MACHYDRA

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SCAN ME

Product Technical Manual

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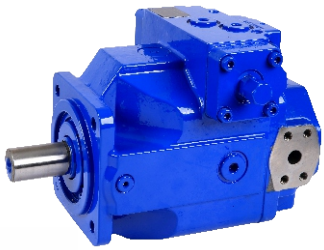
Products serve customers,quality builds brand

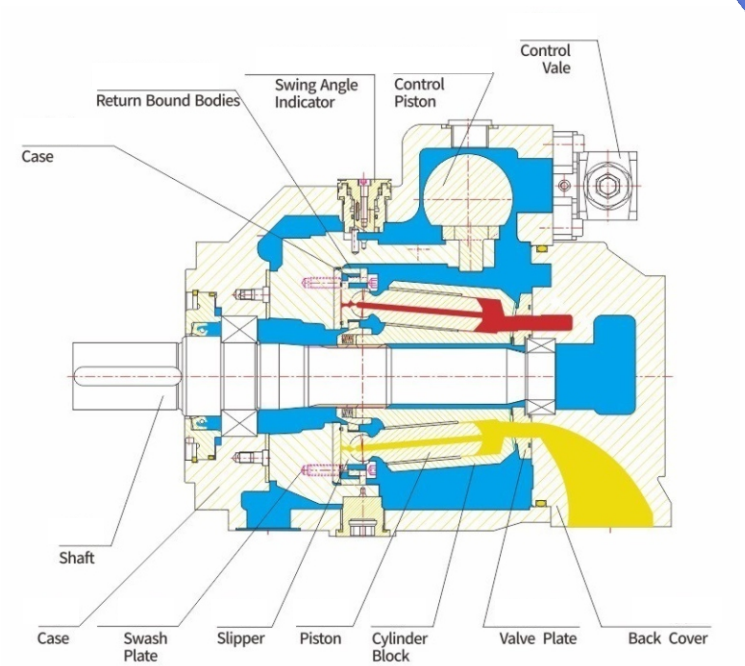
CONTENTS

Variable Displacement Piston Pump OS–A4VSO

Overview



This product is an axial piston pump in swash plate design for hydrostatic drives in open circuit operation. With through–shaft construction, its rated pressure is up to 35MPa.



Features

※ The capacity of the pump is in proportion to its rotating speed and displacement; the stepless adjustment of the displacement can be materialized by regulating the swivel angle of its swash plate;
※ With through–shaft structure, able to form combination pump;
※ Position constraint return mechanism;
※ Spherical flow distribution, the piston is inclined around the shaft;
※ Equipped with swivel angle indicator of swash plate;
※ Stepless variable displacement;
※ Excellent suction performance;
※ Rated working pressure of 35MPa;
※ Fast control response;
※ Low noise;
※ Long lifespan;
※ Excellent power/weight ratio;
※ Modular design;
※ The drive shaft is able to bear the axial and radial load;
※ Optional installation position;
※ It can operate with HF fluid to lower the operating parameter.

Type Code

OS–	E	A4V	S	O	125	DR	/	30	R	–	P	P	B	25	U	34
	1	2	3	4	5	6		7	8		9	10	11	12	13	14

1–Operating Medium

Mineral oil（ No Code ）	
HFA、HFB、HFC Hydraulic fluid	E

2–Machinery Type

Axial piston， swash plate design， variable	A4V

3–Speed

Normol speed	S
High Speed	L

4–Operational Mode

Open circuit	O

5–Size

Nominal displacement mL/r	40	71	125	180	200	250	280	355	

6–Control devices

Pressure control DR	●	●	●	●	●	●	●	●	DR
Flow control FR	●	●	●	●	●	●	●	●	FR
Pressure and flow control DFR	●	●	●	●	●	●	●	●	DFR
Power control with hyperbolic curve LR2	●	●	●	●	●	●	●	●	LR2
Constant power remote pressure control LR2G	●	●	●	●	●	●	●	●	LR2G
Constant power pressure control LR2D	●	●	●	●	●	●	●	●	LR2D
Manual control MA	●	●	●	●	●	●	●	●	MA
Hydraulic flow control	○	○	●	●	●	●	●	●	E02

7–Series

	●	●	–	–	–	–	–	–	10
	–	–	●	●	●	●	●	●	30

8–Rotating Direction（ View on Shaft End ）

Clockwise	R
Counterclockwise	L

9–Seals

Shaft seal FKM	P
FKM	V

10–Shaft End

Keyed shaft DIN6885	P
Splined shaft DIN5480	Z

Chart shows：●= Available，O=In preparation，–=Not available

11–Mounting Flange

ISO 4 Hole	B

12,13–Ports Type

Suction port S, Pressure port B, Auxiliary port B_1	13
Suction port S, Pressure port B, The second pressure port B_1	25

14 –Through Drive

			40	71	125	180	200	250	300	355	
Without through drive			●	●	●	●	●	●	●	●	N00
With through drive, mounting dimensions are as follows			●	●	–	–	–	–	–	–	K
Universal through drive, mounting dimensions are as follows			–	–	●	●	●	●	●	●	U
Flange	Splined shaft	To mount pump									
ISO125, 4	W32x2x30x14x9g	–A4VSO40	●	●	●	●	●	●	●	●	31
ISO140, 4	W40x2x30x18x9g	OS–A4VSO71	–	●	●	●	●	●	●	●	33
ISO160, 4	W50x2x30x24x9g	OS–A4VSO125	–	–	●	●	●	●	●	●	34
ISO160, 4	W50x2x30x24x9g	OS–A4VSO180/200		–	–	●	●	●	●	●	34
ISO224, 4	W60x2x30x28x9g	OS–A4VSO250/280	–	–	–	–	–	●	●	●	35
ISO224, 4	W70x3x30x22x9g	OS–A4VSO355	–	–	–	–	–	–	–	●	77
ISO80, 2	3/4in11T16/32DP S	OS–A10VS018	●	●	○	○	○	○	○	○	B2
ISO100, 2	7/8in13T16/32DP S	OS–A10VSO28	●	●	●	●	●	●	●	●	B3
ISO100, 2	1in15T16/32DP S	OS–A10VS045	●	●	●	●	●	●	●	●	B4
ISO125, 2	1 1/4in14T12/24DP S	OS–A10VS071/31	–	●	●	●	●	●	●	●	B5
ISO125, 2	1 1/2in17T12/24DP S	OS–A10VS0100/31	–	–	●	●	●	●	●	●	B6
ISO180, 4	1 3/4in13T8/16DP S	OS–A10VSO140	–	–	–	●	●	●	●	●	B7
ISO160, 4	1 1/4in14T12/24DP S	OS–A10VSO71/32	–	○	○	○	○	○	○	○	B8
ISO180, 4	1 1/2in17T12/24DP S	OS–A10VSO100/32	–	–	○	○	○	○	○	○	B9
SAE82, 2	3/4in11T16/32DP S	OS–A10VSO18	●	●	○	○	○	○	○	○	52
SAE101, 2	7/8in13T16/32DP S	OS–A10VO28	●	●	●	●	●	●	●	●	68
SAE101, 2	1in15T16/32DP S	OS–A10VO45	●	●	●	●	●	●	●	●	04
SAE127, 2	1 1/4in14T12/24DP S	OS–A10VO71	–	●	●	●	●	●	●	●	07
SAE127, 2	1 1/2in17T12/24DP S	OS–A10V0100	–	–	●	●	●	●	●	●	24
SAE152, 4	1 3/4in13T8/16DP S	OS–A10VO140	–	–	–	●	●	●	●	●	17
With through drive shaft, wvithout coupler closed with blind flange.			●	●	●	●	●	●	●	●	99

Two pumps can be connectec in series by their heac and end, namely integrated to be a combination pump by the means of through–shaft, and the second pump of the series combination is called the subordinate pump.

In case of placing an order, the combination pump model equals to the model of the first pump + the model of the second.

Illustrat on of combination pump model:CR–A4VSO125DR/30R–PPB13U34+CR–A4VSO125DR/30R–PPB13N00

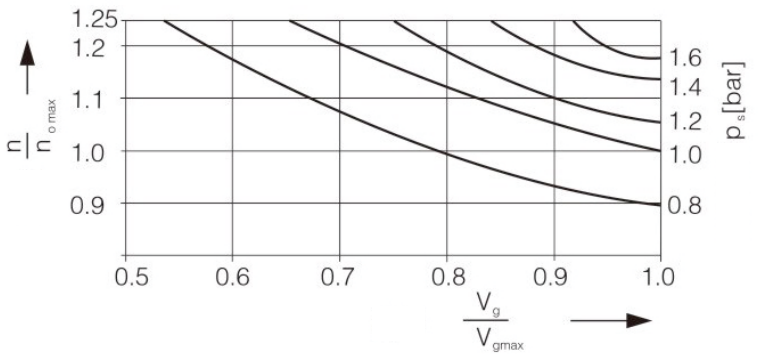
Technical Data

1、Range of operating pressure——Side of inlet

Pressure at suction port S（absolute pressure）

$p_{s\,min}$ 0.8bar

$p_{s\,max}$ 30bar



Inlet pressure is static input pressure or minimum dynamic value of boost pressure.

2、Range of operating pressure——Side of outlet

Pressure at port B (absolute pressure)

p_n ..... 350 bar

p_{max} ..... 400 bar

p_{min} ..... 15 bar

3、Flowing Direction

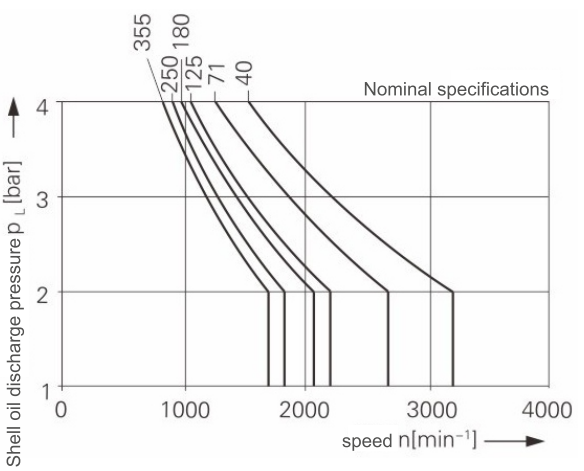
S→B

4、Case Drain Pressure

The allowed maximum case drain pressure (absolute pressure) depends on the rotating speed of the pump. Please see the figure.

The maximum case drain pressure (absolute pressure)：

P_{Lmax} 4 bar



This is approximate value. This value needs to be decreased under some operating conditions.

5、The Parameter List (theoretical values)

Size				40	71	125	180/H	200	250/H	280	355/H
Displacement		$V_{g\,max}$	mL/r	40	71	125	180/180	200	250/250	280	355/355
Max. Speed	$V_g = V_{g\,max}$	$n_{o\,max}$	r/min	2600	2200	1800	1800/2000	1800	1500/1900	1500	1500/1700
	$V_g < V_{g\,max}$		r/min	3200	2700	2200	2100/2200	2100	1800/2100	1800	1700
Flow	$n = n_{o\,max}$	$q_{vo\,max}$	L/min	104	156	225	324/360	360	375/475	420	533/604
	n = 1500 r/min		L/min	60	107	186	270	420	375	504	533
Power △p= 350 bar	$n = n_{o\,max}$	$p_{o\,max}$	kW	61	91	131	189	210	219/277	245	311/352
	n = 1500 r/min		kW	35	62	109	158	245	219	294	311
Torque $V_g = V_{g\,max}$	△ p=350 bar	T_{max}	Nm	223	395	696	1002	1114	1391	1560	1976
	△ p=100 bar	T	Nm	64	113	199	286	318	398	445	564
Inertia moment of the drive shaft		J	kgm^2	0.0049	0.0121	0.03	0.055	0.055	0.0959	0.0959	0.19
Volume of case			L	2	2.5	5	4	4	10	10	8
Weight			kg	39	53	88	102	102	184	184	207
Permissibleload of the drive shaft	Max.axial force		N	600	800	1000	1400	1400	1800	1800	2000
	Max.radial force		N	1000	1200	1600	2000	2000	2000	2000	2200

1) Once Vg=Vgmax, the value is applicable for the condition in which inlet pressure at Suction Port S equals to 1 bar, the absolute pressure; when the inlet pressure ps increases or the displacement decreases, the rotating speed will increase; once Vg < Vgmax, the value amounts to the limit of the rotating speed.

Bearing flushing

For the axial piston variable pump A4VSO at the following operating conditions bearing flushing is required for a safe, ontinuons operation.

——Applications with special fluids (non mineral oils)due to limited lubricity and narrow operating emperature range.

——Operation at critical conditions of temperature and viscosity with mineral oil and vertical mounting (drive shaft facing upwards).

Flushingis recommended in order to ensure lubrication of the front bearing and shaft seal.

Flushing is carried out via port "U" located in the front bearing and leaves the pump together with the case drain flow.

Regarding series 30 when using external bearing flushing the throttle screw at port U must be turned in to the end stop.

Depending on pump size, the following flushing flows are recommended:

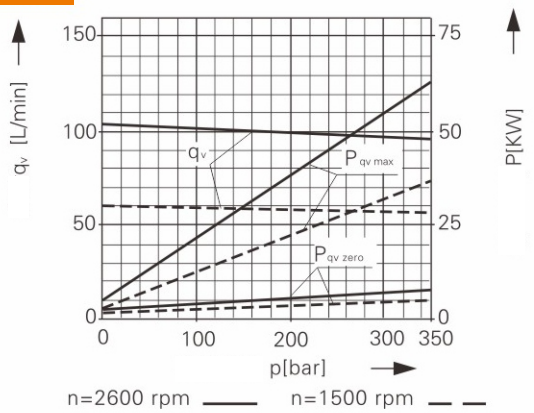
Size	40	71	125	180/200	250/280	355
Flow	3	4	5	7	10	15

These recommended flushing flows will cause a pressure drop of approx. 2bar (series 10) and 3 bar (series 30) between the entrance to port U and the pump case.

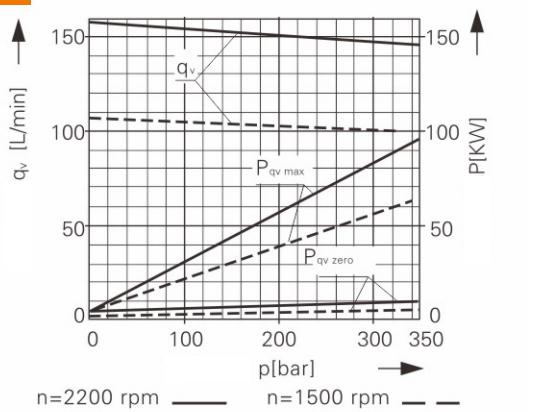
Characteristic curves

Drive power and flow

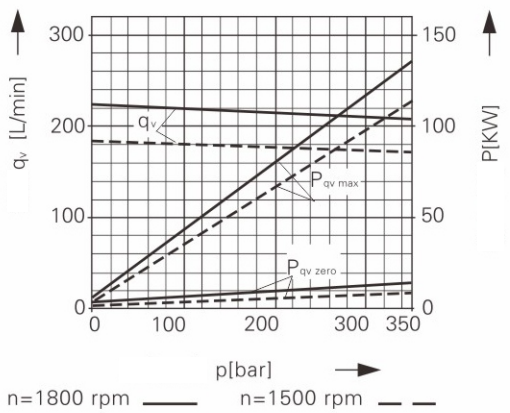
Size 40



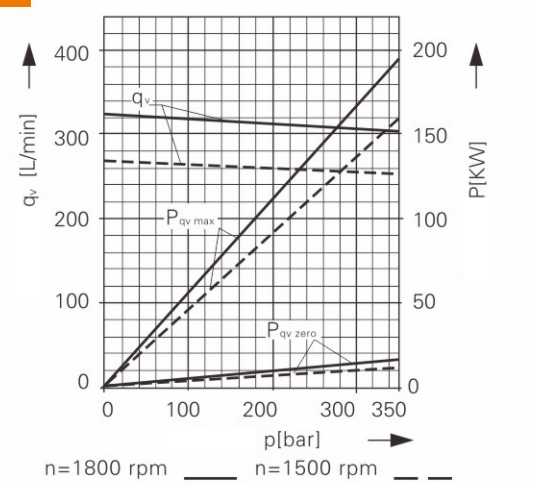
Size 71



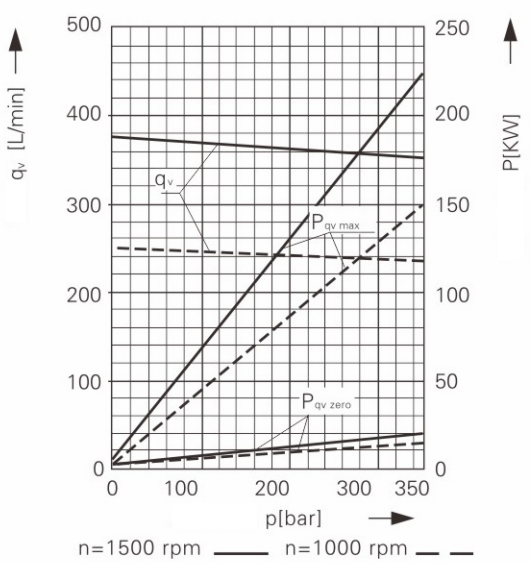
Size 125



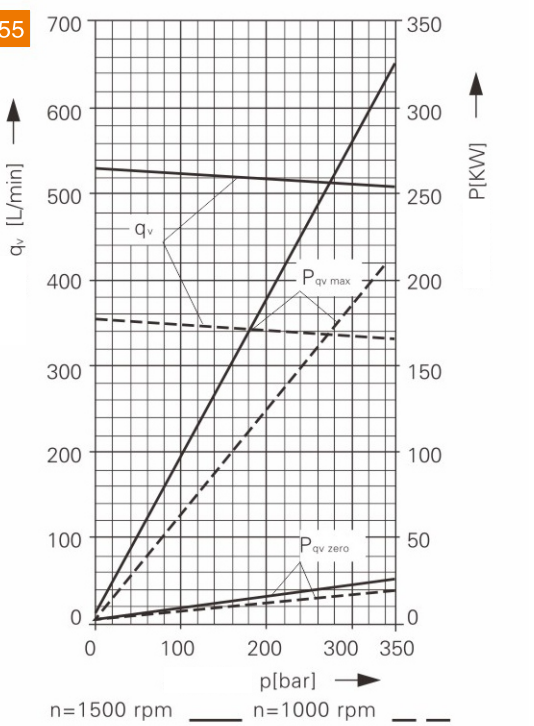
Size 180



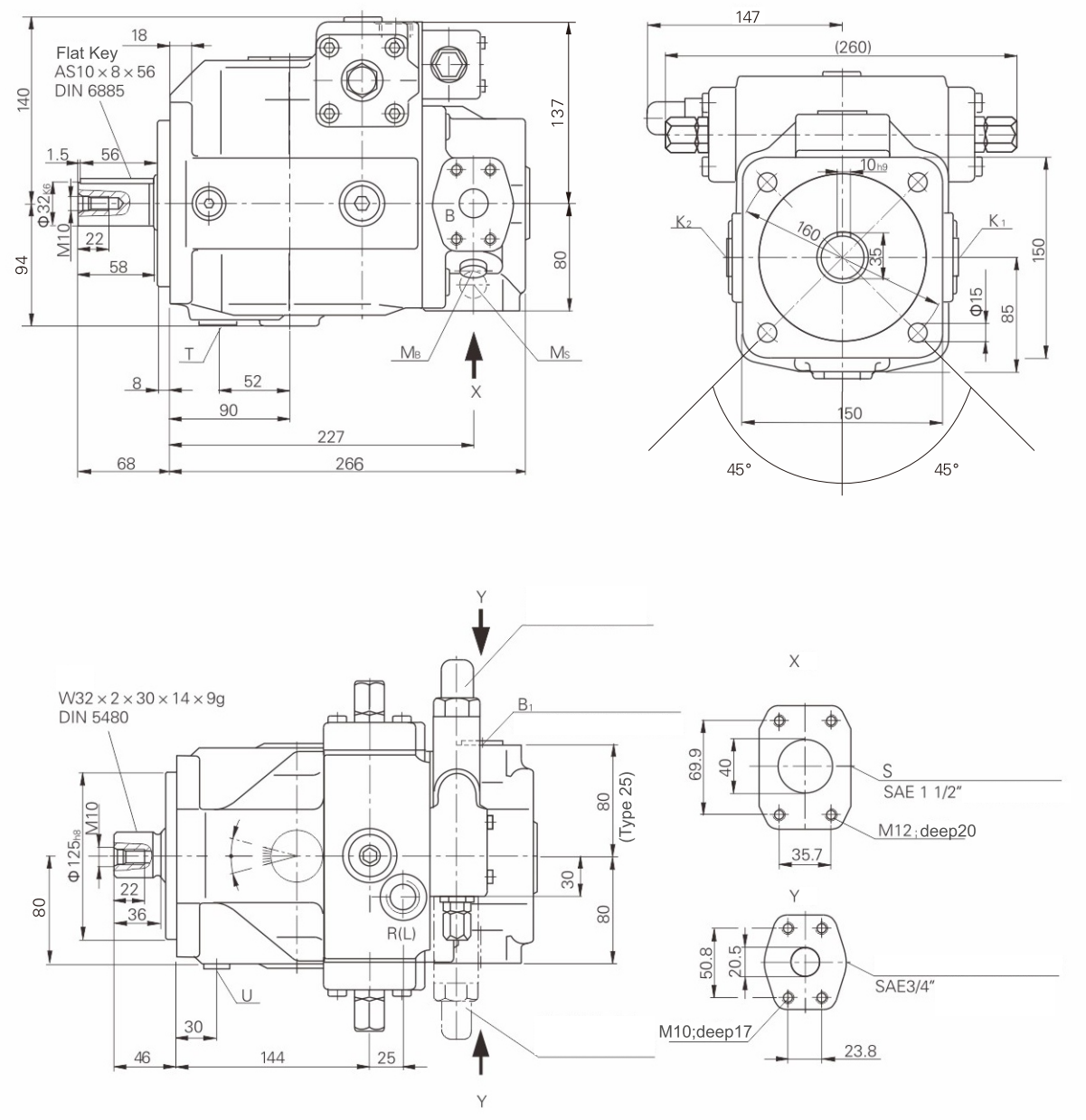
Size 250



Size 355



Dimension Size 40, Series 10 （Example: pressure control）



Ports type 13

B	pressure port
B1	auxiliary port

Ports type 25

B	pressure port
B1	second pressure port

Other ports

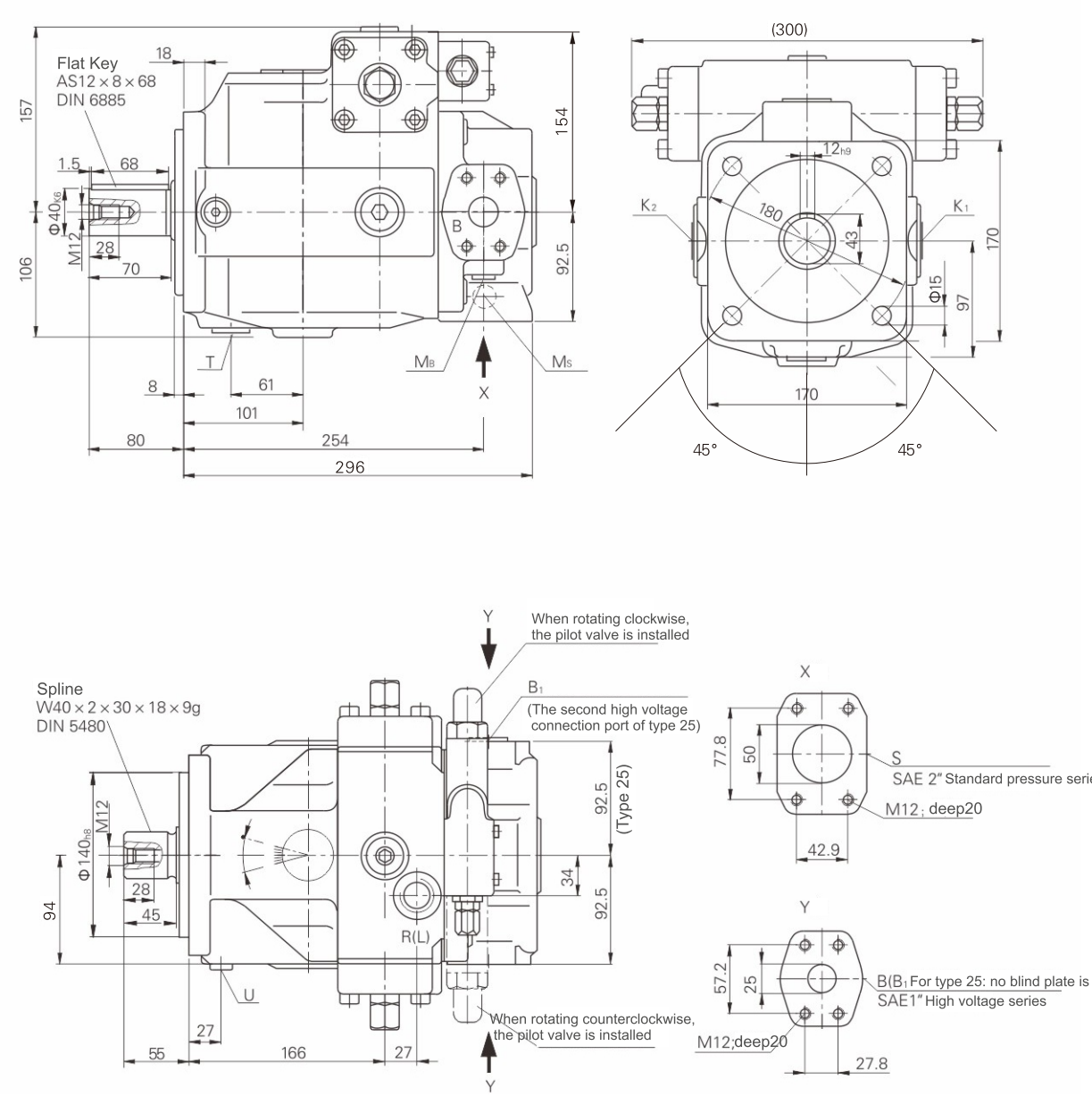
S	suction port
K1,K2	flushing port
T	drain port
MB,MS	measuring port
R(L)	filling port + bleed port
U	flushing port

SAE3/4" (High voltage series high pressure series)
M22 x 1.5 deep depth14 (plugged)

SAE3/4" (High voltage series high pressure series)
SAE3/4" (High voltage series high pressure series) (closed)

SAE1 1/2" (standard series)
M22 x 1.5 deep depth14 (plugged)
M22 x 1.5 deep depth14 (plugged)
M14 x 1.5 deepdepth12 (plugged)
M22 x 1.5
M14 x 1.5 deep depth12 (plugged)

Dimension Size 71, Series 10 （Example: pressure control）



Ports type 13

B	pressure port
B1	auxiliary port

Ports type 25

B	pressure port
B1	second pressure port

Other ports

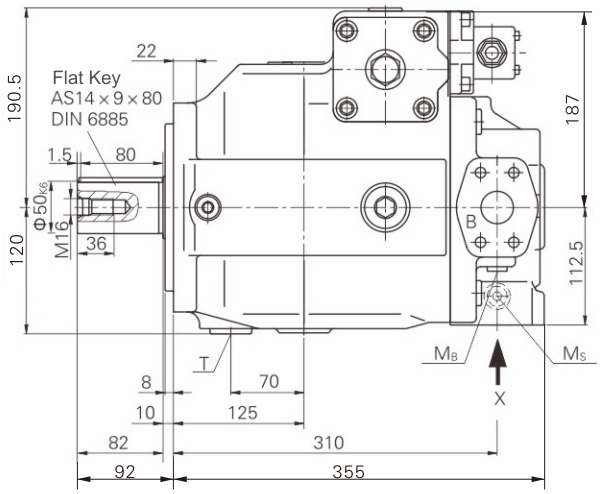
S	suction port
K1,K2	flushing port
T	drain port
MB,MS	measuring port
R(L)	filling port + bleed port
U	flushing port

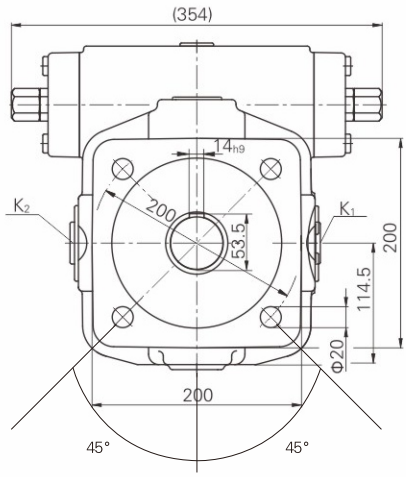
SAE1" (high pressure series)
M27 x 2 深depth16 (plugged)

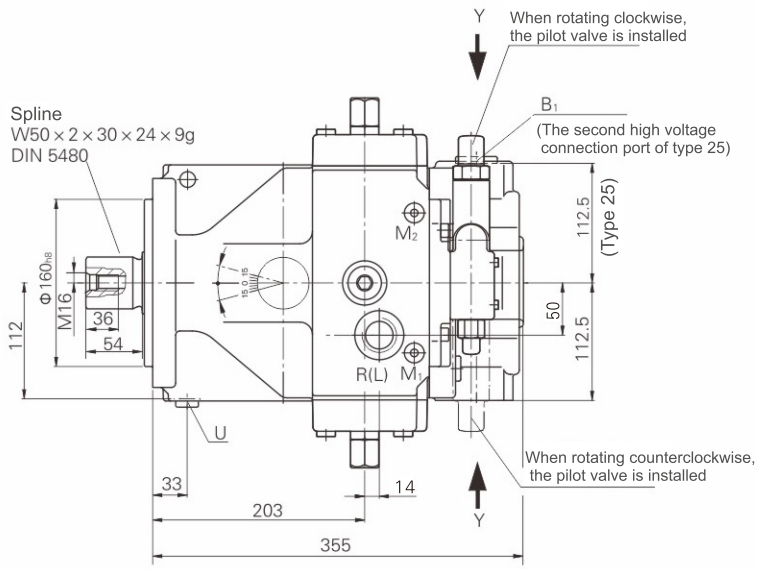
SAE1" (high pressure series)
SAE1" (high pressure series) (closed)

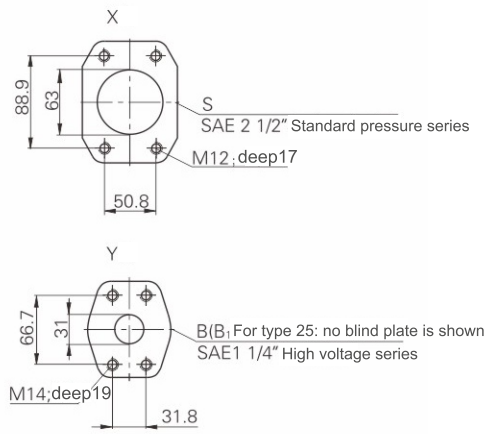
SAE2" (standard series)
M27 x 2 depth16 (plugged)
M27 x 2 depth16 (plugged)
M14 x 1.5 depth12 (plugged)
M27 x 2
M14 x 1.5 depth12 (plugged)

Dimension Size 125, Series 30 （Example: pressure control）









Ports type 13

B	pressure port	SAE1 1/4" (high pressure series)
B1	auxiliary port	M33 x 2 depth18 (plugged)

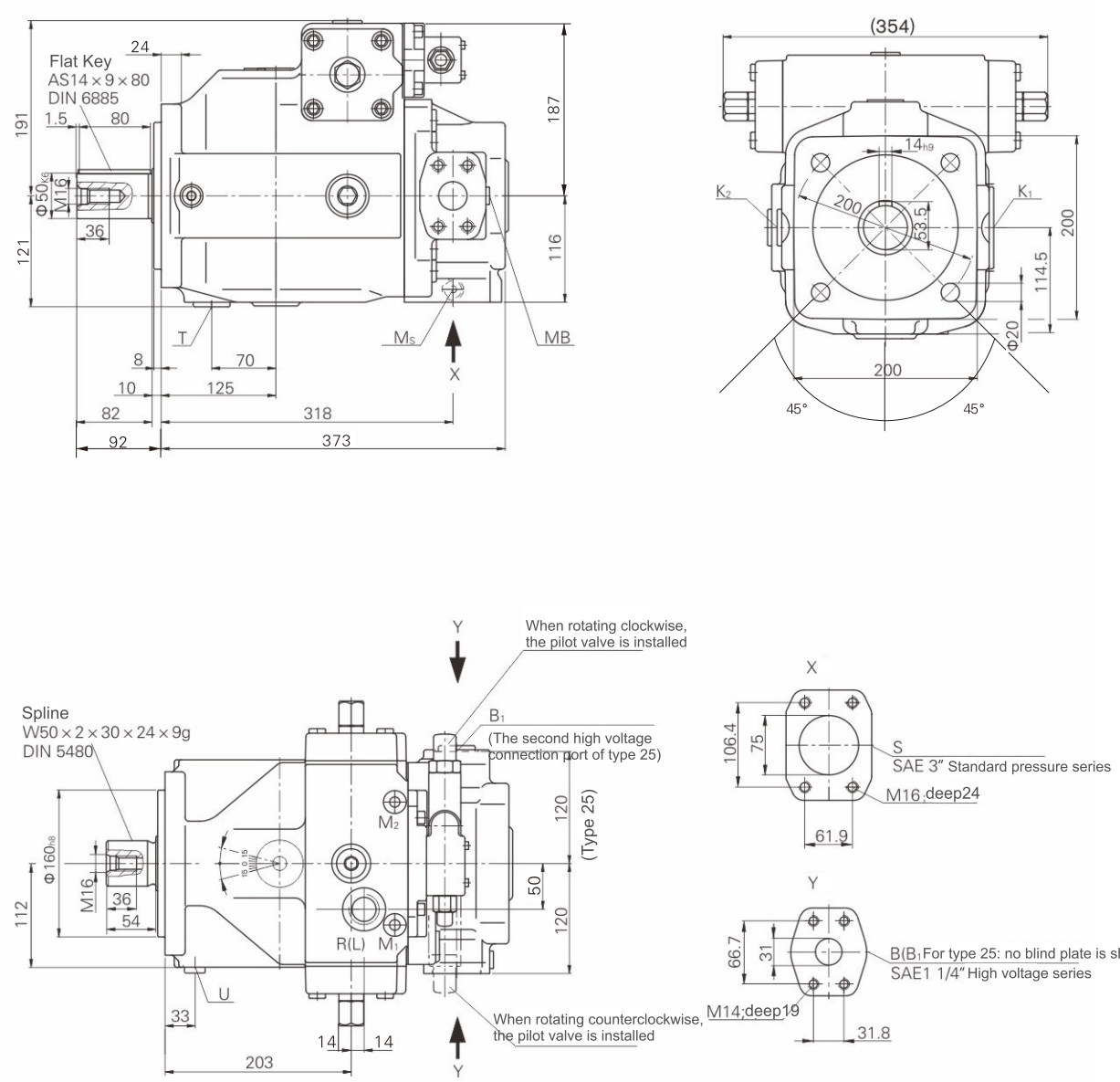
Ports type 25

B	pressure port	SAE1 1/4" (high pressure series)
B1	second pressure port	SAE1 1/4" (high pressure series) (closed)

Other ports

S	suction port	SAE2 1/2" (standard series)
K1,K2	flushing port	M33 x 2 depth18 (plugged)
T	drain port	M33 x 2 depth18 (plugged)
MB,MS	measuring port	M14 x 1.5 depth12 (plugged)
R(L)	filling port + bleed port	M33 x 2
U	flushing port	M14 x 1.5 depth12 (plugged)
M1,M2	measuring port control device	M14 x 1.5 (plugged)

Dimension Size 180/200, Series 30 （Example: pressure control）



Ports type 13

B	pressure port
B1	auxiliary port

Ports type 25

B	pressure port
B1	second pressure port

Other ports

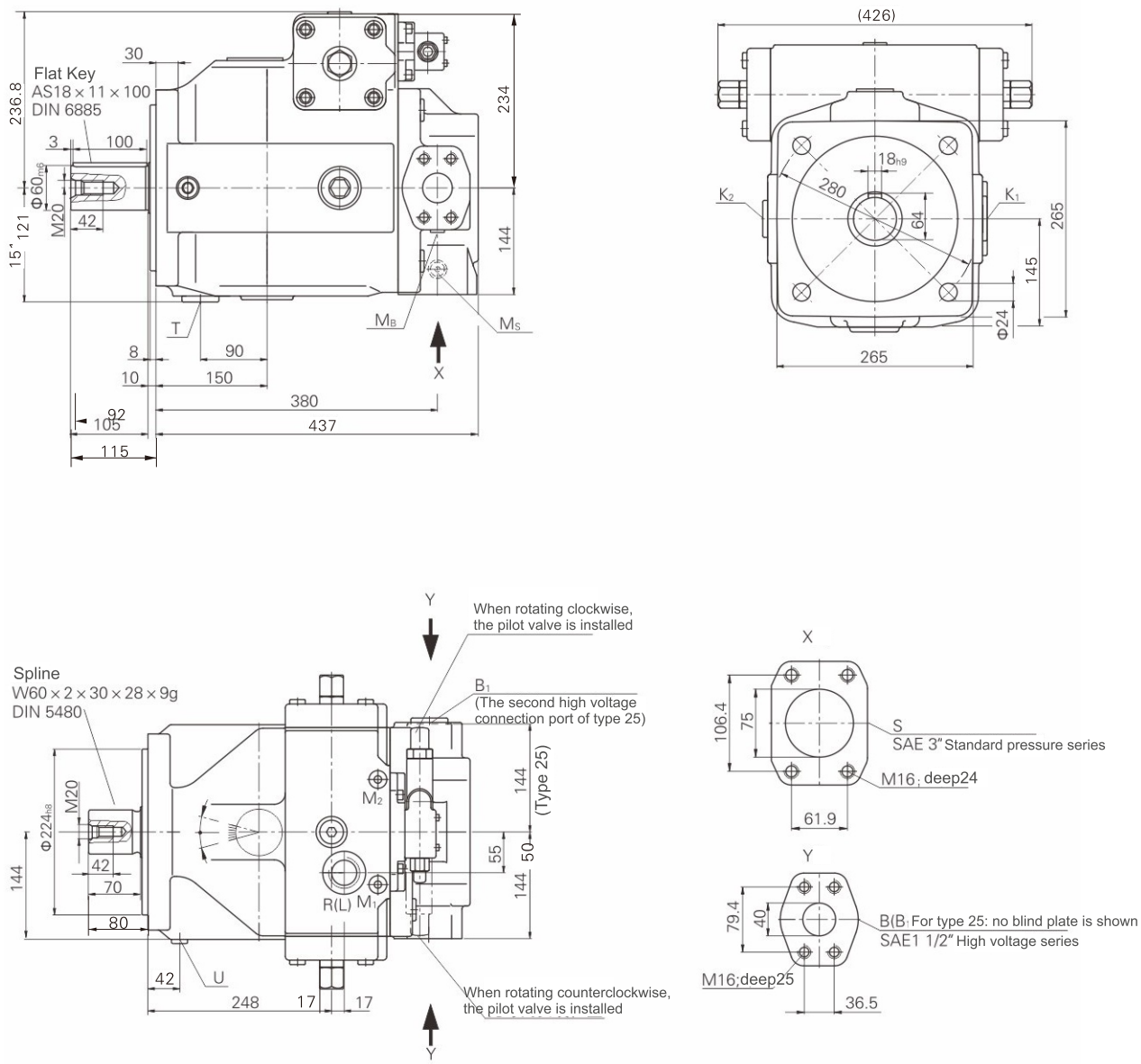
S	suction port
K1,K2	flushing port
T	drain port
MB,MS	measuring port
R(L)	filling port + bleed port
U	flushing port
M1,M2	measuring port control device

SAE1 1/4”（high pressure series)
M33 x 2 depth18 （plugged）

SAE1 1/4”（high pressure series）
SAE1 1/4”（high pressure series)（closed）

SAE3”（standard series)
M33 x 2 depth18 （plugged）
M33 x 2 depth18 （plugged）
M14 x 1.5 depth12（plugged）
M33 x 2
M14 x 1.5 depth12（plugged）
M14 x 1.5（plugged）

Dimension Size 250/280, Series 30 （Example: pressure control）



Ports type 13

B	pressure port
B1	auxiliary port

Ports type 25

B	pressure port
B1	second pressure port

Other ports

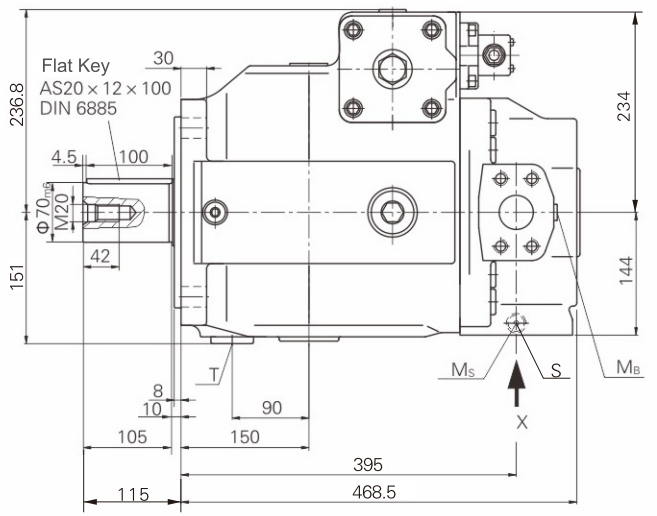
S	suction port
K1,K2	flushing port
T	drain port
MB,MS	measuring port
R(L)	filling port + bleed port
U	flushing port
M1,M2	measuring port control device

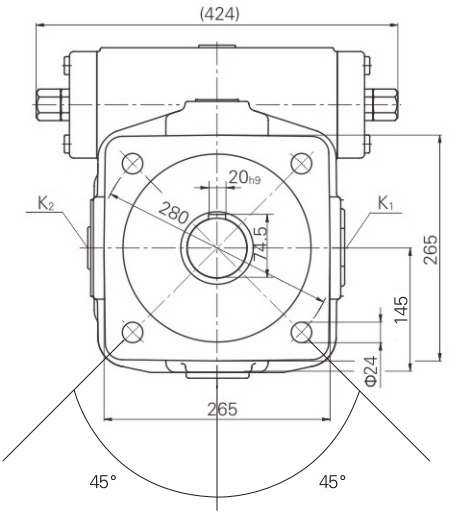
SAE1 1/2”（high pressure series)
M42 x 2 depth20 （plugged）

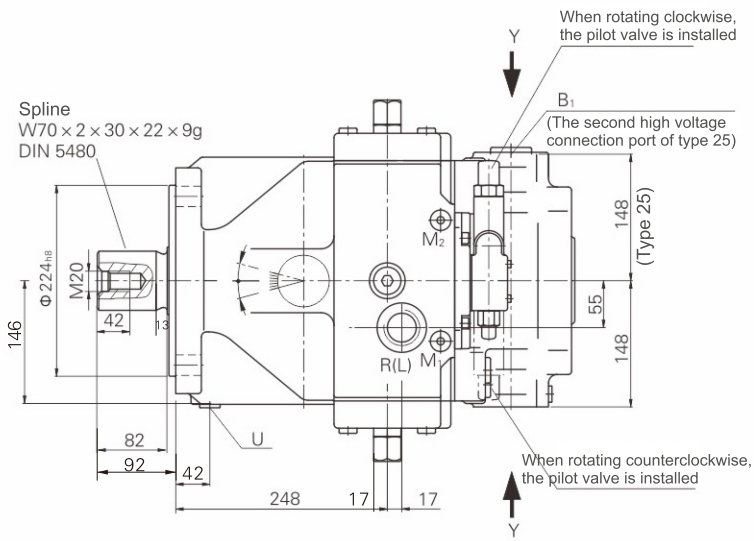
SAE1 1/2”（high pressure series）
SAE1 1/2”（high pressure series)（closed）

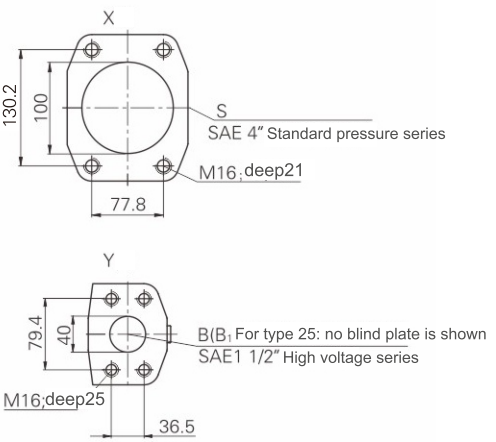
SAE3”（standard series)
M42 x 2 depth20 （plugged）
M42 x 2 depth20 （plugged）
M14 x 1.5 depth12（plugged）
M42 x 2
M14 x 1.5 depth12（plugged）
M18 x 1.5（plugged）

Dimension Size 355, Series 30 （Example: pressure control）





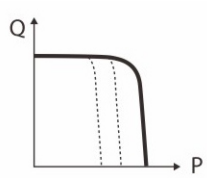




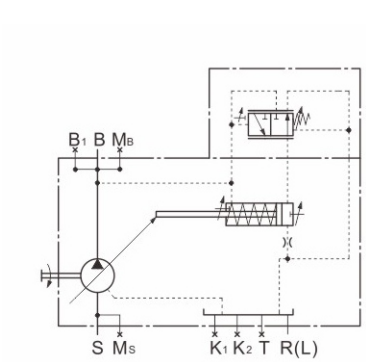
Ports type 13		
B	pressure port	SAE1 1/2”（high pressure series)
B1	auxiliary port	M42 x 2 depth20 （plugged）
Ports type 25		
B	pressure port	SAE1 1/2”（high pressure series）
B1	second pressure port	SAE1 1/2”（high pressure series)（closed）
Other ports		
S	suction port	SAE4”（standard series)
K1,K2	flushing port	M42 x 2 depth20 （plugged）
T	drain port	M42 x 2 depth20 （plugged）
MB,MS	measuring port	M14 x 1.5 depth12（plugged）
R(L)	filling port + bleed port	M42 x 2
U	flushing port	M14 x 1.5 depth12（plugged）
M1,M2	measuring port control device	M18 x 1.5（plugged）

Control Devices

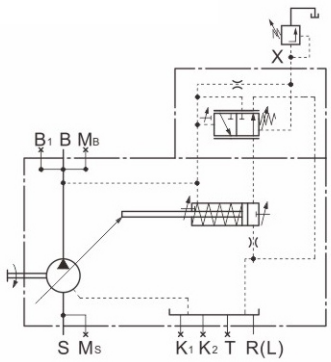
1、Pressure Control DR



Pressure control keeps the pressure constant within the control range of the pump at the pump outlet. There fore, the pump only delivers as much fluid as required by the actuators.
Setting range 20 ~ 350bar.
Optional: with remote pressure control DRG



DR Schematic

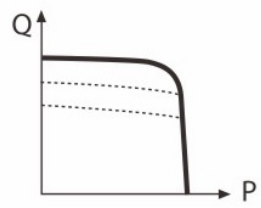


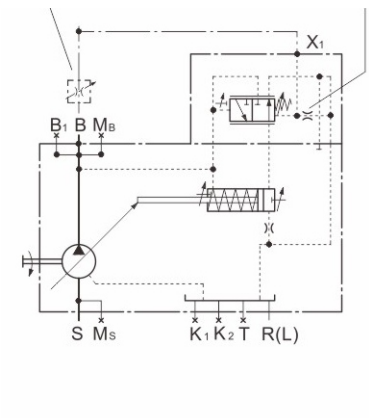
DRG Schematic

Ports

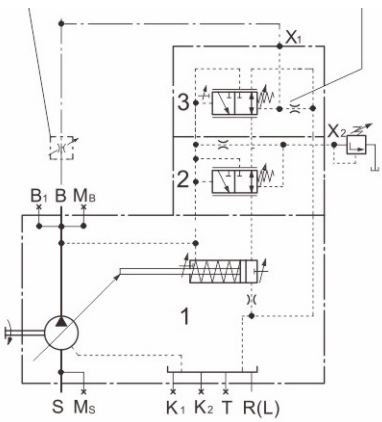
Pilot pressure port, for remote pressure control M 14 x 1.5 深12

2、Pump flow may be requlated by means of a differential pressure at an orifice and maintains a constant regulating flow in a hydraulic system.
Optional: with remote pressure control FRG
For model FR1 or FRG1 the orifice closed in the X port





FR Schematic



FRG Schematic

Ports

X_1 Pilot pressure port, for flow control M 14 x 1.5 deep12

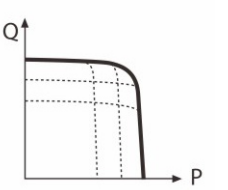
X_2 Pilot pressure port, for remote pressure control M 14 x 1.5 deep12

Diagram components

1. Axial piston pump (with hydraulic positioning device)
2. Pressure control valve
3. Flow controly valve

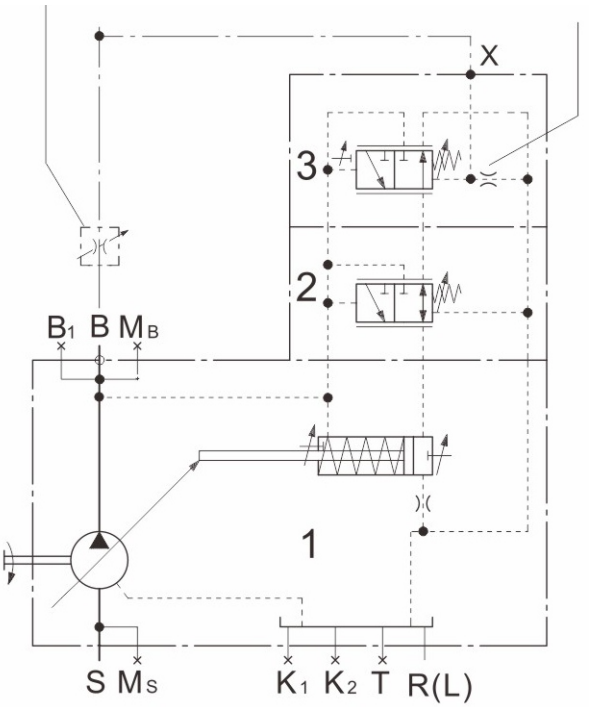
Control Devices

3、Pressure and Flow Control DFR



This control maintains a constant flow from the pump even under varying oprerating conditions. Overriding this control is a mechanically adjustable pressure control.

Optional: For model DFR1 the orifice closed in the X port



DFR Schematic

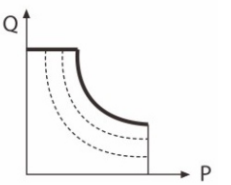
Ports

X Pilot pressure port, for flow control M14 x 1.5 deep12

Diagram components

1. Axial piston pump (with hydraulic positioning device)
2. Pressure control valve
3. Flow control valve

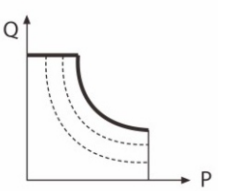
4、Pressure Control LR2



The hyperbolic power control maintains a constant preset drive power at the same input speed.

Optional: with pressure control LR2D, with remote pressure control LR2G

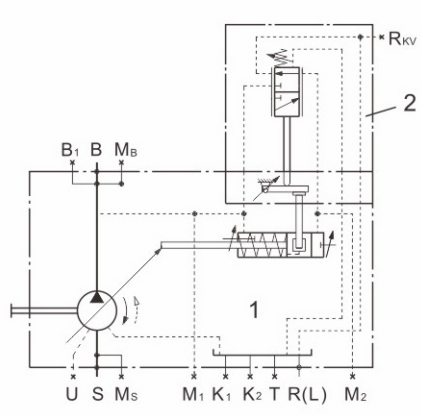
5、Pressure Control Lr3



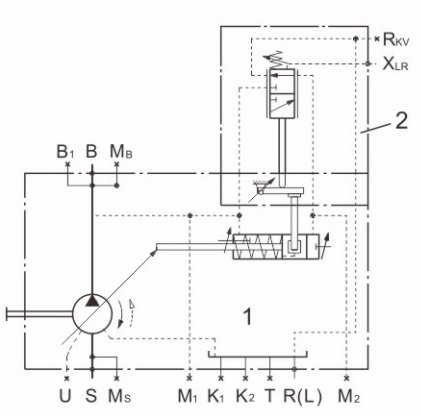
The hyperbolic power control maintains a constant preset drive power at the same input speed. The power characteristics can be adjusted remotely.

Optional: with pressure control LR3D, with remote pressure control LR3G

Control Devices



Lr2 Schematic



Lr3 Schematic

Ports

R_{KV} External control oil return port M18x1.5，12

X_{LR} Pilot pressure port, for rem ote power control M14 x 1.5 12

Diagram components

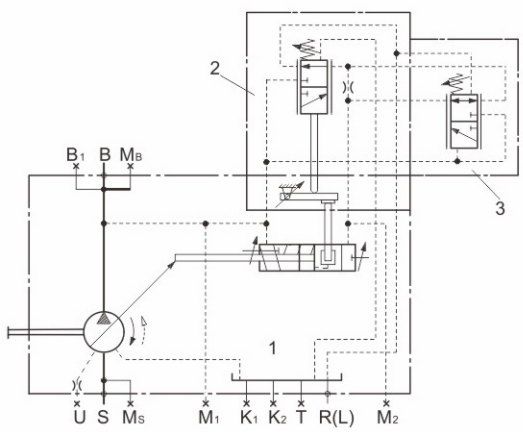
1. Axial piston pump (with hydraulic positioning device)
2. Power control valve

⋯D With Pressure Control

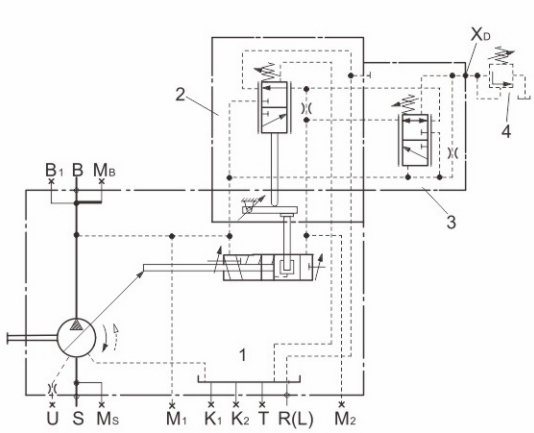
The pressure control overrides the power control, i.e. below the set pressure control level the unlt follwes the power control function. As soon as the pump output pressure reaches the pressure control level, the pump turns into the pressure control model and delivers only the amount of fluid as requlred to maintain this pressure.

⋯G With Remote Pressure Control

Pressure rellef valve is connected to port X_D, for remote control. As soon as the pump output pressure(relief valve setting plus pressure differential over the pressure control valve spool) reaches the pressure control level, the pump turns into the pressure control model and delivers only the amount of fluid as required to maintain this pressure.



LR2D Schematic



LR2G Schematic

Ports

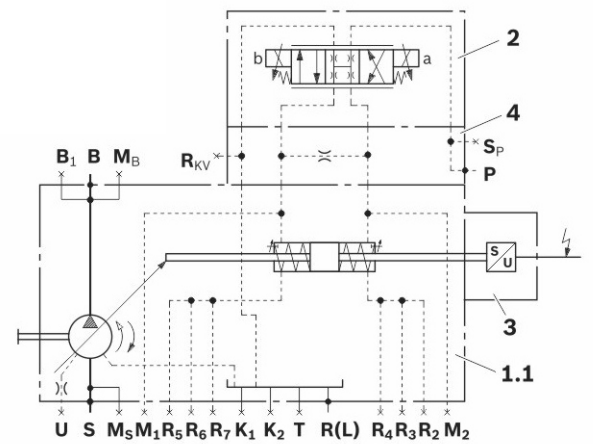
X_D Pilot pressure port, for remot e pressure control M14 x 1.5，deep12

Diagram components

1. Axial piston pum p (with hydraulic positioning device)
2. Power control valve
3. Pressure control valve
4. Pressure reliefl valve (noti in scope of supply)

Control Devices

6、EO2



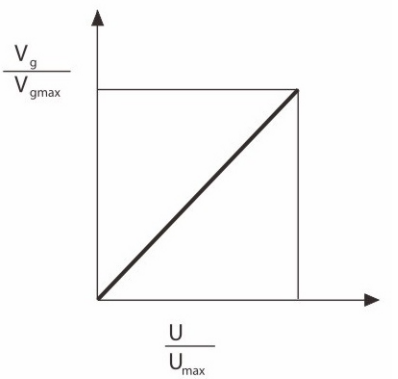
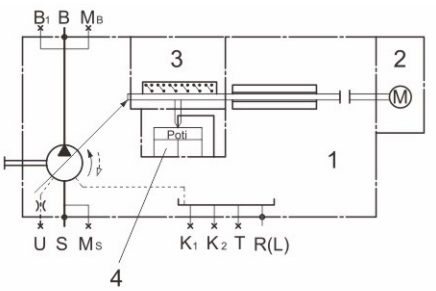


Diagram components

1.A4VSO type axial piston pump
2.Proportional valve
3. Position sensor
4.Transition board

7、EM Motor Control EM

Stepless adjustment of displacement via an electric motor. Various intermediate displacement values can be selected with a programmed sequence control, by means of built on limit switches and an optional potentiometer for feedback signal.



EM Schematic

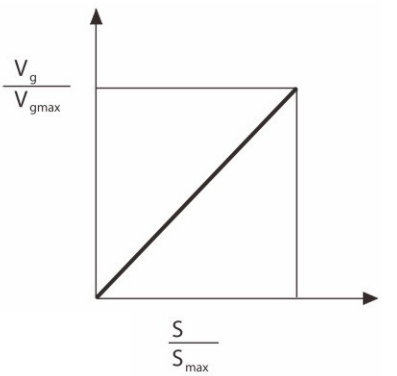


Diagram components

1. Axial piston pu imp (with mechanical positioning device)
2. Motor
3. Limit switch
4. Potentiometer

Through Drive

OS–A4VSO axial piston pump can be equipped with a through drive, as shown in the type code on page 2–3

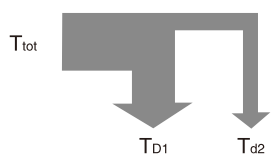
We recommend that no more than three pumps be coupled together(main pump and following pump a total of three).

Permissible input torque and through drive torque（Unit：Nm）

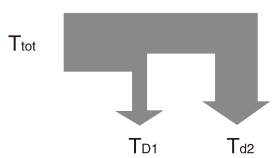
Size		40	71	125	180/200	250/280	355
Splined Shaft							
Maximum input torque of the main pump	$T_{tot\,max}$	446	790	1392	2004	2782	3952
A Permissible through drive torque	T_{D1max}	223	395	696	1002	1391	1976
	$T_{D2\,max}$	223	395	696	1002	1391	1976
B Permissible through drive torque	T_{d1max}	223	395	696	1002	1391	1976
	$T_{D2\,max}$	223	395	696	1002	1391	1976
Keyed shaft							
Maximum input torque of the main pump	$T_{tot\,max}$	380	700	1392	1400	2300	3557
A Permissible through drive torque	T_{D1max}	223	395	696	1002	1391	1976
	$T_{D2\,max}$	157	305	696	398	909	1581
B Permissible through drive torque	T_{D1max}	157	305	696	398	909	1581
	$T_{D2\,max}$	223	395	696	1002	1391	1976

Torque Distribution Pattern

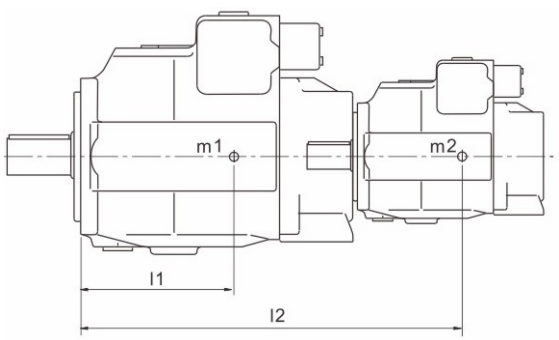
Distribution pattern A



Distribution pattern B



Permissible mass moment of inertia referred to the mounting flange of the main pump



Size	40	71	125	180/200	250/280	355
T_m	1800	2000	4200		9300	
$T_{m\,10g}$	180	200	420		930	
m	39	53	88	102	184	207
l_1	120	140	170	180	210	220

Tm–Perm. mass moment of inertia (Nm)

Tm10g–Perm. mass moment at dynam acceleration of 10g (Nm)

m1–The quality of the main pump (kg)

m2–The quality of the following pump (kg)

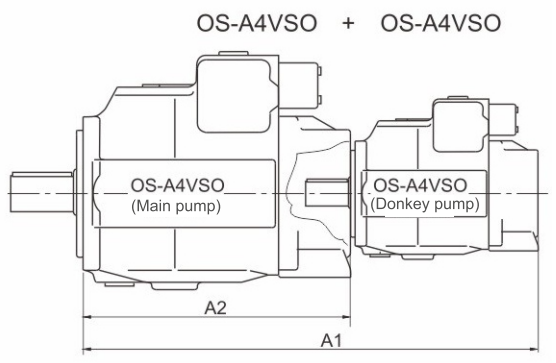
l1–The distance between barycenter of main pump and mounting flange (mm)

l2–The distance between barycenter of following pump and mounting flange of main pump (mm)

Through Drive

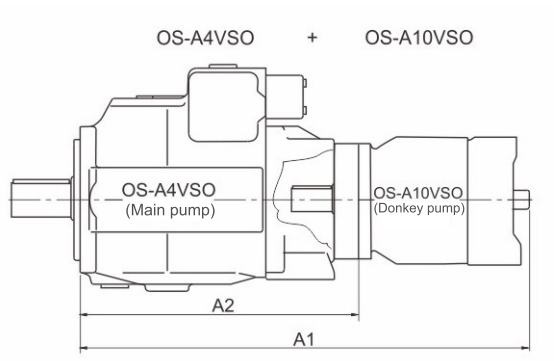
Combination Pump Dimensions

Dimensions of following pumps OS–A4VSO



Main pump			40	71	125	180/200	250/280	355
Following pump	A_1	40	554	582	635	659	719	748
		71	–	611	664	688	748	777
		125	–	–	724	748	808	837
		180	–	–	–	768	828	857
		250	–	–	–	–	904	933
		355	–	–	–	–	–	962
	A_2	⩽180	288	316	369	393	453	482
		⩾250	–	–	–	–	469	498

Dimensions of following pumps OS–A10VOand OS–A10VSO



Main pump			40	71	125	180/200	250/280	355
Following pump	A_1	18	458	486	564	588	648	677
		28	496	497	575	599	659	688
		45	514	540	593	617	677	706
		71	–	580	628	652	712	741
		100	–	–	698	722	782	801
		140	–	–	–	744	791	820
	A_2		288	316	369	393	453	482

The dimension A2 is 406 for that OS–A4VSO180 pump couples OS–A10VSO 140 or OS–A10V0 140 pump

Mounting

◆General requirements

The mounting position is discretionary. Before trial running, the pump body must be filled with fluid and kept filled while working.

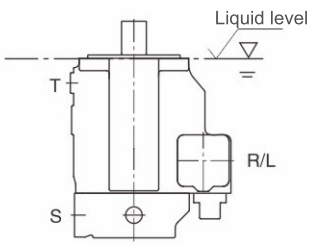
To reduce noise, all connecting pipes (inlet pipe, pressure pipe and casting drain pipe) must be separated from the tank by using flexible components. Avoid mounting check valve on the casting drain pipe. The leaked oil shall return directly to the tank, but the through– flow section shall not be reduced.

◆Vertical mounting (with shaft end upward)

In case of vertical mounting, we recommend flushing bearings as mentioned above to ensure the lubricatlon of the front bearings.

Mounting inside the tank

When the minimum level in the tank is lower than the flange face of the pump, port R/L, T and possible port S must be connected with pipes, as shown in Figure 2.This situation is same as what is specified in Mounting outside of the Tank in this section.

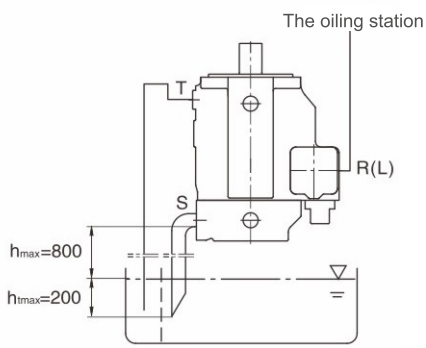


picture 1

Mounting outside the tank

Before mounting, the pump shall be placed horizontally and filled with fluid. Port T is connected with the tank and port R/L shall be blocked. Filling while mounting：Filling from port R/L and venting by port T and then blocking port R/L

Conditions：The minimum inlet pressure (absorption pressure) of the pump shall not be lower than 0.8 bar, the absolute pressure. If low noise running is required, the pump shall not be placed on the tank.



picture 2

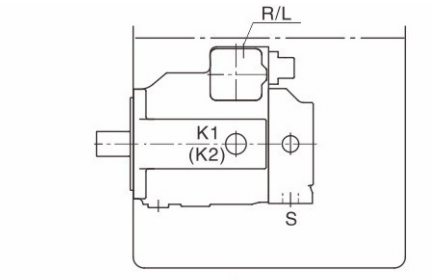
◆Horizontally placed

Place port T, K1, K2 or R/L higher than the highest position for filling /venting and for connecting with drain pipe.

Mounting inside the tank

a) When the minimum level in the tank is as same as or higher than the upper end of the drain port and port S can be open (see Figure 3)

b) When the minimum level in the tank is lower than the upper end of the pump, the drain port and possible port S must be connected with pipes. (See Figure 4) .This situation is same as what is specified in a) Mounting outside of the Tank in this section.



picture 3

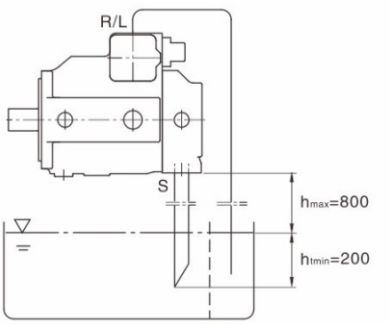
Before trial running, the pump body must be filled with fluid

Mounting outside the tank

Before trial running, the pump body must be filled with fluid.

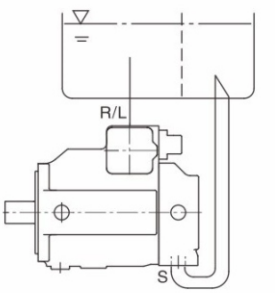
a) For mounting on the tank, see Figure 4.

Conditions: The minimum inlet pressure (absorption pressure) of the pump shall not be lower than 0.8 bar, the absolute pressure. If low noise running is required, the pump shall not be placed on the tank.



picture 4

b) For mounting under the tank, port R/L and S must be connected with pipes, as shown in Figure 5.

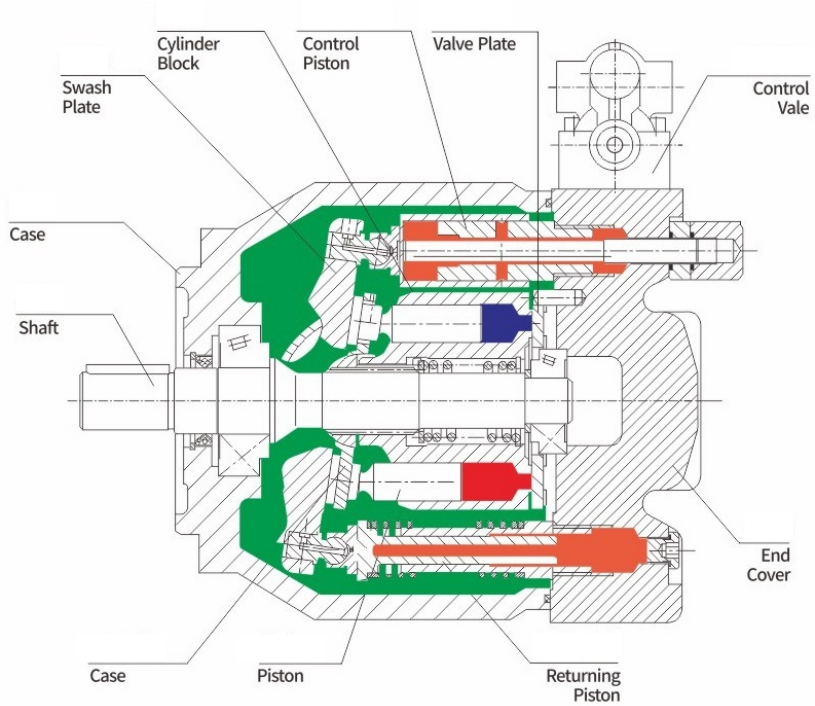


picture 5

Variable Displacement Piston PumP OS –A10V(S)O/31

Overview

OS –A10V(S)O/31 series variable displacement piston pump swash plate axial plunger variable pump,respectively for industrial use and for mobile machinery design, is designed for open loop hydraulic driven design, adopts a shaft structure, rated working pressure up to 28Mpa.



Features

※The capacity of the pump is in proportion to its rotating speed anddisplacement;the stepless adjustment of the displacement can be materialized by regulating the swivel angle of its swash plate.

