

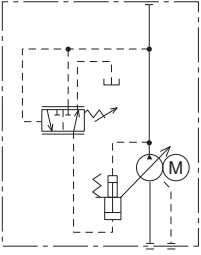
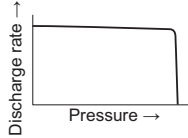
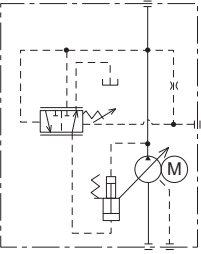
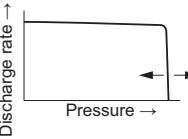
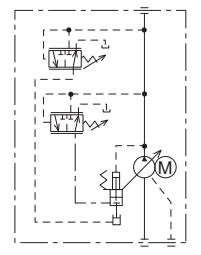
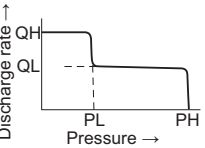
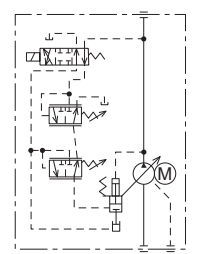
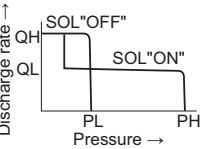
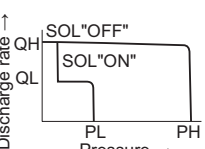
# C

## ROTOR PUMPS

	Model No.	Maximum operating pressure* <sup>1</sup> MPa {kgf/cm <sup>2</sup> }	Theoretical discharge rate cm <sup>3</sup> /rev										Page			
			1	5	10	50	100									
RP series	RP08	14 {140}	8.0													C-5
	RP15	14 {140} 21 {210}	14.8													
	RP23		24.4													
	RP38		37.7													

Note: \*<sup>1</sup> The maximum operating pressure varies depending on the control method and motor output. Refer to Page C-7 for details.

## Control method

Control method		JIS graphic symbols for hydraulic system	Characteristics	Features/Application
Control	Code			
Pressure compensator control	A			<ul style="list-style-type: none"> <li>When the discharge pressure approaches the preset full-cutoff pressure, the discharge rate automatically decreases to the level required to maintain the preset pressure.</li> <li>The full-cutoff pressure and discharge rate can be manually adjusted.</li> </ul>
Remote pressure compensator control	A-RC			<ul style="list-style-type: none"> <li>The full-cutoff pressure can be adjusted through remote operation of the remote control relief valve.</li> <li>The discharge rate can be manually adjusted.</li> </ul>
Combination control (pressure feedback method)	CH			<ul style="list-style-type: none"> <li>This control method achieves both low-pressure high-flow-rate control and high-pressure low-flow-rate control with a single pump and this helps reduce power consumption and suppress oil temperature rise.</li> <li>When the discharge pressure approaches the preset pressure PL, the discharge rate automatically decreases to QL.</li> <li>The discharge rate automatically changes according to increase/decrease of the actuator pressure and this enables switching of the feedrate.</li> <li>The feedrate switches to a low value at the start of machining.</li> </ul>
Combination control (solenoid operated method)	CJ			<ul style="list-style-type: none"> <li>The control mode can be switched between high-pressure low-flow-rate control and low-pressure high-flow-rate control by turning the solenoid on and off and this enables switching between high and low actuator feedrates.</li> <li>Machining can be started after switching to the low feedrate.</li> </ul>
				<ul style="list-style-type: none"> <li>Two types of variable pump characteristics (high-pressure high-flow-rate and low-pressure low-flow-rate) can be selected by turning the solenoid on and off.</li> </ul>

## Handling

### ● Ambient conditions

- Use the product under the following conditions. Ambient temperature: -20 to 40°C, Ambient humidity: 95 %RH maximum, Altitude: 4,000 m maximum

### ● Hydraulic oil

- Use a general-purpose hydraulic fluid (R&O) equivalent to ISO VG32 to 68 or wear-resistant hydraulic fluid (7 MPa {70 kgf/cm<sup>2</sup>}).  
Use of hydraulic fluids other than the petroleum-based type (e.g. hydrous/synthetic) is prohibited.  
Even when a petroleum-based hydraulic fluid is used, there is a danger of shorting or earth leakage if an excessive amount of water gets mixed into the fluid.
- Operate the unit in an environment where both the following conditions are satisfied: viscosity in the range 15 to 400 mm<sup>2</sup>/s {cSt} and fluid temperature in the range 0 to 60°C.
- Be sure to maintain the water content in the hydraulic fluid at 0.1% maximum by volume.
- Contamination of the hydraulic fluid causes pump trouble and reduces the service life, so pay due attention to controlling contamination and ensure that it goes no higher than NAS contamination class 9.

### ● Installation

- To transport the rotor pump alone, use the two eyebolts at the top of the unit.  
Take care not to subject the unit to strong impact due to dropping or a collision during transportation.
- Install the unit using the four holes in the foot support, oriented with the oil filler port at the top and the vibration-absorbing rubber pad at the bottom, and make sure it is leveled.
- The fixing bracket is fitted between the unit body and the foot support to facilitate piping work and to protect the vibration-absorbing rubber pad, so do not remove it until the start of a trial run. Even after completing installation, refit the fixing bracket to protect the vibration-absorbing rubber pad before starting work where the pad may be subjected to strong vibration or force, such as transportation or re-piping.
- When installing a rotor pump, be sure to secure sufficient ambient space and avoid any object coming into contact with it since the temperature at its surface may rise up to around 80°C while it is running.

### ● Filters

- Use a suction filter with 150 meshes per inch at the inlet side.
- In the return line to the tank at the delivery side, use a line filter with a filtration accuracy of 25 μm or better.  
For delivery pressures of 14 MPa {140 kgf/cm<sup>2</sup>} or greater, use a line filter with a filtration accuracy of 10 μm or better.

### ● Piping

- To exploit the low-noise characteristics of the rotor pumps, they are equipped with a vibration-absorbing rubber pad between the unit body and the foot support. Therefore, use hoses for piping to the unit to provide flexibility.

Model No.	RP08, RP15	RP23, RP38
Suction port	SHA15, SSA20 (JIS B 2291)	Size 1¼ split flange boss (SAE J518 STANDARD PRESSURE SERIES)
Discharge port	Rc¾	Rc¾

### ● Drain piping

- Isolate drain piping from other returning lines (do not merge it with them) and arrange it such that the pressure inside the pump case can be maintained at no greater than 0.1 MPa {1 kgf/cm<sup>2</sup>}.
- Merge the return line of the drain piping lower than the tank oil level and as far as possible from the suction line.

