



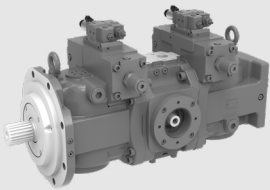
1.7

V93N SERIES

Axial Piston Tandem Variable Pumps

V93N variable axial piston double pump is designed for the high pressure open circuit.. Increase displacement and have a wider range of applications.

Apply to open circuits			
Size:	145	185	375
Nominal pressure(bar):	380	380	420
Peak pressure(bar):	420	420	460



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Features

- Variable axial piston double pump design for the open circuit.
- High working pressure (460 bar) and long lifetime.
- Newly developed control valve with built-in high-precision filter to enhance anti pollution capability.
- Horizontal piston design, short longitudinal length, large diameter variable piston, faster variable response speed.
- More power output interfaces can be provided. The variable speed ratio of the power take-off improves the boosting effect and maximizes the performance of the auxiliary pump.
- The booster impeller enhances the oil suction capacity of the entire pump and increases the operating speed of the pump. Simultaneously equipped with a booster impeller and a power take-off, it can save the cost of the main engine transfer case.

Technical data

Size		V93N 145	V93N 185	V93N 375
Displacement(cc/rev)		145×2	185×2	375×2
Speed	Rated speed (rpm) ^{*1}	2200	2100	1600
	Maximum speed (rpm)	2500	2400	1700
Pressure	Rated pressure (bar)	380	380	420
	Maximum pressure (bar)	420	420	460
Maximum torque (N.m) @Vgmax and Δp=380bar		1754	2238	4538
Case volume (L)		3	4.6	13
Suction port pressure (abs bar)		0.8 ~ 2		
Drain pressure (bar)		2		
Max. drain pressure (bar)		5 ^{*3}		
Mass (Kg)		170	180	400
Temperature range (°C)		-20 ~ 95		
Hydraulic fluid viscosity range (mm ² /s)		10 ~ 1000 ^{*2} (optimum viscosity range 16 ~ 36)		

- 1 Ensure the relative pressure at the suction port is ≥ -0.1 bar (recommended for normal operation).
- 2 In case of 200-1000mm²/s, please allow system to warm up before using machine.
- 3 The pressure at the drain port is 1.2 bar (18 psi) higher than the inlet pressure at port S, but not higher than P_{Lmax}.

Type introduction

V93N	375	T	V	R	E1	/	G	J7	K0	N	G	M	S
①	②	③	④	⑤	⑥		⑦	⑧	⑨	⑩	⑪	⑫	⑬

Product series

①	Double pump, variable swash-plate design, open circuit	V93N
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Size

②	Size	145	185	375
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Structure type

③			145	185	375	Code
	Structure type	Tandem double pump	●	●	●	T

Seals

④		145	185	375	Code
	FKM	●	●	●	V

Direction rotation

⑤		145	185	375	Code
	Clockwise	●	●	●	R
	Counter-clockwise			●	L

Control type

⑥			145	185	375	Code
	Electric proportional displacement	Pilot operated proportional displacement control (positive control), 24V	●	●		E1
		Pilot-operated electro-proportional displacement control, pressure cut-off, positive control, 24V			●	F1
	Negative displacement control	Hydraulic pilot negative flow + Proportional increasing power control (+ total power control)	●			H1

Mounting flange

⑦		145	185	375	Code
	SAE J617 N0.3 flywheel flange, see "Installation size" (Axial length : narrow)	●	●		A
	315 B8 HW ISO 3019-2			●	G
	4-hole flange	●			G4

Type introduction

Input shaft

		145	185	375	Code
⑧	JIS B 1603 47.5×17×2.5	●	●		J2
	JIS B 1603 40×14×2.5				J3
	DIN 5480×W70×3×22×9g			●	J7
	ANIS 21T-8/16DP			●	X1

Through drive and pilot pump

		145	185	375	Code
⑨	None	●	●	●	N
	With pilot gear pump and pressure relief valve (only for none through drive)	●	●	●	K0

PTO Power port drive

		145	185	375	Code
⑩	No pressurization, no force extractor	●	●	●	N
	Pressurization, force extractor	●		●	T
	Pressurization, no force extractor			●	H

Connection type (except inlet and outlet port)

