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.

**Easy Operation and Maintenance**
Simple construction and highly reliable pump controls mean excellent maintenance and handling.

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

**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**

<table>
<thead>
<tr>
<th>Item</th>
<th>NSP-<strong>-VOA</strong></th>
<th>NSP-<strong>-V1A</strong></th>
<th>NSP-<strong>-V2A</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump Capacity cm³/rev</td>
<td>8.0</td>
<td>16.0</td>
<td>26.0</td>
</tr>
<tr>
<td>Maximum Pressure MPa</td>
<td>8.0 (81.6kgf/cm²) (Full Cutoff Pressure)</td>
<td>7.0 (Full Cutoff Pressure) * Allowed peak pressure is 13.0</td>
<td></td>
</tr>
<tr>
<td>Motor Output kW</td>
<td>0.75, 1.5</td>
<td>1.5, 2.2</td>
<td>2.2, 3.7</td>
</tr>
<tr>
<td>Tank Capacity ℓ</td>
<td>10, 20</td>
<td></td>
<td>30, 40</td>
</tr>
<tr>
<td>Installation Space mm</td>
<td>300 × 400</td>
<td></td>
<td>340 × 450</td>
</tr>
<tr>
<td>Approximate Weight kg</td>
<td>39 (10ℓ, 1.5kW, excluding options)</td>
<td>81 (30ℓ, 2.2kW, excluding options)</td>
<td></td>
</tr>
</tbody>
</table>
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-**"V**A*-14(U)

Note: See the following page for dimensions.
### Selecting a Motor

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

* See page B-43 for the characteristics of the drive motor.
[Block Addition Example]
NSP-10-07V0 A2-F2-14(U)

Performance Characteristics

Noise Characteristics

Model No. : NSP—20—”V”A4—14(U)

<table>
<thead>
<tr>
<th>Discharge pressure P MPa[kgf/cm²]</th>
<th>Noise level dB (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>70</td>
</tr>
<tr>
<td>0.2</td>
<td>65</td>
</tr>
<tr>
<td>0.4</td>
<td>60</td>
</tr>
<tr>
<td>0.6</td>
<td>55</td>
</tr>
<tr>
<td>0.8</td>
<td>50</td>
</tr>
<tr>
<td>1.0</td>
<td>45</td>
</tr>
<tr>
<td>1.2</td>
<td>40</td>
</tr>
<tr>
<td>1.4</td>
<td>35</td>
</tr>
<tr>
<td>1.6</td>
<td>30</td>
</tr>
</tbody>
</table>

Capacity 8cm³/rev, motor 1.5kw
Capacity 16cm³/rev, motor 2.2kw

Oil Temperature Characteristics

Model No. : NSP—”V1A”—14(U)

- Tank volume 10L
  - F.C. pressure 5.0MPa
  - Oil temperature rise 10°C
- Tank volume 20L
  - F.C. pressure 7.0MPa
  - Oil temperature rise 20°C

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

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.

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.

Part numbers 10 and 11 are options. Part number 11 is standard when a block is equipped.
Selection Precautions

1. 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.

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

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.

Environment

1. Temperature: 10 to 35°C
2. Avoid areas exposed to mist of water-soluble coolant.

Adjusting the Pressure and Discharge

Pressure adjusting screw

Discharge rate adjusting screw

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

Hydraulic Circuit Diagram For F3

Note) Options
- 1. Blocks can be selected from among the five types (F1 through R2) shown above. The P and T ports of each block are closed with plugs when shipped.
- 2. The shape of the temperature gauge with fluid level gauge "T" is shown to the left.

Handling Overview

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

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.