



2.3

V90C SERIES

Swash-plate Type Axial Piston
Variable Displacement Double Pump

V90C series axial piston pump is a high pressure closed circuit double pump, which can meet the application requirements of customers for harsh working conditions such as high pressure, high rotational speed and frequent impact.

Suitable for a high-pressure closed circuit

Size:	23	47	56
Rated pressure (bar):	250	420	420
Max. pressure (bar):	300	450	450



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Features

- Swashplate design axial piston pump for traveling machinery applications such as skid steer loader.
- Compact size, small installation space
- Various control modes such as hydraulic control, electronic control and manual control.
- Combination of DA control valve and emergency shut-off valve, etc.
- With pressure gauge oil port MA and MB.

Technical data

02

Technical data

Type introduction

V90	C		47	E1	A	N	/	R	B4	3	K	B1	E	-	S

Axial piston unit

Swashplate design, variable	V90
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Operating mode

Pump, closed circuit	C
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Variable mechanism

	23	47	56	Code
With servo piston	•	•	•	Blank
Without servo piston manual variable		•		S

Size

Size	23	47	56
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Control mode

	23	47	56	Code
Proportional control, electric U = 12 V DC	•	•	•	E1
Proportional control, electric U = 24 V DC	•	•	•	E2
Mechanical servo control		•	○	H1
Hydraulic control direct operated – optimized for hydraulic control	•	•	○	H3
Manual direct displacement control		•		H5

Remark V90C47 when selecting without servo piston (manual variable), please choose manual direct variable control as the control method.

DA control valve

	23	47	56	Code
Without swivel DA control valve	•	•	•	Blank
Swivel DA control valve		•	○	A

Remark V90C47 when selecting without servo piston (manual variable), without swivel DA control valve.
The DA valve and the emergency brake valve cannot be selected simultaneously.

Oil Port Specifications and Seals

	Seals	A/B Port Specifications	S Port Specifications	Port Specifications (excluding A/B/S ports)	23	47	56	Code
	Sealed at room temperature	ISO 11926	ISO 11926	ISO 11926	•	•	•	N
		ISO 1179	ISO 1179	ISO 1179	•			E

Rotation

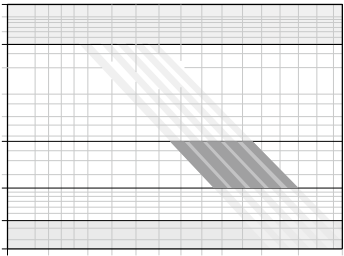
Right hand (clockwise)	R
Left hand (counter-clockwise)	L

Boost pump and rotary group con f guration

02

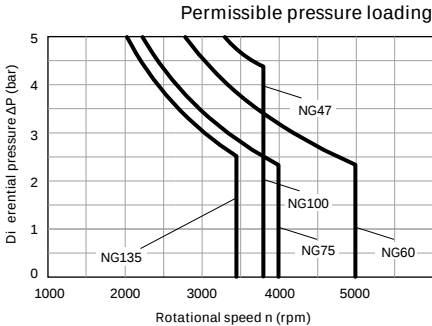
Through drive

Hydraulic fluid



Hydraulic fluid

Finer filtration improves the cleanliness of the hydraulic fluid, thereby extending the life of rotating parts. A cleanliness of at least 20/18/15 (ISO 4406) should be maintained. When the viscosity of the hydraulic fluid is less than 10mm²/s (e.g. due to high temperatures during short-term operation, a cleanliness level of at least 19/17/14 (ISO 4406) is required.



