

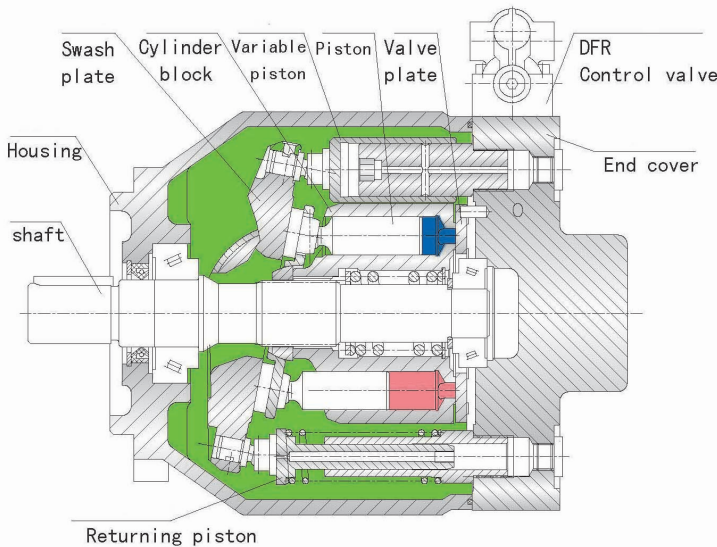
Variable displacement pump S10VO, Series 31



Features:

Axial piston pump S10VO in swashplate design is used for hydrostatic transmissions in open loop circuits. Flow is proportional to drive speed and displacement. By adjusting the position of the swashplate it is possible to smoothly vary the flow.

- Flange connections to SAE-UNC or SAE metric
- 2 leakage ports
- High permissible speeds
- Good suction characteristics
- Low noise level
- High power/weight ratio
- Long service life
- Short control times
- Axial and radial loading of drive shaft possible
- Wide range of controls
- Through drive option for multi-circuit system



Technical data

1、 Input operating pressure range

Absolute pressure at port S (A)

Pabs min.....0.8bar

Pabs max.....3bar

2、 Output operating pressure range

Pressure at port B

Nominal pressure P_N.....280bar

Peak pressure P_{max}.....350bar

3、 Case drain pressure

Maximum pressure of leakage fluid (at ports L, L1), Maximum 7 psi (0.5 bar) higher than input pressure at port S, but not higher than 30 psi (2 bar) absolute.

4、 Direction of flow

(S to B)

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

Size				28	45	71	100
Displacement		V _{gmax}	cm ³	28	45	71	100
Max. speed	at V _{gmax}	n _{omax}	rpm	3000	2600	2200	2000
Max. flow	at n _{omax}	Q _{omax}	L/min	84	117	156	200
Max. power	at n _{omax}	P _{omax}	kW	39	55	73	93
Max. torque	at V _{gmax}	T _{max}	Nm	125	200	316	445
Weight (without fluid)		m	kg	15	21	33	45

Notes: Values shown are valid for an absolute pressure of 1 bar at suction port. If the flow is reduced or if the inlet pressure is increased the speed may be increased.

6、 Determination of size

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

Drive torque $T = \frac{1 \cdot 59 \cdot V_g \cdot \Delta P}{100 \cdot \eta_{mh}}$ [N·m]

Drive power $P = \frac{2 \pi \cdot T \cdot n}{60000} = \frac{Q \cdot \Delta P}{600 \cdot \eta_t}$ [Kw]

V_g= geometric displacement [cm³] per rev.

ΔP= differential pressure [bar]

n= speed [rpm]

η_v= volumetric efficiency

η_{mh}= mechanical-hydraulic efficiency

η_t= total efficiency (η_t=η_v · η_{mh})

Variable displacement pump S10VO, Series 31

Ordering Code:

Swash plate variable pump

S10V

Swash plate variable pump, for industrial

S10VS

Mode of operation

Pump, open circuit

O

Size

Displacement

Vgmax (cm³)

28

45

71

100

140

Control devices

pressure control

Remote control

●

●

●

○

—

DR

DRG

Pressure and flow control, I—

X port closed

●

●

●

●

—

DFR

DFR1

Pressure flow and power control

●

●

●

●

—

DFLR

Electronic flow control+pressure control

●

●

●

●

—

RZQZ

Series

Series

31

Direction of rotation

Viewed on drive shaft

clockwise

counter-clockwise

R

L

Seals

Buna-N (NBR per DIN ISO 1629);

FPM (fluorocarbon)

P

V

Shaft end

SAE-splined shaft

SAE-splined shaft, reinforced (higher thru drive torques)

SAE-splined shaft, smaller size (not for pumps with thru drive)

SAE-splined shaft, reinforced U-type shaft

SAE-keyed shaft

parallel with key DIN 6885

28

45

71

100

140

S

R

U

W

K

P

Thru-drive

Without through drive

With thru-drive, pump with side port only

28

45

71

100

140

●

●

●

●

—

N00

Mounting flange

Shaft/coupling

For the mounting of:

82-2 (SAE A)

16-4 (SAE A)

G2, GC2/GC3-1X

●

●

●

—

—

K01

101-2 (SAE B)

22-4 (SAE B)

A10VO28 (shaft S), G3

●

○

●

—

—

K02

101-2 (SAE B)

22-4 (SAE B)

A10VO28 (shaft S), G4

○

●

○

—

—

K68

127-2 (SAE C)

32-4 (SAE C)

A10VO 71 (shaft S)

●

—

—

K07

Service ports

(Pressure port B and Suction port S)

28

45

71

100

140

(Rear ports, UNC mounting screws)

●

●

●

—

—

61

Port pos. 61, 11, 91 and 41 only for version without through drive

(Opposite side ports, UNC mounting screws)

●

●

●

●

—

62

(Rear ports, metric mounting screws)

○

○

●

—

—

11

(Opposite side ports, metric mounting screws)

●

●

●

●

—

12

(Rear ports, UNC mounting screws)

—

—

●

—

—

91

(Opposite side ports, UNC mounting screws)

—

—

●

—

—

92

(Rear ports, metric mounting screws)

●

—

41

(Opposite side ports, metric mounting screws)

—

—

○

—

—

42

Mounting flange

SAE 2 hole

ISO 2 hole

SAE 4 hole

28

45

71

100

140

●

●

●

●

—

C

●

●

●

●

—

A

—

—

—

—

—

D

Multiple pumps

1. If a second Liyuan hydraulic pump is to be factory-mounted, then both ordering codes are to be specified, combined with a "+" . Ordering code 1st pump + Ordering code 2nd pump
Ordering example: L10VO71DR/31R-PSC62K02+L10VO28DR/31R-PSC62N00

2. If a gear pump is to be factory-mounted please contact us.

● = available

○ = in preparation

— = not available

Variable displacement pump S10VO, Series 31

Fluid

- Fluid : MR20S(Q/TCNK12-2001)
- Operating viscosity range

For optimum efficiency and service life we recommend that the operating viscosity (at operating temperature) be selected in the range:

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

referred to tank temperature (open loop circuit).

Limits of viscosity range

The following values are valid for extreme operating conditions:

$V_{min} = 10 \text{ mm}^2/\text{s}$

for short periods at max. leakage oil temperature of 80°C.

$V_{max} = 1000 \text{ mm}^2/\text{s}$

for short periods upon cold start.

- Temperature range

$t_{min} = -20^\circ\text{C}$; $t_{max} = +80^\circ\text{C}$

- Filtration

In order to ensure reliable operation of the axial piston unit, the operating fluid must be maintained to a cleanliness class of at least: 16/19 to ISO4406. This may be achieved with filter elements, cleanliness class of pump leakage fluid 10um.

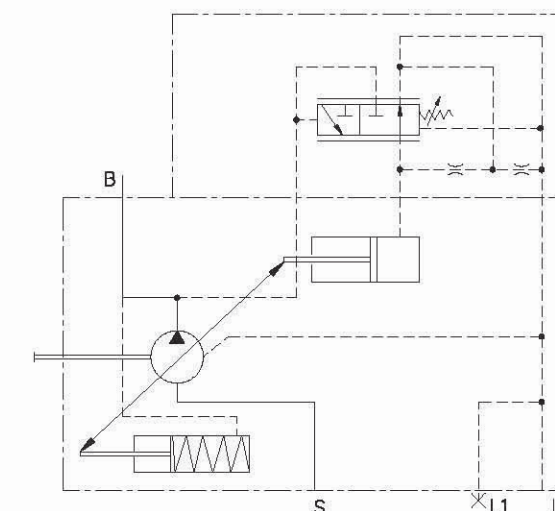
Installation notes

The pump housing must be filled with fluid during commissioning and remain full when operating.

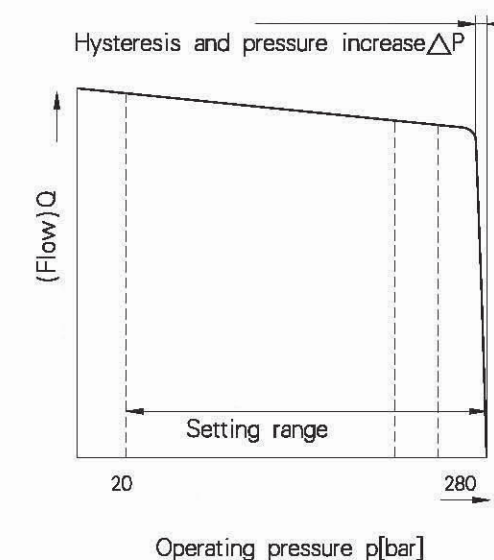
The concentricity between engine transmission shaft and pump shaft must less than $\Phi 0.05\text{mm}$

DR Pressure control

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



Static characteristic
(at $n=1450\text{rpm}$; $t_{oil}=50^\circ\text{C}$)



Ports

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

Control data

Hysteresis and repetitive accuracy Δp max. 3 bar

Max. pressure increase

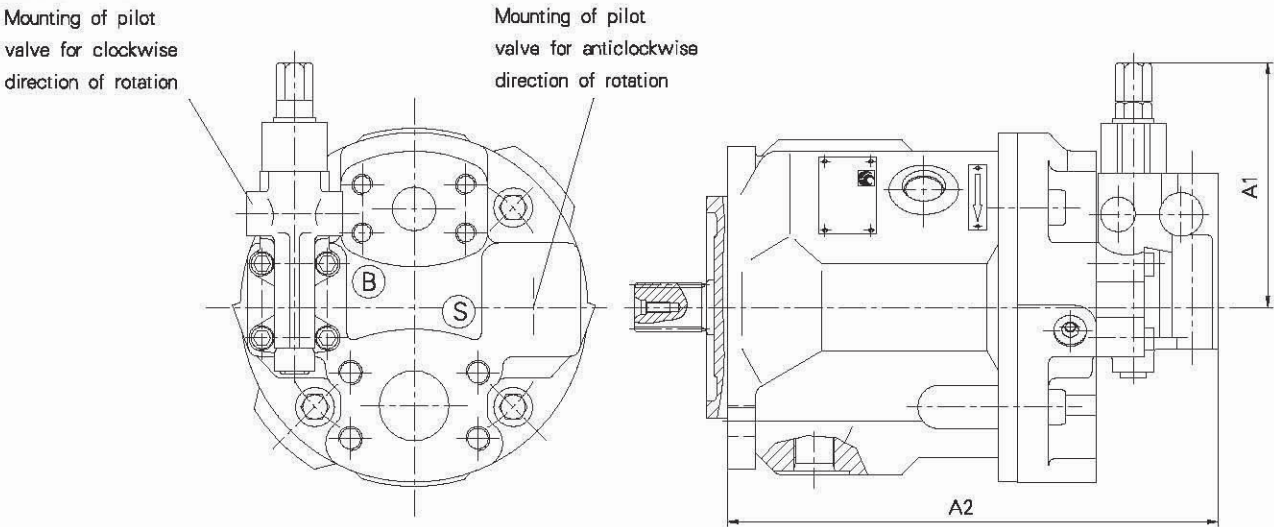
Size		28	45	71	100
ΔP	Bar	4	6	8	10

Pilot oil consumption max. approx. 3 L/min

Variable displacement pump S10VO, Series 31

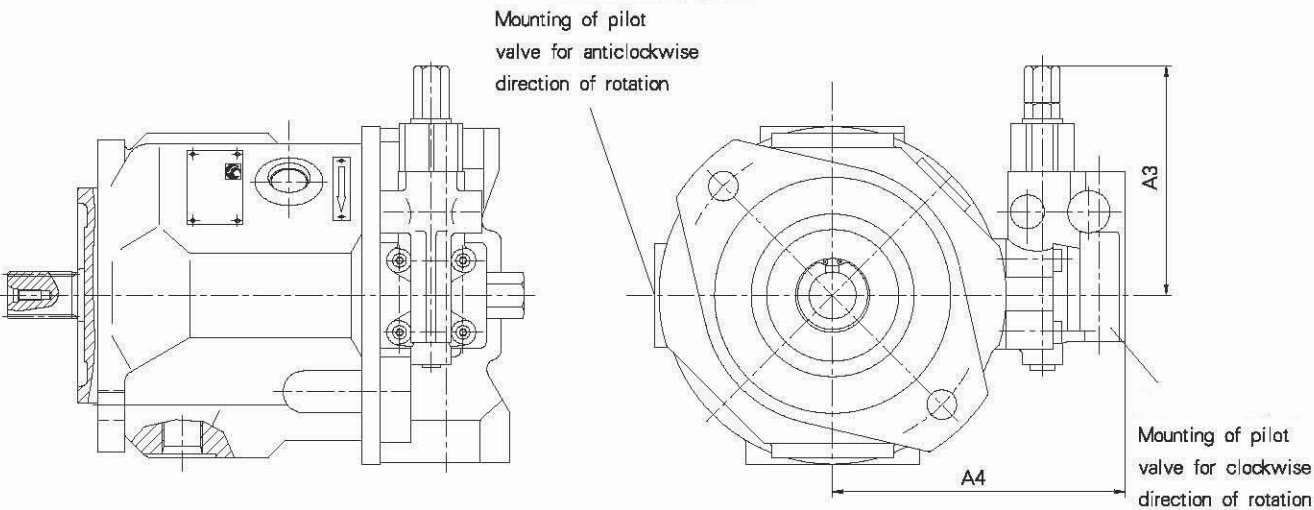
Unit dimensions DR
Service ports at rear, Models 61N00 and 11N00

Sizes 28 to 100



Unit dimensions DR
Service ports on sides, Models 62N00 and 12N00

Sizes 28 to 100

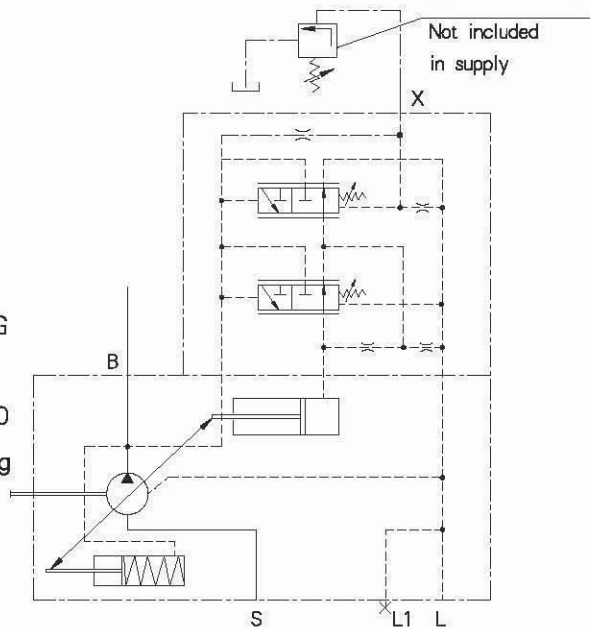
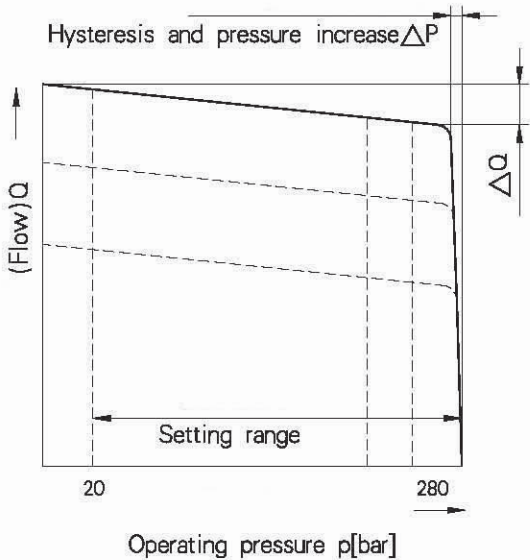


Sizes	A1	A2	A3	A4
28	108.5	226.2	108.5	136
45	108.5	245	108.5	146
71	106	279	108.5	160
100			108.5	158
140				

Pressure control, remote control

Function and design as for DR.
A pressure relief valve may be externally piped to port X for remote control purposes. It is not, however, included with the DRG control.
The differential pressure at the pilot valve is set as standard to 20 bar and this results in a pilot flow of 1,5 L/min. If another setting is required (in the range 10–22 bar), please state this in clear text.

