2013
.08

RV,RVA

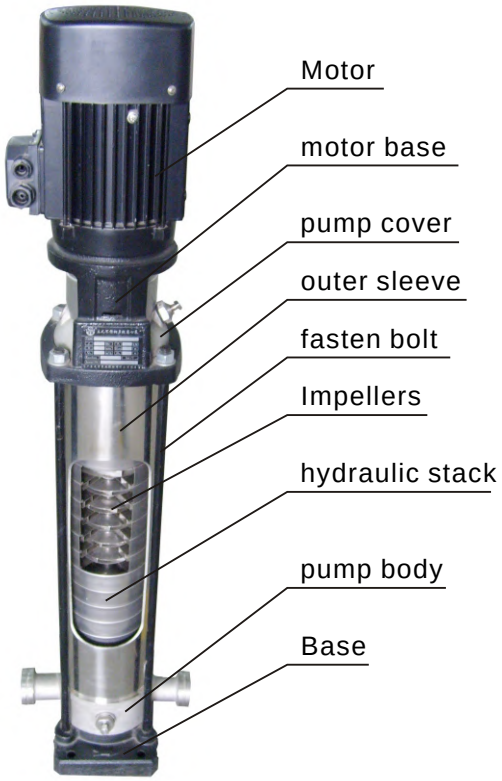
Vertical Multistage Centrifugal Pump

50Hz

Pump

RVA and RV are non-self priming vertical multistage centrifugal pump, the pumps are available with standard motor, the inlet and outlet are located at the pump bottom at the same plane (inline type).
All pumps are equipped with a maintenance-free mechanical seal set of the cartridge type.

Fig.1 RVA



Motor

RVA and RV are fitted with a totally enclosed、fan-cooled、2-pole、three-phase standard motor. From 0.37kW to 2.2kW, are also available with single-phase motor.(1*220-230V/240V).

Motor Protection

Single-phase motor have a built-in thermal overload switch.
Three-phase motors must be connected to a motor protective circuit breaker according to local regulations.

Ambient temperature

Ambient temperature: maximum+40℃, if the ambient temperature exceeds +40℃, or the pump is installed at an altitude exceeding 1000 meters, the motor must not be fully loaded due to the risk of overheating.
Overheating may result from excessive ambient temperatures or the low density and consequently low cooling effect of the air.
In such cases ,it may be necessary to use a motor with a higher rated output.

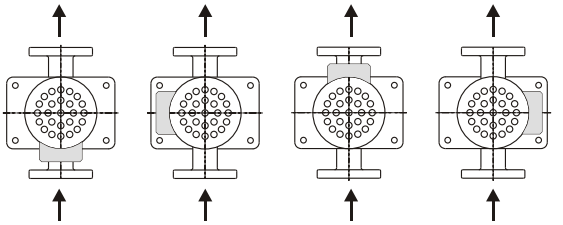
Terminal box positions

As standard the terminal box is mounted on the suction side of the pump, meanwhile, 0˚,90˚,180˚,270˚ could be adjusted according to the following proceeding:

1.If necessary, disassembling the protective cover of the shaft connector, but did not disassembling the shaft connector.
2.Disassembling the motor fixation screws.
3.Turn the motor to the required direction.
4.Fasten the motor screws.
5.Install the shaft connector's protective cover.

The voltage and frequency are marked on the label, the correct power should be confirm with the label before usage.
To ensure the electric connection is conformity to the drawing marked on the label inside the terminal box.

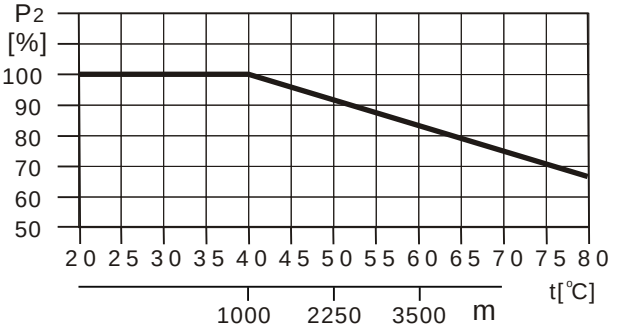
Fig2. Terminal box positions



Viscosity

The pumping of liquids with densities or kinematic viscosities higher than those of water will cause a considerable pressure drop, a drop in the hydraulic performance and a rise in the power consumption.
In such situations the pump should be fitted with a larger motor, if in doubt, contact.

