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, NSP unit enables machine efficiency that delivers energy savings of approximately 40% when compared with standard Nachi units, all in a compact, lightweight hydraulic unit.

Features

Space-saving, lightweight design
A smaller tank capacity makes it easier for the unit to fit in, and greatly reduces space requirements.

New structure increases efficiency
A structure that draws on years of accumulated know-how includes an improved pump joint that provides more efficient operation.

Greatly improved cooling capacity
A powerful, energy-efficient built-in cooling system eliminates the need for fan motor wiring and coolant pipes.

Specifications

Item \ Model No.		NSP-*-*V0A*	NSP-*-*V1A*	NSP-*-*V2A*
Pump Capacity	cm^3/rev	8.0	16.0	26.0
Maximum Pressure	MPa (psi)	8.0 (1160 psi) (Full Cutoff Pressure)		7.0 (Full Cutoff Pressure) * Allowed peak pressure is 13.0
Motor Output	kW (hp)	0.75, 1.5 (1, 2)	1.5, 2.2 (2, 3)	2.2, 3.7 (3, 5)
Tank Capacity	ℓ	10, 20		30, 40
Installation Space	mm	300 × 400		340 × 450
Approximate Weight	kg	37 (10 ℓ, 1.5kW, excluding options)		63 (30 ℓ, 2.2kW, excluding options)
Pump Volume 60 Hz		3.8 gpm	7.6 gpm	12 gpm

Understanding Model Numbers

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.

NSP – 10 – 07 V 0 A2 – F2T – E13

- Design number
  - E13 220V 60 Hz
  - E13G 460v 60 Hz
  - E13M 230v 60Hz
- Option (Indicate in alphabetic sequence.)
  - F*, R* : Built-in block (See page L-30 for details.)
  - T : Thermometer installed on oil level gauge
- Pressure adjustment range (A : Constant discharge type)
  - A2 : 1.5 to 4.0MPa (507 psi) Pressure gauge Scale 16MPa
  - A3 : 3.5 to 6.0MPa (725 psi) Pressure gauge Scale 25MPa
  - A4 : 5.5 to 8.0MPa (1015 psi) Pressure gauge Scale 25MPa
  - Note : 1. Figures in parentheses show factory default full cutoff set values.
- Flow rate adjustment range (Maximum capacity)
  - 0 : 8cm³/rev (.49 cu in)
  - 1 : 16cm³/rev (.98 cu in)
  - 2: 26cm³/rev (1.59 cu in)
  - Note : 2. Factory defaults are maximum values shown above.
- Pump type : Variable vane pump
- Motor capacity
  - 07 : 0.75kW (1 hp)
  - 15 : 1.5kW (2 hp)
  - 22 : 2.2kW (3 hp)
  - 37 : 3.7kW (5 hp)
- Tank volume : 10, 20, 30, 40ℓ
- NSP Series compact variable pump unit