Static characteristic
(at $n_1=1450\text{rpm}$; $t_{oil}=50^\circ\text{C}$)



Ports	
B	Pressure port
S	Suction port
L, L1	Case drain ports (L1 sealed)
X	Pilot pressure port

Control data

Hysteresis and repetitive accuracy p..... max., 3 bar

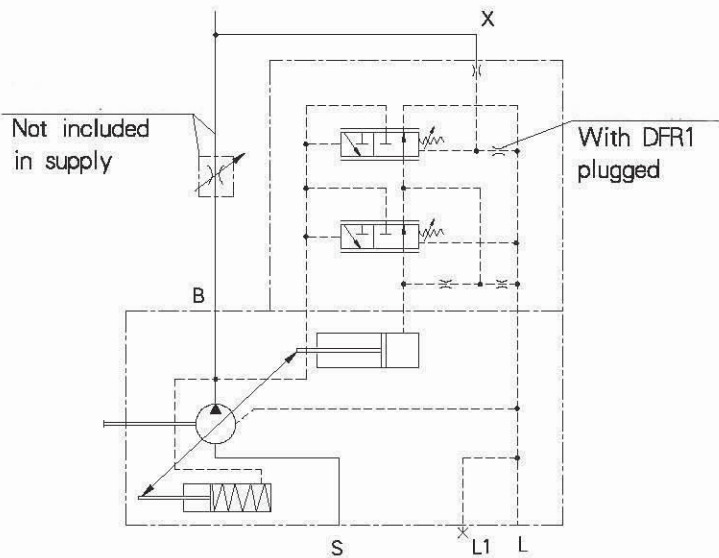
Max. pressure increase		28	45	71	100
Size					
ΔP	Bar	4	6	8	10

Pilot oil consumption..... max., approx. 4,5 L/min

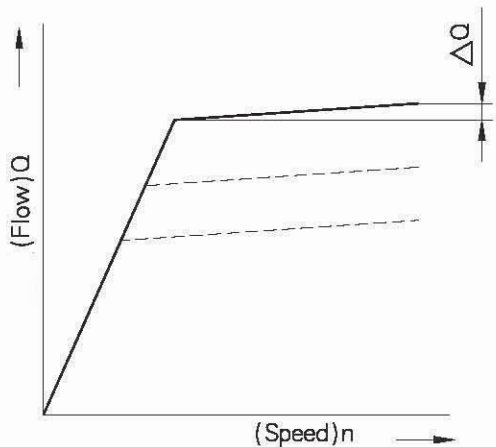
Variable displacement pump S10VO, Series 31

Pressure/flow control

In addition to the pressure control function, the pump flow may be varied by means of a differential pressure at the actuator (e.g. an orifice).
In model DFR1 the X orifice is plugged.

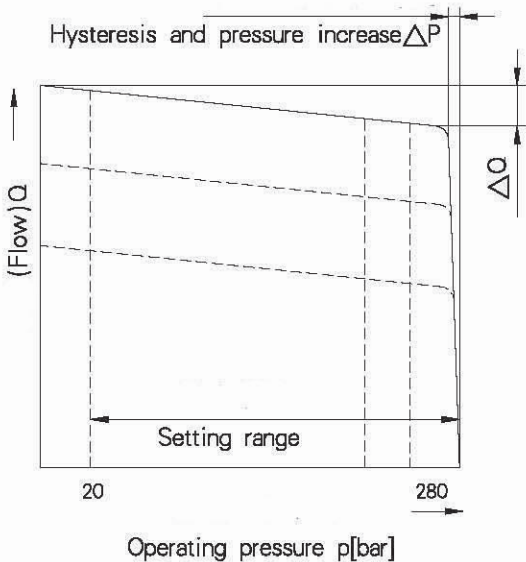


Static characteristic at variable speed



Flow control/differential pressure Δp :
Adjustable between 10 and 22 bar (higher values on request) Standard setting: 14 bar. If a different setting is required, please state in clear text.
When port X is unloaded to tank, a zero stroke pressure of
 $p = 18 \pm 2$ bar ("stand by") results.

(at $n_1=1450$ rpm; $t_{oil}=50^\circ\text{C}$)



Ports	
B	Pressure port
S	Suction port
L, L1	Case drain ports (L1 sealed)
X	Pilot pressure port

Control data
For pressure control technical data see DR Pressure control

Max. flow deviation (hysteresis and increase) measured at drive speed $n = 1450$ rpm

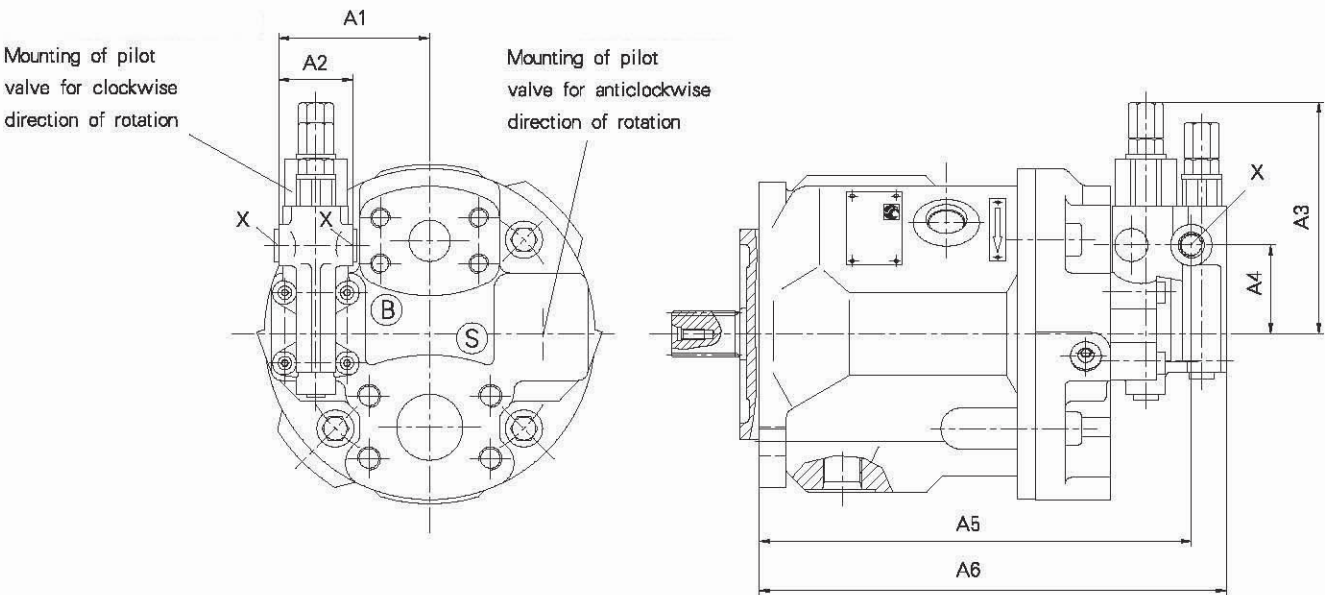
Size	28	45	71	100
ΔQ_{max} L/min	1.0	1.8	2.8	4.0

Pilot oil consumption DFR.....max. approx. 3–4,5 L/min
Pilot oil consumption DFR1.....max. approx. 3 L/min

Variable displacement pump S10VO, Series 31

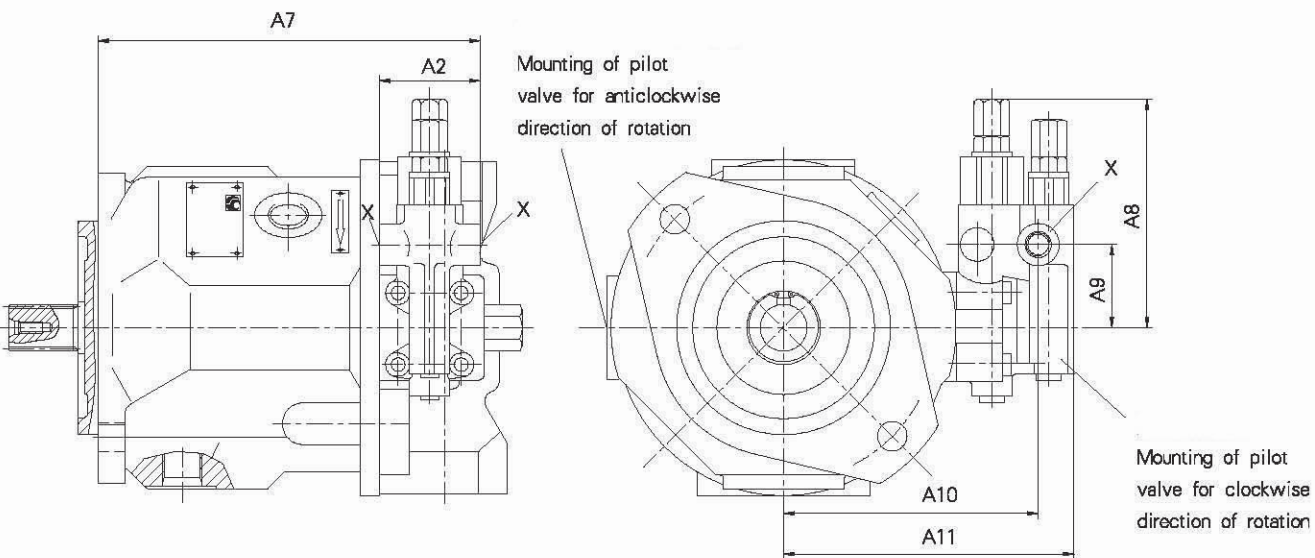
Unit dimensions DFR/DFR1/DRG
Service ports at rear; Models 61N00 and 11N00

Sizes 28 to 100



Unit dimensions DFR/DFR1/DRG
Service ports on sides; Models 62N00 and 12N00

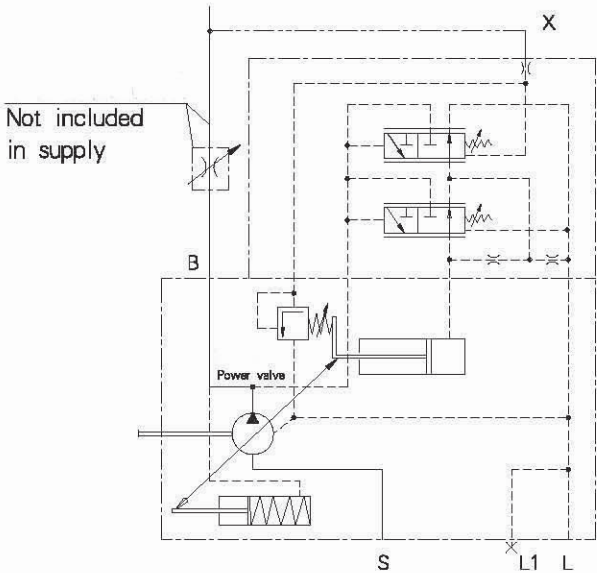
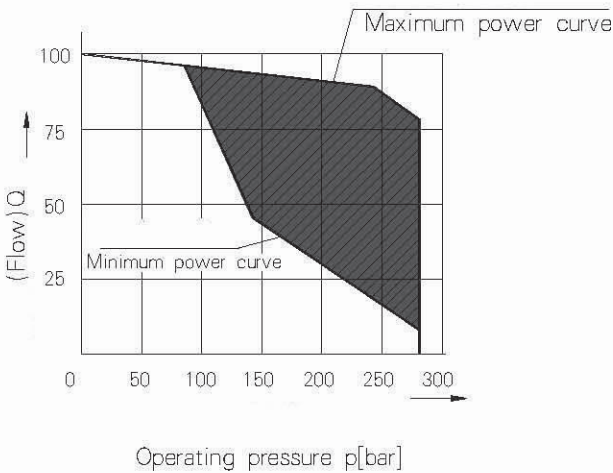
Sizes 28 to 100



Sizes	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	X
28	73	36	108.5	43	209.2	226.2	176	108.5	40	119	136	7/16-20UNF-2B
45	82	36	108.5	40	229	245	191	108.5	40	129	146	7/16-20UNF-2B
71	91	36	106	42	262	279	218.8	108.5	40	143	160	7/16-20UNF-2B
100							287	108.5	40	141	158	7/16-20UNF-2B
140												

DFLR Pressure/flow/power control

In order to achieve a constant drive torque with a varying operating pressure, the swivel angle and with it the output flow from the axial piston unit is varied so that the product of flow and pressure remain constant.
Flow control is possible below the limit of the power curve.



Ports	
B	Pressure port
S	Suction port
L, L1	Case drain ports (L1 sealed)
X	Pilot pressure port

The power characteristic is factory-set, so please enter details in clear text, e.g. 20 kW at 1450 rpm.

Control data

For pressure control technical data see DR Pressure control.
For flow control technical data see DFR control.

