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**Hydraulic fluid power — Single rod  
cylinders, 16 MPa (160 bar) medium and  
25 MPa (250 bar) series — Mounting  
dimensions for accessories**

*Transmissions hydrauliques — Vérins à simple tige, 16 MPa (160 bar)  
série moyenne et 25 MPa (250 bar) — Dimensions d'interchangeabilité  
des accessoires*



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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 2.

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 document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 8132 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 3, *Cylinders*.

This second edition cancels and replaces the first edition (ISO 8132:1986), ISO 6981:1992 and ISO 6982:1992, which have been technically revised.

## Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit.

One component of such systems is the fluid power cylinder. This is a device that converts power into linear mechanical force and motion. It consists of a movable element, i.e. a piston and piston rod, operating within a cylindrical bore.

# Hydraulic fluid power — Single rod cylinders, 16 MPa (160 bar) medium and 25 MPa (250 bar) series — Mounting dimensions for accessories

## 1 Scope

This International Standard lays down the mounting dimensions required for the interchangeability of accessories for the 16 MPa [160 bar<sup>1)</sup>] medium series cylinders in accordance with ISO 6020-1 and for the 25 MPa (250 bar) series cylinders in accordance with ISO 6022. The accessories have been designed specifically for use with cylinders manufactured in accordance with ISO 6020-1 and ISO 6022, but this does not limit their application.

This International Standard covers the following accessories, identified in accordance with ISO 6099:

- AP2 — rod clevis, female thread (see Figure 1 and Table 1);
- AF3 — rod flange, circular (see Figure 2 and Table 2);
- AB4 — clevis bracket, straight (see Figure 3 and Table 3);
- AB3 — clevis bracket, in angle (see Figure 4 and Table 4);
- AT4 — trunnion bracket (see Figure 5 and Table 5);
- AA8 — pivot pin, plain or spherical bearing (cotter pin or snap ring type) (see Figure 6 and Table 6);
- AP6 — rod eye spherical, female thread (see Figure 7 and Table 7);
- AP4 — rod eye plain, female thread (see Figure 8 and Table 8).

These accessories are used on hydraulic cylinders for mechanically transmitting the cylinder force. The design of these accessories is based on the maximum forces resulting from the specified internal diameters of the cylinders and pressures according to ISO 3320 and ISO 3322.

This International Standard applies only to the dimensional criteria of products manufactured in conformity with this International Standard; it does not apply to their functional characteristics.

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1) 1 bar = 0,1 MPa = 10<sup>5</sup> Pa; 1 MPa = 1 N/mm<sup>2</sup>

## 2 Normative references

The following referenced documents are indispensable for the application 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.

ISO 286-2, *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts*

ISO 3320, *Fluid power systems and components — Cylinder bores and piston rod diameters — Metric series*

ISO 3322, *Fluid power systems and components — Cylinders — Nominal pressures*

ISO 5598<sup>2)</sup>, *Fluid power system and components — Vocabulary*

ISO 6020-1, *Hydraulic fluid power — Mounting dimensions for single rod cylinders, 16 MPa (160 bar) series — Part 1: Medium series*

ISO 6022, *Hydraulic fluid power — Mounting dimensions for single rod cylinders, 25 MPa (250 bar) series*

ISO 6099, *Fluid power systems and components — Cylinders — Identification code for mounting dimensions and mounting types*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5598 apply.

## 4 Mounting dimensions

The mounting dimensions for accessories are shown in Figures 1 to 8 and given in Tables 1 to 8.

## 5 Material — Load capacity

All cross-sections shall be selected so that, under the maximum tensile load produced by the cylinder, the yield strength of the material used for accessories is at least 2,5 times the maximum tensile load.

## 6 Application instructions

### 6.1 Installation

6.1.1 A tolerance of f8 in accordance with ISO 286-2 is recommended for the bearing shafts.

6.1.2 The rod clevis, female thread (AP2) shall be screwed firmly against the piston rod shoulder before the two pieces are locked.

