

CHIE VARIABLE SPEED BOOSTER <u>PUMP SYSTEM</u> OPERATION & MAINTENANCE MANUAL

Manufactured With Pride In The USA

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VARIABLE SPEED PUMP SYSTEM INTRODUCTION

THEORY OF OPERATION

The variable speed pump controls out going variable pressures of the water for better equipment operation by maintaining a constant pressure on the system. The pump is capable of producing 26 GPM or more at a minimum of 30 PSI.

The variable speed pump system is controlled by a VFD controller mounted to the motor. The unit is set to stop at the set pressure if there is no flow. The electronics will look at the pressure but will not try to start the motor until it sees pressure drop.

INSTALLATION

The following guidelines should be met at installation.

- 1. Mount the variable speed booster pump system on a firm level foundation by using bolts through the .50 dia. pre drilled holes in the unistrut channel.
- To insure sufficient cooling of motor and electronics, the following must be observed: Place the pump in such a way that sufficient cooling is ensured. The temperature of the cooling air must not exceed 40 degrees C. Cooling fins and fan blades must be kept clean.
- 3. The size of the inlet water supply piping should be 1".
- 4. The size of the outlet piping from the variable speed pump system should be 1".
- 5. Follow all local plumbing and electrical codes. The pump is 220-230 volt single-phase.

Warning: All electric supply circuits must be interrupted before working in the pump terminal box. Never make any connections in the pump terminal box unless the electricity supply has been switched off for at least 5 minutes.

6. A blade or service disconnect isn't provided. It must be installed. The pump must be connected to an external all-pole mains switch with a contact separation of at least 3 mm in each pole according to IEC 364.

Warning: The pump must be earthed and protected against indirect contact in accordance with national regulations.

Protective earth conductors must always have a yellow/green (PE) or yellow/green/blue (PEN) color marking.

7. If the pump is connected to an electric installation where an earth leakage circuit breaker is used as additional protection, this circuit must be marked with the following symbol:



When an earth leakage circuit breaker is selected, the total leakage current of all the electrical equipment in the installation must be taken into account.

Earth leakage current < 3.5 mA. The leakage currents are measured in accordance with EN 60 355-1

- 8. The motor requires no external motor protection. The pump is overvoltage-protected.
- 9. Supply voltage:

1 x 208-230V Single Phase. Cable: 0.5 – 1.5mm₂ / 14-12 AWG. See nameplate.

Recommended fuse size:

Motor sizes from 0.37 to 1.1 kW: Max. 10 A. Standard as well as quick-blow or slow-blow fuses may be used



Example of a mains-connected pump with mains switch, back-up fuses and additional protection



Mains connection

Warning: If the supply cable is damaged, it must be replaced by the manufacturer, the manufacturer's service partner or similarly qualified persons in order to avoid a hazard.

10. The number of starts and stops by way of the mains voltage must not exceed 4 times per hour.

When the pump is switched on by way of the mains, it will start after approx. 5 seconds.

When the pump is started/stopped by way of an external on/off switch, it will start immediately.

Note: These steps have been already completed at assembly for this product. For your information:

The connection terminals inside the pump terminal box for the pressure sensor and blade or service disconnect cord are shown in the figure below with installation directions listed.

Warning: Never make any connections in the pump terminal box unless the electricity supply has been switched off for at least 5 minutes.



Pressure Sensor Installation: With the protective cover off, bring the wire from the pressure sensor into the motor through the strain relief in the middle. Connect the yellow-green wire to terminal 6, the blue wire to terminal 7 and the brown wire to terminal 8. Clip the remaining wires as they are not used. Make sure remaining wires are isolated from ground. Replace the access cover after all connections have been made.

Blade or Service Disconnect Cord Installation: With the protective cover off, bring the line cord through the strain relief furthest from the pump inlet. Terminate the white wire into the connection marked N, the green wire to ground terminal and the black wire to L. Replace the grey protective cover after all connections have been made.



