Rexroth
Bosch Group

Axial Piston
Fixed Displacement Pump KFA

RE 91 501/06.03 1/12
Replaces: 05.98

open circuits, for commercial vehicles

Sizes	23...125		
Series	6		
Sizes	23 ... 107	Nominal pressure	300 bar
		Peak pressure	350 bar
Size	125	Nominal pressure	250 bar
		Peak pressure	300 bar

Index

Features

- A fixed displacement pump of axial piston design with a tapered piston bent axis rotary group. Designed especially to meet the requirements of truck applications.
- Output flow is proportional to input speed.
- 40° bent axis design giving high power/weight ratio, small overall dimensions, optimum efficiency and economic design
- Simple change of direction of rotation
- Self aspirating, for open circuit operation
- No drain line required
- Flange and shaft designed for direct mounting on truck gearbox PTO's
- Noise-optimised

- Further information:

  Variable Displacement Pump KVA _____ RE 92 250
  Designed especially to meet the requirements of truck applications.

Ordering Code / Standard Program

KFA2F	O		/	6	3	–	M	E	K	64

Axial piston unit

Fixed displacement, bent axis design for commercial vehicles	KFA2F

Operation

Pump in open circuit	O

Size

≙ Displacement V_g (cm^3)	23	32	45	63	80	107	125

Series

	6

Index

	3

Seals

NBR (nitrile-caoutchouc), with 2 shaft seals in FKM (fluor-caoutchouc)	M

Shaft end

Splined shaft similar DIN ISO 14 (for truck use)	E

Mounting flange

Special flange ISO 7653-1985 (for truck use)	K

Service line connections

Service line ports A(B): threads at rear Suction port S: threads at rear	64

Technical Data

Fluid

Before starting a project, get detailed information about the selection of pressure fluids and application conditions from our catalog sheets RE 90220 (mineral oil), RE 90221 (environmentally acceptable hydraulic fluids).

When operating with environmentally acceptable hydraulic fluids, limitations of the technical data and seals, as specified in RE 90221, must be taken into account. If necessary, please contact us, specifying the hydraulic fluid used.

Attention: For the operation with water-containing HF-fluids the fixed displacement pump KFA is not suitable.

Operating viscosity range

In order to obtain optimum efficiency and service life, select the operating viscosity (at operating temperature) from within the range

ν_{opt} = operating viscosity 16...36 mm²/s

depending on the tank temperature (open circuit).

Viscosity limits

The limiting values for viscosity are as follows:

ν_{min} = 5 mm²/s
short term (t < 3 min)
at a max. permissible temp. of t_{max} = +115°C.

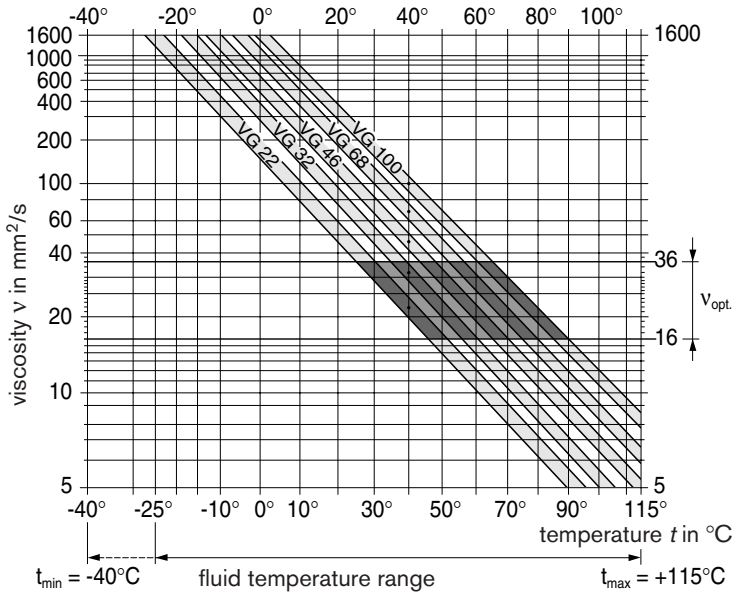
Ensure that the max. fluid temperature is also not exceeded in any pump space (for instance bearing area).

ν_{max} = 1600 mm²/s
short term (t < 3min)
on cold start (p ≤ 30 bar, n ≤ 1000 rpm, t_{min} = -40°C).

At temperatures of -25°C down to -40°C special measures are required. Please contact us for further information.

For detailed information on use at low temperatures, see RE 90300-03-B.

Selection diagram



Notes on the selection of the hydraulic fluid

In order to select the correct fluid, it is necessary to know the operating temperature in the tank (open circuit) in relation to the ambient temperature.

The hydraulic fluid should be selected so that within the operating temperature range, the operating viscosity lies within the optimum range (ν_{opt}) (see shaded section of below selection diagram). We recommend to chose the higher possible viscosity class.

Example: at an operating temperature of 60°C, the viscosity classes VG64 and VG68 are in the optimal viscosity range (ν_{opt}, shaded section). In this case, we recommend that you choose VG 68.

