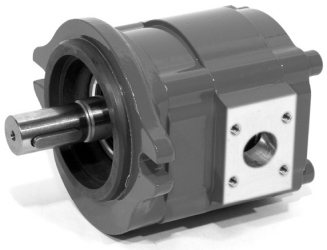


5.3 HEAVY DUTY SERIES SIZE 2/3/6

CONTENTS PGI102

ORDERING CODE

5.3.1 Heavy Duty Series

PGI102 – 2 – 004 – R K 0 3 – 10 – XXXX

Heavy Duty Series

Size

Displacement

PGI102-2-		PGI102-3-		PGI102-6-	
004	3.8 cm³/rev	014	14.6 cm³/rev	040	40.8 cm³/rev
005	5.4 cm³/rev	016	16.0 cm³/rev	050	50.6 cm³/rev
006	6.4 cm³/rev	020	20.0 cm³/rev	064	65.3 cm³/rev
008	7.9 cm³/rev	025	24.8 cm³/rev	080	80.0 cm³/rev
011	10.9 cm³/rev	032	32.1 cm³/rev	100	101.2 cm³/rev
013	13.3 cm³/rev	040	40.1 cm³/rev	125	125.7 cm³/rev
016	15.8 cm³/rev	050	50.3 cm³/rev	160	160.1 cm³/rev
019	19.3 cm³/rev	064	64.6 cm³/rev	200	200.9 cm³/rev
022	22.2 cm³/rev			250	249.9 cm³/rev
025	25.2 cm³/rev				

Shaft rotation (viewed from shaft end)

R Clockwise
L Anti-clockwise

Shaft

A Parallel shaft with key (only PGI102-3-064)
K Keyed shaft with through drive (not PGI102-3-064)
P Splined shaft with through drive (only for multiple pumps)

Mounting flange

0 SAE J744 82-2 A - Ø 82.55 mm (size 2)
2 SAE J744 101-2 B - Ø 101.6 mm (size 3)
SAE J744 152-2 D - Ø 152.4 mm (size 6)
3 Direct mounting (only on multiple pumps)
5 VDMA (on request)

Ports

3 SAE flange
0 Suction port sealed (only on multiple pumps)

Series

Modification number

XXXX Determined by manufacturer

TECHNICAL INFORMATION

5.3.2 Specifications

Pump size			PGI102-2-									
			004	005	006	008	011	013	016	019	022	025
Geometric displacement		[cm³/rev]	3.8	5.4	6.4	7.9	10.9	13.3	15.8	19.3	22.2	25.2
Pressure	Rated	[bar]	330							300	250	250
	Intermittent		350							300		280
	Peak		400							325		300
Drive speed	Min.	[rpm]	400									
	Max.		4000			3600				3000		
Approx. weight		[kg]	4.9	4.9	5.0	5.2	5.4	5.5	5.7	6.1	6.3	6.5

Pump size			PGI102-3-							
			014	016	020	025	032	040	050	064
Geometric displacement		[cm³/rev]	14.6	16.0	20.0	24.8	32.1	40.1	50.3	64.6
Pressure	Rated	[bar]	330					280		
	Intermittent		350					300		
	Peak		400					325		
Drive speed	Min.	[rpm]	400							
	Max.		3600		2800			2200	1800	
Approx. weight		[kg]	13.1	13.2	13.4	13.5	13.7	16.4	17.5	19.5

Pump size			PGI102-6-								
			040	050	064	080	100	125	160	200	250
Geometric displacement		[cm³/rev]	40.8	50.6	65.3	80.0	101.2	125.7	160.1	200.9	249.9
Pressure	Rated	[bar]	330		315	300		280		150	
	Intermittent		340		330			300		150	
	Peak		350		340			320		165	
Drive speed	Min.	[rpm]	400								
	Max.		2200			2000			1800		
Approx. weight		[kg]	23	25	28	31	36	41.5	49	58	69

5

5.3.3 Hydraulic fluids

The pump series is designed for use with

HLP	Hydraulic oil

Before using synthetic fluids, please contact HYDAC:

HEES, HETG	Environmentally-friendly operating fluids
HFC	Water glycol
HFD-U	Fire-resistant fluids based on polyolester
HFD-R	Fire-resistant fluids based on phosphate ester

5.3.4 Viscosity range

	cSt (mm²/s)
Minimum viscosity:	10
Normal operating viscosity:	10 - 300
Maximum viscosity:	2,000

5.3.5 Temperature range

Temperature range
-20 to 100 °C

Maximum ambient temperature
-40 to 80 °C

Maximum fluid temperature
-40 to 120 °C

Before using synthetic fluids, please contact HYDAC.