SYSTEM DESIGN DRAWING



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START-UP

Warning: At high temperatures, the pump may be extremely hot. Do not touch it.

Priming:

Before startup, or if the pump has been drained, the pump must be filled with liquid and vented.

Proceed as follows:

- Close the discharge isolating valve and bypass valve. (See System Design drawing)
- Remove the priming plug in the pump sleeve. (See Plug drawing). Slowly open the suction valve (See System Design drawing), in the inlet pipe until a steady stream of liquid runs out of the priming port.

Warning: The escaping liquid may be very hot. Therefore, care must be taken to ensure that the liquid does not cause personal injury or damage to other components.

- Replace priming plug and tighten securely.
- Start the pump and slowly open the discharge valve until it is fully open.
- Completely open the suction valve in the inlet pipe.



Plug Drawing

MAINTENANCE

The pump and motor are maintenance free.

PRELIMINARY CHECKS: MEASURING VOLTAGE & CURRENT

When measuring voltage, use a volt meter, (set to the proper scale) to measure the voltage at the pump terminal box or starter.

Measure between power leads L1 and L2 or L1 and N for 115 volt units. When the motor is under load, the voltage should be within +6% to +10% of the Nameplate voltage. Larger voltage variation may cause winding damage.

Large variations in the voltage indicate a poor electrical supply and the pump should not be operated until these variations have been corrected. If the voltage constantly remains high or low, the motor should be changed.

When measuring current, use an ammeter (set on the proper scale) to measure the current on each power lead at the terminal box or starter. See the motor nameplate for amp draw information.

Current should be measured when the pump is operating at a constant discharge pressure.

TROUBLE SHOOTING THE PUMP

Before removing the terminal box cover, make sure that the electricity supply has been switched off.

Warning: The pumped liquid may be scalding hot and under high pressure. Before any removal or dismantling of the pump, the system must be drained or the suction & discharge valves must be closed.

Fault	Cause
Pump capacity not constant.	 a) Pump inlet pressure is too low. b) Inlet pipe partly blocked by impurities c) Pump takes in air.
Pump runs but gives no water.	 a) Inlet pipe partly blocked by impurities b) Suction valve blocked in closed position. c) Leakage in inlet pipe. d) Air in inlet pipe or pump.
Pump runs backwards when switched off.	a) Leakage in inlet pipe.b) Suction valve defective.c) Suction valve blocked in open or partly open position.

Valves

Do not run the pump without the suction or discharge valve completely open during normal operation. The bypass valve should be closed at this time.

INDICATOR LIGHTS

The operating condition of the pump is indicated by the green and red indicator lights on the pump control panel.



Indicator lights

Indicator lights	S	
Fault (red)	Operation (green)	Description
Off	Off	The electricity supply has been switched off.
Off	Permanently on	The pump is operating.
Permanently on	Off	The pump has stopped because of a fault. Restarting will be attempted (it may be necessary to restart the pump by resetting the fault indication). Possible causes: * Too high motor temperatures * Undervoltage * Overvoltage * Too many restarts (after faults) * Overload
Permanently on	Permanently on	The pump is operating, but it has been stopped because of a fault. Reset the fault indication or switch off the electricity supply.

Note: See Setting By Means Of Control Panel on page 10-12, for information on resetting the fault indication and stopping/starting the pump.

SETTING BY MEANS OF CONTROL PANEL

Warning: The motor can develop surface temperatures up to 115 degrees F. Touching the motor for any length of time may cause burns. Only the buttons should be touched to avoid injury.

The pump control panel, incorporates the following buttons and indicator lights:

- · Light fields, yellow, for indication of setpoint.
- · Indicator lights, green (operation) and red (fault).



CONTROL PANEL

The desired setpoint is set by pressing the up or down button. The light fields on the control panel will indicate the setpoint set.

SETPOINT SETTING PUMP IN CONTROLLED-OPERATION MODE

The figure below represents the pump in controlled-operation mode (pressure control).

The light fields 5 and 6 are activated, indicating a desired setpoint of 3 bar. The setting range is equal to the sensor measuring range (see sensor nameplate).



