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**Plugs and receptacles for domestic
and similar general use**

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Electrical Wiring Devices and Equipment Industries Association (JEWA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14. Consequently **JIS C 8303** : 1993 is replaced with this Standard.

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Plugs and receptacles for domestic and similar general use

Introduction

This Japanese Industrial Standard has been prepared by reviewing the contents of the previous edition of **JIS C 8303**, which was revised in 1993, as a product standard, and citing some parts of the safety requirements from **JIS C 8282-1** and **JIS C 8282-2-11**.

No International Standard corresponding to this Standard has been established at this point. A related international standard report is **IEC TR 60083** *Plugs and socket-outlets for domestic and similar general use standardized in member countries of IEC*.

1 Scope

This Standard specifies plugs and receptacles used for connection between the wiring and the cord or for mutual connection between cords in electric circuits of 50 Hz or 60 Hz in frequency and a.c. 250 V or less in voltage (hereafter referred to as “connectors”). The ambient temperature at which these connectors are used shall be not more than 40 °C.

This Standard also covers connection incorporating pilot lamps or earth terminals, and connectors of waterproof type, clamp type and slip check type, and also connectors for plastic surface raceways for interior wiring (hereafter referred to as “raceway connectors”).

This Standard does not cover connectors for special purposes, such as connectors for industrial works where they are handled particularly under severe conditions, connectors of explosion-proof type, and of floor mounting type as well as connectors equipped with automatic circuit breaking mechanism and with timer.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. For the normative standards with the year indication, only the editions of the indicated year shall apply but the revisions (including amendments) made thereafter shall not apply. The normative references without the indication of the year shall apply only to the most recent editions (including amendments).

JIS B 0205-1 *ISO general purpose metric screw threads—Part 1: Basic profile*

JIS B 0205-2 *ISO general purpose metric screw threads—Part 2: General plan*

JIS B 0205-3 *ISO general purpose metric screw threads—Part 3: Selected sizes for screws, bolts and nuts*

JIS B 1012 *Cross recesses for screws*

JIS C 0920 *Degrees of protection provided by enclosures (IP Code)*

JIS C 3301 *Rubber insulated flexible cords*

- JIS C 3306 *Polyvinyl chloride insulated flexible cords*
- JIS C 3307 *600 V Polyvinyl chloride insulated wires*
- JIS C 3312 *600 V Grade polyvinyl chloride insulated and sheathed portable power cables*
- JIS C 3342 *600 V Polyvinyl chloride insulated and sheathed cables*
- JIS C 3612 *600 V Flame retardant polyethylene insulated wires*
- JIS C 8282-1:2007 *Plugs and socket-outlets for household and similar purposes—Part 1: General requirements*
- JIS C 8282-2-11:2007 *Plugs and socket-outlets for household and similar purposes—Part 2-11: Particular requirements for twist lock and another*
- JIS C 8306:1996 *Testing methods for wiring devices*
- JIS C 8340:1999 *Boxes and box covers for rigid metal conduits*
- JIS C 8375 *Mounting frame for interchangeable wiring devices of large square boss type*
- JIS C 8425 *Plastic surface raceways for interior wiring*
- JIS H 3100 *Copper and copper alloy sheets, plates and strips*
- JIS H 3110 *Phosphor bronze and nickel silver sheets, plates and strips*
- JIS H 8610 *Electroplated coatings of zinc on iron or steel*

3 Terms and definitions

For the purposes of this Standard, the following terms and definitions apply.

3.1 plug, receptacle and connector

a connector consisting of an attachment plug and a receptacle which enables electrical connection and/or disconnection between the wiring and the cord or between individual cords by inserting or withdrawing the plug into or from the receptacle

The devices covered by this term are plugs with blades, receptacles with plug receptacle, cord connectors, and multiple taps.

3.2 plug

a device consisting of blades, joints with cords (including cab tire cable) sheathed with insulating material, etc. capable of being inserted into or withdrawn from a receptacle by hand

There are flat blade type and clamp type blade specified in **3.7**.

It can be used as the generic name to refer to all of the devices of this type.

3.3 receptacle

a kind of plug receptacle of connector consisting of a blade receiver, connection terminals with wiring and other parts, capable of being fixed to structural members, appliances or the like

3.4 cord connector

a kind of receptacle of connector having a blade receiver, means for connecting cords (including cab tire cable)

It is used, without fixing, for extension of cords.

3.5 multiple tap

a kind of receptacle of a connector consisting of blade receivers (two or more sets of openings), joints with cords (including cab tire cables) and blades for connection to power source

It is used, without fixing, to branch out two or more circuits from one socket-outlet or one cord.

Those to which cords can be connected are called “cord-connecting multiple taps”.

Multiple taps include table taps intended to be used on the table or the like and pendant type multiple taps intended to be used being suspended by a cord.

Those provided with blades for connection to power source are called “plug-in type multiple taps” (also called triangle taps).

3.6 clamp type

a kind of receptacle of a connector consisting of blade receivers, terminals for wiring connection, etc.

It is so constructed that the plug does not slip out easily, when the plug shown in figure A.1 or in figure A.9 is inserted and turned in right direction.

3.7 twist locking type

a kind of connector, in which the blades and blade receivers are curved in circular arc

It is so constructed that the plug does not slip out, when the mating plug is inserted and turned in right direction. The plug in this case is called a locking type plug.

3.8 waterproof type

a connector which is so constructed that it can be used outdoors where it is splashed with rain or the like

It is classified into watertight type and rain-proof type according to the grade of waterproof.

Designation of this type according to the protection against ingress of water is IPX3 for rain-proof type and IPX7 for the watertight type as defined in **JIS C 0920**.

3.9 ordinary type

connectors used indoors, that are not water proof type

3.10 terminal

a part of a connector provided for electrical and mechanical connection with external electric wires (including cords)

3.11 screwless terminal

a terminal so constructed that connection is automatically made by inserting the conductor of wire (solid annealed copper wire) directly into the terminal

3.12 moulded type

a connector, in which the terminal and cord are connected by welding, crimping caulking, or by other means, and this assembly is moulded with thermoplastic resin or the like

3.13 assembled type

a connector made by assembling, other than moulded type connectors

3.14 with shutter

a connector having a shutter which automatically shields the blade receiving hole

3.15 with pilot lamp

a connector which incorporates a pilot lamp in a part of the connector

There are two systems i.e. the lamp is operated by the line voltage or by the load current passing through the connector.

3.16 earth terminal for user

a connector having a terminal to which the user connects the earthing conductor of an electrical appliance

3.17 earth terminal for installer

terminals used by the installer or the manufacturer to connect the earthing wire to the receptacle, plug, cord connector or multiple tap that are with earthing poles

3.18 interchangeable type

a recessed type socket-outlet which has dimensions shown in figure A.31 to figure A.33, and satisfies such requirements that three socket-outlets, at the maximum, can be attached and detached to the mounting from shown in the same figure when the boss is oval or square, or to the mounting frame of large square multiple wiring apparatus specified in **JIS C 8375** when the boss is large square boss, the above assembly can be mounted to the switch box for one switch specified in attached figure 2 of **JIS C 8340 : 1999**

3.19 movable blade type

a power supply plug in which the blades are rotatable

3.20 socket-outlet for case way

a kind of receptacle of connector which consists of blade receivers, wiring terminals, etc. and can be recessed in and fixed to the plastic surface raceway for interior wiring specified in **JIS C 8425**

3.21 with cord

moulded and assembled type connectors whose attached cords are not removable through the use of general tool

3.22 union ring

an annular nut used for waterproofing of joints between the plug and blade receiver of a waterproof type connector

Usually, it belongs to the plug, has a gasket, and engages with the external screw thread provided on the receptacle. It tightens the gasket to ensure waterproofing.

4 Classification, number of poles, pole arrangement and rating

The classification of connectors, the number of poles, pole arrangement and rating shall be as shown in table 1. However, the rated currents of plug with cord and cord connectors shall be as specified in table 2 according to the size (nominal sectional area of conductor) of the cord attached.














Table 1 Classification, number of poles, pole arrangement and rating of connectors

Classification		Number of poles	Pole arrangement ^{a)}		Rating	Figure of Annex A
Designation	Type		Blade	Blade receiver		
Plug, receptacle, cord connector	Normal type, rain-proof type, watertight type ^{a)}	2			15 A 125 V	A.1
					15 A 250 V	A.2
					20 A 125 V	A.3
					20 A 250 V	A.4
					30 A 250 V	A.5
					15 A 125 V	Blade receiver A.6 Blade A.1
					20 A 125 V	Blade receiver A.7 Blade A.3
					20 A 250 V	A.8
		2 (With earthing pole)			15 A 125 V	A.9
					15 A 250 V	A.10
					20 A 125 V	A.11
					20 A 250 V	A.12
					30 A 250 V	A.13

Table 1 (continued)

Classification		Number of poles	Pole arrangement ^{a)}		Rating	Figure of Annex A
Designation	Type		Blade	Blade receiver		
Plug, receptacle, cord connector	Normal type, rain-proof type, watertight type ^{a)}	2 (With earthing pole)			50 A 250 V	A.14
					20 A 125 V	Blade receiver A.15 Blade A.11
					20 A 250 V	A.16
					15 A 125 V	Blade receiver A.17 Blade A.9
		3			15 A 250 V	A.18
					20 A 250 V	
					30 A 250 V	
		3 (With earthing pole)			15 A 250 V	A.19
					20 A 250 V	
					30 A 250 V	
Twist locking type plug, twist locking type receptacle, twist locking type cord connector	Normal type, rain-proof type	2			15 A 125 V	A.20
					20 A 250 V	A.21
					30 A 250 V	A.22
		2 (With earthing pole)			15 A 125 V	A.23
					15 A 250 V	A.24
					20 A 250 V	A.25
					30 A 250 V	A.26
		3			20 A 250 V	A.27
					30 A 250 V	A.28
		3 (With earthing pole)			20 A 250 V	A.29

Table 1 (concluded)

Classification		Number of poles	Pole arrangement ^{a)}		Rating	Figure of Annex A	
Designation	Type		Blade	Blade receiver			
Multiple tap	Normal type	2			(10 A 125 V)	A.1	
					12 A 125 V		
					15 A 125 V		
					(10 A 125 V)		Blade receiver A.6 Blade A.1
					12 A 125 V		
					15 A 125 V		
		2 (With earthing pole)				(10 A 125 V)	Blade receiver A.9, A.17 Blade A.9
						12 A 125 V	
						15 A 125 V	
		2				(10 A 125 V)	A.20
						12 A 125 V	
						15 A 125 V	
2 (With earthing pole)				(10 A 125 V)	A.23		
				12 A 125 V			
				15 A 125 V			

The types are classified according to the waterproof construction. However, the normal type is not provided with waterproofing means.

The number of poles shall be indicated by the number of poles of the blades or blade receivers intended for constant carriage of current and shall not include the number of poles exclusively used for earthing.

The combination of the kind of connector, number of poles, and rating is specified in figures A.1 to A.29 along with the pole arrangement.

Notes ^{a)} The pole arrangement for watertight type connectors is not specified.

^{b)} Connectors need not be polarized, except receptacles, if polarization is unnecessary for practical use or is difficult due to construction.

^{c)} As for the pole arrangement of plug, that given in figure A.1 is also used for blade receiver of figure A.7, and those given in figures A.1, A.3 and A.9 are also used for blade receiver of figure A.15.

^{d)} As for the pole arrangement of plug, that given in figure A.2 is also used for blade receiver of figure A.8 and those given in figures A.2, A.8 and A.10 are also used for plug receiver of figure A.16.

Table 2 Rated current of plug with cord and cord connector body

Size of attached cord (nominal sectional area of conductor) mm ²		0.75	1.25	2.0	3.5
Rated current of connector A	General cord	7	12	15	20
	Heat-resistant cord	7 or 8	14	15	20
<p>The rated current of connectors shall not exceed the values shown in table 1 even when the permissible current of the attached cord is larger than the rated current of the respective connectors specified in table 1.</p> <p>The heat-resistant cord shall be Class 2 polyvinyl chloride insulated flexible cord specified in JIS C 3306 or rubber insulated flexible cord of JIS C 3301, except natural rubber insulated ones.</p> <p>The attached cord shall have, at least, the sectional area specified in table 2, even if a cord with a sectional area other than that specified in JIS C 3301 or JIS C 3306, or a cord consisting of component wires of thinner diameter is used.</p>					

5 Performances

5.1 Retaining force

When a connector is tested according to **7.2**, the retaining force of the blade receiver shall conform to the value specified in table 3 according to the number of poles and rated current. However, this does not apply to twist locking type and clamp type connector.

Table 3 Retaining force

Number of poles	Rated current A	Retaining force N
2 poles	15 or less	10 to 60
	20	15 to 60
	30	20 to 100
2 poles with earthing pole 3 poles	15 or less	15 to 60
	20	20 to 100
	30, 50	30 to 120
3 poles with earthing pole	15 or less	20 to 80
	20	30 to 130
	30	40 to 150

5.2 Temperature rise

When the test of **7.3** is performed, the temperature rise of the contact between the blade and the blade receiver and that of the screwless terminal and the blade of movable blade type shall not exceed the following values:

- a) Contact between blade and blade receiver
 - Rated current 15 A or less 30 °C
 - Rated current 20 A or more 40 °C
- b) Screwless terminal 35 °C
- c) Blade of movable blade type 35 °C

5.3 Contact resistance

When the test of 7.4 is performed, the contact resistance between the blade and the blade receiver of earthing pole, between the earth terminal for installer and earth terminal for user shall not exceed 50 mΩ.

5.4 Make and break

When the test of 7.5 is performed, no short circuit between poles or other trouble harmful to use shall occur.

The pilot lamp, if equipped, shall operate surely.

5.5 Insulation resistance

When the test of 7.6 is performed, the insulation resistance shall be 100 MΩ or more before the make and break test, and 5 MΩ or more after the same test.

5.6 Dielectric withstand voltage

When connectors are tested according to 7.7, they shall withstand this test.

5.7 Resistance to heat

When the test of 7.8 is performed, softening, deformation, swelling, or other abnormalities harmful to use shall not occur on synthetic resin mouldings or rubber mouldings.

5.8 Strength of screw terminal and lead-wire joint

When the test of 7.9 is performed, the strength of the screw terminal and lead-wire joint shall be as follows:

- a) **For screw terminal**
Terminals or terminal screws shall not break.
- b) **For connectors with lead wires**
The joint with lead wire shall not be damaged.

5.9 Strength of blade fixing part

When the test of 7.10 is performed, the strength of blade fixing part shall be as follows:

- a) When connectors having blades fixed by caulking or screwing and not held or fixed at the outlet are tested according to 7.10 a), the blade fixing parts shall not be damaged.

- b) When connectors other than **a)**, having round or flat enclosure, and moulded type connectors whose blade-support circumference is covered by such a hard insulating material as thermosetting resin are tested according to **7.10 b)**, the blades shall not drop out of their fixed part.
- c) Moulded type connectors shall be as follows: However, moulded type connectors in which the circumference of blade support is covered with hard insulation material such as thermo-setting resin are excluded.
 - 1) When the test of **7.10 c) 1)** is performed, the force required to bend the blades shall be not less than 40 N.
 - 2) When the test of **7.10 c) 2)** is performed, the blades shall not break down or the enclosure of the blade fixing part shall not be damaged.
 - 3) When the test of **7.10 c) 3)** is performed, the blades shall not be broken.

5.10 Rotating property of movable plug type

When the test of **7.19** is performed, no short circuit between poles or other trouble detrimental to use shall occur.

5.11 Strength of enclosure

When the test of **7.11** is performed, there shall be no damage of the enclosure or other trouble harmful to use. However, the enclosure compression test shall be applied exclusively to plugs, cord connectors, and multiple taps; the pendulum free fall test exclusively to plugs, cord connectors, and cord connecting type multiple taps; and the single body free fall test exclusively to plug-in-type multiple taps.

5.12 Strength of cord anchorage (cord tension releasing device)

When the test of **7.12** is performed to check the strength of cord anchorage of connectors with cord and connectors which can connect cord, the displacement between the supply cord and the connected internal terminal shall not exceed 2 mm. However, test is applicable only to plugs, cord connectors, and cord-connecting multiple taps.

5.13 Strength of cord outlet (cord flexural performance)

When connectors with cord are tested according to **7.13**, for the strength of cord outlet, no short circuit between lines shall occur, and rate of broken wires shall not exceed 20 %.

5.14 Performance of screwless terminals

When the tests of **7.14** to **7.17** are performed, screwless terminal shall comply with the following requirements.

The wires used in these tests shall be the insulated solid annealed copper wire specified in **JIS C 3307**.

Terminals allowing connection with wires of two or more sizes (nominal) shall be tested by using the wires of the minimum and the maximum sizes (nominal) on separate specimen connectors.

- a) **Tensile strength** When the test of **7.14** is performed, no coming out of the wire, damage on terminal parts, or other trouble harmful to use shall occur.
- b) **Bending strength** When the test of **7.15** is performed, the requirements of **5.2** shall be satisfied without occurrence of coming out of the wire, damage to terminal parts, or other trouble harmful to use.
- c) **Terminal heat cycle** When the test of **7.16** is performed, the temperature rise of 125th cycle shall not exceed the temperature rise of 25th cycle plus 8 °C. This test shall not be applied to earth terminals for installers and earth terminals for users.
- d) **Withstand overcurrent** When the test of **7.17** is performed, there shall be no trouble harmful to use on the terminal parts.

5.15 Endurance to ammonia gas

When the test of **7.18** is performed, there shall not be any damage or cracking on the terminal screws or other brass members. However, this test is not applicable to connectors other than receptacles.

5.16 Tensile load

When the test of **7.20** is performed, there shall be no damage on the enclosure or cord grips or other trouble.

5.17 Waterproof

When the test of **7.21** is performed, waterproof of connectors shall be as followings:

- a) For rain-proof type connectors, no ingress of water shall be found in the live parts.
- b) For watertight type connectors, no ingress of water shall be found in the connector.
- c) When the test of **7.6** is performed, the insulation resistance shall be not less than 5 MΩ.
- d) When the test of **7.7** is performed, the connector shall withstand the test.

5.18 Flame resistance

When the test of **7.22** is performed, flame resistance of moulded type cord connector integrated with supply wire or the like, shall be such that the flame goes out naturally within 60 s after removal of the flame.

5.19 Moisture resistance

When the test of **16.3** of **JIS C 8282-1 : 2007** is performed, moisture resistance of connectors shall as follows. However, this test is not applied for the meantime.

- a) When the test of **7.6** is performed, the insulation resistance shall be not less than 5 MΩ.
- b) When the test of **7.7** is performed, the connector shall withstand the test.

6 Construction, dimension and material

The acceptance shall be judged by visual inspection. Where this is not effective, the judgment shall be made by conducting measurement or test.

6.1 Construction in general

The construction shall be as follows:

- a) The connector shall have a correct shape and be durable.
- b) Insertion and withdrawal of the plug shall be smooth and the electrical contact shall be sure.
- c) There shall be no risk of contact of a person with the live metal parts in normal service condition.
- d) There shall be no risk of occurrence of short circuit or earthing due to electric arc at the time of make or break (insertion or withdrawal of the plug).
- e) For connectors having a metal enclosure (box and lid) or the like which is liable to be reached by arcs, such parts of the enclosure shall be provided with a lining of insulation material or the like.
- f) The wire or cord entry shall be treated to prevent damage of the wire or cords.
- g) Conducting metal parts and fixtures shall either be firmly installed by a method to prevent loosening, or be provided with effective means to restrict their movement to prevent adverse effects on their function.
- h) The parts which are clamped by screws or rivets to pass current shall not be clamped with an insulating material liable to shrink under service condition inserted between the conductors. If means are provided to prevent poor contact even when the insulation shrinks, this shall not apply.
- i) Connectors to be connected with cord shall provide a space to allow terminal treatment of cord or a suitable tension releasing means so that the cord tension is not directly exerted on the joint of terminal and cord.
- j) The number of working threads of terminal screw shall be not less than two.
- k) The lid shall be no risk of dropout in normal service conditions.

In connectors having screwed lid, one or more screw threads shall engage.

- l) Live metal parts on the accessible surface and the back surface of the base of surface type connectors (those installed on the surfaces of structural members and the like) shall be recessed from respective surfaces by not less than 3 mm and filled with a suitable quantity of a water resistant insulating mixture (excluding sulfur), which does not soften at 65 °C, by a method to prevent its dropping out. However, the filling with the mixtures may be omitted if the live metal parts on the back surface of the base have a clearance of 6 mm or more and a creepage distance of 10 mm or more from the mounting face.
- m) The mounting frame of an interchangeable receptacle (see figures A.31 to A.33) shall be capable of fixing the receptacle firmly.

- n) Plugs and cord connectors shall have a size to allow easy insertion and withdrawal by hand and be provided with a slip-preventing means.
- o) Connectors having the earth pole or neutral pole shall have such a construction that the blade of earthing pole contacts earlier than other blades when the said plug is pushed in and disconnects later than other blades when the plug is pulled out.
- p) In moulded type multiple taps, the blade receiving parts shall not be fixed directly with soft thermoplastic resin (soft vinyl chloride, etc.).
- q) The roots (the parts which are not inserted into the blade receiver) of folded blades (see figures A.1 and A.9) shall be fixed not to drop out of the body, by bending them in L-shape or by other means.
- r) Connectors having lead wires in place of terminals shall comply with the following requirements:
 - 1) The lead wires shall be wires or cords conforming to **JIS C 3307, JIS C 3306, JIS C 3301, JIS C 3312, JIS C 3342, JIS C 3612** or those at least equivalent thereto.
 - 2) The joint between the terminal and the wire or the cord shall be securely connected by means of caulking, welding or the like.
- s) In a movable blade type plug, the blade shall rotate smoothly over the movable range and shall ensure electrical contact.

