



3.3

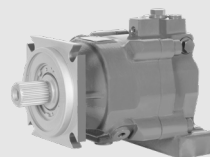
M70F(E) SERIES

Swash-plate Type Axial Piston Fixed Displacement Motor

M70F(E) series swash plate axial piston motor is a kind of fixed displacement motor with wide application for open and closed circuit. The swashplate design allows a compact motor with high power density. This series is applicable to farm machinery, construction machinery and industrial vehicles.

Apply to open and closed hydraulic circuit

Displacements (cc/rev)	45	63	65	75	85	100	130
Rated pressure (bar)	280	400	280	400	400	400	400
Maximum pressure(bar)	350	450	350	450	450	450	450



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Features

- **High speed operation and smooth starting characteristics:**
Optimized rotary balance design high-speed performance and excellent starting characteristics.
- **Low speed operation:**
Superior performance in low speed operation provides excellent controllability.
- **Compact size:**
Swash plate conguration enables the motor to be much more compact.
- **Long bearing life:**
Swash plate conguration results in longer bearing life.

Technical Data

Size	45	63	65	75	85	100	130
Max. Displacement: q_{\max} cm^3	45	63	65	75	85	100	130
Max. speed: N min^{-1}	4000	5000	3400	4500	4500	3550	3400
Rated pressure: P_{nom} *1 bar	280	400	280	400	400	400	400
Max. pressure: P_{\max} *2 bar	350	450	350	450	450	450	450
Theoretical output torque $\text{N} \cdot \text{m}$	200	401	289	478	542	636	830
Power Kw	84	210	103	225	255	236	295
Max. Flow: Q L/min	180	315	221	337	382	355	442
Moment of inertia $\text{kg} \cdot \text{m}^2$	0.0033	0.0072	0.0072	0.0072	0.011	0.015	0.025
Volume in the case L	0.7	1	0.7	1	0.5	0.5	1.2
Mass Kg	19.4	26	29.9	26.5	28.6	32.8	49.4
Temperature $^{\circ}\text{C}$	at drain port: -20 ~ +115 at inlet port: -20 ~ +90						

The data in the above table is the theoretical value.

* 1: Nominal pressure corresponds to the design pressure to provide appropriate performance, function, and service life.

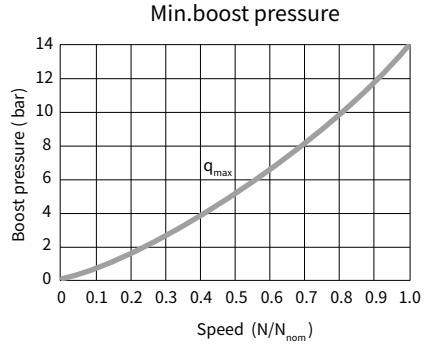
: Nominal pressure corresponds to the design pressure at which the products will function properly.

* 2: Hengli standard.

Min.boost pressure

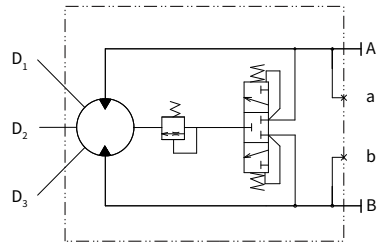
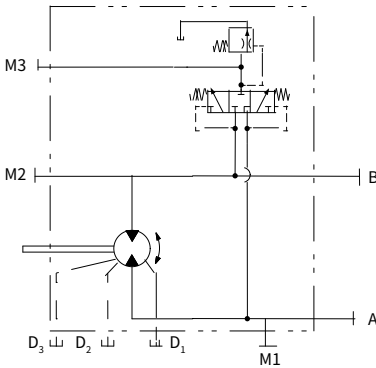
To prevent cavitation when the motor is operating in a pumping mode, a positive pressure is required at the suction port.

The figure above shows the minimum boost pressure requirement based on regular operation. In case of a rapid change of the ow, more boost pressure must be applied.

