



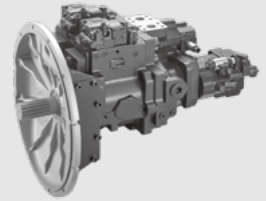
V90N-D SERIES

Swash-plate Type Axial Piston Double Pump

(Original HP3V-D Series)

V90N variable axial piston double pump is designed for the high pressure open circuit.

Dis. (cc/rev)	75×2	140×2	180×2	230×2	280×2
Nom. pressure (bar)	350	380	380	350	350
Max. pressure (bar)	400	420	420	392	392



Contents

Technical Data	02
Type introduction	03-04
V90N 75D type	
• Control principle	05-06
• Installation size	07-09
V90N 180D type	
• Control principle	10-11
• Installation size	12-13
V90N 230D type	
• Control principle	14-15
• Installation size	16-17
V90N 280D type	
• Control principle	18-19
• Installation size	20-21

Features

- Variable axial piston double pump design for the open circuit.
- Various controllers available: hydraulic and electrical control design available, which can combined the different controllers of flow control, pressure control, Electric proportional control and power control.
- High efficiency, High working pressure (350 bar) and long lifetime.
- Compact design with PTO Power port drive for connecting different auxiliary pumps.
- Special pump housing structure design meets the low noise requirements.
- More suitable for mobile machinery like excavators, cranes, drilling rigs and so on.

Technical data

Size		72	140	180	230	280
Displacement(cc/rev)		75×2	139×2	180×2	230×2	280×2
Speed	Rated speed (rpm) ¹	2450	2200	2000	1800	1800 (Self-Priming)
	Maximum speed (rpm) ²	3000	2600	2400	2000	2100
Pressure	Rated pressure (bar)	350	380	380	350	350
	Maximum pressure (bar)	400	420	420	392	400
Maximum torque (N.m)		415	843	1200	1800	2800
Case volume (L)		2.6	5.2	10	10	8
Suction port pressure (abs bar)		0.7 ~ 2				
Drain pressure (bar)		1				
Max. drain pressure (bar)		3				
Mass (Kg)		95	180	262	270	290
Temperature range (°C)		-20 ~ 95				
Hydraulic fluid viscosity range (mm ² /s)		10 ~ 1000 ^{*3} (optimum viscosity range 16 ~ 36)				

1 Steady state suction pressure should be 0 bar and above (at normal condition);

2 If suction pressure less than 0 bar, Boost pressure should be required;

3 In case of 200-1000mm²/s, please allow system to warm up before using machine.

Type introduction

V90N	75	DT	O	R	E1	/	C2	S3	N	PA1	M	M
①	②	③	④	⑤		⑥	⑦	⑧	⑨	⑩	⑪	⑫

Product series

①	Product series	V90N
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Displacement

②	Displacement cc/rev	75	140	180	230	280
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Structure type

③	Structure type		75	140	180	230	280	Code
		Tandem double pump	●				●	DT
		Parallel construction double pump		●	●	●		DP

Charge pump (impeller)

④		75	140	180	230	280	Code
	with charge pump				●	●	H
	without charge pump	●	●	●		●	O

Direction rotation

⑤		75	140	180	230	280	Code
	Clockwise	●	●	●	●	●	R
	Counter-clockwise						L

Control type

⑥			75	140	180	230	280	Code
	Electric proportional displacement	Pilot-operated electro-proportional displacement control, positive displacement control, 24V	●	●	●	●	●	E1
	Negative displacement control	Hydraulic pilot negative flow + Proportional increasing power control + (total power control)	●	●	●	●	●	H1
		Hydraulic pilot negative flow + Proportional decreasing power control + (total power control)	●	●	●	●	●	H2
		Hydraulic pilot negative flow +divided power control	○	○	○	○	○	H3

Mounting flange

⑦	Mounting flange	75	140	180	230	280	Code
	SAE C 127-2	●					C2
	SAE J617 NO.1 flywheel flange			●	●		F1
	SAE J617 NO.2 flywheel flange						F2
	SAE J617 NO.3 flywheel flange		●				F3
	Special 4-hole flange					●	G4

Type introduction

Input shaft

		75	140	180	230	280	Code
⑧	Input shaft size						
	SAE J744-32-4 14T 12/24DP	●					S3
	JIS D2001 34.5×12×2.5	○					J3
	JIS D2001 40×14×2.5		●				J4
	JIS B1603 18×3×20					●	J6
ANSI B92.1-1996 17T 8/16DP			●	●		S7	

Through drive

		75	140	180	230	280	Code
⑨	None	●	●	●	●	●	N
	SAE A 82-2 SAE J744-16-4 9T 16/32DP		●		○		A1
	SAE A 82-2 SAE J744-19-4 11T 16/32DP		●		○		A2
	SAE B 101-2 SAE J744-22-4 13T 16/32DP			●	●		B1
	SAE B 101-2 SAE J744-25-4 15T 16/32DP			●	●		B2

PTO Power port drive

		75	140	180	230	280	Code
⑩	None	●	●		●		N
	SAE A 82-2 SAE J744-16-4 9T 16/32DP	●				○	PA1
	SAE B 101-2 SAE J744 15T 16/32DP					●	PB1
	SAE C 127-2 SAE J744-J744-32-4 14T 12/24DP			●	●	○	PC1

Connection type (except inlet and outlet port)

		75	140	180	230	280	Code
⑪	UNC port, ISO11926	○			○		A
	Metric port, ISO 6149	○			○		M
	BSPP G thread, JIS B2351	●	●	●	●	●	G

