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मानक

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IS/IEC 60309-2 (2002): Plugs, Socket-Outlets and Couplers for Industrial Purposes, Part 2: Dimensional Interchangeability Requirements for Pin and Contact-Tube Accessories [ETD 14: Electrical Wiring Accessories]



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“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

औद्योगिक प्रयोजनों के लिए प्लग
सॉकेट-आऊटलेट और कपलर्स

भाग 2 पिन और सम्पर्क नलिका साधित्रों की आयाम विनिमय अपेक्षाएँ
(पहला पुनरीक्षण)

Indian Standard

**PLUGS, SOCKET-OUTLETS AND COUPLERS FOR
INDUSTRIAL PURPOSES**

**PART 2 DIMENSIONAL INTERCHANGEABILITY REQUIREMENTS
FOR PIN AND CONTACT-TUBE ACCESSORIES**

(First Revision)

ICS 29.120.30

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

NATIONAL FOREWORD

This Indian Standard (Part 2) (First Revision) which is identical with IEC 60309-2 (1999) 'Plugs, socket-outlets and couplers for industrial purposes — Part 2 : Dimensional interchangeability requirements for pin and contact-tube accessories' issued by the International Electrotechnical Commission (IEC) was adopted by the Bureau of Indian Standards on the recommendation of the Electrical Wiring Accessories Sectional Committee and approval of the Electrotechnical Division Council.

This standard (Part 2) was first published in 1996. The first revision has been undertaken to bring it in line with latest version of corresponding IEC publication.

The text of the IEC standard has been approved as suitable for publication as an Indian Standard without deviations.

This standard shall be read in conjunction with Part 1 of this standard.

In this adopted standard, certain terminology and convention are however not identical to those used in Indian Standard. Attention is particularly drawn to the following.

- a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'; and
- b) Comma (,) has been used as a decimal marker, while in Indian Standard, the current practice is to use a point (.) as the decimal marker.

Only the English text of the IEC Publication has been retained while adopting it as an Indian Standard, and as such the page numbers given here are not same as in IEC Publication.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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Indian Standard

**PLUGS, SOCKET-OUTLETS AND COUPLERS FOR
INDUSTRIAL PURPOSES**

**PART 2 DIMENSIONAL INTERCHANGEABILITY REQUIREMENTS
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(First Revision)

1 Scope

Replacement:

This standard applies to plugs and socket-outlets, cable couplers and appliance couplers with a rated operating voltage not exceeding 690 V, 500 Hz and a rated current not exceeding 125 A, primarily intended for industrial use, either indoors or outdoors.

NOTE – All references for accessories with a rated current of more than 125 A in part 1 are not applicable to this part 2.

This standard applies to plugs and socket-outlets, cable couplers and appliance couplers with pins and contact tubes of standardized configurations.

This standard applies to plugs and socket-outlets, cable couplers and appliance couplers, hereinafter referred to as accessories, for use when the ambient temperature is normally within the range $-25\text{ }^{\circ}\text{C}$ to $40\text{ }^{\circ}\text{C}$.

The use of these accessories on building sites and for agricultural, commercial and domestic applications is not precluded.

Socket-outlets or appliance inlets incorporated in or fixed to electrical equipment are within the scope of this standard. This standard also applies to accessories intended to be used in extra-low voltage installations.

NOTE – This standard does not apply to accessories primarily intended for domestic and similar general purposes. In locations where special conditions prevail, for example on board ship or where explosions are liable to occur, additional requirements may be necessary.

2 Definitions

This clause of part 1 is applicable except as follows:

Additional subclause:

2.101

phase inverter

a plug or an appliance inlet with operating means to interchange the position of two phase pins without disconnecting them from the conductors

3 Normative references

This clause of part 1 is applicable except as follows:

Addition:

IEC 60617-2:1996, *Graphical symbols for diagrams – Part 2: Symbol elements, qualifying symbols and other symbols having general application*

4 General

This clause of part 1 is applicable except as follows:

Additional subclause:

4.101 If gauges are used, they shall be of hardened steel, all corners shall be slightly rounded-off with a maximum radius of 0,1 mm, and the surface finish for all measurement surfaces shall be $\sqrt[0.8]{Ra}$ min., if not otherwise specified.

In this standard:

2P + $\frac{1}{2}$ covers both 2P + $\frac{1}{2}$ and 1P + N + $\frac{1}{2}$ and

3P + $\frac{1}{2}$ covers both 3P + $\frac{1}{2}$ and 2P + N + $\frac{1}{2}$

unless specifically excluded (see table 104).

5 Standard ratings

This clause of part 1 is applicable except as follows:

5.2 Replacement:

Standard rated currents are given in table 101.

Table 101

Series I	Series II
A	A
16	20
32	30
63	60
125	100

6 Classification

This clause of part 1 is applicable except as follows:

6.1.2 Replacement:

According to degrees of protection:

- either in accordance with IEC 60529: IP44, IP67
- or according to degree of protection against moisture:
 - splash-proof accessories;
 - watertight accessories.

For new designs, degrees of protection according to IEC 60529 shall be used.

7 Marking

This clause of part 1 is applicable except as follows:

7.1 Modification:

Delete the note

Addition:

The symbol indicating the position of the earthing contact or of the minor key or keyway shall be placed before or above the figure for the rated operating voltage, and separated from it by a line.

These markings shall be placed after that for rated current, separated from it by a dash if an oblique line separates the symbol indicating the position of the earthing contact or of the minor key or keyway from the figure for the rated operating voltage.

If a symbol for nature of supply is used, it shall be placed next to or below the marking for rated operating voltage.

For three-phase accessories it is not necessary to mark the voltage phase to neutral, if any.

The marking for rated current(s), position of the earthing contact or the minor key, keyway, rated operating voltage(s) and nature of supply accordingly may be as follows:

For series I:

16 A - 9 h/400 V~, or 16 - 9 h/400~, or 16 - $\frac{9 \text{ h}}{400 \sim}$, or

16 A - 9 h/380-415 V~, or 16 - 9 h/380-415~, or 16 - $\frac{9 \text{ h}}{380 - 415 \sim}$

32 A - 6 h/230/400 V~, or 32 - 6 h/230/400~, or 32 - $\frac{6 \text{ h}}{230 / 400 \sim}$, or

32 A - $\frac{6 \text{ h} / 220 / 380 \text{ V} \sim}{240 / 415 \text{ V} \sim}$, or 32 - $\frac{6 \text{ h} / 220 / 380 \sim}{240 / 415 \text{ V} \sim}$, or 32 - $\frac{6 \text{ h}}{220 / 380 \sim}$
240 / 415 ~

For series II

20 A - 7 h/480 V a.c. or 20 A - 7 h/480~, or 20 A - $\frac{7 \text{ h}}{480 \sim}$

30 A - 7 h/480 V, 3 Phase, or 30 A - 7 h/480, 3Φ, or 30 A - $\frac{7 \text{ h}}{480 \text{ V, } 3\Phi}$

60 A - 7 h/277/480 V, 3 Phase Y, or 60 A - 7 h/277/480, 3ΦY, or 60 A - $\frac{7 \text{ h}}{277 / 480 \text{ V, } 3\Phi Y}$

It is allowed to put the symbols for a.c. (~) and d.c. (— or —) after the values (IEC 60617-2).

The drawings of standard sheets 2-I, 2-II, 2-III and 2-IV show accessories with the symbol 6 h and those of standard sheets 2-VIII and 2-IX accessories with the symbol 12 h.

For accessories having rated operating voltages exceeding 50 V, the symbol indicating the position of the earthing contact shall be a numeral followed by the letter h.

The numeral is derived from the position of the earth contact tube, when compared with the face of a clock, the socket-outlet or connector being viewed from the front with the keyway at the sixth hour.

For accessories having rated operating voltages not exceeding 50 V, the symbol indicating the position of the minor key shall be a numeral followed by the letter h.

The numeral is derived from the position of the minor key, when compared with the face of a clock, the socket-outlet or connector being viewed from the front with the major key at the sixth hour.

For plugs and appliance inlets, the symbol indicating the position of the earthing contact or the minor keyway shall be the same as that for the corresponding socket-outlet or connector.

Contact tubes of socket-outlets and connectors shall be positioned in the clockwise order when viewed from the front as shown in the standard sheets (see also 7.5).

Pins of plugs and appliance inlets shall be positioned in the opposite order viewed from the front.

7.2 Modification:

Delete the following:

IPXX (relevant figures)..... degree of protection according to IEC 60529

Add the following:

Where IP Code is used only the following are permitted:

- IP44..... degree of protection according to IEC 60529
- IP67..... degree of protection according to IEC 60529

7.4 Replacement

For plugs and connectors, the marking specified in 7.1 shall be easily discernible when the accessory is wired ready for use.

The marking for insulation voltage shall be on the main part; it shall not be visible when the accessory is mounted and wired as in normal use.

NOTE 1 – The term "ready for use" does not imply that the plug or connector is engaged with its complementary accessory.

NOTE 2 – The term "main part" of a plug or a connector means the part carrying the contacts.

Compliance is checked by inspection.

7.5 Replacement

For rewirable accessories, the contacts shall be indicated by the following symbols.

- for accessories with three contacts (phase + neutral + earth, or, phase + phase + earth):

L / +, unmarked,  or 



except for Series II clock position 4 h and 5 h which are marked:

N, unmarked,  or 

- for accessories with four contacts (three phase + earth):

L1, L2, L3,  or  or alternatively 1, 2, 3,  or 

except for Series II clock position 12 h (phase + centre tap + phase + earth) which is marked:

L1, N, L2,  or 

- for accessories with five contacts (three phase + neutral + earth):


L1, L2, L3, N,  or  or alternatively 1, 2, 3, N  or 

- for a period of time the marking R1, S2, T3 may be used instead of L1, L2, L3.

These symbols shall be placed close to the relevant terminals; they shall not be placed on screws, removable washers or other removable parts.

For phase inverters these symbols shall conform in one position with the requirements of 7.1. In the other position of the inverting means, the phase marking need not conform.

NOTE – The terminals for pilot conductors are not required to be indicated.

The figures used with the letters may be written as an index. It is recommended that where practicable the symbol  be used.

Compliance is checked by inspection.

7.7 *Modification:*

This subclause of part 1 is applicable except for the following addition:

Add:

The 2P + N + earth, 12 h, Series II accessories shall use the indicating colour orange.

8 **Dimensions**

This clause of part 1 is applicable except as follows:

8.1 *Replacement:*

Accessories shall comply with the relevant standard sheets as specified below:

- accessories having rated operating voltages exceeding 50 V:
 - 16/20 A and 32/30 A: Sheets 2-I and 2-II;
 - 63/60 A and 125/100 A, without pilot contact: Sheets 2-III and 2-IV;
 - 63/60 A and 125/100 A, with pilot contact: Sheets 2-IIIa and 2-IVa;
 - mechanical interlock for 16 A to 125 A accessories Sheet 2-V
- accessories having rated operating voltage not exceeding 50 V:
 - 16/20 A and 32/30 A: Sheets 2-VIII and 2-IX.

Deviations from the dimensions specified in the standard sheets may be made, but only if they provide a technical advantage and do not adversely affect the purpose and safety of the accessories complying with the standard sheets, especially with regard to interchangeability and non-interchangeability.

Compliance is checked by means of gauges or by measurement for those dimensions not covered by gauges,

- *for accessories having rated operating voltages exceeding 50 V according to:*
 - *figures 101 and 102 for socket-outlets and connectors;*
 - *figures 107 and 108 for plugs and appliance inlets;*
- *for accessories having rated operating voltages not exceeding 50 V according to:*
 - *figures 110 and 112 for 16/20 A and 32/30 A accessories.*

The gauges shall be moved axially to the centre line of the accessory with a force as shown in the table 102, applied for 1 min.

Table 102

Rated operating voltage V	Rated current A		Force (max.) for "GO" gauge N	Force (max.) for "NOT GO" gauge N $\begin{pmatrix} 0 \\ -1 \end{pmatrix}$
	Series I	Series II		
Not exceeding 50 V	16	20	150	30
	32	30	150	30
Exceeding 50 V	16	20	60	20
	32	30	90	30
	63	60	165	55
	125	100	240	80

Before the test, the test specimen of insulating material shall be stored at a temperature of (20 ± 5) °C and a relative humidity between 45 % and 75 % for four weeks.

For accessories having rated operating voltages not exceeding 50 V, the position of the minor key or keyway shall be as shown in table 103.

For accessories having rated operating voltages exceeding 50 V, the position of the earthing contact shall be as shown in table 104.

Compliance is checked by inspection.

Table 103

Rated operating voltage V	Frequency Hz	Minor key or keyway position*
20 to 25	50 and 60	No minor key or keyway
40 to 50	50 and 60	12
20 to 25 and 40 to 50	100 up to and including 200	4
	300	2
	400	3
	Over 400 up to and including 500	11
	Direct current	10
* The minor key or keyway position is indicated by the relevant number (see 7.1).		

Positions 1, 8, and 9 are reserved for future standardization. For constructional reasons, positions 5, 6 and 7 cannot be used.

Table 104

Number of contacts	Type	Frequency Hz	Rated operating voltage V	Accessories earthing-contact position ¹⁾	
				16/20 A 32/30 A	63/60 A 125/100 A
3 contacts	1P+N+ \perp Series II	50 and 60	100 to 130	4	4
		60	277	5	5
	2P+ \perp Series I and II	50 and 60	100 to 130	4	4
			200 to 250	6	6
		50 and 60	380 to 415	9	9
			480 to 500	7	7
			Supply from an isolating transformer	12	12
		100 up to and including 300	Over 50	-	-
		Over 300 up to and including 500	Over 50	2	-
		Direct current	Over 50 up to and including 250	3	3
Over 250	8		8		
4 contacts	2P+N+ \perp Series II	50 and 60	125/250 single-phase	12	12
	3P+ \perp Series I and II	50 and 60	100 to 130	4	4
			200 to 250	9	9
			380 to 415	6	6
		60	440 to 460 ²⁾	11	11
		50 and 60	480 to 500	7	7
			600 to 690	5	5
		50 60	380 440 ³⁾	3	-
		100 up to and including 300	Over 50	10	-
	Over 300 up to and including 500	Over 50	2	-	
5 contacts	3P+N+ \perp Series I and II	50 and 60	57/100 to 75/130	4	4
			120/208 to 144/250	9	9
			200/346 to 240/415	6	6
			277/480 to 288/500	7	7
			347/600 to 400/690	5	5
		60	250/440 to 265/460 ²⁾	11	11
		50 60	220/380 250/440 ³⁾	3	-
		100 up to and including 300	Over 50	-	-
		Over 300 up to and including 500	Over 50	2	-
		All types	All rated operating voltage and/or frequencies not covered by other configurations.		1

1) The earthing-contact position is indicated by the relevant numeral (see 7.1).

2) Mainly for marine installations.

3) Only for refrigerated containers (standardized ISO).

NOTE – The positions shown by a dash (-) are not standardized.

8.2 Replacement:

For accessories having rated operating voltages exceeding 50 V, it shall not be possible to engage plugs or connectors with socket-outlets or appliance inlets having different ratings, or having different contact combinations.

In addition, for all accessories the design shall be such that improper connections shall not be possible between:

- the earth and/or pilot plug-contact and a live socket-contact, or a live plug-contact and the earth and/or pilot socket-contact;
- the phase plug-contacts and the neutral socket-contact, if any;
- the neutral plug-contact and a phase socket-contact.

Compliance is checked by inspection, with the following exception:

For the two last indents, compliance is not required between three contacts accessories Series I and II, 4 h, since these have reciprocal contact positions.

NOTE – These conflicting versions have both been in use for many years and resolution of this problem has been found to be impractical.

It shall not be possible to engage plugs with socket-outlets or connectors having different earthing-contact positions or minor key positions.

Compliance is checked by inspection and tests using the methods indicated below. These tests are made after storage of test specimens of insulating material at a temperature of $(20 \pm 5) ^\circ\text{C}$ and with relative humidity between 45 % and 75 % for four weeks.

For accessories having thermoplastic housing, this test is made at a temperature of $(35 \pm 2) ^\circ\text{C}$, both the accessories and the gauges being at this temperature.

a) Checking plugs and appliance inlets

For plugs and appliance inlets with rated operating voltage exceeding 50 V, gauges according to figure 109 are used.

For plugs and appliance inlets with rated operating voltage not exceeding 50 V, gauges according to figure 113 are used.

First test (key)

The socket-gauge shown in figure 109 is placed before the plug in such a way that during the test the key shall hit the lower part of the shroud of the gauge approximately in the middle.

The force F is slowly increased in such a way that the total force given in table 105 is exerted after 15 s. After that the full force is applied for 1 min.

The forces used are given in table 105.

Table 105

Rated current Series I/II	A	16/20	32/30	63/60	125/100
Force F	N	175	210	385	560

When the force is applied the gauge is not permitted to move more than 4 mm in relation to the shroud of the plug or appliance inlet.

After the test, the plug and appliance inlet shall not be damaged in such a way that impairs further use of the accessory.

These forces are equal to 1,4 times the corresponding withdrawal forces.

Second test (earth-pin)

The force *F* shall be applied to the earth-pin in the same manner and for the same duration as in the previous test.

After that test, the plug and appliance inlet shall comply with the relevant standard sheet.

b) Checking socket-outlets and connectors

For socket-outlets and connectors having rated operating voltages exceeding 50 V, gauges according to figure 104 are used.

For socket-outlets and connectors having rated operating voltages not exceeding 50 V, gauges according to figure 111 are used.

First test (shroud)

The first test is carried out on all different clock positions, except for the one corresponding to the socket-outlet or connector to be used.

The test specimen shall be fixed and supported in such a way that the rigidity of the socket-outlet or connector is not influenced.

Arrangement for test shall be according to figure 103.

The gauge shown in figure 104 shall hit two opposite points of the accessory at the same time. The axis of the gauge and of the accessory shall be approximately parallel and the chamfer shall be equally divided in both sides.

The force *F* is slowly increased in such a way that the total force given in table 105 is exerted after 15 s. After that the full force is applied for 1 min.

When the force is applied, the gauge is not permitted to move more than 4 mm in relation to the shroud of the socket-outlet or connector.

After the test, the socket-outlet of the connector shall not be damaged to the extent of impairing the further use of the accessory.

Second test (holes)

For the second test, the gauge shown in figure 105 is inserted in each phase hole.

The gauge shall not enter the phase hole by a greater distance than that shown in table 106 measured from the front of the internal part (see figure 106).

The same forces and duration and the same method of application are used as for the previous test.

Table 106

Rated current Series I/II	A	16/20	32/30	63/60	125/100
Distance <i>X</i>	mm	11	12,5	15	20

8.3 Addition:

Compliance is checked by manual test and, for accessories with enclosures of resilient or thermoplastic material, by means of the gauge shown in figure 114.

The gauge is applied with a force of 200 N for 1 min. For accessories with enclosures of thermoplastic material the gauge is applied at a temperature of (35 ± 2) °C, both the accessories and the gauge being at this temperature.

NOTE – For accessories of rigid material, such as metal, thermosetting resins, ceramic material and the like, conformity to the relevant standard sheets ensures compliance with this requirement.

9 Protection against electric shock

This clause of part 1 is applicable except as follows:

9.1 Addition:

Conformity with the relevant standard sheets ensures compliance with the requirement as far as inaccessibility of contacts during insertion of a plug or connector into the complementary accessories is concerned.

9.2 Addition:

Conformity with the relevant standard sheets ensures compliance with these requirements.

10 Provision for earthing

This clause of part 1 is applicable.

11 Terminals

This clause of part 1 is applicable except as follows:

11.4 Replacement:

Terminals shall allow the connection of conductors having nominal cross-sectional areas specified in table 107 and are identified by the terminal sizes given in the table.

Terminals shall comply with standard sheets as specified in 11.8 of this standard and are not subject to be tested as in 11.8 and 11.9 of part 1.

11.8 Replacement:

First test:

Terminals shall comply with the standard sheets as specified below, except that for standard sheets 2-X, 2-XI and 2-XII the length of thread in the fixed part or nut and the length of thread on the screw or stud may be reduced, if the mechanical strength of the terminal is adequate and at least two full threads of every clamping screw are in engagement when a conductor of the most unfavourable cross-sectional area is clamped.

Standard sheet 2-X applies to pillar terminals.

Standard sheet 2-XI applies to screw terminals and stud terminals.

Standard sheet 2-XII applies to saddle terminals.

Standard sheet 2-XIII applies to lug terminals.

