



### NACHI NN Pack High-Pressure Standard Variable Pump Unit

Newly developed compact variable pump unit has environmentally friendly low hydraulic fluid temperature for cutting and manufacturing equipment hydraulic units. Extensive lineup in the series to handle requirements exactly.

#### Features

Low hydraulic fluid temperature = room temperature + 7 °C

{
 NNP-20-22P16N1-20  
 60Hz, 7MPa Full cut-off in  
 continuous operation

A wide selection of models from which to choose

{
 Basic Series: 10 types  
 Pump Variable Controllers: 5 types  
 Options: 8 types

Fan to cool pump drain is standard equipment, hydraulic fluid temperatures are kept low using tank construction focused on anti-foaming.

A wide range of models provides a selection of capacity levels, and selecting a variable control mechanism helps to reduce energy needs.

#### Specifications

Power supply: AC200V-50/60Hz AC220V-60Hz

Model No.	Pump Capacity cm <sup>3</sup> /rev	Motor capacity kW-P	Maximum Pressure [Full Cutoff Pressure] MPa(kgf/cm <sup>2</sup> )	Tank Capacity ℓ	Fan Cooler Motor Input W(at50/60Hz)	Standard Weight kg <small>(Note)</small>	
NNP-20-22P8N***-20	8.0	2.2 - 4	21(214)	20	16/15W Single-phase	65	
NNP-20-37P8N***-20		3.7 - 4		20		75	
NNP-20-22P16N***-20	2.2 - 4	20		70			
NNP-30-37P16N***-20	3.7 - 4	30		80			
NNP-20-22P22N***-20	22.0	2.2 - 4	14(143)	20	33/30W Single-phase	70	
NNP-30-37P22N***-20		3.7 - 4		30		80	
NNP-40-37P35N***-20	35.0	3.7 - 4	21(214)	40		33/30W Single-phase	105
NNP-60-55P35N***-20		5.5 - 4		60			125
NNP-80-37P45N***-20	45.0	3.7 - 4	14(143)	80	33/30W Single-phase		120
NNP-80-55P45N***-20		5.5 - 4		80			130

Note: Operating fluid is not included in options

#### Understanding Model Numbers

**NNP - 20 - 22 P 16 N2 - \*\* - 20**

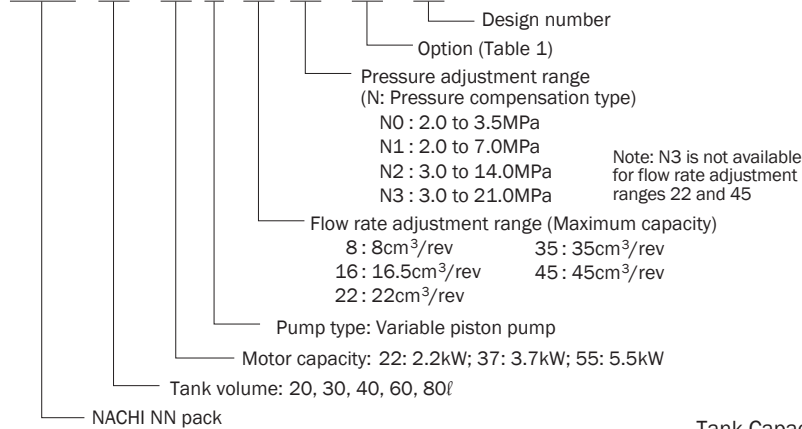


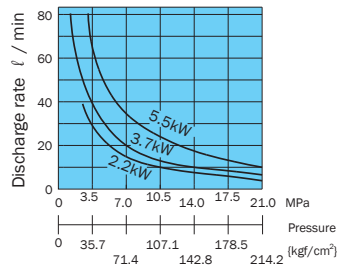
Table 1: Option Symbols (Specify in alphabetic sequence.)

