



1.5.1

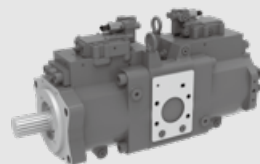
V90N-T SERIES

Axial Piston Tandem Variable Pumps

Mainly suitable for use in mobile machinery such as excavators, cranes, rotary drilling rigs, etc

Apply to open circuits

Size:	75	85	130	180	280	300	330
Nominal pressure(bar):	350	350	380	380	380	380	380
Peak pressure(bar):	400	400	420	420	420	420	420



Contents

Technical Data	02
Type introduction	03-05
Control module function introduction	06-08
Installation size:	
·V90N 75T/85T Installation size	09-12
·V90N 130T/180T Installation size	13-17
·V90N 280T Installation size	18-19
·V90N 300T Installation size	20-21
·V90N 330T Installation size	22-23

Features

- ★ Variable displacement tandem pump for open circuit heavy-duty applications
- ★ Optional PTO power take-off or supercharging impeller
- ★ Multiple Control Modes Available
- ★ High efficiency, long lifespan
- ★ Compact Design
- ★ Special housing structure design to meet low-noise requirements

Technical Data

Size			75	85	130	180	280	300	330
Displacement(cc/rev)			75×2	85×2	130×2	180×2	280×2	300×2	330×2
Speed	Rated(rpm)	Not pressurized	2450	2200	2200	2100	1800	1800	1800
		Pressurization	-	-	-	-	2000	2000	1800
	Max(rpm)	Not pressurized	3000	2800	2500	2400	2000	2000	2000
		Pressurization	-	-	-	-	2200	2200	2000
	Min(rpm)		500						
Pressure	Rated(bar)		350	350	380	380	380	380	380
	Peak(bar)		400	400	420	420	420	420	420
Case pressure (Relative)*	Rated(bar)		2						
	Peak(bar)		5						
Suction pressure (Absolute)	Rated(bar) Oil viscosity ≤ 30mm²/s		0.8						
	Peak(bar)		2						
Case oil filling volume (L)			2.6	2.6	2.8	3.4	8	9	10
Oil viscosity (mm²/s)			10~1000, optimal range 16~36						
Oil temperature (°C)			-20~100						
Oil cleanliness			20/18/15 (ISO 4406) and above						
Weight (kg) Without auxiliary flange			87	87	166	174	300	304	359

Remark: "*" ensure the relative pressure at the suction port is ≥ - 0.1 bar (recommended for normal operation).

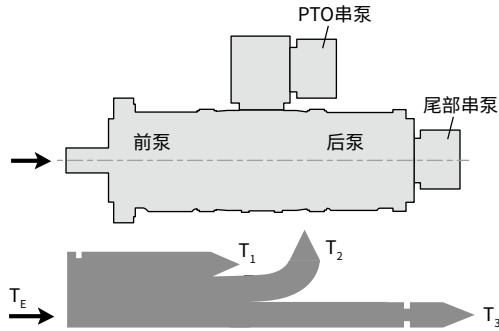
•Theoretical Calculation

Flow	$Q = \frac{V_g \cdot n \cdot \eta_v}{1000}$ (L/min)	V_g	= Displacement (cc/rev)
		Δp	= Pressure (bar)
Torque	$T = \frac{V_g \cdot \Delta p}{20 \cdot \pi \cdot \eta_{mh}}$ (N·m)	n	= Speed (rpm)
		η_v	= Volume efficiency
Power	$P = \frac{2\pi \cdot T \cdot n}{60000} = \frac{Q \cdot \Delta p}{600 \cdot \eta_t}$ (kW)	η_{mh}	= Mechanical-hydraulic efficiency
		η_t	= Total efficiency ($\eta_t = \eta_v \cdot \eta_{mh}$)

Technical Data

允许的输入扭矩、通轴驱动扭矩、PTO 驱动扭矩									
规格			75	85	130	180	280	300	330
扭矩 (at Vg max and P _{nom} 时) N·m	T		836	947	1572	2177	3387	3629	
驱动轴的最大输入扭矩 (N·m)									
JIS B 1603	40×14×2.5	T _{E max}			1000				
	47.5×17×2.5	T _{E max}			1500	1500			
	60×18×3	T _{E max}					3120	3120	
ANSI B 92.1	14T 12/24DP	T _{E max}	552	552					
最大通轴驱动扭矩 (N·m)									
ANSI B 92.1	13T 16/32DP	T _{3 max}	171		171	171	171		
	15T 16/32DP	T _{3 max}	272		272	272			
最大 PTO 驱动扭矩 (N·m)									
ANSI B 92.1	9T 16/32DP	T _{2 max}	59	59					
	10T 16/32DP	T _{2 max}	92	92					
	13T 16/32DP	T _{2 max}			171	171	171	171	
	15T 16/32DP	T _{2 max}			272	272	272	272	
	14T 12/24DP	T _{2 max}			552		552	552	

· 扭矩分配



V90N-T	前泵	T ₁
	后泵	
PTO 串泵		T ₂
尾部串泵		T ₃
输入扭矩		T _E =T ₁ +T ₂ +T ₃
		T _E < T _{E max}

Type introduction

V90N	130	T	V	R	E1	/	AJ1	N	N	G	M	S
①	②	③	④	⑤	⑥		⑦	⑧	⑨	⑩	⑪	⑫

Product series

①	Variable swash-plate design, double pump, open circuit	V90N
---	--	------

Size

②	Size	75	85	130	180	280	300	330
---	------	----	----	-----	-----	-----	-----	-----

Structure type

③		75	85	130	180	280	300	330	Code
	Tandem double pump	●	●	●	●	●	●	●	T

Seals

④		75	85	130	180	280	300	330	Code
	FKM (Viton rubber: DIN ISO 1629)	●	●	●	●	●	●	●	V
	NBR (Nitrile rubber: DIN ISO 1629)	●		●					N

Direction rotation

⑤		75	85	130	180	280	300	330	Code
	Clockwise	●	●	●	●	●	●	●	R
	Counter-clockwise	●			●	●	●		L

Control type

⑥		75	85	130	180	280	300	330	Code
	Electric proportional displacement (positive control)*	●	●	●	●	●	●	●	E1
	Electric proportional displacement (negative control)*	●							E2
	Electric proportional power control + load sensing *				●				LE1
	Hydraulic control negative flow + Electric proportional total power control (positive control)*	●	●	●	●	●	●		H1
	Hydraulic control negative flow + Electric proportional total power control (negative control)*	●	●	●	●				H2

Remark: "*" mean Deutsch DT04-2P; 2 contact pin(24V)

Type introduction

Mounting flange and input shaft

	Mounting flange	Input shaft	75	85	130	180	280	300	330	Code
⑦	SAE C J744-127-2	ANSI B92.1 1 1/4 in 14T 12/24DP	●	●						C2S3
	SAE J617 N0.3	JIS B 1603 40×14×2.5			●					AJ1
		JIS B 1603 40×14×2.5 (长)			●					AJ3
		JIS B 1603 47.5×17×2.5			●	●				AJ2
		JIS B 1603 47.5×17×2.5			●					AJ7 ¹
	SAE J617 N0.2	JIS B 1603 47.5×17×2.5			●	●				CJ2
		JIS B 1603 47.5×17×2.5				●				CJ7 ¹
	SAE J617 N0.1	JIS B 1603 47.5×17×2.5				●				DJ2
	4-hole flange	JIS B 1603 40×14×2.5			●					FJ1
		JIS B 1603 47.5×17×2.5			●					HJ2
		JIS B 1603 60×18×3					●	●	●	G4J6

Note: “1” indicates that the PTO port is available only when both the AJ7 and CJ7 are selected.

Through drive

		75	85	130	180	280	300	330	Code
⑧	None	●	●	●	●	●	●	●	N
	Installation method	Spline shaft							
	SAE B J744-101-2	ANSI B92.1 7/8 in 13T 16/32DP			●	●	●		B1
		ANSI B92.1 1 in 15T 16/32DP	●		●	●			B2
	With pilot gear pump and pressure relief valve (only for none through drive)		●	●	●	●	●	●	K0

PTO installation method

		75	85	130	180	280	300	330	Code
⑨	No boost, no power take-off		●	●	●	●	●		N
	Boost, no power take-off						●	●	H
	With power take-off	Installation method	Spline shaft						
		SAE A J744-82-2	ANSI B92.1 5/8 in 9T 16/32DP	●	●				A1
			ANSI B92.1 2/3 in 10T 16/32DP	●	●				A2
			ANSI B92.1 7/8 in 13T 16/32 DP	●	●	●	●		A3
		SAE B J744-101-2	ANSI B92.1 7/8 in 13T 16/32DP			●	●	●	B1
			ANSI B92.1 1 1/4 in 14T 12/24DP			●			B3
			ANSI B92.1 1 in 15T 16/32 DP			●	●	●	B2
		SAE C J744-127-2	ANSI B92.1 1 1/4 in 14T 12/24 DP				●	●	C1

Note: “*” indicates that the PTO is only available on the V90N330T turbocharged model. Other turbocharged variants without PTO are not listed.

Type introduction

Port Type (excluding inlet/outlet ports)

		75	85	130	180	280	300	330	Code
⑩	BSPP G thread Complies with standard JIS B2351	●	●	●	●	●	●	●	G

Threaded connection types for oil port flanges

		75	85	130	180	280	300	330	Code
⑪	Metric threads	●	●	●	●	●	●	●	M

Standard / special version

		75	85	130	180	280	300	330	Code
⑪	Standard version	●	●	●	●	●	●	●	None
	Special version	○	○	○	○	○	○	○	S

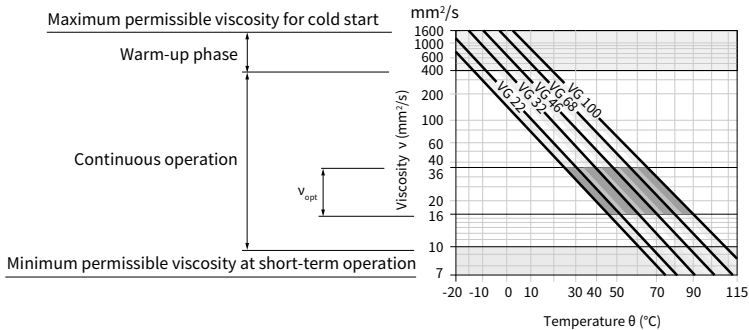
Remark: ● = Available; ○ = On request

Hydraulic fluid

Viscosity and temperature of the hydraulic fluid

	Viscosity(mm ² /s)	Oil seal	Temperature	Note
Cold start	$v_{\max} \leq 1600$	NBR	$\theta_{st} \geq -40^{\circ}\text{C}$	$t \leq 3$ minutes, no load($p \leq 50\text{bar}$), $n \leq 1000\text{rpm}$, Maximum permissible temperature difference between the rotating parts of the system and the hydraulic fluid 25°C .
		FKM	$\theta_{st} \geq -25^{\circ}\text{C}$	
Warm-up phase	$v = 1600 \cdots 400$			$t \leq 15$ minutes, $p \leq 0.7 \times p_{\text{nom}}$, $n \leq 0.5 \times n_{\text{nom}}$
Continuous operation	$v = 400 \cdots 10$	NBR	$\theta \leq +85^{\circ}\text{C}$	Measured at oil port T
		FKM	$\theta \leq +110^{\circ}\text{C}$	
	$v_{\text{opt}} = 36 \cdots 16$			Optimum operating viscosity and efficiency range
Short-term operation	$v_{\min} = 10 \cdots 7$	NBR	$\theta \leq +85^{\circ}\text{C}$	$t \leq 3$ minutes, $p \leq 0.3 \times p_{\text{nom}}$, Measured at oil port T
		FKM	$\theta \leq +110^{\circ}\text{C}$	

Selection chart



Detailed information on the selection of hydraulic fluids

To select the hydraulic fluid correctly, it is necessary to know the operating temperature in relation to the ambient temperature: in open circuits the tank temperature.

