

22

variable displacement pumps

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Variable Displacement Pumps



Part number	Description	Retail price R
A10VS018	piston pump 18cc	
A10VS028	piston pump 28cc	
A10VS045	piston pump 45cc	
A10VS071	piston pump 71cc	
A10VS0100	piston pump 100cc	
A10VS0140	piston pump 140cc	

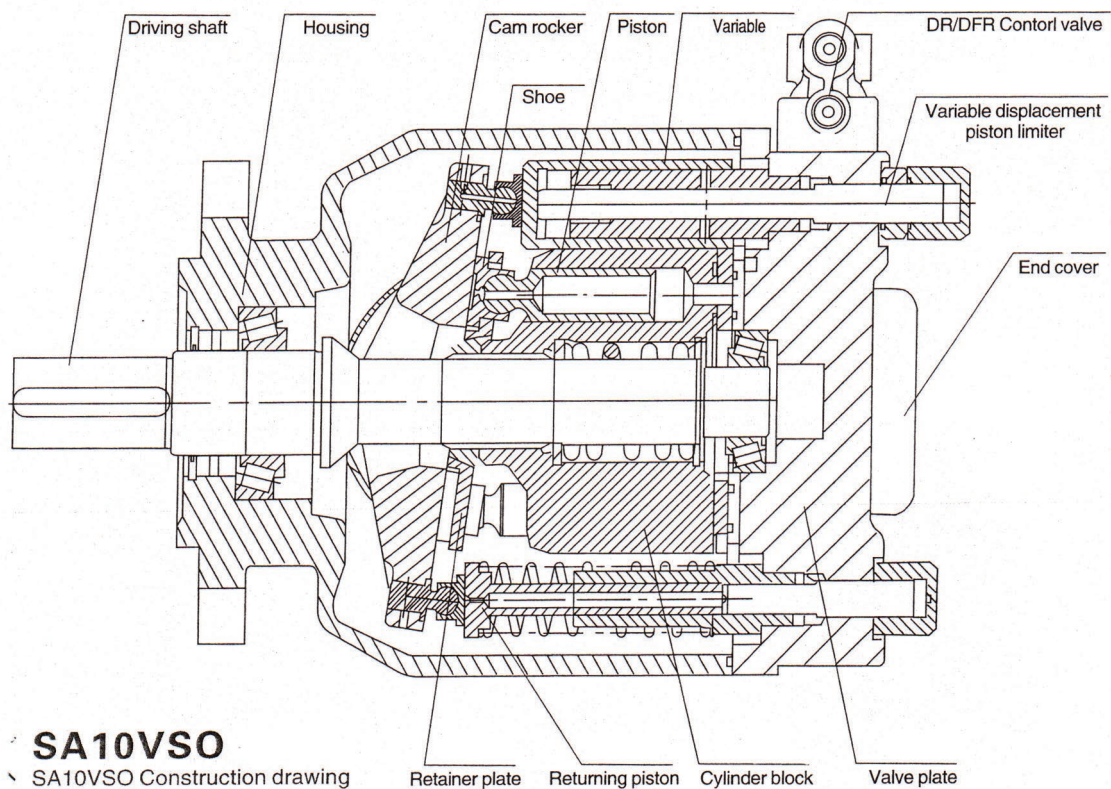
Seal kits

Part number	Description	Retail price R
SKTA10VS018	Seal kit for 18 cc pump	
SKTA10VS028	Seal kit for 28 cc pump	
SKTA10VS045	Seal kit for 45 cc pump	
SKTA10VS071	Seal kit for 71 cc pump	
SKTA10VS0100	Seal kit for 100 cc pump	
SKTA10VS0140	Seal kit for 140 cc pump	

Prices on piggy back pumps, double pumps and spares available on request.

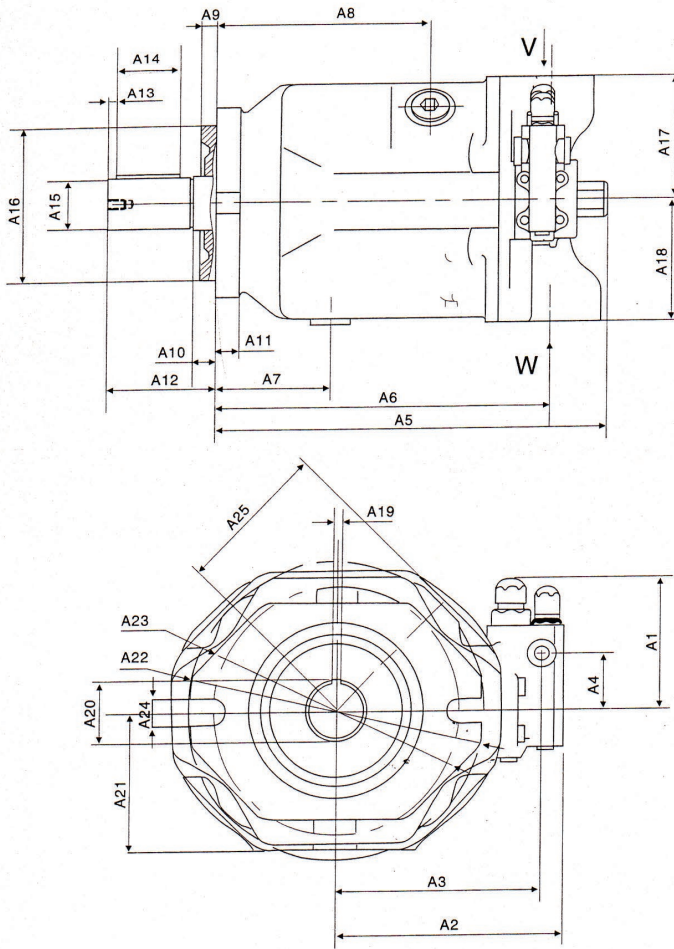
Application and Features

SA10VSO Series Axial Piston Variable Pump (DFR/DFLR), constant pressure control and constant pressure/flow control, simple configuration, low noise level, long service life, can couple another pump through the drive shaft. This pump series is widely applicable for fluid power in applications such as the mining industry and engineering machines.