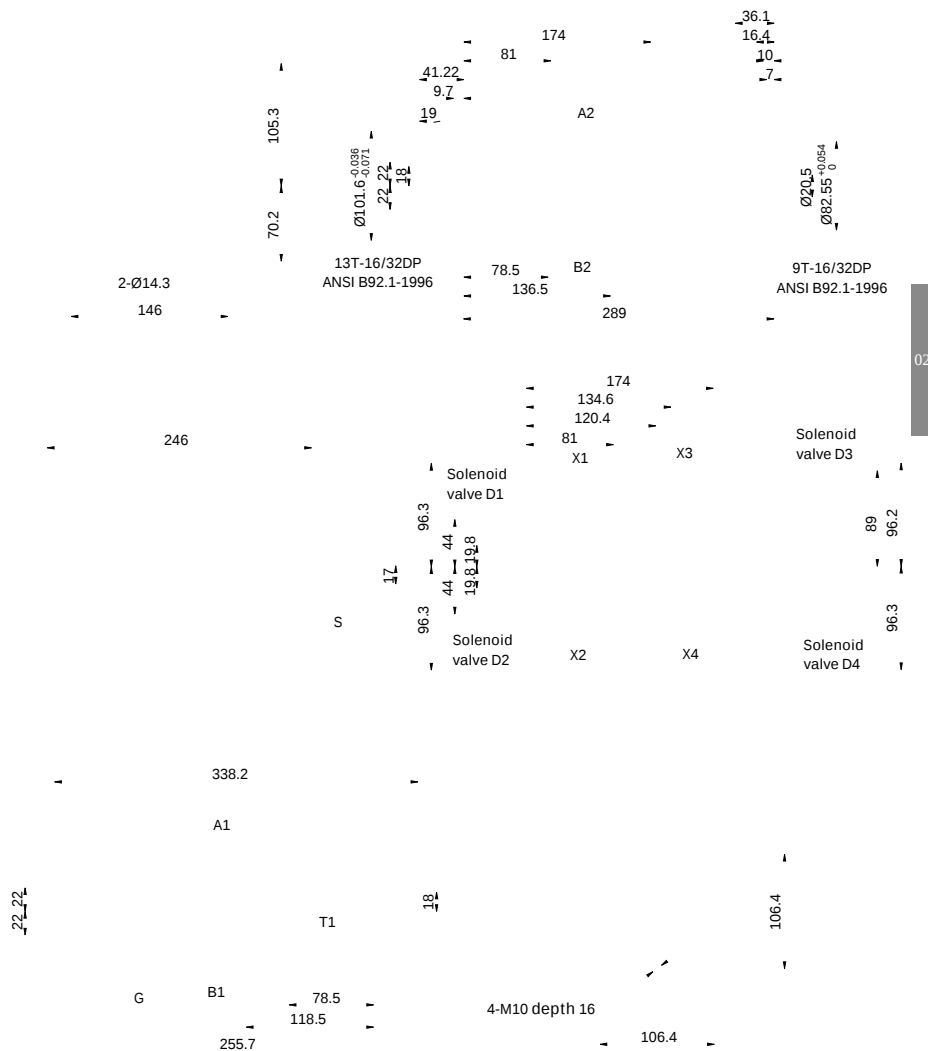
When using mineral oil based hydraulic fluid, refer to the left diagram for the range of pressures used for oil seals, please contact us if other hydraulic fluids are used.

The service life of the oil seal is affected by the rotational speed and the pressure difference between the inside and outside of the seal, in addition to the hydraulic oil and temperature.

Installation size

V90C23 Installation size

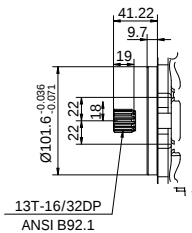
- **Proportional control**



Installation size

•V90C23 Port details

Port	Port use	Standard	Oil Port Specification (thread depth)	Maximum pressure (bar)
A1, B1	Work lines	ISO 1179-1	G 1/2 depth 15	250
A2, B2	Work lines	ISO 1179-1	G 1/2 depth 15	250
S1, S2	Oil suction line	ISO 1179-1	G 1/2 depth 15	5
T1	Oil drain line	ISO 1179-1	G 1/2 depth 15	3
T2	Oil drain line	ISO 1179-1	G 1/2 depth 15	3
R	Exhaust port	ISO 1179-1	G 1/4 depth 12.5	3
X1, X2, X3, X4	Control cavity pressure	ISO 1179-1	G 1/4 depth 12.5	40
G	Top-up pressure	ISO 1179-1	G 1/4 depth 12.5	40