6.2 Terminals

Terminals, terminal screws and screwless terminals to be connected with wires or cords shall be as follows:

- a) Excluding the terminals of connectors integral with lead wires or cords, terminals shall have such a construction that wires or cords having a size corresponding to the rated current can be easily and securely connected.
- b) A terminal which clamps the wire or cord directly by the head of the terminal screw (hereafter referred to as "screw terminal") shall be large fillister head machine screws (figure B.1) or screws having at least equivalent clamping effect thereto. However, the terminal screws of earth poles shall be slotted hexagon head machine screws (figure B.2) or slotted head machine screws having at least equivalent clamping effect thereto.
- c) Terminal screws shall be made of brass. However, terminal screws of 30 A or more in rated current and not intended to carry current directly (excluding terminal screws for earth poles) may be made of steel plated as specified Class 2-Grade 2 in **JIS H 8610** or better. Terminal screws made of steel, shall comply with **17 (2) of JIS C 8306 : 1996**.
- d) The size (nominal) of terminal screws shall, at least, have the value shown in table 4 corresponding to the rated current. However, the terminal screws of earth poles shall have a size not less than M4 (M3.5 or more for terminal screws of 15 A or less in rated current).

Table 4 Size of terminal screws (nominal)

Rated current A		10, 12, 15	20	30	50
Designation of terminal screw (nominal)	For screw terminal	M4 ^{a)}	M4	M4.5	M5
	For terminals by other clamping means	M3.5	M4	M4.5	M5
Note ^{a)} Terminal screws intended for connection with cords only may be M3.5 for 10 A, 12 A and 15 A.					

- e) Terminal screws shall not also be used for fixing of parts other than wires or cords. However, terminal screws which will not cause loosening of such parts when the wire or cord is attached or detached are exempted from the above requirement.
- f) A terminal screw for earth terminal for user which is fastened by fingers shall be so constructed that it can be fastened by fingers sufficiently, and will not loosen easily.
- g) Screwless terminal shall be as follows:
- 1) The ratings of the devices shall be not more than 20 A.
 - 2) The construction shall be such that the conductor of the wire or cord (hereafter referred to as “conductor”) is supported between metal bodies under sufficient pressure without harmful damage to the conductor.
 - 3) The construction shall be such that the conductor can be directly inserted into and connected with the terminal correctly and easily and no harmful effect is given to the function of the device or to the terminal part when the conductor of the specified length is inserted to a sufficient depth.
 - 4) The construction shall allow easy detachment of the conductor by hand. In this case, simple tools in daily use (for example, a screw driver) may be used as an aid, but the terminals shall be so constructed that no harmful effect is given to the terminal or other parts by the use of such tools.
 - 5) A terminal in which two or more conductors are connected shall have such a construction that individual conductors are connected, supported, and detached independently. However, it may be so constructed that all the conductors can be detached simultaneously.
 - 6) The length of the conductor required for connection shall be clearly marked on each connector.
- h) Cord or cables used for connectors with code shall be those complying with the provisions of **JIS C 3301**, **JIS C 3306**, **JIS C 3312**, **JIS C 3342** or **JIS C 3612** or those at least equivalent thereto.
- i) The construction of shifting terminal shall be such that the wire corresponding to the apparatus rating (1.6 mm or more diameter solid wire or 2 mm² or more sectional area conductor stranded wire) can be connected.

6.3 Insulation

The insulation shall be as follows:

- a) It shall endure the temperature under the normal service conditions.
- b) It shall endure the temperature of any part in contact with it or in its vicinity, and shall be of small susceptibility to moisture. Those in accordance with appended table 4 in clause 1 or clause 2 of the Ministerial Ordinance Stipulating the Technical Standards of Electrical Appliances (Ordinance No. 85 of Minister of International Trade and Industry, 1962) shall satisfy the requirements of **6.3**.

6.4 Materials of conductive metal parts

Materials of conductive metal parts shall be as follows:

- a) The material of conductive metal parts other than those specified in **b**) shall be copper or copper alloys.
- b) The material of conductive metal parts acting as spring shall be phosphor bronze specified in **JIS H 3110**, brass specified in **JIS H 3100**, or similar spring characteristics and rust-resistant metals.
- c) The caulking rivets and the like used for mutual connection between conductive metal parts shall be made of copper or copper alloys.

6.5 Material of non-conductive metal parts

The material of metal parts which are not intended to be conductive shall be as follows:

- a) The materials of springs shall be hard steel wires, piano wires, phosphor bronze, or stainless steel.
- b) The material other than those specified in **a**) shall be steel plated for rust prevention or other rust-resistant metals.

6.6 Shapes and dimensions of blades and blade receiving holes

The shapes and dimensions of blades and blade receiving holes shall be as shown in figures A.1 to A.29 according to the number of poles, pole arrangement, and rating.

The shapes of parts for which the dimensions are not specified in the figures A.1 to A.29 are shown as examples.

6.7 Dimensions of mounting parts of recessed receptacles

The dimensions of mounting parts of interchangeable receptacle of normal type shall be as given in figures A.31 to A.33 respectively. The dimensions of the enclosures and mounting parts of normal type recessed receptacles (excluding those of the interchangeable type) should be in accordance with figure A.30. If receptacles are built in an apparatus, furniture, socket-outlet for case way or the like, the dimensions of mounting parts and bosses are not necessarily comply with figures A.30 to A.33.

The dimensions of interchangeable receptacles without mounting frame shall comply with figures A.31 to A.33 under the condition that the outlet is fixed to the mounting frame.

6.8 Dimensions of cable entry

The cable entry of the normal type surface type receptacle shall allow the electric wire designated by the manufacturer to pass through. The acceptability of the cable entry shall be confirmed by the successful connection of the electric wire. An example of dimensions of cable entry is given in table 5.

Table 5 Size of cable entry

Unit: mm

Rated current		15 A	20 A	30 A
Dimensions of cable entry (minimum value)	Single-core	$\phi 7$	$\phi 8$	$\phi 9$
	2-core	7×12	8×14	9×14
	3-core	7×16	8×19	9×19
The dimensions for 2-core and 3-core cables are respected for parallel type cables (VVF) in JIS C 3342 .				

6.9 Insulation distances

The insulation distances shall be, except those specified in **6.1 I**), in accordance with clause **27** of **JIS C 8282-1:2007**.

6.10 Symbols of terminals

For connectors having an earth terminal for installer, earth terminal for user or a pole earth side, symbols and letter symbols shall be clearly marked on the terminals or the base in the vicinity as follows:

- a) Earth terminal for installer, earth terminal for user shall be marked with graphic symbol \oplus . However, the marking may be letter symbols "PE", "protective earth", or indications such as " \perp ", "E", "G", "earth" or "earth terminal" for the time being.
- b) Pole of earth side shall be marked with the letter symbol N or W.

6.11 Twist locking type, clamp type connectors

The construction, dimensions, and materials of twist locking type, clamp type connectors shall comply with the following requirements in addition to those specified in **6.1** to **6.10**.

- a) Receptacle and cord connector have such construction that the blades catch the blade receivers in proper position of contact when respective adaptable plug is inserted into it and turned to the right, and the blades can be withdrawn when the plug is turned to left from the said position. The direction of turning shall be marked.

Further, the plug shall not rotate or come out easily due to the twisting of the cord.

- b) Excluding those of the moulded type, connectors to be connected with cords shall be provided with cord grips or mechanism to release cord tension so that the cord tension is not exerted on the joint between the terminal and cord.

- c) Twist locking type plug and twist locking type cord connector shall have shapes which facilitate gripping when withdrawing and inserting the plug.
- d) For the tolerances on shape and dimensions of blade (figures A.20 to A.29), those on the curvature radius or the diameter (R or ϕ) shall be recommended values for the time being.

6.12 Waterproof connectors

The construction, dimensions, and material of waterproof connectors shall comply with the following requirements in addition to compliance with provisions of 6.1 to 6.11.

- a) Rain-proof connectors shall comply with the following requirements:
 - 1) The construction shall be resistant, in normal service conditions, to water entering into the connector through wire or cord entries, mounting holes, other openings on the enclosure, etc.
 - 2) Receptacles shall have construction to prevent the penetration of water from the blade receiving holes without the plug inserted, by suitable means such as a shutter.
 - 3) For surface type receptacles having live metal parts on the mounting side, there shall be a clearance of not less than 4 mm between the surface of that part and the mounting face of the receptacle. The live metal parts shall be recessed by not less than 3 mm from the mounting face, and the spaces shall be filled with less hygroscopic insulating mixtures (excluding sulfur) to seal the live metal parts in such a manner as to prevent the dropping out of the insulating compound.
- b) Watertight connectors shall comply with the following requirements:
 - 1) The construction shall be such that no water can enter into the connector under normal service conditions.
 - 2) The construction shall be such that the dropping out of the plug can be prevented by suitable means such as a union ring so that the plug does not drop out due to the tension exerted on the cord under the condition of the plug being inserted.
 - 3) Receptacles and cord connectors shall have such a construction that no water can enter through the blade receiving holes with the plug detached.
 - 4) Plug and cord connectors shall have cord grips so that the tension exerted on the cord is not exerted on the joint between the cord and the terminal.
 - 5) The construction shall be such that plugs having the blade specified in table 1 cannot be inserted into the watertight connectors.
- c) Lids, union rings, and the like used for waterproofing shall be connected with the connector by suitable means such as a chain to avoid the risk of missing of such parts.
- d) Metallic materials used for the parts exposed to rain water shall be rust-resistant and durable metals, or steel or iron treated for deterrent against rusting. However,

the material of springs shall be phosphor bronze as specified in **JIS H 3110** or stainless steel.

- e) The material used for gaskets shall be that resistant to deterioration, such as synthetic rubber.

7 Test methods

7.1 Construction test

The method specified in clause **3** of **JIS C 8306**:1996 shall be applied. In addition, the items specified in clauses **6** and **10** of this Standard shall be investigated.

The mounting dimensions of attachment plug shall be measured at the root of blade (in a plane where the plug mates with the receptacle) and the width and thickness shall be measured at a position almost 2/3 of the total length from the root.

7.2 Retaining force test

The method specified in clause **6** of **JIS C 8306**:1996 shall be applied.

7.3 Temperature rise test

The method specified in clause **4** of **JIS C 8306**:1996 shall be applied. When it is difficult to disassemble, however, the temperature rise of the blade receiver may be measured at the root of plug.

For connectors of recessed type which are mounted to a structure other than a switch box, the measurements shall be carried out with the connector mounted simulating the practical service state.

7.4 Contact resistance test

The method specified in **5.1** or **5.2** of **JIS C 8306**:1996 shall be applied.

7.5 Make and break test

The make and break test shall be performed in accordance with clause **10** of **JIS C 8306**:1996 under the following conditions:

- a) For connectors having blade receivers of a rated currents not exceeding 20 A, a make and break operation is repeated 5 000 cycles continuously at a rate of 20 cycles per minute under application of current in both the make and break operations, in accordance with table 5 (**b**) of **10.7** specified in **JIS C 8306**:1996. Then the test of table 3 (**a**) of **10.6** specified in **JIS C 8306**:1996 shall be carried out.

For a connector having a shutter so constructed that the shutter is opened by being pushed by the tip of the plug blade, the test plug shall be replaced every 1 000 cycles of the make and break operation.

- b) For a connector having blade receivers of a rated current 30 A or 50 A, the test shall be performed in accordance with table 3 (**a**) of **10.6** specified in **JIS C 8306**:1996.
- c) For twist locking type and clamp type connectors, the test shall be performed in accordance with table 3 (**a**) of **10.6** specified in **JIS C 8306**:1996.

7.6 Insulation resistance test

The insulation resistance test shall be performed in accordance with clause 7 of **JIS C 8306**:1996.

For connectors having pilot lamps or the like between poles, the test shall be performed with such pilot lamps removed.

7.7 Dielectric withstand voltage test

The dielectric withstand voltage test shall be performed in accordance with clause 8 of **JIS C 8306**:1996.

The test shall be performed on a connector to be mounted to a place other than switch box, with the connector mounted as in practical service, and on a connector having pilot lamp or the like between poles, with the lamp removed.

7.8 Heat resistance test

The heat resistance test shall be performed in accordance with clause 14 of **JIS C 8306**:1996. However, the test shall be performed at 100 °C for 1 h for products of thermosetting resin moulding, and at 80 °C for 7 h for thermoplastic resin-moulded products and rubber-moulded products.

7.9 Strength test of screw terminal and lead-wire joint

The strength test of screw terminal and lead-wire joint shall be performed as follows:

- a) The strength test of screw terminal part shall be performed in accordance with **13.1.1 (1)** and **13.1.1 (2)** of **JIS C 8306**:1996.
- b) The connector with lead wire shall be tested as specified in **13.1.3** of **JIS C 8306**:1996.

7.10 Test for strength of blade fitting part

The test for strength of blade fitting parts shall be performed as follows for connectors having normal type 2-pole plugs excluding earthing pole of 15 A or less in rated current, with the exception of twist locking type.

- a) For connectors in which the blades are fixed by caulking or screws, and the outlet of blades is not held or fixed; the enclosure is fixed on a suitable testing base, a force is applied on the tip of blades (the part of nib hole) in the direction at right angles to the blade surface (wide surface) and the force is gradually increased to reach 100 N, the force is maintained at this value for 1 min and then presence or absence of damage on the fitting parts is checked.
- b) For connectors having flat-shape and round-shape enclosure other than those of **7.10 a)** and moulded type connectors in which the periphery of blade support is covered with rigid insulation such as thermosetting resins; a flat steel plate, having holes of such a size as to allow a gap of about 1 mm around the blade, is placed horizontally, the specimen connector is placed on the plate so that its blades protrude downward from the centres of the holes, a gradually increasing tensile force is applied straightly downward on the tips of the blades (the part of nib hole) so that the force is exerted simultaneously on the two blades, the force is gradually increased to 100 N, the force is maintained at this value for

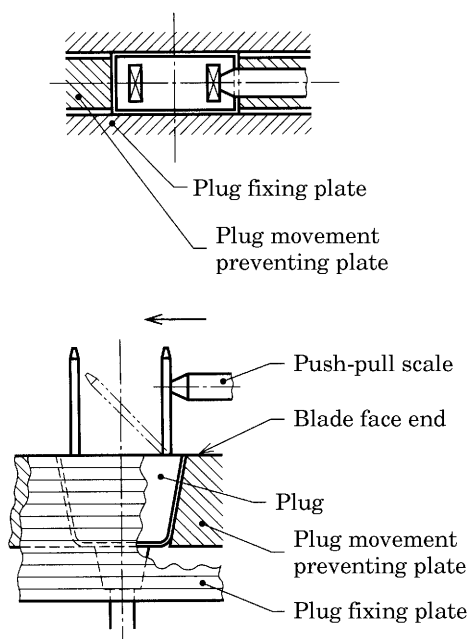
2 min and then presence or absence of dripping out of blades is checked. However, for connectors having blade fitting parts consisting of soft insulating material such as polyvinyl chloride, the force used shall be 70 N.

- c) For moulded type connectors, the test shall be performed according to the following 1), 2) and 3):

Moulded type connectors in which the circumference of blade support is covered with hard insulating material such as thermosetting resin are excluded. Provided that, 1) applies to folded blades and 3) to solid blade.

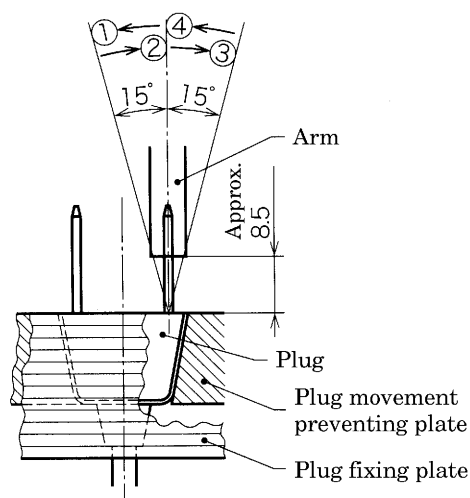
- 1) The specimen is allowed to stand in air at $20\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ for about 1 h, and immediately fixed as shown in figure 1. A force is applied to the tip of one of the blades (the part of nib hole) in the direction at right angles to the surface (wide surface) of the blade, and the force is gradually increased. The value of the force when the blade tip touches the other blade is measured.
- 2) The specimen is allowed to stand in air at $20\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ for about 1 h, and immediately fixed as shown in figure 2. One of the blades is moved alternately to the right and left, through an angle of 15° in each direction continuously 30 times at a rate of 10 times per minute.
- 3) The blade is fixed as shown in figure 3 and is moved alternately to the right and left, through an angle of 30° in each direction, 5 times.

Unit: mm



The plug fixing plate shall fix the plug at the corresponding plug surface, and the plug movement preventing plate shall be placed in close contact with the corresponding plug surface. If the plug surface is uneven, movement may be prevented at two or more points, with one of the points positioned at the blade face end.

Figure 1 Loading direction to blade

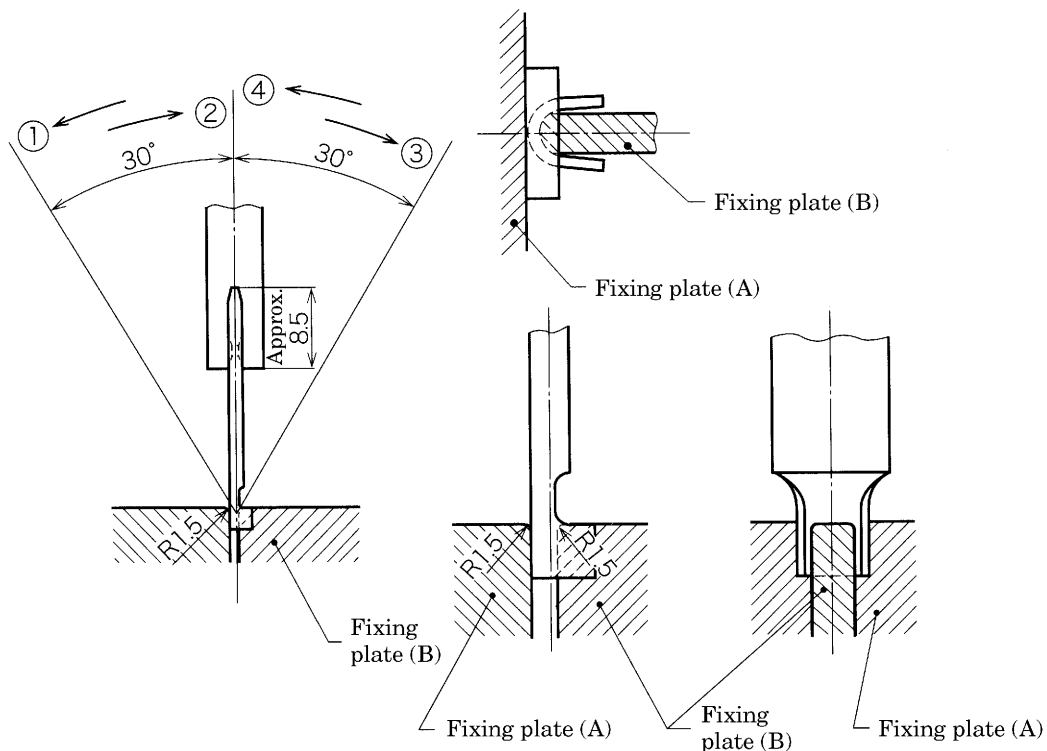


The plug fixing plate shall fix the plug at the corresponding plug surface, and the plug movement preventing plate shall be placed in close contact with the corresponding plug surface. If the plug surface is uneven, movement may be prevented at two or more points, with one of the points positioned at the blade face end.

The number of times shall be counted by taking the movement of ①—② as one time and the movement of ③—④ as one time.

Figure 2 Fixing and reciprocating angle of blade

Unit: mm



The movement of ①—② shall be counted as one time, and the movement of ③—④, also as one time.

Figure 3 Fixing and reciprocating angle of blade

7.11 Enclosure strength tests

The tests for the strength of enclosure shall be performed as follows:

- a) **Enclosure compressing test** The test of 13.5.2 of JIS C 8306 : 1996 shall be performed.
- b) **Pendulum free fall test** The test of 13.5.3 (1) of JIS C 8306 : 1996 shall be performed.

However, the height of fall (H) shall be 1 m, length of cord (L) shall be 1 m and the number of times of falling shall be three.

- c) **Single body free fall test** The test of 13.5.3 (2) of JIS C 8306 : 1996 shall be performed.

However, the height of fall (H) shall be 1 m and the number of times of falling shall be three.

7.12 Strength test of cord anchorage (cord tension releasing device)

The test of 13.2.1 of JIS C 8306 : 1996 shall be performed.

7.13 Strength test of cord outlet (cord flexural performance)

The test of 13.2.2 (2) of JIS C 8306 : 1996 shall be performed.

7.14 Tensile strength test of screwless terminal

The test of **13.1.2 (1)** of **JIS C 8306 : 1996** shall be performed.

7.15 Bending test of screwless terminal

The test of **13.1.2 (2)** of **JIS C 8306 : 1996** shall be performed.

7.16 Cyclic heating test of screwless terminal

The test of clause **16** of **JIS C 8306 : 1996** shall be performed. The test shall be performed on all terminals of the same specimen.

When there is no shifting terminals, however, the test shall be performed under such a state that a plug corresponding to the pole arrangement of the specimen to which about 30 cm of the cord specimen specified in table 2 is inserted into the specimen.

7.17 Withstand over current test of screwless terminal

The test of clause **12** of **JIS C 8306 : 1996** shall be performed.

The connecting wire shall be as specified in table 2 of **JIS C 8306 : 1996**, and the test current shall be 1 000 A.

7.18 Ammonia gas durability test

The test of clause **18** of **JIS C 8306 : 1996** shall be performed.

The duration of test and tightening torque of the terminal screw for terminal with screw shall be as follows:

- a) The duration of test shall be 24 h.
- b) Tightening torque of the terminal screw shall be 2/3 of the value specified in table 7 of **JIS C 8306 : 1996**.

7.19 Rotating test of the movable plug-blade type

The movable plug-blade type connector shall be rotated continuously 1 000 times at a rate of 20 times per minute, under the conditions of (a) rated load test given in table 5 in **10.7** of **JIS C 8306 : 1996**, where reciprocation from the centre of movable range to one end of the range and back to the centre is counted as one time.

