

RE 92 703/12.99

Replaces: 04.96

**Variable displacement pump A10VO**

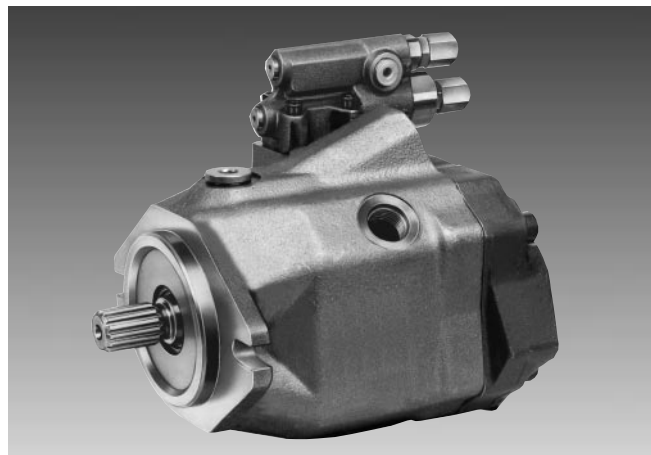
open-loop circuit, axial piston – swashplate design

Size 28 - 85

Series 52

Nominal pressure 250 bar

Peak pressure 315 bar



A10VO

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Features

- 1 – Variable-displacement axial piston pump in swashplate design for hydrostatic drives in open circuits
- 2, 3
- 4 – Flow is proportional to drive speed and displacement. It can be infinitely varied by adjustment of the swashplate.
- 5, 6
- 7 – Strong bearings for long life
- 8 – High permissible drive speed
- 9 – High power-weight ratio - small dimensions
- 10 – Low noise level
- 11 – Good suction characteristics
- 12 – Permissible continuous pressure 250 bar
- 13 – Axial and radial loading of drive shaft possible
- 14 – Pressure and flow control
- 15 – Electro-hydraulic pressure control
- 16 – Short response times
- 17 – 2 drain ports



Ordering code

Fluid

Mineral oil (no short code)

Axial piston unit

Swashplate design, variable
Nominal pressure 250 bar, peak pressure 315 bar

A10V

Operating mode

Pump, open-loop circuit

O

Size

Displacement $V_g \text{ max (cm}^3\text{)}$

28 45 60 85

● ● ● ●

Control devices

Pressure control	DR		●	●	●	●	DR
Pressure-remote control	DRG		●	●	●	●	DRG
Pressure- and flow control	DFR		●	●	●	●	DFR
	DFR	1	●	●	●	●	DFR1
without orifice between X and tank							
Electro-hydraulic pressure control	ED		●	●	●	○	ED

see RE 92707
(in preparation)

Series

52

Direction of rotation

Viewed on shaft end

clockwise

R

anticlockwise

L

Seals

NBR (Nitrile rubber to DIN ISO 1629)

P

FKM (Fluoride rubber to DIN ISO 1629)

V

Shaft end

	28	45	60	85	
Splined shaft SAE	7/8"	1"	1 1/4"	1 1/2"	S
Splined shaft SAE (higher through drive torque)	7/8"	1"	○	○	R
Splined shaft SAE (not suitable for through drive)	–	7/8"	1"	1 1/4"	U
Splined shaft SAE (with run out spline)	–	7/8"	1"	○	W
SAE key	7/8"	1"	1 1/4"	○	K

= Preferred range (short delivery times)
(Preferred types see page 24)

Ordering code

A10V	O			/ 52	-						
------	---	--	--	------	---	--	--	--	--	--	--

Mounting flange

	28	45	60	85	
SAE - 2 hole	●	●	●	●	C
SAE - 4 hole	-	-	●	○	D

Connection for service lines

	28	45	60	85	
Pressure port B } Threaded, UN rear Suction port S	●	●	-	-	64
Pressure port B } SAE- flange rear - UNC threads Suction port S	●	●	●	○	61
Pressure port B } SAE- flange rear - metric threads Suction port S	●	●	●	●	11
Pressure port B } SAE- flange side ports Suction port S UNC threads	●	●	●	●	62
Pressure port B } SAE- flange side ports Suction port S metric threads	●	●	●	●	12

only possible
without
through
drive

Through drive

	28	45	60	85	
without through drive	●	●	●	●	N00
Mounting flange shaft-coupler to mount:					
82-2 (SAE A) 16-4 (SAE A) 1PF2G2; PGF2	●	●	●	○	K01
82-2 (SAE A) 19-4 (SAE A-B) A10VSO 10, 18 (shaft S)	○	●	●	○	K52
101-2 (SAE B) 22-4 (SAE B) 1PF2G3	○	●	○	○	K02
101-2 (SAE B) 22-4 (SAE B) A10VO 28 (shaft S); PGF3	●	●	●	○	K68
101-2 (SAE B) 25-4 (SAE B-B) A10VO 45 (shaft S); PGH4	-	●	●	○	K04
127-4 (SAE C) 32-4 (SAE C) A10VO 60 (shaft S)	-	-	●	○	K15
127-2 (SAE C) 38-4 (SAE C-C) A10VO 85 (shaft S); PGH5	-	-	-	●	K24

● = available

○ = in preparation

- = not available

Hydraulic fluid

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

When using environmentally acceptable hydraulic fluids possible limitations for the technical data may apply. If necessary please contact our technical department (please indicate type of the hydraulic fluid used in your application when ordering).

Operating viscosity range

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

$$v_{\text{opt}} = \text{opt. operating viscosity } 16 \dots 36 \text{ mm}^2/\text{s}$$

referred to tank temperature at open circuit.

Viscosity limits

The limiting values for viscosity are as follows:

$$v_{\text{min}} = 5 \text{ mm}^2/\text{s}$$

short term, at a max. permissible leakage oil temperature $t_{\text{max}} = 115^\circ\text{C}$.

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

$$v_{\text{max}} = 1600 \text{ mm}^2/\text{s}$$

short term, on cold start ($t_{\text{min}} = -40^\circ\text{C}$).

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

At temperatures of $+90^\circ\text{C}$ to 115°C please use FKM seals (type code character V).

Notes on the selection of 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 (v_{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 $X^\circ\text{C}$, the operating temperature in the tank is 60°C . In the optimum viscosity range v_{opt} (shaded area), this corresponds to viscosity grades VG 46 or VG 68, VG 68 should be selected.

Important: The leakage oil temperature is influenced by pressure and speed and is typically higher than the tank temperature. However, maximum temperature at any point in the system may not exceed 115°C .

At high temperatures please use FKM seals.

Please consult Brueninghaus Hydromatik if the a.m. conditions cannot be kept at extreme operation parameters or because of high ambient temperature.

Filtration of fluid

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

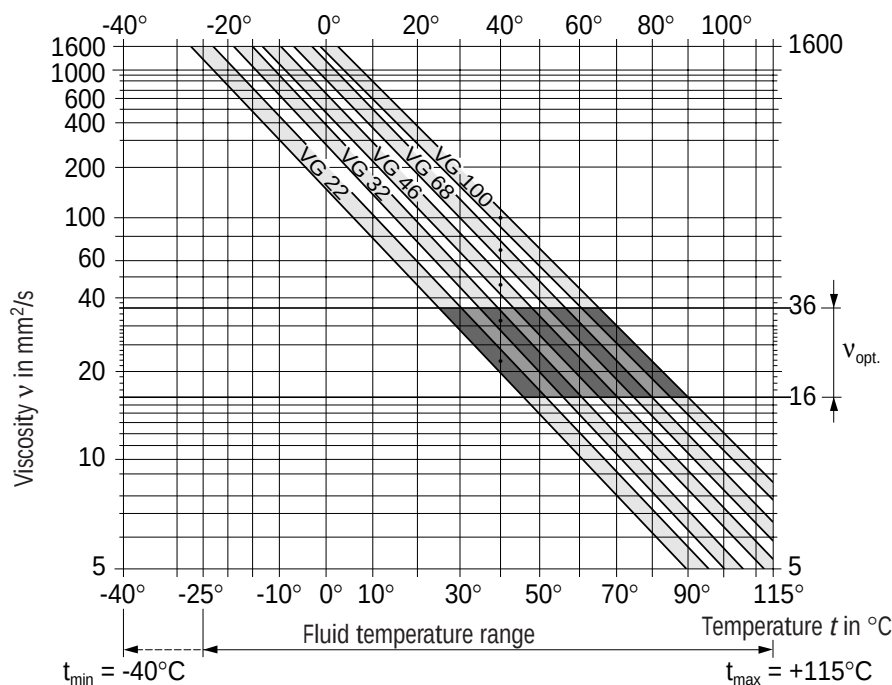
To ensure the functioning of the axial piston unit, a minimum cleanliness of:

9 to NAS 1638

18/15 to ISO/DIS 4406 is necessary.

If above mentioned grades cannot be maintained please consult us.

Selection diagram



Technical data

Input operating pressure range

Absolute pressure at port S (suction port)

$p_{abs \min}$ _____ 0.8 bar

$p_{abs \max}$ _____ 30 bar

Output operating pressure range

Pressure at port B

Nominal pressure p_N _____ 250 bar

Peak pressure $p_{\max}$ _____ 315 bar

(Pressure data to DIN 24312)

Direction of flow

S to B.

Case drain pressure

The maximum permissible pressure of the leakage fluid (at port L, L₁): max. 0.5 bar higher than input pressure at port S, but not higher than 2 bar absolute.

$p_{L \text{ abs max}}$ _____ 2 bar

Determination of input pressure p_{abs} at suction port S or reduction of displacement with increasing speed.

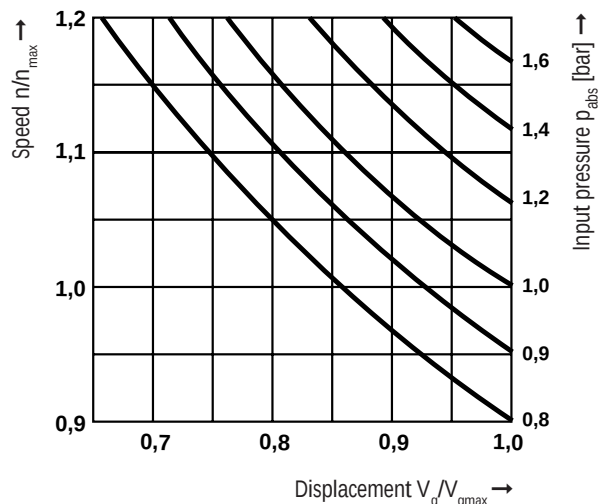


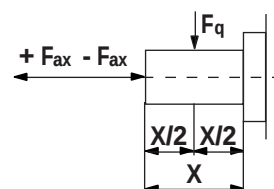
Table of values (theoretical values, without considering η_{mh} and η_v ; approximate values)

Size				28	45	60	85
Displacement		$V_{g \max}$	cm ³	28	45	60	87
Max. speed ¹⁾	at $V_{g \max}$	$n_{o \max}$	rpm	3000	2600 ²⁾	2700	2500
Max. flow	at $n_{o \max}$	$q_{v o \max}$	L/min	84	117	162	217
	at $n_E = 1500$ rpm		L/min	42	68	90	130
Max. power ($\Delta p = 250$ bar)	at $n_{o \max}$	$P_{o \max}$	kW	35	49	68	90
	at $n_E = 1500$ rpm		kW	18	28	38	54
Max. torque ($\Delta p = 250$ bar)	at $V_{g \max}$	$T_{\max}$	Nm	111	179	238	345
Moment of inertia about the drive axis		J	kgm ²	0.0017	0.0033	0.0056	0.012
Fill volume			L	0.3	0.5	0.8	1
Mass (without fluid)		m	kg	14	18	22	34
Permissible loading of drive shaft:							
Max. permissible axial force		$F_{ax \max}$	N	1000	1500	2000	3000
Max. permissible radial force		$F_{q \max}$	N	1200	1500	1700	2000

¹⁾ The values are quoted for an absolute pressure of 1 bar at suction port S. If the displacement is reduced or the input pressure is increased, the speed can be increased as shown in the graph.

²⁾ Higher speeds available on request.