Setpoint set to 3 bar, pressure-control mode

The buttons on the pump control panel will toggle the pressure up or down at 14.5 PSI increments. The gauge positioned by the sensor on the variable speed unit, shows the discharge pressure of the pump.

Setting to max. curve duty

Press O continuously to change to the max. curve of the pump (top light field flashes). When the top light field is on, O must be pressed for 3 seconds before the light field starts flashing.

To return to uncontrolled or controlled operation, press Θ continuously until the desired setpoint is indicated.



Setting to min. curve duty

Press O continuously to change to the min. curve of the pump (bottom light field flashes). When the bottom light field is on, O must be pressed for 3 seconds before the light field starts flashing.

To return to uncontrolled or controlled operation, press O continuously until the desired setpoint is indicated.



Min. curve duty

Start/stop of pump

Stop the pump by continuously pressing O until none of the light fields are activated and the green indicator light flashes.

Start the pump by continuously pressing (2) until the desired setpoint is indicated.

FAULT INDICATION

A fault indication can be reset in one of the following ways:

- By briefly pressing the up or down button on the pump. This will not change the setting of the pump.
 A fault indication cannot be reset by means of the up or down button if the buttons have been locked.
- By switching off the electricity supply until the indicator lights are off.

REPLACEMENT PARTS DRAWING

66510621	15	-	STRAIN RELIEF, SNPT, 1 HOLE, 19-47 ID
66-0027	14	10,	WIRE, SJO CORD, 300V, 14/3, BLACK SHEATH
53-0015	13	1	PRESSURE TRANSMITTER, TYPE MBS 3000, REPLACEMENT
92531904	12	4	WASHER,5/16 FLAT SS
92531907	11	4	WASHER,5/16 LOCK SS
92530125	10	4	NUT,FLANGE,5/16-18,HEX,SS
94725433	6	4	VIBRATION ISOLATORS 5/16-18
91730214	80	4	UNST, SPRING NUT. 31, PLTD
91730086	7	'n	UNST, 1. 625, FIBERGLASS PE
43-0020	6	-	GAU.0-10025,2.5,CBM,LF,SS/BR
041004	с С	1	VAL, BALL, EL., 25, MPTXFPT, PVC80
041730384	4	2	VAL, CHECK, BALL, 1.25, PVC80
041720169	£	Ļ	VAL, BALL, 1, TU, PVC80
041732001	2	2	VAL, BALL, 1.25, TU, PVC80
80-0132	1	٢	PUMP, GRUNDFOS CHIE, 1.5HP, 1PH, 208-230V
AWI P/N	ITEM #	QТҮ	DESCRIPTION





WARNING

This product can expose you to chemicals such as vinyl chloride (used in the production of PVC) or Nickel (used in the production of stainless steel), that are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

Dear Valued Customer,

California Proposition 65 (Prop 65) is the Safe Water and Toxic Enforcement Act of 1986. The State of California began enforcing amendments to California Prop 65 at the end of August 2018. Prop 65 requires manufacturers to provide a clear and reasonable warning to residents of California about chemicals used in products that they purchase that are included on the Prop 65 Chemical List. The chemicals included on the list are chemicals that are known to the State of California to cause cancer, birth defects, or other reproductive harm. One such chemical is Vinyl Chloride, a compound used to produce Polyvinyl Chloride (PVC). The AmeriWater system you have purchased may contain PVC or stainless steel parts. While warnings are only required in the State of California, AmeriWater has initiated the use of Prop 65 labeling for all products to ensure compliance with California regulations. Please note that the above warning does not necessarily mean that the product that you have purchased is unsafe. Products that have been cleared for market by FDA have been determined to be safe and effective by the United States Food and Drug Administration. The warning is simply a requirement by the State of California. If you wish to obtain additional information, please visit: p65warnings.ca.gov. You may also contact your AmeriWater representative if you have any questions.

Thank you for your understanding and we look forward to continuing to serve you.