Thread type of Flange Port

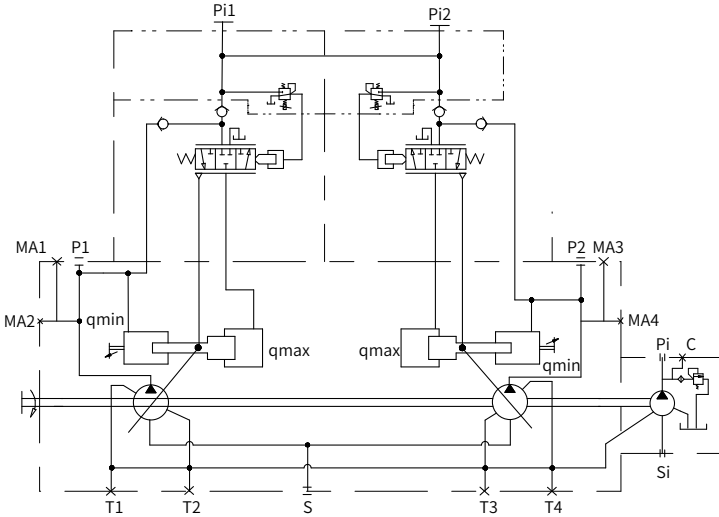
		75	140	180	230	280	Code
⑫	UNC threads (only for UNC port)	○	○				A
	Metric thread	●	●	●	●	●	M

Note: Marked with "○" means under development.

V90N 75D Control principle

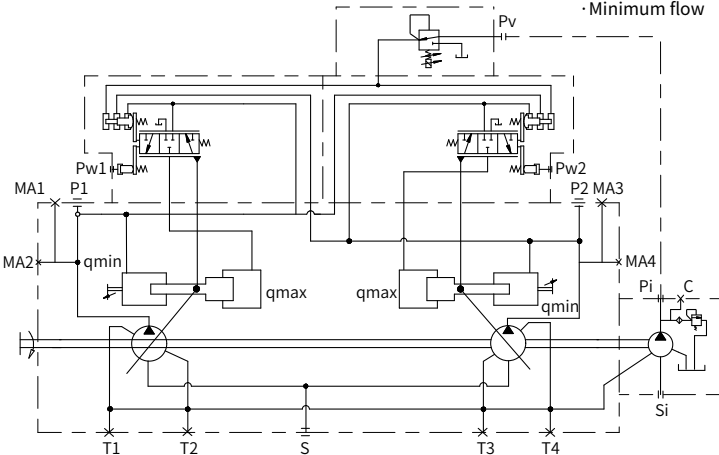
·E1 Electro-proportional displacement control principle

Electro-proportional displacement control: With pilot-pressure-related control, the pump displacement is adjusted in proportion to the pilot pressure. Basic position without pilot signal is $V_g \text{ min}$, which includes the mechanically depressurized basic position $V_{g\text{min}}$. With increasing pilot pressure the pump swivels to a larger displacement. The necessary control power is taken from the operating pressure or the external control pressure applied to port P. If the pump is to be adjusted from the zero basic setting or from a low operating pressure, port P must be supplied with an external control pressure of at least 30 bar, maximum 50 bar.



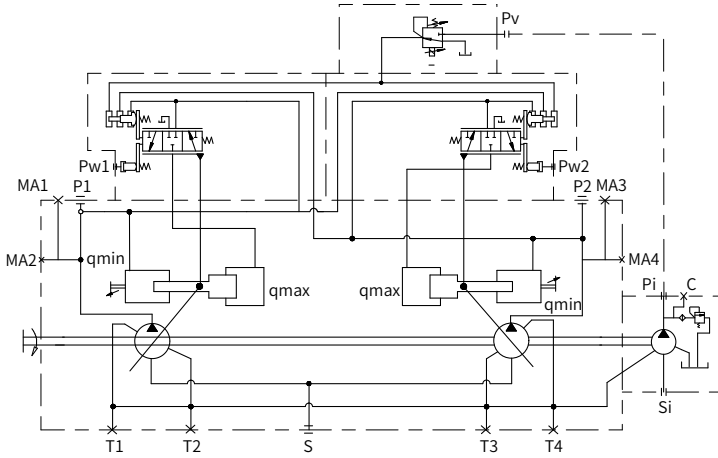
Note:
 When ordering, please provide the information as below:
 · Working pressure
 · Maximum flow
 · Minimum flow

·H1 Negative flow control schematic



V90N 75D Control principle

· H2 Negative flow control schematic



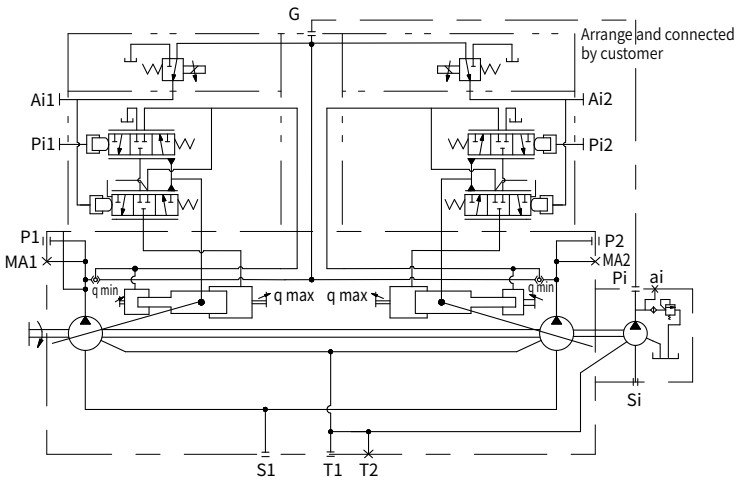
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· H3 Negative flow control schematic

