RE 91 501/05.98

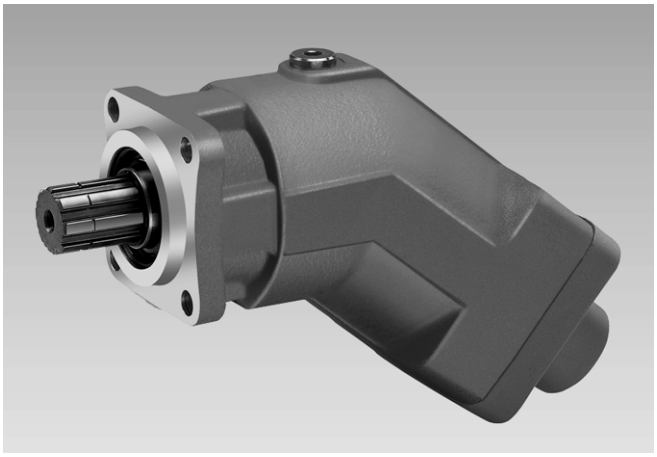
Replaces: 11.96

engineering
mannesmann
Rexroth

Fixed Displacement Pump KFA

for commercial vehicles in open circuits

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



KFA

List of contents

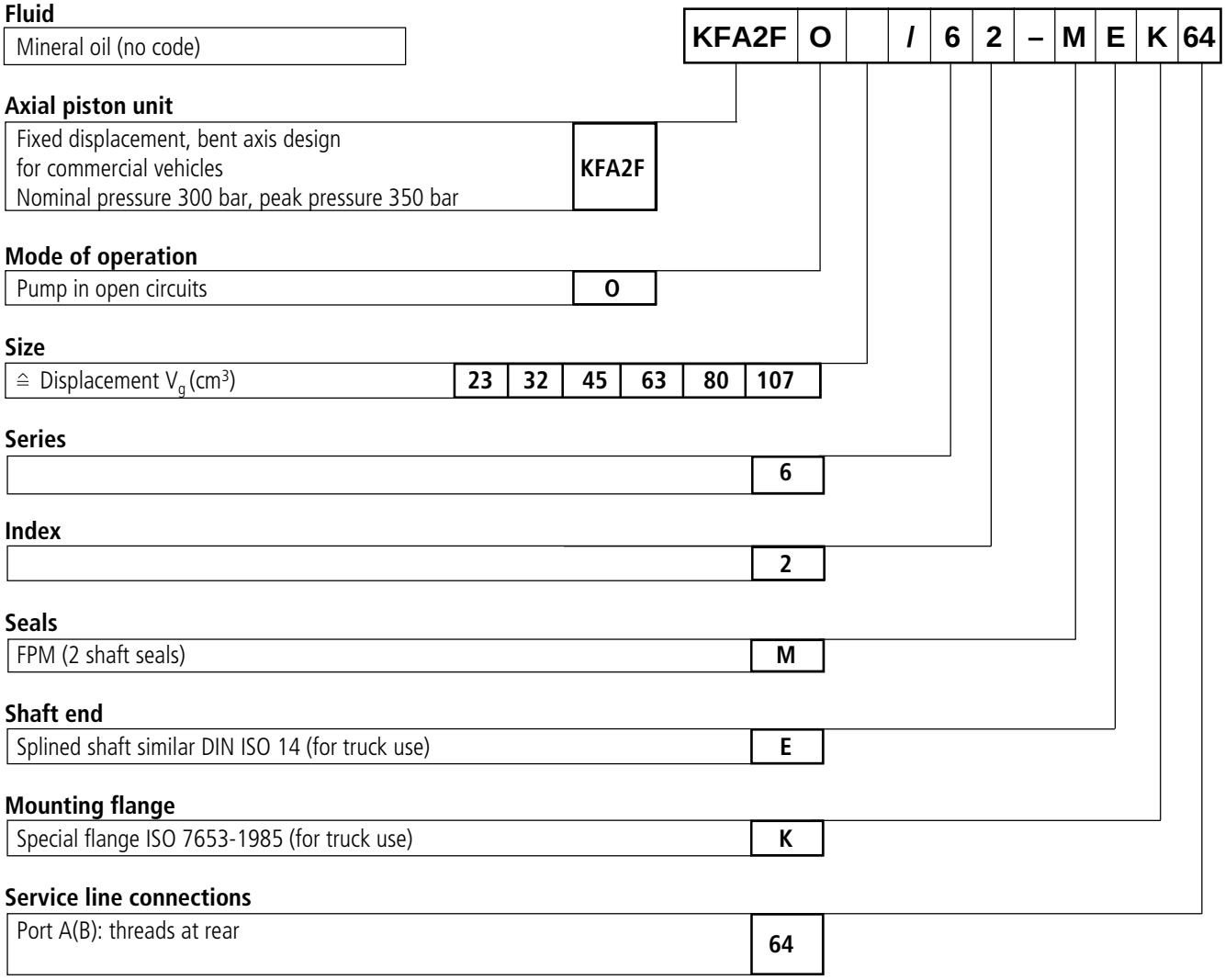
Features

- 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 and displacement.
- 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

- Further information:
  Variable Displacement Pump KVA RE 92 250
  Designed especially to meet the requirements of truck applications.

Brueninghaus
Hydromatik

Ordering Code



Technical Data

Hydraulic fluid

We request that before starting a project detailed information about the choise of hydraulic fluids and application conditions are taken from our catalogue sheets RE 90220 (mineral oil) and RE 90221 (environmentally acceptable hydraulic fluids).

When using environmentally acceptable hydraulic fluids possible limitations for the technical data have been taken into consideration. If necessary please contact our technical department (please indicate type fo the hydraulic fluid used in your application when ordering).

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

Operating viscosity range