Start of controlfrom 80 bar

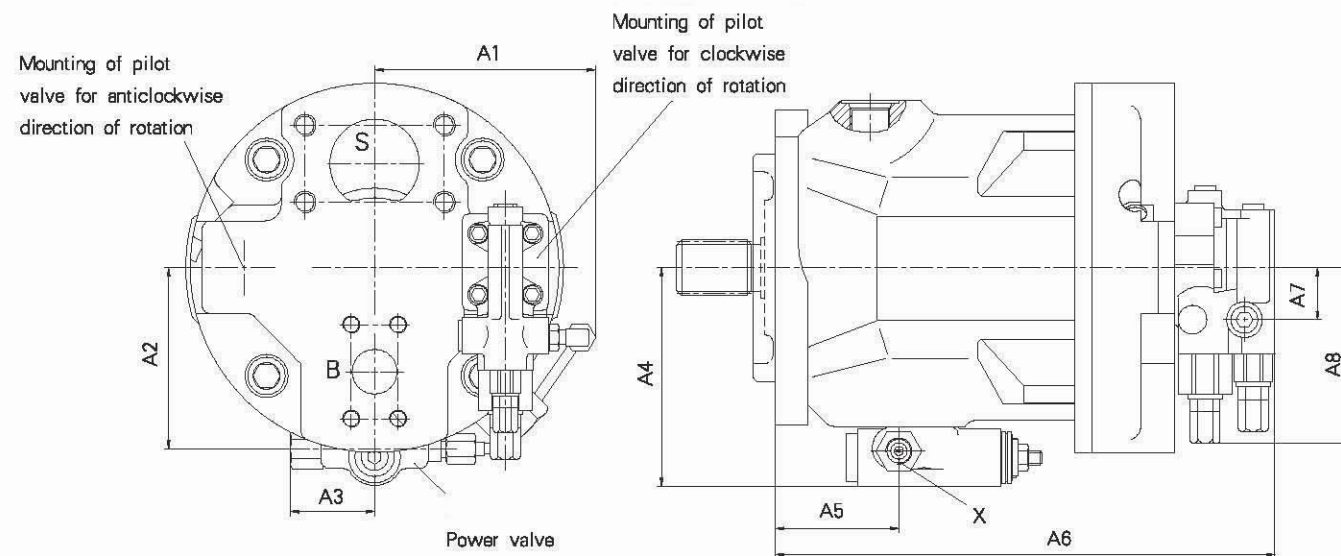
Pilot oil consumption..... max. approx. 5,5 L/min

Variable displacement pump S10VO, Series 31

Unit dimensions DFLR

Service ports at rear; Models 61N00 and 11N00

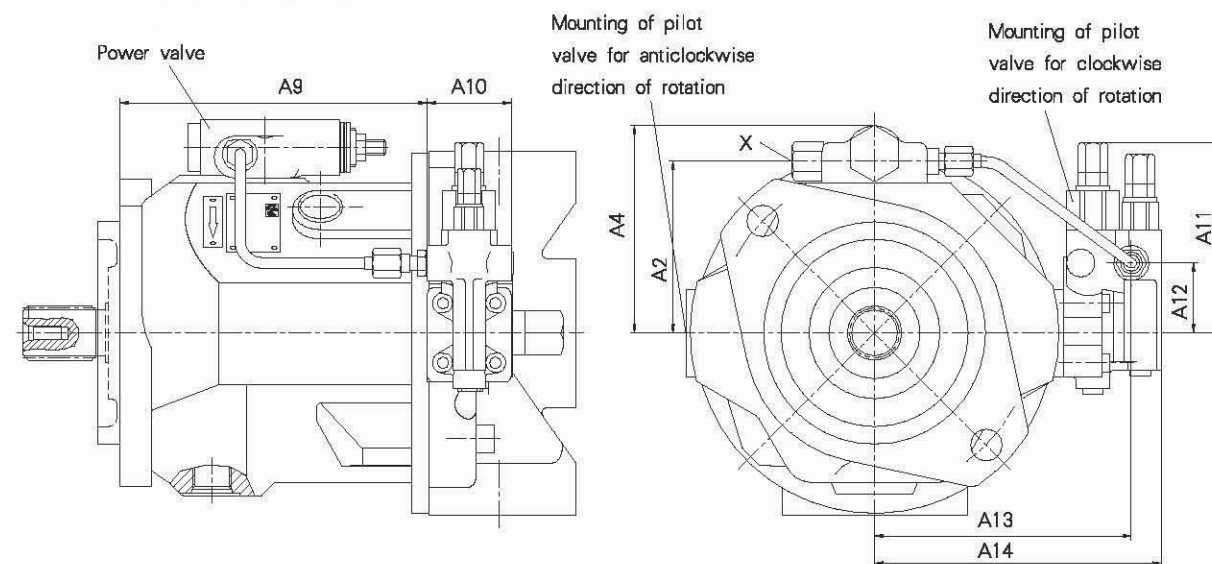
Sizes 28 to 100



Unit dimensions DFLR

Service ports on sides; Models 62N00 and 12N00

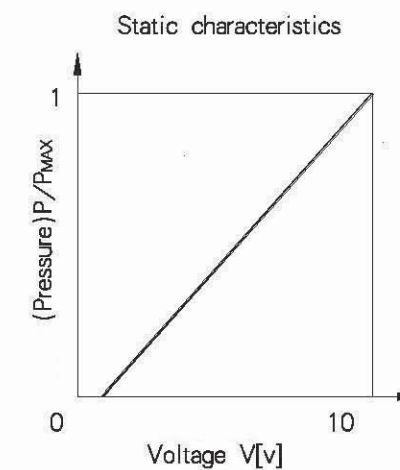
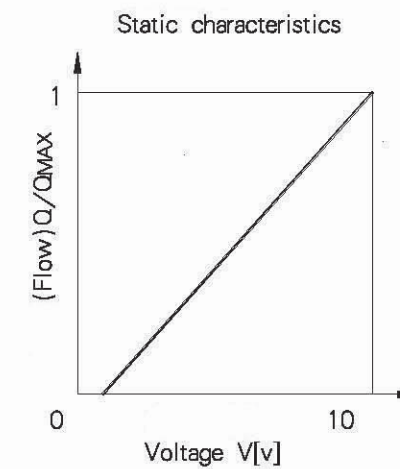
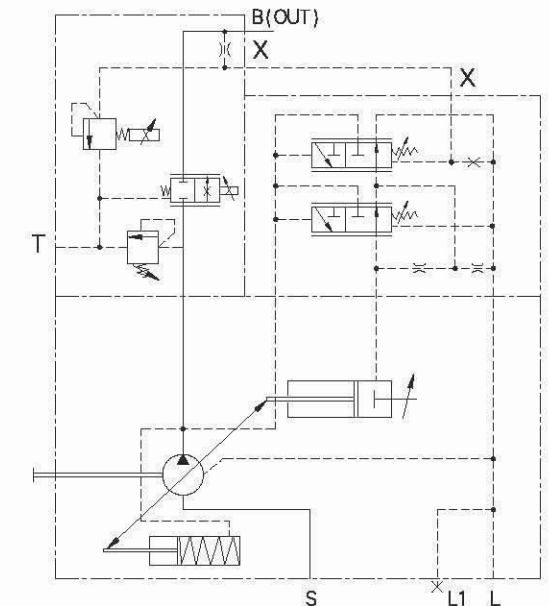
Sizes 28 to 100



Sizes	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	X
28		87,5							140	36	108,5	40	119	136	7/16-20UNF-2B
45															
71	123,5	103,5	48	124	69	279	42	106	218,8	36	108,5	40	143	160	7/16-20UNF-2B
100									250	36	108,5	40	141	158	M14 x 1.5-6H
140															

Electronic flow control + Electronic pressure control

Pressure and flow control of the pump are carried out by an electrically controlled proportional valve mounting at pressure port. Pressure and flow increased with voltage.



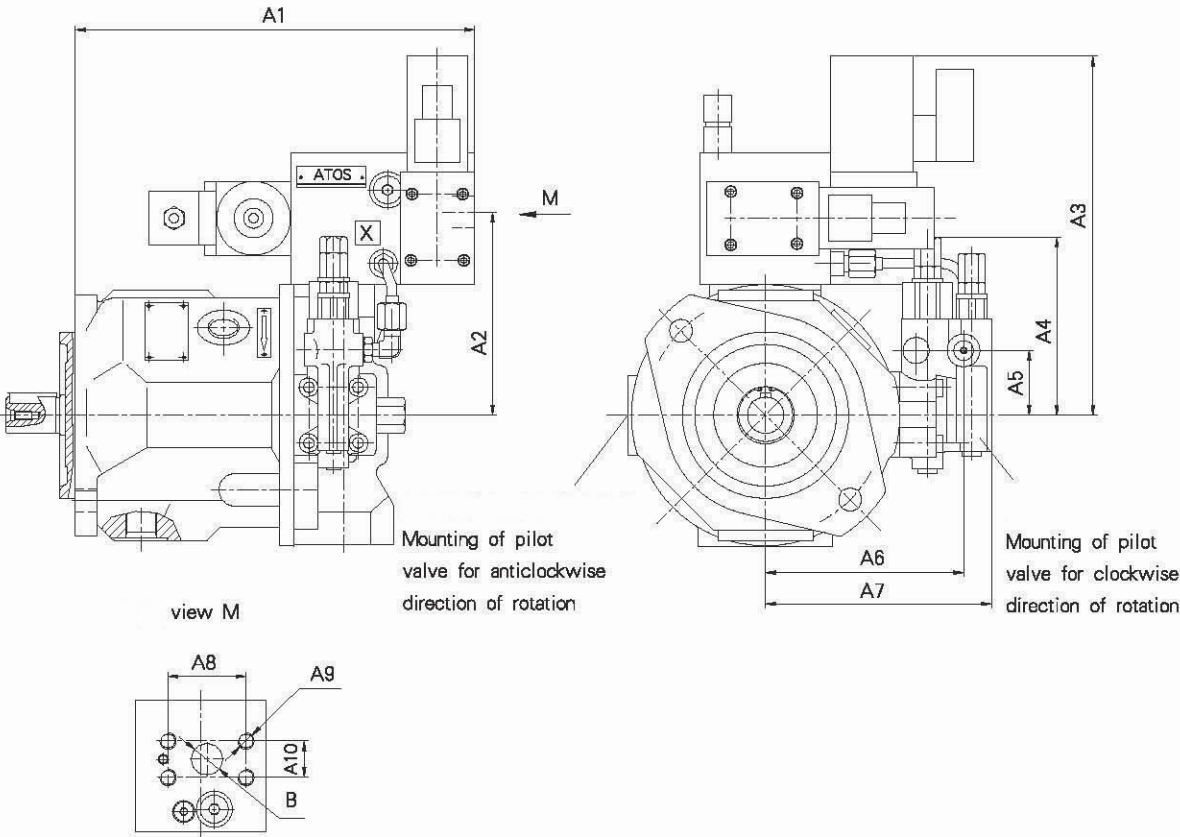
Ports

B	Pressure port
S	Suction port
L, L1	Case drain ports (L1 sealed)
T	drain port
X	Pilot pressure port

Variable displacement pump S10VO, Series 31

Unit dimensions RZQZ
Service ports on sides; Models 62N00 and 12N00

Sizes 28 to 100

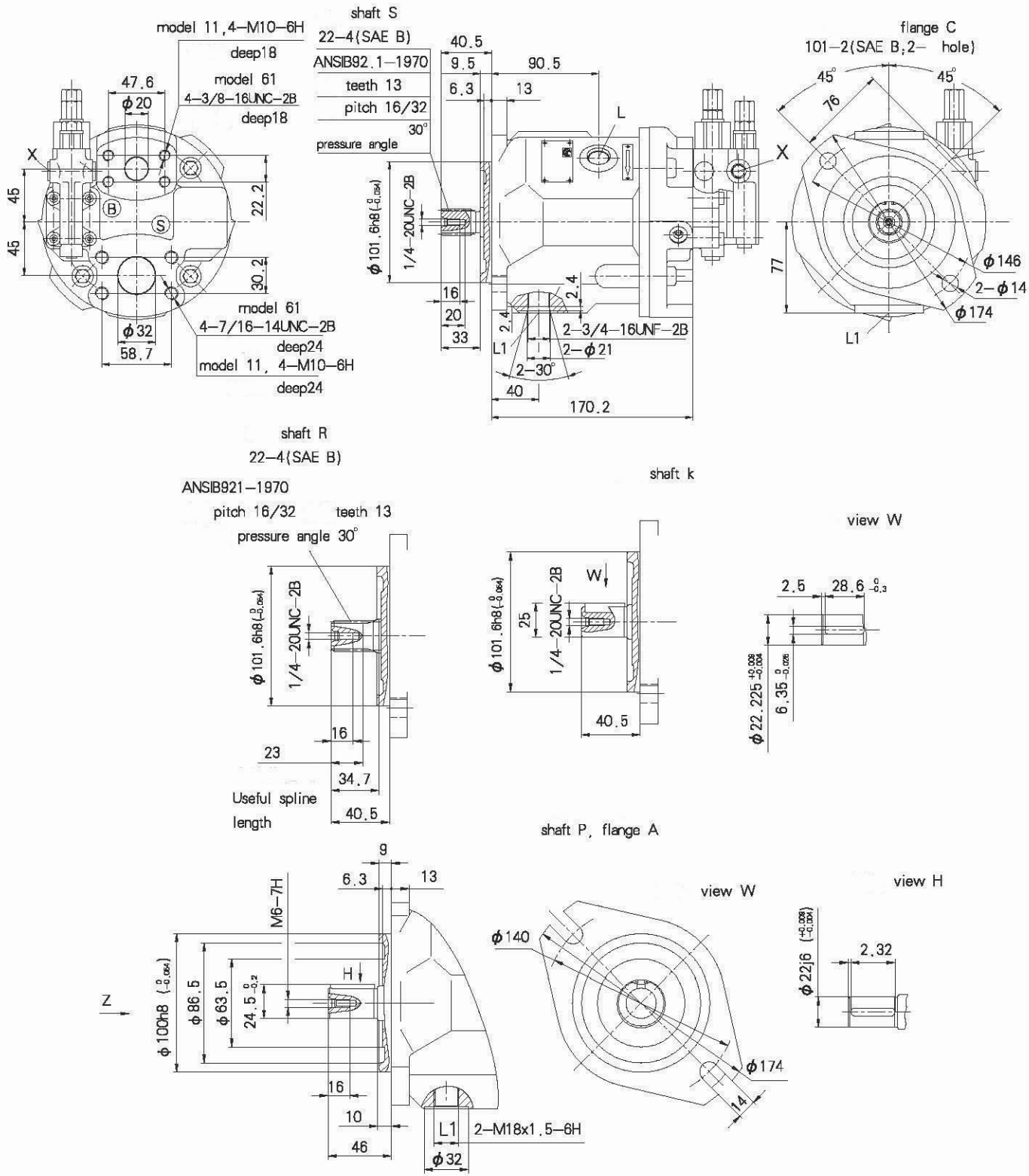


Sizes	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	(B Port)
28	245.2	144	222.5	108.5	40	119	136	47.6	4-M10-6H, 21(21 deep)	22.2	φ 19
45	270.5	147.5	232	108.5	40	129	146	52.4	4-M10-6H, 17(17 deep)	26.2	φ 24.5
71	303.8	160	251.5	108.5	40	143	160	58.7	4-M12-6H, 20(20 deep)	30.2	φ 32
100											
140											

Mounting Dimension, Sizes 28

Service ports at rear; no through drive; Models 61N00 and 11N00 ;

without considering adjustment

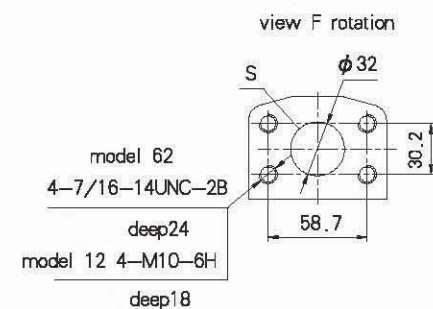
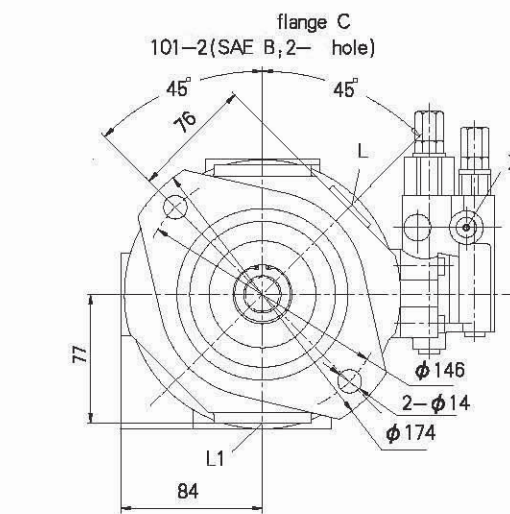
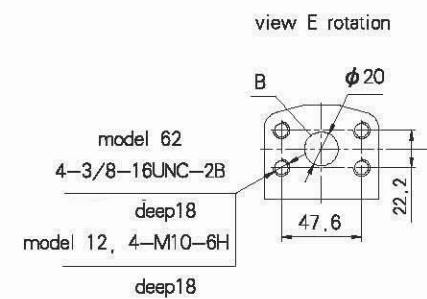
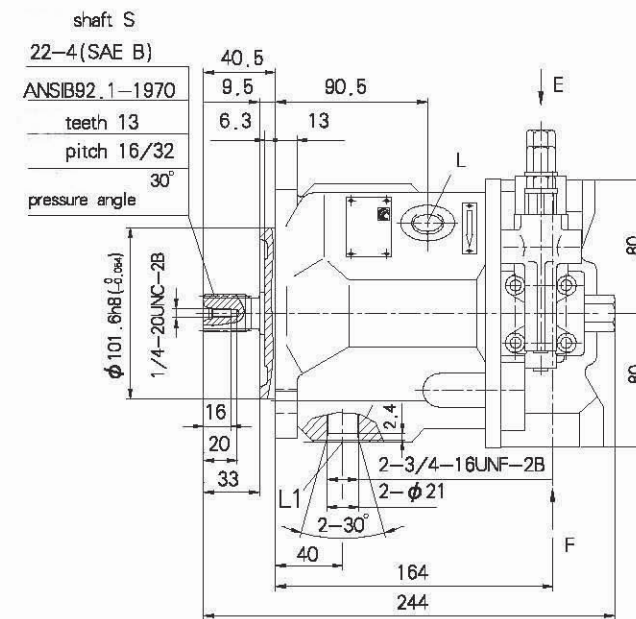


