

Vane pumps (for mineral oil)

B
O-1

Fixed Displacement Vane Pumps

Model Code	Max. Working Pressure MPa	Max. Speed min ⁻¹	(Delivery Speed Delivery pressure	L/min 1000 min ⁻¹ 0.7 MPa)	Description	Page					
Fixed Displacement Vane Pumps											
			5	10	20	30	50	100	200		
SQP1-2	14	1800	7.5							SQP1, SQPS1	B1-1
3			10.2								
4	12.8										
5	16.7										
6	19.2										
7	22.9										
8	26.2										
9	28.3										
11	35.0										
12	16			37.9						Double small displ. SQP21, SQPS21 SQP31, SQPS31 SQP41, SQPS41	B2-1
14	14		44.2								
										Triple medium displ. SQP211, SQP311	B3-1
										Triple small displ. SQP211, SQP311 SQP321, SQP421 SQP431	
SQP2-10	17.5	1800			32.5					SQP2, SQPS2	B1-1
12			38.3								
14			43.3								
15			46.7								
17			52.5								
19			59.2								
21			65.0								
											Double large displ. SQP21, SQPS21
									Double small displ. SQP32, SQPS32 SQP42, SQPS42	B2-1	
									Triple large displ. SQP211	B3-1	
									Triple medium displ. SQP321, SQP421		
									Triple small displ. SQP432		
SQP3-17	17.5	1800			53.3					SQP3, SQPS3	B1-1
21			66.7								
25			79.2								
30			95.0								
32			100								
35			109								
38			118								
											Double large displ. SQP31, SQPS31 SQP32, SQPS32
									Double small displ. SQP43, SQPS43	B2-1	
									Triple large displ. SQP311, SQP321	B3-1	
									Triple medium displ. SQP431, SQP432		
SQP4-30	17.5	1800			96					SQP4, SQPS4	B1-1
35			109								
38			128								
42			134								
50			156								
60			189								
									Double large displ. SQP41, SQPS41 SQP42, SQPS42 SQP43, SQPS43	B2-1	
									Triple large displ. SQP421, SQP431 SQP432	B3-1	
20VQ5	※ 21	2700			16.7					Double small displ. 2520VQ, 3520VQ 4520VQ	B6-1
8	26.2										
11	35.0										
12	37.9										
14	44.2										
25VQ12	※ 21	2700			38.3					25VQ	B5-1
14		43.3									
17		2500	52.5						Double large displ. 2520VQ	B6-1	
21		65.0									
									Double small displ. 3525VQ, 4525VQ		
35VQ25	※ 21	2500			79.2					35VQ	B5-1
30		95.0									
35		2400	109						Double large displ. 3520VQ, 3525VQ	B6-1	
38		118									
									Double small displ. 4535VQ		
45VQ42	17.5	2200			134					45VQ	B5-1
50			156								
60			189								
									Double large displ. 4520VQ, 4525VQ 4535VQ	B6-1	

Model Code	Max. Working Pressure MPa	Max. Speed min ⁻¹	(Delivery Speed (Delivery pressure) L/min 1000 min ⁻¹ 0.7 MPa)	Description	Page
------------	---------------------------	------------------------------	---	-------------	------

			5	10	20	30	50	100	200			
V-104/108-Y	7	1800	5.7							V-104	B7-1	
E			8.5							Double large displ.	V-108	B8-1
G			11.7									
A		16.8										
C		25.8										
D	1200	36.3							Double small displ.	V-108, V-128 V-138, V-148	B8-1	
V-124/128	7	1500	48.6							V-124, V-134 V-144	B7-1	
V-134/138			61.5							Double large displ.	V-128, V-138 V-148	B8-1
V-134U/138U			72.6									
V-134X/138X		94.2										
V-144/148		1200	119									

Note: • For triple SQP pumps (SQP**1, SQP432), there may be speed limitations for small displ. side pumps. See page B3-2.
 • Max. working pressure (Marked※) of VQ Series pumps are allowable pressure for mobile application. Consult Tokyo Keiki for industrial applications.

