INTERNATIONAL STANDARD

ISO 11687-3

First edition
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Plain bearings — Pedestal plain bearings —

Part 3:
Centre flange bearings

Paliers lisses — Paliers lisses à chaise sur le sol —
Partie 3: Paliers à bride centrale

Reference number
ISO 11687-3:1995(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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.

International Standard ISO 11687-3 was prepared by Technical Committee ISO/TC 123, *Plain bearings*, Subcommittee SC 3, *Dimensions, tolerances and construction details*.

ISO 11687 consists of the following parts, under the general title *Plain bearings — Pedestal plain bearings*:

— *Part 1: Pillow blocks*

— *Part 2: Side flange bearings*

— *Part 3: Centre flange bearings*

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Plain bearings — Pedestal plain bearings —

Part 3:
Centre flange bearings

1 Scope

This part of ISO 11687 specifies design characteristics for centre flange bearings for the size range 9 to 28, as well as design characteristics for shafts.

It is applicable to centre flange bearings used mainly in electrical and turbo engineering industries.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 11687. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 11687 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 185:1988, *Grey cast iron — Classification.*

ISO 426-1:1983, *Wrought copper-zinc alloys — Chemical composition and forms of wrought products — Part 1: Non-leaded and special copper-zinc alloys.*

ISO 426-2:1983, *Wrought copper-zinc alloys — Chemical composition and forms of wrought products — Part 2: Leaded copper-zinc alloys.*

ISO 630:1980, *Structural steels.*

ISO 683-11:1987, *Heat-treatable steels, alloy steels and free-cutting steels — Part 11: Wrought case-hardening steels.*

ISO 1302:1992, *Technical drawings — Method of indicating surface texture.*

ISO 2768-1:1989, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications.*

ISO 2768-2:1989, *General tolerances — Part 2: Geometrical tolerances for features without individual tolerance indications.*

ISO 3755:1991, *Cast carbon steels for general engineering purposes.*

ISO 4381:1991, *Plain bearings — Lead and tin casting alloys for multilayer plain bearings.*

ISO 8062:1994, *Castings — System of dimensional tolerances and machining allowances.*

ISO 12129-1:—[1], *Plain bearings — Part 1: Fits.*

ISO 12129-2:—[1], *Plain bearings — Part 2: Tolerances on form and position and surface roughness for shafts, flanges and thrust collars.*

1) To be published.

3 Types of bearing

According to their design, centre flange bearings can be devised as follows, each characteristic being designated by a letter symbol.

Housing:

M Centre flange bearing with cooling fins

Heat dissipation:

N Natural cooling
W Water cooling in oil sump
U Circulation pump and natural cooling
T Circulation pump and water cooling in oil sump
Z Recirculating oil lubrication with external cooling of oil

Shape of bore for journal bearing and type of lubrication:

C Circular cylindrical bore without oil ring
L Circular cylindrical bore with split oil ring not fixed on a rotating shaft
Y Lobed bearing with two sliding surfaces without oil ring
V Lobed bearing with four sliding surfaces without oil ring

Thrust bearing:

Q Without sliding surfaces [non-locating (free) bearing]
B Plain sliding surfaces with oil grooves (guide bearing)
K Wedge surfaces
A Tilting pads
} (design and dimensions at the manufacturer's discretion)

Seal:

Type and dimensions subject to agreement

The symbols above figure 1 explain only the type illustrated; the complete type required shall be specified in the above-mentioned sequence when ordering.

4 Dimensions

See figures 1 to 3 and tables 1 and 2.

The centre flange bearings are not expected to conform to the design illustrated in figure 1; compliance is only required with respect to the dimensions specified.

NOTE 1 All dimensions are given in millimetres.

Details which are not specified shall be chosen as appropriate.

5 Shaft design

See figures 2 and 3 and table 2.

6 Materials

Housing:

Grade 300 in accordance with ISO 185; other materials subject to agreement

Half-bearing:

Bearing back:

Fe 360 B in accordance with ISO 630
C10 or C15 E 4 in accordance with ISO 683-11
200 to 400 in accordance with ISO 3755
} Type of material at the manufacturer's discretion

Bearing metal:

Lead-tin-alloy in accordance with ISO 4381, or subject to agreement

Seal:

Copper alloy, aluminium alloy or plastic, subject to agreement

Oil ring, not fixed on rotating shaft:

Copper-zinc alloy in accordance with ISO 426, or subject to agreement

7 Design

General tolerances:

For machined surfaces:

ISO 2768-1 and ISO 2768-2 - mH

For unmachined surfaces:

ISO 8062 - CT 9 (for grade 300), or corresponding standards for other materials agreed upon.

