

SOUTH AFRICAN NATIONAL STANDARD

**Plug and socket outlet systems for household
and similar purposes for use in South Africa**

Part 1: Conventional system, 16 A 250 V a.c.

**WARNING — Can only be used
in conjunction with
SANS 164-0.**

SANS 164-1:2012
Edition 5.2

Table of changes

Change No.	Date	Scope
Amdt 1	2007	Amended to include maximum lengths of sleeves on plug pins, to clarify a drawing, and to change a dimension on the gauge in annex D.
Amdt 2	2012	Amended to state the phasing out period, to restrict the dimensions in standard sheets 1-1, 1-2 and annex D, and to add requirements for the multi-pin gauge.

Foreword

This South African standard was approved by National Committee SABS SC 67C, *Electricity distribution systems and components – Electrical accessories* in accordance with procedures of the SABS Standards Division, in compliance with annex 3 of the WTO/TBT agreement.

This document was published in December 2012.

This document supersedes SANS 164-1:2007 (edition 5.1).

A vertical line in the margin shows where the text has been technically modified by amendment No. 2.

Over the next 5 years SANS 164-1 will be superseded by SANS 164-2 as the applicable standard for the conventional plug and socket-outlet system in South Africa. Amdt 2

This document, by reference in SANS 164-0, is referenced in the *Compulsory specification for plugs, socket-outlets and socket-outlet adaptors*, as published by Government Notice R. 1013 (Government Gazette 33763) of 19 November 2010.

SANS 164 consists of the following parts, under the general title *Plug and socket-outlet systems for household and similar purposes for use in South Africa*:

Part 0: General and safety requirements.

Part 1: Conventional system, 16 A 250 V a.c.

Part 2: IEC system, 16 A 250 V a.c.

Part 3: Conventional system, 6 A 250 V a.c.

Part 4: Dedicated system, 16 A 250 V a.c.

Part 5: Two-pole, non-rewirable plugs, 2,5 A 250 V a.c., with cord, for connection of class II equipment.

Part 6: Two-pole system, 10 A 250 V a.c. and 16 A 250 V a.c., for connection of class II equipment.

Annexes A, B, C, D, E and F form an integral part of this document.

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SANS 164-1:2012

Edition 5.2

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Plug and socket-outlet systems for household and similar purposes for use in South Africa

Part 1:

Conventional system, 16 A 250 V a.c.

1 Scope

This part of SANS 164 covers the rating and dimensions of the conventional 16 A 250 V a.c. plug and socket-outlet system and socket-outlet adaptors for household and similar purposes, for use in South Africa.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of SANS 164. All standards are subject to revision and, since any reference to a standard is deemed to be a reference to the latest edition of that standard, parties to agreements based on this part of SANS 164 are encouraged to take steps to ensure the use of the most recent edition of the standards indicated below. Information on currently valid national and international standards can be obtained from the SABS Standards Division.

SANS 164-0, *Plug and socket-outlet systems for household and similar purposes for use in South Africa – Part 0: General and safety requirements.*

SANS 60884-1, *Plugs and socket-outlets for household and similar purposes – Part 1: General requirements.*

3 Definitions

For the purposes of this part of SANS 164, the definitions given in SANS 164-0 apply.

