

JIS

JAPANESE INDUSTRIAL STANDARD

Gear Pumps for Hydraulic Use

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JAPANESE INDUSTRIAL STANDARD

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Gear Pumps for Hydraulic Use

B 8352-1976
(Reaffirmed: 1979)1. Scope

This Japanese Industrial Standard specifies the gear pumps for hydraulic use with a discharge bore of 10 mm to 50 mm which are used for the hydraulic drive source of hydraulic system of various machines exclusive of aircraft, among single stage⁽¹⁾ external gear pumps for hydraulic use, hereinafter referred to as the "pumps", which are driven by power.

Note ⁽¹⁾ The single stage external-type is defined as the type with a pair of external gears engaging with each other.

Remark: The conversion rates of units given in { } in this standard are as follows:

$$1 \text{ bar} = 100 \text{ kPa}$$

$$1 \text{ kgf/cm}^2 = 98.0665 \text{ kPa} \approx 100 \text{ kPa}$$

2. Classification and Marking Symbols

The pumps shall be classified according to the maximum discharge pressure, nominal bore and shape number by gears. The classes and marking symbols shall be as specified in Table 1.

Table 1

Max. discharge pressure (kgf/cm ²)(bar)	Nominal bore ⁽²⁾	Shape number	Marking symbol
35	15×10 (15×15)	1	GP 15101- 35 (GP 15151- 35)
		2	GP 15102- 35 (GP 15152- 35)
		3	GP 15103- 35 (GP 15153- 35)
	20×15 (20×20)	1	GP 20151- 35 (GP 20201- 35)
		2	GP 20152- 35 (GP 20202- 35)
		3	GP 20153- 35 (GP 20203- 35)
	25×20 (25×25)	1	GP 25201- 35 (GP 25251- 35)
		2	GP 25202- 35 (GP 25252- 35)
		3	GP 25203- 35 (GP 25253- 35)
	32×25 (32×32)	1	GP 32251- 35 (GP 32321- 35)
		2	GP 32252- 35 (GP 32322- 35)
		3	GP 32253- 35 (GP 32323- 35)
	40×32 (40×40)	1	GP 40321- 35 (GP 40401- 35)
		2	GP 40322- 35 (GP 40402- 35)
		3	GP 40323- 35 (GP 40403- 35)
	50×40 (50×50)	1	GP 50401- 35 (GP 50501- 35)
		2	GP 50402- 35 (GP 50502- 35)
		3	GP 50403- 35 (GP 50503- 35)

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Table 1. (Continued)

Max. discharge pressure (kgf/cm ²)(bar)	Nominal bore(2)	Shape number	Marking symbol
35	65×50 (65×65)	1	GP 65501 - 35 (GP 65651 - 35)
		2	GP 65502 - 35 (GP 65652 - 35)
		3	GP 65503 - 35 (GP 65653 - 35)
70	15×10 (15×15)	1	GP 15101 - 70 (GP 15151 - 70)
		2	GP 15102 - 70 (GP 15152 - 70)
		3	GP 15103 - 70 (GP 15153 - 70)
	20×15 (20×20)	1	GP 20151 - 70 (GP 20201 - 70)
		2	GP 20152 - 70 (GP 20202 - 70)
		3	GP 20153 - 70 (GP 20203 - 70)
	25×20 (25×25)	1	GP 25201 - 70 (GP 25251 - 70)
		2	GP 25202 - 70 (GP 25252 - 70)
		3	GP 25203 - 70 (GP 25253 - 70)
	32×25 (32×32)	1	GP 32251 - 70 (GP 32321 - 70)
		2	GP 32252 - 70 (GP 32322 - 70)
		3	GP 32253 - 70 (GP 32323 - 70)
	40×32 (40×40)	1	GP 40321 - 70 (GP 40401 - 70)
		2	GP 40322 - 70 (GP 40402 - 70)
		3	GP 40323 - 70 (GP 40403 - 70)
	50×40 (50×50)	1	GP 50401 - 70 (GP 50501 - 70)
		2	GP 50402 - 70 (GP 50502 - 70)
		3	GP 50403 - 70 (GP 50503 - 70)
	65×50 (65×65)	1	GP 65501 - 70 (GP 65651 - 70)
		2	GP 65502 - 70 (GP 65652 - 70)
		3	GP 65503 - 70 (GP 65653 - 70)
105	15×10 (15×15)	1	GP 15101 - 105 (GP 15151 - 105)
		2	GP 15102 - 105 (GP 15152 - 105)
		3	GP 15103 - 105 (GP 15153 - 105)



