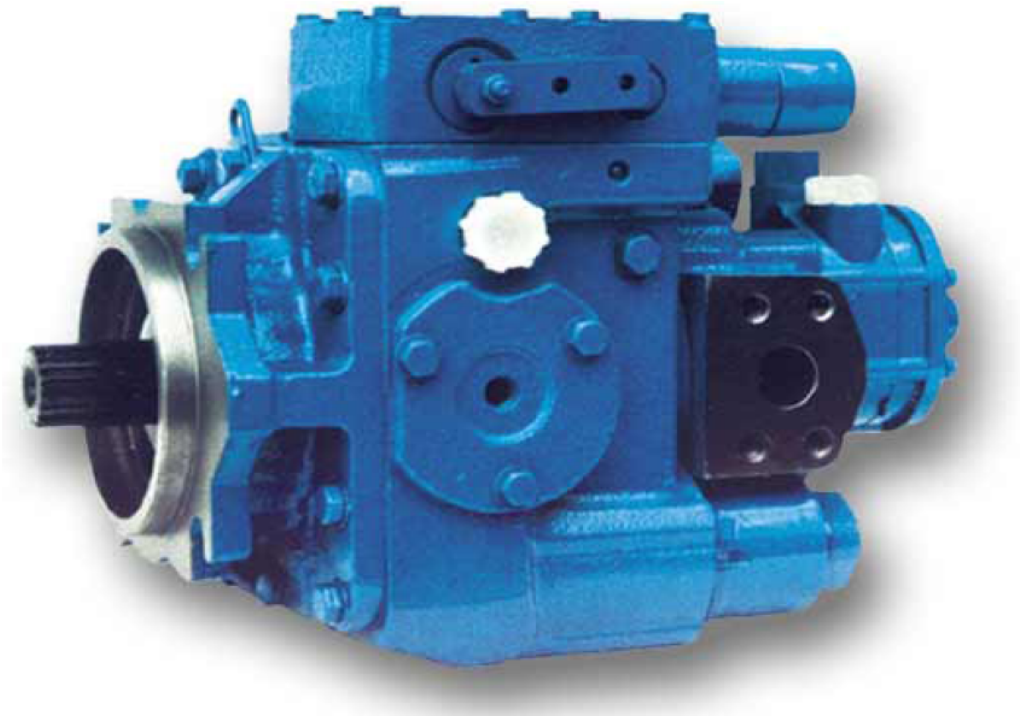
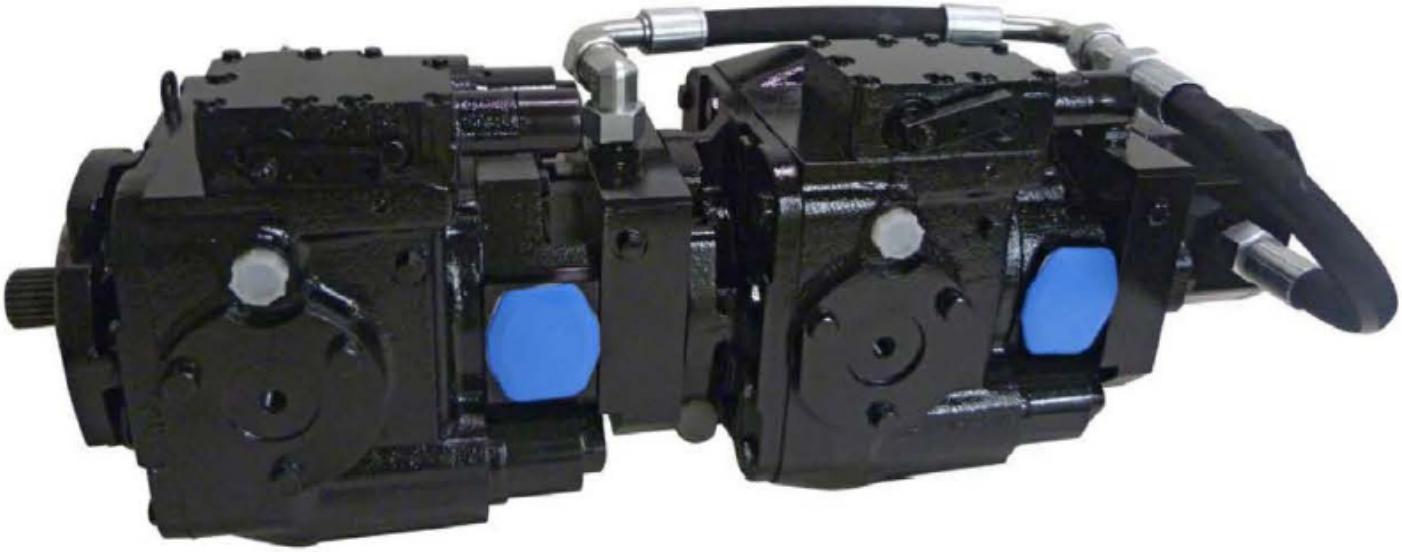
PV系列闭式变量柱塞泵

——适合于静液传动系统





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概述：

20系列轴向变量柱塞泵，采用斜盘结构，适用于闭式回路静液传动。流量正比于泵驱动速度，反过来，改变旋转斜盘的角度，可实现泵在零和最大排量之间无级调节。可调节控制手柄相对于0位的位置（左侧或右侧），来改变流体的方向，从而达到换向的目的。