Important: The leakage oil (case drain oil) temperature is influenced by pressure and pump speed and is always higher than the tank temperature. However, the temperature must not exceed 115°C at no point in the circuit.

If it is not possible to comply with the above conditions because of extreme operating parameters or high ambient temperatures please consult us.

Technical Data

Filtration

The finer the filtration the better the achieved purity grade of the pressure fluid and the longer the life of the axial piston unit.

To ensure safe operation of the axial piston unit, a minumum purity grade of

20/18/15 to ISO 4406 is necessary.

At very high temperatures of the hydraulic fluid (90°C to max. 115°C) at least purity grade

19/17/14 to ISO 4406 is necessary.

If above mentioned grades cannot be maintained please consult us.

Temperature range of the radial shaft seal

The FKM shaft seal is admissible for a housing temperature range from -25°C to +115°C.

Note:
For applications below -25°C a NBR shaft seal is necessary (admissible temperature range -40°C to +90°C).
When ordering, please state in clear text: with NBR shaft seal

Operating pressure range – inlet side

Absolute pressure at port S (suction inlet)

$p_{abs\ min}$ _____ 0,8 bar

$p_{abs\ max}$ _____ 2 bar

Operating pressure range – outlet side

Pressure at port A or B

sizes 23 ... 107	nominal pressure p_N	300 bar
	peak pressure p_{max}	350 bar
size 125	nominal pressure p_N	250 bar
	peak pressure p_{max}	300 bar

(pressure data to DIN 24312)

Case drain fluid

The housing room is connected to the suction chamber, a leakage line from port "R" is therefore not necessary (port "R" is plugged).

Technical Data

Table of values (theoretical values, without considering mech-hyd. and volumetric efficiency, values rounded)

Size				23	32	45	63	80	107	125
Displacement		V_g	cm^3	22,9	32	45,6	63	80,4	106,7	125
Speed max. at 1,0 bar [1]		n_{max}	rpm	2920	2900	2560	2300	2130	1860	1800
Flow max. at n_{max} [2]		$q_{V\,max}$	L/min	65	90	113	141	166	193	218
Drive power max. at $q_{V\,max}$; $\Delta p = 300$ bar		P_{max}	kW	32,5	45	56,5	70,5	83	96,5	109
Torque	$\Delta p = 300$ bar	T	Nm	109	153	218	301	384	509	597
	$\Delta p = 350$ bar	T	Nm	128	178	254	351	448	594	696
Rotary stiffness			Nm/rad	304	304	435	520	711	806	806
Moment of inertia about the drive axis		J	kgm^2	0,0012	0,0012	0,003	0,0042	0,0072	0,0116	0,0116
Weight (approx.)		m	kg	5,8	5,8	8,0	9,0	11,6	14,5	14,5

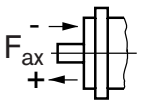
[1]) These values apply at absolute pressures at suction opening »S« and operating on mineral oil (at 0,8 bar at suction port S reduced technical data)

[2]) 3% flow loss included

Pump drive

Permissible axial load of the drive shaft.

Size		23	32	45	63	80	107	125
With pump stationary or on low pressure by-pass	$\pm F_{ax\,max}$ (N)	0	0	0	0	0	0	0
permissible axial load /	$+ F_{ax\,perm.}$(N/bar)	+ 5,2	+ 5,2	+ 7,0	+ 8,7	10,6	12,9	12,9
bar operating pressure	$- F_{ax\,perm.}$(N/bar)	– 24	– 33	– 43	– 53	– 60	– 71	– 77



$- F_{ax\,max}$ = increases bearing life

$+ F_{ax\,max}$ = reduces bearing life (avoid if possible)

For drives with radial force load (pinion, V-belt drives), please contact us!

Calculation of size

Flow $q_v = \dfrac{V_g \cdot n \cdot \eta_v}{1000}$ in L/min

Torque $T = \dfrac{V_g \cdot \Delta p}{20 \cdot \pi \cdot \eta_{mh}}$ in Nm

Power $P = \dfrac{2 \pi \cdot T \cdot n}{60\,000} = \dfrac{q_v \cdot \Delta p}{600 \cdot \eta_t}$ in kW

V_g = geom. displacement per revolution in cm^3

Δp = differential pressure in bar

n = speed in rpm

η_v = volumetric efficiency

η_{mh} = mech-hydraulic efficiency

η_t = overall efficiency ($\eta_t = \eta_v \cdot \eta_{mh}$)

