RAE PUMPS
A RUTHMAN COMPANY

Installation, Operation, and Maintenance Manual

GMVCP Series
Multistage Vertical Immersion Pumps

60 Hz
MODELS

GMVCP 2
GMVCP 4
GMVCP 8
GMVCP 16

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 GMVCP Series vertical multistage centrifugal pump. This pump should be immersed during operation.

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

Standard pump construction is stainless steel immersed parts.

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 !

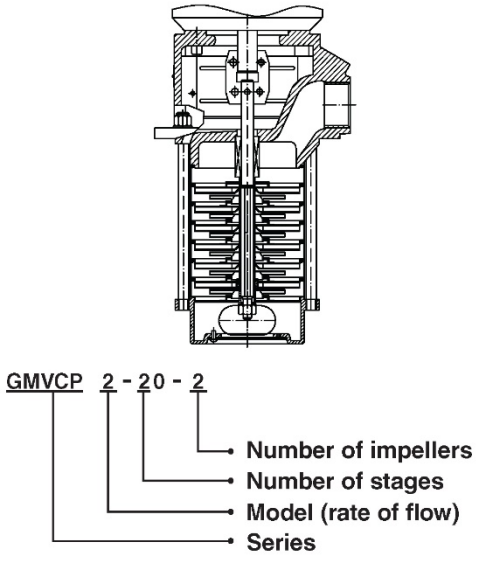
This pump is not intended to transfer explosive liquids, such as gasoline, diesel oil and other similar liquids. It is only suitable for water, and diluted, low viscosity, non-corrosive cooling or lubricant liquids.

SPECIFICATIONS–SECTION A

MODEL CODE EXPLANATION

The pump models are coded based on the number of pump stages. Standard stages consist of both diffusers and impellers. Some models contain null stages for special installation considerations. Null stages consist of only the diffuser chamber.

The number of stages is followed by a zero in the model code. This zero is not part of the stage count number. The pump model is shown on the pump nameplate.



OPERATING PARAMETERS

Ambient temperature: Max 104°F
Liquid temperature range: 5°F to 221°F

	GMVCP 2	GMVCP 4
Flow (gpm):	4 to 20	11 to 35
Head (feet):	60 to 775	85 to 768
Max psi:	335	333
Submerged depth:	Min 3.36”	Min 3.36”

	GMVCP 8	GMVCP 16
Flow (gpm):	31 to 62	44 to 114
Head (feet):	85 to 722	131 to 650
Max psi:	315	290
Submerged depth:	Min 3.94”	Min 3.94”

MOTOR DATA

Nominal speed: 3500 rpm at 60 Hz
Standard voltage: 3 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.

REQUIREMENTS

1. The pump should be located in a well-ventilated but frost-free area.
2. Immersion depth should be as deep as possible, but not less than the minimum Submerged Depth listed in **SECTION A** of this manual to prevent dry running and damage to the pump.
3. When installing the drainage pipe, support pipe weight to avoid strain on the pump and twisting of the pipe.
4. Motor should be correctly grounded. Pump can be damaged by phase loss, unstable power or power surge.
5. Install a pressure meter on pump outlet to monitor pump operation.

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 three phase motor, rotating direction is critical. The rotating direction is indicated on the fan cover (counterclockwise viewing from fan cover end). Interchanging any two leads with power off can reverse the pump rotation.

POSITIONING CONNECTION BOX

The position of the motor connecting box is adjustable. Referring to Figure 3, the position can be changed by removing the motor fan cover, unscrewing the frame bolts, and turning the motor casing and connecting box subassembly together to proper position. Finally, screw the frame bolts tight, and put the fan cover back.

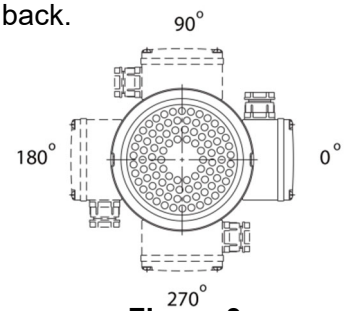
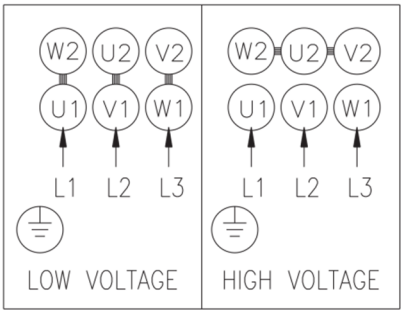


Figure 3

WIRING DIAGRAM



OPERATION AND MAINTENANCE–SECTION D

! WARNING !

The pump cannot be operated with discharge outlet fully closed. Doing so will raise the liquid temperature abnormally, and quickly damage pump.