5.3.6 Seals

The pump series is equipped with FPM (Viton) seals. Before using synthetic fluids, please contact HYDAC.

5.3.7 Filtration

For maximum service life of the pump and system components, the system should be protected from contamination by effective filtration.

Cleanliness class:

20/ 18/ 15 to ISO 4406:1999
or
Class 9 to NAS 1638 or cleaner.

To ensure a longer service life, cleanliness class:

18/16/13 to ISO 4406:1999
or
Class 9 to NAS 1638.

5.3.8 Installation notes

A. Mounting

The pump can be installed horizontally or vertically with the shaft at the top. If the pump is installed on the tank or above the oil level, the distance between the pump inlet and the oil level should not exceed 1 metre.

When installing a HYDAC pump always ensure that the fluid remains in the pump during stoppages.

B. Suction pipe

If the pump is installed above the oil level, particular attention must be paid to the suction pressure. The cross-section of the suction pipe must be equal to or larger than the cross-section of the pump port. The suction pressure must be kept within the values specified.

Minimum suction pressure: 0.8 bar abs.

Maximum suction pressure: 2.0 bar abs.

- When installing a HYDAC pump always ensure that the fluid remains in the pump during stoppages..

C. Drive

Use a flexible coupling whenever possible. There must not be any radial or axial forces on the pump shaft. The maximum misalignment of the shafts is 0.2 mm and the angular deviation must be less than 0.2°.

5.3.9 Multiple pumps

Internal gear pumps in the PGI102 series can be combined to form double or triple gear pumps (for larger units please contact HYDAC). The performance characteristics for single pumps generally applies but the following points must be taken into consideration:

- It is recommended that the pump with the largest load be placed on the drive side.
- The maximum drive speed of the multiple pump is limited to the lowest speed of the individual pumps.
- The maximum drive and through drive torques must be checked for each stage.
- The torques generated by the pump unit can be calculated using the following formula:

$$M_{max} = \frac{\Delta p_1 \bullet V_1}{20 \bullet \pi \bullet \eta_{mh}} + \frac{\Delta p_2 \bullet V_2}{20 \bullet \pi \bullet \eta_{mh}} + \frac{\Delta p_3 \bullet V_3}{20 \bullet \pi \bullet \eta_{mh}}$$

Maximum drive and through drive torques

Size	Drive torque		Though drive torque	
	Rated	Max.	Rated	Max.
2	160 Nm	200 Nm	120 Nm	130 Nm
3	325 Nm	400 Nm	230 Nm	240 Nm
6	1100 Nm	1300 Nm	850 Nm	900 Nm

- Common suction port, separate drain ports
- There is no sealing between the individual pump stages
- PGI101 and PGI102 can be combined to form multiple units.

If a double internal gear pump combination is installed vertically in V1 arrangement and there is no guarantee that the primary stage is completely submerged in the oil in the tank under all operating conditions, we recommend that only the suction port of the primary stage is used to supply the oil to the double internal gear pump combination.

In this case the common suction port of the double internal gear pump combination and the suction port of the secondary stage must be plugged.

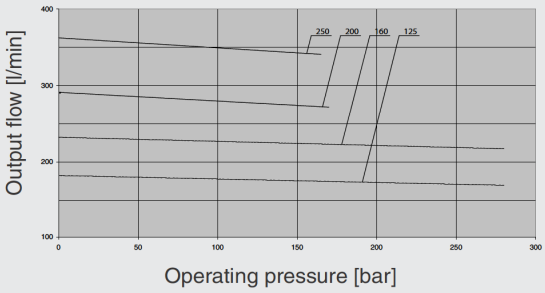
In addition, the suction port of the primary stage must be fitted with an anti-siphon to ensure the fluid remains in the double internal gear pump combination after a lengthy stoppage.

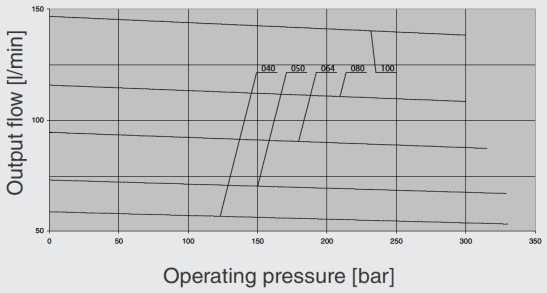
For triple and multiple internal gear pump combinations, please contact HYDAC.