Note:

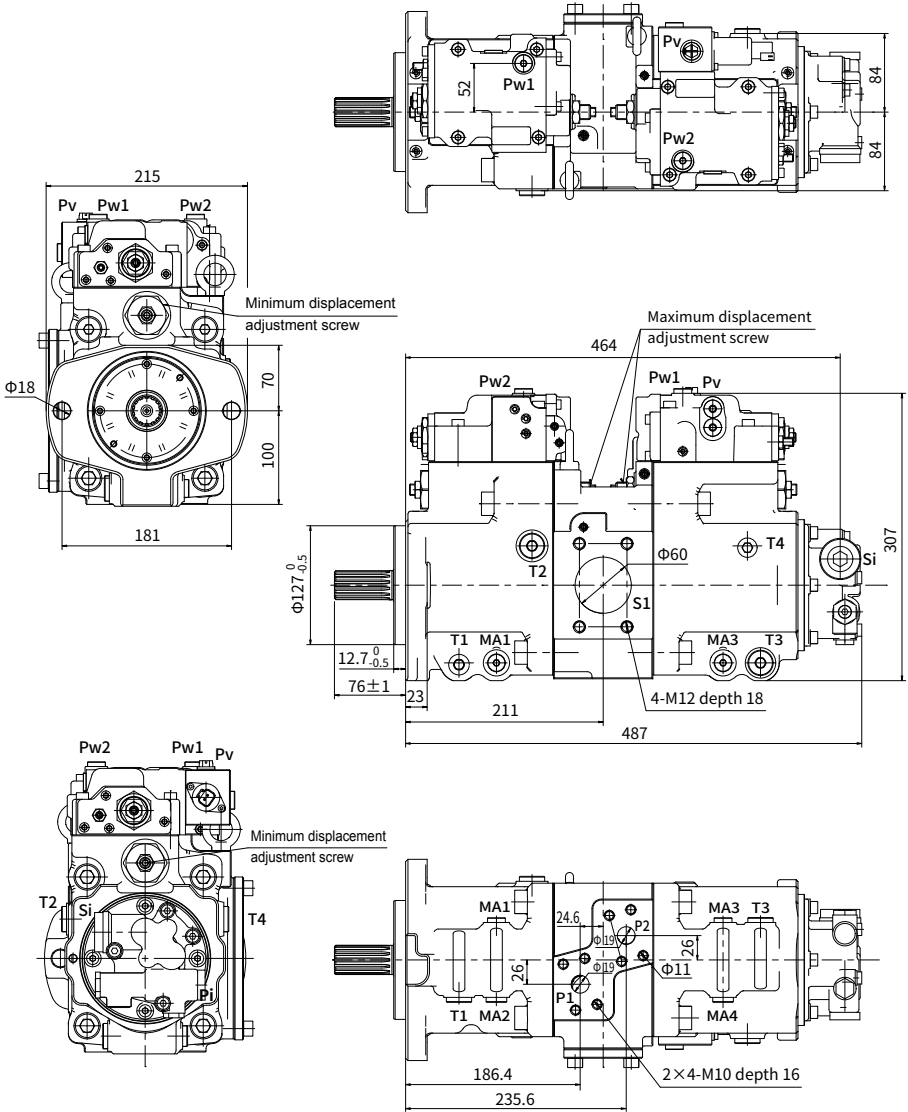
When ordering, please provide the information as below:

- Working pressure
- Maximum flow
- Minimum flow



Installation size

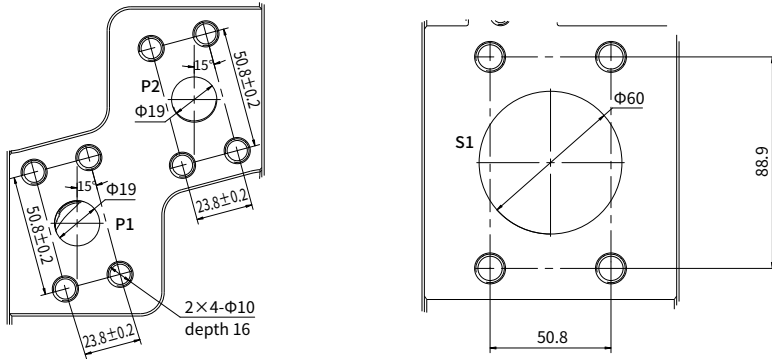
V90N 75D type



05

Installation size

·V90N 75D Description of oil port



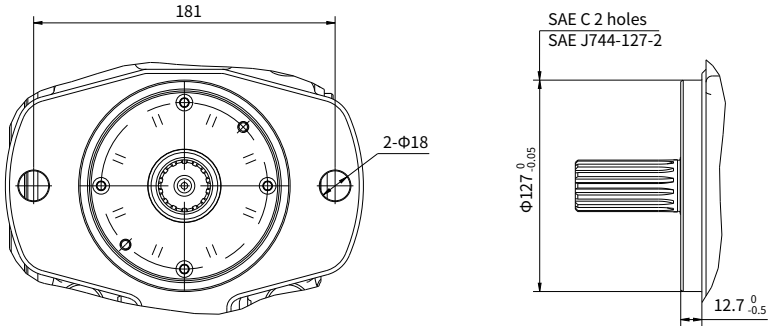
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Port Details

