

**MANNESMANN  
REXROTH**

## Variable displacement pump A4VSO

Series 1, 2, and 3, Open Circuit  
Axial Piston – Swashplate Design

**RA**

**92 050/10.97**

SAE and Metric

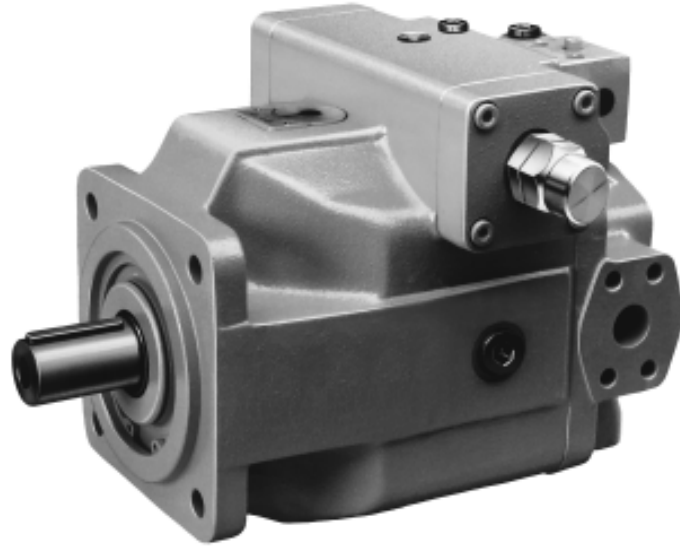
Replaces 05.95

Sizes 40...1000

Nominal pressure 5100 psi  
(350 bar)

Peak pressure 5800 psi  
(400 bar)

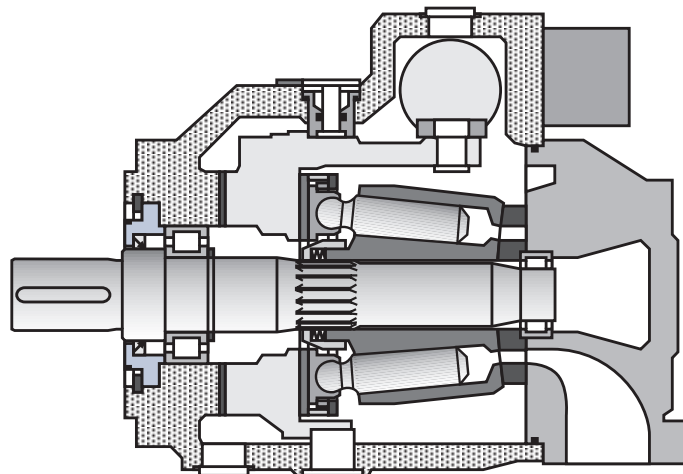
For the description and operation of the various controls, see relevant RA-sheets (see page 2)



Axial piston variable displacement pump A4VSO is of swashplate design and is designed for open circuit operation.

Flow is proportional to input speed and displacement, and is infinitely variable by adjustment of the swashplate angle.

- Swashplate design
- Infinitely variable displacement
- Good self priming suction characteristics
- Continuous operating pressure of 5100 psi (350 bar)
- Low noise level
- Excellent service life
- Drive shaft able to accept axial and radial loading
- Low power to weight ratio
- Compact modular design
- Short control times
- Over-center design (swallow circuits)
- Through drive and pump combinations possible
- Swivel angle indicator standard
- Installation positional optional
- Operation on HF fluids permitted at derated parameters



Variable displacement pump A4VSO, Series 1, 2, and 3

### Ordering code

A	A4VS	O	/	-																
---	------	---	---	---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Hydraulic fluid / version	40	71	125	180	250	355	500	750	1000	
Mineral oil (no code)	●	●	●	●	●	●	●	●	●	
HF hydraulic fluid (with the exception of Skydrol)	●	●	●	●	●	●	●	-	-	E
High-speed version	-	-	-	-	●	●	●	-	-	H
High-speed version for HF fluids	-	-	-	-	●	●	●	-	-	K

Version	
SAE	A

Axial piston unit	
Swashplate design, variable, industrial design	A4VS

Charging pump	40	71	125	180	250	355	500	750	1000	
Without charging pump (no code)	●	●	●	●	●	●	●	●	●	
With impeller, only for port option 25	-	-	-	-	-	-	-	●	-	L

Mode of operation	
Pump, open circuit	O

Nominal size	40	71	125	180	250	355	500	750	1000	
Displacement, V <sub>g max</sub>	in <sup>3</sup> (40)	4.33 (71)	7.63 (125)	10.98 (180)	15.26 (250)	21.66 (355)	30.51 (500)	45.77 (750)	61.02 (1000)	

Control and adjustment devices		40	71	125	180	250	355	500	750	1000	
Constant pressure control	DR	●	●	●	●	●	●	●	●	●	DR..
Parallel pressure control	DP	●	●	●	●	●	●	●	○	○	DP..
Constant flow control (load sensing)	FR	●	●	●	●	●	-	-	-	-	FR..
Const. power control with hyperbolic oper. curve	LR	●	●	●	●	●	●	●	○	○	LR..
Manual control	MA	●	●	●	●	●	●	-	-	-	MA..
Electric motor control	EM	●	●	●	●	●	●	-	-	-	EM..
Hydraulic control, with rotary servo	HW	●	●	●	●	●	●	●	○	○	HW..
Hydraulic control, volume dependent	HM	●	●	●	●	●	●	○	○	○	HM..
Hydraulic control with servo/proportional valve	HS	●	●	●	●	●	●	●	○	○	HS..
Electronic control	EO	●	●	●	●	●	●	○	○	○	EO..
Hydraulic control, pilot pressure dependent	HD	●	●	●	●	●	●	●	○	○	HD..
Hydraulic control, speed dependent	DS	●	●	●	●	●	●	●	○	○	DS..

Series	
Series 10	10 <sup>1</sup>
Series 22	22
Series 30	30

Direction of rotation	
As viewed from drive shaft	clockwise R counter-clockwise L

Seals	
NBR (Nitrile rubber to DIN ISO 1629) with shaft seal FPM	P
FPM (Fluorocarbon rubber to DIN ISO 1629)	V

Shaft end	
SAE parallel keyed shaft	K
SAE splined shaft	S
Metric keyed parallel shaft DIN 6885	P
Metric splined shaft DIN 5480	Z

Hydraulic fluid / version	40	71	125	180	250	355	500	750	1000	
SAE 4-bolt	●	●	●	●	●	●	-	-	-	D
ISO 4-bolt	●	●	●	●	●	●	-	-	-	B
ISO 8-bolt	-	-	-	-	-	-	●	●	●	H

Port Connections	40	71	125	180	250	355	500	750	1000	
Connections B and S: SAE on side 90° offset, UNC mounting bolts	●	●	●	●	●	●	●	●	-	63
Connections B and S: SAE on side 90° offset, metric mounting bolts	●	●	●	●	●	●	●	●	-	13
Connections B and S: SAE on side 90° offset, metric mounting bolts 2nd pressure connection B1 opposite B - when delivered blanked off with a flange	●	●	●	●	●	●	●	●	●	25

Through drive	
Without thru drive, without auxiliary pump	● ● ● ● ● ● ● ● ● ● N00
With thru drive (For information, please refer to table on Page 4)	K...

Filtration (only for control device HS- and DS-)	
Without filtration (no code)	N
Sandwich plate filter (with HS- and DS- controls, see RA 92076 and RE 92055)	Z

● = available  
○ = in preparation  
- = not available

Variable displacement pump A4VSO, Series 1, 2, and 3

Through drive ordering codes			40	71	125	180	250	355	500	750	1000	
Without auxiliary pump, without through drive			●	●	●	●	●	●	●	●	●	N00
With through drive for mounting of axial piston unit, gear or radial piston pump												
Flange	Hub/shaft	to accept										
ISO 125, 4-bolt	Splined shaft 32x2x30x14x9g	A4VSO/H/G 40	●	●	●	●	●	●	○	○		K31
ISO 140, 4-bolt	Splined shaft 40x2x30x18x9g	A4VSO/H/G 71	-	●	●	●	●	●	○	○		K33
ISO 140, 4-bolt	Splined shaft 40x2x30x18x9g	A4VSO/H/G 71	-	●	●	●	●	●	○	○		K33
ISO 160, 4-bolt	Splined shaft 50x2x30x24x9g	A4VSO/H/G 125	-	-	●	●	●	●	○	○		K34
ISO 160, 4-bolt	Splined shaft 50x2x30x24x9g	A4VSO/G 180	-	-	-	●	●	●	○	○		K34
ISO 224, 4-bolt	Splined shaft 60x2x30x28x9g	A4VSO/H/G 250	-	-	-	-	●	●	○	○		K35
ISO 224, 4-bolt	Splined shaft 70x3x30x22x9g	A4VSO/G 355	-	-	-	-	-	●	●	○		K77
ISO 315, 8-bolt	Splined shaft 80x3x30x25x9g	A4VSO/G 500	-	-	-	-	-	-	●	●	○	K43
ISO 400, 8-bolt	Splined shaft 90x3x30x28x9g	A4VSO/G 750	-	-	-	-	-	-	-	●	○	K76
ISO 400, 8-bolt	Splined shaft 100x3x30x32x9g	A4VSO/G 1000	-	-	-	-	-	-	-	-	●	K88
ISO 80, 2-bolt	Splined shaft 3/4" 19-4 (SAE A-B)	A10VSO 18	○	○	●	○	○	○	○	○	○	KB2
ISO 100, 2-bolt	Splined shaft 7/8" 22-4 (SAE B)	A10VSO 28	●	○	○	○	○	○	○	○	○	KB3
ISO 100, 2-bolt	Splined shaft 1" 25-4 (SAE B-B)	A10VSO 45	○	○	○	○	●	○	○	○	○	KB4
ISO 125, 2-bolt	Splined shaft 1 1/4" 32-4 (SAE C)	A10VSO 71	-	○	●	●	○	○	○	○	○	KB5
ISO 125, 2-bolt	Splined shaft 1 1/2" 38-4 (SAE C-C)	A10VSO 100	-	-	○	○	○	○	○	○	○	KB6
ISO 180, 4-bolt	Splined shaft 1 3/4" 44-4 (SAE D)	A10VSO 140	-	-	-	○	●	●	○	○	○	KB7
127-4 (SAE C, 4-bolt)	Splined, 32-4 (SAE C)	AA4VSO/G 40	○	○	○	○	○	●	-	-	-	K15
127-4 (SAE C, 4-bolt)	Splined, 38-4 (SAE C-C)	AA4VSO/G 71	-	○	○	○	○	○	●	-	-	K16
152-4 (SAE D, 4-bolt)	Splined, 44-4 (SAE D)	AA4VSO/G 125	-	-	○	○	○	○	○	-	-	K17
152-4 (SAE D, 4-bolt)	Splined, 50-4 (SAE F)	AA4VSO/G 180	-	-	-	○	○	○	○	-	-	K78
165-4 (SAE E, 4-bolt)	Splined, 50-4 (SAE F)	AA4VSO/G 250	-	-	-	-	●	●	-	-	-	K18
82-2 (SAE A, 2-bolt)	Keyed, 19-1 (SAE A-B)	AA10VSO 18	○	○	○	○	○	○	●	-	-	K40
101-2 (SAE B, 2-bolt)	Keyed, 22-1 (SAE B)	AA10VSO 28	●	●	●	●	●	●	-	-	-	K03
101-2 (SAE B, 2-bolt)	Keyed, 25-1 (SAE B-B)	AA10VSO 45	○	●	○	○	●	●	-	-	-	K05
127-2 (SAE C, 2-bolt)	Keyed, 32-1 (SAE C)	AA10VSO 71	-	●	●	●	●	●	-	-	-	K08
127-2 (SAE C, 2-bolt)	Keyed, 38-1 (SAE C-C)	AA10VSO 100	-	-	●	○	○	○	○	-	-	K38
152-4 (SAE D, 4-bolt)	Keyed, 44-1 (SAE D)	AA10VSO 140	-	-	-	○	○	○	○	-	-	K21
82-2 (SAE A, 2-bolt)	Splined shaft 5/8" 16-4 (SAE A)	G2 / GC2/GC3-1X	●	●	●	●	●	●	●	○	○	K01
82-2 (SAE A, 2-bolt)	Splined shaft 3/4" 19-4 (SAE A-B)	A10VSO 18	●	●	●	●	●	●	○	○		K52
101-2 (SAE B, 2-bolt)	Splined shaft 7/8" (SAE B)	G3	●	●	●	●	●	●	○	○		K02
101-2 (SAE B)	Splined shaft 25-4 (SAE B-B)	GC4-1X, A10VO 45	○	○	○	○	○	○	○	○	○	K04
127-2 (SAE C)	Splined shaft 32-4 (SAE C)	A10VO 71	-	○	○	○	○	○	○	○	○	K07
101-2 (SAE B)	Splined shaft 32-4 (SAE C)	GC5-1X	○	●	●	○	○	○	○	○	○	K06
127-2 (SAE C)	Splined shaft 38-4 (SAE C-C)	GC6-1X, A10VO 100	-	-	●	●	○	○	○	○	○	K24
152-4 (SAE D)	Splined shaft 44-4 (SAE D)	A10VO 140	-	-	-	○	○	○	○	○	○	K17
Ø 63, metric 4-bolt	Keyed shaft Ø 25	R4	●	●	●	○	○	○	○	○	○	K57
101-2 (SAE B)	Splined shaft 22-4(SAE B)	G4, A10VO 28	●	●	●	●	○	○	○	○	○	K68
101-2 (SAE B, 2-bolt)	Splined 7/8"-R shaft (SAE B)	A10VO 28..R, PVV1/2	○	○	○	○	○	○	○	○	○	KA3
101-2 (SAE B, 2-bolt)	Splined 1"-R shaft (SAE BB)	A10VO 45..R, PVV4/5	○	○	○	○	○	○	○	○	○	KA4
127-2 (SAE C, 2-bolt)	Splined 1-1/4"-R shaft (SAE C)	A10VO 71..R, PVV4/5	○	○	○	○	○	○	○	○	○	KA5
With through drive shaft, without hub, without adapter flange, with cover plate			●	●	●	●	●	●	○	○		K99

**Combination pumps**

1. When ordering a second axial piston pump factory mounted, the "+" symbol must be used to join the ordering codes of each pump. Ordering code of 1st pump + Ordering code of 2nd pump.

**Example: AA4VSO 125 DR/22R – PKD63K08 + AA4VSO 71 DR/10R – PKD63N00.**

2. When ordering a gear or radial piston pump factory mounted, please specify as a separate line item and "+" symbol.

Variable displacement pump A4VSO, Series 1, 2, and 3

### Hydraulic Fluid

The A4VSO pumps in the standard design, should be used with good quality, petroleum oil based, anti-wear hydraulic fluids. More detailed information regarding the selection of hydraulic fluids and their application limits can be found in our Data Sheets RA 90 220 (Petroleum Oil), RA 90 221 (Biodegradable Fluids) and RA 90 223 (Type HF–Fire Resistant/Synthetic Fluids).

When operating with environmentally compatible fluids (Biodegradable) or Fire Resistant (Type HF synthetic fluids) possible reduction of the operating specifications may be required. Please consult with us and your fluid supplier.

### Operating Viscosity Range

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

Optimum Viscosity ( $v_{opt}$ ) 80...170 SUS (16...36 mm<sup>2</sup>/s)

### Limits of Viscosity Range

The limiting values for viscosity are as follows:

Absolute Minimum Viscosity ( $v_{min}$ ) 45 SUS (10 mm<sup>2</sup>/s)  
 Only for short periods at max. permissible leakage oil temperature  $t_{max} = 195^{\circ}\text{F}$  ( $90^{\circ}\text{C}$ )

Maximum Viscosity ( $v_{max}$ ) 4600 SUS (1000 mm<sup>2</sup>/s)  
 respectively 1380 SUS (300 mm<sup>2</sup>/s) with auxiliary pump.  
 Only for short periods during cold start-up

### Notes on Hydraulic Fluid Selection

In order to select the correct fluid, it is necessary to know the operating temperature in the tank (open circuits) 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  $v_{opt}$  (see shaded area of the 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  $v_{opt}$ , this corresponds to viscosity grades VG 46 or VG 68, VG 68 should be selected.

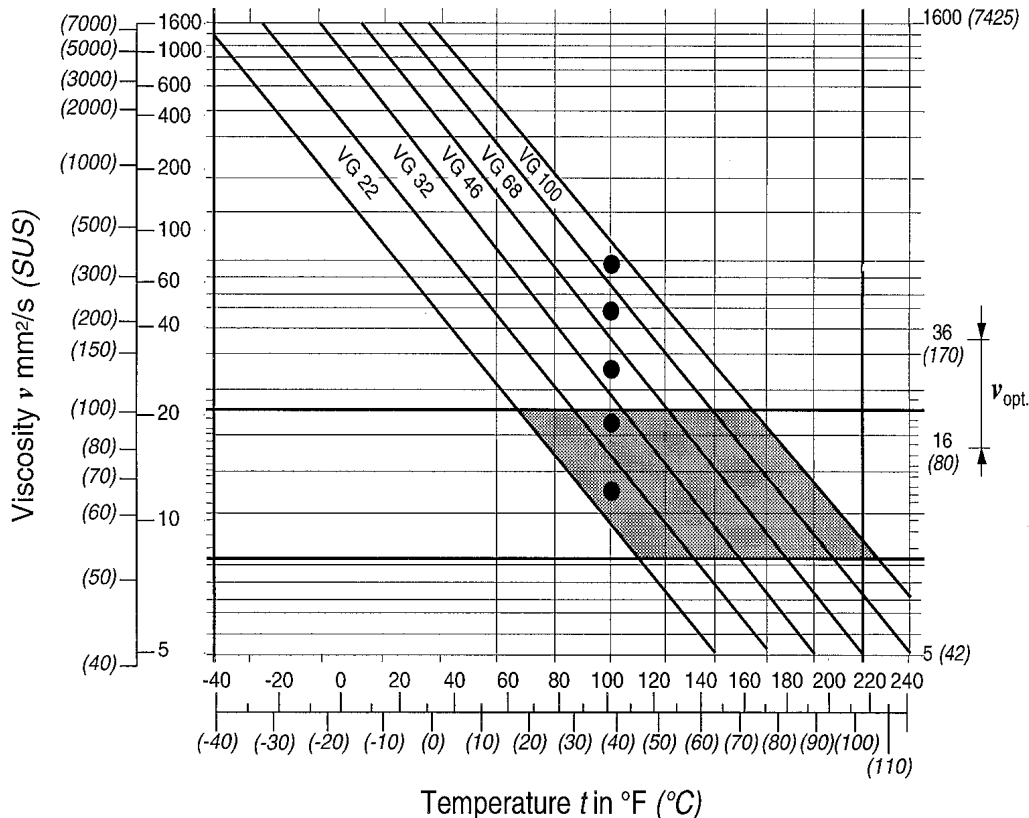
Important: The leakage fluid (case drain fluid) temperature is influenced by pressure and speed and is typically higher than the tank temperature. However, maximum temperature at any point in the system must be less than 195°F (90°C).

### Temperature range (See Selection Diagram)

$t_{min} = -13^{\circ}\text{F}$  ( $-25^{\circ}\text{C}$ )

$t_{max} = +195^{\circ}\text{F}$  ( $+90^{\circ}\text{C}$ )

### Selection Diagram



Variable displacement pump A4VSO, Series 1, 2, and 3

### Hydraulic Fluid (continued)

#### Bearing flushing

For a reliable continuous operation bearing flushing is required with the following operating conditions:

- Applications with special fluids (non mineral) due to limited lubricity and narrow temperature range
- operation with mineral oils, however with marginal conditions for temperature and viscosity
- with vertical mounting (shaft up). In order to ensure lubrication of front bearing and shaft seal, we recommend bearing flushing.

The bearing flushing port "U" is located in the mounting flange area of the pump. The flushing oil flows through the pump's front bearing and leaves via the case drain.

We recommend the following flushing flows:

Size	40	71	125	180	250	355	500	750	1000
Q <sub>Sp</sub> GPM	0.8	1.0	1.3	1.8	2.6	4.0	5.3	7.9	10.6
L/min	(3)	(4)	(5)	(7)	(10)	(15)	(20)	(30)	(40)

For the given flushing flows there will be a pressure difference of ~29 psi (2 bar) (Series 1 and 2) and ~44 psi (3 bar) (Series 3) between port "U" (including screwed fitting) and the pump case.

#### Note regarding series 30

When using external bearing flushing at port "U", the throttle screw, which is found at port "U", has to be screwed in completely.

With throttle screw back out, the U-port is connected to case. In this position and with U-port plugged, a patented impeller provides lubrication flow through the front bearing and shaft seal area.

#### Filtration of the Hydraulic Fluid (Axial Piston Unit)

In order to guarantee reliable operation, the hydraulic fluid must be maintained to a cleanliness level of minimum:

- 9 to NAS 1638
- 6 to SAE, ASTM, AIA
- 18/15 to ISO/DIS 4406

This may be achieved, for example, with filter elements type...D 020... (see RA 31 278)

Hence the following filtration ration is achieved

$$\beta_{20} \text{ ratio} \geq 100.$$

### Technical Specifications

(Valid for operation on petroleum oil based fluids)

#### Operating pressure range – Inlet Port

Absolute pressure at port S (suction inlet)

- p<sub>abs min</sub> \_\_\_\_\_ 12 psi (0.8 bar)
- p<sub>abs max</sub> \_\_\_\_\_ 435 psi (30. bar)

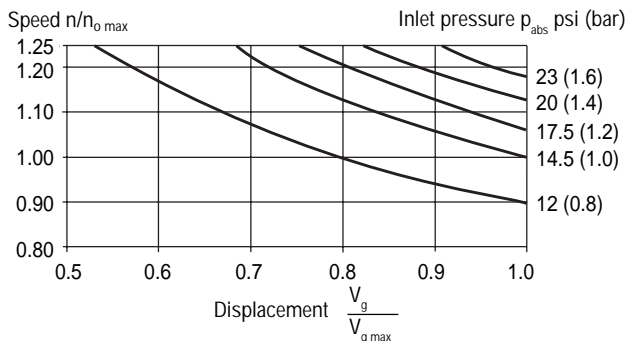
#### Operating pressure range – Outlet Port

Pressure at port B

- Nominal pressure p<sub>n</sub> \_\_\_\_\_ 5100 psi (350 bar)
  - Peak pressure p<sub>max</sub> \_\_\_\_\_ 5800 psi (400 bar)
- (Pressure specification per DIN/DIS 24312)

Direction of flow: S to B

#### Determination of inlet pressure p<sub>abs</sub> at the suction port S, or the reduction in output flow when increasing rotational speed



The inlet pressure is the static fill pressure i.e. the min. dynamic charge pressure.

Caution: Max. permissible speed n<sub>o max. perm.</sub> (speed limit)

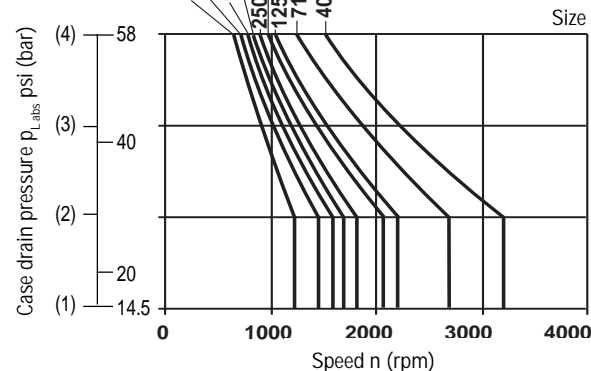
#### Max. case drain pressure (housing pressure)

- p<sub>L abs max</sub> \_\_\_\_\_ 60 psi (4 bar)

These are approximate values. Under certain operating conditions a reduction in these values may be necessary.

#### Case drain pressure

The permissible case drain pressure is dependent on the drive speed. (see diagram)



Variable displacement pump A4VSO, Series 1, 2, and 3

**Table of values** (theoretical values, without considering  $\eta_{mh}$  and  $\eta_v$ ; values rounded)

\* with impeller

Size			40	71	125	180	250/H*	355/H*	500/H*	750	750*	1000		
Displacement	$V_{g \max}$	in <sup>3</sup> /rev	2.44	4.33	7.63	11.0	15.26	21.7	30.51	45.8	45.8	61.02		
		(cm <sup>3</sup> )	(40)	(71)	(125)	(180)	(250/250)	(355/355)	(500/500)	(750)	(750)	(1000)		
Max. speed at $p_{abs}$ 14.5 psi (1 bar) at port S	$n_{o \max}$	rpm	2600	2200	1800	1800	1500/1900	1500/1700	1320/1500	1200	1500	1000		
Max. perm. speed (speed limit) dependent on inlet pressure $p_{abs}$ or reduced displacement $V_g < V_{g \max}$	$n_{o \max \text{ perm.}}$	rpm	3200	2700	2200	2100	1800/2100	1700/1900	1600/1800	1500	1500	1000		
Max. flow at $n_{o \max}$	$Q_{o \max}$	gpm	27.5	41.2	59.4	85.6	99/125	140/159	174/198	237.9	297.2	264.1		
		(L/min)	(104)	(156)	(225)	(324)	(375/475)	(533/604)	(660/750)	(900)	(1125)	(1000)		
		at $n_E = 1500$ rpm	Q	gpm	15.8	28.2	49.1	71.3	99.0	140	153.4 <sup>1)</sup>	203.4 <sup>1)</sup>	297.1	
				(L/min)	(60)	(107)	(186)	(270)	(375)	(533)	(581 <sup>1)</sup> )	(770 <sup>1)</sup> )	(1125) —	
		at $n_{o \max}$	$P_{o \max}$	HP	81	122	176	254	294	419	518	708	885	781
				(kW)	(61)	(91)	(131)	(189)	(219/277)	(311/352)	(385/437)	(525)	(656)	(583)
		at $n_E$ 1500 rpm	P	HP	9.24	16.3	28.7	41.7	57.8	82.1	89.5 <sup>1)</sup>	118.6 <sup>1)</sup>	173.29	
				(kW)	(35)	(62)	(109)	(158)	(219)	(311)	(339 <sup>1)</sup> )	(449 <sup>1)</sup> )	(656) —	
Max. torque at $V_{g \max}$	$T_{\max}$	lb-ft	165	292	516	744	1032	1467	2063	3097	3097	4104		
		(Nm)	(223)	(395)	(696)	(1002)	(1391)	(1976)	(2783)	(4174)	(4174)	(5565)		
Torque at $V_{g \max}$	T	lb-ft	47	83	147	211	294	417	586	880	880	1172		
$\Delta p = 1450$ psi (100 bar)		(Nm)	(64)	(113)	(199)	(286)	(398)	(564)	(795)	(1193)	(1193)	(1590)		
Moment of inertia about drive axis	J	lb-ft <sup>2</sup>	0.116	0.287	0.712	1.305	2.276	4.509	7.890	15.66	15.66	28.47		
		(kgm <sup>2</sup> )	(0.005)	(0.012)	(0.03)	(0.055)	(0.096)	(0.19)	(0.333)	(0.66)	(0.66)	(1.20)		
Filling volume (case)		gal	0.5	0.6	1.3	1.0	2.6	2.1	3.7	5.0	5.8	7.13		
		(L)	(2)	(2.5)	(5)	(4)	(10)	(8)	(14)	(19)	(22)	(27)		
Approx. weight (pump with press. control)	m	lbs	86	117	194	225	406	456	705	1014	1080	1333		
		(kg)	(39)	(53)	(88)	(102)	(184)	(207)	(320)	(460)	(490)	(605)		
Permissible loading of drive shaft	max. axial force $\pm F_{ax \max}$	lbf	135	180	225	315	405	450	450	495	495	495		
		(N)	(600)	(800)	(1000)	(1400)	(1800)	(2000)	(2000)	(2200)	(2200)	(2200)		
	max. radial force $F_{q \max}$	lbf	225	270	360	450	450	495	560	675	675	786		
		(N)	(1000)	(1200)	(1600)	(2000)	(2000)	(2200)	(2500)	(3000)	(3000)	(3500)		

1)  $V_g < V_{g \max}$

H\* = High-Speed-Version

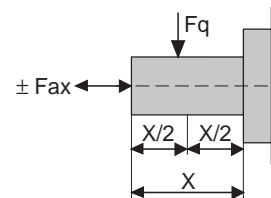
**Calculation of size**

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

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

Power  $P = \frac{Q \cdot \Delta p}{1714 \cdot \eta_t}$  HP  $\left( P = \frac{Q \cdot \Delta p}{600 \cdot \eta_t} \text{ kW} \right)$

**Application of force**



- $V_g$  = Geometric displacement per rev. - in<sup>3</sup> (cm<sup>3</sup>)
- $n$  = Speed rpm (rpm)
- $\Delta p$  = Pressure differential - psi (bar)
- $Q$  = Flow - gpm (L/min)
- $T$  = Torque - lb-ft (Nm)
- $P$  = Power - HP (kW)
- $\eta_v$  = Volumetric efficiency
- $\eta_{mh}$  = Mechanical-hydraulic efficiency
- $\eta_t$  = Total efficiency ( $\eta_t = \eta_v \cdot \eta_{mh}$ )









Variable displacement pump A4VSO, Series 1, 2, and 3

## Installation Notes

Installation position is optional. The pump housing must be filled with fluid both when commissioning and in operation. In order to achieve low noise levels, all connecting lines (suction, pressure and drain lines) are to be isolated from the tank by flexible members. A non-return line in the drain lines should be avoided. In individual cases, this may be possible, please enquire.