We recommend that the operating viscosity (at operating temperature), for both efficiency and life of the unit, be chosen within the optimum range of:

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

referred to tank temperature at open circuit.

Viscosity limits

The limiting values for viscosity are as follows:

ν_{min} = 5 mm²/s

short term at a max. permissible temperature t_{max} = 115°C.

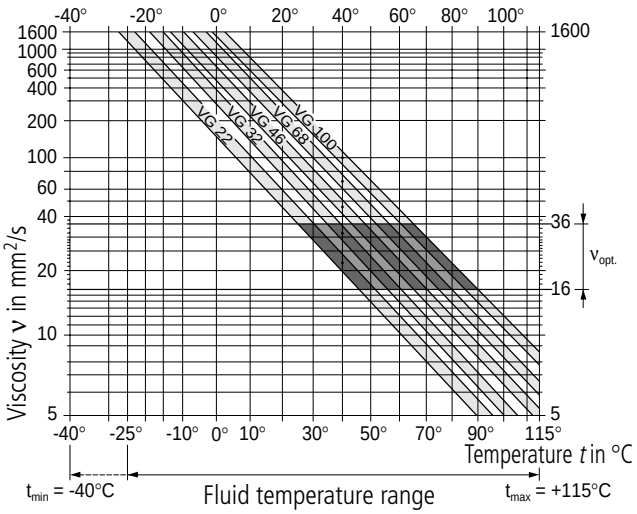
Please note that the max. fluid temperature of 115°C is also not exceeded in certain areas (for instance bearing area).

ν_{max} = 1600 mm²/s

short term on cold start, (t_{min} = -40°C).

At temperatures of -25°C up to -40°C special measures may be required for certain installation positions. Please contact us for further information.

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 ($\nu_{opt.}$) (see shaded section of the selection diagram). We recommend that the higher viscosity grade is selected in each case.

Example: At an ambient temperature of X°C, the operating temperature in the tank is 60°C. In the optimum viscosity range ν_{opt} (shaded area), this corresponds to viscosity grades VG 46 or VG 68, VG 68 should be selected.

Important: The leakage fluid temperature is influenced by pressure and speed and is typically higher than the tank temperature. However, maximum temperature at any point in the system must be less than 115°C.