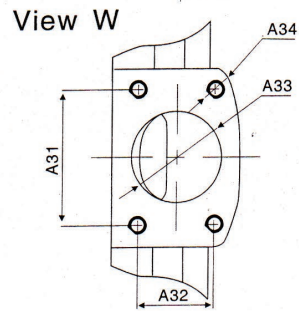
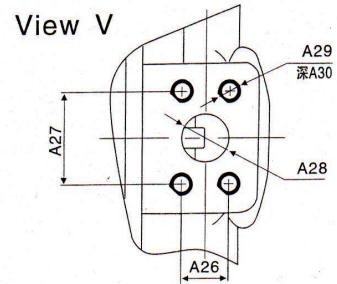


A10VSO

Dimensions



A10VSO



	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17
18	104.5	125.5	119	40	195	145	43	83	6.3	8	11.5	26	2	25	18	82.5	63
28	105	135.5	119	40	206	164.5	40	90	9	10	13	46	2	32	22	100	80
45	105	145.5	129	40	224	184	45	96	9	10	13	52	3	36	25	100	90
71	105	159.5	143	40	257	217	53	115	9	10	20	60	2.5	45	32	127	104
100	105	164.5	148	40	326	275	95	175	9	10	17	80	1.5	68	40	127	100
140	105	209	183	40	337	275	78	173	9	10	21	92	1.5	80	45	180	110
	A18	A19	A20	A21	A22	A23	A24	A25	A26	A27	A28	A29	A30	A31	A32	A33	A34
18	63	6	20.5	68		109	11	66	22.2	47.6	20	3/8"	20	52.4	26.2	25	3/8"
28	80	6	24.5	75	174	140	14	74	22.2	47.6	20	M10	17	58.7	30.2	32	M10
45	90	8	28	81	177	140	14	83	26.2	52.4	25	M10	17	69.9	35.7	40	M12
71	104	10	35	92	210	180	18	98	30.2	58.7	25	M10	20	77.8	42.9	50	M12
100	100	12	43	95		180	17.5	106	31.8	66.7	32	M14	19	88.9	50.8	61	M12
140	110	14	48.5	108		224	18	118.5	31.8	66.7	32	M14	20	88.9	50.8	63	M12

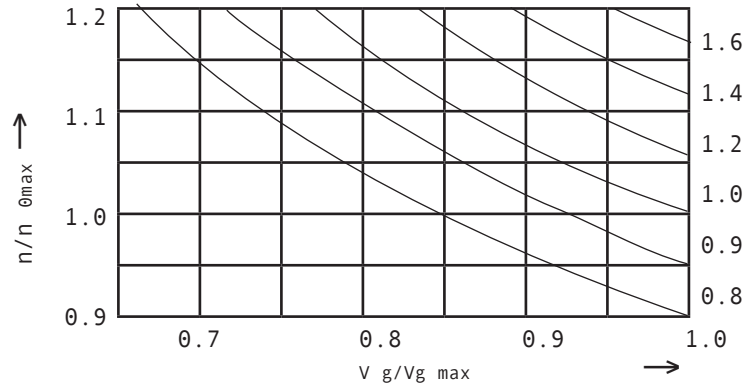
A10VSO

Technical data
according to mineral oil,
working-stress range of entrance
absolute pressure of ports S.

