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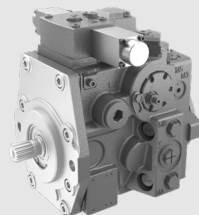
V40D SERIES

Swash-plate Type Axial Piston Variable Displacement Pump

V40D series variable axial piston pump with swashplate design for hydrostatic drives in closed circuit, high pressure, high speed, high reliability, low noise, can be applied in engineering machinery, mobile machinery and agricultural machinery.

Applied in medium pressure closed circuit

Size:	28	32
Rated pressure (bar):	345	345
Max. pressure (bar):	380	380



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Features

- Variable axial piston pump of swashplate design for hydrostatic drives in closed circuit.
- The flow is proportional to the drive speed and displacement. The flow increases as the angle of the swashplate is adjusted from zero to its maximum value.
- Flow direction changes smoothly when the swashplate is moved through the neutral position.
- Two pressure-relief valves are provided on the high pressure ports to protect the hydrostatic transmission (pump and motor) from overload.
- The integrated charge pump can provide system replenishing and cooling fluid flow.
- High reliability, long working lifetime
- Compact structure, high power density.

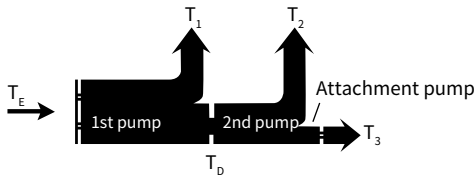
Technical data

Size		28	32
Displacement (cc/rev)		28	32
Speed	Rated (rpm)	3400	3400
	Max. (rpm)	4000	4000
	Min. (rpm)	500	500
Pressure	Rated (bar) (relative to Charge pressure)	345	345
	Max. (bar) (relative to Charge pressure)	380	380
	Min. low loop pressure(bar) (relative to Charge pump)	10	10
Charge pressure (relative to Charge pump)	Min. (bar)	16	16
	Max. (bar)	31	31
Control Pressure (relative to Charge pump)	Min. (bar) (EDC control)(bar)	24	24
Charge pump displacement (cc/rev)		9/12	9/12
Casting pressure	Rated (bar)	3	3
	Max. (bar) (Short-time peak pressure)	5	5
Suction pressure (Absolute pressure)	Rated (bar) Oil viscosity $\leq 30\text{mm}^2/\text{s}$	0.8	0.8
	Max. (bar)	2	2
	Oil viscosity (mm ² /s)	10~1000, Best range: 16~36	
Oil Temperature (°C)	-20~95		
Oil Cleanliness	ISO 4406 20/18/15 or higher		
Weight (w/o auxiliary flange) (Kg)		32	32

Technical data

Permissible input and through-drive torques				
Size			28	32
Torque at $V_{g,max}$ and $\Delta p = 345$ bar Nm		T	153.7	175.7
Maximum input torque at drive shaft (Nm)				
ANSI B92.1b	7/8 in 13T 16/32DP	$T_{E,max}$	198	198
	1 in 15T 16/32 DP	$T_{E,max}$	319	319
Maximum through-drive torque (Nm)		$T_{D,max}$	198	198

• Torque distribution



HP3G	1st pump	T_1
	2nd pump	T_2
Attachment pump		T_3
Input torque		$T_E = T_1 + T_2 + T_3$
		$T_E < T_{E,max}$
Through-drive torque		T_{D1}
		T_{D2}

Type introduction

V40	D	28	E1	M	/	R	N	B1	F1	A2	K4	2	P	S	-	F
①	②	③	④	⑤		⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭		⑮

Product series

①	Variable piston pump of swashplate in closed circuit	V40
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Nominal pressure

②	nominal pressure 345 bar	D
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Displacement

③	Displacement cc/rev	28	32
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Control mode

		28	32	Code
④	High current electric proportional displacement control (HC EDC), oil filled, Deutsch DT04-2P, voltage 12V DC, control range: 600mA~1650mA	●	●	E1
	High current electric proportional displacement control (HC EDC), oil filled, Deutsch DT04-2P, voltage 24V DC, control range: 200mA~500mA	●	●	E2
	Manual displacement control, (control handle) -29° ~+29°	●	●	H1
	Hydraulic pilot proportional control	●	●	H2

