

### VDS Series Small Variable Volume Vane Pump

0.5 in<sup>3</sup>/rev  
3.94 gpm  
1015 psi

### Features

#### High efficiency operation with minimal power loss

All the performance of the original new VDR series mechanisms combines with precision machining for a pump that minimizes power loss, especially at full cutoff.

#### Quiet operation

Journal bearings with a proven record on IP pumps plus new suction and discharge port configurations reduce operating noise and deliver quiet

operation with minimal vibration, even in the high-pressure range.

#### Compact and simple design, easy operation

Compact and quiet, VDS Series variable vane pumps are economical and easy to handle. A simple design allows use in a wide range of hydraulic systems.

#### Precise characteristics, prompt response

Prompt response at both ON-OFF

and OFF-ON ensures instantaneous, stable, high-precision operation.

#### Solidly built for high efficiency and long life

VDS Series pumps are built to last, with a design that incorporates years of NACHI experience and know-how. Specially selected materials and skilled workmanship provide outstanding durability along with stable, high-efficiency operation.

### Specifications

Model No.	Capacity in <sup>3</sup> /rev	No-load Discharge Rate gpm				Pressure Adjustment Range psi	Allowable Peak Pressure psi	Revolution Speed min min <sup>-1</sup>		Weight lbs
		1000min <sup>-1</sup>	1200min <sup>-1</sup>	1500min <sup>-1</sup>	1800min <sup>-1</sup>			Min.	Max.	
VDS-0A(B)-1A1-E11						145 ~ 290				
" -1A2-E11	.50	2.1	2.6	3.2	3.94	317 ~ 507	2030	800	1800	A : 14.3 B : 9.9
" -1A3-E11						435 ~ 1015				

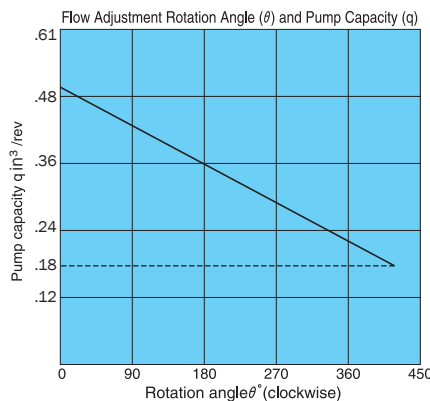
#### • Handling

- The direction of rotation for this pump is clockwise (rightward) when viewed from the shaft side.
- Drain piping must be direct piping up to a point that is below the tank fluid level, and back pressure due to pipe resistance should not exceed 4.3 psi.
- When adjusting pressure, pressure is increased by clockwise (rightward) rotation of the adjusting screw and decreased by counterclockwise (leftward) rotation.
- When adjusting the flow rate, the flow rate is decreased by clockwise (rightward) rotation of the adjusting screw and increased by counterclockwise (leftward) rotation. The graph on the right provides general guidelines for the relationship between the rotation angle of the flow rate adjusting screw and the no-load discharge rate.
- Factory Default P-Q Settings (Standard Model)
  - Flow Rate Setting = Maximum flow rate for model as indicated in the catalog.
  - Pressure Setting = Pressure shown in table below.

Factory Default Pressure Settings kgf/cm <sup>2</sup> (psi)	
1	: 20.4 (290)
2	: 35.7 (507)
3	: 71.4 (1015)

$$\text{Flow rate gpm} = \frac{\text{in}^3 \times \text{rpm}}{231}$$

Q: No-load Discharge Rate (gpm)  
q: Capacity (in<sup>3</sup>/rev)



The values indicated above are at maximum pump discharge volume with the flow volume adjusting screw at the 0° position. The broken line shows the flow volume adjustment range lower limit value.

#### 6 Thrust Screw

The thrust screw is precision adjusted at the factory during assembly. Never touch the thrust screw.

See callout 9 in the cross-section diagram on page B-4.

#### 7 Initial Operation

Before operating the pump for the first time, put the pump discharge side into the no-load state and then repeatedly start and stop the motor to bleed all air from inside the pump and the suction piping. After confirming that the pump is discharging oil, continue the no-load operation for at least 10 minutes to discharge all the air from the circuit.

8 For the hydraulic operating fluid, use an R&O type and wear-resistant type of ISO VG32 to 68 or equivalent (viscosity index of at least 90). Use hydraulic operating fluid that provides kinematic viscosity during operation in the range of 20 to 150 centistokes.

9 The operating temperature range is 59 to 140 °F. When the oil temperature at startup is 59 °F or less, perform a warm-up operation at low pressure until the oil temperature reaches 59 °F. Use the pump in an area where the temperature is within the range of 59 to 140 °F.

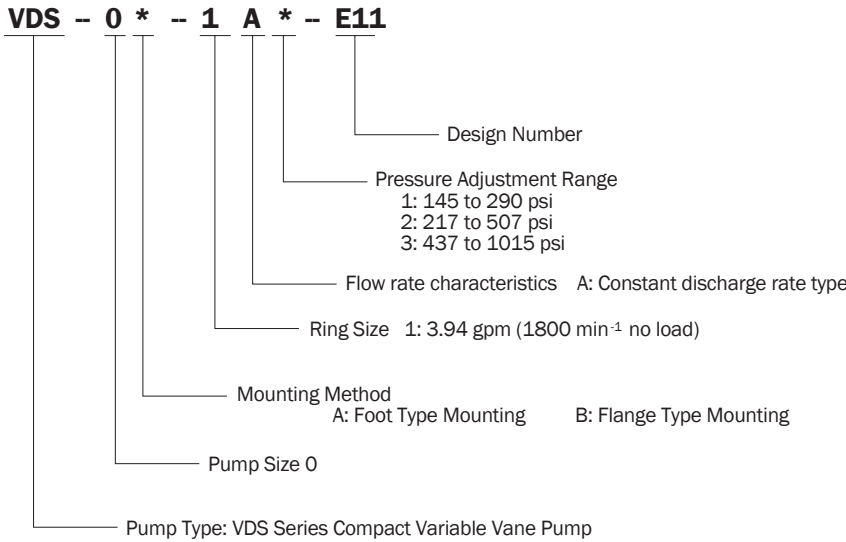
(continued on following page)

- 10 Suction pressure is 4.35 psi, and the suction port flow rate should be greater than 6 ft/sec.
- 11 Avoid pulley, gear, and other drive systems that impart a radial or thrust load on the end of the pump shaft. Mount the pump so its pump shaft is oriented horizontally.
- 12 Provide a suction strainer with a filtering grade of about 100 μm (150 mesh). For the return line to the tank, use a 10 μm line filter.

- 13 Manage hydraulic operating fluid so contamination is maintained at class NAS10 or lower. Take care to avoid contamination with water or other foreign matter, and watch for discoloration. Whitish fluid indicates that air has contaminated the fluid, and brownish fluid indicates the fluid is dirty.
- 14 Contact your agent about using water- and glycol-based hydraulic operating fluids.
- 15 At startup, repeat the inching operation

- (start-stop) to bleed air from the pump and pipes.
- 16 Equip an air bleed valve in circuits where it is difficult to bleed air before startup. See page C-13 for more information.
- 17 To ensure proper lubrication of the pump's rubbing surfaces, supply oil to the interior of the pump before starting operation.
- 18 When centering the pump shaft, eccentricity with the motor shaft should be no greater than 0.001 in. The angle error should be no greater than 1°.

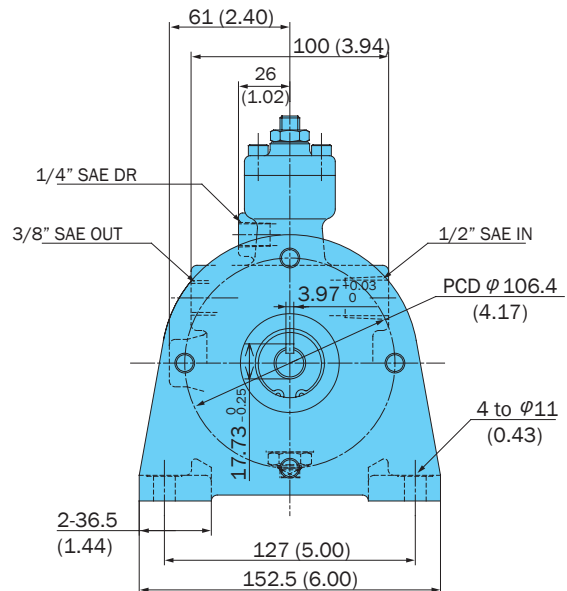
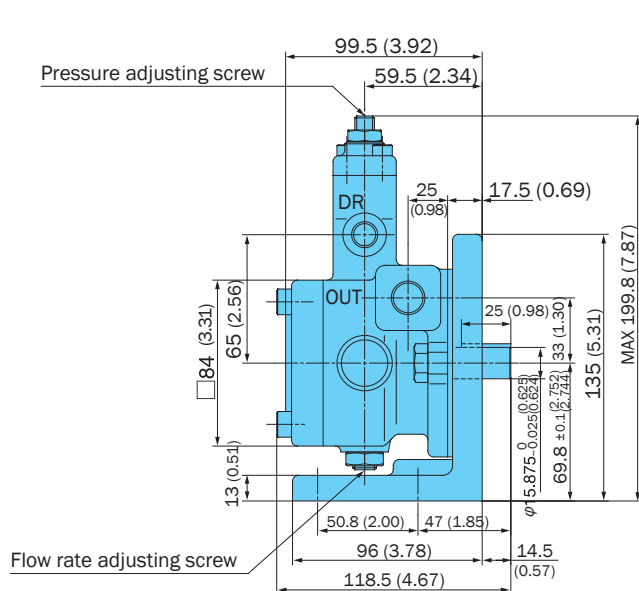
### Understanding Model Numbers



### Installation Dimension Drawings

VDS-0A-1A-\*-10

Foot Mounting Type mm (inch)

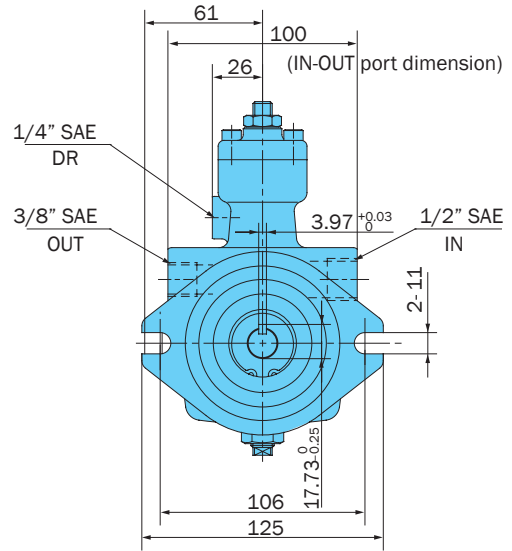
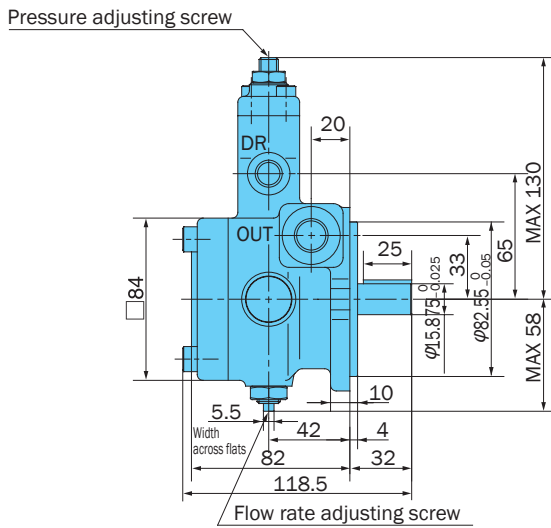


Note: Foot Mounting Kit: IHM-2-10

VDS-0B-1A-\*-10

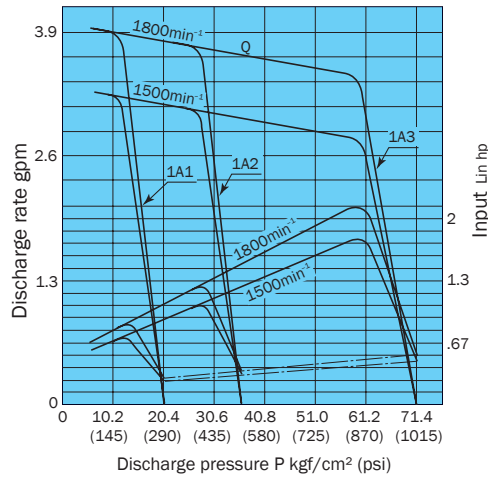
SAE A Mount

Flange Mounting

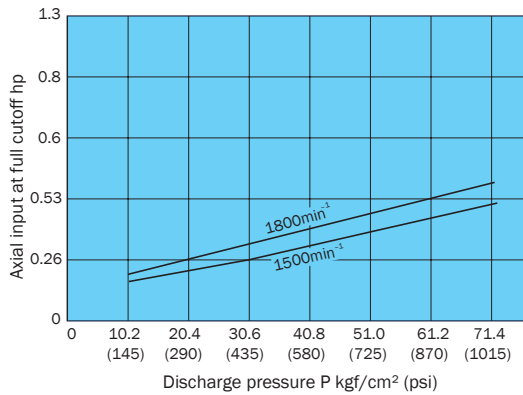


## Specifications

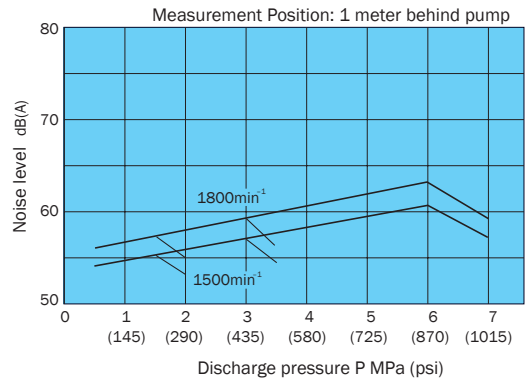
Typical characteristics at hydraulic operating fluid kinematic viscosity of 32 centistokes



### Axial Input at Full Cutoff

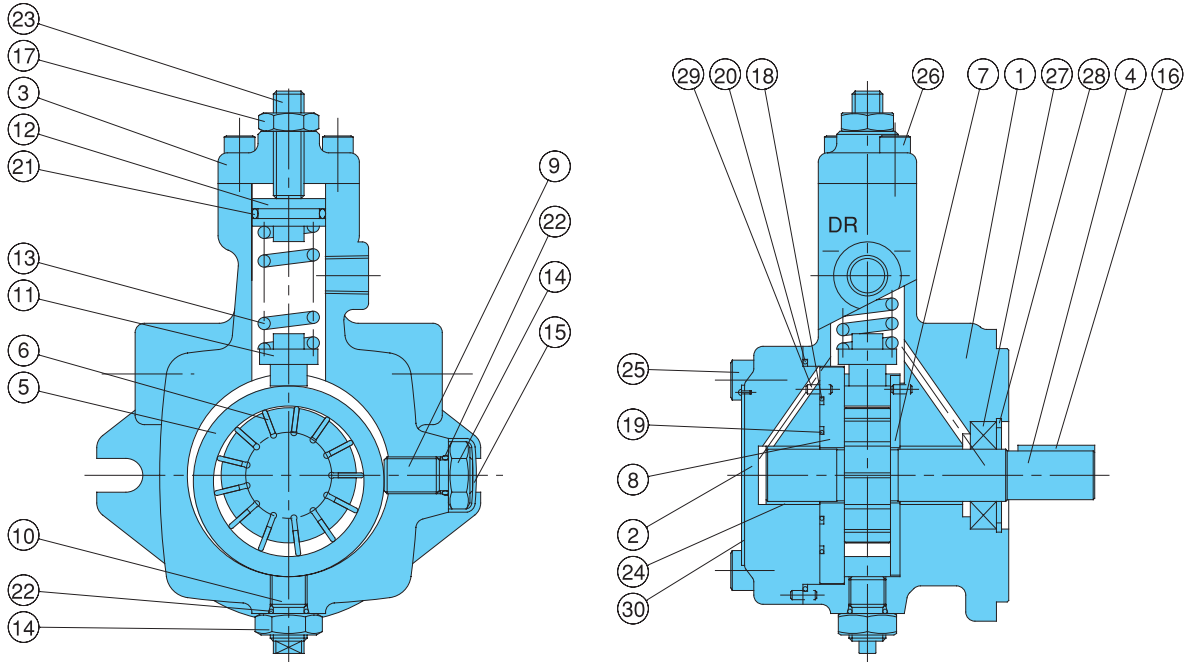


### Noise Characteristics



## Cross-Sectional Drawing

VDS-0B-1A\*-10



### List of Sealing Parts

Seal Kit: VBAS-100B00

Applicable Pump Model: VDS-0A/B-1A \*10

Part No.	Part Name	Part Number	Q'ty
18	O-ring	AS568-032	1
19	O-ring	AS568-023	1
20	O-ring	S71 (NOK)	1
21	O-ring	1A-P20	1
22	O-ring	1A-P10	2
27	Oil seal	TC-17358	1

Note:

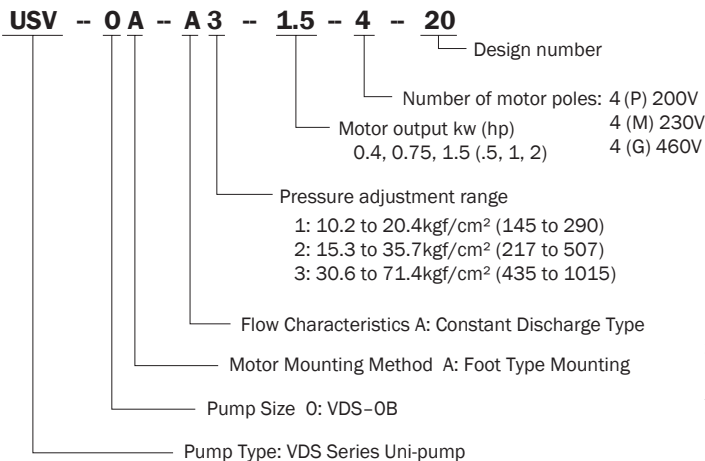
1. Oil seals are manufactured by Nippon Oil Seal Industry Co. Ltd. (NOK).
2. O-ring 1A/B-\*\* refers to JIS B2401-1A.

Part No.	Part Name	Part No.	Part Name
1	Body	16	Key
2	Cover (A)	17	Nut
3	Cover (B)	18	O-ring
4	Shaft	19	O-ring
5	Cam ring	20	O-ring
6	Vane	21	O-ring
7	Plate (S)	22	O-ring
8	Plate (H)	23	Screw
9	Thrust screw	24	Bearing
10	Screw	25	Screw
11	Piston	26	Screw
12	Holder	27	Oil seal
13	Spring	28	Snap ring
14	Nut	29	Pin
15	Cap	30	Nameplate

## Uni-Pump Specifications

(CE mark standard compliant)

### Understanding Model Numbers



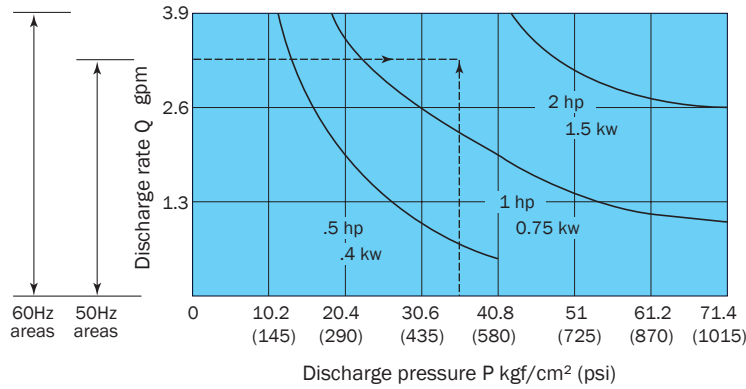
Cartridge Kit:  
VBAC-100\*A\*

Includes Items: 4, 5, 6, 7, 8, 16, 29

Maximum Working Pressure kgf/cm (psi)	Maximum Flow Rate gpm	
	50Hz	60Hz
71.4 (1015)	3.30	3.94

1. Standard drive motor is the fully enclosed fan-cooled B type.
2. Standard voltage for drive motor is 200 VAC, 50/60 Hz or 220 VAC, 60 Hz.
3. Standard terminal box is B terminal (right side viewed from pump).

**Motor Selection Curves**



**• How to select a motor**

The area under a motor output curve in the graph to the left is the operating range for that motor under the rated output for that motor.

Example:

To find the motor that can produce pressure of 507 psi and a discharge rate of 3.3 gpm.

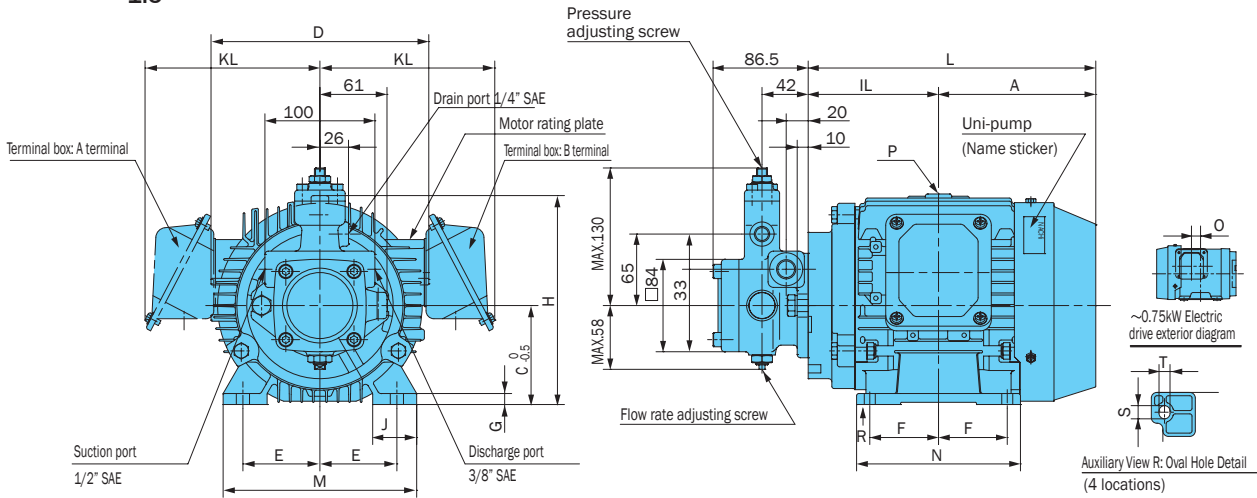
Selection Process:

Since the intersection of the two broken lines from a pressure of 507 psi and discharge rate of 3.3 gpm intersect in the area under the 2 hp curve, it means that a 2 hp motor should be used.

\* Select a uni-pump that has a pressure and flow rate that is within the range of the drive so that the drive will not overload.

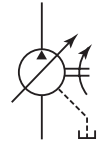
**Installation Dimension Drawings**

0.4  
USV-0A-A\* - 0.75-4-20  
1.5



Uni-pump	Motor Dimensions mm																Frame No.	Output hp (4 poles)	Weight lbs
	A	IL	C	D	E	F	G	H	J	L	M	N	S × T	KD	KL	O			
USV-0A-A1-0.4-4-20	121	107.5	71	150	56	45	2.3	146	30	228.5	140	110	15 × 7	φ27	151	35	71M	0.5	30
USV-0A-A2-0.4-4-20																			
USV-0A-A3-0.4-4-20																			
USV-0A-A1-0.75-4-20	133	107.5	80	170	62.5	50	4.5	165	35	240.5	165	130	18 × 10	φ27	157	27.5	80M	1.0	42
USV-0A-A2-0.75-4-20																			
USV-0A-A3-0.75-4-20																			
USV-0A-A3-1.5-4-20	143	118.5	90	198	70	62.5	10	190	40	261.5	176	150	12 × 10	φ27	159	-	90L	2	45

\* See page A-21 for the characteristics of the drive motor for the unipump (domestic standard 3 rating).



### VDR Design Series Variable Volume Vane Pump

7.9 gpm at 2030 psi  
10.5 gpm at 1000 psi

#### Features

##### Stable, highly efficient operation up to 2030 psi

A biased piston that minimizes ring vibration and leak-free pressure balance construction enables highly efficient highpressure operation, and very stable performance up to 2030 psi.

##### High-precision instantaneous response

Response has been improved by a special bias piston mechanism. Prompt response at both ON-OFF and OFF-ON

ensures instantaneous, stable, high-precision operation.

##### Silent operation, even in the high pressure range

CQuiet journal bearings, a bias piston that allows a 3-point support system, and new suction and discharge port shapes all contribute to minimize operation noise. Silent, vibration-free operation is ensured, even in the high pressure range.

##### Reduced power loss

A combination of NACHI-original mechanical innovations and precision machining create a pump that minimizes power loss, especially at full cutoff.

##### Solid construction stands up to harsh operating conditions

The tough and rugged construction of this pump is made possible by a long history of quality pump designs. This, in combination with specially selected materials and skilled workmanship, provides outstanding durability.

#### Specifications

##### Single Pump

Model Type		No-load Discharge Rate l/min (gpm)			Pressure Adjustment Range psi	Allowable Peak Pressure psi	Revolution Speedmin <sup>-1</sup>		Weight lbs
Foot Mounting	Flange Mounting	1800 rpm	1500 rpm	1200 rpm			Min.	Max.	
VDR-1A-1A2-*22	VDR-1B-1A2-*22	30 (7.9)	25 (6.6)	20 (5.3)	217 ~ 507	500	800	1800	19.9
VDR-1A-1A3-*22	VDR-1B-1A3-*22				435 ~ 1015	1000			
VDR-1A-1A4-*22	VDR-1B-1A4-*22				942 ~ 1522	1500			
VDR-1A-1A5-*22	VDR-1B-1A5-*22				1305 ~ 2030	2000			
VDR-1A-2A2-*22	VDR-1B-2A2-*22	40 (10.6)	33 (8.7)	27 (7.1)	214 ~ 500	500	800	1800	19.9
VDR-1A-2A3-*22	VDR-1B-2A3-*22				429 ~ 1000	1000			

##### Double Pump

Model No.	Vent Side		Shaft Side		Vent Side	Shaft Side	Revolution Speedmin <sup>-1</sup>		Weight lbs
Foot Mounting Type (Flange Mounting Type)	Discharge Rate gpm	Pressure Adjustment Range psi	Discharge Rate gpm	Pressure Adjustment Range psi	Allowable Peak Pressure psi	Min.	Max.		
VDR-11A(B)-1A2-1A2-22 VDR-11A(B)-1A2-1A3-22	7.9	217 ~ 507	7.9	217 ~ 507 435 ~ 1015	2030	800	1800	37	
VDR-11A(B)-1A3-1A3-22		435 ~ 1015		435 ~ 1015					
VDR-11A(B)-2A2-2A2-22 VDR-11A(B)-2A2-2A3-22	10.5	217 ~ 507	10.5	217 ~ 507 435 ~ 1015	2030	800	1800	37	
VDR-11A(B)-2A3-2A3-22		435 ~ 1015		435 ~ 1015					

Note: 1. The discharge rate is the value at 1800min<sup>-1</sup> no load.

