



NSP Series Compact Variable Pump Unit

Compact hydraulic units are widely used as a power source in such machine tool applications as NC lathe check opening and closing, tool rotation, machining center spindle raise and lower operations, etc.

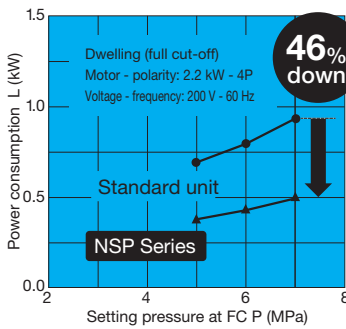
During pressure holding, the NSP unit enables high machine efficiency that delivers energy savings of approximately 46% compared

to standard Nachi units (in-house comparison), all in a compact, lightweight hydraulic unit.

Features

Increased energy savings

Support for using an efficient IE3 premium motor provides 46% energy savings compared to standard unit (in-house comparison while dwelling)



Space-saving

Variable vane pump has integrated motor so installations in compact spaces are easy in a compact and streamlined layout.

Conserve Resources

Hydraulic fluid in a low-volume tank helps conserve the world's resources.

Easy Operation and Maintenance

Simple construction and highly reliable pump controls mean excellent maintenance and handling.

Compliant with UL and EISA in the US

Lineup of models use UL certified electric motors and comply with the US Energy Independence and Security Act.

High Efficiency for Low Heat Output

Motor efficiency is high and heat output is low, particularly when the pump is dwelling, to support high accuracy for the parent machine.

Specifications

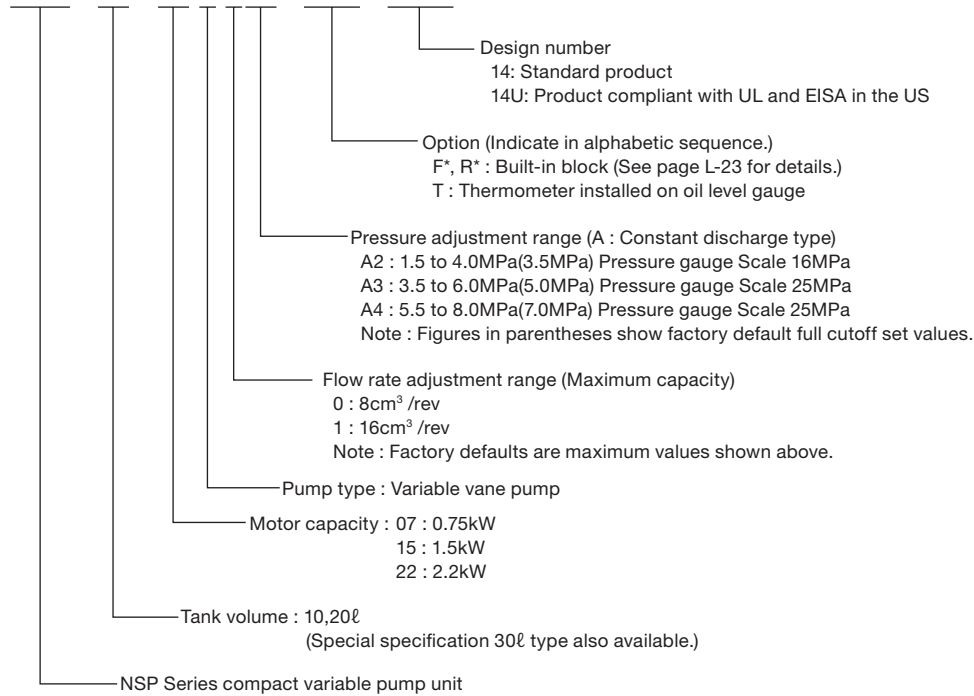
Item	Model No.	NSP-*-VOA*	NSP-*-V1A*	NSP-*-V2A*
Pump Capacity	cm ³ /rev	8.0	16.0	26.0
Maximum Pressure	MPa	8.0 (81.6kgf/cm ²) (Full Cutoff Pressure)		7.0 (Full Cutoff Pressure) * Allowed peak pressure is 13.0
Motor Output	kW	0.75, 1.5	1.5, 2.2	2.2, 3.7
Tank Capacity	ℓ	10, 20		30, 40
Installation Space	mm	300 × 400		340 × 450
Approximate Weight	kg	39 (10ℓ, 1.5kW, excluding options)		81 (30ℓ, 2.2kW, excluding options)

Explanation of model No.