Displacement Limiters

⑤	Without displacement limiters	Blank
	With displacement limiters	M

Rotation

⑥	Right hand (clockwise)	R
	Left hand (counter-clockwise)	L

Sealing material

⑦	NBR (nitrile rubber) Shaft seal in NBR (nitrile rubber)	N
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Mounting flange and input shaft

	Mounting flange	Input shaft	28	32	Code
⑧	SAE A J744-82-2	Straight shaft (Inch) 1/4×1/4	●	●	A4
	SAE B J744-101-2	ANSI B92.1b 7/8 in 13T 16/32DP	●	●	B1
		ANSI B92.1b 1 in 15T 16/32 DP	●	●	B3

Type introduction

Boost pump and rotary group configuration

	Standard rotary group, without boost pump				K	
⑨	Standard rotary group, boost pump integrated	Charge pump displacement (cc/rev)		28	32	Code
		9		●	●	F1
		12		●	●	F3

Through drive option

⑩	Through drive		28	32	Code
	Without through drive		●	●	Blank
	Flange	Splined shaft			
	SAE A J744-82-2	ANSI B92.1b 5/8 in 9T 16/32 DP	●	●	A1
	SAE B J744-101-2	ANSI B92.1b 3/4 in 11T 16/32 DP	●	●	A2
	SAE B J744-101-2	ANSI B92.1b 7/8 in 13T 16/32DP	●	●	B1

High-pressure relief valve

⑪	High-pressure relief valve	Setting range Δp	28	32	Code
	High pressure relief valve setting (differential pressure: relative to Charge pressure)	245 bar	●	●	K1
		260 bar	●	●	K3
		280 bar	●	●	K4
		300 bar	●	●	K5
		320bar	●	●	K6
	345 bar	●	●	K8	

Remark: Please contact us for configurations or pressures not shown in above form.

Setting pressure of the low pressure relief valve

⑫	21.5 bar	1
	24 bar	2
	26.9 bar	3

Control orifice

⑬	None	N
	Control orifice of Servo A&B $\phi 0.9\text{mm}$	P
	Control orifice of Servo A&B $\phi 1.3\text{mm}$	R

Type introduction

Filtration boost circuit/external boost pressure supply

⑭	Filtration boost circuit/external boost pressure supply	28	32	Code
	Filtration in the boost pump suction line	●	●	S
	Filtration in the boost pump pressure line (ports with external filter circuit)	●	●	D

Standard / special version

⑮	Standard / Special version	28	32	Code							
	Standard version	●	●	Blank							
	Special version	With neutral position switch	●	●	K						
		Emergency return valve (Brake unloading valve)	●	●	F						
		cryogenic seal	●	●	W						
With flush valve (differential pressure $\Delta P=5\text{bar}$, low pressure side 20 bar, damping hold $\Phi 1.6\text{mm}$)		<table border="1"> <tr> <td>Flushing flow (L/min)</td> <td>28</td> <td>32</td> <td>Code</td> </tr> <tr> <td>6</td> <td>●</td> <td>●</td> <td>1</td> </tr> </table>			Flushing flow (L/min)	28	32	Code	6	●	●
Flushing flow (L/min)	28	32	Code								
6	●	●	1								

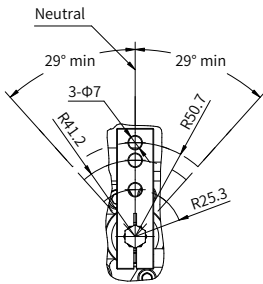
Remark: ● = Available; ○ = On request

Manual displacement control (MDC)

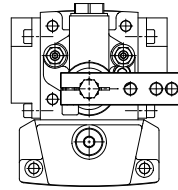
The manual proportional displacement control (MDC) consists of a handle on top of a rotary input shaft.

The shaft provides an eccentric connection to a feedback link. This link is connected on its one end with a porting spool. On its other end the link is connected the pumps swashplate.

The MDC changes the pump displacement between no flow and full flow into opposite directions.



Schematic diagram of control joystick adjustment



Control valve

Electrical displacement control (EDC)

The High Current Electrical Displacement Control (HC EDC) consists of a pair of proportional solenoids on each side of a three-position, four-way porting spool. The proportional solenoid applies a force input to the spool, which ports hydraulic pressure to either side of a double acting servo piston. Differential pressure across the servo piston rotates the swashplate, changing the pump's displacement from full displacement in one direction to full displacement in the opposite direction.

