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МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

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

Part 3 : Polygonal flanges (including circular flanges)

Transmissions hydrauliques — Pompes volumétriques et moteurs — Dimensions et code d'identification des flasques de montage et des bouts d'arbres —

Partie 3 : Flasques polygonaux (y compris les flasques circulaires)

Reference number
ISO 3019-3 : 1988 (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 approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 3019-3 was prepared by Technical Committee ISO/TC 131, *Hydraulic fluid power.*

This second edition cancels and replaces the first edition (ISO 3019-3 : 1981), of which it constitutes a technical revision.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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

Part 3 :
Polygonal flanges (including circular flanges)

0 Introduction

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

1 Scope and field of application

1.1 This part of ISO 3019 specifies dimensions and establishes an identification code for mounting flanges of positive displacement rotary hydraulic fluid power pumps and motors having a geometry which cannot accept a flange covered in ISO 3019-2.

1.2 This part of ISO 3019 also specifies dimensions and establishes an identification code for shaft ends of positive displacement rotary hydraulic fluid power pumps and motors of the following types :

— cylindrical shaft end with key;

— conical shaft end with key and external thread;

— cylindrical shaft end with metric involute spline.

1.3 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.

1.4 This part of ISO 3019 provides

— a minimum number of flanges and shaft sizes to cover probable present and future requirements;

— dimensional interchangeability of flange and shaft end mountings;

— flange and spigot dimensions which allow for recommended sealing arrangements when sealing is required between a flange and its mating housing;

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

2 References

ISO 261, *ISO general purpose metric screw threads — General plan.*

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

ISO/R 773, *Rectangular or square parallel keys and their corresponding keyways (Dimensions in millimetres).*

ISO/R 775, *Cylindrical and* 1/10 *conical shaft ends.*

ISO 1101, *Technical drawings — Geometrical tolerancing — Tolerancing of form, orientation, location and run-out — Part 1 : Generalities, definitions, symbols, indications on drawings.*

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

ISO 3019-1, *Hydraulic fluid power — Positive displacement pumps and motors — Dimensions and identification code for mounting flanges and shaft ends — Part 1 : Inch series shown in metric units.*

ISO 3019-2, *Hydraulic fluid power — Positive displacement pumps and motors — Dimensions and identification code for mounting flanges and shaft ends — Part 2 : Two- and four-hole flanges and shaft ends — Metric series.*

ISO 3912, *Woodruff keys and keyways.*

ISO 4156, *Straight cylindrical involute splines — Metric module, side fit — Generalities, dimensions and inspection.*

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

3 Definitions

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

4 Dimensions

4.1 Tolerances

4.1.1 Dimensions shown without tolerances are nominal.

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

4.2 Selection of sizes

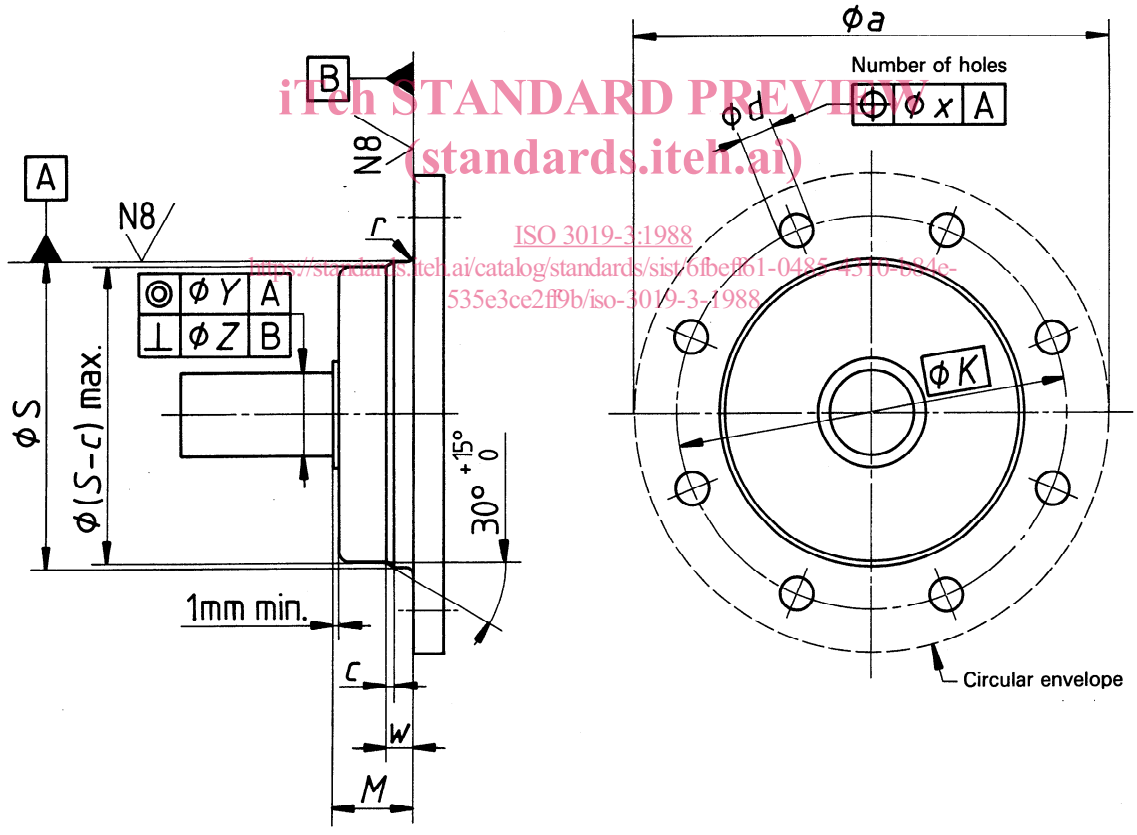
Mounting flanges and shaft dimensions for pumps and motors manufactured in accordance with this part of ISO 3019 shall be selected as follows :