### 1. Vertical installation (shaft end upwards)

The following installation conditions should be noted:

#### 1.1 Installation within a tank

a) If the minimum fluid level is level with or above the pump mounting flange: Ports »R/L«, »T« and »S« are open (see fig. 1).

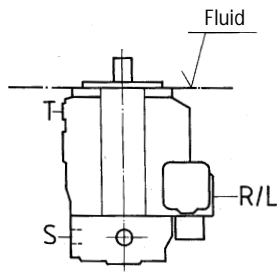


Fig. 1

b) If the minimum fluid level falls below the pump mounting flange: Ports »R/L«, »T« and possibly »S« must be piped, see fig. 2. The requirements then correspond to point 1.2.

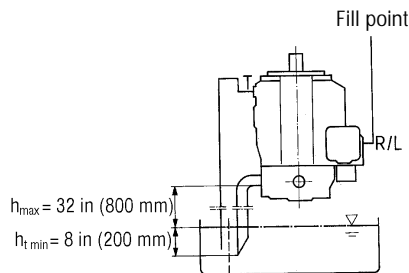


Fig. 2

#### 1.2 Installation outside a tank

Fill the pump housing before installation, with the pump in a horizontal position. Pipe port »T« to tank and plug port »R/L«. For filling when already installed: fill via »R« and bleed port »T«. Then plug port »R«.

**Requirement:** The minimum pump inlet pressure (suction pressure) is to be 12 psi (0.8 bar) abs. Mounting above the tank is to be avoided wherever possible if a low noise level is to be achieved.

### 2. Horizontal installation

The pump is to be filled through whichever port is uppermost »T«, »K<sub>1</sub>«, »K<sub>2</sub>« or »R/L«, and this port is to be used as a drain port.

#### 2.1 Installation within a tank

a) If the minimum fluid level does not fall below the upper point on the pump: The drain port and the suction port »S« remain open (see fig.3)

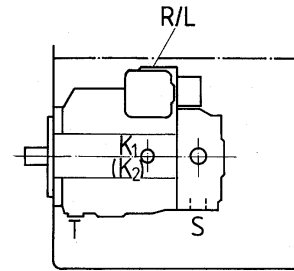


Fig. 3

b) If the minimum fluid level falls below the upper point on the pump: The leakage port and possibly the suction port are to be piped according to the fig. 4. The requirements in point 1.2. are to be met. Fill the pump housing before commissioning.

#### 2.2 Installation outside a tank

Fill the pump housing before commissioning.

a) For mounting above the tank install as fig. 4.

The requirements of point 1.2. must be met.

b) Below the tank.

Pipe the drain port and the suction port »S« as fig.5.

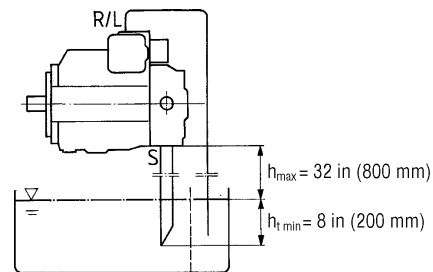


Fig. 4

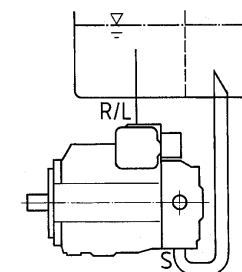
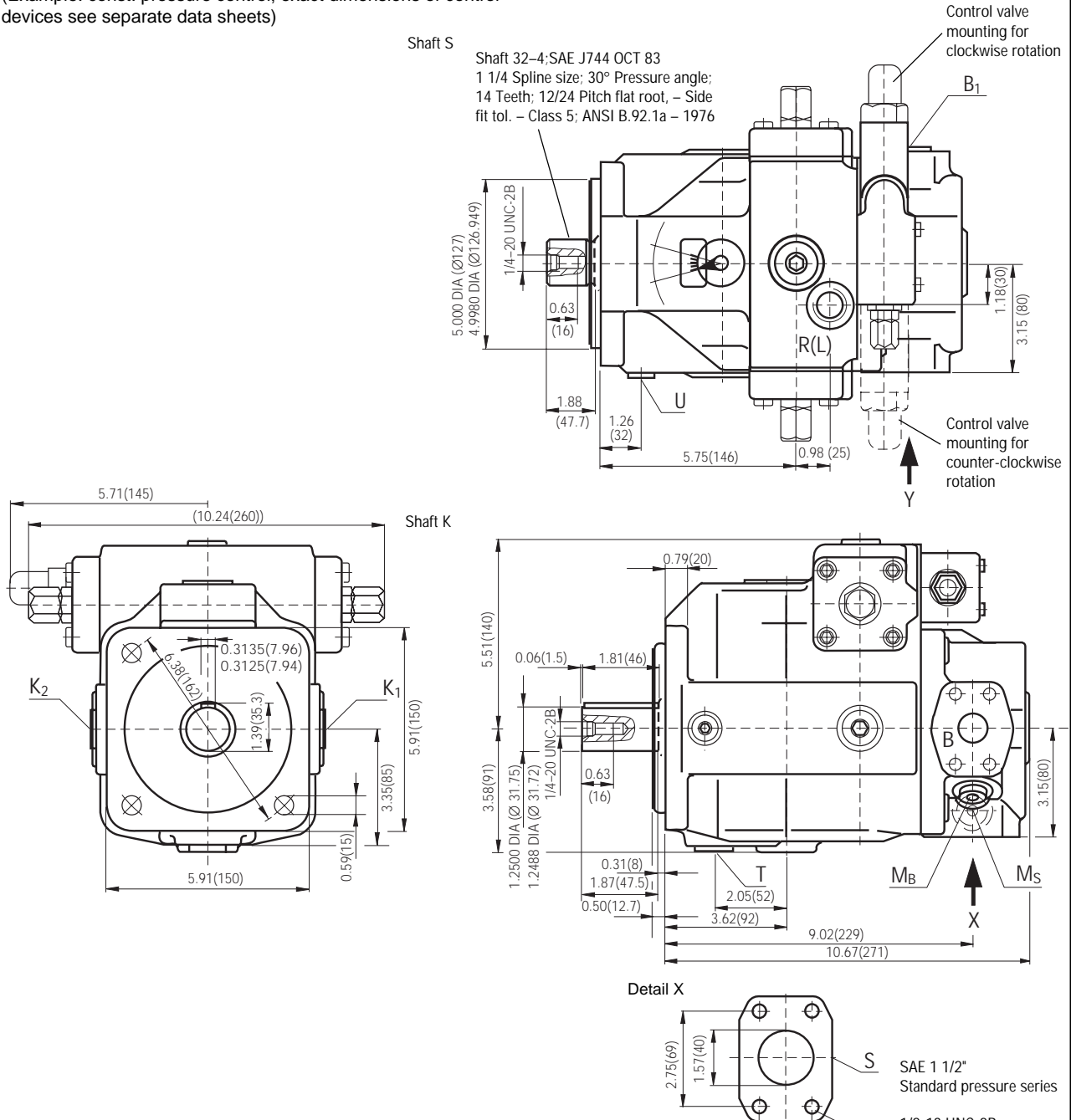


Fig. 5

### Unit Dimensions, Size 40, SAE Version

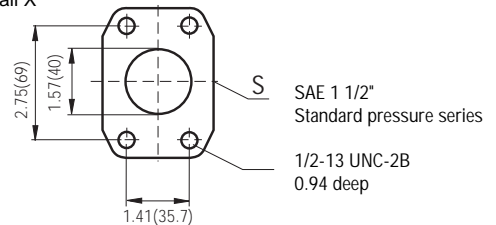
(Example: const. pressure control; exact dimensions of control devices see separate data sheets)



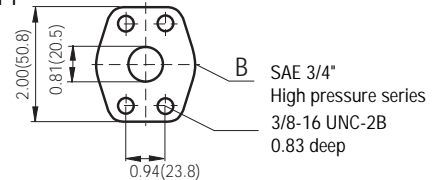
**Port connections**

- B Pressure port 3/4" SAE (High pressure series)
- B<sub>1</sub> Additional port 7/8-14 UNF-2B
- S Suction port 1 1/2" SAE (Standard pressure series)
- K<sub>1</sub>, K<sub>2</sub> Flushing ports 7/8-14 UNF-2B
- T Case drain port 7/8-14 UNF-2B
- M<sub>B</sub>, M<sub>S</sub> Test ports 7/16-20 UNF-2B
- R(L) Fluid fill and air bleed port 7/8-14 UNF-2B  
for exact location see control data sheet
- U Flushing port 7/16-20 UNF-2B

Detail X

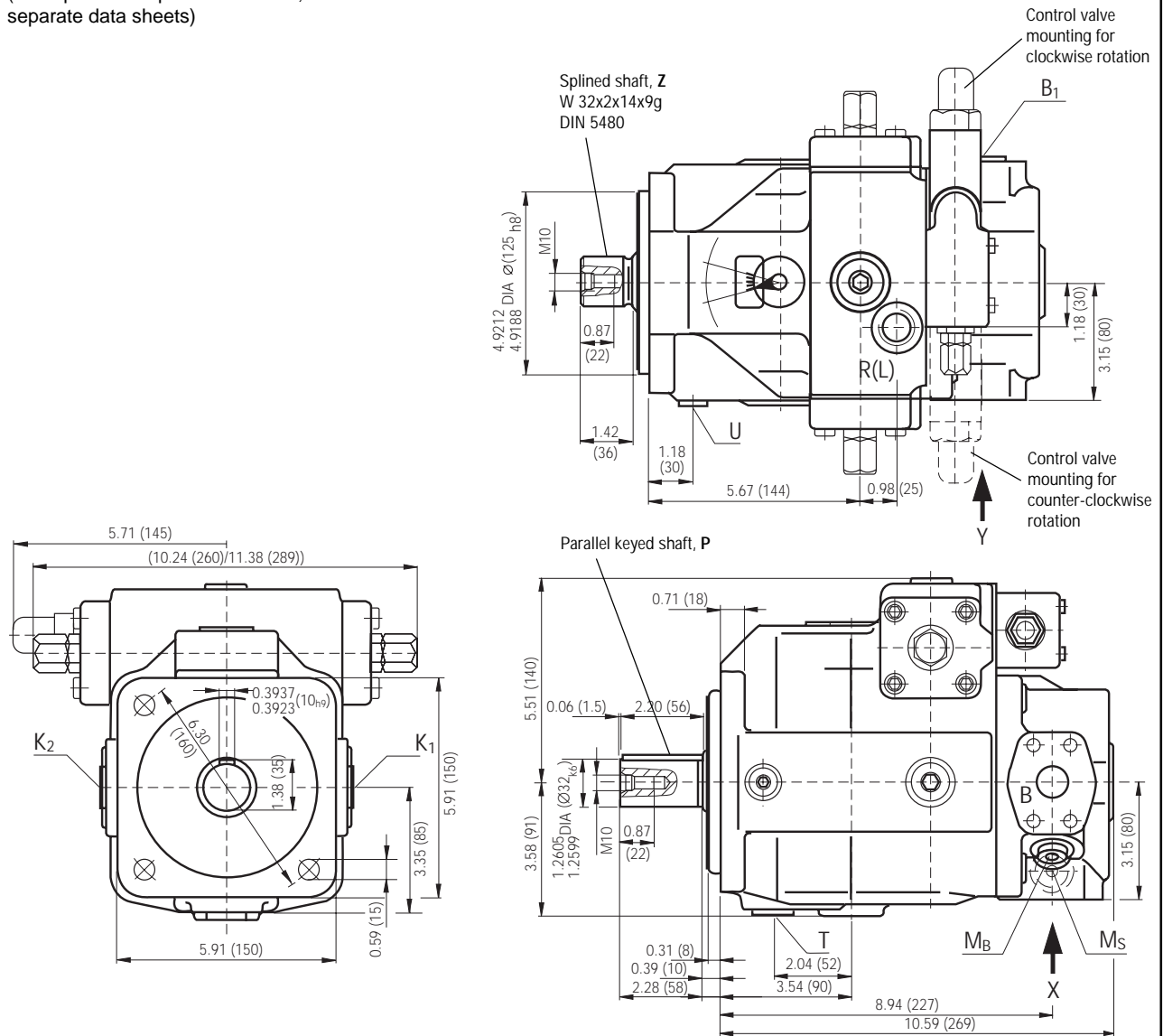


Detail Y



### Unit Dimensions, Size 40, Series 1, Metric Version

(Example: const. pressure control; exact dimensions of control devices see separate data sheets)



#### Connections for version 13

- B Pressure port SAE 3/4" (high pressure range)
- B<sub>1</sub> Auxiliary port M 22x1.5; 14 deep (plugged)

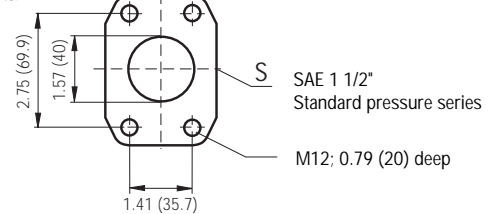
#### Connections for version 25

- B Pressure port SAE 3/4" (high pressure range)
- B<sub>1</sub> 2nd pressure port SAE 3/4" (high pressure range) (closed)

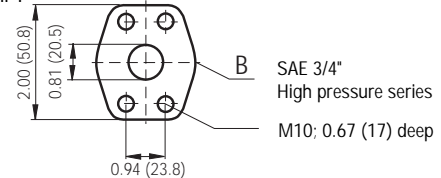
#### Port connections

- B Pressure port SAE 3/4" (high pressure series)
- B<sub>1</sub> Additional port M 22 x 1.5; 0.55 (14) deep (plugged)
- S Suction port SAE 1 1/2" (standard pressure series)
- K<sub>1</sub>, K<sub>2</sub> Flushing ports M 22 x 1.5; 0.55 (14) deep (plugged)
- T Case drain port M 22 x 1.5; 0.55 (14) deep (plugged)
- M<sub>B</sub>, M<sub>S</sub> Test ports M 14 x 1.5; 0.47 (12) deep (plugged)
- R(L) Fluid fill and air bleed port M 22 x 1.5 for exact location see control data sheet
- U Flushing port M 14 x 1.5; 0.47 (12) deep (plugged)

#### Detail X

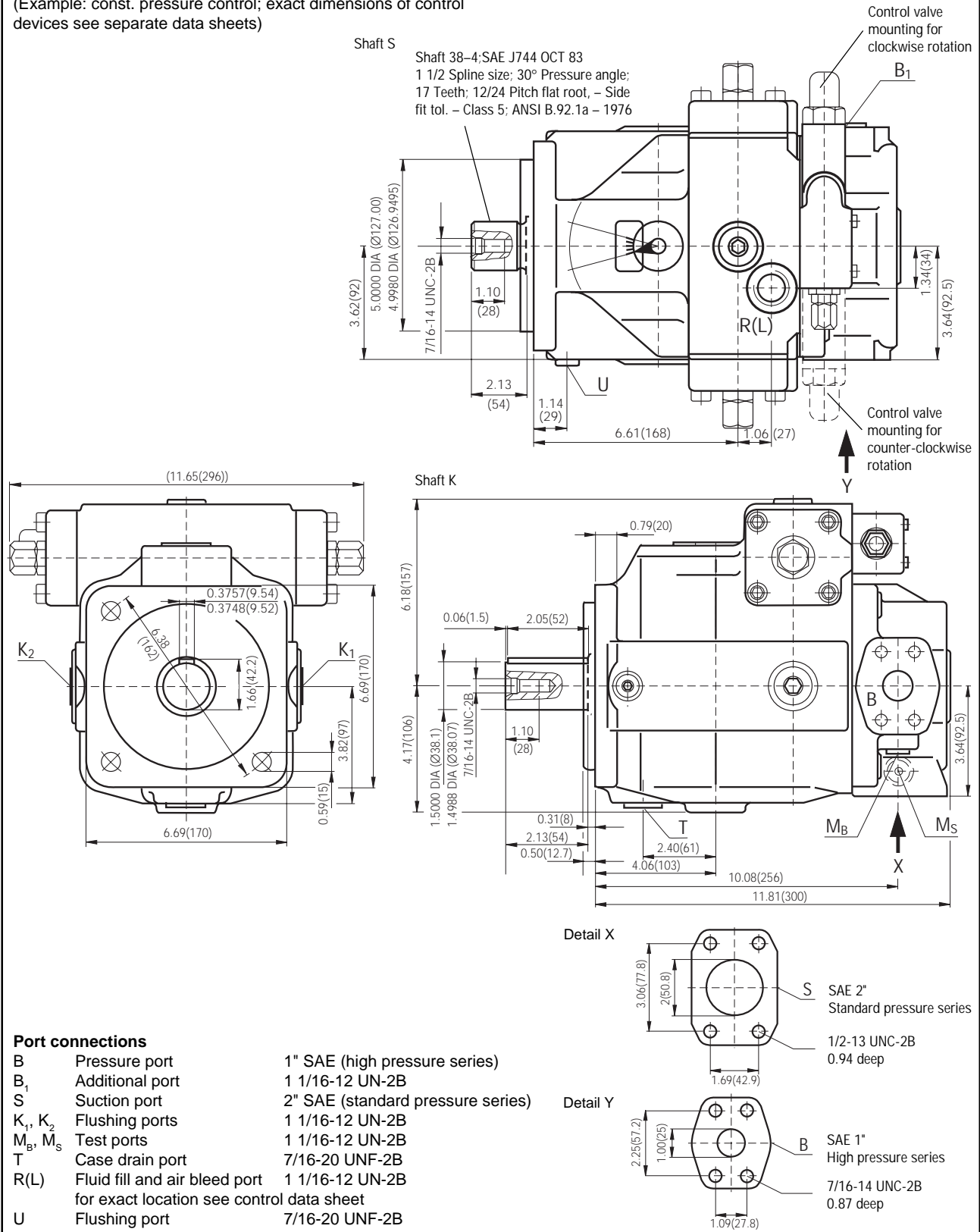


#### Detail Y



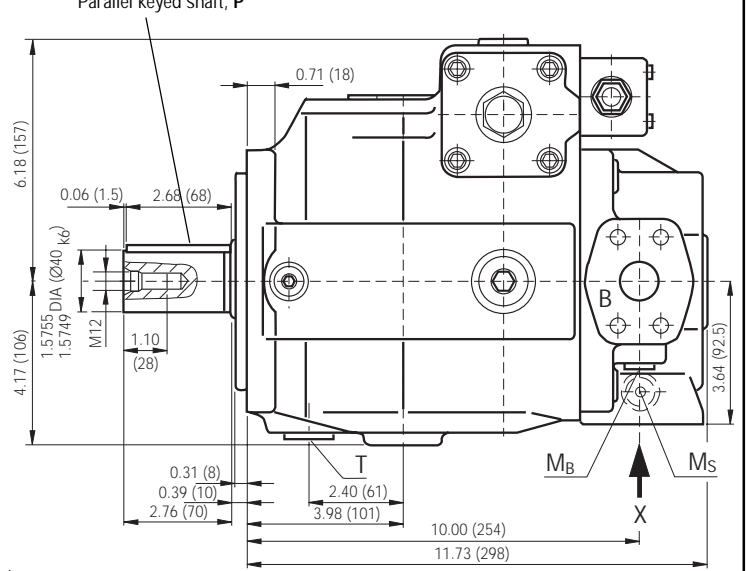
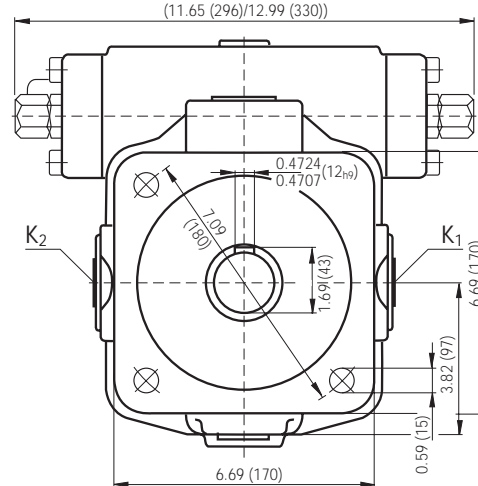
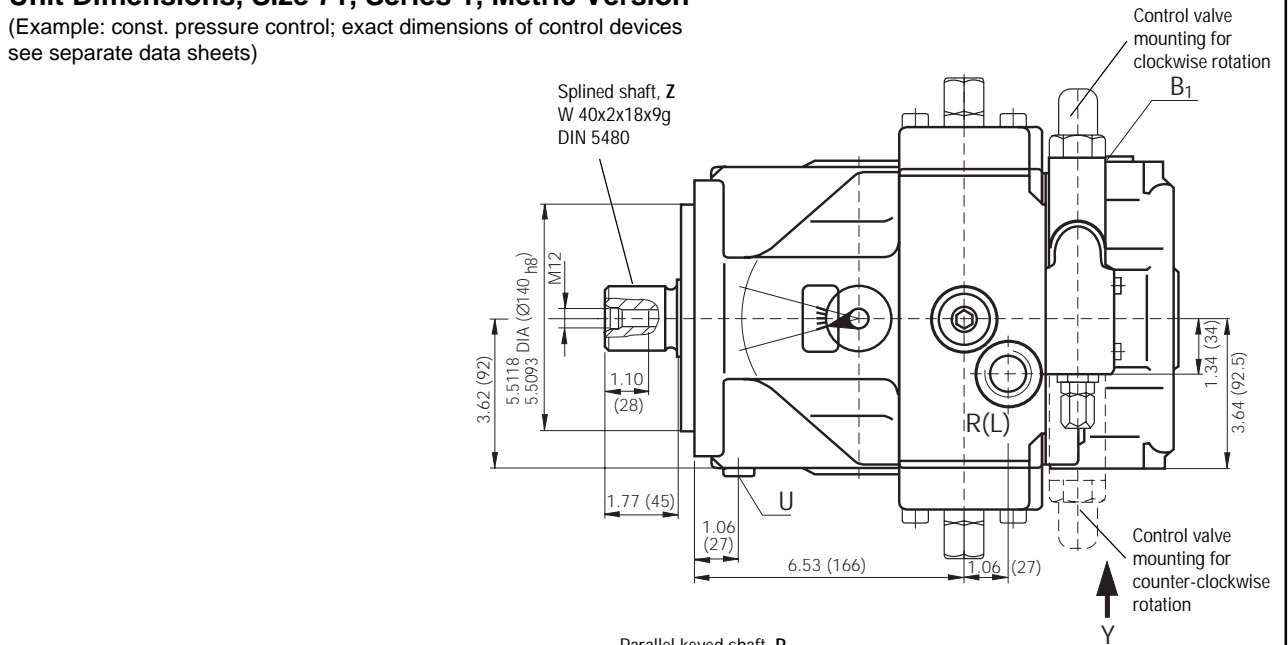
### Unit Dimensions, Size 71, SAE Version

(Example: const. pressure control; exact dimensions of control devices see separate data sheets)



**Unit Dimensions, Size 71, Series 1, Metric Version**

(Example: const. pressure control; exact dimensions of control devices see separate data sheets)



**Connections for version 13**

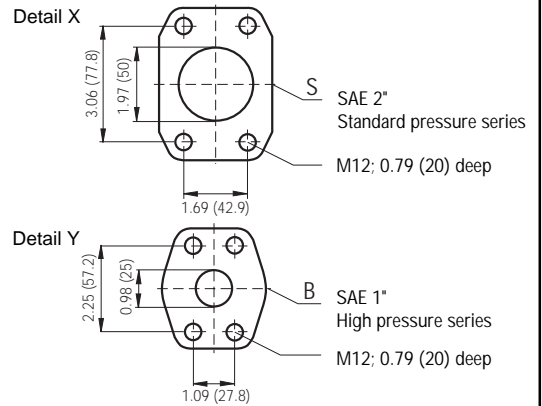
- B Pressure port SAE 1" (high pressure range)
- B<sub>1</sub> Auxiliary port M 27x2; 16 deep (plugged)

**Connections for version 25**

- B Pressure port SAE 1" (high pressure range)
- B<sub>1</sub> 2nd pressure port SAE 1" (high pressure range) (closed)

**Port connections**

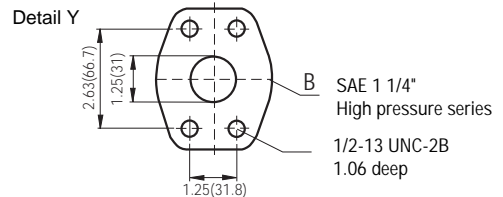
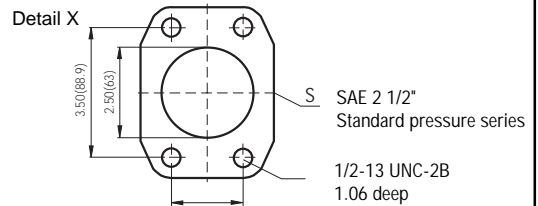
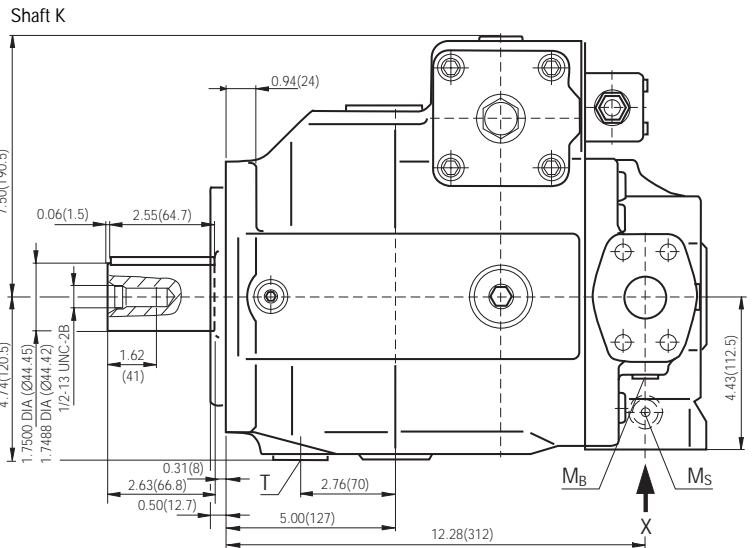
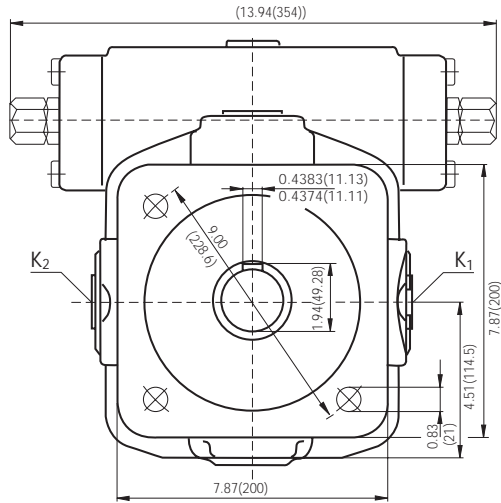
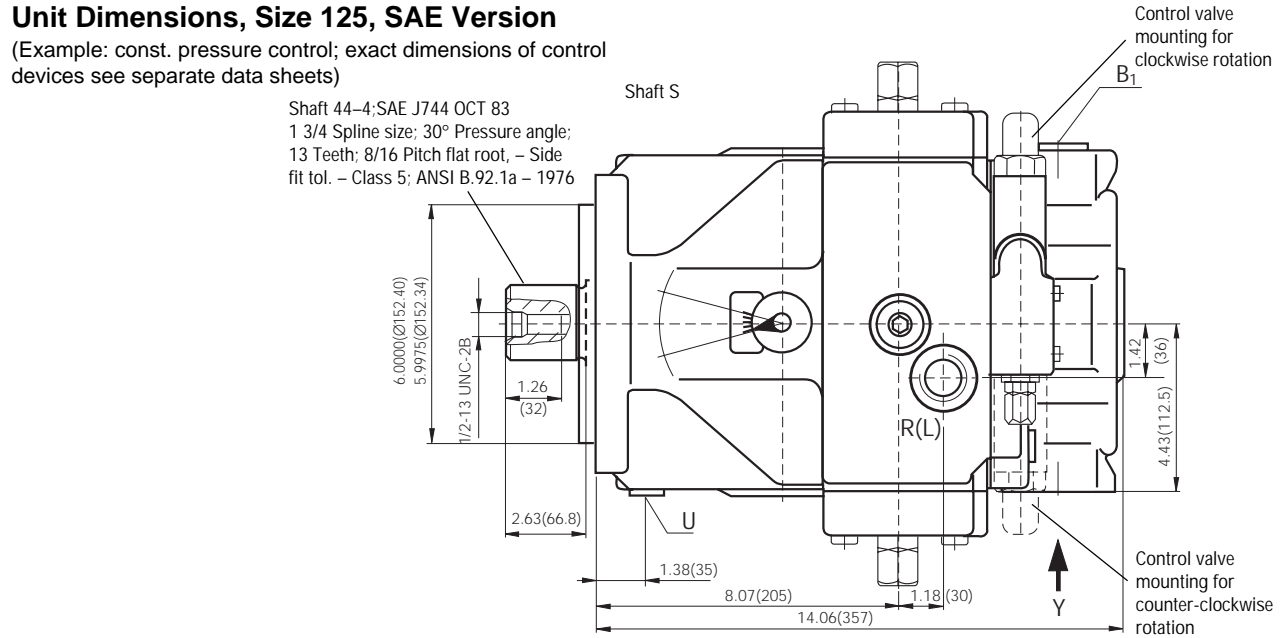
- B Pressure port SAE 1" (high pressure series)
- B<sub>1</sub> Additional port M 27 x 2; 0.63 (16) deep (plugged)
- S Suction port SAE 2" (standard pressure series)
- K<sub>1</sub>, K<sub>2</sub> Flushing ports M 27 x 2; 0.63 (16) deep (plugged)
- T Case drain port M 27 x 2; 0.63 (16) deep (plugged)
- M<sub>B</sub>, M<sub>S</sub> Test ports M 14 x 1.5; 0.47 (12) deep (plugged)
- R(L) Fluid fill and air bleed port M 27 x 2 for exact location see control data sheet
- U Flushing port M 14 x 1.5; 0.47 (12) deep (plugged)