! 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 counterclockwise viewing from fan cover end.
2. Piping and joints are fitted carefully to prevent leaks.
3. Check that foot and air vent bolts are secure and tighten if loose.
4. The pump has been filled with liquid and **air vented** as described in the **START UP** instructions below. Failure to do so will damage the bearing and mechanical seal.
5. The suction filter is clear of obstruction.

START UP

1. Start motor, verify motor is turning and is turning in the right direction.
2. Open outlet valve, adjust it to the required working condition. Suggested flow is 0.5 to 1.3 times of the pump's rated flow.
3. Check pressure meter on pump's discharge for fluctuations in pressure and observe pump for vibration. If pressure drops/vibration indicate air in the liquid, loosen air vent bolts to vent air, retighten bolts once pressure stabilizes and vibrations stops.
4. Observe for changes in the sound of pump operation. If there are any abnormal noises, pump should be stopped and checked immediately.

SHUT DOWN

1. Close outlet valve slowly.
2. Switch off the power.

! WARNING !

Avoid frequent pump shut down and start up.
Pumps with a motor power equal to or less than 5HP should not be restarted more than 100 times per hour. Pumps with a motor power greater than 5HP should not be restarted more than 20 times per hour.

MOTOR LUBRICATION

For motor powers less than 7.5HP, lubrication is not needed. For motor power equal to or greater than 7.5HP, fill grease every 5000 running hours.

SUCTION FILTER

For maximum performance, the suction filter should be always kept clean and free from obstructions.

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. Measure motor temperature for changes.
4. Examine the motor starter/container.

TROUBLE SHOOTING–SECTION E

! WARNING !

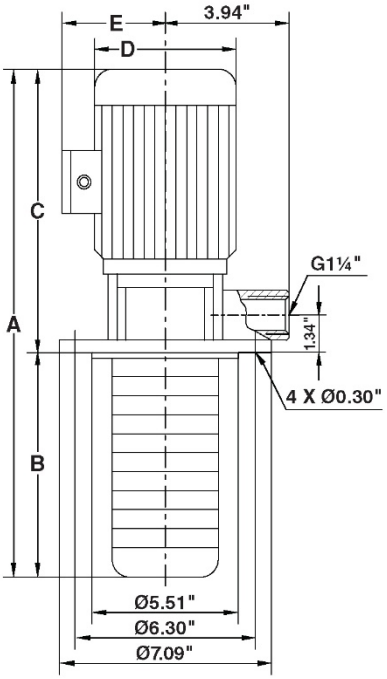
Verify electrical supply has been switched off before trouble shooting.

Fault	Possible Causes	Possible Solutions
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	Check power supply and circuit.
Pump runs but no liquid discharges	1. Incorrect rotating direction 2. Not immersed to correct minimum depth 3. Insufficient liquid level 4. Air in suction head or pump	1. Adjust motor connection 2. Lower installation position 3. Add liquid 4. Vent air
Insufficient flow	1. Pipe clogged 2. Neck ring worn 3. Incorrect model for application	1. Clean pump and pipes 2. Replace neck ring 3. Replace with correct model
Pump consumes too much power	1. Flow is too large 2. Motor bearing worn	1. Reduce flow 2. Replace motor
Abnormal noise/no liquid discharges	1. Insufficient liquid level 2. Temperature of pumped liquid is too high	1. Check pump suction and liquid level 2. Lower pump suction height or decrease liquid temperature
Very loud operation	1. Motor bearing or pump parts broken	1. Inspect and replace motor bearing or pump parts as needed

DIMENSIONS AND WEIGHT–SECTION F

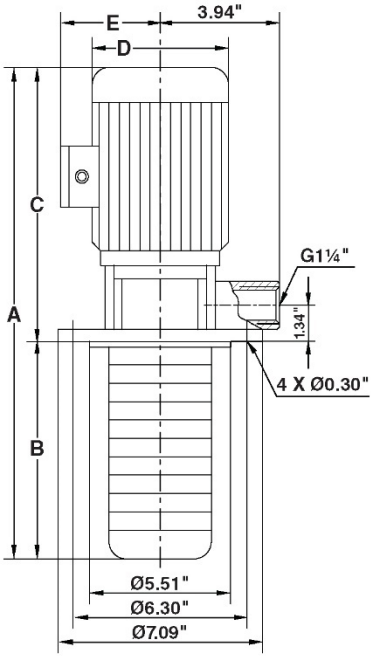
GMVCP 2

Model	A	B	C	D	E	Weight
	(inches)	(inches)	(inches)	(inches)	(inches)	(pounds)
GMVCP2-20-2	17.83	4.84	12.99	5.83	4.60	33
GMVCP2-30-3	19.65	5.55	14.09	6.69	5.59	40
GMVCP2-40-4	20.35	6.26	14.09	6.69	5.59	44
GMVCP2-50-5	21.06	6.97	14.09	6.69	5.59	44
GMVCP2-60-6	21.77	7.68	14.09	6.69	5.59	49
GMVCP2-70-7	24.65	8.39	16.26	7.48	6.10	60
GMVCP2-90-9	26.06	9.80	16.26	7.48	6.10	68
GMVCP2-110-11	27.48	11.22	16.26	7.48	6.10	68
GMVCP2-130-13	31.46	12.64	18.82	7.76	6.50	82
GMVCP2-150-15	32.87	14.06	18.82	7.76	6.50	83
GMVCP2-180-18	35.39	16.81	19.21	9.06	7.28	93