4 Requirements

4.1 The requirements of SANS 164-0 apply.

4.2 Socket-outlets, socket-outlet adaptors and rewirable plugs shall be rated at 16 A and 250 V a.c.

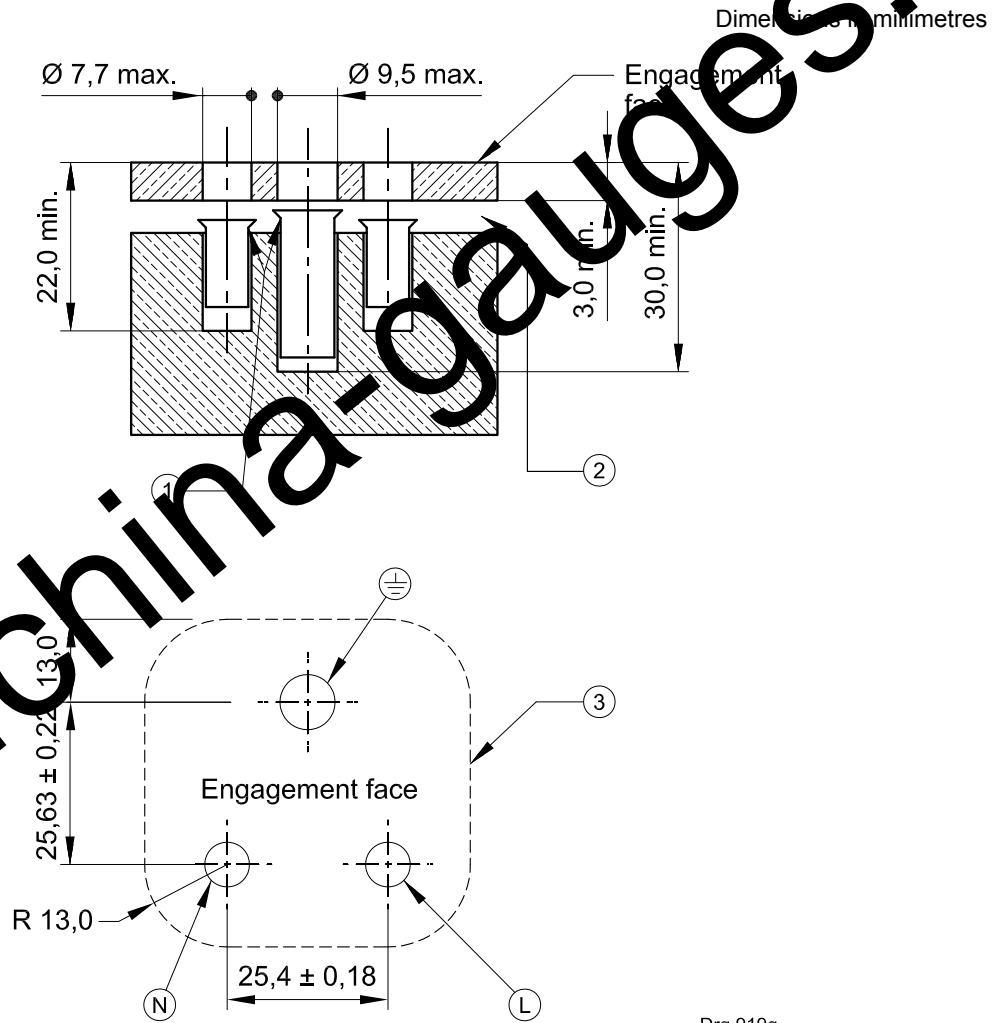
4.3 Plugs and socket-outlets shall comply with the dimensions given on the appropriate of standard sheets 1-1 or 1-2.

Use the gauges given in annexes A to F for checking the dimensions.

4.4 When tested in accordance with 22.2 in SANS 60884-1:2006, the maximum multi-pin gauge force for products above 10 A up to and including 16 A 3-poles shall be reduced to 25 N.

Amdt 2

Standard sheet 1-1 — 16 A Two-pole and earthing-contact socket-outlets



Amdt 1; amdt 2

Explanation of reference numbers on standard sheet 1-1

Amdt 2

1 Chamfer to laid entry of plug pins.

Amdt 2

2 Space for shutters.

Amdt 2

3 The restricted encroachment area is to allow unimpeded engagement of plugs and adaptors.

Amdt 2

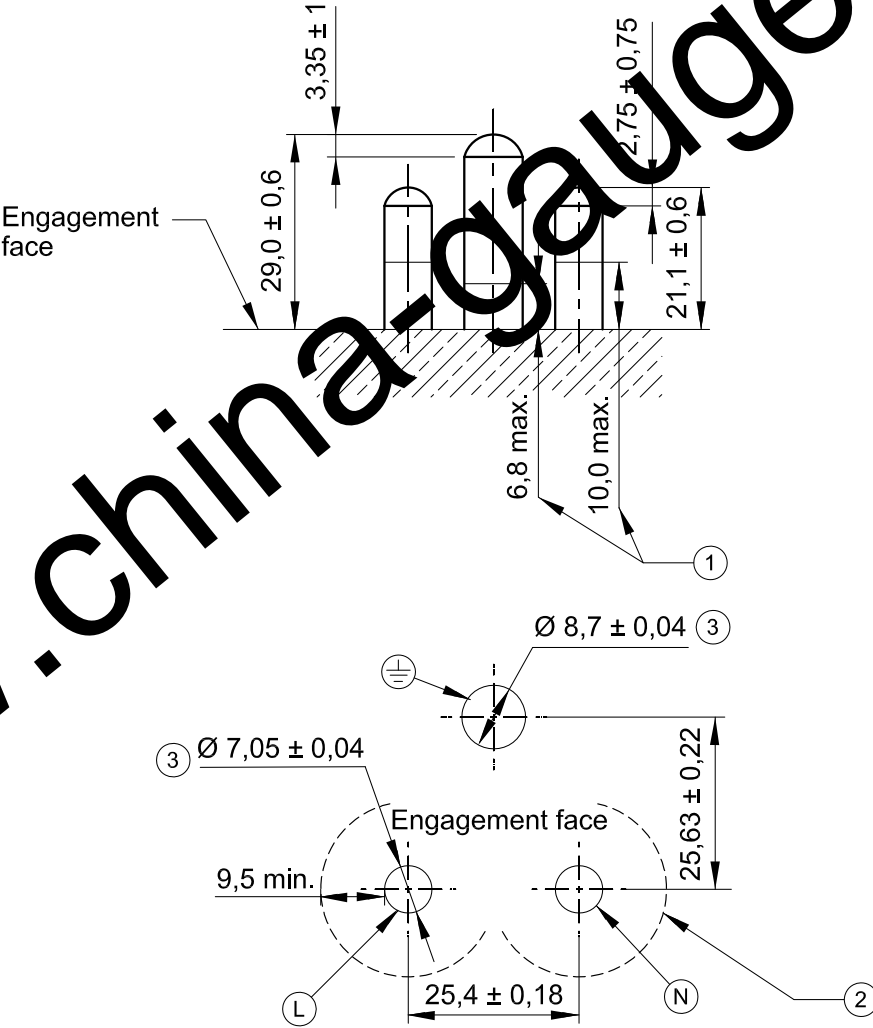
NOTE 1 Single pin insertion tests are covered in annex D.

