

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Ball and socket couplings of string insulator units – Dimensions

Assemblages à rotule des éléments de chaînes d'isolateurs – Dimensions



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CONTENTS

FOREWORD	4
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 Designated size of coupling	7
5 Pin ball	7
6 Socket	7
7 Hook-on "GO" gauge	7
8 Lower part of the insulator	7
9 Locking device	7
10 Dimensions of the pin ball	8
11 Dimensions of the socket end	9
12 Dimensions of the hook-on "GO" gauge	10
13 Dimensions of twin-balled pins	13
14 Dimensions of the hole for the split-pin	13
15 Dimensions of the hole for the W-clip	15
Annex A (informative) Extreme positions of the pin ball in the socket	16
Annex B (normative) Recommended gauges	18
Annex C (informative) Dimensions obtained by calculation	35
Bibliography	37
Figure 1 – Schematic of the pin ball	8
Figure 2 – Schematic of the socket end	9
Figure 3 – Schematic of the hook-on "GO" gauge	10
Figure 4 – Schematic of twin-balled pins	13
Figure 5 – Schematic of the hole for the split-pin	14
Figure 6 – Schematic of the hole for the W-clip	15
Figure A.1 – Sliding position of the pin ball (socket end)	16
Figure A.2 – Over-tilting position of the pin ball in the socket end	17
Figure B.1 – Schematic of ball part for pin ball	19
Figure B.2 – Schematic of inspecting part for cap	19
Figure B.3 – Schematic of pin "GO" gauge for ball height, shank diameter and shank length	20
Figure B.4 – Schematic of pin "GO" gauge for ball diameter	22
Figure B.5 – Schematic of pin "NOT GO" gauge for ball height	23
Figure B.6 – Schematic of pin "NOT GO" gauge for ball diameter	25
Figure B.7 – Schematic of pin "NOT GO" gauge for shank diameter	26
Figure B.8 – Schematic of socket "GO" gauge for entry height, entry width and neck width	27
Figure B.9 – Schematic of socket "GO" gauge for internal height and internal diameter	29
Figure B.10 – Schematic of socket "NOT GO" gauge for entry height	32
Figure B.11 – Schematic of socket "NOT GO" gauge for neck width	34

Figure C.1 – Schematic of clearance between the pin ball and the socket end	35
Figure C.2 – Effectiveness of locking the pin ball	36
Table 1 – Dimensions of the pin ball	8
Table 2 – Dimensions of the socket end.....	9
Table 3 – Dimensions of the hook-on "GO" gauge.....	11
Table 4 – Dimensions of twin-balled pins	13
Table 5 – Dimensions of the hole for the split-pin.....	14
Table 6 – Dimensions of the hole for the W-clip	15
Table A.1 – Allowed deviation angle of pin.....	16
Table A.2 – Allowed deviation angle of pin.....	17
Table B.1 – Dimensions of pin "GO" gauge for ball height, shank diameter and shank length	21
Table B.2 – Dimensions of pin "GO" gauge for ball diameter.....	23
Table B.3 – Dimensions of pin "NOT GO" gauge for ball height.....	24
Table B.4 – Dimensions of pin "NOT GO" gauge for ball diameter.....	25
Table B.5 – Dimensions of pin "NOT GO" gauge for shank diameter	26
Table B.6 – Dimensions of socket "GO" gauge for entry height, entry width and neck width.....	27
Table B.7 – Dimensions of socket "GO" gauge for internal height and internal diameter.....	30
Table B.8 – Dimensions of socket "NOT GO" gauge for entry height	32
Table B.9 – Dimensions of socket "NOT GO" gauge for neck width.....	34
Table C.1 – Clearance between the pin ball and the socket end.....	35
Table C.2 – Effectiveness of locking the pin ball	36

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**BALL AND SOCKET COUPLINGS OF STRING
INSULATOR UNITS – DIMENSIONS**

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International Standard IEC 60120 has been prepared by IEC technical committee 36: Insulators.

This fourth edition cancels and replaces the third edition published in 1984. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Two new designated size of couplings, 36 and 40 were introduced;
- b) According to the results of the questionnaire(36/424/Q), the relevant content of the 28B W-clip was deleted;
- c) The Q_{min} column in Table C.1 was deleted;
- d) Annex A is informative, Annex B is normative, Annex C is informative.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
36/486/FDIS	36/492/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

BALL AND SOCKET COUPLINGS OF STRING INSULATOR UNITS – DIMENSIONS

1 Scope

The object of this international standard is to define the dimensions of a series of standard ball and socket couplings using the standard locking devices (see IEC 60372) in order to permit the assembly of insulators or metal fittings supplied by different manufacturers.

This document applies to string insulator units of the cap and pin and long rod types and their associated metal fittings.

For the pin ball and the socket, dimensions apply to the finished product after any surface treatment.

Extreme positions of the pin ball in the socket are given in Annex A.

Typical examples of gauges for checking the dimensions of pin balls and sockets are given in Annex B.

NOTE Only the dimensions necessary for assembly are dealt with in this standard. Properties of material and working loads are not specified. The co-ordination of dimensions with strength classes is specified in IEC 60305 and IEC 60433.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-471:2007, *International Electrotechnical Vocabulary (IEV) – Part 471: Insulators*

IEC 60372, *Locking devices for ball and socket couplings of string insulator units – Dimensions and tests*

3 Terms and definitions

For the purposes of this document, the terms and definitions of IEC 60050-471, some of which are reproduced below for ease of reference, apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

ball and socket coupling

coupling consisting of a ball, a socket and a locking device, and providing flexibility

[SOURCE: IEC 60050-471:2007, 471-03-11]

3.2

string insulator unit

cap and pin insulator or long rod insulator of which end fitting are suitable for flexible attachment to other similar insulator units or to connecting accessories

[SOURCE: IEC 60050-471:2007, 471-03-08]

4 Designated size of coupling

This document includes eight standard ball and socket couplings designated by the nominal pin diameters in millimetres. Each designated size of coupling is defined by the dimensions of the pin ball, of the socket, of the hook-on "GO" gauge, of the lower part of the insulator and of the corresponding locking device.