V90C47 Installation size

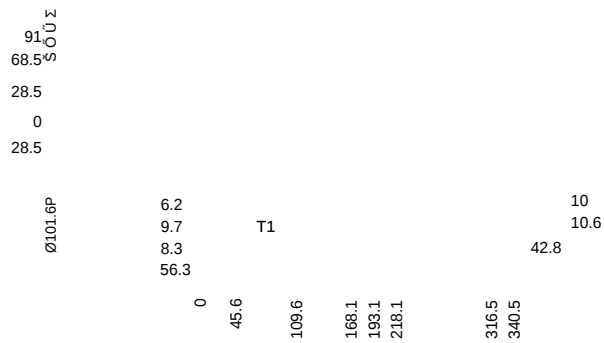
- Mwchanical
zero adjustment
- Charge pressure
relief valve
- High pressure
relief valve

Installation size

Installation size

V90C47 Installation size

• Mechanical servo control



Installation size

V90C47 Port details

• Mechanical servo control

Port	Port Name	Standard	Oil Port Specification (thread depth)
A, B	Working port	ISO 11926	1 1/16-12UN-2B depth 20
T1	Drain port	ISO 11926	1 1/16-12UN-2B depth 20
R	Air bleed port	ISO 11926	9/16-18UNF-2B depth 13
X1 X2 X3 X4	Control pressure port	ISO 11926	9/16-18UNF-2B depth 13
G	Boost pressure port inlet	ISO 11926	3/4-16UNF-2B depth 15
MA1 MB1 MA2 MB2	Pressure port	ISO 11926	9/16-18UNF-2B depth 13

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V90C47 Control principle

•Proportional control

R T1

MB1 B

B MB2



X1

X2

MA1 A G

A MA2

X3

X4

Direction of rotation	Clockwise				Counter-clockwise			
	1st pump		2nd pump		1st pump		2nd pump	
Start the electromagnet	D1	D2	D3	D4	D1	D2	D3	D4
Control pressure	X1	X2	X3	X4	X1	X2	X3	X4
Flow direction	A to B	B to A	B to A	A to B	B to A	A to B	A to B	B to A
Working pressure	MB1	MA1	MA2	MB2	MA1	MB1	MB2	MA2

Installation size

V90C47 Installation size

- **Proportional control**

	Mechanical zero adjustment	Charge pressure relief valve	High pressure relief valve
91	68.5		
28.5	0		
Ø101.6 ^{+0.05} ₋₀	Ø80		
Ø95	Ø25.8 ⁺⁰ _{-0.2}		
6.2	9.7	T1	
8.3	56.3		
0	0		
45.6			
109.6			
168.1			
193.1			
218.1			
316.5			
340.5			
125.3			
108.5			
49			
0			
49			
92			
99.5			
125.3			
0			
53.6			
62.6			
179.1			
207.1			
323.5			
139.5			
G			
57			
2.5			
0			
57			
81			
122.3			
110.5			
92			
73			
44			
0			
M12 M12			
44			
73			
85			
90			
16			
			2-M2 × 1.75 deep 19
			Ø101.6 H7 ^{+0.05} ₀