Forces



Determination of size

$$\text{Flow} \quad q_v = \frac{V_g \cdot n \cdot \eta_v}{1000} \quad [\text{L/min}]$$

$$\text{Drive torque} \quad T = \frac{1.59 \cdot V_g \cdot \Delta p}{100 \cdot \eta_{mh}} \quad [\text{Nm}]$$

$$\text{Drive power} \quad P = \frac{2\pi \cdot T \cdot n}{60000} = \frac{T \cdot n}{9549} = \frac{q_v \cdot \Delta p}{600 \cdot \eta_t} \quad [\text{kW}]$$

V_g = Geometric displacement [cm³] per revolution

Δp = Differential pressure [bar]

n = Speed [rpm]

η_v = Volumetric efficiency

η_{mh} = Mechanical-hydraulic efficiency

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

Operating curves for pump with pressure control DR

Noise level

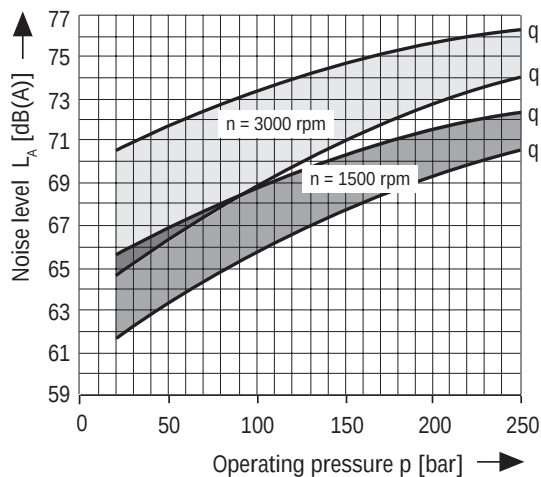
Measured in an anechoic chamber to DIN 43635

Distance from microphone to pump = 1 m

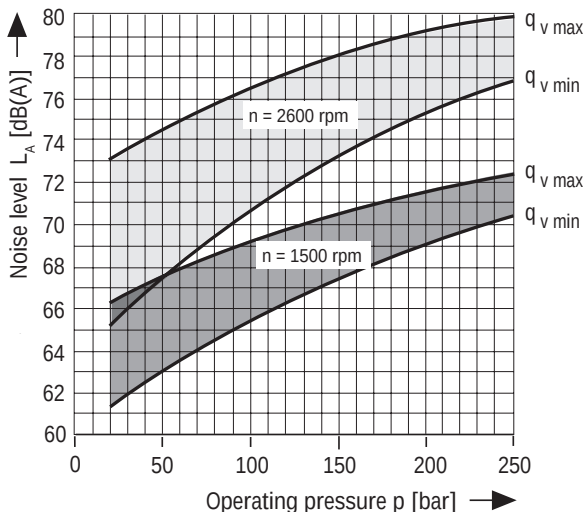
Measuring error to DIN 45635, part 1: ± 2 dB (A)

(Fluid: hydraulic oil to ISO VG 46 DIN 51519, $t = 50^\circ\text{C}$)

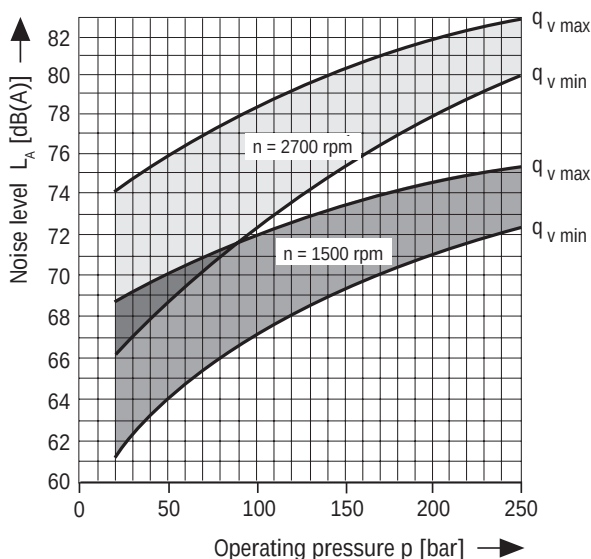
Size 28



Size 45



Size 60



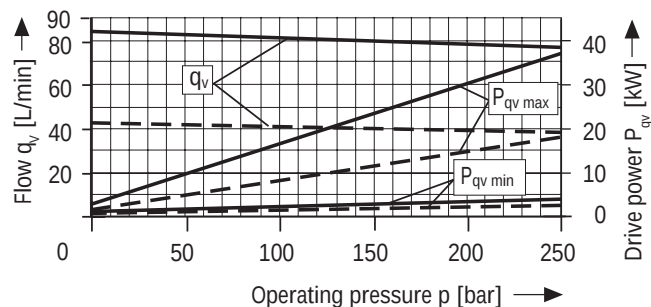
Data for size 85 available on request.

Drive power and flow

(fluid: mineral oil to ISO VG 46 DIN 51519, $t = 50^\circ\text{C}$)

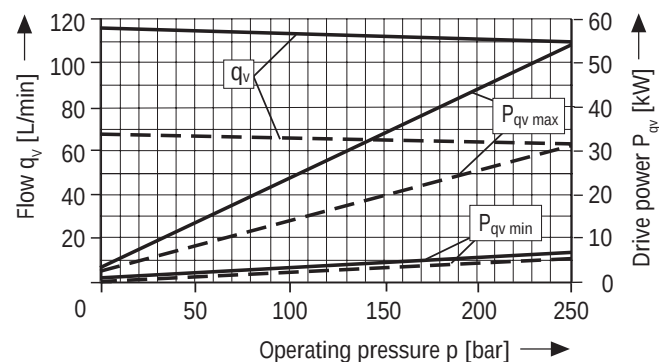
Size 28

--- n = 1500 rpm
— n = 3000 rpm



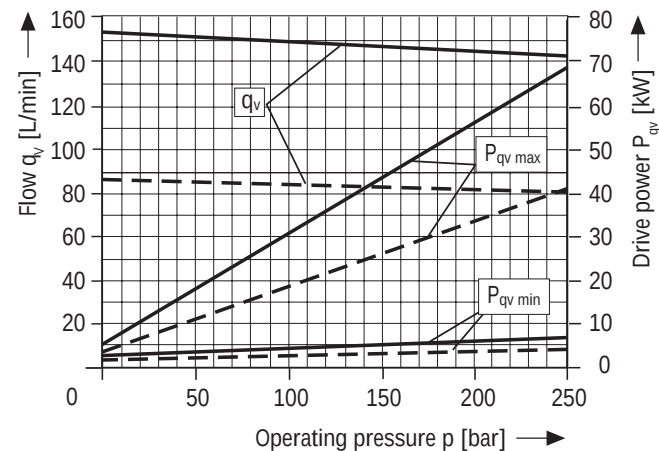
Size 45

--- n = 1500 rpm
— n = 2600 rpm



Size 60

--- n = 1500 rpm
— n = 2700 rpm



Installation Notes

Installation position is optional. The pump housing must be filled with fluid during commissioning and remain full when operating. In order to achieve the lowest noise value, all connections (suction, pressure, case drain ports) must be linked by flexible couplings to the reservoir.

Avoid placing a check valve in the case drain line.

This may, however, be permissible in individual cases, after consultation with us.

1. Vertical installation (shaft end upwards)

Please contact us.

The following installation conditions must be taken into account:

1.1. Arrangement in the reservoir

Before installation fill pump housing, keeping it in a horizontal position.

a) If the minimum fluid level is equal to or above the pump mounting face leave ports "L", "L₁" and "S" open (see Fig.1).

b) If the minimum fluid level is below the pump mounting face pipe port "L₁", and possibly "S" according to Fig. 2.

Close port "L" with respect taking into consideration conditions in 1.2.1.

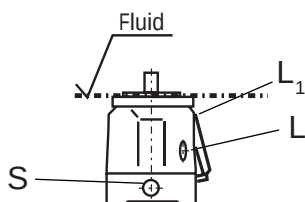


Fig. 1

1.2. Installation outside the reservoir

Before installing the pump, fill the pump with housing in the horizontal position. For mounting above reservoir see Fig. 2.

Limiting conditions:

1.2.1. Minimum pump inlet pressure $p_{in\ min} = 0.8$ bar both static and dynamic conditions.

Note: Avoid mounting above reservoir wherever possible in order to achieve a low noise level.

The permissible suction height h comes from the overall pressure loss, but may not be bigger than $h_{max} = 800$ mm (immersion depth $h_{d\ min} = 200$ mm).

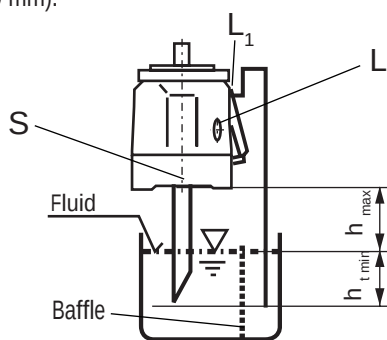


Fig. 2

Overall pressure loss $\Delta p_{tot} = \Delta p_1 + \Delta p_2 + \Delta p_3 \leq (1 - p_{in\ min}) = 0.2$ bar

Δp_1 : Pressure loss in pipe due to accelerating column of fluid

$$\Delta p_1 = \frac{\rho \cdot l \cdot dv}{dt} \cdot 10^{-5} \text{ (bar)}$$

ρ = density (kg/m³)
 l = pipe length (m)
 dv/dt = rate of change in fluid velocity (m/s²)

Δp_2 : Pressure loss due to static head

$$\Delta p_2 = h \cdot \rho \cdot g \cdot 10^{-5} \text{ (bar)}$$

h = head (m)
 ρ = density (kg/m³)
 g = gravity. = 9.81 m/s²

Δp_3 : Line losses (elbows etc.)

2. Horizontal installation

The pump must be installed, so that "L" or "L₁" is at the top.

2.1. Installation within the reservoir

a) If the minimum fluid level is equal to or above the top of the pump, ports "L", "L₁" and "S" should remain open (see Fig. 3)

b) If the minimum fluid level is below the top of the pump, pipe ports "L", "L₁" and possibly "S" as Fig. 4. The conditions correspond to item 1.2.1.

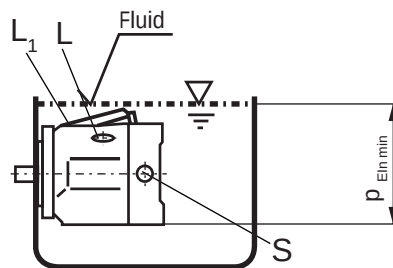


Fig. 3

2.2. Installation outside the reservoir

Fill the pump housing before commissioning.

Pipe ports "S" and the higher port "L" or "L₁".

a) When mounting above the reservoir, see Fig. 4. Conditions correspond to 1.2.1.

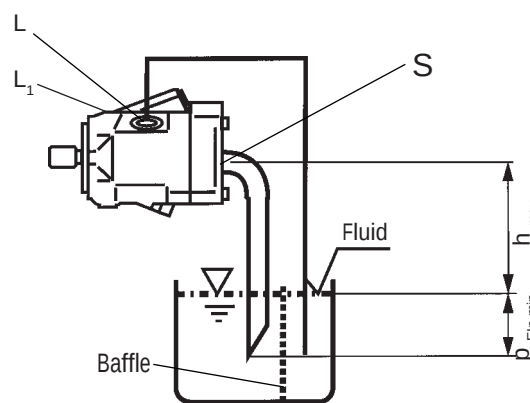


Fig. 4

b) Mounting below the reservoir

Pipe ports "L" and "S" according to Fig.5.