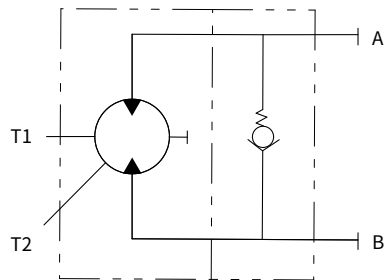
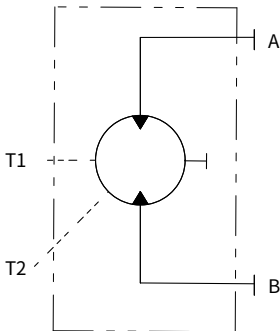


Principle

• M70F



• M70FE



Type introduction

M70F	85	A	A	M	A	L2	—	N
①	②	③	④	⑤	⑥	⑦		⑧

Product series

	Product series	45	63	65	75	85	100	130	Code
①	Swash-plate Type Axial Piston Fixed Displacement Motor (Flange-type motor)		●		●	●	●	●	M70F
	Swash-plate Type Axial Piston Fixed Displacement Motor (Plug-in motor)	●		●					M70FE

Displacement

②	Displacement	45	63	65	75	85	100	130
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Port flange and port position

	Port flange	Port position	45	63	65	75	85	100	130	Code
③	ISO 6162-2 DN19	working ports A and B at side, opposite		●						1A
		working ports A and B, at bottom	●		●					1R
	ISO 6162-2 DN25	working ports A and B at side, opposite				●	●			2A
		working ports A and B, at bottom				●	●	●		2R
	ISO 6162-2 DN32	working ports A and B at side, opposite								3A
		working ports A and B, at bottom							●	3R

Thread connection type (except inlet and thread type of Flange Port)

		45	63	65	75	85	100	130	Code
④	UNC port, ISO 11926	●	●	●	●	●	●	●	A
	Metric port, ISO 6149		●		●	●	●		M
	Metric port, DIN 3852		●		●	●	●		E
	BSPPG thread, JIS B2351		●		●	●	●		G

Thread type of Flange Port

		45	63	65	75	85	100	130	Code
⑤	UNC threads (only for UNC port)		●		●	●	●		A
	Metric thread	●	●	●	●	●	●	●	M

Type introduction

Input Shaft

	Standard	Size	45	63	65	75	85	100	130	Code
⑥	ANSI B92.1	1 1/2 in 17T 12/24DP					○			1
	ANSI B92.1	1 3/4 in 13T 8/16DP					○			2
	ANSI B92.1	2 in 15T 8/16DP					○			3
	ANSI B92.1	1 3/8 in 21T 16/32DP				●	●	○		4
	ANSI B92.1	1 1/4 in 14T 12/24DP					○			5
	DIN 5480	W35×2×16×9g		●			○			6
	DIN 5480	W40×2×18×9g					○			7
	DIN 5480	W45×2×21×9g					○			8
	DIN 5480	W50×2×24×9g					○			9
	ANSI B92.1	23T 16/32DP				●	●	●		A
	SAE J498B	27T 16/32DP						○	●	B
	Taper (125: 1000)		●		●					D

Mounting flange

⑦	Mounting flange (M70F)		63		75	85	100	130	Code
	SAE J744 127-4		●		●	●	●		L2
	SAE J744 152-4							●	L3
	Mounting flange(M70FE)	45		65					Code
	SAE 2-Hole	●		●					L1

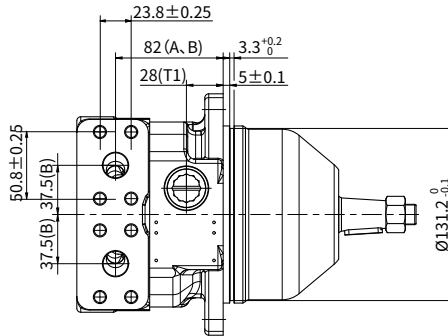
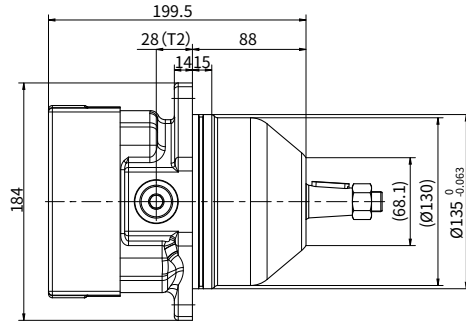
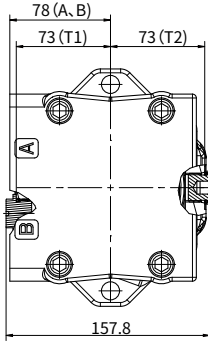
Flushing flow (L/min)