Surface roughness in accordance with ISO 1302:

Flange bearing:

Mounted surfaces: $R_a = 3{,}2\ \mu m$
Sliding surfaces: $R_a = 0{,}8\ \mu m$

Shaft: See table 2, footnote 1.

Housing:

Flange bearing housing with lifting eye bolts or means of conveyance at the manufacturer's discretion.

The inner surfaces of the housing shall be clean and shall have a coat of paint resistant to oil and solvents.

The outer surfaces of the housing shall be protected against corrosion.

For the purpose of pressure compensation, the individual oil spaces within the flange bearing housing shall be connected to each other by means of appropriate openings above the oil level.

All bearing housing connections on both sides; other connecting dimensions and arrangements than those given in figure 1 as well as additional connections subject to agreement.

Type of inspection plate at the manufacturer's discretion.

With bolts and screws for housing parts and seals, at the manufacturer's discretion.

Bolts and screws for the housing flange do not form part of the delivery.

General:

Particular agreements shall be made for applications under special conditions (e.g. inclined positions).

Chamfered edges: type of edge chamfering at the manufacturer's discretion.

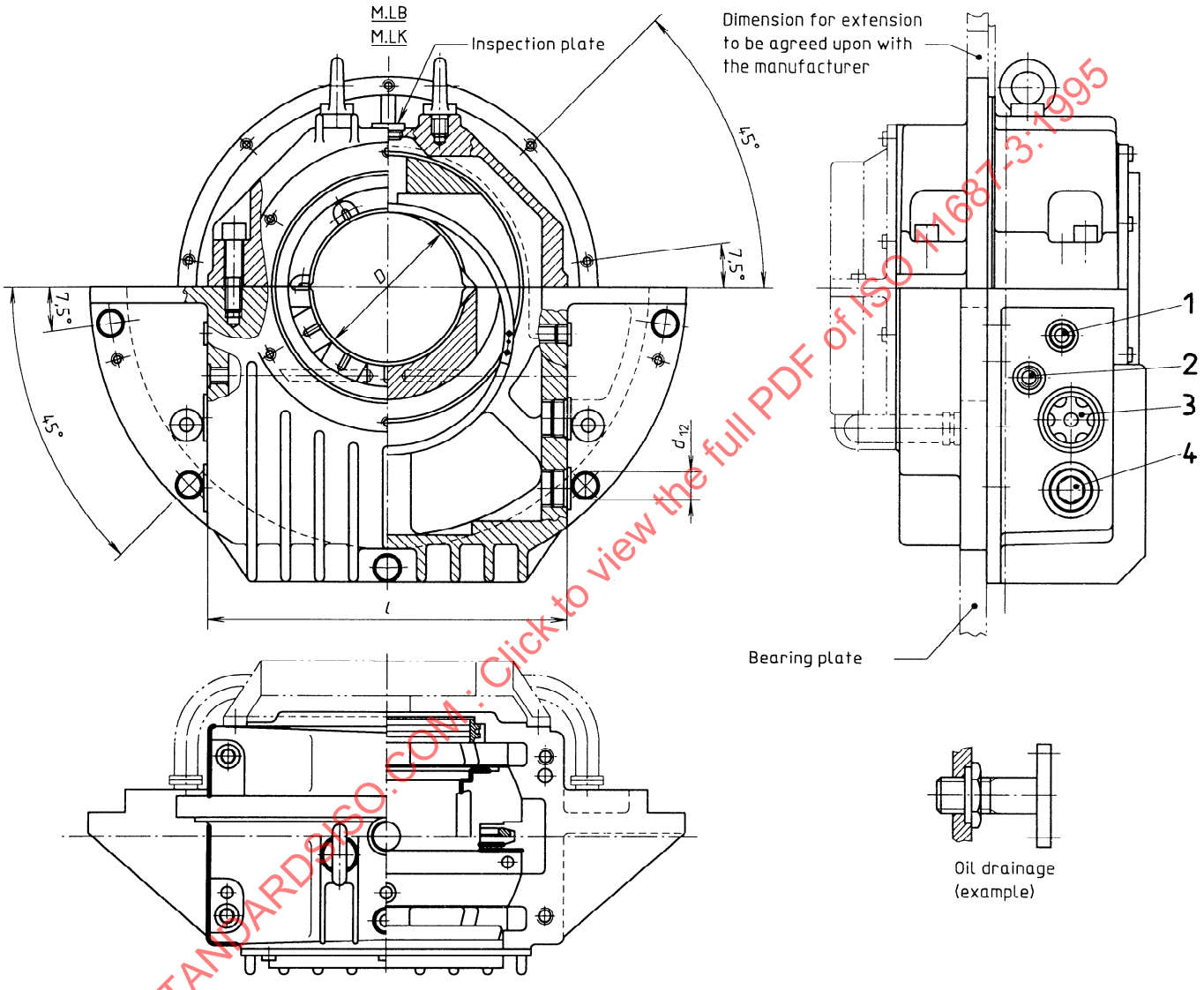
If the bearing is only applicable to one direction of rotation, a directional arrow shall be provided.