2. The change from design number 21 to design number 22 represents a change in the shaft key width from .125 in to .187 in. This means that when using a .125 in key coupling, you need to use a stepped key (VD31J-302000) or add a new key groove at .187 in.

##### • Handling

###### 1 Rotation Direction

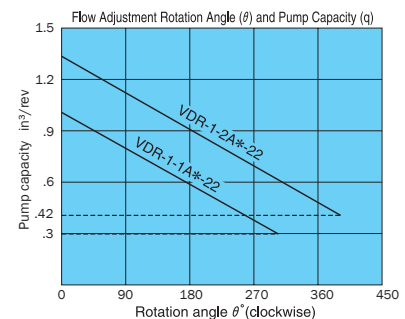
The direction of rotation is always clockwise (rightward) when viewed from the shaft side.

###### 2 Drain

Drain piping must be direct piping up to a point that is below the tank fluid level, and back pressure due to pipe resistance should not exceed 4.35 psi. When using a pump that has drain ports at two locations, use the drain port that is higher after the pump is installed.

###### 3 Discharge Volume Adjustment

The discharge flow rate is decreased by clockwise (rightward) rotation of the discharge rate adjusting screw, and increased by counterclockwise (leftward) rotation. Loosen the lock nut before making adjustments. After adjustment is complete, re-tighten the lock nut. The graph on the right provides general guidelines for the relationship between the rotation angle of the flow rate adjusting screw and the no-load discharge rate.



(continued on following page)

Flow rate gpm:  $Q = \frac{\text{in}^3 \times \text{rpm}}{231}$

Q: No-load Discharge Rate Q r/min  
 q: Volume cm<sup>3</sup>/rev  
 N: Revolution Speed min<sup>-1</sup>

The broken line shows the flow volume adjustment range lower limit value.

Note:

The values indicated above are at maximum discharge volume with the flow volume adjusting screw at the 0° position.

4 Pressure Adjustment

Pressure is decreased by clockwise (rightward) rotation of the discharge rate

adjusting screw, and increased by counterclockwise (leftward) rotation.

5 Factory Default P-Q Settings (Standard Model)

- Flow Rate Setting = Maximum flow rate for model as indicated in the catalog
- Pressure Setting = Pressure shown in table to the right

6 Thrust Screw

The thrust screw is precision adjusted at the factory during assembly. Never touch the thrust screw. See callout ②1 in the cross-section diagram on page B-11.

Factory Default Pressure Settings kgf/cm <sup>2</sup> (psi)
2 : 35.7 (507)
3 : 30.6 (435)
4 : 66.3 (942)
5 : 91.8 (1305)

7 Initial Operation

Before operating the pump for the first time, put the pump discharge side into the no-load state and then repeatedly start and stop the motor to bleed all air from inside the pump and the suction piping. After confirming that the pump is discharging oil, continue the no-load operation for at least 10 minutes to discharge all the air from the circuit.

Provide an air bleed valve in circuits where it is difficult to bleed air before startup.

8 Sub Plate

Use the following table for specification when a sub plate is required. For detailed dimensions, see pages B-17 through B-19.

- 9 For the hydraulic operating fluid, use type ISO VG32 or equivalent (viscosity index of at least 90) for pressures of 1015 psi or lower, and type ISO VG68 or equivalent (viscosity index of at least 90) for pressures greater than 1015 psi.

Pump Model No.	Sub Plate Number	Motor(hp)
VDR-1A-1A*-22	MVD-1-115-10	1 ~ 2
	MVD-1-135-10	3 ~ 5
VDR-1A-2A*-22	MVD-1-115Y-10	1 ~ 2
	MVD-1-135Y-10	3 ~ 5
VDR-11A-*A* -*A*-22	MVD-11-135-10	2 ~ 5
	MVD-11-135X-10	

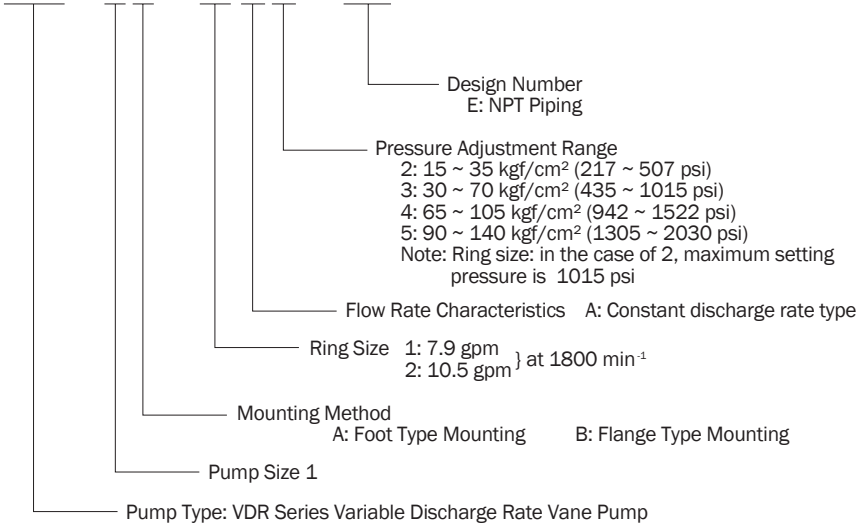
- 10 The operating temperature range is 59 to 140 °F. When the oil temperature at startup is 59 °F or less, perform a warm-up operation at low pressure until the oil temperature reaches 59 °F. Use the pump in an area where the temperature is within the range of 32 to 140 °F.
- 11 Suction pressure is 4.35 psi, and the suction port flow rate should be to greater than 6 ft/sec. Avoid pulley, gear, and other drive systems that impart a radial or thrust load on the end of the pump shaft. Mount the pump so its pump shaft is oriented horizontally.

(Continued on following page)

**Understanding Model Numbers**

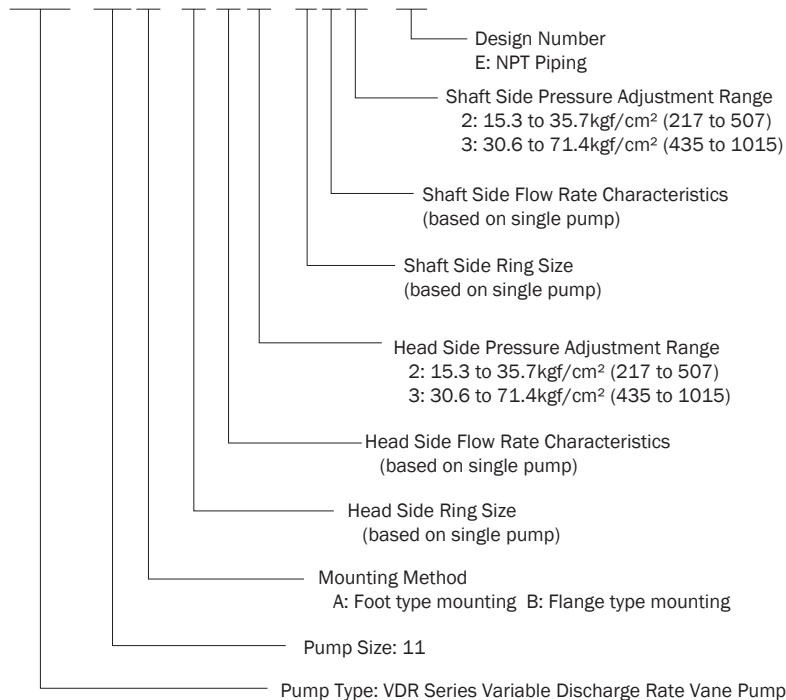
Single Pump

VDR -- 1 A -- 1 A 2 -- \*22



Double pump

VDR -- 11 A -- 1 A 2 -- 1 A 3 -- 22





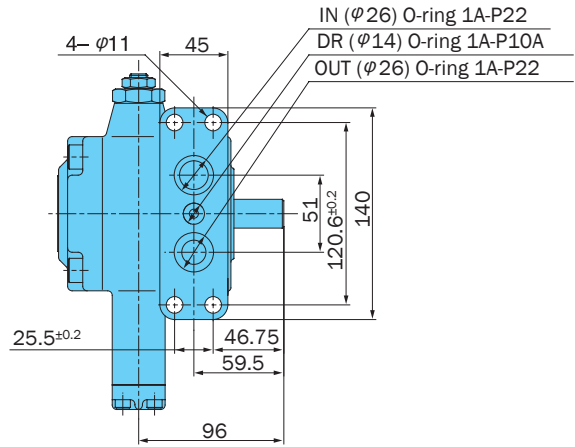
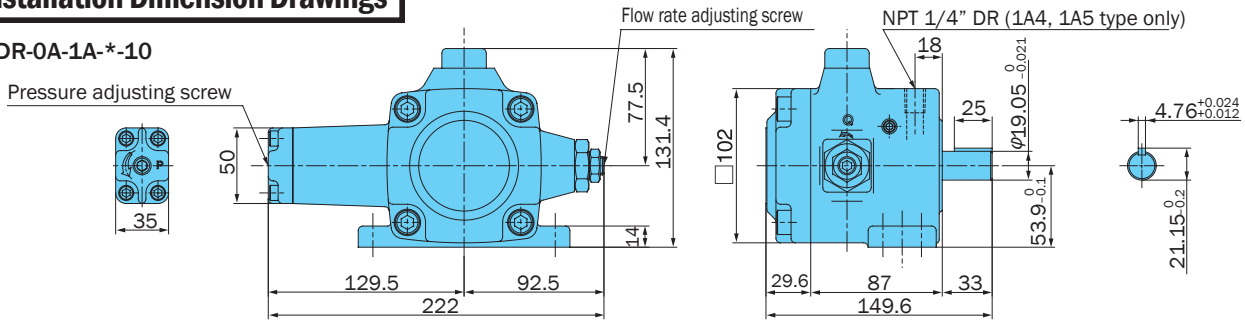
- 13 Provide a suction strainer with a filtering grade of about 100 μm (150 mesh). For the return line to the tank, use a 10μm line filter.
- 14 Manage hydraulic operating fluid so contamination is maintained at class NAS10 or lower. Take care to avoid contamination with water or other foreign matter, and watch out for discoloration. Whitish fluid indicates that air has contaminated the fluid, and brownish

- fluid indicates the fluid is dirty.
- 15 Contact your agent about using water- and glycol-based hydraulic operating fluids.
- 16 At startup, repeat the inching operation (start-stop) to bleed air from the pump and pipes.
- 17 Equip an air bleed valve in circuits where it is difficult to bleed air before startup. See page C-13 for more information.

- 18 To ensure proper lubrication of the pump's rubbing surfaces, supply oil to the interior of the pump before starting operation.
- 19 When centering the pump shaft, eccentricity with the motor shaft should be no greater than 0.001 in. Use a pump mounting base of sufficient rigidity. The angle error should be no greater than 1°.

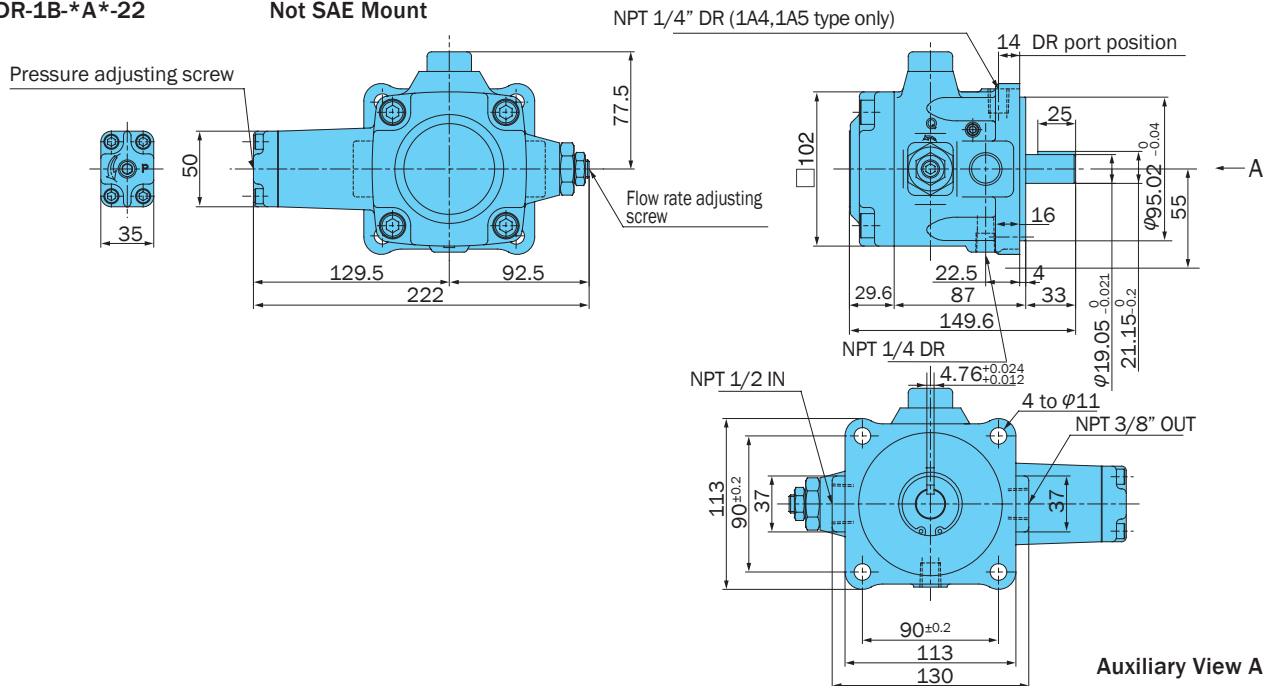
### Installation Dimension Drawings

VDR-0A-1A-\*-10



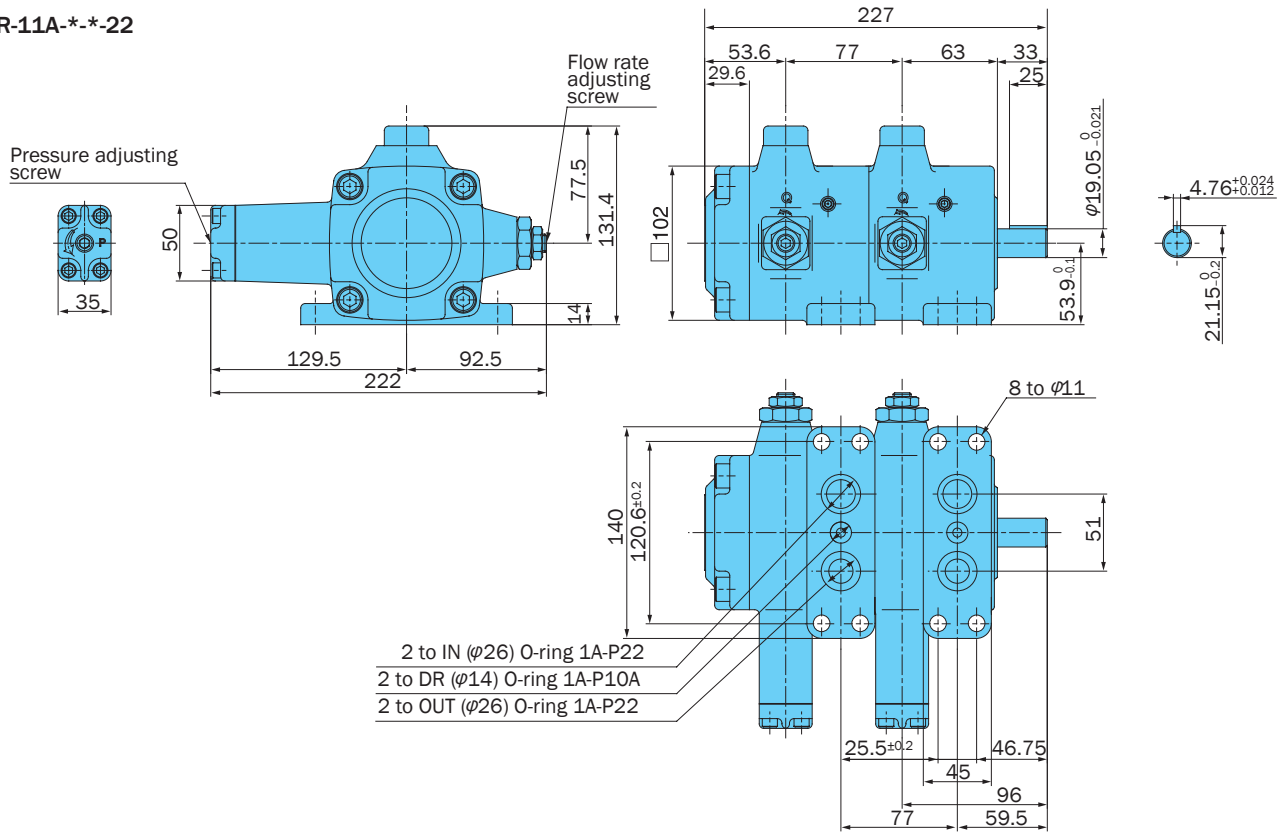
VDR-1B-\*A\*-22

Not SAE Mount



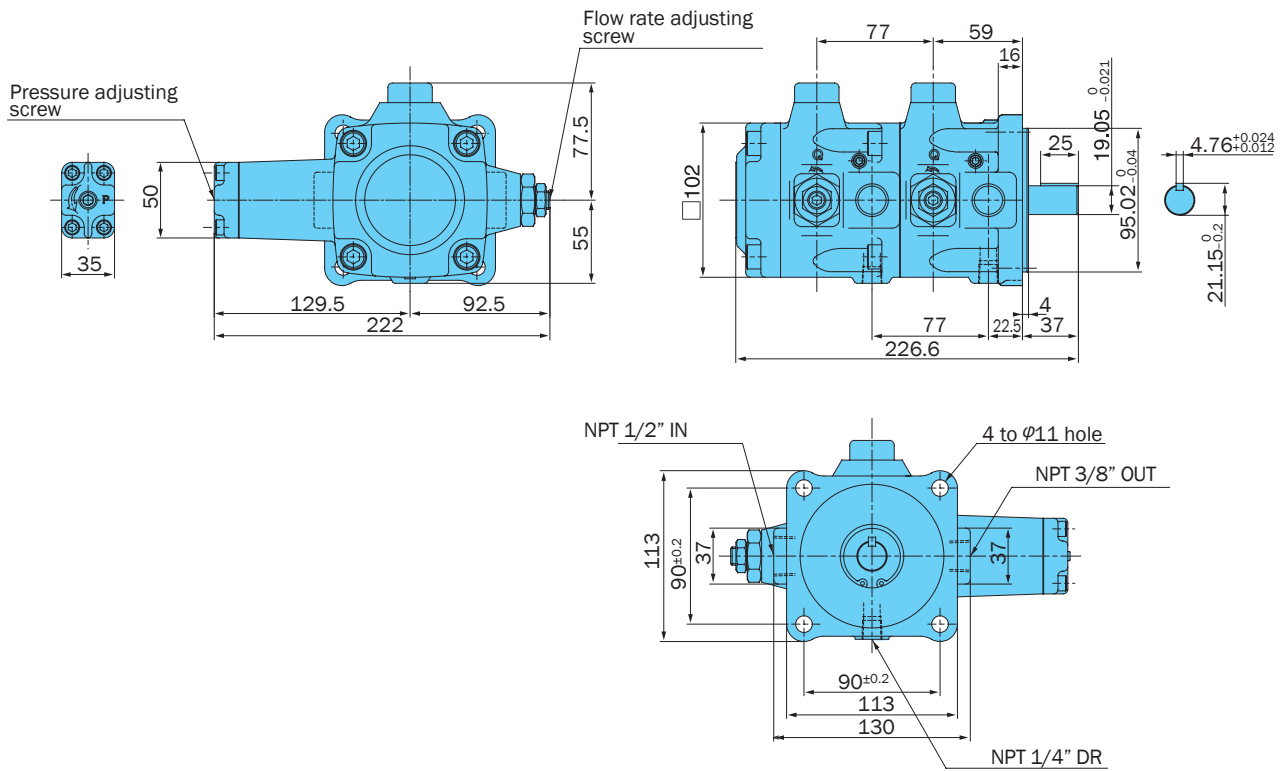


VDR-11A-\*-22



VDR-11B-\*-22

Not SAE Mount



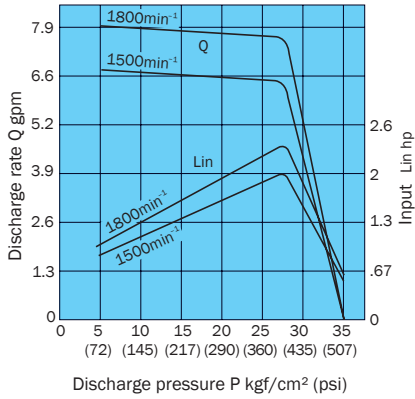
# Performance Curves

Typical characteristics at hydraulic operating fluid kinematic viscosity of 32 centistokes.

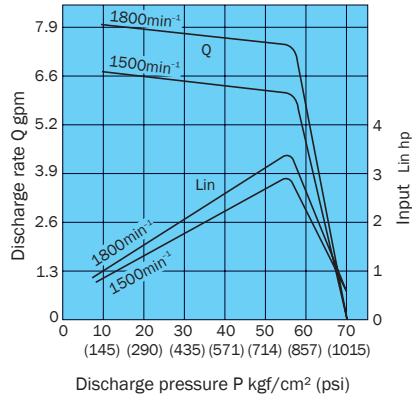
B

Vane Pumps

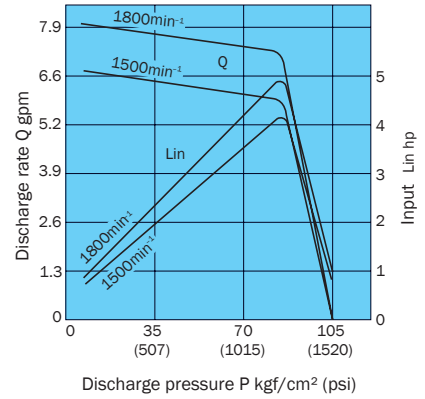
VDR-1\*-1A2-22



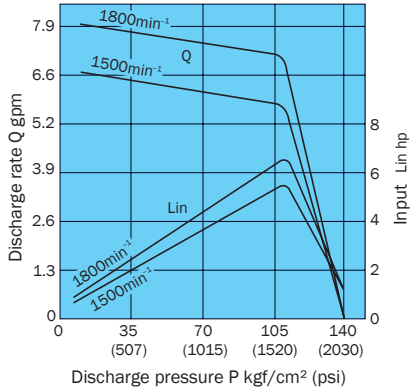
VDR-1\*-1A3-22



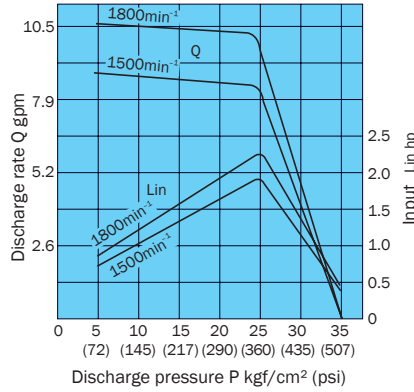
VDR-1\*-1A4-22



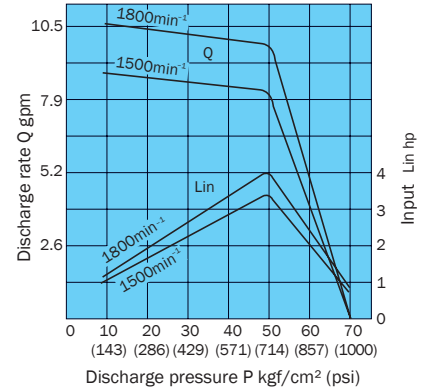
VDR-1\*-1A5-22



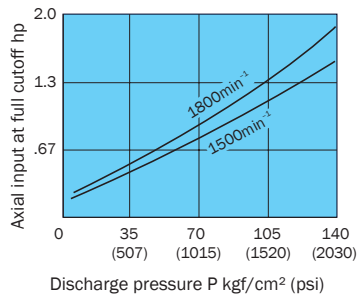
VDR-1\*-2A2-22



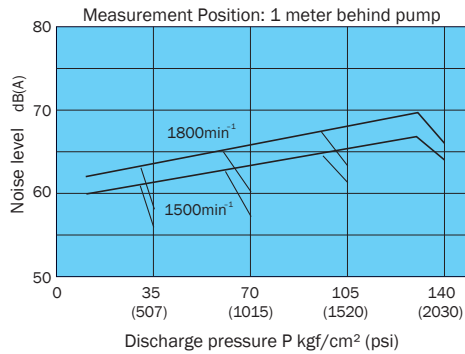
VDR-1\*-2A3-22



Axial Input At Full Cutoff

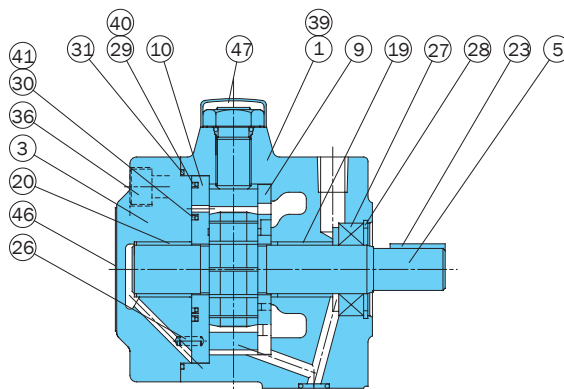
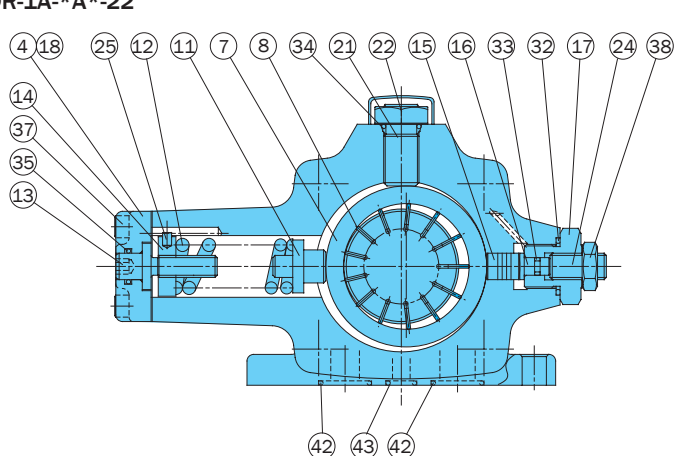


Noise Characteristics



## Cross-Sectional Drawing

VDR-1A-\*A\*-22



### List of Sealing Parts

#### Single Pump

Part No.	Applicable Pump Model No.	VDR-1A-*A*-22	
	Seal Kit Number	VDBS-101A00	
	Part Name	Part Number	Q'ty
18	Packing	VDB32-101000	1
27	Oil seal	ISRD-224211	1
29	Backup ring	VDB34-101000	1
30	Backup ring	VDB34-201000	1
31	O-ring	S85(NOK)	1
32	O-ring	1A-P22	1
33	O-ring	1A-P5	1
34	O-ring	1A-P14	1
35	O-ring	1A-P12	1
40	O-ring	AS568-036	1
41	O-ring	AS568-029	1
42	O-ring	1A-P22	2
43	O-ring	1A-P10A	1

Note:

- Oil seals are manufactured by Nippon Oil Seal Industry Co. Ltd. (NOK).
- O-ring 1A-\*\* refers to JIS B2401-1A-\*\*.
- For VDR-1B-\*A\*-22, the seal kit number becomes VDBS-101B00, without the 42 and 43 O-rings.