Symbol	Description
F*	F*Type block (See block specifications.)
R*	R*Type block (See block specifications.)
G	Fluid level gauge guard
H	Temperature switch (Contact on at fluid temperature of 65 °C)
M	Microseparator
P	Bottom oil pan
S	Float switch (Contact on at fluid low limit level)
T	Fluid level gauge with temperature gauge (with guard)
W	Self Leak Test

Note: Return filter and fan cooler are equipped as standard.

#### Selecting a Motor

The lower sides of the curves for each of the motors shown in the graph, indicate the operating range under rated output for that motor.

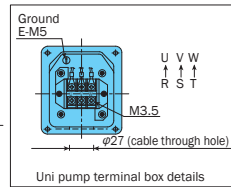
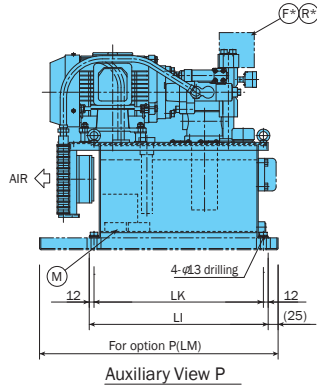
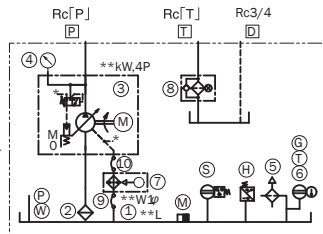
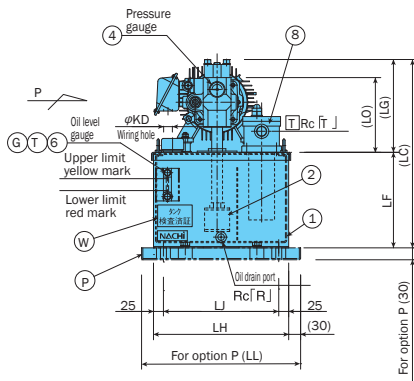
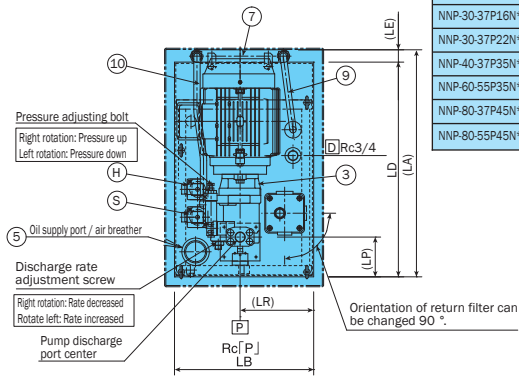


#### Tank Capacity and Motor/Pump Combinations

Tank Capacity ( ℓ )	Motor capacity (kW-P)			2.2 - 4					3.7 - 4					5.5 - 4	
	8	16	22	8	16	22	35	45	35	45	35	45	35	45	
20ℓ	○	○	○	○											
30ℓ					○	○									
40ℓ							○								
60ℓ													○		
80ℓ													○	○	

# Design Drawings, Dimension Tables

Model No.	Dimensions																			
	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	LL	LM	LO	LP	LR	KD	P	T	R
NNP-20-22P 8N*..*20	571	350	466	540	31	240	226	340	450	290	426	400	179	100	185	100	185	1/2	3/4	3/4
NNP-20-22P16N*..*20			474				234						188							
NNP-20-22P22N*..*20			526				286						191							
NNP-20-37P 8N*..*20	601	605	570	570	31	319	286	340	450	290	426	400	200	100	185	100	185	1/2	3/4	3/4
NNP-30-37P16N*..*20																		319		
NNP-30-37P22N*..*20	711	450	575	680	31	319	286	340	450	290	426	500	200	100	185	100	185	1/2	3/4	3/4
NNP-40-37P35N*..*20																		319		
NNP-60-55P35N*..*20	776	450	686	745	31	358	328	440	560	390	536	500	230	172	245	100	185	1/2	3/4	3/4
NNP-80-37P45N*..*20	711	450	686	745	31	358	328	440	560	390	536	500	230	172	245	100	185	1/2	3/4	3/4
NNP-80-55P45N*..*20	776	450	783	745	31	454	329	440	560	390	536	500	231	172	245	100	185	1/2	3/4	3/4