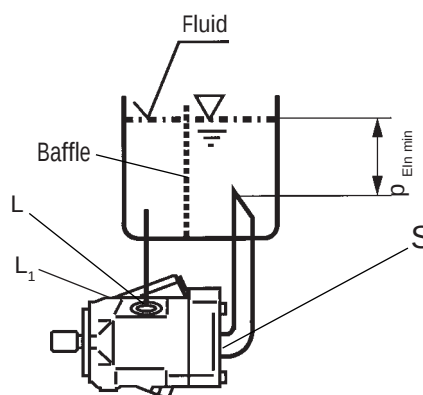


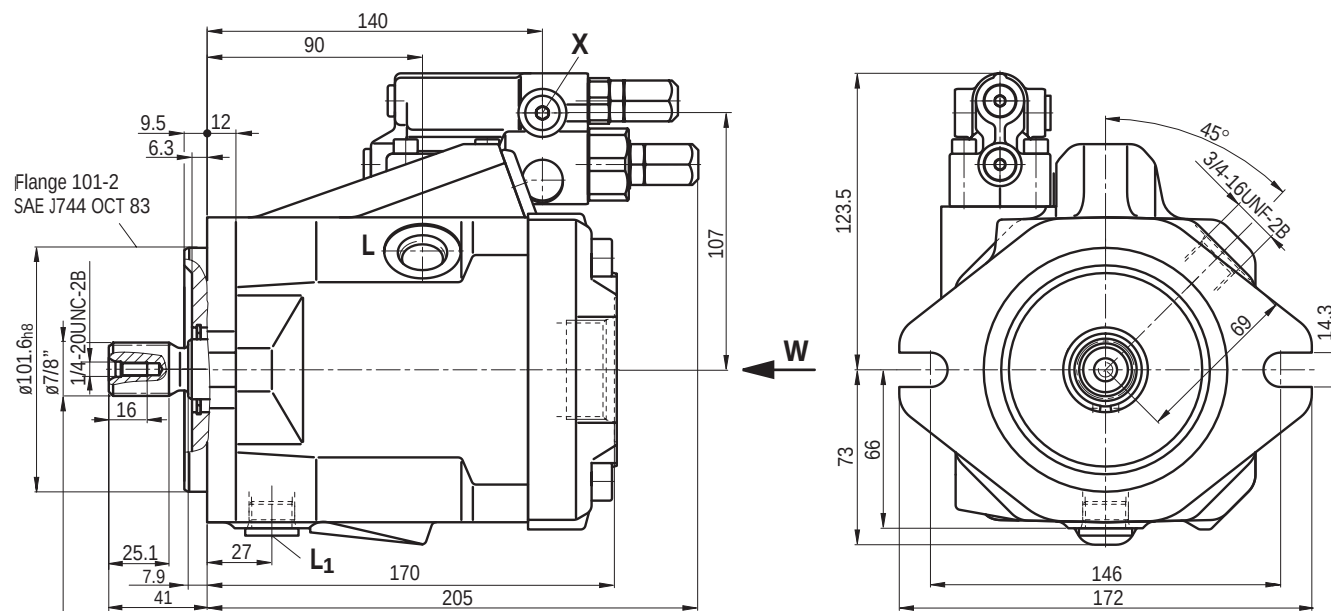
Fig. 5

Unit dimensions, size 28

Prior to finalising your design, please request certified installation drawing.
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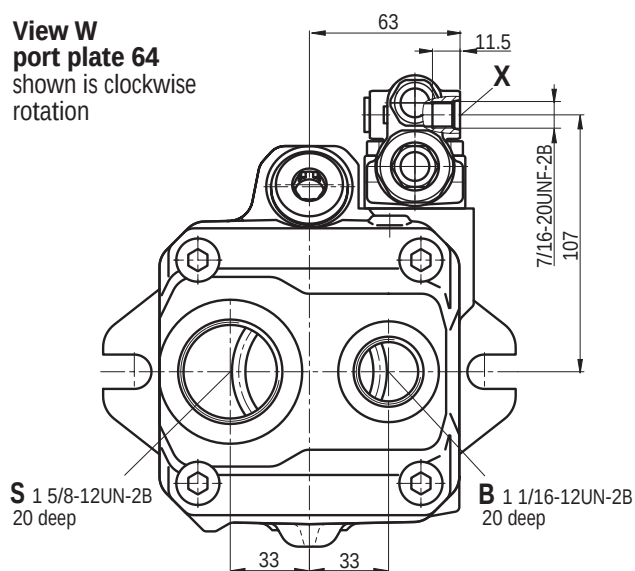
Version A10VO 28

DR
DFR
DFR1 /52 R -X S C 61
DRG 11

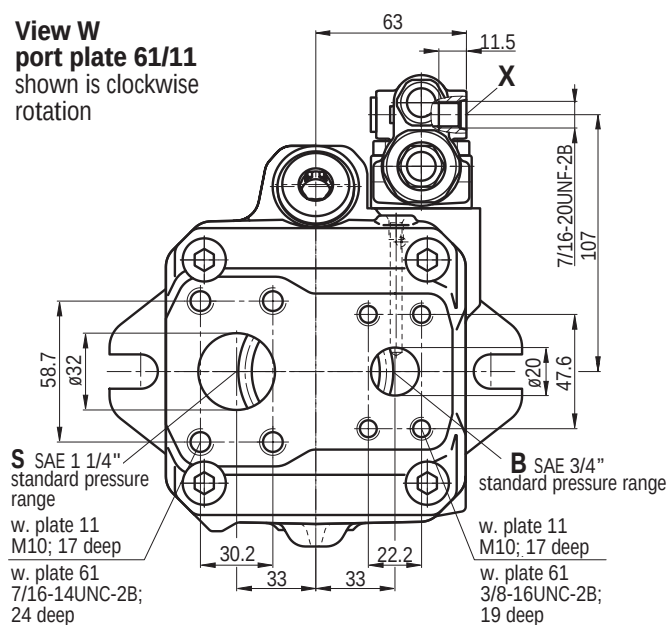


Shaft S 22-4; SAE J744 OCT 83
7/8" splined shaft size; 30° pressure angle
13 teeth; 16/32 DP

View W
port plate 64
shown is clockwise
rotation



View W
port plate 61/11
shown is clockwise
rotation



R and K shaft, see page 9.

For ccw - rotation, turn port plate 180°

Connections – Port Plate 64

B	Pressure port	1 1/16-12UN-2B
S	Inlet port	1 5/8-12UN-2B
L/L ₁	Case drain	3/4-16UNF-2B
X	Pilot port	7/16-20UNF-2B

with control DR, pilot port X is plugged

For ccw - rotation, turn port plate 180°

Connections – Port plates 61 and 11

B	Pressure port	SAE 3/4"	(Standard pressure range)
S	Inlet port	SAE 1 1/4"	(Standard pressure range)
L/L ₁	Case drain	3/4-16UNF-2B	
X	Pilot port	7/16-20UNF-2B	

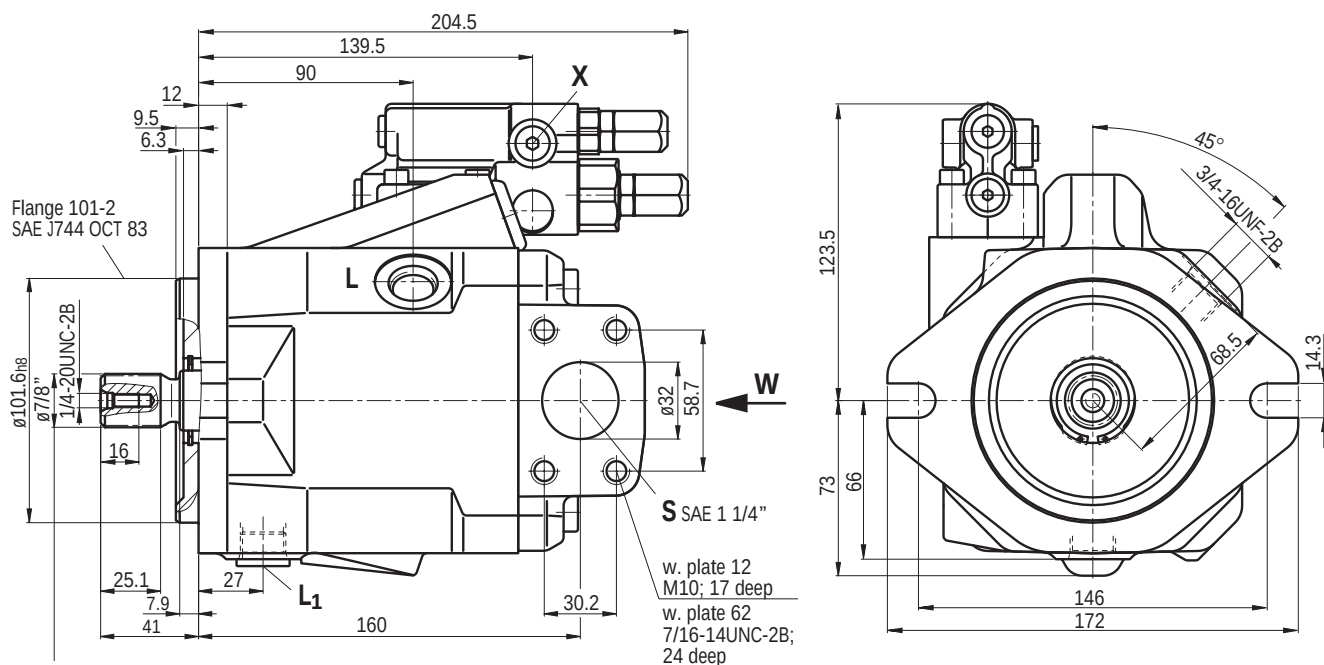
with control DR, pilot port X is plugged

Unit dimensions, size 28

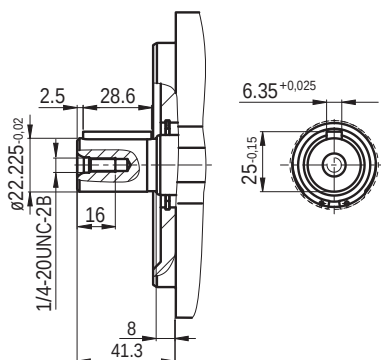
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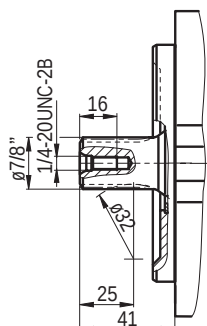
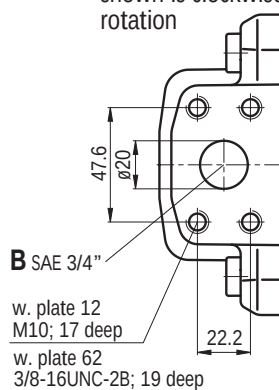
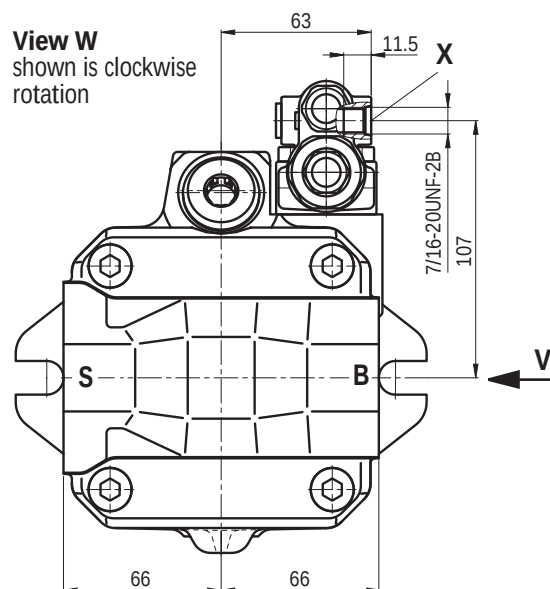
DFR
DFR1 /52 R -X S C 62 N00
DRG 12



Shaft S 22-4; SAE J744 OCT 83
7/8" splined shaft size; 30° pressure angle
13 teeth; 16/32 DP

Shaft K

Shaft R 22-4; SAE J744 OCT 83
7/8" splined shaft size; 30° pressure angle
13 teeth; 16/32 DP

**View V**
shown is clockwise rotation**View W**
shown is clockwise rotation

For ccw - rotation, turn port plate 180°

Connections – Port plates 12 and 62

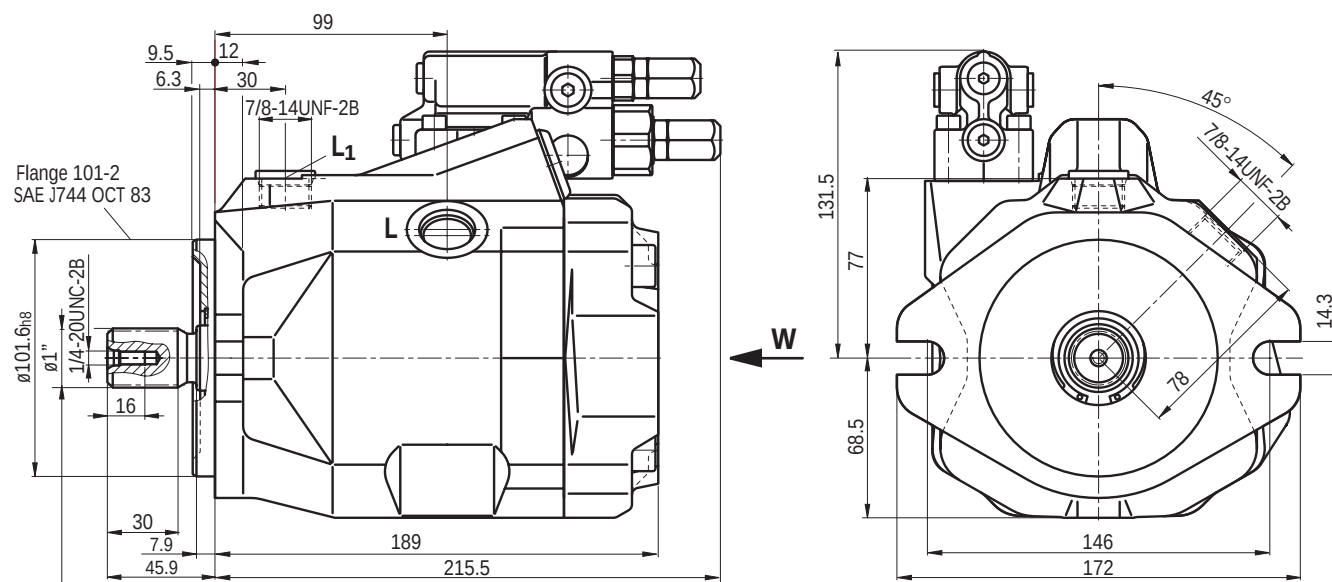
B	Pressure port	3/4"	(Standard pressure range)
S	Inlet port	SAE 1 1/4"	(Standard pressure range)
L/L ₁	Case drain	3/4-16UNF-2B	
X	Pilot port	7/16-20UNF-2B	

