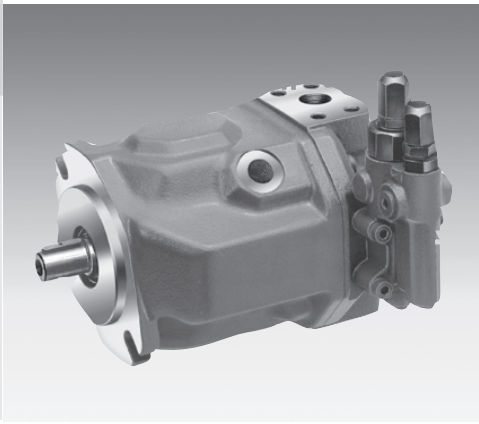
Rexroth
Bosch Group

Variable Axial Piston Pump (A)A10VSO

RA 92711/05.04 1/36
Replaces: RA 92 712/05.95

Open circuit



Size 18 ... 140
Series 31
Nominal pressure 4000 psi (280 bar)
Peak pressure 5100 psi (350 bar)

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Features

- Variable displacement axial piston pump of swashplate design for hydrostatic open circuit systems
- Flow is proportional to drive speed and displacement. It can be infinitely varied by adjustment of the swashplate.
- SAE mounting flange
- Flange connections to SAE
- Two case drain ports
- Good suction characteristics
- Permissible continous pressure 280 bar (4000 PSI)
- Low noise level
- Long service life
- Axial and radial load of drive shaft possible
- High power-weight ratio
- Wide range of controls
- Short response times
- Through drive option for multi-circuit system

Ordering code – standard range

Hydraulic Fluid, Type of rotary group	**18...45**	**71...140**	
Mineral oil and HFD (no code)	●	●	
HFA, HFB and HFC - Fluids	●	●	**E**
High-Speed-Version	–	●	**H**

Axial Piston Unit		
Swashplate design, variable	size 18	**A10VS**
	size 28 to 140	**AA10VS**

Type of operation	
Pump in open circuit	**O**

Size		**18**	**28**	**45**	**71**	**100**	**140**
Displacement $V_{g\ max}$	in^3/rev.	1.10	1.71	2.75	4.33	6.10	8.54
	cm^3/rev.	18	28	45	71	100	140

Control device			**18**	**28**	**45**	**71**	**100**	**140**	
Two-position control, direct controls	DG		●	●	●	●	●	●	**DG**
Pressure control	DR		●	●	●	●	●	●	**DR**
	DR	G	●	●	●	●	●	●	**DRG**
remote control									
Pressure flow control	DFR		●	●	●	●	●	●	**DFR**
	DFR	1	●	●	●	●	●	●	**DFR1**
without orifice between X and tank									
Pressure, flow and power control			–	●	●	●	●	●	**DFLR**
Pressure and flow control, electronic, see RA30022			●	●	●	●	●	●	**DFE1**
Electro-hydraulic pressure control, see RE92707			●	●	●	●	●	●	**ED**

Series	
	31

Direction of rotation		
Viewed on shaft end	clockwise	**R**
	counter clockwise	**L**

Seals	
NBR nitril-caoutchouc, shaft seal in FKM	P
FKM flour-caoutchouc	V

Shaft end	**18**	**28**	**45**	**71**	**100**	**140**	
SAE Parallel with key	●	●	●	●	●	●	**K**
SAE Splined shaft	●	●	●	●	●	●	**S**
SAE Splined shaft (higher through drive torque)	●	●	●	●	–	–	**R**
SAE Splined shaft (not suitable for through drive)	●	–	●	–	●	–	**U**

Mounting flange	**18**	**28**	**45**	**71**	**100**	**140**	
SAE 2-bolt	●	●	●	●	●	–	**C**
SAE 4-bolt	–	–	–	–	–	●	**D**

● = available

❍ = in preparation

\- = not available

	AA10VS	O			/	31		-					

Hyraulic Fluid, Type of rotary group

Axial Piston Unit

Type of operation

Size

Control device

Series

Direction of rotation

Seals

Shaft end

Mounting flange

Service line connections		**18**	**28**	**45**	**71**	**100**	**140**	
Pressure port B and suction port S:	SAE ports at opposite sides	●	●	●	-	●	●	**62**
	UNC fixing threads	-	-	-	●	-	-	**92**

Through drives			**18**	**28**	**45**	**71**	**100**	**140**	
without through drive			●	●	●	●	●	●	**N00**
with through drive to accept an axial piston pump or a gear pump									
Mounting flange SAEJ744	hub	sealing							
82-2(A)	keyed (A-B)	axial	❍	●	●	●	●	●	**K40**[1]
101-2 (B)	keyed (B)	axial	–	●	●	●	●	●	**K03**[1]
101-2 (B-B)	keyed (B-B)	axial	–	–	●	●	●	●	**K05**[1]
127-2 (C)	keyed (C)	axial	–	–	–	●	●	●	**K08**[1]
127-2 (C)	keyed (C)	radial	–	–	–	–	●	●	**K38**[1]
152-4 (D)	keyed (D)	axial	–	–	–	–	–	●	**K21**[1]
82-2 (A)	5/8 in (A)	axial	●	●	●	●	●	●	**K01**
82-2 (A)	3/4 in (A-B)	axial	●	●	●	●	●	●	**K52**
101-2 (B)	7/8 in (B)	axial	–	●	●	●	●	●	**K68**
101-2 (B)	1 in (B-B)	axial	–	–	●	●	●	●	**K04**
127-2 (C)	1 1/4 in (C)	axial	–	–	–	●	●	●	**K07**
127-2 (C)	1 1/2 in (C-C)	axial	–	–	–	–	●	●	**K24**
152-4 (D)	1 3/4 in (D)	axial	–	–	–	–	–	●	**K17**

[1] Not for new projects. Permitted with reduced through drive torque only (see page 26).

Fluids

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

When using environmentally acceptable hydraulic fluids possible limitations for the technical data 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

ν_{opt} = opt. operating viscosity 16...36 mm²/s (80...170 SUS)

referred to tank temperature at open circuit.

Viscosity limits

The limiting values for viscosity are as follows:

ν_{min} = 10 mm²/s (60 SUS)
short term (t ≤ 1 min)
at a max. permissible leakage oil temperature
of t_{max} = 90 °C (195 °F).

Please note that the max. fluid temperature of 90 °C (195 °F) is also not exceeded in certain areas (for instance bearing area). The temperature in the bearing area is approx. 7 °F (5 K) higher than the average leakage fluid temperature.

ν_{max} = 7500 SUS (1600 mm²/s)
short term (t ≤ 1min)
on cold start
(p ≤ 30 bar (435 PSI), n ≤ 1000 rpm,
t_{min} = –25 °C (–13 °F)

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 viscosity is within the op-timum 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 (°F) the operating temperature in the tank is 60 °C (140 °F). 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 oil temperature is influenced by pressure and speed and is typically higher than the tank temperature. However max. temperature at any point in the system may not exceed 90 °C (195 °F).

At high temperatures please use FKM seals.

If the above mentioned conditions cannot be kept due to extreme operating parameters or high ambient temperatures, please consult us.

Filtration of fluid

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

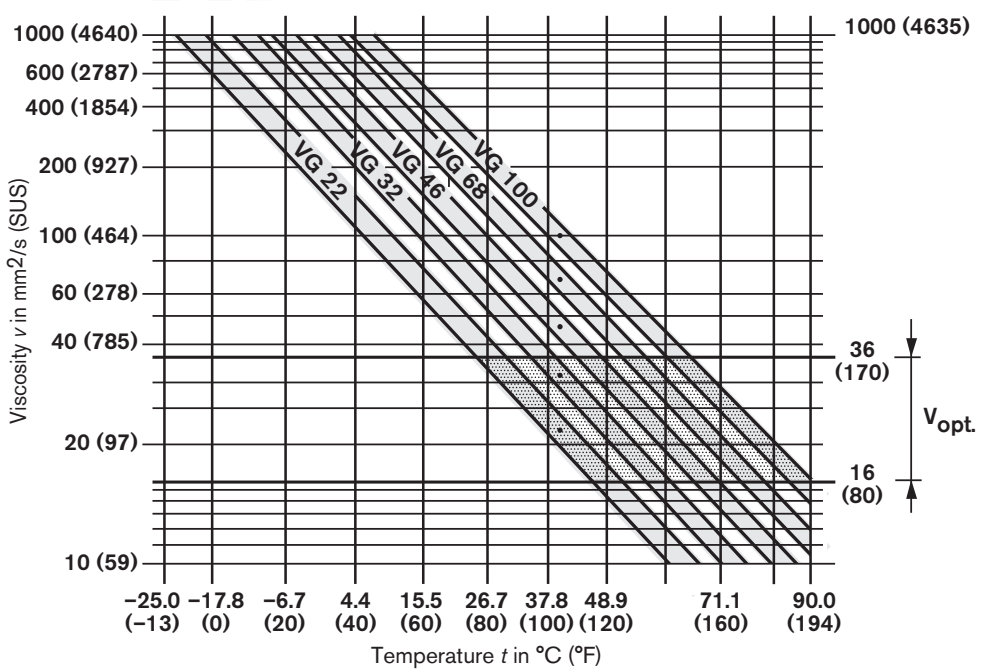
To ensure a reliable functioning of the axial piston unit, a minimum cleanliness of

20/18/15 acc. to ISO 4406[1)] is necessary.

If the above cleanliness classes cannot be met please consult us.

[1)] draft issue 1999

Selection diagram



Technical data

Inlet operating pressure range

Absolute pressure at port S

$p_{abs\ min}$ ____ 0.8 bar (12 PSI)

$p_{abs\ max}$ ____ 30 bar (435 PSI)

Output operating pressure range

Pressure at port B

Nominal pressure p_N ____ 280 bar (4000 PSI)

Peak pressure p_{max} ____ 350 bar (5100 PSI)

(Pressure data to DIN 24312)

Applications with intermittet operating pressure up to 315 bar (4600 PSI) at < 10 % duty are permissible.

Limitation of pump output pressure spikes is possible with relief valve blocks mounted directly on flange connection, acc. to data sheets RA 25 880 and RE 25 890 to be ordered separately.

Direction of flow

S to B.

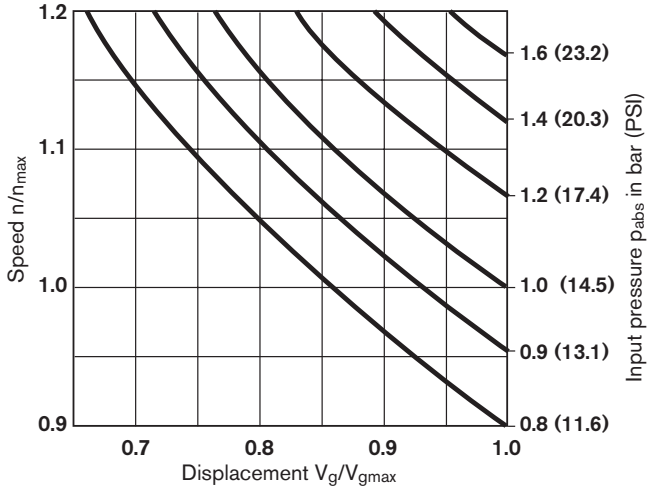
Case drain pressure

The max. permissible pressure of the leakage fluid (at port L, L_1) max. 0.5 bar (7 PSI) higher than inlet pressure at port S, but not higher than 2 bar (29 PSI) absolute.

$p_{L\ abs\ max}$ ____ 2 bar (29 PSI)

Maximum permissible speed (Speed limit)

Graph, showing permissible speed with increased inlet pres-sure at port S (pw_{abs}) resp. reduced displacement ($V_g < V_{g\ max}$).



High speed version

The size 71...140 is available in an optional high speed version. This version allows higher drive speeds at max. displacement (higher output flow) without affecting outside dimensions, see table on page 6.

Important: The drive speed increase (1.2 • n_0) refers to the standard drive speed n_0.

e.g. size 100: n_{max} = 1.2 • 2000 rpm = 2400 rpm

WRONG: 1.2 • 2400 rpm = 2880 rpm

Mechanical displacement limiter

Mechanical displacement limiter is standard on the non-through drive model N00, but not possible for the model with through drive.

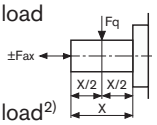
Exception: With DFE1 control a max. displacement screw is not possible at all.

$V_{g\ max}$: for sizes 18 to 140
Setting range from 50 % to $V_{g\ max}$ stepless

$V_{g\ min}$: for sizes 100 to 140
Setting range from zero to 50 % of $V_{g\ max}$ stepless

Technical Data

Table of values

Size (A)A10VSO Standard / AA10VSO High Speed			18	28	45	71	100	140	71	100	140
Displacement	$V_{g\ max}$	cm^3 (in^3)	18 (1.10)	28 (1.71)	45 (2.75)	71 (4.33)	100 (6.10)	140 (8.54)	71 (4.33)	100 (6.10)	140 (8.54)
Speed[1], max.											
at $V_{g\ max}$	$n_{0\ max}$	rpm	3300	3000	2600	2200	2000	1800	2550	2300	2050
at increased inlet pressure p_{abs} resp. $V_g < V_{gmax}$	$n_{0\ max\ perm.}$	rpm	3900	3600	3100	2600	2400	2100	2600	2400	2100
Flow, max											
at $n_{0\ max}$	$q_{vo\ max}$	L/min (GPM)	59.4 (15.7)	84 (22)	117 (31)	156 (41)	200 (53)	252 (67)	181 (48)	230 (61)	287 (76)
at $n_E = 1800$ rpm	q_{vo}	L/min (GPM)	32 (7.2)	59 (13.3)	81 (21.4)	128 (33.8)	180 (47.6)	252 (67)	128 (33.8)	180 (47.6)	252 (67)
Power, max. ($\Delta p = 280$ bar (4000 PSI)) at $n_{0\ max}$	$P_{o\ max}$	kW (HP)	28 (36.6)	39 (51)	55 (72)	73 (96)	93 (124)	118 (156)	84 (112)	107 (142)	134 (177)
at $n_E = 1800$ rpm	P	kW (HP)	15 (19)	24 (31)	38 (50)	69 (79)	84 (111)	118 (156)	69 (79)	84 (111)	118 (156)
Torque, max.											
at $V_{g\ max}$ $\Delta p = 280$ bar (4000 PSI)	T_{max}	Nm (ft-lb)	80 (58)	125 (91)	200 (146)	316 (230)	445 (324)	623 (453)	316 (230)	445 (324)	623 (453)
at $V_{g\ max}$ $\Delta p = 100$ bar (1450 PSI)	T	Nm (ft-lb)	28.6 (14.6)	45 (33)	72 (53)	113 (83)	159 (117)	223 (164)	113 (83)	159 (117)	223 (164)
Moment of inertia (about drive axis)	J	kgm^2 ($lbs\text{-}ft^2$)	0.0009 (0.022)	0.0017 (0.0403)	0.0033 (0.0783)	0.0083 (0.1970)	0.0167 (0.3963)	0.0242 (0.5743)	0.0083 (0.1970)	0.0167 (0.3963)	0.0242 (0.5743)
Fill volume		L (gal.)	0.4 (0.1)	0.7 (0.2)	1.0 (0.3)	1.6 (0.4)	2.2 (0.6)	3.0 (0.8)	1.6 (0.4)	2.2 (0.6)	3.0 (0.8)
Weight (without fluid) ca.	m	kg (lbs.)	12 (27)	15 (33)	21 (46)	33 (73)	45 (99)	60 (132)	33 (73)	45 (99)	60 (132)
Permissible loading of drive shaft											
max. perm. load 	$F_{ax\ max}$	N (lbs.)	700 (157)	1000 (225)	1500 (337)	2400 (540)	4000 (900)	4800 (1080)	2400 (540)	4000 (900)	4800 (1080)
max. perm. load[2]	$F_{q\ max}$	N (lbs.)	350 (79)	1200 (270)	1500 (337)	1900 (427)	2300 (517)	2800 (630)	1900 (427)	2300 (517)	2800 (630)

1) These values are valid for an absolute pressure of 14.5 psi (1 bar) at the suction port S.
By reducing the displacement or increasing the input pressure the speed can be increased as shown in the diagram.

2) Please consult us for higher radial forces.