Model No.	RP08, RP15	RP23, RP38
Size of pipe joint	Rc¾ I.D. φ8.5 minimum	Rc½ I.D. φ12 minimum
Pipe I.D.	φ12 minimum	φ15 minimum
Drain pipe length	1 m maximum	1 m maximum

## Handling

### ● Electric wiring

- Install a no-fuse breaker in the main power supply to protect the power circuits against shorting and overcurrent, and install a ground fault interrupter to prevent electric shocks.
- Securely connect wires using crimp-style terminals of appropriate sizes in accordance with the wiring guide on the back of the terminal box cover to prevent shorting between the phases and current leakage to the unit. Be sure to provide a ground connection.

### ● At start

- Remove the filler cap on the pump, fill the pump case with hydraulic fluid through the filler port, and securely refit the filler cap before starting the pump. Use the same hydraulic fluid as for the hydraulic circuit. The filling volume is as follows.

Model No.	RP08	RP15	RP23-22	RP23-37	RP38
Pump case filling volume (cm <sup>3</sup> )	1100	2300	4500	4000	4000

- Remove the two fixing bolts that secure the foot support to the bottom part of both sides of the rotor pump.
- 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.
- Set the discharge rate adjusting screw provided on the front cover of the rotor pump to no lower than two-thirds of the maximum discharge rate. The suction capacity at the start may be insufficient if the adjusting screw is tightened too far.
- 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. Noise may be observed until the air has been completely removed but this is not abnormal.
- When a rotor pump is driven for the first time, it may take some time before it discharges fluid due to its structure. If the pressure does not rise within 5 minutes after turning the power on, the phase order may be wrong. In that case, switch the wires for two phases among the three.  
Even if it takes time for discharge to start, this will not cause any abnormality of the rotor pump.

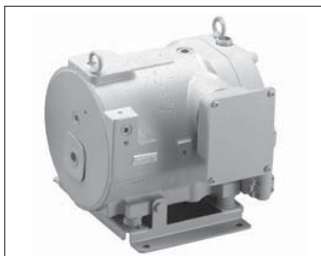
### ● Suction pressure

- Maintain the suction pressure no lower than  $-16.7 \text{ kPa}$   $\{-125 \text{ mmHg}\}$ .
- High suction pressures will generate cavitation and cause damage to the parts, noise, and vibration, resulting in a shorter pump service life.

### ● Maximum operating pressure

- This refers to the maximum pressure at which the unit can be operated.

## RP series Rotor Pumps



### Features

- **Low noise**  
Substantial reduction of the operation noise, by 10 to 15 db (comparison with Daikin products), and improved sound quality are achieved by adopting noise reduction technology unique to Daikin.
- **Downsizing**  
The integrated structure reduces the total length by approximately 40% in comparison with Daikin conventional models, makes handling simpler, and is leading to downsizing the main machine.
- **Low pulsation**  
Pulsation has also been reduced by approximately 50% in comparison with Daikin conventional models.
- **High reliability**  
The fully enclosed structure with no shaft protruding from the casing eliminates the possibility of oil leakage without an oil seal. In addition, the oil-cooled motor suppresses temperature rise of the coil and enables prolonged continuous overloaded operation.
- **CE compliant**  
These models are best suited to integration into European Safety Standard (CE) compliant equipment since they are equipped with a terminal box that satisfies the IP54 ingress protection grade and complies with international standards such as EN60034-1.

C  
ROTOR PUMPS

### Nomenclature

#### ● Pressure compensator control

RP ※ ※ A ※ - ※ ※ ※ - 30 ※ ※ - ※  
1 2 3 4     9 10     11 12     13

#### ● Combination control (pressure feedback method)

RP ※ ※ C ※ ※ H - ※ ※ ※ - 30  
1 2 3 5 6 7     9 10     11

#### ● Combination control (solenoid operated method)

RP ※ ※ C ※ ※ J ※ - ※ ※ ※ - 30  
1 2 3 5 6 7 8     9 10     11

Note: Refer to Page C-6 for possible combinations of pump capacities, control methods, and motor outputs.

#### 1 Model No.

RP: RP series rotor pump

#### 2 Pump capacity

08: 8.0 cm<sup>3</sup>/rev  
 15: 14.8 cm<sup>3</sup>/rev  
 23: 24.4 cm<sup>3</sup>/rev  
 38: 37.7 cm<sup>3</sup>/rev

#### 3 Control method I

A: Pressure compensator control  
 C: Combination control

#### 4 Pressure adjustment range

(See the pressure adjustment range table)

#### 5 Low pressure adjustment range

1: 2.5 to 7 MPa {25 to 70 kgf/cm<sup>2</sup>}  
 2: 2.5 to 14 MPa {25 to 140 kgf/cm<sup>2</sup>}

#### 6 High pressure adjustment range

1: 2.5 to 7 MPa {25 to 70 kgf/cm<sup>2</sup>}  
 2: 2.5 to 14 MPa {25 to 140 kgf/cm<sup>2</sup>}  
 3: 3.5 to 21 MPa {35 to 210 kgf/cm<sup>2</sup>}

#### 7 Control method II

H: Pressure feedback method  
 J: Solenoid operated method

#### 8 Voltage code for the solenoid valve

A: AC 100 V (50/60 Hz), AC 110 V (60 Hz)  
 B: AC 200 V (50/60 Hz), AC 220 V (60 Hz)  
 P: DC 24 V

#### 9 Motor output (See the motor specification table)

#### 10 Voltage specifications

No designation: AC 200 V (50/60 Hz), AC 220 V (60 Hz)  
 X: AC 230 V (50 Hz)  
 Y: AC 380 V (50 Hz), AC 400 V (50/60 Hz)  
 AC 415 V (50 Hz), AC 440 V (60 Hz)  
 AC 460 V (60 Hz)

#### 11 Design No.

(The design No. is subject to change)

#### 12 Control method III

No designation: Without remote control system  
 RC: With remote control system

#### 13 Pump installation

No designation: Foot support mount  
 T: Vertical installation\*<sup>1</sup>

Note: \*<sup>1</sup> Vertical installation can only be applied to RP08 and RP15. Since the vibration-absorbing rubber pad has no effect in vertical installation, be sure to secure sufficient rigidity on the mounting base and incorporate a structure that absorbs vibration. Insufficient rigidity of the mounting base may cause noise and vibration.

Refer to Page N-8 for NDR series rotor packs, i.e. hydraulic units equipped with an RP series rotor pump.