— flanges from table 1;

— shaft ends from 4.4.

4.3 Mounting flanges — Polygonal and circular flanges

Mounting flange dimensions shall be selected from figure 1 and table 1.



NOTE — Surface roughness is indicated in accordance with ISO 1302.

Figure 1 — Basic layout of polygonal flanges

Table 1 — Range of dimensions for polygonal flanges

Dimensions in millimetres

S h8[1]	K	Fixation				a max.	w $+\frac{1}{0}$	c max.	r max. (r min. = 0)	Y[3]	Z[3]	M
		Bolts		Clearance holes[2]								
		Quantity	Nominal diameter	d H13[1]	x						mm/mm	
80	103	5, 6, 7 or 8	M8	9	0,5	125	7	2	1,6	0,25	0,001 5	20 ± 1
100	125		M10	11		160	9			0,3		
125	160		M12	13,5		200	12			0,35	0,002	25 ± 1
160	200		M16	17,5	1	250						
180	224		M20	22		280						40 ± 1,5
200	250					300						
224	280					335						
250	300					355						
280	320					375	16	3				50 ± 2
315	360					425						
355	400					465						
400	450					515						
450	510	5, 7, 8 10, 12 or 14	M24	26		585	20	5				60 ± 3
500	560					635						
560	630					710						
630	710					800						
710	800					900						
800	900		M30	33	1,5	1 000						
900	1 000					1 100						
1 000	1 100					1 200						

1) For tolerance values, see ISO 286-2.

2) Threaded holes or slots instead of clearance holes by agreement between purchaser and supplier.

3) Tolerances stated are for the unladen condition. (Rigid couplings may require tighter tolerances.)

4.4 Shaft ends

The characteristics specified in 4.4.1 to 4.4.5 have been taken from ISO/R 775, unless otherwise stated.

4.4.1 Nominal diameters, d_1 (see figures 2 and 3) of shaft ends in relation to the spigot diameter (S), shall be selected from table 2.

Table 2 — Nominal diameter of shaft ends

Dimensions in millimetres

Flange spigot S	Nominal shaft end d_1 1st series	Nominal shaft end d_1 2nd series
80	20	25
100	25	32
125	32	40
160	40	50
180	40	50
200	50	63
224	50	63
250	63	70
280	63	80
315	70	80
355	70	80
400	80	90
450	90	110
500	90	110
560	110	125
630	125	140
710	140	160
800	160	180
900	160	180
1 000	180	200

NOTE — For some applications, such as those involving high torque or heavy side loads, other shaft dimensions may be selected.

