MANNESMANN REXROTH

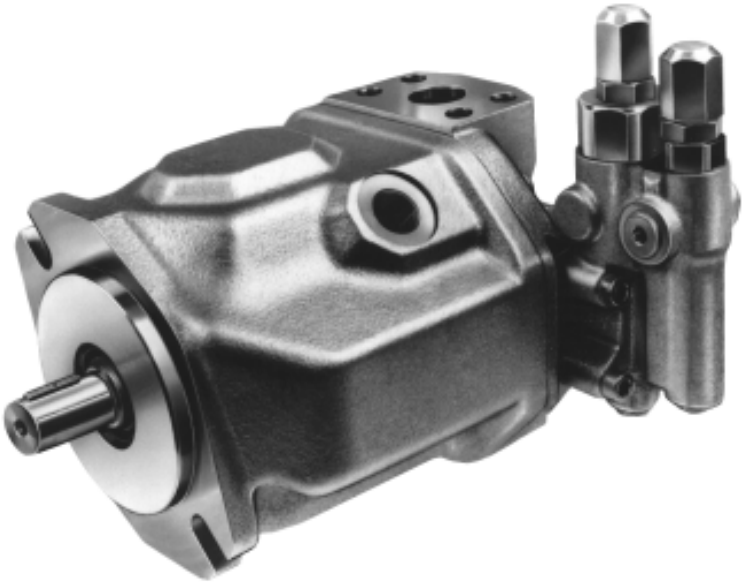
Brueninghaus Hydromatik

Variable Displacement Pump A10VSO

Series 31, open circuit
Axial Piston Swashplate Design

Size 18 | Nominal pressure 4000 psi (280 bar) | Peak pressure 5100 psi (350 bar)

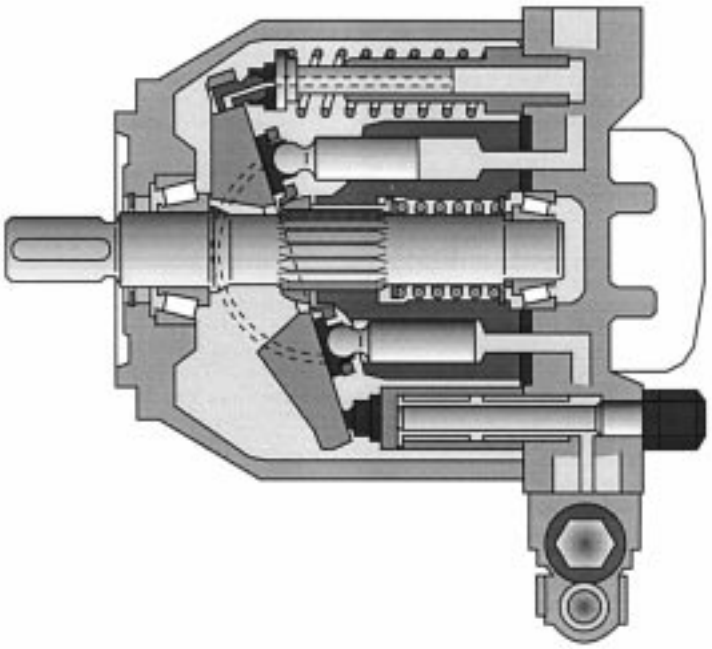
RA 92 712/05.95



Variable displacement axial piston pump A10VSO in swashplate design is designed for hydrostatic transmissions in open circuits.

It can be used in mobile and industrial applications.
Flow is proportional to the drive speed and the displacement. By adjusting the position of the swashplate it is possible to steplessly vary the flow.

- ISO or SAE mounting flange
- SAE flanged connections with metric or UNC fixing threads
- 2 case drain ports
- Good suction characteristics
- Permissible continuous operating pressure 4000psi (280 bar)
- Low noise level
- Long service life
- Axial and radial loading of drive shaft possible
- Low specific weight
- Short control times
- Through drive for multi-circuit system possible



Variable Displacement Pump A10VSO, Series 31

Ordering code

A10VS	O	18		/	31		–					

Hydraulic fluid

Petroleum oil (no code)

Axial piston unit

Swashplate design, variable Nominal pressure 4000 psi (280 bar) Peak pressure 5100 psi (350 bar)	**A10VS**

Mode of operation

Pump, open circuit	**O**

Size

Displacement V_{gmax} 1.10 in³ (18 cm³)	**18**

Control device

Pressure control	DR		●	**DR**
	DR	G	●	**DRG**
remote controlled				
Pressure and flow control	DFR		●	**DFR**
	DFR	1	●	**DFR1**
X-channel plugged				
Pressure and flow control, electronic	DFE1		●	**DFE1**
	DFEE		●	**DFEE** **

Series

	31

Direction of Rotation

Viewed on drive shaft	clockwise	**R**
	counter-clockwise	**L**

Seals

NBR- (Buna-N) / shaft seal FPM	**P**
FPM-	**V**

Shaft end

		DIN	SAE	
Parallel with key	DIN 6885	●	–	**P**
Parallel with key	19-1 (SAE A-B)	–	●	**K**
Splined	19-4 (SAE A-B, 3/4")	–	●	**S**
Splined	16-4 (SAE A, 5/8", not suitable for through drive)	–	●	**U**
Splined	19-4 (SAE A-B) modified	–	●	**R**

Mounting flange

ISO 2-hole	●	–	**A**
SAE 2-hole	–	●	**C**

Service line connections

Ports B and S	SAE ports on opposite sides metric fixing threads	●	–	**12**
	SAE ports on opposite sides UNC fixing threads	●	●	**62**

Through drive

Without through drive		**N00**
With through drive for building on axial piston unit or gear pump		
Mounting flange	**Shaft/coupling for mounting:**	
82-2 (SAE A)	Splined shaft 16-4 (SAE A; 5/8") G2	**K01**
82-2 (SAE A)	Splined shaft 19-4 (SAE A-B; 3/4")A10VSO 18	**K52**

****For complete ordering code information for DFEE, see page 16.**

● = available
– = not available

Hydraulic fluid

The A10VSO pump in the standard design should be used with good quality, petroleum oil based, anti-wear hydraulic fluids. More detailed information please see our data sheet RA 90220.

Operating viscosity range

In order to obtain optimum efficiency and service life we recommend that the operating viscosity (at operating temperature) be selected from within the range:

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

Viscosity limits

The limiting values for viscosity are as follows:

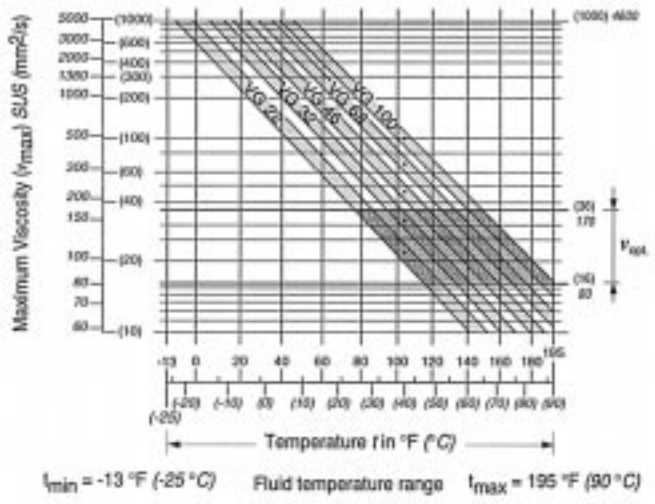
ν_{min} = 60 SUS (10 mm²/s)
short-term at maximum permissible drain temperature of 195°F (90°C)

ν_{max} = 4600 SUS (1000 mm²/s) or
1400 SUS (300 mm²/s) with built-on boost pump
short-term on cold start

Temperature range

t_{min} = – 13° (– 25° C)
t_{max} = + 195° F (+ 90° C)

Selection diagram



Notes on hydraulic fluid selection

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

The hydraulic fluid should be selected so that, within the operating temperature range, the fluid viscosity is within the optimum range (ν_{opt}) - see shaded area of selection diagram. We recommend that the higher viscosity grade is selected in each case.

Example: At an ambient temperature of X° the operating temperature in the reservoir is 140° F (60°C). In the optimum operating viscosity range ν_{opt} (shaded area), this corresponds to viscosity grades VG 46 or VG 68. VG 68 should be selected.

Important: The leakage fluid (case drain fluid) temperature is influenced by pressure and speed and is typically higher than the tank temperature. However, maximum temperature at any point in the system must be less than 195° F (90°C).