Please consult Brueninghaus Hydromatik if the a.m. conditions connot be kept at extreme operation parameters or because of high ambient temperature.

Filtration of fluid

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 the functioning of the axial piston unit a minimum purity grade of:

9 to NAS 1638

6 to SAE

18/15 to ISO/DIS 4406 is necessary.

If above mentioned grades cannot be maintained please consult us.

Installation position

With drive shaft horizontal. The pump housing must be filled with fluid prior to commissioning, and must remain full whenever it is operating.

For pump installation positions above the tank special measures are necessary.

For extensive information on installation position, please consult our data sheet RE 90270 before completing your design work.

Working pressure range – inlet side

Absolute pressure at port S (suction inlet)

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

$p_{abs\ max}$ 2 bar

Working pressure range – outlet side

Pressure at ports A or B

Nominal pressure p_N 300 bar

Peak pressure p_{max} 350 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
Displacement		V_g	cm^3	22,9	32	45,6	63	80,4	106,7
Max. speed at 1,0 bar [1]		n_{max}	rpm	2500	2500	2240	2000	1800	1600
Max. output flow at n_{max} [2]		$q_{V\,max}$	L/min	56	78	99	122	140	166
Max. drive power at $q_{V\,max}$; Δp = 300 bar		P_{max}	kW	28	39	50	61	70	83
Torque	Δp = 300 bar	T	Nm	109	153	218	301	384	509
	Δp = 350 bar	T	Nm	128	178	254	351	448	594
Moment of inertia about the drive axis		J	kgm^2	0,0012	0,0012	0,003	0,0042	0,0072	0,0116
Weight (approx.)		m	kg	5,8	5,8	8,0	9,0	11,6	14,5

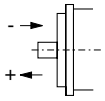
[1]) These values apply at absolute pressures at suction opening »S« and operating on mineral oil (at 0,8 bar at suction port S reduced technical data)

[2]) 3% flow loss included

Pump drive

Permissible axial load of the drive shaft, for drives with radial force load (pinion, V-belt drives), please contact us!
The values shown are maximum values and are not permitted for continuous operation.

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



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

Calculation of size

Flow $q_V = \dfrac{V_g \bullet n \bullet \eta_v}{1000}$ in L/min

Drive torque $T = \dfrac{V_g \bullet \Delta p}{20 \bullet \pi \bullet \eta_{mh}} = \dfrac{1{,}59 \bullet V_g \bullet \Delta p}{100 \bullet \eta_{mh}}$ in Nm

Drive power $P = \dfrac{2\,\pi \bullet T \bullet n}{60\,000} = \dfrac{T \bullet n}{9549} = \dfrac{q_V \bullet \Delta p}{600 \bullet \eta_t}$ in kW

V_g = geom. displacement per rev. in cm^3
T = torque in Nm
Δp = differential pressure in bar
n = speed in rpm
η_v = volumetric efficiency
η_{mh} = mech-hyd. efficiency
η_t = overall efficiency ($\eta_t = \eta_v \bullet \eta_{mh}$)

Accessories for KFA

For the KFA-pump the following accessories are available from Brueninghaus Hydromatik:

– 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)