NOTE Dimensions of twin-balled pins for coupling of two sockets are stated in Clause 13. Dimensions of the hole for the locking devices are stated in Clause 14 and Clause 15.

5 Pin ball

The pin ball shall conform to the dimensions specified in Clause 10. The main dimensions governing the shape of the pin ball are h_1 , d_2 , r_1 and r_2 . Dimension r_3 is given for guidance because its accurate value may be obtained only by the drawing. In addition, the shank diameter d_1 , must not exceed the specified values within a length equal to H_3 of the corresponding worn hook-on "GO" gauge (see Clause 12).

6 Socket

The socket interior shall conform to the dimensions specified in Clause 11, which also specifies the thickness of the locking device.

The 16 mm designated size of coupling according to Clause 11 includes two alternative sockets. There is only one type of pin ball fit for it, but the corresponding locking device should be used. That is, the 16A socket should be matched with the 16A locking device, the 16B socket should be matched with the 16B locking device.

NOTE Sockets according to the clause mentioned are shown with flat bottoms. Sockets with rounded bottoms with radii of curvature not less than the dimensions r_2 of the pin balls can also be used. In this case, the dimensions R_5 have to be correspondingly decreased.

7 Hook-on "GO" gauge

The external dimensions of the socket have not been laid down. However, the socket shall permit acceptance of the hook-on "GO" gauge according to Clause 12.

8 Lower part of the insulator

The shape of the lower part of the insulator shall be such that assembly with the socket of maximum external dimensions according to Clause 7 will always be possible.

9 Locking device

The locking device, i. e. a split-pin or W-clip, shall be designed for locking the minimum-size pin ball in the maximum size socket. This requirement is fulfilled if the locking devices standardized in IEC 60372 are used.

10 Dimensions of the pin ball

Figure 1 shows a schematic of the pin ball. Table 1 gives dimensions of the pin ball.

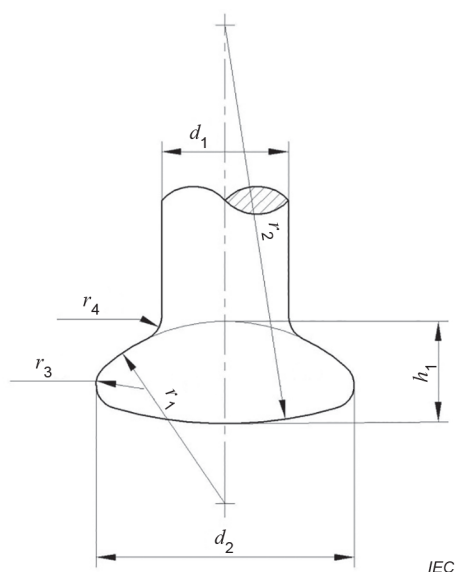


Figure 1 – Schematic of the pin ball

Table 1 – Dimensions of the pin ball

Dimensions in millimetres

Designated size of coupling	d_1	d_2	h_1	r_1	r_2	r_3^a	r_4
11	$11,9^{0}_{-1,1}$	$22,8^{0}_{-1,3}$	$9,1^{0}_{-1,2}$	35,0	35,0	3,5	$1,5^{+1,0}_{0}$
16	$17,0^{0}_{-1,2}$	$33,3^{0}_{-1,5}$	$13,4^{0}_{-1,3}$	23,0	50,0	3,0	$3,0^{+1,0}_{-0,5}$
20	$21,0^{0}_{-1,3}$	$41,0^{0}_{-1,6}$	$19,5^{0}_{-1,4}$	27,0	60,0	5,7	$3,5^{+1,0}_{-1,0}$
24	$25,0^{0}_{-1,4}$	$49,0^{0}_{-1,8}$	$21,0^{0}_{-1,7}$	40,0	70,0	6,6	$4,0^{+1,5}_{-1,0}$
28	$29,0^{0}_{-1,5}$	$57,0^{0}_{-1,9}$	$23,5^{0}_{-1,8}$	55,0	80,0	8,0	$4,5^{+1,5}_{-1,0}$
32	$33,0^{0}_{-1,6}$	$65,0^{0}_{-2,1}$	$27,0^{0}_{-1,9}$	70,0	90,0	10,0	$5,0^{+1,5}_{-1,0}$
36	$37,0^{0}_{-1,6}$	$73,0^{0}_{-2,1}$	$34,0^{0}_{-1,9}$	50,0	110,0	10,5	$8,0^{+1,5}_{-1,0}$
40	$41,0^{0}_{-1,6}$	$81,0^{0}_{-2,1}$	$39,5^{0}_{-1,9}$	55,0	120,0	12,5	$9,0^{+1,5}_{-1,0}$
^a Given for guidance.							

11 Dimensions of the socket end

Figure 2 shows a schematic of the socket end. Table 2 gives dimensions of the socket end.

