1.5.1

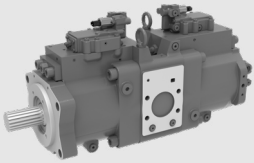
V90N-T SERIES

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
Nominal pressure(bar):	350	350	380	380	380	380
Peak pressure(bar):	400	400	420	420	420	420



Contents

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
Displacement(cc/rev)			75×2	85×2	130×2	180×2	280×2	300×2
Speed	Rated(rpm)	Not pressurized	2450	2200	2200	2100	1800	1800
		Pressurization	-	-	-	-	2000	2000
	Max(rpm)	Not pressurized	3000	2800	2500	2400	2000	2000
		Pressurization	-	-	-	-	2200	2200
	Min(rpm)		500					
Pressure	Rated(bar)		350	350	380	380	380	380
	Peak(bar)		400	400	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
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

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（$\eta_t=\eta_v \cdot \eta_{mh}$）

Type introduction

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

Product series

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

Size

②	Size	75	85	130	180	280	300

Structure type

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

Seals

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

Direction rotation

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

Control type

⑥		75	85	130	180	280	300	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	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 (Long)			●				AJ3
		JIS B 1603 47.5×17×2.5			●	●			AJ2
		JIS B 1603 47.5×17×2.5 (Long)			●				AJ4
		JIS B 1603 47.5×17×2.5 (PTO)			●				AJ7
	SAE J617 N0.3 (Thickened)	JIS B 1603 40×14×2.5 (Short)			●				BJ0
		JIS B 1603 40×14×2.5			●				BJ1
	SAE J617 N0.2	JIS B 1603 47.5×17×2.5			●	●			CJ2
		JIS B 1603 47.5×17×2.5 (PTO)				●			CJ7
	SAE J617 N0.1	JIS B 1603 47.5×17×2.5				●			DJ2
	4-hole flange (Thinned version)*	JIS B 1603 40×14×2.5			●				FJ1
		JIS B 1603 47.5×17×2.5			●				HJ2
	4-hole flange*	JIS B 1603 40×14×2.5 (Long)			●				EJ3
		JIS B 1603 47.5×17×2.5			●				EJ2
		JIS B 1603 60×18×3					●	●	G4J6

Note: "*" is a non-standard customized version. If you need to select, please contact Hengli (recommended to use a thinner version).

Through drive

			75	85	130	180	280	300	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	Code
⑨	No boost, no power take-off			●	●	●	●	●	●	N
	Boost, no power take-off							●	●	H
	Without pressurization 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

Type introduction

Working port

⑩	Inlet and outlet flange connection thread	Port type	75	85	130	180	280	300	Code
	Metric Thread	BSPP G thread (JIS B2351)	●	●	●	●	●	●	GM

Standard / special version

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

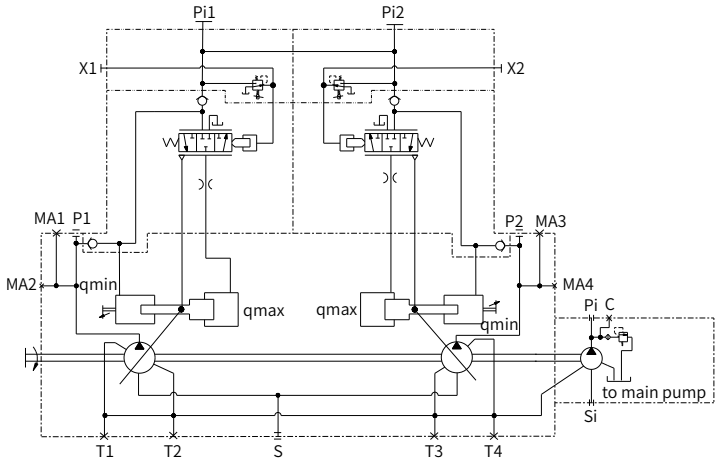
Remark：● = Available； ○ = On request

Control module function symbols

E1

Electric proportional displacement (positive control)

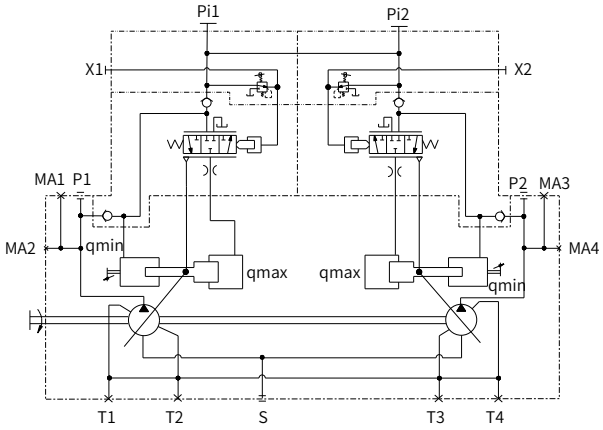
·V90N75T as an example



E2

Electric proportional displacement (negative control)