P-abs min 0.8bar
P-abs max 30bar

Working-stress range of export
The pressure of ports B

Pn 200bar
Pmax 250bar
peak pressure Pmax

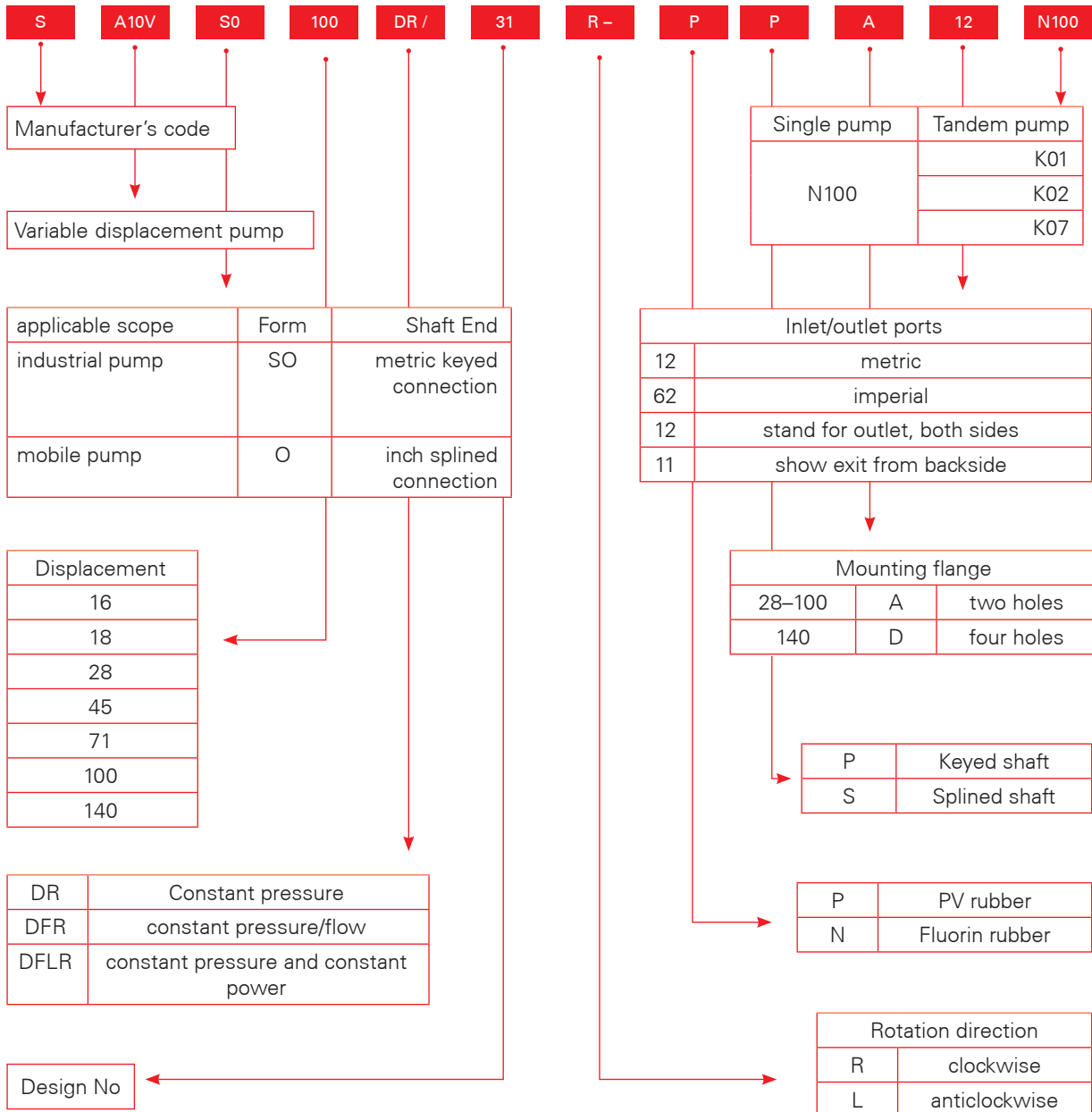


Specification (theoric value, take no account of η_{mh} and η_v)

Size			16	18	28	45	71	100	140	
Displacement	V_{gmax}	Cm^3	16	18	28	45	71	100	140	
max. Speed	V_{gmax}	$n_{o max}$	rpm	3000	3000	3000	2600	2200	200	1800
		$n_{o max}$	rpm	3900	3900	3600	3100	2600	2400	2100
max. Flow	$n_{o max}$	$Q_{o max}$	L/min	59.4	59.4	84	117	156	200	250
		$V_E=1500$ rpm	L/min	27	27.7	42	68	107	150	210
max. Power	$n_{o max}$	$P_{o max}$	kW	27.2	27.7	39	55	73	93	118
		$=1500$ rpm	kW	12.6	12.6	20	32	50	70	98
max. Torque	V_{gmax}	M_{gmax}	Nm	80.1	80.1	125	200	316	445	625
Weight	V_{gmax}	M	kg	12	12	15	21	33	45	60
max. power on drive shaft		$F_{ax,max}$	N	700	700	1000	1500	2400	4000	4800
max. axial power										
max. radial power		$F_{q gmax}$	N	350	350	1200	1500	1900	2300	2800

A10VSO

ordering code



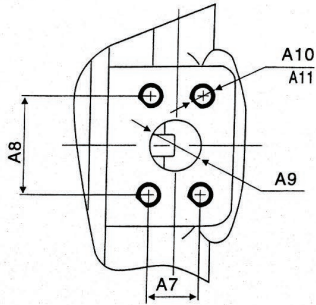
1. SA10VSO is of swash plate design axial variable piston pump used in open hydraulic circuit.

- ISO or SAE mounting flange
- two drain ports
- high speed
- good suction capability
- low noise
- high power/weight ratio
- long service life
- short control time
- drive shaft capable to support axial and radial load
- wide control range
- through drive for multi circuit

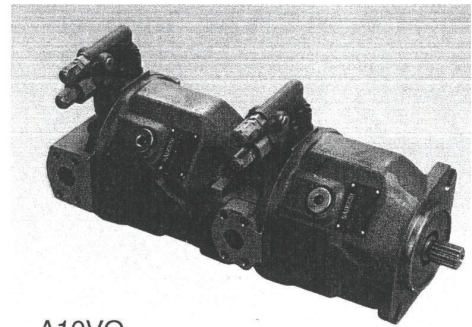
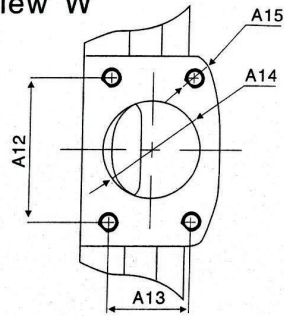
A10VSO

