PSM HYDRAULICS
ОАО ПНЕВМОСТРОЙМАШИНА

FIXED DISPLACEMENT AXIAL PISTON PUMPS

PTO design

TECHNICAL CATALOGUE

Ordering Code

A				B			C				D		E			F				G			H		I	
			.		.					.		.			.				.			.			.		

● = standart
o = optional
- = not available

A - series

code	description	311.K.28	411.K.56	411.K.63	311.K.80	411.K.107	411.K.125
311	series 311	o	-	-	●	-	-
411	series 411	-	●	●	-	●	●

B - product version

code	description	311.K.28	411.K.56	411.K.63	311.K.80	411.K.107	411.K.125
K	PTO flange	o	●	●	●	●	●

C - displacement

code	description	311.K.28	411.K.56	411.K.63	311.K.80	411.K.107	411.K.125
28	28 ccm	o	-	-	-	-	-
56	56 ccm	-	●	-	-	-	-
63	63 ccm	-	-	●	-	-	-
80	80 ccm	-	-	-	●	-	-
107	107 ccm	-	-	-	-	●	-
125	125 ccm	-	-	-	-	-	●

D - rotation

code	description	311.K.28	411.K.56	411.K.63	311.K.80	411.K.107	411.K.125
R	right	o	●	●	●	●	●
L	left	o	●	●	●	●	●

E - shaft end

code	description	311.K.28	411.K.56	411.K.63	311.K.80	411.K.107	411.K.125
P1	splined W8x2x32x35 DIN / ISO 14	o	●	●	●	●	●

F - end cap options

code			description	311.K.28	411.K.56	411.K.63	311.K.80	411.K.107	411.K.125
F	6	0	2 threaded ports at rear side according DIN / ISO 228	o	●	●	●	●	●

G - special featurers

code	description	311.K.28	411.K.56	411.K.63	311.K.80	411.K.107	411.K.125
NN	none	o	●	●	●	●	●
01	90° suction pipe according DIN / ISO 228	o	●	●	●	●	●
02	45° suction pipe according DIN / ISO 228	o	●	●	●	●	●
03	straight suction pipe according DIN / ISO 228	o	●	●	●	●	●

H – shaft seal

code	description	311.K.28	411.K.56	411.K.63	311.K.80	411.K.107	411.K.125
B	NBR	o	●	●	●	●	●
F	FKM	o	●	●	●	●	●

I - climatic version and category of desposition

code	description	311.K.28	411.K.56	411.K.63	311.K.80	411.K.107	411.K.125
У1	temperate climate, placing on open air	o	●	●	●	●	●
Т1	tropical climate, placing on open air	o	●	●	●	●	●

Technical characteristics.

Size	311.K.28	411.K.56	411.K.63	311.K.80	411.K.107	411.K.125
Displacement V_g, ccm/rev	28	56	63	80	106,7	125
Shaft speed n, rpm						
- min n_{min}	400	400	400	400	400	400
- nom n_{nom}	1920	1500	1500	1200	1200	1200
- max n_{max}, at input pressure 1 bar	3000	2000	2000	2240	1600	1600
- peak n_{peak}, at input pressure 2 bar	4750	3750	3750	3350	3000	3000
Flow Q, l/min						
- nom	54	84	95	96	128	150
- max (at n_{max})*	84	112	126	179	171	200
Working pressure ΔP, bar						
- nom ΔP_{nom}	200	300	300	200	300	300
- max ΔP_{max}	350	350	350	350	350	350
Power N, kW						
- nom N_{nom} (at n_{nom}, P_{nom})*	28	42	48	32	64	75
- max N_{max} (at n_{max}, P_{max})*	49	66	74	105	100	117
Torgue T, Nm						
- nom T_{nom} (at P_{nom})*	90	268	301	255	510	597
- max T_{max} (at P_{max})*	156	312	351	446	595	697
Volume efficiency	0.95	0.95	0.95	0.95	0.95	0.95
Weight, kg	9	12	18	18	18	32

* theoretical values

Requirements for working fluids.

Working fluid temperature:

max constant in hydraulic tank	+85ºC
max peak (output from drain hole)	+100ºC
min short-term (at cold start)	- 40ºC

kinematic viscosity of working fluid:

optiomal (constant)	20-35 mm^2/sec (cSt)
vax starting	1500 mm^2/sec (cSt)
min short-term	10 mm^2/sec (cSt)

Working fluid fineness:

not lower than class 12 as per GOST 17216-71
not lower than class 18/15 as per ISO/DIN 4406