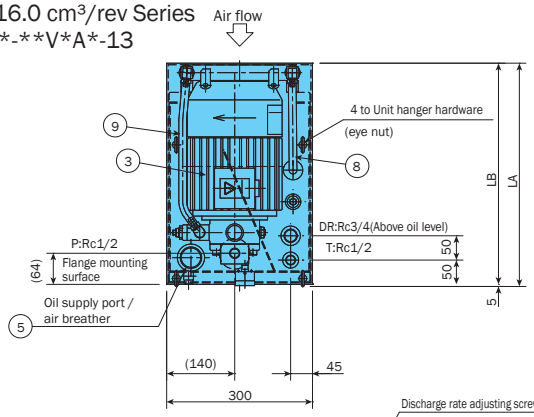
NSP – 20L – 07 V 0 A2 – F – 13

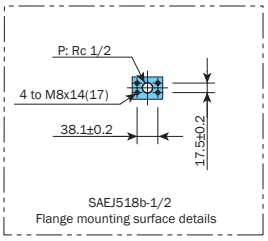
- Design number
  - E13 220V 60 Hz
  - E13G 460v 60 Hz
  - E13M 230v 60Hz
- Option (Indicate in alphabetic sequence.)
  - F*, R*: Built-in Block (standard)
- Pressure adjustment range (A : Constant discharge type)
  - A2 : 2.0 to 4.0MPa (507 psi)
  - A3 : 3.5 to 6.0MPa (725 psi)
  - A4 : 5.5 to 7.0MPa (1015 psi)
  - Note : Figures in parentheses show factory default full cutoff set values.
- Flow rate adjustment range (Maximum capacity)
  - 0 : 8cm³/rev (.49 cu in)
- Pump type : Variable vane pump
- Motor capacity
  - 0.75kW (1 hp)
  - 1.5kW (2 hp)
- Tank volume : 20ℓ (8 gal)
- NSP- 20L Series compact variable pump unit

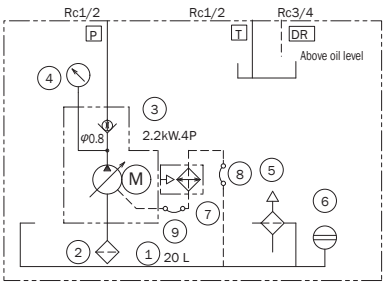
Design Drawings, Dimension Tables

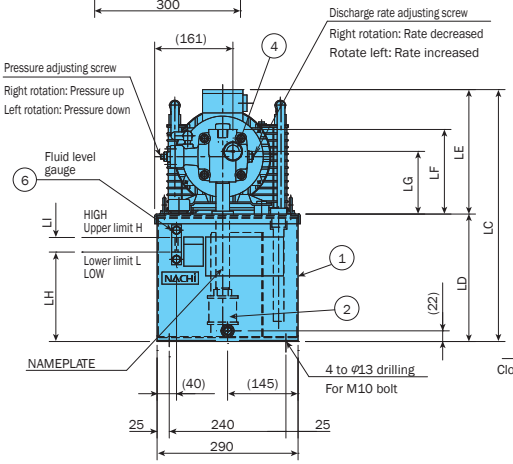
Note: See the following page for dimensions.

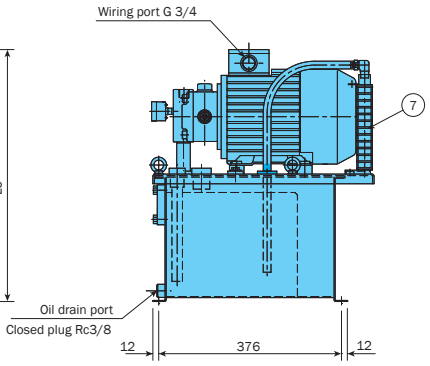
8.0, 16.0 cm³/rev Series
NSP-*-**V*A*-13