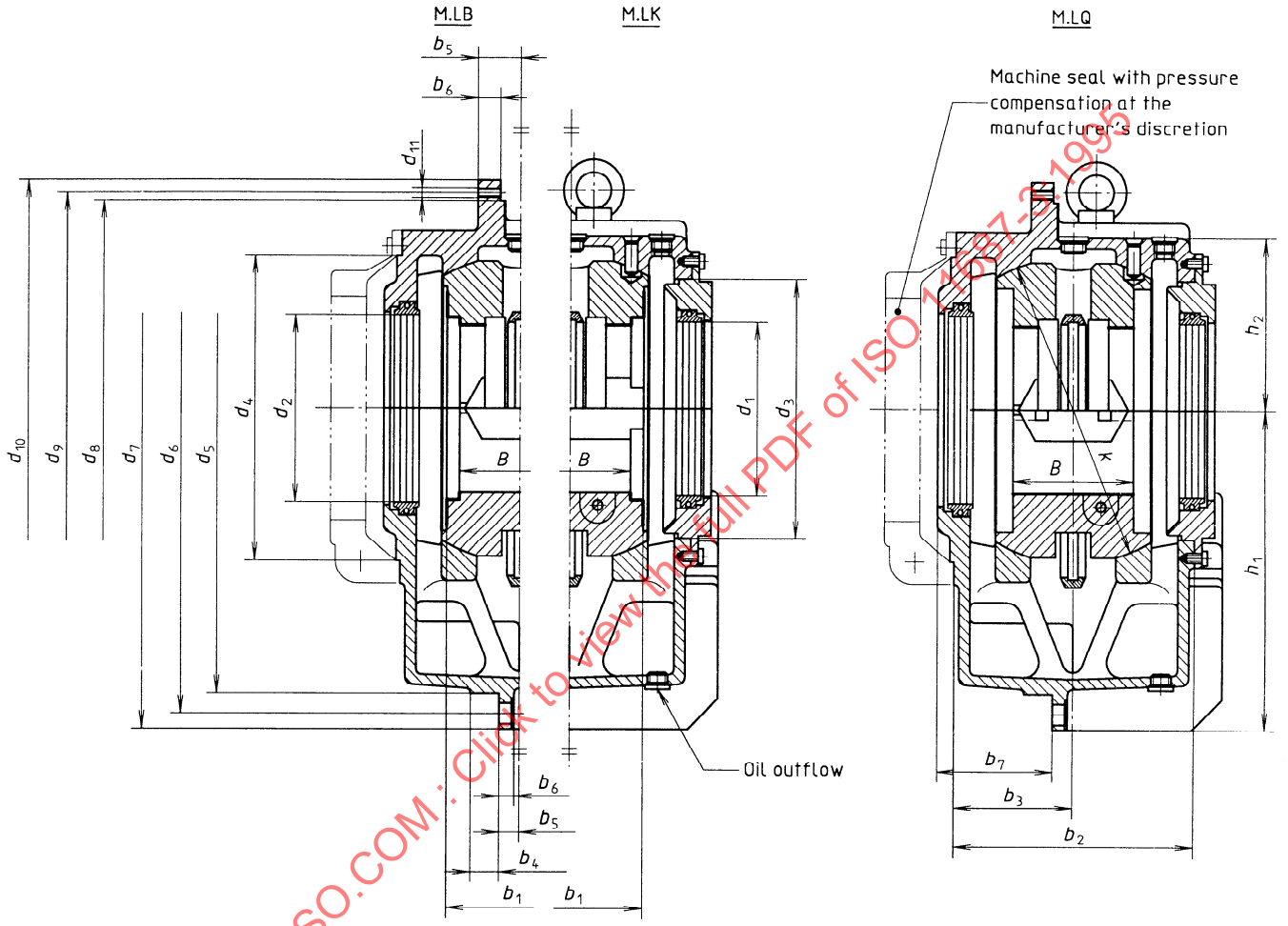
8 Designation

EXAMPLE

Designation of a centre flange bearing of size 14, shaft diameter 125 mm, housing with cooling fins (M), for recirculating oil lubrication with external cooling of oil (Z), circular cylindrical bore with split oil ring not fixed on a rotating shaft for emergency run (L) and thrust bearing with wedge surfaces (K):

Centre flange bearing ISO 11687-3 - 14 - 125 - MZLK





Key

1 d_{13} Oil inlet (recirculating plant, circulation pump)

2 Thread G 1/2 Connection for thermoprobe

3 d_{14} Oil-level indicator or oil drainage for recirculating plant

4 Screw plug (connection for radiator, oil-sump thermometer, suction line of circulation pump, finned cooler)

Figure 1 — Examples of centre flange bearings — Size range 9 to 28

Table 1 — Centre flange bearings — Size range 9 to 28 (see figure 1)

Size		9			11			14			18			22			28		
D	H7 [1]	80	90	100	100	110	125	125	140	160	160	180	200	200	225	250	250	280	300
B [2]		60			80			105			135			170			215		
b_1		80			100			125			160			200			250		
b_2		160			190			225			265			335			425		
b_3		80			95			112,5			132,5			167,5			212,5		