7.20 Tensile load test

The tensile load test for twist locking type and clamp type connectors shall be performed in accordance with clause **22** of **JIS C 8282-2-11 : 2007**.

7.21 Waterproof test

The waterproof test of waterproof-type connectors shall be performed in accordance with clause **9** of **JIS C 8306 : 1996**.

7.22 Flame resistance test

The flame resistance test shall be carried out in such a manner that the cord connector is held horizontally. The central part of the body is burnt by reducing flame of about 130 mm long produced by a Bunsen burner, and the period after removal of the flame until the burning dies out naturally is measured.

The fuel for Bunsen burner shall be methane gas for industrial use, of approximately 37 MJ/m³ or those having a calorific value at least equal thereto.

8 Inspection

8.1 Type inspection

The type inspection shall be performed by testing the same specimen connector by the testing methods of clause 7 in the order of the following items, and the test results shall comply with the requirements of clauses 5, 6 and 10. However, the tests of a), m) to ab) may be performed by using separate specimen connectors.

The tests of b) and d) to i) shall be carried out on connectors having blade receivers and movable plug-blade type.

- a) Construction
- b) Retaining force (excluding twist locking type and clamp type)
- c) Insulation resistance
- d) Temperature rise
- e) Contact resistance (for only connectors with earthing pole)
- f) Make and break (at rated load, overload)
- g) Rotation of movable plug-blade type (for only connector of movable plug-blade type)
- h) Retaining force (excluding twist locking type and clamp type)
- i) Temperature rise
- j) Contact resistance (for only connectors with earthing pole)
- k) Insulation resistance
- l) Dielectric withstand voltage
- m) Resistance to heat
- n) Terminal strength (excluding moulded type connectors)
- o) Enclosure strength (enclosure compressing test is applicable only to plugs, cord connectors and table taps; pendulum free fall test only to plugs, cord connectors, and multiple taps having joints with cord; and single body free fall test only to insertion type multiple taps.)
- p) Blade fitting strength (for only normal type, 2-pole, 15 A or less plugs, excluding twist locking type.)
- q) Strength of cord anchoring (cord tension releasing device) (applicable only to connectors with cords excluding twist locking type, and connectors which can connect a cord.)
- r) Cord outlet strength (cord flexural performance) (applicable only to connectors with cord.)

- s) Tensile strength of screwless terminal (applicable only to connectors having screwless terminals.)
- t) Bending of screwless terminal (applicable only to connectors having screwless terminals.)
- u) Terminal heat cycle of screwless terminal (applicable only to connectors having screwless terminals.)
- v) Withstand over current of screwless terminal (applicable only to connectors having screwless terminals.)
- w) Endurance to ammonia gas (for only receptacles)
- x) Tensile load (for only twist locking type and clamp type)
- y) Waterproof (for only waterproof connectors)
- z) Flame resistance (for only moulded type cord connector)
- aa) Moisture resistance (it does not apply for the time being)
- ab) Marking

8.2 Acceptance inspection

The acceptance inspection shall be performed on the same specimen connector accordance to the test in the order the following items, and the test results shall comply with the requirements of **5.1**, **5.5**, **5.6**, clauses **6** and **10**. However, a part of the inspection items may be omitted subject to the agreement between the parties concerned with acceptance.

The sampling inspection method shall be applied as agreed between the parties concerned with acceptance.

- a) Construction
- b) Insulation resistance
- c) Dielectric withstand voltage
- d) Retaining force (for only connectors having blade receivers, but excluding twist locking type and clamp type connectors.)

9 Designation of products

The product shall be designated by the type, number of poles, and rating.

Example: Plug with earthing pole 2-pole 15 A 125 V

Receptacle with earth terminal with earthing 2-pole 15 A 125 V

Twist locking type surface receptacle 3-pole 20 A 250 V

Rain-proof receptacle with earthing pole 2-pole 30 A 250 V

10 Marking

The connectors shall be marked with the following items clearly and indelibly on the surface of the enclosure or at an easily visible position of each product.

- a) Rated voltage
- b) Rated current
- c) Name of manufacture or its abbreviation
- d) Size (nominal) of cable or cords connectable to the terminal (for only connectors having screwless terminals)
- e) Length of conductor to be inserted into the terminals (for only connectors having screwless terminals) [see **6.2 g) 6)**]
- f) Kind of waterproof (Omitted for normal type. It may be in the IP display.)
- g) Marking of terminal (for only connectors having earth terminal and earth side terminal) (see **6.10)**)

Annex A (normative)

Standard dimensions of connectors

Introduction

This Annex specifies the pole arrangement dimensions of connectors and the standard dimensions of recessed type receptacles.

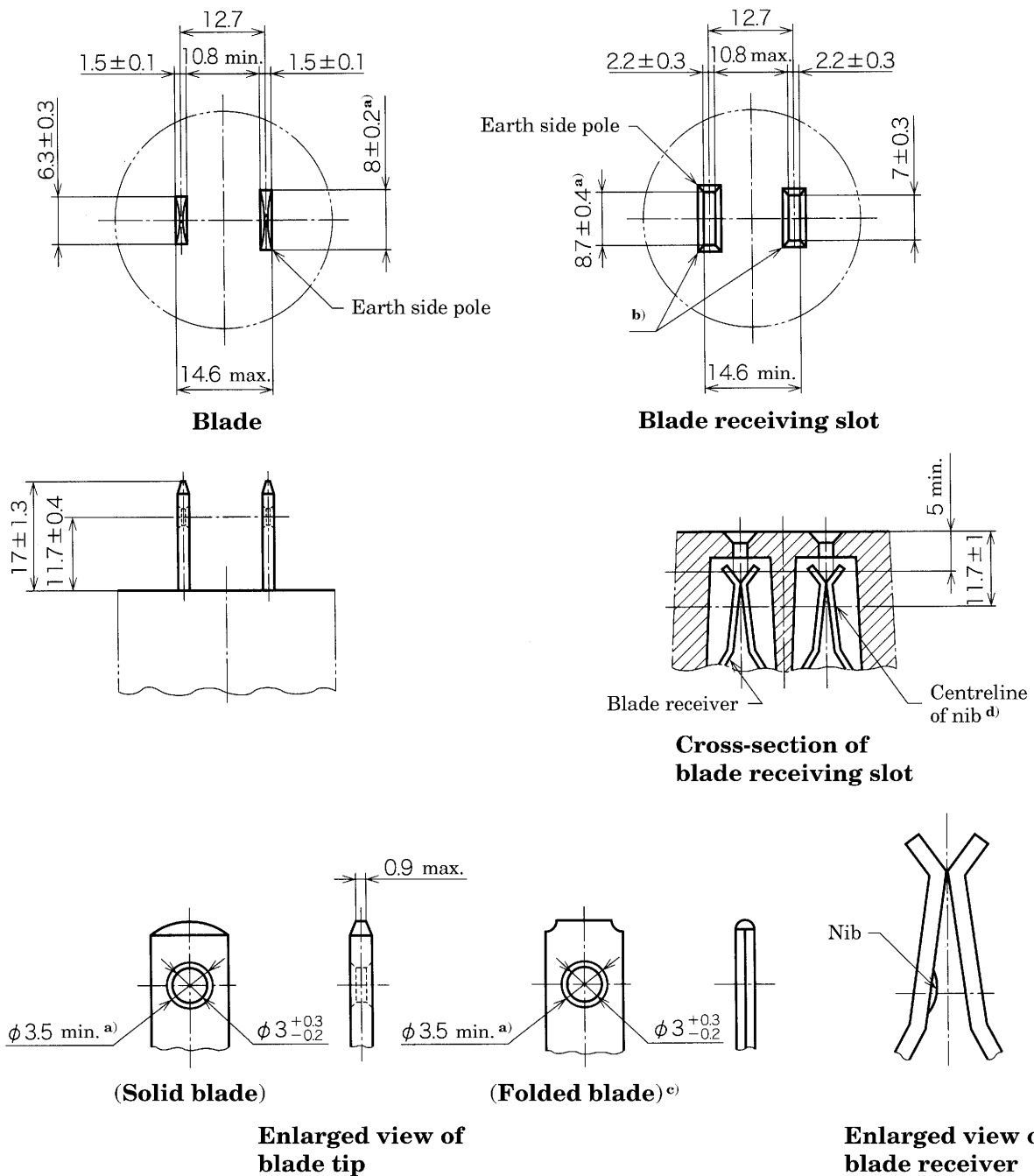
A.1 Dimensions of blades of plugs and blade receiving holes of receptacles

The standard dimensions of connectors given in table 1 shall be shown in figures A.1 to A.29.

The general matters of the figures shall be as follows:

- values without tolerances are basic sizes;
- the tip of the blade shall be smooth;
- the plug insertion port of blade receiving slot shall be chamfered;
- the blade of the earthing pole may be a round pin (in figures A.9 to A.14 and in figure A.16);
- to the earthing pole of the blade receiving slot, the nib dimension ($11.7 \text{ mm} \pm 1 \text{ mm}$) shall not be applied (in figures A.9 to A.12 and figures A.15 to A.17);
- the shape of the blade receiver shown is an example;
- an example of the nib shape of the blade receiver is shown in figure A.1.

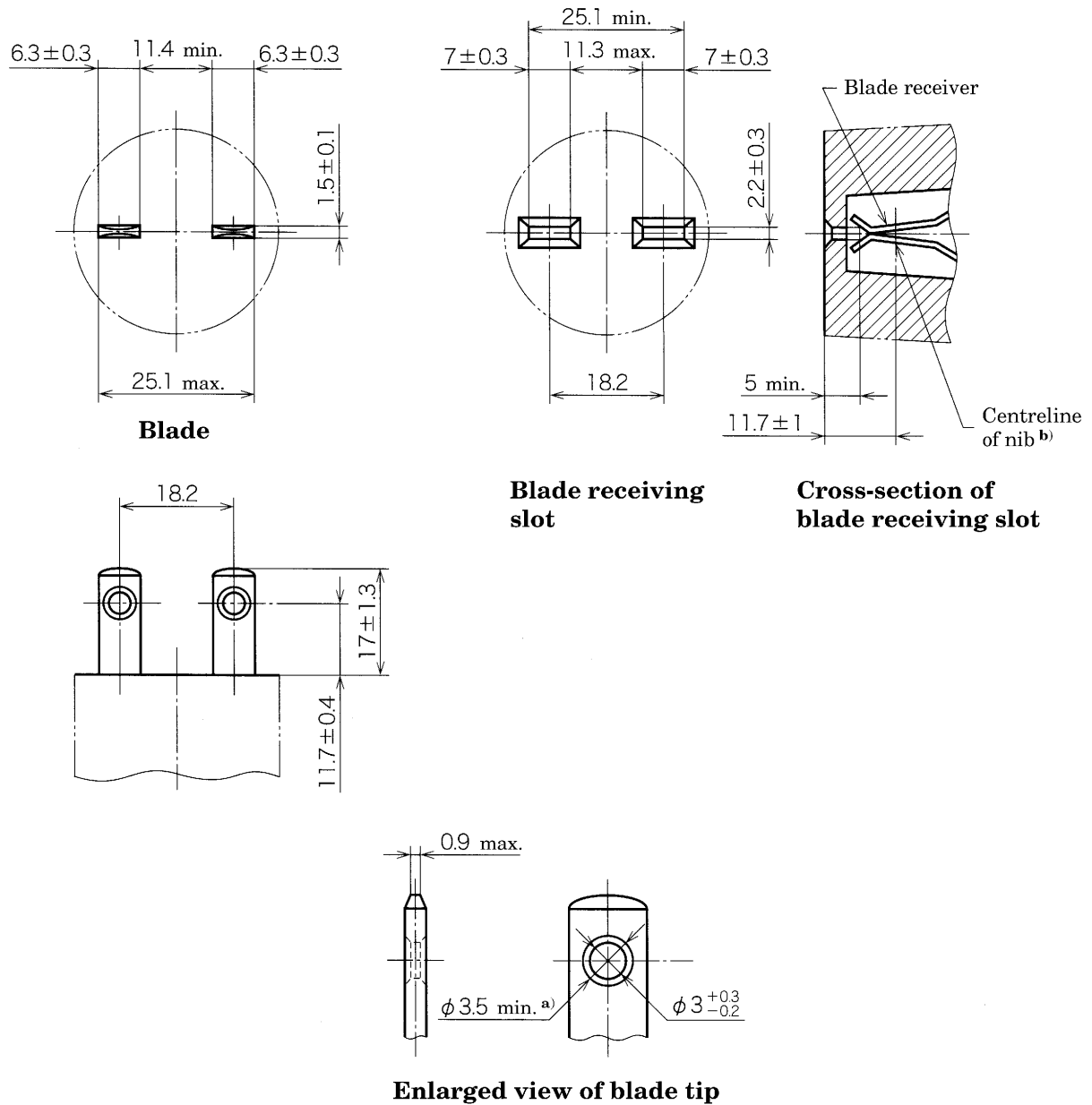
Unit: mm



- Notes
- a) Where blades are not polarized, the blade width shall be $6.3 \text{ mm} \pm 0.3 \text{ mm}$, and the width of the blade receiving slot shall be $7 \text{ mm} \pm 0.3 \text{ mm}$. The chamfering of nib hole of blade shall be applied to both sides.
 - b) The chamfering of insertion holes may be partially omitted if it is difficult due to manufacturing process.
 - c) In the case of folded blades, the thickness of material plate shall be 0.6 mm or larger, and ribs or the like may be provided. However, the finished thickness shall be $1.5 \text{ mm} \pm 0.1 \text{ mm}$ and the rated current shall be 7 A or less.
 - d) Nib of blade receiver may be omitted.

Figure A.1 Two-pole connector 15 A 125 V

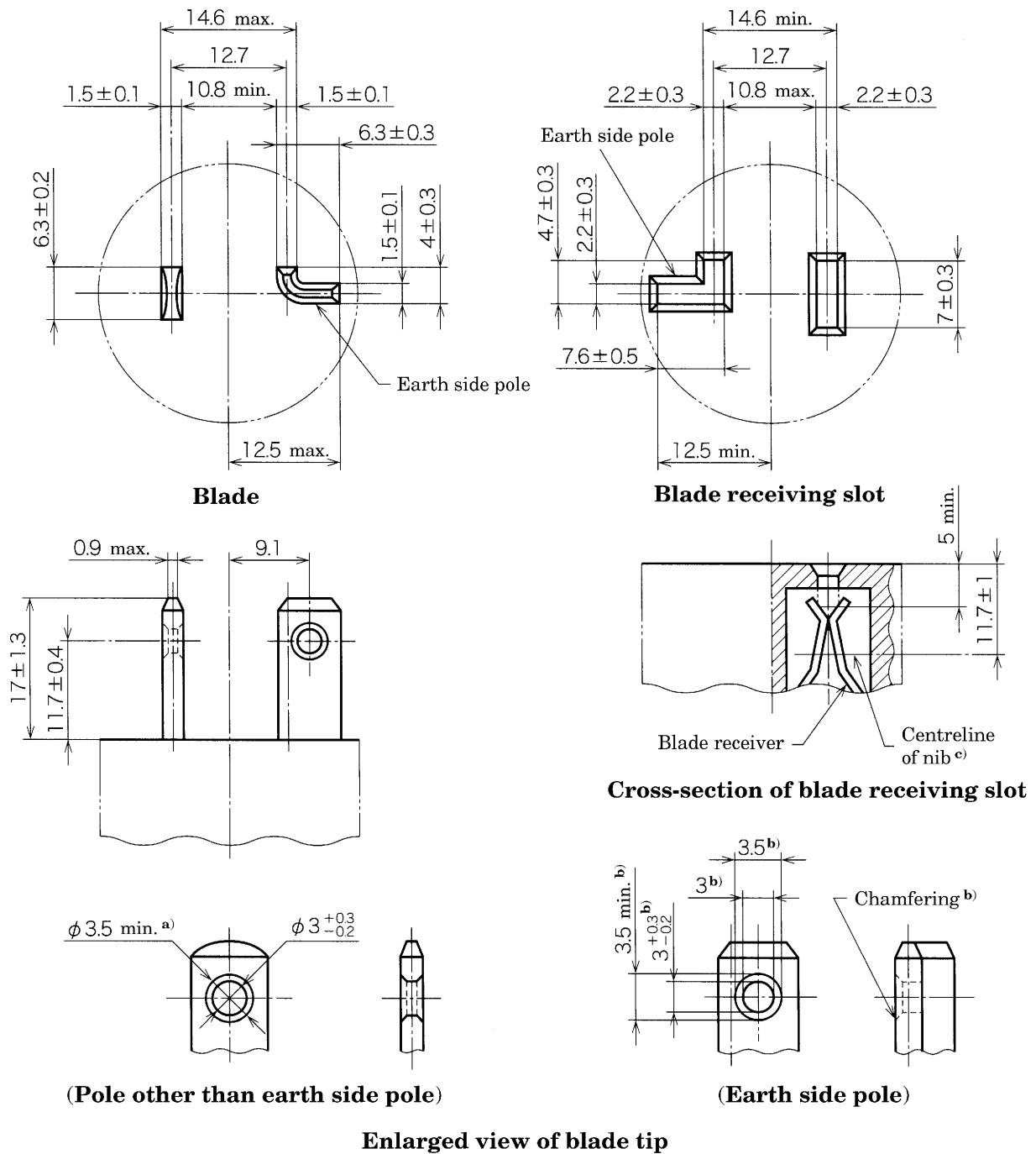
Unit: mm



- Notes ^{a)} The chamfering of nib hole of blade shall be applied to each of both sides.
^{b)} Nib of blade receiver may be omitted.

Figure A.2 Two-pole connector 15 A 250 V

Unit: mm



- Notes
- a) The chamfering of nib hole of blade shall be applied to each of both sides.
 - b) The dimensions of nib hole of blade of the earth side pole and chamfering of nib hole is applicable with respect to the longitudinal direction of blade and reference values to the traverse direction of the blade.
 - c) Nib of blade receiver may be omitted.

Figure A.3 Two-pole connector 20 A 125 V

Unit: mm

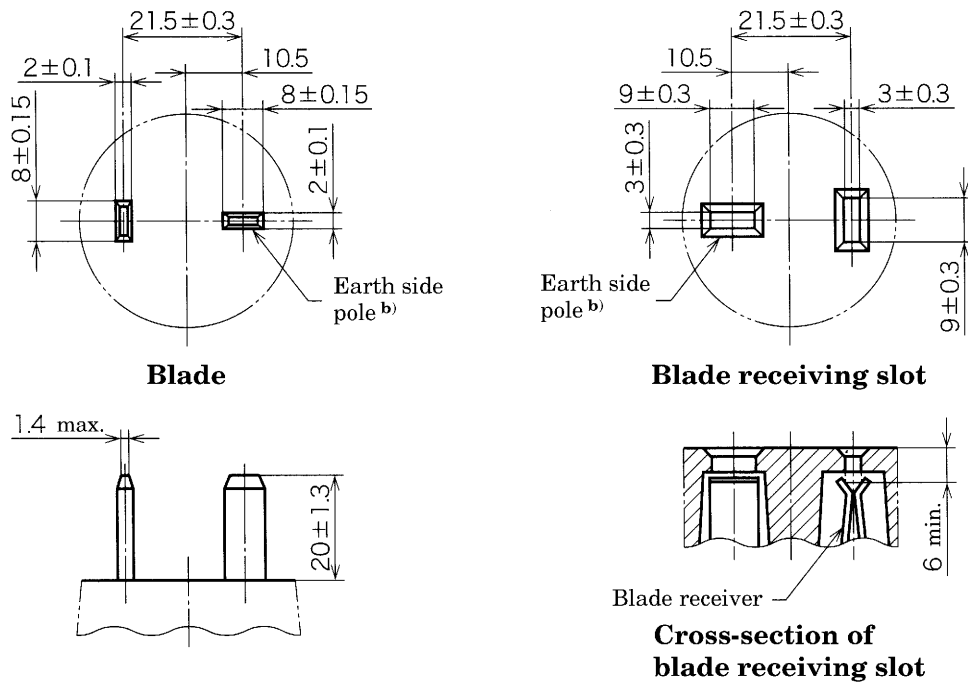
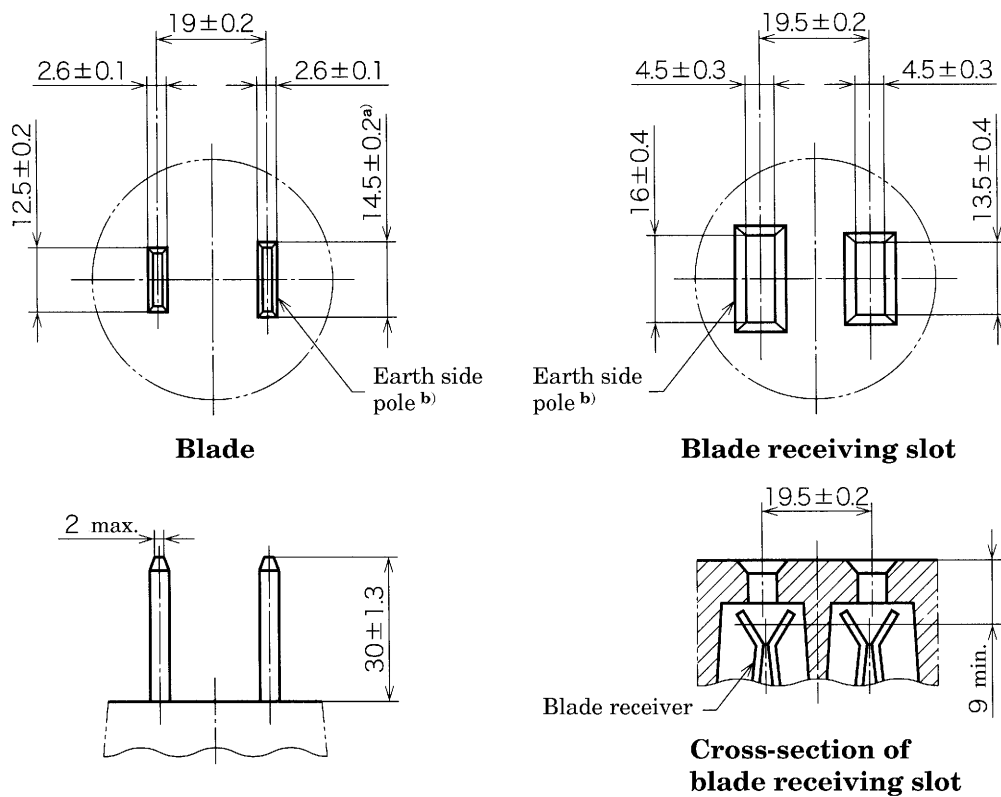


Figure A.4 Two-pole connector 20 A 250 V

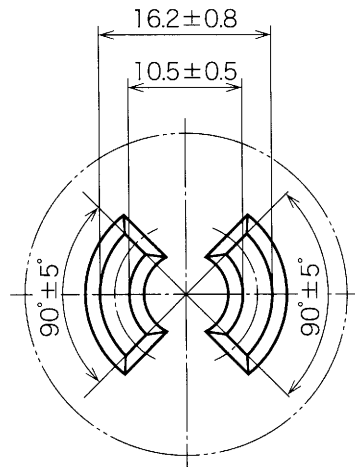
Unit: mm



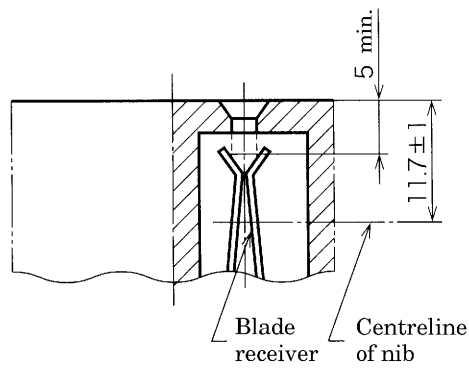
- Notes ^{a)} Where blades are not polarized, the blade width shall be 12.5 mm ± 0.2 mm.
^{b)} Marking the earth side may be omitted.