### 6.2 Lubrication

6.2.1 Sufficient lubrication for the satisfactory performance of these accessories shall be provided.

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2) To be published. (Revision of ISO 5598:1995)

**6.2.2** The method and frequency of such lubrication depend on the particular operating conditions.

**6.2.3** For maintenance-free mating parts, no additional lubrication is required.

## 7 Designation

Accessories in accordance with this International Standard shall be designated by the mounting type identification in accordance with ISO 6099, followed by "ISO 8132", followed by a dash, followed by the size type from the relevant table.

EXAMPLE 1 A rod clevis, female thread of type 20 ( $CK = 20$ ) in accordance with ISO 8132 is designed:

**AP2 ISO 8132 - 20**

EXAMPLE 2 A rod flange, circular of type 20 ( $KK = M16 \times 1,5$ ) in accordance with ISO 8132 is designed:

**AF3 ISO 8132 - 20**

EXAMPLE 3 A clevis bracket, straight of type 20 ( $CK = 20$ ), in accordance with ISO 8132 is designed:

**AB4 ISO 8132 - 20**

EXAMPLE 4 A clevis bracket, in angle of type 20 ( $CK = 20$ ), in accordance with ISO 8132 is designed:

**AB3 ISO 8132 - 20**

EXAMPLE 5 A trunnion bracket of type 20 ( $CR = 20$ ), in accordance with ISO 8132 is designed:

**AT4 ISO 8132 - 20**

EXAMPLE 6 A pivot pin, plain (cotter pin or snap ring type) of type 25 ( $EK = 25$ ), in accordance with ISO 8132 is designed:

**AA8 ISO 8132 - 25**

EXAMPLE 7 A rod eye spherical, female thread of type 20 ( $CN = 20$ ), in accordance with ISO 8132 is designed:

**AP6 ISO 8132 - 20**

EXAMPLE 8 A rod eye plain, female thread of type 20 ( $CK = 20$ ), in accordance with ISO 8132 is designed:

**AP4 ISO 8132 - 20**

## 8 Identification statement (Reference to this International Standard)

Use the following statement in test reports, catalogues and sales literature when electing to comply with this International Standard:

*"Interchangeable cylinder accessory mounting dimensions selected in accordance with ISO 8132:2006, Hydraulic fluid power — Single rod cylinders, 16 MPa (160 bar) medium and 25 MPa (250 bar) series — Mounting dimensions for accessories."*