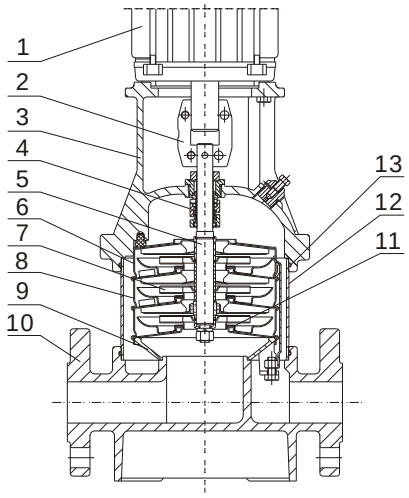
Fig.3 Relationship between motor output (P2) and temperature



Example:
From the Fig.3, the pump is installed at an altitude exceeding altitude 3500 meters, P2 will decrease to 88%, if the ambient temperature is up to 70℃,P2 will decrease to 78%.

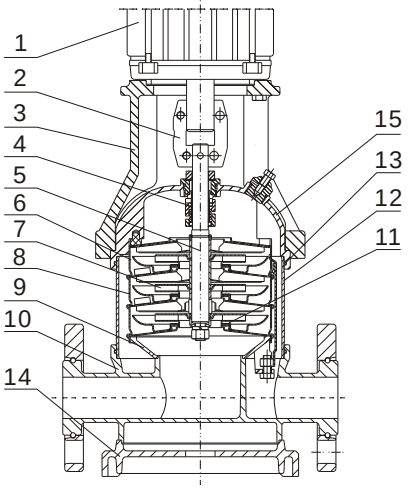
RV10,15,20

Sectional drawing



RVA10,15,20

Sectional drawing



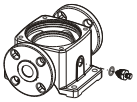
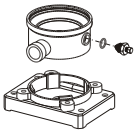
Material RV

No.	Description	Material	EN/DIN	AISI/ASTM
1	Motor			
2	Shaft connector			
3	Pump head	Cast iron	EN-JL1030	ASTM25B
4	Mechanical seal			
5	Shaft	S.S		AISI420
6	Outlet	S.S	1.4301	AISI304
7	Impeller	S.S	1.4301	AISI304
8	Hydraulic stack	S.S	1.4301	AISI304
9	Settled cover	S.S	1.4301	AISI304
10	Pump body	Cast iron	EN-JL1030	ASTM25B
11	Neck ring	PTFE		
12	Outer sleeve	S.S	1.4301	AISI304
13	O-ring	EPDM/FKM		

Material RVA

No.	Description	Material	EN/DIN	AISI/ASTM
1	Motor			
2	Shaft connector			
3	Pump head	Cast iron	EN-JL1030	ASTM25B
4	Mechanical seal			
5	Shaft	S.S	1.4057	AISI431
6	Outlet	S.S	1.4301	AISI304
7	Impeller	S.S	1.4301	AISI304
8	Hydraulic stack	S.S	1.4301	AISI304
9	Settled cover	S.S	1.4301	AISI304
10	Pump body	S.S	1.4301	AISI304
11	Neck ring	PTFE		
12	Outer sleeve	S.S	1.4301	AISI304
13	O-ring	EPDM/FKM		
14	Bottom base	Cast iron	EN-JL1030	ASTM25B
15	Pump cover	S.S	1.4301	AISI304