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

Fluid filtration

Correct functioning of the unit calls for a minimum level of cleanliness

to NAS, 1638 class 9
to SAE, class 6 or
to ISO/DIS 4406 18/15

This can be achieved, for example, using filter element type ...D 020...(see RE 31278).

This gives a filter quotient of

$\beta_{20} \geq 100$.

Mechanical flow limiting

Mechanical flow limiting **on the version without through drive it is standard, it is not possible with through drive**

Q_{max}: Setting range $V_{g\,max}$ to 50 % $V_{g\,max}$

Combination pumps

1. If a ***second Brueninghaus Hydromatik pump is fitted in the factory***, both ordering codes should be joined with "+" .

Typical order format: **A10VSO 18DFR/31R-PSC62K52 + A10VSO 18DFR/31R-PSC62N00**

2. If a ***gear pump is fitted in the factory*** please consult us (RE 90139 in preparation).

Technical data

Operating pressure range - Inlet side
Absolute pressure at port S

$p_{abs\ min}$ ____ 12 psi (0.8 bar)
$p_{abs\ max}$ ____ 435 psi (30 bar)

Operating pressure range - Outlet side
Pressure at port B
Nominal pressure p_N ____ 4000 psi (280 bar)
Peak pressure p_{max} ____ 5100 psi (350 bar)
(Pressure information to DIN 24312)
Applications at intermittent operating pressures of up to 4600 psi (315 bar) at 10% duty are permissible.

Case drain pressure
Maximum permissible pressure of case drain fluid (at port L, L_1):
Maximum 7 psi (0.5 bar) higher than inlet pressure at port S,but no higher than 30 psi (2 bar) absolute.

Direction of flow
S to B.

Determination of inlet pressure p_{abs} at suction port S or reduction in output flow for increasing speed

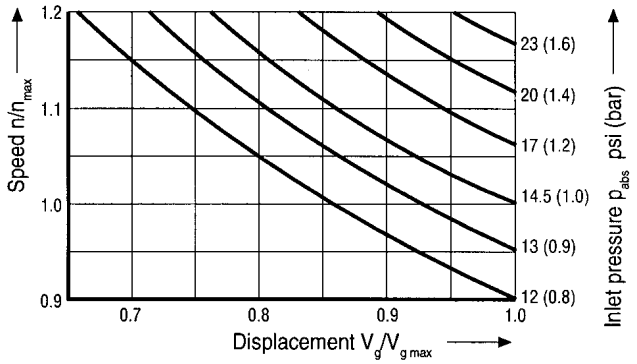


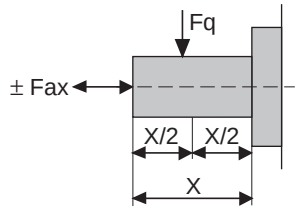
Table of values (theoretical values, without considering η_{mh} and η_v; values rounded)

Size				**18**		
Displacement		$V_{g\ max}$	in^3	1.10	(cm^3	18)
Max. speed[1])	at $V_{g\ max}$	$n_{o\ max}$	rpm	3300		
Max. permissible speed (speed limit) on increase in inlet pressure p_{abs} or $V_g < V_{g\ max}$		$n_{o\ max\ perm}$	rpm	3900		
Max. flow	at $n_{o\ max}$	$Q_{o\ max}$	gpm	15.7	(L/min	59.4)
Max. power Δp = 4000 psi (280 bar)	at $n_{o\ max}$	$P_{o\ max}$	HP	36.6	(kW	27.7)
Max. torque Δp = 4000 psi (280 bar)	at $V_{g\ max}$	T_{max}	lb-ft	58.3	(Nm	80.1)
Torque Δp = 1000 psi (100 bar)	at $V_{g\ max}$	T	lb-ft	14.6	(Nm	28.6)
Moment of inertia about drive axis		J	$lb\text{-}ft^2$	0.022	(kgm^2	0.00093)
Fill capacity			gal	0.1	(L	0.4)
Weight (without oil fill)		m	lbs	26.5	(kg	12)
Permissible shaft loading Max. permissible axial force		$F_{ax\ max}$	lbf	157	(N	700)
Max. permissible radial force [2])		$F_{q\ max}$	lbf	79	(N	350)

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

[2]) For higher radial forces please consult us.

Application of forces



Reference formulas

Flow $Q = \dfrac{V_g \cdot n \cdot \eta_v}{231}$ gpm $\left(\dfrac{V_g \cdot n \cdot \eta_v}{1000} \right.$ L/min $\left. \right)$

Torque $T = \dfrac{V_g \cdot \Delta p}{24 \cdot \pi \cdot \eta_{mh}}$ lb-ft $\left(\dfrac{1.59 \cdot V_g \cdot \Delta p}{100 \cdot \eta_{mh}} \right.$ Nm $\left. \right)$

Power $P = \dfrac{T \cdot n}{5252} = \dfrac{Q \cdot \Delta p}{1714 \cdot \eta_t}$ HP $\left(\dfrac{2\pi \cdot T \cdot n}{60000} = \dfrac{T \cdot n}{9549} = \dfrac{Q \cdot \Delta p}{600 \cdot \eta_t} \right.$ kW $\left. \right)$

V_g = geometric displacement in^3 (cm^3) per revolution
Δp = Differential pressure psi (bar)
n = Speed (rpm)
η_v = Volumetric efficiency
η_{mh} = Mechanical hydraulic efficiency
η_t = Total efficiency ($\eta_t = \eta_v \cdot \eta_{mh}$)

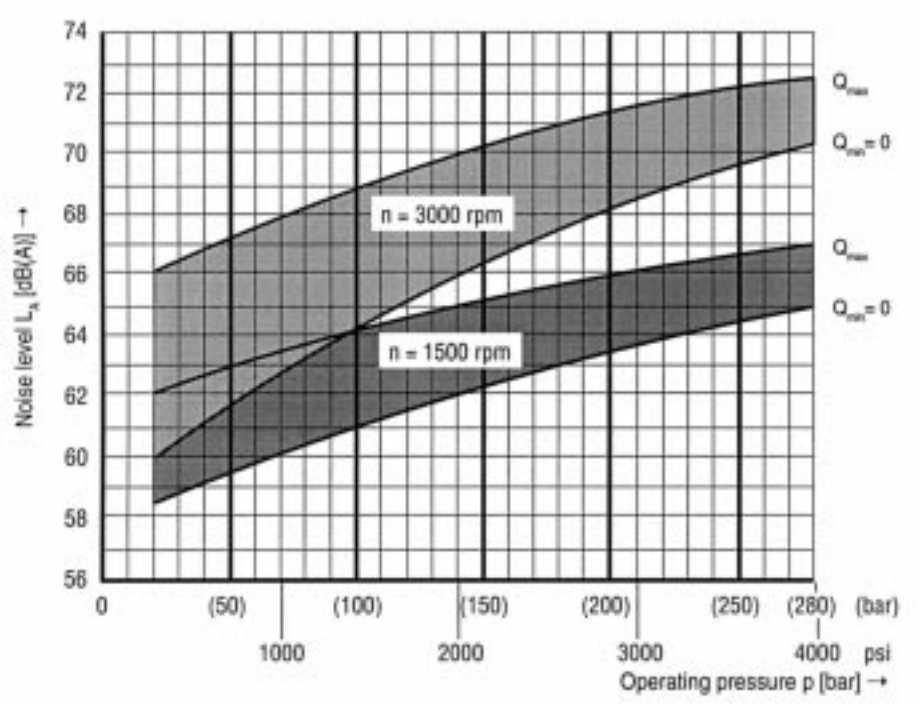
Installation notes

The installation position is optional. The pump housing must be filled with hydraulic fluid during commissioning and stay full when operating. In order to ensure the lowest possible noise values all connections (suction, pressure and drain connections) must be flexible.
Avoid a non-return valve in the drain line. In exceptional cases this may be permissible, but only after prior consultation with us.