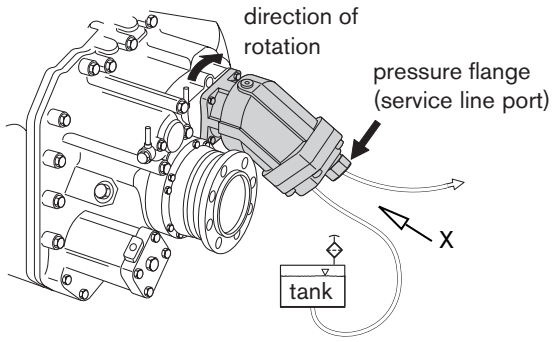
Technical Data

Direction of rotation and change of direction

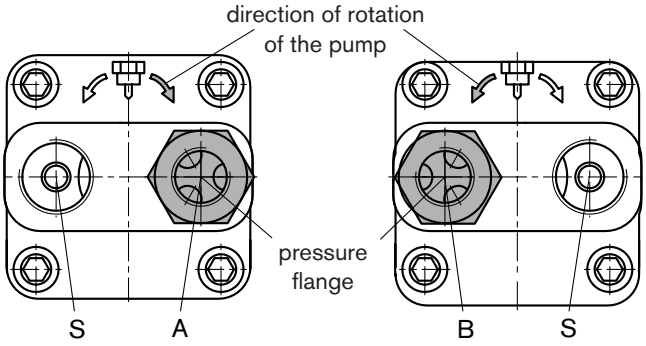
The direction of rotation of the pump is defined through a pressure flange screwed on the service line port. Through a simple change of the pressure flange the service line port and the suction line port are changed, the pump can be operated in reverse direction of rotation.

The pump is originaly delivered with the pressure flange on the service line port A.

Design at delivery



View X (viewed from port plate)



Design at delivery

(pressure flange in port A)

Design after change

(pressure flange in port B)

Max. tightening torque M_{max} for pressure flange

Size		**23, 32**	**45, 63**	**80, 107, 125**
Torque M_{max}	Nm	70	100	180

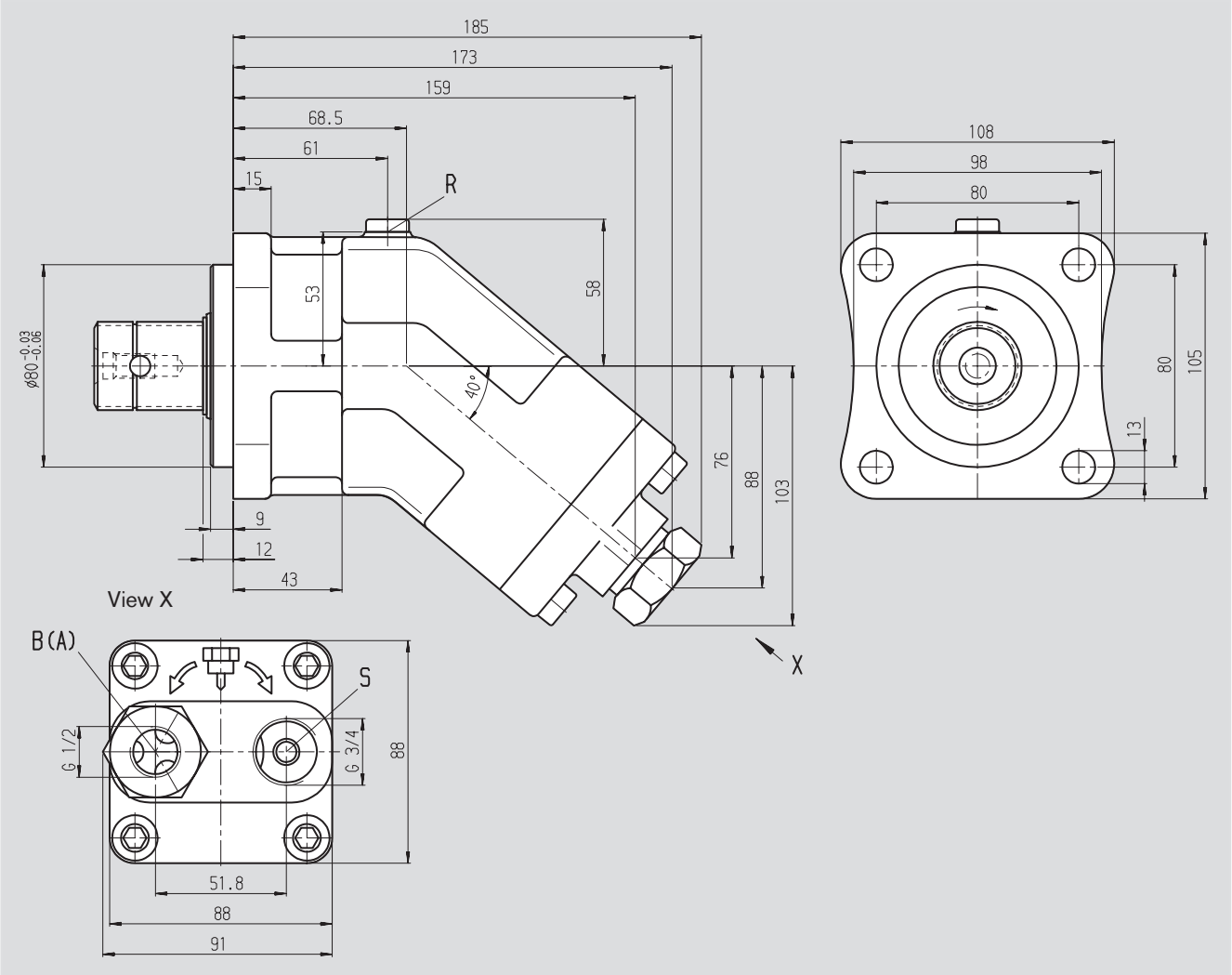
Accessories for KFA

For the KFA-pump the following accessories are available from Rexroth:

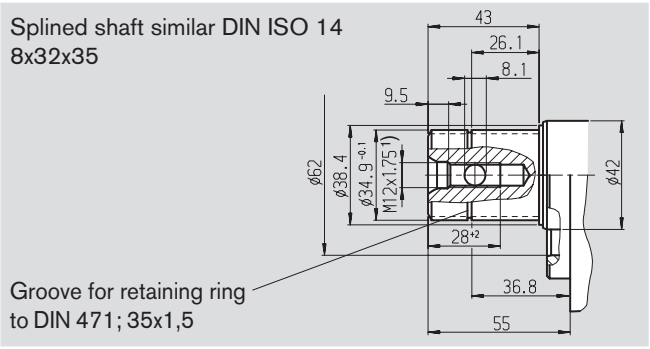
- Coupling flange, used in pump operation via a joint shaft (see RE 95001)
- Suction pipe, in all variations (see RE 95004)
- Adaption flange, for KFA-mounting in unfavourable mounting conditions (on enquiry)

Unit Dimensions, Size 23, 32

Before finalising your design, please request a certified drawing.



Shaft end



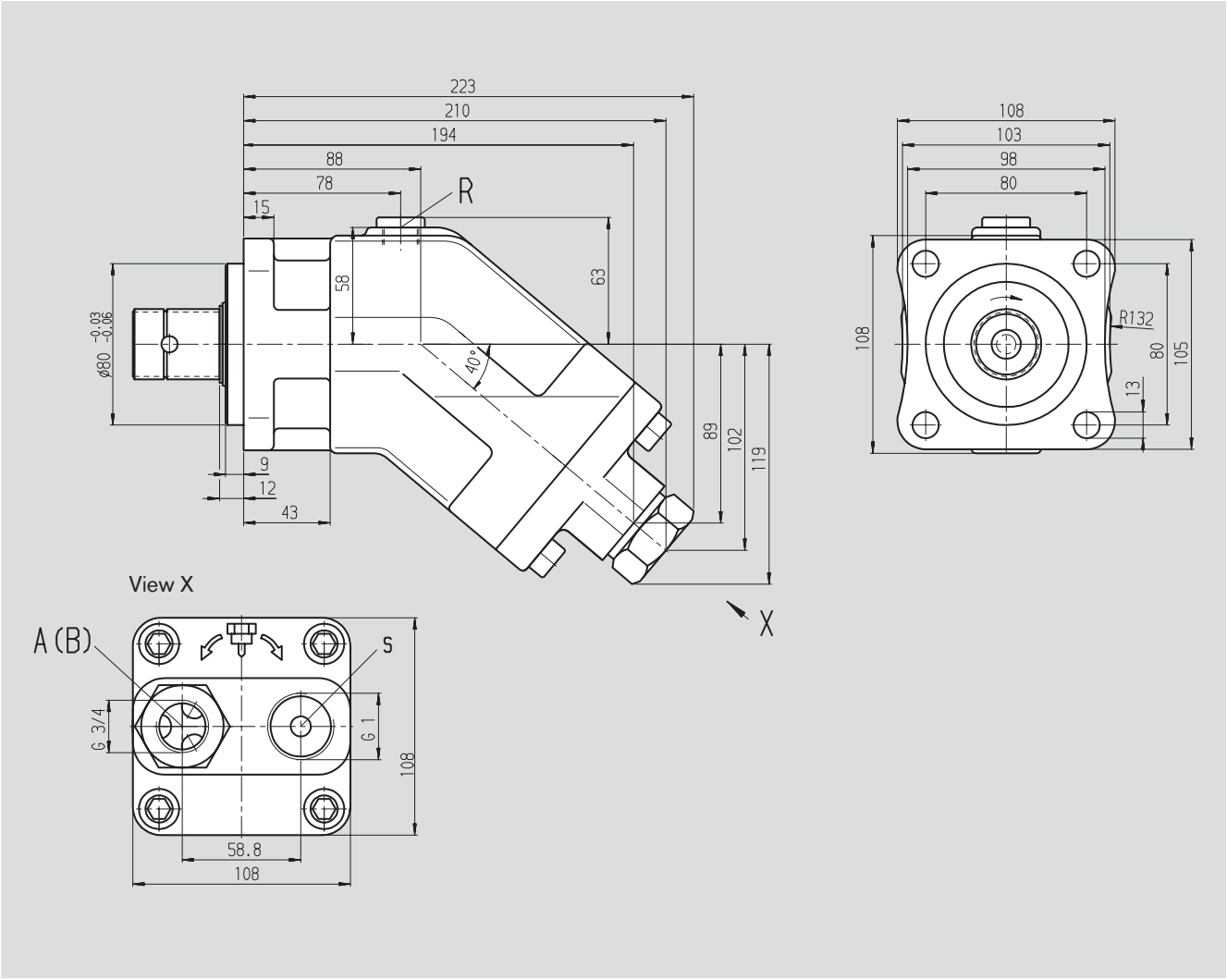
1) Centre bore to DIN 332

Connections

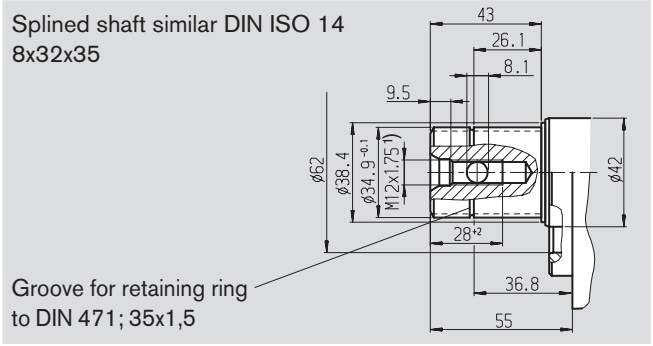
				Tightening torque, max.
A or B	Service line port	DIN ISO 228	G 1/2; 14 deep	200 Nm
S	Suction port for operation fluid	DIN ISO 228	G 3/4; 16 deep	330 Nm
R	Air bleed (plugged, leakage returned internally)	DIN 3852	M10x1; 8 deep	30 Nm

Unit Dimensions, Size 45

Before finalising your design, please request a certified drawing.