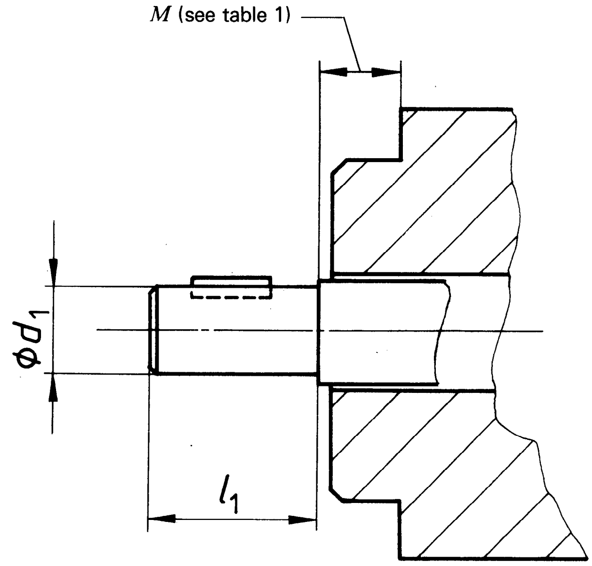


Figure 2 — Cylindrical shaft end with key

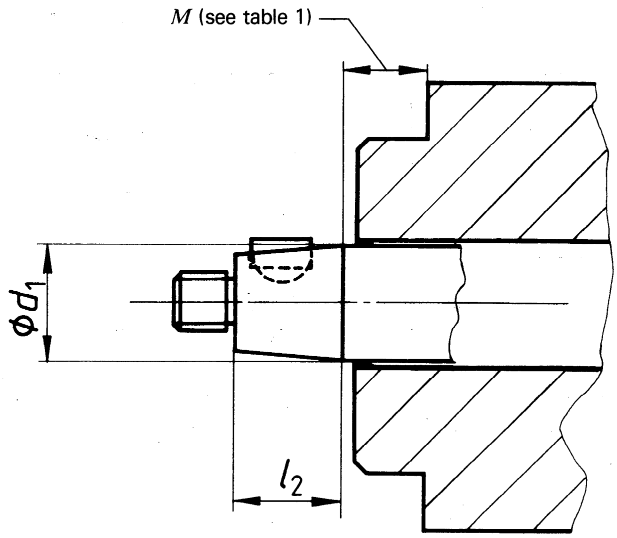


Figure 3 — Conical shaft end with key and external thread

4.4.2 Shaft end shapes shall be one of the following types :

a) cylindrical shaft end with key, see figure 2;

b) conical shaft end with key and external thread, see figure 3;

c) metric involute spline shaft end in accordance with ISO 4156 (see 4.4.6). The module of involute spline shaft end (and corresponding number of teeth with respect to the maximum major diameter) in relation to the nominal shaft end diameter, d_1, shall be selected from table 3.

Table 3 — Compatible metric involute spline shaft ends

Nominal shaft end diameter d_1 mm	Involute spline shaft end: Module	Number of teeth	Maximum major diameter mm
20	1	19	20
25	1	24	25
32	1	31	32
40	1	39	40
50	2,5	19	50
63	2,5	24	62,5
70	2,5	27	70
80	2,5	31	80
90	2,5	35	90
110	5	21	110
125	5	24	125
140	5	27	140
160	5	31	160
180	5	35	180
200	5	39	200

4.4.3 Only parallel keys in accordance with ISO/R 773 or Woodruff keys in accordance with ISO 3912 shall be used.

4.4.4 Shaft end lengths shall be selected from the short series in ISO/R 775.

4.4.5 Other shaft end dimensions shall be selected from ISO/R 775, except for the tolerances on the diameter of cylindrical shaft ends.

4.4.6 The shaft ends with metric involute splines in accordance with ISO 4156 shall have an angle of pressure of 30° and shall be selected from table 3.

5 Identification code

5.1 Code for mounting dimensions

When it is required to identify mounting flanges in accordance with this part of ISO 3019, the following code shall be used :

a) use the word "Flange";

b) refer to this part of ISO 3019 : ISO 3019-3;

NOTE — When both a flange and shaft are coded jointly, this reference should only occur once (see 5.3.3).

c) indicate the size reference of the flange by using the spigot diameter, S, in millimetres;

d) indicate the flange shape, using the following code :

— polygonal flanges (including circular flanges) : D

e) indicate the number of fixing holes;

NOTE — Slots can be used in place of holes by agreement between the user and the supplier.

f) "H" indicates clearance holes

"T" indicates tapped holes;

NOTE — The option of tapped fixing holes mounting flanges should be subject to agreement between the user and the supplier. Tapped holes of the same nominal diameter as the flange fixing bolts and conforming with ISO 261 can be substituted for the "d" clearance holes in all flange sizes.

See 5.3 for designation examples.

5.2 Code for shaft ends

When it is required to identify shaft ends in accordance with this part of ISO 3019, the following codes shall be used

a) use the words "Shaft end";

b) refer to this part of ISO 3019 : ISO 3019-3;

NOTE — When both a flange and shaft are coded jointly, this reference should only occur once (see 5.3.3).

c) indicate the shape of the shaft end using the following code :

— cylindrical shaft end with key but without internal thread : E

— conical shaft end with external thread : F

— cylindrical shaft end with key and internal thread : G

— metric involute spline shaft end : K

d) indicate the size reference of the shaft by using its nominal diameter, d_1, in millimetres.

See 5.3 for designation examples.

5.3 Designation examples

5.3.1 A circular mounting flange of spigot diameter 100 mm, with 5 holes, with clearance holes shall be designated as follows :

Flange ISO 3019-3 100D5H

5.3.2 A conical shaft end, with external thread, of nominal diameter (d_1) 63 mm, shall be designated as follows :

Shaft end ISO 3019-3 F63

5.3.3 The combination of both elements defined in 5.3.1 and 5.3.2 shall be designated as follows :

Flange and shaft end ISO 3019-3 100D5H-F63

6 Identification statement (Reference to this part of ISO 3019)

Use the following statement in test reports, catalogues and sales literature when electing to comply with this part of ISO 3019-3 :

"Dimensions and identification code for mounting flanges and shaft ends, metric series, are in accordance with ISO 3019-3, *Hydraulic fluid power — Positive displacement pumps and motors — Dimensions and identification code for mounting flanges and shaft ends — Part 3 : Polygonal flanges (including circular flanges).*"

Bibliography

The following document served as reference in the preparation of this part of ISO 3019 and will be helpful when using it :

ISO 273, *Fasteners — Clearance holes for bolts and screws.*

UDC 621.65 : 621.225 : 621.824.8

Descriptors : hydraulic fluid power, hydraulic equipment, pumps, positive displacement pumps, hydraulic motors, retaining flanges, shaft ends, dimensions, designation, codes, metric system.

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