Determination of the nominal size range of the pump

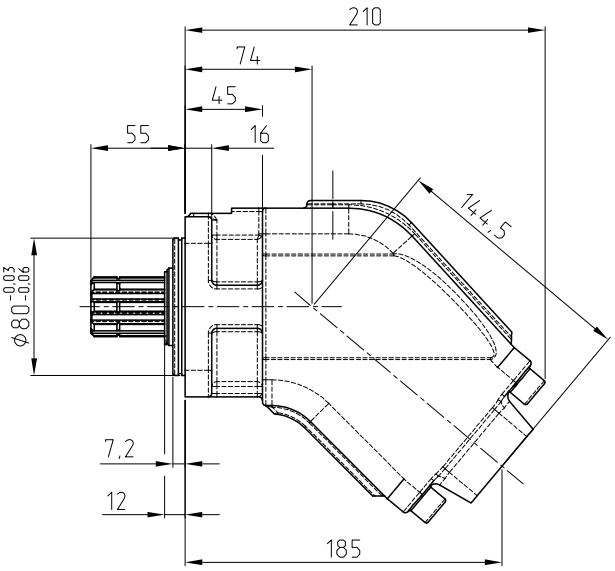
Flow $Q = \frac{V_g \cdot n \cdot \eta_v}{1000}$ l/min

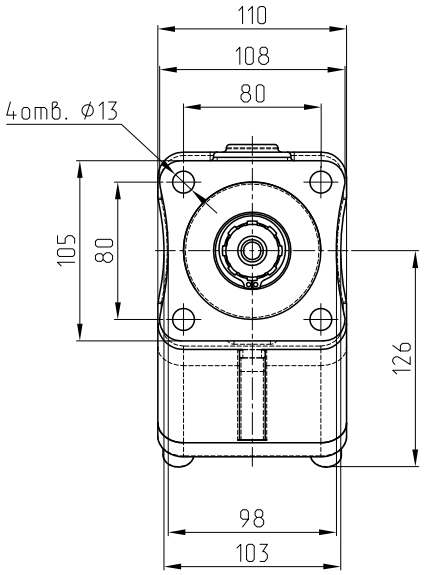
Torgue $T = \frac{V_g \cdot \Delta P}{20 \cdot \pi \cdot \eta_{mh}}$ Nm

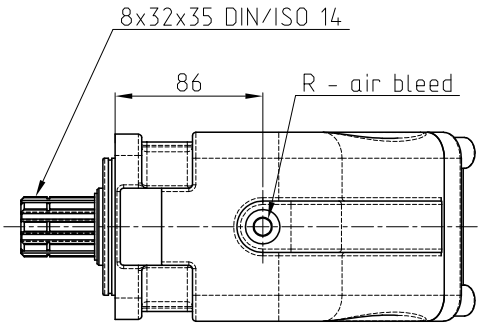
Power $N = \frac{Q \cdot \Delta P}{600 \cdot \eta_t}$ kW

where:
Q – flow, l/min
T – torgue, Nm
N – power, kW
V_g – displacement, ccm/rev
n – shaft speed, rpm
ΔP – pressure diference, bar
η_v – volume efficiency
η_{mh} – hydraulic mechanical efficiency
$\eta_t = \eta_v \cdot \eta_{mh}$ – full efficiency

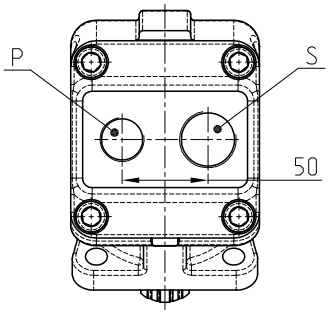
411.K.56, 411.K.63
Overall dimentions



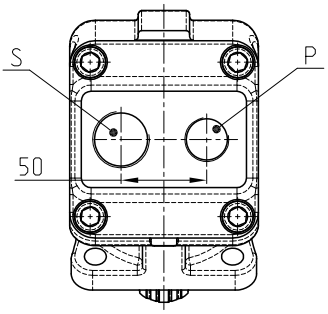




right rotation



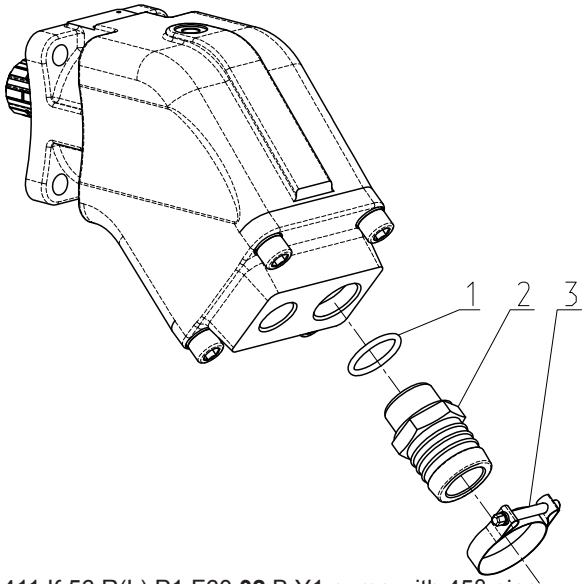
left rotation



S - inlet port G1” x 18
P - outlet port G¾” x 16
R - air bleed M10x1

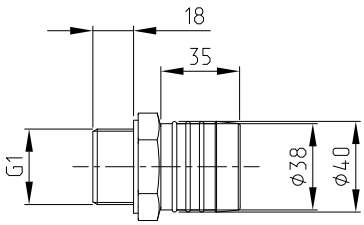
411.K.56, 411.K.63
Suction pipe

411.K.56.R(L).P1.F60.**01**.B.Y1 pump with straight pipe
411.K.63.R(L).P1.F60.**01**.B.Y1 pump with straight pipe

