SMV VERTICAL MULTISTAGE INLINE PUMPS

FOR WHERE IT REALLY MATTERS

SPP PUMPS

SPP PUMPS

Application

- Suitable for transferring liquids of low viscosity, non-inflammable and non-explosive, not containing solid particles or fibers
- Water supply & drainage for high-rise buildings, filtration and transfer at waterworks, pressure boosting in main pipe
- Washing and cleaning systems, boiler feeding, cooling water circulation, water treatment systems, auxiliary system, support equipment
- Ultra-filtration systems, reverse-osmosis systems, distillation systems, separators, swimming pools
- Agricultural irrigation: sprinkler irrigation, drip-feed irrigation
- Food & beverage industry
- Fire-fighting system

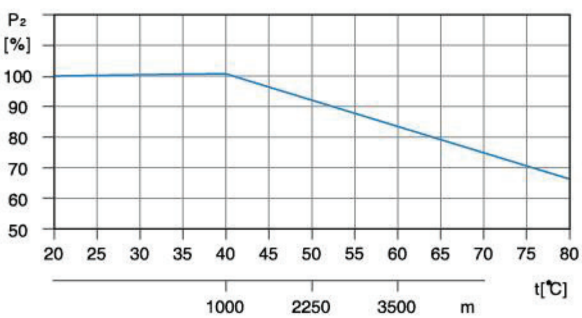
Operating Conditions

- Low viscosity, non-inflammable and non-explosive liquids not containing solid particles or fibers. The liquids must not chemically attack the pump materials. When pumping liquids with a density or viscosity is higher than that of water, a motor with a higher output power rating shall be used.
- Liquid temperature: -20℃~+120℃
- Flow ranges: 0.7-120 m^3/h
- Liquid pH value: 4 - 10
- Max. ambient temperature: +40℃
- Max. operation pressure: 33 bar
- Altitude: up to 1000 m

Ambient Temperature

Max. ambient temperature: + 40℃. Ambient temperature above 40℃ or installation at altitude of more than 1000 meters above sea level require the use of an oversize motor. Because of low air density and poor cooling effects, the motor output power P_2 will be decreased. See the picture.

In such cases, it may be necessary to use a motor with a higher output power rating.



For example, when the pump is installed at altitude of more than 3500 meters above sea level, P_2 will be decreased to 88%. When the ambient temperature is 70℃, P_2 will be decreased to 78%.

Motor

- Totally enclosed & fan-cooled motor
- Protection class: IP55
- Standard voltage: 50Hz 1×220V/3×380V
1×220V/3×415±15V (Option)

Identification Codes

SMVS 45 - 10 - 2 - B - K

- K: Pipeline Port Code (Flange Structure)
- B: AISI316 Stainless Steel Material
- 2: Small Impeller Stages
- 10: Impeller Stages
- 45: Rated Flow (m^3/h)
- SMVS: SMVS,SMVR Vertical Multistage Pump Series

SMVS: Stainless steel wetted parts
SMVR: Cast iron base & pump cover

Identifications codes of flange structure

A: Oval flange; K: Clamp connector ;
G: Threaded connector F: Flange connection

Identification code for stainless steel material
B: AISI316 stainless steel
C: AISI304 stainless steel

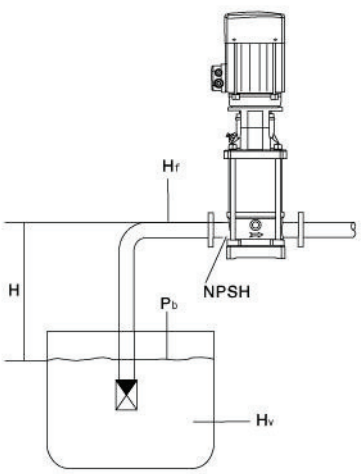
Minimum Inlet Pressure–Npsh

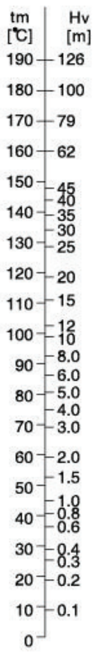
Calculation of the inlet pressure “H” is recommended in these situations:
The liquid temperature is high.
The flow is significantly higher than the rated flow.
Water is drawn from depths.
Water is drawn through long pipes.
Inlet conditions are poor.