#### Double Pump

Part Name	Applicable Pump Model No.	VDR-11A-*A*-22	
	Seal Kit Number	VDBS-111A00	
	Part Name	Part Number	Q'ty
18	Packing	VDB32-101000	2
27	Oil seal	ISRD-224211	1
29	Backup ring	VDB34-101000	2
30	Backup ring	VDB34-201000	2
31	O-ring	S85(NOK)	2
32	O-ring	1A-P22	2
33	O-ring	1A-P5	2
34	O-ring	1A-P14	2
35	O-ring	1A-P12	2
40	O-ring	AS568-036	2
41	O-ring	AS568-029	2
42	O-ring	1A-P22	4
43	O-ring	1A-P10A	2

Note:

- Oil seals are manufactured by Nippon Oil Seal Industry Co. Ltd. (NOK).
- O-ring 1A-\*\* refers to JIS B2401-1A-\*\*.
- For VDR-11B-\*A\*-22, the seal kit number becomes VDBS-111B00, without the 42 and 43 O-rings.

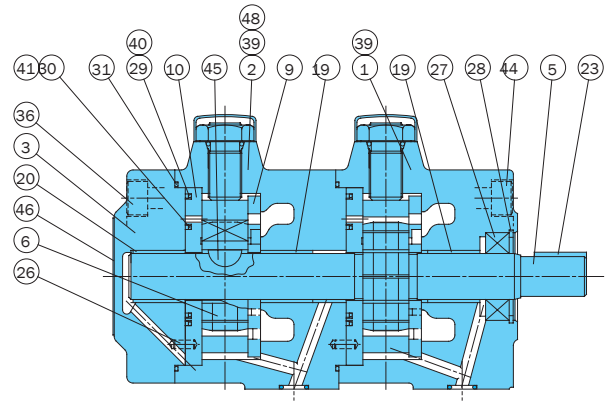
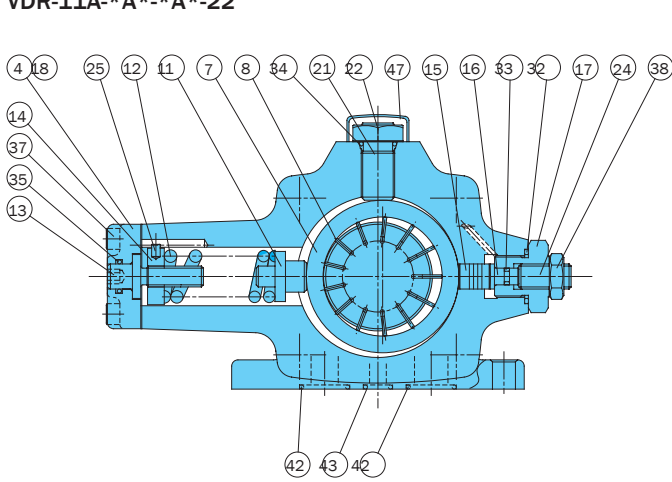
Part No.	Part Name	Part No.	Part Name
1	Body (A)	25	Pin
2	Body (B)	26	Spring pin
3	Cover	27	Oil seal
4	Cover	28	Snap ring
5	Shaft	29	Backup ring
6	Rotor	30	Backup ring
7	Ring	31	O-ring
8	Vane	32	O-ring
9	Plate (S)	33	O-ring
10	Plate (H)	34	O-ring
11	Piston	35	O-ring
12	Spring	36	Screw
13	Screw	37	Screw
14	Nut	38	Nut
15	Piston	39	Plug
16	Holder	40	O-ring
17	Adapter	41	O-ring
18	Packing	42	O-ring
19	Bearing (S)	43	O-ring
20	Bearing (H)	44	Screw
21	Thrust screw	45	Key
22	Nut	46	Nameplate
23	Key	47	Cap
24	Screw	48	Pin

Cartridge Kit:

VDR-1-22; VDBC-101\*A\*

Includes Items: 5, 7, 8, 9, 10, 23, 25

VDR-11A-\*A\*-\*A\*-\*22



**Uni-Pump Specifications**

(CE mark standard compliant)

Understanding Model Numbers

Single Pump

**UVD - 1 A - 2 A 2 - 1.5 - 4 - 40**

- Design Number - E=NPT
- Number of Motor Poles: 4 (P) 200V  
4 (G) 230V  
4 (M) 460V
- Motor Output kw (hp)  
0.75, 1.5, 2.2, 3.7 (1, 2, 3, 5)
- Pressure Adjustment Range  
2: 15.3 to 35.7kgf/cm<sup>2</sup> (217 to 507)  
3: 30.6 to 71.4kgf/cm<sup>2</sup> (435 to 1015)
- Flow Characteristics A: Constant Discharge Type
- Ring Size  
None: 7.9 gpm } at 1800min<sup>-1</sup>  
2 : 10.5 gpm }
- A: Foot Type Mounting
- Pump Size 1: VDR-1B (22D)
- Pump Type: VDR (220) Series Uni-Pump

Double Pump

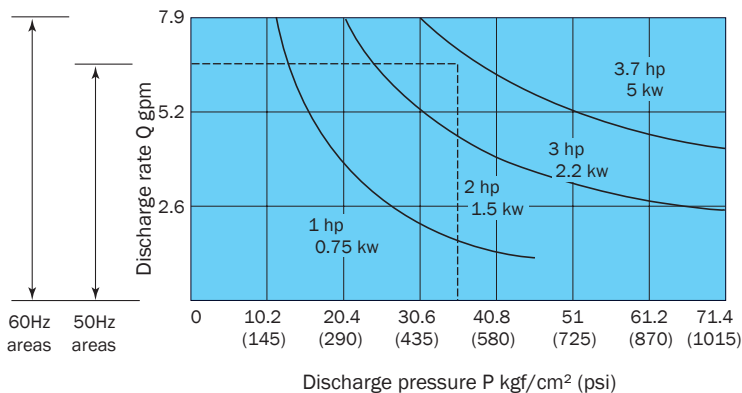
**UVD - 11 A - 2 A 2 - 2 A 2 - 3.7 - 4 - 40**

- Design Number - E=NPT
- Number of Motor Poles: 4 (P) 200V  
4 (G) 230V  
4 (M) 460V
- Motor Output kw (hp)  
1.5, 2.2, 3.7 (2, 3, 5)
- Shaft Side Pump Pressure Adjustment Range  
2: 15.3 to 35.7kgf/cm<sup>2</sup> (217 to 507)  
3: 30.6 to 71.4kgf/cm<sup>2</sup> (435 to 1015)
- Shaft Side Pump Flow Rate Characteristics  
A: Constant Discharge Type
- Shaft Side Pump Ring Size  
None: 7.9 gpm } at 1800min<sup>-1</sup>  
2 : 10.5 gpm }
- Head Side Pump Pressure Adjustment Range:  
Same as the shaft side pump
- Head Side Pump Flow Rate Characteristics  
A: Constant Discharge Type
- Head Side Pump Ring Size  
None: 7.9 gpm } at 1800min<sup>-1</sup>  
2 : 10.5 gpm }
- A: Foot Type Mounting
- Pump Size 11: VDR-11B (22D)
- Pump Type: VDR (220) Series Uni-Pump

Specifications

Model No.	Maximum Working Pressure kgf/cm <sup>2</sup> (psi)	Maximum Flow Rate gpm (A*)		Maximum Flow Rate gpm (2A*)	
		50Hz	60Hz	50Hz	60Hz
UVD-1A	71.4 (1015)	6.6	7.9	8.7	10.5
UVD-11A	71.4 (1015)				

**Motor Selection Curves**



\* Select a uni-pump that has a pressure and flow rate that is within the range of the drive so that the drive will not overload.

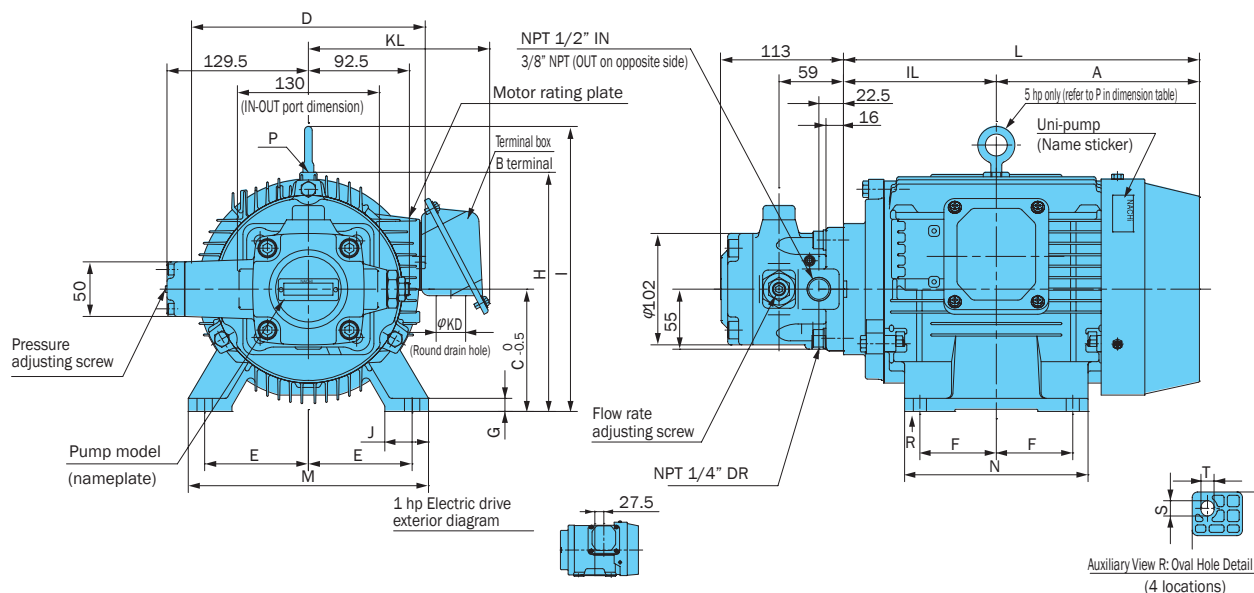
• **Selecting a motor**  
The area under a motor output curve in the graph to the left is the operating range for that motor under the rated output for that motor.

Example:  
To find the motor that can produce pressure of 435 psi and a discharge rate of 6.6 gpm.

Selection Process:  
Since the intersection of the two broken lines from a pressure of 435 psi and discharge rate of 6.6 gpm intersect in the area under the 3 hp curve, it means that a 3 hp motor should be used. In the case of a double pump configuration, select a motor that is larger than the total power required by both pumps.

**Installation Dimension Drawings**

**UVD-1A**



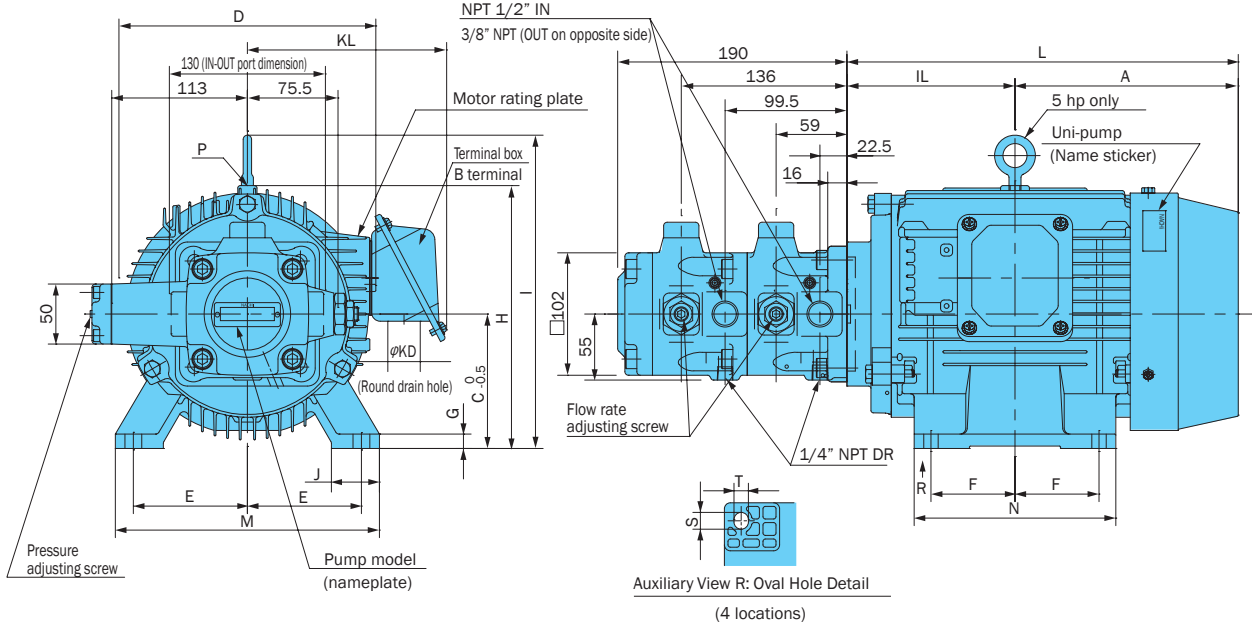
Uni-pump	Motor Dimensions mm																Frame No.	Output hp (4 poles)	Weight lbs	
	A	IL	C	D	E	F	G	H	I	J	L	M	N	S × T	KD	KL				O
UVD-1A-A2-0.75-4-40	133	105	80	170	62.5	50	4.5	165	-	35	238	165	130	18 × 10	φ27	157	27.5	80M	1	53
UVD-1A-A2-1.5-4-40	143	118.5	90	198	70	62.5	10	190	-	40	261.5	176	150	12 × 10	φ27	159	-	90L	2	55
UVD-1A-A3-1.5-4-40																				
UVD-1A-2A2-1.5-4-40	157.5	133	100	198	80	70	12	200	-	40	290.5	200	168	14 × 12	φ27	159	-	100L	3	66
UVD-1A-A2-2.2-4-40																				
UVD-1A-A3-2.2-4-40																				
UVD-1A-2A2-2.2-4-40	186	140	112	214	95	70	12	-	261	40	326	220	168	14 × 12	φ27	166	-	112M	5	80
UVD-1A-A3-3.7-4-40																				
UVD-1A-2A2-3.7-4-40																				
UVD-1A-2A3-3.7-4-40																				

- 1 - 3 hp model does not have hangers.
- 1. Standard drive motor is the fully enclosed fan-cooled B type.
- 2. Standard voltage for drive motor is 200 VAC, 50/60 Hz or 220 VAC, 60 Hz.
- 3. Standard terminal box is B terminal (right side viewed from pump).
- 4. See page A-21 for the characteristics of the drive motor for the unipump (domestic standard 3 rating).

UVD-11A

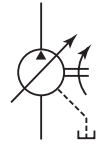
B

Vane Pumps



Uni-Pump	Motor Dimensions mm																	Frame No.	Output hp (4 poles)	Weight lbs	
	A	IL	C	D	E	F	G	H	I	J	L	M	N	S × T	KD	KL	O				
UVD-11A-A2-A2-1.5-4-40	143	118.5	90	198	70	62.5	10	190	-	40	261.5	176	150	12 × 10	φ27	159	-	90L	2	73	
UVD-11A-A2-A3-1.5-4-40																					
UVD-11A-A3-A3-1.5-4-40																					
UVD-11A-A2-A2-2.2-4-40	157.5	133	100	198	80	70	12	200		40	290.5	200	168	14 × 12	φ27	159	-	100L	3	84	
UVD-11A-A2-A3-2.2-4-40																					
UVD-11A-A3-A3-2.2-4-40																					
UVD-11A-2A2-2A2-2.2-4-40																					
UVD-11A-A2-A2-3.7-4-40	186	140	112	214	95	70	12	-	261	40	326	220	168	14 × 12	φ27	166	-	112M	5	97	
UVD-11A-A2-A3-3.7-4-40																					
UVD-11A-A3-A3-3.7-4-40																					
UVD-11A-2A2-2A2-3.7-4-40																					
UVD-11A-2A2-2A3-3.7-4-40																					

1. 2 to 3 hp model does not have hangers.
1. Standard drive motor is the fully enclosed fan-cooled B type.
2. Standard voltage for drive motor is 200 VAC, 50/60 Hz or 220 VAC, 60 Hz.
3. Standard terminal box is B terminal (right side viewed from pump).
4. See page A-21 for the characteristics of the drive motor for the unipump (domestic standard 3 rating).



### VDR13 Design Series Variable Volume Vane Pump

5.2 to 11.8 gpm  
870 psi

The new design number 13 was created by modifying some of the components of old design numbers 11 and 12, and the new design installation is compatible with the old design.

#### Features

**Energy efficient, economical operation**

**Built-in high-precision temperature compensation mechanism**

The ring is displaced by a spring, and a rise in pressure automatically moves it to the center to make the discharge rate zero.

Relief valve and unloading valve can be eliminated from the circuit.

It was possible to reduce the size of the unit because there was no increase of proportional input to pressure which prevented increases in the temperature of the fluid.

**New design for lower noise and improved durability**

• Handling

- 1 Rotation Direction The direction of rotation is always clockwise (rightward) when viewed from the shaft side.
- 2 Drain Drain piping must be direct piping up to a point that is below the tank fluid level, and back pressure due to pipe resistance should not exceed 4.35 psi.

#### Specifications

##### Single Pump

Model No.	Capacity in <sup>3</sup> /rev	No-load Discharge Rate (gpm)				Pressure Adjustment Range kgf/cm <sup>2</sup> (psi)	Allowable Peak Pressure kgf/cm <sup>2</sup> (psi)	Revolution Speed min <sup>-1</sup>		Weight lbs
		1000min <sup>-1</sup>	1200min <sup>-1</sup>	1500min <sup>-1</sup>	1800min <sup>-1</sup>			Min.	Max.	
VDR-1A(B) -1A1-13 -1A2- -1A3-	.84	3.6	4.3	5.5	6.6	10.2 ~ 20.6 (145 ~ 290)	143 (2030)	800	1800	17.6
	.84	3.6	4.3	5.5	6.6	15.3 ~ 35.7 (217 ~ 507)				
	.67	2.9	3.9	4.5	5.2	30.6 ~ 61.2 (435 ~ 870)				
VDR-2A(B) -1A1-13 -1A2- -1A3-	1.5	6.6	7.9	10	11.8	10.2 ~ 20.6 (145 ~ 290)	143 (2030)	800	1800	46
	1.5	6.6	7.9	10	11.8	15.3 ~ 35.7 (217 ~ 507)				
	1.3	5.8	7.0	8.9	10.5	30.6 ~ 61.2 (435 ~ 870)				

##### Double Pump

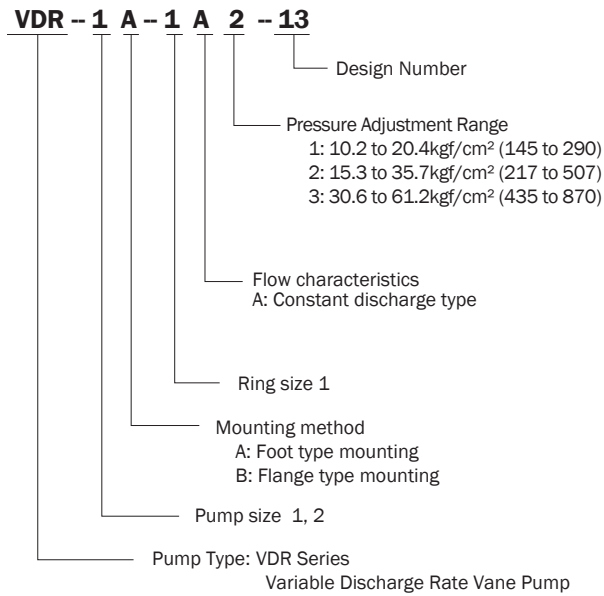
Model No.	Vent Side		Shaft Side		Vent Side	Shaft Side	Revolution Speed min <sup>-1</sup>		Weight lbs
	Discharge Rate gpm	Pressure Adjustment Range kgf/cm <sup>2</sup> (psi)	Discharge Rate gpm	Pressure Adjustment Range kgf/cm <sup>2</sup> (psi)	Allowable Peak Pressure kgf/cm <sup>2</sup> (psi)		Min.	Max.	
VDR-11A(B)-1A1-1A1-13 VDR-11A(B)-1A1-1A2-13 VDR-11A(B)-1A1-1A3-13	6.6	10.2 ~ 20.6 (145 ~ 290)	6.6	10.2 ~ 20.6 (145 ~ 290) 15.3 ~ 35.7 (217 ~ 507) 30.6 ~ 51 (435 ~ 725)	143 (2030)		800	1800	A : 30 B : 30
		15.3 ~ 35.7 (217 ~ 507)	6.6	15.3 ~ 35.7 (217 ~ 507) 30.6 ~ 51 (435 ~ 725)	143 (2030)				
		30.6 ~ 51 (435 ~ 725)	5.2	30.6 ~ 51 (435 ~ 725)	143 (2030)				
VDR-11A(B)-1A3-1A3-13	5.2	30.6 ~ 51 (435 ~ 725)	5.2	30.6 ~ 51 (435 ~ 725)	143 (2030)				

- Note:
1. The discharge rate is the value at 1800min<sup>-1</sup> no-load.
  2. In addition to this model, the VDC Series (maximum working pressure: 2030 psi) high-pressure variable vane pump is also available. See page B-25 for more information.
  3. The change from VDR-1 Series design number 11 to design number 12 represents a change in the shaft key width from .125 in. to .187 in. This means that when using a .125 in. key coupling, you need to use a stepped key (VD31J-302000) or add a new key groove at .187 in.
  4. There is no change in the mounting method with the change from the VDR-1 size design number 12 and VDR-2 design number 11 to design number 13.

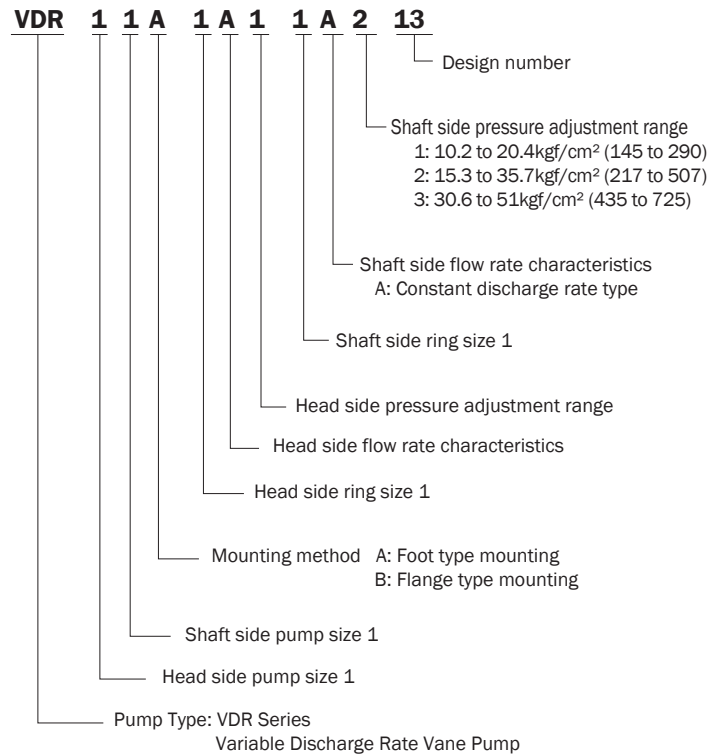


## Understanding Model Numbers

### Single Pump



### Double Pump



#### 3 Discharge Volume Adjustment

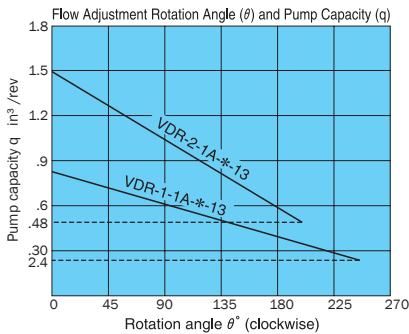
The discharge flow rate is decreased by clockwise (rightward) rotation of the discharge rate adjusting screw, and increased by counterclockwise (leftward) rotation. Loosen the lock nut before making adjustments. After adjustment is complete, re-tighten the lock nut. The graph below provides general guidelines for the relationship between the rotation angle of the flow rate adjusting screw and the no-load discharge rate.

However:  

$$Q: \text{Flow rate gpm} = \frac{\text{in}^3 \times \text{rpm}}{231}$$

#### 4 Pressure Adjustment

Pressure is decreased by clockwise (rightward) rotation of the discharge rate adjusting screw, and increased by counterclockwise (leftward) rotation.



#### 5 Factory Default P-Q Settings (Standard Model)

- Flow Rate Setting = Maximum flow rate for model as indicated in the catalog
- Pressure Setting = Pressure shown in table to the right

Factory Default Pressure Settings kgf/cm <sup>2</sup> (psi)
1: 20.4 (290)
2: 35.7 (507)
3: 30.6 (435)

#### 6 Initial Operation

Before operating the pump for the first time, put the pump discharge side into the no-load state and then repeatedly start and stop the motor to bleed all air from inside the pump and the suction piping. After confirming that the pump is discharging oil, continue the no-load operation for at least 10 minutes to discharge all the air from the circuit. Provide an air bleed valve in circuits where it is difficult to bleed air before startup.

#### 7 Sub Plate

When a sub plate is required, specify a sub-plate type from the table in the installation dimension diagram.

#### 8 For the hydraulic operating fluid, use an R&O type and wear-resistant type of ISO VG32 to 68 or equivalent (viscosity index of at least 90). Use hydraulic operating

Note) The values indicated above are at maximum pump discharge volume with the flow volume adjusting screw at the 0° position. The broken line shows the flow volume adjustment range lower limit value.

fluid that provides kinematic viscosity during operation in the range of 20 to 150 centistokes.

- 9 The operating temperature range is 59 to 140 °F. When the oil temperature at startup is 59 °F or less, perform a warm-up operation at low pressure and low speed until the oil temperature reaches 59 °F. Use the pump in an area where the temperature is within the range of 32 to 140 °F.
- 10 Suction pressure is 4.35 psi, and the suction port flow rate should be to greater than 6 ft/sec.