Figure A.5 Two-pole connector 30 A 250 V

Unit: mm



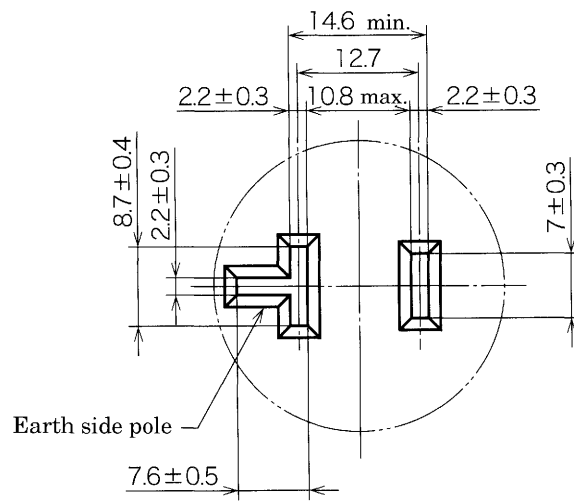
Blade receiving slot



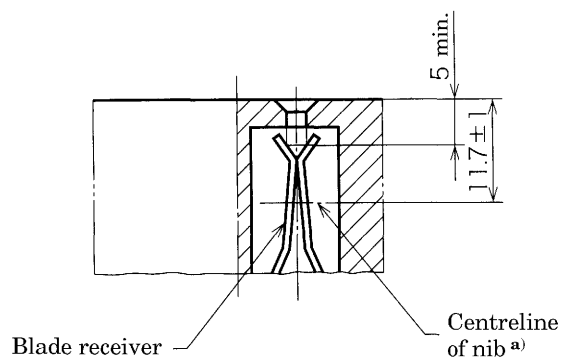
Cross-section of blade receiving slot

Figure A.6 Two-pole clamp type connector 15 A 125 V

Unit: mm



Blade receiving slot

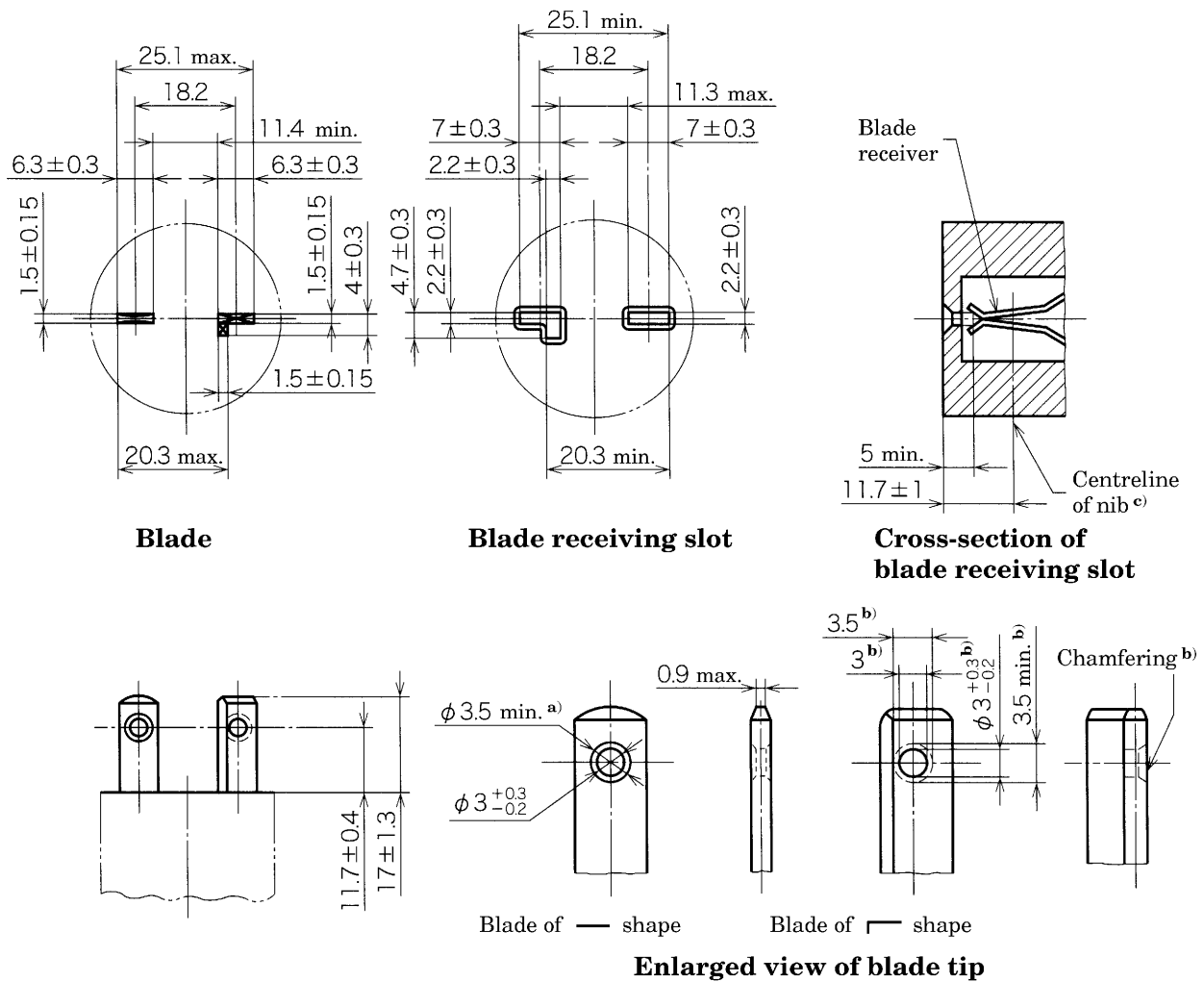


Cross-section of blade receiving slot

Note ^{a)} Nib of blade receiver may be omitted.

Figure A.7 Two-pole connector 20 A 125 V

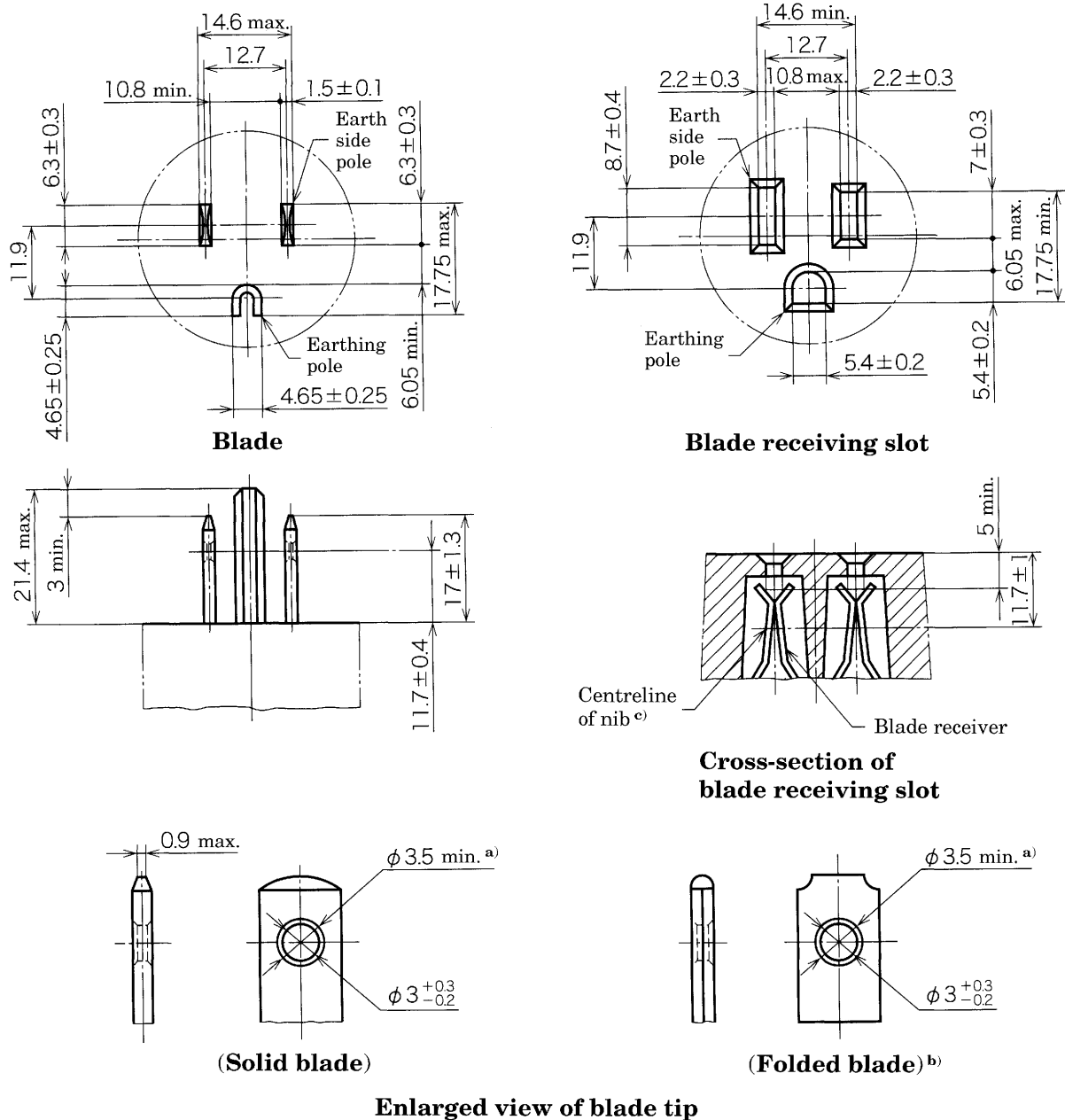
Unit: mm



- Notes
- a) The chamfering of nib hole of blade shall be applied to both sides.
 - b) The dimensions of nib hole of blade of L shape and chamfering of nib hole are applicable to the longitudinal direction of blade, but they are reference values for the lateral direction of blade.
 - c) Nib of blade receiver may be omitted

Figure A.8 Two-pole connector 20 A 250 V

Unit: mm



The centre of round shaped plugs and cord connector contours and the centre position of the flat blades should be 3.2 mm.

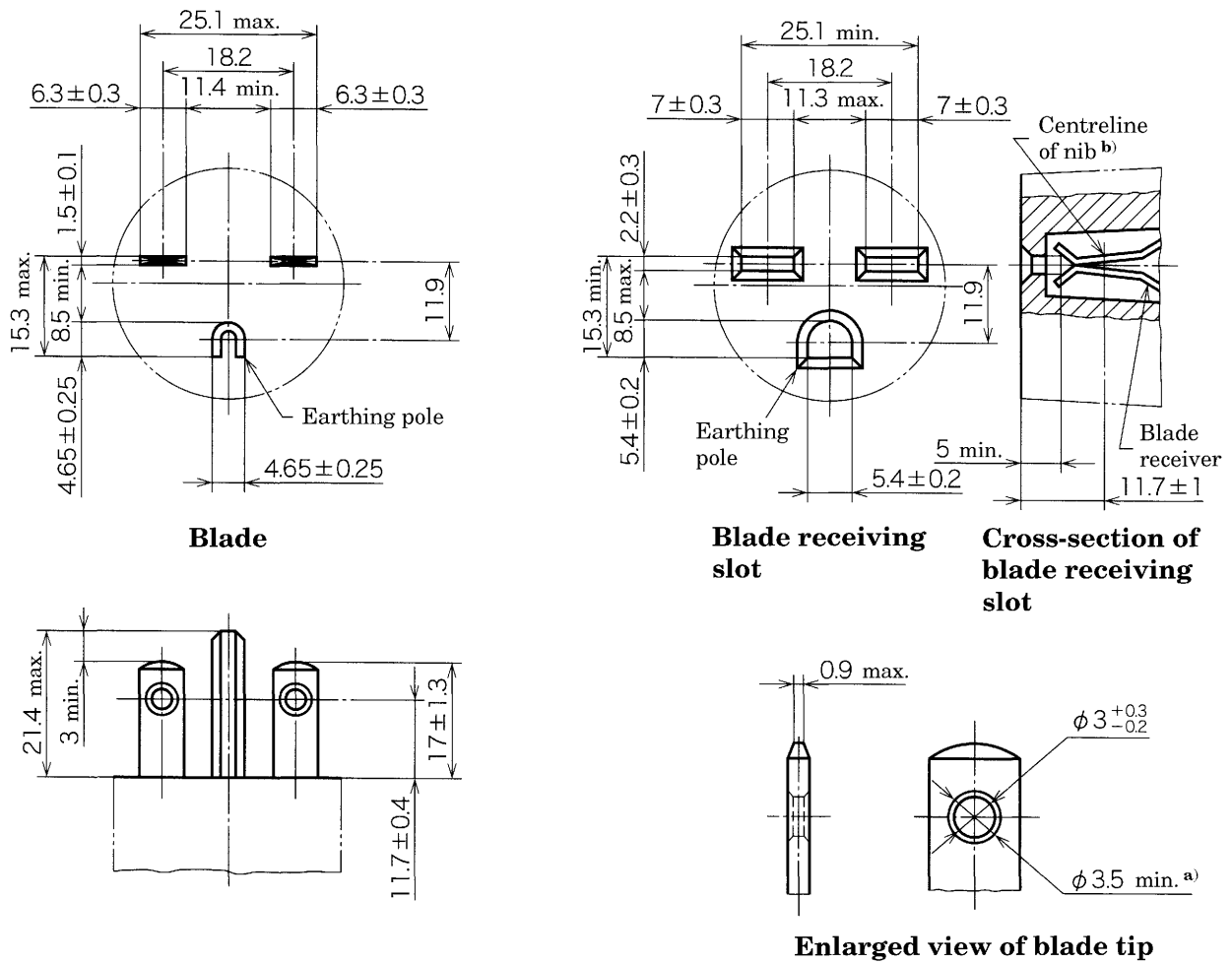
Notes ^{a)} The chamfering of nib hole of blade shall be applied to each of both sides.

^{b)} In the case of folded blades, the thickness of material plate shall be 0.6 mm or large, and ribs or the like may be provided. However, the finished thickness shall be 1.5 mm ± 0.1 mm and the rated current shall be 7 A or less.

^{c)} Nib of blade receiver may be omitted.

Figure A.9 Two-pole connector with earthing pole 15 A 125 V

Unit: mm

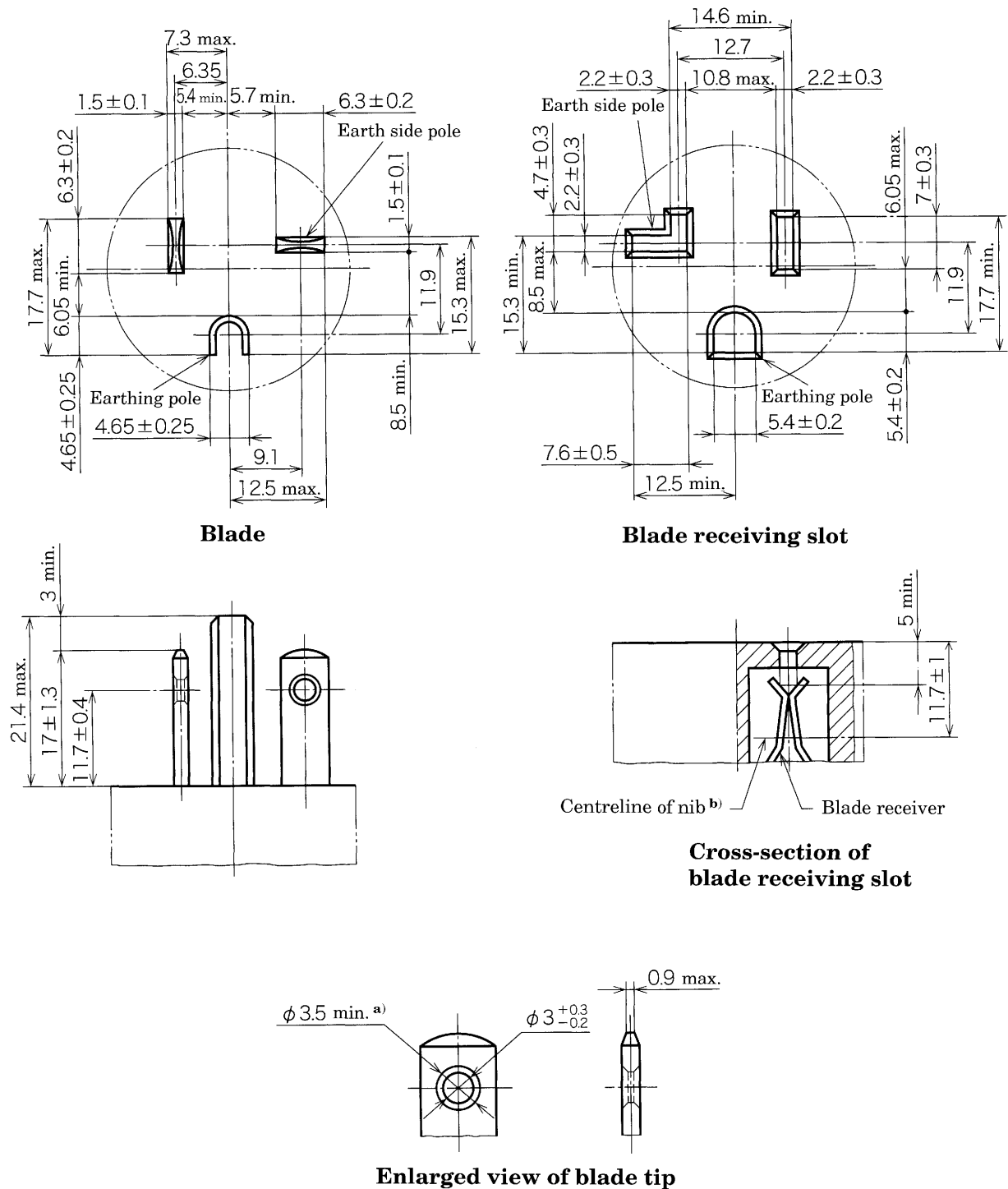


Notes a) The chamfering of nib hole of blade shall be applied to each of both sides.

b) Nib of blade receiver may be omitted.

