INTERNATIONAL STANDARD

ISO 15170-1

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Road vehicles — Four-pole electrical connectors with pins and twist lock —

Part 1: Dimensions and classes of application

Véhicules routiers — Connecteurs électriques à quatre contacts avec broches et verrouillage direct —

Partie 1: Dimensions et classes d'application

Reference number
ISO 15170-1:2001(E)

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 15170 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 15170-1 was prepared by Technical Committee ISO/TC 22, *Motor vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

ISO 15170 consists of the following parts, under the general title *Road vehicles — Four-pole electrical connectors with pins and twist lock*:

— *Part 1: Dimensions and classes of application*

— *Part 2: Tests and requirements*

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Road vehicles — Four-pole electrical connectors with pins and twist lock —

Part 1: Dimensions and classes of application

1 Scope

This part of ISO 15170 specifies those items, principally dimensions and classes of application of electrical connectors with up to four pins and twist lock coupling, necessary for assuring the interchangeability of both parts of electrical connections according to ISO 15170.

This type of connection is intended for electrical connections in truck, bus and trailer applications (e.g. for components directly mounted on the engine).

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 15170. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 15170 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 8092-4:1997, *Road vehicles — Connections for on-board electrical wiring harnesses — Part 4: Pins for single- and multi-pole connections — Dimensions and specific requirements*

ISO 15170-2:2001, *Road vehicles — Four-pole electrical connectors with pins and twist lock — Part 2: Tests and requirements*

3 Dimensions

The dimensions of the connector shall be according to those shown in Figures 1, 2 and 3.

Details unspecified are left to the manufacturer's choice.

The free coupler connectors shall be manufactured such that the coupled arrangement of both connectors fulfils the requirements of ISO 15170-2.

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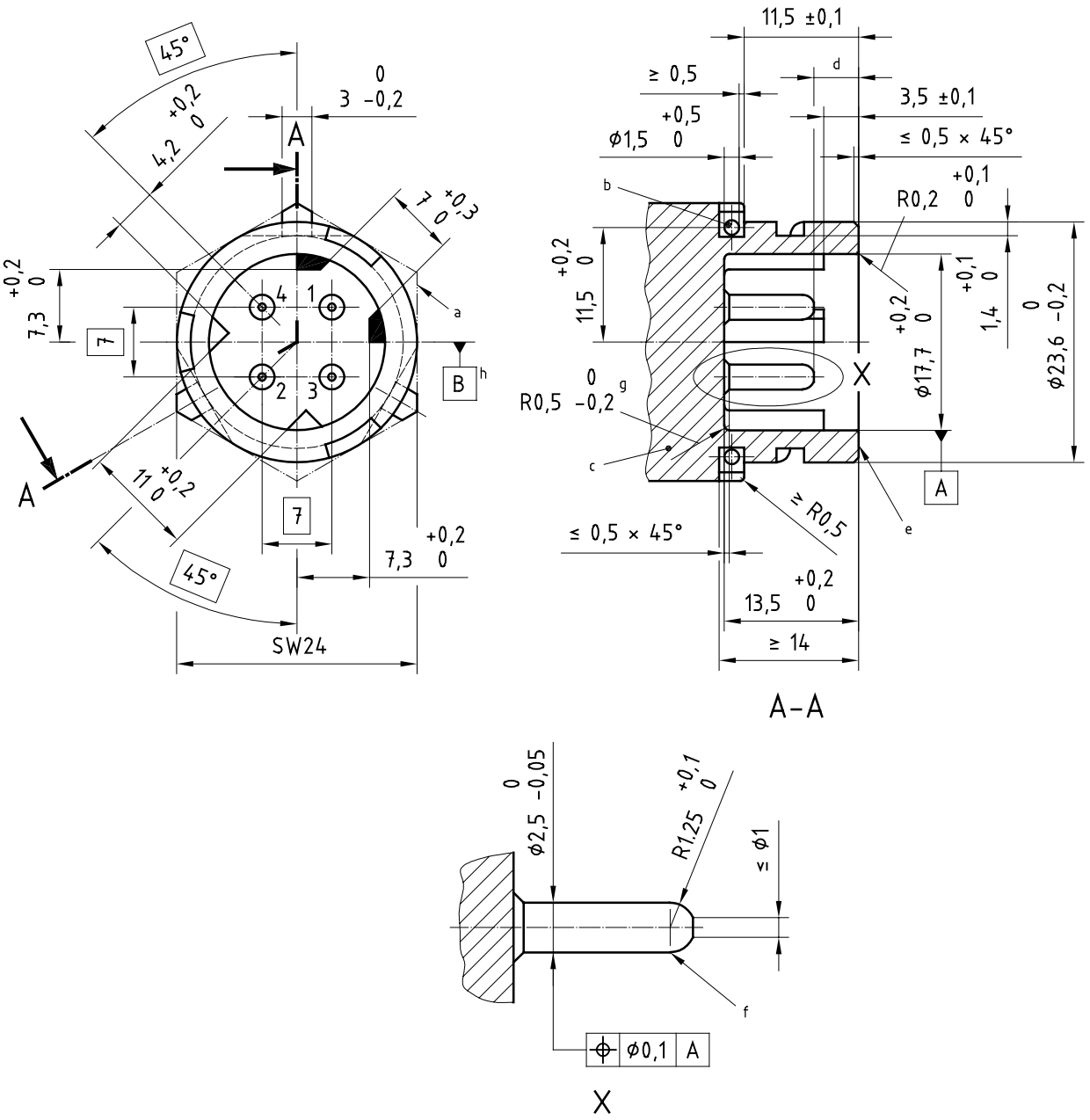
Dimensions in millimetres