## Models and pressure adjustment range table

### ● Pressure compensator control

#### 4 Pressure adjustment range

Code	Pressure adjustment range MPa {kgf/cm <sup>2</sup> }	Without remote control system				With remote control system			
		RP08	RP15	RP23	RP38	RP08	RP15	RP23	RP38
1	1.5 to 7 {15 to 70}	✓	✓	✓	✓	-	-	-	-
1	2.0 to 7 {20 to 70}	-	-	-	-	✓	-	-	-
2	1.5 to 14 {15 to 140}	✓	✓	✓	✓	-	-	-	-
2	2.0 to 14 {20 to 140}	-	-	-	-	✓	✓*1	✓*2	✓
3	2.0 to 21 {20 to 210}	-	-	-	-	-	✓*2	✓*3	✓*4
3	3.5 to 21 {35 to 210}	-	✓*2	✓*3	✓*4	-	-	-	-

Note: \*1 Applies only to the models with the motor output of 1.5 kW.

\*2 Applies only to the models with the motor output of 2.2 kW.

\*3 Applies only to the models with the motor output of 3.7 kW.

\*4 Applies only to the models with the motor output of 5.5 kW.

### ● Combination control

#### 5 Low pressure adjustment range

Code	Pressure adjustment range MPa {kgf/cm <sup>2</sup> }	Without remote control system							
		Pressure feedback method				Solenoid operated method			
		RP08	RP15	RP23	RP38	RP08	RP15	RP23	RP38
1	2.5 to 7 {25 to 70}	-	✓	✓	✓	-	✓	✓	✓
2	2.5 to 14 {25 to 140}	-	✓	✓	✓	-	✓	✓	✓

#### 6 High pressure adjustment range

Code	Pressure adjustment range MPa {kgf/cm <sup>2</sup> }	Without remote control system							
		Pressure feedback method				Solenoid operated method			
		RP08	RP15	RP23	RP38	RP08	RP15	RP23	RP38
1	2.5 to 7 {25 to 70}	-	✓	✓	✓	-	✓	✓	✓
2	2.5 to 14 {25 to 140}	-	✓	✓	✓	-	✓	✓	✓
3	3.5 to 21 {35 to 210}	-	✓	✓	✓	-	✓	✓	✓

## 9 : Motor output

Code	Output kW (Number of poles: 4P)	Insulation type	Applicable model			
			RP08	RP15	RP23	RP38
07	0.75	Type B	✓	-	-	-
15	1.5		-	✓	-	-
22	2.2		-	✓	✓	-
37	3.7		-	-	✓	✓
55	5.5		-	-	-	✓

## Specifications

Model code	Pump			Motor				Mass kg
	Theoretical discharge rate cm <sup>3</sup> /rev	Maximum operating pressure MPa {kgf/cm <sup>2</sup> }	Discharge rate adjustment range 60 Hz L/min	Output kW (Number of poles: 4P)	Rated current A <sup>*3</sup>			
					200 V (50 Hz)	200 V (60 Hz)	220 V (60 Hz)	
RP08A*-07-30(RC)	8.0	14 {140} <sup>*1</sup>	4.8 to 14.0	0.75	3.8	3.4	3.4	30
RP15A*-15-30(RC)	14.8	14 {140}	12.0 to 25.0	1.5	6.8	6.0	5.8	45
RP15A*-22-30(RC)		21 {210}		2.2	9.6	8.8	8.4	
RP15C**H(J)-15-30		21 {210}	High quantity adjustment range 12.0 to 25.0 <sup>*2</sup> Low quantity adjustment range 3.5 to 10.0	1.5	6.8	6.0	5.8	H:50 (J:52)
RP15C**H(J)-22-30				2.2	9.6	8.8	8.4	
RP23A*-22-30(RC)	24.4	14 {140}	20.0 to 42.0	2.2	10.0	9.2	8.7	67
RP23A*-37-30(RC)		21 {210}		3.7	15.1	14.7	13.4	73
RP23C**H(J)-22-30		21 {210}	A <sup>*2</sup>	2.2	10.0	9.2	8.7	H:70 (J:72)
RP23C**H(J)-37-30			B <sup>*2</sup>	3.7	15.1	14.7	13.4	H:76 (J:78)
RP38A*-37-30(RC)	37.7	14 {140}	20.0 to 64.0	3.7	15.1	14.7	13.4	73
RP38A*-55-30(RC)		21 {210}		5.5	22.0	21.2	19.6	87
RP38C**H(J)-37-30		21 {210}	High quantity adjustment range 30.0 to 64.0 <sup>*2</sup> Low quantity adjustment range 5.8 to 25.0	3.7	15.1	14.7	13.4	H:76 (J:78)
RP38C**H(J)-55-30				5.5	22.0	21.2	19.6	H:90 (J:92)

C  
ROTOR PUMPS

The unit is painted in white (Munsell code N8.5).

Note: <sup>\*1</sup> Some restrictions apply to the conditions of use when using the product at a pressure in the range 7 to 14 MPa {70 to 140 kgf/cm<sup>2</sup>}.

○ JR-G(T)02 and JRP-G02 are recommended for the remote control system's relief valve. If the vent port is blocked, the pressure compensation structure does not work and the pump operates at a fixed pressure. In such a case, connect a relief valve at the discharge side of the pump.

<sup>\*2</sup> The high quantity adjustment range may be restricted due to the setting for the low quantity range. See the graphs on Page C-9 for details.

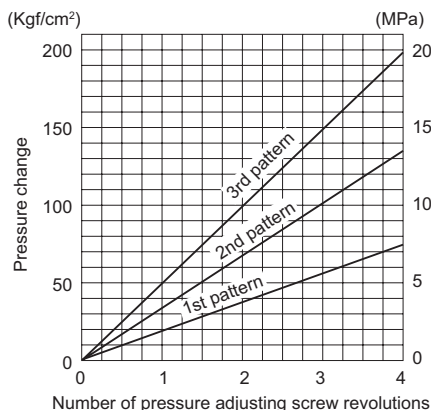
A: RP23-22 High quantity adjustment range: 20.0 to 42.0, Low quantity adjustment range: 3.7 to 15.0

B: RP23-37 High quantity adjustment range: 30.0 to 42.0, Low quantity adjustment range: 5.8 to 25.0

<sup>\*3</sup> Refer to Page C-11 for the reference current values for selecting the thermistor capacity.

- Piping flanges are not provided with the pump. Order them separately as required by referring to Page S-4.