Standard version							N
⑧	Special version	Without flush valve (Only M70F75、M70F85、M70F100、M70F130)	Flushing flow	Code	Flushing flow	Code	Opening pressure 16bar, differential pressure ΔP=25bar
			3.5	A	20	G	
			5	B	25	H	
			8	C	30	I	
			10	D	35	J	
			14	E	40	K	
			17	F			

Remark: ● = Available; ○ = On request

Installation size

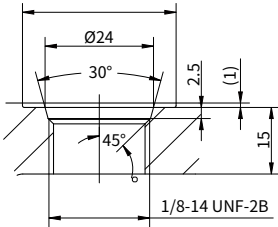
M70FE 45 Installation size



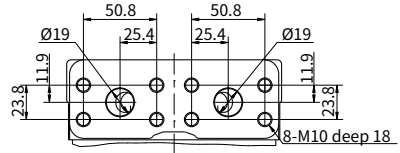
Control and Flow		Oil direction	
		Oil port A	Oil port B
Rotation direction	Clockwise rotation	Out	Inlet
	Counter clockwise rotation	Inlet	Out

Installation size

• M70FE 45 Port details



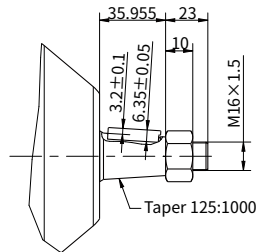
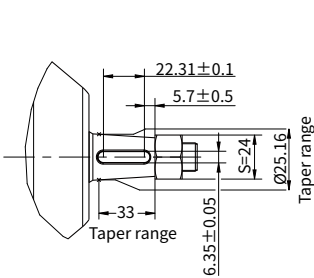
T1, T2 Port Details



Port details

	Port name	Port size and description
A、 B	Inlet port and Delivery port	SAE J518 3/4" M10
T1、 T2	Case drain port	ISO 11926 7/8-14 UNF-2B

• M70FE 45 Input shaft type

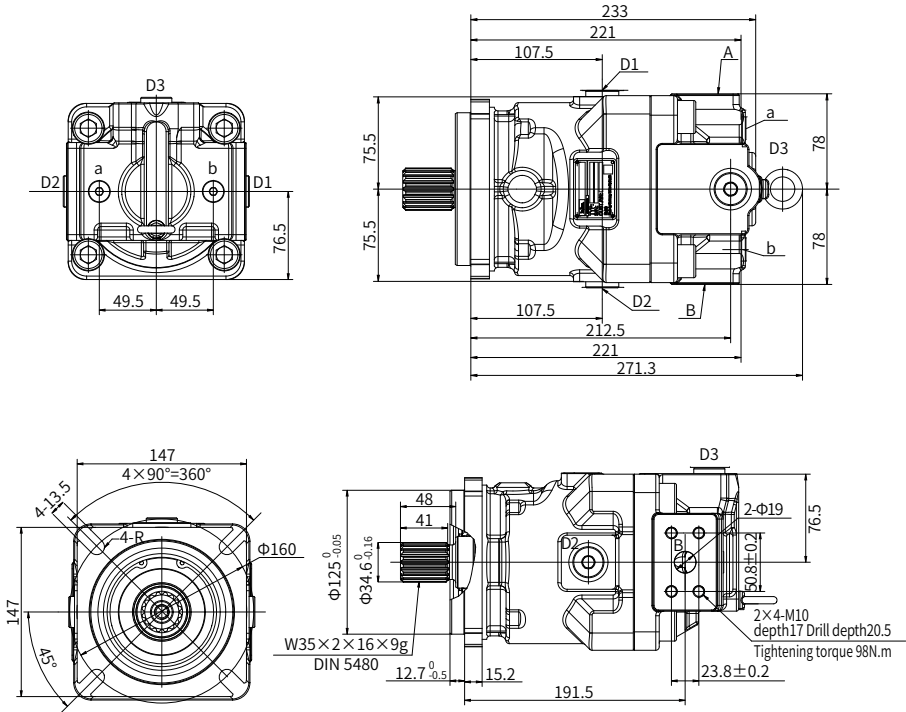


“D” type shaft

Installation size

M70F 63 Installation size

Working ports A and B at side, opposite



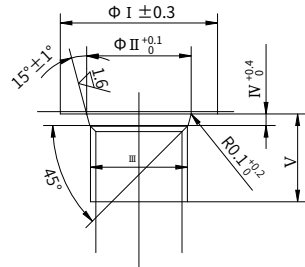
Inlet port	Outlet port	Rotation direction
A	B	Clockwise
B	A	Anti-clockwise

Note: The rotation direction is looked from the shaft end.