Mantle terminals shall comply with standard sheet 2-X with regard to the dimensions D and e . Terminals which are essentially of the pillar type, but with the part with the hole for the conductor slotted to enable the conductor to be moved laterally into position, shall comply with standard sheet 2-X, except that the maximum gap between the conductor restraining parts on the side where the slot is located shall comply with standard sheet 2-XI.

If the required length of thread in a terminal screw hole is obtained by plunging, the edge of the extrusion shall be reasonably smooth and the length of thread shall exceed the specified minimum value by at least 0,5 mm.

Compliance is checked by inspection, by measurement and, for terminals with a reduced length of thread, by the tests of 11.9.

The maximum gap between the conductor restraining parts is checked by means of a steel gauge pin with a diameter equal to $e \pm 0,05$ mm.

For terminals without pressure plate or the like, complying with standard sheet 2-X, the clamping screw is screwed fully home without a conductor in position. It shall not then be possible to insert the gauge pin between the threaded part of the screw and the wall of the conductor space.

For terminals complying with standard sheet 2-XI, and for terminals with a pressure plate or the like complying with standard sheet 2-X, where it is not appropriate to insert the gauge pin in all positions, a conductor is clamped in the terminal.

For terminals complying with standard sheet 2-X, the conductor is in the form of a rod with a diameter equal to that corresponding to the middle cross-sectional area of the range specified for the particular terminal, and having a flat end perpendicular to the axis.

For terminals complying with standard sheet 2-XI, the conductor is solid and has a diameter D as specified in the standard sheet for the particular terminal.

With this conductor in position, it shall not be possible to insert the gauge pin, applied in a direction parallel to the axis of the conductor, into any gap through which a wire of a stranded conductor might escape.

The minimum distance between the clamping screw and the end of the conductor when fully inserted, which is specified in standard sheet 2-X, is checked by means of the rod conductor specified above, which shall pass into the conductor space for a distance beyond the threaded hole at least equal to the minimum distance specified.

For terminals with pressure plate, complying with standard sheet 2-X, the gauge pin is applied to the gap between the pressure plate and the wall of the conductor space.

The following negative deviations from the specified values are allowed for the minimum nominal thread diameter of the screw:

- 0,15 mm for screws with a nominal diameter not exceeding 5 mm;
- 0,22 mm for screws with a nominal diameter over 5 mm but not exceeding 10 mm;
- 0,27 mm for screws with a nominal diameter over 10 mm.

This subclause does not exclude terminals of types other than those shown in the standard sheets. Such terminals shall, however, comply with the other requirements of this clause as far as is reasonable, and it may be necessary to formulate additional requirements.

If the thread in the fixed part or nut is recessed, the total length of the shank of headed screws shall be increased accordingly.

If one or more of the dimensions are larger than the minimum values specified in the standard sheets, the other dimensions need not be correspondingly increased, but departures from the specified values shall not impair the function of the terminal.

11.9 Replacement:

Second test:

Terminals complying with standard sheet 2-X, but with a reduced length of thread, are fitted with a conductor of the smallest cross-sectional area specified in table 107, tightly clamped, or a conductor of the largest cross-sectional area specified in this table, lightly clamped, whichever is the more unfavourable.

Table 107 – Size of connectable conductors

Rating of the accessory			Internal connection ¹⁾						External earthing connection if any		
Voltage V	Current A		Flexible cables for plugs and connectors ²⁾			Solid or stranded cables for socket-outlets ²⁾					
	Series I	Series II	mm ²	AWG/MCM ³⁾	Terminal size	mm ²	AWG/MCM ³⁾	Terminal size			
Not exceeding 50	16	20	4 to 10	12 to 8	6	4 to 10	12 to 8	5			
	32	30	4 to 10	12 to 8	6	4 to 10	12 to 8	5			
Exceeding 50	16	20	1 to 2,5	16 to 12	2	1,5 to 4	16 to 12	3 ⁴⁾	6	10	4
	32	30	2,5 to 6	14 to 10	5	2,5 to 10	14 to 8	5	10	8	5
	63	60	6 to 16	10 to 6	7	6 to 25	10 to 4	7	25	4	7
	125	100	16 to 50	6 to 2	9 ⁵⁾	25 to 70	4 to 0	9 ⁵⁾	25	4	7

1) Terminals for pilot conductors, if any, shall allow the connection of conductors having the same nominal cross-sectional areas as the terminals of 16 A accessories having rated operating voltages exceeding 50 V.

2) Classification of conductors: according to IEC 60228, clause 2, solid (Class 1); stranded (Class 2); flexible (Class 5).

3) The nominal cross-sectional areas of conductors are given in square millimetres (mm²). AWG/MCM values are considered as equivalent to mm² for the purpose of this standard.

AWG: American Wire Gauge is a system of identifying wires in which the diameters are in geometric progression between size 36 and size 0000

MCM: Mille Circular Mills denotes circle surface unit. 1 MCM = 0,5067 mm².

4) For pillar terminals, size 2.

5) Compliance with terminal size 9 is provisionally not required.

Terminals complying with standard sheets 2-XI or 2-XII, but with a reduced length of thread, are fitted with a conductor of the largest cross-sectional area specified in table 107, lightly clamped.

At least two threads shall be in full engagement.

The terminals are then fitted with conductors of the smallest and largest cross-sectional areas specified in table 107, rigid (solid or stranded) for socket-outlets and appliance inlets, and flexible for plugs and connectors, and the terminal screws are tightened, the maximum torque applied being equal to two-thirds of the torque specified in table 15 of IEC 60309-1. Each conductor is subjected to a pull force N of the value, in newtons, shown in table 108; the pull is applied without jerks, for 1 min, in the direction of the axis of the conductor space.

Table 108

Terminal size	2	3	4	5	6	7	8	9	10
Pulling force N	50	50	60	80	90	100	120	150	200

During the test, the conductor shall not move noticeably in the terminal.

NOTE – For terminals of sizes 8 to 10, the value of the pulling force N is provisional.

12 Interlocks and retaining devices

This clause of part 1 is applicable except as follows:

12.1 Addition:

If an accessory having a rated operating voltage exceeding 50 V is provided with a mechanical interlock, this shall comply with standard sheet 2-V.

It shall not be possible to operate the mechanical switching device of a mechanically interlocked switched socket-outlet or switched connector, except after the insertion of an appropriate plug.

NOTE – Tools are not considered as appropriate plugs.

It is accepted that tools may be used to override interlock for circuit testing purposes.

12.3 Addition:

Accessories shall be provided with a retaining device as indicated in table 109.

13 Resistance to ageing of rubber and thermoplastic material

This clause of part 1 is applicable.

Table 109

Rated current of the accessory A	Classification according to degree of protection against moisture	Socket-outlets and connectors			Plugs and appliance inlets		
		Retaining means	Standard sheet		Retaining means	Standard sheet	
			Rated operating voltage exceeding 50 V	Rated operating voltage not exceeding 50 V		Rated operating voltage exceeding 50 V	Rated operating voltage not exceeding 50 V
16/20 and 32/30	IP44/splash-proof	Lid	2-I (continuation 1)	2-VIII (continuation 1)	Lug or cavity	2-II (continuation 1)	2-IX (continuation 1)
	IP67/watertight	Two-ramp system	2-I (continuation 2)	2-VIII (continuation 2)	Lug or cavity and bayonet ring	2-II (continuation 2)	2-IX (continuation 2)
63/60	IP44/splash-proof	Lid and two-ramp system	2-III (continuation 1)	–	Lug or cavity	2-IV (continuation 1)	–
	IP67/watertight	Two-ramp system	2-III (continuation 2)	–	Bayonet ring	2-IV (continuation 2)	–
125/100	IP67/watertight ¹⁾	Two-ramp system	2-III (continuation 2)	–	Bayonet ring	2-IV (continuation 2)	–

¹⁾ When 125/100 A socket-outlets are mounted on or integrated with enclosures, the whole unit can also be IP44.

14 General construction

This clause of part 1 is applicable except as follows:

Addition:

Accessories having a rated current of 63/60 A shall be IP44/splashproof or IP67/watertight.

Accessories having a rated current of 125/100 A shall be IP67/watertight.

When 125/100 A socket-outlets are mounted on or integrated with enclosures, the whole unit can be IP44.

14.101 Additional subclause:

It shall not be possible to operate the phase inverting means unintentionally or to operate the phase inverting means when the phase inverter is inserted in the complementary accessory.

The phase inverting means shall incorporate a latching means to retain it in its defined position.

Compliance is checked by inspection and manual test.

The operation of the phase inverting means shall not damage the cable or wiring.

Compliance is checked by inspection and by the test of clause 21.

15 Construction of socket-outlets

This clause of part 1 is applicable except as follows:

15.1 Addition:

Contact tubes shall be self-adjusting and so designed as to ensure adequate contact continuity before and after a number of operations corresponding to their operational life.

Contact tubes other than the earth-contact shall be floating.

Earth contact tubes need not be floating, provided that they have the necessary resilience in all directions.

Compliance is checked by inspection and by the following test:

The sample is mounted so that the axes of the contact tubes are vertical with the contact openings downwards.

A gauge of hardened steel, with a finish of 0,002 mm and free from grease, having the dimensions shown in table 110, is inserted into each contact tube, also free from grease, and the force necessary to withdraw the gauge is measured.

The sum of the force and the weight of the gauge shall exceed the minimum total force shown in table 110.

Table 110

Nominal pin diameter mm	Gauge	
	Diameter of gauge mm ⁺⁰ / _{-0,01}	Minimum total force N
5	4,80	2,5
6	5,80	5
7	6,80	5
8	7,80	10
10	9,80	15
12	11,80	20

This test shall be made after that of 15.2.

15.2 Replacement:

The pressure exerted by the contact tubes on the pins of a plug shall not be so great as to prevent easy insertion and withdrawal of the plug.

Compliance is checked by determining the force necessary to withdraw the test plug from the sample, this being mounted so that the axes of the contact tubes are vertical with the contact opening downwards, as shown in figure 115.

A test plug provided with pins having the dimensions shown in table 111 is inserted into the sample.

Table 111

Nominal pin diameter mm	Diameter of pins of the test plug mm ^{+0,01} / ₀
5	5,00
6	6,00
7	7,00
8	8,00
10	10,00
12	12,00

The principal weight, together with the supplementary weight (the latter being such that it exerts a force equal to one-tenth of the force exerted by the principal weight) and the test plug, exert a force equal to the maximum withdrawal force shown in table 112.

The principal weight is hung without jolting on the test plug, and the supplementary weight is allowed to fall from a height of 5 cm onto the principal weight.

The plug shall not remain in the sample.

Table 112

Rated current A		Maximum withdrawal force N
Series I	Series II	
16	20	150
32	30	150
63	60	275
125	100	400

NOTE – Details of the test plugs are under consideration.

15.7 Modification:

Instead of the third paragraph of the requirements, the following applies:

Socket-outlets, splash-proof or up to and including IP44, designed for only one mounting position, shall have provision for opening a drain hole at least 5 mm in diameter, or 20 mm² in area with a width of at least 3 mm, which is effective when the socket-outlet is in the mounting position.

16 Construction of plugs and connectors

This clause of part 1 is applicable except as follows:

16.1 Replacement of the third paragraph by the following:

Accessories shall be so designed that they can only be reassembled so as to ensure the correct angular relationship between key(s), keyway(s), the earthing pin and the earthing-contact tube, as originally assembled.

Compliance is checked by inspection and, if necessary, by manual test.

Tests to be carried out are those described in 15.1 and 15.2.

16.101 Additional subclause:

Pins shall be solid.

Compliance is checked by inspection.

16.102 Additional subclause:

Plugs rated up to 32 A may incorporate a phase inverting means. These plugs shall comply with the general requirements for plugs and with clause 21 for phase inverters. They shall be delivered with an instruction sheet with the following information:

Use class 5 or class 6 flexible conductors only and make sure that the conductors can move to permit operation of the phase inverting means.

An integral switching device shall not be used as a phase inverting means.

The phase inverting means shall be preconditioned when wired with class 5 cables according to clause 23 by carrying out 1 000 position changing operations.

17 Construction of appliance inlets

This clause of part 1 is applicable except as follows:

Additional subclauses:

17.101 Pins shall be solid.

Compliance is checked by inspection.

17.102 Appliance inlets rated up to 32 A may incorporate a phase inverting means. These inlets shall comply with the general requirements for inlets and clause 21 for phase inverters. They shall be delivered with an instructions sheet with the following information:

Use class 5 or class 6 flexible conductors only and make sure that the conductors can move to permit operation of the phase inverting means.

For appliance inlets, switches can be used as phase inverting means.

Switches shall comply with IEC 60947-3 in a utilisation category of at least AC 22A.

The phase inverting means shall be preconditioned when wired with class 5 cables according to clause 23, by carrying out 1 000 position changing operations.

18 Degrees of protection

This clause of part 1 is applicable.

19 Insulation resistance and dielectric strength

This clause of part 1 is applicable except as follows:

19.1 *Add before the note:*

For phase inverters, the testing is carried out with the phase inverting means in each of the end positions.

19.4 *Replacement:*

Immediately after the test of 19.3 it shall not be possible to engage accessories with enclosures of thermoplastic material with gauges having an earthing-contact position or a minor key or keyway position different from that of the sample.

For socket-outlets and connector having rated operating voltages exceeding 50 V, the gauges shown in figure 104 are used. For plugs and appliance inlets having rated operating voltages exceeding 50 V, the gauges shown in figure 109 are used.

For 16/20 A and 32/30 A socket-outlets and connectors having rated operating voltages not exceeding 50 V, the gauges shown in figure 111 are used. For plugs and appliance inlets having rated operating voltages not exceeding 50 V, the gauges shown in figure 113 are used.

The gauges are applied with a force of 200 N applied for 1 min.

20 **Breaking capacity**

This clause of part 1 is applicable except as follows:

Addition:

Plugs and appliance inlets complying with this standard are not to be tested.

21 **Normal operation**

This clause of part 1 is applicable except as follows:

Addition:

Plugs and appliance inlets complying with this standard are not to be tested.

Phase inverters are to be tested without load. The phase inverter shall be tested in each position for half of the cycles.

The wires of the cable shall not be twisted or damaged or show harmful alterations of cable insulation or broken strands in wires. The inverting means shall remain functional.

Compliance is checked by inspection.

22 **Temperature rise**

This clause of part 1 is applicable except as follows:

Addition:

Phase inverters are to be tested in each of the end positions.

23 Flexible cables and their connection

This clause of part 1 is applicable except as follows:

23.1 Addition:

Cable anchorages shall be of insulating material or be provided with an insulating lining fixed to the metal parts.

24 Mechanical strength

This clause of part 1 is applicable.

25 Screws, current-carrying parts and connections

This clause of part 1 is applicable.

26 Creepage distances, clearances and distances through sealing compound

This clause of part 1 is applicable.

27 Resistance to heat, fire and tracking

This clause of part 1 is applicable.

28 Corrosion and resistance to rusting

This clause of part 1 is applicable.

29 Conditional short-circuit current withstand test

Replacement:

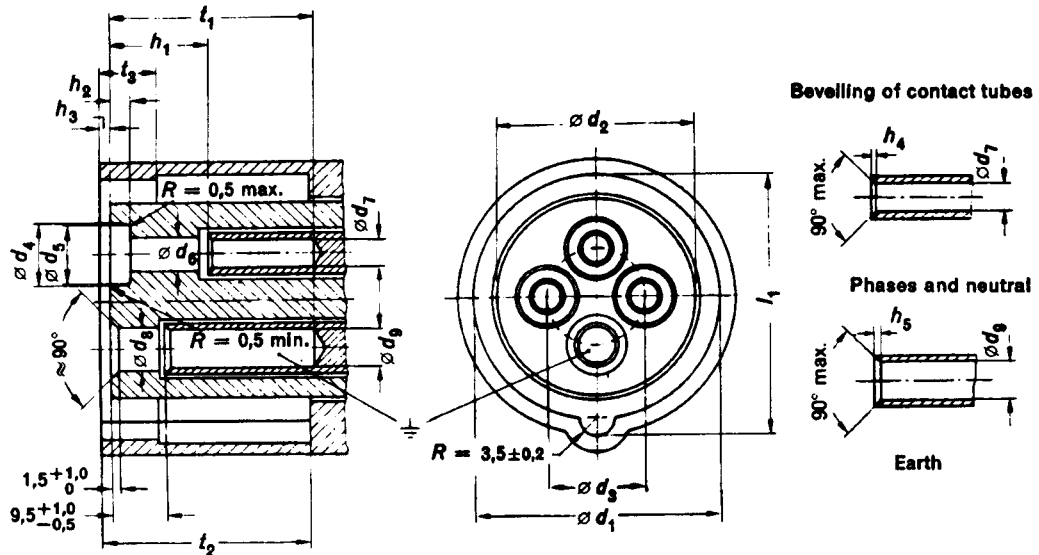
Accessories according to this part are considered to have a minimum prospective short-circuit current withstand of 10 kA. If a higher value is requested, this clause of part 1 is applicable.

30 Electromagnetic compatibility

This clause of part 1 is applicable.

STANDARD SHEET 2-1

16/20 A AND 32/30 A SOCKET-OUTLETS AND CONNECTORS HAVING RATED OPERATING VOLTAGES EXCEEDING 50 V



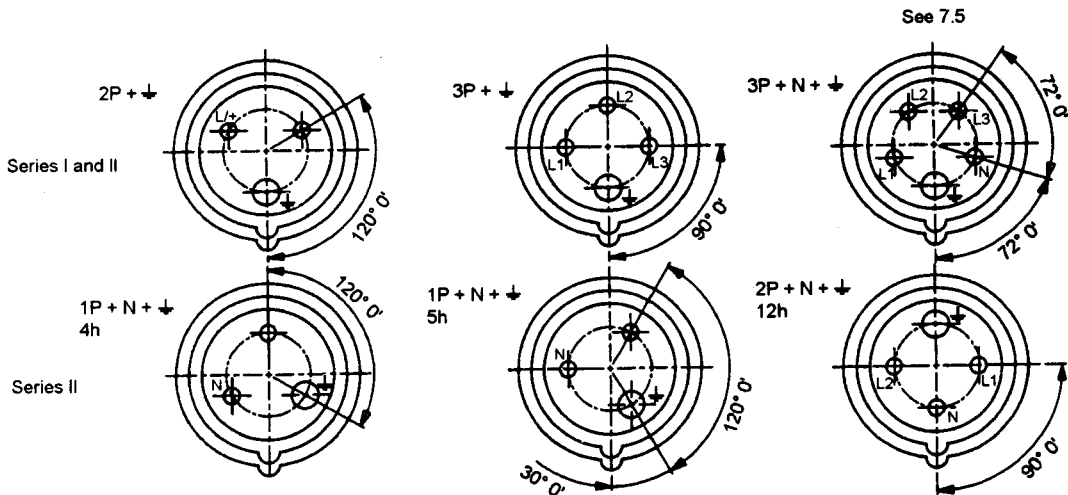
Holes or recesses in the front face, if any, other than those for contact tubes, shall not have a depth of more than 10 mm.

Exception: see note²).

Socket-outlet for mechanical interlocking shall be so designed that any excessive angular movement of a fully inserted plug which would render the mechanical interlocking ineffective is prevented.