Installation size

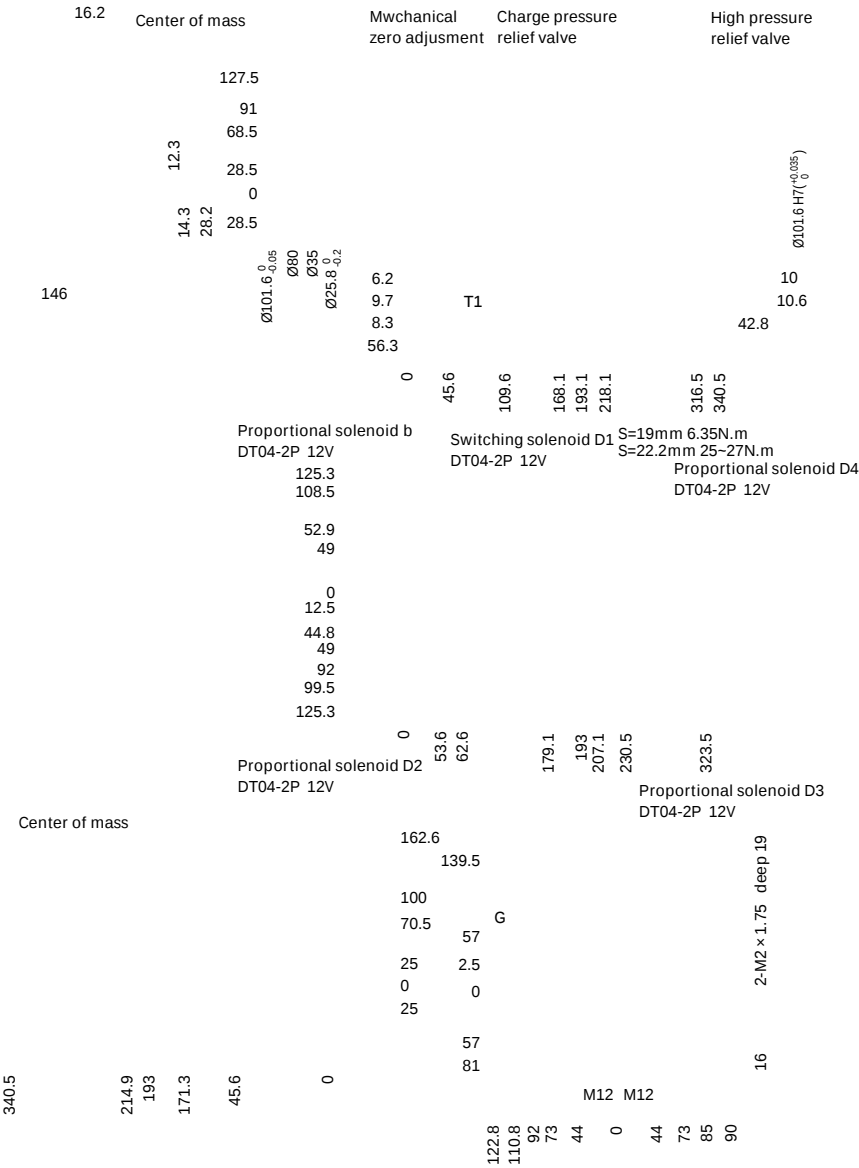
V90C47 Control principle

- Proportional control (with emergency brake valve)

Installation size

V90C47 Installation size

·Proportional control (with emergency brake valve)



Installation size

V90C47 Port details

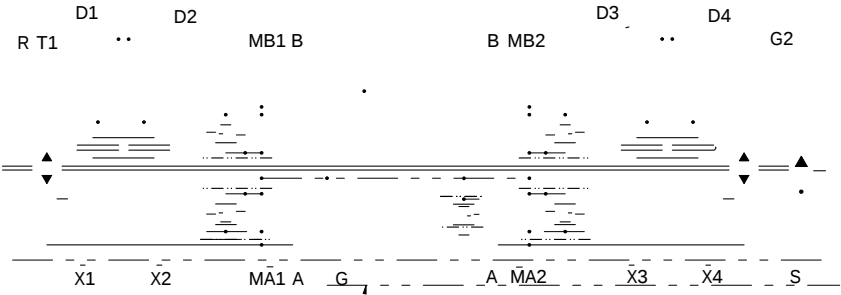
· Proportional control (with emergency brake valve)