※There are many variable control forms, Fast control response;

※Allows for continuous operating pressures up to 28MPa;

※There are two shell discharge ports;

※High power/weight ratio;

※The drive shaft is able to bear the axial and radial load;

※With through–shaft structure,able to form combination pump;

Type Code

OS–		A10VS	O	28	DR	/	31	R	—	V	P	A	12	KB3
	1	2	3	4	5		6	7		8	9	10	11	12

1– Operating Medium

Mineral oil (No Code)	

2–Machinery Classification

Axial piston, swash plate design, variable, used in industry	A10VS
Axial piston, swash plate design, variable, used in industry	A10V

3–Operational Mode

Open circuit	O

4–Size

Nominal displacement mL/r	18	28	45	71	88	100	140	

5–Control Devices

Two point control,directly operated DG	●	●	●	●	●	●	●	DG
Pressure Control DR	●	●	●	●	●	●	●	DR
Remote pressure control DRG	●	●	●	●	●	●	●	DRG
Pressure and flow control DFR	●	●	●	●	●	●	●	DFR
Pressure and flow control DFR1	●	●	●	●	●	●	●	DFR1
Pressure and power control DLR	●	●	●	●	●	●	●	DLR
Pressure and flow and power control DFLR	●	●	●	●	●	●	●	DFLR

6–Series

	31

7–Rotating Direction(View on Shaft End)

Clockwise	R
Counterclockwise	L

8–Seals

Shaftseal FKM	P
VitonFKM	V

Chart shows: ●=Available，○=In preparation，–=Not available

9–Shaft End

	18	28	45	71	88	100	140	
Keyedshaft DIN6885	●	●	●	●	●	●	●	P
Parallelshaft SAE withkey J744(ISO3019–1)	●	●	●	●	●	●	●	K
Splinedshaft ANSIB92.1a, standard shaft Similartoshaft S	3/4″ 3/4″	7/8″ 7/8″	1″ 1″	1 1/4″ 1 1/4″	1 1/4″ 1 1/4″	1/2″ 1 –	3/4″ –	S R
Splinedshaft to SAE J744,reduced diameter not for through drive	3/8″	3/4″	7/8″	1″	1″	1 1/4″	–	U
Splinedshaft SAE	–	–	–	–		1 1/4″	–	W

10–MountingFlange

	18	28	45	71	88	100	140	
ISO 2	●	●	●	●	●	●	–	A
SAE 2	●	●	●	●	●	●	–	C
ISO 4	–	–	–	–	–	–	●	B
SAE 4	–	–	–	–	–	–	●	D

11–Service Line Ports

	18	28	45	71	88	100	140	
Port S and port B at opposite sides,SAE flanged ,metric	●	●	●	●	●	●	●	12
	–	–	–	●	●	–	–	42
Port S and port B at opposite sidesSAE flanged, UNC mounting bolts	●	●	●	●	●	●	●	62
	–	–	–	●	●	–	–	92

12–Through Drive

			18	28	45	71	88	100	140	
Without through drive			●	●	●	●	●	●	●	N00
With through drive, the second pump connection dimension as follows										
Mounting flange	Spline shaft	The second pump								
SAE82,2	U 5/8in9T16/32DP	CR10VS018/31	●	●	●	●	●	●	●	K01
SAE82, 2	S 3/4in11T16/32DP	CR10VS018/31	●	●	●	●	●	●	●	K52
SAE101,2	S 7/8in13T16/32DP	CR10VO28/31		●	●	●	●	●	●	K68
SAE101,2	S 7/8in13T16/32DP	CR		●	●	●	●	●	●	K02
SAE101,2	S 1in15T16/32DP	CR 0VO45/31			●	●	●	●	●	K04
SAE127,2	S 1 1/4in14T12/24DP	CR 0V071/31				●	●	●	●	K07
SAE127,2	S 1 1/2in17T12/24DP	CR 0V0100/31						●	●	K24
SAE152,4	S 1 3/4in13T8/16DP	CR 0VO140/31							●	K17
SO80, 2	S 3/4in11T16/32DP	CR 0VSO18/31	●	●	●	●	●	●	●	KB2
SO100,2	S 7/8in13T16/32DP	CR 0VSO28/31		●	●	●	●	●	●	KB3
ISO100,2	S 1in15T16/32DP	CR 0VSO45/31			●	●	●	●	●	KB4
SO125,2	S 1 1/4in14T12/24DP	CR 0VS071/31				●	●	●	●	KB5
ISO125,2	S 1 1/2in17T12/24DP	CR 0VSO100/31						●	●	KB6
ISO180,4	S 1 3/4in13T8/16DP	CR 0VSO140/31							●	KB7
ISO 80,2	ϕ 18	CR 0VS018/31	●	●	●	●	●	●	●	K51
SAE82,2	ϕ 19.05	CR 0VS018/31	●	●	●	●	●	●	●	K40
SAE100,2	ϕ 22	CR 0VS028/31		●	●	●	●	●	●	K25

			18	28	45	71	88	100	140	
Without through drive			●	●	●	●	●	●	●	N00
With through drive, the second pump connection dimension as follows										
Mounting flange	Spline shaft	The second pump								
SAE101,2	22.225	CR10VS028/31	–	●	●	●	●	●	●	K03
ISO 100,2	25	CR10VSO45/31	–	–	●	●	●	●	●	K26
SAE101,2	25.4	CR10VSO45/31	–	–	●	●	●	●	●	K05
ISO 125,2	32	CR10VS071/31	–	–	–	●	●	●	●	K27
SAE127,2	31.75	CR10VS071/31	–	–	–	●	●	●	●	K08
ISO 125,2	40	CR10VSO100/31	–	–	–	–	–	●	●	K37
SAE127,2	38.1	CR10VS0100/31	–	–	–	–	–	●	●	K38
ISO 180,4	45	CR10VSO140/31	–	–	–	–	–	–	●	K59
SAE152,4	44.45	CR10VSO140/31	–	–	–	–	–	–	●	K21

Description of combination pump: Two pumps can be connedted in series by their head and end, namely integrated to be a combination pump.by the means of through–shaft,and the se cond pump of the series combination is called the subordinate pump.

In case of placing an order, the combination pump model equals to the model of the first pump + the model of the second.

Illustration of combination pump model:OS4VSO45 DR/31R–PPA12KB3+OS10VSO28DR/31R–PSA12N00

Technical Data

■Parameters Table

Size				18	28	45	71	88	100	140
Displacement		V_{gmax}	mL/r	18	28	45	71	88	100	140
Pressure at suction port S (Absolute pressure)	Minimum pressure	$P_{s\,min}$	bar	0.8						
	Minimum pressure	$P_{s\,max}$	bar	10						
Pressure at Outlet port B (Absolute pressure)	Rated pressure	P_N	bar	280						
	Peak pressure	P_{max}	bar	350						
	Minimum pressure		bar	10						
Rate of pressure change		R_A	bar/s	16000						
Drain port L, L_1 pressure (Absolute pressure)		P_L	bar	≤2						
Max. speed	$V_g = V_{g\,max}$	$n_{o\,max}$	r/min	3300	3000	2600	2200	2100	2000	1800
Ps= 1bar	$V_g = V_{g\,max}$		r/min	3900	3600	3100	2600	2500	2400	2100
Max. flow	$n = n_{o\,max}$	$q_{vo\,max}$	L/min	59.4	84	117	156	185	200	252
	n = 1500 r/min		L/min	27	42	68	107	132	150	210

Size				18	28	45	71	88	100	140
Displacement		$V_{g\,max}$	mL/r	18	28	45	71	88	100	140
Maximum power (△p = 280 bar)	n = $n_{o\,max}$	P_{omax}	kW	27.7	39	55	73	86	93	118
	n = 1500 r/min		kW	12.6	20	32	50	62	70	98
Torque ($V_g = V_{g\,max}$)	△ p=280 bar	T_{max}	Nm	80.1	125	200	316	392	445	623
	△ p=100 bar	T	Nm	28.6	45	72	113	140	159	223
Torsional stiffness	Shaft extension P		Nm/rad	13158	25656	41232	80627	80627	132335	188406
	Shaft extension S		Nm/rad	11087	22317	37500	71884	71884	121142	169537
	Shaft extension R		Nm/rad	14850	26360	41025	76545	76545	–	–
	Shaft extension U		Nm/rad	8090	16695	30077	52779	52779	91903	–
	Shaft extension K		Nm/rad	13340	26189	43905	82112	82112	135303	196844
Moment of inertia of the rotating assembly		J	kgm^2	0.00093	0.0017	0.0033	0.0083	0.0083	0.0167	0.0242
Max. angular acceleration			rad/s^2	6800	5500	4000	3300	3300	2700	2700
Volume of case			L	0.4	0.7	1.0	1.6	1.6	2.2	3.0
Weight			kg	12	15	21	33	33	45	60
Drive shaft Allowable load	Max. axial force		N	700	1000	1500	2400	2400	4000	4800
			N	350	1200	1500	1900	1900	2300	2800

1) Once$V_g = V_{g\,max}$, the value is applicable to the inlet pressure at suction port S is P_s = 1bar (absolute pressure),when the inlet pressure P_s increase or decrease the displacement,the speed can be increased,when the inlet pressure $P_{s\,min}$=0.8bar,the speed should be reduced to 90%.V_g<$V_{g\,max}$ value when the speed limit.

Technical Data

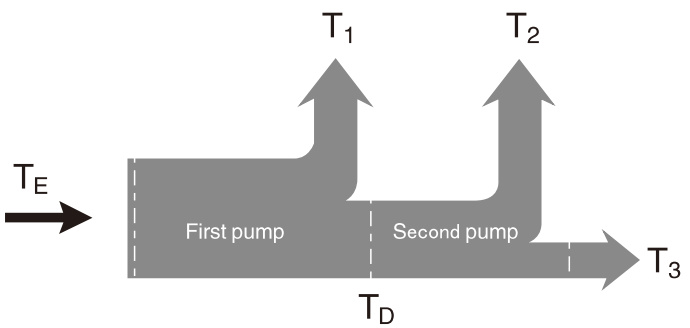
■Permissible input torque and through drive torque

Size				18	28	45	71	88	100	140
Torque (V △P=280 bar)		T_{max}	Nm	80	125	200	316	392	445	623
Max . input torque 1)	Shaft P	T_{Emax}	Nm	88	137	200	439	439	857	1206
		ϕ	mm	18	22	25	32	32	40	45
	Shaft S	T_{Emax}	Nm	124	198	319	626	626	1104	1620
		ϕ	in	3/4	7/8	1	1 1/4	1 1/4	1 1/2	1 3/4

Size				18	28	45	71	88	100	140
Torque ($V_{g\,max}$ △P=280 bar)		T_{max}	Nm	80	125	200	316	392	445	623
Max . input torque[1)]	Shaft R	T_{Emax}	Nm	160	250	400	644	644	–	–
		ϕ	mm	3/4	7/8	1	1 1/4	1 1/4	–	–
	Shaft K	T_{Emax}	Nm	104	145	212	433	433	750	1186
		ϕ	in	3/4	7/8	1	1 1/4	1 1/4	1 1/2	1 3/4
Max . Through drive torque	Shaft S	T_{Dmax}	Nm	108	160	319	492	492	778	1266
	Shaft R	T_{Dmax}	Nm	120	176	365	548	548	–	–
	Shaft K	T_{Emax}	Nm	104	145	212	433	433	750	1186

1) For drive shaft free of radial load

Torque Distribution



■Hydraulic oil

Operating viscosity range

For optimum efficiency and service life, we recommend that the operating viscosity in the range of the following best (at operating temperature)

Optimum operating viscosity v_{opt} =16~36mm^2/s

Limits of viscosity range

Under critical operating conditions the following values apply:

V_{min} =10mm^2/s Short time (t≤1min)

Max. permissible case drain temperature of 90℃

V_{max} =1000mm^2/s Short time (t≤ 1min)

p≤30bar，n≤1000 r/min， θ ≥–25℃

Selection Considerations of hydraulic oil

Inorder to select the correct hydraulic oil. it must be determined at ambient temperature within the tank temperature (open circuit). Select the hydraulic fluid in the working temperature range for optimum viscosity range, it recommended to choose where relevant, the higher viscosity grade.

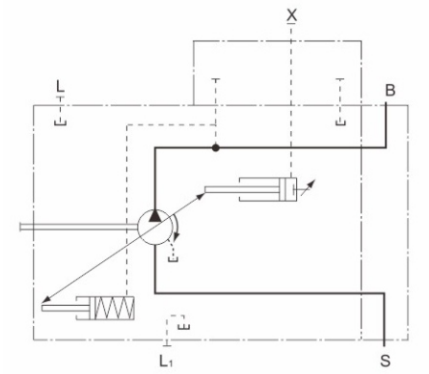
The case drain temperature is influenced by pressure and input speed and is always higher than the tank temperature. However, any part of the piston temperature shall not exceed 90℃.The fluid temperature in the bearing area is generally higher than the average case drain oil temperature high around 5℃

Control Devices

1、DG Direct Control DG

An external switching pressure can be applied to Port X to minimize the swivel angle of the variable pump. Control oil can be supplied directly for the control piston under the necessary minimum pressure of 50 bar. The variable pump can only be shifted between Vg max and Vgmin .

Note: the switching pressure needed at Port X is in direct correlation with the actual working pressure of Pressure Port B.



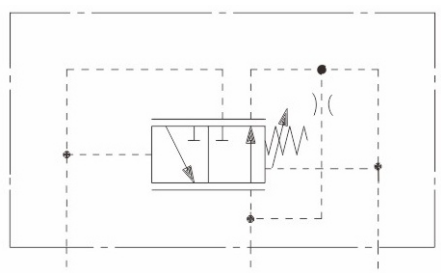
2、Pressure Control DR

The pressure control will keep the outlet pressure constant. Therefore, the variable pump only delivers as much fluidas required by the actuator elements of the hydraulic system. The outlet pressure can be set through stepless adjustmenton the control valve.

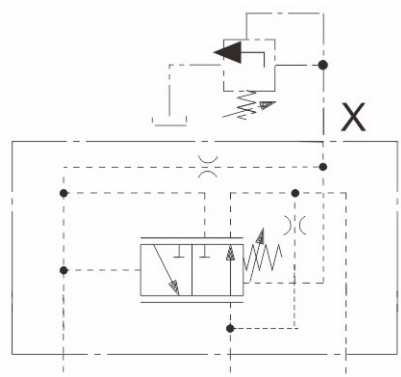
3、Remote Pressure Control DRG

The function and equipment of constant control is slmilar to that of DR. The remote control can be realized by connecting an external relief valve with Port X. Relief valve is not included in the scope of supply for DRG control.

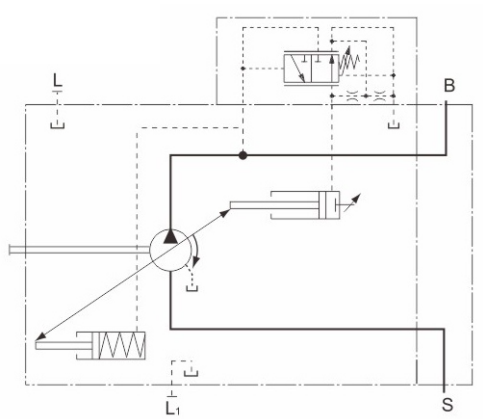
Size 140



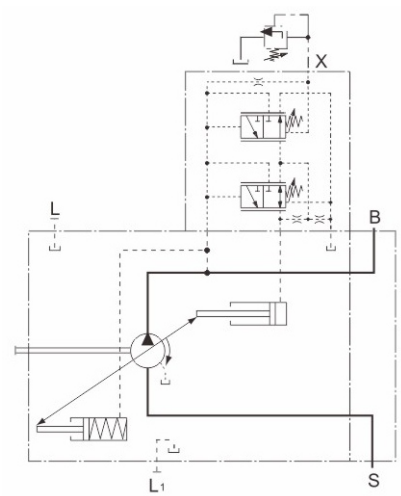
Size 140



Size 18 ~ 100



Size 18 ~ 100



Control Devices

4、Pressure and Flow Control DFR/DFR1

In addition to the pressure control function, the outlet flow of the pump can be adjusted by the differential pressure of the throttle valve installed on the oil supply pipe. The varlable pump delivers the fluid needed by the actuator elements of the hydraulic system and is free from the influence of the changes in actual working pressure. Pressure control takes precedence over flow control.

Relief valve is not included in the scope of supply for DFR/ DFR1 control.

The throttle orifice between Port X of DFR1 control valve and the pump chamber is enclosed.

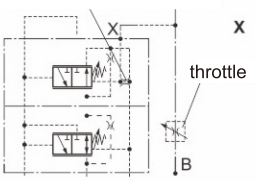
5、Pressure and Flow and Power Control DFLR

In order to gain constant driving torque under the working conditions with changeable working pressure, the output flow can be changed to keep the product of flow and pressure constant, namely to keep the output powerful of the pump constant.

Flow control can only be conducted below the constant power control curve.

Relief valve is not included in the scope of supply for DFLR control.

Size 140



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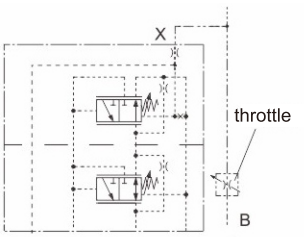
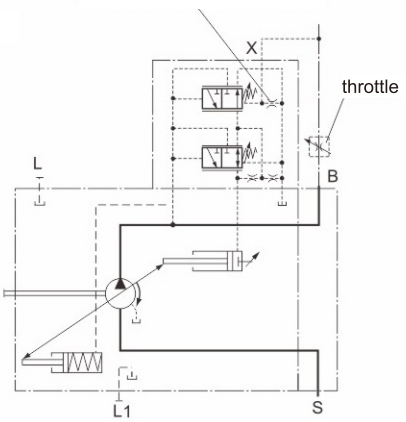
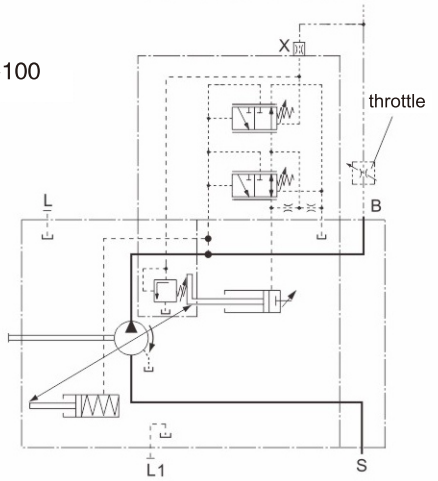


Size 18~100



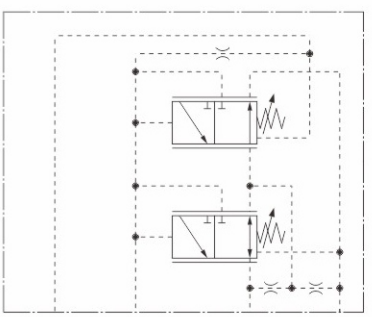
Size 28~100



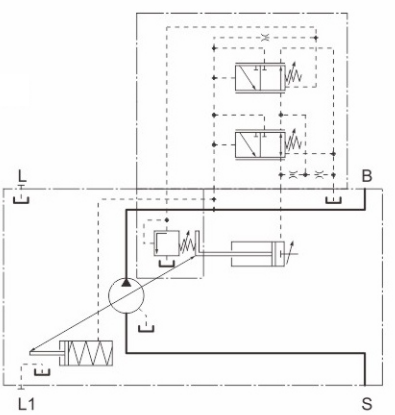
6、Pressure and Power control DLR

The control unit no flow control.

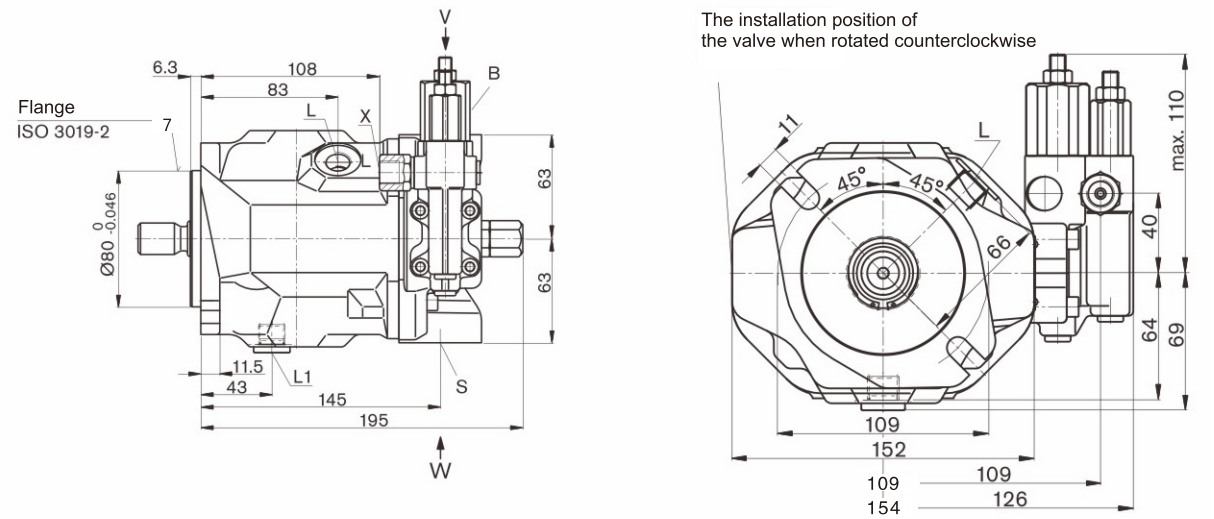
Size 140



Size 28~100

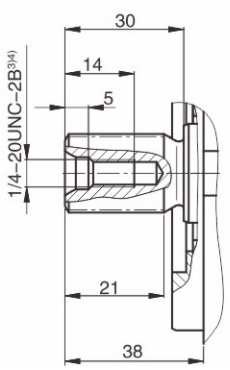


Dimensions size 18 Flange A (Control devices DR, DRG, DFR/DFR1)

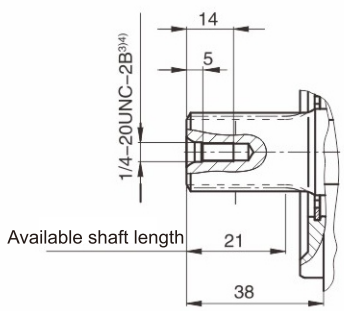


Shaft

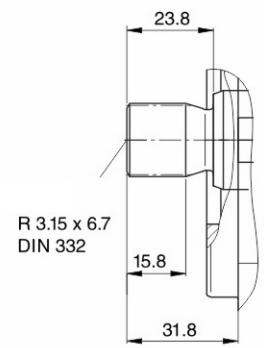
S Available spline length, 3/4 in 11T 16/32DP[1] (SAE J744)



R Available spline length, 3/4 in 11T 16/32DP[1)2)] (SAE J744)



U Available spline length, 5/8 in 9T 16/32DP[1)2)] (SAE J744)

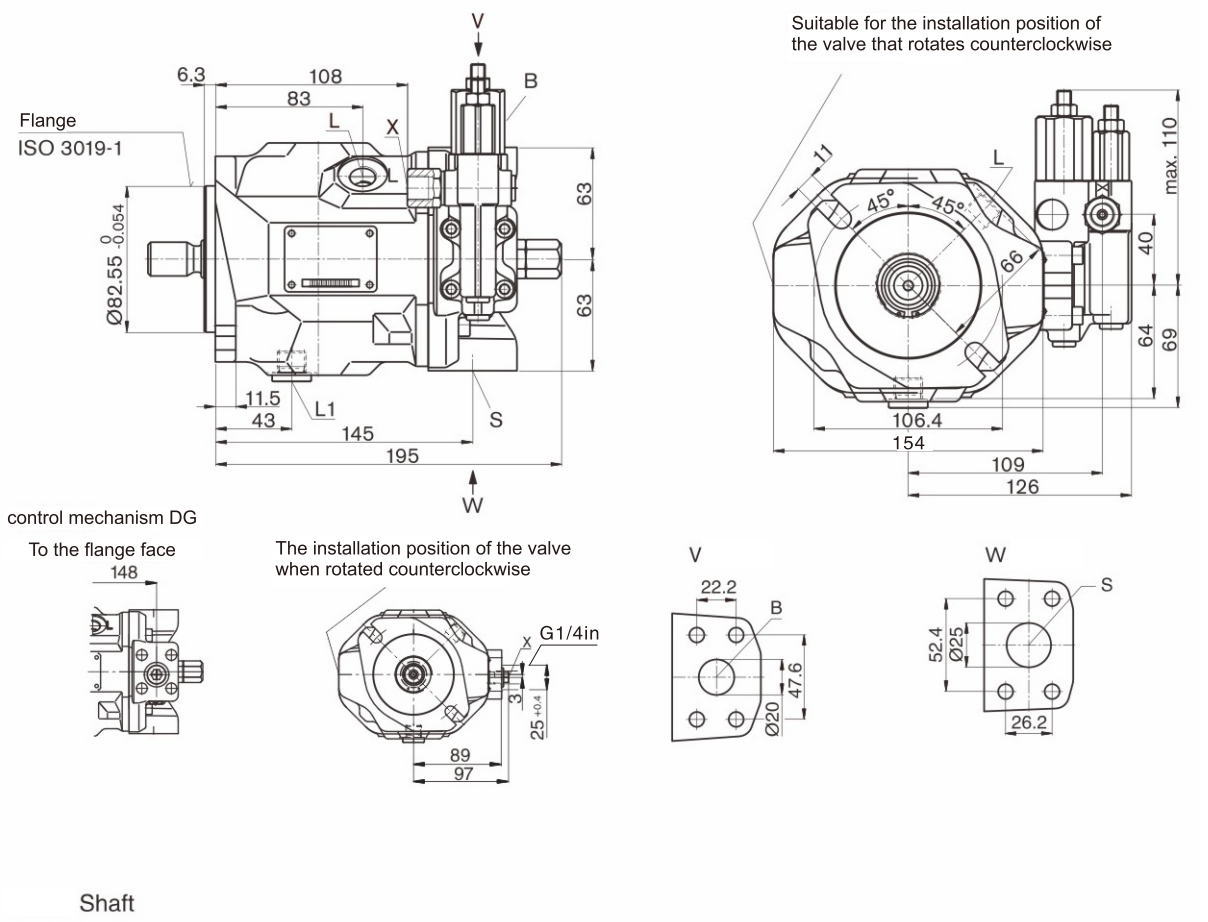


Ports

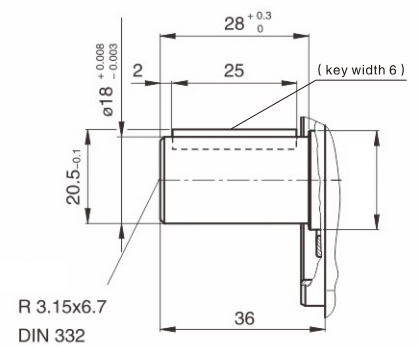
B	Outlet port	Flange SAE J518 3/4in (Standardseries) Fixing thread M10 17
S	Suction port	Flange SAE J518 1in (Standard series) Fixing thread M10 17
L	Drain port	M16 x 1.5 12
L1	Drain port	M16 x 1.5 12
X	Control pressure	M14 x 1.5 12
X1	Control pressure	G1/4 12 For DG Control

Dependent on the installation position,port L or port L1 must be connected.

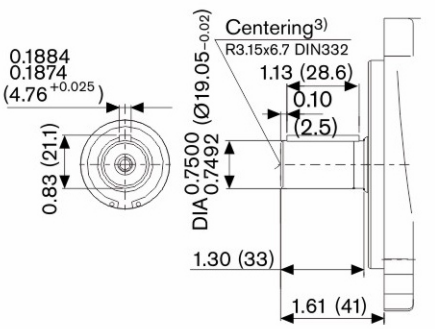
Dimensions size 18 Flange C (Control devices DR, DRG, DFR/DFR1)



P Plain key shaft DIN6885, A6 × 6 × 25



K Plain key shaft, Parallel with key
ISO 3019–1 22–1

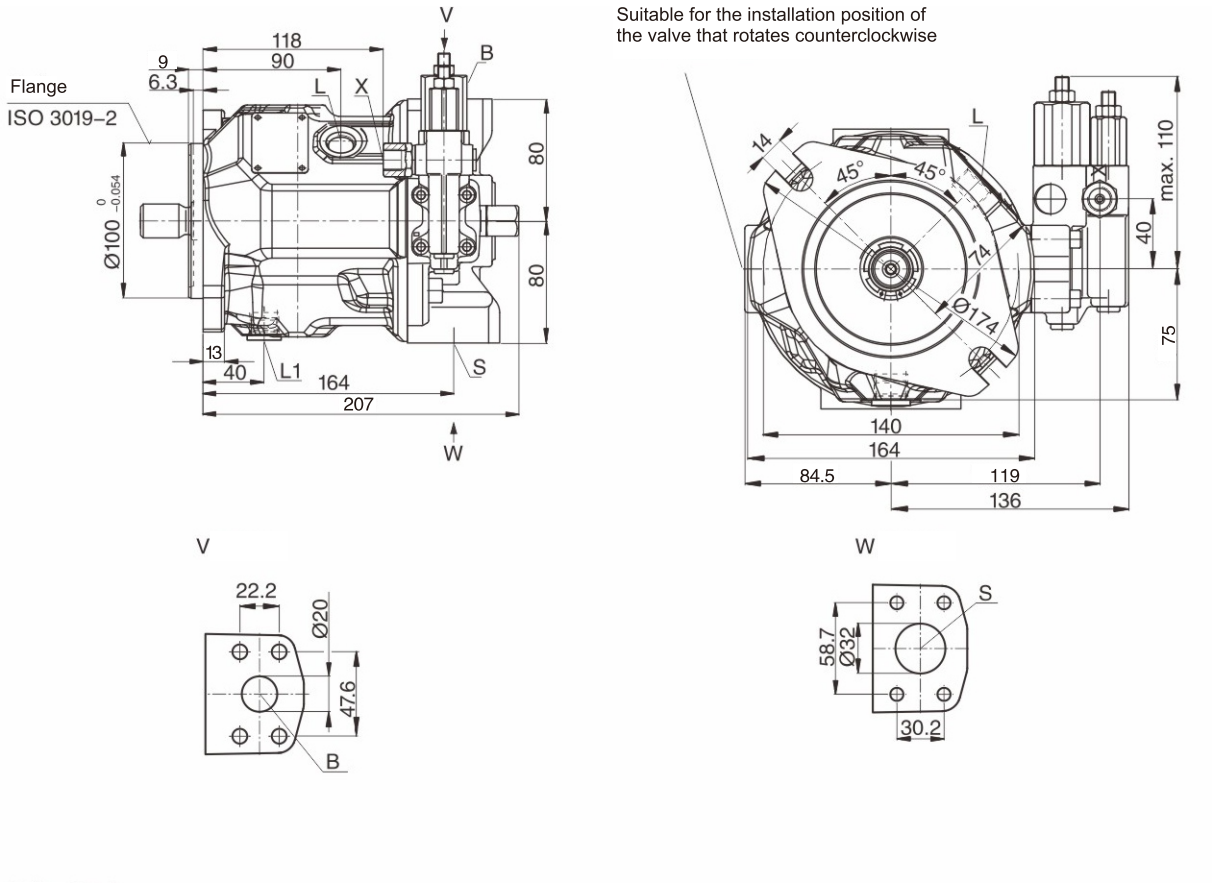


Oil Ports

B	Outlet port	Flange SAE J518 3/4in (Standardseries) Fixing thread 3/8–16UNC;20 deep
S	Suction port	Flange SAE J518 1in (Standard series) Fixing thread 3/8–16UNC;20 deep
L	Drain port	M16 x 1.5 12
L1	Drain port	9/16–18UNF–2B 12
X	□Control pressure	M14 x 1.5 12
X1	Control pressure	G1/4 12 For DG Control

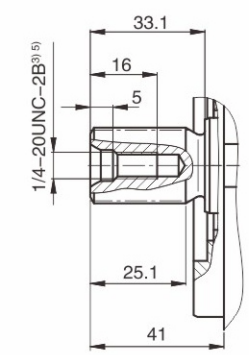
Dependent on the installation position,port L or port L1 must be connected.

Dimensions size 28 Flange A (Control devices DR, DRG, DFR/DFR1)

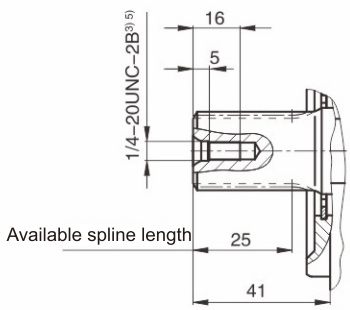


Shaft

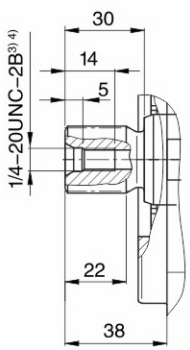
S spline shaft , 7/8 in 13T 16/32DP[1)]
(SAE J744)



R spline shaft , 7/8 in 13T 16/32DP[1)2)]
(SAE J744)



U spline shaft , 3/4 in 11T 16/32DP[1)]
(SAE J744)



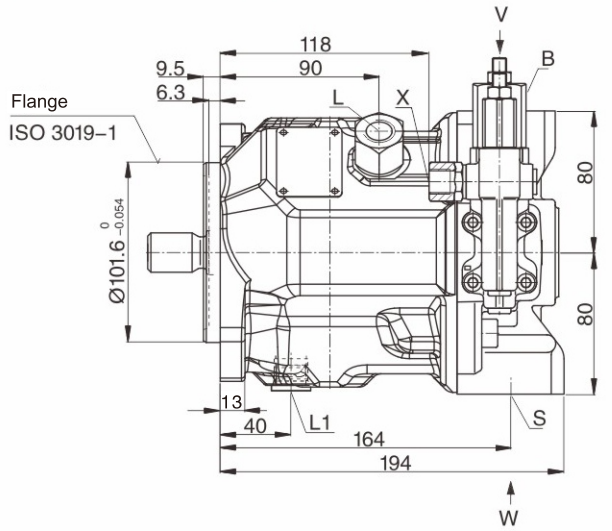
Ports

B	Outlet port	Flange SAE J518 3/4in (Standardseries) Fixing thread M10 17
S	Suction port	Flange SAE J518 1 1/4in (Standard series) Fixing thread M10 17
L	Drain port	M18 x 1.5 12
L1	Drain port	M18 x 1.5 12
X	Control pressure	M14 x 1.5 12
X1	Control pressure	G1/4 12For DG Control

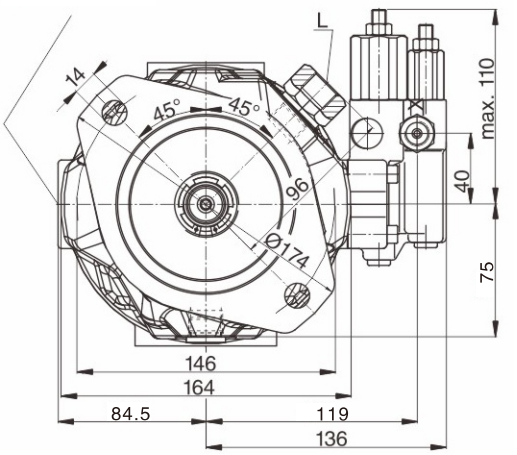
Dependent on the installation position,port L or port L1 must be connected.

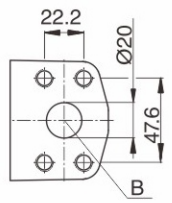
Dimensions size 28 Flange C (Control devices DR, DRG, DFR/DFR1)

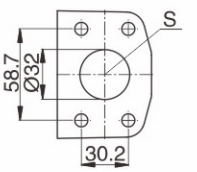
Port 12(control mechanism DG、DFLR、DLR) Port 11 (Control devices DG, DFLR, DLR)



The installation position of the valve when rotated counterclockwise

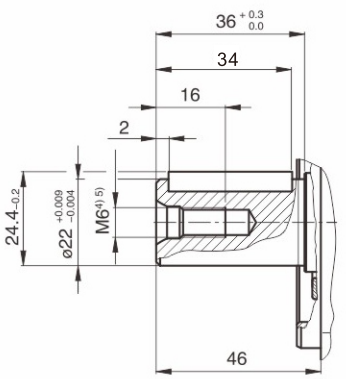




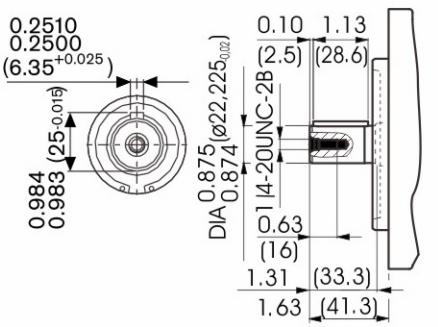


Shaft

P Plain key shaft DIN6885, A6 × 6 × 32



K Plain key shaft, Parallel with key ISO 3019–1 22–1



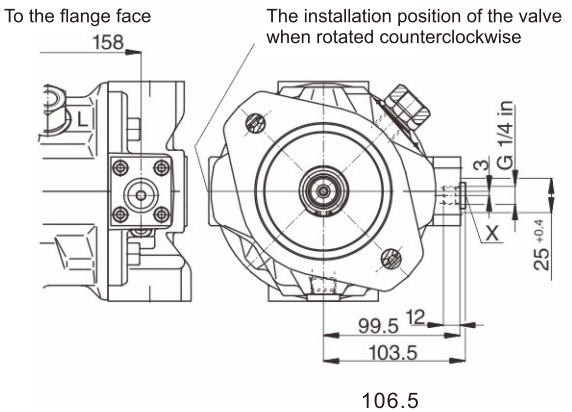
Ports

B	Outlet port	Flange SAE J518 3/4in (Standardseries) Fixing thread 3/8–16UNC;20 deep
S	Suction port	Flange SAE J518 1 1/4in (Standard series) Fixing thread 7/16–14UNC;24 deep
L	Drain port	M18 x 1.5 12
L1	Drain port	3/4–16UNF–2B 14
X	Control pressure	M14 x 1.5 12
X1	Control pressure	G1/4 12 For DG Control

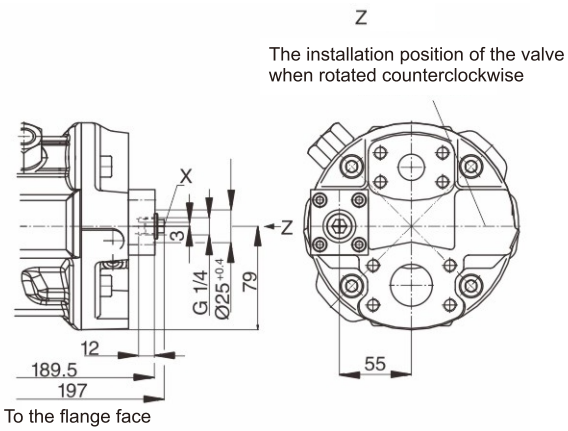
Dependent on the installation position,port L or port L1 must be connected.

Dimensions size 28

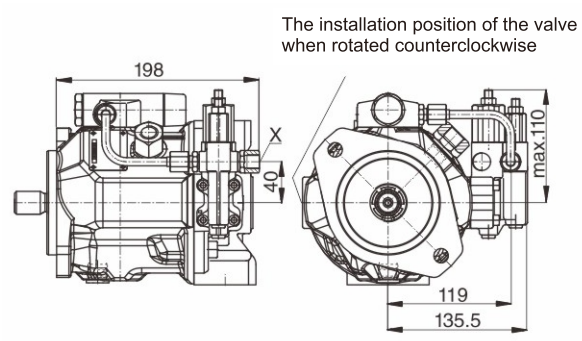
Control devices DG port 12



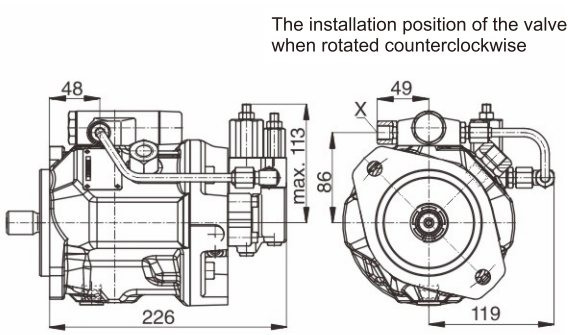
Control devices DG port 11



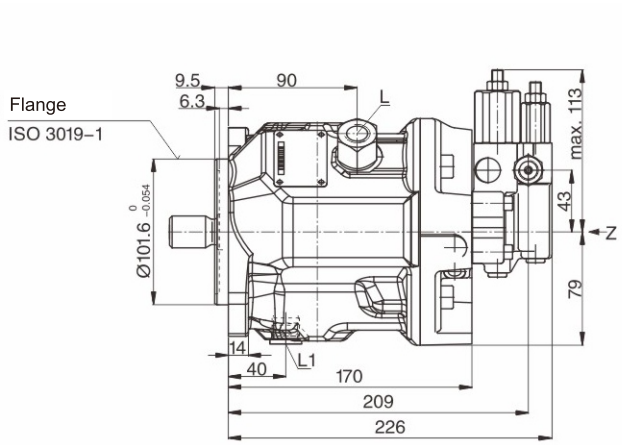
Control devices DFLR, DLR port 12

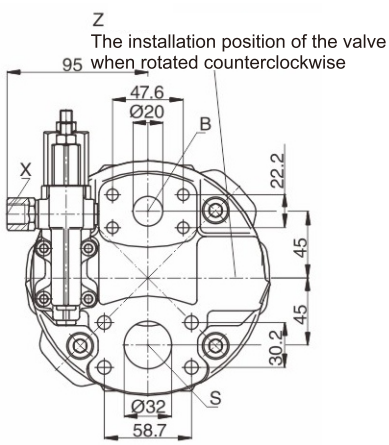


Control devices DFLR, DLR port 11

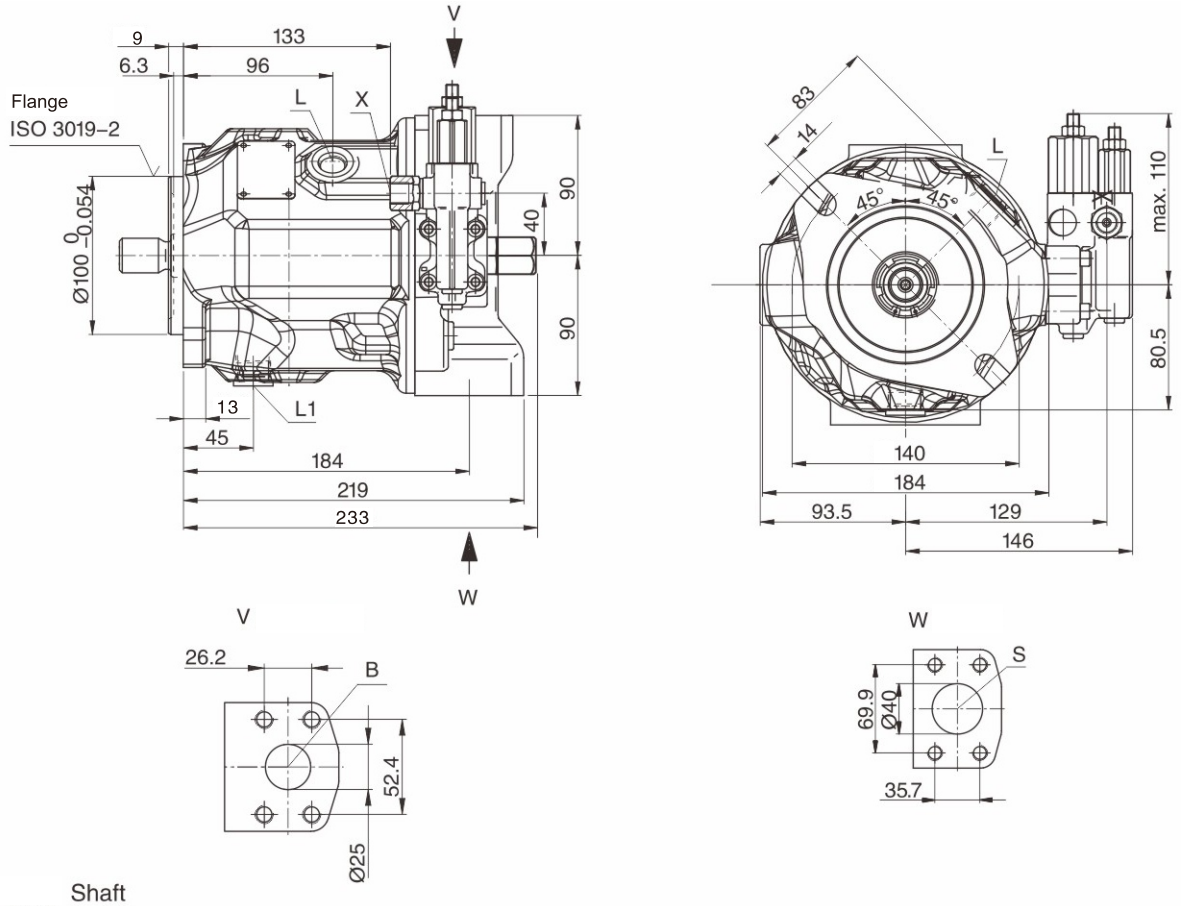


port 11 （Control devices DG,DFLR, DLR ）

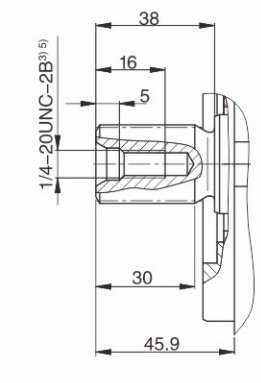




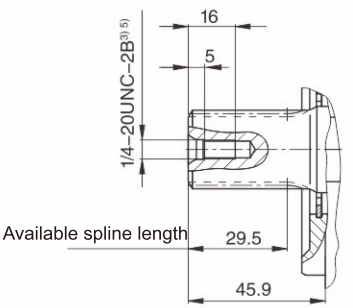
Dimensions size 45 Flange A (Control devices DR, DRG, DFR/DFR1)



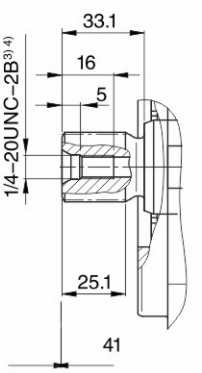
S spline shaft , 1 in 15T 16/32DP[1)]
(SAE J744)



R spline shaft , 1 in 15T 16/32DP[1)2)]
(SAE J744)



U spline shaft , 7/8 in 13T 16/32DP[1)]
SAE J744



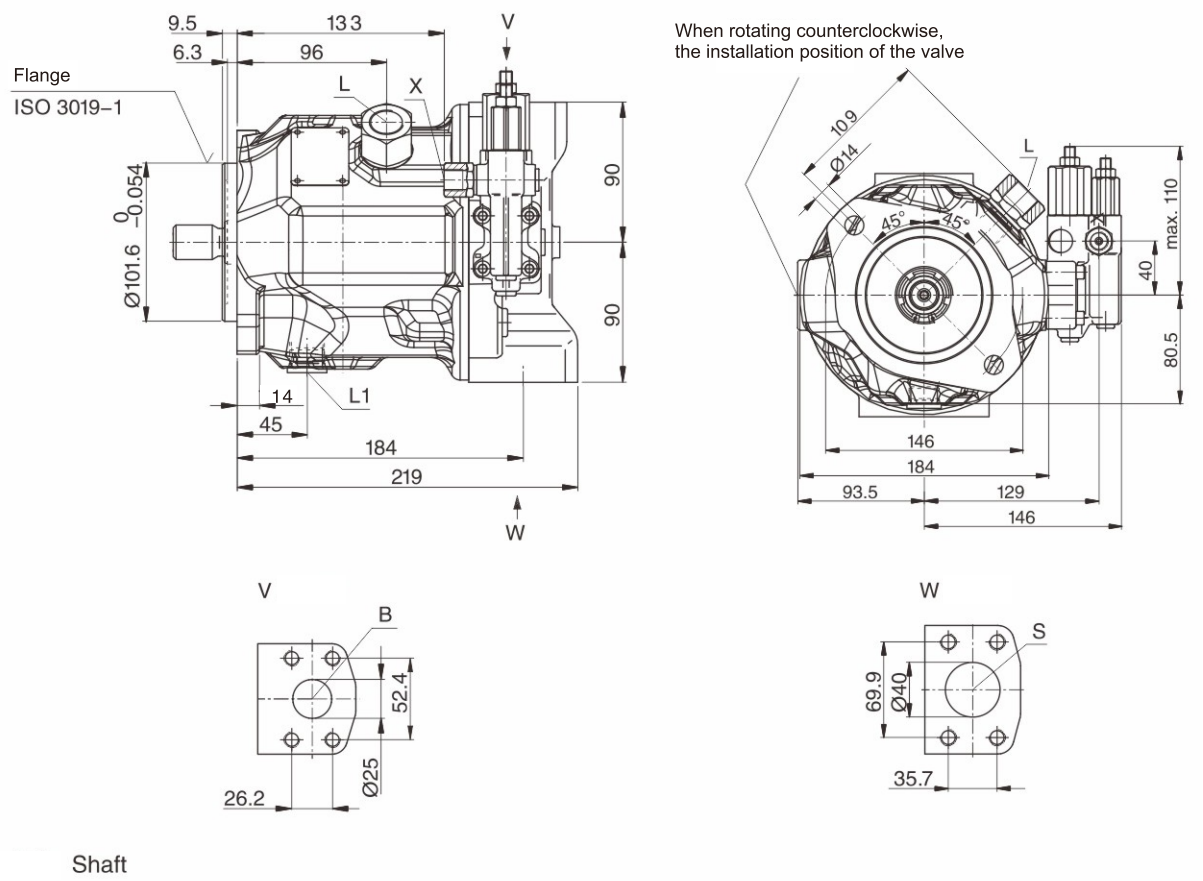
Ports

B	Outlet port	Flange SAE J518 1in (Standardseries)Fixing thread M10 17
S	Suction port	Flange SAE J518 1 1/4–1 1/2in (Standard series) Fixing thread M12 20
L	Drain port	M22 x 1.5 14
L1	Drain port	M22 x 1.5 14
X	Control pressure	M14 x 1.5 12
X1	Control pressure	G1/4 12 For DG Control

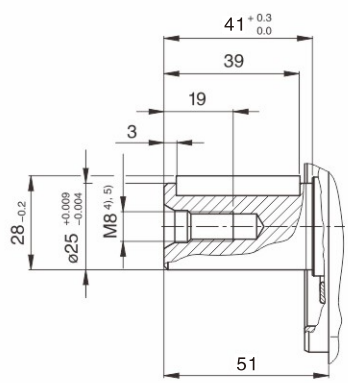
Dependent on the installation position,port L or port L1 must be connected.

Dimensions size 45 Flange C (Control devices DR, DRG, DFR/DFR1)

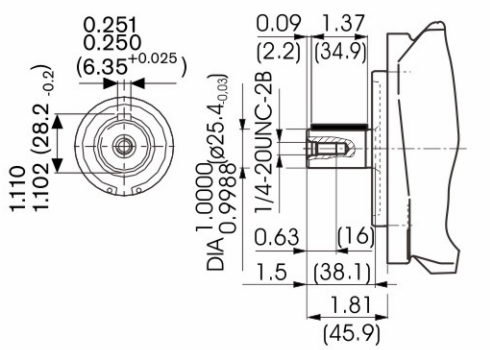
Port 12 (Control devices DG, DFLR, DLR)



P Plain key shaft DIN6885, A8 × 7 × 36



K Plain key shaft, Parallel with key ISO 3019–1 25–1



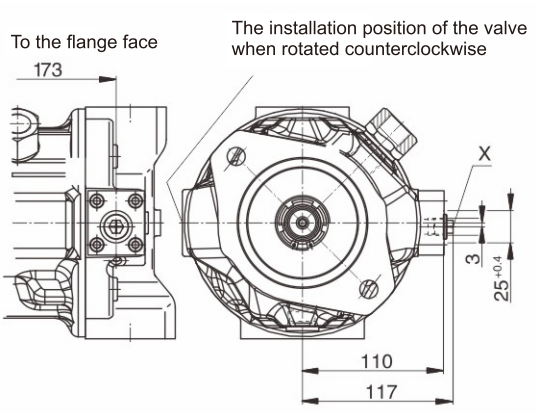
Ports

B	Outlet port	Flange SAE J518 1in (Standardseries) Fixing thread 3/8–16UNC;18 deep
S	Suction port	Flange SAE J518 1 1/2in (Standard series) Fixing thread 1/2–13UNC;22 deep
L	Drain port	M22 x 1.5 14
L1	Drain port	7/8–14unf–2B 16
X	Control pressure	M14 x 1.5 12
X1	Control pressure	G1/4 12 For DG Control

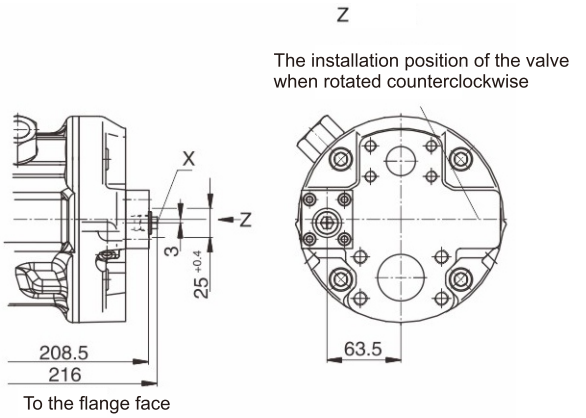
Dependent on the installation position,port L or port L1 must be connected.

Dimensions

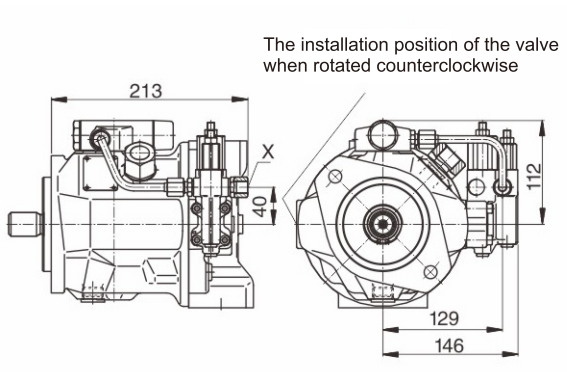
Control device DG port 12



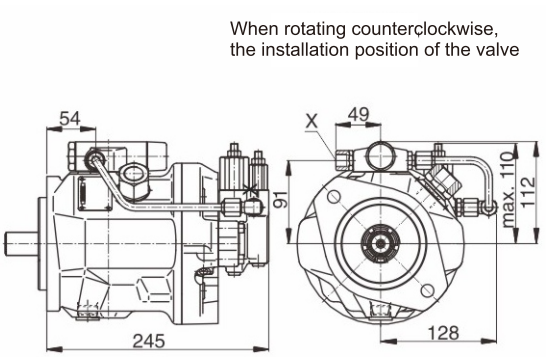
Control device DG port 11



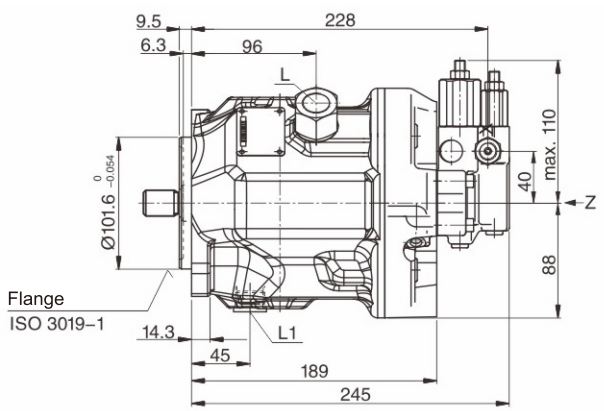
Control device DFLR, DLR port 12

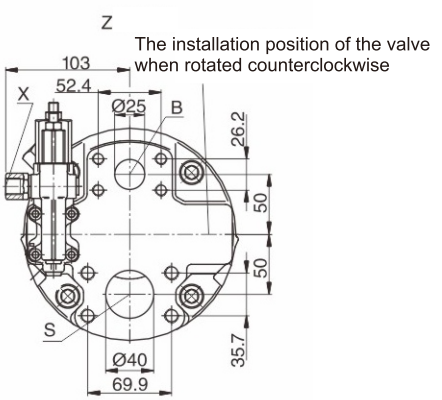


Control device DFLR, DLR port 11

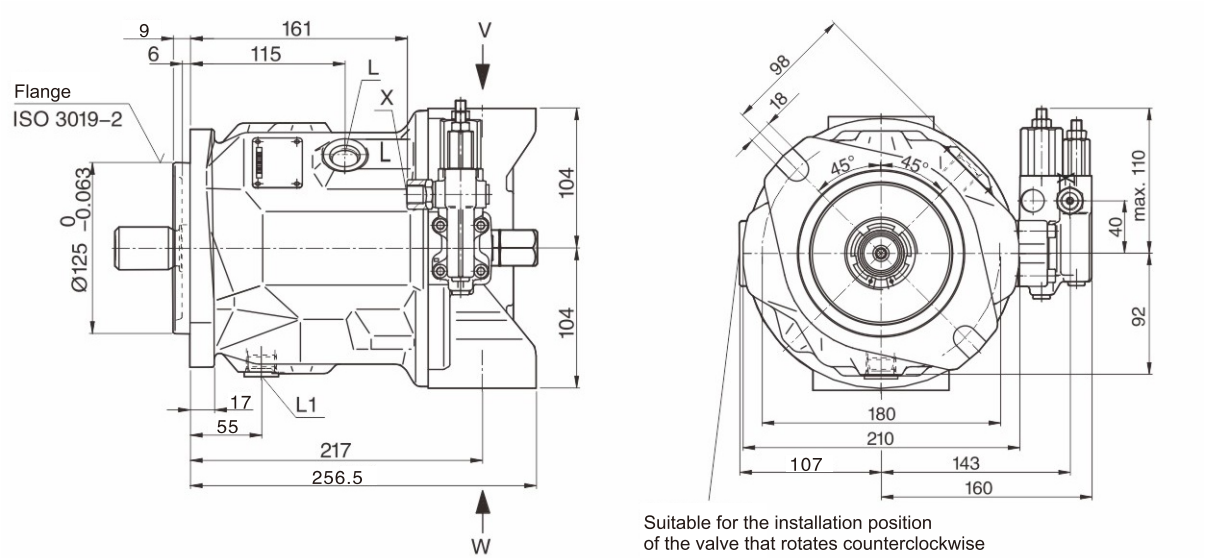


port 11（Control devices DG,DFLR, DLR）



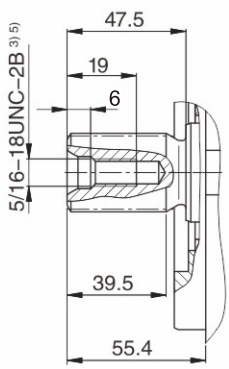


Dimensions size 71 Flange A (Control devices DR, DRG, DFR/DFR1)

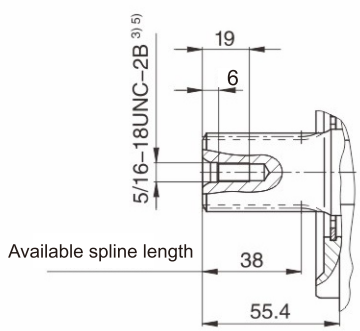


Shaft

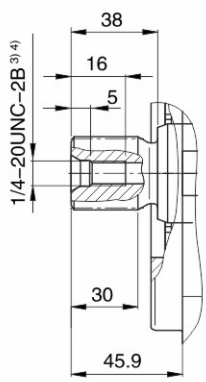
S spline shaft , 1 1/4 in 14T 12/24DP[1] (SAE J744)



R spline shaft , 1 1/4 in 14T 12/24DP[1,2] (SAE J744)



U spline shaft , 1 in 15T 16/32DP[1] (SAE J744)



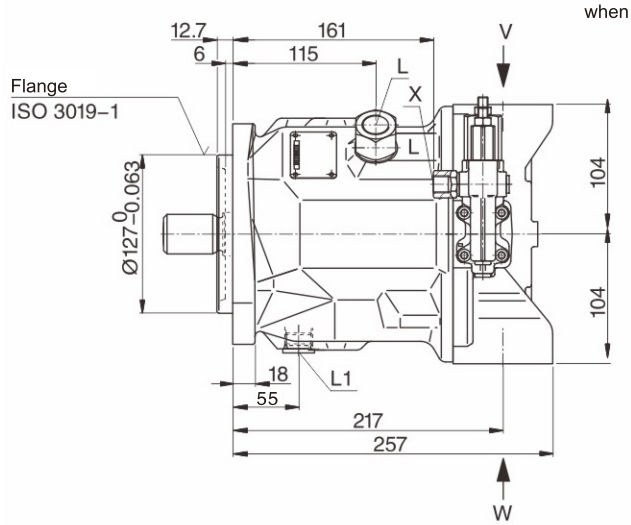
Ports

B	Outlet port	Flange SAE J518 1in (Standardseries) Fixing thread M10 17
S	Suction port	Flange SAE J518 2in (Standard series) Fixing thread M12 20
L	Drain port	M22 x 1.5 14
L1	Drain port	M22 x 1.5 14
X	Control pressure	M14 x 1.5 12
X1	Control pressure	G1/4 deep 12 for DG control

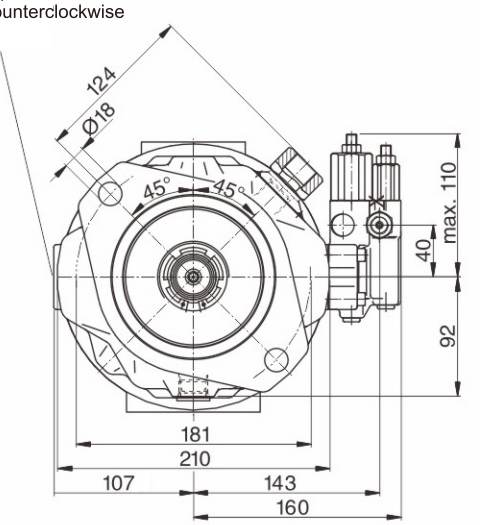
Dependent on the installation position,port L or port L1 must be connected.

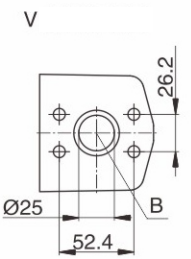
Dimensions size 71 Flange C (Control devices DR, DRG, DFR/DFR1)

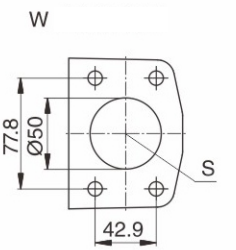
port 42（Control devices DG,DFLR, DLR）



The installation position of the valve when rotated counterclockwise

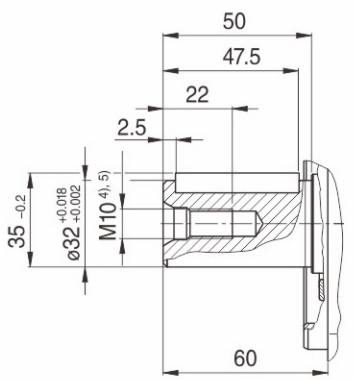




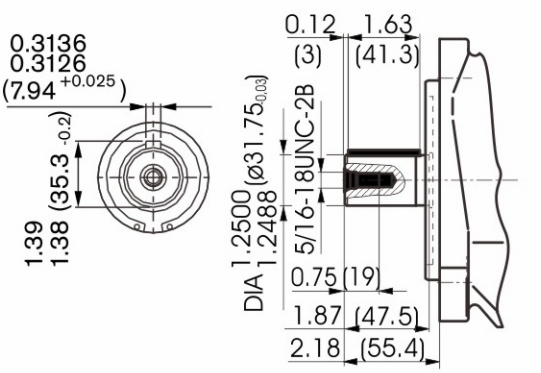


Shaft

P Plain key shaft DIN6885，A10 × 8 × 45



K Plain key shaft，Parallel with key ISO3019–1 32–1



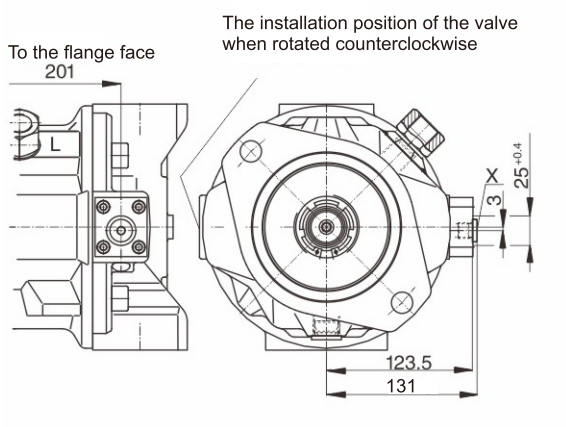
Ports

B	Outlet port	Flange SAE J518 1in (Standardseries) Fixing thread 3/8–16UNC;18 deep
S	Suction port	Flange SAE J518 2in (Standard series) Fixing thread 1/2–13UNC;22 deep
L	Drain port	M22 x 1.5 14
L1	Drain port	7/8–14UNF–2B 16
X	Control pressure	M14 x 1.5 12
X1	Control pressure	G1/4 12For DG Control

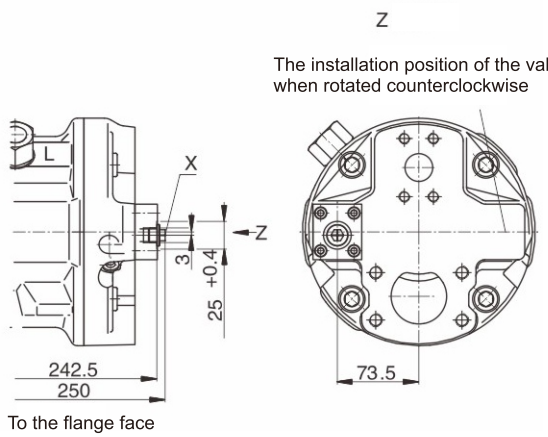
Dependent on the installation position,port L or port L1 must be connected.

Dimensions size 71

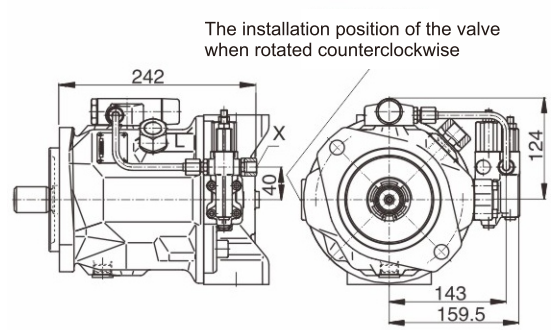
Control device DG port 42



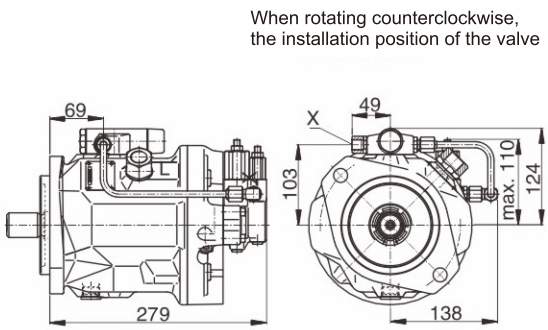
Control device DG port 41



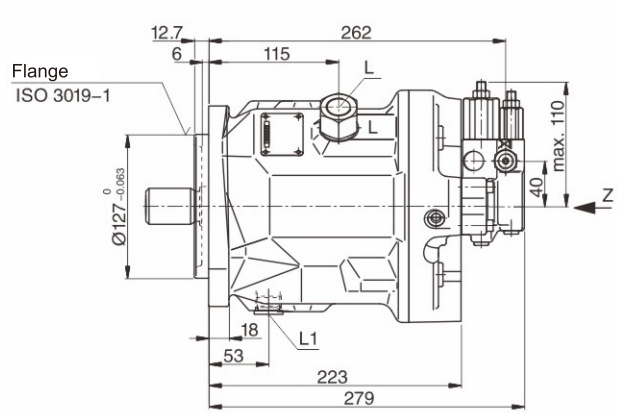
Control device DFLR, DLR port 42

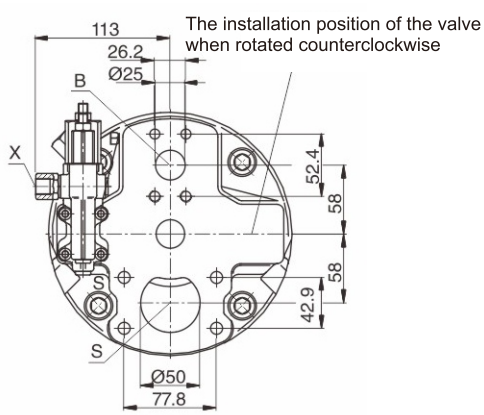


Control device DFLR, DLR port 41

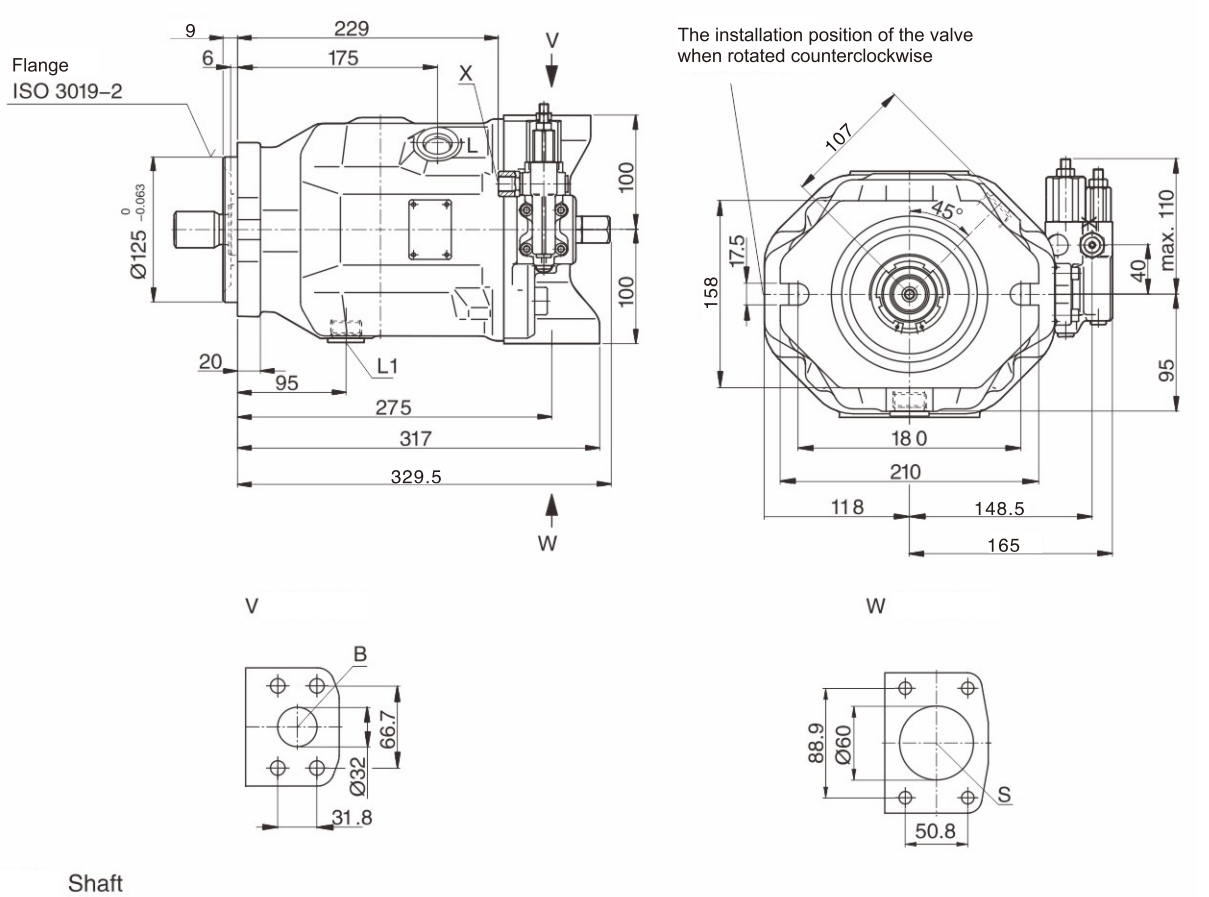


port 11（Control devices DG,DFLR, DLR）

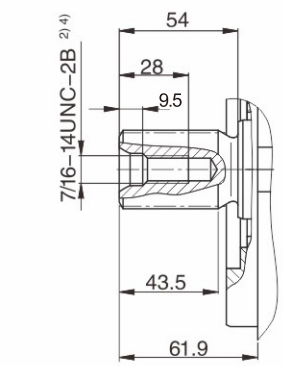




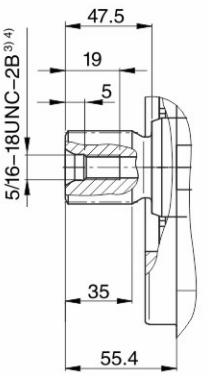
Dimensions size 100 Flange A (Control devices DR, DRG, DFR/DFR1)



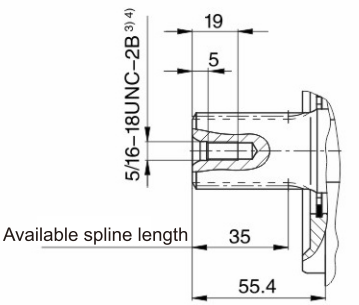
S spline shaft, 1 1/2 in 17T 12/24DP[1)] (SAE J744)



U spline shaft, 1 1/4 in 14T 12/24DP[1)] (SAE J744)



W spline shaft, 1 1/4 in 14T 12/24DP[1)2)] (SAE J744)



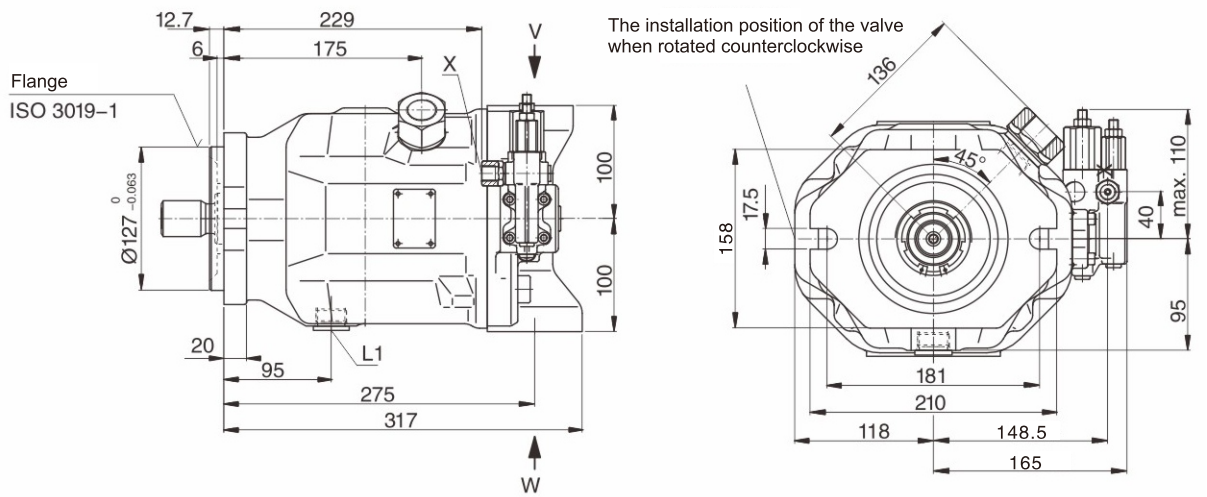
Ports

B	Outlet port	Flange SAE J518 1 1/4in (High–pressure series) Fixing thread M14 19
S	Suction port	Flange SAE J518 2 1/2in (Standard series) Fixing thread M12 17
L	Drain port	M27 x 2 16
L1	Drain port	M27 x 2 16
X	Control pressure	M14 x 1.5 12
X1	Control pressure	G1/4 12 For DG Control

Dependent on the installation position,port L or port L1 must be connected.