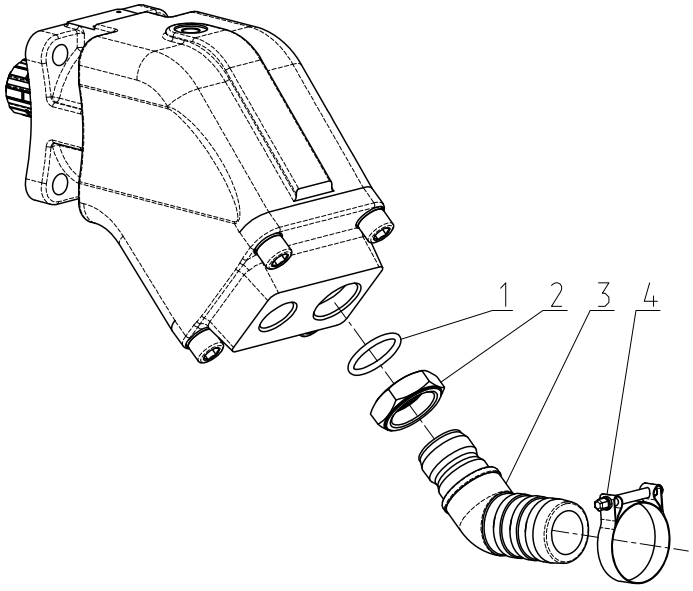


1 - O-ring
2 - straight pipe G1”
3 - hose clamps

pipe dimentions

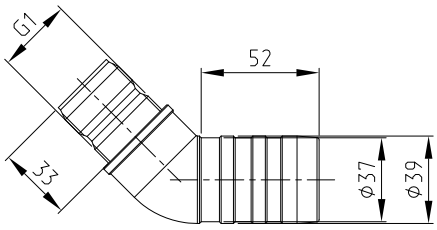


411.K.56.R(L).P1.F60.**02**.B.Y1 pump with 45° pipe
411.K.63.R(L).P1.F60.**02**.B.Y1 pump with 45° pipe

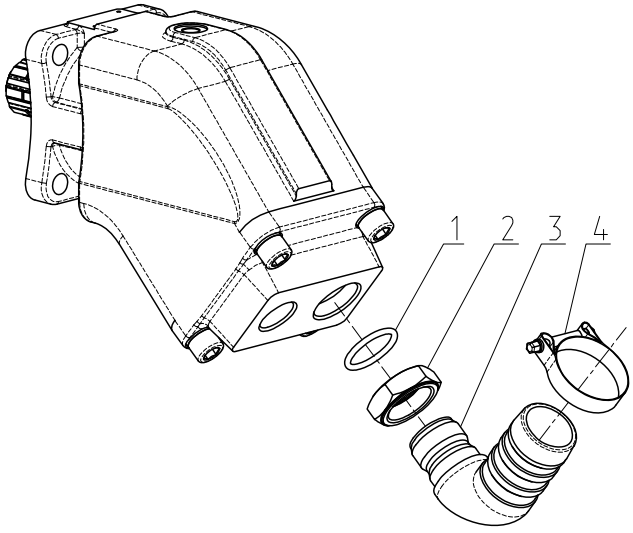


1 - O-ring
2 - nut
3 - 45° pipe G1”
4 - hose clamp

pipe dimentions

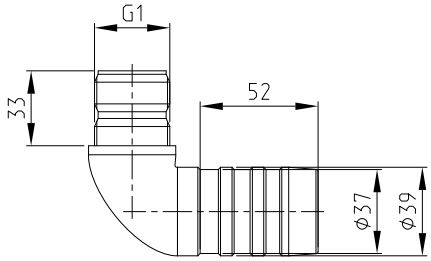


411.K.56.R(L).P1.F60.**03**.B.Y1 pump with 90° pipe
411.K.63.R(L).P1.F60.**03**.B.Y1 pump with 90° pipe