Installation size

• Port and flange fixing thread

(Ordering Code ④)



• Drain port and gauge port

Parallel piping thread type (Code : 1)

	Symbol	I	II	III	IV	V	Tightening torque (N.m)
a,b	Gauge port	24	15.6	G1/4	2.5	15	36
D1/D2/D3	Drain port	34	22.6	G1/2	2.5	13/13/19	98

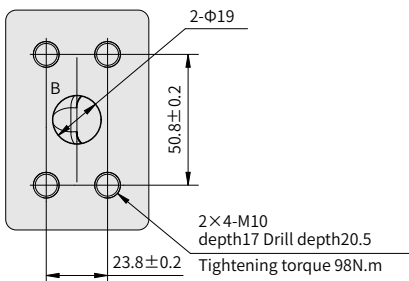
Metric thread type (Code : 4)

	Symbol	I	II	III	IV	V	VI	Tightening torque (N.m)
25	Gauge port	15.6	M14×1.5	2.4	15.5	15	47	59
40	Drain port	29.2	M27×2	3.1	13	15	180	170

ANSI thread type (Code : 2, 3)

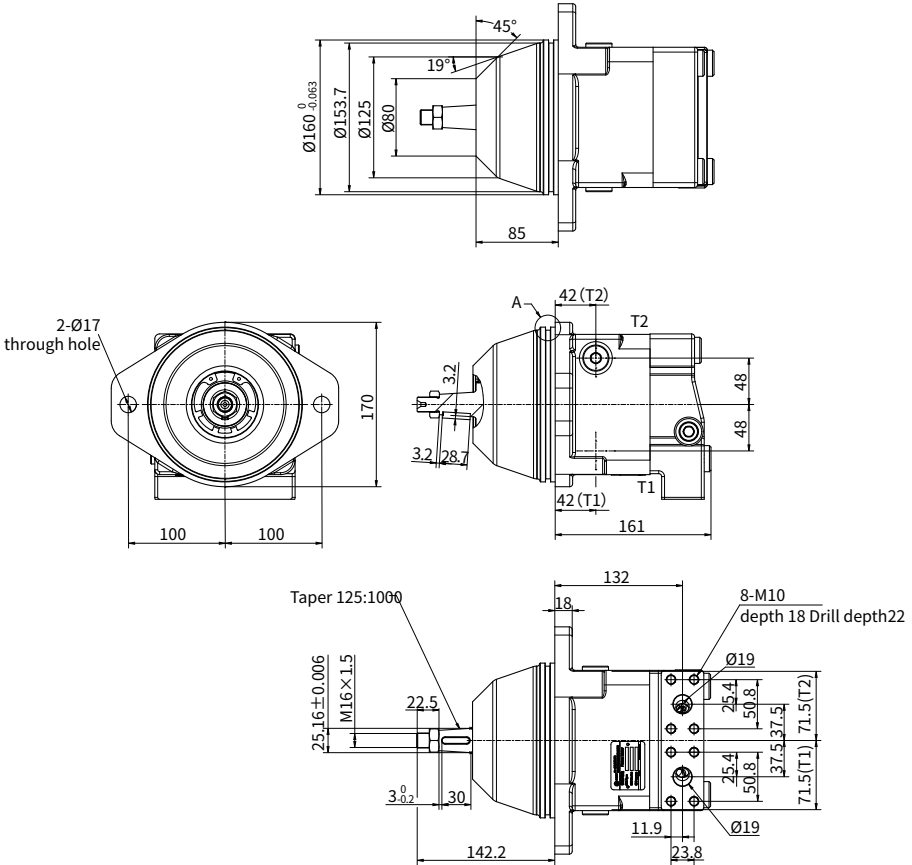
	Symbol	I	II	III	IV	V	VI	Tightening torque (N.m)
25	Gauge port	25	15.6	9/16-18UNF-2B	2.5	15.5	12	59
34	Drain port	41	29.2	1-1/16-12UN-2B	3.3	13	15	170

