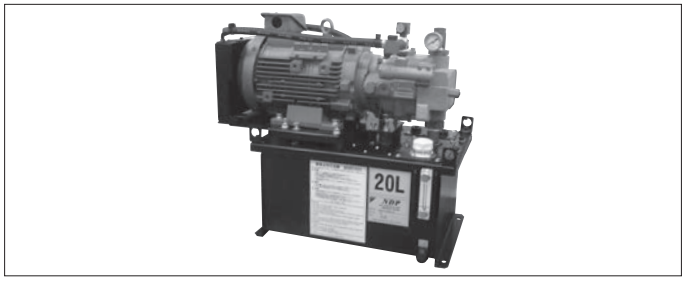
Piston Pack



Features

- **Easy maintenance**
  - Easy cleaning with detachable suction strainer design.
  - A return filter and magnet separator can be retrofitted for protection against fluid contamination. They are of course easily detachable too.
  - A radiator filter can also be retrofitted to prevent clogging of the radiator. The element is also replaceable.
  - A parallel thread is adopted for the discharge port plug. Fluid can be changed anytime and anywhere since no sealing tape is required.
  - A yellow cap is fitted to the filler port with air breather.
  - Tank volume sign is affixed as standard.
  - A fluid level gauge guard is equipped as standard.
- **Low noise, low fluid temperature rise**
  - Pump and motors are fitted with vibration-absorbing rubber pads.
  - A drain cooler is equipped as standard. The radiator maintains a low fluid temperature in the tank, contributing to a longer fluid lifetime.
- **A wide variety of optional devices (separately available parts)**
  - Temperature switch, fluid level switch, return filter, magnet separator, radiator filter, thermometer, manifold for control valves.
- **Control valves installable**
  - Up to 3 series of 1/4B solenoid valves and modular stack valves that come in a wide variety of types can be installed.
- **Equipped with best seller V series high efficiency piston pump**

Refer to Page A-8 for details of V series piston pumps equipped in these units..

Nomenclature

NDP	2	15	1	N	3	N	N	-	20	-	1	1	1	1
1	2	3	4	5	6	7	8		9		10	11	12	13

Optional part
(no designation when no option is selected)

1 Model No.
NDP: Piston pack
(Compact hydraulic unit equipped with V series piston pump)

2 Tank capacity
2: 20 L

3 Pump capacity
08: V8 pump (8.0 cm^3/rev)
15: V15 pump (14.8 cm^3/rev)
For specifications of pumps themselves, refer to V8A1RX and V15A1R(X).

4 Maximum operating pressure
1: 7 MPa

5 Control valves installation
N: Standard
J: Installable

6 Motor capacity
1: 0.75 kW, 4-pole (V8 pump only)
2: 1.5 kW, 4-pole
3: 2.2 kW, 4-pole (V15 pump only)

7 Motor specifications
N: Standard specifications, Japanese standard voltage
(E: CE compliant, standard voltage)
A: Standard specifications, different voltage
(B: CE compliant, different voltage)

8 Manifold installation
N: Manifold not installed
1: 1-series manifold installed
2: 2-series manifold installed
3: 3-series manifold installed

9 Design No.
The design number was changed to 20 due to the motor high efficiency restrictions that took effect in April 2015.

10 Filters and related parts
0: None
1: With return filter
2: With magnet separator
3: With return filter + magnet separator

11 Radiator filter
0: None
1: With radiator filter

12 Switches and related parts
0: None
1: Fluid level switch (LSN-90L-B-11)
2: Temperature switch (TSF-60X-150-11)
3: Thermometer (RBT-ST-R1/4-100-6X150)
4: Electronic pressure switch (PK6732: PNP output)
5: Fluid level switch + temperature switch
6: Fluid level switch + electronic pressure switch
7: Temperature switch + electronic pressure switch
8: Thermometer + electronic pressure switch
9: Fluid level switch + temperature switch + electronic pressure switch
A: Fluid level switch + temperature switch + electronic pressure switch + Thermometer

13 Tank type *
0: Standard tank
1: Water leak test compliant tank
2: Water fill test compliant tank
3: Tank with oil pan
4: Water leak test compliant tank with oil pan
5: Water fill test compliant tank with oil pan
* Tank types
Water leak test compliant tank:
Tank material thickness of 1.6 mm. A water leak test is conducted after coating the tank. The tank comes with the test certificate affixed.
Water fill test compliant tank:
Tank material thickness of 3.2 mm. A water fill test is conducted before coating the tank. The tank comes with the test certificate affixed.