ARRANGEMENT OF CONTACT TUBES

Front view of contact tubes of socket-outlet or connector



Dimensions for standard sheet 2-1

Rated current A	Type	1) d_1		2) d_2		d_3	d_4	d_5	d_6	3) d_7		3) d_8		4) h_1		h_2	h_3	5) h_4		5) h_5		1) l_1	l_1 min.	l_2 min.	l_3 min.
		Tol.	0 -1,5	±0,5	+1,0 0	min.	+0,6 0	+0,6 0	+1,0 -0,5	+3,0 0	0 -1	max.	min.	max.	min.	max.	min.	+0,6 0							
16/20	2P + ⊥	44,3	+0,4 0	36,0	17,5	11,6	11,0	6,0	5	8,0	7	19,5	3,8	2	0,8	0,3	1,2	0,4	47,5	37	38	10			
	3P + ⊥	50,4	+0,5 0	40,8	21,5	11,6	11,0	6,0	5	8,0	7	19,5	3,8	2	0,8	0,3	1,2	0,4	54,0	37	38	10			
	3P+N+ ⊥	57,3	+0,6 0	46,4	26,5	11,6	11,0	6,0	5	8,0	7	19,5	3,8	2	0,8	0,3	1,2	0,4	61,3	37	38	10			
32/30	2P + ⊥	58,6	+0,6 0	47,0	25,0	13,6	13,0	7,0	6	9,1	8	21,5	5,3	3	1,0	0,3	1,5	0,5	64,6	45	48	15			
	3P + ⊥	58,6	+0,6 0	47,0	25,0	13,6	13,0	7,0	6	9,1	8	21,5	5,3	3	1,0	0,3	1,5	0,5	64,6	45	48	15			
	3P+N+ ⊥	64,7	+0,6 0	52,9	30,3	13,6	13,0	7,0	6	9,1	8	21,5	5,3	3	1,0	0,3	1,5	0,5	71,2	45	48	15			

Dimensions in millimetres

- 1) The dimensions d_1 and l_1 shall be within the prescribed limits over the distance l_3 . Beyond this, they may be larger but not smaller.
- 2) The dimension d_2 shall not exceed the prescribed limit at any point over the whole depth, and shall be within the prescribed limits over a minimum depth of 3 mm, with the exception of a maximum of:
 - three cut-outs for the accessories 2P + ⊥
 - four cut-outs for the accessories 3P + ⊥; and
 - five cut-outs for the accessories 3P + N + ⊥

spaced along the circumference with not more than one between adjacent holes for the contact tubes and each having a width not exceeding 10 mm,

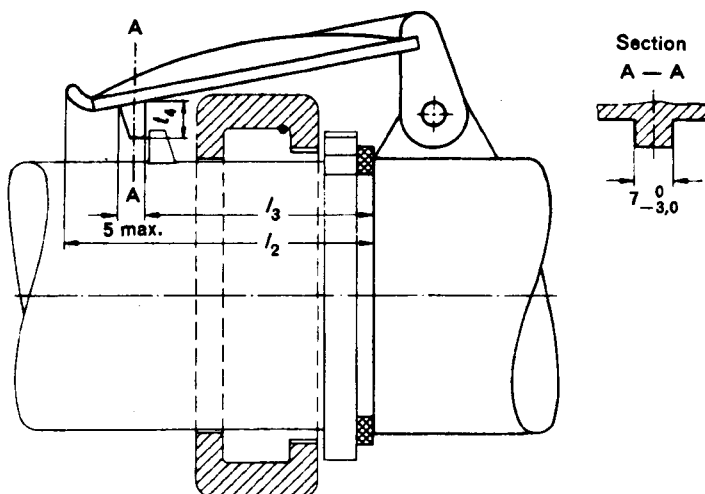
including any radii. Holes deeper than 10 mm in the area of cut-outs are allowed.

- 3) The dimensions d_7 and d_8 refer to the pins; the contact tubes need not be circular.
- 4) For type 3P + N + ⊥ and series II, 2P + N + ⊥, 12 h accessories, the value for the dimension h_1 is 16,0 for the neutral contact.
- 5) The bevelling of the contact tubes may be well rounded off towards the internal cylindrical surface within a distance of $1\frac{1}{2}$ times the value h_4 max. or h_5 max.

STANDARD SHEET 2-I
(continuation 1)

**RETAINING MEANS FOR
IP44/SPLASH-PROOF SOCKET-OUTLETS
AND CONNECTORS**

Lid or lever shown in latched position



Rated current A	Type	l_2 max.	l_3		t_4 min.
				Tol.	
16/20	2P + \perp	70	41,5	+1,5 0	5
	3P + \perp	75	47,5	+1,5 0	5
	3P + N + \perp	85	53,5	+1,5 0	6
32/30	2P + \perp	85	54,5	+1,5 0	6
	3P + \perp	85	54,5	+1,5 0	6
	3P + N + \perp	100	60,5	+2,0 0	7

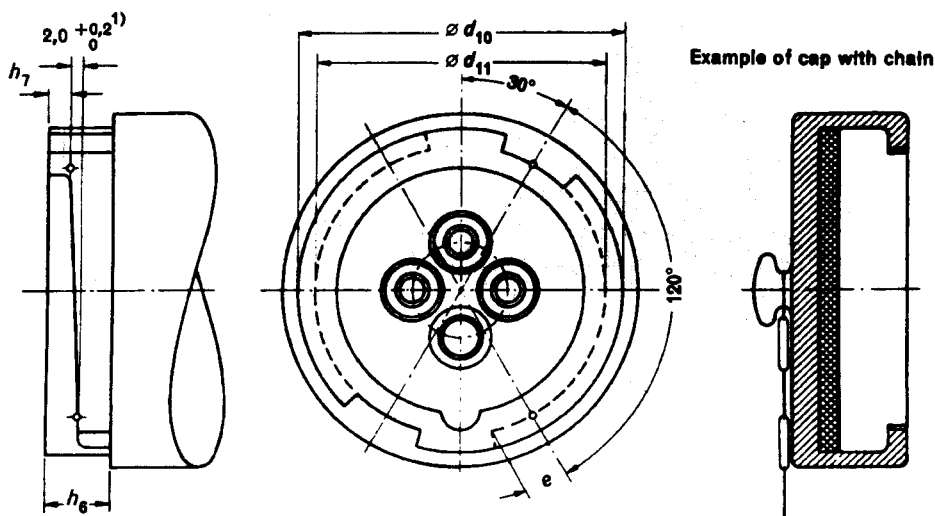
Dimensions in millimetres

For IP44/splash-proof accessories, the retaining means shall be in the form of a lid such that IP67/watertight plugs or appliance inlets complying

with standard sheet 2-II, and provided with a bayonet ring having maximum dimensions, can be correctly introduced and retained.

STANDARD SHEET 2-I
(continuation 2)

**RETAINING MEANS FOR IP67/WATERTIGHT
SOCKET-OUTLETS AND CONNECTORS**



Rated current A	Type	d_{10}	d_{11}	e min.	h_6 min.	h_7 0 -0,2
		0 -0,5	0 -0,5			
16/20	2P + \perp	60	53	8	12	4,2
	3P + \perp	68	60	10	12	4,2
	3P + N + \perp	76	68	12	12	4,2
32/30	2P + \perp	82	72	12	14	6,2
	3P + \perp	82	72	12	14	6,2
	3P + N + \perp	89	79	15	14	6,2

Dimensions in millimetres

¹⁾ The inclination of the ramps shall be such that this dimension refers to angle of 120° shown.

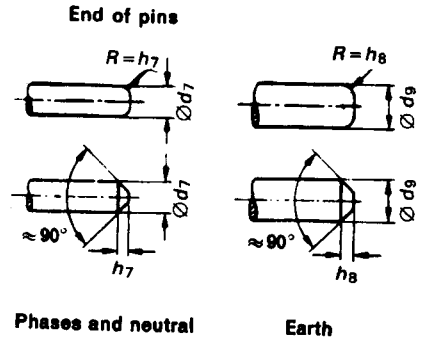
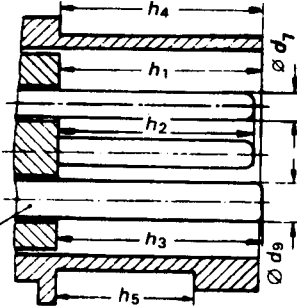
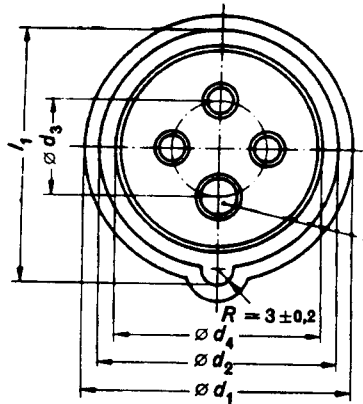
inlets complying with standard sheet 2-II, and provided with a bayonet ring having maximum dimensions, can be correctly introduced at an angle of (30 ± 3)° and rotated up to a maximum of 120°.

The retaining means shall be in the form of bayonet ramps such that IP67/watertight plugs or appliance

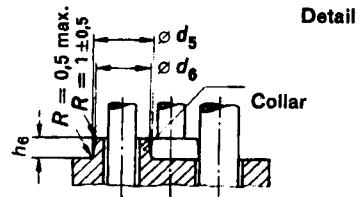
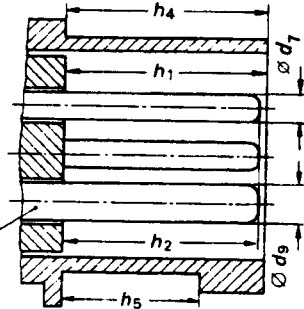
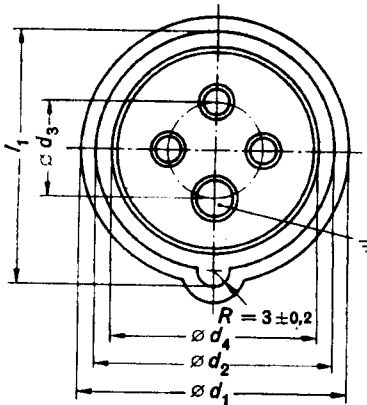
The sketches are not intended to govern design except as regards the dimensions shown.

STANDARD SHEET 2-II

16/20 A AND 32/30 A PLUGS AND APPLIANCE INLETS
HAVING RATED OPERATING VOLTAGES
EXCEEDING 50 V



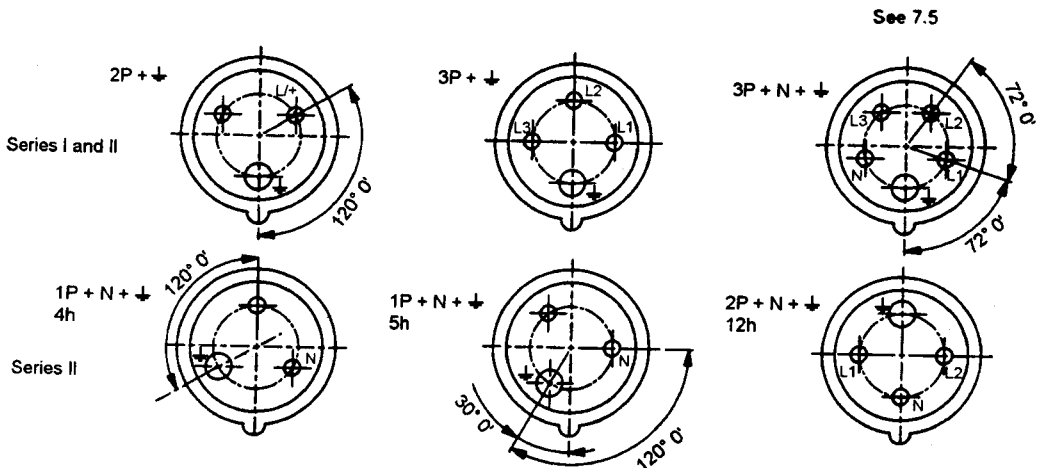
TYPE 16/20 A



TYPE 32/30 A

ARRANGEMENT OF PINS

Front view of pins of plugs or appliance inlet



Dimensions for standard sheet 2-II

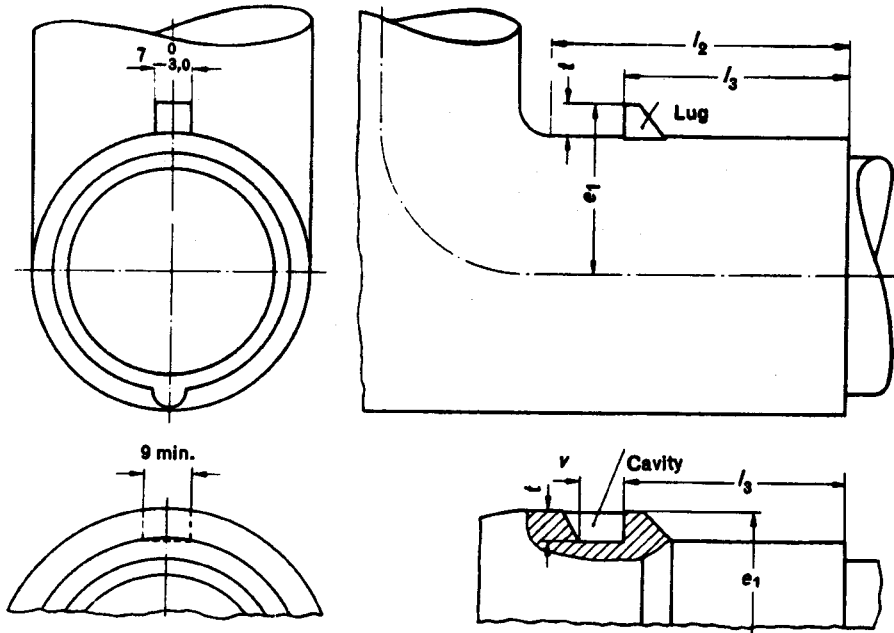
Rated current A	Type	d_1 min.	d_2		d_3 $\pm 0,5$	d_4			1)	1)	d_7 $\begin{matrix} 0 \\ -0,075 \end{matrix}$	d_9 $\begin{matrix} 0 \\ -0,09 \end{matrix}$	h_1 $\begin{matrix} 0 \\ -1 \end{matrix}$	h_2 $\begin{matrix} 0 \\ -1 \end{matrix}$	h_3 $\begin{matrix} 0 \\ -1 \end{matrix}$	h_4 $\begin{matrix} 0 \\ -1 \end{matrix}$	h_5 $\begin{matrix} +1,0 \\ 0 \end{matrix}$		1)	6)		6)		l_1			
			Tol.	Tol.		Tol.	max.	max.	max.	max.							max.	max.	max.	min.	max.	min.	4)	5)	Tol.		
																										2)	3)
																										2)	3)
16/20	2P + \perp	47,5	43,5	$\begin{matrix} 0 \\ -0,6 \end{matrix}$	17,5	37,9	$\begin{matrix} +1,9 \\ 0 \end{matrix}$	$\begin{matrix} +1,5 \\ 0 \end{matrix}$	11	10	5	7	37	36	38	37	24,0	27,5	3,5	1,7	0,8	1,5	0,75	46,5	47,0	$\begin{matrix} 0 \\ -0,4 \end{matrix}$	
	3P + \perp	53,5	49,5	$\begin{matrix} 0 \\ -0,6 \end{matrix}$	21,5	42,8	$\begin{matrix} +1,9 \\ 0 \end{matrix}$	$\begin{matrix} +1,5 \\ 0 \end{matrix}$	11	10	5	7	37	36	38	37	24,0	27,5	3,5	1,7	0,8	1,5	0,75	52,9	53,6	$\begin{matrix} 0 \\ -0,5 \end{matrix}$	
	3P + N + \perp	60,5	56,1	$\begin{matrix} 0 \\ -0,6 \end{matrix}$	26,5	48,8	$\begin{matrix} +1,9 \\ 0 \end{matrix}$	$\begin{matrix} +1,5 \\ 0 \end{matrix}$	11	10	5	7	37	36	38	37	24,0	27,5	3,5	1,7	0,8	1,5	0,75	60,1	61,0	$\begin{matrix} 0 \\ -0,6 \end{matrix}$	
32/30	2P + \perp	61,5	57,3	$\begin{matrix} 0 \\ -0,8 \end{matrix}$	25,0	49,7	$\begin{matrix} +1,9 \\ 0 \end{matrix}$	$\begin{matrix} +1,6 \\ 0 \end{matrix}$	13	12	6	8	46	45	-	46	32,0	35,5	5,0	2,0	1,0	2,5	1,2	63,2	63,2	$\begin{matrix} 0 \\ -0,6 \end{matrix}$	
	3P + \perp	61,5	57,3	$\begin{matrix} 0 \\ -0,8 \end{matrix}$	25,0	49,7	$\begin{matrix} +1,9 \\ 0 \end{matrix}$	$\begin{matrix} +1,6 \\ 0 \end{matrix}$	13	12	6	8	46	45	-	46	32,0	35,5	5,0	2,0	1,0	2,5	1,2	63,2	63,2	$\begin{matrix} 0 \\ -0,6 \end{matrix}$	
	3P + N + \perp	67,5	63,4	$\begin{matrix} 0 \\ -0,8 \end{matrix}$	30,3	55,6	$\begin{matrix} +1,9 \\ 0 \end{matrix}$	$\begin{matrix} +1,6 \\ 0 \end{matrix}$	13	12	6	8	46	45	-	46	32,0	35,5	5,0	2,0	1,0	2,5	1,2	69,9	69,9	$\begin{matrix} 0 \\ -0,7 \end{matrix}$	

Dimensions in millimetres

- 1) Collars, as shown in the detail, required for accessories having rated operating voltages exceeding 500 V, optional for other accessories
- 2) For IP44/splashproof accessories.
- 3) For IP67/watertight accessories.
- 4) For accessories with metal enclosures.
- 5) For accessories with enclosures of insulating material.
- 6) The end of the pins may be well rounded off towards the external cylindrical surface within a distance of 1 ½ times the value h_7 max. or h_8 max.

STANDARD SHEET 2-II
(continuation 1)

RETAINING MEANS FOR
IP44/SPLASH-PROOF PLUGS AND
APPLIANCE INLETS



Rated current A	Type	e_1 $\begin{matrix} 0 \\ -2 \end{matrix}$	1) l_2 min.	l_3		t min.	v min.
					Tol.		
16/20	2P + \perp	31	75	41	$\begin{matrix} 0 \\ -1.0 \end{matrix}$	4	8
	3P + \perp	35	80	47	$\begin{matrix} 0 \\ -1.0 \end{matrix}$	5	8
	3P + N + \perp	39	90	53	$\begin{matrix} 0 \\ -1.0 \end{matrix}$	7	8
32/30	2P + \perp	41	90	54	$\begin{matrix} 0 \\ -1.0 \end{matrix}$	7	8
	3P + \perp	41	90	54	$\begin{matrix} 0 \\ -1.0 \end{matrix}$	7	8
	3P + N + \perp	46	105	60	$\begin{matrix} 0 \\ -1.5 \end{matrix}$	8	9

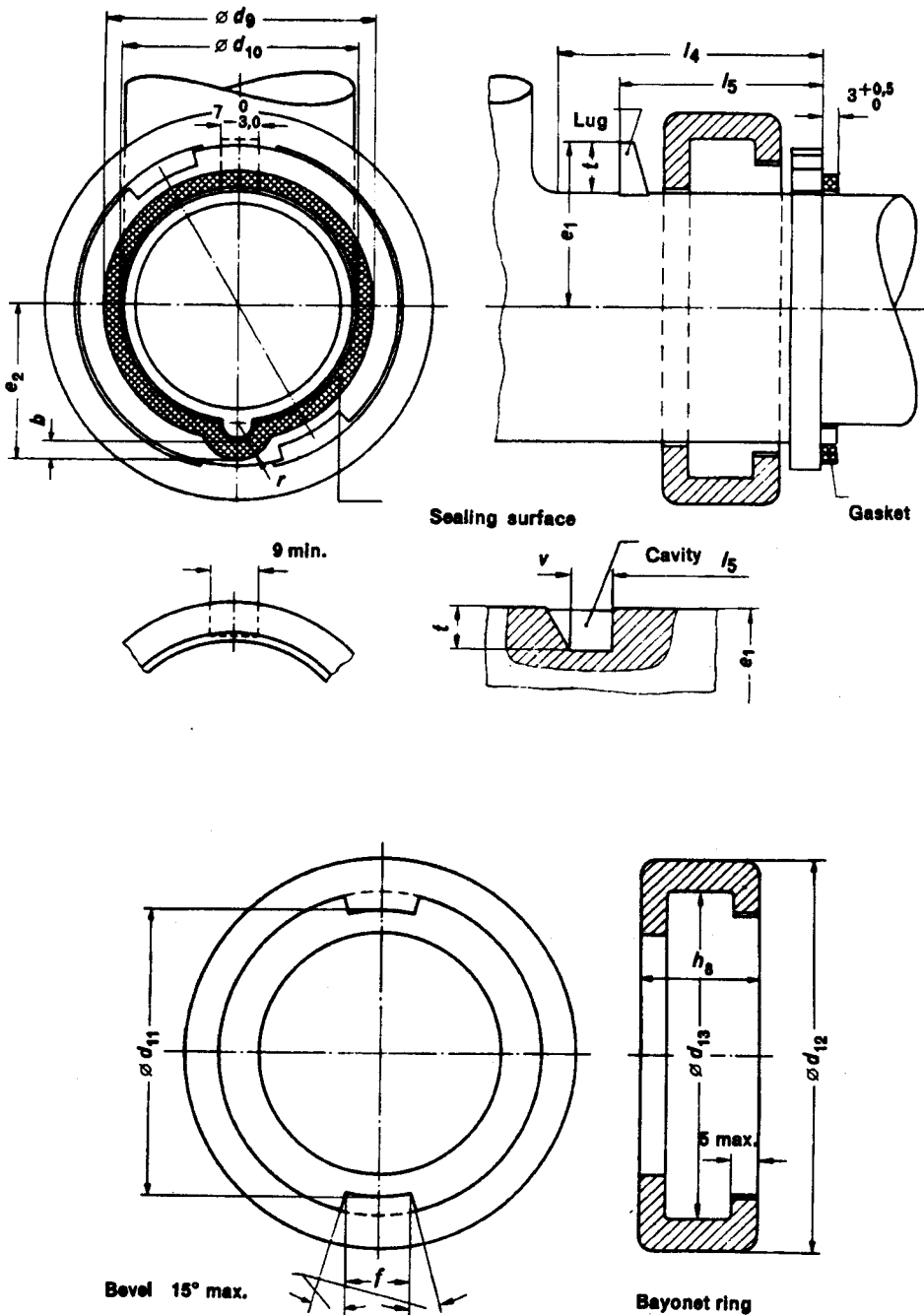
Dimensions in millimetres

1) Minimum clearance required for movement of hinged lid.