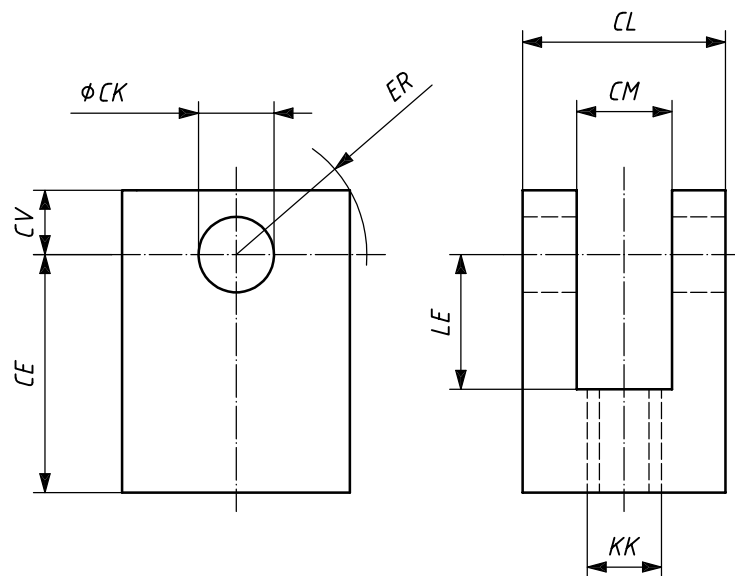


Figure 1 — AP2 — Rod clevis, female thread

Table 1 — Dimensions of AP2 — Rod clevis, female thread

Dimensions in millimetres

Type	Nominal force N	CK H9	CL h16	CM A13	CE js13	CV max.	KK 6H	LE min.	ER max.
12	8 000	12	28	12	38	16	M12 × 1,25	18	16
16	12 500	16	36	16	44	20	M14 × 1,5	22	20
20	20 000	20	45	20	52	25	M16 × 1,5	27	25
25	32 000	25	56	25	65	32	M20 × 1,5	34	32
32	50 000	32	70	32	80	40	M27 × 2	41	40
40	80 000	40	90	40	97	50	M33 × 2	51	50
50	125 000	50	110	50	120	63	M42 × 2	63	63
63	200 000	63	140	63	140	71	M48 × 2	75	71
70	250 000	70	150	70	160	80	M56 × 2	84	80
80	320 000	80	170	80	180	90	M64 × 3	94	90
90	400 000	90	190	90	195	100	M72 × 3	109	100
100	500 000	100	210	100	210	110	M80 × 3	114	110



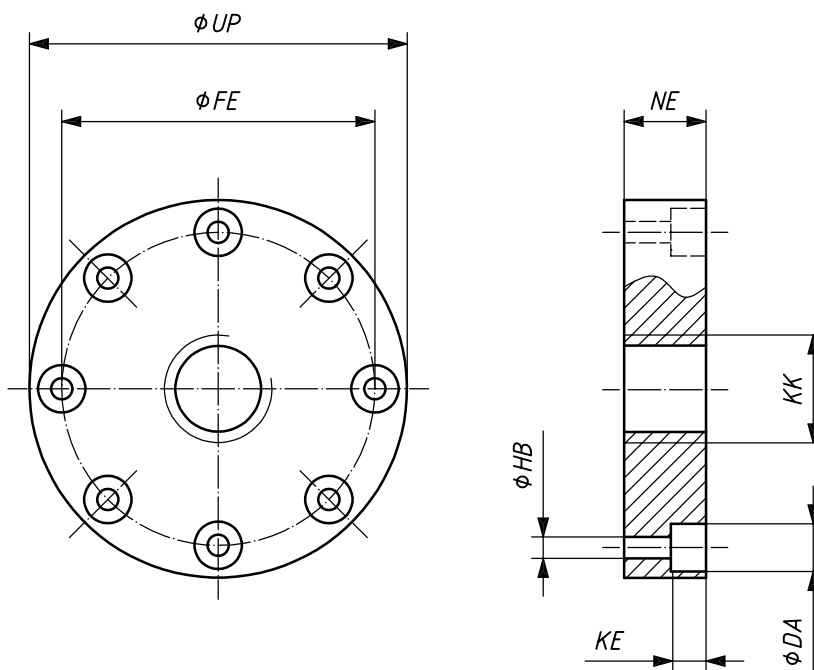


Figure 2 — AF3 — Rod flange, circular

Table 2 — Dimensions of AF3 — Rod flange, circular

Dimensions in millimetres

Type	Nominal force N	KB	FE	Number of holes	HB	NE	UP	DA	KE
		6H	JS13		H13	JS13	max.	H13	+0,4 0
12	8 000	M12 × 1,25	40	4	6,6	17	56	11	6,8
16	12 500	M14 × 1,5	45	4	9	19	63	14,5	9
20	20 000	M16 × 1,5	54	6	9	23	72	14,5	9
25	32 000	M20 × 1,5	63	6	9	29	82	14,5	9
32	50 000	M27 × 2	78	6	11	37	100	17,5	11
40	80 000	M33 × 2	95	8	13,5	46	120	20	13
50	125 000	M42 × 2	120	8	17,5	57	150	26	17,5
63	200 000	M48 × 2	150	8	22	64	190	33	21,5
70	250 000	M56 × 2	165	8	24	77	212	36	23,5
80	320 000	M64 × 3	180	8	26	86	230	39	25,5
90	400 000	M72 × 3	195	10	29	89	250	43	28,5
100	500 000	M80 × 3	210	10	29	96	270	43	28,5