Determination of size

Flow $q_v = \frac{V_g \bullet n \bullet \eta_v}{231}$ [L/min] $\left(q_v = \frac{V_g \bullet n \bullet \eta_v}{1000} \text{ [gpm]} \right)$

Torque $T = \frac{V_g \bullet \Delta p}{24 \bullet \pi \bullet \eta_{mh}}$ [Nm] $\left(T = \frac{V_g \bullet \Delta p}{20 \bullet \pi \bullet \eta_{mh}} \text{ [lb-ft]} \right)$

Power $P = \frac{q_v \bullet \Delta p}{1714 \bullet \eta_t}$ [kW] $\left(P = \frac{q_v \bullet \Delta p}{600 \bullet \eta_t} \text{ [HP]} \right)$

V_g = Displacement per revolution in cm^3 (in^3)
Δp = Differential pressure in bar (PSI)
n = Speed in rpm (min^{-1})
η = Volumetric efficiency
η_{mh} = Mechanical-hydraulic efficiency
η_t = Total efficiency

Noise level

Characteristics for pump

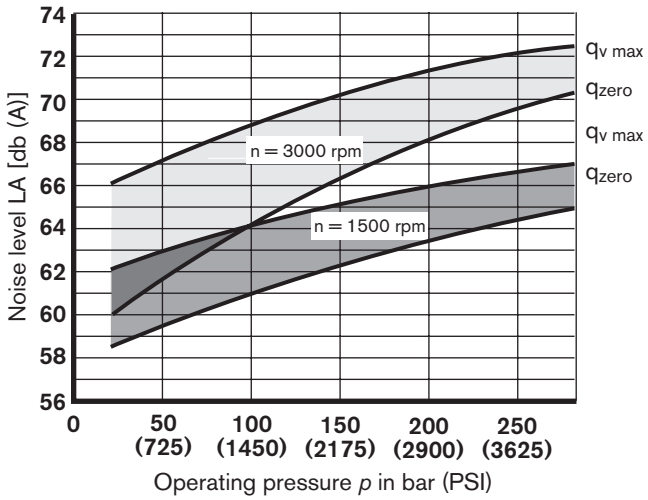
Measured in an anechoic chamber

Distance from microphone to pump = 1 m (3.3 ft)

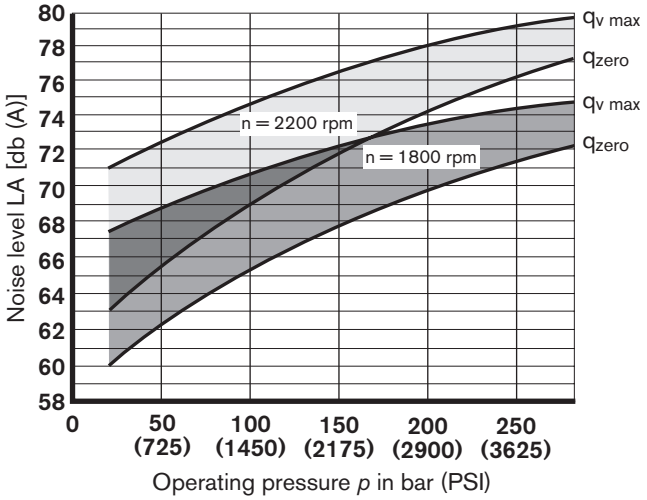
Measuring error: ± 2 dB(A)

Fluid: Hydraulic oil to ISO VG 46 DIN 51519, t = 50 °C (122 °F)

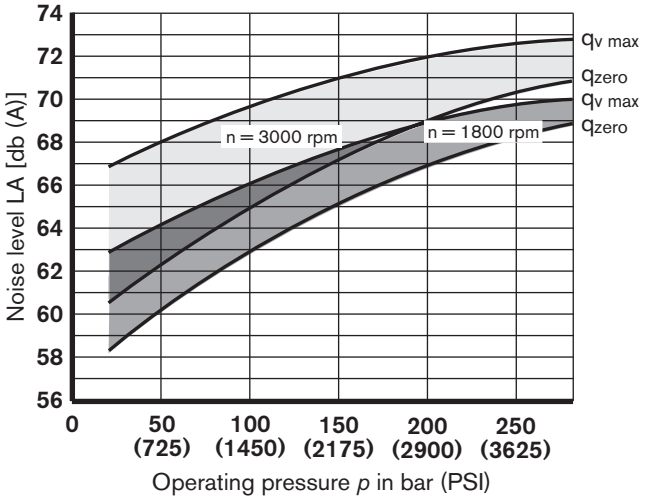
Size 18



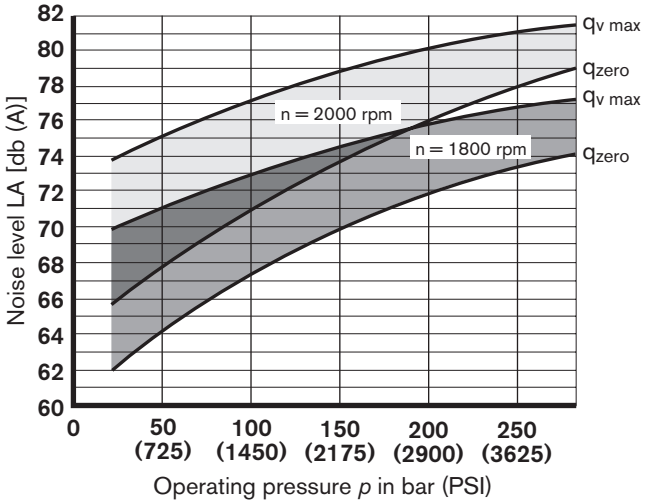
Size 71



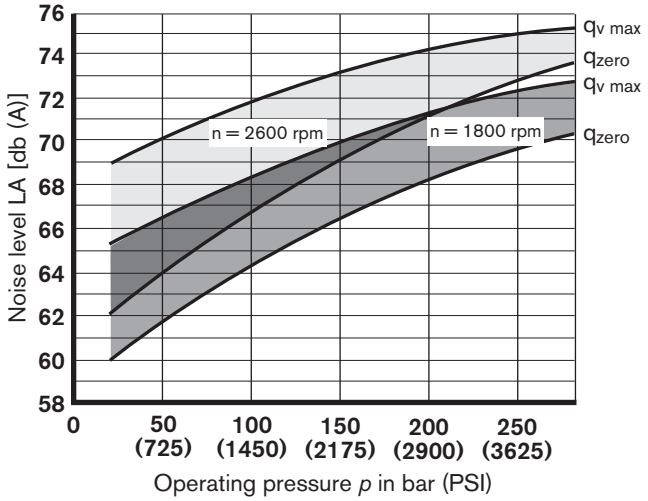
Size 28



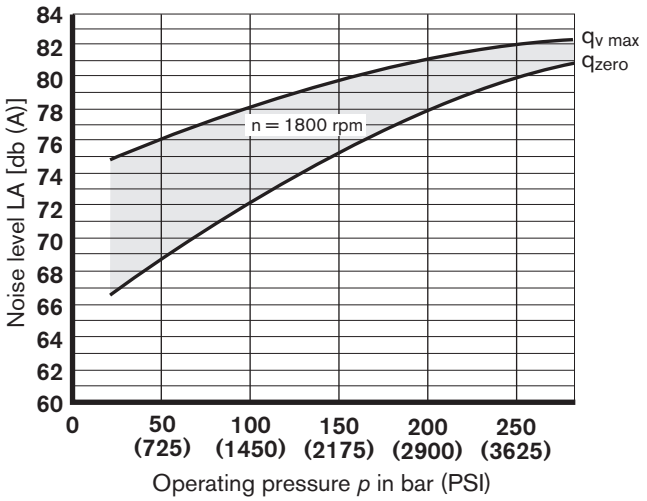
Size 100



Size 45



Size 140

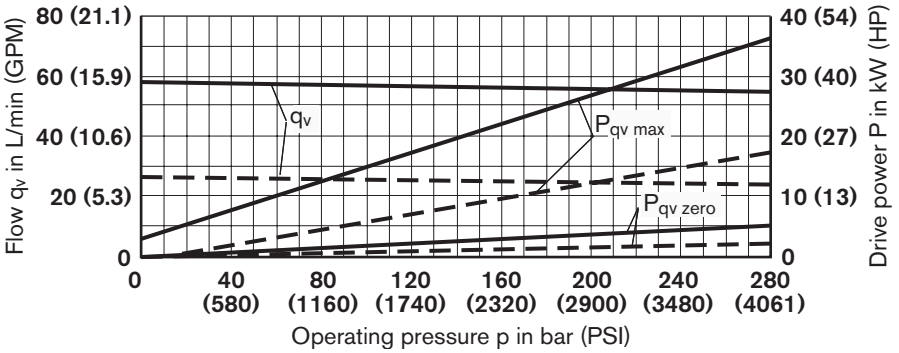


Drive power and flow

Fluid: Hydraulic oil to ISO VG 46 DIN 51519, t = 50 °C (122 °F)

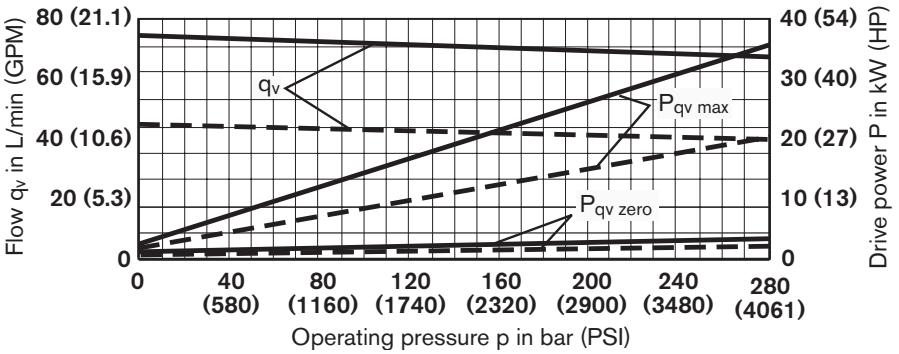
Size 18

– – – – n = 1500 rpm
_____ n = 3300 rpm



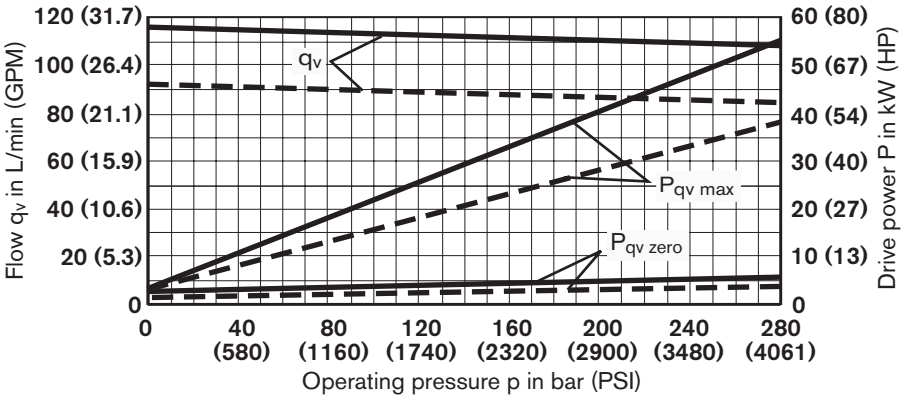
Size 28

– – – – n = 1800 rpm
_____ n = 2000 rpm



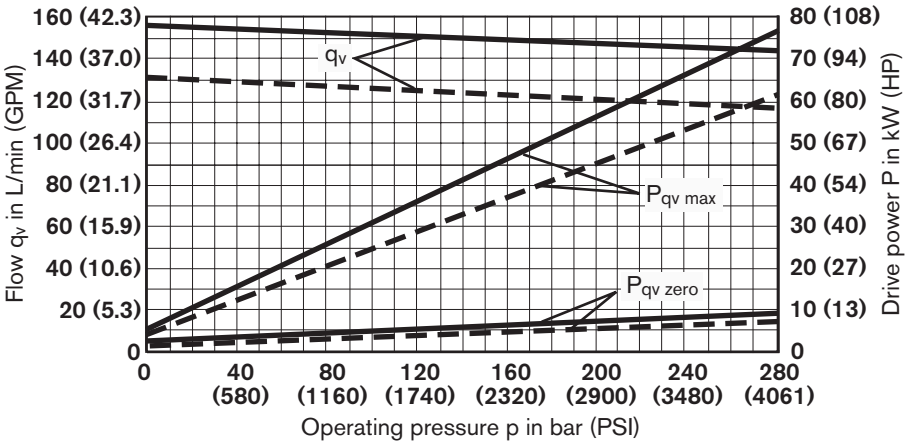
Size 45

– – – – n = 1800 rpm
_____ n = 2000 rpm



Size 71

– – – – n = 1800 rpm
_____ n = 2000 rpm



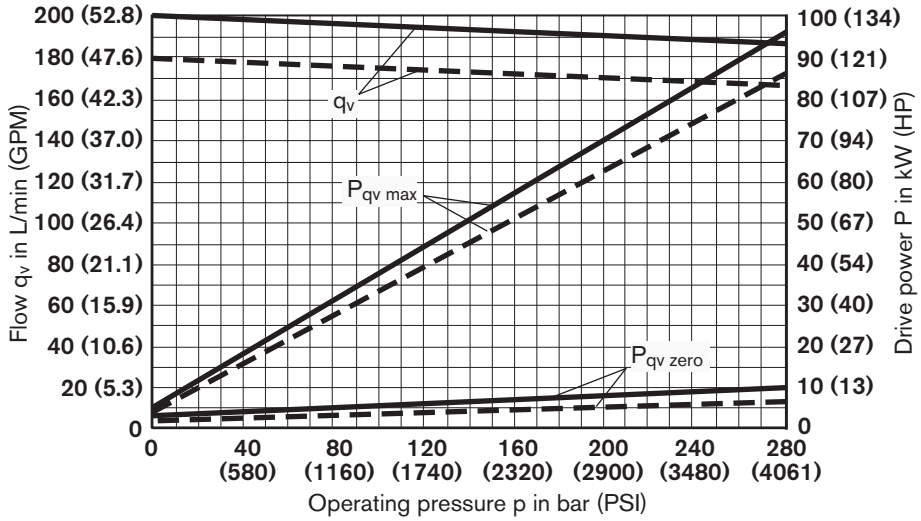
Drive power and flow

Fluid: Hydraulic oil to ISO VG 46 DIN 51519, t = 50 °C (122 °F)

Size 100

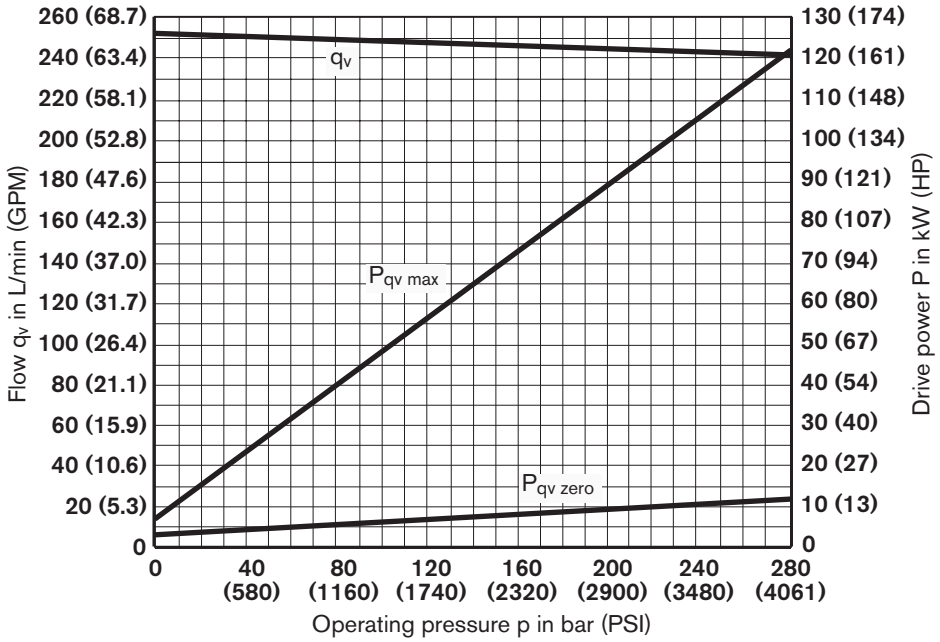
– – – – n = 1800 rpm

——— n = 2000 rpm



Size 140

——— n = 1800 rpm



Overall efficiency

$$\eta_t = \frac{q_v \bullet p}{P_{qv\ max} \bullet 1714} \left(\frac{q_v \bullet p}{P_{qv\ max} \bullet 600} \right)$$

Volumetric efficiency

$$\eta_v = \frac{q_v}{q_{v\ theor.}}$$

DG – two point, direct control

The pump can be set to a minimum swivel angle by connecting an external switching pressure to port X.

This will supply the control pistion directly with control oil; a minimum pressure of $p_{st} \geq 50$ bar (725 PSI) is required.

The pump can only be switched between $V_{g\,max}$ or $V_{g\,min}$.

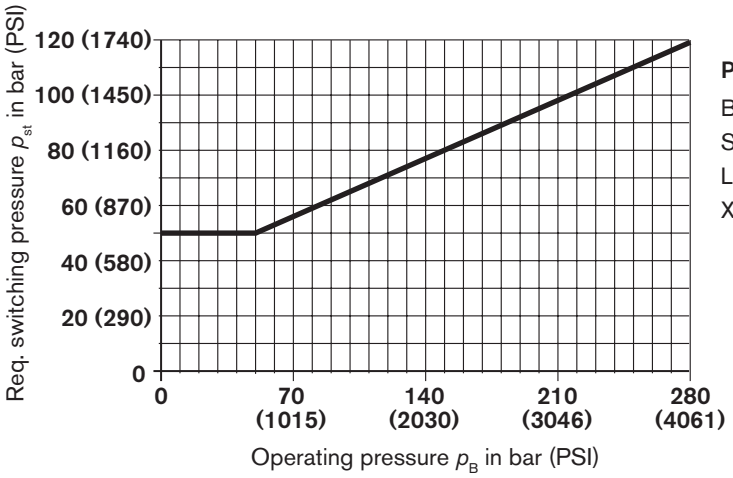
Please note, that the required switching pressure at port X is directly dependent on the actual operating pressure p_B in port B. (See switching pressure diagramm)

Control pressure p_{st} in X = 0 bar (0 PSI) $V_{g\,max}$

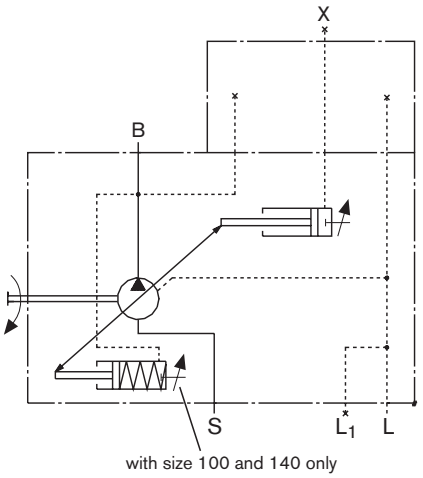
Control pressure p_{st} in X ≥ 50 bar (729 PSI) $V_{g\,min}$

The max. premissible switching pressure p_{st} is 280 bar (4000 PSI).