Amdt 2

NOTE 2 Typical features that may encroach on and impede plug access are switches, overload devices, and indicator lamp

Standard sheet 1-2 — 16 A 250 V Two-pole and earthing-pin plugs

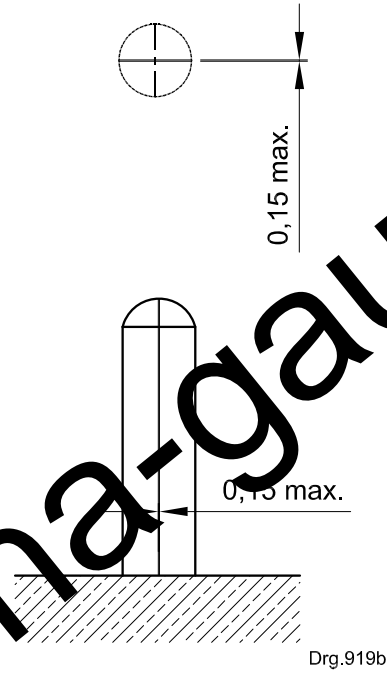
Dimensions in millimetres



Drg.919h

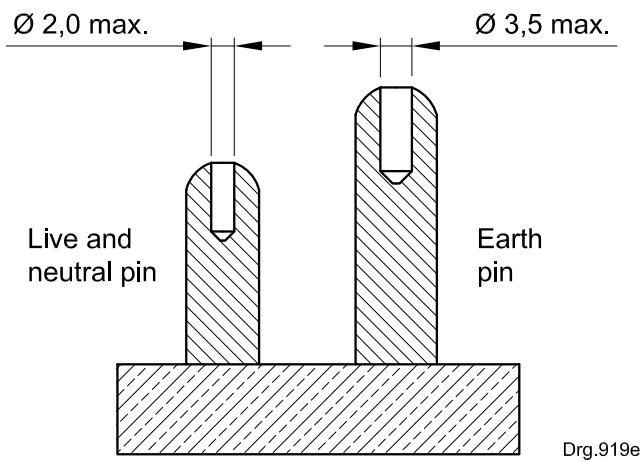
Amdt 1; amdt 2

Folded contact pins: Maximum seam width



Amdt 2

Machined contact pins: Maximum flat spot or core dimensions

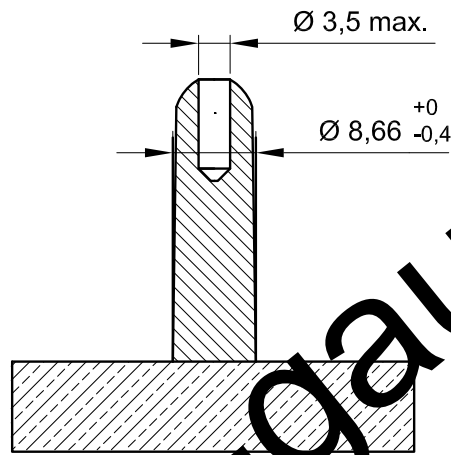


Amdt 2

Standard sheet 1-2 (concluded)