·V90N75T as an example

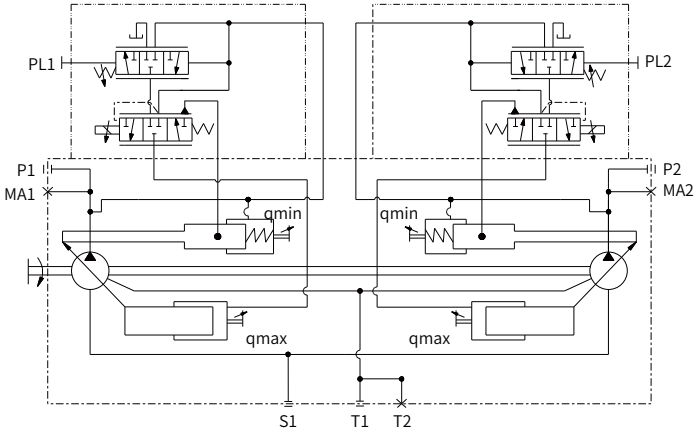


Control module function symbols

LE1

Electric proportional power control + load sensing

·V90N180T as an example

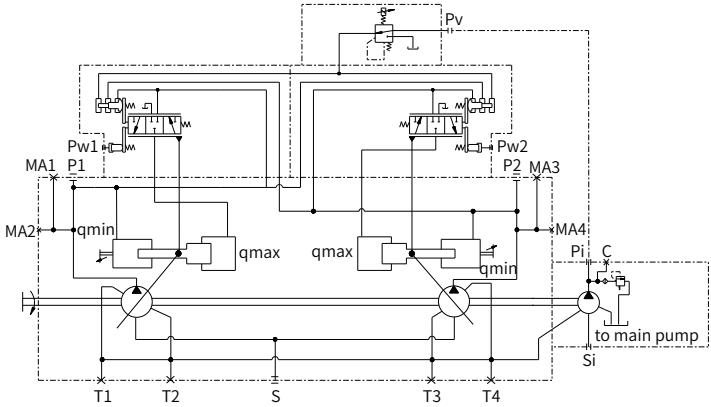


H1

Hydraulic control negative flow +

Electric proportional total power control (positive control)