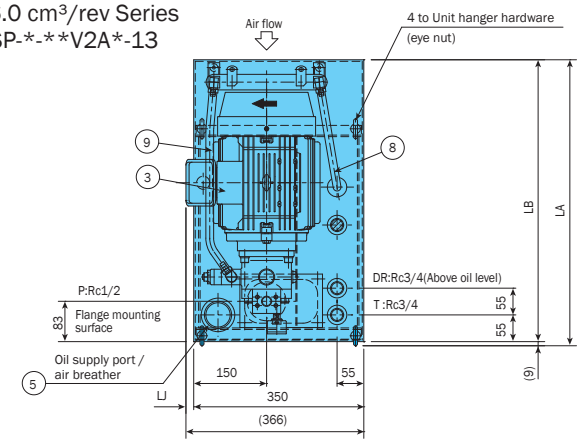


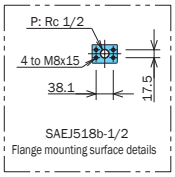


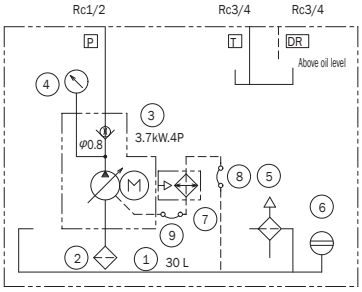


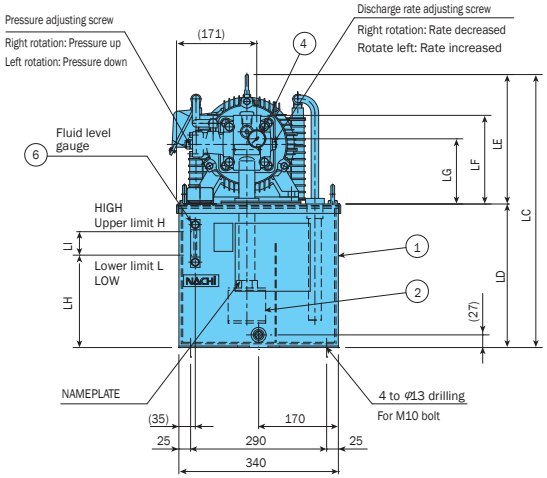
Part No.	Part Name
1	Oil tank
2	Suction strainer
3	Uni-pump
4	Pressure gauge
5	Fluid supply port/air breather
6	Fluid level gauge
7	Radiator
8	Flexible hose
9	Flexible hose

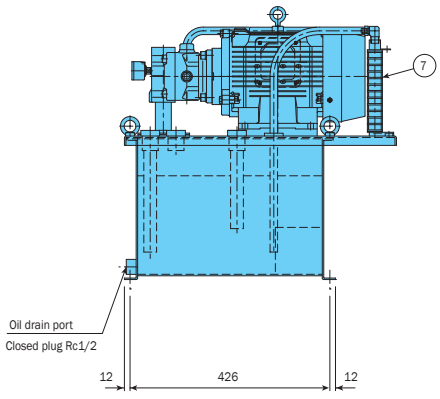
26.0 cm³/rev Series
NSP-*-**V2A*-13











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*-*-13	0.75 – 4	405	400	394	160	234	154	109	102	10	10L	9L	33
NSP-10-15V*A*-*-13	1.5 – 4	430	425	396		236	164	119					37
NSP-10-22V*A*-*-13	2.2 – 4	460	455	422		262	174	129					42
NSP-20-07V*A*-*-13	0.75 – 4	405	400	496	262	234	154	109	185	30	20L	17L	35
NSP-20-15V*A*-*-13	1.5 – 4	430	425	498		236	164	119					39
NSP-20-22V*A*-*-13	2.2 – 4	460	455	524		262	174	129					44

(Excluding operating fluid)

26.0cm³/rev Series

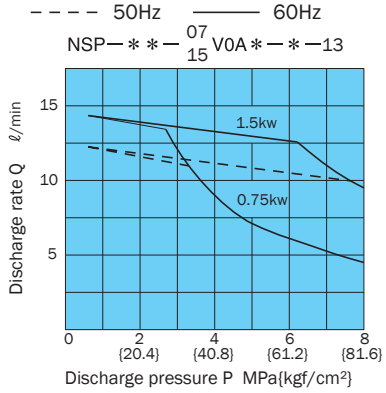
Model No.	Motor (kW-P)	Dimensions												Approximate Weight (kg)
		LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	H	L	
NSP-30-22V2A*-*-13	2.2 – 4	564	555	619	306	234	177	127	197	50	9	30L	23L	63
NSP-30-37V2A*-*-13	3.7 – 4	589	580	661		276	189	139			15			73
NSP-40-22V2A*-*-13	2.2 – 4	564	555	619	385	234	177	127	256	70	9	40L	31L	67
NSP-40-37V2A*-*-13	3.7 – 4	589	580	661		276	189	139			15			77