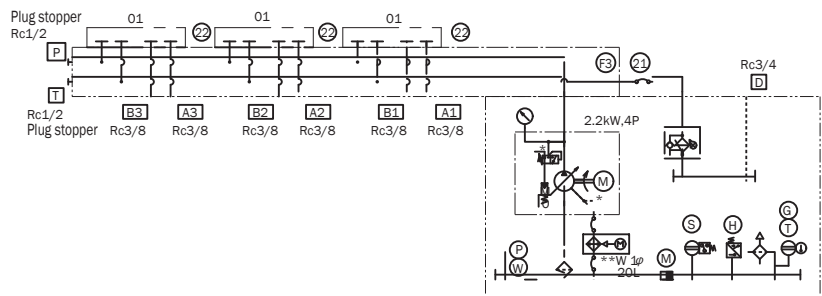
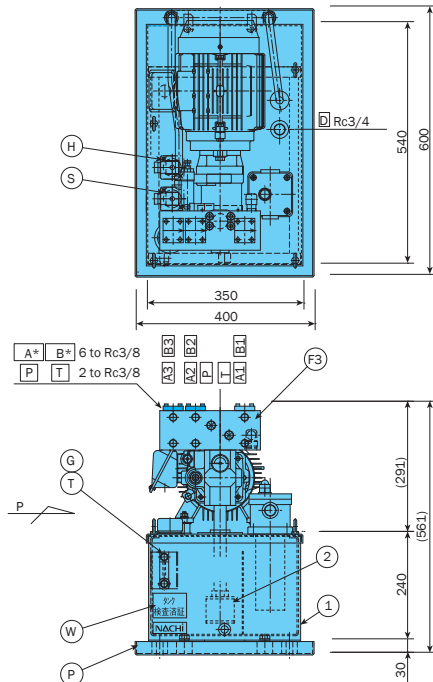
Part No.	Part Name
1	Fluid tank
2	Suction strainer
3	Uni-pump
4	Pressure gauge
5	Fluid supply port/air breather
6	Fluid level gauge
7	Fan cooler
8	Return filter
9	Flexible hose
10	Flexible hose

## Options

Part No.	Part Name
F*	Built-in block (F Type)
R*	Built-in block (R Type)
G	Fluid level gauge with guard
H	Temperature switch
M	Microseparator
P	Bottom oil pan
S	Float switch
T	Fluid level gauge with temperature gauge (with guard)
W	Self leak test

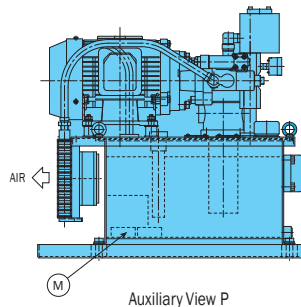
## Option Installation Example

Model No. : NNP-20-22P16N2-F3HMPSTW-20



Symbol	Name
11	Flexible hose
12	End Plates

Note: Part numbers 11 and 12 are standard with a built-in block.



# F\* and R\* Block Specifications

Note: Note that there are certain restrictions on block-equipped combinations. See the Selection Precautions on page L-32.