Dimensions in millimetre

Moulded plastic earth pin: Maximum taper dimensions



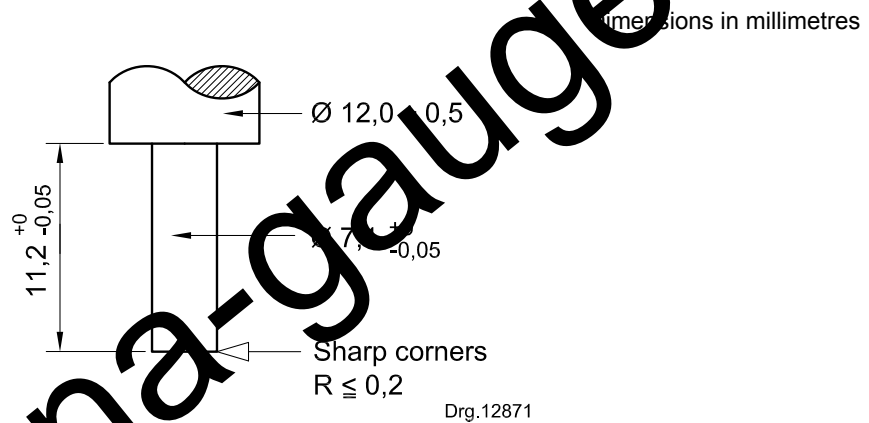
Drg.919f

Explanation of reference numbers on standard sheet 1-2

- | | |
|--|--------|
| 1 Maximum length of insulating sleeves. | Amdt 2 |
| 2 Minimum profile of plug body if pins are not sleeved. | Amdt 2 |
| 3 Pin diameter is measured by means of a micrometer. Measurements are taken at at least two places, 90° apart, at two points: | Amdt 2 |
| a) one situated at the radius transition point; and | Amdt 2 |
| b) the other at a distance of between 5 mm and 10 mm from the end of the pin. | Amdt 2 |
| All measurements shall be within the specified limits. | Amdt 2 |

Annex A
(normative)

Gauge for the distance from the engagement face to the current-carrying contact tubes of socket-outlets

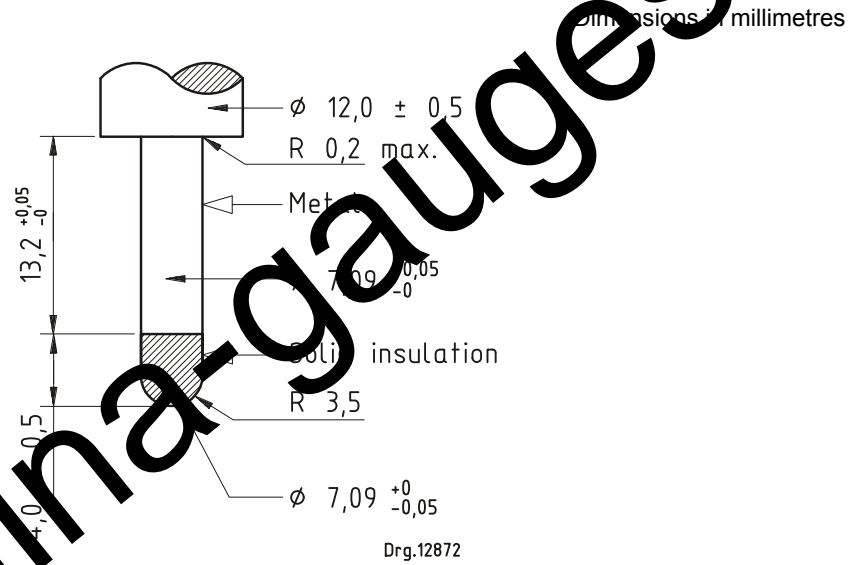


Insert the gauge as far as possible into the guidance hole of a socket-outlet, with shutters removed. Move the gauge around the periphery of the guidance hole, and ensure that it does not make contact with the socket-outlet contact tube. Indication of contact shall be by means of a lamp connected between the gauge and the appropriate contact tube. The a.c. or d.c. voltage of the circuit shall be between 12 V and 24 V.

Gauges shall be made of a hard, corrosion-resistant metal such as stainless steel.

Annex B
(normative)

**Gauge for the distance from the engagement face to the point of first contact with the current-carrying contacts of socket-outlets
(no contact gauge)**