		145	185	375	Code
⑪	BSPP G thread, JIS B2351	●	●	●	G

Thread type of Flange Port

		145	185	375	Code
⑫	Metric thread	●	●	●	M

Standard / special version

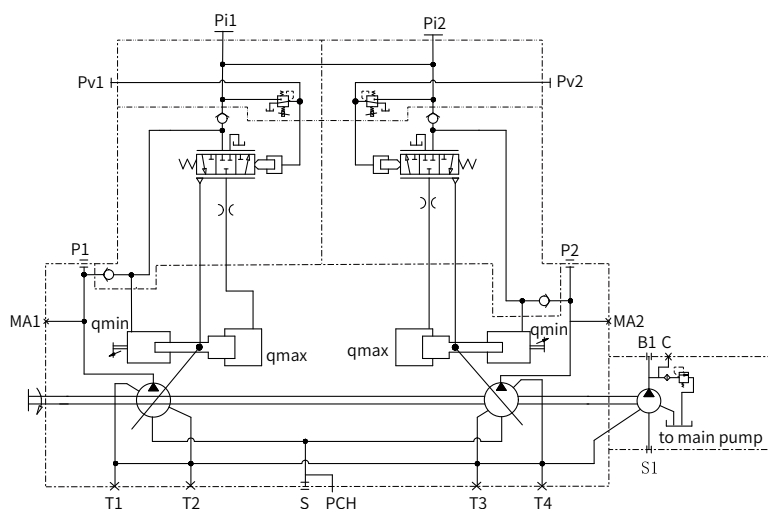
		145	185	375	Code
⑫	Standard version	●	●	●	None
	Special version	○	○	○	S

Remark: ● = Available; ○ = On request

V93N 145 Control principle

·E1 Electro-proportional displacement control principle

Positive flow electric proportional displacement control. Driven by electromagnet magnetic force, the pump displacement is proportional to the current. The pump is initially located at the minimum displacement V_{gmin} , and as the current rises, the pump displacement increases. When the oil outlet pressure of the pump is less than 30bar, to change the pump from small displacement to large displacement, an external pilot oil source must be provided, with a minimum pressure of 30bar and a maximum pressure of 50bar.



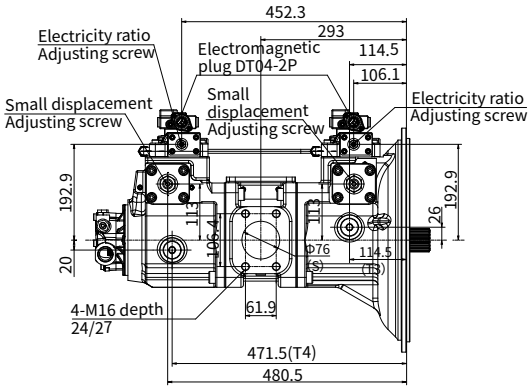
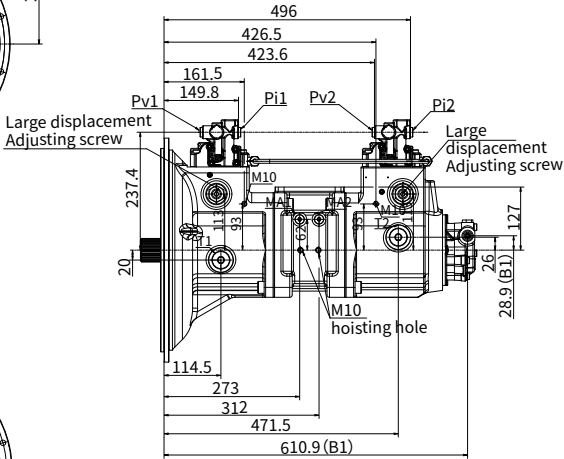
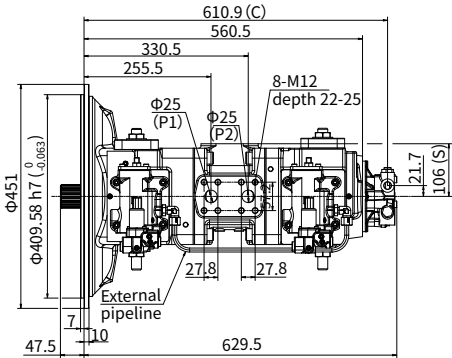
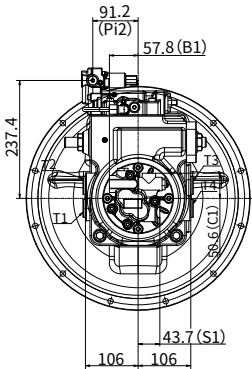
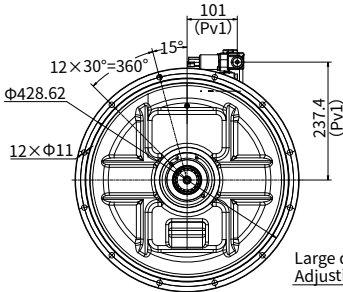
Note:

When ordering, please provide the information as below:

- Working pressure
- Maximum flow
- Minimum flow

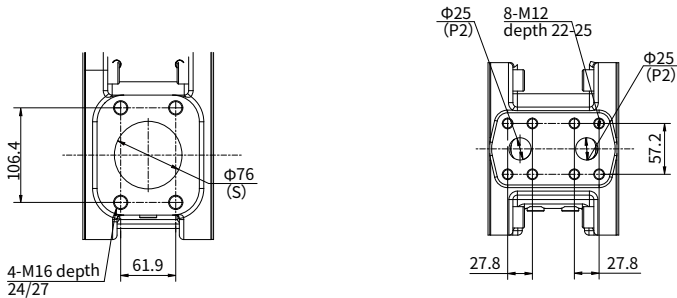
Installation size

V93N 145 Type



Installation size

·V93N 145 Description of oil port

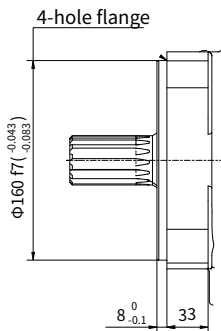
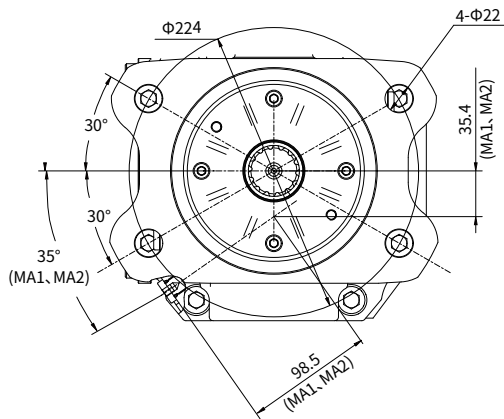


Port Details

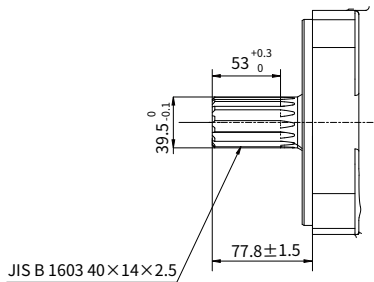
	Port Name	Port Size and Description
P1,P2	Output Port	SAE 1" 4-M12×1.75, depth 22mm
S	Input Port	SAE 3" 4-M16×2, depth 24mm
T1,T2,T3,T4	Drain Port	G 3/4 depth 24mm
Pi1/Pi2	Pilot Port	G 1/4 depth 13mm
PV1/PV2	Pressure Measureing	G 1/4 depth 13mm
MA1,MA2,PCH	Pressure Measureing	G 1/4 depth 13mm
S1	Pilot Pump Output Port	G 3/4 depth 26mm
B1	Pilot Pump Input Port	G 1/2 depth 19mm
C	Pressure Measureing	G 1/4 depth 13mm