Variable displacement pump S10VO, Series 31

Mounting Dimension, Sizes 28

Service ports on sides, no through drive, Models 62N00 and 12N00

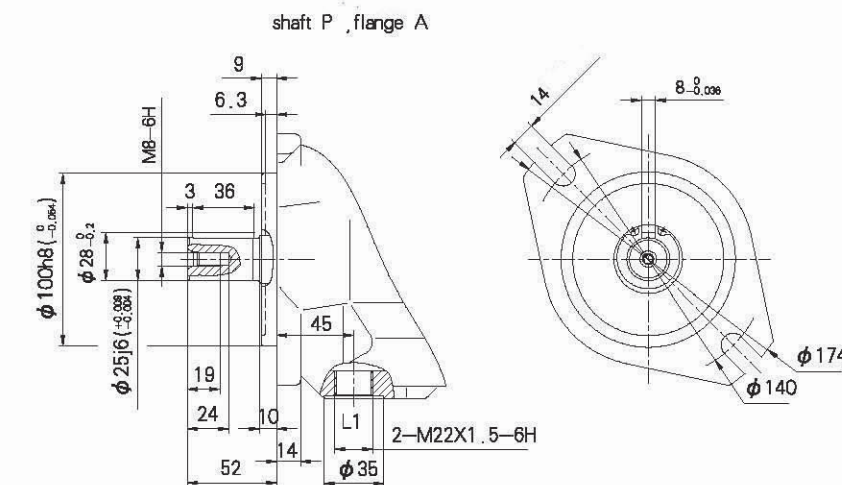
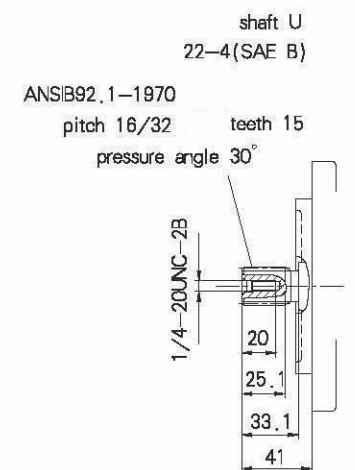
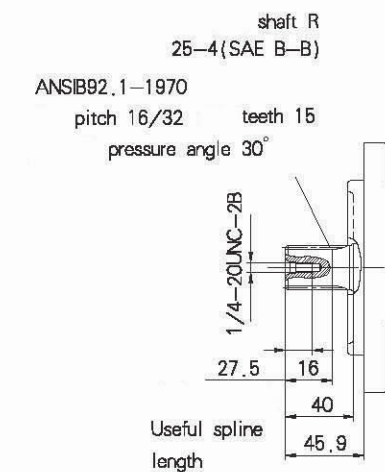
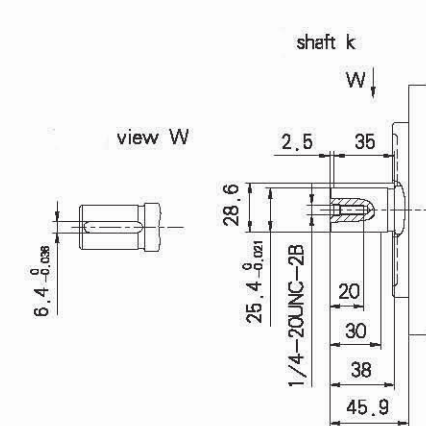
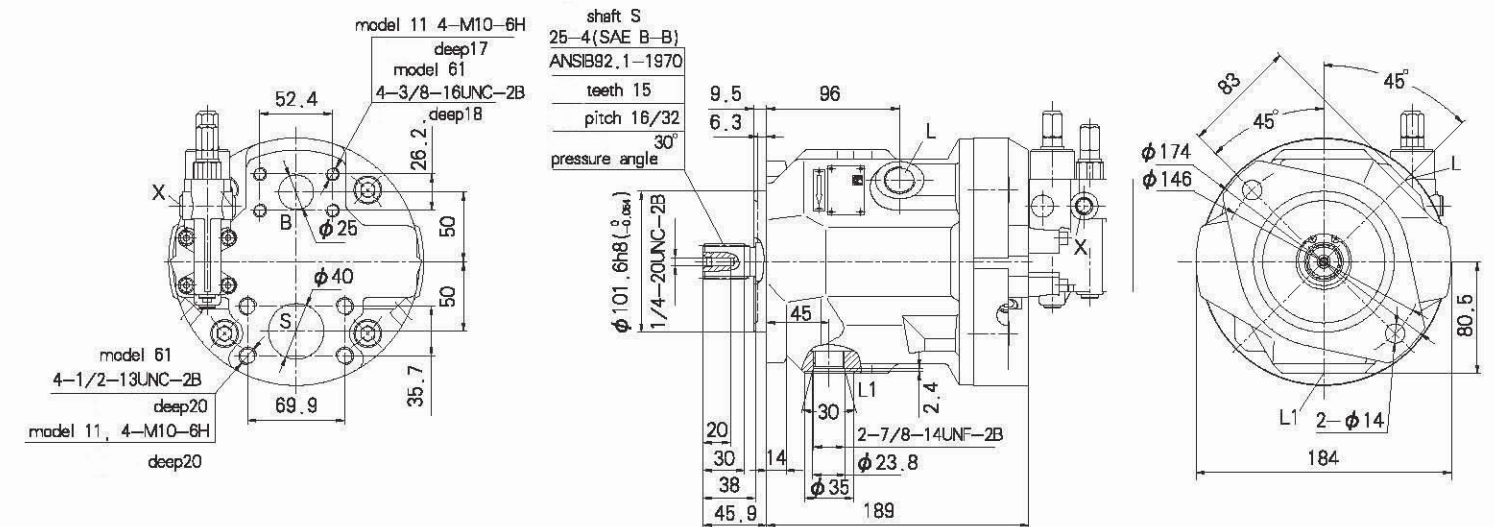
without considering adjustment