液压 - 机械伺服排量控制装置保持或调节斜盘位置，因此泵排量控制手柄后的释放，旋转斜盘自动返回到零位位置和流量变为零。

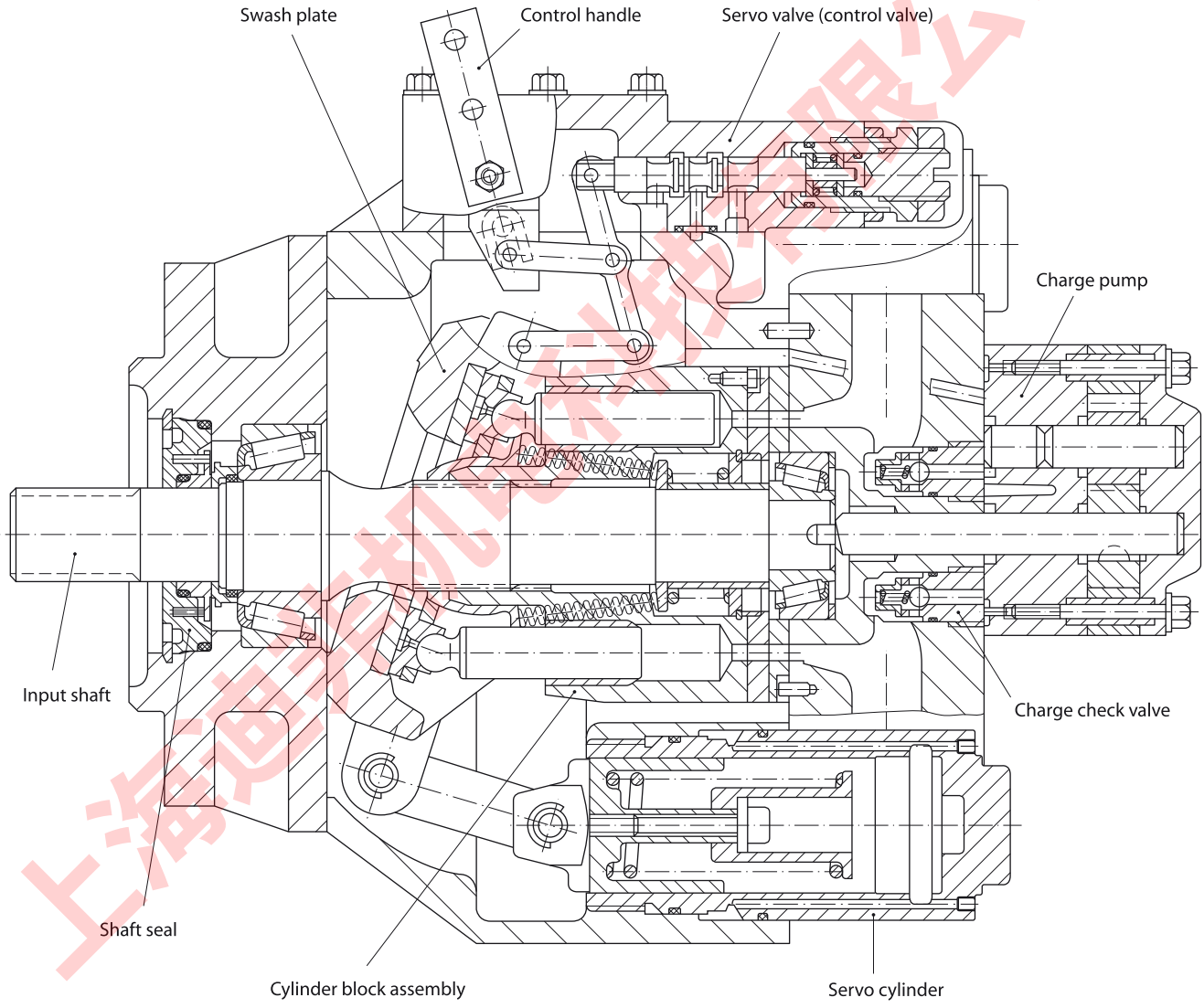




图2

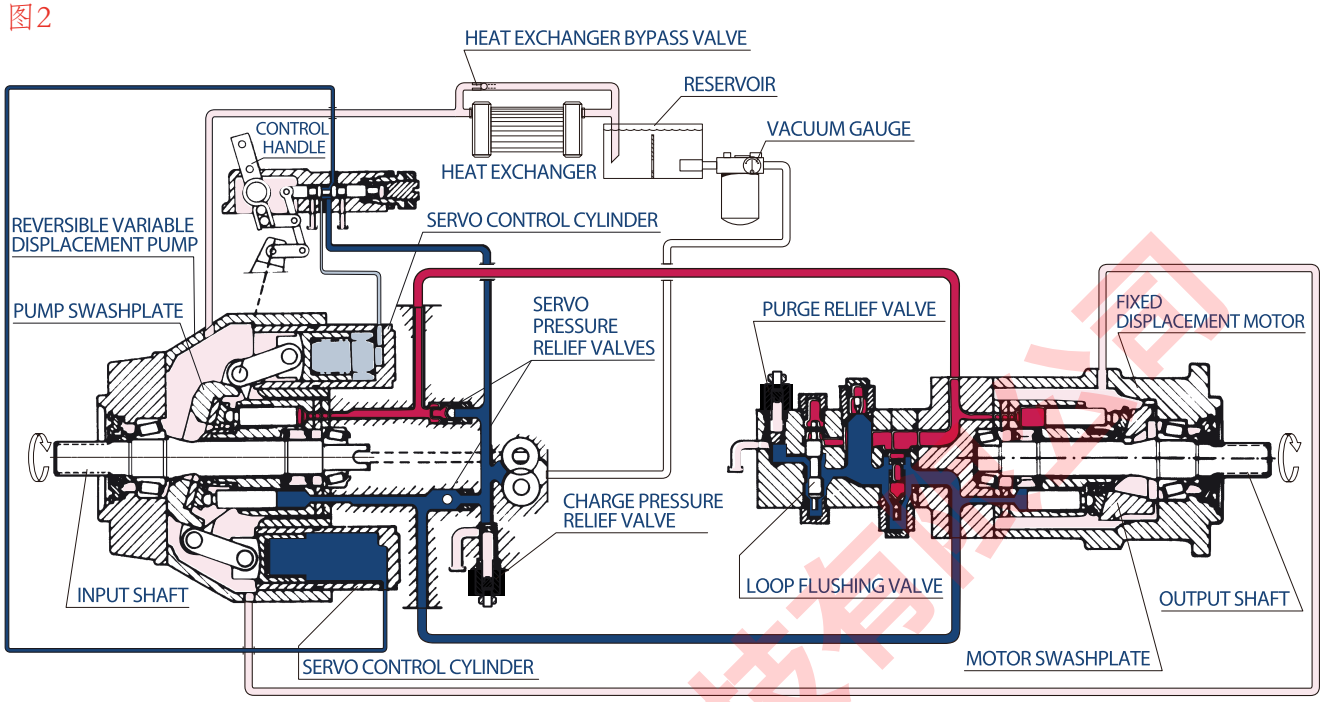
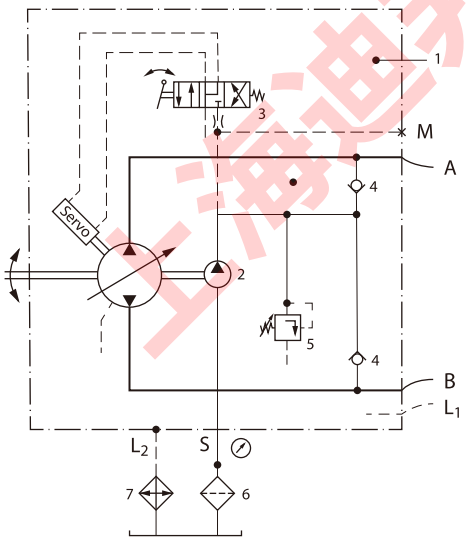


图2 为采用变量轴向柱塞泵和定量马达在闭式回路中的示例图。

Figure 2 shows schematically the function of hydrostatic transmission using an axial piston variable displacement pump and fixed displacement motor.



Designation:

1	=	Variable displacement pump | 变量泵
2	=	Charge pump | 补油泵
3	=	Servo control valve | 伺服控制阀
4	=	Charge check valve | 单向阀
5	=	Charge relief valve | 溢流阀
6	=	Filter | 过滤器
7	=	Heat exchanger | 热交换器

Ports:

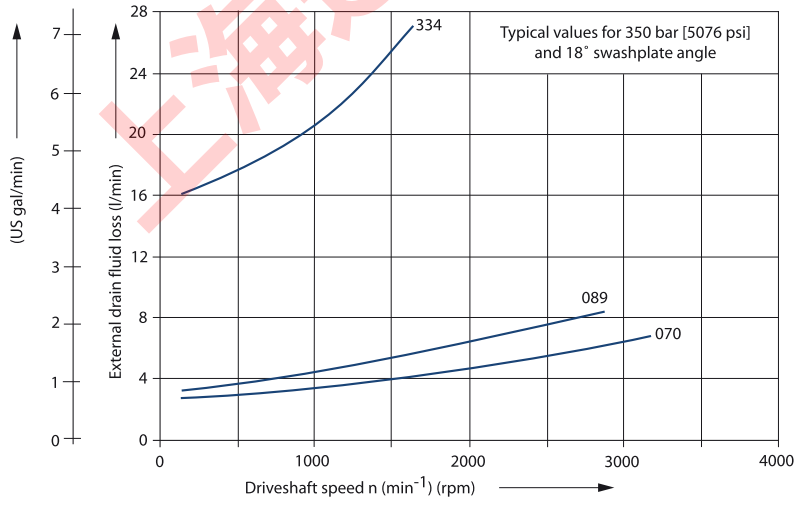
A, B	=	Main pressure ports | 主压力口 (working loop)
S	=	Suction port - charge pump | 补油泵吸油口
L1 , L2	=	Drain ports | 泄油口
M	=	Gauge port - charge pressure | 补油压力表端口

技术参数：

	Dimension	Frame size							
		20	21	22	23	24	25	26	27
每转最大排量	cm^3	33,30	51,60	69,80	89,00	118,70	165,80	227,30	333,70
最大流量	dm^3min^{-1}	119,54	159,96	196,14	230,51	278,94	348,18	429,59	557,28
补油泵每转排量	cm3	12,30	12,30	18,03	18,03	18,80	32,80	32,80	65,50
最大压力	MPa	35							
额定压力	MPa	21							
最大控制压力	MPa	3,5							
补油压力	MPa	0,8 - 2,0							
壳体最大压力	MPa	0,25 continuous 0,5 intermittent							
最大速度	min^{-1}	3590	3100	2810	2590	2350	2100	1890	1670
最小速度	min^{-1}	500							
额定速度	min^{-1}	1500							
流体工作的动态粘度范围 -starting |开始 -operating | 运转 -optimum |最佳	mm^2s^{-1}	1000 12-600 25-35							
液压油种类		mineral oil							
操作温度	°C	-40 to +50							
油箱中液压油最高温度	°C	80							
过滤精度	µm	10							
旋转方向		clockwise or counter clockwise							
斜盘最大倾斜角度	°	±18°							
重量	**kg**	**45**	**55**	**63**	**78**	**124**	**164**	**212**	**270**

+ for higher speeds contact our Application department | 更高速度的应用，请联系我们。

Figure 3. External drain fluid loss for frame sizes 20 – 23
Determination of nominal pump size



$$Q_e = \frac{V_g \cdot n \cdot \eta_v}{1000} \text{ (l/min)}$$

$$M_e = \frac{15{,}9 \cdot V_g \cdot \Delta p}{100 \cdot \eta_{mh}} \text{ (Nm)}$$

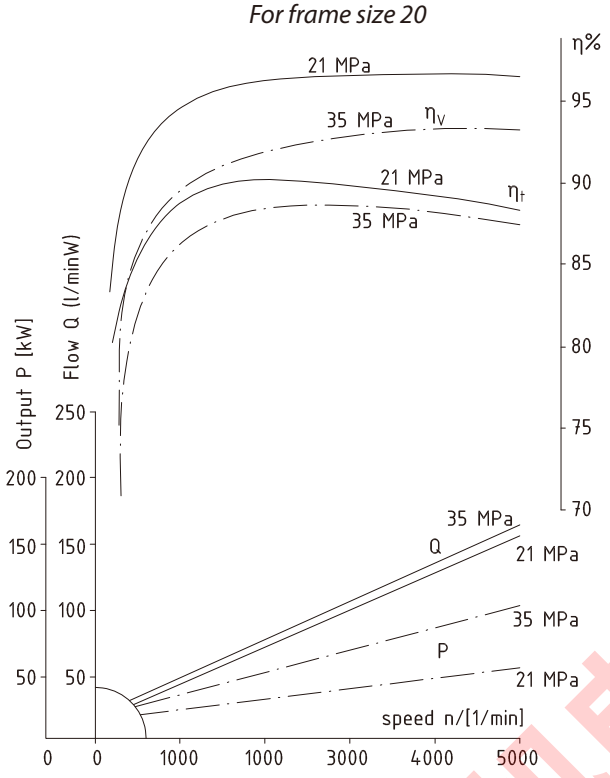
$$P_e = \frac{M_g \cdot n}{9550} = \frac{Q_e \cdot \Delta p}{600\ \eta_t}$$

V	displacement (cm3) per revolution
Δ_p	difference high and low pressure (MPa)
n	speed (min –1)
η_v	volumetric efficiency
η_{mh}	mechanical – hydraulic efficiency
η_t	total efficiency

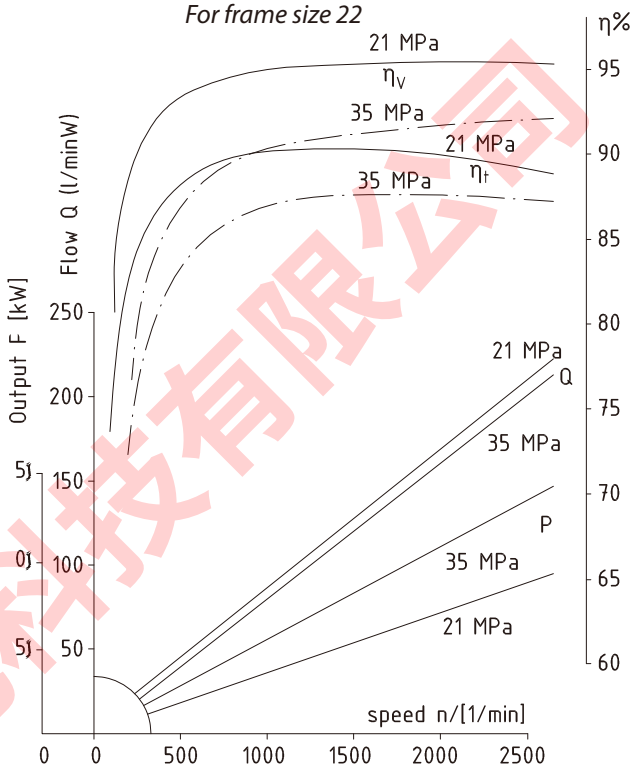
效率变化曲线实例,流量和输出速度.(在18度斜盘角度操作条件下)
EXAMPLES OF CURVES DEPENDENCES OF EFFICIENCY, FLOW AND OUTPUT ON THE SPEED.