Standard voltage (3 ratings)	Different voltage (3 ratings)
• AC 200 V (50 Hz) • AC 200 V (60 Hz) • AC 220 V (60 Hz)	• AC 400 V (50 Hz) • AC 400 V (60 Hz) • AC 440 V (60 Hz)

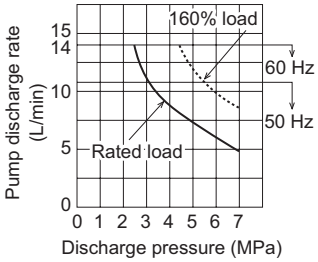
Specifications

Specifications / Model	Pump capacity cm^3/rev	Pump maximum discharge rate *1 L/min at 50/60 Hz (1.0 MPa)	Maximum operating pressure *1 MPa	Motor capacity kW (4-pole)	Tank capacity L	Manifold installation					Mass*3 kg
						Installable	Number of series *2				
							None	1	2	3	
NDP2081N1※N-20	8.0	11/14	7	0.75	20	–	–	–	–	–	37
NDP2081J1※N-20						○	○	□	□	□	
NDP2081N2※N-20				1.5		–	–	–	–	–	44
NDP2081J2※N-20						○	○	□	□	□	
NDP2151N2※N-20	14.8	20/25				–	–	–	–	–	49
NDP2151J2※N-20						○	○	□	□	□	
NDP2151N3※N-20				2.2		–	–	–	–	–	56
NDP2151J3※N-20						○	○	□	□	□	
NDP2081J1※1-20	8.0	11/14		0.75		○	–	○	–	–	50
NDP2081J1※2-20								–	○	-	52
NDP2081J1※3-20								–	–	○	54
NDP2081J2※1-20				1.5				○	–	–	57
NDP2081J2※2-20								–	○	–	59
NDP2081J2※3-20								–	–	○	61
NDP2151J2※1-20	14.8	20/25				○	–	○	–	–	62
NDP2151J2※2-20								–	○	–	64
NDP2151J2※3-20								–	–	○	66
NDP2151J3※1-20				2.2				○	–	–	69
NDP2151J3※2-20								–	○	–	71
NDP2151J3※3-20								–	–	○	73

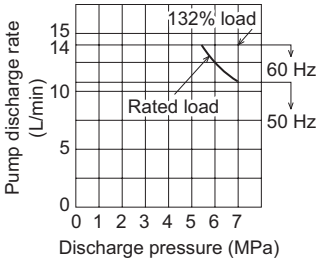
Note: *1 The flow rate is set to the maximum discharge rate and the pressure is set to 3.5 MPa before shipment. Set an appropriate pressure and discharge rate according to the capacity of the motor used.
*2 In the number of series field, the ○ symbol indicates the number installed before shipment and the □ symbol indicates the number installable afterwards.
*3 The mass increases by 1 kg for each CE compliant motor.

Pressure - Flow rate characteristics

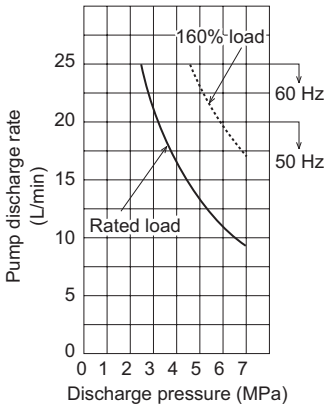
NDP2081※1※※
(M8-0.75 kW)



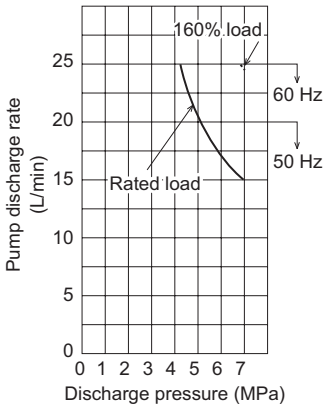
NDP2081※2※※
(M8-1.5 kW)



NDP2151※2※※
(M15-1.5 kW)



NDP2151※3※※
(M15-2.2 kW)



Paint color

The tank's coating color is black (Munsell code N1).