a Different contours are permitted.

b Hole for security device. The outer contour of the eye shall be within the contour of the 24 mm hexagon.

c Dimensions, sealing and cable retention at manufacturer's discretion.

d Type A: $(4{,}5 \pm 0{,}1)$ mm; type B: $(4{,}5\,^{+0{,}5}_{-0{,}4})$ mm.

e Sealing area (i.e. no burrs or ridges permitted).

f No transition area.

g Circular.

h See Figure 2.

Figure 1 — Type A, fixed, and type B, free, connector dimensions (with preferred code 1)

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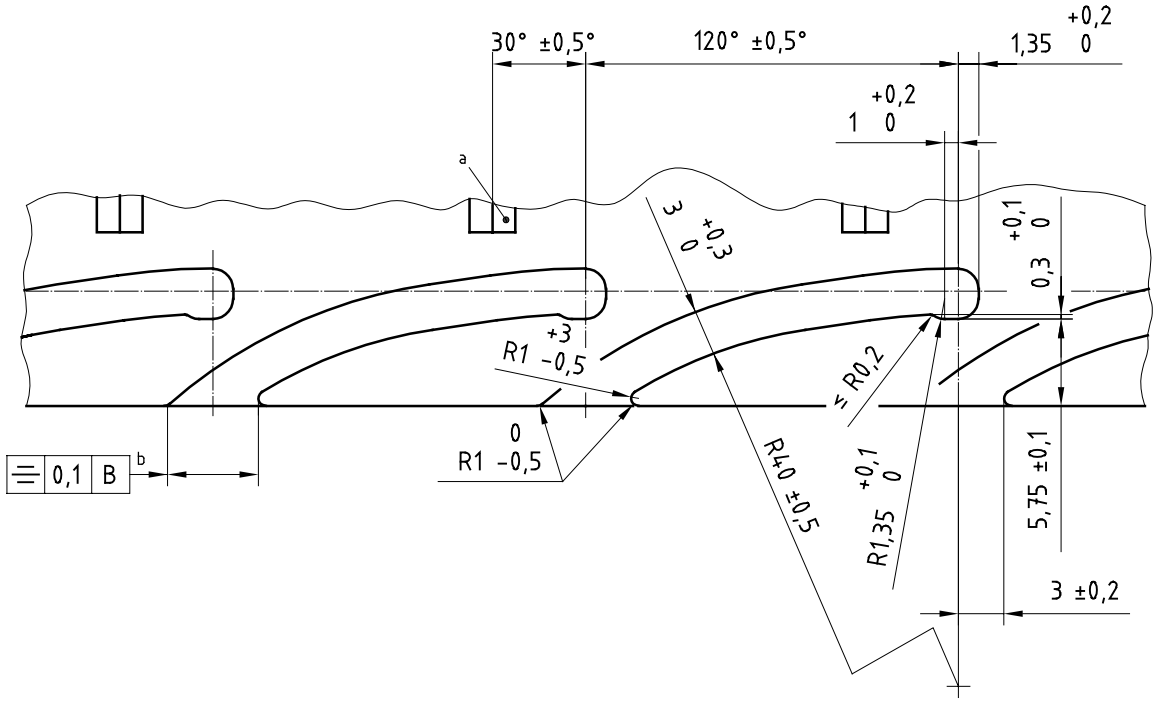
Dimensions in millimetres