Options F1, F2, F3, F6															Options R1, R2, R3, R6														
Symbol	Description	Model No.																											
		Tank Capacity 20, 30 l						Tank Capacity 40, 60, 80 l																					
F1	F1 Type Block (01 x 1)	F1-1A						F1-2A																					
F2	F2 Type Block (01 x 2)	F2-1A						F2-2A																					
F3	F3 Type Block (01 x 3)	F3-1A						F3-2A																					
F6	F6 Type Block (03 x 1 - M6)	F6-1A-M6 (Standard M6)						F6-2A-M6 (Standard M6)																					

Tank Capacity	Options	Dimensions																
		MA	MB	MC	MD	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN	N	F	S
20r	F1	133	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
	F2	175	-	-	20	90	55	88	15	58	33	22	88	65	21	4	3/8	1/2
	F3	225	105	55	-	-	-	-	-	-	-	-	-	-	-	6	-	-
30r	F6	152	-	-	25	102	67	103	18	67	39	25	103	80	26	2	1/2	3/4
	F1	143	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
	F2	183	-	-	20	96	58	88	15	58	33	22	98	68	24	4	3/8	1/2
40r	F3	233	108	58	-	-	-	-	-	-	-	-	-	-	-	6	-	-
	F6	155	-	-	25	105	70	103	18	67	39	25	103	73	2	1/2	3/4	

Tank Capacity	Options	Dimensions																
		MA	MB	MC	MD	ME	MF	MG	MH	MI	MJ	MK	ML	MM	MN	MO	N	F
20r	R1	123	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
	R2	170	-	42	42	85	12	73	15	43	20	17	98	42	16.5	4	3/8	1/2
	R3	220	92	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-
30r	R6	160	-	-	54	119	0	98	18	62	49	0	108	47	9	2	1/2	3/4
	R1	132	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
	R2	180	-	45	45	92	13	73	15	43	23	14	103	45	16.5	4	3/8	1/2
40r	R3	230	95	-	-	-	-	-	-	-	-	-	-	-	6	-	-	
	R6	167	-	-	57	122	0	98	18	62	49	0	110	47	9	2	1/2	3/4

Valve mounting surface

01 mounting surface (ISO 4401-AB-03-4-A)

03 mounting surface (ISO 4401-AC-05-4-A)

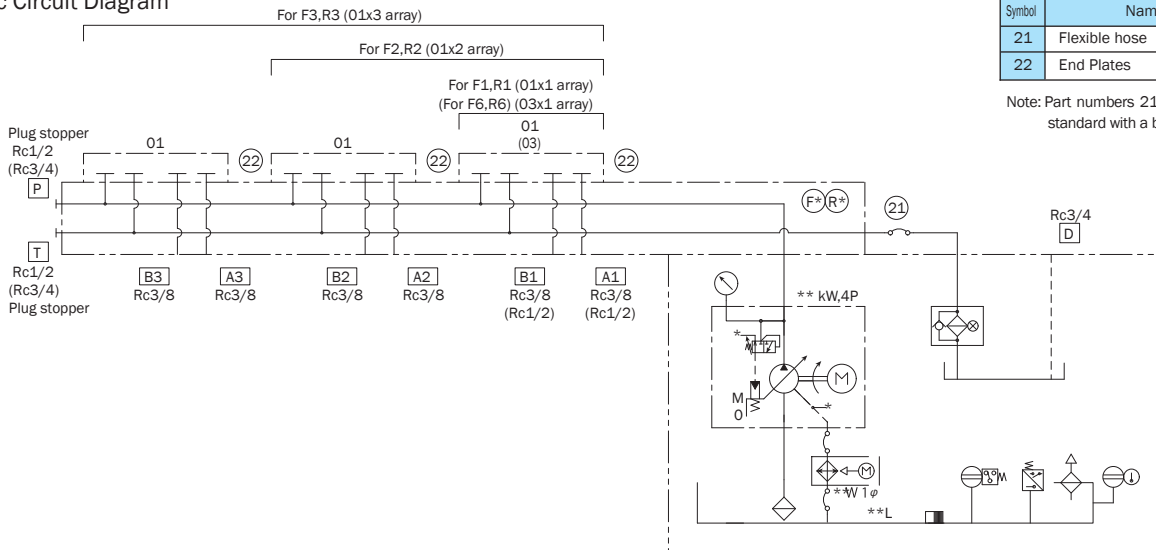
Valve mounting surface

01 mounting surface (ISO 4401-AB-03-4-A)

03 mounting surface (ISO 4401-AC-05-4-A)

Note: Each block is shipped with plug stoppers in the P and T ports.