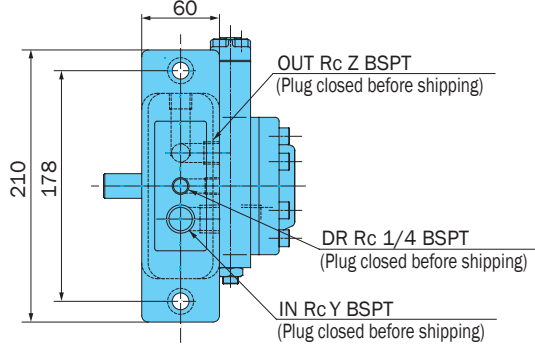
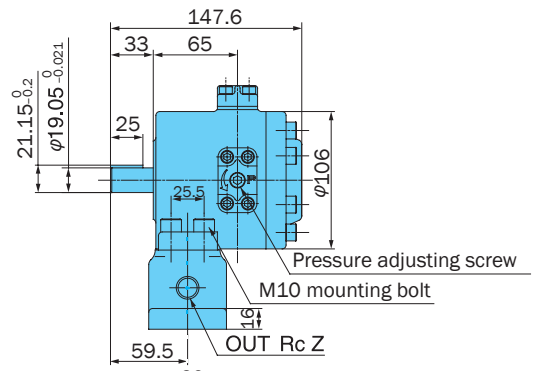
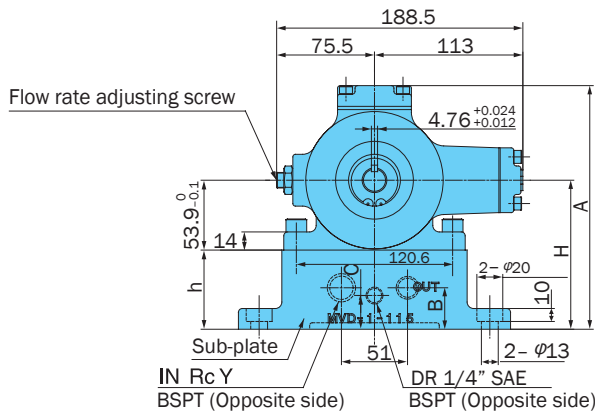
- 11 Avoid pulley, gear, and other drive systems that impart a radial or thrust load on the end of the pump shaft. Mount the pump so its pump shaft is oriented horizontally.
- 12 Provide a suction strainer with a filtering grade of about 100µm (150 mesh). For the return line to the tank, use a 10µm line filter.
- 13 Manage hydraulic operating fluid so contamination is maintained at class NAS10 or lower. Take care to avoid contamination with water and other foreign matter, and watch out for

- discoloration. Whitish fluid indicates that air has contaminated the fluid, and brownish fluid indicates the fluid is dirty.
- 14 At startup, repeat the inching operation (start-stop) to bleed air from the pump and pipes.
- 15 Equip an air bleed valve in circuits where it is difficult to bleed air before startup. See page C-13 for more information.
- 16 To ensure proper lubrication of the pump's rubbing surfaces, supply oil to the interior of the pump before

- starting operation.
- 17 When centering the pump shaft, eccentricity with the motor shaft should be no greater than 0.05mm. Use a pump mounting base of sufficient rigidity. The angle error should be no greater than 1°.

### Installation Dimension Drawings

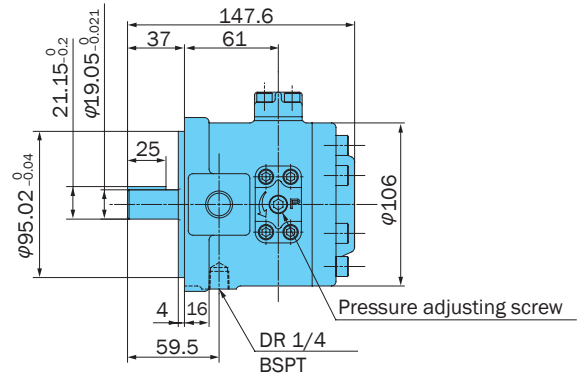
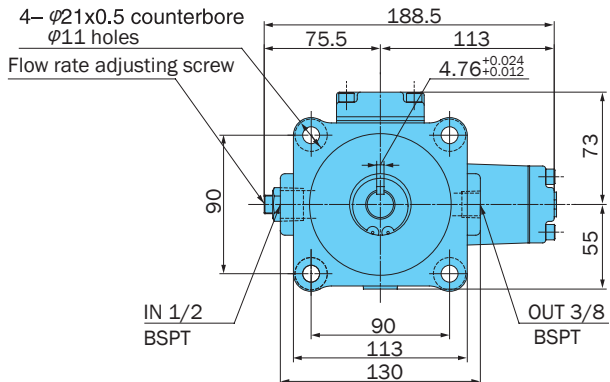
#### VDR-1A-\*-13 (Foot Mounting)



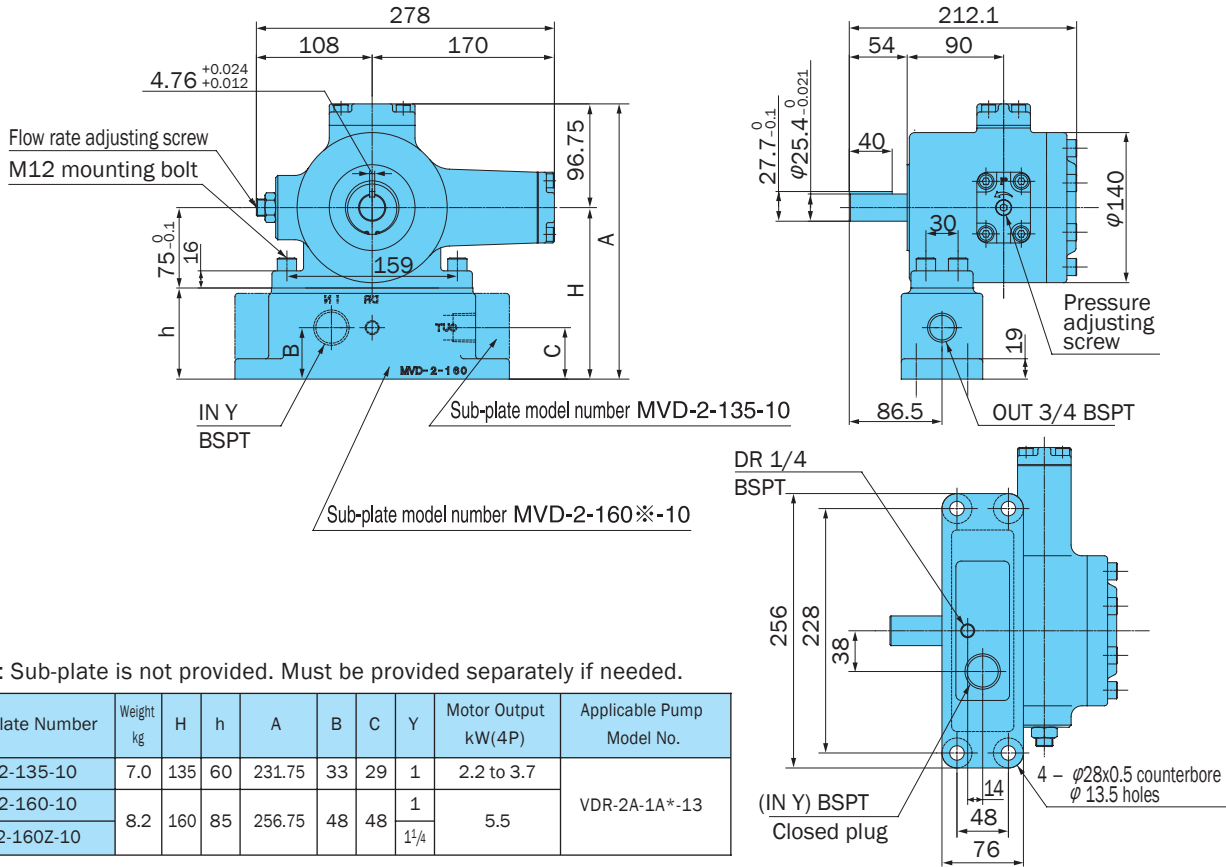
Note: Sub-plate is not provided. Must be provided separately if needed.

Sub Plate Number	Weight lb	H	h	A	B	C	Y	Z	Motor Output hp (4P)
MVD-1-115-10	8	115	61.1	188	32	26	1/2	3/8	1 to 2
MVD-1-115Y-10							3/4	1/2	
MVD-1-135-10	10.8	135	81.1	208	40	40	1/2	3/8	3 to 5
MVD-1-135Y-10							3/4	1/2	

#### VDR-1B-\*-13 (Flange Mounting) Not SAE Mount



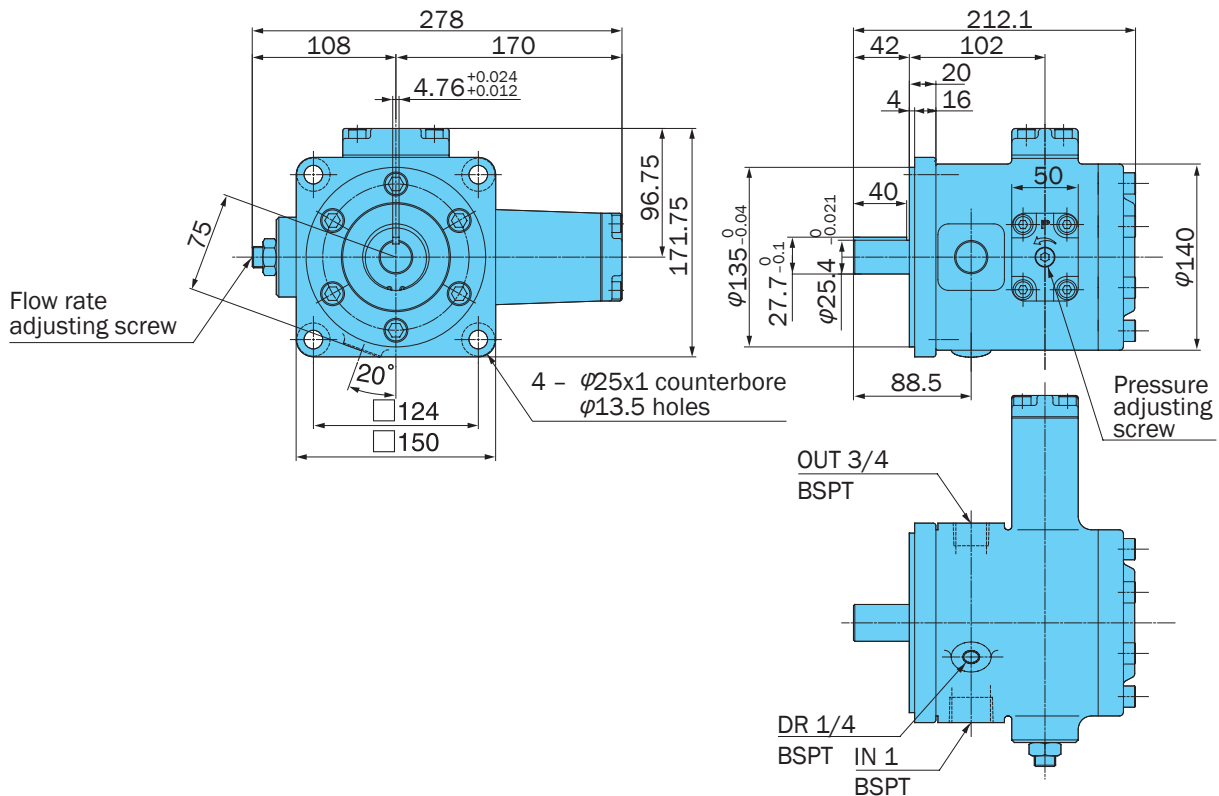
VDR-2A-\*-13 (Foot Mounting)



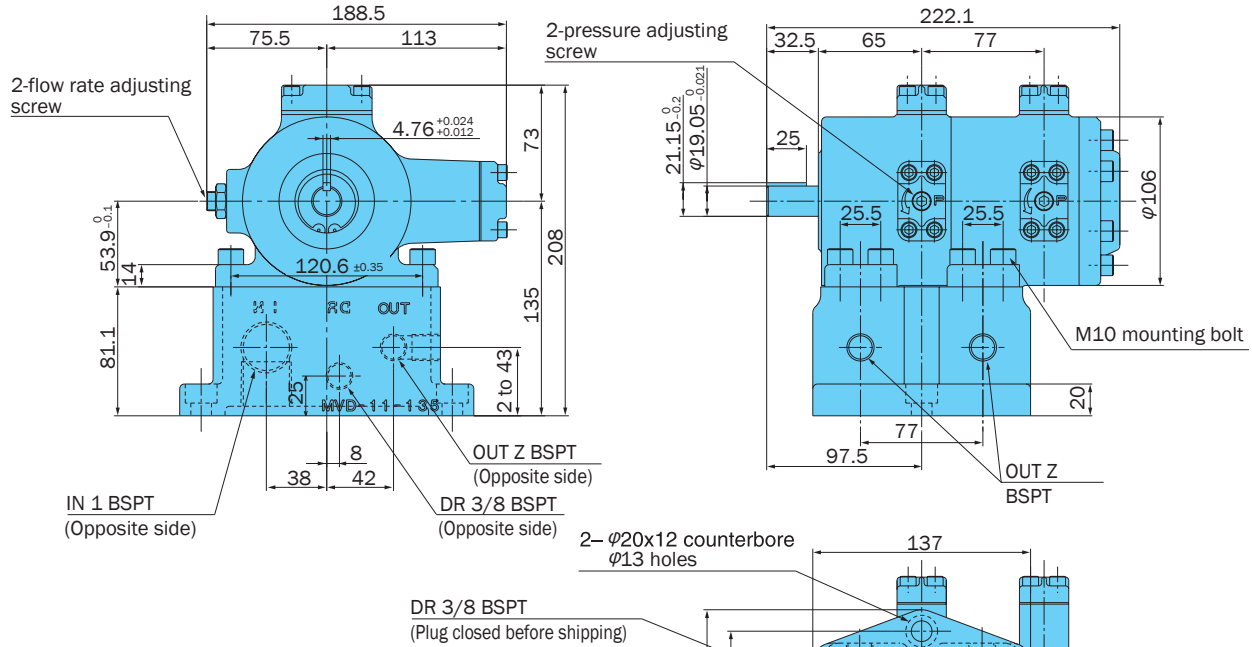
Note: Sub-plate is not provided. Must be provided separately if needed.

Sub Plate Number	Weight kg	H	h	A	B	C	Y	Motor Output kW(4P)	Applicable Pump Model No.
MVD-2-135-10	7.0	135	60	231.75	33	29	1	2.2 to 3.7	VDR-2A-1A*-13
MVD-2-160-10	8.2	160	85	256.75	48	48	1	5.5	
MVD-2-160Z-10							1 1/4		

VDR-2B-\*-13 (Flange Mounting) Not SAE Mount



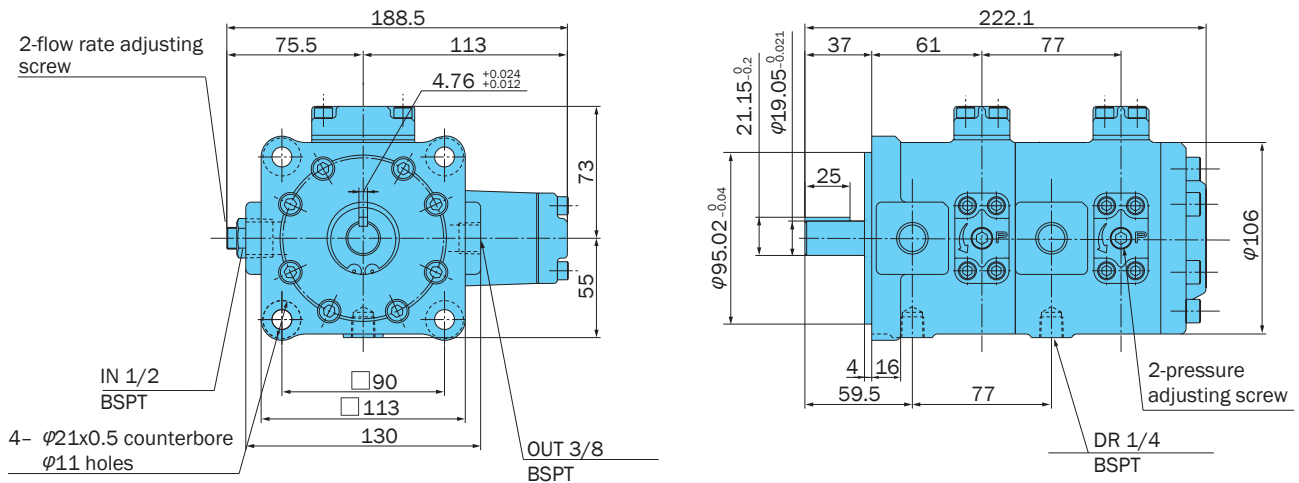
**VDR-11A-\*-13 (Foot Mounting)**



Note: Sub-plate is not provided. Must be provided separately if needed.

Sub Plate Number	Z	Weight lbs	Applicable Pump Model No.
MVD-11-135-10	3/8	10.3	VDR-11A-1A-*-1A*-13
MVD-11-135X-10	1/2		

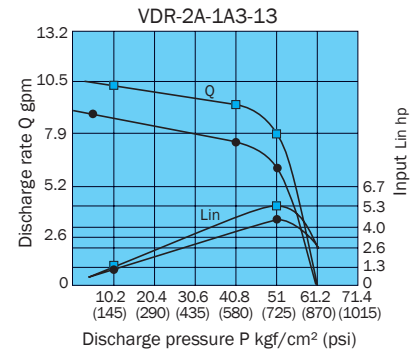
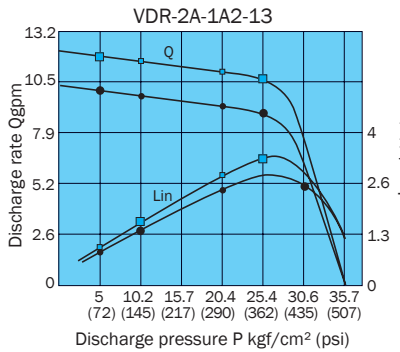
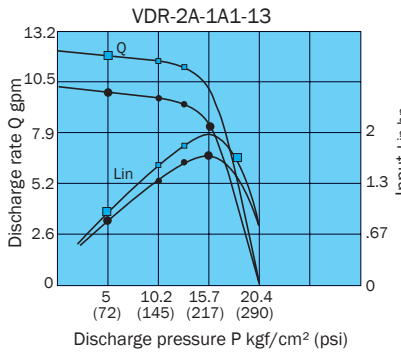
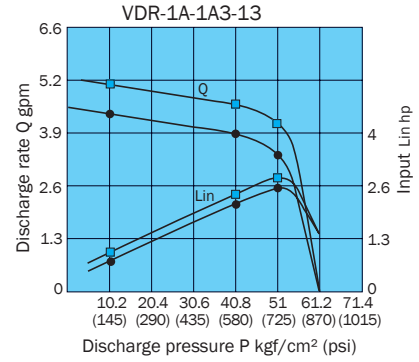
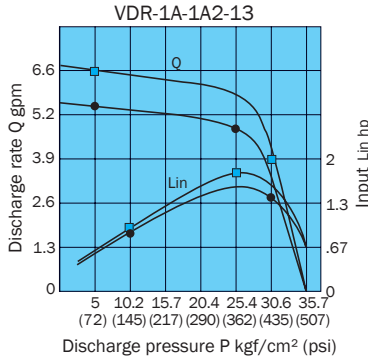
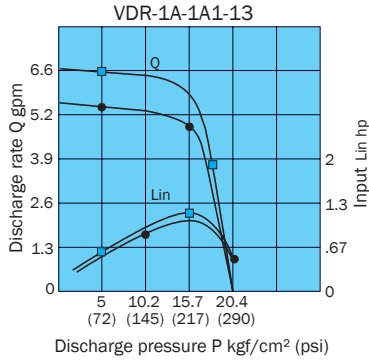
**VDR-11B-\*-13 (Flange Mounting) Not SAE Mount**



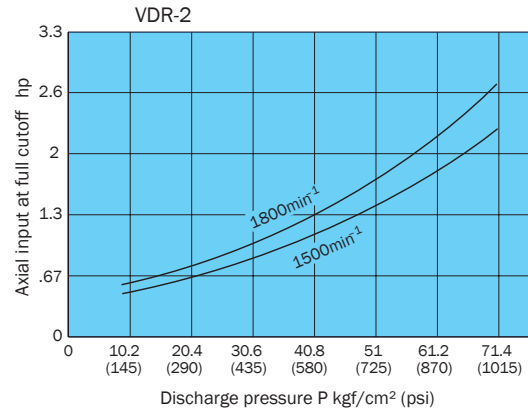
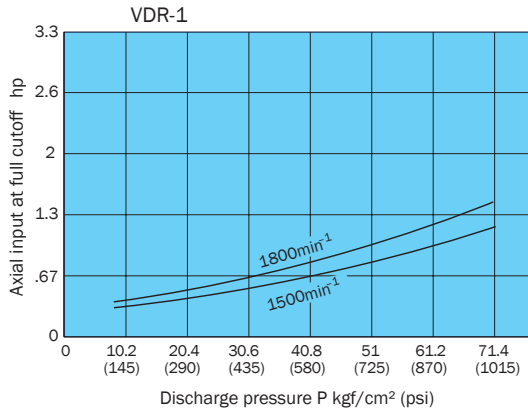
# Performance Curves

Typical characteristics at hydraulic operating fluid kinematic viscosity of 32 centistokes.

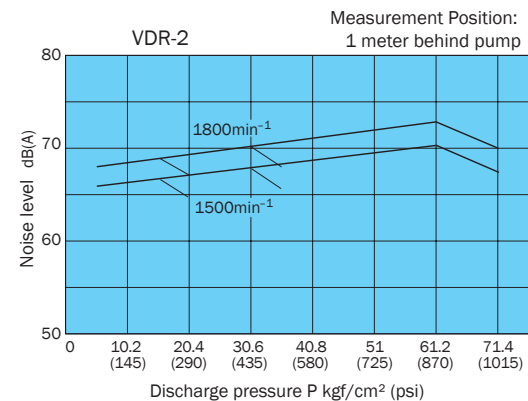
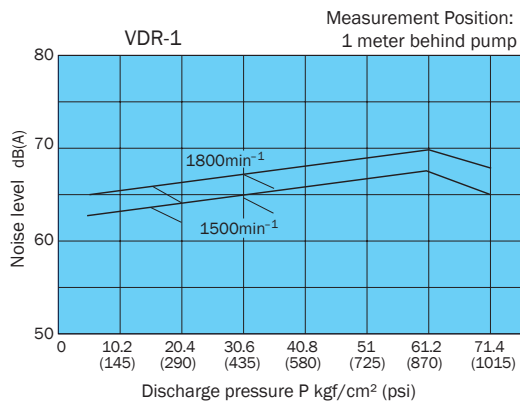
Revolution Speed  $1500\text{min}^{-1}$  —●—  
 $1800\text{min}^{-1}$  —□—



## Axial Input At Full Cutoff

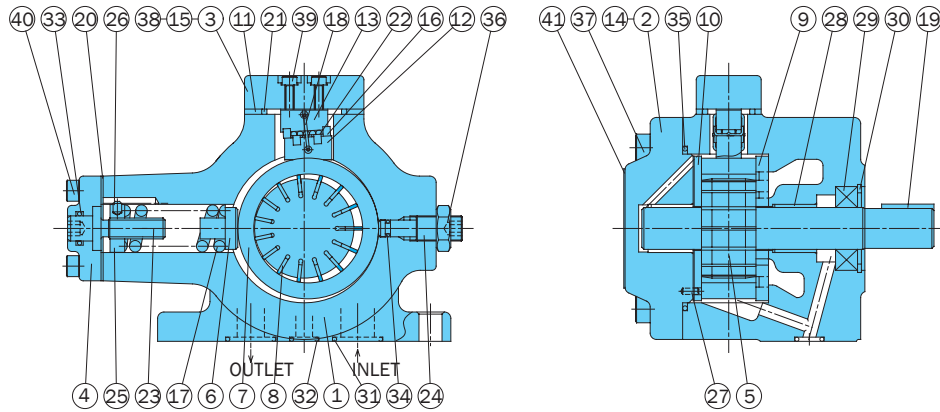


## Noise Characteristics



**Cross-sectional Drawing**

VDR-1A-\*-13  
VDR-2A-\*-13



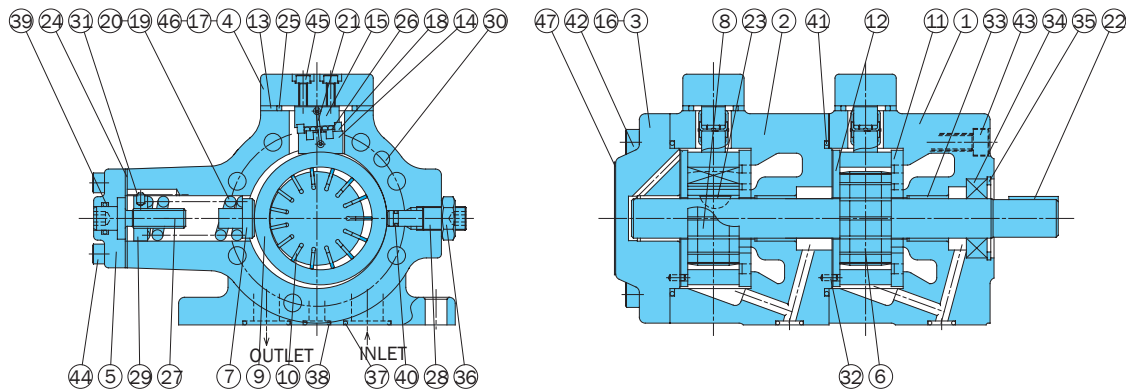
**List of Sealing Parts**

Part No.	Applicable Pump Model No.	VDR-1A-*-13		VDR-2A-*-13	
	Seal Kit Number	VDAS-101A00		VDAS-102A00	
	Part Name	Part Number	Q'ty	Part Number	Q'ty
20	Packing	VD32J-101000	1	VD32J-102000	1
21	Square ring	VD33J-101000	1	1A-G45	1
29	Oil seal	ISRD-204010	1	ISP-284811	1
31	O-ring	1A-P20	2	1A-G30	2
32	O-ring	1A-P10A	1	1A-P12	1
33	O-ring	1A-P12	1	1A-P14	1
34	O-ring	1A-P5	1	1A-P9	1
35	O-ring	1A-G70	1	1A-G100	1

Part No.	Part Name	Part No.	Part Name	Part No.	Part Name
1	Body	15	Shim	29	Oil seal
2	Cover	16	Retainer	30	Snap ring
3	Cover	17	Spring	31	O-ring
4	Cover	18	Spring	32	O-ring
5	Shaft	19	Key	33	O-ring
6	Piston	20	Packing	34	O-ring
7	Ring	21	Square ring (O-ring)	35	O-ring
8	Vane	22	Needle	36	Nut
9	Plate (S)	23	Screw	37	Screw
10	Plate (H)	24	Screw	38	Screw
11	Plate	25	Nut	39	Screw
12	Holder	26	Pin	40	Screw
13	Holder	27	Pin	41	Nameplate
14	Shim	28	Bearing		

Note: 1. Oil seals are manufactured by Nippon Oil Seal Industry Co. Ltd. (NOK)  
2. O-ring 1A-\*\* refers to JIS B2401-1A-\*\*.  
3. For VDR-\*B-\*-13, the seal kit number becomes VDBS-10\*B00, without the 31 and 32 O-rings.