Handling

- **Hydraulic fluid, ambient environment**
  - ○ Use a petroleum-based hydraulic fluid equivalent to ISO VG32 to 46.
    Use of hydraulic fluids other than the petroleum-based type (e.g. hydrous/synthetic) is prohibited.
  - ○ Operate the unit in an environment where both the following conditions are satisfied: viscosity range from 15 to 400 mm2/s and oil temperature from 0 to 60° C (within 15 to 50° C recommended).
  - ○ Be sure to maintain the water content in the hydraulic fluid at 0.1% maximum by volume.
  - ○ Contamination of the hydraulic fluid causes device trouble and reduces the service life, so ensure that the contamination of the hydraulic fluid goes no higher than NAS contamination class 10.
  - ○ Use the unit indoors under the following conditions.
    Ambient temperature: 0 to 40° C, Ambient humidity: 20 to 90%RH (with no condensation)
    If using the unit where there is a lot of dust or oil mist, clean it periodically by applying compressed air or by other means since the oil cooler is prone to clogging in such environments.
- **At start**
  - ○ Fill the pump case with hydraulic fluid through the filler port before starting trial operation, after replacing the pump, or after stopping the unit for 3 months or longer. Use the same hydraulic fluid as for the hydraulic circuit.

	NDP208※※※※※	NDP215※※※※※
Case capacity cm^3	300	500

  - ○ After checking that all hydraulic circuits and electrical circuits are ready for operation, set the hydraulic circuit at the load side in the no-load status or connect an unloading circuit before starting the pump. When the pump is driven for the first time, turn the power switch to the motor on and off a few times to let the air out of the piping and then run it continuously at full speed. A roaring noise may be observed until the air has been completely removed but this is not abnormal.
  - ○ Check that the pressure rises at the pressure gauge.
- **Electric wiring**
  - ○ Connect the power cable matching the phases at the pump motor and power supply sides as shown to the right.

Motor side [U —— R / V —— S / W —— T] Power supply side

    Check that the pressure rises at the pressure gauge.
    If the motor would be rotated in the reverse direction, switch the connection between two phases among the three to correct the direction of rotation.
  - ○ Be sure to connect the ground terminal.
  - ○ Install a no-fuse breaker and an earth leakage breaker on the main power supply.
    The electrical ratings are as shown in the table to the right.
  - ○ These are premium efficiency products and therefore they tend to have a higher current value than products with the previous design. Pay attention to the design of the power distribution when replacing products of the previous design.

<Motor rating table (rated current)> Permissible voltage fluctuation: ±10%

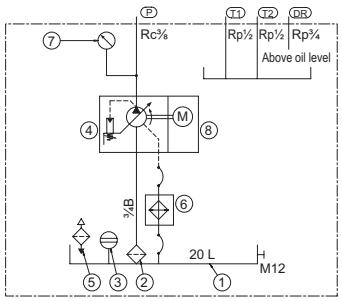
Motor capacity Output (kW) (Number of poles: 4)	Rated current (A)			Starting current (A)		
	AC 200 V (50 Hz)	AC 200 V (60 Hz)	AC 220 V (60 Hz)	AC 200 V (50 Hz)	AC 200 V (60 Hz)	AC 220 V (60 Hz)
0.75	4.2	3.6	3.6	28.0	25.0	28.0
1.5	6.8	6.4	6.0	46.6	41.0	45.1
2.2	10.6	9.4	9.2	96.0	81.0	89.1