Switching pressure diagram



Circuit drawing



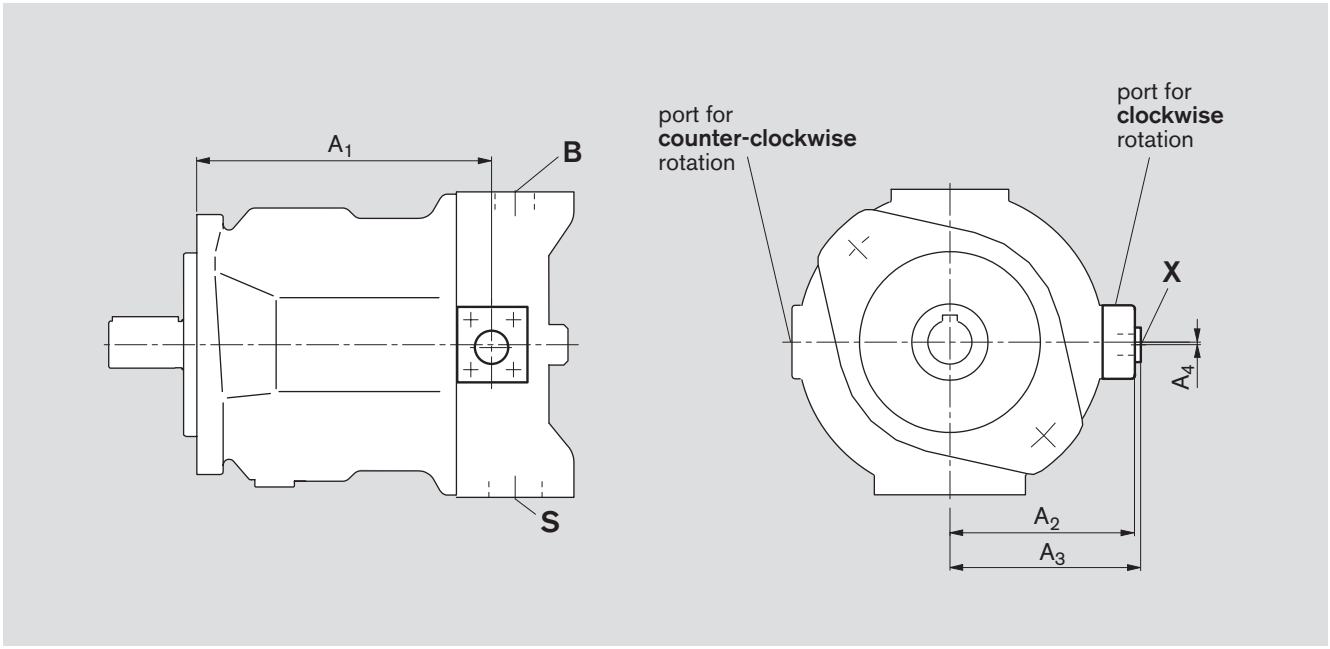
Ports

B	Pressure port
S	Inlet port
L,L_1	Case drain port (L_1 plugged)
X	Control port (plugged)

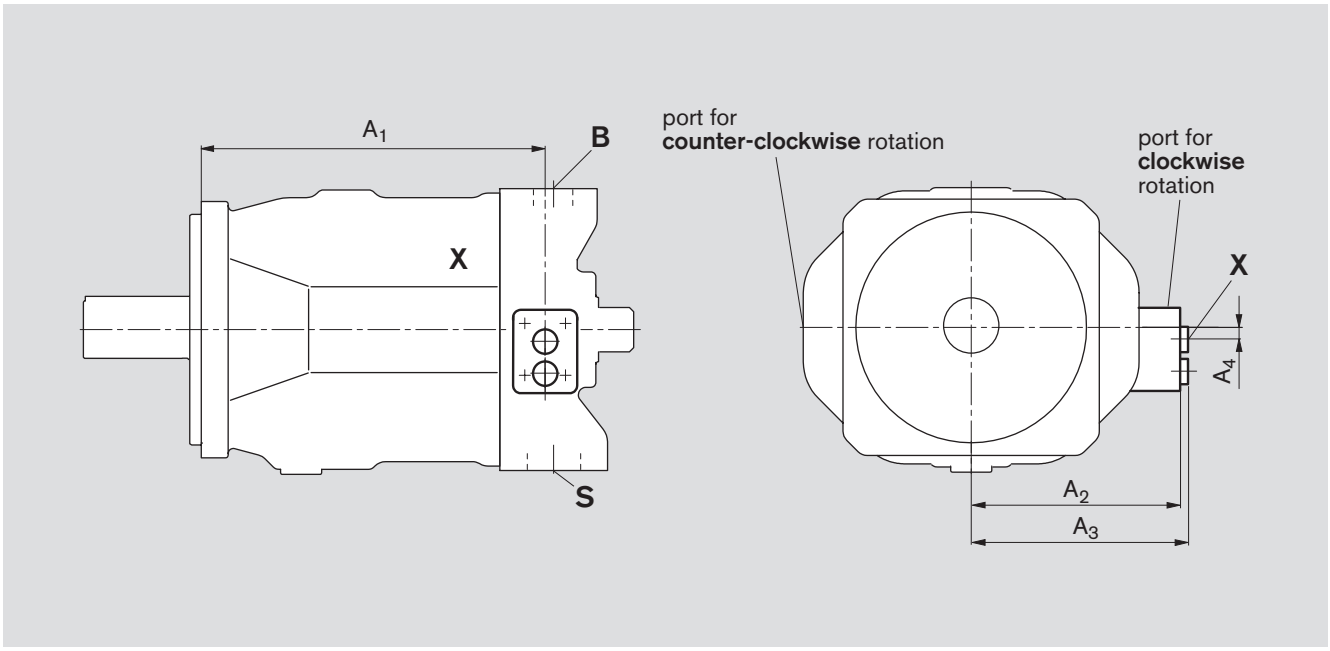
Unit dimensions DG – dimensions in millimeters (inches)

Before finalizing your design, please request a certified installation drawing.

Size 18 ... 100



Size 140



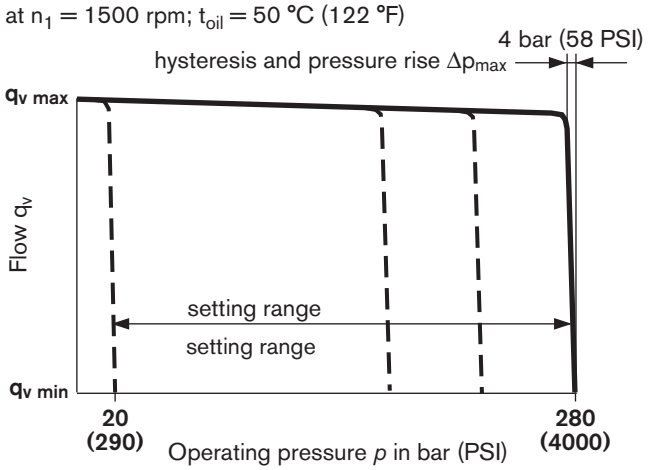
Size	A_1	A_2	A_3	A_4	X (plugged)
18	148 (5.83)	89.5 (3.52)	93.5 (3.68)	3 (0.12)	R 1/4 in
28	158 (6.22)	100 (3.94)	103.5 (4.07)	3 (0.12)	R 1/4 in
45	173 (6.81)	110 (4.33)	113.5 (4.47)	3 (0.12)	R 1/4 in
71	201 (7.91)	123.5 (4.86)	127.5 (5.02)	3 (0.12)	R 1/4 in
100	268 (10.55)	128.5 (5.06)	132.5 (5.22)	3 (0.12)	R 1/4 in
140	268 (10.55)	153 (6.02)	158 (6.22)	4 (0.18)	R 1/4 in

DR – Pressure control

The pressure controller serves to maintain a constant pressure in a hydraulic system within the range of the pump. The pump therefore supplies only the amount of hydraulic fluid required by the system. Pressure may be steplessly set at the pilot valve.

Static characteristic

at $n_1 = 1500$ rpm; $t_{oil} = 50$ °C (122 °F)

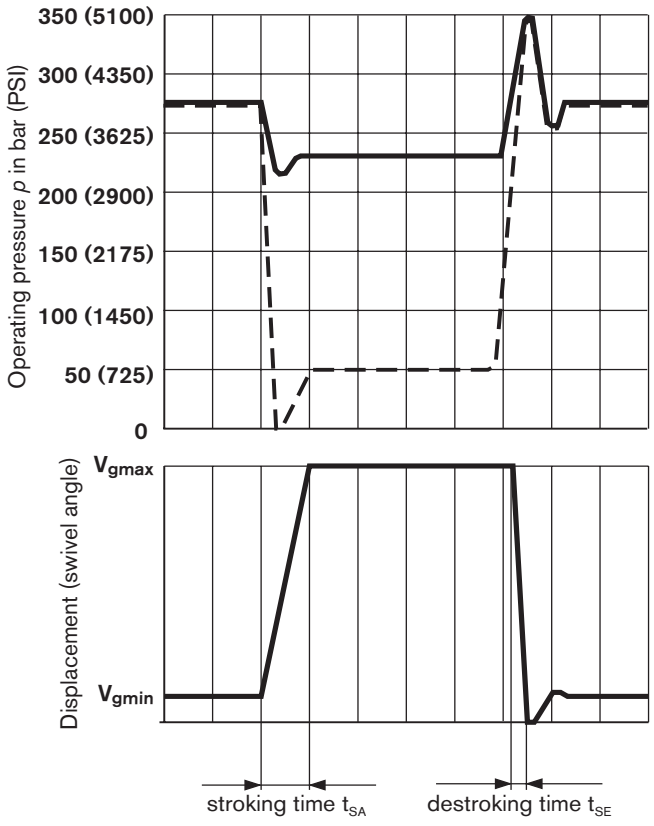


Dynamic characteristic

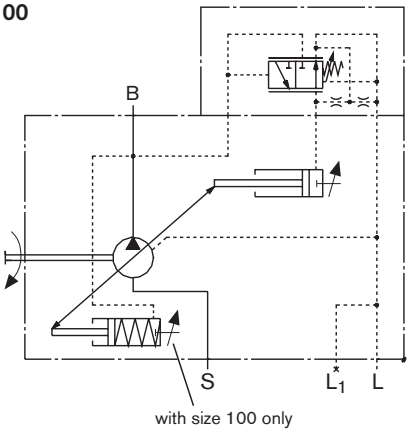
The opening curves are mean values measured under test conditions with the unit mounted inside the tank.

Conditions: n = 1500 rpm
$t_{oil} = 50$°C (122°F)
Main relief set at 350 bar (5100 PSI)

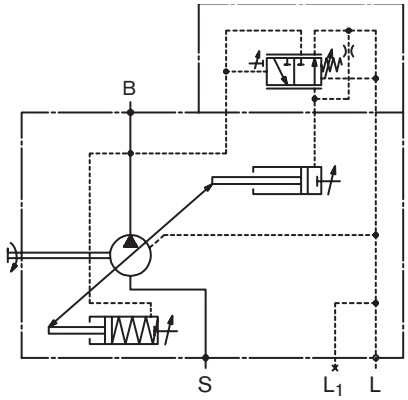
Stepped loading by suddenly opening or closing the pressure line using a pressure relief valve at 3.3 ft (1 m) downstream from the pump pressure outlet.



Circuit drawing
Size 18 ... 100



Circuit drawing
Size 140



Ports

B	Pressure port
S	Inlet port
L,L_1	Case drain port (L_1 plugged)

Control data

Hysteresis and repetitive accuracy Δp ____ max. 3 bar (45 PSI)
Pilot oil consumption max. approx 3 L/min (0.8 GPM)
Flow loss at q_{vmax} see pages 8 and 9.

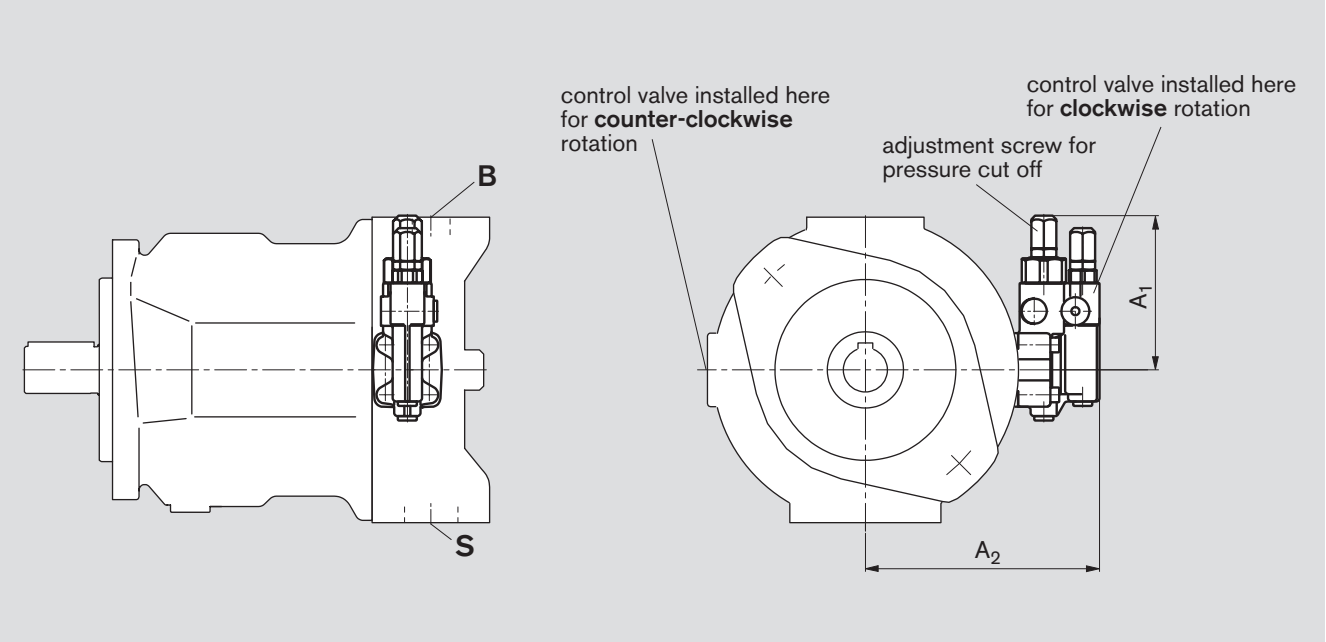
Control times

Size	t_{SA} [ms] Against 50 bar (725 PSI)	t_{SA} [ms] Against 220 bar (3200 PSI)	t_{SE} [ms] Zero stroke 280 bar (4000 PSI)
18	50	25	20
28	60	30	20
45	80	40	20
71	100	50	25
100	125	90	30
140	130	110	30

Unit dimensions DR – dimensions in millimeters (inches)

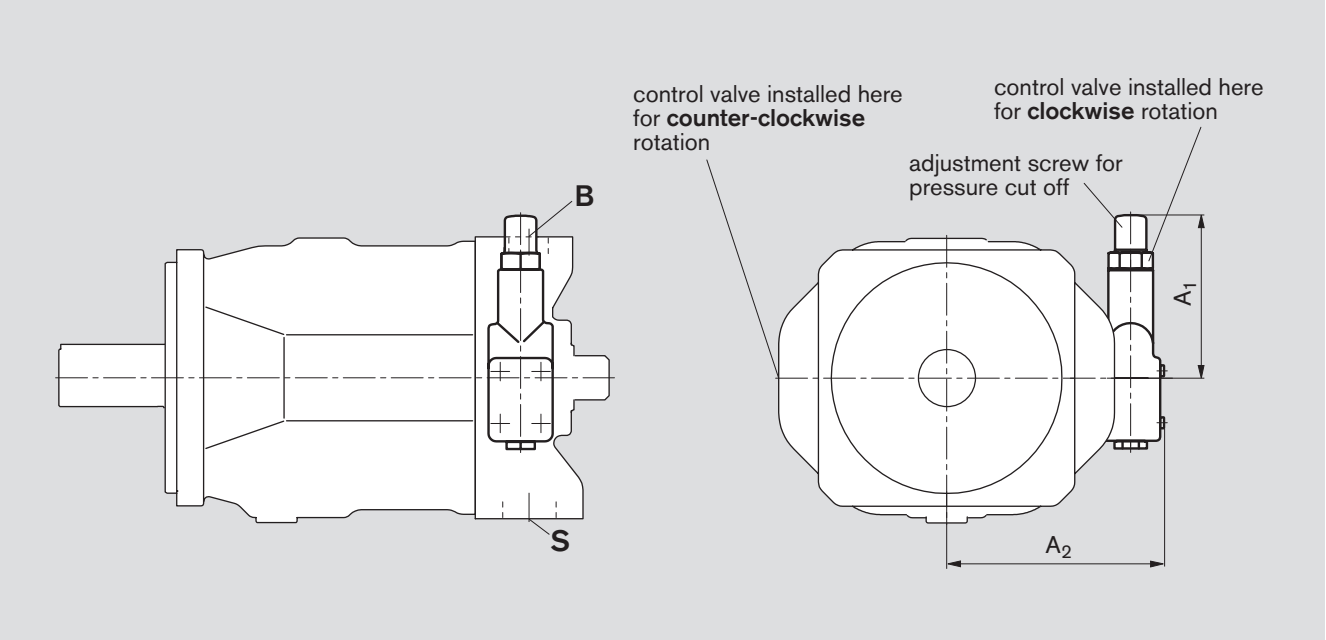
Before finalizing your design, please request a certified installation drawing.

Size 18 ... 100



On sizes 18 to 100 the DFR valve is used. The flow control spool is blocked and not tested.

Size 140



Size	A_1	A_2
18	105 (4.13)	126 (4.96)
28	106 (4.17)	136 (5.35)
45	106 (4.17)	146 (5.75)
71	106 (4.17)	160 (6.30)
100	106 (4.17)	165 (6.50)
140	127 (5.00)	169 (6.65)

DRG - Pressure control, remote

Function and design same as DR.

A pressure relief valve may be externally piped to port X for remote control purposes. However it is not included in the scope of supply with the DRG control.

The differential presssure at the DRG control spool is set as standard to 20 bar (290PSI) and this results in a pilot flow of 1.5 L/min (0.4 GPM). If another setting is required, please state this in clear text.

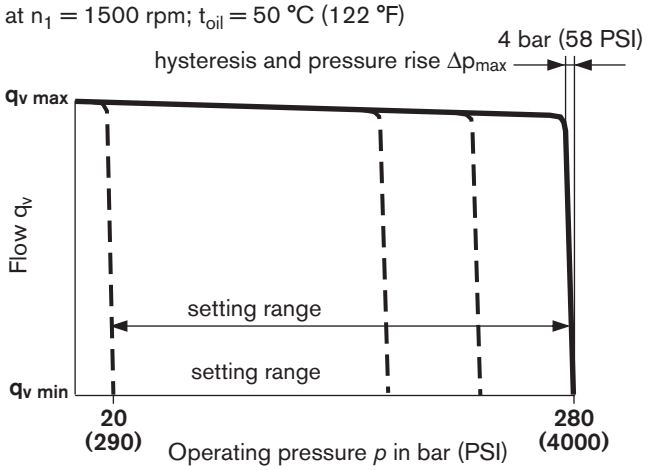
We recommend that one of the following is used as the seperate pressure relief valve.

DBDH 6 /hydraulic) to RA 25402 or DBETR-SO 381 with orifice DIA 0.8 mm (0.03 in) in P (electric) to RA 29166.

Max, length of piping should not exceed 2 m (6.5 ft).

Static characteristic

at $n_1 = 1500$ rpm; $t_{oil} = 50$ °C (122 °F)



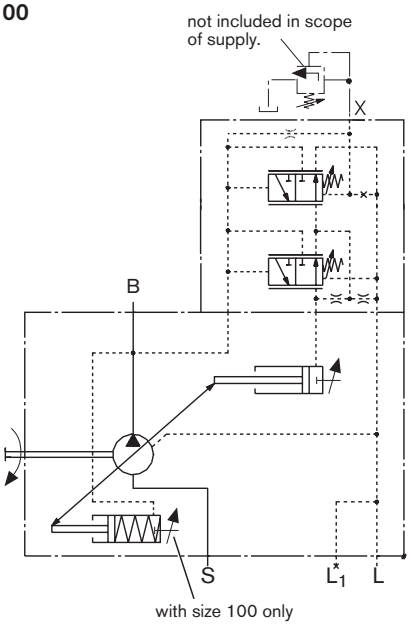
Control data

Hysteresis Δp _____ max. 3 bar (45 PSI)

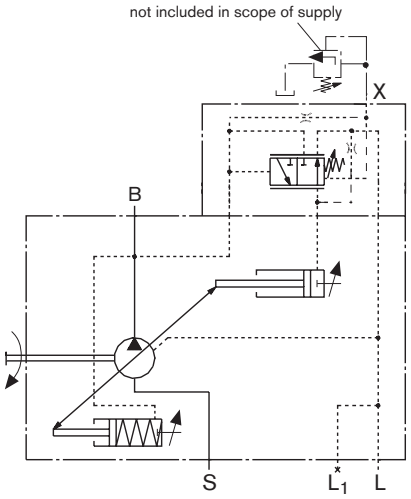
Pilot oil requirement _____ approx. 4.5 L/min (1.2 GPM)

Flow loss at q_{vmax} see pages 8 and 9.