**VDR-11A-\*-13**



**List of Sealing Parts**

Part No.	Applicable Pump Model No.	VDR-11A-*-13	
	Seal Kit Number	VDAS-111A00	
	Part Name	Part Number	Q'ty
24	Packing	VD32J-101000	2
25	Square ring	VD33J-101000	2
34	Oil seal	ISRD-204010	1
37	O-ring	1A-P20	4
38	O-ring	1A-P10A	2
39	O-ring	1A-P12	2
40	O-ring	1A-P5	2
41	O-ring	1A-G70	2

Part No.	Part Name	Part No.	Part Name	Part No.	Part Name	Part No.	Part Name
1	Body	11	Plate (S)	21	Spring	31	Pin
2	Body	12	Plate (H)	22	Key	32	Pin
3	Cover	13	Plate	23	Key	33	Bearing
4	Cover	14	Holder	24	Packing	34	Oil seal
5	Cover	15	Holder	25	Square ring	35	Snap ring
6	Shaft	16	Shim	26	Needle	36	Nut
7	Piston	17	Shim	27	Screw	37	O-ring
8	Rotor	18	Retainer	28	Screw	38	O-ring
9	Ring	19	Spring	29	Nut	39	O-ring
10	Vane	20	Spring	30	Pin	40	O-ring
						41	O-ring
						42	Screw
						43	Screw
						44	Screw
						45	Screw
						46	Screw
						47	Nameplate

Note: 1. Oil seals are manufactured by Nippon Oil Seal Industry Co. Ltd. (NOK).  
2. O-ring 1A-\*\* refers to JIS B2401-1A-\*\*.  
3. For VDR-11B-\*-13, the seal kit number becomes VDBS-111B00, without the 37 and 38 O-rings.

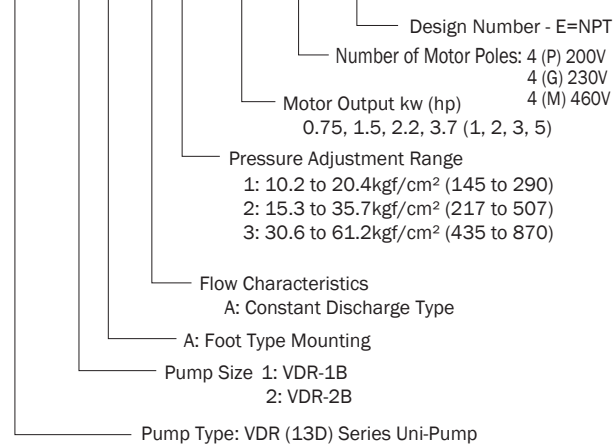
# Performance Curves

(CE mark standard compliant)

## Understanding Model Numbers

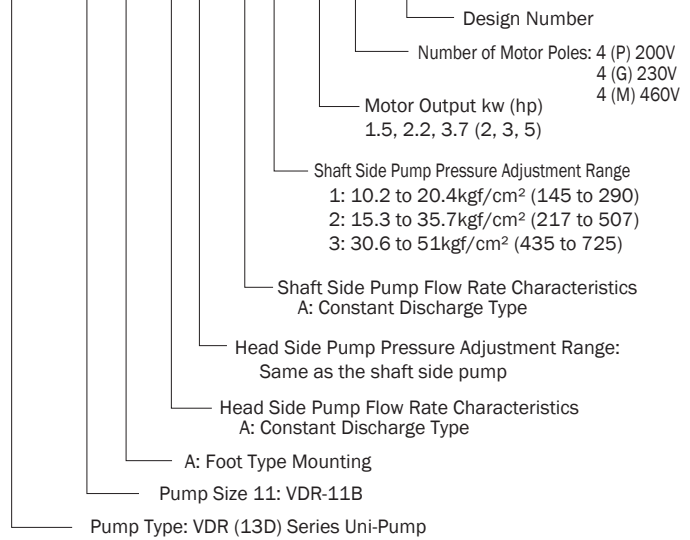
### Single Pump

**UVD - 1 A - A 2 - 1.5 - 4 - 30**



### Double Pump

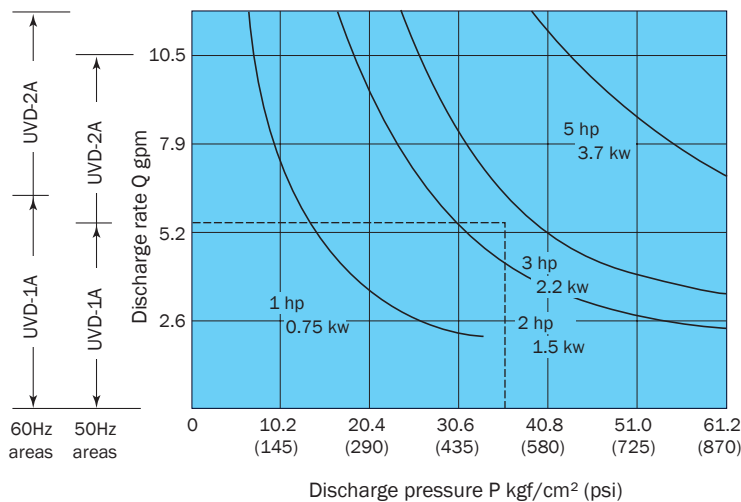
**UVD - 11 A - A \* - A \* - \* - 4 - 30**



## Specifications

Model No.	Maximum Working Pressure kgf/cm <sup>2</sup> (psi)	Maximum Flow Rate gpm	
		50Hz	60Hz
UVD- 1A	61.2 (870)	5.5	6.6
UVD- 2A	51.0 (725)	10	11.8
UVD- 11A	51.0 (725)	5.5	6.5-6.6

## Motor Selection Curves



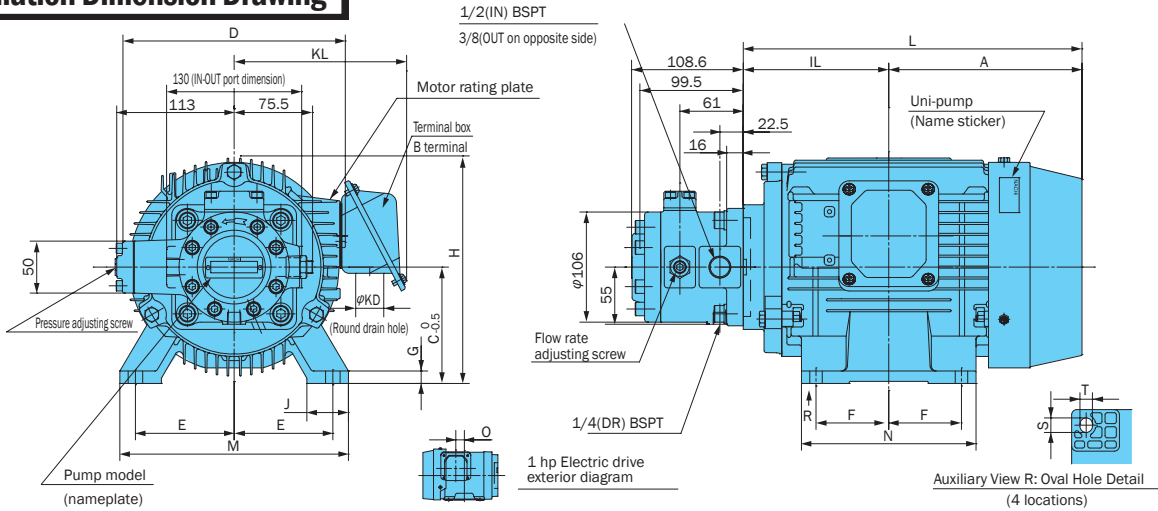
- Selecting a motor
- The area under a motor output curve in the graph to the left is the operating range for that motor under the rated output for that motor.
- Example:  
To find the motor that can produce pressure of 507 psi and a discharge rate of 5.5 gpm.
- Selection Process:  
Since the intersection of the two broken lines from a pressure of 507 psi and discharge rate of 5.5 gpm intersect in the area under the 3 hp curve, it means that a 3 hp motor should be used. In the case of a double pump configuration, select a motor that is larger than the total power required by both pumps.

\*Select a uni-pump that has a pressure and flow rate that is within the range of the drive so that the drive will not overload.



### Installation Dimension Drawing

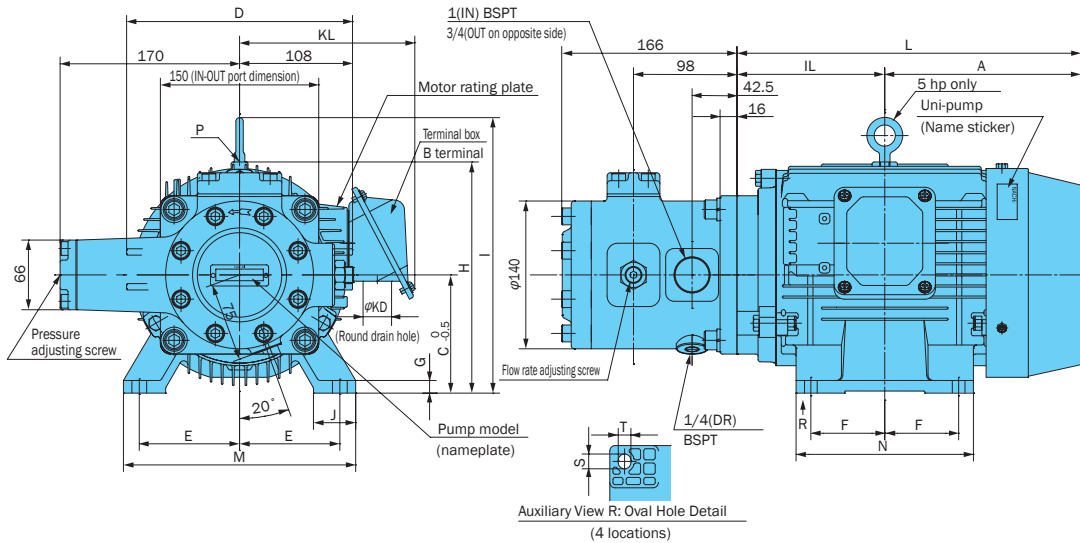
#### UVD-1A



Uni-pump	Motor Dimensions mm																Frame No.	Output hp (4poles)	Weight lbs	
	A	IL	C	D	E	F	G	H	J	L	M	N	S×T	KD	KL	O				
UVD-1A-A1-0.75-4-30	133	105	80	170	62.5	50	4.5	165	35	238	165	130	18×10	φ27	157	27.5	80M	1	50	
UVD-1A-A2-0.75-4-30																				
UVD-1A-A2-1.5-4-30	143	118.5	90	198	70	62.5	10	190	40	261.5	176	150	12×10	φ27	159	-	90L	2	53	
UVD-1A-A3-1.5-4-30																				
UVD-1A-A3-2.2-4-30	157.5	133	100	198	80	70	12	200	40	290.5	200	168	14×12	φ27	159	-	100L	3	64	

- No hanger.
- Standard drive motor is the fully enclosed fan-cooled B type.
  - Standard voltage for drive motor is 200 VAC, 50/60 Hz or 220 VAC, 60 Hz.
  - Standard terminal box is B terminal (right side viewed from pump).
  - See page A-21 for the characteristics of the drive motor for the unipump (domestic standard 3 rating).

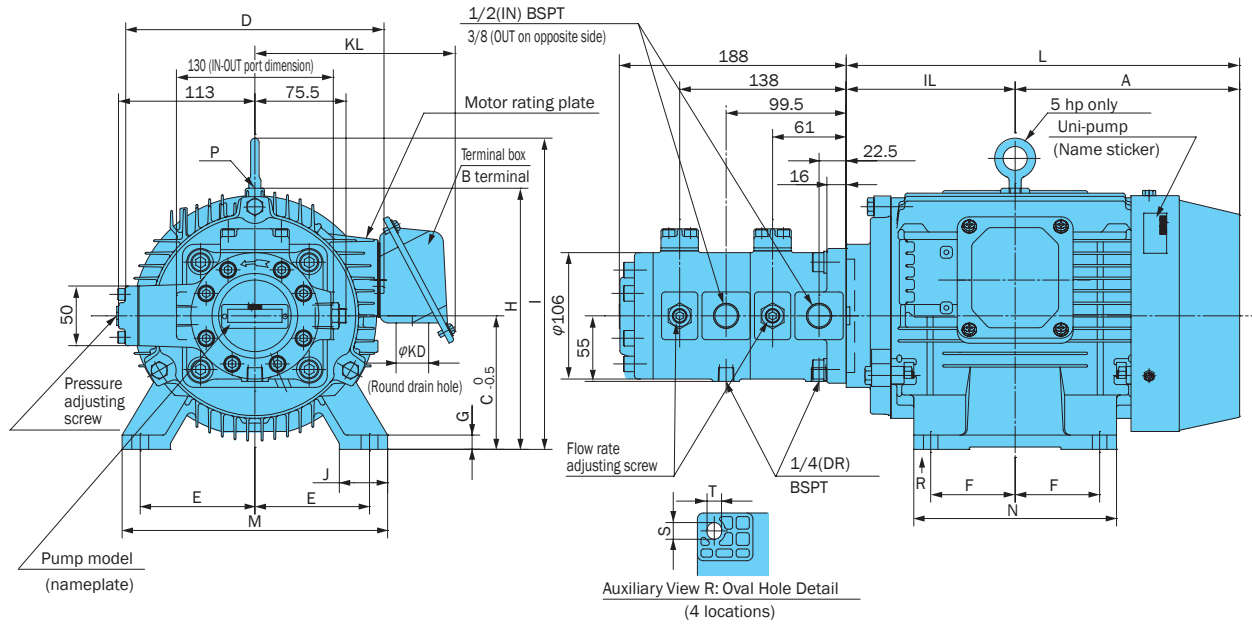
#### UVD-2A



Uni-pump	Motor Dimensions mm																Frame No.	Output hp (4poles)	Weight lbs		
	A	IL	C	D	E	F	G	H	I	J	L	M	N	S×T	KD	KL				O	
UVD-2A-A1-1.5-4-30	143	118.5	90	198	70	62.5	10	190	-	40	261.5	176	150	12×10	φ27	159	-	90L	2	84	
UVD-2A-A2-1.5-4-30																					
UVD-2A-A2-2.2-4-30	157.5	133	100	198	80	70	12	200	-	40	290.5	200	168	14×12	φ27	159	-	100L	3	95	
UVD-2A-A3-2.2-4-30																					
UVD-2A-A2-3.7-4-30	186	140	112	214	95	70	12	-	261	40	326	220	168	14×12	φ27	166	-	112M	5	108	
UVD-2A-A3-3.7-4-30																					

- 2 to 3 hp model does not have hangers.
- Standard drive motor is the fully enclosed fan-cooled B type.
  - Standard voltage for drive motor is 200 VAC, 50/60 Hz or 220 VAC, 60 Hz.
  - Standard terminal box is B terminal (right side viewed from pump).
  - See page A-21 for the characteristics of the drive motor for the unipump (domestic standard 3 rating).

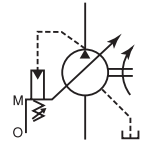
UVD-11A



Uni-pump	Motor Dimensions mm																Frame No.	Output hp (4poles)	Weight lbs	
	A	IL	C	D	E	F	G	H	I	J	L	M	N	S×T	KD	KL				O
UVD-11A-A1-A1-1.5-4-30	143	118.5	90	198	70	62.5	10	190	40	261.5	176	150	12×10	φ27	159	-	90L	2	66	
UVD-11A-A1-A2-1.5-4-30																				
UVD-11A-A1-A3-1.5-4-30																				
UVD-11A-A2-A2-1.5-4-30																				
UVD-11A-A2-A3-1.5-4-30																				
UVD-11A-A3-A3-1.5-4-30																				
UVD-11A-A1-A2-2.2-4-30	157.5	133	100	198	80	70	12	200	-	40	290.5	200	168	14×12	φ27	159	-	100L	3	77
UVD-11A-A1-A3-2.2-4-30																				
UVD-11A-A2-A2-2.2-4-30																				
UVD-11A-A2-A3-2.2-4-30																				
UVD-11A-A3-A3-2.2-4-30																				
UVD-11A-A1-A3-3.7-4-30	186	140	112	214	95	70	12	-	261	40	326	220	168	14×12	φ27	166	-	112M	5	90
UVD-11A-A2-A2-3.7-4-30																				
UVD-11A-A2-A3-3.7-4-30																				
UVD-11A-A3-A3-3.7-4-30																				

No hanger on 2 and 3 hp models.

- Standard drive motor is the fully enclosed fan-cooled B type.
- Standard voltage for drive motor is 200 VAC, 50/60 Hz or 220 VAC, 60 Hz.
- Standard terminal box is B terminal (right side viewed from pump).
- See page A-21 for the characteristics of the drive motor for the unipump (domestic standard 3 rating).



### VDC Series High Pressure Type Variable Volume Vane Pump

7.9 to 31.7 gpm  
2000 psi

### Features

#### Highly efficient and stable high-pressure operation

Innovative pressure control and pressure balance mechanisms combine with an original 3-point ring support system dramatically improves high-pressure operation. The result is outstanding performance at high pressures up to 2000 psi.

#### Low vibration and noise

A number of innovative new mechanisms are adopted to minimize vibration and noise. In particular, a 3-point support system is used for the control piston and bias piston to increase ring

stability. This minimizes ring vibration and delivers quiet operation.

#### Outstanding response, high-precision operation

An innovative new ring stopper eliminates excessive ring displacement and improves response. The result is high precision operation at all times, including during starts, stops, and load changes.

#### Precise characteristics for a stable discharge rate

A revolutionary new pressure compensator type pressure control mechanism

ensures a highly stable fixed discharge rate, even in the high pressure range.

#### High efficiency operation with minimal power loss

New mechanical innovations minimize power loss, especially at full cutoff.

#### Simplified maintenance and handling

Pressure adjusting and discharge rate adjusting mechanisms are located on the same side of the pump for simplified maintenance and handling.

### Specifications

#### Single Pump

Model No.		Capacity in <sup>3</sup> /rev	No-load Discharge Rate gpm		Pressure Adjustment Range kgf/cm (psi)	Allowable Peak Pressure kgf/cm (psi)	Revolution Speed min <sup>-1</sup>		Weight lbs
Foot Mounting	Flange Mounting		1500min <sup>-1</sup>	1800min <sup>-1</sup>			Min.	Max.	
VDC-1A-1A2-*20 VDC-1A-1A3-*20 VDC-1A-1A4-*20 VDC-1A-1A5-*20	VDC-1B-1A2-*20/35 VDC-1B-1A3-*20/35 VDC-1B-1A4-*20/35 VDC-1B-1A5-*20/35	1.0	6.6	7.9	15.3 to 35.7 (217 to 507) 20.4 to 71.4 (290 to 1000) 51 to 107 (725 to 1500) 71.4 to 143 (1000 to 2000)	143 (2000) 214 (3000)	800	1800	21
VDC-1A-2A2-*20 VDC-1A-2A3-*20	VDC-1B-2A2-*20/35 VDC-1B-2A3-*20/35	1.3	8.7	10.5	15.3 to 35.7 (217 to 507) 20.4 to 71.4 (290 to 1000)	143 (2000)	800	1800	21
VDC-2A-1A2-*20 VDC-2A-1A3-*20 VDC-2A-1A4-*20 VDC-2A-1A5-*20	VDC-2B-1A2-*20/35 VDC-2B-1A3-*20/35 VDC-2B-1A4-*20/35 VDC-2B-1A5-*20/35	1.8	11.8	14.2	15.3 to 35.7 (217 to 507) 20.4 to 71.4 (290 to 1000) 51 to 107 (725 to 1500) 71.4 to 143 (1000 to 2000)	143 (2000) 214 (3000)	800	1800	55
VDC-2A-2A2-*20 VDC-2A-2A3-*20	VDC-2B-2A2-*20/35 VDC-2B-2A3-*20/35	2.3	15.3	18.4	15.3 to 35.7 (217 to 507) 20.4 to 71.4 (290 to 1000)	143 (2000)	800	1800	55
VDC-3A-1A2-*20 VDC-3A-1A3-*20 VDC-3A-1A4-*20 VDC-3A-1A5-*20	VDC-3B-1A2-*20 VDC-3B-1A3-*20 VDC-3B-1A4-*20 VDC-3B-1A5-*20	4.0	26.4	31.7	15.3 to 35.7 (217 to 507) 20.4 to 71.4 (290 to 1000) 51 to 107 (725 to 1500) 71.4 to 143 (1000 to 2000)	143 (2000) 214 (3000)	800	1800	103

#### Double Pump

Model No.	Vent Side			Shaft Side			Revolution Speed min <sup>-1</sup>		Weight lbs
	Discharge Rate gpm		Pressure Adjustment Range kgf/cm (psi)	Discharge Rate gpm		Pressure Adjustment Range kgf/cm (psi)	Min.	Max.	
	1800min <sup>-1</sup>	1500min <sup>-1</sup>		1800min <sup>-1</sup>	1500min <sup>-1</sup>				
VDC-11A(B)-2A3-2A*20/35 VDC-11A(B)-2A3-1A*20/35	10.5	8.7	20.4 to 71.4 (290 to 1000)	10.5 7.9	8.7 6.6	20.4 to 71.4 (290 to 1000) 71.4 to 143 (1000 to 2000)	800	1800	Type A 59 Type B 44
VDC-12A(B)-2A3-2A*20/35 VDC-12A(B)-2A3-1A*20/35 VDC-12A(B)-1A5-2A*20/35 VDC-12A(B)-1A5-1A*20/35	10.5 7.9	8.7 6.6	20.4 to 71.4 (290 to 1000) 71.4 to 143 (1000 to 2000)	18.4 14.2 18.4 14.2	15.3 11.8 15.3 11.8	20.4 to 71.4 (290 to 1000) 71.4 to 143 (1000 to 2000) 20.4 to 71.4 (290 to 1000) 71.4 to 143 (1000 to 2000)	800	1800	Type A 92 Type B 77
VDC-22A(B)-2A3-2A*20/35 VDC-22A(B)-2A3-1A*20/35	18.4	15.3	20.4 to 71.4 (290 to 1000)	18.4 17.2	15.3 11.8	20.4 to 71.4 (290 to 1000) 71.4 to 143 (1000 to 2000)	800	1800	Type A 136 Type B 110
VDC-13A(B)-2A3-1A*20 VDC-13A(B)-2A3-1A*20 VDC-13A(B)-1A5-1A*20 VDC-13A(B)-1A5-1A*20	10.5 7.9	8.7 6.6	20.4 to 71.4 (290 to 1000) 71.4 to 143 (1000 to 2000)	31.7	26.4	20.4 to 71.4 (290 to 1000) 71.4 to 143 (1000 to 2000) 20.4 to 71.4 (290 to 1000) 71.4 to 143 (1000 to 2000)	800	1800	Type A 136 Type B 105

Note: 1. VDC-3A, VDC-11A, VDC-12A and VDC-13A are foot mounting types, and come with foot mountings.  
2. VDC-1A and VDC-2A are sub plate types. Sub plates are not included.

• Handling

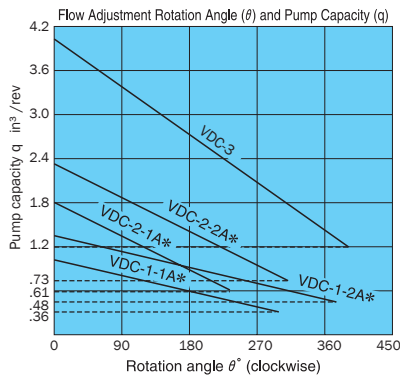
- 1 Rotation Direction The direction of rotation is always clockwise (rightward) when viewed from the shaft side.
- 2 Drain Drain piping must be direct piping up to a point that is below the tank fluid level, and piping should comply with the conditions shown in the table below to ensure that back pressure due to pipe resistance does not exceed 14 psi. When using a pump that has drain ports at two locations, use the drain port that is higher after the pump is installed. In the case of a double pump, run separate pipes from both the shaft side and the head side drains directly connect to the tank, so the drain pipe is below the surface of the oil.
- 3 Discharge Volume Adjustment

Model No. Item	VDC-1	VDC-2	VDC-3
Pipe Joint Size	At least 1/4"	At least 1/4"	At least 3/8"
Pipe I.D.	At least .29	At least .29	At least .37
Pipe Length	1m or less	1m or less	1m or less

The discharge flow rate is decreased by clockwise (rightward) rotation of the discharge rate adjusting screw, and increased by counterclockwise (leftward) rotation.

Loosen the lock nut before making adjustments. After adjustment is complete, re-tighten the lock nut. The graph below provides general guidelines for the relationship between the rotation angle of the flow rate adjusting screw and the no-load discharge rate.

$$Q: \text{Flow rate gpm} = \frac{\text{in}^3 \times \text{rpm}}{231}$$



Note:

The values indicated above are at maximum pump discharge volume with the flow volume adjusting screw at the 0° position. The broken line shows the flow volume adjustment range lower limit value.

- 4 Pressure Adjustment Pressure is increased by clockwise (rightward) rotation of the discharge rate adjusting screw, and decreased by counterclockwise (leftward) rotation. Loosen the lock nut before making adjustments. After adjustment is complete, re-tighten the lock nut.
- 5 Factory Default P-Q Settings (Standard Model)
  - Flow Rate Setting = Maximum flow rate for model as indicated in the catalog
  - Pressure Setting = Pressure shown in table below
- 6 Thrust Screw and Stopper The thrust screw and stopper are precision adjusted at the factory during assembly. Never touch them. See callouts 15/43 and 15/38 in the VDC-1A and 2A/3A cross-section diagrams on pages B-33 and B-34.
- 7 An unload circuit is required when the motor is started under condition WYE Delta. Contact your agent about the unload circuit.
- 8 Initial Operation Before operating the pump for the first time, put the pump discharge side into the no-load state and then repeatedly start and stop the motor to bleed all air from inside the pump and the suction piping. After confirming that the pump is discharging oil, continue the no-load operation for at least 10 minutes to discharge all the air from the circuit. Provide an air bleed valve in circuits where it is difficult to bleed air before startup.
- 9 Sub Plate Use the table below for to specify a sub plate type when one is required.

Factory Default Pressure Settings kgf/cm <sup>2</sup> (psi)
2: 35.7 (507)
3: 30.6 (435)
4: 5.1 (725)
5: 71.4 (1000)

Sub Plate Number

Pump Model No.	Sub Plate Number	Motor (hp)
VDC-1A-1A*-20	MVD-1-115-10	1 - 2
	MVD-1-135-10	3 - 5
VDC-1A-2A*-20	MVD-1-115Y-10	1 - 2
	MVD-1-135Y-10	3 - 5
VDC-2A-*A*-20	MVD-2-135-10	3 - 5
	MVD-2-160-10	7
VDC-2A-2A*-20	MVD-2-160Z-10	7

Note: See pages B-17 and B-18 for detailed dimensions.