Note) 1.Note that there are certain restrictions on pump capacity and motor capacity combinations. See the Selection Precautions on page L-23 before selecting a model.
2.Design numbers are subject to change without notice.

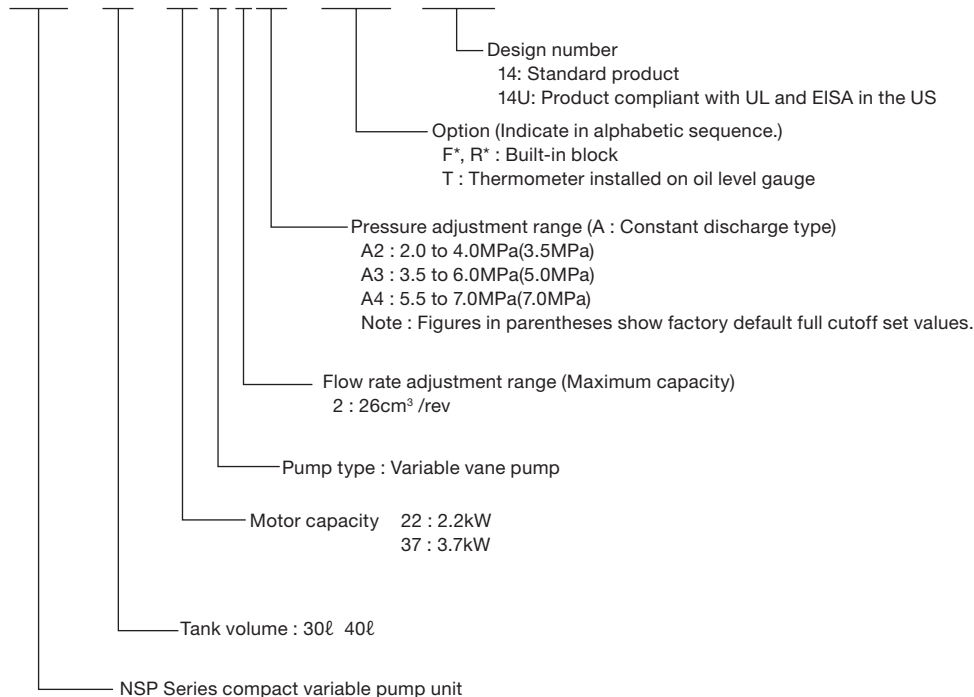
8.0, 16.0cm³/rev Series

NSP-10-07V0A2-F2T-14(U)



26.0cm³/rev Series

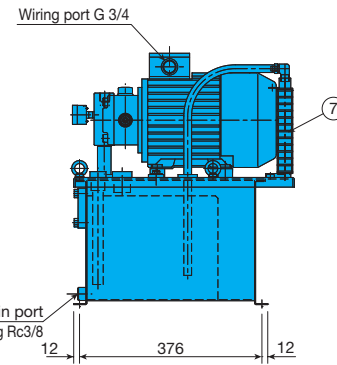
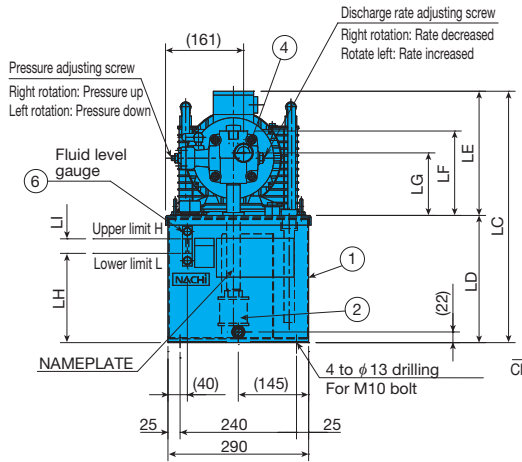
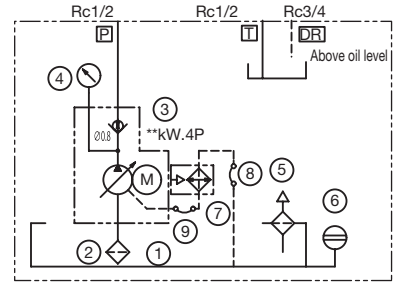
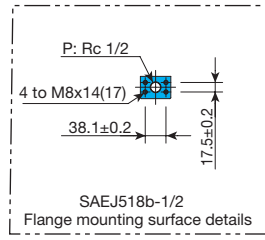
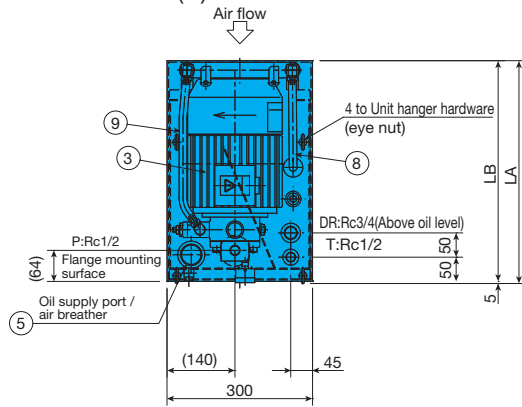
NSP-30-22V2A2-F22T-14(U)