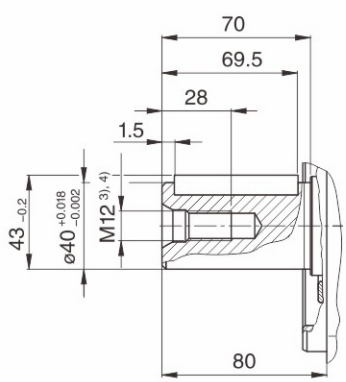
Dimensions size 100 Flange C (Control devices DR, DRG, DFR/DFR1)

Port 12 (Control devices DG, DFLR, DLR)

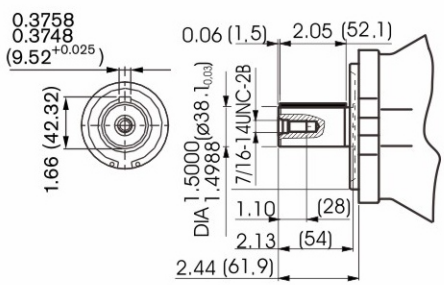


Shaft

P Plain key shaft DIN6885, A12 × 8 × 68



K Plain key shaft, Parallel with key ISO 3019–1 38–1



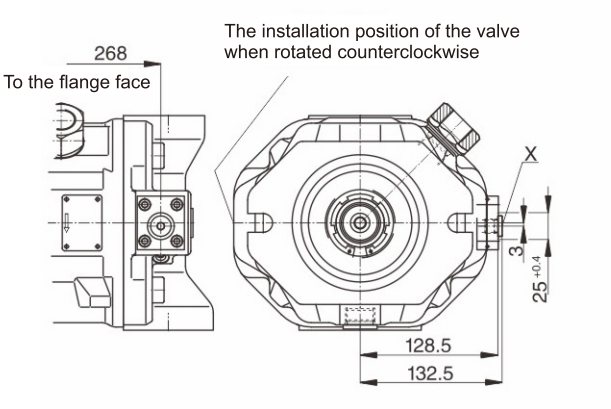
Ports

B	Outlet port	Flange SAE J518 1 1/4in (High–pressure series) Fixing thread 1/2–13UNC;19 deep
S	Suction port	Flange SAE J518 2 1/2in (Standard series) Fixing thread 1/2–13UNC;27 deep
L	Drain port	M27 x 1.5 14
L1	Drain port	1/16–12unf–2B 18
X	Control pressure	M14 x 1.5 12
X1	Control pressure	G1/4 12 For DG Control

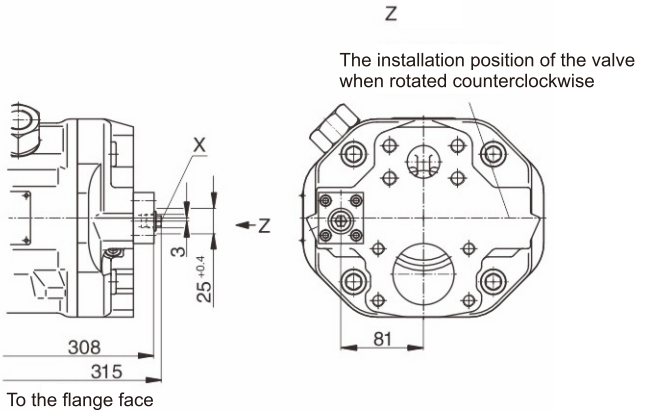
Dependent on the installation position,port L or port L1 must be connected.

Dimensions size 100

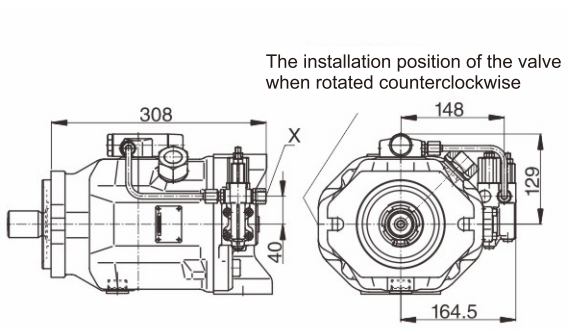
Control device DG port 12



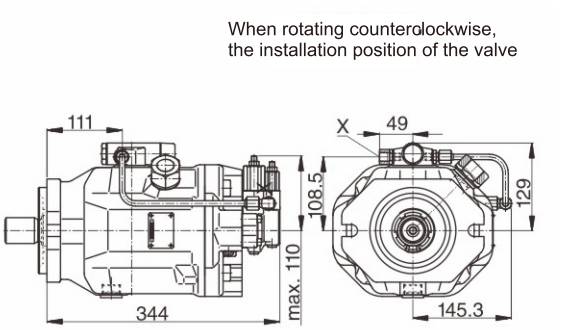
Control device DG port 11



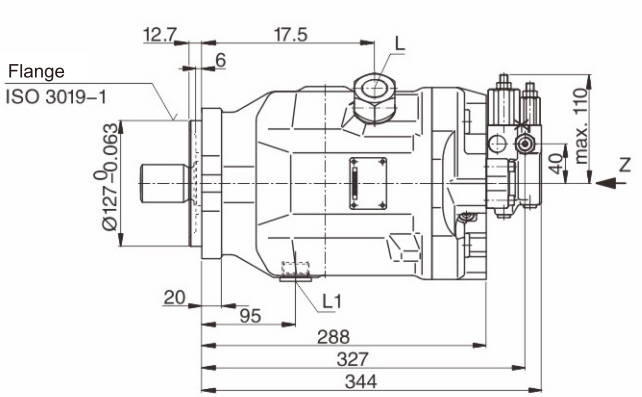
Control device DFLR, DLR port 12

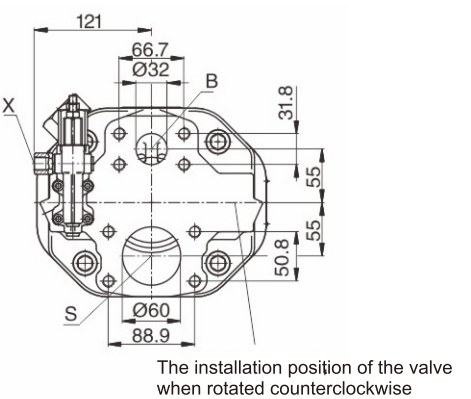


Control device DFLR, DLR port 11

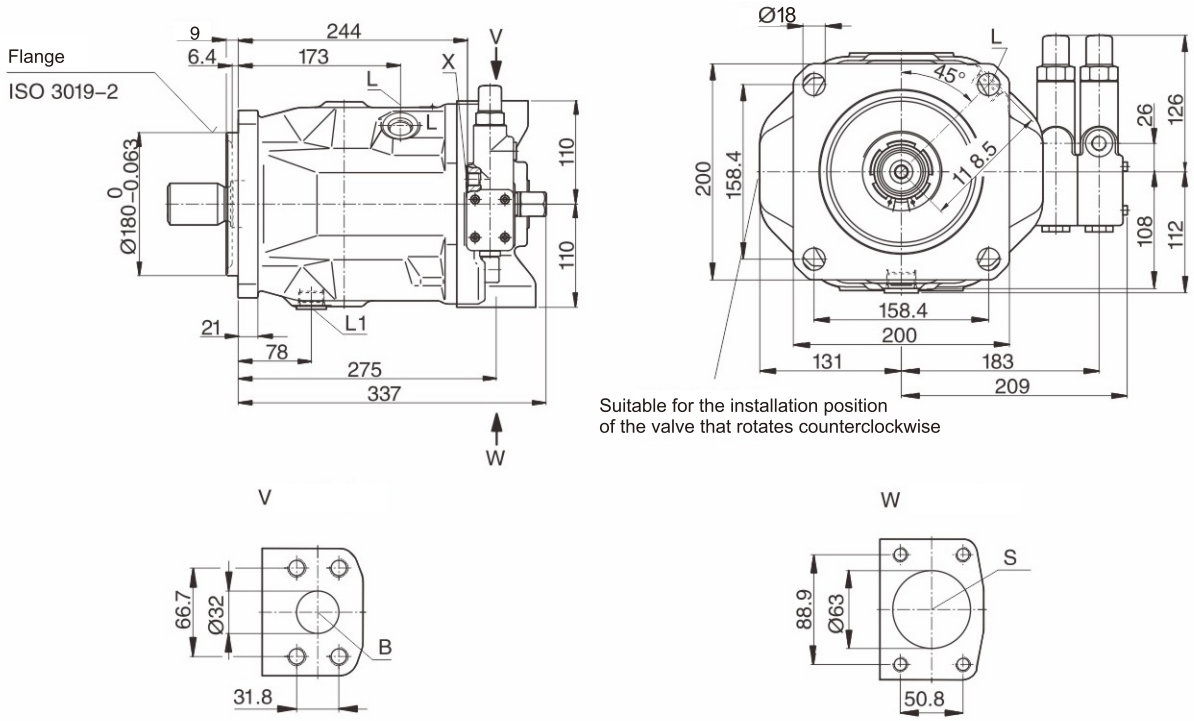


port 11（Control devices DG,DFLR, DLR）



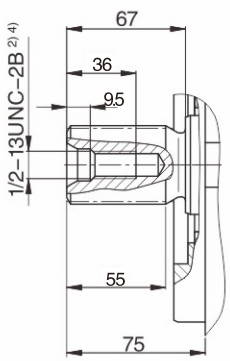


Dimensions size 140 Flange B (Control devices DR, DRG, DFR/DFR1)

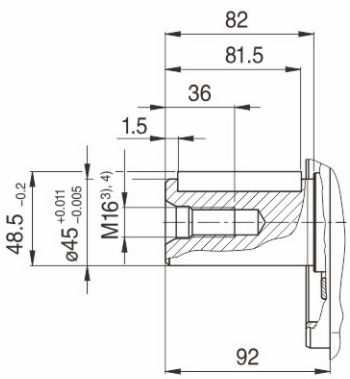


Shaft

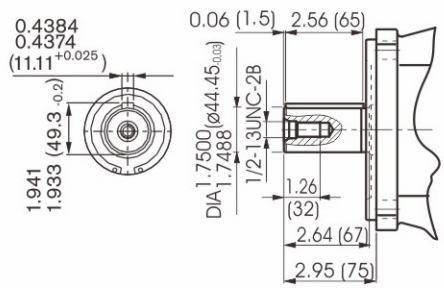
S spline shaft , 1 3/4 in 13T 8/16DP[1] (SAE J744)



P Plain key shaft DIN6885, A14 × 9 × 80



K Plain key shaft Parallel with key ISO 3019–1 44–1



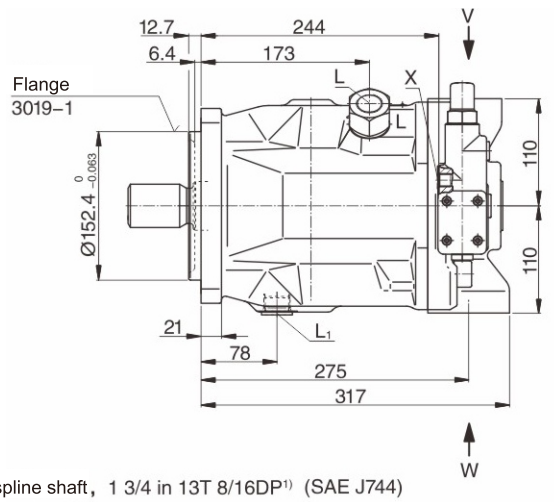
Ports

B	Outlet port	Flange SAE J518 1 1/4in (High–pressure series) Fixing thread M14 19
S	Suction port	Flange SAE J518 2 1/2in (Standard series) Fixing thread M12 17
L	Drain port	M27 x 2 16
L1	Drain port	M27 x 2 16
X	Control pressure	M14 x 1.5 12
X1	Control pressure	G1/4 12 For DG Control

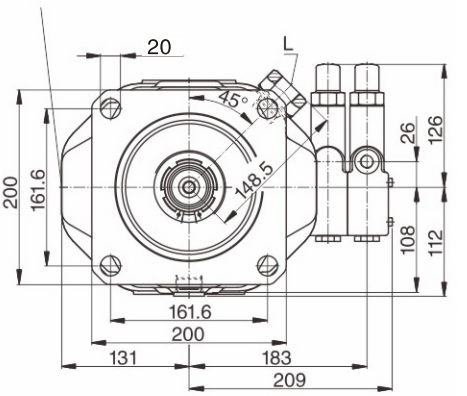
Dependent on the installation position,port L or port L1 must be connected.

Dimensions size 140 Flange D (Control devices DR, DRG, DFR/DFR1)

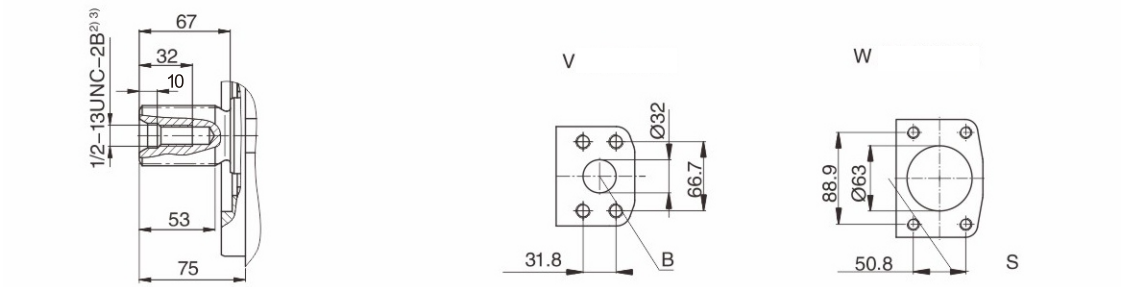
port 12 (Control devices DG,DR,DFLR, DLR)



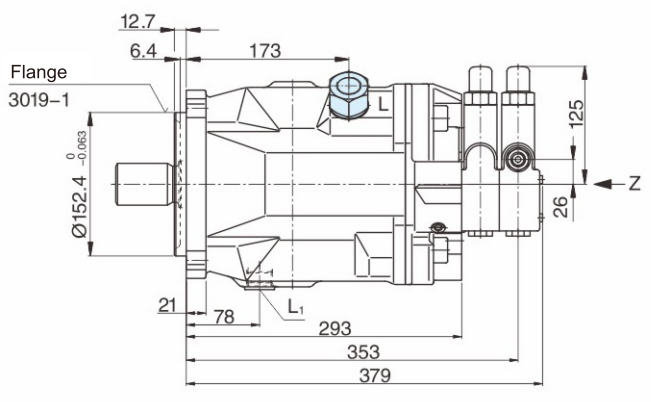
The installation position of the valve when rotated counterclockwise

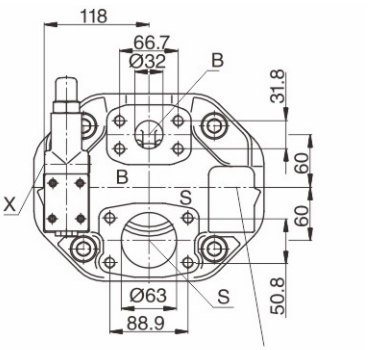


S spline shaft, 1 3/4 in 13T 8/16DP[1] (SAE J744)



port 11 (Control devices DG,DR,DFLR, DLR)





The installation position of the valve when rotated counterclockwise

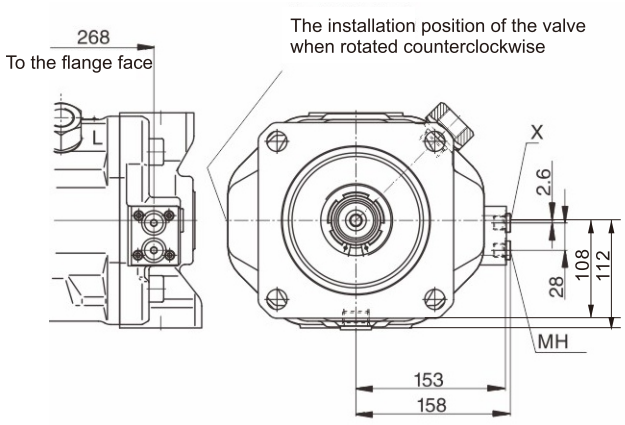
Ports

B	Outlet port	Flange SAE J518 1 1/4in (High–pressure series)Fixing thread 1/2–13UNC;24 deep
S	Suction port	Flange SAE J518 2 1/2in (Standard series) Fixing thread 1/2–13UNC;24 deep
L	Drain port	M27 x 2 16
L1	Drain port	1 1/16–12UNF–2B 18
X	Control pressure	M14 x 1.5 12
X1	Control pressure	M14 x 1.5 12 For DG Control

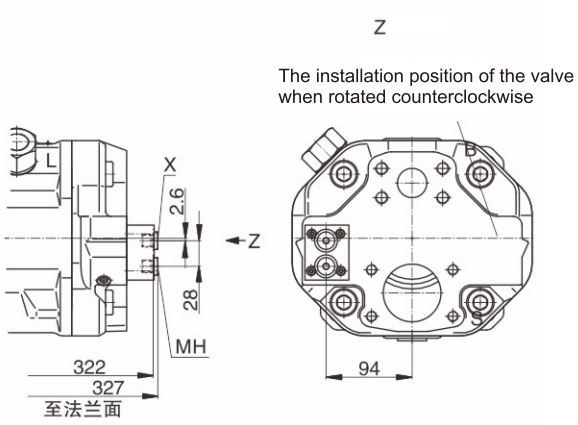
Dependent on the installation position,port L or port L1 must be connected.

Dimensions size 140

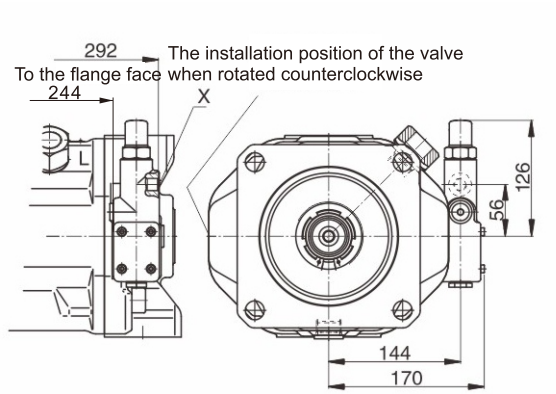
Control device DG port 12



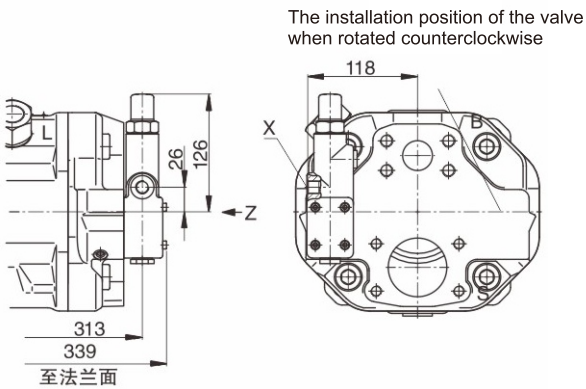
Control device DG port 11



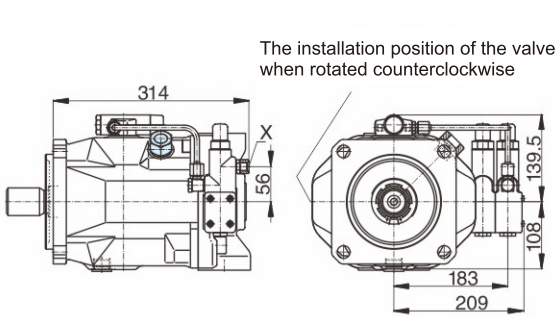
Control device DR, DRG port 12



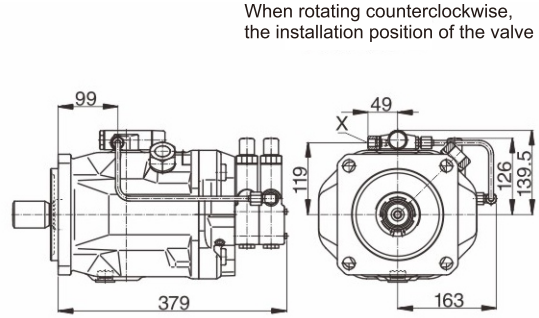
Control device DR, DRG port 11



Control device DFLR, DLR port 12



Control device DFLR, DLR port 11

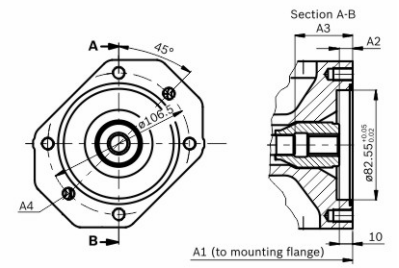


Dimensions，throug drive

Flange ISO 3019-1(SAE) Diameter	Symbol		Hub for splined shaft[1] Diameter		Availability over sixes 18	28	45	71	88	100	140	Code
82-2	(A)		5/8 in	9T 16/32DP	●	●	●	●	●	●	●	K01
			3/4 in	11T 16/32DP	●	●	●	●	●	●	●	K52

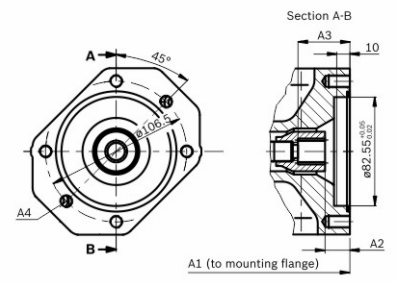
● = Available – = Not available

▼ 82-2



K01	NG	A1	A2	A3	A4[2]
(SAE J744 16-4(A)	18	182	10	43.3	M10x1.5;14.5 deep
	28	204	10	33.7	M10x1.5;16 deep
	45	229	10.7	53.4	M10x1.5;16 deep
	71	267	11.8	61.3	M10x1.5;20 deep
	88	267	11.8	61.3	M10x1.5;20 deep
	100	338	10.5	65	M10x1.5;16 deep
	140	350	10.8	77.3	M10x1.5;16 deep

▼ 82-2

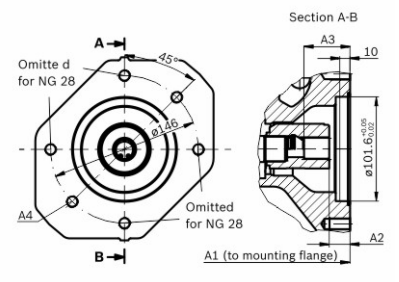


K52	NG	A1	A2	A3	A4[2]
(SAE J744 19-4(A-B))	18	182	18.8	38.7	M10x1.5;14.5 deep
	28	204	18.8	38.7	M10x1.5;16 deep
	45	229	18.9	38.7	M10x1.5;16 deep
	71	267	21.3	41.4	M10x1.5;20 deep
	88	267	21.3	41.4	M10x1.5;20 deep
	100	338	19	38.9	M10x1.5;16 deep
	140	350	18.9	38.6	M10x1.5;16 deep

Flange ISO 3019-1(SAE) DiameterSymbol			Hub for splined shaft[1] Diameter		Availability over sixes 18	28	45	71	88	100	140	Code
101-2	(A)		7/8 in	13T 16/32DP	–	●	●	●	●	●	●	K68
			1 in	15T 16/32DP		–	●	●	●	●	●	K04

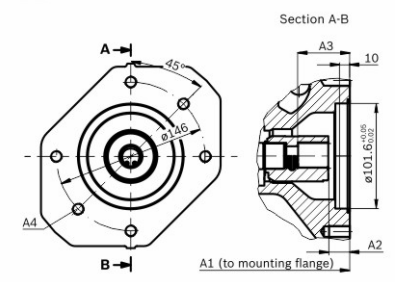
● = Available – = Not available

▼ 101-2



K68	NG	A1	A2	A3	A4[2]
(SAEJ744 22-4(B)	28	204	17.8	41.7	M12x1.75
	45	229	17.9	41.7	M12x1.75;18 deep
	71	267	20.3	44.7	M12x1.75;20 deep
	88	267	20.3	44.7	M12x1.75;20 deep
	100	338	18	41.9	M12x1.75;20 deep
	140	350	17.8	41.6	M12x1.75;20 deep

▼ 101-2



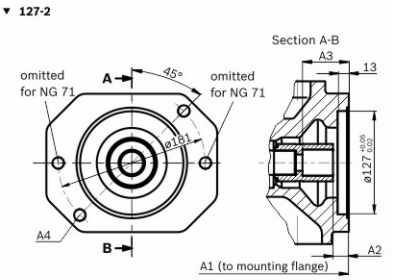
K04	NG	A1	A2	A3	A4[2]
(SAEJ744 25-4(B-B))	45	229	18.4	46.7	M12x1.75;18 deep
	71	267	20.8	49.1	M12x1.75;20 deep
	88	267	20.8	49.1	M12x1.75;20 deep
	100	338	18.2	46.6	M12x1.75;20 deep
	140	350	18.3	45.9	M12x1.75;20 deep

1) According to ANSI B92.1a,30° pressure angle, flat root, side fit,tolerance class 5
2) Thread according to DIN 13

Flange ISO 3019-1(SAE) DiameterSymbol			Hub for splined shaft[1] Diameter		Availability over sixes							Code
					18	28	45	71	88	100	140	
127-2	(C)		1 1/4in	14T 12/24DP	–	–	–	●	●	●	●	K07
			1 1/2 in	17T 12/24DP	–	–	–	–	–	●	●	K24

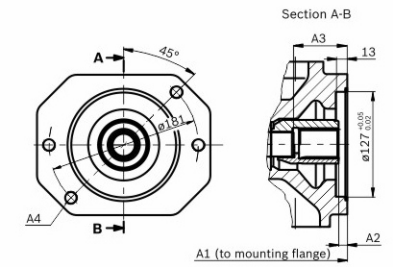
● = Available – = Not available

▼ 127-2



K07	NG	A1	A2	A3	A4[2]
(SAE J744 32-4(C))	71	267	21.8	58.6	M16x2
	88	267	21.8	58.6	M16x2
	100	338	19.5	56.4	M16x2
	140	350	19.3	56.1	M16x2;24 deep

▼ 127-2

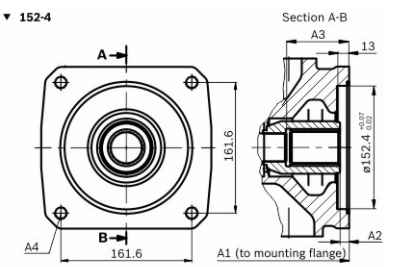


K24	NG	A1	A2	A3	A4[2]
(SAE J744 38-4(C-C))	100	338	10.5	65	M16x2
	140	350	7.9	73.3	M16x2;32 deep

Flange ISO 3019-1(SAE) DiameterSymbol			Hub for splined shaft[1] Diameter		Availability over sixes							Code
					18	28	45	71	88	100	140	
152-4 63-4	(A)	⌘	1 3/4in	13T 8/16DP	–	–	–	–	–	–	●	K17
		⌘	Metric keyed shaft ⌀25		–	●	●	●	●	●	●	K57

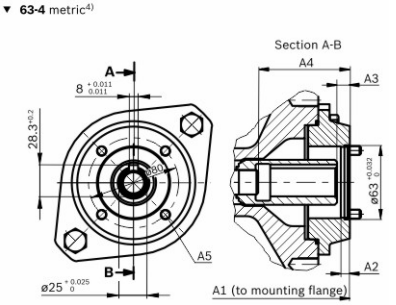
● = Available – = Not available

▼ 152-4



K17	NG	A1	A2	A3	A4[2]
(SAE J744 44-4(D))	140	350	11	77.3	M16x2

▼ 63-4 metric[4]



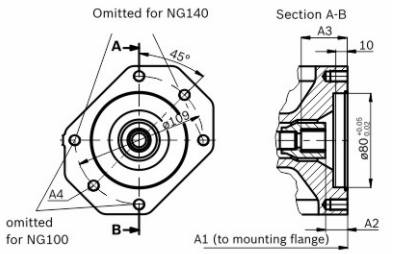
K57	NG	A1	A2	A3	A4	A5
(4-hole flange)	28	232	8	10.6	58.4	M8
	45	257	8	11	81	M8
	71	283	8	12.5	77	M10
	88	283	8	12.5	77	M10
	100	354	8	10.5	81	M10
	140	366	8	11	93	M8

1) According to ANSI B92.1a,30° pressure angle, flat root, side fit,tolerance class 5
2) Thread according to DIN 13

Flange ISO 3019-1(SAE) DiameterSymbol			Hub for splined shaft [1] Diameter		Availability over sixes							Code
					18	28	45	71	88	100	140	
80 100	2-hole 2-hloe		3/4 in	11T 16/32DP	●	●	●	●	●	●	●	KB2
			7/8 in	13T 16/32DP	-	●	●	●	●	●	●	KB3
			1 in	15T 16/32DP	-	-	●	●	●	●	●	KB4

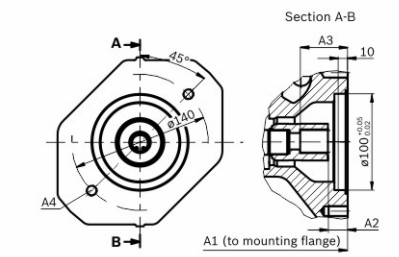
● = Available - = Not available

▼ **80, 2-hole**



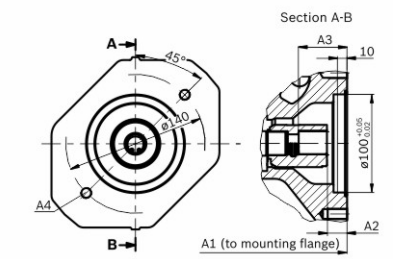
KB2	NG	A1	A2	A3	A4[2]
(SAE J744 19-4(A-B))	18	182	18.8	38.7	M10x1.5;14.5 deep
	28	204	18.8	38.7	M10x1.5;16 deep
	45	229	18.9	38.7	M10x1.5;16 deep
	71	267	21.3	41.4	M10x1.5;20 deep
	88	267	21.3	41.4	M10x1.5;20 deep
	100	338	19	38.9	M10x1.5;20 deep
	140	350	18.9	38.6	M10x1.5;20 deep

▼ **100, 2-hole**



KB3	NG	A1	A2	A3	A4[2]
(SAE J744 22-4(B))	28	204	17.8	41.7	M12x1.5;
	45	229	17.9	41.7	M12x1.5;
	71	267	20.3	44.1	M12x1.5;20 deep
	88	267	20.3	44.1	M12x1.5;20 deep
	100	338	18	41.9	M12x1.5;20 deep
	140	350	17.8	41.6	M12x1.5;20 deep

▼ **100, 2-hole**



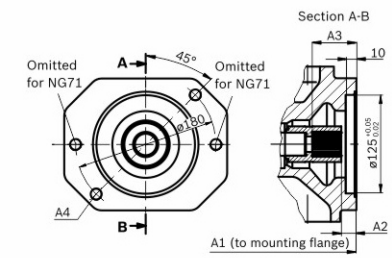
KB4	NG	A1	A2	A3	A4[2]
(SAE J744 25-4(B-B))	45	229	18.4	46.7	M12x1.75
	71	267	20.8	49.1	M12x1.75;20 deep
	88	267	20.8	49.1	M12x1.75;20 deep
	100	338	18.2	46.6	M12x1.75;20 deep
	140	350	18.3	45.9	M12x1.75;20 deep

1) According to ANSI B92.1a,30° pressure angle, flat root, side fit,tolerance class 5
2) Thread according to DIN 13

Flange ISO 3019-1(SAE) DiameterSymbol			Hub for splined shaft [1] Diameter		Availability over sixes							Code
					18	28	45	71	88	100	140	
125 180	2-hole 2-hloe		1 1/4 in	14T 12/24DP	–	–	–	●	●	●	●	KB5
			1 1/2 in	17T 12/24DP	–	–	–	–	–	●	●	KB6
			1 3/4 in	13T 8/16DP	–	–	–	–	–	–	●	KB7

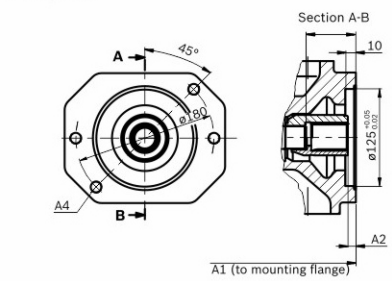
● = Available – = Not available

▼ 125, 2-hole



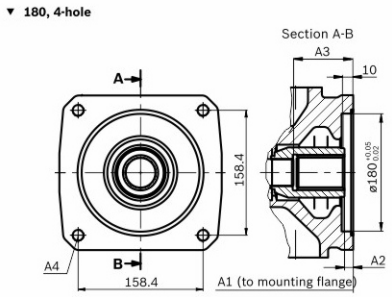
KB5	NG	A1	A2	A3	A4 [2]
(SAE J744 32-4(C))	71	267	21.8	58.6	M16x2
	88	267	21.8	58.6	M16x2
	100	338	19.5	56.4	M16x2
	140	350	19.3	56.1	M16x2;24 deep

▼ 125, 2-hole



KB6	NG	A1	A2	A3	A4 [2]
(SAE J744 38-4(C-C))	100	338	10.5	65	M16x2
	140	350	7.9	73.3	M16x2;32 deep

▼ 180, 4-hole



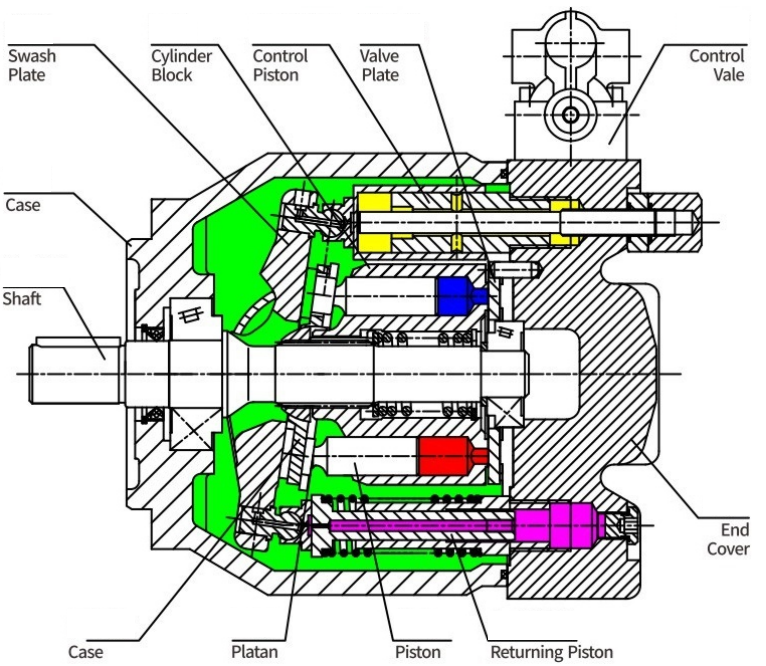
KB7	NG	A1	A2	A3	A4 [2]
(SAE J744 44-4(D))	140	350	11.3	77.3	M16x2 [2]

1) According to ANSI B92.1a,30° pressure angle, flat root, side fit,tolerance class 5
2) Thread according to DIN 13

Variable Displacement Piston PumP OS –A10VO/32

Overview

OS –A10V(S)O/32 series variable displacement piston pump swash plate axial plunger variable pump,respectively for industrial use and for mobile machinery design, is designed for open loop hydraulic driven design, adopts a shaft structure, rated working pressure up to 28Mpa.



Features

※Variable pump with axial piston rotary group of swash– plate design for hydrostatic drives in open circuit
※Flow is proportional to the drive speed and displacement.
※The flow can be infinitely varied by adjusting the swash– plate angle.
※Hydrostatic unloading of the cradle bearings
※Connection for measuring sensor on the high–pressure port
※Low noise level
※Low pressure pulsation
※High efficiency
※High resistance against cavitation, loss of suction
pressure and case pressure peaks
※Universal through driv

Type Code

OS–	A10VS	O	45	DR	/	32	R	—	V	P	B	22U	B3
	1	2	3	4		5	6		7	8	9	10	11

1–Machinery Classification

Axial piston, swash plate design, variable, used in industry	A10VS

2–Operational Mode

Open circuit	O

3–Size

Nominal displacement mL/r	45	71	100	140	

4–Control Devices

Two point control, directly operated DG							DG
Pressure Control			●	●	●	●	DR
	with flow controller	X–Topen	●	●	●	●	DRF
		X–Tplugged	●	●	●	●	DRS
	Remote pressure control		●	●	●	●	DRG
Power control	With pressure cut–off beginning of control	5MPa	●	●	●	●	LA5D
		5.1–9MPa	●	●	●	●	LA6D
		9.1–16MPa	●	●	●	●	LA7D
		16–24MPa	●	●	●	●	LA8D
		24MPa	●	●	●	●	LA9D
Power controller with pressure cut–off , remotely operated			●	●	●	●	LA*DG
Poywer ,controller with pressure cut–off flow control, X–T plugged			●	●	●	●	LA*DS
Power controller flow control, X–T plugged, electically over–ridable (nega –tive control)			●	●	●	●	LA*S

5–Series

	32

6–Rotating Direction(View on Shaft End)

Clockwise	R
Counterclockwise	L

7–Seals

VitonFKM	V

8–Shaft End

	45	71	100	140	
Keyed shaft DIN6885	●	●	●	●	P
Splined shaft SAE	●	●	●	●	S
Similar to shaftS	●	●	–	–	R

Chart shows: ●=Available，○=In preparation，–=Not available

9–Mounting Flange

ISO 4	B

10–Service Line Ports

	22U

11–Through Drive

			45	71	100	140	
Without through drive			●	●	●	●	N00
With through drive, the second pump connection dimension as follows							
Mounting flange	Spline shaft	The second pump					
ISO80–2	S 3/4in11T16/32DP	CR10VS018/31	●	●	●	●	B2
ISO100–2	S 7/8in13T16/32DP	CR10VSO28/31	●	●	●	●	B3
ISO100–2	S 1 in15T16/32DP	CR10VSO45/31	●	●	●	●	B4
ISO125–4	S 1 in15T16/32DP	CR10VSO45/32	●	●	●	●	E1
ISO160–4	S 1 1/4in14T12/24DP	CR10VSO71/32	–	●	●	●	B8
IS0180–4	S 1 1/2in17T12/24DP	CR10VS0100/32	–	–	●	●	B9
IS0180–4	S 1 3/4in13T8/16DP	CR10V0140/31–32	–	–	–	●	B7
SAE82–2	U 5/8in9T16/32DP	CR10VSO18/31	●	●	●	●	01
SAE82–2	S 3/4in11T16/32DP	CR10VSO18/31	●	●	●	●	52
SAE101–2	S 7/8in13T16/32DP	CR10VSO28/31	●	●	●	●	68
SAE101–2	S 1 in15T16/32DP	CR10VSO45/31	●	●	●	●	04
SAE127–4	S 1in 5T16/32DP	CR10VS071/31	●	●	●	●	E2
SAE127–4	S 1 1/4in14T12/24DP	CR10VS0100/31	–	●	●	●	15
SAE127–2	S 1 1/2in17T12/24DP	CR10VS0140/31	–	–	●	●	24
SAE152–4	S 1 1/2in17T12/24DP	CR10VS0100/32	–	–	●	●	96
SAE152–4	S 1 3/4in13T8/16DP	CR10V0140/31–32	–	–	–	●	17

Technical Data

■ Parameters Table

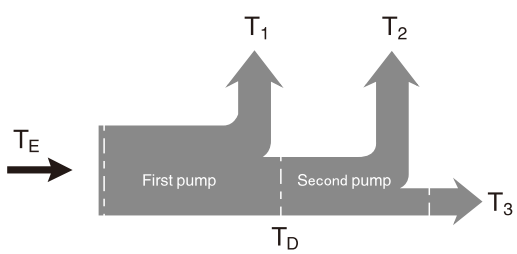
Size				45	71	100	140
Displacement		$V_{g\,max}$	mL/r	45	71	100	140
Pressure at suction port US (Absolute pressure)	Minimum pressure	$P_{s\,min}$	bar	0.8		1	
	Maximum pressure	$P_{s\,max}$	bar	10			
Pressure at Outlet port B (Absolute pressure)	Rated pressure	P_N	bar	280			
	Peak pressure	P_{max}	bar	350			
	Minimum pressure		bar	10			
Rate of pressure change		R_A	bar/s	16000			
Drain port L,L_1 pressure (Absolute pressure)		P_L	bar	2			

Size				45	71	100	140
Displacement		$V_{g\,max}$	mL/r	45	71	100	140
Max. speed P_s = 1bar	Vg= Vg max	$n_{o\,max}$	r/min	1800	1800	–	–
	Vg< Vg max		r/min	–	–	1800	1800
Max. flow	n = n o max	$q_{vo\,max}$	L/min	81	128	180	252
	n = 1500 r/min		L/min	67.5	106.7	150	210
Maximum power (△p= 280 bar)	n = n o max	$p_{o\,max}$	kW	38	59.7	84	118
	n = 1500 r/min		kW	31	50	70	98
Torque (V_g= V_{gmax})	△ p=280 bar	T_{max}	Nm	200	317	446	624
	△ p=100 bar	T	Nm	72	113	159	223
Torsional stiffness	Shaft extension P		Nm/rad	34587	80627	132335	188406
	Shaft extension S		Nm/rad	29497	71884	121142	169537
	Shaft extension R		Nm/rad	41025	76545	–	–
Moment of inertia of the rotating assembly		J	kgm^2	0.0035	0.0087	0.0185	0.0276
Max. angular acceleration			rad/s^2	4000	2900	2400	2000
Volume of case			L	1.0	1.6	2.2	3.0
Weight			kg	30	47	69	73
Torque (Vgmax△ p=280 bar)		T_{max}	Nm	200	317	446	624
Max. input torque[1)]	Shaft extension P	T_{Emax}	Nm	200	439	857	1206
		ϕ	mm	25	32	40	45
	Shaft extension S	T_{Emax}	Nm	319	626	1104	1620
		ϕ	in	1	1 1/4	1 1/2	1 3/4
	Shaft extension R	T_{Emax}	Nm	400	644	–	–
		ϕ	in	1	1 1/4	–	–

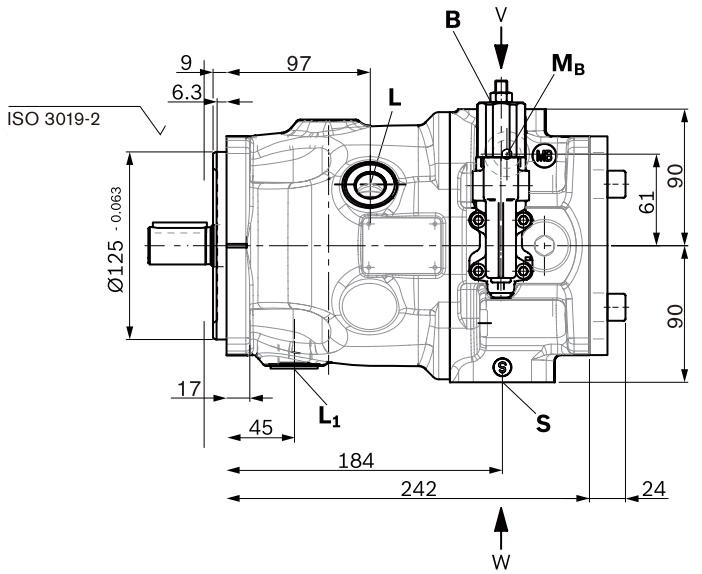
1) Once V_g=$V_{g\,max}$, the value is applicable to the inlet pressure at suction port S is P_s = 1bar (absolute pressure), when the inlet pressure P_s increase or decrease the displacement,the speed can be in creased,when the inlet pressure $P_{s\,min}$ = 0.8bar, the speed should be reduced to 90%. V_g < $V_{g\,max}$ value when the speed limit.

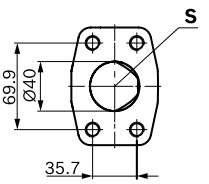
2) For drive shaft free of radial load

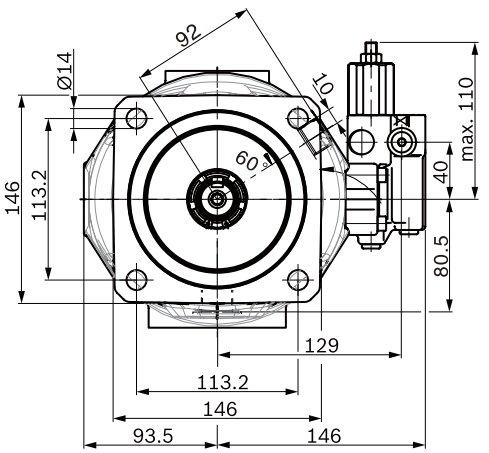
Torque Distribution

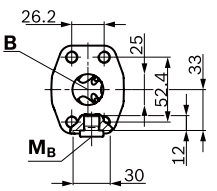


Dimensions size 45 (Control devices DR, DRG, DFR/DFR1)



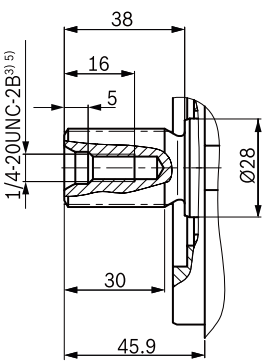




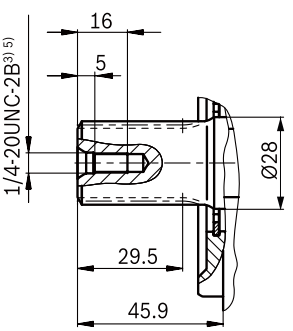


Shaft

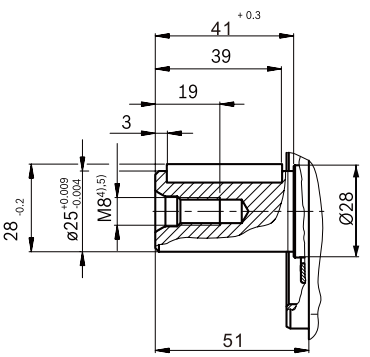
S spline shaft , 15T 16/32DP[1)2)]
(SAE J744)



R spline shaft , 15T 16/32DP[1)2)]
(SAE J744)

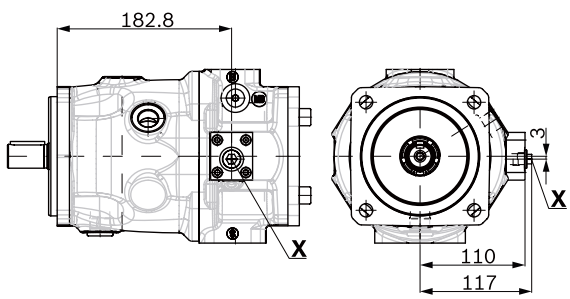


P Plain key shaft DIN6885 , A8x7x36

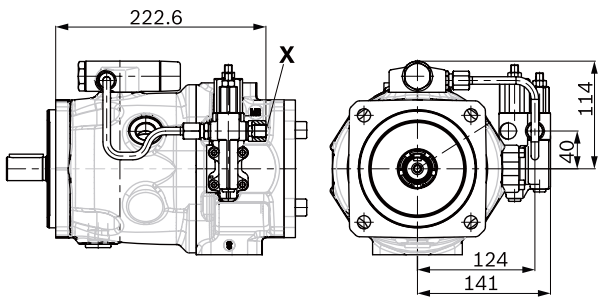


Ports	Standard	Size	P_{max} [bar]	State
B Outlet port	SAE J518	1 in	350	O
Fastening thread	DIN 13	M10 x 1.5;17(deep)		
S Suction port	SAE J518	1 1/2 in	10	O
Fastening thread	DIN 13	M12 x 1.75;20(deep)		
L Drain port	DIN 3852	M22 x 1.5;14(deep)	2	O
L_1 Drain port	DIN 3852	M22 x 1.5;14(deep)	2	X
X Control pressure	DIN 3852	M14 x1.5;12(deep)	350	O
X Control pressure for DG control	DIN ISO 228	G 1/4 in;12(deep)	280	O
M_B B Measuring pressure B	DIN 3852	G 1/4 in;12(deep)	350	X

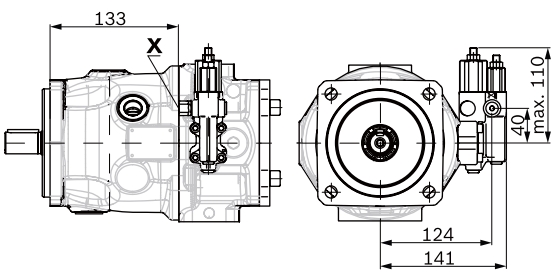
▼ DG



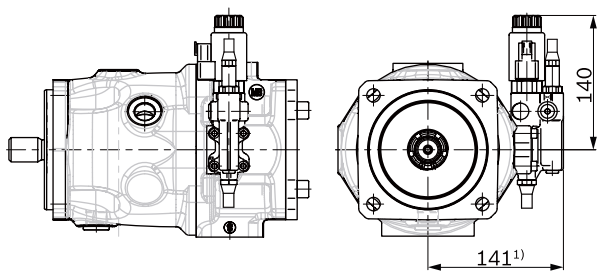
▼ LA.DS



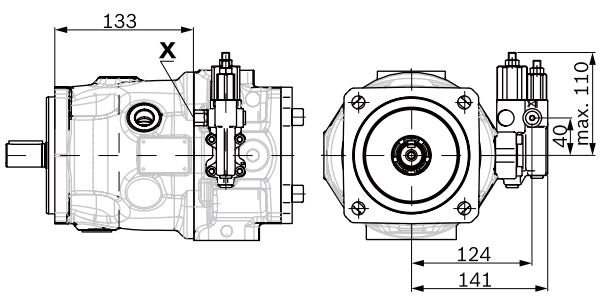
▼ DRG



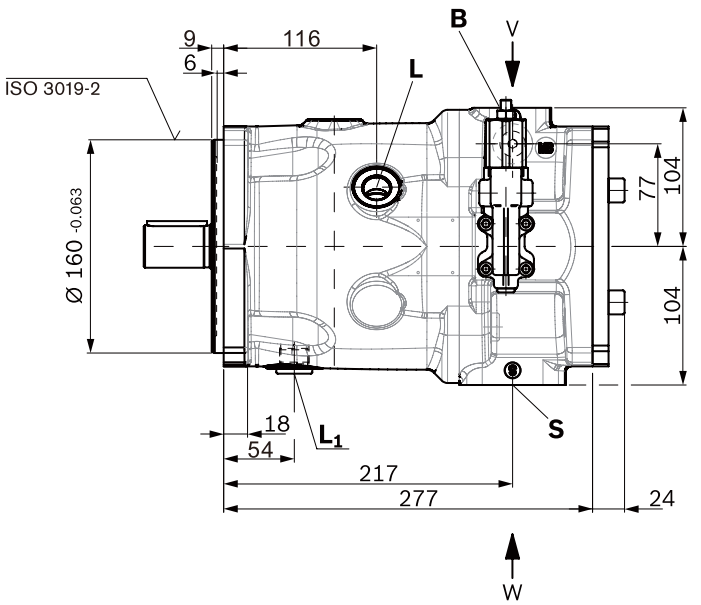
▼ ED7./ER7.

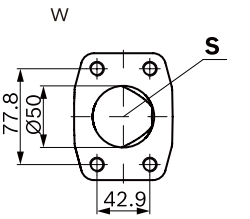


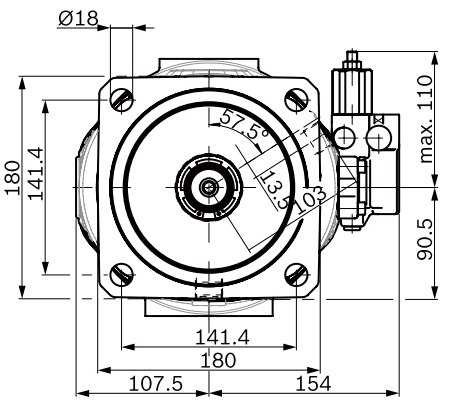
▼ DRF/DRS

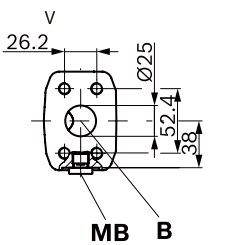


Dimensions size 71 (Control devices DR, DRG, DFR/DFR1)



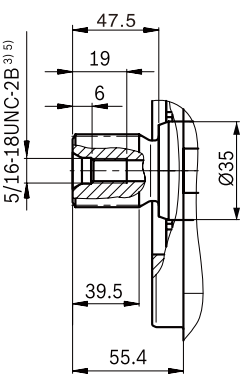




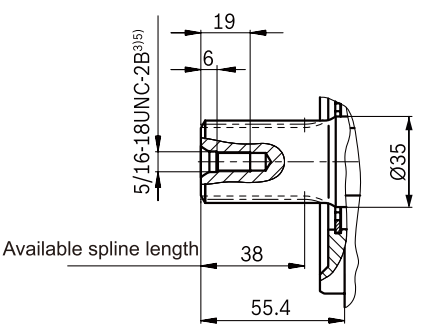


Shaft

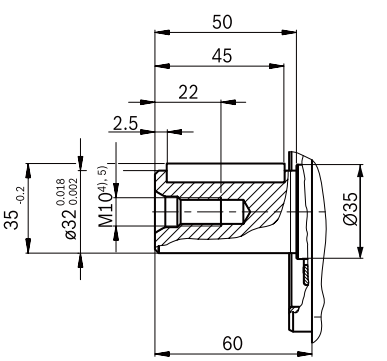
S spline shaft , 14T 12/24DP[1)]
(SAE J744)



R spline shaft , 14T 12/24DP[1)2)]
(SAE J744)

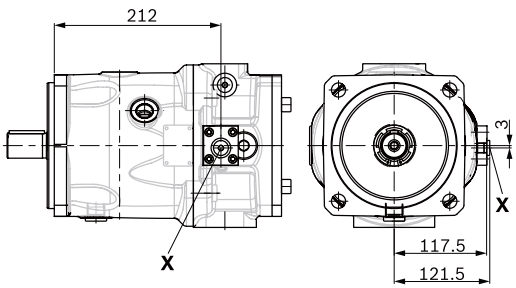


P Plain key shaft DIN6885 , A10x8x45

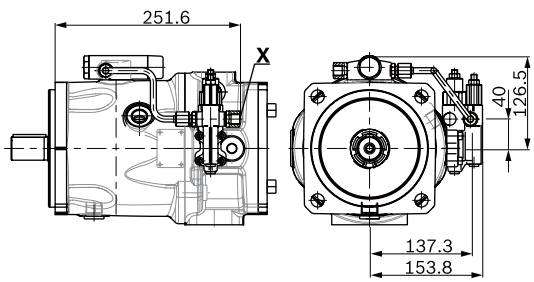


Ports	Standard	Size	P_{max} [bar]	State
B Outlet port Fastening thread	SAE J518 DIN 13	1 in M10 x 1.5;17(deep)	350	O
S Suction port Fastening thread	SAE J518 DIN 13	2 in M12 x 1.75;20(deep)	10	O
L Drain port	DIN 3852	M22 x 1.5;14(deep)	2	O
L_1 Drain port	DIN 3852	M22 x 1.5;14 (deep)	2	X
X Control pressure	DIN 3852	M14 x1.5;12(deep)	350	O
X Control pressure for DG control	DIN ISO 228	G 1/4 in;12 (deep)	280	O
M_B B Measuring pressure B	DIN 3852	G 1/4 in;12(deep)	350	X

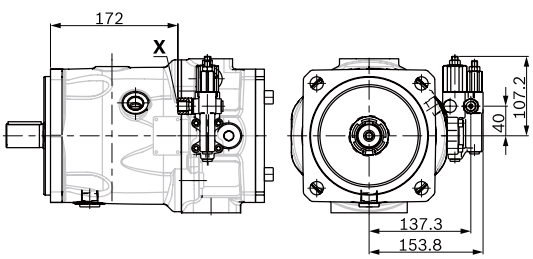
▼ DG



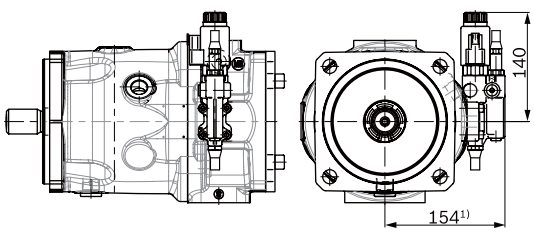
▼ LA.DS



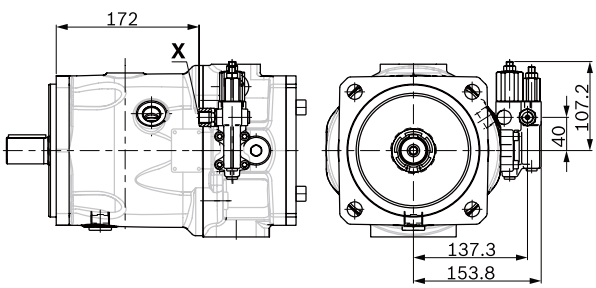
▼ DRG



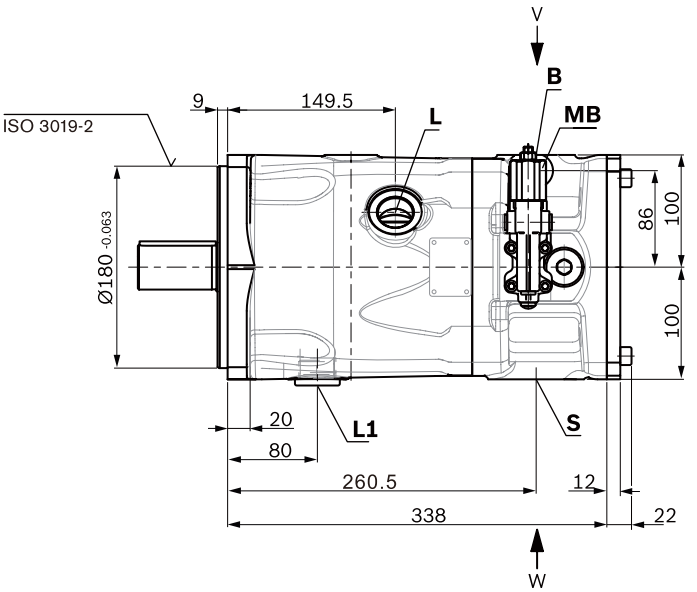
▼ ED7./ER7

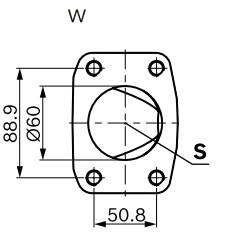


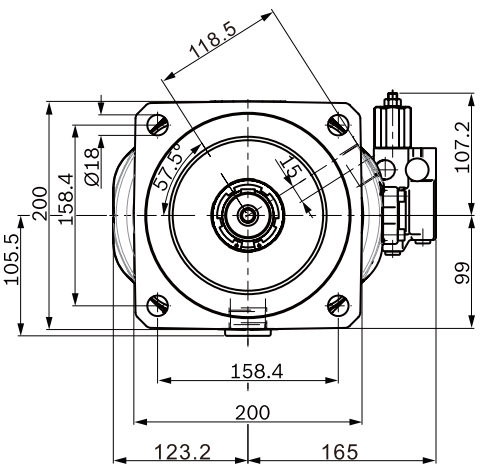
▼ DRF/DRS

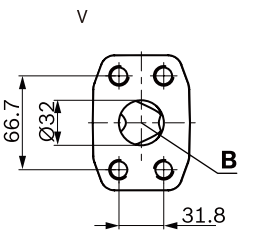


Dimensions size 100 (Control devices DR, DRG, DFR/DFR1)



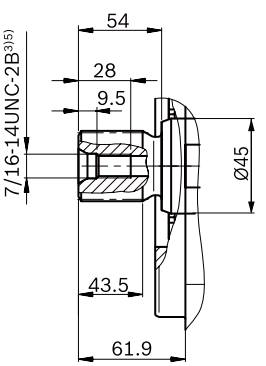




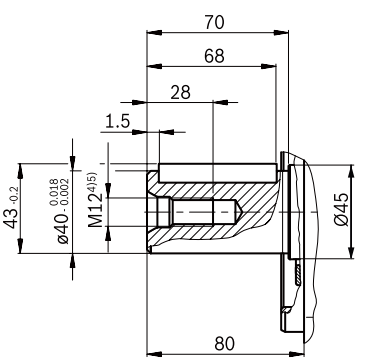


Shaft

S spline shaft ,17T 12/24DP[1)]
(SAE J744)

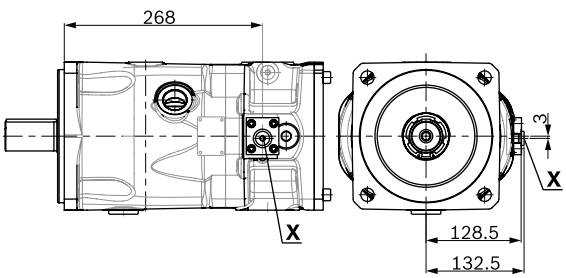


P Plain key shaft DIN6885'A12x8x68

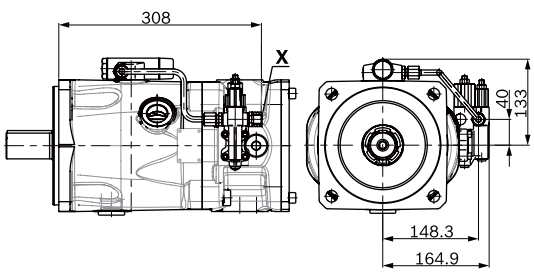


Oil Ports	Standard	Size	P_{max} [bar]	State
B Outlet port Fastening thread	SAE J518 DIN 13	1 1/4 in M14 x 2;19(deep)	350	O
S Suction port Fastening thread	SAE J518 DIN 13	2 1/2 in M12 x 1.75;17(deep)	10	O
L Drain port	DIN 3852	M33 x 2;16 (deep)	2	O
L_1 Drain port	DIN 3852	M33 x 2;16 (deep)	2	X
X Control pressure	DIN 3852	M14 x1.5;12 (deep)	350	O
X Control pressure for DG control	DIN ISO 228	G 1/4 in;12(deep)	280	O
M_B B Measuring pressure B	DIN 3852	G 1/4 in;12(deep)	350	X

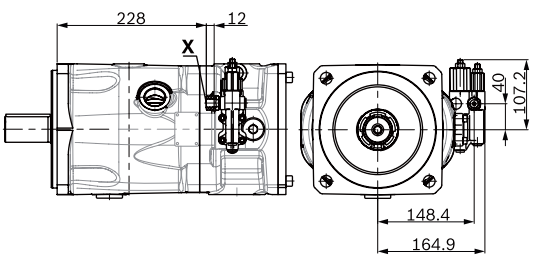
▼ DG



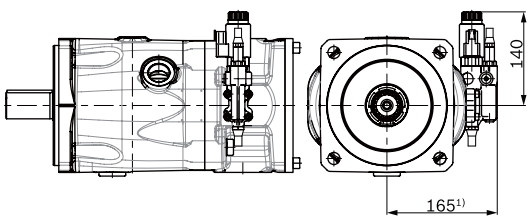
▼ LA.DS



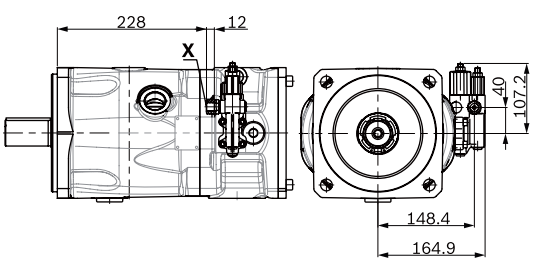
▼ DRG



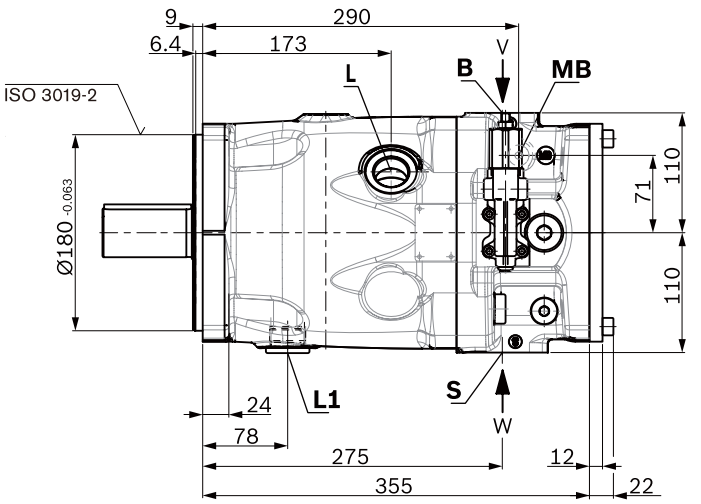
▼ ED7./ER7

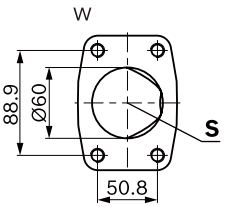


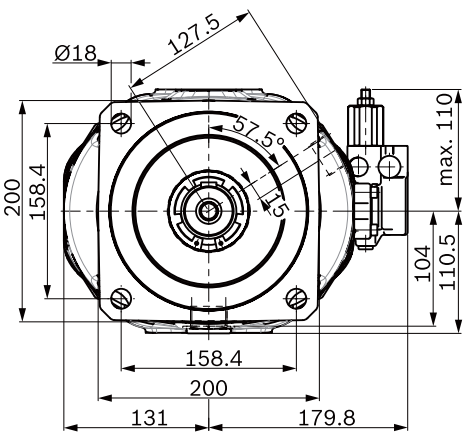
▼ DRF/DRS

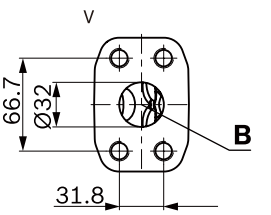


Dimensions size 140(Control devices DR, DRG, DFR/DFR1)



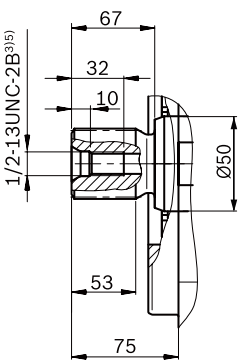




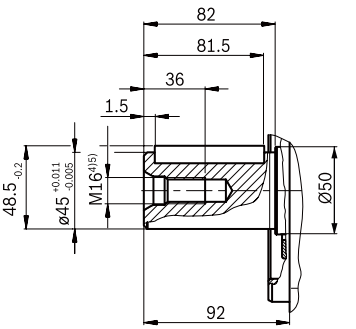


Shaft

S spline shaft , 13T 8/16DP[1)]
(SAE J744)