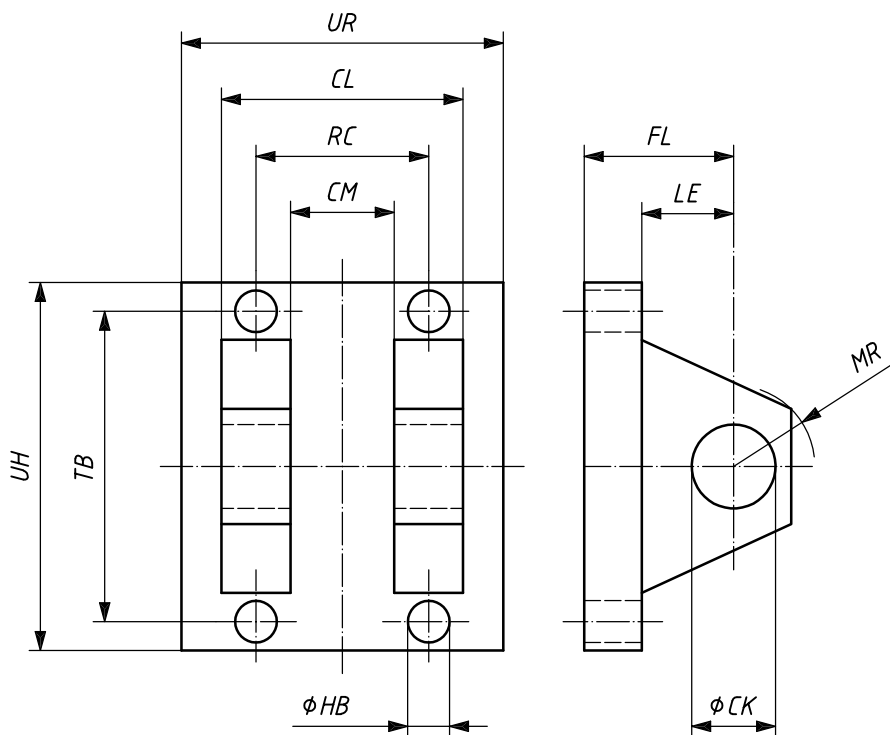


Figure 3 — AB4 — Clevis bracket, straight

Table 3 — Dimensions of AB4 — Clevis bracket, straight

Dimensions in millimetres

Type	Nominal force N	CK H9	CL h16	CM A13	FL JS12	HB H13	LE min.	MR max.	RC JS14	TB JS14	UR max.	UH max.
12	8 000	12	28	12	34	9	22	12	20	50	40	70
16	12 500	16	36	16	40	11	27	16	26	65	50	90
20	20 000	20	45	20	45	11	30	20	32	75	58	98
25	32 000	25	56	25	55	13,5	37	25	40	85	70	113
32	50 000	32	70	32	65	17,5	43	32	50	110	85	143
40	80 000	40	90	40	76	22	52	40	65	130	108	170
50	125 000	50	110	50	95	26	65	50	80	170	130	220
63	200 000	63	140	63	112	33	75	63	100	210	160	270
70	250 000	70	150	70	130	33	90	70	110	230	175	300
80	320 000	80	170	80	140	39	95	80	125	250	210	320
90	400 000	90	190	90	160	45	108	90	140	290	230	370
100	500 000	100	210	100	180	45	120	100	160	315	260	400
110	635 000	110	240	110	200	52	138	110	180	350	290	445
125	800 000	125	270	125	230	52	170	125	200	385	320	470