The retaining mean shall be in the form of a lug or a cavity, at position 12 h.

STANDARD SHEET 2-II
(continuation 2)

RETAINING MEANS FOR IP67/WATERTIGHT
PLUGS AND APPLIANCE INLETS



Rated current A	Type	Nose and cavity						Sealing surface					Bayonet ring				
		e_1 0 -2	¹⁾ l_4 min.	l_5		t min.	v min.	b min.	d_9 min.	d_{10} max.	e_2 min.	r min.	d_{11} +0,5 0	d_{12} max.	d_{13} min.	f 0 -0,5	h_8 max.
					Tol.												
16/20	2P + \perp	31	75	38	$\begin{matrix} 0 \\ -1,0 \end{matrix}$	4	8	3,0	50,8	44,8	28,6	6,7	53,5	73	60,5	12	22
	3P + \perp	35	80	44	$\begin{matrix} 0 \\ -1,0 \end{matrix}$	5	8	3,5	57,9	50,9	32,6	7,2	60,5	81	68,5	16	24
	3P + N + \perp	39	90	50	$\begin{matrix} 0 \\ -1,0 \end{matrix}$	7	8	4,0	65,8	57,8	36,9	7,7	68,5	89	76,5	19	26
32/30	2P + \perp	41	90	51	$\begin{matrix} 0 \\ -1,0 \end{matrix}$	7	8	4,6	69,5	59,1	40,1	8,2	72,5	95	82,5	19	30
	3P + \perp	41	90	51	$\begin{matrix} 0 \\ -1,0 \end{matrix}$	7	8	4,6	69,5	59,1	40,1	8,2	72,5	95	82,5	19	30
	3P + N + \perp	46	105	57	$\begin{matrix} 0 \\ -1,5 \end{matrix}$	8	9	5,3	76,6	65,2	43,4	9,0	79,5	102	89,5	22	32

Dimensions in millimetres

¹⁾ Minimum clearance required for movement of hinged lid.

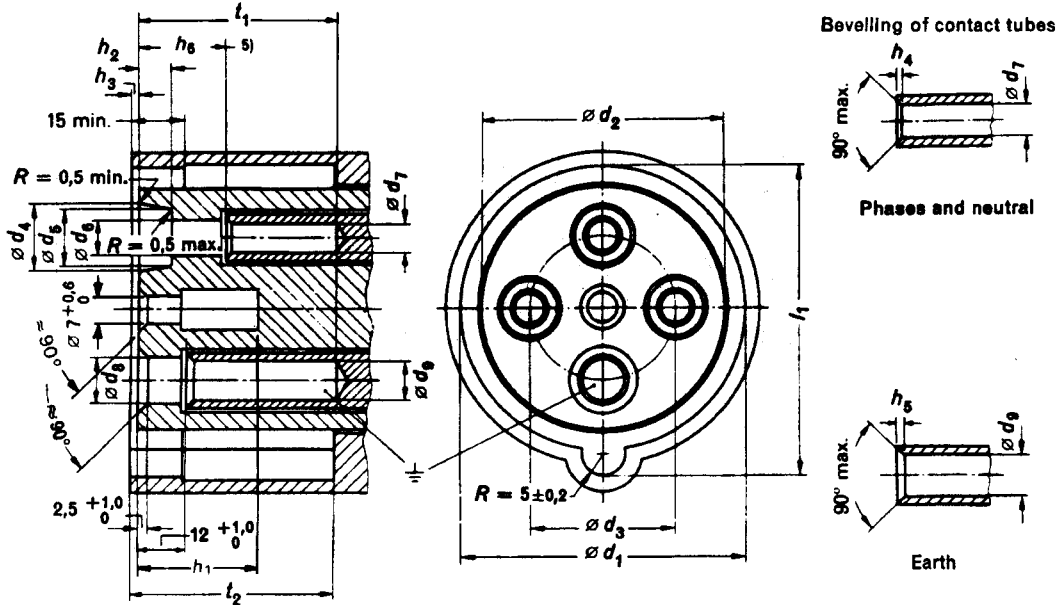
The sketches are not intended to govern design except as regards the dimensions shown.

The retaining means shall be in the form of a bayonet ring and a lug or a cavity, at position 12 h.

STANDARD SHEET 2-III

63/60 A AND 125/100 A SOCKET-OUTLETS AND
CONNECTORS HAVING RATED OPERATING
VOLTAGES EXCEEDING 50 V

WITHOUT PILOT CONTACT



A hole in the front face is mandatory to accept the pilot pins of plugs or appliance inlets.

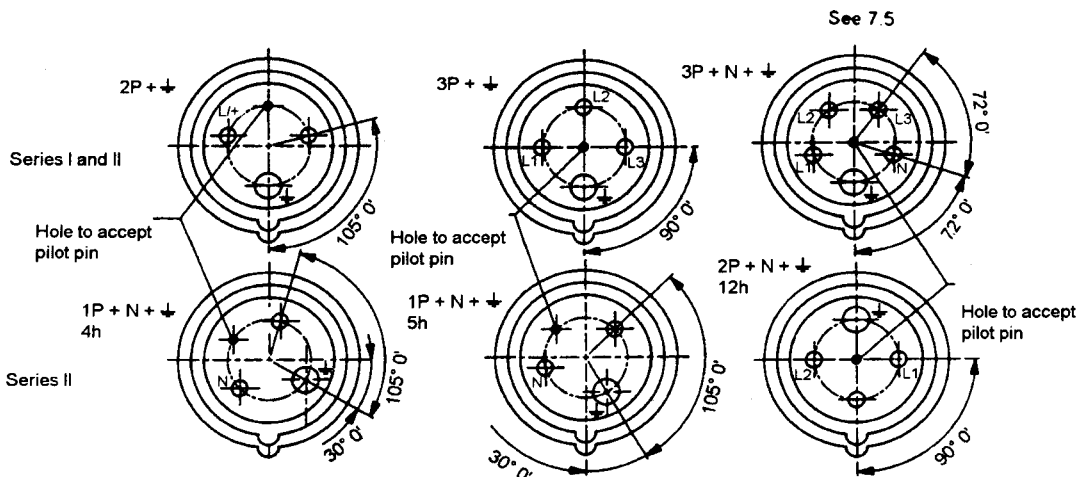
Holes or recesses in the front face, if any, other than those for contact holes shall have a depth of not more

than 10 mm except for pilot pin holes (exception: see note²).

Socket-outlets for mechanical interlocking shall be so designed that any angular movement of a fully inserted plug which would render the mechanical interlocking ineffective is prevented.

ARRANGEMENT OF CONTACT TUBES

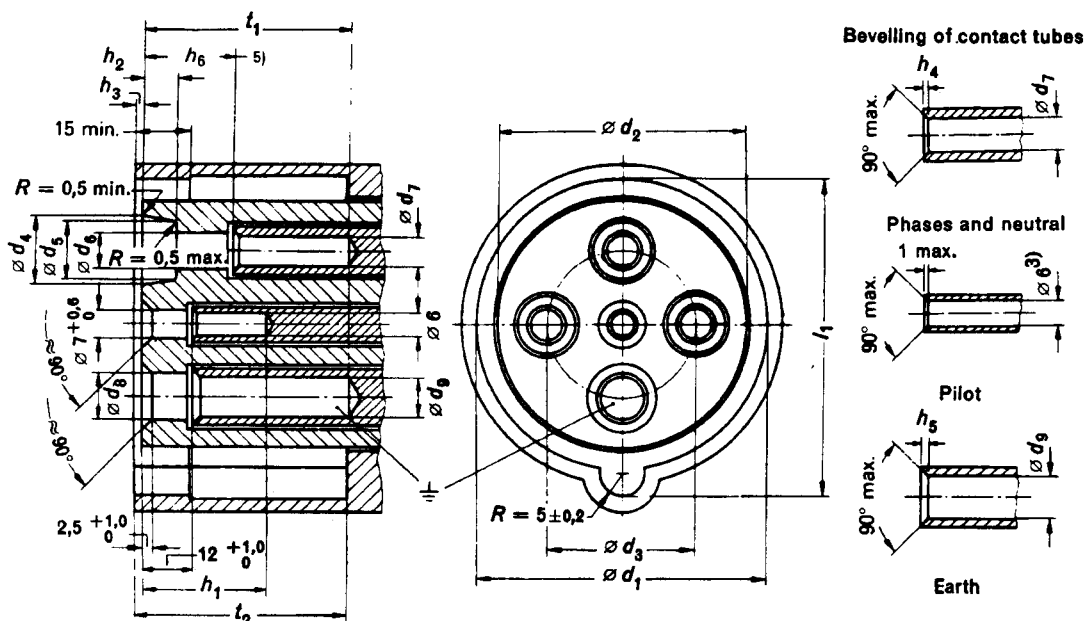
Front view of contact tubes of socket-outlet or connector



STANDARD SHEET 2-IIIa

63/60 A AND 125/100 A SOCKET-OUTLETS AND CONNECTORS HAVING RATED OPERATING VOLTAGES EXCEEDING 50 V

WITH PILOT CONTACT

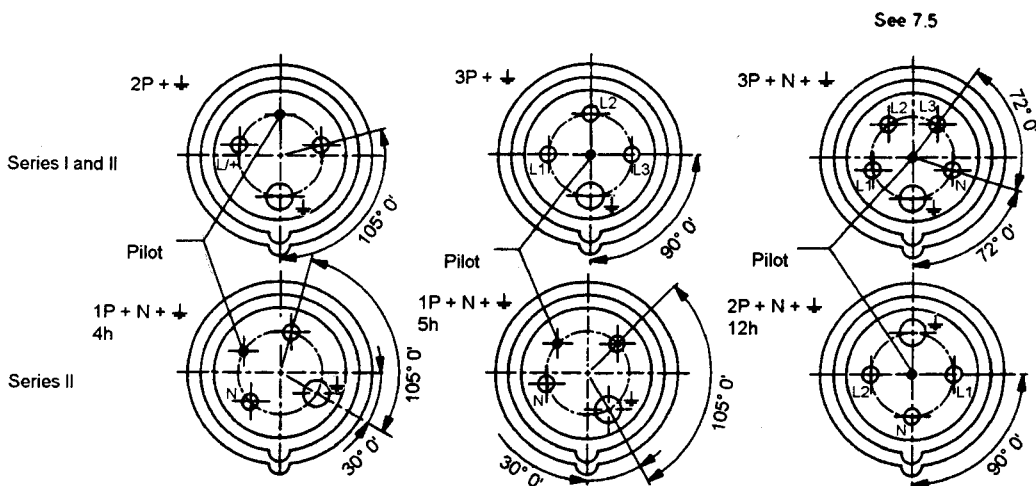


Holes or recesses in the front face, if any, other than those for contact tubes, shall have a depth of not more than 10 mm (exception: see note²).

Socket-outlets for mechanical interlocking shall be so designed that any excessive movement of a fully inserted plug which would render the mechanical interlocking ineffective is prevented.

ARRANGEMENT OF CONTACT TUBES

Front view of contact tubes of socket-outlet or connector



Dimensions for standard sheets 2-III and 2-IIIa

Type	Rated current A	1)	2)	d_3	d_4	d_5	d_6	3)	d_8	3)	h_1	h_2	h_3	4)		4)		1)	t_1	t_2
		d_1	d_2					d_7		d_9				h_4	h_5	l_1				
		+0,8 0	0 -1,5	±0,5	+1,0 0	min.	+0,6 0		+0,6 0		min.	+3,0 0	0 -1	max.	min.	max.	min.	+0,8 0	min.	min.
2P + \perp	63/60	71,0	60,0	36,5	16,6	15,1	9,0	8	11,0	10	30,0	8,0	2,5	1,5	0,5	2,0	0,6	77,5	67	69
3P + \perp	125/100	83,0	71,0	42,5	21,0	19,0	11,0	10	14,0	12	32,0	10,0	4	2,0	0,6	2,5	0,8	89,5	71	76
3P + N + \perp																				

Dimensions in millimetres

- 1) The dimensions d_1 and l_1 shall be within the prescribed limits over a distance of 15 mm. Beyond this, they may be larger but not smaller.
- 2) The dimension d_2 shall not exceed the prescribed limit at any point over the whole depth, and shall be within the prescribed limits over a minimum depth of 6 mm with the exception of a maximum of:
 - three cut-outs for the accessories 2P + \perp ,
 - four cut-outs for the accessories 3P + \perp , and
 - five cut-outs for the accessories 3P + N + \perp
 spaced along the circumference, with not more than one between adjacent holes for the contact tubes, and each having a width not exceeding 15 mm including any radii. Holes deeper than 10 mm in the area of cut-outs are allowed.
- 3) The dimensions d_7 and d_9 refer to the pins; the contact tubes need not be circular.
- 4) The bevelling of the contact tubes may be rounded off towards the internal cylindrical surface within a distance of 1½ times the values h_4 max. or h_5 max.
- 5) The dimension shall be in accordance with the table below:

Value of h_6 for standard sheets 2-III and 2-IIIa

h_6 $\begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$ mm		Depth of the contact hole
63/60 A	125/100 A	Type
21	21	Electrically interlocked assemblies
21 ou/or 40	21 ou/or 40	Mechanically interlocked assemblies
21 ou/or 40	40	Without interlock

Dimensions in millimetres

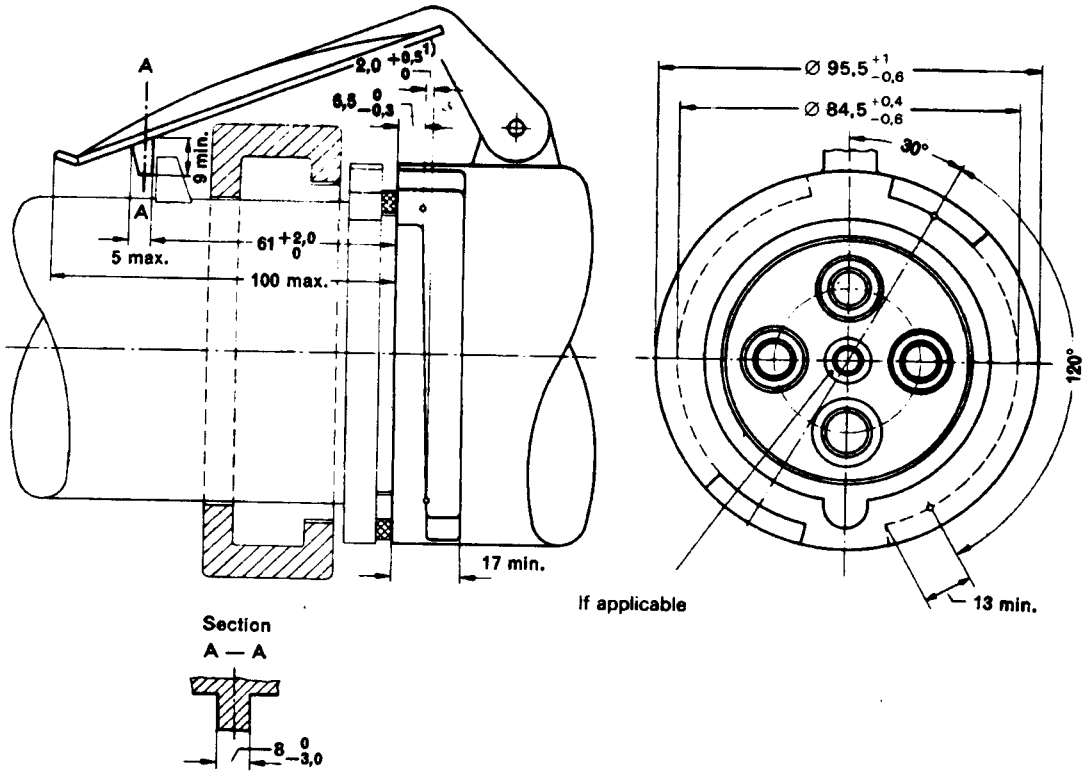
- 6) For 3P + N + \perp and series II, 2P + N + \perp , 12 h accessories, the depth of the neutral contact shall be less than for the phase contacts but greater than for the earth contact.

STANDARD SHEET 2-III
(continuation 1)

RETAINING MEANS FOR 63/60 A
IP44/SPLASHPROOF SOCKET-OUTLETS
AND CONNECTORS

ALL TYPES

Lid shown in latched position



Dimensions in millimetres

1) The inclination of the ramps shall be such that this dimension refers to the angle of 120° shown.

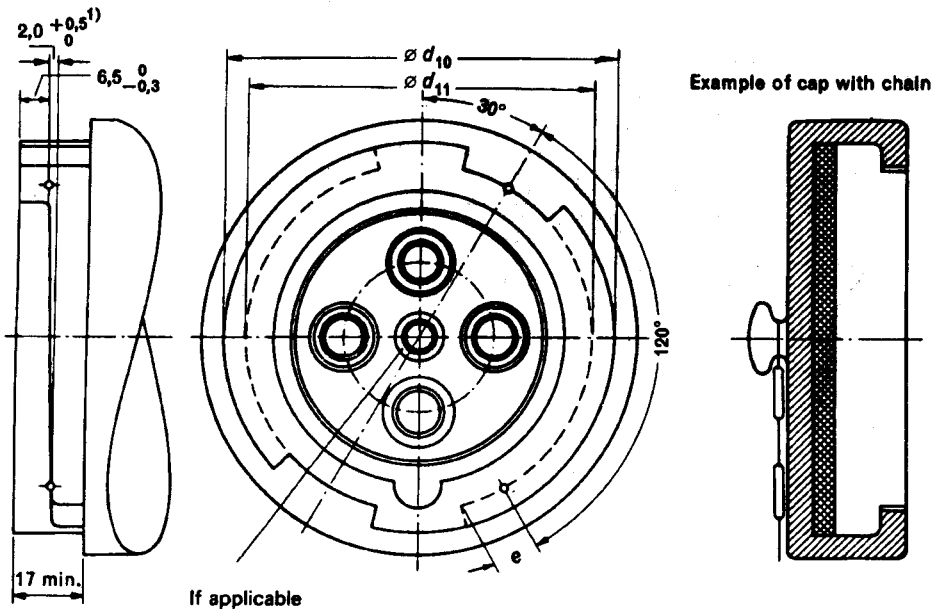
appliance inlets complying with standard sheets 2-IV and 2-IVa, and provided with a bayonet ring having maximum dimensions, can be correctly introduced at an angle of $(30 \pm 3)^\circ$ and rotated up to a maximum of 120°

The retaining means shall be in the form of bayonet ramps and a lid such that IP67/watertight plugs or

STANDARD SHEET 2-III
(continuation 2)

**RETAINING MEANS FOR 63/60 A
AND 125/100 A IP67/WATERTIGHT
SOCKET-OUTLETS AND CONNECTORS**

ALL TYPES



Type	Rated current A	d_{10} +1 -0,6	d_{11} +0,4 -0,6	e min.
2P + \perp	63/60	95,5	84,5	13
3P + \perp 3P + N + \perp	125/100	108,5	97,5	16

Dimensions in millimetres

1) The inclination of the ramps shall be such that this dimension refers to the angle of 120° shown.

inlets complying with standard sheets 2-IV and 2-IVa, and provided with a bayonet ring having maximum dimensions, can be correctly introduced at an angle of (30 ± 3)° and rotated up to a maximum of 120°.

