6.1 SIZE 0

CONTENTS PGE100

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6.1.1 External Gear Pump

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6.1.10 Mounting flange
6.1.11 Ports
6.1.12 Preferred series

ORDERING CODE

6.1.1 External Gear Pump

PGE100 – 100 – R M K 1 – N – XXXX

External gear pump
Size 0

Displacement

25	0.25 cm³/rev
30	0.30 cm³/rev
50	0.50 cm³/rev
75	0.75 cm³/rev
100	1.00 cm³/rev
125	1.25 cm³/rev
150	1.50 cm³/rev
175	1.75 cm³/rev
200	2.00 cm³/rev

Shaft rotation (viewed from shaft end)

R	Clockwise
L	Anti-clockwise

Shaft

C	Tang
M	Parallel shaft with key Ø 7 mm

Mounting flange

I	2-hole mounting, centering Ø 22 mm
K	Flange, centering Ø 22 mm

Ports

1	Pipe thread ISO 228-1, radial
A	Pipe thread ISO 228-1, axial - discharge port in mounting flange
B	Pipe thread ISO 228-1, axial
9	Special version (only on request)

Seals

N	NBR
V	FPM

Modification number

XXXX	Determined by manufacturer

Not all combinations in the ordering code are possible.
Please refer to 6.1.12 Preferred series or consult HYDAC.

6.1.2 Specifications

Pump size			25	30	50	75	100	125	150	175	200
Geometric displacement		[cm³/rev]	0.25	0.30	0.50	0.75	1.00	1.25	1.50	1.75	2.00
Pressure	Rated	[bar]	170						145	130	130
	Intermittent, max. 20 sec		200						175	160	160
	Peak, max. 0.5 sec		210		230		210		200	180	170
Drive speed	min.	[rpm]	750								
	max.		3500					3000	2500		2000
Approx. weight		[kg]	0.37	0.38	0.39	0.40	0.41	0.43	0.44	0.45	0.47

The continuous and maximum pressures given here only apply to pumps with flange ports. If threaded ports are required, the performance will be reduced. To find out whether a pump with threaded ports can be used in a high pressure application, please consult HYDAC.

6.1.3 Hydraulic fluids

The pump series is designed for use with

HL Hydraulic oil (normal mineral oil) and
HLP Hydraulic oils of the R&O type (Rust and Oxidation inhibitor)

6.1.4 Viscosity range

Normal operating viscosity:
16 - 200 cSt (mm²/s)

6.1.5 Temperature range

Ambient temperature range
-22 to 55 °C

Fluid temperature range
NBR
-25 up to 85 °C
Viton
-15 up to 90 °C

6.1.6 Seals

The pump series is equipped with NBR seals.

If special hydraulic fluids are used, the seal material must be changed if required. Please contact HYDAC.

6.1.7 Filtration

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

21/ 18/ 15 to ISO 4406:1999

or

Class 9 to NAS 1638 or cleaner.

At system pressures above 160 bar cleanliness class:

19/17/14 to ISO 4406:1999

or

Class 8 to NAS 1638 is required.

6.1.8 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.

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:
2.2 bar abs.

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°.

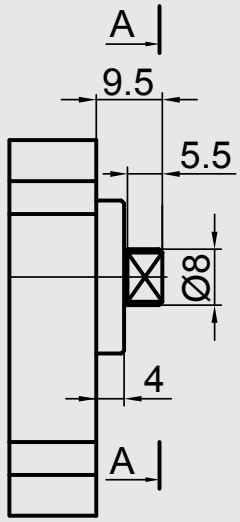
Drive shafts with tang are for direct mounting onto an electric motor or a gearbox. The driver for the tang is not included.

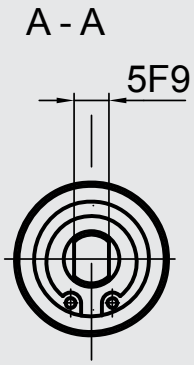
Indirect drives (with gear, chain or belt drives) are not possible.

DIMENSIONS

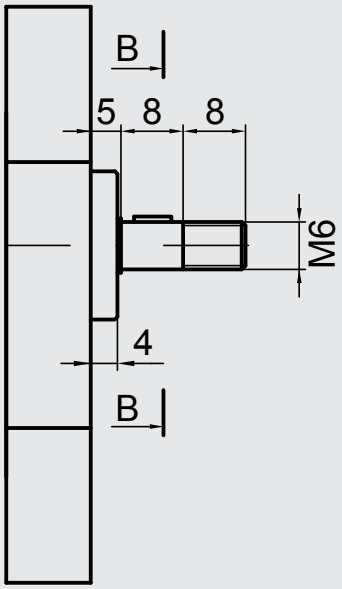
6.1.9 Drive shafts

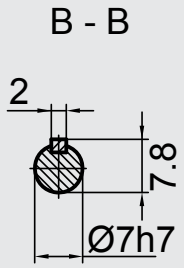
C Tang





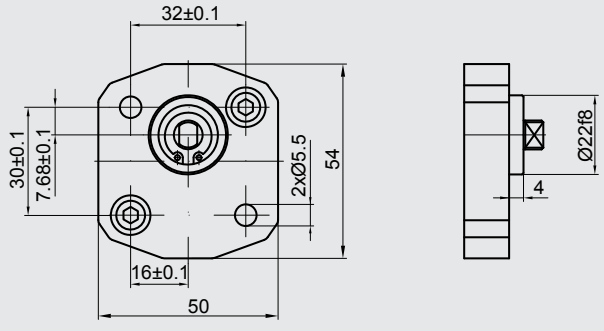
M Parallel shaft with key Ø 7 mm



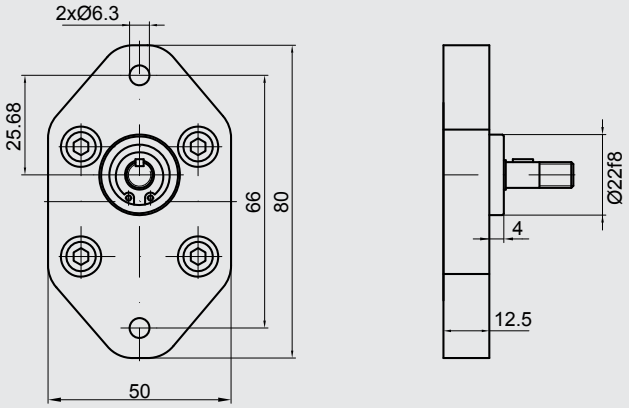


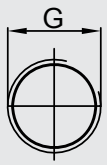
6.1.10 Front cover

I 2-hole mounting
centering Ø 22 mm



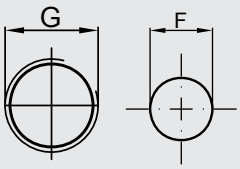
K Flange
centering Ø 22 mm





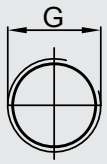
1 Pipe thread
ISO 228/1, radial

Ordering code	Displacement	Outlet G	Inlet G
1	0.25 ... 2 cm³	G 1/4	G 1/4



A Pipe thread ISO 228/1, axial
discharge port in mounting flange

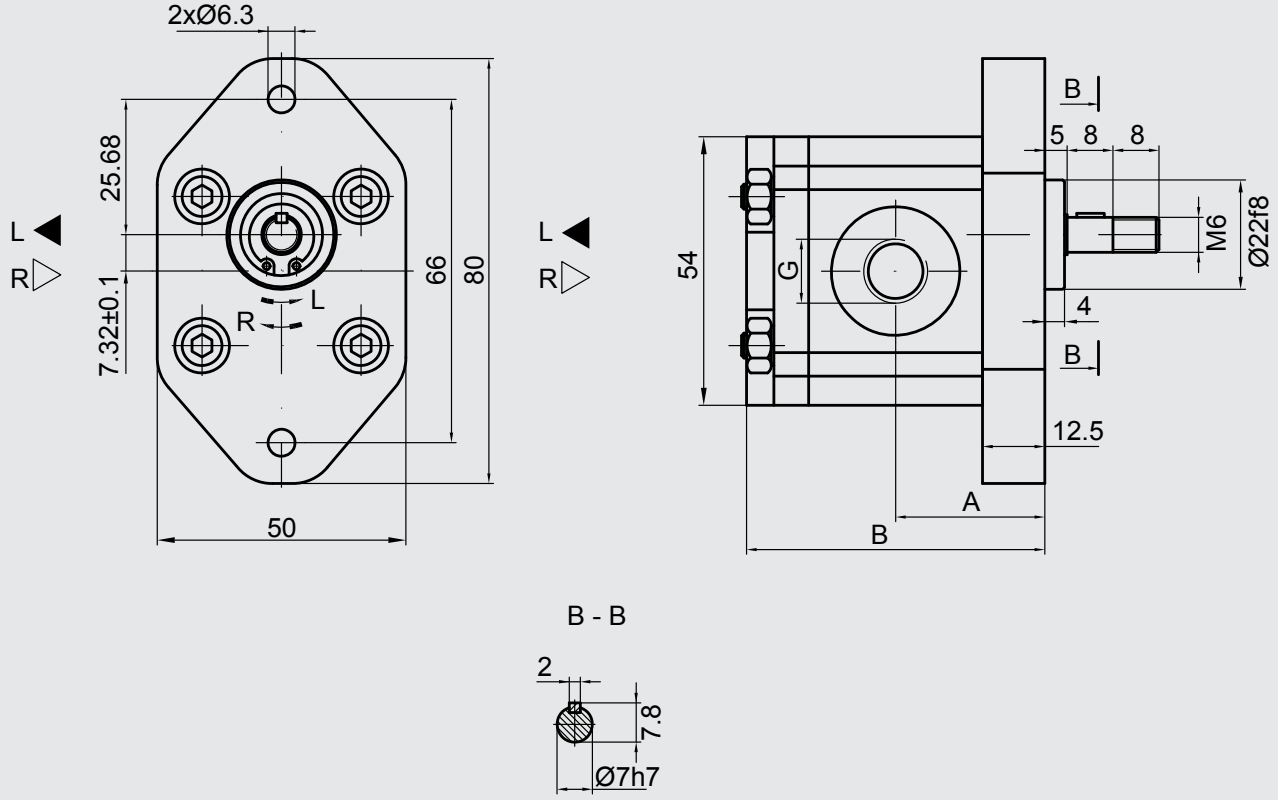
Ordering code	Displacement	Outlet F	Inlet G
A	0.25 ... 2 cm³	Ø 5.5	G 1/4



B Pipe thread
ISO 228/1, axial

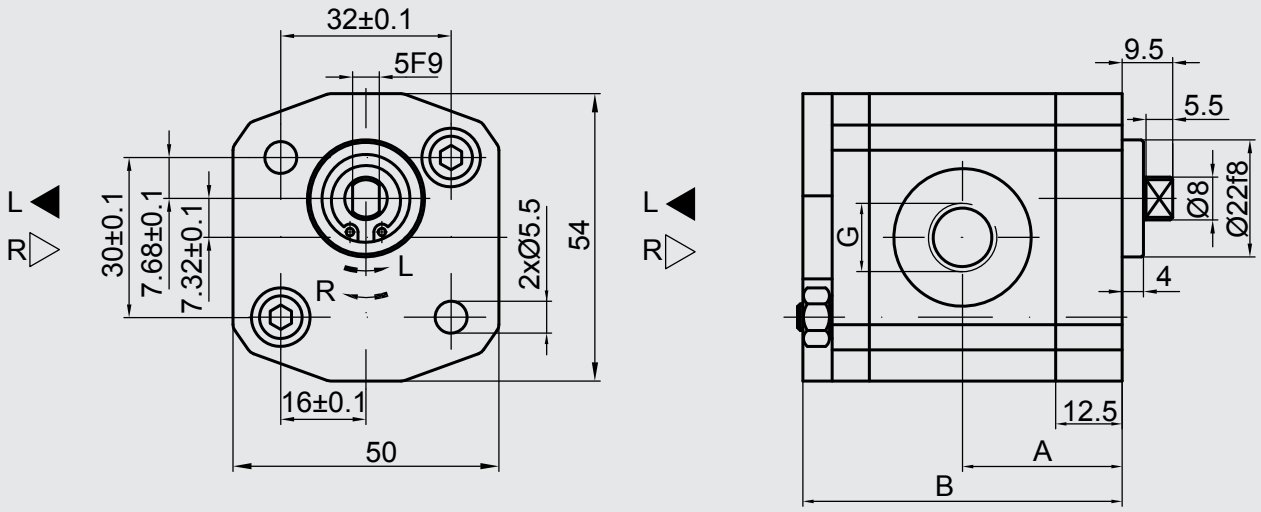
Ordering code	Displacement	Outlet G	Inlet G
B	0.25 ... 2 cm³	G 1/4	G 1/4

PGE100-...-.MK1-N



Type	Displacement	Output flow		Rated	Max. speed	Dimensions			
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]	A [mm]	B [mm]	Inlet G	Outlet G
PGE100-25-. MK1-N	0.25	0.3	0.8	170	3500	27.6	55.3	G 1/4	G 1/4
PGE100-30-. MK1-N	0.30	0.4	0.9			27.7	55.7		
PGE100-50-. MK1-N	0.50	0.7	1.6			28.7	57.5		
PGE100-75-. MK1-N	0.75	1.0	2.3			29.9	59.8		
PGE100-100-. MK1-N	1.00	1.4	3.2			31.0	62.0		
PGE100-125-. MK1-N	1.25	1.7	3.4		3000	32.1	64.2		
PGE100-150-. MK1-N	1.50	2.1	3.5	145	2500	33.2	66.5		
PGE100-175-. MK1-N	1.75	2.4	4.1	130		34.3	68.7		
PGE100-200-. MK1-N	2.00	2.8	3.7		2000	35.5	70.9		

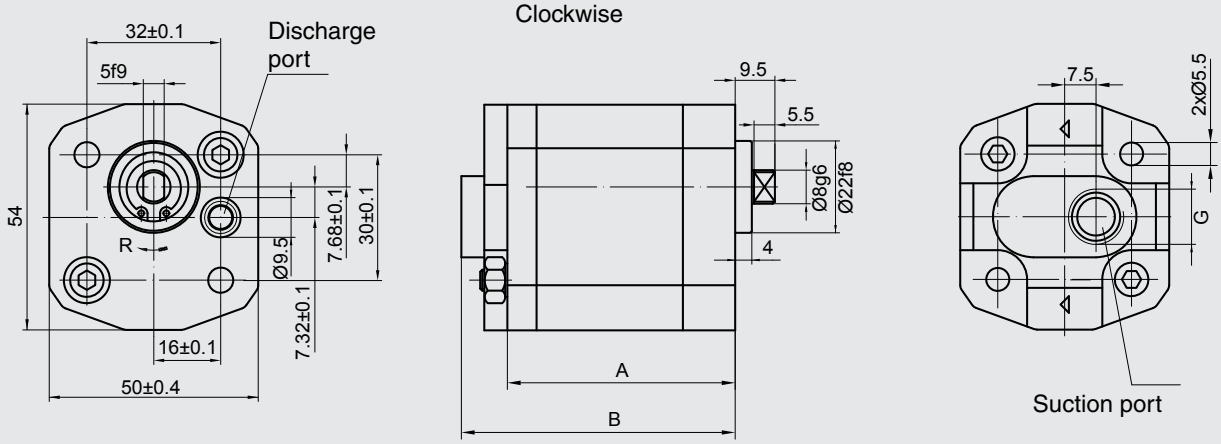
PGE100-...-.CK1-N



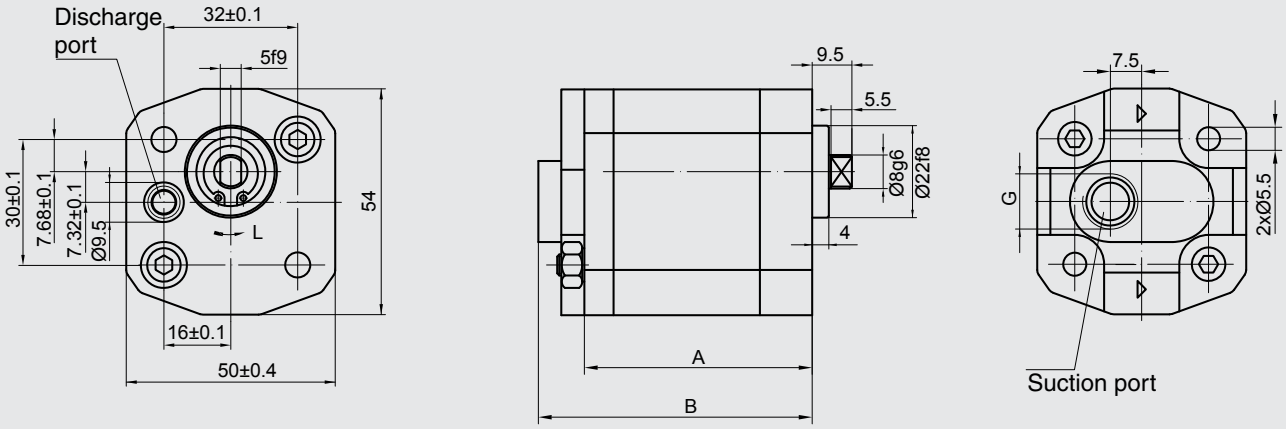
Type	Displacement	Output flow		Rated	Max. speed	Dimensions			
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]	A [mm]	B [mm]	Inlet G	Outlet G
PGE100-25-. CK1-N	0.25	0.3	0.8	170	3500	27.6	55.3	G 1/4	G 1/4
PGE100-30-. CK1-N	0.30	0.4	0.9			27.7	55.7		
PGE100-50-. CK1-N	0.50	0.7	1.6			28.7	57.5		
PGE100-75-. CK1-N	0.75	1.0	2.3			29.9	59.8		
PGE100-100-. CK1-N	1.00	1.4	3.2			31.0	62.0		
PGE100-125-. CK1-N	1.25	1.7	3.4		3000	32.1	64.2		
PGE100-150-. CK1-N	1.50	2.1	3.5	145	2500	33.2	66.5		
PGE100-175-. CK1-N	1.75	2.4	4.1	130		34.3	68.7		
PGE100-200-. CK1-N	2.00	2.8	3.7		2000	35.5	70.9		

PGE100-...-.CIA-N

Clockwise

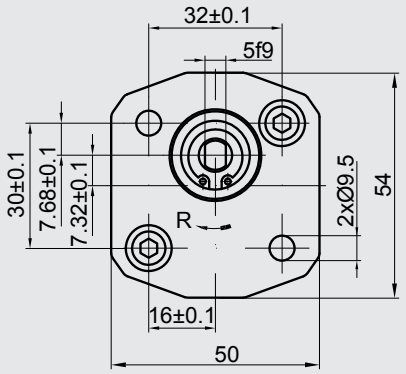


Anti-clockwise

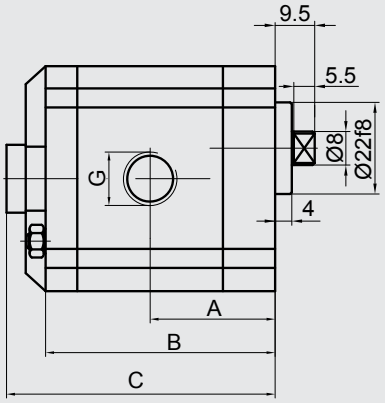


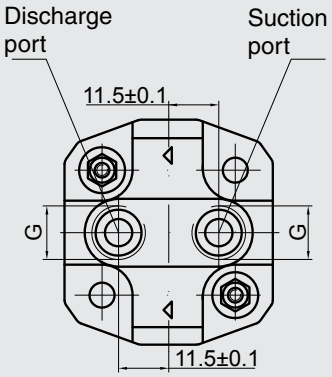
Type	Displacement	Output flow		Rated	Max. speed	Dimensions			
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]	A [mm]	B [mm]	Inlet G	Outlet G
PGE100-25-. CIA-N	0.25	0.3	0.8	170	3500	55.3	60.8	G 1/4	Ø 5.5
PGE100-30-. CIA-N	0.30	0.4	0.9			55.7	61.2		
PGE100-50-. CIA-N	0.50	0.7	1.6			57.5	63.0		
PGE100-75-. CIA-N	0.75	1.0	2.3			59.8	65.3		
PGE100-100-. CIA-N	1.00	1.4	3.2			62.0	67.5		
PGE100-125-. CIA-N	1.25	1.7	3.4		3000	64.2	69.7		
PGE100-150-. CIA-N	1.50	2.1	3.5	145	2500	66.5	72.0		
PGE100-175-. CIA-N	1.75	2.4	4.1	130		68.7	74.2		
PGE100-200-. CIA-N	2.00	2.8	3.7		2000	70.9	76.4		

PGE100-...-.CIB-N

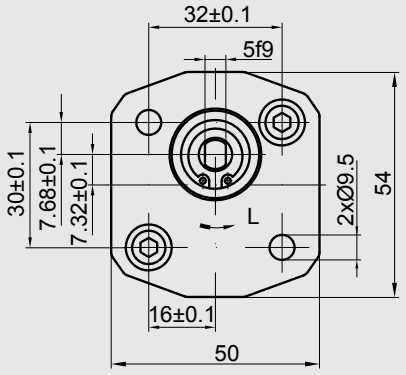


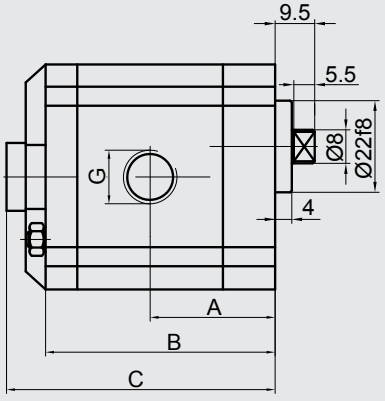
Clockwise

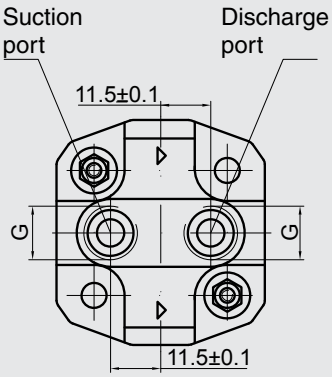




Anti-clockwise







Type	Displacement	Output flow		Rated	Max. speed	Dimensions				
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]	A [mm]	B [mm]	C [mm]	Inlet G	Outlet G
PGE100-25-. CIB-N	0.25	0.3	0.8	170	3500	27.6	55.3	60.8	G 1/4	G 1/4
PGE100-30-. CIB-N	0.30	0.4	0.9			27.7	55.7	61.2		
PGE100-50-. CIB-N	0.50	0.7	1.6			28.7	57.5	63.0		
PGE100-75-. CIB-N	0.75	1.0	2.3			29.9	59.8	65.3		
PGE100-100-. CIB-N	1.00	1.4	3.2			31.0	62.0	67.5		
PGE100-125-. CIB-N	1.25	1.7	3.4		3000	32.1	64.2	69.7		
PGE100-150-. CIB-N	1.50	2.1	3.5	145	2500	33.2	66.5	72.0		
PGE100-175-. CIB-N	1.75	2.4	4.1	130		34.3	68.7	74.2		
PGE100-200-. CIB-N	2.00	2.8	3.7		2000	35.5	70.9	76.4		

6.1 SIZE 1

CONTENTS PGE101

Ordering Code

6.2.1 External Gear Pump

Technical Information

6.2.2 Specifications
6.2.3 Hydraulic fluids
6.2.4 Viscosity range
6.2.5 Temperature range
6.2.6 Seals
6.2.7 Filtration
6.2.8 Installation notes

Dimensions

6.2.9 Drive shafts
6.2.10 Mounting flange
6.2.11 Ports
6.2.12 Preferred series

ORDERING CODE

6.2.1 External Gear Pump

PGE101 – 100 – R B Q 1 – N – XXXX

External gear pump
Size 1

Displacement

100	1	cm³/rev
125	1.25	cm³/rev
160	1.6	cm³/rev
200	2	cm³/rev
250	2.5	cm³/rev
315	3.15	cm³/rev
365	3.65	cm³/rev
420	4.2	cm³/rev
500	5	cm³/rev
610	6.1	cm³/rev
740	7.4	cm³/rev

Shaft rotation (viewed from shaft end)

R	Clockwise
L	Anti-clockwise

Shaft

A	Tapered keyed shaft 1:5
B	Tapered keyed shaft 1:8
C	Tang
Z	Special shaft (only on request)

Mounting flange

L	2-hole mounting, centering Ø 32 mm
M	2-hole mounting, centering Ø 32 mm with O-ring
Q	Square flange centering Ø 25.4 mm
Z	Special flange (only on request)

Ports

1	Pipe thread ISO 228-1
2	Metric thread DIN 3852-1
3	Thread UN 2B SAE O-ring boss
4	Square flange (ital. design)
5	Square flange DIN 3901/ ISO 8435
9	Special ports (only on request)

Seals

N	NBR
V	FPM

Modification number

XXXX	Determined by manufacturer

Not all combinations in the ordering code are possible.
Please refer to 6.2.12 Preferred series, or consult HYDAC.
Special options are possible upon request.

6.2.2 Specifications

Pump size			100	125	160	200	250	315	365	420	500	610	740
Geometric displacement		[cm³/rev]	1	1.25	1.6	2	2.5	3.15	3.65	4.2	5	6.1	7.4
Pressure	Rated	[bar]	250									200	170
	Intermittent		280									220	190
	Peak		300									230	200
Drive speed	min.	[rpm]	750										
	max.		3500								3000	2500	2500
Approx. weight		[kg]	1	1.02	1.04	1.05	1.07	1.11	1.14	1.18	1.25	1.3	1.37

The continuous and maximum pressures given here only apply to pumps with flange ports. If threaded ports are required, the performance will be reduced. To find out whether a pump with threaded ports can be used in a high pressure application, please consult HYDAC.

6.2.3 Hydraulic fluids

The pump series is designed for use with

HL Hydraulic oil
(normal mineral oil)
and
HLP Hydraulic oils of the R&O type
(Rust and Oxidation inhibitor)

6.2.4 Viscosity range

Normal operating viscosity:
16 - 200 cSt (mm²/s)

For other viscosity ranges, please contact HYDAC.

6.2.5 Temperature range

Ambient temperature range
-22 to 55 °C

Fluid temperature range
NBR
-25 up to 85 °C
Viton
-15 up to 90 °C

6.2.6 Seals

The pump series is equipped with NBR seals.

If special hydraulic fluids are used, the seal material must be changed if required. Please contact HYDAC.

6.2.7 Filtration

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

21/ 18/ 15 to ISO 4406:1999

or

Class 9 to NAS 1638 or cleaner.

At system pressures above 160 bar cleanliness class:

19/17/14 to ISO 4406:1999

or

Class 8 to NAS 1638 is required.

6.2.8 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:
2.2 bar abs.

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°.

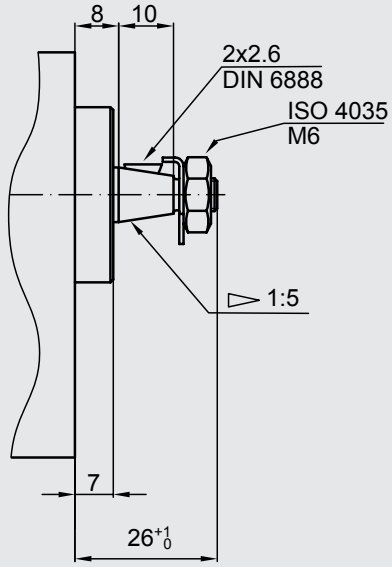
Drive shafts with tang are for direct mounting onto an electric motor or a gearbox. The driver for the tang is not included.

For indirect drives (with gear, chain or belt drives) please consult Hydac.

DIMENSIONS

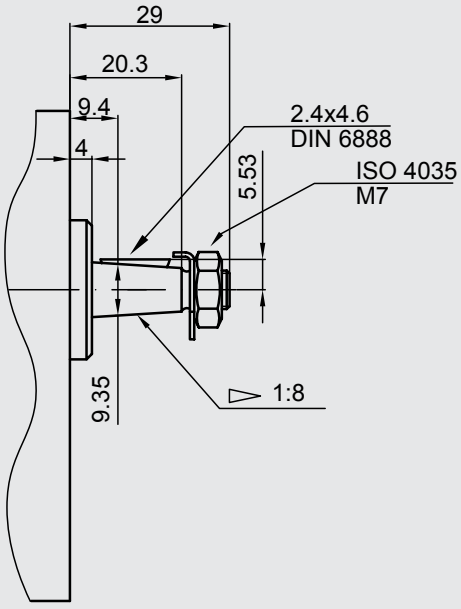
6.2.9 Drive shafts

A Tapered keyed shaft 1:5



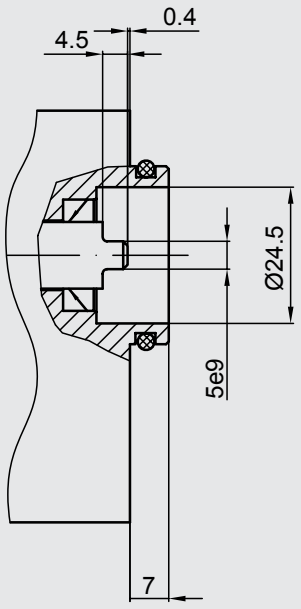
relevant mounting flange **L**

B Tapered keyed shaft 1:8



relevant mounting flange **Q**

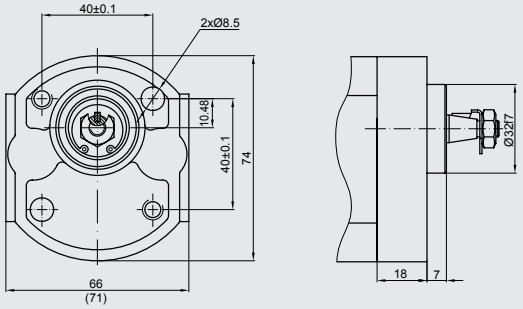
C Tang



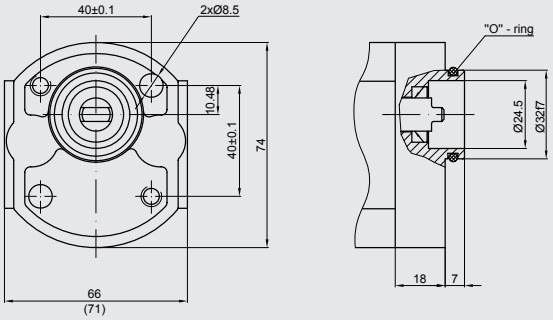
relevant mounting flange **M**

6.2.10 Mounting flange

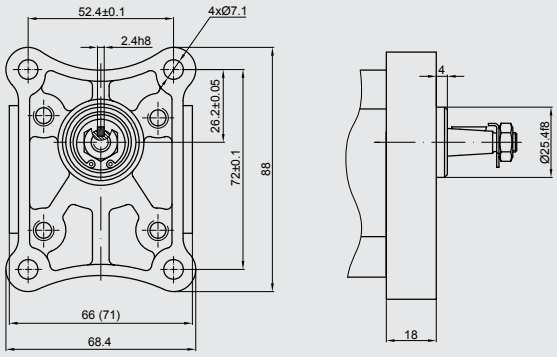
L 2-hole mounting centering Ø 32 mm

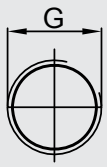


M 2-hole mounting centering Ø 32 mm with O-ring



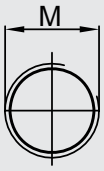
Q Square flange centering Ø 25.4 mm





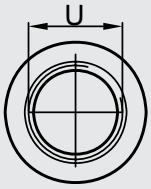
1 Pipe thread
ISO 228/1

Ordering code	Displacement	Outlet G	Inlet G
1	1 ... 2.5 cm³	G 3/8	G 3/8
	3.15 ... 7.4 cm³	G 3/8	G 1/2



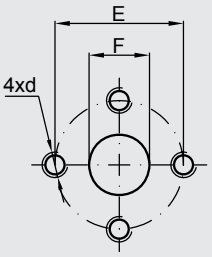
2 Metric thread
DIN 3852-1

Ordering code	Displacement	Outlet M	Inlet M
2	1 ... 2.5 cm³	M16x1.5	M16x1.5
	3.15 ... 6.1 cm³	M16x1.5	M20x1.5
	7.4 cm³	M18x1.5	M22x1.5



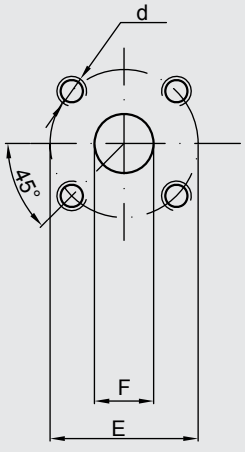
3 Pipe thread
UN 2B SAE
O-ring boss

Ordering code	Displacement	Outlet U	Inlet U
3	1 ... 6.1 cm³	9/16-18 UNF	3/4-16 UNF
	7.4 cm³	3/4 16 UNF	7/8-14 UNF



4 Square flange
(Italian design)

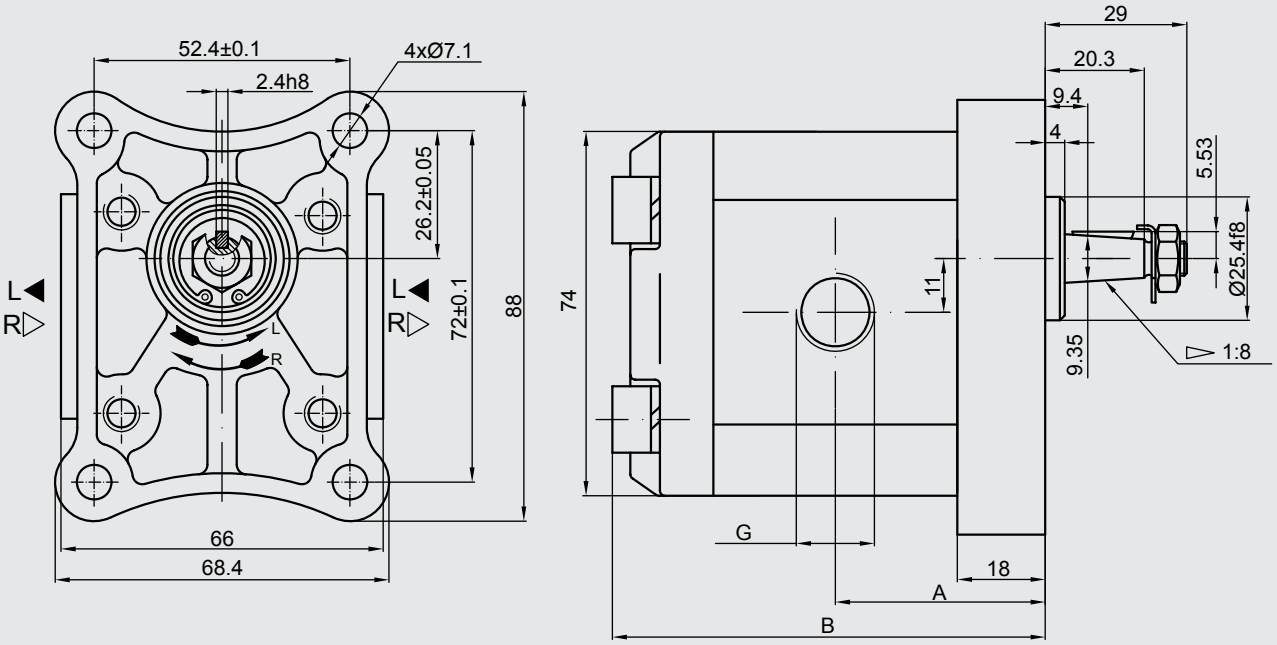
Ordering code	Displacement	Outlet			Inlet		
		F	E	d	F	E	d
4	1 ... 7.4 cm³	12	30	M6	12	30	M6



5 Square flange
DIN 3901/ ISO 8435

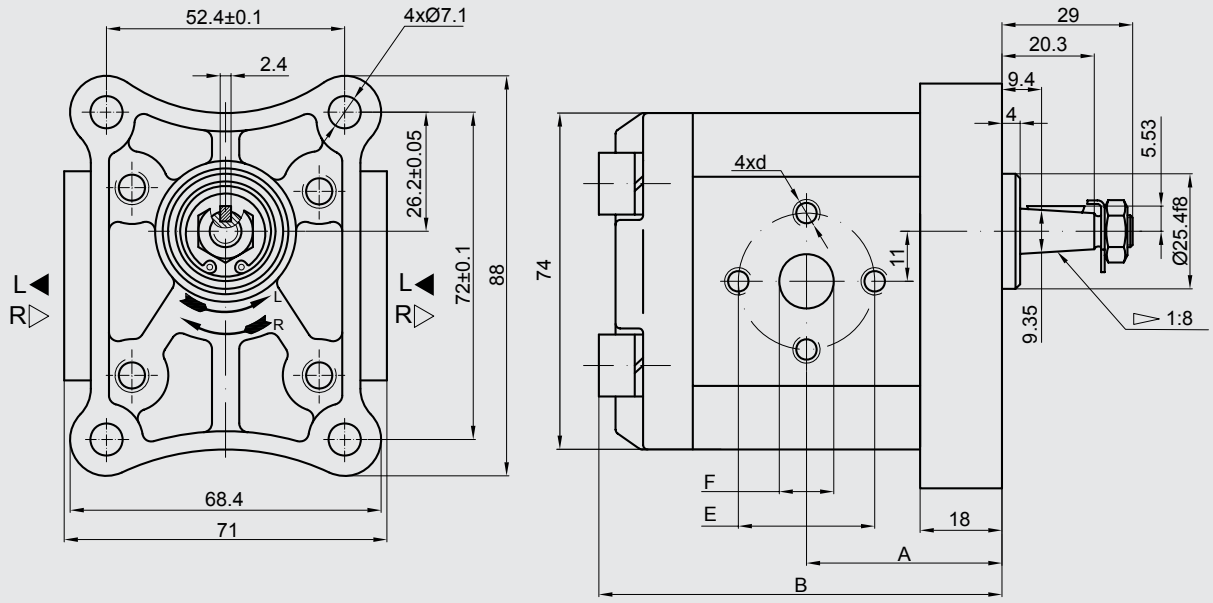
Ordering code	Displacement	Outlet			Inlet		
		F	E	d	F	E	d
5	1 ... 7.4 cm³	12	30	M6	12	30	M6

PGE101-...-.BQ1-N



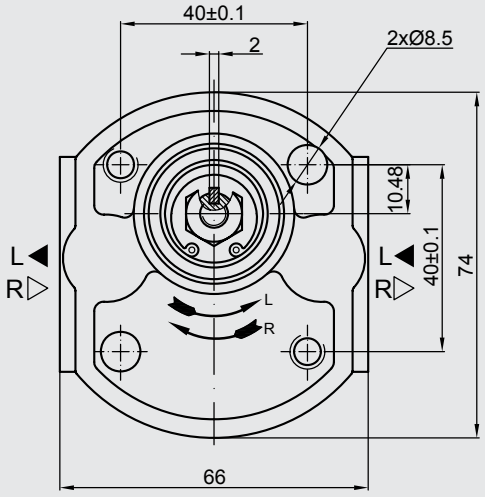
Type	Displacement	Output flow		Rated	Max. speed	Dimension			
		at 1500 rpm	at max. rpm						
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]	A [mm]	B [mm]	Inlet G	Outlet G
PGE101-100-. BQ1-N	1	1.40	3.26			39.1	81		
PGE101-125-. BQ1-N	1.25	1.74	4.07			39.5	82		
PGE101-160-. BQ1-N	1.6	2.23	5.21			40.3	83.6	G 3/8"	
PGE101-200-. BQ1-N	2	2.82	6.58			41.1	85.2		
PGE101-250-. BQ1-N	2.5	3.53	8.23	250	3500	42.1	87.2		
PGE101-315-. BQ1-N	3.15	4.44	10.36			43.5	89.8		
PGE101-365-. BQ1-N	3.65	5.15	12.01			44.4	91.9		
PGE101-420-. BQ1-N	4.2	5.92	13.82			45.5	94.1		G 3/8"
PGE101-500-. BQ1-N	5	7.05	14.10			47.1	97.2	G 1/2"	
PGE101-610-. BQ1-N	6.1	8.69	14.49	200	3000	49.4	101.8		
PGE101-740-. BQ1-N	7.4	10.55	17.58	170	2500	52.1	107.2		

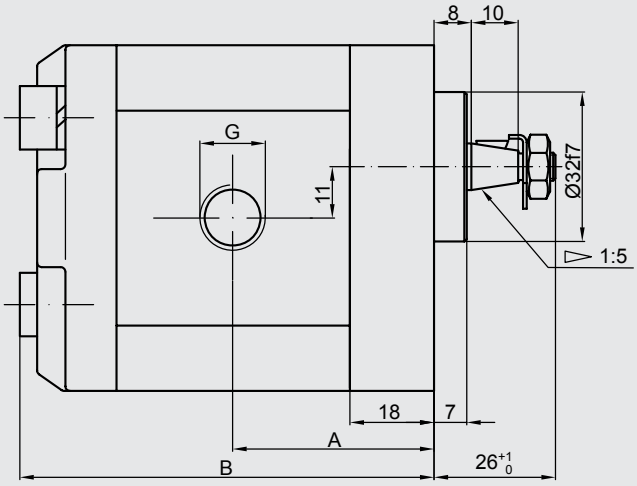
PGE101-...-.BQ4-N



Type	Displacement	Output flow		Rated	Max. speed	Dimension						
		at 1500 rpm	at max. rpm		n	A	B	Inlet			Outlet		
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	E	F	d	E	F	d
PGE101-100-. BQ4-N	1	1.40	3.26	250	3500	39.1	81	Ø 30	Ø 12	M6	Ø 30	Ø 12	M6
PGE101-125-. BQ4-N	1.25	1.74	4.07			39.5	82						
PGE101-160-. BQ4-N	1.6	2.23	5.21			40.3	83.6						
PGE101-200-. BQ4-N	2	2.82	6.58			41.1	85.2						
PGE101-250-. BQ4-N	2.5	3.53	8.23			42.1	87.2						
PGE101-315-. BQ4-N	3.15	4.44	10.36			43.5	89.8						
PGE101-365-. BQ4-N	3.65	5.15	12.01			44.4	91.9						
PGE101-420-. BQ4-N	4.2	5.92	13.82			45.5	94.1						
PGE101-500-. BQ4-N	5	7.05	14.10			47.1	97.2						
PGE101-610-. BQ4-N	6.1	8.69	14.49	200	3000	49.4	101.8						
PGE101-740-. BQ4-N	7.4	10.55	17.58	170	2500	52.1	107.2						

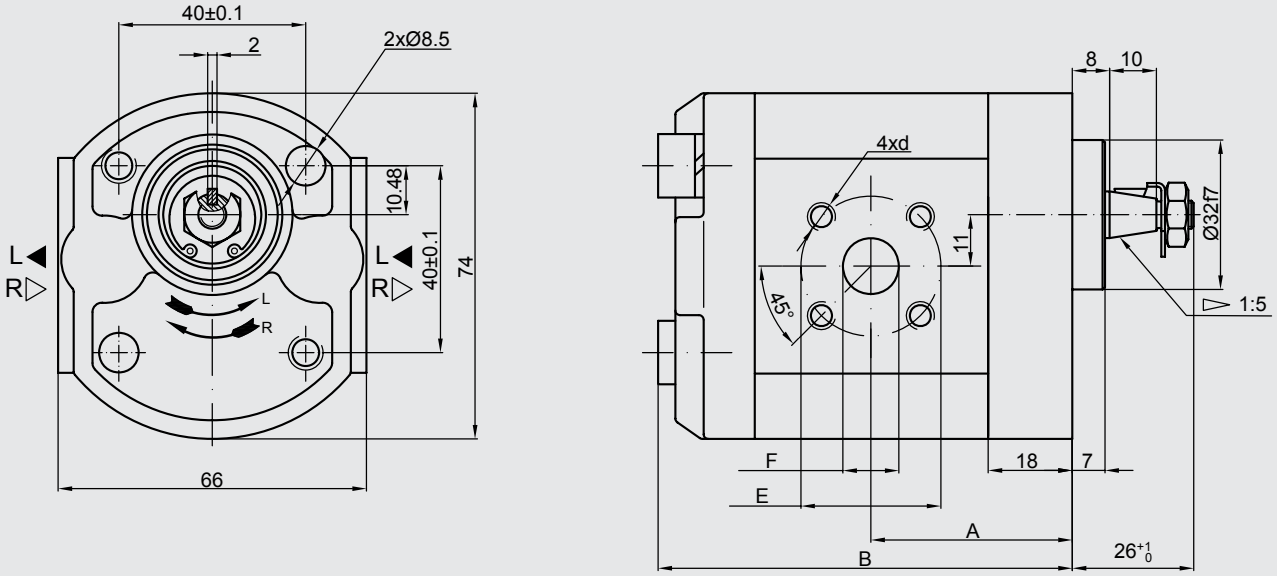
PGE101-...-.AL1-N





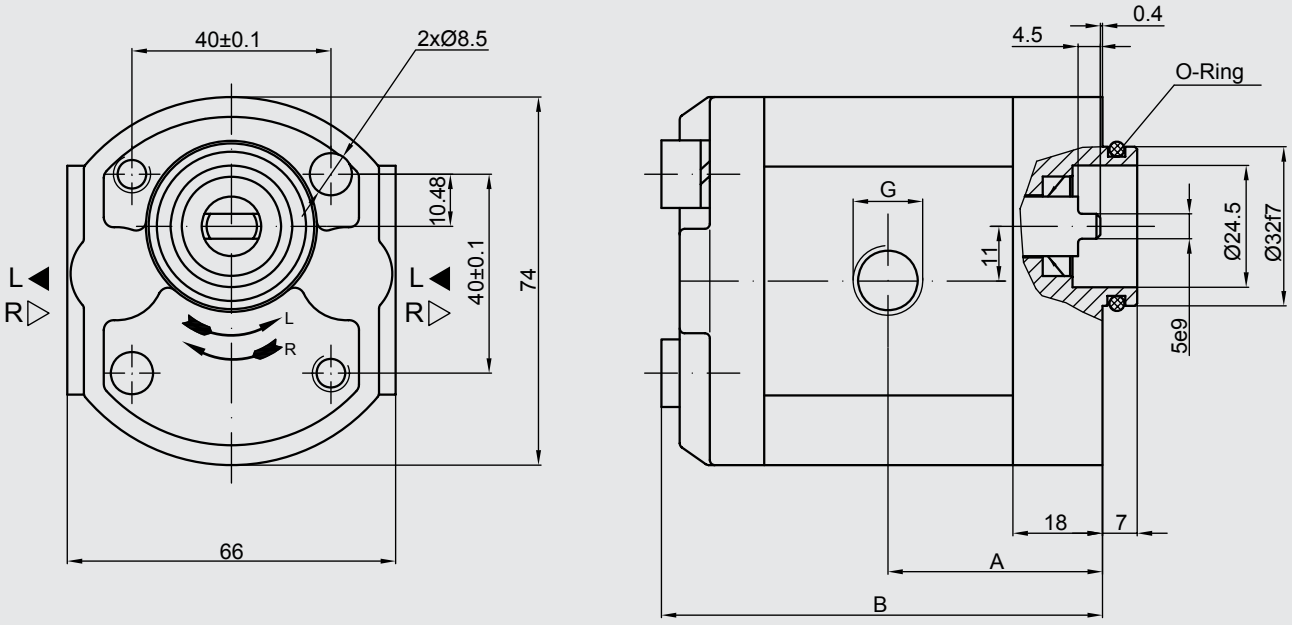
Type	Displacement	Output flow		Rated	Max. speed	Dimension			
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]	A [mm]	B [mm]	Inlet G	Outlet G
PGE101-100-. AL1-N	1	1.40	3.26	250	3500	39.1	81	G 3/8"	G 3/8"
PGE101-125-. AL1-N	1.25	1.74	4.07			39.5	82		
PGE101-160-. AL1-N	1.6	2.23	5.21			40.3	83.6		
PGE101-200-. AL1-N	2	2.82	6.58			41.1	85.2		
PGE101-250-. AL1-N	2.5	3.53	8.23			42.1	87.2		
PGE101-315-. AL1-N	3.15	4.44	10.36			43.5	89.8	G 1/2"	
PGE101-365-. AL1-N	3.65	5.15	12.01			44.4	91.9		
PGE101-420-. AL1-N	4.2	5.92	13.82			45.5	94.1		
PGE101-500-. AL1-N	5	7.05	14.10			47.1	97.2		
PGE101-610-. AL1-N	6.1	8.69	14.49	200	3000	49.4	101.8		
PGE101-740-. AL1-N	7.4	10.55	17.58	170	2500	52.1	107.2		

PGE101-...-.AL5-N



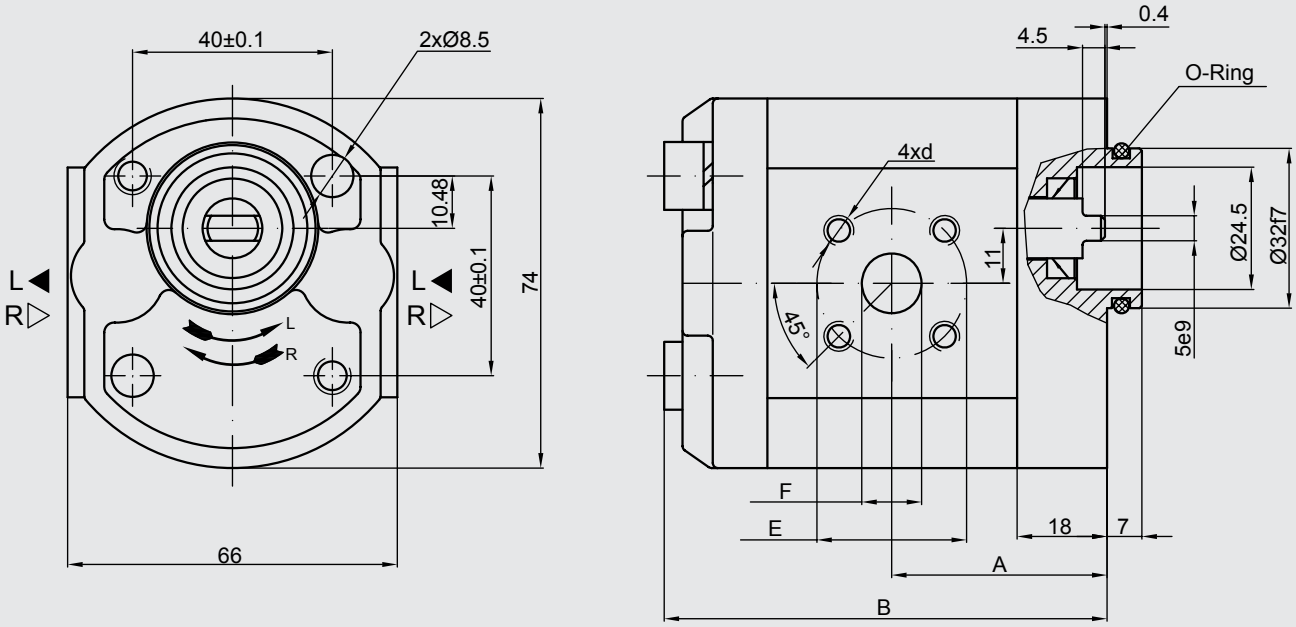
Type	Displacement	Output flow		Rated	Max. speed	Dimension						
		at 1500 rpm	at max. rpm					Inlet			Outlet		
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]	A [mm]	B [mm]	E	F	d	E	F	d
PGE101-100-. AL5-N	1	1.40	3.26			39.1	81						
PGE101-125-. AL5-N	1.25	1.74	4.07			39.5	82						
PGE101-160-. AL5-N	1.6	2.23	5.21			40.3	83.6						
PGE101-200-. AL5-N	2	2.82	6.58			41.1	85.2						
PGE101-250-. AL5-N	2.5	3.53	8.23	250	3500	42.1	87.2						
PGE101-315-. AL5-N	3.15	4.44	10.36			43.5	89.8	Ø 30	Ø 12	M6	Ø 30	Ø 12	M6
PGE101-365-. AL5-N	3.65	5.15	12.01			44.4	91.9						
PGE101-420-. AL5-N	4.2	5.92	13.82			45.5	94.1						
PGE101-500-. AL5-N	5	7.05	14.10			47.1	97.2						
PGE101-610-. AL5-N	6.1	8.69	14.49	200	3000	49.4	101.8						
PGE101-740-. AL5-N	7.4	10.55	17.58	170	2500	52.1	107.2						

PGE101-...-.CM1-N



Type	Displacement	Output flow		Rated	Max. speed	Dimension			
		at 1500 rpm	at max. rpm						
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]	A [mm]	B [mm]	Inlet G	Outlet G
PGE101-100-. CM1-N	1	1.40	3.26			39.1	81		
PGE101-125-. CM1-N	1.25	1.74	4.07			39.5	82		
PGE101-160-. CM1-N	1.6	2.23	5.21			40.3	83.6	G 3/8"	
PGE101-200-. CM1-N	2	2.82	6.58			41.1	85.2		
PGE101-250-. CM1-N	2.5	3.53	8.23	250	3500	42.1	87.2		
PGE101-315-. CM1-N	3.15	4.44	10.36			43.5	89.8		G 3/8"
PGE101-365-. CM1-N	3.65	5.15	12.01			44.4	91.9		
PGE101-420-. CM1-N	4.2	5.92	13.82			45.5	94.1	G 1/2"	
PGE101-500-. CM1-N	5	7.05	14.10			47.1	97.2		
PGE101-610-. CM1-N	6.1	8.69	14.49	200	3000	49.4	101.8		
PGE101-740-. CM1-N	7.4	10.55	17.58	170	2500	52.1	107.2		

PGE101-...-.CM5-N



Type	Displacement	Output flow		Rated	Max. speed	Dimension							
		at 1500 rpm	at max. rpm					Inlet			Outlet		
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]	A [mm]	B [mm]	E	F	d	E	F	d
PGE101-100-. CM5-N	1	1.40	3.26	250	3500	39.1	81	Ø 30	Ø 12	M6	Ø 30	Ø 12	M6
PGE101-125-. CM5-N	1.25	1.74	4.07			39.5	82						
PGE101-160-. CM5-N	1.6	2.23	5.21			40.3	83.6						
PGE101-200-. CM5-N	2	2.82	6.58			41.1	85.2						
PGE101-250-. CM5-N	2.5	3.53	8.23			42.1	87.2						
PGE101-315-. CM5-N	3.15	4.44	10.36			43.5	89.8						
PGE101-365-. CM5-N	3.65	5.15	12.01			44.4	91.9						
PGE101-420-. CM5-N	4.2	5.92	13.82			45.5	94.1						
PGE101-500-. CM5-N	5	7.05	14.10			47.1	97.2						
PGE101-610-. CM5-N	6.1	8.69	14.49	200	3000	49.4	101.8						
PGE101-740-. CM5-N	7.4	10.55	17.58	170	2500	52.1	107.2						

6.3 SIZE 2

CONTENTS PGE102

Ordering Code

6.3.1 External Gear Pump

Technical Information

6.3.2 Specifications
6.3.3 Hydraulic fluids
6.3.4 Viscosity range
6.3.5 Temperature range
6.3.6 Seals
6.3.7 Filtration
6.3.8 Installation notes

Dimensions

6.3.9 Drive shafts
6.3.10 Mounting flange
6.3.11 Ports
6.3.12 Preferred series

ORDERING CODE

6.3.1 External Gear Pump

PGE102 – 1000 – R B R 1 – N – XXXX

External gear pump
Size 2

Displacement

450	4.5 cm³/rev
630	6.3 cm³/rev
820	8.2 cm³/rev
1000	10.0 cm³/rev
1130	11.3 cm³/rev
1200	12.0 cm³/rev
1400	14.0 cm³/rev
1500	15.0 cm³/rev
1600	16.0 cm³/rev
1730	17.3 cm³/rev
1900	19.0 cm³/rev
2200	22.0 cm³/rev
2500	25.0 cm³/rev
2800	28.0 cm³/rev

Shaft rotation (viewed from shaft end)

R	Clockwise
L	Anti-clockwise

Shaft

A	Tapered keyed shaft 1:5
B	Tapered keyed shaft 1:8
C	Tang
E	Splined shaft SAE A - J 744 16-4 9T
G	Splined shaft SAE J 744 19-4 11T
H	Keyed shaft SAE A - J 744 16-1 A
I	Keyed shaft ISO Ø 18 mm
Z	Special shaft (only on request)

Mounting flange

N	2-hole mounting, centering Ø 50 mm
O	2-hole mounting, centering Ø 52 mm with O-ring
R	Square flange, centering Ø 36.5 mm
T	Square flange, centering Ø 80 mm
W	SAE J 744 82-2 A Ø 82.55 mm
X	SAE J 744 101-2 B Ø 101.6 mm
Y	Outboard bearing Ø 80 mm, type 1
Z	Special flange (only on request)

Ports

1	Pipe thread ISO 228-1
2	Metric thread DIN 3852-1
3	Thread UN 2B SAE O-ring boss
4	Square flange (Italian design)
5	Square flange DIN 3901/ ISO 8435
9	Special ports (only on request)

Seals

N	NBR
V	FPM

Modification number

XXXX	Determined by manufacturer

Not all combinations in the ordering code are possible.
Please refer to point 6.3.12 Preferred series, or consult HYDAC.
Special options are possible upon request.