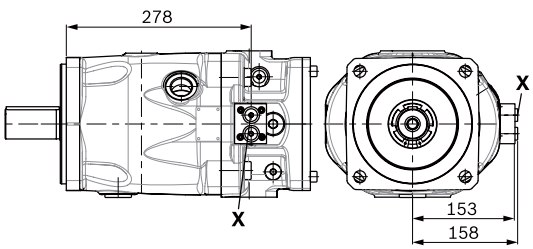


P Plain key shaft DIN6885 , A12x8x68

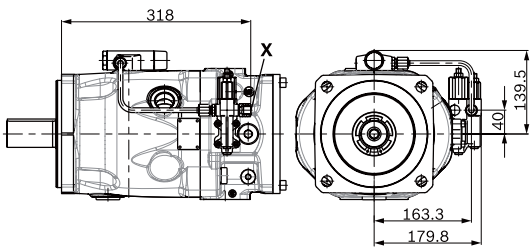


Ports	Standard	Size	P_{max} [bar]	State
B Outlet port	SAE J518	1 1/4 in	350	O
Fastening thread	DIN 13	M14 x 2;19(deep)		
S Suction port	SAE J518	2 1/2 in	10	O
Fastening thread	DIN 13	M12 x 1.75;17(deep)		
L Drain port	DIN 3852	M33 x 2;16 (deep)	2	O
L_1 Drain port	DIN 3852	M33 x 2;16(deep)	2	X
X Control pressure	DIN 3852	M14 x1.5;12 (deep)	350	O
X Control pressure for DG control	DIN ISO 228	G 1/4 in;12 (deep)	280	O
M_B B Measuring pressure B	DIN 3852	G 1/4 in;12(deep)	350	X

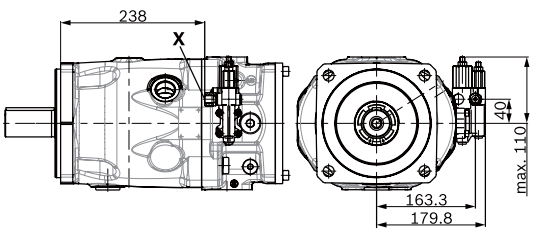
▼ DG



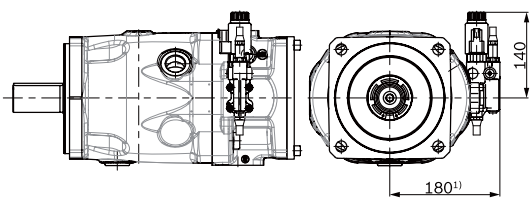
▼ LA.DS



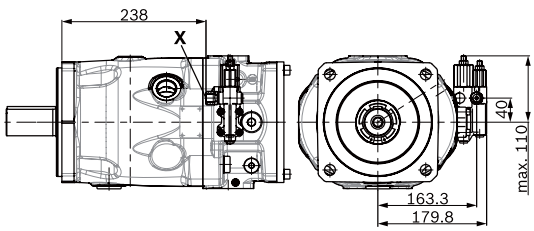
▼ DRG



▼ ED7./ER7



▼ DRF/DRS

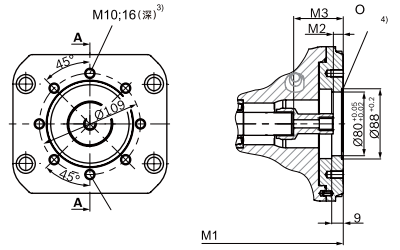


Dimensions, , throug drive

Flange ISO 3019-1(SAE) Diameter	Symbol	Hub for splined shaft[1] Diameter		Availability over sixes 45	71	100	140	Code
80-2		3/4 in	11T 16/32DP	●	●	●	●	UB2
100-2		7/8 in	13T 16/32DP	●	●	●	●	UB3

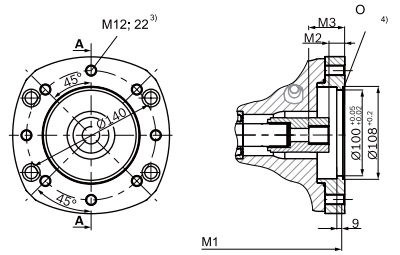
● = Available – = Not available

▼ 80, 2-hole



UB2	NG	M1	M2	M3
(SAE J744 16-4(A-B))	45	264		
	71	299	21.3	40.6
	100	360	19	38.6
	140	377	19	38.6

▼ 100, 2-hole

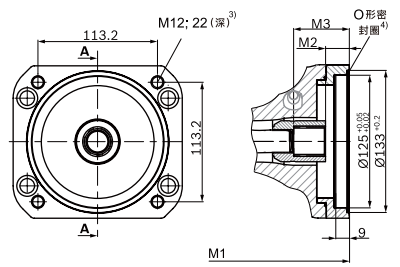


UB3	NG	M1	M2	M3
(SAE J744 22-4(B))	45	264	18	41.7
	71	299	20.3	44.1
	100	360	18	41.9
	140	377	18	41.6

Flange ISO 3019-1(SAE) Diameter	Symbol	Hub for splined shaft[1] Diameter		Availability over sixes 45	71	100	140	Code
125-4		1 in	15T 16/32DP	●	●	●	●	UE1
160-4		11/4 in	14T 12/24DP	–	●	●	●	UB8

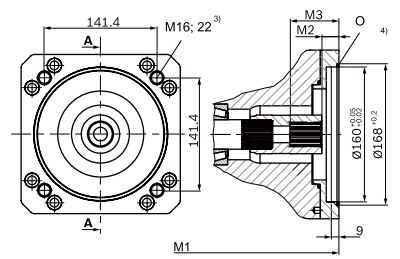
● = Available – = Not available

▼ 125-4



UE1	NG	M1	M2	M3
(SAE J744 25-4(B-B))	45	264		
	71	299		
	100	360	18.2	46.9
	140	377	18.5	45.9

▼ 160-4



UB8	NG	M1	M2	M3
(SAE J744 32-4(C))	71	299	20.1	58.1
	100	360	19.8	56.4
	140	377	19.8	56.4
	180	387	20.1	56.4

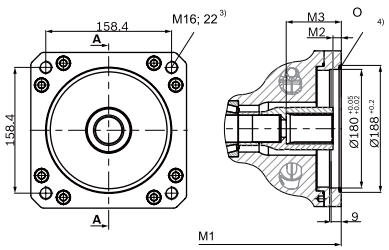
1)According to ANSIB92.1a,30° pressure angle, flat root, side fit,tolerance class 5

2)Thread according to DIN 13

Flange ISO 3019-1(SAE) Diameter	Symbol	Hub for splined shaft[1] Diameter		Availability over sixes				Code
				45	71	100	140	
180-4	⌘	1 1/2 in	17T 16/24DP	–	–	●	●	UB9
		1 3/4 in	13T 8/16DP	–	–	–	●	UB7

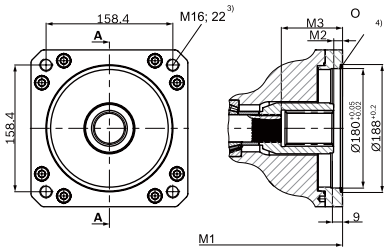
● = Available – = Not available

▼ 180-4



UB2	NG	M1	M2	M3
(SAE J744 38-4(C-C))	100	360	9	63.9
	140	377	10.2	74.9

▼ 180-4

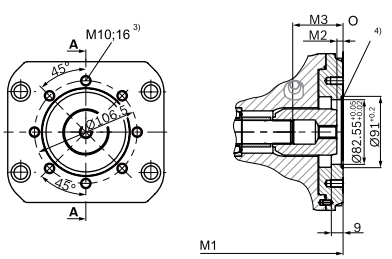


UB7	NG	M1	M2	M3
(SAE J744 44-4(D))	140	377	10.4	77.4

Flange ISO 3019-1(SAE) Diameter	Symbol	Hub for splined shaft[1] Diameter		Availability over sixes				代号 Code
				45	71	100	140	
82-2 (A)		5/8 in	9T 16/32DP	●	●	●	●	U01
		3/4 in	11T 16/32DP	●	●	●	●	U52

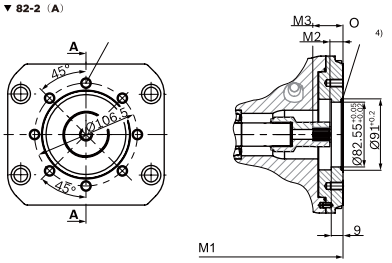
● = Available – = Not available

▼ 82-2 (A)



U01	NG	M1	M2	M3
(SAE J744 16-4(A))	45	264		
	71	299	9.3	61.3
	100	360	10.5	65
	140	377		

▼ 82-2 (A)



UB8	NG	M1	M2	M3
(SAE J744 19-4(A-B))	45	264	18.6	38.7
	71	299	20.7	41.4
	100	360	17	38
	140	377	19	38.6

1)According to ANSIB92.1a,30° pressure angle, flat root, side fit,tolerance class 5

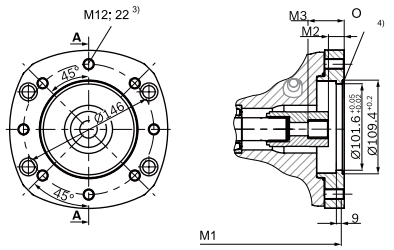
2)Thread according to DIN 13

Dimensions,, throug drive

Flange ISO 3019-1(SAE) Diameter	Symbol	Hub for splined shaft[1] Diameter		Availability over sixes 45	71	100	140	Code
101-2(B)		7/8 in	13T 16/32DP	●	●	●	●	U68
		1 in	15T 16/32DP	●	●	●	●	U04

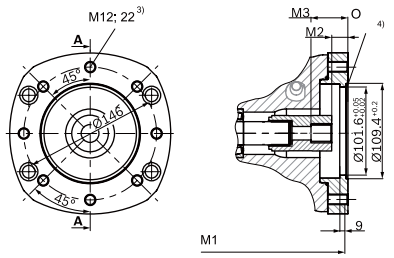
● = Available – = Not available

▼ 101-2 (B)



U68	NG	M1	M2	M3
(SAE J744 22-4(B))	45	264	18.2	41.5
	71	299	19.7	44.1
	100	360	17.4	41.3
	140	377	17.4	41.6

▼ 101-2 (B)

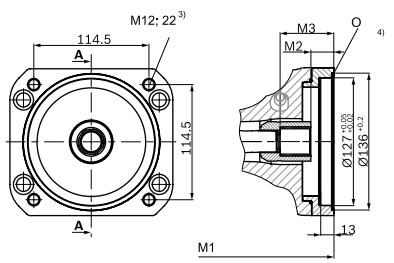


U04	NG	M1	M2	M3
(SAE J744 25-4(B-B))	45	264		
	71	299	20.8	49.1
	100	360	17.6	46.6
	140	377	17.9	46.3

Flange ISO 3019-1(SAE) Diameter	Symbol	Hub for splined shaft[1] Diameter		Availability over sixes 45	71	100	140	Code
127-4 (C)		1 in	15T 16/32DP	●	●	●	●	UE2
		1 1/4 in	14T 12/24DP	–	●	●	●	U15
127-2 (C)		1 1/2 in	17T 12/24DP	–	–	●	●	U24

● = Available – = Not available

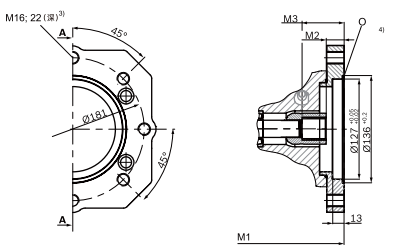
▼ 127-4 (C)



UE2	NG	M1	M2	M3
127-4 (C)	45	264	18.7	46.6
	71	299		
	100	360		
	140	377		

U15	NG	M1	M2	M3
127-4 (C)	71	299	21.8	58.1
	100	360		
	140	377		

▼ 127-2 (C)



U24	NG	M1	M2	M3
127-2 (C)	100	360	21.5	62.3
	140	377	10.5	62.3

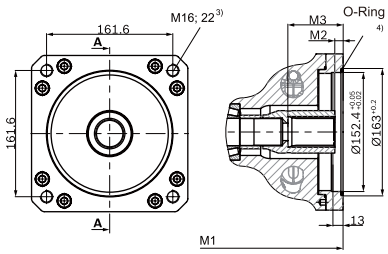
1)3According to ANSIB92.1a,30° pressure angle, flat root, side fit,tolerance class 5

2)Thread according to DIN 13

Flange ISO 3019-1(SAE) Diameter	Symbol	Hub for splined shaft[1] Diameter		Availability over sixes				Code
				45	71	100	140	
152-4(C)	⌘	1 1/2 in	17T 12/24DP	–	–	●	●	U96
		1 3/4 in	13T 8/16DP	–	–	–	●	U17

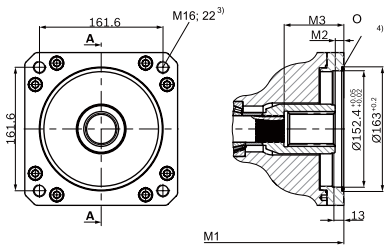
● = Available – = Not available

▼ 152-4 (C)



U96	NG	M1	M2	M3
152-4(D)	100	360		
	140	377		

▼ 152-4 (C)



U17	NG	M1	M2	M3
152-4(D)	140	377	11	77.5

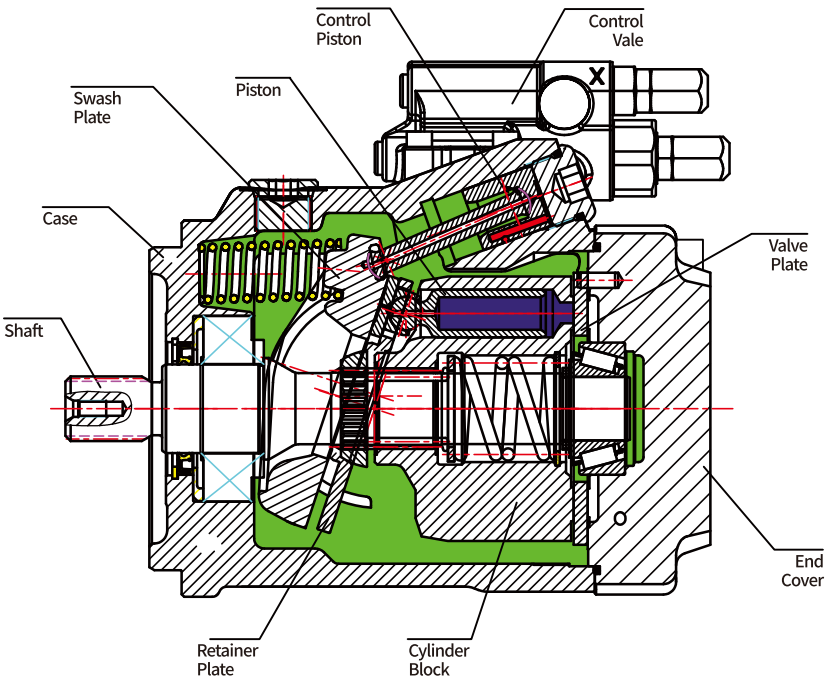
1)According to ANSIB92.1a,30° pressure angle, flat root, side fit,tolerance class 5

2)Thread according to DIN 13

Variable Displacement Piston Pump OS–A10VO/52 53

Overview

CR–A10VO/5253 series variable displacement piston pump swash plate axial plunger variable pump, respectively for mobile machinery design, is designed for open loop hydraulic driven design, adopts a shaft structure, rated working pressure up to25Mpa.



Features

※ Variable pump with axial piston rotary group in swash–plate design for hydrostatic drives in open circuit.

※ The flow is proportional to the drive speed and the displacement.

※ The flow can be infinitely varied by adjusting the swash–plate angle.

※ Stable bearing for long service life

※ High permissible drive speed

※ Favorable power–to–weight ratio–compact dimensions

※ Low noise

※ Excellent suction characteristics

※ Electro–hydraulic pressure control

※ Power control

※ Electro–proportional swivel angle control

※ Short response times

Type Code

OS–	A10VS	O	45	DR	/	52	R	—	V	S	D	12	N00
	1	2	3	4		5	6		7	8	9	10	11

1–Machinery Classification

Axial piston, swash plate design, variable, used in industry	A10V

2–Operational Mode

Open circuit	O

3–Size

Nominal displacement mL/r	10	28	45	60	85	

4–Control Devices

Pressure Control			●	●	●	●	●	DR
	with flow controller	X–T open	●	●	●	●	●	DFR
		X–T plugged	●	●	●	●	●	DFR1
	Remote pressure control		●	●	●	●	●	DRG
	Electric	negative control	–	●	●	●	●	ED72

5–Series

	52

6–Rotating Direction(View on Shaft End)

Clockwise	R
Counterclockwise	L

7–Seals

VitonFKM	V

8–Shaft End

Keyed shaft DIN6885	●	–	–	–	–	P
Splined shaft SAE	●	●	●	●	●	S
Splined shaft SAE	–	●	●	●	●	R
Splined shaft SAE	●	●	●	●	●	U
Splined shaft SAE	–	●	●	●	●	W

9–Mounting Flange

ISO3019–2(ISO)	●	–	–	–	–	A
ISO3019–1(ISO)	●	–	–	–	–	
	–	–	–	●	–	

Chart shows: ●=Available，○=In preparation，–=Not available

10–Service Line Ports

			10	28	45	60	85	
SAE Flange Mouth Metric Fastening Thread	back section	Not used for open–shaft drive	–	●	●	●	●	11
	side	It is suitable for open–shaft drive	–	●	●	●	●	12
	side 90° offset	Not used for forward axis drive only for counter clock rotaion	–	–	●	–	–	13
Metrical screw oil mouth	back section	Not used for open–shaft drive	●	–	–	–	–	14

11– Through Drive

Without through drive		●	●	●	●	●	N00
With through drive, the second pump connection dimension as follows							
Mounting flange	Spline shaft						
SAE82– –2(A)	5/8 in 9 T 16/32DP	–	●	●	●	●	K01
	3/4 in 11T 16/32DP	–	●	●	●	●	K52
SAE101–2(B)	7/8 in 13T 16/32DP	–	●	●	●	●	K68
	1 in 15T 16/32DP	–	–	●	●	●	K04
SAE127–4	1 1/4 in 14T 12/24DP	–	–	–	●	●	K15
	1 1/2 in 17T 12/24DP	–	–	–	–	●	K16
SAE127–2	1 1/4 in 14T 12/24DP	–	–	–	–	●	K07
	1 1/2 in 1 7T 12/24DP	–	–	–	–	●	K24

Type Code

OS–	A10VS	O	63	LA8D	/	53	R	—	V	S	D	12	N00
	1	2	3	4		5	6		7	8	9	10	11

1–Machinery Classification

Axial piston, swash plate design, variable, used in industry	A10V

2–Operational Mode

Open circuit	O

3–Size

Nominal displacement mL/r	18	28	45	63	72	85	100	

4–Control Devices

				18	28	45	63	72	85	100	
Pressure Control				●	●	●	●	●	●	●	DR
	with flow controller	X–T open		●	●	●	●	●	●	●	DFR
		X–T plugged		●	●	●	●	●	●	●	DFR1
	Remote pressure control			●	●	●	●	●	●	●	DRG
	Electric	negative control		●	●	●	●	●	●	●	ED72
Power control	With pressure cut–off beginning of control		5MPa	●	●	●	●	●	●	●	LA5D
			5.1–9MPa	●	●	●	●	●	●	●	LA6D
			9.1–16MPa	●	●	●	●	●	●	●	LA7D
			16.1–24MPa	●	●	●	●	●	●	●	LA8D
			24MPa	●	●	●	●	●	●	●	LA8D
Power controller with pressure cut–off , remotely operated				●	●	●	●	●	●	●	LA*DG
Poywer ,controller with pressure cut–off flow control, X–T plugged				●	●	●	●	●	●	●	LA*DS
Power controller flow control, X–T plugged, electically over–ridable (nega –tive control)				●	●	●	●	●	●	●	LA*S

5–Series

	53

6–Rotating Direction(View on Shaft End)

Clockwise	R
Counterclockwise	L

7–Seals

VitonFKM	V

8–Shaft End

Splined shaft SAE	●	●	●	●	●	●	●	S
Splined shaft SAE	●	●	●	●	●	●	●	R
Splined shaft SAE	●	●	●	●	●	●	●	U
Splined shaft SAE	–	●	●	●	●	●	●	W

9–Mounting Flange

ISO3019–1(ISO)	●	●	●	●	●	●	●	C
	–	–	–	●	●	●	●	D

10–Service Line Ports

SAE Flange Mouth Metric Fastening Thread	back section	Not used for open–shaft drive	●	●	●	●	●	●	●	11
	side	It is suitable for open–shaft drive	●	●	●	●	●	●	●	12
	side 90° offset	Not used for forward axis drive only for counter clock rotaion	–	–	●	–	–	–	–	13

11–Through Drive

		18	28	45	63	72	85	100	
Without through drive		●	●	●	●	●	●	●	N00
With through drive, the second pump connection dimension as follows									
Mounting flange	Spline shaft								
SAE82–2(A)	5/8in9T16/32DP	●	●	●	●	●	●	●	
	3/4in11T16/32DP	●	●	●	●	●	●	●	
SAE101–2(B)	7/8in13T16/32DP	–	●	●	●	●	●	●	K68
	1in15T16/32DP	–	–	●	●	●	●	●	K04
SAE127–4	11/4in14T12/24DP 11/2in 17T12/24DP								
SAE127–2	11/4in14T12/24DP	–	–	–	–	–	●	●	K07
	11/2in17T12/24DP	–	–	–	–	–	●	●	K24

Technical Data

■Parameters Table

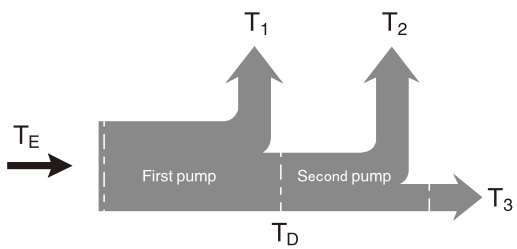
Size				10	18	28	45	60	63	72	85	100
Displacement		$V_{g\,max}$	mL/r	10.5	18	28	45	60	63	72	85	100
Max. speed P_s = 1bar	Vg= Vg max	$n_{o\,max}$	r/min	3600	3300	3000	2600	2700	2600	2600	2500	2300
	Vg< Vg max		r/min	4320	3960	3600	3120	3140	3140	3140	3000	2500
Max. flow	$n = n_{o\,max}$	$q_{vo\,max}$	L/min	37	59	84	117	162	163	187	212	230
	n = 1500 r/min		L/min	15	27	42	68	90	95	108	128	150
Maximum power (△p= 280 bar)	$n = n_{o\,max}$	$p_{o\,max}$	kW	16	25	35	49	65	68	77	89	96
	n = 1500 r/min		kW	7	11	18	28	37	39	45	53	62
Torque (V_g= V_{gmax})	△ p=280 bar	T_{max}	Nm	42	71	111	179	238	250	286	338	398
	△ p=100 bar	T	Nm	17	29	45	72	95	100	114	135	159
Torsional stiffness	Shaft extension S	C	Nm/rad	9200	11000	22300	37500	65500	65500	65500	143000	143000
	Shaft extension R	C	Nm/rad	–	14800	26300	41000	69400	69400	69400	152900	–
	Shaft extension U	C	Nm/rad	6800	8000	16700	30000	49200	49200	49200	102900	102900
	Shaft extension W	C	Nm/rad	–	–	19900	34400	54000	54000	54000	117900	117900
	Shaft extension P	C	Nm/rad	10700	–	–	–	–	–	–	–	–
Moment of inertia of the rotating assembly		J	kgm	0.0006	0.0009	0.0017	0.003	0.0056	0.0056	0.0056	0.012	0.012
Max. angular acceleration		a	rad/s^2	8000	6800	5500	4000	3300	3300	3300	2700	2700
Volume of case		V	L	0.2	0.25	0.3	0.5	0.8	0.8	0.8	1	1
Weight		m	kg	8	11.5	15	18	22	22	22	36	36
Weight				–	13	18	24	28	28	28	45	45

Size				10	18	28	45	60	63	72	85	100
Torque (Vgmax △ p=280 bar)		T_{max}	Nm	42	71	111	179	250	250	321	338	398
Max. input torque[1)]	Shaft extension S	T_{Emax}	Nm	126	124	198	319	630	630	630	1157	1104
		ϕ	in	3/4	3/4	7/8	1	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2
	Shaft extension R	T_{Emax}	Nm	–	160	250	400	650	650	650	1215	–
		ϕ	in	–	3/4	7/8	1	1 1/4	1 1/4	1 1/4	1 1/2	–
	Shaft extension U	T_{Emax}	Nm	60	59	105	188	306	306	306	628	595
		ϕ	in	5/8	5/8	3/4	7/8	1	1	1	1 1/4	1 1/4
	Shaft extension W	T_{Emax}	Nm	–	–	140	220	396	396	383	650	636
		ϕ	in	–	–	3/4	7/8	1	1	1	1 1/4	1 1/4
	Shaft extension P	T_{Emax}	Nm	90	–	–	–	–	–	–	–	–
		ϕ	mm	18	–	–	–	–	–	–	–	–
	Shaft extension S	T_{Dmax}	Nm	–	108	160	319	484	484	484	698	778
	Shaft extension R	T_{Dmax}	Nm	–	120	176	365	484	484	484	698	–
	Shaft extension U	T_{Dmax}	Nm	–	59	105	188	306	306	306	628	595
	Shaft extension W	T_{Dmax}	Nm	–	–	140	220	396	396	383	650	636

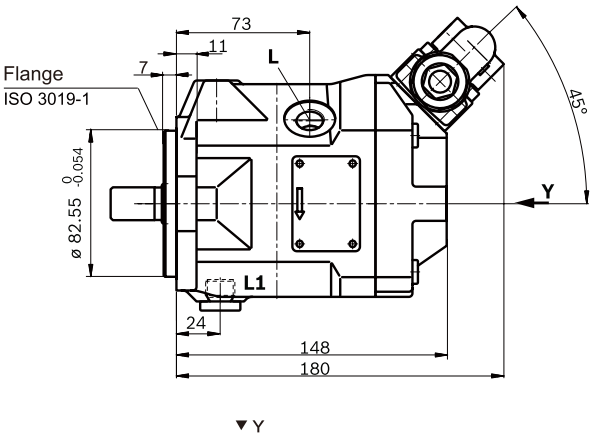
1) Once $V_g=V_{g\,max}$, the value is applicable to the inlet pressure at suction port S is P_s = 1bar (absolute pressure), when the inlet pressure P_s increase or decrease the displacement,the speed can be in creased,when the inlet pressure $P_{s\,min}$ = 0.8bar, the speed should be reduced to 90%. $V_g < V_{g\,max}$ value when the speed limit.

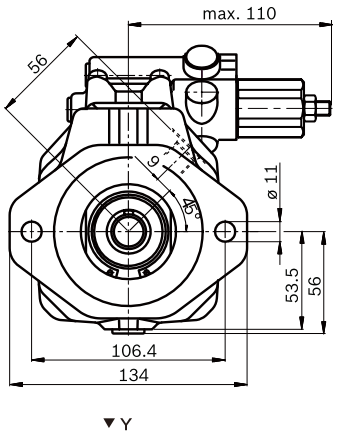
2) For drive shaft free of radial load

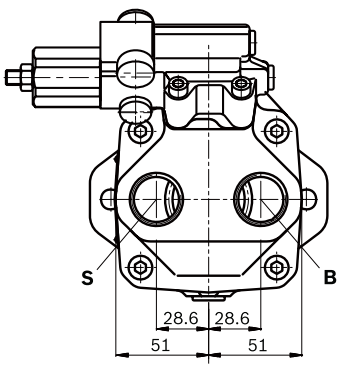
Torque Distribution

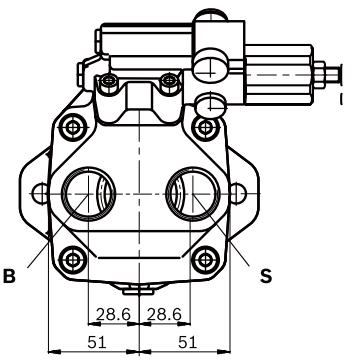


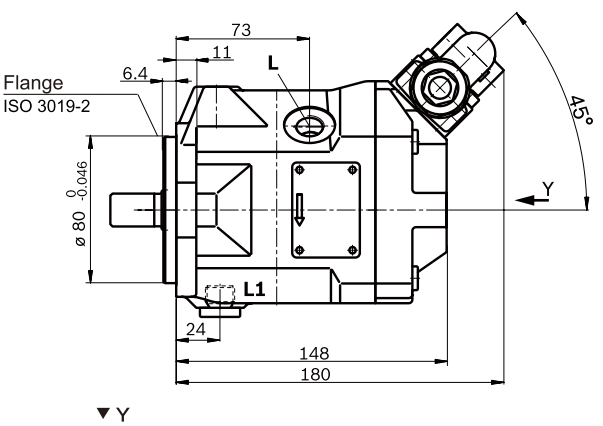
Dimensions size 10 (Control devices DR, DRG, DFR/DFR1)

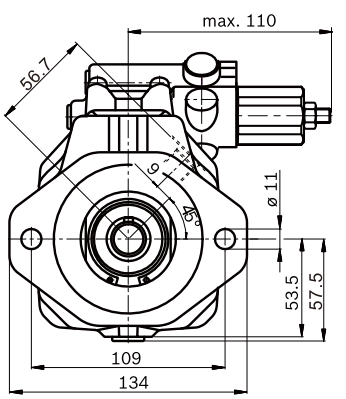


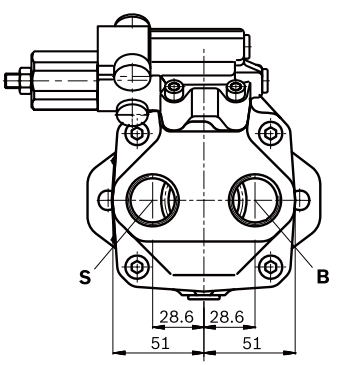


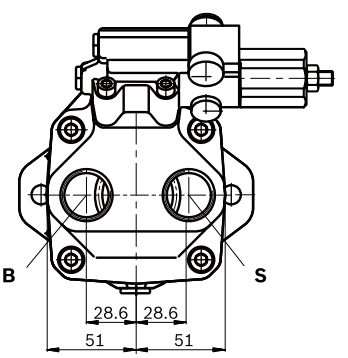






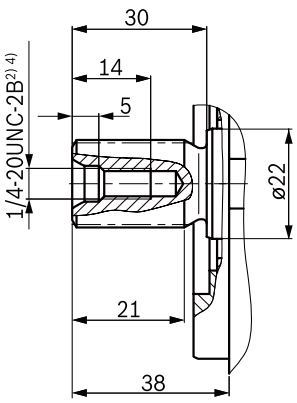




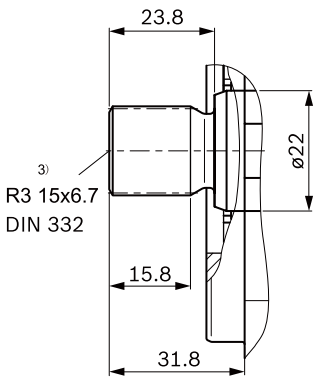


Shaft

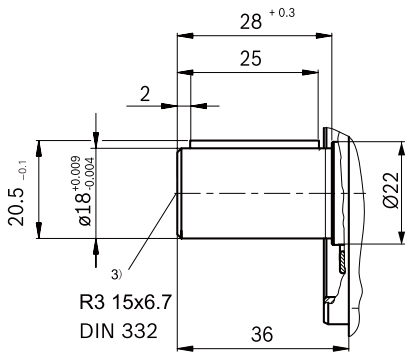
S spline shaft , 11T 16/32DP[1)]
3/4 in (SAE J744)



U spline shaft , 9T 16/32DP[1)]
5/8 in (SAE J744)

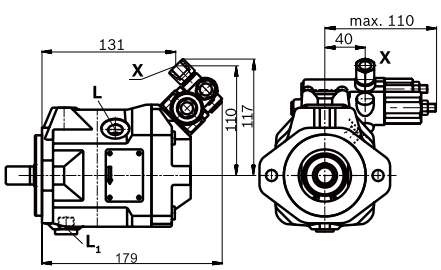


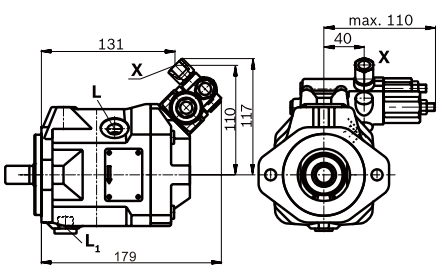
P Plain key shaft DIN6885 , A6x6x25

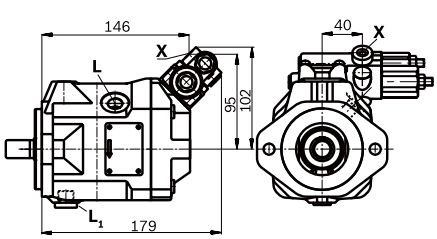


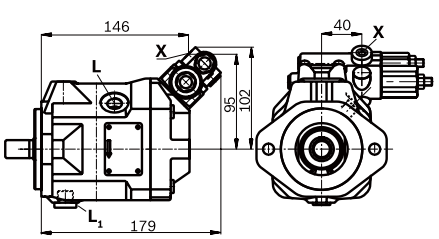
Ports			Standard	Size	P_{max} [bar] [5)]	State
B	Outlet port		DIN 3852	M27x2;16 deep	315	O
S	Suction port		DIN 3852	M27x2;16 deep	5	O
L	Drain port		DIN 3852 [6)]	M16x1.5;12 deep	2	O [7)]
L_1	Drain port		DIN 3852 [6)]	M16x1.5;12 deep	2	X [7)]
X	Control	pressure for DG control	DIN 3852	M14x1.5;11.5 deep	315	O
SAEC model						
L	Drain port		DIN 11926 [6)]	9/16–18UNF–2B;10 deep	2	O [7)]
L_1	Drain port		DIN 11926 [6)]	9/16–18UNF–2B;10 deep	2	X [7)]
X	Control	pressure for DG control	DIN 11926	7/16–20UNF–2B;11.5deep	315	O

1) Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Thread according to ASME B1.1
3) Coupling axially secured, e.g. with a clamp coupling or radially mounted clamping screw
4) Observe the instructions in the operating instructions concerning the maximum tightening torques.
5) Momentary pressure spikes may occur depending on the application. Keep this in mind when selecting measuring devices and fittings.
6) The spot face can be deeper than as specified in the standard.
7) Depending on the installation position, L or L1 must be connected.
8) O = Must be connected (plugged when delivered) X = Plugged (in normal operation)





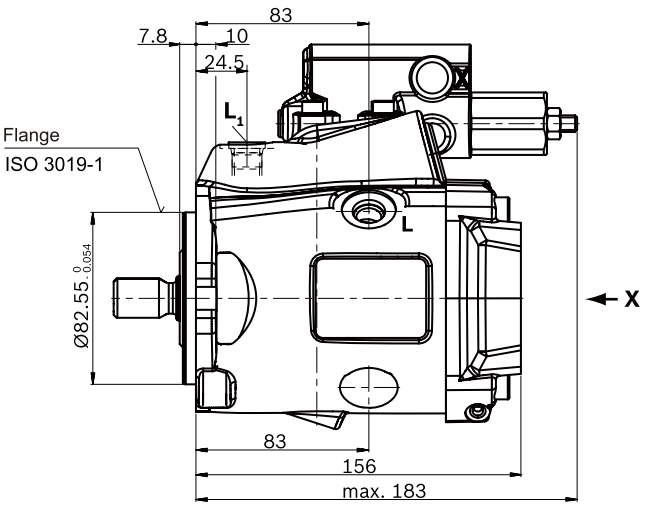


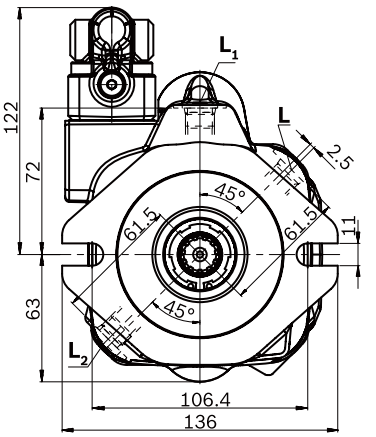


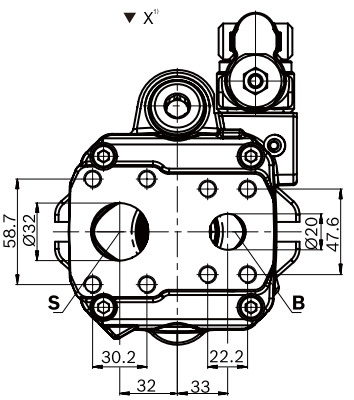
Dimensions size 18 (Control devices DR, DRG, DFR/DFR1)

DR –

▼







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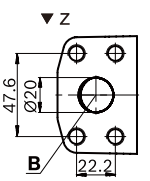
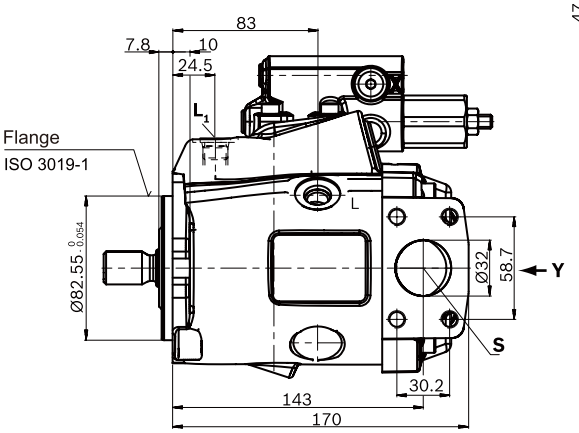
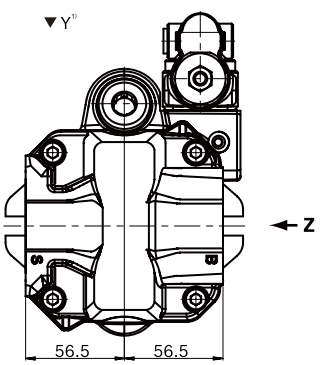
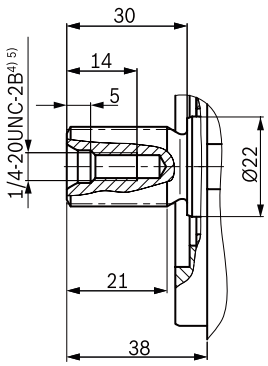




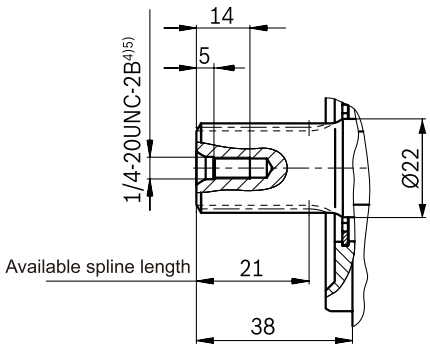


Shaft

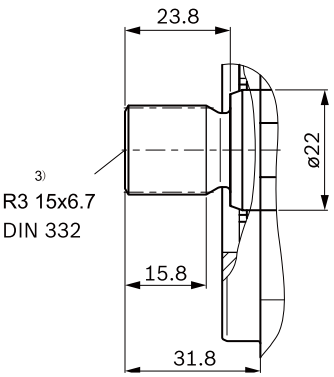
S spline shaft , 11T 16/32DP[1)]
3/4 in (SAE J744)



R spline shaft , 11T 16/32DP[1) 2)]
3/4 in (SAE J744)



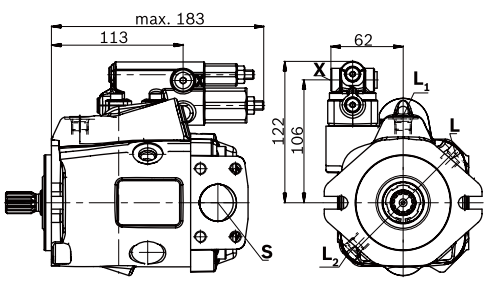
U spline shaft 9T 16/32DP[1)]
5/8 in (SAE J744)



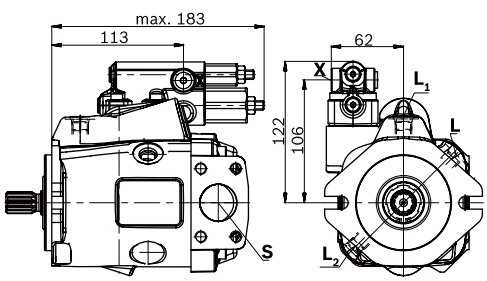
Ports		Standard	Size	P_{max} [bar][6)]	State
B	Outlet port Fastening thread	SAE J518[7)] DIN 13	3/4 M10X1.5;17 deep	315	O
S	Suction port Fastening thread	SAE J518[7)] DIN 13	1 1/4 M10X1.5;17 deep	5	O
L	Drain port	DIN 11926[8)]	3/4–16UNF–2B;12 deep	2	O[9)]
L_1、L_2[10)]	Drain port	DIN 11926[8)]	3/4–16UNF–2B;12 deep	2	X[9)]
X	Control pressure	DIN 11926	7/16–20UNF–2A;11.5 deep	315	O

1) Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard.
3) Center bore according to DIN 332
4) Thread according to ASME B1.1
5) Observe the instructions in the operating instructions concerning the maximum tightening orques.
6) Momentary pressure spikes may occur depending on the application.Keep this in mind when selecting measuring devices and fittings.
7) Metric fastening thread is a deviation from standard.
8) The spot face can be deeper than as specified in the standard.
9) Depending on the installation position, L, L1 or L2 must be connected
10) Only series 53
11) O = Must be connected (plugged when delivered) X = Plugged (in normal operation)

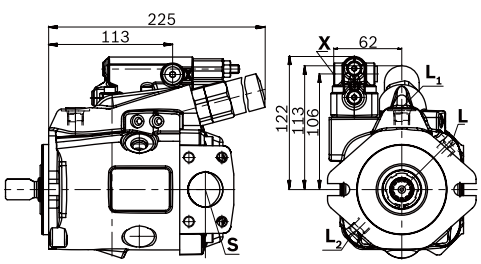
DRG



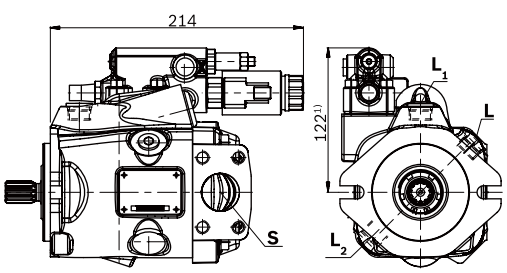
DRF/DRS/DRSC



LA.D. -



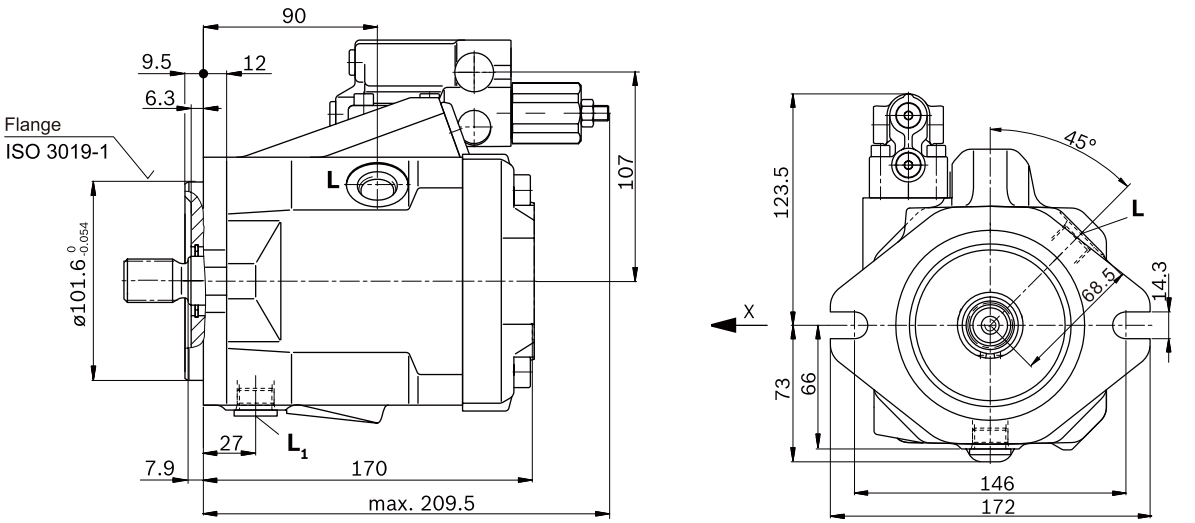
ED7./ ER7.

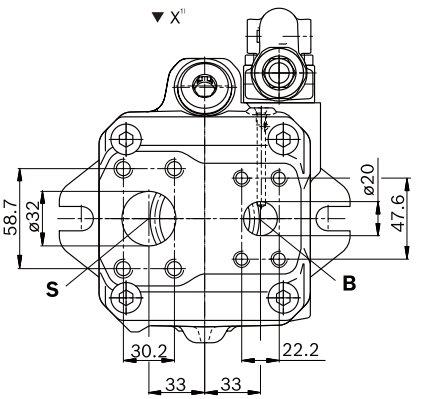


Dimensions size 28 (Control devices DR, DRG, DFR/DFR1)

DR –

▼





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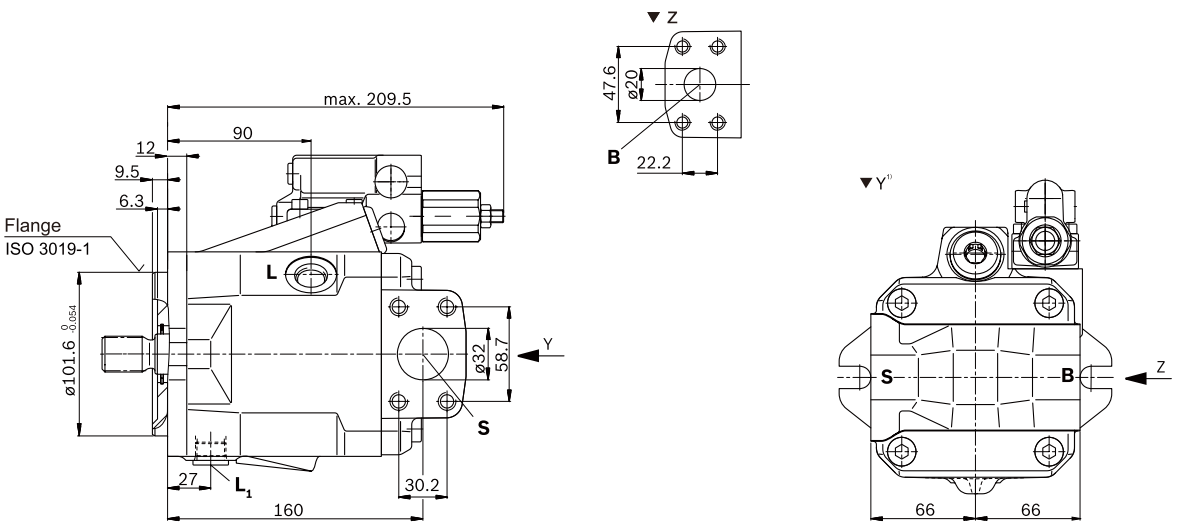
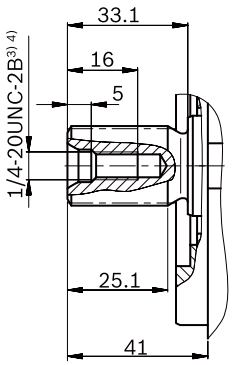
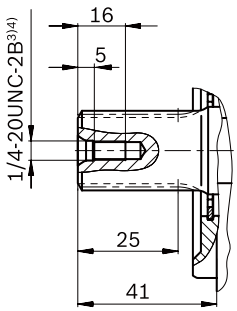


Shaft

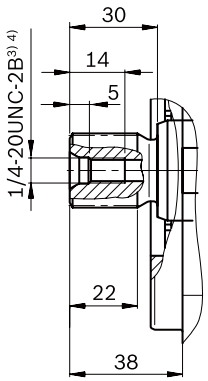
S spline shaft , 13T 16/32DP[1)]
7/8 in (SAE J744)



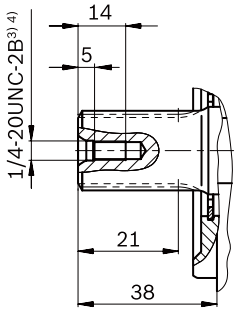
R spline shaft, 13T 16/32DP[1) 2)]
7/8 in (SAE J744)



U spline shaft , 11T 16/32DP[1)]
3/4 in (SAE J744)



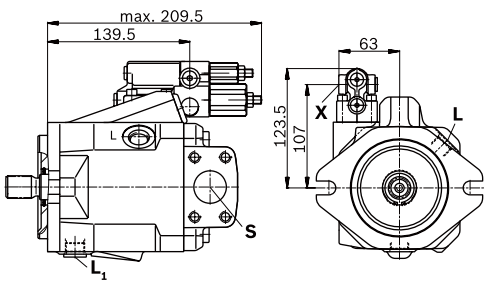
W spline shaft , 11T 16/32DP[1)2)]
3/4 in (SAE J744)



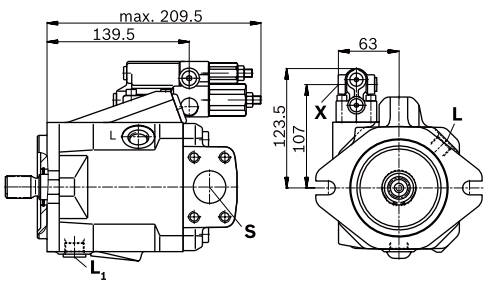
Ports		Standard	Size	P_{max} [bar][5)]	State
B	Outlet port Fastening thread	SAE J518[6)] DIN 13	3/4 in M10X1.5;17 deep	315	O
S	Suction port Fastening thread	SAE J518[6)] DIN 13	1 1/4 in M10X1.5;17 deep	5	O
L	Drain port	DIN 11926[7)]	3/4–16UNF–2B;12 deep	2	O[8)]
L_1、L_2[9)]	Drain port	DIN 11926[7)]	3/4–16UNF–2B;12 deep	2	X[8)]
X	Control pressure	DIN 11926	7/16–20UNF–2B;11.5 deep	315	O

1) Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard.
3) Thread according to ASME B1.1
4) Observe the instructions in the operating instructions concerning the maximum tightening torques.
5) Momentary pressure spikes may occur depending on the application.Keep this in mind when selecting measuring devices and fittings.
6) Metric fastening thread is a deviation from standard.
7) The spot face can be deeper than as specified in the standard.
8) Depending on the installation position, L, L1 or L2 must be connected
9) Only series 53
10) O = Must be connected (plugged when delivered) X = Plugged (in normal operation)

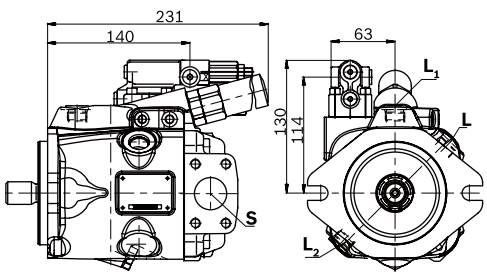
DRG



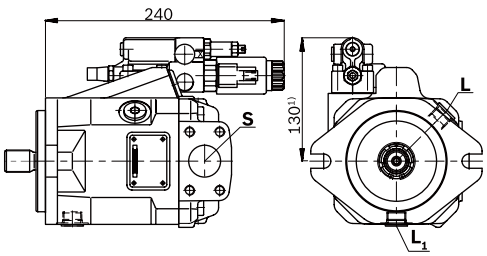
DRF/DFR1/DRSC



LA.D.



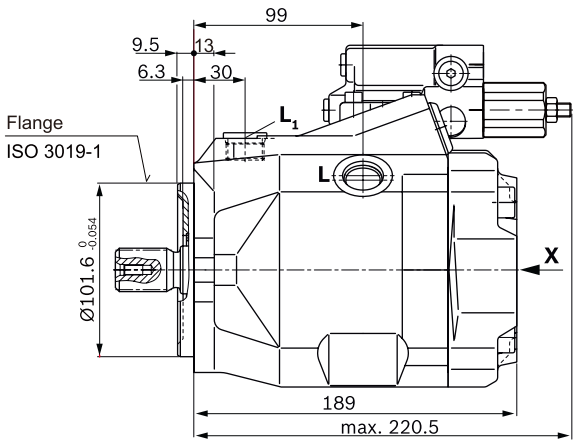
Ed7./ ER7.

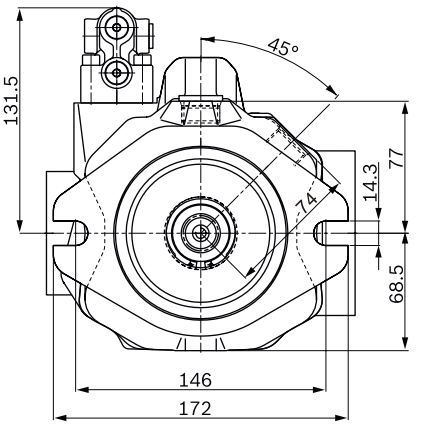


Dimensions size 45 (Control devices DR, DRG, DFR/DFR1)

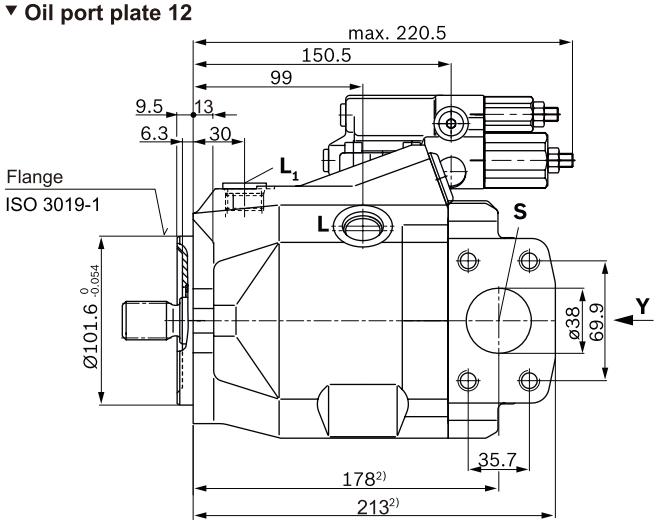
DR –

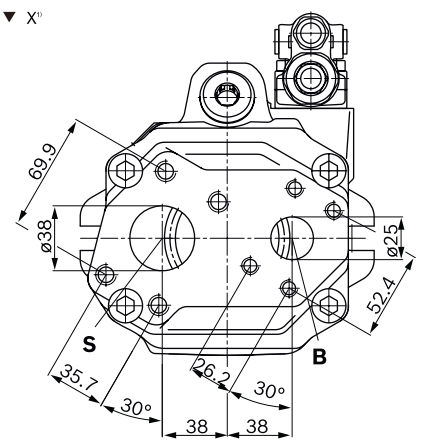
▼ **Oil port plate 11**



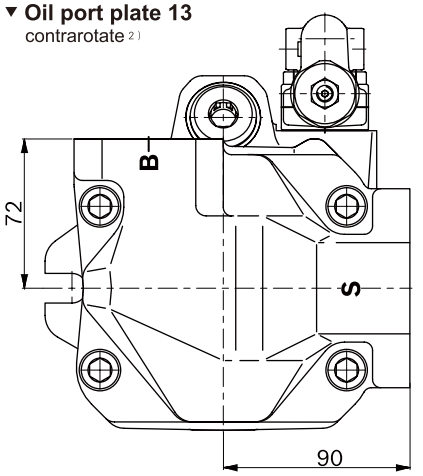


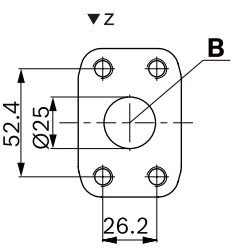
▼ **Oil port plate 12**

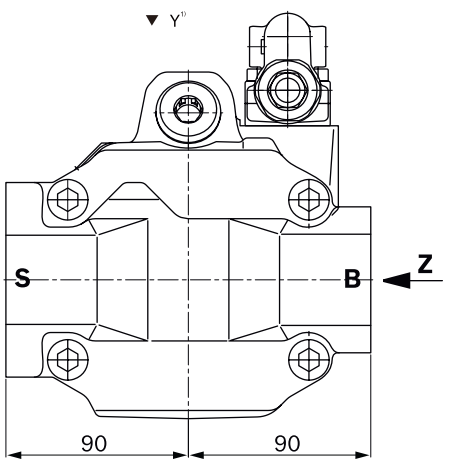




▼ **Oil port plate 13**
contrarotate ²)

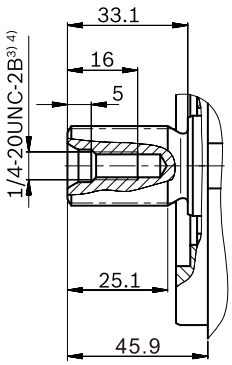




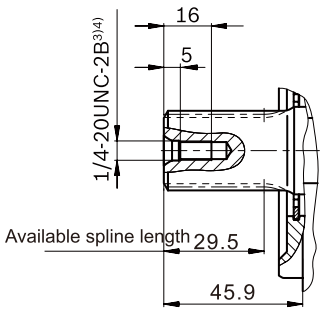


Shaft

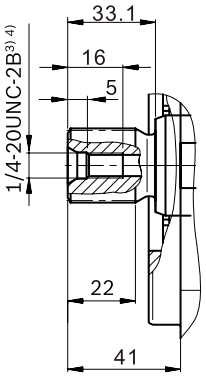
S spline shaft ,1in 15T 16/32DP[1] (SAE J744)



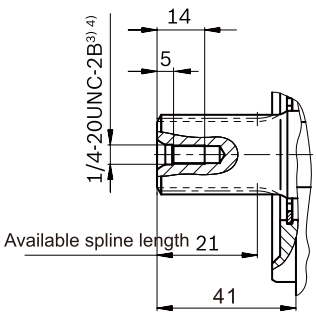
R spline shaft 1in 15T 16/32DP (SAE J744-25-4 (B-B))



U spline shaft ,7/8in 13T 16/32DP (SAE J744-22-4 (B))



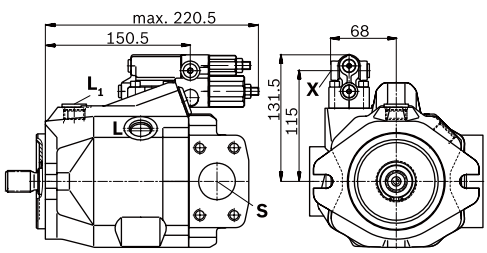
W spline shaft,7/8in 13T 16/32DP (SAE J744-22-4 (B))



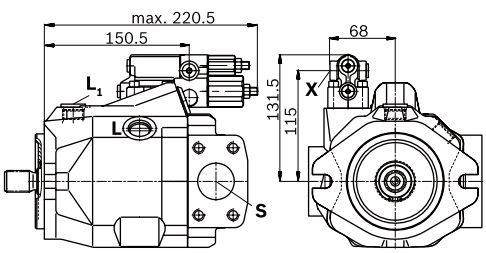
Ports		Standard	Size	P_{max} [bar][5]	State
B	Outlet port Fastening thread	SAE J518[6] DIN 13	1 1/2 in M10X1.5;17 deep	315	O
S	Suction port Fastening thread	SAE J518[6] DIN 13	1 in M12X1.75;20 deep	5	O
L	Drain port	DIN 11926[7]	7/8-14UNF-2B;13 deep	2	O[8]
L_1、L_2[9]	Drain port	DIN 11926[7]	7/8-14UNF-2B;13 deep	2	X[8]
X	Control pressure	DIN 11926	7/16-20UNF-2A;11.5 deep	315	O

1) Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard.
3) Thread according to ASME B1.1
4) Observe the instructions in the operating instructions concerning the maximum tightening torques.
5) Momentary pressure spikes may occur depending on the application.Keep this in mind when selecting measuring devices and fittings.
6) Metric fastening thread is a deviation from standard.
7) The spot face can be deeper than as specified in the standard.
8) Depending on the installation position, L, L1 or L2 must be connected
9) Only series 53
10) O = Must be connected (plugged when delivered) X = Plugged (in normal operation)

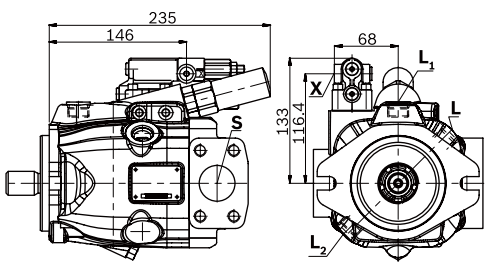
DRG



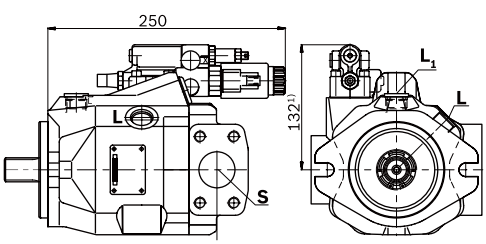
DRF/DFR1/DRSC



LA.D.



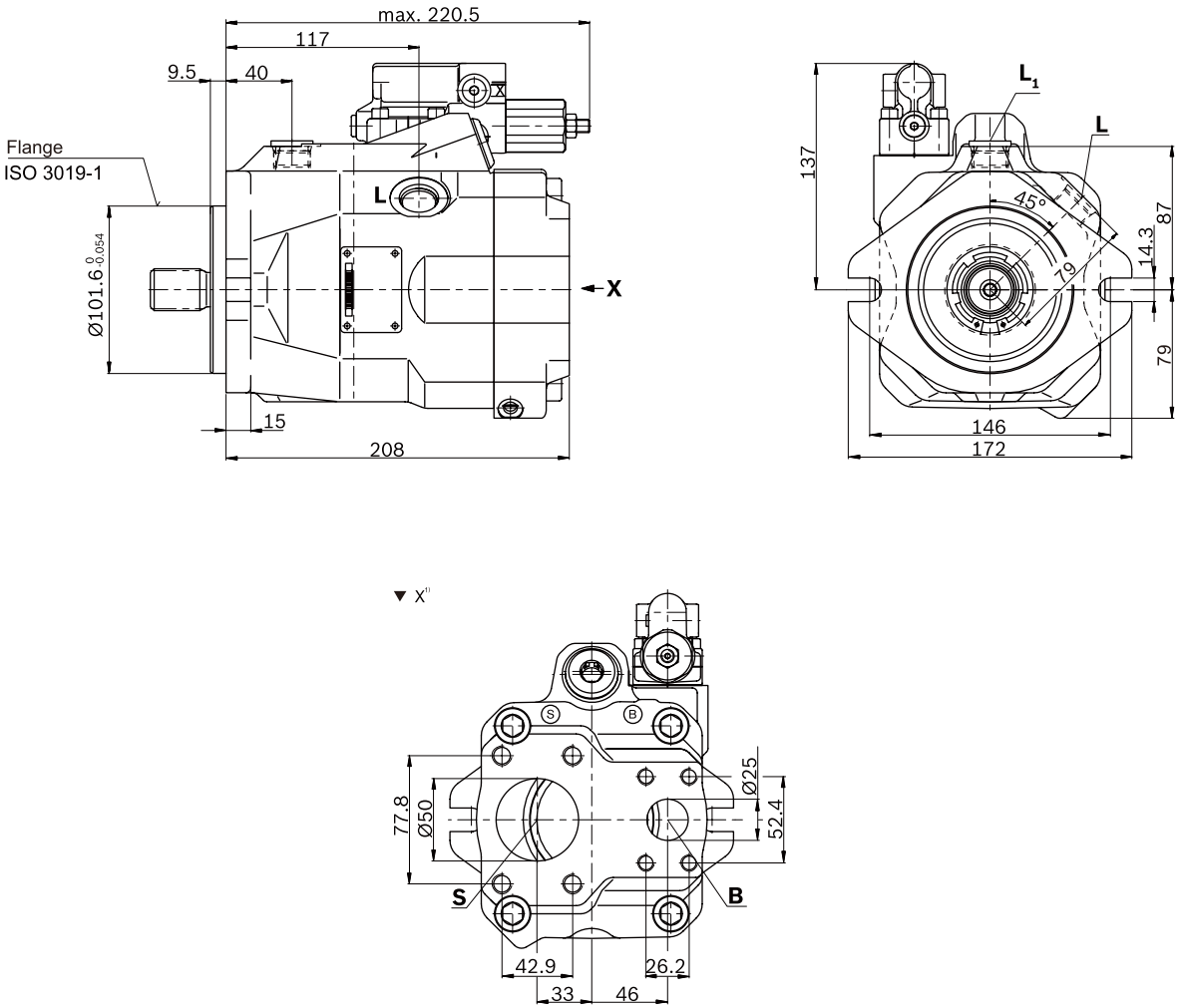
Ed7./ ER7.