(for operating condition of 18° swash plate angle)

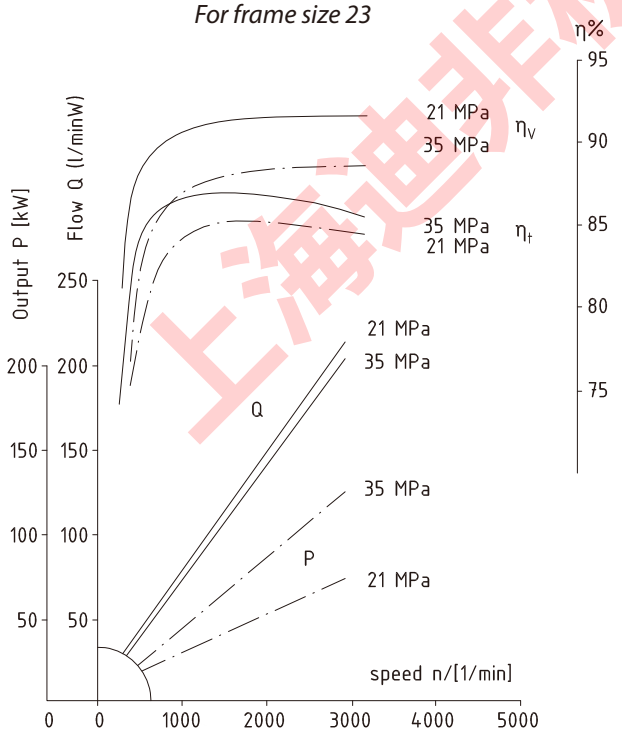
For frame size 20



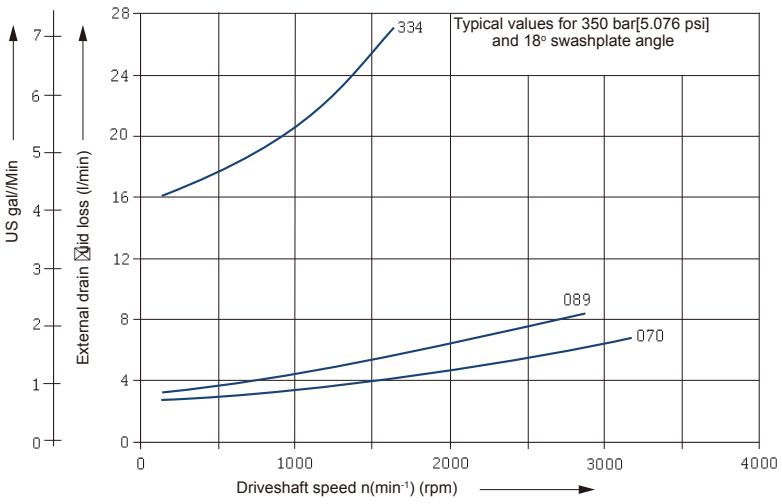
For frame size 22



For frame size 23



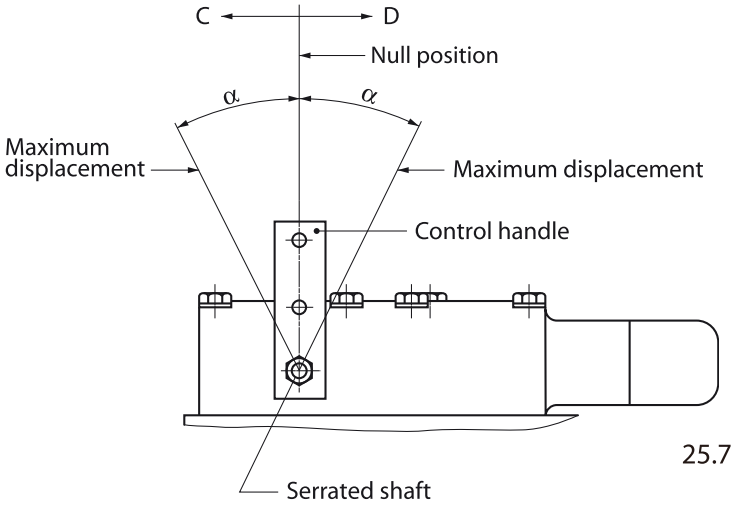
Preview 22-27



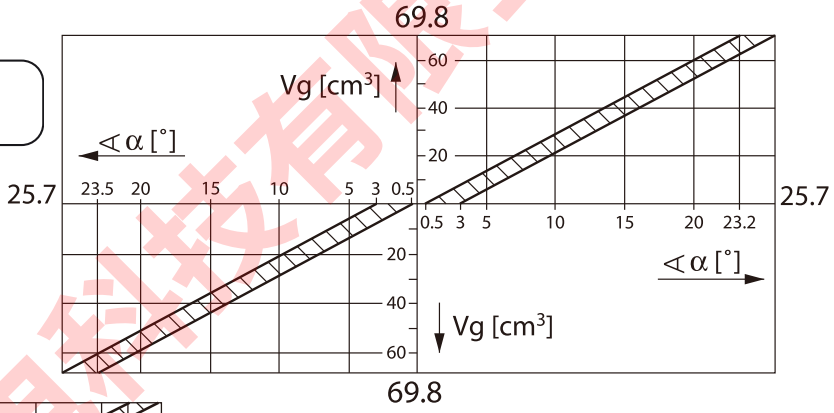
η_v – volumetric efficiency |容积效率
η_T – total efficiency | 总效率

伺服排量控制（线性响应）

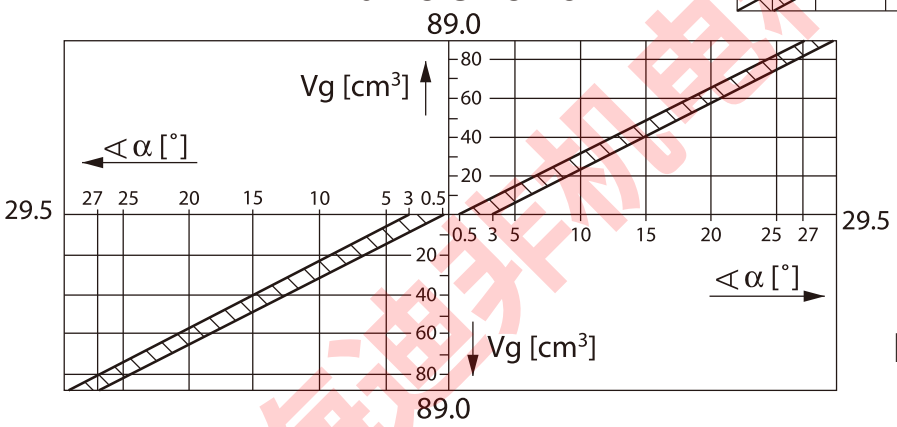
通过对伺服阀的控制手柄调节，通过伺服系统的帮助旋转斜盘可在两个方向上无级变化。控制手柄在任何位置,都能产生排量,可用图(5a-5c)确定.控制手柄行程释放和对行程的最终位置的角度可以在公差带（图5a-5c）的范围内变化。



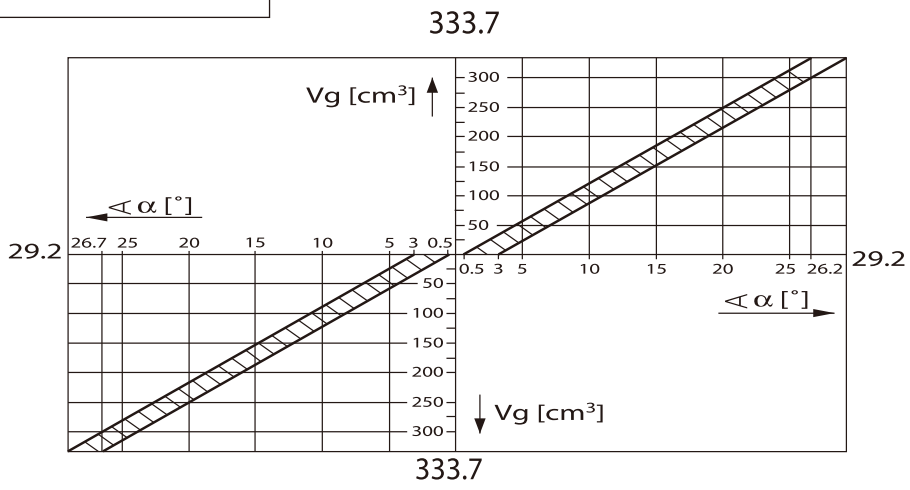
Frame size 22



Frame size 23



Frame size 27

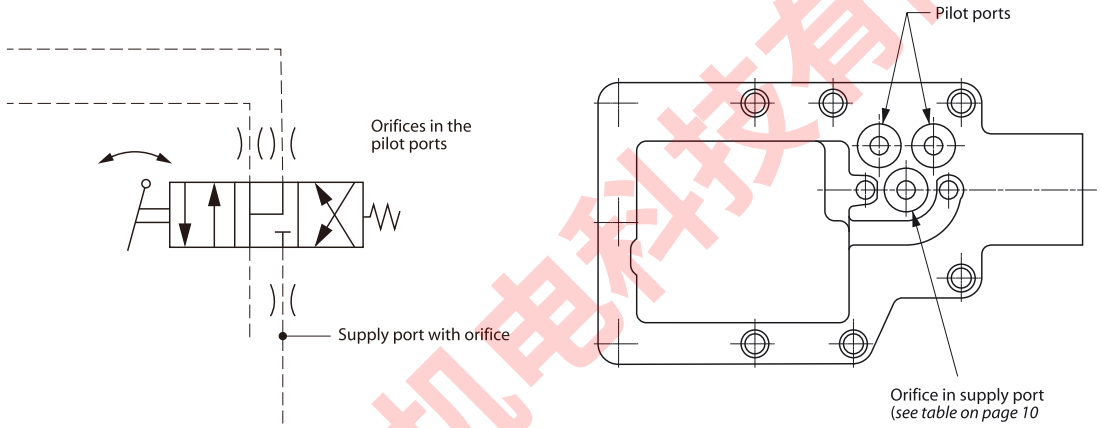


换向时间:

流量从最大Qmax到零再到最大Qmax的换向时间,取决于伺服阀供给口的阻尼孔的尺寸.给出的值是假定控制手柄的运动直接从一端向另一端。

手柄调节时间: < 最小反向时间
运转压力: 21 MPa
速度: 1450 rpm
粘度: 35 mm2.s-1

伺服阀与另外的阻尼口位置示意图



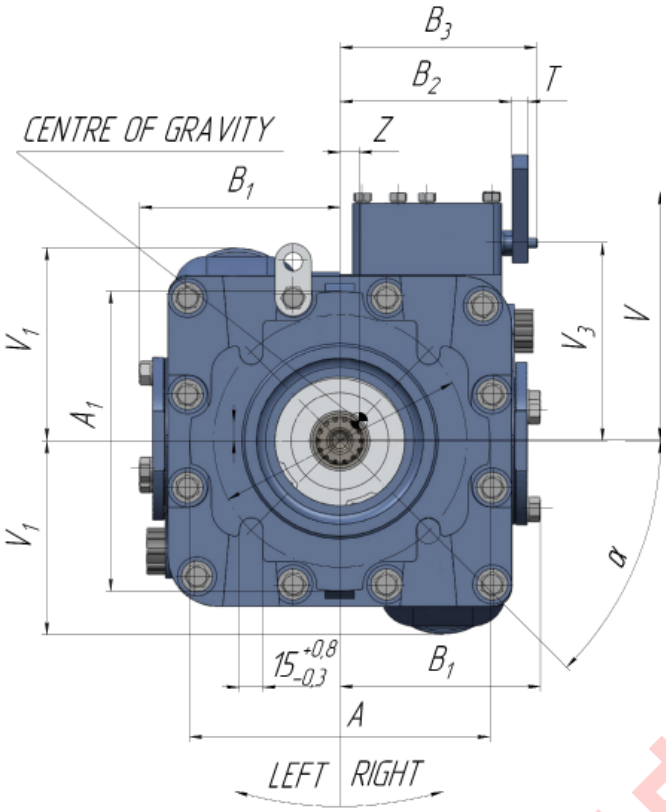
可以通过仅仅一路先导口插入阻尼口延迟这一路的换向时间.