6.3.2 Specifications

Pump size			450	630	820	1000	1130	1200	1400	1500	1600	1730	1900	2200	2500	2800
Geometric displacement		[cm³/ rev]	4.5	6.3	8.2	10	11.3	12	14	15	16	17.3	19	22	25	28
Pressure	Rated	[bar]	250						250			220	200	180	160	120
	Intermittent		280						270			250	220	200	180	140
	Peak		300						280			270	230	210	190	150
Drive speed	Min.	[rpm]	750													
	Max.		3500							3000				2500		
Approx. weight		[kg]	3.34	3.36	3.37	3.57	3.62	3.64	3.78	4.16	4.2	4.24	4.32	4.44	4.56	4.68

The continuous and maximum pressures given here only apply to pumps with flange ports. If threaded ports are required, the performance will be reduced. To find out whether a pump with threaded ports can be used in a high pressure application, please consult HYDAC.

6.3.3 Hydraulic fluids

The pump series is designed for use with

HL Hydraulic oil (normal mineral oil) and

HLP Hydraulic oils of the R&O type (Rust and Oxidation inhibitor)

6.3.4 Viscosity range

Normal operating viscosity:
16 - 200 cSt (mm²/s)

For other viscosity ranges, please contact HYDAC.

6.3.5 Temperature range

Ambient temperature range
-22 to 55 °C

Fluid temperature range
NBR
-25 to 85 °C
Viton
-15 to 90 °C

6.3.6 Seals

The pump series is equipped with NBR seals.

If special hydraulic fluids are used, the seal material must be changed if required. Please contact HYDAC.

6.3.7 Filtration

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

21/ 18/ 15 to ISO 4406:1999

or

Class 9 to NAS 1638 or cleaner.

At system pressures above 160 bar cleanliness class:

19/17/14 to ISO 4406:1999

or

Class 8 to NAS 1638 is required.

6.3.8 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:
2.2 bar abs.

C. Drive

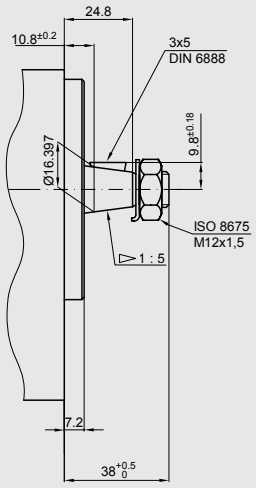
Use a flexible coupling whenever possible. There must not be any radial or axial forces on the pump shaft. The maximum permitted misalignment of the shafts is 0.2 mm and the angular deviation must be less than 0.2°.

Drive shafts with tang are for direct mounting onto an electric motor or a gearbox. The driver for the tang is not included.

For indirect drives (with gear, chain or belt drives) please consult Hydac.

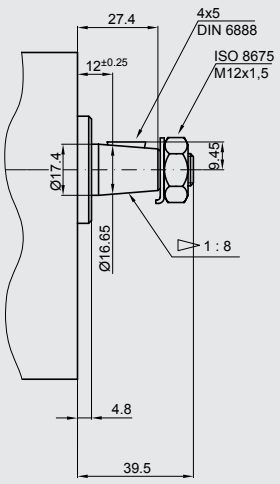
6.3.9 Drive shafts

A Tapered keyed shaft 1:5



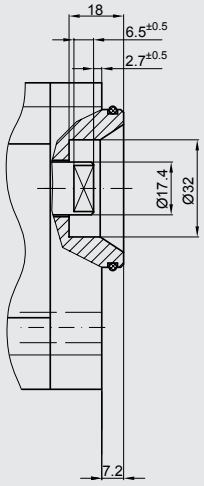
relevant mounting flange **T** **N** **Y**

B Tapered keyed shaft 1:8



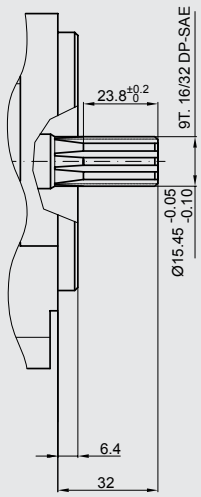
relevant mounting flange **R**

C Tang



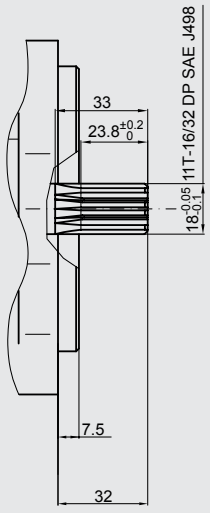
relevant mounting flange **O**

E Splined shaft SAE A - J 744 16-4 9T



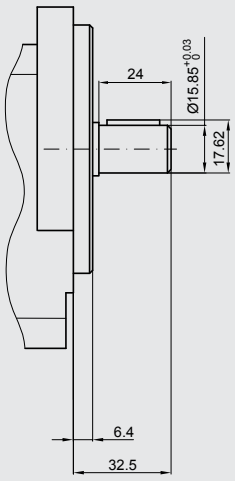
relevant mounting flange **W**

G Splined shaft SAE J 744 19-4 11T



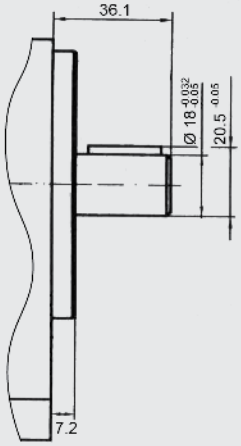
relevant mounting flange **W** **X**

H Keyed shaft SAE A - J 744 16-1 A



relevant mounting flange **W**

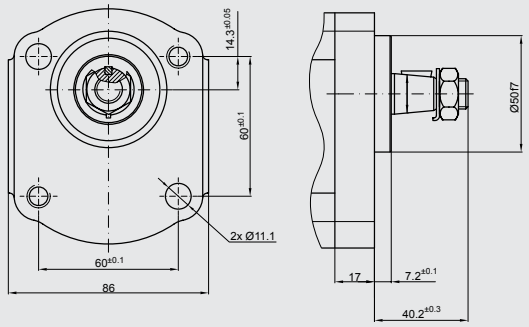
I Keyed shaft ISO Ø 18 mm



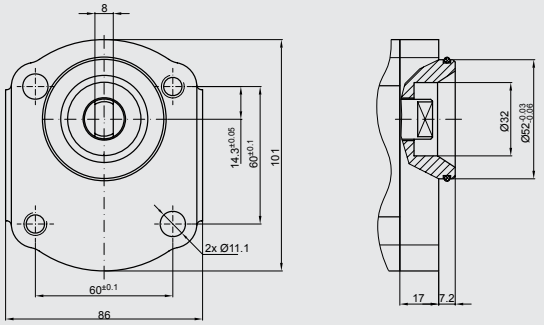
relevant mounting flange **T**

6.3.10 Mounting flange

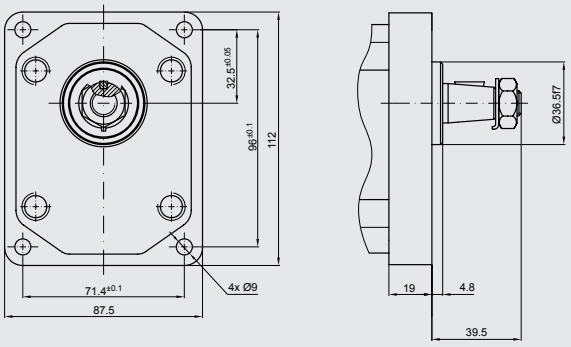
N 2-hole mounting
centering Ø 50 mm



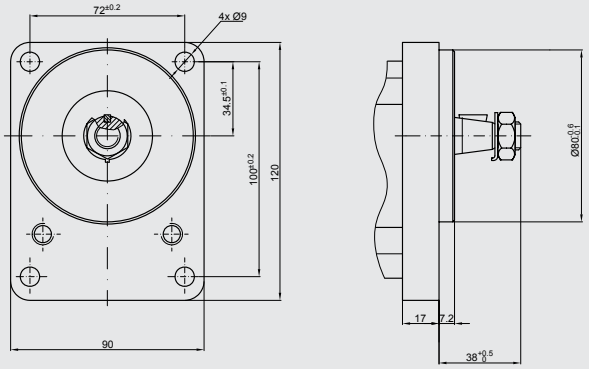
O 2-hole mounting
centering Ø 52 mm with O-ring



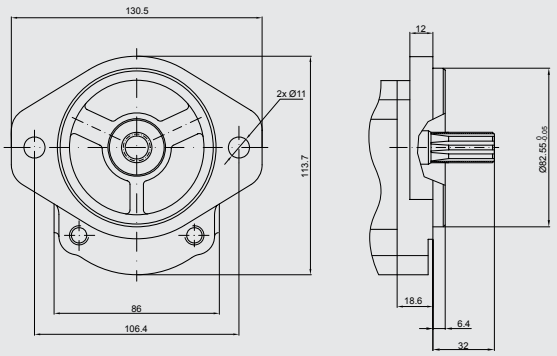
R Square flange
centering Ø 36.5 mm



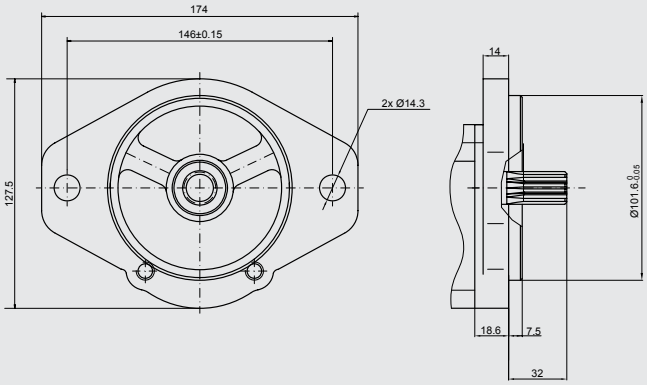
T Square flange
centering Ø 80 mm



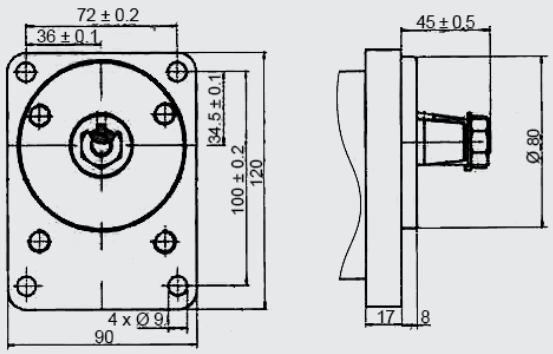
W SAE J 744 82-2 A
Ø 82.55 mm

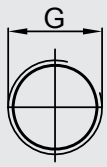


X SAE J 744 101-2 B
Ø 101.6 mm



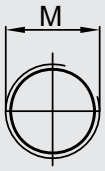
Y Outboard bearing
Ø 80 mm type 1





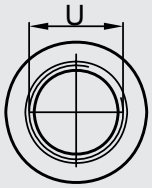
1 Pipe thread
ISO 228/1

Ordering code	Displacement	Outlet G	Inlet G
1	4.5 ... 8.2 cm³	G 1/2	G 1/2
	10 ... 25 cm³	G 1/2	G 3/4
	28 cm³	G 3/4	G 1



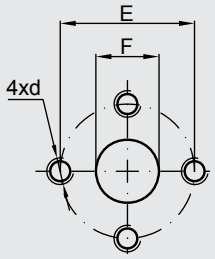
2 Metric thread
DIN 3852-1

Ordering code	Displacement	Outlet M	Inlet M
2	4.5 ... 25 cm³	M16x1.5	M20x1.5
	28 cm³	M20x1.5	M27x2



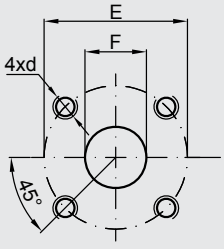
3 Pipe thread
UN 2B SAE
O-ring boss

Ordering code	Displacement	Outlet U	Inlet U
3	4.5 ... 25 cm³	7/8" -14 UNF	1 1/16" -12 UN
	28 cm³	1 1/16" -12 UN	1 5/16" -12 UN



4 Square flange
(Italian design)

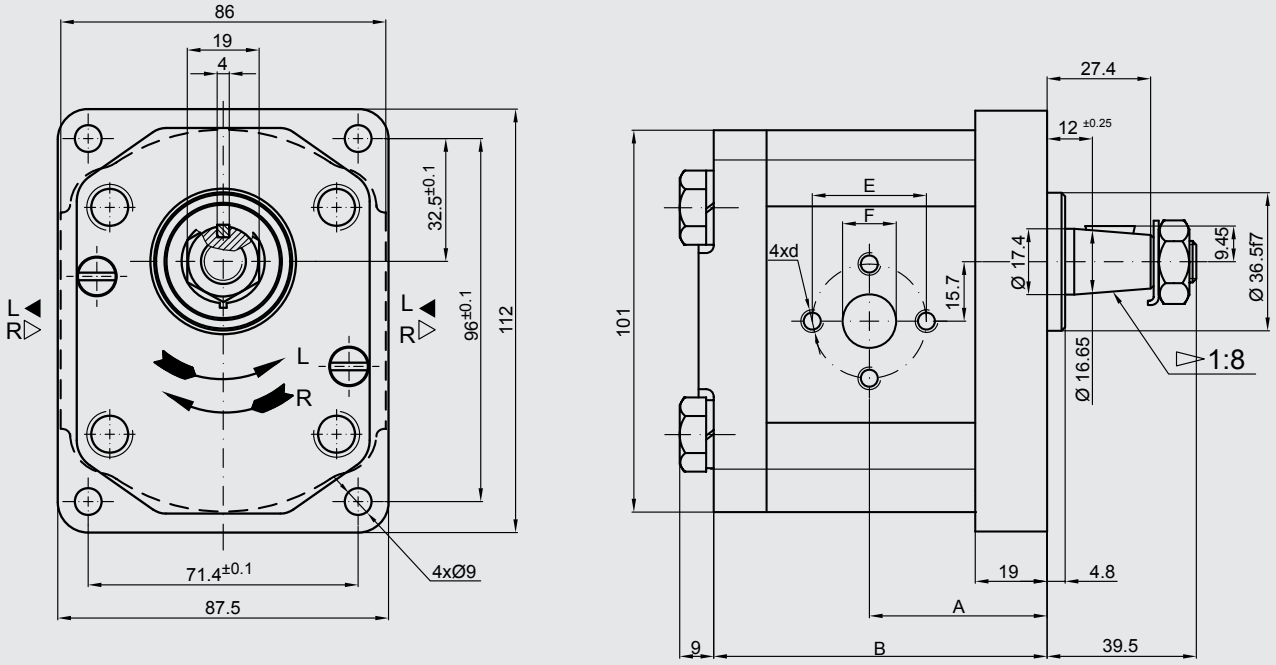
Ordering code	Displacement	Outlet			Inlet		
		E	F	d	E	F	d
4	4.5 ... 8.2 cm³	30	13.1	M6	30	13.1	M6
	10 ... 22 cm³	30	14.2	M6	40	19	M8
	25 ... 28 cm³	40	19	M8	40	19	M8



5 Square flange
DIN 3901/ ISO 8435

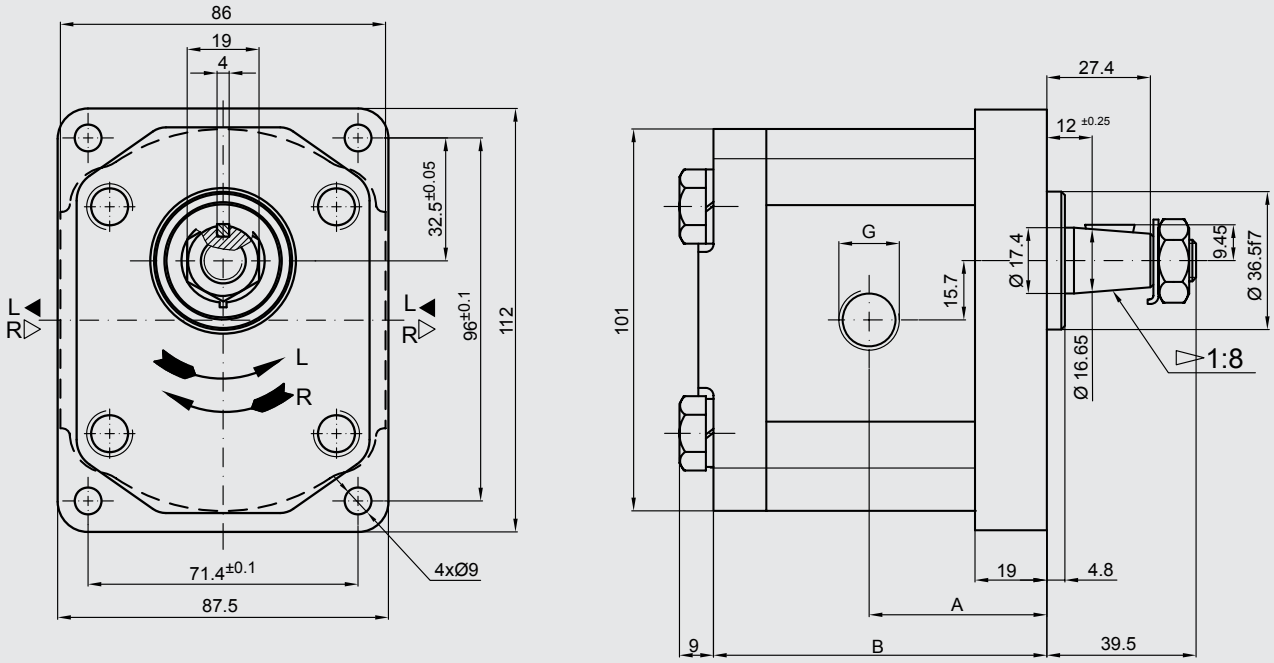
Ordering code	Displacement	Outlet			Inlet		
		E	F	d	E	F	d
5	4.5 ... 6.3 cm³	35	15	M6	40	15	M6
	8.2 ... 25 cm³	35	15	M6	40	20	M6
	28 cm³	40	20	M6	40	20	M6

PGE102-...-. BR4-N



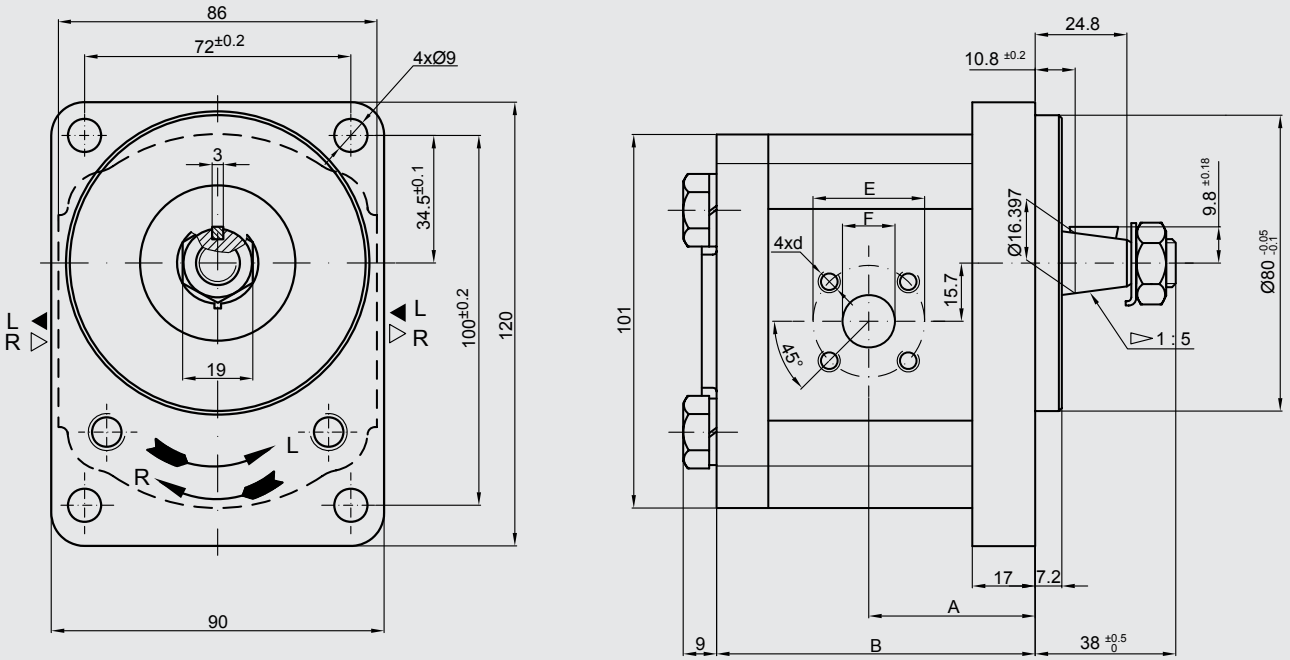
Type	Displace-ment	Output flow		Rated	Drive speed	Dimension							
		at 1500 rpm	at max. rpm					Inlet			Outlet		
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]	A [mm]	B [mm]	E	F	d	E	F	d
PGE102-450-. BR4-N	4.5	6.14	14.33	250	3500	42.5	80	30	13.1	M6	30	14.2	M6
PGE102-630-. BR4-N	6.3	8.69	20.29			42.5	80						
PGE102-820-. BR4-N	8.2	11.32	26.40			42.5	80						
PGE102-1000-. BR4-N	10	13.95	32.55			47	89	40	19	M8			
PGE102-1130-. BR4-N	11.3	15.76	36.78			48	91.1						
PGE102-1200-. BR4-N	12	16.92	39.48			48.6	92.3						
PGE102-1400-. BR4-N	14	19.95	46.55			50	95.4						
PGE102-1500-. BR4-N	15	21.60	43.20		3000	56	107.2						
PGE102-1600-. BR4-N	16	23.04	46.08			56.9	108.8						
PGE102-1730-. BR4-N	17.3	24.91	49.82	220		58	110.9						
PGE102-1900-. BR4-N	19	27.36	54.72	200		59.4	113.8						
PGE102-2200-. BR4-N	22	31.68	52.80	180	2500	61.9	118.8						
PGE102-2500-. BR4-N	25	36.00	60.00	160		64.3	123.7				40	19	M8
PGE102-2800-. BR4-N	28	40.32	67.20	120		66.8	128.5						

PGE102-...-.BR1-N



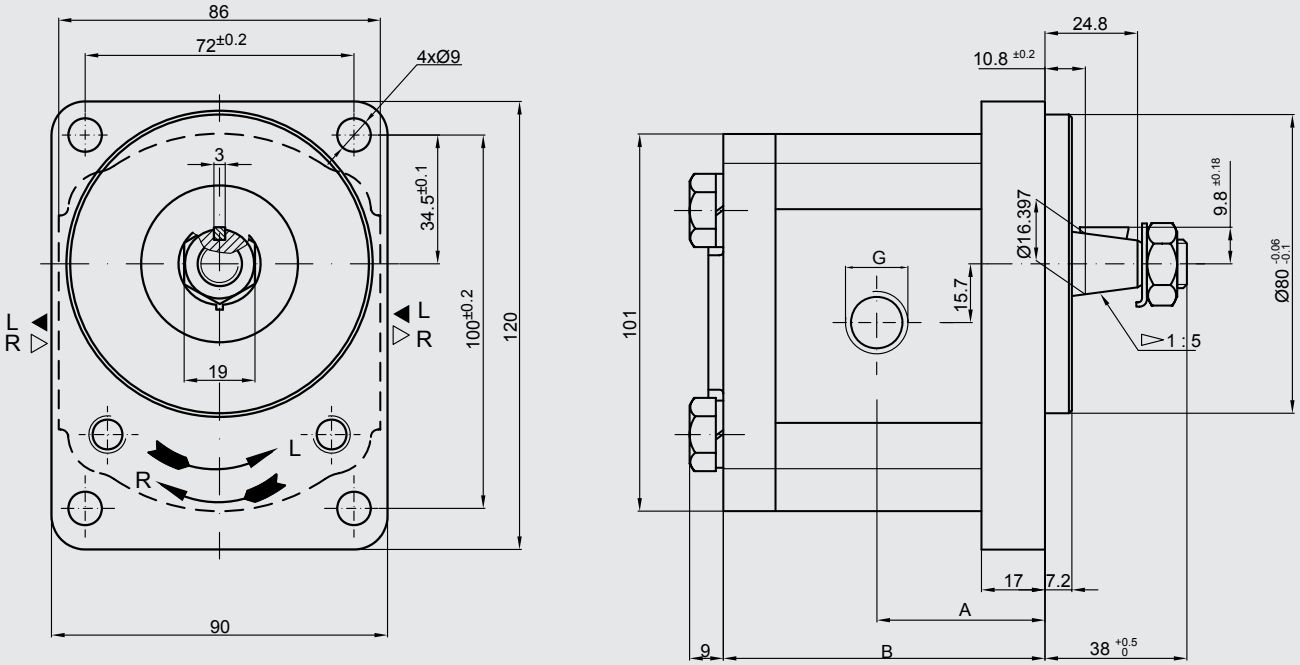
Type	Displacement [cm³/rev]	Output flow at 1500 rpm [l/min]	Output flow at max. rpm [l/min]	Rated [bar]	Drive speed n [rpm]	Dimension A [mm]	Dimension B [mm]	Inlet G	Outlet G
PGE102-450-. BR1-N	4.5	6.14	14.33	250	3500	42.5	80	G 1/2	G 1/2
PGE102-630-. BR1-N	6.3	8.69	20.29			42.5	80		
PGE102-820-. BR1-N	8.2	11.32	26.40			42.5	80		
PGE102-1000-. BR1-N	10	13.95	32.55			47	89	G 3/4	
PGE102-1130-. BR1-N	11.3	15.76	36.78			48	91.1		
PGE102-1200-. BR1-N	12	16.92	39.48			48.6	92.3		
PGE102-1400-. BR1-N	14	19.95	46.55			50	95.4		
PGE102-1500-. BR1-N	15	21.60	43.20		3000	56	107.2		
PGE102-1600-. BR1-N	16	23.04	46.08			56.9	108.8		
PGE102-1730-. BR1-N	17.3	24.91	49.82	220		58	110.9		
PGE102-1900-. BR1-N	19	27.36	54.72	200		59.4	113.8		
PGE102-2200-. BR1-N	22	31.68	52.80	180	2500	61.9	118.8		
PGE102-2500-. BR1-N	25	36.00	60.00	160		64.3	123.7		
PGE102-2800-. BR1-N	28	40.32	67.20	120		66.8	128.5	G 1	G 3/4

PGE102-...-.AT5-N



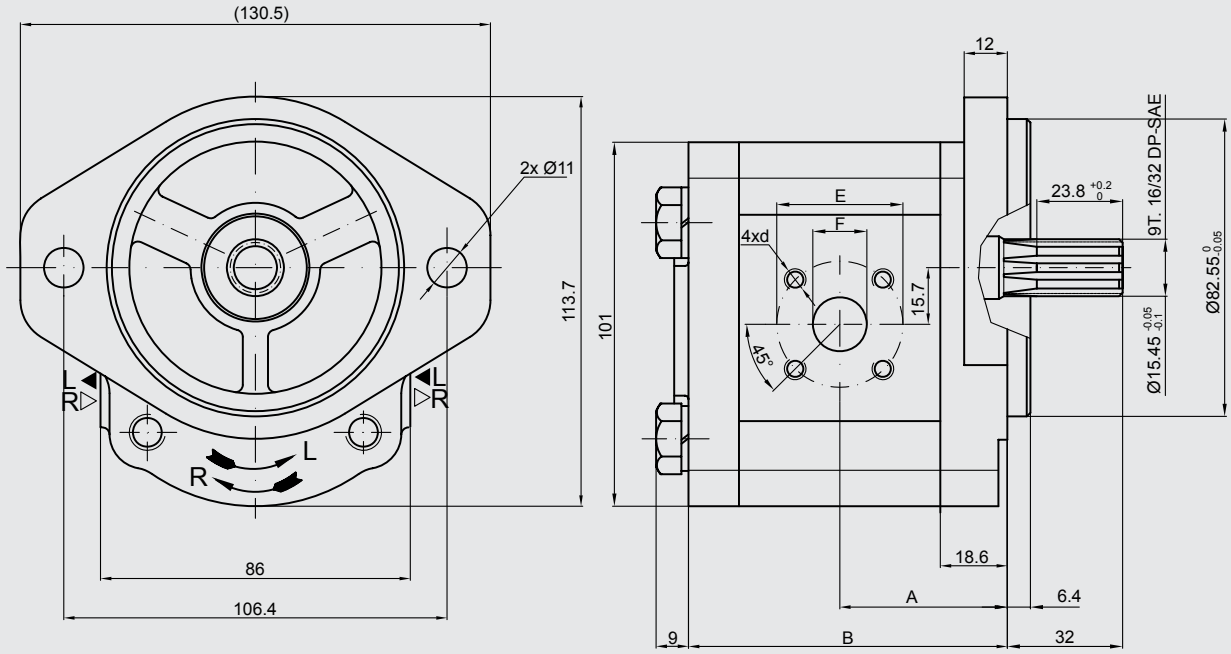
Type	Displacement	Output flow		Rated	Drive speed	Dimension								
		at 1500 rpm	at max. rpm		n	A	B	Inlet			Outlet		
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	E	F	d	E	F	d
PGE102-450-. AT5-N	4.5	6.14	14.33	250	3500	39.8	78	40	15	M6	35	15	M6
PGE102-630-. AT5-N	6.3	8.69	20.29			41	81						
PGE102-820-. AT5-N	8.2	11.32	26.40			43.1	83.9		20				
PGE102-1000-. AT5-N	10	13.95	32.55			47.5	87						
PGE102-1130-. AT5-N	11.3	15.76	36.78				89						
PGE102-1200-. AT5-N	12	16.92	39.48				90.3						
PGE102-1400-. AT5-N	14	19.95	46.55				93.4						
PGE102-1500-. AT5-N	15	21.60	43.20		3000		105.2						
PGE102-1600-. AT5-N	16	23.04	46.08				106.8						
PGE102-1730-. AT5-N	17.3	24.91	49.82	220			108.9						
PGE102-1900-. AT5-N	19	27.36	54.72	200			111.8						
PGE102-2200-. AT5-N	22	31.68	52.80	180	2500	55	116.8						
PGE102-2500-. AT5-N	25	36.00	60.00	160		57.2	121.7						
PGE102-2800-. AT5-N	28	40.32	67.20	120		64.8	126.5				40	20	

PGE102-...-.AT1-N



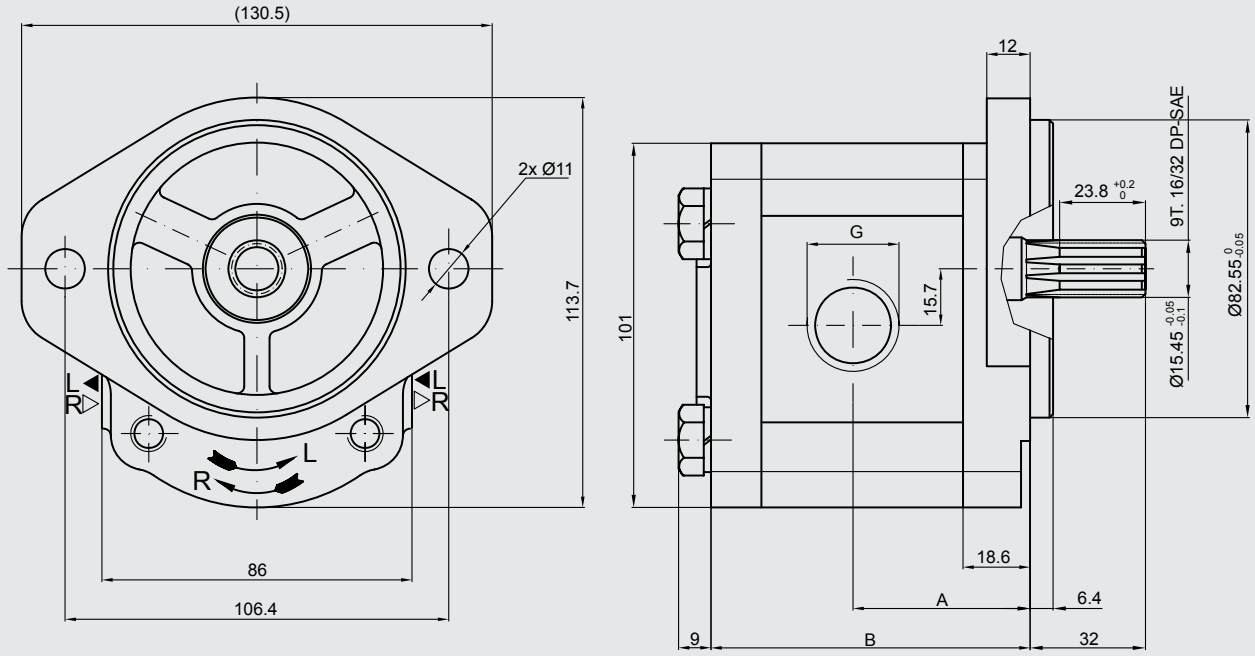
Type	Displacement	Output flow		Rated	Drive speed	Dimension			
		at 1500 rpm	at max. rpm		n	A	B	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G	G
PGE102-450-. AT1-N	4.5	6.14	14.33	250	3500	40.4	78	G 1/2	G 1/2
PGE102-630-. AT1-N	6.3	8.69	20.29			42	81		
PGE102-820-. AT1-N	8.2	11.32	26.40			43.4	83.9		
PGE102-1000-. AT1-N	10	13.95	32.55			45	87	G 3/4	
PGE102-1130-. AT1-N	11.3	15.76	36.78			46	89		
PGE102-1200-. AT1-N	12	16.92	39.48			46.6	90.3		
PGE102-1400-. AT1-N	14	19.95	46.55			48	93.4		
PGE102-1500-. AT1-N	15	21.60	43.20		3000	54	105.2		
PGE102-1600-. AT1-N	16	23.04	46.08			54.9	106.8		
PGE102-1730-. AT1-N	17.3	24.91	49.82	220		56	108.9		
PGE102-1900-. AT1-N	19	27.36	54.72	200		57.4	111.8		
PGE102-2200-. AT1-N	22	31.68	52.80	180	2500	59.9	116.8		
PGE102-2500-. AT1-N	25	36.00	60.00	160		64.3	121.7		
PGE102-2800-. AT1-N	28	40.32	67.20	120		64.8	126.5	G 1	G 3/4

PGE102-...-.EW5-N



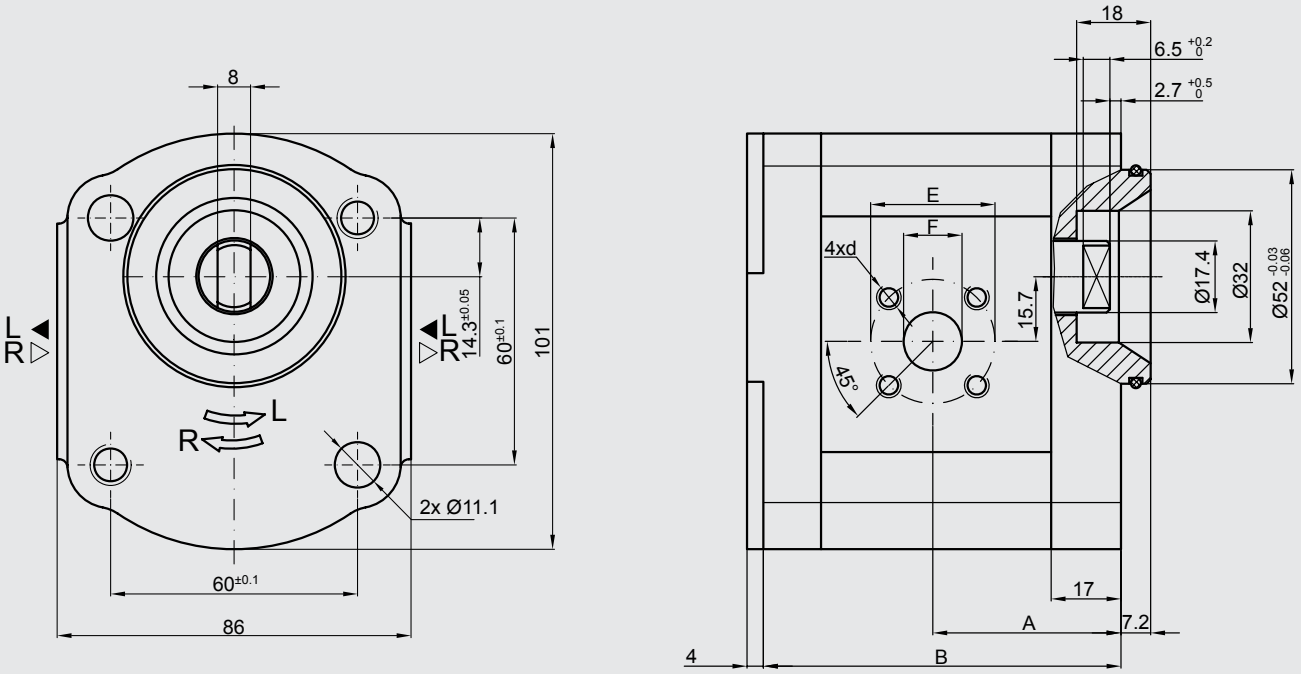
Type	Displacement	Output flow		Rated	Drive speed	Dimension								
		at 1500 rpm	at max. rpm		n	A	B	Inlet			Outlet		
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	E	F	d	E	F	d
PGE102-450-. EW5-N	4.5	6.14	14.33	250	3500	42	79.6	40	15	M6	35	15	M6
PGE102-630-. EW5-N	6.3	8.69	20.29			43.6	82.6						
PGE102-820-. EW5-N	8.2	11.32	26.40			45	85.6		20				
PGE102-1000-. EW5-N	10	13.95	32.55			46.6	88.7						
PGE102-1130-. EW5-N	11.3	15.76	36.78			47.6	90.7						
PGE102-1200-. EW5-N	12	16.92	39.48			48.2	91.9						
PGE102-1400-. EW5-N	14	19.95	46.55			49.6	95						
PGE102-1500-. EW5-N	15	21.60	43.20		3000	55.6	106.8						
PGE102-1600-. EW5-N	16	23.04	46.08			56.5	108.4						
PGE102-1730-. EW5-N	17.3	24.91	49.82	220		57.6	110.5						
PGE102-1900-. EW5-N	19	27.36	54.72	200		59	113.4						
PGE102-2200-. EW5-N	22	31.68	52.80	180	2500	61.5	118.4						
PGE102-2500-. EW5-N	25	36.00	60.00	160		63.9	123.3						
PGE102-2800-. EW5-N	28	40.32	67.20	120		66.4	128.1				40	20	

PGE102-...-.EW1-N



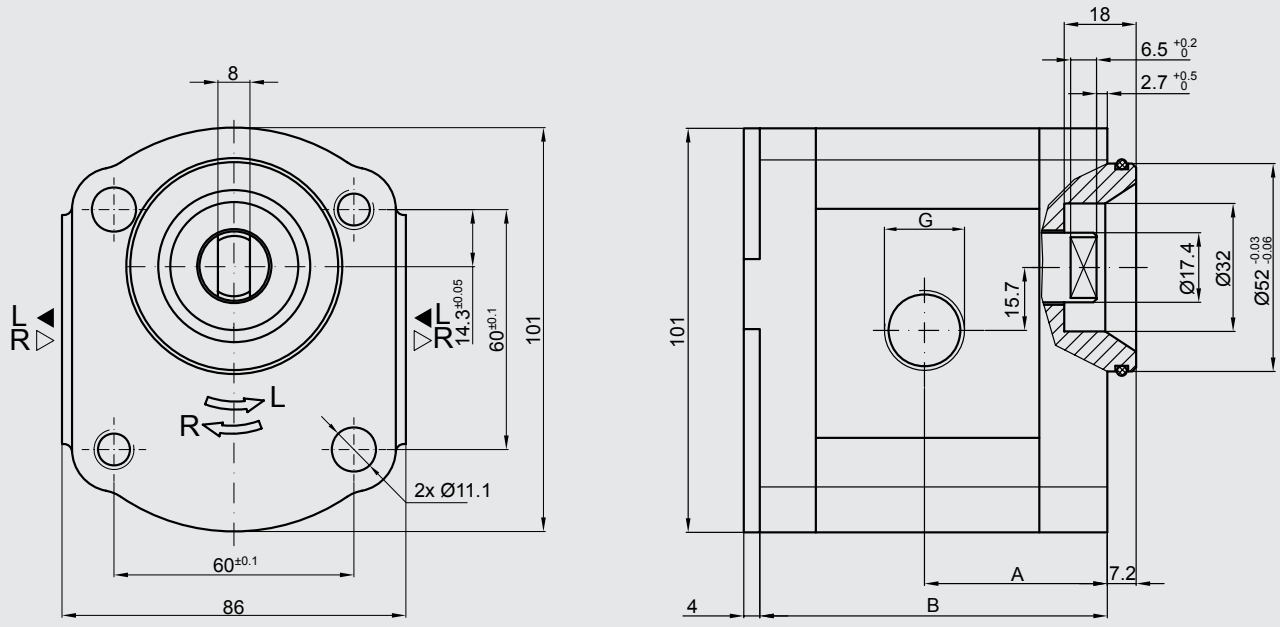
Type	Displacement	Output flow		Rated	Drive speed	Dimension			
		at 1500 rpm	at max. rpm		n	A	B	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G	G
PGE102-450-. EW1-N	4.5	6.14	14.33	250	3500	42	79.6	G 1/2	G 1/2
PGE102-630-. EW1-N	6.3	8.69	20.29			43.6	82.6		
PGE102-820-. EW1-N	8.2	11.32	26.40			45	85.6		
PGE102-1000-. EW1-N	10	13.95	32.55			46.6	88.7	G 3/4	
PGE102-1130-. EW1-N	11.3	15.76	36.78			47.6	90.7		
PGE102-1200-. EW1-N	12	16.92	39.48			48.2	91.9		
PGE102-1400-. EW1-N	14	19.95	46.55			49.6	95		
PGE102-1500-. EW1-N	15	21.60	43.20		3000	55.6	106.8		
PGE102-1600-. EW1-N	16	23.04	46.08			56.5	108.4		
PGE102-1730-. EW1-N	17.3	24.91	49.82	220		57.6	110.5		
PGE102-1900-. EW1-N	19	27.36	54.72	200		59	113.4		
PGE102-2200-. EW1-N	22	31.68	52.80	180	2500	61.5	118.4		
PGE102-2500-. EW1-N	25	36.00	60.00	160		63.9	123.3		
PGE102-2800-. EW1-N	28	40.32	67.20	120		66.4	128.1	G 1	G 3/4

PGE102-...-.CO5-N



Type	Displacement	Output flow		Rated	Drive speed	Dimension								
		at 1500 rpm	at max. rpm					Inlet			Outlet		
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]	A [mm]	B [mm]	E	F	d	E	F	d
PGE102-450-. CO5-N	4.5	6.14	14.33	250	3500	37.3	78	40	15	M6	35	15	M6
PGE102-630-. CO5-N	6.3	8.69	20.29			38.6	81						
PGE102-820-. CO5-N	8.2	11.32	26.40			40.6	83.9		20				
PGE102-1000-. CO5-N	10	13.95	32.55			45	87						
PGE102-1130-. CO5-N	11.3	15.76	36.78			45	89						
PGE102-1200-. CO5-N	12	16.92	39.48			45	90.3						
PGE102-1400-. CO5-N	14	19.95	46.55			45	93.4						
PGE102-1500-. CO5-N	15	21.60	43.20		3000	54	105.2						
PGE102-1600-. CO5-N	16	23.04	46.08			54.9	106.8						
PGE102-1730-. CO5-N	17.3	24.91	49.82	220		56	108.9						
PGE102-1900-. CO5-N	19	27.36	54.72	200		57.4	111.8						
PGE102-2200-. CO5-N	22	31.68	52.80	180	2500	59.9	116.8						
PGE102-2500-. CO5-N	25	36.00	60.00	160		62.3	121.7				40	20	
PGE102-2800-. CO5-N	28	40.32	67.20	120		64.8	126.5						

PGE102-...-.CO1-N



Type	Displacement	Output flow		Rated	Drive speed	Dimension			
		at 1500 rpm	at max. rpm		n	A	B	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G	G
PGE102-450-. CO1-N	4.5	6.14	14.33	250	3500	40.5	78	G 1/2	G 1/2
PGE102-630-. CO1-N	6.3	8.69	20.29			42	81		
PGE102-820-. CO1-N	8.2	11.32	26.40			43.5	83.9		
PGE102-1000-. CO1-N	10	13.95	32.55			45	87	G 3/4	
PGE102-1130-. CO1-N	11.3	15.76	36.78			46	89		
PGE102-1200-. CO1-N	12	16.92	39.48			46.5	90.3		
PGE102-1400-. CO1-N	14	19.95	46.55			48	93.4		
PGE102-1500-. CO1-N	15	21.60	43.20		3000	54	105.2		
PGE102-1600-. CO1-N	16	23.04	46.08			54.9	106.8		
PGE102-1730-. CO1-N	17.3	24.91	49.82	220		56	108.9		
PGE102-1900-. CO1-N	19	27.36	54.72	200		57.4	111.8		
PGE102-2200-. CO1-N	22	31.68	52.80	180	2500	59.9	116.8		
PGE102-2500-. CO1-N	25	36.00	60.00	160		62.3	121.7		
PGE102-2800-. CO1-N	28	40.32	67.20	120		64.8	126.5	G 1	G 3/4

6.4 SIZE 3

CONTENTS PGE103

Ordering Code

6.4.1 External Gear Pump

Technical Information

6.4.2 Specifications
6.4.3 Hydraulic fluids
6.4.4 Viscosity range
6.4.5 Temperature range
6.4.6 Seals
6.4.7 Filtration
6.4.8 Installation notes

Dimensions

6.4.9 Drive shafts
6.4.10 Mounting flange
6.4.11 Ports
6.4.12 Preferred series

ORDERING CODE

6.4.1 External Gear Pump

PGE103 – 2000 – R B S 1 – N – XXXX

External gear pump
Size 3

Displacement

2000	20.0 cm³/rev
2250	22.5 cm³/rev
2500	25.0 cm³/rev
2800	28.0 cm³/rev
3200	32.0 cm³/rev
3600	36.0 cm³/rev
4200	42.0 cm³/rev
4600	46.0 cm³/rev
5000	50.0 cm³/rev
5500	55.0 cm³/rev
6000	60.0 cm³/rev

Shaft rotation (viewed from shaft end)

R	Clockwise
L	Anti-clockwise

Shaft

A	Tapered key shaft 1:5
B	Tapered key shaft 1:8
F	Splined shaft SAE B - J 744 22-4 13T
Z	Special shaft (only on request)

Mounting flange

S	Square, centering Ø 50.8 mm
V	Square, centering Ø 105 mm
X	SAE J 744 101-2 B Ø 101.6 mm
Z	Special flange (only on request)

Ports

1	Pipe thread ISO 228-1
4	Square flange (Italian design)
5	Square flange DIN 3901/ ISO 8435
7	SAE flange with metric threads
8	SAE flange with UNC threads
9	Special ports (only on request)

Seals

N	NBR
V	FPM

Modification number

XXXX	Determined by manufacturer

Not all combinations in the ordering code are possible.
Please refer to point 6.4.12 Preferred series, or consult HYDAC.
Special options are possible upon request.

6.4.2 Specifications

Pump size			2000	2250	2500	2800	3200	3600	4200	4600	5000	5500	6000
Geometric displacement		[cm³/rev]	20	22.5	25.0	28.0	32.0	36.0	42.0	46.0	50.0	55.0	60.0
Pressure	Rated	[bar]	250					240	230	210	185	165	150
	Intermittent		270					260	250	230	200	180	165
	Peak		300					280	270	250	230	200	180
Drive speed	Min.	[rpm]	750										
	Max.		3000					2800	2500	2300	2100	1750	
Approx. weight		[kg]	7.83	8.0	8.16	8.34	8.78	8.99	9.25	9.47	9.60	9.85	10.10

The continuous and maximum pressures given here only apply to pumps with flange ports. If threaded ports are required, the performance will be reduced. To find out whether a pump with threaded ports can be used in a high pressure application, please consult HYDAC.

6.4.3 Hydraulic fluids

The pump series is designed for use with

HL Hydraulic oil
(normal mineral oil)
and
HLP Hydraulic oils of the R&O type
(Rust and Oxidation inhibitor)

6.4.4 Viscosity range

Normal operating viscosity:
16 - 200 cSt (mm²/s)

For other viscosity ranges, please contact HYDAC.

6.4.5 Temperature range

Ambient temperature range
-22 to 55 °C

Fluid temperature range
NBR
-25 up to 85 °C
Viton
-15 up to 90 °C

6.4.6 Seals

The pump series is equipped with NBR seals.

If special hydraulic fluids are used, the seal material must be changed if required. Please contact HYDAC.

6.4.7 Filtration

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

21/ 18/ 15 to ISO 4406:1999

or

Class 9 to NAS 1638 or cleaner.

At system pressures above 160 bar cleanliness class:

19/17/14 to ISO 4406:1999

or

Class 8 to NAS 1638 is required.

6.4.8 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.

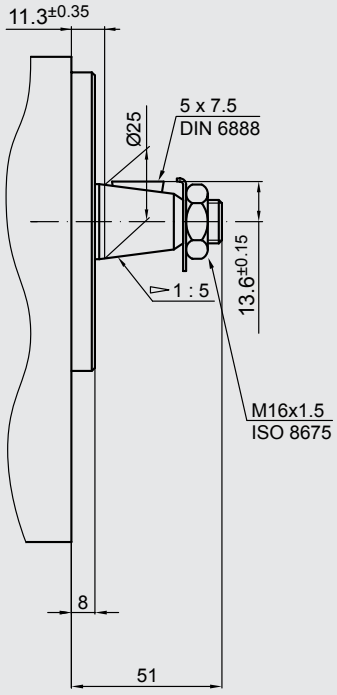
Maximum suction pressure:
2.2 bar abs.