### Unit Dimensions, Size 125, SAE Version

(Example: const. pressure control; exact dimensions of control devices see separate data sheets)

Shaft 44-4; SAE J744 OCT 83  
 1 3/4 Spline size; 30° Pressure angle;  
 13 Teeth; 8/16 Pitch flat root, - Side  
 fit tol. - Class 5; ANSI B.92.1a - 1976

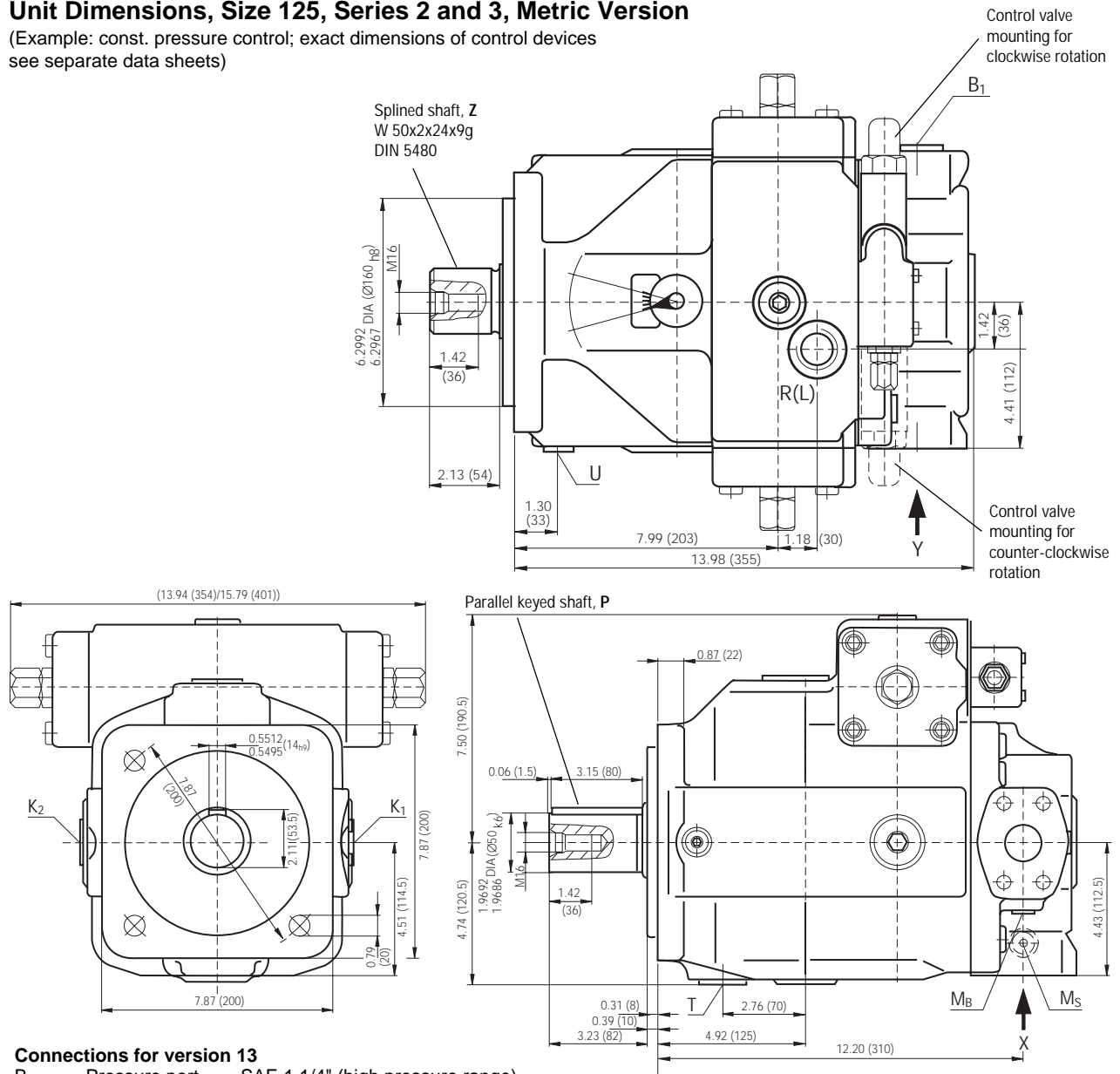


#### Port connections

- |                                 |   |                                       |
|---------------------------------|---|---------------------------------------|
| B                               | Pressure port                             | 1 1/4" SAE (High pressure series)     |
| B <sub>1</sub>                  | Additional port                           | 1 5/16-12 UN-2B                       |
| S                               | Suction port                              | 2 1/2" SAE (Standard pressure series) |
| K <sub>1</sub> , K <sub>2</sub> | Flushing ports                            | 1 5/16-12 UN-2B                       |
| T                               | Case drain port                           | 1 5/16-12 UN-2B                       |
| M <sub>B</sub> , M <sub>S</sub> | Test ports                                | 7/16-20 UNF-2B                        |
| R(L)                            | Fluid fill and air bleed port             | 1 5/16-12 UN-2B                       |
|                                 | for exact location see control data sheet |                                       |
| U                               | Flushing port                             | 7/16-20 UNF-2B                        |

### Unit Dimensions, Size 125, Series 2 and 3, Metric Version

(Example: const. pressure control; exact dimensions of control devices see separate data sheets)



**Connections for version 13**

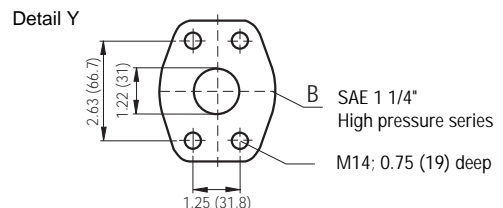
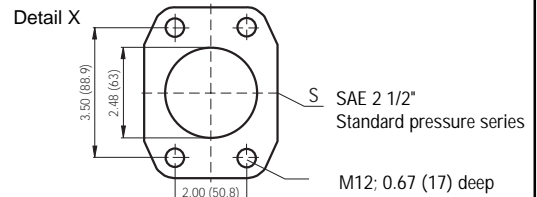
- B Pressure port SAE 1 1/4" (high pressure range)
- B<sub>1</sub> Auxiliary port M 33x2; 18 deep (plugged)

**Connections for version 25**

- B Pressure port SAE 1 1/4" (high pressure range)
- B<sub>1</sub> 2nd pressure port SAE 1 1/4" (high pressure range) (closed)

**Port connections**

- B Pressure port SAE 1 1/4" (high pressure series)
- B<sub>1</sub> Additional port M 33 x 2; 0.71 (18) deep (plugged)
- S Suction port SAE 2 1/2" (standard pressure series)
- K<sub>1</sub>, K<sub>2</sub> Flushing ports M 33 x 2; 0.71 (18) deep (plugged)
- T Case drain port M 33 x 2; 0.71 (18) deep (plugged)
- M<sub>B</sub>, M<sub>S</sub> Test ports M 14 x 1.5; 0.47 (12) deep (plugged)
- R(L) Fluid fill and air bleed port M 33 x 2  
for exact location see control data sheet
- U Flushing port M 14 x 1.5; 0.47 (12) deep (plugged)



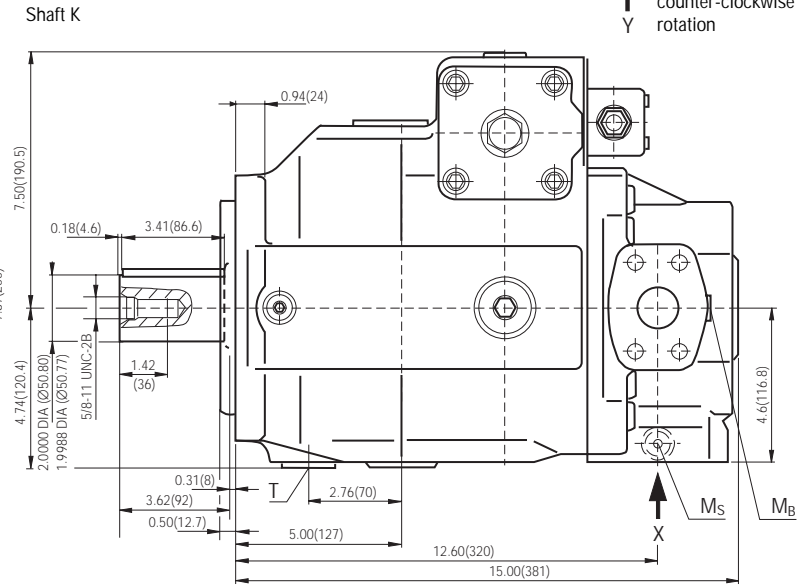
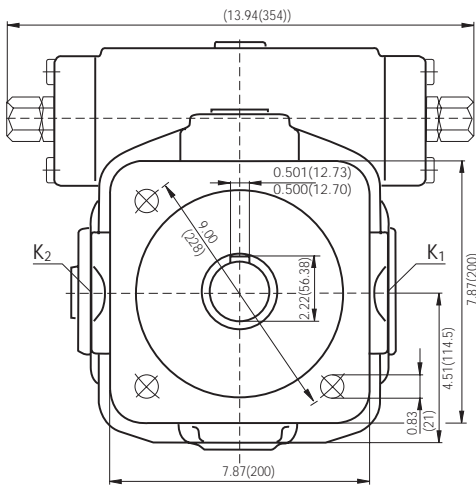
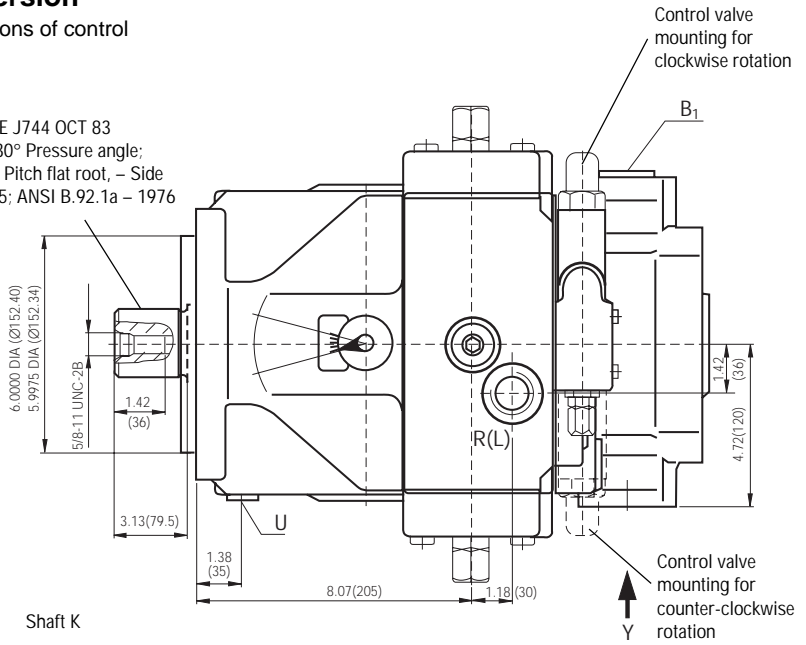


### Unit Dimensions, Size 180, SAE Version

(Example: const. pressure control; exact dimensions of control devices see separate data sheets)

Shaft S

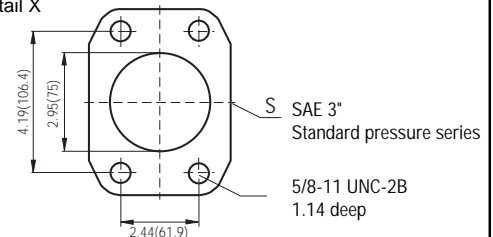
Shaft 50-4; SAE J744 OCT 83  
 2 Spline size: 30° Pressure angle;  
 15 Teeth; 8/16 Pitch flat root, - Side  
 fit tol. - Class 5; ANSI B.92.1a - 1976



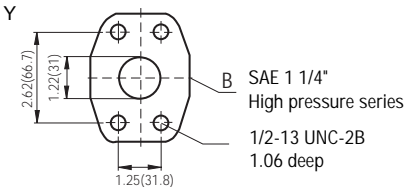
**Port connections**

- B Pressure port 1 1/4" SAE (High pressure series)
- B<sub>1</sub> Additional port 1 5/16-12 UN-2B
- S Suction port 3" SAE (Standard pressure series)
- K<sub>1</sub>, K<sub>2</sub> Flushing ports 1 5/16-12 UN-2B
- T Case drain port 1 5/16-12 UN-2B
- M<sub>B</sub>, M<sub>S</sub> Test ports 7/16-20 UNF-2B
- R(L) Fluid fill and air bleed port 1 5/16-12 UN-2B  
 for exact location see control data sheet
- U Flushing port 7/16-20 UNF-2B

Detail X

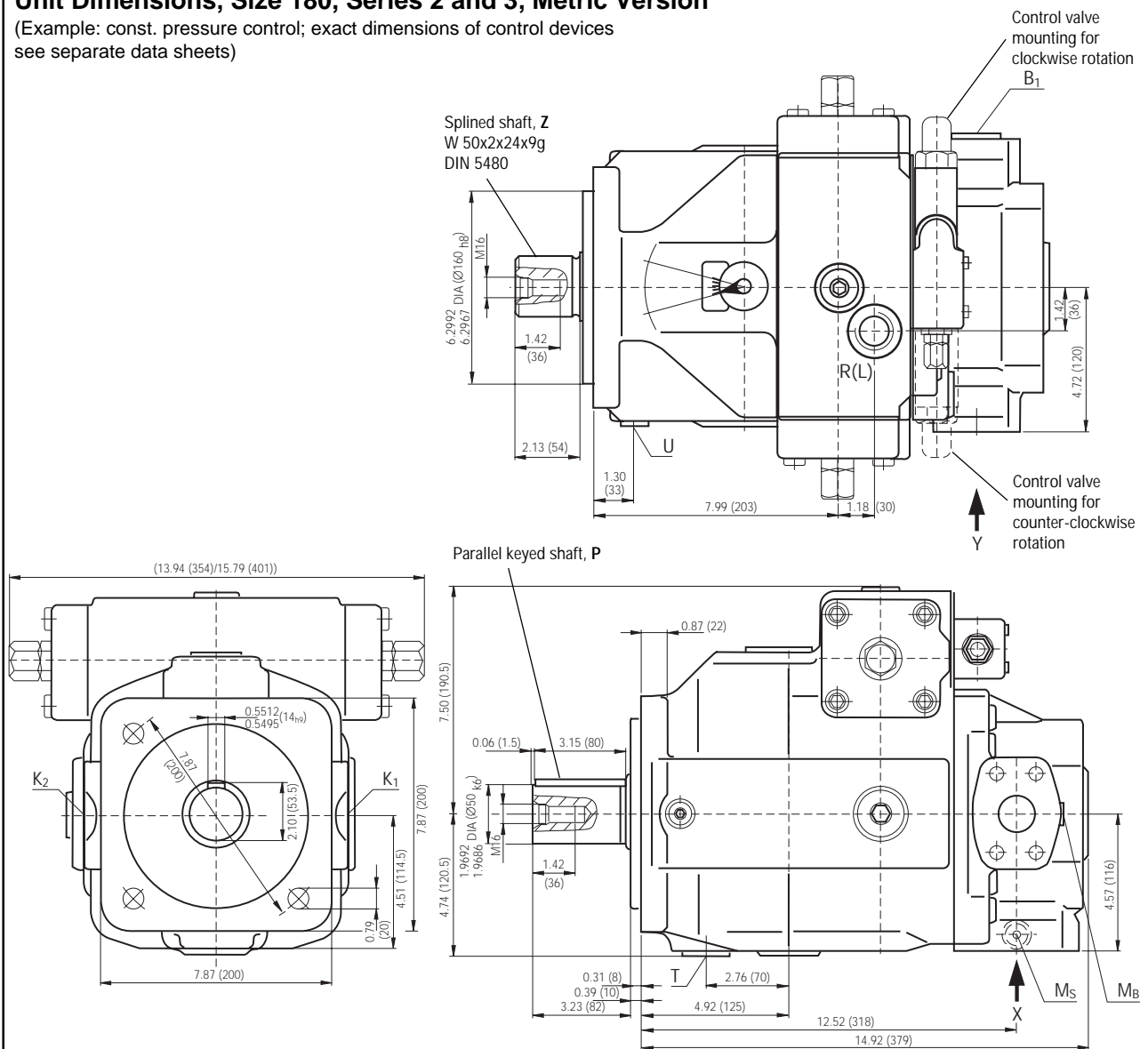


Detail Y



### Unit Dimensions, Size 180, Series 2 and 3, Metric Version

(Example: const. pressure control; exact dimensions of control devices see separate data sheets)



**Connections for version 13**

- B Pressure port SAE 1 1/4" (high pressure range)
- B<sub>1</sub> Auxiliary port M 33x2; 18 deep (plugged)

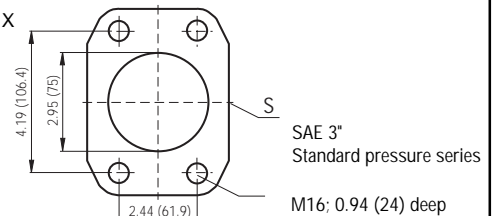
**Connections of version 25**

- B Pressure port SAE 1 1/4" (high pressure range)
- B<sub>1</sub> 2nd pressure port SAE 1 1/4" (high pressure range) (closed)

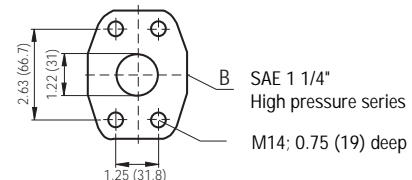
**Port connections**

- B Pressure port SAE 1 1/4" (high pressure series)
- B<sub>1</sub> Additional port M 33 x 2; 0.71 (18) deep (plugged)
- S Suction port SAE 3" (standard pressure series)
- K<sub>1</sub>, K<sub>2</sub> Flushing ports M 33 x 2; 0.71 (18) deep (plugged)
- T Case drain port M 33 x 2; 0.71 (18) deep (plugged)
- M<sub>B</sub>, M<sub>S</sub> Test ports M 14 x 1.5; 0.47 (12) deep (plugged)
- R(L) Fluid fill and air bleed port M 33 x 2 for exact location see control data sheet
- U Flushing port M 14 x 1.5; 0.47 (12) deep (plugged)

Detail X



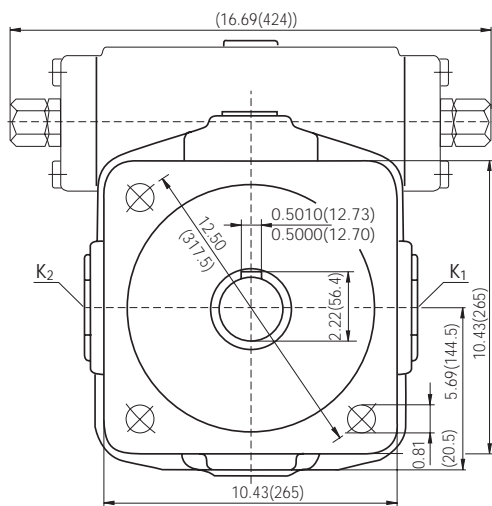
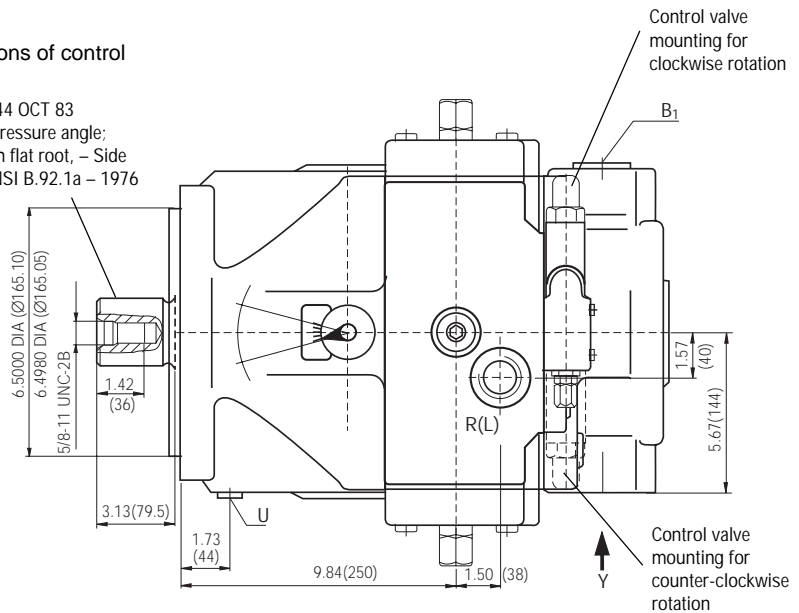
Detail Y



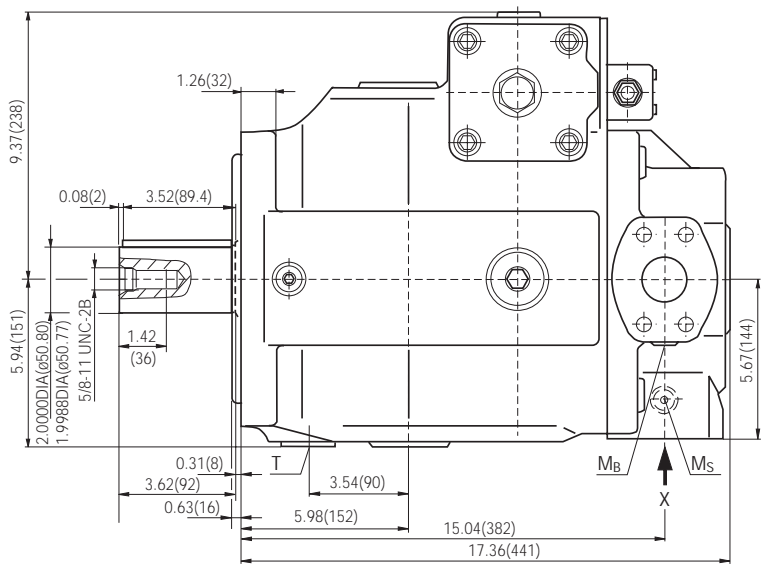
### Unit Dimensions, Size 250

(Example: const. pressure control; exact dimensions of control devices see separate data sheets)

Shaft S Shaft 50-4; SAE J744 OCT 83  
 2 Spline size: 30° Pressure angle;  
 15 Teeth; 8/16 Pitch flat root, - Side  
 fit tol. - Class 5; ANSI B.92.1a - 1976



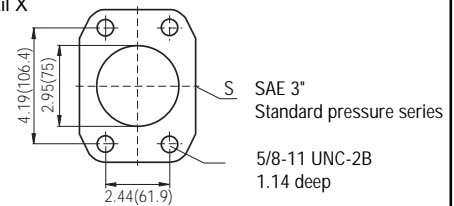
Shaft K



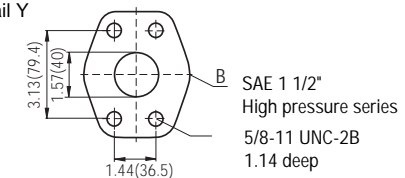
**Port connections**

- B Pressure port 1 1/2" SAE (High pressure series)
- B<sub>1</sub> Additional port 1 5/8-12 UN-2B
- S Suction port 3" SAE (Standard pressure series)
- K<sub>1</sub>, K<sub>2</sub> Flushing ports 1 5/8-12 UN-2B
- T Case drain port 1 5/8-12 UN-2B
- M<sub>B</sub>, M<sub>S</sub> Test ports 7/16-20 UNF-2B
- R(L) Fluid fill and air bleed port 1 5/8-12 UN-2B  
 for exact location see control data sheet
- U Flushing port 7/16-20 UNF-2B

Detail X

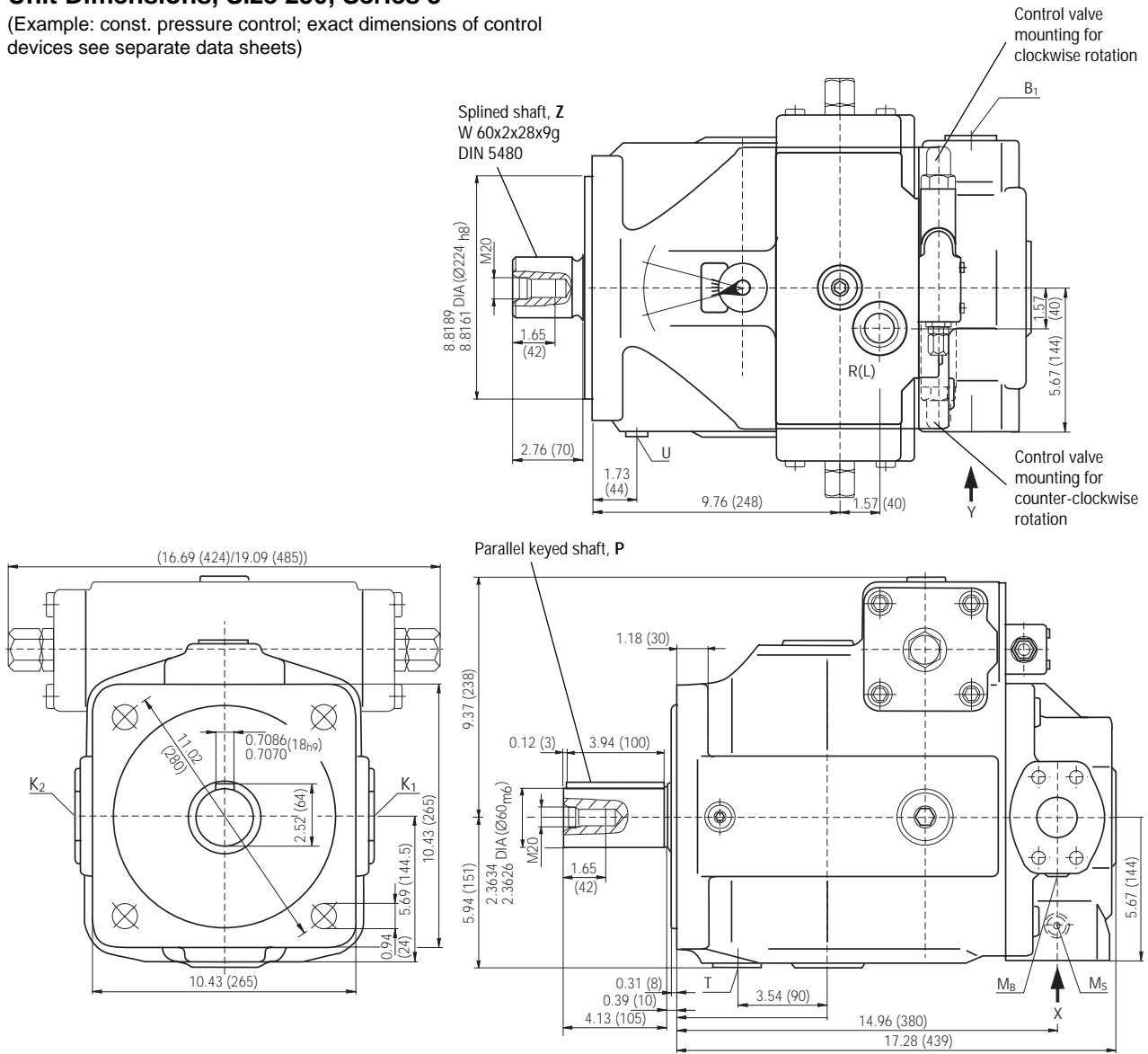


Detail Y



### Unit Dimensions, Size 250, Series 3

(Example: const. pressure control; exact dimensions of control devices see separate data sheets)