Design Drawings, Dimension Tables

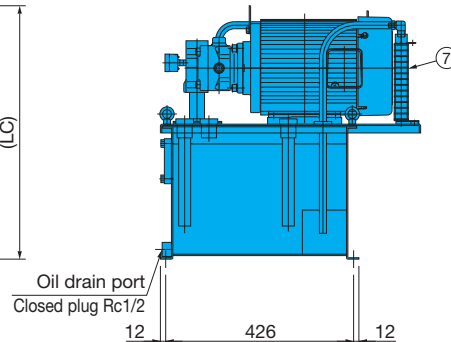
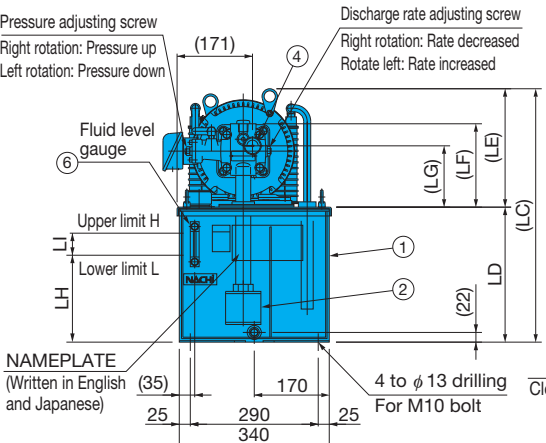
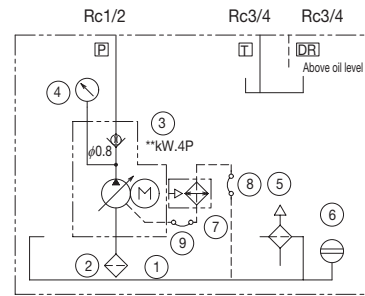
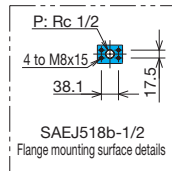
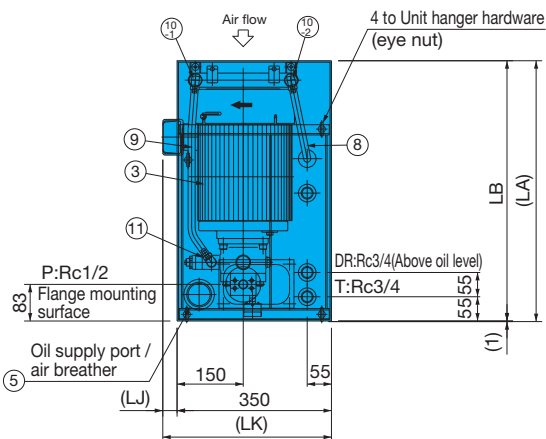
Note: See the following page for dimensions.

