RAE PUMPS
A RUTHMAN COMPANY

Installation, Operation, and Maintenance Manual

VBV Series
Sealless Vertical Immersion Pumps

60 Hz
MODELS

SINGLE PHASE
THREE PHASE

RAE Pumps
1212 Streng Street
Cincinnati, OH 45223
513.779.3034
www.RAEPumps.com

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Please read this manual carefully before beginning installation and operation.

INTRODUCTION

This Installation, Operation, and Maintenance Manual is designed to help you get the best performance and longest life from your RAE pump.

This pump is a VBV Series sealless vertical immersion pump. This self-priming pump should be immersed during operation.

VBV Series pumps are intended for industrial use to carry fluids such as water, coolant, light oil and other clean, non-aggressive liquids.

If there are any questions regarding the pump or its applications which are not covered in this manual, or in other literature accompanying this unit, please contact your RAE Pumps distributor, or write:

RAE Pumps
1212 Streng Street
Cincinnati, OH 45223
513.779.3034
Info@RAEPumps.com
www.RAEPumps.com

For information or technical assistance on the power source, contact the power source manufacturer's local dealer or representative.

! DANGER !

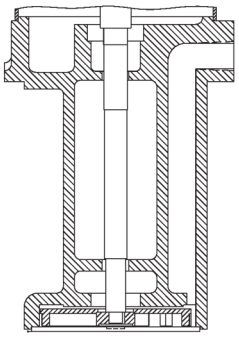
This pump is not intended to transfer explosive liquids, such as gasoline, diesel oil and other similar liquids. It is only suitable for water, and diluted, low viscosity, non-corrosive cooling or lubricant liquids.

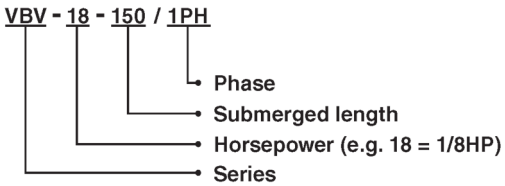
SPECIFICATIONS–SECTION A

MODEL CODE EXPLANATION

The pump models are coded based on the motor horsepower, submerged length and phase.

The pump model is shown on the pump nameplate.





OPERATING PARAMETERS

Ambient temperature: Max 180°F
Liquid temperature range: 32°F to 176°F
Submerged depth: Varies by pump model.

MOTOR DATA

Nominal speed: 3500 rpm at 60 Hz
Standard voltage: Single phase; 115V/230V
Three phase; 230V/460V
Protection class: IP54
Insulation class: F

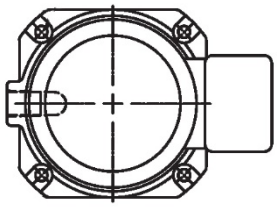
INSTALLATION–SECTION B

! WARNING !

When running, the motor surface temperature is extremely high. Mount pump in a safe place to avoid accidental touch.

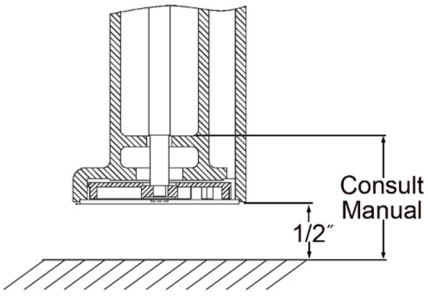
MOUNTING POSITION

The pump must be mounted vertically, inserted into the hole on the top of the tank, and fixed by four bolts in mounting flange.



SUBMERGED DEPTH

To avoid dry running, pump must installed at minimum submerged depth. The minimum pump submerged depth varies by model, see tables in this manual. These measurements include an additional ½" gap between pump suction inlet and tank to allow for sediment build up.



SUBMERGED DEPTH BY MODEL

Single Phase Models

Model	Submerged Depth (inches)
VBV-18-150/1PH	1.375"
VBV-16-150/1PH	1.500"
VBV-14-180/1PH	1.625"
VBV-14-200/1PH	1.625"
VBV-14-240/1PH	1.625"
VBV-14-270/1PH	1.625"

Three Phase Models

Model	Submerged Depth (inches)
VBV-18-180/3PH	1.375"
VBV-14-180/3PH	1.625"
VBV-14-200/3PH	1.625"
VBV-14-240/3PH	1.625"
VBV-14-270/3PH	1.625"
VBV-34-180/3PH	2.000"
VBV-34-250/3PH	2.000"
VBV-34-280/3PH	2.000"
VBV-10-280/3PH	2.000"

ELECTRICAL CONNECTION– SECTION C

! WARNING !

Electrical installation should be carried out in accordance with the local electrical code. Make sure that the electricity supply has been switched off before electrical connection.

Use care when accessing pump electrical components.

SPECIFICATIONS

Electrical specifications (voltage, hertz) are shown on the pump nameplate. Verify that the power supply voltage and hertz match pump requirements. An external ON/OFF switch must be installed.

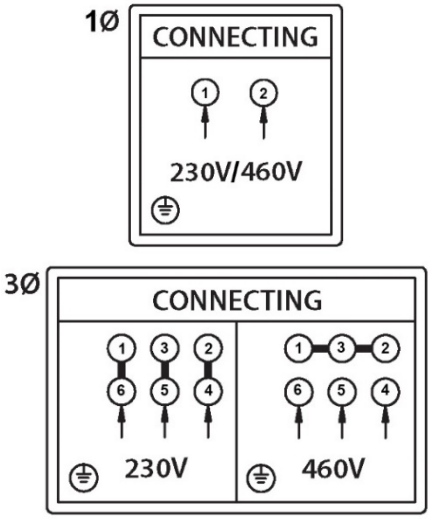
CONNECTION

Electrical connection should be in accordance with diagram shown on the connecting box, and motor current should be within rated amps as shown on nameplate. Three phase pump requires extra magnetic starter with protection.