• Port details



Installation size

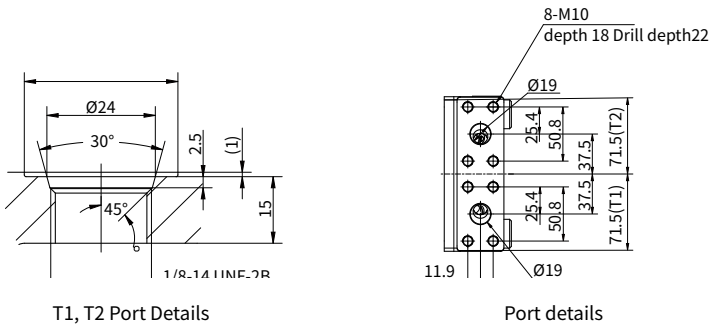
M70FE 65 Installation size



Control and Flow		Oil direction	
		Oil port A	Oil port B
Rotation direction	Clockwise rotation	Out	Inlet
	Counter clockwise rotation	Inlet	Out

Installation size

• M70FE 65 Port details

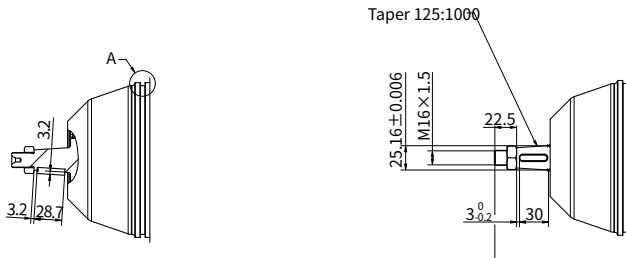


T1, T2 Port Details

Port details

	Port name	Port size and description
A、 B	Inlet port and Delivery port	SAE J518 3/4" M10
T1、 T2	Case drain port	ISO 11926 7/8-14 UNF-2B

• M70FE 65 Input shaft type

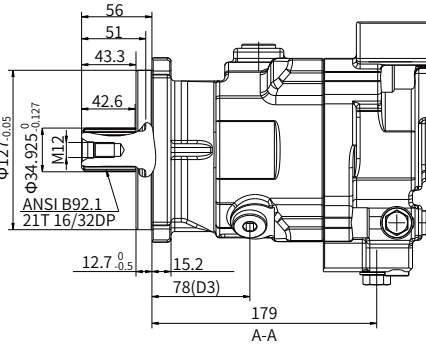
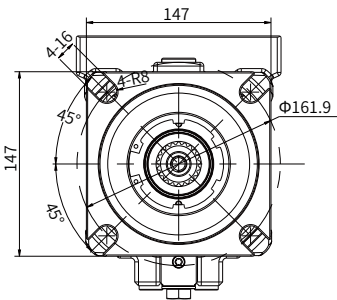
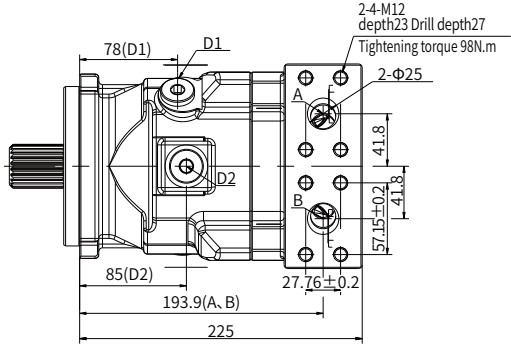
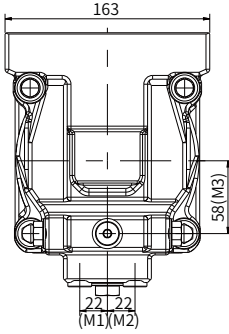


“D” type shaft

Installation size

M70F 75 Installation size

working ports A and B, at bottom

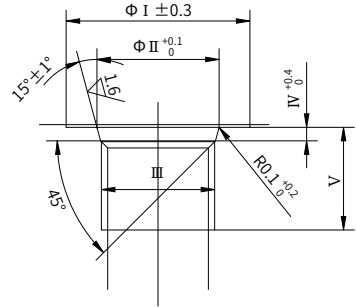


Inlet port	Outlet port	Rotation direction
A	B	Clockwise
B	A	Anti-clockwise

Note: The rotation direction is looked from the shaft end.