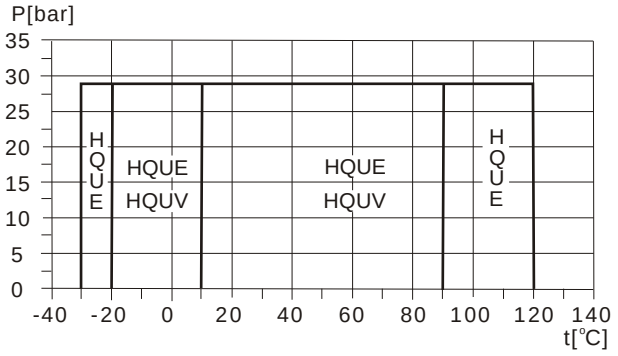
Maximum operating pressure and temperature range

	DIN-FGJ	UNION	PJE
			
	Max. permissible operating pressure		Liquid temperature range
RV,RVA1	25bar		-20℃ to +104℃
RV,RVA2	25bar		-20℃ to +104℃
RV,RVA3	25bar		-20℃ to +104℃
RV,RVA4	25bar		-20℃ to +104℃
RV,RVA5	25bar		-20℃ to +104℃
RV,RVA10-1→RV,RVA10-10	16bar		-20℃ to +104℃
RV,RVA10-12→RV,RVA10-17	25bar		-20℃ to +104℃
RV,RVA15-1→RV,RVA15-8	16bar		-20℃ to +104℃
RV,RVA15-9→RV,RVA15-12	25bar		-20℃ to +104℃
RV,RVA20-1→RV,RVA20-7	16bar		-20℃ to +104℃
RV,RVA20-8→RV,RVA20-10	25bar		-20℃ to +104℃
RV,RVA32-1-1→RV,RVA32-5	16bar		-20℃ to +104℃
RV,RVA32-6-2→RV,RVA32-8	25bar		-20℃ to +104℃
RV,RVA32-9-2→RV,RVA32-10-2	30bar		-20℃ to +104℃
RV,RVA45-1-1→RV,RVA45-4	16bar		-20℃ to +104℃
RV,RVA45-5-2→RV,RVA45-6-1	25bar		-20℃ to +104℃
RV,RVA45-6→RV,RVA45-7	30bar		-20℃ to +104℃
RV,RVA64-1-1→RV,RVA64-3	16bar		-20℃ to +104℃
RV,RVA64-4-2→RV,RVA64-5-2	25bar		-20℃ to +104℃
RV,RVA90-1-1→RV,RVA90-3	16bar		-20℃ to +104℃
RV,RVA90-4-2	25bar		-20℃ to +104℃

Operating range of the shaft seal

The operating range of the shaft seal depends on operating pressure, pump type, type of shaft seal and liquid temperature. The range shown in fig 4. Applies to clean water and water with glycol liquids.

Fig.4 Operating range of standard shaft seals



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 metres head can be calculated as follows:

$H=P_b*10.2-NPSH-Hf-Hv-Hs$

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 metres head.
(To be read from the NPSH curve at the highest flow the pump will be deivering).

Hf = Friction loss in suction pipe(unit:m).
(At the highest flow the pump will be delivering.)

Hv = Vapour pressure (unit:m).
(To be read from the vapour pressure scale).

Hs = safty margin=minimum 0.5 metres head.

If the "H" calculted is positive,the pump can operate at a suction lift of maximum "H" metres head. If the "H" calculted is negative,
an inlet pressure of minimum "H" metres head is required.

Example:

P_b=1bar
pump model:RVA10,50Hz
flow: 10m^3/h
NPSH(P36 reference:2.1 metres head.
liquid temperature:+50C
Hv(reference picture4):1.3metres head.
$H=P_b*10.2-NPSH-Hf-Hv-Hs$
$H=1*10.2-2.1-3.0-1.3-0.5=3.3$(metres)

It means the pump can operate at a suction lift of maximum 3.3 metres head.

exchaged meter head to bar:
1 metre head=1*0.0981=0.0981bar
exchaged metre head to kpa:
1 metre head=1*9.81=9.81kpa.

Fig.13 Mimimum inlet pressure-NPSH