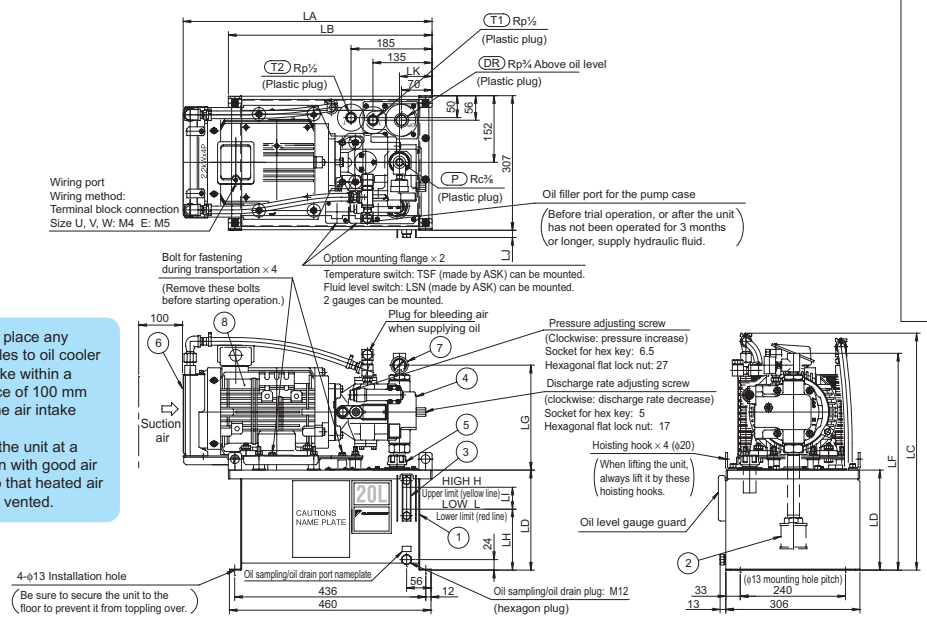
- **Transportation**
  - ○ Use the hoisting hooks (ϕ20-hole at 4 locations) when transporting or hoisting the unit.
- **Installation**
  - ○ The unit is a stationary type. Fix it on a level location that is free of vibration.
  - ○ Be sure to secure the unit to the floor to prevent it from toppling over.

External dimension diagram

Standard type NDP2※※※N※※※-20

■ Hydraulic circuit diagram





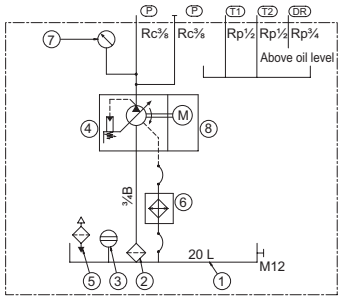
Do not place any obstacles to oil cooler air intake within a distance of 100 mm from the air intake face.
Install the unit at a location with good air flow so that heated air can be vented.

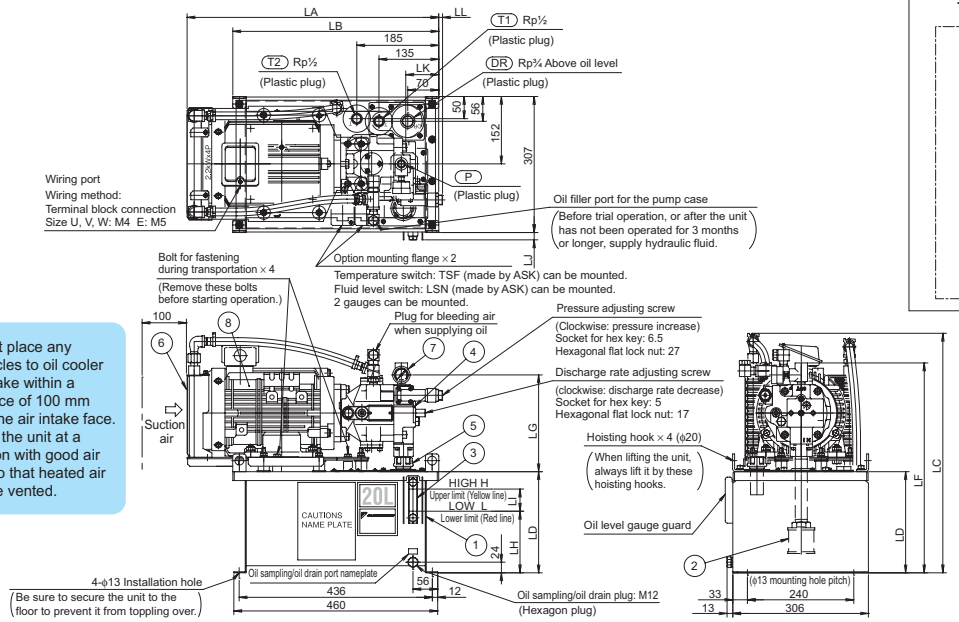
Part No.	Name
1	Oil tank
2	Suction strainer
3	Oil level gauge
4	Piston pump
5	Oil filler port with air breather
6	Oil cooler
7	Pressure gauge
8	Motor