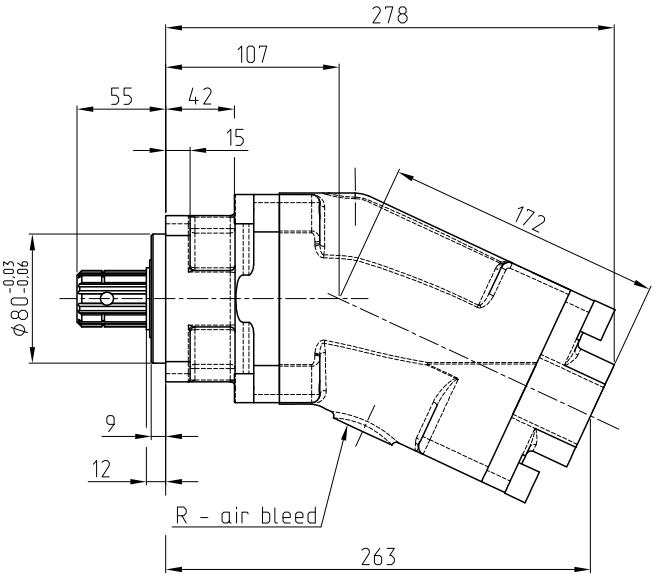


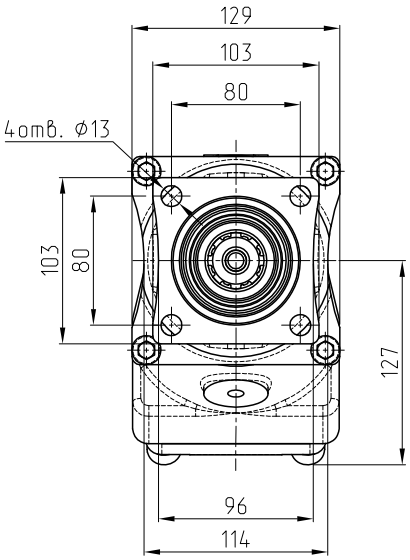
1 - O-ring
2 - nut
3 - 90° pipe G1”
4 - hose clamp