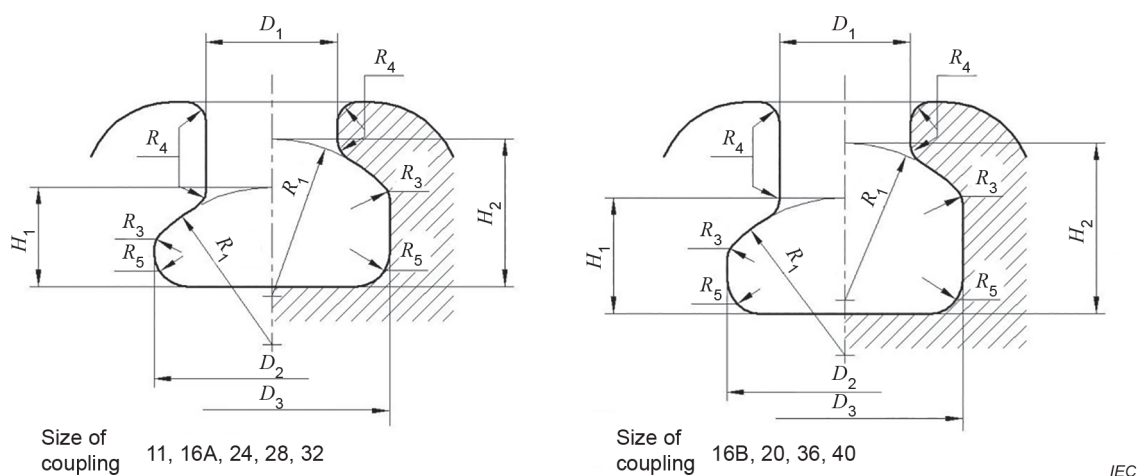


Figure 2 – Schematic of the socket end

Table 2 – Dimensions of the socket end

Dimensions in millimetres

Designated size of coupling	D_1	D_2	D_3	H_1	H_2 for W-clips and alternative split-pins	H_2^a for standard split-pins	R_1	R_3	R_4	R_5	T^b
					Min.	Min.					
11	$12,5^{+1,3}_0$	24,5	24,5	$10,5^{+1,3}_0$	15,5	16,3	35,0	4,0	1,5	4,0	$4,8^{+0,2}_0$
16	$19,2^{+1,6}_0$	34,5	34,5	$14,5^{+1,6}_0$	20,5	21,6	23,0	3,0	3,0	5,0	$5,5^{+0,2}_0$
					25,0	25,5					$7,9^{+0,2}_0$
20	$23,0^{+2,1}_0$	42,5	42,5	$20,5^{+2,1}_0$	28,5	29,3	27,0	6,0	3,5	7,0	$7,0^{+0,2}_0$
24	$27,5^{+2,5}_0$	51,0	51,0	$23,5^{+2,5}_0$	32,5	33,5	40,0	5,0	4,0	10,0	$8,7^{+0,2}_0$
28	$32,0^{+2,9}_0$	59,0	59,0	$26,0^{+2,9}_0$	36,5	37,4	55,0	8,0	4,5	12,0	$10,0^{+0,2}_0$
32	$36,0^{+3,3}_0$	67,5	67,5	$30,0^{+3,3}_0$	42,0	43,0	70,0	10,0	5,0	14,0	$11,5^{+0,2}_0$
36	$40,0^{+3,3}_0$	75,5	75,5	$38,0^{+3,3}_0$	-	51,0	50,0	10,5	8,0	16,0	$11,5^{+0,2}_0$
40	$44,0^{+3,3}_0$	83,5	83,5	$43,5^{+3,3}_0$	-	56,5	55,0	12,5	9,0	17,0	$11,5^{+0,2}_0$

^a A greater value is given because in this case the split-pin does not always rest on the bottom of the socket. The position of the standard split-pin is determined by the position H_3 of the centre of the hole and its diameter D_4 (see clause 14) and dimension F_2 (see IEC 60372) and is also influenced by the tips of legs resting in contact with the socket. The values of H_2 ensure the correct clearances for split-pins.

^b Thickness of the locking device.

^c See Clause 6.

12 Dimensions of the hook-on "GO" gauge

Figure 3 shows a schematic of the hook-on "GO" gauge. Table 3 gives dimensions of the hook-on "GO" gauge.

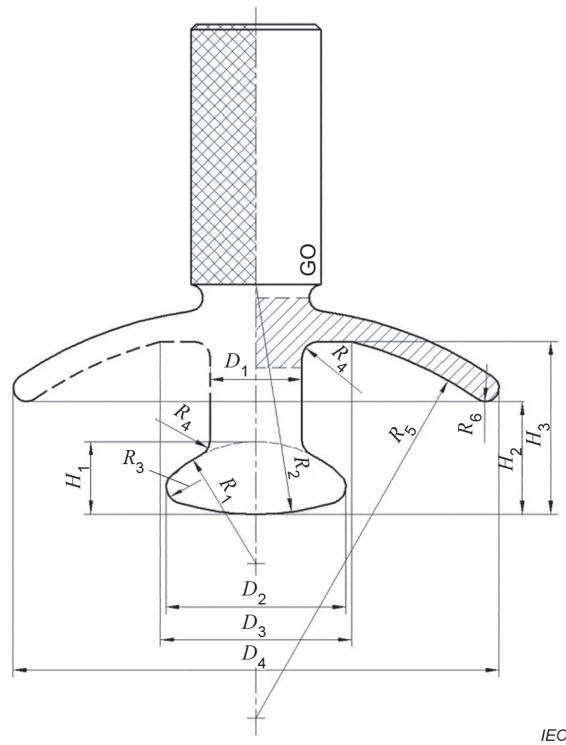


Figure 3 – Schematic of the hook-on "GO" gauge

Table 3 – Dimensions of the hook-on "GO" gauge (1 of 2)