8.0, 16.0cm³/rev Series NSP-**-**V*A*-14(U)



Part No.	Part Name
1	Oil tank
2	Suction strainer
3	Uni-pump
4	Pressure gauge
5	Fluid supply port/air breather
6	Fluid level gauge
7	Radiator
8	Flexible hose
9	Flexible hose

26.0cm³/rev Series NSP-**-**V2A*-14(U)



Part No.	Part Name
1	Oil tank
2	Suction strainer
3	Uni-pump
4	Pressure gauge
5	Fluid supply port/air breather
6	Fluid level gauge
7	Radiator
8	Flexible hose
9	Flexible hose

8.0, 16.0cm³/rev Series

Model No.	Motor (kW-P)	Dimensions											Approximate Weight (kg)
		LA	LB	LC	LD	LE	LF	LG	LH	LI	H	L	
NSP-10-07V*A*-14(U)	0.75-4	405	400	394	160	234	154	109	102	10	10L	9L	35
NSP-10-15V*A*-14(U)	1.5-4	430	425	396		236	164	119					39
NSP-10-22V*A*-14(U)	2.2-4	460	455	422		256	174	129					46
NSP-20-07V*A*-14(U)	0.75-4	405	400	496	262	234	154	109	185	30	20L	17L	37
NSP-20-15V*A*-14(U)	1.5-4	430	425	498		236	164	119					41
NSP-20-22V*A*-14(U)	2.2-4	460	455	518		256	174	129					48

(Excluding operating fluid)

26.0cm³/rev Series

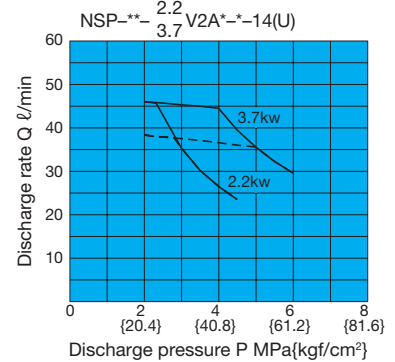
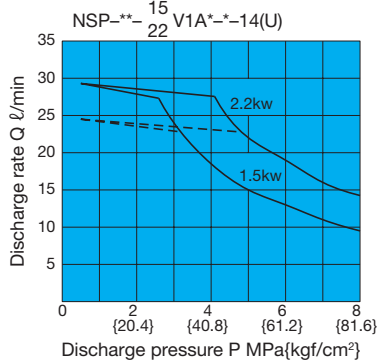
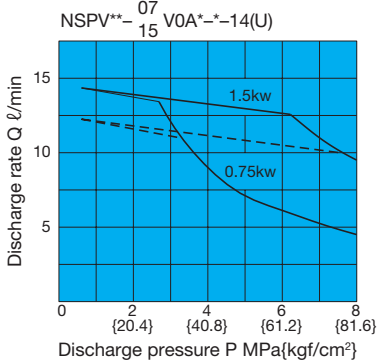
Model No.	Motor (kW-P)	Dimensions													Approximate Weight (kg)
		LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	H	L	
NSP-30-22V2A*-14(U)	2.2-4	566	565	547	306	241	177	127	197	50	3	353	30L	23L	80
NSP-30-37V2A*-14(U)	3.7-4	591	590	574		268	189	139			32	382			86
NSP-40-22V2A*-14(U)	2.2-4	566	565	626	385	241	177	127	256	70	3	353	40L	31L	84
NSP-40-37V2A*-14(U)	3.7-4	591	590	653		268	189	139			32	382			90

(Excluding operating fluid)