Model	Motor	Wiring port	LA	LB	LC	LD	LF	LG	LH	LI	LJ	LK	H	L
NDP2081N1EN-20	0.75 kW, 4-pole, CE compliant	G¾	481	465	480	228	471	215	139	50	17	79	20 L	14 L
NDP2081N1NN-20	0.75 kW, 4-pole													
NDP2081N2EN-20	1.5 kW, 4-pole, CE compliant	ϕ27	514		522		481	225						
NDP2081N2NN-20	1.5 kW, 4-pole													
NDP2151N2EN-20	1.5 kW, 4-pole, CE compliant		529				485	229				74		
NDP2151N2NN-20	1.5 kW, 4-pole													
NDP2151N3EN-20	2.2 kW, 4-pole, CE compliant		568		542		495	239						
NDP2151N3NN-20	2.2 kW, 4-pole													

Control valves installable type NDP2※※※J※※※-20

■ Hydraulic circuit diagram





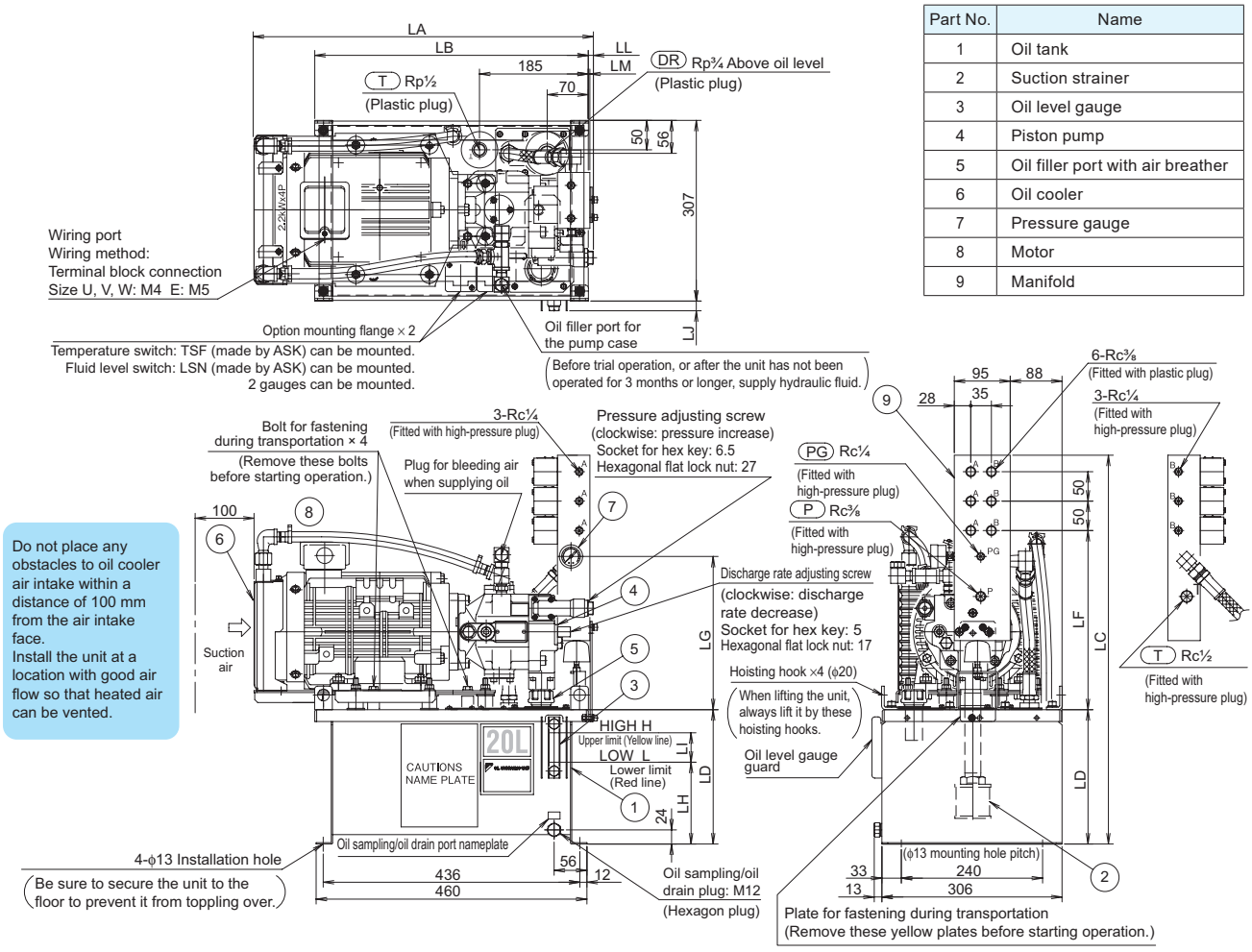
Do not place any obstacles to oil cooler air intake within a distance of 100 mm from the air intake face. Install the unit at a location with good air flow so that heated air can be vented.