Dimensions in millimetres

Designated size of coupling	Gauge	D_1	D_2	D_3	D_4	H_1	H_2	H_3	R_1	R_2	R_3	R_4	R_5	R_6
		D_1	D_2	D_3	D_4	H_1	H_2	H_3	R_1	R_2	R_3	R_4	R_5	R_6
11	New	12,000	22,950	25,322	60,15	9,250	17,775	23,775	35,075	35,075	3,631	1,450	49,70	2,80
	Nominal contour	11,980	22,920	25,348	59,95	9,220	17,860	23,860	35,060	35,060	3,616	1,460	49,80	2,70
	Min. contour ^a	11,960	22,890	25,374	59,75	9,190	17,945	23,945	35,045	35,045	3,601	1,470	49,90	2,60
	Worn ^b	11,900	22,800	25,400	59,55	9,100	18,000	24,000	35,000	35,000	3,556	1,500	50,00	2,50
16	New	17,122	33,490	35,326	90,59	13,572	20,686	31,786	23,086	50,086	3,071	2,939	71,70	2,80
	Nominal contour	17,096	33,450	35,351	90,39	13,536	20,768	31,868	23,068	50,068	3,055	2,952	71,80	2,70
	Min. contour ^a	17,070	33,410	35,376	90,19	13,500	20,850	31,950	23,050	50,050	3,039	2,965	71,90	2,60
	Worn ^b	17,000	33,300	35,400	89,99	13,400	20,900	32,000	23,000	50,000	2,993	3,000	72,00	2,50
20	New	21,150	41,220	45,484	120,95	19,702	25,551	42,151	27,101	60,101	5,845	3,425	89,55	3,45
	Nominal contour	21,120	41,170	45,523	120,65	19,656	25,678	42,278	27,078	60,078	5,824	3,440	89,70	3,30
	Min. contour ^a	21,090	41,120	45,561	120,35	19,610	25,805	42,405	27,055	60,055	5,803	3,455	89,85	3,15
	Worn ^b	21,000	41,000	45,600	120,05	19,500	25,900	42,500	27,000	60,000	5,753	3,500	90,00	3,00
24	New	25,172	49,250	50,490	140,90	21,242	25,971	46,171	40,121	70,121	6,732	3,914	104,55	3,45
	Nominal contour	25,136	49,190	50,527	140,60	21,186	26,093	46,293	40,093	70,093	6,706	3,932	104,70	3,30
	Min. contour ^a	25,100	49,130	50,564	140,30	21,130	26,215	46,415	40,065	70,065	6,680	3,950	104,85	3,15
	Worn ^b	25,000	49,000	50,600	140,00	21,000	26,300	46,500	40,000	70,000	6,615	4,000	105,00	3,00
^a The contour of the new gauge shall fall between the maximum and minimum contours.														
^b See Clause B.1.														

Table 3 (2 of 2)

Designated size of coupling	Gauge	D_1	D_2	D_3	D_4	H_1	H_2	H_3	R_1	R_2	R_3	R_4	R_5	R_6
28	New	29,190	57,290	66,870	165,94	23,770	29,100	51,100	55,135	80,135	7,994	4,414	129,55	3,45
	Nominal contour	29,150	57,215	66,915	165,64	23,708	29,250	51,250	55,104	80,104	7,967	4,432	129,70	3,30
	Min. contour ^a	29,110	57,140	66,960	165,34	23,646	29,400	51,400	55,073	80,073	7,938	4,450	129,85	3,15
32	Worn ^b	29,000	57,000	67,000	165,04	23,500	29,500	51,500	55,000	80,000	7,864	4,500	130,00	3,00
	New	33,220	65,310	85,800	198,45	27,300	34,000	61,400	70,150	90,150	9,719	4,914	149,55	3,45
	Nominal contour	33,170	65,230	85,850	198,22	27,225	34,175	61,600	70,112	90,113	9,683	4,932	149,70	3,30
	Min. contour ^a	33,120	65,150	85,900	197,98	27,150	34,350	61,800	70,075	90,075	9,647	4,950	149,85	3,15
	Worn ^b	33,000	65,000	86,000	197,83	27,000	34,500	62,000	70,000	90,000	9,572	5,000	150,00	3,00
36	New	37,220	73,310	105,800	230,90	34,300	41,000	71,850	50,135	110,165	10,219	7,914	169,55	3,45
	Nominal contour	37,170	73,230	105,850	230,60	34,225	41,175	72,100	50,104	110,123	10,183	7,932	169,70	3,30
	Min. contour ^a	37,120	73,150	105,900	230,30	34,150	41,350	72,350	50,073	110,081	10,147	7,950	169,85	3,15
	Worn ^b	37,000	73,000	106,000	230,00	34,000	41,500	72,500	50,000	110,000	10,072	8,000	170,00	3,00
40	New	41,220	81,310	126,800	262,90	39,800	46,500	82,300	55,135	120,180	12,219	8,914	189,55	3,45
	Nominal contour	41,170	81,230	126,850	262,60	39,725	46,675	82,600	55,104	120,133	12,183	8,932	189,70	3,30
	Min. contour ^a	41,120	81,150	126,900	262,30	39,650	46,850	82,900	55,073	120,086	12,147	8,950	189,85	3,15
	Worn ^b	41,000	81,000	127,000	262,00	39,500	47,000	83,000	55,000	120,000	12,072	9,000	190,00	3,00
^a The contour of the new gauge shall fall between the maximum and minimum contours.														
^b See Clause B.1.														

13 Dimensions of twin-balled pins

Figure 4 shows a schematic of the twin-balled pins. Table 4 gives dimensions of the twin-balled pins.