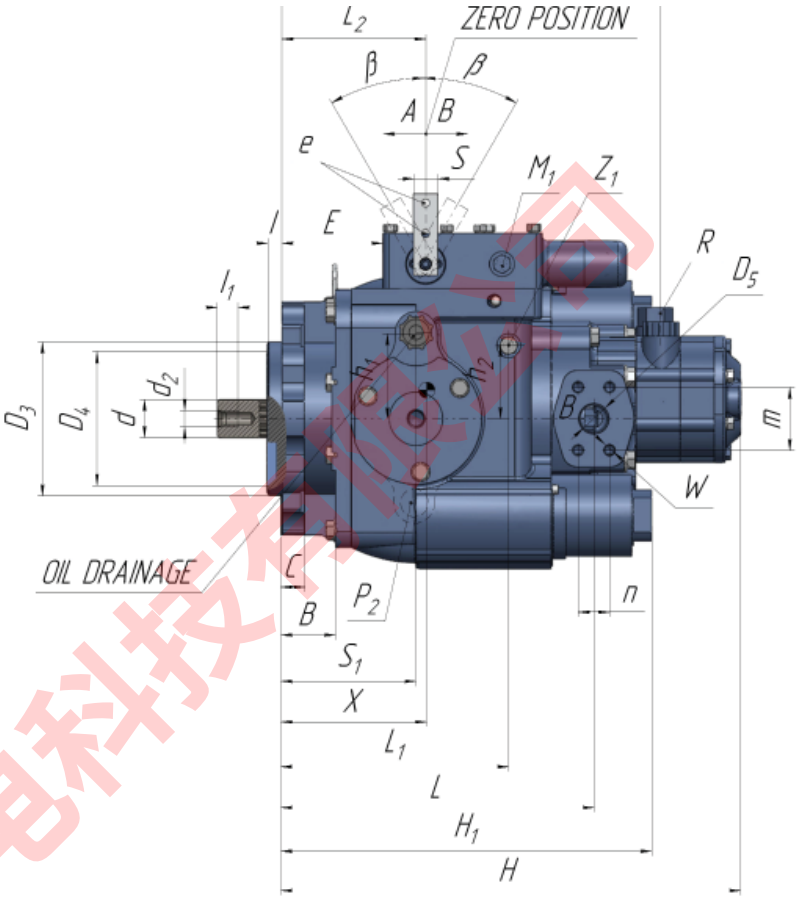
Table 2:

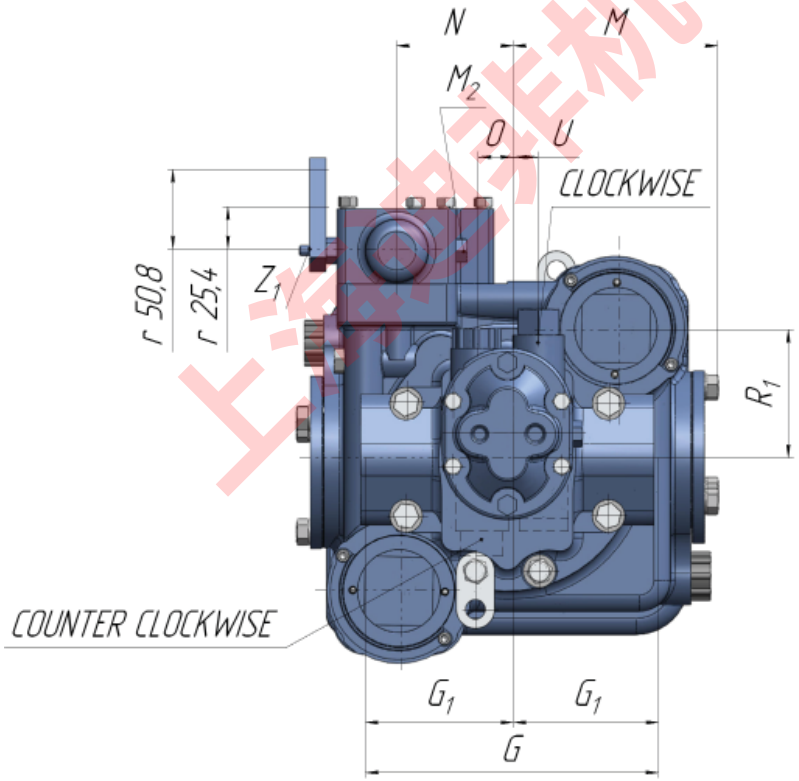
Frame size	Diameter of orifice (mm)	Reversing time (s)
20	0,76 1,05 1,60 without orifice	3,78 2,16 1,14 0,60
21	0,76 1,05 1,60 without orifice	4,14 2,34 1,20 0,66
22	0,76 1,05 1,60 without orifice	6,06 3,42 1,74 0,96
23	0,76 1,05 1,60 without orifice	6,24 3,54 1,80 1,02

Frame size	Diameter of orifice (mm)	Reversing time (s)
24	0,76 1,05 1,60 without orifice	10,20 5,82 2,88 1,68
25	0,76 1,05 1,60 without orifice	11,58 5,92 3,12 1,86
26	0,76 1,05 1,60 without orifice	29,70 16,20 7,50 3,78
27	0,76 1,05 1,60 without orifice	30,90 15,72 7,80 5,64

20系列轴向闭式变量柱塞泵外形尺寸图 PV20-PV23







伺服偏差控制杆 - 阀方向:
A:泵顺时针旋转,高压在A阻尼孔,
泵逆时针旋转,高压在B阻尼孔
B:泵顺时针旋转,高压在B阻尼孔,
泵逆时针旋转,高压在A阻尼孔

DIMENSIONS | 尺寸

Frame size	A	A_1	B	B_1	B_2	B_3	C	D	D_3	D_4	D_5	E	F +-0,4	G
20	190	146	47,6	112,7	100	122	56	162	$127^{0,005}$	84	25,4	56	15	163
21	191	146	48	124	110	131						70	15	172
22	194	194	48	133	113	135						83	15	172
23	194	194	49	150,8	123,8	146						90	15	190,4
24	213	204	70	167	132	153	75	229	152,4	98		133	21,3	213
25	286	254	80	174	142	162	77	317,5	165,1	98		160	21,3	260
26	285	240	81	197	153	174		317,5	165,1	110		180	21,3	287,4
27	300	274	86	212	172	193		350	177,8	114		208	27,7	317,4

Frame size	G1	H	H_1	H_2	H_3	L	L1	L_2	S	M	N	R_1	S_1
20	81,03	340	270	284	352	224	161,2	93,7	$19^{-0,25}$	94,7	55,6	68	100
21	86	358	282	301	367	246	174	106		108,7	65	68	107
22	86	381	311	314	381	256	188	119		112,7	68,3	68,3	111
23	95,2	395	320	327	395	270	194	127		127,6	77,8	68,3	117
24	106,5	498	377	412	510	318	239	169		146	87,3	76	148
25	130	560	423	457	560	366	264	196		153,7	97	76	171
26	143,7	584	451	486	614	388	283	215		170,3	108	76	162
27	158,7	656	475	578	656	433	311	244		187,2	127	76	198

Frame size	T	U	V	V_1	V_3	X	Y	Z	W	d	d_1	f
20	$9,4^{+0,2}$	19	152	113	115,9	159	3	3	3/8-16 UNC-2B	$34,5^{-0,17}$	M10-5 H	16
21			160	122	128,6	152	6,35	6,35				
22			165	123	128,6	146	9,5	9,5				
23			171	134	139,8	140	12,7	12,7		$37,68^{-0,18}$		17,5
24		21	186	154	152,3	173	14	14		44,03	M14-5 H	23,5
25			199	175	165,1	219	16	16	5/8-11 UNC-2B			
26			201	214	167,4	235	14,3	16,3				
27			225	216	190,5	246	17,5	17,5		64,66	M16	25

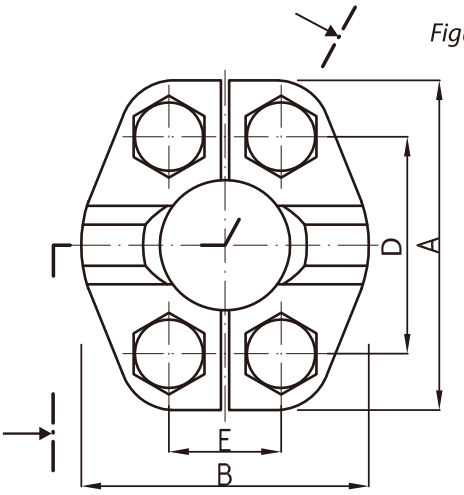
Frame size	e	h1	h2	k	l	l1	α	m	n
20	6,73	62	51,16	48	12,5	min20	45 °	52,4	26,2
21		68	54						
22		71,4	60,5						
23		77,7	65						
24		88,5	68,2	67	12,45	30			
25		98	74		15,6	30		79,4	36,5
26		100	79,4			36,7			
27		116	95,3			30			

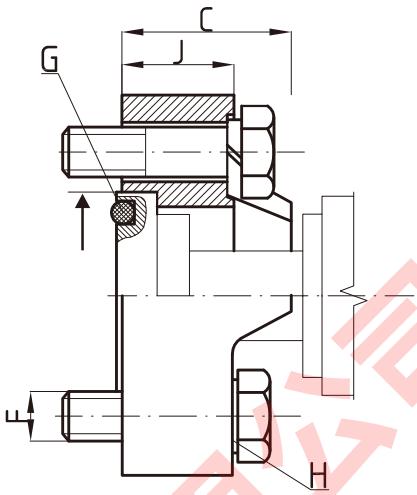
H – with charge pump 12 cm3
(sizes 20-23), 33 cm3 (size 25)

H3 – with charge pump 18 cm3
(sizes 20-23), 33 cm3 (size 24), 66 cm3 (size 25)

Frame size	Port A and B	$P_{1,2}$ drain	Port R gear pump	M_1, M_2, Z_2
20-24	SAE flange, 3000 psi 4 threads, 3/8-16 UNC-2B, 18 deep	7/8-14 UNF-2B	7/8-14 UNF-2B	7/16-20 UNF-2B, SAE straight thread „O"-ring boss
25	SAE flange, size $1^{1/2}$ 4 threads, 6000 psi, 5/8-11 UNC-2B, 35 deep	$1^{5/16}$ – 12 UN-2B	1 5/16 – 12 UN-2B	
26		1 7/8-12 UNF-2B SAE straight threads „O" ring boss	$1^{5/16}$ – 12 UN-2B	
27			SAE flange,size 1 1/4, 3000 psi, 4 threads 7/16-14 UNC-2B	

Figure 9: Hose flange

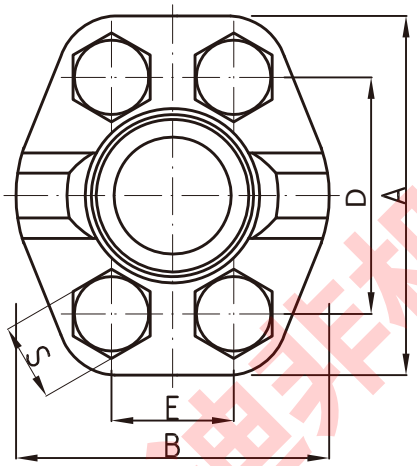


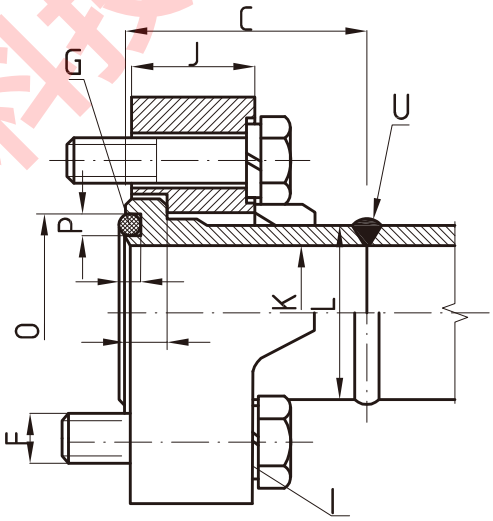


Dimensions /mm/:

Frame size	PSI	A	B	C	D-0,1	E-0,1	F	H	J
20-24	5.000 PSI-(Code 61)	81	70	35	52,40	26,20	3/8-16 UNC-2A	Washer 10,20	22,50
20-24	6.000 PSI-(Code 62)	81	70	35	56,37	27,94	7/16-14 UNC-2B	Washer 13,20	22,50
25-27	6.000 PSI-(Code 62)	112	95	46	79,40	36,50	5/8-11 UNC-2A	Washer 16,00	30,00

Firuge 10: Flange for piping





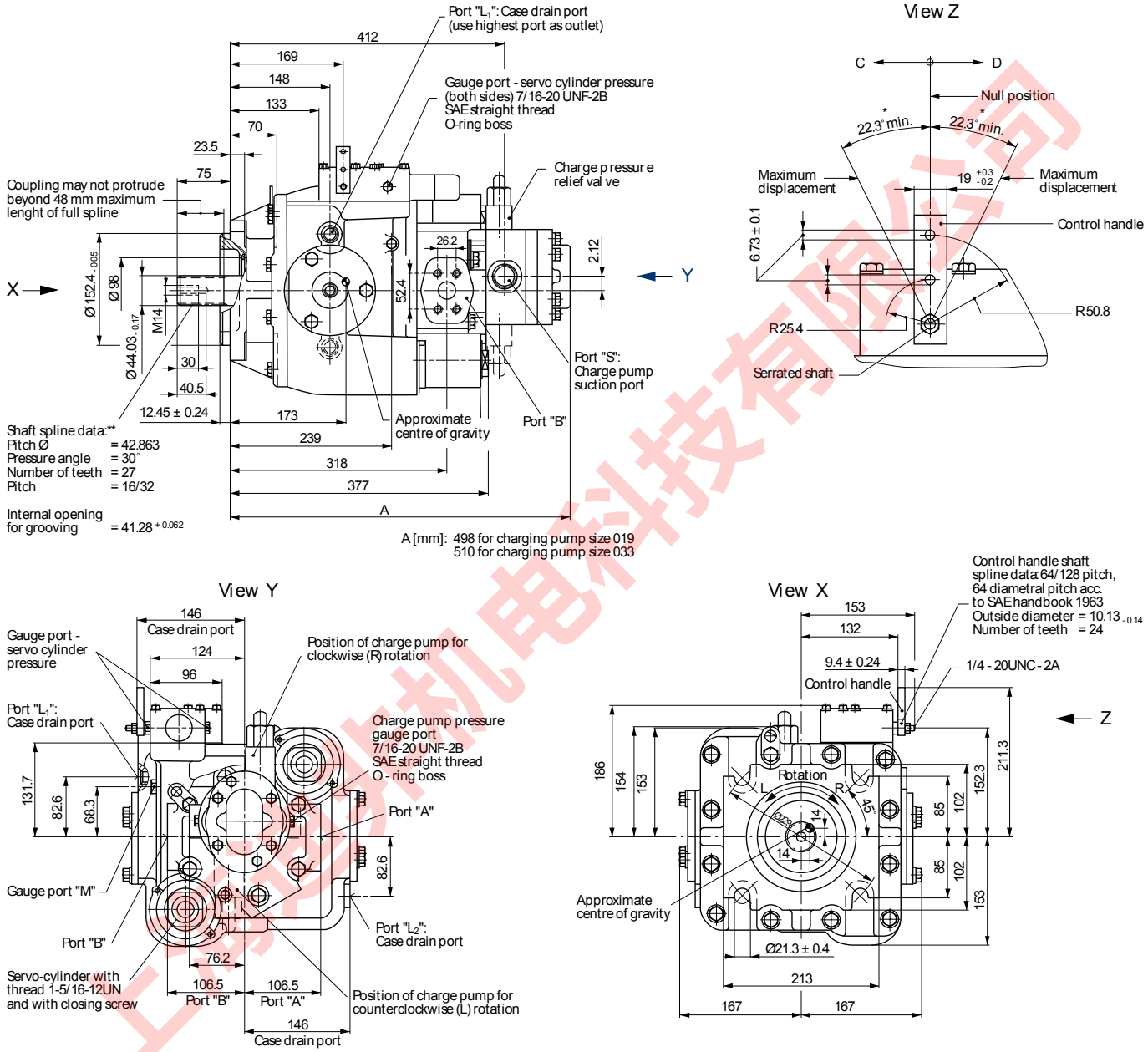
Dimensions /mm/:

Frame size	PSI	A	B	C	D-0,1	E-0,1	F	H	J
20-24	5.000 PSI-(Code 61)	81	70	40	52,40	26,20	3/8-16 UNC-2A	Washer 10,00	22,50
20-24	6.000 PSI-(Code 62)	81	70	35	56,37	27,94	7/16-14 UNC-2B	Washer 13,20	22,50
25-27	6.000 PSI-(Code 62)	112	95	46	79,40	36,50	5/8-11 UNC-2A	Washer 16,00	30,00

Frame size	PSI	K	L	M-0,1	N-0,1	O	P+0,2	U
20-24	5.000 PSI-(Code 61)	28	38	8,00	2,80	39,7 ± 0,05	4	V5-104
20-24	6.000 PSI-(Code 62)	28	38	8,00	2,80	39,7 ± 0,05	4	V5-104
25-27	6.000 PSI-(Code 62)	38	50	12,60	2,80	53,9 ± 0,01	4	V6-158

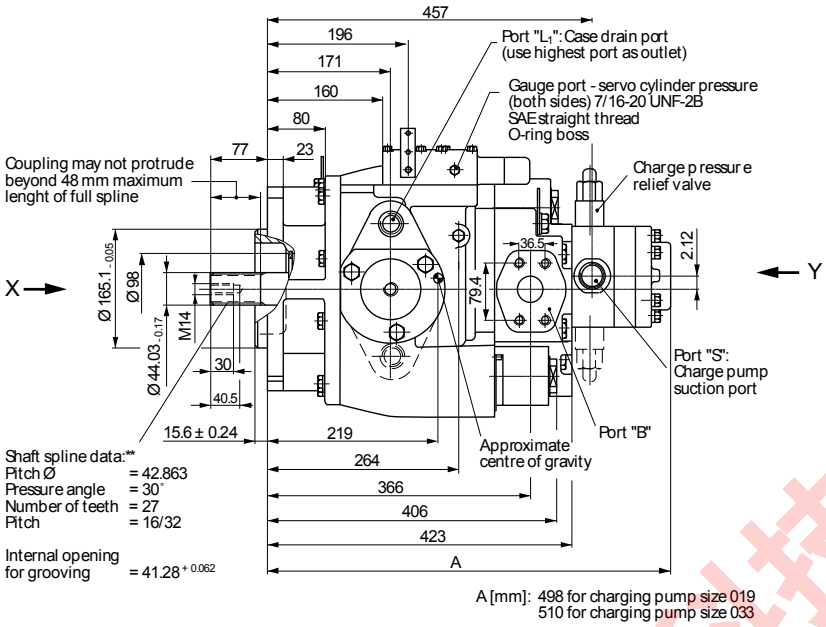
Note:
Flange according to SAE J 518 c
Frame size 20 – 24: size 1, 5000 psi, torque for screw tightening 3/8 – 16 UNC2A: 37 – 42 Nm
Frame size 25 – 27: size 1 1/2, 6000 psi, torque for screw tightening 5/8 – 11 UNC2A: 158 – 181 Nm

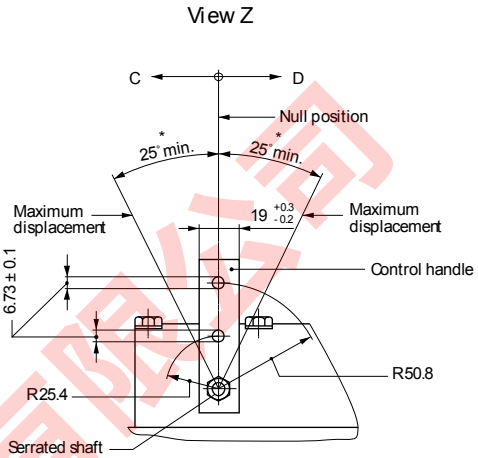
AXIAL PISTON VARIABLE PUMP PV24

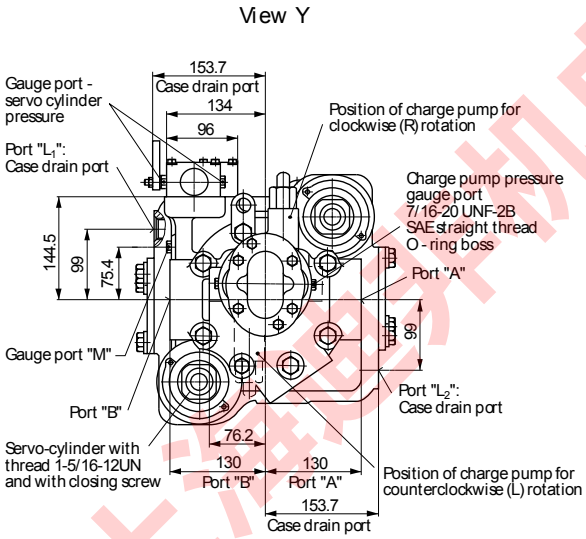


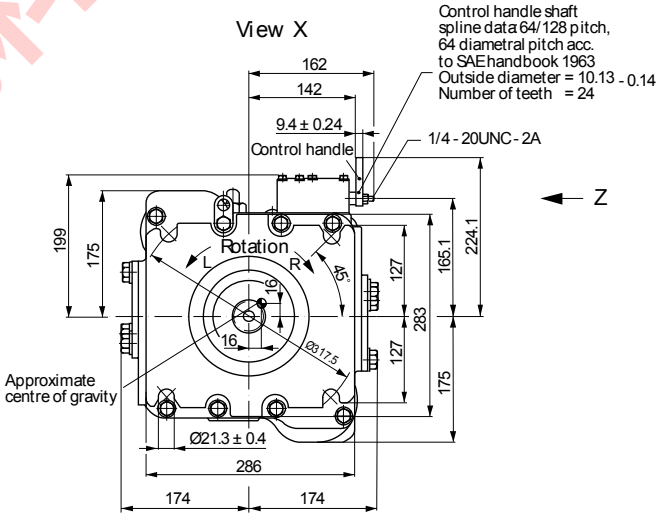
Frame size	Port A and B	Port L_1 and L_2	Port S	Port M
119	SAE flange, size 1 SAE split flange boss 5000 psi, 4 threads 3/8-16 UNC-2B 18 deep	7/8-14 UNF-2B SAE straight thread O-ring boss	1 5/16-12 UNF-2B SAE straight thread O-ring boss	7/16-20 UNF-2B SAE straight thread O-ring boss