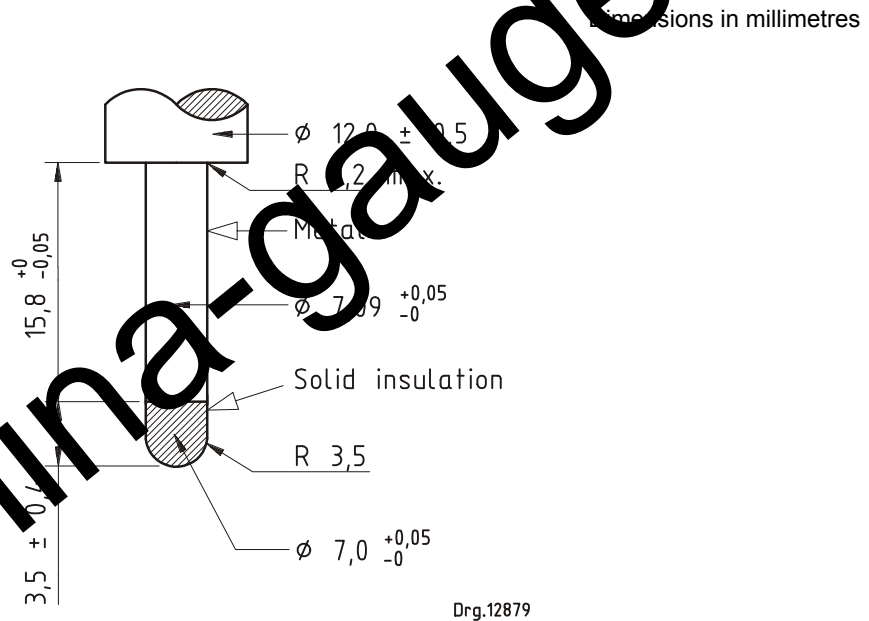


Insert the gauge as far as possible into the guidance hole of a socket-outlet. The indicator lamp described in annex A shall not light.

NOTE: the insulated tips of gauges are for guiding the gauges.

Annex C
(normative)

Gauge for the distance from the engagement face to the point of first contact with the current-carrying contacts of socket-outlets (contact gauge)



Insert the gauge as far as possible into the guidance hole of a socket-outlet. The indicator lamp described in annex A shall light. **Amdt 2**

NOTE The insulated tips of gauges are for guiding the gauges.

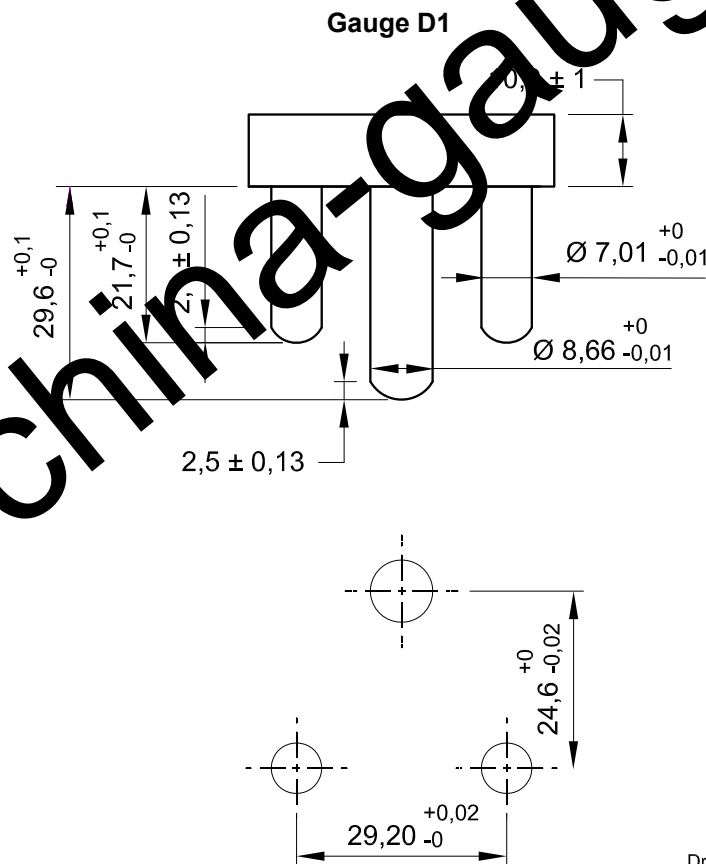
Annex D
(normative)

**Gauges for proving that it is not possible to make connection
between a pin of a plug and a current-carrying contact of a
socket-outlet while any other current-carrying pin is accessible**
(See requirements for protection against electric shock in SANS 60884-1)

Amdt 1

NOTE The tests in accordance with this annex are conducted on socket-outlets with fully functional shutters.
Amdt 2