Shaft end



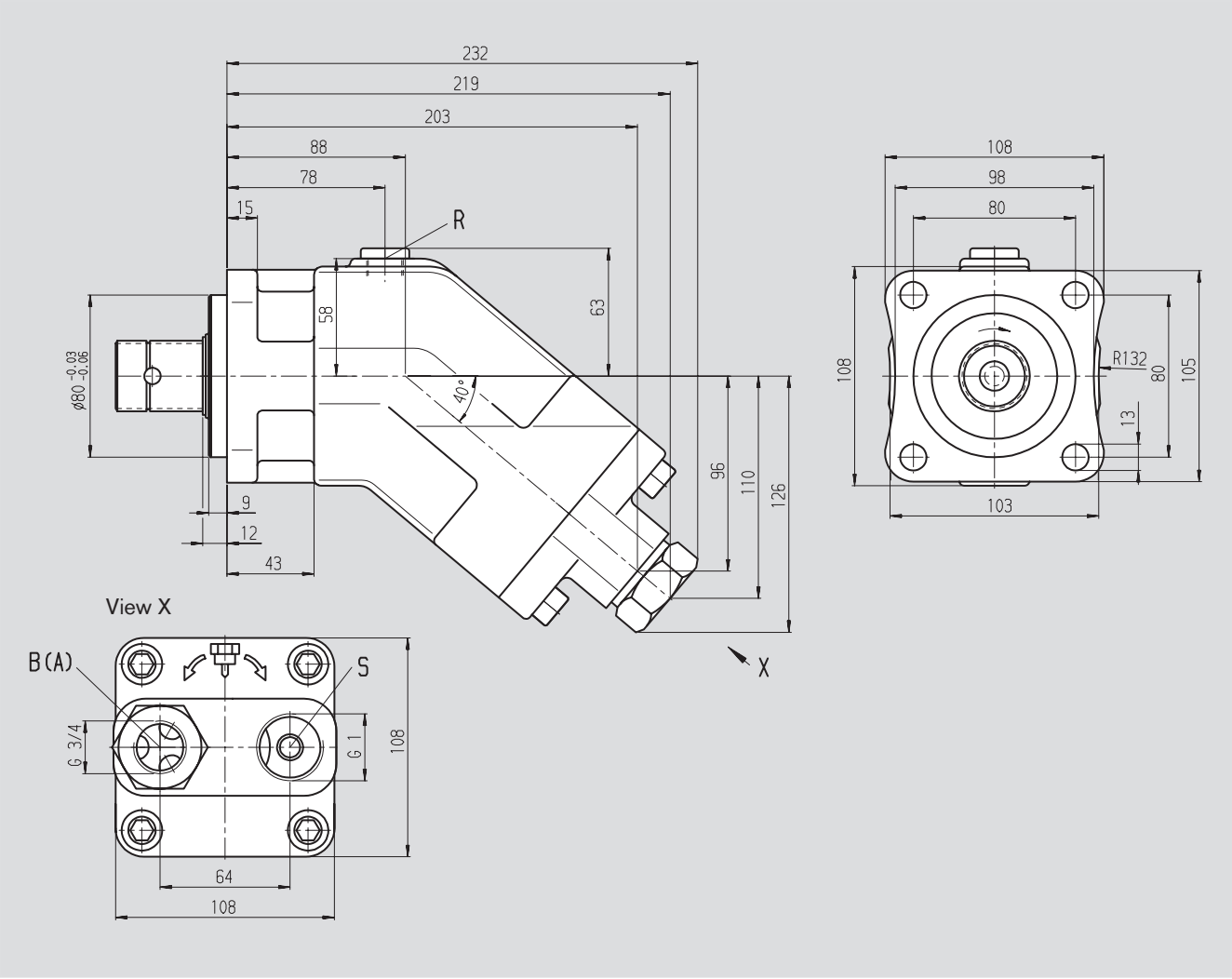
1) Centre bore to DIN 332

Connections

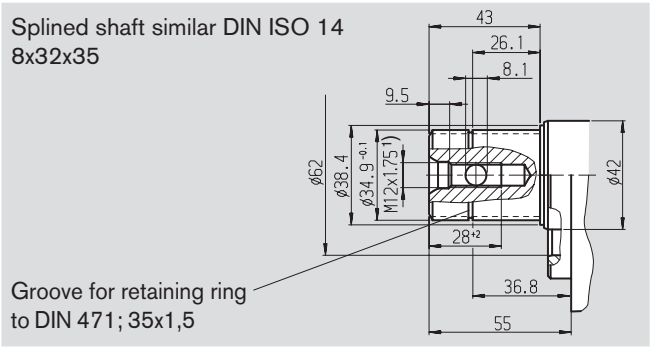
				Tightening torque, max.
A or B	Service line port	DIN ISO 228	G 3/4; 16 deep	330 Nm
S	Suction port for operation fluid	DIN ISO 228	G 1; 18 deep	480 Nm
R	Air bleed (plugged, leakage returned internally)	DIN 3852	M10x1; 8 deep	30 Nm

Unit Dimensions, Size 63

Before finalising your design, please request a certified drawing.