## Hydraulic Circuit Diagram



## Typical Performance Characteristics

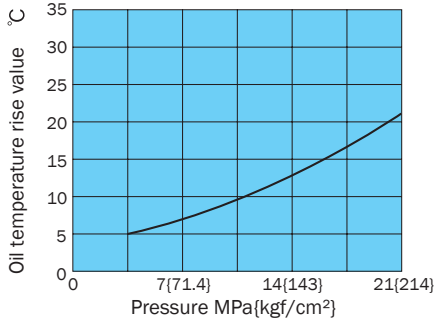
### Fluid Temperature Rise Characteristics - Full Cutoff

These graphs show fluid temperature rise during continuous operation.

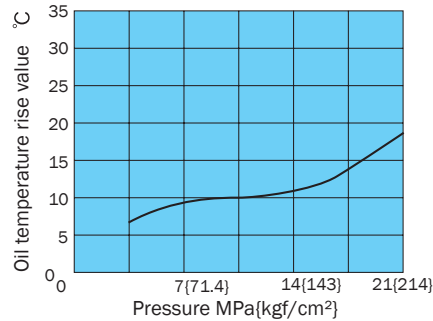
- Tank Fluid Pressure = Room Temperature + Fluid Temperature Rise Value
- Operating Fluid: ISO VG32 equivalent
- Revolution Speed: 1800min<sup>-1</sup> (60Hz)

Note: The fluid temperature rise value depends on actual operating conditions, and so actual temperatures may be different from those indicated above.

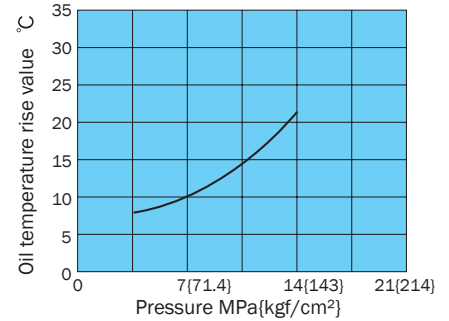
**NNP-20-22P16N\*-10**



**NNP-60-55P35N\*-10**



**NNP-30-37P22N\*-10**



### Noise Characteristics - Measurement Position

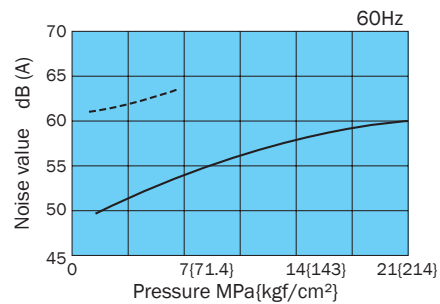
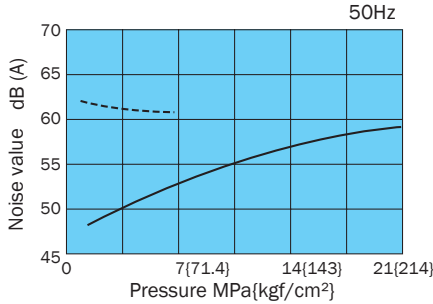
These graphs show noise values at locations one meter in front of and behind the pump.

