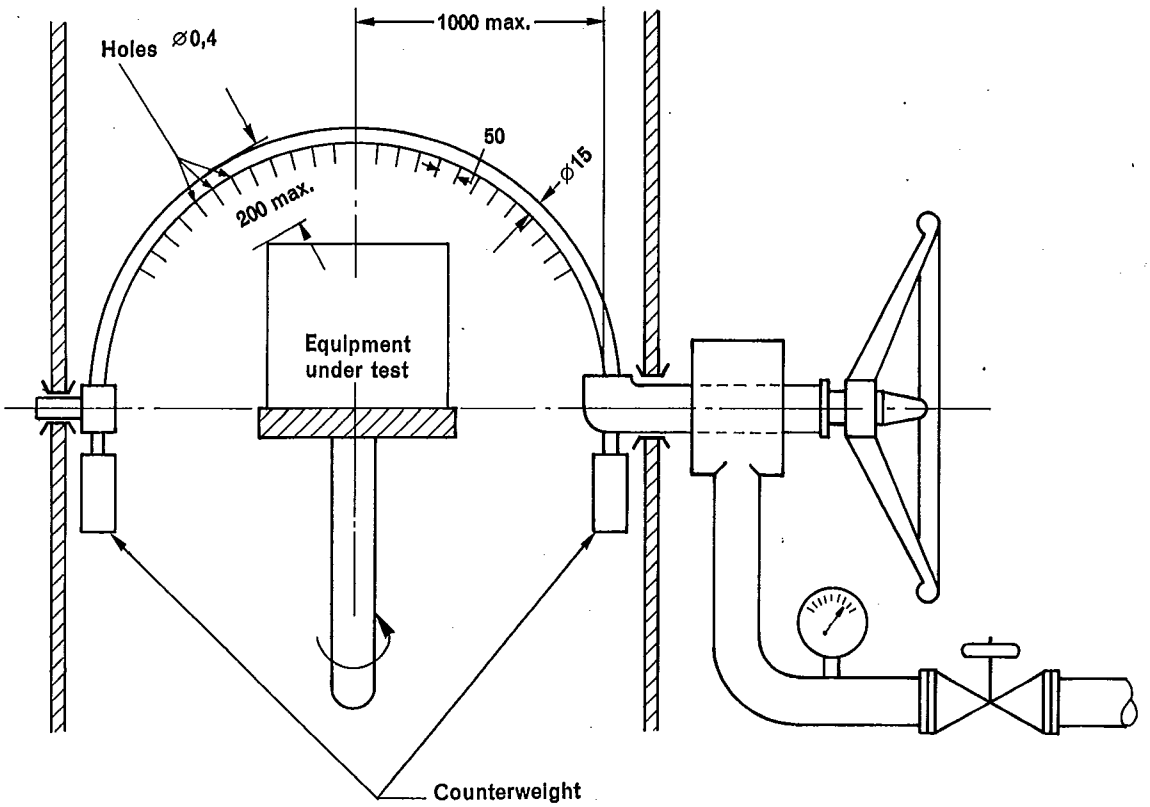
FIG. 2. — Equipment to prove protection against dust.