Figure A.10 Two-pole connector with earthing pole 15 A 250 V

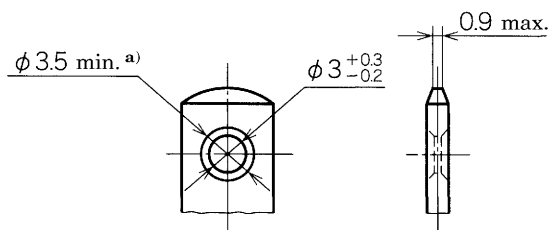
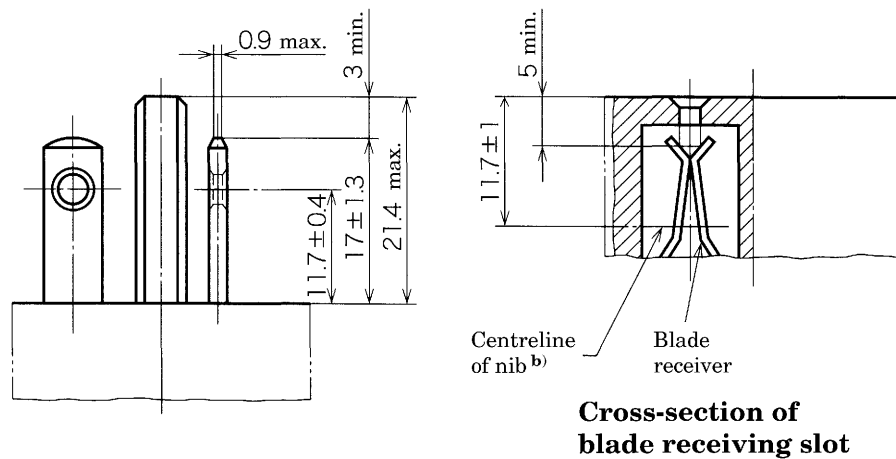
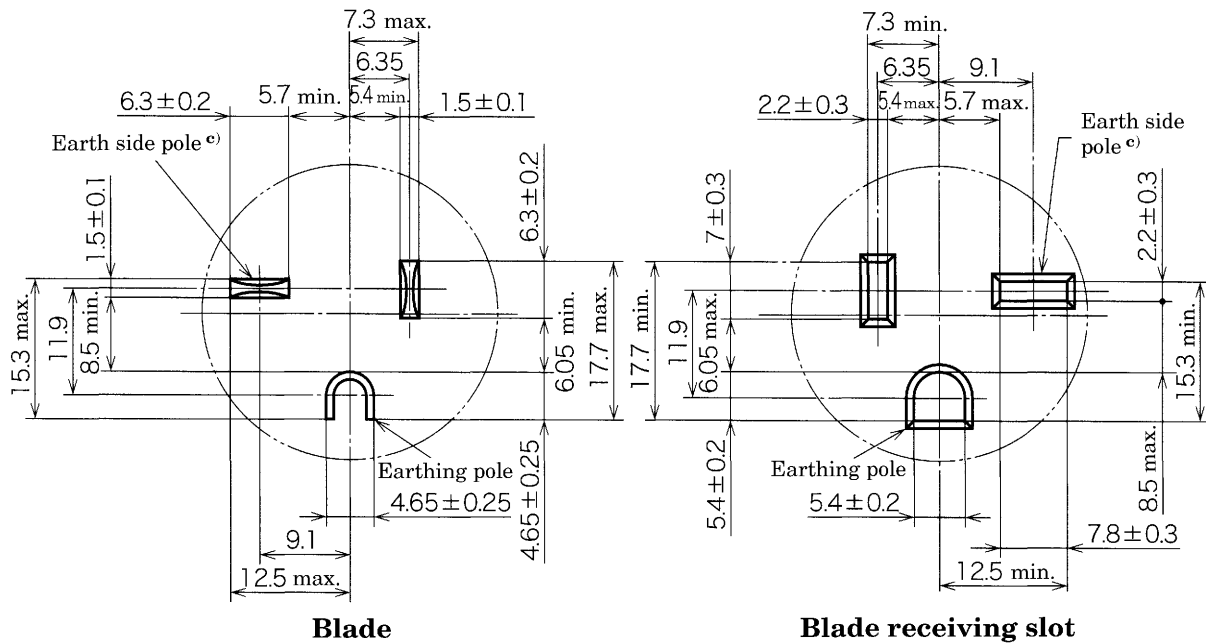
Unit: mm



- Notes ^{a)} The chamfering of nib hole of blade shall be applied to each of both sides.
^{b)} Nib of blade receiver may be omitted.

Figure A.11 Two-pole connector with earthing pole 20 A 125 V

Unit: mm



Enlarged view of blade tip

- Notes a) The chamfering of nib hole of blade shall be applied to each of both sides.
 b) Nib of blade receiver may be omitted.
 c) Marking on the earth side may be omitted.

Figure A.12 Two-pole connector with earthing pole 20 A 250 V

Unit: mm

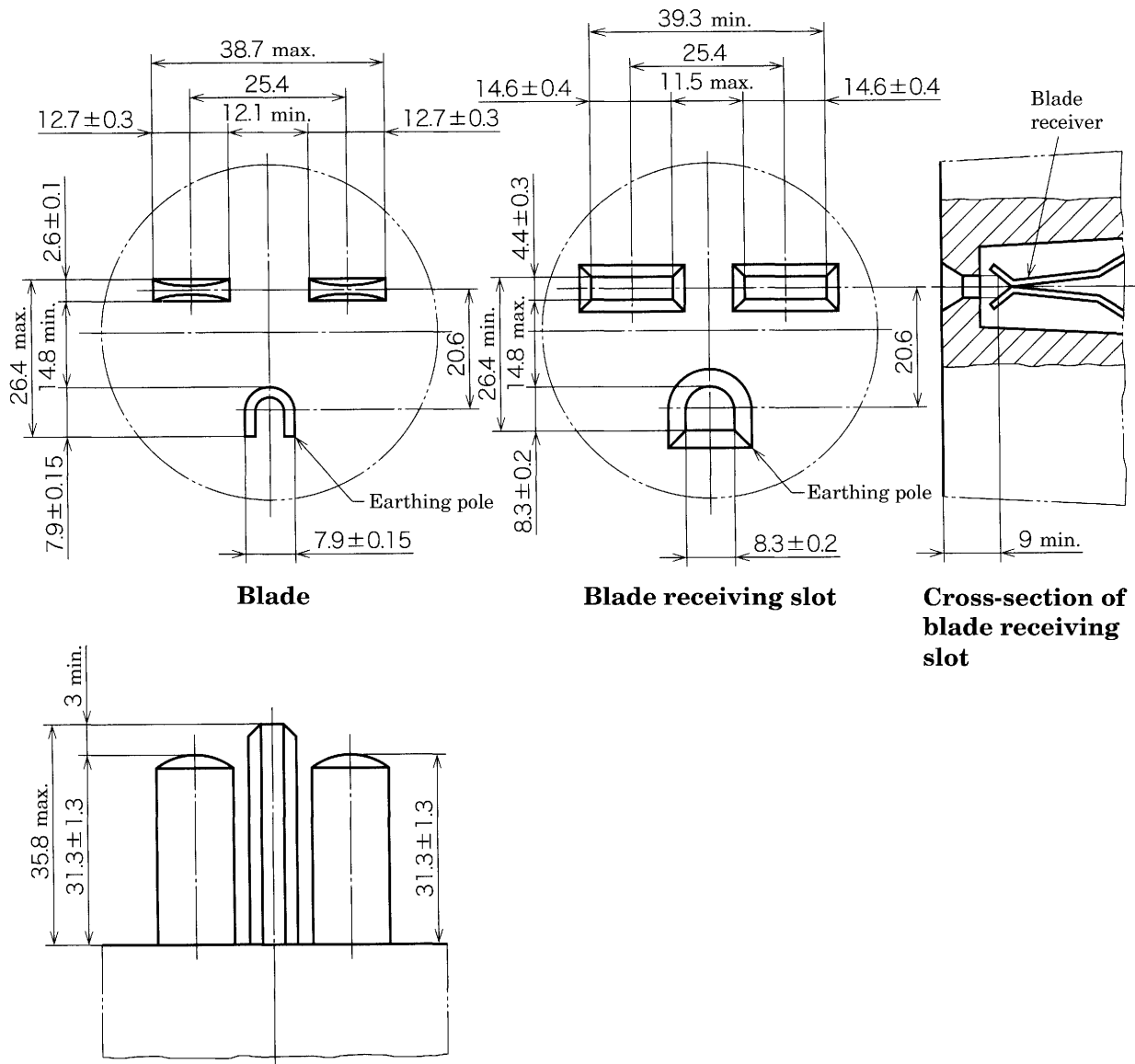
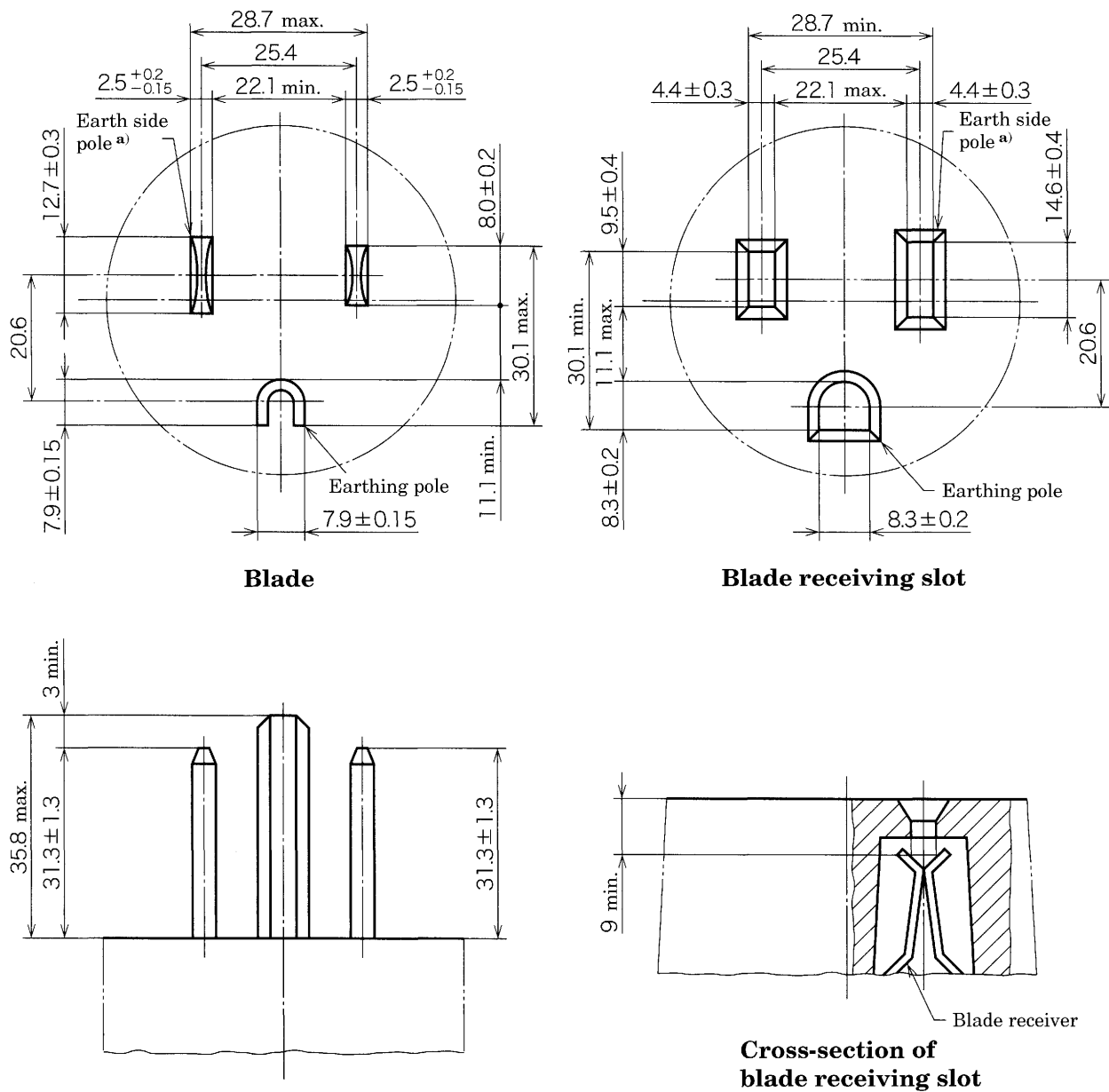


Figure A.13 Two-pole connector with earthing pole 30 A 250 V

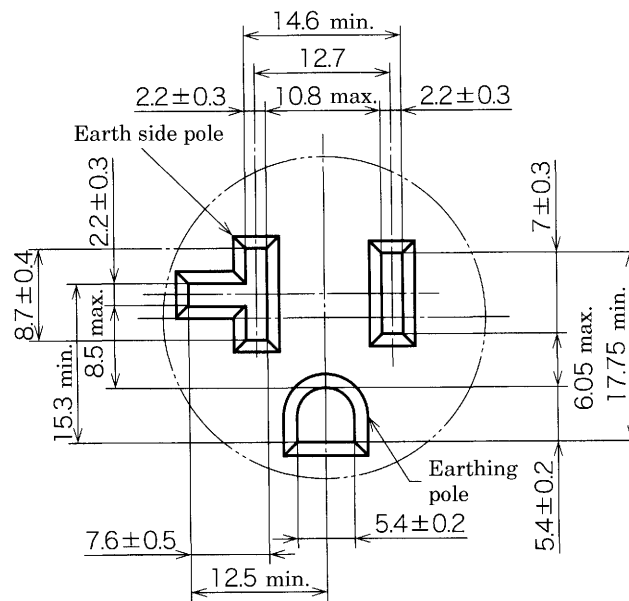
Unit: mm



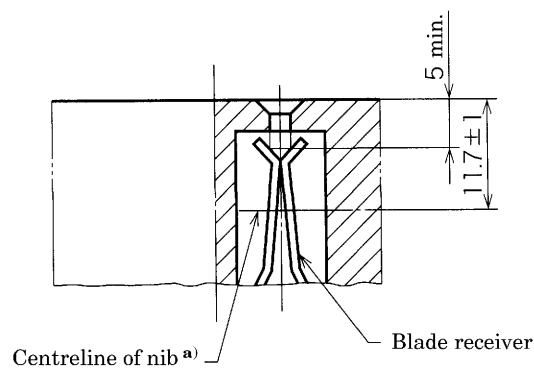
Note ^{a)} Marking on the earth side may be omitted.

Figure A.14 Two-pole connector with earthing pole 50 A 250 V

Unit: mm



Blade receiving slot

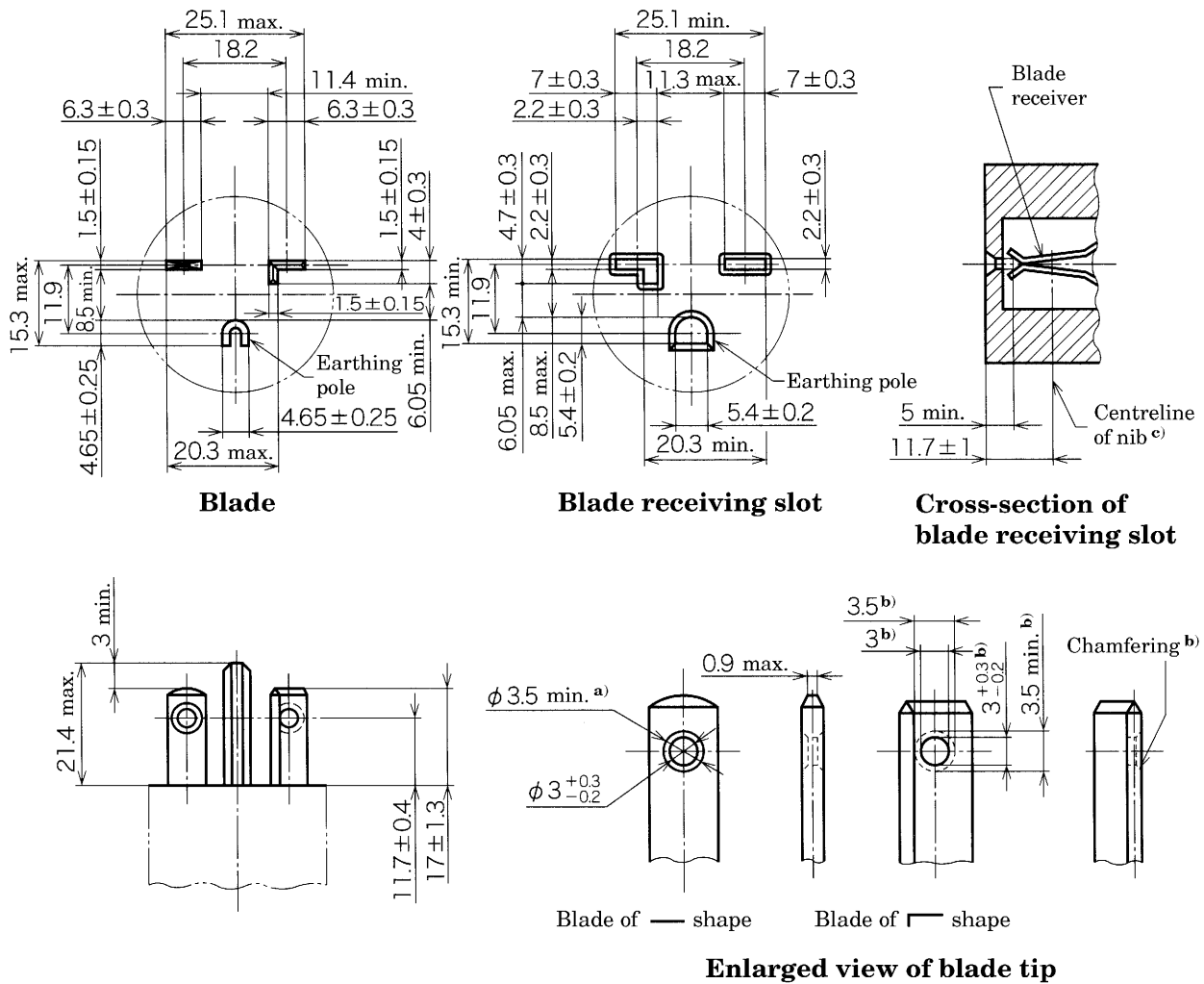


**Cross-section of
blade receiving slot**

Note ^{a)} Nib of blade receiver may be omitted.

Figure A.15 Two-pole connector with earthing pole 20 A 125 V

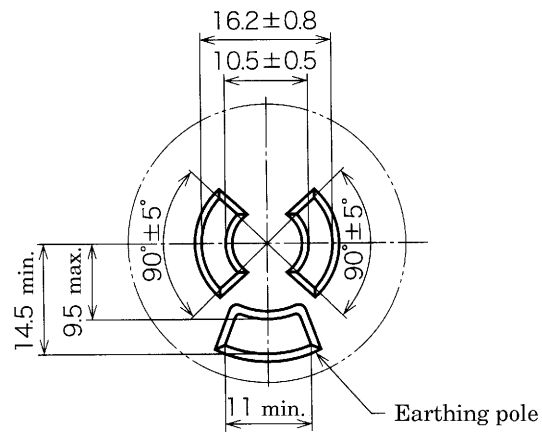
Unit: mm



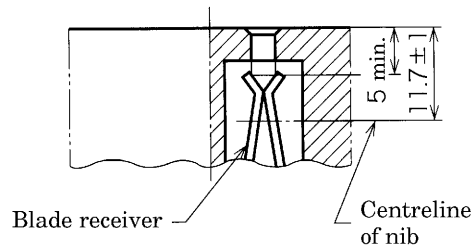
- Notes
- a) The chamfering of nib hole of blade shall be applied to both sides.
 - b) The dimensions of nib hole of blade of ㄟ shape and chamfering of nib hole are applicable to the longitudinal direction of blade, but they are reference values for the lateral direction of blade.
 - c) Nib of blade receiver may be omitted.

Figure A.16 Two-pole connector with earthing pole 20 A 250 V

Unit: mm



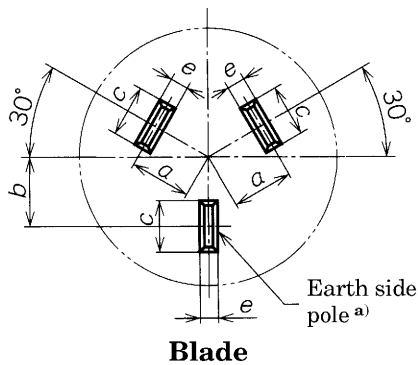
Blade receiving slot



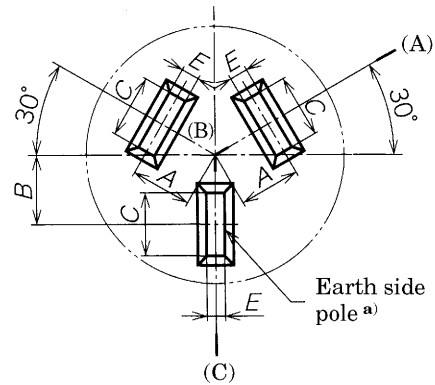
**Cross-section of
blade receiving slot**

Figure A.17 Two-pole connector with earthing pole 15 A 125 V

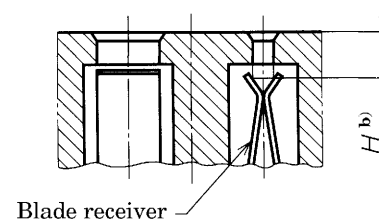
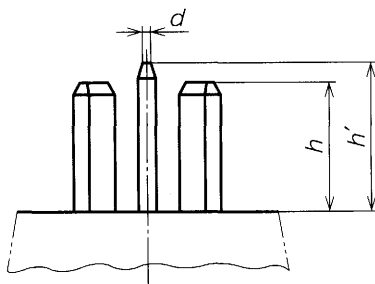
Unit: mm



Blade



Blade receiving slot



Cross-section of blade receiving slot
[(A)-(B)-(C)]

Dimensions of blade

Unit: mm

Rated current A	<i>a</i>	<i>b</i>	<i>c</i>	<i>e</i>	<i>h</i>	<i>h'</i>	<i>d</i>
15	8 ±0.15	10 ±0.15	6 ±0.15	1.4 ±0.1	17	20	0.9 max.
20	9.5 ±0.15	11 ±0.2	8 ±0.15	2 ±0.1	20	23	1.4 max.
30	13.5 ±0.2	13.5 ±0.2	12.5 ±0.2	2.6 ±0.1	30	33	2.0 max.