To avoid cavitation, make sure that there is a minimum pressure on the suction side of the pump. The maximum suction lift “H” in meters head can be calculated as follows:

H	$= P_b \times 10.2 - NPSH - H_f - H_v - H_s$
P_b	= Barometric pressure in bar. (Barometric pressure can be set to 1 bar). In closed systems, P_b indicates the system pressure in bar.
NPSH	= Net Positive Suction Head in meters head. (To be read from the NPSH curve at the highest flow the pump will be delivering.)
H_f	= Friction loss in suction pipe in meters head. (At the highest flow the pump will be delivering.)
H_v	= Vapor pressure in meters head. (To be read from the vapor pressure scale. “H_v” depends on the liquid temperature “tm”)
H_s	= Safety margin=minimum 0.5 meters head.

If the “H” calculated is positive, the pump can operate at a suction lift of maximum “H” meters head.
If the “H” calculated is negative, an inlet pressure of minimum “H” meters head is required.





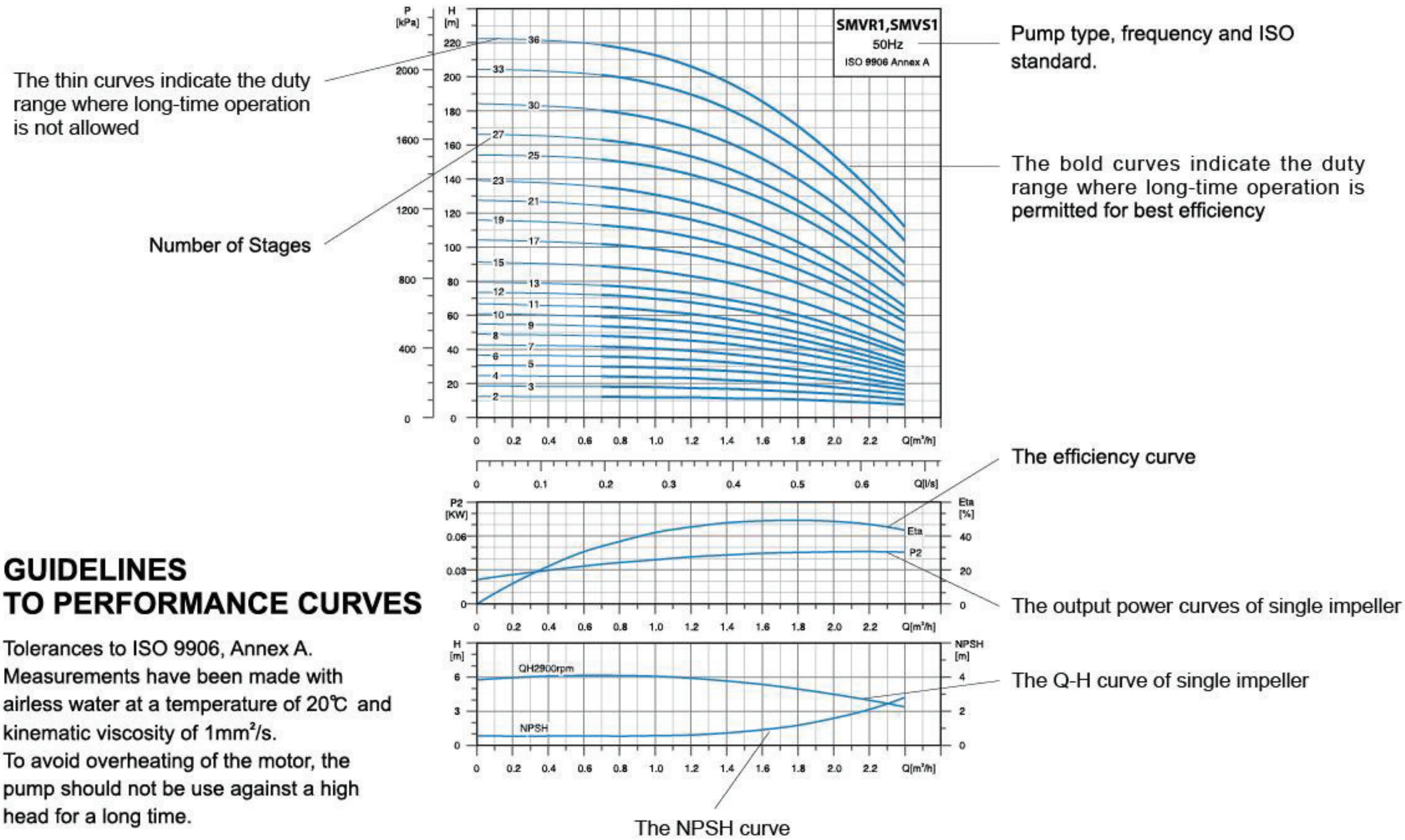
Note: To avoid cavitation, never select a pump with a duty point too far to the right on the NPSH curve.
Always check the NPSH value of the pump at the highest possible flow.