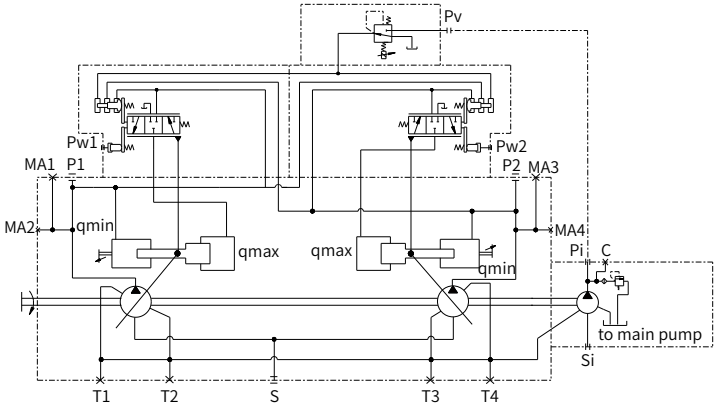
·V90N75T as an example



Control module function symbols

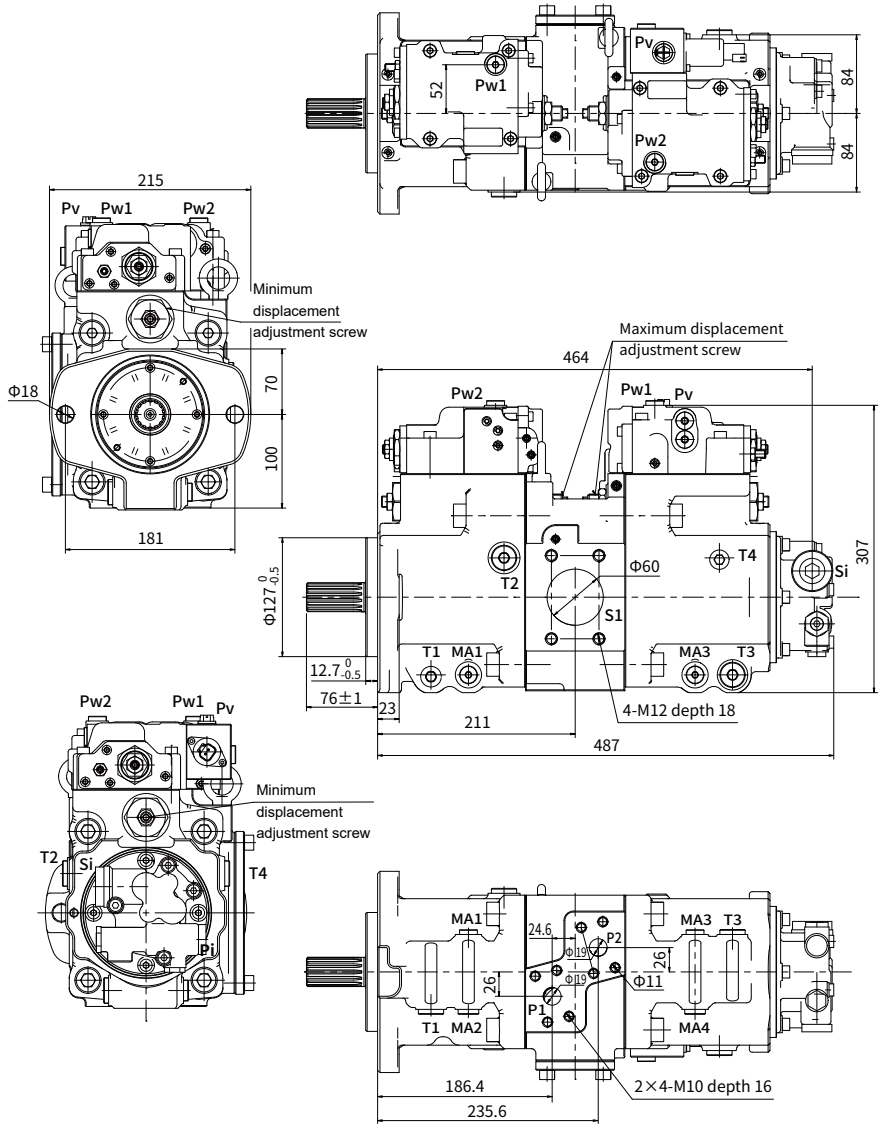
H2

Hydraulic control negative flow +
Electric proportional total power control (negative control)
·V90N75T as an example



Installation size

V90N 75T Type



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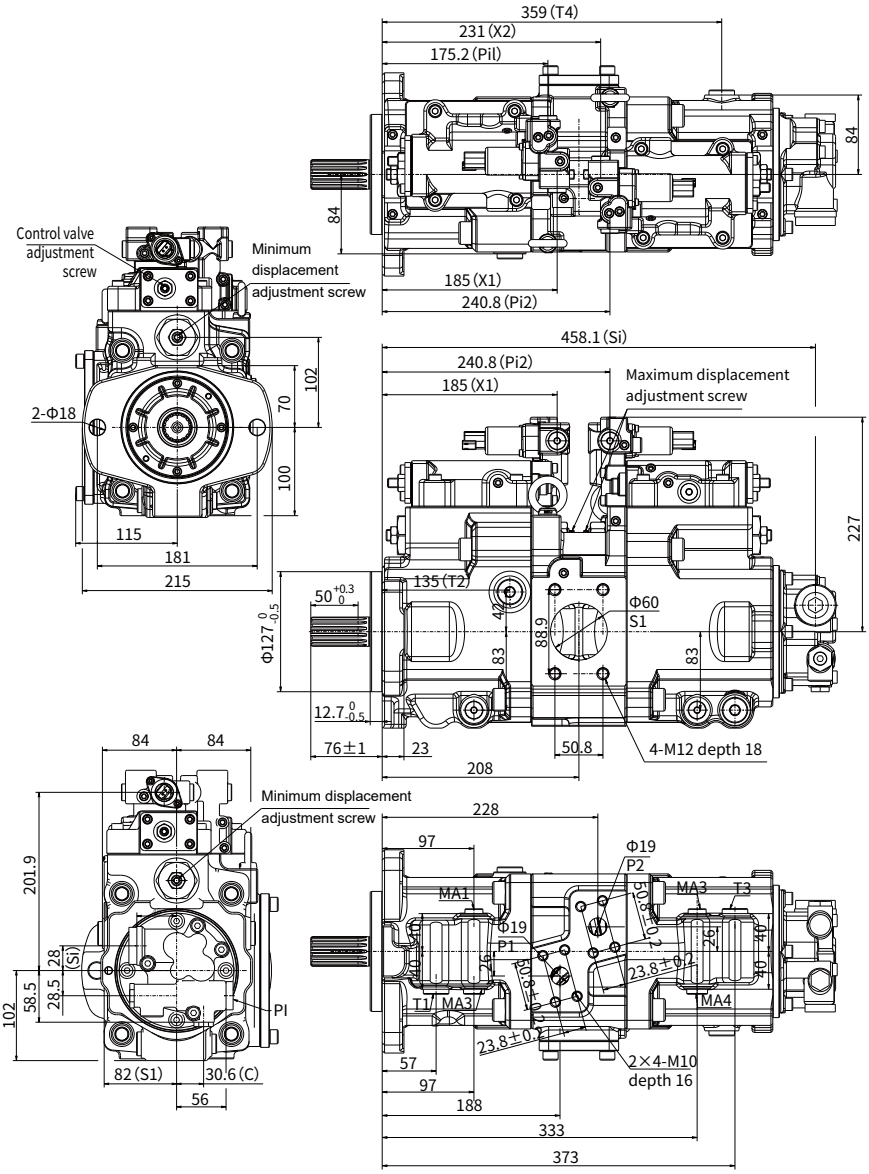
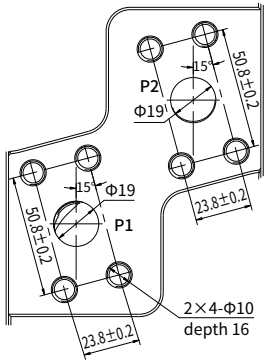
Installation size