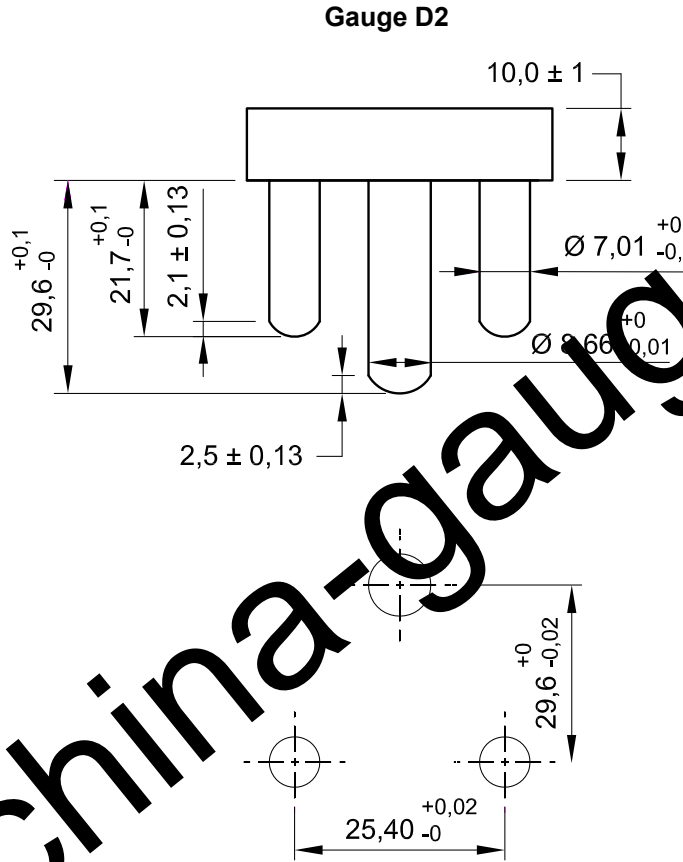
Dimensions in millimetres



Drg.919c

Amdt 1; amdt 2

Dimensions in millimetres



Drg.919d

Notes on the application of gauges D1 and D2

a) Gauge D1 is inserted so as to attempt:

i) the engagement of the earth pin and neutral pin, and

b) the engagement of the earth pin and the live pin into the socket contacts.

In both cases it shall not be possible to fully engage the gauge into the socket. Contact engagement is determined such that an indicator lamp, as described in annex E, connected between the gauge plug and both socket-outlet current-carrying contact tubes, shall not light when the gauge plug is inserted into the sample socket.

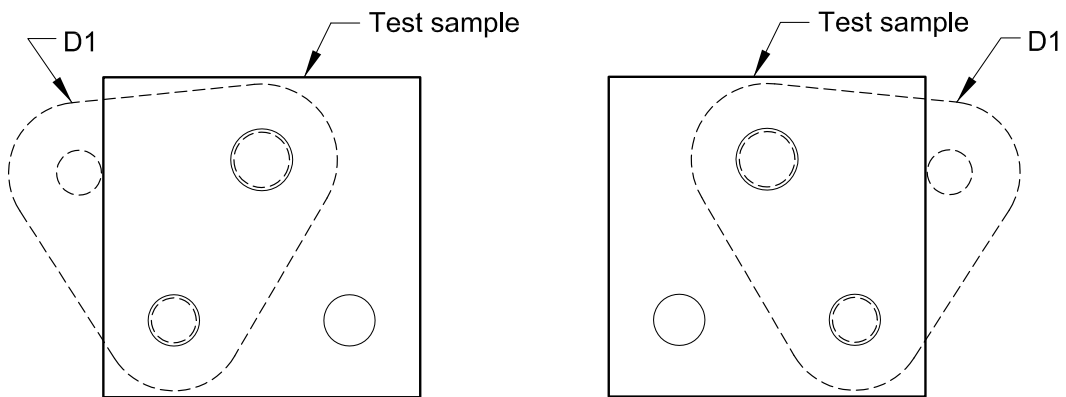
Amdt 2

Amdt 2

Amdt 2

Amdt 2

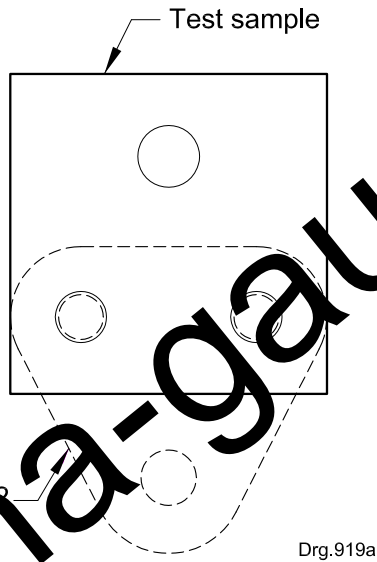
Amdt 2



Drg.919

Amdt 2

2 Gauge D2 is inserted so as to attempt the engagement of the live and neutral pins whilst the earth pin is left exposed. It shall not be possible to fully engage the gauge into the socket and expose the earth pin. Contact engagement is determined such that an indicator lamp as described in annex E, connected between the gauge plug and both socket-outlet current-carrying contact tubes, shall not light when the gauge plug is inserted into the sample socket. **Amdt**