Vane pumps (for fire-resistant fluids)

Water Glycol Fluid			Phosphate Ester Fluid		
Model Code	Max. Working Pressure MPa	Max. Speed min ⁻¹	Model Code	Max. Working Pressure MPa	Max. Speed min ⁻¹
F11-SQP Series	※1 17.5	※2 1200	F3-SQP Series	14	※2 1200
F11-SQPS Series			F3-SQPS Series		
SQP Series	12.5	※2 1200	F3-SQPS Series		
SQPS Series			F3-VQ Series	14	※3 1600
VQ Series	12.5	1200	F3-V-1*4 Series ※5	7	1200
V-1*4 Series ※4	5.5	1200			

Note: ※1 F11-SQP(S), F11-SQP(S)*1 displacements 2, 3, and 14 are 14 MPa, displacement 12 is 16 MPa.
 ※2 For triple SQP pumps, depending on the small size displacement, max. speed may be limited to 1000 min⁻¹.
 ※3 25VQ displacements 12, 14 are 1800 min⁻¹, 45VQ is 1500 min⁻¹.
 ※4 V-104-D, V-144 cannot be used with water glycol fluids.
 ※5 V-104-D, V-134X, V-144 cannot be used with phosphate ester fluids.

Installation and Pump-Prime Mover Alignment

- The base for the electric motor and pump should offer sufficient rigidity. Vibration absorbing construction is recommended.
- Flexible type coupling is recommended to join the drive shaft of the prime mover and the pump shaft. (DO NOT USE tire shaped coupling) Shafts should be aligned within recommended TIR (Total Indicator Reading) 0.05 mm tolerance. However this may be affected by differences in connection methods and type of couplings. Please consult Tokyo Keiki in such case.
- Poor shaft alignment may cause shaft damage, heat and friction of bearings, leakage from oil seals, pump noise and vibration, etc. Thus shaft should be aligned with care.
- In principle, there should be no external radial or thrust loads on shaft ends. Please consult Tokyo Keiki if belt, chain, or gear couplings are to be used.

Piping and Filtration

- Suction pressure (gauge pressure)
Proper inlet suction pressures are +35~-16.7 kPa for mineral oil fluids and +35~-10.1 kPa for water glycol and phosphate ester fluids.
- Suction pipe flow rate should be kept within 0.5~1.5 m/s.
- Filtration
On the suction side, a 150 μm or equivalent tank filter (suction filter) should be used.
On the delivery side, a full flow filter which provides filtration of less than 25 μm or bypass filter which provides filtration of less than 10 μm should be installed.
- Filter installation
When using an immersion type tank filter, please install filter so it is about 50~70 mm from the tank bottom to discourage ingress of contaminant precipitate. In the case of greatly fluctuating oil level, the installation should be designed so that air does not enter the filter.
- Suction, return piping
 - Stipulated suction pressure should be considered and suction resistance should be kept as low as possible.
 1. Use large diameter pipe with as few bends as possible.
 2. Height from pump suction port to tank standard oil level should be less than 1 m.
 - Distance from suction piping end to tank bottom should be more than 50 mm.
 - Air in system causes noise, vibration, and parts damage. As air can easily be drawn in through suction piping, care should be paid to ensure that joints, especially, are airtight.
 - The end of the return pipe should always be below the oil level regardless of fluctuations in oil level.
 - A baffle should be installed in the tank between the suction and return lines.
 - Use of flexible rubber hose piping instead of steel piping for pump suction, delivery, and drain lines provides effective vibration dampening and reduces noise.

Air bleed

- During initial system startup (and startups after long period of storage), pump may have difficulty drawing fluid. By pre-installing an air bleed valve (ABT-03) or by loosening a fitting in the delivery pipe, air can be bled from the system.
- During air bleed of pump and piping, pump should be run at no load.

Warm up

- During startup, if viscosity is higher than proper viscosity (54 mm^2/s), system should be warmed up with pressure less than half of maximum working pressure until viscosity falls below 54 mm^2/s .