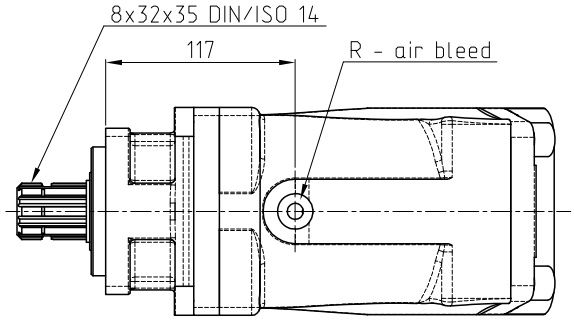
pipe dimentions



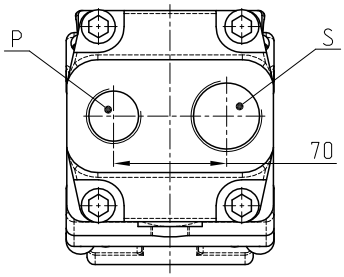
311.K.80
Overall drawings



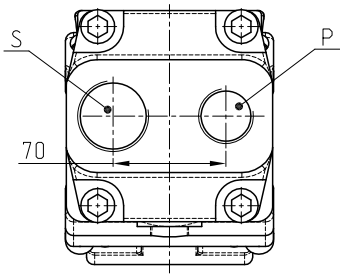




right rotation



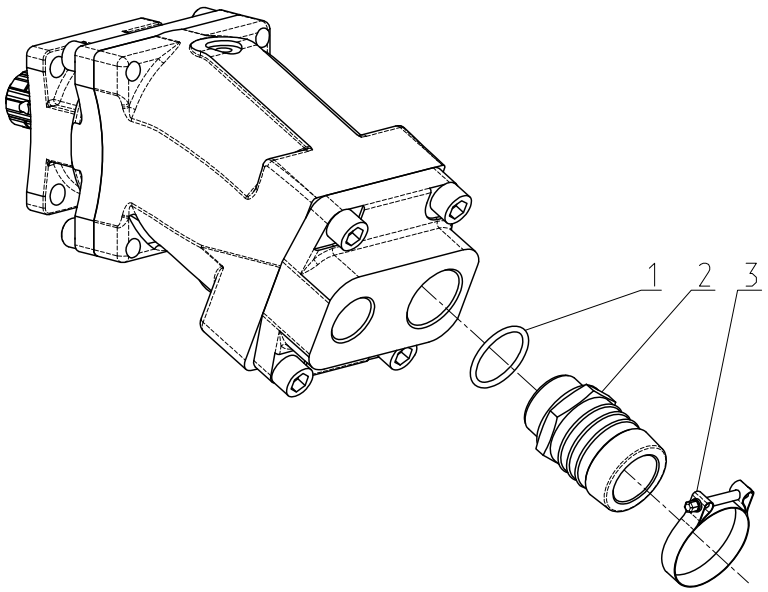
left rotation



S - inlet port G1¼" x 20
P - outlet port G1" x 18
R - air bleed M10x1

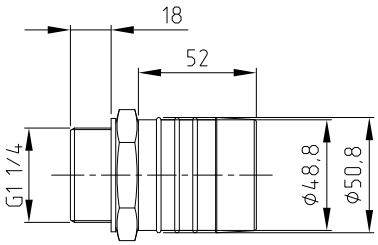
311.K.80
Suction pipe

311.K.80.R(L).P1.F60.**01**.B.Y1 pump with straight pipe

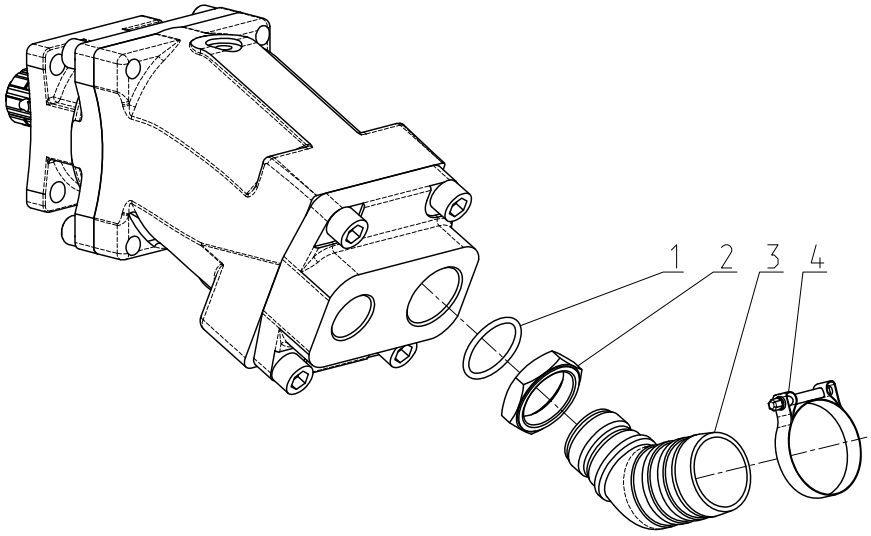


1 - O-ring
2 - straight pipe G1¼”
3 - hose clamp

pipe dimentions

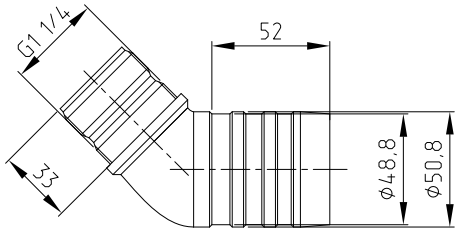


311.K.80.R(L).P1.F60.**02**.B.Y1 pump with 45° pipe

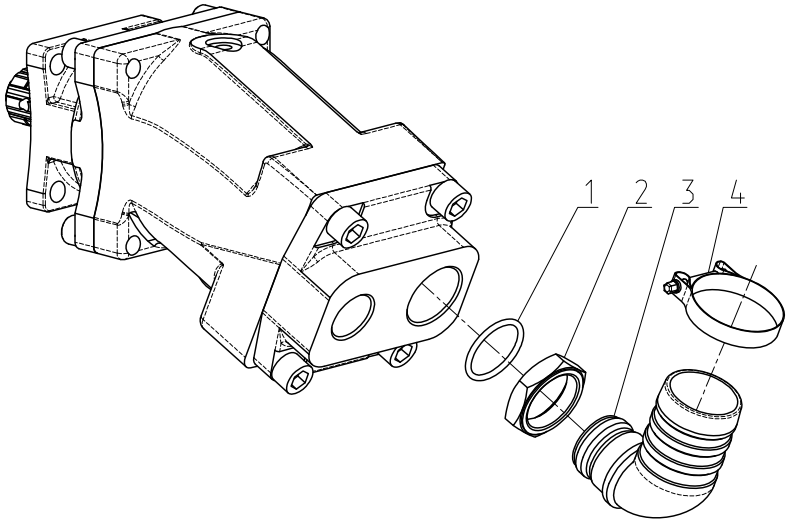


1 - O-ring
2 - nut
3 - 45° pipe G1¼”
4 - hose clamp

pipe dimentions