Dimensions of blade receiving slot

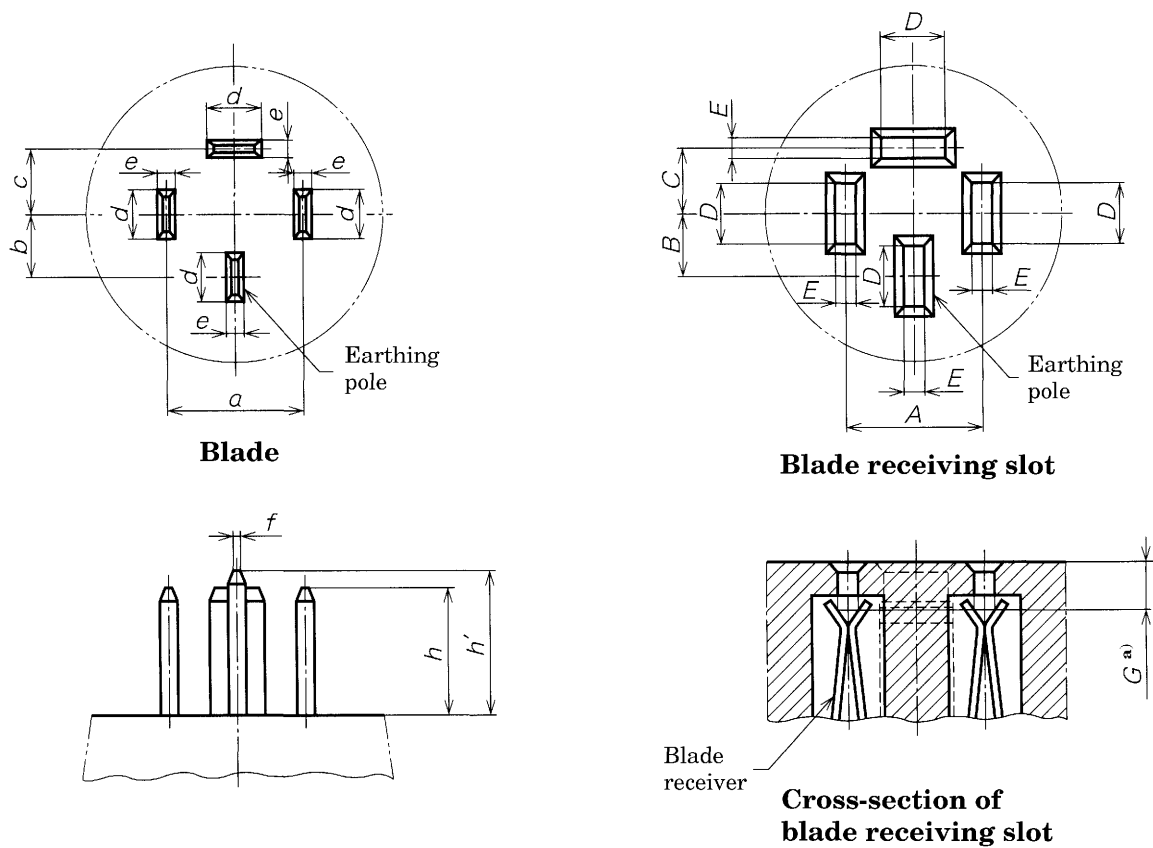
Unit: mm

Rated current A	<i>A</i>	<i>B</i>	<i>C</i>	<i>E</i>	<i>H</i>
15	8 ±0.15	10 ±0.15	7.5	2.5	5 min.
20	9.5 ±0.15	11 ±0.2	9.5	3	6 min.
30	13.5 ±0.2	13.5 ±0.2	14	4.5	9 min.

Notes ^{a)} Marking on the earth side may be omitted.

^{b)} The value of *H* shall be the same for all the three-poles.

Figure A.18 Three-pole connector 250 V



Dimensions of blade

Unit: mm

Rated current A	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>h</i>	<i>h'</i>
15	15 ±0.2	11 ±0.15	7.5 ±0.15	6 ±0.15	1.4 ±0.1	0.9 max.	17	20
20	20.6 ±0.2	9.5 ±0.15	10.3 ±0.15	8 ±0.15	2 ±0.1	1.4 max.	20	23
30	35 ±0.2	17.5 ±0.15	17.5 ±0.15	12.5 ±0.2	2.6 ±0.1	2.0 max.	30	33

Dimensions of blade receiving slot

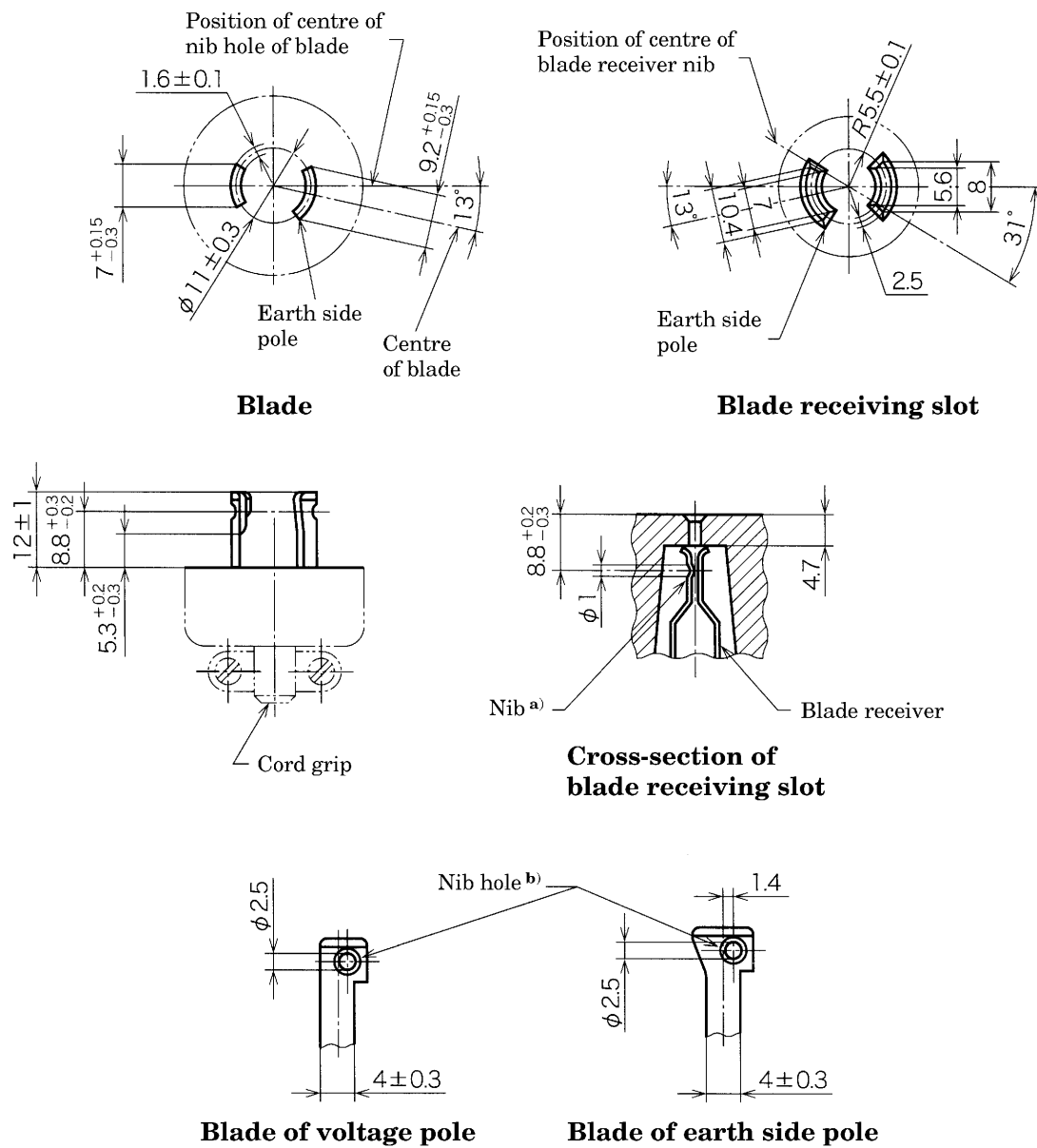
Unit: mm

Rated current A	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>G</i>
15	15 ±0.2	11 ±0.15	7.5 ±0.15	7	2.5	5 min.
20	20.6 ±0.2	9.5 ±0.15	10.3 ±0.15	9	3	6 min.
30	35 ±0.2	17.5 ±0.15	17.5 ±0.15	13.5	4.5	9 min.

Note ^{a)} The value of *G* shall be the same for all three poles and earthing pole.

Figure A.19 Three-pole connector with earthing pole 250 V

Unit: mm

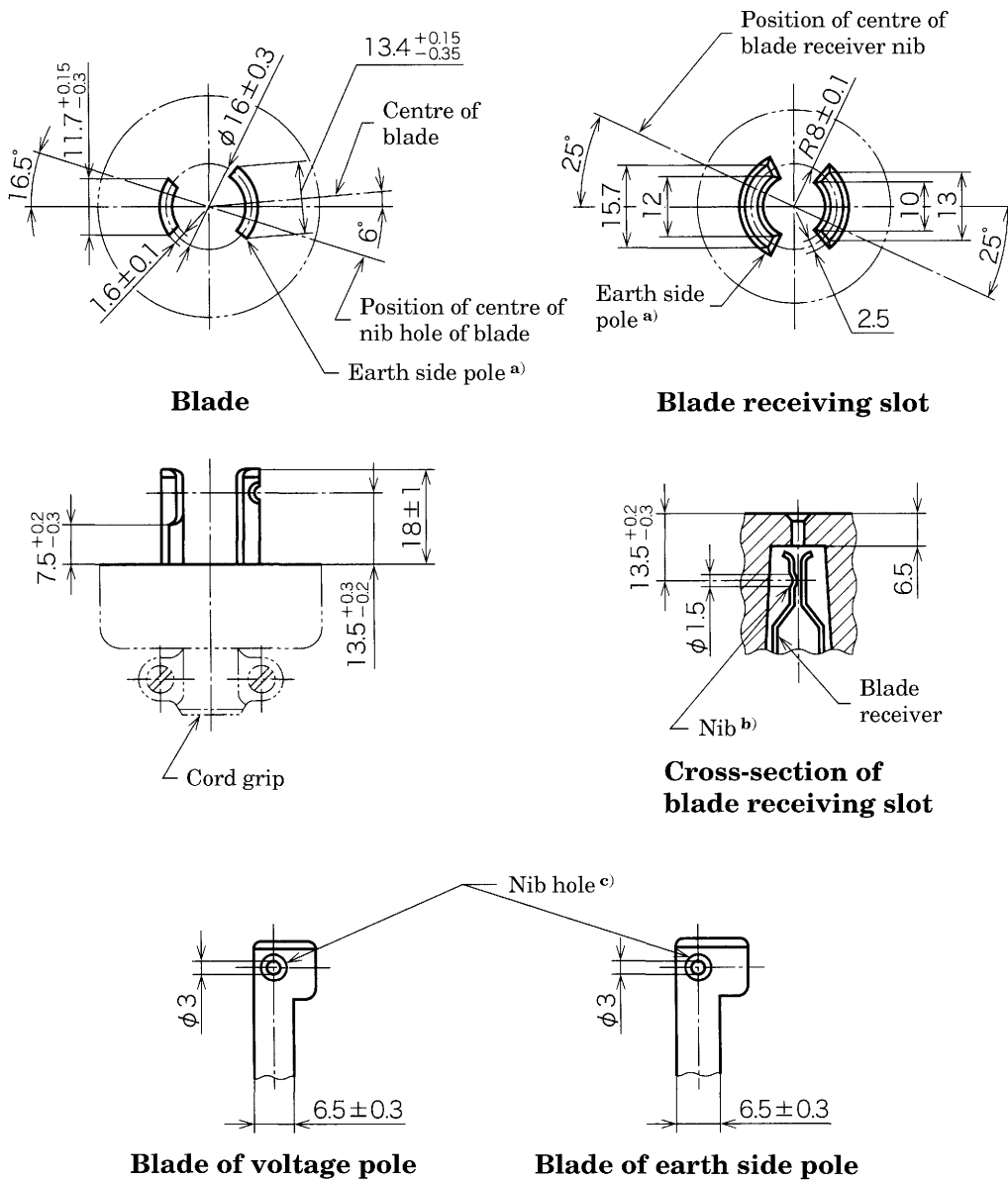


Notes a) Nib of blade receiver shall be attached on the side to contact with the outer side of the blade.

b) The chamfering of nib hole of blade shall be made on the outer side of each blade.

Figure A.20 Two-pole twist locking type connector 15 A 125 V

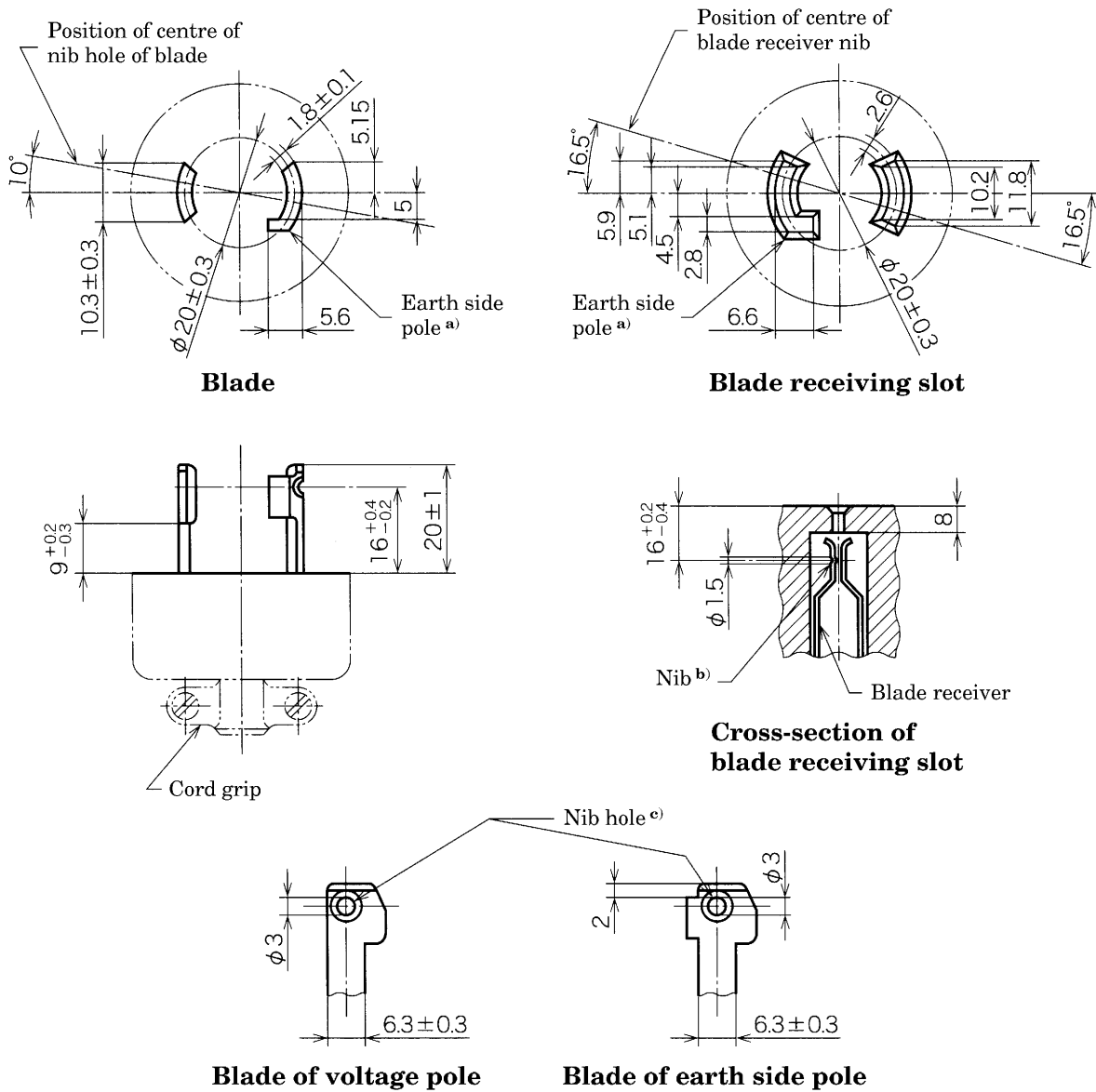
Unit: mm



- Notes
- a) Marking on earth side may be omitted.
 - b) Nib of blade receiver shall be attached on the side to contact with the outer side of the blade.
 - c) The chamfering of nib hole of blade shall be made on the outer side of each blade.

Figure A.21 Two-pole twist locking type connector 20 A 250 V

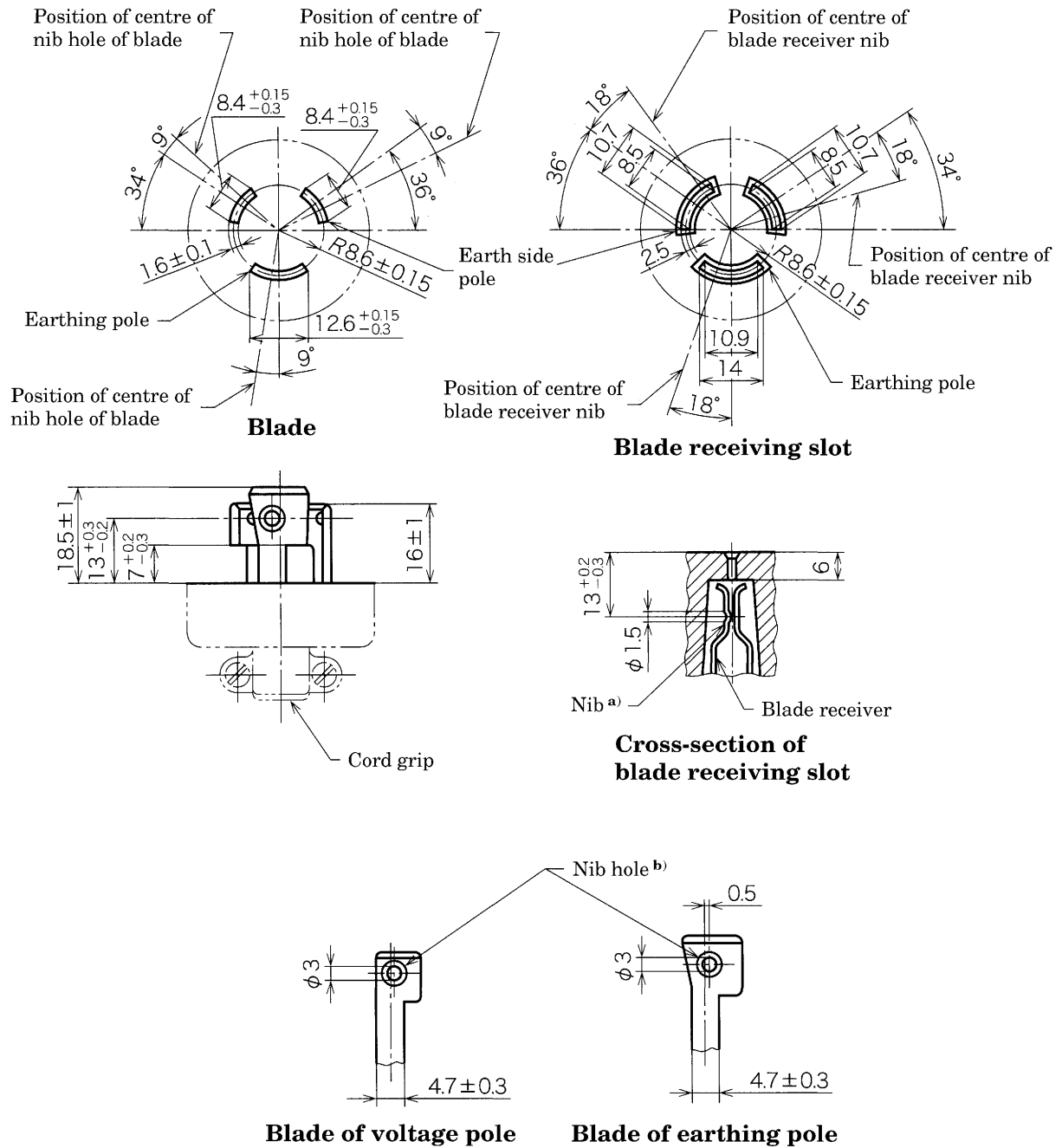
Unit: mm



- Notes
- a) Marking on earth side may be omitted.
 - b) Nib of blade receiver shall be attached on the side to contact with the outer side of the blade.
 - c) The chamfering of nib hole of blade shall be made on the outer side of each blade.

Figure A.22 Two-pole twist locking type connector 30 A 250 V

Unit: mm

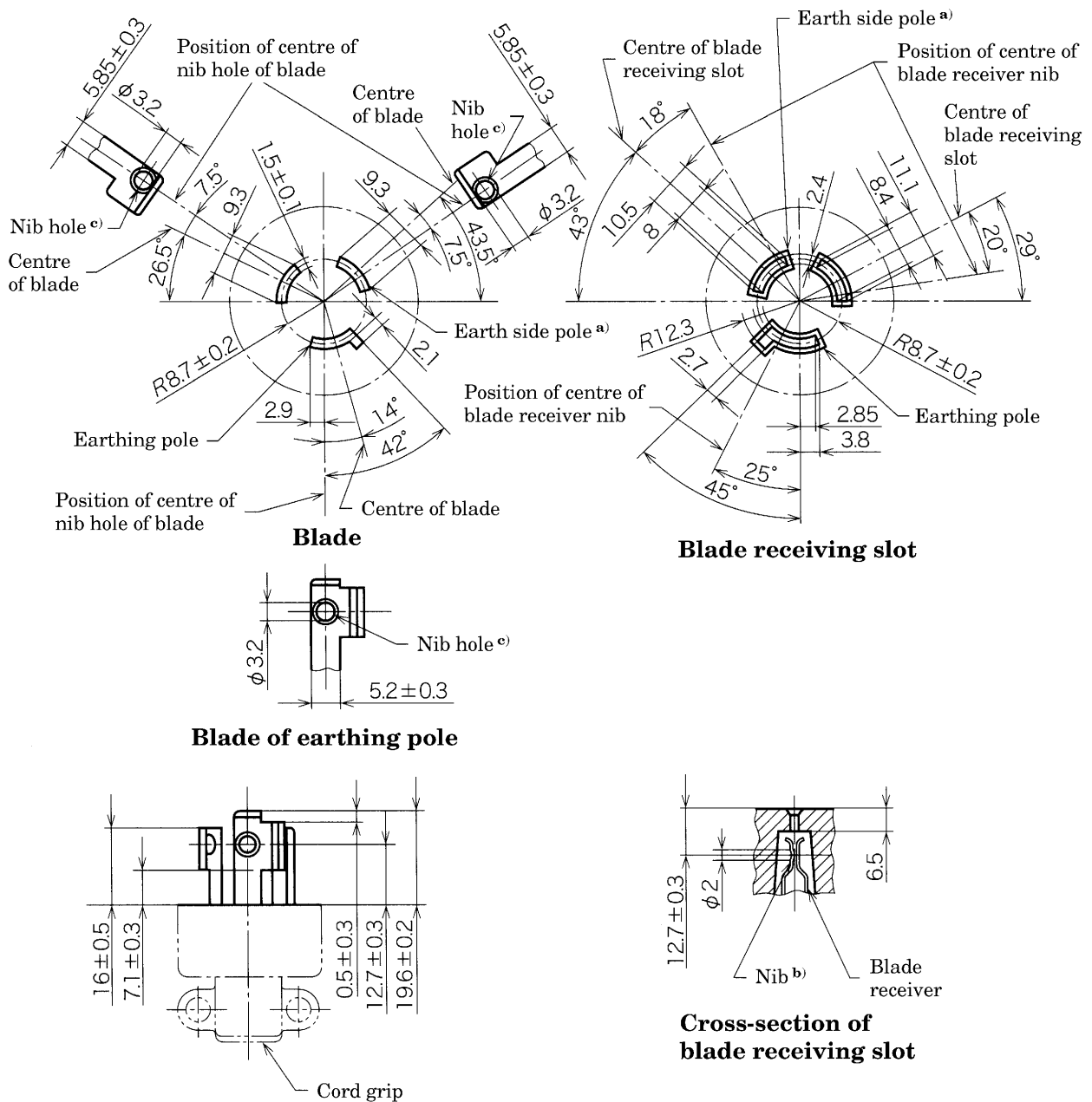


Notes ^{a)} Nib of blade receiver shall be attached on the side to contact with the outer side of the blade.