Port	Port Name	Standard	Oil Port Specification (thread depth)
A, B	Working port	ISO 11926	1 1/16-12UN-2B depth 20
T1	Drain port	ISO 11926	1 1/16-12UN-2B depth 20
R	Air bleed port	ISO 11926	9/16-18UNF-2B depth 13
X1 X2 X3 X4	Control pressure port	ISO 11926	9/16-18UNF-2B depth 13
G	Boost pressure port inlet	ISO 11926	3/4-16UNF-2B depth 15
Y _{BR}	Pressure port	ISO 11926	9/16-18UNF-2B depth 13
P _s	Pressure port	ISO 11926	9/16-18UNF-2B depth 13
MA1 MB1 MA2 MB2	Pressure port	ISO 11926	9/16-18UNF-2B depth 13

02

V90C47 Control principle

•Proportional control (with oil replenishment pump)



Poping by customer

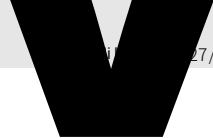
Direction of rotation	Clockwise				Counter-clockwise			
	1st pump		2nd pump		1st pump		2nd pump	
Start the electromagnet	D1	D2	D3	D4	D1	D2	D3	D4
Control pressure	X1	X2	X3	X4	X1	X2	X3	X4
Flow direction	A to B	B to A	B to A	A to B	B to A	A to B	A to B	B to A
Working pressure	MB1	MA1	MA2	MB2	MA1	MB1	MB2	MA2

Installation size

V90C47 Installation size

- Proportional control (with oil replenishment pump)