Installation size

- Port and flange fixing thread
(Ordering Code ④)

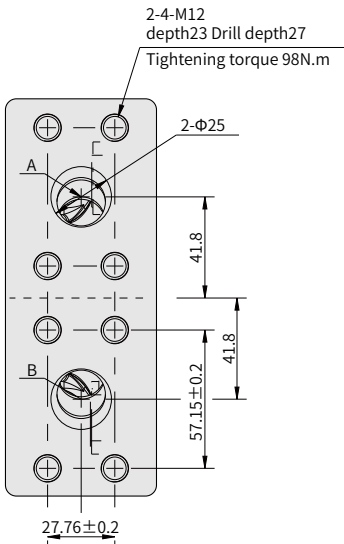


- Drain port and gauge port

ANSI thread type (Code : 2,3)

	Symbol	I	II	III	IV	V	Tightening torque (N.m)
M1/M2/M3	Gauge port	24	15.6	G1/4	2.5	15	36
D1/D2/D3	Drain port	34	22.6	G1/2	2.5	13/13/19	98

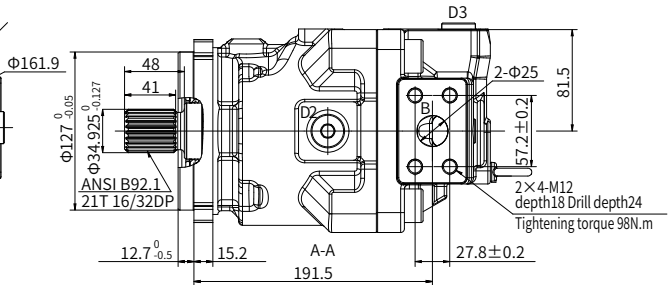
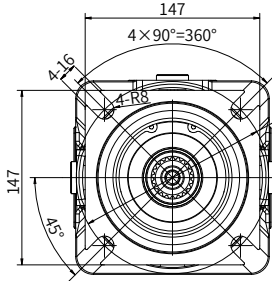
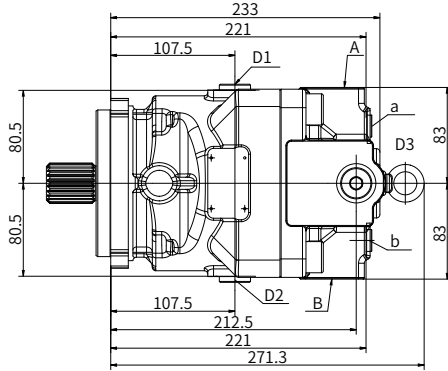
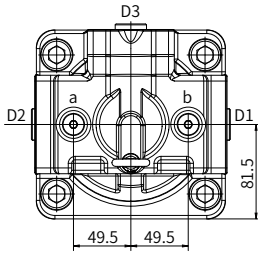
- Port details



Installation size

M70F 85 Installation size

working ports A and B at side, opposite



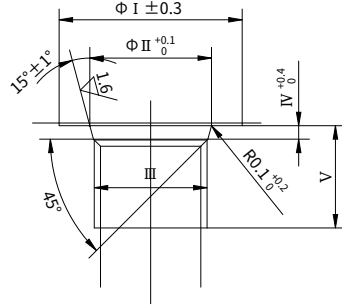
Inlet port	Outlet port	Rotation direction
A	B	Clockwise
B	A	Anti-clockwise

Note: The rotation direction is looked from the shaft end.

Installation size

• Port and flange fixing thread

(Ordering Code ④)



• Drain port and gauge port

ANSI thread type (Code : 2,3)

	Symbol	I	II	III	IV	V	Tightening torque (N.m)
a,b	Gauge port	24	15.6	G1/4	2.5	15	36
D1/D2/D3	Drain port	34	22.6	G1/2	2.5	13/13/19	98

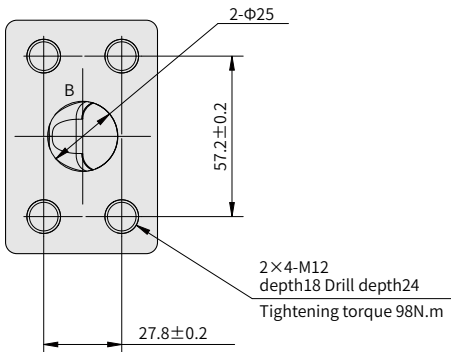
Metric thread type (Code : 4)