^{b)} The chamfering of nib hole of blade shall be made on the outer side of each blade.

Figure A.23 Two-pole twist locking type connector with earthing pole 15 A 125 V

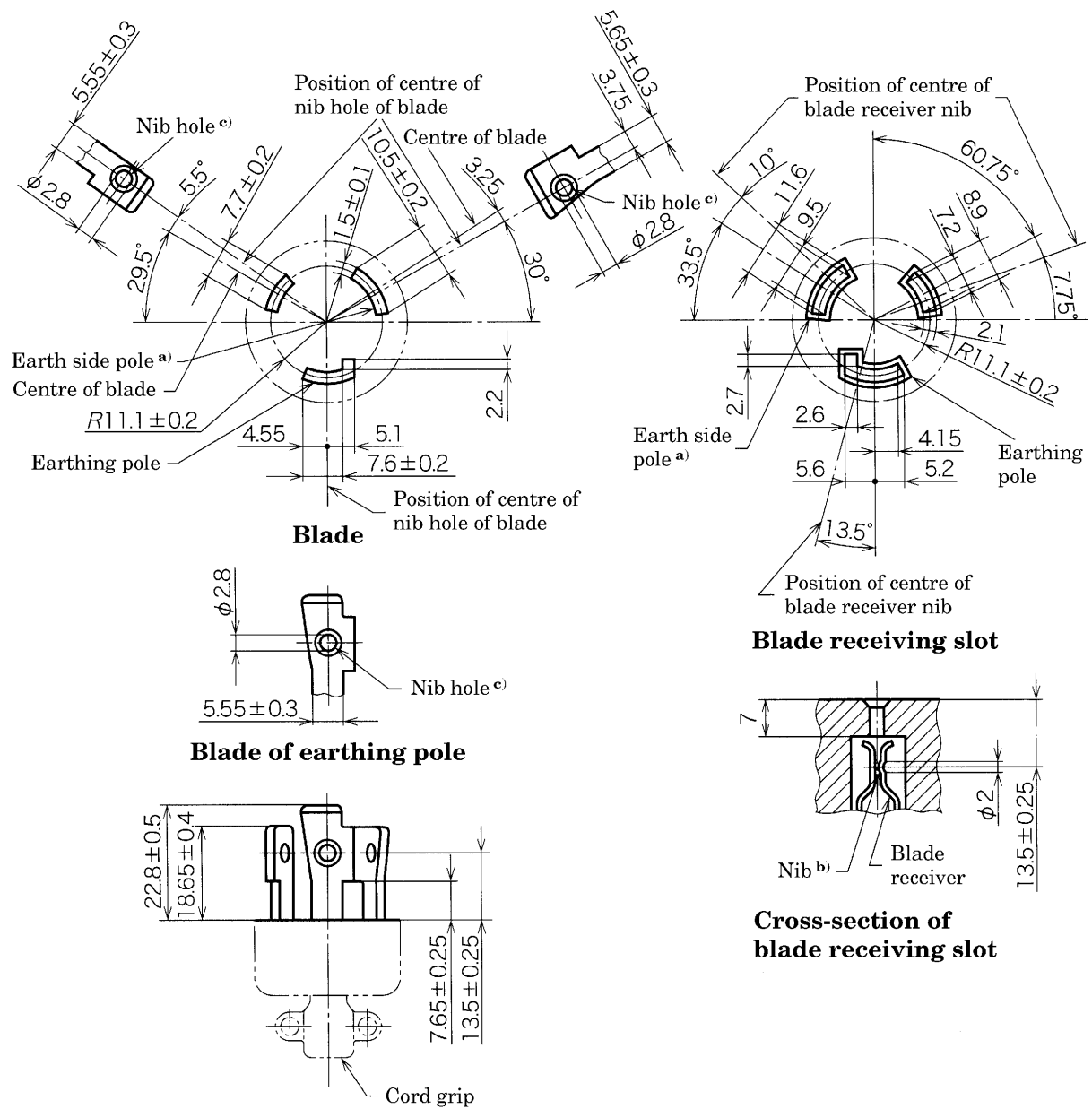
Unit: mm



- Notes
- a) Marking of earth side may be omitted.
 - b) Nib of blade receiver shall be attached on the side to contact with outside of the blade.
 - c) The chamfering of nib hole of blade shall be made on outside of each blade.

Figure A.24 Two-pole twist locking type connector with earthing pole 15 A 250 V

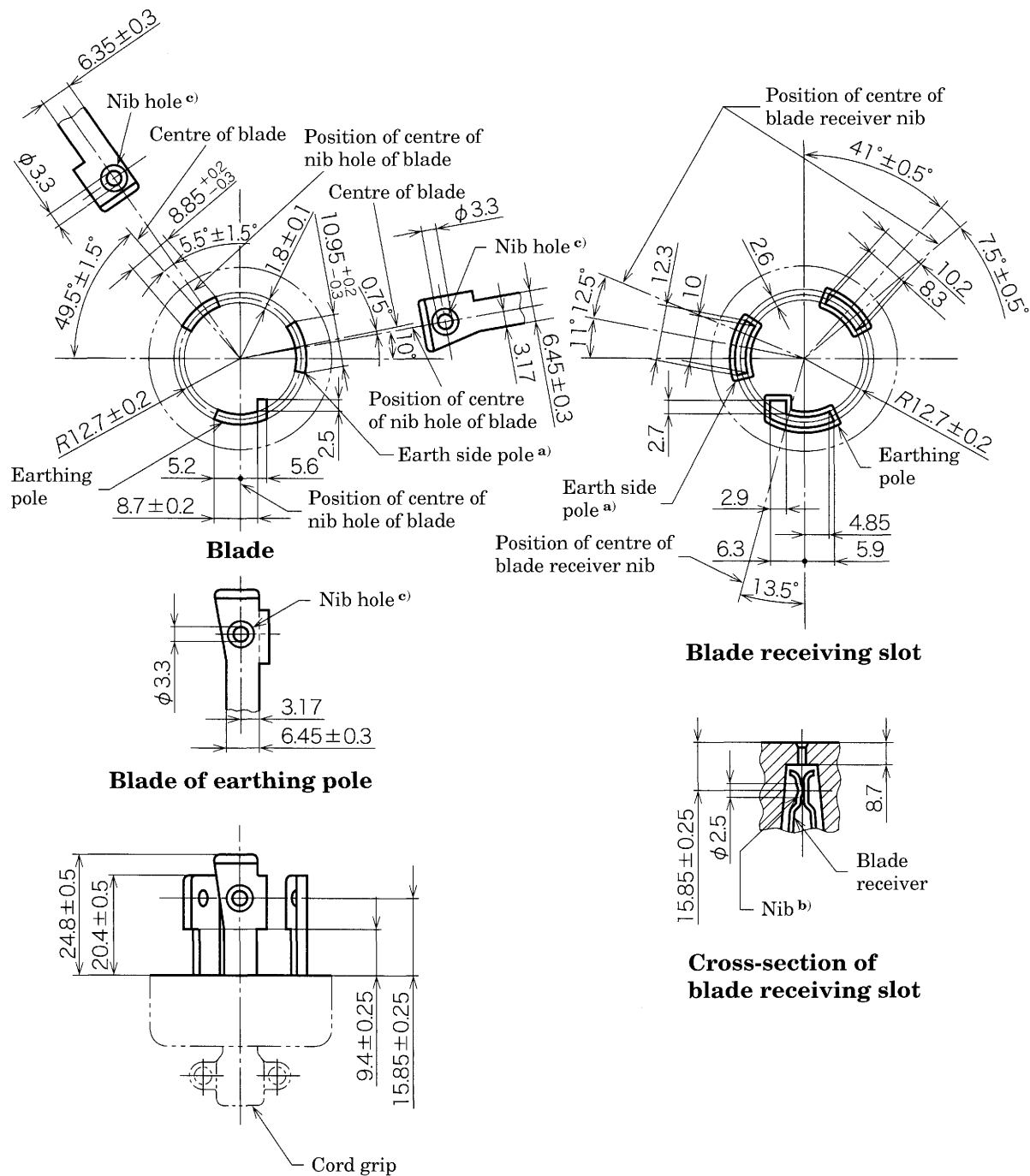
Unit: mm



- Notes
- a) Marking on earth side may be omitted.
 - b) Nib of blade receiver shall be attached on the side to contact with the outer side of the blade.
 - c) The chamfering of nib hole of blade shall be made on the outer side of each blade.

Figure A.25 Two-pole twist locking type connector with earthing pole 20 A 250 V

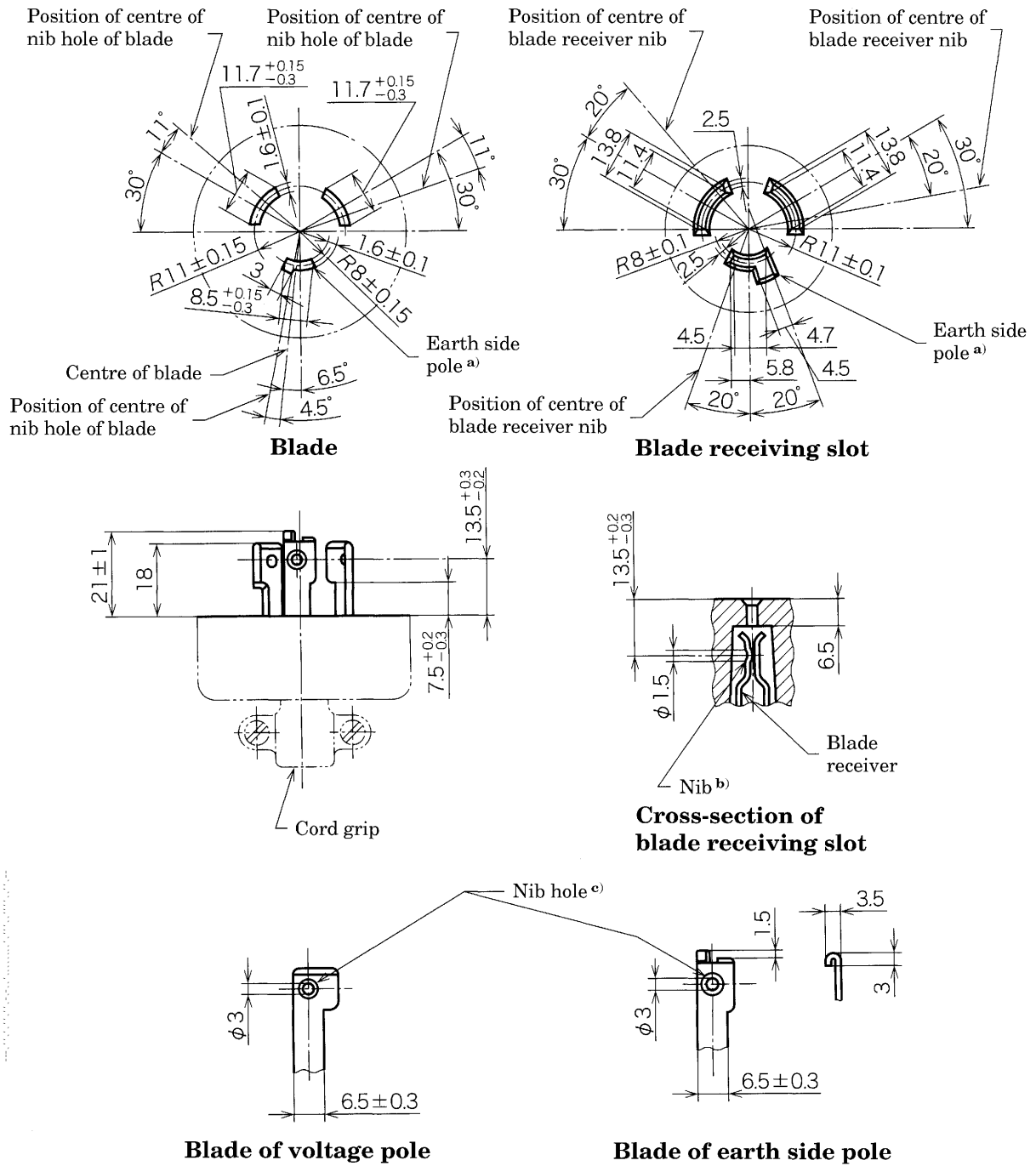
Unit: mm



- Notes
- a) Marking on earth side may be omitted.
 - b) Nib of blade receiver shall be attached on the side to contact with the outer side of the blade.
 - c) The chamfering of nib hole of blade shall be made on the outer side of each blade.

Figure A.26 Two-pole twist locking type connector with earthing pole 30 A 250 V

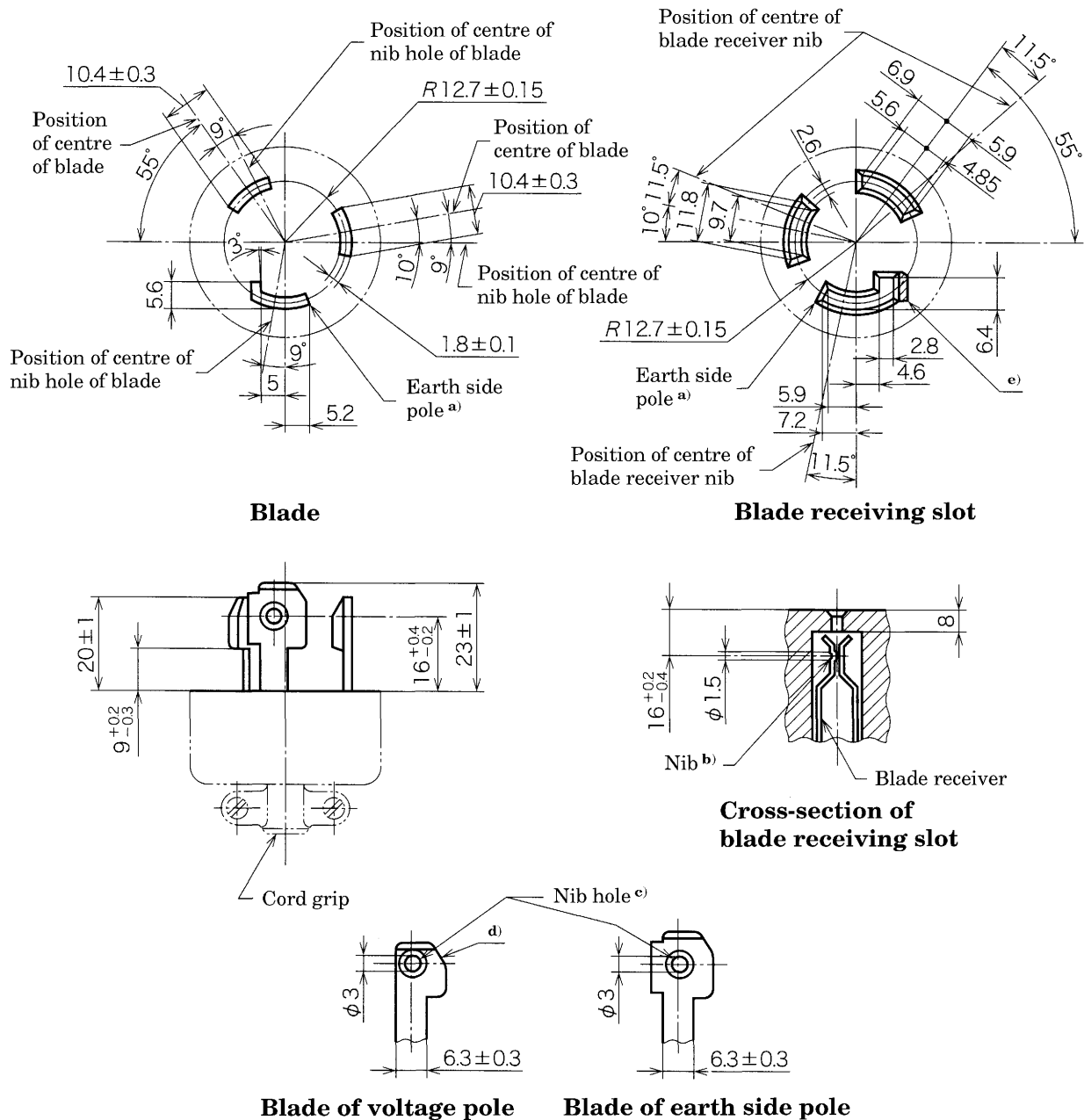
Unit: mm



- Notes
- a) Marking on earth side may be omitted.
 - b) Nib of blade receiver shall be attached on the side to contact with the outer side of the blade.
 - c) The chamfering of nib hole of blade shall be made on the outer side of each blade.

Figure A.27 Three-pole twist locking type connector 20 A 250 V

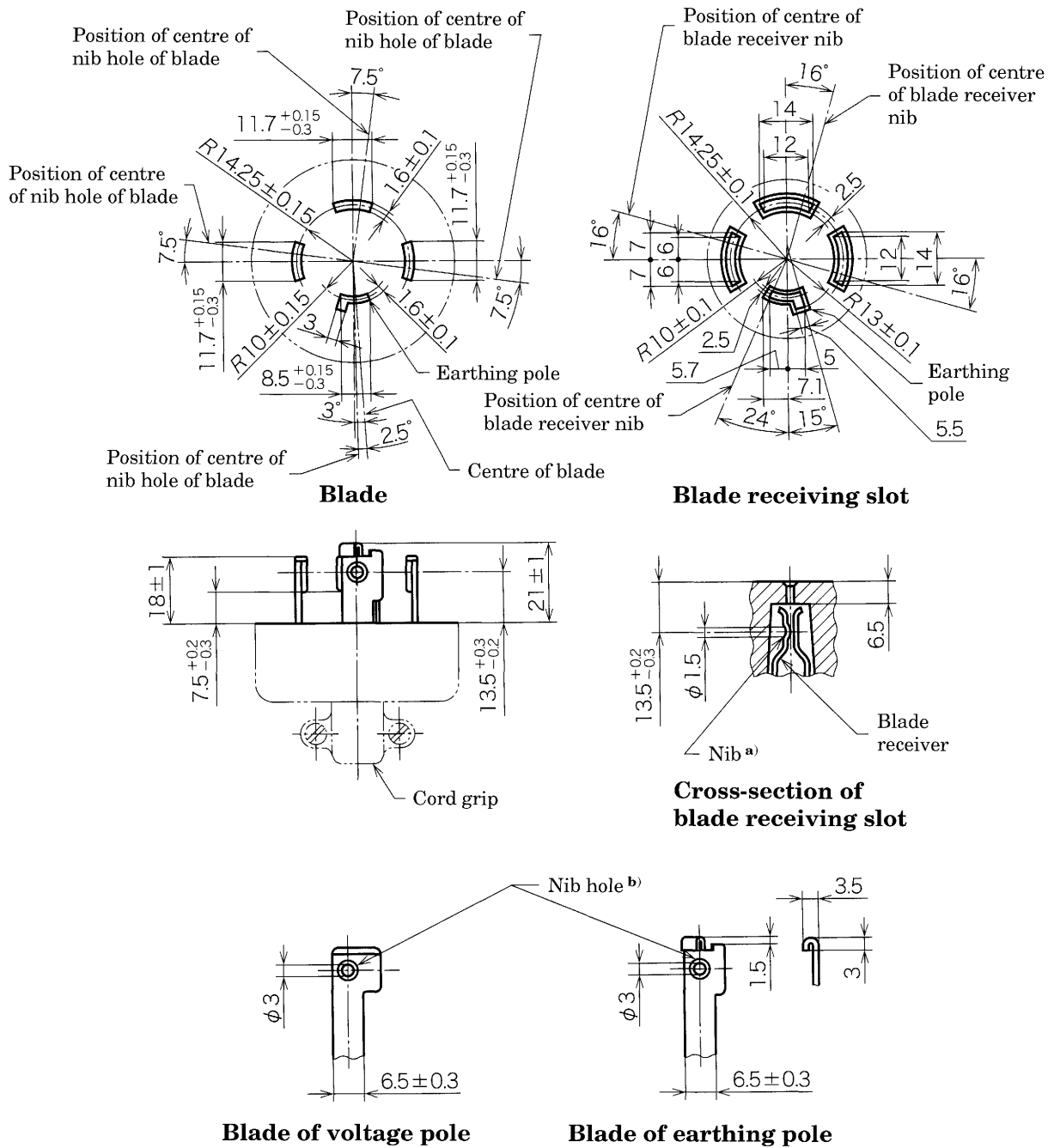
Unit: mm



- Notes
- a) Marking on earth side may be omitted.
 - b) Nib of blade receiver shall be attached on the side to contact with the outer side of the blade.
 - c) The chamfering of nib hole of blade shall be made on the outer side of each blade.
 - d) Cutting of the tip may be omitted.
 - e) The stopper for the folded part of blade of earth side pole L11-30P of NEMA may be provided at the rear of blade receiving slot.