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Table 1. (Continued)

Max. discharge pressure (kgf/cm ²)(bar)	Nominal bore(2)	Shape, number	Marking symbol
105	20 × 15 (20 × 20)	1	GP 20151 - 105 (GP 20201 - 105)
		2	GP 20152 - 105 (GP 20202 - 105)
		3	GP 20153 - 105 (GP 20203 - 105)
	25 × 20 (25 × 25)	1	GP 25201 - 105 (GP 25251 - 105)
		2	GP 25202 - 105 (GP 25252 - 105)
		3	GP 25203 - 105 (GP 25253 - 105)
	32 × 25 (32 × 32)	1	GP 32251 - 105 (GP 32321 - 105)
		2	GP 32252 - 105 (GP 32322 - 105)
		3	GP 32253 - 105 (GP 32323 - 105)
	40 × 32 (40 × 40)	1	GP 40321 - 105 (GP 40401 - 105)
		2	GP 40322 - 105 (GP 40402 - 105)
		3	GP 40323 - 105 (GP 40403 - 105)
	50 × 40 (50 × 50)	1	GP 50401 - 105 (GP 50501 - 105)
		2	GP 50402 - 105 (GP 50502 - 105)
		3	GP 50403 - 105 (GP 50503 - 105)
140	15 × 10 (15 × 15)	1	GP 15101 - 140 (GP 15151 - 140)
		2	GP 15102 - 140 (GP 15152 - 140)
		3	GP 15103 - 140 (GP 15153 - 140)
	20 × 15 (20 × 20)	1	GP 20151 - 140 (GP 20201 - 140)
		2	GP 20152 - 140 (GP 20202 - 140)
		3	GP 20153 - 140 (GP 20203 - 140)
	25 × 20 (25 × 25)	1	GP 25201 - 140 (GP 25251 - 140)
		2	GP 25202 - 140 (GP 25252 - 140)
		3	GP 25203 - 140 (GP 25253 - 140)
	32 × 25 (32 × 32)	1	GP 32251 - 140 (GP 32321 - 140)
		2	GP 32252 - 140 (GP 32322 - 140)
		3	GP 32253 - 140 (GP 32323 - 140)

Table 1. (Continued)

Max. discharge pressure (kgf/cm ²){bar}	Nominal bore ⁽²⁾	Shape number	Marking symbol
140	40 × 32 (40 × 40)	1	GP 40321 - 140 (GP 40401 - 140)
		2	GP 40322 - 140 (GP 40402 - 140)
		3	GP 40323 - 140 (GP 40403 - 140)
	50 × 40 (50 × 50)	1	GP 50401 - 140 (GP 50501 - 140)
		2	GP 50402 - 140 (GP 50502 - 140)
		3	GP 50403 - 140 (GP 50503 - 140)

Note (2) The nominal bore is in accordance with the bore of suction opening x discharge opening.

Remark: The indicated number given in () means a pump of which the discharge bore is equal to its inlet bore. This pump is used where necessary particularly for its use. In this case, the marking symbol given in () shall be used.

3. Names of Main Parts of Pump

The names of main parts of pump shall be as shown in Attached Figure.

4. Materials

The materials used for each part of pump shall be as specified in Table 2, or they shall be equal or superior thereto in quality.