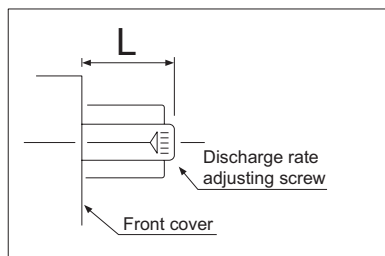
## Relationship between number of revolutions of the pressure adjusting screw and variation of discharge pressure



- Although the discharge pressure varies depending on the load conditions, the PC pressure setting that serves as the upper limit for the discharge pressure can be set using the PC valve's pressure adjusting function.
  - Turning the adjusting screw clockwise (tightening direction) increases the PC pressure setting.
  - Turning the adjusting screw counterclockwise (loosening direction) decreases the PC pressure setting.
- Excessive loosening of the pressure adjusting screw may cause oil to leak from the threaded section or parts to spring out. Do not loosen the screw beyond the pressure adjustment range.
- The 1st to 3rd patterns correspond to the pressure adjustment range designation codes 1 to 3.

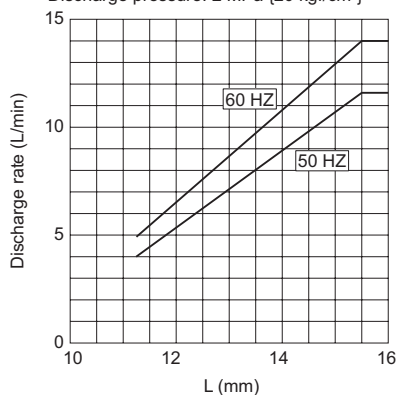
## Relationship between the protruding length of the discharge rate adjusting screw and the discharge rate (pressure compensator control)

- The discharge rate can be set to the desired value by turning the discharge rate adjusting screw provided on the front cover.
  - Turning the adjusting screw clockwise (tightening direction) decreases the discharge rate.
  - Turning the adjusting screw counterclockwise (loosening direction) increases the discharge rate.
- The relationship between the discharge rate and the protruding length of the adjusting screw is shown below.
- Set the discharge rate to no lower than two-thirds of the maximum discharge rate, otherwise the suction capacity may be insufficient.
- Overtightening of the discharge rate adjusting screw may cause oil to leak from the threaded section. Do not tighten the screw beyond the adjustment range.



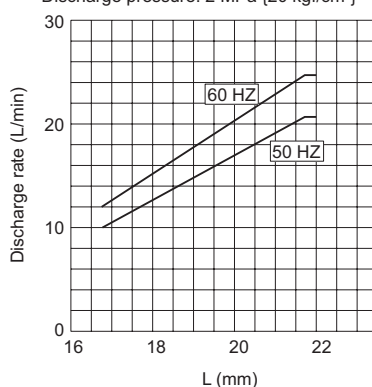
### RP08A※

Discharge pressure: 2 MPa {20 kgf/cm<sup>2</sup>}



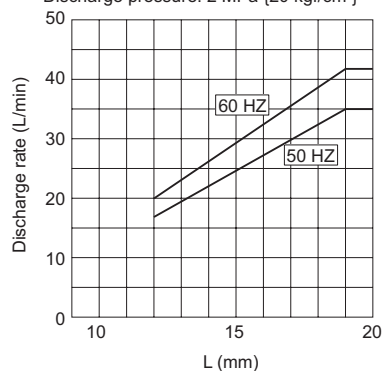
### RP15A※

Discharge pressure: 2 MPa {20 kgf/cm<sup>2</sup>}



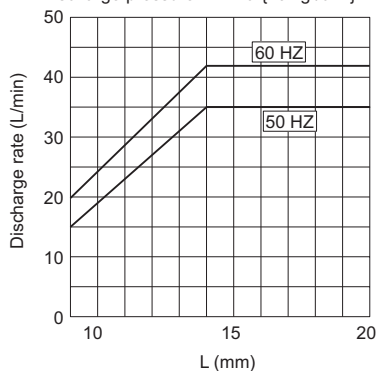
### RP23A※-22

Discharge pressure: 2 MPa {20 kgf/cm<sup>2</sup>}



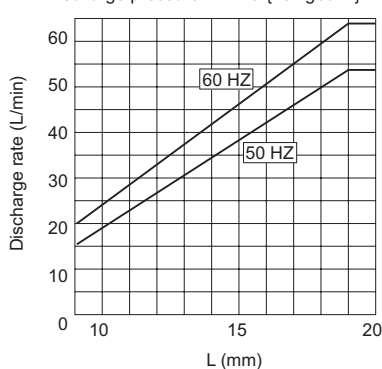
### RP23A※-37

Discharge pressure: 2 MPa {20 kgf/cm<sup>2</sup>}



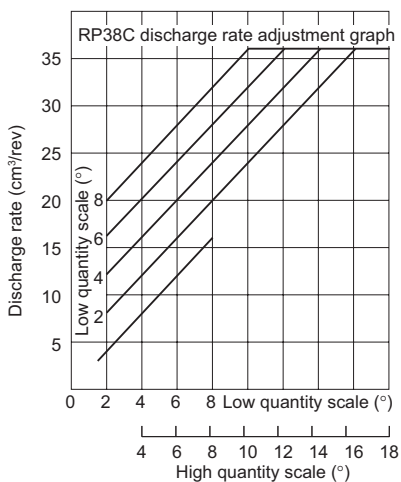
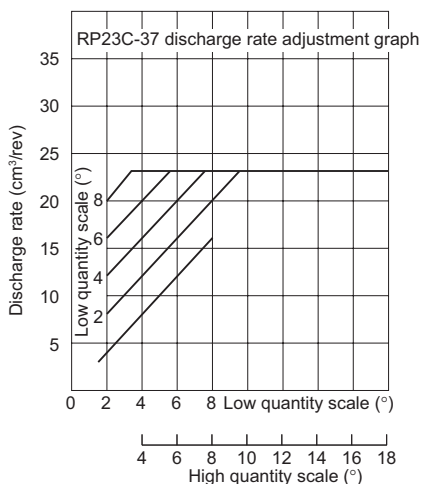
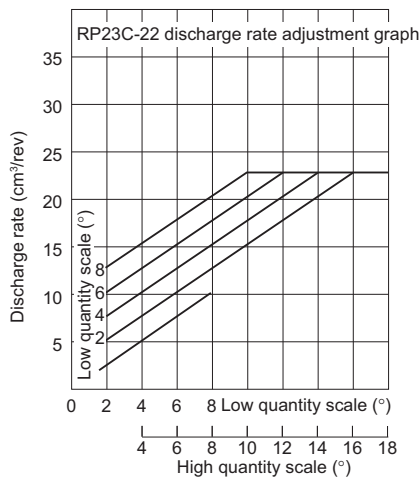
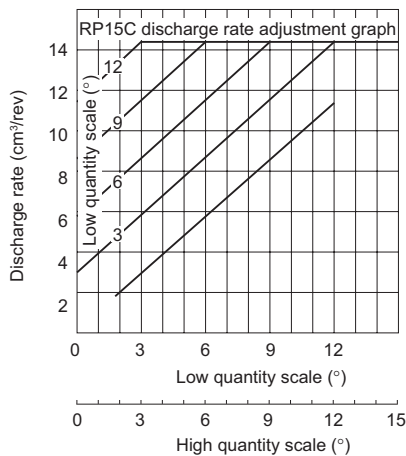
### RP38A※

Discharge pressure: 2 MPa {20 kgf/cm<sup>2</sup>}





## Relationship between the protruding length of the discharge rate adjusting screw and the discharge rate (combination control)



Note: Refer to Page A-12 for the discharge rate setting procedure.