Dimensions

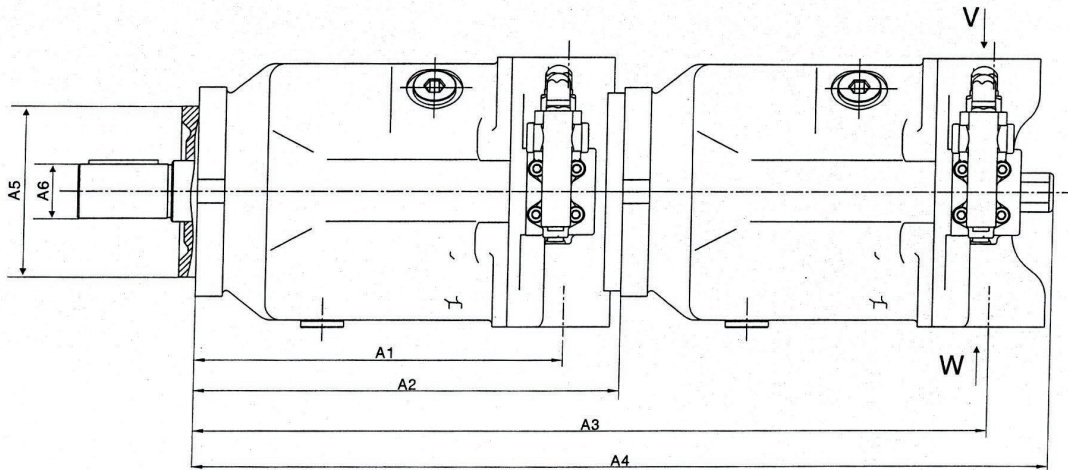
View V



View W



A10VO

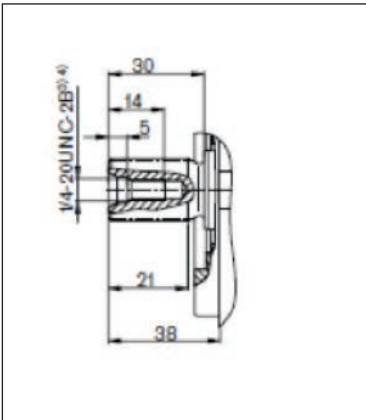


Part number	A10VS028						A10VS028						A10VS071			
	A1	A2	A3	A4	A5	A6	A1	A2	A3	A4	A5	A6	A1	A2	A3	A4
A10VS018	165	204	349	399	φ100	φ22	184	229	374	424	φ100	φ25	217	267	412	412
A10VS028	165	204	369	398	φ100	φ22	184	229	394	423	φ100	φ25	217	267	431	431
A10VS045	/	/	/	/	/	/	184	229	413	448	φ100	φ25	217	267	451	451
A10VS071	/	/	/	/	/	/	/	/	/	/	/	/	217	267	484	484

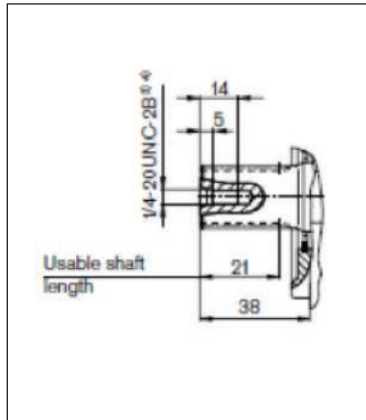
Part number	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15
A10VS018	φ125	φ32	22.2	47.6	20	3/8"	20	52.4	26.2	25	3/8"
A10VS028	φ125	φ32	22.2	47.6	20	M10	17	58.7	30.2	32	M10
A10VS045	φ125	φ32	26.2	52.4	25	M10	17	69.9	35.7	40	M12
A10VS071	φ125	φ32	30.2	58.7	25	M10	20	77.8	42.9	50	M12

Size 18

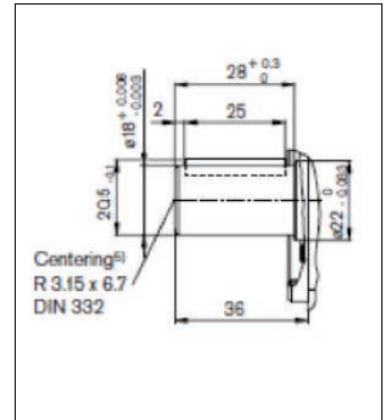
S Splined shaft 3/4"
11T 16/32DP¹⁾ (SAE J744)



R Splined shaft 3/4"
11T 16/32DP¹⁾²⁾ (SAE J744)

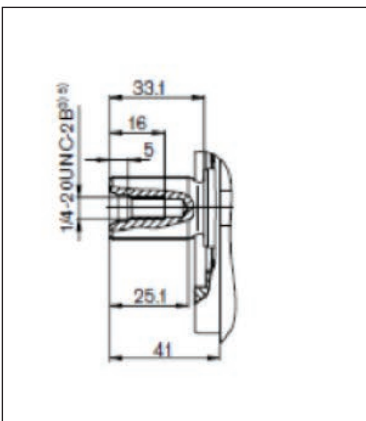


P Parallel shaft key
DIN 6885, A6x6x25

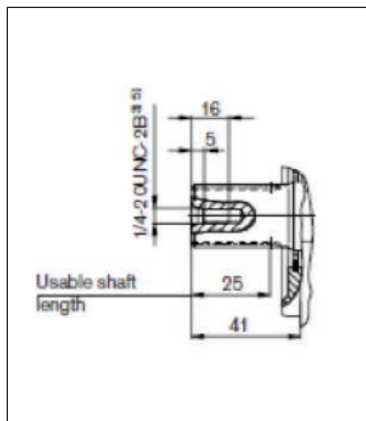


Size 28

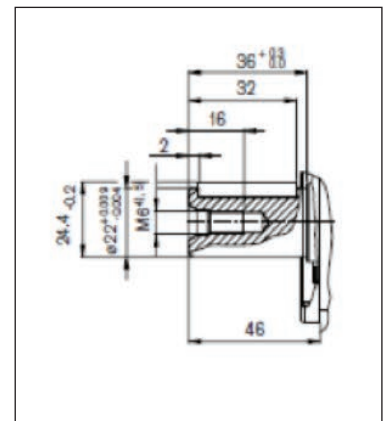
S Splined shaft 7/8"
13T 16/32DP¹⁾ (SAE J744)