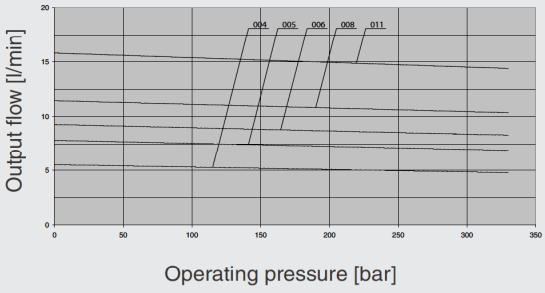
PERFORMANCE DATA

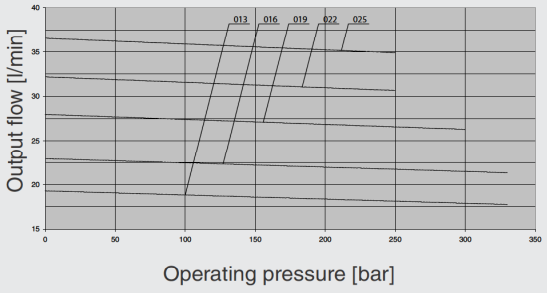
5.3.10 PGI102

Output flow

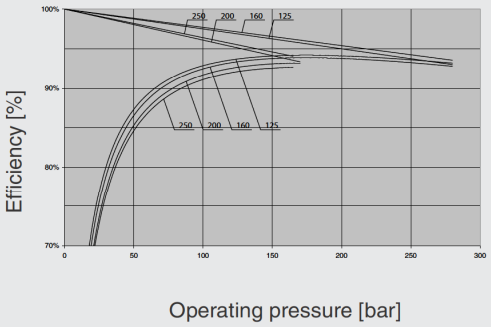


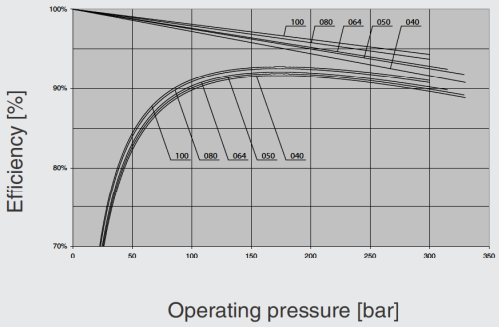


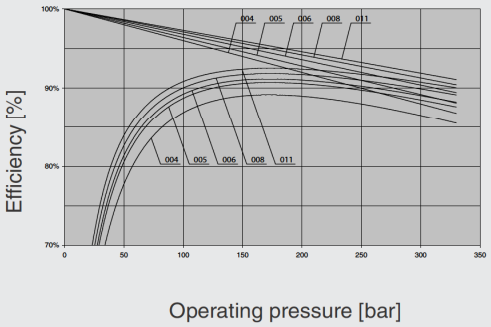


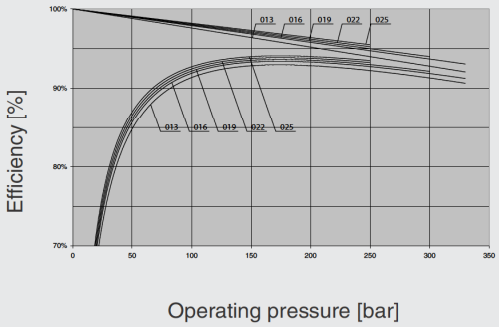


Efficiency





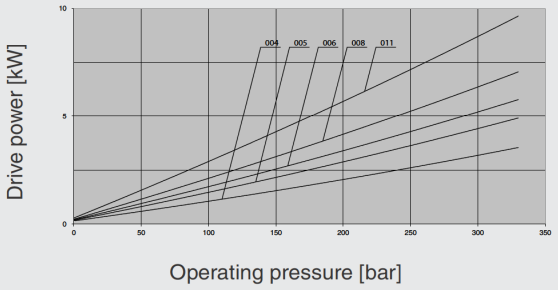


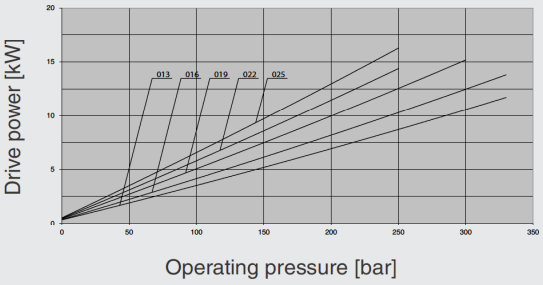


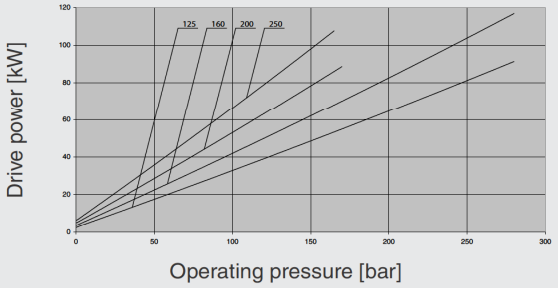
Measurement conditions:
Drive speed 1450 rpm, viscosity 46 mm²/sec, operating temperature 40 °C
Acoustic pressure measured in an anechoic room to DIN 45 635 Sheet 26;
Microphone distance 1.0 m axial.