- 10 Foot Mounting For a double pump with VDC-3 foot mounting, the foot mounting kit and pump are sold as a set. When only the mounting feet are required, pump mounting bolts, washers and other parts are sold together as the Foot Mounting Kit. See page B-36 for detailed dimensions.
- 11 For the hydraulic operating fluid, use type ISO VG32 or equivalent (viscosity index of at least 90) for pressures of 1000 psi or lower, and type ISO VG68 or equivalent (viscosity index of at least 90) for pressures greater than 1000 psi.
- 12 The operating temperature range is 59 to 140 °F. When the oil temperature at startup is 59 °F or less, perform a warm-up operation at low pressure until the oil temperature reaches 59 °F. Use the pump in an area where the temperature is within the range of 32 to 140 °F.
- 13 Suction pressure is 4.35 psi, and the suction port flow rate should be no greater than 6 ft/sec.
- 14 Avoid pulley, gear, and other drive systems that impart a radial or thrust load on the end of the pump shaft. Mount the pump so its pump shaft is oriented horizontally.
- 15 Provide a suction strainer with a filtering grade of about 100µm (150 mesh). For the return line to the tank, use a 10µm line filter.
- 16 Manage hydraulic operating fluid so contamination is maintained at class NAS10 or lower. Take care to avoid contamination with water and other foreign matter, and watch out for discoloration. Whitish fluid indicates that water has contaminated the fluid, and brownish fluid indicates the fluid is dirty.
- 17 Contact your agent about using water- and glycol-based hydraulic operating fluids.
- 18 At startup, repeat the inching operation (start-stop) to bleed air from the pump and pipes.

(Continued on following page)

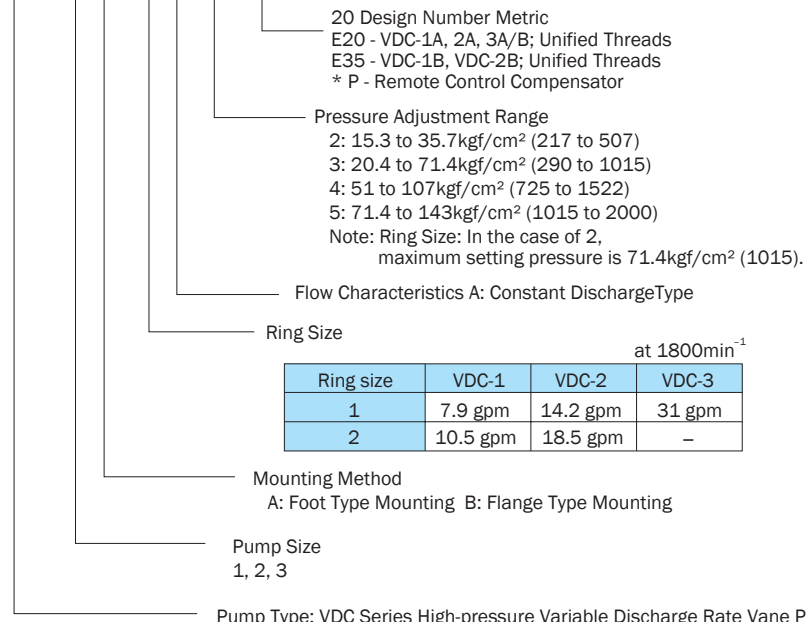
- 19 Equip an air bleed valve in circuits where it is difficult to bleed air before startup. See page C-13 for more information.
- 20 To ensure proper lubrication of the pump's rubbing surfaces, supply oil to the interior of the pump before starting operation.

- 21 When centering the pump shaft, eccentricity with the motor shaft should be no greater than 0.001 in. Use a pump mounting base of sufficient rigidity. The angle error should be no greater than 1°.

### Understanding Model Numbers

#### Single Pump

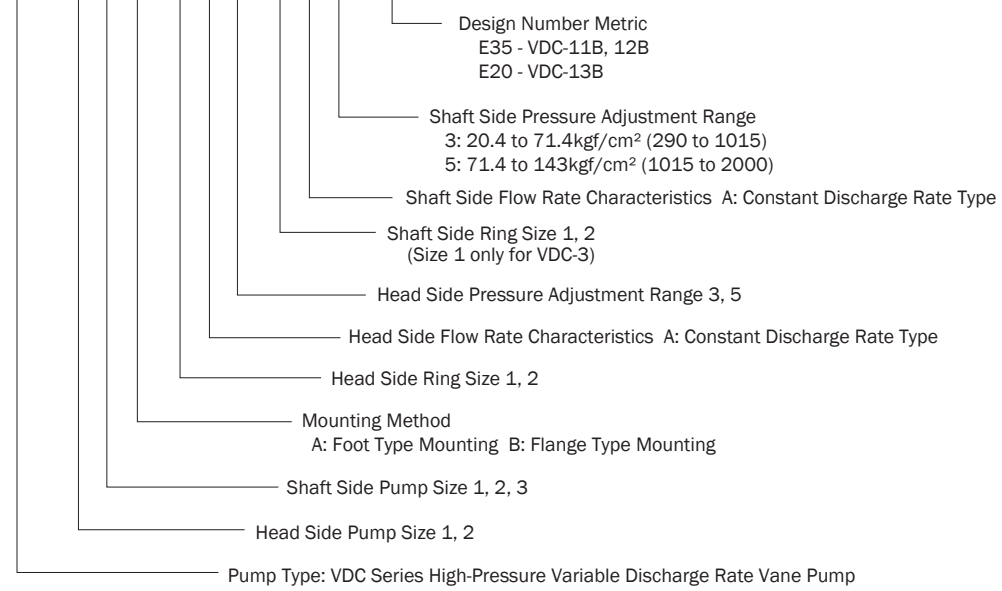
**VDC - 2 A - 1 A 2 \* 20**



The ZR-T02-\*5895\* is the recommended remote control valve. Provide piping to the remote control valve at a pipe volume of 9 cu in or less.

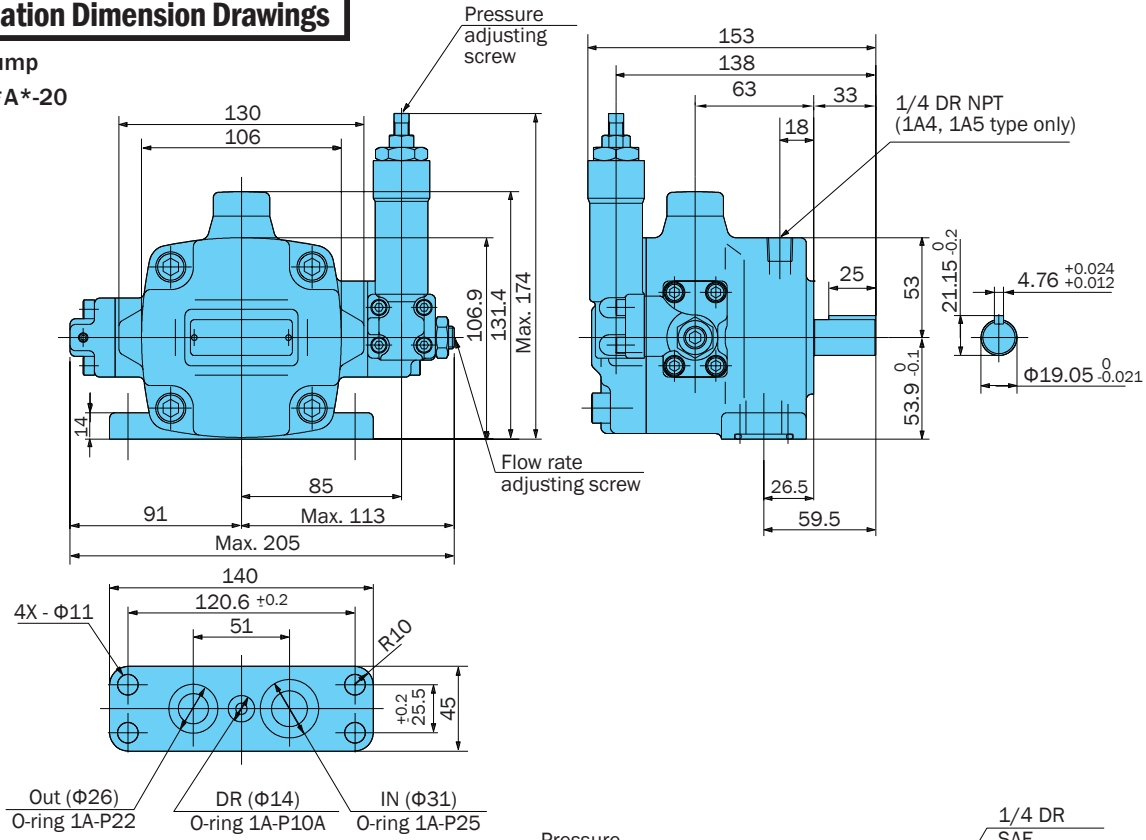
#### Double Pump

**VDC - 1 2 A - 1 A 5 - 2 A 3 - 20**

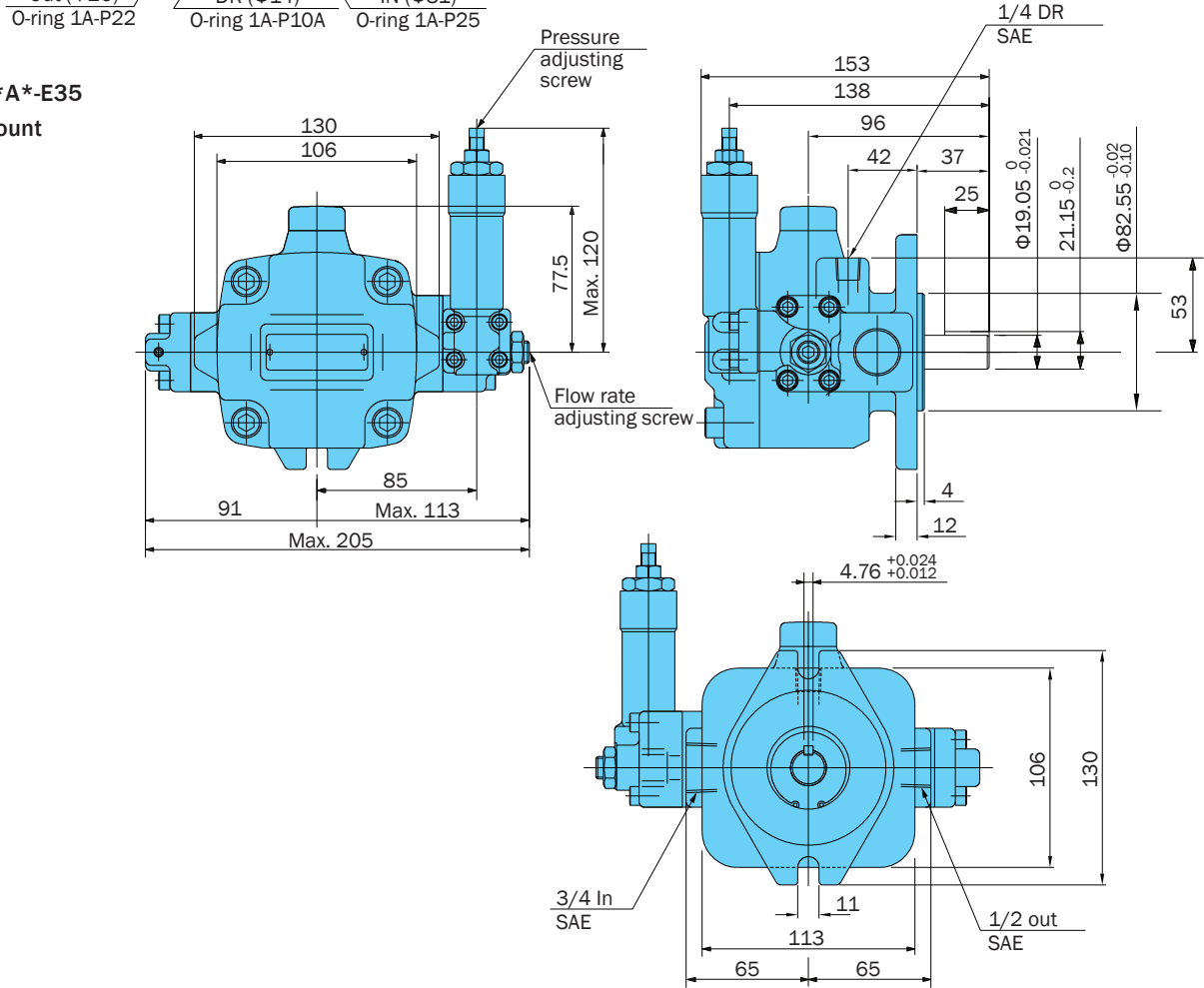


**Installation Dimension Drawings**

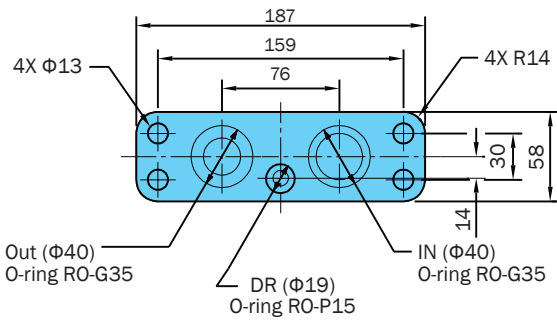
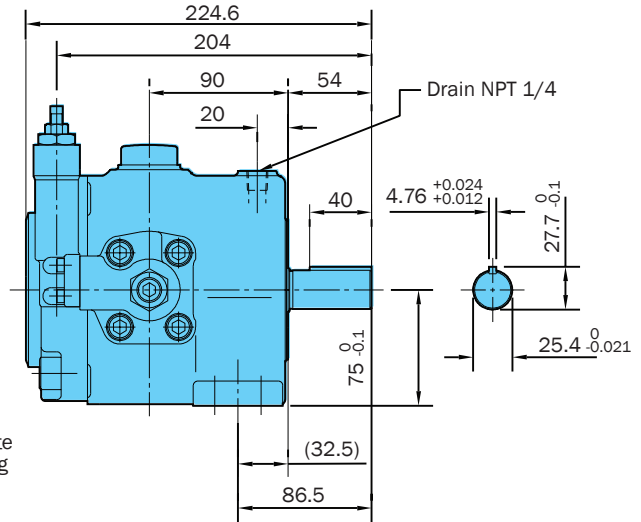
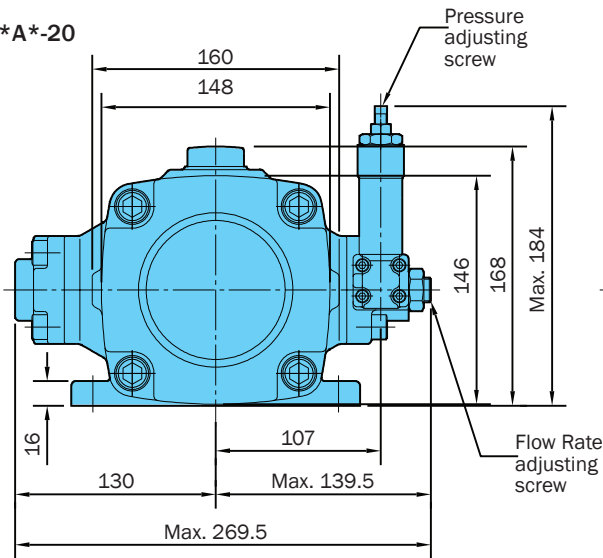
Single Pump  
VDC-1A-\*A\*-20



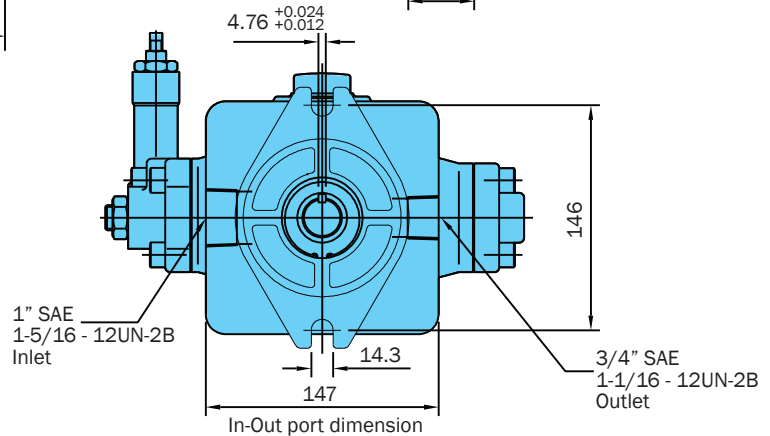
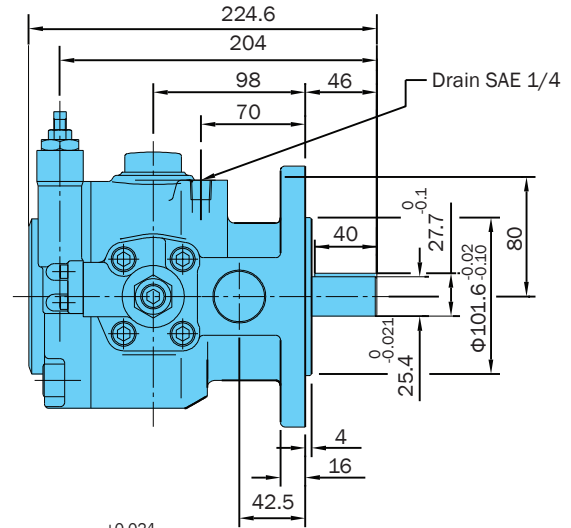
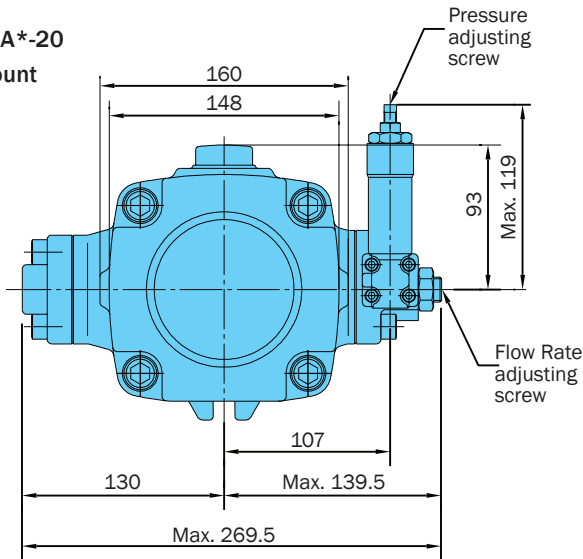
VDC-1B-\*A\*-E35  
SAE A Mount