b_4		30			30			30			30			30			35		
b_5		20			20			25			25			30			30		
b_6		16			18			20			25			30			30		
b_7 [3]		100			115			135			150			185			225		
d_1 (nominal dimension seal)		80 90 100 110			100 110 125 140			125 140 160 180			160 180 200 225			200 225 250 280			250 280 315 355		
d_2		100			125			160			200			250			315		
d_3		150			180			230			275			340			440		
d_4		180			220			280			330			420			550		
d_5	h6	375			450			530			630			800			1 000		
d_6		400			475			560			670			850			1 060		
d_7		425			500			600			710			900			1 120		
d_8		270			320			380			450			570			730		
d_9		285			340			400			475			600			765		
d_{10}		300			355			425			500			630			800		
d_{11}		M6			M6			M6			M8			M10			M12		
d_{12}		11			13,5			17,5			22			26			33		
d_{13} [4]		G 3/8			G 3/8			G 3/8			G 1/2			G 3/4			G 3/4		
d_{14} [4]		G 1 1/4			G 1 1/4			G 1 1/2			G 1 1/2			G 2			G 2 1/2		
h_1		212			250			300			355			450			560		
h_2		110			130			160			190			235			300		
l		250			300			355			425			530			670		
ϕk [5] (spherical)	h6	190			212			280			335			425			530		

1) Applies only to circular cylindrical bores.