Dimensions in millimetres

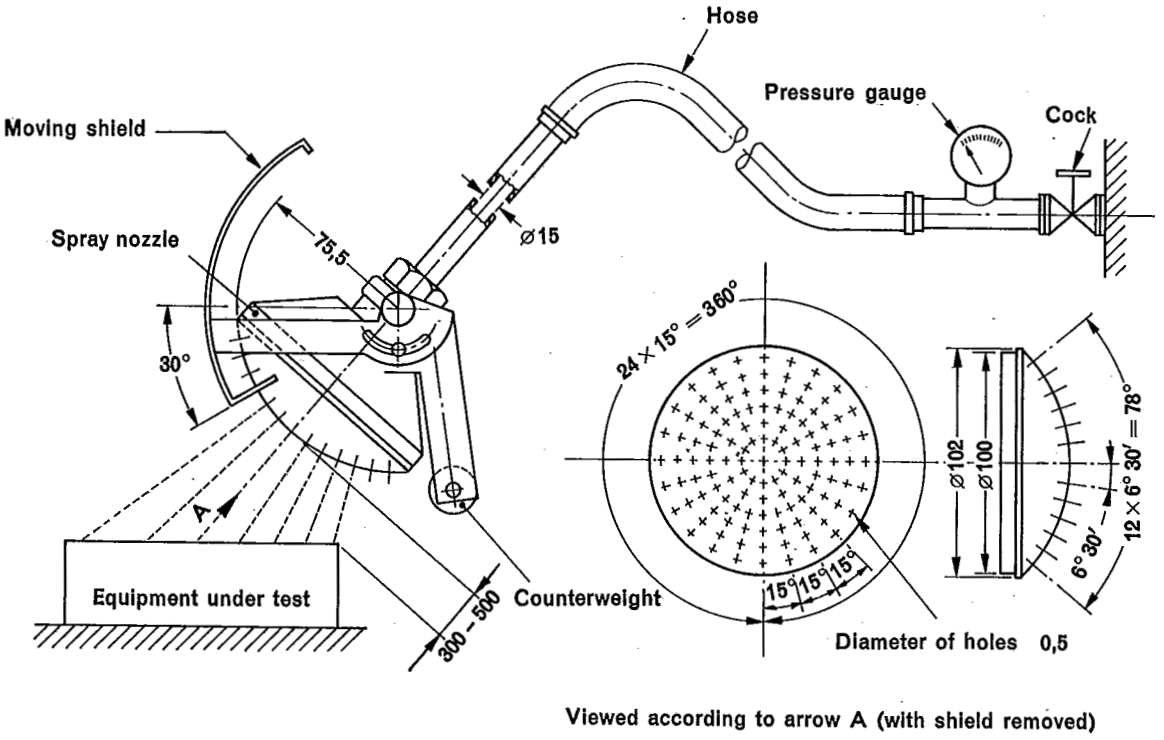
Note. — The support must be smaller than the equipment under test.

FIG. 3. — Equipment to prove protection against drops of water.



Dimensions in millimetres

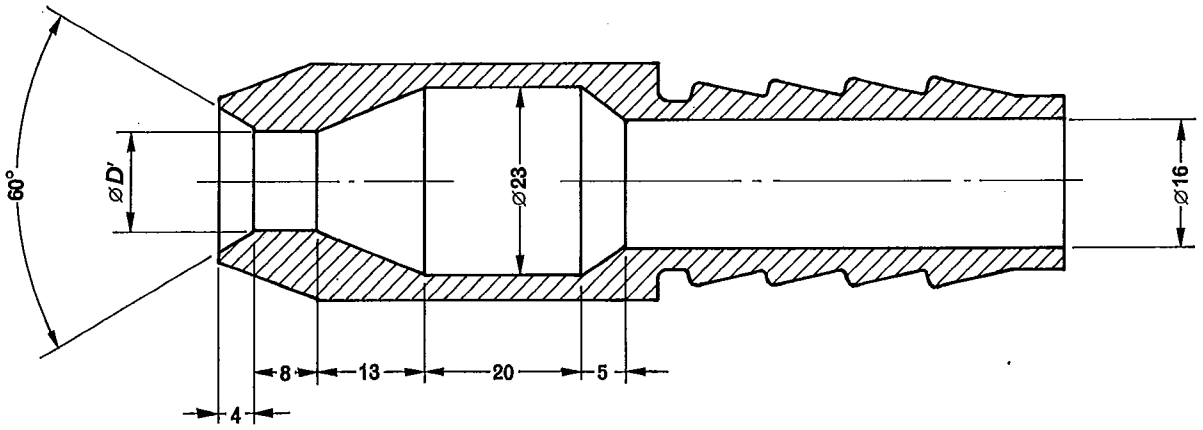
FIG. 4.— Equipment to prove protection against spraying and splashing water.



Dimensions in millimetres

121 holes of Ø 0.5:
1 hole at the centre
2 inner circles of 12 holes at 30° pitch
4 outer circles of 24 holes at 15° pitch
Moving shield — Aluminium
Spray nozzle — Brass

FIG. 5. — Hand-held equipment to prove protection against spraying and splashing water.



D' = 6,3 mm for the tests of Sub-clause 8.5

D' = 12,5 mm for the tests of Sub-clause 8.6

FIG. 6. — Standard nozzle for hose tests.

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Committee reference GEL/97 Draft for comment 68/17419

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Post Office
Radio and Electronic Components Manufacturers' Federation
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Control and Automation Manufacturers' Association (BEAMA)
Electrical Installation Equipment Manufacturers' Association (BEAMA)
Rotating Electrical Machines Association (BEAMA)

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Amendments issued since publication

Amd. No.	Date of issue	Text affected
2804	April 1979	Indicated by a line in the margin
4458	December 1983	Indicated by a line in the margin
—	May 1986	Clause 7.5. a) Dust test. Correction to second sentence