Mounting Dimension, Sizes 45

Service ports at rear, no through drive, Models 61N00 and 11N00

without considering adjustment

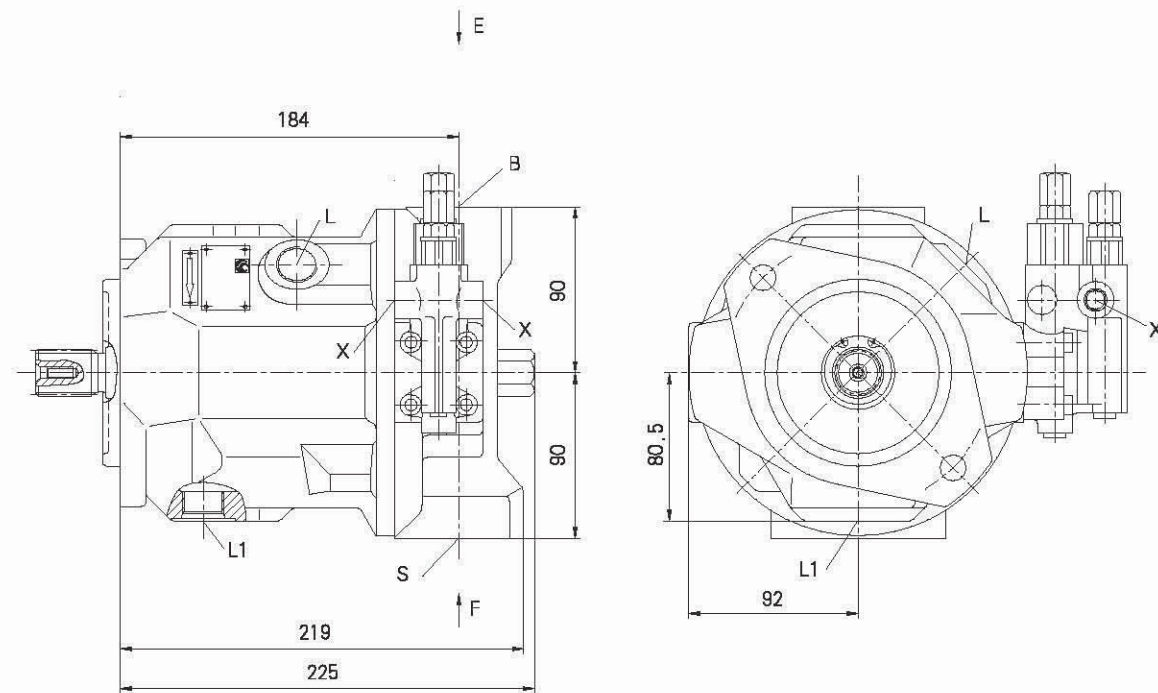


Variable displacement pump S10VO, Series 31

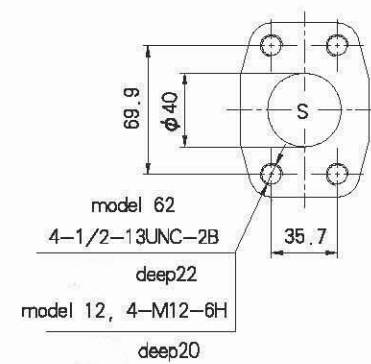
Mounting Dimension, Sizes 45

Service ports on sides, no through drive, Models 62N00 and 12N00

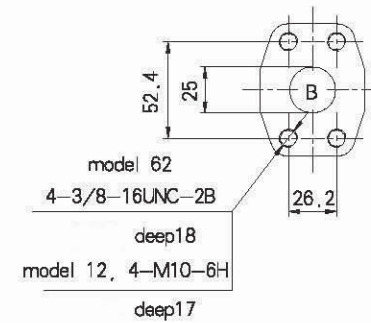
without considering adjustment



view F rotation



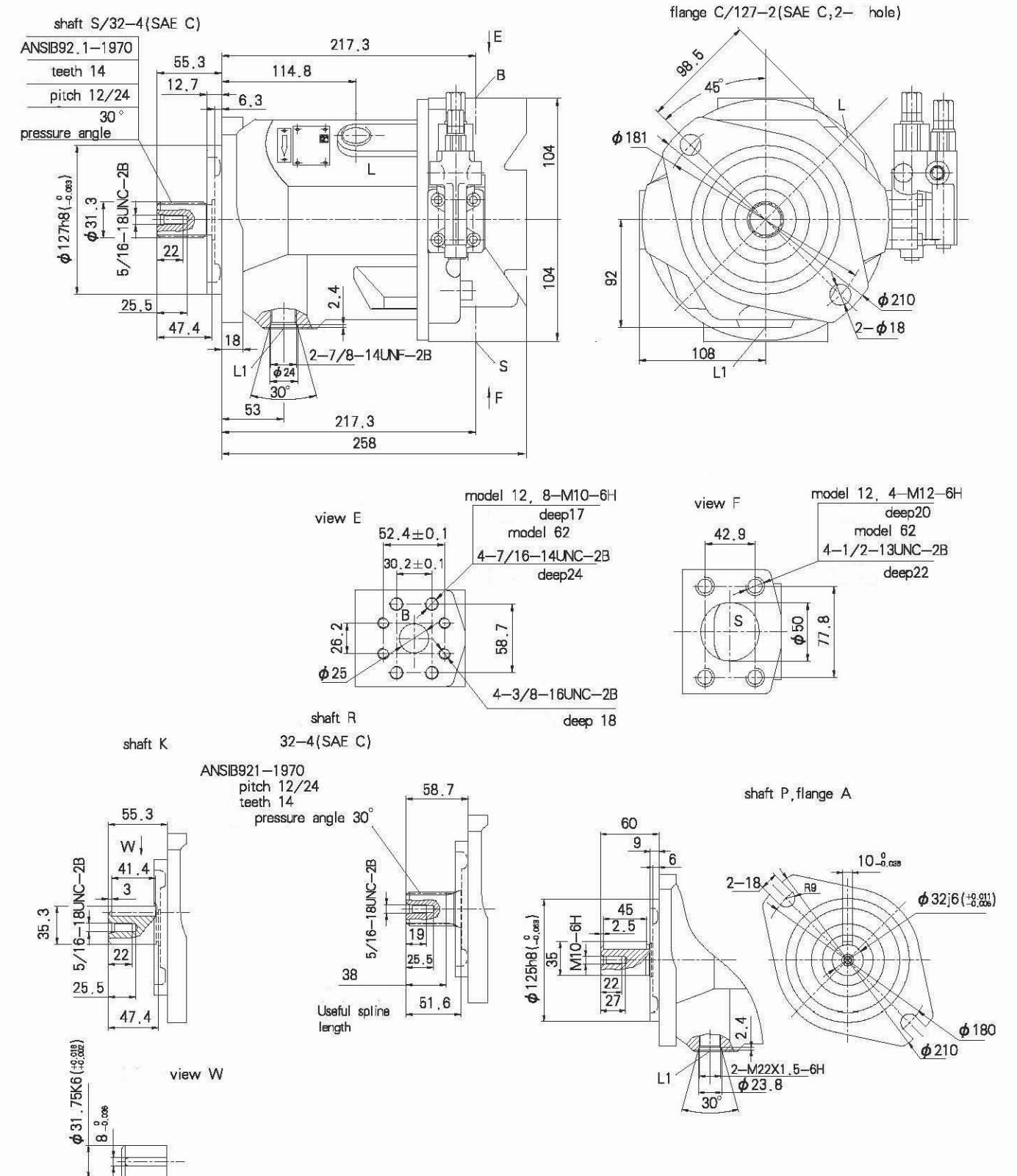
view E rotation



Mounting Dimension, Sizes 71

Service ports on sides, no through drive, Models 62N00 and 12N00

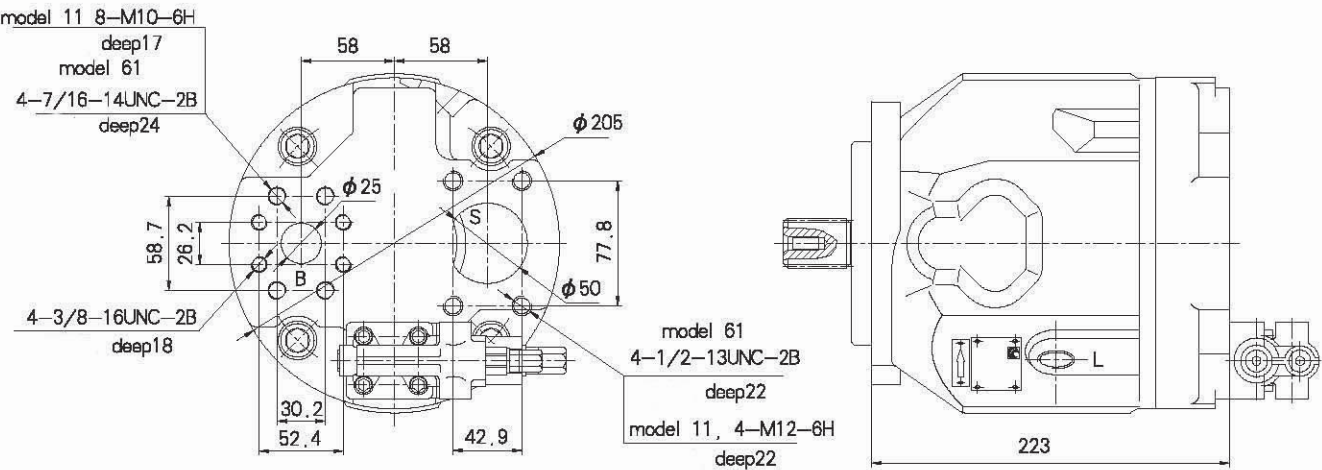
without considering adjustment



Variable displacement pump S10VO, Series 31

Mounting Dimension, Sizes 71

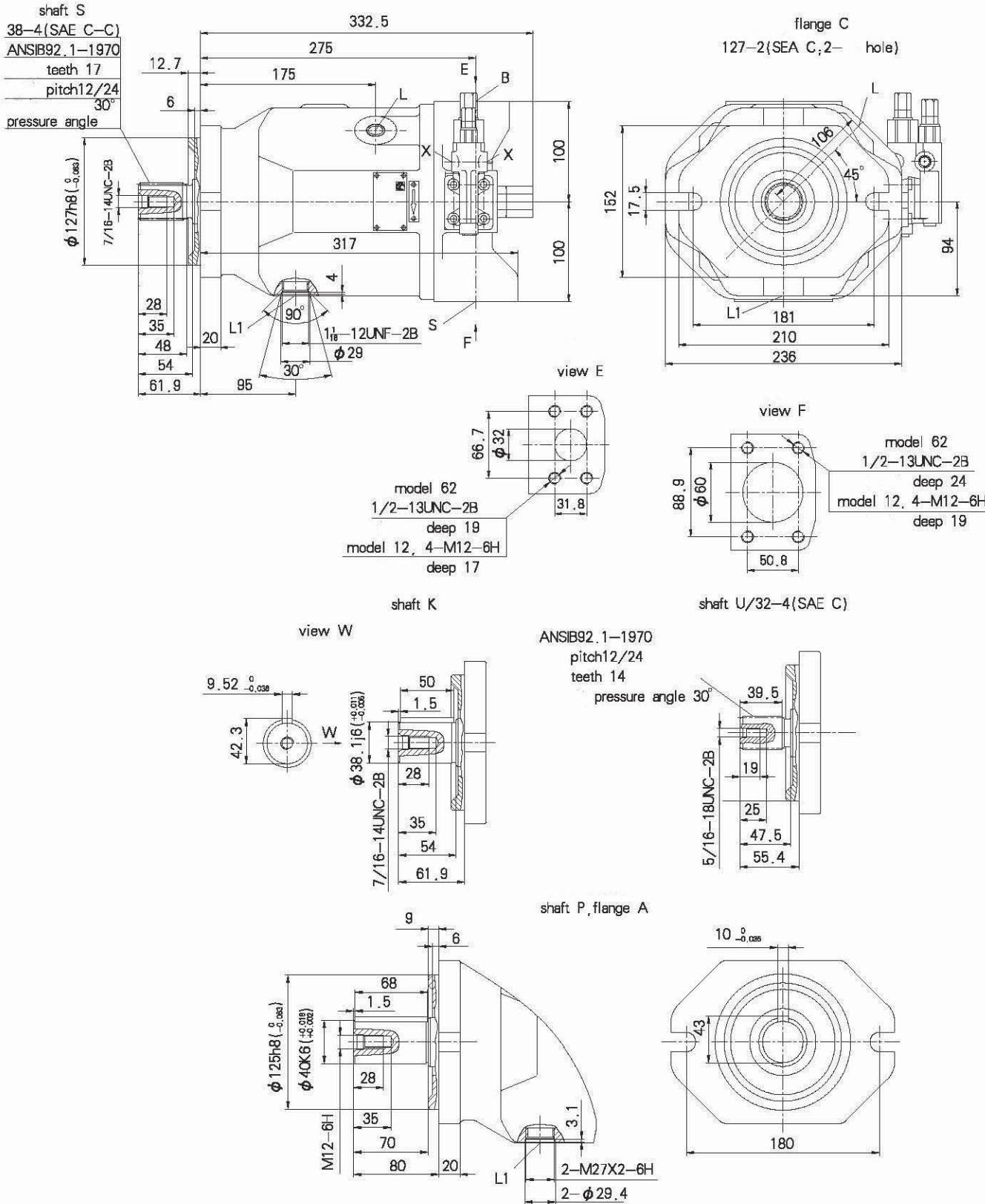
Service ports at rear, no through drive, Models 61N00 and 11N00 ;
without considering adjustment



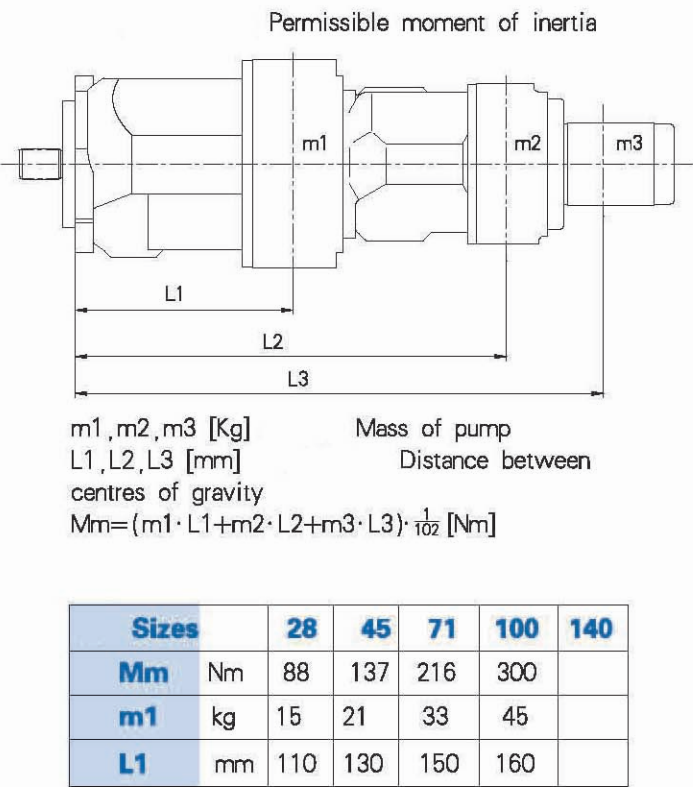
Mounting Dimension, Sizes 100

Service ports on sides, no through drive, Models 62N00 and 12N00

without considering adjustment



Variable displacement pump S10VO, Series 31



Through drive

Axial piston unit L10VO can be supplied with a through drive, as shown in the ordering code on page 3.

The type of through drive is determined by codes (K01–K17). If the combination pump is not mounted in the factory, the simple type code is sufficient.

Included in this case are:

coupling sleeve, seals and if necessary a sandwich flange.

Combination pumps

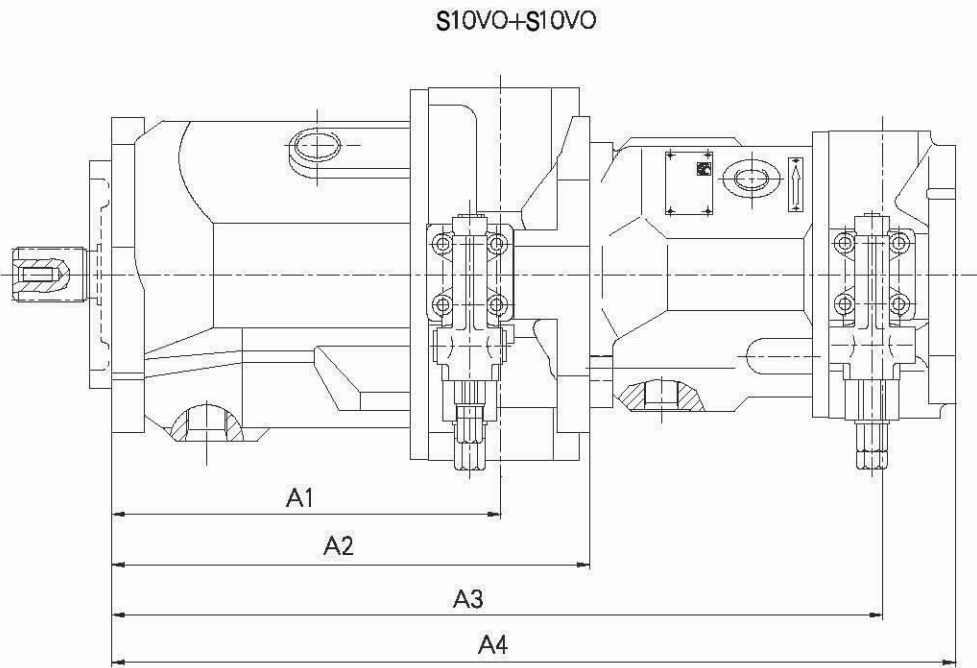
By mounting combination pumps circuits independent of each other are available for use.

1. If the combination pump consists of 2 L10VO pumps and if these are to be delivered ready assembled, then the two type codes are to be combined with a "+".

Ordering example: L10VO71DR/31R–PSC62K02 +L10VO28DR/31R–PSC62N00

2. If a gear pump or radial piston pump is to be mounted in the factory as a second pump, it contains a list of the various pump combinations together with the type code of the first pump.

Unit dimensions of combination pumps

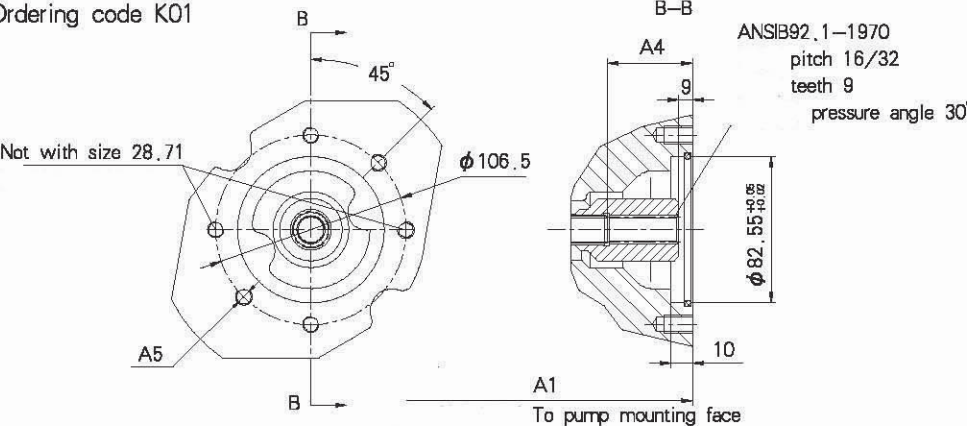


Pump 1 Pump 2	S10VO28				S10VO45				S10VO71				S10VO100				S10VO140			
	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4
S10VO28	165	204	369	408	184	229	394	423	217	267	432	461	275	338	503	532				
S10VO45	—	—	—	—	184	229	413	458	217	267	451	486	275	338	522	557				
S10VO71	—	—	—	—	—	—	—	—	217	267	484	534	275	338	555	605				
S10VO100	—	—	—	—	—	—	—	—	—	—	—	—	275	338	613	676				
S10VO140	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				

Variable displacement pump S10VO, Series 31

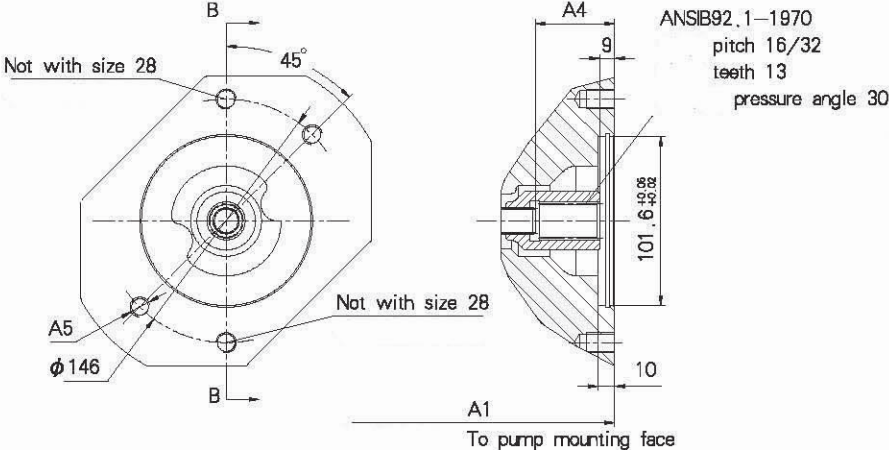
Dimensions of through drives

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



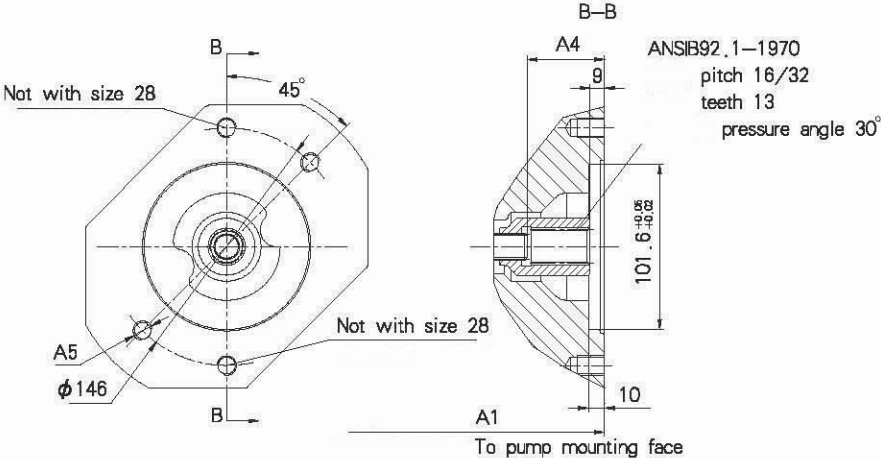
Sizes	A1	A4	A5
28	204	47	4-M10-6H, (16 deep)
45	229	53	6-M10-6H, (16 deep)
71	267	60	4-M10-6H, (20 deep)
100	338	65	6-M10-6H, (20 deep)
140			

Flange SAE 101-2 (SAE B, 2-hole) for mounting of external gear pump G3 or S10VO28 (shaft S); Ordering code K02



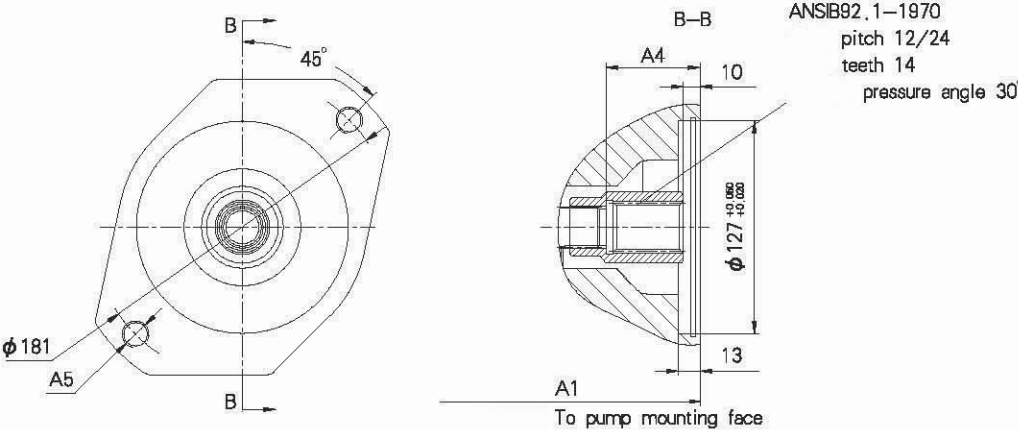
Sizes	A1	A4	A5
28	204	47	2-M12-6H, (15 deep)
45	229	53	4-M12-6H, (18 deep)
71	267	60	4-M12-6H, (20 deep)
100	338	65	4-M12-6H, (20 deep)
140			