Selecting a Motor

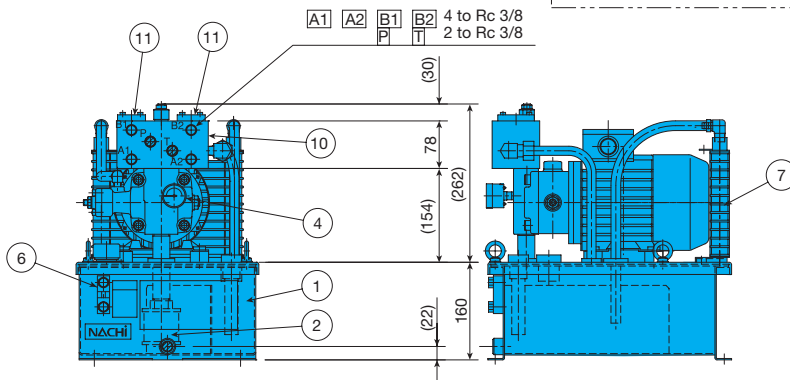
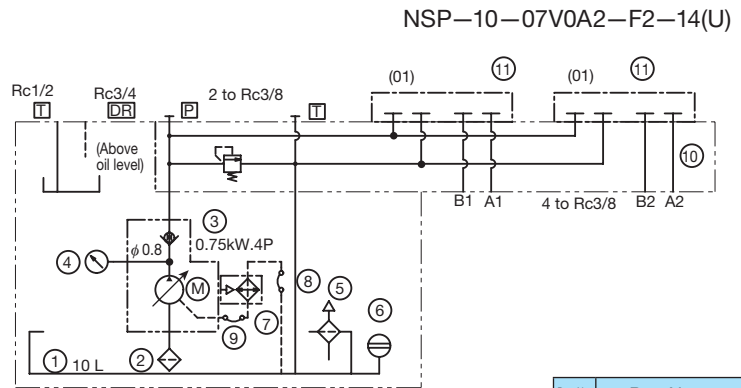
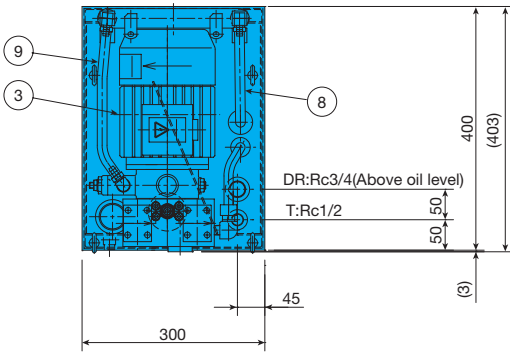
NSP Motor Selection Curves (Standard voltage for drive motor is 200 VAC, 50/60 Hz or 220 VAC, 60 Hz.)

--- 50Hz ——— 60Hz



* See page B-43 for the characteristics of the drive motor.

[Block Addition Example]
NSP-10-07V0 A2-F2-14(U)

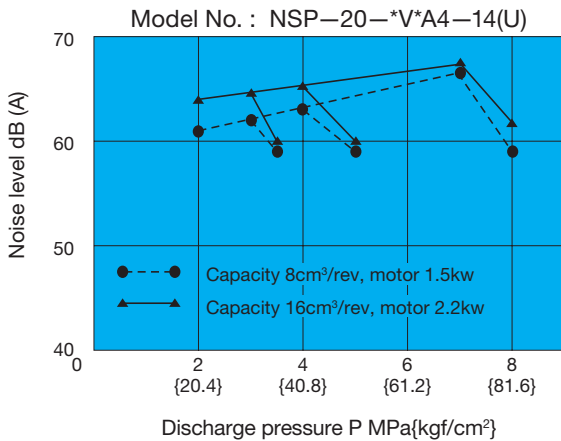


Part No.	Part Name
1	Oil tank
2	Suction strainer
3	Uni-pump
4	Pressure gauge
5	Fluid supply port/air breather
6	Fluid level gauge
7	Radiator
8	Flexible hose
9	Flexible hose
☆ 10	Base Blocks
☆ 11	End Plates

☆: Part numbers 10 and 11 are options. Part number 11 is standard when a block is equipped.