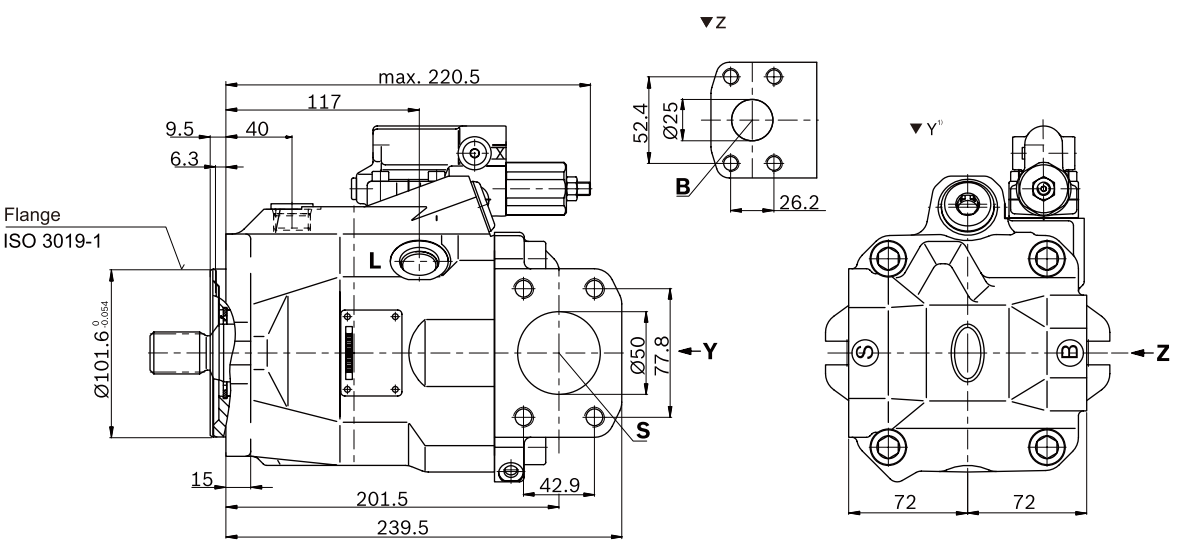
Dimensions size 60 (Control devices DR, DRG, DFR/DFR1)

DR –

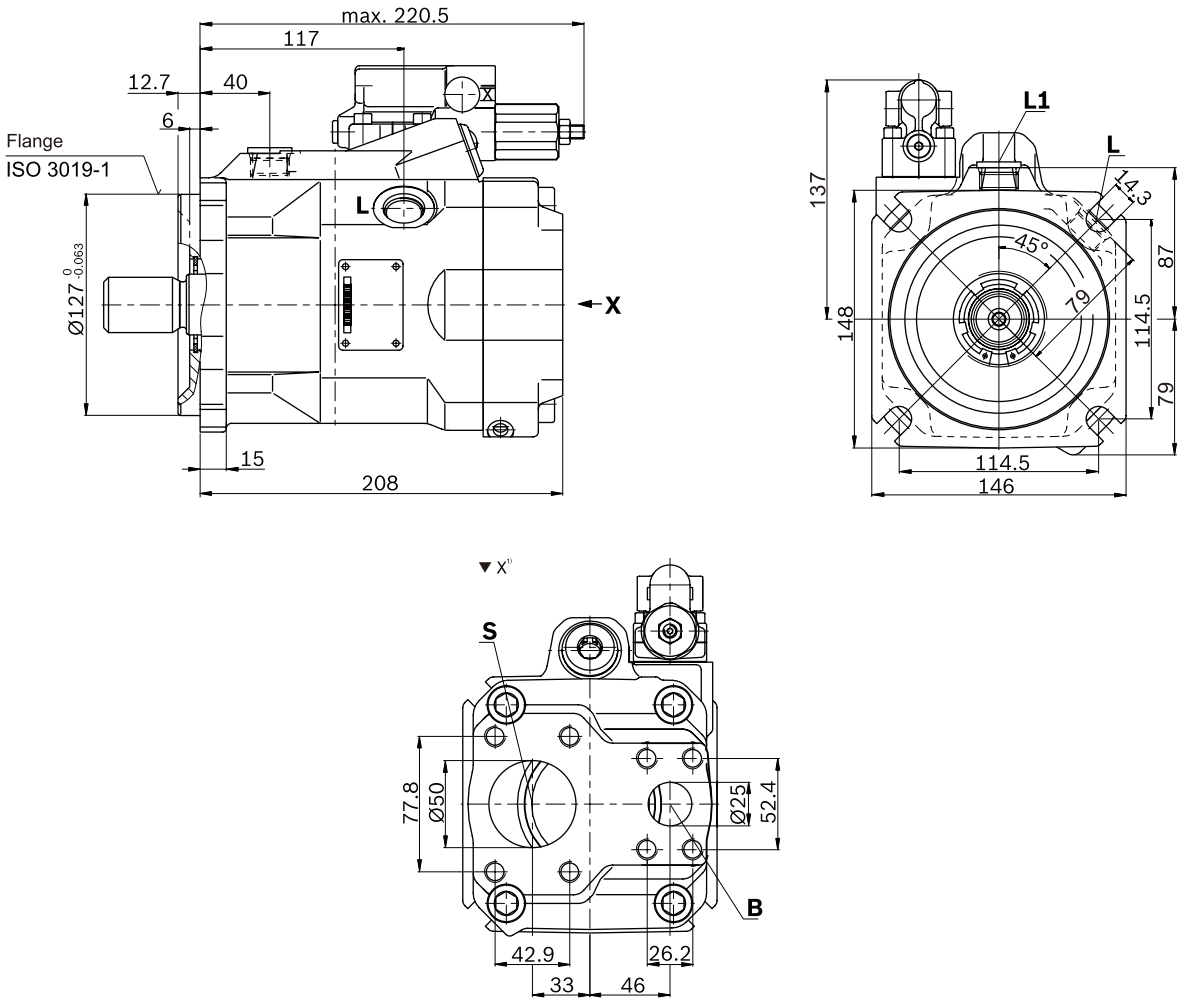
▼ **Oil port plate 11**



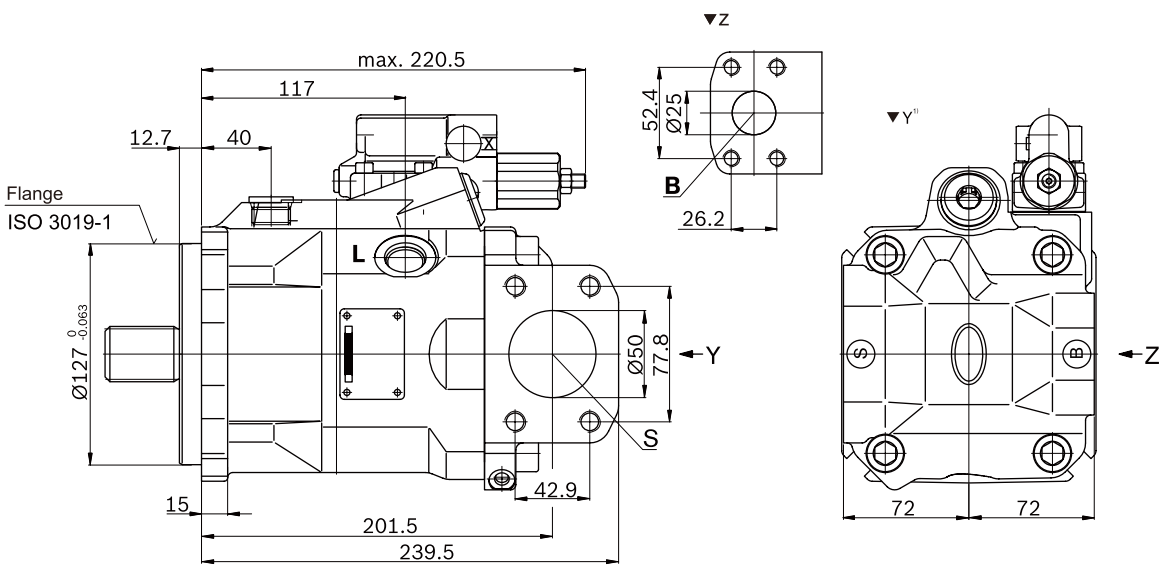
▼ **Oil port plate 12**



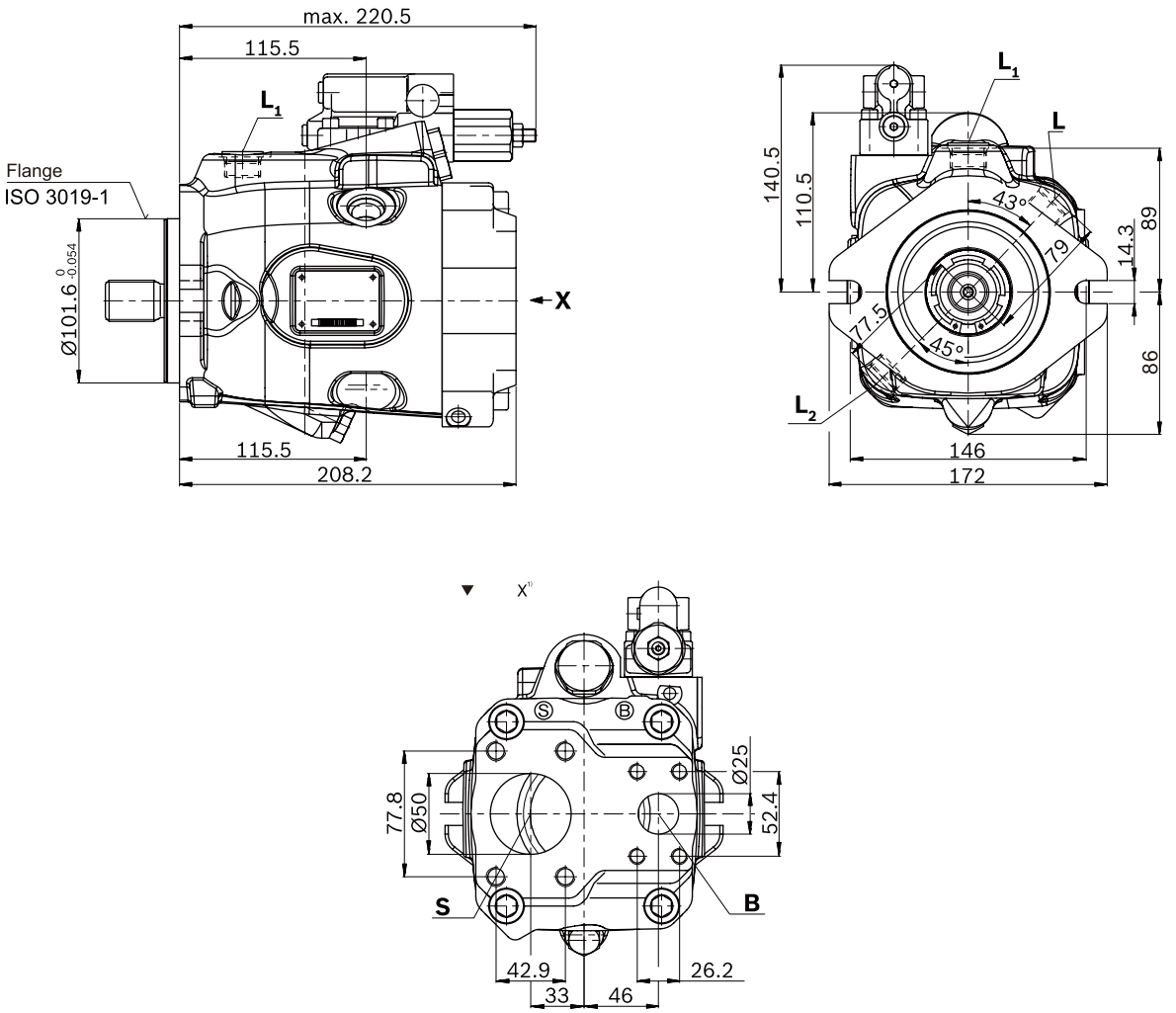
▼ **Oil port plate 11**



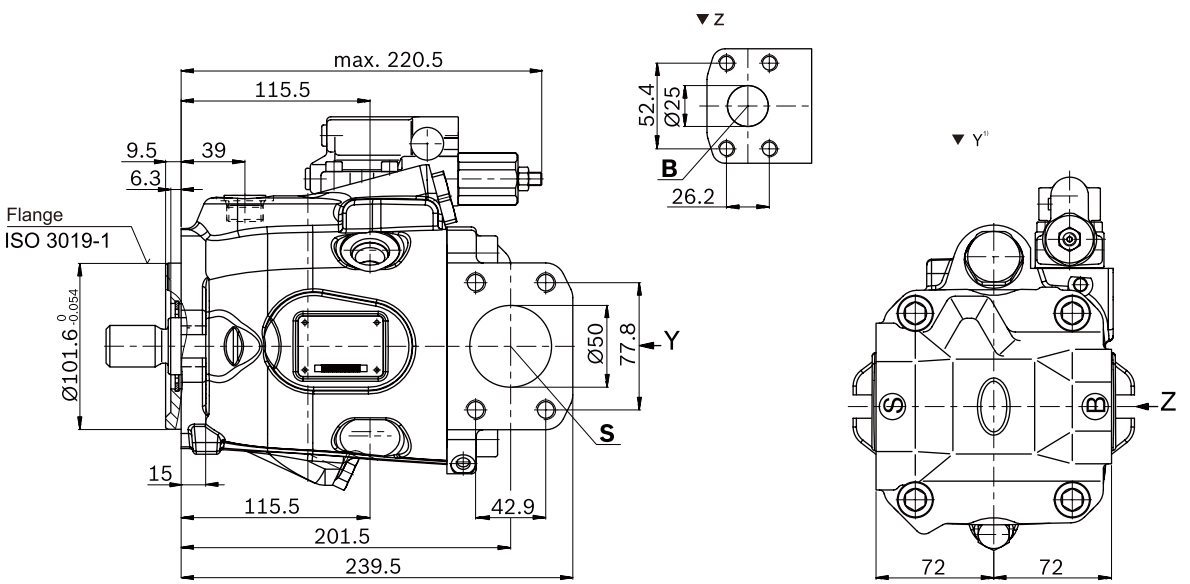
▼ **Oil port plate 12**



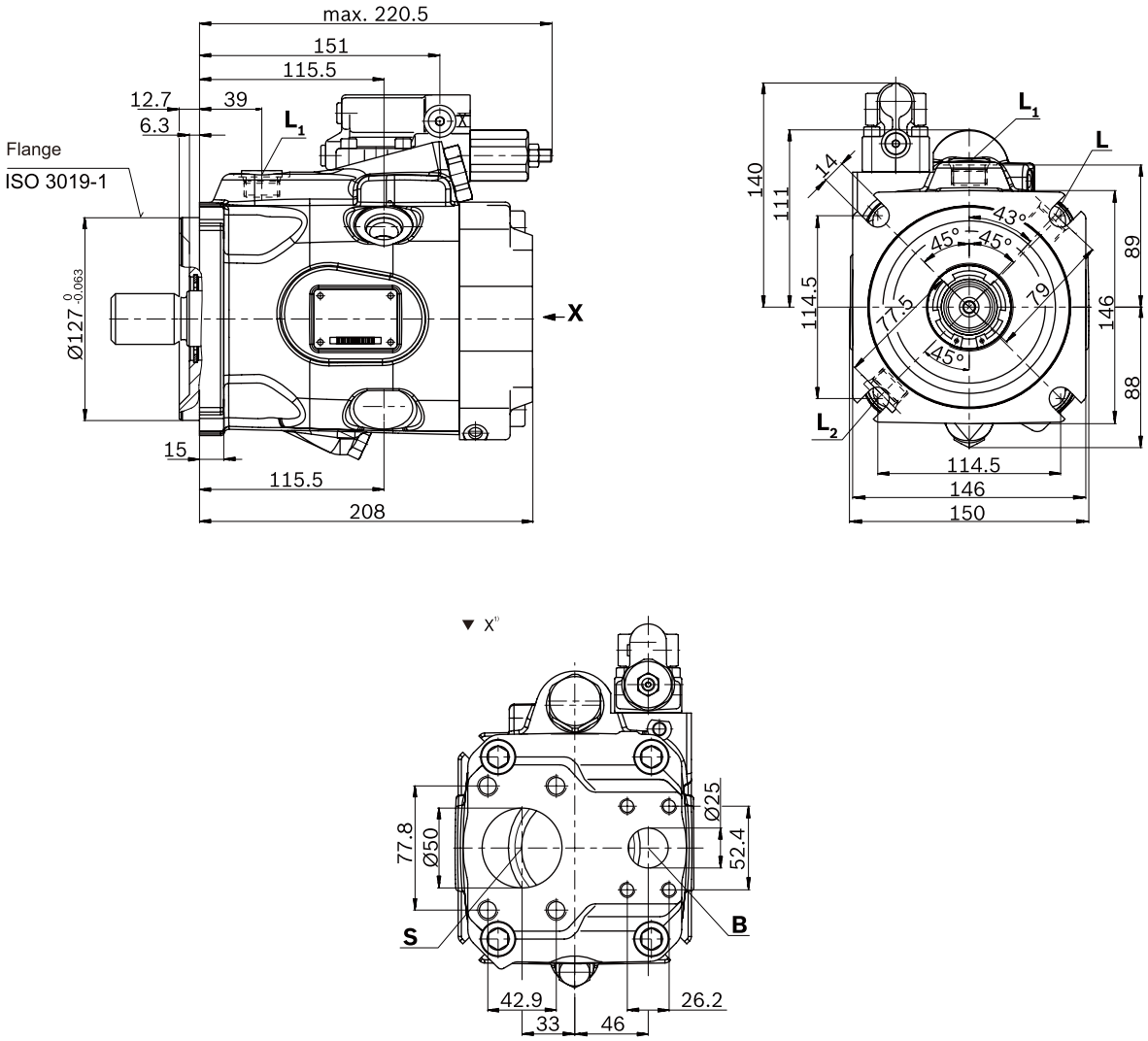
▼ **Oil port plate 11**



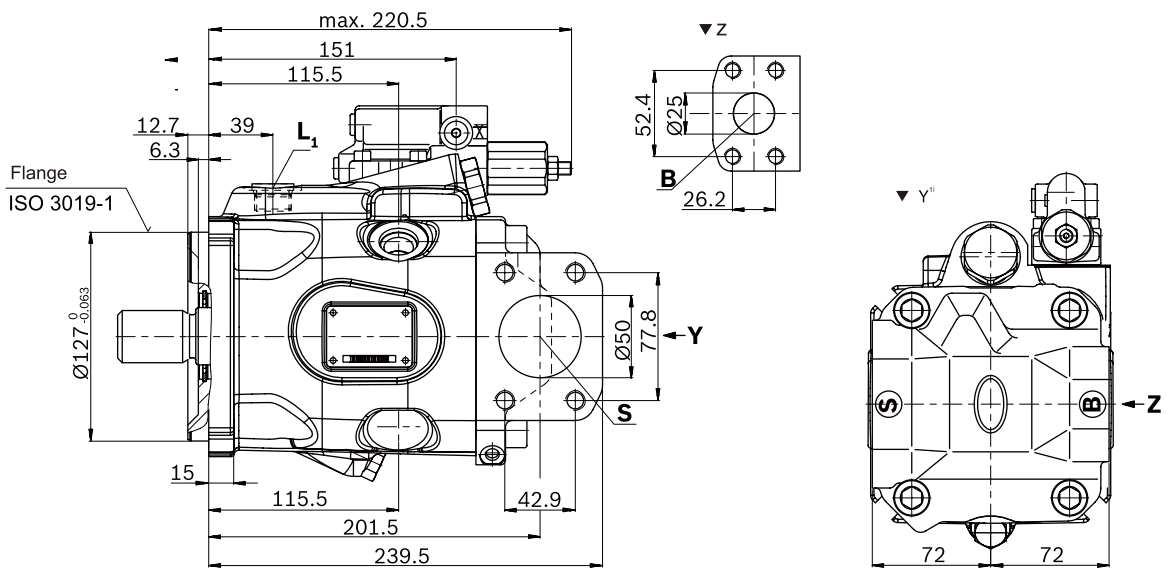
▼ **Oil port plate 12**



▼ **Oil port plate 11**

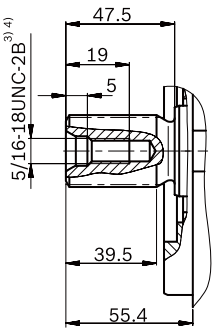


▼ **Oil port plate 12**

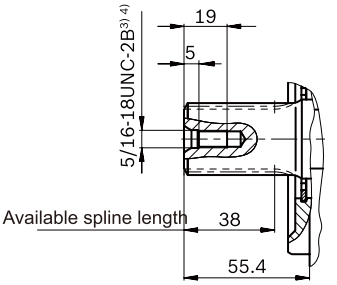


Shaft

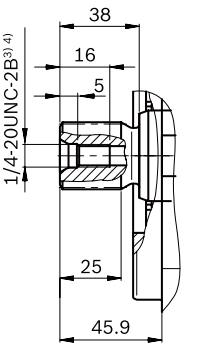
S spline shaft，14T 12/24DP[1]
1 1/4 in （SAE J744）



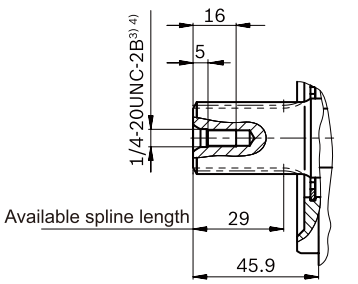
R spline shaft，14T 12/24DP[1) 2)]
1 1/4 in （SAE J744）



U spline shaft，15T 16/32DP[1)]
1 in （SAE J744）



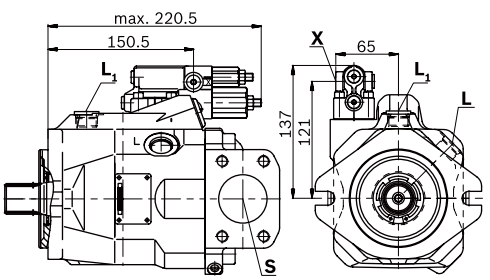
W spline shaft，15T 16/32DP[1)2)]
1 in （SAE J744）



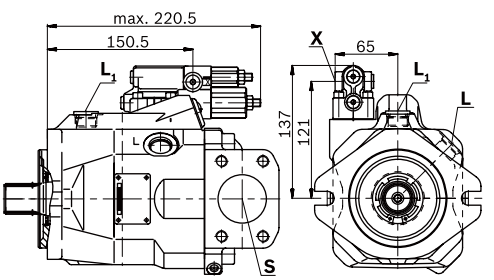
Ports		Standard	Size	P_{max} [bar][5)]	State
B	Outlet port Fastening thread	SAE J518[6)] DIN 13	1 M10X1.5;17 deep	315	O
S	Suction port Fastening thread	SAE J518[6)] DIN 13	2 M12X1.75;20 deep	5	O
L	Drain port	ISO 11926[7)]	7/8–14UNF–2B;13 deep	2	O[8)]
L_1、L_2[9)]	Drain port	ISO 11926[7)]	7/8–14UNF–2B;13 deep	2	X[8)]
X	Control pressure	ISO 11926	7/16–20UNF–2A;11.5 deep	315	O

1) Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard.
3) Thread according to ASME B1.1
4) Observe the instructions in the operating instructions concerning the maximum tightening torques.
5) Momentary pressure spikes may occur depending on the application.Keep this in mind when selecting measuring devices nd fittings.
6) Metric fastening thread is a deviation from standard.
7) The spot face can be deeper than as specified in the standard.
8) Depending on the installation position, L, L1 or L2 must be connected
9) Only series 53
10) O = Must be connected (plugged when delivered) X = Plugged (in normal operation)

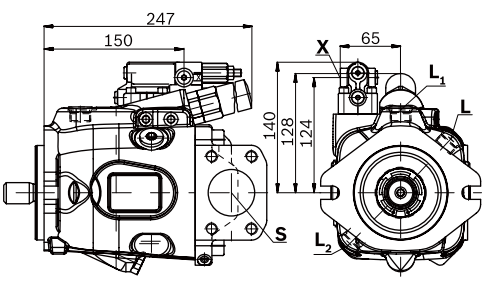
DRG



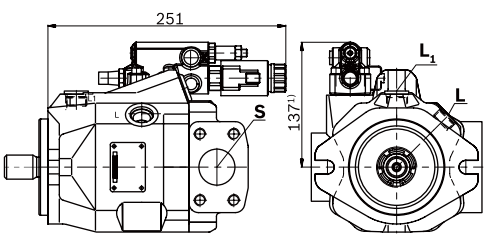
DRF/DFR1/DRSC



LA.D.



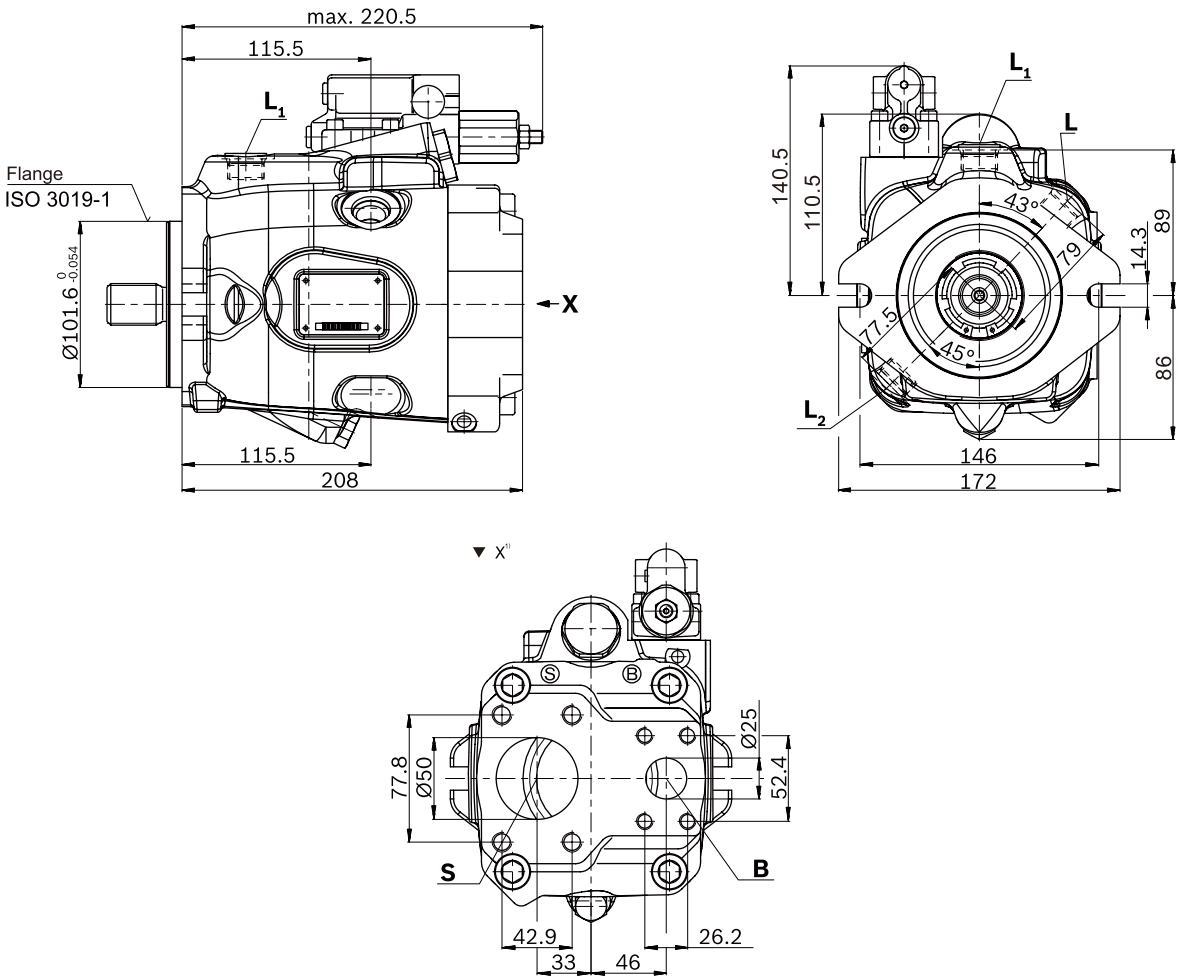
Ed7./ ER7.



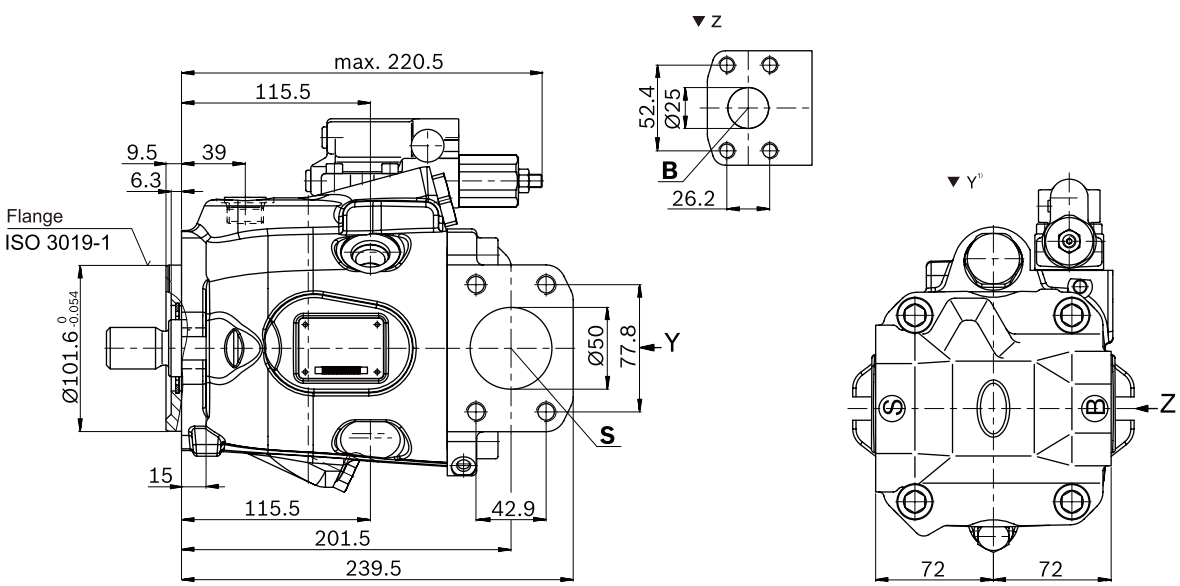
Dimensions size 72 (Control devices DR DRG DFR/DFR1)

DR –

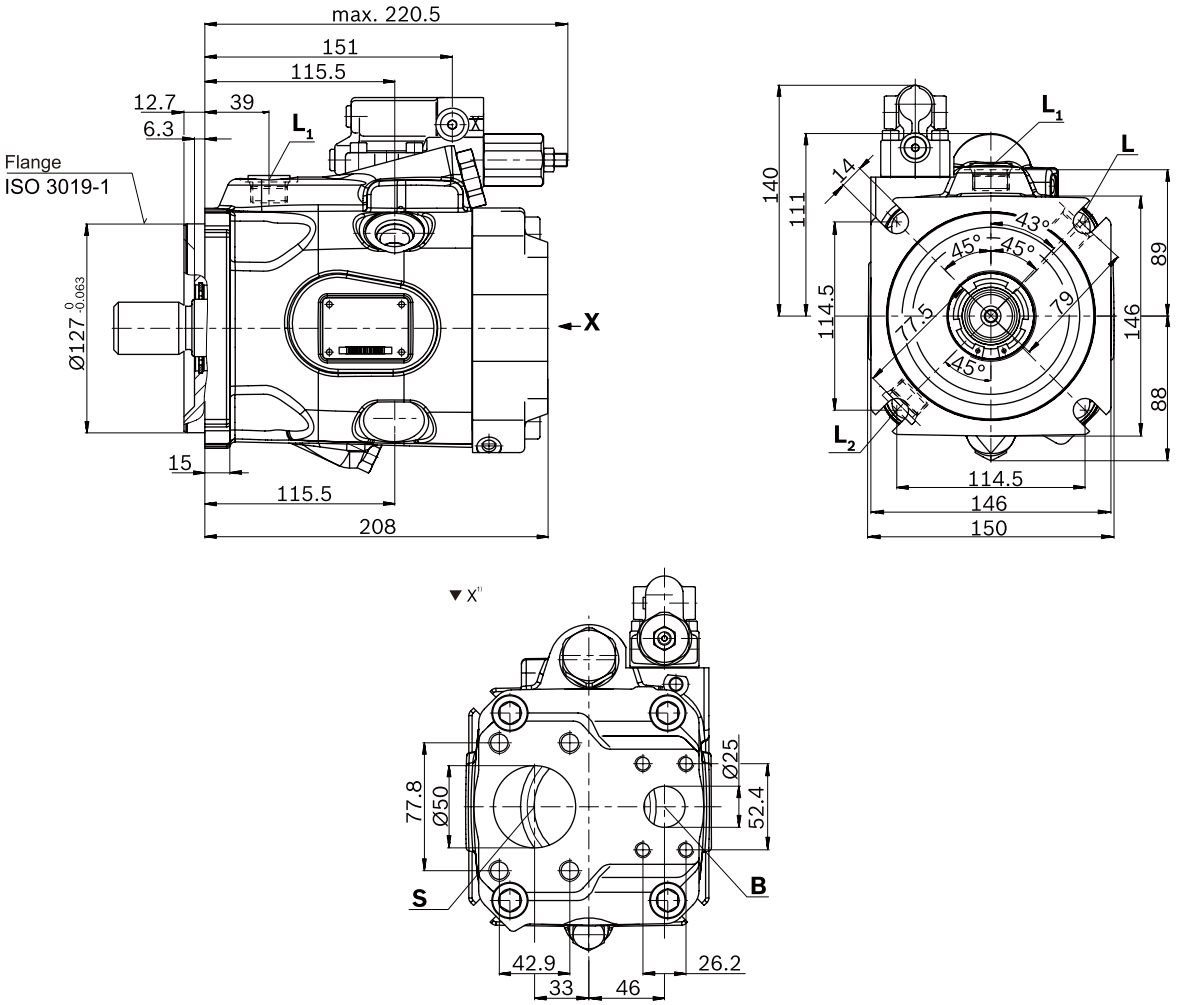
▼ **Oil port plate 11**



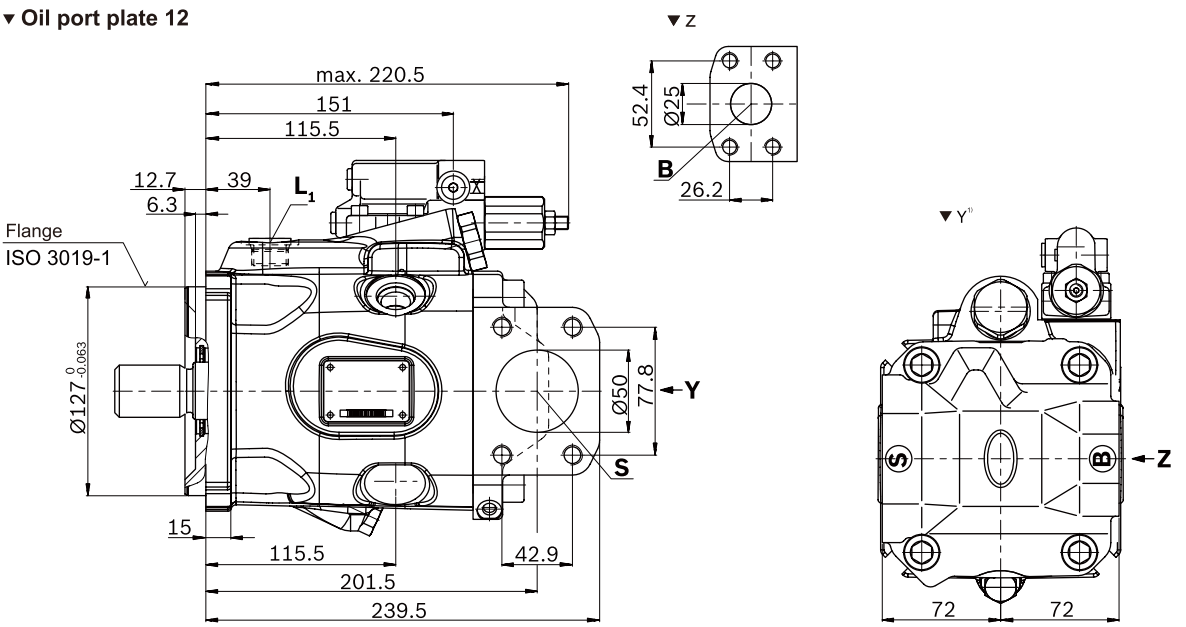
▼ **Oil port plate 12**



▼ **Oil port plate 11**

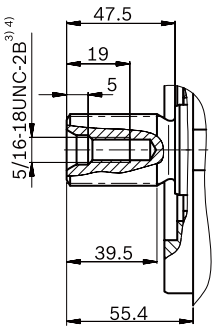


▼ **Oil port plate 12**

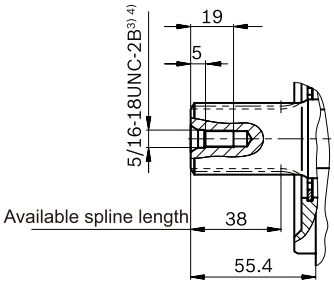


Shaft

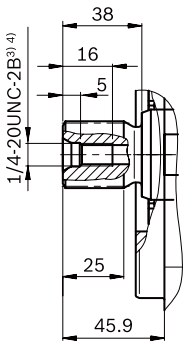
S spline shaft，14T 12/24DP[1)]
1 1/4 in （SAE J744）



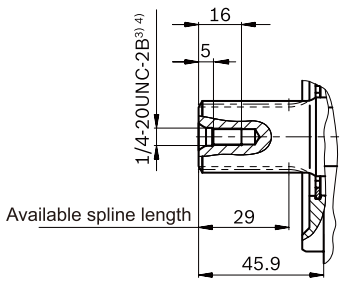
R spline shaft，14T 12/24DP[1) 2)]
1 1/4 in （SAE J744）



U spline shaft，15T 16/32DP[1)]
1 in （SAE J744）



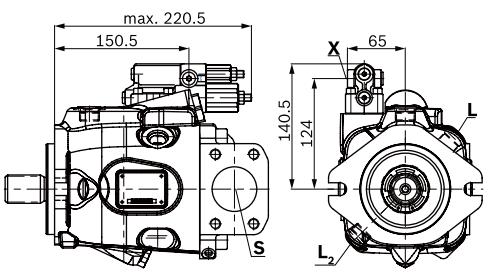
W spline shaft，15T 16/32DP[1)2)]
1 in （SAE J744）



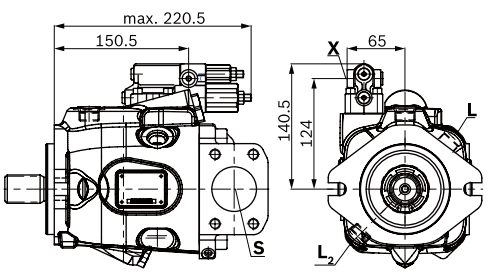
Ports		Standard	Size	P_{max} [bar][5)]	State
B	Outlet port Fastening thread	SAE J518[6)] DIN 13	1 M10X1.5;17 deep	315	O
S	Suction port Fastening thread	SAE J518[6)] DIN 13	2 M12X1.75;20 deep	5	O
L	Drain port	ISO 11926[7)]	7/8–14UNF–2B;13 deep	2	O[8)]
L_1、L_2[9)]	Drain port	ISO 11926[7)]	7/8–14UNF–2B;13 deep	2	X[8)]
X	Control pressure	ISO 11926	7/16–20UNF–2A;11.5 deep	315	O

1) Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard.
3) Thread according to ASME B1.1
4) Observe the instructions in the operating instructions concerning the maximum tightening torques.
5) Momentary pressure spikes may occur depending on the application.Keep this in mind when selecting measuring devices and fittings.
6) Metric fastening thread is a deviation from standard.
7) The spot face can be deeper than as specified in the standard.
8) Depending on the installation position, L, L1 or L2 must be connected
9) Only series 53
10) O = Must be connected (plugged when delivered) X = Plugged (in normal operation)

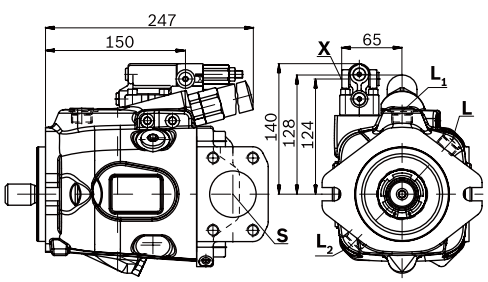
DRG



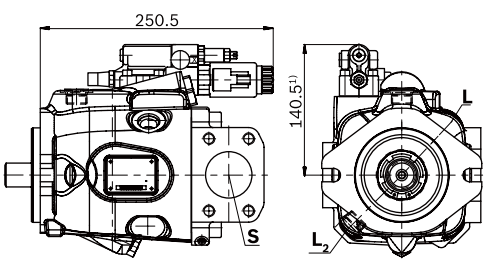
DRF/DFR1/DRSC



LA.D.



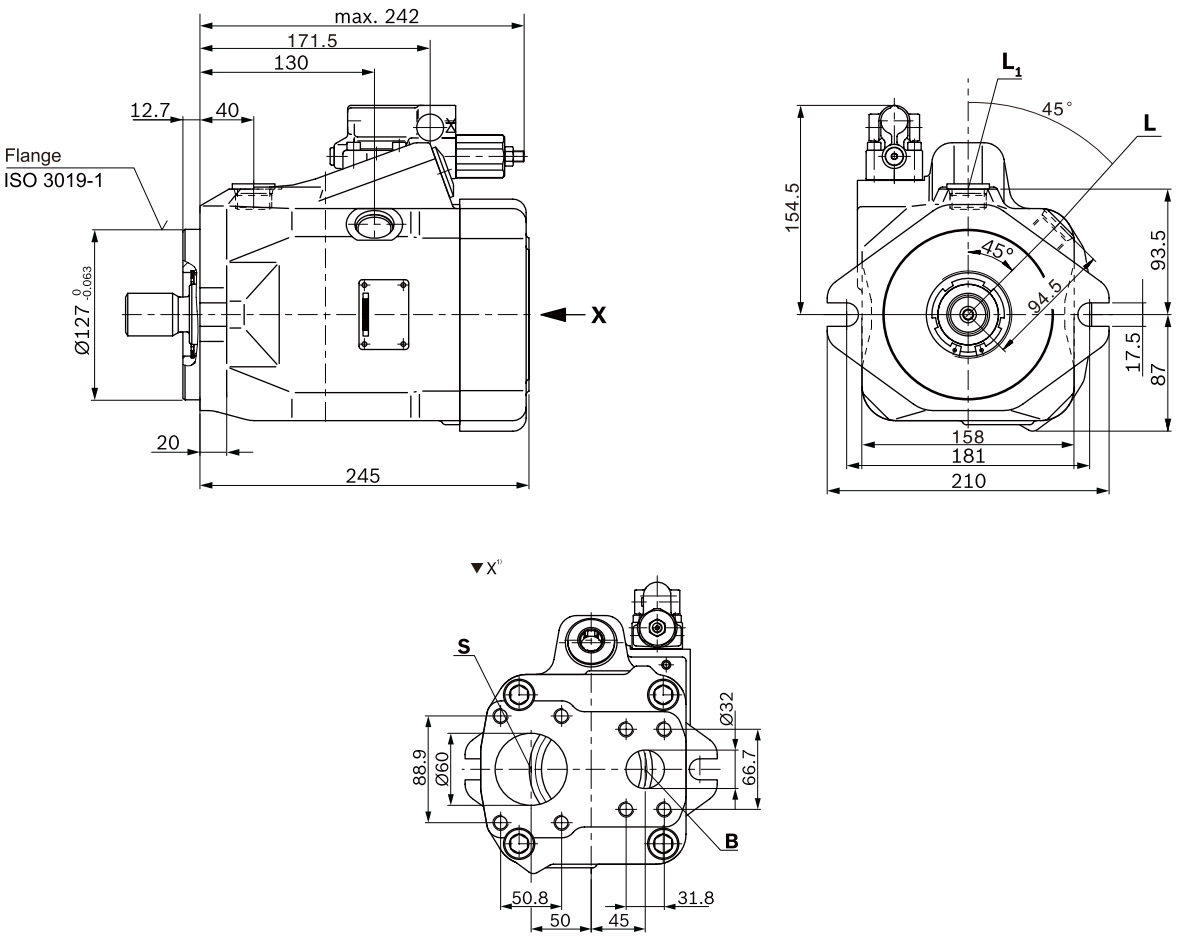
ED7./ ER7.



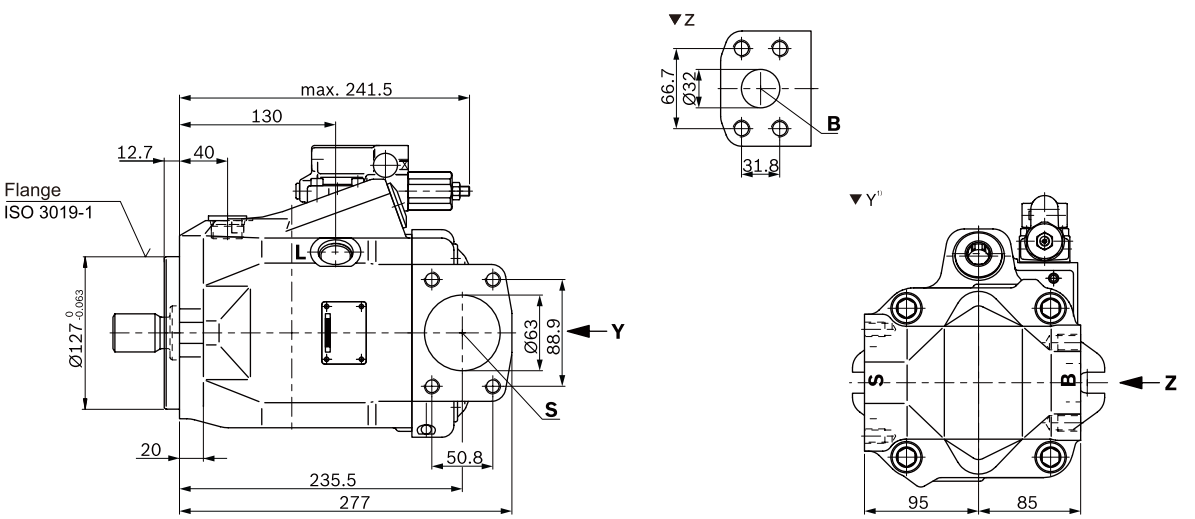
Dimensions size 85 (Control devices DR, DRG, DFR/DFR1)

DR –

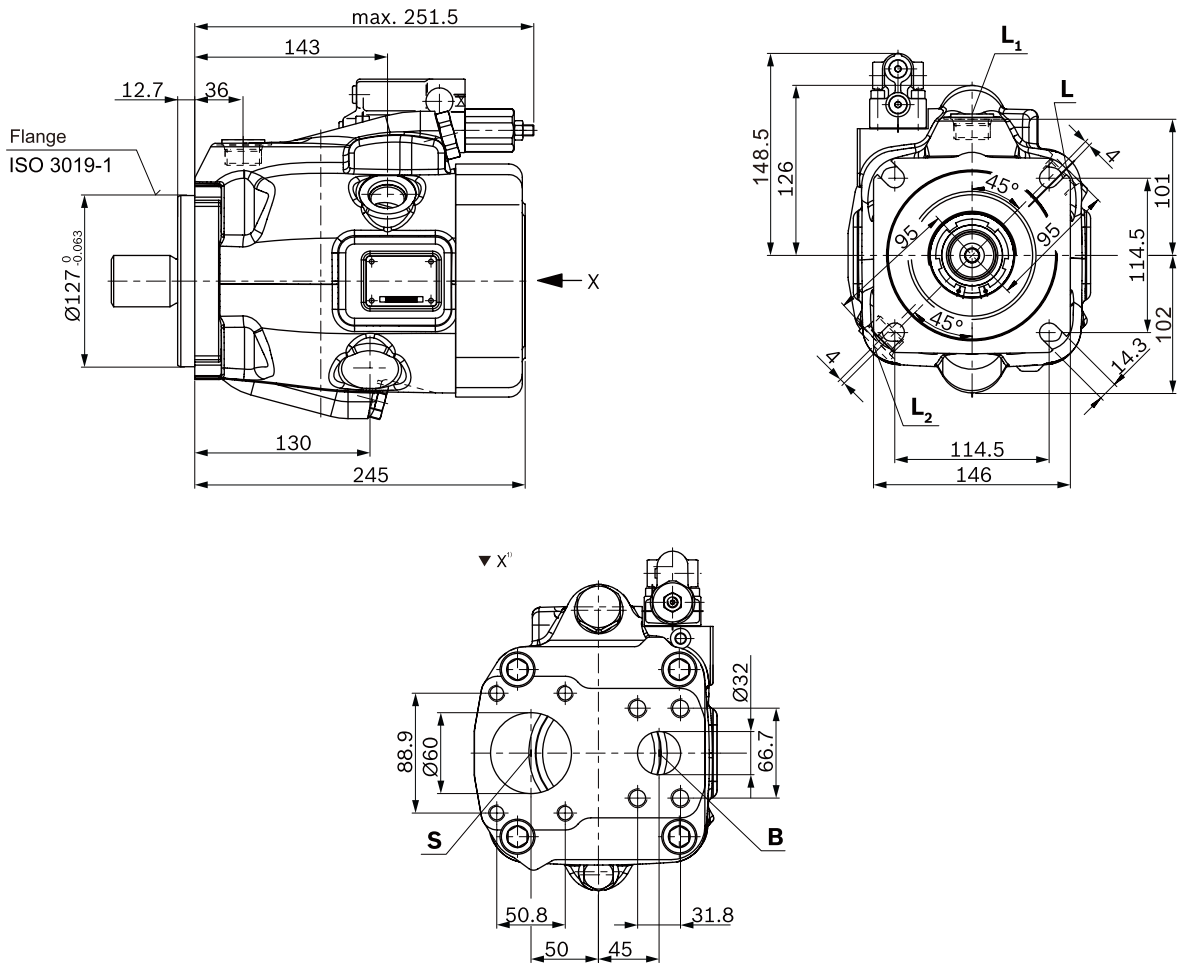
▼ **Oil port plate 11**



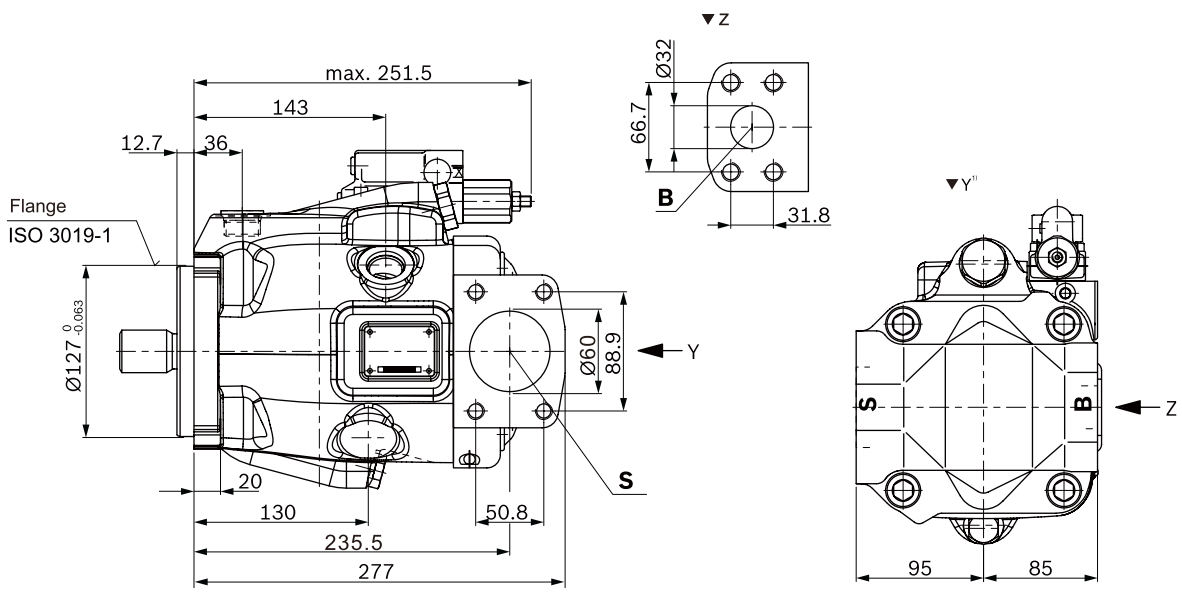
▼ **Oil port plate 12**



Oil port plate 11

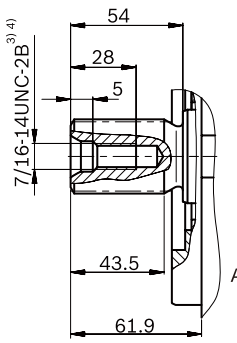


Oil port plate 12

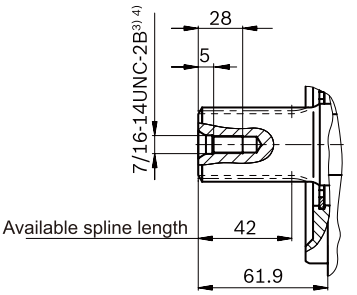


Shaft

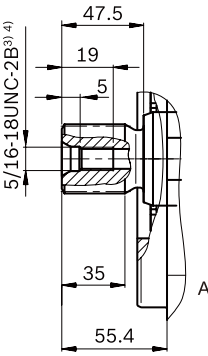
S spline shaft ,17T 12/24DP[1)]
1 1/2 in （SAE J744）



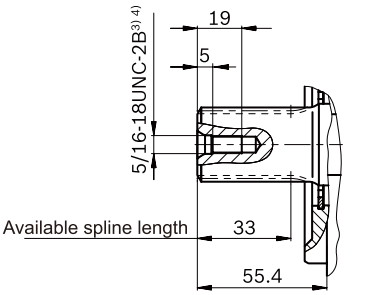
R spline shaft ,14T 12/24DP[1) 2)]
1 1/2 in （SAE J744）



U spline shaft ,14T 12/24DP[1)]
1 1/4 in （SAE J744）



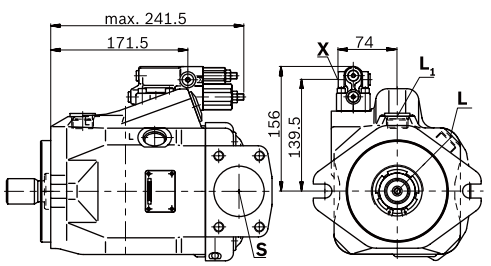
W spline shaft ,14T 12/24DP[1)]
1 1/4 in （SAE J744）



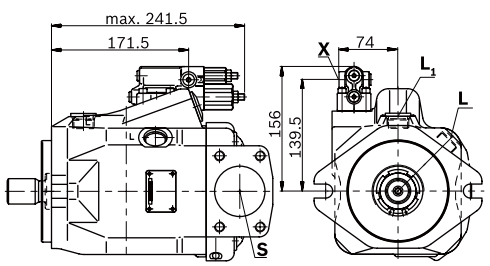
Ports		Standard	Size	P_{max} [bar][5)]	State
B	Outlet port Fastening thread	SAE J518[6)] DIN 13	1 1/4 M14X2;19 deep	315	O
S	Suction port Fastening thread	SAE J518[6)] DIN 13	2 1/2 M12X1.75;17 deep	5	O
L	Drain port	ISO 11926[7)]	1 1/16–12UNF–2B;15 2 deep	2	O[8)]
L_1、L_2[9)]	Drain port	ISO 11926[7)]	1 1/16–12UNF–2B;15 2 deep	2	X[8)]
X	Control pressure	ISO 11926	7/16–20UNF–2A;11.5 deep	315	O

1) Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard.
3) Thread according to ASME B1.1
4) Observe the instructions in the operating instructions concerning the maximum tightening torques.
5) Momentary pressure spikes may occur depending on the application.Keep this in mind when selecting measuring devices and fittings.
6) Metric fastening thread is a deviation from standard.
7) The spot face can be deeper than as specified in the standard.
8) Depending on the installation position, L, L1 or L2 must be connected
9) Only series 53
10) O = Must be connected (plugged when delivered) X = Plugged (in normal operation)

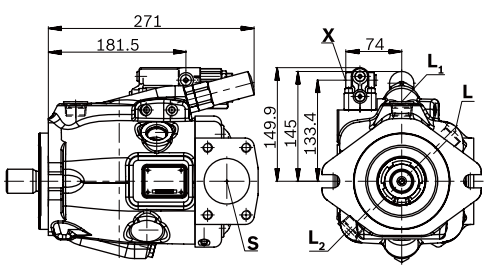
DRG –



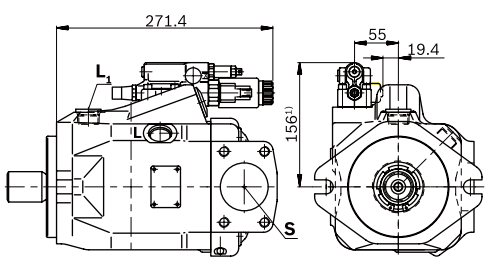
DFR/DFR1–



LA.D. –



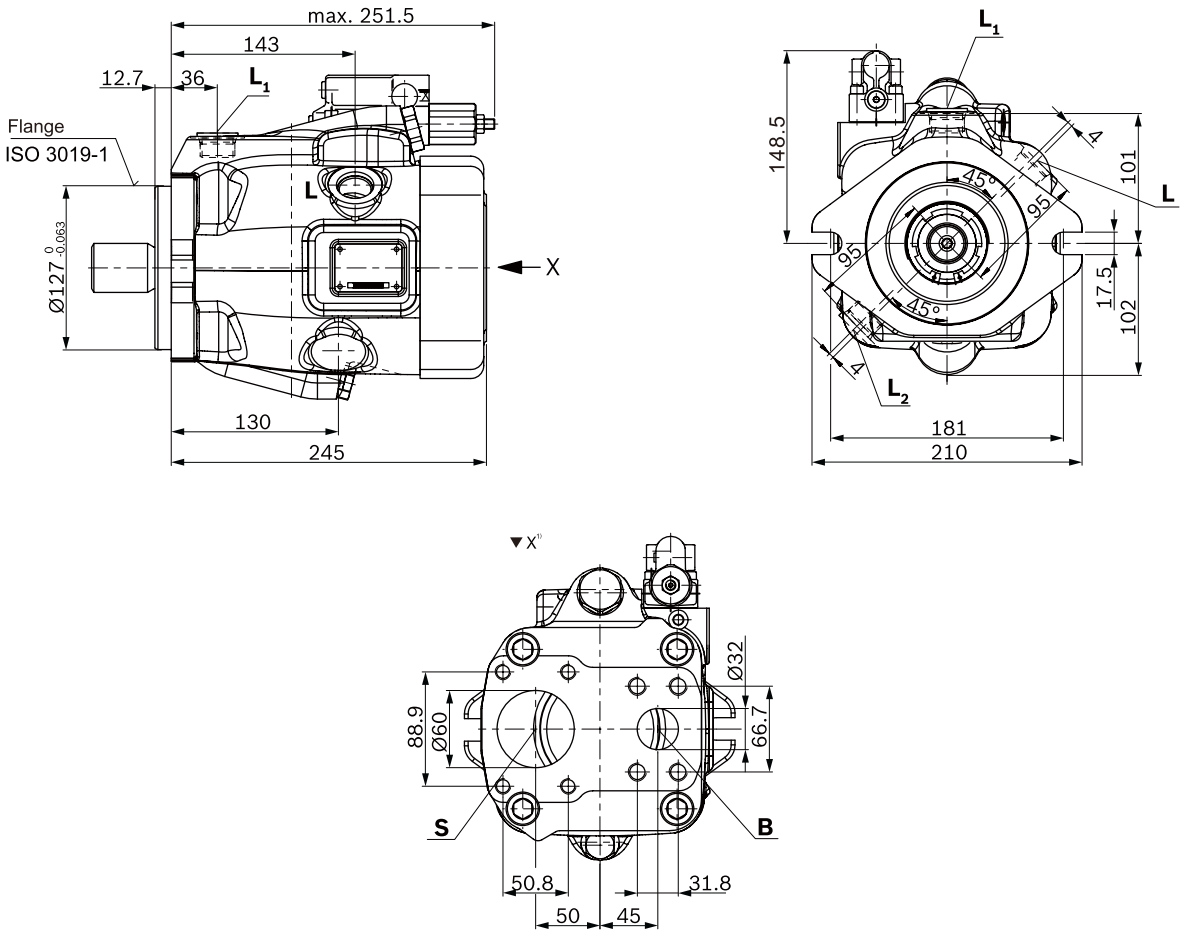
ED../ER..–



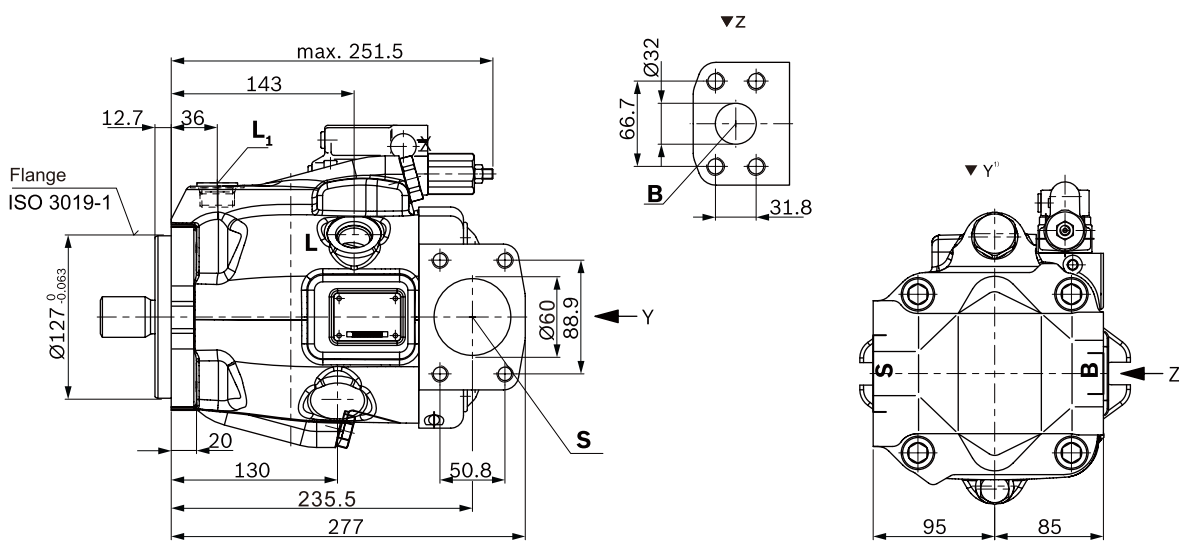
Dimensions size 100 (Control devices DR, DRG, DFR/DFR1)

DR -

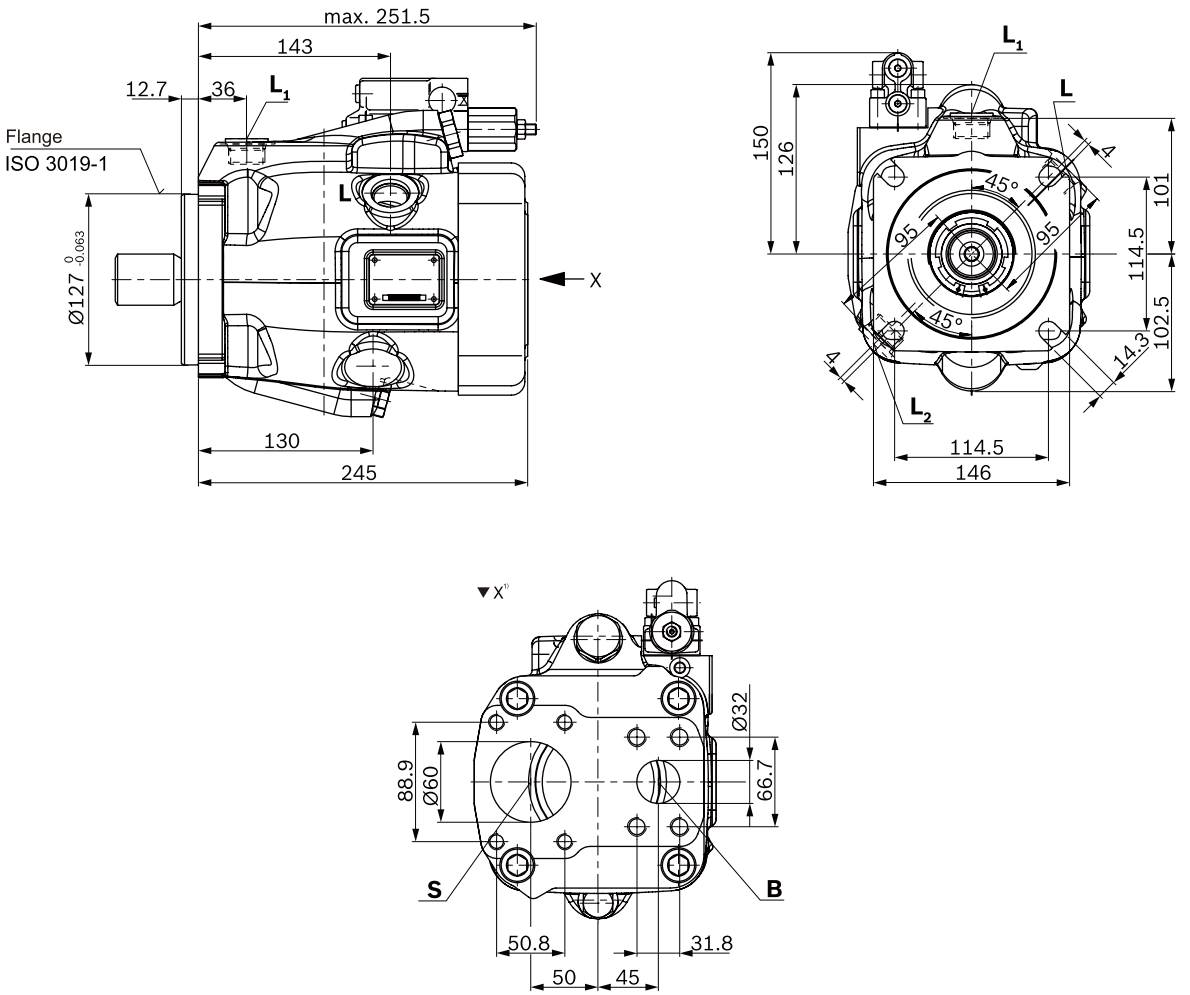
▼ **Oil port plate 11**



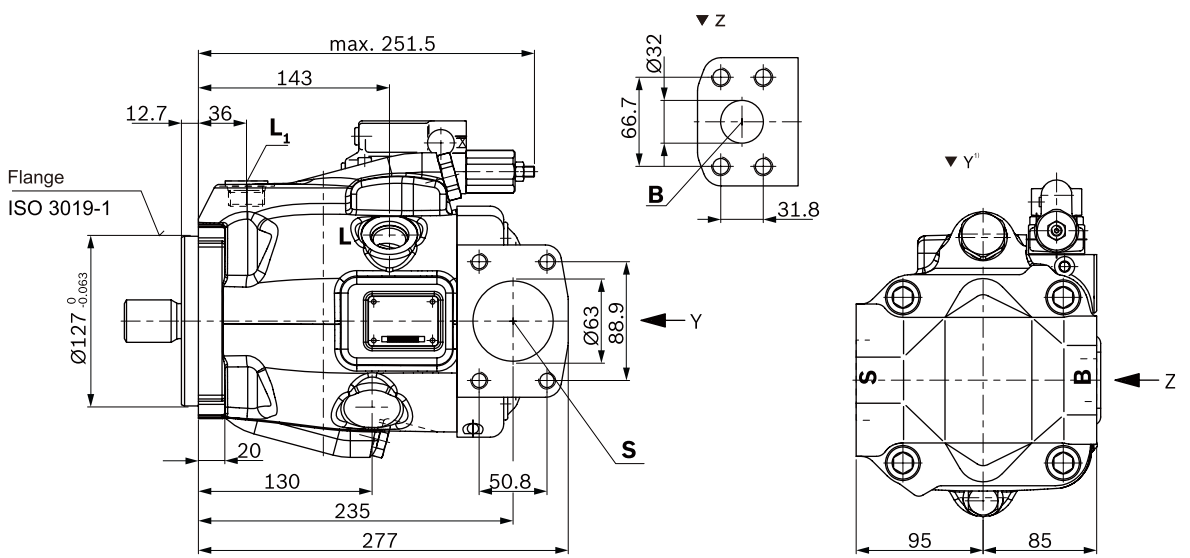
▼ **Oil port plate 12**



▼ **Oil port plate 11**

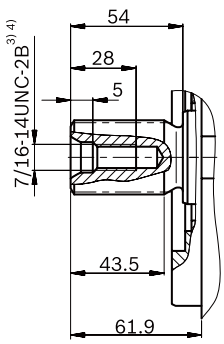


▼ **Oil port plate 12**

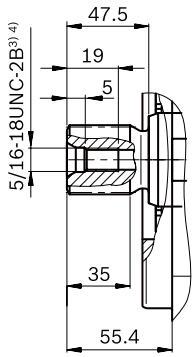


Shaft

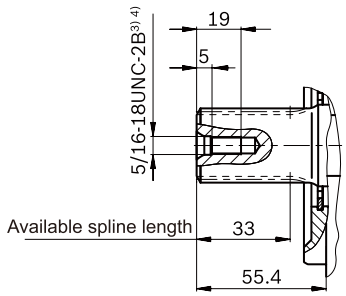
S spline shaft，17T 12/24DP[1)]
1 1/2 in （SAE J744）



U spline shaft，14T 12/24DP[1)]
1 1/4 in （SAE J744）



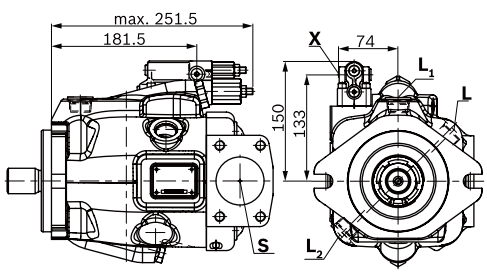
W spline shaft，14T 12/24DP[1)]
1 1/4 in （SAE J744）



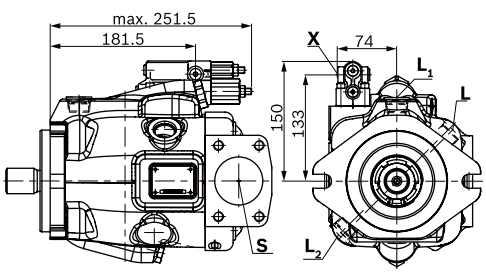
Ports		Standard	Size	P_{max} [bar][5)]	State
B	Outlet port Fastening thread	SAE J518[6)] DIN 13	1/4 M14X2;19 deep	315	O
S	Suction port Fastening thread	SAE J518[6)] DIN 13	2 1/2寸 M12X1.75;17 deep	5	O
L	Drain port	ISO 11926[7)]	1 1/16–12UNF–2B;15 deep	2	O[8)]
L_1、L_2[9)]	Drain port	ISO 11926[7)]	1 1/16–12UNF–2B;15 deep	2	X[8)]
X	Control pressure	ISO 11926	7/16–20UNF–2A;11.5 deep	315	O

1) Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard.
3) Thread according to ASME B1.1
4) Observe the instructions in the operating instructions concerning the maximum tightening torques.
5) Momentary pressure spikes may occur depending on the application.Keep this in mind when selecting measuring devices and fittings.
6) Metric fastening thread is a deviation from standard.
7) The spot face can be deeper than as specified in the standard.
8) Depending on the installation position, L, L1 or L2 must be connected
9) Only series 53
10) O = Must be connected (plugged when delivered) X = Plugged (in normal operation)

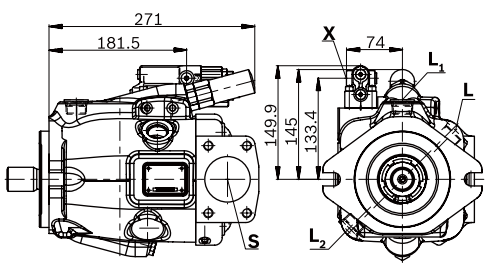
DRG



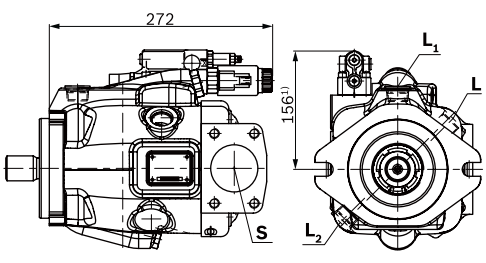
DRF/DRS/DRSC



LA.D.



ED7./ ER7.