ROTATION DIRECTION

On this pump, rotating direction is critical. The rotating direction is indicated on the motor (clockwise viewing from above). Interchanging any two leads with power off can reverse the pump rotation.

WIRING DIAGRAMS



OPERATION AND MAINTENANCE–SECTION D

! WARNING !

The pump cannot be operated with discharge outlet fully closed. Doing so will raise the liquid temperature abnormally, damaging the pump after 5 minutes.

! WARNING !

The pump cannot be used to transfer explosive liquids.

Extra protective gear is required if the working liquid temperature exceeds 140°F to avoid scald hazard.

The pump should not be used to transfer toxic or contaminated liquid. Warranty will be void if the pump application is not in compliance with the installation and operation procedures.

FINAL CHECKS

Before starting the pump, verify:

1. Pump rotation–the rotating direction should be clockwise viewing from above.
2. Piping and joints are fitted carefully to prevent leaks.
3. The pump is submerged to minimum depth.
4. The intake is clear of obstruction.

PERIODIC INSPECTION

The following checks should be carried out periodically to ensure normal operation:

1. Measure the discharge and output pressure.
2. Inspect piping and joints for leaks.
3. Examine the motor starter/container.

TROUBLE SHOOTING–SECTION E

! WARNING !

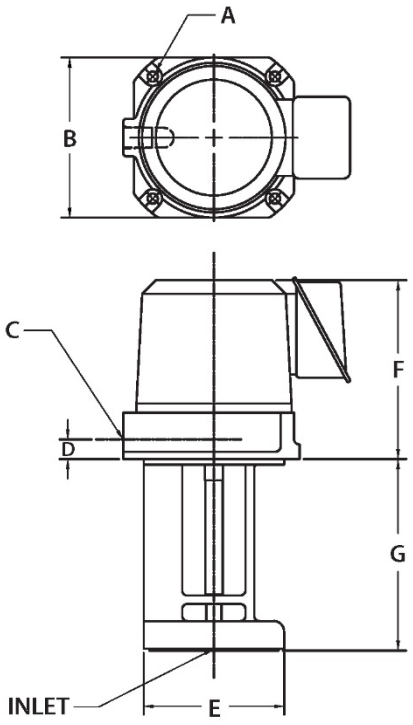
Verify electrical supply has been switched off before trouble shooting.

Fault	Possible Causes
Motor does not start	1. No electrical supply 2. Fuses blown or breaker tripped 3. Overheating relay tripped 4. Defective magnetic contact 5. Control circuit malfunction
Motor cut out during operation	1. Fuses blown or breaker tripped 2. Overheating relay tripped 3. Control circuit malfunction 4. Pump blocked by foreign objects
Pump discharge is unstable	1. Pump impeller blocked by foreign objects 2. Insufficient liquid level
Pump runs but no liquid discharges	1. Intake blocked by foreign objects 2. Insufficient liquid level 3. Incorrect rotating direction
Experiencing hydraulic loss	1. Inspect piping and joints for leaks.

DIMENSIONS–SECTION F

Single Phase Models								
Model	**Power** (hp)	**A** (inches)	**B** (inches)	**C** (inches)	**D** (inches)	**E** (inches)	**F** (inches)	**G** (inches/mm)
VBV-18-150/1PH	0.125	0.28	5.04	0.38	0.71	3.54	5.91	5.91/150
VBV-16-150/1PH	0.167	0.28	5.04	0.50	0.71	3.94	5.91	5.91/150
VBV-14-180/1PH	0.25	0.31	6.50	0.50	0.94	4.72	7.09	7.09/180
VBV-14-200/1PH	0.25	0.31	6.50	0.50	0.94	4.72	7.09	7.87/200
VBV-14-240/1PH	0.25	0.31	6.50	0.50	0.94	4.72	7.09	9.45/240
VBV-14-270/1PH	0.25	0.31	6.50	0.50	0.94	4.72	7.09	10.63/270

Three Phase Models								
Model	**Power** (hp)	**A** (inches)	**B** (inches)	**C** (inches)	**D** (inches)	**E** (inches)	**F** (inches)	**G** (inches/mm)
VBV-18-180/3PH	0.125	0.28	5.04	0.38	0.71	3.54	5.91	7.09/180
VBV-14-180/3PH	0.25	0.31	6.50	0.50	0.94	4.72	7.09	7.09/180
VBV-14-200/3PH	0.25	0.31	6.50	0.50	0.94	4.72	7.09	7.87/200
VBV-14-240/3PH	0.25	0.31	6.50	0.50	0.94	4.72	7.09	9.45/240
VBV-14-270/3PH	0.25	0.31	6.50	0.50	0.94	4.72	7.09	10.63/270
VBV-34-180/3PH	0.75	0.35	7.48	1.0	1.10	5.91	10.04	7.09/180
VBV-34-250/3PH	0.75	0.35	7.48	1.0	1.10	5.91	10.04	9.84/250
VBV-34-280/3PH	0.75	0.35	7.48	1.0	1.10	5.91	10.04	11.02/280
VBV-10-280/3PH	1.0	0.35	7.48	1.0	1.10	5.91	10.83	11.02/280



WARRANTY–SECTION G

RAE Pumps will replace, within one year of shipment from our plant, any pump that, in our judgment, has failed due to defects in materials or workmanship, provided the pump has been properly installed and maintained and has not been subject to abuse.

Modifications, including removal of pump tags or misapplication, void this warranty.

Pump must return to RAE Pumps with complete history of service for inspection and warranty consideration.

RAE Pumps does not accept the responsibility for transportation to and from our plant. Furthermore, we do not assume any responsibility for consequential damage or loss of production.