#### Connections for version 13

- B Pressure port SAE 1 1/2" (high pressure range)
- B<sub>1</sub> Auxiliary port M 42x2; 20 deep (plugged)

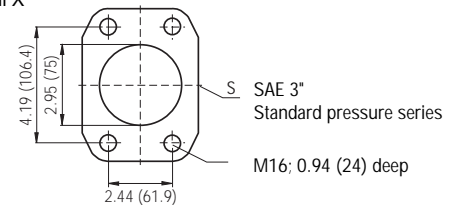
#### Connections for version 25

- B Pressure port SAE 1 1/2" (high pressure range)
- B<sub>1</sub> 2nd pressure port SAE 1 1/2" (high pressure range) (closed)

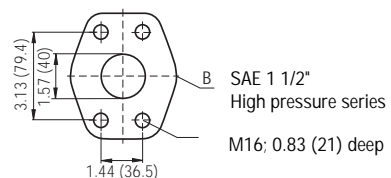
#### Port connections

- B Pressure port SAE 1 1/2" (high pressure series)
- B<sub>1</sub> Additional port M 42 x 2 ; 0.79 (20) deep (plugged)
- S Suction port SAE 3" (standard pressure series)
- K<sub>1</sub>, K<sub>2</sub> Flushing ports M 42 x 2 ; 0.79 (20) deep (plugged)
- T Case drain port M 42 x 2 ; 0.79 (20) deep (plugged)
- M<sub>B</sub>, M<sub>S</sub> Test ports M 14 x 1.5 ; 0.47 (12) deep (plugged)
- R(L) Fluid fill and air bleed port M 42 x 2  
for exact location see control data sheet
- U Flushing port M 14 x 1.5 ; 0.47 (12) deep (plugged)

#### Detail X

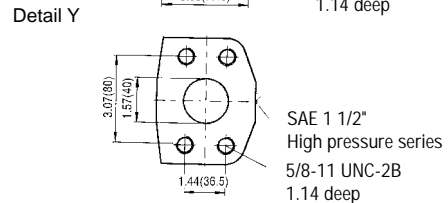
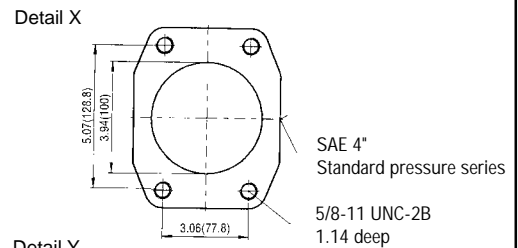
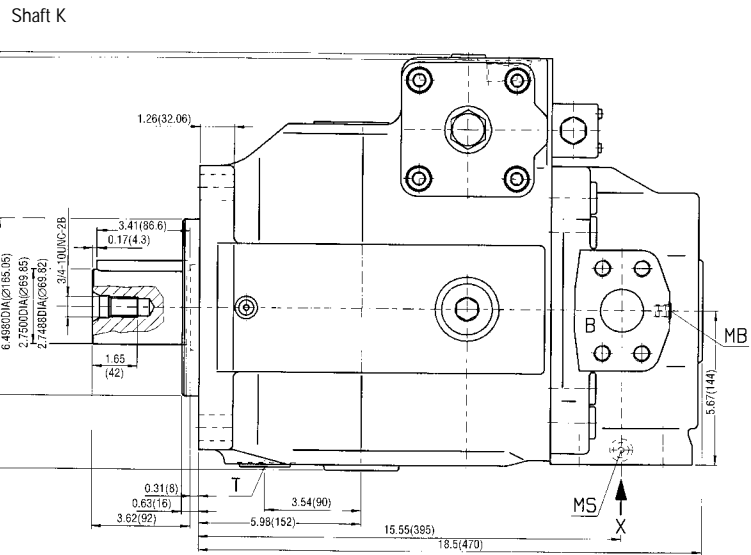
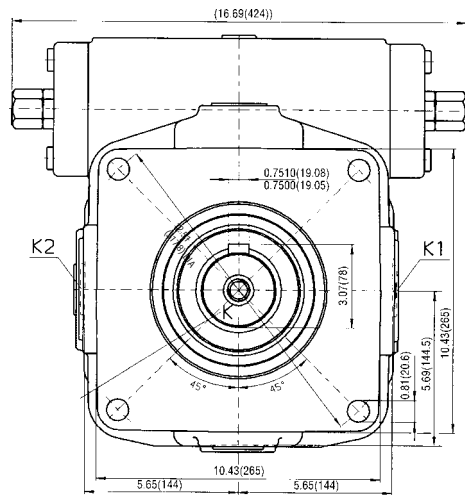
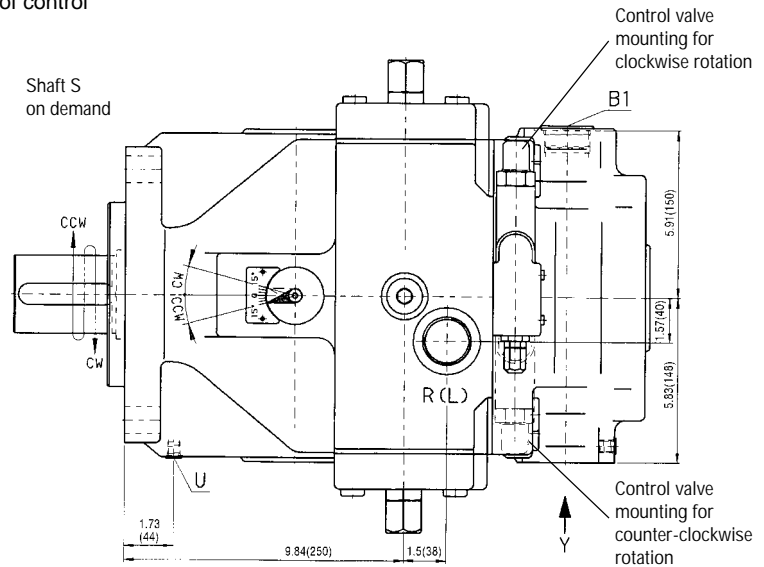


#### Detail Y



### Unit Dimensions, Size 355, SAE Version

(Example: const. pressure control; exact dimensions of control devices see separate data sheets)

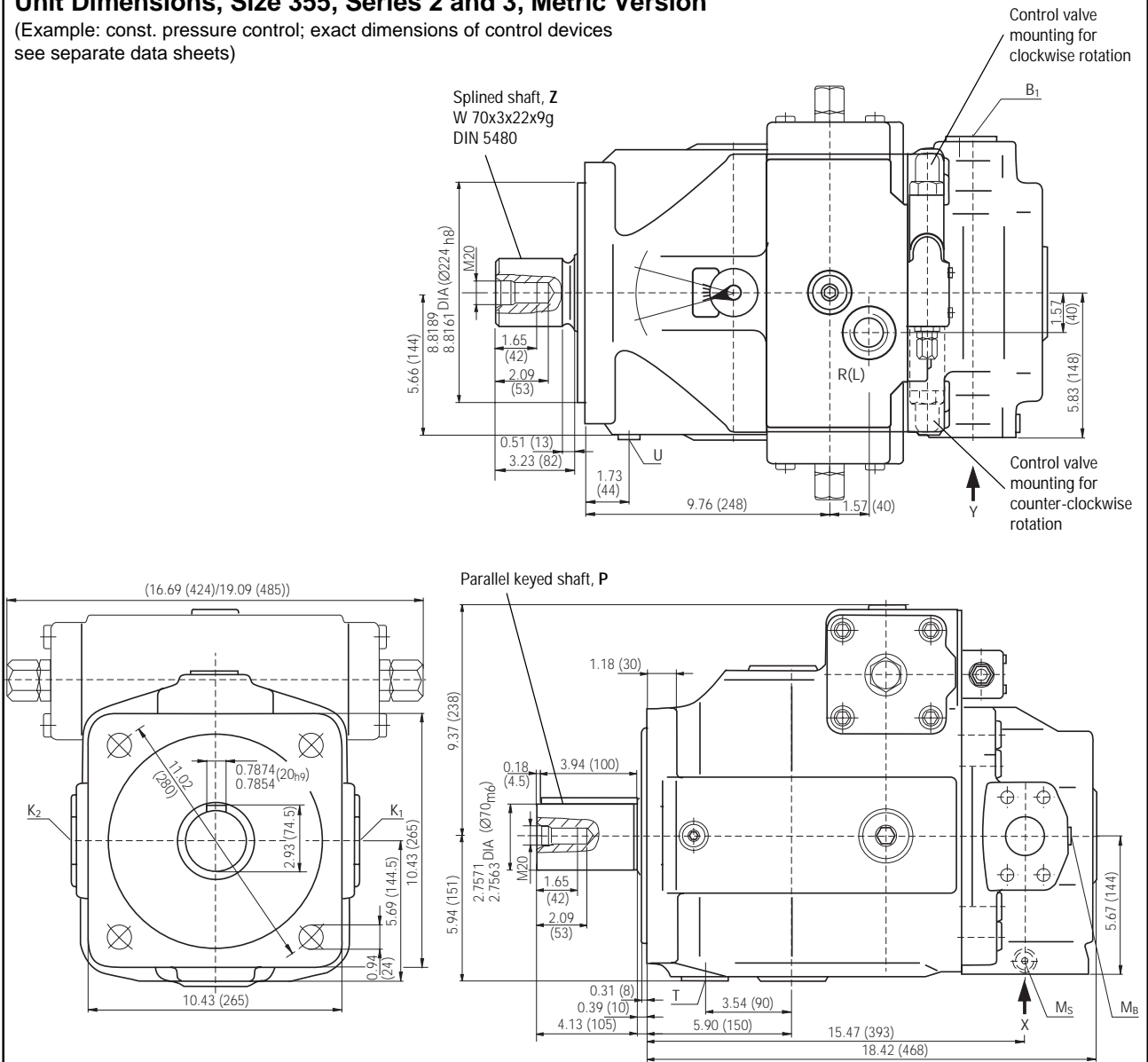


#### Port connections

B	Pressure port	1 1/2" SAE (High pressure series)
B <sub>1</sub>	Additional port	1 5/8-12 UN-2B
S	Suction port	4" SAE (Standard pressure series)
K <sub>1</sub> , K <sub>2</sub>	Flushing ports	1 5/8-12 UN-2B
T	Case drain port	1 5/8-12 UN-2B
M <sub>B</sub> , M <sub>S</sub>	Test ports	7/16-20 UNF-2B
R(L)	Fluid fill and air bleed port	1 5/8-12 UN-2B
	for exact location see control data sheet	
U	Flushing port	3/4-16 UNF-2B

### Unit Dimensions, Size 355, Series 2 and 3, Metric Version

(Example: const. pressure control; exact dimensions of control devices see separate data sheets)



**Connections for version 13**

- B Pressure port SAE 1 1/2" (high pressure range)
- B<sub>1</sub> Auxiliary port M 42x2; 20 deep (plugged)

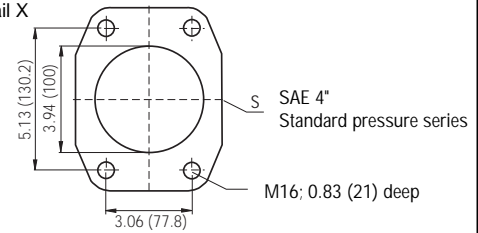
**Connections for version 25**

- B Pressure port SAE 1 1/2" (high pressure range)
- B<sub>1</sub> 2nd pressure port SAE 1 1/2" (high pressure range) (closed)

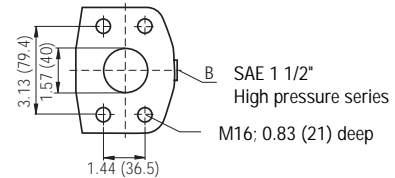
**Port connections**

- B Pressure port SAE 1 1/2" (high pressure series)
- B<sub>1</sub> Additional port M 42 x 2; 0.79 (20) deep (plugged)
- S Suction port SAE 4" (standard pressure series)
- K<sub>1</sub>, K<sub>2</sub> Flushing ports M 42 x 2; 0.79 (20) deep (plugged)
- T Case drain port M 42 x 2; 0.79 (20) deep (plugged)
- M<sub>B</sub>, M<sub>S</sub> Test ports M 14 x 1.5; 0.47 (12) deep (plugged)
- R(L) Fluid fill and air bleed port M 42 x 2; for exact location see control data sheet
- U Flushing port M 18 x 1.5; 0.47 (12) deep (plugged)

**Detail X**

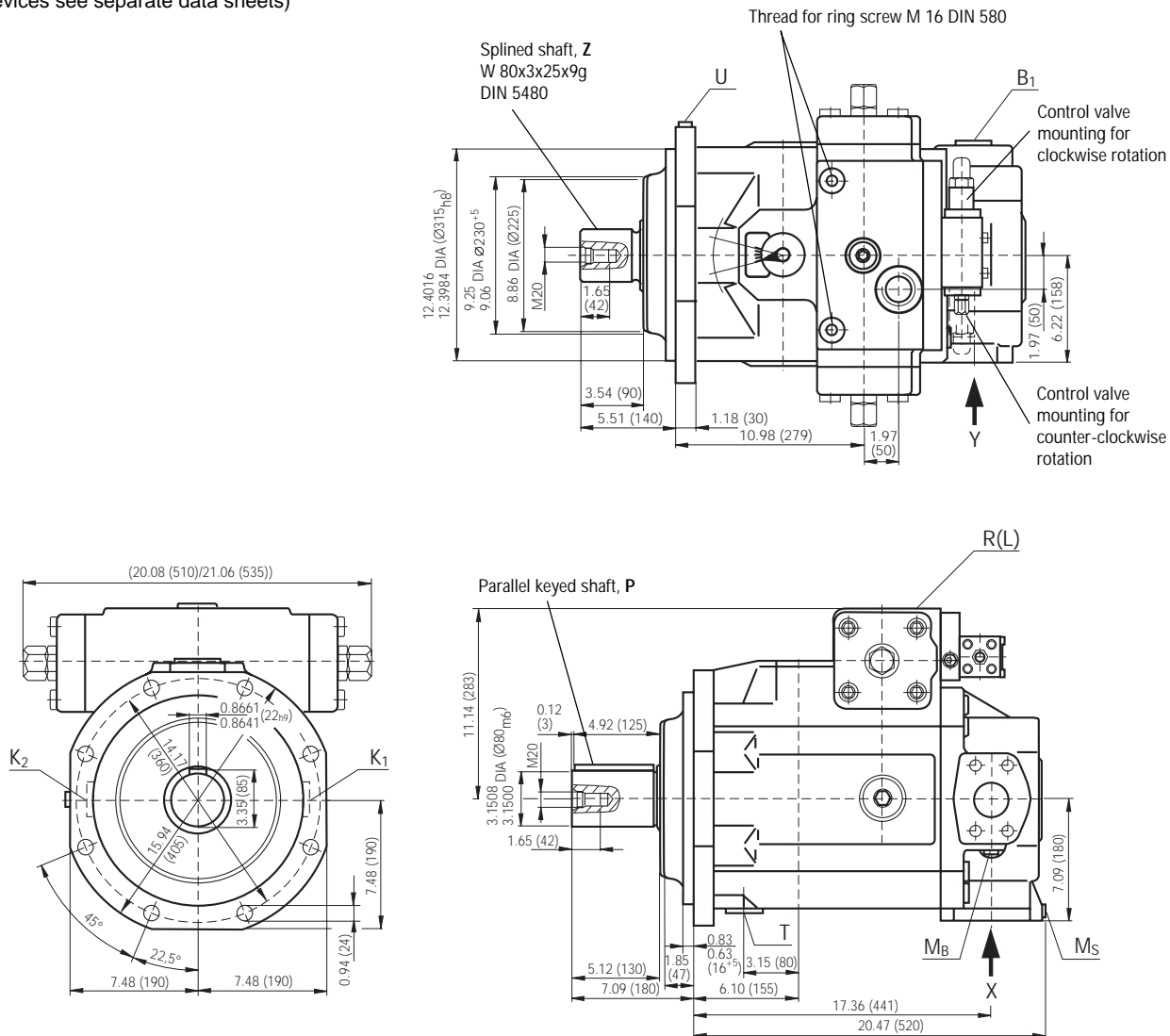


**Detail Y**



### Unit Dimensions, Size 500, Series 3

(Example: const. pressure control; exact dimensions of control devices see separate data sheets)



**Connections for version 13**

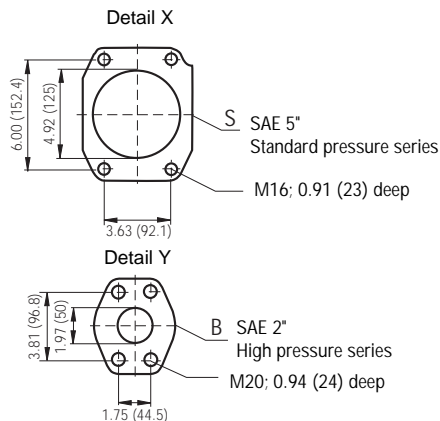
- B Pressure port SAE 2" (high pressure range)
- B<sub>1</sub> Auxiliary port M 48x2;22 deep (plugged)

**Connections for version 25**

- B Pressure port SAE 2" (high pressure range)
- B<sub>1</sub> 2nd pressure port SAE 2" (high pressure range) (closed)

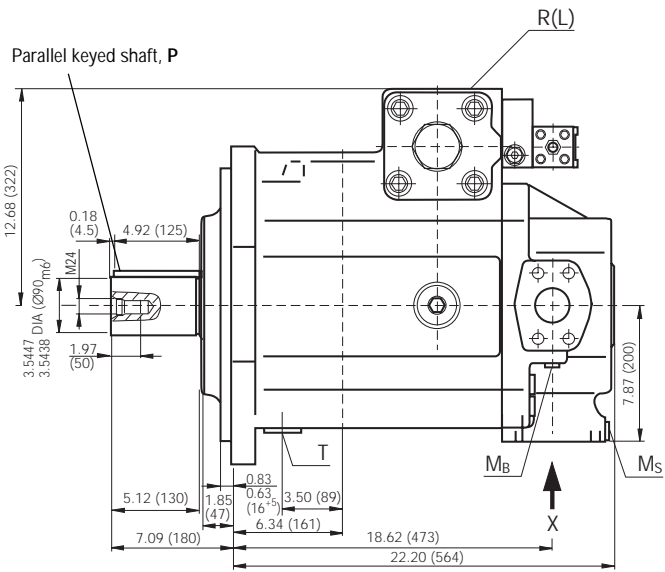
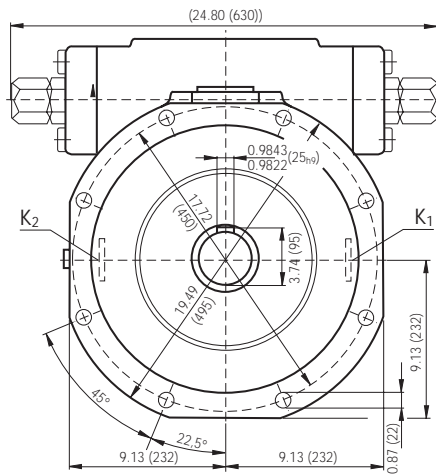
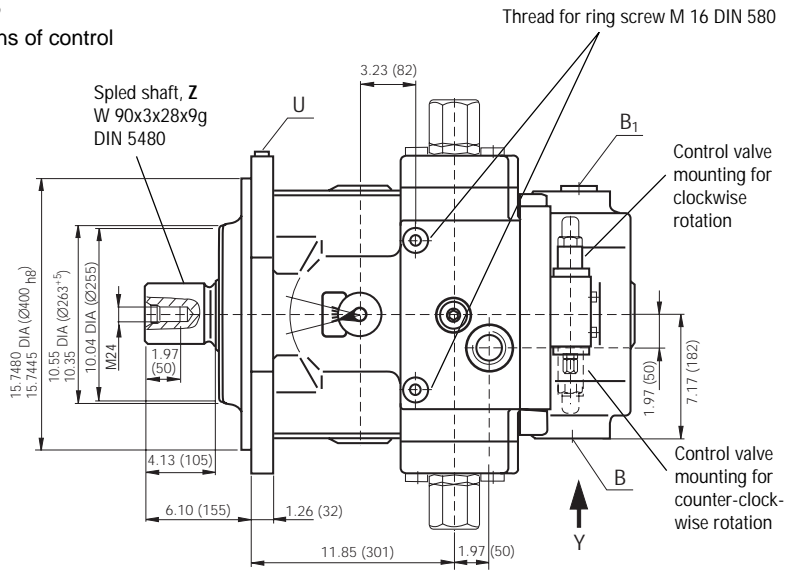
**Port connections**

- B Pressure port SAE 2" (high pressure series)
- B<sub>1</sub> Additional port M 48 x 2; 0.87 (22) deep (plugged)
- S Suction port SAE 5" (standard pressure series)
- K<sub>1</sub>, K<sub>2</sub> Flushing ports M 48 x 2; 0.87 (22) deep (plugged)
- T Case drain port M 48 x 2; 0.87 (22) deep (plugged)
- M<sub>B</sub>, M<sub>S</sub> Test ports M 18 x 1.5; 0.47 (12) deep (plugged)
- R(L) Fluid fill and air bleed port M 48 x 2; for exact location see control data sheet
- U Flushing port M 18 x 1.5; 0.47 (12) deep (plugged)



**Unit Dimensions, Size 750, Series 3**

(Example: const. pressure control; exact dimensions of control devices see separate data sheets)



**Connections for version 13**

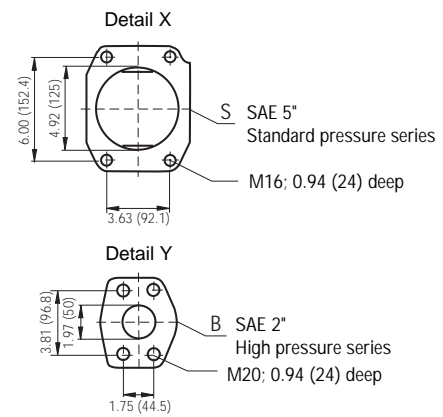
- B Pressure port SAE 2" (high pressure range)
- B<sub>1</sub> Auxiliary port M 48x2; 20 deep (plugged)

**Connections for version 25**

- B Pressure port SAE 2" (high pressure range)
- B<sub>1</sub> 2nd pressure port SAE 2" (high pressure range) (closed)

**Port connections**

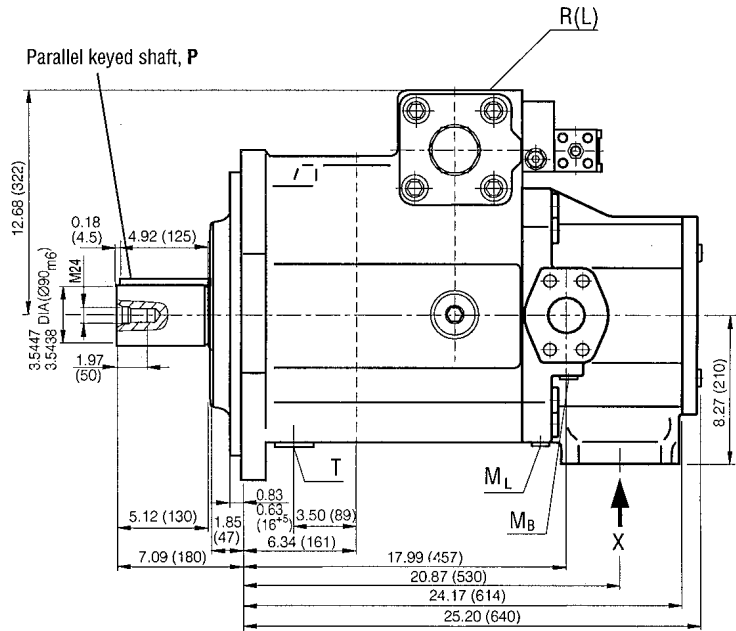
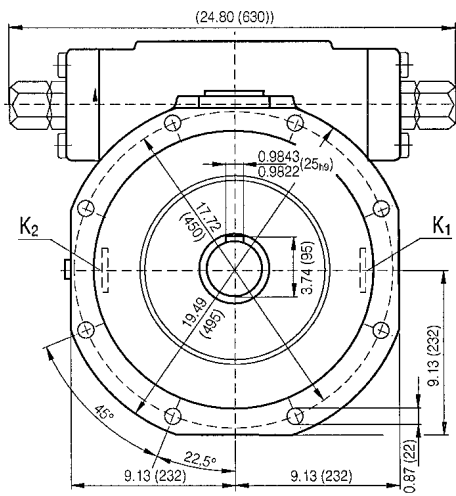
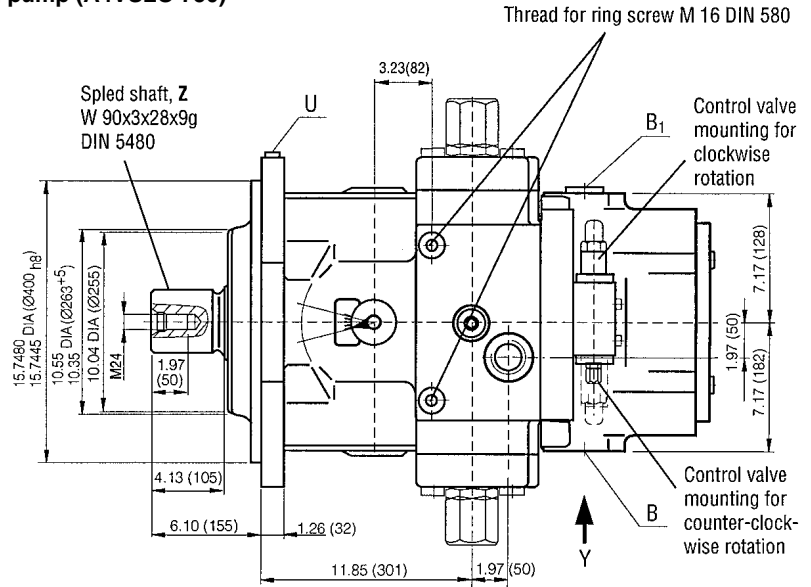
- B Pressure port SAE 2" (high pressure series)
- B<sub>1</sub> Additional port M 48 x 2; 0.79 (20) deep (plugged)
- S Suction port SAE 5" (standard pressure series)
- K<sub>1</sub>, K<sub>2</sub> Flushing ports M 48 x 2; 0.79 (20) deep (plugged)
- T Case drain port M 48 x 2; 0.79 (20) deep (plugged)
- M<sub>B</sub>, M<sub>S</sub> Test ports M 18 x 1.5; 0.47 (12) deep (plugged)
- R(L) Fluid fill and air bleed port M 48 x 2; for exact location see control data sheet
- U Flushing port M 18 x 1.5; 0.47 (12) deep (plugged)





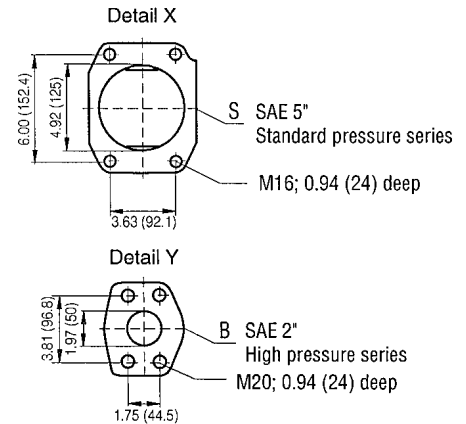
### Unit Dimensions, Size 750 with charging pump (A4VSL0 750)