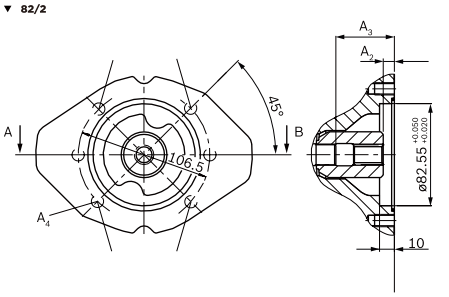


Dimensions,, throug drive

Flange ISO 3019-1(SAE) Diameter	Symbol	Hub for splined shaft [1] Diameter	Availability over sixes 18	28	45	60/63	72	85	100	Code
82-2(A)	☍, ⊶	5/8 9T 16/32DP	●	●	●	●	●	●	●	K01
		3/4	●	●	●	●	●	●	●	K52

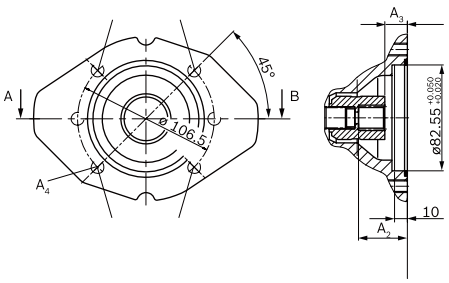
● = Available – = Not available

▼ 82/2



K01	NG	A1	A2	A3	A4 [3]
(SAE J744 16-4(A))	18	182	9.3	43.3	M10x1.5;14.5
	28	204	9.9	47	M10x1.5;16
	45 60	229	10.7	53	M10x1.5;16
	63	255	9.5	59	M10x1.5;16
	72	255	9.5	59	M10x1.5;16
	85	302	13.4	68	M10x1.5;20
	100	302	13.4	68	M10x1.5;20

▼ 82/2

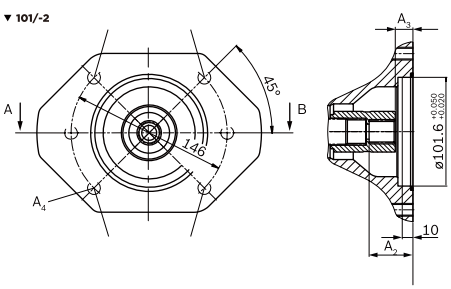


K52	NG	A1	A2	A3	A4 [3]
(SAE J744 19-4(A-B))	18	182	39	9.3	M10x1.5;14.5
	28	204	39.3	18.8	M10x1.5;16
	45 60	229	39.4	18.9	M10x1.5;16
	63	255	39.4	18.9	M10x1.5;16
	72	255	39.4	18.9	M10x1.5;16
	85	302	44.1	23.6	M10x1.5;20
	100	302	44.1	23.6	M10x1.5;20

Flange ISO 3019-1(SAE) Diameter	Symbol	Hub for splined shaft [1] Diameter	Availability over sixes 18	28	45	60/63	72	85	100	Code
101-2(A)	☍, ⊶	7/8 in 13T 16/32DP	–	●	●	●	●	●	●	K68
		1in 15T 16/32DP	–	–	●	●	●	●	●	K04

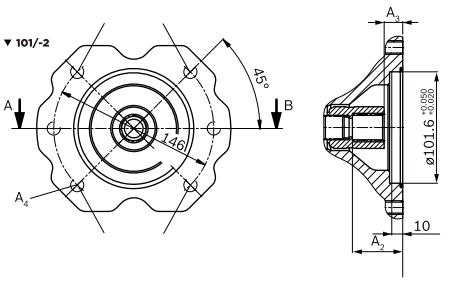
● = Available – = Not available

▼ 101/-2



K68	NG	A1	A2	A3	A4 [3]
(SAE J744 22-4(B))	28	204	42.3	17.8	M12x1.75;18
	45	229	42.4	17.9	M12x1.75;18
	60 63	255	42.4	17.9	M12x1.75;18
	72	255	42.4	17.9	M12x1.75;18
	85	302	46.5	22	M12x1.75;20
	100	302	46.5	22	M12x1.75;20

▼ 101/-2



K04	NG	A1	A2	A3	A4 [3]
(SAE J744 25-4(B-B))	45	229	47.9	18.9	M12x1.75;18
	60 63	255	47.4	18.4	M12x1.75;18
	72	255	47.4	18.4	M12x1.75;18
	85	302	51.2	22.2	M12x1.75;20
	100	302	51.2	22.2	M12x1.75;20

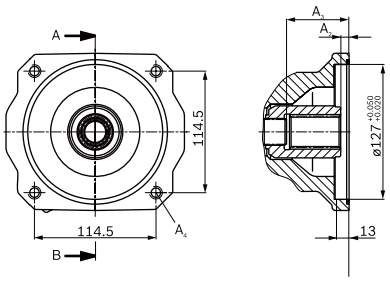
1)According to ANSIB92.1a,30° pressure angle, flat root, side fit,tolerance class 5

2)Thread according to DIN 13

Flange ISO 3019-1(SAE) Diameter	Symbol	Hub for splined shaft[1] Diameter	Availability over sixes							Code
			18	28	45	60/63	72	85	100	
127-4 (C)	⌘	1 1/4 in 14T 12/24DP	–	–	–	●	●	●	●	K07
		1 1/2in 17T 12/24DP	●	●	●	●	●	●	●	K24

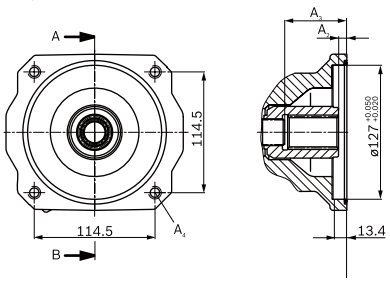
● = Available – = Not available

▼ 127/-4



K15	NG	A1	A2	A3	A4[3]
(SAE J744 32-4(C))	60 63	255	8	59	M12x1.75;16
	72	255	8	59	M12x1.75;16
	85	301.5	13	67.9	M12x1.75;
	100	301.5	13	67.9	M12x1.75;

▼ 127/-4

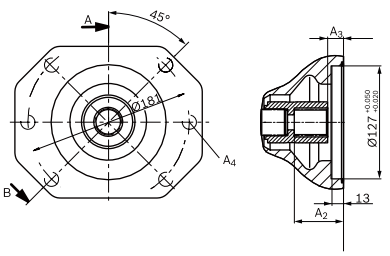


K16	NG	A1	A2	A3	A4[3]
(SAE J744 32-4(C))	85	301.5	13	67.9	M12x1.75;
	100	301.5	13	67.9	M12x1.75;

Flange ISO 3019-1(SAE) Diameter	Symbol	Hub for splined shaft[1] Diameter	Availability over sixes							Code
			18	28	45	60/63	72	85	100	
127-2 (B)	☍, ⚮	1 1/4 in 14T 12/24DP	–	–	–	–	–	●	●	K07
		1 1/2in 17T 12/24DP	–	–	–	–	–	●	●	K24

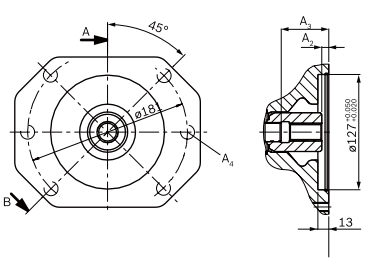
● = Available – = Not available

▼ 127/-2



K07	NG	A1	A2	A3	A4[3]
(SAE J744 32-4(C))	85	301.5	13	67.9	M12x1.75
	100	301.5	13	67.9	M12x1.75

▼ 127/-2



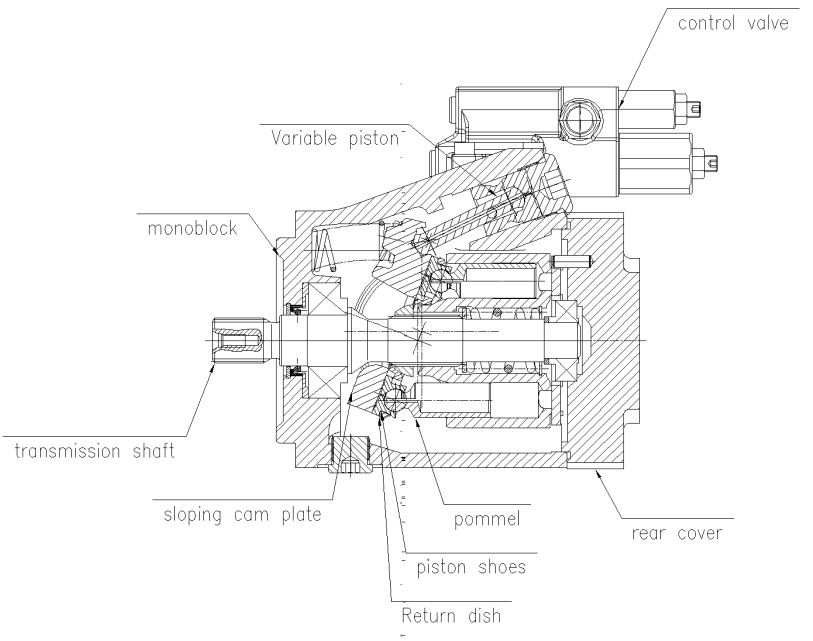
K24	NG	A1	A2	A3	A4[3]
(SAE J744 38-4(C-C))	85	302	8	68	M16x2;24
	100	302	8	68	M16x2;24

1)According to ANSIB92.1a,30° pressure angle, flat root, side fit,tolerance class 5
2)Thread according to DIN 13

Variable Displacement Piston Pump OS–A10VNO

Overview

A10VNO Series plunger pump are inclined disc axial plunger variable pump, designed for walking machinery, Are designed for open loop hydraulic drive, using open shaft structure,rated working pressure. Up to 25MPa.



Features

※ Inclevel disc structure axial plunger variable pump suitable for hydrostatic drive of open circuit.

※ Flow rate is proportional to the drive speed and displacement. By adjusting the inclined plate, the flow can be adjusted without pless.

※ High power–weight ratio–small size and low noise level.

※ Permissible continuous working pressure of 210 bar

※ Drive shaft can withstand axial and radial load pressure and flow control (load sensing)

※ Short response time

※ Mature A10–Technical, ultra–small installation size

※ Replace the quantitative pump with low cost and high efficiency

※ Cost–optimized design

Type Code

A10VN	O		DRS		5X		—	V		C		N00
1	2	3	4		5	6		7	8	9	10	11

1–Axial plunger elements

Slined disc design, variable, nominal pressure 210 bar, peak pressure 250 bar	A10VN

2–Operate mode

Pump, open loop	O

3–Size

Nominal displacement mL/r	45

4–Control device

Pressure control	DR
Flow control, fluid control, and X–T closure	DRS

5–Series

				–	52
			–		53

6–Rotating Direction(View on Shaft End)

From the axis end	Clockwise	R
	Counterclockwise	L

7–Seals

VitonFKM	V

8–Shaft End

SAE J744 Strip axis SAE J744	R
SAE J744 Strip axis SAE J744	W

9–Mounting Flange

SAE 2	C

10–Actuator port

ISO 6149–1 rear end surface thread mouth, metric system			–	–	40
SAE rear end flange, metric mounting thread		–			11

11–The shaft drive

No pass axis drive	N00

Chart shows: ●=Available，○=In preparation，–=Not available

Technical parameter

Range of imported working pressure

Absolute pressure of S mouth

Pabs min. _____0,8 bar

Pabs max_____5 bar

Range of the outlet working pressure

B mouth pressure

PN_____210 bar

Pmax_____250 bar

(Pressure specification determined per DIN 24312)

Flow direction

S到B. S arrive B

Shell oil discharge pressure

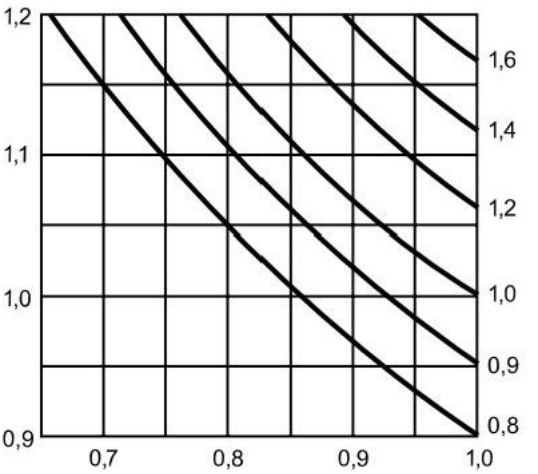
Maximum allowable housing oil drain pressure (oil port Lx):

Higher than S mouth oil suction pressure 0.5 bar, but can not exceed the absolute pressure 2 bar

PLabs max_____2 bar

Allowable maximum speed （speed limit）

ncreasing speed is allowed, but must correspond to the pressure of suction port S, based on Vg <Vgmax.



Size				45
Displacement		Vgmax	mL/r	45
Max.flow	Vg=Vgmax	n0max	r/min	1800
Max.flow	n=n0max	qv0max	L/min	81
Maximum power	qv=qv0max	P0max	kW	28
Acrot orque	△P=210bar	Tmax	Nm	150
Moment of inertia（around the drive shaft）		J	Kgm^3	0.002
maximum angular acceleration			rad/s^3	4900
Terror resistance	R transmission shaft	C	Nm/rad	26500
	W transmission shaft	C	Nm/rad	–
Shell volume		V	L	0.3
Weight（with pressure control）		m	kg	14

1)Theoretical values, without considering nmmn and η y, the values are rounded

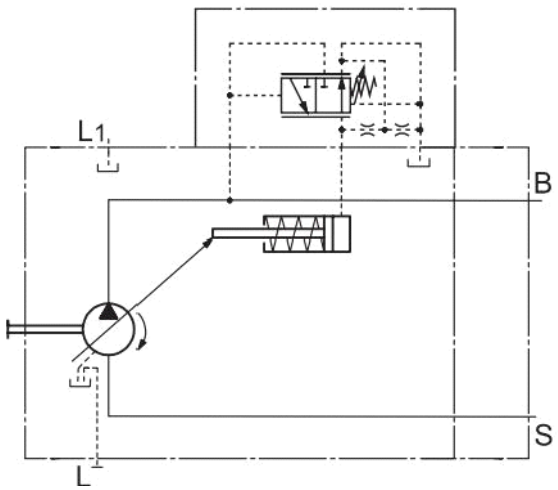
2) Self–priming when the absolute pressure of oil port S is 1bar

3) Higher rotational speeds are in preparation

DR–pressure control

Pressure control is used to maintain the constant pressure of the hydraulic system within the pump control range. Therefore, the pump will only supply the amount of hydraulic oil required for the actuator element. The pressure can be set stepless through the pilot valve.

Circuit diagram



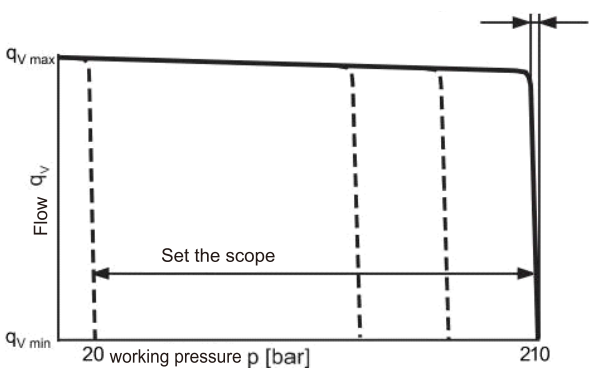
Maximum pilot fuel consumption: 3 L / min

Static characteristic

At n,=1500 minr';tnud=50℃时

At n, =1500 minr '; tnud = 50℃

Stapring and pressure rise △Pmay4 bar



Dynamic characteristis

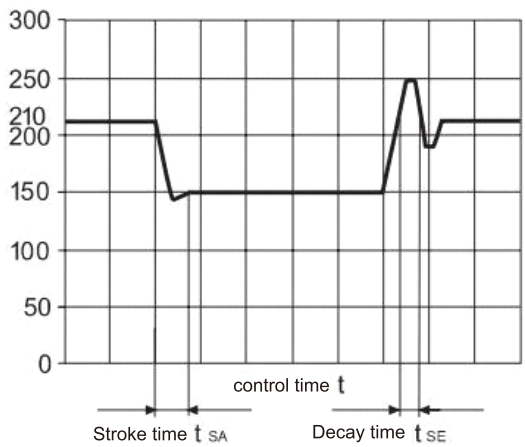
The characteristic curve was measured in the oil tank under the SAE J745 experimental conditions average value.

test condition： n= 1500 min–1

tnuid =50℃

The line main safety valve is set at 250 bar

1m downstream of the pump pressure outlet using the overflow valve Line bing as step load.



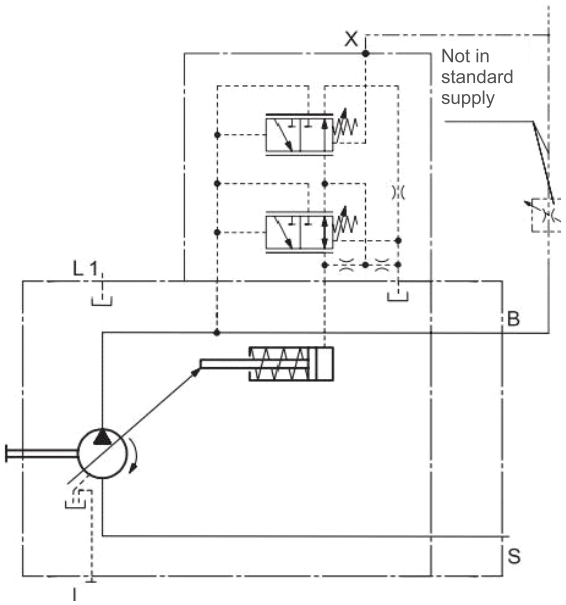
Size	ts[ms] 150 bar	tse[ms] 210 ba
28	90	45
45	90	45
63	100	55
85	110	70

DRS– Pressure and flow control

Use the empty system valve as described on the previous page. Pressure control is used to maintain the constant pressure of the hydraulic system within the pump control range. Therefore, the pump will only supply the amount of hydraulic oil required for the actuator element. The pressure can be set stepless through the pilot valve.

Constant pressure control takes precedence over flow control.

Circuit diagram



Maximum pilot fuel consumption is 3 L / min

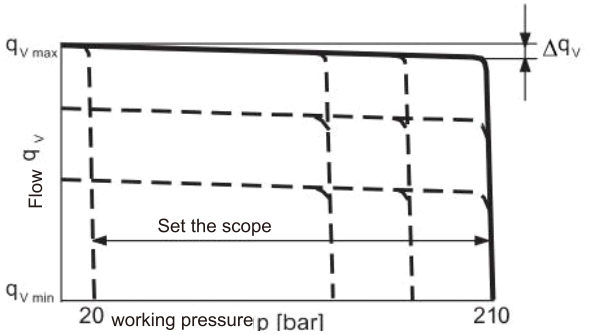
Differential pressure △p:

Can be regulated between 20 and 40 bar

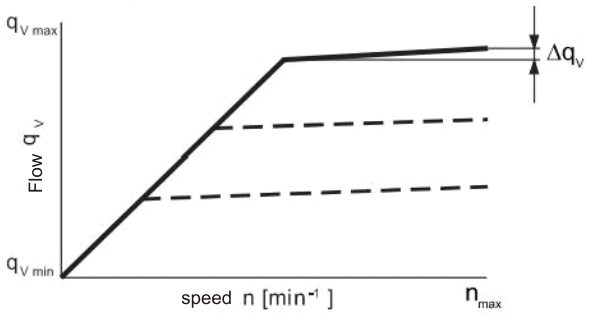
Standard set–point of 27 bar

Static characteristic

Flow control at n1=1500min–1;toel= 50℃



Static characteristics at a variable–speed condition



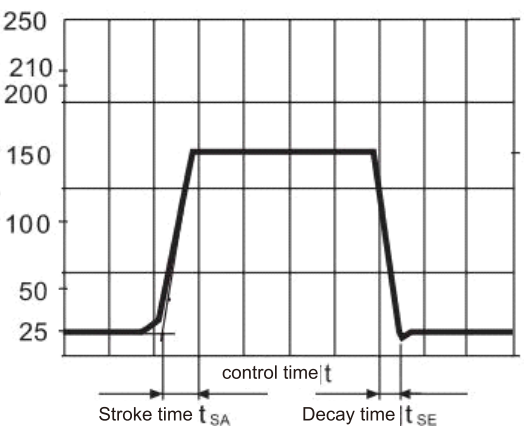
Maximum traffic deviation

Hysterese und Anstieg bei n,= 1500 min–

Size	28	45	63	85
△qy[L/min]	1,0	1,0	1,8	2,5

Dynamic characteristis

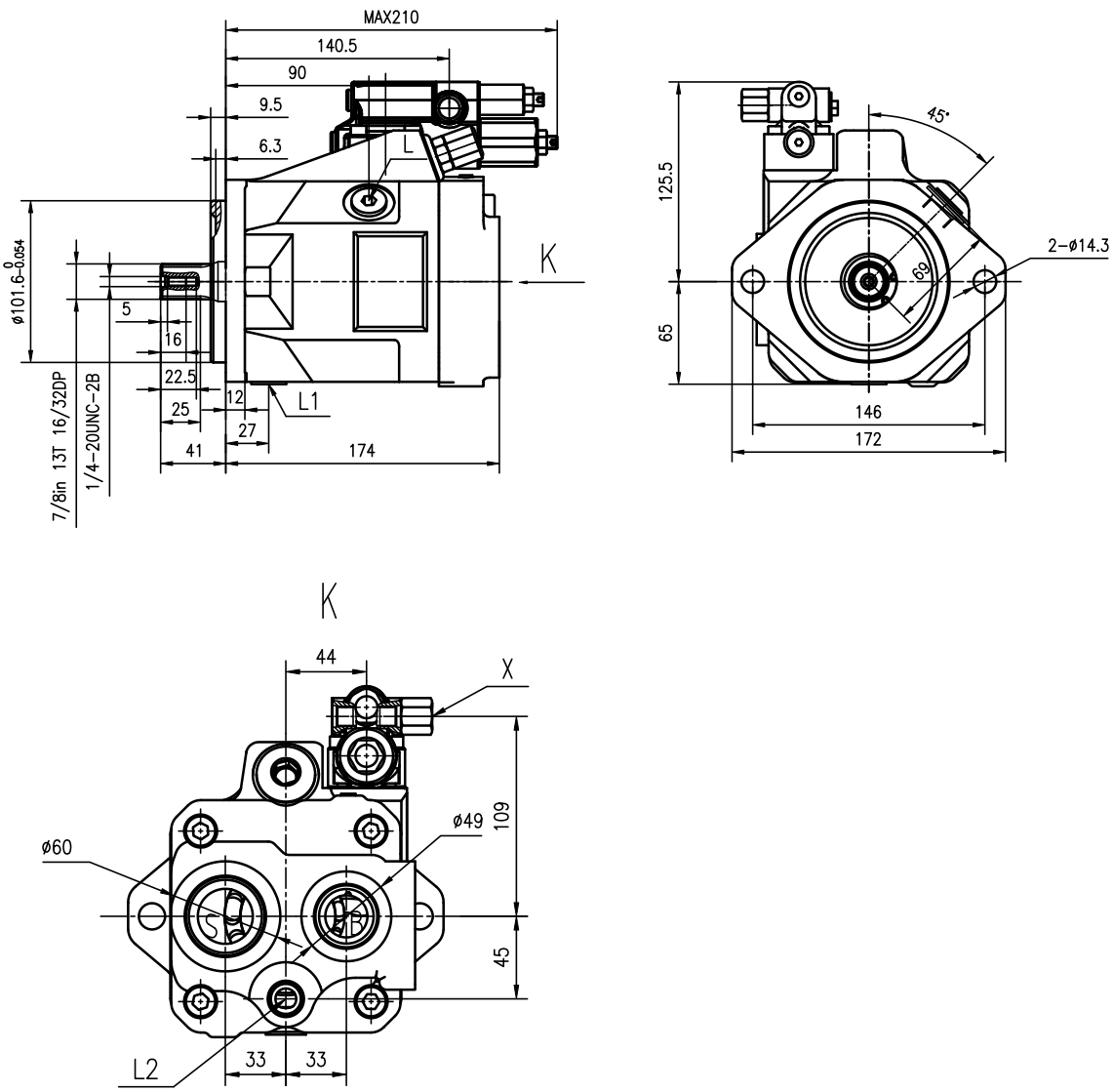
The characteristic curve is the average value measured in the fuel tank under the SAE J745 experimental conditions.



Size	ts[ms] 150 bar	tse[ms] 210 ba
28	90	45
45	90	45
63	100	55
85	110	70

Specification size 45

A10VNO45DRS/52R–VRC40N00–S2020



Ports	Standard	Size	Maximum torque tightening
B Oil–out	ISO 6149	M33 × 2；deep19	310Nm
S Inlet port	ISO 6149	M42 × 2；deep19	330Nm
L,L1 Drain port	ISO 11926	3/4–16UNF–2B	160Nm
L2 Drain port	ISO 6149	M18 × 1.5；deep14.5	160Nm
X Control port	ISO 11926	M14 × 1.5，deep12	35Nm

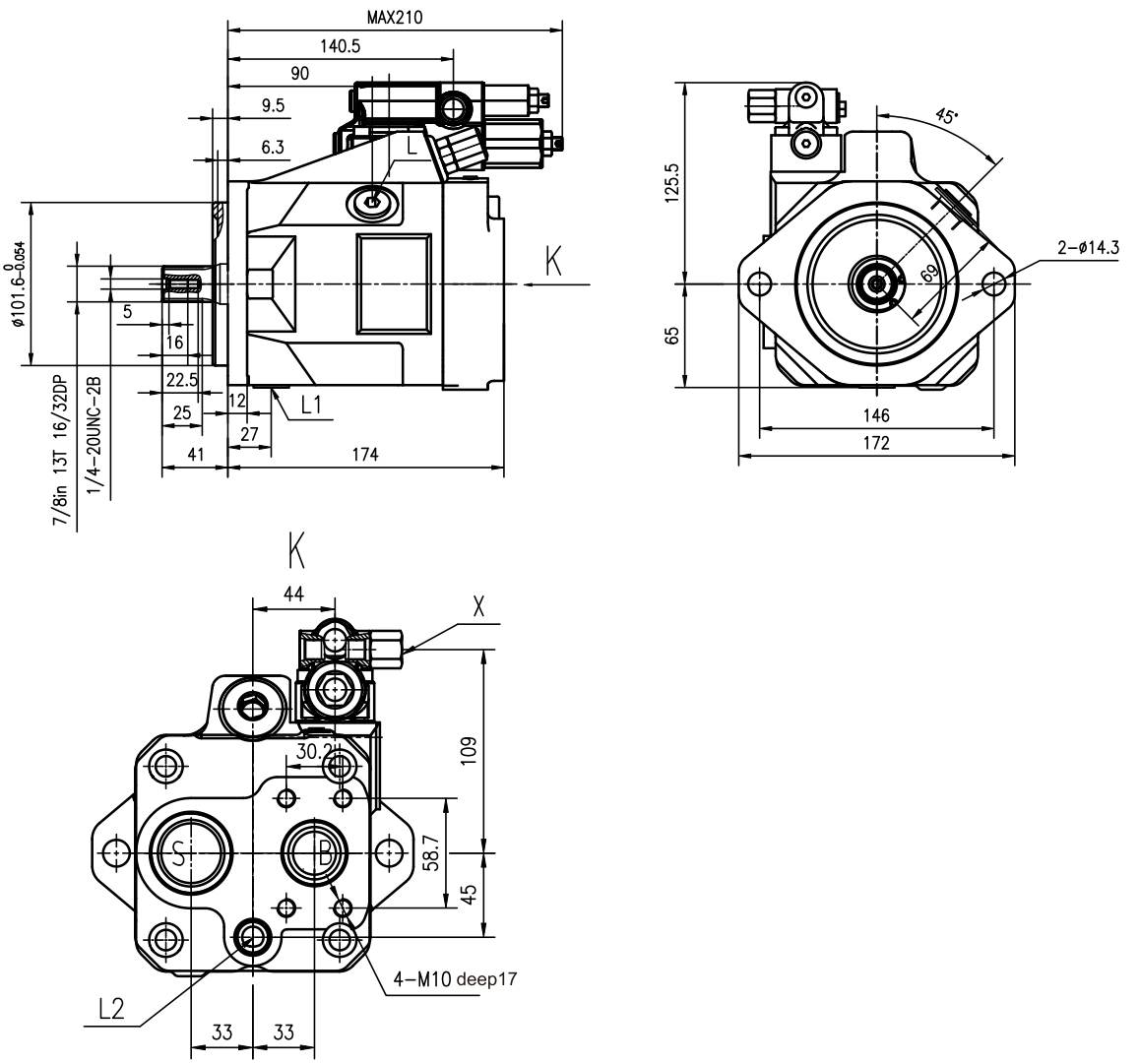
1)ANSI B92.1a–1996,30 pressure Angle, flat tooth root, lateral tooth pair, accuracy level 5

2) See the general instructions

3) Axlock of the coupling, such as fastening screws installed by clamping the coupling or radially

Specification size 45

A10VNO45DRS/52R–VRC71N00



Ports	Standard	Size	Maximum torque tightening
B Oil–out Fastening thread	ISO 6149 DIN 13	1 1/4 in M10 × 1.5deep17	310Nm
S Inlet port	ISO 6149	M42 × 2; deep19	330Nm
L,L1 Drain port	ISO 11926	3/4–16UNF–2B	160Nm
L2 Drain port	ISO 6149	M18 × 1.5; deep14.5	160Nm
X Control port	ISO 11926	M14 × 1.5, deep12	35Nm

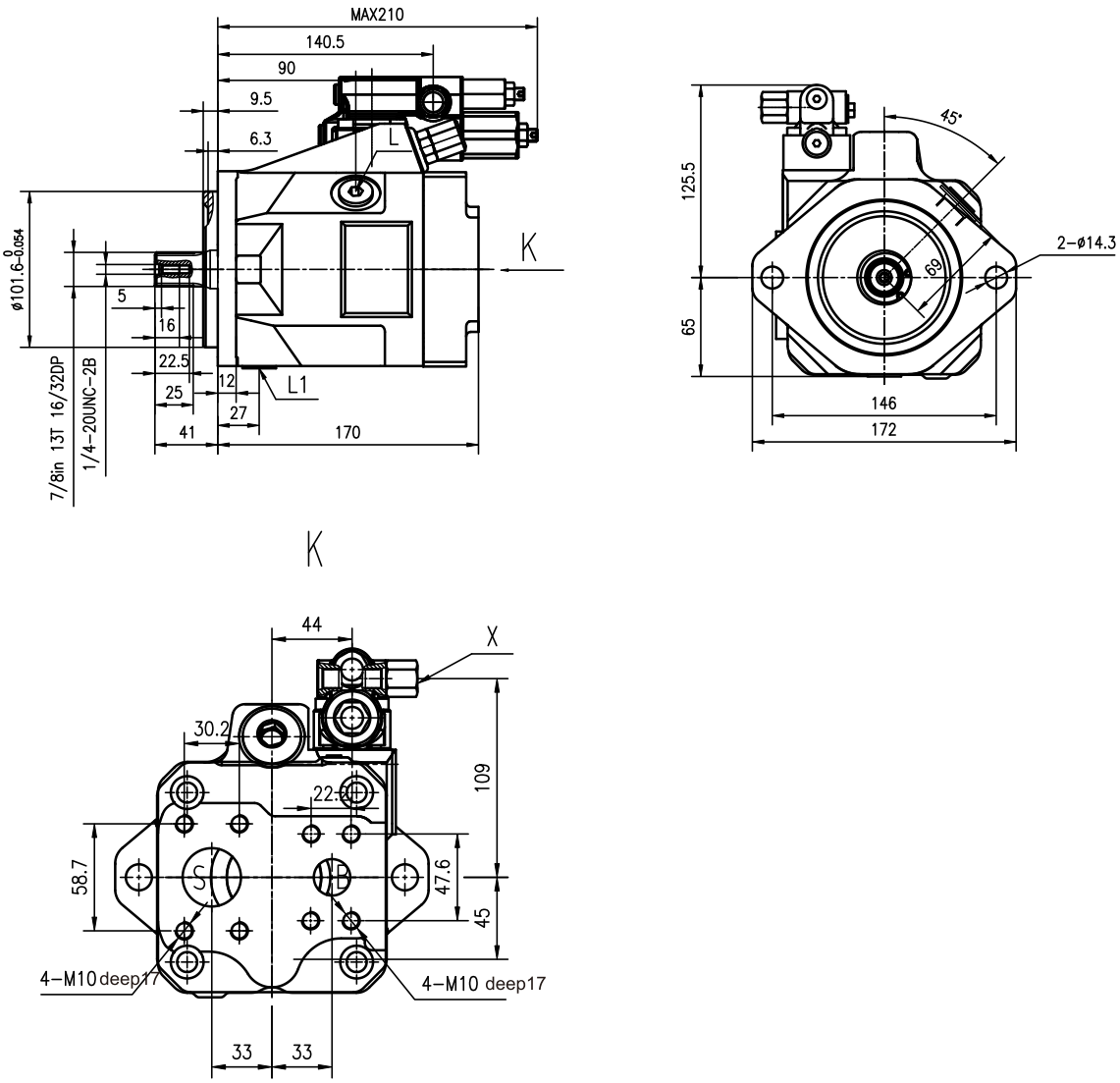
1)ANSI B92.1a–1996,30 pressure Angle, flat tooth root, lateral tooth pair, accuracy level 5

2) See the general instructions

3) Axlock of the coupling, such as fastening screws installed by clamping the coupling or radially

Specification size 45

A10VNO45DRS/52R–VRC11N00



Ports	Standard	Size	Maximum torque tightening
B Oil–out Fastening thread	ISO 6149 DIN 13	3/4 in M10 × 1.5deep17	310Nm
S Inlet port Fastening thread	ISO 6149 DIN 13	1 1/4 in M10 × 1.5deep17	330Nm
L,L1 Drain port	ISO 11926	3/4–16UNF–2B	160Nm
L2 Drain port	ISO 6149	M18 × 1.5；deep14.5	160Nm
X Control port	ISO 11926	M14 × 1.5，deep12	35Nm

1)ANSI B92.1a–1996,30 pressure Angle, flat tooth root, lateral tooth pair, accuracy level 5

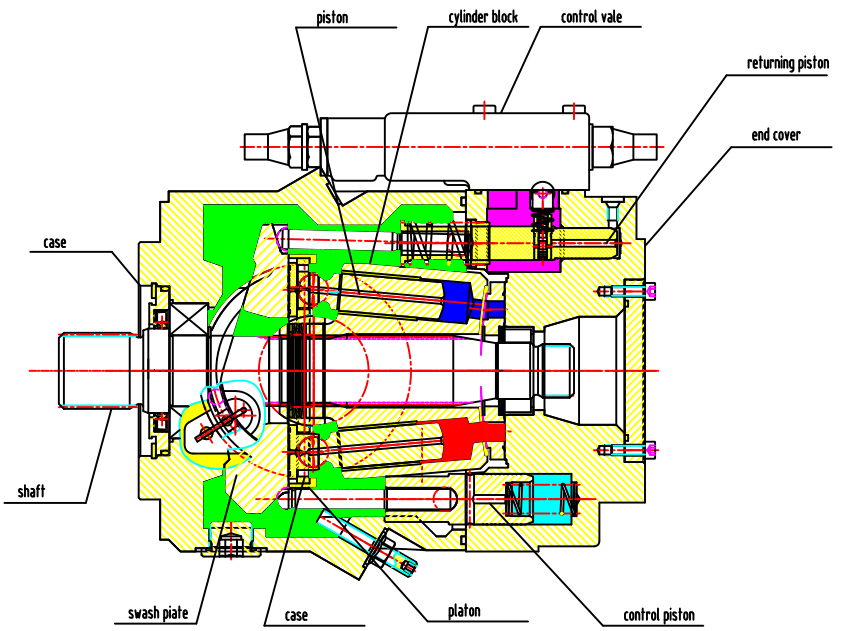
2) See the general instructions

3) Axlock of the coupling, such as fastening screws installed by clamping the coupling or radially

Variable Displacement Piston PumP OS –A11VO/10

Overview

OS –A11V(S)O/10 series variable displacement piston pump swash plate axial plunger variable pump,respectively for industrial use and for mobile machinery design, is designed for open loop hydraulic driven design, adopts a shaft structure, rated working pressure up to 35Mpa.



Features

※Variable pump with axial piston rotary group of swash–plate design for hydrostatic drives in open circuit.

※ Designed primarily for the use of walking machines.

※ When the mailbox is pressurized or when an optional built–in impeller is used The pump is operated under the condition of automatic start–up and oil injection.

※Provide a variety of optional control parts to meet the requirements of various applications.

※ Power control optional parts are externally adjustable, even when the pump is running.

※ Through shaft drive is suitable for adding gear pump and axial piston pump.

※The output flow rate is proportional to the driving speed and can vary freely between qv max and qv min=0

Type Code

OS–	A11V		O			/	1			—	N							
	1	2	3	4	5		6	7	8		9	10	11	12	13	14	15	16

1–Axial piston unit

Swashplate design, variable, nominal pressure 350 bar, maximum pressure 400 bar	A11V

2–Charge pump (impeller)

	75	95	130	145	190	260	
without charge pump (no code)	●	●	●	●	●	●	
with charge pump			●	●	●	●	L

3–Operation

Pump, open circuit	O

4–Size

	75	95	130	145	190	260	
≈ Displacement $V_{g\,max}$ in cm^3							

5–Control unit

Power control	●	●	●	●	●	●	LR
with pressure cut–off and Power control	●	●	●	●	●	●	LRD
with pressure cut–off and with load sensing Power control	●	●	●	●	●	●	LRDS
with stroke limiter and Power control	●	●	●	●	●	●	LRDU2
Pressure control	●	●	●	●	●	●	DR
with load sensing and Power control	●	●	●	●	●	●	DRS
Electric control with proportional solenoid	●	●	●	●	●	●	EP2D

6–Series

	1

7–Index

Size 95 130	0
Size 145 190	1

Chart shows: ●=Available，○=In preparation，–=Not available

8–Rotating Direction(View on Shaft End)

Clockwise	R
Counterclockwise	L

9–Seals

Shaftseal FKM	N

10–Shaft end

		75	95	130	145	190	260	
DIN 5480S plined shaft DIN 5480 for single and combination pump		●	●	●	●	●	●	Z
Parallel keyed shaft DIN 6885		●	●	●	●	●	●	P
Splined shaft ANSI B92.1a-1976	for single pump	●	●	●	●	●	●	S
	for combination pump	●	–	–	–	●	●	T

11–Mounting flange

SAE J744– 4 Hole		●	●	●	●	●	●	D

12–Service line ports

Pressure and suction port SAE, at side, opposite side(with metric fastening threads)		●	●	●	●	●	●	12

13–Through drive

SAE J744										
–	–			●	●	●	●	●	●	N00
82–2 (A)	5/8in	9T 16/32DP	(A)	●	●	●	●	●	●	K01
	3/4in	11T 16/32DP	(A–B)	○	●	●	●	○	○	K52
101–2 (B)	7/8in	13T 16/32DP	(B)	●	●	●	●	●	●	K02
	1 in	15T 16/32DP	(B–B)	●	●	●	●	●	●	K04
	W35	2x30x16x9g		●	●	●	●	●	●	K79
127–2 (C)[4]	1 1/4in	14T 12/24DP	(C)	●	●	●	●	●	●	K07
	1 1/2in	17T 12/24DP	(C–C)	–	●	●	●	●	●	K24
	W30	2x30x14x9g		●	●	●	●	●	●	K80
	W35	2x30x16x9g		●	●	●	●	●	●	K61
152–4 (D)	1 1/4in	14T 12/24DP	(C)	●	●	●	●	●	●	K86
	1 3/4in	13T 8/16DP	(D)	–	●	●	●	●	●	K17
	W40	2x30x18x9g		●	●	●	●	●	●	K81
	W45	2x30x21x9g		–	●	●	●	●	●	K82
	W50	2x30x24x9g		–	–	–	●	●	●	K83
165–4 (E)	1 3/4in	13T 8/16DP	(D)	–	–	–	–	●	●	K72
	W50	2x30x24x9g		–	–	–	–	●	●	K84
	W60	2x30x28x9g		–	–	–	–	–	●	K67

Chart shows: ●=Available，○=In preparation，–=Not available

Technical Data

Table of values (theoretical values, without efficiency and tolerances; values rounded)

Size	A11VO		75	95	130	145	190	260
Displacement	$V_{g\,max}$	cm^3	74	93.5	130	145	193	260
	$V_{g\,min}$	cm^3	0	0	0	0	0	0
Speed $V_{g\,max}$ [1]	n_{max}	rpm	2550	2350	2100	2200	2100	1800
$V_g \leqslant V_{g\,max}$ [3]	n_{max1}	rpm	3000	2780	2500	2500	2100	2300
n_{max} $V_{g\,max}$	$q_{v\,max}$	L/min	189	220	273	319	405	468
$q_{v\,max}$ $\triangle p = 350$ bar	P_{max}	kW	110	128	159	186	236	273
$V_{g\,max}$ $\triangle p = 350$ bar	T_{max}	Nm	412	521	724	808	1075	1448
Rotary stiffness	Z	Nm/rad	145836	199601	302495	302495	346190	686465
	P	Nm/rad	143104	196435	312403	312403	383292	653835
	S	Nm/rad	101921	173704	236861	236861	259773	352009
	T	Nm/rad	125603	–	–	–	301928	567115
Moment of inertia for rotary group	J_{TW}	kgm^2	0.0115	0.0173	0.0318	0.0341	0.055	0.0878
Angular acceleration, max. [4]	a	rad/s^2	15000	13000	10500	9000	6800	4800
Filling capacity	V	L	1.85	2.1	2.9	2.9	3.8	4.6
Mass (approx)	m	kg	45	53	66	76	95	125

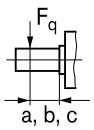
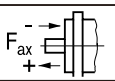
Size	A11VO		130	145	190	260
Displacement	$V_{g\,max}$	cm^3	130	145	193	260
	$V_{g\,min}$	cm^3	0	0	0	0
Speed $V_{g\,max}$ [2]	n_{max}	rpm	2500	2500	2500	2300
$V_g \leqslant V_{g\,max}$ [3]	n_{max1}	rpm	2500	2500	2500	2300
n_{max} $V_{g\,max}$	$q_{v\,max}$	L/min	325	363	483	598
$q_{v\,max}$ $\triangle p = 350$ bar	P_{max}	kW	190	211	281	349
$V_{g\,max}$ $\triangle p = 350$ bar	T_{max}	Nm	724	808	1075	1448
Rotary stiffness	Z	Nm/rad	302495	302495	346190	686465
	P	Nm/rad	312403	312403	383292	653835
	S	Nm/rad	236861	236861	259773	352009
	T	Nm/rad	–	–	301928	567115
Moment of inertia for rotary group	J_{TW}	kgm^2	0.0337	0.036	0.0577	0.0895
Angular acceleration, max. [4]	a	rad/s^2	10500	9000	6800	4800
Filling capacity	V	L	2.9	2.9	3.8	4.6
Mass (approx)	m	kg	72	73	104	138

1) The values apply to suction port S and mineral hydraulic fluid under absolute pressure (pabs) of 1 bar.
2) The values apply to suction port S and mineral hydraulic fluid under absolute pressure (pabs) of at least 0.8 bar.
3) The values apply when Vg ⩽ Vgmax or the inlet pressure pabs of suction port S increases (see chart on page 6).
4) –The effective range is between 0 and the maximum allowable speed. It applies to external excitation (for example, engine rotation frequency is 2–8 times the original, universal joint shaft rotation frequency is twice the original). –Limit values apply only to single–stage pumps. –Load on the connections must be considered. Caution: Exceeding the allowable limits may result in loss of function, shortened lifespan, or component damage of axial piston elements. Permissible values can be determined through calculation.

Technical Data

Permissible radial and axial loading on drive shaft

The values stated are maximum data and not permissible for continuous operation

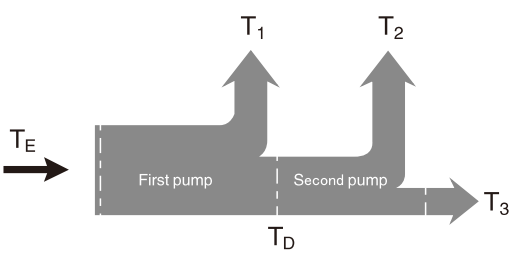
Size			Size	95	130	145	190
Radial force, max. at distance a, b, c(from shaft collar)		$F_{q\,max}$	N	8000	11000	11000	16925
		a	mm	20	22.5	22.5	26
		$F_{q\,max}$	N	6334	8594	8594	13225
		B	mm	35	40	40	46
		$F_{q\,max}$	N	5242	7051	7051	10850
		c	mm	50	57.5	57.5	66
Axial force, max.		$\pm F_{ax\,max}$	N	3500	4800	4800	6000

Permissible input and through drive torques

Size		Size	95	130	145	190
Torque (At $V_{g\,max}$ $\triangle p = 350$ bar)[1]	T_{max}	Nm	521	724	808	1075
Input torque, max.[2] at shaft end P Shaft key DIN 6885	$T_{E\,perm}$	Nm	1044	1448	1448	2226
			ø45	ø50	ø50	ø55
at Z shaft end DIN 5480	$T_{E\,perm}$	Nm	2190	3140	3140	3140
			W45	W50	W50	W50
ANSI B92.1a–1976 (SAE J744)	$T_{E\,perm}$	Nm	1640	1640	1640	1640
			1 3/4 in	1 3/4 in	1 3/4 in	1 3/4 in
at T shaft end ANSI B92.1a–1976 (SAE J744)	$T_{E\,perm}$	Nm	–	–	–	2670
			–	–	–	2 in
Through drive torque, max.[3]	$T_{D\,perm}$	Nm	822	1110	1110	1760

1) Efficiency not considered
2) For drive shafts with no radial force
3) Observe max. input torque for shaft S

Torque Distribution



Determine the nominal value

rate of flow $q_v = \frac{V_g \cdot n \cdot \eta_v}{1000}$ l/min

Torque $T = \frac{V_g \cdot \Delta p}{20 \cdot \pi \cdot \eta_{mh}}$ Nm

power $P = \frac{2\,\pi \cdot T \cdot n}{60{,}000} = \frac{q_v \cdot \Delta p}{600 \cdot \eta_t}$ kW

V_g = Per revolution displacement (cm)

Δp = differential pressure (bar)

n = speed (rpm)

η_v = volumetric efficiency

η_{mh} = Mechanical–hydraulic efficiency

η_t = gross efficiency ($n_t = n_v \cdot n_{mh}$)

Power Control

The power control regulates the displacement of the pump depending on the operating pressure so that a given drive power is not exceeded at constant drive speed.

$p_B \cdot V_g =$ Constant

p_B = operating pressure
V_g = displacement

The precise control with a hyperbolic control characteristic, provides an optimum utilization of available power.

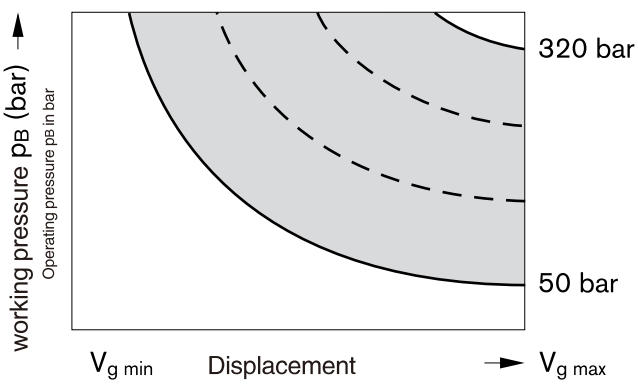
The operating pressure acts on a rocker via a measuring piston. An externally adjustable spring force counteracts this, it determines the power setting.

If the operating pressure exceeds the set spring force, the control valve is actuated by the rocker, the pump swivels back (direction Vg min). The lever length at the rocker is shortened and the operating pressure can increase at the same rate as the displacement decreases without the drive powers being exceeded (pB · Vg = constant).

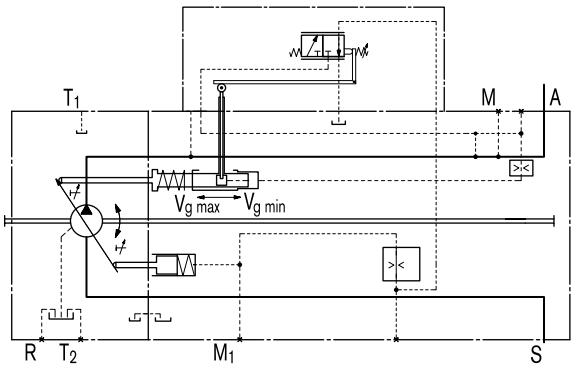
The hydraulic output power (characteristic LR) is influenced by the efficiency of the pump.

State in clear text in the order:
– drive power P in kW
– drive speed n in rpm
– max. flow qv max in l/min

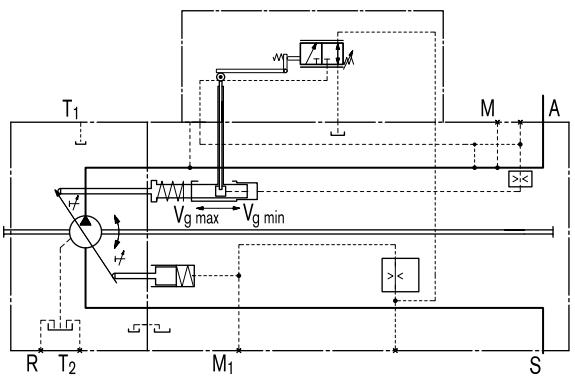
After clarifying the details a power diagram can be created by our computer.



Circuit diagram LR
Size 40·····145



Size 190·····260



LR– Power Control

LRD Power control with pressure cut–off

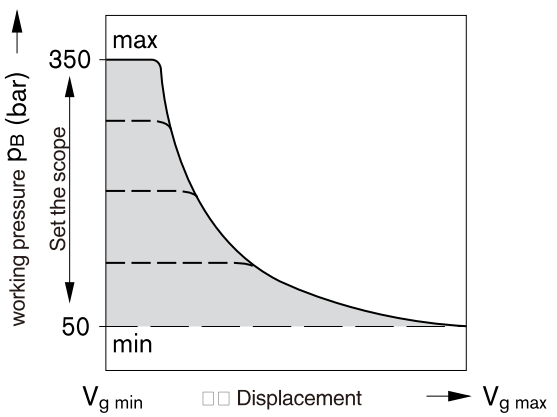
The pressure cut–off corresponds to a pressure control which adjusts the pump displacement back to Vg min, when the pressure setting is reached.

This function overrides the power control, i.e. below the preset pressure value, the power function is effective.

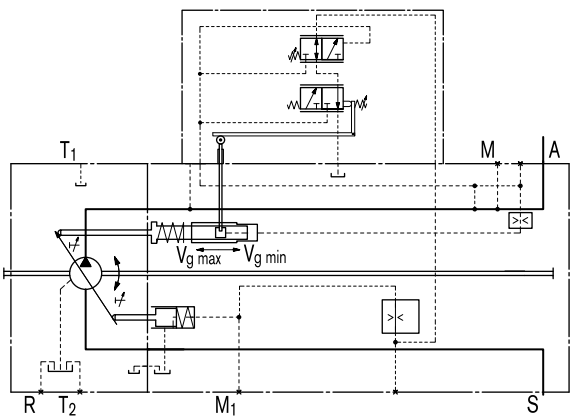
The pressure cut–off function is integrated into the pump control module and is preset to a specified value at the factory.

Setting range from 50 to 350 bar

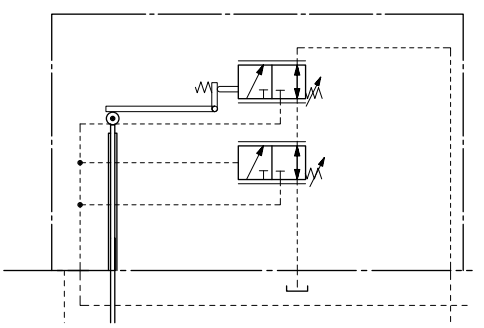
LRD Characteristic LRD



LR CIRCUIT DIAGRAM LR
SIZE 40·····145



SIZE 190·····260



Power Control

LRDS Power control with pressure cut–off and load sensing

The load sensing control is a flow control option that operates as a function of the load pressure to regulate the pump displacement to match the actuator flow requirement.

The flow depends here on the cross section of the external sensing orifice (1) fitted between the pump outlet and the actuator. The flow is independent of the load pressure below the power curve and the pressure cut–off setting and within the control range of the pump.

The sensing orifice is usually a separately arranged load sensing directional valve (control block). The position of the directional valve piston determines the opening cross section of the sensing orifice and thus the flow of the pump.

The load sensing control compares pressure before and after the sensing orifice and maintains the pressure drop across the orifice (differential pressure Δp) and with it the pump flow constant.

If the differential pressure Δp increases at the sensing orifice, the pump is swivelled back (towards Vg min), and, if the differential pressure Δp decreases, the pump is swivelled out (towards Vg max) until the pressure drop across the sensing orifice in the valve is restored.

$\Delta p_{orifice} = p_{pump} - p_{actuator}$

The setting range for Δp is between 14 bar and 25 bar.

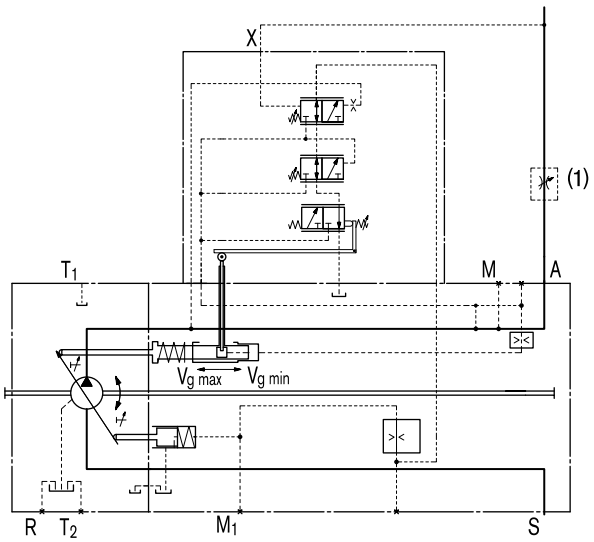
The standard differential pressure setting is 18 bar. (Please state in clear text when ordering).

The stand–by pressure in zero stroke operation (sensing orifice plugged) is slightly above the Δp setting.

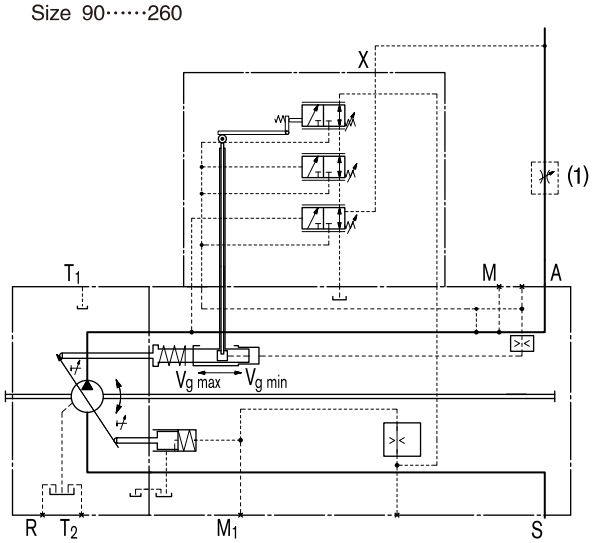
In a standard LS system the pressure cut–off is integrated in the pump control. In a LUDV (flow sharing) system the pressure cut–off is integrated in the LUDV control block.

(1) The sensing orifice (control block) is not included in the pump supply.

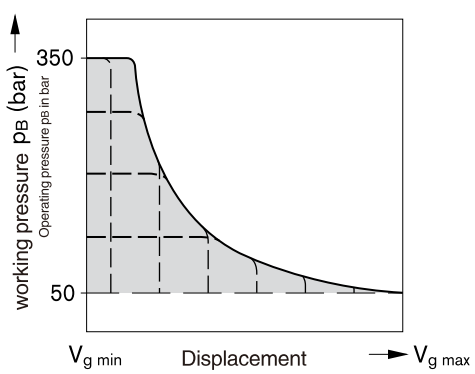
Circuit diagram LR
Size 40·····145



Size 90·····260



LRDS Characteristic LRDS



Power Control

LR... Power control with stroke limiter

The stroke limiter can be used to vary or limit the displacement of the pump continuously over the whole control range. The displacement is set in LRH with the pilot pressure pSt (max. 40 bar) applied to port Y or in LRU by the control current applied to the proportional solenoid. A DC current of 12V (U1) or 24V (U2) is required to control the proportional solenoid.

The power control overrides the stoke limiter control, i.e. below the hyperbolic power characteristic, the displacement is controlled by the control current or pilot pressure. When exceeding the power characteristic with a set flow or load pressure, the power control overrides and reduces the displacement following the hyperbolic characteristic.

To permit operation of the pump displacement control from its starting position Vg max to Vg min, a minimum control pressure of 30 bar is required for the electric stroke limiter LRU1/2 and the hydraulic stroke limiter LRH2/6.

The required control pressure is taken either from the load pressure, or from the externally applied control pressure at the G port.

To ensure functioning of the stroke limiter even at low operating pressure, port G must be supplied with external control pressure of approx. 30 bar.

Note：
If no external control pressure is connected at G, the shuttle valve must be removed.

Note：
The spring return feature in the controller is not a safety device

The spool valve inside the controller can get stuck in an undefined position by internal contamination (contaminated hydraulic fluid, abrasion or residual contamination from system components). As a result, the axial piston unit can no longer supply the flow specified by the operator.

Check whether your application requires that remedial measures be taken on your machine in order to bring the driven consumer into a safe position (e.g. immediate stop).

DR – Pressure Control

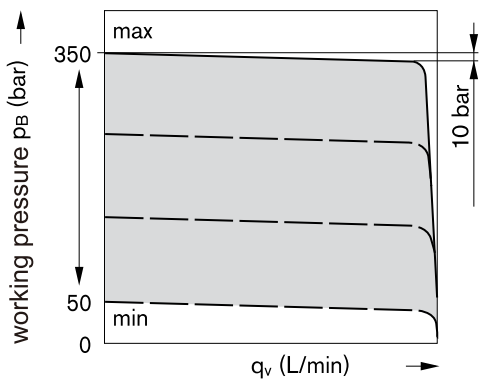
The pressure control keeps the pressure in a hydraulic system constant within its control range even under varying flow conditions. The variable pump only moves as much hydraulic fluid as is required by the actuators.

If the operating pressure exceeds the setpoint set at the integral pressure control valve, the pump displacement is automatically swivelled back until the pressure deviation is corrected.

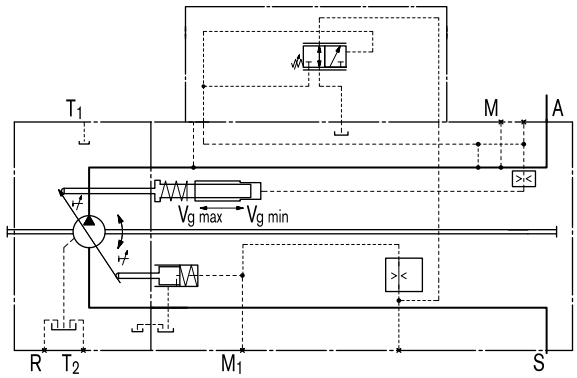
Starting position in depressurized state: $V_{g\,max}$

Setting range from 50 to 350 bar.

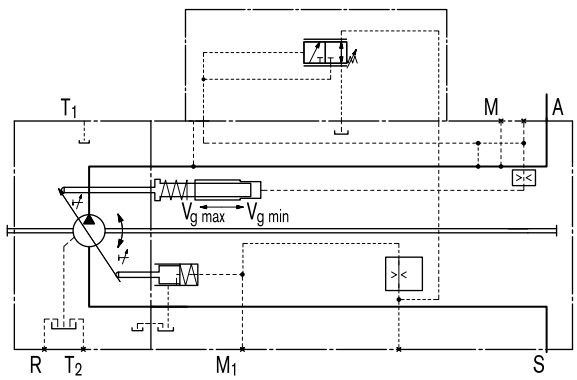
DR Characteristic: DR



Circuit diagram DR
Size 40·····145



Size 190·····260



DR– Power Control

DRS Pressure control with load sensing

The load sensing control is a flow control option that operates as a function of the load pressure to regulate the pump displacement to match the actuator flow requirement.

The flow depends here on the cross section of the external sensing orifice (1) fitted between the pump outlet and the actuator. The flow is independent of the load pressure below the pressure cut–off setting and within the control range of the pump.

The sensing orifice is usually a separately arranged load sensing directional valve (control block). The position of the directional valve piston determines the opening cross section of the sensing orifice and thus the flow of the pump.

The load sensing control compares pressure before and after the sensing orifice and maintains the pressure drop across the orifice (differential pressure Δp) and with it the pump flow constant.

If the differential pressure Δp increases at the sensing orifice, the pump is swivelled back (towards Vg min), and, if the differential pressure Δp decreases, the pump is swivelled out (towards Vg max) until the pressure drop across the sensing orifice in the valve is restored.

$\Delta p_{orifice} = p_{pump} - p_{actuator}$

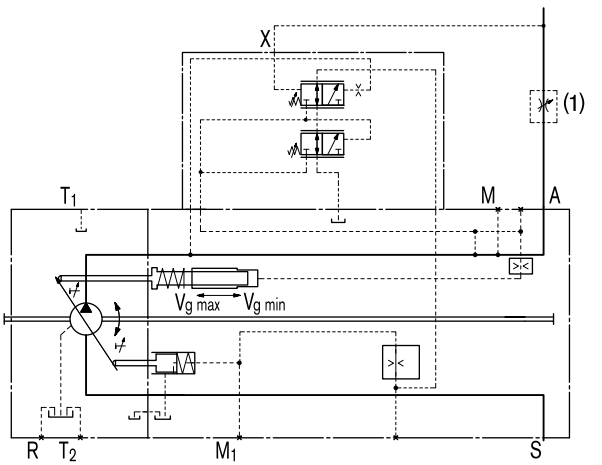
The setting range for Δp is between 14 bar and 25 bar.

The standard differential pressure setting is 18 bar. (Please state in clear text when ordering).

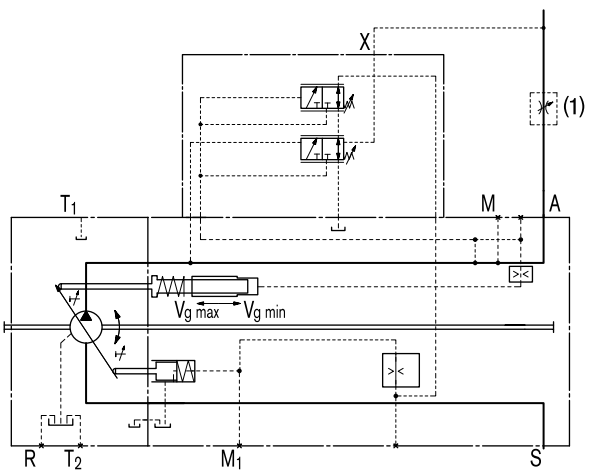
The stand–by pressure in zero stroke operation (sensing orifice plugged) is slightly above the Δp setting.

(1) The sensing orifice (control block) is not included in the pump supply.

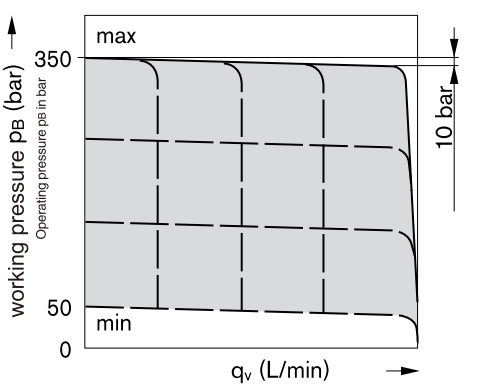
Circuit diagram LR
Size 40·····145



Size 190·····260



Characteristic DRS



DR – Pressure Control

DRG Pressure control, remote controlled

The remote control pressure cut–off regulator permits the adjustment of the pressure setting by a remotely installed pressure relief valve (1). Pilot flow for this valve is provide by a fixed orifice in the control module.

Setting range from 50 to 350 bar.

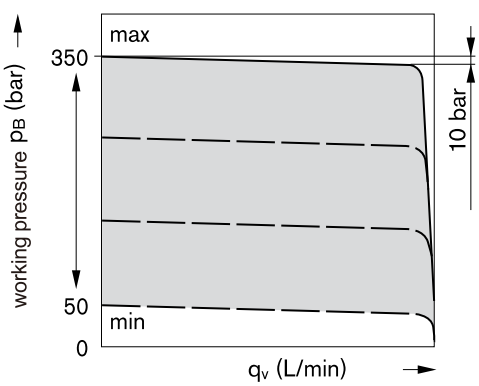
In addition the pump can be unloaded into a standby pressure condition by an externally installed 2/2–way directional valve (2).

Both functions can be used individually or in combination (see circuit diagram).

The external valves are not included in the pump supply.

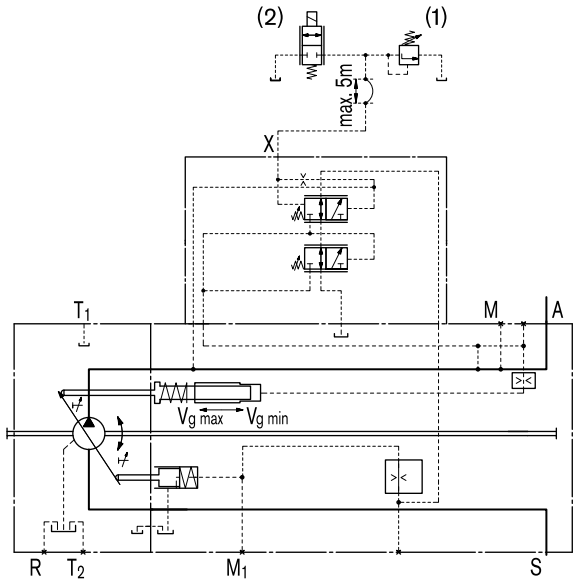
As a separate pressure relief valve (1) we recommend: DBDH 6 (manual control), see RE 25402

Characteristic: DRG

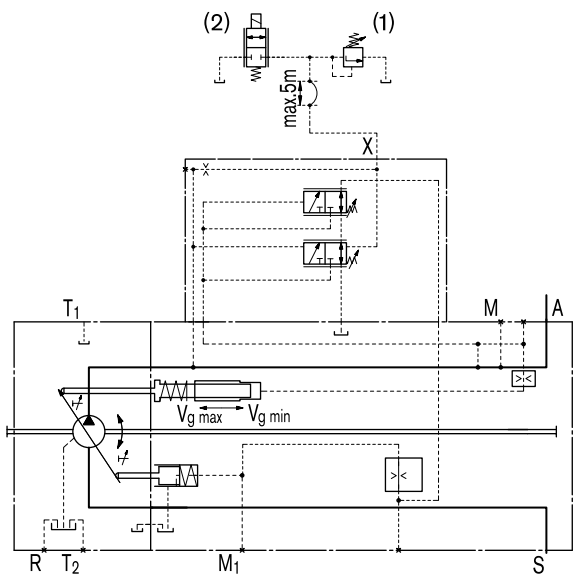


Note: The remote controlled pressure cut–off is also possible in combination with LR, HD and EP.

Circuit diagram DRG
Size 40·····145



Size 190·····260



EP – Electric Control with Proportional Solenoid

With the electric control with proportional solenoid, the pump displacement is adjusted proportionally to the solenoid current, resulting in a magnetic control force, acting directly onto the control spool that pilots the pump control piston.

Control from Vg min to Vg max

With increasing control current the pump swivels to a higher displacement.

Starting position wthout control signal (control current):
– at operating pressure and external control pressure
< 30 bar: $V_{g\,max}$
– at operating pressure or external control pressure
> 30 bar: $V_{g\,min}$

A control pressure of 30 bar is required to swivel the pump from its starting position $V_{g\,max}$ to $V_{g\,min}$.

The required control pressure is taken either from the load pressure, or from the externally applied control pressure at port G.To ensure the control even at low operating pressure < 30 bar the port G must be supplied with an external control pressure of approx. 30 bar.

Note:
If no external control pressure is connected at G, the shuttle valve must be removed.

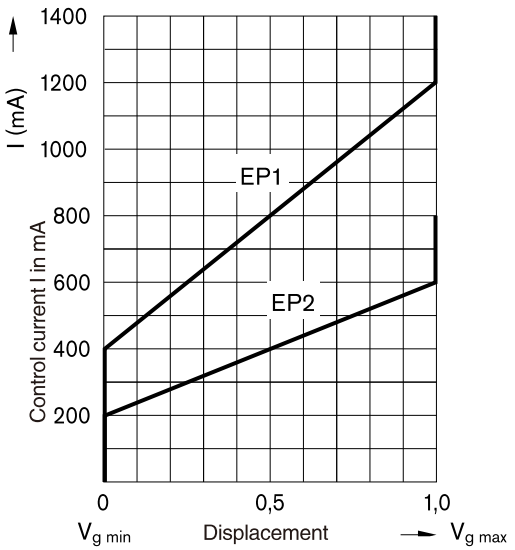
Note:
Install pump with EP control in the oil tank only when using mineral hydraulic oils and an oil temperature in the tank of max. 80℃.

www.boschrexroth.com/mobilelektronik):
The following electronic control units and amplifiers are available for actuating the proportional solenoids (see also www.boschrexroth.com/mobilelektronik):

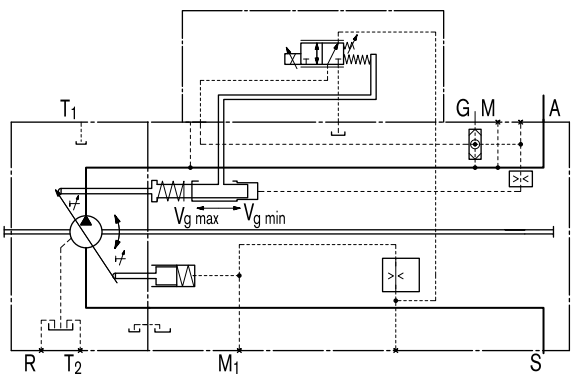
–BODAS controller RC
Series 20 _____ RD 95200
Series 21 _____ RD 95201
Series 22 _____ RD 95202
Series 30 _____ RD 95203
and application software

– RA Analog amplifier R _____ RC 95230

Characteristic EP1/2



EP1/2 Circuit diagram EP1/2
Size 40 ... 260



Technical data, solenoid at EP1, Ep2

	EP1	EP2
Voltage	12 V (± 20 %)	24 V (± 20 %)
Control current Start of control at $V_{g\,min}$	400mA	200mA
End of control at $V_{g\,max}$	1200mA	600mA
Limiting current	1.54A	0.77A
Nominal resistance (at 20° C)	5.5Ω	22.7Ω
Dither frequency	100Hz	100Hz
Actuated time	100%	100%

EP – Electric Control with Proportional Solenoid

EP.D Electric control with pressure cut–off

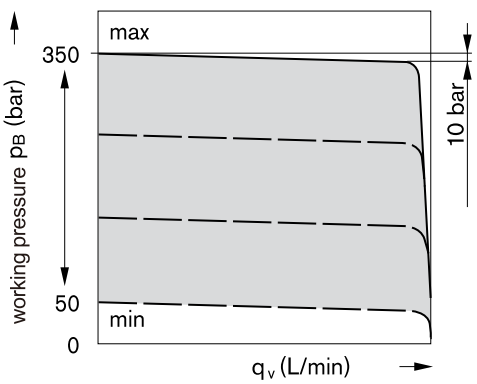
The pressure cut–off corresponds to a pressure control which adjusts the pump displacement back to Vg min when the pressure setting is reached.

This function overrides the EP control, i.e. the control current related displacement control is functional below he pressure setting.

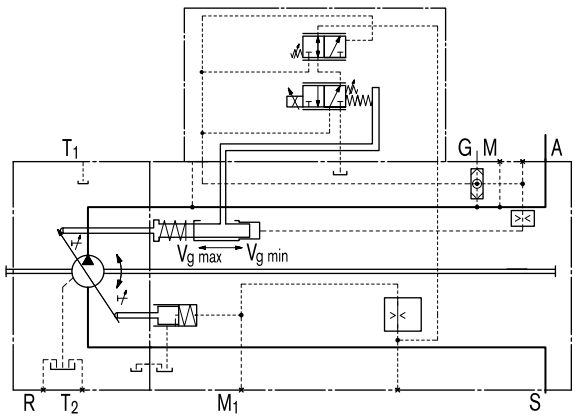
The valve for the pressure cut–off is integrated in the control case and is set to a fixed specified pressure value at the factory.