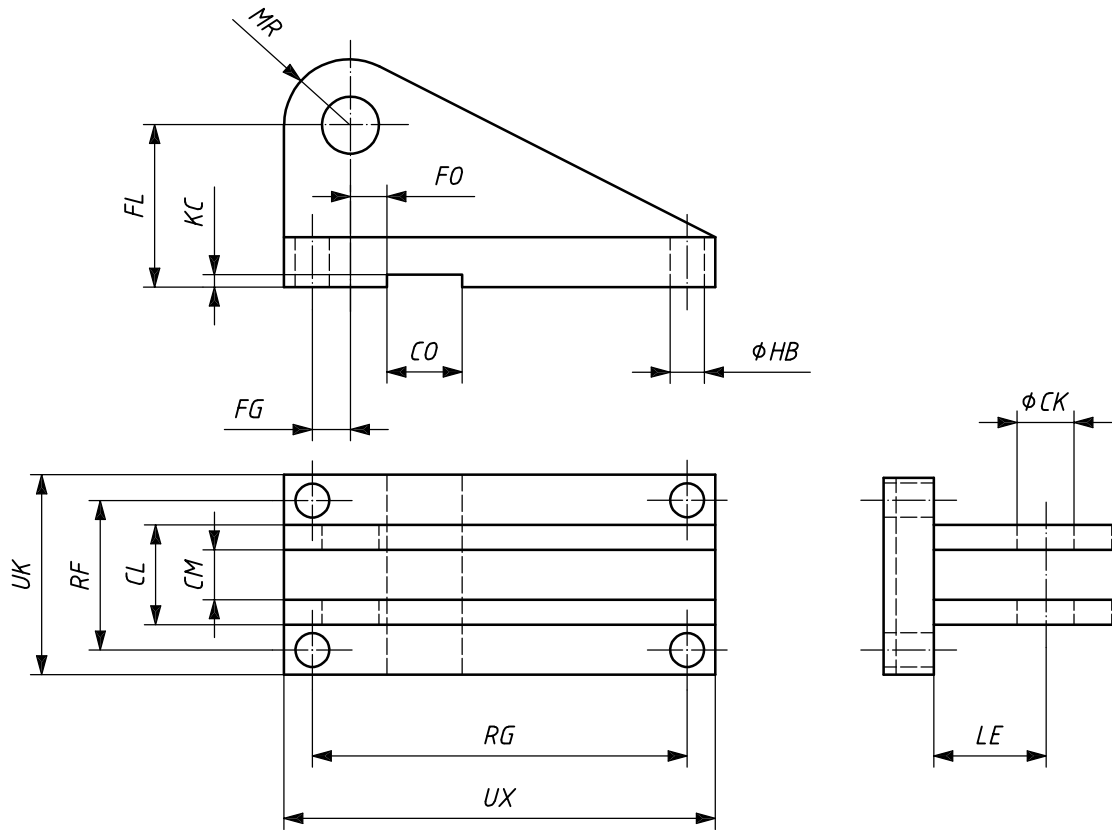


Figure 4 — AB3 — Clevis bracket, in angle

Table 4 — Dimensions of AB3 — Clevis bracket, in angle

Dimensions in millimetres

Type	Nominal force N	CK	CL	CM	FL	HB	CO	LE	MR	RG	RF	UX	UK	FG	KC	FO
		H9	h16	A13	js13	H13	N9	min.	max.	js13	js13	max.	max.	JS14	+0,3 0	JS14
12	8 000	12	28	12	34	9	10	22	12	45	52	65	72	2	3,3	10
16	12 500	16	36	16	40	11	16	27	16	55	65	80	90	3,5	4,3	10
20	20 000	20	45	20	45	11	16	30	20	70	75	95	100	7,5	4,3	10
25	32 000	25	56	25	55	13,5	25	37	25	85	90	115	120	10	5,4	10
32	50 000	32	70	32	65	17,5	25	43	32	110	110	145	145	14,5	5,4	6
40	80 000	40	90	40	76	22	36	52	40	125	140	170	185	17,5	8,4	6
50	125 000	50	110	50	95	26	36	65	50	150	165	200	215	25	8,4	—
63	200 000	63	140	63	112	33	50	75	63	170	210	230	270	33	11,4	—
70	250 000	70	150	70	130	33	50	90	70	190	230	250	290	40	11,4	—
80	320 000	80	170	80	140	39	50	95	80	210	250	280	320	45	11,4	—
90	400 000	90	190	90	160	45	63	108	90	235	280	320	360	47,5	12,4	—
100	500 000	100	210	100	180	52	63	120	100	250	315	345	405	52,5	12,4	—
110	635 000	110	240	110	200	52	80	138	110	305	335	400	425	62,5	15,4	—
125	800 000	125	270	125	230	52	80	170	125	350	365	450	455	75	15,4	—