Flange SAE 101-2 (SAE B, 2-hole) for mounting of G4 or S10VO28 (shaft S); Ordering code K68



Sizes	A1	A4	A5
28	204	47	2-M12-6H, (15 deep)
45	229	53	4-M12-6H, (18 deep)
71	267	60	4-M12-6H, (20 deep)
100	338	65	4-M12-6H, (20 deep)
140			

Flange SAE 127-2 (SAE C, 2-hole) for mounting of S10VO71 (shaft S); Ordering code K07

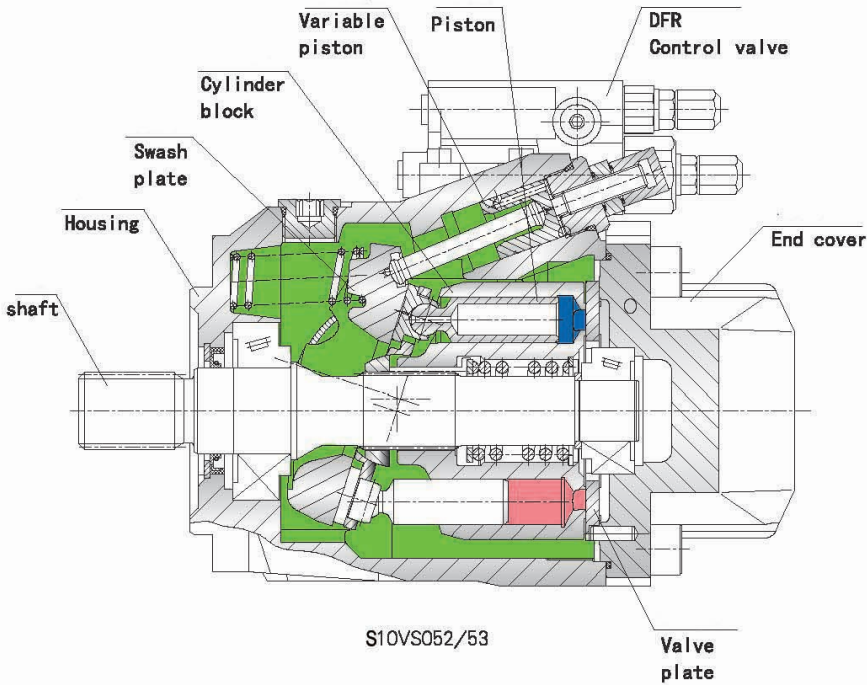


Sizes	A1	A4	A5
71	267	60	2-M16-6H, (18 deep)
100	338	65	2-M16-6H, (25 deep)
140			

Variable displacement pump S10VSO, Series 52/53



Features:
Axial piston pump S10VSO in swashplate design is used for hydrostatic transmissions in open loop circuits. Flow is proportional to drive speed and displacement. By adjusting the position of the swashplate it is possible to smoothly vary the flow.



- Flange connections to SAE-UNC or SAE metric
- 2 leakage ports
- High permissible speeds
- Good suction characteristics
- Low noise level
- High power/weight ratio
- Long service life
- Short control times
- Axial and radial loading of drive shaft possible
- Wide range of controls
- Through drive option for multi-circuit system

Technical data

- 1、 Absolute pressure at port S (A)
Pabs min.....0.8bar
Pabs max.....3bar

- 2、 Output operating pressure range
Pressure at port B
Nominal pressure P_N.....250bar
Peak pressure P_{max}.....315bar

- 3、 Case drain pressure
Maximum pressure of leakage fluid (at ports L, L1), Maximum 7 psi (0.5 bar) higher than input pressure at port S, but not higher than 30 psi (2 bar) absolute.

- 4、 Direction of flow
(S to B)

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

Size				28	45	60	85
Displacement		V _{gmax}	cm³	28	45	60	85
Max. speed	at V _{gmax}	n _{omax}	rpm		2600	2700	
Max. flow	at n _{omax}	Q _{omax}	L/min		117	162	
Max. power	at n _{omax}	P _{omax}	kW		49	68	
Max. torque	at V _{gmax}	T _{max}	Nm		179	238	
Weight (without fluid)		m	kg		18	22	

Notes: Values shown are valid for an absolute pressure of 1 bar at suction port ,If the flow is reduced or if the inlet pressure is increased the speed may be increased according to the diagram.

- 6、 Determination of size

Flow

$$Q = \frac{V_g \cdot n \cdot \eta_v}{1000}$$

[L/min]

Drive torque

$$T = \frac{1 \cdot 59 \cdot V_g \cdot \Delta P}{100 \cdot \eta_{mh}}$$

[N·m]

Drive power

$$P = \frac{2 \pi \cdot T \cdot n}{60000} = \frac{Q \cdot \Delta P}{600 \cdot \eta_t}$$

[Kw]

V_g=

geometric displacement [cm³] per rev.

ΔP=

differential pressure [bar]

n=

speed [rpm]

η_v=

volumetric efficiency

η_{mh}=

mechanical–hydraulic efficiency

η_t=

total efficiency (η_t=η_v·η_{mh})

Variable displacement pump S10VSO, Series 52/53

Ordering Code:

S10VS		O	45	DFR	/	52/53	R	-	P	S	C					62	N00
Axial piston unit																	
Swash plate variable pump		S10VS															
Mode of operation																	
Pump, open circuit															O		
Size																	
Displacement Vgmax (cm³)		28	45	60	85												
Control devices																	
pressure control		-	●	●	-	DR											
Remote control		-	●	●	-	DRG											
Pressure and flow control, I—		-	●	●	-	DFR											
X port closed		-	●	●	-	DFR1											
Series																	
Series															52/53		
Direction of rotation																	
Viewed on drive shaft															clockwise		R
															counter-clockwise		L
Seals																	
(NBR per DIN ISO 1629);															P		
FPM (fluorocarbon)															V		
Shaft end																	
		28	45	60	85												
SAE-splined shaft		-	●	●	-	S											
SAE-splined shaft, reinforced (higher thru drive torques)		-	●	○	-	R											
SAE-splined shaft, smaller size (not for pumps with thru drive)		-	●	●	-	U											
SAE-splined shaft, reinforced U-type shaft		-	-	-	-	W											
SAE-keyed shaft		-	●	○	-	K											
parallel with key DIN 6885		-	●	○	-	P											
Mounting flange																	
		28	45	60	85												
SAE 2 hole		-	●	●	-	C											
ISO 2 hole		-	○	○	-	A											
SAE 4 hole		-	○	●	-	D											

Thru-drive			28	45	60	85	
Without through drive			—	●	●	—	N00
With thru-drive, pump with side port only							
Mounting flange	Shaft/coupling	For the mounting of:					
82-2 (SAE A)	16-4 (SAE A)	G2, GC2/GC3-1X	—	●	○	—	K01
101-2 (SAE B)	25-4 (SAE B-B)	S10VS045 (shaft S);PGH4	—	●	○	—	K04
100-2		Gear pump	—	●	—	—	K10
80-2	Keyed shaft	Gear pump	—	●	—	—	KP1

Service ports (Pressure port B and Suction port S)						28	45	60	85
Rear ports, UNC mounting screws	–	○	●	–	61	Port pos. 61, 11and 64 only for version without through drive			
Opposite side ports, UNC mounting screws	–	●	●	–	62				
Rear ports,metric mounting screws	–	○	●	–	11				
Opposite side ports, metric mounting screws	–	●	●	–	12				
SAE-threaded rear	–	●	○	–	64				

● = available

○ = in preparation

- = not available

Multiple pumps

1. If a second hydraulic pump is to be factory-mounted, then both ordering codes are to be specified, combined with a "+" . Ordering code 1st pump + Ordering code 2nd pump
- Ordering example: S10VSO45DFR/52R-PSC62K04+S10VSO45DR/52R-PSC62N00
2. If a gear pump is to be factory-mounted please contact us.

Variable displacement pump 10VSO, Series 52/53

Fluid

- 1、 Fluid : MR20S(Q/TCNK12-2001)
- 2、 Operating viscosity range

For optimum efficiency and service life we recommend that the operating viscosity (at operating temperature) be selected in the range:

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

referred to tank temperature (open loop circuit).

Limits of viscosity range

The following values are valid for extreme operating conditions:

$$V_{min} = 10\text{ mm}^2/\text{s}$$

for short periods at max. leakage oil temperature of 80°C.

$$V_{max} = 1000\text{ mm}^2/\text{s}$$

for short periods upon cold start.

- 3、 Temperature range
 $t_{min} = -20^{\circ}\text{C}$; $t_{max} = +80^{\circ}\text{C}$

- 4、 Filtration

In order to ensure reliable operation of the axial piston unit, the operating fluid must be maintained to a cleanliness class of at least, 16/19 to ISO4406. This may be achieved with filter elements, cleanliness class of pump leakage fluid 10um.

PERFORMANCE DATA

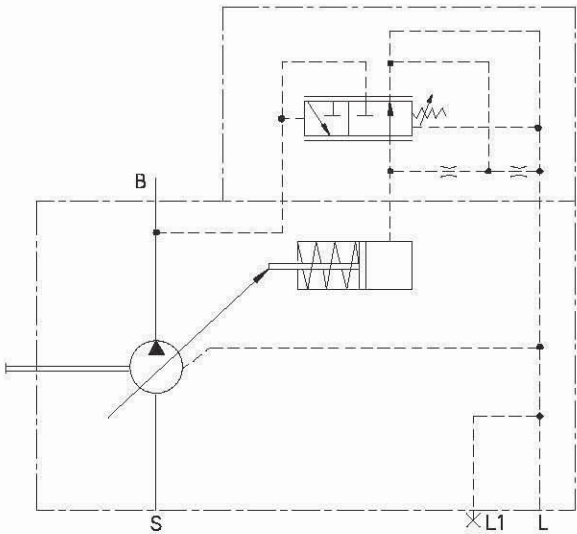
Installation notes

The pump housing must be filled with fluid during commissioning and remain full when operating.

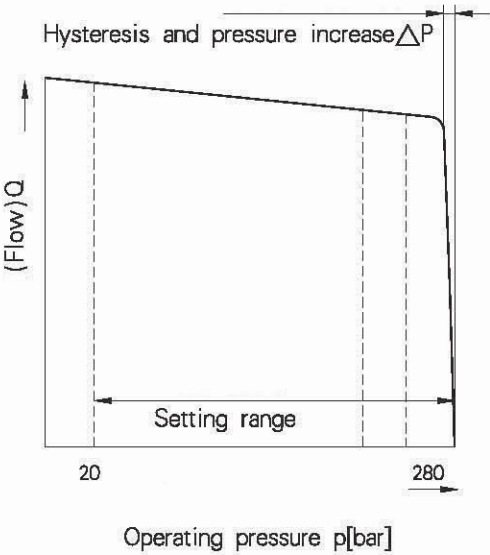
The concentricity between engine transmission shaft and pump shaft must less than $\Phi 0.05\text{mm}$

DR Pressure control

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



Static characteristic
(at $n=1450\text{rpm}$, $t_{oil}=50^{\circ}\text{C}$)



Ports

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

Control data

Hysteresis and repetitive accuracy Δp max. 3 bar

Max. pressure increase

Size		28	45	60	85
ΔP	Bar		6	8	

Pilot oil consumption..... max. approx. 3 L/min

Variable displacement pump S10VSO, Series 52/53

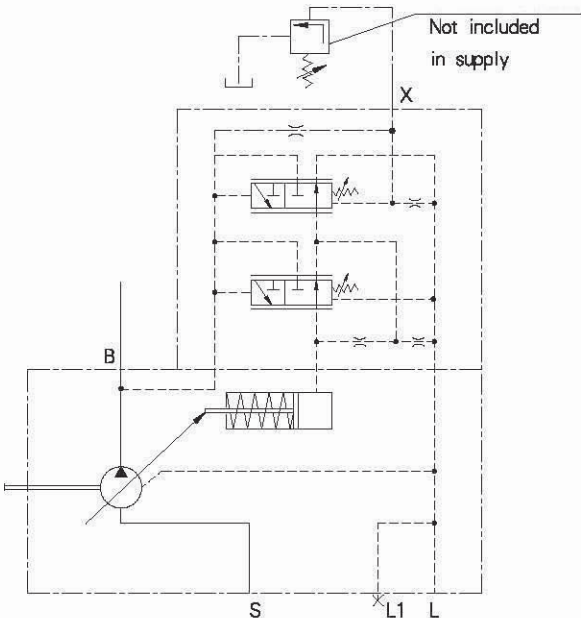
DFR/DFR1 Pressure/flow control

DRG Pressure control, remote control

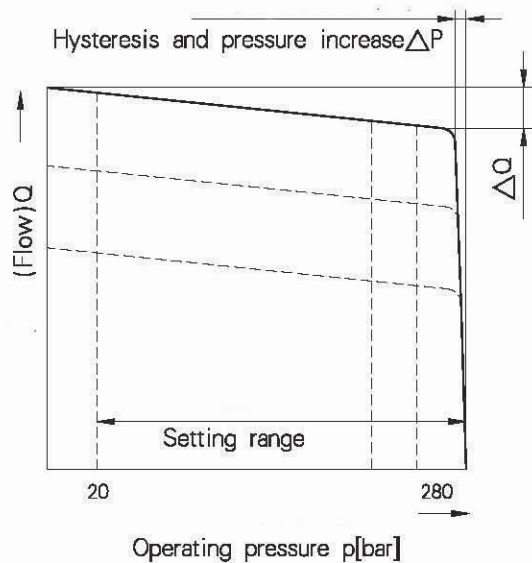
Function and design as for DR.

A pressure relief valve may be externally piped to port X for remote control purposes. It is not, however, included with the DRG control.

The differential pressure at the pilot valve is set as standard to 20 bar and this results in a pilot flow of 1,5 L/min. If another setting is required (in the range 10–22 bar), please state this in clear text.



Static characteristic
(at $n_1=1450\text{rpm}$; $t_{oil}=50^\circ\text{C}$)



Ports	
B	Pressure port
S	Suction port
L, L1	Case drain ports (L1 sealed)
X	Pilot pressure port

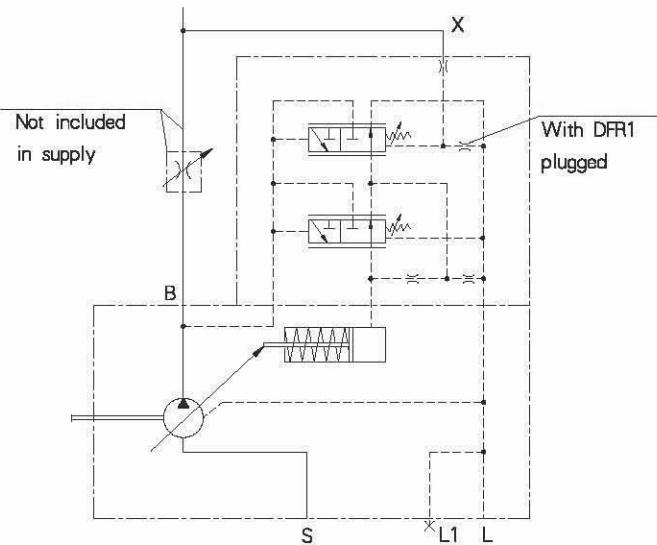
Control data

Hysteresis and repetitive accuracy ΔP max. 3 bar

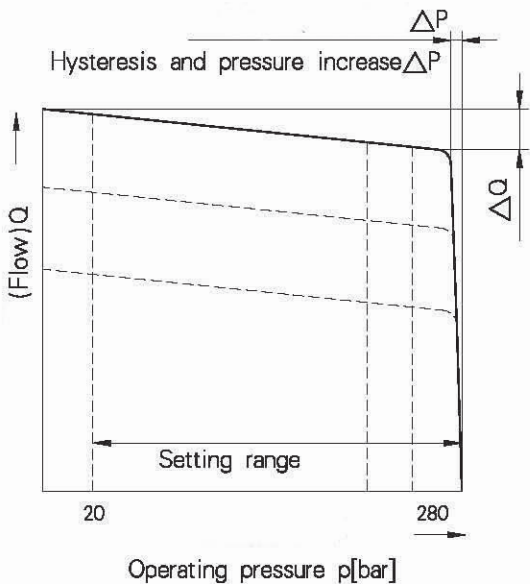
Max. pressure increase		28	45	60	85
Size					
ΔP	Bar		6	8	

Pilot oil consumption max. approx. 4.5 L/min

In addition to the pressure control function, the pump flow may be varied by means of a differential pressure at the actuator (e.g. an orifice).
In model DFR1 the X orifice is plugged.