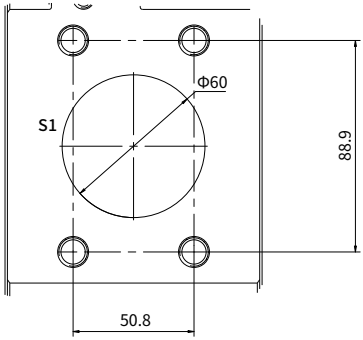
V90N 85T Type



Installation size

·V90N 75T/85T Description of oil port





Port Details

· H1

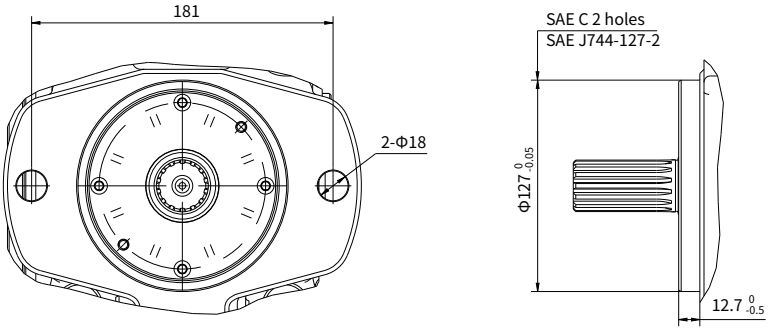
	Port Name	Port Description and Size
P1,P2	Output Port	SAE 3/4" 4-M10×1.5, depth 17mm
S1	Input Port	SAE 2-1/2" 4-M12×1.75, depth 20mm
T1,T2,T3,T4	Drain Port	G 1/2 depth 19mm
Pw1/Pw2	Pilot Port	G 1/4 depth 12mm
MA1,MA3	Pressure Measureing	G 1/4 depth 15mm
MA2,MA4	Pressure Sensor Port	G 3/8 depth 16mm
Pi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

· E1

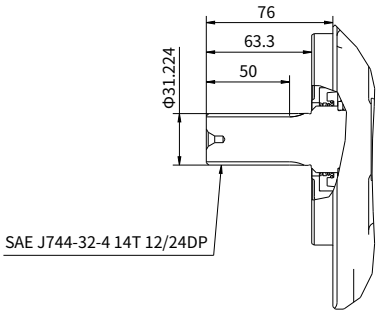
	Port Name	Port Description and Size
P1,P2	Output Port	SAE 3/4" 4-M10×1.5, depth 17mm
S1	Input Port	SAE 2-1/2" 4-M12×1.75, depth 20mm
T1,T2,T3,T4	Drain Port	G 1/2 depth 19mm
Pi1/Pi2	Pilot Port	G 1/4 depth 12mm
MA1,MA3	Pressure Measureing	G 1/4 depth 15mm
MA2,MA4	Pressure Sensor Port	G 3/8 depth 16mm
Pi	Pilot Port	G 1/2 depth 19mm
Si	Pilot Port	G 3/4 depth 20.5mm
C	External Control Pressure Port	G 1/4 depth 12mm
X1,X2	Pressure tap of electric proportional pressure reducing valve	G 1/4 depth 15mm