When selecting a hydraulic fluid, the operating viscosity should be in the optimum range for the operating temperature range (v_{opt} see shaded area of the selection chart). We recommend selecting a higher viscosity grade in all cases.

Example: When the operating temperature in the circuit is 60°C , in the optimum operating viscosity range (shaded area of the v_{opt}), corresponding to viscosity grades VG46 or VG68; VG68 should be selected.

Caution

The case drain temperature (influenced by pressure and speed) may be higher than the oil line temperature or tank temperature.

However, the temperature of any part of the component must not exceed 100°C .

Hydraulic fluid

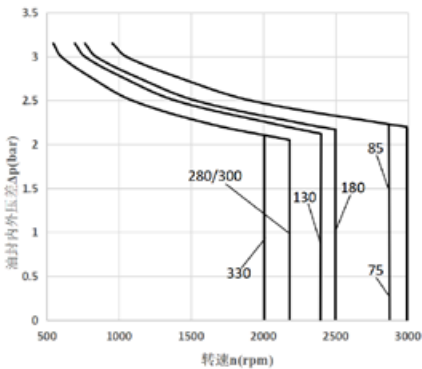
Filtration of hydraulic fluid

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.

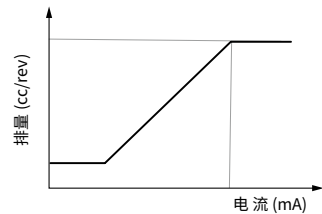
Oil seals

▲ Note

- 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.
- The pressure difference between the inside and outside of the seal must be greater than or equal to zero.



Control module function introduction



*The starting and ending points vary depending on the engine displacement.

Electronic proportional displacement control (positive control)

Features

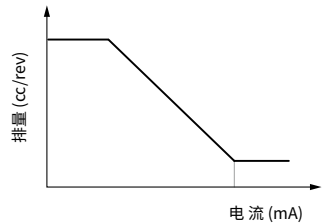
The pump's flow rate is proportional to the current; as the current increases, the flow rate increases.

Electrical connections

Voltage (V)	24 (+20%)
Maximum current (mA)	0.75
Rated resistance (at 20° C) (Ω)	24
Recommended PWM Frequency (Hz)	130 ~ 200
Install the connector	Deutsch DT04-2P
Protection rating	IP69K

Hydraulic connection

When the pump's discharge pressure is very low, an external oil supply must be provided to allow the pump to transition from a low flow rate to a high flow rate; the pressure of this supply must be between 30 bar and 50 bar.



*The starting and ending points vary depending on the engine displacement.

Electronic proportional displacement control (negative control)

Features

The pump's flow rate is directly proportional to the current; as the current increases, the pump's flow rate increases.

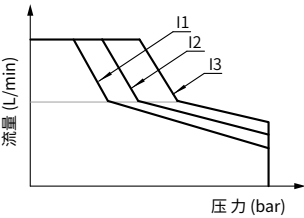
Electrical connections

Voltage (V)	24 (+20%)
Maximum Current (mA)	0.75
Rated Resistance (at 20° C) (Ω)	24
Recommended PWM Frequency (Hz)	130 ~ 200
Mounting Connector	Deutsch DT04-2P
Protection Rating	IP69K

Hydraulic connection

When the pump's discharge pressure is very low, an external oil supply must be provided to switch the pump from high flow rate to low flow rate; the pressure of this supply must be between 30 bar and 50 bar.

Control module function introduction



Electronic Power Control

Features

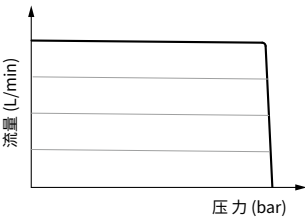
By incorporating a proportional solenoid into the constant-power control system, the output power can be maintained at various constant levels, thereby meeting the power requirements of different operating modes on the host machine.

Adjustment range

Electronic proportional power control can reduce output power by up to 40%.

Electrical connections

Voltage (V)	24 (+20%)
Maximum Current (mA)	0.65
Rated Resistance (at 20° C) (Ω)	23.5
Recommended PWM Frequency (Hz)	100
Mounting Connector	Deutsch DT04-2P
Protection Rating	IP69K



Load-sensing control

Features

Load-sensing control compares the pressure before and after the sensing orifice and maintains the pressure drop across the orifice, thereby keeping the pump flow rate constant. If the pressure differential at the sensing orifice increases, the pump displacement decreases. Conversely, if the pressure differential decreases, the pump displacement increases until the pressure drop across the orifice within the valve returns to the set value.

Adjustment range

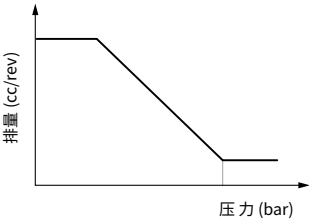
Standard setting: 15 bar

Adjustable range: 10 bar to 25 bar (Please contact Hengli if the pressure exceeds this range)

Hydraulic connection

If the line from the control port to the main valve does not provide sufficient relief capacity, a relief function can be added to the pump control valve; please specify this clearly when placing your order.

Control module function introduction



*The starting and ending points vary depending on the engine displacement.

Hydraulic negative flow control

Features

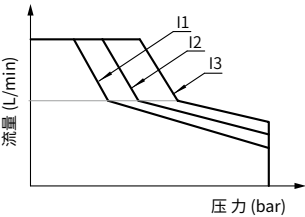
The pump's flow rate is inversely proportional to the feedback pressure; as the feedback pressure increases, the pump's flow rate decreases.

Adjustment range

The feedback pressure fluctuates by approximately 2 MPa.

Hydraulic connection

Connect the feedback pressure line to the main valve of the machine's hydraulic system.



Total Power Control (Proportional)

Features

At a given engine speed, the proportional solenoid can be used to control the sum of the power output from the front and rear pumps to maintain different constant values, thereby meeting the power requirements of various operating modes on the host machine.

$P = p1q + p2q$. The total power output P of the two pumps is proportional to the current, where $I1 < I2 < I3$; as the current increases, the total power output of the two pumps increases.

Adjustment range

Power ranges vary depending on engine displacement; please contact Hengli.

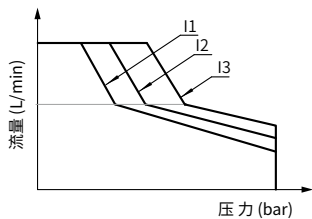
Electrical connections

Voltage (V)	24 (+20%)
Maximum Current (mA)	0.75
Rated Resistance (at 20° C) (Ω)	24
Recommended PWM Frequency (Hz)	130 ~ 200
Mounting Connector	Deutsch DT04-2P
Protection Rating	IP69K

Hydraulic connection

A pilot oil line must be connected; the pilot oil pressure should be 30–50 bar.

Control module function introduction



Total Power Control (Inverse Proportional) Features

At a given engine speed, the proportional solenoid can be used to control the sum of the power output from the front and rear pumps to maintain different constant values, thereby meeting the power requirements of various operating modes on the host machine.

$P = p_1q + p_2q$. The total power output P of the two pumps is proportional to the current, where $I_3 < I_2 < I_1$; as the current increases, the total power output of the two pumps decreases.

Electrical connections

Voltage (V)	24 (+20%)
Maximum Current (mA)	0.75
Rated Resistance (at 20° C) (Ω)	24
Recommended PWM Frequency (Hz)	130 ~ 200
Mounting Connector	Deutsch DT04-2P
Protection Rating	IP69K

Adjustment range

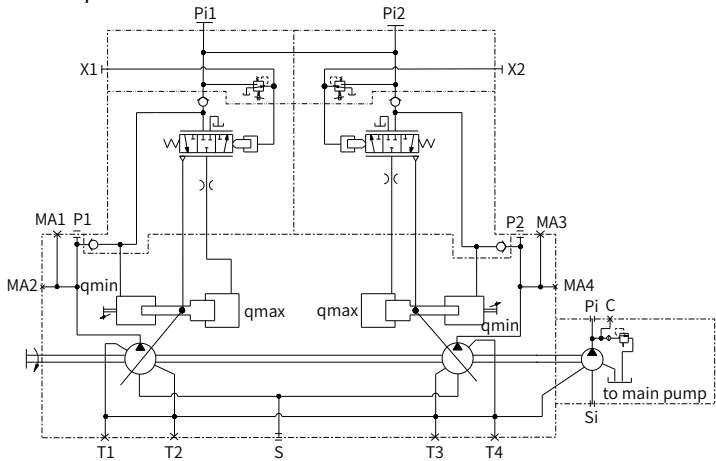
Adjustable range: 0–700 mA.

Control module function symbols

E1

Electronic proportional displacement control (positive control)

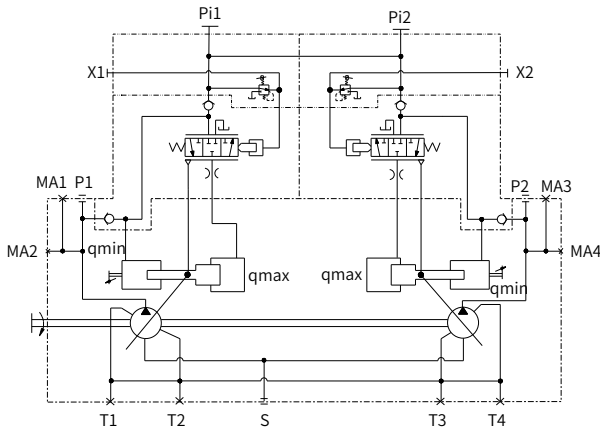
·V90N75T as an example



E2

Electronic proportional displacement control (negative control)

·V90N75T as an example

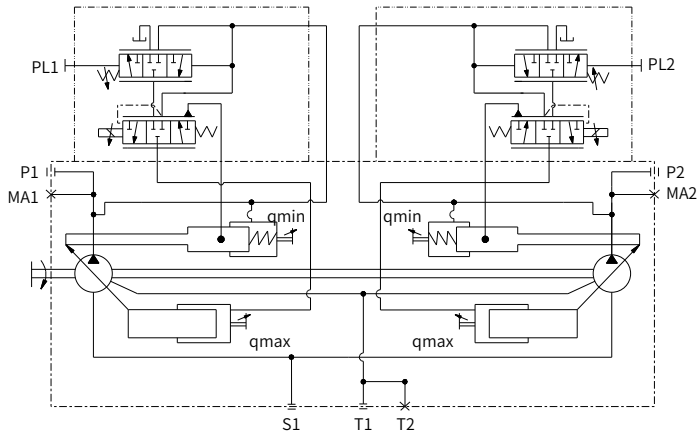


Control module function symbols

LE1

Electronic proportional power control + load-sensing

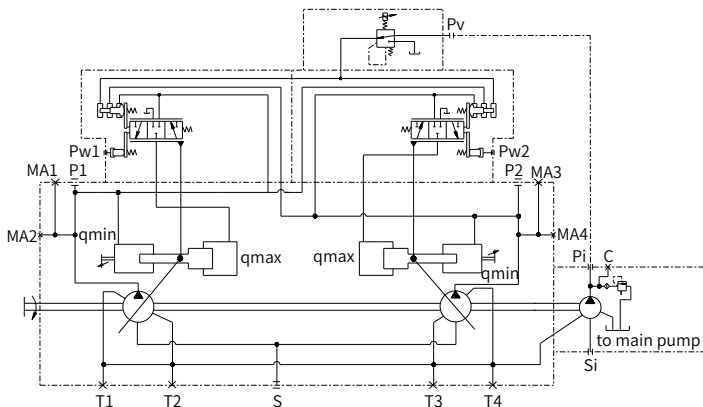
- V90N180T as an example



H1

Hydraulic negative flow control + total power control (proportional variable power)