Table 2

Name of part	Material
Gear case, Driving side cover, Cover	FC 20 of JIS G 5501, SC 42 of JIS G 5101, AC 1A of JIS H 5202 or A 5056 FD of JIS H 4140.
Driving shaft	S 45 C ⁽³⁾ of JIS G 4051, S 15 CK ⁽³⁾ of JIS G 4051 or SCM 21 ⁽⁴⁾ of JIS G 4105.
Driven shaft	
Driving gear	S 45 C ⁽³⁾ of JIS G 4051, S 15 CK ⁽³⁾ of JIS G 4051 or SCM 21 ⁽⁴⁾ of JIS G 4105
Driven gear	
Journal bearing	BC 6 of JIS H 5111
Needle roller bearing	Needle roller bearings of JIS B 1536
Cylindrical roller bearing	Cylindrical roller bearings of JIS B 1533
Ball bearing	Deep groove ball bearing of JIS B 1521
Side plate	BC 6 of JIS H 5111
Guide pin	S 45 C ⁽³⁾ of JIS G 4051
Key	S 45 C ⁽³⁾ of JIS G 4051
Counterpose flange	S 20 C of JIS G 4051

Notes (3) To perform the heat treatment specified in the Japanese Industrial Standard for the materials or the normalizing, quenching and tempering corresponding to this treatment.

(4) For the pumps with the maximum discharge pressure of 105 kgf/cm² { 105 bar } and 140 kgf/cm² { 140 bar }.

5. Structure, Shape and Dimensions

5.1 General Items The general items shall be as follows:

- (1) Unless otherwise specially specified, the rotating direction of pump shall be the right side direction when seeing it from the driving side.
- (2) Main parts of the same class⁽⁵⁾ of pumps shall have interchangeability.

Note (5) The same class of pump means the pump produced in accordance with the same design by the same manufacturer.

- (3) The fit of each part of pump shall be in accordance with the basic hold system of JIS B 0401.

Further, the fits of main parts should be preferably in accordance with Table 3.

Table 3

Main parts	Fit
Outside diameter of bearing of journal bearing and gear case or cover	H 7 j 6
Inside diameter of bearing of journal bearing and shaft	H 7 e 7
Outside diameter of bearing of needle roller bearing and gear case or cover	H 7 hB 5
Inside diameter of bearing of needle roller bearing and shaft	KB 5 k 5
Outside diameter of bearing of cylindrical roller bearing and gear case or cover	J 7 hB 5
Inside diameter of bearing of cylindrical roller bearing and shaft	KB 5 j 6
Outside diameter of bearing of ball bearing and gear case or cover	J 7 hB 5
Inside diameter of bearing of ball bearing and shaft	KB 5 j 6
Drive (or driven) shaft and driving (or driven) gear	H 7 m 7
Drive shaft and shaft coupling or pulley	H 7 h 7
Spigot of fitting bracket	f 7

- (4) The dimensions of parts relating to the fitting of pump and the fitting bolts of pump should be preferably in accordance with Attached Table 1.

5.2 Suction Opening and Discharge Opening The suction opening and discharge opening shall be in accordance with either of screw coupling or flange coupling and its dimensions shall be in accordance with Table 4.

Table 4

Nominal bore	Suction opening		Discharge opening	
	Nominal size of screw coupling	Nominal size of flange coupling	Nominal size of screw coupling	Nominal size of flange coupling
15×10 (15×15)	PT 1/2	15	PT 3/8 (PT 1/2)	10 (15)
20×15 (20×20)	PT 3/4	20	PT 1/2 (PT 3/4)	15 (20)
25×20 (25×25)	PT 1	25	PT 3/4 (PT 1)	20 (25)
32×25 (32×32)	PT 1 1/4	32	PT 1 (PT 1 1/4)	25 (32)
40×32 (40×40)	PT 1 1/2	40	PT 1 1/4 (PT 1 1/2)	32 (40)
50×40 (50×50)	PT 2	50	PT 1 1/2 (PT 2)	40 (50)
65×50 (65×65)	PT 2 1/2	65	PT 2 (PT 2 1/2)	50 (65)