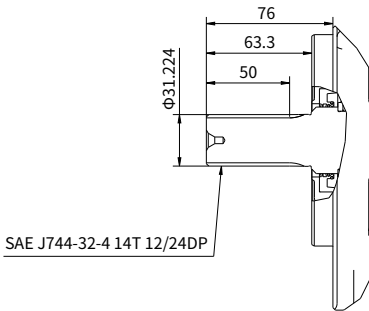
	Port Name	Port Size and Description
P1,P2	Output Port	SAE 3/4" 4-M10×1.5, depth 17mm
S1	Input Port	SAE 2-1/2" 4-M12×1.75, depth 20mm
T1,T2,T3,T4	Drain Port	G 1/2 depth 19mm
Pw1/Pw2	Pilot Port	G 1/4 depth 12mm
MA1,MA3	Pressure Measureing	G 1/4 depth 15mm
MA2,MA4	Pressure Sensor Port	G 3/8 depth 16mm
Pi	Pilot Pump Output Port	G 1/2 depth 19mm
Si	Pilot Pump Input Port	G 3/4 depth 20.5mm
Pv	External Control Pressure Port	G 1/4 depth 12mm

Installation size

·V90N 75D flange



·V90N 75D Input shaft

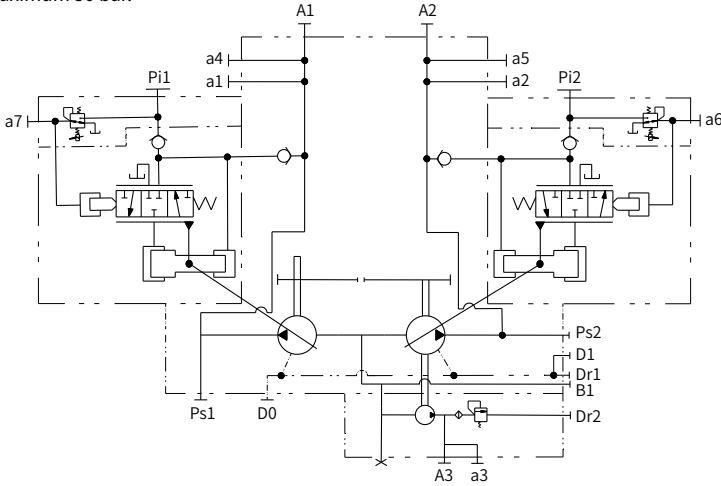


“S3” type spline shaft

V90N 180D Control principle

· E1 Electro-proportional displacement control principle

Electro-proportional displacement control: With pilot-pressure-related control, the pump displacement is adjusted in proportion to the pilot pressure. Basic position without pilot signal is $V_{g\ min}$, which includes the mechanically depressurized basic position $V_{g\ min}$. With increasing pilot pressure the pump swivels to a larger displacement. The necessary control power is taken from the operating pressure or the external control pressure applied to port P. If the pump is to be adjusted from the zero basic setting or from a low operating pressure, port P must be supplied with an external control pressure of at least 30 bar, maximum 50 bar.

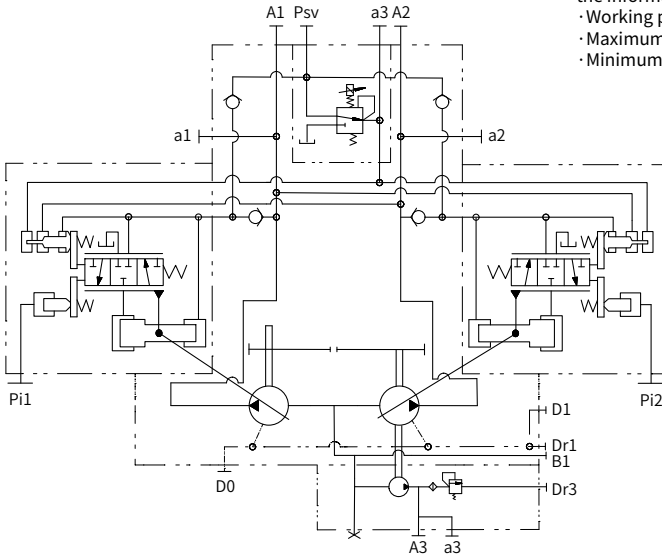


· H1 Negative flow control schematic

Note:

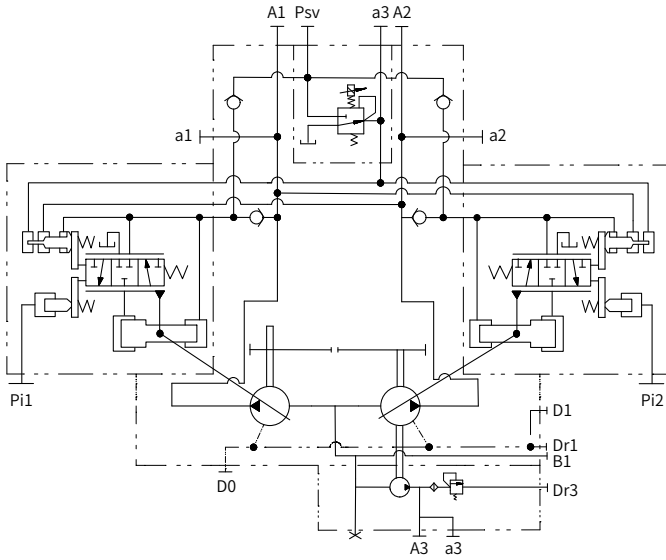
When ordering, please provide the information as below:

- Working pressure
- Maximum flow
- Minimum flow

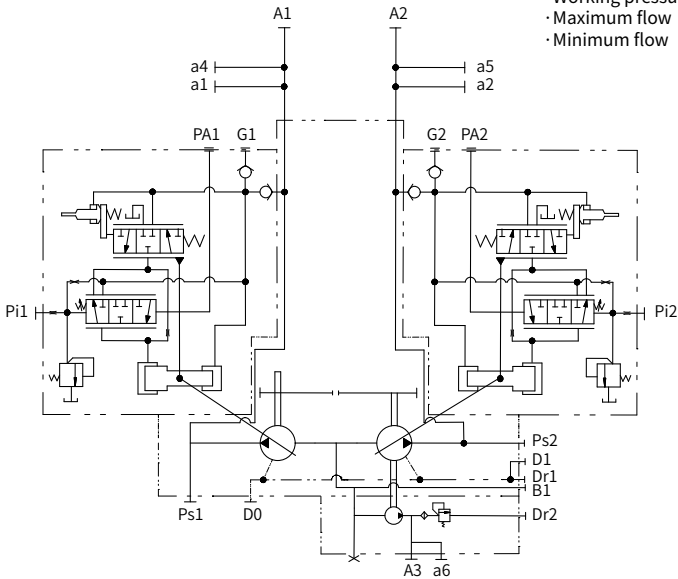


V90N 180D Control principle

·H2 Negative flow control schematic



·H3 Negative flow control schematic



Note:

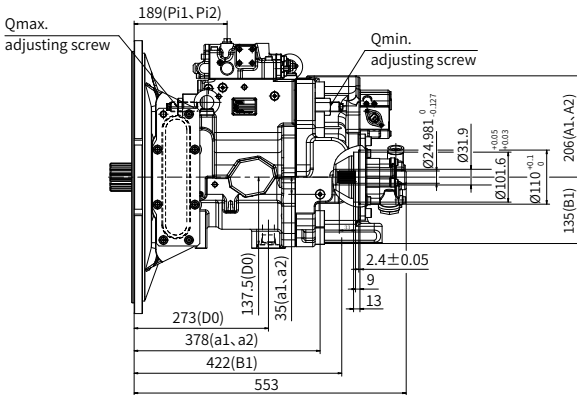
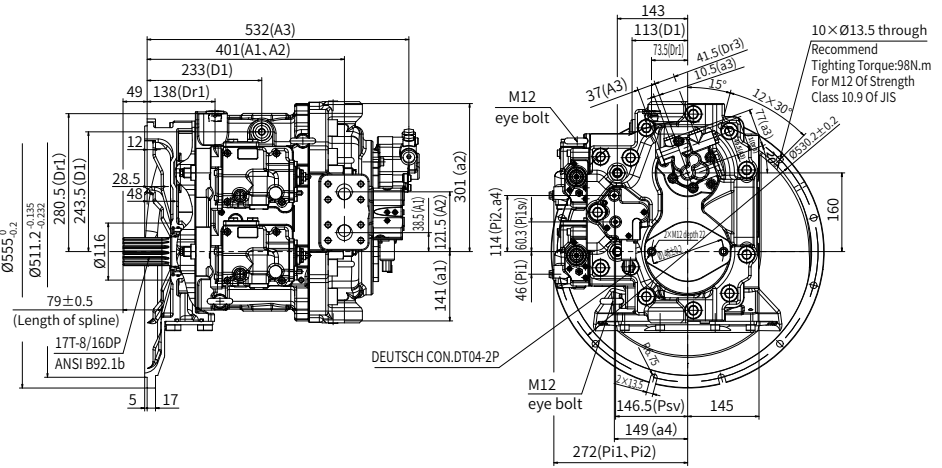
When ordering, please provide the information as below:

- Working pressure
- Maximum flow
- Minimum flow

05

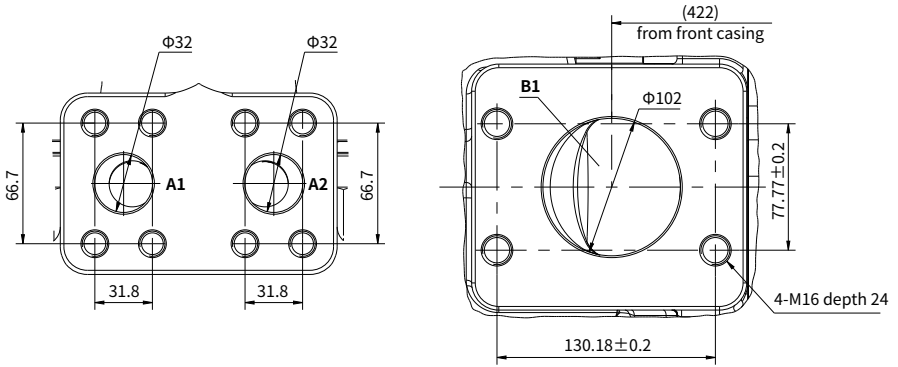
Installation size

V90N 180D type



Installation size

·V90N 180D Description of oil port



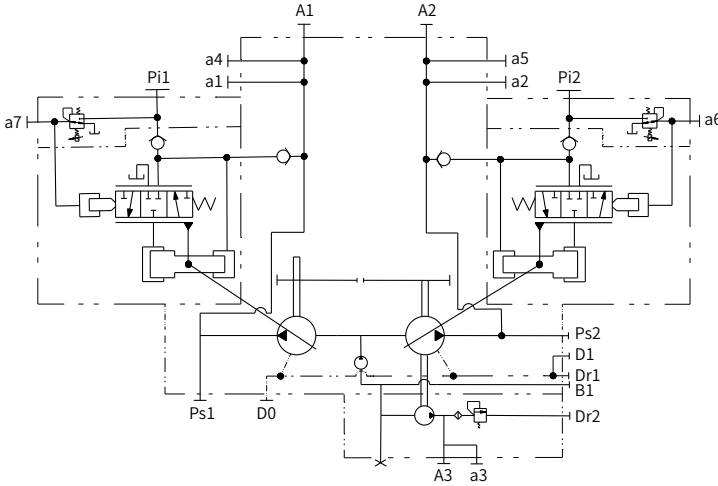
Port Details

	Port Name	Port Size and Description	Tighting Torque(N.m)
A1, A2	Delivery Port	SAE 6000psi 1 1/4"	98
B1	Suction Port	SAE 500psi 4"	240
Dr1	Drain Port	G 3/4 depth 20	170
Psv	Serve Assist Port	G 1/4 depth 15	36
Pi1, Pi2	Pilot Port	G 1/4 depth 15	36
a1, a2, a3	Gauge Port	G 1/4 depth 15	36
D1	Oil Filling Port	G 3/4 depth 20	170
D0	Outlet Port	G 3/4 depth 20	170
A3	Gear Pump Delivery Port	G 1/2 depth 19	53
Dr3	Gear Pump Drain Port	G 3/8 depth 15	34
a3	Gear Pump Gauge Port	G 1/4 depth 15	16

V90N 230D Control principle

· E1 Electro-proportional displacement control principle

Electro-proportional displacement control: With pilot-pressure-related control, the pump displacement is adjusted in proportion to the pilot pressure. Basic position without pilot signal is $V_g \text{ min}$, which includes the mechanically depressurized basic position $V_{g \text{ min}}$. With increasing pilot pressure the pump swivels to a larger displacement. The necessary control power is taken from the operating pressure or the external control pressure applied to port P. If the pump is to be adjusted from the zero basic setting or from a low operating pressure, port P must be supplied with an external control pressure of at least 30 bar, maximum 50 bar.



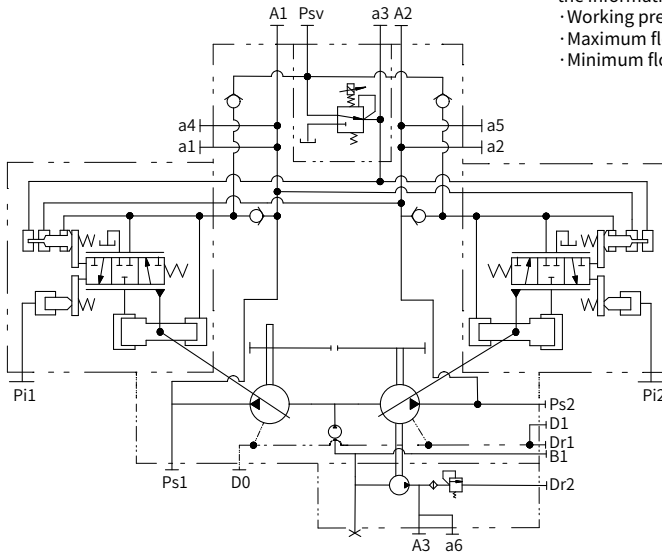
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· H1 Negative flow control schematic

Note:

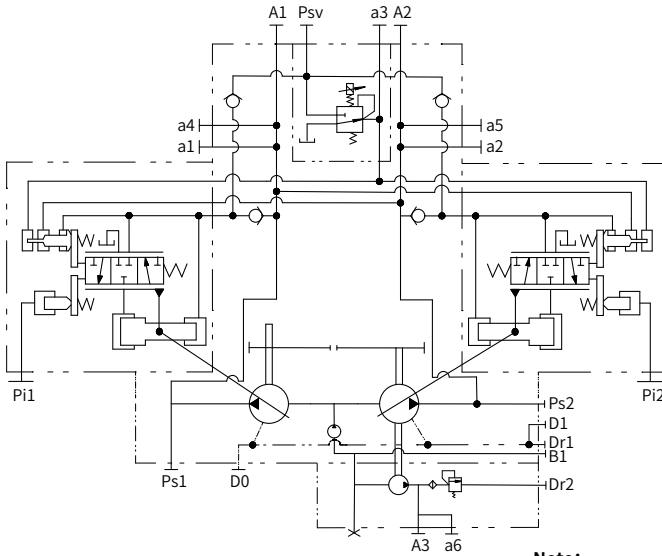
When ordering, please provide the information as below:

- Working pressure
- Maximum flow
- Minimum flow

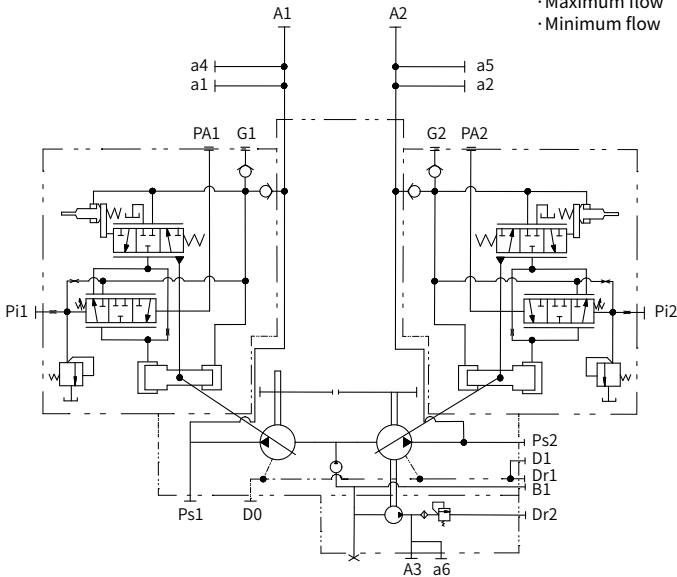


V90N 230D Control principle

·H2 Negative flow control schematic



·H3 Negative flow control schematic



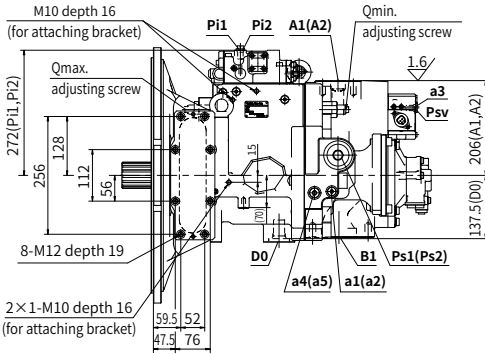
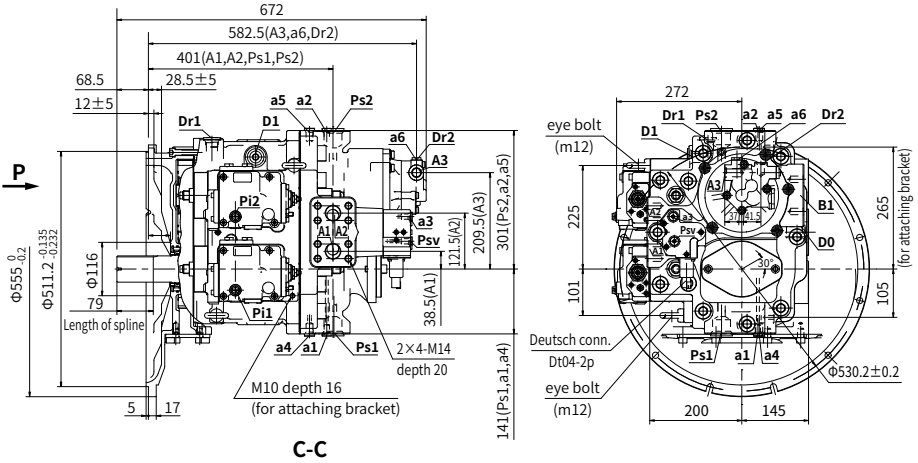
Note:

When ordering, please provide the information as below:

- Working pressure
- Maximum flow
- Minimum flow

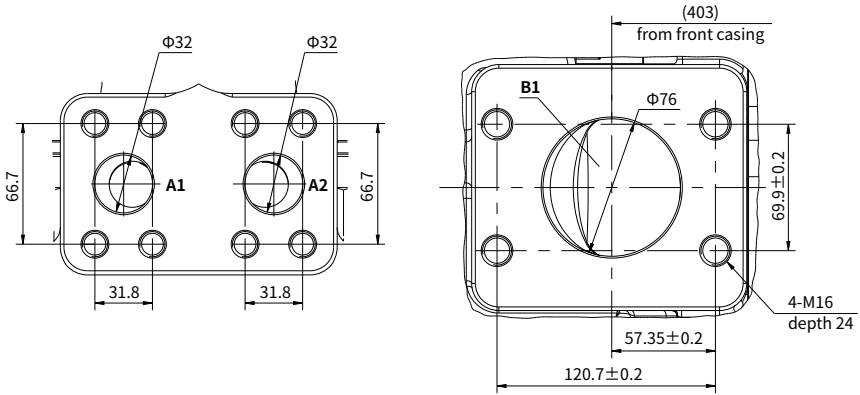
Installation size

V90N 230D type



Installation size

·V90N 230D Description of oil port



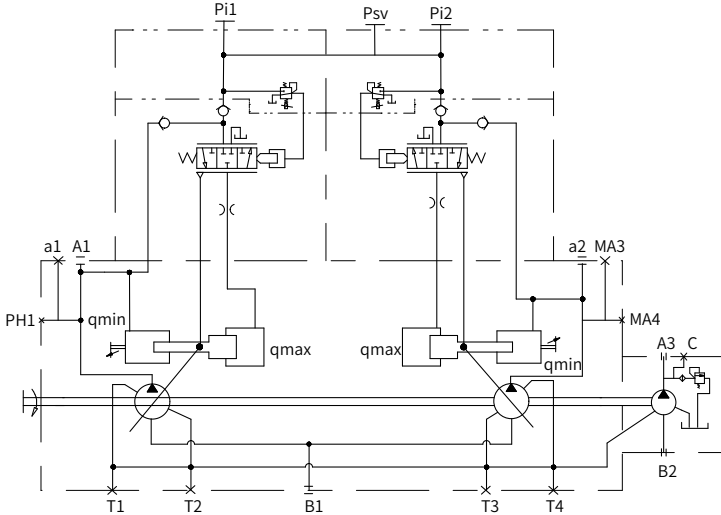
Port Details

	Port Name	Port Size and Description
A1, A2	Output Port	1 1/4" SAE J518C Code 62 (6000psi)
B1	Suction Port	3-1/2" SAE J518C Code 61 (2500psi)
Dr1	Drain Port	G 3/4 depth 20mm
Psv	Servo Assist Port	G 1/4 depth 15mm
Pi1, i2	Pilot Port	G 1/4 depth 15mm
D1	Oil Filling Port	G 3/4 depth 20mm
D0	Outlet Port	G 3/4 depth 20mm
A3	Gear Pump Output Port	G 1/2 depth 19mm
Dr2	Gear Pump Drain Port	G 3/8 depth 15mm