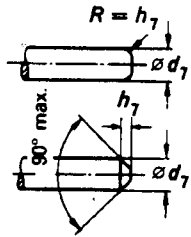
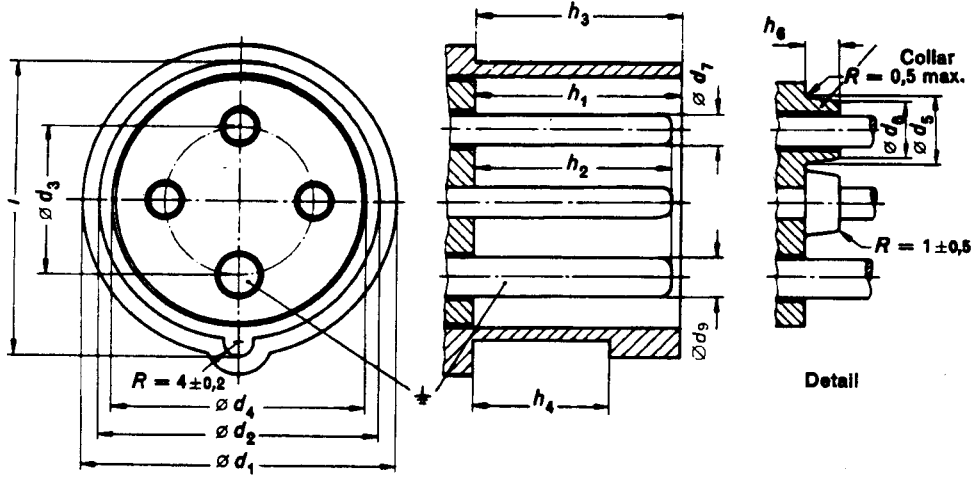
The retaining means shall be in the form of bayonet ramps such that IP67/watertight plugs or appliance

The sketches are not intended to govern design except as regards the dimensions shown.

STANDARD SHEET 2-IV

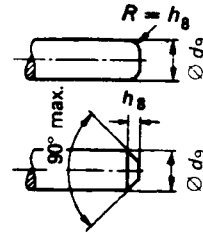
63/60 A AND 125/100 A PLUGS AND APPLIANCE
INLETS HAVING RATED OPERATING VOLTAGES
EXCEEDING 50 V

WITHOUT PILOT PIN



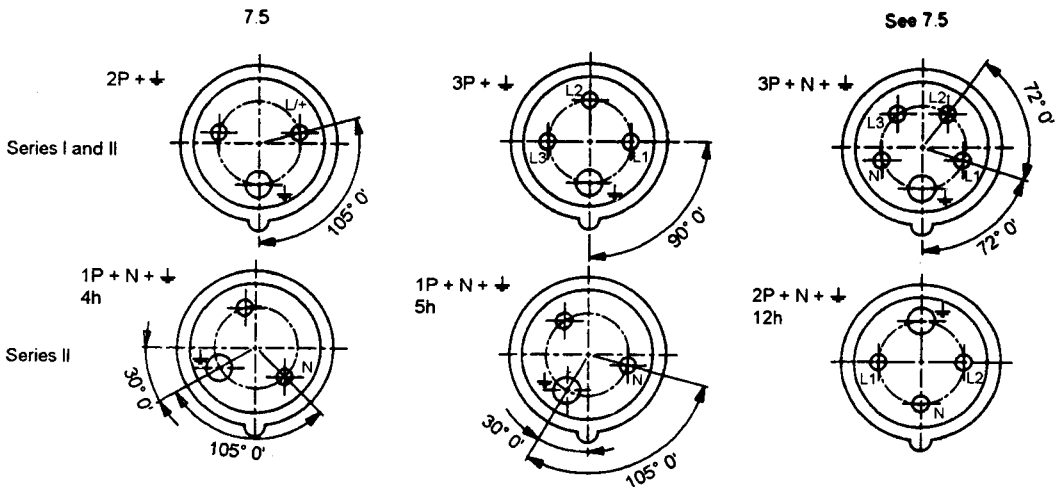
Phases and neutral

End of pins



Earth

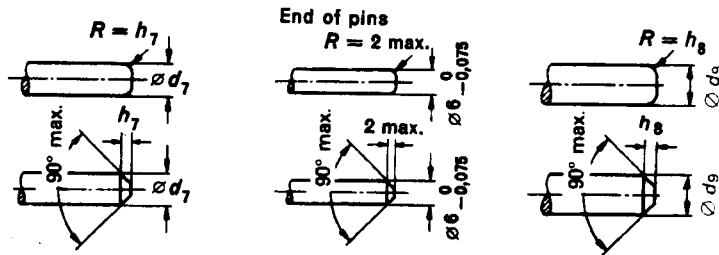
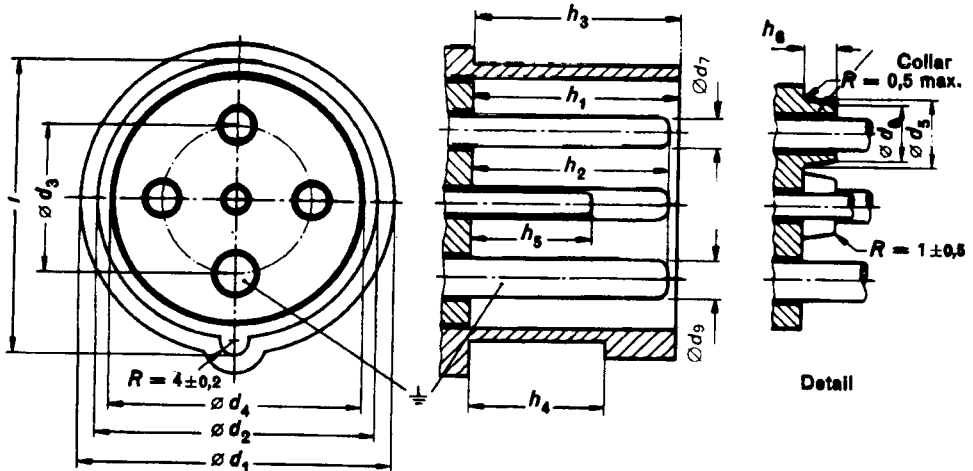
ARRANGEMENT OF PINS
Front view of pins of plug or appliance inlet



STANDARD SHEET 2-IVa

63/60 A AND 125/100 A PLUG AND APPLIANCE
INLETS HAVING RATED OPERATING VOLTAGES
EXCEEDING 50 V

WITH PILOT PIN



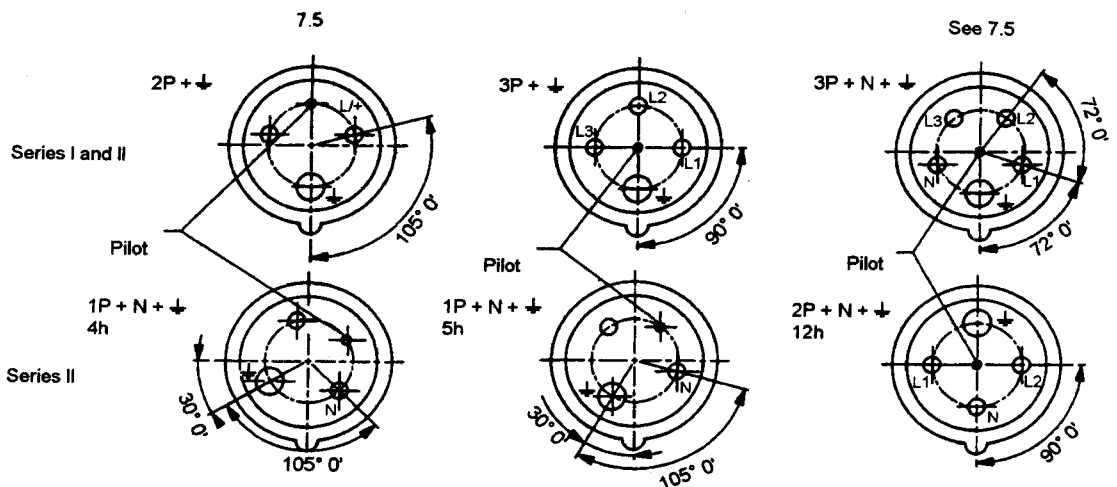
Phases and neutral

Pilot

Earth

ARRANGEMENT OF PINS

Front view of pins of plug or appliance inlet



Dimensions for standard sheets 2-IV and 2-IVa

Type	Rated current A	d_1	d_2	d_3	d_4		1) d_5	1) d_6	d_7	d_8	h_1	h_2	h_3	h_4	h_5	1) h_6	2) h_7		2) h_8	l	
		min.	0 -0,8	$\pm 0,5$		Tol.	max.	max.	0 -0,09	0 -0,11	0 -1,0	0 -1,0	0 -1,0	+2 0	0 -1,0	max.	max.	min.	max.	min.	0 -0,6
2P + \perp	63/60	75,5	69,5	36,5	61,5	+2 0	15,8	14,3	8	10	67,0	66,0	67,0	50	29,0	8	2,5	1,2	3,0	1,5	75,5
3P + \perp																					
3P + N + \perp	125/100	87,5	81,5	42,5	72,5	+2,5 0	20,2	18,2	10	12	74,5	69,5	75,5	58	31,5	10	3,0	1,5	4,0	2,0	87,5

Dimensions in millimetres

1) Collars, as shown in the detail, required for accessories having rated operating voltages exceeding 500 V, optional for other accessories.

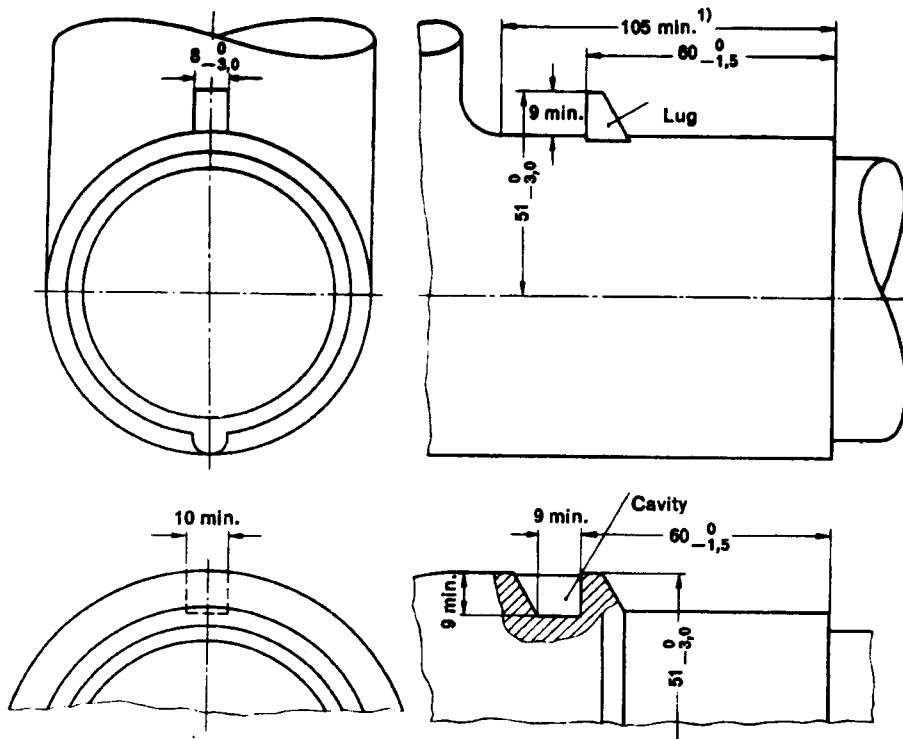
2) The end of the pins may be rounded off towards the external cylindrical surface within a distance of $1\frac{1}{2}$ times the value h_7 max. or h_8 max.

STANDARD SHEET 2-IV

(continuation 1)

**RETAINING MEANS FOR 63/60 A
IP44/SPLASH-PROOF PLUGS AND APPLIANCE
INLETS**

ALL TYPES



Dimensions in millimetres

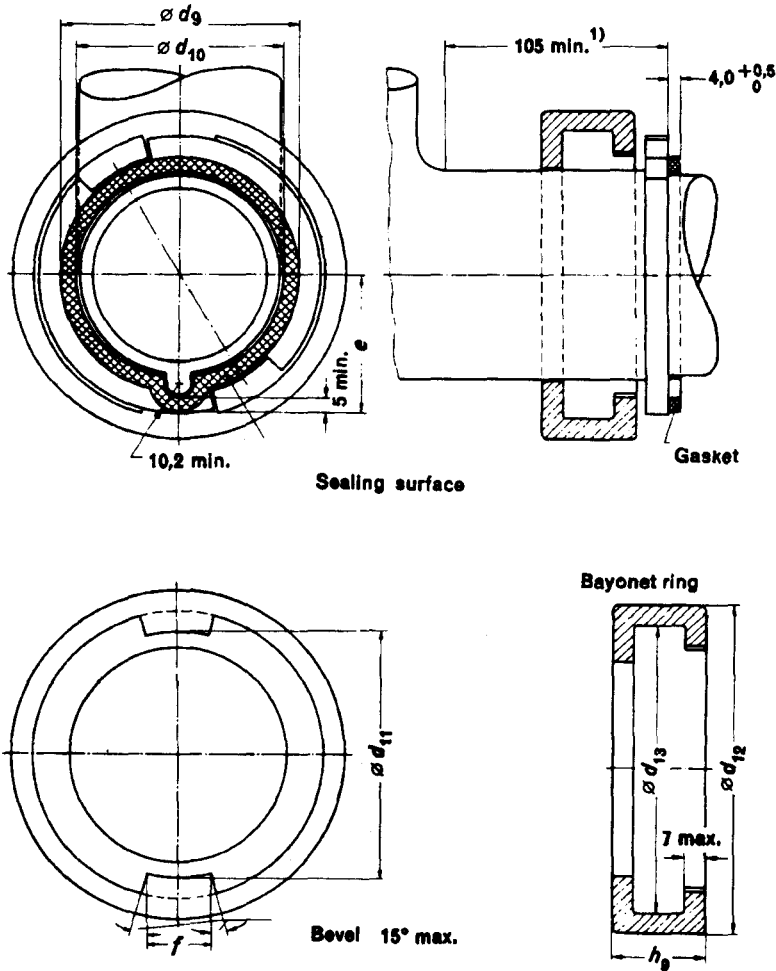
¹⁾ Minimum clearance required for movement of hinged lid.

The retaining means must be in the form of a lug or a cavity, at position 12 h.

STANDARD SHEET 2-IV
(continuation 2)

RETAINING MEANS FOR 63/60 A AND 125/100 A
IP67/WATERTIGHT PLUGS AND APPLIANCE
INLETS

ALL TYPES



Dimensions for standard sheet 2-IV (continuation 2)

Type	Rated current A	Sealing surface			Bayonet ring				
		d_9 min.	d_{10} max.	e min.	d_{11} +0,6 -0,4	d_{12} max.	d_{13} min.	f 0 -0,5	h_9 max.
2P + $\frac{1}{2}$	63/60	81,5	71,5	46,8	86,0	114	98	22	32
3P + $\frac{1}{2}$									
3P + N + $\frac{1}{2}$	125/100	93,5	83,5	53,3	99,0	131	111	27	35

Dimensions in millimetres

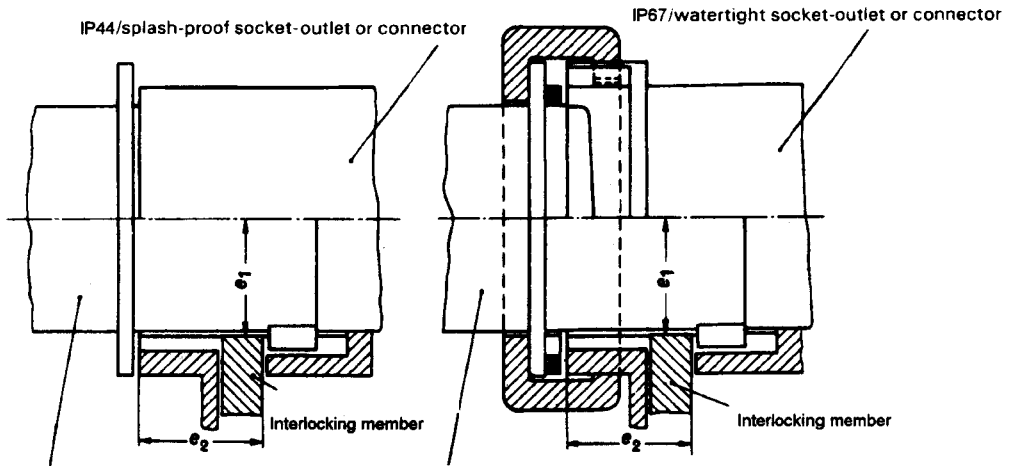
1) Minimum clearance required for movement of hinged lid; applicable only to 63/60 A accessories.

The sketches are not intended to govern design except as regards the dimensions shown.

The retaining means must be in the form of a bayonet ring.

STANDARD SHEET 2-V

MECHANICAL INTERLOCK FOR 16/20 A, 32/30 A,
63/60 A AND 125/100 A ACCESSORIES HAVING
RATED OPERATING VOLTAGES EXCEEDING 50 V



IP44/splash-proof plug or appliance inlet

IP67/watertight plug or appliance inlet

Dimensions for standard sheet 2-V

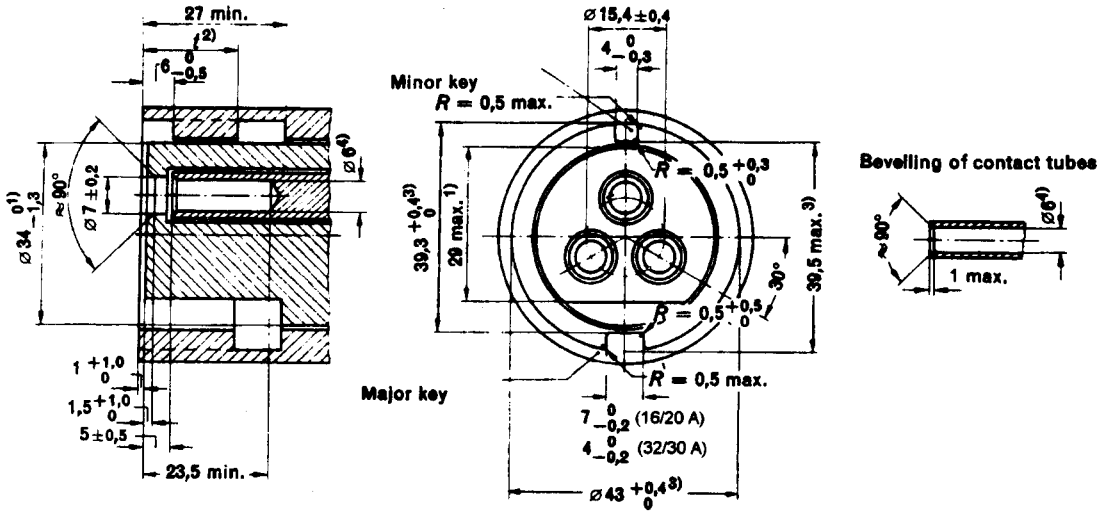
Rated current A	Type	e_1		e_2	
			Tol.		Tol.
16/20	2P + \perp	22,0	$\begin{smallmatrix} +0,5 \\ 0 \end{smallmatrix}$	23,5	$\begin{smallmatrix} 0 \\ -0,3 \end{smallmatrix}$
	3P + \perp	25,0	$\begin{smallmatrix} +0,5 \\ 0 \end{smallmatrix}$	23,5	$\begin{smallmatrix} 0 \\ -0,3 \end{smallmatrix}$
	3P + N + \perp	28,3	$\begin{smallmatrix} +0,5 \\ 0 \end{smallmatrix}$	23,5	$\begin{smallmatrix} 0 \\ -0,3 \end{smallmatrix}$
32/30	2P + \perp	29,0	$\begin{smallmatrix} +0,7 \\ 0 \end{smallmatrix}$	31,5	$\begin{smallmatrix} 0 \\ -0,5 \end{smallmatrix}$
	3P + \perp	29,0	$\begin{smallmatrix} +0,7 \\ 0 \end{smallmatrix}$	31,5	$\begin{smallmatrix} 0 \\ -0,5 \end{smallmatrix}$
	3P + N + \perp	32,1	$\begin{smallmatrix} +0,7 \\ 0 \end{smallmatrix}$	31,5	$\begin{smallmatrix} 0 \\ -0,5 \end{smallmatrix}$
63/60	All types	35	$\begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$	45	$\begin{smallmatrix} 0 \\ -1 \end{smallmatrix}$
125/100	All types	41	$\begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$	53	$\begin{smallmatrix} 0 \\ -1 \end{smallmatrix}$

Dimensions in millimetres

The sketches are not intended to govern design
except as regards the dimensions shown.