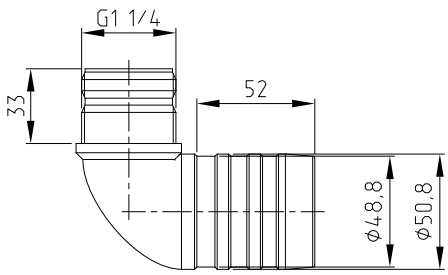


311.K.80.R(L).P1.F60.**03**.B.Y1 pump with 90° pipe

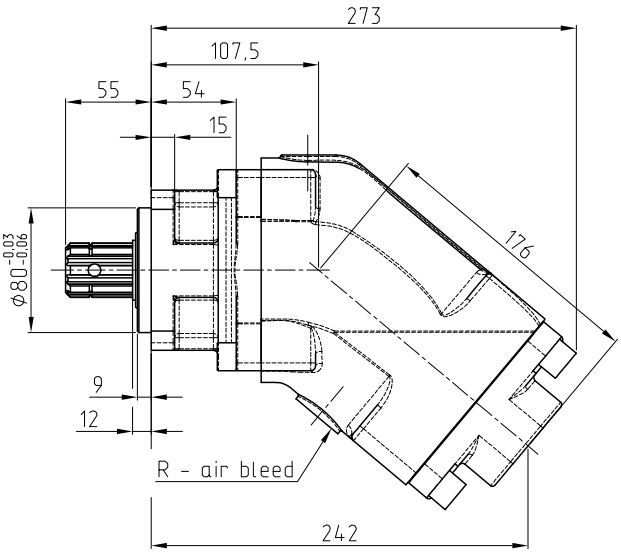


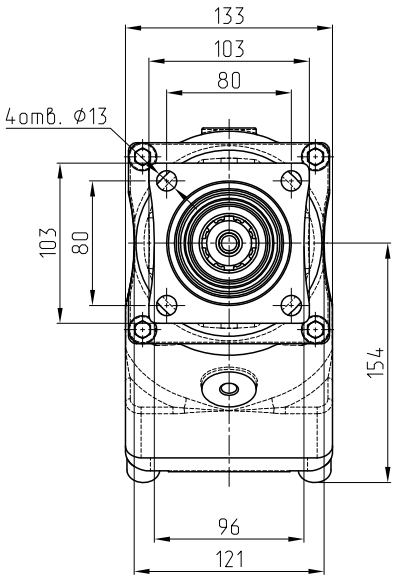
1 - O-ring
2 - nut
3 - 90° pipe G1¼”
4 - hose clamp

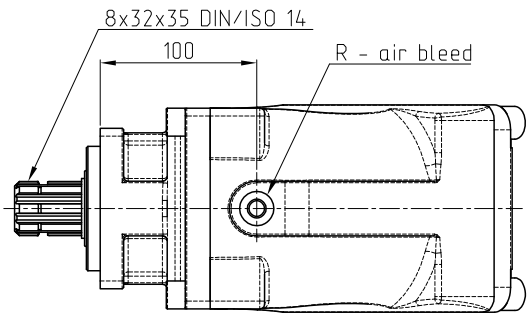
pipe dimentions



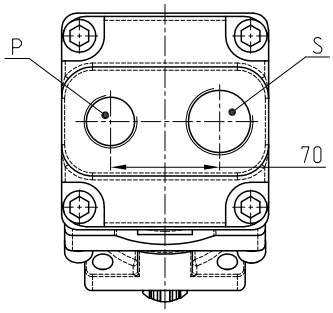
411.K.107, 411.K.125
Overall dimentions



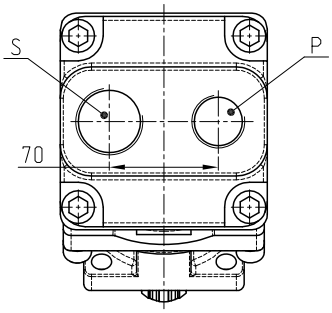




right rotation



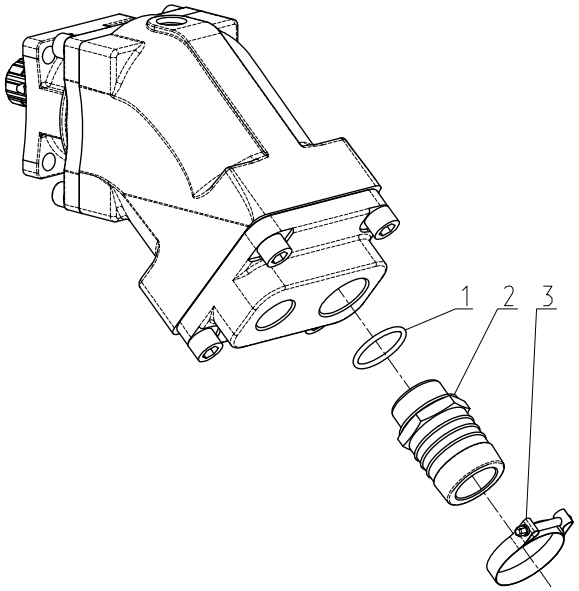
left rotation



S - inlet port G1¼" x 20
P - outlet port G1" x 18
R - air bleed M10x1

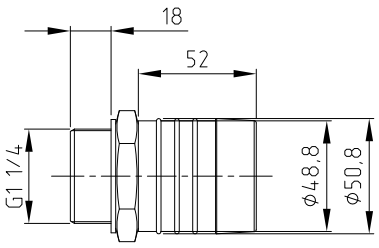
411.K.107, 411.K.125
Suction pipe

411.K.107.R(L).P1.F60.**01**.B.Y1 pump with straight pipe
411.K.125.R(L).P1.F60.**01**.B.Y1 pump with straight pipe