- V90N75T as an example

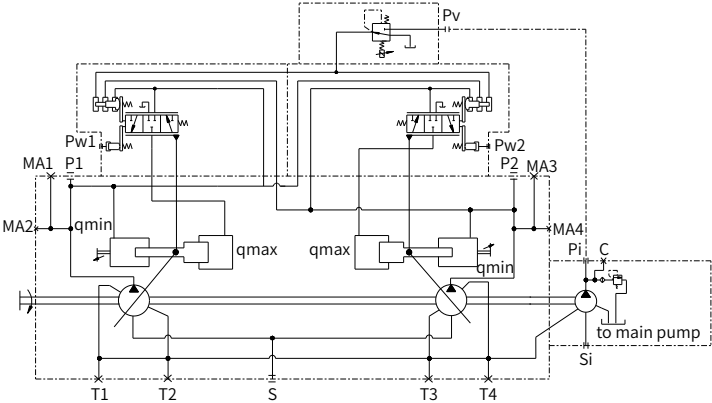


Control module function symbols

H2

Hydraulic negative flow control + total power control
(inverted proportional power control)

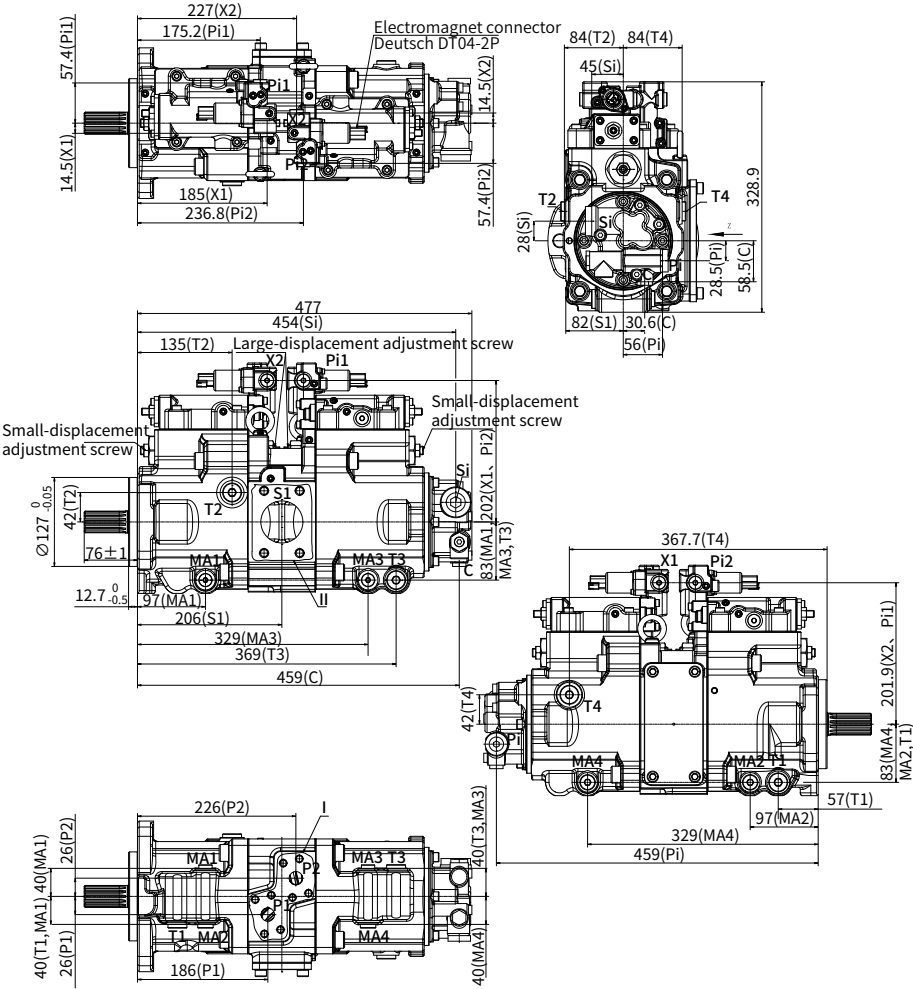
·V90N75T as an example



Installation size

V90N75T Installation Dimensions

·V90N75TVRE1/C2S3K0NGM as an example

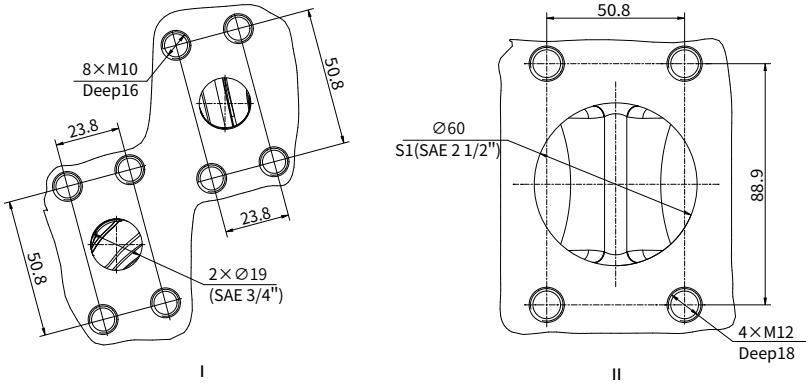


Installation size

V90N75T Installation Dimensions

·V90N75TVRH1/C2S3K0NGM as an example

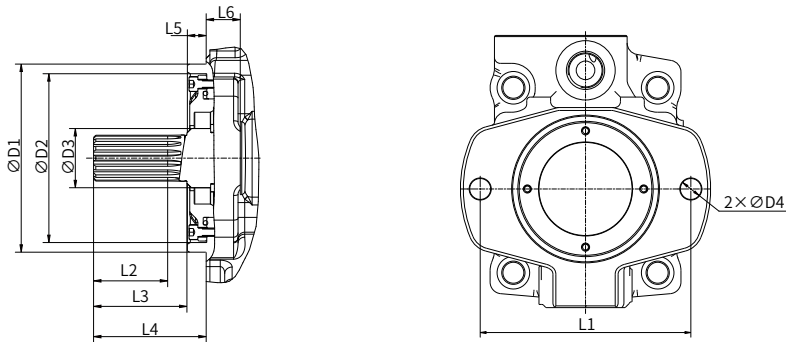
Oil port size



Port	Port Name	Standard	Port Specifications (Thread Depth)	Maximum Pressure (bar)
P1,P2	Oil outlet	SAE J518C	M10×1.5(Thread depth17mm)	400
S1	Oil inlet	SAE J518C	M12×1.75(Thread depth20mm)	1
T1,T2,T3,T4	Drain port	JIS B2351	G 1/2(Thread depth19mm)	3
Pi1,Pi2	Pilot pressure port	JIS B2351	G 1/4(Thread depth12mm)	400
MA1,MA3	Pressure tap	JIS B2351	G 1/4(Thread depth15mm)	400
MA2,MA4	Pressure tap	JIS B2351	G 3/8(Thread depth16mm)	400
Pi	Pilot pump outlet	JIS B2351	G 1/2(Thread depth19mm)	41
Si	Pilot pump inlet	JIS B2351	G 3/4(Thread depth20.5mm)	1
X1,X2	Pressure tap downstream of the electric proportional pressure-reducing valve	JIS B2351	G 1/4(Thread depth12mm)	41
C	Pilot pump pressure tap	JIS B2351	G 1/4(Thread depth12mm)	41

Installation size

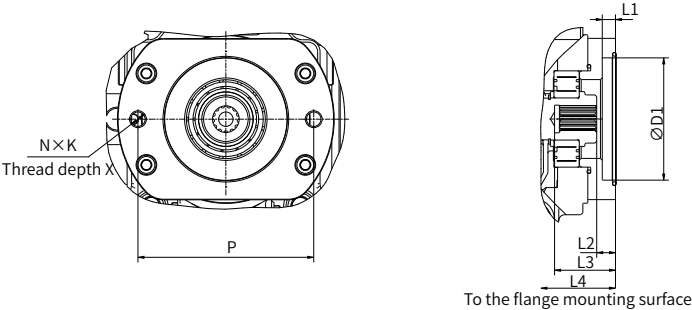
V90N75T Mounting Flange and Input Shaft Dimensions