AXIAL PISTON VARIABLE PUMP PV25



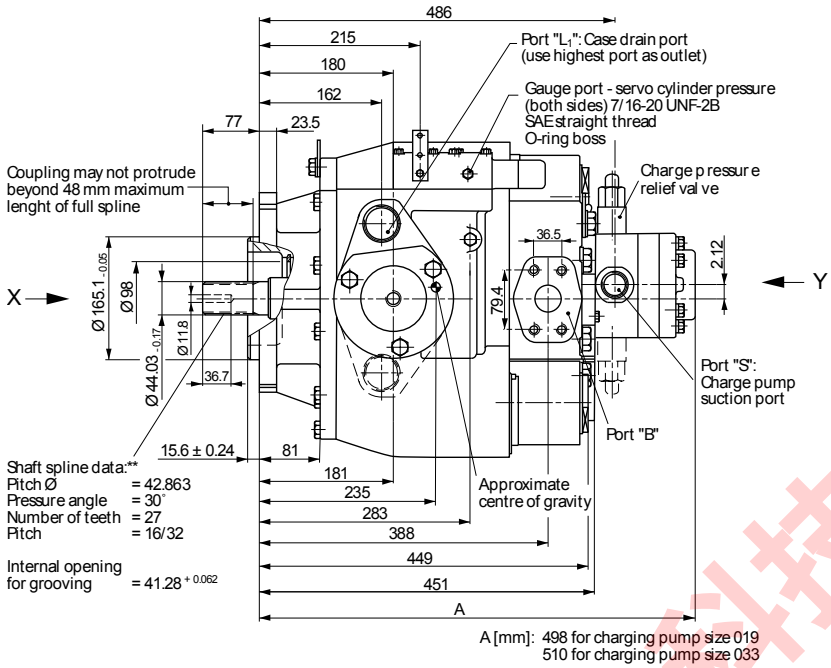


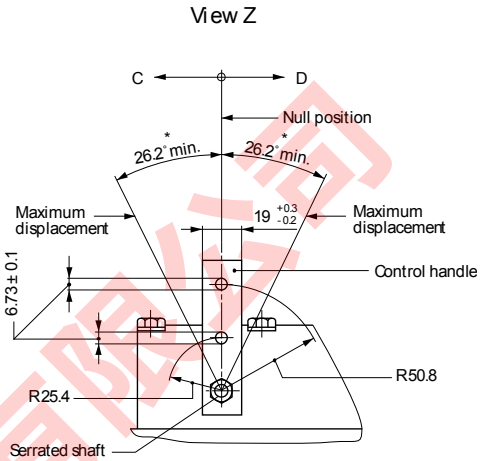


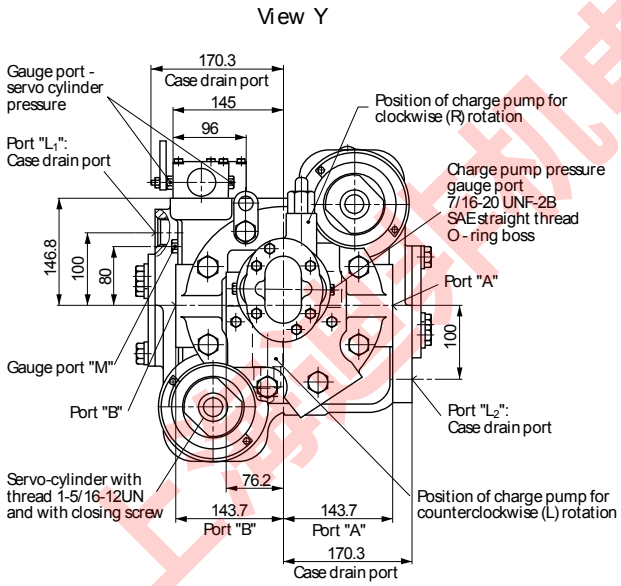


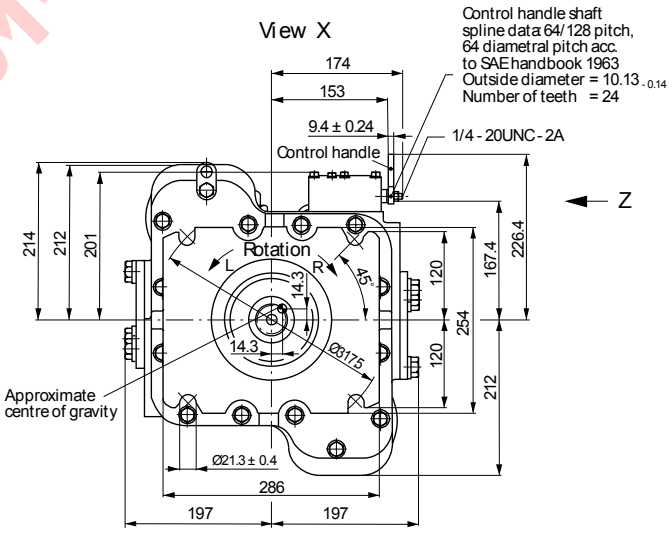
Frame size	Port A and B	Port L_1 and L_2	Port S	Port M
166	SAE flange, size 1 1/2 SAE split flange boss 6000 psi, 4 threads 5/8-11 UNC-2B 35 deep	1 5/16-12 UNF-2B SAE straight thread O-ring boss	1 5/16-12 UNF-2B SAE straight thread O-ring boss	7/16-20 UNF-2B SAE straight thread O-ring boss

AXIAL PISTON VARIABLE PUMP PV26



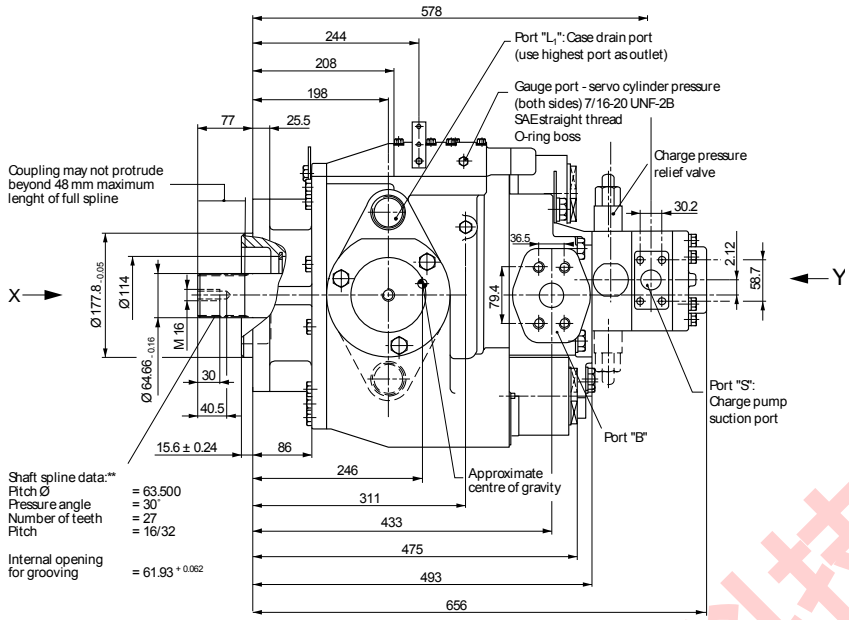


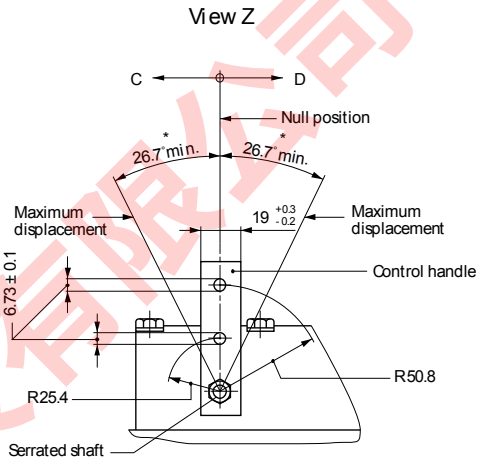


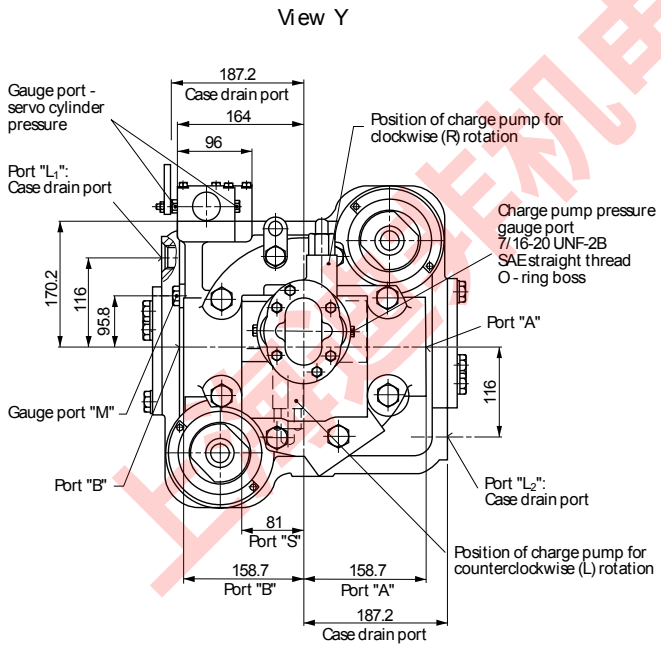


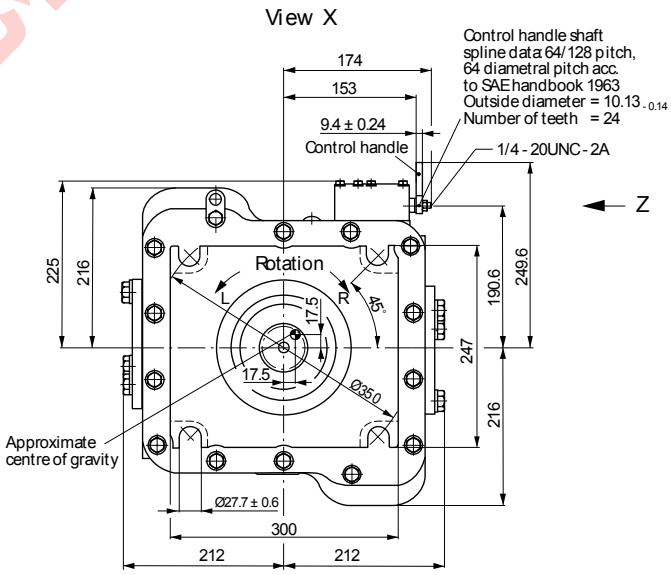
Frame size	Port A and B	Port L_1 and L_2	Port S	Port M
227	SAE flange, size 1 1/2 SAE split flange boss 6000 psi, 4 threads 5/8-14 UNC-2B 35 deep	1 7/8-12 UNF-2B SAE straight thread O-ring boss	1 5/16-12 UNF-2B SAE straight thread O-ring boss	7/16-20 UNF-2B SAE straight thread O-ring boss

AXIAL PISTON VARIABLE PUMP PV27









Frame size	Port A and B	Port L_1 and L_2	Port S	Port M
27	SAE flange, size 1 1/2 SAE split flange boss 6000 psi, 4 threads 5/8-11 UNC-2B 35 deep	1 7/8-12 UNF-2B SAE straight thread O-ring boss	SAE flange, size 1 1/4 SAE split flange boss 3000 psi, 4 threads 7/16-14 UNC-2B 28 deep	7/16-20 UNF-2B SAE straight thread O-ring boss

TYPE DESIGNATION | 型号命名

1	2	3	4	5	6	7	8	9	10
PV	XX	XXX	X	X	X	XX	XX	XX	XXX

1.