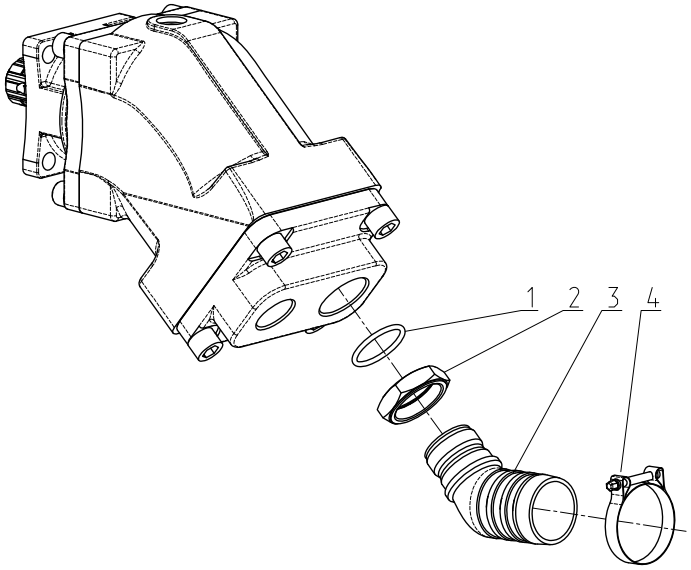


1 - O-ring
2 - straight pipe G1”
3 - hose clamp

pipe dimentions

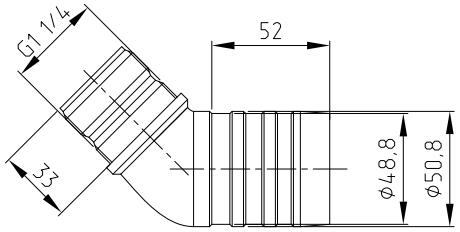


411.K.107.R(L).P1.F60.**02**.B.Y1 pump with 45° pipe
411.K.125.R(L).P1.F60.**02**.B.Y1 pump with 45° pipe

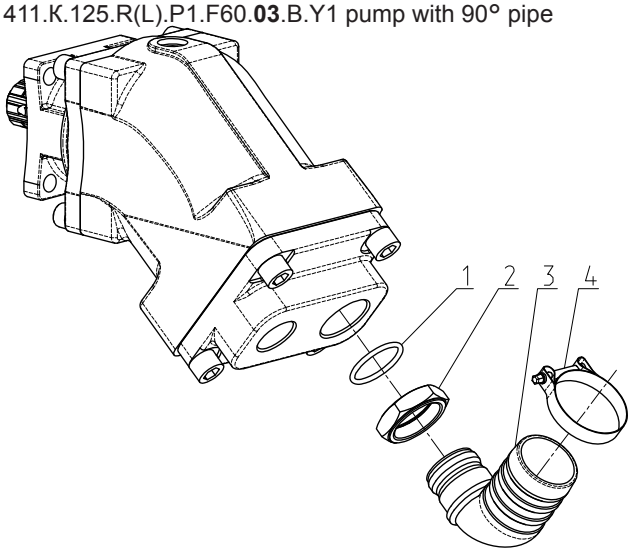


1 - O-ring
2 - nut
3 - 45° pipe G1¼”
4 - hose clamp

pipe dimentions

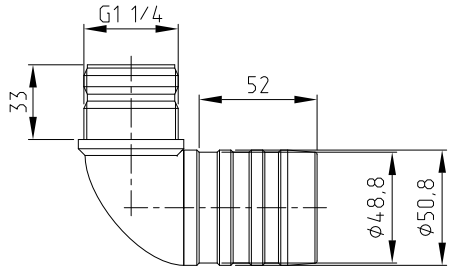


411.K.107.R(L).P1.F60.**03**.B.Y1 pump with 90° pipe
411.K.125.R(L).P1.F60.**03**.B.Y1 pump with 90° pipe



1 - O-ring
2 - nut
3 - 90° pipe G1¼”
4 - hose clamp

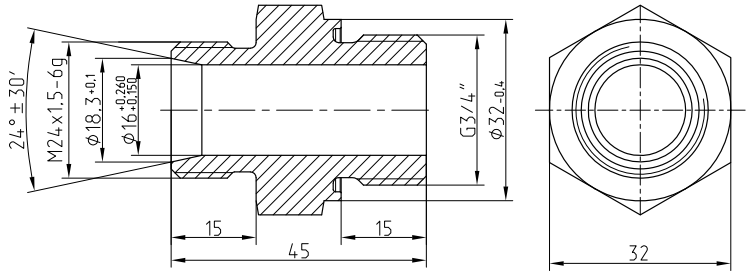
pipe dimentions



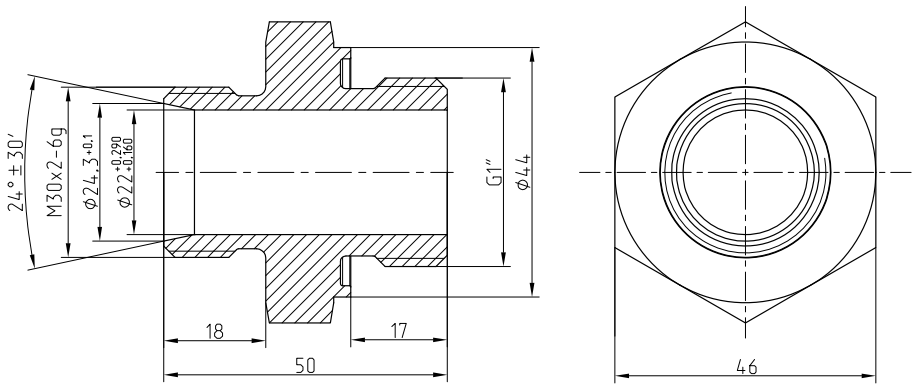
Accessories.