R Splined shaft 7/8"
13T 16/32DP¹⁾²⁾ (SAE J744)

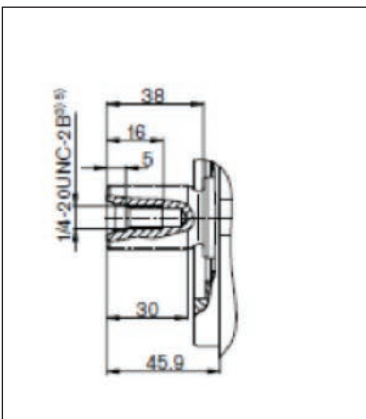


P Parallel shaft key
DIN 6885, A6x6x32

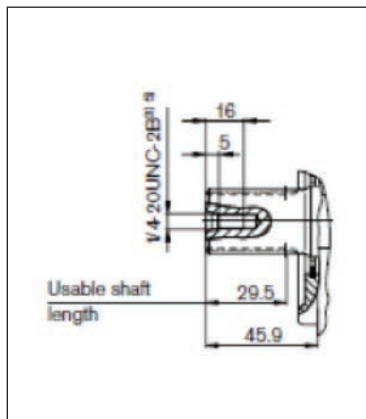


Size 45

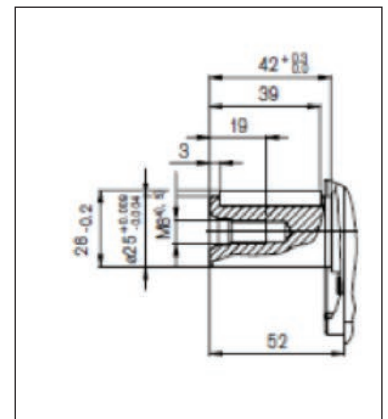
S Splined shaft 1"
15T 16/32DP¹⁾ (SAE J744)



R Splined shaft 1"
15T 16/32DP¹⁾²⁾ (SAE J744)



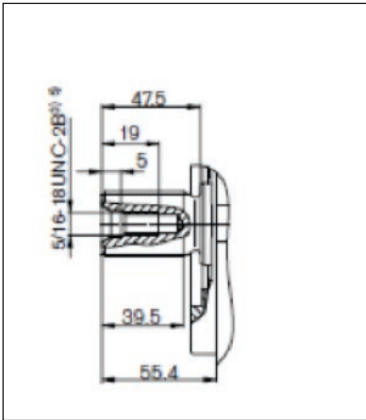
P Parallel shaft key
DIN 6885, A8x7x36



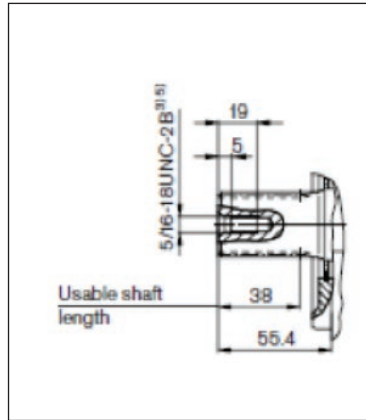
Technical Information (Drive Shafts)

Size 71

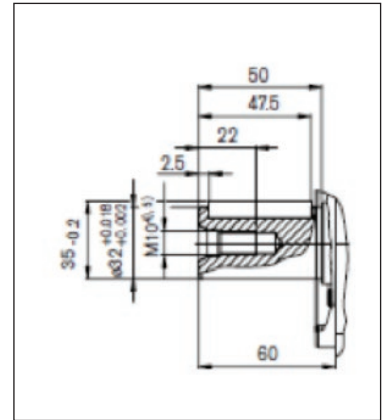
S Splined shaft 1 1/4"
14T 12/24DP¹⁾ (SAE J744)



R Splined shaft 1 1/4"
14T 12/24DP¹⁾²⁾ (SAE J744)



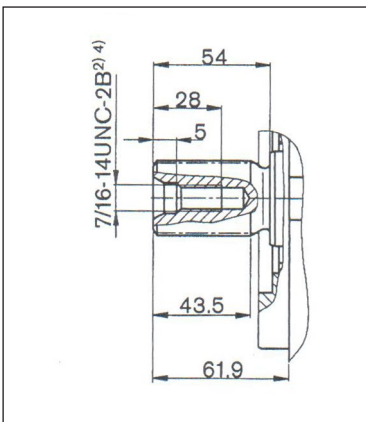
P Parallel shaft key
DIN 6885, A10x8x45



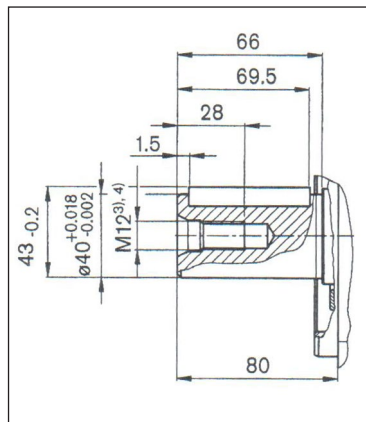
Technical Information (Drive Shafts)

Size 100

S Splined shaft 1 1/2"
17T 12/24DP¹⁾ (SAE J744)