Code	L1	L2	L3	L4	L5	L6	D1	D2	D3	D4
C2S3	181	50	63	76	12.7	23	127	114	40	18

Installation size

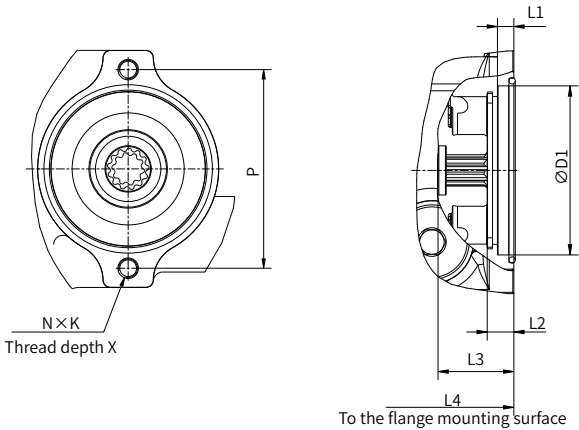
V90N75T 通轴尺寸



Code	L1	L2	L3	L4	D1	N	K	X	P
B2	11	15.6	50.6	436.1	101.6	2	M14	23	146

Installation size

V90N75T Installation Dimensions for the PTO and Booster Impeller

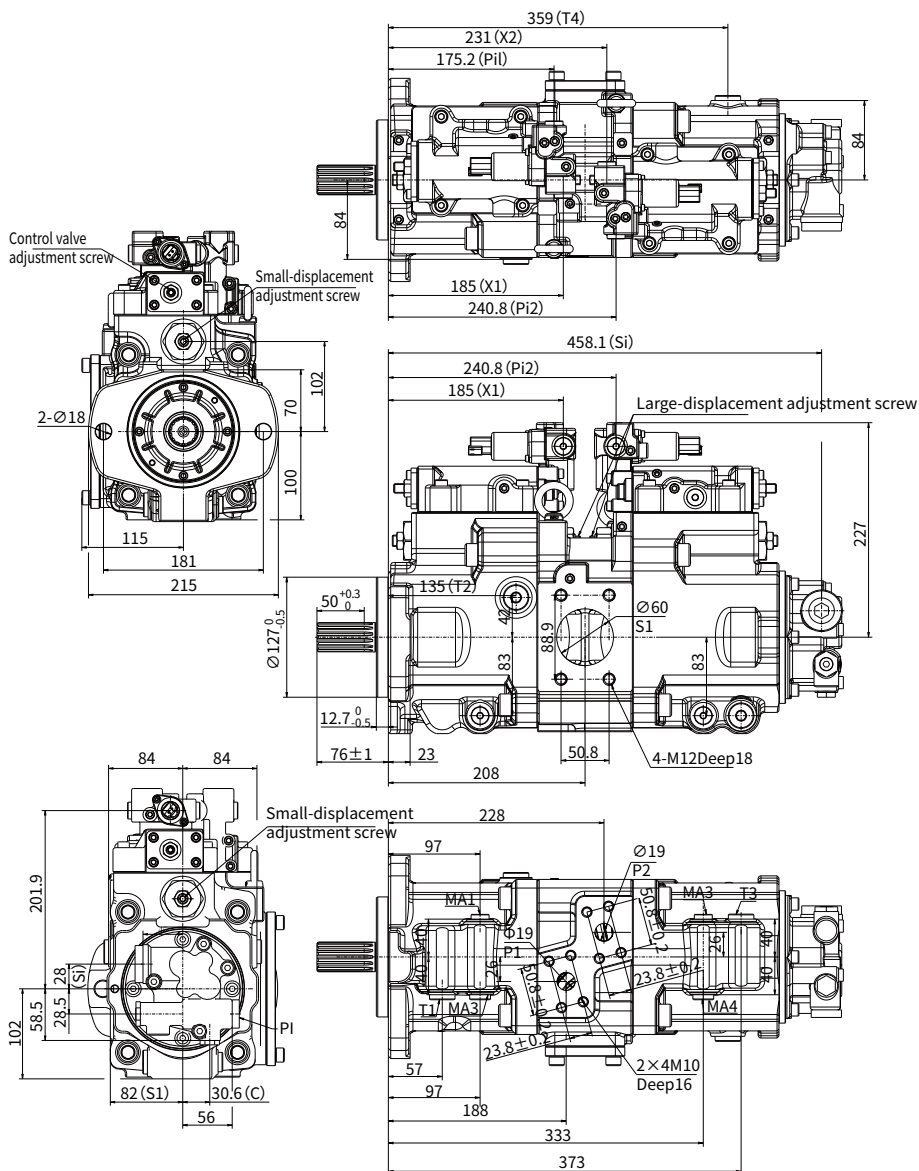


Code	L1	L2	L3	L4	D1	N	K	X	P
A1	8	13	37	246	82.55	2	M10	25	106.4
A2									
A3			47						

Installation size

V90N85T Installation Dimensions

- V90N85TVRE1/C2S3K0NGM as an example

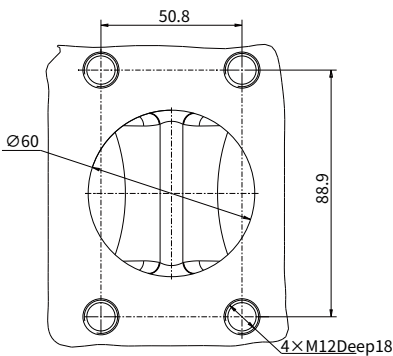
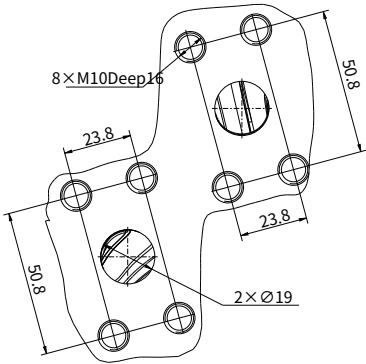


Installation size

V90N85T Installation Dimensions

· V90N85TVRE1/C2S3K0NGM as an example

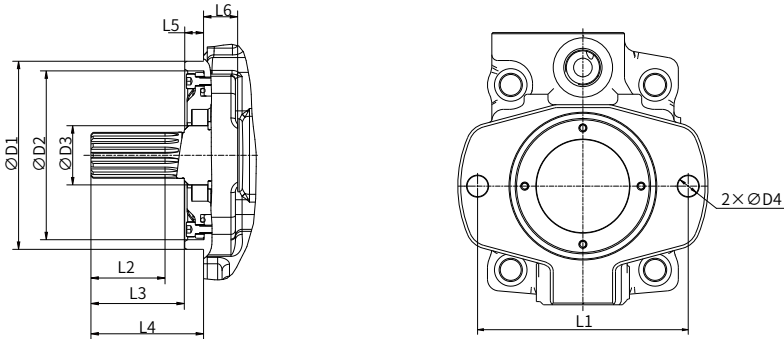
Oil port size



Port	Port Name	Standard	Port Specifications (Thread Depth)	Maximum Pressure (bar)
P1,P2	Oil outlet	SAE J518C	M10×1.5(Thread depth17mm)	400
S1	Oil inlet	SAE J518C	M12×1.75(Thread depth20mm)	1
T1,T2,T3,T4	Drain port	JIS B2351	G 1/2(Thread depth19mm)	3
Pi1,Pi2	Pilot pressure port	JIS B2351	G 1/4(Thread depth12mm)	400
MA1,MA3	Pressure tap	JIS B2351	G 1/4(Thread depth15mm)	400
MA2,MA4	Pressure tap	JIS B2351	G 3/8(Thread depth16mm)	400
Pi	Pilot pump outlet	JIS B2351	G 1/2(Thread depth19mm)	41
Si	Pilot pump inlet	JIS B2351	G 3/4(Thread depth20.5mm)	1

Installation size

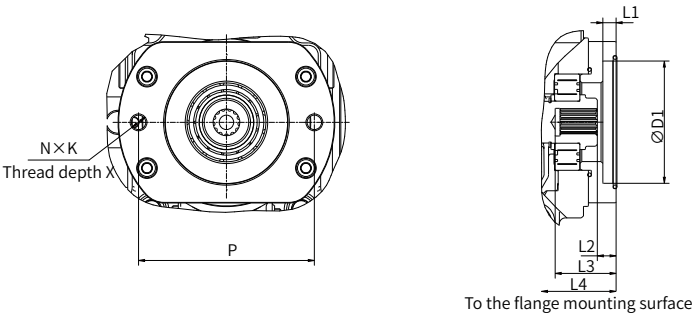
V90N85T Mounting Flange and Input Shaft Dimensions



Code	L1	L2	L3	L4	L5	L6	D1	D2	D3	D4
C2S3	181	50	63	76	12.7	23	127	114	40	18

Installation size

V90N85T Installation Dimensions for the PTO and Booster Impeller

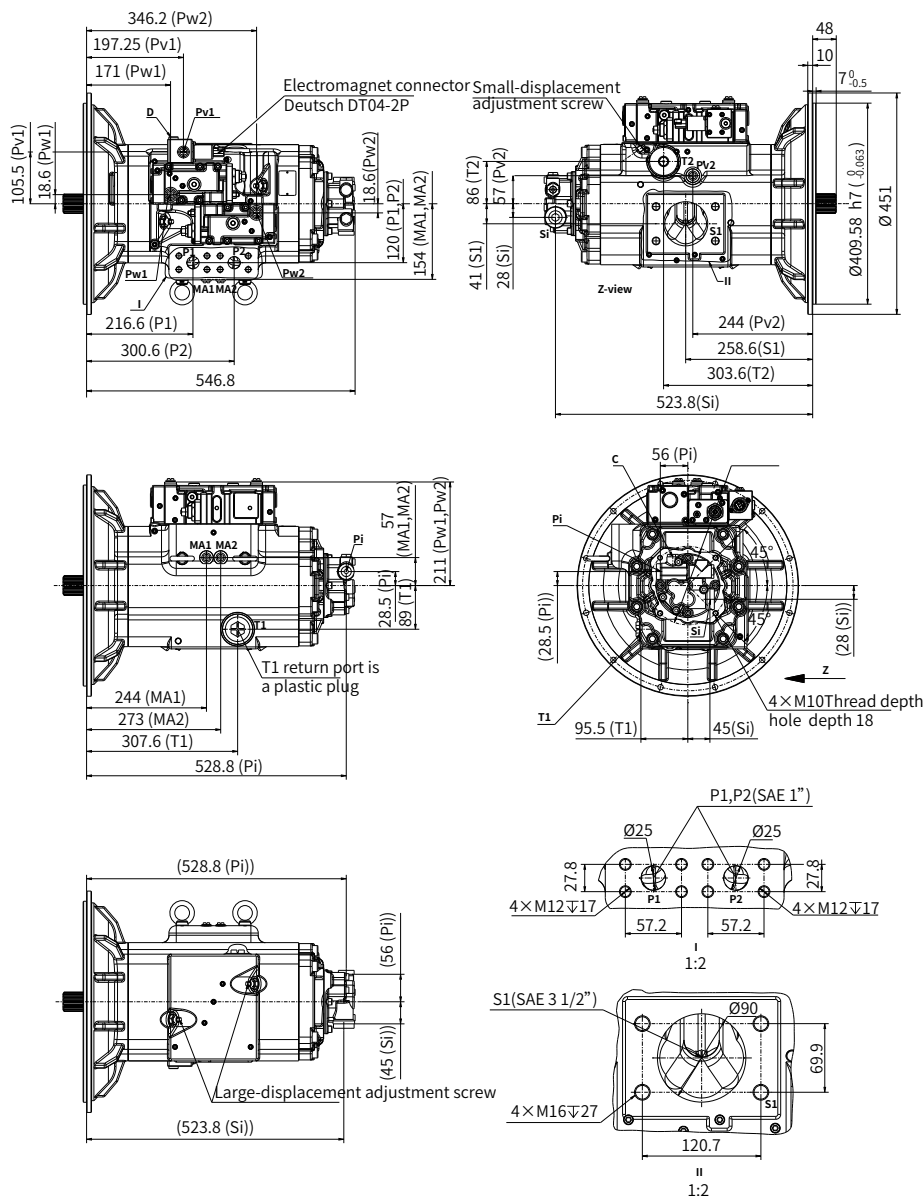


Code	L1	L2	L3	L4	D1	N	K	X	P
A1	8	13	37	246	82.55	2	M10	25	106.4
A2			47						
A3									

Installation size

V90N130T Installation Dimensions

- V90N130TVRH1/AJ1K0NGM as an example



Installation size

V90N130T Installation Dimensions

· V90N130TVRH1/AJ1K0NGM as an example

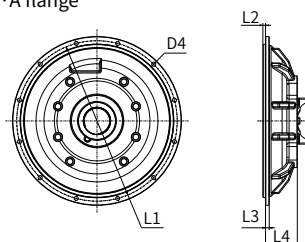
Oil port size

Port	Port Name	Standard	Port Specifications (Thread Depth)	Maximum Pressure (bar)
P1, P2	Oil outlet	SAE J518C	M12×1.75(Thread depth17mm)	420
S1	Oil inlet	SAE J518C	M16×2(Thread depth27mm)	1
T1, T2	Drain port	JIS B2351	G1 1/4 (Thread depth22mm)	3
Pw1, Pw2	Pilot pressure port	JIS B2351	G1/4 (Thread depth12mm)	41
MA1, MA2	Pressure test port	JIS B2351	G1/4 (Thread depth13mm)	420
C	Pressure test port	JIS B2351	G1/4 (Thread depth12mm)	40
D	Pressure test port	JIS B2351	G1/4 (Thread depth12mm)	40
Pi	Pilot pump outlet	JIS B2351	G1/2 (Thread depth19mm)	41
Si	Pilot pump inlet	JIS B2351	G3/4 (Thread depth20.5mm)	1
Pv1, Pv2	External control port	JIS B2351	G1/4 (Thread depth13mm)	40