The discharge rate adjusting screws are provided with scales on the nameplates as shown below.

Pump model	Scale (°)	
	Low quantity adjusting screw	High quantity adjusting screw
RP15	0 to 12	0 to 15
RP23, 38	0 to 8	4 to 18

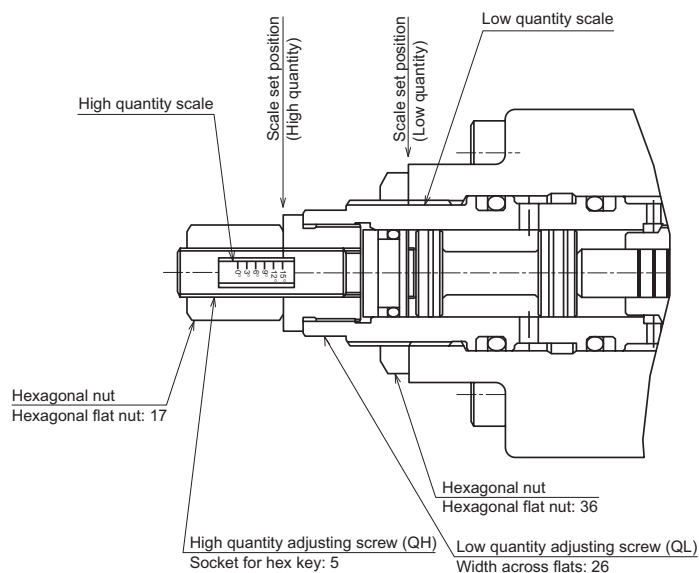
(Scale graduation: 1°)

### Factory settings

The discharge rate for the high quantity range is factory adjusted to the maximum discharge rate and the discharge rate for the low quantity range is factory adjusted as follows.

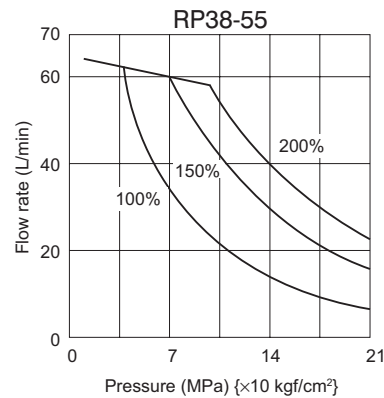
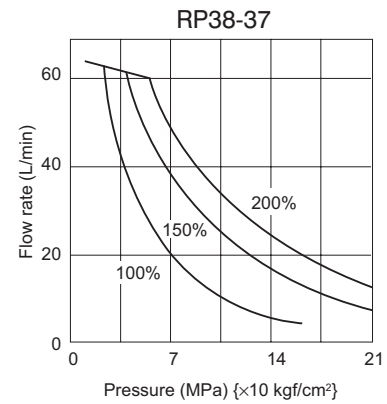
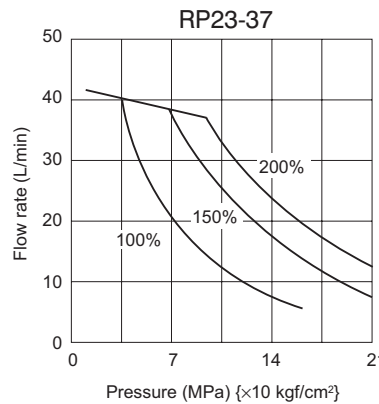
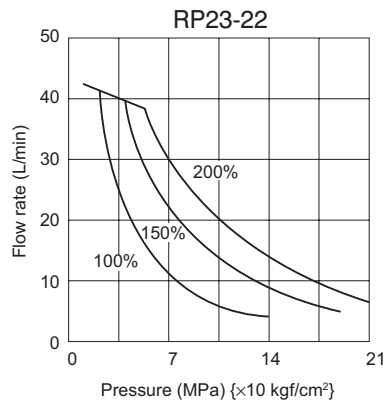
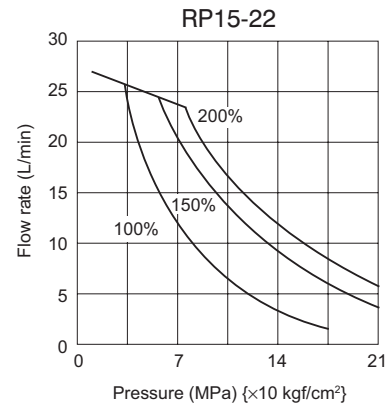
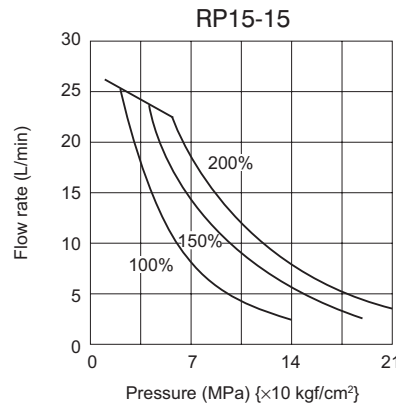
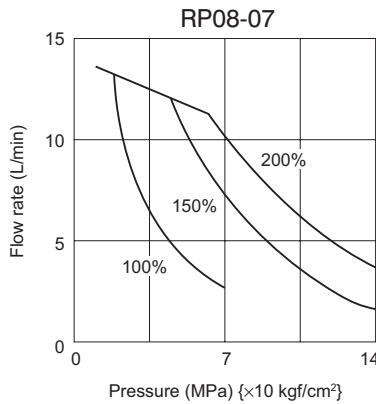
Pump type	Low quantity (QL) setting
RP15C-15	Scale position: 2°
RP15C-22	Scale position: 4°
RP23C-22	Scale position: 2°
RP23C-37	Scale position: 3°
RP38C-37	Scale position: 3°
RP38C-55	Scale position: 5°