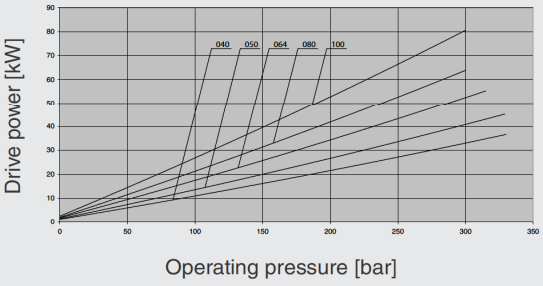
5.3.10 PGI102

Drive power

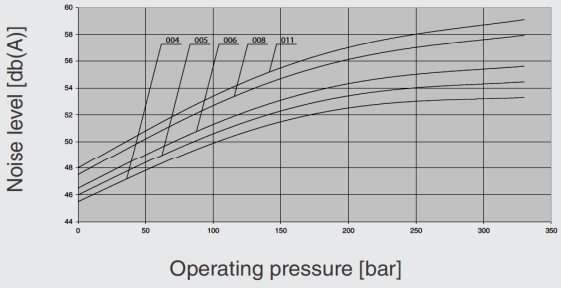


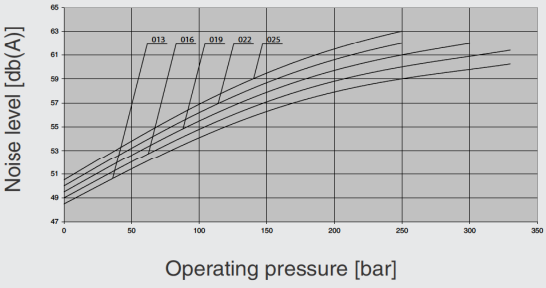


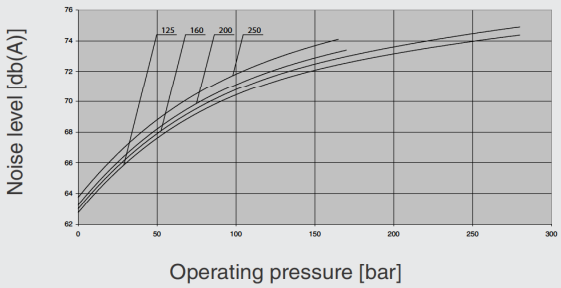


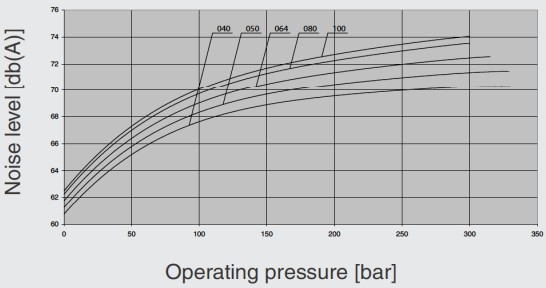


Noise level







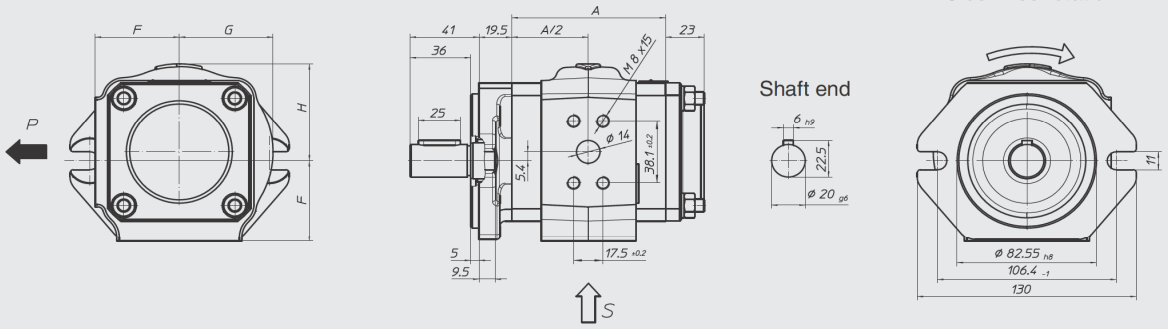


Measurement conditions:
Drive speed 1450 rpm, viscosity 46 mm²/sec, operating temperature 40 °C
Acoustic pressure measured in an anechoic room to DIN 45 635 Sheet 26;
Microphone distance 1.0 m axial.