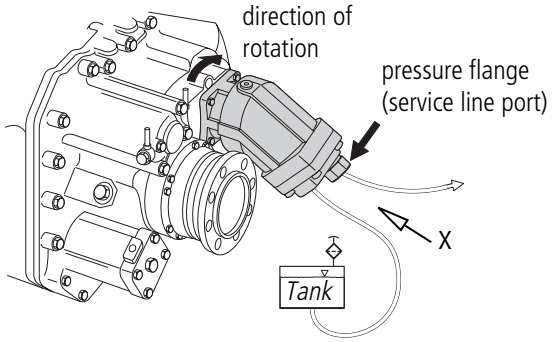
Technical Data

Direction of rotation and change of direction

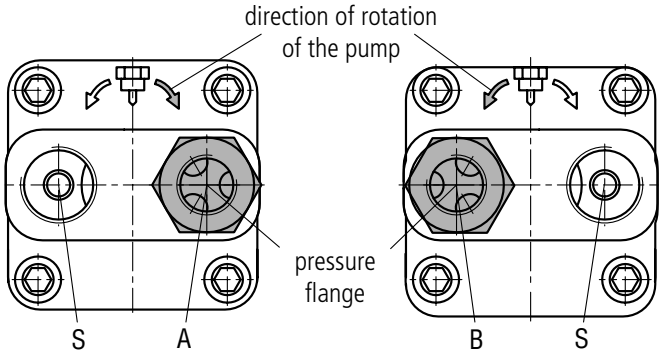
The direction of rotation of the pump is defined through a pressure flange screwed on the service line port. Through a simple change of the pressure flange the service line port and the suction line port are changed, the pump can be operated in reverse direction of rotation.

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)

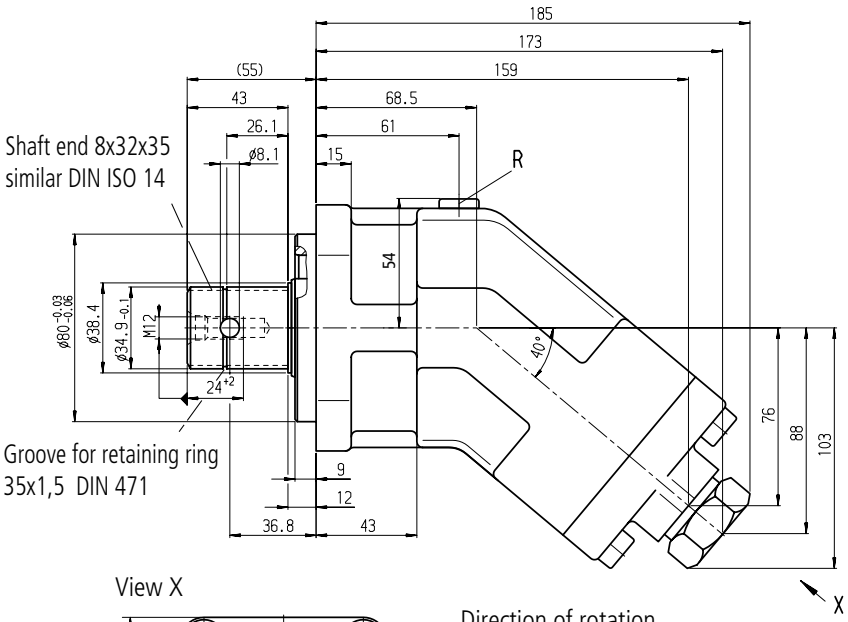
Design after change
(pressure flange in port B)

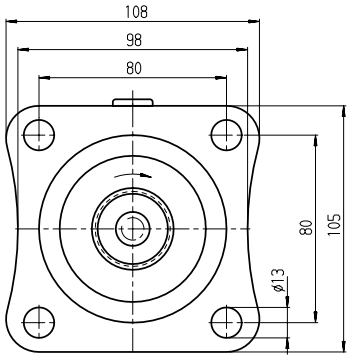
Max. tightening torque M_{max} for pressure flanges

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

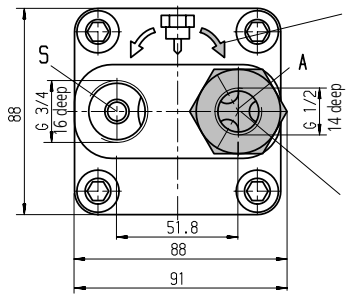
Unit Dimensions, Size 23, 32

Prior to finalising your design, please obtain a certified drawing.