A serviceable 125 μm screen is located in the supply line immediately before the control porting spool.

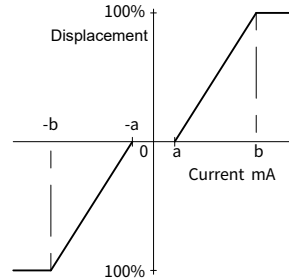
Features:

- Precision parts provide repeatable accurate displacement settings with a given input signal.
- Both ends of the double acting servo piston are drained to case when input signal current is not present. The servo piston is coupled to a spring centering mechanism.

Benefits:

- Simple, low-cost design.
- Pump will return to neutral after prime mover shuts down.
- Pump will return to neutral if external electrical input signal fails or if there is a loss of charge pressure

• Pump displacement — control current

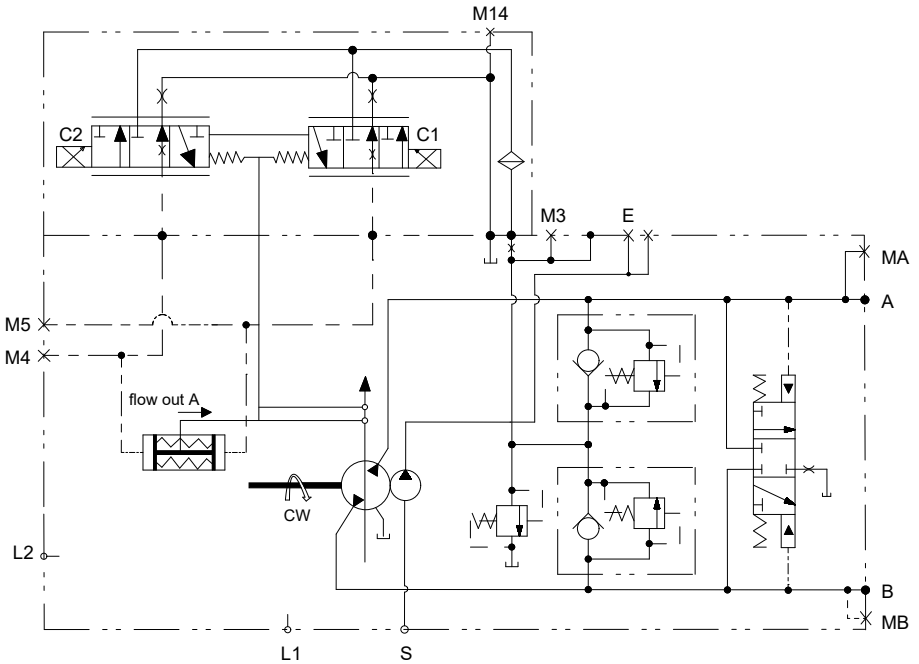


• EDC Response time

Orifice diameter* mm [in]	Average response time [seconds]	
	Acceleration	Deceleration
1.2 [0.046]	2.0	1.6
None	0.9	1.0

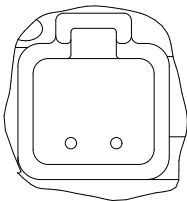
*Contact Hengli for special orifice combinations.

V40D28 Pump principle



Input shaft rotation	CW		CCW	
	C2	C1	C2	C1
Energized coil	Out	In	In	Out
Oil port A	In	Out	Out	In
Servo pressure acting oil port	M4	M5	M4	M5

Connector:

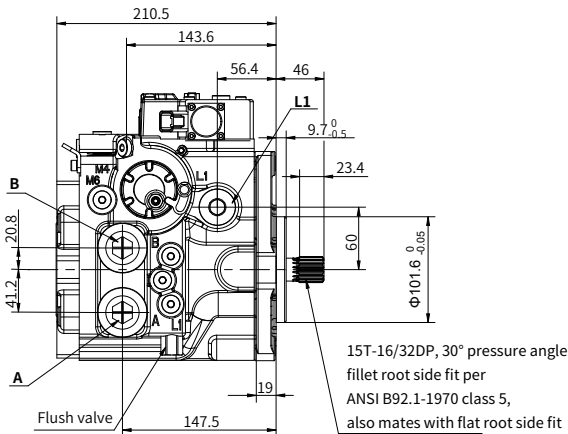
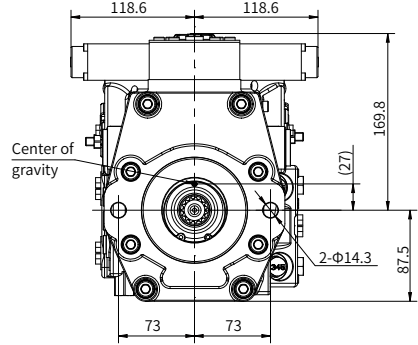
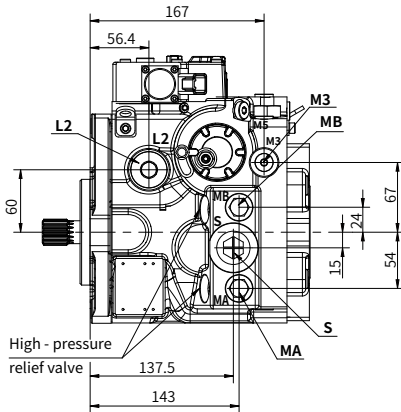
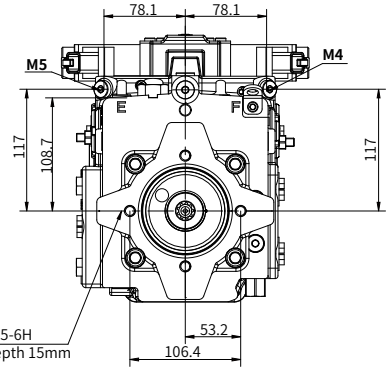
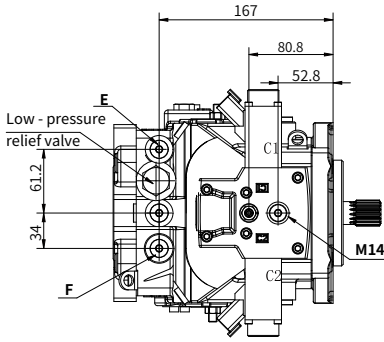


Deutsch DT04-2P
Voltage: 12V/24V
V View

Refer to pump installation drawing for port locations.

Installation size

V40D28 installation size



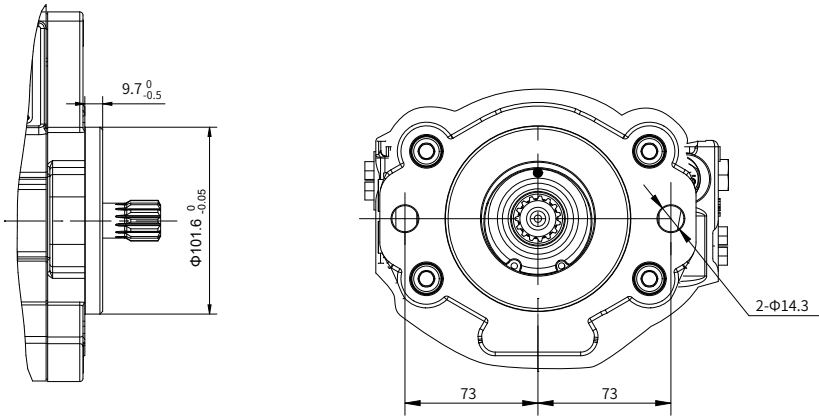
Installation size

•V40D28Port details

	Port Name	Port Size and Description	Tightening Torque(N.m)
S	Suction port	ISO 11926-1 (1 1/16-12UN)	101
A, B	Working port	ISO 11926-1 (1 1/16-12UN)	101
L1, L2	Drain port	ISO 11926-1 (1 1/16-12UN)	101
MA, MB	Port "A" and "B" gage port	ISO 11926-1 (9/16-18UNF)	25
M3	Gauge port of charge pump	ISO 11926-1 (9/16-18UNF)	25
E	External control port	ISO 11926-1 (9/16-18UNF)	25
M4, M5	Servo gage port	ISO 11926-1 (7/16-20UNF)	15
M14	Air bleed port	ISO 11926-1 (7/16-20UNF)	15