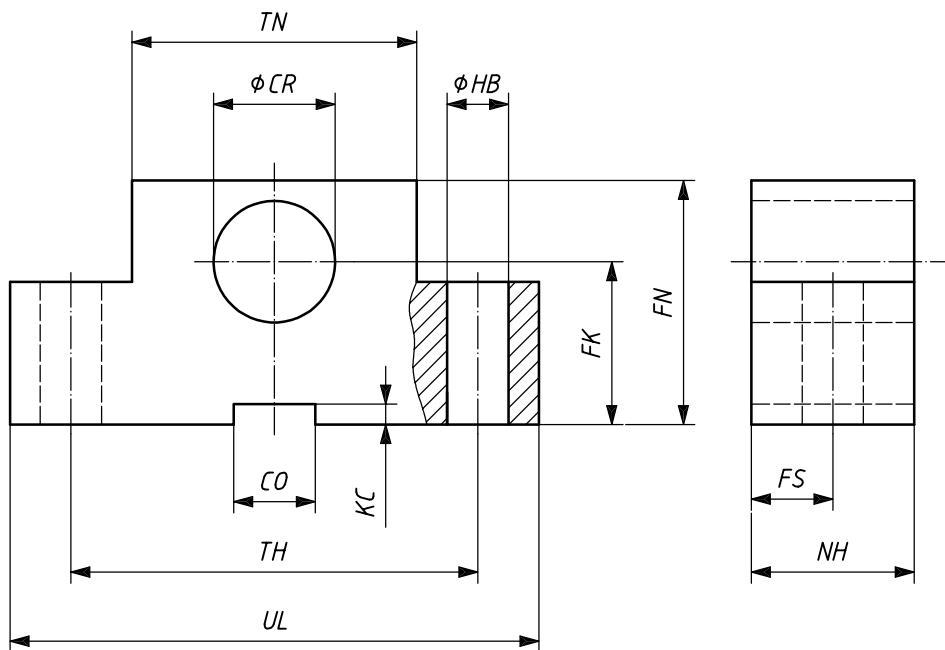


Figure 5 — AT4 – Trunnion bracket

Table 5 — Dimensions of AT4 – Trunnion bracket

Dimensions in millimetres

Type	Nominal force N	CR	FK	FN	HB	NH	TH	TN	UL	CO	KC	FS
		H7	JS12	max.	H13	max.	js13	max.	max.	N9	+0,3 0	js13
12	8 000	12	34	50	9	17	40	24	63	10	3,3	8
16	12 500	16	40	60	11	21	50	31	80	16	4,3	10
20	20 000	20	45	70	11	21	60	41	90	16	4,3	10
25	32 000	25	55	80	13,5	26	80	56	110	25	5,4	12
32	50 000	32	65	100	17,5	33	110	70	150	25	5,4	15
40	80 000	40	76	120	22	41	125	88	170	36	8,4	16
50	125 000	50	95	140	26	51	160	105	210	36	8,4	20
63	200 000	63	112	180	33	61	200	130	265	50	11,4	25
80	320 000	80	140	220	39	81	250	170	325	50	11,4	31
90	385 000	90	160	250	45	91	265	190	345	63	12,4	40
100	500 000	100	180	280	52	102	295	215	385	63	12,4	45
110	630 000	110	200	310	52	112	320	240	410	80	15,4	50
125	785 000	125	220	345	45	132	385	270	570	80	15,4	56

NOTE These dimensions are valid for operation at 16 MPa (160 bar) of cylinders with bores of 25 mm up to and including 250 mm; they are also valid for operation at 25 MPa (250 bar) of cylinders with bores of 50 mm up to and including 200 mm.

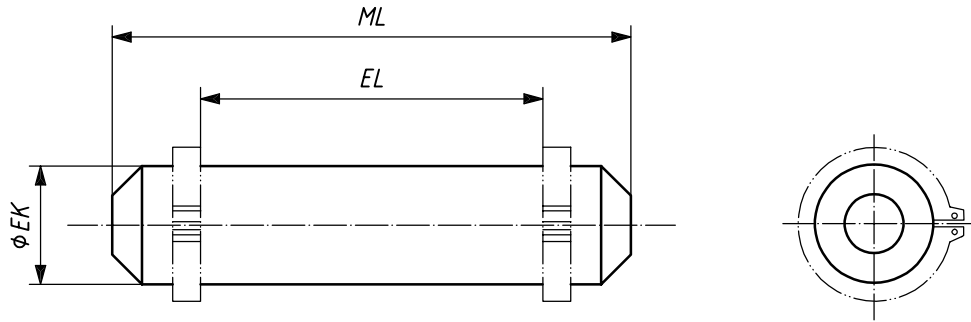


Figure 6 — AA8 — Pivot pin, plain or spherical bearing (cotter pin or snap ring type)