**VDC-2A-\*A\*-20**



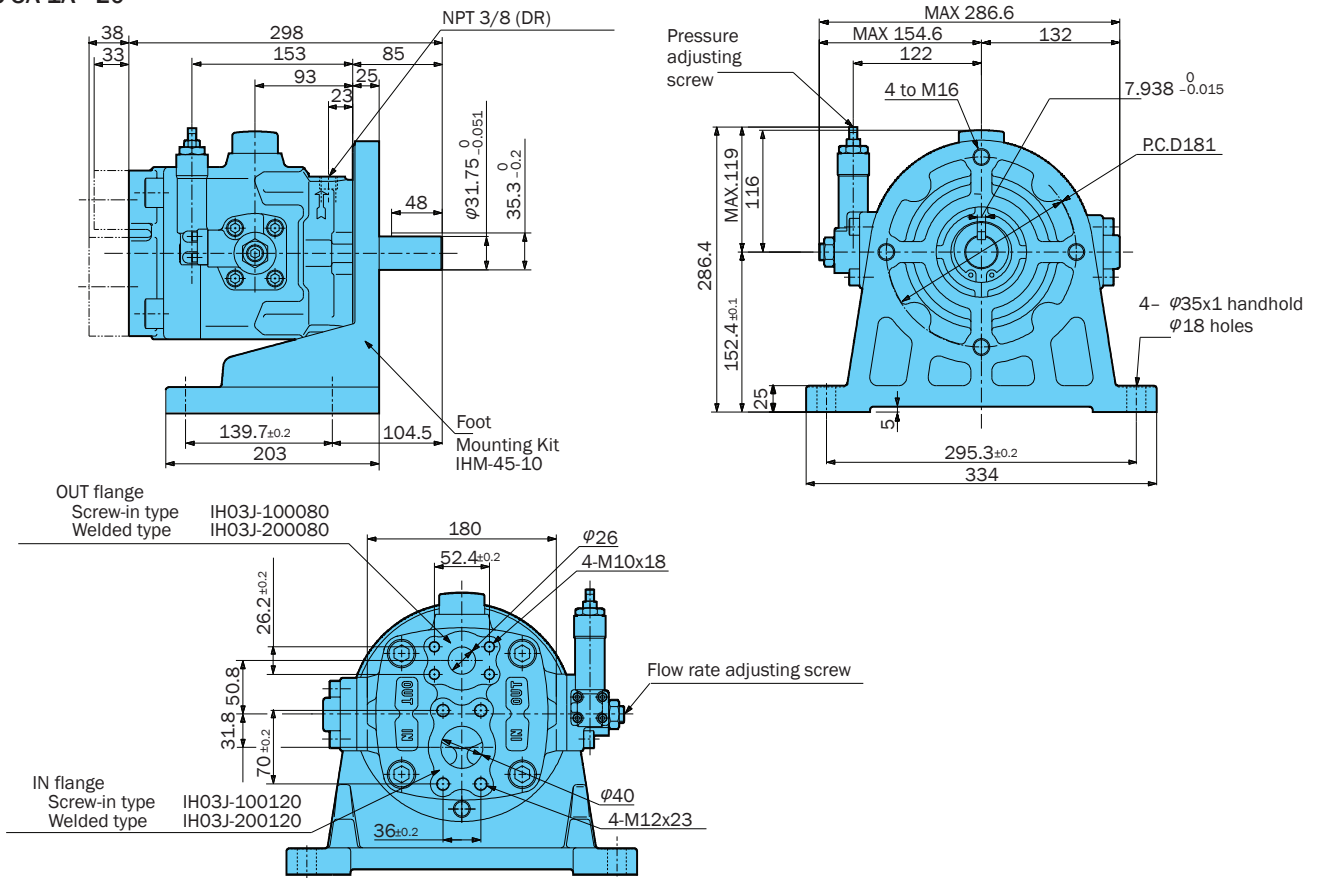
**VDC-2B-\*A\*-20**  
**SAE B Mount**





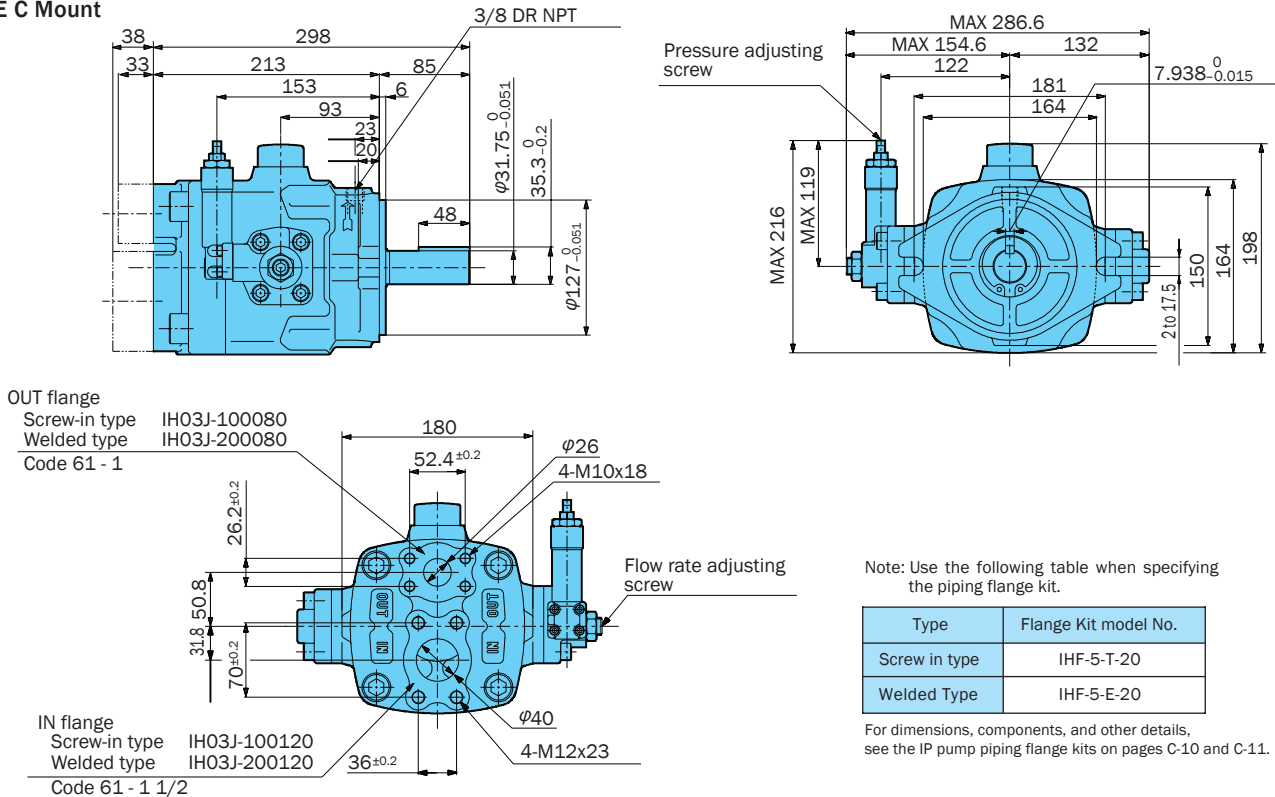
### Installation Dimension Drawings

VDC-3A-1A\*-20

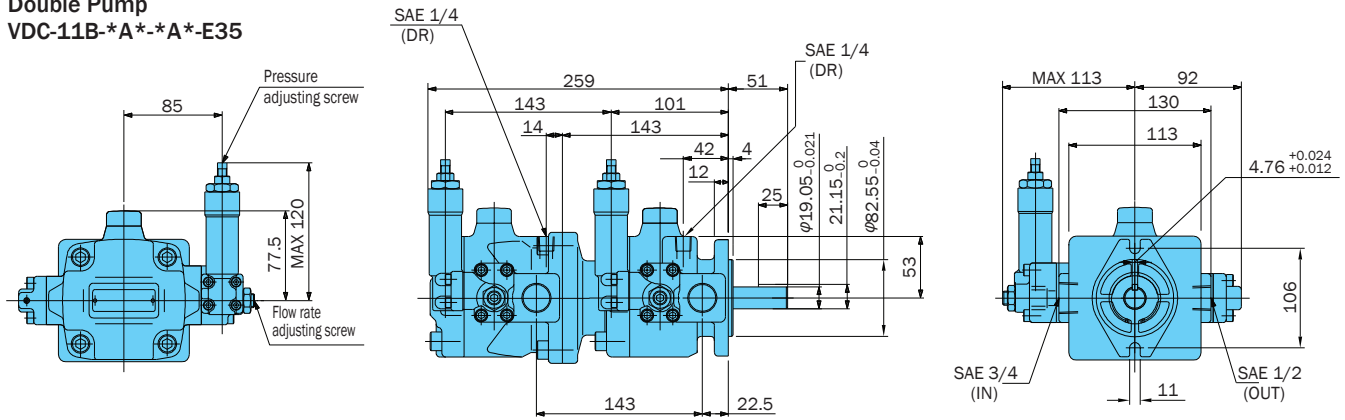


VDC-3B-1A\*-E35

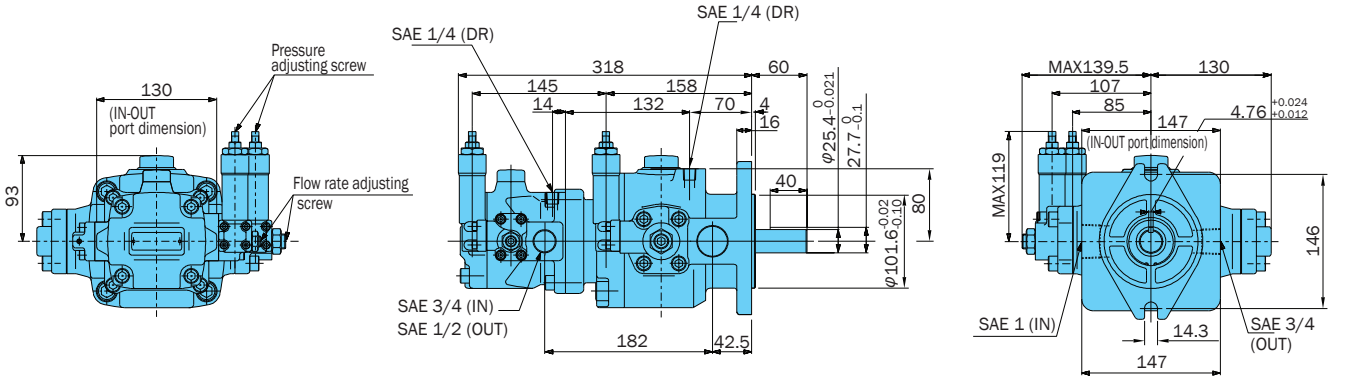
SAE C Mount



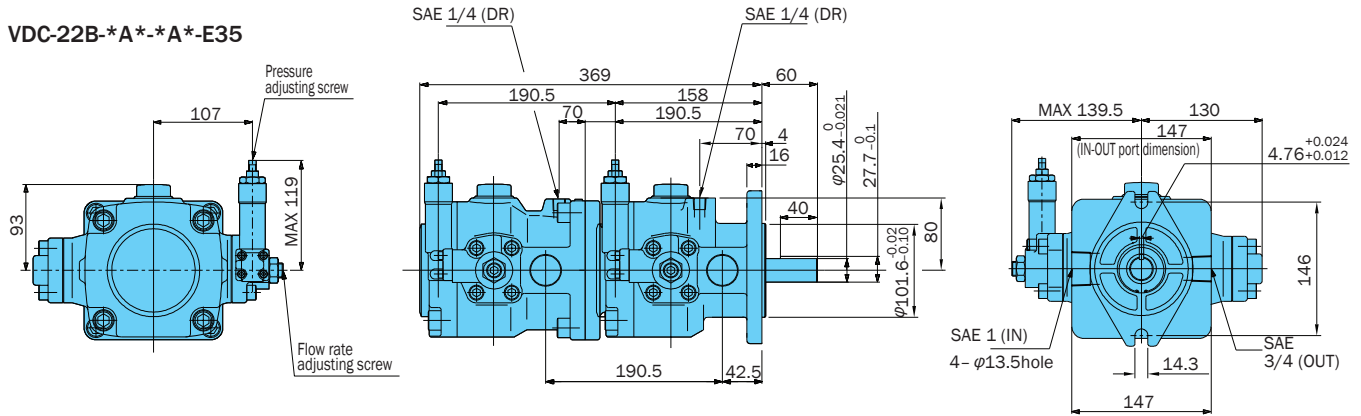
**Double Pump  
VDC-11B-\*A\*-\*A\*-E35**



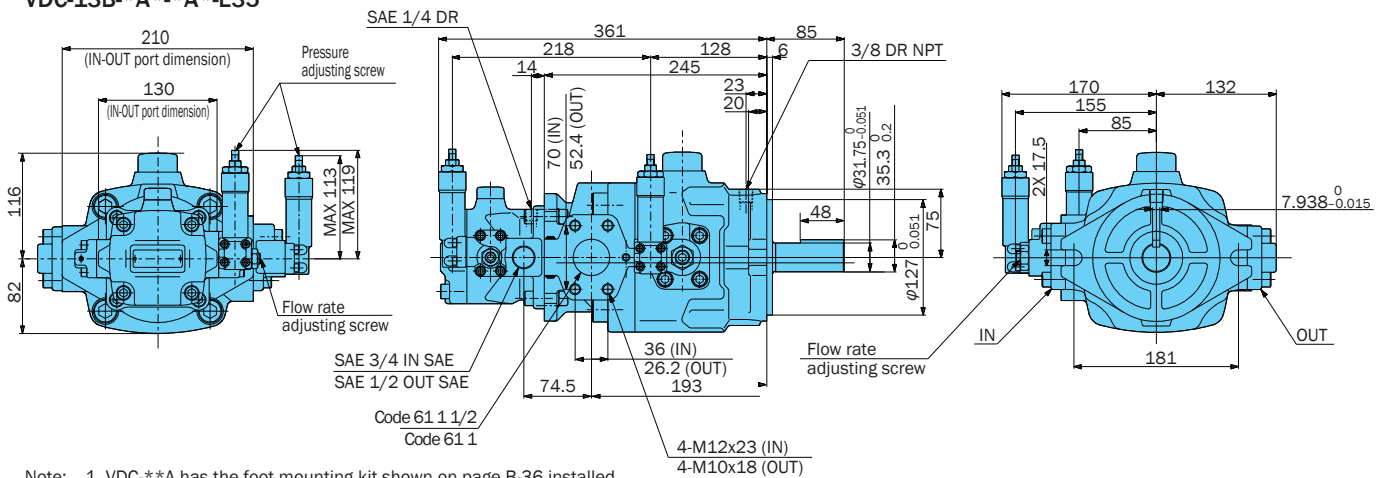
**VDC-12B-\*A\*-\*A\*-E35**



**VDC-22B-\*A\*-\*A\*-E35**



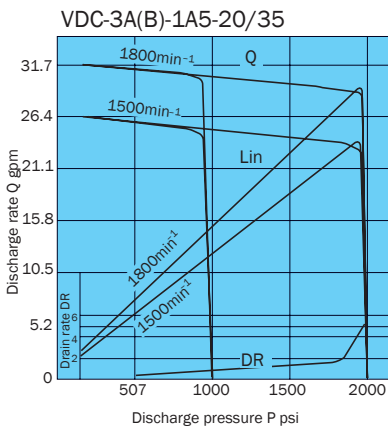
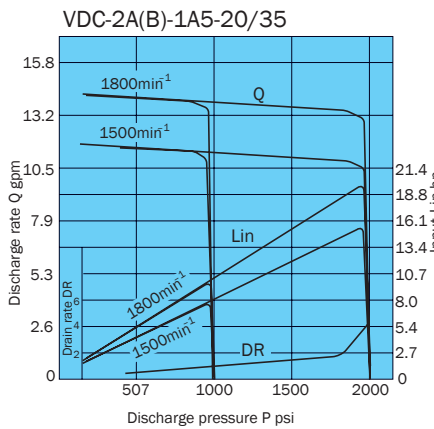
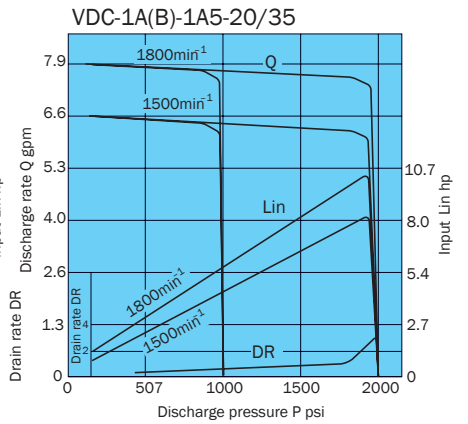
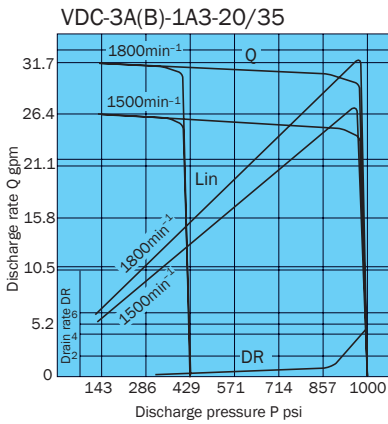
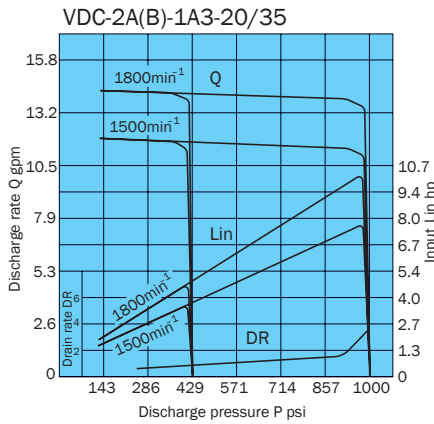
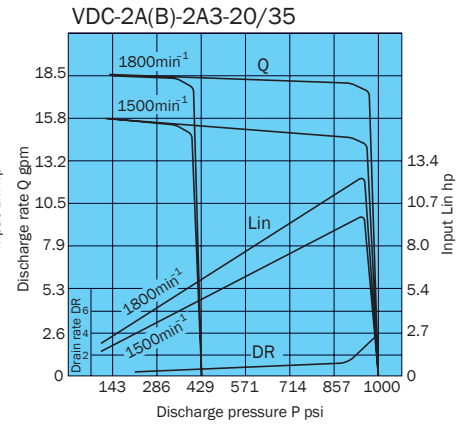
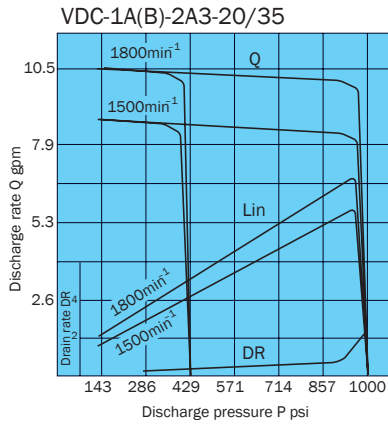
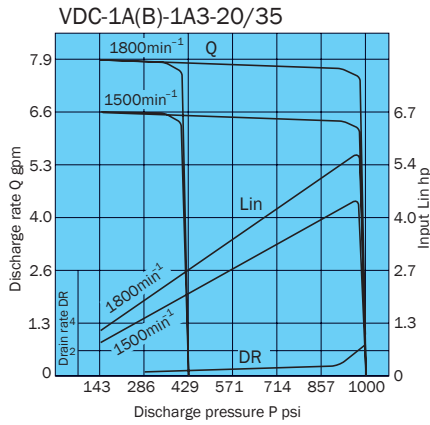
**VDC-13B-\*A\*-\*A\*-E35**



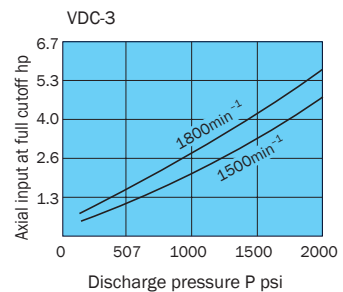
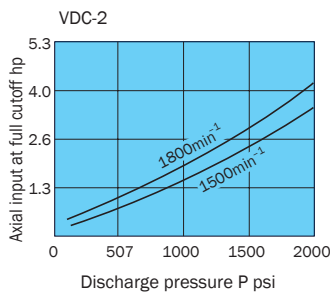
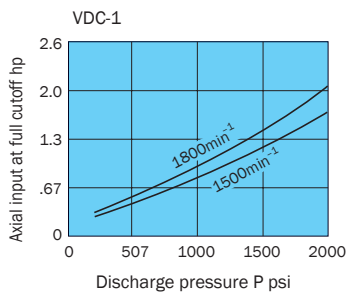
Note: 1. VDC-\*\*\*A has the foot mounting kit shown on page B-36 installed.

# Performance Curves

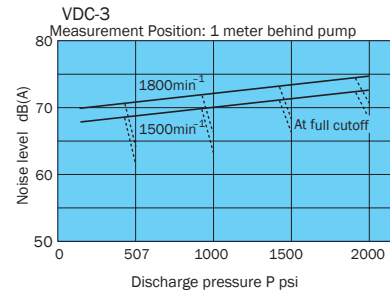
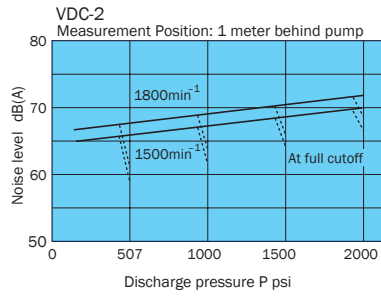
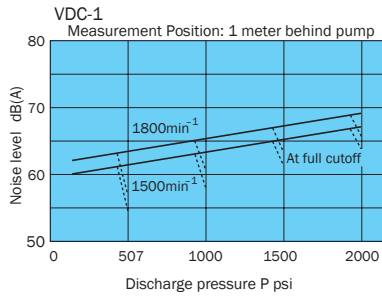
Typical characteristics at hydraulic operating fluid kinematic viscosity of 32 centistokes



## Axial input at full cutoff



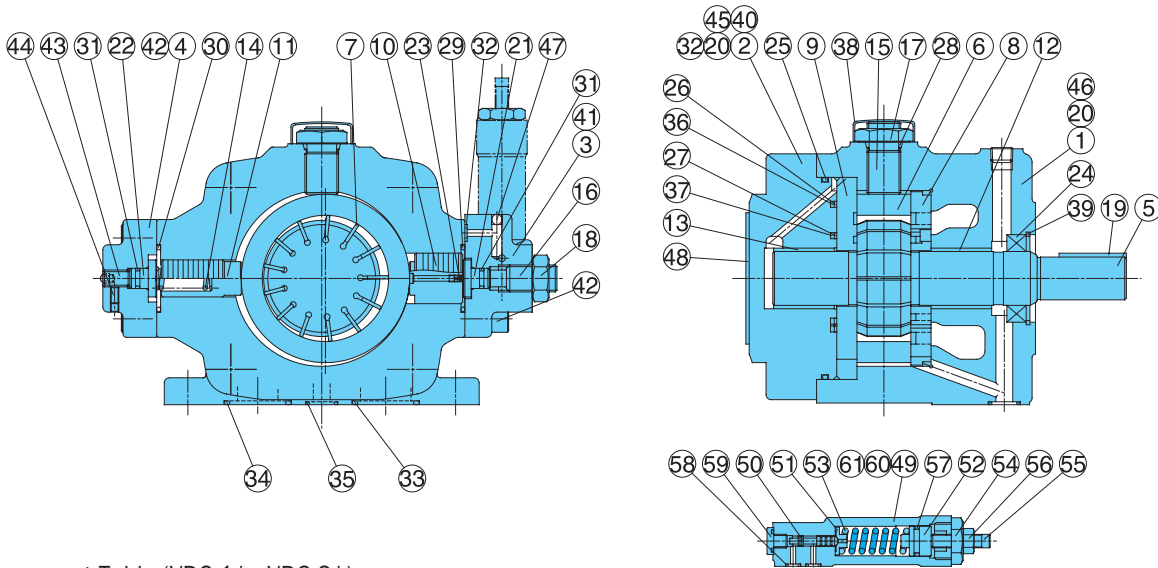
**Noise Characteristics**



**Cross-sectional Drawing**

VDC-1A-\*A\*-20

VDC-2A-\*A\*-20



Seal Component Table (VDC-1\*, VDC-2\*)

Part No.	Applicable Pump Model No.	VDC-1A-*A*-20		VDC-2A-*A*-20	
	Seal Kit Number	VCBS-101A00		VCBS-102A00	
	Part Name	Part Number	Q'ty	Part Number	Q'ty
24	Oil seal	TCV-224211	1	TCN-325211	1
25	O-ring	S85(NOK)	1	1A-G115	1
26	O-ring	AS568-034	1	AS568-150	1
27	O-ring	AS568-026	1	AS568-134	1
28	O-ring	1A-P14	1	1A-P18	1
29	O-ring	1A-P22	1	1A-G35	1
30	O-ring	1A-P20	1	1A-G35	1
31	O-ring	1A-P5	2	1A-P9	2
32	O-ring	1A-P6	4	1A-P7	4
33	O-ring	1A-P25	1	1A-G35	1
34	O-ring	1A-P22	1	1A-G35	1
35	O-ring	1A-P10A	1	1A-P15	1
36	Backup ring	VCB34-101000	1	VCB34-102000	1
37	Backup ring	VCB34-201000	1	VCB34-202000	1
57	O-ring	1A-P14	1	1A-P14	1
58	O-ring	1B-P6(Hs90)	3	1B-P6(Hs90)	3

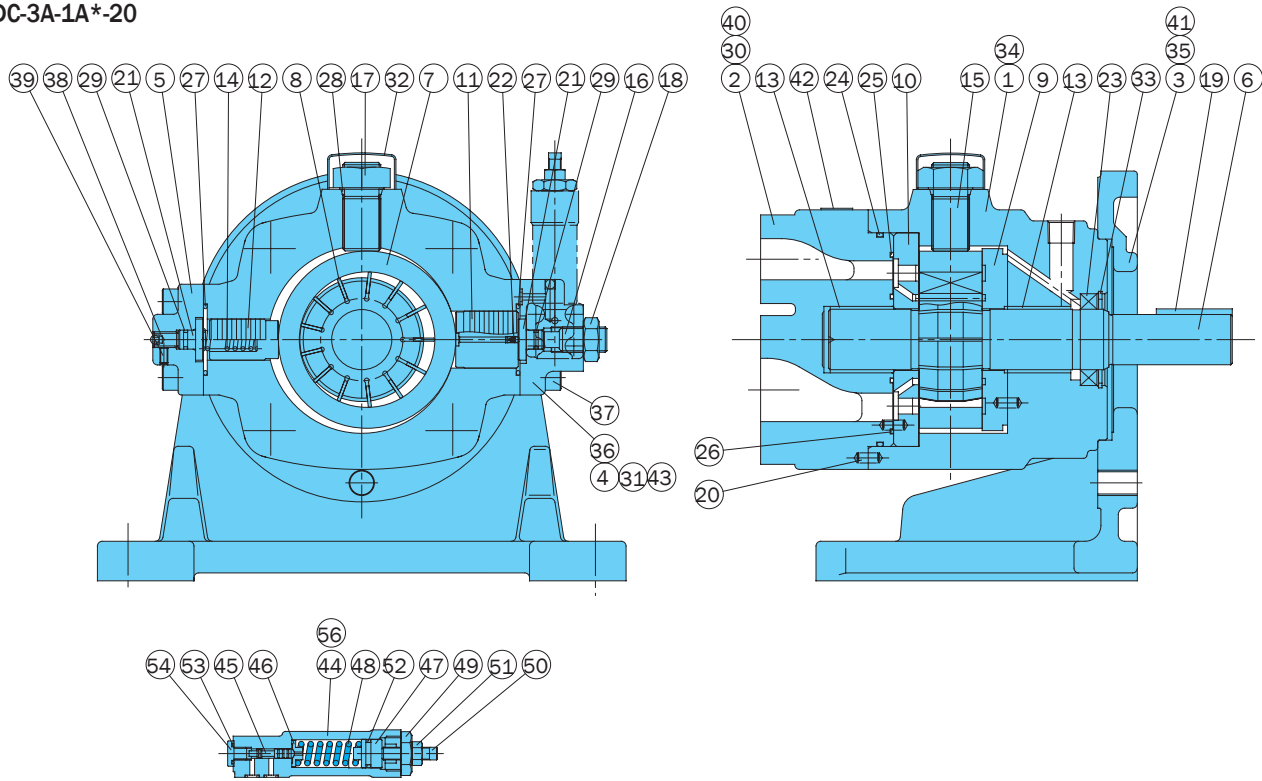
Note: 1. Oil seals are manufactured by Nippon Oil Seal Industry Co. Ltd. (NOK).  
 2. O-ring 1A-\*\* refers to JIS B2401-1A-\*\*.  
 3. For VDR-\*B\*-20, the seal kit number becomes VDBS-10\*B00, without the 33, 24, and 35 O-rings.

Part No.	Part Name	Part No.	Part Name	Part No.	Part Name
1	Body (1)	21	Holder	41	Screw
2	Body (2)	22	Holder	42	Screw
3	Cover (1)	23	Orifice	43	Screw (stopper)
4	Cover (2)	24	Oil seal	44	Screw
5	Shaft	25	O-ring	45	Plug
6	Ring	26	O-ring	46	Plug
7	Vane	27	O-ring	47	Pole
8	Plate (S)	28	O-ring	48	Nameplate
9	Plate (H)	29	O-ring	49	Valve body
10	Piston (1)	30	O-ring	50	Spool
11	Piston (2)	31	O-ring	51	Holder
12	Bearing	32	O-ring	52	Plunger
13	Bearing	33	O-ring	53	Spring
14	Spring	34	O-ring	54	Retainer
15	Thrust screw	35	O-ring	55	Screw
16	Screw	36	Backup ring	56	Nut
17	Nut	37	Backup ring	57	O-ring
18	Nut	38	Cap	58	O-ring
19	Key	39	Snap ring	59	Plug
20	Pin	40	Screw	60	Plug
				61	Screw

Cartridge Kits:  
 VDC-1 VCBC-101\*A\*  
 VDC-2 VCBC-102\*A\*  
 Includes Items: 5, 6, 7, 8, 9, 19, 20

## Performance Curves

VDC-3A-1A\*-20



Seal Component Table (VDC-3\*)

Part No.	Applicable Pump Model No. VDC-3A(B)*-20		
	Seal Kit Number VCBS-103B00		
	Part Name	Part Number	Q'ty
23	Oil seal	TCN-385811	1
24	O-ring	1A-G130	1
25	O-ring	AS568-154(Hs90)	1
26	O-ring	AS568-151(Hs90)	1
27	O-ring	1A-G40	2
28	O-ring	1A-P22	1
29	O-ring	1A-P9	2
30	O-ring	1A-P7	2
31	O-ring	1A-P7	2
52	O-ring	1A-P14	1
53	O-ring	1B-P6(Hs90)	3

Note: 1. Oil seals are manufactured by Nippon Oil Seal Industry Co. Ltd. (NOK).  
2. O-ring 1A-\*\* refers to JIS B2401-1A-\*\*.

Part No.	Part Name	Part No.	Part Name	Part No.	Part Name
1	Body (1)	20	Pin	39	Screw
2	Body (2)	21	Holder	40	Plug
3	Mounting	22	Orifice	41	Washer
4	Cover (1)	23	Oil seal	42	Nameplate
5	Cover (2)	24	O-ring	43	Pole
6	Shaft	25	O-ring	44	Valve body
7	Ring	26	O-ring	45	Spool
8	Vane	27	O-ring	46	Holder
9	Plate (S)	28	O-ring	47	Plunger
10	Plate (H)	29	O-ring	48	Spring
11	Piston (1)	30	O-ring	49	Retainer
12	Piston (2)	31	O-ring	50	Screw
13	Bearing	32	Cap	51	Nut
14	Spring	33	Snap ring	52	O-ring
15	Thrust screw	34	Screw	53	O-ring
16	Screw	35	Screw	54	Plug
17	Nut	36	Screw	55	Plug
18	Nut	37	Screw	56	Screw
19	Key	38	Screw (stopper)		

### Compensator Kits:

VDC-1 Thru -3 are same  
 VDC-A2 ZR-G01-A2-1688C  
 -A3 ZR-G01-A3-1688C  
 -A4 ZR-G01-A4-1688C  
 -A5 ZR-G01-A5-1688C  
 P-Remote ZR-G01-P-E1235A

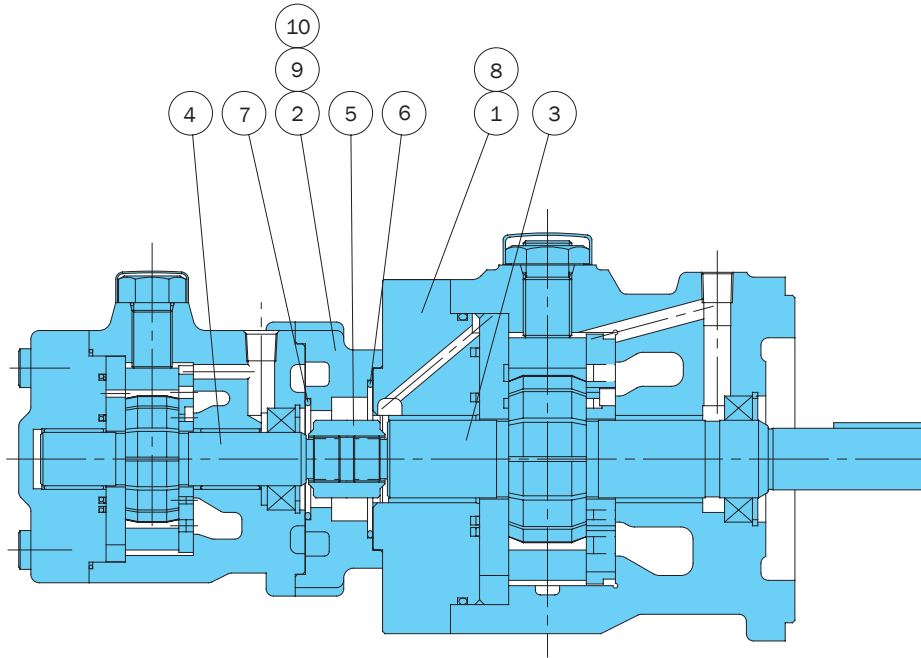
### Cartridge Kits:

VDC-1-20/35  
 VCBC-1011A2 (A2,A3)  
 VCBC-1011A4 (A4,A5)  
 VCBC-1012A2 (2A2,2A3)  
 VDC-2-20/35  
 VCBC-1021A2 (A2,A3)  
 VCBC-1021A4 (A4,A5)  
 VCBC-1022A2 (2A2,2A3)

VDC-3-20/35  
 VCBC-1031A2 (A2,A3)  
 VCBC-1031A4 (A4,A5)

Includes Items: 6, 7, 8, 9, 10, 19, 20

VDC Series  
Double Pump



Part No.	Part Name
1	Body (2)
2	Body (3)
3	Shaft (S)
4	Shaft (H)
5	Joint
6	O-ring
7	O-ring
8	Screw
9	Screw
10	Screw

Note:  
In the case of a double pump, use single pump parts in addition to the 10 parts listed above.