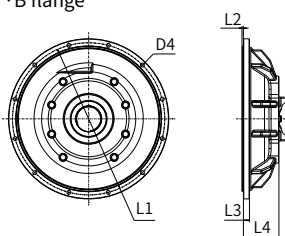
Installation size

V90N130T Mounting Flange and Input Shaft Dimensions

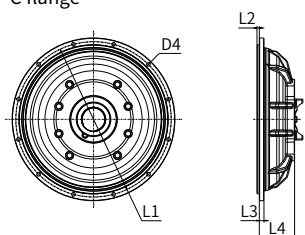
· A flange



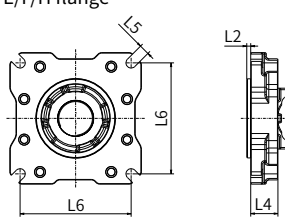
· B flange



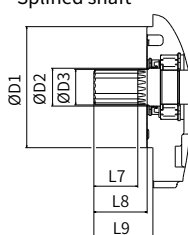
· C flange



· E/F/H flange



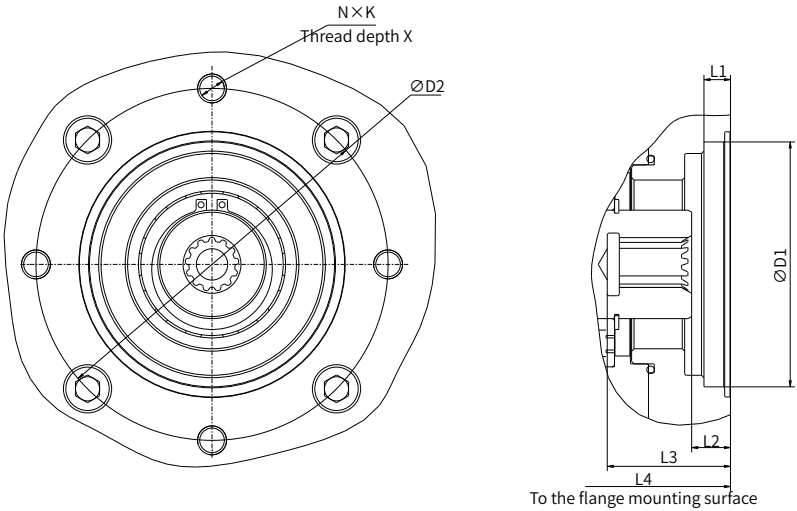
· Splined shaft



Code	L1	L2	L3	L4	L5	L6	L7	L8	L9	D1	D2	D3	D4
AJ1	428.62	7	10	85	-	-	58	70.9	48	100	50	39.5	11
AJ2	428.62	7	10	85	-	-	58	70.9	48	100	50	47	11
AJ3	428.62	7	10	85	-	-	68	84.9	62	100	50	39.5	11
AJ7	428.62	7	14.65	144.65	-	-	63	78.2	25.05	-	50	47	11
BJ1	428.62	4	17	100	-	-	58	70.9	33	100	50	39.5	11
CJ2	466.72	7	14	106	-	-	58	70.9	27	100	50	47	11
FJ1	-	8	-	55	21	224.5	58	70.4	78	165.1	50	39.5	-
HJ2	-	8	-	55	21	224.5	58	70.4	78	160	50	47	-

Installation size

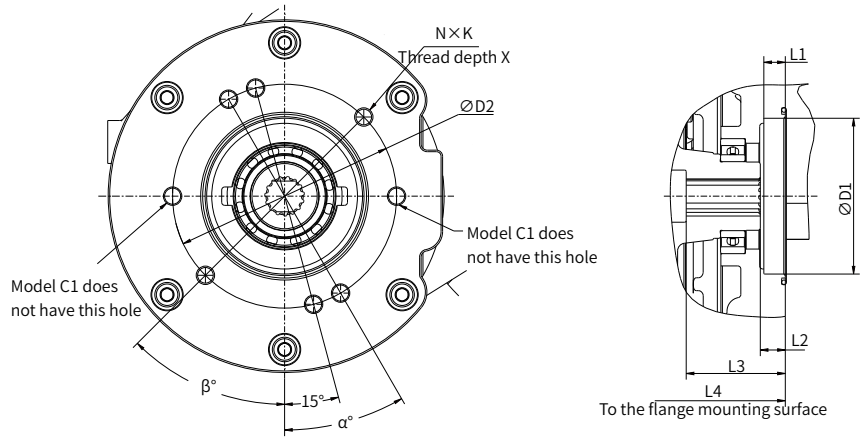
V90N130T 通轴尺寸



Code	L1	L2	L3	L4	D1	D2	N	K	X
B1/B2	14	16.1	51.1	516.9	101.6	146	4	M12	25

Installation size

V90N130T Installation Dimensions for the PTO and Booster Impeller

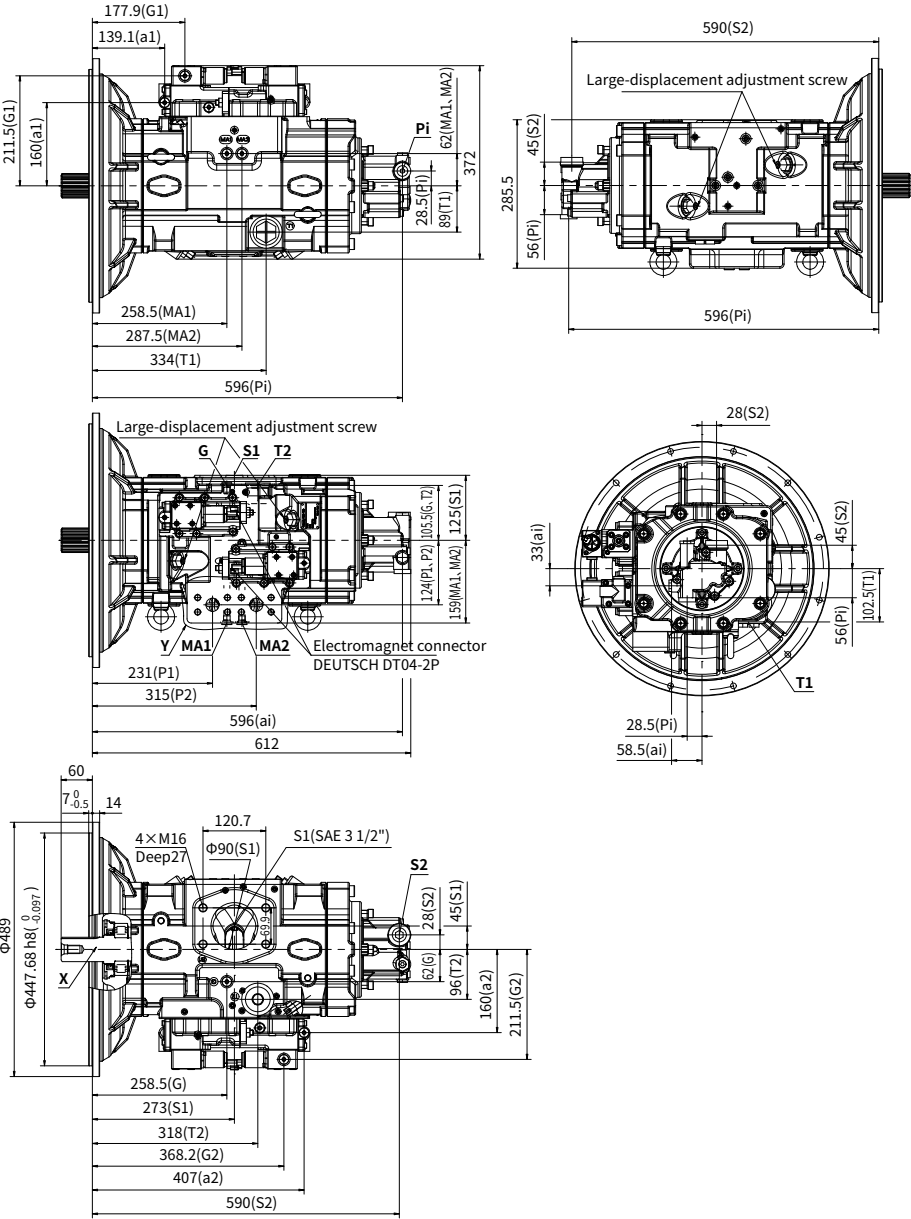


Code	L1	L2	L3	L4	D1	N	K	X	D2	α	β
A3	14	16.3	64.6	158.7	82.55	8	M10	118.5	1006.4	45	45
B1	14	16.3	64.6	158.7	101.6	8	M12	220.5	1446	30	45
B2	14	16.3	64.6	158.7	101.6	8	M12	220.5	1446	30	45
B3	14	16.3	64.6	158.7	101.6	8	M12	220.5	1446	30	45

Installation size

V90N180T Installation Dimensions

· V90N180TVRE1/CJ2K0NGM as an example

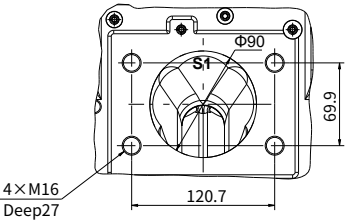
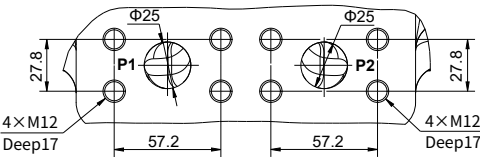


Installation size

V90N180T Installation Dimensions

·V90N180TVRE1/CJ2K0NGM as an example

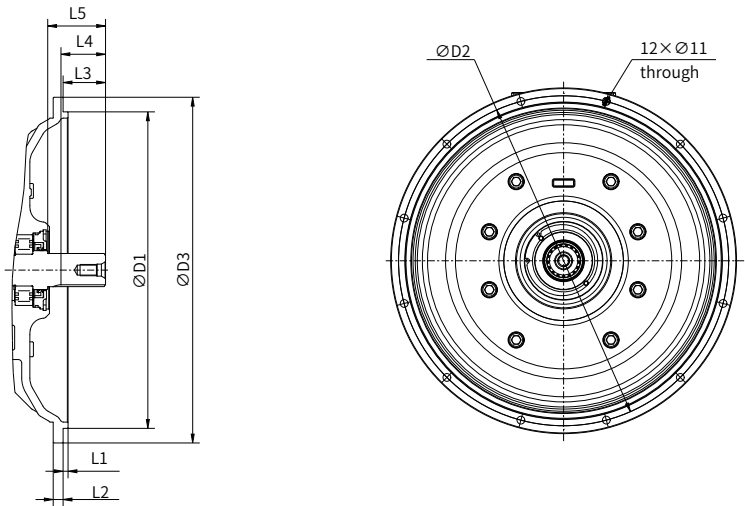
Oil port size



Port	Port Name	Standard	Port Specifications (Thread Depth)	Maximum Pressure (bar)
P1,P2	Discharge Port	SAE J518C	1" M12×1.75 Thread depth 17mm	420
S1	Inlet Port	SAE J518C	3 1/2" M16×2 Thread depth 27mm	2
T1,T2	Drain Port	JIS B2351	G 3/4 Thread depth 20mm	5
G,G1,G2	External Control Port	JIS B2351	G 1/4 Thread depth 13mm	41
MA1,MA2	Pressure Test Port	JIS B2351	G 1/4 Thread depth 13mm	420
Pi	Pilot Pump Discharge Port	JIS B2351	G 1/2 Thread depth 19mm	41
S2	Pilot Pump Inlet Port	JIS B2351	G 3/4 Thread depth 20.5mm	5
ai	Gear Pump Pressure Test Port	JIS B2351	G 1/4 Thread depth 15mm	41
a1,a2	Pressure Test Port	JIS B2351	G 1/4 Thread depth 15mm	41