Unit dimensions, size 45

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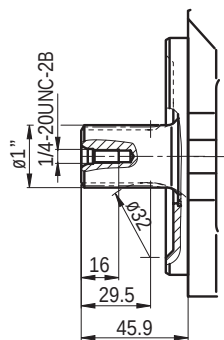
Pressure control DR

Version A10VO 45 **DR /52 R-X S C 11 N00**
61

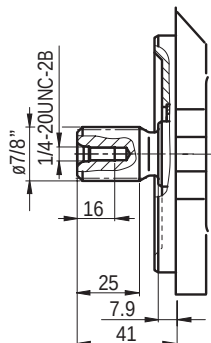


Shaft S 25-4; SAE J744 OCT 83
1" splined shaft size; 30° pressure angle
15 teeth; 16/32 DP

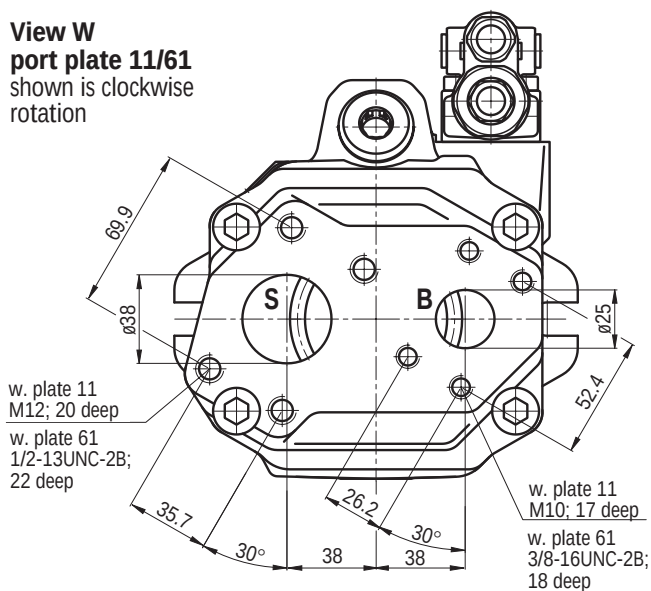
Shaft R 25-4; (SAE B-B) SAE J744 OCT 83
1" splined shaft size; 30° pressure angle
15 teeth; 16/32 DP



Shaft U 22-4; (SAE B) SAE J744 OCT 83
7/8" splined shaft size; 30° pressure angle
13 teeth; 16/32 DP



View W
port plate 11/61
shown is clockwise
rotation



For ccw - rotation, turn port plate 180°

W shaft see page 11, K shaft see page 12.

Ports

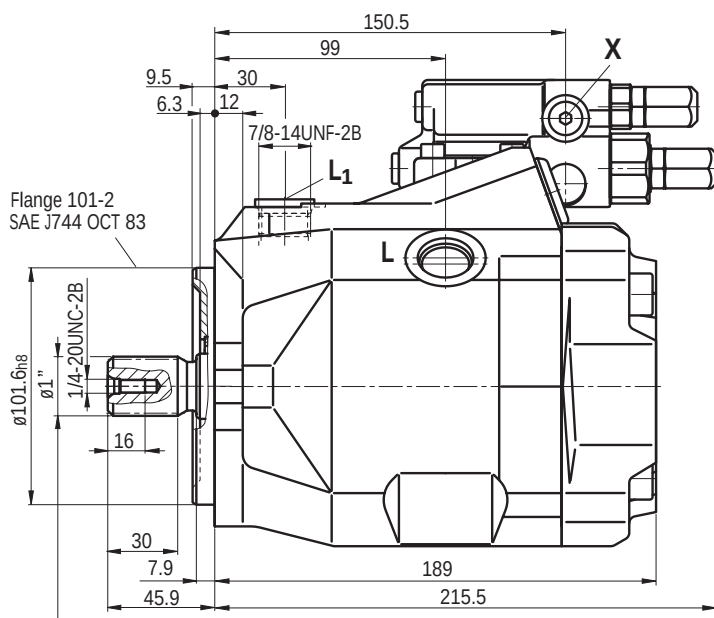
B	Pressure port	SAE 1"	(Standard pressure range)
S	Inlet port	SAE 1 1/2"	(Standard pressure range)
L/L ₁	Case drain	7/8-14UNF-2B	

Unit dimensions, size 45

Version A10VO 45

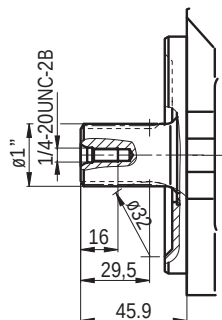
DRG
DFR /52 R-X S C 64 N00
DFR1

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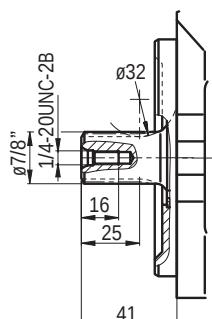


Shaft S 25-4; SAE J744 OCT 83
 1" splined shaft size; 30° pressure angle
 15 teeth; 16/32 DP

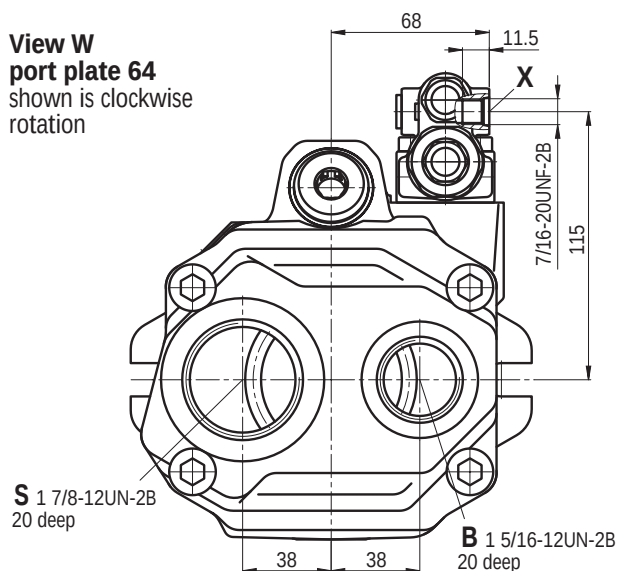
Shaft R 25-4; (SAE B-B) SAE J744 OCT 83
 1" splined shaft size; 30° pressure angle
 15 teeth; 16/32 DP



Shaft W 22-4; (SAE B) SAE J744 OCT 83
 7/8" splined shaft size; 30° pressure angle
 13 teeth; 16/32 DP



View W
port plate 64
 shown is clockwise
 rotation



For ccw - rotation, turn port plate 180°

U shaft see page 10, K shaft see page 12.

Ports

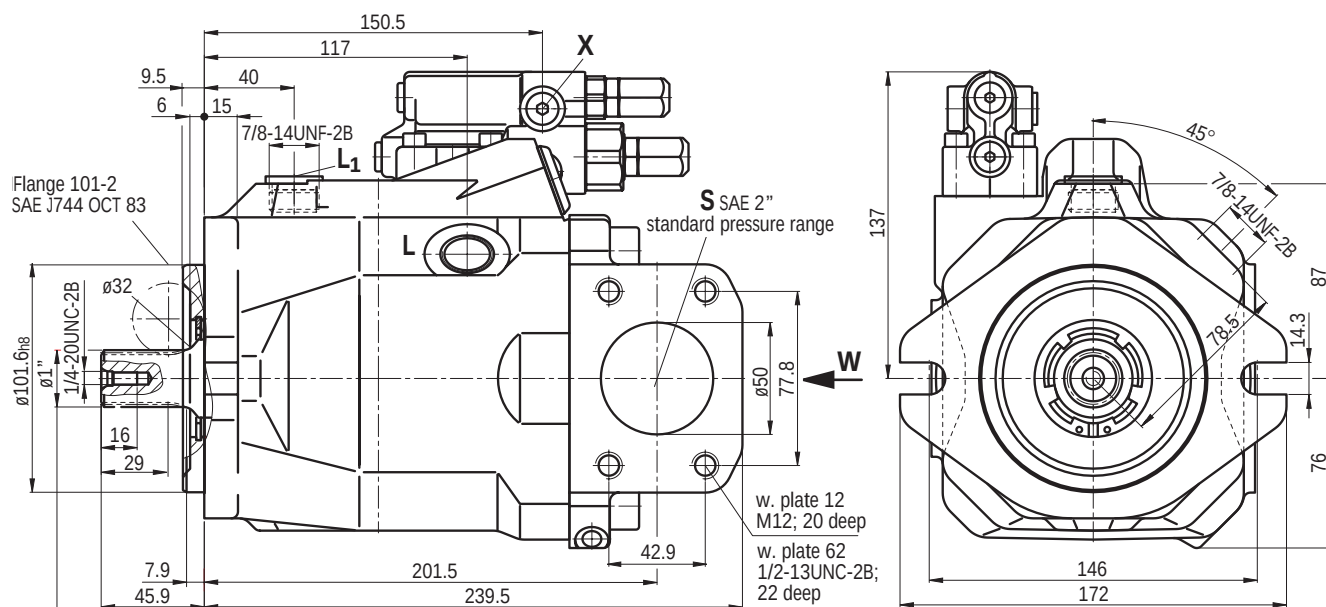
B	Pressure port	1 5/16-12UN-2B
S	Inlet port	1 7/8-12UN-2B
L/L ₁	Case drain	7/8-14UNF-2B
X	Pilot port	7/16-20UNF-2B

Unit dimensions, size 60

Prior to finalising your design, please request certified installation drawing.
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Version A10VO 60

DR
DRG
DFR /52 R-X W C 12 N00
DFR1 62

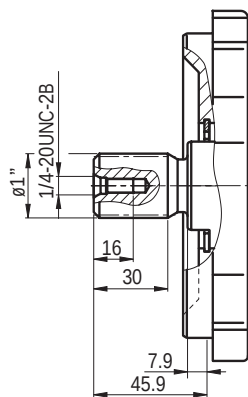


Shaft W 32-4; SAE J744 OCT 83

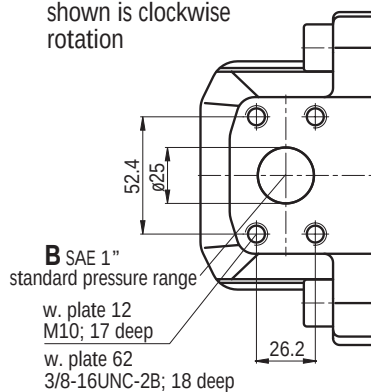
1" splined shaft size; 30° pressure angle
15 teeth; 16/32 DP

Shaft U 25-4; (SAE B-B) SAE J744 OCT 83

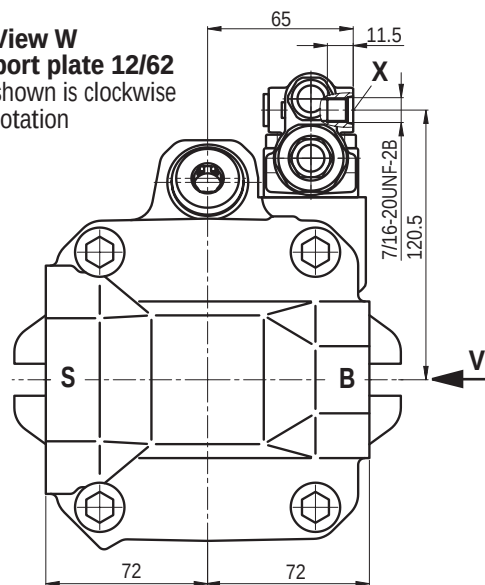
1" splined shaft size; 30° pressure angle
15 teeth; 16/32 DP



View V
shown is clockwise
rotation



View W
port plate 12/62
shown is clockwise
rotation



For ccw - rotation, turn port plate 180°

S, K shaft and 4 hole mounting flange, see page 14.