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

For indirect drives (with gear, chain or belt drives) please consult Hydac.

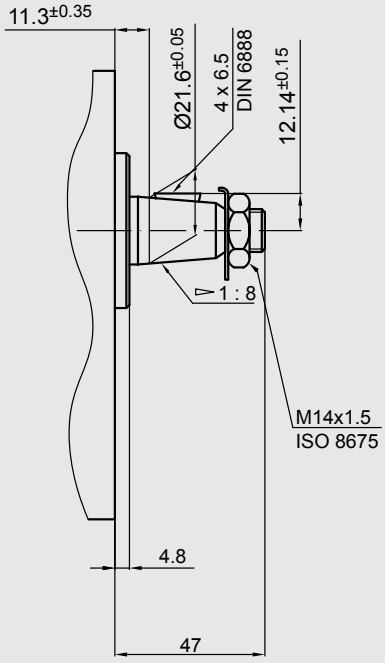
6.4.9 Drive shafts

A Tapered keyed shaft 1:5



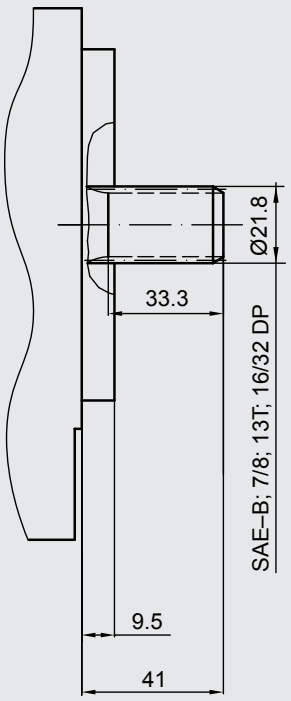
relevant mounting flange **V**

B Tapered keyed shaft 1:8



relevant mounting flange **S**

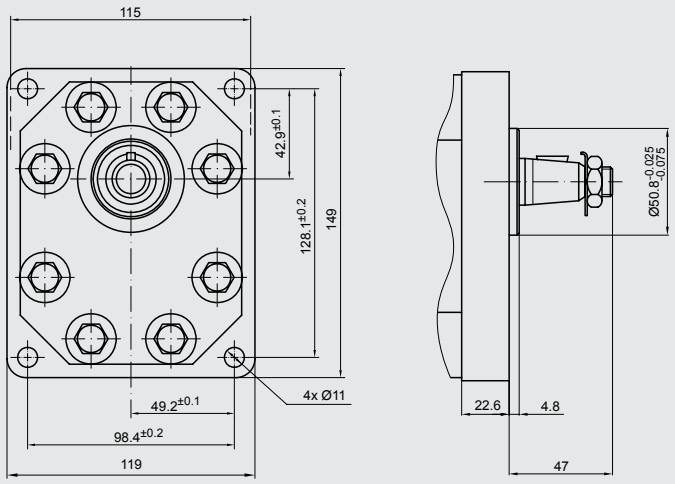
F Splined shaft SAE B - J 744 22-4 13T



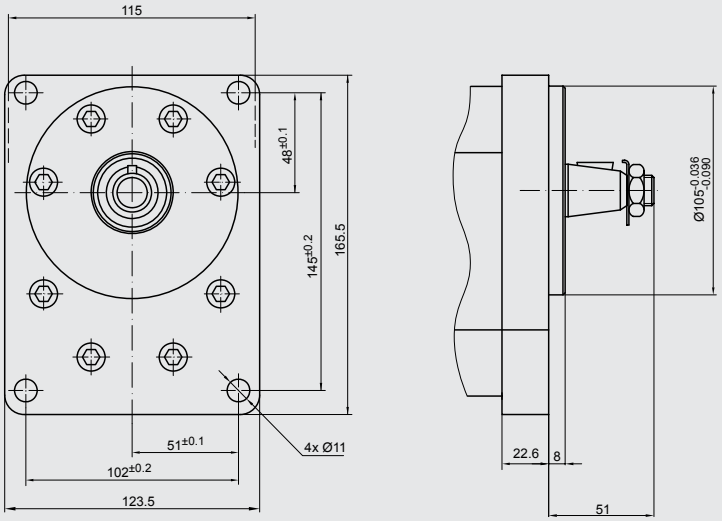
relevant mounting flange **X**

6.4.10 Mounting flange

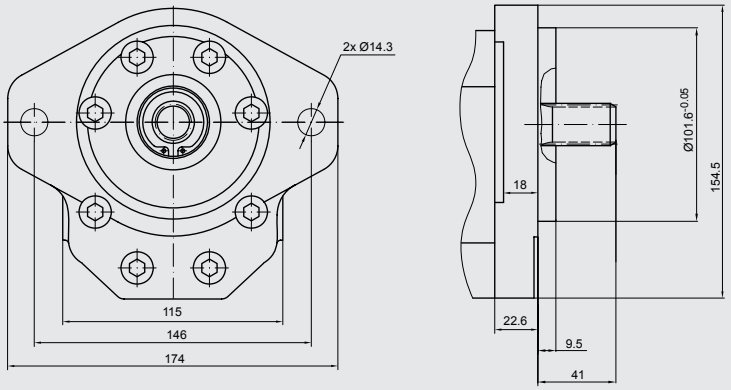
S Square flange
centering Ø 50.8 mm

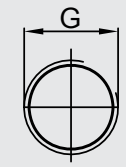


V Square flange
centering Ø 105 mm



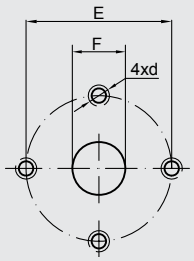
X SAE J 744 101-2 B
Ø 101.6 mm





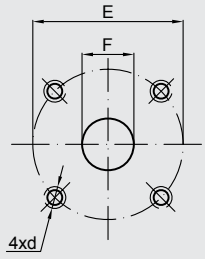
1 Pipe thread
ISO 228/1

Ordering code	Displacement	Outlet G	Inlet G
1	20 ... 28 cm³	G 3/4	G 3/4
	32 ... 60 cm³	G 3/4	G 1



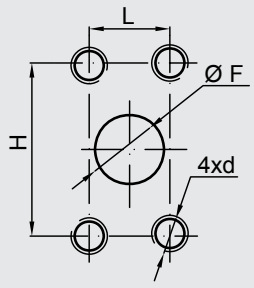
4 Square flange
(Italian design)

Ordering code	Displacement	Outlet			Inlet		
		F	E	d	F	E	d
4	20 ... 28 cm³	19	40	M8	19	40	M8
	32 ... 60 cm³	19	40	M8	27	51	M10



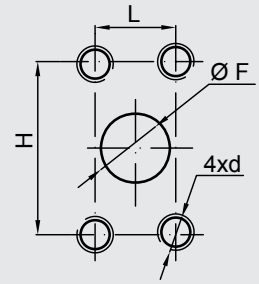
5 Square flange
DIN 3901/ ISO 8435

Ordering code	Displacement	Outlet			Inlet		
		F	E	d	F	E	d
5	20 ... 28 cm³	19	40	M8	19	40	M8
	32 ... 60 cm³	19	55	M8	27	55	M8



7 SAE flange with metric threads

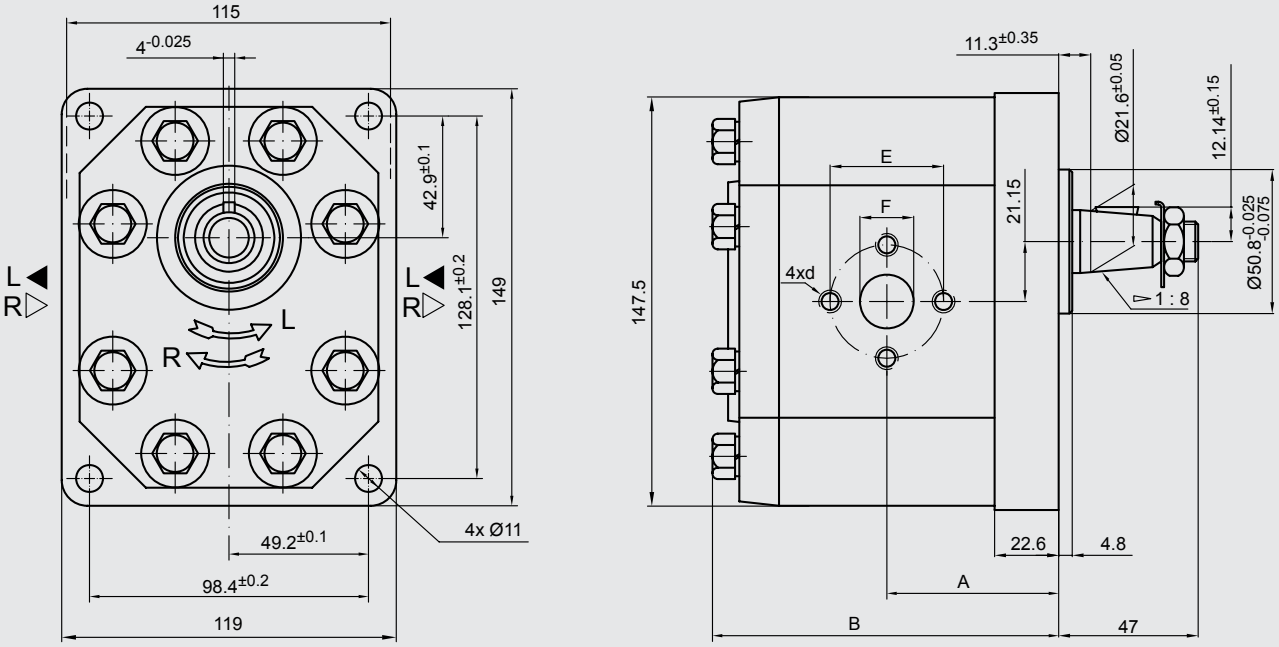
Ordering code	Displacement	Outlet				Inlet			
		F	H	L	d	F	H	L	d
7	20 ... 28 cm³	19	47.6	22.2	M10	19	47.6	22.2	M10
	32 ... 60 cm³	19	47.6	22.2	M10	27	52.4	26.2	M10



8 SAE flange with UNC threads

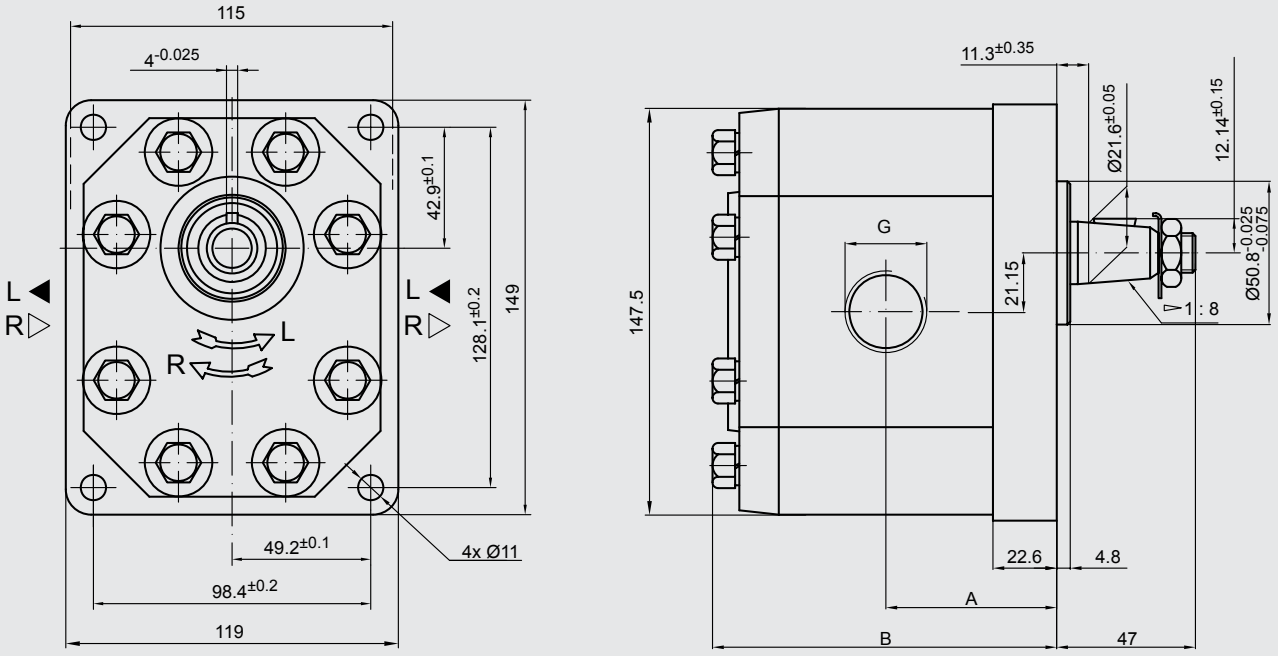
Ordering code	Displacement	Outlet				Inlet			
		F	H	L	d	F	H	L	d
8	20 ... 28 cm³	19	47.6	22.2	3/8 - 16 UNC	19	47.6	22.2	3/8 - 16 UNC
	32 ... 60 cm³	19	47.6	22.2		27	52.4	26.2	

PGE103-...-.BS4-N



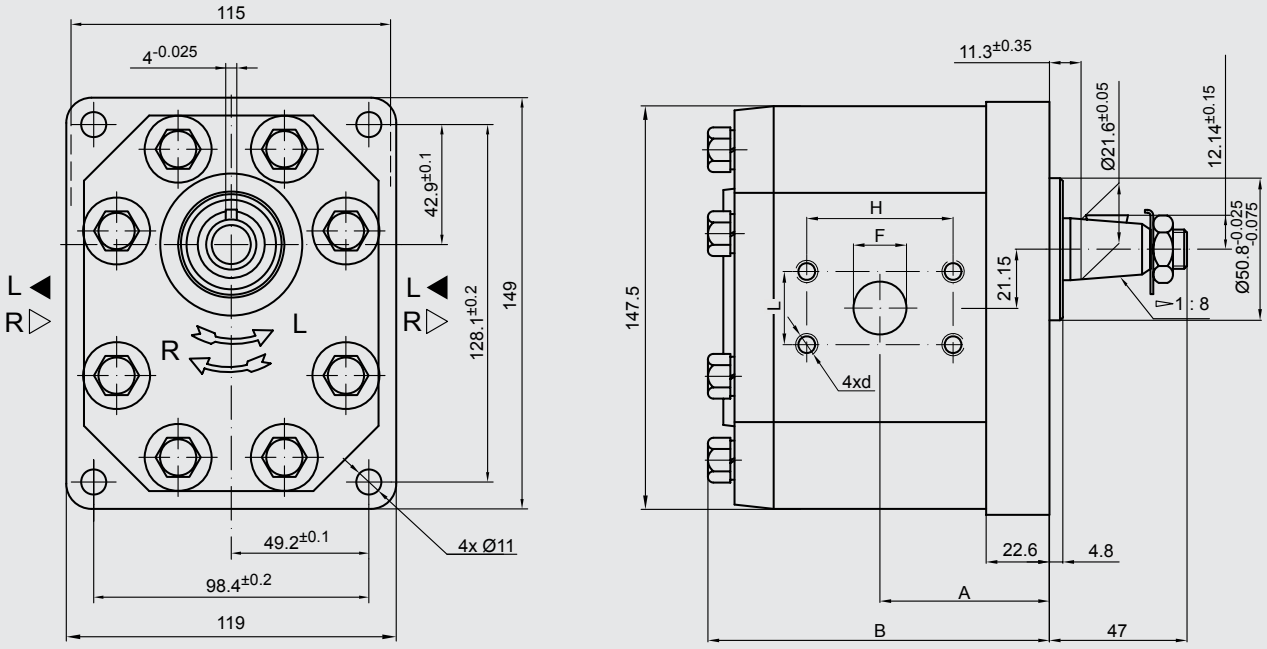
Type	Displacement	Output flow		Rated	Drive speed	Dimension							
		at 1500 rpm	at max. rpm					Inlet			Outlet		
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]	A [mm]	B [mm]	E	F	d	E	F	d
PGE103-2000-. BS4-N	20	28.2	56.4	250	3000	56.1	116.7	40	19	M8	40	19	M8
PGE103-2250-. BS4-N	22.5	31.7	63.5			57.6	119.7						
PGE103-2500-. BS4-N	25	35.3	70.5			58.3	121.1						
PGE103-2800-. BS4-N	28	39.5	79			60.2	124.7						
PGE103-3200-. BS4-N	32	45.1	90.2			66.5	137.3	51	27	M10			
PGE103-3600-. BS4-N	36	51.3	95.8	240	2800	68.0	140.5						
PGE103-4200-. BS4-N	42	59.9	99.8	230	2500	70.8	146.1						
PGE103-4600-. BS4-N	46	65.6	100.5	210	2300	72.7	149.8						
PGE103-5000-. BS4-N	50	71.3	99.8	185	2100	74.5	153.4						
PGE103-5500-. BS4-N	55	78.4	91.4	165	1750	76.7	157.9						
PGE103-6000-. BS4-N	60	85.5	99.8	150		78.7	162.4						

PGE103-...-.BS1-N



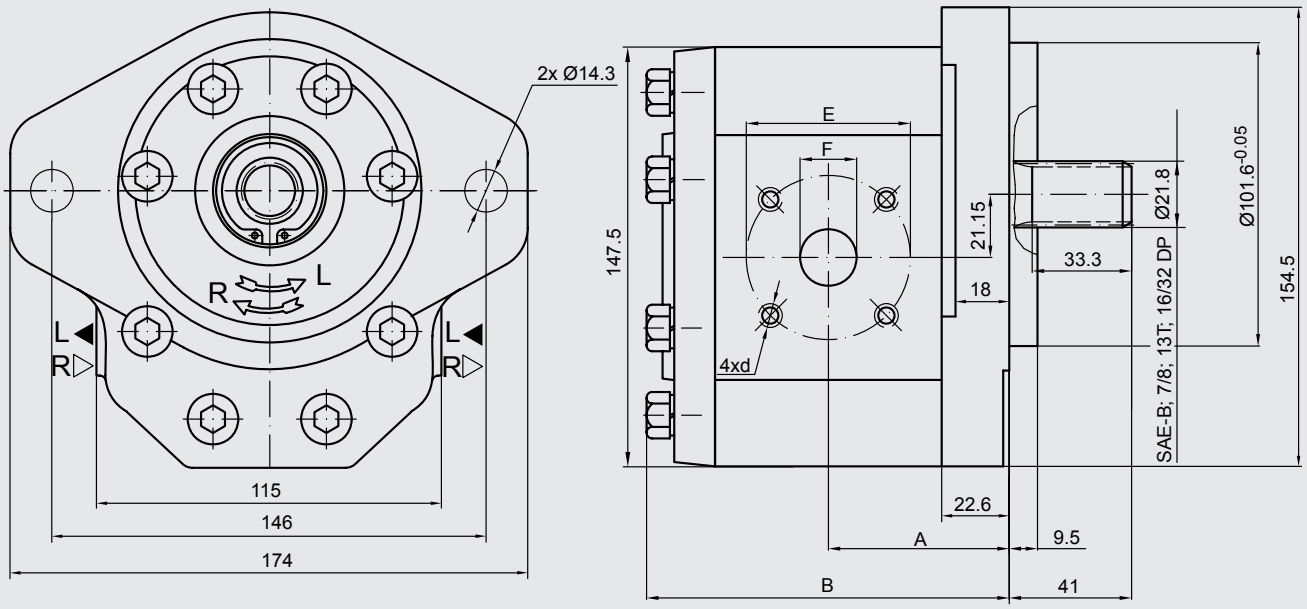
Type	Displacement	Output flow		Rated	Drive speed	Dimension			
		at 1500 rpm	at max. rpm		n	A	B	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G	G
PGE103-2000-. BS1-N	20	28.2	56.4	250	3000	56.1	116.7	G 3/4	G 3/4
PGE103-2250-. BS1-N	22.5	31.7	63.5			57.6	119.7		
PGE103-2500-. BS1-N	25	35.3	70.5			58.3	121.1		
PGE103-2800-. BS1-N	28	39.5	79			60.2	124.7		
PGE103-3200-. BS1-N	32	45.1	90.2			66.5	137.3	G 1	
PGE103-3600-. BS1-N	36	51.3	95.8	240	2800	68.0	140.5		
PGE103-4200-. BS1-N	42	59.9	99.8	230	2500	70.8	146.1		
PGE103-4600-. BS1-N	46	65.6	100.5	210	2300	72.7	149.8		
PGE103-5000-. BS1-N	50	71.3	99.8	185	2100	74.5	153.4		
PGE103-5500-. BS1-N	55	78.4	91.4	165	1750	76.7	157.9		
PGE103-6000-. BS1-N	60	85.5	99.8	150		78.7	162.4		

PGE103-...-.BS7-N



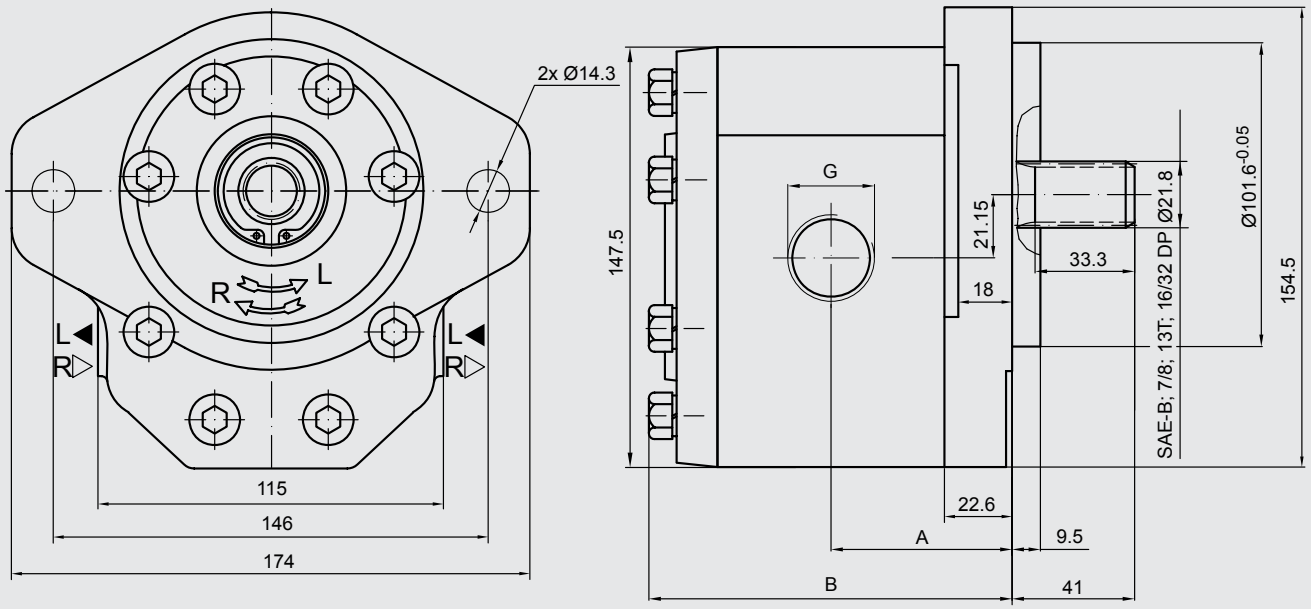
Type	Displacement	Output flow		Rated	Drive speed	Dimension								
		at 1500 rpm	at max. rpm					Inlet				Outlet			
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]	A [mm]	B [mm]	H	F	L	d	H	F	L	d
PGE103-2000-. BS7-N	20	28.2	56.4			56.1	116.7								
PGE103-2250-. BS7-N	22.5	31.7	63.5			57.6	119.7								
PGE103-2500-. BS7-N	25	35.3	70.5	250	3000	58.3	121.1								
PGE103-2800-. BS7-N	28	39.5	79			60.2	124.7								
PGE103-3200-. BS7-N	32	45.1	90.2			66.5	137.3								
PGE103-3600-. BS7-N	36	51.3	95.8	240	2800	68.0	140.5	52.4	27	26.2	M10	52.4	19	26.2	M10
PGE103-4200-. BS7-N	42	59.9	99.8	230	2500	70.8	146.1								
PGE103-4600-. BS7-N	46	65.6	100.5	210	2300	72.7	149.8								
PGE103-5000-. BS7-N	50	71.3	99.8	185	2100	74.5	153.4								
PGE103-5500-. BS7-N	55	78.4	91.4	165	1750	76.7	157.9								
PGE103-6000-. BS7-N	60	85.5	99.8	150		78.7	162.4								

PGE103-...-.FX5-N



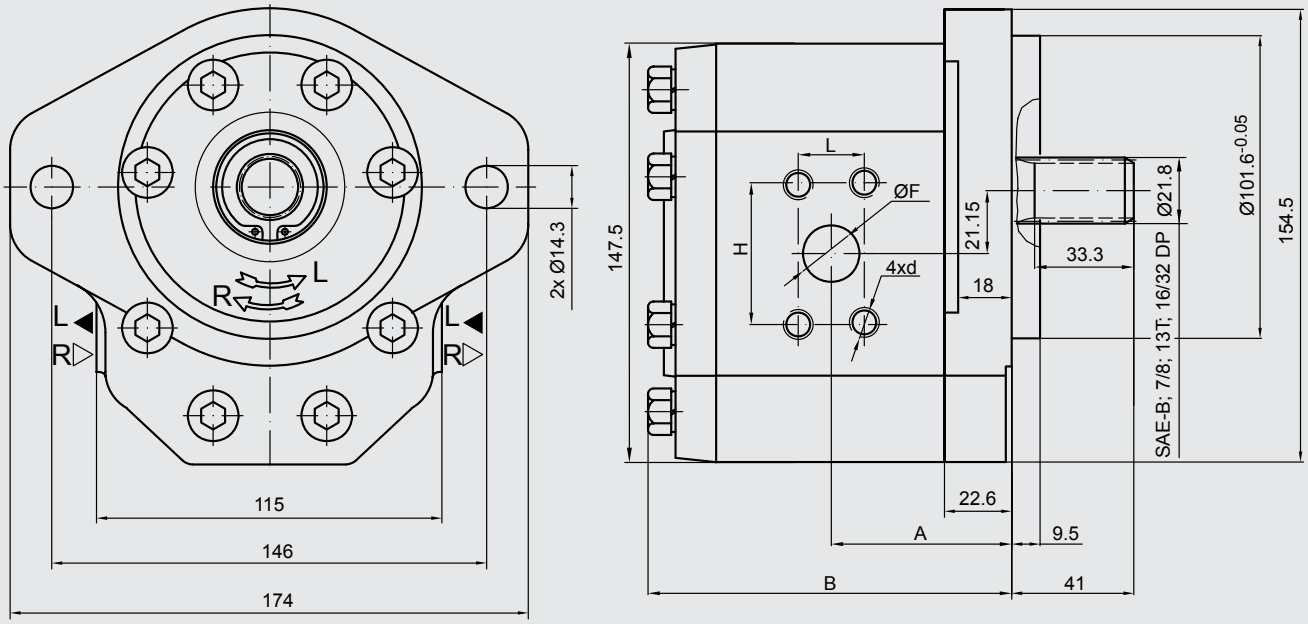
Type	Displacement	Output flow at 1500 rpm	Output flow at max. rpm	Rated	Drive speed	Dimension A	Dimension B	Inlet E	Inlet F	Inlet d	Outlet E	Outlet F	Outlet d
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]	[mm]	[mm]						
PGE103-2000-. FX5-N	20	28.2	56.4	250	3000	56.1	116.7	40	19	M8	40	19	M8
PGE103-2250-. FX5-N	22.5	31.7	63.5			57.6	119.7						
PGE103-2500-. FX5-N	25	35.3	70.5			58.3	121.1						
PGE103-2800-. FX5-N	28	39.5	79			60.2	124.7						
PGE103-3200-. FX5-N	32	45.1	90.2			66.5	137.3	55	27		55		
PGE103-3600-. FX5-N	36	51.3	95.8	240	2800	68.0	140.5						
PGE103-4200-. FX5-N	42	59.9	99.8	230	2500	70.8	146.1						
PGE103-4600-. FX5-N	46	65.6	100.5	210	2300	72.7	149.8						
PGE103-5000-. FX5-N	50	71.3	99.8	185	2100	74.5	153.4						
PGE103-5500-. FX5-N	55	78.4	91.4	165	1750	76.7	157.9						
PGE103-6000-. FX5-N	60	85.5	99.8	150		78.7	162.4						

PGE103-...-.FX1-N



Type	Displacement	Output flow		Rated	Drive speed	Dimension			
		at 1500 rpm	at max. rpm		n	A	B	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G	G
PGE103-2000-. FX1-N	20	28.2	56.4	250	3000	56.1	116.7	G 3/4	G 3/4
PGE103-2250-. FX1-N	22.5	31.7	63.5			57.6	119.7		
PGE103-2500-. FX1-N	25	35.3	70.5			58.3	121.1		
PGE103-2800-. FX1-N	28	39.5	79			60.2	124.7		
PGE103-3200-. FX1-N	32	45.1	90.2			66.5	137.3	G 1	
PGE103-3600-. FX1-N	36	51.3	95.8	240	2800	68.0	140.5		
PGE103-4200-. FX1-N	42	59.9	99.8	230	2500	70.8	146.1		
PGE103-4600-. FX1-N	46	65.6	100.5	210	2300	72.7	149.8		
PGE103-5000-. FX1-N	50	71.3	99.8	185	2100	74.5	153.4		
PGE103-5500-. FX1-N	55	78.4	91.4	165	1750	76.7	157.9		
PGE103-6000-. FX1-N	60	85.5	99.8	150		78.7	162.4		

PGE103-...-.FX7-N



Type	Displacement	Output flow		Rated	Drive speed	Dimension								
		at 1500 rpm	at max. rpm					Inlet				Outlet			
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]	A [mm]	B [mm]	H	F	L	d	H	F	L	d
PGE103-2000-. FX7-N	20	28.2	56.4	250	3000	56.1	116.7	47.6	19	22.2	M10	47.6	19	22.2	M10
PGE103-2250-. FX7-N	22.5	31.7	63.5			57.6	119.7								
PGE103-2500-. FX7-N	25	35.3	70.5			58.3	121.1								
PGE103-2800-. FX7-N	28	39.5	79			60.2	124.7								
PGE103-3200-. FX7-N	32	45.1	90.2			66.5	137.3	52.4	27	26.2					
PGE103-3600-. FX7-N	36	51.3	95.8	240	2800	68.0	140.5								
PGE103-4200-. FX7-N	42	59.9	99.8	230	2500	70.8	146.1								
PGE103-4600-. FX7-N	46	65.6	100.5	210	2300	72.7	149.8								
PGE103-5000-. FX7-N	50	71.3	99.8	185	2100	74.5	153.4								
PGE103-5500-. FX7-N	55	78.4	91.4	165	1750	76.7	157.9								
PGE103-6000-. FX7-N	60	85.5	99.8	150		78.7	162.4								

6.5 MULTIPLE PUMPS

CONTENTS PGE104

Ordering Code

6.5.1 External Gear Pump

Technical Information

6.5.2 Specifications
6.5.3 Hydraulic fluids
6.5.4 Viscosity range
6.5.5 Temperature range
6.5.6 Seals
6.5.7 Filtration
6.5.8 General notes
6.5.9 Max. drive and through drive torques
6.5.10 Pressure restrictions for through drive pumps
6.5.11 Installation notes

Dimensions

6.5.12 Drive shafts for front pump size 1
6.5.13 Drive shafts for front pump size 2
6.5.14 Drive shafts for front pump size 3
6.5.15 Mounting flange for front pump size 1
6.5.16 Mounting flange for front pump size 2
6.5.17 Mounting flange for front pump size 3
6.5.18 Ports

Preferred series

6.5.19 Double pump size 1
6.5.20 Triple pump size 1
6.5.21 Double pump size 2
6.5.22 Triple pump size 2
6.5.23 Double pump size 2 / size 1
6.5.24 Triple pump size 2 / size 2 / size 1
6.5.25 Triple pump size 2 / size 1 / size 1
6.5.26 Double pump size 3
6.5.27 Triple pump size 3
6.5.28 Double pump size 3 / size 2
6.5.29 Triple pump size 3 / size 3 / size 2
6.5.30 Triple pump size 3 / size 2 / size 2
6.5.31 Double pump size 3 / size 1
6.5.32 Triple pump size 3 / size 1 / size 1
6.5.33 Triple pump size 3 / size 2 / size 1

ORDERING CODE

6.5.1 External Gear Pump

PGE104 – 1000 / 1000 / 1000 – R B R 1 / 1 / 1 – N – XXXX

External gear pump

Displacement

	Stage 1		Stage 2		Stage 3
Size 1	100 125 160 200 250 315 365 420 500 610 740	/	100 125 160 200 250 315 365 420 500 610 740	/	100 125 160 200 250 315 365 420 500 610 740
Size 2	450 630 820 1000 1130 1200 1400 1500 1600 1900 2200 2500	/	450 630 820 1000 1130 1200 1400 1500 1600 1900 2200 2500	/	450 630 820 1000 1130 1200 1400 1500 1600 1900 2200 2500
Size 3	2000 2250 2500 2800 3200 3600 4200 4600 5000 5500 6000	/	2000 2250 2500 2800 3200 3600 4200 4600 5000 5500 6000	/	2000 2250 2500 2800 3200 3600 4200 4600 5000 5500 6000

Shaft rotation (viewed from shaft end)

R Clockwise
L Anti-clockwise

Shaft

A Tapered keyed shaft 1:5
B Tapered keyed shaft 1:8
E Splined shaft SAE A - J 744 16-4 9T (only for front pump size 2)
F Splined shaft SAE B - J 744 22-4 13T (only for front pump size 3)

PGE104 – 1000 / 1000 / 1000 – R B R 1 / 1 / 1 – N – XXXX

Mounting flange

L	2-hole mounting, centering Ø 32 mm (only for front pump size 1)
Q	Square flange, centering Ø 25.4 mm (only for front pump size 1)
N	2-hole mounting, centering Ø 50 mm (only for front pump size 2)
R	Square flange, centering Ø 36.5 mm (only for front pump size 2)
T	Square flange, centering Ø 80 mm (only for front pump size 2)
W	SAE J 744 82-2 A Ø 82.55 mm (only for front pump size 2)
S	Square flange, centering Ø 50.8 mm (only for front pump size 3)
V	Square flange, centering Ø 105 mm (only for front pump size 3)
X	SAE J 744 101-2 B Ø 101.6 mm (only for front pump size 3)

Ports

1	Pipe thread ISO 228-1
2	Metric thread DIN 3852-1
3	Thread UN 2B SAE O-ring boss
4	Square flange (Italian design)
5	Square flange DIN 3901/ ISO 8435
7	SAE flange with metric threads (only for size 3)
8	SAE flange with UNC threads (only for size 3)
9	Special ports (only on request)

Seals

N	NBR
V	FPM

Modification number

XXXX	Determined by manufacturer

Not all options in the ordering code are possible.
Only combinations of the same size or in descending order are possible.
Please refer to 6.5.19 ff - Preferred series, or consult HYDAC.
Special options are possible on request.

6.5.2 Specifications

Single pump Size 1			100	125	160	200	250	315	365	420	500	610	740
Geometric displacement		[cm³/rev]	1	1.25	1.6	2	2.5	3.15	3.65	4.2	5	6.1	7.4
Pressure	Rated	[bar]	250									200	170
	Peak		300									230	200
Drive speed	Min.	[rpm]	750										
	Max.		3500								3000	2500	
Approx. weight		[kg]	1	1.02	1.04	1.05	1.07	1.11	1.14	1.18	1.25	1.3	1.37

Single pump Size 2			450	630	820	1000	1130	1200	1400	1500	1600	1900	2200	2500
Geometric displacement		[cm³/rev]	4.5	6.3	8.2	10	11.3	12	14	15	16	19	22	25
Pressure	Rated	[bar]	250									200	180	160
	Peak		300						280			230	210	150
Drive speed	Min.	[rpm]	750											
	Max.		3500							2500			2000	
Approx. weight		[kg]	3.34	3.36	3.37	3.57	3.62	3.64	3.78	4.16	4.2	4.32	4.44	4.56

Single pump Size 3			2000	2250	2500	2800	3200	3600	4200	4600	5000	5500	6000
Geometric displacement		[cm³/rev]	20	22.5	25	28	32	36	42	46	50	55	60
Pressure	Rated	[bar]	250					240	230	210	185	165	150
	Peak		300					280	270	250	230	200	180
Drive speed	Min.	[rpm]	750										
	Max.		3000					2800	2500	2300	2100	1750	
Approx. weight		[kg]	7.83	8.0	8.16	8.34	8.78	8.99	9.25	9.47	9.60	9.85	10.10

The continuous and maximum pressures given here only apply to pumps with flange ports. If threaded ports are required, the performance will be reduced. To find out whether a pump with threaded ports can be used in a high pressure application, please contact HYDAC.

6.5.3 Hydraulic fluids

The pump series is designed for use with

HL Hydraulic oil (normal mineral oil) and

HLP Hydraulic oils of the R&O type (Rust and Oxidation inhibitor)

6.5.4 Viscosity range

Normal operating viscosity:
16 - 200 cSt (mm²/s)

For other viscosity ranges, please contact HYDAC.

6.5.5 Temperature range

Ambient temperature range
-22 to 55 °C

Fluid temperature range
NBR
-25 to 85 °C
Viton
-15 to 90 °C

6.5.6 Seals

The pump series is equipped with NBR seals.

If special hydraulic fluids are used, the seal material must be changed if required. Please contact HYDAC.

6.5.7 Filtration

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

Cleanliness class:

21/ 18/ 15 to ISO 4406:1999

or

Class 9 to NAS 1638 or cleaner.

At system pressures above 160 bar cleanliness class:

19/17/14 to ISO 4406:1999

or

Class 8 to NAS 1638 is required.

6.5.8 General notes

Gear pumps can be combined to form double or triple units (for larger units please contact HYDAC). Generally, the specifications for single pumps apply, but the following must be observed:

- Only pumps of the same size or in decreasing order of size can be combined.
- It is recommended that the pump with the largest displacement is used as the front pump.
- The maximum speed of the multiple unit is limited to that of the individual stage with the lowest speed.
- The maximum pressure of the pump unit or the individual stages is determined by the maximum drive and through drive torques (see point 6.5.9).

6.5.9 Max. drive and through drive torques

Size	Drive shaft	Max. drive torque	Max. through drive torque		
			Secondary pump Size 1	Secondary pump Size 2	Secondary pump Size 3
1	Tapered 1 : 5	30 Nm	30 Nm		
	Tapered 1 : 8	30 Nm			
2	Tapered 1 : 5	193 Nm	30 Nm	65 Nm	
	Tapered 1 : 8	198 Nm			
	Splined SAE A	86 Nm			
3	Tapered 1 : 5	301 Nm	30 Nm	65 Nm	228 Nm
	Tapered 1 : 8	218 Nm			
	Splined SAE B	272 Nm			

The resulting torque can be calculated by the following formula:

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

Efficiency $\eta_{mh} \approx 0.8 - 0.9$

6.5.10 Pressure restrictions for through drive pumps

There is a pressure restriction at maximum pressure for the secondary and any further pumps due to the maximum permitted through drive torque.

Size	Displacement [cm³/rev]	Peak pressure [bar]
2	16	220
	19	190
	22	160
	25	130

6.5.11 Installation notes

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 line

If the pump is installed above the oil level, particular attention must be paid to the suction pressure. The minimum 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.

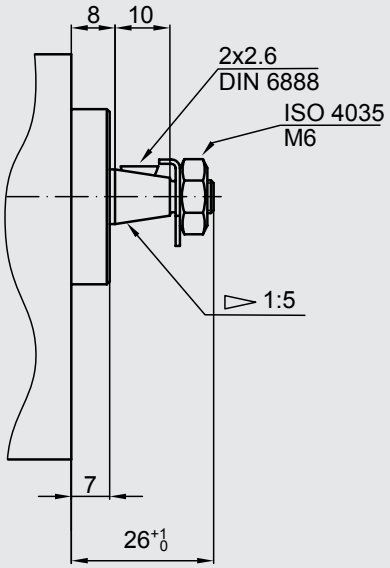
Maximum suction pressure:
2.2 bar abs.

C. Drive

Use a flexible coupling whenever possible. There must not be any radial or axial forces on the pump shaft. The maximum permitted misalignment is 0.2 mm and the angular deviation must be less than 0.2°. Where there may be excessive bending moments or vibrations, the pump unit must be supported by suitable means.

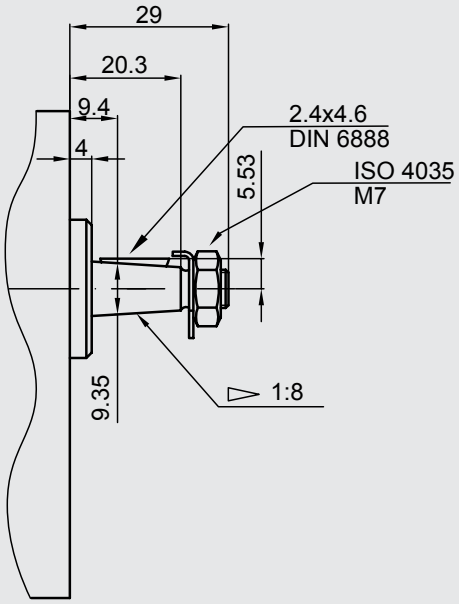
6.5.12 Drive shafts for front pump size 1

A Tapered keyed shaft 1:5



relevant mounting flange: **L**

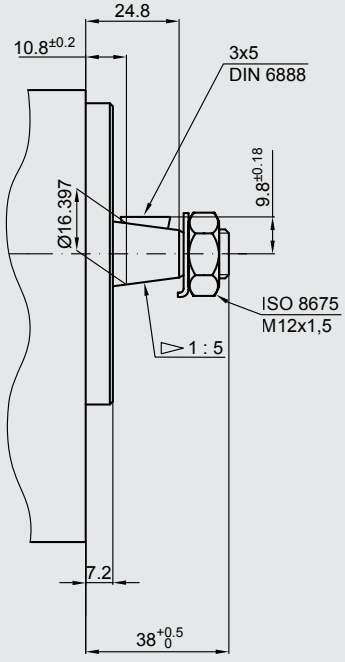
B Tapered keyed shaft 1:8



relevant mounting flange: **Q**

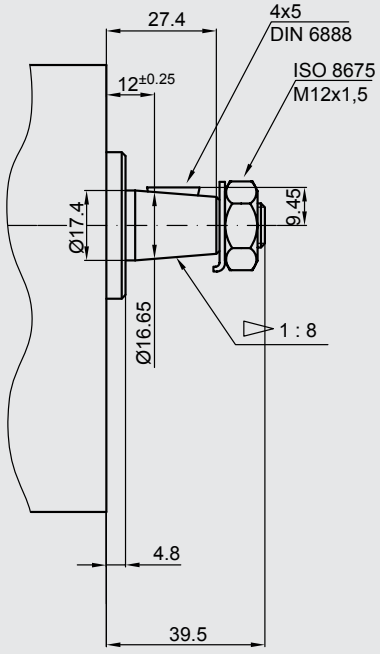
6.5.13 Drive shafts for front pump size 2

A Tapered keyed shaft 1:5



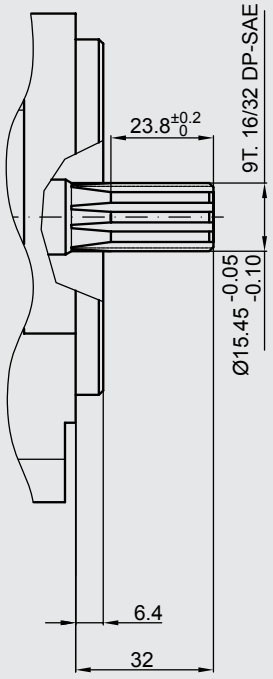
relevant mounting flange: **N** **T**

B Tapered keyed shaft 1:8



relevant mounting flange: **R**

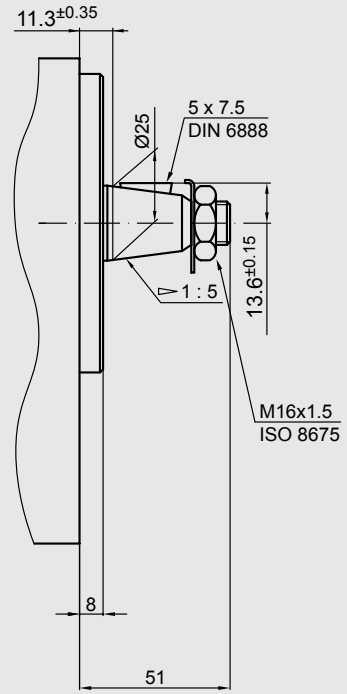
E Splined shaft SAE A - J 744 16-4 9T



relevant mounting flange: **W**

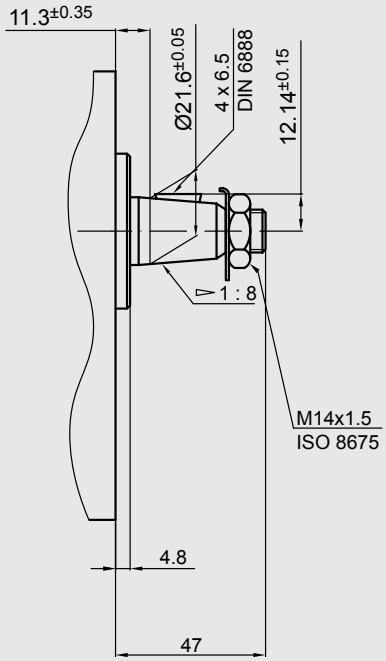
6.5.14 Drive shafts for front pump size 3

A Tapered keyed shaft 1:5



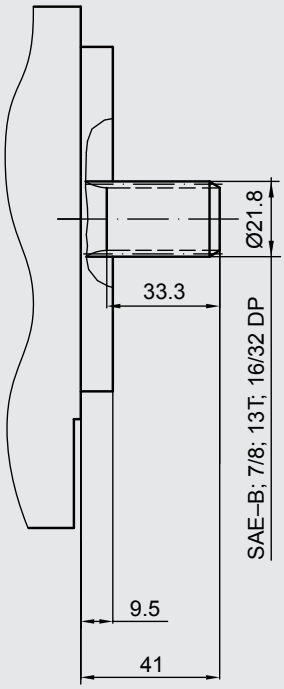
relevant mounting flange: **V**

B Tapered keyed shaft 1:8



relevant mounting flange: **S**

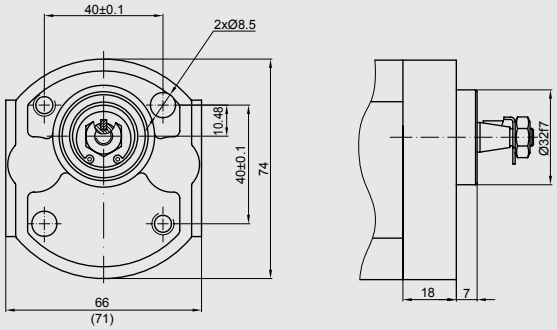
F Splined shaft SAE B - J 744 22-4 13T



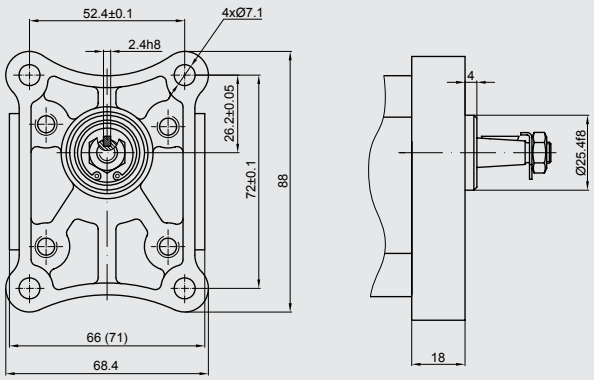
relevant mounting flange: **X**

6.5.15 Mounting flange for front pump size 1

L 2-hole mounting centering Ø 32 mm

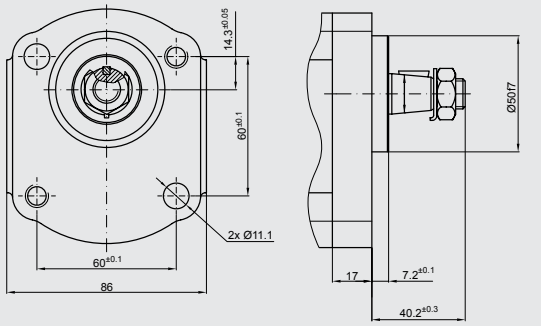


Q Square flange centering Ø 25.4 mm

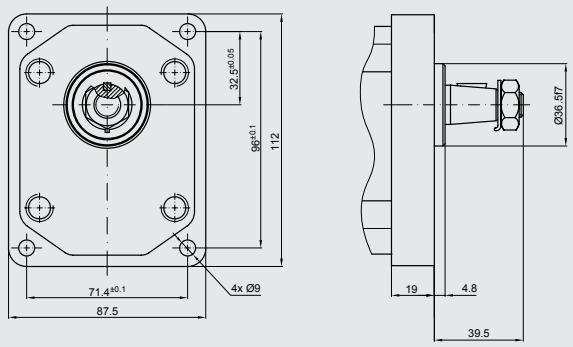


6.5.16 Mounting flange for front pump size 2

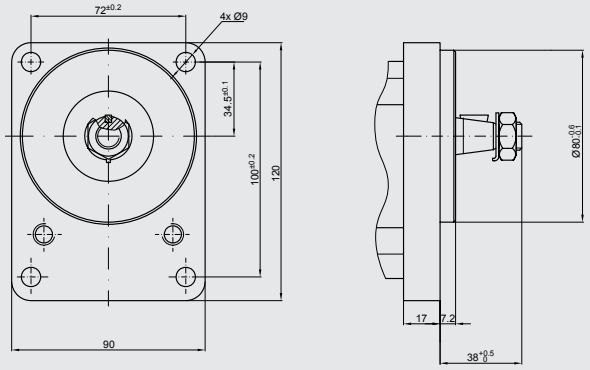
N 2-hole mounting
centering Ø 50 mm



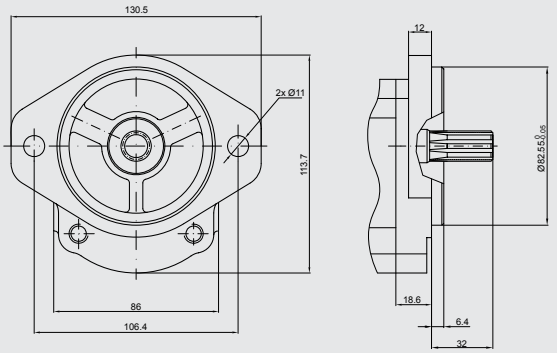
R Square flange
centering Ø 36.5 mm



T Square flange
centering Ø 80 mm

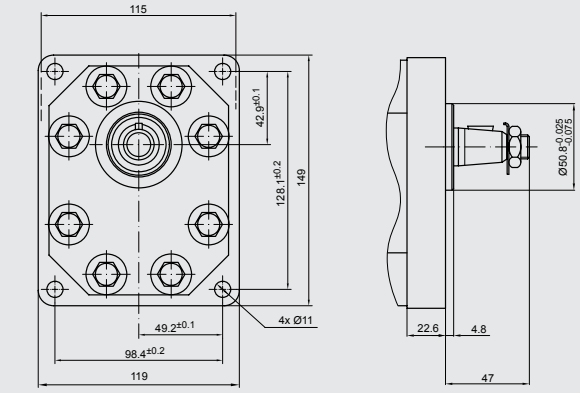


W SAE J 744 82-2 A
Ø 82.55 mm

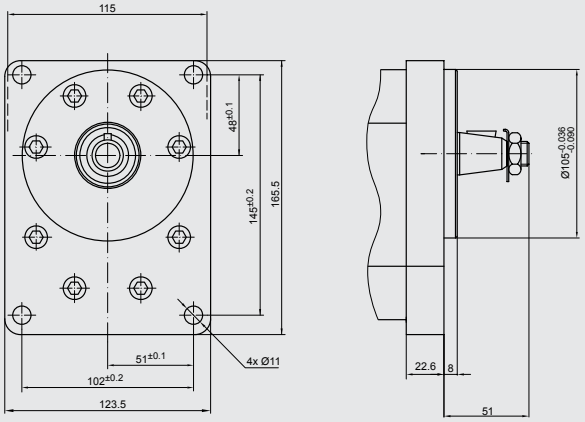


6.5.17 Mounting flange for front pump size 3

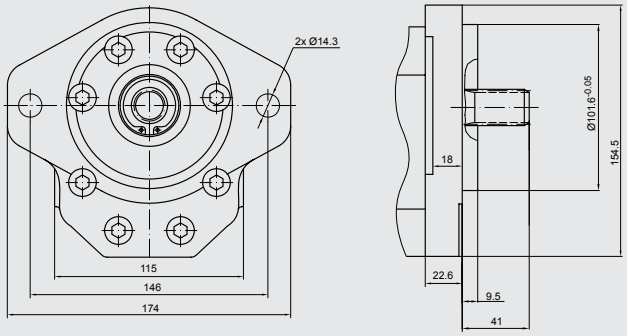
S Square flange
centering Ø 50.8 mm



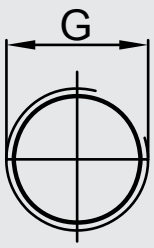
V Square flange
centering Ø 105 mm



X SAE J 744 101-2 B
Ø 101.6 mm

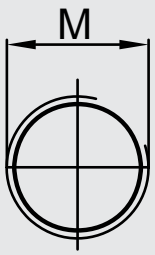


1 Pipe thread
ISO 228/1



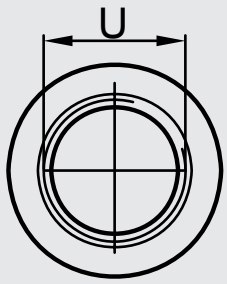
Ordering code	Size	Displacement	Outlet G	Inlet G
1	1	1 ... 2.5 cm³	G 3/8	G 3/8
		3.15 ... 7.4 cm³	G 3/8	G 1/2
	2	4.5 ... 8.2 cm³	G 1/2	G 1/2
		10 ... 25 cm³	G 1/2	G 3/4
	3	20 ... 28 cm³	G 3/4	G 3/4
		32 ... 60 cm³	G 3/4	G1