Installation size

·V90N 75T/85T Flange



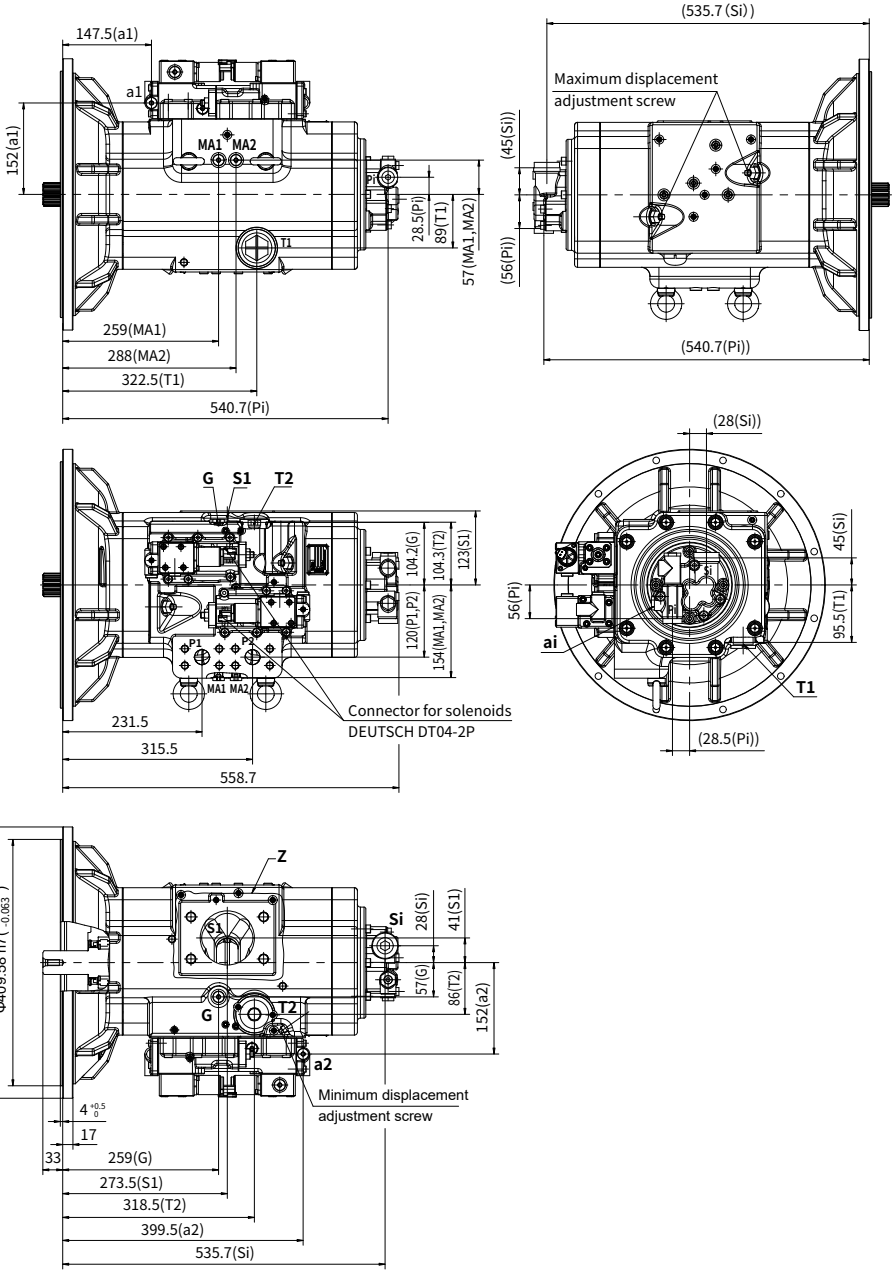
·V90N 75T/85T Input shaft



“S3” type spline shaft

Installation size

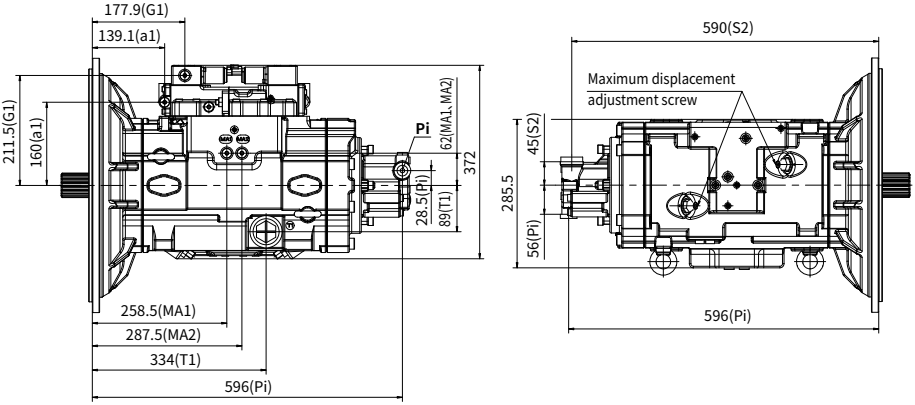
·V90N 130T Type

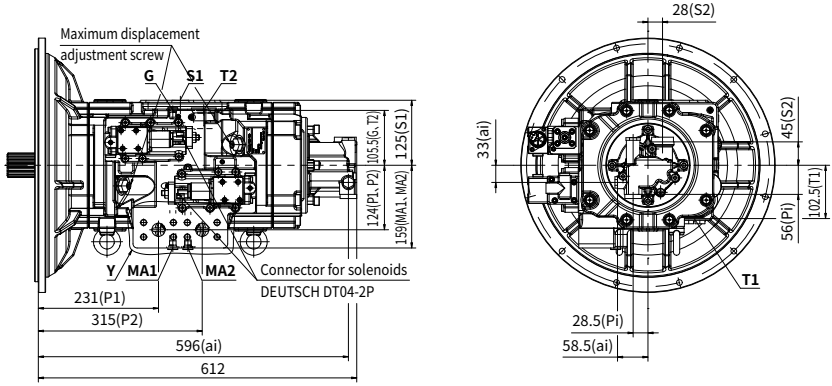


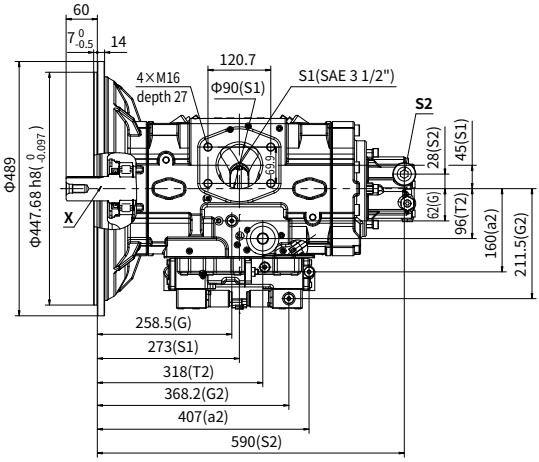
01

Installation size

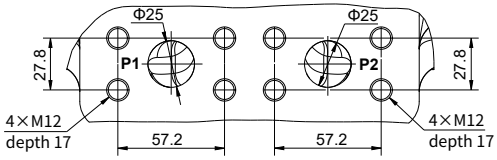
·V90N 180T type

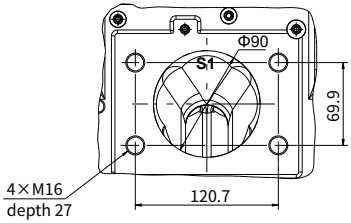