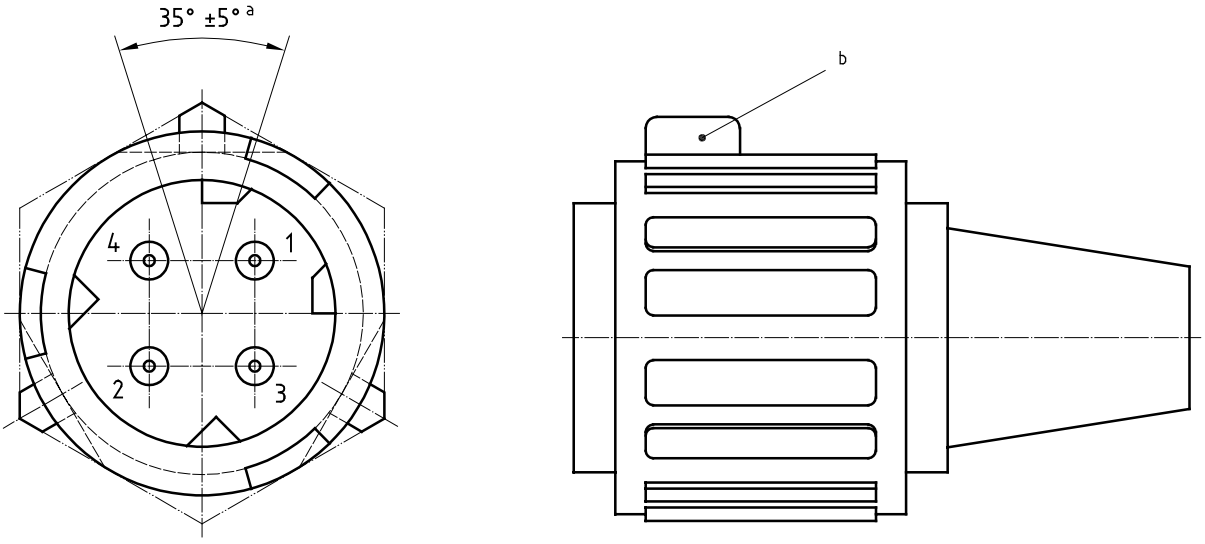


a Seal eye.

b See Figure 1.

Figure 2 — Twist lock development at bottom of groove

Dimensions in millimetres



a) Marking zone at fixed or free connector

b) Marking at free coupler connector

a Zone for positive marking.

b Positive marking of coupling ring position ready for connection.

Figure 3 — Marking

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4 Classes of application

The classes of application K1, K2 and K3 are specified in Table 1.

Table 1 — Classes of application

Class	Material of contact surface (plating)	Contact temperature range °C	Max. acceleration of vibrations m/s^2
K1	Sn	– 40 to + 120	200
K2	Sn	– 40 to + 120	300
K3	Ag	– 40 to + 140 [a]	300
[a] Higher temperatures are to be agreed between manufacturer and user.			

5 Designation

EXAMPLE 1 Fixed connector (type A) with preferred coding (1), three contacts fitted, with contact numbers 1, 2 and 3 (3.1: see Table 2), equipped with tin-plated (Sn) contacts, and withstanding class K1:

Connector ISO 15170 - A1-3.1-Sn/K1

EXAMPLE 2 Free connector (type B) with preferred coding (1), two contacts fitted, with contact numbers 1 and 3 (2.2: see Table 2), equipped with silver-plated (Ag) contacts for crimp size coding 1, and withstanding class K3:

Connector ISO 15170 - B1-2.2-1-Ag/K3

6 Coding

Table 2 presents the coding of pole arrangements, with the preferred variants.

If, in this table, the variety of codes provided by the different contact allocations with code 1 is insufficient, the following mechanical codings shall be used in the sequence given.

a) Colour coding as specified in Figure 4 shall be applied. Colour coding is not required for the lock ring.

b) Additional coding may be applied as agreed between manufacturer and user.

c) For connecting devices where the polarity of the d.c. supply is essential, pole number 1 shall be used for the positive polarity.