View X



Direction of rotation
(in case of change of direction of rotation screw pressure flange on opposite port S)

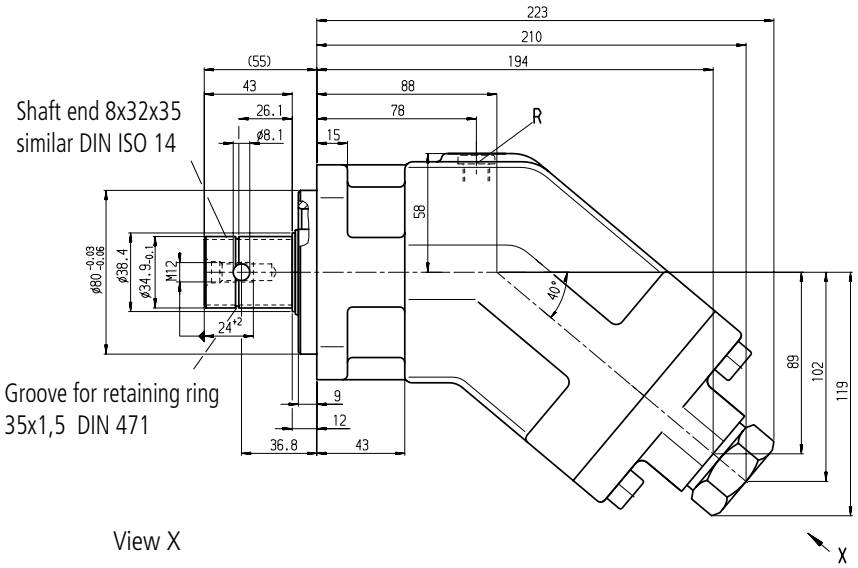
Pressure flange

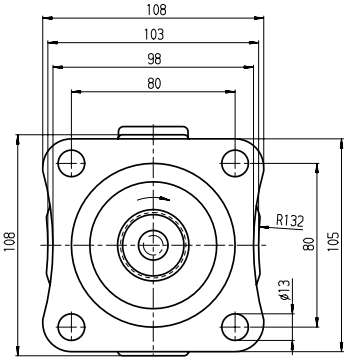
Connections

A (B)	Service line ports	G1/2
S	Suction port	G3/4
R	Bleed port (plugged, leakage returned internally)	M10x1

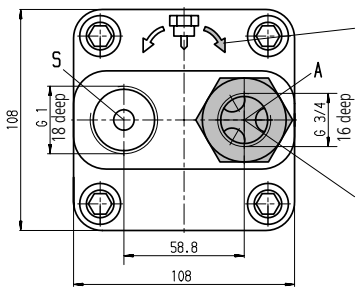
Unit Dimensions, Size 45

Prior to finalising your design, please obtain a certified drawing.





View X



Direction of rotation
(in case of change of direction of rotation screw pressure flange on opposite port S)