2 Metric thread
DIN 3852-1



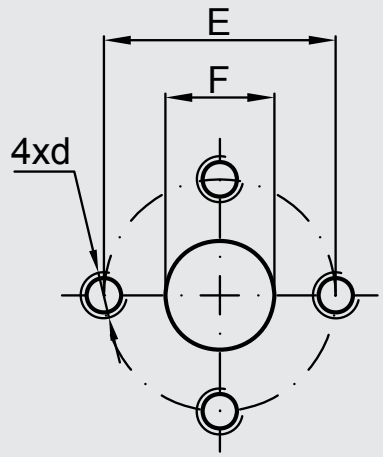
Ordering code	Size	Displacement	Outlet M	Inlet M
2	1	1 ... 2.5 cm³	M16x1.5	M16x1.5
		3.15 ... 6.1 cm³	M16x1.5	M20x1.5
		7.4 cm³	M18x1.5	M22x1.5
	2	4.5 ... 25 cm³	M16x1.5	M20x1.5

3 Pipe thread
UN 2B SAE
O-ring boss



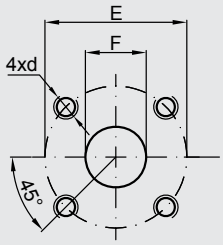
Ordering code	Size	Displacement	Outlet U	Inlet U
3	1	1 ... 6.1 cm³	9/16-18 UNF	3/4-16 UNF
		7.4 cm³	3/4-16 UNF	7/8-14 UNF
	2	4.5 ... 25 cm³	7/8-14 UNF	1 1/16-12 UN

4 Square flange
(Italian design)



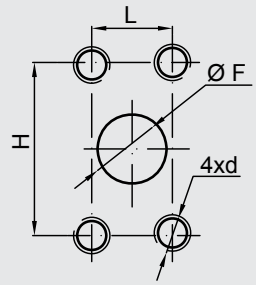
Ordering code	Size	Displacement	Outlet			Inlet		
			F	E	d	F	E	d
4	1	1 ... 7.4 cm³	12	30	M6	12	30	M6
	2	4.5 ... 8.2 cm³	13.1	30	M6	13.1	30	M6
		10 ... 22 cm³	14.2	30	M6	19	40	M8
		25 cm³	19	40	M8	19	40	M8
	3	20 ... 28 cm³	19	40	M8	19	40	M8
		32 ... 60 cm³	19	40	M8	27	51	M10

5 Square flange DIN 3901/ ISO 8435



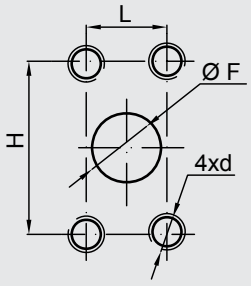
Ordering code	Size	Displacement	Outlet			Inlet		
			F	E	d	F	E	d
5	1	1 ... 7.4 cm³	12	30	M6	12	30	M6
	2	4.5 ... 6.3 cm³	15	35	M6	15	40	M6
		8.2 ... 25 cm³	15	35	M6	20	40	M6
	3	20 ... 28 cm³	19	40	M8	19	40	M8
		32 ... 60 cm³	19	55	M8	27	55	M8

7 SAE flange with metric threads



Ordering code	Size	Displacement	Outlet				Inlet			
			F	H	L	d	F	H	L	d
7	3	20 ... 28 cm³	19	47.6	22.2	M10	19	47.6	22.2	M10
		32 ... 60 cm³	19	47.6	22.2	M10	27	52.4	26.2	M10

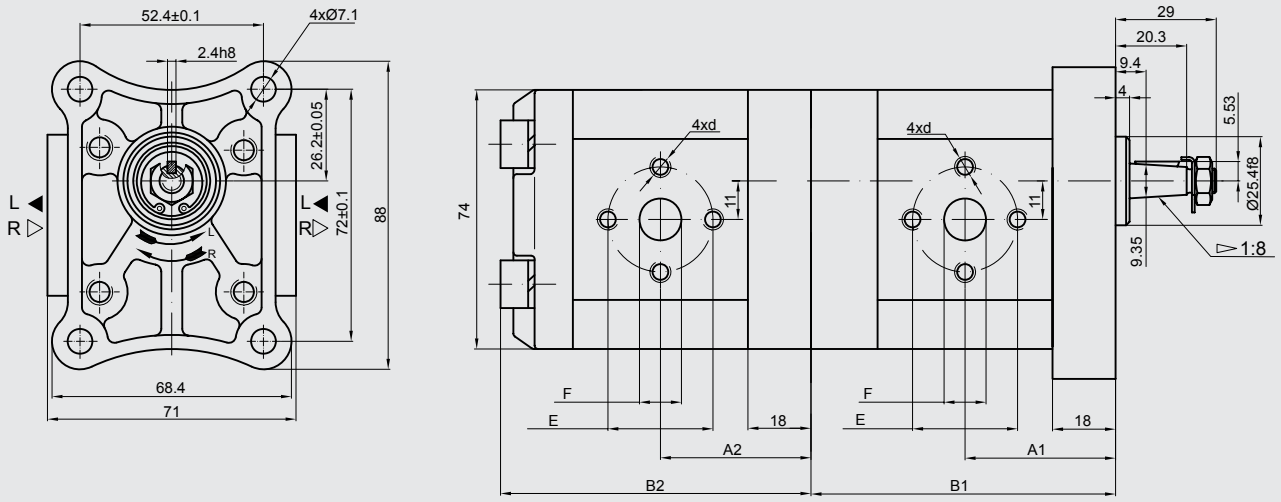
8 SAE flange with UNC threads



Ordering code	Size	Displacement	Outlet				Inlet			
			F	H	L	d	F	H	L	d
8	3	20 ... 28 cm³	19	47.6	22.2	3/8 - 16 UNC	19	47.6	22.2	3/8 - 16 UNC
		32 ... 60 cm³	19	47.6	22.2		27	52.4	26.2	

6.5.19 Double pump size 1

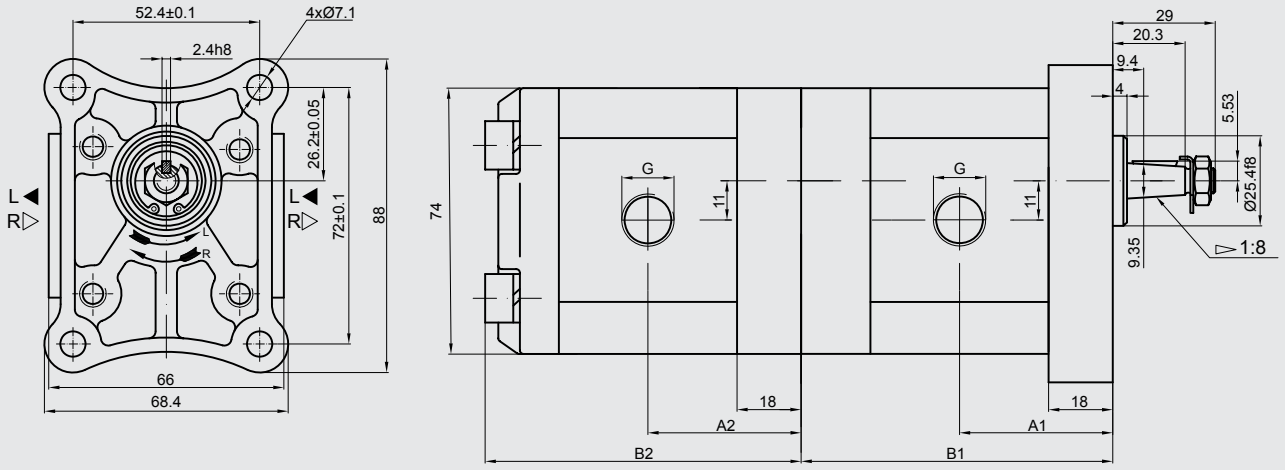
PGE104-.../...-.BQ4/4-N



Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
100	1	1.40	3.26	250	3500
125	1.25	1.74	4.07		
160	1.6	2.23	5.21		
200	2	2.82	6.58		
250	2.5	3.53	8.23		
315	3.15	4.44	10.36		
365	3.65	5.15	12.01		
420	4.2	5.92	13.82		
500	5	7.05	16.45		3000
610	6.1	8.69	14.49	200	2500
740	7.4	10.55	17.58	170	

Displacement	Dimensions									
	A1	B1	A2	B2	Inlet			Outlet		
	[mm]	[mm]	[mm]	[mm]	E	F	d	E	F	d
100	39.1	79.1	39.1	79	30	12	M6	30	12	M6
125	39.5	80.1	39.5	80						
160	40.3	81.5	40.3	81.6						
200	41.1	83.2	41.1	83.2						
250	42.1	85.2	42.1	85.2						
315	43.5	87.8	43.5	87.8						
365	44.4	89.8	44.4	89.9						
420	45.5	92	45.5	92.1						
500	47.1	95.2	47.1	95.2						
610	49.4	99.8	49.4	99.8						
740	52.1	105.2	52.1	105.2						

PGE104-.../...-.BQ1/1-N

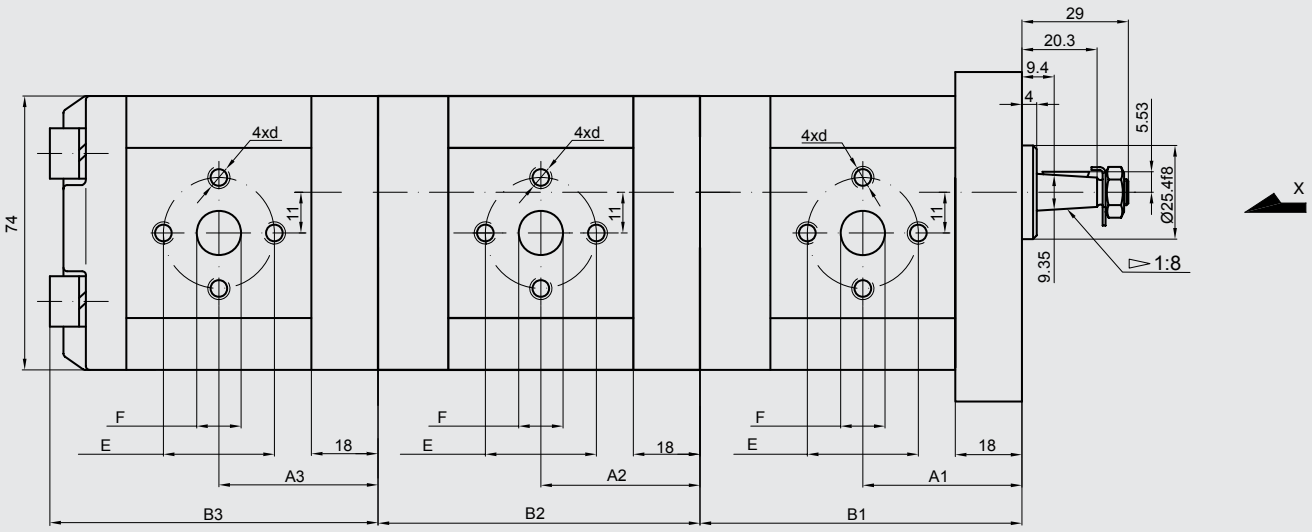


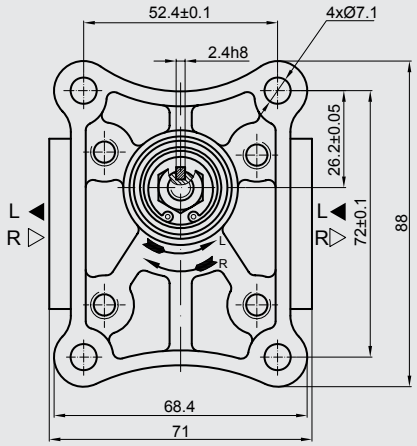
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
100	1	1.40	3.26	250	3500
125	1.25	1.74	4.07		
160	1.6	2.23	5.21		
200	2	2.82	6.58		
250	2.5	3.53	8.23		
315	3.15	4.44	10.36		
365	3.65	5.15	12.01		
420	4.2	5.92	13.82		
500	5	7.05	14.10		3000
610	6.1	8.69	14.49	200	2500
740	7.4	10.55	17.58	170	

Displacement	Dimensions					
	A1 [mm]	B1 [mm]	A2 [mm]	B2 [mm]	Inlet G	Outlet G
100	39.1	79.1	39.1	79	G 3/8	G 3/8
125	39.5	80.1	39.5	80		
160	40.3	81.5	40.3	81.6		
200	41.1	83.2	41.1	83.2		
250	42.1	85.2	42.1	85.2		
315	43.5	87.8	43.5	87.8	G 1/2	
365	44.4	89.8	44.4	89.9		
420	45.5	92	45.5	92.1		
500	47.1	95.2	47.1	95.2		
610	49.4	99.8	49.4	99.8		
740	52.1	105.2	52.1	105.2		

6.5.20 Triple pump size 1

PGE104-.../.../...-.BQ4/4/4-N



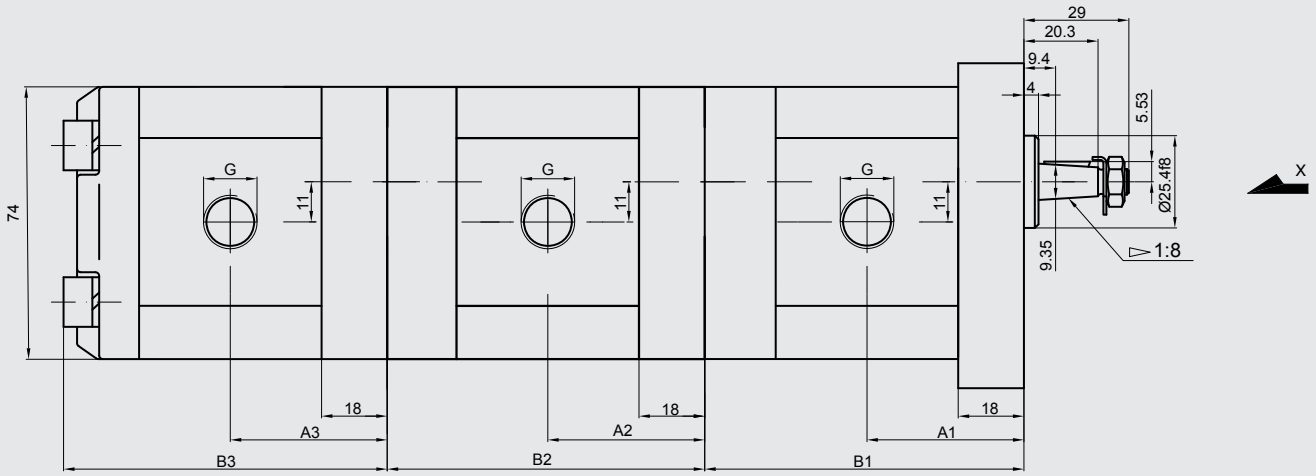


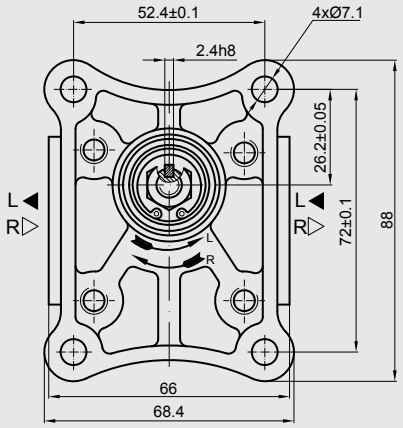
View X

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
100	1	1.40	3.26	250	3500
125	1.25	1.74	4.07		
160	1.6	2.23	5.21		
200	2	2.82	6.58		
250	2.5	3.53	8.23		
315	3.15	4.44	10.36		
365	3.65	5.15	12.01		
420	4.2	5.92	13.82		
500	5	7.05	16.45		3000
610	6.1	8.69	14.49	200	2500
740	7.4	10.55	17.58	170	

Displacement	Dimensions											
	A1	B1	A2	B2	A3	B3	Inlet			Outlet		
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	E	F	d	E	F	d
100	39.1	79.1	39.1	79	39.1	79	30	12	M6	30	12	M6
125	39.5	80.1	39.5	80	39.5	80						
160	40.3	81.5	40.3	81.6	40.3	81.6						
200	41.1	83.2	41.1	83.2	41.1	83.2						
250	42.1	85.2	42.1	85.2	42.1	85.2						
315	43.5	87.8	43.5	87.8	43.5	87.8						
365	44.4	89.8	44.4	89.9	44.4	89.9						
420	45.5	92	45.5	92.1	45.5	92.1						
500	47.1	95.2	47.1	95.2	47.1	95.2						
610	49.4	99.8	49.4	99.8	49.4	99.8						
740	52.1	105.2	52.1	105.2	52.1	105.2						

PGE104-.../.../...-.BQ1/1/1-N





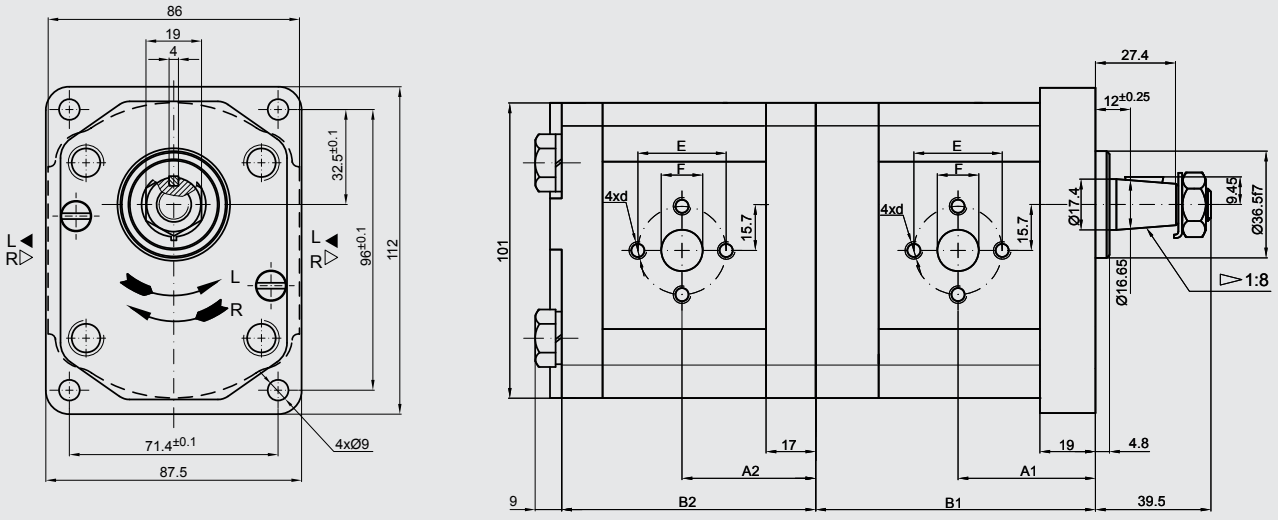
View X

Displacement	Geometric displacement [cm³/rev]	Flow at 1500 rpm [l/min]	Flow at max. rpm [l/min]	Pressure Rated [bar]	Max. speed n [rpm]
100	1	1.40	3.26	250	3500
125	1.25	1.74	4.07		
160	1.6	2.23	5.21		
200	2	2.82	6.58		
250	2.5	3.53	8.23		
315	3.15	4.44	10.36		
365	3.65	5.15	12.01		
420	4.2	5.92	13.82		
500	5	7.05	14.10		3000
610	6.1	8.69	14.49	200	2500
740	7.4	10.55	17.58	170	

Displacement	Dimensions						Inlet G	Outlet G
	A1 [mm]	B1 [mm]	A2 [mm]	B2 [mm]	A3 [mm]	B3 [mm]		
100	39.1	79.1	39.1	79	39.1	79	G 3/8	G 3/8
125	39.5	80.1	39.5	80	39.5	80		
160	40.3	81.5	40.3	81.6	40.3	81.6		
200	41.1	83.2	41.1	83.2	41.1	83.2		
250	42.1	85.2	42.1	85.2	42.1	85.2		
315	43.5	87.8	43.5	87.8	43.5	87.8	G 1/2	
365	44.4	89.8	44.4	89.9	44.4	89.9		
420	45.5	92	45.5	92.1	45.5	92.1		
500	47.1	95.2	47.1	95.2	47.1	95.2		
610	49.4	99.8	49.4	99.8	49.4	99.8		
740	52.1	105.2	52.1	105.2	52.1	105.2		

6.5.21 Double pump size 2

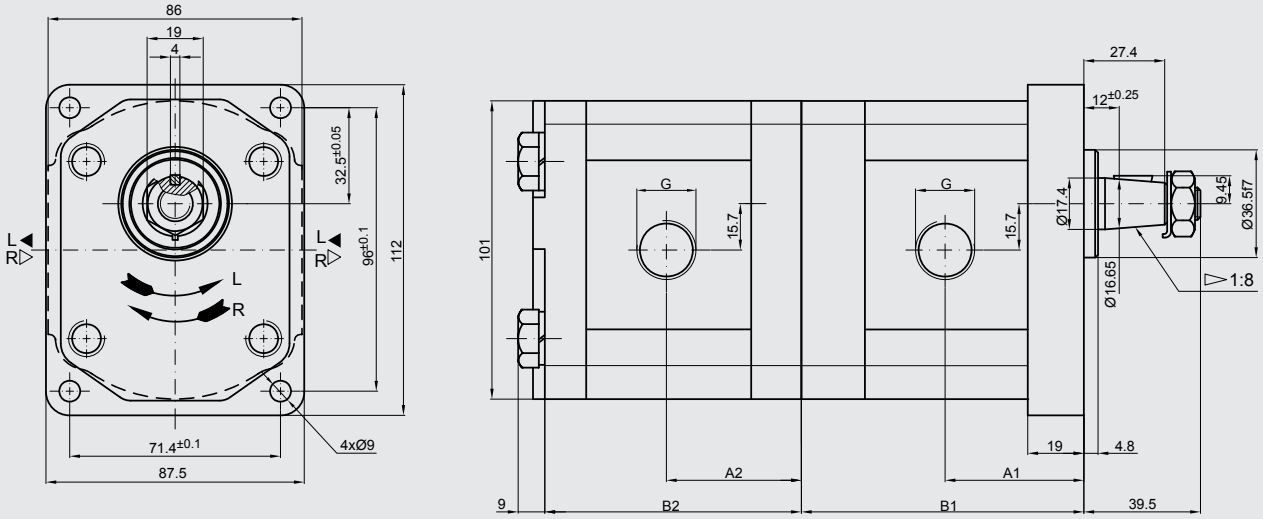
PGE104-.../...-.BR4/4-N



Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
450	4.5	6.14	14.33	250	3500
630	6.3	8.69	20.29		
820	8.2	11.32	26.40		
1000	10	13.95	32.55		
1130	11.3	15.76	36.78		
1200	12	16.92	39.48		
1400	14	19.95	46.55		
1500	15	21.60	36.00		2500
1600	16	23.04	38.40		
1900	19	27.36	45.60	200	
2200	22	31.68	42.24	180	2000
2500	25	36.00	48.00	160	

Displacement	Dimensions									
	A1	B1	A2	B2	Inlet			Outlet		
	[mm]	[mm]	[mm]	[mm]	E	F	d	E	F	d
450	42.5	87.2	40.5	78	30	13.1	M6	30	13.1	M6
630	44	90.2	42	81						
820	45.5	93.1	43.5	83.9						
1000	47	96.2	45	87	40	19	M8		14.2	
1130	48	98.2	46	89.1						
1200	48.6	99.5	46.6	90.3						
1400	50	102.6	48	93.4						
1500	51	104.1	49	95						
1600	52	105.8	50	96.6						
1900	54	110.7	52	101.5						
2200	57	115.7	55	106.5						
2500	59.2	120.6	57.2	111.4				40	19	M8

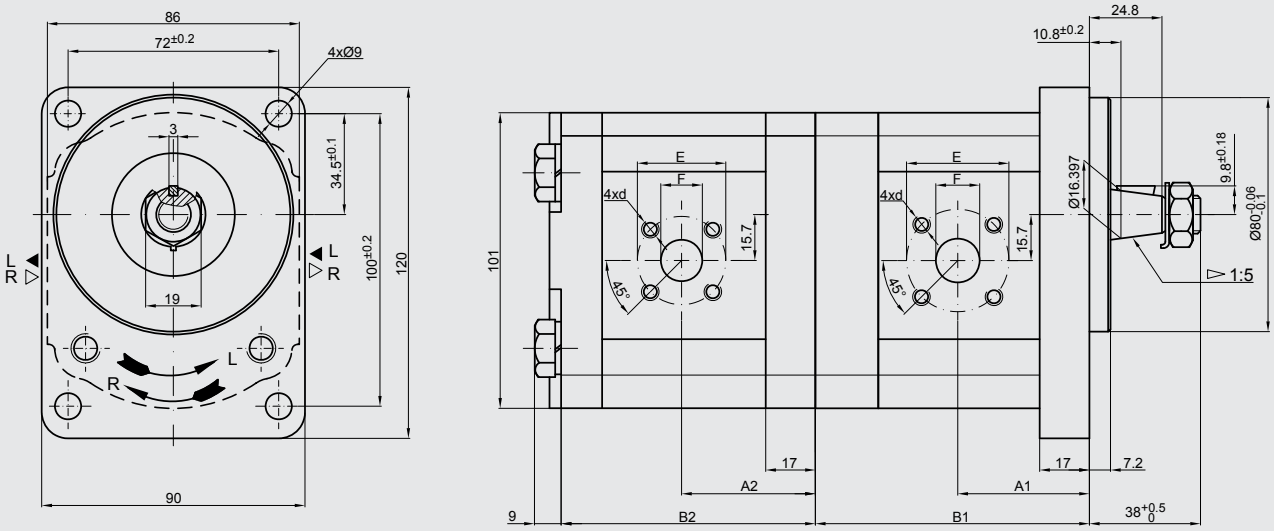
PGE104-.../...-.BR1/1-N



Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
450	4.5	6.14	14.33	250	3500
630	6.3	8.69	20.29		
820	8.2	11.32	26.40		
1000	10	13.95	32.55		
1130	11.3	15.76	36.78		
1200	12	16.92	39.48		
1400	14	19.95	46.55		
1500	15	21.60	36.00		2500
1600	16	23.04	38.40		
1900	19	27.36	45.60	200	
2200	22	31.68	42.24	180	2000
2500	25	36.00	48.00	160	

Displacement	Dimensions					
	A1	B1	A2	B2	Inlet	Outlet
	[mm]	[mm]	[mm]	[mm]	G	G
450	42.5	87.2	40.5	78	G 1/2	G 1/2
630	44	90.2	42	81		
820	45.5	93.1	43.5	83.9		
1000	47	96.2	45	87	G 3/4	
1130	48	98.2	46	89		
1200	48.6	99.5	46.5	90.3		
1400	50	102.6	48	93.4		
1500	51	104.1	49	95		
1600	52	105.8	50	96.5		
1900	54	110.7	52	101.5		
2200	57	115.7	55	106.5		
2500	59.2	120.6	57.2	111.4		

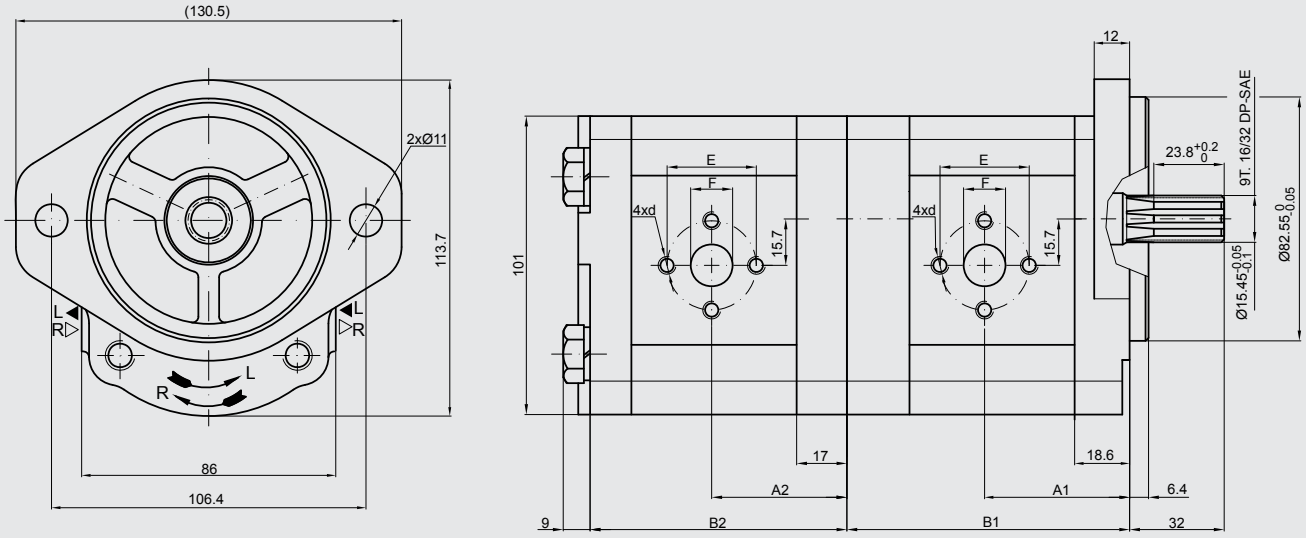
PGE104-.../...-.AT5/5-N



Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
450	4.5	6.14	14.33	250	3500
630	6.3	8.69	20.29		
820	8.2	11.32	26.40		
1000	10	13.95	32.55		
1130	11.3	15.76	36.78		
1200	12	16.92	39.48		
1400	14	19.95	46.55		
1500	15	21.60	36.00		2500
1600	16	23.04	38.40		
1900	19	27.36	45.60	200	
2200	22	31.68	42.24	180	2000
2500	25	36.00	48.00	160	

Displacement	Dimensions									
	A1	B1	A2	B2	Inlet			Outlet		
	[mm]	[mm]	[mm]	[mm]	E	F	d	E	F	d
450	39.8	85.2	37.3	78	40	15	M6	35	15	M6
630	41	88.2	38.6	81						
820	43.1	91.1	40.6	83.9		20				
1000	47.5	94.1	45	87						
1130	47.5	96.2	45	89						
1200	47.5	97.5	45	90.3						
1400	47.5	100.6	45	93.4						
1500	47.5	102.1	45	95						
1600	47.5	103.8	45	96.5						
1900	47.5	108.7	45	101.5						
2200	55	113.7	52.5	106.5						
2500	57.2	118.5	57.2	111.4						

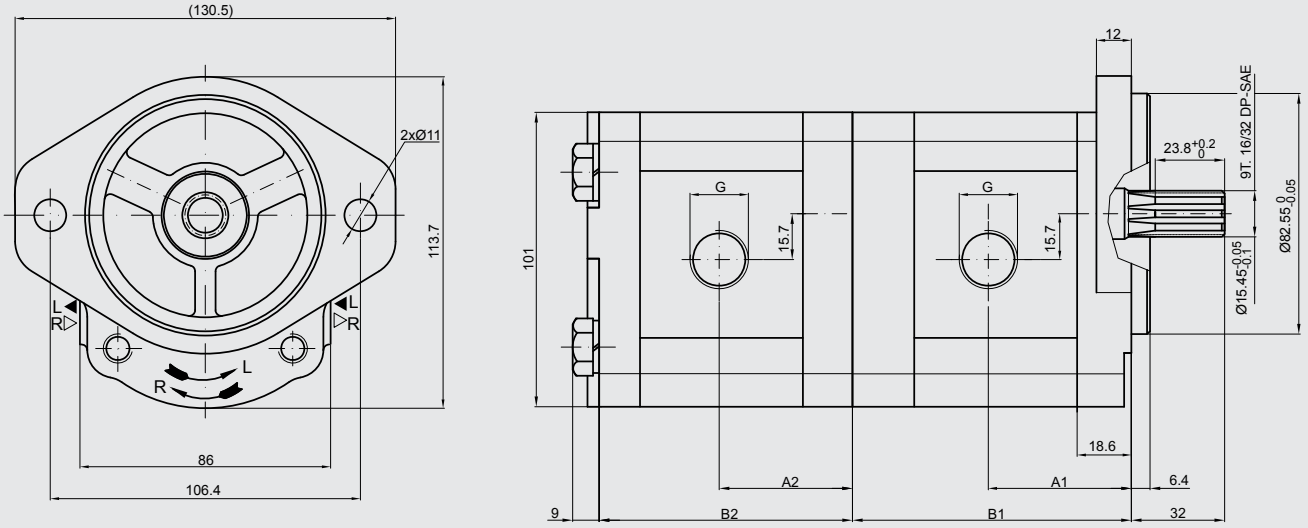
PGE104-.../...-.EW4/4-N



Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
450	4.5	6.14	14.33	250	3500
630	6.3	8.69	20.29		
820	8.2	11.32	26.40		
1000	10	13.95	32.55		
1130	11.3	15.76	36.78		
1200	12	16.92	39.48		
1400	14	19.95	46.55		
1500	15	21.60	36.00		2500
1600	16	23.04	38.40		
1900	19	27.36	45.60	200	
2200	22	31.68	42.24	180	2000
2500	25	36.00	48.00	160	

Displacement	Dimensions									
	A1	B1	A2	B2	Inlet			Outlet		
	[mm]	[mm]	[mm]	[mm]	E	F	d	E	F	d
450	42.1	86.8	40.5	78	30	13.1	M6	30	13.1	M6
630	43.6	89.8	42	81						
820	45.1	92.7	43.5	83.9						
1000	46.6	95.7	45	87	40	19	M8		14.2	
1130	47.6	97.8	46	89.1						
1200	48.2	99.1	46.6	90.3						
1400	49.6	102.1	48	93.4						
1500	50.6	103.7	49	95						
1600	51.6	105.3	50	96.6						
1900	53.6	110.3	52	101.5						
2200	56.6	115.3	55	106.5						
2500	58.8	120.2	57.2	111.4				40	19	M8

PGE104-.../...-.EW1/1-N

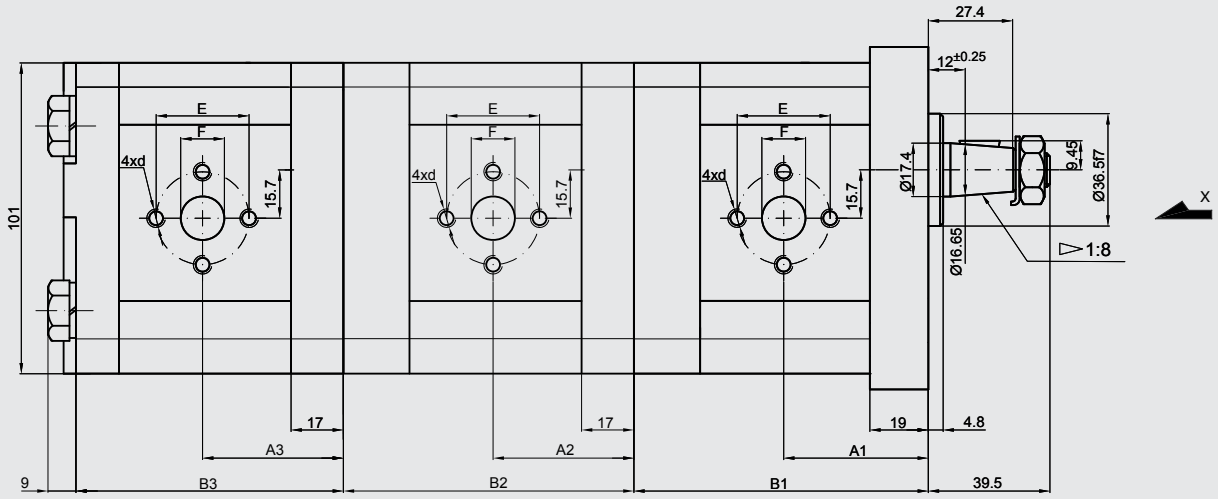


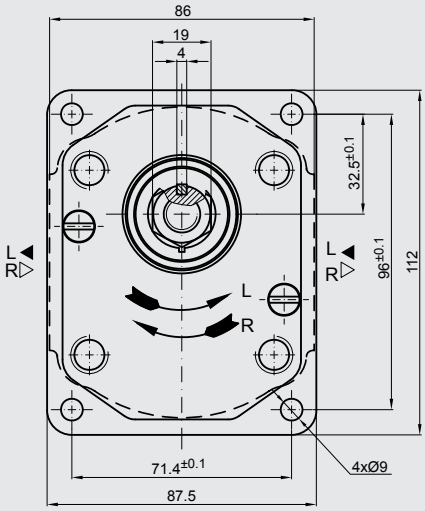
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
450	4.5	6.14	14.33	250	3500
630	6.3	8.69	20.29		
820	8.2	11.32	26.40		
1000	10	13.95	32.55		
1130	11.3	15.76	36.78		
1200	12	16.92	39.48		
1400	14	19.95	46.55		
1500	15	21.60	36.00		2500
1600	16	23.04	38.40		
1900	19	27.36	45.60	200	
2200	22	31.68	42.24	180	2000
2500	25	36.00	48.00	160	

Displacement	Dimensions					
	A1	B1	A2	B2	Inlet	Outlet
	[mm]	[mm]	[mm]	[mm]	G	G
450	42	86.8	40.5	78	G 1/2	G 1/2
630	43.6	86.8	42	81		
820	45	86.8	43.5	83.9		
1000	46.6	95.8	45	87	G 3/4	
1130	47.6	97.9	46	89		
1200	48.2	99.1	46.5	90.3		
1400	49.6	102.1	48	93.4		
1500	50.6	103.7	49	95		
1600	51.6	105.3	50	96.5		
1900	53.6	110.3	52	101.5		
2200	56.6	115.3	55	106.5		
2500	58.8	120.2	57.2	111.4		

6.5.22 Triple pump size 2

PGE104-.../.../...-.BR4/4/4-N



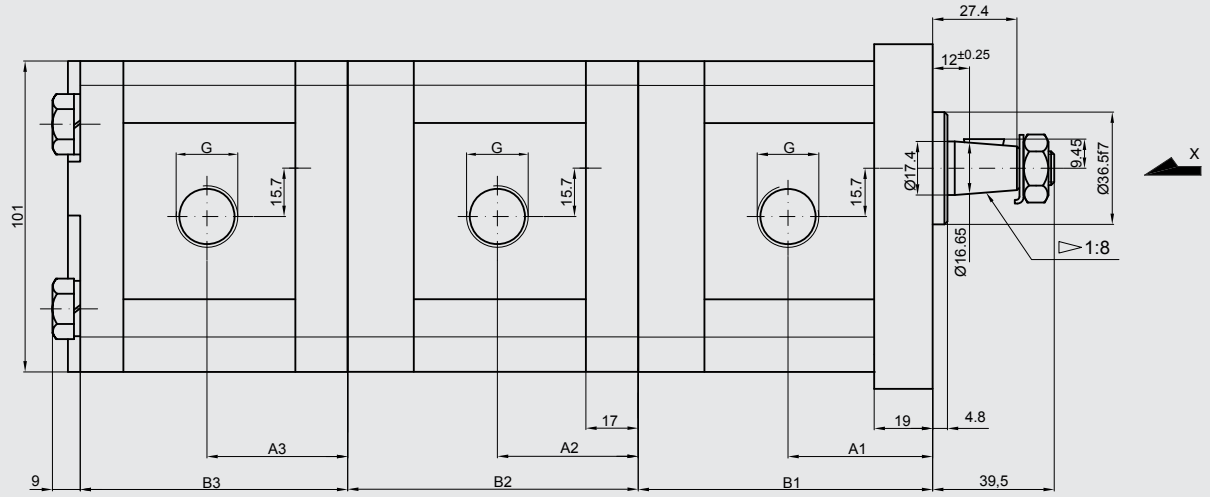


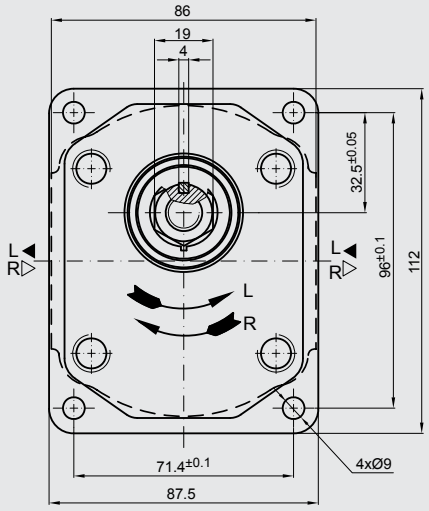
View X

Displacement	Geometric displacement [cm³/rev]	Flow at 1500 rpm [l/min]	Flow at max. rpm [l/min]	Pressure Rated [bar]	Max. speed n [rpm]
450	4.5	6.14	14.33	250	3500
630	6.3	8.69	20.29		
820	8.2	11.32	26.40		
1000	10	13.95	32.55		
1130	11.3	15.76	36.78		
1200	12	16.92	39.48		
1400	14	19.95	46.55		
1500	15	21.60	36.00		2500
1600	16	23.04	38.40		
1900	19	27.36	45.60	200	
2200	22	31.68	42.24	180	2000
2500	25	36.00	48.00	160	

Displacement	Dimensions											
	A1 [mm]	B1 [mm]	A2 [mm]	B2 [mm]	A3 [mm]	B3 [mm]	Inlet E	Inlet F	Inlet d	Outlet E	Outlet F	Outlet d
450	42.5	87.2	40.5	85.2	40.5	78	30	13.1	M6	30	13.1	M6
630	44	90.2	42	88.2	42	81						
820	45.5	93.1	43.5	91.1	43.5	83.9						
1000	47	96.2	45	94.1	45	87	40	19	M8		14.2	
1130	48	98.2	46	96.2	46	89.1						
1200	48.6	99.5	46.6	97.5	46.6	90.3						
1400	50	102.6	48	100.6	48	93.4						
1500	51	104.1	49	102.1	49	95						
1600	52	105.8	50	103.8	50	96.6						
1900	54	110.7	52	108.7	52	101.5						
2200	57	115.7	55	113.7	55	106.5						
2500	59.2	120.6	57.2	118.5	57.2	111.4				40	19	M8

PGE104-.../.../...-.BR1/1/1-N



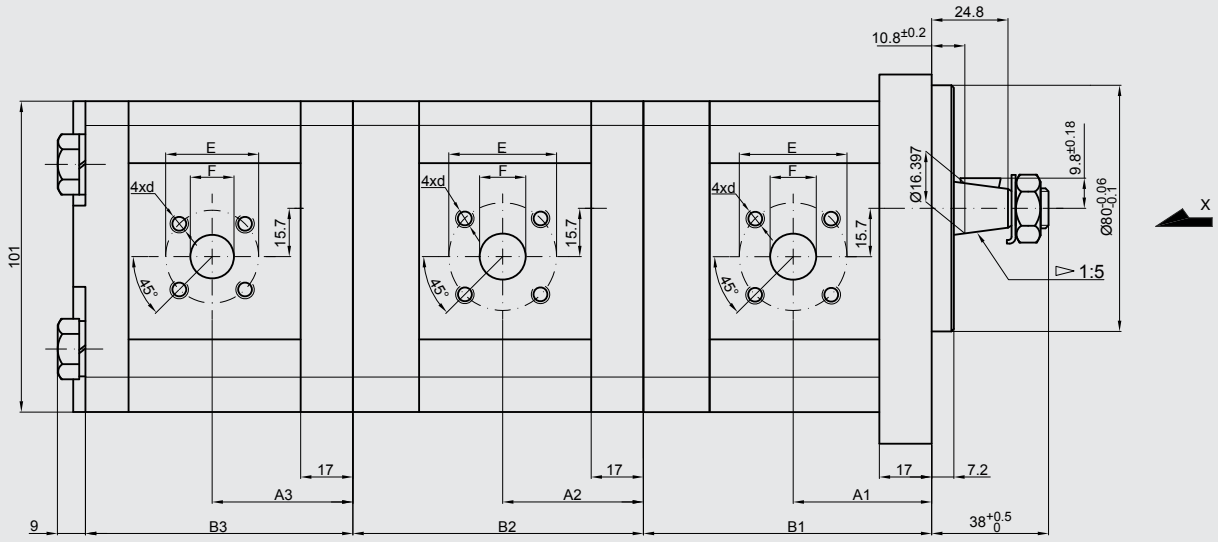


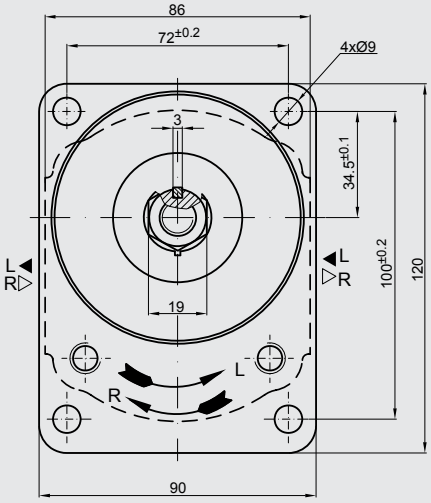
View X

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
450	4.5	6.14	14.33	250	3500
630	6.3	8.69	20.29		
820	8.2	11.32	26.40		
1000	10	13.95	32.55		
1130	11.3	15.76	36.78		
1200	12	16.92	39.48		
1400	14	19.95	46.55		
1500	15	21.60	36.00		2500
1600	16	23.04	38.40		
1900	19	27.36	45.60	200	
2200	22	31.68	42.24	180	2000
2500	25	36.00	48.00	160	

Displacement	Dimensions							
	A1	B1	A2	B2	A3	B3	Inlet	Outlet
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	G	G
450	42.5	87.2	40.5	85.2	40.5	78	G 1/2	G 1/2
630	44	90.2	42	88.2	42	81		
820	45.5	93.1	43.5	91.1	43.5	83.9		
1000	47	96.2	45	94.1	45	87	G 3/4	
1130	48	98.2	46	96.2	46	89		
1200	48.6	99.5	46.6	97.5	46.5	90.3		
1400	50	102.6	48	100.6	48	93.4		
1500	51	104.1	49	102.1	49	95		
1600	52	105.8	50	103.8	50	96.6		
1900	54	110.7	52	108.7	52	101.5		
2200	57	115.7	55	113.7	55	106.5		
2500	59.2	120.6	57.2	118.5	57.2	111.4		

PGE104-.../.../...-.AT5/5/5-N





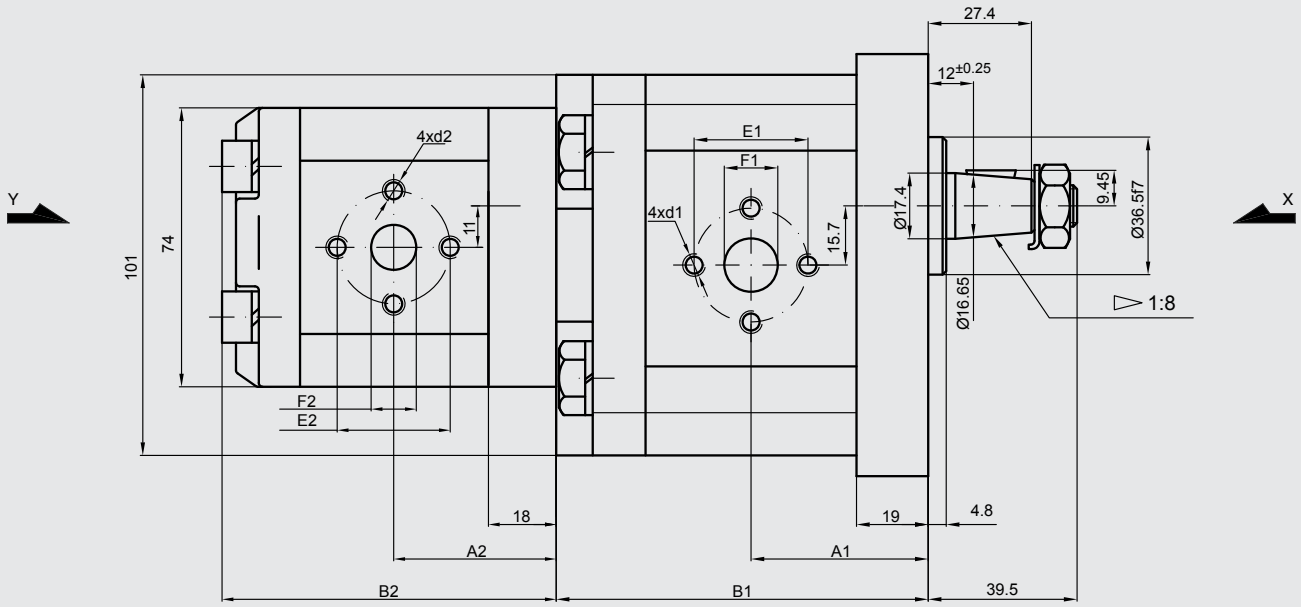
View X

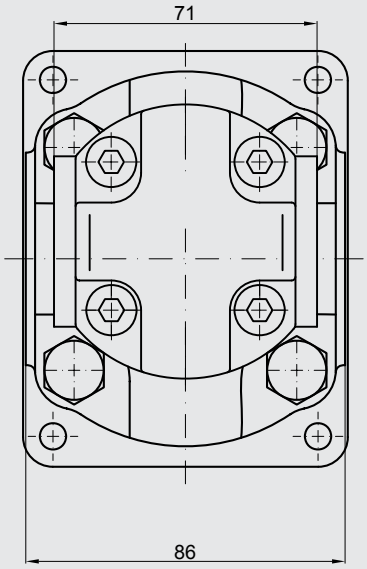
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
450	4.5	6.14	14.33	250	3500
630	6.3	8.69	20.29		
820	8.2	11.32	26.40		
1000	10	13.95	32.55		
1130	11.3	15.76	36.78		
1200	12	16.92	39.48		
1400	14	19.95	46.55		
1500	15	21.60	36.00		2500
1600	16	23.04	38.40		
1900	19	27.36	45.60	200	
2200	22	31.68	42.24	180	2000
2500	25	36.00	48.00	160	

Displacement	Dimensions											
	A1	B1	A2	B2	A3	B3	Inlet			Outlet		
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	E	F	d	E	F	d
450	39.8	85.2	40.5	85.2	37.3	78	40	15	M6	35	15	M6
630	41	88.2	42	88.2	38.6	81						
820	43.1	91.1	43.5	91.1	40.6	83.9		20				
1000	47.5	94.1	45	94.1	45	87						
1130	47.5	96.2	46	96.2	45	89						
1200	47.5	97.5	46.6	97.5	45	90.3						
1400	47.5	100.6	48	100.6	45	93.4						
1500	47.5	102.1	49	102.1	45	95						
1600	47.5	103.8	50	103.8	45	96.5						
1900	47.5	108.7	52	108.7	45	101.5						
2200	55	113.7	55	113.7	52.5	106.5						
2500	57.2	118.5	57.2	118.5	57.2	111.4						