DIMENSIONS

5.3.11 PGI102-2

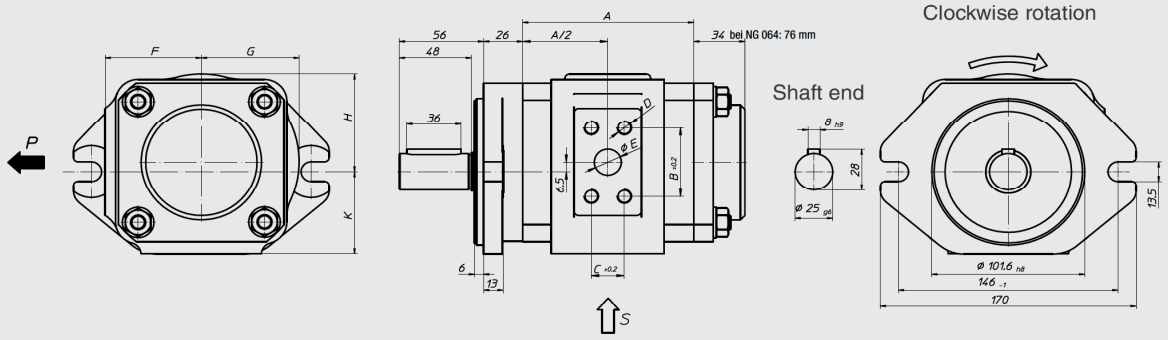
Ordering example: PGI 102-2-...RK03-1x



Size	A	F	G	H	L	M	N	O
004	71	50	54	57	38.1	17.5	14	M8 x 15
005	71	50	54	57	38.1	17.5	14	M8 x 15
006	73	50	54	57	47.5	22.0	19	M10 x 16
008	76	50	54	57	47.5	22.0	19	M10 x 16
011	82	50	54	57	52.4	26.2	25	M10 x 17
013	87	50	54	57	52.4	26.2	25	M10 x 17
016	92	50	54	57	52.4	26.2	25	M10 x 17
019	99	55	59	62	52.4	26.2	25	M10 x 17
022	105	55	59	62	52.4	26.2	25	M10 x 17
025	111	55	59	62	52.4	26.2	25	M10 x 17