Figure A.28 Three-pole twist locking type connector 30 A 250 V

Unit: mm



Notes a) Nib of blade receiver shall be attached on the side to contact with the outer side of the blade.

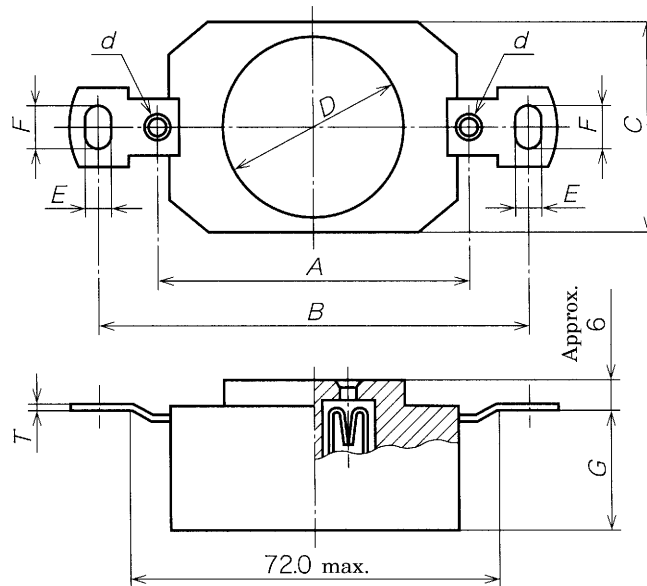
b) The chamfering of nib hole of blade shall be made on the outer side of each blade.

Figure A.29 Three-pole twist locking type connector with earthing pole 20 A 250 V

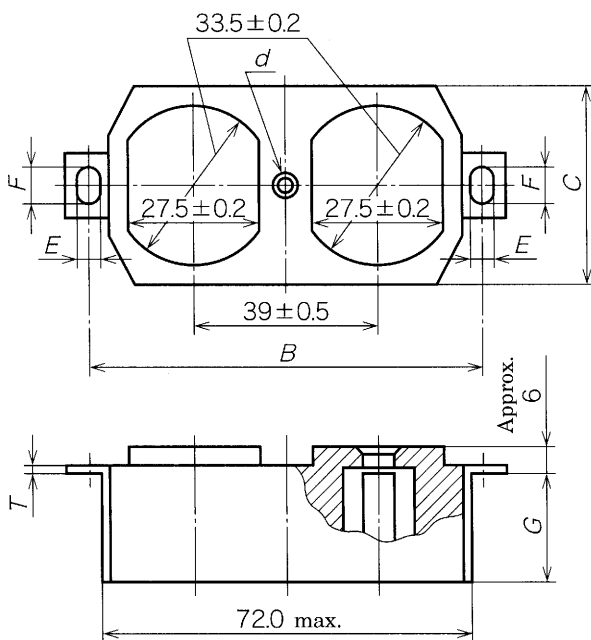
A.2 Dimension of recessed type receptacle

The dimensions of recessed type receptacles that are provided by 6.7 are shown in figures A.30 to A.33.

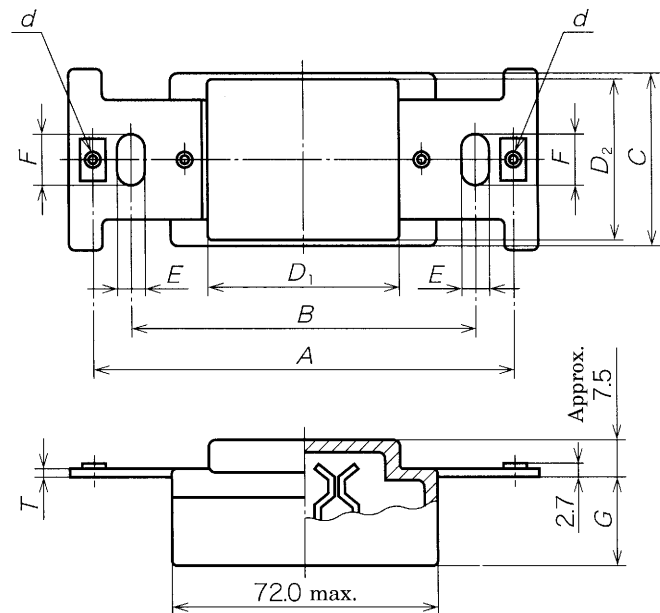
Unit: mm



Round type



Duplex type



Square type

The shown values of the height from the building component to the boss surface (approx. 6, approx. 7.5) are informative.

Figure A.30 Recessed type receptacle (excluding interchangeable type)

Unit: mm

Position specified	Symbol	Number of poles	Boss				
			Round type			Duplex type	Square type
			Rated current (A)				
			15	20	30, 50	15	15, 20
Distance between plate fixing screw holes	<i>A</i>	2, 3	60.5 ± 0.4	60.5 ± 0.4	60.5 ± 0.4 ^{a)}	—	101 ± 0.4
Distance between box mounting holes	<i>B</i>	2, 3	83.5 ± 0.4	83.5 ± 0.4	83.5 ± 0.4 ^{b)}	83.5 ± 0.4	83.5 ± 0.4
Width of body ^{h)}	<i>C</i>	2	43 max.	43 max.	43 max. ^{g)}	43 max.	43 max.
		3			91 max.		
Diameter of boss	<i>D</i>	2, 3	34.5 ^{+0.5} ₀ ^{e)}	34.5 ^{+0.5} ₀ ^{d)}	40.5 ^{+0.5} ₀ 57 ^{+0.5} ₀	—	<i>D</i> ₁ 46 <i>D</i> ₂ 38
Diameter of plate fixing screw	<i>d</i>	2, 3	3.5	3.5	3.5	3.5	3.5
Width of box mounting holes	<i>E</i>	2, 3	5 ± 0.5	5 ± 0.5	5 ± 0.5	5 ± 0.5	5 ± 0.5
Length of box mounting holes	<i>F</i>	2, 3	7.5 min.	7.5 min.	7.5 min.	7.5 min.	7.0 min.
Depth of body	<i>G</i>	2, 3	30 max. ^{e)}	30 max. ^{e)}	45 max.	30 max. ^{e)}	35 max.
Thickness of metal fixture ^{f)}	<i>T</i>	2, 3	1.2 min.	1.2 min.	1.6 min.	1.2 min.	1.2 min.

Dimensions not accompanied by tolerances show basic size.

The plug insertion port of blade receiving slot shall be chamfered.

Notes ^{a)} This dimension does not apply to receptacles of 50 A rated current.

^{b)} A two-unit switch box shall be used for receptacles of two-pole type with earthing pole, three-pole type, and three-pole type with earthing pole. Consequently, the lateral distance between box mounting holes shall be 46 mm ± 0.4 mm.

^{c)} This may be 25.5^{+0.5}₀ mm for twist locking type diameter of boss.

^{d)} The boss diameter for three-pole twist locking type receptacles with earthing pole shall be 40.5^{+0.5}₀ mm.

^{e)} This may be 35 mm or smaller for receptacle of three-pole type, three-pole type with earthing pole, and twist locking type.

^{f)} The thickness indicates the nominal value of thickness of the base material plate.

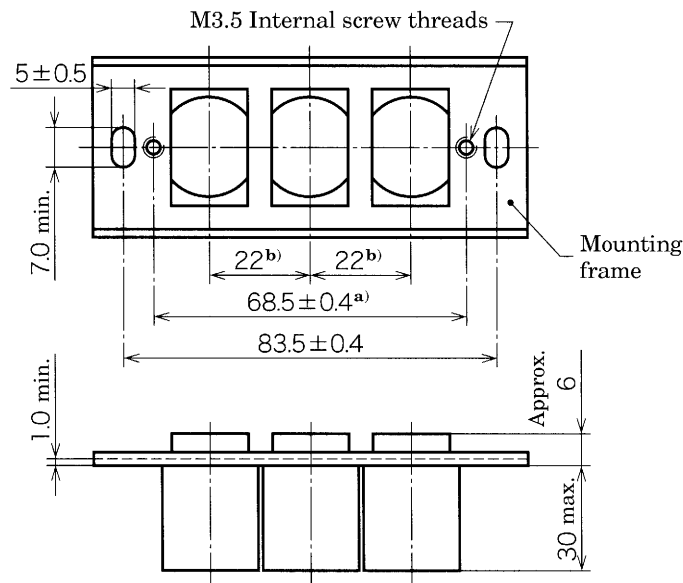
^{g)} This shall be 91 mm or smaller for two-pole receptacles with earthing pole.

^{h)} This specified value 43 mm or smaller may be replaced by 46 mm or smaller for receptacles with the side surface of the body covered with an insulating material.

(The dimensions in above table are recommended values.)

Figure A.30 (concluded)

Unit: mm



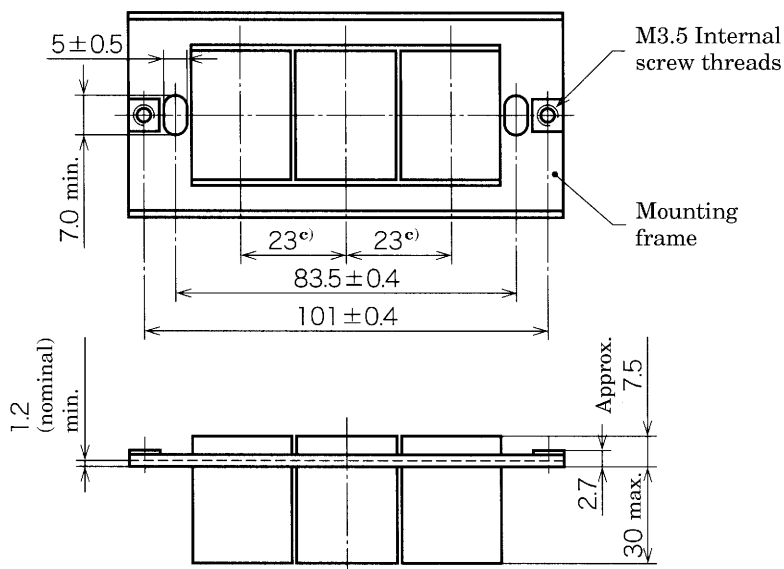
Receptacle assembly which contains two or three bosses of the same shape and dimensions are also included (the same applied in this figure.)

The dimensions of interchangeable receptacle without mounting frame show when it is fixed to the mounting frame shown in figure A.30 (the same applied in this figure.)

Notes a) The dimension $60.5 \text{ mm} \pm 0.4 \text{ mm}$ may be used where a single receptacle is installed.

b) The dimension 22 indicated the pitch between bosses.

a) For oval and square bosses



The shown values of the height from the building component to the boss surface (approx. 6, approx. 7.5) are informative.

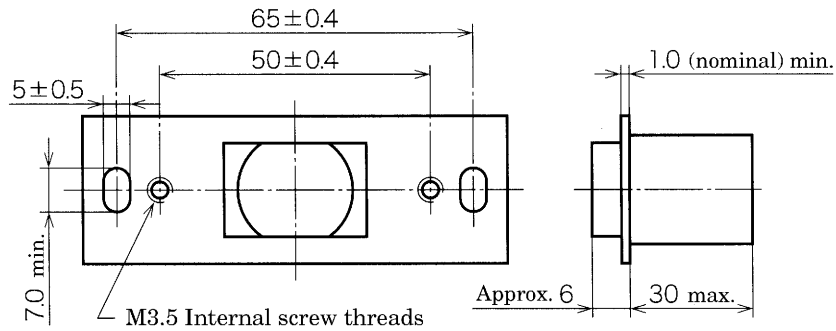
The shown dimension of box thread hole, $[7.0 \text{ min.} \times (5 \pm 0.5)]$ is an informative value.

Note c) The dimension 23 indicates the pitch between bosses.

b) For large square bosses

Figure A.31 Dimensions of interchangeable receptacle
(Shape of mounting frame shows one example.)

Unit: mm

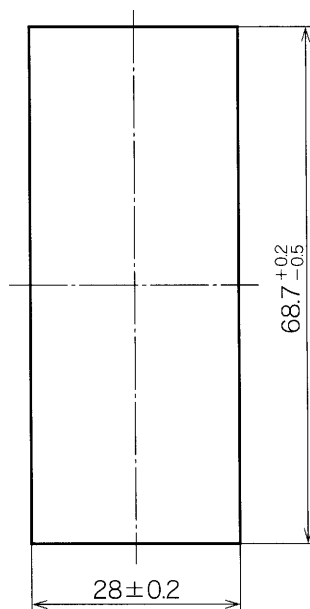
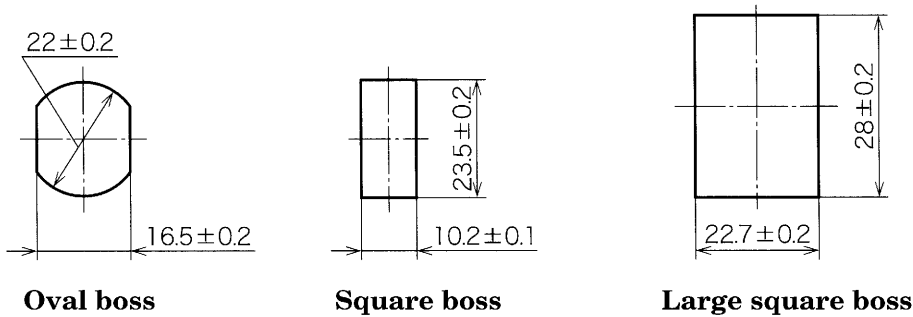


The shown value of the height from the building component to the boss surface (approx. 6) is informative.

The shown dimension of box thread hole, [7.0 min. \times (5 ± 0.5)], is an informative value.

Figure A.32 Dimension of small-size switch box receptacle

Unit: mm



Large square boss (for 3 units)

Figure A.33 Shape and dimensions of boss of receptacle

Annex B (normative)

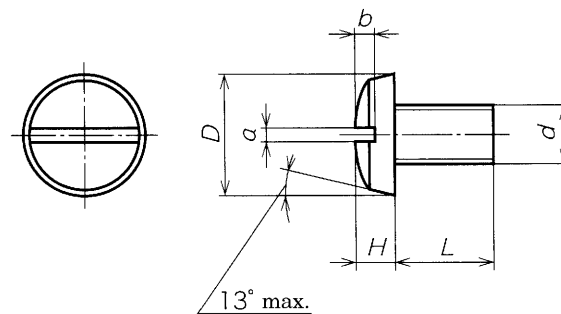
Dimensions of screw threads of screw terminals

Introduction

This Annex specifies the dimensions of screw threads of screw terminals.

B.1

The detailed dimensions of large fillister head machine screws and slotted hexagon head machine screws as specified in 6.2 shall be as shown in figures B.1 and B.2.

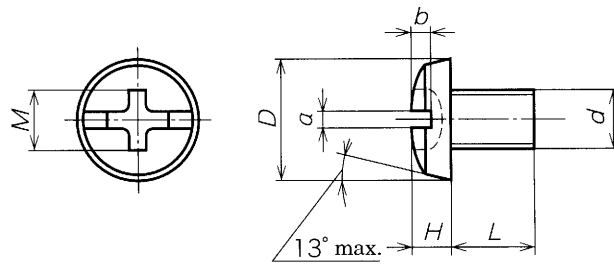


Unit: mm

Outer diameter of screw (nominal)	d	3	3.5	4	4.5	5	6
Diameter of head	D	6.5 ± 0.3	7.5 ± 0.3	8.5 ± 0.3	10.5 ± 0.5	11.5 ± 0.5	13.0 ± 0.5
Height of head	H	1.6	2.0	2.4	3.0	3.6	3.7
Width of slot	a	0.8	1.0	1.0	1.2	1.2	1.2
Depth of slot	b	0.8	1.0	1.2	1.6	2.0	2.0
Length of screw	L	4, 5, 6	5, 6, 7	6, 7, 8	8, 9, 10	8, 10, 12	11, 12, 13
Pitch of threads	P	0.5	0.6	0.7	0.75	0.8	1.0
The screw threads are based on JIS B 0205-1 , JIS B 0205-2 and JIS B 0205-3 .							

a) Slotted screw

Figure B.1 Large fillister head machine screws



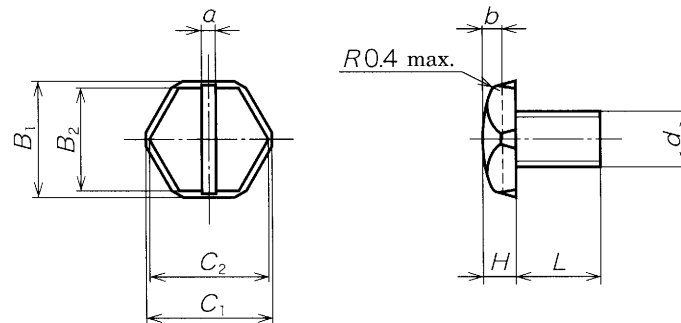
Unit: mm

Outer diameter of screw (nominal)	d	3	3.5	4	4.5	5	6
Diameter of head	D	6.5 ± 0.3	7.5 ± 0.3	8.5 ± 0.3	10.5 ± 0.5	11.5 ± 0.5	13.0 ± 0.5
Height of head	H	1.9	2.2	2.5	3.0	3.6	3.7
Width of slot	a	0.8	1.0	1.0	1.2	1.2	1.2
Depth of slot	b	0.8	1.0	1.2	1.6	2.0	2.0
Cross recess number ^{a)}		2	2	2	2	2	3
Length of cross recess (maximum)	M	3.6	3.9	4.2	4.6	4.9	6.2
Indentation depth of cross recess ^{b)}	Q	1.01 to 1.53	1.30 to 1.83	1.60 to 2.13	1.99 to 2.53	2.29 to 2.83	2.31 to 2.86
Length of screw	L	4, 5, 6	5, 6, 7	6, 7, 8	8, 9, 10	8, 10, 12	11, 12, 13
Pitch of threads	P	0.5	0.6	0.7	0.75	0.8	1.0
The screw threads are based on JIS B 0205-1 , JIS B 0205-2 and JIS B 0205-3 .							
Notes ^{a)} The cross recess number is based on JIS B 1012 .							
^{b)} Symbol Q indicates the gauge penetration depth of cross recess.							

b) Slotted cross recess head screw

Figure B.1 (concluded)

Unit: mm

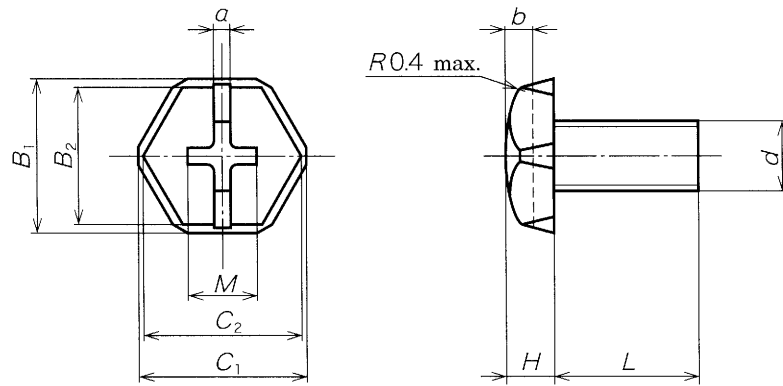


Outer diameter of screw (nominal)	d	3.5	4	4.5	5	6
Width across flats (lower)	B_1	7.2	8.5	9.9	11.2	12.7
Width across flats (upper)	B_2	6.4	7.5	8.7	9.8	11.1
Maximum diameter of head (lower)	C_1	7.5 ± 0.3	8.8 ± 0.3	10.2 ± 0.3	11.5 ± 0.3	13.0 ± 0.3
Maximum diameter of head (upper)	C_2	7.2	8.5	9.9	11.2	12.7
Height of head	H	2.0	2.4	3.0	3.6	3.7
Width of slot	a	1.0	1.0	1.2	1.2	1.2
Depth of slot	b	1.0	1.2	1.6	2.0	2.0
Length of screw	L	5, 6, 7	6, 7, 8	8, 9, 10	8, 10, 12	11, 12, 13
Pitch of threads	P	0.6	0.7	0.75	0.8	1.0
The direction of the slot may be arbitrarily specified. The screw threads are based on JIS B 0205-1 , JIS B 0205-2 and JIS B 0205-3 .						

a) Slotted screw

Figure B.2 Slotted hexagon head machine screw (for earthing terminals)

Unit: mm



Outer diameter of screw (nominal)	d	3.5	4	4.5	5	6
Width across flats (lower)	B_1	7.2	8.5	9.9	11.2	12.7
Width across flats (upper)	B_2	6.4	7.5	8.7	9.8	11.1
Maximum diameter of head (lower)	C_1	7.5 ± 0.3	8.8 ± 0.3	10.2 ± 0.3	11.5 ± 0.3	13.0 ± 0.3
Maximum diameter of head (upper)	C_2	7.2	8.5	9.9	11.2	12.7
Height of head	H	2.2	2.5	3.0	3.6	3.7
Width of slot	a	1.0	1.0	1.2	1.2	1.2
Depth of slot	b	1.0	1.2	1.6	2.0	2.0
Cross recess number ^{a)}		2	2	2	2	3
Length of cross recess (maximum)	M	3.9	4.2	4.6	4.9	6.2
Indentation depth of cross recess ^{b)}	Q	1.30 to 1.83	1.60 to 2.13	1.99 to 2.53	2.29 to 2.83	2.31 to 2.86
Length of screw	L	5, 6, 7	6, 7, 8	8, 9, 10	8, 10, 12	11, 12, 13
Pitch of threads	P	0.6	0.7	0.75	0.8	1.0
<p>The direction of the slot may be arbitrarily specified. The screw threads are based on JIS B 0205-1, JIS B 0205-2 and JIS B 0205-3.</p> <p>Notes ^{a)} The cross recess number is based on JIS B 1012. ^{b)} Symbol Q indicates the gauge penetration depth in the cross recess.</p>						

b) Slotted cross recess screw

Figure B.2 (concluded)

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