Ports

B	Pressure port	SAE 1" (Standard pressure range)
S	Inlet port	SAE 2" (Standard pressure range)
L/L ₁	Case drain	7/8-14UNF-2B
X	Pilot port	7/16-20UNF-2B

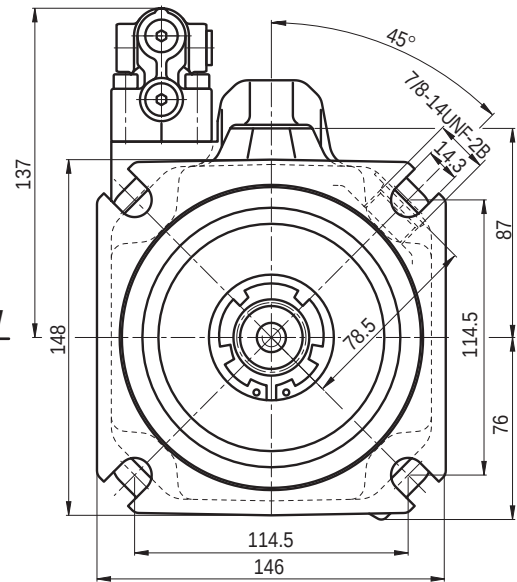
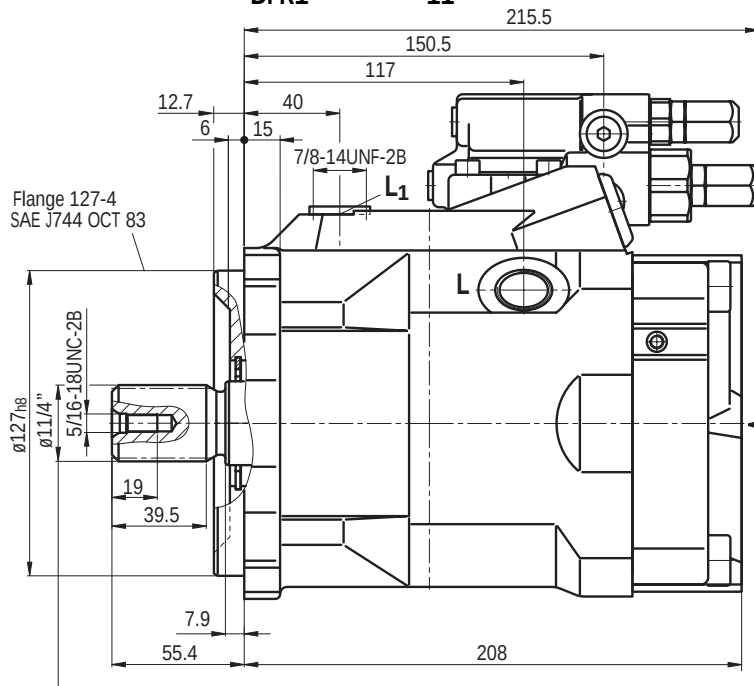
with control DR, pilot port X is plugged

Unit dimensions, size 60

Prior to finalising your design, please request certified installation drawing.
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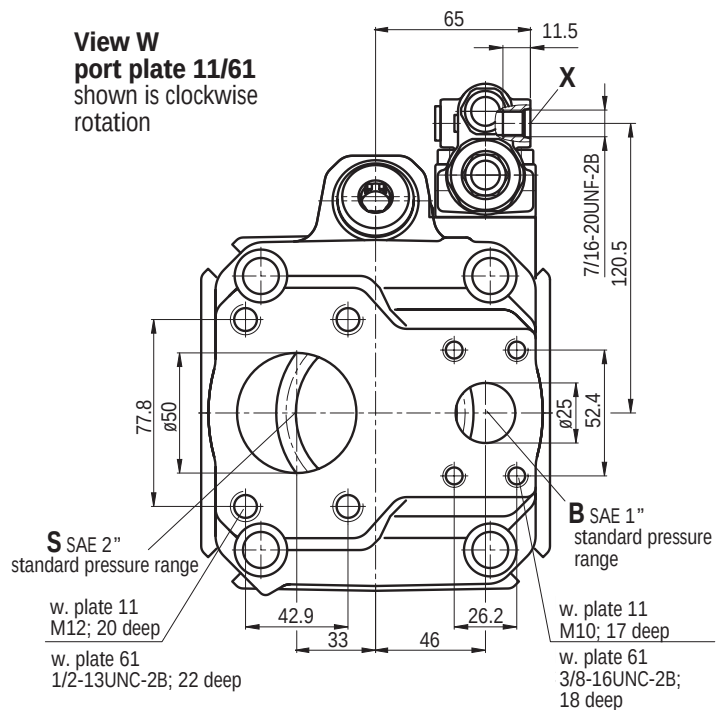
Version A10VO 60

DR
DRG
DFR /52 R-X S D 61 N00
DFR1 11



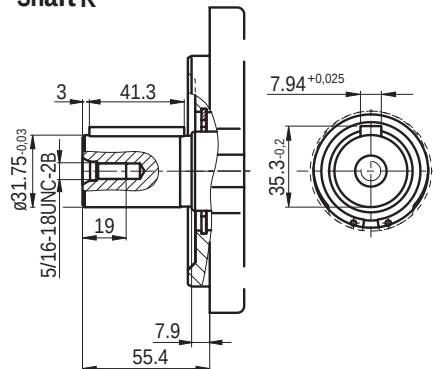
Shaft S 32-4; SAE J744 OCT 83
1 1/4" splined shaft size; 30° pressure angle
14 teeth; 12/24 DP

View W
port plate 11/61
shown is clockwise
rotation



For ccw - rotation, turn port plate 180°

Shaft K



W, U shaft and 2 hole mounting flange, see page 13.

Ports

B	Pressure port	SAE 1"	(Standard pressure range)
S	Inlet port	SAE 2"	(Standard pressure range)
L/L ₁	Case drain	7/8-14UNF-2B	
X	Pilot port	7/16-20UNF-2B	

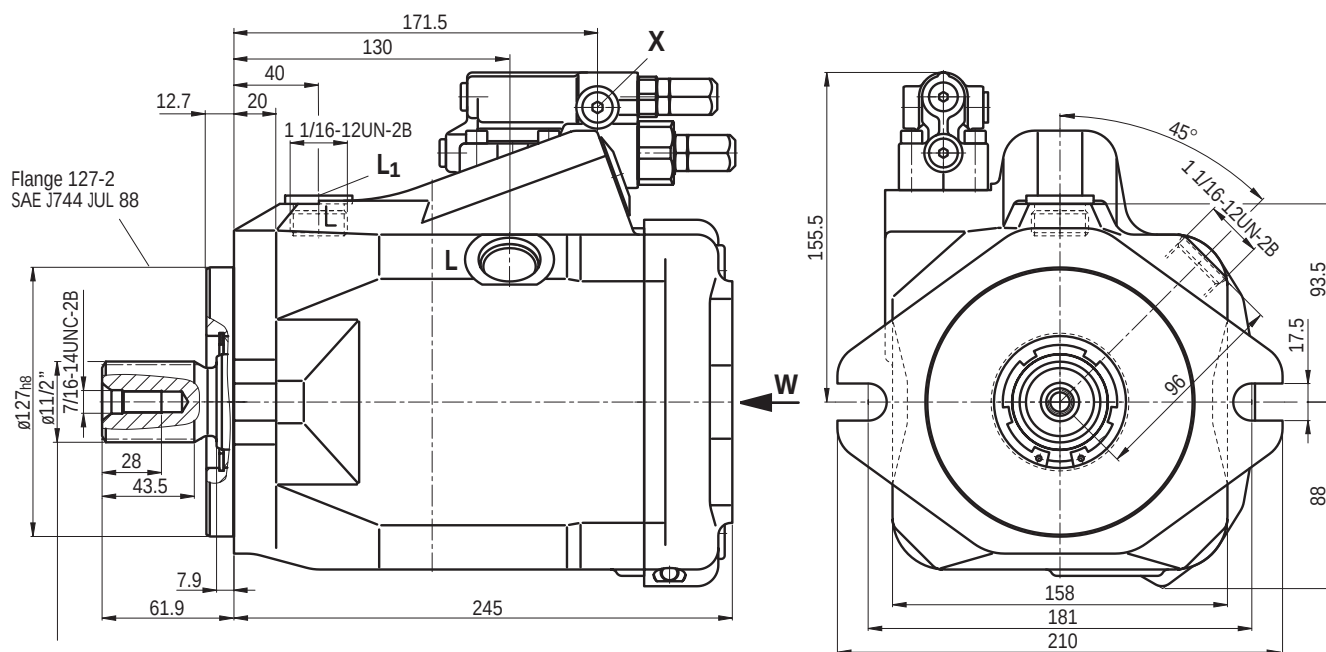
with control DR, pilot port X is plugged

Unit dimensions, size 85

Version A10VO 85

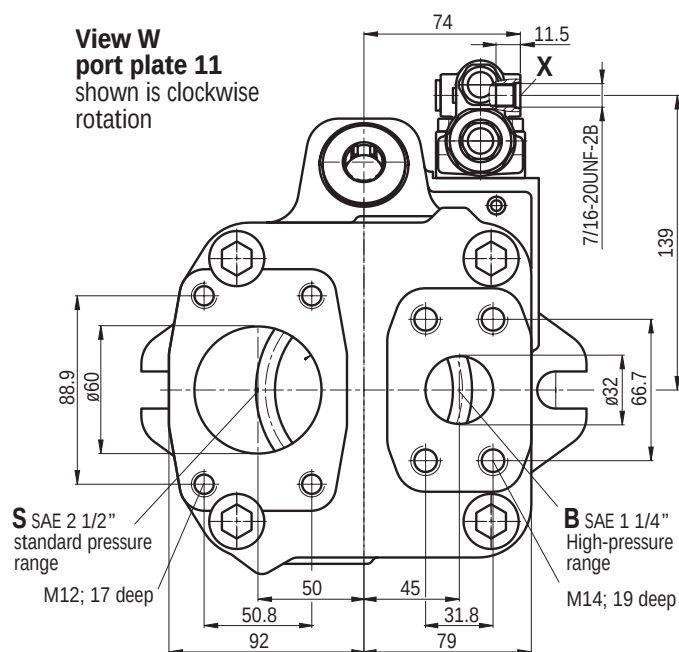
DR
DRG
DFR /52 R -X S C 11 N00
DFR1

Prior to finalising your design, please request certified installation drawing.
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Shaft S 38-4; SAE J744 JUL 88
1 1/2" splined shaft size; 30° pressure angle
17 teeth; 12/24 DP

View W
port plate 11
shown is clockwise
rotation



For ccw - rotation, turn port plate 180°

Ports

B	Pressure port	SAE 1 1/4"	(High-pressure range)
S	Inlet port	SAE 2 1/2"	(Standard pressure range)
L/L ₁	Case drain	1 1/16-12UN-2B	
X	Pilot port	7/16-20UNF-2B	

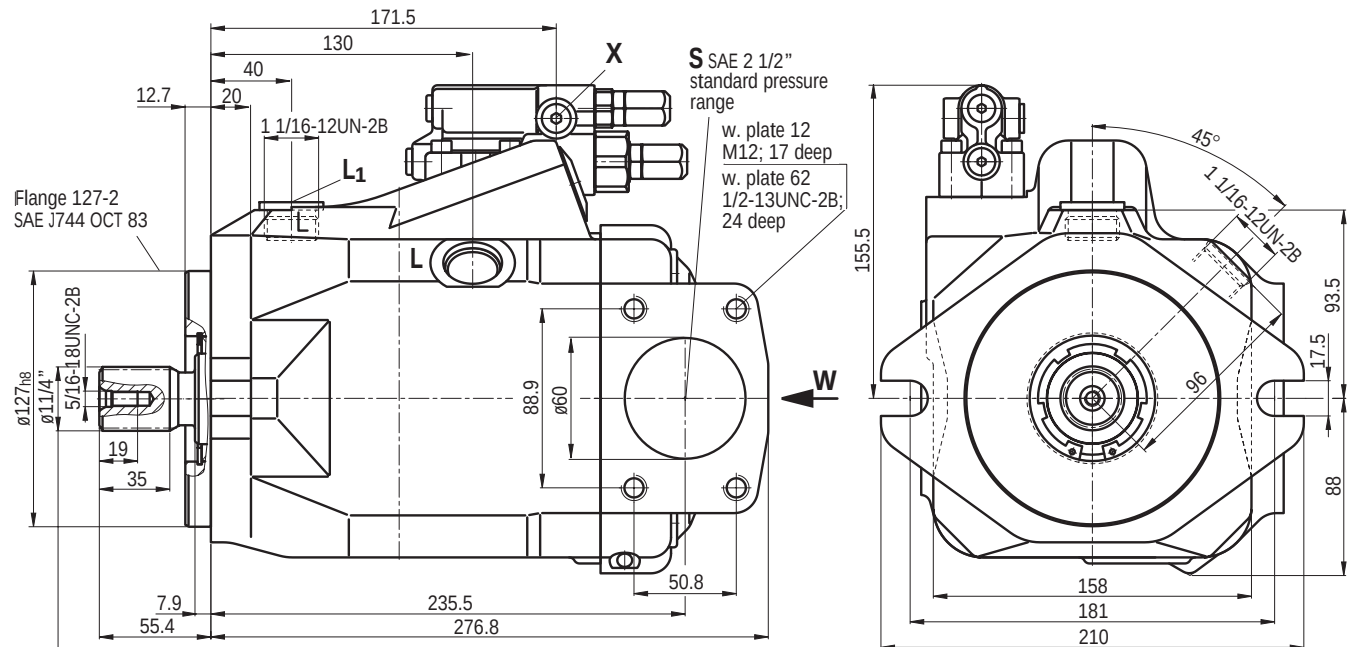
with control DR, pilot port X is plugged