Shaft end



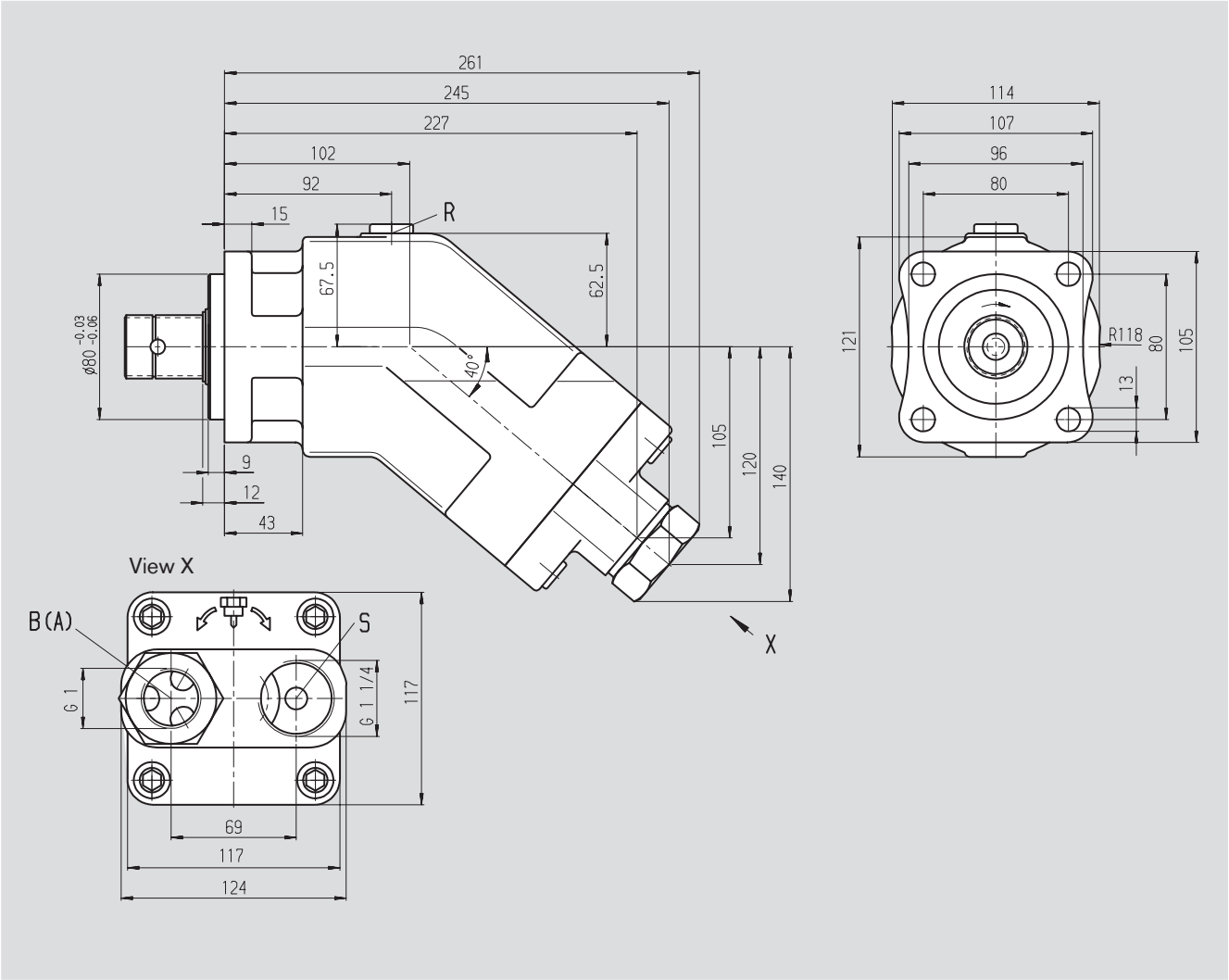
1) Centre bore to DIN 332

Connections

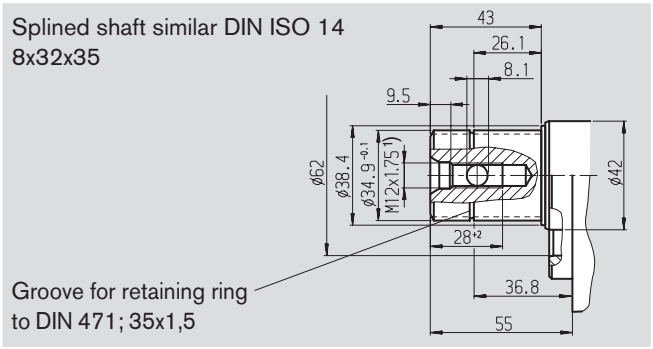
				Tightening torque, max.
A or B	Service line port	DIN ISO 228	G 3/4; 16 deep	330 Nm
S	Suction port for operation fluid	DIN ISO 228	G 1; 18 deep	480 Nm
R	Air bleed (plugged, leakage returned internally)	DIN 3852	M10x1; 8 deep	30 Nm

Unit Dimensions, Size 80

Before finalising your design, please request a certified drawing.