(Example: const. pressure control  
exact dimensions of control devices  
see separate data sheets)



#### Port connections

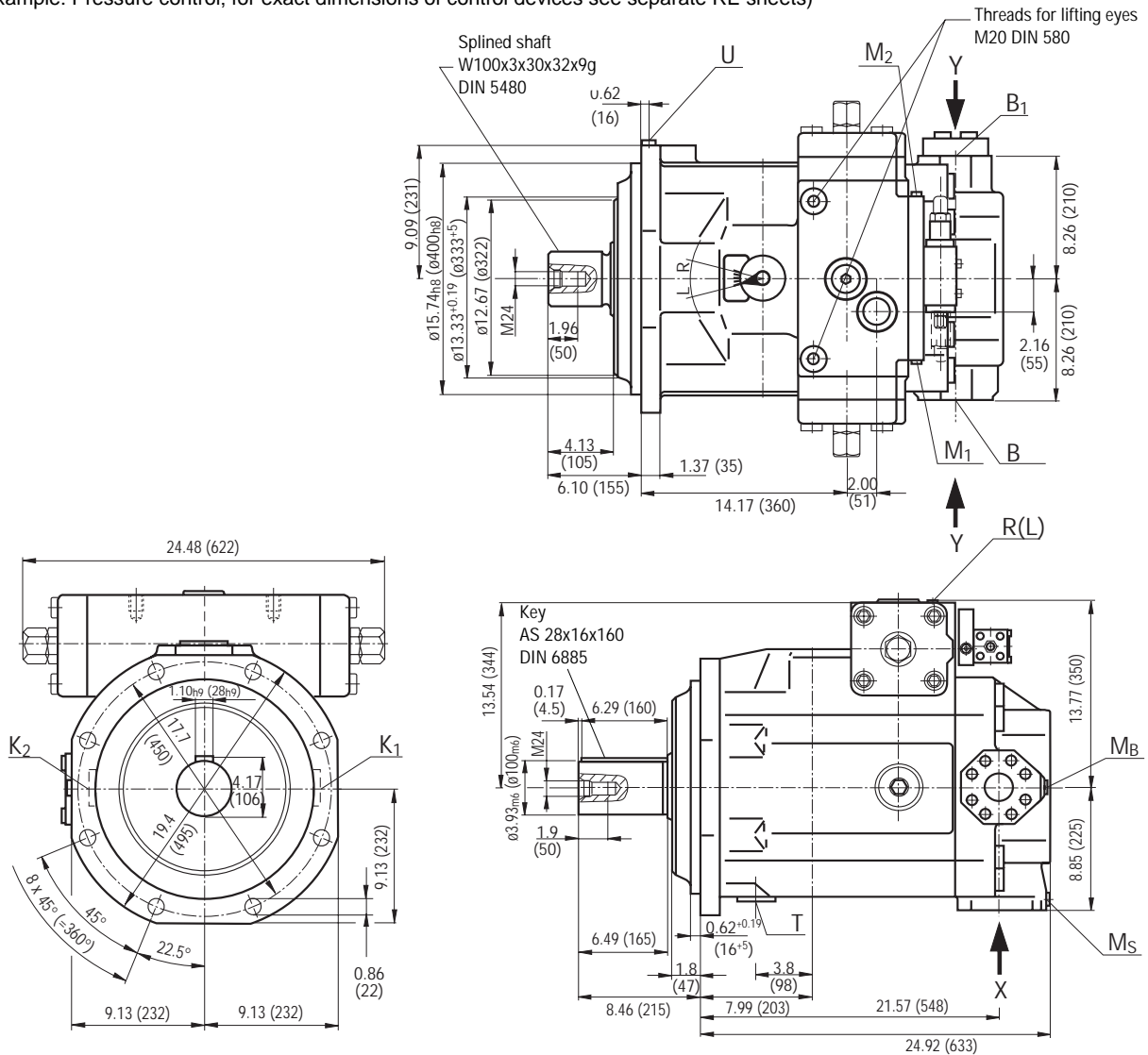
B	Pressure port	SAE 2" (high pressure series)
B <sub>1</sub>	Additional port	SAE 2" (plugged)
S	Suction port	SAE 5" (standard pressure series)
K <sub>1</sub> , K <sub>2</sub>	Flushing ports	M 48 x 2; 0.87 (20) deep (plugged)
T	Case drain port	M 48 x 2; 0.87 (20) deep (plugged)
M <sub>B</sub>	Test port (operating press.)	M 18 x 1.5; 0.47 (12) deep (plugged)
M <sub>S</sub>	Test port (suction press.)	M 18 x 1.5; 0.47 (12) deep (plugged)
M <sub>L</sub>	Test port (charging press.)	M 18 x 1.5; 0.47 (12) deep (plugged)
R(L)	Fluid fill and air bleed port for exact location see control data sheet	M 48 x 2;
U	Flushing port	M 18 x 1.5; 0.47 (12) deep (plugged)



Variable displacement pump A4VSO, Series 1, 2, and 3

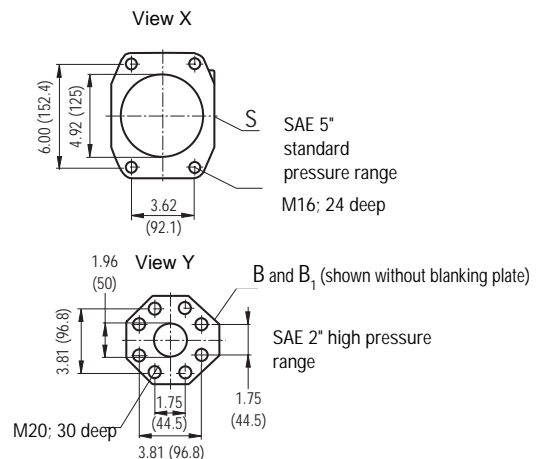
### Unit dimensions A4VSO 1000, series 3

(Example: Pressure control; for exact dimensions of control devices see separate RE sheets)



#### Connections – version 25

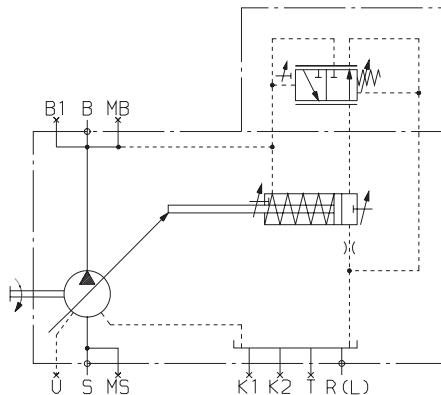
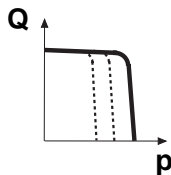
B	Pressure port	SAE 2" (high pressure range)
B <sub>1</sub>	2nd pressure port	SAE 2" (high pressure range) (closed)
S	Suction port	SAE 5" (standard series)
K <sub>1</sub> , K <sub>2</sub>	Flushing ports	M 48x2; 20 deep (plugged)
T	Oil drain	M 48x2; 20 deep (plugged)
M <sub>B</sub>	Test point operating pressure	M 18x1.5; 12 deep (plugged)
M <sub>S</sub>	Test point suction pressure	M 18x1.5; 12 deep (plugged)
R(L)	Oil filling + air bleed	M 48x2;
U	Flushing port	M 18x1.5; 12 deep (plugged)
M <sub>1</sub> , M <sub>2</sub>	Test points for adjustment pressure	M 18x1.5 (plugged)



**Summary of controls**

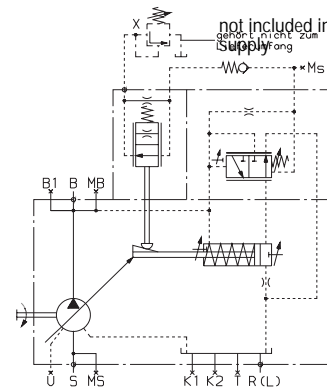
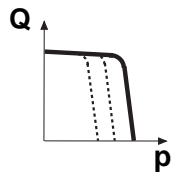
**Pressure control DR (see RE/RA 92 060)**

Maintains a max. pressure level in a hydraulic system.  
 setting range 290 – 5100 psi (20 – 350 bar)  
 Optional:  
 Remote control (DRG)



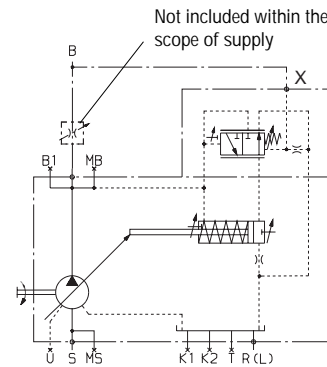
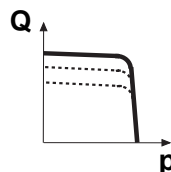
**Pressure control for operation in parallel DP (see RE/RA 92 060)**

Suitable to maintain max. pressure in a system with multiple pumps in parallel operation.  
 Optional:  
 Flow control (DPF)



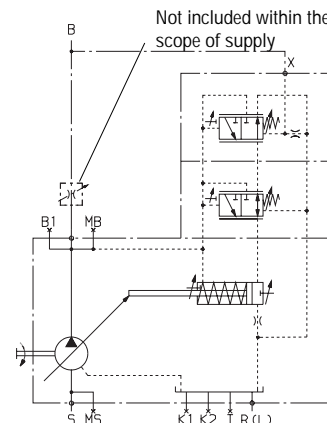
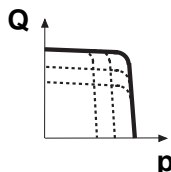
**Flow control FR (see RE/RA 92 060)**

This control maintains a fixed pressure drop over a flow valve, installed in the service line, thus maintains a constant flow.  
 Optional:  
 Remote pressure control (FRG),  
 Orifice in X-chamber closed (FR1, FRG1)



**Pressure- and flow control DFR (see RE/RA 92060)**

This control maintains a constant flow through a flow valve regardless of operating conditions. Overriding this flow control is a mechanically adjustable pressure control.  
 Optional:  
 Orifice in X-chamber closed (DFR1)



Variable displacement pump A4VSO, Series 1, 2, and 3

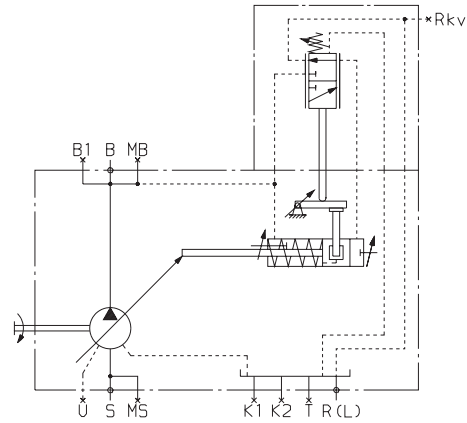
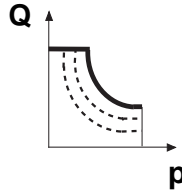
### Summary of controls

#### Power control LR2 (RE/RA 92 064) with hyperbolic curve

The power control holds the preset drive power constant at a constant drive speed.

Optional:

- Pressure control (LR2D),
- remotely adjustable (LR2G),
- flow control (LR2F, LR2S),
- hydraulic stroke limiter (LR2H)
- mech. stroke limiter (LR2M);
- hydr. two-point adjustment (LR2Z);
- elec. relief valve (LR2Y).

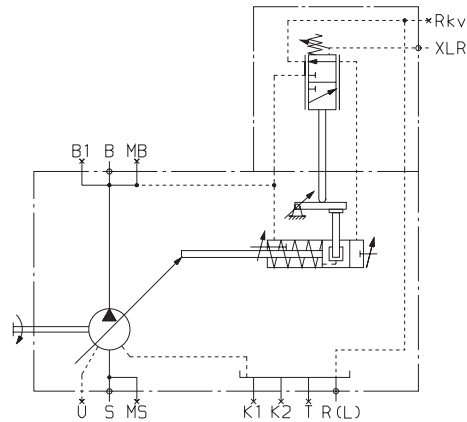
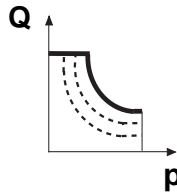


#### Power control LR3 (RE/RA 92 064) with remote adjustment of control curve

This hyperbolic power control holds the preset drive power constant; the power control curve is remotely adjustable.

Optional:

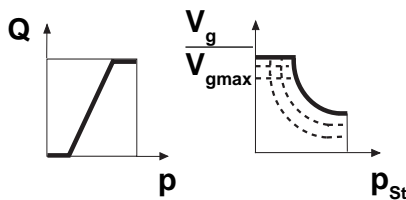
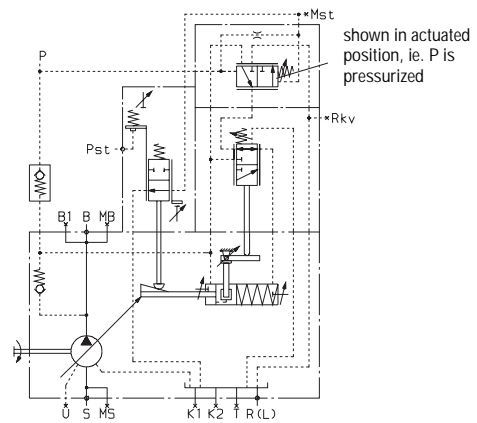
- Pressure control (LR3D),
- remotely adjustable (LR3G),
- flow control (LR3F, LR3S)
- hydr. stroke limiter (LR3H)
- mech. stroke limiter (LR3M);
- hydr. two-point adjustment (LR3Z).



#### Hydraulic control LR2N (RE/RA 92 064) pilot pressure dependent, normally at $V_{g \min}$

With overriding power control. The displacement is proportional to the pilot pressure in  $P_{st}$ . The hyperbolic power control is overriding the pilot pressure signal and holds the preset power constant.

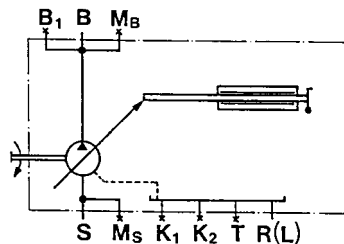
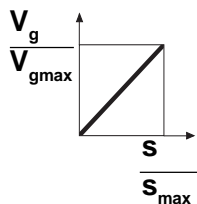
- Optional: Pressure control (LR2DN),
- remotely adjustable (LR2GN)
- power control curve remotely adjustable (LR3N, LR3DN, LR3GN)



### Summary of controls

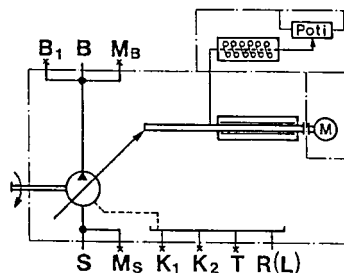
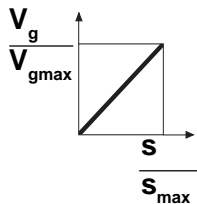
#### Manual control MA (RE/RA 92 072)

Stepless adjustment of displacement by means of handwheel.



#### Electrical motor control EM (RE/RA 92 072)

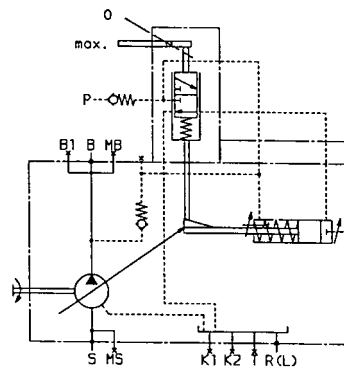
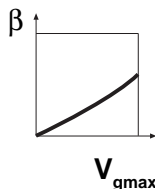
Stepless flow adjustment via an electric motor. With a programmed sequence control, various intermediate displacements can be selected by means of built-on limit switches or a potentiometer.



#### Hydraulic control HW (RA 92 068; in preparation) with rotary servo

Infinite adjustment of the pump flow as a function of the angle position ( $\sin \beta$ ) of the pivot.

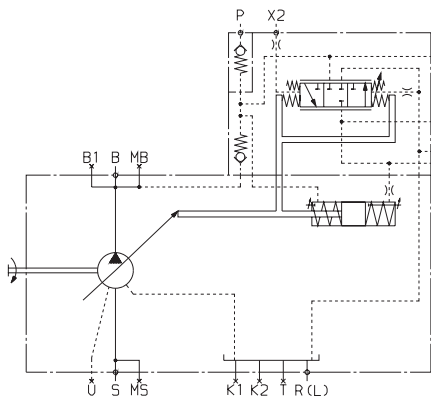
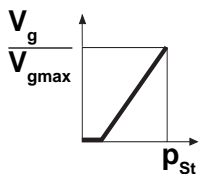
Optional:  
with hyperbolic horse power control (HWP)



#### Hydraulic control HD (RE/RA 92 080) pilot pressure dependent

Stepless control of displacement dependent on pilot pressure signal. The displacement is proportional to the pilot pressure.

Optional:  
Pilot characteristics (HD1, HD2, HD3)  
Pressure control (HD.B),  
- remotely adjustable (HD.GB)  
Power control (HD1P)  
electr. pilot pressure control (HD1T)



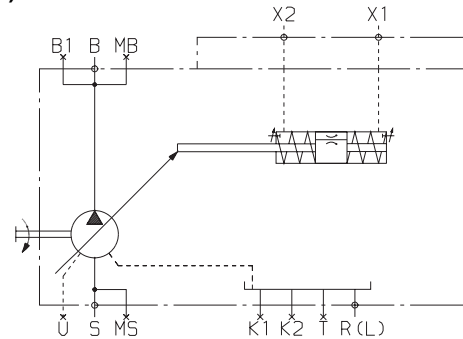
Variable displacement pump A4VSO, Series 1, 2, and 3

## Summary of controls

### Hydraulic displacement control HM1 / HM2 / HM3 (see RE/RA 92 076) flow related

The pump displacement is infinitely adjustable, dependent on the control volume in port X<sub>1</sub> and X<sub>2</sub>.

- Application:
- 2 point control
  - basic control device for servo- or proportional controls



### Hydraulic displacement control HS / HS1 (see RE/RA 92 076) HS3 (see RE 30021)

#### with servo or proportional valve

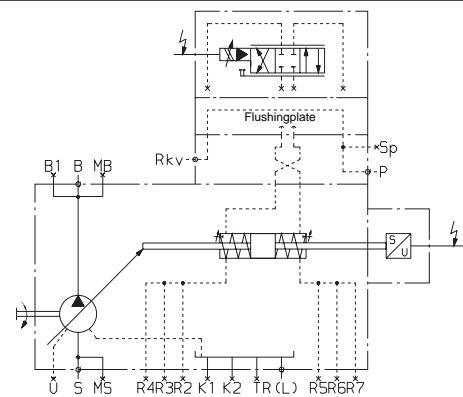
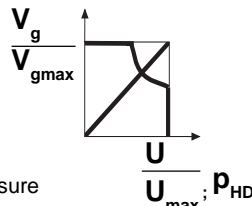
The stepless displacement control is accomplished by means of a servo or proportional valve with electric feedback of swivel angle.

#### Electronic control

Optional:

- Servo valve (HS/HS1), Proportional valve (HS3)
- Bypass valve (HS1K/HS3K);
- without valves (HSE/HS1E/HS3E)

The HS3P-control is equipped with built-on pressure transducer, which makes it suitable for pressure- and power control



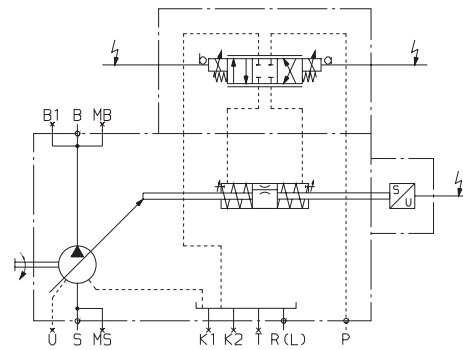
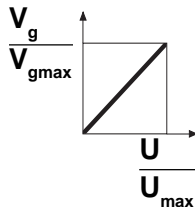
### Hydraulic displacement control EO1/EO2 (see RE/RA 92 076)

The stepless displacement control is accomplished with a proportional valve with electrical feedback of swivel angle.

#### Electronic control

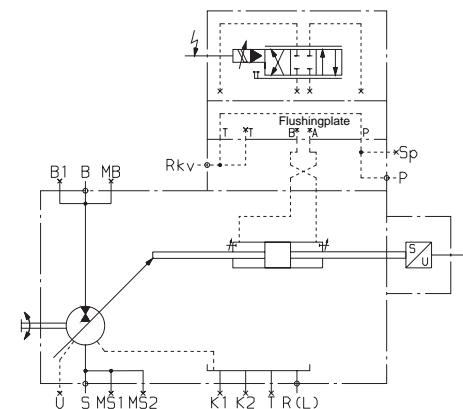
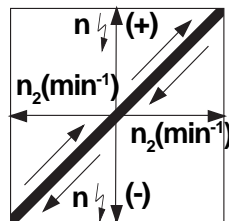
Optional:

- Bypass valve (EO1K/EO2K)
- Without valves (EO1E/EO2E)



### Speed control DS1 (see RA 92 055) secondary controlled

The speed control DS1 controls the secondary unit (the motor) in such a manner, that this motor supplies sufficient torque to maintain the required speed. Hooked up to a system with constant pressure, this torque is proportional to displacement, thus to swivel angle.



### Through-drive

Model A4VSO can be supplied with a through-drive capability, as shown in the ordering code on page 3. It is recommended, that no more than three individual pumps are coupled in series.

Included in the supply are: Coupling, fixing screws, seal and an intermediate flange (if required).

### Combination pumps

Two or more independent circuits are available to the user when combination pumps are used

1. If the combination pump consists of 2 units and if it is supposed to be delivered as an assembled unit, the two ordering codes are to be combined with the "+" symbol.

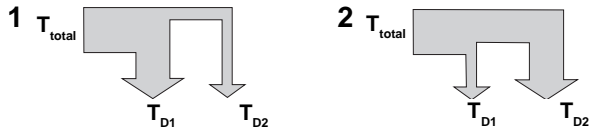
#### Example:

A4VSO 125 DR/22R – PB13K33 +  
A4VSO 71 DR /10 R – PZB13 N00

- 1.1 Please see data sheet RA 90 139 (in preparation) if a gear pump or radial piston pump is to be mounted as a combination pump at the factory. This data sheet lists the pumps which can be mounted and they are included in the ordering code of the first pump.

When planning a pump combination with equal pump sizes (i.e. 125+125) and controls HD.P, HD.T and HD.U it is necessary to consult us.

### Permissible through drive torque



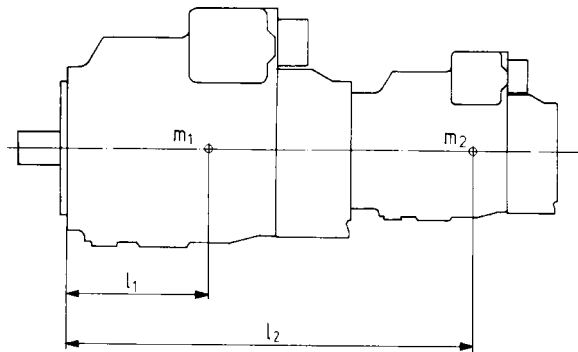
### Spined shaft, Z

Size	40	71	125	180	250	355	500	750	1000	
Max. perm. through drive torque at mounting flange pump 1 (pump 1 + pump 2)										
$T_{Ges\ max}$	lb-ft 329 Nm (446)	583 (790)	1027 (1392)	1478 (2004)	2052 (2782)	2915 (3952)	4105 (5566)	6157 (8348)	8209 (11130)	
1	Permissible through drive torque $T_{D1max}$	lb-ft 164 Nm (223)	291 (395)	513 (696)	739 (1002)	1026 (1391)	1457 (1976)	2052 (2783)	3078 (4174)	4104 (5565)
	$T_{D2max}$	lb-ft 164 Nm (223)	291 (395)	513 (696)	739 (1002)	1026 (1391)	1457 (1976)	2052 (2783)	3078 (4174)	4104 (5565)
2	Permissible through drive torque $T_{D1max}$	lb-ft 164 Nm (223)	291 (395)	513 (696)	739 (1002)	1026 (1391)	1457 (1976)	2052 (2783)	3078 (4174)	4104 (5565)
	$T_{D2max}$	lb-ft 164 Nm (223)	291 (395)	513 (696)	739 (1002)	1026 (1391)	1457 (1976)	2052 (2783)	3078 (4174)	4104 (5565)

### Keyed shaft, P

Size	40	71	125	180	250	355	500	750	1000	
Max. perm. through drive torque at mounting flange pump 1 (pump 1 + pump 2)										
$T_{tot\ max}$	lb-ft 280 Nm (380)	516 (700)	1027 (1392)	1032 (1400)	1696 (2300)	2623 (3557)	3835 (5200)	5541 (7513)	6965 (9444)	
1	Permissible through drive torque $T_{D1max}$	lb-ft 164 Nm (223)	291 (395)	513 (696)	739 (1002)	1026 (1391)	1457 (1976)	2052 (2783)	3078 (4174)	4104 (5565)
	$T_{D2max}$	lb-ft 116 Nm (157)	225 (305)	513 (696)	293 (398)	670 (909)	1166 (1581)	1783 (2417)	2463 (3339)	2860 (3879)
2	Permissible through drive torque $T_{D1max}$	lb-ft 116 Nm (157)	225 (305)	513 (696)	293 (398)	670 (909)	1166 (1581)	1783 (2417)	2463 (3339)	2860 (3879)
	$T_{D2max}$	lb-ft 164 Nm (223)	291 (395)	513 (696)	739 (1002)	1026 (1391)	1457 (1976)	2052 (2783)	3078 (4174)	4104 (5565)

### Permissible bending moment related to mounting flange of main pump



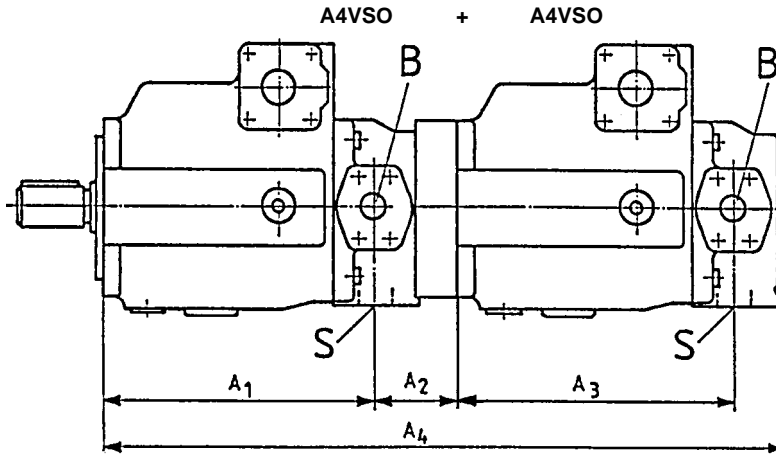
$m_1, m_2$  lbs (kg) weight of pumps  
 $l_1, l_2$  in (mm) center to center distance

$$T_m = m_1 \cdot l_1 \cdot \frac{1}{12} + m_2 \cdot l_2 \cdot \frac{1}{12} \text{ [lb-ft]}$$

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

Size	40	71	125	180	250	355	500	750	1000		
Permissible bending moment	$T_{m\ perm.}$ lb-ft 1327 Nm (1800)	1475 (2000)	3098 (4200)	3098 (4200)	6859 (9300)	6859 (9300)	11506 (15600)	14382 (19500)	14382 (19500)		
Perm. bending moment referred to mounting flange of main pump at $10\ g \approx 98.1\ m/sec^2$	$T_{m\ perm.}$ lb-ft 132 Nm (180)	148 (200)	310 (420)	310 (420)	686 (930)	686 (930)	1151 (1560)	1438 (1950)	1438 (1950)		
Weight	m	lbs	86	117	194	225	406	456	705	1014	1333
		kg	(39)	(53)	(88)	(102)	(184)	(207)	(320)	(460)	(605)
Center to center distance	$l_1$	in	4.72	5.51	6.69	7.08	8.26	8.66	9.05	10.23	11.41
		mm	(120)	(140)	(170)	(180)	(210)	(220)	(230)	(260)	(290)

**Unit dimensions for combination pumps**



**SAE Version**

main pump \ 2nd pump	AA4VSO 125				AA4VSO 250			
	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>
AA4VSO 125	12.28 (312)	2.84 (72)	12.28 (312)	29.18 (741)				
AA4VSO 250					15.04 (382)	3.90 (99)	15.04 (382)	36.30 (922)

Other combination pumps in SAE-version on request..