The pumps can be supplied together with suction line connection pipes.
The connection pipes do not make part of the set and should be ordered additionally.

For pump 411.K.56, 411.K.63
Ordering code: St.08.M24x1.5-03.G3/4-16
O-ring: 025-028-019 GOST9833-73



For pump 311.K.80, 411.K.107, 411.K.125
Ordering code: St.08.M30x2-03.G1-22
O-ring: 035-040-030 GOST9833-73



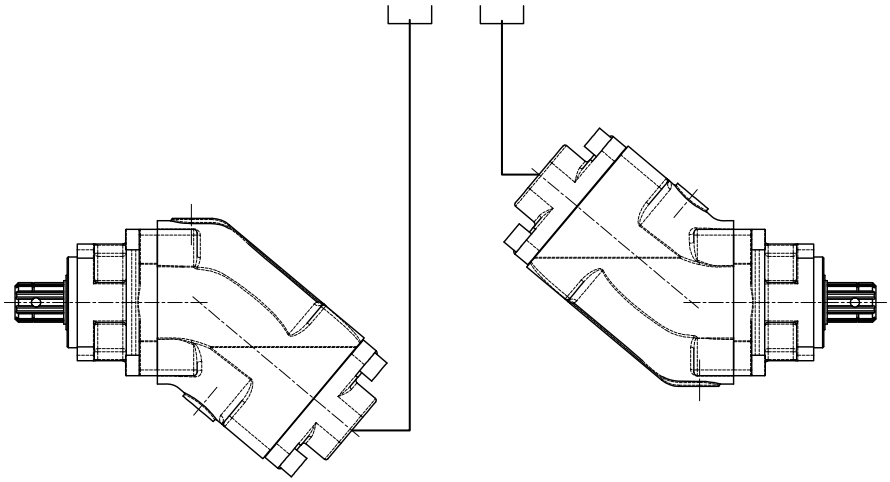
Recommendation for installation

In order pumps for commercial vehicles functioned properly it is necessary to fulfill the requirements of the present section.

The pumps can be mounted in any position.

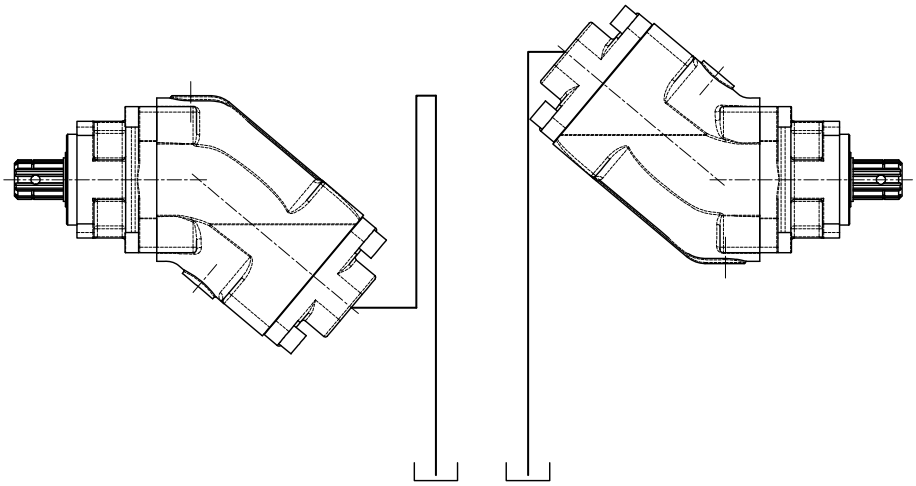
The internal cavity of the pump should always be filled with working fluid. It is recommended to connect the suction line as shown on the schemes.

Position of the pump below the hydraulic tank level



During the first start-up of the pump it is necessary:
- to fill the working cavity of the pump with working fluid. For that bleed the air through port R at the upper point;
- to fill the suction line with working fluid;
- to fulfill the first start-up at the minimal rotation speed in order the hydraulic system filled with hydraulic fluid completely.

Position of the pump above the hydraulic tank level



During the first start-up of the pump it is necessary:
- to fill the working cavity of the pump with working fluid. For that bleed the air through port R at the upper point;
- to fill the suction line with working fluid;
- to fulfill the first start-up at the minimal rotation speed in order the hydraulic system filled with hydraulic fluid completely.

To mount the pump in other positions please contact the manufacturer.