Characteristic curves for pump with pressure control DR

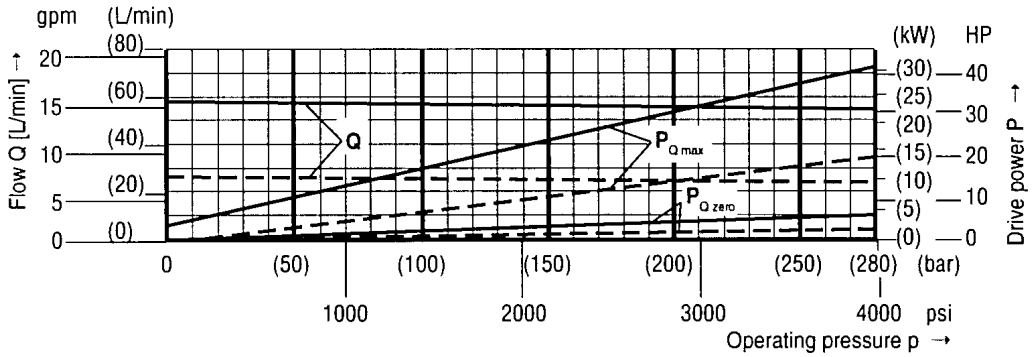
Noise levels
Measured in an anechoic chamber
Distance from microphone to pump = 3.3 ft (1 m)
Measuring error: ± 2 dB (A)
(Fluid: ISO VG 46 DIN 51519, t = 122° F (50° C)

Size 18



Drive power and output flow

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

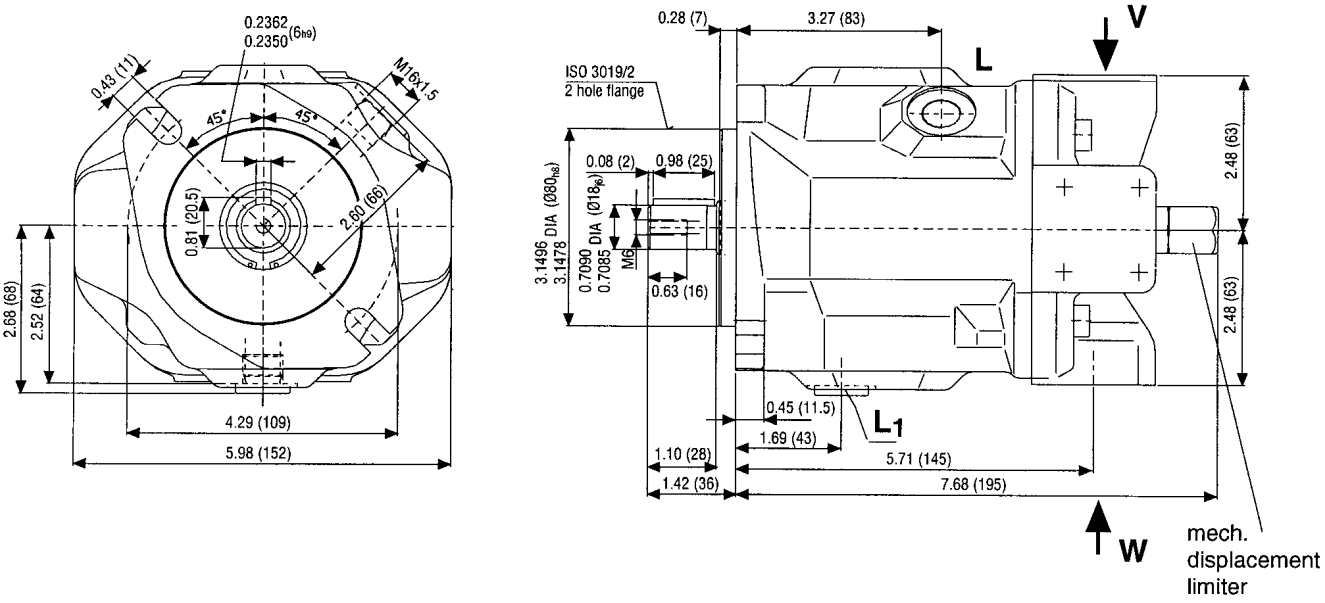


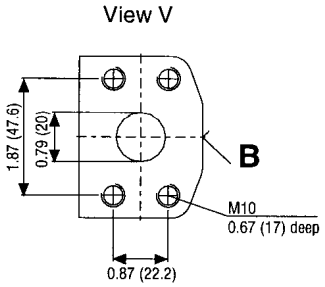
Size 18
– – – – n = 1500 rpm
——— n = 3300 rpm

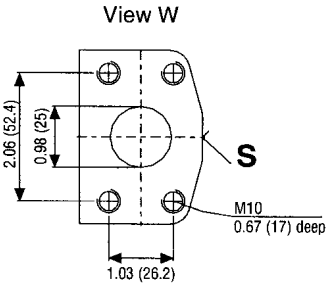
Unit dimensions size 18

ISO version
Through drive version N**00** (without through drive)
not including control

Shaft end "P"



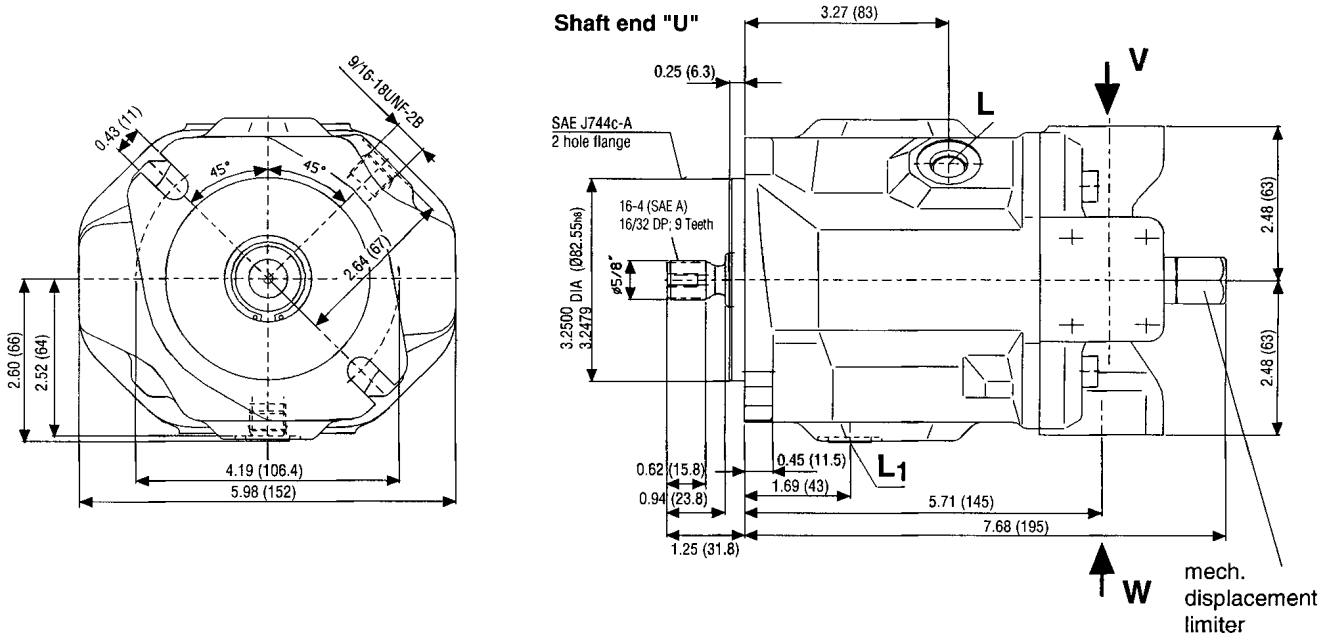




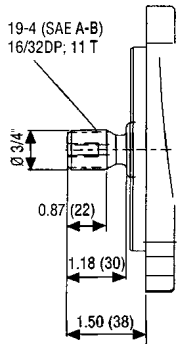
B	Pressure port	SAE 3/4"	(Standard pressure series)
S	Suction port	SAE 1"	(Standard pressure series)
L/L_1	Case drain ports	M16x1.5 (metric thread)	(L_1 plugged at factory)

Unit dimensions size 18

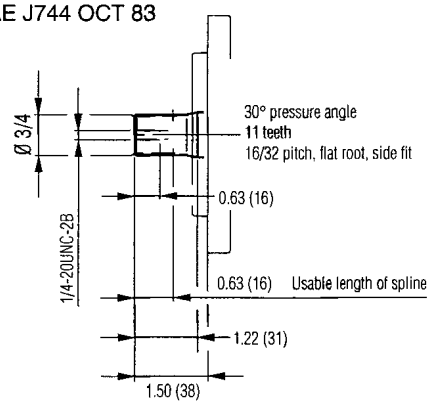
SAE version
Through drive version N**00** (without through drive)
not including control