### Discharge rate adjusting section



## Pressure - Flow Rate characteristics

### ● 220 V (60 Hz)

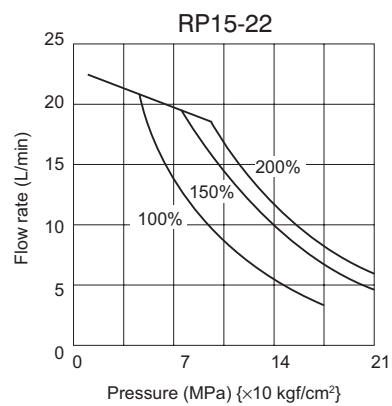
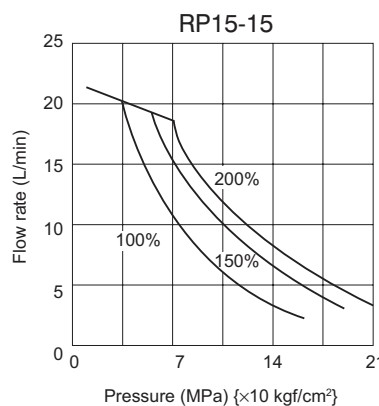
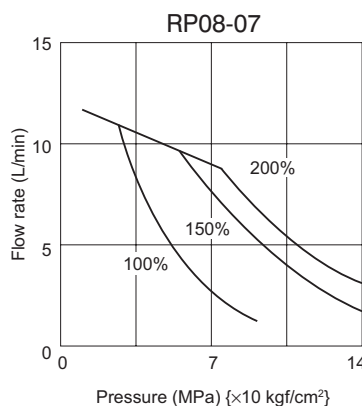


Note: The diagrams show the pressure - flow rate characteristics under the following conditions.

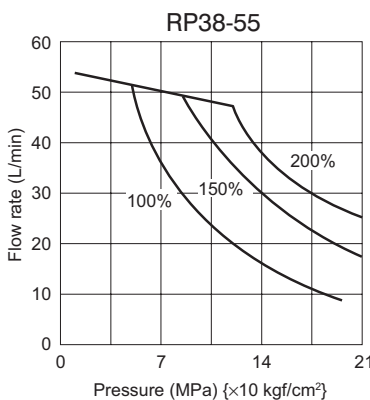
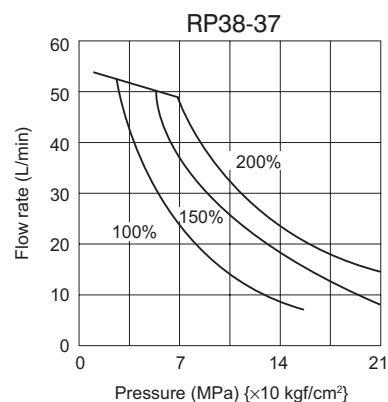
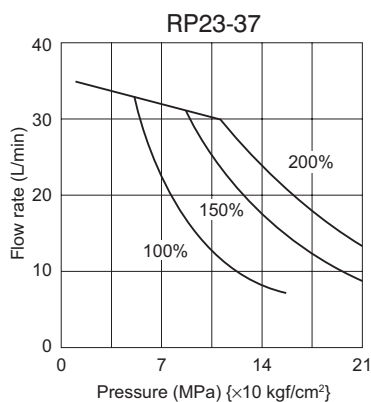
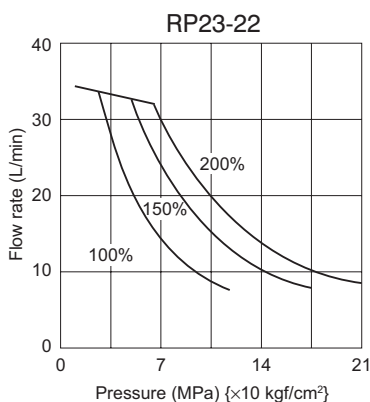
- 100%: Output at the rated current
- 150%: Output at 150% of the rated current (continuous operation possible)
- 200%: Output at 200% of the rated current (momentary operation possible)

\* Refer to the next page for the thermistor capacities of rotor pumps.

### ● 200 V (50 Hz)



**Pressure - Flow Rate characteristics**



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\* The reference current values for selecting the thermistor capacity are given below for each of the rotor pump models and operation conditions.

Model	RP08-07		
	200 V (50 Hz)	200 V (60 Hz)	220 V (60 Hz)
Input power			
Input current = 100% (A)	3.8	3.4	3.4
Input current = 150% (A)	5.7	5.1	5.1
Input current = 200% (A)	7.6	6.8	6.8

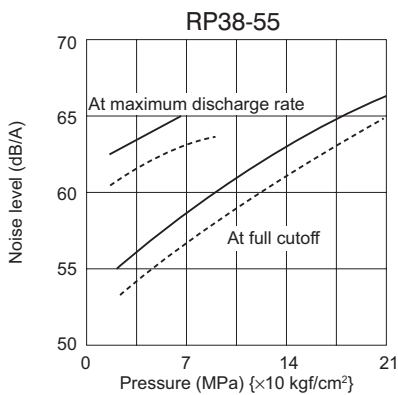
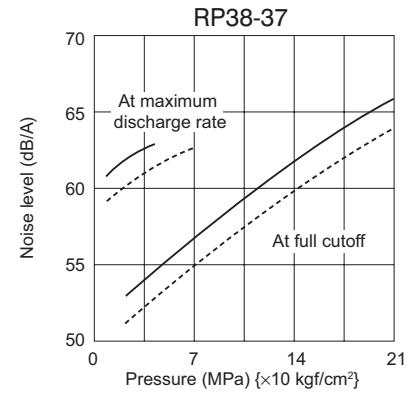
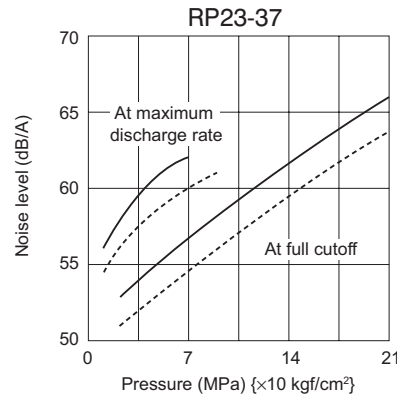
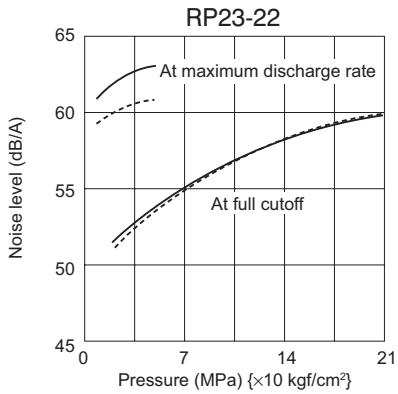
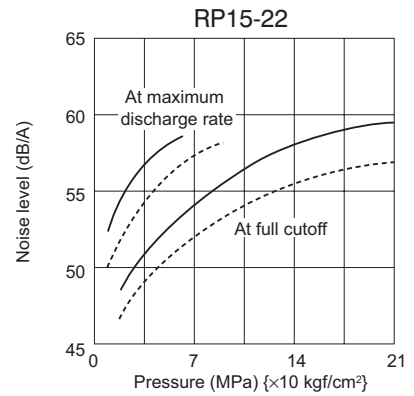
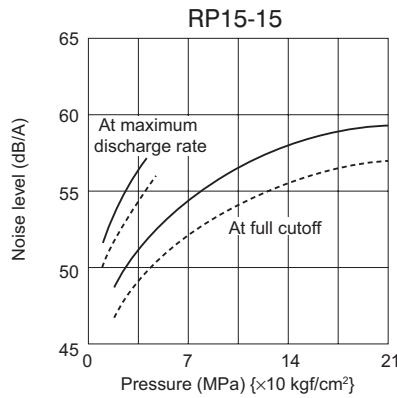
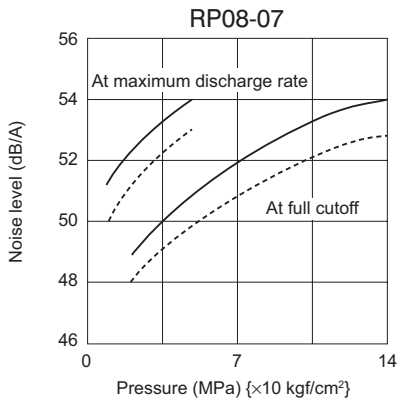
Note: When taking the power supply voltage fluctuation of 10% into account, it is recommended to use the thermistor current setting obtained by multiplying the current value at the 150% load in the tables to the left by 1.1.