Table 6 — Dimensions of AA8 — Pivot pin, plain or spherical bearing (cotter pin or snap ring type)

Dimensions in millimetres

Type	Nominal force N	<i>ML</i> max.	<i>EL</i> H16	<i>EK</i> <sup>a</sup> f8
12	8 000	49	29	12
16	12 500	57	37	16
20	20 000	72	46	20
25	32 000	84	57	25
32	50 000	105	72	32
40	80 000	133	92	40
50	125 000	165	112	50
63	200 000	185	142	63
70	250 000	205	152	70
80	320 000	225	172	80

<sup>a</sup> Tolerances for spherical bearing is "m6."

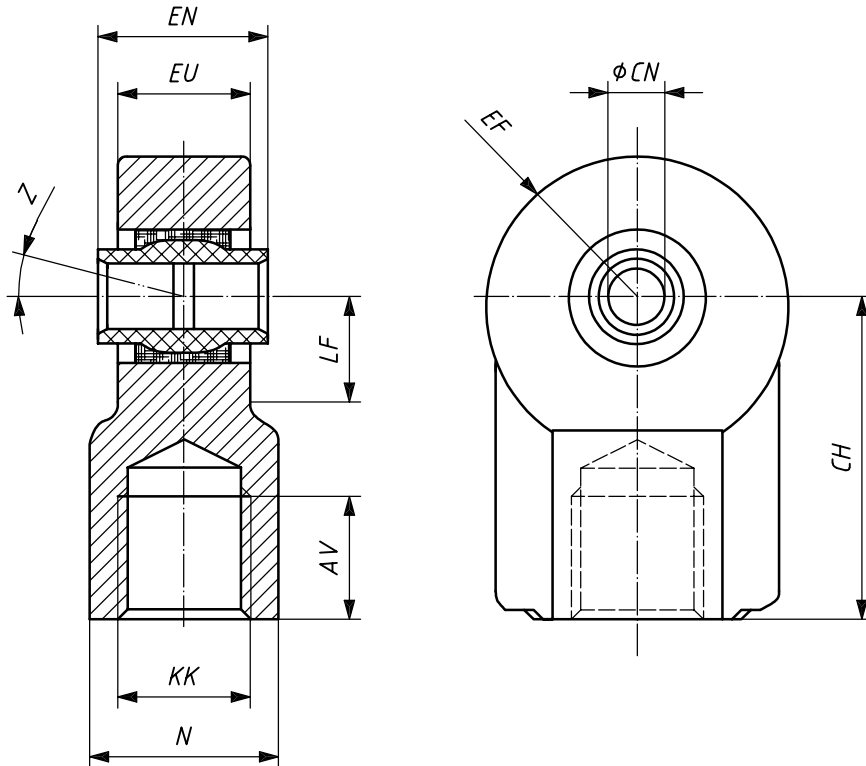


Figure 7 — AP6 — Rod eye spherical, female thread

Table 7 — Dimensions of AP6 — Rod eye spherical, female thread

Dimensions in millimetres

Type	Nominal force N	N max.	KK 6H	CN		EN		EF max.	CH js13	AV min.	LF min.	EU max.	Tilting angle Z min.
				nom.	tol. µm	nom.	tol. µm						
12	8 000	19	M12 × 1,25	12	+18 0	12	0	16,5	38	17	13	11	4°
16	12 500	22	M14 × 1,5	16	0	16	-180	20,5	44	19	16,5	14	
20	20 000	28	M16 × 1,5	20	+21 0	20	0	25	52	23	20,5	17,5	
25	32 000	31	M20 × 1,5	25	0	25	-210	32	65	29	25,5	22	
32	50 000	38	M27 × 2	32	+25 0	32	0	40	80	37	30	28	
40	80 000	47	M33 × 2	40	0	40	-250	50	97	46	39	34	
50	125 000	58	M42 × 2	50	+30 0	50	0	63	120	57	47	42	
63	200 000	70	M48 × 2	63	0	63	-300	72,5	140	64	58	53,5	
80	320 000	91	M64 × 3	80	+35 0	80	0	92	180	86	74	68	
100	500 000	110	M72 × 3	100	0	100	-350	114	210	91	94	85,5	
			M80 × 3							96			
125	800 000	135	M90 × 3	125	+40 0	125	0	160	260	107	116	105	
			M100 × 3							113			
160	1 250 000	165	M125 × 4	160	+46 0	160	0	200	310	126	145	133	
200	2 000 000	215	M160 × 4	200	0	200	-460	250	390	161	190	165	
250	3 200 000	300	M200 × 4	250	+57 0	250	0	320	530	205	260	200	
320	5 000 000	360	M250 × 6	320	0	320	-570	375	640	260	320	265	