Unit dimensions, size 85

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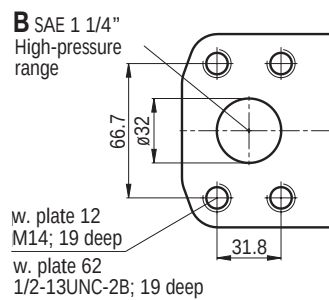
Version A10VO 85

DR
DRG
DFR /52 R -X U C **12** N00
DFR1 **62**

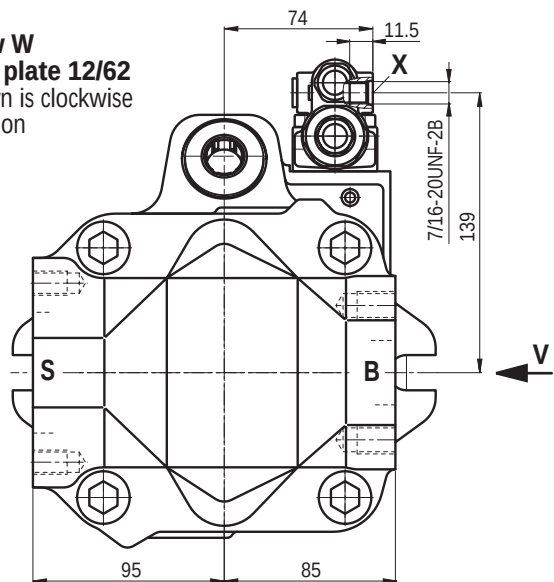


Shaft U 32-4; SAE J744 OCT 83
1 1/4" splined shaft size; 30° pressure angle
14 teeth; 12/24 DP

View V
shown is clockwise
rotation



View W
port plate 12/62
shown is clockwise
rotation



For ccw - rotation, turn port plate 180°

Ports

B	Pressure port	SAE 1 1/4"	(High-pressure range)
S	Inlet port	SAE 2 1/2"	(Standard pressure range)
L/L ₁	Case drain	1 1/16-12UN-2B	
X	Pilot port	7/16-20UNF-2B	

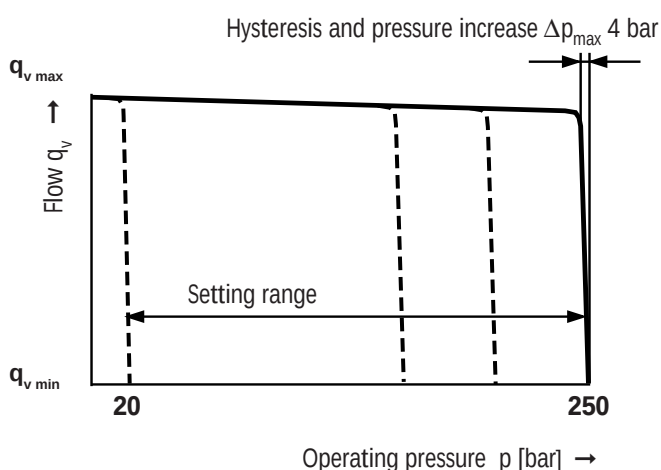
with control DR, pilot port X is plugged

DR Pressure control

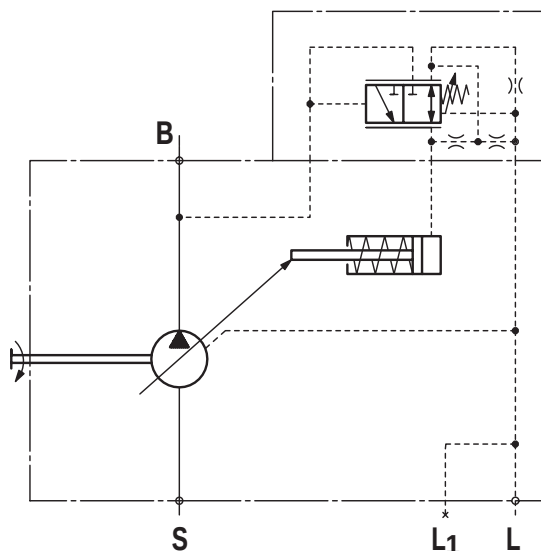
The pressure control serves to maintain a constant pressure in the hydraulic system, within the control range of the pump. The pump therefore supplies only the amount of hydraulic fluid required by the actuators. Pressure may be steplessly set at the pilot valve. Dimensions see pages 8, 10 and 13 to 16.

Static characteristic

(at $n_1 = 1500 \text{ rpm}$; $t_{oil} = 50^\circ\text{C}$)



Control oil consumption max. 3 L/min.



Dynamic characteristics

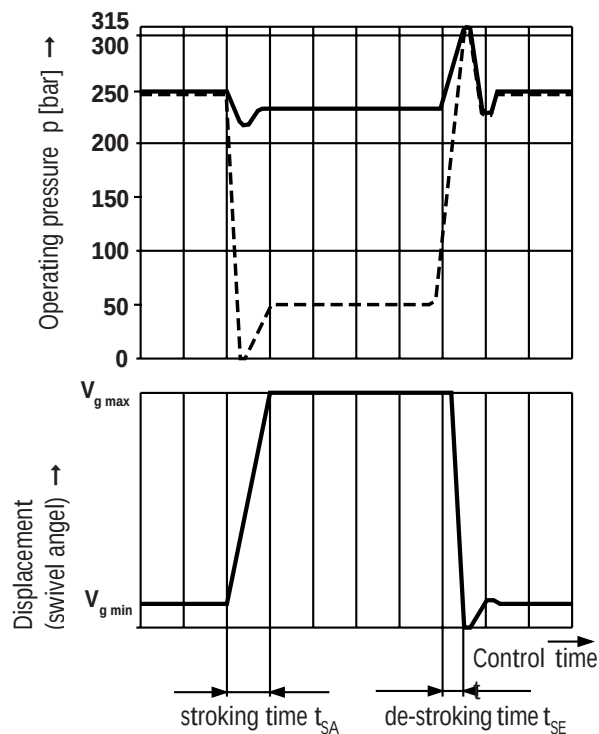
The curves show average measured values under test conditions, unit in the tank.

Conditions: $n = 1500 \text{ rpm}$

$t_{oil} = 50^\circ\text{C}$

Line relief valve set at 315 bar

Jump loading by suddenly opening or closing the pressure line using a pressure relief valve at 1m downstream from the axial piston unit.



Size	t_{SA} (ms) against 50 bar	t_{SA} (ms) against 220 bar	t_{SE} (ms) zero stroke 250 bar
28	70	65	20
45	85	75	20
60	100	85	25
85	on request		

DRG Pressure-remote control

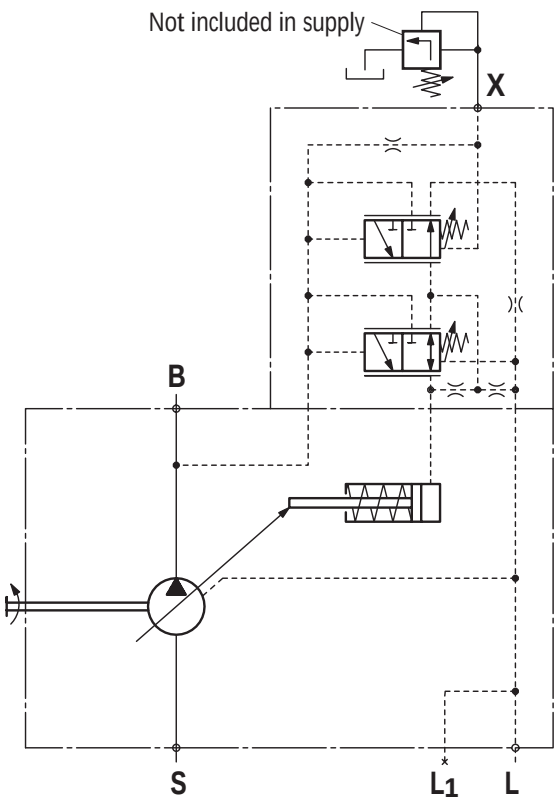
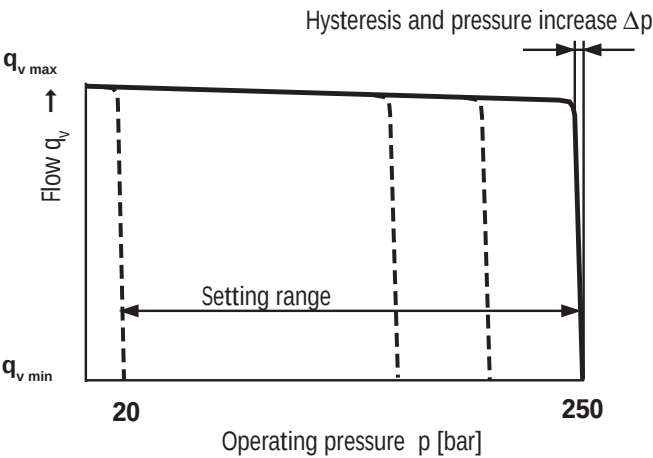
Function and design as for DR.

A pressure relief valve may be externally piped to port X for remote control purposes. It is not, however, included with the DRG control. The differential pressure at the pilot valve is set as standard to 20 bar and this results in a pilot flow of 1.5 L/min. If another setting is required (in the range 10 – 22 bar), please state this in clear text.

We recommend that one of the following is used as the separate pressure relief valve:
DBDH 6 (hydraulic) to RE 25402 or
DBETR-SO 381 with 0.8 mm dia. nozzle in P (electrical) to RE 29166.
The length of piping must not exceed 2 m.

Static characteristic

(at $n_1 = 1500 \text{ rpm}$; $t_{oil} = 50^\circ\text{C}$)



Unit dimensions see pages 8, 9 and 11 to 16.

Control data

Hysteresis and repetitive accuracy Δp max. 3 bar

Max. pressure increase

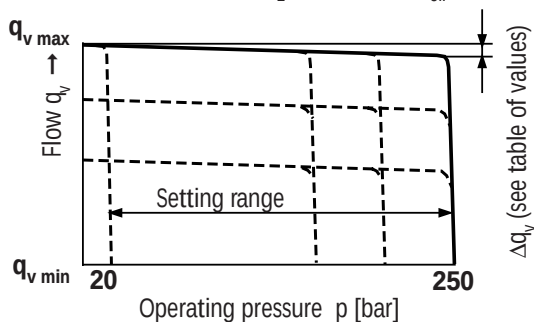
Size	28	45	60	85
Δp bar	4	6	8	on request

Control oil consumption approx. 4.5 L/min
Flow loss at $q_{v \text{ max}}$ see page 6.

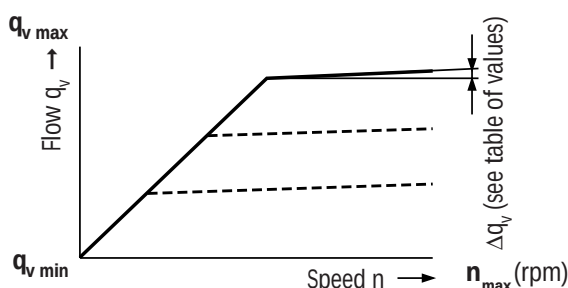
DFR/DFR1 Pressure/flow control

In addition to the pressure control function, the pump flow may be varied by means of a differential pressure at the actuator (e.g. an orifice resp. mobile valve block s.b.; not included in supply). The pump flow is equal to the actual required flow by the actuator. The DFR1-valve has no connection between X and tank.