V90N 280D Control principle

· E1 Electro-proportional displacement control principle

Electro-proportional displacement control: With pilot-pressure-related control, the pump displacement is adjusted in proportion to the pilot pressure. Basic position without pilot signal is $V_g \text{ min}$, which includes the mechanically depressurized basic position $V_{g\text{min}}$. With increasing pilot pressure the pump swivels to a larger displacement. The necessary control power is taken from the operating pressure or the external control pressure applied to port P. If the pump is to be adjusted from the zero basic setting or from a low operating pressure, port P must be supplied with an external control pressure of at least 30 bar, maximum 50 bar.

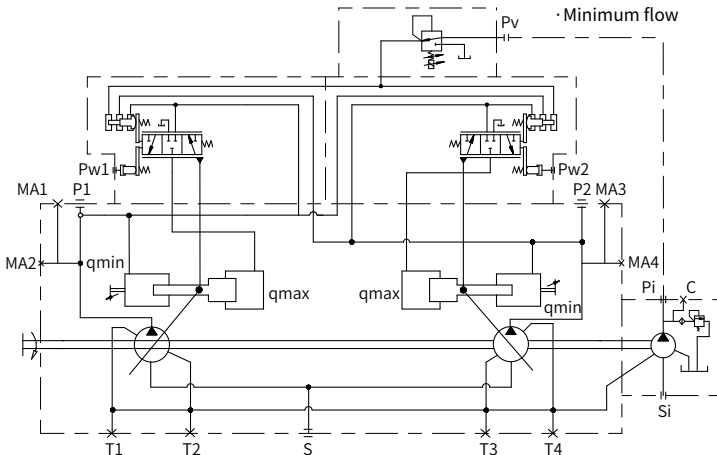


Note:

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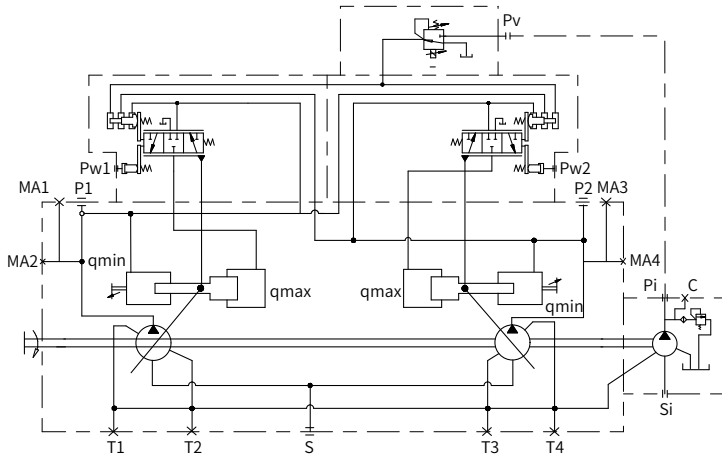
- Working pressure
- Maximum flow
- Minimum flow

· H1 Negative flow control schematic



V90N 280D Control principle

·H2 Negative flow control schematic



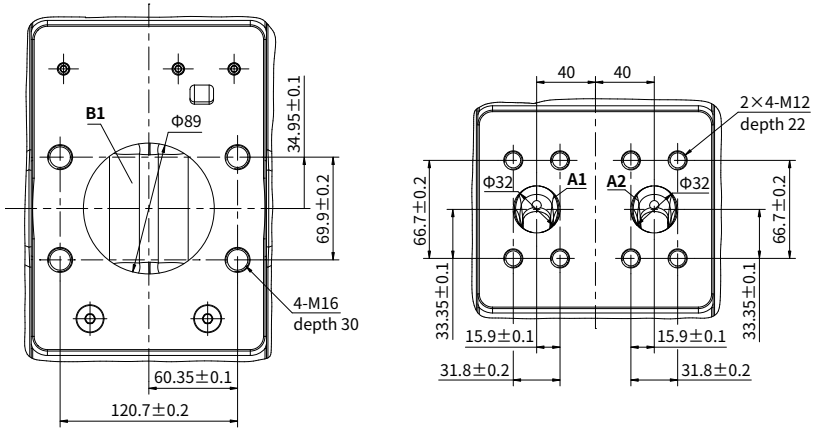
Note:

When ordering, please provide the information as below:

- Working pressure
- Maximum flow
- Minimum flow

Installation size

·V90N 280D Description of oil port



Port Details

	Port Name	Port Size and Description	Tightening Torque(N.m)
A1, A2	Output Port	SAE 6000psi 1 1/4"	98
B1	Suction Port	SAE 2500psi 3 1/2	240
T1, T2, T3, T4	Drain Port	G 3/4 depth 20mm	170
Psv	Serve Assist Port	G 3/8 depth 17mm	74
Pi1, Pi2	Pilot Port	G 1/4 depth 12mm	36
a1, a2	Gauge Port	G 1/4 depth 15mm	36
PH1, PH2	Gauge Port	G 3/8 depth 15mm	74
A3	Gear Pump Output Port	G 1/2 depth 19mm	53
B2	Gear Pump Suction Port	G 3/4 depth 20.5mm	74