Circuit drawing Size 18 ... 100



Circuit drawing Size 140



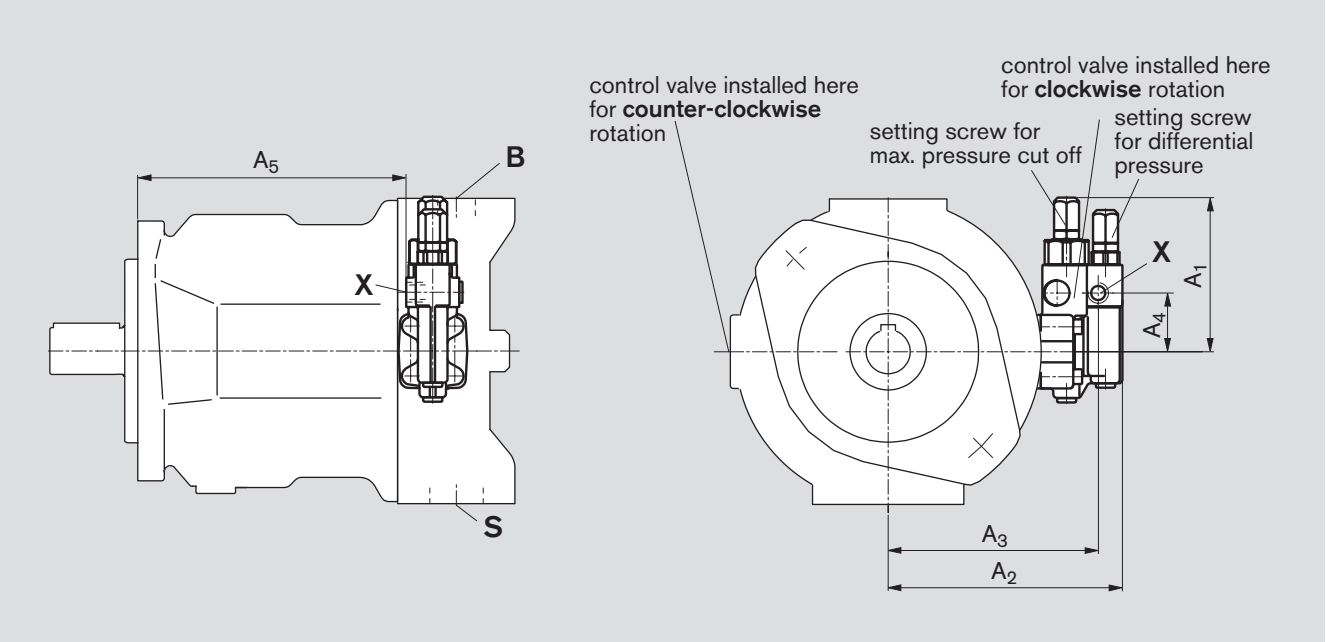
Ports

B	Pressure port
S	Inlet port
L, L_1	Case drain port (L_1 plugged)
X	Pilot pressure port

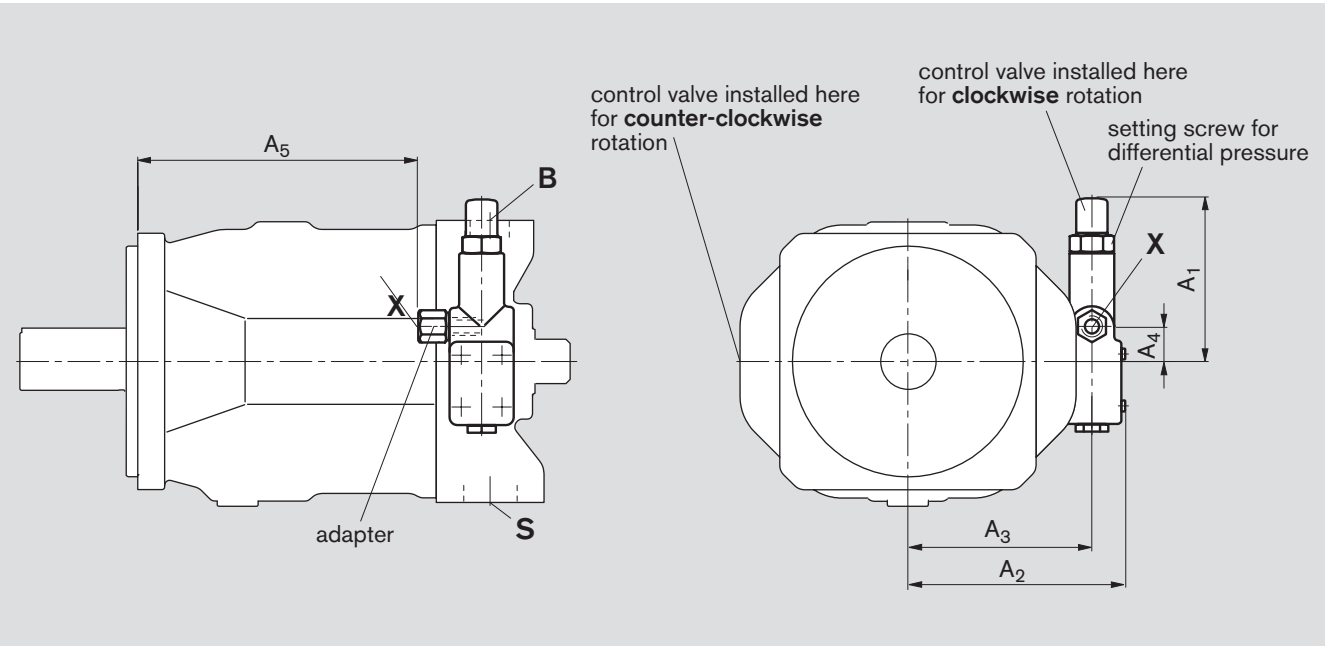
Unit dimensions DRG – dimensions in millimeters (inches)

Before finalizing your design, please request a certified installation drawing.

Size 18 ... 100



Size 140



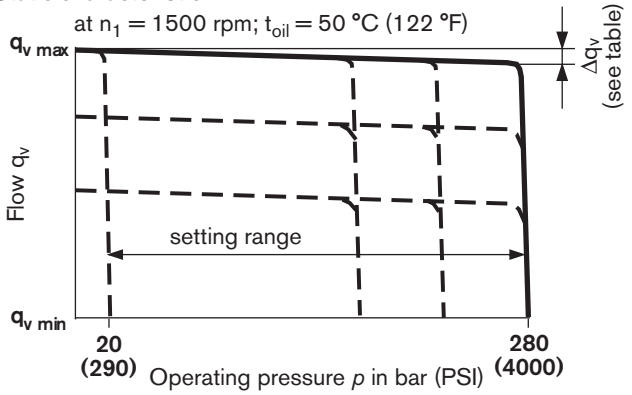
Size	A_1	A_2	A_3	A_4	A_5	Port X
18	104.5 (4.11)	125 (4.94)	109 (4.29)	40 (1.57)	130 (5.12)	7/16-20 UNF-2B; 11.5 (0.45) deep
28	106 (4.17)	136 (5.35)	119 (4.69)	40 (1.57)	138 (5.43)	7/16-20 UNF-2B; 11.5 (0.45) deep
45	106 (4.17)	146 (5.75)	129 (5.08)	40 (1.57)	153 (6.02)	7/16-20 UNF-2B; 11.5 (0.45) deep
71	106 (4.17)	160 (6.30)	143 (5.63)	40 (1.57)	181 (7.13)	7/16-20 UNF-2B; 11.5 (0.45) deep
100	106 (4.17)	165 (6.50)	148 (5.83)	40 (1.57)	248 (9.76)	7/16-20 UNF-2B; 11.5 (0.45) deep
140	127 (5.00)	169 (6.65)	143 (5.63)	27 (1.06)	222 (8.74)	9/16-18 UNF-2B; 13 (0.51) deep

DFR / DFR1 – Pressure flow control

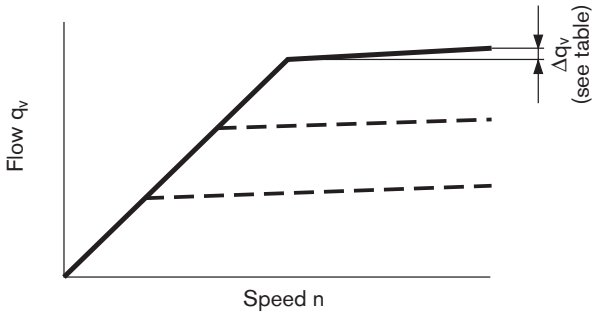
In addition to the pressure control function, the pump flow to the actuator may be varied by means of a differential pressure (e.g. over an orifice or directional control valve). The pump supplies only the amount of fluid as required by the actuator.
In the DFR1-valve version the orifice between the X port and tank is plugged.

For function and content of pressure control see pages 12.

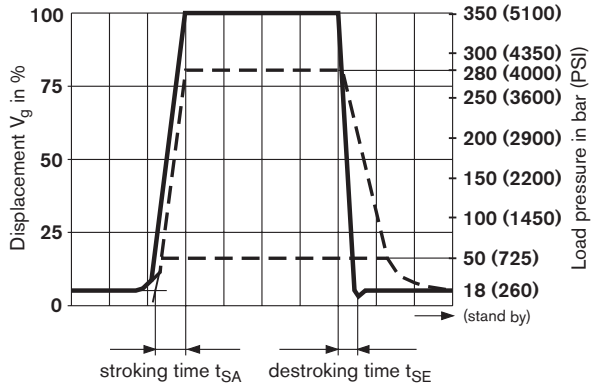
Static characteristic



Static characteristic at variable speed

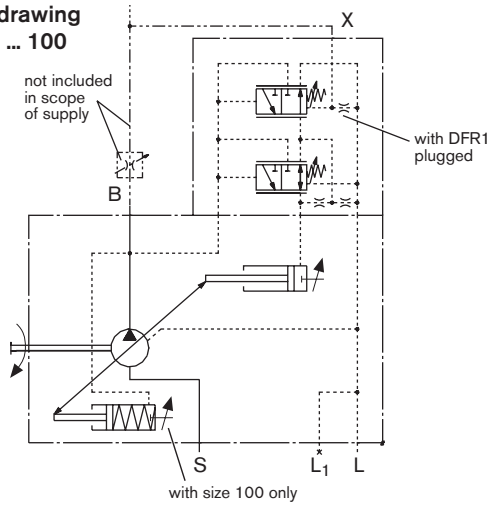


Dynamic characteristic operating curve

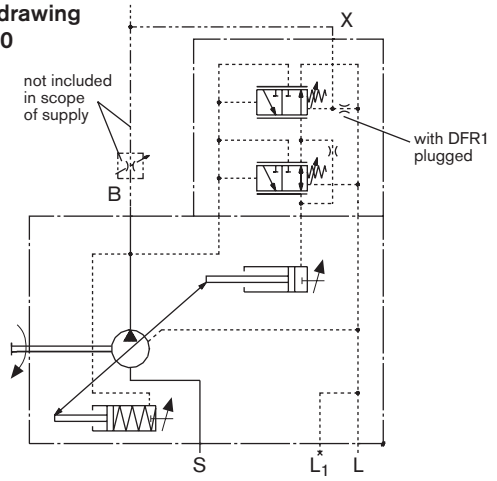


Size	t_{SA} [ms] 280 bar (4000 PSI) stand by	t_{SE} [ms] 280 bar (4000 PSI) stand by	t_{SE} [ms] 50 bar (725 PSI) stand by
18	40	15	40
28	40	20	40
45	50	25	50
71	60	30	60
100	120	60	120
140	130	60	130

Circuit drawing
Size 18 ... 100



Circuit drawing
Size 140



Ports

B Pressure port
S Inlet port
L,L_1 Drain port (L_1 closed)
X Pilot pressure port

Differential pressure Δp:

Standard setting: 14 bar (200 PSI). If a different setting is required please state in clear text.

When port X is loaded to tank (and outlet B is closed), a zero stroke pressure (standby) of p = 18±2 bar (260±30 PSI) results. (depends on Δp)

Control data

For technical data of pressure control see page 12.
Max. flow deviation (hysteresis and rise) measured at drive speed n = 1500 rpm.

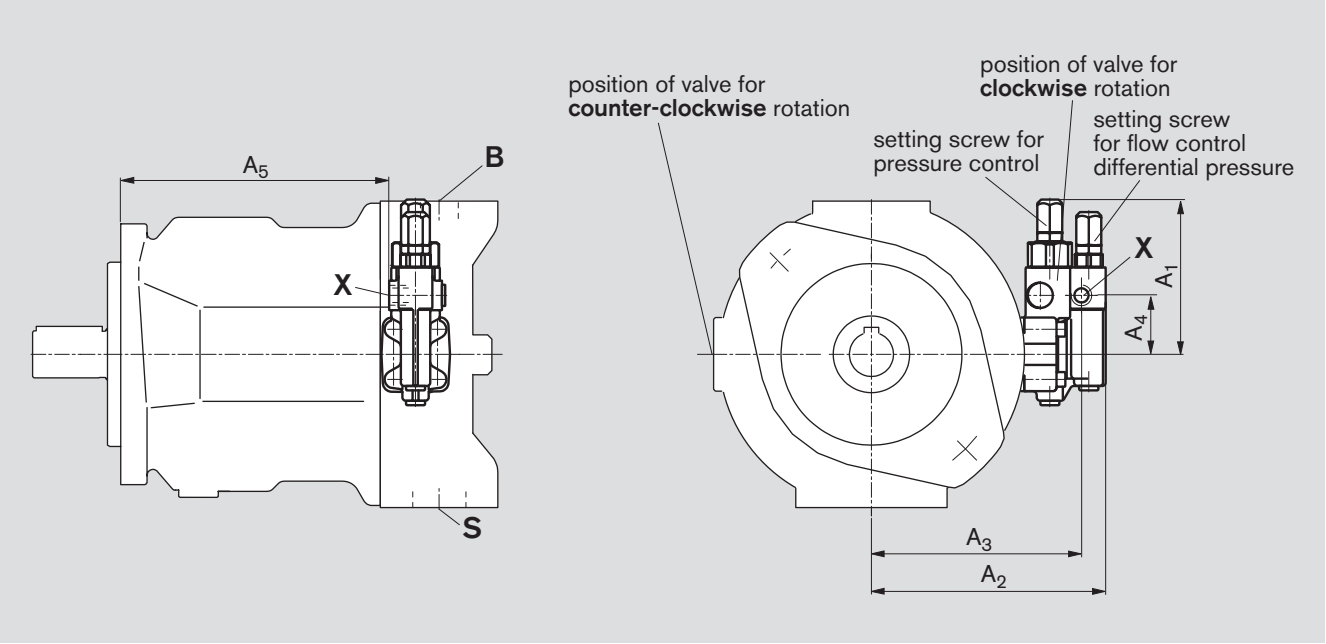
Size	18	28	45	71	100	140
Δq_{vmax} L/min (GPM)	0.9 (0.24)	1.0 (0.26)	1.8 (0.48)	2.8 (0.75)	4.0 (1.06)	6.0 (1.60)

DFR pilot oil consumption ____ max. approx. 3 ... 4.5 L/min (0.8 ... 1.2 GPM)
DFR1 pilot oil consumption ___ max. approx. 3 L/min (0.8 GPM)
Flow loss at q_{vmax} see pages 8 and 9.

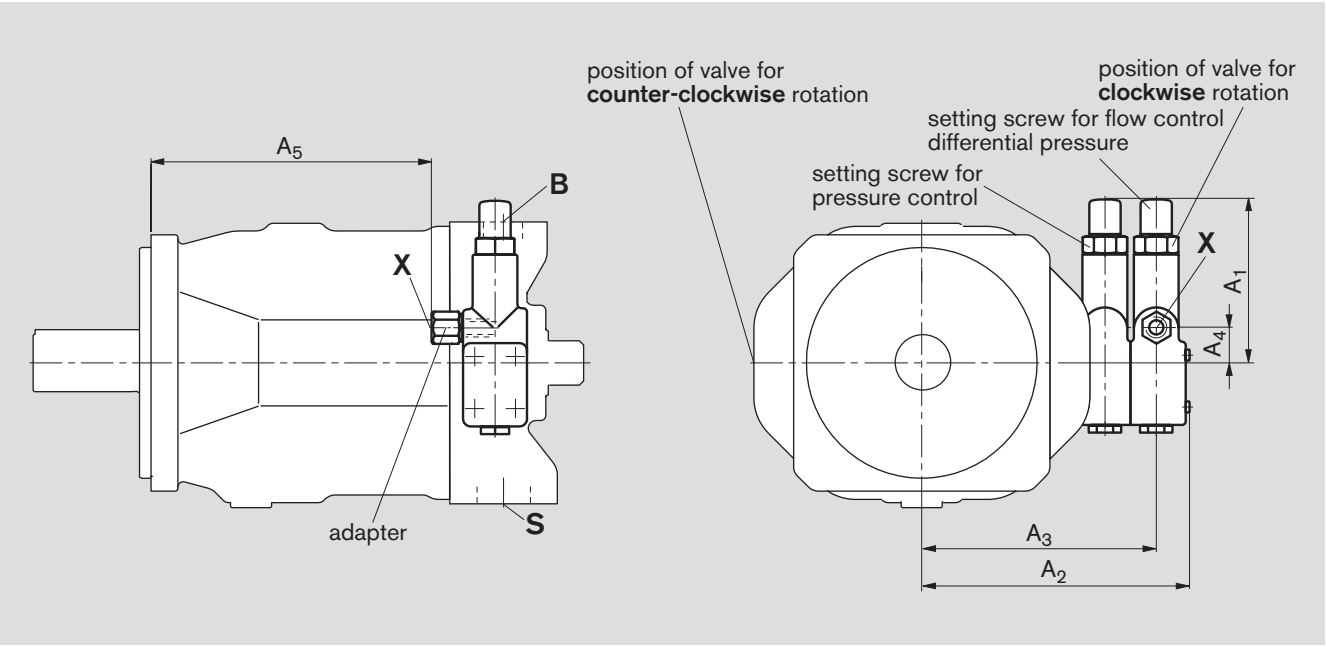
Unit dimensions DFR – dimensions in dimensions (inches)

Before finalizing your design, please request a certified installation drawing.