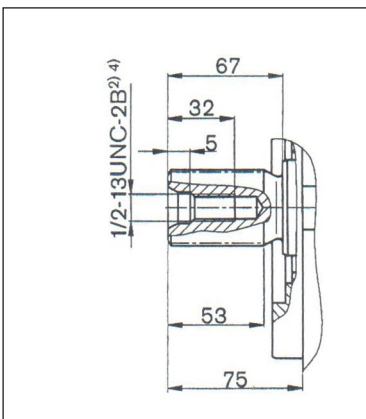


P Parallel shaft key
DIN 6885, A12x8x68

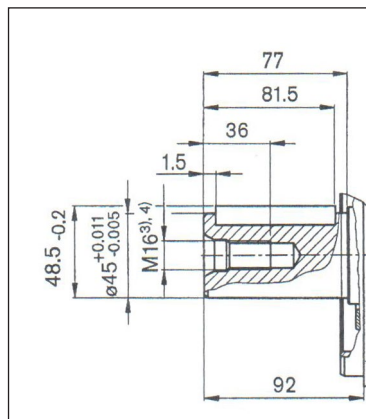


Size 140

S Splined shaft 1 3/4"
13T 8/16DP¹⁾ (SAE J744)



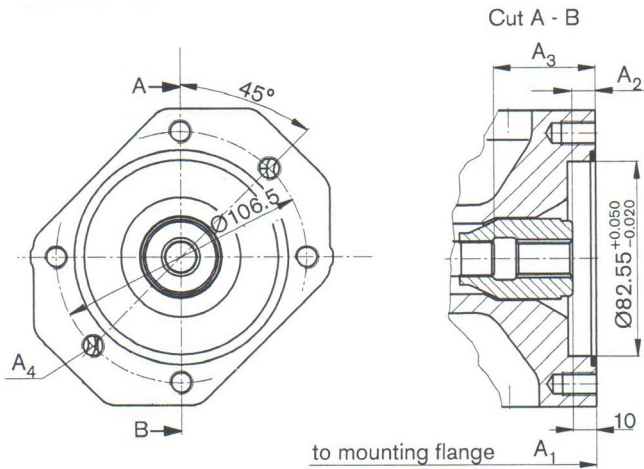
P Parallel shaft key
DIN 6885, A14x9x80



Technical Information

K01 flange ISO 3019-2 (SAE J744 - 82-2 (A))

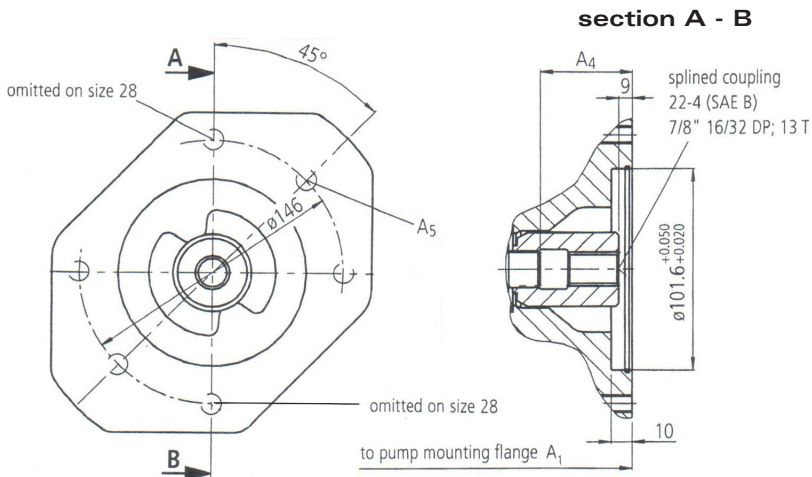
Coupling for splined shaft according to ANSI 892.1 a-1996



5/8 in 9T 16/32 DP11 (SAE J744 - 16-4 (A))				
NG	A ₁	A ₂	A ₃	A ₄ ²⁾
18	182	10	43.3	M10 x 1.5, 14.5 deep
28	204	10	33.7	M10 x 1.5, 16 deep
45	229	10.7	53.4	M10 x 1.5, 16 deep
71	267	11.8	61.3	M10 x 1.5, 20 deep
100	338	10.5	65	M10 x 1.5, 16 deep
140	350	10.8	77.3	M10 x 1.5, 16 deep

Flange SAE 101-2 (SAE B, 2-hole) for built-on external gear pump 1PF2G3 (see RD 10039)

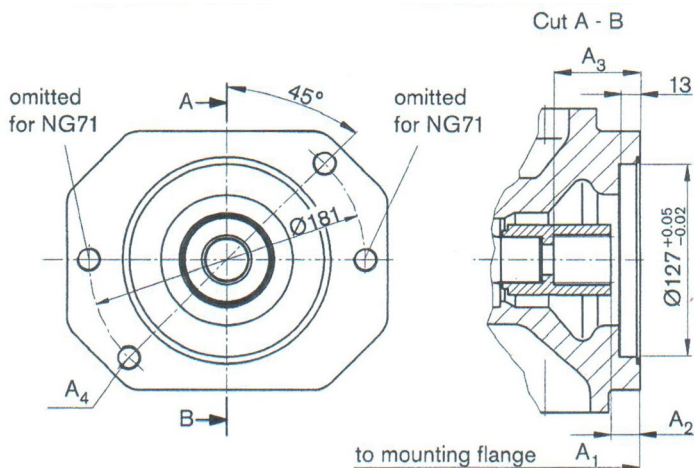
Order code K02



Size main pump	A ₁	A ₄	A ₅
28	204	47	M12; 15 deep
45	229	53	M12; 18 deep
71	267	61	M12; 20 deep
100	338	65	M12; 20 deep
140	350	77	M12; 20 deep

K07 flange ISO 3019-2 (SAE J744 - 127-2 (C))