V90N 130T/180T Installation size



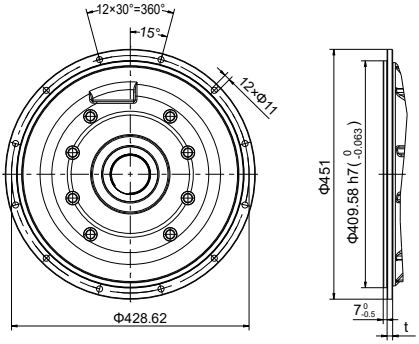


Port Details

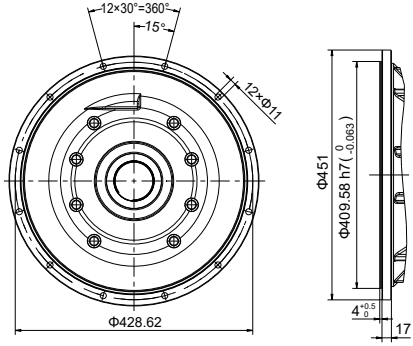
	Port Name	Port Description and Size
P1、P2	Output Port	1" SAE J518C Code 62 (6000psi)
		4×M12 depth 17mm
S1	Input Port	3-1/2" SAE J518C Code 61 (500psi)
		4×M16 depth 27mm
T1、T2	Drain Port	G1 1/4 , G 3/4
G	External Control Pressure Port	G 1/4
MA1, MA2	Pressure Measureing	G 1/4
Pi	Output Port	G 1/2
Si	Input Port	G 3/4