- ISO VG32 equivalent
- Fluid Temperature: 40±5°C

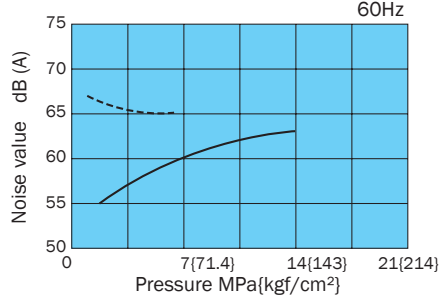
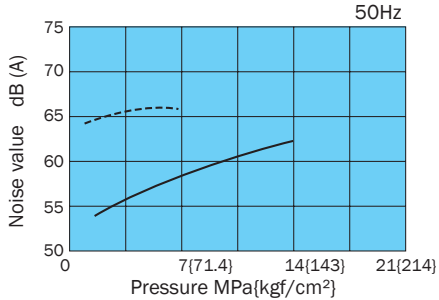
Note: Noise characteristics are affected by the condition of the floor and stand where the unit is mounted, whether there are noise reflective items nearby, and other factors. Such factors can produce different characteristics than those indicated below.

--- Full flow  
— Full cutoff

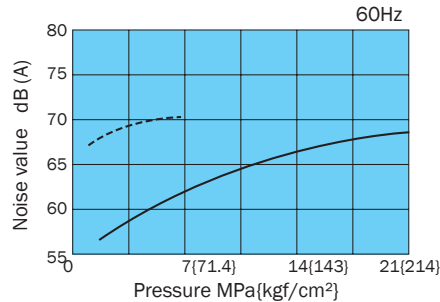
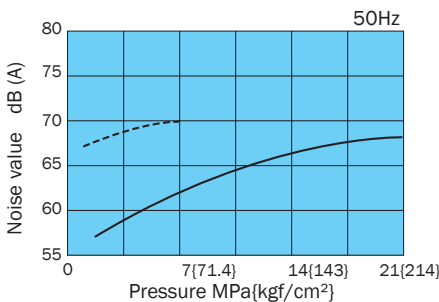
**NNP-20-22P16N\*-10**



**NNP-30-37P22N\*-10**



**NNP-60-55P35N\*-10**



## Selection Precautions

- **Standard Accessories**  
A return filter with visual clogging inspection tool, and a fan cooler are equipped as standard.
- **Options**  
Options F\* and R\* cannot be selected for inclusion with an 8N\* pump (NNP-\*\*-\*P8N\* Type).  
For optional F\* and R\* blocks, up to three blocks can be specified for O1 size, and only one block can be specified for O3 size. Note, however, that the total weight of blocks and valves should not exceed 20kg.

• Tank Capacity 20ℓ, 30ℓ

Block Type	F1	F2	F3	F6	R1	R2	R3	R6
Block Weight (kg)	7.5	9.5	12.5	11.5	6.5	8.5	11.0	12.0
Allowable Additional Weight (kg)	12.5	10.5	7.5	8.5	13.5	11.5	9.0	8.0

• Tank Capacity 40ℓ, 60ℓ, 80ℓ

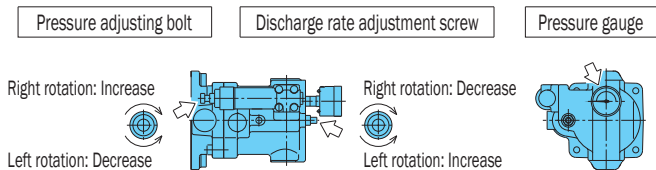
Block Type	F1	F2	F3	F6	R1	R2	R3	R6
Block Weight (kg)	8.5	11.0	14.0	11.5	7.0	9.5	12.0	12.5
Allowable Additional Weight (kg)	11.5	9.0	6.0	8.5	13.0	10.5	8.0	7.5

Note: M6 is the standard mounting tap for O3 size.

## Handling Overview

- **Hydraulic Operating Fluid**  
Use general oil-based operating fluid equivalent to viscosity grade ISO VG32 or 46. Just contact us regarding options to petroleum based hydraulic operating fluid. The following is the viscosity grade and operating pressure.  
  - Up to 7.0MPa: ISO VG32
  - 7.0MPa or higher: ISO VG46
- Keep the moisture content of the operating fluid below 0.1% vol. Excessive moisture in the fluid creates the risk of short-circuiting and current leakage.  
Contaminated operating fluid can lead to malfunction and shortened pump life. Manage operating fluid so that contamination is maintained at class NAS10 or lower.
- **Startup Precautions**  
Before starting the pump, inch the electric drive to make sure there is hydraulic fluid being sucked up.  
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
- Do not touch the surface of the pump while it is operating, it is very hot.