PV	变量泵

2.

最大排量 $V_{g\,max}$ (cm^3)	
20	**33**
21	**52**
22	**70**
23	**90**
24	**119**
25	**166**
26	**227**
27	**334**

3.

XXX	控制类型

4.

R	顺时针 CW	旋转方向
L	逆时针 CCW	
V	可逆	

5.

输入轴尺寸	
A	14 teeth, 12/24 PITCH φ31,20
B	19 teeth, 16/32 PITCH φ31,75
C	21 teeth, 16/32 PITCH φ34,50
D	23 teeth, 16/32 PITCH φ37,68
E	27 teeth, 16/32 PITCH φ44,03
F	40 teeth, 16/32 PITCH φ64,66
G	3 teeth, 8/16 PITCH Φ43,71
I	20 teeth, 16/32 PITCH φ32,91
J	cone 1:8, SAE J501, 41,27
K	cone 1:8, SAE J501, 31,75
L	parallel with key 34,925;
M	parallel with key 44,45;
P	15 teeth, 16/2 PITCH, 25,40
R	13 teeth, 16/32 PITCH, 21,80

6.

高压端口尺寸		Thread
A	SAE J518c, code 62, size 1", 6000PSI	7/16"-14 UNC-2A
B	SAE J518c, code 61, size 1", 5000PSI	3/8"-16 UNC-2A
C	ISO 6162, DN 25, type II, 40 MPa	M12
D	SAE J518c, code 62, size 3/4", 6000PSI	3/8"-16 UNC-2B
E	SAE J518c, code 61, size 3/4", 5000PSI	3/8"-16 UNC-2B
F	ISO 6162, DN 19, type II, 40 MPa	M10

7.

补油泵 Vg	
A	8,2 cm^3
B	12,3 cm^3
C	18,03 cm^3
D	18,85 cm^3
F	65,5 cm^3
NN	without charge pump
AA	8,2 + 8,2 cm^3
BA	12,3 + 8,2 cm^3
CA	18,3 + +8,2 cm^3

8.

齿轮泵压力设定		
13	1.3 MPa (1.3 ±0.05 MPa at 3.8 $dm^3 .min^{-1}$)	•
XX	other	°
00	without charge pump	°

Other values according to mutual agreement, max 3,5 MPa

9.

阻尼孔		
A	0,76 mm	°
B	0,91 mm	°
C	1,05 mm	•
D	1,36 mm	°
E	1,6 mm	°
N	without orifice	°
1	orifice in channel "P"	•
2	orifice in channel "A","B"	°
3	orifice in channel "P","A","B"	°
4	orifice in channel "A"	°
5	orifice in channel "B"	°
6	orifice in channel "P","A"	°
7	orifice in channel "P","B"	°
0	without orifice	°

10.

000	特殊	•
XXX	特殊产品代码	°

° - available | 可用
• - standard design|标准

TYPES OF CONTROLS | 控制类型

WITHOUT CONTROL DEVICE | 不带控制装置

AAA	- without the mechanical-hydraulic servo valve, with top cover only | 不带机械-液压伺服阀,只带端盖.
BBB	- without the mechanical-hydraulic servo valve, with joining piece and cover | 不带机械-液压伺服阀,带连接件和端盖.

MECHANICAL - HYDRAULIC | 机械-液压

MHx **0**	- mechanical-hydraulic servo valve | 机械液压伺服阀 - standard | 标准配置
MBx **0** **1** **2**	- mechanical-hydraulic servo valve with a neutral position switch | 开关 机械液压伺服阀带空档位置 - empty | 空 - electric control; voltage 12V = | 12V电控 - electric control; voltage 24 V = | 24V电控
MCx **0** **1** **2**	- mechanical-hydraulic servo valve with straightway valve - hydraulic control |液压控制 机械液压伺服阀带直通阀 - electric control; voltage 12V = |12V电控 - electric control; voltage 24 V = |24V电控
MDx **0** **1** **2**	- MBx + MCx - hydraulic control - electric control; voltage 12V = - electric control; voltage 24 V =

ELECTRICAL - HYDRAULIC | 电液控制

EHx **0** **1** **2**	- electro-hydraulic servo valve | 电液伺服阀 - empty - MOOG - NC Servo
EVx **0** **1** **2**	- three-positional distributor + pressure reducing valve (proportional) 三位换向阀+比例减压阀 - empty - electric control; voltage 12V = - electric control; voltage 24 V =
ERx **0** **1** **2** **3** **4** **5** **6** **7** **8** **9**	- mechanical-hydraulic servo valve with straightway valve - hydraulic control 机械液压伺服阀带直通阀 - electric control; voltage 12V =, D_n 6 mm - electric control; voltage 24 V =, D_n 6 mm - electric control; voltage 12 V =, D_n 4 mm - electric control; voltage 24 V =, D_n 4 mm

HYDRAULIC | 液压

PHx **0** **1**	- hydraulic - direct - empty

AUTOMATIC | 自动控制

PRx **H** **1** **2** **3** **4** **5** **6** **7** **8** **9**	- automatic direct regulation - constant power - hydraulic control 自动直接调节 - 恒功率 - electric control; voltage 12V =, D_n 6 mm - electric control; voltage 24V =, D_n 6 mm - electric control; voltage 12V =, D_n 4 mm - electric control; voltage 24V =, D_n 4 mm
Qxx **M** **H** **0** **1** **2** **3** **4** **5** **6** **7** **8** **9** **P** **1** **2** **3** **4** **5** **6** **7** **8** **9** **0**	- automatic control - constant rate of flow 自动控制- 恒流 - mechanical-hydraulic servo valve - hydraulic control - empty - electric control; voltage 12V =, D_n 6 mm - electric control; voltage 24V =, D_n 6 mm - electric control; voltage 12V =, D_n 4 mm - electric control; voltage 24V =, D_n 4 mm - pneumatic control - rate of flow up to 10 l . min^{-1} - rate of flow up to 20 l . min^{-1} - rate of flow up to 30 l . min^{-1} - rate of flow up to 40 l . min^{-1} - rate of flow up to 50 l . min^{-1} - rate of flow up to 60 l . min^{-1} - rate of flow up to 70 l . min^{-1} - rate of flow up to 80 l . min^{-1} - rate of flow up to 90 l . min^{-1} - rate of flow up to 100 l . min^{-1} and higher
Rxx **M** **H** **0** **1** **2** **3** **4** **5** **6** **7** **8** **9** **1** **2** **3** **4** **5** **6** **7** **8** **9**	- automatic control - constant pressure 自动控制-恒压 - mechanical-hydraulic servo valve - hydraulic control - empty - electric control; voltage 12V =, D_n 6 mm - electric control; voltage 24V =, D_n 6 mm - electric control; voltage 12V =, D_n 4 mm - electric control; voltage 24V =, D_n 4 mm - pressure value 5 MPa - pressure value 10 MPa - pressure value 15 MPa - pressure value 20 MPa - pressure value 25 MPa - pressure value 30 MPa - pressure value 35 MPa - pressure value 40 MPa - on request

TANDEM VARIABLE PUMP SERIES 20

串联闭式变量柱塞泵

Design

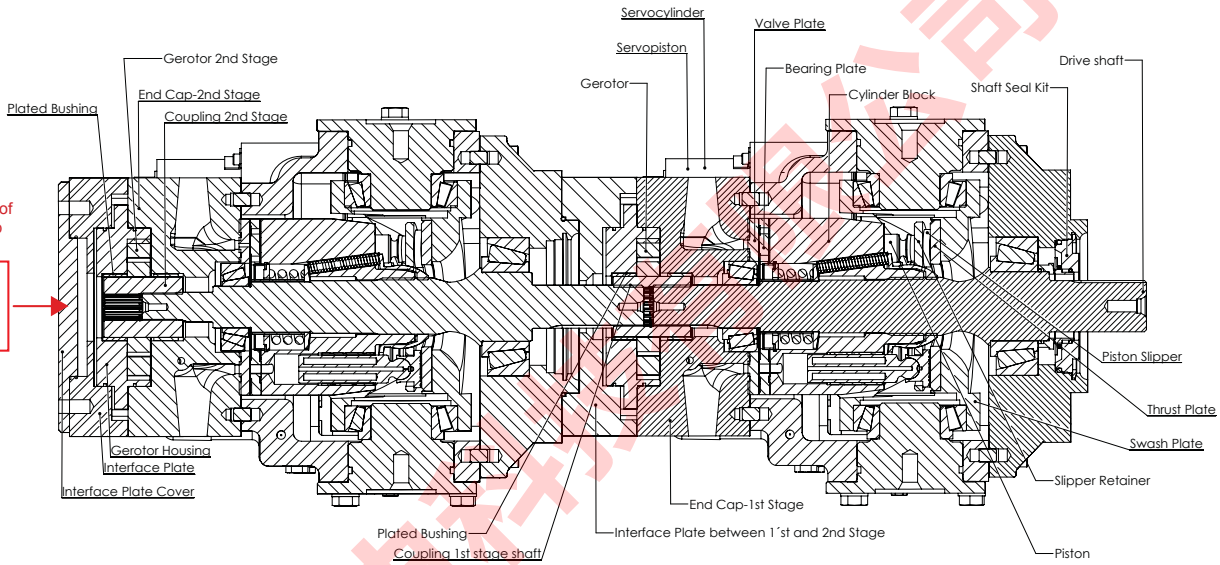
Difei Series 20 closed circuit piston pump - TANDEM VERSION, is the hydrostatic transmission, which converts input torque, coming from the engine PTO shaft into the hydraulic power. Rotational force is transmitted through the input shaft, to the cylinder block. The input shaft is supp-orted by bearings at the front and rear part of the pump and is splined into the cylinder block. A shaft seal at the front end of the pump, prevents leakage where the shafts exits the pump housing. The spinning cylinder block, contains 9 (nine) reciprocating pistons. Each piston has a brass slipper, connected at one end by a ball joint. The slippers are held to the swash plate by a spring washer and charge pressure. The reciprocating movement of the pistons occurs as the slippers slide against the inclined swasplate, during rotation. Via the valve plate, one half of the cylinder block is connected to low pressure and the other half to the high pressure. As each piston cycles in and out of its bore in the cylinder block, fluid is reple-nished by charge flow, suplied by the gerotor assembly, and displaced to the outlet thereby transferring hydraulic power into the system. A small amount of flused for cooling. case drain ports return this fluid to the resorvoir. The volume of the fluid is controlled by the angle of the swashplate. The swashplate is forced into an inclined position (into stroke) by the servopiston.The pump control, by varying the pressure at the servopiston, controls the displacement of fluid in the system circuit.