Model	RP15-15			RP15-22		
	200 V (50 Hz)	200 V (60 Hz)	220 V (60 Hz)	200 V (50 Hz)	200 V (60 Hz)	220 V (60 Hz)
Input power						
Input current = 100% (A)	6.8	6.0	5.8	9.6	8.8	8.4
Input current = 150% (A)	10.2	9.0	8.7	14.4	13.2	12.6
Input current = 200% (A)	13.6	12.0	11.6	19.2	17.6	16.8

Model	RP23-22			RP23-37		
	200 V (50 Hz)	200 V (60 Hz)	220 V (60 Hz)	200 V (50 Hz)	200 V (60 Hz)	220 V (60 Hz)
Input power						
Input current = 100% (A)	10.0	9.2	8.7	15.1	14.7	13.4
Input current = 150% (A)	15.0	13.8	13.1	22.7	22.1	20.1
Input current = 200% (A)	20.0	18.4	17.4	30.2	29.4	26.8

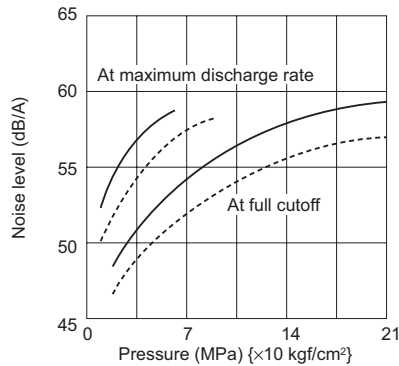
Model	RP38-37			RP38-55		
	200 V (50 Hz)	200 V (60 Hz)	220 V (60 Hz)	200 V (50 Hz)	200 V (60 Hz)	220 V (60 Hz)
Input power						
Input current = 100% (A)	15.1	14.7	13.4	22.0	21.2	19.6
Input current = 150% (A)	22.7	22.1	20.1	33.0	31.8	29.4
Input current = 200% (A)	30.2	29.4	26.8	44.0	42.4	39.2

**Noise characteristics (measuring position: 1 m from pump front)**

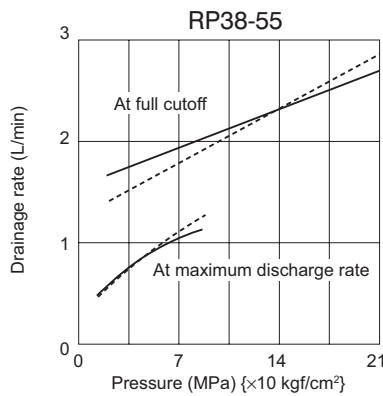
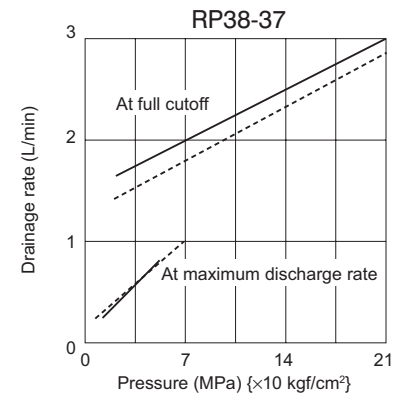
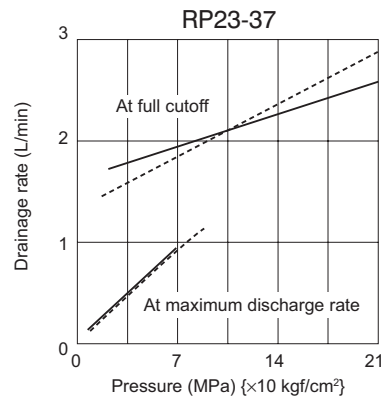
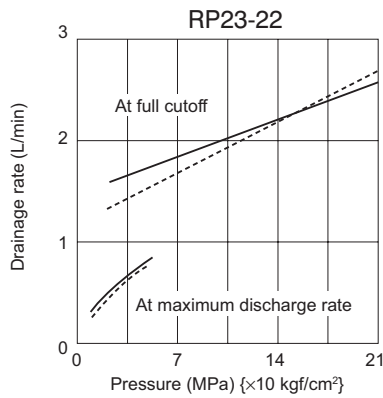
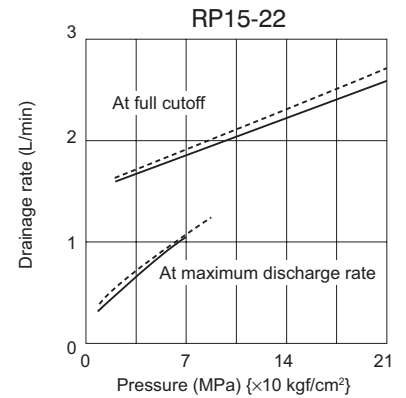
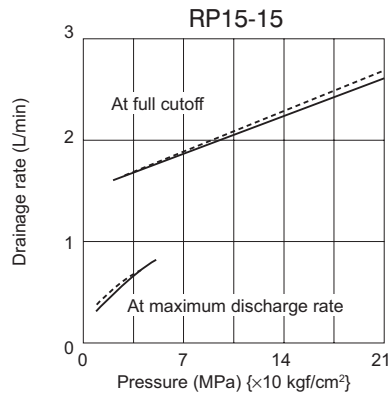
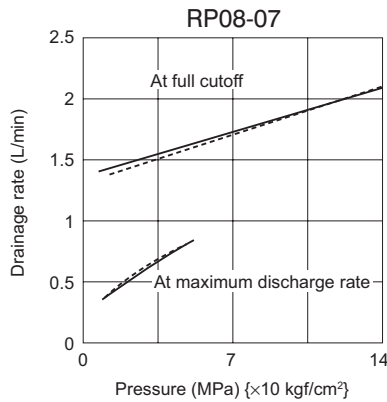