Installation size

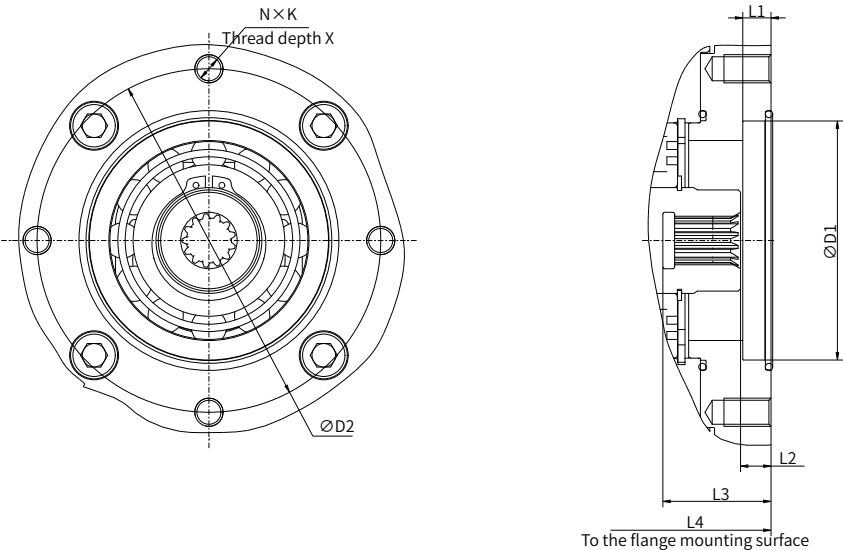
V90N180T Mounting Flange and Input Shaft Dimensions



Code	D1	D2	D3	L1	L2	L3	L4	L5
AJ2	409.58	428.62	451	7	14	43	48	666.8
CJ2	477.68	466.72	489	7	14	60	63	81.8
CJ7	477.68	466.72	489	7	14	30.335	66	84.5
DJ2	511.1	530.2	555	7	14	63	63	81.8

Installation size

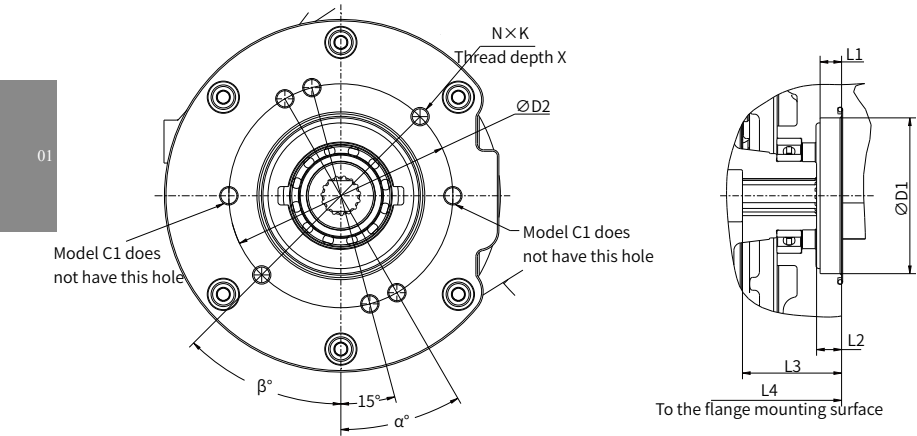
V90N180T 通轴尺寸



Code	L1	L2	L3	L4	D1	D2	N	K	X
B1/B2	12	13	46	556.4	101.6	146	4	M12	21

Installation size

V90N180T Installation Dimensions for the PTO and Booster Impeller

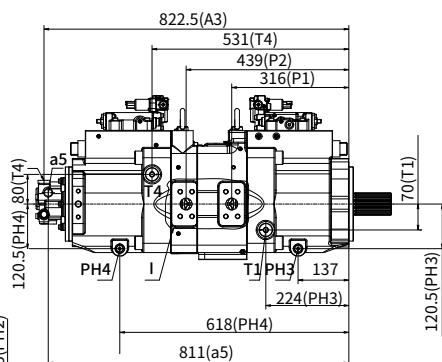
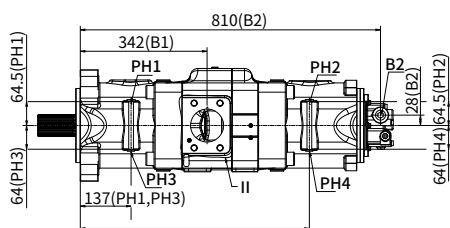
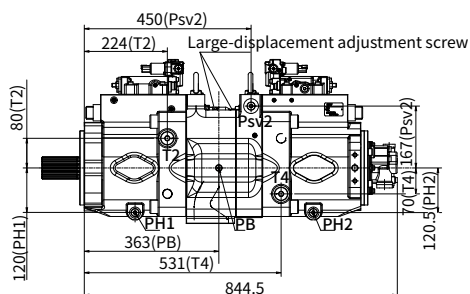
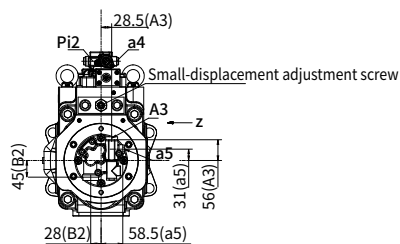
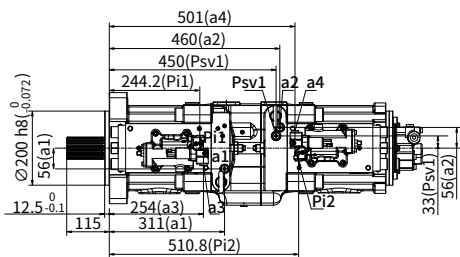


Code	L1	L2	L3	L4	D1	N	K	X	D2	α	β
A3	14	16.3	64.6	158.7	82.55	8	M10	118.5	1006.4	45	45
B1	14	16.3	64.6	158.7	101.6	8	M12	220.5	1446	30	45
B2	14	16.3	64.6	158.7	101.6	8	M12	220.5	1446	30	45

Installation size

V90N280T Installation Dimensions

· V90N280TVRE1/G4J6K0HGM as an example

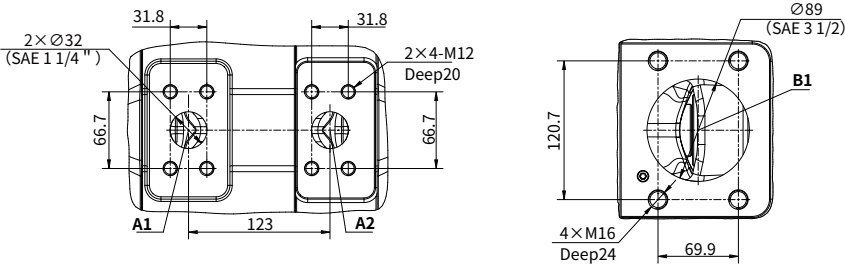


Installation size

V90N280T Installation Dimensions

·V90N280TVRE1/G4J6K0HGM as an example

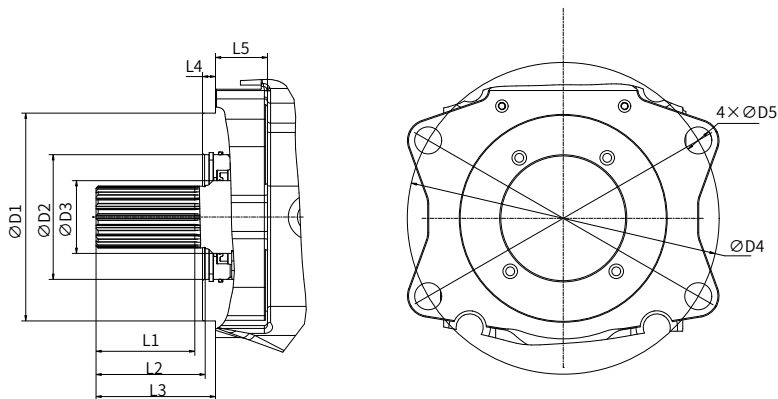
Oil port size



Port	Port Name	Standard	Port Specifications (Thread Depth)	Maximum Pressure (bar)
A1,A2	Discharge Port	SAE J518C	1 1/4" M12×1.75 Thread depth 20mm	420
B1	Suction Port	SAE J518C	3 1/2" M16×2 Thread depth 26mm	1
T1,2,3,4	Return Port	JIS B2351	G 3/4 Thread depth 20mm	3
Psv2	Pilot Port	JIS B2351	G 3/8 Thread depth17mm	40
Psv1	Pilot Port	JIS B2351	G 1/4 Thread depth15mm	40
a1,a2 PH3,PH4	Pressure Test Port	JIS B2351	G 1/4 Thread depth15mm	420
Pi1,Pi2	Pilot Port	JIS B2351	G 1/4 Thread depth12mm	41
a3,a4,a5	Pressure Test Port	JIS B2351	G 1/4 Thread depth12mm	41
PB	Pressure Test Port	JIS B2351	G 1/8 Thread depth12mm	3
PH1,2	Pressure Test Port	JIS B2351	G 3/8 Thread depth17mm	420
A3	Gear Pump Discharge Port	JIS B2351	G 1/2 Thread depth19mm	41

Installation size

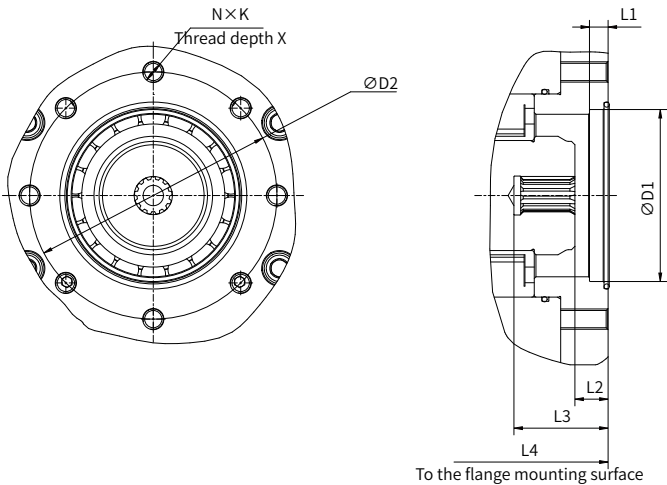
V90N280T Mounting Flange and Input Shaft Dimensions