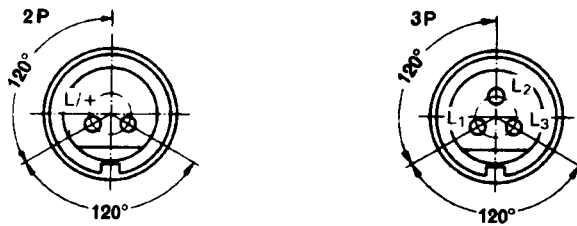
STANDARD SHEET 2-VIII

16/20 A AND 32/30 A SOCKET-OUTLETS AND CONNECTORS HAVING RATED OPERATING VOLTAGES NOT EXCEEDING 50 V



ARRANGEMENT OF CONTACT TUBES

Front view of contact tubes of socket-outlet or connector



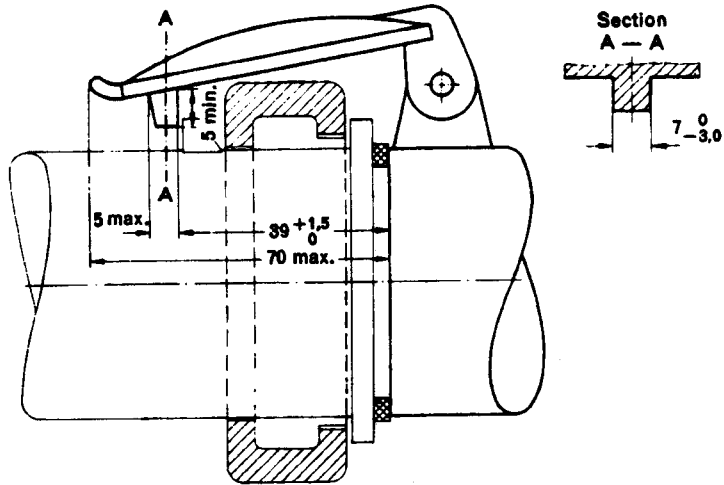
Dimensions in millimetres

- 1) These dimensions shall be within the prescribed limits over a distance of 27 mm.
- 2) The dimension *t* is 10 mm for a minor key of metal and 18 mm for a minor key of insulating material.
- 3) These dimensions shall be within the prescribed limits over the distance *t*. Beyond this, they may be larger but not smaller.
- 4) This dimension refers to the pins; the contact tubes need not be circular.

STANDARD SHEET 2-VIII
(continuation 1)

**RETAINING MEANS FOR
IP44/SPLASH-PROOF SOCKET-OUTLETS
AND CONNECTORS**

Lid or lever shown in latched position



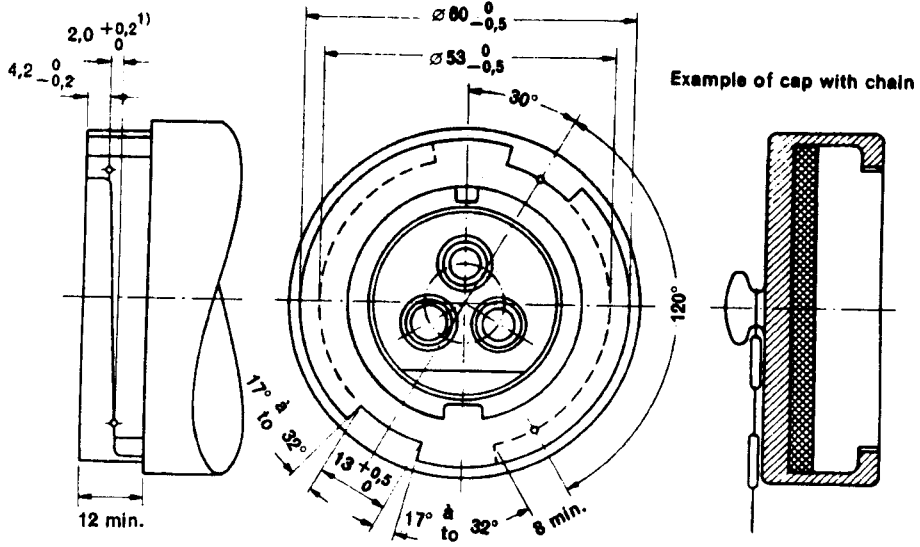
Dimensions in millimetres

For IP44/splash-proof accessories, the retaining means must be in the form of a lid such that IP67/watertight plugs or appliance inlets complying

with standard sheet 2-IX and provided with a bayonet ring having maximum dimensions can be correctly introduced and retained.

STANDARD SHEET 2-VIII
(continuation 2)

RETAINING MEANS FOR IP67/WATERTIGHT
SOCKET-OUTLETS AND CONNECTORS



Dimensions in millimetres

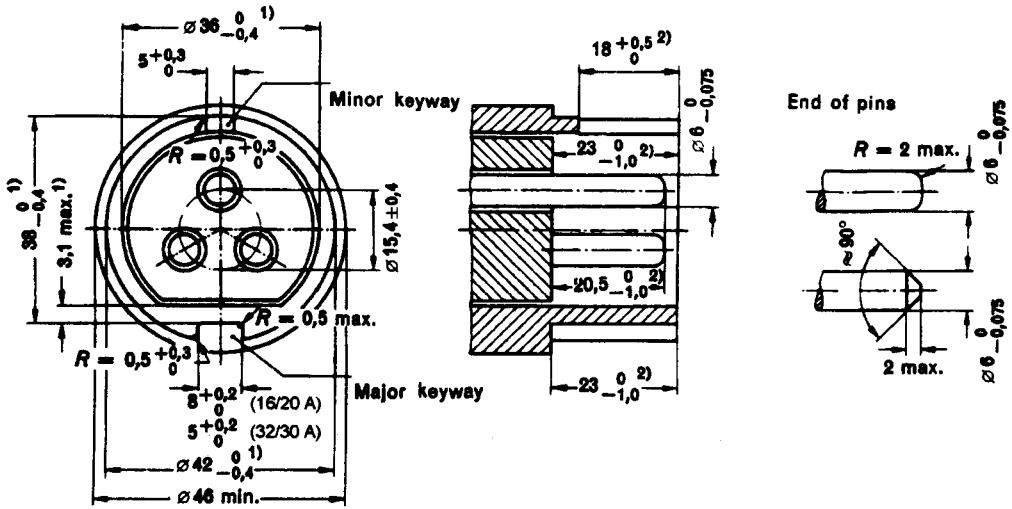
1) The indication of the ramps shall be such that this dimension refers to the angle of 120° shown.

The sketches are not intended to govern design except as regards the dimensions shown.

The retaining means shall be in the form of bayonet ramps.

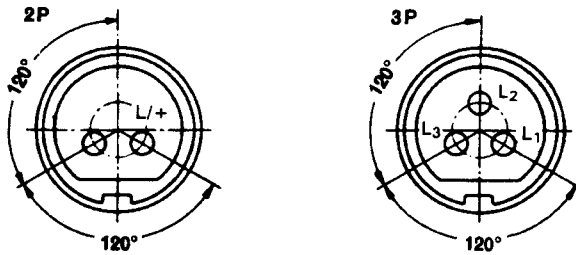
STANDARD SHEET 2-IX

16/20 A AND 32/30 A PLUGS AND APPLIANCE
INLETS HAVING RATED OPERATING VOLTAGES
NOT EXCEEDING 50 V



ARRANGEMENT OF PINS

Front view of pins of plug or appliance inlet



Dimensions in millimetres

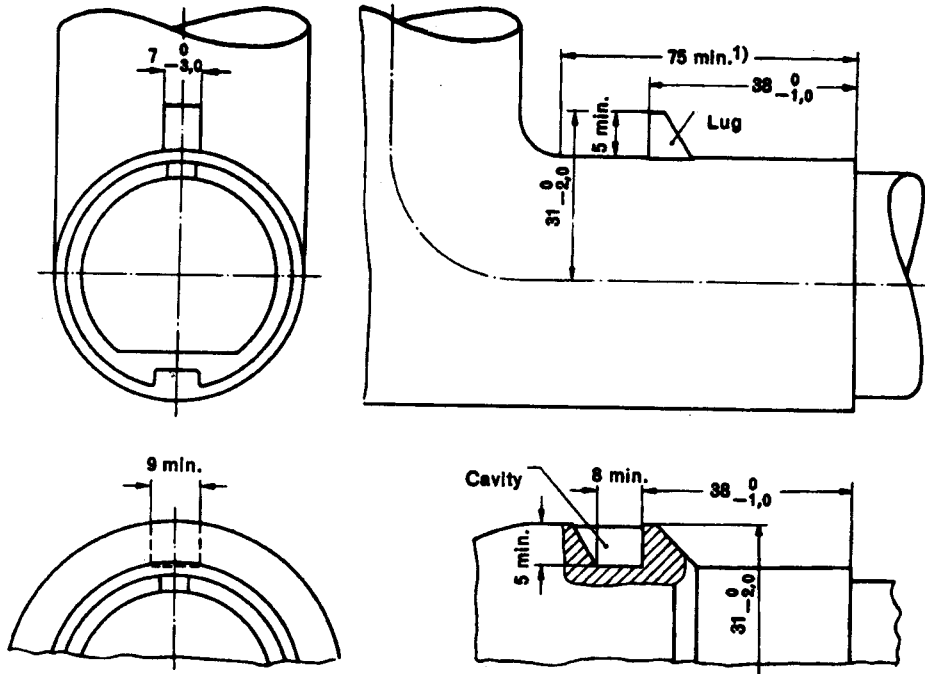
1) These dimensions shall be within the prescribed limits over a distance of:
26 mm for IP67/watertight accessories,

23 mm for other accessories.

2) For IP67/watertight accessories, these dimensions are increased by 3,0 mm.

STANDARD SHEET 2-IX
(continuation 1)

**RETAINING MEANS FOR
IP44/SPLASH-PROOF PLUGS AND
APPLIANCE INLETS**



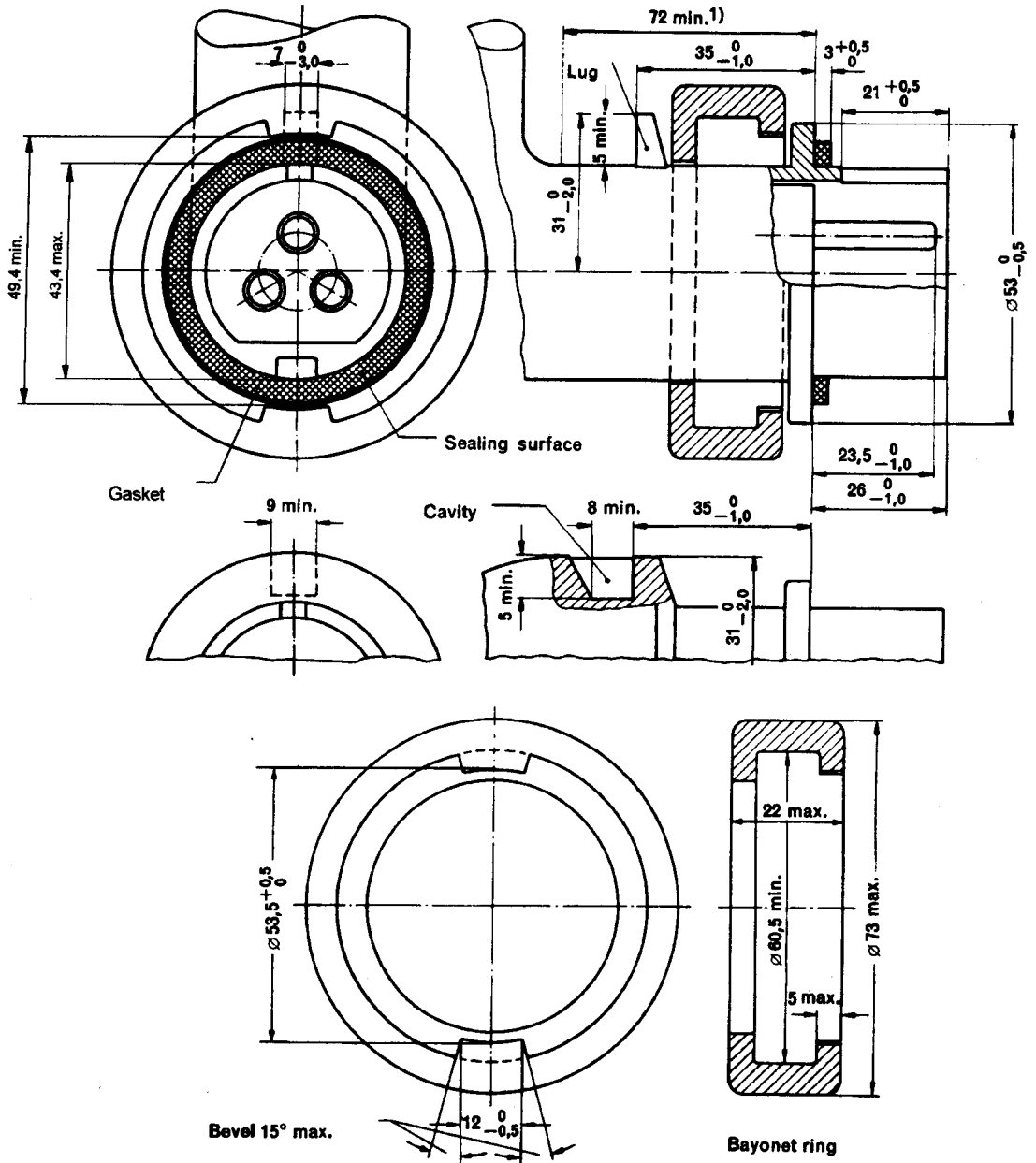
Dimensions in millimetres

¹⁾ Minimum clearance required for movement of hinged lid.

The retaining means shall be in the form of a lug or a cavity, at position 12 h.

STANDARD SHEET 2-IX
(continuation 2)

RETAINING MEANS FOR IP67/WATERTIGHT
PLUGS AND APPLIANCE INLETS



Dimensions in millimetres

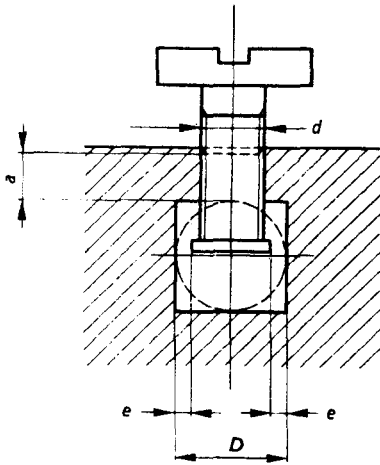
1) Minimum clearance required for movement of hinged lid.

The sketches are not intended to govern design except as regards the dimensions shown

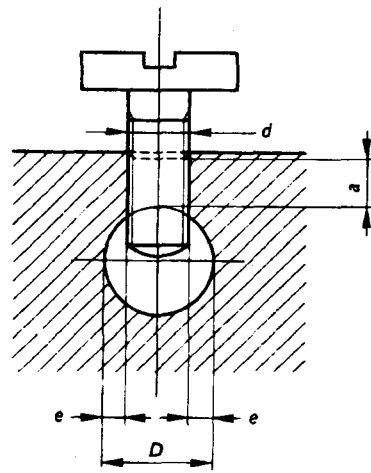
The retaining means shall be in the form of a bayonet ring and a lug or a cavity, at position 12 h.

STANDARD SHEET 2-X

PILLAR TERMINALS



Terminal with pressure plate



Terminal without pressure plate

Terminal size	Minimum diameter of conductor space <i>D</i>	Minimum nominal thread diameter <i>d</i>		Maximum gap between conductor restraining parts <i>e</i>	Minimum length of thread in terminal <i>a</i>		Minimum distance between clamping screw and end of conductor when fully inserted	
		One screw	Two screws		One screw	Two screws	One screw	Two screws
2	3,0	3,0 ¹⁾	2,5	0,5	2,0	1,8	1,5	1,5
3	3,6	3,5	2,5 ²⁾	0,5	2,5	1,8	1,8	1,5
4	4,0	3,5	3,0 ¹⁾	0,6	2,5	2,0	1,8	1,5
5	4,5	4,0	3,0 ¹⁾	1,0	3,0	2,0	2,0	1,5
6	5,5	5,0	4,0	1,3	4,0	3,0	2,5	2,0
7	7,0	6,0	4,0	1,5	4,0	3,0	3,0	2,0
8	10,0	—	6,0	—	—	4,0	—	3,0
9	13,0	—	10,0	—	—	7,5	—	3) ³⁾
10	16,0	—	3) ³⁾	—	—	3) ³⁾	—	3) ³⁾

Dimensions in millimetres

¹⁾ For BA threads, this value is reduced to 2,8.

²⁾ If the screws have a nominal thread diameter of 2,5 mm, it is necessary to use a pressure plate

to ensure that the gap between conductor restraining parts does not exceed the prescribed value.

³⁾ These values are under consideration.

For headed screws, the length of thread on the screw shall not be less than the sum of the diameter of the conductor space and the actual length of thread in the terminal. For other screws, the length of thread shall not be less than the sum of the diameter of the conductor space and the specified minimum length of thread in the terminal.

The part of the terminal containing the threaded hole and the part of the terminal against which the conductor is clamped by the screw may be two separate parts, as in the case of terminals provided with a stirrup.

The shape of the conductor space may differ from

those shown in the figures, provided a circle with a diameter equal to the minimum value specified for D can be inscribed.

The length of thread in the terminal is measured from the point where the thread is first broken by the hole for the conductor.

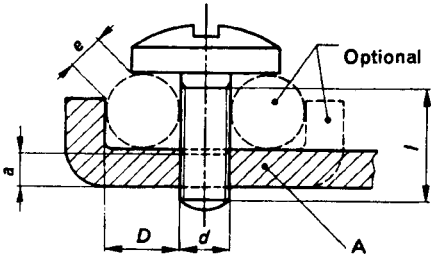
The minimum distance between the clamping screw and the end of the conductor when fully inserted applies only to terminals in which the conductor cannot pass right through.

The sketches are not intended to govern design except as regards the dimensions shown.

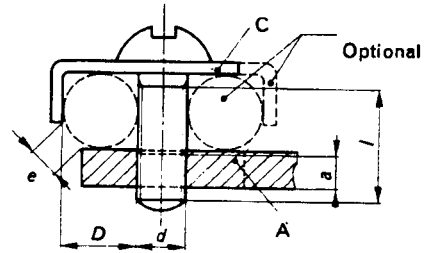
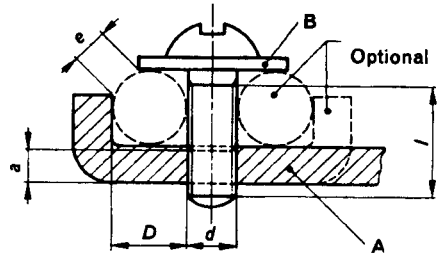
STANDARD SHEET 2-XI

SCREW TERMINALS AND STUD TERMINALS

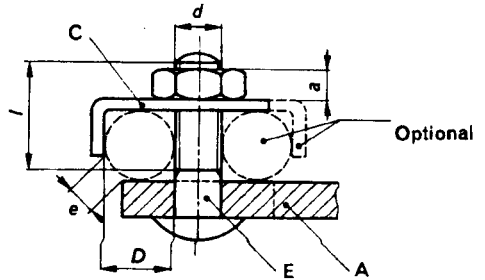
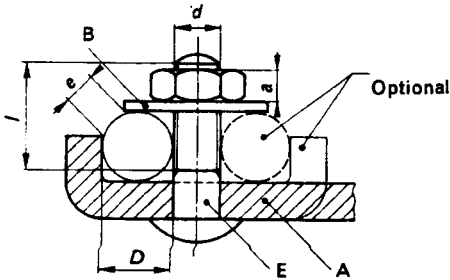
Screw not requiring washer or clamping plate



Screw requiring washer or clamping plate



Screw terminals



Stud terminals

- A Fixed part.
- B Washer or clamping plate.
- C Anti-spread device.
- E Stud.