Maximum Inlet Pressure

The following table shows the maximum permissible inlet pressure. However, the current inlet pressure + the pressure against a closed valve must always be lower than the Max. permissible operating pressure.
If the maximum permissible operating pressure is exceeded, the bearing in the motor may be damaged and the life of the shaft seal reduced.

Pump Type	Maximum Inlet Pressure [bar]
SMVR1,SMVS1	
1–2 — 1–36	10
SMVR2,SMVS2	
2–2	6
2–3 — 2–12	10
2–13 — 2–26	15
SMVR3,SMVS3	
3–2 — 3–29	10
3–31 — 3–26	15
SMVR4,SMVS4	
4–2	6
4–3 — 4–11	10
4–12 — 4–22	15
SMVR5,SMVS5	
5–2 — 5–16	10
5–18 — 5–29	15
SMVR10,SMVS10	
10–1 — 10–6	8
10–7 — 10–22	10
SMVR15,SMVS15	
15–1 — 15–3	8
15–4 — 15–17	10
SMVR20,SMVS20	
20–1 — 20–3	8
20–4 — 20–17	10
SMVR32,SMVS32	
32–1–1 — 32–4	4
32–5–2 — 32–10	10
32–11 — 32–14	15
SMVR45,SMVS45	
45–1–1 — 45–2	4
45–3–2 — 45–5	10
45–6–2 — 45–13–2	15
SMVR64,SMVS64	
64–1–1 — 64–2–2	4
64–2–1 — 64–4–2	10
64–4–1 — 64–8–1	15
SMVR90,SMVS90	
90–1–1 — 90–1	4
90–2–2 — 90–3–2	10
90–3 — 90–6	15

How To Read The Curve Charts



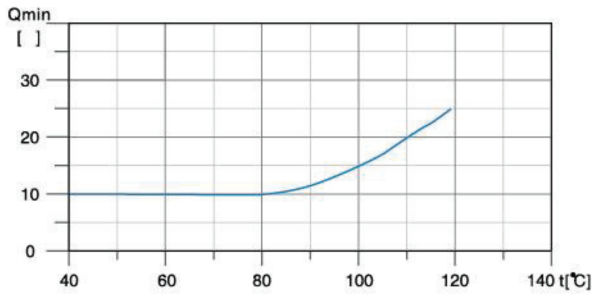
GUIDELINES TO PERFORMANCE CURVES

Tolerances to ISO 9906, Annex A.
Measurements have been made with airless water at a temperature of 20℃ and kinematic viscosity of $1mm^2/s$.
To avoid overheating of the motor, the pump should not be use against a high head for a long time.

Minimum Flow Rate

Due to the risk of overheating, the pump should not be used at a flow below the minimum flow rate. The curve below shows the minimum flow rate as a percentage of the nominal flow rate in relation to the liquid temperature.

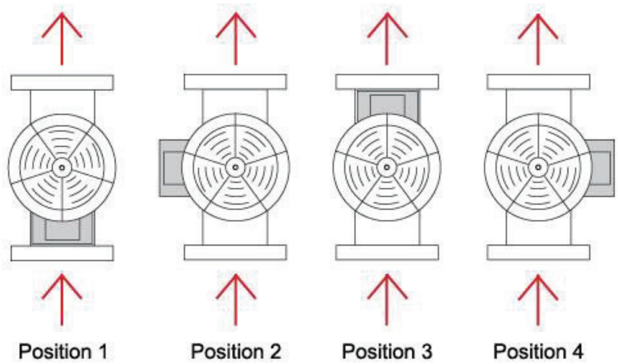
Air cooling apparatus



Note: The outlet valve must be opened when the pump is in operation.