Size 18 ... 100



Size 140



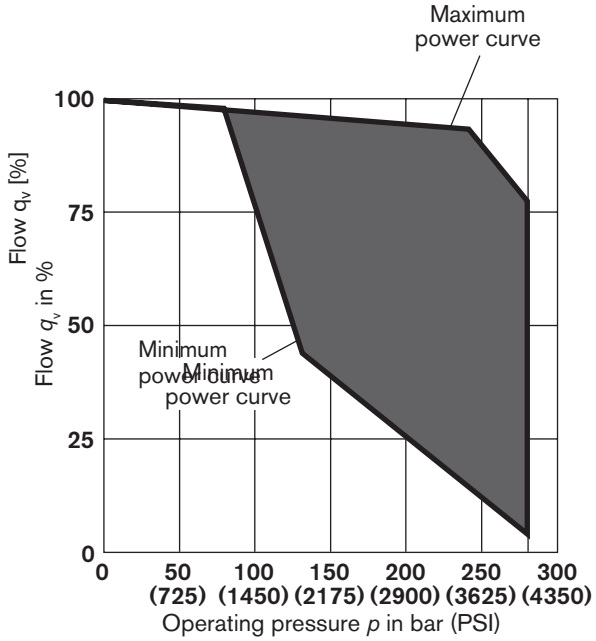
Size	A_1	A_2	A_3	A_4	A_5	Port X
18	105 (4.13)	126 (4.96)	109 (4.29)	40 (1.57)	109 (4.29)	7/16-20 UNF-2B; 0.45 (11,5) deep
28	106 (4.17)	136 (5.35)	119 (4.69)	40 (1.57)	138 (5.43)	7/16-20 UNF-2B; 0.45 (11,5) deep
45	106 (4.17)	146 (5.75)	129 (5.08)	40 (1.57)	153 (6.02)	7/16-20 UNF-2B; 0.45 (11,5) deep
71	106 (4.17)	160 (6.30)	143 (5.63)	40 (1.57)	181 (7.13)	7/16-20 UNF-2B; 0.45 (11,5) deep
100	106 (4.17)	165 (6.50)	148 (5.83)	40 (1.57)	248 (9.76)	7/16-20 UNF-2B; 0.45 (11,5) deep
140	127 (5.00)	209 (8.23)	183 (7.20)	27 (1.06)	222 (8.74)	9/16-18 UNF-2B; 0.51 (13) deep

DFLR – Pressure / flow / power control

In order to achieve a constant drive torque with a varying operating pressure, the swivel angle and with it the output flow from the axial piston unit is varied so that the product of flow and pressure remains constant.

Flow control is possible below the limit of the power curve.

Static characteristic



The power characteristic is set at the factory, please state your requirements in clear text e.g. 20 kW (27 HP) at 1800 rpm.

Control data

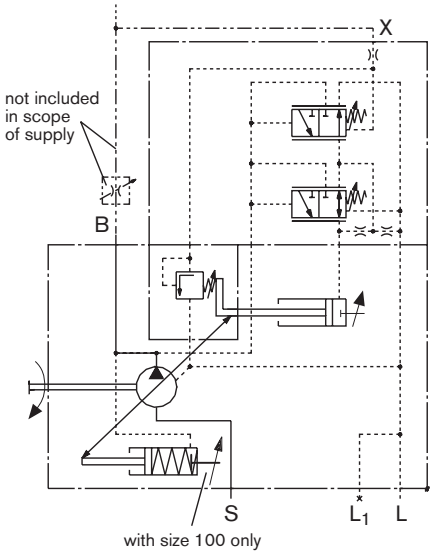
For technical data constant pressure control see page 12.
For technical data flow control see page 16.

Start of control _____ from 80bar (1160 PSI)

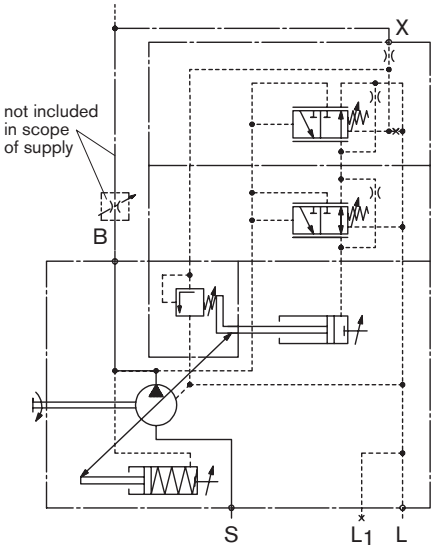
Pilot oil consumption _____ max. approx. 5.5 L/min (1.45 GPM)

Flow loss at q_{vmax} see pages 8 and 9.

Circuit drawing
Size 28 ... 100



Circuit drawing
Size 140



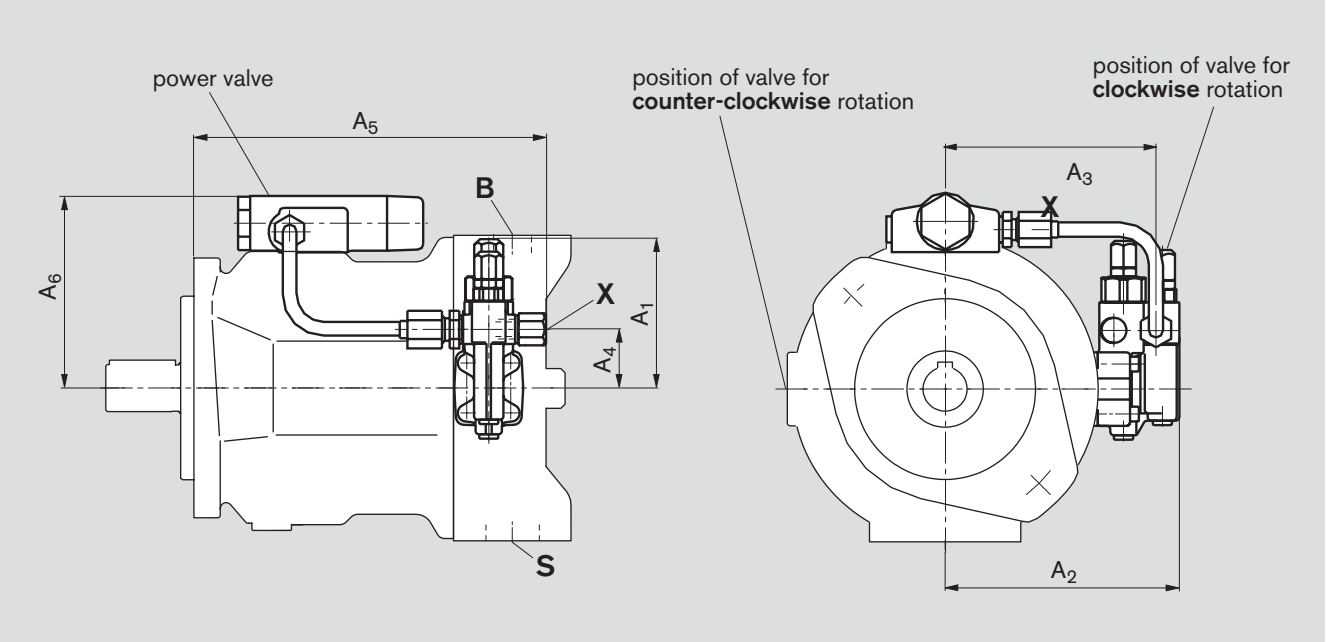
Ports

B	Pressure port
S	Inlet port
L,L_1	Case drain port (L_1 closed)
X	Pilot pressure port

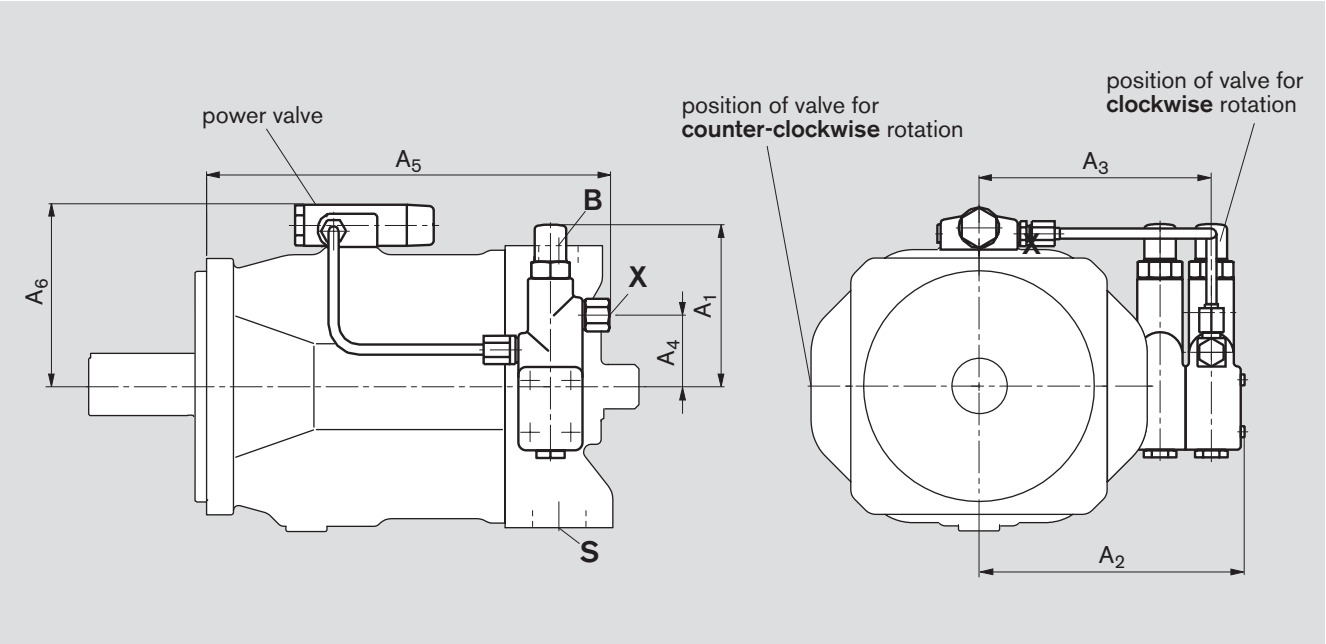
Unit dimensions DFLR – dimension in millimeters (inches)

Before finalizing your design, please request a certified installation drawing.

Size 28 ... 100



Size 140



Size	A_1	A_2	A_3	A_4	A_5	A_6	Port X
28	4.17 (106)	5.35 (136)	4.69 (119)	1.57 (40)	7.60 (193)	4.21 (107)	7/16-20 UNF-2B; 0.39 (10) deep
45	4.17 (106)	5.75 (146)	5.08 (129)	1.57 (40)	8.23 (209)	4.41 (112)	7/16-20 UNF-2B; 0.39 (10) deep
71	4.17 (106)	6.30 (160)	5.63 (143)	1.57 (40)	9.37 (238)	4.88 (124)	7/16-20 UNF-2B; 0.39 (10) deep
100	4.17 (106)	6.50 (165)	5.83 (148)	1.57 (40)	11.93 (303)	5.08 (129)	7/16-20 UNF-2B; 0.39 (10) deep
140	5.00 (127)	8.23 (209)	7.20 (183)	2.22 (56,4)	12.36 (314)	5.51 (140)	9/16-18 UNF-2B; 0.51 (13) deep

Unit dimensions, Size 18 – dimensions in millimeters (inches)

Before finalizing your design, please request a certified installation drawing.

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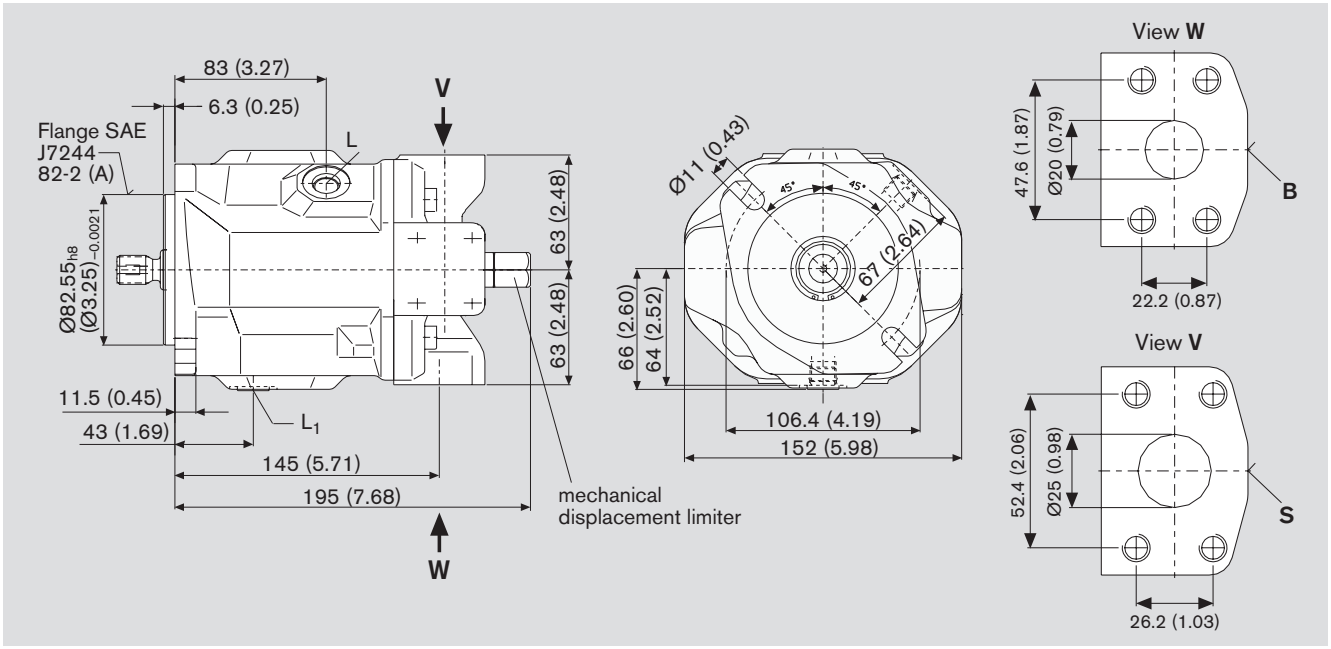
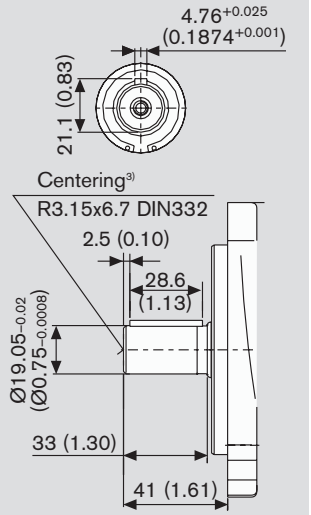
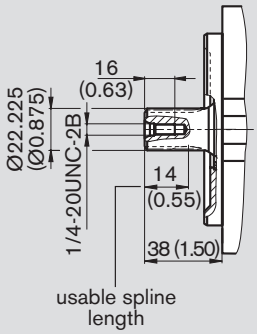


Shaft ends

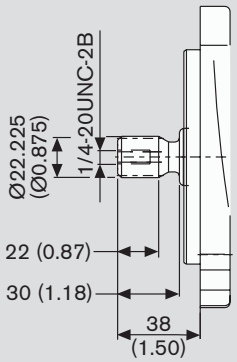
K Parallel with key
ISO 3019-1 19-1



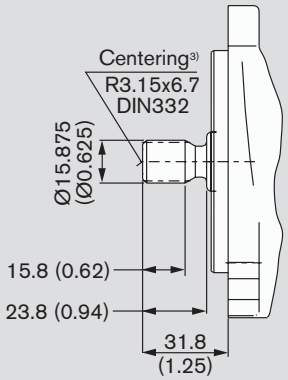
R Splined shaft 3/4 in 11 T
16/32 DP 1)
SAE J744-19-4 (A-B)



S Splined shaft 3/4 in 11 T
16/32 DP 1)
SAE J744-19-4 (A-B)



U Splined shaft 5/8 in 9 T
16/32 DP 1)
SAE J744-16-4 (A)



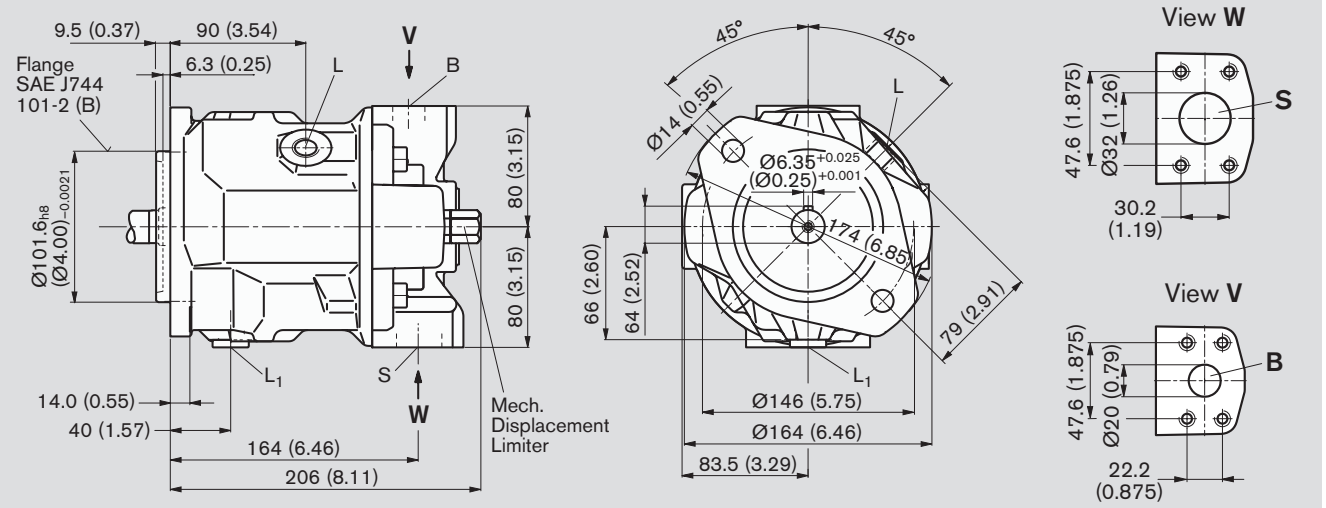
Ports			**Tightening torques, max.2)**	
B	Pressure port (standard pressure range) Threading in bolt holes	SAE J518 ISO 68	3/4 in 3/8-16 UNC-2B; 0.79 (20) deep	40 Nm (29 lb-ft)
S	Inlet port (standard pressure range) Threading in bolt holes	SAE J518 ISO 68	1 in 3/8-16 UNC-2B; 0.79 (20) deep	40 Nm (29 lb-ft)
L/L_1	Case drain port (L_1 plugged)	ISO 11926	9/16-18 UNF-2B	80 Nm (59 lb-ft)

1) ANSI B92.1a-1976, pressure angle 30°, flat root side fit, tolerance class 5
2) See safety information
3) Axial locking of the coupling e.g. via clamping coupling or radial mounted binding screw

Unit dimensions, Size 28 – dimensions in millimeters (inches)

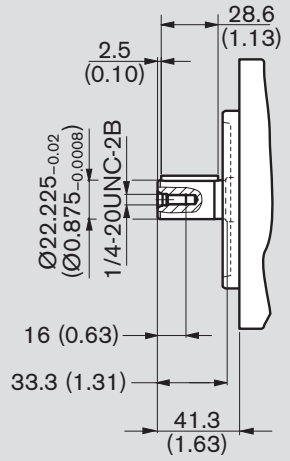
Before finalizing your design, please request a certified installation drawing.