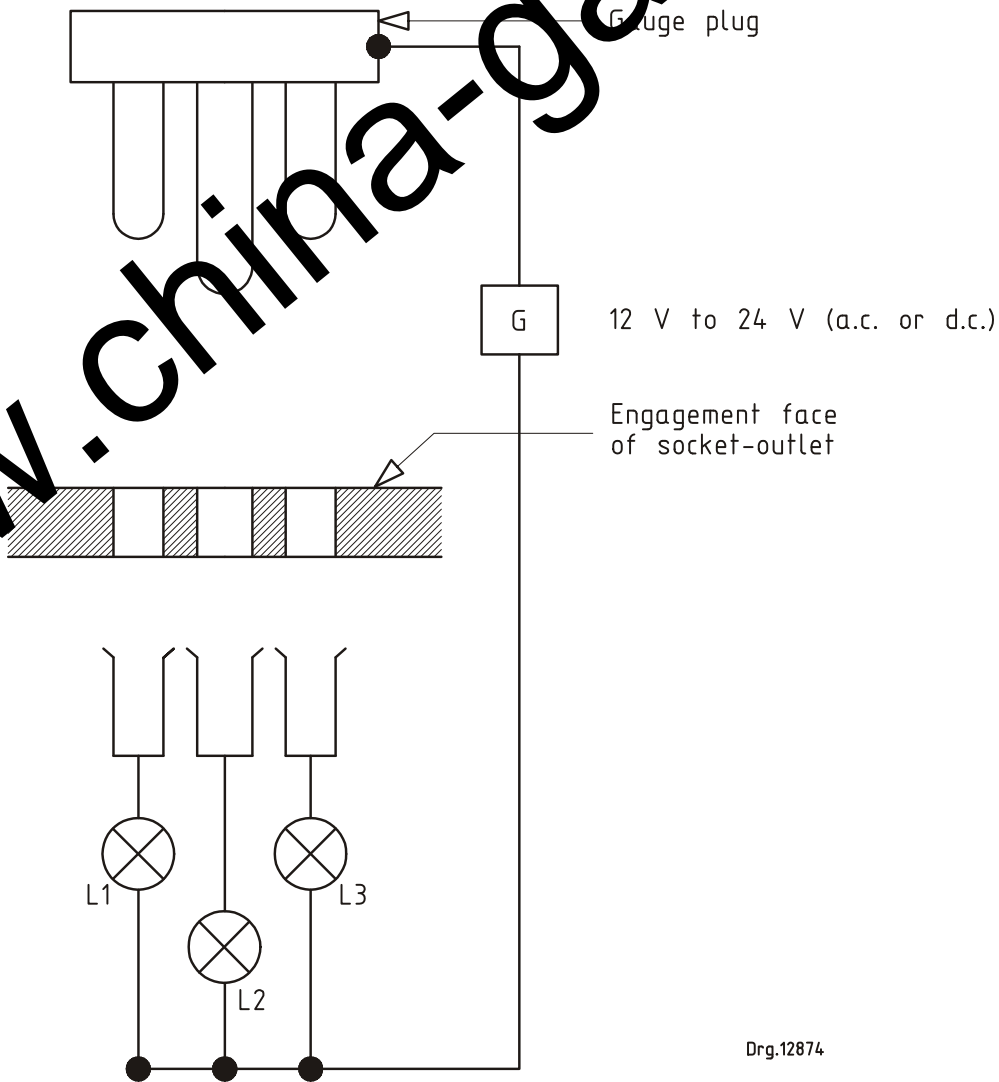
3 The force applied perpendicular to the gauge shall not exceed 20 N in all cases. **Amdt 2**

4 The gauges shall be of a hard, corrosion-resistant metal such as stainless steel. **Amdt 2**

Annex E
(normative)

Gauge for proving that, during insertion of a plug, the earth pin makes connection before either of the current-carrying pins, and that, during plug withdrawal, both current-carrying pins break connection before the earth pin (see requirements for protection against electric shock in SANS 60884-1)

Gauge E is used as a test plug and is constructed in the same manner as gauge D1 with the exception that the dimensions of the pins are the same as the nominal dimensions described in standard sheet 1-2. Amdt 2