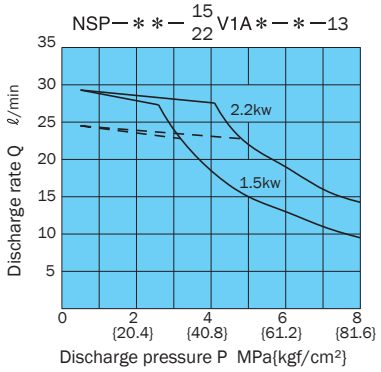
(Excluding operating fluid)

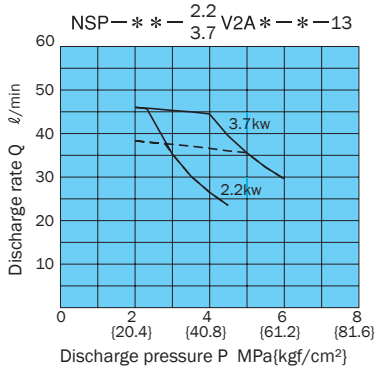
Selecting a Motor

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

– – – – 50Hz ——— 60Hz

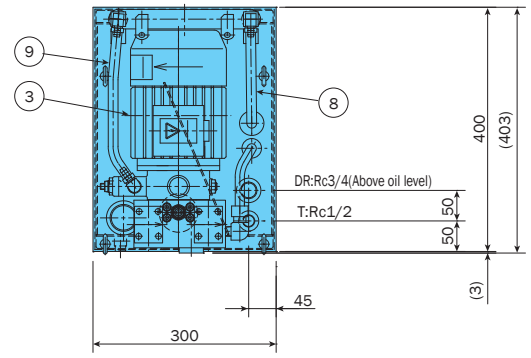


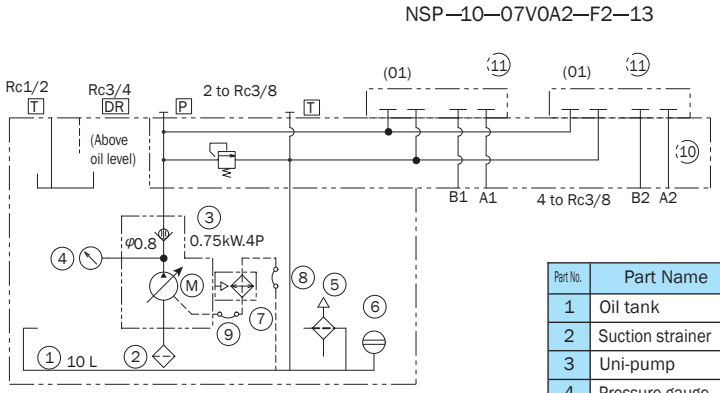


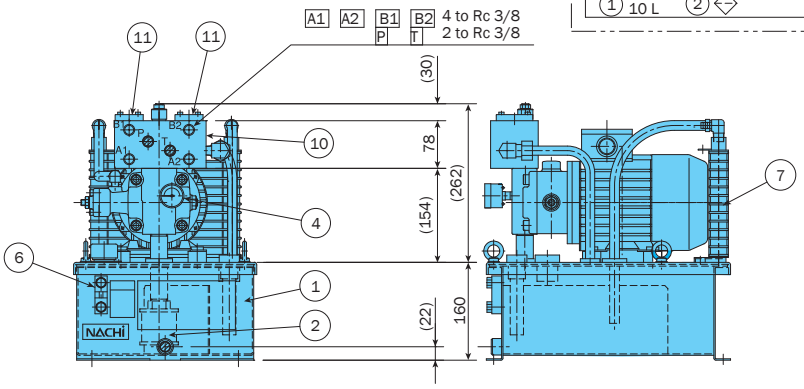


* See page B-40 for the characteristics of the drive motor.