Code	L1	L2	L3	L4	L5	D1	D2	D3	D4	D5
G4J6	95	105	115	12.5	50	200	120	70	300	26

Installation size

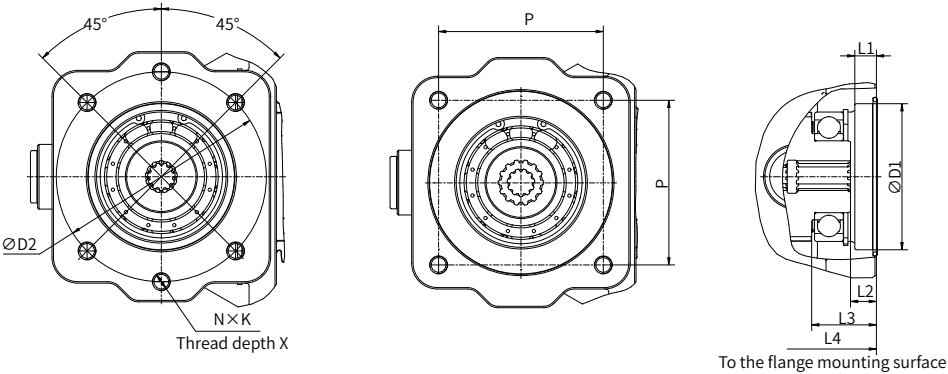
V90N280T 通轴尺寸



Code	L1	L2	L3	L4	D1	D2	N	K	X
B1	11	19.6	55.6	742	101.6	146	8	M12	25

Installation size

V90N280T Installation Dimensions for the PTO and Booster Impeller

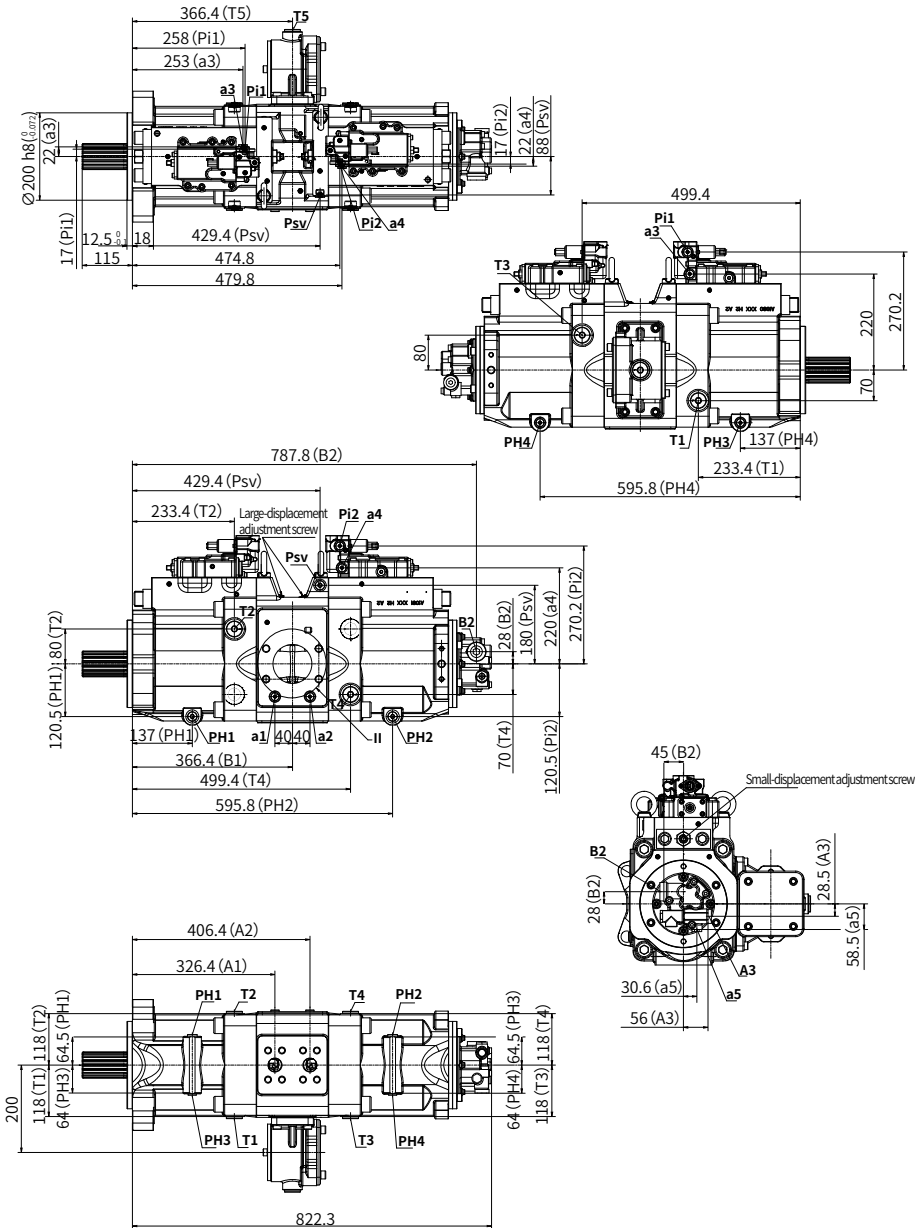


Code	L1	L2	L3	L4	D1	D2	N	K	X	P
B1/B2	15	18	45	413	101.6	146	6	M12	20	/
C1						/	4	M12	17	114.5

Installation size

V90N300T Installation Dimensions

· V90N300TVRE1/G4J6K0B2GM as an example

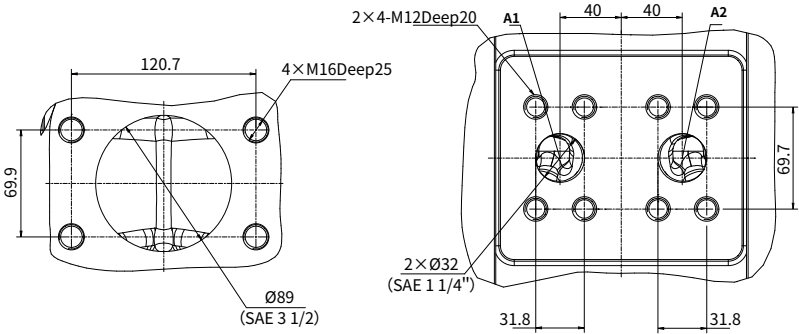


Installation size

V90N300T Installation Dimensions

·V90N300TVRE1/G4J6K0B2GM as an example

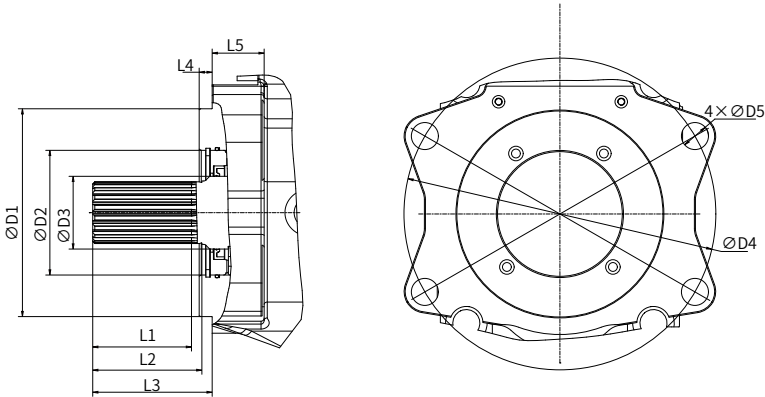
Oil port size



Port	Port Name	Standard	Port Specifications (Thread Depth)	Maximum Pressure (bar)
A1,A2	DELIVERY PORT	SAE J518C	1 1/4" M12×1.75 深 20mm	420
B1	SUCTION PORT	SAE J518C	3 1/2" M16×2 深 25mm	2
T1,2,3,4,5	DRAIN PORT	JIS B2351	G 3/4—20mm	3
Psv	PILOT PORT	JIS B2351	G 3/8—18mm	40
a1,a2 PH3,PH4	SENSOR PORT	JIS B2351	G 1/4—15mm	420
Pi1,Pi2	PILOT PORT	JIS B2351	G 1/4—13mm	40
a3,a4,a5	SENSOR PORT	JIS B2351	G 1/4—13mm	40
PH1,2	SENSOR PORT	JIS B2351	G 3/8—15mm	420
A3	GEAR PUMP DELIVERY PORT	JIS B2351	G 1/2—19mm	40
B2	GEAR PUMP SUCTION PORT	JIS B2351	G 3/4—20.5mm	2

Installation size

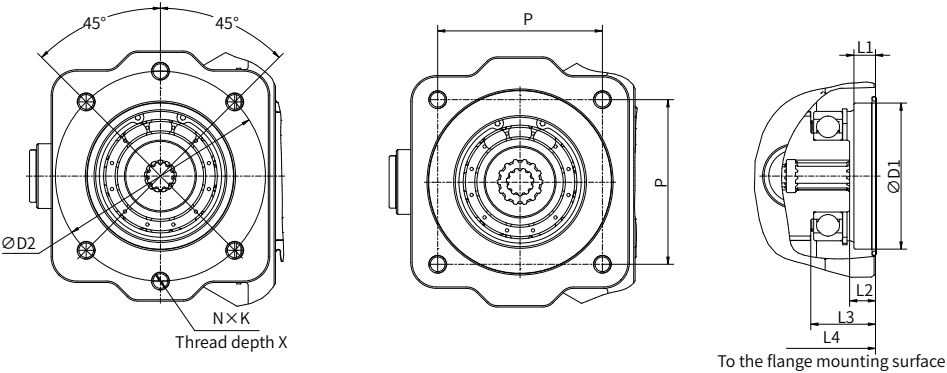
V90N300T Mounting Flange and Input Shaft Dimensions



Code	L1	L2	L3	L4	L5	D1	D2	D3	D4	D5
G4J6	95	105	115	12.5	50	200	120	70	300	26

Installation size

V90N300T Installation Dimensions for the PTO and Booster Impeller



Code	L1	L2	L3	L4	D1	D2	N	K	X	P
B1/B2	15	18	45	413	101.6	146	6	M12	20	/
C1						/	4	M12	17	114.5

V90N330T Installation Dimensions

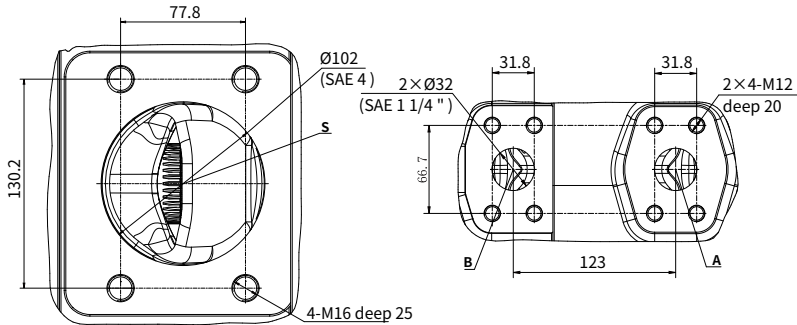


Installation size

V90N330T Installation Dimensions

· V90N330TVRE1/G4J6NB2GM as an example

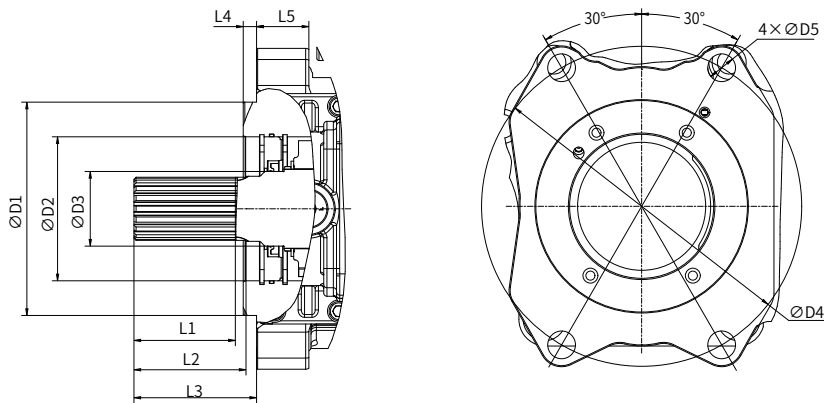
Oil port size



Port	Port Name	Standard	Port Specifications (Thread Depth)	Maximum Pressure (bar)
A,B	Oil outlet	SAE J518C	SAE 6000psi 1 1/4"	420
S	Oil inlet	SAE J518C	SAE 3000psi 4"	2
T1,2,3,4,5,6	Return port	JIS B2351	G 3/4—20mm	5
Psv	Pilot port	JIS B2351	G 1/4—13mm	40
MA1,MA2	Pressure test port	JIS B2351	G 3/8—15mm	420
Pi1,Pi2	Pilot port	JIS B2351	G 1/4—13mm	40
a1,a2	Pressure test port	JIS B2351	G 1/4—13mm	40
MA3,MA4	Pressure test port	JIS B2351	G 1/4—13mm	420
PCH1	Pressure test port	JIS B2351	G 1/8—11mm	40
PCH2	Pressure test port	JIS B2351	G 1/4—13mm	40