Version AA10VSO 28 XXXX/31X-XXX62N00

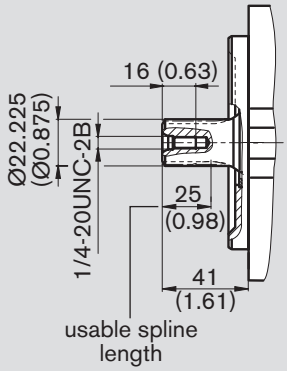


Shaft ends

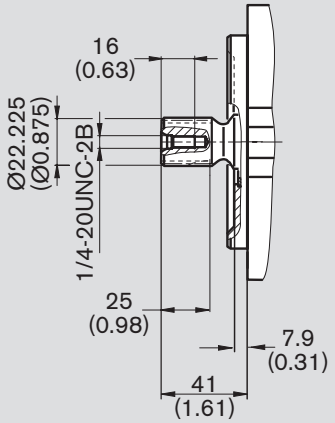
K Parallel with key
ISO 3019-1 22-1



R Splined shaft 7/8 in 13T 16/32 DP[1)]
SAE J744-22-4 (B)



S Splined shaft 7/8 in 13T 16/32 DP[1)]
SAE J744-22-4 (B)



Ports			**Tightening torques, max.[2)]**	
B	Pressure port (standard pressure range)	SAE J518	3/4 in	
	Threading in bolt holes	ISO 68	3/8-16 UNC-2B; 0.71 (18) deep	40 Nm (29 lb-ft)
S	Inlet port (standard pressure range)	SAE J518	1 1/4 in	
	Threading in bolt holes	ISO 68	7/16-14 UNC-2B; 0.94 (24) deep	65 Nm (48 lb-ft)
L/L_1	Case drain port (L_1 plugged)	ISO 11926	3/4-16 UNF-2B	160 Nm (118 lb-ft)

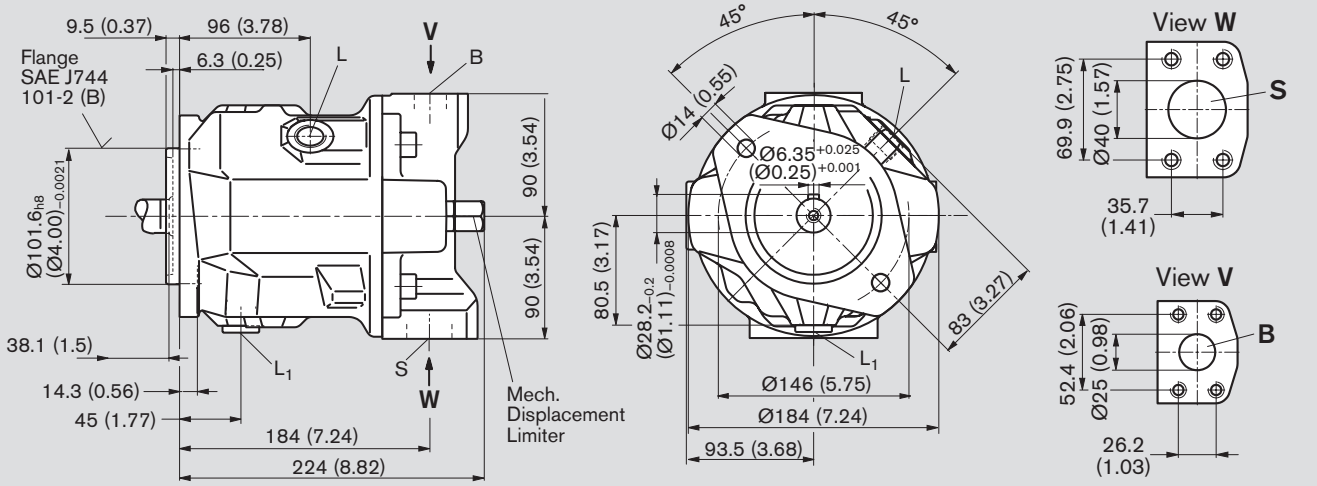
[1)] ANSI B92.1a-1976, pressure angle 30°, flat root side fit, tolerance class 5

[2)] See safety information

Unit dimensions, Size 45 – dimensions in millimeters (inches)

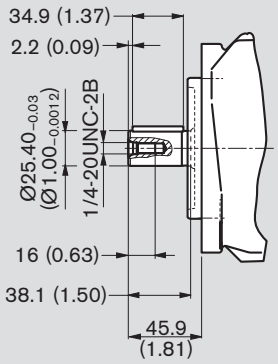
Before finalizing your design, please request a certified installation drawing.

Version AA10VSO 45 XXXX/31X-XXX62N00

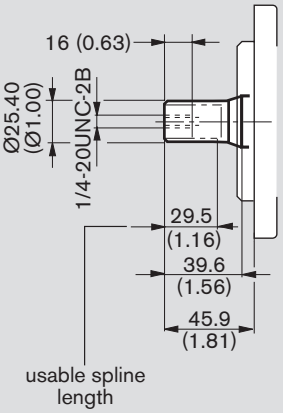


Shaft ends

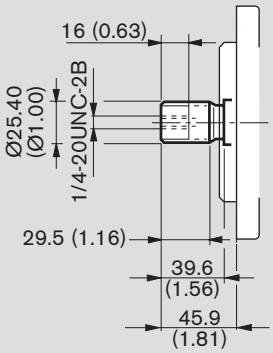
K Parallel with key
ISO 3019-1 25-1



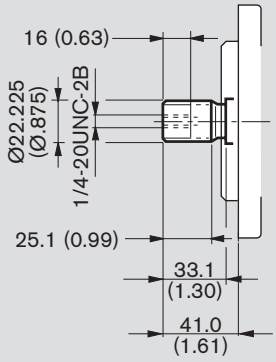
R Splined shaft 1 in 15T
16/32 DP[1)]
SAE J744-25-4 (B-B)



S Splined shaft 1 in 15T
16/32 DP[1)]
SAE J744-25-4 (B-B)



U Splined shaft 7/8 in
13T 16/32 DP[1)]
SAE J744-22-4 (B)



Ports

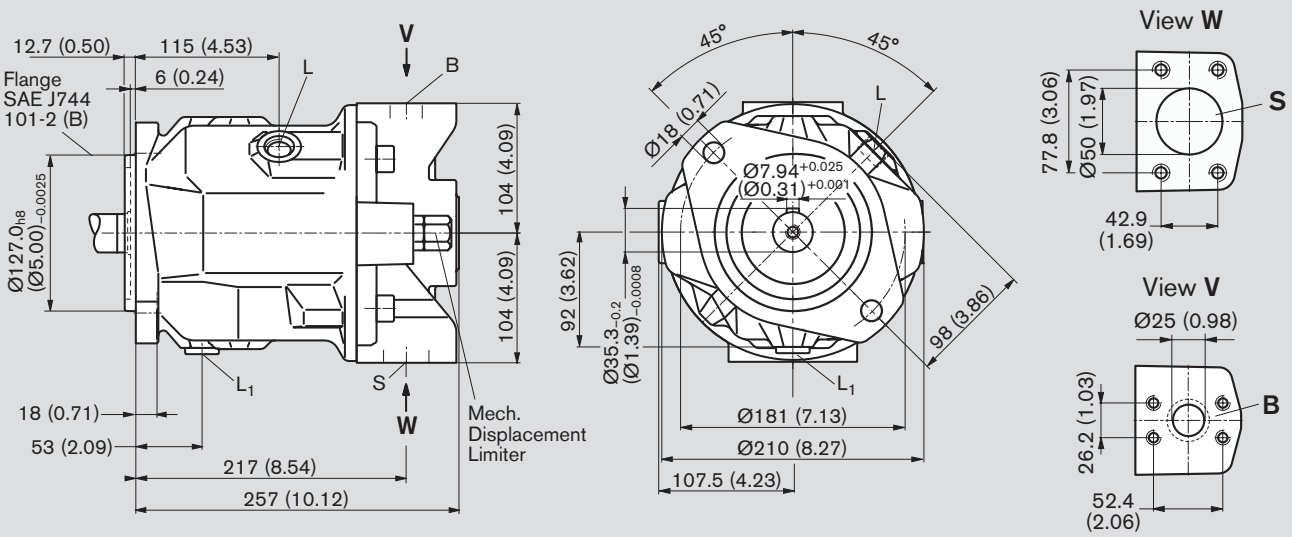
			Tightening torques, max.[2)]	
B	Pressure port (standard pressure range) Threading in bolt holes	SAE J518 ISO 68	1 in 3/8-16 UNC-2B; 0.71 (18) deep	40 Nm (29 lb-ft)
S	Inlet port (standard pressure range) Threading in bolt holes	SAE J518 ISO 68	1 1/2 in 1/2-13 UNC-2B; 0.87 (22) deep	90 Nm (66 lb-ft)
L/L_1	Case drain port (L_1 plugged)	ISO 11926	7/8-14 UNF-2B	240 Nm (177 lb-ft)

[1)] ANSI B92.1a-1976, pressure angle 30°, flat root side fit, tolerance class 5
[2)] See safety information

Unit dimensions, Size 71 – dimensions in millimeters (inches)

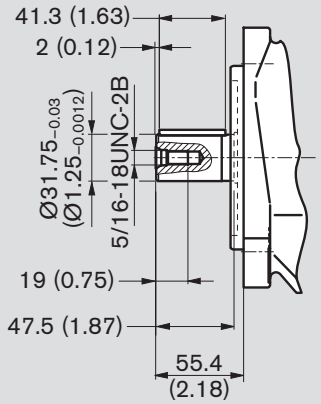
Before finalizing your design, please request a certified installation drawing.

Version AA10VSO 71 XXXX/31X-XXX92N00

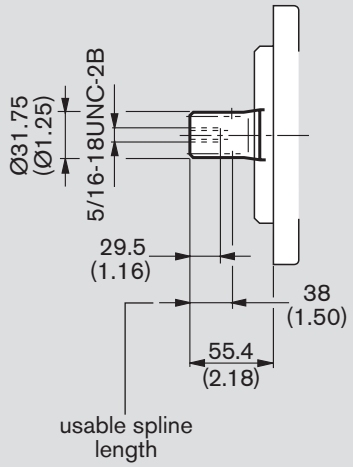


Shaft ends

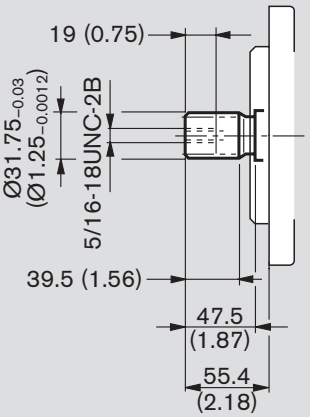
K Parallel with key
ISO 3019-1 32-1



R Splined shaft 1 1/4 in 14T 12/24 DP[1)]
SAE J744-32-4 (C)



S Splined shaft 1 1/4 in 14T 12/24 DP[1)]
SAE J744-32-4 (C)



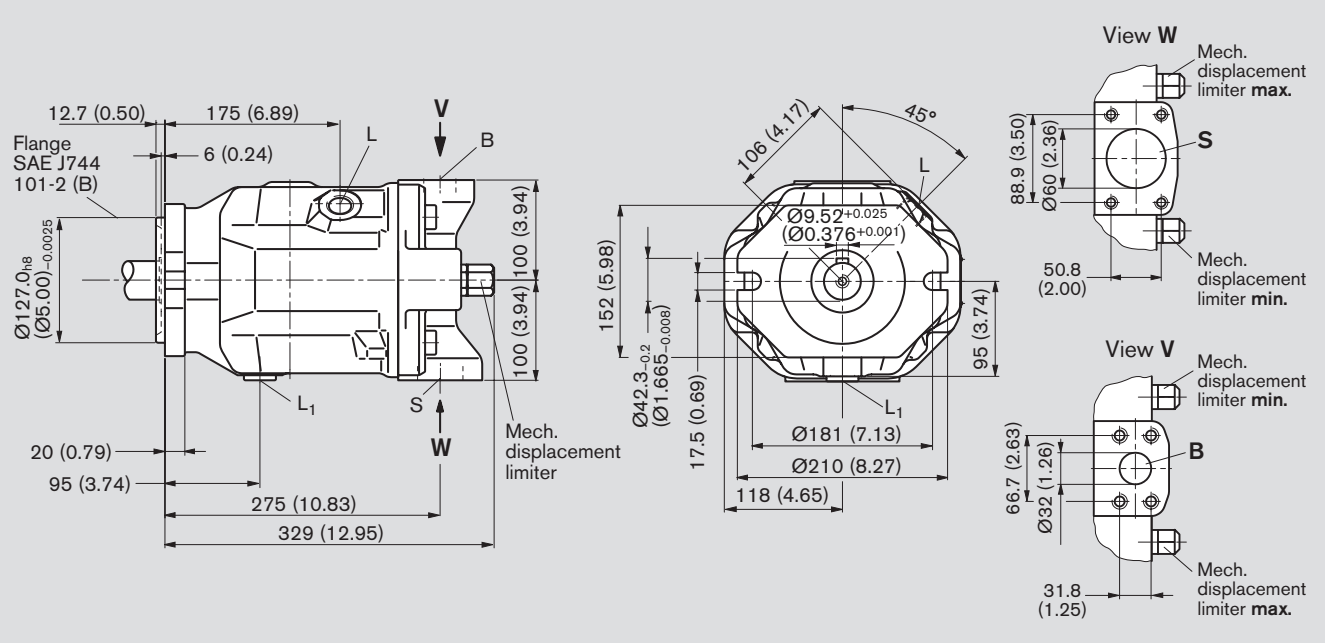
Ports			**Tightening torques, max.[2)]**	
B	Pressure port (standard pressure range)	SAE J518	1 in	
	Threading in bolt holes	ISO 68	3/8-16 UNC-2B; 0.71 (18) deep	40 Nm (29 lb-ft)
S	Inlet port (standard pressure range)	SAE J518	2 in	
	Threading in bolt holes	ISO 68	1/2-13 UNC-2B; 0.87 (22) deep	90 Nm (66 lb-ft)
L/L_1	Case drain port (L_1 plugged)	ISO 11926	7/8-14 UNF-2B	240 Nm (177 lb-ft)

[1)]ANSI B92.1a-1976, pressure angle 30°, flat root side fit, tolerance class 5
[2)]See safety information

Unit dimensions, Size 100 – dimensions in millimeters (inches)

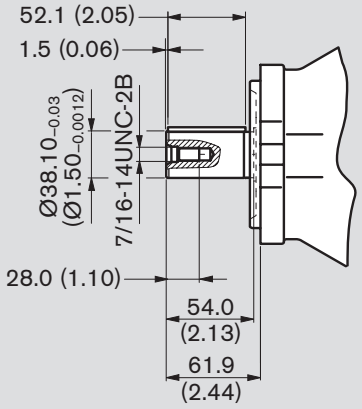
Before finalizing your design, please request a certified installation drawing.

Version AA10VSO 100 XXXX/31X-XXX62N00

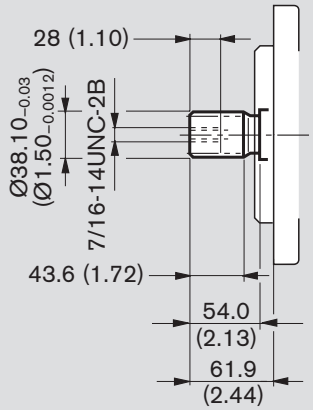


Shaft ends

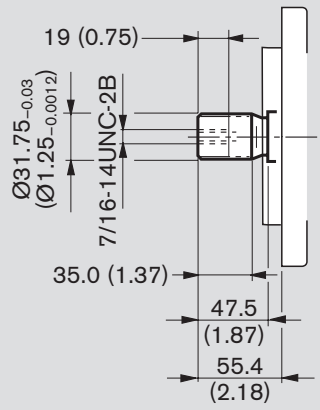
K Parallel with key
ISO 3019-1 38-1



S Splined shaft 1 1/2 in 17T 12/24 DP[1)]
SAE J744-38-4 (C-C)



U Splined shaft 1 1/4 in 14T 12/24 DP[1)]
SAE J744-32-4 (C)



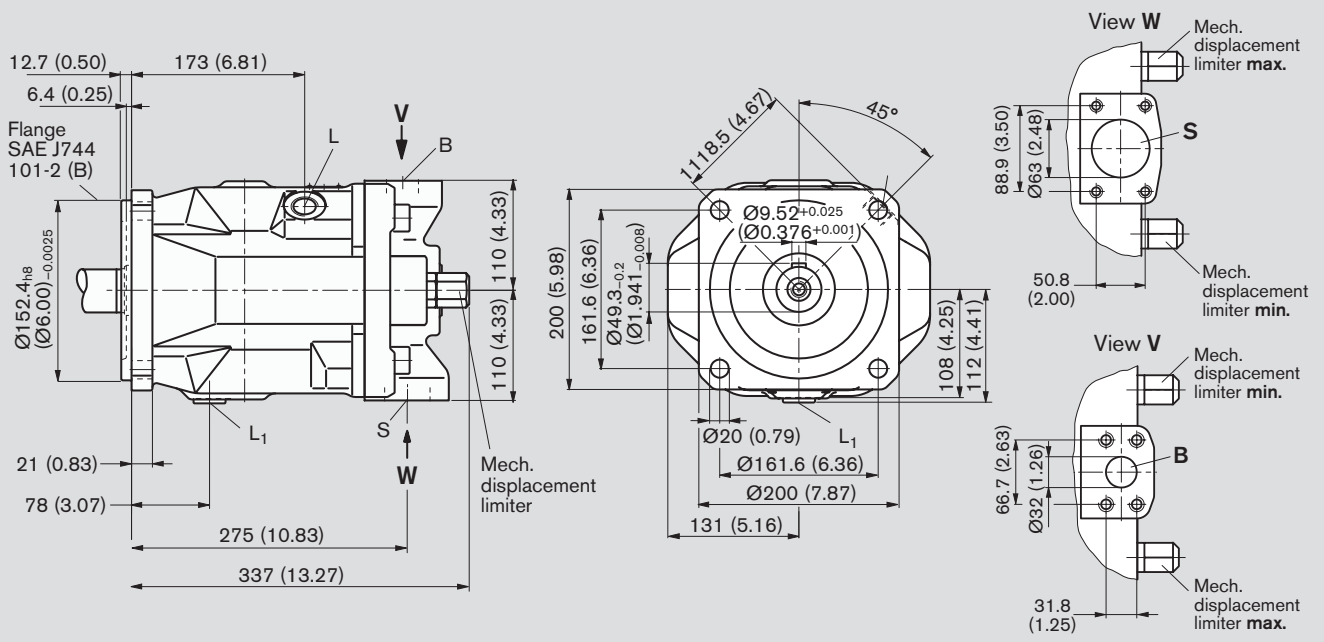
Ports			Tightening torques, max.[2)]	
B	Pressure port (high pressure range) Threading in bolt holes	SAE J518 ISO 68	1 1/4 in 1/2-13 UNC-2B; 0.75 (19) deep	90 Nm (66 lb-ft)
S	Inlet port (standard pressure range) Threading in bolt holes	SAE J518 ISO 68	2 1/2 in 1/2-13 UNC-2B; 0.94 (27) deep	90 Nm (66 lb-ft)
L/L_1	Case drain port (L_1 plugged)	ISO 11926	1 1/16-12 UN-2B	360 Nm (265 lb-ft)

[1)] ANSI B92.1a-1976, pressure angle 30°, flat root side fit, tolerance class 5
[2)] See safety information

Unit dimensions, Size 140 – dimensions in millimeters (inches)

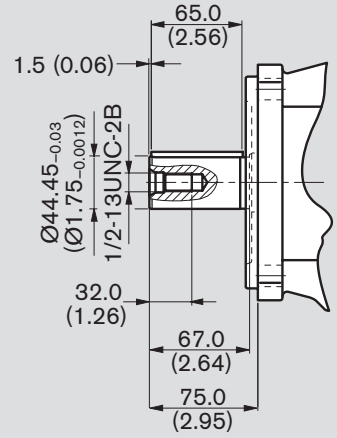
Before finalizing your design, please request a certified installation drawing.