**Metric Version**

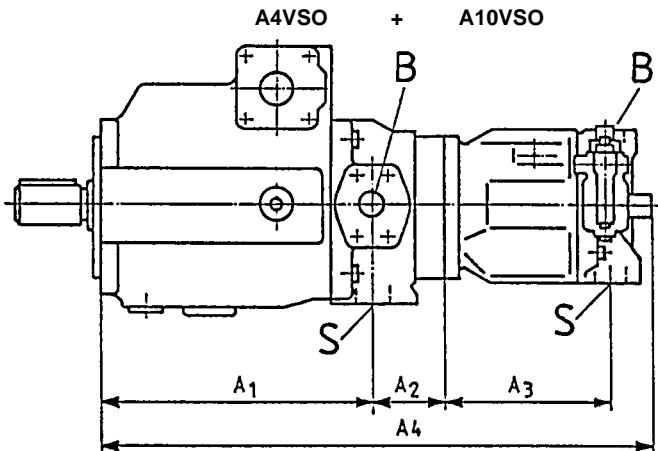
main pump \ 2nd pump	A4VSO 40				A4VSO 71				A4VSO 125				A4VSO 180				A4VSO 250			
	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>
A4VSO 40	8.94 (227)	2.40 (61)	8.94 (227)	21.93 (557)	10.00 (254)	2.44 (62)	8.94 (227)	23.03 (585)	12.20 (310)	1.46 (37)	8.94 (227)	24.25 (616)	12.52 (318)	2.09 (53)	8.94 (227)	25.20 (640)	14.96 (380)	2.01 (51)	8.94 (227)	27.56 (700)
A4VSO 71	-	-	-	-	10.00 (254)	2.44 (62)	10.00 (254)	24.17 (614)	12.20 (310)	2.48 (63)	10.00 (254)	26.42 (671)	12.52 (318)	3.11 (79)	10.00 (254)	27.36 (695)	14.96 (380)	2.01 (51)	10.00 (254)	28.70 (729)
A4VSO 125	-	-	-	-	-	-	-	-	12.20 (310)	2.72 (69)	12.20 (310)	28.90 (734)	12.52 (318)	3.35 (85)	12.20 (310)	29.84 (758)	14.96 (380)	3.50 (89)	12.20 (310)	32.44 (824)
A4VSO 180	-	-	-	-	-	-	-	-	-	-	-	-	12.52 (318)	3.35 (85)	12.52 (318)	30.79 (782)	14.96 (380)	3.50 (89)	12.52 (318)	33.38 (848)
A4VSO 250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.96 (380)	3.50 (89)	14.96 (380)	35.74 (908)

main pump \ 2nd pump	A4VSO 355				A4VSO 500				A4VSO 750				A4VSO 1000			
	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>
A4VSO 40	15.47 (393)	2.64 (67)	8.94 (227)	28.70 (729)	17.36 (441)	2.52 (64)	8.94 (227)	30.47 (774)	18.62 (473)	3.23 (82)	8.94 (227)	32.44 (824)	21.57 (548)	*	8.93 (227)	*
A4VSO 71	15.47 (393)	2.64 (67)	10.00 (254)	29.84 (758)	17.36 (441)	2.52 (64)	10.00 (254)	31.61 (803)	18.62 (473)	3.23 (82)	10.00 (254)	33.58 (853)	21.57 (548)	*	10.00 (254)	*
A4VSO 125	15.47 (393)	4.13 (105)	12.20 (310)	33.58 (853)	17.36 (441)	2.52 (64)	12.20 (310)	33.86 (860)	18.62 (473)	3.23 (82)	12.20 (310)	35.83 (910)	21.57 (548)	*	12.20 (310)	*
A4VSO 180	15.47 (393)	4.13 (105)	12.52 (318)	34.52 (877)	17.36 (441)	2.52 (64)	12.52 (318)	34.80 (884)	18.62 (473)	3.23 (82)	12.52 (318)	36.77 (934)	21.57 (548)	*	12.52 (318)	*
A4VSO 250	15.47 (393)	4.13 (105)	14.96 (380)	36.89 (937)	17.36 (441)	3.94 (100)	14.46 (380)	38.58 (980)	18.62 (473)	4.65 (118)	14.96 (380)	40.55 (1030)	21.57 (548)	*	14.46 (380)	*
A4VSO 355	15.47 (393)	4.13 (105)	15.47 (393)	38.03 (966)	17.36 (441)	3.94 (100)	15.47 (393)	39.72 (1009)	18.62 (473)	4.65 (118)	15.47 (393)	41.69 (1059)	21.57 (548)	*	15.47 (393)	*
A4VSO 500	-	-	-	-	17.36 (441)	5.87 (149)	17.36 (441)	43.70 (1110)	18.62 (473)	6.58 (167)	17.36 (441)	45.67 (1160)	21.57 (548)	*	17.36 (441)	*
A4VSO 750	-	-	-	-	-	-	-	-	18.62 (473)	7.17 (182)	18.62 (473)	48.00 (1219)	21.57 (548)	*	18.62 (473)	*
A4VSO 1000	-	-	-	-	-	-	-	-	-	-	-	-	21.57 (548)	7.08 (180)	21.57 (548)	53.58 (1361)

\* on request



**Unit dimensions of combination pumps**



**SAE Version**

main pump \ 2nd pump	AA4VSO 40				AA4VSO 71				AA4VSO 125				AA4VSO 180				AA4VSO 250			
	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>
AA10VSO 28	9.02 (229)	2.48 (63)	6.46 (164)	19.61 (498)	10.08 (256)	2.66 (68)	6.46 (164)	20.87 (530)	12.28 (312)	1.46 (37)	6.46 (164)	21.85 (555)	12.6 (320)	2.10 (54)	6.46 (164)	22.81 (580)	15.04 (382)	2.01 (51)	6.46 (164)	25.16 (639)
AA10VSO 45					10.08 (256)	2.68 (68)	7.24 (184)	21.58 (548)									15.04 (382)	2.01 (51)	7.24 (184)	25.87 (657)
AA10VSO 71					10.08 (256)	2.64 (67)	8.54 (217)	22.84 (580)	12.28 (312)	2.64 (67)	8.54 (217)	25.04 (636)	12.6 (320)	3.27 (83)	8.54 (217)	25.99 (660)	15.04 (382)	2.01 (51)	8.54 (217)	27.17 (690)
AA10VSO 100									12.28 (312)	2.64 (67)	10.83 (275)	27.75 (705)					15.04 (382)	2.79 (71)	10.83 (275)	30.66 (779)

Other combination pumps in SAE-version on request.

**Metric Version**

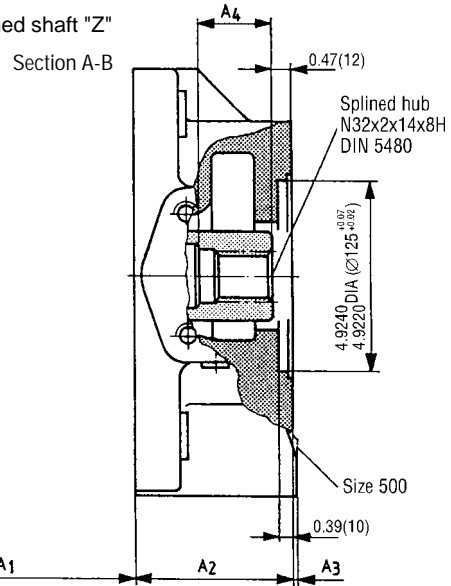
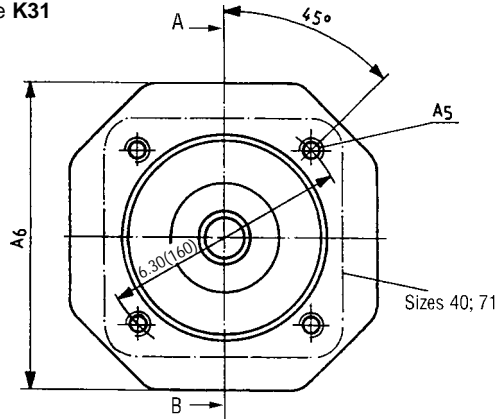
main pump \ 2nd pump	A4VSO 40				A4VSO 71				A4VSO 125				A4VSO 180				A4VSO 250			
	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>
A10VSO 18	8.94 (227)	1.42 (36)	5.70 (145)	18.03 (458)	10.00 (254)	1.46 (37)	5.70 (145)	19.13 (486)	12.20 (310)	1.46 (37)	5.70 (145)	21.34 (542)	12.52 (318)	2.09 (53)	5.70 (145)	22.28 (566)	14.96 (380)	2.01 (51)	5.70 (145)	24.65 (626)
A10VSO 28	8.94 (227)	2.48 (63)	6.46 (164)	19.52 (496)	10.00 (254)	1.46 (37)	6.46 (164)	19.56 (497)	12.20 (310)	1.46 (37)	6.46 (164)	21.77 (553)	12.52 (318)	2.09 (53)	6.46 (164)	22.72 (577)	14.96 (380)	2.01 (51)	6.46 (164)	25.08 (637)
A10VSO 45	8.94 (227)	2.48 (63)	7.24 (184)	20.23 (514)	10.00 (254)	2.24 (57)	7.24 (184)	21.06 (535)	12.20 (310)	2.24 (57)	7.24 (184)	23.26 (591)	12.52 (318)	2.87 (73)	7.24 (184)	24.21 (615)	14.96 (380)	2.01 (51)	7.24 (184)	25.78 (655)
A10VSO 71	-	-	-	-	10.00 (254)	2.64 (67)	8.54 (217)	22.76 (578)	12.20 (310)	2.67 (68)	8.54 (217)	24.99 (635)	12.52 (318)	3.31 (84)	8.54 (217)	25.95 (659)	14.96 (380)	2.71 (69)	8.54 (217)	27.79 (706)
A10VSO 100	-	-	-	-	-	-	-	-	12.20 (310)	2.93 (74.5)	10.83 (275)	27.97 (710.5)	12.52 (318)	3.56 (90.5)	10.83 (275)	28.92 (734.5)	14.96 (380)	3.03 (77)	10.83 (275)	30.82 (783)
A10VSO 140	-	-	-	-	-	-	-	-	-	-	-	-	12.52 (318)	* (90.5)	10.83 (275)	* (734.5)	14.96 (380)	3.50 (89)	10.83 (275)	31.73 (806)

main pump \ 2nd pump	A4VSO 355				A4VSO 500				A4VSO 750			
	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>
A10VSO 18	15.47 (393)	2.64 (67)	5.70 (145)	25.79 (655)	17.36 (441)	2.52 (64)	5.70 (145)	27.56 (700)	18.62 (473)	3.23 (82)	5.70 (145)	29.53 (750)
A10VSO 28	15.47 (393)	2.64 (67)	6.46 (164)	26.22 (666)	17.36 (441)	2.52 (64)	6.46 (164)	28.00 (711)	18.62 (473)	3.23 (82)	6.46 (164)	29.96 (761)
A10VSO 45	15.47 (393)	2.64 (67)	7.24 (184)	26.93 (684)	17.36 (441)	2.52 (64)	7.24 (184)	28.70 (729)	18.62 (473)	3.23 (82)	7.24 (184)	30.67 (779)
A10VSO 71	15.47 (393)	3.34 (85)	8.54 (217)	28.93 (735)	17.36 (441)	2.52 (64)	8.54 (217)	30.00 (762)	18.62 (473)	3.23 (82)	8.54 (217)	31.97 (812)
A10VSO 100	15.47 (393)	3.66 (93)	10.83 (275)	31.96 (812)	17.36 (441)	3.54 (90)	10.83 (275)	33.74 (857)	18.62 (473)	4.25 (108)	10.83 (275)	35.71 (907)
A10VSO 140	15.47 (393)	4.13 (105)	10.83 (275)	32.87 (835)	17.36 (441)	3.50 (89)	10.83 (275)	34.13 (867)	18.62 (473)	4.21 (107)	10.83 (275)	36.10 (917)

\* on demand

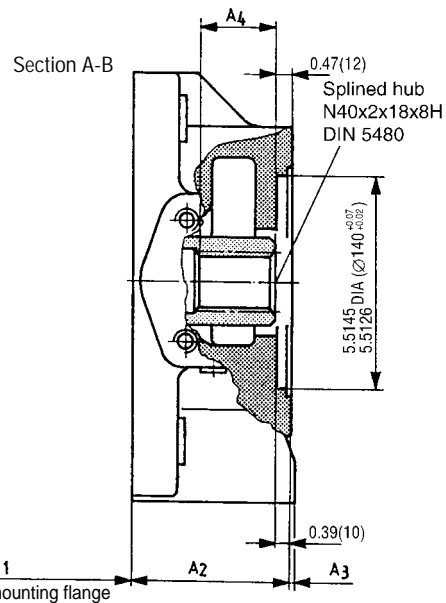
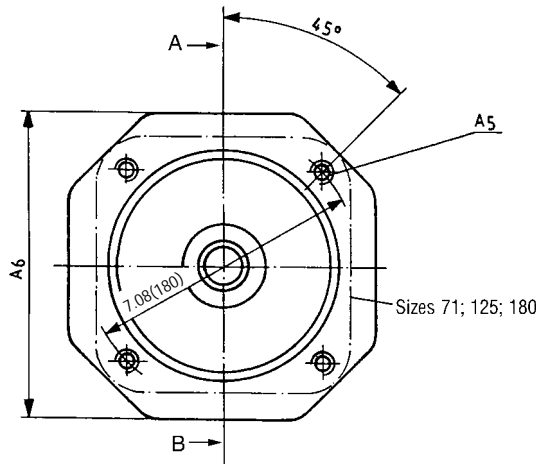
**Dimensions - Through drive**

**Flange ISO 125, 4-bolt;** for mounting of axial piston pump A4VSO/H/G 40 - splined shaft "Z"  
Ordering Code **K31**



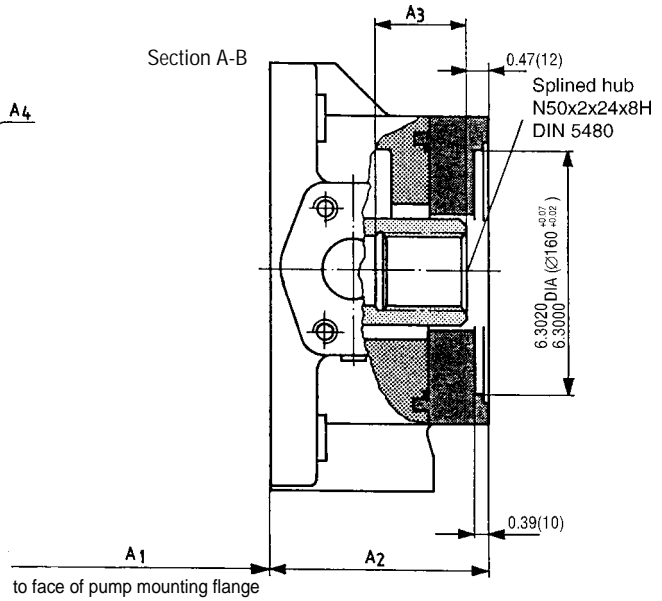
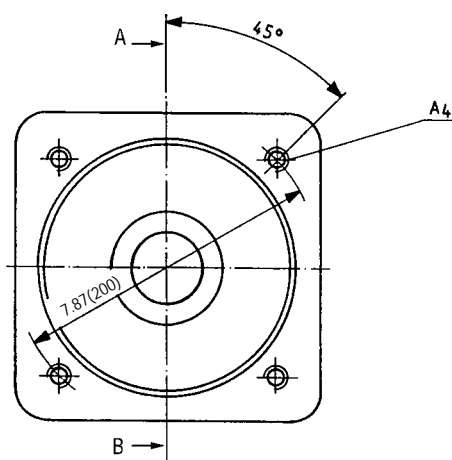
Size of main pump A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub>
40	7.44 (189)	3.90 (99)	–	2.28 (58)	M12; 0.94 (24) deep –
71	8.50 (216)	3.94 (100)	–	2.17 (55)	M12; 0.94 (24) deep –
125	10.43 (265)	3.23 (82)	0.31 (8)	1.46 (37)	M12; 0.71 (18) deep 5.91 (150)
180	10.43 (265)	4.17 (106)	–	1.46 (37)	M12; 0.71 (18) deep 6.30 (160)
250	12.87 (327)	4.09 (104)	0.08 (2)	1.89 (48)	M12; 0.71 (18) deep 7.87 (200)
355	12.87 (327)	5.24 (133)	–	1.89 (48)	M12; 0.71 (18) deep 8.66 (220)
500	14.37 (365)	5.51 (140)	0.55 (14)	2.36 (60)	M12; 0.71 (18) deep 9.45 (240)

**Flange ISO 140, 4-bolt;** for mounting of axial piston pump A4VSO/H/G 71 - splined shaft "Z"  
Ordering code **K33**



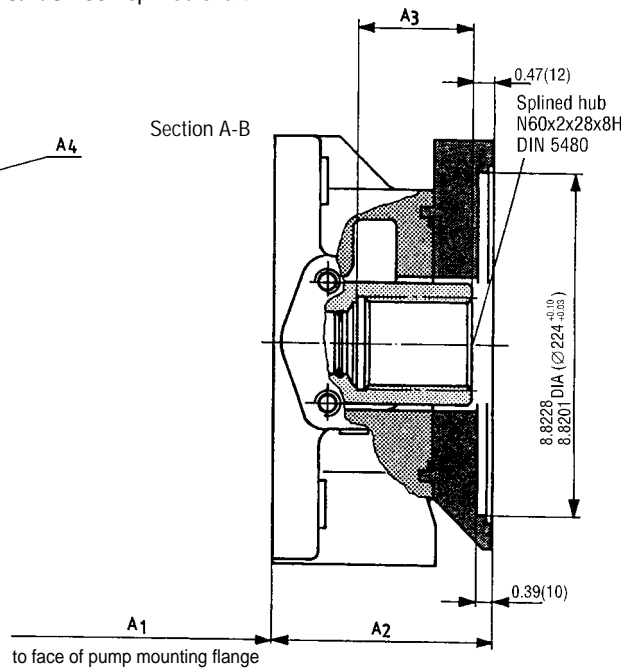
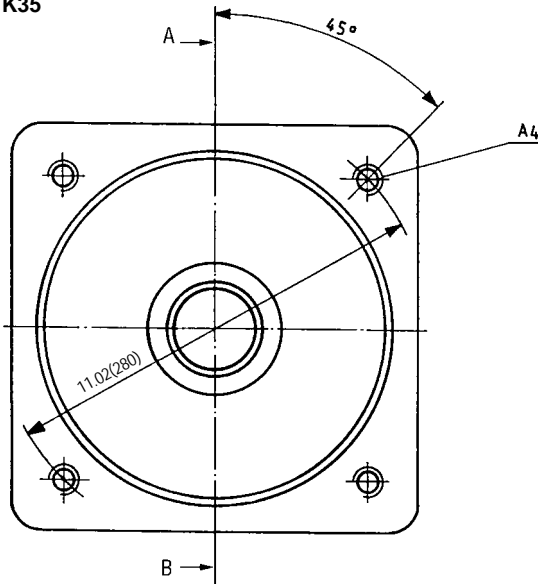
Size of main pump A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub>
71	8.50 (216)	3.94 (100)	–	1.73 (44)	M12; 0.94 (24) deep –
125	10.43 (265)	4.25 (108)	–	1.77 (45)	M12; 0.98 (25) deep –
180	10.43 (265)	5.20 (132)	–	1.77 (45)	M12; 0.71 (18) deep –
250	12.87 (327)	4.09 (104)	0.08 (2)	1.89 (48)	M12; 0.71 (18) deep 7.87 (200)
500	14.37 (365)	5.51 (140)	0.59 (15)	2.36 (60)	M12; 0.71 (18) deep 9.45 (240)

**Flange ISO 160, 4-bolt; for mounting of axial piston pump A4VSO/H/G 125 or 180 - splined shaft "Z"**  
Ordering Code **K34**



Size of main pump A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>
125	10.43 (265)	4.49 (114)	2.28 (58) M16; 1.22 (31) deep
180	10.43 (265)	5.43 (138)	2.09 (53) M16; 1.26 (32) deep
250	12.87 (327)	5.59 (142)	2.36 (60) M16; 1.26 (32) deep
355	12.87 (327)	6.73 (171)	2.36 (60) M16; 1.26 (32) deep
500	14.37 (365)	5.51 (140)	2.36 (60) M16; 0.94 (24) deep

**Flange ISO 224, 4-bolt; for mounting of axial piston pump A4VSO/H/G 250 - splined shaft "Z"**  
Ordering Code **K35**

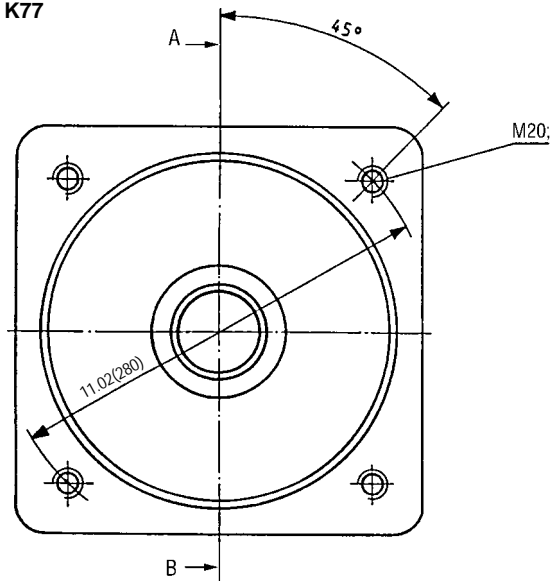


Size of main pump A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>
250	12.87 (327)	5.59 (142)	2.95 (75) M20; 1.46 (37) deep
355	12.87 (327)	6.73 (171)	2.95 (75) M20
500	14.37 (365)	6.93 (176)	2.91 (74) M20; 1.42 (36) deep

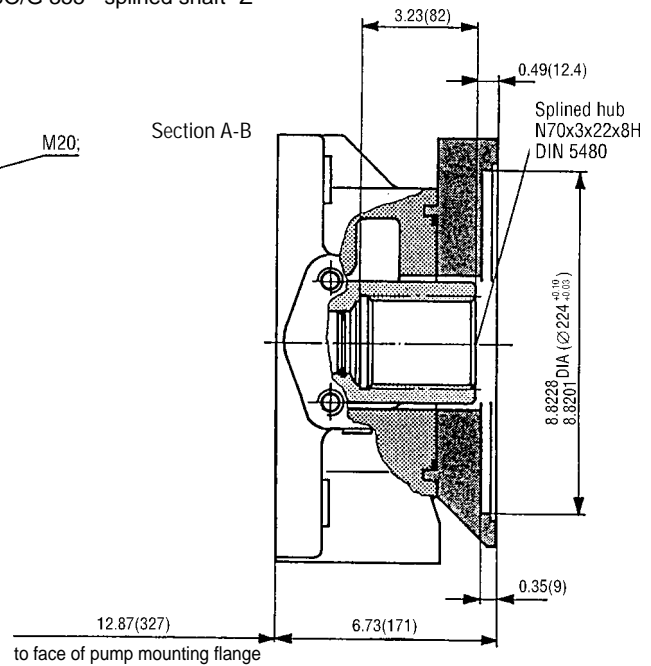
Variable displacement pump A4VSO, Series 1, 2, and 3

Before finalizing your design, please request a certified drawing.  
Dimensions in inches and millimeters ( ).

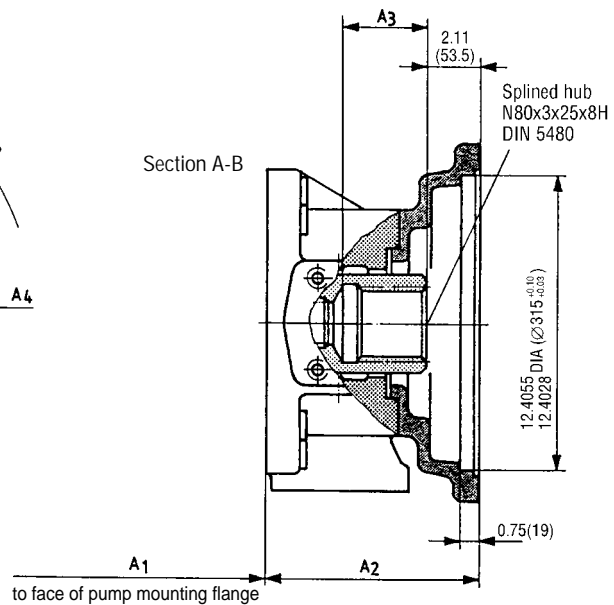
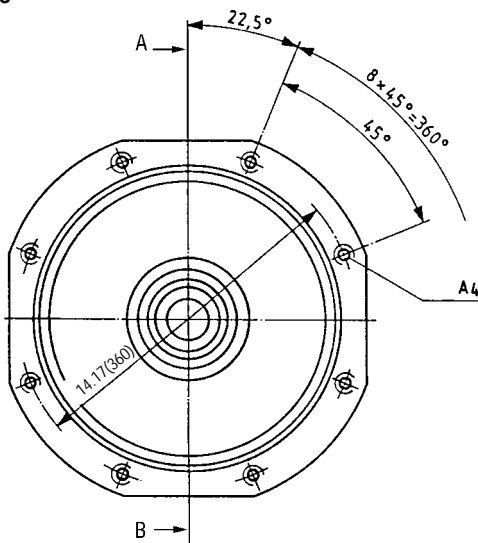
**Flange ISO 224, 4-bolt;** for mounting of axial piston pump A4VSO/G 355 - splined shaft "Z"  
Ordering code **K77**



Size of main pump 355

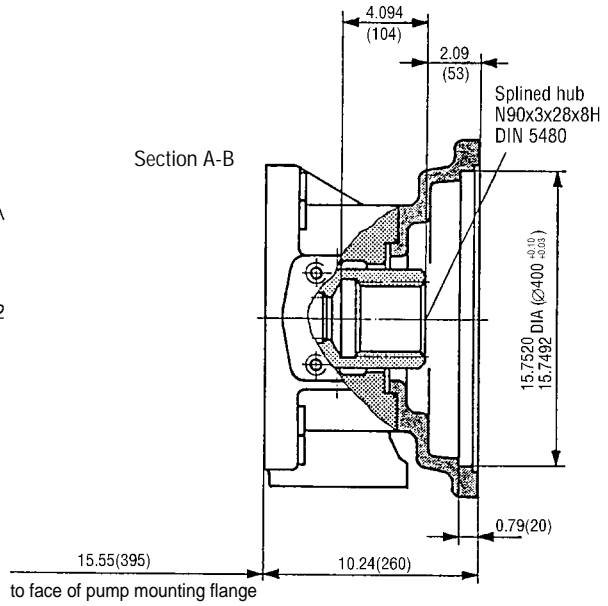
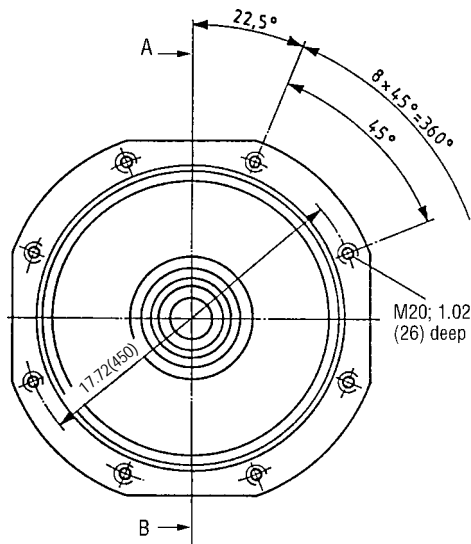