Installation size

·V93N 145 Flange



·V93N 145 Input shaft

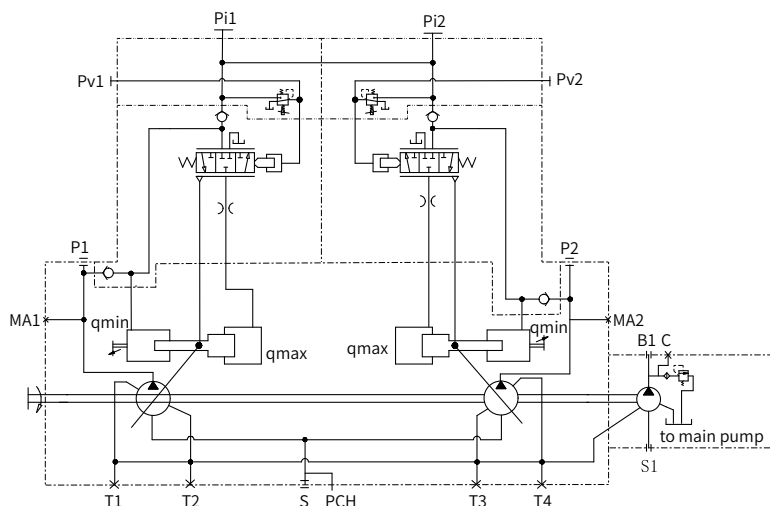


“J1” type spline shaft

V93N 185 Control principle

·E1 Electro-proportional displacement control principle

Positive flow electric proportional displacement control. Driven by electromagnet magnetic force, the pump displacement is proportional to the current. The pump is initially located at the minimum displacement V_{gmin} , and as the current rises, the pump displacement increases. When the oil outlet pressure of the pump is less than 30bar, to change the pump from small displacement to large displacement, an external pilot oil source must be provided, with a minimum pressure of 30bar and a maximum pressure of 50bar.



Note:

When ordering, please provide the information as below:

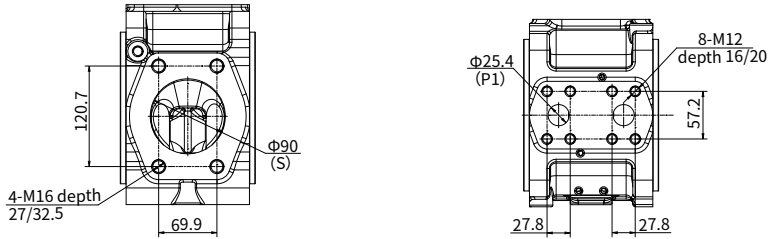
- Working pressure
- Maximum flow
- Minimum flow

V93N 185 Type



Installation size

·V93N 185 Description of oil port

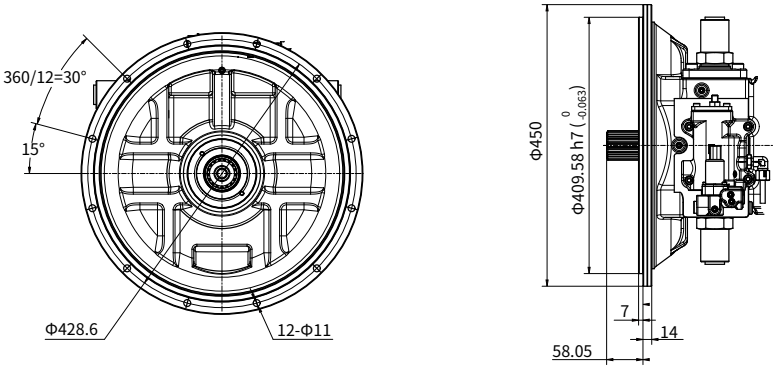


Port Details

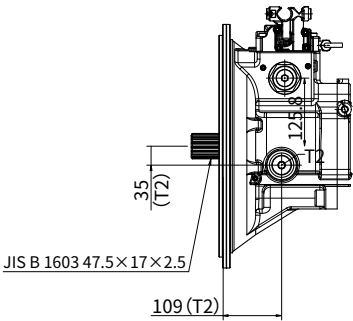
	Port Name	Port Size and Description
P1,P2	Output Port	SAE 1" 4-M12 $\times$ 1.75, depth 17mm
S	Input Port	SAE 3" -1/2 4-M16 $\times$ 2, depth 27mm
T1,T2,T3,T4	Drain Port	G 3/4 depth26mm
Pi1,Pi2	Pilot Port	G 1/4 depth13mm
PV1,PV2	Pressure Measureing	G 1/4 depth13mm
MA1,MA2,PCH	Pressure Measureing	G 1/4 depth15mm
S1	Pilot Pump Output Port	G 3/4 depth20.5mm
Pi	Pilot Pump Input Port	G 1/2 depth19mm
C	Pressure Measureing	G 1/4 depth15mm