**Overall noise characteristics**

- Solid line: 220 V (60 Hz)
- Dashed line: 200 V (50 Hz)

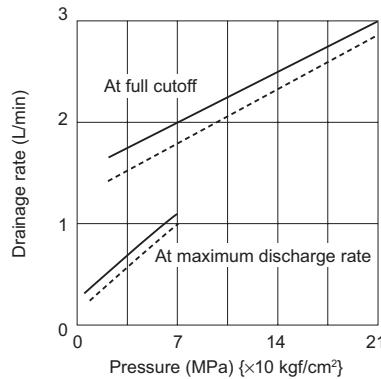


## Drainage volume characteristics

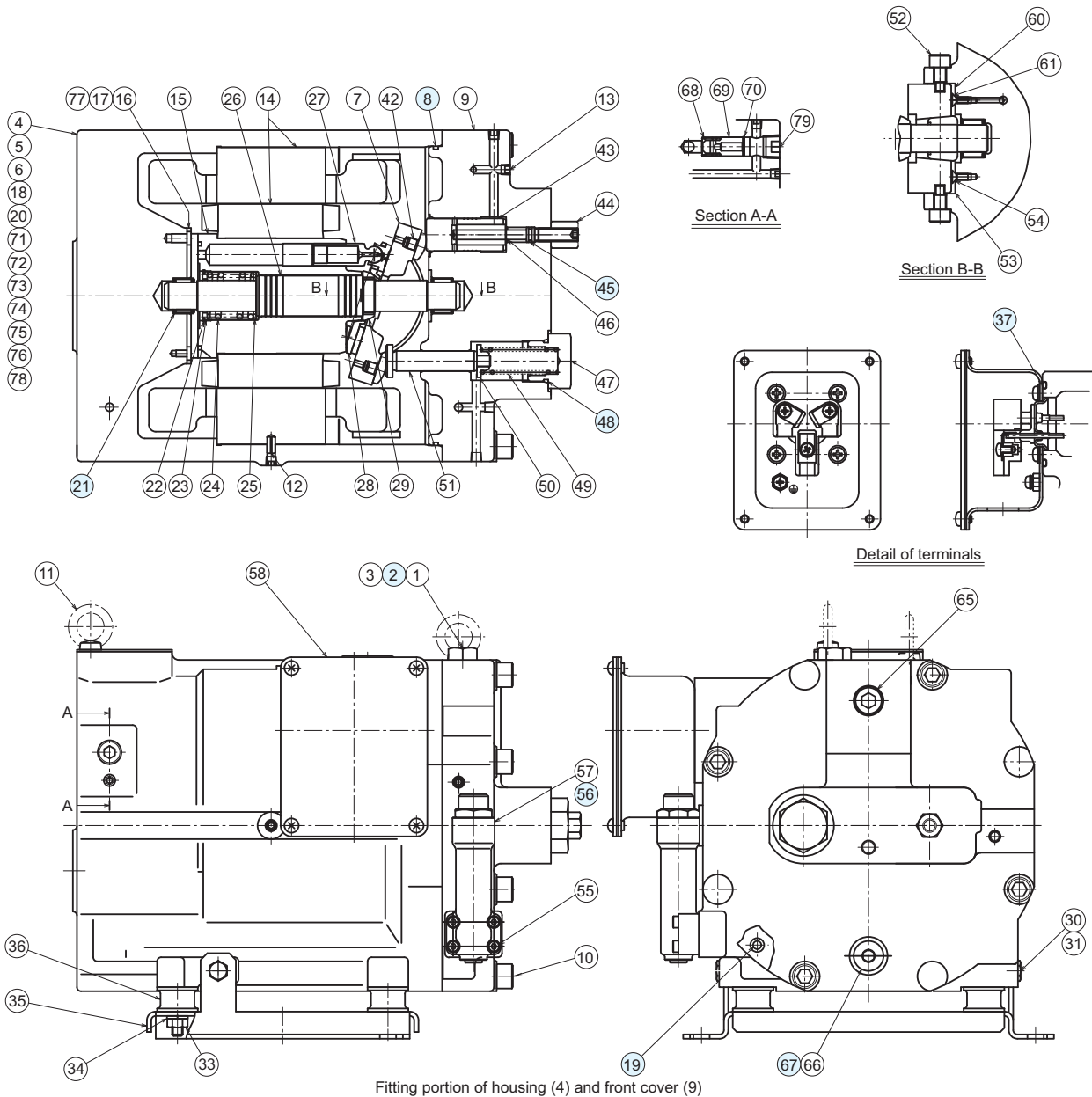


### Overall drainage volume characteristics

- Solid line: 220 V (60 Hz) ———
- Dashed line: 200 V (50 Hz) - - - - -



Sectional structural diagram



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Seal/bearing table

Part No.	Product name	Specifications			Material	Quantity
		RP08	RP15	RP23, RP38		
2	Sealing washer	WF12192			NBR	1
8	O-ring	AS568-160 (HS90)	AS568-167 (HS90)	AS568-172 (HS90)	NBR	1
19	O-ring	JIS B 2401 1B-P7			NBR	1
21	Needle bearing	HK1210	HMK1715	F2016		2
37	O-ring	JIS B 2401 1B-G45			NBR	1
45	O-ring	JIS B 2401 1A-P8			NBR	1
48	O-ring	AS568-914 (HS90)			NBR	1
56	Gasket	1740698 (special part)				1
67	O-ring	JIS B 2401 1B-P14			NBR	1

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