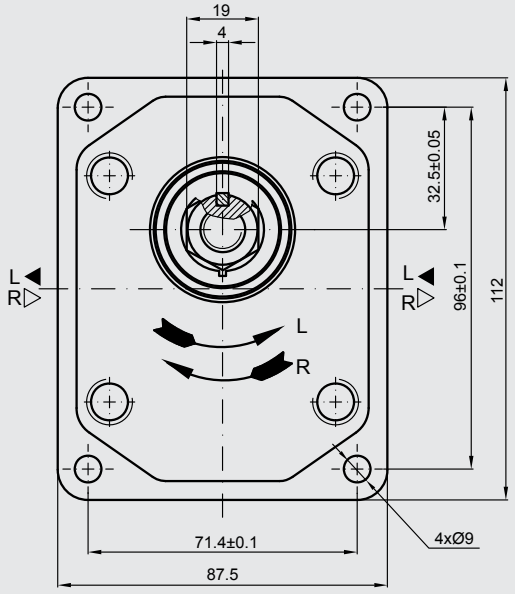
6.5.23 Double pump size 2 / size 1

PGE104-.../...-.BR4/4-N





View Y



View X

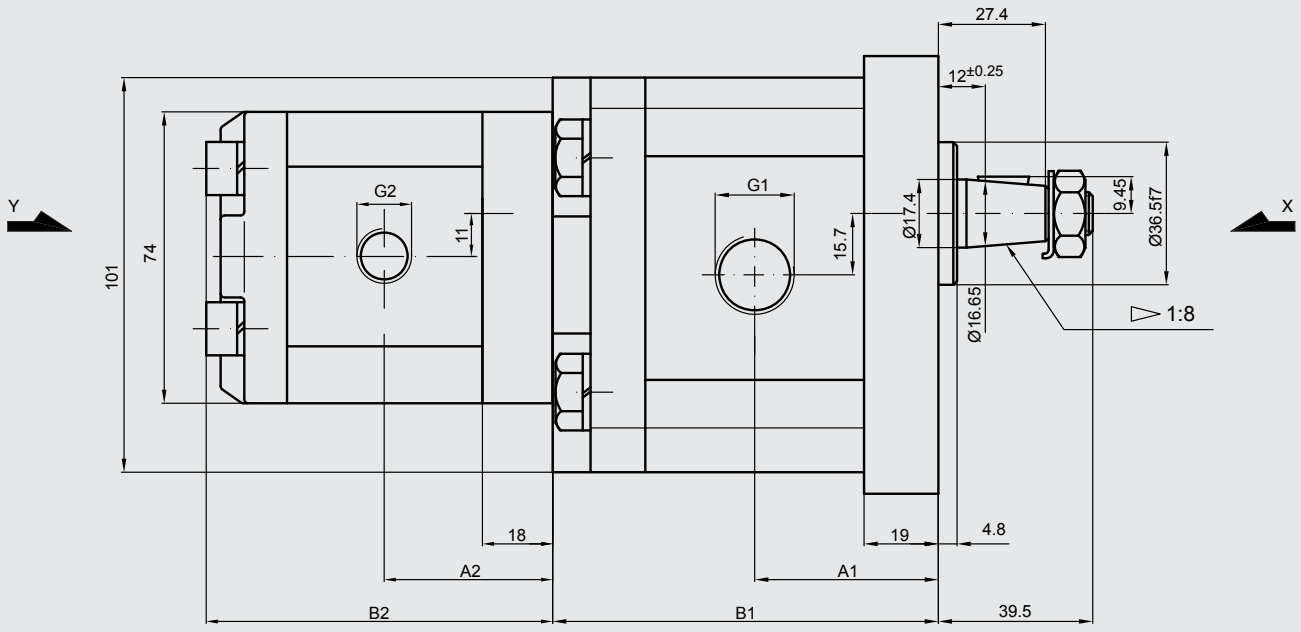
Front pump size 2:

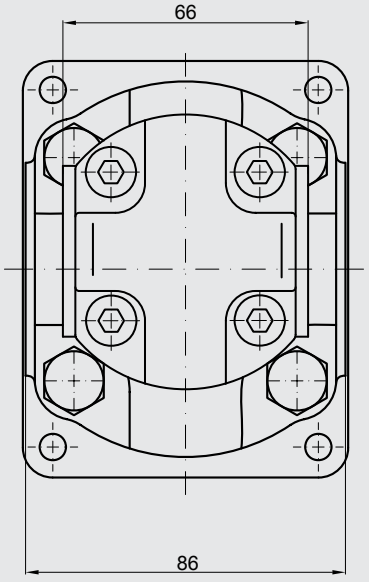
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions								
								Inlet			Outlet		
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]	A1 [mm]	B1 [mm]	E1	F1	d1	E1	F1	d1
450	4.5	6.14	14.33	250	3500	42.5	89.7	30	13.1	M6	30	13.1	M6
630	6.3	8.69	20.29			44	92.7						
820	8.2	11.32	26.40			45.5	95.6						
1000	10	13.95	32.55			47	98.7	40	19	M8		14.2	
1130	11.3	15.76	36.78			48	100.7						
1200	12	16.92	39.48			48.6	102						
1400	14	19.95	46.55			50	105.1						
1500	15	21.60	36.00		2500	51	106.6						
1600	16	23.04	38.40			52	108.3						
1900	19	27.36	45.60	200		54	113.2						
2200	22	31.68	42.24	180	2000	57	118.2						
2500	25	36.00	48.00	160		59.2	123.1				40	19	M8

End pump size 1:

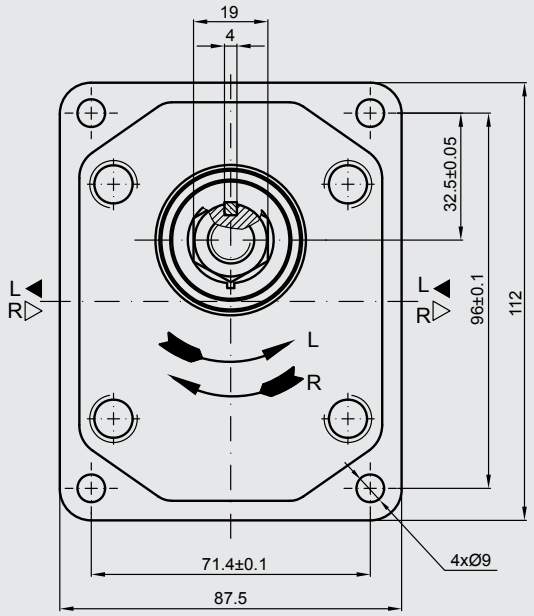
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions								
								Inlet			Outlet		
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]	A2 [mm]	B2 [mm]	E2	F2	d2	E2	F2	d2
100	1	1.40	3.26	250	3500	39.1	81	30	12	M6	30	12	M6
125	1.25	1.74	4.07			39.5	82						
160	1.6	2.23	5.21			40.3	83.6						
200	2	2.82	6.58			41.1	85.2						
250	2.5	3.53	8.23			42.1	87.2						
315	3.15	4.44	10.36			43.5	89.8						
365	3.65	5.15	12.01			44.4	91.9						
420	4.2	5.92	13.82			45.5	94.1						
500	5	7.05	14.10		3000	47.1	97.2						
610	6.1	8.69	14.49	200	2500	49.4	101.8						
740	7.4	10.55	17.58	170		52.1	107.2						

PGE104-.../...-.BR1/1-N





View Y



View X

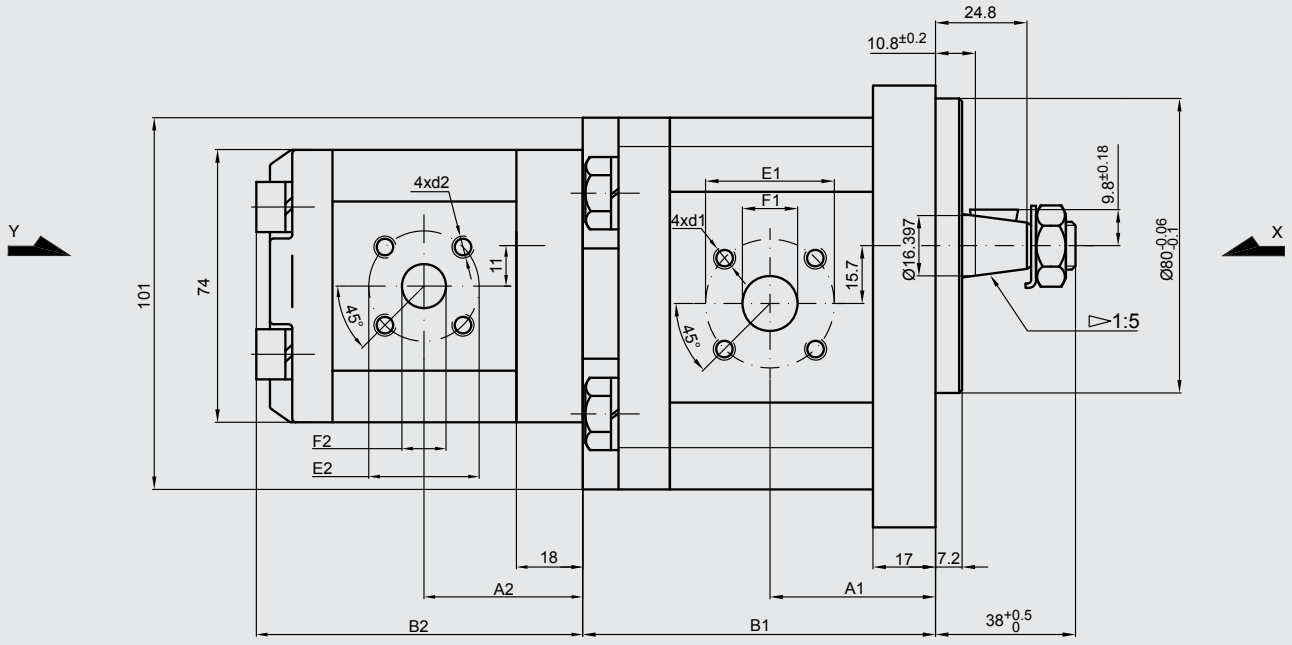
Front pump size 2:

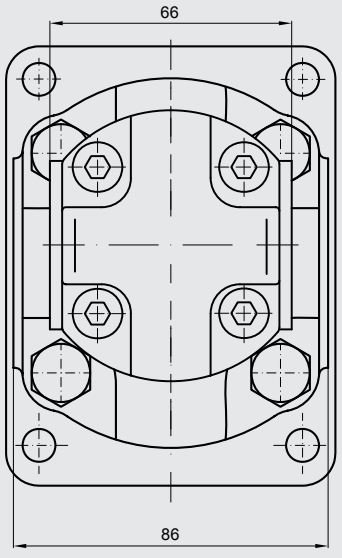
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
		at 1500 rpm	at max. rpm		n	A1	B1	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G1	G1
450	4.5	6.14	14.33	250	3500	42.5	89.7	G 1/2	G 1/2
630	6.3	8.69	20.29			44	92.7		
820	8.2	11.32	26.40			45.5	95.6		
1000	10	13.95	32.55			47	98.7	G 3/4	
1130	11.3	15.76	36.78			48	100.7		
1200	12	16.92	39.48			48.6	102		
1400	14	19.95	46.55			50	105.1		
1500	15	21.60	36.00		2500	51	106.6		
1600	16	23.04	38.40			52	108.3		
1900	19	27.36	45.60	200		54	113.2		
2200	22	31.68	42.24	180	2000	57	118.2		
2500	25	36.00	48.00	160		59.2	123.1		

End pump size 1:

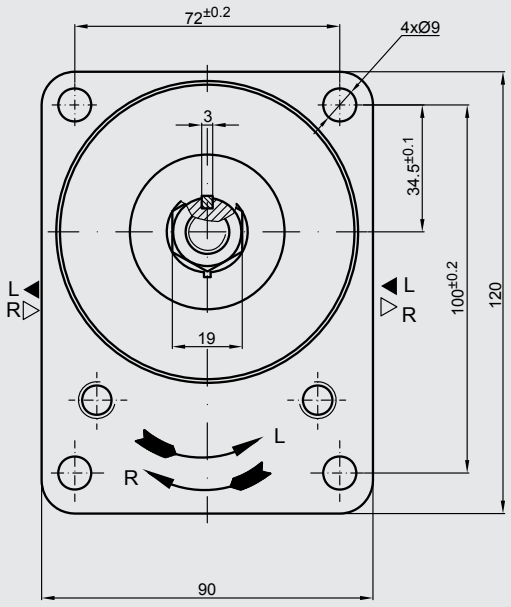
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
		at 1500 rpm	at max. rpm		n	A2	B2	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G2	G2
100	1	1.40	3.26	250	3500	39.1	81	G 3/8	G 3/8
125	1.25	1.74	4.07			39.5	82		
160	1.6	2.23	5.21			40.3	83.6		
200	2	2.82	6.58			41.1	85.2		
250	2.5	3.53	8.23			42.1	87.2		
315	3.15	4.44	10.36			43.5	89.8	G 1/2	
365	3.65	5.15	12.01			44.4	91.9		
420	4.2	5.92	13.82			45.5	94.1		
500	5	7.05	14.10		3000	47.1	97.2		
610	6.1	8.69	14.49	200	2500	49.4	101.8		
740	7.4	10.55	17.58	170		52.1	107.2		

PGE104-.../...-.AT5/5-N





View Y



View X

Front pump size 2:

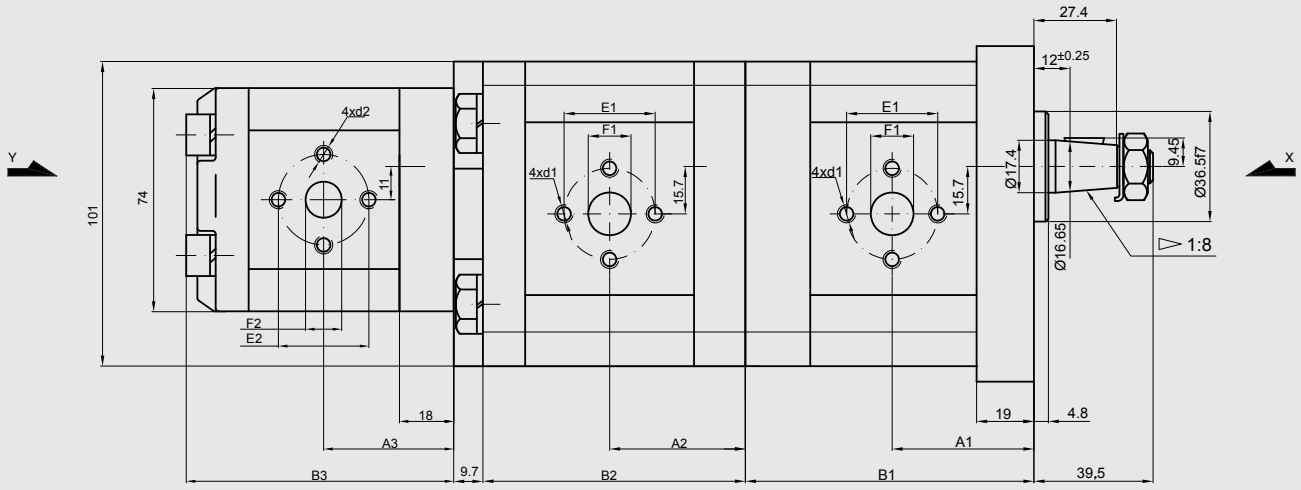
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions								
		at 1500 rpm	at max. rpm		n	A1	B1	Inlet			Outlet			
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	E1	F1	d1	E1	F1	d1
450	4.5	6.14	14.33	250	3500	39.8	87.6	40	15	M6	35	15	M6
630	6.3	8.69	20.29			41	90.6						
820	8.2	11.32	26.40			43.1	93.5		20				
1000	10	13.95	32.55			47.5	96.6						
1130	11.3	15.76	36.78			47.5	98.7						
1200	12	16.92	39.48			47.5	99.9						
1400	14	19.95	46.55			47.5	103						
1500	15	21.60	36.00		2500	47.5	104.5						
1600	16	23.04	38.40			47.5	106.2						
1900	19	27.36	45.60	200		47.5	111.1						
2200	22	31.68	42.24	180	2000	55	116.1						
2500	25	36.00	48.00	160		57.5	121.1						

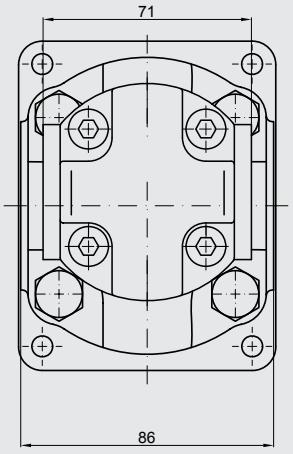
End pump size 1:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions								
		at 1500 rpm	at max. rpm		n	A2	B2	Inlet			Outlet			
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	E2	F2	d2	E2	F2	d2
100	1	1.40	3.26	250	3500	39.1	81	30	12	M6	30	12	M6
125	1.25	1.74	4.07			39.5	82						
160	1.6	2.23	5.21			40.3	83.6						
200	2	2.82	6.58			41.1	85.2						
250	2.5	3.53	8.23			42.1	87.2						
315	3.15	4.44	10.36			43.5	89.8						
365	3.65	5.15	12.01			44.4	91.9						
420	4.2	5.92	13.82			45.5	94.1						
500	5	7.05	14.10		3000	47.1	97.2						
610	6.1	8.69	14.49	200	2500	49.4	101.8						
740	7.4	10.55	17.58	170		52.1	107.2						

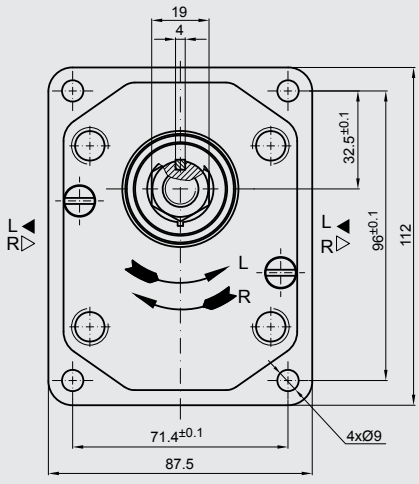
6.5.24 Triple pump size 2 / size 2 / size 1

PGE104-.../.../...-.BR4/4/4-N





View Y



View X

Front and middle pump size 2:

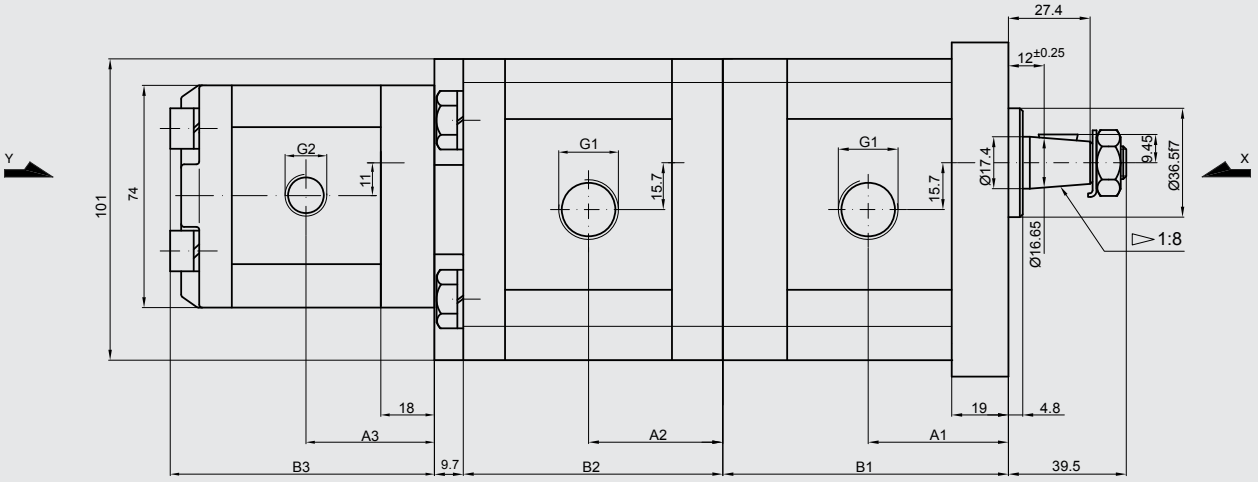
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
450	4.5	6.14	14.33	250	3500
630	6.3	8.69	20.29		
820	8.2	11.32	26.40		
1000	10	13.95	32.55		
1130	11.3	15.76	36.78		
1200	12	16.92	39.48		
1400	14	19.95	46.55		
1500	15	21.60	36.00		2500
1600	16	23.04	38.40		
1900	19	27.36	45.60	200	
2200	22	31.68	42.24	180	2000
2500	25	36.00	48.00	160	

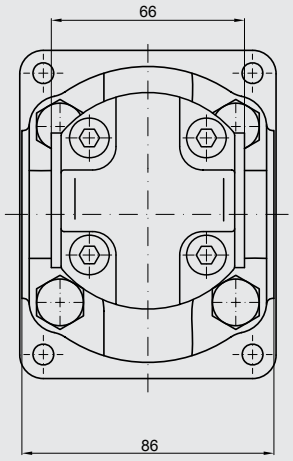
Displacement	Dimensions									
	A1	B1	A2	B2	Inlet			Outlet		
	[mm]	[mm]	[mm]	[mm]	E1	F1	d1	E1	F1	d1
450	42.5	87.2	40.5	78	30	13.1	M6	30	13.1	M6
630	44	90.2	42	81						
820	45.5	93.1	43.5	83.9						
1000	47	96.2	45	87	40	19	M8		14.2	
1130	48	98.2	46	89.1						
1200	48.6	99.5	46.6	90.3						
1400	50	102.6	48	93.4						
1500	51	104.1	49	95						
1600	52	105.8	50	96.6						
1900	54	110.7	52	101.5						
2200	57	115.7	55	106.5						
2500	59.2	120.6	57.2	111.4				40	19	M8

End pump size 1:

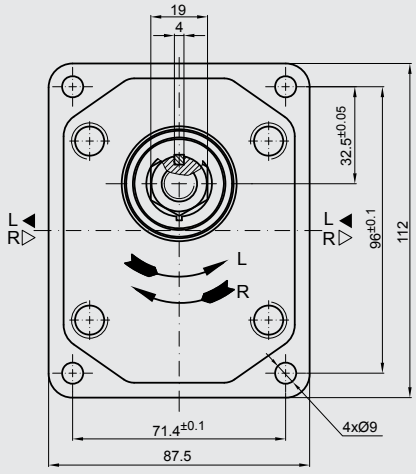
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions							
		at 1500 rpm	at max. rpm		n	A3	B3	Inlet			Outlet		
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	E2	F2	d2	E2	F2	d2
100	1	1.40	3.26	250	3500	39.1	81	30	12	M6	30	12	M6
125	1.25	1.74	4.07			39.5	82						
160	1.6	2.23	5.21			40.3	83.6						
200	2	2.82	6.58			41.1	85.2						
250	2.5	3.53	8.23			42.1	87.2						
315	3.15	4.44	10.36			43.5	89.8						
365	3.65	5.15	12.01			44.4	91.9						
420	4.2	5.92	13.82			45.5	94.1						
500	5	7.05	14.10		3000	47.1	97.2						
610	6.1	8.69	14.49	200	2500	49.4	101.8						
740	7.4	10.55	17.58	170		52.1	107.2						

PGE104-.../.../...-.BR1/1/1-N





View Y



View X

Front and middle pump size 2:

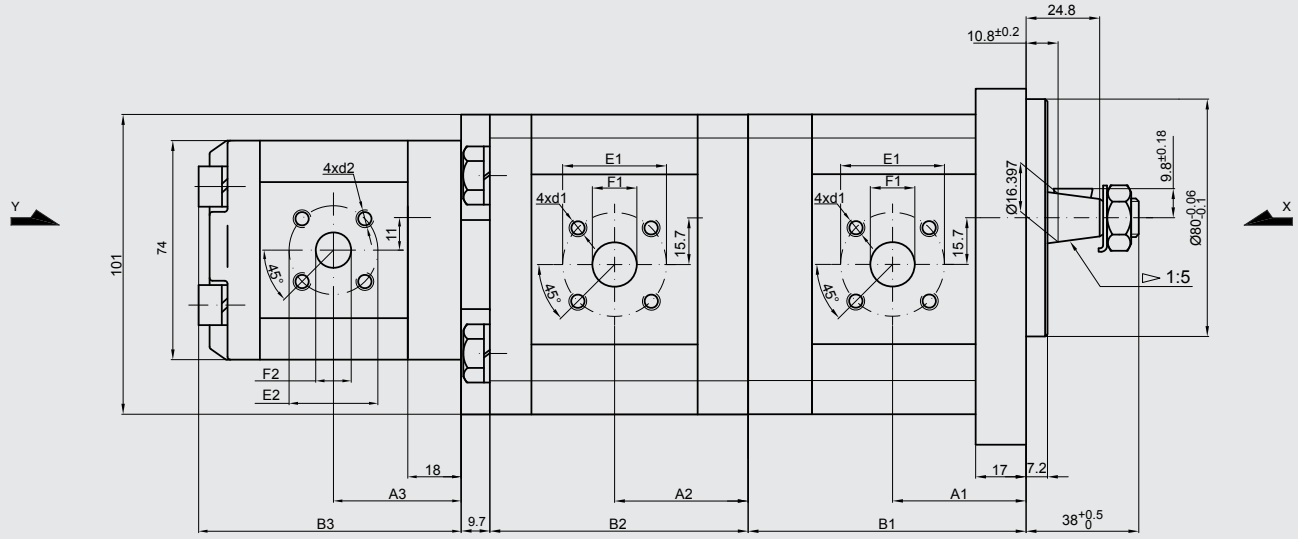
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
450	4.5	6.14	14.33	250	3500
630	6.3	8.69	20.29		
820	8.2	11.32	26.40		
1000	10	13.95	32.55		
1130	11.3	15.76	36.78		
1200	12	16.92	39.48		
1400	14	19.95	46.55		
1500	15	21.60	36.00		2500
1600	16	23.04	38.40		
1900	19	27.36	45.60	200	
2200	22	31.68	42.24	180	2000
2500	25	36.00	48.00	160	

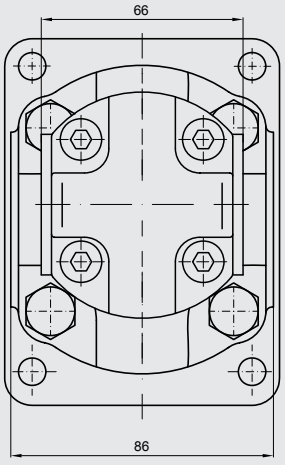
Displacement	Dimensions					
	A1 [mm]	B1 [mm]	A2 [mm]	B2 [mm]	Inlet G1	Outlet G1
450	42.5	87.2	40.5	78	G 1/2	G 1/2
630	44	90.2	42	81		
820	45.5	93.1	43.5	83.9		
1000	47	96.2	45	87	G 3/4	
1130	48	98.2	46	89.1		
1200	48.6	99.5	46.6	90.3		
1400	50	102.6	48	93.4		
1500	51	104.1	49	95		
1600	52	105.8	50	96.6		
1900	54	110.7	52	101.5		
2200	57	115.7	55	106.5		
2500	59.2	120.6	57.2	111.4		

End pump size 1:

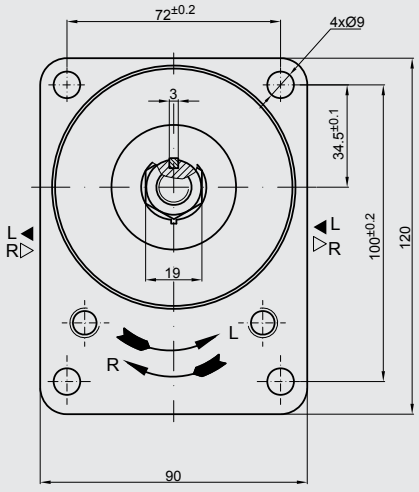
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
		at 1500 rpm	at max. rpm		n	A3	B3	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G2	G2
100	1	1.40	3.26	250	3500	39.1	81	G 3/8	G 3/8
125	1.25	1.74	4.07			39.5	82		
160	1.6	2.23	5.21			40.3	83.6		
200	2	2.82	6.58			41.1	85.2		
250	2.5	3.53	8.23			42.1	87.2		
315	3.15	4.44	10.36			43.5	89.8	G 1/2	
365	3.65	5.15	12.01			44.4	91.9		
420	4.2	5.92	13.82			45.5	94.1		
500	5	7.05	14.10		3000	47.1	97.2		
610	6.1	8.69	14.49	200	2500	49.4	101.8		
740	7.4	10.55	17.58	170		52.1	107.2		

PGE104-.../.../...-.AT5/5/5-N





View Y



View X

Front and middle pump size 2:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
450	4.5	6.14	14.33	250	3500
630	6.3	8.69	20.29		
820	8.2	11.32	26.40		
1000	10	13.95	32.55		
1130	11.3	15.76	36.78		
1200	12	16.92	39.48		
1400	14	19.95	46.55		
1500	15	21.60	36.00		2500
1600	16	23.04	38.40		
1900	19	27.36	45.60	200	
2200	22	31.68	42.24	180	2000
2500	25	36.00	48.00	160	

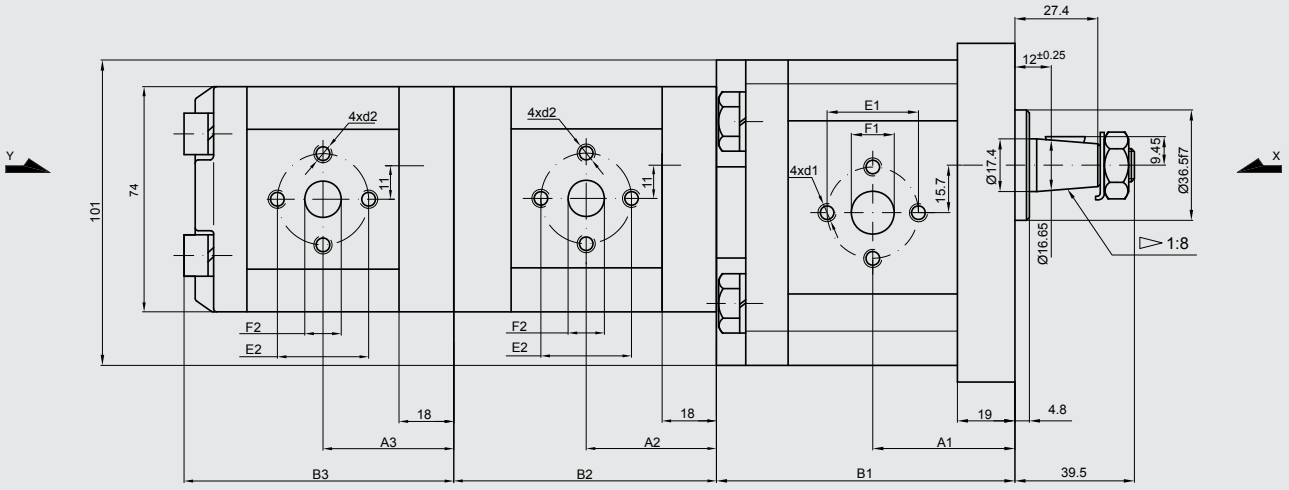
Displacement	Dimensions									
	A1	B1	A2	B2	Inlet			Outlet		
	[mm]	[mm]	[mm]	[mm]	E1	F1	d1	E1	F1	d1
450	39.8	85.2	40.5	78	40	15	M6	35	15	M6
630	41	88.2	42	81						
820	43.1	91.1	43.5	83.9		20				
1000	47.5	94.1	45	87						
1130	47.5	96.2	46	89.1						
1200	47.5	97.5	46.6	90.3						
1400	47.5	100.6	48	93.4						
1500	47.5	102.1	49	95						
1600	47.5	103.8	50	96.6						
1900	47.5	108.7	52	101.5						
2200	55	113.7	55	106.5						
2500	57.2	118.5	57.2	111.4						

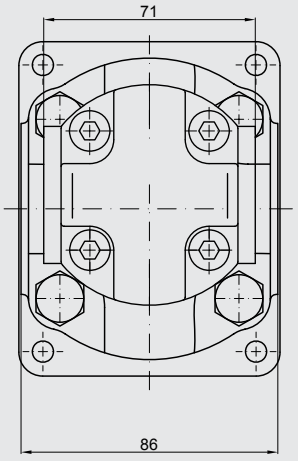
End pump size 1:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions							
		at 1500 rpm	at max. rpm		n	A3	B3	Inlet			Outlet		
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	E2	F2	d2	E2	F2	d2
100	1	1.40	3.26	250	3500	39.1	81	30	12	M6	30	12	M6
125	1.25	1.74	4.07			39.5	82						
160	1.6	2.23	5.21			40.3	83.6						
200	2	2.82	6.58			41.1	85.2						
250	2.5	3.53	8.23			42.1	87.2						
315	3.15	4.44	10.36			43.5	89.8						
365	3.65	5.15	12.01			44.4	91.9						
420	4.2	5.92	13.82			45.5	94.1						
500	5	7.05	14.10		3000	47.1	97.2						
610	6.1	8.69	14.49	200	2500	49.4	101.8						
740	7.4	10.55	17.58	170		52.1	107.2						

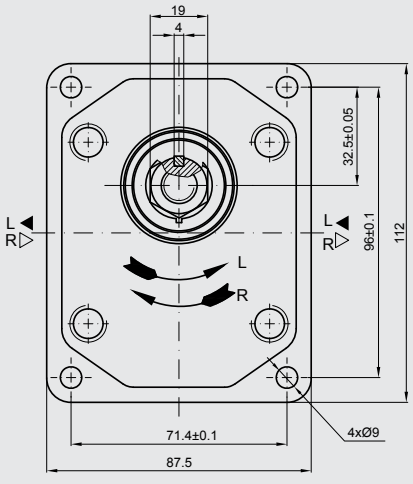
6.5.25 Triple pump size 2 / size 1 / size 1

PGE104-.../.../...-.BR4/4/4-N





View Y



View X

Front pump size 2:

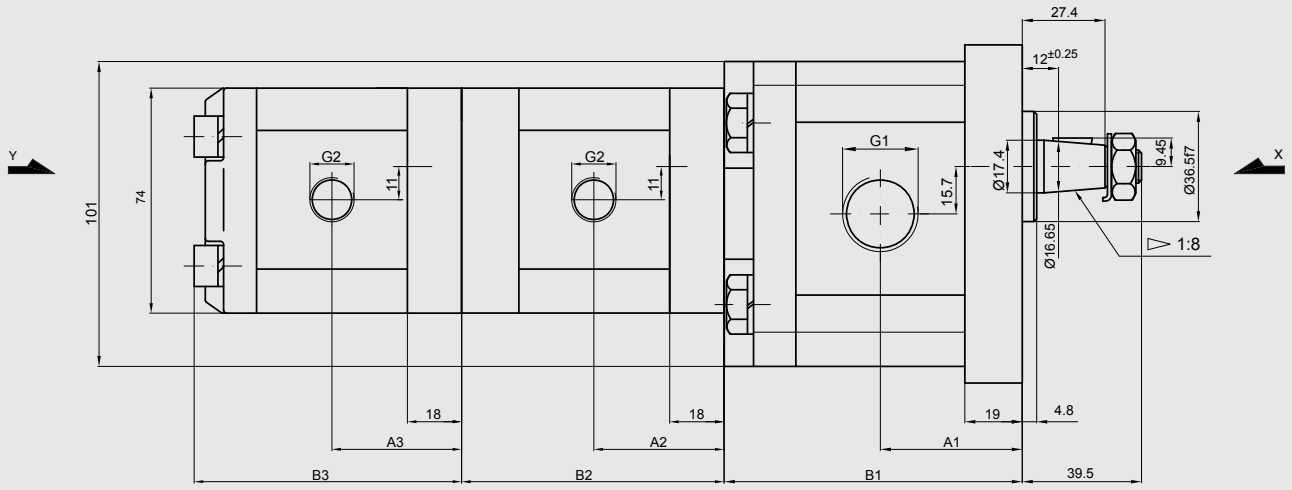
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions								
								Inlet			Outlet		
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]	A1 [mm]	B1 [mm]	E1	F1	d1	E1	F1	d1
450	4.5	6.14	14.33	250	3500	42.5	89.7	30	13.1	M6	30	13.1	M6
630	6.3	8.69	20.29			44	92.7						
820	8.2	11.32	26.40			45.5	95.6						
1000	10	13.95	32.55			47	98.7	40	19	M8		14.2	
1130	11.3	15.76	36.78			48	100.7						
1200	12	16.92	39.48			48.6	102						
1400	14	19.95	46.55			50	105.1						
1500	15	21.60	36.00		2500	51	106.6						
1600	16	23.04	38.40			52	108.3						
1900	19	27.36	45.60	200		54	113.2						
2200	22	31.68	42.24	180	2000	57	118.2						
2500	25	36.00	48.00	160		59.2	123.1				40	19	M8

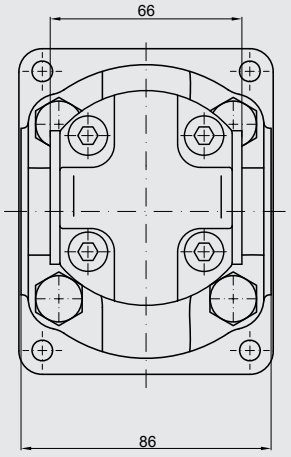
Middle and end pump size 1:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
100	1	1.40	3.26	250	3500
125	1.25	1.74	4.07		
160	1.6	2.23	5.21		
200	2	2.82	6.58		
250	2.5	3.53	8.23		
315	3.15	4.44	10.36		
365	3.65	5.15	12.01		
420	4.2	5.92	13.82		
500	5	7.05	14.10		3000
610	6.1	8.69	14.49	200	2500
740	7.4	10.55	17.58	170	

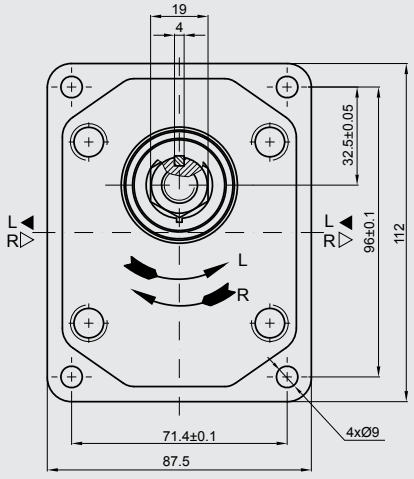
Displacement	Dimensions									
	A2	B2	A3	B3	Inlet			Outlet		
	[mm]	[mm]	[mm]	[mm]	E2	F2	d2	E2	F2	d2
100	39.1	79	39.1	79	30	12	M6	30	12	M6
125	39.5	80	39.5	80						
160	40.3	81.6	40.3	81.6						
200	41.1	83.2	41.1	83.2						
250	42.1	85.2	42.1	85.2						
315	43.5	87.8	43.5	87.8						
365	44.4	89.9	44.4	89.9						
420	45.5	92.1	45.5	92.1						
500	47.1	95.2	47.1	95.2						
610	49.4	99.8	49.4	99.8						
740	52.1	105.2	52.1	105.2						

PGE104-.../.../...-.BR1/1/1-N





View Y



View X

Front pump size 2:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
		at 1500 rpm	at max. rpm		n	A1	B1	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G1	G1
450	4.5	6.14	14.33	250	3500	42.5	89.7	G 1/2	G 1/2
630	6.3	8.69	20.29			44	92.7		
820	8.2	11.32	26.40			45.5	95.6		
1000	10	13.95	32.55			47	98.7	G 3/4	
1130	11.3	15.76	36.78			48	100.7		
1200	12	16.92	39.48			48.6	102		
1400	14	19.95	46.55			50	105.1		
1500	15	21.60	36.00		2500	51	106.6		
1600	16	23.04	38.40			52	108.3		
1900	19	27.36	45.60	200		54	113.2		
2200	22	31.68	42.24	180	2000	57	118.2		
2500	25	36.00	48.00	160		59.2	123.1		

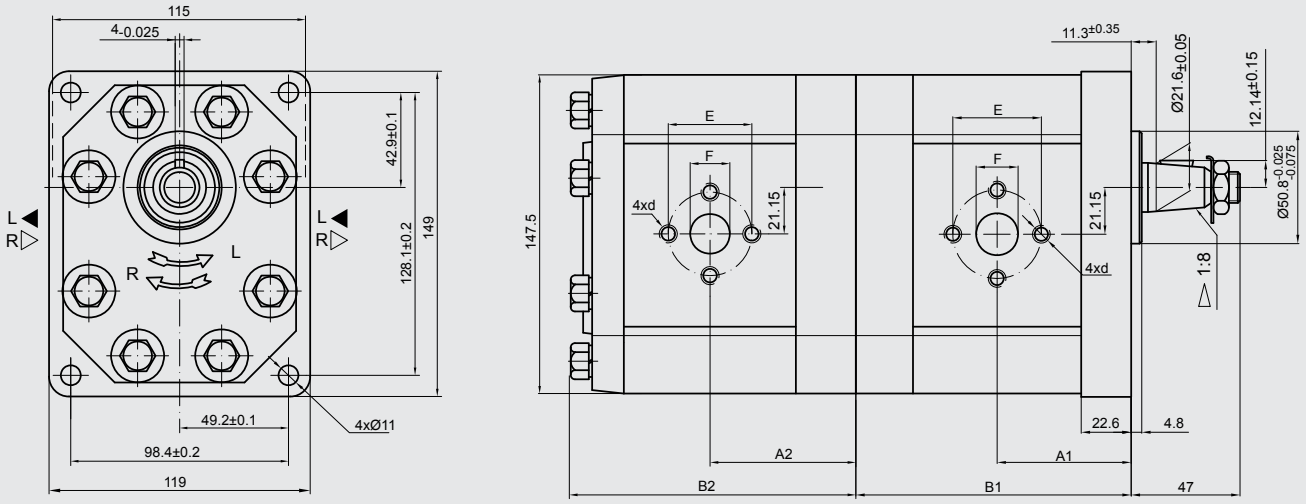
Middle and end pump size 1:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
100	1	1.40	3.26	250	3500
125	1.25	1.74	4.07		
160	1.6	2.23	5.21		
200	2	2.82	6.58		
250	2.5	3.53	8.23		
315	3.15	4.44	10.36		
365	3.65	5.15	12.01		
420	4.2	5.92	13.82		
500	5	7.05	14.10		3000
610	6.1	8.69	14.49	200	2500
740	7.4	10.55	17.58	170	

Displacement	Dimensions					
	A2	B2	A3	B3	Inlet	Outlet
	[mm]	[mm]	[mm]	[mm]	G2	G2
100	39.1	79	39.1	79	G 3/8	G 3/8
125	39.5	80	39.5	80		
160	40.3	81.6	40.3	81.6		
200	41.1	83.2	41.1	83.2		
250	42.1	85.2	42.1	85.2		
315	43.5	87.8	43.5	87.8	G 1/2	
365	44.4	89.9	44.4	89.9		
420	45.5	92.1	45.5	92.1		
500	47.1	95.2	47.1	95.2		
610	49.4	99.8	49.4	99.8		
740	52.1	105.2	52.1	105.2		

6.5.26 Double pump size 3

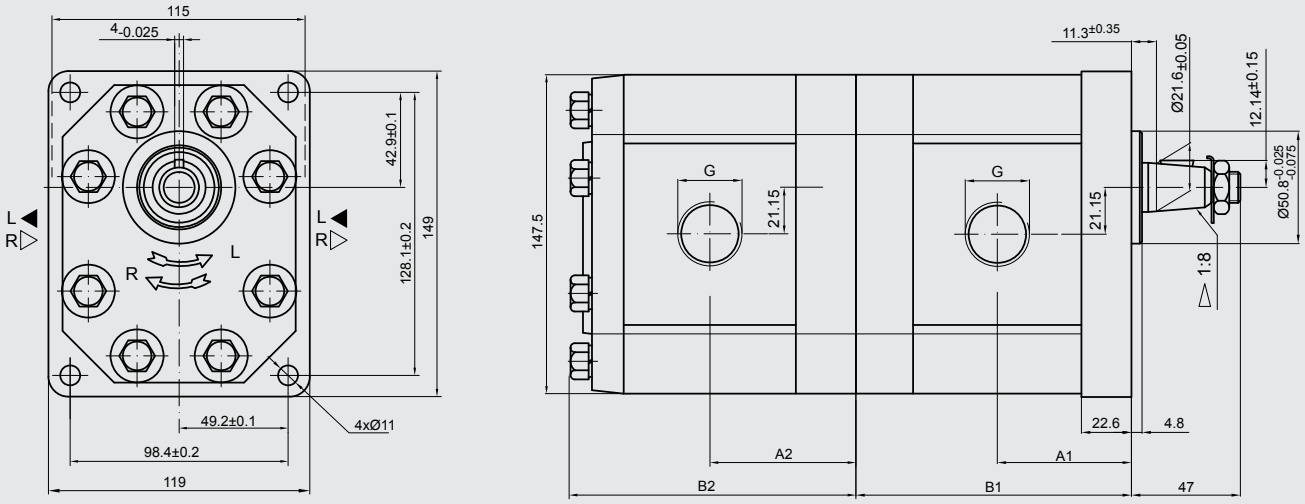
PGE104-.../...-.BS4/4-N



Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]
2000	20	28.2	56.4	250	3000
2250	22.5	31.7	63.5		
2500	25	35.3	70.5		
2800	28	39.5	79.0		
3200	32	45.1	90.2		
3600	36	51.3	95.8	240	2800
4200	42	59.9	99.8	230	2500
4600	46	65.6	100.5	210	2300
5000	50	71.3	99.8	185	2100
5500	55	78.4	91.4	165	1750
6000	60	85.5	99.8	150	

Displacement	Dimensions									
	A1	B1	A2	B2	Inlet			Outlet		
	[mm]	[mm]	[mm]	[mm]	E	F	d	E	F	d
2000	56.1	114.7	58.3	118.9	40	19	M8	40	19	M8
2250	57.6	117.7	59.7	121.9						
2500	58.3	119.1	60.5	123.3						
2800	60.2	122.7	62.4	126.9						
3200	66.5	135.3	68.7	139.5	51	27	M10			
3600	68.0	138.5	70.2	142.7						
4200	70.8	144.0	73.0	148.3						
4600	72.7	147.8	74.9	152.0						
5000	74.5	151.4	76.7	155.6						
5500	76.7	155.9	78.9	160.1						
6000	78.7	160.4	80.9	164.6						

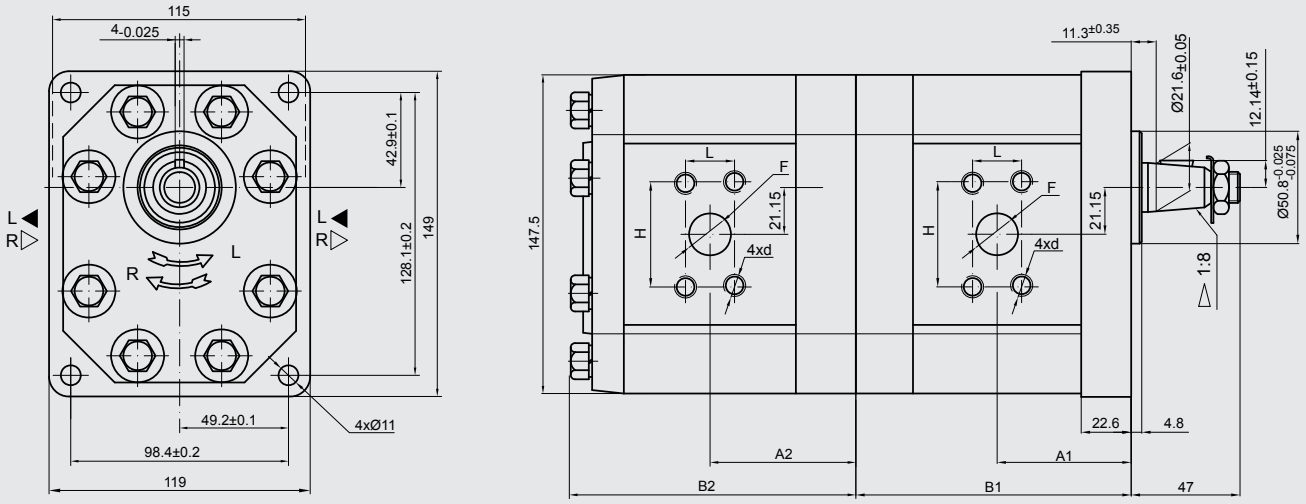
PGE104-.../...-.BS1/1-N



Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
2000	20	28.2	56.4	250	3000
2250	22.5	31.7	63.5		
2500	25	35.3	70.5		
2800	28	39.5	79.0		
3200	32	45.1	90.2		
3600	36	51.3	95.8	240	2800
4200	42	59.9	99.8	230	2500
4600	46	65.6	100.5	210	2300
5000	50	71.3	99.8	185	2100
5500	55	78.4	91.4	165	1750
6000	60	85.5	99.8	150	

Displacement	Dimensions					
	A1 [mm]	B1 [mm]	A2 [mm]	B2 [mm]	Inlet G	Outlet G
2000	56.1	114.7	58.3	118.9	G 3/4	G 3/4
2250	57.6	117.7	59.7	121.9		
2500	58.3	119.1	60.5	123.3		
2800	60.2	122.7	62.4	126.9		
3200	66.5	135.3	68.7	139.5		
3600	68.0	138.5	70.2	142.7	G 1	
4200	70.8	144.0	73.0	148.3		
4600	72.7	147.8	74.9	152.0		
5000	74.5	151.4	76.7	155.6		
5500	76.7	155.9	78.9	160.1		
6000	78.7	160.4	80.9	164.6		

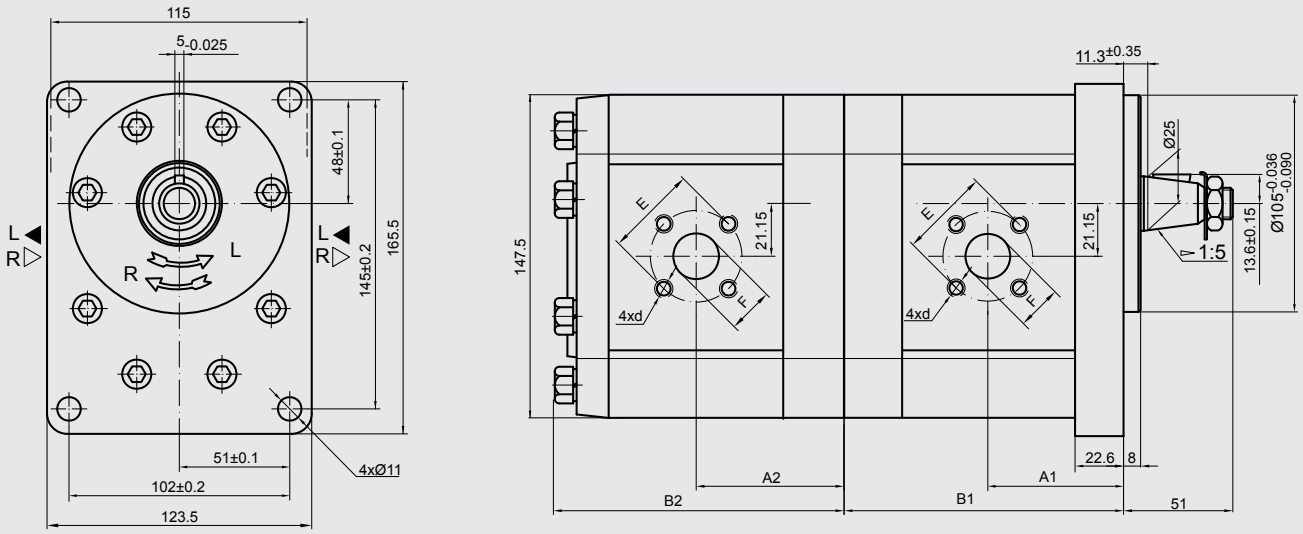
PGE104-.../...-.BS7/7-N



Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]
2000	20	28.2	56.4	250	3000
2250	22.5	31.7	63.5		
2500	25	35.3	70.5		
2800	28	39.5	79.0		
3200	32	45.1	90.2		
3600	36	51.3	95.8	240	2800
4200	42	59.9	99.8	230	2500
4600	46	65.6	100.5	210	2300
5000	50	71.3	99.8	185	2100
5500	55	78.4	91.4	165	1750
6000	60	85.5	99.8	150	

Displacement	Dimensions											
	A1	B1	A2	B2	Inlet				Outlet			
	[mm]	[mm]	[mm]	[mm]	F	d	H	L	F	d	H	L
2000	56.1	114.7	58.3	118.9	19	M10	47.6	22.2	19	M10	47.6	22.2
2250	57.6	117.7	59.7	121.9								
2500	58.3	119.1	60.5	123.3								
2800	60.2	122.7	62.4	126.9								
3200	66.5	135.3	68.7	139.5	27		52.4	26.2				
3600	68.0	138.5	70.2	142.7								
4200	70.8	144.0	73.0	148.3								
4600	72.7	147.8	74.9	152.0								
5000	74.5	151.4	76.7	155.6								
5500	76.7	155.9	78.9	160.1								
6000	78.7	160.4	80.9	164.6								

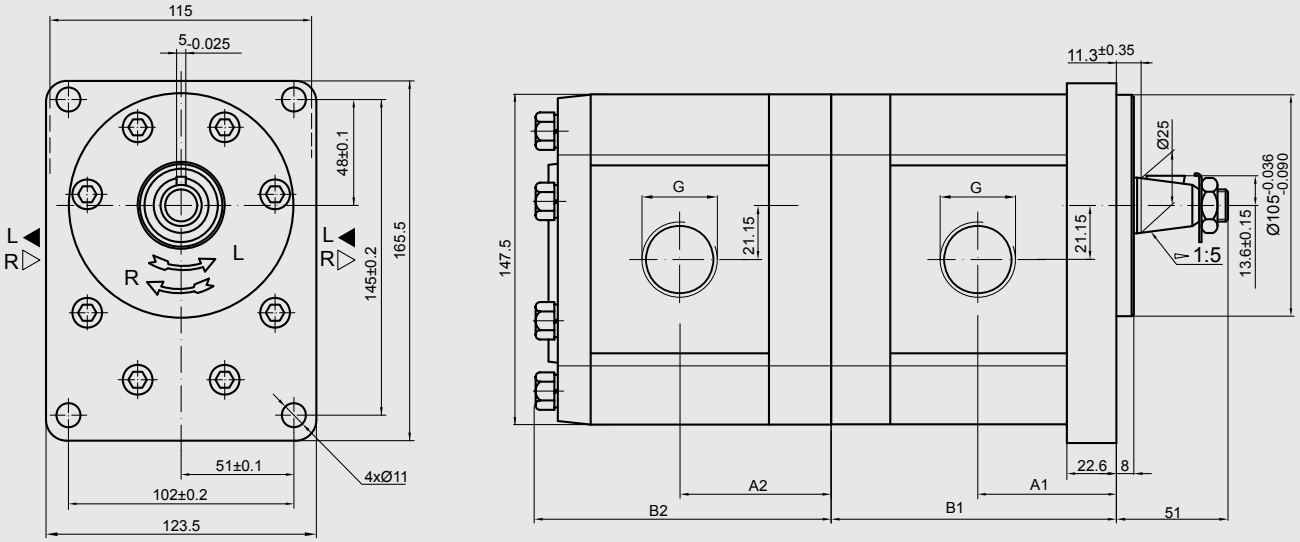
PGE104-.../...-.AV5/5-N



Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
2000	20	28.2	56.4	250	3000
2250	22.5	31.7	63.5		
2500	25	35.3	70.5		
2800	28	39.5	79.0		
3200	32	45.1	90.2		
3600	36	51.3	95.8	240	2800
4200	42	59.9	99.8	230	2500
4600	46	65.6	100.5	210	2300
5000	50	71.3	99.8	185	2100
5500	55	78.4	91.4	165	1750
6000	60	85.5	99.8	150	