Terminal Box Positions

(Note: set to position 1 before delivery)

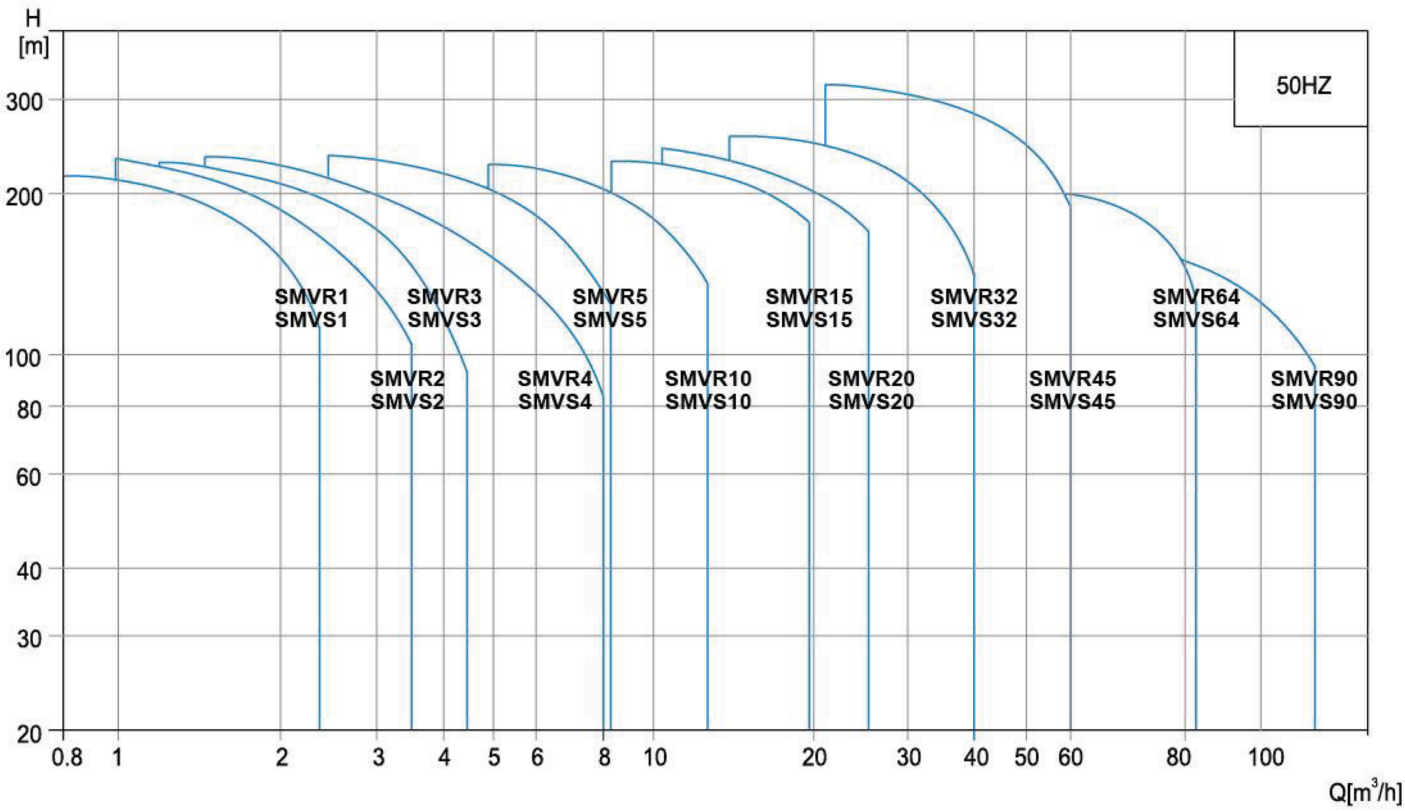


Product Range

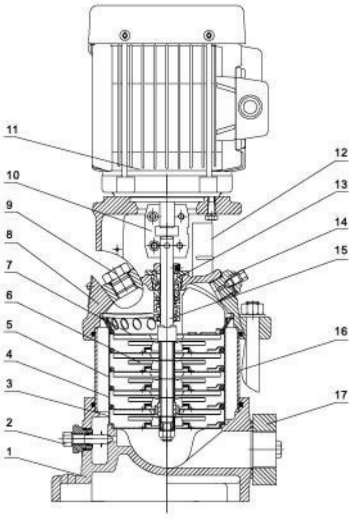
MODEL / DESCRIPTION	SMVR(S) 1	SMVR(S) 2	SMVR(S) 3	SMVR(S) 4	SMVR(S) 5	SMVR(S) 10	SMVR(S) 15	SMVR(S) 20	SMVR(S) 32	SMVR(S) 45	SMVR(S) 64	SMVR(S) 90
Rated flow [m^3/h]	1	2	3	4	5	10	15	20	32	45	64	90
Flow range [m^3/h]	0.7–2.4	1.0–3.5	1.2–4.5	2–8	2.5–8.5	5–13	9–24	11–29	15–40	22–58	30–85	45-120
Max. pressure [bar]	22	23	24	21	24	22	23	25	28	33	22	20
Motor power [kW]	0.37–2.2	0.37–3	0.37–3	0.37–4	0.37–4	0.37–7.5	1.1–15	1.1–18.5	1.5–30	3–45	4–45	5.5–45
Temperature Range [℃]	–20℃~+120℃ (Note: Both the Max. permissible pressure and liquid temperature range refer to the pump capacity.)											
Max. pump efficiency [%]	45	46	55	59	60	65	70	72	78	79	80	81
Pipe connection-SMVR												
Oval flange	G1	G1	G1	G1 1/4	G1 1/4	–	–	–	–	–	–	–
DIN flange	DN25	DN25	DN25	DN32	DN32	DN 40	DN 50	DN 50	DN65	DN80	DN100	DN100
Flange structure	○	○	○	○	○	○	○	○	●	●	●	●