Performance Characteristics

① Noise Characteristics

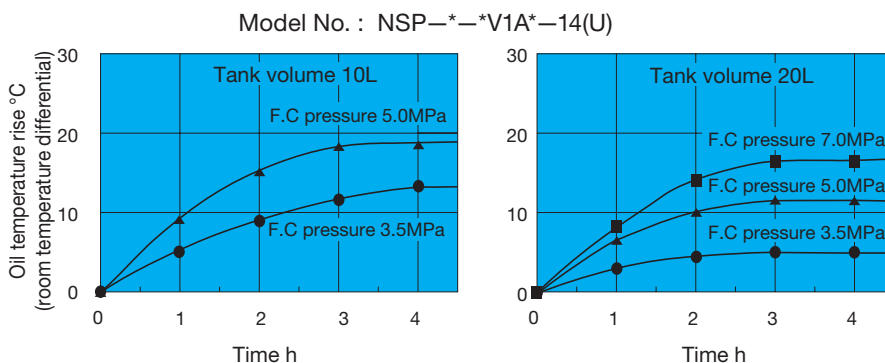


Conditions

(The values shown in the graph to the left are typical characteristics under the following conditions.)
Operating Fluid: ISO VG32 equivalent
Oil Temperature: 40±5°C
Revolution Speed: 1800min⁻¹
Measurement Distance: 1 meter around the unit
(Average value from four directions)

Note) Noise characteristics are affected by the condition of the floor and stand where the unit is mounted, whether there are noise reflective items nearby, and other factors. Such factors can produce different characteristics than those indicated above.

② Oil Temperature Characteristics



Conditions

(The values shown in the graph to the left are typical characteristics under the following conditions.)
Operating Fluid: ISO VG32 equivalent
Revolution Speed: 1800min⁻¹
Room Temperature: 29°C
Motor: 0.75 to 2.2kW

Note) 1. Note that continuous operation at pressures of 5.0MPa or greater with the 10L tank cause a large rise in oil temperature. A 20L tank is recommended in this case.
2. Rises in oil temperature depend on actual operating conditions, and so actual temperatures may be different from those indicated above.

Note) For information about power consumption, see the data for the UVN Series variable vane uni-pump on page B-43.

Selection Precautions

Model Combinations

- 1 The table below shows the standard pump and motor combinations.

Pump	Motor kW			
	0.75	1.5	2.2	3.7
0A*	○	○		
1A*		○	○	
2A2			○	○
2A3			○	○
2A4				○

- 2 A 30L tank capacities with 8.0 or 16.0 cm³/rev are special specifications.
 3 A model equipped with a block comes with a stopper plate on the block.

Circuit Configuration

- 1 The basic configuration is a standard NSP-** plus an external manifold (circuit).
 2 Provide piping with sufficient flexibility between the unit and external manifold.

- Make sure the maximum peak pressure (setting pressure + surge pressure) during operation does not exceed 14MPa.

The following are typical pipe conditions at a reference maximum peak pressure at 14MPa or less as reference. Rubber hose (for 14MPa) 1/2" x 2m (Pipe Capacity: 250cm³) pump operating conditions: 1MPa→7MPa, full cutoff

- At pressures in excess of 14MPa, equip a circuit side surge cutoff relief valve.

Note) The maximum peak pressure of a pump capacity of 26 cm³/rev is 13 MPa.

Built-in Manifold Block

- 1 When a manifold block (optional) is built into the pump, make sure the

block and valve total weight is not greater than 15kg.