Displacement	Dimensions									
	A1	B1	A2	B2	Inlet			Outlet		
	[mm]	[mm]	[mm]	[mm]	E	F	d	E	F	d
2000	56.1	114.7	58.3	118.9	40	19	M8	40	19	M8
2250	57.6	117.7	59.7	121.9						
2500	58.3	119.1	60.5	123.3						
2800	60.2	122.7	62.4	126.9						
3200	66.5	135.3	68.7	139.5	55	27		55		
3600	68.0	138.5	70.2	142.7						
4200	70.8	144.0	73.0	148.3						
4600	72.7	147.8	74.9	152.0						
5000	74.5	151.4	76.7	155.6						
5500	76.7	155.9	78.9	160.1						
6000	78.7	160.4	80.9	164.6						

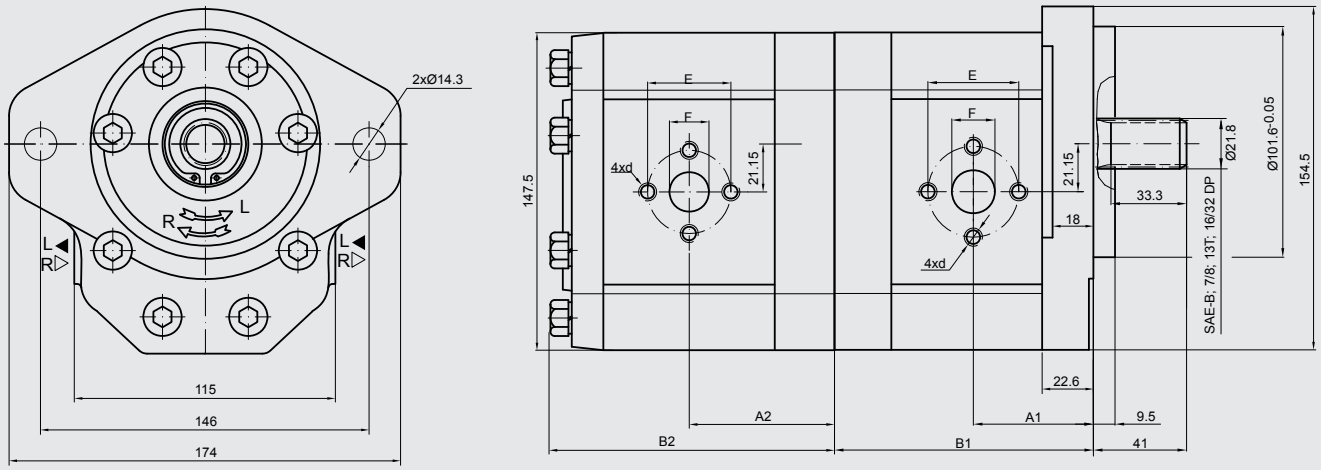
PGE104-.../...-.AV1/1-N



Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]
2000	20	28.2	56.4	250	3000
2250	22.5	31.7	63.5		
2500	25	35.3	70.5		
2800	28	39.5	79.0		
3200	32	45.1	90.2		
3600	36	51.3	95.8	240	2800
4200	42	59.9	99.8	230	2500
4600	46	65.6	100.5	210	2300
5000	50	71.3	99.8	185	2100
5500	55	78.4	91.4	165	1750
6000	60	85.5	99.8	150	

Displacement	Dimensions					
	A1 [mm]	B1 [mm]	A2 [mm]	B2 [mm]	Inlet G	Outlet G
2000	56.1	114.7	58.3	118.9	G 3/4	G 3/4
2250	57.6	117.7	59.7	121.9		
2500	58.3	119.1	60.5	123.3		
2800	60.2	122.7	62.4	126.9		
3200	66.5	135.3	68.7	139.5	G 1	
3600	68.0	138.5	70.2	142.7		
4200	70.8	144.0	73.0	148.3		
4600	72.7	147.8	74.9	152.0		
5000	74.5	151.4	76.7	155.6		
5500	76.7	155.9	78.9	160.1		
6000	78.7	160.4	80.9	164.6		

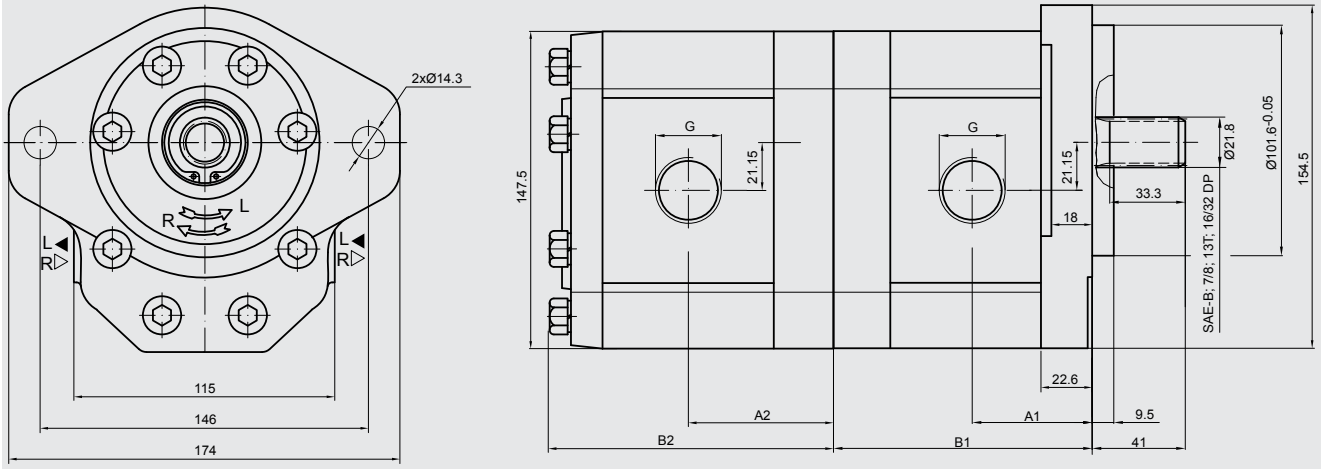
PGE104-.../...-.FX4/4-N



Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
2000	20	28.2	56.4	250	3000
2250	22.5	31.7	63.5		
2500	25	35.3	70.5		
2800	28	39.5	79.0		
3200	32	45.1	90.2		
3600	36	51.3	95.8	240	2800
4200	42	59.9	99.8	230	2500
4600	46	65.6	100.5	210	2300
5000	50	71.3	99.8	185	2100
5500	55	78.4	91.4	165	1750
6000	60	85.5	99.8	150	

Displacement	Dimensions									
	A1	B1	A2	B2	Inlet			Outlet		
	[mm]	[mm]	[mm]	[mm]	E	F	d	E	F	d
2000	56.1	114.7	58.3	118.9	40	19	M8	40	19	M8
2250	57.6	117.7	59.7	121.9						
2500	58.3	119.1	60.5	123.3						
2800	60.2	122.7	62.4	126.9						
3200	66.5	135.3	68.7	139.5	51	27	M10			
3600	68.0	138.5	70.2	142.7						
4200	70.8	144.0	73.0	148.3						
4600	72.7	147.8	74.9	152.0						
5000	74.5	151.4	76.7	155.6						
5500	76.7	155.9	78.9	160.1						
6000	78.7	160.4	80.9	164.6						

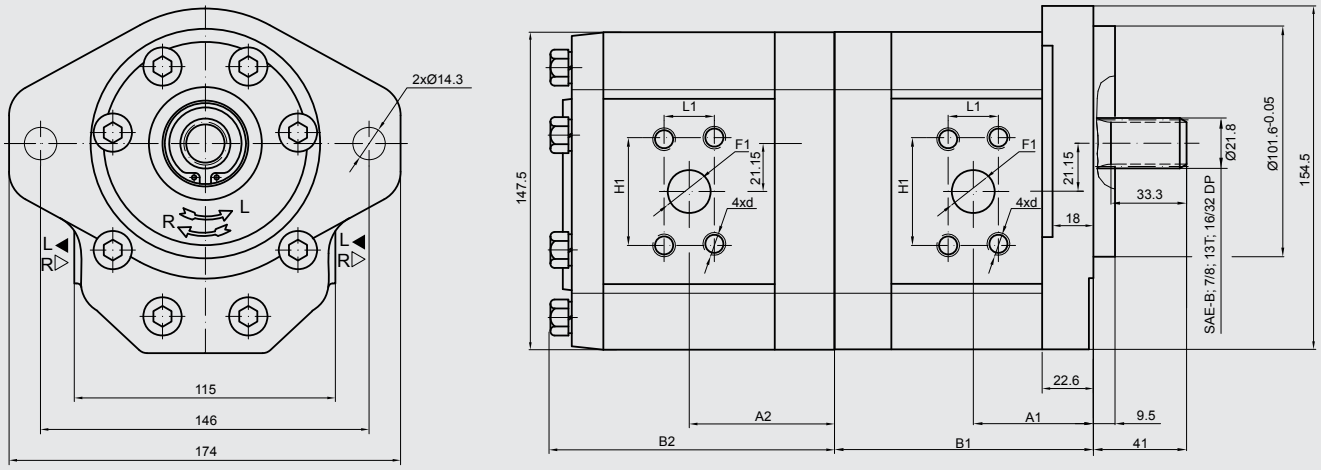
PGE104-.../...-.FX1/1-N



Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]
2000	20	28.2	56.4	250	3000
2250	22.5	31.7	63.5		
2500	25	35.3	70.5		
2800	28	39.5	79.0		
3200	32	45.1	90.2		
3600	36	51.3	95.8	240	2800
4200	42	59.9	99.8	230	2500
4600	46	65.6	100.5	210	2300
5000	50	71.3	99.8	185	2100
5500	55	78.4	91.4	165	1750
6000	60	85.5	99.8	150	

Displacement	Dimensions					
	A1 [mm]	B1 [mm]	A2 [mm]	B2 [mm]	Inlet G	Outlet G
2000	56.1	114.7	58.3	118.9	G 3/4	G 3/4
2250	57.6	117.7	59.7	121.9		
2500	58.3	119.1	60.5	123.3		
2800	60.2	122.7	62.4	126.9		
3200	66.5	135.3	68.7	139.5	G 1	
3600	68.0	138.5	70.2	142.7		
4200	70.8	144.0	73.0	148.3		
4600	72.7	147.8	74.9	152.0		
5000	74.5	151.4	76.7	155.6		
5500	76.7	155.9	78.9	160.1		
6000	78.7	160.4	80.9	164.6		

PGE104-.../...-.FX7/7-N

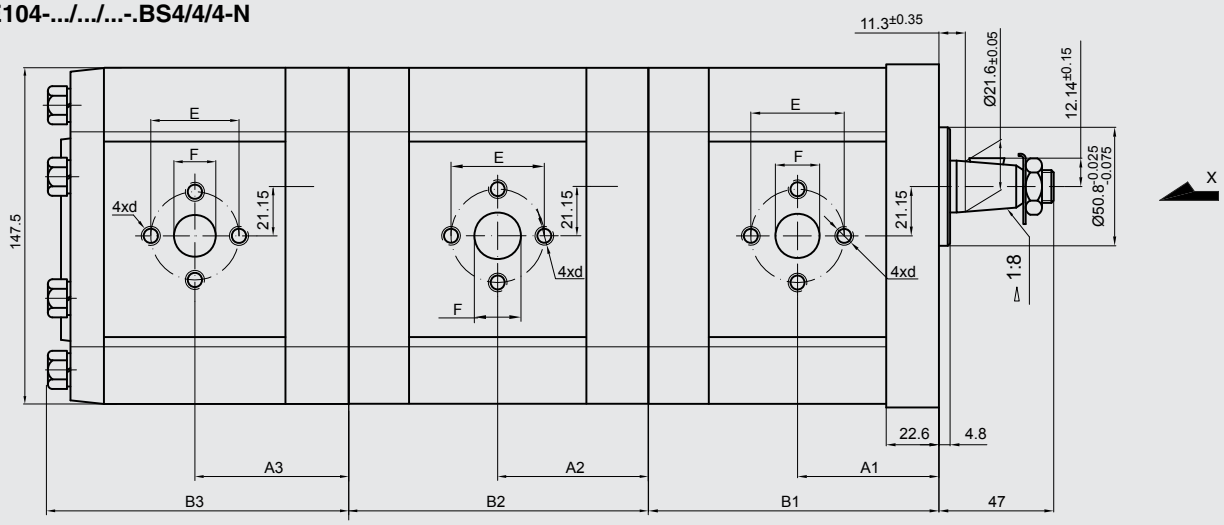


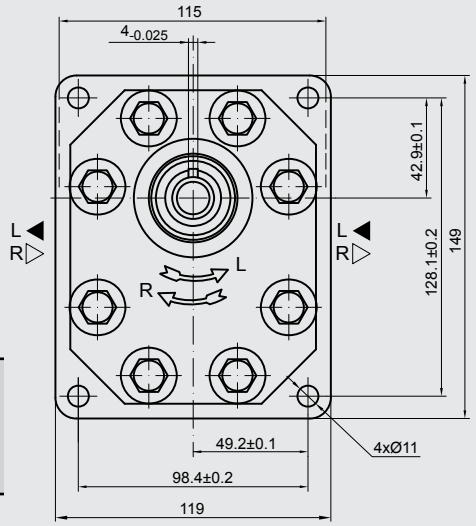
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]
2000	20	28.2	56.4	250	3000
2250	22.5	31.7	63.5		
2500	25	35.3	70.5		
2800	28	39.5	79.0		
3200	32	45.1	90.2		
3600	36	51.3	95.8	240	2800
4200	42	59.9	99.8	230	2500
4600	46	65.6	100.5	210	2300
5000	50	71.3	99.8	185	2100
5500	55	78.4	91.4	165	1750
6000	60	85.5	99.8	150	

Displacement	Dimensions											
	A1	B1	A2	B2	Inlet				Outlet			
	[mm]	[mm]	[mm]	[mm]	F1	d	H1	L1	F1	d	H1	L1
2000	56.1	114.7	58.3	118.9	19	M10	47.6	22.2	19	M10	47.6	22.2
2250	57.6	117.7	59.7	121.9								
2500	58.3	119.1	60.5	123.3								
2800	60.2	122.7	62.4	126.9								
3200	66.5	135.3	68.7	139.5	27		52.4	26.2				
3600	68.0	138.5	70.2	142.7								
4200	70.8	144.0	73.0	148.3								
4600	72.7	147.8	74.9	152.0								
5000	74.5	151.4	76.7	155.6								
5500	76.7	155.9	78.9	160.1								
6000	78.7	160.4	80.9	164.6								

6.5.27 Triple pump size 3

PGE104-.../.../...-.BS4/4/4-N



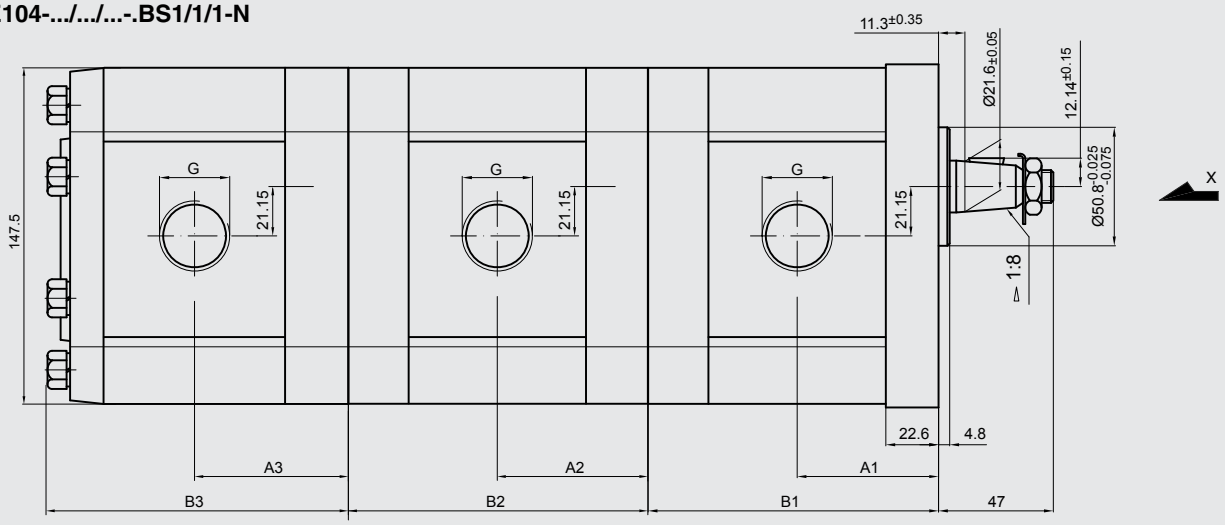


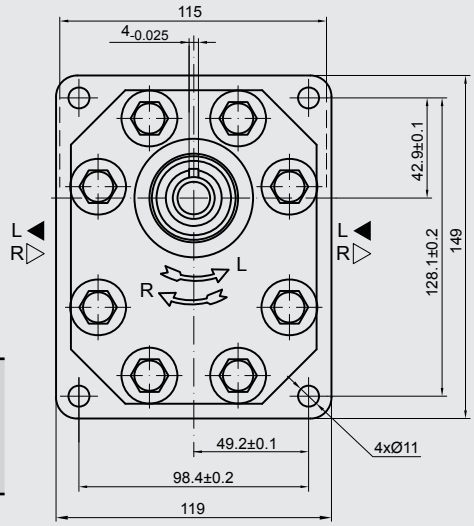
View X

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]
2000	20	28.2	56.4	250	3000
2250	22.5	31.7	63.5		
2500	25	35.3	70.5		
2800	28	39.5	79.0		
3200	32	45.1	90.2		
3600	36	51.3	95.8	240	2800
4200	42	59.9	99.8	230	2500
4600	46	65.6	100.5	210	2300
5000	50	71.3	99.8	185	2100
5500	55	78.4	91.4	165	1750
6000	60	85.5	99.8	150	

Displacement	Dimensions											
	A1 [mm]	B1 [mm]	A2 [mm]	B2 [mm]	A3 [mm]	B3 [mm]	Inlet E	Inlet F	Inlet d	Outlet E	Outlet F	Outlet d
2000	56.1	114.7	58.5	117.1	58.3	118.9	40	19	M8	40	19	M8
2250	57.6	117.7	60.0	120.1	59.7	121.9						
2500	58.3	119.1	60.8	121.5	60.5	123.3						
2800	60.2	122.7	62.5	125.1	62.4	126.9						
3200	66.5	135.3	68.8	137.7	68.7	139.5	51	27	M10			
3600	68.0	138.5	70.5	140.9	70.2	142.7						
4200	70.8	144.0	73.2	146.5	73.0	148.3						
4600	72.7	147.8	75.1	150.2	74.9	152.0						
5000	74.5	151.4	76.9	153.8	76.7	155.6						
5500	76.7	155.9	79.1	158.3	78.9	160.1						
6000	78.7	160.4	81.4	162.8	80.9	164.6						

PGE104-.../.../...-.BS1/1/1-N



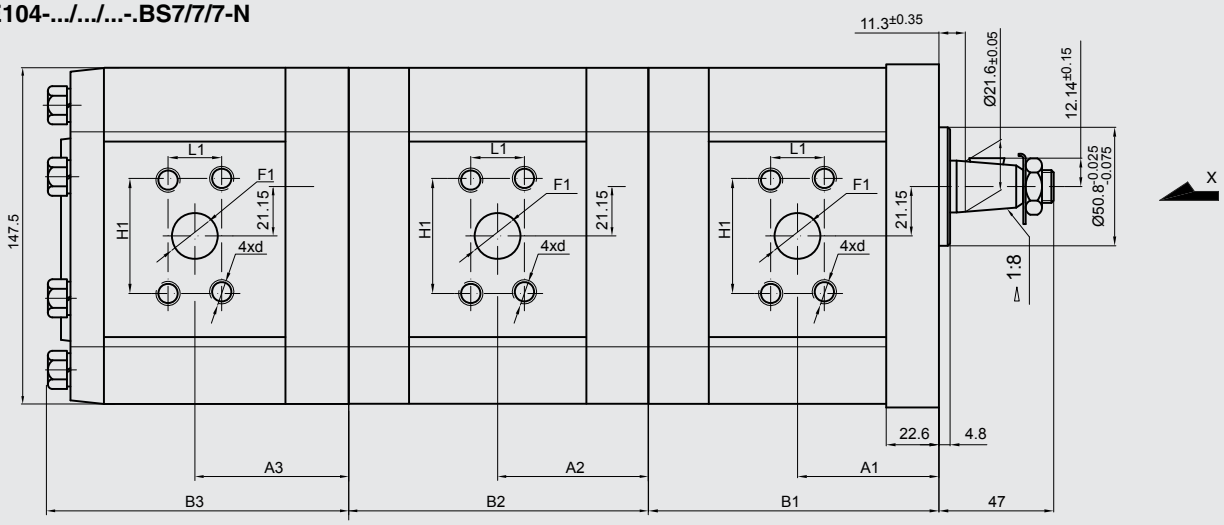


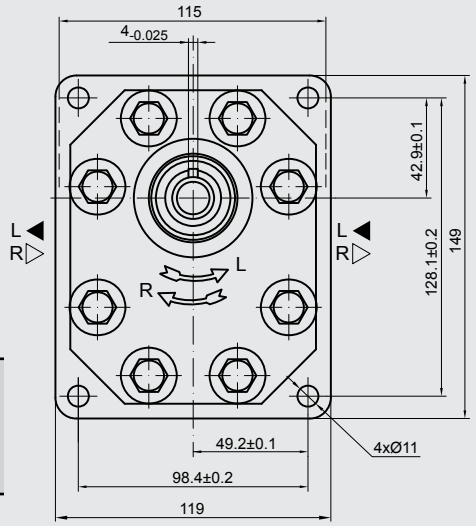
View X

Displace-ment	Geometric displacement	Flow		Pressure Rated	Max. speed
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]
2000	20	28.2	56.4	250	3000
2250	22.5	31.7	63.5		
2500	25	35.3	70.5		
2800	28	39.5	79.0		
3200	32	45.1	90.2		
3600	36	51.3	95.8	240	2800
4200	42	59.9	99.8	230	2500
4600	46	65.6	100.5	210	2300
5000	50	71.3	99.8	185	2100
5500	55	78.4	91.4	165	1750
6000	60	85.5	99.8	150	

Displace-ment	Dimensions							
	A1 [mm]	B1 [mm]	A2 [mm]	B2 [mm]	A3 [mm]	B3 [mm]	Inlet G	Outlet G
2000	56.1	114.7	58.5	117.1	58.3	118.9	G 3/4	G 3/4
2250	57.6	117.7	60.0	120.1	59.7	121.9		
2500	58.3	119.1	60.8	121.5	60.5	123.3		
2800	60.2	122.7	62.5	125.1	62.4	126.9		
3200	66.5	135.3	68.8	137.7	68.7	139.5	G 1	
3600	68.0	138.5	70.5	140.9	70.2	142.7		
4200	70.8	144.0	73.2	146.5	73.0	148.3		
4600	72.7	147.8	75.1	150.2	74.9	152.0		
5000	74.5	151.4	76.9	153.8	76.7	155.6		
5500	76.7	155.9	79.1	158.3	78.9	160.1		
6000	78.7	160.4	81.4	162.8	80.9	164.6		

PGE104-.../.../...-.BS7/7/7-N



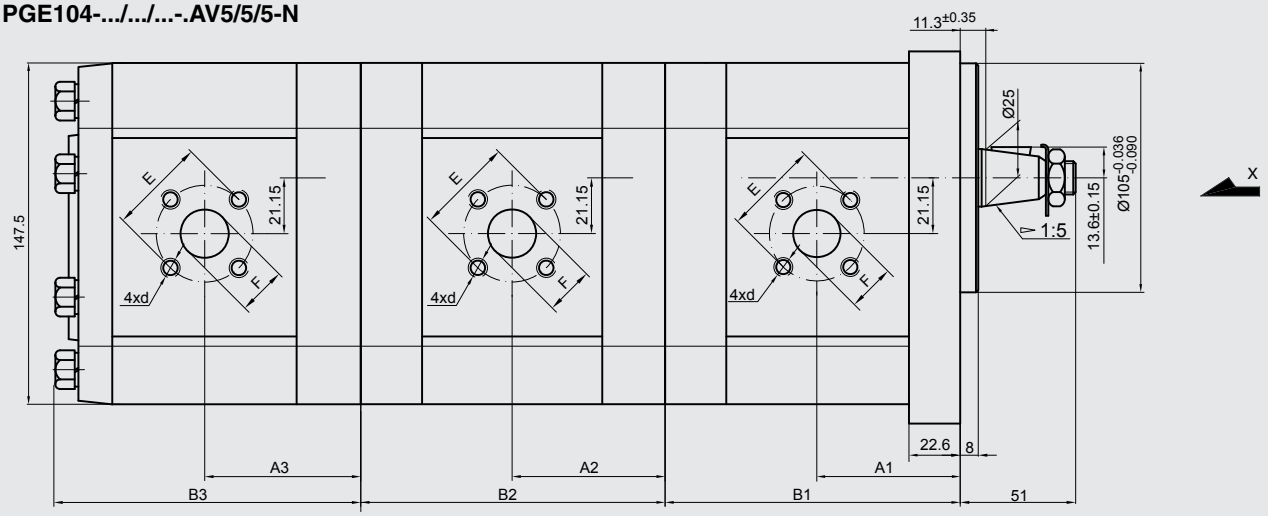


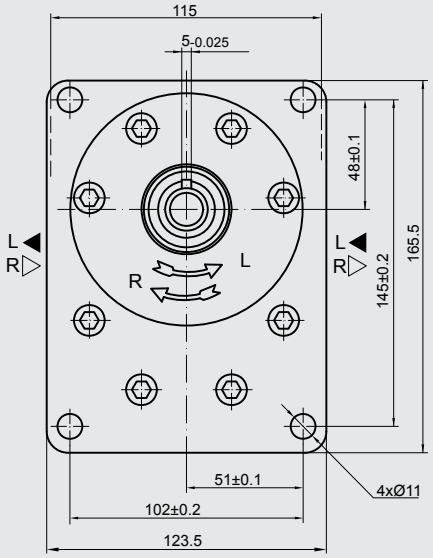
View X

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]
2000	20	28.2	56.4	250	3000
2250	22.5	31.7	63.5		
2500	25	35.3	70.5		
2800	28	39.5	79.0		
3200	32	45.1	90.2		
3600	36	51.3	95.8	240	2800
4200	42	59.9	99.8	230	2500
4600	46	65.6	100.5	210	2300
5000	50	71.3	99.8	185	2100
5500	55	78.4	91.4	165	1750
6000	60	85.5	99.8	150	

Displacement	Dimensions													
	A1	B1	A2	B2	A3	B3	Inlet				Outlet			
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	F1	d	H1	L1	F1	d	H1	L1
2000	56.1	114.7	58.5	117.1	58.3	118.9	19	M10	47.6	22.2	19	M10	47.6	22.2
2250	57.6	117.7	60.0	120.1	59.7	121.9								
2500	58.3	119.1	60.8	121.5	60.5	123.3								
2800	60.2	122.7	62.5	125.1	62.4	126.9								
3200	66.5	135.3	68.8	137.7	68.7	139.5	27		52.4	26.2				
3600	68.0	138.5	70.5	140.9	70.2	142.7								
4200	70.8	144.0	73.2	146.5	73.0	148.3								
4600	72.7	147.8	75.1	150.2	74.9	152.0								
5000	74.5	151.4	76.9	153.8	76.7	155.6								
5500	76.7	155.9	79.1	158.3	78.9	160.1								
6000	78.7	160.4	81.4	162.8	80.9	164.6								

PGE104-.../.../...-.AV5/5/5-N



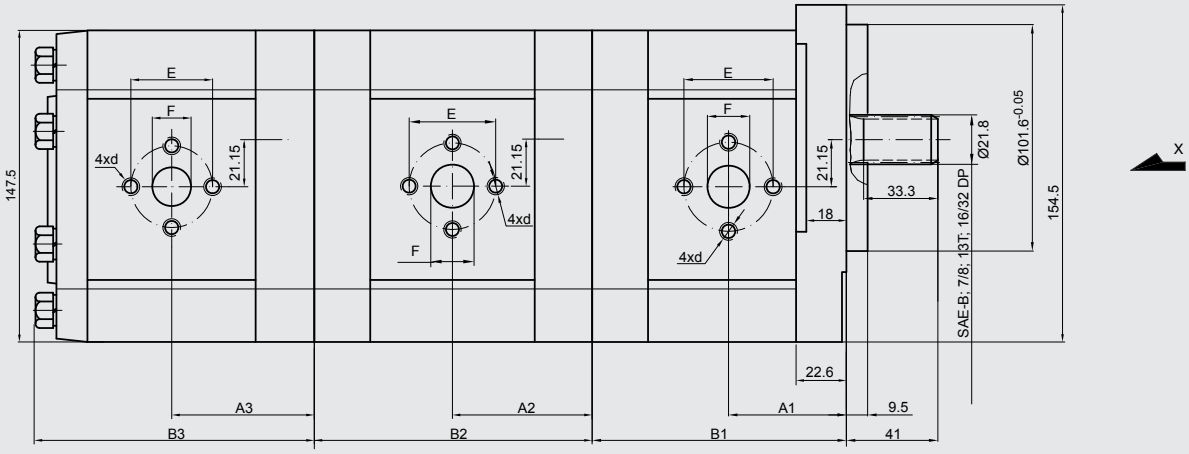


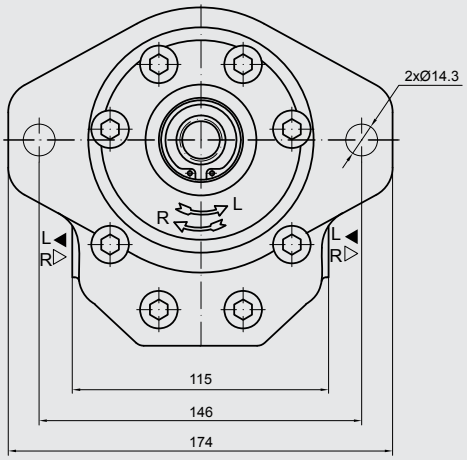
View X

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
2000	20	28.2	56.4	250	3000
2250	22.5	31.7	63.5		
2500	25	35.3	70.5		
2800	28	39.5	79.0		
3200	32	45.1	90.2		
3600	36	51.3	95.8	240	2800
4200	42	59.9	99.8	230	2500
4600	46	65.6	100.5	210	2300
5000	50	71.3	99.8	185	2100
5500	55	78.4	91.4	165	1750
6000	60	85.5	99.8	150	

Displacement	Dimensions											
	A1	B1	A2	B2	A3	B3	Inlet			Outlet		
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	E	F	d	E	F	d
2000	56.1	114.7	58.5	117.1	58.3	118.9	40	19	M8	40	19	M8
2250	57.6	117.7	60.0	120.1	59.7	121.9						
2500	58.3	119.1	60.8	121.5	60.5	123.3						
2800	60.2	122.7	62.5	125.1	62.4	126.9						
3200	66.5	135.3	68.8	137.7	68.7	139.5	55	27		55		
3600	68.0	138.5	70.5	140.9	70.2	142.7						
4200	70.8	144.0	73.2	146.5	73.0	148.3						
4600	72.7	147.8	75.1	150.2	74.9	152.0						
5000	74.5	151.4	76.9	153.8	76.7	155.6						
5500	76.7	155.9	79.1	158.3	78.9	160.1						
6000	78.7	160.4	81.4	162.8	80.9	164.6						

PGE104-.../.../...-.FX4/4/4-N



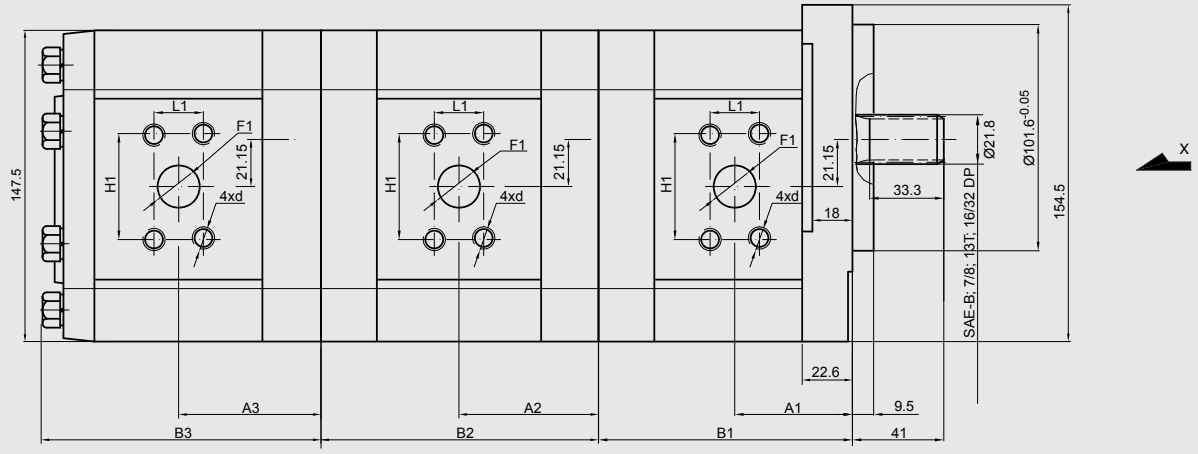


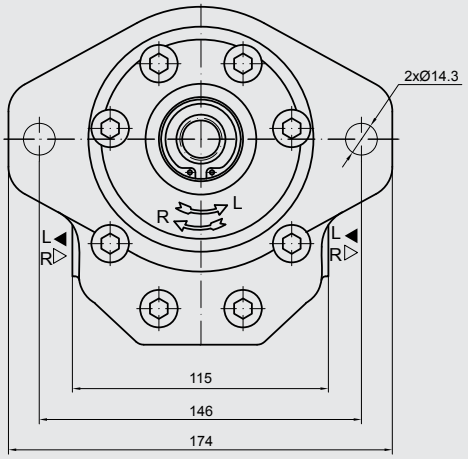
View X

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]
2000	20	28.2	56.4	250	3000
2250	22.5	31.7	63.5		
2500	25	35.3	70.5		
2800	28	39.5	79.0		
3200	32	45.1	90.2		
3600	36	51.3	95.8	240	2800
4200	42	59.9	99.8	230	2500
4600	46	65.6	100.5	210	2300
5000	50	71.3	99.8	185	2100
5500	55	78.4	91.4	165	1750
6000	60	85.5	99.8	150	

Displacement	Dimensions											
	A1	B1	A2	B2	A3	B3	Inlet			Outlet		
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	E	F	d	E	F	d
2000	56.1	114.7	58.5	117.1	58.3	118.9	40	19	M8	40	19	M8
2250	57.6	117.7	60.0	120.1	59.7	121.9						
2500	58.3	119.1	60.8	121.5	60.5	123.3						
2800	60.2	122.7	62.5	125.1	62.4	126.9						
3200	66.5	135.3	68.8	137.7	68.7	139.5	51	27	M10			
3600	68.0	138.5	70.5	140.9	70.2	142.7						
4200	70.8	144.0	73.2	146.5	73.0	148.3						
4600	72.7	147.8	75.1	150.2	74.9	152.0						
5000	74.5	151.4	76.9	153.8	76.7	155.6						
5500	76.7	155.9	79.1	158.3	78.9	160.1						
6000	78.7	160.4	81.4	162.8	80.9	164.6						

PGE104-.../.../...-.FX7/7/7-N





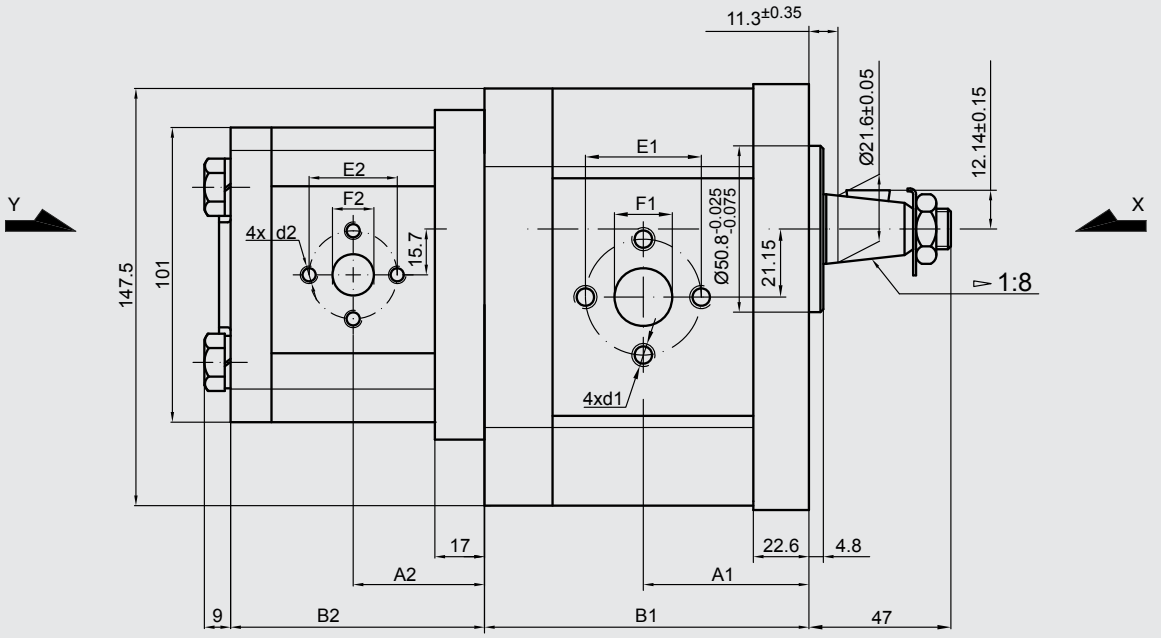
View X

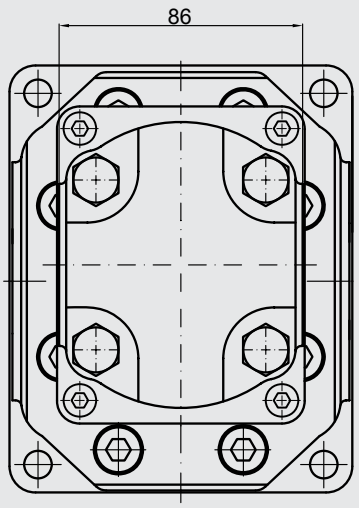
Displacement	Geometric displacement [cm³/rev]	Flow at 1500 rpm [l/min]	Flow at max. rpm [l/min]	Pressure Rated [bar]	Max. speed n [rpm]
2000	20	28.2	56.4	250	3000
2250	22.5	31.7	63.5		
2500	25	35.3	70.5		
2800	28	39.5	79.0		
3200	32	45.1	90.2		
3600	36	51.3	95.8	240	2800
4200	42	59.9	99.8	230	2500
4600	46	65.6	100.5	210	2300
5000	50	71.3	99.8	185	2100
5500	55	78.4	91.4	165	1750
6000	60	85.5	99.8	150	

Displacement	Dimensions													
	A1 [mm]	B1 [mm]	A2 [mm]	B2 [mm]	A3 [mm]	B3 [mm]	Inlet F1	Inlet d	Inlet H1	Inlet L1	Outlet F1	Outlet d	Outlet H1	Outlet L1
2000	56.1	114.7	58.5	117.1	58.3	118.9	19	M10	47.6	22.2	19	M10	47.6	22.2
2250	57.6	117.7	60.0	120.1	59.7	121.9								
2500	58.3	119.1	60.8	121.5	60.5	123.3								
2800	60.2	122.7	62.5	125.1	62.4	126.9								
3200	66.5	135.3	68.8	137.7	68.7	139.5	27		52.4	26.2				
3600	68.0	138.5	70.5	140.9	70.2	142.7								
4200	70.8	144.0	73.2	146.5	73.0	148.3								
4600	72.7	147.8	75.1	150.2	74.9	152.0								
5000	74.5	151.4	76.9	153.8	76.7	155.6								
5500	76.7	155.9	79.1	158.3	78.9	160.1								
6000	78.7	160.4	81.4	162.8	80.9	164.6								

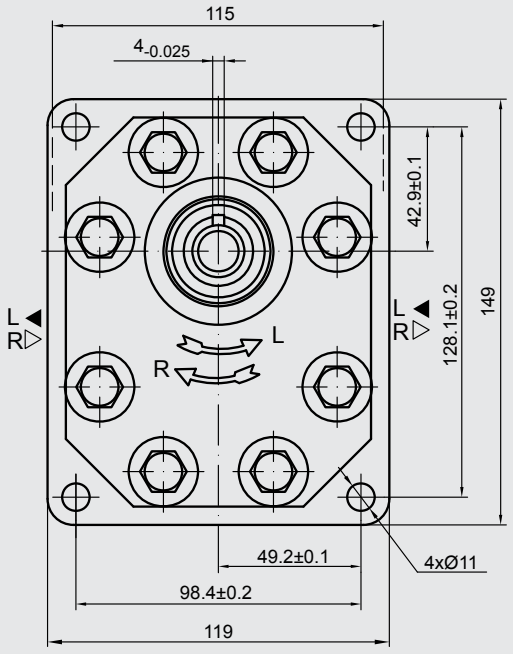
6.5.28 Double pump size 3 / size 2

PGE104-.../...-.BS4/4-N





View Y



View X

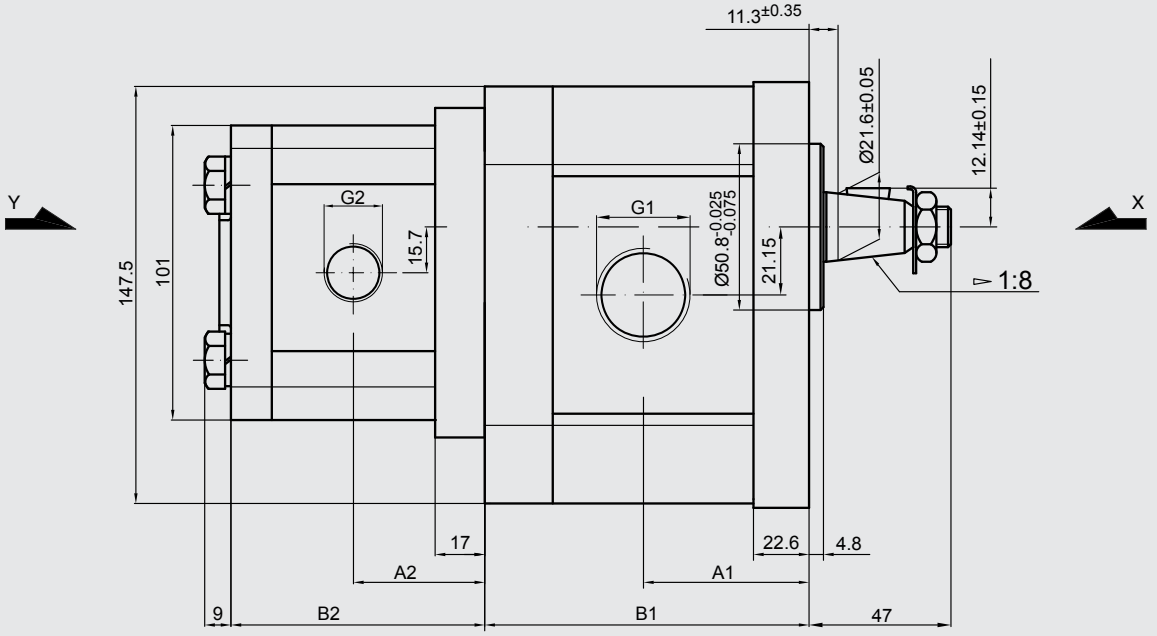
Front pump size 3:

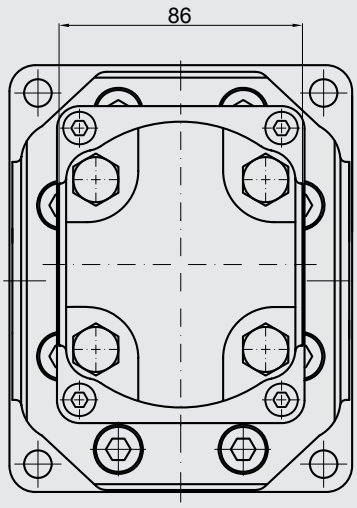
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions								
		at 1500 rpm	at max. rpm					Inlet			Outlet		
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]	A1 [mm]	B1 [mm]	E1	F1	d1	E1	F1	d1
2000	20	28.2	56.4	250	3000	56.1	114.7	40	19	M8	40	19	M8
2250	22.5	31.7	63.5			57.6	117.7						
2500	25	35.3	70.5			58.3	119.1						
2800	28	39.5	79.0			60.2	122.7						
3200	32	45.1	90.2			66.5	135.3	51	27	M10			
3600	36	51.3	95.8	240	2800	68.0	138.5						
4200	42	59.9	99.8	230	2500	70.8	144.0						
4600	46	65.6	100.5	210	2300	72.7	147.8						
5000	50	71.3	99.8	185	2100	74.5	151.4						
5500	55	78.4	91.4	165	1750	76.7	155.9						
6000	60	85.5	99.8	150		78.7	160.4						

End pump size 2:

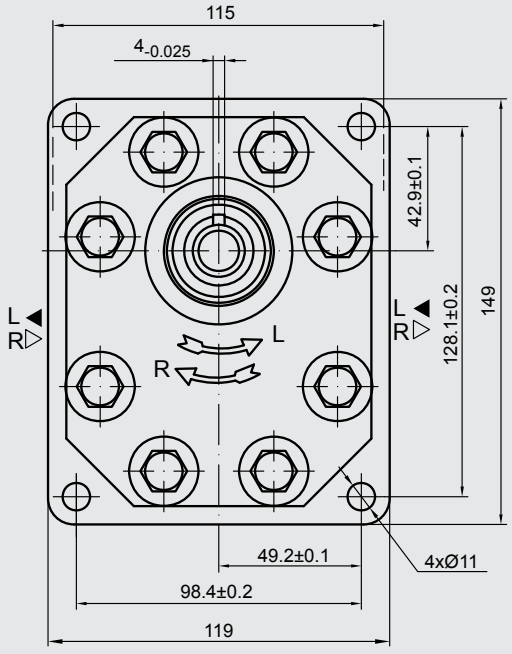
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions								
		at 1500 rpm	at max. rpm					Inlet			Outlet		
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]	A2 [mm]	B2 [mm]	E2	F2	d2	E2	F2	d2
450	4.5	6.14	14.33	250	3500	40.5	78	30	13.1	M6	30	13.1	M6
630	6.3	8.69	20.29			42	81						
820	8.2	11.32	26.40			43.5	83.9						
1000	10	13.95	32.55			45	87	40	19	M8		14.2	
1130	11.3	15.76	36.78			46	89.1						
1200	12	16.92	39.48			46.6	90.3						
1400	14	19.95	46.55			48	93.4						
1500	15	21.60	36.00		2500	49	95						
1600	16	23.04	38.40			50	96.6						
1900	19	27.36	45.60	200		52	101.5						
2200	22	31.68	42.24	180	2000	55	106.5						
2500	25	36.00	48.00	160		57.2	111.4				40	19	M8

PGE104-.../...-.BS1/1-N





View Y



View X

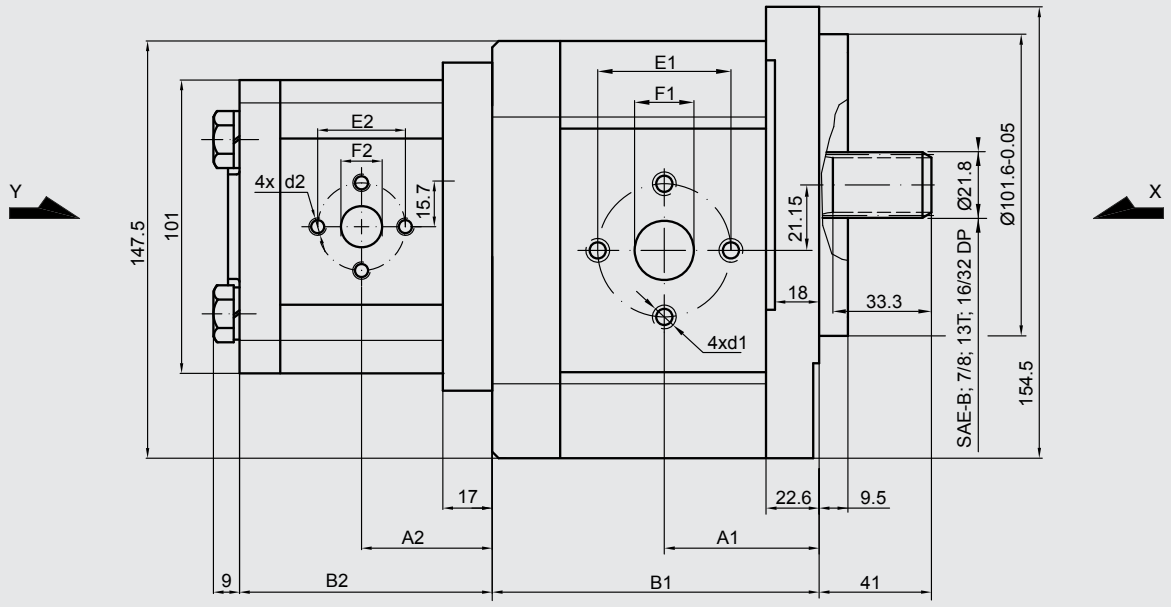
Front pump size 3:

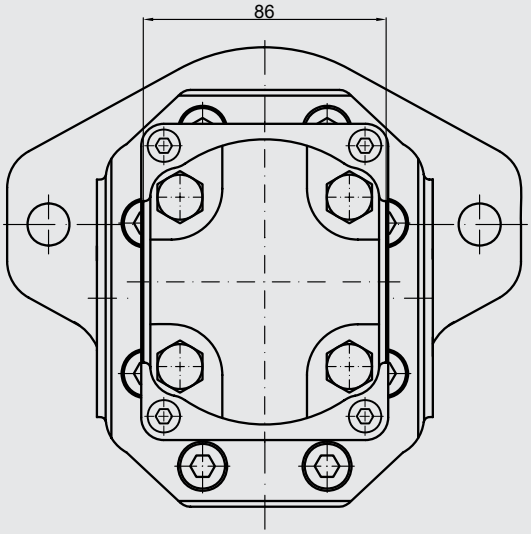
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
		at 1500 rpm	at max. rpm		n	A1	B1	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G1	G1
2000	20	28.2	56.4	250	3000	56.1	114.7	G 3/4	G 3/4
2250	22.5	31.7	63.5			57.6	117.7		
2500	25	35.3	70.5			58.3	119.1		
2800	28	39.5	79.0			60.2	122.7		
3200	32	45.1	90.2			66.5	135.3	G 1	
3600	36	51.3	95.8	240	2800	68.0	138.5		
4200	42	59.9	99.8	230	2500	70.8	144.0		
4600	46	65.6	100.5	210	2300	72.7	147.8		
5000	50	71.3	99.8	185	2100	74.5	151.4		
5500	55	78.4	91.4	165	1750	76.7	155.9		
6000	60	85.5	99.8	150		78.7	160.4		

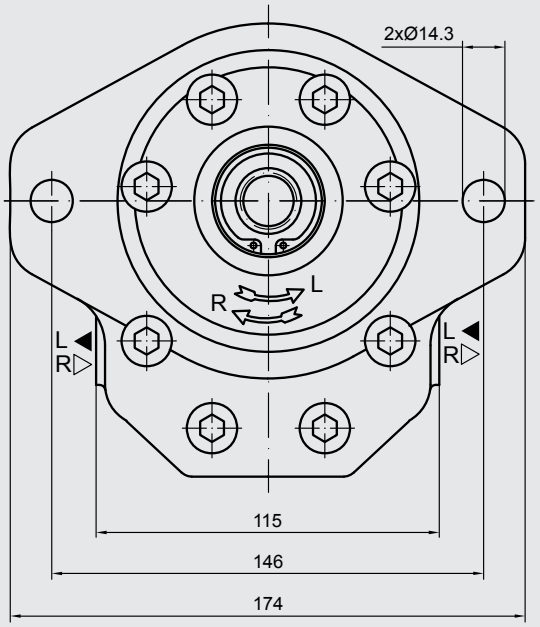
End pump size 2:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
		at 1500 rpm	at max. rpm		n	A2	B2	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G2	G2
450	4.5	6.14	14.33	250	3500	40.5	78	G 1/2	G 1/2
630	6.3	8.69	20.29			42	81		
820	8.2	11.32	26.40			43.5	83.9		
1000	10	13.95	32.55			45	87	G 3/4	
1130	11.3	15.76	36.78			46	89.1		
1200	12	16.92	39.48			46.6	90.3		
1400	14	19.95	46.55			48	93.4		
1500	15	21.60	36.00		2500	49	95		
1600	16	23.04	38.40			50	96.6		
1900	19	27.36	45.60	200		52	101.5		
2200	22	31.68	42.24	180	2000	55	106.5		
2500	25	36.00	48.00	160		57.2	111.4		