Installation size

·V93N 185 Flange



·V93N 185 Input shaft

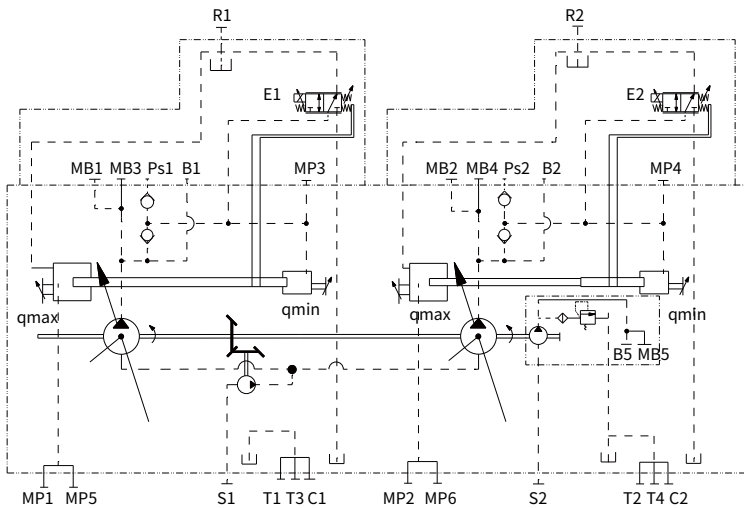


“J2” type spline shaft

V93N 375 Control principle

·F1 Electro-proportional displacement control principle

Positive flow electric proportional displacement control. Driven by electromagnet magnetic force, the pump displacement is proportional to the current. The pump is initially located at the minimum displacement V_{gmin} , and as the current rises, the pump displacement increases. When the oil outlet pressure of the pump is less than 30bar, to change the pump from small displacement to large displacement, an external pilot oil source must be provided, with a minimum pressure of 30bar and a maximum pressure of 50bar.



Note:

When ordering, please provide the information as below:

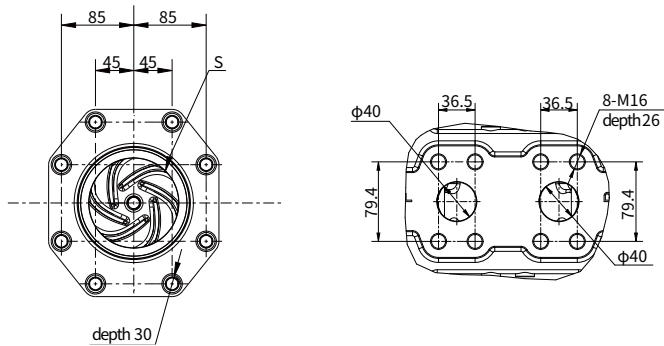
- Working pressure
- Maximum flow
- Minimum flow

V93N 375 Type



Installation size

·V93N 375 Description of oil port

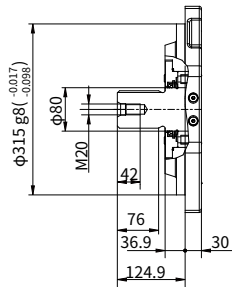
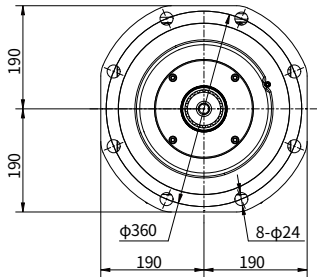


Port Details

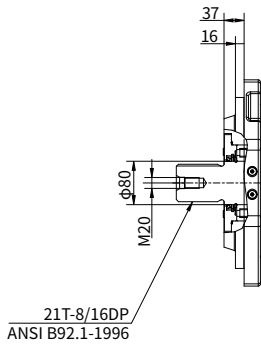
	Port Name	Port Size and Description
B1,B2	Output Port	1-1/2" SAE J518 M16, depth26mm
S1	Input Port	φ125 M16, depth 30mm (Thickness of pressure plate included)
T1,T2,T3,T4	Drain Port	G1 1/4 depth 22mm
Ps1,Ps2	Pilot Port	G 1/4 depth 13mm
R1,R2	Exhaust port	G 1/8 depth 11mm
MB1,MB2,MB3,MB4	High pressure pressure tap	G 1/4 depth 13mm
MP1,MP2,MP3,MP4,MP5,MP6	Variable pressure tap	G 1/4 depth 13mm
C1,C2	Exhaust port	G 1/4 depth 13mm
S2	Gear pump suction port	G 3/4 depth 20mm
B5	Gear pump outlet	G 1/2 depth 19mm
MB5	Gear pump outlet pressure tap	G 1/4 depth 12mm

Installation size

•V93N 375 Flange



•V93N 375 Input shaft



“X1” type spline shaft

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