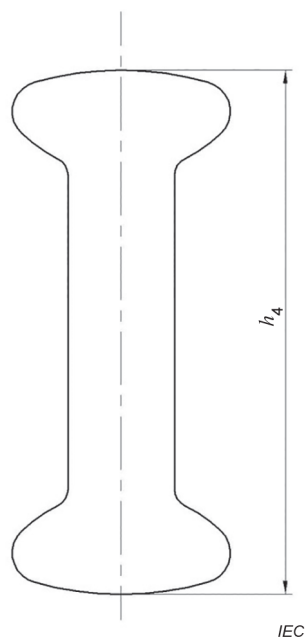


Figure 4 – Schematic of twin-balled pins

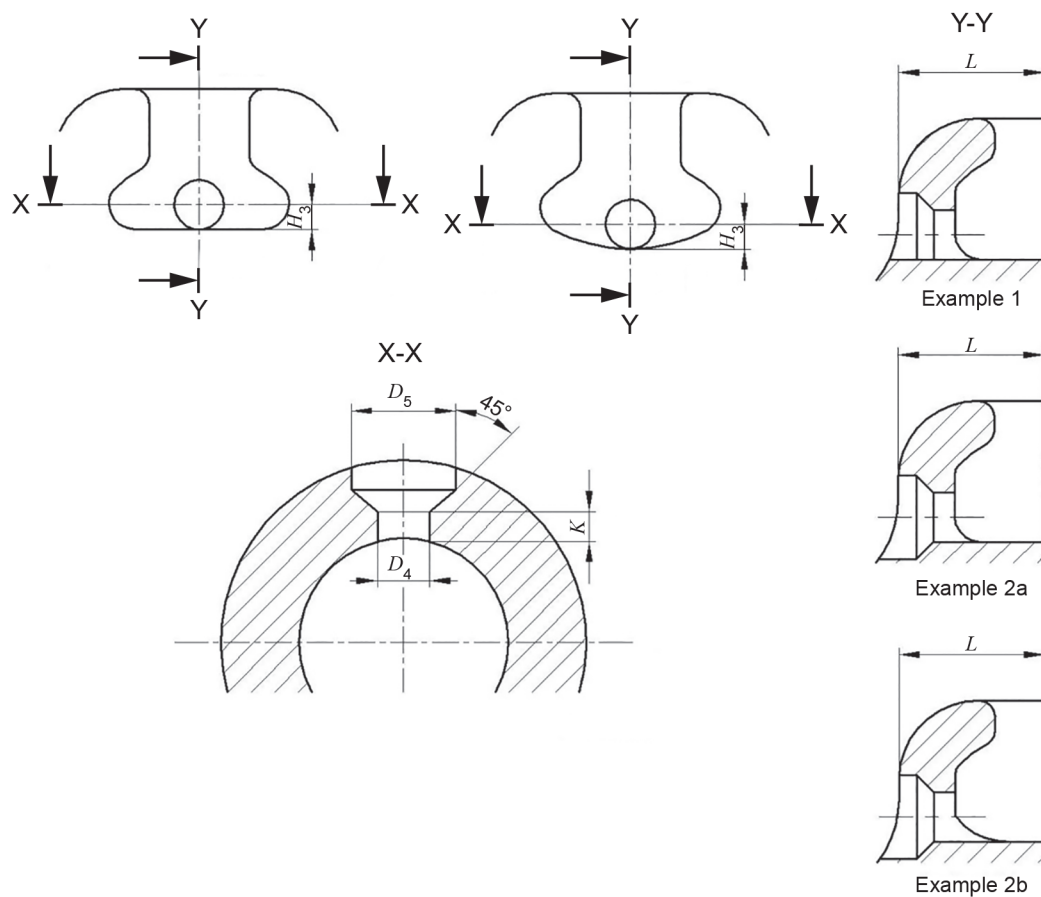
Table 4 – Dimensions of twin-balled pins

Dimensions in millimetres

Designated size of coupling	h_4
11	$47,0^{0}_{-2,5}$
16	$63,0^{0}_{-3,0}$
20	$83,0^{0}_{-3,2}$
24	$90,0^{0}_{-3,5}$
28	$97,0^{0}_{-3,5}$
32	$120,0^{0}_{-4,0}$
36	$135,0^{0}_{-4,0}$
40	$150,0^{0}_{-4,0}$
NOTE For other dimensions, see Clause 10.	

14 Dimensions of the hole for the split-pin

Figure 5 shows a schematic of the hole for the split-pin. Table 5 gives dimensions of the hole for the split-pin.



IEC

Figure 5 – Schematic of the hole for the split-pin

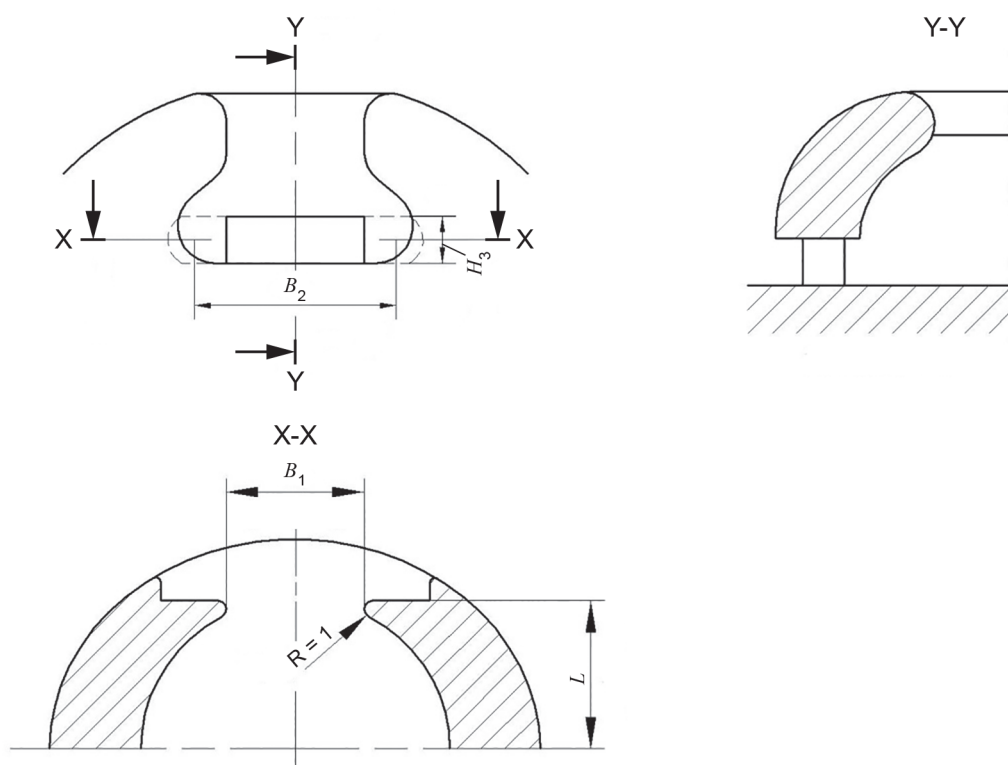
Table 5 – Dimensions of the hole for the split-pin

Dimensions in millimetres

Designated size of coupling	D_4	D_5	H_3	K	L
		Min.			Max.
11	$7,5 \pm 0,4$	13,5	$3,75^{+1,0}_0$	$3,5 \pm 0,6$	24
16	A ^a	$9,5 \pm 0,5$	$4,75^{+1,0}_0$	$4,0 \pm 0,7$	32
	B ^a	$10,0 \pm 0,5$	$5,0^{+1,0}_0$	$5,0 \pm 1,0$	
20	$10,0 \pm 0,5$	18,0	$5,0^{+1,2}_0$	$5,0 \pm 1,0$	40
24	$12,0 \pm 0,5$	21,5	$6,0^{+1,5}_0$	$6,0 \pm 1,0$	51
28	$13,0 \pm 0,5$	24,0	$6,5^{+1,5}_0$	$7,0 \pm 1,2$	59
32	$15,0 \pm 0,5$	28,0	$7,5^{+1,5}_0$	$8,0 \pm 1,4$	68
36	$17,0 \pm 0,5$	34,0	$8,5^{+1,5}_0$	$9,0 \pm 1,4$	78
40	$17,0 \pm 0,5$	34,0	$8,5^{+1,5}_0$	$10,0 \pm 1,4$	88
NOTE The dimensions are applicable to both standard and alternative split-pins (see IEC 60372).					
^a See Clause 6.					