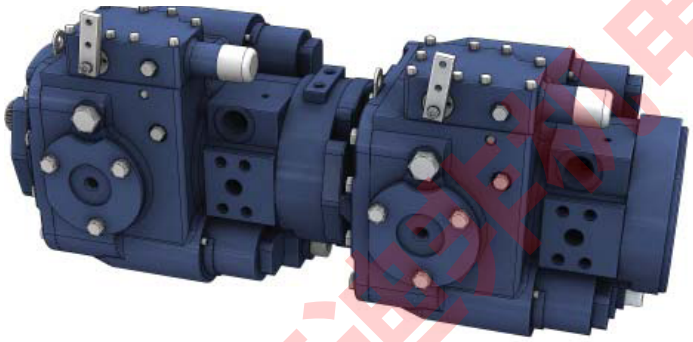
迪非20系列闭式变量串联柱塞泵，适用于静液传动，将从发动机输出轴或取力器输入的扭矩转换成液压能，旋转力通过输入轴传递至柱塞。输入轴在泵的前面和后面部分由轴承支撑，并通过花键进入柱塞。轴密封在泵的前端，当轴离开泵壳时防止泄漏，花键轴通过斜盘链接9个往复柱塞，每个活塞具有黄铜滑靴，通过球窝接头的一端连接。滑靴通过弹簧垫片保持在斜盘上从而使泵产生压力。通过斜盘的旋转柱塞在滑靴里往复滑动。通过阀板，其中一半活塞连接到低压，另一半连接到高压。每个活塞在其缸体中周期往复，流体通过补油齿轮泵补充，通过泵的出口传递液压能至液压系统中。少量的液体被允许从柱塞/配油盘及滑靴/斜盘接口流动以散热和润滑，同样多余的流量通过溢流阀用于冷却。壳体卸油口将多余的流量返回油箱。流量是通过斜盘的角度来控制的，斜盘被伺服油缸强迫固定在某一个角度，通过改变伺服油缸的压力，控制泵的排量。

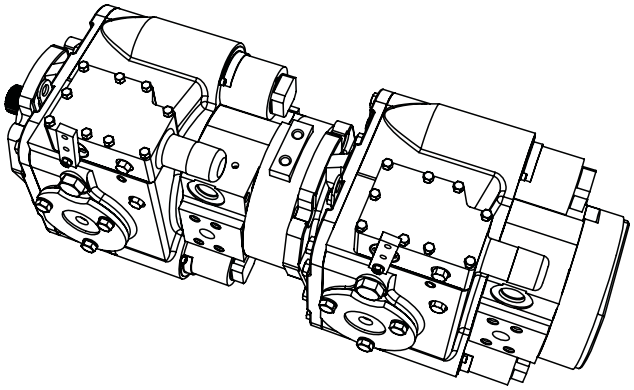
齿轮泵最大的特性之一
One of the most important features of Gerotor Assembly Hydraulic Pump

Optional Connection for another Hydraulic Pump, Charge Pump/ Application - **all on ONE AXLE**

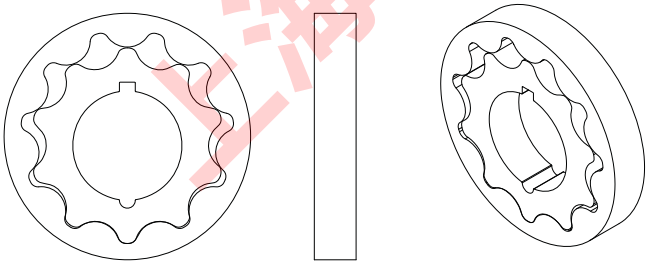
可选连接其他的液压泵，补油泵/应用-所有的泵同轴







Ep Gerotor Assembly - for PV 23(90ccm)-26,21 ccm/rev

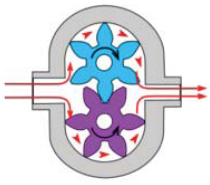


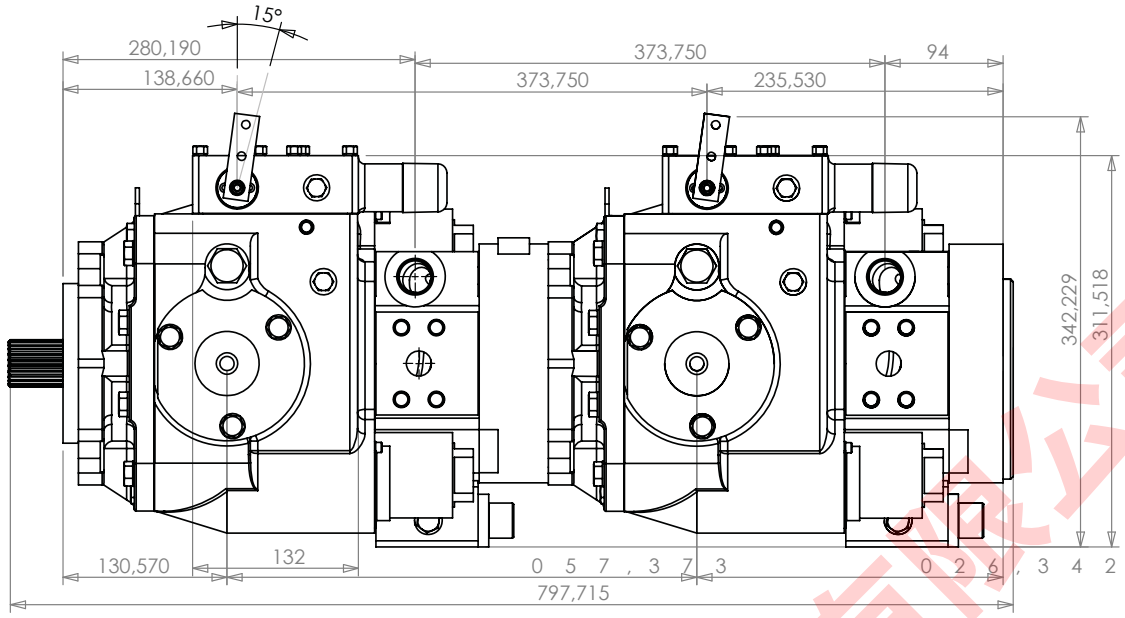
Tandem Pump is comprised of two identical rotating groups, that are designed to pump fluid into the hydraulic system/mechanism. Each rotating group is used to produce a specific volumetric displacement per revolution of the input shaft. Used together , these two rotating groups produce twice the volumetric flow rate as compared to a single rotating group. Tandem alignment of the hydraulic pumps is the connection of the two/or more hydraulic pumps, consecutively, on one axle, which is connected through the coupling directly to the combustion or an electrical engine. This type of the connection, saves the costs, as there is no need to use additional axle drive assembly.

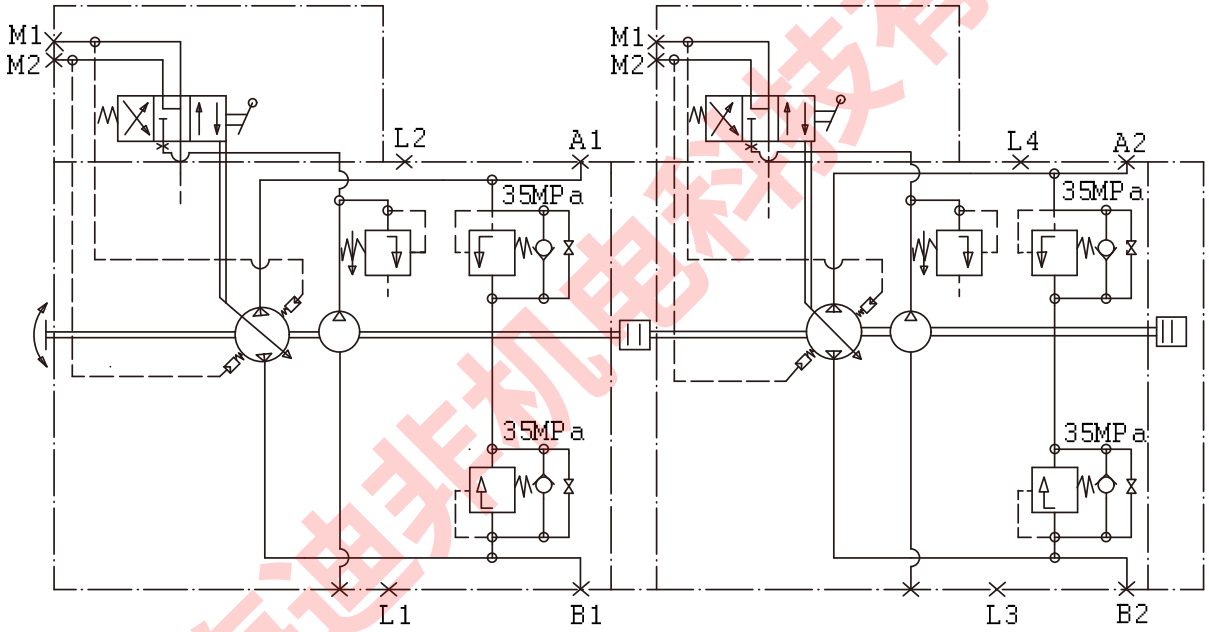
串联泵是由两个相同的泵件组成，输入轴旋转，每一个泵都产生特定的排量，两组泵总共产生两倍的单泵排量。所述液压泵的串联排列是2/或多个液压泵，连续地，同轴，通过直接连接一起。这种类型的连接，节省成本，因为没有必要使用附加的轴驱动组件。

标准式补油泵
Standard Charge Pump

转子时补油泵
Gerotor Charge Pump







Available Sizes PV	HYDRAULIC PISTON PUMPS- "TANDEM" version					
	Displacement [ccm/rev]	Nominal Pressure [Mpa]	Max Speed [Rpm]	Power [kW]	Weight [kg]	Charge Pump Ass´y [cc/rev]
PV20+PV20	33.3+33.3	35	3590	139,40	90,00	12,30x2
PV21+PV21	51.6+51.6	35	3100	186,60	110,00	12,30x2

Available Sizes PV	HYDRAULIC PISTON PUMPS-"TANDEM" version					
	Displacement [ccm/rev]	Nominal Pressure [Mpa]	Max Speed [Rpm]	Power [kW]	Weight [kg]	Gerotor Ass´y [cc/rev]
PV22+PV22	69.8+69.8	35	2810	228,80	126,00*	18,03x2
PV23+PV23	89.0+89.0	35	2590	268,80	156,00*	18,03x2

* Approximate Weight