Static characteristic (at $n_1 = 1500 \text{ rpm}$; $t_{oil} = 50^\circ\text{C}$)



Static characteristic at variable speed

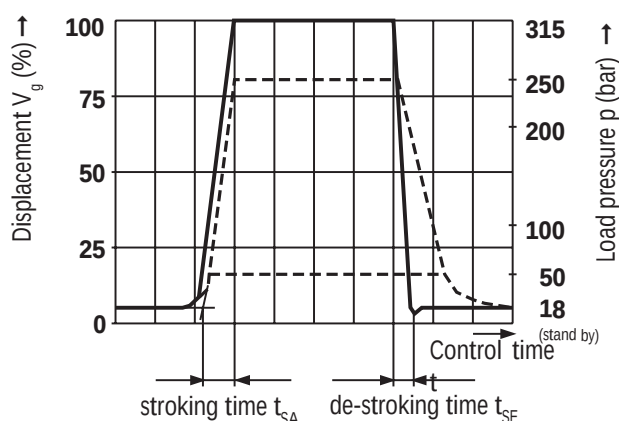


Max. Flow deviation (hysteresis and increase)
measured at drive speed $n = 1500 \text{ rpm}$

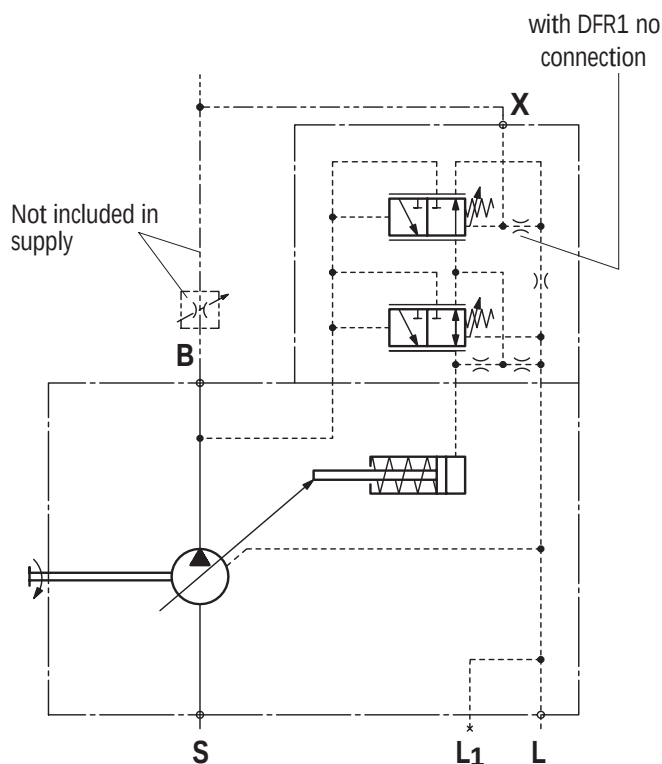
Size	28	45	60	85
$\Delta q_v \text{ L/min}$	1.0	1.8	2.5	on request

Dynamic characteristic of flow control

The curves shown are measured average values under test conditions, with the unit within the tank.



Size	$t_{SA} \text{ (ms)}$ stand by—250 bar	$t_{SE} \text{ (ms)}$ 250 bar—stand by	$t_{SE} \text{ (ms)}$ 50 bar—stand by
28	80	20	50
45	100	25	60
60	120	30	75
85	on request		



Control oil consumption max. 3 L/min.

Flow control/differential pressure Δp :

Adjustable between 10 and 22 bar

Standard setting: 14 bar.

If a different setting is required, please state in clear text.

When port X is unloaded to tank, a zero stroke pressure of $p = 18 \pm 2 \text{ bar}$ ("stand by") results (dependent on Δp).

Unit dimensions see pages 8, 9 and 11 to 16.

Optional valves at port B

(not included in supply)

LS - mobile valve blocks

Mobile valve blocks M4-12 (RE 64278)

Mobile valve blocks M4-15 (RE 64282)

Mobile valve blocks SX 18 (RE 64127)

Mobile valve blocks MP 18 (RA 64960)

Mobile valve blocks MP 22 (RA 64980)

LUDV - mobile valve blocks*

Mobile valve blocks M6 15 (RE 64284)

Mobile valve blocks M7 22 (RE 64287)

Mobile valve blocks SX 14 (RE data sheet currently in preparation)

* The setting of the pump pressure control must be about 20 bar greater than the setting of the LS pressure limiting valve in the LUDV block.

Through-drive

The A10VO axial piston unit can be supplied with through-drive in accordance with the ordering code on page 3.

The through-drive version is designated by the code numbers (K01–K24).

If no other pumps are fitted by the manufacturer, the simple type designation is sufficient.

In this case, the delivery package comprises:

Hub, fixing screws, seal.

Combination pumps

By mounting additional pumps, the user can use mutually independent circuits.

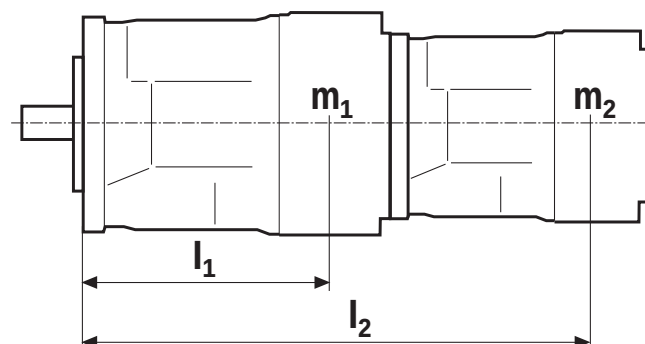
If the combination pump consists of **two A10VO units** and if these pumps **should be supplied ready-assembled together**, the two type designations should be joined by "+".

Example order:

A10VO 45 DR/52 L–PSC62K04 + A10VO 45 DR/52 L–PSC61N00

If you wish a gear pump to be factory-fitted as add-on pump, please contact us.

Permissible moment of inertia



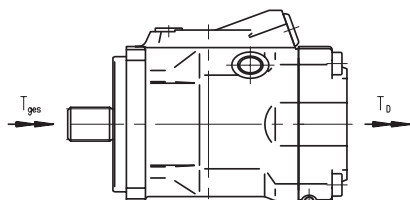
m_1, m_2 [kg] Pump mass
 l_1, l_2 [mm] Centre-to-centre spacing

$$T_m = (m_1 \cdot l_1 + m_2 \cdot l_2) \cdot \frac{1}{102} \quad [\text{Nm}]$$

Size			28	45	60	85
Permissible moment of inertia T_m	Nm					
Permissible moment of inertia at dynamic mass acceleration T_m	Nm					
10 g $\triangleq$ 98.1 m/sec ²						
Mass	m_1	kg	14	18	22	34
Centre-to-centre spacing	l_1	mm	81	95	100	122
Missing values available on request						

Missing values available on request

Maximum permissible input and through-drive torque



The split in torque between pump 1 and 2 is optional. The max. permissible input torque T_{tot} as well as the max. permissible through-drive torque T_D may not be exceeded.

Size			28	45	60	85
Max. permissible input torque at pump 1 with shaft "S"						
	T _{tot}	Nm	198	319	630	1157
Max. permissible through-drive torque						
	T _D	Nm	160	319	484	778

Size			28	45	60	85
Max. permissible input torque at pump 1 with shaft "R"						
	T _{tot}	Nm	225	400		
Max. permissible through-drive torque						
	T _D	Nm	176	365		

Missing values available on request

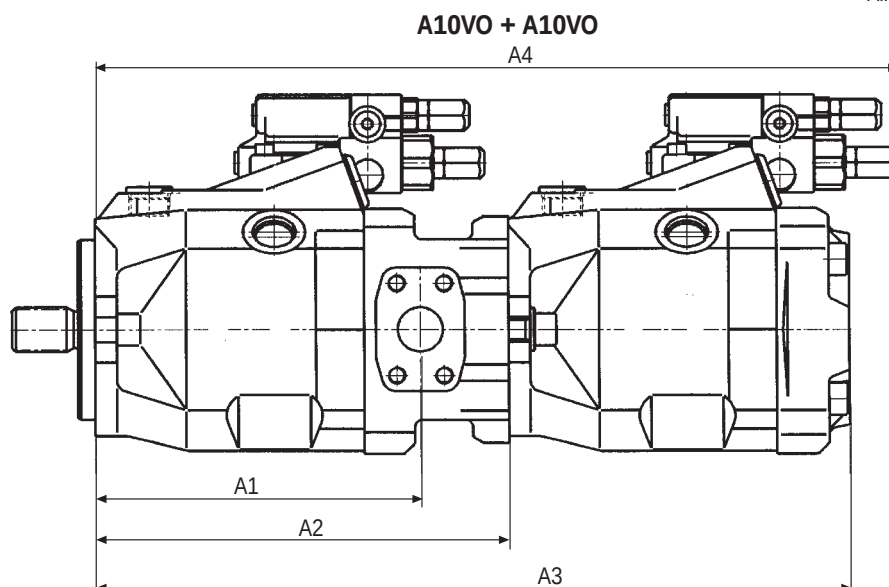
Size	28	45	60	85
Max. permissible input torque at pump 1 with shaft "U"				
T_{tot} Nm	-	188	306	628
Max. permissible through-drive torque				
T_D Nm	-	188		

Size			28	45	60	85
Max. permissible input torque at pump 1 with shaft "W"						
	T _{tot}	Nm	-	220	396	
Max. permissible through-drive torque						
	T _D	Nm	-	220	396	

Size		28	45	60	85
Max. permissible input torque at pump 1 with shaft "K"					
	T _{tot}	Nm	145	212	441
Max. permissible through-drive torque					
	T _D	Nm	145	212	

Unit dimensions of the combination pump and through-drive K01, K52

Prior to finalising your design, please request certified installation drawing.
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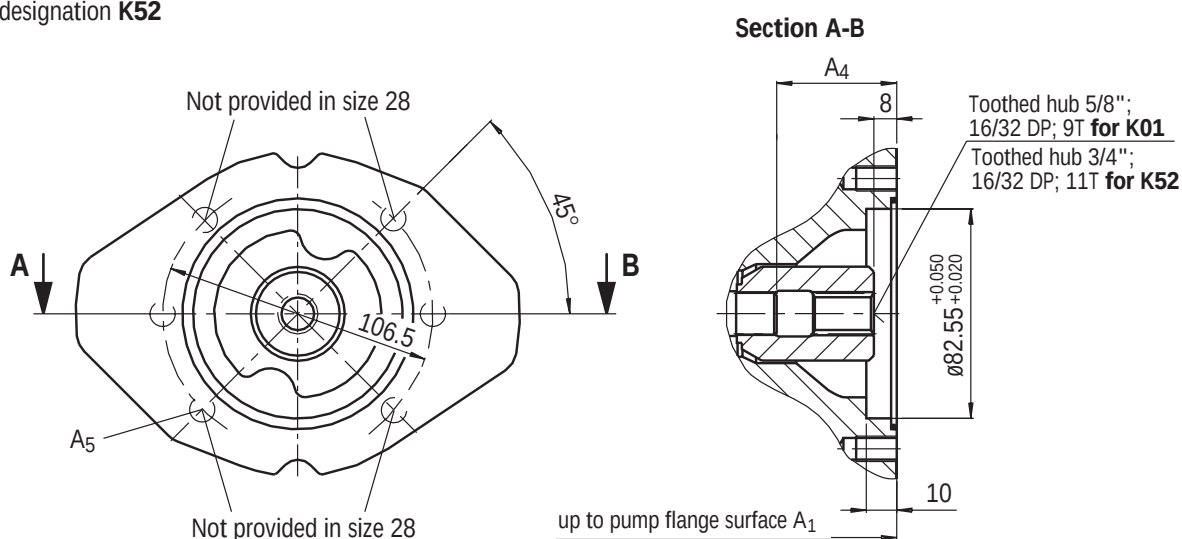


Main pump	A10VO 28				A10VO 45				A10VO 60				A10VO 85			
Aux pump	A ₁	A ₂	A ₃	A ₄	A ₁	A ₂	A ₃	A ₄	A ₁	A ₂	A ₃	A ₄	A ₁	A ₂	A ₃	A ₄
A10VO 28	160	204	374	414	178	229	399	439	202	255	425	465	236			
A10VO 45	-	-	-	-	178	229	418	445	202	255	444	471	236			
A10VO 60	-	-	-	-	-	-	-	-	202	255	463	471	236			
A10VO 85	-	-	-	-	-	-	-	-	-	-	-	-	236	302	537	537

Missing values available on request

Flange SAE 82-2 (SAE A, 2-hole) for adding an externally geared gear pump 1PF2G2 (see RE 10030)
or an internally geared gear pump PGF2 (shaft J, flange U2, see RE 10213)
Order designation **K01**

Flange SAE 82-2 (SAE A, 2-hole) for adding an A10VSO 10 (shaft S, flange C, see RE 92713)
or an A10VSO 18 (shaft S, flange C, see RE 92712)
Order designation **K52**



Main pump Size	A ₁	A ₄	A ₅
28	204	47	M 10; 16 deep
45	229	53	M 10; 16 deep
60	255	59	M 10; 16 deep

in size 28, the variable displacement pump A10VSO18 can only be mounted at 45° angle.