V90N 130T/180T Installation size

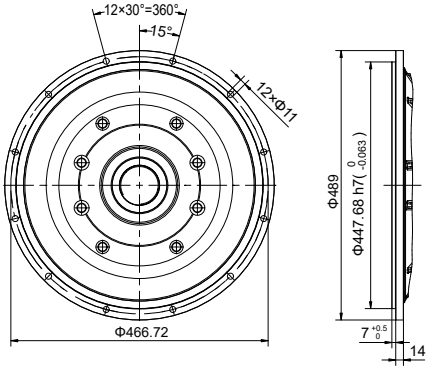
·Flywheel flange



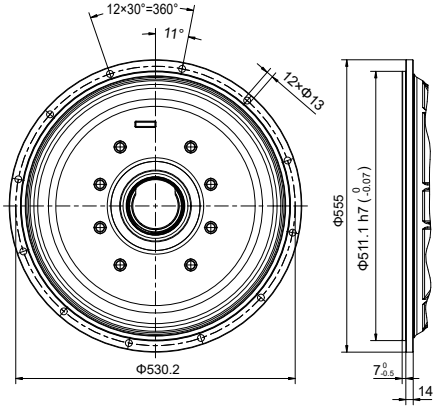
A Type Note：V90N130T t=10
V90N180T t=14



B Type



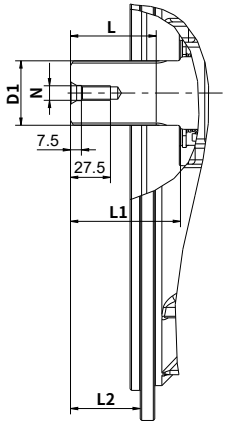
C Type



D Type

V90N 130T/180T Installation size

·Input shaft

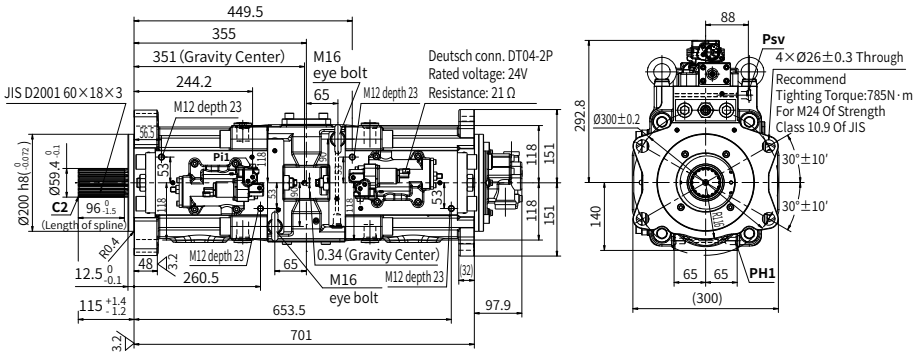


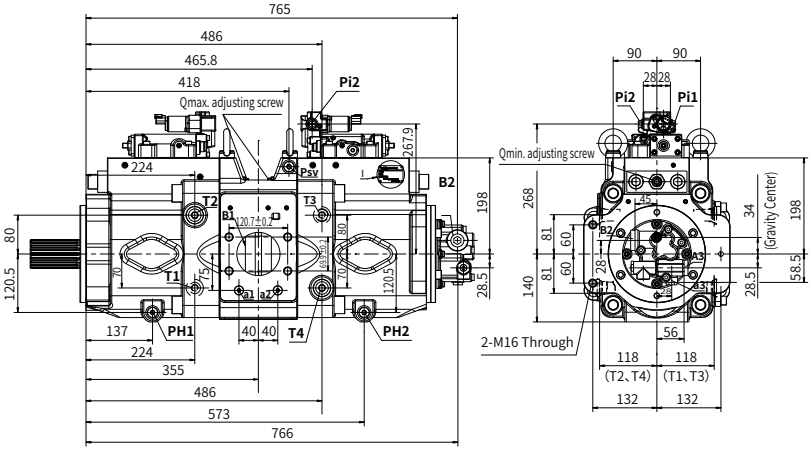
Size		D1	L	L1	N	L2			
						A	B	C	D
130	S5	44.45	58	74.9	M10	48	33	—	—
	J1	39.5							
	J2	47							
	J0	39.5	53	68.9		42	27	—	—
	J3	39.5	68	88.9		62	47	—	—
	J4	47	68	94.9		64	45	—	—
180	J2	47	63	81.8	M16	—	—	60	63
		47	48	66.8		43	—	58	—