[Block Addition Example]
NSP-10-07V0 A2-F2-13







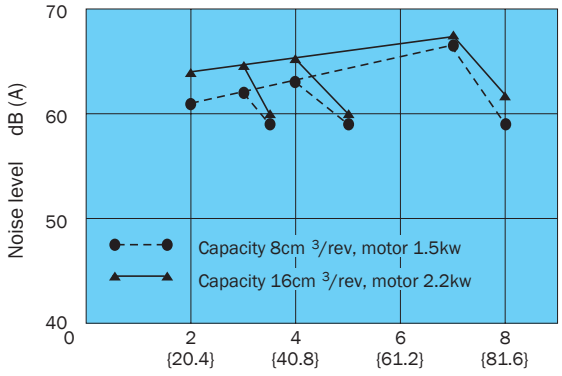
Part No.	Part Name
1	Oil tank
2	Suction strainer
3	Uni-pump
4	Pressure gauge
5	Fluid supply port/air breather
6	Fluid level gauge
7	Radiator
8	Flexible hose
9	Flexible hose
☆ 10	Base Blocks
☆ 11	End Plates

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

Performance Characteristics

Noise Characteristics

Model No.: NSP—20—＊V＊A4—13

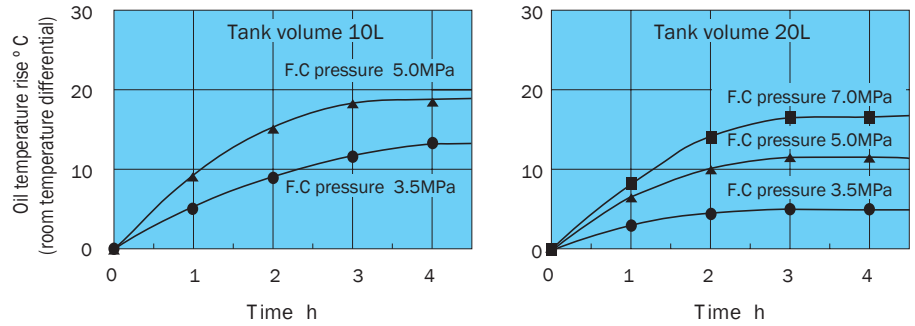


Discharge pressure P MPa{kgf/cm²}

Conditions
(The values shown in the graph to the left are typical characteristics under the following conditions.)
Operating Fluid: ISO VG32 equivalent
Fluid Temperature: 40±5℃
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 near-by, and other factors. Such factors can produce different characteristics than those indicated above.

Fluid Temperature Characteristics

Model No.: NSP—＊—＊V1A＊—13



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 ℃
Motor: 0.75 to 2.2kW
Note) 1.Note that conti nuous operation at pressures of 5.0MPa or greater with the 10 ℓ tank cause a large rise in fluid temperature. A 20 ℓ tank is recommended in this case.
2.Rises in fluid 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-41.

Selection Precautions

• Model Combinations

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				○

A 30ℓ tank capacities with 8.0 or 16.0 cm³/rev are special specifications.

A model equipped with a block comes with a stopper plate on the block.

• Circuit Configuration

The basic configuration is a standard NSP-** plus an external manifold (circuit).

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.

• Built-in Manifold Block

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

Contact your agent for information about equipping a circuit.

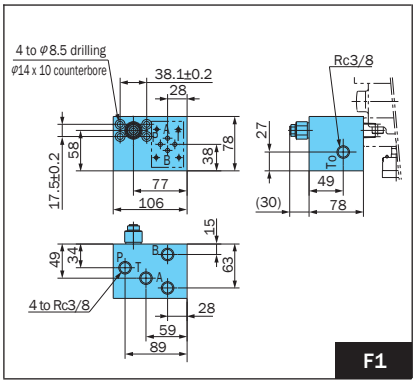
The 26 cm3/rev series blocks are different, contact us for information.

