INTERNATIONAL STANDARD

ISO 3019-2

Third edition
2001-06-01

Hydraulic fluid power — Dimensions and identification code for mounting flanges and shaft ends of displacement pumps and motors —

Part 2: Metric series

Transmissions hydrauliques — Dimensions et code d'identification des flasques de montage et des bouts d'arbres des pompes volumétriques et moteurs —
Partie 2: Série métrique

Reference number
ISO 3019-2:2001(E)

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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.

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

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 3019 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 3019-2 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 2, *Pumps, motors and integral transmissions*.

This third edition cancels and replaces the second edition (ISO 3019-2:1986) and ISO 3019-3:1988, which have been technically revised.

ISO 3019 consists of the following parts, under the general title *Hydraulic fluid power — Dimensions and identification code for mounting flanges and shaft ends of displacement pumps and motors*:

— *Part 1: Inch series shown in metric units*

— *Part 2: Metric series*

Annex A of this part of ISO 3019 is for information only.

Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit. Pumps convert mechanical power into hydraulic fluid power, while motors convert hydraulic fluid power into mechanical power.

This part of ISO 3019 provides

— a minimum number of flanges and shaft sizes to cover probable present and future requirements (short and long flange spigot options are included),

— dimensional interchangeability of flange and shaft end mountings,

— flange and spigot dimensions allowing for recommended sealing arrangements when sealing is required between a flange and its mating housing (see annex A), and

— identification codes for flanges and shaft ends that can be used separately or in combination.

Hydraulic fluid power — Dimensions and identification code for mounting flanges and shaft ends of displacement pumps and motors —

Part 2:
Metric series

1 Scope

This part of ISO 3019 establishes a metric series of mounting flanges and shaft ends for positive-displacement, rotary hydraulic fluid power pumps and motors. It specifies sizes and dimensions and establishes an identification code for two- and four-bolt, and polygonal (including circular), mounting flanges, as well as for cylindrical keyed shaft ends, conical keyed shaft ends with an external thread and metric involute spline shaft ends.

NOTE Involute spline is in accordance with DIN 5480 [1]...[8].

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 3019. 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 3019 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 261:1998, *ISO general-purpose metric screw threads — General plan*.

ISO 286-2:1988, *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts*.

ISO 1101:—[1)], *Geometrical Product Specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*.

ISO 3912:1977, *Woodruff keys and keyways*.

ISO 5598, *Fluid power systems and components — Vocabulary.*

3 Terms and definitions

For the purposes of this part of ISO 3019, the terms and definitions given in ISO 5598 apply.

4 Dimensions

4.1 Tolerances

Dimensions shown without tolerances are nominal.

Tolerances of form and position are shown in accordance with ISO 1101.

4.2 Selection of mounting flanges and shaft ends

4.2.1 General

Selection of mounting flange (4.2.2) and shaft end (4.2.3) dimensions for pumps and motors manufactured in accordance with this part of ISO 3019 shall be according to Tables 1 to 6 and Figures 1 to 6.

For the dimensions of cylindrical keyed shaft ends without internal thread, conical shaft ends with external thread and metric involute spline shaft ends, see Figures 4, 5 and 6, and Tables 7, 8 and 9, respectively.

4.2.2 Mounting flanges

Select mounting flanges according to the following.

— For two-bolt mounting flanges, choose from Table 4, see Figure 1.

— For four-bolt mounting flanges, choose from Table 5, see Figure 2.

— For polygonal (including circular) mounting flanges, choose from Table 6, see Figure 3.

— Avoid, whenever possible, the non-preferred series of two- and four-bolt mounting flanges identified in Tables 1, 4 and 5.

1) To be published. (Revision of ISO 1101:1983)

4.2.3 Shaft ends

4.2.3.1 Nominal shaft end diameter, *D* (see Figure 4 and Figure 5), in relation to flange spigot diameter, *A*, shall be selected from Table 1 or 2, depending on the type of mounting flange.

Table 1 — Series of shaft ends for two- and four-bolt mounting flanges

Dimensions in millimetres

Flange spigot *A*	**Shaft end** *D*		
	1st choice	2nd choice	Non-preferred
32	10	—	—
40	12	—	—
50	12	16	10
63	16	20	12
80	20	25	16
100	25	32	20
125	32	40	25
140 [a]	32	40	25
160	40	50	32
180 [a]	40	50	32
200	50	63/60 [b]	40
224 [a]	50	63/60 [b]	40
250	63/60[b]	80	50
For applications such as those involving high torque or heavy side loads, other shaft dimensions may be selected.			
[a] Non-preferred flange spigot dimensions.			
[b] Reference diameter for spline shaft.			

Table 2 — Series of shaft ends for polygonal mounting flanges

Dimensions in millimetres

Flange spigot A	Shaft end D		
	1st choice	2nd choice	Non-preferred
80	20	25	16
100	25	32	20
125	32	40	25
160	40	50	32
180	40	50	32
200	50	63	40
224	50	63	40
250	63	70	50
280	63	80	—
315	70	80	—
355	70	80	—
400	80	90	—
450	90	110	—
500	90	110	—
560	110	125/120 [a]	—
630	125/120 [a]	140	—
710	140	160	—
800	160	180	—
900	160	180	—
1 000	180	200	—
For applications such as those involving high torque or heavy side loads, other shaft dimensions may be selected.			
[a] Reference diameter for spline shaft.			

4.2.3.2 The shaft end shape shall be of one of the following types:

a) cylindrical keyed shaft end (see Figure 4),

b) conical keyed shaft end with external thread (see Figure 5), or

c) metric involute spline shaft end (see Figure 6).

For the nominal shaft end diameter, D, select the module of involute spline shaft end and the corresponding number of teeth with respect to the reference diameter from Table 3.

Shaft ends a) and c) may be provided with a tapped hole.

4.2.3.3 Only parallel or Woodruff keys in accordance with ISO 3912 shall be used.

4.2.3.4 For the first and second choices, select shaft end lengths L_L, L_S and L_{ST} from the short series, except for conical shaft ends of nominal diameters 10 and 12, for which the long series only is available.

For the non-preferred series, select the shaft end lengths L_L, L_S and L_{ST} from the long series.

On conical shaft ends, the length of the conical surface may exceed L_{ST} towards the mounting flange, provided D is located at L_{ST}.