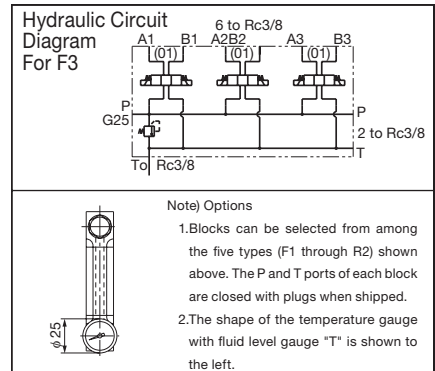
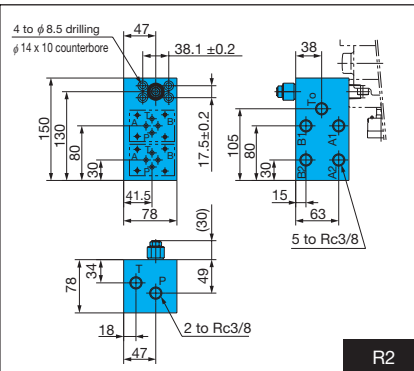
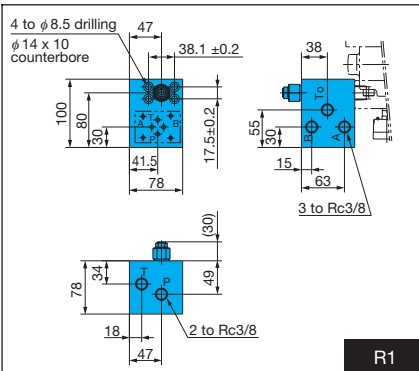
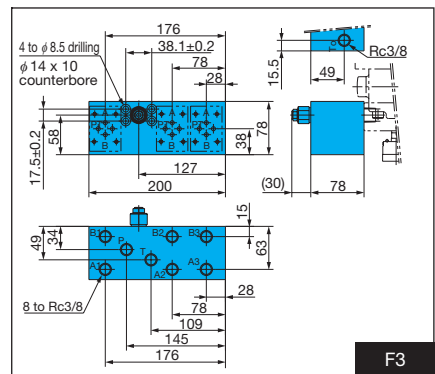
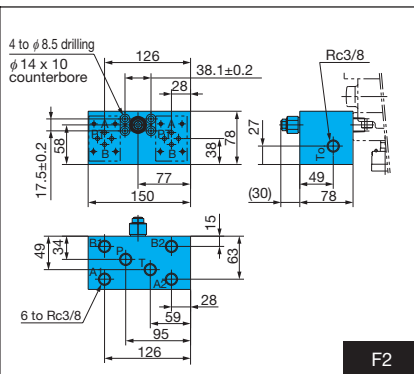
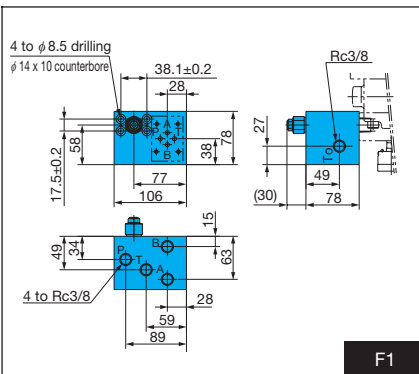
Block Type	F1-R1	F2-R2	F3
Block Weight (kg)	4.5	6.5	8.5
Allowable Additional Weight (kg)	10.5	8.5	6.5

- 2 Contact your agent for information about equipping a circuit.
 3 The 26 cm³/rev series blocks are different, contact us for information.

Paint Specifications

- 1 The interior and exterior of the tank are coated with a melamine baked-on resin coating, the motor is coated with cation electrodeposition coating, while the pump is spray painted with a lacquer finish. Color is Nachi standard color (Munsell No.N-1 70% gloss).
 2 Contact your agent about specifying external paint colors.

Option Details



Handling Overview

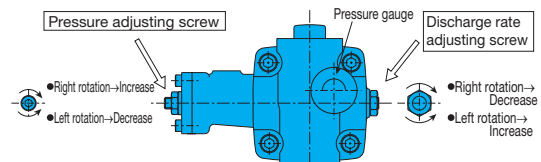
Startup Precautions

- 1 Check to make sure that the operating fluid in the tank is at the prescribed level.
 A Upper Limit Mark (Yellow): Prescribed fluid level (nominal capacity)
 B Lower Limit Mark (Red): Minimum fluid level
 Hydraulic Operating Fluid: General oil-based operating fluid equivalent to ISO VG32
 2 Perform electrical wiring exactly as shown below.

Motor and Power Supply Polarity R→U S→V T→W	⇒ If wiring is performed incorrectly... · Electric pump rotates in reverse, fluid is not discharged. Continued operation can damage the pump. · Attach a pressure gauge to the discharge side and check for pressure rise.
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- 3 Perform repeated motor starts and stops to bleed air from the interior of the pump and the suction piping. A no-load circuit allows faster bleeding.

Adjusting the Pressure and Discharge



Note: Do not touch anything except the adjustment screw shown above.

Maintenance and Inspection

- 1 Oil Temperature: Use in an area where the temperature is 15°C to 60°C.
 2 Operating Fluid Replacement Cycle: Perform the initial fluid replacement after three months of operation. After that, replace fluid when it becomes dirty or once a year, whichever comes first.
 3 Radiator Fin Cleaning and Fin Strainer Cleaning: Every six months or 4,000 hours of operation, whichever comes first.
 Environment
 1 Temperature: 10 to 35°C
 2 Avoid areas exposed to mist of water-soluble coolant.