### Adjusting the Pressure and Discharge Rate



- O1, O3 size solenoid valves and modular valves can be selected.
- With option F\* and R\*, block and cylinder piping is hoses, configured by Nachi.
- Contact your agent for information about equipping a circuit.
- Option P is a bottom type oil pan.  
The oil pan does not have an oil drain port.  
The oil drain port is secured in place with the same mounting holes as the hydraulic unit.
- Option W is a leak test performed by Nachi.
- **Circuit Configuration**  
Allow for sufficient flexibility in the piping between the NN pack, external manifold, and actuator.
- **Paint**  
Nachi-Fujikoshi standard color: Mancel No. 5B6/3 (Iacquer)  
However, the electric drive is Munsell No. N7.  
Contact your agent about specifying external paint colors.

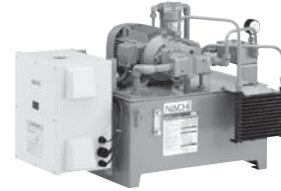
- **Electrical Wiring**  
Perform electrical wiring exactly as shown below.

Motor and Power Supply
R - U
S - V
T - W

If wiring is performed incorrectly...
• Electric pump rotates in reverse, fluid is not discharged
• Attach a pressure gauge to the discharge side and check for pressure rise.

- Do not forget to ground the pump!
- After wiring is complete, be sure to cover the terminal box with the cover that comes with it.
- Do not forget to wire the fan motor of the fan cooler. The power supply is single-phase 200V AC, non-polarity.  
Provide a no fuse breaker on the main power supply to protect electric circuitry against shorts and other current leakage, and as protection against motor overload. Also provide a leak breaker to protect against the risk of electric shock, etc.
- **Air intake and Exhaust**  
Take care so there is nothing blocking the area around air intake and exhaust of the pump drain fan cooler. Also, be sure to locate the pump in a well-ventilated area where heat will not build up.
- **Transport and Installation**  
Use the hangers when transporting the pump.  
Since this is a stationary type pump, secure it with bolts on a vibration-free, level surface.

- **Maintenance and Inspection**  
Fluid Temperature: Use the pump in an area where the temperature is 10°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.  
Strainer and Tank Internal Inspection and Cleaning: Every three months  
Return Filter Element Inspection: Every three months (replace as required)  
Fan Cooler Fin Inspection and Cleaning: Every six months
- **Environment**  
Temperature: 10 to 35°C  
Avoid areas exposed to mist of water-soluble coolants, etc.



### Inverter Drive NCP/NNP Series Energy-Saving Variable Pump Unit with Inverter Drive

By adding an inverter drive to our NCP/NNP series standard variable pump unit, we created the inverter drive NCP/NNP series hydraulic units to achieve great energy savings. They are great for jobs that need to dwell for long periods.

#### Features

##### Low increase in hydraulic fluid temperature

Maintained at room temperature +2.5:.

- NNP-60E-55P35N1-10
- 7MPa maintained while dwelling

##### 40% energy savings compared to the NCP unit

- NCP-60E-3.7PV16N3-C1R2-12
- 21MPa while dwelling (in contrast to standard unit)

##### Quiet

Sound level is 52dB (A).

- NNP-20E-22P16N1-10
- 7MPa while dwelling
- One meter behind pump

##### Easy Operation

Can start as soon as power is turned on. Absolutely no external commands or delicate electrical adjustments needed.

- Operates even with the inverter removed in emergencies.