**Flange ISO 315, 8-bolt;** for mounting of axial piston pump A4VSO/G 500 - splined shaft "Z"  
Ordering code **K43**

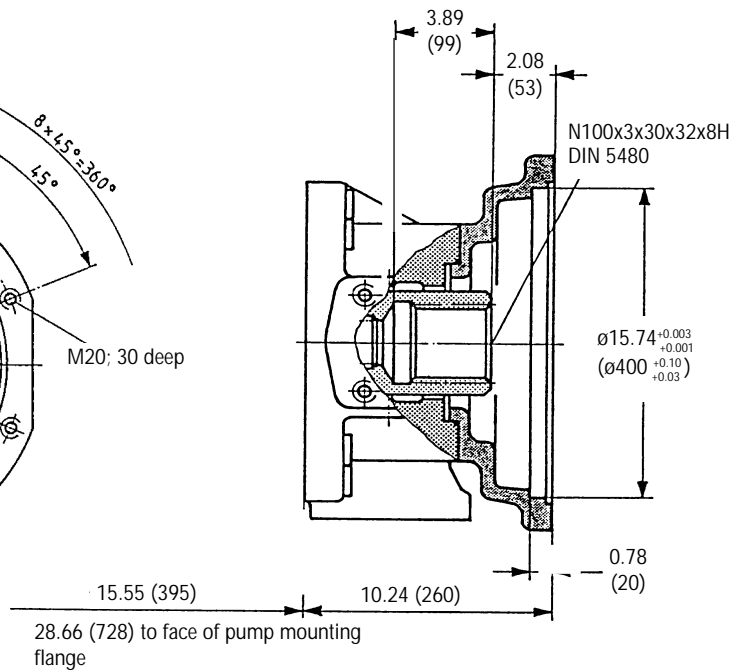
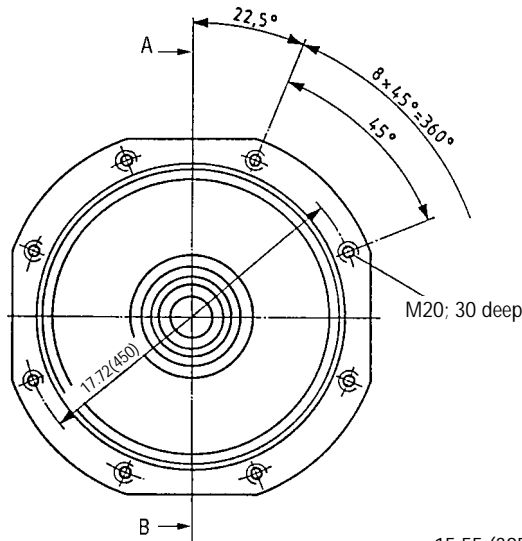


Size of main pump A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>
500	14.37 (365)	8.86 (225)	3.58 (91) M20; 1.02 (26) deep
750	15.63 (397)	9.57 (243)	3.58 (91) M20; 1.02 (26) deep

**Flange ISO 400, 8-bolt;** for mounting of axial piston pump A4VSO/G 750 - splined shaft "Z"  
Ordering code **K76**  
Main pump nominal size 750



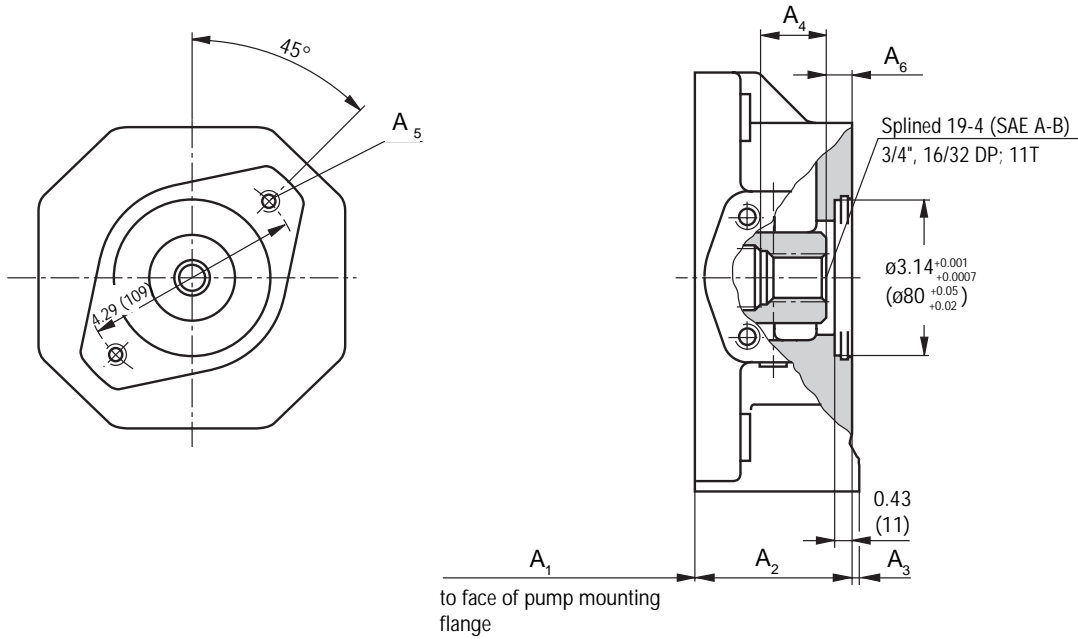
**ISO 400, 8-hole;** for mounting a second A4VSO/G 1000 (splined shaft)  
Ordering code **K88**  
Main pump nominal size 1000



Variable displacement pump A4VSO, Series 1, 2, and 3

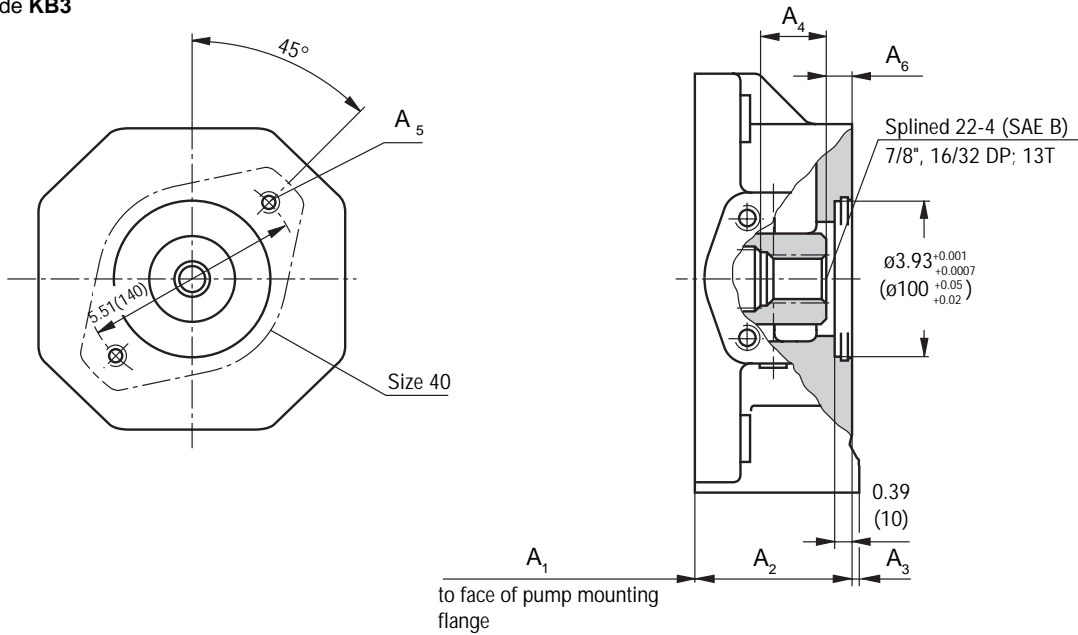
Before finalizing your design, please request a certified drawing.  
Dimensions in inches and millimeters ( ).

**ISO 80, 2-hole;** for mounting an A10VSO 18 (splined shaft S) - see RA 92712  
Ordering code **KB2**



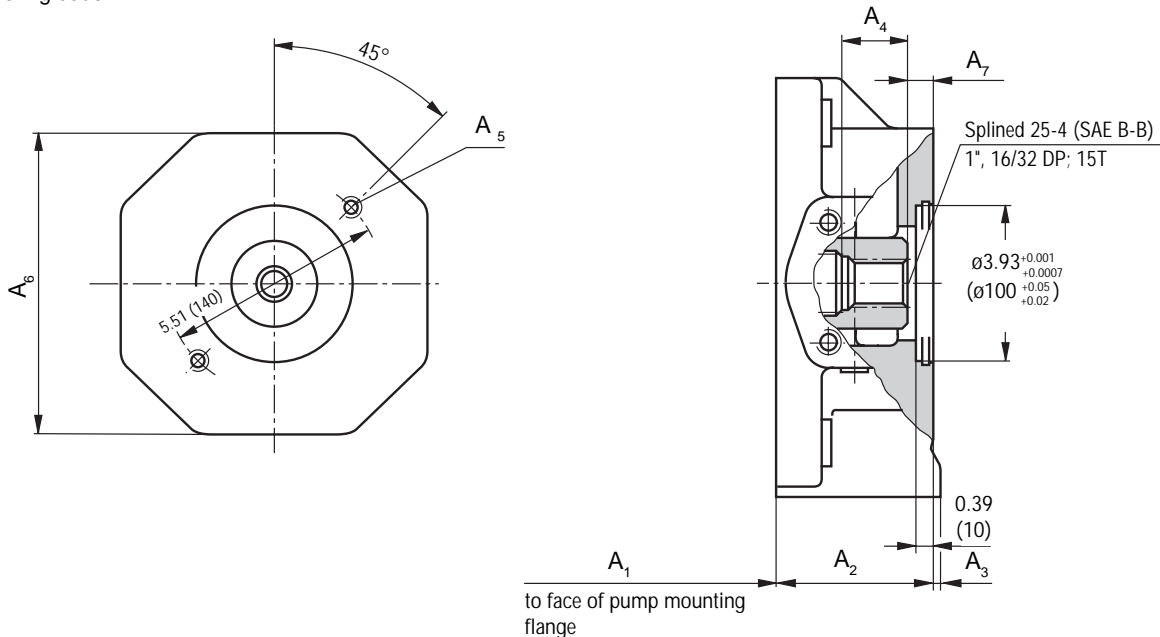
Size, main pump	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub>
125	10.43 (265)	3.23 (82)	0.45 (11.5)	0.75 (19.1)	M10; 0.47 (12) deep	0.84 (21.4)

**ISO 100, 2-hole;** for mounting an A10VSO 28 (splined shaft S) - see RA 92711 (in preparation)  
Ordering code **KB3**



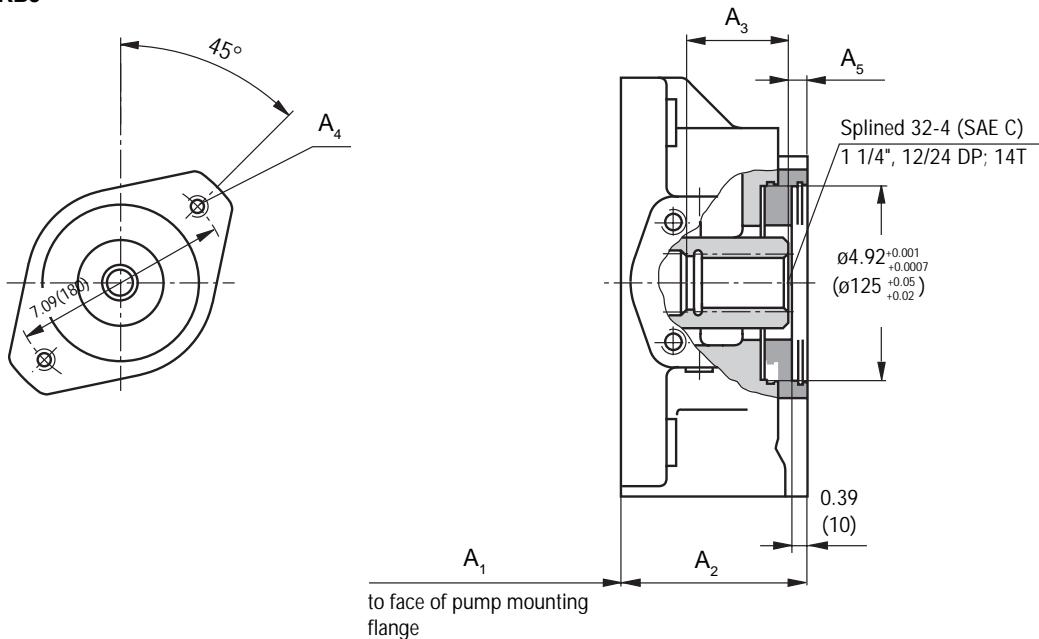
Size, main pump	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub>
40	7.44 (189)	3.98 (101)	-	2.17 (55)	M12; 1.02 (26) deep	0.79 (20.3)

**ISO 100, 2-hole;** for mounting an A10VSO 45 (splined shaft S) - see RA 92711 (in preparation)  
Ordering code **KB4**



Size, main pump	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub>	A <sub>7</sub>
250	12.87 (327)	4.09 (104)	0.11 (3)	1.08 (27.5)	M12; 0.71 (18) deep	7.87 (200)	0.82 (20.9)

**ISO 125, 2-hole;** for mounting an A10VSO 71 (splined shaft S) - see RA 92711 (in preparation)  
Ordering code **KB5**

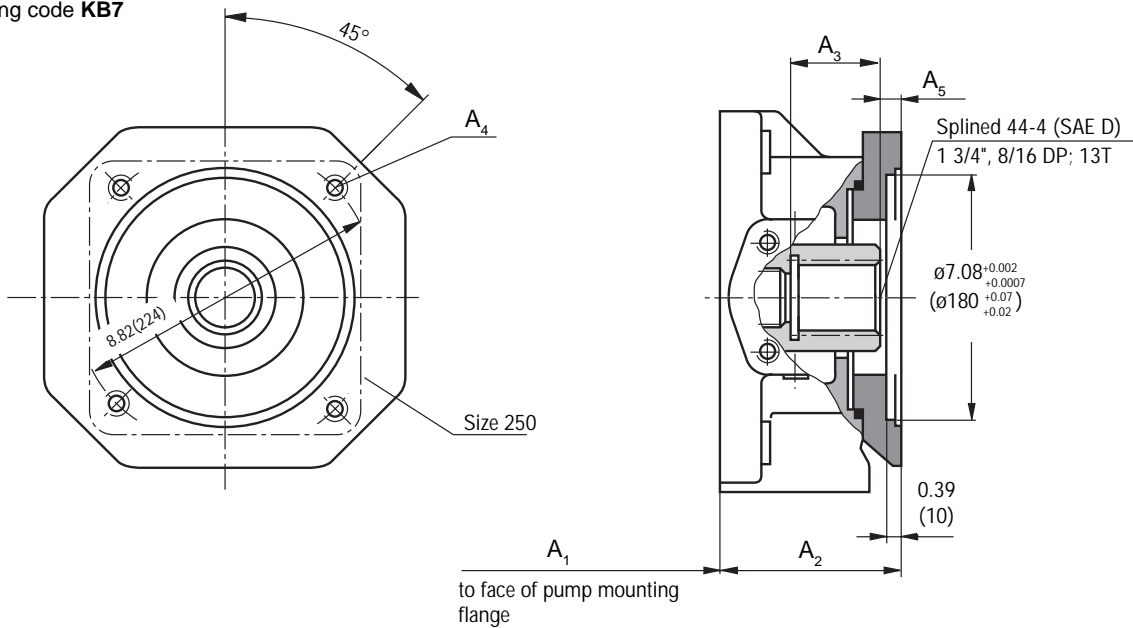


Size, main pump	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>
125	10.43 (265)	4.44 (113)	1.50 (38.1)	M16; 0.94 (24) deep	0.93 (23.7)
180	10.43 (265)	5.39 (137)	1.50 (38.1)	M16; 0.94 (24) deep	0.93 (23.7)

Variable displacement pump A4VSO, Series 1, 2, and 3

Before finalizing your design, please request a certified drawing.  
Dimensions in inches and millimeters ( ).

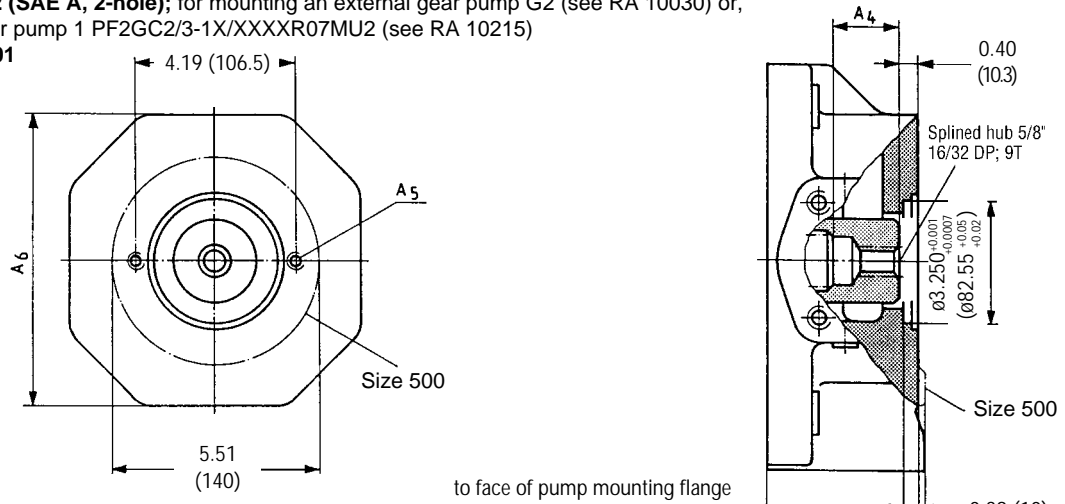
**ISO 180, 4-hole;** for mounting an A10VSO 140 (splined shaft S) - see RE 92711 (in preparation)  
Ordering code **KB7**



Amplifier for valve Model 4WRA 6..., Series 1X = 17  
Amplifier for valve Model 4WRA 10..., Series 1X = 18

Size, main pump	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>
250	12.87 (327)	5.59 (142)	3.22 (82)	M16; 1.25 (32) deep	0.42 (10.8)
355	12.87 (327)	6.73 (171)	3.22 (82)	M16; 1.25 (32) deep	0.42 (10.8)

**Flange SAE 82-2 (SAE A, 2-hole);** for mounting an external gear pump G2 (see RA 10030) or, of an internal gear pump 1 PF2GC2/3-1X/XXXXR07MU2 (see RA 10215)  
Ordering code **K01**



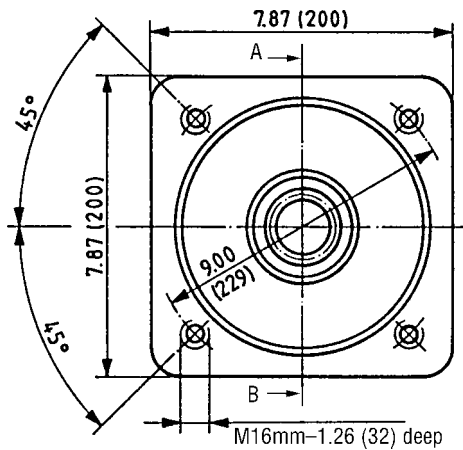
Size, main pump	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub>
40	7.44 (189)	2.91 (74)	—	1.57 (40)	M10; 0.59 (15) deep	5.12 (130)
71	8.50 (216)	2.95 (75)	0.08 (2)	1.46 (37)	M10; 0.59 (15) deep	5.51 (140)
125	10.43 (265)	3.23 (82)	0.31 (8)	1.54 (39)	M10; 0.79 (20) deep	5.91 (150)
180	10.43 (265)	4.17 (106)	—	1.10 (28)	M10; 0.59 (15) deep	—
250	12.87 (327)	4.09 (104)	0.12 (3)	1.97 (50)	M10; 0.59 (15) deep	7.87 (200)
355	12.87 (327)	5.24 (133)	—	1.97 (50)	M10; 0.59 (15) deep	8.66 (220)
500	14.37 (365)	5.51 (140)	0.47 (12)	2.44 (62)	M10; 0.59 (15) deep	—
750	14.37 (365)	7.48 (190)	—	2.44 (62)	M10; 0.59 (15) deep	—

Pay attention to correct hydraulic fluid (see RA 10 030 or 10 215)

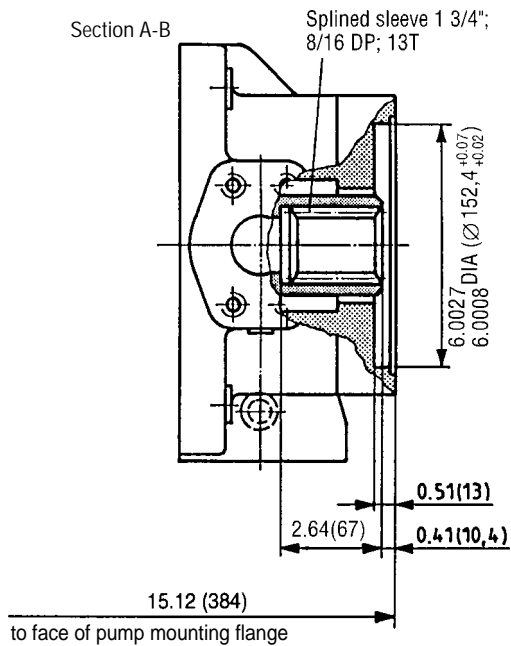


Variable displacement pump A4VSO, Series 1, 2, and 3

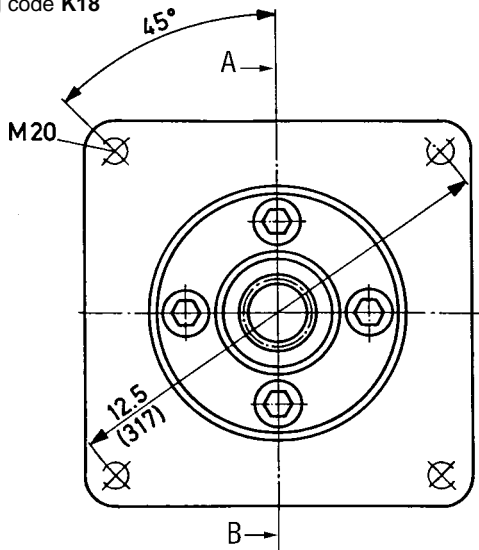
**Flange 152-4 (SAE D, 4-bolt);** for mounting of axial piston pump AA4VSO/G 125 - splined shaft "S"  
 Ordering Code **K17**



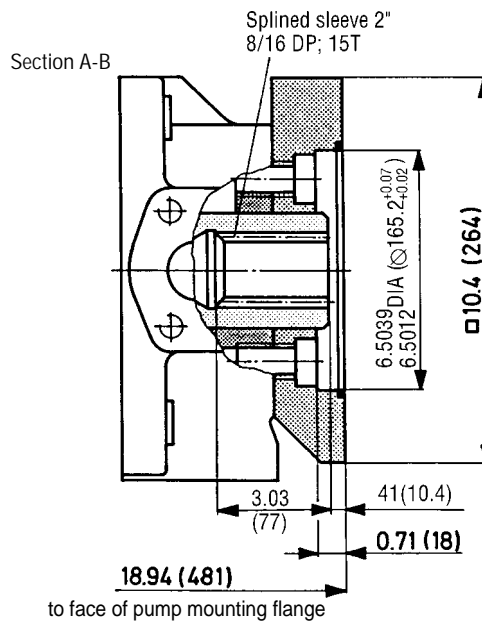
Size of main pump:  
 AA4VSO 125



**Flange 165-4 (SAE E, 4-bolt);** for mounting of axial piston pump AA4VSO/G 250 - splined shaft "S"  
 Ordering code **K18**

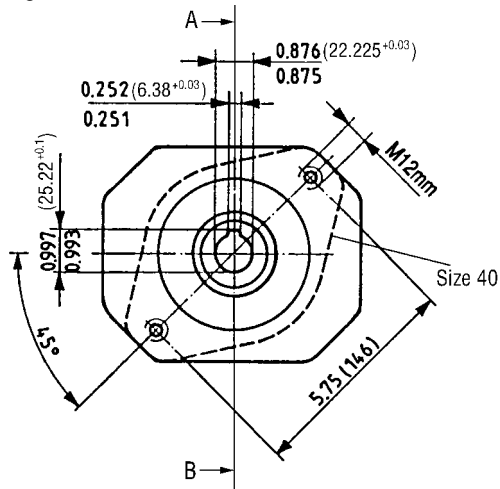


Size of main pump:  
 AA4VSO 250

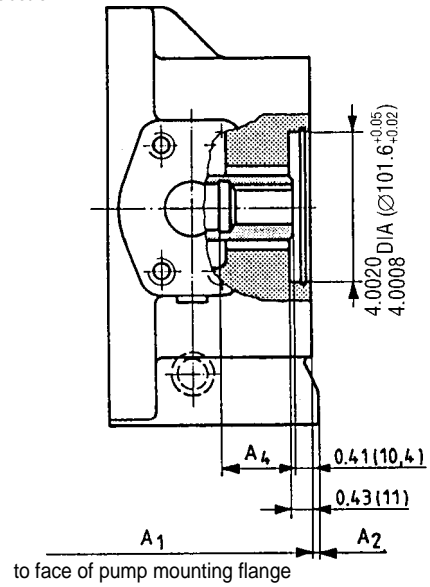


Variable displacement pump A4VSO, Series 1, 2, and 3

**Flange 101-2 (SAE B, 2-bolt);** for mounting of axial piston pump AA10VSO 28 - parallel keyed shaft "K" (see RA 92 711)  
 Ordering code **K03**

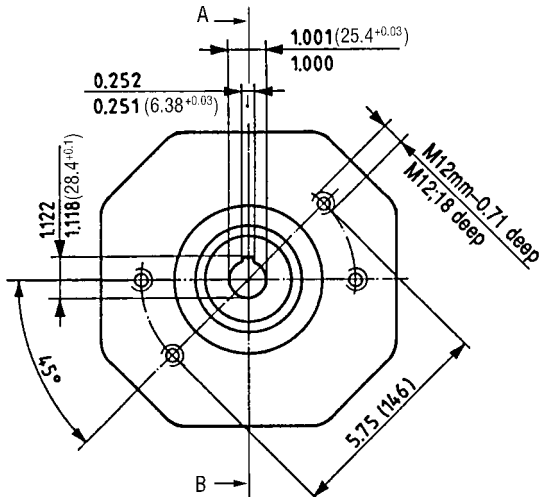


Section A-B

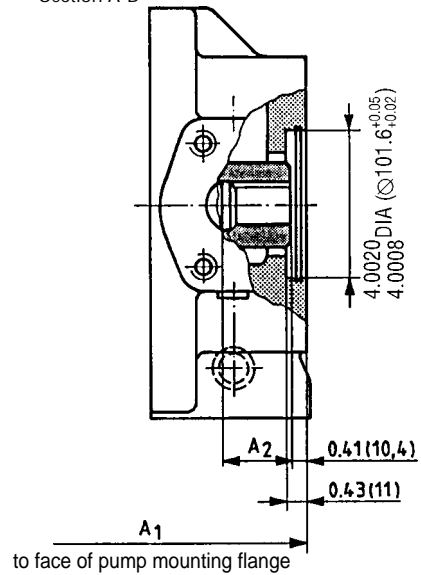


Size of main pump	A <sub>1</sub>	A <sub>2</sub>	A <sub>4</sub>
40	11.50 (292.1)	—	1.41(36)
71	12.74 (324)	—	1.28(33)
125	13.74 (349)	0.32 (8)	1.43(36)
180	14.7 (373)	—	1.43(36)
250	17.05 (433)	0.32 (8)	1.98(50)

**Flange 101-2 (SAE B, 2-bolt);** for mounting of axial piston pump AA10VSO 45 - parallel keyed shaft "K" (see RA 92 711)  
 Ordering code **K05**



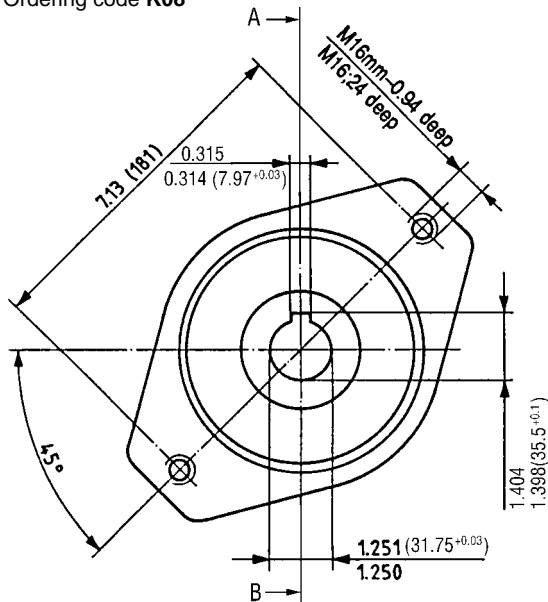
Section A-B



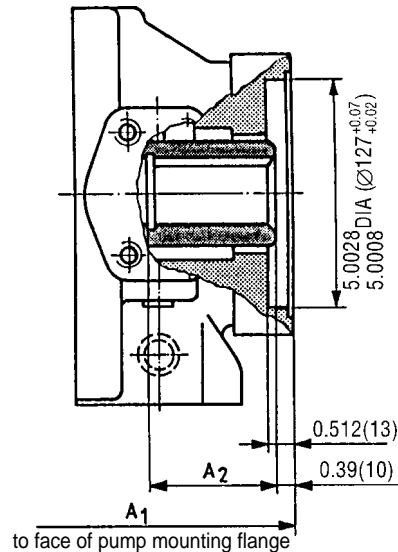
Size of main pump	A <sub>1</sub>	A <sub>2</sub>
71	12.76 (324)	1.48(38)
250	17.05 (433)	2.00 (51)