Shaft end



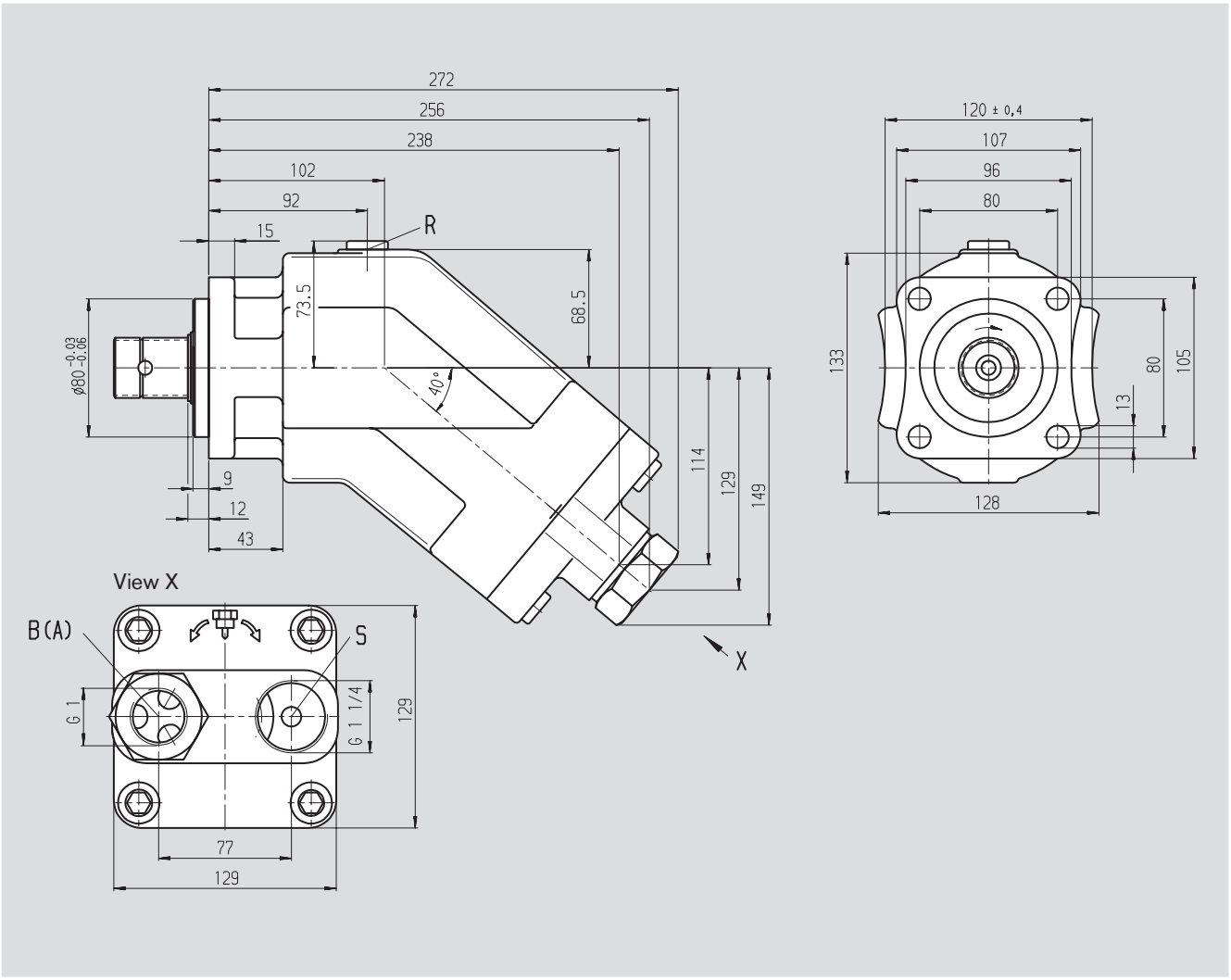
1) Centre bore to DIN 332

Connections

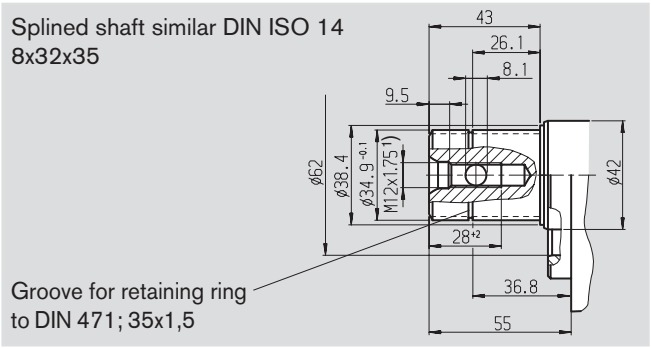
				Tightening torque, max.
A or B	Service line port	DIN ISO 228	G 1; 18 deep	480 Nm
S	Suction port for operation fluid	DIN ISO 228	G 1 1/4; 20 deep	720 Nm
R	Air bleed (plugged, leakage returned internally)	DIN 3852	M10x1; 8 deep	30 Nm

Unit Dimensions, Size 107, 125

Before finalising your design, please request a certified drawing.



Shaft end



1) Centre bore to DIN 332

Connections

				Tightening torque, max.
A or B	Service line port	DIN ISO 228	G 1; 18 deep	480 Nm
S	Suction port for operation fluid	DIN ISO 228	G 1 1/4; 20 deep	720 Nm
R	Air bleed (plugged, leakage returned internally)	DIN 3852	M10x1; 8 deep	30 Nm

Installation Instructions

General

The pump housing must be filled with hydraulic fluid both when starting and during operation (filling the case). The pump must be started at low speed and without load until the plant has been vented completely.

Fluid can drain from the housing via the service lines during prolonged stoppages. Care must therefore be taken to ensure that there is sufficient fluid in the housing when restarting.

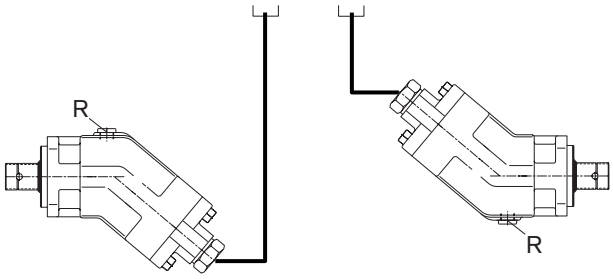
The leakage oil chamber is internally connected to the suction chamber. A leakage oil connection to the tank is not required. The minimum absolute suction pressure of 0,8 bar at port S must be maintained at all times.

The pump is installed horizontally.

Installation below the tank