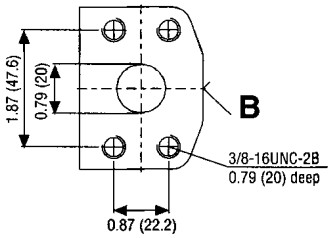
Shaft end "S"



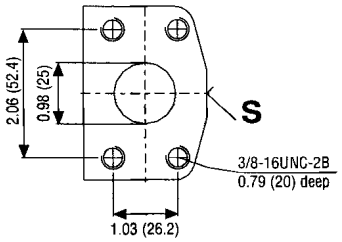
Shaft end "R"
19-4 (SAE A-B) mod.
SAE J744 OCT 83



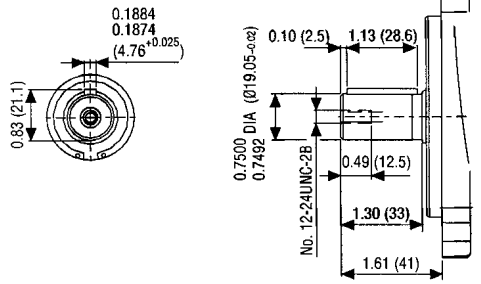
View V



View W



Shaft end "K"



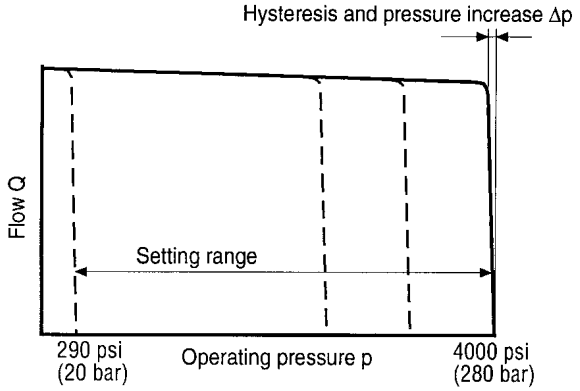
B	Pressure port	SAE 3/4"	(Standard pressure series)
S	Suction port	SAE 1"	(Standard pressure series)
L/L_1	Case drain ports	9/16-18 UNF-2B	(L_1 plugged at factory)

DR Pressure control

The constant pressure control serves to maintain a constant pressure in a hydraulic system within the control 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 curve

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

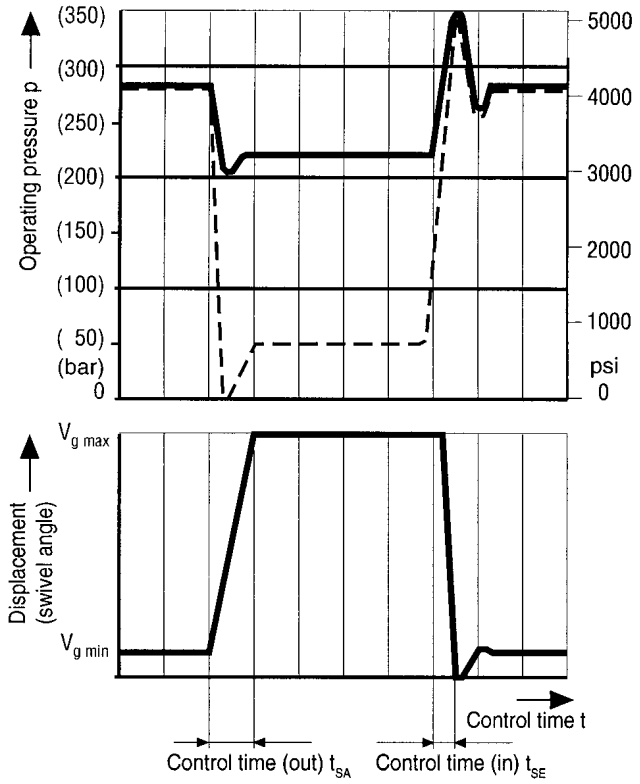


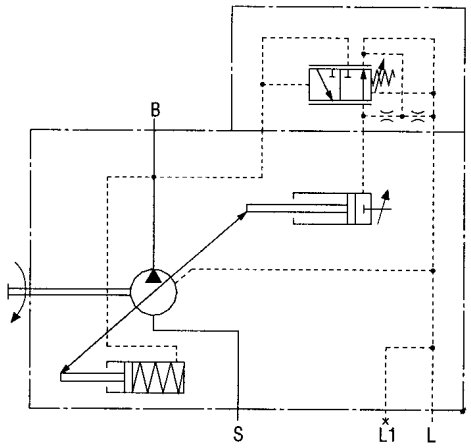
Dynamic Curves

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

Conditions: n = 1500 rpm
t_{oil} = 122° F (50° C)
Pressure cut-off at 5100 psi (350 bar)

Load steps were obtained by suddenly opening and closing the pressure line with a pressure relief valve as load valve 3.3 ft (1 m) from the mounting flange of the axial piston unit.





Ports

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

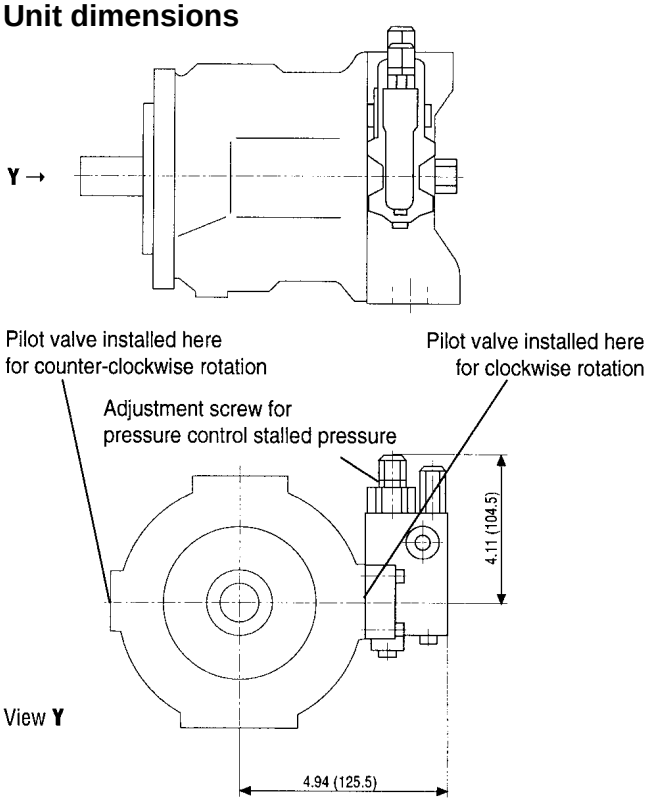
Control data

Hysteresis and pressure increase Δp ——— max. 60 psi (4 bar)
Pilot oil requirement ——— max. approx. 0.8 gpm (3 L/min)
Loss of flow at Q_{max} see page 5.

Control time

Size	t_{SA} (ms) against 725 psi (50 bar)	t_{SA} (ms) against 3200 psi (220 bar)	t_{SE} (ms) zero stroke 4000 psi (280 bar)
18	50	25	20

Unit dimensions



DFR valve, flow control blocked and not tested

DRG Pressure control, remote controlled

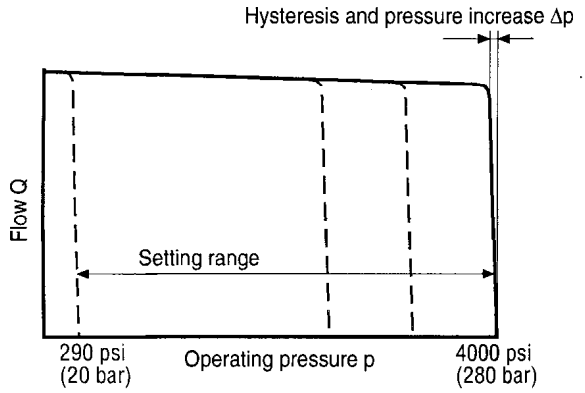
Function and equipment as for DR.

A pressure relief valve can be connected here at port X. This is not included in the items supplied for the DRG control

The standard setting for differential pressure at the pilot valve is 290 psi (20 bar). The amount of pilot oil required is approx. 0.4 gpm (1.5 L/min). If a different setting is required - range 145-320 psi (10-22 bar) - please indicate in clear text.
We recommend the following as a separate pressure relief valve:
DBDH 6 (hydraulic) to RA 25 402,
DBEC-3X (electrical) to RA 29 142 or
DBETR -SO 381 w. nozzle 0.03 DIA (ø 0.8 mm) in P (electrical) to RA 29 166.