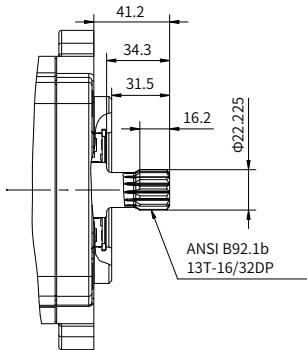
Installation size

V40D28 Mounting Flange



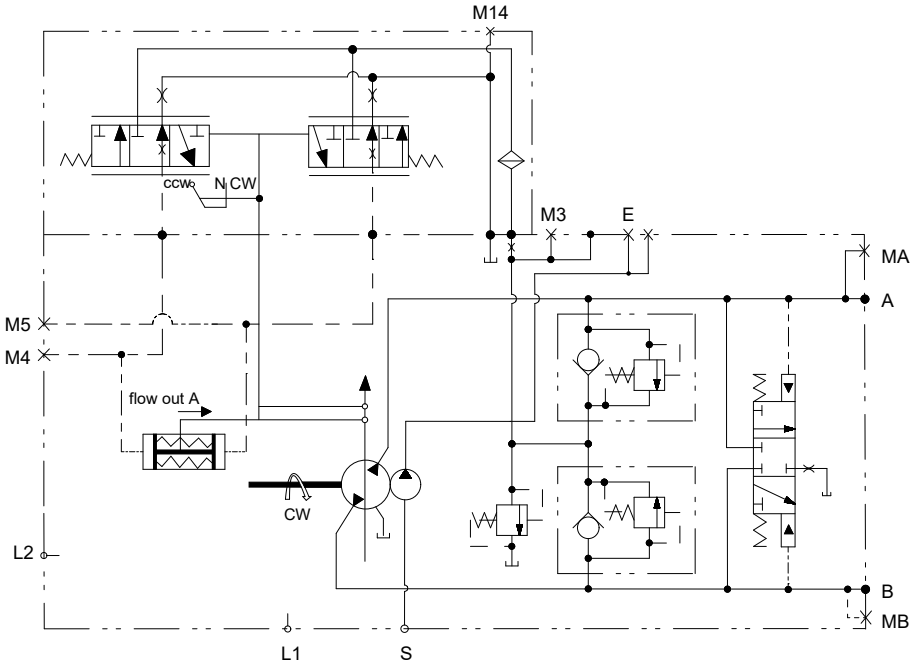
02

V40D28 Input Shaft type



"B1" type spline shaft

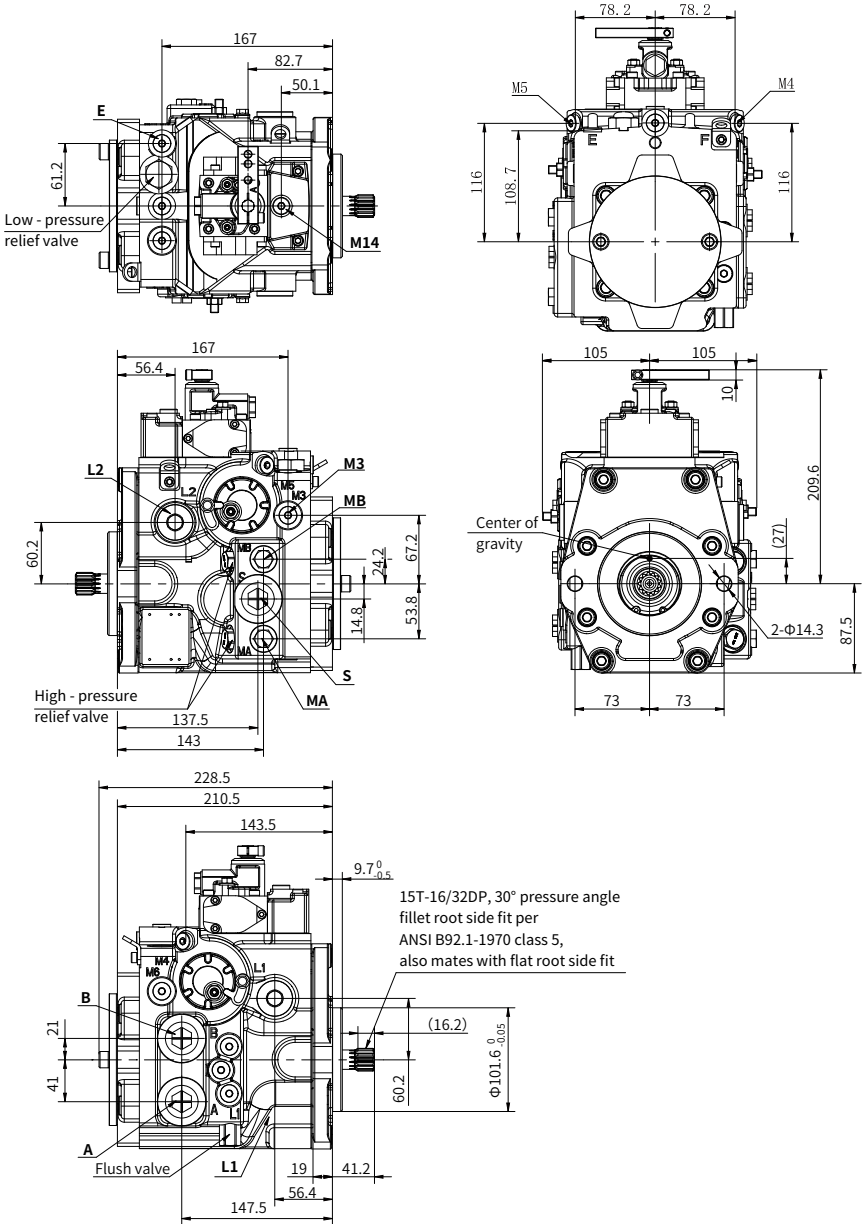
V40D32 Pump principle



Input shaft rotation	CW		CCW	
Energized coil	C2	C1	C2	C1
Oil port A	Out	In	In	Out
Oil port B	In	Out	Out	In
Servo pressure acting oil port	M4	M5	M4	M5

Installation size

V40D32 Installation size



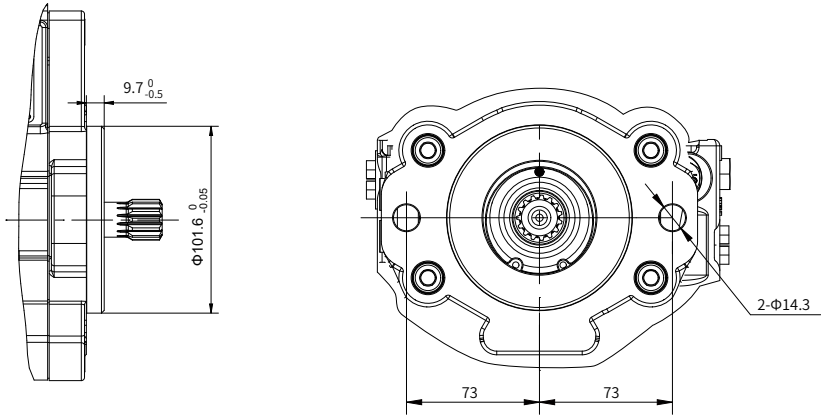
Installation size

•V40D32 Port details

	Port Name	Port Size and Description	Tightening Torque(N.m)
S	Suction port	ISO 11926-1 (1 1/16-12UN)	101
A, B	Working port	ISO 11926-1 (1 1/16-12UN)	101
L1, L2	Drain port	ISO 11926-1 (1 1/16-12UN)	101
MA, MB	Port "A" and "B" gage port	ISO 11926-1 (9/16-18UNF)	25
M3	Gauge port of charge pump	ISO 11926-1 (9/16-18UNF)	25
E	External control port	ISO 11926-1 (9/16-18UNF)	25
M4, M5	Servo gage port	ISO 11926-1 (7/16-20UNF)	15
M14	Air bleed port	ISO 11926-1 (7/16-20UNF)	15

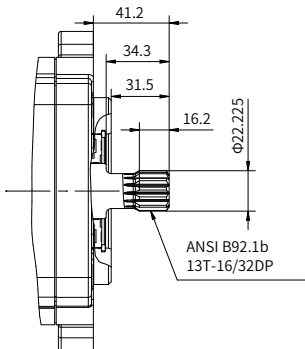
Installation size

V40D32 Mounting Flange



02

V40D32 Input Shaft type



"B1" type spline shaft

China

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America

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Germany

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Japan

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