5.3.12 PGI102-3

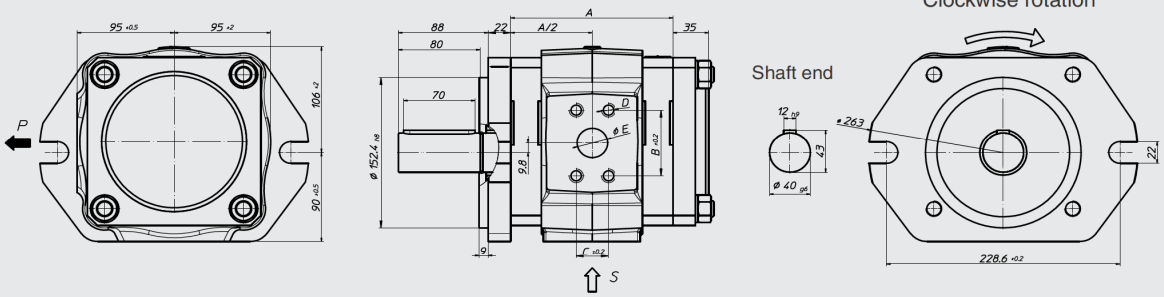
Ordering example: PGI 102-3-...RK23-1x



Size	A	B	C	D	E	F	G	H	K	L	M	N	O
014	90.4	38.1	17.5	M8 x 15	14	64	65	67	57	52.4	26.2	25	M10 x 17
016	92.4	38.1	17.5	M8 x 15	14	64	65	67	57	52.4	26.2	25	M10 x 17
020	97.9	47.5	22	M10 x 17	18	64	65	67	57	58.7	30.2	32	M10 x 17
025	104.4	47.5	22	M10 x 17	18	64	65	67	57	58.7	30.2	32	M10 x 17
032	114.4	47.5	22	M10 x 17	18	64	65	67	57	58.7	30.2	32	M10 x 17
040	125.4	52.4	26.2	M10 x 17	20	70	73	79	63	58.7	30.2	32	M10 x 20
050	139.4	52.4	26.2	M10 x 17	20	70	73	79	63	58.7	30.2	32	M10 x 20
064	139.4	52.4	26.2	M10 x 17	20	70	73	79	63	58.7	30.2	32	M10 x 20

5.3.13 PGI102-6

Ordering example: PGI102-6-...RK23-1x

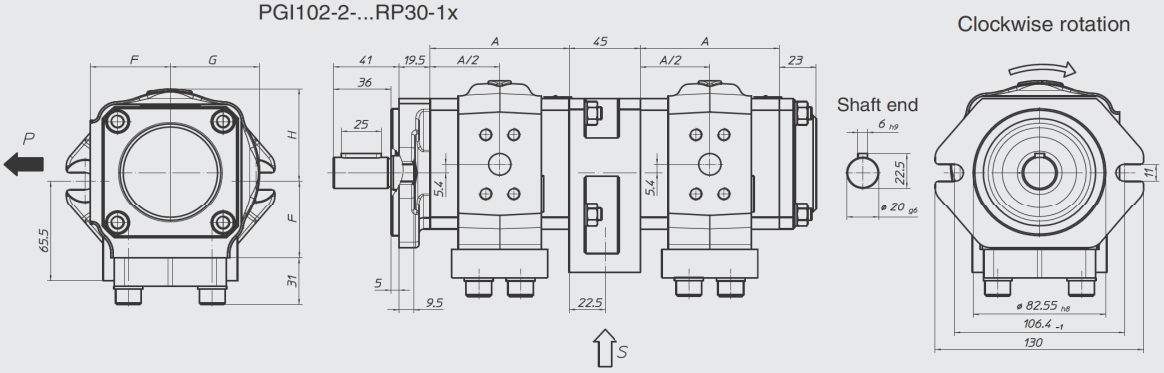


Size	A	B	C	D	E	L	M	N	O
040	123	57.2*	27.8*	M12 x 22	20	69.9	35.7	35	M12 x 25
050	129	57.2*	27.8*	M12 x 22	20	69.9	35.7	40	M12 x 25
064	138	57.2*	27.8*	M12 x 22	20	69.9	35.7	40	M12 x 25
080	147	66.7*	31.8*	M14 x 25	30	77.8	42.9	50	M12 x 25
100	160	66.7*	31.8*	M14 x 25	30	77.8	42.9	50	M12 x 25
125	175	66.7*	31.8*	M14 x 25	30	77.8	42.9	50	M12 x 25
160	196	66.7*	31.8*	M14 x 25	30	88.9	50.8	65	M12 x 25
200	221	79.4*	36.5*	M16 x 28	38	106.4	61.9	76	M16 x 25
250	251	79.4*	36.5*	M16 x 28	38	106.4	61.9	76	M16 x 25

* Discharge port: SAE 518C, High pressure range (code 62)

5.3.14 Double pump PGI102-2 + PGI102-2

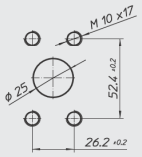
Ordering example: PGI102-2-...RK00-1x+
PGI102-2-...RP30-1x



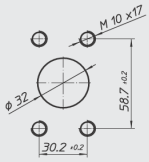
Size	A	F	G	H
004	71	50	54	57
005	71	50	54	57
006	73	50	54	57
008	76	50	54	57
011	82	50	54	57
013	87	50	54	57
016	92	50	54	57
019	99	55	59	62
022	105	55	59	62
025	111	55	59	62