	Symbol	I	II	III	IV	V	VI	Tightening torque (N.m)
25	Gauge port	15.6	M14×1.5	2.4	15.5	15	47	59
40	Drain port	29.2	M27×2	3.1	13	15	180	170

Parallel piping thread type (Code : 1)

	Symbol	I	II	III	IV	V	VI	Tightening torque (N.m)
25	25	15.6	G 1/4	2.5	15.5	15	36	59
34	34	29.2	G 1/2	2.5	13	15	98	170

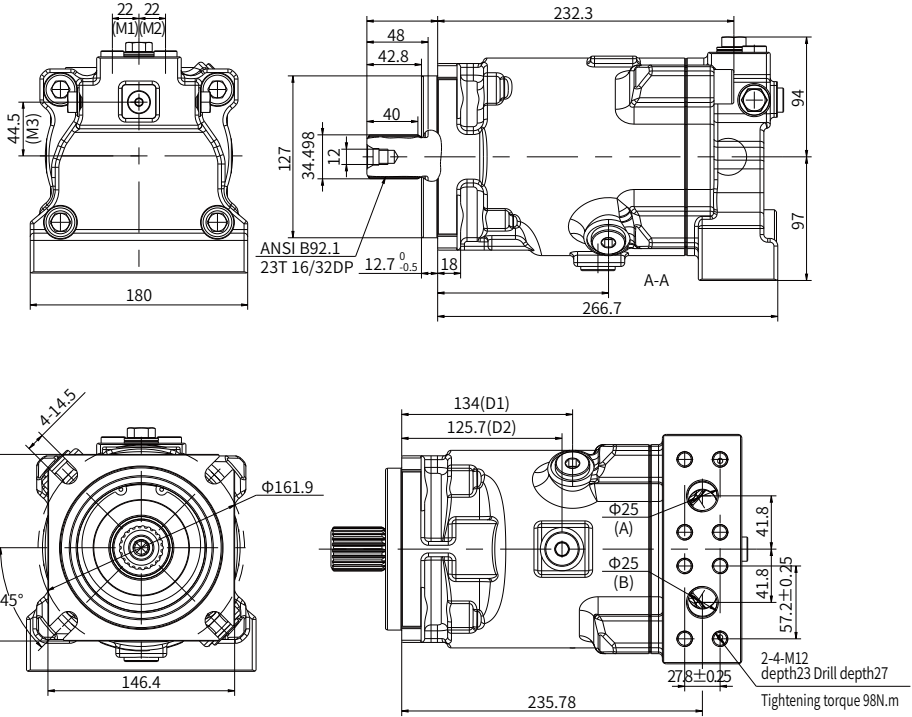
• Port details



Installation size

M70F 100 Installation size

working ports A and B, at bottom



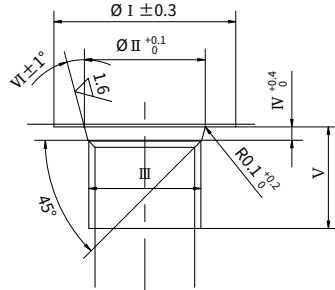
Inlet port	Outlet port	Rotation direction
A	B	Clockwise
B	A	Anti-clockwise

Note: The rotation direction is looked from the shaft end.

Installation size

• Port and flange fixing thread

(Ordering Code ④)



• Drain port and gauge port

ANSI thread type (Code : 2,3)

	Symbol	I	II	III	IV	V	VI	Tightening torque (N.m)
M1/M2/M3	Gauge port	25	15.6	9/16-18UNF-2B	2.5	15.5	12	59
D1/D2/D3	Drain port	41	29.2	1-1/16-12UN-2B	3.3	13	15	170

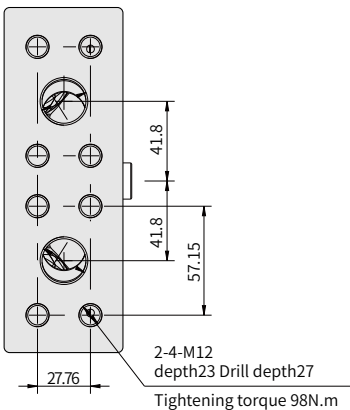
Metric thread type (Code : 4)