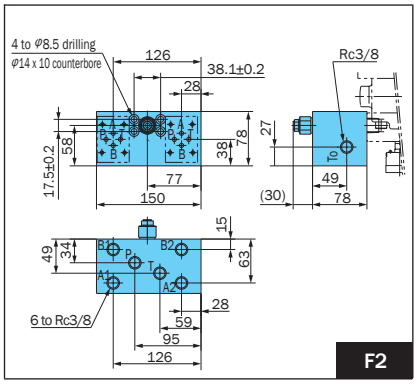
• Paint Specifications

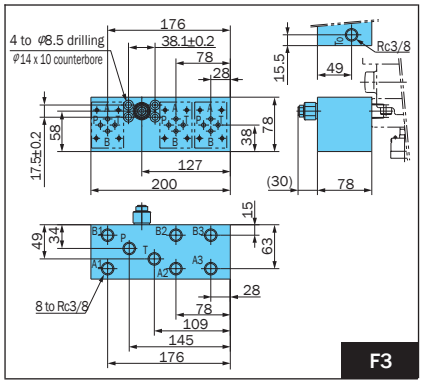
The interior and exterior of the tank and the motor are covered with a melanin baked-on resin coating, while the pump is spray painted with a lacquer finish. Color is Nachi standard color (Mancel No. 5B6/3).

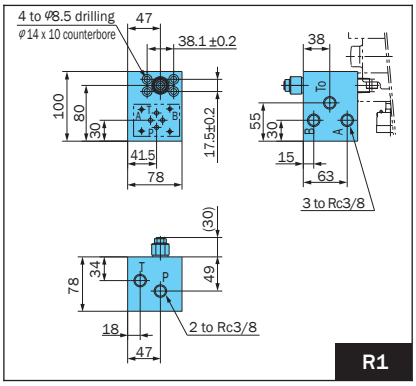
Contact your agent about specifying external paint colors.

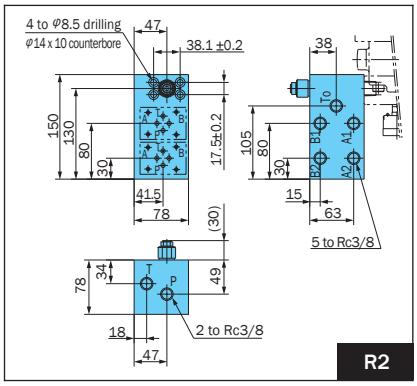
Option Details

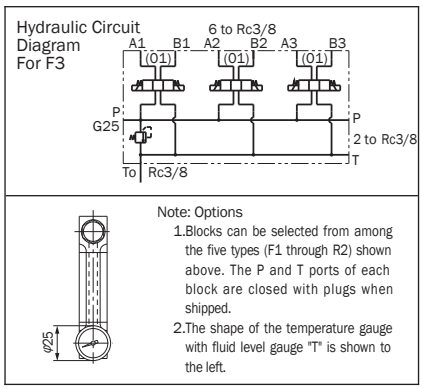












Handling Overview

Startup Precautions

Check to make sure that the operating fluid in the tank is at the prescribed level.

- Upper Limit Mark (Yellow): Prescribed fluid level (nominal capacity)
- Lower Limit Mark (Red): Minimum fluid level

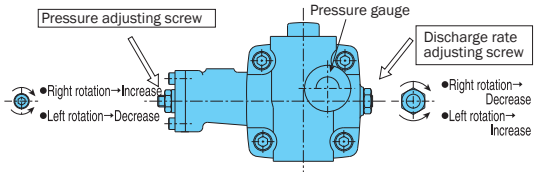
Hydraulic Operating Fluid: General oil-based operating fluid equivalent to ISO VG32

Perform electrical wiring exactly as shown below.

Motor and Power Supply Polarity	→	If wiring is performed incorrectly...
R → U S → V T → W	→	· 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.

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

Fluid Temperature: Use in an area where the temperature is 15° C to 60° C.

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.

Radiator Fin Cleaning and Fin Strainer Cleaning: Every six months or 4,000 hours of operation, whichever comes first.

• Environment

Temperature: 10 to 35° C

Avoid areas exposed to mist of water-soluble coolant.