Terminal size	Minimum diameter of conductor space <i>D</i>	Minimum nominal thread diameter <i>d</i>		Maximum gap between conductor restraining parts <i>e</i>	Minimum length of thread in fixed part or nut <i>a</i>		Minimum length of thread on screw or stud <i>l</i>
		One screw	Two screws		One screw	Two screws	
2	2,0	3,5	–	1,5	1,5	–	4,0
3	2,7	4,0	3,0 ¹⁾	2,5	1,5	1,5	5,5
4	3,6	5,0	4,0	1,5	3,0	2,5	6,5
5	4,3	5,0	4,0	2,0	3,0	2,5	7,5
6	5,5	5,0	4,0	2,0	3,5	2,5	9,0
7	7,0	6,0	5,0	2,0	3,5	3,0	10,5
8	8,0	6,0	5,0	2,0	4,0	3,0	12,0
9	2)	8,0	2)	2)	5,5	2)	14,0
10	2)	10,0	2)	2)	7,0	2)	16,0

Dimensions in millimetres

1) For BA threads, this value is reduced to 2,8.

2) These values are under consideration.

If an intermediate part is used between the head of the screw or the nut and the conductor, the minimum value for the length of the thread on the screw or stud is increased by the thickness of the intermediate part.

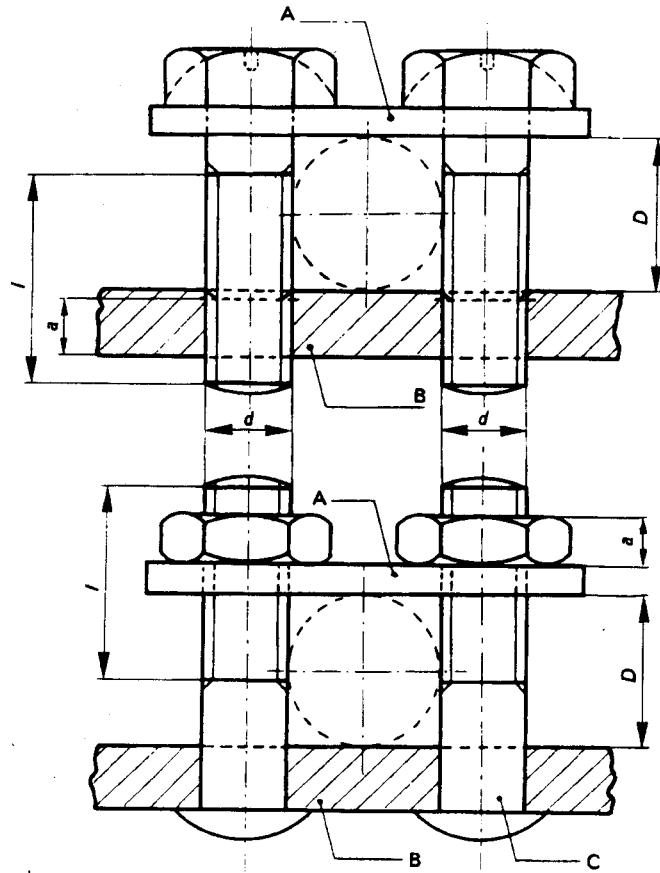
An intermediate part, such as a washer, clamping plate or anti-spread device, is necessary on all stud terminals, unless the base of the nut is itself round. Such an intermediate part is necessary on screw terminals, if the head of the screw is of insufficient diameter to meet the requirement regarding the gap between conductor restraining parts.

The part which retains the conductor in position, to which the dimension *e* is measured, may be of insulating material, provided that the pressure necessary to clamp the conductor is not transmitted through the insulating material.

The sketches are not intended to govern design except as regards the dimensions shown.

STANDARD SHEET 2-XII

SADDLE TERMINALS



- A Saddle.
- B Fixed part.
- C Stud.

Terminal size	Minimum diameter of conductor space <i>D</i>	Minimum nominal thread diameter <i>d</i>	Minimum length of thread in fixed part or nut <i>a</i>	Minimum length of thread on screws or studs <i>l</i>
3	3,0	3,0 ¹⁾	1,5	5,0
4	4,0	3,5	1,5	6,0
5	4,5	4,0	2,5	7,0
6	5,5	4,0	2,5	8,0
7	7,0	5,0	3,0	10,0

Dimensions in millimetres

¹⁾ For BA threads, this value is reduced to 2,8.

The shape of the section of the conductor space may differ from that shown in the figures, provided a circle with a diameter equal to the minimum value specified for D can be inscribed.

The shape of the upper and lower faces of the saddle may be different to accommodate both small and large cross-sectional area conductors by reversing the saddle.

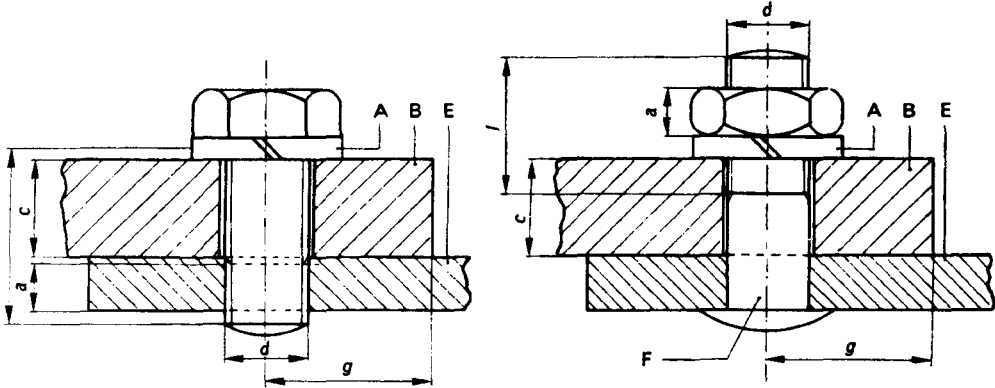
The terminals may have more than two clamping screws or studs.

If the non-threaded part of the shank of the screw or stud is shorter than the thickness of the saddle, the minimum value specified for the length of thread on the screw or stud is taken from the saddle, this being in contact with the head of the screw for terminals with screws, and in contact with the fixed part for terminals with studs.

The sketches are not intended to govern design except as regards the dimensions shown.

STANDARD SHEET 2-XIII

LUG TERMINALS



- A Locking means.
- B Cable lug or bar.
- E Fixed part.
- F Stud.

Terminal size	Minimum nominal thread diameter	Minimum length of thread in fixed part or nut	Minimum length of thread on screw or stud	Maximum thickness of lug or bar to be accommodated	Minimum distance from centre of screw or hole to side of rectangular clamping area
	<i>d</i>	<i>a</i>	<i>l</i>	<i>c</i>	<i>g</i>
6	5,0	3,0	10	6,0	10
7	6,0	3,5	12	8,0	12

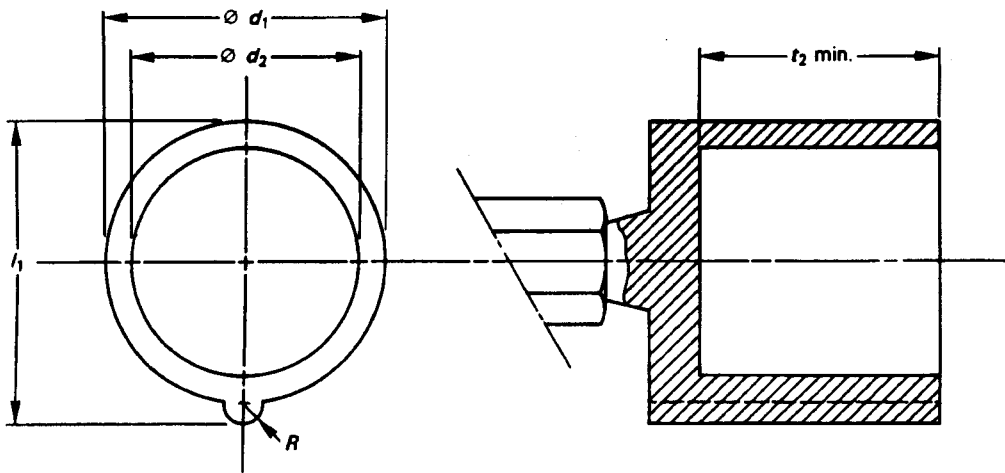
Dimensions in millimetres

A spring washer or equally effective locking means shall be provided for this type of terminal.

A clamping area with a smooth contact surface shall be provided around the screw or hole for clamping the lugs or bars, this area being sufficient to accommodate the rectangular gauge strip specified in 11.7.

If the non-threaded part of the shank of the screw or stud is shorter than the thickness of the locking means, the minimum value specified for the length of thread on the screw or stud shall be increased accordingly.

The sketches are not intended to govern design except as regards the dimensions shown.



The eccentricity between the centres of d_1 and d_2 shall not exceed 0,05 mm.

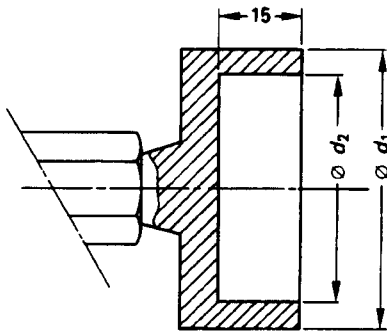
Type	d_1 0 -0,05	d_2 +0,05 0	l_1 0 -0,05	R 0 -0,025	t_2 min.
16/20 A - 2P + \perp	44,3	36,0	47,5	3,3	38
16/20 A - 3P + \perp	50,4	40,8	54,0	3,3	38
16/20 A - 3P + N + \perp	57,3	46,4	61,3	3,3	38
32/30 A - 2P + \perp , 3P + \perp	58,6	47,0	64,6	3,3	48
32/30 A - 3P + N + \perp	64,7	52,9	71,2	3,3	48
63/60 A	71,0	60,0	77,5	4,8	69
125/100 A	83,0	71,0	89,5	4,8	76

Dimensions in millimetres

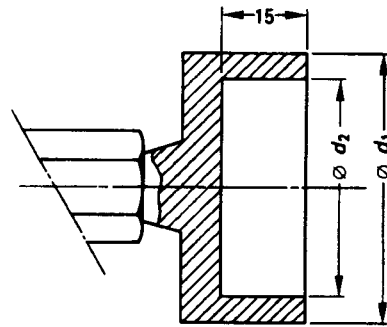
(See 4.101)

It shall be possible to insert the appropriate gauge into the socket-outlet or connector.

Figure 101 – 16/20 A, 32/30 A, 63/60 A and 125/100 A socket-outlets and connectors having rated operating voltages exceeding 50 V – "GO" gauges for checking dimensions d_1 , d_2 , l_1



GAUGE A FOR CHECKING $\varnothing d_1$



GAUGE B FOR CHECKING $\varnothing d_2$

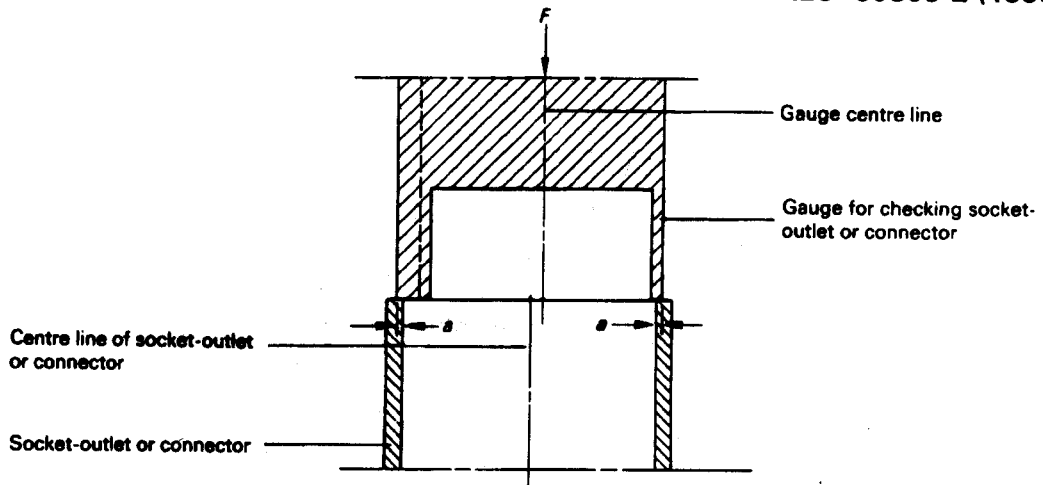
Type	Gauge A		Gauge B	
	d_1 +0,05 0	d_2 +0,5 0	d_1 0 -0,5	d_2 0 -0,05
16/20 A - 2P + $\frac{1}{2}$	44,73	37,0	43,3	34,47
16/20 A - 3P + $\frac{1}{2}$	50,93	41,8	49,4	39,27
16/20 A - 3P + N + $\frac{1}{2}$	57,93	47,4	56,3	44,87
32/30 A - 2P + $\frac{1}{2}$, 3P + $\frac{1}{2}$	59,23	48,0	57,6	45,47
32/30 A - 3P + N + $\frac{1}{2}$	65,33	53,9	63,7	51,37
63/60 A	71,83	61,0	70,0	58,47
125/100 A	83,83	72,0	82,0	69,47

Dimensions in millimetres

(See 4.101)

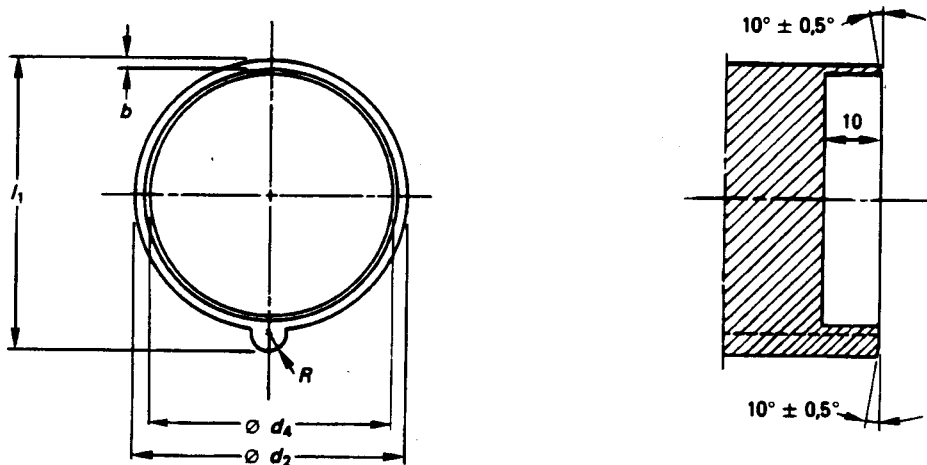
It shall not be possible to insert the gauges A and B into the socket-outlet or connector.

Figure 102 – 16/20 A, 32/30 A, 63/60 A and 125/100 A socket-outlets and connectors having rated operating voltages exceeding 50 V – "NOT GO" gauges for checking dimensions d_1 , d_2



(See 4.101)

Figure 103 – Arrangement for test using "NOT GO" gauge for checking 16/20 A, 32/30 A, 63/60 A and 125/100 A socket-outlets and connectors having rated operating voltages exceeding 50 V



(See 4.101)

The eccentricity between the centres of d_2 and d_4 shall not exceed 0,05 mm.

Figure 104 – Gauges for checking socket-outlets or connectors of 16/20 A, 32/30 A, 63/60 A and 125/100 A having rated operating voltages exceeding 50 V

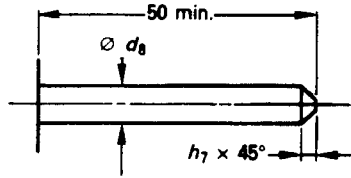


Figure 105 – Gauge for checking phase holes

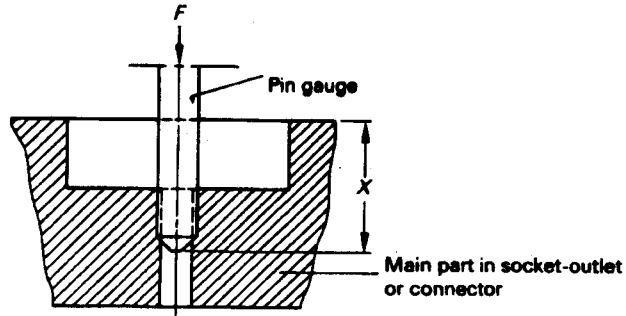
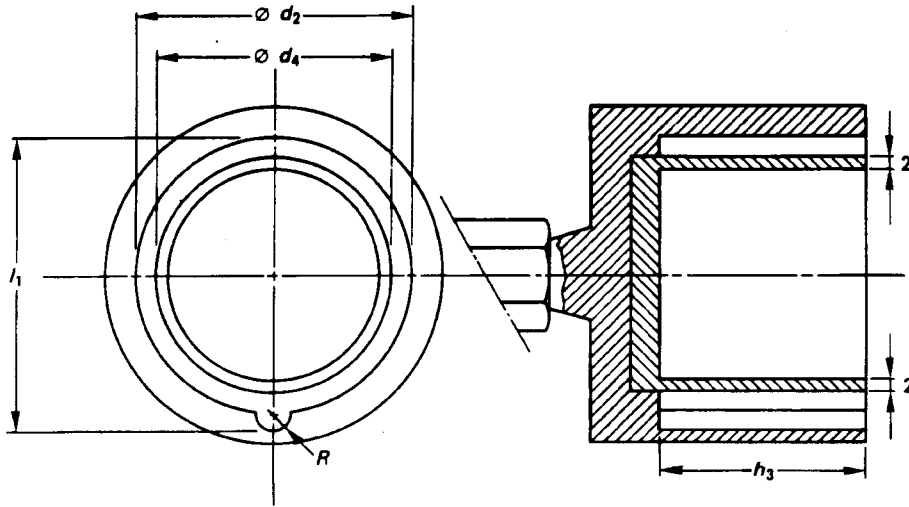


Figure 106 – Test of phase hole

Dimensions for figures 104 and 105

Type	Gauge						
	d_2 0 -0,05	d_4 +0,1 0	d_8 0 -0,03	h_7 +0,1 0	l_1 0 -0,05	b $\pm 0,1$	R 0 -0,1
16/20 A – 2P + $\frac{1}{2}$	42,9	39,4	6,91	2,2	46,1	1,4	2,8
16/20 A – 3P + $\frac{1}{2}$	48,9	44,3	6,91	2,2	52,4	1,5	2,8
16/20 A – 3P + N + $\frac{1}{2}$	55,5	50,3	6,91	2,2	59,5	1,6	2,8
32/30 A – 2P + $\frac{1}{2}$, 3P + $\frac{1}{2}$	56,5	51,3	7,91	2,5	62,6	2,5	2,8
32/30 A – 3P + N + $\frac{1}{2}$	62,6	57,2	7,91	2,5	69,2	2,7	2,8
63/60 A	68,7	63,5	9,89	3	74,9	2,45	3,8
125/100 A	80,7	75,0	11,89	4	86,9	2,45	3,8

Dimensions in millimetres



The eccentricity between the centres of d_2 and d_4 shall not exceed 0,05 mm.

Type	Calibre					R +0,25 0
	d_2 +0,05 0	d_4 0 -0,05	h_3	l_1 +0,05 0		
				1)	2)	
16/20 A - 2P + $\frac{1}{2}$	43,5	37,9	37,05	46,5	47,0	3,2
16/20 A - 3P + $\frac{1}{2}$	49,5	42,8	37,05	52,9	53,6	3,2
16/20 A - 3P + N + $\frac{1}{2}$	56,1	48,8	37,05	60,1	61,0	3,2
32/30 A - 2P + $\frac{1}{2}$, 3P + $\frac{1}{2}$	57,3	49,7	46,05	63,2	63,2	3,2
32/30 A - 3P + N + $\frac{1}{2}$	63,4	55,6	46,05	69,9	69,9	3,2
63/60 A	69,5	61,5	67,05	75,5		4,2
125/100 A	81,5	72,5	75,55	87,5		4,2

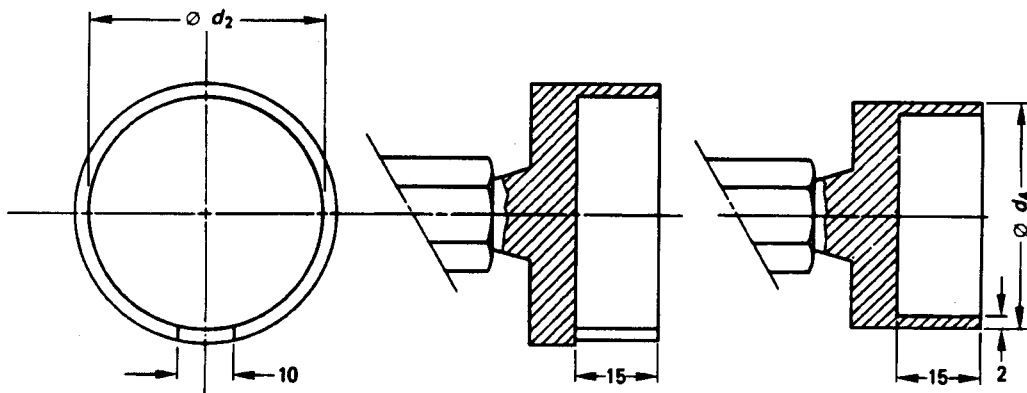
Dimensions in millimetres

(See 4.101)

- 1) For accessories with metal enclosures.
- 2) For accessories with enclosures of insulating material.