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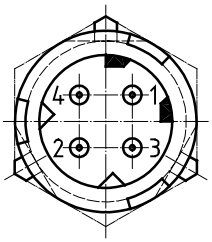
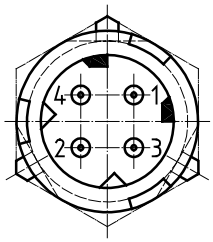
Table 2 — Coding of pole arrangement
(bold signifies preferred variants; see 7.4 for symbol meanings)

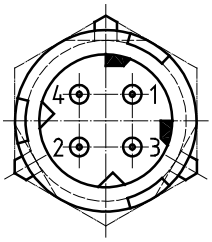
No. of poles	Designation of poles				Code
	1	2	3	4	
2	**X**	**X**	–	–	**2.1**
	X	–	**X**	–	**2.2**
	X	–	–	**X**	**2.3**
	–	X	X	–	2.4
	–	X	–	X	2.5
	–	–	X	X	2.6
3	**X**	**X**	**X**	–	**3.1**
	X	**X**	–	**X**	**3.2**
	X	–	X	X	3.3
	–	X	X	X	3.4
	X [+2]	X	X [+2]	–	3.5
	X	X [+1]	–	X [+1]	3.6
4	**X**	**X**	**X**	**X**	**4.1**
	X	X [+1]	X	X [+1]	4.2
	X [+2]	X	X [+2]	X	4.3
	X [+2]	**X [+1]**	**X [+2]**	**X [+1]**	**4.4**



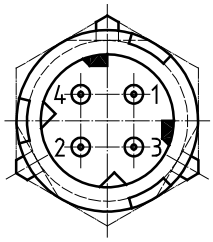
a) Code 1 — Colour: black (BK)



b) Code 2 — Colour: grey (GY)



c) Code 3 — Colour: green (GN)



d) Code 4 — Colour: blue (BU)

Figure 4 — Mechanical and colour coding

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7 Contacts

7.1 Surface

The contact plating shall be shown in the designation by adding the appropriate chemical symbol:

— Sn for tin-plated contacts;

— Ag for silver-plated contacts.

Mated contacts shall have the same plating.

7.2 Crimp sizes and attachable cable cross-sectional areas

The crimp size shall be chosen from Table 3.

Table 3 — Crimp sizes and cable cross-sectional areas

Crimp size coding	Corresponding cable cross-sectional area mm^2
1	0,5 to 1
2	> 1 to 2,5

7.3 Requirements

The contacts used shall be in accordance with ISO 8092-4.

7.4 Pole allocation

The connectors are equipped with the contacts designated by “X” in Table 2. Each pair of poles designated with “$^{+1}$” or “$^{+2}$” is interconnected within the connector.

8 Performance requirements

Connectors shall fulfil the requirements of ISO 15170-2.

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Annex A
(informative)

Examples of pole allocation

Examples of pole allocation are given in Table A.1.

Table A.1 — Pole allocation — Examples

Component	Designation of poles			
	1	2	3	4
Solenoid valve, air dryer	Plus	Ground [b]		Ground [b]
Pressure control valve for single-channel ABS [a]	Plus for depressurizing	Ground [b]	Plus for pressurizing	Ground [b]
Solenoid valve for ABS [a]	Plus for pressurizing, right wheel	Ground [b]	Plus for pressurizing, left wheel	Ground [b]
Pressure control valve for two-channel ABS [a]	(Continuous) plus	Switched ground, pressurizing, left wheel	Switched ground, pressurizing, right wheel	Switched ground, de-pressurizing
Pressure switch	Plus	Ground [b]	Switched ground [c]	Ground [b]
Pressure sensor	Analogue output for the display	Ground [b]	Switched ground	Ground [b]
Water and oil sensor	Plus	Ground [b]	Switched ground [c]	Ground [b]
Speed sensor, trucks	Plus	Ground	Signal	Inverted signal
Speed sensor, coded	Plus	Ground	Signal	

[a] ABS (Antilock Braking System).

[b] Ground contact connected within the device.

[c] Load (signal lamp) may be connected to plus or ground.

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