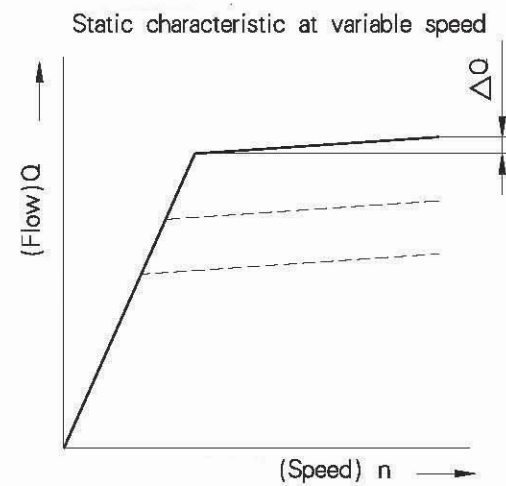
Static characteristic
(at $n_1=1450\text{rpm}$; $t_{oil}=50^\circ\text{C}$)



Ports

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

Variable displacement pump S10VSO, Series 52/53



Flow control/differential pressure Δp :

Adjustable between 10 and 22 bar (higher values on request) Standard setting: 14 bar. If a different setting is required, please state in clear text.

When port X is unloaded to tank, a zero stroke pressure of
 $p = 18.2 \text{ bar}$ ("stand by") results.

Control data

For pressure control technical data see DR Pressure control

Max. flow deviation (hysteresis and increase) measured at drive speed $n = 1450$ rpm

Size		28	45	60	85
ΔQ_{max}	L/min		1.8	2.5	

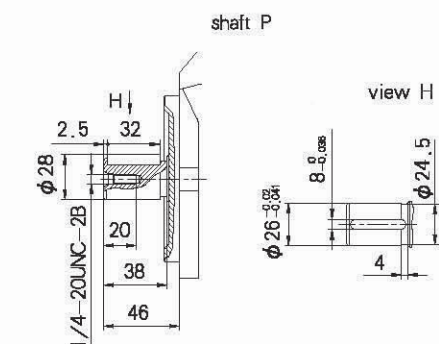
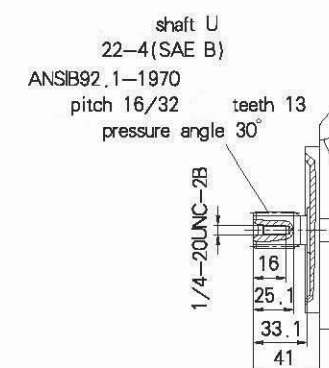
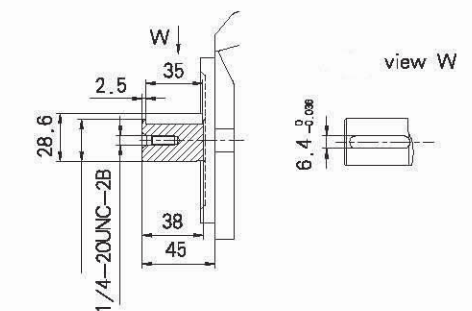
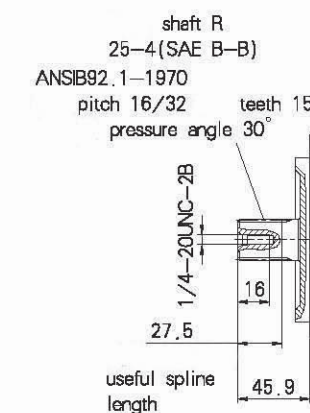
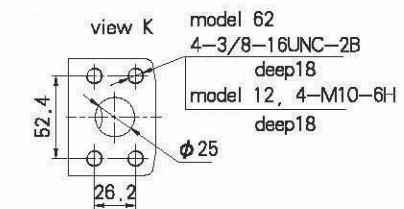
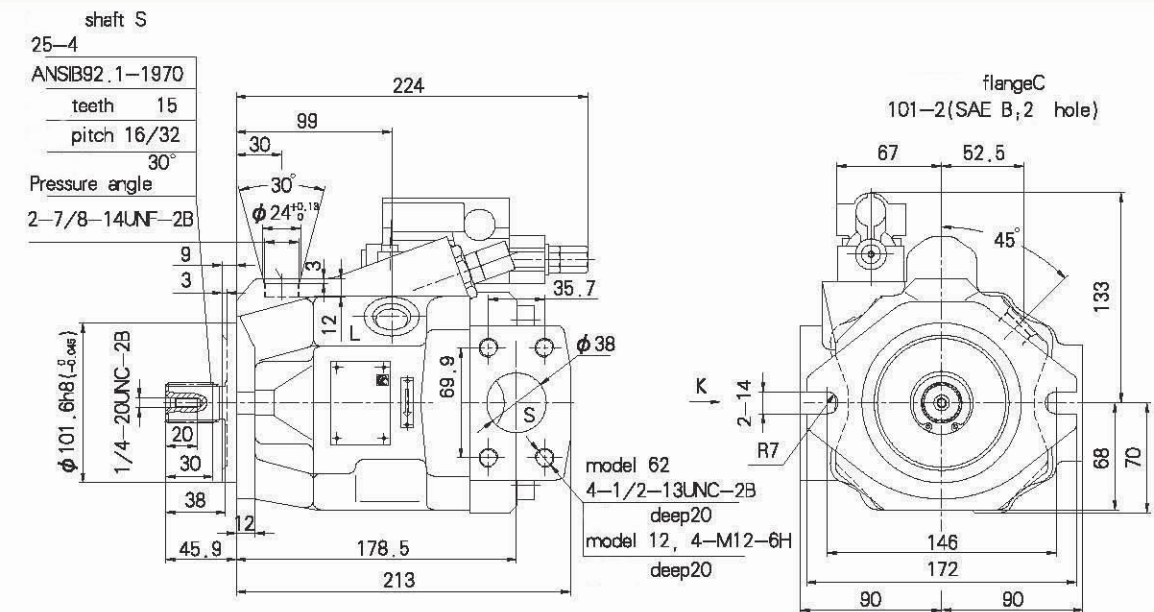
Pilot oil consumption DFR.....max. approx. 3–4.5 L/min