Pumps ***below*** the minimum oil level in the tank (standard)

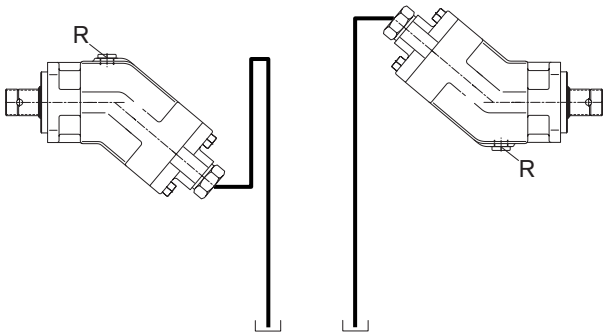
- The axial-piston pump must be filled via the suction lines and vented via the air bleed port before starting.
- Run the pump at low speed (starter speed) until the housing has filled up completely.
- Note: Minimum immersion depth of suction line in tank: 200 mm (referred to the minimum oil level in the tank).
- Vent the pump via port R. The oil flows into the pump via the suction line until the housing has filled up.



Installation above the tank

Pump ***above*** the minimum oil level in the tank

- Note: Max. permissible suction height $h_{max} = 800$ mm
  Min. permissible pressure at port S
  (minimum suction pressure)
- The pump must be filled with oil and vented ***before*** starting operation.



Safety Instructions

- The pump KFA is **strictly** designed for application in open circuits.
- Layout, assembly, startup of the pump requires sufficiently trained staff.
- The service and operating ports are only designed for the connection of hydraulic lines.
- Tightening torques: Do not exceed the max. permissible tightening torque of the fittings used, see manufacturer's specifications.
  For fixing screws conforming to DIN 13, we recommend to verify the tightening torque in each individual case in accordance with VDI 2230, edition 2003.
- During and shortly after operation of the pump: do not touch - risk of burns.
- The specified data and instructions must be observed.

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