For discharge port see single pump

Suction port NG 004-016

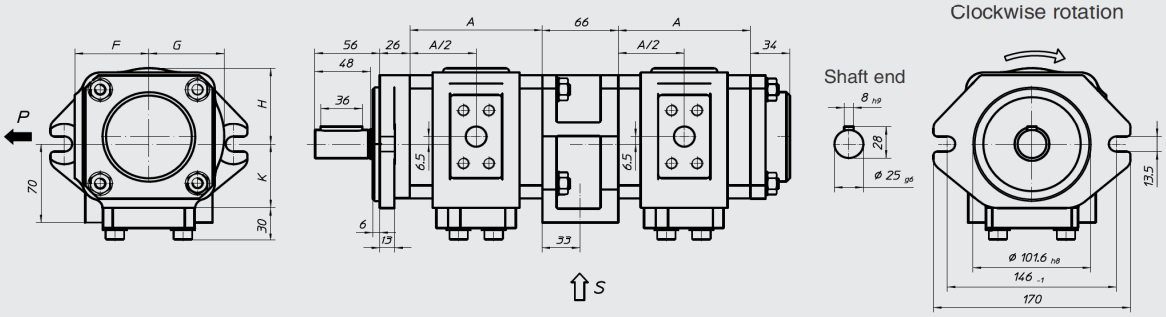


Suction port NG 019-025



5.3.15 Double pump PGI102-3 + PGI102-3

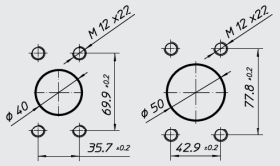
Ordering example: PGI102-3-...RK20-1x+
PGI102-3-...RP30-1x



Size	A	F	G	H	K
014	90.4	64	65	67	57
016	92.4	64	65	67	57
020	97.9	64	65	67	57
025	104.4	64	65	67	57
032	114.4	64	65	67	57
040	125.4	70	73	79	63
050	139.4	70	73	79	63

For discharge port see single pump

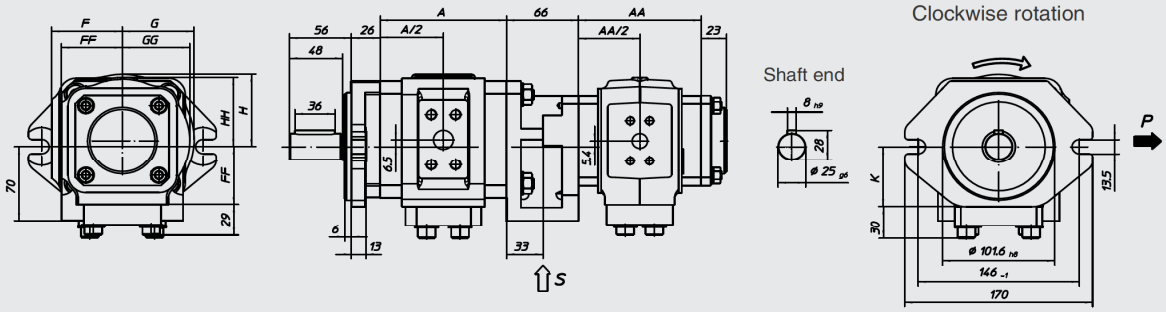
Suction port



size 014-032 size 040-050

Double pump PGI102-3 + PGI102-2

Ordering example: PGI102-3-...RK20-1x +
PGI102-2-...RP30-1x

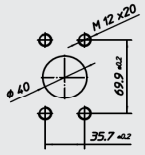


Size	A	F	G	H	K
014	90.4	64	65	67	57
016	92.4	64	65	67	57
020	97.9	64	65	67	57
025	104.4	64	65	67	57
032	114.4	64	65	67	57
040	125.4	70	73	79	63
050	139.4	70	73	79	63

Size	AA	FF	GG	HH
004	71	50	54	57
005	71	50	54	57
006	73	50	54	57
008	76	50	54	57
011	82	50	54	57
013	87	50	54	57
016	92	50	54	57
019	99	55	59	62
022	105	55	59	62
025	111	55	59	62