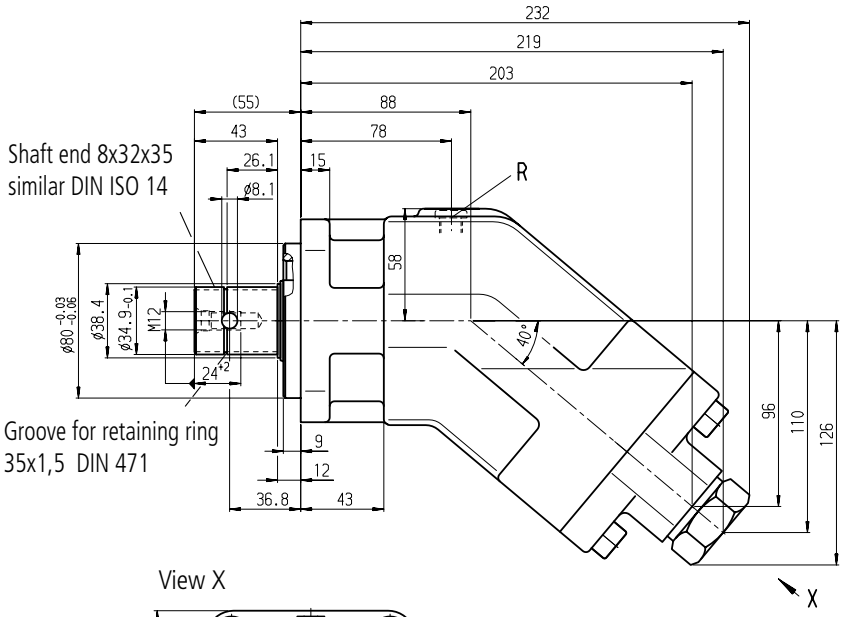
Pressure flange

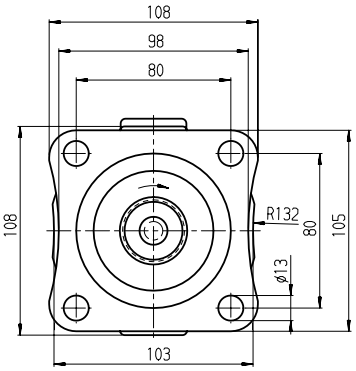
Connections

A (B)	Service line ports	G3/4
S	Suction port	G1
R	Bleed port (plugged, leakage returned internally)	M10x1

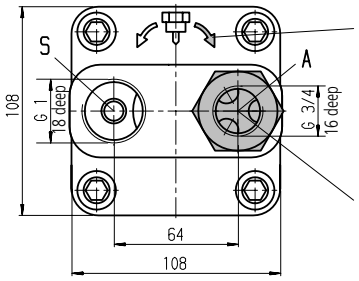
Unit Dimensions, Size 63

Prior to finalising your design, please obtain a certified drawing.





View X



Direction of rotation
(in case of change of direction of rotation screw pressure flange on opposite port S)

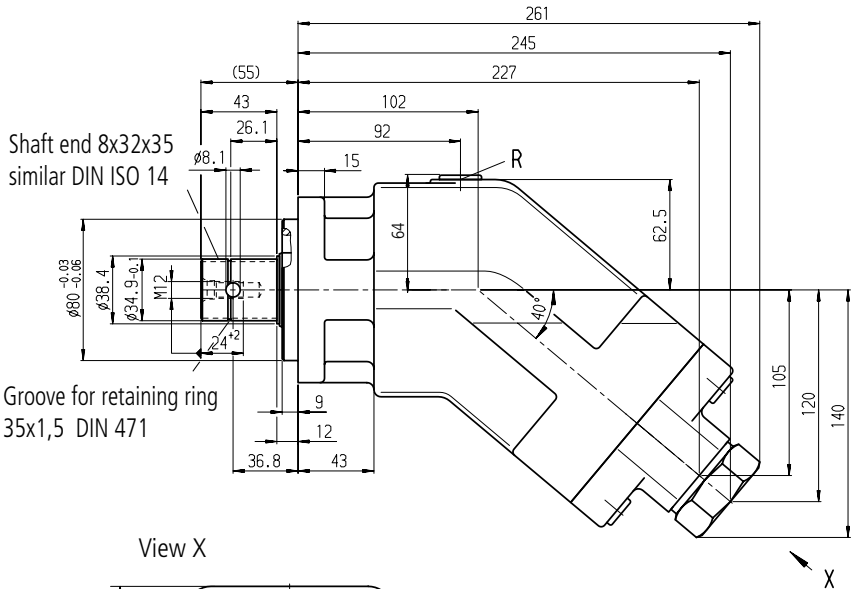
Pressure flange

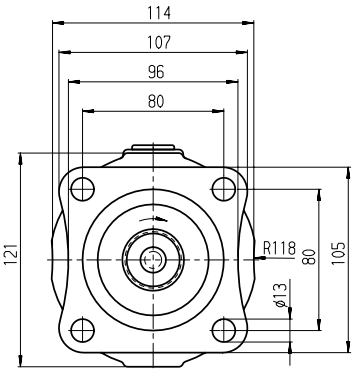
Connections

A (B)	Service line ports	G3/4
S	Suction port	G1
R	Bleed port (plugged, leakage returned internally)	M10x1

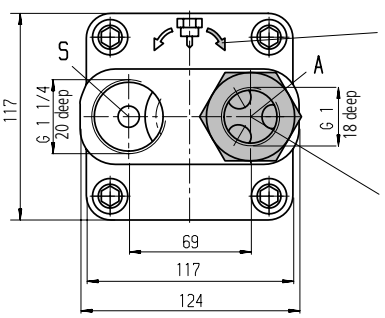
Unit Dimensions, Size 80

Prior to finalising your design, please obtain a certified drawing.