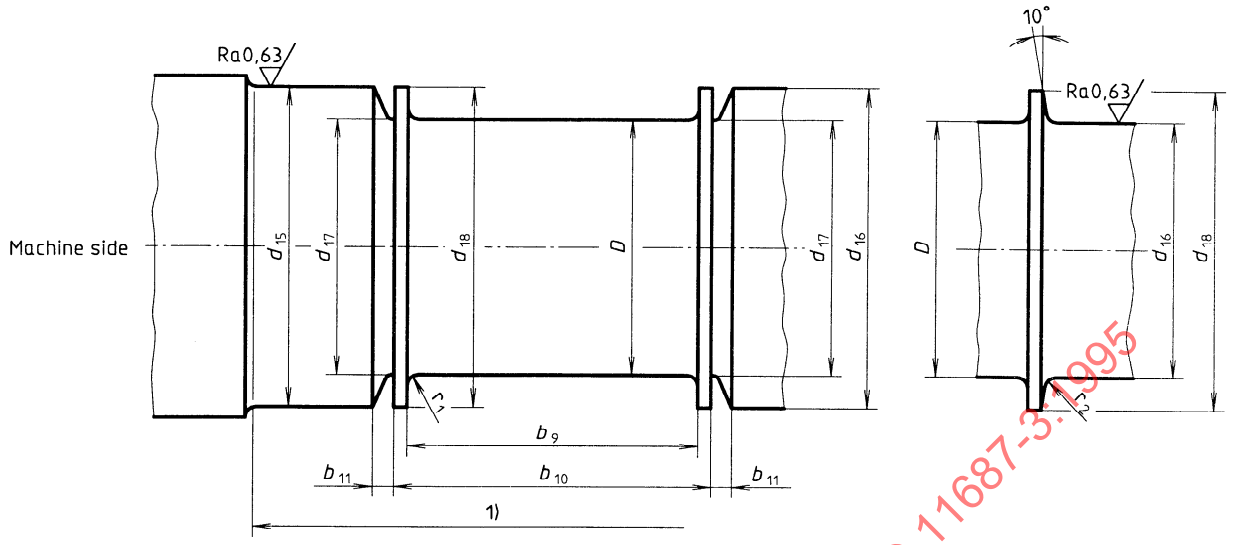
2) For the design with thrust bearing part (A), dimensions B may slightly deviate in order to obtain (depending on the type of tilting pad) a constant dimension b_1 (interchangeability of the half-bearing shell).

3) Applies only to the seal shown in figure 1.

4) If larger connections are necessary, this shall be the subject of a special agreement.

5) The fit of the half-bearing and housing shall be a transition fit or shall be subject to agreement.

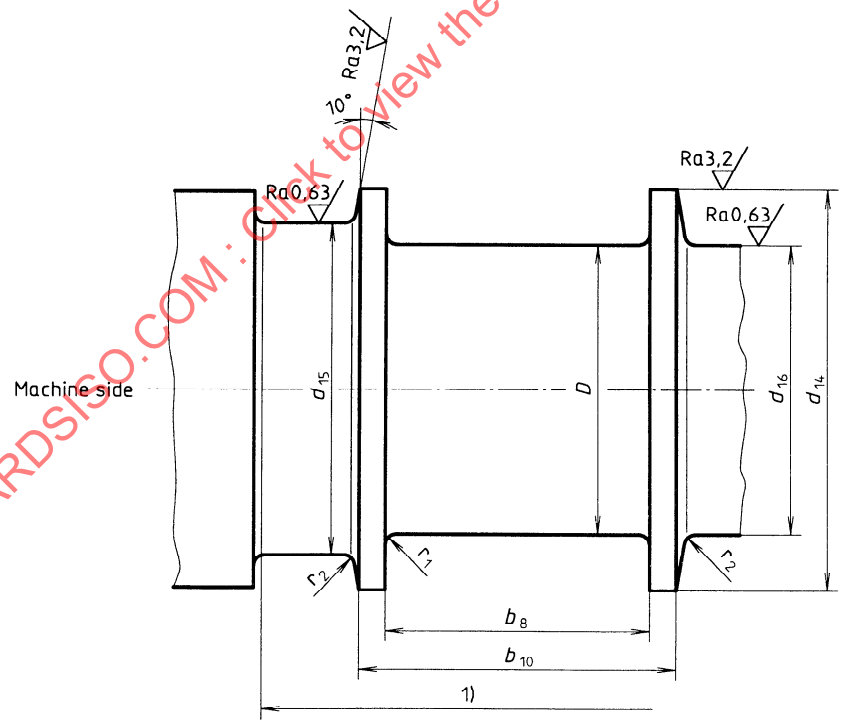
Surface roughness in micrometres



1) Bearing width including seal.

Figure 2 — Shaft design for non-locating (free) bearing (thrust bearing part Q)

Surface roughness in micrometres



1) Bearing width including seal.

Figure 3 — Shaft design for fixed bearing (thrust bearing parts A, B and K)