It shall be possible to insert the appropriate gauge into the plug or appliance inlet.

Figure 107 – 16/20 A, 32/30 A, 63/60 A and 125/100 A plugs and appliance inlets having rated operating voltages exceeding 50 V "GO" gauges for checking dimensions d_2 , d_4 , l_1



GAUGE A FOR CHECKING $\varnothing d_2$

GAUGE B FOR CHECKING $\varnothing d_4$

Type	Gauge A	Gauge B	
	d_2	d_4	
	$\begin{matrix} 0 \\ -0,05 \end{matrix}$	$\begin{matrix} +0,05 \\ 0 \end{matrix}$	
		1)	2)
16/20 A - 2P + $\frac{1}{2}$	42,87	39,83	39,43
16/20 A - 3P + $\frac{1}{2}$	48,87	44,73	44,33
16/20 A - 3P + N + $\frac{1}{2}$	55,47	50,73	50,33
32/30 A - 2P + $\frac{1}{2}$, 3P + $\frac{1}{2}$	56,47	51,63	51,33
32/30 A - 3P + N + $\frac{1}{2}$	62,57	57,53	57,23
63/60 A	68,67	63,53	
125/100 A	80,67	75,03	

Dimensions in millimetres

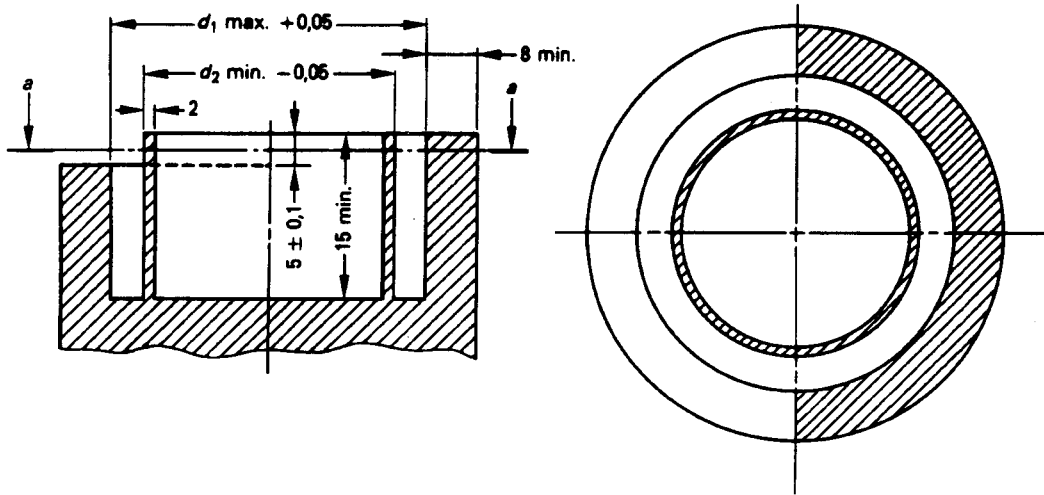
(See 4.101)

1) For accessories with metal enclosures.

It shall not be possible to insert the gauges A and B into the plug or appliance inlet.

2) For accessories with enclosures of insulating material.

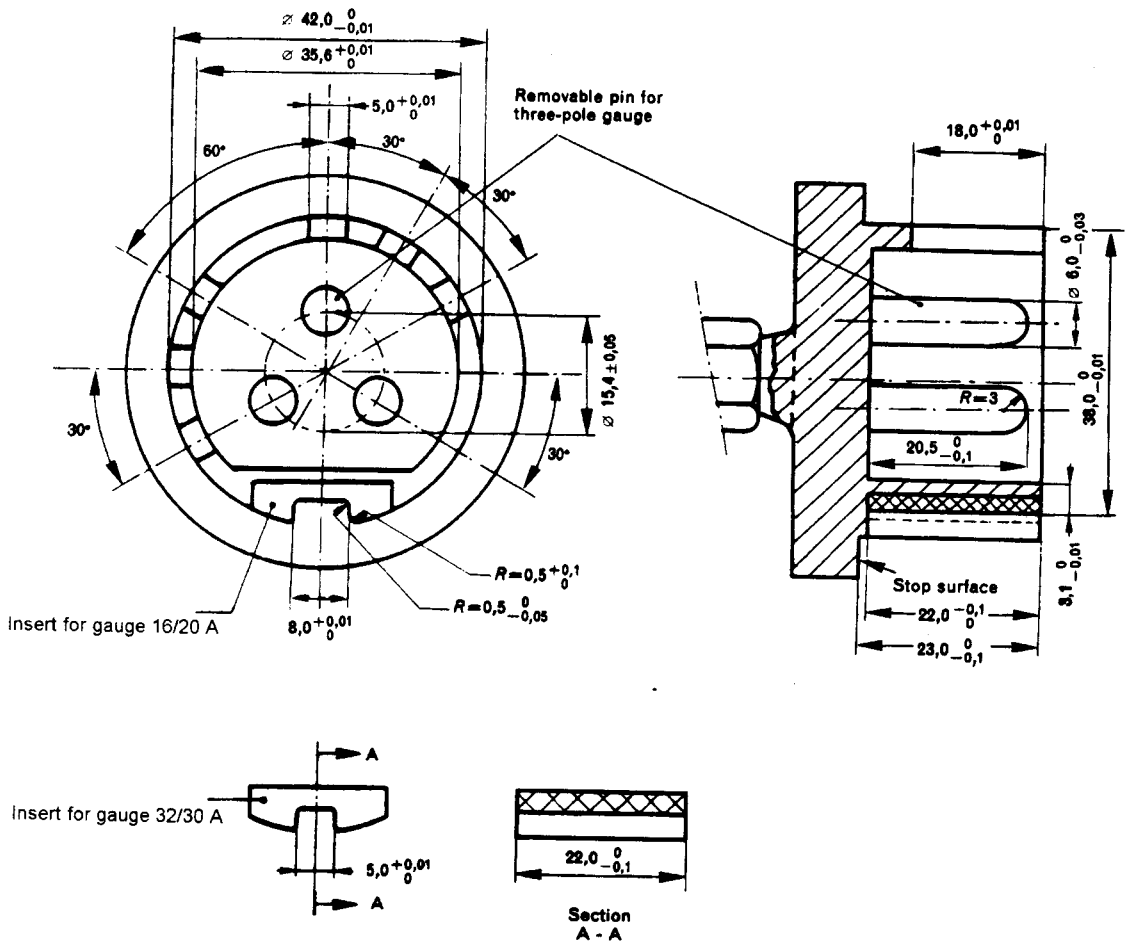
Figure 108 - 16/20 A, 32/30 A, 63/60 A and 125/100 A plugs and appliance inlets having rated operating voltages exceeding 50 V - "NOT-GO" gauges for checking dimensions d_2 , d_4



Dimensions in millimetres

The dimensions d_1 and d_2 are those of the corresponding socket-outlets or connectors.

Figure 109 – "NOT-GO" gauges for checking 16/20 A, 32/30 A, 63/60 A and 125/100 A plugs and appliance inlets having rated operating voltages exceeding 50 V

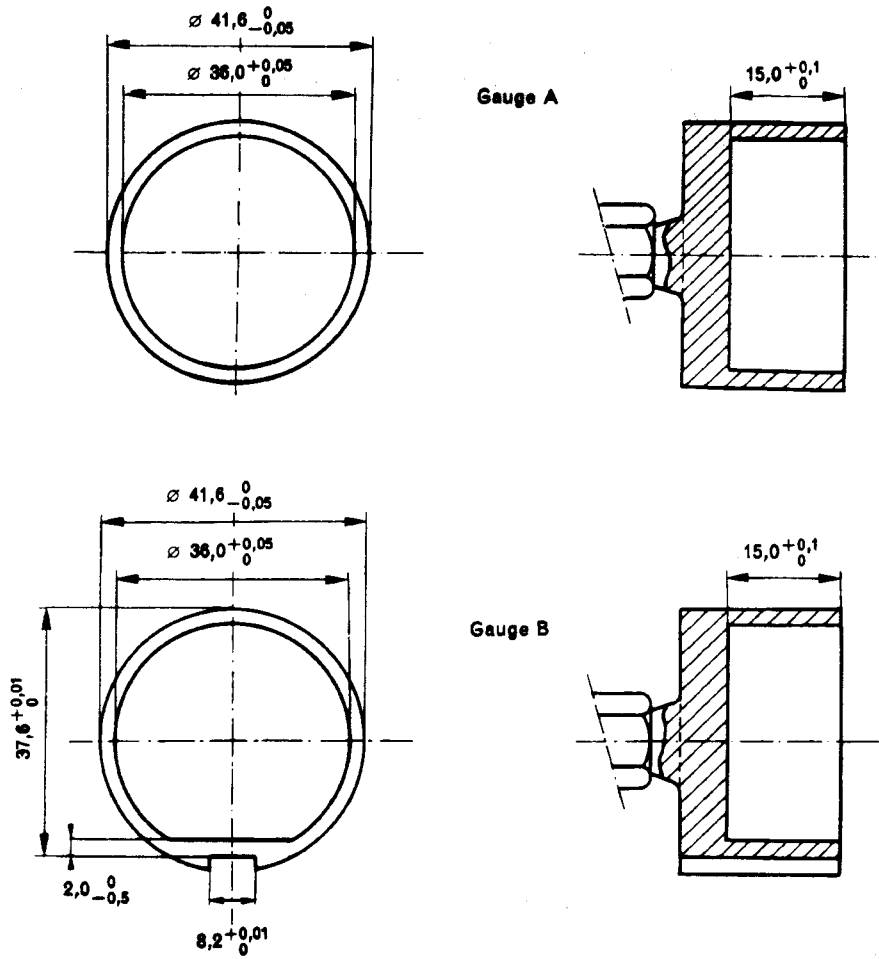


Dimensions in millimetres

It shall be possible to insert the appropriate gauge to the socket-outlet or connector so that the stop surface of the gauge comes into contact with the front

surface of the shroud of the socket-outlet or connector.

Figure 110 – 16/20 A and 32/30 A socket-outlets and connectors having rated operating voltages not exceeding 50 V – Gauges for checking interchangeability

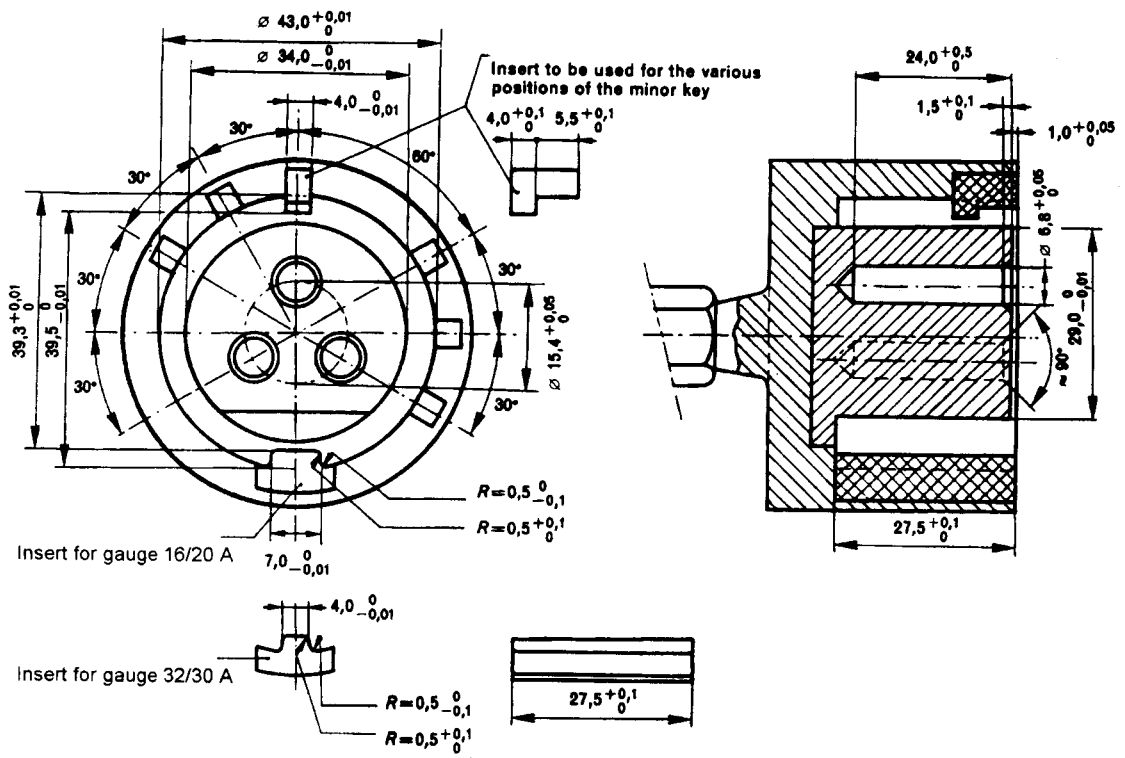


Dimensions in millimetres

It shall not be possible to insert the gauge A into the socket-outlet or connector.

It shall not be possible to insert the gauge B in the correct position into the shroud of the socket-outlet or connector.

Figure 111 – 16/20 A and 32/30 A socket-outlets and connectors having rated operating voltages not exceeding 50 V – Gauges for checking rigidity of enclosures of thermoplastic material under humid and warm conditions

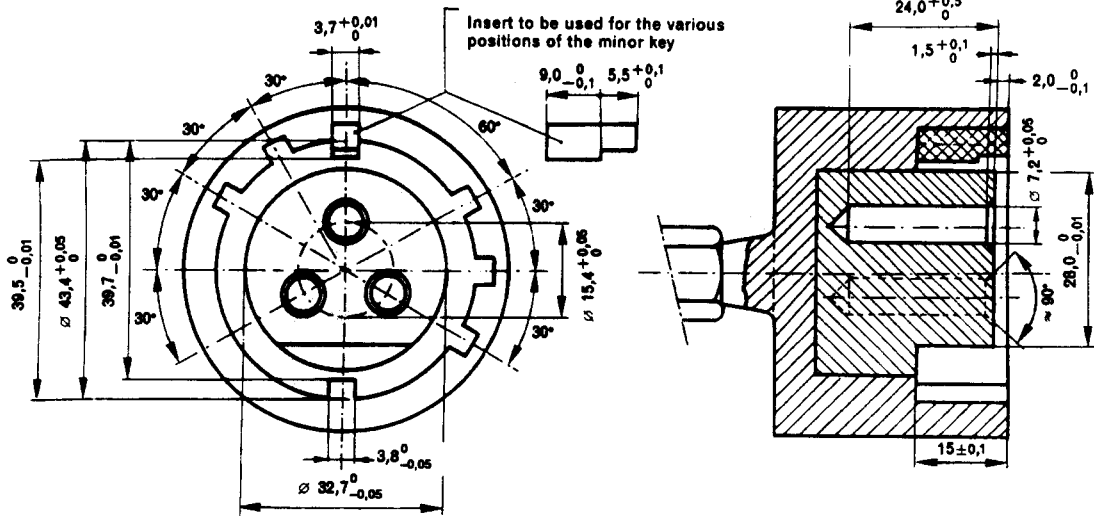


Dimensions in millimetres

It shall be possible to insert the appropriate gauge, without undue force, into the plug or appliance inlet so

that the front surface of the gauge comes into contact with the stop surface of the plug or appliance inlet.

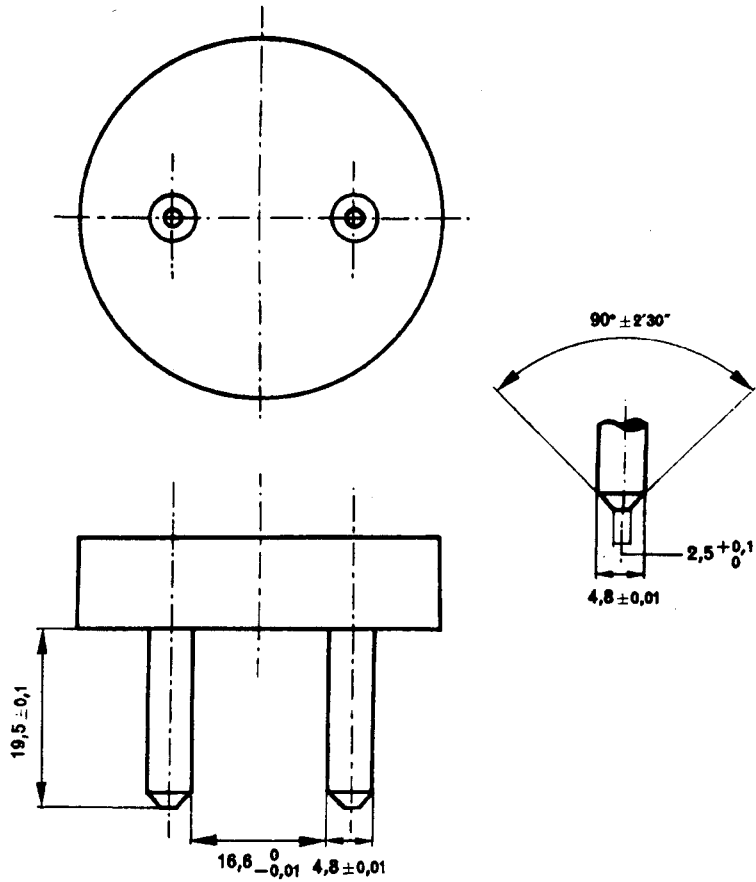
Figure 112 – 16/20 A and 32/30 A plugs and appliance inlets having rated operating voltages not exceeding 50 V – Gauges for checking interchangeability



Dimensions in millimetres

In any position of the insert, it shall not be possible to pass the gauge in the correct position over the shroud of the plug or appliance inlet.

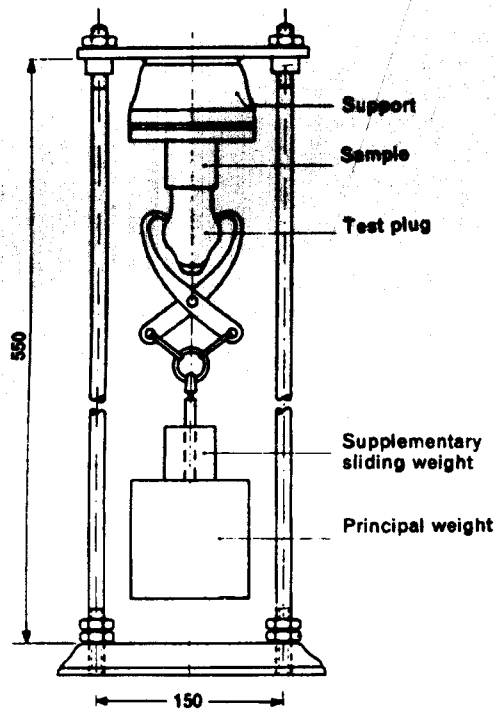
Figure 113 – 16/20 A and 32/30 A plugs and appliance inlets having rated operating voltages not exceeding 50 V – Gauges for checking rigidity of enclosures of thermoplastic material under humid and warm conditions



Dimensions in millimetres

It shall not be possible to touch a phase contact tube of the socket-outlet or connector with one gauge pin only.

Figure 114 – Socket-outlets and connectors with enclosures of resilient or thermoplastic material – Gauge for checking impossibility of single-pole insertion of 10/16 A 250 V two-pole plugs



Dimensions in millimetres

Figure 115 – Apparatus for checking the withdrawal force

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