Hydraulic fluid

- Note that pump specifications such as maximum working pressure and maximum speed may differ with the type of hydraulic fluid used. See Appendix 1 regarding hydraulic fluid selection.
- Mineral oil based fluid
 - General industrial anti-wear hydraulic fluid is recommended.
- Fire resistant fluids
 - Water glycols may be used with Tokyo Keiki standard type pumps. However maximum working pressures, maximum speeds, etc., specifications will differ from those of mineral oil based fluids.
Please refer to specifications of each pump for details.
 - Fluorine seals are used with pumps that operate on phosphate ester fluids. An "F3-" suffix is used to designate such pumps. Specifications for maximum working pressures, maximum speeds, etc., will differ from those of mineral oil fluids.
Please refer to specifications of each pump for details.
 - Please consult Tokyo Keiki regarding other fire resistant fluids.

Hydraulic fluid viscosity and temperature

- Pump should be operated with hydraulic fluid viscosity range of 13 ~ 54 mm^2/s . At pump startup a maximum viscosity of 860 mm^2/s is allowed however care should be paid to observe the section 'Warm Up' regarding warm up of hydraulic fluid.
- Hydraulic fluid temperature should be maintained below 65°C.

SQP/SQPS series Low noise fixed displacement vane pumps

The SQP series are low-noise vane pumps offered in single, double, or triple pumps, with 4 frame sizes, 16 series and 31 models of different discharge displacements.

The wide extent of this range allows users to select the optimum combination of discharge displacements for their circuits, leading to an energy efficient system.

B
0-5

Fixed Displacement Vane Pumps

SQP Series

1. LOWER NOISE

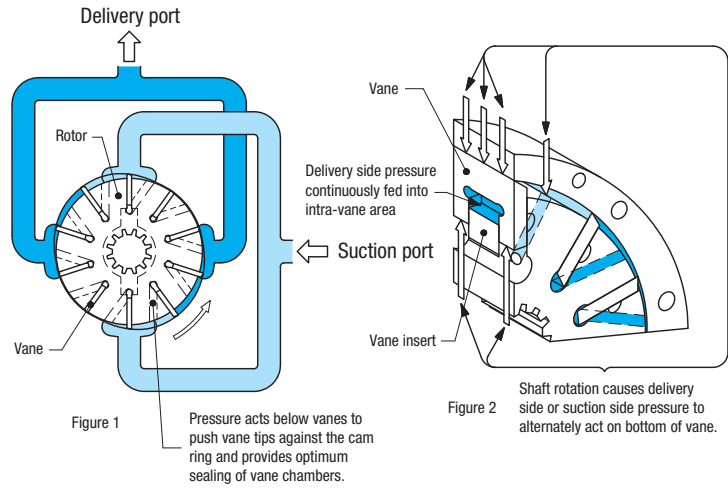
Offers very quiet and soft operational noise levels.

2. GREATER FLEXIBILITY

Multiple pump combinations of different displacements permits simpler circuit design compared to systems using one large displacement pump and provides greater flexibility in circuit design with low noise levels.

3. MAINTENANCE FRIENDLY

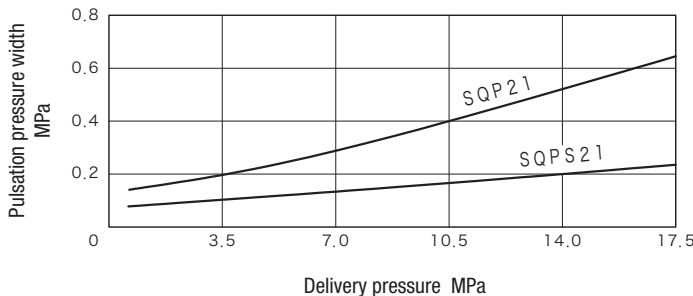
Rotating element in cartridge kit form allows simple maintenance.



SQPS Series

The SQPS Series incorporate special pulsation damping chambers which minimize pulsation amplitude from delivery pressure, contributing to a great reduction in overall noise levels.

● Comparison of Pump Pressure Pulsations



F11-SQP(S) Series

The F11-SQP(S) Series is designed for use with fire-resistant fluids such as water-glycol fluids which consist of 40% water.

The pumps are designed to provide high pressure and long life even when using such fluids with good anti-wear characteristics. The below graphs shows the amount of wear is similar to pumps operating on anti-wear mineral oil.

Vane Wear Comparison (Tokyo Keiki pumps)