Setting range from 50 to 350 bar

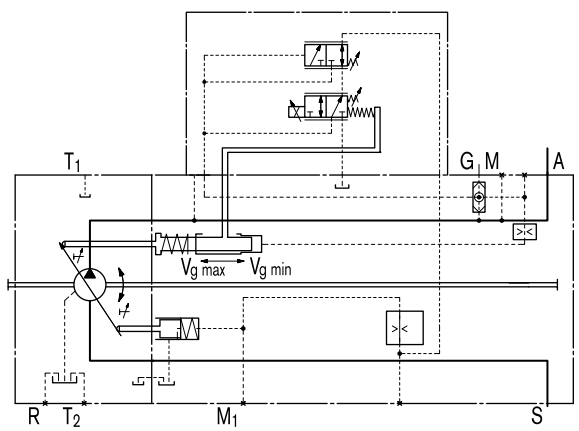
Pressure cut–off characteristic D



Circuit diagram EP.D
Size 40 ... 145



Size 190·····260

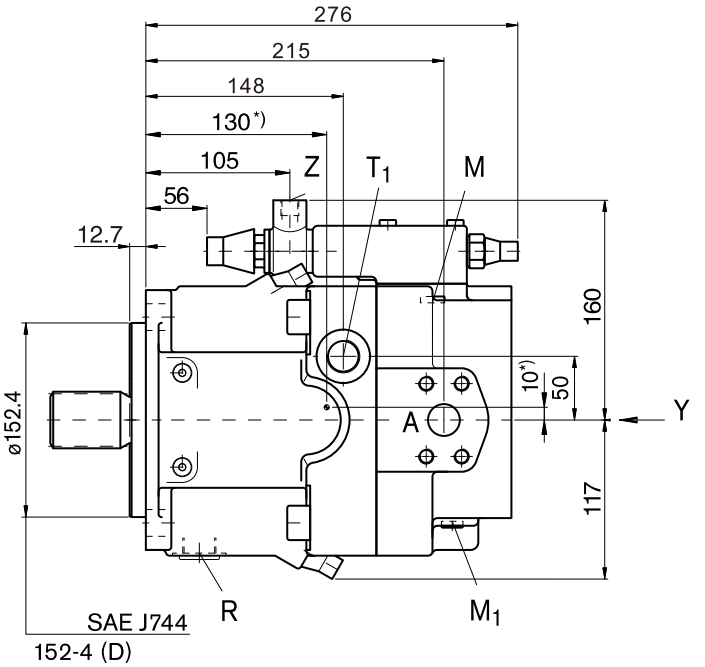


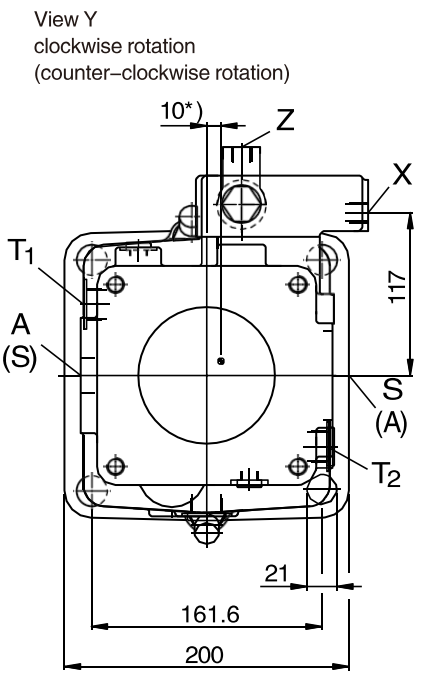
Dimensions size 75

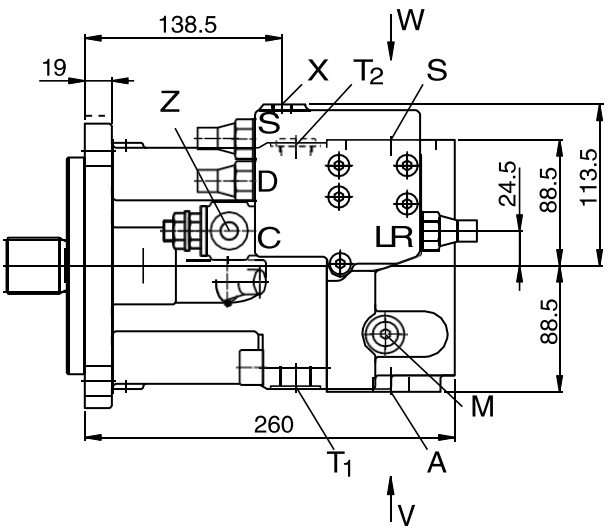
LRDCS

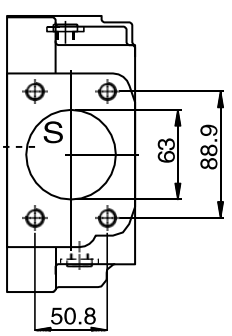
Power control LR with pressure cut–off D, cross sensing control C and load sensing control S

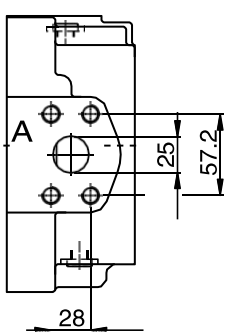
*) Center of gravity









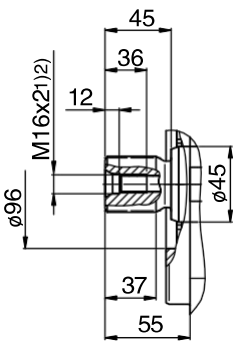


1) Dimensions according to SAE J617–No. 3, for connection to the flywheel case of the combustion engine

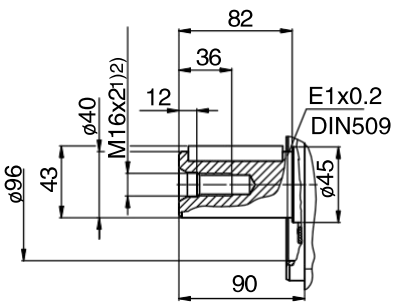
Dimensions size 75

Shaft ends

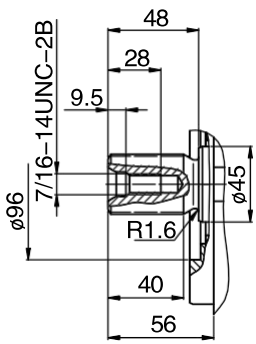
Z DIN 5480 spline shaft
W 40x2x30x18x9g



P DIN 6885 Plain key shaft –
AS 12x8x80



S spline shaft SAE J744
1 1/4 in, 14T 12/24DP[3)]



Ports		Standard	Size [2)]	(bar) [4)]	State
A	Service line port Fixing thread	SAE J518 DIN 13	1 in M12x1.75; 17 (deep)	400	O
S	Suction port Fixing thread	SAE J518 DIN 13	2 1/2 in M12x1.75; 17 (deep)	30	O
T_1 T_2	Tank port	DIN 3852	M22x1.5; 14 (deep)	10	5)
R	Air bleed	DIN 3852	M22x1.5; 14 (deep)		
M_1	Measurement point, positioning chamber	DIN 3852	M12x1.5; 12 (deep)	400	X
M	Measurement point, service line port	DIN 3852	M12x1.5; 12 (deep)	400	X
X	Pilot pressure oil mouth	DIN 3852	M14x1.5; 12 (deep)	400	O
Y	Pilot pressure oil mouth	DIN 3852	M14x1.5; 12 (deep)		
Z	Pilot pressure oil mouth	DIN 3852	M14x1.5; 12 (deep)	400 40	O
Control the pressure (controller) oil port		DIN 3852	M14x1.5; 12 (deep)		

1) Center bore according to DIN 332 (thread acc. to DIN 13)

2) For max. tightening torque, please refer to general notes on page 64

3) ANSI B92.1a–1976, 30° pressure angle, flat root, side fit, tolerance class 5

4) Depending on adjustment data and operating pressure

5) Depending on installation position, T1 or T2 must be connected (see also page 61)

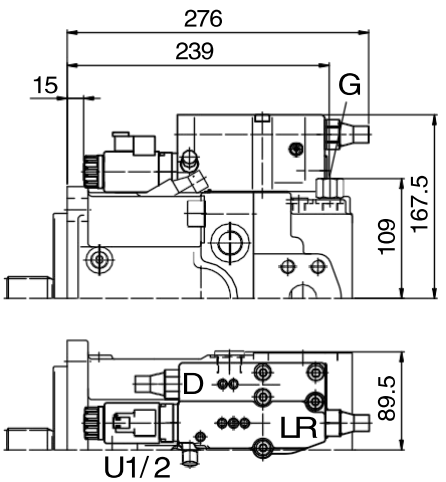
O = Open, must be connected (closed on delivery)

X = Closed (in normal operation)

Dimensions size 75

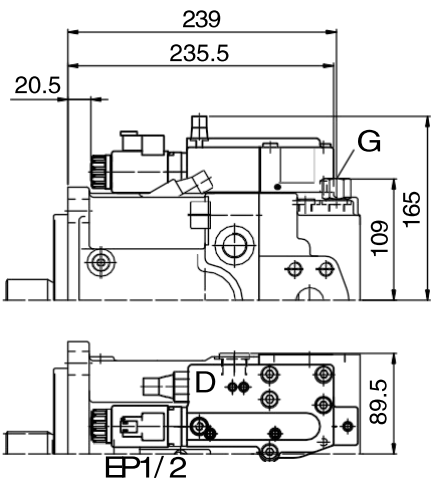
LRDU1/LRDU2

Power control with pressure cut and electronic travel limiter (cathode characteristics)



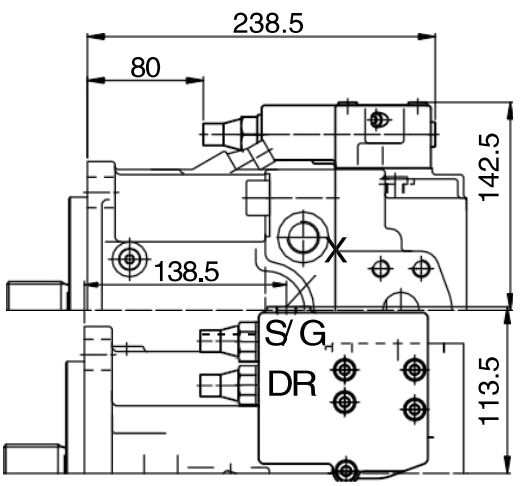
EP1D/EP2D

Electric control with proportional solenoid and pressure cut–off



DRS/DRG

Pressure control with load sensing control
Pressure control remote controlled

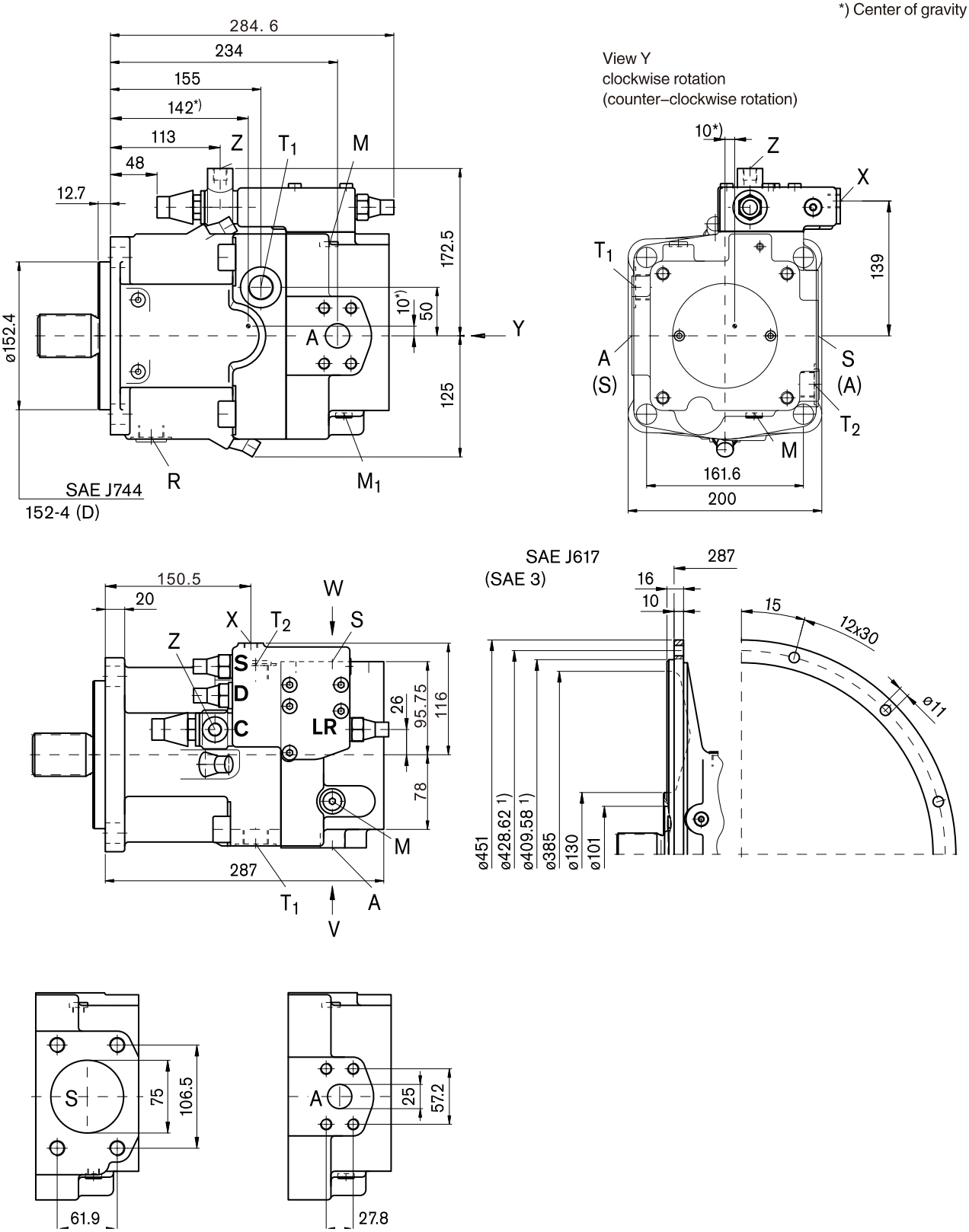


Dimensions size 95

LRDCS

Power control LR with pressure cut–off D, cross sensing control C and load sensing control S

*) Center of gravity

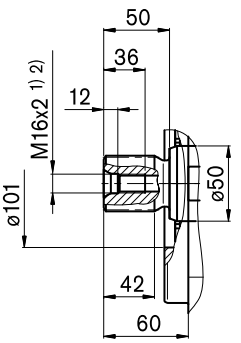


1) Dimensions according to SAE J617–No. 3, for connection to the flywheel case of the combustion engine

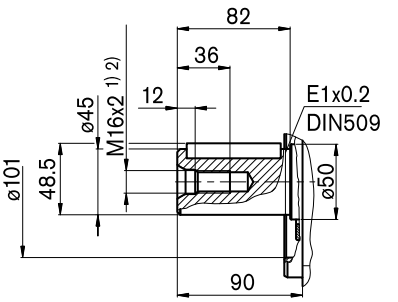
Dimensions size 95

Shaft ends

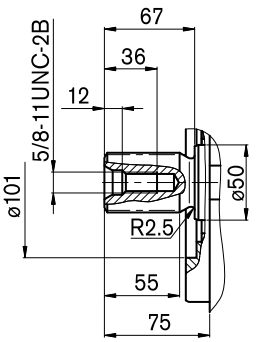
Z DIN 5480 spline shaft
W45x2x30x21x9g



P DIN 6885 的Plain key shaft –
As14x9x80



S spline shaft SAE J744
1 3/4 in，13T 8/16DP3)



Ports		Standard	Size 2)	(bar) 4)	State
A	Service line port Fixing thread	SAE J518 DIN 13	1 in M12x1.75；17 (deep)	400	O
S	Suction port Fixing thread	SAE J518 DIN 13	3 in M16x2；24 (deep)	30	O
T_1 T_2	Tank port	DIN 3852	M26x1.5；16 (deep)	10	5)
R	Air bleed	DIN 3852	M26x1.5；16 (deep)		X
M_1	Measurement point, positioning chamber	DIN 3852	M12x1.5；12 (deep)	400	X
M	Measurement point, service line port	DIN 3852	M12x1.5；12 (deep)	400	X
X	The pilot pressure port is availa ble in models with load sensing (S) and remote control pressure cut–off (G)	DIN 3852	M14x1.5；12 (deep)	400	O
Y	The pilot pressure port is availa ble in models with a stroke limiter (H...), a two–stage pressure cut–off (E), and HD	DIN 3852	M14x1.5；12 (deep)	40	O
Z	The pilot pressure oil port is available in models with cross induction (C) and power overrider control (LR3) power overrider control (Lg1)	DIN 3852	M14x1.5；12 (deep)	400 40	O
G	Control pressure (controller) ports are available in HD and EP models with travel limiters (H...U2) and threaded pipe fittings Ge10–PLM (otherwise closed)	DIN 3852	M14x1.5；12 (deep)	40	O

1) Center bore according to DIN 332 (thread acc. to DIN 13)

2) For max. tightening torque, please refer to general notes on page 140

3) ANSI B92.1a–1976, 30° pressure angle, flat root, side fit, tolerance class 5

4) Depending on adjustment data and operating pressure

5) Depending on installation position, T1 or T2 must be connected

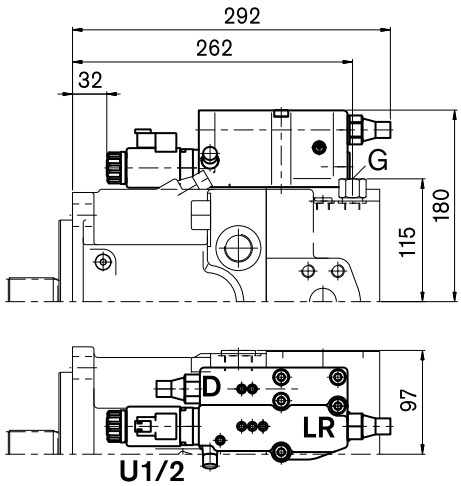
O = Open, must be connected (closed on delivery)

X = Closed (in normal operation)

Dimensions size 95

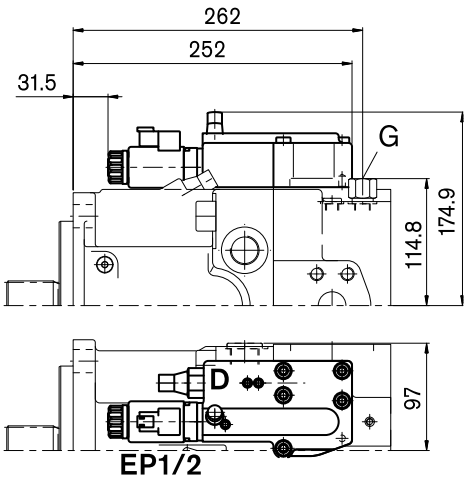
LRDU1/LRDU2

Power control with pressure cut–off and electric stroke limiter (positive characteristic)



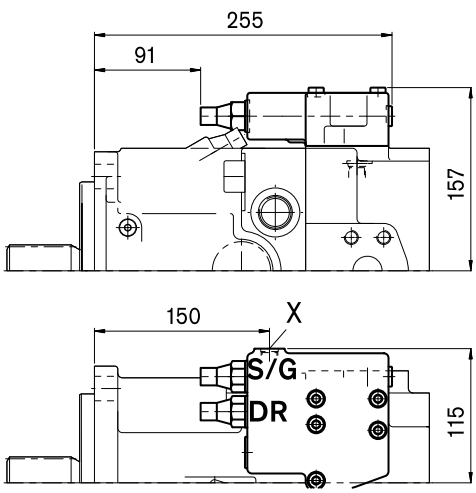
EP1D/EP2D

Electric control with proportional solenoid and pressure cut–off



DRS/DRG

Pressure control with load sensing control
Pressure control remote controlled

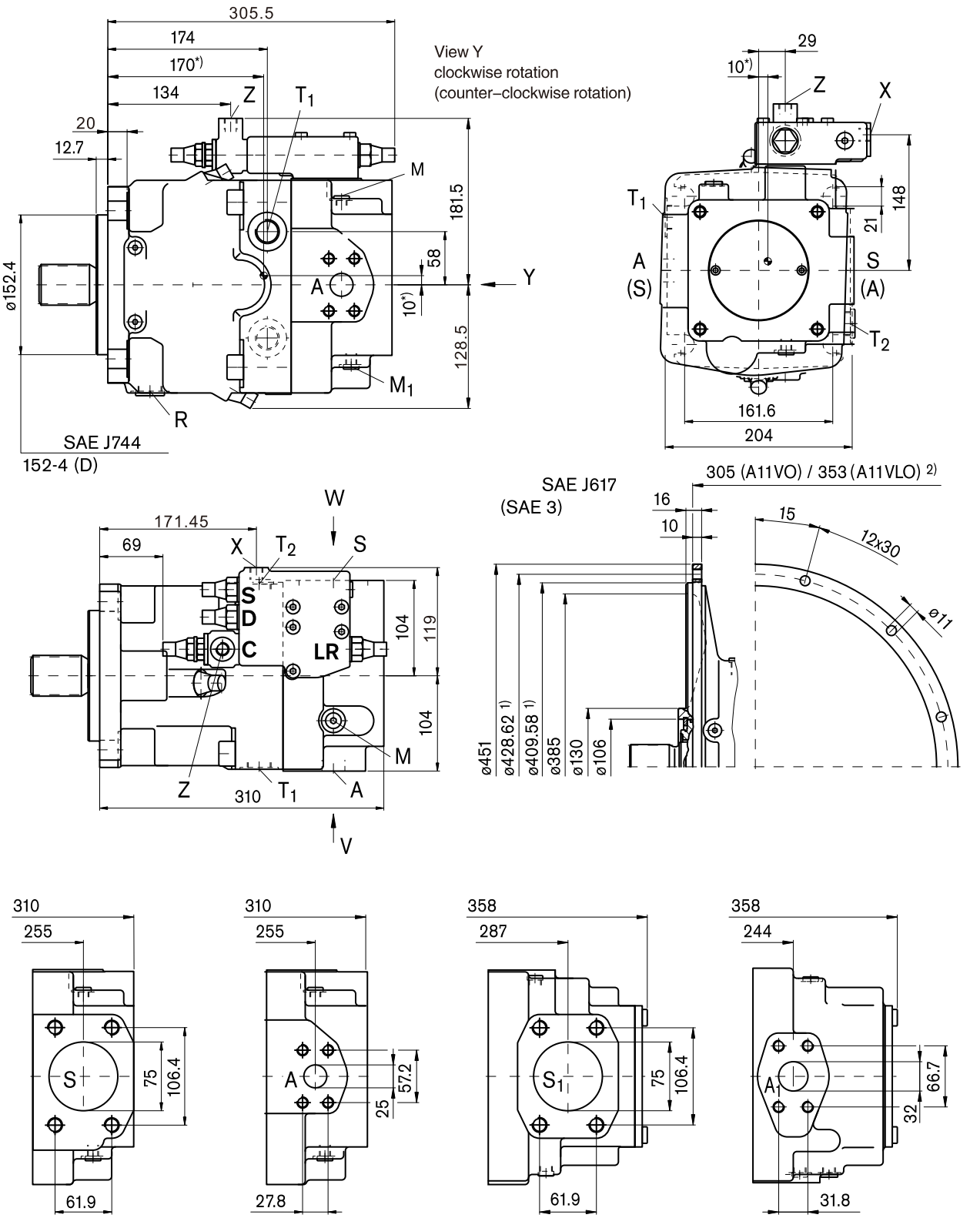


Dimensions size 130/145

LRDCS

Power control LR with pressure cut–off D, cross sensing control C and load sensing control S

*) Center of gravity



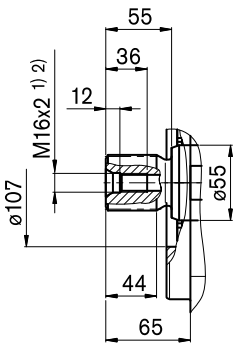
1) Dimensions according to SAE J617–No. 3, for connection to the flywheel case of the combustion engine

2) The case or length dimension with flange SAE 3 is 5 mm shorter than the standard case.

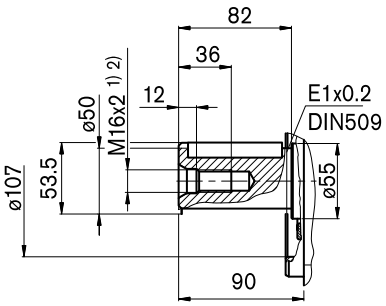
Dimensions size 130/145

Shaft ends

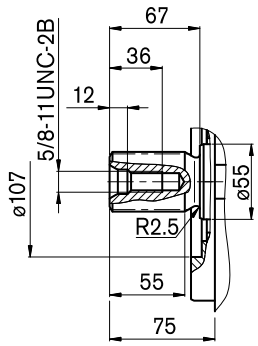
Z DIN 5480 spline shaft
W50x2x30x24x9g



P DIN 6885 Plain key shaft
AS14x9x80



S spline shaft SAE J744
1 3/4 in，13T 8/16DP3)



Ports		Standard	Size 2)	(bar) 4)	State
A	Service line port Fixing thread	SAE J518 DIN 13	1 in M12x1.75；17 (deep)	400	O
A_1	Service line port Fixing thread	SAE J518 DIN 13	1 1/4 in M14x2；19 (deep)	400	O
S S_1	Suction port Fixing thread	SAE J518 DIN 13	3 in M16x2；24 (deep)	30 2 6)	O
T_1 T_2	Tank port	DIN 3852	M26x1.5；16 (deep)	10	5)
R	Air bleed	DIN 3852	M26x1.5；16 (deep)	10	X
M_1	Measurement point, positioning chamber	DIN 3852	M12x1.5；12 (deep)	400	X
M	Measurement point, service line port	DIN 3852	M12x1.5；12 (deep)	400	X
X	The pilot pressure port is available in models with load sensing (S) and remote control pressure cut–off (G)	DIN 3852	M14x1.5；12 (deep)	400	O
Y	The pilot pressure port is available in models with a stroke limiter (H…), a two–stage pressure cut–off (E), and HD	DIN 3852	M14x1.5；12 (deep)	40	O
Z	The pilot pressure oil port is available in models with cross induction (C) and power overrider control (LR3) power overrider control (Lg1)	DIN 3852	M14x1.5；12 (deep)	400 40	O
G	Control pressure (controller) ports are available in HD and EP models with travel limiters (H...U2) and threaded pipe fittings Ge10–PLM (otherwise closed)	DIN 3852	M14x1.5；12 (deep)	40	O

1) Center bore according to DIN 332 (thread acc. to DIN 13)

2) For max. tightening torque, please refer to general notes on page 140

3)ANSI B92.1a–1976, 30° pressure angle, flat root, side fit, tolerance class 5

4) Depending on adjustment data and operating pressure

5) Depending on installation position, T1 or T2 must be connected

6) with charge pump

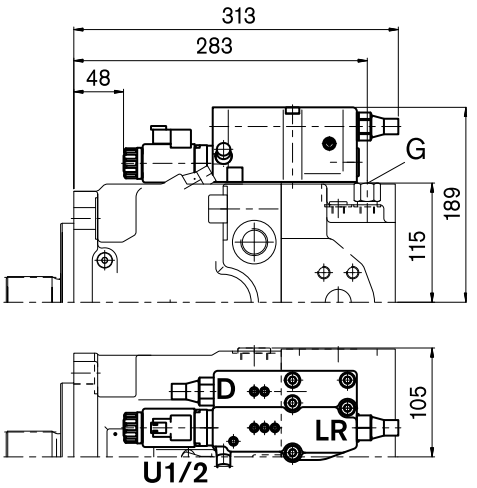
O = Open, must be connected (closed on delivery)

X = Closed (in normal operation)

Dimensions size 130/145

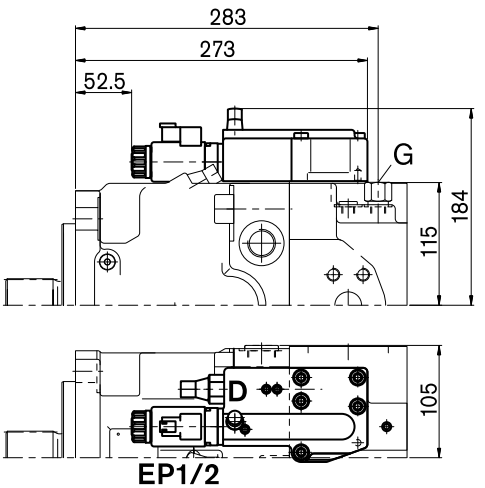
LRDU1/LRDU2

Power control with pressure cut–off and electric stroke limiter (positive characteristic)



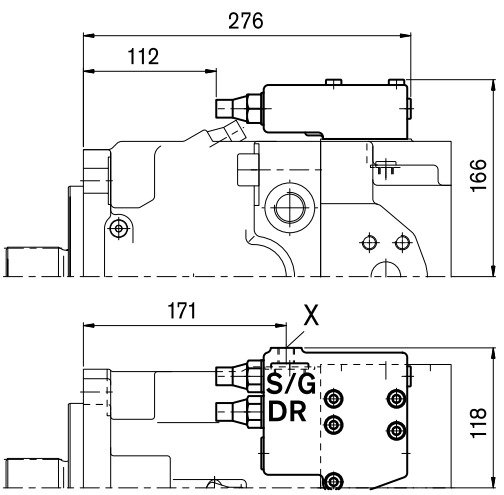
EP1D/EP2D

Electric control with proportional solenoid and pressure cut–off



DRS/DRG

Pressure control with load sensing control
Pressure control remote controlled

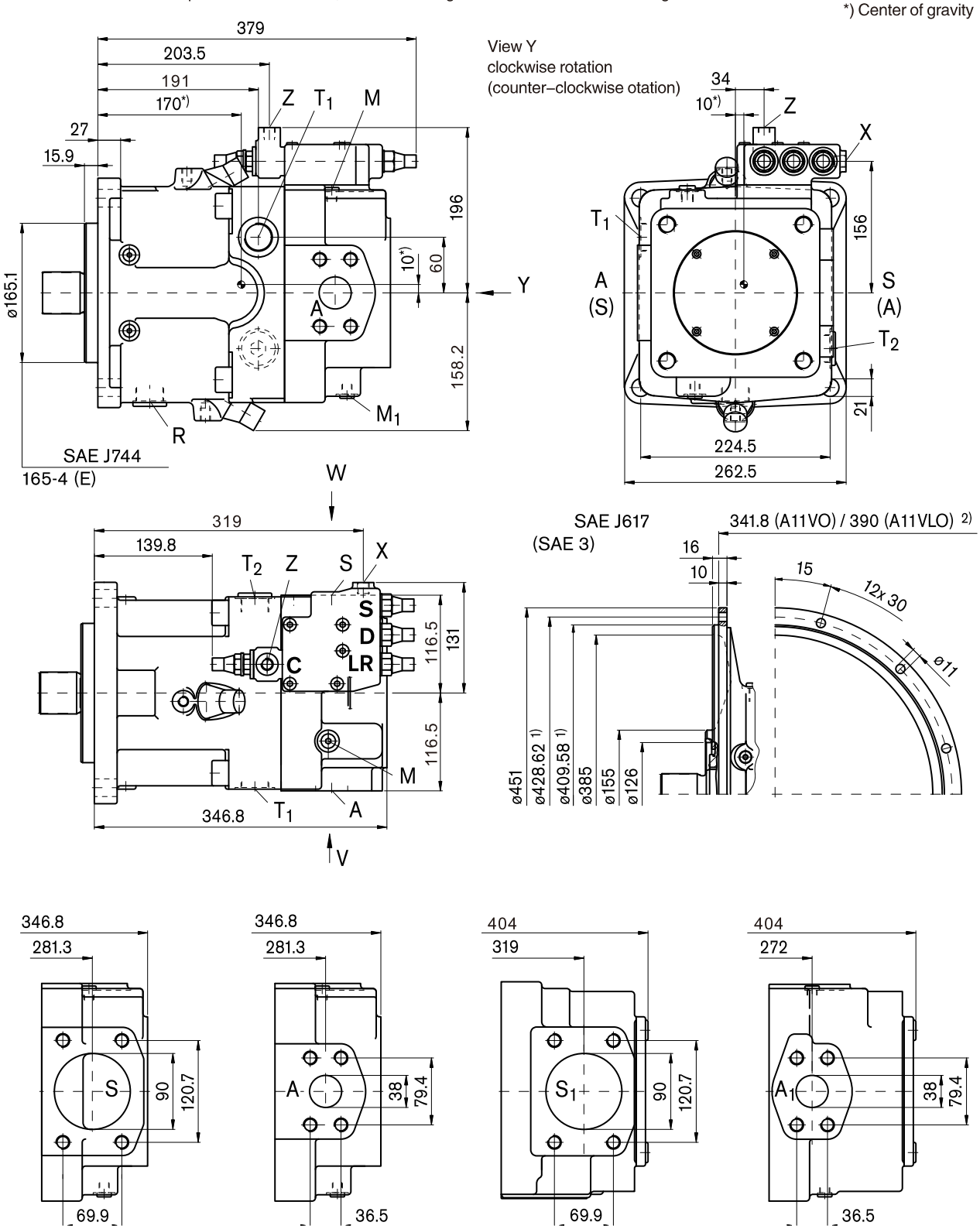


Dimensions size 190

LRDCS

Power control LR with pressure cut–off D, cross sensing control C and load sensing control S

*) Center of gravity



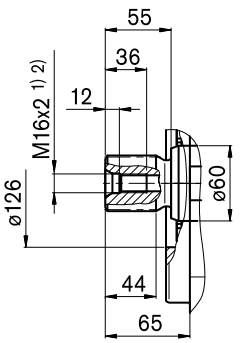
1) Dimensions according to SAE J617–No. 3, for connection to the flywheel case of the combustion engine

2) The case or length dimension with flange SAE 3 is 5 mm shorter than the standard case.

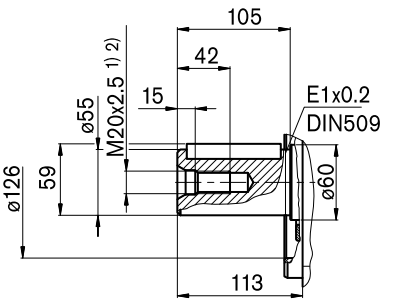
Dimensions size 190

Shaft ends

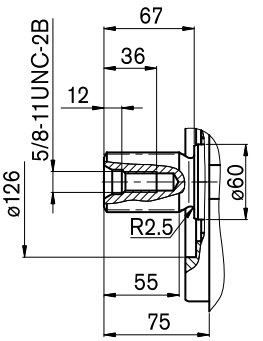
Z DIN 5480 spline shaft
W50x2x30x24x9g



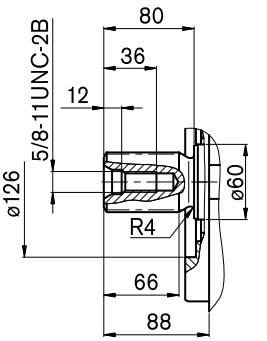
P DIN 6885 Plain key shaft,
AS16x10x100



S spline shaft SAE J744
1 3/4 in, 13T 8/16DP



T spline shaft SAE J744
2 in, 15T 8/16DP3)



Ports		Standard	Size 2)	(bar) 4)	State
A A_1	Service line port Fixing thread	SAE J518 DIN 13	1 1/2 in M16x2; 21 (deep)	400	O
S S_1	Suction port Fixing thread	SAE J518 DIN 13	3 1/2 in M16x2; 24 (deep)	30 2 6)	O
T_1 T_2	Tank port	DIN 3852	M33x2; 18 (deep)	10	5)
R	Air bleed	DIN 3852	M33x2; 18 (deep)	10	X
M_1	Measurement point, positioning chamber	DIN 3852	M12x1.5; 12 (deep)	400	X
M	Measurement point, service line port	DIN 3852	M12x1.5; 12 (deep)	400	X
X	The pilot pressure port is available in models with load sensing (S) and remote control pressure cut–off (G)	DIN 3852	M14x1.5; 12 (deep)	400	O
Y	The pilot pressure port is available in models with a stroke limiter (H...), a two–stage pressure cut–off (E), and HD	DIN 3852	M14x1.5; 12 (deep)	40	O
Z	The pilot pressure oil port is available in models with cross induction (C) and power overrider control (LR3) power overrider control (Lg1)	DIN 3852	M14x1.5; 12 (deep)	400 40	O
G	Control pressure (controller) ports are available in HD and EP models with travel limiters (H...U2) and threaded pipe fittings Ge10–PLM (otherwise closed)	DIN 3852	M14x1.5; 12 (deep)	40	O

1) Center bore according to DIN 332 (thread acc. to DIN 13)

2) For max. tightening torque, please refer to general notes on page 140

3) ANSI B92.1a–1976, 30° pressure angle, flat root, side fit, tolerance class 5

4) Depending on adjustment data and operating pressure

5) Depending on installation position, T1 or T2 must be connected

6) with charge pump

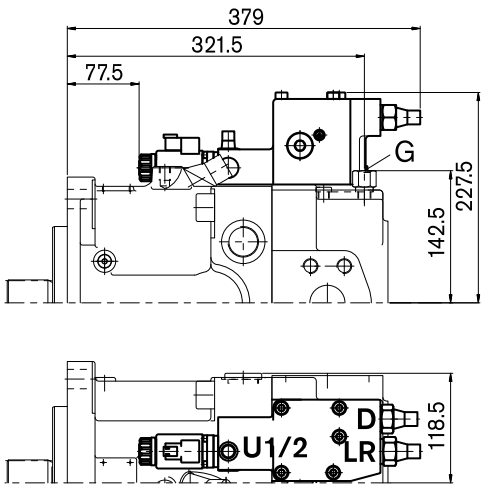
O = Open, must be connected (closed on delivery)

X = Closed (in normal operation)

Dimensions size 190

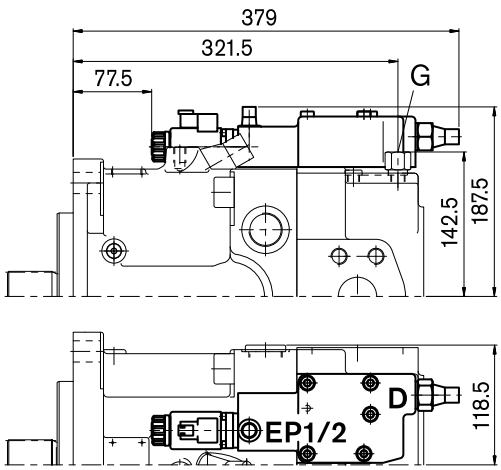
LRDU1/LRDU2

Power control with pressure cut–off and electric stroke limiter (positive characteristic)



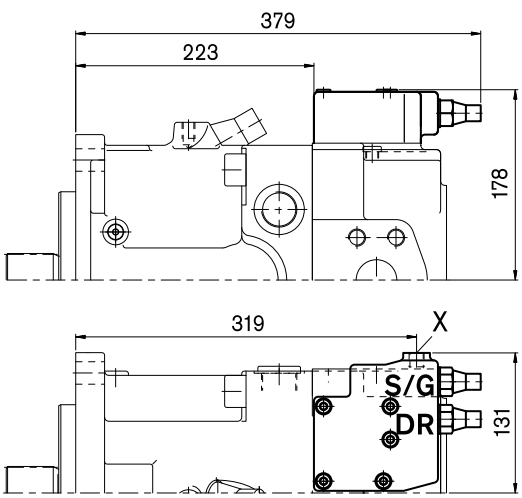
EP1D/EP2D

Electric control with proportional solenoid and pressure cut–off



DRS/DRG

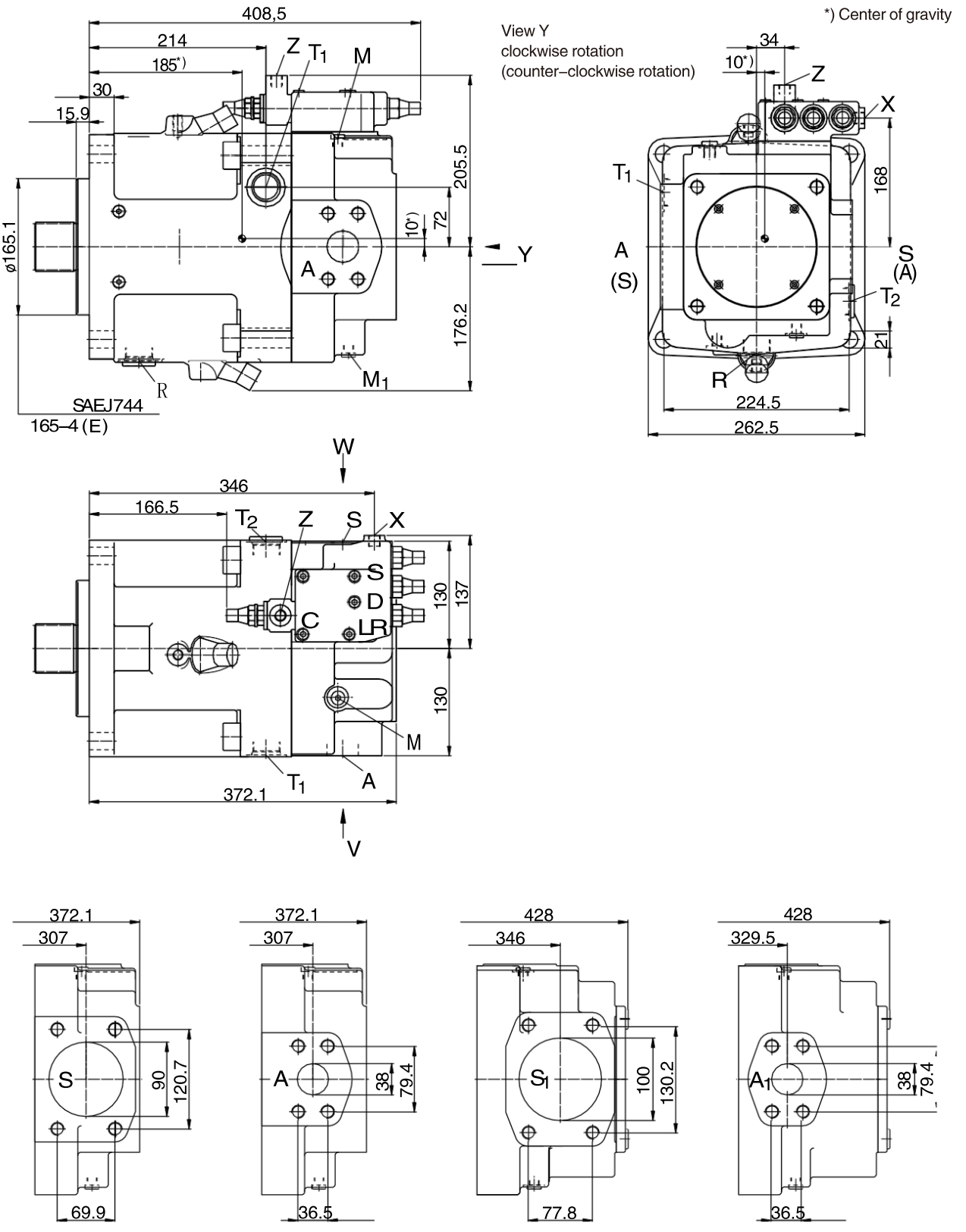
Pressure control with load sensing control
Pressure control remote controlled



Dimensions size 260

LRDCS

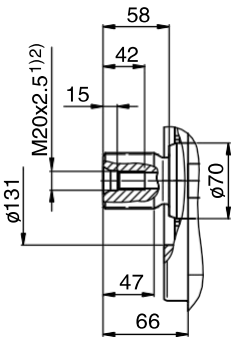
Power control LR with pressure cut–off D, cross sensing control C and load sensing control S



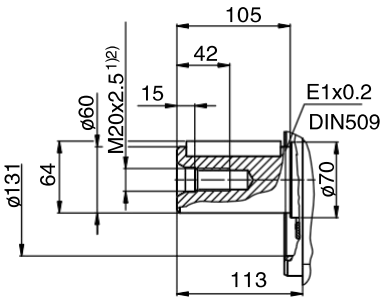
Dimensions size 260

Shaft ends

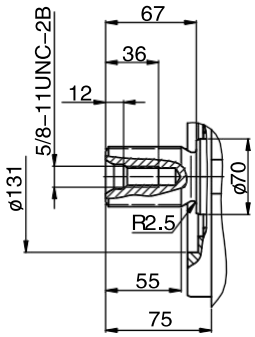
Z DIN 5480 spline shaft
W60x2x30x28x9g



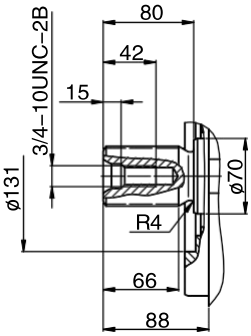
P DIN 6885 Plain key shaft
AS18x11x100



S spline shaft SAE J744
1 3/4 in，13T 8/16DP 3)



T spline shaft SAE J744
2 1/4 in，17T 8/16DP 3)



Ports		Standard	Size 2)	(bar) 4)	State
A A_1	Service line port Fixing thread	SAE J518 DIN 13	1 1/2 in M16x2；21 (deep)	400	O
S S_1	Suction port Fixing thread	SAE J518 DIN 13	3 1/2 inM16x2；24 (deep) 4 inM16x2；21(deep)	30 2 6)	O
T_1 T_2	Tank port	DIN 3852	M33x2；16 (deep)	10	5)
R	Air bleed	DIN 3852	M33x2；16 (deep)	10	X
M_1	Measurement point, positioning chamber	DIN 3852	M12x1.5；12 (deep)	400	X
M	Measurement point, service line port	DIN 3852	M12x1.5；12 (deep)	400	X
X	The pilot pressure port is available in models with load sensing (S) and remote control pressure cut–off (G)	DIN 3852	M14x1.5；12 (deep)	400	O
Y	The pilot pressure port is available in models with a stroke limiter (H...), a two–stage pressure cut–off (E), and HD	DIN 3852	M14x1.5；12 (deep)	40	O
Z	The pilot pressure oil port is available in models with cross induction (C) and power overrider control (LR3) power overrider control (Lg1)	DIN 3852	M14x1.5；12 (deep)	400 40	O
G	Control pressure (controller) ports are available in HD and EP models with travel limiters (H...U2) and threaded pipe fittings Ge10–PLM (otherwise closed)	DIN 3852	M14x1.5；12 (deep)	40	O

1) Center bore according to DIN 332 (thread acc. to DIN 13)

2) For max. tightening torque, please refer to general notes on page 64

3) ANSI B92.1a–1976, 30° pressure angle, flat root, side fit, tolerance class 5

4) Depending on adjustment data and operating pressure

5) Depending on installation position, T1 or T2 must be connected (see also page 61)

6) with charge pump

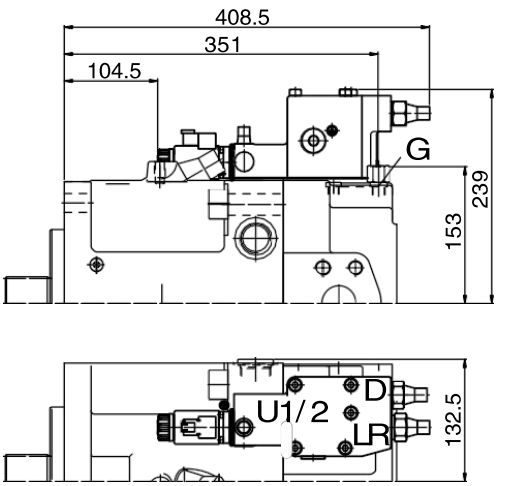
O = Open, must be connected (closed on delivery)

X = Closed (in normal operation)

Dimensions size 260

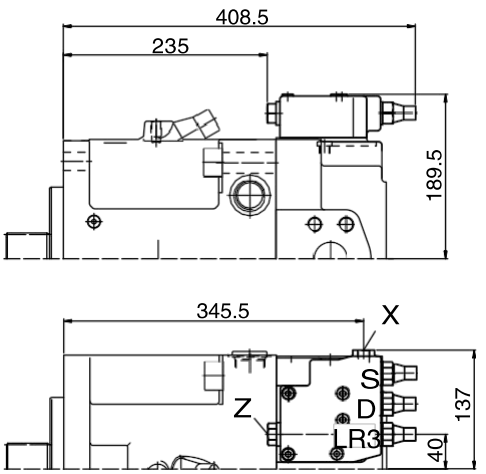
LRDU1/LRDU2

Power control with pressure cut–off and electric stroke limiter (positive characteristic)



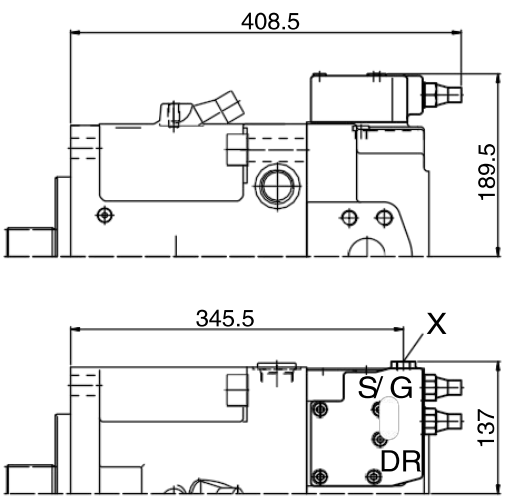
LR3DS

Power control with high pressure control, pressure cut–off and load–sensing control



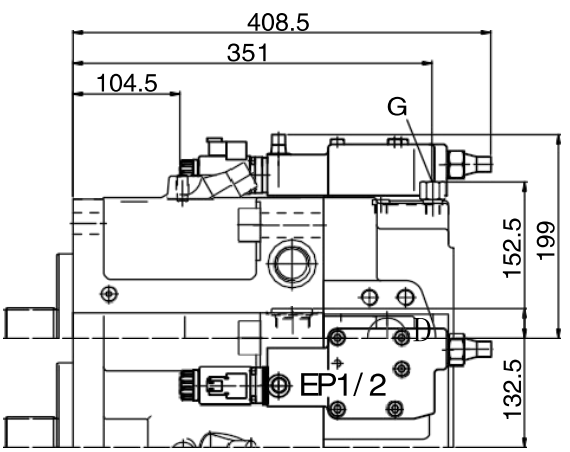
DRS/DRG

Pressure control with load sensing control
Pressure control remote controlled



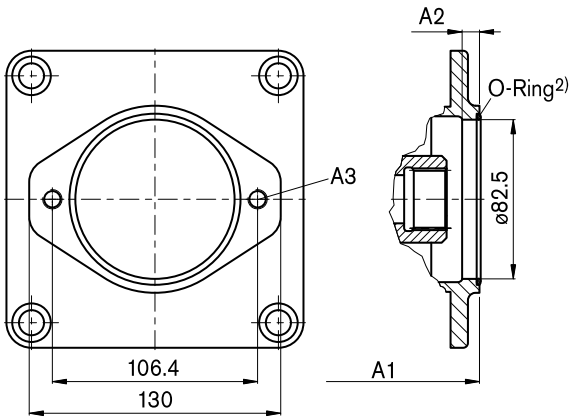
EP1D/EP2D

Electric control with proportional solenoid and pressure cut–off



Through Drive Dimensions

SAE J744 – 82–2 (A)
ANSI B92.1a–1976

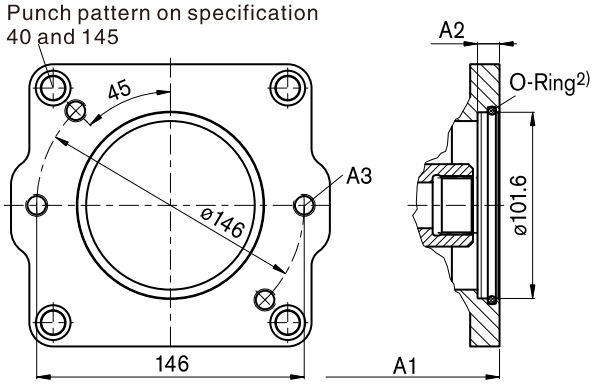


5/8 in, 9T 16/32 DP[1] (SAE J744 – 16–4 (A)) K01
3/4 in, 11T 16/32 DP[1] (SAE J744 – 19–4 (A–B)) K52

Size	A1		A2	A3[3]
	K01	K52		
40	240	240	8	M10x1.5; 15 (deep)
60	257	257	–	M10x1.5; 15 (deep)
75	275	275	–	M10x1.5; 15 (deep)
95	306	306	–	M10x1.5; 12.5 (deep)
130/145	329	329	–	M10x1.5; 12.5 (deep)
130/145*	363	363	–	M10x1.5; 12.5 (deep)
190	359.8	359.8	–	M10x1.5; 13 (deep)
190*	394	394	–	M10x1.5; 13 (deep)
260	385	385	–	M10x1.5; 13 (deep)
260*	427.3	427.3	–	M10x1.5; 13 (deep)

*) Models with added pumps

SAE J744 - 101–2 (B)
ANSI B92.1a–1976
DIN 5480
Punch pattern on specification
40 and 145



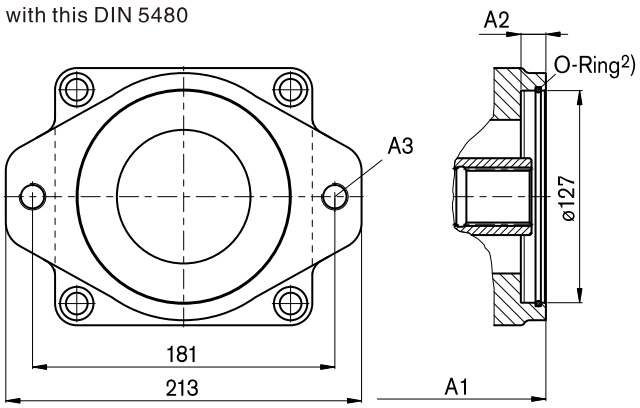
In specifications 190 and 260,
the hole sample is rotated counterclockwise by 45

7/8 in, 13T 16/32 DP[1] (SAE J744 – 22–4 (B)) K02
1 in, 15T 16/32 DP[1] (SAE J744 – 25–4 (B–B)) K04
W35x2x30x16x9g K79

Size	A1			A2	A3[3]
	K02	K04	K79		
40	244	244		10	M12x1.75; 19 (deep)
60	261	261	261	10	M12x1.75; 19 (deep)
75	279	279		10	M12x1.75; 19 (deep)
95	303	303	303	10	M12x1.75; 16 (deep)
130/145	326	326	326	10	M12x1.75; 16 (deep)
130/145*	360	360	360	10	M12x1.75; 16 (deep)
190	371.8	369.8	361.8	–	M12x1.75; 15 (deep)
190*	404	404	394	–	M12x1.75; 15 (deep)
260	395	395	395	–	M12x1.75; 15 (deep)
260*	437.5	437.5	437.5	–	M12x1.75; 15 (deep)

*) Models with added pumps

SAE J744 – 127–2 (C)
Couplings for spline shafts are in line
with this ANSI B92.1a–1976
Couplings for spline shafts are in line
with this DIN 5480



1 1/4 in, 14T 12/24 DP[1] (SAE J744 – 32–4 (C)) K07
1 1/2 in, 17T 12/24 DP[1] (SAE J744 –38–4 (C–C)) K24
W30x2x30x14x9g K80
W35x2x30x16x9g K61

Size	A1				A2	A3[3]
	K07	K24	K80	K61		
60	272	–	265	265	13	M16x2;20 (deep)
75	290	–	283	283	13	M16x2;20 (deep)
95	318	318	318	318	13	M16x2;16 (deep)
130/145	330	330	330	330	13	M16x2;20 (deep)
130/145*	364	364	364	364	13	M16x2;20 (deep)

*) Models with added pumps

Note:
The mounting flange may be turned through 90° . Standard position as illustrated. Please state in clear text if required.

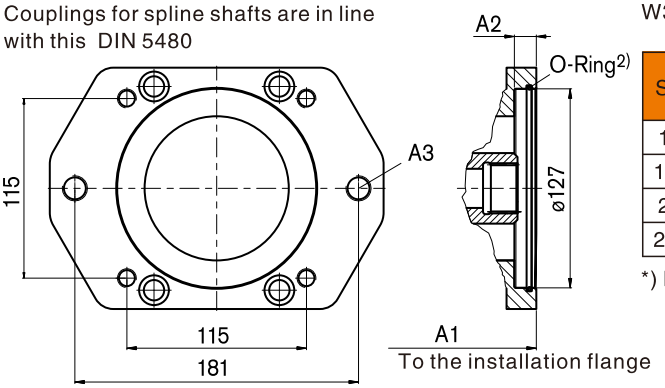
1) pressure angle, flat root, side fit, tolerance class 5

2) O–ring included in the delivery contents

3) DINB, For max. tightening torque, please refer to general notes on page 140

Through Drive Dimensions

SAE J744–127–2+4 (A)
Couplings for spline shafts are in line with this ANSI B92.1a–1976
Couplings for spline shafts are in line with this DIN 5480

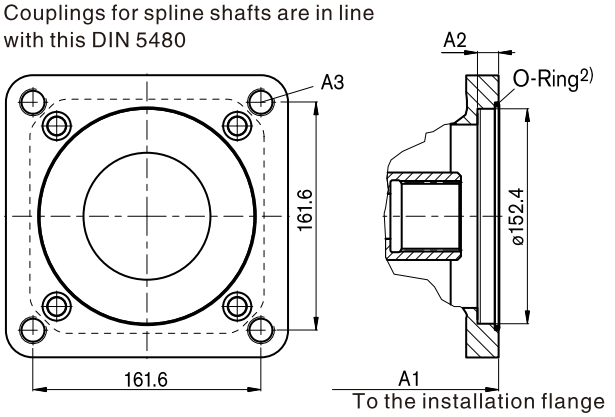


1 1/4 in, 14T 12/24 DP[1] (SAE J744 – 32–4 (C) K07
1 1/2 in, 17T 12/24 DP[1] (SAE J744 – 38–4 (C–C)) K24
W30x2x30x14x9g K80
W35x2x30x16x9g K61

Size	A1				A2	A3[3]
	K07	K24	K80	K61		
190	367.8	367.8	367.8	367.8	13	M16x2; 19 (deep)
190*	400	400	400	400	13	M16x2; 19 (deep)
260	391.5	391.5	391.5	391.5	13	M16x2; 19 (deep)
260*	433.5	433.5	433.5	43.5	13	M16x2; 19 (deep)

*) Models with added pumps

SAE J744 –152–4 (D)
Couplings for spline shafts are in line with this ANSI B92.1a–1976
Couplings for spline shafts are in line with this DIN 5480

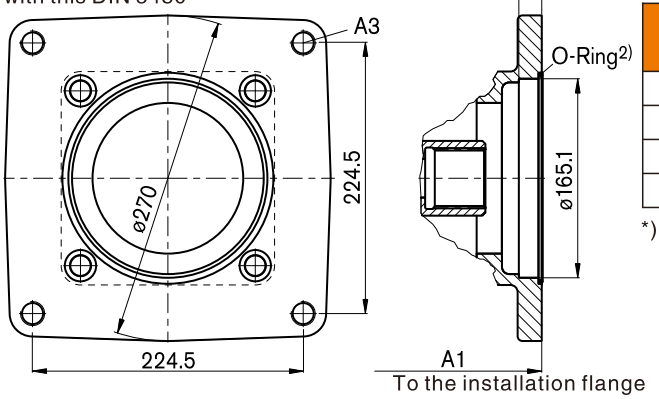


1 1/4 in, 14T 12/24 DP[1] (SAE J744 – 32–4 (C)) K86
1 3/4 in, 13T 8/16 DP[1] (SAE J744 – 44–4 (D) K17
W40x2x30x18x9g K81
W45x2x30x21x9g K82
W50x2x30x24x9g K83

Size	A1					A2	A3[3]
	K86	K17	K81	K82	K83		
75	290	–	290	–	–	13	M20x2.5;28 (deep)
95	317	327	317	317	–	30	M20x2.5;25 (deep)
130/145	340	350	340	340	340	30	M20x2.5;25 (deep)
130/145*	374	384	374	374	374	30	M20x2.5;25 (deep)
190	392	392	392	392	392	13	M20x2.5;22 (deep)
190*	424	424	424	424	424	13	M20x2.5;22 (deep)
260	417	417	417	417	417	13	M20x2.5;22 (deep)
260*	459	459	459	459	459	13	M20x2.5;22 (deep)

*) Models with added pumps

SAE J744 – 101–2 (E)
Couplings for spline shafts are in line with thisANSI B92.1a–1976
Couplings for spline shafts are in line with this DIN 5480



1 3/4 in, 13T 16/32 DP[1] (SAE J744 – 32–4 (C)) K72
W50x2x30x24x9g) K84
W60x2x30x28x9g K67

Size	A1			A2	A3[3]
	K72	K84	K67		
190	376.8	376.8	–	19	M20x2.5; 20 (deep)
190*	409	409	–	19	M20x2.5; 20 (deep)
260	417	400	400	19	M20x2.5; 20 (deep)
260*	459	442.5	442.5	19	M20x2.5; 20 (deep)

*) Models with added pumps

Note:
The mounting flange may be turned through 90° . Standard position as illustrated. Please state in clear text if required.

1) pressure angle, flat root, side fit, tolerance class 5

2) O–ring included in the delivery contents

3) DINB, For max. tightening torque, please refer to general notes on page 140

Overview of Attachments for A11V(L)O

Through shaft drive flange	A11VO Flank shaft coupling	code	Attachment–II Pump							The through-shaft drive is available for use in various specifications
			A11VO Specification (shaft)	A10V(S) O/31 Specification (shaft)	A10V(S) O/53 Specification (shaft)	A4FO Specification (shaft)	A4VG Specification (shaft)	A10VG Specification (shaft)	external gear rotary pump	
82–2 (A)	5/8 in	K01	–	18 (U)	10 (U)	–	–	–	Base sizeF Specification4–22[1]	40…260
	3/4 in	K52	–	18 (S)	10 (S)	–	–	–	–	40…260
101–2 (B)	7/8 in	K02	–	28 (S、R) 45 (U)	28 (S、R) 45 (U、W)	16、22、28 (S)	–	18 (S)	Base size N Specification 20–32[1] Base size G Specification 38–45[1]	40…260
	1 in	K04	40 (S)	45 (S、R)	45 (S、R) 60 (U、W)	–	28 (S)	28、45 (S)	–	40…260
	W35	K79	40 (Z)	–	–	–	–	–	–	40…260
127–2 (C)	1 1/4in	K07	60 (S)	71 (S、R) 100 (U)	60 (S)[2] 85 (U)	–	40、56 71(S)	63 (S)	–	60…260
	1 1/2in	K24	–	100 (S)	85 (S)	–	–	–	–	95…260
	W30	K80	–	–	–	–	40、56 (Z)	–	–	60…260
	W35	K61	60 (Z)	–	–	–	40、56 (A) 71 (Z)	–	–	60…260
152–4 (D)	1 1/4in	K86	75 (S)	–	–	–	–	–	–	75…260
	1 3/4in	K17	95、130 145 (S)	140 (S)	–	–	90、 125 (S)	–	–	130…260
	W40	K81	75 (Z)	–	–	–	125 (Z)	–	–	75…260
	W45	K82	95 (Z)	–	–	–	90、 125 (A)	–	–	95…260
	W50	K83	130、145 (Z)	–	–	–	–	–	–	130…260
165–4 (E)	1 3/4in	K72	190、260 (S)	–	–	–	180、 250 (S)	–	–	190…260
	W50	K84	190 (Z)	–	–	–	180 (Z)	–	–	190…260
	W60	K67	260 (Z)	–	–	–	–	–	–	260

1) Rexroth recommends special versions of the gear pumps. Please ask.

2) Only A10VO with 4–hole mounting flange can be mounted to A11V(L)O 190 and 260.

Combination Pumps A11VO + A11VO

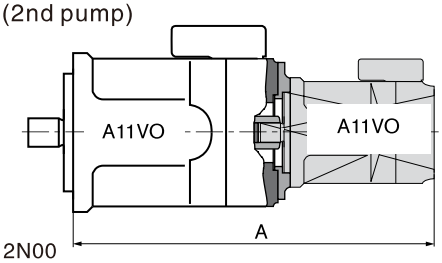
overall length A[1]

A11VO	Two pumps									
One pump	Size 40	Size 60	Size 75	Size 95	Size130/145	Size 130/145[2]	Size 190	Size 190[2]	Size 260	Size 260[2]
Size 40	–	–	–	–	–	–	–	–	–	–
Size 60	490	507	–	–	–	–	–	–	–	–
Size 75	–	525	550	–	–	–	–	–	–	–
Size 95	528	560	577	604	–	–	–	–	–	–
Size 130/145	551	572	600	627	650	698	–	–	–	–
Size 130/145[2]	585	606	634	661	684	732	–	–	–	–
Size 190	586.8	609.8	652	679	702	750	723.6	772.3	–	–
Size 190[2]	619	642	684	711	734	782	755.8	804.5	–	–
Size 260	620	633.5	677	704	727	775	746.8	795.5	772	828
Size 260[2]	662.5	675.5	719	746	769	817	789.3	838	814.5	870.5

1) When using the Z shaft (splined shaft DIN 5480) for the attached pump (2nd pump)

2) Version with charge pump

When ordering combination pumps, the type designations of the 1st and 2nd pumps must be connected by a "+".
Ordering code 1st pump + Ordering code 2nd pump



Ordering example：A11VO130LRDS/10R–NZD12K61 + A11VO60LRDS/10R–NZC12N00

Installation Notes

General

During commissioning and operation, the axial piston unit must be filled with hydraulic fluid and air bled. This is also to be observed following a relatively long standstill as the system may empty via the hydraulic lines.

The case drain in the case interior must be directed to the tank via the highest tank port (T1, T2). The minimum suction pressure at port S must not fall below 0.8 bar absolute (without charge pump) or 0.6 bar (with charge pump).

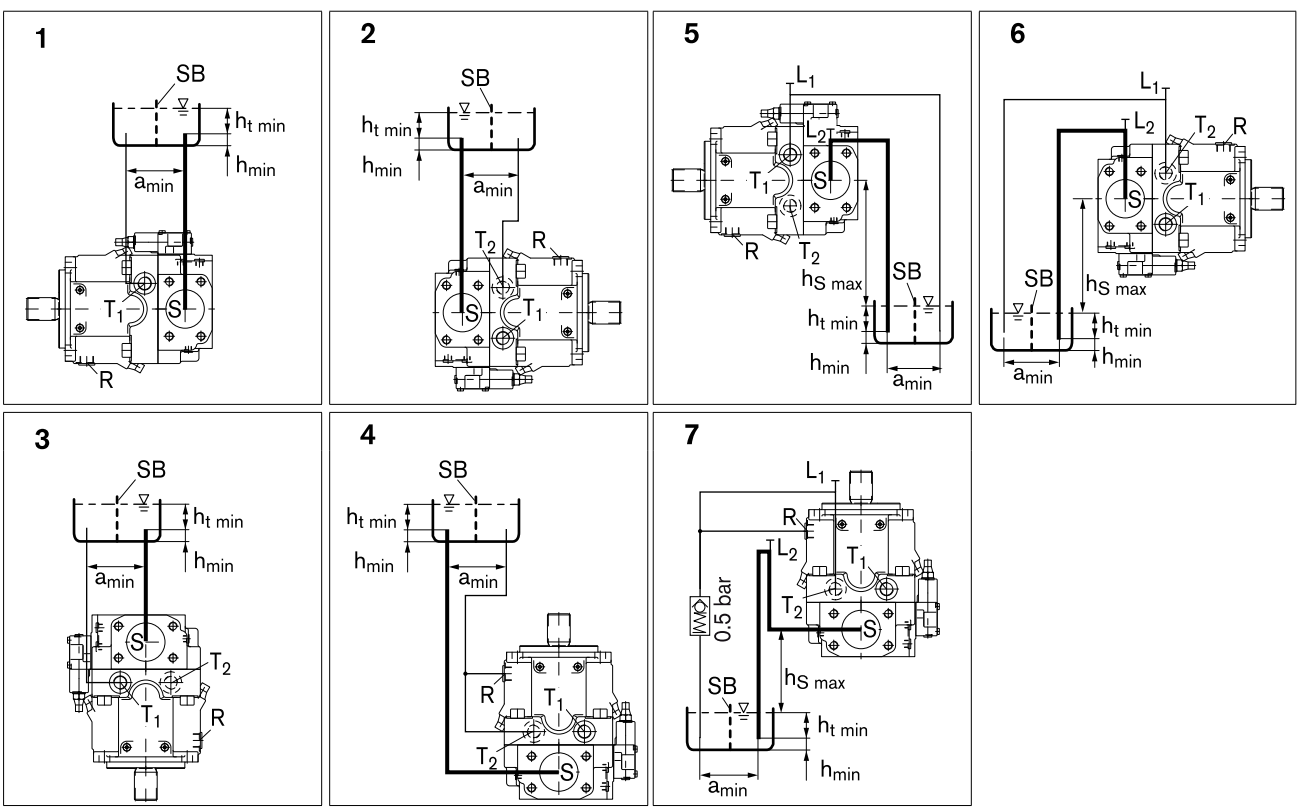
In all operational conditions, the suction line and case drain line must flow into the tank below the minimum fluid level.

Installation position

See examples below. Additional installation positions are available upon request.

Below–tank installation (standard)
Pump below the minimum fluid level of the tank.
Recommended installation positions: 1 and 2.

Above–tank installation
Pump above the minimum fluid level of the tank.
Observe the maximum permissible suction height
$h_{s\,max}$ = 800 mm.
The version A11VLO (with charge pump) is not designed for installation above the tank.
Recommendation for installation position 7 (shaft up): A check valve in the case drain line (opening pressure 0.5 bar) can prevent the case interior from draining.
For control options with pressure control, displacement limiters, HD and EP control, the minimum displacement setting must be $V_g \geqslant 5\%\ V_{g\,max}$.



hs max = 800 mm、ht min = 200 mm、hmin = 100 mm、SB = Silencer plate (baffle plate)

When designing the tank, ensure adequate space amin between the suction line and the case drain line to prevent the heated, returned fluid from being directly drawn back out.

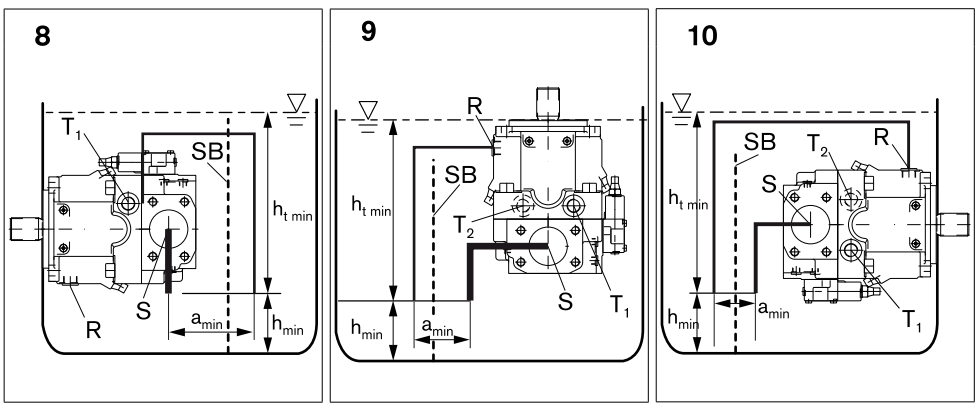
Installation position	Air bleeding	Filling
1	T_1	S + T_1
2	R	S + T_2
3	T_1/T_2	S + T_1/T_2
4	R	S + T_1/T_2

Installation position	Air bleeding	Filling
5	L_1+ L_2	L_2(S) + L_1(T_1)
6	R + L_2	L_2(S) + L_1(T_2)
7	L_1+ L_2	L_2(S) + L_1(T_1/T_2)

Installation Notes

Tank installation

Pump below the minimum fluid level in the tank.



hs max = 800 mm、ht min = 200 mm、hmin = 100 mm.
SB = Silencer plate (baffle plate)

When designing the tank, ensure adequate space amin between the suction line and the case drain line to prevent the heated, returned fluid from being directly drawn back out.