Version AA10VSO 140 XXXX/31X-XXX62N00

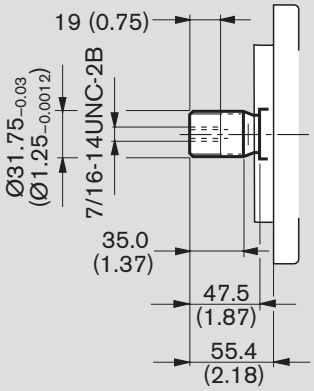


Shaft ends

K Parallel with key
ISO 3019-1 44-1



S Splined shaft 1 3/4 in 13T 8/16 DP[1)]
SAE J744-44-4 (D)



Ports			**Tightening torques, max.[2)]**	
B	Pressure port (high pressure range) Threading in bolt holes	SAE J518 ISO 68	1 1/4 in 1/2-13 UNC-2B; 0.75 (24) deep	90 Nm (66 lb-ft)
S	Inlet port (standard pressure range) Threading in bolt holes	SAE J518 ISO 68	2 1/2 in 1/2-13 UNC-2B; 0.94 (24) deep	90 Nm (66 lb-ft)
L/L_1	Case drain port (L_1 plugged)	ISO 11926	1 1/16-12 UN-2B	360 Nm (265 lb-ft)

[1)] ANSI B92.1a-1976, pressure angle 30°, flat root side fit, tolerance class 5

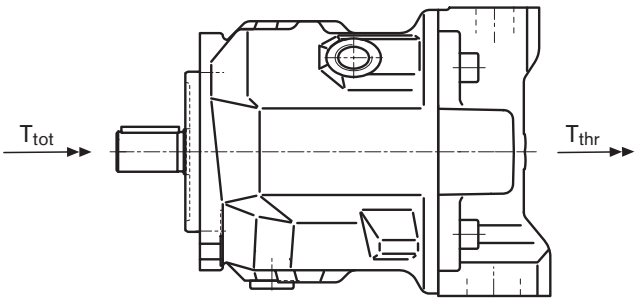
[2)] See safety information

Through drives

Axial piston units (A)A10VSO can be supplied with a through drive as shown in the ordering code on page 3. The type of through drive is determined by codes (K40-K...). If the combination pump is not mounted in the factory, the simple type code is sufficient.

Included in this case are: shaft coupler, seals, and if necessary an adapter flange.

Maximum permissible input and through drive torque.

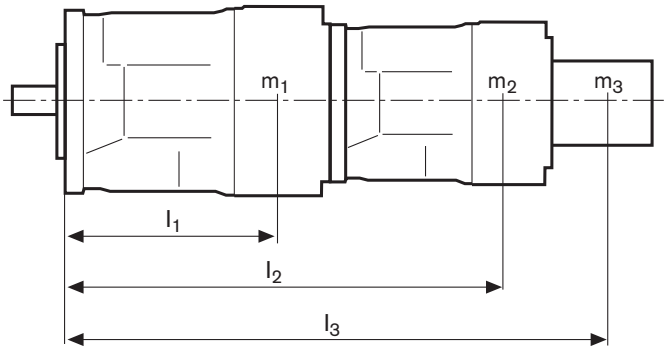


The drive torques for pump 1 and pump 2 can be split up as required. However the max. permissible input torque T_{tot} as well as the max. permissible through drive torque T_{thr} may not be exceeded.

Max. perm. input torque T_{tot}			**18**	**28**	**45**	**71**	**100**	**140**
With shaft U	T_{tot}	Nm (lb-ft)	59 (43)	– (–)	188 (139)	– (–)	595 (439)	– (–)
With shaft K	T_{tot}	Nm (lb-ft)	104 (77)	145 (107)	212 (156)	433 (319)	750 (553)	1186 (875)
With shaft S	T_{tot}	Nm (lb-ft)	124 (92)	198 (146)	319 (235)	626 (462)	1104 (814)	1620 (1195)
With shaft R	T_{tot}	Nm (lb-ft)	150 (111)	225 (166)	400 (295)	644 (475)	– (–)	– (–)
Max. perm. through drive torque T_{thr}								
With shaft K	T_{thr}	Nm (lb-ft)	104 (77)	145 (107)	212 (156)	433 (319)	750 (553)	1186 (875)
With shaft S	T_{thr}	Nm (lb-ft)	108 (80)	160 (118)	319 (235)	492 (363)	778 (574)	1266 (934)
With shaft R	T_{thr}	Nm (lb-ft)	120 (88)	176 (130)	365 (269)	548 (404)	– (–)	– (–)
Keyed shaft	$T_{thr\ keyed}$	Nm (lb-ft)	72 (53)	112 (83)	179 (132)	283 (209)	398 (293)	557 (411)

T_{tot} = max. permissible input torque pump 1
T_{thr} = max. permissible through drive torque
$T_{thr\ keyed}$ = max. permissible through drive torque at through drive to keyed shaft

Permissible overhang moment



m_1, m_2, m_3 weight of pump [kg (lbs.)]
l_1, l_2, l_3 distance to center of gravity [mm (in.)]

$$T_m = (m_1 \bullet l_1 + m_2 \bullet l_3 + m_3 \bullet l_3) \bullet \frac{1}{12} \text{ [lb-ft]}$$

$$\ldots \bullet \frac{1}{102} \text{ [Nm]}$$

Size			**18**	**28**	**45**	**71**	**100**	**140**
Permissible overhang moment	T_m	Nm (lb-ft)	500 (369)	880 (649)	1370 (1010)	2160 (1593)	3000 (2213)	4500 (3319)
at dyn. acceleration 10g = 98.1 m/s^2	T_m	Nm (lb-ft)	50 (37)	88 (65)	137 (101)	216 (159)	300 (221)	450 (332)
Weight	m	kg (lbs.)	12 (26.5)	15 (33)	21 (46)	33 (73)	45 (99)	60 (132)
Distance to center of gravity	l_1	mm (in.)	90 (3.54)	110 (4.33)	130 (5.12)	150 (5.91)	160 (6.30)	160 (6.30)

Overview of through drive mounting options

Before finalizing your design, please request a certified installation drawing.

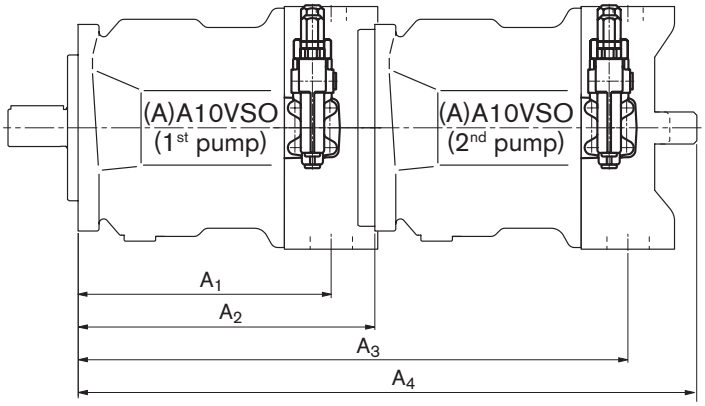
Through drives – (A)A10VSO			Mounting option – 2nd pump			
Flange SAE J744	hub keyed	code	(A)A10VSO.../31... size (shaft)	A10V(S)O.../52 size (shaft)	gear pump	aviable on size
82-2(A)	keyed (A-B)	K40	18 (K)	10 (K)	–	18–100
101-2 (B)	keyed (B)	K03	28 (K)	28 (K)	–	28–140
101-2 (B-B)	keyed (B-B)	K05	45 (K)	60, 45 (K)	–	45–140
127-2 (C)	keyed (C)	K08	71 (K)	–	–	71–140
127-2 (C)	keyed (C)	K38	100 (K)	85 (K)	–	100–140
152-4 (D)	keyed (D)	K21	140 (K)	–	–	140
SAE J744	**splined**					
82-2 (A)	5/8 in (A)	K01	18 (U)	–	size F	18–140
82-2 (A)	3/4 in (A-B)	K52	18 (S, R)	10 (S)	–	18–140
101-2 (B)	7/8 in (B)	K68	28 (S, R) 45 (U)[1]	28 (S, R) 45 (U, W)[1]	size N, G	28–140
101-2 (B)	1 in (B-B)	K04	45 (S, R)	45 (S, R) 60 (U, W)[2]	–	45–140
127-2 (C)	1 1/4 in (C)	K07	71 (S, R) 100 (U)[3]	85 (U, W)[3]	–	71–140
127-2 (C)	1 1/2 in (C-C)	K24	100 (S)	85 (S)	–	100–140
152-4 (D)	1 3/4 in (D)	K17	140 (S)	–	–	140

[1] Not with K68 through drive on main pump size 28
[2] Not with K04 through drive on main pump size 45
[3] Not with K07 through drive on main pump size 71

Unit dimensions combination pumps – dimensions in mm (inches)

Before finalizing your design, please request a certified installation drawing.

(A)A10VSO (1st pump)		(2nd pump) 18	28	45	71	100	140
18	A_1	145 (5.71)	–	–	–	–	–
	A_2	182 (7.16)	–	–	–	–	–
	A_3	327)12.87)	–	–	–	–	–
	A_4	377 (14.84)	–	–	–	–	–
28	A_1	165 (6.49)	165 (6.49)	–	–	–	–
	A_2	204 (8.03)	204 (8.03)	–	–	–	–
	A_3	349 (13.74)	368 (14.49)	–	–	–	–
	A_4	399 (15.71)	410 (16.14)	–	–	–	–
45	A_1	184 (7.24)	184 (7.24)	184 (7.24)	–	–	–
	A_2	229 (9.02)	229 (9.02)	229 (9.02)	–	–	–
	A_3	374 (14.72)	393 (15.47)	413 (16.26)	–	–	–
	A_4	424 (16.69)	435 (17.13)	453 (17.83)	–	–	–
71	A_1	217 (8.54)	217 (8.54)	217 (8.54)	217 (8.54)	–	–
	A_2	267 (10.51)	267 (10.51)	267 (10.51)	267 (10.51)	–	–
	A_3	412 (16.22)	431 (16.97)	451 (17.76)	484 (19.06)	–	–
	A_4	462 (18.19)	473 (18.62)	491 (19.33)	524 (20.63)	–	–
100	A_1	275 (10.83)	275 (10.83)	275 (10.83)	275 (10.83)	275 (10.83)	–
	A_2	338 (13.31)	338 (13.31)	338 (13.31)	338 (13.31)	338 (13.31)	–
	A_3	483 (19.02)	502 (19.76)	522 (20.55)	555 (21.85)	613 (24.13)	–
	A_4	533 (20.98)	544 (21.42)	562 (22.13)	595 (23.43)	667 (26.26)	–
140	A_1	275 (10.83)	275 (10.83)	275 (10.83)	275 (10.83)	275 (10.83)	275 (10.83)
	A_2	350 (13.78)	350 (13.78)	350 (13.78)	350 (13.78)	350 (13.78)	350 (13.78)
	A_3	495 (19.49)	514 (20.24)	534 (21.02)	567 (22.32)	625 (24.61)	625 (24.61)
	A_4	545 (21.46)	556 (21.89)	574 (22.60)	607 (23.90)	679 (26.73)	688 (27.09)



1. If a **second Rexroth pump must be factory mounted** the two individual model codes must be combined with a "+." Model code pump 1+ model code pump 2.

   Ordering example:

   AA10VSO71 DR/31 L-PKC92K68 + AA10VSO28 DR/31L-PSC62N00

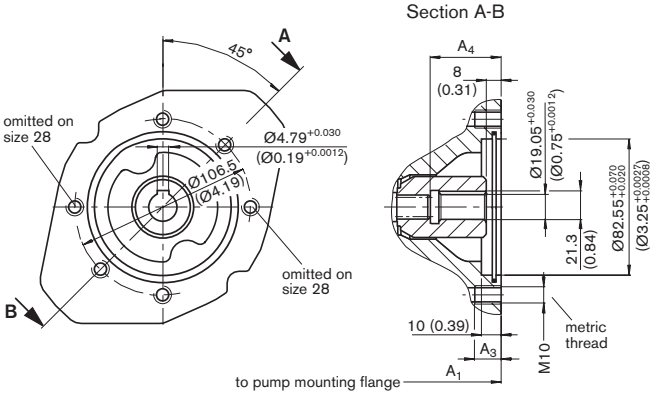
2. If a **gear pump or a radial piston pump is to be factory mounted** as a second pump please consult the factory.

Dimensions of through drives – dimensions in millimeters (inches)

Before finalizing your design, please request a certified installation drawing.

K40[1] Flange SAE J744 – 82-2 (A)

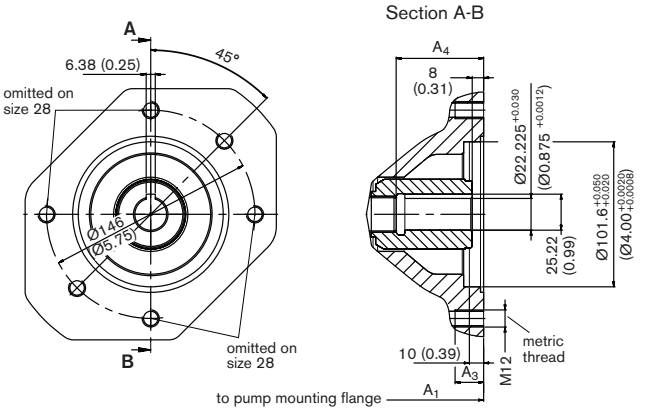
Hub for keyed shaft to ISO 3019-1 19-1



Size	A_1	A_3	A_4
28	204 (8.03)	16 (0.63)	47 (1.85)
45	229 (9.02)	16 (0.63)	53 (2.09)
71	267 (10.51)	20 (0.79)	61 (2.40)
100	338 (13.31)	20 (0.79)	65 (2.56)
140	350 (13.78)	17 (0.67)	77 (3.03)

K03[1] Flange SAE J744 – 101-2 (B)

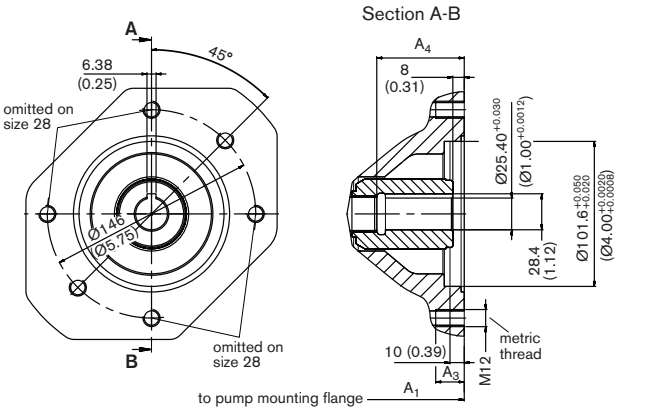
Hub for keyed shaft to ISO 3019-1 22-1



Size	A_1	A_3	A_4
28	204 (8.03)	18 (0.71)	47 (1.85)
45	229 (9.02)	18 (0.71)	53 (2.09)
71	267 (10.51)	20 (0.79)	61 (2.40)
100	338 (13.31)	20 (0.79)	65 (2.56)
140	350 (13.78)	20 (0.79)	77 (3.03)

K05[1] Flange SAE J744 – 101-2 (B-B)

Hub for keyed shaft SAE to ISO 3019-1 25-1



Size	A_1	A_3	A_4
45	229 (9.02)	18 (0.71)	53 (2.09)
71	267 (10.51)	20 (0.79)	61 (2.40)
100	338 (13.31)	20 (0.79)	65 (2.56)
140	350 (13.78)	20 (0.79)	77 (3.03)

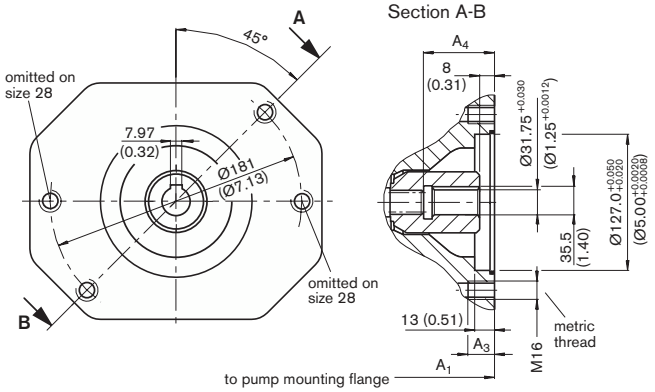
[1] Not for new projects. Permitted with reduced through drive torque only (see page 26).

Dimensions of through drives – dimensions in millimeters (inches)

Before finalizing your design, please request a certified installation drawing.