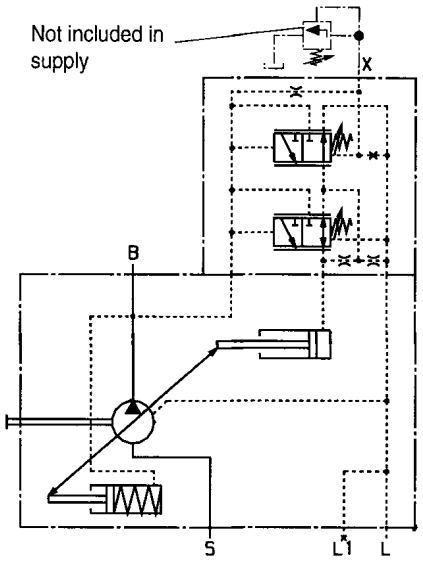
Max. line length should not exceed 6.5 ft (2 m).

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



Control data

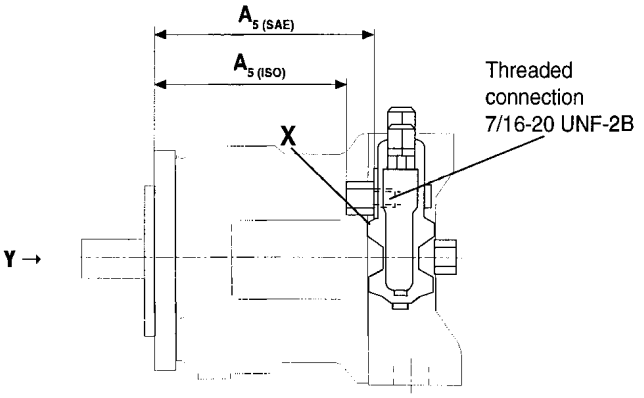
Hysteresis and pressure increase Δp _____ max. 60 psi (4 bar)
Pilot oil requirement _____ approx. 1.2 gpm (4.5 L/min)
Loss of flow at Q_{max} see page 5.

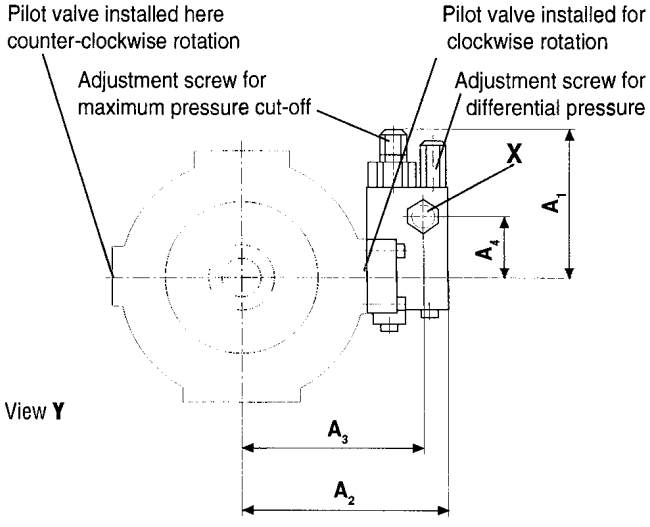


Ports

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

Unit dimensions



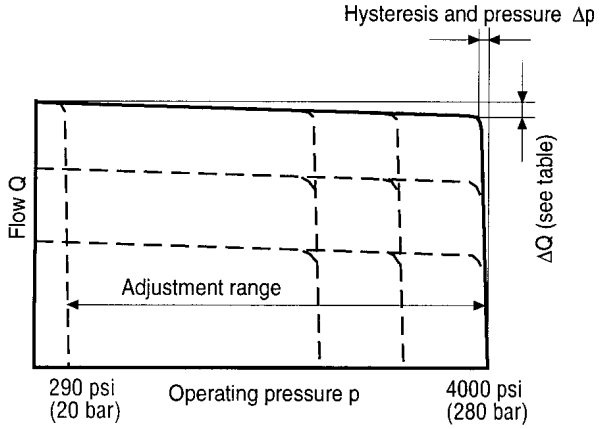


Size	A_1	A_2	A_3	A_4	A_5	Port X
18_{ISO}	4.11 (104.5)	4.94 (125.5)	4.29 (109)	1.57 (40)	4.29 (109)	M14x1.5;0.47 deep (M14x1.5;12 deep)
18_{SAE}	4.11 (104.5)	4.94 (125.5)	4.29 (109)	1.57 (40)	5.12 (130)	7/16-20 UNF-2B;0.39 deep 7/16-20 UNF-2B;10 deep

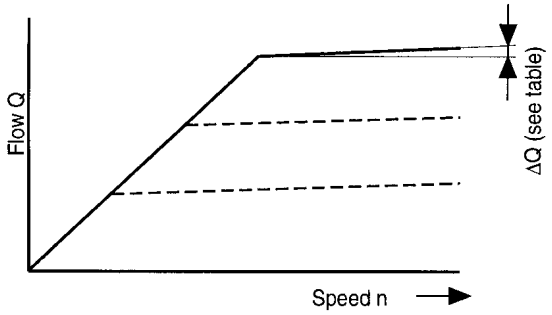
DFR1/DFR Pressure - Flow Control

In addition to the pressure control, it is also possible to set the pump flow by means of differential pressure at the operator (e.g., a throttle); load sensing.
In model DFR, an additional bleed down orifice is provided to vent trapped pressure in the load sense line.

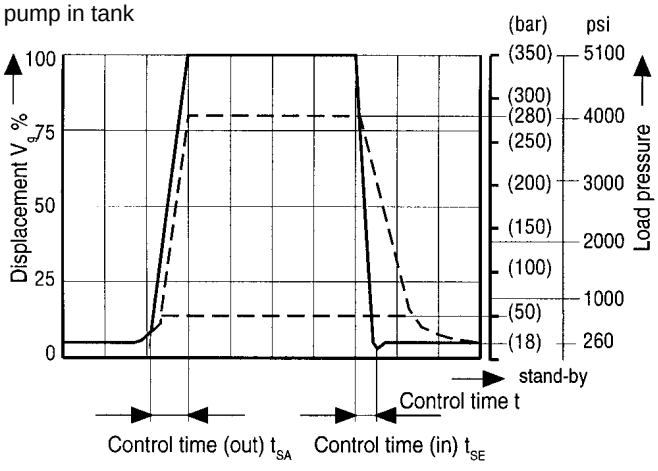
Static curve
at n_1 = 1500 rpm, t_{oil} = 122° F (50° C)



Static curve at variable speed



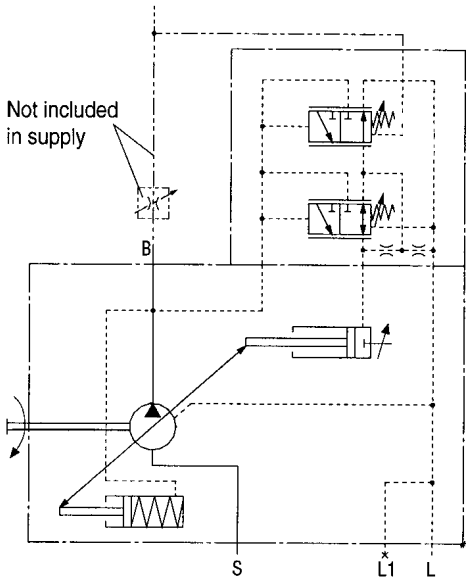
Dynamic flow control curve
The curves are mean values measured under test conditions, pump in tank



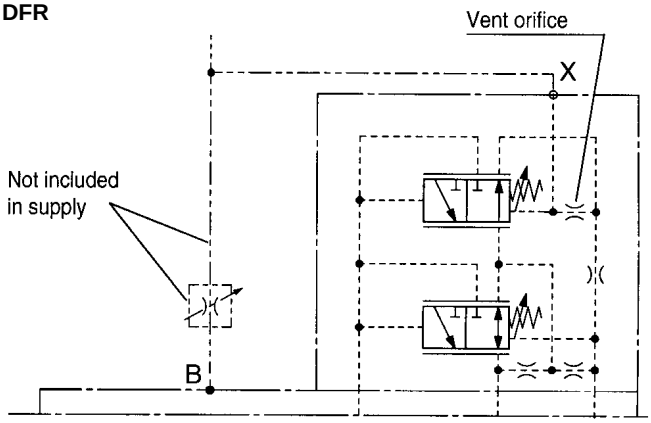
Control time

Size	t_{SA} (ms) stand by-4000 psi (stand by-280 bar)	t_{SE} (ms) 4000 psi-stand by (280 bar-stand by)	t_{SE} (ms) 725 psi-stand by (50 bar-stand by)
18	40	15	40