Coupling for splined shaft according to ANSI 892.1 a-1996



1 1/4 in 14T 12/24 DP11 (SAE J744 - 32-4 (C))				
NG	A ₁	A ₂	A ₃	A ₄ ²⁾
71	267	21.8	58.6	M16 x 2, continuous
100	338	19.5	56.4	M16 x 2, continuous
140	350	19.3	56.1	M16 x 2, 24 deep

DFR/DFR1 - Pressure and flow control

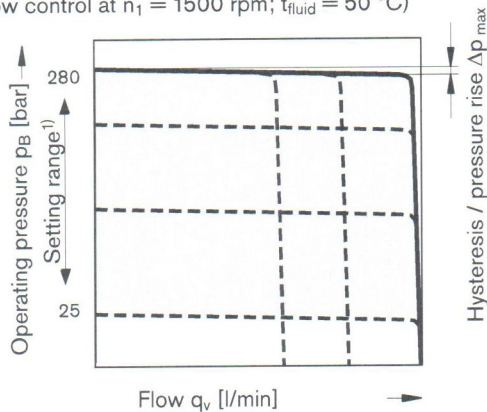
In addition to the pressure control function, the pump flow may be varied by means of a differential pressure over an adjustable orifice (e.g. directional valve) installed in the service line to the actuator. The pump flow is equal to the actual required flow by the actuator, regardless of changing pressure levels.

The pressure control overrides the flow control function.

Note: The DFR1 version has no connection between X and the reservoir. Unloading the LS-pilot line must be possible in the valve system. Because of the flushing function, sufficient unloading of the X-line must also be provided.

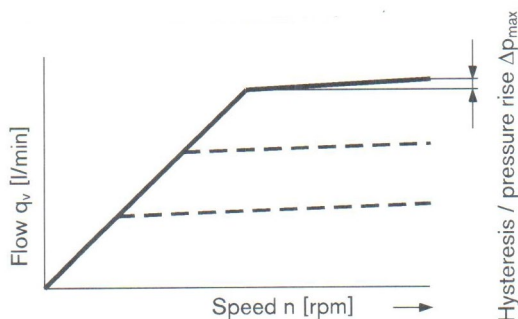
Static characteristic

Flow control at $n_1 = 1500 \text{ rpm}$; $t_{\text{fluid}} = 50 \text{ }^\circ\text{C}$



- 1) In order to prevent damage to the pump and the system, this setting range is the permissible setting range and must not be exceeded. The range of possible settings at the valve are greater.

Static characteristic at variable speed

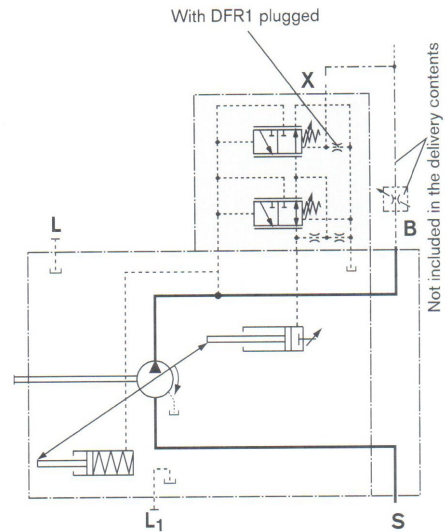


Differential pressure Δp

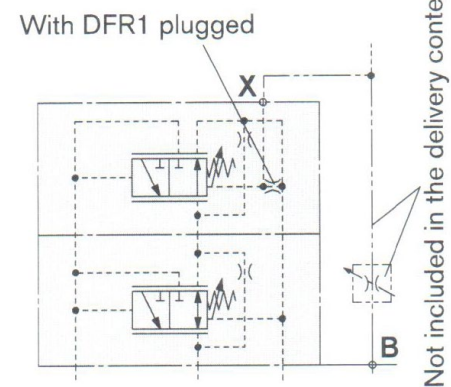
Standard setting: 14 to 22 bar.

If another setting is required, please state in clear text. Relieving the load on port X to the reservoir results in a zero stroke ('standby') pressure which lies about 1 to 2 bar higher than the differential pressure Δp . System influences are not taken into account.

Circuit diagram, sizes 18 to 100



Circuit diagram, size 140



Port for	
B	Service line
S	Suction line
L, L ₁	Case drain (L ₁ plugged)
X	Pilot pressure

Control data						
Data for pressure control DR, Maximum flow deviation measured at drive speed $n = 1500 \text{ rpm}$.						
NG	18	28	45	71	100	140
$\Delta q_{v \text{ max}}$ l/min	0.9	1.0	1.8	2.8	4.0	6.0

Control fluid consumption DFR maximum approx. 3 to 4.5 l/min

Control fluid consumption DFR1 __ maximum approx. 3 l/min

Volume flow loss at $q_{v \text{ max}}$:

Technical Information

DFLR - Pressure, flow and power control

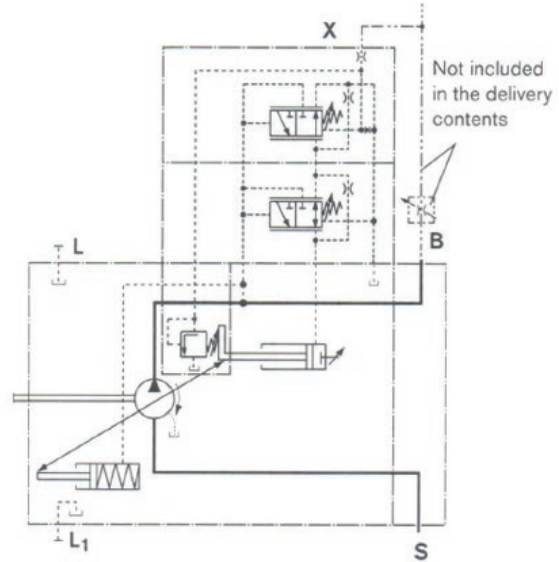
In order to achieve a constant drive torque with varying operating pressures, the swivel angle and with it the output flow from the axial piston pump is varied so that the product of flow and pressure remains constant.