View X



Direction of rotation
(in case of change of direction of rotation screw pressure flange on opposite port S)

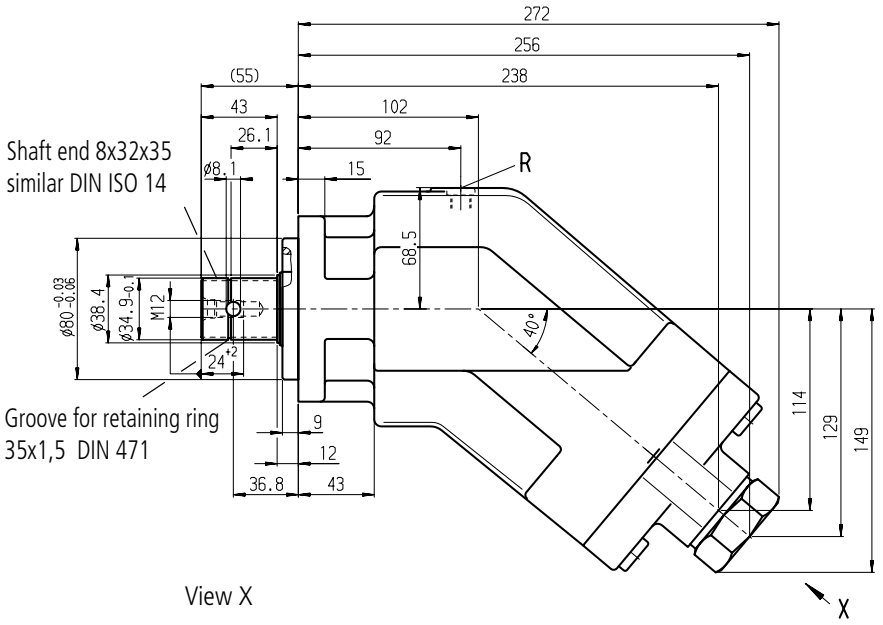
Pressure flange

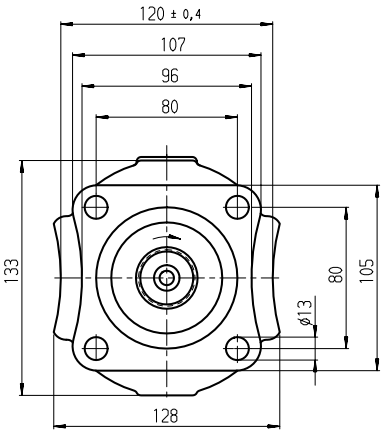
Connections

A (B)	Service line ports	G1
S	Suction port	G1 1/4
R	Bleed port (plugged, leakage returned internally)	M10x1

Unit Dimensions, Size 107

Prior to finalising your design, please obtain a certified drawing.





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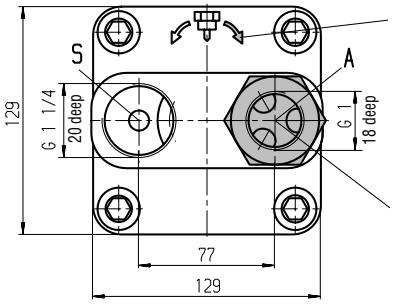

Direction of rotation
(in case of change of direction of rotation screw pressure flange on opposite port S)

Pressure flange

Connections

A (B)	Service line ports	G1
S	Suction port	G1 1/4
R	Bleed port (plugged, leakage returned internally)	M10x1

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