Part No.	Name
1	Oil tank
2	Suction strainer
3	Oil level gauge
4	Piston pump
5	Oil filler port with air breather
6	Oil cooler
7	Pressure gauge
8	Motor

Model	Motor	Wiring port	LA	LB	LC	LD	LF	LG	LH	LI	LJ	LK	LL	H	L
NDP2081J1EN-20	0.75 kW, 4-pole, CE compliant	G¾	481	465	480	228	450	194	139	50	17	86	9.0	20 L	14 L
NDP2081J1NN-20	0.75 kW, 4-pole														
NDP2081J2EN-20	1.5 kW, 4-pole, CE compliant	ϕ27	514		522		460	204							
NDP2081J2NN-20	1.5 kW, 4-pole														
NDP2151J2EN-20	1.5 kW, 4-pole, CE compliant		529				464	208				84	8.5		
NDP2151J2NN-20	1.5 kW, 4-pole														
NDP2151J3EN-20	2.2 kW, 4-pole, CE compliant		570		542		474	218							
NDP2151J3NN-20	2.2 kW, 4-pole														

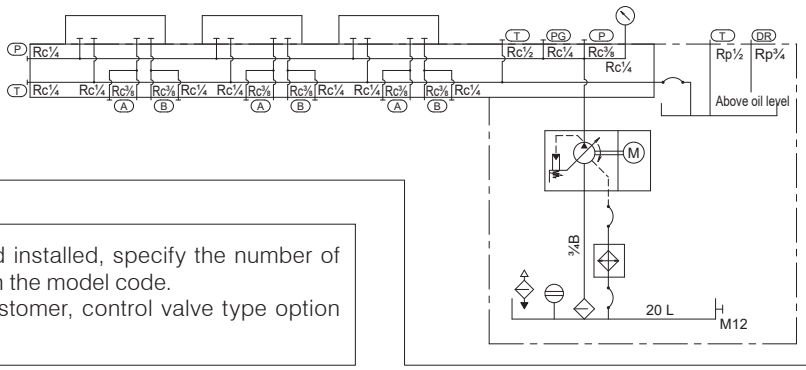
External dimension diagram

Control valves installation: Control valves for up to 3 series can be installed arbitrarily.
(The figure below shows an example with a 3-series system.)