DFR1



DFR



Ports

B	Pressure port
S	Suction port
L, L1	Case drain ports (L1 plugged)
X	Pilot (load sense) pressure port

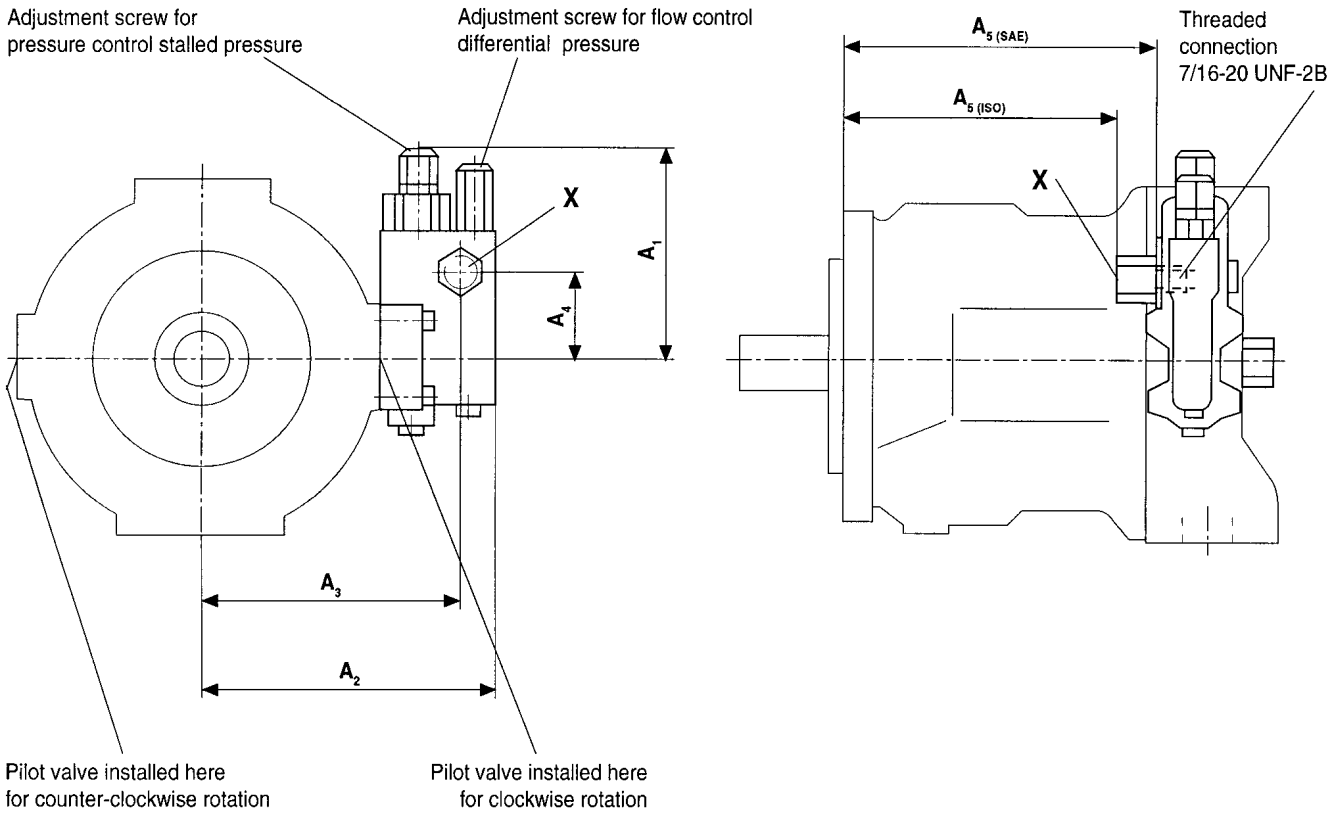
Differential pressure Δp:
Adjustable between 145 and 320 psi (10 and 22 bar) (higher values on request).
Standard setting: 200 psi (14 bar). If another setting is required please state in clear text.
When pressure is relieved on port X to tank a stalled pressure of p = 260 ± 30 psi (18 ± 2 bar) ("stand by") is set.

Control data
Max. flow deviation (hysteresis and increase)
measured at drive speed n = 1500 rpm

Size	18	
ΔQ_{max}	0.24 gpm	(0.9 L/min)

Hysteresis and pressure increase Δp _____ max. 75 psi (5 bar)
Pilot oil requirement DFR _____ max. approx. 0.8 ... 1.2 gpm (max. approx. 3 ... 4.5 L/min)
Pilot oil requirement DFR1 ____ max. approx. 0.8 gpm (3 L/min)
Loss of flow at Q_{max} see page 5.

Unit dimensions



Size	A_1	A_2	A_3	A_4	A_5	Port X
18$_{ISO}$	4.11	4.94	4.29	1.57	4.29	M14x1.5;0.47 deep
	(104.5)	(125.5)	(109)	(40)	(109)	(M14x1.5;12 deep)
18$_{SAE}$	4.11	4.94	4.29	1.57	5.12	7/16-20 UNF-2B;0.39 deep
	(104.5)	(125.5)	(109)	(40)	(130)	7/16-20 UNF-2B;10 deep

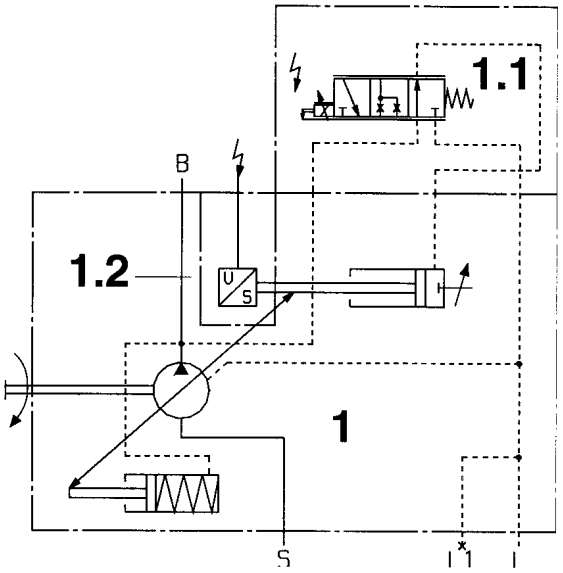
DFE1 Pressure and flow control, electronic

Pressure and flow to the pump are controlled by an electrically operated proportional valve. Flow control is via the variable pump swivel angle without compensation for drive speed variations (e.g. due to the diesel motor). Pump pressure and pump position are signalled via a pressure sensor and inductive positional transducer to the amplifier card which is required to operate the closed loop control.

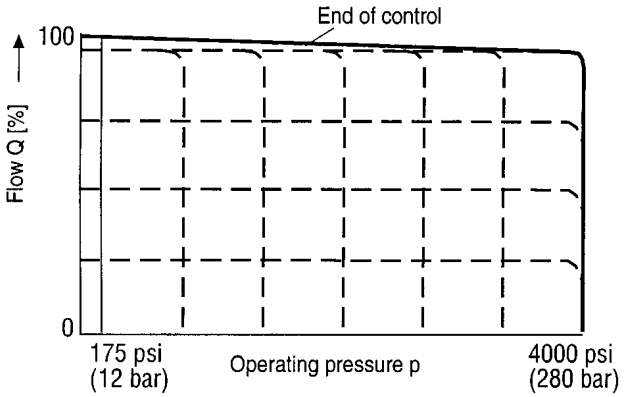
DFE1 model pump is suitable for operation with analogue amplifier card VT 5041.
The amplifier card and the pressure sensor should be ordered separately.

For safety reasons an additional pressure relief valve should be installed in addition to the pump pressure control. This is to safeguard the maximum permissible operating pressure.

For further information and some typical applications see data sheet RA 30 022.