PGE104-.../...-.FX4/4-N







View Y

View X

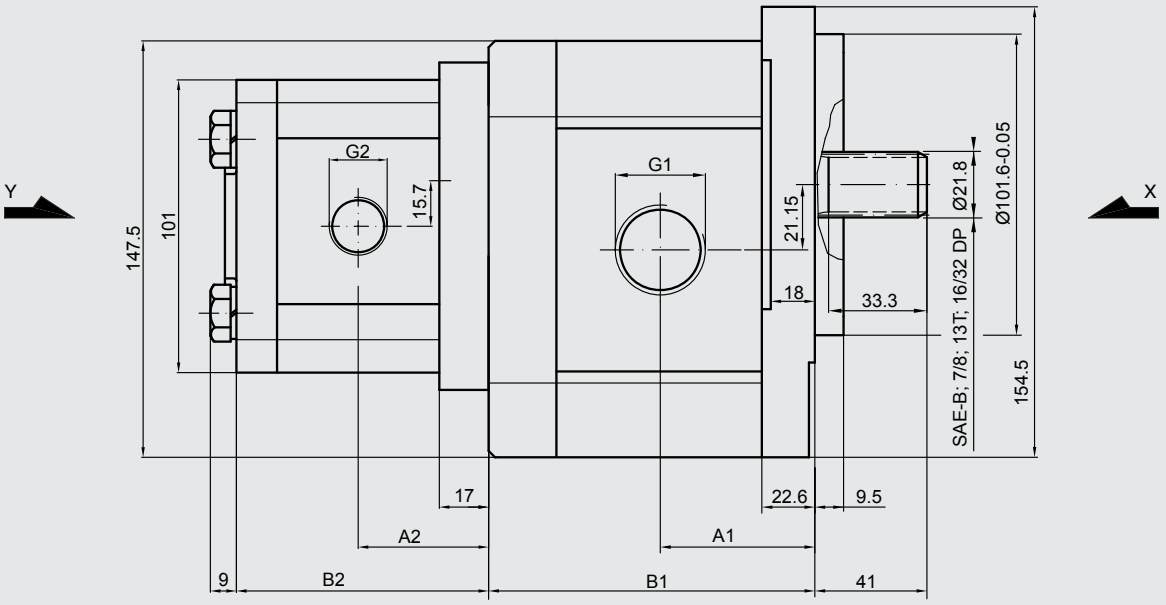
Front pump size 3:

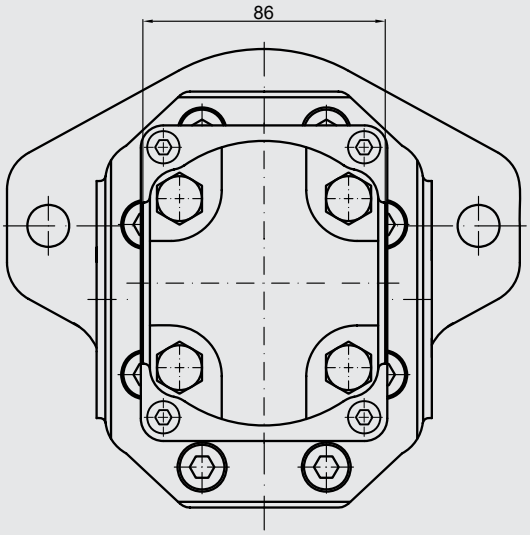
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions								
		at 1500 rpm	at max. rpm		n	A1	B1	Inlet			Outlet		
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	E1	F1	d1	E1	F1	d1
2000	20	28.2	56.4	250	3000	56.1	114.7	40	19	M8	40	19	M8
2250	22.5	31.7	63.5			57.6	117.7						
2500	25	35.3	70.5			58.3	119.1						
2800	28	39.5	79.0			60.2	122.7						
3200	32	45.1	90.2			66.5	135.3	51	27	M10			
3600	36	51.3	95.8	240	2800	68.0	138.5						
4200	42	59.9	99.8	230	2500	70.8	144.0						
4600	46	65.6	100.5	210	2300	72.7	147.8						
5000	50	71.3	99.8	185	2100	74.5	151.4						
5500	55	78.4	91.4	165	1750	76.7	155.9						
6000	60	85.5	99.8	150		78.7	160.4						

End pump size 2:

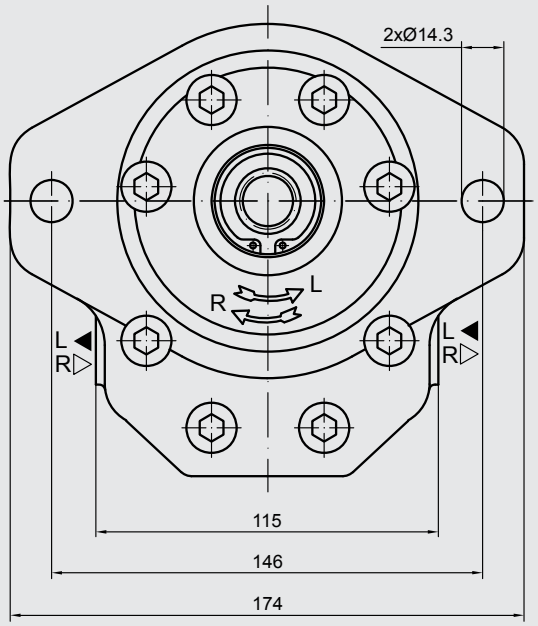
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions								
		at 1500 rpm	at max. rpm		n	A2	B2	Inlet			Outlet		
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	E2	F2	d2	E2	F2	d2
450	4.5	6.14	14.33	250	3500	40.5	78	30	13.1	M6	30	13.1	M6
630	6.3	8.69	20.29			42	81						
820	8.2	11.32	26.40			43.5	83.9						
1000	10	13.95	32.55			45	87	40	19	M8		14.2	
1130	11.3	15.76	36.78			46	89.1						
1200	12	16.92	39.48			46.6	90.3						
1400	14	19.95	46.55			48	93.4						
1500	15	21.60	36.00		2500	49	95						
1600	16	23.04	38.40			50	96.6						
1900	19	27.36	45.60	200		52	101.5						
2200	22	31.68	42.24	180	2000	55	106.5						
2500	25	36.00	48.00	160		57.2	111.4				40	19	M8

PGE104-.../...-.FX1/1-N





View Y



View X

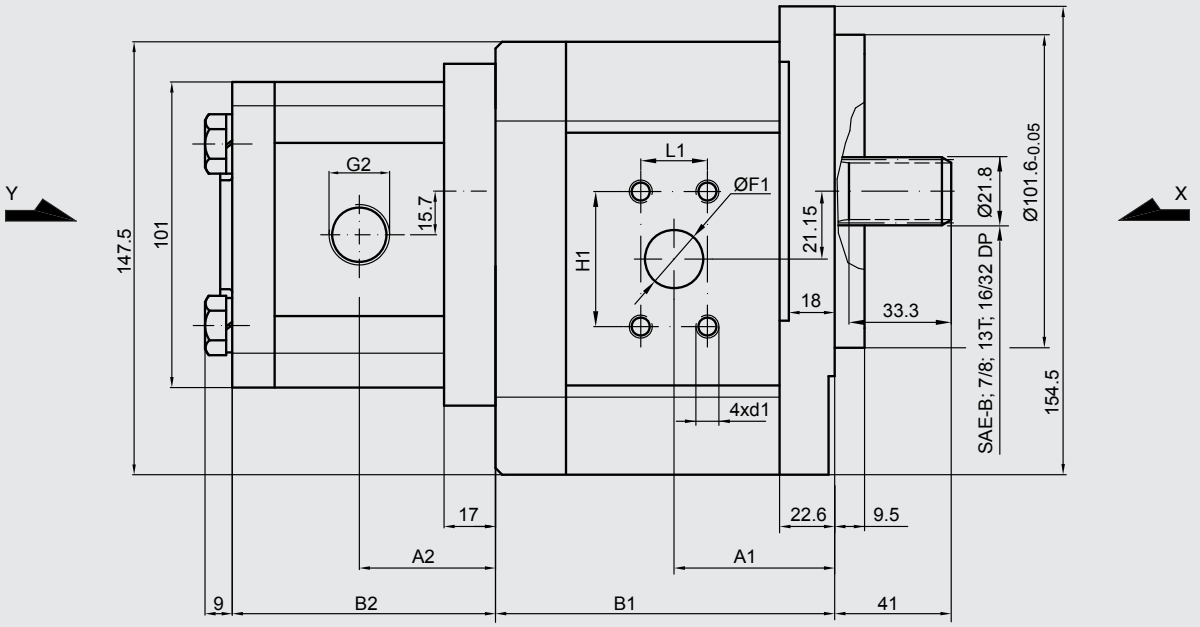
Front pump size 3:

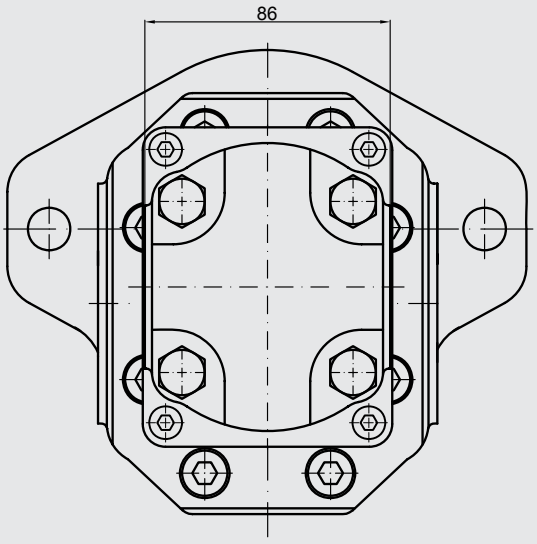
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
		at 1500 rpm	at max. rpm		n	A1	B1	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G1	G1
2000	20	28.2	56.4	250	3000	56.1	114.7	G 3/4	G 3/4
2250	22.5	31.7	63.5			57.6	117.7		
2500	25	35.3	70.5			58.3	119.1		
2800	28	39.5	79.0			60.2	122.7		
3200	32	45.1	90.2			66.5	135.3	G 1	
3600	36	51.3	95.8	240	2800	68.0	138.5		
4200	42	59.9	99.8	230	2500	70.8	144.0		
4600	46	65.6	100.5	210	2300	72.7	147.8		
5000	50	71.3	99.8	185	2100	74.5	151.4		
5500	55	78.4	91.4	165	1750	76.7	155.9		
6000	60	85.5	99.8	150		78.7	160.4		

End pump size 2:

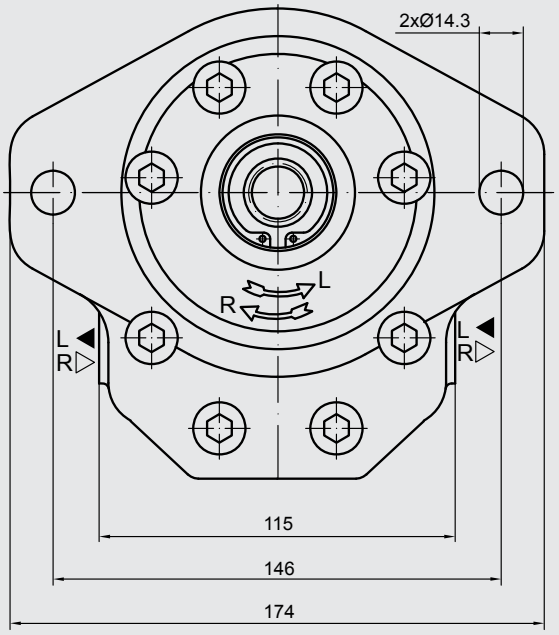
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
		at 1500 rpm	at max. rpm		n	A2	B2	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G2	G2
450	4.5	6.14	14.33	250	3500	40.5	78	G 1/2	G 1/2
630	6.3	8.69	20.29			42	81		
820	8.2	11.32	26.40			43.5	83.9		
1000	10	13.95	32.55			45	87	G 3/4	
1130	11.3	15.76	36.78			46	89.1		
1200	12	16.92	39.48			46.6	90.3		
1400	14	19.95	46.55			48	93.4		
1500	15	21.60	36.00		2500	49	95		
1600	16	23.04	38.40			50	96.6		
1900	19	27.36	45.60	200		52	101.5		
2200	22	31.68	42.24	180	2000	55	106.5		
2500	25	36.00	48.00	160		57.2	111.4		

PGE104-.../...-.FX7/1-N





View Y



View X

Front pump size 3:

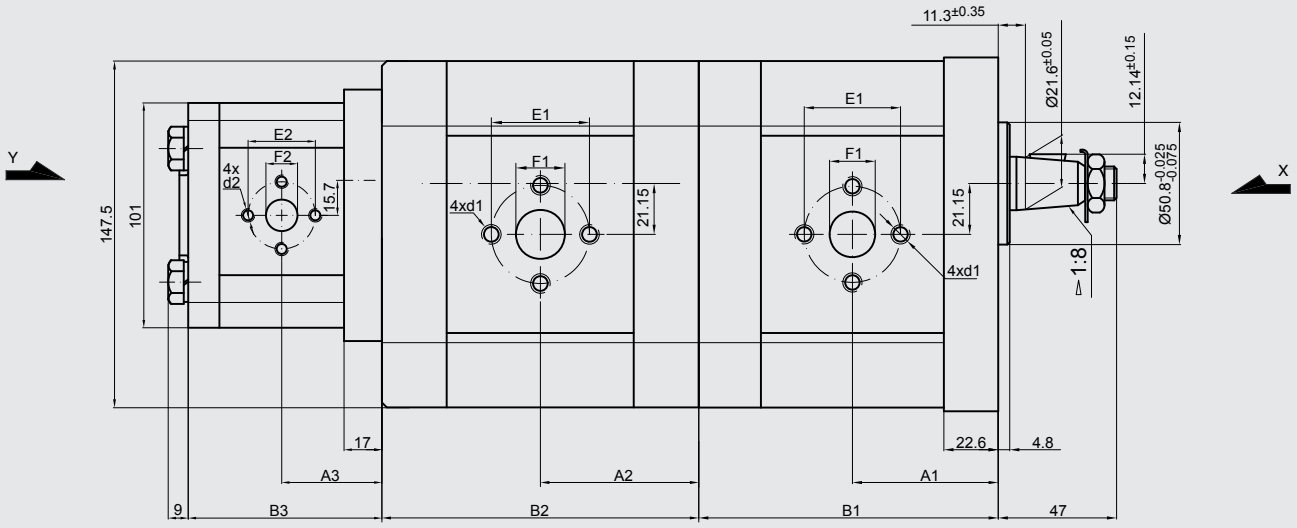
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions									
								Inlet				Outlet			
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]	A1 [mm]	B1 [mm]	F1	d1	H1	L1	F1	d1	H1	L1
2000	20	28.2	56.4	250	3000	56.1	114.7	19	M10	47.6	22.2	19	M10	47.6	22.2
2250	22.5	31.7	63.5			57.6	117.7								
2500	25	35.3	70.5			58.3	119.1								
2800	28	39.5	79.0			60.2	122.7								
3200	32	45.1	90.2			66.5	135.3	27		52.4	26.2				
3600	36	51.3	95.8	240	2800	68.0	138.5								
4200	42	59.9	99.8	230	2500	70.8	144.0								
4600	46	65.6	100.5	210	2300	72.7	147.8								
5000	50	71.3	99.8	185	2100	74.5	151.4								
5500	55	78.4	91.4	165	1750	76.7	155.9								
6000	60	85.5	99.8	150		78.7	160.4								

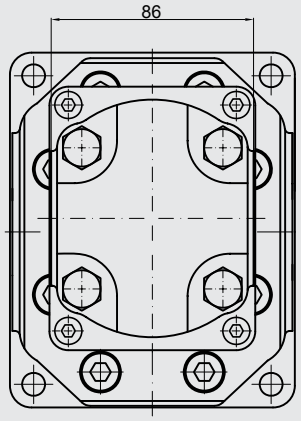
End pump size 2:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
								Inlet	Outlet
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]	A2 [mm]	B2 [mm]	G2	G2
450	4.5	6.14	14.33	250	3500	40.5	78	G 1/2	G 1/2
630	6.3	8.69	20.29			42	81		
820	8.2	11.32	26.40			43.5	83.9		
1000	10	13.95	32.55			45	87	G 3/4	
1130	11.3	15.76	36.78			46	89.1		
1200	12	16.92	39.48			46.6	90.3		
1400	14	19.95	46.55			48	93.4		
1500	15	21.60	36.00		2500	49	95		
1600	16	23.04	38.40			50	96.6		
1900	19	27.36	45.60	200		52	101.5		
2200	22	31.68	42.24	180	2000	55	106.5		
2500	25	36.00	48.00	160		57.2	111.4		

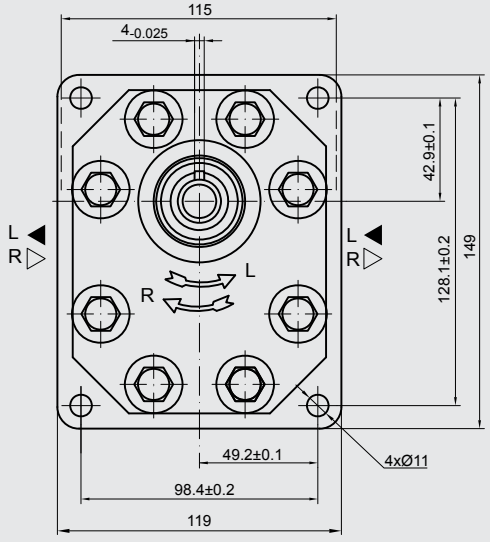
6.5.29 Triple pump size 3 / size 3 / size 2

PGE104-.../.../...-.BS4/4/4-N





View Y



View X

Front and middle pump size 3:

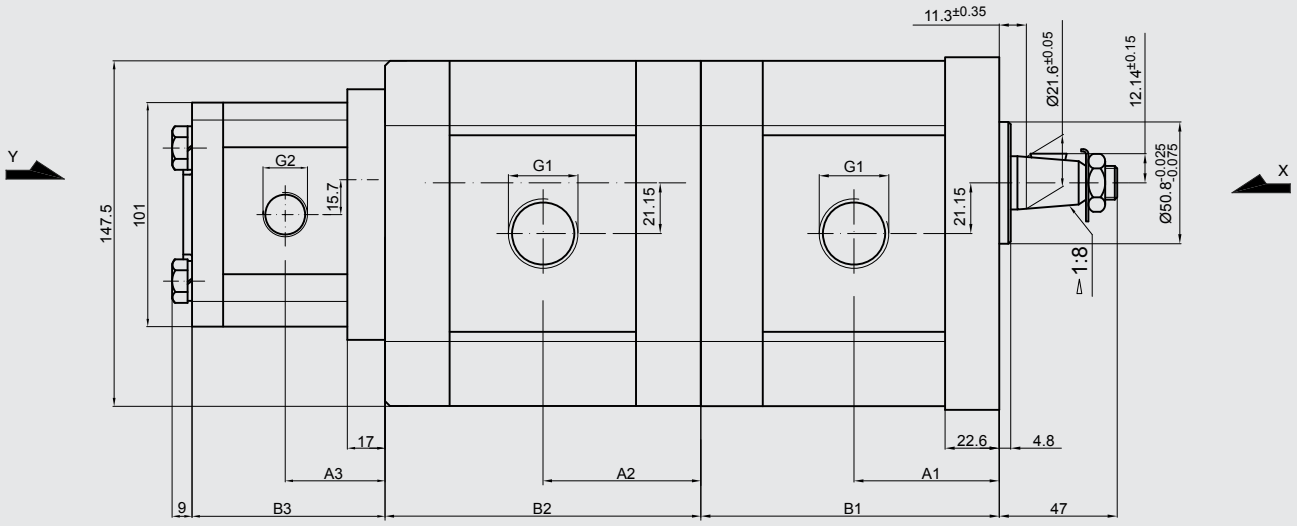
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]
2000	20	28.2	56.4	250	3000
2250	22.5	31.7	63.5		
2500	25	35.3	70.5		
2800	28	39.5	79.0		
3200	32	45.1	90.2		
3600	36	51.3	95.8	240	2800
4200	42	59.9	99.8	230	2500
4600	46	65.6	100.5	210	2300
5000	50	71.3	99.8	185	2100
5500	55	78.4	91.4	165	1750
6000	60	85.5	99.8	150	

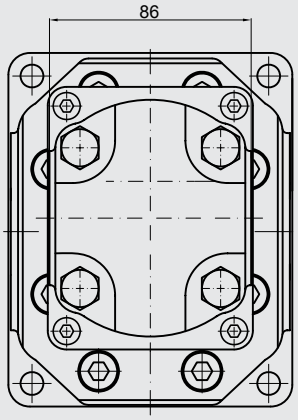
Displacement	Dimensions									
	A1 [mm]	B1 [mm]	A2 [mm]	B2 [mm]	Inlet E1	Inlet F1	Inlet d1	Outlet E1	Outlet F1	Outlet d1
2000	56.1	114.7	58.5	117.1	40	19	M8	40	19	M8
2250	57.6	117.7	60.0	120.1						
2500	58.3	119.1	60.8	121.5						
2800	60.2	122.7	62.5	125.1						
3200	66.5	135.3	68.8	137.7	51	27	M10			
3600	68.0	138.5	70.5	140.9						
4200	70.8	144.0	73.2	146.5						
4600	72.7	147.8	75.1	150.2						
5000	74.5	151.4	76.9	153.8						
5500	76.7	155.9	79.1	158.3						
6000	78.7	160.4	81.4	162.8						

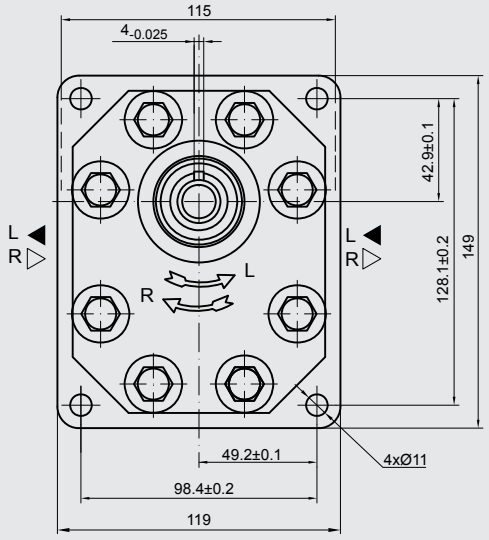
End pump size 2:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions								
								Inlet			Outlet		
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]	A3 [mm]	B3 [mm]	E2	F2	d2	E2	F2	d2
450	4.5	6.14	14.33	250	3500	40.5	78	30	13.1	M6	30	13.1	M6
630	6.3	8.69	20.29			42	81						
820	8.2	11.32	26.40			43.5	83.9						
1000	10	13.95	32.55			45	87	40	19	M8		14.2	
1130	11.3	15.76	36.78			46	89.1						
1200	12	16.92	39.48			46.6	90.3						
1400	14	19.95	46.55			48	93.4						
1500	15	21.60	36.00		2500	49	95						
1600	16	23.04	38.40			50	96.6						
1900	19	27.36	45.60	200		52	101.5						
2200	22	31.68	42.24	180	2000	55	106.5						
2500	25	36.00	48.00	160		57.2	111.4				40	19	M8

PGE104-.../.../...-.BS1/1/1-N







View Y

View X

Front and middle pump size 3:

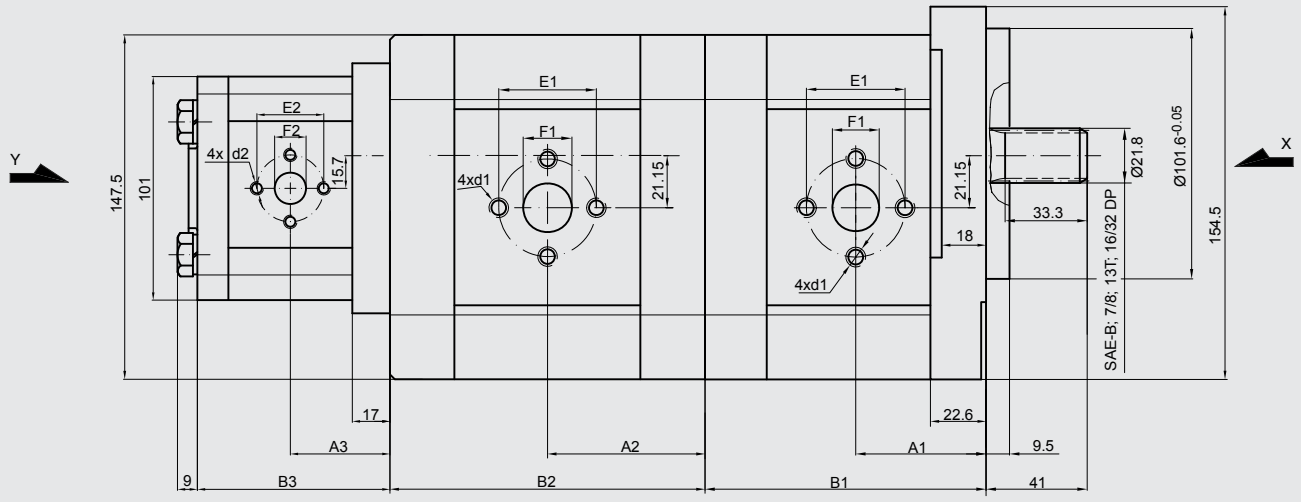
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]
2000	20	28.2	56.4	250	3000
2250	22.5	31.7	63.5		
2500	25	35.3	70.5		
2800	28	39.5	79.0		
3200	32	45.1	90.2		
3600	36	51.3	95.8	240	2800
4200	42	59.9	99.8	230	2500
4600	46	65.6	100.5	210	2300
5000	50	71.3	99.8	185	2100
5500	55	78.4	91.4	165	1750
6000	60	85.5	99.8	150	

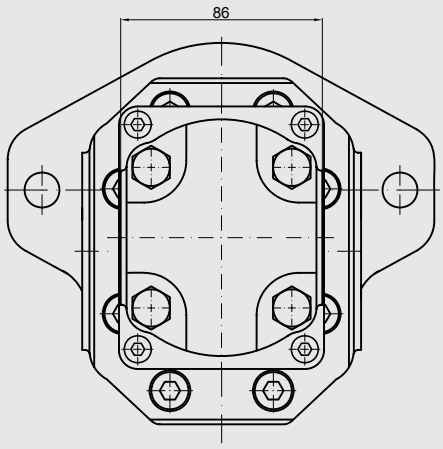
Displacement	Dimensions					
	A1 [mm]	B1 [mm]	A2 [mm]	B2 [mm]	Inlet G1	Outlet G1
2000	56.1	114.7	58.5	117.1	G 3/4	G 3/4
2250	57.6	117.7	60.0	120.1		
2500	58.3	119.1	60.8	121.5		
2800	60.2	122.7	62.5	125.1		
3200	66.5	135.3	68.8	137.7	G 1	
3600	68.0	138.5	70.5	140.9		
4200	70.8	144.0	73.2	146.5		
4600	72.7	147.8	75.1	150.2		
5000	74.5	151.4	76.9	153.8		
5500	76.7	155.9	79.1	158.3		
6000	78.7	160.4	81.4	162.8		

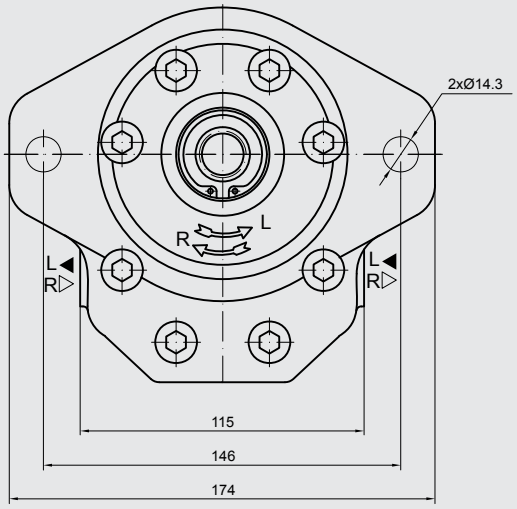
End pump size 2:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
		at 1500 rpm	at max. rpm					Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]	A3 [mm]	B3 [mm]	G2	G2
450	4.5	6.14	14.33	250	3500	40.5	78	G 1/2	G 1/2
630	6.3	8.69	20.29			42	81		
820	8.2	11.32	26.40			43.5	83.9		
1000	10	13.95	32.55			45	87	G 3/4	
1130	11.3	15.76	36.78			46	89.1		
1200	12	16.92	39.48			46.6	90.3		
1400	14	19.95	46.55			48	93.4		
1500	15	21.60	36.00		2500	49	95		
1600	16	23.04	38.40			50	96.6		
1900	19	27.36	45.60	200		52	101.5		
2200	22	31.68	42.24	180	2000	55	106.5		
2500	25	36.00	48.00	160		57.2	111.4		

PGE104-.../.../...-.FX4/4/4-N







View Y

View X

Front and middle pump size 3:

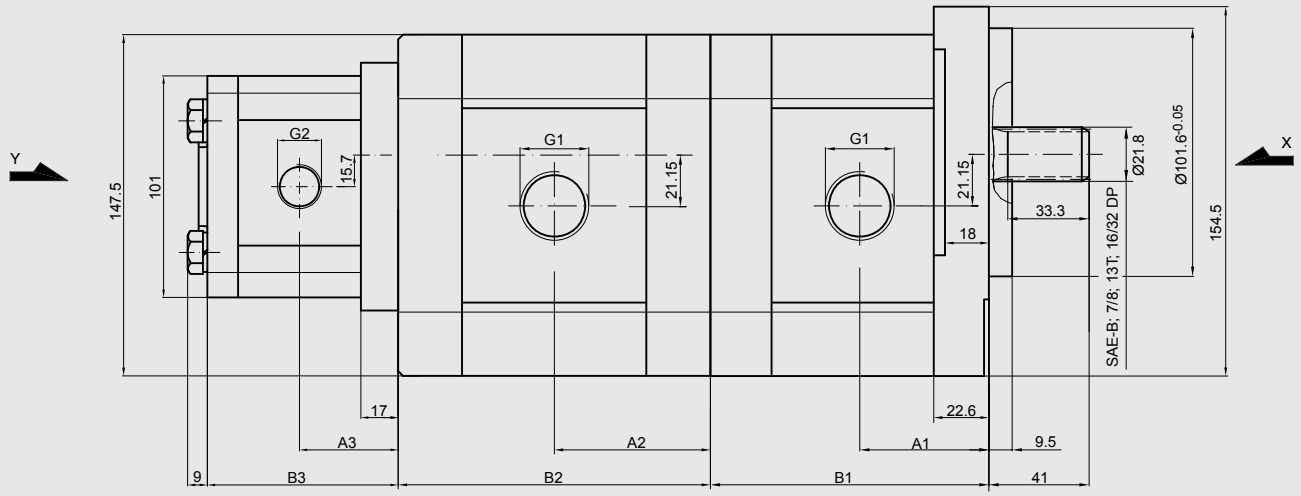
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
2000	20	28.2	56.4	250	3000
2250	22.5	31.7	63.5		
2500	25	35.3	70.5		
2800	28	39.5	79.0		
3200	32	45.1	90.2		
3600	36	51.3	95.8	240	2800
4200	42	59.9	99.8	230	2500
4600	46	65.6	100.5	210	2300
5000	50	71.3	99.8	185	2100
5500	55	78.4	91.4	165	1750
6000	60	85.5	99.8	150	

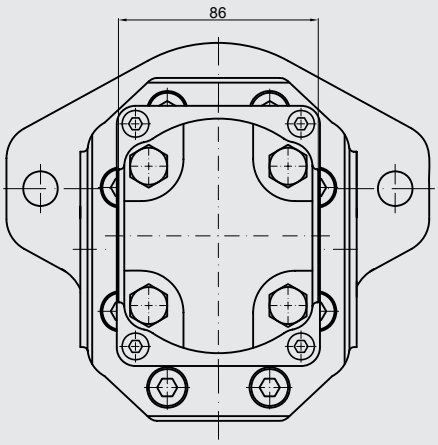
Displacement	Dimensions									
	A1	B1	A2	B2	Inlet			Outlet		
	[mm]	[mm]	[mm]	[mm]	E1	F1	d1	E1	F1	d1
2000	56.1	114.7	58.5	117.1	40	19	M8	40	19	M8
2250	57.6	117.7	60.0	120.1						
2500	58.3	119.1	60.8	121.5						
2800	60.2	122.7	62.5	125.1						
3200	66.5	135.3	68.8	137.7	51	27	M10			
3600	68.0	138.5	70.5	140.9						
4200	70.8	144.0	73.2	146.5						
4600	72.7	147.8	75.1	150.2						
5000	74.5	151.4	76.9	153.8						
5500	76.7	155.9	79.1	158.3						
6000	78.7	160.4	81.4	162.8						

End pump size 2:

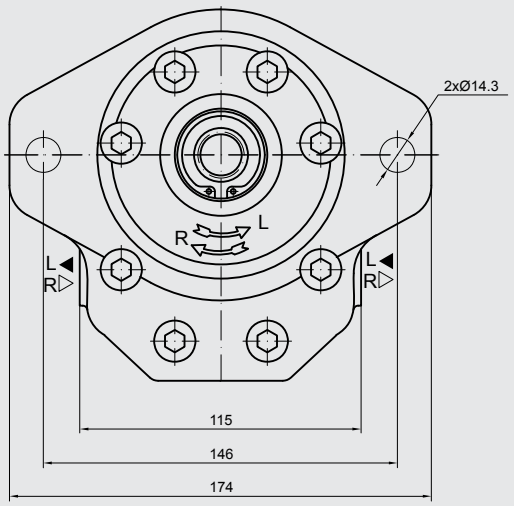
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions								
		at 1500 rpm	at max. rpm		n	A3	B3	Inlet			Outlet		
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	E2	F2	d2	E2	F2	d2
450	4.5	6.14	14.33	250	3500	40.5	78	30	13.1	M6	30	13.1	M6
630	6.3	8.69	20.29			42	81						
820	8.2	11.32	26.40			43.5	83.9						
1000	10	13.95	32.55			45	87	40	19	M8		14.2	
1130	11.3	15.76	36.78			46	89.1						
1200	12	16.92	39.48			46.6	90.3						
1400	14	19.95	46.55			48	93.4						
1500	15	21.60	36.00		2500	49	95						
1600	16	23.04	38.40			50	96.6						
1900	19	27.36	45.60	200		52	101.5						
2200	22	31.68	42.24	180	2000	55	106.5						
2500	25	36.00	48.00	160		57.2	111.4				40	19	M8

PGE104-.../.../...-.FX1/1/1-N





View Y



View X

Front and middle pump size 3:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
2000	20	28.2	56.4	250	3000
2250	22.5	31.7	63.5		
2500	25	35.3	70.5		
2800	28	39.5	79.0		
3200	32	45.1	90.2		
3600	36	51.3	95.8	240	2800
4200	42	59.9	99.8	230	2500
4600	46	65.6	100.5	210	2300
5000	50	71.3	99.8	185	2100
5500	55	78.4	91.4	165	1750
6000	60	85.5	99.8	150	

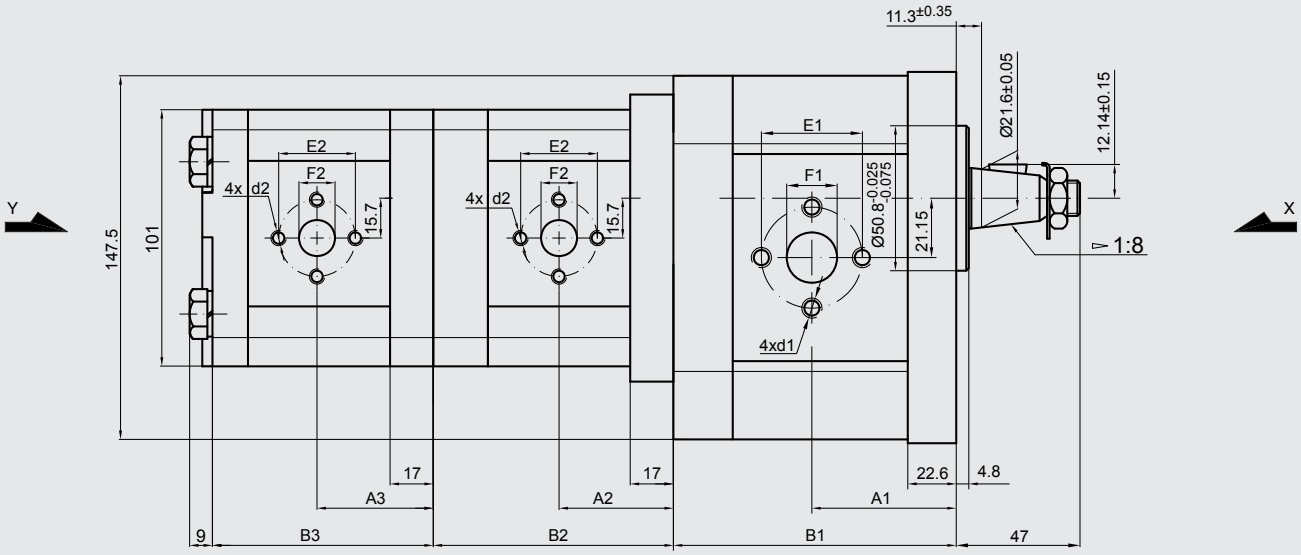
Displacement	Dimensions					
	A1 [mm]	B1 [mm]	A2 [mm]	B2 [mm]	Inlet G1	Outlet G1
2000	56.1	114.7	58.5	117.1	G 3/4	G 3/4
2250	57.6	117.7	60.0	120.1		
2500	58.3	119.1	60.8	121.5		
2800	60.2	122.7	62.5	125.1		
3200	66.5	135.3	68.8	137.7	G 1	
3600	68.0	138.5	70.5	140.9		
4200	70.8	144.0	73.2	146.5		
4600	72.7	147.8	75.1	150.2		
5000	74.5	151.4	76.9	153.8		
5500	76.7	155.9	79.1	158.3		
6000	78.7	160.4	81.4	162.8		

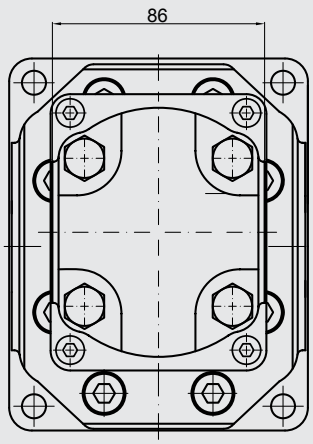
End pump size 2:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
		at 1500 rpm	at max. rpm		n	A3	B3	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G2	G2
450	4.5	6.14	14.33	250	3500	40.5	78	G 1/2	G 1/2
630	6.3	8.69	20.29			42	81		
820	8.2	11.32	26.40			43.5	83.9		
1000	10	13.95	32.55			45	87		
1130	11.3	15.76	36.78			46	89.1	G 3/4	
1200	12	16.92	39.48			46.6	90.3		
1400	14	19.95	46.55			48	93.4		
1500	15	21.60	36.00		2500	49	95		
1600	16	23.04	38.40			50	96.6		
1900	19	27.36	45.60	200		52	101.5		
2200	22	31.68	42.24	180	2000	55	106.5		
2500	25	36.00	48.00	160		57.2	111.4		

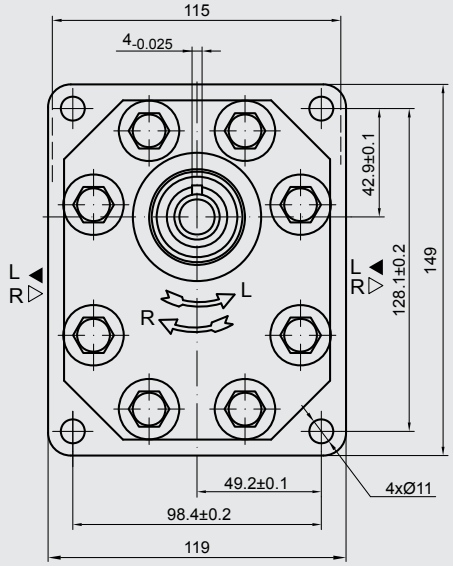
6.5.30 Triple pump size 3 / size 2 / size 2

PGE104-.../.../...-.BS4/4/4-N





View Y



View X

Front pump size 3:

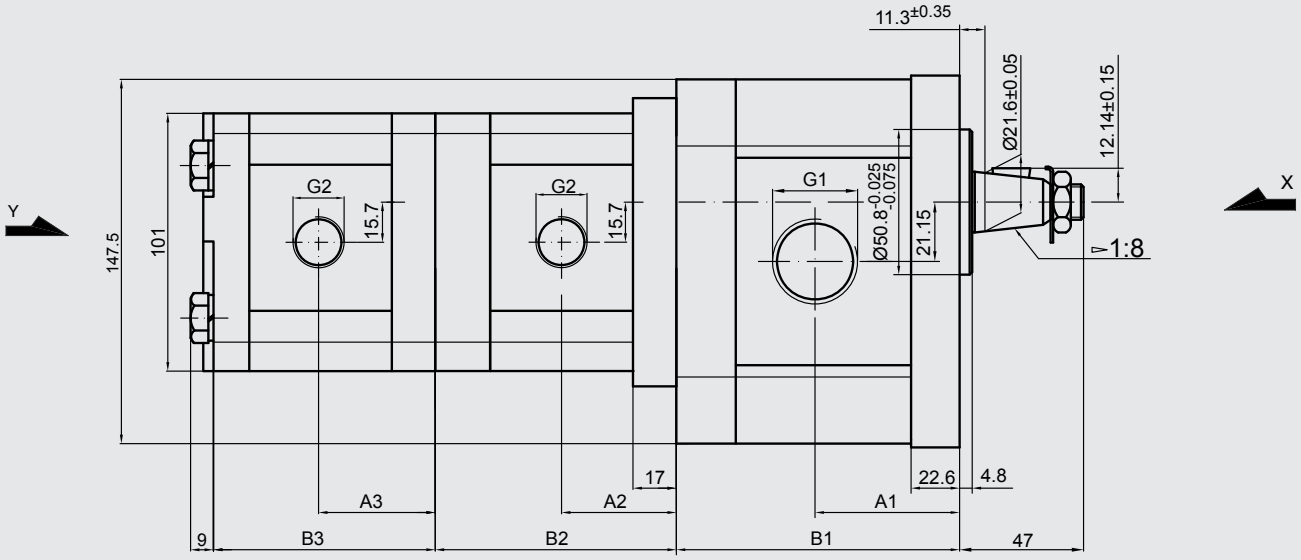
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions								
		at 1500 rpm	at max. rpm		n	A1	B1	Inlet			Outlet		
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	E1	F1	d1	E1	F1	d1
2000	20	28.2	56.4	250	3000	56.1	114.7	40	19	M8	40	19	M8
2250	22.5	31.7	63.5			57.6	117.7						
2500	25	35.3	70.5			58.3	119.1						
2800	28	39.5	79.0			60.2	122.7						
3200	32	45.1	90.2			66.5	135.3	51	27	M10			
3600	36	51.3	95.8	240	2800	68.0	138.5						
4200	42	59.9	99.8	230	2500	70.8	144.0						
4600	46	65.6	100.5	210	2300	72.7	147.8						
5000	50	71.3	99.8	185	2100	74.5	151.4						
5500	55	78.4	91.4	165	1750	76.7	155.9						
6000	60	85.5	99.8	150		78.7	160.4						

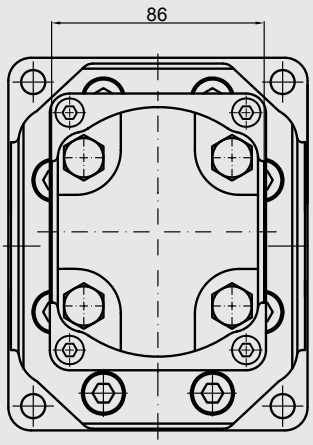
Middle and end pump size 2:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
450	4.5	6.14	14.33	250	3500
630	6.3	8.69	20.29		
820	8.2	11.32	26.40		
1000	10	13.95	32.55		
1130	11.3	15.76	36.78		
1200	12	16.92	39.48		
1400	14	19.95	46.55		
1500	15	21.60	36.00		2500
1600	16	23.04	38.40		
1900	19	27.36	45.60	200	
2200	22	31.68	42.24	180	2000
2500	25	36.00	48.00	160	

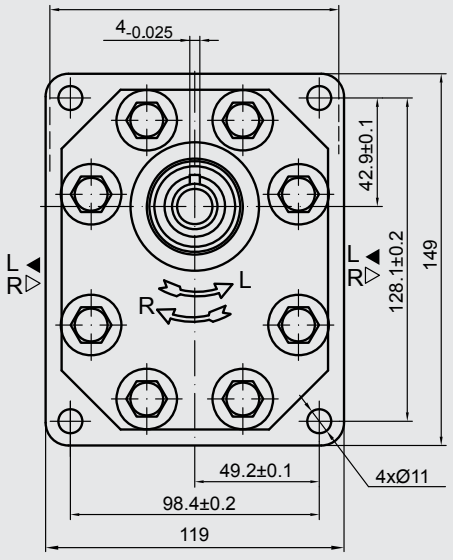
Displacement	Dimensions									
	A2	B2	A3	B3	Inlet			Outlet		
	[mm]	[mm]	[mm]	[mm]	E2	F2	d2	E2	F2	d2
450	40.5	78	40.5	85.2	30	13.1	M6	30	13.1	M6
630	42	81	42	88.2						
820	43.5	83.9	43.5	91.1						
1000	45	87	45	94.2	40	19	M8		14.2	
1130	46	89.1	46	96.3						
1200	46.6	90.3	46.6	97.5						
1400	48	93.4	48	100.6						
1500	49	95	49	102.1						
1600	50	96.6	50	103.8						
1900	52	101.5	52	108.7						
2200	55	106.5	55	113.7						
2500	57.2	111.4	57.2	118.6				40	19	M8

PGE104-.../.../...-.BS1/1/1-N





View Y



View X

Front pump size 3:

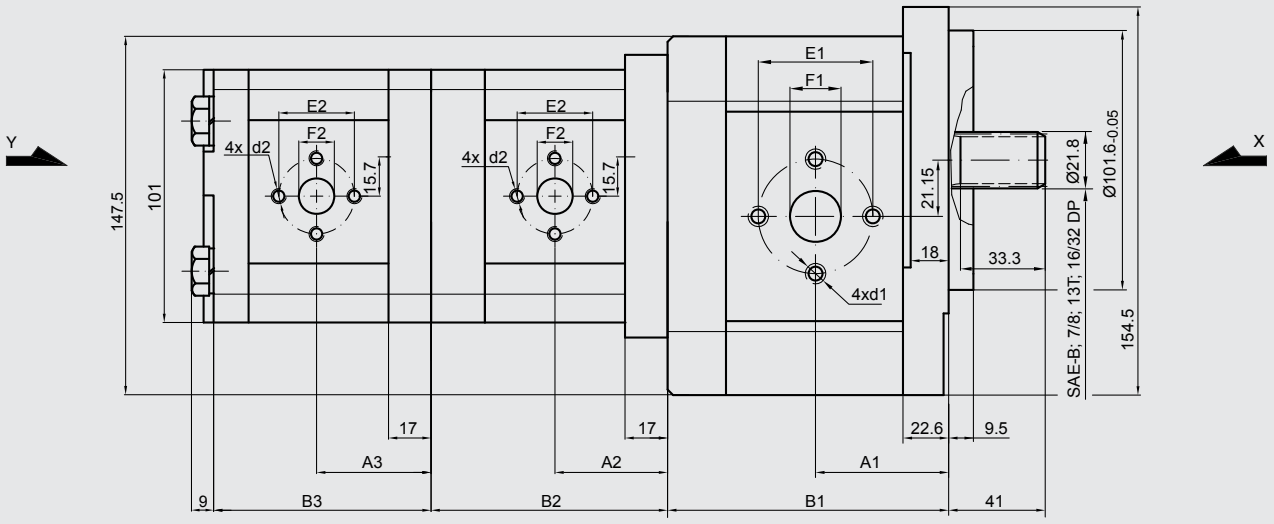
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
		at 1500 rpm	at max. rpm					Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]	A1 [mm]	B1 [mm]	G1	G1
2000	20	28.2	56.4	250	3000	56.1	114.7	G 3/4	G 3/4
2250	22.5	31.7	63.5			57.6	117.7		
2500	25	35.3	70.5			58.3	119.1		
2800	28	39.5	79.0			60.2	122.7		
3200	32	45.1	90.2			66.5	135.3	G 1	
3600	36	51.3	95.8	240	2800	68.0	138.5		
4200	42	59.9	99.8	230	2500	70.8	144.0		
4600	46	65.6	100.5	210	2300	72.7	147.8		
5000	50	71.3	99.8	185	2100	74.5	151.4		
5500	55	78.4	91.4	165	1750	76.7	155.9		
6000	60	85.5	99.8	150		78.7	160.4		

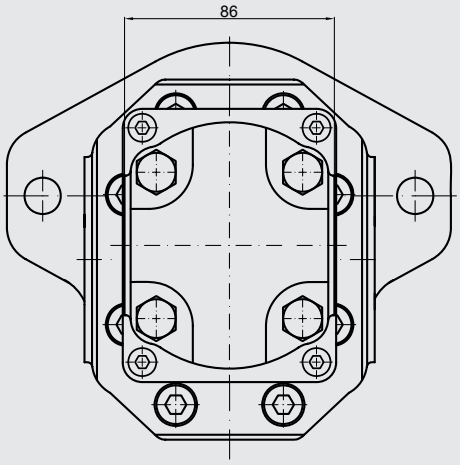
Middle and end pump size 2:

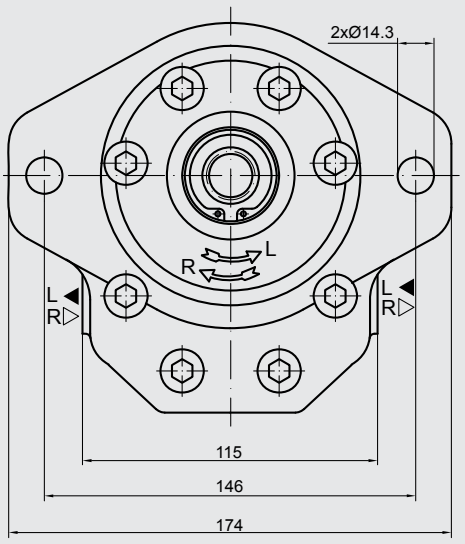
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]
450	4.5	6.14	14.33	250	3500
630	6.3	8.69	20.29		
820	8.2	11.32	26.40		
1000	10	13.95	32.55		
1130	11.3	15.76	36.78		
1200	12	16.92	39.48		
1400	14	19.95	46.55		
1500	15	21.60	36.00		2500
1600	16	23.04	38.40		
1900	19	27.36	45.60	200	
2200	22	31.68	42.24	180	2000
2500	25	36.00	48.00	160	

Displacement	Dimensions					
	A2 [mm]	B2 [mm]	A3 [mm]	B3 [mm]	Inlet G2	Outlet G2
450	40.5	85.2	40.5	78	G 1/2	G 1/2
630	42	88.2	42	81		
820	43.5	91.1	43.5	83.9		
1000	45	94.2	45	87	G 3/4	
1130	46	96.3	46	89		
1200	46.6	97.5	46.6	90.3		
1400	48	100.6	48	93.4		
1500	49	102.1	49	95		
1600	50	103.8	50	96.5		
1900	52	108.7	52	101.5		
2200	55	113.7	55	106.5		
2500	57.2	118.6	57.2	111.4		

PGE104-.../.../...-.FX4/4/4-N







View Y

View X

Front pump size 3:

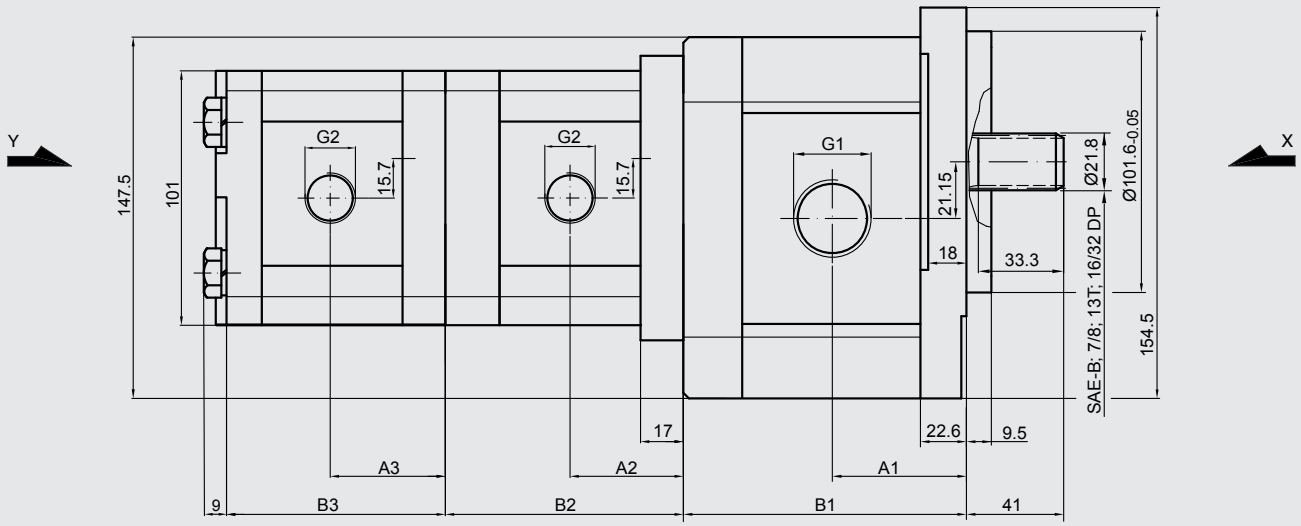
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions								
								Inlet			Outlet		
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]	A1 [mm]	B1 [mm]	E1	F1	d1	E1	F1	d1
2000	20	28.2	56.4	250	3000	56.1	114.7	40	19	M8	40	19	M8
2250	22.5	31.7	63.5			57.6	117.7						
2500	25	35.3	70.5			58.3	119.1						
2800	28	39.5	79.0			60.2	122.7						
3200	32	45.1	90.2			66.5	135.3	51	27	M10			
3600	36	51.3	95.8	240	2800	68.0	138.5						
4200	42	59.9	99.8	230	2500	70.8	144.0						
4600	46	65.6	100.5	210	2300	72.7	147.8						
5000	50	71.3	99.8	185	2100	74.5	151.4						
5500	55	78.4	91.4	165	1750	76.7	155.9						
6000	60	85.5	99.8	150		78.7	160.4						