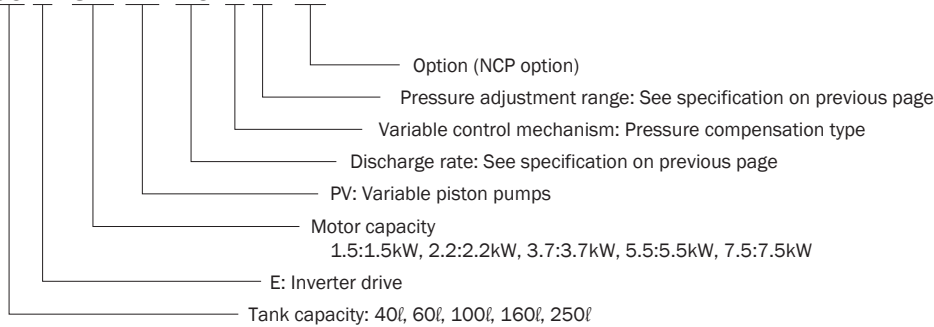
#### Specifications

1. Power Supply Rated Input Current	3φ AC200 to 220V, 50/60Hz 9.8A/1.5kW (NCP series only) 13.5A/2.2kW 22.5A/3.7kW 21.4A/5.5kW 29.1A/7.5kW (NCP series only)
2. Pressure Adjustment Range	N0: 2.0 to 3.5MPa N1: 2.0 to 7.0MPa N2: 3.0 to 14.0MPa N3: 3.0 to 21.0MPa
3. Output Flow (Theoretical Value at No-load)	8: 14.4ℓ /min 16: 29.7ℓ /min 22: 39.6ℓ /min 35: 63.0ℓ /min 45: 81.0ℓ /min
4. Hydraulic Fluid	Standard mineral-based hydraulic fluid ISO VG32 or 46
5. Hydraulic Fluid Temperature	0 to 60:
6. Ambient Temperature/Humidity	10 to 35: /20 to 85%RH (non-condensation)
7. Color of Inverter Box	Munsell no. 2.5Y9/1 (cream)

## Understanding Model Numbers

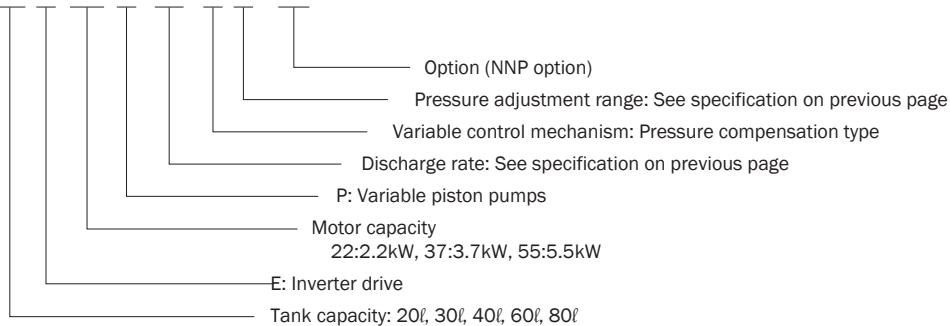
Inverter Drive NCP Series

**NCP - 60 E - 3.7 PV 16 N 2 - \*\* - 12**



Inverter Drive NNP Series

**NNP - 20 E - 22 P 16 N 2 - \*\* - 10**



## Design Drawings, Dimension Tables

Contact us for more information.

### Precautions

- Turning the inverter on and off by cutting the main power supply (circuit breaker) significantly reduces the life of the inverter and should be limited to once an hour.  
Contact us if you need to start and stop operations frequently.
- Do not change or adjust any switches except the inverter parameter settings and the pressure setting switches.
- Allow for sufficient flexibility in the piping between the hydraulic unit, external manifold, and actuator.  
(Recommended: Flexible hose that is at least 1 meter long)
- Some options are not compatible with the inverter drive models, contact us for more information.
- Contact us if excessive leakage in the external hydraulic circuit limits energy saving efficiency.