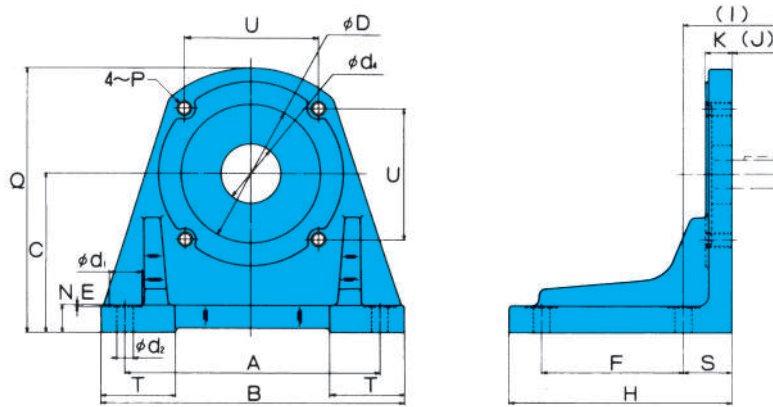
List of Sealing Parts

Part No.	Part Name	VDC-11A-*-*-20		VDC-12A-*-*-20		VDC-22A-*-*-20		VDC-13A-*-*-20	
		Part Number	Q'ty	Part Number	Q'ty	Part Number	Q'ty	Part Number	Q'ty
6	O-ring			1A-G60	1	1A-G60	1		
7	O-ring	1A-G85	1	1A-G45	1	1A-G60	1	1A-G85	1

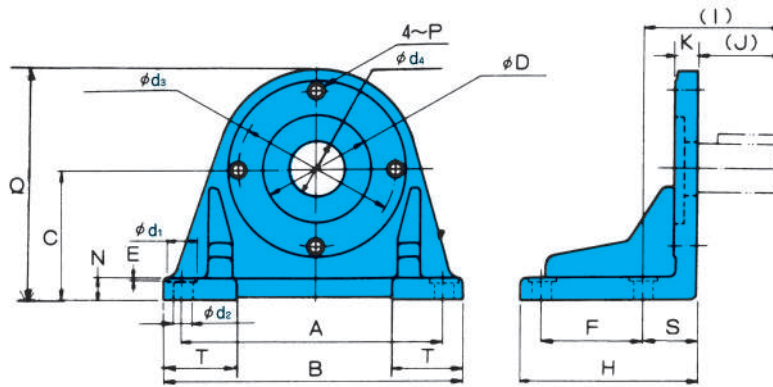
Note: 1. See the description of the single pump for seal parts that are not included in the list.  
2. O-ring 1A-\*\* refers to JIS B2401-1A-\*\*.

### Foot Mounting Installation Measurement Chart

For VDC-11A, VDC-12 and VDC-22 (for double pump)



For VDC-3A and VDC-13A



Foot Mounting Kit Model No.	Applicable Pump Model No.	Accessories				Dimensions (mm)					
		Bolt	Q'ty	Washer	Q'ty	A	B	C	E	F	H
VCM-11-20	VDC-1 (20) VDC-11 (20)	TH-10 × 30	4	WS-B-10	4	171.45	204	107.95	1	95.25	150
VCM-22-20	VDC-2 (20) VDC-12 (20) VDC-22 (20)	TH-12 × 35	4	WS-B-12	4	235	267	139.7	1	127	193
IHM-45-10	VDC-3 (20) VDC-13 (20)	TB-16 × 40	2	WP-16	2	295.3	334	152.4	1	139.7	203

Foot Mounting Kit Model No.	Dimensions (mm)														Weight lbs
	(I)	(J)	K	N	P	Q	S	T	U	φ D	φ d <sub>1</sub>	φ d <sub>2</sub>	φ d <sub>3</sub>	φ d <sub>4</sub>	
VCM-11-20	66.5	33	18	18	M10	180	32.5	50	90	95.02	22	11		40	14.3
VCM-22-20	84.5	40	20	20	M12	232	44.5	57.5	124	135	22	14		40	26.4
IHM-45-10	104.5	60	25	25	M16	259	44.5	61		127	35	18	181	86	29.7

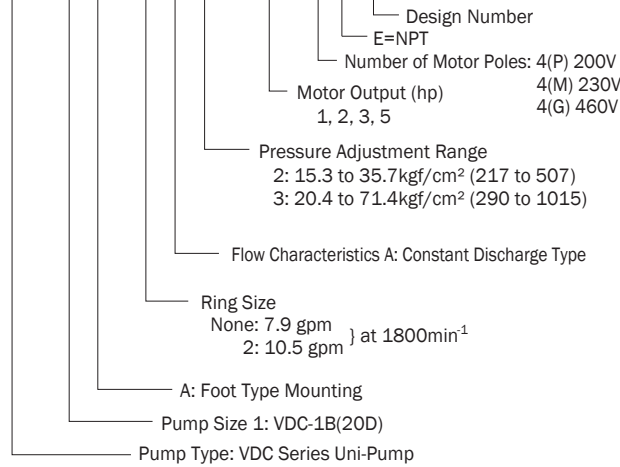


# Uni-Pump Specifications

(CE mark standard compliant)

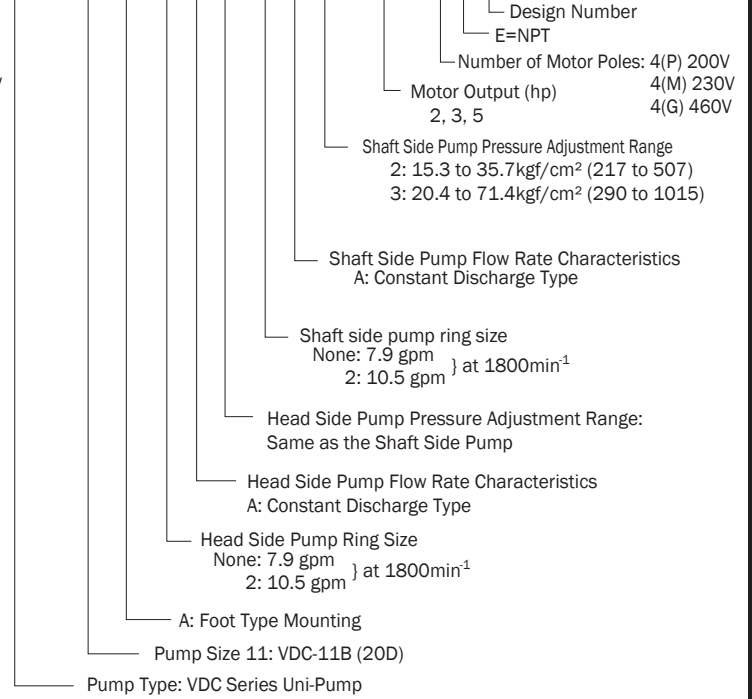
## Single Pump

**UVC - 1 A - 2 A 2 - 1.5 - 4 \* 30**



## Double Pump

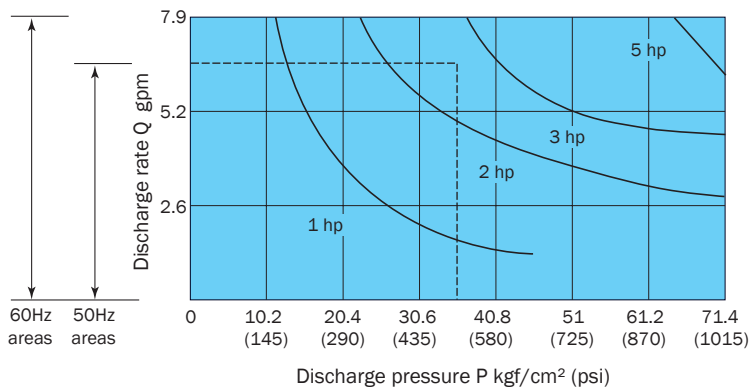
**UVC - 11 A - 2 A 2 - 2 A 2 - 3.7 - 4 \* 30**



## Specifications

Model No.	Maximum Working Pressure kgf/cm <sup>2</sup> (psi)	Maximum Flow Rate gpm (A*)		Maximum Flow Rate gpm(2A*)	
		50Hz	60Hz	50Hz	60Hz
UVC- 1A UVC-11A	71.4 (1015)	6.6	7.9	8.7	10.3

## Motor selection curves



### • Selecting a motor

The area under a motor output curve in the graph to the left is the operating range for that motor under the rated output for that motor.

### Example:

To find the motor that can produce pressure of 507 psi and a discharge rate of 6.6 gpm.

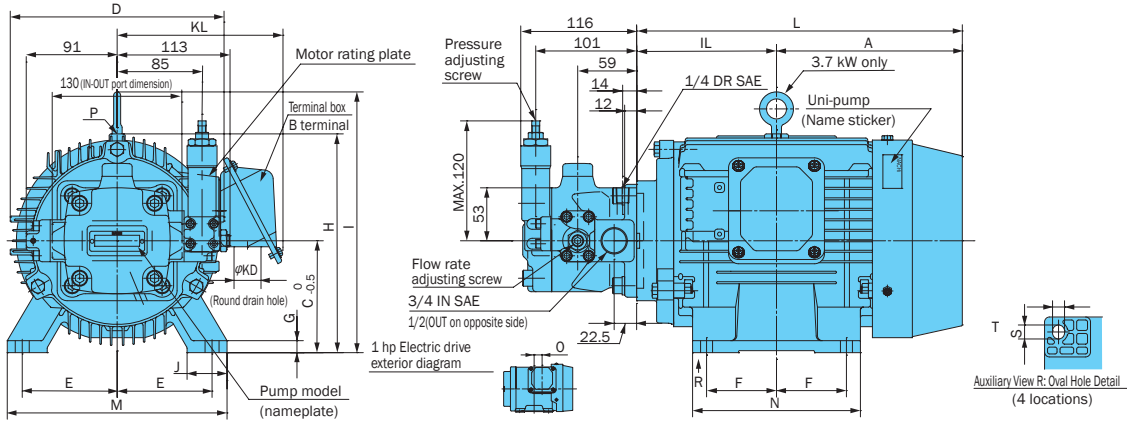
### Selection Process:

Since the intersection of the two broken lines from a pressure of 507 psi and discharge rate of 6.6 gpm intersect in the area under the 3 hp curve, it means that a 3 hp motor should be used. In the case of a double pump configuration, select a motor that is larger than the total power required by both pumps.

\* Select a uni-pump that has a pressure and flow rate that is within the range of the drive so that the drive will not overload.

# Installation Dimension Drawings

## UVC-1A

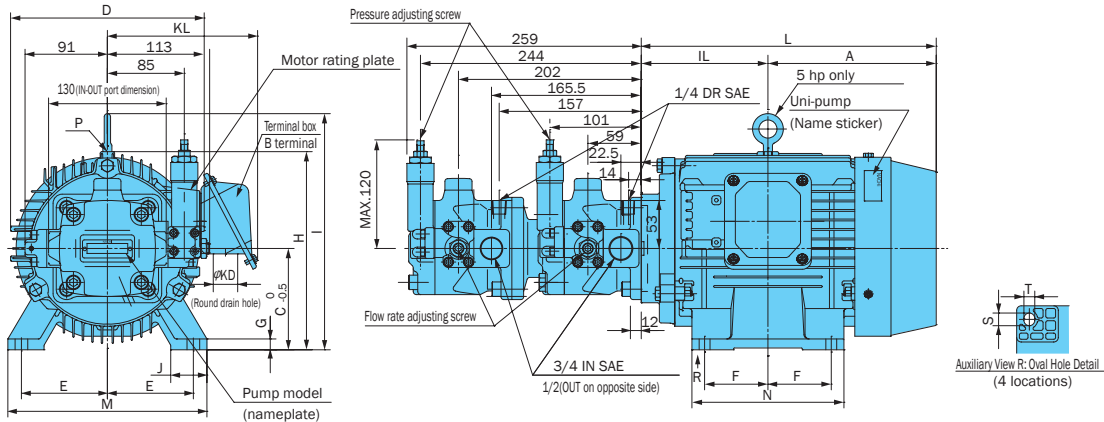


Uni-pump	Motor Dimensions mm																Frame No.	Output hp (4 poles)	Weight lbs	
	A	IL	C	D	E	F	G	H	I	J	L	M	N	S *T	KD	KL				O
UVC-1A-A2-0.75-4-30	133	105	80	170	62.5	50	4.5	165	-	35	238	165	130	18*10	ø27	157	27.5	80M	1	53
UVC-1A-A2-1.5-4-30	143	118.5	90	198	70	62.5	10	190	-	40	261.5	176	150	12*10	ø27	159	-	90L	2	56
UVC-1A-A3-1.5-4-30																				
UVC-1A-2A2-1.5-4-30	157.5	133	100	198	80	70	12	200	-	40	290.5	200	168	14*12	ø27	159	-	100L	3	67
UVC-1A-A2-2.2-4-30																				
UVC-1A-A3-2.2-4-30	186	140	112	214	95	70	12	-	261	40	326	220	168	14*12	ø27	166	-	112M	5	80
UVC-1A-A4-3.7-4-30																				
UVC-1A-2A2-3.7-4-30	186	140	112	214	95	70	12	-	261	40	326	220	168	14*12	ø27	166	-	112M	5	80
UVC-1A-2A3-3.7-4-30																				

0.75 to 2.2kW model does not have hangers.

- Standard drive motor is the fully enclosed fan-cooled B type.
- Standard voltage for drive motor is 200 VAC, 50/60 Hz or 220 VAC, 60 Hz.
- Standard terminal box is B terminal (right side viewed from pump).
- See page A-21 for the characteristics of the drive motor for the unipump (domestic standard 3 rating).

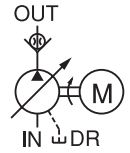
## UVC-11A



Uni-pump	Motor Dimensions mm																Frame No.	Output hp (4 poles)	Weight lbs
	A	IL	C	D	E	F	G	H	I	J	L	M	N	S *T	KD	KL			
UVC-11A-A2-A2-1.5-4-30	143	118.5	90	198	70	62.5	10	190	-	40	261.5	176	150	12*10	ø27	159	90L	2	79
UVC-11A-A2-A3-1.5-4-30																			
UVC-11A-A3-A3-1.5-4-30	157.5	133	100	198	80	70	12	200	-	40	290.5	200	168	14*12	ø27	159	100L	3	90
UVC-11A-A2-A2-2.2-4-30																			
UVC-11A-A3-A3-2.2-4-30	186	140	112	214	95	70	12	-	261	40	326	220	168	14*12	ø27	166	112M	5	103
UVC-11A-A2-A2-3.7-4-30																			
UVC-11A-A3-A3-3.7-4-30	186	140	112	214	95	70	12	-	261	40	326	220	168	14*12	ø27	166	112M	5	103
UVC-11A-A2-A2-3.7-4-30																			
UVC-11A-A3-A3-3.7-4-30	186	140	112	214	95	70	12	-	261	40	326	220	168	14*12	ø27	166	112M	5	103
UVC-11A-2A2-2A2-3.7-4-30																			
UVC-11A-2A2-2A3-3.7-4-30	186	140	112	214	95	70	12	-	261	40	326	220	168	14*12	ø27	166	112M	5	103
UVC-11A-2A2-2A3-3.7-4-30																			

No hanger on 2 and 3 hp models.

- Standard drive motor is the fully enclosed fan-cooled B type.
- Standard voltage for drive motor is 200 VAC, 50/60 Hz or 220 VAC, 60 Hz.
- Standard terminal box is B terminal (right side viewed from pump).
- See page A-21 for the characteristics of the drive motor for the unipump (domestic standard 3 rating).



### UVN Series Variable Volume Vane Uni-Pump NSP Uni-Pump

7.9 to 31.7 gpm  
2000 psi

### Features

#### Energy efficient high performance

All the performance of a vane pump, right from the low pressure range, is enhanced even further by eliminating the external drain and optimizing the pressure balance, creating a design that generates little heat. The result is a pump that contributes to the energy efficiency of the

mother machine, as well as to process precision.

#### Lightweight, compact design

The pump and motor are designed for exclusive uni-pump use, making them lightweight, compact, easy to handle, and suitable for a wide range of applications.

#### Low noise, long life

The pump and motor shaft are linked by a joint, which minimizes noise by eliminating the effects of shaft vibration and an off-center shaft. The coupling is constructed to allow constant lubrication, for friction-free long life.

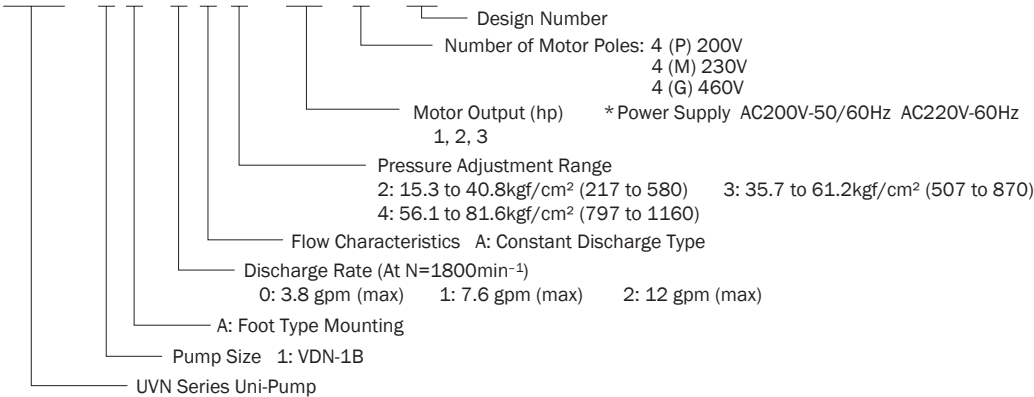
### Specifications

Model No.	Pump Capacity in <sup>3</sup> /rev	Pressure Adjustment Range kgf/cm <sup>2</sup> (psi)	No-load Discharge Rate gpm	
			50Hz	60Hz
UVN-1A-0A2- <sup>0.7</sup> / <sub>1.5</sub> -4-11	.49	15.3 to 40.8 (217 to 580)	3.1	3.8
UVN-1A-0A3- <sup>0.7</sup> / <sub>1.5</sub> -4-11		35.7 to 61.2 (507 to 870)		
UVN-1A-0A4- <sup>0.7</sup> / <sub>1.5</sub> -4-11		56.1 to 81.6 (797 to 1160)		
UVN-1A-1A2- <sup>1.5</sup> / <sub>2.2</sub> -4-11	.98	15.3 to 40.8 (217 to 580)	6.3	7.6
UVN-1A-1A3- <sup>1.5</sup> / <sub>2.2</sub> -4-11		35.7 to 61.2 (507 to 870)		
UVN-1A-1A4- <sup>1.5</sup> / <sub>2.2</sub> -4-11		56.1 to 81.6 (797 to 1160)		
UVN-1A-2A3- <sup>2.2</sup> / <sub>3.7</sub> -4-11	1.59	(507 to 870)	10	3.7 - 12
UVN-1A-2A4- <sup>2.2</sup> / <sub>3.7</sub> -4-11		(797 to 1160)		

Note: Contact your agent for combinations other than those noted above.

### Understanding Model Numbers

**UVN - 1 A - 1 A 4 - 1.5 - 4 - 11**



#### • Handling

1. Installation and Piping Precautions
  - 1 Provide a mounting base of sufficient rigidity, and install so that the pump shaft is oriented horizontally.
  - 2 Make sure the flow rate of the suction piping is no more than 6 ft/s, and that the suction pressure at the pump suction port is in the range of 4.35 psi.
  - 3 Drain piping must be direct piping up to a point that is below the tank fluid level, and back pressure due to pipe resistance should not exceed 14 psi.

Provide a suction strainer with a filtering grade of about 100 μm (150 mesh).

#### 2. Running Precautions

- 1 The direction of rotation is clockwise (rightward) when viewed from the motor fan side.
- 2 At startup, repeat the inching operation (start-stop) with the pump discharge side at no-load to bleed air from the pump and suction piping.
- 3 Equip an air bleed valve in circuits where it is difficult to bleed air before

startup.

- 4 Make sure the maximum peak pressure (setting pressure + surge pressure) during operation does not exceed 2000 psi. Refer to the following piping conditions as a guideline to keep the maximum peak pressure below 2000 psi. 1/2" x 2 m rubber hose (for 2000 psi) (pipe volume: approximately 15 in<sup>3</sup>)
- 5 Install a relief valve to cut surges in the circuit if pressure exceeds 2000 psi.

### 3. Management of Hydraulic Operating Fluid

- Use only good-quality hydraulic operating fluid with a kinematic viscosity at a fluid temperature of 104 °F within the range of (30 to 50cSt).
- Normally, you should use an R&O type and wear-resistant type of ISO VG32 or 46, or equivalent.  
The operating temperature range is 59 to 140 °F. When the oil temperature at startup is 59 °F or less, perform a warm-up operation at low pressure until the oil temperature reaches 59 °F. Use the pump in an area where the temperature is within the range of 50 to 104 °F.
- For the return line to the tank, use a 10µm line filter.
- Manage hydraulic operating fluid so contamination is maintained at class NAS10 or lower. Take care to avoid contamination with water, foreign matter, and other oil, and watch out for discoloration.

### 4. Setting the Pressure and Discharge Rate

- When adjusting pressure, pressure is increased by clockwise (rightward) rotation of the adjusting screw and decreased by counterclockwise (leftward) rotation. After adjustment is complete, securely tighten the lock nut.
- Turn adjustment screw right to decrease or left to increase volume of discharge. Refer to guidelines in the following diagram for the relationship of the non-load volume of discharge and the position of the flow adjustment screw.

After adjustment is complete, securely tighten the lock nut.

### 3 Factory Default P-Q Settings (Standard Model)

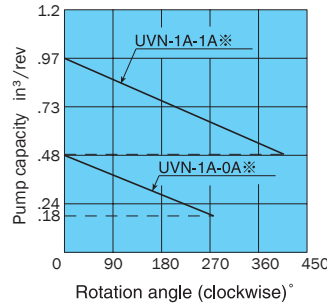
- Flow Rate Setting = Maximum flow rate for model as indicated in the catalog
- Pressure Setting = Pressure shown in table below

Factory Default Pressure Settings
2: 35.7 (507)
3: 51.0 (725)
4: 71.4 (1015)

- All adjustments, except the flow volume adjusting screw, are precision adjusted at the factory during assembly, do not adjust them. (Do not make any adjustments other than the pressure adjustment screw and the flow rate adjusting screw.)

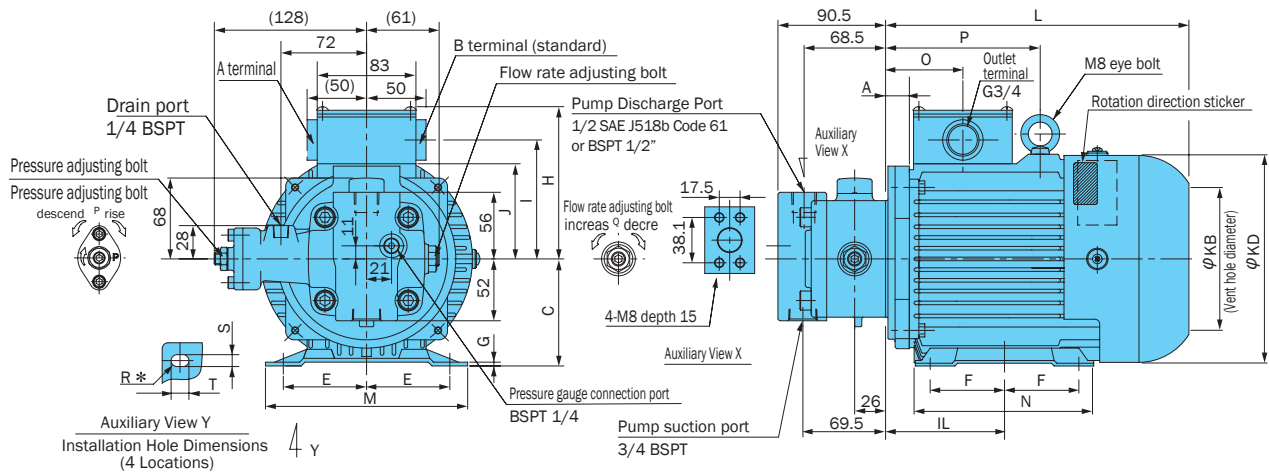
Note:

The values indicated above are at maximum pump discharge volume with the flow volume adjusting screw at the 0° position. The broken lines show the flow volume adjustment range lower limit value.



## Installation Dimensions

Installation method is the same as design number 10D (old design).



Model No.	Output - Poles (hp - 4P)	Motor Dimensions mm (mm)																	Weight lbs	
		A	IL	C	φKD	E	F	G	H	J	L	M	N	T × S	R*	φKB	O	P		I
UVN-1A-A*0.7*4-11	1 - 4	20	90	80	157	62.5	50	2.3	120	72	230	155	120	15 × 10	R5	110	65	130	92	37
UVN-1A-A*1.5*4-11	2 - 4	20	100	90	175	70	62.5	3.2	128	80	255	170	150	15 × 10	R5	120	65	130	100	46
UVN-1A-A*2.2*4-11	3 - 4	20	110	100	195	80	70	3.2	138	90	285	200	165	17 × 12	R6	134	65	135	110	57

No hanger.

- Standard drive motor is the fully enclosed fan-cooled E type.
- Standard voltage for drive motor is 200 VAC, 50/60 Hz or 220 VAC, 60 Hz.
- Standard terminal box is B terminal (right side viewed from pump).

### Characteristics of drive motor for Uni-Pump (domestic standard 3 rating)

Output hp	Poles	(Note-1) Model Number	Voltage [V]	Frequency [Hz]	Current rating [A]	RPM rating [min <sup>-1</sup> ]	Heat resistance
1	4	The drive motor is specialized for the unipump and is not a specific model.	230 200 460	50	3.9	1400	E
			230 200 460	60	3.6	1690	
2	4		230 220 460	60	3.5	1710	E
			230 200 460	50	7.1	1390	
3	4		230 200 460	60	6.6	1670	E
			230 220 460	60	6.3	1700	
3	4	230 200 460	50	9.0	1410	E	
		230 200 460	60	8.7	1700		
			230 220 460	60	8.2	1720	

## Performance Curves

UVN-1A-A\*-4-11  
 Operating Fluid : ISO VG 32  
 Oil temperature : 104°F

Motor selection curves

The area under a motor output curve in the graph below is the operating range for that motor under the rated output for that motor.

Example:  
 To find the motor that can produce pressure of 507 psi and a discharge rate of 3.1 gpm.

Selection Process  
 Since the intersection of the two broken lines from a pressure of 507 psi and discharge rate of 3.1 gpm intersect in

the area under the 2 hp curve, it means that a 2 hp motor should be used.

\* Select a uni-pump that has a pressure and flow rate that is within the range of the drive so that the drive will not overload.