V90CS47



Installation size

V90CS47 Installation size

· Manual direct displacement control

Charge pressure
relief valve

-2xØ28.2
2-Ø14.3

2-M12x1.75
deep26.5

Installation size

V90CS47 Port details

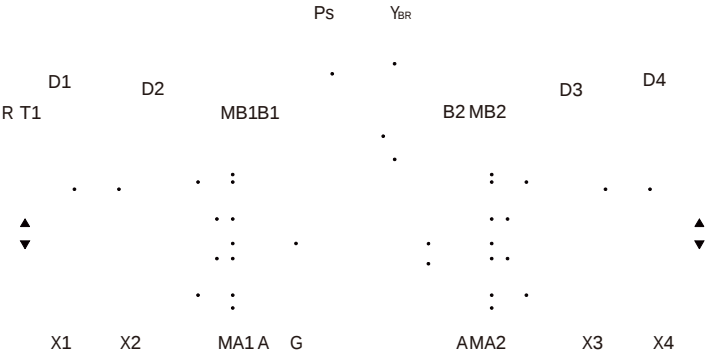
· Manual direct displacement control

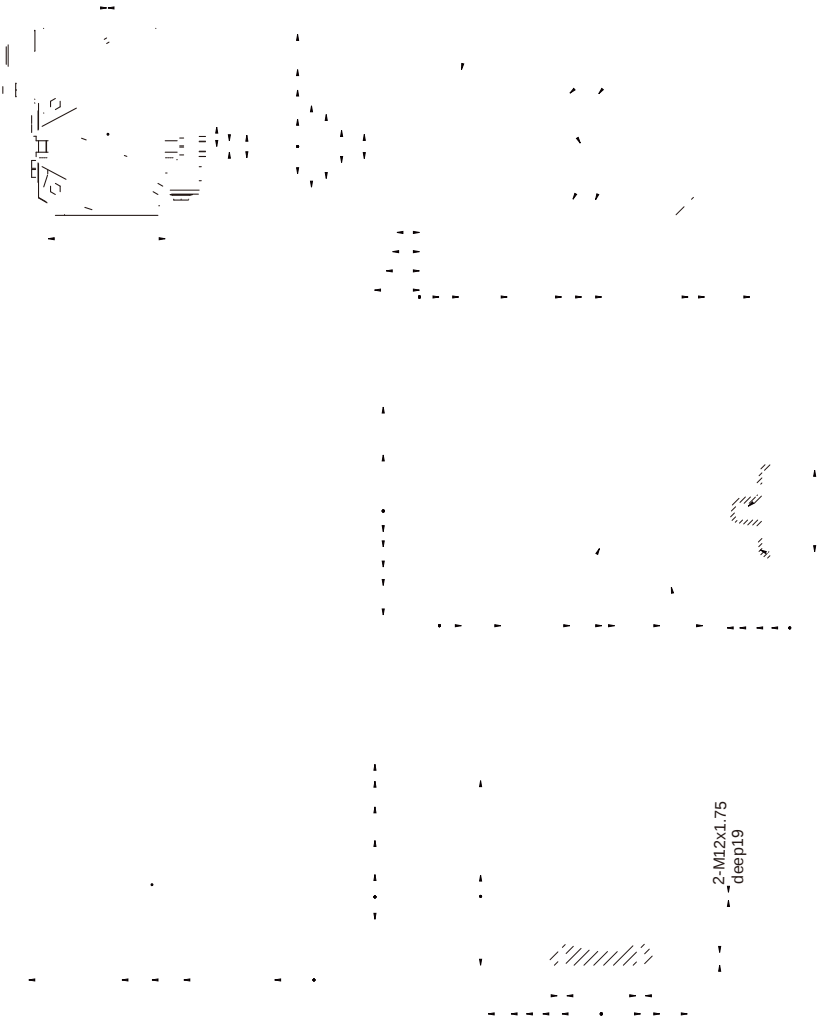
Port	Port Name	Standard	Oil Port Specification (thread depth)
A, B	Working port	ISO 11926	1 1/16-12UN-2B depth 20
T1	Drain port	ISO 11926	1 1/16-12UN-2B depth 20
G	Boost pressure port inlet	ISO 11926	3/4-16UNF-2B depth 15
MA1 MB1 MA2 MB2	Pressure port	ISO 11926	9/16-18UNF-2B depth 13
PS1 PS2	Boost pressure port	ISO 11926	9/16-18UNF-2B depth 13

Installation size

	22
Ø101.6 ⁰ _{-0.05}	6.2
Ø80	8.3
Ø35	9.7
Ø22.62 ⁰ _{-0.2}	46

Ø101.6 ⁰ _{-0.05}	6.2
Ø80	9.7
Ø35	8.3
Ø25.8 ⁰ _{-0.2}	56.3





Installation size

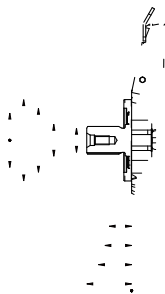
V90C56 Port details

·Proportional control (with emergency brake valve)

Port	Port Name	Standard	Oil Port Specification (thread depth)
A, B	Working port	ISO 11926	1 1/16-12UN-2B depth 20
T1	Drain port	ISO 11926	1 1/16-12UN-2B depth 20
R	Air bleed port	ISO 11926	9/16-18UNF-2B depth 13
X1 X2 X3 X4	Control pressure port	ISO 11926	9/16-18UNF-2B depth 13
G	Boost pressure port inlet	ISO 11926 3/4-16UNF-2B	depth 15
Y _{BR}	Pressure port	ISO 11926	9/16-18UNF-2B depth 13
P _s	Pressure port	ISO 11926	9/16-18UNF-2B depth 13
MA1 MB1 MA2 MB2	Pressure port	ISO 11926	9/16-18UNF-2B depth 13

Installation size

·V90C56 shaft extension type



"B6" type spline shaft
ANSI B92.1
1 3/8 21T 16/32 DP

·V90C56 through shaft drive

"B1" type through drive