Installation size

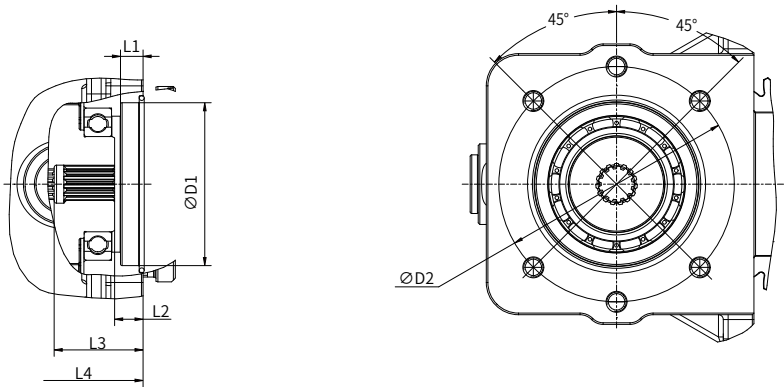
V90N330T Mounting Flange and Input Shaft Dimensions



Code	L1	L2	L3	L4	L5	D1	D2	D3	D4	D5
G4J6	95	105	115	12.5	49	200	135	70	300	26

Installation size

V90N330T Installation Dimensions for the PTO and Booster Impeller



Code	L1	L2	L3	L4	D1	D2	N	K	X
B2	14	17.6	55	84	101.6	146	6	M12	22
B1			49						

Installation type

Installation instructions

- △ During commissioning and operation, the plunger pump must always be filled with hydraulic oil and purged of air. After prolonged periods of inactivity, the above precautions must also be observed, as the plunger pump may drain hydraulic oil back to the tank through the hydraulic lines. Particularly when the drive shaft is in a vertical orientation (facing upward or downward), complete filling and thorough venting are essential; otherwise, risks such as dry running may occur.
- △ The plunger pump must be drained through the highest installed port among the three available drain ports: T1, T2, and T3.
- △ When multiple plunger pumps operate together, each pump must be connected to a drain line. If a common drain line is used, ensure that the line pressure does not exceed the case pressure of any pump. If pressure differences exist between the drain ports of individual pumps, the drain line must be adjusted to ensure that under no circumstances does the drain pressure exceed the permissible case pressure of all pumps. If this cannot be achieved, separate drain lines should be installed.
- △ To suppress noise generation, different lines should be isolated using elastic elements, and mounting the plunger pump directly on the oil tank should be avoided. Under all operating conditions, the suction and drain lines must extend below the minimum submerged depth in the oil tank. When the plunger pump is mounted above the oil tank, the height (hs) from the pump's suction port to the highest oil level in the tank must not exceed 800 mm. During operation, including cold starts, the minimum suction pressure at the suction port must not fall below 0.8 bar (absolute pressure).
- △ When designing the oil tank, ensure sufficient distance between the suction line and the case drain line. Prevent heated return flow from being directly drawn back into the suction line.
- △ Under certain installation conditions, gravity, hydraulic oil, and case pressure may cause slight variations in control characteristics and alter response times.

Symbol definitions and notes

Symbol	
R	Filling / Air bleeding
S	Suction port
T1/T2/T3	Drain port
DB	Baffle plate
h _{t min}	Minimum required depth of immersion depth (200mm)
h _{min}	Minimum distance required to the bottom (100mm)
h _{ES min}	Minimum height required to prevent piston unit from draining (25mm)
h _{s max}	Maximum permissible suction height (800mm)

Note : The oil port R is part of the external pipework and must be supplied by the customer to make filling and venting easier.

Please refer to the following examples: Figure 1 to Figure 15.

Other installation positions are available upon request.

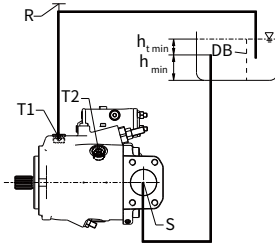
Recommended installation positions: 1 and 3.

Installation type

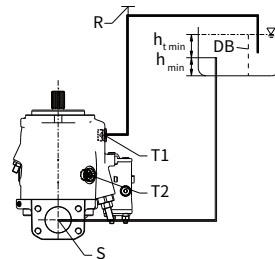
Mounting under tank (Standard)

Under tank mounting means that the piston pump is mounted outside the tank, below the lowest oil level.

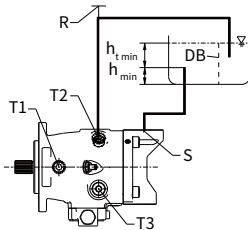
- Figure 1
Air bleed: R
Filling: T1 or T2



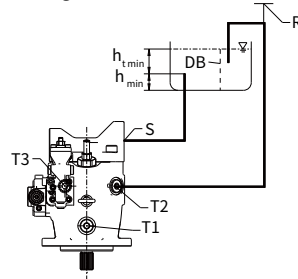
- Figure 2*
Air bleed: R
Filling: T1



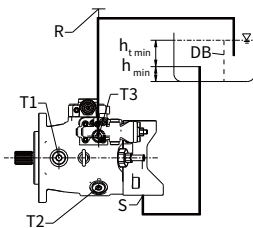
- Figure 3
Air bleed: R
Filling: T2



- Figure 4
Air bleed: R
Filling: T3



- Figure 5
Air bleed: R
Filling: T3



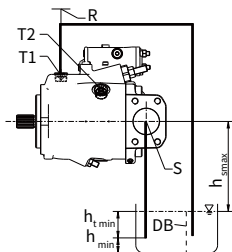
Note: "*" As the pump cannot be fully vented and oiled in this position, it should be vented and oiled in a horizontal position before installation.

Installation type

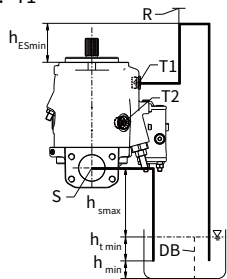
Mounting above tank

Mounting above the tank means that the piston pump is mounted above the lowest level of the tank and that the difference in height, $h_{ES\ min}$, must be at least 25 mm in order to prevent the piston pump from emptying out in Fig. 7. Observe the maximum permissible suction height, $h_{s\ max} = 800\ mm$. The use of check valves in the drain line is only permitted in individual cases. Information can be obtained by contacting Hengli.

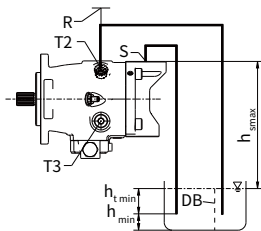
- Figure 6
Air bleed: R
Filling: T1 or T2



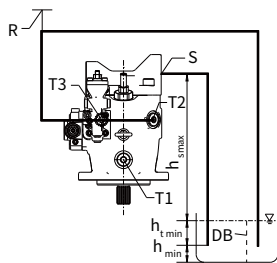
- Figure 7
Air bleed: R
Filling: T1



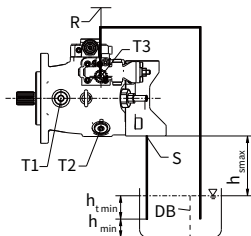
- Figure 8
Air bleed: R
Filling: T2



- Figure 9
Air bleed: R
Filling: T2



- Figure 10
Air bleed: R
Filling: T3



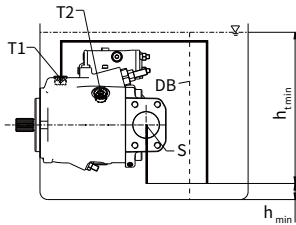
Note: " " As the pump cannot be fully vented and oiled in this position, it should be vented and oiled in a horizontal position before installation.

Installation type

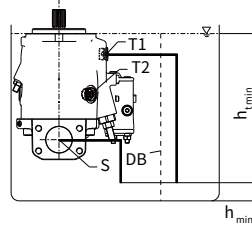
In-tank mounting

In-tank mounting means that the axial piston pump is mounted in the tank, below the lowest oil level. The axial piston pump is completely below the hydraulic oil. If the minimum oil level is equal to or lower than the upper edge of the pump, see section "Mounting above the tank". Piston pumps with electrical components (e.g. electronic controllers, sensors) cannot be mounted below the oil level in the tank.

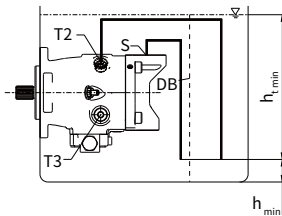
- **Figure 11***
Air bleed: Through the highest available port T1



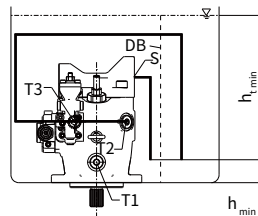
- **Figure 12***
Air bleed: Through the highest available port T1



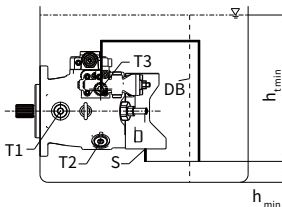
- **Figure 13***
Air bleed: Through the highest available port T2



- **Figure 14***
Air bleed: Through the highest available port T3



- **Figure 15***
Air bleed: Through the highest available port T3



Note: " " As the position is below the hydraulic oil level, oil filling is carried out automatically via the open ports T1, T2 or T3.

Instructions

Rules of use

- △ This fluid technology product leaves the factory in a technically safe and perfect condition. In order to maintain this condition and ensure safe operation, the user must observe the instructions and warnings contained in this document.
- △ The fluid technology products may only be installed and integrated into hydraulic systems by qualified specialists who have knowledge of and observe the general standards for this technology. In addition, it must be ensured, if necessary, that the selected product is suitable for its specific application and meets environmental and legal requirements.
- △ The products may only be used as pumps in hydraulic systems.
- △ The products must operate within the specified technical parameters.

Tips for use

The hydraulic components are to be integrated into the unit with the aid of commercially available, compliant connecting elements (bolted connections, hoses, pipes...). Before dismantling, stop the hydraulic system as specified (especially in the case of equipment with hydraulic accumulators).



© 未经恒立液压公司授权，此宣传册任何部分不得以任何方式翻版、编辑、复制及使用电子方式进行传播。由于产品一直在不断开发创新中，本宣传册中信息不针对特定行业的特殊条件或适用性，对于因此而产生的任何不完整或不准确描述，恒立液压不承担责任。