Static curves



Ports

B	Pressure port
S	Suction port
L, L1	Case drain ports (L1 plugged)

Components

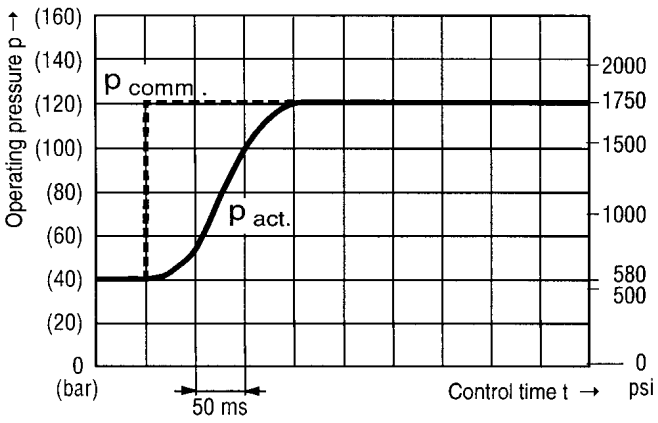
1 A10VSO with hydraulic setting device
1.1 Proportional valve
1.2 Inductive positional transducer (LVDT)
Pressure sensor and control electronics are loose items (please order separately to RA 67016)

Control data

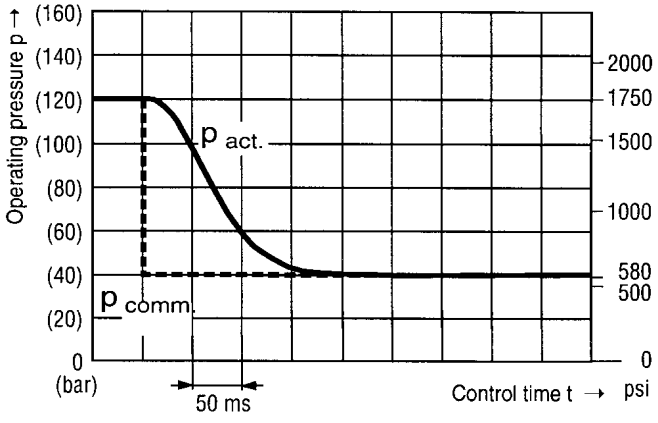
Hysteresis ____ < 1% of $V_{g\,max}$
Repeatability ____ < 1%
Pilot oil requirement ____ max. approx. 0.66 gpm (2.5 L/min)
Loss of flow at Q_{max} see page 5.

Dynamic curves

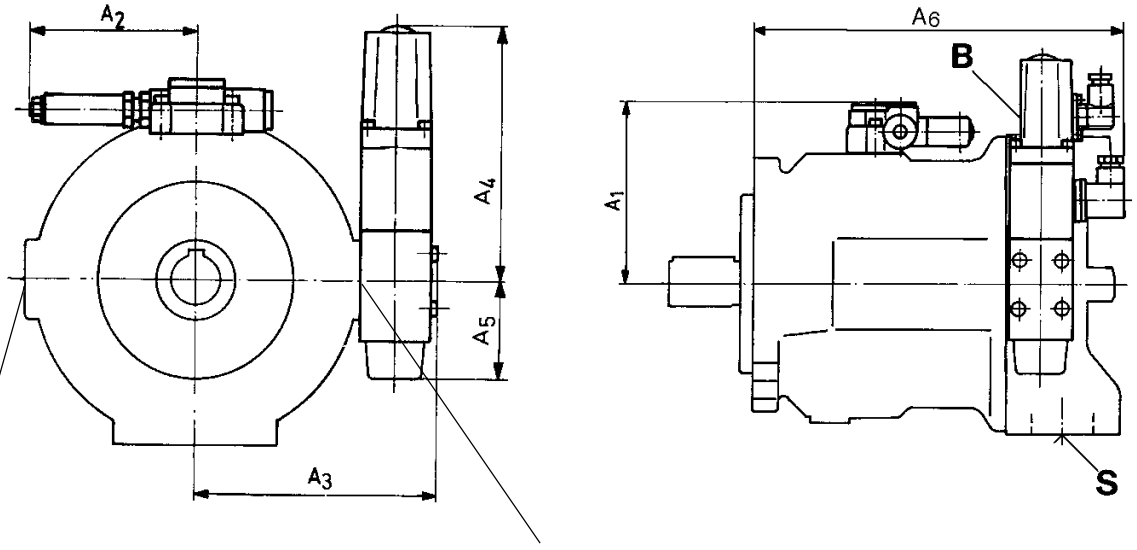
Pressure stepped signal value e.g. 580 psi – 1750 psi (40 bar–120 bar)
DFE1 45 with compression oil volume (1.3 gal / 5 L)



Pressure stepped signal value 1750 psi – 580 psi (120 bar – 40 bar)
DFE1 45 with compression oil volume (1.3 gal / 5L)



Unit dimensions



Pilot valve installed this side
for counter-clockwise rotation

Pilot valve installed this side
for clockwise rotation

Size	A_1	A_2	A_3	A_4	A_5	A_6
18	3.82 (97)	4.19 (106.5)	4.65 (118)	6.22 (158)	2.48 (63)	8.50 (216)

Through drive

The A10VSO axial piston unit can be supplied with through drive in accordance with the coding on page 3.
The type of through drive is determined by the coding (KXX).

The following are included in the supply:

Coupler, mounting screws, o-ring seal and, if required, an intermediate flange.

Combination pumps

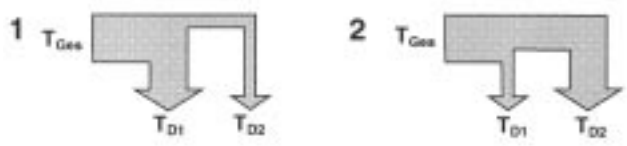
By building on other pumps mutually independent circuits can be made available for use.

1. If the combination pump consists of **2 Brueninghaus Hydromatik units** and if these are to be **supplied assembled** then the two ordering codes should be joined with **"+".**

   Typical order:
   A10VSO 18 DR/31 R–PSC62K52 **+**
   A10VSO 18 DR/31 R–PSC62N00

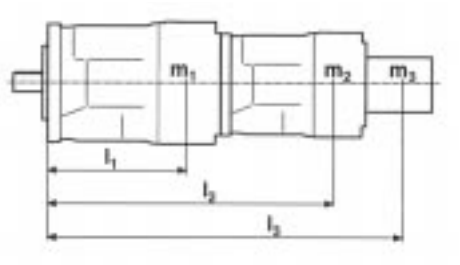
2. If a **gear- or radial piston pump** is to be **fitted at the factory** please consult us.

Permitted through drive torque



Size			18	
Max. permitted. total through drive torque at shaft "**K**", Pump 1				
(Pump 1 + Pump 2)		$T_{tot\ max}$	lb-ft 59	(Nm 80)
1	Permitted.through drive torque.	T_{D1max}	lb-ft 59	(Nm 80)
		T_{D2max}	lb-ft 0	(Nm 0)
2	Permitted.through drive torque.	T_{D1max}	lb-ft 0	(Nm 0)
		T_{D2max}	lb-ft 59	(Nm 80)
Max. permitted. total through drive torque at shaft "**S**", Pump 1				
(Pump 1 + Pump 2)		$T_{tot\ max}$	lb-ft 74	(Nm 100)
1	Permitted.through drive torque.	T_{D1max}	lb-ft 59	(Nm 80)
		T_{D2max}	lb-ft 15	(Nm 20)
2	Permitted.through drive torque.	T_{D1max}	lb-ft 15	(Nm 20)
		T_{D2max}	lb-ft 59	(Nm 80)
Max. permitted. total through drive torque at shaft "**R**", Pump 1				
(Pump 1 + Pump 2)		$T_{tot\ max}$	lb-ft 105	(Nm 143)
1	Permitted.through drive torque.	T_{D1max}	lb-ft 59	(Nm 80)
		T_{D2max}	lb-ft 46	(Nm 63)
2	Permitted.through drive torque.	T_{D1max}	lb-ft 46	(Nm 63)
		T_{D2max}	lb-ft 59	(Nm 80)
Max. permitted. total through drive torque at shaft "**U**", Pump 1				
(Pump 1 + Pump 2)		$T_{tot\ max}$	lb-ft 59	(Nm 80)
1	Permitted.through drive torque.	T_{D1max}	lb-ft 37	(Nm 50)
		T_{D2max}	lb-ft 0	(Nm 0)
2	Permitted.through drive torque.	T_{D1max}	lb-ft 0	(Nm 0)
		T_{D2max}	lb-ft 27	(Nm 50)