Variable displacement pump A4VSO, Series 1, 2, and 3

**Flange 127-2 (SAE C, 2-bolt);** for mounting of axial piston pump AA10VSO 71 - parallel keyed shaft "K" (see RA 92 711)  
 Ordering code **K08**

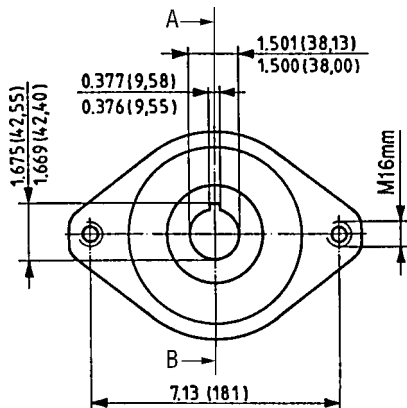


Section A-B

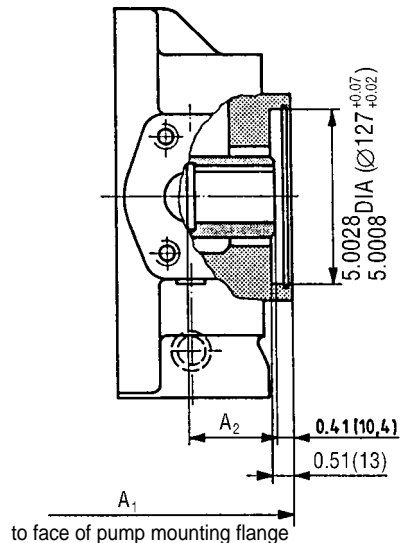


Size of main pump	A <sub>1</sub>	A <sub>2</sub>
71	12.72(323)	2.106(54)
125	14.92(379)	2.582(65)
180	15.87 (403)	1.91 (48)
250	17.05 (433)	2.00 (51)

**Flange 127-2 (SAE C, 2-bolt);** for mounting of axial piston pump AA10VO 100 - parallel keyed shaft "K" (see RA 92 711)  
 Ordering code **K38**

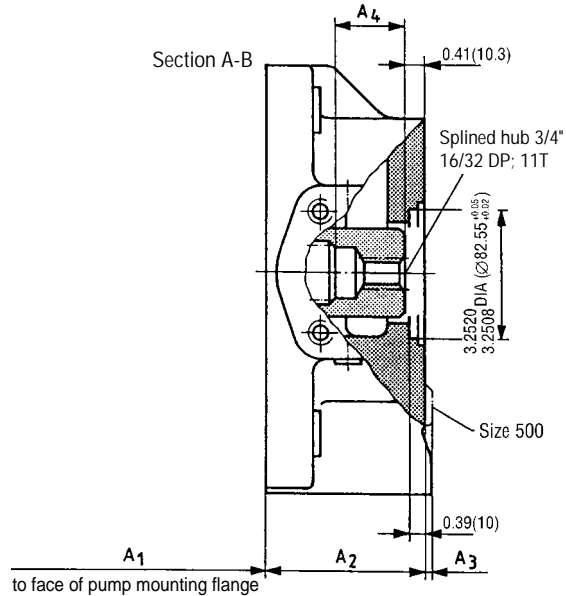
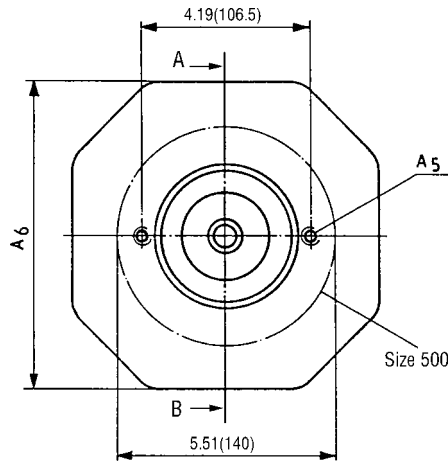


Section A-B



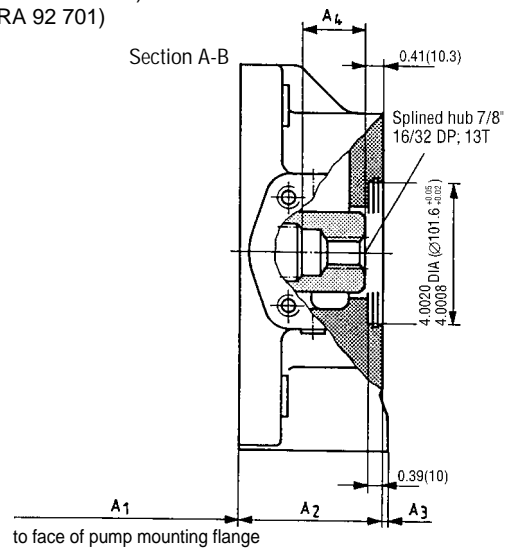
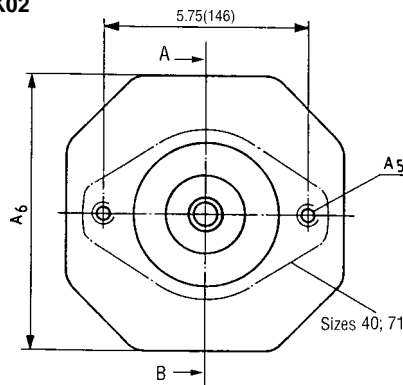
Size of main pump	A <sub>1</sub>	A <sub>2</sub>
125	14.92(379)	2.13(54)
250	17.83 (453)	2.28 (60)

**Flange SAE 82-2**, (SAE A, 2-bolt); for mounting of axial piston pump A10VSO 18 - splined shaft "S" (see RA 92 712)  
Ordering code **K52**



Size of main pump A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub>
40	7.44 (189)	2.91 (74)	—	1.57 (40)	M10; 0.59 (15) deep 5.12 (130)
71	8.50 (216)	2.95 (75)	0.08 (2)	1.46 (37)	M10; 0.59 (15) deep 5.51 (140)
125	10.43 (265)	3.23 (82)	0.31 (8)	1.54 (39)	M10; 0.79 (20) deep 5.91 (150)
180	10.43 (265)	4.17 (106)	—	1.10 (28)	M10; 0.59 (15) deep —
250	12.87 (327)	4.09 (104)	0.12 (3)	1.97 (50)	M10; 0.59 (15) deep 7.87 (200)
355	12.87 (327)	5.24 (133)	—	1.97 (50)	M10; 0.59 (15) deep 8.66 (220)
500	14.37 (365)	5.51 (140)	0.47 (12)	2.44 (62)	M10; 0.59 (15) deep —

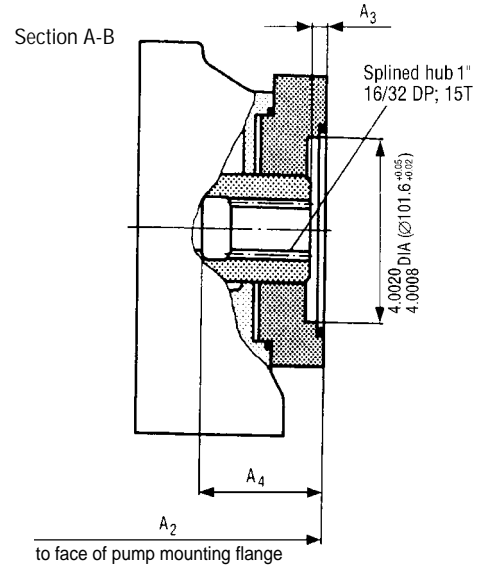
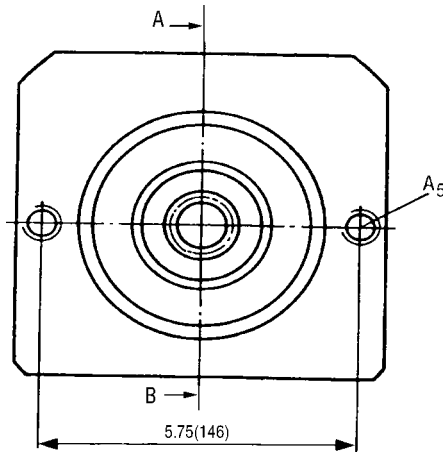
**Flange SAE 101-2**, (SAE B, 2-bolt); for mounting of gear pump G3 (see RA 10 039) or for mounting of axial piston pump A10VO 28 - splined shaft "S" (see RA 92 701)  
Ordering code **K02**



Size of main pump A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub>
40	7.44 (189)	3.98 (101)	—	2.52 (64)	M12; 1.02 (26) deep —
71	8.50 (216)	4.17 (106)	—	2.52 (64)	M12; 1.18 (30) deep —
125	10.43 (265)	3.23 (82)	0.31 (8)	1.54 (39)	M12; 0.59 (15) deep 5.91 (150)
180	10.43 (265)	4.17 (106)	—	1.54 (39)	M12; 0.59 (15) deep 6.30 (160)
250	12.87 (327)	4.09 (104)	0.12 (3)	1.97 (50)	M12; 0.71 (18) deep 7.87 (200)
355	12.87 (327)	5.24 (133)	—	1.97 (50)	M12; 0.71 (18) deep 8.66 (220)
500	14.37 (365)	5.51 (140)	—	2.44 (62)	M12; 0.71 (18) deep 9.45 (240)

**Pay attention to correct hydraulic fluid for mounting of gear pump G3 (see RA 10 039)**

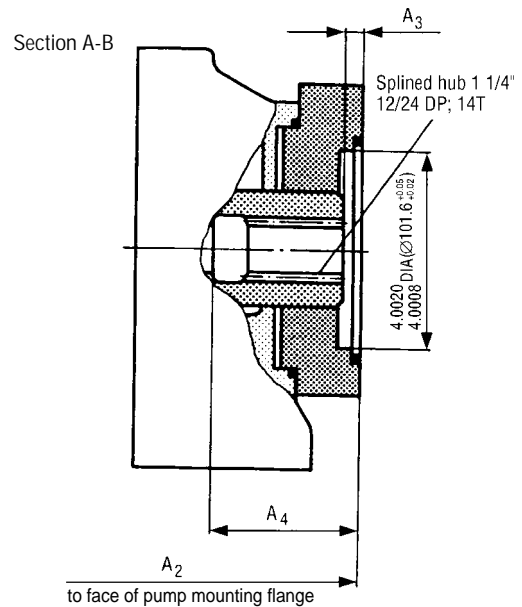
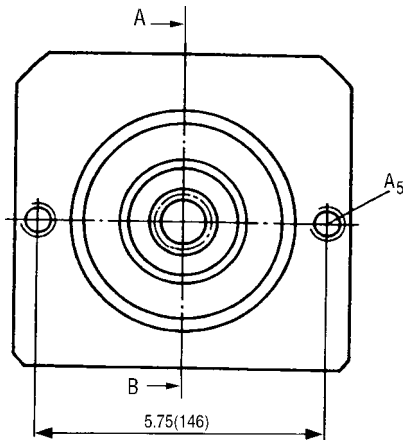
**Flange SAE 101-2**, (SAE B, 2-bolt); for mounting of axial piston pump A10VO 45 - splined shaft "S" (see RA 92 701)  
or for mounting of internal gear pump 1PF2GC4-1X/0XXXR07MU2 (see RA 10 215)  
Ordering code **K04**



Size of main pump A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>
125	13.66 (347)	0.35 (9)	1.91 (48.4) M12; 0.59 (15) deep
250	16.97 (431)	0.41 (10.4)	2.40 (61) M12; 0.71 (18) deep
355	18.11 (460)	0.41 (10.4)	2.06 (52.4) M12; 0.71 (18) deep

Pay attention to correct hydraulic fluid for mounting of internal gear pump (see RA 10 215)

**Flange SAE 101-2**, (SAE B, 2-bolt); for mounting of internal gear pump 1PF2GC5-1X/0XXXR07MU2 (see RA 10 215)  
Ordering code **K06**



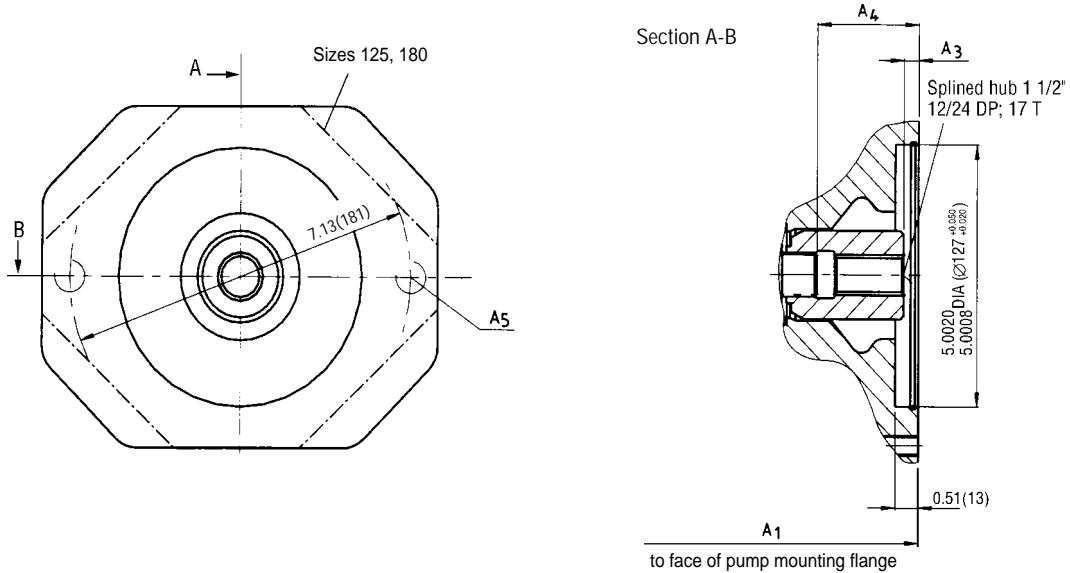
Size of main pump A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>
71	12.64 (321)	0.35 (9)	2.34 (59.5) M12
125	14.88 (378)	0.35 (9)	2.23 (56.6) M12; 0.71 (18) deep

Pay attention to correct hydraulic fluid for mounting of internal gear pump (see RA 10 215)

Variable displacement pump A4VSO, Series 1, 2, and 3

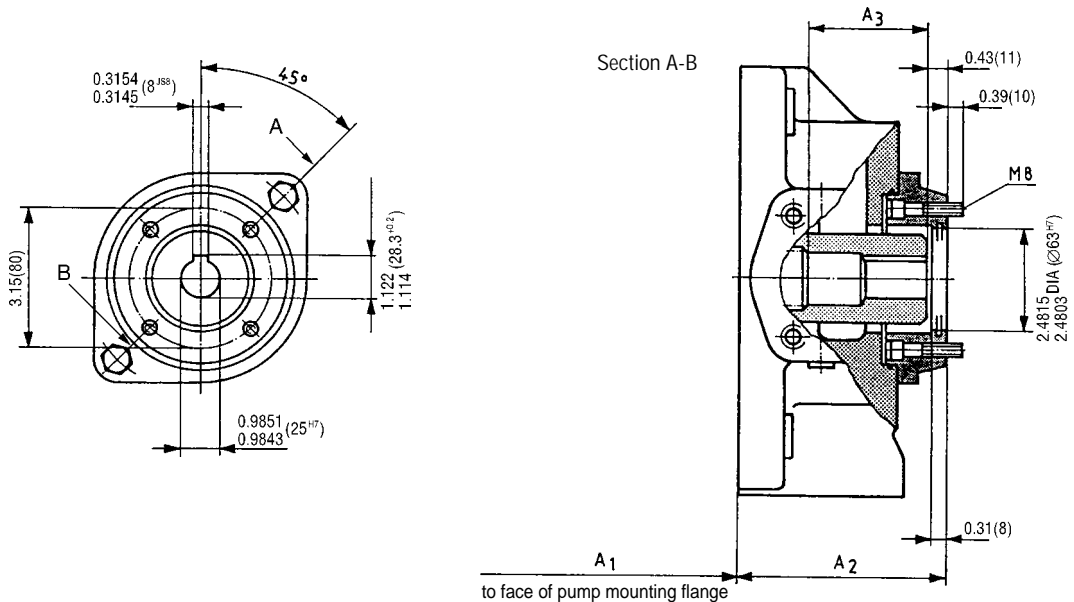
Before finalizing your design, please request a certified drawing.  
Dimensions in inches and millimeters ( ).

**Flange SAE 127-2**, (SAE C, 2-bolt); for mounting of axial piston pump A10VO 100 - splined shaft "S" (see RA 92 701) or mounting of internal gear pump 1PF2GC6-1X/XXXXR07MU2 (see RA 10 215)  
Ordering code **K24**



Size of main pump A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>
125	14.84 (377)	0.35 (9)	2.91 (74) M16; 0.94 (24) deep
180	15.79 (401)	0.39 (10)	2.83 (72) M16; 0.94 (24) deep
250	17.76 (451)	0.41 (10.5)	2.99 (76) M16; 0.79 (20) deep

**Flange ø 63 (mm) metric**, 4-bolt; for mounting of radial piston pump R4 - keyed shaft (see RA 11 263),  
Ordering code **K57**



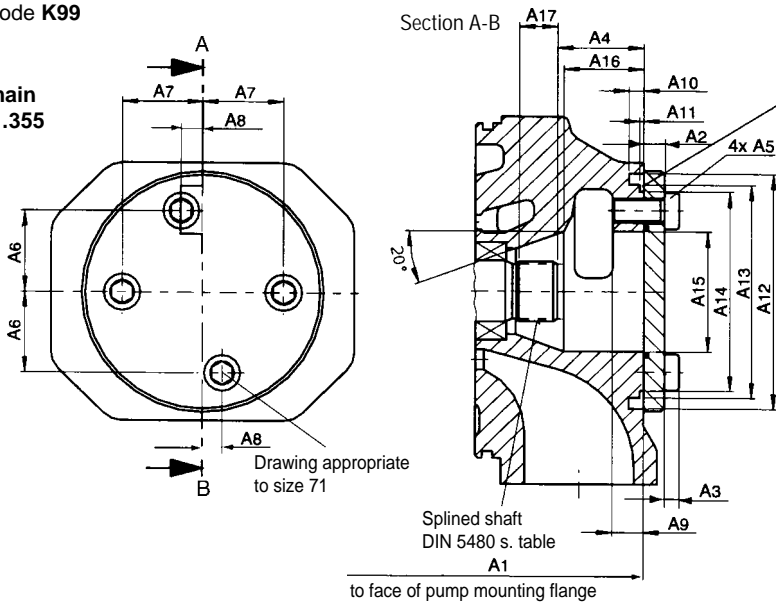
Size of main pump A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>
40*	7.44 (189)	3.94 (100) 2.40 (61)
71*	8.50 (216)	4.06 (103) 2.20 (56)
125	10.43 (265)	4.33 (110) 2.44 (62)
250	12.87 (327)	5.20 (132) 3.07 (78)

Pay attention to correct hydraulic fluid for mounting of radial piston pump (see RA 11 263)

\* At main pump A4VSO, sizes 40 and 71 with control devices LR.D; LR.S or LR.G only possible mounting of a radial piston pump R4-3.

With through drive shaft, without hub, without intermediate flange, covered.  
Ordering code **K99**

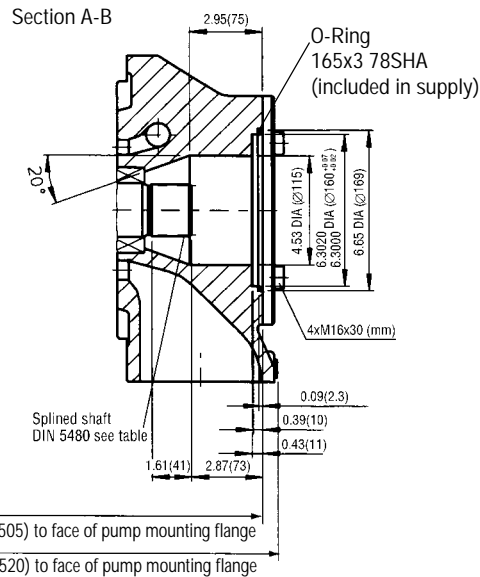
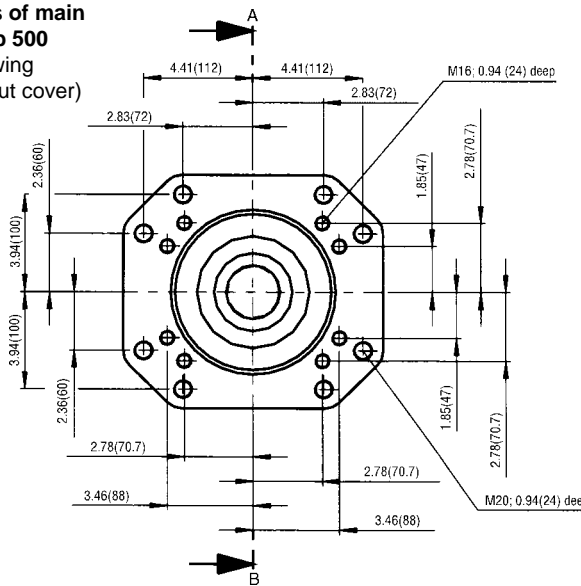
**Sizes of main pump 40...355**



Size of main pump	O-Ring (not included in supply)
40	99x3 78 SH A
71	PRP 245 7509
125	119x3 78 SH A
180	119x3 78 SH A
250	162x3 78 SH A
355	162x3 78 SH A

Size of main pump	Spined shaft DIN 5480
40	W25x1.25x18x9g
71	W30x1.25x22x9g
125	W35x1.25x26x9g
180	W35x1.25x26x9g
250	W42x1.25x32x9g
355	W42x1.25x32x9g
500	W55x1.25x42x9g

**Sizes of main pump 500 (Drawing without cover)**



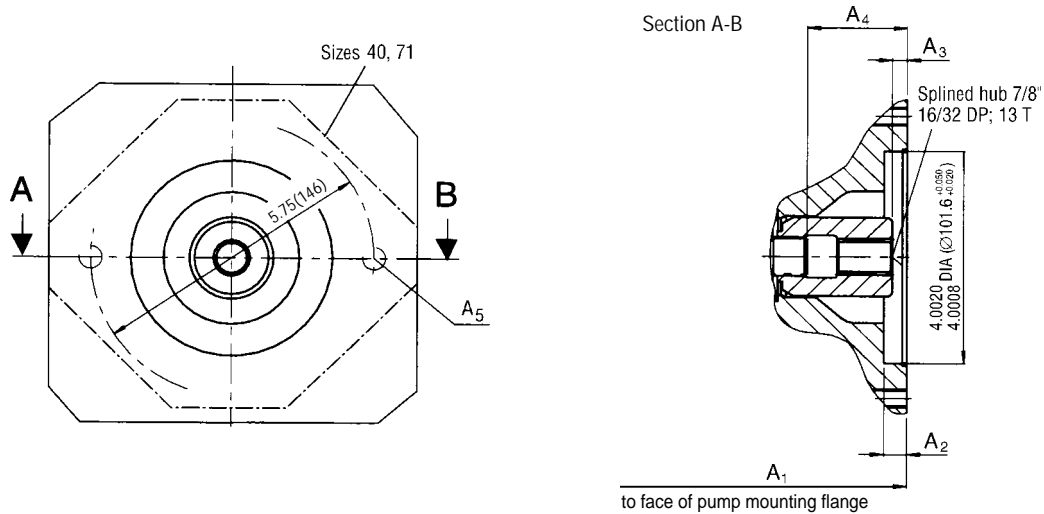
Size of main pump	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub>	A <sub>7</sub>	A <sub>8</sub>	A <sub>9</sub>
40	10.35(263)	0.39(10)	0.30(7.5)	2.02(51.3)	M12x25(mm)	1.46(37)	1.46(37)	0	0.71(18)
71	11.46(291)	0.39(10)	0.30(7.5)	1.89(48)	M12x25(mm)	1.67(42.3)	1.77(45)	0.61(15.4)	0.71(18)
125	13.66(347)	0.47(12)	0.34(8.5)	1.96(49.7)	M14x30(mm)	1.85(47)	1.85(47)	0	0.71(18)
180	14.61(371)	0.47(12)	0.34(8.5)	1.96(49.7)	M14x30(mm)	1.85(47)	1.85(47)	0	0.71(18)
250	16.97(431)	0.59(15)	0.47(12)	2.42(61.4)	M20x40(mm)	2.48(63)	2.48(63)	0	1.02(26)
355	18.11(460)	0.59(15)	0.47(12)	2.42(61.4)	M20x40(mm)	2.48(63)	2.48(63)	0	1.02(26)

Size of main pump	A <sub>10</sub>	A <sub>11</sub>	A <sub>12</sub> DIA (ø)	A <sub>13</sub> DIA (ø)	A <sub>14</sub> DIA (ø)	A <sub>15</sub> DIA (ø)	A <sub>16</sub>	A <sub>17</sub>
40	0.35(9)	0.09(2.3)	4.65(118)	4.1334/4.1325(105 <sub>g6</sub> )	3.84(97.6)	2.05(52)	1.73(44)	0.55(14)
71	0.35(9)	0.11(2.7)	5.12(130)	4.5665/4.5656(116 <sub>g6</sub> )	4.19(106.4)	2.48(63)	1.50(38)	0.63(16)
125	0.33(8.5)	0.09(2.3)	5.39(137)	4.8813/4.8803(124 <sub>g6</sub> )	4.57(116)	2.76(70)	1.81(46)	0.87(22)
180	0.33(8.5)	0.09(2.3)	5.39(137)	4.8813/4.8803(124 <sub>g6</sub> )	4.57(116)	2.76(70)	1.81(46)	0.98(25)
250	0.35(9)	0.09(2.3)	7.07(180)	6.4955/6.4945(165 <sub>g6</sub> )	6.18(157)	3.46(88)	2.52(64)	1.20(30.5)
355	0.35(9)	0.09(2.3)	7.07(180)	6.4955/6.4945(165 <sub>g6</sub> )	6.18(157)	3.46(88)	2.52(64)	1.34(34)

Variable displacement pump A4VSO, Series 1, 2, and 3

Before finalizing your design, please request a certified drawing.  
Dimensions in inches and millimeters.

**Flange SAE 101-2** (SAE B, 2-bolt); for mounting of gear pump G4 (see RA 10 042)  
Ordering code **K68**



Size of main pump A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>
<b>40</b>	11.42 (290)	0.41 (10.3)	0.39 (10)	1.85 (47) M12
<b>71</b>	12.68 (322)	0.41 (10.3)	0.39 (10)	2.44 (62) M12
<b>125</b>	13.98 (355)	0.39 (10)	0.35 (9)	M12; 0.59 (15) deep
<b>180</b>	14.61 (371)	0.41 (10.3)	0.39 (10)	M12; 0.71 (18) deep
<b>500</b>	19.88 (505)	0.41 (10.3)	0.39 (10)	3.07 (78) M12

Pay attention to correct hydraulic fluid for mounting of gear pump (see RA 10 042)

**Model list (short delivery times)**, in case of an order please state type and part no.

Model	Ident. no.	Model	Ident. no.
A4VSO40DFR/10X-PPB13N00	902310	A4VSO180DFR/22R-PPB13N00	934730
A4VSO40DR/10X-PPB13N00	955019	A4VSO180DR/22R-PPB13N00	934611
A4VSO40DRG/10X-PPB13N00	901396	A4VSO180DRG/22R-PPB13N00	949541
A4VSO40LR2/10R-PPB13N00	903578	A4VSO180LR2/22R-PPB13N00	939769
A4VSO40LR2G/10R-PPB13N00	905023	A4VSO180LR2G/22R-PPB13N00	935375
		A4VSO180LR2N/22R-PPB13N00	934974
A4VSO71DFR/10X-PPB13N00	931535		
A4VSO71DR/10X-PPB13N00	933007	A4VSO250DFR/30R-PPB13N00	985509
A4VSO71DRG/10X-PPB13N00	942715	A4VSO250DR/30R-PPB13N00	974769
A4VSO71LR2/10R-PPB13N00	904555	A4VSO250DRG/30R-PPB13N00	976965
A4VSO71LR2D/10R-PPB13N00	905142	A4VSO250LR2/30R-PPB13N00	985297
		A4VSO250LR2G/30R-PPB13N00	977295
		A4VSO250LR2N/30R-PPB13N00	978355
A4VSO125DFR/22R-PPB13N00	939924		
A4VSO125DR/22R-PPB13N00	937693		
A4VSO125DR/22R-VPB13N00	938745		
A4VSO125LR2/22R-PPB13N00	936376		
A4VSO125LR2G/22R-PPB13N00	940247		
A4VSO125LR2N/22R-PPB13N00	940251		



Variable displacement pump A4VSO, Series 1, 2, and 3

## Notes



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