Part No.	Name
1	Oil tank
2	Suction strainer
3	Oil level gauge
4	Piston pump
5	Oil filler port with air breather
6	Oil cooler
7	Pressure gauge
8	Motor
9	Manifold

■Hydraulic circuit diagram

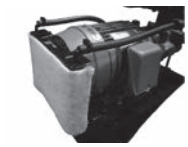


If the unit is to be shipped with the manifold installed, specify the number of series (1, 2 or 3) for 8 (manifold installation) in the model code.
If the manifold is to be retrofitted by the customer, control valve type option parts (manifold, piping set) will be required.

Model code before installation	Motor	Wiring port	LA	LB	LC			LD	LF	LG	LH	LI	LJ	LL	LM	H	L
					1-series	2-series	3-series										
NDP2081J1E※-20	0.75 kW, 4-pole, CE compliant	G¾	481	465	541	591	641	228	285	240	139	50	17	9.0	1.0	20 L	14 L
NDP2081J1N※-20	0.75 kW, 4-pole																
NDP2081J2E※-20	1.5 kW, 4-pole, CE compliant	ϕ27	514		551	601	651		295	250							
NDP2081J2N※-20	1.5 kW, 4-pole																
NDP2151J2E※-20	1.5 kW, 4-pole, CE compliant		529		551	601	651		295	250				8.5	2.5		
NDP2151J2N※-20	1.5 kW, 4-pole																
NDP2151J3E※-20	2.2 kW, 4-pole, CE compliant		568		561	611	661		305	260							
NDP2151J3N※-20	2.2 kW, 4-pole																

Options (separately available parts)

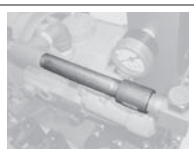
- The table below shows the optional parts that can be incorporated in piston packs.
  Options marked "Possible" in the "Assembly order availability" field will be assembled before shipment if the relevant option code is specified in the model code.

Name	Model	Manufacturer	Assembly order availability	Remarks
Return filter 	RC-06S-10X-A	Yamashin-Filter Corp.	Possible	Filtration accuracy 10 μm (*1)
Magnet separator 	MFB-50B	NEOMAX Co., Ltd.	Possible	(*1)
Radiator filter 	E-DCRFILTER-10B01-10	DAIKIN	Possible	Set of 2 pieces
Fluid level switch 	LSN-90L-B-11	ASK Co., Ltd	Possible	OFF when fluid level drops (*1)
	LSN-90L-A-11		Impossible	ON when fluid level drops (*1)
Temperature switch 	TSF-60X-150-11		Possible	OFF when 60°C exceeded (*1)
	TSF-60Y-150-11		Impossible	ON when 60°C exceeded (*1)
Thermometer 	RBT-ST-R1/4-100-6X150	Nisshin Gauge MFG. Co., Ltd.	Possible	Measurement range: 0 to 100°C Scale mark plate ϕ44.4 (*1)
Electronic pressure switch 	PK6732	efector co., ltd.	Possible	PNP type voltage output Setting range: 10 MPa (*2) With harness (10 m)

*1 When placing an order with DAIKIN, specify the model code prefixed by "E-".
*2 When placing an order with DAIKIN, specify E-PSW10PNP-PK6732 as the model code.

Control valve type option parts table

- When installing a manifold on control system installable piston packs without a manifold, the following option parts will be required.

Name	Model		Remarks
Manifold 	BT-102-NDP-10	1-series	These manifolds can be directly mounted on the end cap of the pump. Each series is provided with pressure measurement ports for ports A and B. In addition, a set of P and T piping ports is provided for the external piping. The piping set listed next will also be required to install a manifold.
	BT-202-NDP-10	2-series	
	BT-302-NDP-10	3-series	
Piping set 	E-NDP-PIPESET-10	For 1.5 and 2.2 kW	This is a hose set to connect the manifold listed above to port T of the tank.
	E-NDP-PIPESET-1-10	For 0.75 kW	
Pump filler port set 	E-NDP-OILINLET-10		This is used to relocate the filler port to another location (rear of the unit or port A/B side) in cases where the original filler port is difficult to reach when the control valves are installed, which may happen with some circuit configurations.