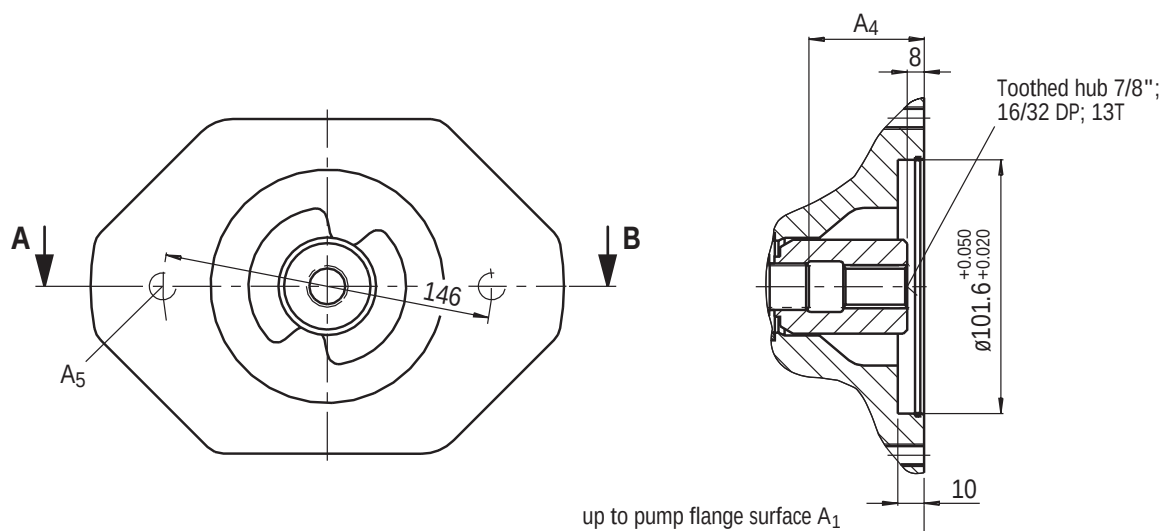
Dimensions of through-drives K02 and K68

Prior to finalising your design, please request certified installation drawing.
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Flange SAE 101-2 (SAE B, 2-hole) for mounting an externally geared gear pump 1PF2G3 (see RE 10039)

Order designation **K02**

Section A-B



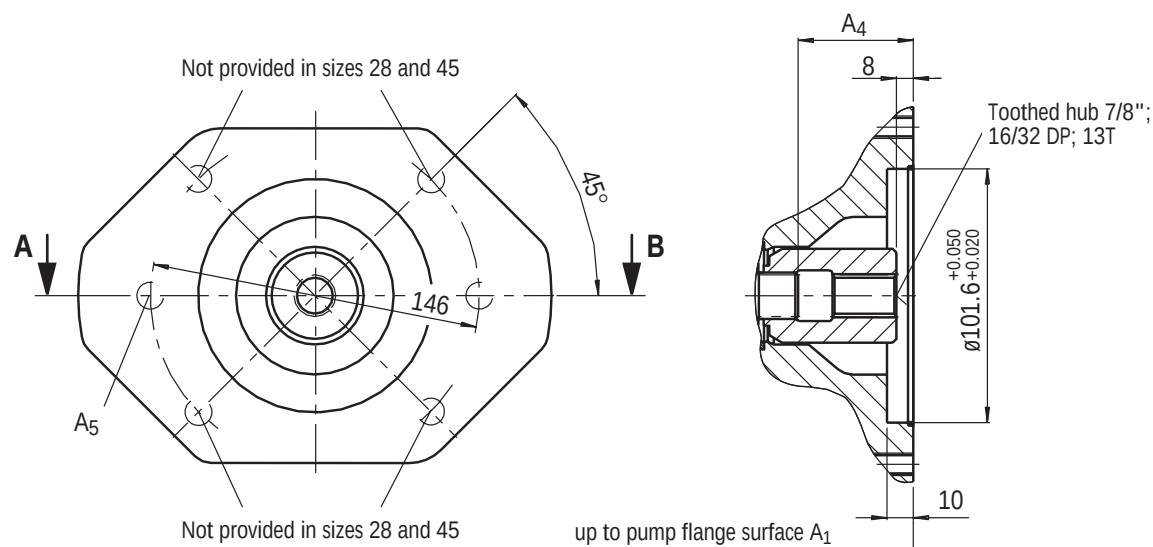
Main pump

Size	A ₁	A ₄	A ₅
45	229	53	M 10; 16 deep

Flange SAE 101-2 (SAE B, 2-hole) for mounting an A10VO 28 (shaft S)
or an internally geared gear pump PGF3 (shaft J, flange U2, see RE 10213)

Order designation **K68**

Section A-B



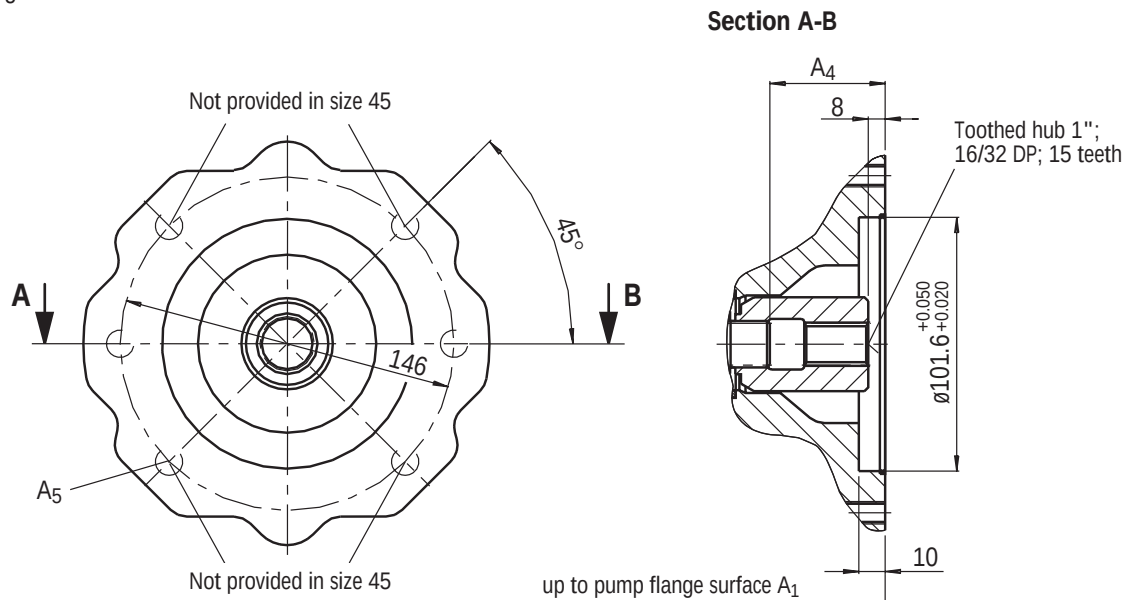
Main pump

Size	A ₁	A ₄	A ₅
28	204	47	M 12; 18 deep
45	229	53	M 12; 18 deep
60	255	59	M 12; 18 deep

Dimensions of through-drives K04 and K15

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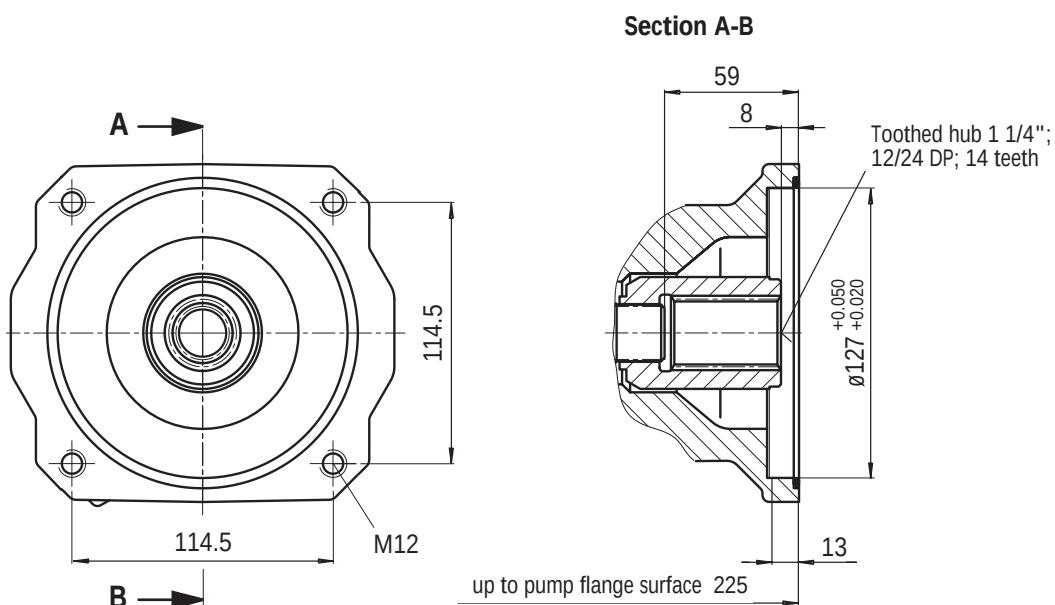
Flange SAE 101-2 (SAE B, 2-hole) for mounting an A10VO 45 - shaft S,
or an internally geared gear pump PGH4 (shaft J, flange U2, see RE 10223)
Order designation **K04**



Main pump Size	A ₁	A ₄	A ₅
45	229	53	M 12; 18 deep
60	255	59	M 12; 18 deep

Flange SAE 127-4 (SAE C) for mounting an A10VO 60 (shaft S, mounting flange D)
Order designation **K15**

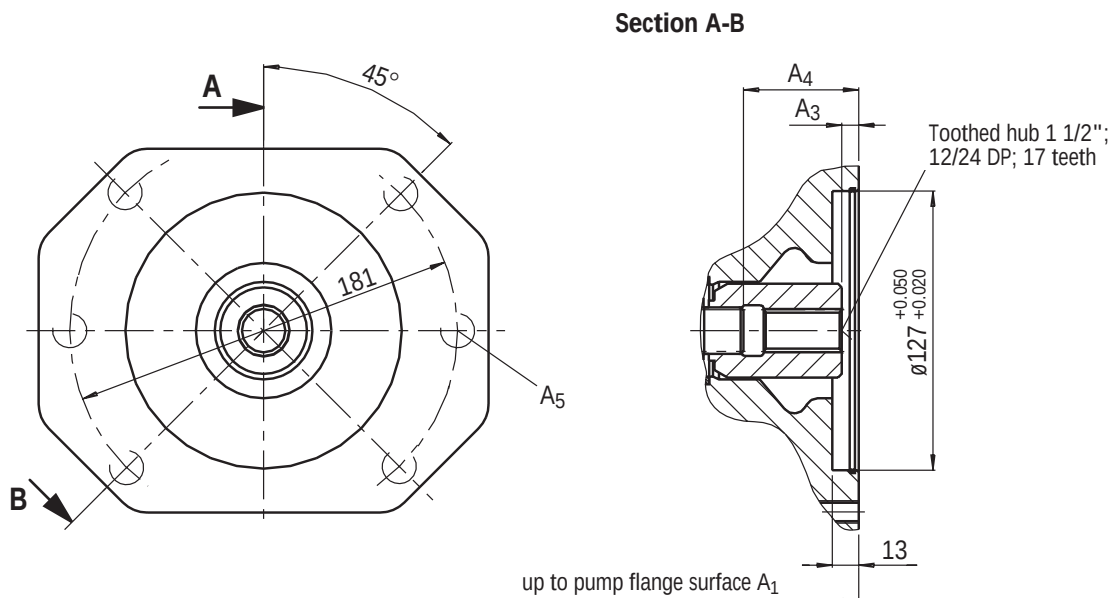
Main pump size 60



Dimensions of through-drives K24

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Flange SAE 127-2 (SAE C) for mounting an A10VO 85 - shaft S,
or an internally geared gear pump PGH5 (shaft J, flange U2, see RE 10223)
Order designation **K24**



Main pump

Size	A ₁	A ₃	A ₄	A ₅
85	302	8	68	M 16; 24 deep

Preferred types (shorter delivery times)

When ordering, please quote type and ID number.

Type	ID number
A10VO 45 DFR/52R-PSC64N00	970 014
A10VO 60 DFR1/52R-PSD61N00	974 886

Brueninghaus Hydromatik GmbH

Horb Plant

An den Kelterwiesen 14 • D-72160 Horb
Telefon +49 (0) 74 51 / 92-0
Telefax +49 (0) 74 51 / 82 21

The specified data is for product description purposes only and may not be deemed to be guaranteed unless expressly confirmed in the contract.