01

Installation size

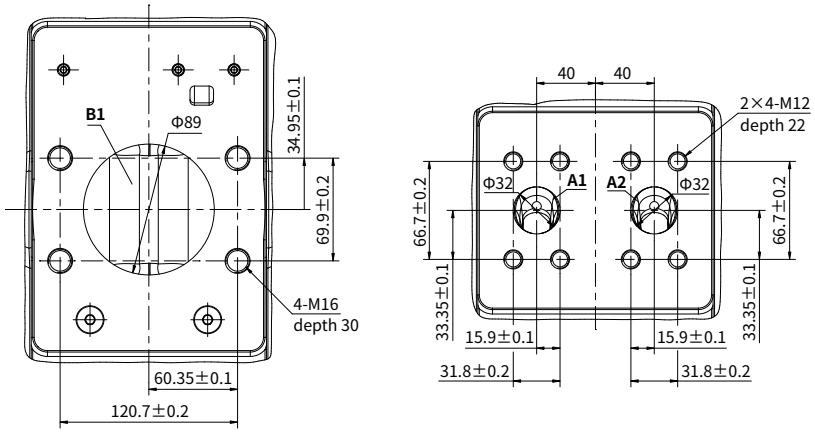
V90N 280T Type





Installation size

·V90N 280T Description of oil port



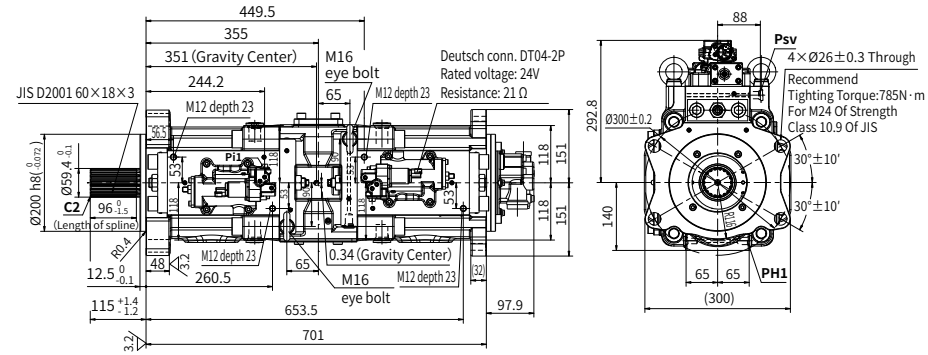
Port Details

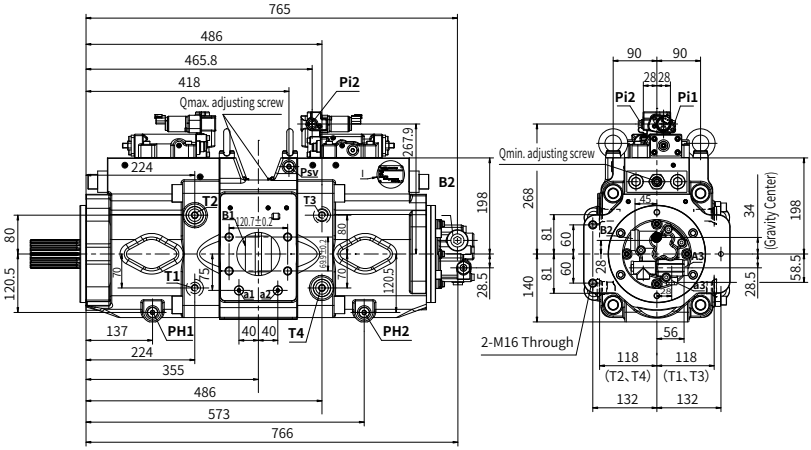
	Port Name	Port Description and Size	Tightening Torque(N.m)
A1, A2	Output Port	SAE 6000psi 1 1/4"	98
B1	Suction Port	SAE 2500psi 3 1/2	240
T1, T2 , T3, T4	Drain Port	G 3/4 depth 20mm	170
Psv	Serve Assist Port	G 3/8 depth 17mm	74
Pi1, Pi2	Pilot Port	G 1/4 depth 12mm	36
a1, a2, a3	Gauge Port	G 1/4 depth 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

01

Installation size

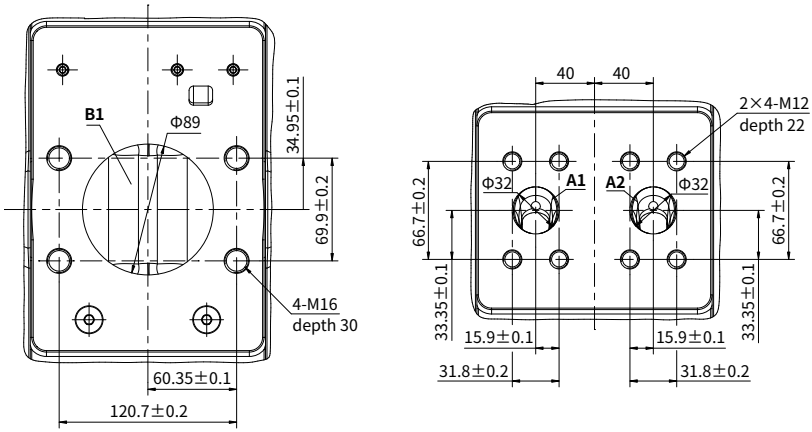
V90N 300T Type





Installation size

·V90N 300T Description of oil port



Port Details

	Port Name	Port Description and Size	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
Psv2	Serve Assist Port	G 3/8 depth 17mm	74
Psv1	Serve Assist Port	G 1/4 depth 15mm	36
Pi1, Pi2	Pilot Port	G 1/4 depth 13mm	16
a1, a2 PH3, PH4	Gauge Port	G 1/4 depth 15mm	36
a3,a4	Gauge Port	G 1/4 depth 13mm	16
PB	Gauge Port	G 1/8 depth 12mm	12
PH1,PH2	Gauge Port	G 3/8 depth 17mm	74

China
+86 400 101 8889

America
+01 630 995 3674

Germany
+49（30）72088-0

Japan
+81 03 6809 1696