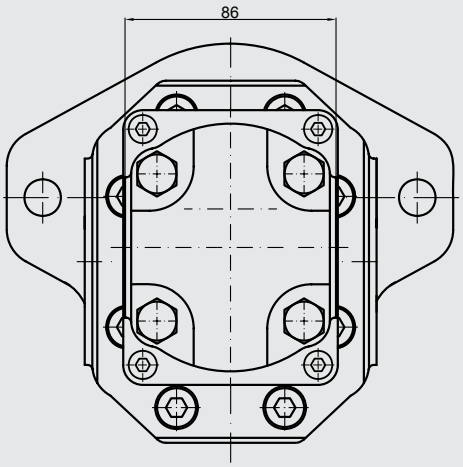
Middle and end pump size 2:

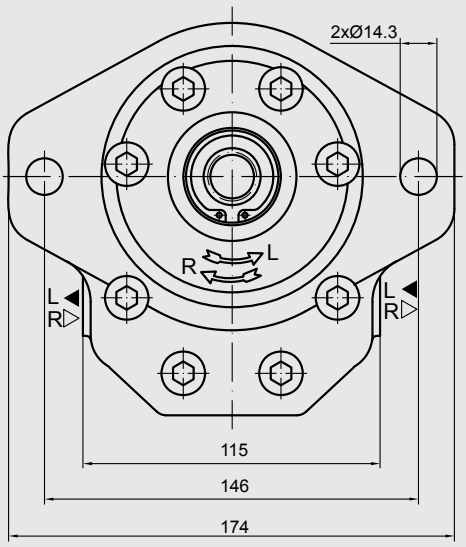
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
450	4.5	6.14	14.33	250	3500
630	6.3	8.69	20.29		
820	8.2	11.32	26.40		
1000	10	13.95	32.55		
1130	11.3	15.76	36.78		
1200	12	16.92	39.48		
1400	14	19.95	46.55		
1500	15	21.60	36.00		2500
1600	16	23.04	38.40		
1900	19	27.36	45.60	200	
2200	22	31.68	42.24	180	2000
2500	25	36.00	48.00	160	

Displacement	Dimensions									
	A2	B2	A3	B3	Inlet			Outlet		
	[mm]	[mm]	[mm]	[mm]	E2	F2	d2	E2	F2	d2
450	40.5	85.2	40.5	78	30	13.1	M6	30	13.1	M6
630	42	88.2	42	81						
820	43.5	91.1	43.5	83.9						
1000	45	94.2	45	87	40	19	M8		14.2	
1130	46	96.3	46	89						
1200	46.6	97.5	46.6	90.3						
1400	48	100.6	48	93.4						
1500	49	102.1	49	95						
1600	50	103.8	50	96.6						
1900	52	108.7	52	101.5						
2200	55	113.7	55	106.5						
2500	57.2	118.6	57.2	111.4				40	19	M8

PGE104-.../.../...-.FX1/1/1-N







View Y

View X

Front pump size 3:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
		at 1500 rpm	at max. rpm					Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]	A1 [mm]	B1 [mm]	G1	G1
2000	20	28.2	56.4	250	3000	56.1	114.7	G 3/4	G 3/4
2250	22.5	31.7	63.5			57.6	117.7		
2500	25	35.3	70.5			58.3	119.1		
2800	28	39.5	79.0			60.2	122.7		
3200	32	45.1	90.2			66.5	135.3	G 1	
3600	36	51.3	95.8	240	2800	68.0	138.5		
4200	42	59.9	99.8	230	2500	70.8	144.0		
4600	46	65.6	100.5	210	2300	72.7	147.8		
5000	50	71.3	99.8	185	2100	74.5	151.4		
5500	55	78.4	91.4	165	1750	76.7	155.9		
6000	60	85.5	99.8	150		78.7	160.4		

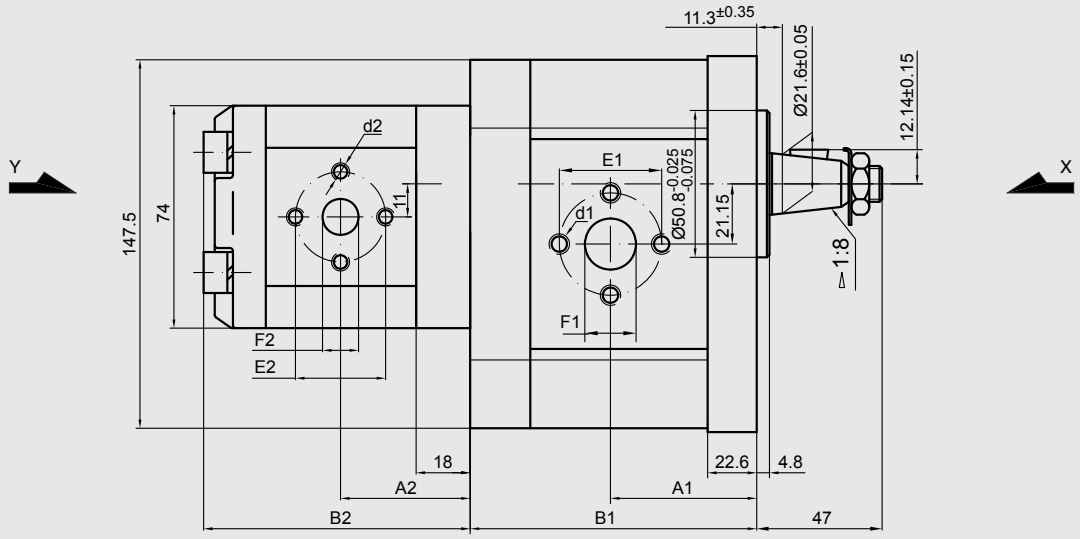
Middle and end pump size 2:

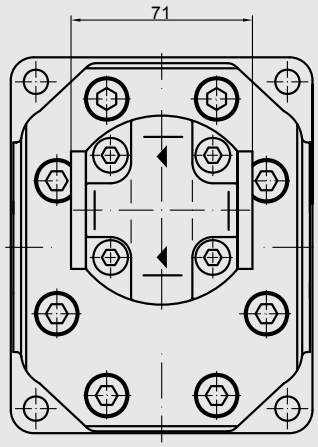
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]
450	4.5	6.14	14.33	250	3500
630	6.3	8.69	20.29		
820	8.2	11.32	26.40		
1000	10	13.95	32.55		
1130	11.3	15.76	36.78		
1200	12	16.92	39.48		
1400	14	19.95	46.55		
1500	15	21.60	36.00		2500
1600	16	23.04	38.40		
1900	19	27.36	45.60	200	
2200	22	31.68	42.24	180	2000
2500	25	36.00	48.00	160	

Displacement	Dimensions					
	A2 [mm]	B2 [mm]	A3 [mm]	B3 [mm]	Inlet G2	Outlet G2
450	40.5	85.2	40.5	78	G 1/2	G 1/2
630	42	88.2	42	81		
820	43.5	91.1	43.5	83.9		
1000	45	94.2	45	87	G 3/4	
1130	46	96.3	46	89		
1200	46.6	97.5	46.5	90.3		
1400	48	100.6	48	93.4		
1500	49	102.1	49	95		
1600	50	103.8	50	96.5		
1900	52	108.7	52	101.5		
2200	55	113.7	55	106.5		
2500	57.2	118.6	57.2	111.4		

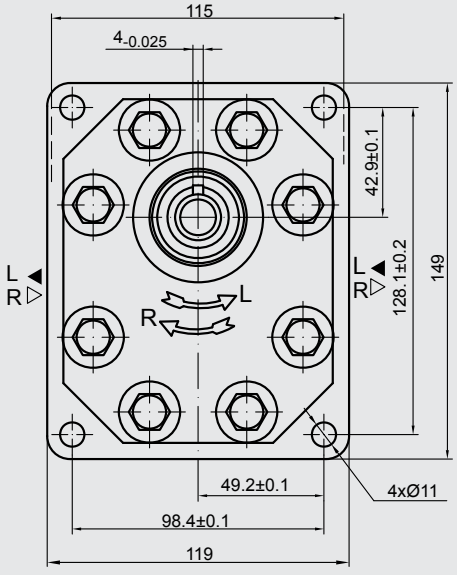
6.5.31 Double pump size 3 / size 1

PGE104-.../...-.BS4/4-N





View Y



View X

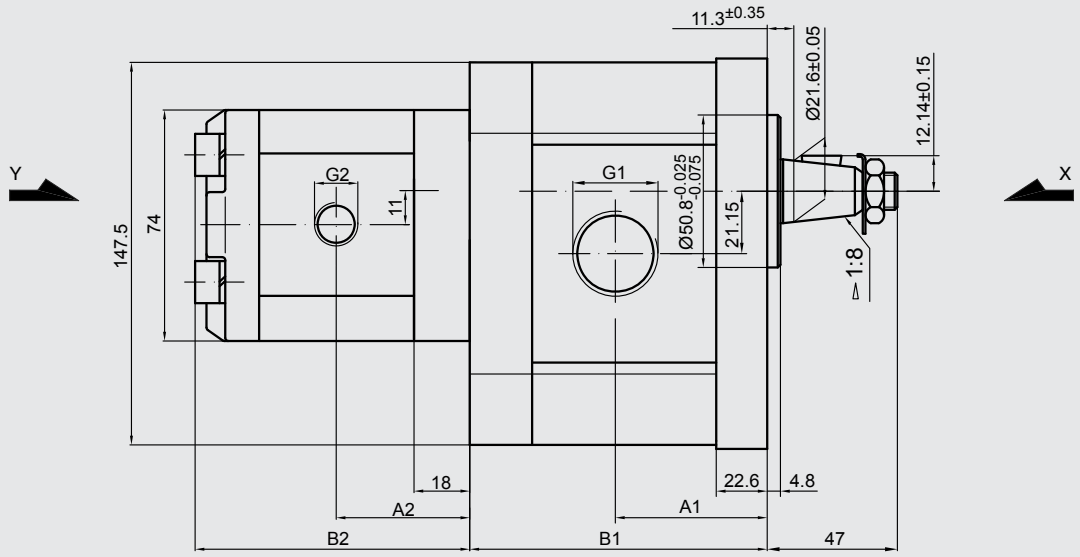
Front pump size 3:

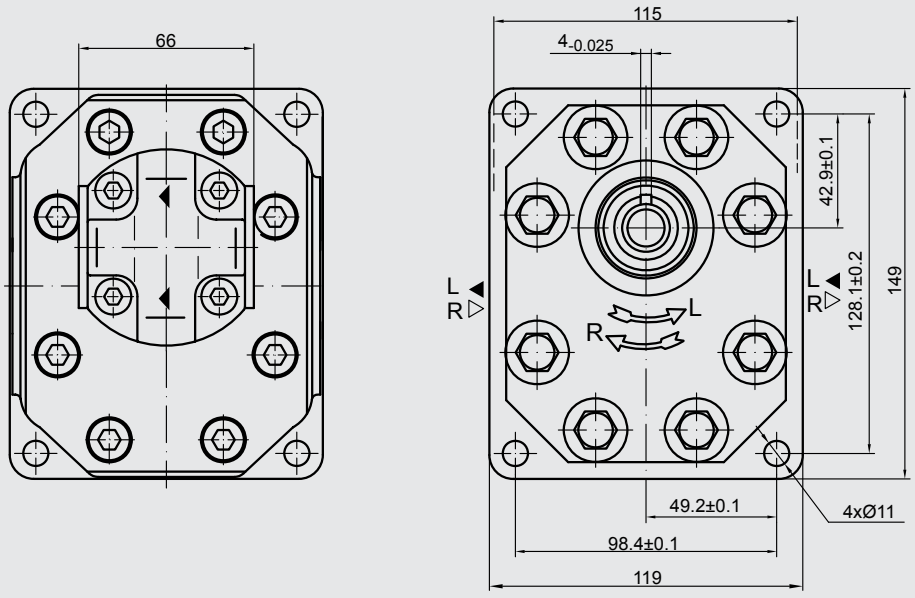
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions								
		at 1500 rpm	at max. rpm					Inlet			Outlet		
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]	A1 [mm]	B1 [mm]	E1	F1	d1	E1	F1	d1
2000	20	28.2	56.4	250	3000	56.1	117.2	40	19	M8	40	19	M8
2250	22.5	31.7	63.5			57.6	120.2						
2500	25	35.3	70.5			58.3	121.6						
2800	28	39.5	79.0			60.2	125.2						
3200	32	45.1	90.2			66.5	137.8	51	27	M10			
3600	36	51.3	95.8	240	2800	68.0	141.0						
4200	42	59.9	99.8	230	2500	70.8	146.5						
4600	46	65.6	100.5	210	2300	72.7	150.3						
5000	50	71.3	99.8	185	2100	74.5	153.9						
5500	55	78.4	91.4	165	1750	76.7	158.4						
6000	60	85.5	99.8	150		78.7	162.9						

End pump size 1:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions								
		at 1500 rpm	at max. rpm					Inlet			Outlet		
	[cm³/rev]	[l/min]	[l/min]	[bar]	n [rpm]	A2 [mm]	B2 [mm]	E2	F2	d2	E2	F2	d2
100	1	1.40	3.26	250	3500	39.1	81	30	12	M6	30	12	M6
125	1.25	1.74	4.07			39.5	82						
160	1.6	2.23	5.21			40.3	83.6						
200	2	2.82	6.58			41.1	85.2						
250	2.5	3.53	8.23			42.1	87.2						
315	3.15	4.44	10.36			43.5	89.8						
365	3.65	5.15	12.01			44.4	91.9						
420	4.2	5.92	13.82			45.5	94.1						
500	5	7.05	14.10		3000	47.1	97.2						
610	6.1	8.69	14.49	200	2500	49.4	101.8						
740	7.4	10.55	17.58	170		52.1	107.2						

PGE104-.../...-.BS1/1-N





View Y

View X

Front pump size 3:

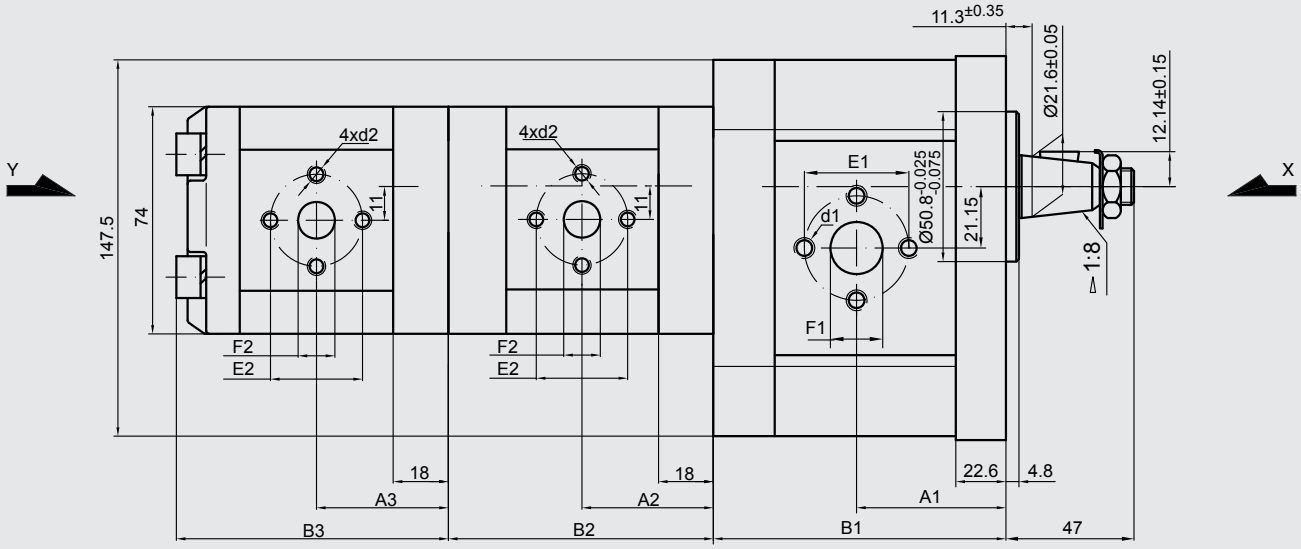
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
		at 1500 rpm	at max. rpm		n	A1	B1	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G1	G1
2000	20	28.2	56.4	250	3000	56.1	117.2	G 3/4	G 3/4
2250	22.5	31.7	63.5			57.6	120.2		
2500	25	35.3	70.5			58.3	121.6		
2800	28	39.5	79.0			60.2	125.2		
3200	32	45.1	90.2			66.5	137.8	G 1	
3600	36	51.3	95.8	240	2800	68.0	141.0		
4200	42	59.9	99.8	230	2500	70.8	146.5		
4600	46	65.6	100.5	210	2300	72.7	150.3		
5000	50	71.3	99.8	185	2100	74.5	153.9		
5500	55	78.4	91.4	165	1750	76.7	158.4		
6000	60	85.5	99.8	150		78.7	162.9		

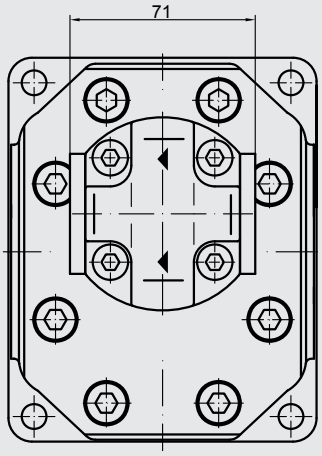
End pump size 1:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
		at 1500 rpm	at max. rpm		n	A2	B2	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G2	G2
100	1	1.40	3.26	250	3500	39.1	81	G 3/8	G 3/8
125	1.25	1.74	4.07			39.5	82		
160	1.6	2.23	5.21			40.3	83.6		
200	2	2.82	6.58			41.1	85.2		
250	2.5	3.53	8.23			42.1	87.2		
315	3.15	4.44	10.36			43.5	89.8	G 1/2	
365	3.65	5.15	12.01			44.4	91.9		
420	4.2	5.92	13.82			45.5	94.1		
500	5	7.05	14.10		3000	47.1	97.2		
610	6.1	8.69	14.49	200	2500	49.4	101.8		
740	7.4	10.55	17.58	170		52.1	107.2		

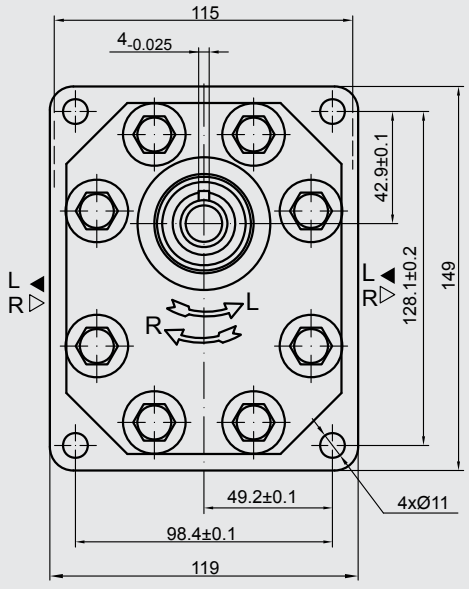
6.5.32 Triple pump size 3 / size 1 / size 1

PGE104-.../.../...-.BS4/4/4-N





View Y



View X

Front pump size 3:

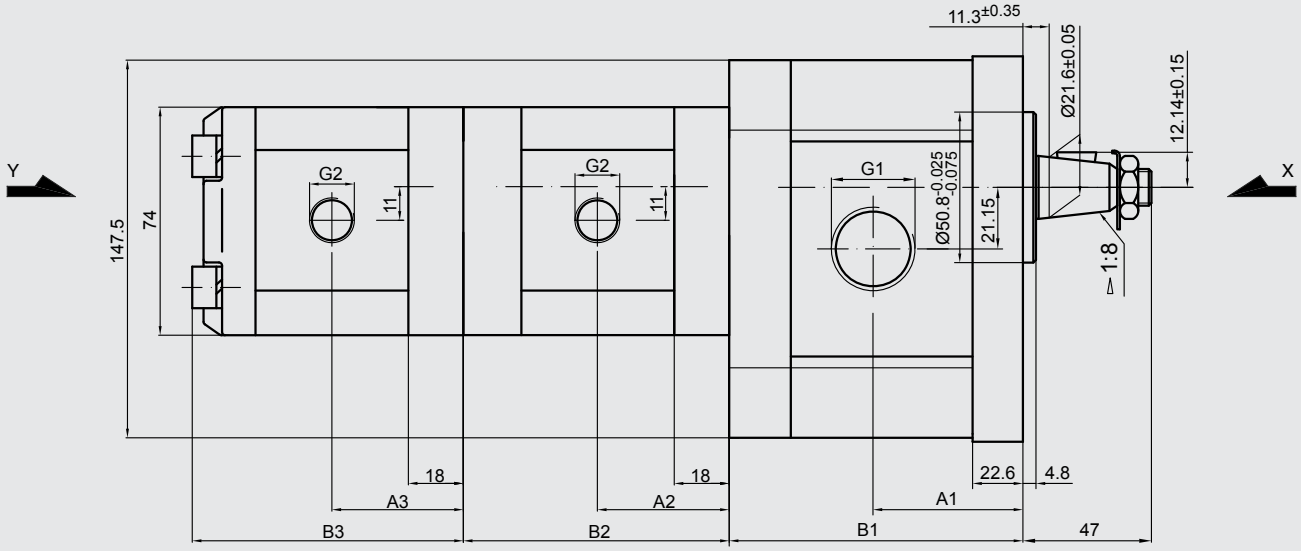
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions								
								Inlet			Outlet		
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]	A1 [mm]	B1 [mm]	E1	F1	d1	E1	F1	d1
2000	20	28.2	56.4	250	3000	56.1	117.2	40	19	M8	40	19	M8
2250	22.5	31.7	63.5			57.6	120.2						
2500	25	35.3	70.5			58.3	121.6						
2800	28	39.5	79.0			60.2	125.2						
3200	32	45.1	90.2			66.5	137.8	51	27	M10			
3600	36	51.3	95.8	240	2800	68.0	141.0						
4200	42	59.9	99.8	230	2500	70.8	146.5						
4600	46	65.6	100.5	210	2300	72.7	150.3						
5000	50	71.3	99.8	185	2100	74.5	153.9						
5500	55	78.4	91.4	165	1750	76.7	158.4						
6000	60	85.5	99.8	150		78.7	162.9						

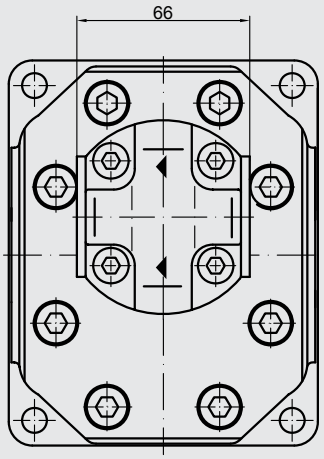
Middle and end pump size 1:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]
100	1	1.40	3.26	250	3500
125	1.25	1.74	4.07		
160	1.6	2.23	5.21		
200	2	2.82	6.58		
250	2.5	3.53	8.23		
315	3.15	4.44	10.36		
365	3.65	5.15	12.01		
420	4.2	5.92	13.82		
500	5	7.05	14.10		3000
610	6.1	8.69	14.49	200	2500
740	7.4	10.55	17.58	170	

Displacement	Dimensions									
	A2 [mm]	B2 [mm]	A3 [mm]	B3 [mm]	Inlet			Outlet		
					E2	F2	d2	E2	F2	d2
100	39.1	79	39.1	79	30	12	M6	30	12	M6
125	39.5	80	39.5	80						
160	40.3	81.6	40.3	81.6						
200	41.1	83.2	41.1	83.2						
250	42.1	85.2	42.1	85.2						
315	43.5	87.8	43.5	87.8						
365	44.4	89.9	44.4	89.9						
420	45.5	92.1	45.5	92.1						
500	47.1	95.2	47.1	95.2						
610	49.4	99.8	49.4	99.8						
740	52.1	105.2	52.1	105.2						

PGE104-.../.../...-.BS1/1/1-N





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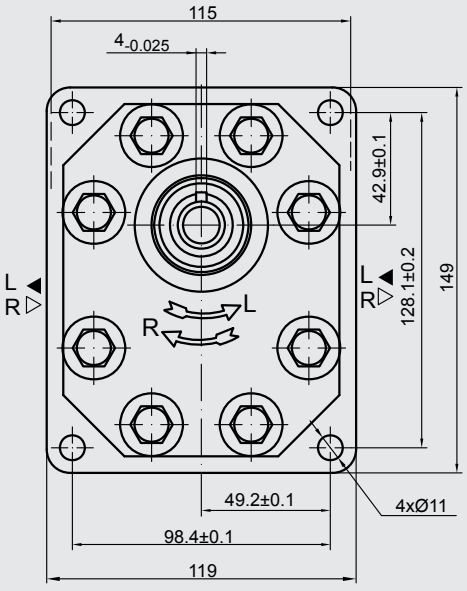

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Front pump size 3:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
		at 1500 rpm	at max. rpm		n	A1	B1	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G1	G1
2000	20	28.2	56.4	250	3000	56.1	117.2	G 3/4	G 3/4
2250	22.5	31.7	63.5			57.6	120.2		
2500	25	35.3	70.5			58.3	121.6		
2800	28	39.5	79.0			60.2	125.2		
3200	32	45.1	90.2			66.5	137.8	G 1	
3600	36	51.3	95.8	240	2800	68.0	141.0		
4200	42	59.9	99.8	230	2500	70.8	146.5		
4600	46	65.6	100.5	210	2300	72.7	150.3		
5000	50	71.3	99.8	185	2100	74.5	153.9		
5500	55	78.4	91.4	165	1750	76.7	158.4		
6000	60	85.5	99.8	150		78.7	162.9		

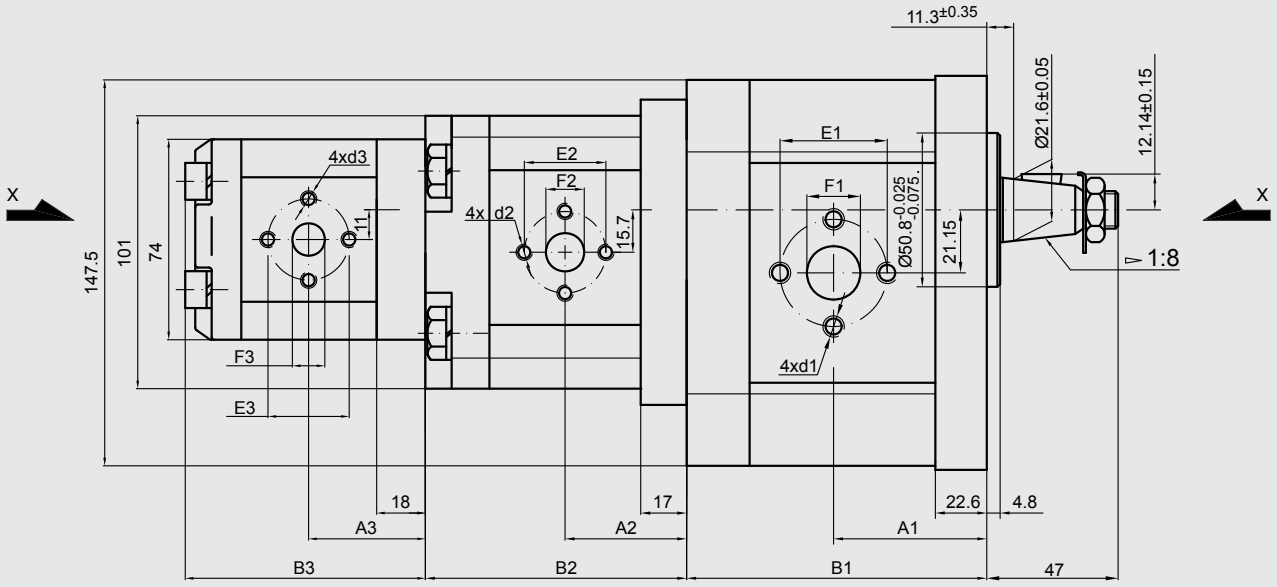
Middle and end pump size 1:

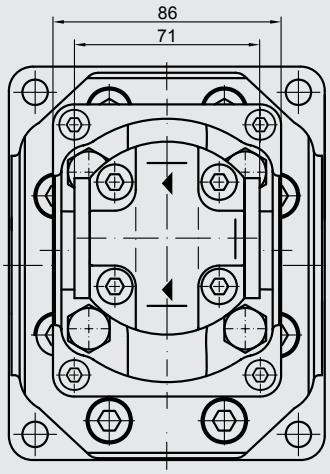
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed
		at 1500 rpm	at max. rpm		n
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]
100	1	1.40	3.26	250	3500
125	1.25	1.74	4.07		
160	1.6	2.23	5.21		
200	2	2.82	6.58		
250	2.5	3.53	8.23		
315	3.15	4.44	10.36		
365	3.65	5.15	12.01		
420	4.2	5.92	13.82		
500	5	7.05	14.10		3000
610	6.1	8.69	14.49	200	2500
740	7.4	10.55	17.58	170	

Displacement	Dimensions					
	A2	B2	A3	B3	Inlet	Outlet
	[mm]	[mm]	[mm]	[mm]	G2	G2
100	39.1	79	39.1	79	G 3/8	G 3/8
125	39.5	80	39.5	80		
160	40.3	81.6	40.3	81.6		
200	41.1	83.2	41.1	83.2		
250	42.1	85.2	42.1	85.2		
315	43.5	87.8	43.5	87.8	G 1/2	
365	44.4	89.9	44.4	89.9		
420	45.5	92.1	45.5	92.1		
500	47.1	95.2	47.1	95.2		
610	49.4	99.8	49.4	99.8		
740	52.1	105.2	52.1	105.2		

6.5.33 Triple pump size 3 / size 2 / size 1

PGE104-.../.../...-.BS4/4/4-N





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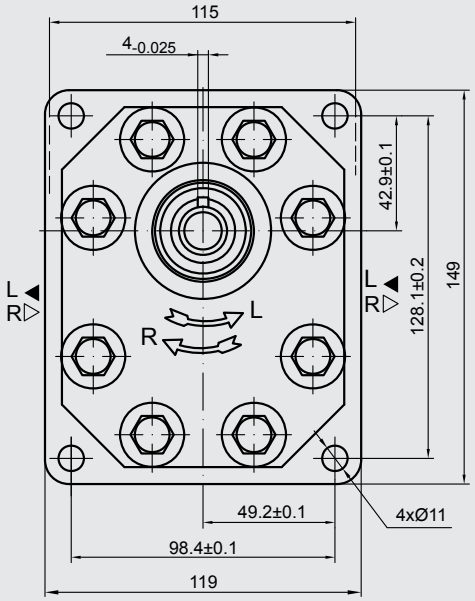

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Front pump size 3:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions								
								Inlet			Outlet		
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]	A1 [mm]	B1 [mm]	E1	F1	d1	E1	F1	d1
2000	20	28.2	56.4	250	3000	56.1	114.7	40	19	M8	40	19	M8
2250	22.5	31.7	63.5			57.6	117.7						
2500	25	35.3	70.5			58.3	119.1						
2800	28	39.5	79.0			60.2	122.7						
3200	32	45.1	90.2			66.5	135.3	51	27	M10			
3600	36	51.3	95.8	240	2800	68.0	138.5						
4200	42	59.9	99.8	230	2500	70.8	144.0						
4600	46	65.6	100.5	210	2300	72.7	147.8						
5000	50	71.3	99.8	185	2100	74.5	151.4						
5500	55	78.4	91.4	165	1750	76.7	155.9						
6000	60	85.5	99.8	150		78.7	160.4						

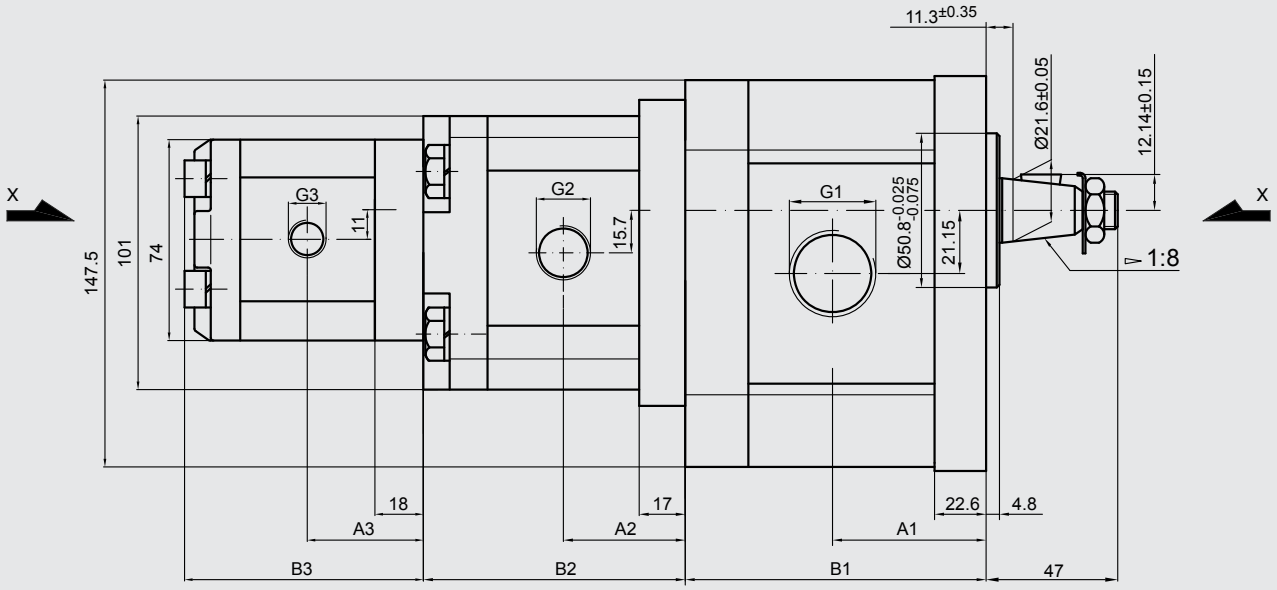
Middle pump size 2:

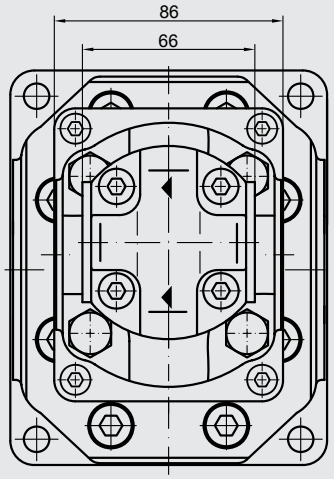
Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions							
								Inlet			Outlet		
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]	A2 [mm]	B2 [mm]	E2	F2	d2	E2	F2	d2
450	4.5	6.14	14.33	250	3500	40.5	87.6	30	13.1	M6	30	13.1	M6
630	6.3	8.69	20.29			42	90.6						
820	8.2	11.32	26.40			43.5	93.5						
1000	10	13.95	32.55			45	96.6	40	19	M8		14.2	
1130	11.3	15.76	36.78			46	98.7						
1200	12	16.92	39.48			46.6	99.9						
1400	14	19.95	46.55			48	103						
1500	15	21.60	36.00		2500	49	104.5						
1600	16	23.04	38.40			50	106.2						
1900	19	27.36	45.60	200		52	111.1						
2200	22	31.68	42.24	180	2000	55	116.1						
2500	25	36.00	48.00	160		57.2	121.1				40	19	M8

End pump size 1:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions							
								Inlet			Outlet		
	[cm³/rev]	at 1500 rpm [l/min]	at max. rpm [l/min]	[bar]	n [rpm]	A3 [mm]	B3 [mm]	E3	F3	d3	E3	F3	d3
100	1	1.40	3.26	250	3500	39.1	81	30	12	M6	30	12	M6
125	1.25	1.74	4.07			39.5	82						
160	1.6	2.23	5.21			40.3	83.6						
200	2	2.82	6.58			41.1	85.2						
250	2.5	3.53	8.23			42.1	87.2						
315	3.15	4.44	10.36			43.5	89.8						
365	3.65	5.15	12.01			44.4	91.9						
420	4.2	5.92	13.82			45.5	94.1						
500	5	7.05	14.10		3000	47.1	97.2						
610	6.1	8.69	14.49	200	2500	49.4	101.8						
740	7.4	10.55	17.58	170		52.1	107.2						

PGE104-.../.../...-.BS1/1/1-N





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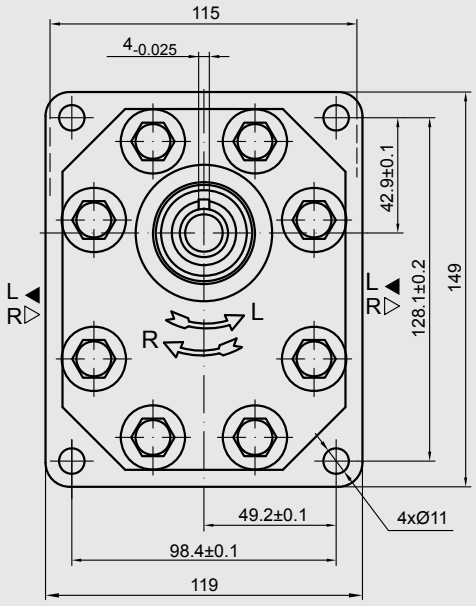

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Front pump size 3:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
		at 1500 rpm	at max. rpm		n	A1	B1	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G1	G1
2000	20	28.2	56.4	250	3000	56.1	114.7	G 3/4	G 3/4
2250	22.5	31.7	63.5			57.6	117.7		
2500	25	35.3	70.5			58.3	119.1		
2800	28	39.5	79.0			60.2	122.7		
3200	32	45.1	90.2			66.5	135.3	G 1	
3600	36	51.3	95.8	240	2800	68.0	138.5		
4200	42	59.9	99.8	230	2500	70.8	144.0		
4600	46	65.6	100.5	210	2300	72.7	147.8		
5000	50	71.3	99.8	185	2100	74.5	151.4		
5500	55	78.4	91.4	165	1750	76.7	155.9		
6000	60	85.5	99.8	150		78.7	160.4		

Middle pump size 2:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
		at 1500 rpm	at max. rpm		n	A2	B2	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G2	G2
450	4.5	6.14	14.33	250	3500	40.5	87.6	G 1/2	G 1/2
630	6.3	8.69	20.29			42	90.6		
820	8.2	11.32	26.40			43.5	93.5		
1000	10	13.95	32.55			45	96.6	G 3/4	
1130	11.3	15.76	36.78			46	98.7		
1200	12	16.92	39.48			46.6	99.9		
1400	14	19.95	46.55			48	103		
1500	15	21.60	36.00		2500	49	104.5		
1600	16	23.04	38.40			50	106.2		
1900	19	27.36	45.60	200		52	111.1		
2200	22	31.68	42.24	180	2000	55	116.1		
2500	25	36.00	48.00	160		57.2	121.1		

End pump size 1:

Displacement	Geometric displacement	Flow		Pressure Rated	Max. speed	Dimensions			
		at 1500 rpm	at max. rpm		n	A3	B3	Inlet	Outlet
	[cm³/rev]	[l/min]	[l/min]	[bar]	[rpm]	[mm]	[mm]	G3	G3
100	1	1.40	3.26	250	3500	39.1	81	G 3/8	G 3/8
125	1.25	1.74	4.07			39.5	82		
160	1.6	2.23	5.21			40.3	83.6		
200	2	2.82	6.58			41.1	85.2		
250	2.5	3.53	8.23			42.1	87.2		
315	3.15	4.44	10.36			43.5	89.8	G1/2	
365	3.65	5.15	12.01			44.4	91.9		
420	4.2	5.92	13.82			45.5	94.1		
500	5	7.05	14.10		3000	47.1	97.2		
610	6.1	8.69	14.49	200	2500	49.4	101.8		
740	7.4	10.55	17.58	170		52.1	107.2		

External Gear Pumps
Installation Manual

SIZE 0

PGE100-25
PGE100-30
PGE100-50
PGE100-75
PGE100-100
PGE100-125
PGE100-150
PGE100-175
PGE100-200

SIZE 1

PGE101-100
PGE101-125
PGE101-160
PGE101-200
PGE101-250
PGE101-315
PGE101-365
PGE101-420
PGE101-500
PGE101-610
PGE101-740

SIZE 2

PGE102-450
PGE102-630
PGE102-820
PGE102-1000
PGE102-1130
PGE102-1200
PGE102-1400
PGE102-1500
PGE102-1600
PGE102-1730
PGE102-1900
PGE102-2200
PGE102-2500
PGE102-2800

SIZE 3

PGE103-2000
PGE103-2250
PGE103-2500
PGE103-2800
PGE103-3200
PGE103-3600
PGE103-4200
PGE103-4600
PGE103-5000
PGE103-5500
PGE103-6000

MULTIPLE PUMPS

PGE104-

	Stage 1		Stage 2		Stage 3
Size 1	100 125 160 200 250 315 365 420 500 610 740		100 125 160 200 250 315 365 420 500 610 740		100 125 160 200 250 315 365 420 500 610 740
Size 2	450 630 820 1000 1130 1200 1400 1500 1600 1900 2200 2500	/	450 630 820 1000 1130 1200 1400 1500 1600 1900 2200 2500	/	450 630 820 1000 1130 1200 1400 1500 1600 1900 2200 2500
Size 3	2000 2250 2500 2800 3200 3600 4200 4600 5000 5500 6000		2000 2250 2500 2800 3200 3600 4200 4600 5000 5500 6000		2000 2250 2500 2800 3200 3600 4200 4600 5000 5500 6000

To prevent serious accidents, equipment damage, and other property damage, please observe the following precautions, as well as all related regulations regarding safety.

Before using the product, make sure you read and understand all the instructions in the Operator‘s Manual entirely.

In this catalogue, safety precautions are classified under three headings:
DANGER, WARNING, and CAUTION.
These words are defined as follows:

DANGER
Indicates an imminent danger that is very likely to cause death or severe injury unless the situation is avoided.

WARNING
Indicates a potential danger that may cause death or severe injury unless the situation is avoided.

CAUTION
Indicates a potential danger that may cause a minor or moderate injury or that may result in property damage.

INFORMATION
Indicates useful hints and system tips. They are necessary for correct installation and safe use of the product.

PRECAUTIONS FOR USE

CAUTION
1. To avoid possible injury when handling the products, wear protective safety equipment in accordance with the instructions in the Operator’s Manual.

CAUTION
2. Failure to support the weight of the product or lifting the product with incorrect posture may result in injury to the hands or back. Be sure to follow the instructions in the Operator's Manual.

CAUTION
3. Do not climb on, strike, drop or exert unnecessary force on the product.This may lead to injury or fire due to incorrect operation, damage, or oil leakage.

CAUTION
4. Oil on the product or floor must be cleaned up thoroughly. Oil could cause you to drop the product or slip on the floor.

PRECAUTIONS FOR INSTALLATION, REMOVAL, AND MAINTENANCE

WARNING
1. All installation, removal, maintenance, piping or wiring work should be carried out by properly trained personnel.

WARNING
2. Before beginning any installation, removal, maintenance, piping or wiring work, the following procedures must be carried out.
Failure to do so may cause the equipment to move suddenly or oil to spill during the work, which may result in serious accidents.

- Shut off the power supply to the equipment and make sure that all the electrical motors and machines cannot restart unintentionally.
- Secure the cylinder rods before installing/removing the cylinder.
- Reduce the pressure in the pipes and cylinders in the hydraulic system to zero pressure.

WARNING
3. Before working on any electrical wiring, be sure to shut off the power supply.
Failure to do this may cause an electric shock.

CAUTION
4. Keep all installation holes and surfaces clean.
Failure to do this may cause insufficient tightening of the bolts which may lead to a fire due to oil leakage.

CAUTION
5. Before commissioning the device, make sure that all bolts are tightened with the specified torque.
Failure to comply with the specifications may cause incorrect operation, damage, oil leakage, etc.

PRECAUTIONS FOR OPERATION

DANGER

1. Never operate any device in an environment where there is danger of explosion or fire, unless the device is fully protected. This may lead to major and serious accidents including explosion or fire.

WARNING

2. Do not approach the pumps or motors when in operation. Hands or clothes can be caught up and wound into the pumps and motors which can lead to serious injury.

WARNING

3. In event of abnormal operation (unusual sounds, oil leakage, smoke, etc.), immediately stop operation and take appropriate corrective measures.

WARNING

4. Completely discharge air from the cylinder at low pressure. Failure to do so may result in unexpected movement of the cylinder, which in turn may cause injury.

WARNING

5. To adjust the damping, gradually increase the cylinder speed from a low speed (50 mm/s or less). Rapidly accelerating the cylinder may produce an abnormal pressure surge, resulting in damage to the cylinder or the machinery and causing a serious accident.

WARNING

6. Before operating this device for the first time, check that hydraulic and electrical circuits are properly connected and that adjoining surfaces are tightly aligned.

WARNING

7. Do not use the product outside of the specifications described in the catalogue, related data sheets, drawings, etc. Failure to adhere to them may cause incorrect operation, damage or injury.

WARNING

8. During operation, high temperatures in the hydraulic system or solenoid valves may occur. Wear protective equipment on hands and body when in the vicinity of these devices.

WARNING

9. Always operate the device with clean oil, and within established ranges for temperature, viscosity and cleanliness. Failure to adhere to the specified limits may result in incorrect operation or fire due to oil leakage.

GENERAL PRECAUTIONS

WARNING

1. Never modify the device.
If any alterations are made, unexpected machine movement may cause injury.

CAUTION

2. Do not disassemble the products without prior consent of the manufacturer.
Failure to adhere to this can cause the products to operate incorrectly which can lead to accidents or damage.

CAUTION

3. For transportation / storage of the product, pay attention to environmental conditions, such as ambient temperature and humidity, and implement anti-dust / anti-corrosion measures.

CAUTION

4. The seals may need to be replaced if the product is used after long-term storage.

CAUTION

5. Read the manual thoroughly and ensure that the seals are replaced properly.

RELATED REGULATIONS

CAUTION

To ensure that this product is used in a safe manner, it is essential to observe the above precautions, as well as all related regulations regarding safety.

EXTERNAL GEAR PUMPS

Technical specifications

Size 0

Series	Geometric displacement [ccm/rev]	Operating pressure			Maximum drive speed [rpm]
		Rated [bar]	Intermittent [bar]	Peak [bar]	
PGE100-25	0.25	170	200	200	3500
PGE100-30	0.30			210	
PGE100-50	0.50			230	
PGE100-75	0.75			230	
PGE100-100	1.00			210	
PGE100-125	1.25			210	3000
PGE100-150	1.50	145	175	200	2500
PGE100-175	1.75	130	160	180	
PGE100-200	2.00			170	2000

Size 1

Series	Geometric displacement [ccm/rev]	Operating pressure			Maximum drive speed [rpm]
		Rated [bar]	Intermittent [bar]	Peak [bar]	
PGE101-100	1	250	280	300	3500
PGE101-125	1.25				
PGE101-160	1.6				
PGE101-200	2				
PGE101-250	2.5				
PGE101-315	3.15				
PGE101-365	3.65				
PGE101-420	4.2				
PGE101-500	5				3000
PGE101-610	6.1	200	220	230	2500
PGE101-740	7.4	170	190	200	2500

Size 2

Series	Geometric displacement [ccm/rev]	Operating pressure			Maximum drive speed [rpm]
		Rated [bar]	Intermittent [bar]	Peak [bar]	
PGE102-450	4.5	250	280	300	3500
PGE102-630	6.3				
PGE102-820	8.2				
PGE102-1000	10				
PGE102-1100	11.3				
PGE102-1200	12				
PGE102-1400	14		270	280	
PGE102-1500	15				3000
PGE102-1600	16				
PGE102-1730	17.3	220	250	270	
PGE102-1900	19	200	220	230	
PGE102-2200	22	180	200	210	2500
PGE102-2500	25	160	180	190	
PGE102-2800	28	120	140	150	

Size 3

Series	Geometric displacement [ccm/rev]	Operating pressure			Maximum drive speed [rpm]
		Rated [bar]	Intermittent [bar]	Peak [bar]	
PGE103-2000	20	250	270	300	3000
PGE103-2250	22.5				
PGE103-2500	25				
PGE103-2800	28				
PGE103-3200	32				3000
PGE103-3600	36	240	260	280	2800
PGE103-4200	42	230	250	270	2500
PGE103-4600	46	210	230	250	2300
PGE103-5000	50	185	200	230	2100
PGE103-5500	55	165	180	200	1750
PGE103-6000	60	150	165	180	

Multiple pumps

Series	Sizes	Operating pressure			Maximum drive speed [rpm]
		Rated [bar]	Intermittent [bar]	Peak [bar]	
PGE104-	1 + 1	max. 250	max. 280	max. 300	max. 3500
	2 + 2				
	2 + 1				
	3 + 3				max. 3000
	3 + 2				
	3 + 1				
	1 + 1 + 1				max. 3500
	2 + 2 + 2				
	2 + 2 + 1				
	2 + 1 + 1				
	3 + 3 + 3				max. 3000
	3 + 3 + 2				
	3 + 3 + 1				
	3 + 2 + 2				
	3 + 2 + 1				
	3 + 1 + 1				

Documentation

Check the product's model code and compare it with your paper work.

Delivery note and / or sales acknowledgement.

Operating fluid:

Hydraulic oils with viscosities of 20 to 200 mm²/s (cSt). Recommended oil viscosity 50 to 100 mm²/s (cSt) at 40 °C. A viscosity of up to 385 mm²/s is possible during start-up. Different types/brands of oil must never be mixed, since this can result in loss of lubrication qualities. The operating oil must be changed periodically. The interval between changes will depend on the operating conditions and must be determined by the operator. At oil change, the reservoir and the filters must also be cleaned.
Temperature range: -20 °C to +80 °C.
Recommended filtration rating: 25 µm or cleaner.
Rpm: from 750 rpm to the maximum value for the particular pump.

Direction of rotation:

Clockwise or anticlockwise when viewed from shaft end - note the arrow marked on the front cover. Rotation in the wrong direction is not permitted as this will damage the rotary shaft seal.

Flow direction - inlet and outlet:

Inlet and outlet are marked on the body / rear cover. Usually, the larger opening is the suction port.

Suction pressure:

The suction line of the pump must always draw steadily without intake of air. The permitted vacuum pressure is 0.2 bar (0.8 bar abs.). Positive pressure greater than 0.5 bar above atmospheric pressure (max. atmospheric pressure 1.5 bar absolute) is not permitted.

Drive shaft:

Radial and axial forces on the shaft are not permitted.

Drive:

The pump can be used for direct drive using flexible or other couplings allowing a gap of 0.2 mm in a radial direction. The axial tolerance of the driving shaft in relation to the leading shaft of the pump must not exceed 0.1 mm. Belt and chain driven applications, as well as vibrations and unbalanced drive are not permitted.

Piping:

The suction line must be completely sealed, as short as possible and of adequate diameter to withstand permitted vacuum pressures and oil speeds of 0.6 up to 1 m/s. If a filter is fitted to the inlet, it must have sufficient capacity so as not to impede suction (see Suction Pressure).
The discharge line must be short and have as few curved sections and joints as possible. If there are vibrations between the pump and the motor (for example, from an internal-combustion engine or vibrations in the hydraulic system), a rubber hose must be used.
Permitted speed of the oil is 2 - 5 m/s.

Reservoir:

The volume and the design of the tank depend on the operating conditions. For the pump, the suction and the return lines must be positioned such that the returning oil is not drawn out again immediately, i.e. they must be positioned as far as possible from each other. The pipe ends must be cut at an angle of less than 45° and pointing in opposite directions. The suction line must be mounted at least 50 mm above the bottom, so as to avoid contamination deposited on the bottom. In order to avoid foaming, all the pipes must be at least 50 mm below the lowest permitted oil level.

Mounting:

The pumps must be aligned centrally to the diameter of the mounting flange. Ensure the suction and discharge lines are connected correctly, and check the direction of rotation (note direction of arrow).

Initial start-up:

First check that the pump is mounted correctly. Start and stop (jog) the pump several times (off-load) to allow the pump to fill with oil. This is necessary to ensure bearing lubrication and to bleed all air from the hydraulic system to prevent erratic operation. After lines are full, the pressure may be increased gradually to the required operating pressure. Never exceed the maximum operating pressure for the relevant pump type.