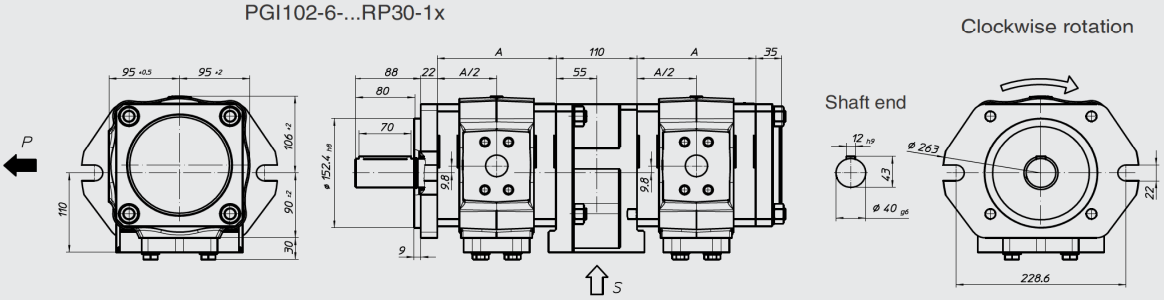
For discharge port see single pump

Suction port



5.3.16 Double pump PGI102-6 + PGI102-6

Ordering example: PGI102-6-...RK20-1x+
PGI102-6-...RP30-1x

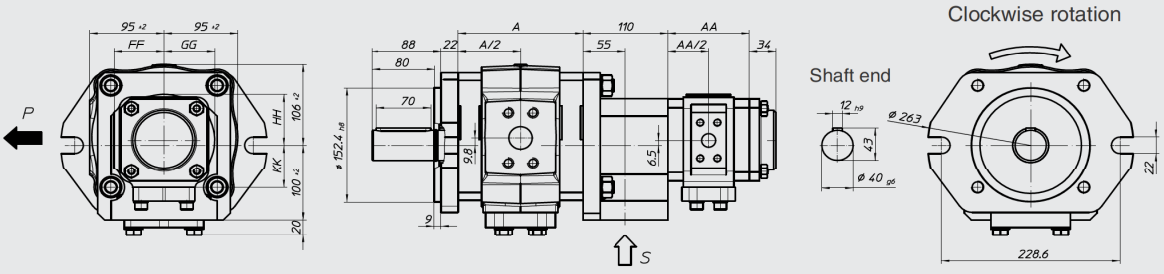


Size	A
040	123
050	129
064	138
080	147
100	160
125	175
160	196
200	221
250	251

For discharge port see single pump

Double pump PGI102-6 + PGI102-3

Ordering example: PGI102-6-...RK20-1x +
PGI102-3-...RP30-1x



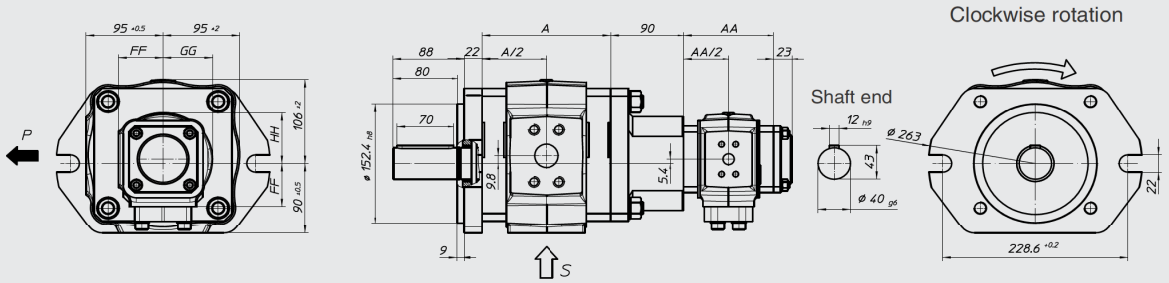
Size	A
040	123
050	129
064	138
080	147
100	160
125	175
160	196
200	221
250	251

Size	AA	FF	GG	HH	KK
014	90.4	64	65	67	57
016	92.4	64	65	67	57
020	97.9	64	65	67	57
025	104.4	64	65	67	57
032	114.4	64	65	67	57
040	125.4	70	73	79	63
050	139.4	70	73	79	63

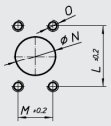
For discharge port see single pump

Double pump PGI102-6 + PGI102-2

Ordering example: PGI102-6-...RK23-1x +
PGI102-2-...RP30-1x



Suction port



Size	A	L	M	N	O
040	123	69.9	35.7	35	M12 x 25
050	129	69.9	35.7	40	M12 x 25
064	138	69.9	35.7	40	M12 x 25
080	147	77.8	42.9	50	M12 x 25
100	160	77.8	42.9	50	M12 x 25
125	175	77.8	42.9	50	M12 x 25
160	196	88.9	50.8	65	M12 x 25
200	221	106.4	61.9	76	M16 x 25
250	251	106.4	61.9	76	M16 x 25

Size	AA	FF	GG	HH
004	71	50	54	57
005	71	50	54	57
006	73	50	54	57
008	76	50	54	57
011	82	50	54	57
013	87	50	54	57
016	92	50	54	57
019	99	55	59	62
022	105	55	59	62
025	111	55	59	62

For discharge port see single pump