15 Dimensions of the hole for the W-clip

Figure 6 shows a schematic of the hole for the W-clip. Table 6 gives dimensions of the hole for the W-clip.



IEC

Figure 6 – Schematic of the hole for the W-clip

Table 6 – Dimensions of the hole for the W-clip

Dimensions in millimetres

Designated size of coupling		B_1	B_2^a	H_3	L
			Min.		Max.
11		$12,5 \pm 0,8$	24,0	$6,5 \pm 0,8$	18
16	A ^b	$16,0 \pm 1,0$	33,0	$7,0 \pm 0,8$	24
	B ^b			$9,5 \pm 0,8$	
20		$17,0 \pm 1,0$	34,0	$8,5 \pm 0,8$	29
24		$17,5 \pm 1,0$	34,5	$10,5 \pm 0,8$	34
28		$20,0 \pm 1,0$	39,0	$11,5 \pm 0,8$	42
32		$22,0 \pm 1,0$	42,0	$13,0 \pm 0,8$	48
^a Dimension B_2 is the length of the recess over which the height H_3 shall be maintained. Beyond B_2 , the shape of the recess is not important.					
^b See Clause 6.					

Annex A (informative)

Extreme positions of the pin ball in the socket

A.1 Sliding position of the pin ball in the socket end

Figure A.1 shows the sliding position of the pin ball (socket end). Table A.1 gives the allowed deviation angle of the pin.

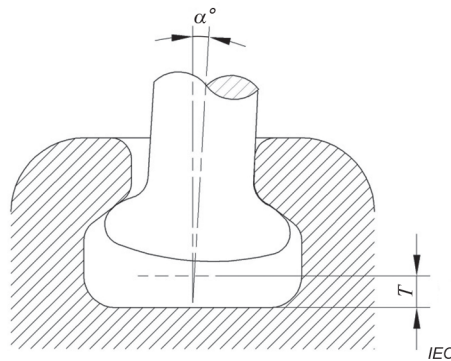


Figure A.1 – Sliding position of the pin ball (socket end)

Table A.1 – Allowed deviation angle of pin

Designated size of coupling		α average
11		1,3°
16	A ^a	4,0°
	B ^a	
20		3,3°
24		2,7°
28		2,5°
32		2,0°
36		2,5°
40		2,0°
^a See Clause 6.		

A.2 Over-tilting position of the pin ball in the socket end

Figure A.2 shows the over-tilting position of the pin ball in the socket end. Table A.2 gives the allowed deviation angle of the pin.

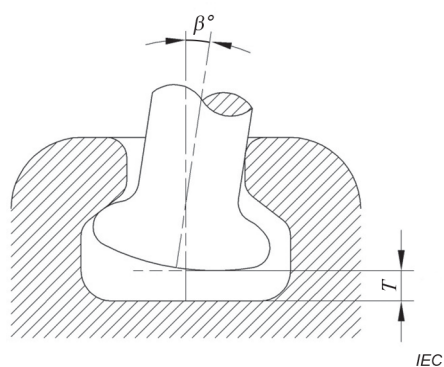


Figure A.2 – Over-tilting position of the pin ball in the socket end

Table A.2 – Allowed deviation angle of pin

Designated size of coupling		β^a Average
11		12,0°
16	A ^b	9,5°
	B ^b	12,0°
20		9,0°
24		10,0°
28		9,0°
32		9,0°
36		8,0°
40		7,0°
^a β values assume reasonable tolerances for H_2 .		
^b See Clause 6.		

Annex B (normative)

Recommended gauges

B.1 Tolerance system

The tolerance for the gauges follow the ISO system. This means that the "NOT GO" gauges only have manufacturing tolerances which are symmetrically located in relation to the corresponding tolerance limit of the coupling part. It also means that the "GO" gauges have allowances for wear and manufacturing tolerances which fall within the tolerance zone of the coupling part.

Gauges which have been worn beyond any of the limits given for worn gauges should not be used.

NOTE For "GO" gauges it is left to the choice of each country to use the allowance for wear to increase the proposed manufacturing tolerances.

B.2 Constructional features of the gauges

The choice of material, the hardness, the surface finish, the surface treatment and the method of manufacture are liable to vary from one country to another. Therefore, the following recommendations are given only for general guidance:

- the thickness of the pin gauges should be not less than 5 mm;
- gauges provided with round holes should be somewhat thicker;
- the material should be a non-shrinking, oil-hardening steel;
- the Rockwell C hardness number should be 62 to 63 in order to reduce deformations and wear;
- the surface roughness should be less than 4µm;
- hard chromium plating can, in certain cases, increase resistance to wear.

NOTE The socket gauges can be provided with a ground shaft, diameter D_1 , or with centre holes in order to facilitate checking of the gauges. A centre hole removes part of the curved surface, and this reduces the manufacturing tolerance.

B.3 Checking the pin ball

Figure B.1 shows the schematic of the ball part for the pin ball.