Pipe connection-SMVS												
Oval flange	–	–	–	–	–	–	–	–	–	–	–	
DIN flange	DN 32	DN 32	DN 32	DN 32	DN 32	DN 40	DN 50	DN 50	DN65	DN80	DN100	DN100
Flange structure	●	●	●	●	●	●	●	●	●	●	●	●
Clamp connector	ϕ42	ϕ42	ϕ42	ϕ42	ϕ42	–	–	–	–	–	–	–
Threaded connector	G1 1/4	G1 1/4	G1 1/4	G1 1/4	G1 1/4	–	–	–	–	–	–	–

Note: ○ It means stationary flange structure , ● It means dynamic flange structure

Scope Of Performance–SMVR,SMVS

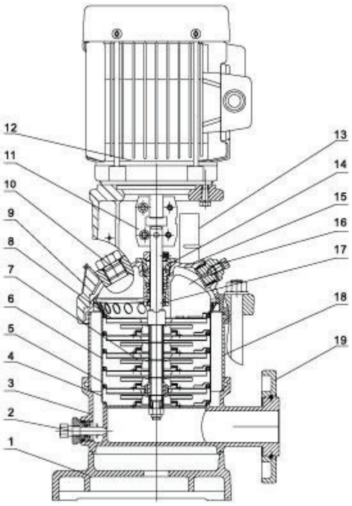


Cross Section



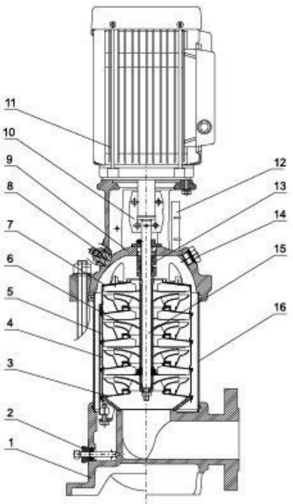
MODEL：SMVR1(2,3,4,5)

	Part	Material
1	Base	HT200
2	Drainage plug assembly	AISI304
3	Primary diffuser	AISI304
4	Diffuser with bearing	AISI304
5	Medium diffuser	AISI304
6	Impeller	AISI304
7	Final volute	AISI304
8	Motor base	HT200
9	Filling plug	AISI304
10	Coupling	Iron based powder metallurgy
11	Motor	
12	Guarding plate	AISI304
13	Cartridge seal	
14	Vent plug assembly	AISI304
15	Pump shaft	AISI304
16	Pump barrel	AISI304
17	Oval flange	HT200



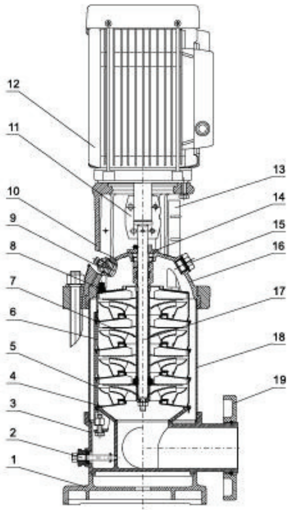
MODEL：SMVS1(2,3,4,5)