Pilot oil consumption DFR1max, approx. 3 L/min

Mounting Dimension, Sizes 45

Pressure control DR

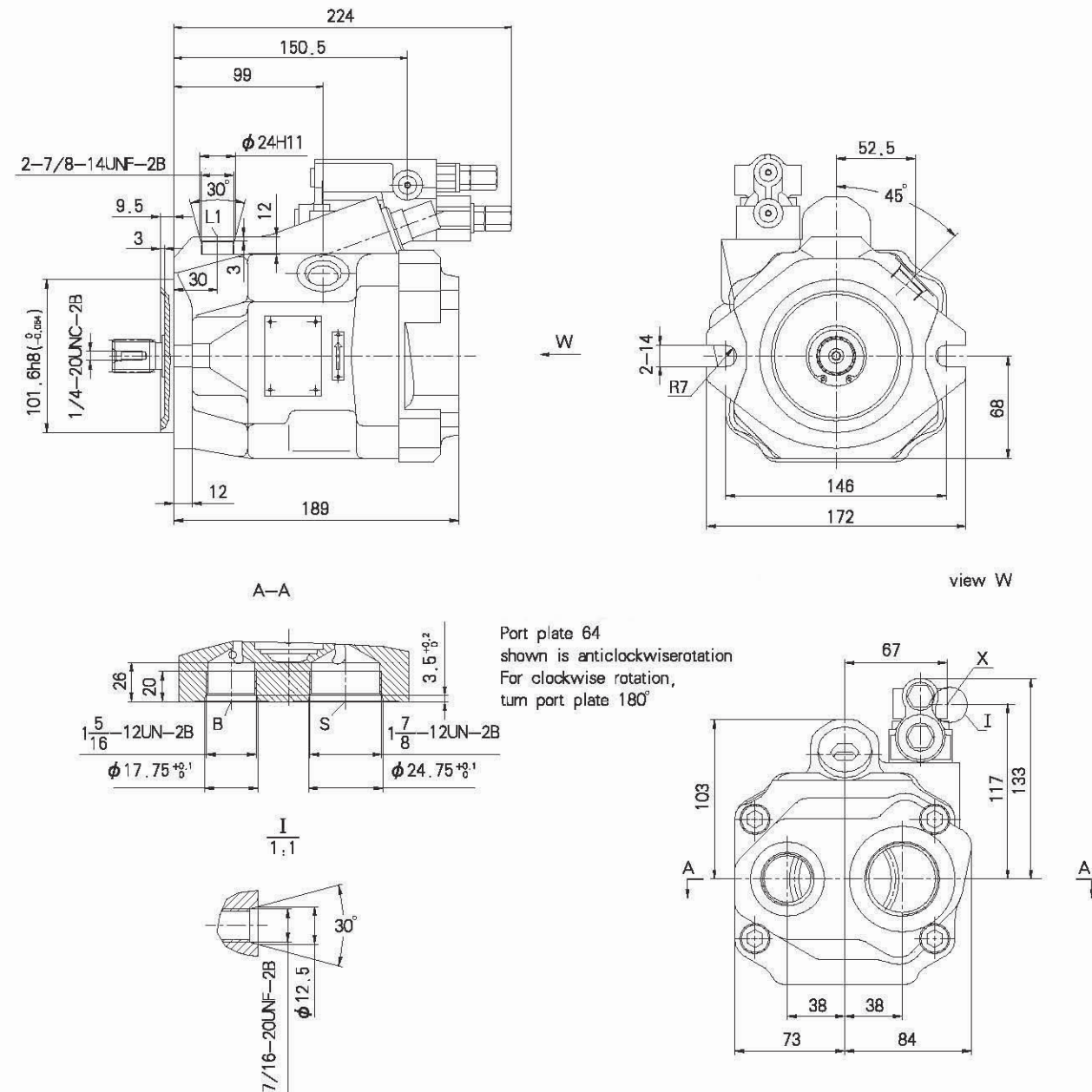
Version S10VSO45DR/52R-XXC62/12N00



Variable displacement pump S10VSO, Series 52/53

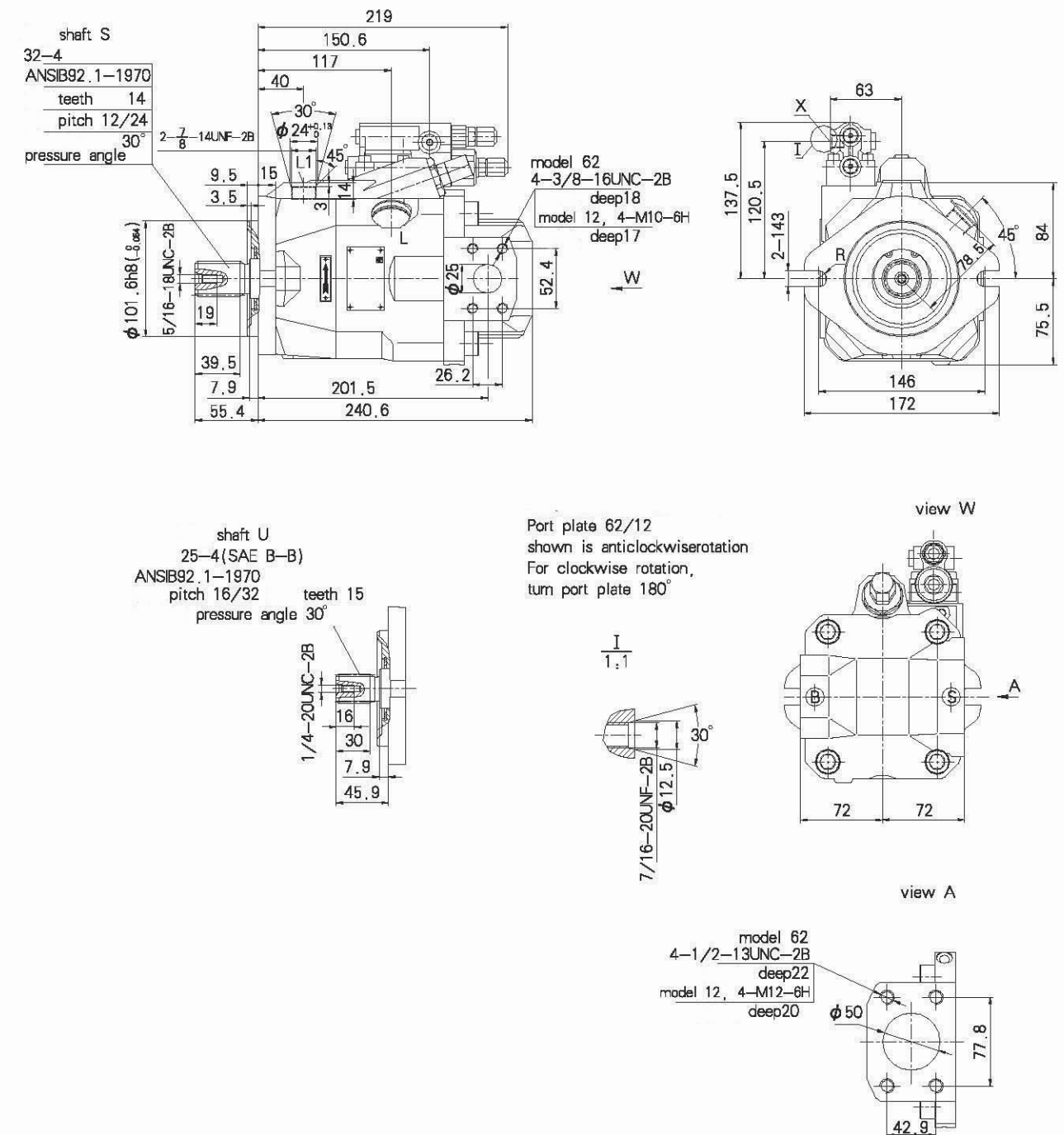
Mounting Dimension, Sizes 45

Version S10VSO45 DFR1 /52L-XXC64N00
DRG



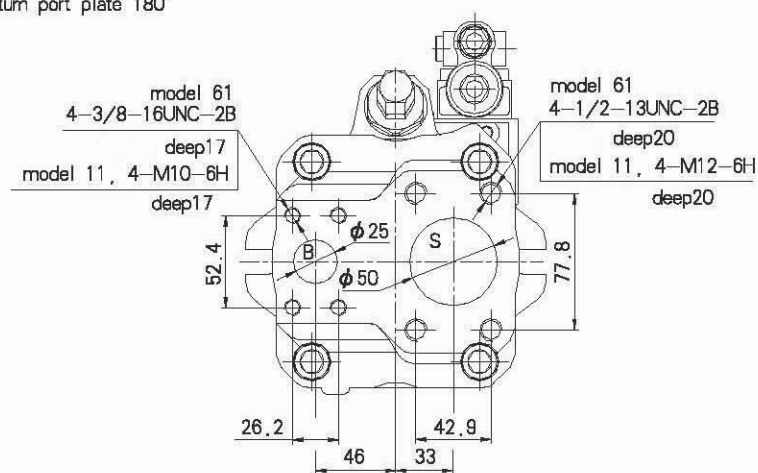
Mounting Dimension, Sizes 60

Version S10VSO60 DFR1 /53L-XXC62/12N00
DRG

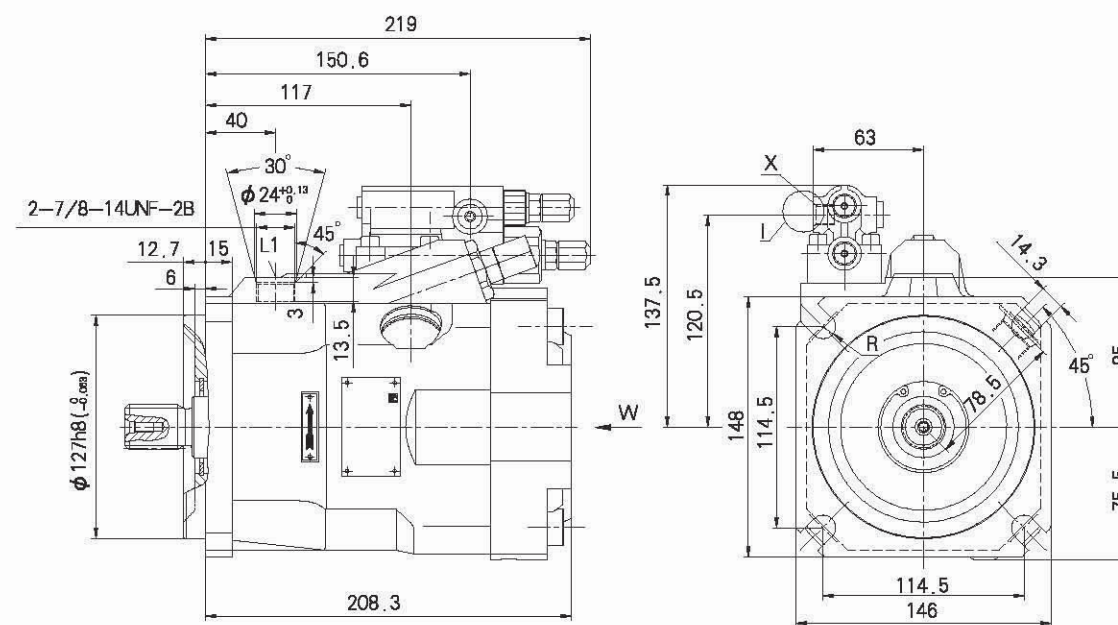


Mounting Dimension, Sizes 60

view W

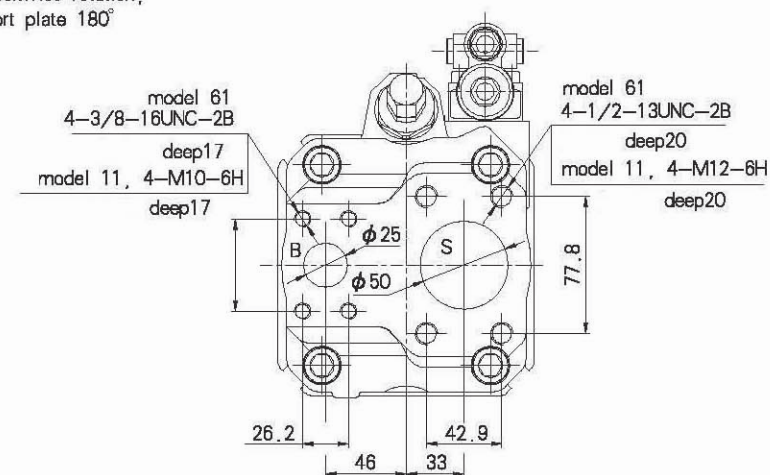


Version S10VSO60 DFR
DFR1 /53L-XXD61/11N00
DRG

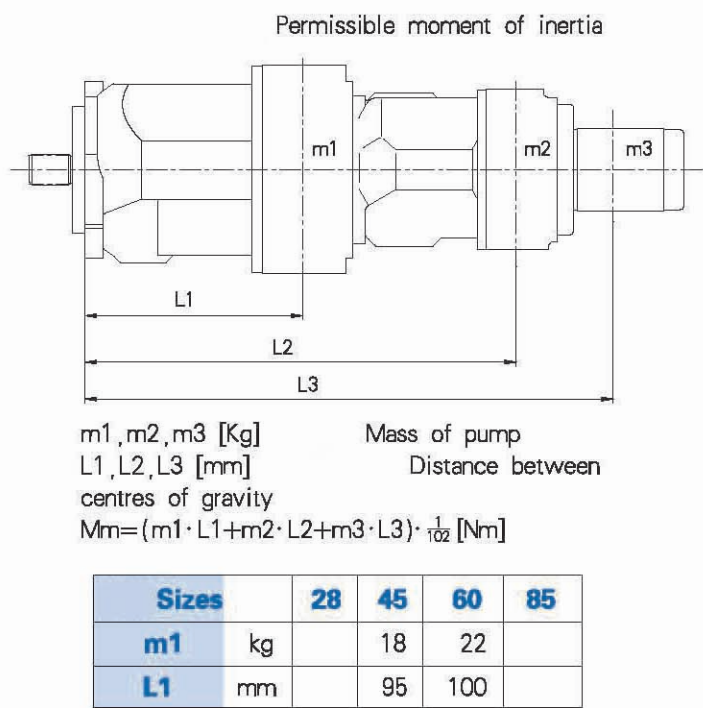


Port plate 61/11
shown is anticlockwise rotation
For clockwise rotation,
turn port plate 180°

view W



Variable displacement pump 10VSO, Series 52/53



Through drive

Axial piston unit S10VO can be supplied with a through drive, as shown in the ordering code on page 3.

The type of through drive is determined by codes (K01–K04). If the combination pump is not mounted in the factory, the simple type code is sufficient.

Included in this case are:

coupling sleeve, seals and if necessary a sandwich flange.

Combination pumps

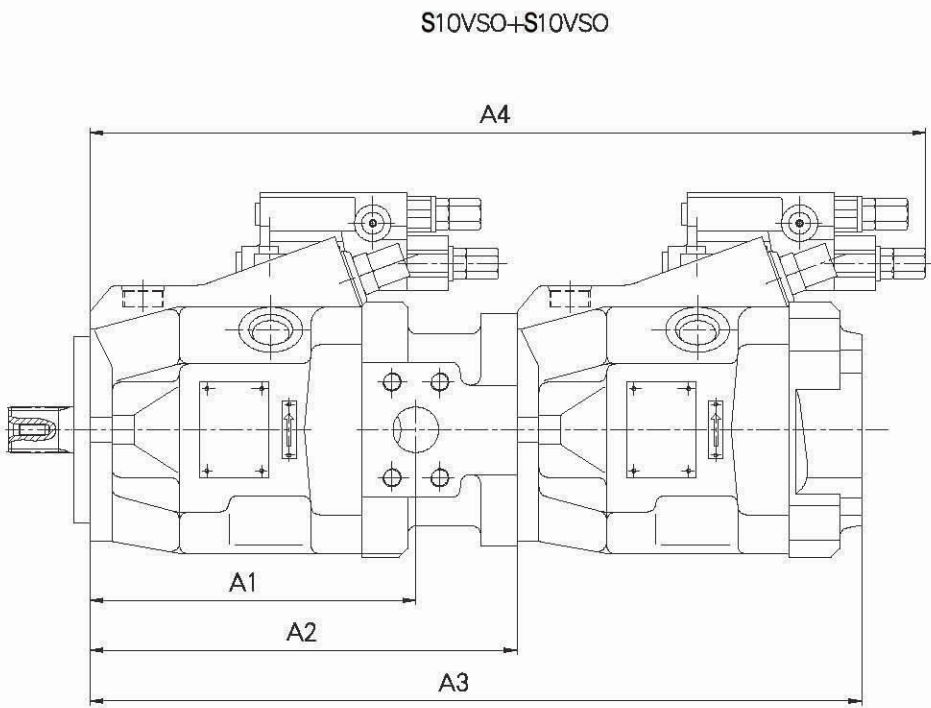
By mounting combination pumps circuits independent of each other are available for use.

1. If the combination pump consists of 2 S10VO pumps and if these are to be delivered ready assembled, then the two type codes are to be combined with a "+".

Ordering example: S10VSO45DR/52R–PSC62K04 +S10VSO45DFR/52R–PSC62N00

2. If a gear pump or radial piston pump is to be mounted in the factory as a second pump. It contains a list of the various pump combinations together with the type code of the first pump.

Unit dimensions of combination pumps

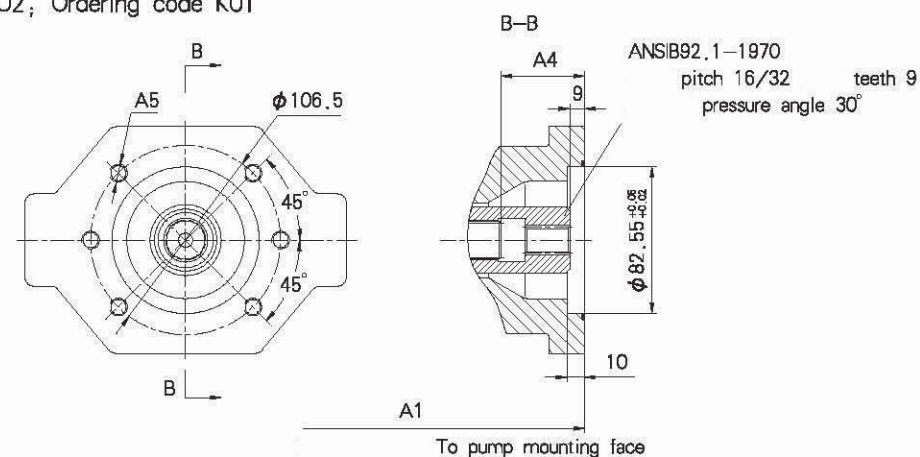


Pump 1 Pump 2	S10VSO28				S10VSO45				S10VSO60				S10VSO85			
	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4	A1	A2	A3	A4
S10VS028																
S10VS045	—	—	—	—	178	229	418	445	202	255	444	471				
S10VS060	—	—	—	—	—	—	—	—	202	255	463	471				
S10VS085	—	—	—	—	—	—	—	—	—	—	—	—				

Variable displacement pump S10VSO, Series 52/53

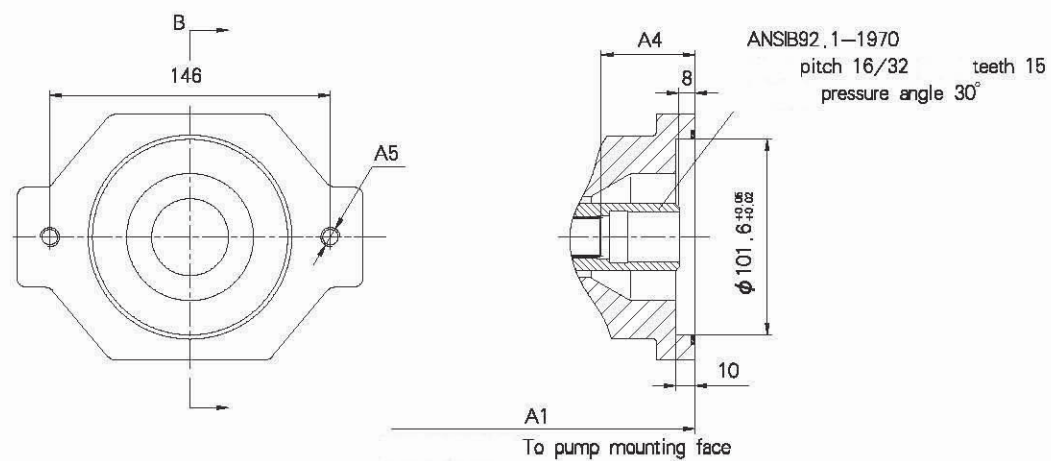
Dimensions of through drives

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



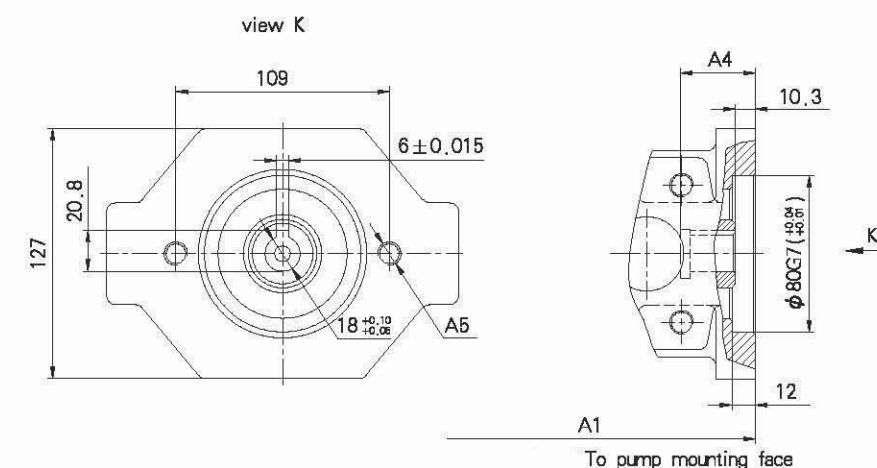
Sizes	A1	A4	A5	
28				
45	234	53	6—M10—6H	(16 deep)
60	255	59	6—M10—6H	(16 deep)
85				

Flange SAE 101-2 (SAE B, 2-hole) for mounting an S10VSO45 — shaft S or an internally geared gear pump PGH4; Ordering code K04



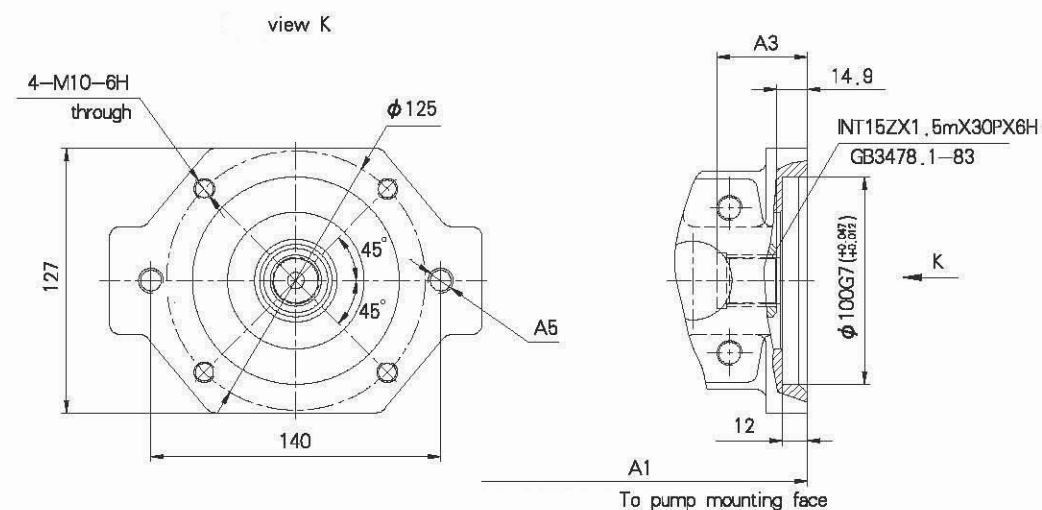
Sizes	A1	A4	A5	
45	234	53	2—M12—6H	(18 deep)
60	255	59	2—M12—6H	(18 deep)

Flange 80-2 (2-hole) for mounting of gear pump; Ordering code KP1



Sizes	A1	A4	A5
45	234	38.3	2—M10—6H (18 deep)

Flange 100-2 (2-hole) for mounting of gear pump; Ordering code K10



Sizes	A1	A4	A5
45	234	43.9	2-M12-6H (18 deep)