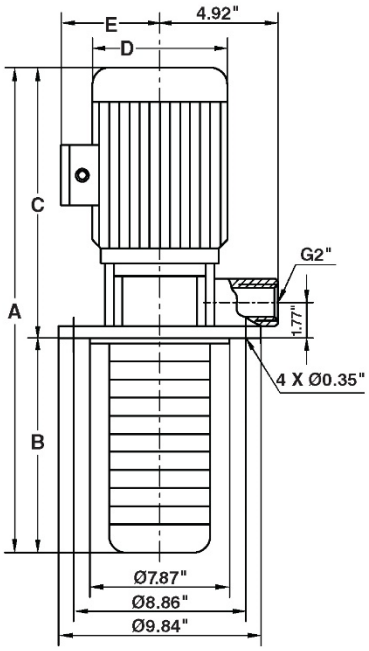
GMVCP 4

Model	A	B	C	D	E	Weight
	(inches)	(inches)	(inches)	(inches)	(inches)	(pounds)
GMVCP4-20-2	19.92	5.83	14.09	6.69	5.59	33
GMVCP4-30-3	20.98	6.89	14.09	6.69	5.59	40
GMVCP4-40-4	24.21	7.95	16.26	7.48	6.10	51
GMVCP4-50-5	25.28	9.02	16.26	7.48	6.10	60
GMVCP4-60-6	26.34	10.08	16.26	7.48	6.10	60
GMVCP4-70-7	29.97	11.14	18.82	7.76	6.50	73
GMVCP4-80-8	31.02	12.20	18.82	7.76	6.50	73
GMVCP4-100-10	33.54	14.33	19.21	9.06	7.28	84
GMVCP4-120-12	35.67	16.46	19.21	9.06	7.28	84
GMVCP4-140-14	39.96	18.58	21.38	10.24	8.27	139
GMVCP4-160-16	42.09	20.71	21.38	10.24	8.27	143



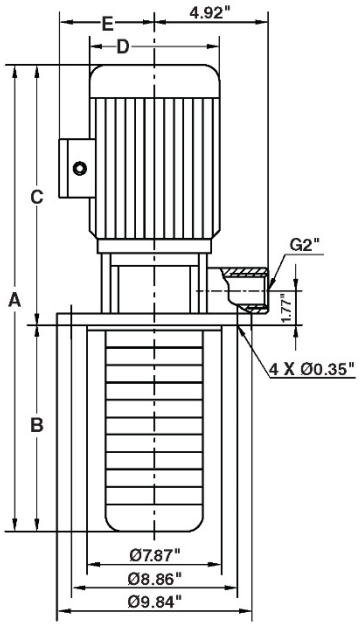
GMVCP 8

Model	A	B	C	D	E	Weight
	(inches)	(inches)	(inches)	(inches)	(inches)	(pounds)
GMVCP8-20-2	22.40	5.91	16.50	7.48	6.10	71
GMVCP8-30-3	23.58	7.09	16.50	7.48	6.10	82
GMVCP8-40-4	27.32	8.27	19.06	7.76	6.50	99
GMVCP8-50-5	28.50	9.45	19.06	7.76	6.50	104
GMVCP8-60-6	30.01	10.63	19.45	9.06	7.28	115
GMVCP8-80-8	34.60	12.99	21.61	10.24	8.27	159
GMVCP8-100-10	36.97	15.35	21.61	10.24	8.27	172
GMVCP8-120-12	39.33	17.72	21.61	10.24	8.27	176
GMVCP8-140-14	47.64	20.08	27.56	12.99	10.04	298



GMVCP 16

Model	A	B	C	D	E	Weight
	(inches)	(inches)	(inches)	(inches)	(inches)	(pounds)
GMVCP16-20-2	26.54	7.09	19.45	9.06	7.28	110
GMVCP16-30-3	30.47	8.86	21.61	10.24	8.27	143
GMVCP16-40-4	32.24	10.63	21.61	10.24	8.27	165
GMVCP16-50-5	39.96	12.40	27.56	12.99	10.04	287
GMVCP16-60-6	41.73	14.17	27.56	12.99	10.04	291
GMVCP16-70-7	43.50	15.94	27.56	12.99	10.04	309
GMVCP16-80-8	45.28	17.72	27.56	12.99	10.04	309
GMVCP16-100-10	50.79	21.26	29.53	12.99	10.04	331



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.