Notes on the application of gauge E

Amdt 2

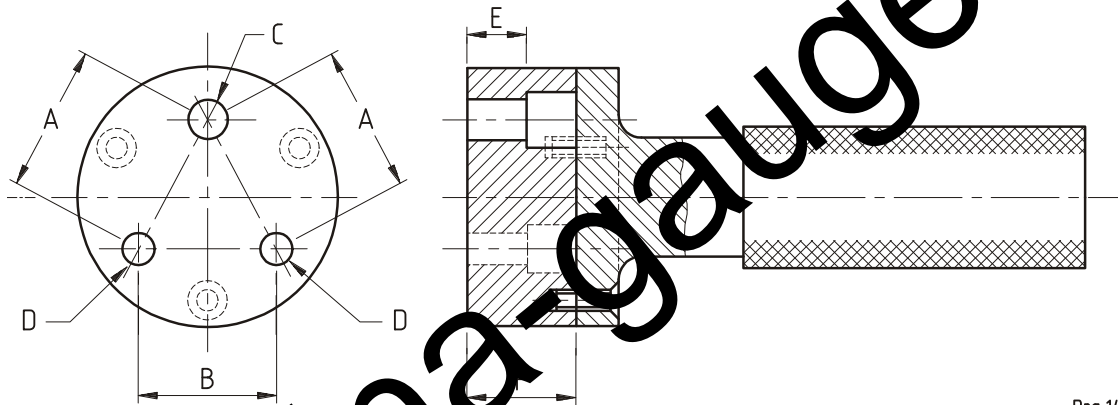
- 1 The gauge shall be of a hard corrosion-resistant metal such as stainless steel. Amdt 2
- 2 Using gauge E connect an indicator lamp as shown above. Amdt 2
- 3 The gauge, when inserted without undue force and at any possible angle shall cause lamp L2 to light up before either L1 or L3. Amdt 2
- 4 When the gauge is withdrawn at any possible angle, both lamps L1 and L3 shall go out before L2. Amdt 2

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Annex F
(normative)

"GO" gauges for plugs and socket-outlets

F.1 "GO" gauge for plugs



Drg.14554

Table F.1 — Dimensions of "GO" gauge for plugs

Dimensions in millimetres									
1	2	3	4	5	6	7	8	9	10
Rate of error A	A	B	Tolerance for A and B	C	D	Tolerance for C and D	E	F	Tolerance for E and F
16	28,58	25,40	± 0,03	8,87	7,21	+ 0,01 - 0,00	11,10	31	± 0,5

All plugs shall be capable of insertion into the relevant gauge without undue force.

Annex F (continued)

F.2 "GO" gauge for socket-outlets

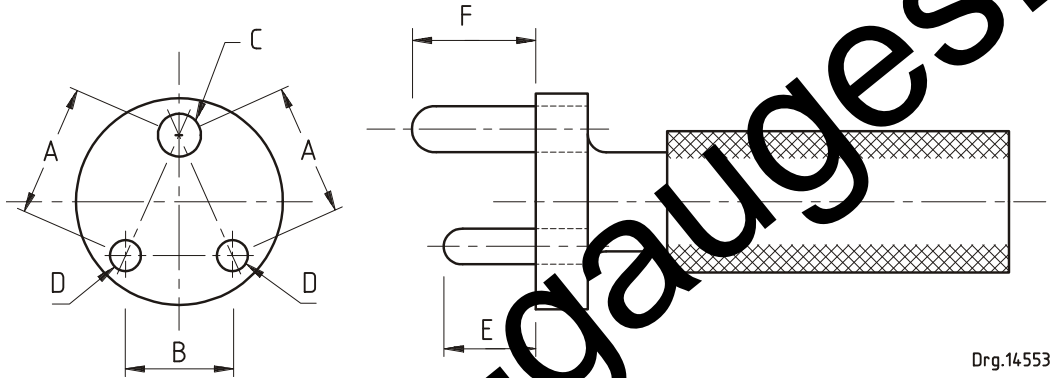


Table F.2 (a) — Dimensions of maximum "GO" gauge for socket-outlets

Dimensions in millimetres

1	2	3	4	5	6	7	8	9	10
Rated current A	A	B	Tolerance for A and B	C	D	Tolerance for C and D	E	F	Tolerance for E and F
16	28,72	25,55	± 0,03	8,74	7,09	+ 0,00 - 0,01	21,8	29,8	+ 0,0 - 0,1

Table F.2 (b) — Dimensions of minimum "GO" gauge for socket-outlets

Dimensions in millimetres

1	2	3	4	5	6	7	8	9	10
Rated current A	A	B	Tolerance for A and B	C	D	Tolerance for C and D	E	F	Tolerance for E and F
16	28,43	25,25	± 0,03	8,74	7,09	+ 0,00 - 0,01	21,8	29,8	+ 0,0 - 0,1

Both maximum and minimum "GO" gauges shall enter all socket-outlets without undue force.

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