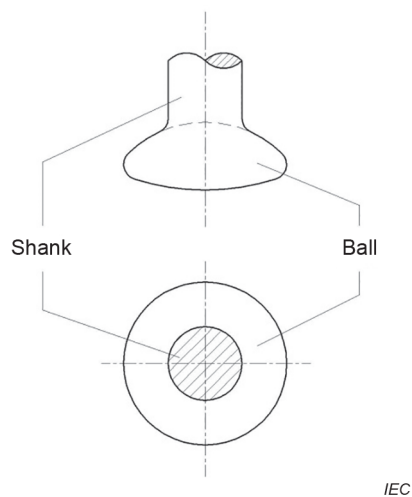


Figure B.1 – Schematic of ball part for pin ball

- Ball and shank shall pass in at least one direction through "GO" gauge for ball height, shank diameter and shank length (see Clause B.5).
- Ball shall pass through "GO" gauge for ball diameter (see Clause B.6).
- Ball and shank shall not pass in any direction through "NOT GO" gauge for ball height (see Clause B.7).
- Ball shall not pass in any direction through "NOT GO" gauge for ball diameter (see Clause B.8).
- Shank shall not enter in any direction through "NOT GO" gauge for ball diameter (see Clause B.9).

B.4 Checking the socket end

Figure B.2 shows the schematic of the inspecting part for the cap.

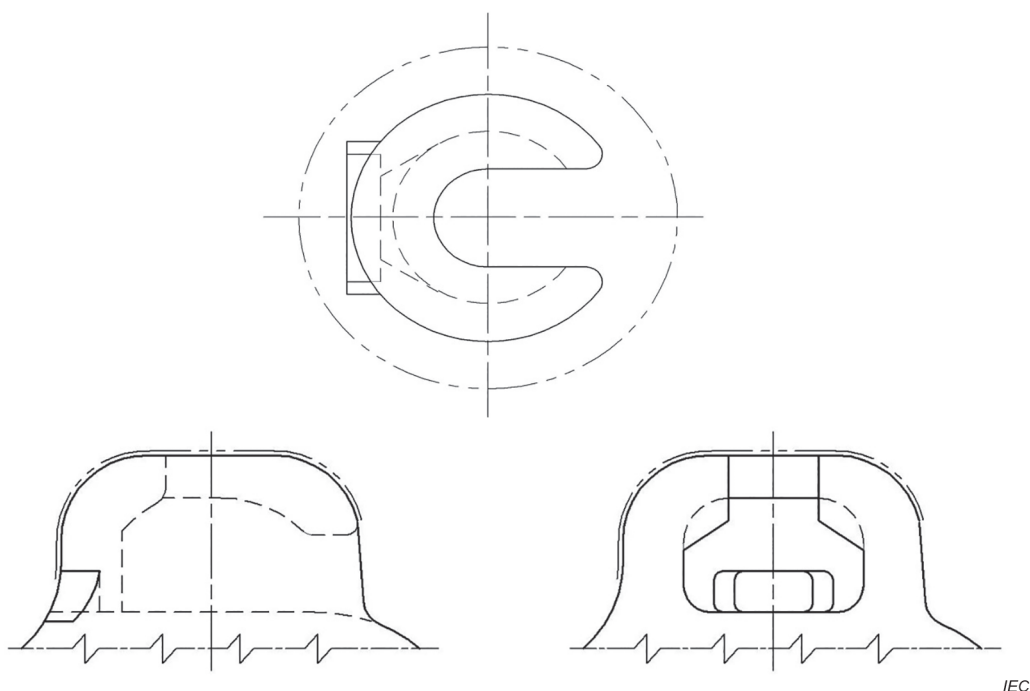


Figure B.2 – Schematic of inspecting part for cap

- a) Socket entry shall accept "GO" gauge for entry height, entry width and neck width(see Clause B.10).
- b) Internal height and internal diameter of socket shall allow rotation through 180° inside the socket of the "GO" gauge for internal height and internal diameter (see Clause B.11).
- c) Socket entry height shall refuse the "NOT GO" gauge for entry height (see Clause B.12).
- d) Socket entry shall refuse "NOT GO" gauge for neck width (see Clause B.13).

NOTE Marked contour(—.—)to accept hook-on "GO" gauge(see Clause 12).

B.5 Pin "GO" gauge for ball height, shank diameter and shank length

Figure B.3 shows the schematic of the pin "GO" gauge for ball height, shank diameter and shank length. Table B.1 gives the dimensions of the pin "GO" gauge for ball height, shank diameter and shank length.

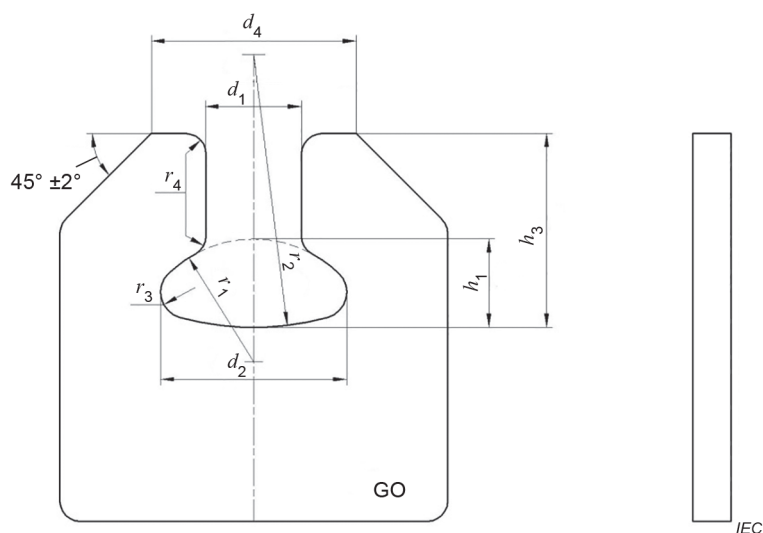


Figure B.3 – Schematic of pin "GO" gauge for ball height, shank diameter and shank length

Table B.1 – Dimensions of pin "GO" gauge for ball height, shank diameter and shank length (1 of 2)