Flow control is possible below the power control curve.

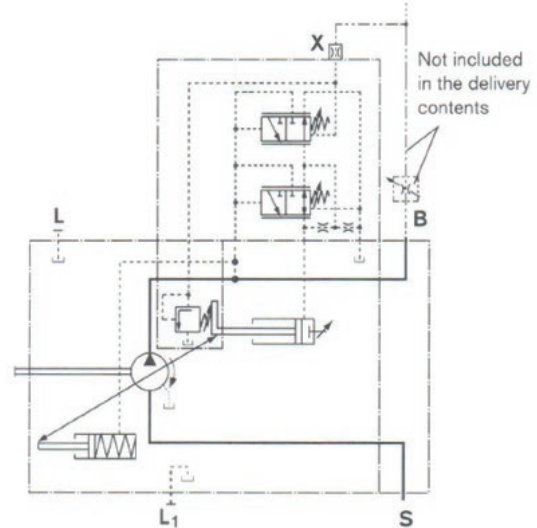
The power characteristic is set in the factory; when ordering, please state in clear text, e.g. 20 kW at 1500 rpm.

The power characteristic is set in the factory; when ordering, please state in clear text, e.g. 20 kW at 1500 rpm.

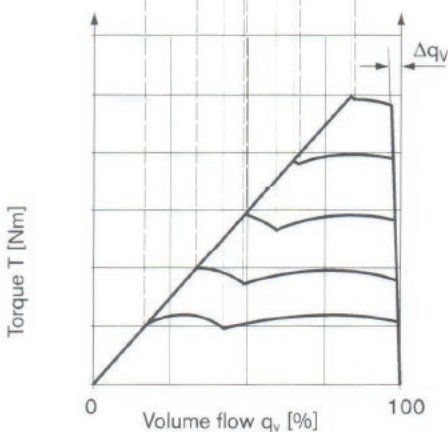
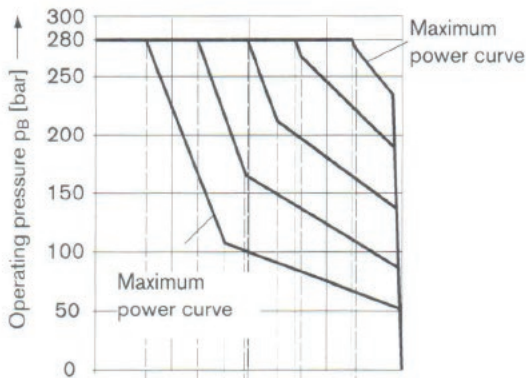
Circuit diagram, sizes 28 to 100



Circuit diagram, size 140



Static curves and torque characteristic



Control data

Beginning of control _____ 50 bar

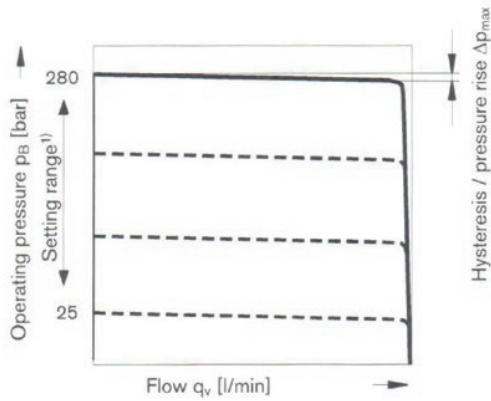
Control fluid consumption _____ maximum approx. 5.5 l/min

	Port for
B	Service line
S	Suction line
L ₁ L ₁	Case drain (L ₁ plugged)
X	Pilot pressure

Technical Information

DR - Pressure control

The pressure control limits the maximum pressure at the pump output within the pump control range. The variable pump only supplies as much hydraulic fluid as is required by the consumers. If the operating pressure exceeds the pressure setpoint set at the integrated pressure valve, the pump will adjust towards a smaller displacement and the control deviation will be reduced. The pressure can be set steplessly at the control valve.



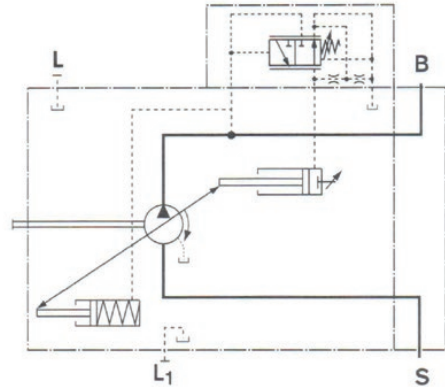
- 1) In order to prevent damage to the pump and the system, this setting range is the permissible setting range and must not be exceeded.

The range of possible settings at the valve are greater.

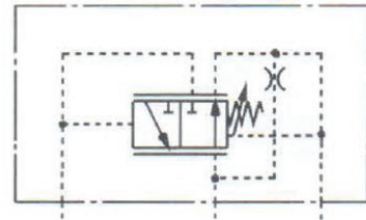
	Port for
B	Service line
S	Suction line
L, L ₁	Case drain (L ₁ plugged)

Control data						
Hysteresis and repeatability Δp _____ maximum 3 bar						
Pressure rise, maximum						
NG	18	28	45	71	100	140
Δp bar	4	4	6	8	10	12
Control fluid consumption _____ maximum approx. 3 l/min						

Circuit diagram, sizes 18 to 100



Circuit diagram, sizes 18 to 100





Notes