Permitted bending moment



m_1, m_2, m_3 (lbs) Weight of pump
l_1, l_2 , l_3 (inches) Center to center spacing

$$T_m = (m_1 \bullet l_1 + m_2 \bullet l_2 + m_3 \bullet l_3) \bullet \frac{1}{12} \text{ lb-ft}$$

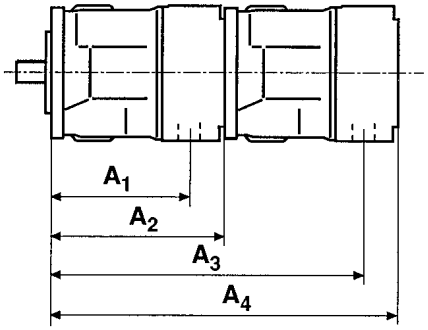
m_1, m_2, m_3 (kg) Weight of pump
l_1, l_2 , l_3 (mm) Center to center spacing

$$T_m = (m_1 \bullet l_1 + m_2 \bullet l_2 + m_3 \bullet l_3) \bullet \frac{1}{102} \text{ lb-ft}$$

Size		18	
Permitted bending moment	$T_{m\ perm.}$	lb-ft 37	(Nm 50)
Weight	m	lbs 26.5	(kg 12)
Center to center spacing	l_1	in 3.54	(mm 90)

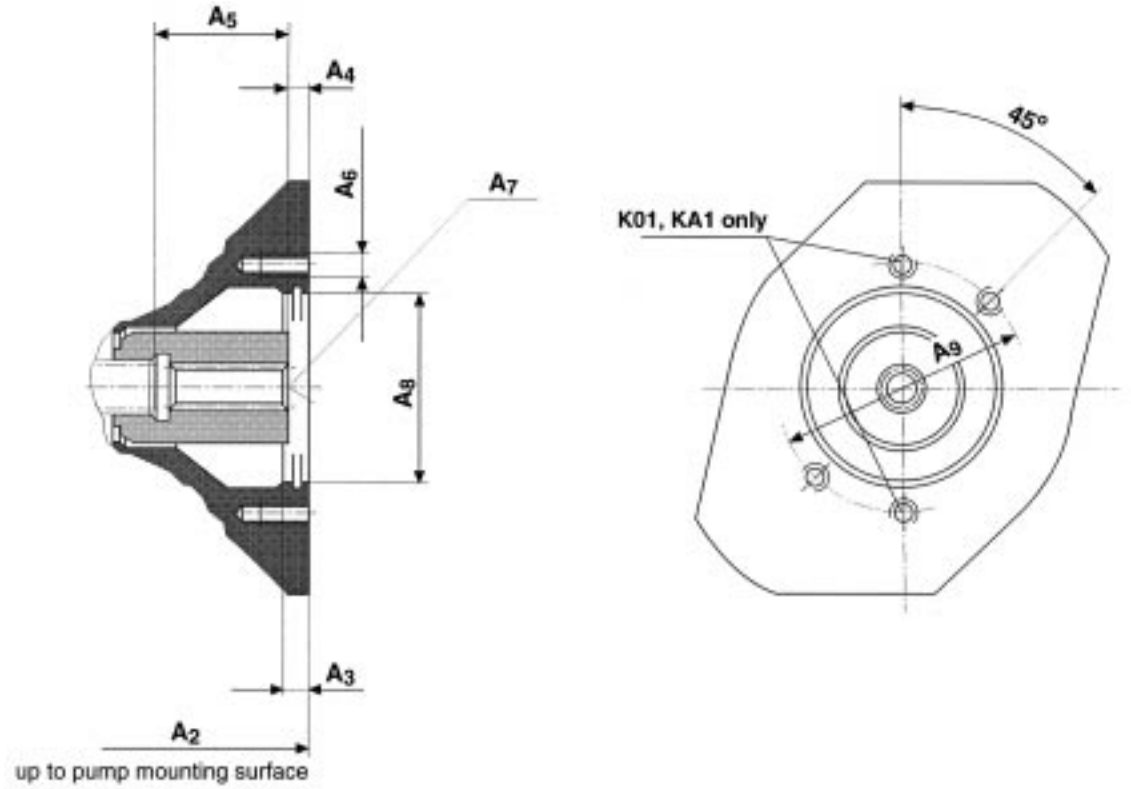
CAUTION!!
Maximum pressure with shaft “U,” size 18 at full displacement: 2500 psi (175 bar)

Unit dimensions: combination pumps A10VSO (AA10VSO) + A10VSO



Main p. / 2nd pump	A10VSO 18				AA10VSO 28				AA10VSO 45				AA10VSO 71				AA10VSO 100				AA10VSO 140			
	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	A_1	A_2	A_3	A_4	A_1	A_2	A_3	A_4
A10VSO 18	5.71 (145)	7.16 (182)	12.87 (327)	14.84 (377)	6.46 (164)	8.03 (204)	13.74 (349)	15.71 (399)	7.24 (184)	9.02 (229)	14.72 (374)	16.69 (424)	8.54 (217)	10.51 (267)	16.22 (412)	18.19 (462)	10.83 (275)	13.31 (338)	19.02 (483)	20.98 (533)	10.83 (275)	13.78 (350)	19.49 (495)	21.46 (545)
					See RE 92711																			

Flange 82-2 (SAE A) 2-bolt; for mounting of gear pump G2 (splined shaft): Ordering code **K01** or
mounting of axial piston pump A10VSO 18 (splined shaft "S"): Ordering code **52** or
mounting of axial piston pum A10VSO18 (splined shaft “R”): Ordering code **KA1**



Thru drive	A_2	A_3	A_4	A_5	A_6	A_7	A_8	A_9
K01	7.16 (182)	0.39 (10)	0.35 (9)	1.70 (43.3)	M10;0.57 deep (M10;14.5 deep)	spline SAE A, 5/8"; 16/32DP; 9T	3.25 DIA (Ø 82.55)	4.19 (106.5)
K52	7.16 (182)	0.39 (10)	0.35 (9)	1.70 (43.3)	M10;0.57 deep (M10;14.5 deep)	spline SAE A-B, 3/4"; 16/32DP; 11T	3.25 DIA (Ø 82.55)	4.19 (106.5)
KA1	7.16 (182)	0.39 (10)	0.63 (16)	1.70 (43.3)	M10;0.57 deep (M10;14.5 deep)	spline SAE A-B, 3/4"; 16/32DP; 11T	3.25 DIA (Ø 82.55)	4.19 (106.5)

Variable Displacement Pump A10VSO, Series 31

DFEE		/	31	R	-	P	K	C	62	N00	2	C	2

Control type

Proportional pressure and flow control	**DFEE**

Additiona functions

Electronics without additional functions	**omit**
Electronics with power limitation as additional functions	**3**

Series

	31

Direction of rotation

Viewed on shaft end	Right hand, clockwise	**R**
	Left hand, counter-clockwise	**L**

Seals

Buna-N (NBR per DIN ISO 1629); shaft seal FPM (fluorocarbon)	**P**

Shaft end

SAE-keyed shaft	**K**
SAE-splined shaft	**S**

Mounting flange

SAE 2-hole flange mounting flange	**C**
SAE 4-hole flange mounting flange, size 140 only	**D**

Service ports

		28	48	71	100	140	
Ports A/B	Opposite side ports, SAE flange, standard series, UNC mounting screws (Code 61)	●	●	–	●	●	**62**
	Opposite side ports, SAE flange, standard series, B port size 1", UNC mounting screws (Code 61)	–	–	●	–	–	**92**

Thru-drive

No thru-drive	**N00**
With thru-drive; for details see RA 92 711	**KXX**

SYDZ sequence valve option

Without sequence valve	**omit**
With sequence and relief valve, pressure limitation up to 2900 psi (200 bar)*	**1**
With sequence and relief valve, pressure limitation up to 3600 psi (250 bar)*	**2**
With sequence and relief valve, pressure limitation up to 4350 psi (300 bar)*	**3**

Pressure transducer input value (pactual)

Current input 4 to 20 mA	**C**
Voltage input 0–10 Volts	**V**
Voltage input 1–10 Volts	**E**

Special options

Without connecting cable	**1**
Connector with cable 5 meter (15 ft) long	**2**
Connector with cable 10 meter (30 ft.) long	**3**
Connector with cable 20 meter (60 ft) long	**4**

*State settings in clear text when ordering.

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