K08[1] Flange SAE J744 – 127-2 (C)

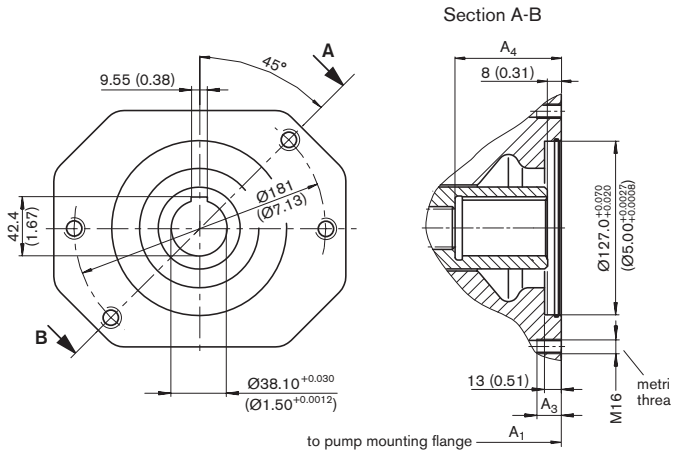
Hub for keyed shaft to ISO 3019-1 32-1



Size	A_1	A_3	A_4
71	267 (10.51)	18 (0.71)	61 (2.40)
100	338 (13.31)	24 (0.95)	64 (2.52)
140	350 (13.78)	24 (0.95)	66.5 (2.62)

K38[1] Flange SAE J744 – 127-2 (C)

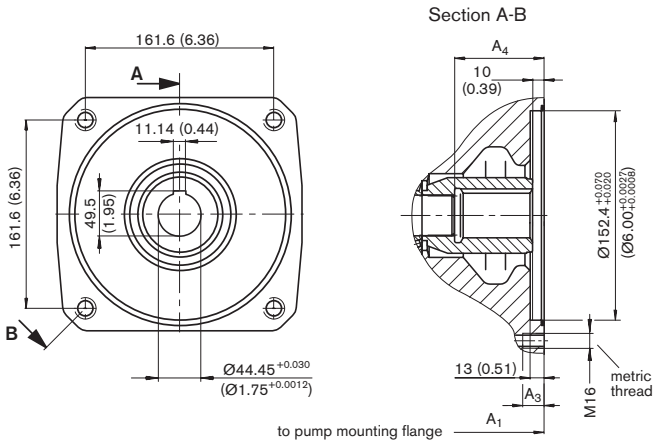
Hub for keyed shaft SAE to ISO 3019-1 38-1



Size	A_1	A_3	A_4
100	338 (13.31)	24 (0.95)	65 (2.56)
140	350 (13.78)	24 (0.95)	77 (3.03)

K21[1] Flange SAE J744 – 152-4 (D)

Hub for keyed shaft to ISO 3019-1 44-1



Size	A_1	A_3	A_4
140	350 (13.78)	approx. 21 (0.83)	77 (3.03)

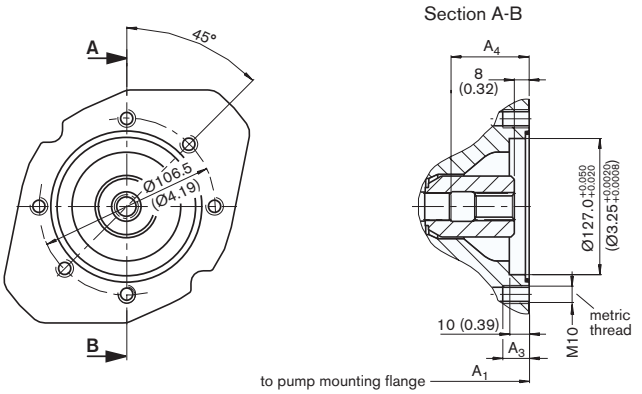
[1] Not for new projects. Permitted with reduced through drive torque only (see page 26).

Dimensions of through drives – dimensions in millimeters (inches)

Before finalizing your design, please request a certified installation drawing.

K01 Flange SAE J744 – 82-2 (A)

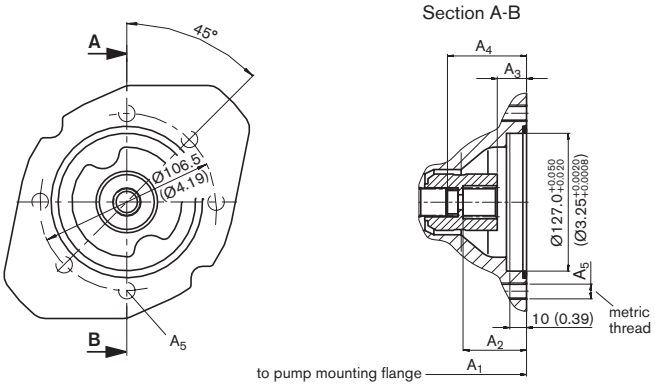
Hub for splined shaft to ANSI B.92.1a-1976 5/8 in 9T 16/32 DP[1] (SAE J744 - 16-4 (A))



Size	A_1	A_3	A_4
18	182 (7.16)	14.5 (0.57)	42 (1.65)
28	204 (8.03)	16 (0.63)	47 (1.85)
45	229 (9.02)	16 (0.63)	53 (2.09)
71	267 (10.51)	20 (0.79)	61 (2.40)
100	338 (13.31)	20 (0.79)	65 (2.56)
140	350 (13.78)	17 (0.63)	77 (3.03)

K52 Flange SAE J744 – 82-2 (A)

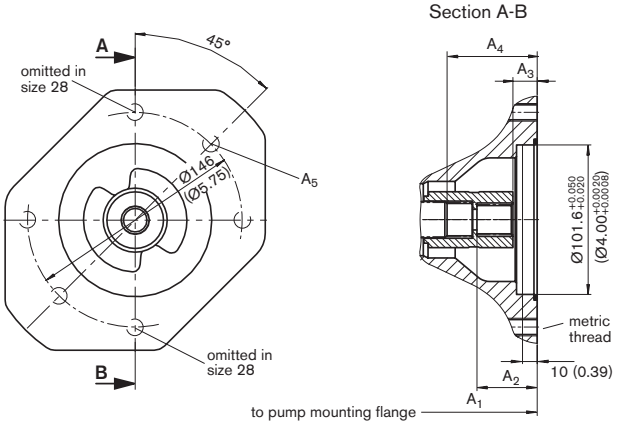
Hub for splined shaft to ANSI B.92.1a-1976 3/4 in 11T 16/32 DP[1] (SAE J744 - 19-4 (A-B))



Size	A_1	A_2	A_3	A_4	A_5 (metric thread)
18	182 (7.16)	40 (1.57)	18.8 (0.74)	43 (1.69)	M10; 14.5 (0.57) deep
28	204 (8.03)	39 (1.53)	18.8 (0.74)	47 (1.85)	M10; 16 (0.63) deep
45	229 (9.02)	40.5 (1.59)	18.9 (0.75)	53 (2.09)	M10; 16 (0.63) deep
71	267 (10.51)	40 (1.57)	21.3 (0.84)	61 (2.40)	M10; 20 (0.79) deep
100	338 (13.31)	40 (1.57)	19 (0.75)	65 (2.56)	M10; 20 (0.79) deep
140	350 (13.78)	41 (1.61)	18.9 (0.75)	77 (3.03)	M10; 17 (0.67) deep

K68 Flange SAE J744 – 101-2 (B)

Hub for splined shaft to ANSI B.92.1a-1976 7/8 in 13T 16/32 DP[1] (SAE J744 - 22-4 (B))



Size	A_1	A_2	A_3	A_4	A_5 (metric thread)
28	204 (8.03)	43 (1.69)	17.8 (0.70)	47 (1.85)	M12; 18 (0.71) deep
45	229 (9.02)	42 (1.65)	17.8 (0.70)	53 (2.09)	M12; 18 (0.71) deep
71	267 (10.51)	43 (1.69)	20.3 (0.80)	61 (2.40)	M12; 20 (0.79) deep
100	338 (13.31)	41 (1.61)	18 (0.71)	65 (2.56)	M12; 20 (0.79) deep
140	350 (13.78)	44 (1.73)	17.9 (0.70)	77 (3.03)	M12; 20 (0.79) deep

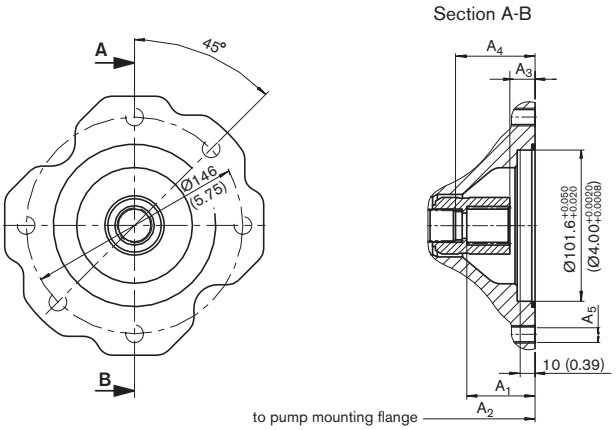
[1] Pressure angle 30°, flat root side fit, tolerance class 5

Dimensions of through drives – dimensions in millimeters (inches)

Before finalizing your design, please request a certified installation drawing.

K04 Flange SAE J744 – 101-2 (B)

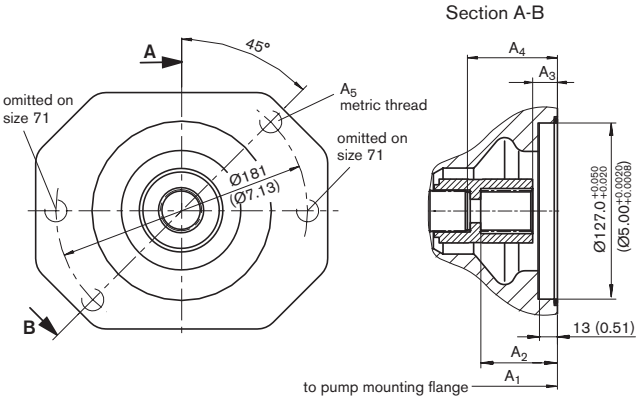
Hub for splined shaft to ANSI B.92.1a-1976 1 in 15T 16/32 DP[1] (SAE J744 - 25-4 (B-B))



Size	A_1	A_2	A_3	A_4	A_5 (metric thread)
45	229 (9.02)	47.5 (1.87)	18.4 (0.73)	53 (2.09)	M12; 18 (0.71) deep
71	267 (10.51)	47.5 (1.87)	20.8 (0.82)	61 (2.40)	M12; 20 (0.79) deep
100	338 (13.31)	47.5 (1.87)	18.2 (0.72)	65 (2.56)	M12; 20 (0.79) deep
140	350 (13.78)	47.5 (1.87)	18.4 (0.73)	77 (3.03)	M12; 20 (0.79) deep

K07 Flange SAE J744 – 127-2 (C)

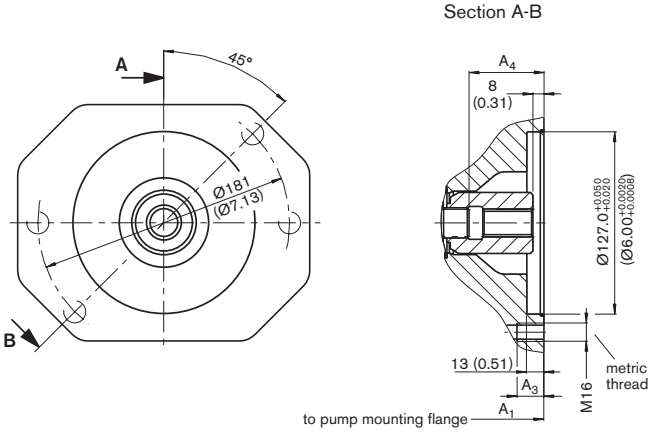
Hub for splined shaft to ANSI B.92.1a-1976 1 1/4 in 14T 12/24 DP[1] (SAE J744 - 32-4 (C))



Size	A_1	A_2	A_3	A_4	A_5 (metric thread)
71	267 (10.51)	55.5 (2.18)	22 (0.87)	61 (2.40)	M16; 18 (0.70) deep
100	338 (13.31)	57 (2.24)	19.5 (0.77)	65 (2.56)	M16; 24 (0.95) deep
140	350 (13.78)	60 (2.36)	19.4 (0.77)	77 (3.03)	M16; 24 (0.95) deep

K24 Flange SAE J744 – 127-2 (C)

Hub for splined shaft to ANSI B.92.1a-1976 1 1/2 in 17T 12/24 DP[1] (SAE J744 - 38-4 (C-C))



Size	A_1	A_3	A_4
100	338 (13.31)	24 (0.95)	65 (2.56)
140	350 (13.78)	24 (0.95)	77 (3.03)

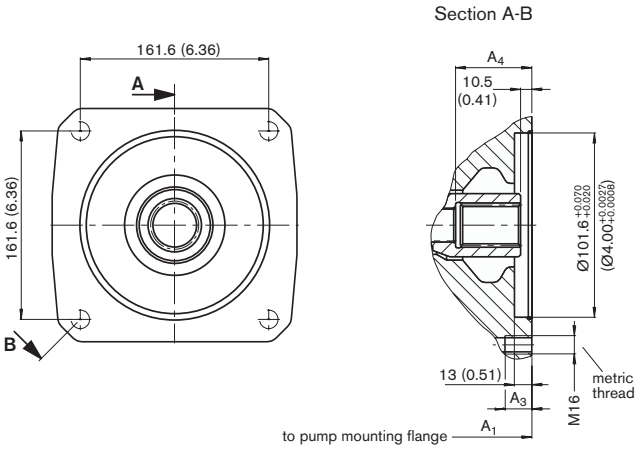
[1] Pressure angle 30°, flat root side fit, tolerance class 5

Dimensions of through drives – dimensions in millimeters (inches)

Before finalizing your design, please request a certified installation drawing.

K17 Flange SAE J744 – 152-4 (D)

Hub for splined shaft to ANSI B.92.1a-1976 1 3/4 in 13T 8/16 DP[1] (SAE J744 - 44-4 (D))



Size	A_1	A_3	A_4
140	350 (13.78)	approx. 21 (0.83)	77 (3.03)

Installation notes

Optional installation position.The pump housing must be filled with fluid during commissionig and operation.

In order to attain the lowest noise level, all connections (suction, pressure, pilot, case drain) must be linked by flexible members to tank.

Avoid placing a check valve in the case drain line.

The case drain hose corresponding to the size of the case drain port should be installed at the highest case drain port location.

Vertical installation (shaft end upwards)
Following installation conditions must be taken into account:

Arrangement inside the reservoir

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

a) If the min. fluid level is equal to or above the pump mounting surface:

Close port "L", "L_1" and "S" open; L_1 piped and also S with suction pipe (see fig. 1).

b) If the min. fluid level is below the pump mounting surface: pipe port "L" and "S" acc. to fig. 2, close port "L" (compare item limiting conditions)

Note: In order to avoid demages to the pump, all attached parts (e.g. protective caps, covers, etc.) must be removed before installation.

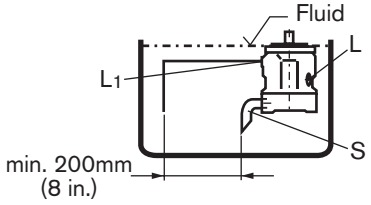


Fig. 1

Arrangement outside the reservoir

Before installation fill pump housing while keeping it in a horizontal position. For mounting above the tank see fig. 2.

Limiting condition:

Min. pump inlet pressure $p_{abs\ min} = 0.8$ bar (12 PSI) under static and dynamic loading.

Note: Avoid mounting above tank wherever possible in order to attain a low noise level.

The permissible suction height h is a result of the overall pressure loss, but may not be greater than $h_{max} = 800$ mm (31.5 in.) (Immersion depth $h_{t\ min} = 200$ mm/ 8 in.).

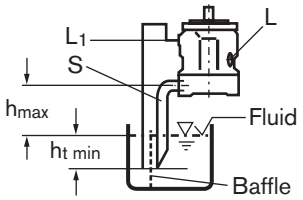


Fig. 2

Overall pressure loss

$\Delta p_{Ges} = \Delta p_1 + \Delta p_2 + \Delta p_3 \leq (1 - p_{abs\ min}) = 0.2$ bar
Δp_1: Pressure loss inpipe due to accelerating column of fluid

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

ρ =density [kg/m^3]
l = pipe lenth [m]
dv/dt = rate of change in fluid velocity[m/s^2]
Δp_2: Pressure lodd due to static head
$\Delta p_2 = h \cdot \rho \cdot g \cdot 10^{-5}$ [bar]
h = head [m]
ρ = density [kg/m^3]
g = gravity. = 9,81 m/s^2
Δp_3: line losses (elbows etc.)

Horizontal installation

The pump must be installaed in such a manner, that either "L" or "L1" is at the top.

Arrangement inside the reservoir

a) If the min. fluid level is above the top of the pump:

Close "L_1" , "L" and "S" open, mount suction pipe to port S, and pipe "L" at least 200 mm away from suction pipe.

(see. fig. 3)

b)If the min. fluid level is equal to or below the top of the pump:

Pipe port "L" and "S" acc.to.fig. 4 , port "L_1" closed. (compare limiting conditions)

Note: In order to avoid demages to the pump, all attached parts (e.g. protective caps, covers, etc.) must be removed before installation.

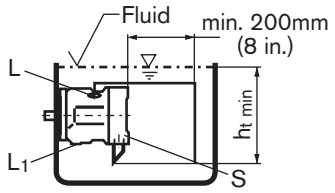


Fig. 3

Arrangement outside the reservoir

Fill pump housing before commissioning.

Pipe port "S" and the higher port "L" or "L_1"

a) When mounting above the reservoir: see fig. 4 (compare item limiting conditions)

b) Mounting below the reservoir: pipe ports "L" and "S" according to fig. 5, "L" closed.

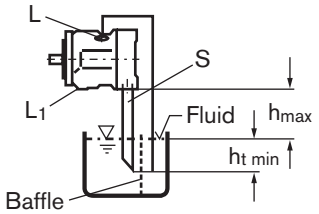


Fig. 4

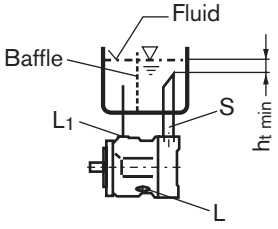


Fig. 5

Safety information

- Pump (A)A10VSO was designed for operation in open loop circuits.
- Systems design, installation and commissioning require trained technicians or tradesmen.
- All hydraulic ports can only be used for the fastening of hydraulic service lines.
- Tightening torques:
  The tightening torques mentioned in this data sheet are maximum values and must not be exceeded (max. values for thread).
  Manufacturers information concerning the maximum permitted tightening torques of the various fittings is to be observed!
  For ISO68/DIN 13 mounting bolts, we recommend that tightening torques be checked on a case by case basis in accordance with VDI 2230, published 2003.
- During and shortly after operation of a pump the housing and especially a solenoid can be extremely hot, avoid being burned!

Notes

Bosch Rexroth Corporation
Mobile Hydraulics
Axial & Radial Piston Units
8 Southchase Court
Fountain Inn, SC 29644-9018
USA
Telephone (864) 967-2777
Facsimile (864) 967-8900
www.boschrexroth-us.com