	Part	Material	Optional Material
1	Base plate	HT200	
2	Drainage plug assembly	AISI304	AISI316
3	Chasis	ZG304	ZG316
4	Primary diffuser	AISI304	AISI316
5	Diffuser with bearing	AISI304	AISI316
6	Medium diffuser	AISI304	AISI316
7	Impeller	AISI304	AISI316
8	Final diffuser	AISI304	AISI316
9	Motor base	HT200	
10	Filling plug	AISI304	AISI316
11	Coupling	Iron based powder metallurgy	
12	Motor		
13	Guarding plate	AISI304	
14	Cartridge seal		
15	Pump cover	ZG304	ZG316
16	Vent plug assembly	AISI304	AISI316
17	Pump shaft	AISI304	AISI316
18	Pump barrel	AISI304	AISI316
19	Flange	ZG35	



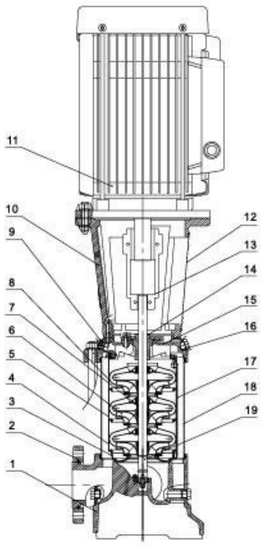
MODEL：SMVR10(15,20)

	Part	Material
1	Base	HT200
2	Drainage plug assembly	AISI304
3	Primary diffuser	AISI304
4	Diffuser with bearing	AISI304
5	Medium diffuser	AISI304
6	Impeller	AISI304
7	Final volute	AISI304
8	Filling plug	AISI304
9	Motor base	HT200
10	Coupling	Iron based powder metallurgy
11	Motor	
12	Guarding plate	AISI304
13	Cartridge seal	
14	Vent plug assembly	AISI304
15	Pump shaft	AISI304
16	Pump barrel	AISI304



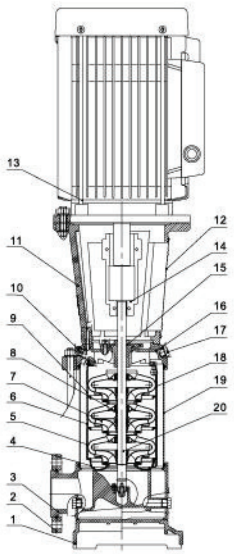
MODEL：SMVS10(15,20)

	Part	Material	Optional Material
1	Base plate	HT200	
2	Drainage plug assembly	AISI304	AISI316
3	Chasis	ZG304	ZG316
4	Primary diffuser	AISI304	AISI316
5	Diffuser with bearing	AISI304	AISI316
6	Medium diffuser	AISI304	AISI316
7	Impeller	AISI304	AISI316
8	Final diffuser	AISI304	AISI316
9	Filling plug	AISI304	AISI316
10	Motor base	HT200	
11	Coupling	Iron based powder metallurgy	
12	Motor		
13	Guarding plate	AISI304	
14	Cartridge seal		
15	Vent plug assembly	AISI304	AISI316
16	Pump cover	ZG304	AISI316
17	Pump shaft	AISI304	AISI316
18	Pump barrel	AISI304	AISI316
19	Flange	ZG35	



MODEL：SMVR32(45,64,90)

	Part	Material
1	Base	HT200
2	Flange	ZG35
3	Primary diffuser	AISI304
4	Medium diffuser	AISI304
5	Diffuser with bearing	AISI304
6	Impeller	AISI304
7	Shaft sleeve assembly	
8	Final diffuser	AISI304
9	Vent plug assembly	AISI304
10	Motor base	HT200
11	Motor	
12	Guarding plate	AISI304
13	Coupling	QT400
14	Cartridge seal	
15	HT200 Pump head	HT200
16	Filling plug	AISI304
17	Tension plate	AISI304
18	Pump barrel	AISI304
19	Pump shaft	AISI304



MODEL：SMVS32(45,64,90)

	Part	Material	Optional Material
1	Base plate	HT200	
2	Flange	ZG35	
3	Chasis	ZG304	ZG316
4	Primary diffuser	AISI304	AISI316
5	Medium diffuser	AISI304	AISI316
6	Diffuser with bearing	AISI304	AISI316
7	Impeller	AISI304	AISI316
8	Shaft sleeve assembly		
9	Final diffuser	AISI304	AISI316
10	Vent plug assembly	AISI304	AISI316
11	Motor base	HT200	
12	Guarding plate	AISI304	
13	Motor		
14	Coupling	QT400	
15	Cartridge seal		
16	Pump head	ZG304	ZG316
17	Filling plug	AISI304	AISI316
18	Tension plate	AISI304	AISI316
19	Pump barrel	AISI304	AISI316
20	Pump shaft	AISI304	AISI316

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