Dimensions in millimetres

Designated size of coupling	Gauge		d_1	d_2	d_4	h_1	h_3	r_1	r_2	r_3	r_4
11	New	Min contour ^a	11,826	22,712	25,5	9,008	24,11	34,954	34,954	3,509	2,537
		Nominal contour	11,836	22,728	25,0	9,024	24,08	34,962	34,962	3,517	2,532
		Max contour ^a	11,846	22,744	24,5	9,040	24,05	34,970	34,970	3,525	2,527
	Worn ^b		11,900	22,800	24,0	9,100	24,00	35,000	35,000	3,556	2,500
16	New	Min contour ^a	16,922	33,204	35,5	13,304	32,14	22,952	49,952	2,945	4,039
		Nominal contour	16,932	33,222	35,0	13,320	32,10	22,960	49,960	2,952	4,034
		Max contour ^a	16,942	33,240	34,5	13,336	32,06	22,968	49,968	2,959	4,029
	Worn ^b		17,000	33,300	34,0	13,400	32,00	23,000	50,000	2,993	4,000
20	New	Min contour ^a	20,916	40,900	45,5	19,400	42,64	26,950	59,950	5,703	4,542
		Nominal contour	20,928	40,920	45,0	19,418	42,60	26,959	59,959	5,711	4,536
		Max contour ^a	20,940	40,940	44,5	19,436	42,56	26,968	59,968	5,719	4,530
	Worn ^b		21,000	41,000	44,0	19,500	42,50	27,000	60,000	5,753	4,500
24	New	Min contour ^a	24,912	48,890	50,5	20,888	46,65	39,944	69,944	6,558	5,544
		Nominal contour	24,924	48,912	50,0	20,908	46,61	39,954	69,954	6,567	5,538
		Max contour ^a	24,936	48,934	49,5	20,928	46,57	39,964	69,964	6,577	5,532
	Worn ^b		25,000	49,000	49,0	21,000	46,50	40,000	70,000	6,615	5,500
28	New	Min contour ^a	28,906	56,881	68,5	23,380	51,66	54,940	79,940	7,803	6,044
		Nominal contour	28,919	56,905	68,0	23,402	51,62	54,951	79,951	7,814	6,038
		Max contour ^a	28,932	56,929	67,5	23,424	51,58	54,962	79,962	7,825	6,032
	Worn ^b		29,000	57,000	67,0	23,500	51,50	55,000	80,000	7,864	6,000
^a The contour of the new gauge shall fall between the minimum and maximum contours.											
^b See Clause B.1.											

Table B.1 (2 of 2)

Designated size of coupling	Gauge		d_1	d_2	d_4	h_1	h_3	r_1	r_2	r_3	r_4
32	New	Min contour ^a	32,899	64,871	87,5	26,868	62,16	69,934	89,934	9,506	6,544
		Nominal contour	32,913	64,897	87,0	26,892	62,12	69,946	89,946	9,517	6,538
		Max contour ^a	32,927	64,923	86,5	26,916	62,08	69,958	89,958	9,528	6,532
	Worn ^b		33,000	65,000	86,0	27,000	62,00	70,000	90,000	9,572	6,500
36	New	Min contour ^a	36,899	72,871	107,5	33,868	72,66	49,940	109,934	10,006	9,544
		Nominal contour	36,913	72,897	107,0	33,892	72,62	49,951	109,946	10,017	9,538
		Max contour ^a	36,927	72,923	106,5	33,916	72,58	49,962	109,958	10,068	9,532
	Worn ^b		37,000	73,000	106,0	34,000	72,50	50,000	110,000	10,072	9,500
40	New	Min contour ^a	40,899	80,871	128,5	39,368	83,16	54,940	119,934	12,006	10,544
		Nominal contour	40,913	80,897	128,0	39,392	83,12	54,951	119,946	12,017	10,538
		Max contour ^a	40,927	80,923	127,5	39,416	83,08	54,962	119,958	12,068	10,532
	Worn ^b		41,000	81,000	127,0	39,500	83,00	55,000	120,000	12,072	10,500

^a The contour of the new gauge shall fall between the minimum and maximum contours.

^b See Clause B.1.

B.6 Pin "GO" gauge for ball diameter

Figure B.4 shows the schematic of the pin "GO" gauge for ball diameter. Table B.2 gives the dimensions of the pin "GO" gauge for ball diameter.

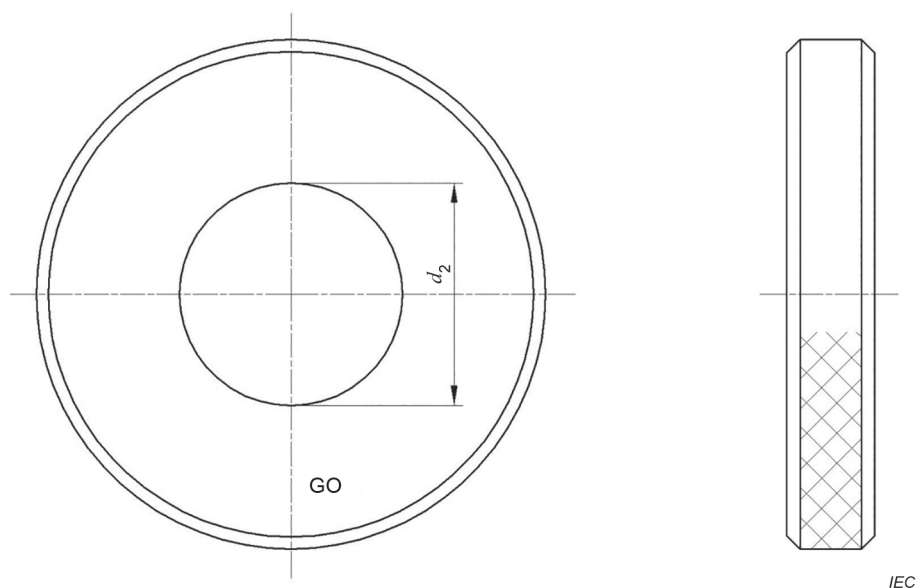


Figure B.4 – Schematic of pin "GO" gauge for ball diameter