Installation position	Air bleeding	Filling
8	T_1	It is automatically performed through all openings T1, T2, R and S oil ports, and the slot position is lower than the hydraulic oil level
9	R	
10	R	

General Notes

The A11VO pump is designed to be used in open circuits.

Project planning, assembly and commissioning of the axial piston unit require the involvement of qualified personnel.

The service line ports and function ports are only designed to accommodate hydraulic lines.

During and shortly after operation, there is a risk of burns on the axial piston unit and especially on the solenoids. Take appropriate safety measures (e. g. by wearing protective clothing).

Depending on the operational state of the axial piston unit (operating pressure, fluid temperature), the characteristic may shift.

Pressure ports:

The ports and fixing threads are designed for the specified maximum pressure. The machine or system manufacturer must ensure that the connecting elements and lines correspond to the specified operating conditions (pressure, flow, hydraulic fluid, temperature) with the necessary safety factors.

The data and notes contained herein must be adhered to.

The following tightening torques apply:

Threaded hole for axial piston unit:

The maximum permissible tightening torques MG max are maximum values for the threaded holes and must not be exceeded.

For values, see the following table.

Fittings:

Observe the manufacturer's instruction regarding the tightening torques of the used fittings.

Fixing screws:

For fixing screws according to DIN 13, we recommend checking the tightening torque individually according to VDI 2230.

Locking screws:

For the metal locking screws supplied with the axial piston unit, the required tightening torques of locking screws MV apply. For values, see the following table.

The product is not approved as a component for the safety concept of a general machine according to DIN EN ISO 13849.

Thread size		Max. permissible tightening torque of the screw thread Mgmax	Required tightening torque for locking screws MV	WAF Hexagon socket
M12x1.5	DIN 3852	50 Nm	25 Nm	6 mm
M14x1.5	DIN 3852	80 Nm	35 Nm	6 mm
M22x1.5	DIN 3852	210 Nm	80 Nm	10 mm
M26x1.5	DIN 3852	230 Nm	120 Nm	12 mm
M33x2	DIN 3852	540 Nm	310 Nm	17 mm

The CR–CRK series of radial pumps

The CR–CRK series of radial pumps are bidirectional radial pumps, which can be used in combination with gear pumps. Especially suitable for the most difficult applications and high continuous working pressures of up to 1000 bar, Long service life!

Features

※High volume efficiency.
※Self–ventilation and self–absorption.
※Low pulse.
※Can be used in combination with a gear pump.

Standard Program of Product

Ordering Code

CR	CRK	0.5	/	01	–	P	P	A	03
	1	2		3		4	5	6	7

Size and Variety

1–Machinery Type

Radial plunger pump, quantitation	CRK

2–Size

Nominal displacement ml/r	0.5

3–Series

	01

4–Seals

Shaft seal FKM	P
FKM	V

5–Shaft End

Keyed shaft DIN6885	P
Splined shaft DIN5480	Z

6–Service Line Ports

Port t and port B at opposite sides,metric	A
Port t and port B at opposite sides,UNC mounting bolts	C

7–Number of plungers

	03

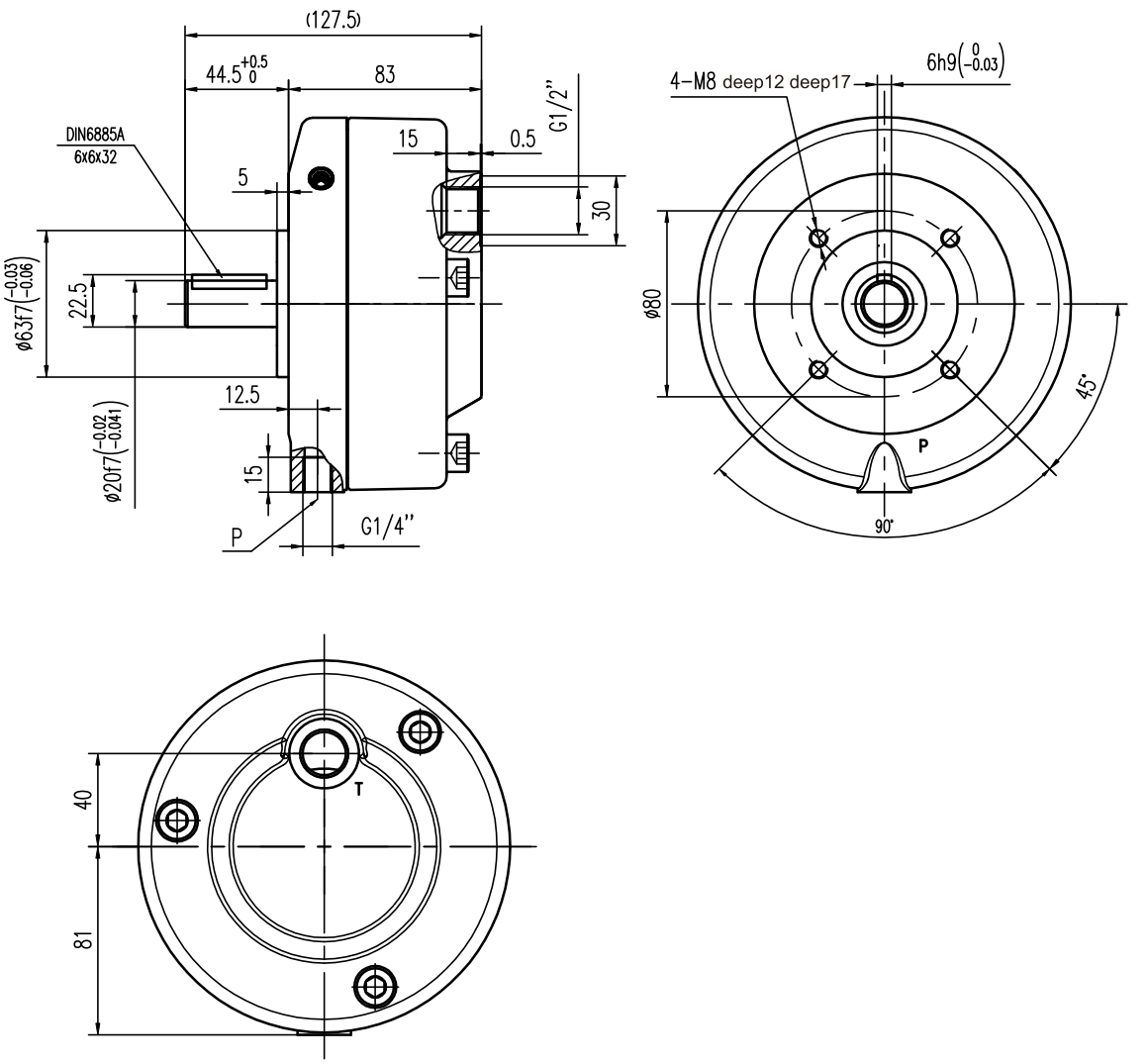
Application scenarios

Solar thermal industry

Technical Parameter

size			05
Displacement	Vg	cm³ /U	0.47
Rated pressure	Pb	bar	300
Acrot orque	Tmax	N・m	9.84
Maximum speed	nmax	r/min	2000
Maximum flow	qvomax	L/min	0.94
Maximum power	Pomax	kW	1.55

Overall size specification 05



OS–A22 VG series axial plunger variable double pump

This product is an axial plunger variable double pump, mainly designed for sliding loader, Are designed forclosed loop hydraulic drive, using the middle can be flat Steady change in the direction of flow, rated pressure up to 380bar.

Features

※Variable double pump with two axial piston rotary groups of swashplate design for hydrostatic drives in a closed circuit .

※The flow is proportional to the drive speed and displacement.

※The flow can be infinitely varied by adjusting the swashplate angle.

※Flow direction changes smoothly when the swashplate is moved through the neutral position.

※Only one shared port for case drain fluid for both circuits.

※Compact design for tight installation conditions.

Standard Program of Product

■ Ordering Code

OS	A22V	G	045	Ht1	0	0	5	M	1	/
	1	2	3	4	5	6	7	8	9	
40	B	R	N	B2	S7	3	F	B2SA	–	Y
10	11	12	13	14	15	16	17	18		19

■ Size and Variety

1–Axial Plunger Elements

Bevel Disk Structure, The Variable	A22V

2–Soperate Mode

Pump, Closed Loop	G

3–Size

DisplacementVgmax,Unitcm^3	045

4–Control Device

Hydraulic control, Direct operated	Ht1

5–Connector For Solenoids

Without connector	0

6–Swivel Angle Sensor

Without swivel angle sensor	0

7–Pilot Pressure Ports

HT 1 control mode Pilot pressure oil port X5X6	5

8–Additional Function

With bilateral mechanical travel limiter, adjustable externally	M

9–DA Control Valve

DA Control Valve Fixed Setting	1

10– Series

Series 4, Label 0	40

11– Configuration of ports and fastening threads

Metric （Screw）Thread	B

12– Direction Of Rotation

From the axis end	Clockwise	R
	Anticlockwise	L

13– Sealing Material

NBR （nitrile–rubber）, shaft seal in FKM （fluoroelastomer）	N

14– Mounting flange

SAE J744 – 2 hole（SAE–B）	B2

15– Drive shaft

Splined shaft ANSI B92.1a–1976, 1 1/4 in　14T 12/24DP	S7

16– Service Line Ports

Threaded ports A and B, Left （viewed on drive shaft）	3

17– Boost pump

Boost pump	F

18– Through drive

Install the flange 101–2, spline set 1in 15T 16 / 32DP	B2SA

19– Standard / Special Version

stallation variants, e.g. T ports against standard open or closed	Y

Application scenarios

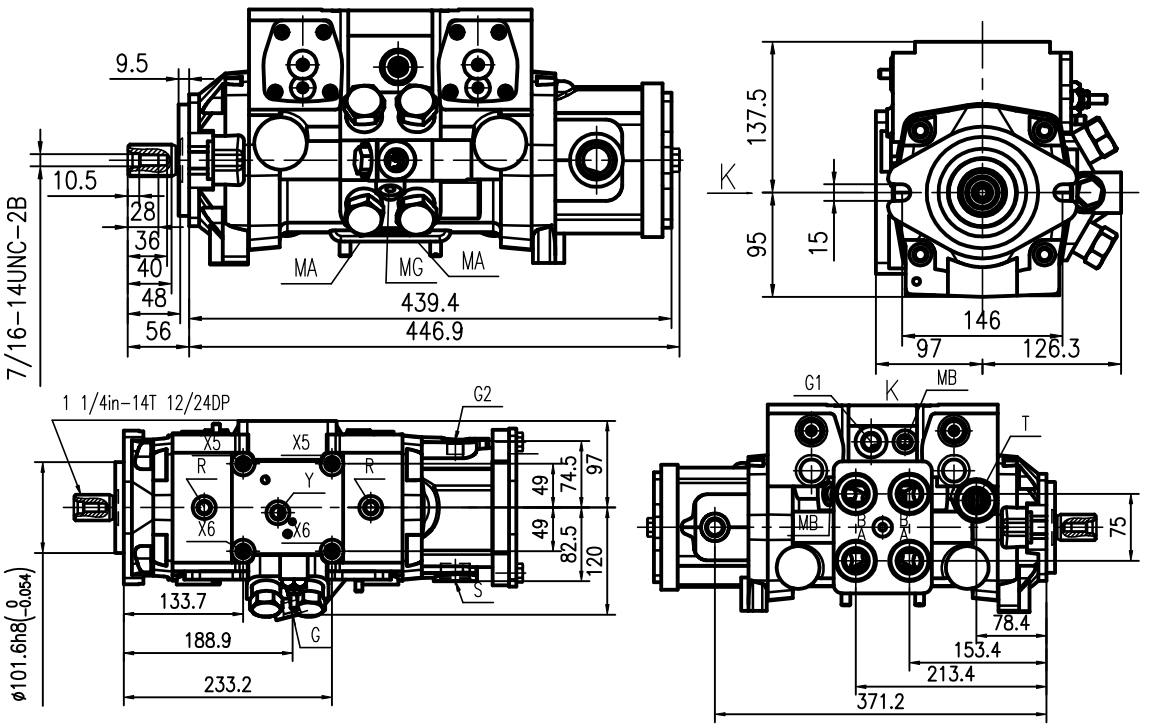
Sliding loader

Chart shows: ●=Available，○=In preparation，–=Not available

Technical Parameter

size	45				
Displacement	main pump		Vgmax	cm^3	2 × 46
	Oil filling pump	at 25bar	VgSp	cm^3	14.9
Operating pressure of the main oil pump	nominal pressure		pnom	bar	380
	maximum pressure		pmax	bar	420
Working pressure of the filling pump	nominal pressure		pSp nom	bar	25
	maximum pressure		pSp max	bar	30
spin velocity	g max maximum at Vgmax		nnom	r/min	3300
	limited maximum		nmax1	r/min	3550
	intermittent maximum		nmax2	r/min	3800
	minimum		nmin	r/min	500
Flow	Vg max nnom At Vg max and nnom		qv	L/min	2 × 152
Power	Vg max, nnom Δp = 380bar at Vg max, nnom and Δp = 380bar		P	kW	192
Torque	Vg max at Vg max and	Δp = 300bar	T	Nm	556
		Δp = 100bar	T	Nm	146
Maximum angular acceleration for each rotating group			α	rad/s^3	4000
Weight with a high–temperature control			m	Kg	53

Overall size specification 45

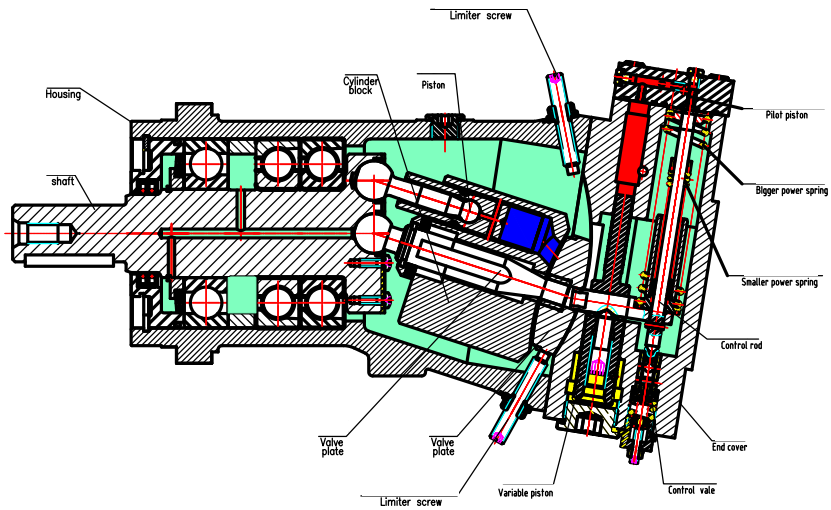


Ports	Standard	Size	(bar)	State
A,B Working port	ISO 11926	1 1/16–12UN–2B; 20deep	420	O
Suction port (only for boost pump)	ISO 11926	1 5/16–12UN–2B; 20deep	5	O
T Drain port	ISO 11926	1 1/16–12UN–2B; 20deep	3	O
R Air bleed	ISO 11926	9/16–18UNF–2B;13deep	3	X
X5,X6 Pilot pressure oil port	ISO 11926	9/16–18UNF–2B;13deep	30	O
The DA valve pilot pressure oil port	ISO 11926	9/16–18UNF–2B;13deep	30	O
Main pump filling oil port	ISO 11926	3/4–16UNF–2B,15deep	30	O
DA valve oil inlet	ISO 11926	3/4–16UNF–2B,15deep	30	O
G2 Oil pump outlet	ISO 11926	3/4–16UNF–2B,15deep	30	O
Pressure gauge for filling fill of main pump	ISO 11926	9/16–18UNF–2B;13deep	30	X
Pressure gauge of working oil port	ISO 11926	9/16–18UNF–2B;13deep	420	X
Pressure gauge of working oil port	ISO 11926	9/16–18UNF–2B;13deep	420	X

Variable Displacement Pump OS–A7V

Description

※Variable displacement pump,axial piston, bent axis design, for hydrostatic transmissions in open circuits.
※The flow if proportional to the drive speed and the displacement and is steplessly variable at constant drive speed.
※Comprehensive programme of control devices for every control and requlation function.
※Operation of both mineral, and fire–resistant fluids.



Special Features

※High performance rotary group with sphericalcontrol area offering the following advantages;self–centering, low peripheral speed, highefficiency.
※Drive shaft will support radial loads.
※Long service life.
※Low noise level.

Notes

Important: The leakage oil (case drain oil) temperature is influenced by pressure and pump speed and is always higher than the circuit temperature. However, at no point in the circuit may the temperature exceed 90℃.

The minimum pressure at the suction port of the pump>0.08MPa (absolute pressure),and the drain pressure(max. permissible casing pressure)is 0.2MPa (absolute pressure).The pressure in the housing must be the same or greater than the external pressure to the shaft seal

The technical information in the catalog is for your reference. Please consult our technical Dept., if you have any special requirements.

Type Code

OS–A7V	55	LV	1	L	Z	F	O	O
1	2	3	4	5	6	7	8	9

1–Machinery Type

Axial piston, bent axis,variable	OS–A7V

2–Size

Displacement mL/r	20	28	40	55	58	80	78	107	117	160	250	

3–Control Device

Constant power control	LV
Constant power control with load sensing	LVS
Constant pressure control	DR
Constant pressure control with load sensing	DRS
Manual control	MA

4–Series

Size 20–160	1
Size 250–500	

5–Rotating Direction(View on Shaft End)

Clockwise	R
Counterclockwise	L

6–Shaft End

Splined shaft DIN 5480	Z
Splined shaftGB3478.1–83	
KeyedshaftGB1096–79	P

7–Ports Type

Pressure port: SAE flange, on side. Suction port: SAE flange, on side.	F
Pressure port: threaded,on side. Suction port: SAE flange, on side.	G

8– Stroke Limiter

none	O
Stroke limiter,mechanically adjustable (for LV and DR)	
Stroke limiter,hydraulic (for LV)	H

9–Auxiliary Equipment

None	O
With pressure cut–off	D

Axial piston variable displacement pump CR–A7V size 55.With constant power control, series 1.
Anti–clockwise rotation, splined shaft, SAE flange connections, without stroke limiter and auxiliary equipment.

Technical Data

1、Inlet Operation Pressure Range(Absolute pressure)

$p_{s\,min}$ ——— 0.08MPa

$p_{s\,max}$ ——— 0.2MPa

2、Outlet Operating Pressure Range

p_n ——— 35MPa

p_{max} ——— 40MPa

3、Technical Date

(Theoretical values,without considering mechanical efficiency and volumetric efficiency)

Size					20	28	40	55	58	80	78	107	117	160	250
Displacement		V_{gmax}	mL/r		20.5	28.1	40.1	54. 8	58.8	80	78	107	117	160	250
		V_{gmin}	mL/r		0	8.1	0	15. 8	0	23. 1	0	30. 8	0	46. 2	0
Control devices ●=Available		LV			●	●	●	●	●	●	●	●	●	●	●
		LVS											●		●
		DR			●		●		●		●		●		●
		DRS											●		●
		MA			●	●	●	●	●	●	●	●	●	●	●
Max.Speed[3]	0.09MPa[1]	$n_{max0.09}$	r/min		3800	2800	3200	2360	2850	2120	2540	1900	2240	1650	1400
	0.1MPa[1]	$n_{max0.1}$	r/min		4100	3000	3400	2500	3000	2240	2700	2000	2360	1750	1500
	0.15MPa[1]	$n_{max0.15}$	r/min		4750	3600	3750	3000	3350	2750	3000	2450	2650	2100	1850
Max.Flow[2]	$n_{max0.09}$	$Q_{max0.99}$	L/min		76	76	124	125	161	164	192	197	254	256	340
	$n_{max0.1}$	$Q_{max0.1}$	L/min		82	82	132	133	170	174	204	208	267	271	364
	$n_{max0.15}$	$Q_{max0.15}$	L/min		94	98	146	160	190	213	227	254	300	326	449
Max . Power (△p=35MPa)	$Q_{max0.99}$	$P_{max0.09}$	KW		45	46	75	75	97	99	116	119	153	154	204
	$Q_{max0.1}$	$P_{max0.1}$	KW		49	49	80	80	102	105	123	125	161	163	218
	$Q_{max0.15}$	$P_{max0.15}$	KW		57	59	88	96	114	128	136	153	181	196	270
Flow	n_E=1450r/min	Q	L/min		28.8	39.5	56.4	77. 1	82.3	112. 5	109.7	150. 5	164.6	225	–
Power (△p=35MPa)	n_E=1450r/min	P	KW		17	24	34	46	50	68	66	91	99	135	–
Torque (△p=10MPa)	V_{gmax}	M	Nm		32.6	44.6	63.7	87	93.2	127. 5	124	169. 7	186	254	397.5
	V_{gmin}	M	Nm		–	12.9	–	25. 1	–	36. 8	–	49	–	73. 5	–
Torque (△p=35MPa)	V_{gmax}	M	Nm		114	156	223	305	326	446	431	594	651	889	1391
	V_{gmin}	M	Nm		–	45	–	88	–	129	–	171	–	257	–
Moment		J	kgm^2		0.0017	0.0017	0.0052	0. 0052	0.0109	0. 0109	0.0167	0. 0167	0.0322	0. 0322	0.088
Weight			kg		19	19	28	28	44	44	53	53	76	76	105

1. The values shown are valid for Vgmax. With an absolute pres–sure at suction inlet S and wh en operated on mineral oil.
2. Calculated with a volumetric efficiency of 97%.
3. The maximum speeds at 0.15MPa shown must not be ex–ceded, even with higher loadin g. On those sizes with Vgmin>0， however the maximum speeds can be increased to the values for those sizes with Vgmin=0 by reducing the displacement (Vg<Vgmax) and maintaining max. flow. The relevant sizes are 28–20，50–40，80–85，107–78，160–117.

Mounting Position

Optional. The pump housing must always be filled with oil. When mounting within a tank the plug must be removed from port R and this port must be at the top.90° pipe bend to be screwed in (noise reduction).

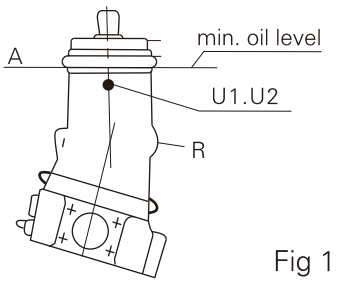


Fig 1

For this case a model with ports U1 and U2 must be ordered (indicate in clear text: "with ports U1 and U2"). The minimumooil level must not fall below the "A" line, as shown is Fig1.
When mounting within a tank the plua must be removed from ports U1 and U2. When mounting outside a tank, thepump must be bled at port U1 or U2 prior to commissioning.

Mounting on Top of Tank

Mounting of the OS–A7V variable pump above tank must be considered as a special pump installation and should only be realized under specific conditions.
When ordering pumps for mounting on top of tank state in clear text: "To Be Used for Above Tank Mounting"
This installation requires that the suction port be at the top and the suction pipe be kept as short as possible and the end of the pope be at least 200mm below minimum oil level, see Fig2. The cross–cut of the suction pump should be dimensioned to ensure that the flow velocity of the pressure fluid lies between 0.8 and 1m/s Start–up of the pump with all controls is only possible when the pump is at its full swivel angle (Vgmax),For pumps with minimum flow of ⩾5% of Vgmas. In order to avoid emptying of the suction line during zero position operation.

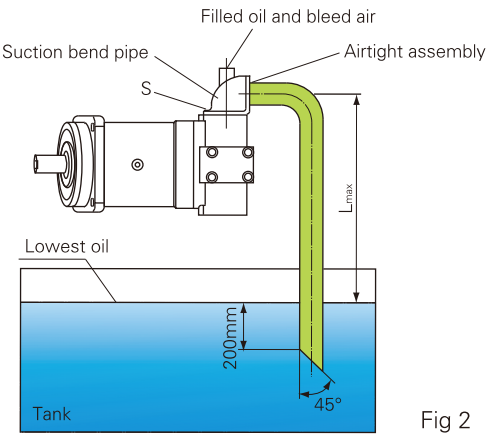


Fig 2

Speed when mounted on top of tank, length and inner diameter of suction pipe

Size	Max. Speed n_{max} r/min	Max. Length of suction pipe L_{max}(mm)	Calculated suction pie 1.D.(mm) at flow velocity V = 0.9m/s and V_{gmax}	
			speed n_{max}(r/min)	speed n_E=1450(r/min)
20	3610	600	41.8	26.5
28	2660	600	42	31
40	3040	750	53.6	37
55	2240	750	53.8	43.3
58	2700	750	61.3	45
80	2015	750	61.6	52.3
78	2410	750	66.6	51.6
107	1800	750	67.5	60.5
117	2125	850	76.6	63.3
160	1565	850	77	74

1) The values shown are valid for Vgmax. with 0.09MPa absolute pressure at suction inlet S and when operated on mineral oil.

Constant Power Control

The constant power control controls flow in relation to pressure. thereby maintaining hydraulic power constant. (Provided that the drive speed is constant.)

$$P=\frac{P \cdot Q}{60}=\text{Constant}$$

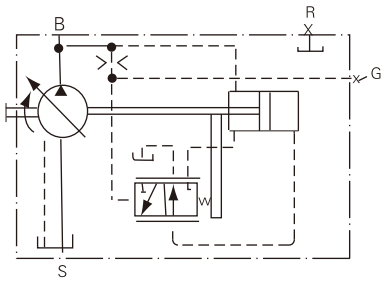
P—power[KW]

P—pressure[MPa]

Q—flow[L/min]

Commencement of control: min. 5MPa

Summation power control possible by throttles via port G.



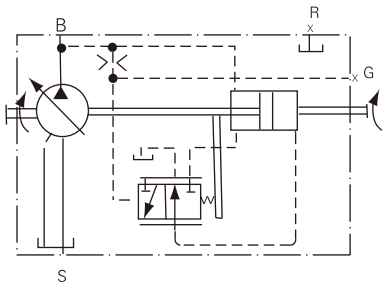
LV
Constant power control

Stroke Limiter

By means of a mechanical or hydraulic stroke limiter, the max. displacement can be infinitely varied or limited Adjustment range from Vgmax to Vgmim.

Mechanical stroke limiter

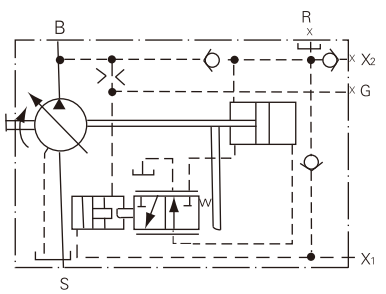
Size	20 28	40 55	58 80	78 107	117 160	250
Spindle Revolutions	23	21	28	31	26	21.25
Required Torque (approx.)Ncm	80	140	500	630	–	–



LV·····M
Constant power control with mechanical stroke limiter

Hydraulic stroke limiter

A Pilot pressure (port X1) of at least 10% of the operating pressure is required for the hydraulic stroke limiter Max. permissible pressure atportX1=20MPa (for all sizes)
if it is required to limit the flow at an operating pressure <5MPa then a boost pressure of min 5MPa must be applied at port X2 (at port X1 then,min10%=0.5MPa)



LV·····H
Constant power control with hydraulic stroke limiter

Auxiliary Equipment

Pressure cut–off

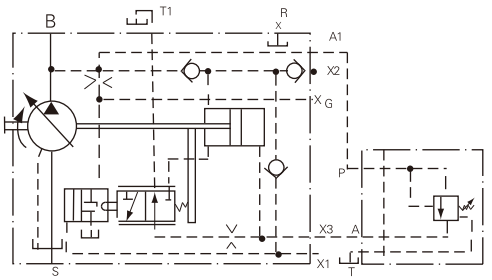
For all sizes with $V_{gmin}=0$

The pressure cut– off is a constant pressure control superposed on the constant power control and is carried out by means of a sequence valve. When the set. maximum pressure is reached(adjustment range up to 315MPa), the valve opens and the flow is automatically reduced (to Q=0).

The sequence valve is mounted separately from the pump in any suitable location one subplate (remote control).

When using the constant power control with pressure cut – off, the pump control times, will be approximately 3 times longer than those obtained with the constant pressure control DR.

Important: Port T from the sequence valve and pilot oil return line T1 must be piped direct to tank (cooler). Continuous operation in zero position see constant pressure control DR.



LV·····HD
Constant power control with pressure cutoff
(remote controlled) and hydraulic stroke limiter

Ports

B	Pressure port
S	Suctiorl port
G	Port for summation power control line
X1	Pilot pressure
X2	Remote control pressure
A1、X3	Ports for remote control valve
T1	Pilot oll return
R	Air bleed

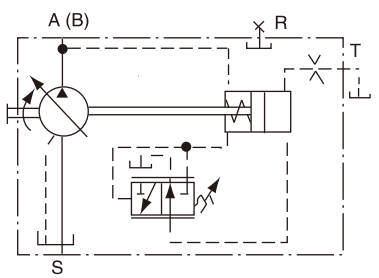
Variable power setting range

Size			20	28	40	55	58	80	78	107	117	160	250
Speed	n_o	r/min	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450	980
Flow	Q_o	L/min	28	39	57	77	81	110.5	110	150	165	225	237
Without pressure cut–off	P_{omin}	KW	3	4	5.5	7.5	7.5	11	11	15	15	22	22
	P_{omax}	KW	11	15	18.5	30	30	37	37	45	55	75	90
With pressure cut–off	P_{omin}	KW	3	–	5.5	–	7.5	–	11	–	15	–	22
	P_{omax}	KW	10	–	18.5	–	27	–	37	–	55	–	90

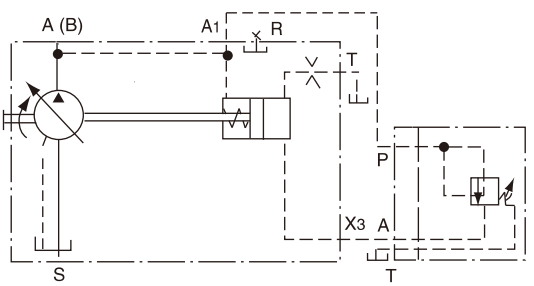
Constant Pressure Control

The constant pressure control maintains the pressure in a hydraulic system constant within its control range in spite of changing pump flow requirements. The variable pump supplies only the volume of fluid required by the services, Should operating pressure exceed the set pressure, the pump is automatically swiveled back to a smaller angle.

The required pressure is set either direct at the pump (valve built in standard model) or at the separate sequence valve for the mode l with remote control. Setting range from 5 to 35MPa. Setting range for re mote control 5 to 31.5MPa.



Constant pressure control DR (valve built–in)



Constant pressure control DR (remote controlled)

Note: Order sequence valve subplate separately.The max. single pipe length should not ex ceed 5m. Port T from the sequence valve must be piped separately to tank. A pressure relief valve installed in the system for protection of the max. pressure must be set 2MPa above the setting of the constant pressure control.

Adjustment Times

Size	20	40	58	78	117
V_{gmin}–V_{gmax} te(S) 35–5MPa Pressure unloading	0.16	0.2	0.25	0.25	0.3
V_{gmax}–V_{gmin} ta(S) 5–35MPa Pressure built–up	0.03	0.04	0.05	0.05	0.06

The values in the table are increased by 3 times for remote control.

Parallel Operation

For parallel operation of several OS–A7V pumps with constant pressure control. A steeper curve is used for the constant pressure control.

Please indicate this requirement in text after the type code when order in (“parallel opperation”)

For parallel operation each individual pump requires its own sequence valve.

Stroke Limiter

The max. displacement can be steplessly limited between Vgmax to Vgmin by means of a mechanical stroke limiter. For details see control device LV.

Continuous Operation in Zero Posi tion

Zero stroke operation without flushing of housing

Short periods <10min	max.pressure P_{max}(MPa)	31.5
	max.temperature t_{max}(℃)	50
Long periods	max.pressure P_{max}(MPa)	20
	max.temperature t_{max}(℃)	50

Zero stroke operation without flushing of housing

Long periods	max.pressure P_{max}(MPa)	31.5
	max.temperature t_{max}(℃)	

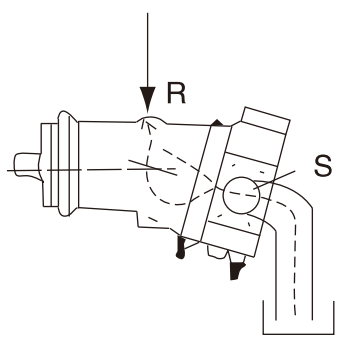
Flushingflow

Size	20	40	58	78	117	250
flow Qsp L/min	2	4	6	8	12	12.5

Note:When mounting the OS–A7V on top of tank and at zero stroke operation for longer periods of time at pressure up to Pmax 31.5MPa a minimum flow > corresponding to flushing flow as indicated for each size in the above table must be set instead of case flushing.

Temperature of flushing fluid<tank temperature

Connection for flushing

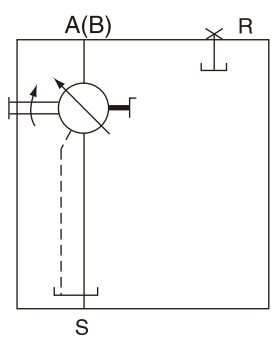


MA Manual control

By turning the handwheel, a piston is moved in an axial direction by means of a threaded spindle. A carrier pin moves the control lens on its sliding plane, thus permitting stepless variation of the pump displacement in the range Vgmin to Vgmax. The pump position indicator is located in the handwheel.

Ports

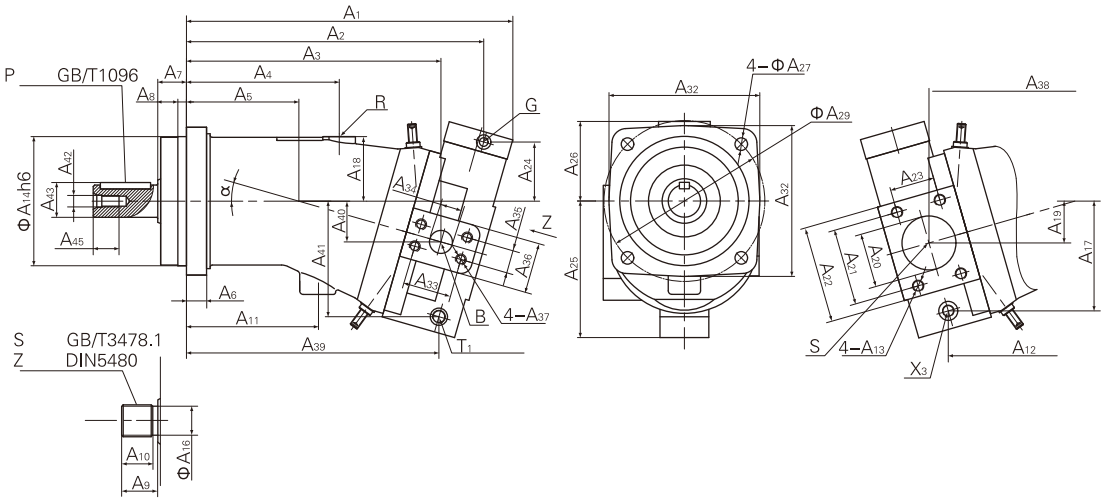
B Pressure port
S Suction port
R Air bleed

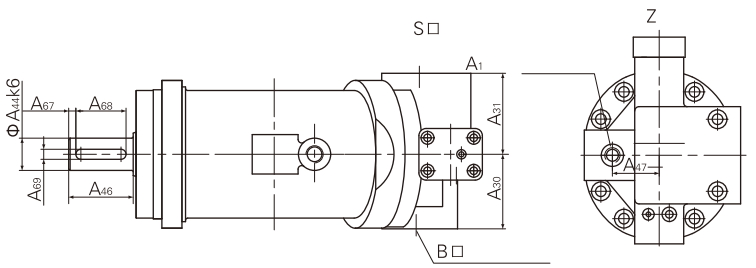


MA
Manual control

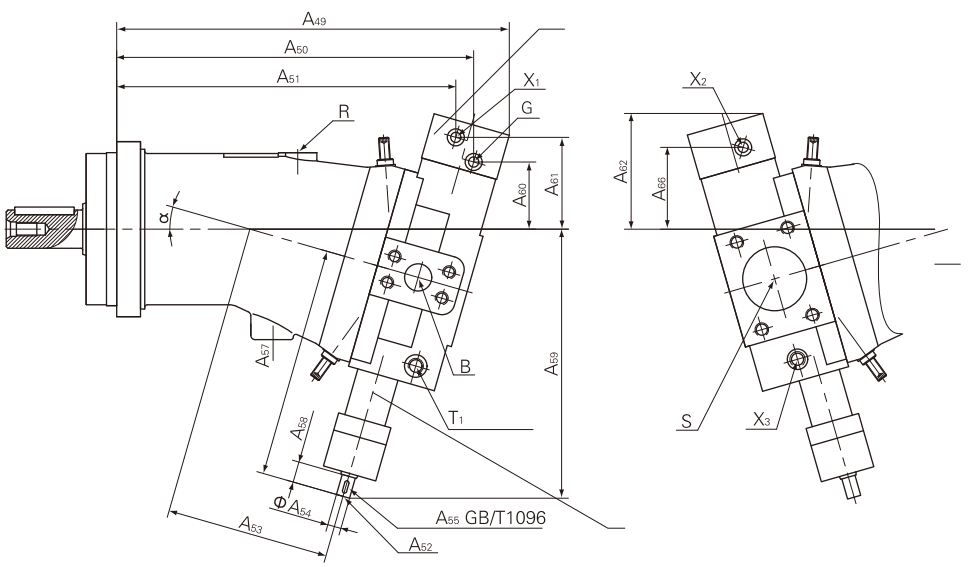
Unit Dimensions

Constant Power Control





Constant power control with stroke limiter



Dimension Size

Size	α	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8	A_9	A_{10}	A_{11}	A_{12}	A_{13}	A_{14}	A_{16}	A_{17}	A_{18}	A_{19}	A_{20}	A_{21}	A_{22}	A_{23}	A_{24}
20	9°	251	224	199	107	75	16	25	8	43	28	80	160	M10deep17	100	21.5	85	52	19	38	69.9	94	35.7	78
28	16°	260	223	195	107	75	16	25	8	43	28	80	149	M10deep17	100	21.5	95	50	33	38	69.9	94	35.7	59
40	9°	317	287	255	123	108	20	32	10	35	28	123	261	M10deep17	125	25	98	63	23	50	77.8	102	42.9	87
55	16°	327	296	251	123	108	20	32	10	35	28	123	–	M10deep17	125	25	–	63	40	50	77.8	102	42.9	64
58	9°	374	337	304	152	137	23	32	10	40	33	152	313	M12deep18	140	30	109	77	26	63	88.9	115	50.8	93
80	16°	385	347	300	152	137	23	32	10	40	33	152	–	M12deep18	140	30	–	77	47	63	88.9	115	50.8	68
78	9°	381	347	310	145	130	25	40	10	45	37.5	145	318	M12deep18	160	35	119	80	28	63	88.9	115	50.8	101
107	16°	393	358	305	145	130	25	40	10	45	37.5	145	–	M12deep18	160	35	–	80	19	63	88.9	115	50.8	73
117	9°	443	402	364	214	156	28	40	12	50	43	174.5	369	M14deep18	180	40	136	93	32	75	106.4	135	61.9	114
160	16°	454	414	359	213	156	28	40	12	50	43	174.5	–	M14deep18	180	40	–	88	57	75	106.4	135	61.9	83

Size	A_{25}	A_{26}	A_{27}	A_{29}	A_{30}	A_{31}	A_{32}	A_{33}	A_{34}	A_{35}	A_{36}	A_{37}	A_{38}	A_{39}	A_{40}	A_{41}	A_{42}	A_{43}	A_{44}	A_{45}	A_{46}	A_{47}	A_{49}	A_{50}
20	132	95	11	125	58	58	118	50.8	19	23.8	46	M10deep17	193	–	19	–	M8	27.9	25	19	50	38	257	226
28	145	80	11	125	58	58	118	50.8	19	23.8	46	M10deep17	189	–	33	–	M8	27.9	25	19	50	38	269	234
40	166	109	13.5	160	71	81	150	50.8	19	23.8	53	M10deep17	253	261	23	98	M12	32.9	30	28	60	40	323	290
55	182	91	13.5	160	71	81	150	50.8	19	23.8	53	M10deep17	249	–	40	–	M12	32.9	30	28	60	40	337	299
58	168	113	13.5	180	86	92	165	57.2	25	27.8	64	M12deep18	301	313	26	109	M12	38	35	28	70	62	378	344
80	194	–	13.5	180	86	92	165	57.2	25	27.8	64	M12deep18	297	–	47	–	M12	38	35	28	70	62	391	354
78	180	120	17.5	200	89	93	190	57.2	25	27.8	64	M12deep18	306	318	28	119	M12	43.1	40	28	80	55	385	342
107	200	98	17.5	200	89	93	190	57.2	25	27.8	64	M12deep18	301	–	19	–	M12	43.1	40	28	80	55	400	363
117	195	137	17.5	224	104	113	210	66.7	32	31.8	70	M14deep19	359	369	32	136	M16	48.5	45	36	90	65	445	408
160	212	112	17.5	224	104	113	210	66.7	32	31.8	70	M14deep19	354	–	57	–	M16	48.5	45	36	90	65	461	420

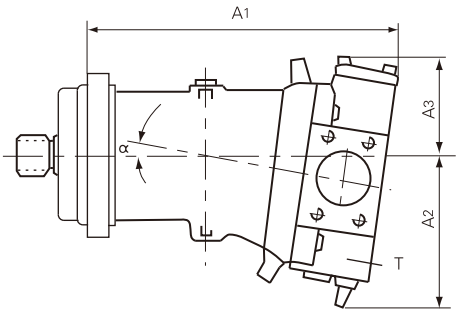
Size	A_{51}	A_{52}	A_{53}	A_{54}	键A55 GB/T3478.1	A_{57}	A_{58}	A_{59}	A_{60}	A_{61}	A_{62}	A_{65}	A_{66}	A_{67}	A_{68}	A_{69}	S GB/T3478.1	Z DIN5480
20	230	M3deep9	108	8	key2X10	161	14	176	77	104	129	228	92	5	40	8	EXT18zx1.25mx30Rx5f	W25x1.25x30x18x9g
28	242	M3deep9	108	8	key2X10	161	14	186	58	84	144	238	73	5	40	8	EXT18zx1.25mx30Rx5f	W25x1.25x30x18x9g
40	279	M4deep10	134	10	key3X10	184	16	204	85	117	147	276	104	5	50	8	EXT14Zx2mx30Rx5f	W30x2x30x14x9g
55	292	M4deep10	134	10	key3X10	184	16	215	62	98	128	288	83	5	50	8	EXT14Zx2mx30Rx5f	W30x2x30x14x9g
58	330	M5deep12	155.5	16	key5X16	228	24	251	91	116	142	328	104	7	56	10	EXT16Zx2mx30Rx5f	W35x2x30x16x9g
80	343	M5deep12	155.5	16	key5X16	228	24	265	65	91	120	339	80	7	56	10	EXT16Zx2mx30Rx5f	W35x2x30x16x9g
78	338	M5deep12	169	16	key5X16	236	24	261	99	124	150	336	112	8.5	63	12	EXT18Zx2mx30Rx5f	W40x2x30x18x9g
107	351	M5deep12	169	16	key5X16	236	24	276	71	97	126	348	86	8.5	63	12	EXT18Zx2mx30Rx5f	W40x2x30x18x9g
117	384	M5deep12.5	192	16	key5X16	266	24	294	111	137	164	382	125	10	70	14	EXT21Zx2mx30Rx5f	W45x2x30x21x9g
160	399	M5deep12.5	192	16	key5X16	266	24	310	79	108	137	396	96	10	70	14	EXT21Zx2mx30Rx5f	W45x2x30x21x9g

Ports Size

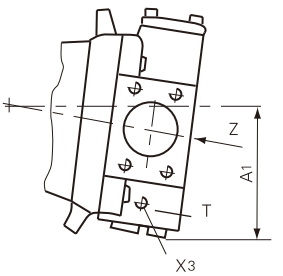
Size	B	B	S	R	G	T1	X1, X2	X3, A1
20	SAE3/4"(High voltage series)	M27x2	SAE1 1/2"(standard series)	M16x1.5	M14x1.5	M12x1.5	M14x1.5	M12x1.5
28	SAE3/4"(High voltage series)	M27x2	SAE1 1/2"(standard series)	M16x1.5	M14x1.5	M12x1.5	M14x1.5	M12x1.5
40	SAE3/4"(High voltage series)	M33x2	SAE2"(standard series)	M18x1.5	M14x1.5	M18x1.5	M14x1.5	M18x1.5
55	SAE3/4"(High voltage series)	M33x2	SAE2"(standard series)	M18x1.5	M14x1.5	M18x1.5	M14x1.5	M18x1.5
58	SAE1"(High voltage series)	M42x2	SAE2 1/2"(standard series)	M18x1.5	M14x1.5	M18x1.5	M14x1.5	M18x1.5
80	SAE1"(High voltage series)	M42x2	SAE2 1/2"(standard series)	M18x1.5	M14x1.5	M18x1.5	M14x1.5	M18x1.5
78	SAE1"(High voltage series)	M42x2	SAE2 1/2"(standard series)	M18x1.5	M14x1.5	M18x1.5	M14x1.5	M18x1.5
107	SAE1"(High voltage series)	M42x2	SAE2 1/2"(standard series)	M18x1.5	M14x1.5	M18x1.5	M14x1.5	M18x1.5
117	SAE1 1/4"(High voltage series)	M48x2	SAE3"(standard series)	M22x1.5	M14x1.5	M18x1.5	M14x1.5	M20x1.5
160	SAE1 1/4"(High voltage series)	M48x2	SAE3"(standard series)	M22x1.5	M14x1.5	M18x1.5	M14x1.5	M20x1.5

DR Constant Pressure Control

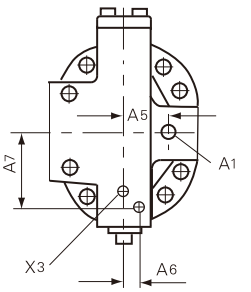
Standard Model



Sremote Control



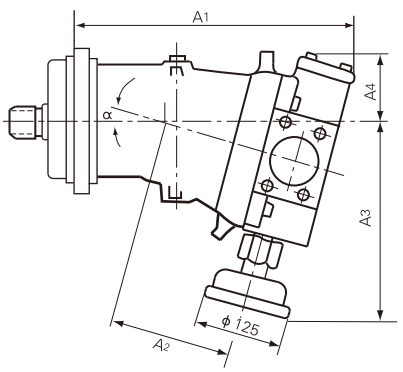
Detail z

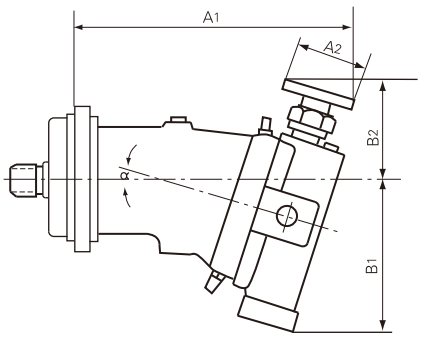


Size	a	A_1	A_2	A_3	A_4	A_5	A_6	A_7
20	9°	251	134	95	106	38	–	–
40	9°	315	166	107	127	40	14	53
58	9°	372	160	107	138	62	15	69
78	9°	380	180	114	147	60	14	70
117	9°	441	199	132	165	65	14	83

A1 and X3 only fot remote control. Other dimensions see LV
T1:M12x1.5

Manual Control





handwheel downwards

Size	a	A_1	A_2	A_3	A_4
20	9°	251	108	175	95
28	16°	260	108	190	80
40	9°	315	134	197	108
55	16°	323	134	215	89
58	9°	327	155.5	215	107
80	16°	380	155.5	235	86
78	9°	355	169	198	138
107	16°	390	169	270	92
117	9°	441	192	261	132
160	16°	450	192	285	107

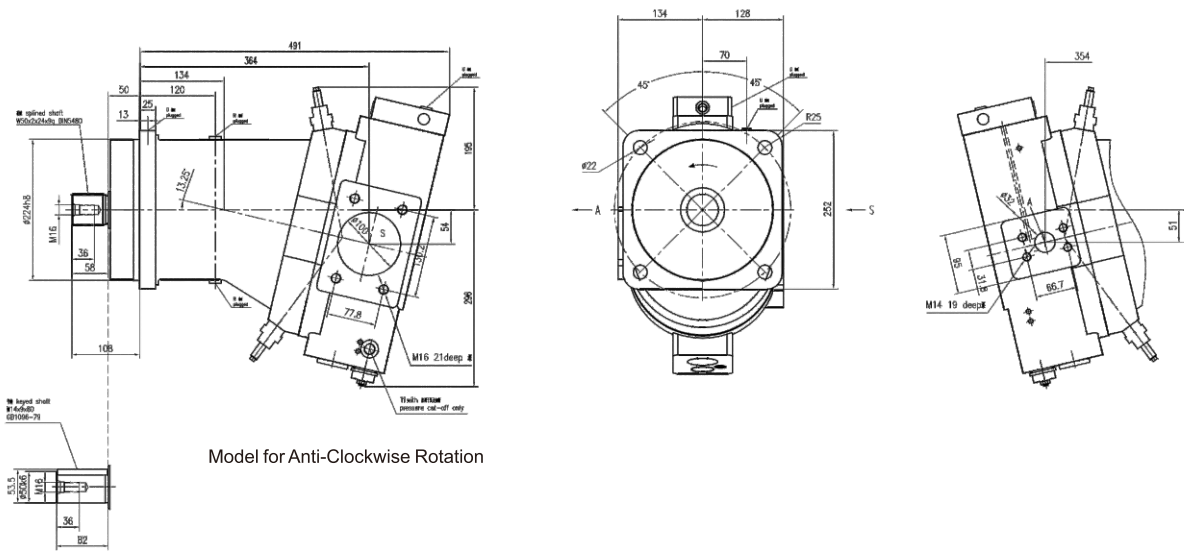
handwheel upwards

Size	a	A_1	A_2	B_1	B_2
20	9°	–	–	–	–
28	16°	–	–	–	–
40	9°	317	100	175	132.5
58	9°	316	100	168	166.5
80	16°	385	100	188	150
78	9°	315	100	180	157.5
107	16°	383	100	270.5	132.5
117	9°	430	100	210	201
160	16°	445	100	225	143
250	26.5°	584	120	320	230

Please give clear indication of the handwheels are upwards or downwards, when you order goods!

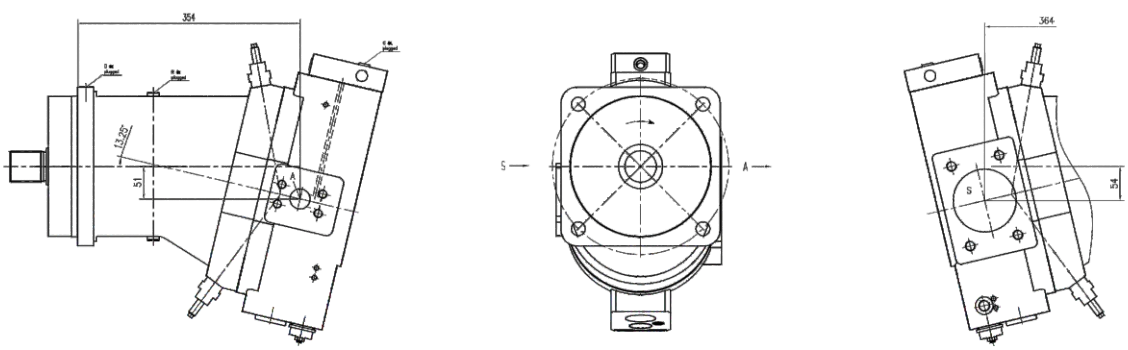
Unit dimensions Size-250

Constant HP control



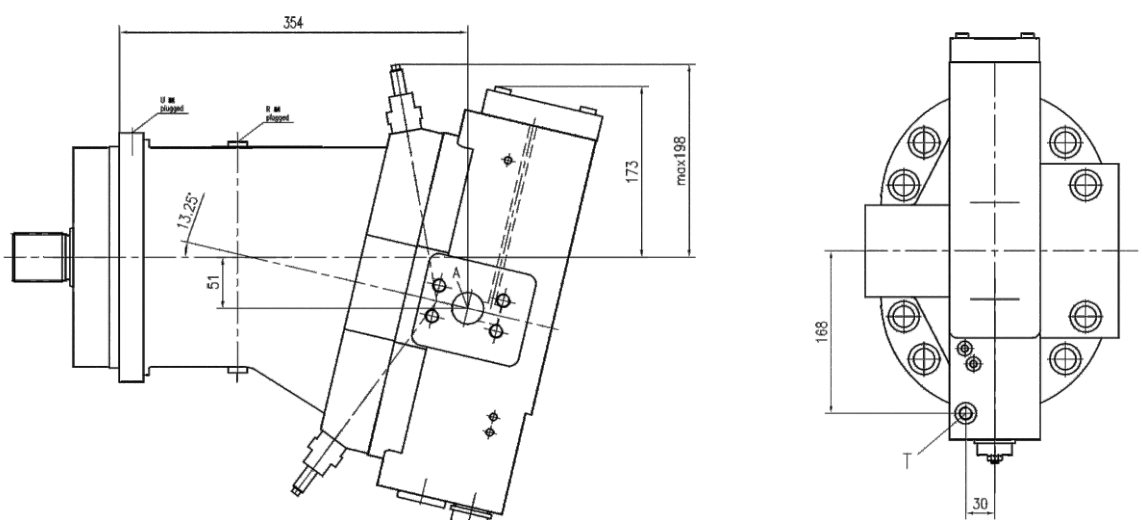
Model for Anti-Clockwise Rotation

Model for Clockwise Rotation



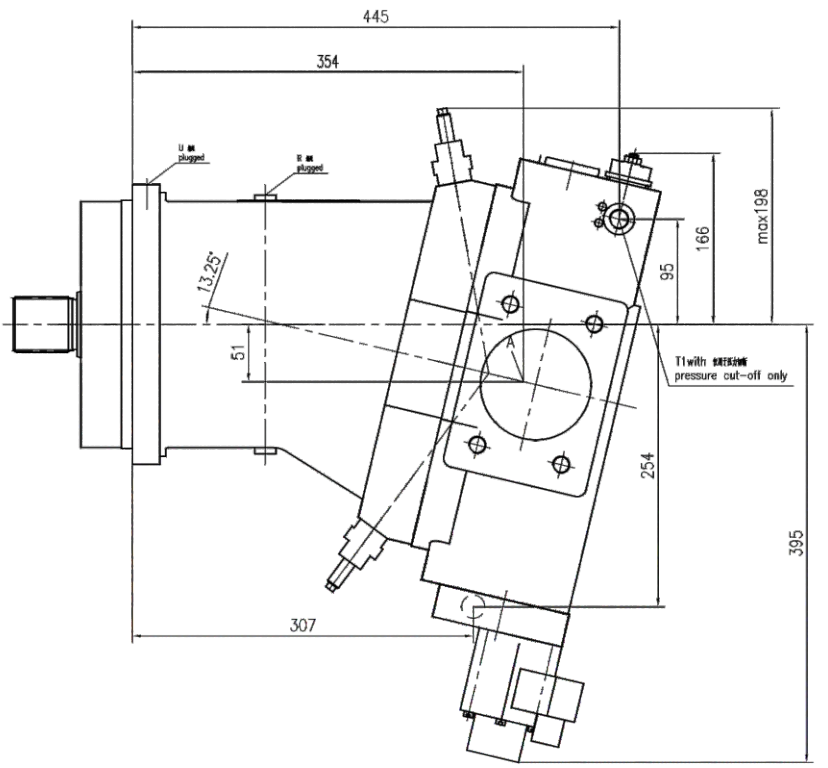
Constant Pressure control

Standard Model



Weight,size 250:approx.105kg

EP Flectric Control



A,B	service lines	T	pilot oil return line M14x1.5
S	suction line	T1	pilot oil return line M18x1.5
G	remote control pressure M14x1.5 (connection for summation HP control)	R	air bleed M22x1.5
U	flushing port M14x1.5		

Fixed Displacement Piston Pump/Motor OS–A2F

rated pressure35Mpa，There are 7 specifications with displacement of 45–460

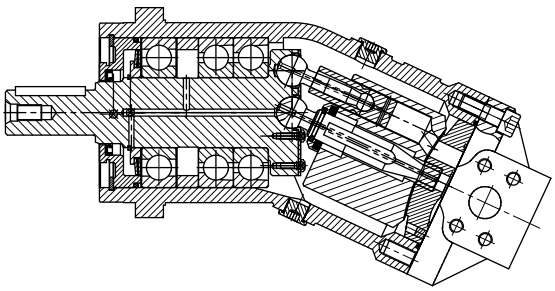
Description

※Axial plunger element, with fixed displacement, used as hydrostatic drive pump or motor in open or closed loop

※As a pump, the flow rate is proportional to the driving speed and displacement.

※As a motor, the output speed is proportional to the flow rate and inversely proportional to the displacement.

※The output torque increases with the pressure difference between the high pressure side and the low pressure side.



Special Features

※The rotor assembly of the spherical valve has the advantages of automatic, high efficiency, low peripheral speed.

※Durable ball bearings and roller bearings for long life work.

※The drive shaft can bear radial load.

※ISO mounting flange, consistent with the A6V variable motor.

Technical Data

1、Operation Pressure Range(Pump)

Import (A, B or S) working pressure

Minimum pressure $p_{s\,min}$ —— 0.08MPa absolute pressure

In the closed circuit, the oil pressure must be between 0.2 and 0.6MPa, depending on the pump's speed and the viscosity of the hydraulic oil.

2、Outlet Operating Pressure Range (Motor)

rated pressure p_n —— 35MPa

Maximum pressure p_{max} —— 40MPa

The pressure at the mouth and A of the B and shall not exceed 70MPa, and the highest 40MPa per side pressure.

3、 Allowed Case Pressure

absolute pressurep_{Lmax} —— 0.2MPa absolute pressure absolute pressure

4、Technical Date

Size					45	55	63	80	107	125	160
Displacement			V_g	mL/r	44.3	54.8	63	80	107	125	160
Max.Speed	Closed loop		n_{max}	r/min	4500	3750	4000	3350	3000	3150	2650
	Open circuit	0.09MPa	no.09	r/min	2850	2360	2550	2120	1900	2120	1650
		0.10MPa	no.10	r/min	3000	2500	2700	2240	2000	2240	1750
		0.1 5MPa	no.15	r/min	3550	3000	3300	2750	2450	2750	2100
Max.Flow	Closed loop	n=nmax	Q_{max}	L/min	199	206	253	268	321	394	424
	Open circuit	n=n0.09	Q0.09	L/min	122	125	156	165	197	257	256
		n=n0.10	Q0.10	L/min	129	133	165	174	208	272	272
		n=n0.15	Q0.15	L/min	157	159	202	213	251	333	326
Max. Power	Closed loop	Q=Qmax	P_{max}	KW	116	120	147	156	187	230	247
	Open circuit	Q=Q0.09	P0.09	KW	71	73	91	96	115	150	149
		Q=Q0.10	P0.10	KW	75	78	96	101	121	159	159
		Q=Q0.15	P0.15	KW	92	93	118	124	148	194	190
Motor speed n=1450r/min △p=35MPa	Flow	closed	Q_{Ec}	L /min	64.2	79.5	91.3	116	155.2	181.2	232
		open	Q_{Eo}	L/min	62.3	77.1	88.6	112.5	150.5	175.8	225
	Power	closed	P_E	KW	27.4	46	53	67.7	90	106	135
Torque		△ p=10MPa	T_{10}	Nm	70	87	100	127	170	199	254
		△p=35MPa	T_{max}	Nm	247	305	35	445	595	696	890
Weight				kg	23	23	33	33	44	63	63

5、Install

Installation location option.Shell must always be filled with oil.

6、Hydraulic oil

a– Viscosity range

ν_{min} =10mm^2/s

ν_{max} =1000mm^2/s

Best working viscosity

ν_{opt} =16~36mm^2/s

b– Temperature range

θ_{min} = –25℃

θ_{max} = +80℃

c– Viscosity grade of oil selection

Operating temperature range	Viscosity grade	Viscosity at 40℃
⩾30~40℃	VG22	22mm^2/s
⩾40~50℃	VG32	32mm^2/s
⩾50~60℃	VG46	46mm^2/s
⩾60~70℃	VG68	68mm^2/s
⩾ 70~80℃	VG100	100mm^2/s

Hydraulic oil filter

Recommended filteraccuracy is 10μm.

Type Code

OS–	A2F	160	R	2	P	1
	1	2	3	4	5	6

1–Machinery Type

Axial piston, bent axis,Ration pump/motor	A2F

2–Size

Nominaldisplacement mL/r	45	55	63	80	107	125	160	

3–Rotating Direction(View on Shaft End)

Clockwise	R
Counterclockwise	L
Two way (not suitable for open cicuit pump)	W

4–Series

	●	●	–	–	●	–	–	1
	●	●	●	●	●	●	●	2

5–Shaft End

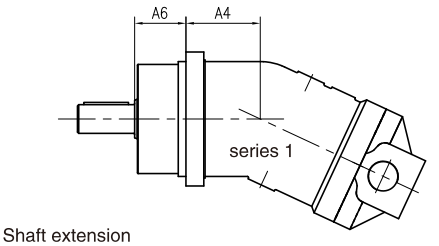
Keyed shaft GB1096–79	P
Splined shaft DIN 5480	Z
Splined shaft GB 3478.1	S

6–Ports Type

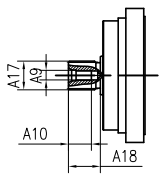
Port A and B in both sides of the rear lid, thread	1
Port A and B in both sides of the rear lid, SAE flange	2
Port B in the back cover side, SAE flange； port S in the rear, flange	3

Chart shows: ●=Available，○=In preparation，–=Not available

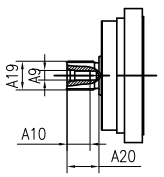
Dimensions Size

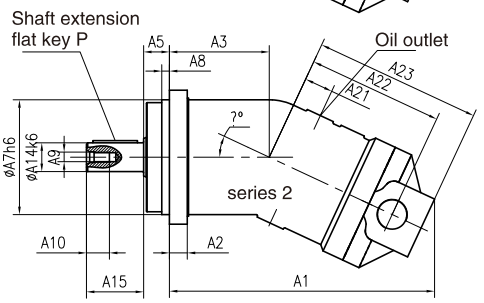


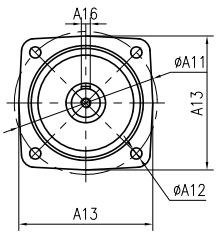
Shaft extension spline Z



Shaft extension spline S

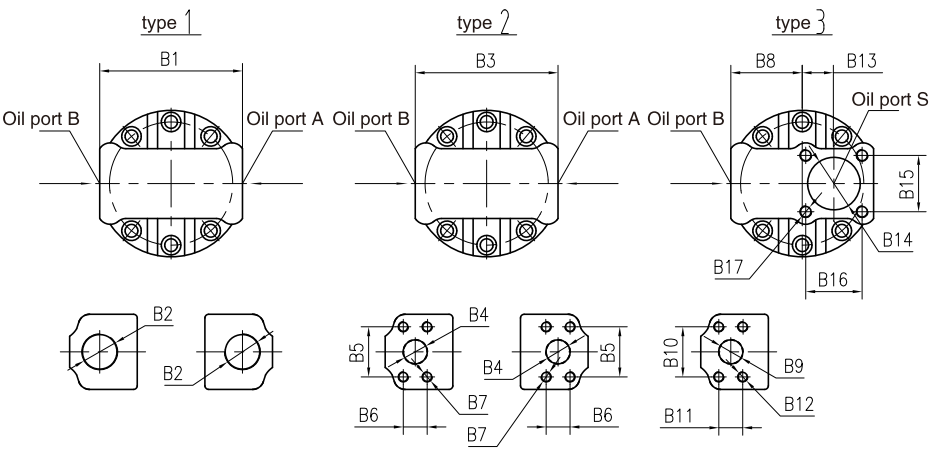






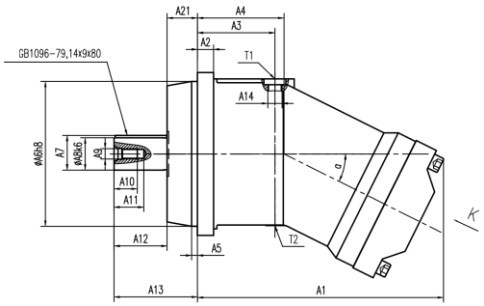
Size	α°	A_1	A_2	A_3	A_4	A_5	A_6	ϕ A_7	A_8	A_9	A_{10}	ϕ A_{11}	ϕ A_{12}	ϕ A_{13}	ϕ A_{14}	A_{15}	A_{16}	A_{17}	A_{18}	A_{19}	A_{20}	A_{21}	A_{22}	A_{23}
45	20	384	20	–	77	32	63	125	10	M12	28	160	16	150	30	60	8	W30x2x14x9g	35	EXT14Zx2mx30Rx5f	35	31.5	151	178
55	25	381	20	108	77	32	63	125	10	M12	28	160	16	150	30	60	8	W30x2x14x9g	35	EXT14Zx2mx30Rx5f	35	31.5	151	178
63	20	452	23	137	86	32	83	140	10	M12	28	180	16	165	35	70	10	W35x2x16x9g	40	EXT16Zx2mx30Rx5f	40	36	174	208
80	25	450	23	137	86	32	83	140	10	M12	28	180	16	165	35	70	10	W35x2x16x9g	40	EXT16Zx2mx30Rx5f	40	36	174	208
107	25	476	25	130	90	40	80	160	12	M12	28	200	20	190	40	80	12	W40x2x18x9g	45	EXT18Zx2mx30Rx5f	45	40	190	225
125	20	552	28	156	–	40	–	180	10	M16	36	224	20	210	45	90	14	W45x2x21x9g	50	EXT21Zx2mx30Rx5f	50	45	212	257
160	25	547	28	156	–	40	–	180	10	M16	36	224	20	210	45	90	14	W45x2x21x9g	50	EXT21Zx2mx30Rx5f	50	45	212	257

Ports

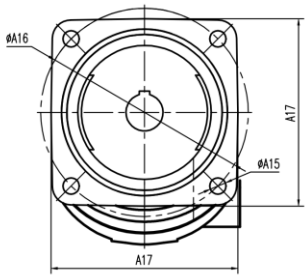


Size	B_1	B_2	B_3	B_4	B_5	B_6	B_7	B_8	B_9	B_{10}	B_{11}	B_{12}	B_{13}	B_{14}	B_{15}	B_{16}	B_{17}	T
45	132	M33x2deep18	126	ϕ 19	50.8	23.8	4–M10deep16	63	ϕ 19	50.8	23.8	4–M10deep16	29	ϕ 42	48	48	4–M10deep16	M18x1.5
55	132	M33x2deep18	126	ϕ 19	50.8	23.8	4–M10deep16	63	ϕ 19	50.8	23.8	4–M10deep16	29	ϕ 42	48	48	4–M10deep16	M18x1.5
63	156	M42x2deep20	150	ϕ 25	57.2	27.8	4–M12deep16	75	ϕ 25	57.2	27.8	4–M12deep16	35.5	ϕ 53	60	60	4–M12deep18	M18x1.5
80	156	M42x2deep20	150	ϕ 25	57.2	27.8	4–M12deep16	75	ϕ 25	57.2	27.8	4–M12deep16	35.5	ϕ 53	60	60	4–M12deep18	M18x1.5
107	165	M42x2deep20	160	ϕ 25	57.2	27.8	4–M12deep18	80	ϕ 25	57.2	27.8	4–M12deep18	35.5	ϕ 53	60	60	4–M12deep18	M18x1.5
125	195	M48x2deep22	190	ϕ 32	66.7	31.8	4–M14deep21	95	ϕ 32	66.7	31.8	4–M14deep21	42.2	ϕ 68	75	75	4–M16deep24	M22x1.5
160	195	M48x2deep22	190	ϕ 32	66.7	31.8	4–M14deep21	95	ϕ 32	66.7	31.8	4–M14deep21	42.2	ϕ 68	75	75	4–M16deep24	M22x1.5

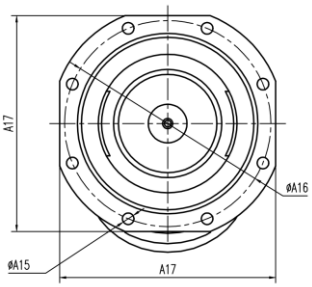
Dimensions Size

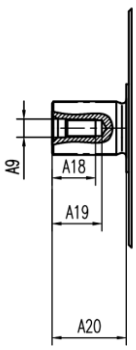


Size 200–250



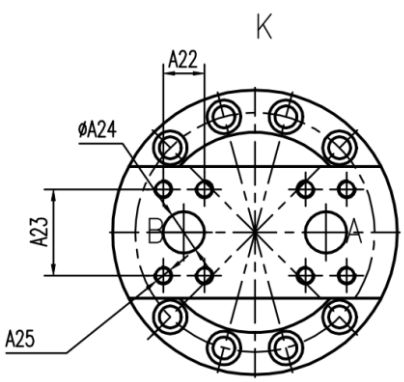
Size 355



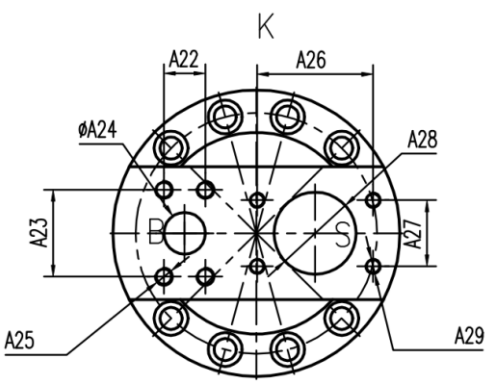


K direction

Rear cover type 1



Rear cover type 2



Size	α °	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8	A_9	A_{10}	A_{11}	A_{12}	A_{13}	A_{14}	A_{15}
200	21	380.8	25	120	134	9	224	53.5	50	M16	36	46	82	129	M22	22
250	26.5	381	25	120	134	9	224	53.5	50	M16	36	46	82	129	M22	22
355	26.5	419.7	28	140	160	14.5	280	64	60	M20	42	52	105	155	M33	18

Size	A_{16}	A_{17}	A_{18}	A_{19}	A_{20}	A_{21}	A_{22}	A_{23}	A_{24}	A_{25}	A_{26}	A_{27}	A_{28}	A_{29}	A_{30}	A_{31}
200	280	252	36	46	58	47	31.8	66.7	32	M14	88.9	50.8	63	M12	55	45
250	280	252	36	46	58	47	31.8	66.7	32	M14	88.9	50.8	63	M12	55	45
355	320	340	48	55	82	50	36.6	79.4	40	M16	88.9	50.8	63	M12	60	50

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