	Symbol	I	II	III	IV	V	VI	Tightening torque (N.m)
25	Gauge port	15.6	M14×1.5	2.4	15.5	15	47	59
40	Drain port	29.2	M27×2	3.1	13	15	180	170

Parallel piping thread type (Code : 1)

	Symbol	I	II	III	IV	V	VI	Tightening torque (N.m)
25	25	15.6	G 1/4	2.5	15.5	15	36	59
34	34	29.2	G 1/2	2.5	13	15	98	170

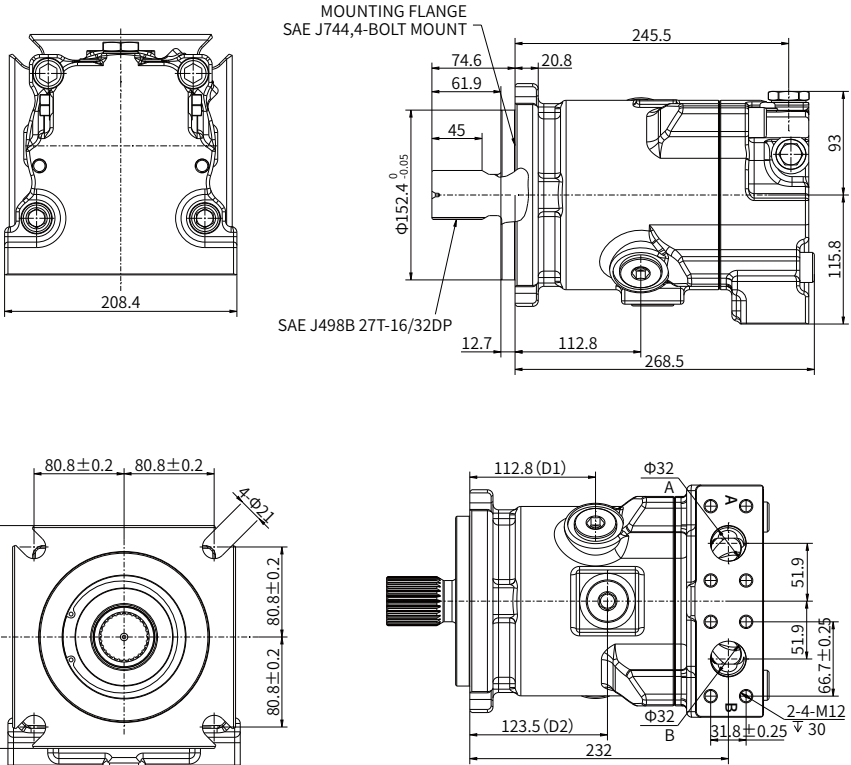
• Port details



Installation size

M70F 130 Installation size

working ports A and B, at bottom

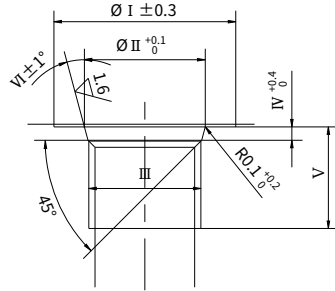


Inlet port	Outlet port	Rotation direction
A	B	Clockwise
B	A	Anti-clockwise

Note: The rotation direction is looked from the shaft end.

Installation size

• Port and flange fixing thread (Ordering Code ④)

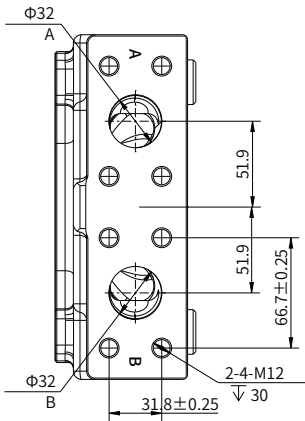


• Drain port and gauge port

ANSI thread type (Code : 2,3)

	Symbol	I	II	III	IV	V	VI	Tightening torque (N.m)
a,b	Gauge port	25	15.7	9/16-18UNF-2B	2.5	14.5	12°	30
D1/D2/D3	Drain port	49	35.55	1 5/16-12UN-2B	3.3	24	15°	150

• Port details



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