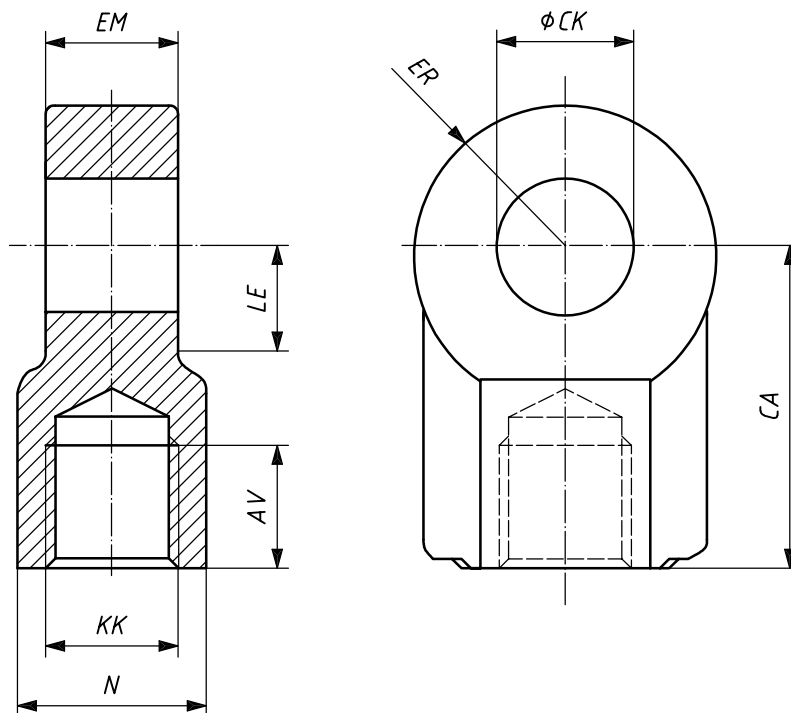


Figure 8 — AP4 — Rod eye plain, female thread

Table 8 — Dimensions of AP4 — Rod eye plain, female thread

Dimensions in millimetres

Type	Nominal force N	KK 6H	CK H9	EM h12	ER max	CA JS13	AV min	LE min	N max
12	8 000	M12 × 1,25	12	12	16,5	38	17	13	19
16	12 500	M14 × 1,5	16	16	20,5	44	19	16,5	22
20	20 000	M16 × 1,5	20	20	25	52	23	20,5	28
25	32 000	M20 × 1,5	25	25	32	65	29	25,5	31
32	50 000	M27 × 2	32	32	40	80	37	30	38
40	80 000	M33 × 2	40	40	50	97	46	39	47
50	125 000	M42 × 2	50	50	63	120	57	47	58
63	200 000	M48 × 2	63	63	72,5	140	64	58	70
80	320 000	M64 × 3	80	80	92	180	86	74	91
100	500 000	M72 × 3	100	100	114	210	91	94	110
		M80 × 3					96		
125	800 000	M90 × 3	125	125	160	260	107	116	135
		M100 × 3					113		
160	1 250 000	M125 × 4	160	160	200	310	126	145	165
200	2 000 000	M160 × 4	200	200	250	390	161	190	215
250	3 200 000	M200 × 4	250	250	320	530	205	260	300
320	5 000 000	M250 × 6	320	320	375	640	260	320	360

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