



**Instruction Sheets
for ECM
Variable Speed Pumps**

AM55 Pages 2-3

AM99 Pages 4-7

WARNING: When installing pump observe all applicable electrical and plumbing codes.

WARNING: ALL electrical work should be performed by a qualified electrician in accordance with the latest edition of the National Electrical Code and local codes or regulations.

WARNING: To avoid electrical shock, disconnect power prior to connecting or disconnecting pump.

WARNING: Risk of electric shock. This pump has not been investigated for use in swimming pool or marine areas.

WARNING: This pump is acceptable for indoor use only. Employer uniquement à l'intérieur.

CAUTION: This pump has been evaluated for use with water only. The suitability of this pump for use with liquids other than water is the responsibility of the end-user.

CAUTION: All ECM pumps have a magnetic rotor which can attract suspended iron. On systems that have black iron oxide in the solution (black water) it is recommended that an iron filter be installed after the pump to remove the iron from the system. If this is not done the pump may lockup and trip to a "E1" fault. To correct the fault, disassemble the pump, remove and clean the iron particles from the rotor and bearings, and reassemble.

APPLICATION

1. AquaMotion circulators are designed to handle water and mixtures of water and up to 50% ethylene or propylene glycol. The addition of certain chemical additives or petroleum based products voids the warranty.
2. For closed loop systems, circulator with cast iron pump housings may be used.
3. For open loops and fresh or potable water, use pumps with bronze or stainless steel housings only.
4. Operating pressures may not exceed 145psi.
5. Maximum fluid temperatures must not exceed nameplate rating.
6. Maximum ambient air temperature is 104°F. (For higher ambient temperatures consult factory).

INSTALLATION AND START- UP

1. Prior to installation, check circulator for damage due to mishandling.
2. Mounting position: The circulator may be installed with the motor in the horizontal position or vertically with the motor up. (Do not install with the motor down).
3. Flow directions: An arrow on the pump housing indicates the direction of flow.
4. Rotating motor: The motor can be rotated relative to the pump housing so that the cord is located in the most convenient position. To rotate the motor, remove the four housing bolts, rotate and replace bolts.
5. Electrical connections: **OBSERVE ALL APPLICABLE CODES WHEN CONNECTING POWER.** Check nameplate for voltage and ampere draw. The circulator is thermally protected; no additional overload protection is required. The black supply wire may be connected to either motor wire. The pump cannot run backwards. Use supply wires rated not less than 90°C. Use copper conductors only. **Attention:** Employer des fils d'alimentation pour 90°C. Utilisez des conducteurs en cuivre seulement.
6. Charging the system: The bearings of the AquaMotion pumps are lubricated by the fluid being pumped, hence they never need to be lubricated. However, to assure adequate initial lubrication, the system must be filled and pressurized. If the motor is mounted vertically, a minimum of 20psi is required. **DO NOT OPERATE THE PUMP UNTIL SYSTEM IS PROPERLY FILLED AND PRESSURIZED**
7. Set the electronics to III and run the system for at least 5-10 minutes to purge air from the pump. After purging the pump can be reset to any control mode.

REPLACEMENT OF BUILT-IN CHECK VALVE (BICV)

All models with a "V" in the model number are equipped with a check valve installed in the outlet of the circulator housing. To replace the check valve, proceed as follows:

1. Disconnect power.
2. Reduce system pressure to zero and let fluid cool down.
3. Remove flange bolts and swing pump away from the pipes. (It is not necessary to break electrical connection in most cases.)
4. Remove the check valve with a rocking / twisting motion, using needle nose pliers.
5. Clean out casing in check valve area.
6. Apply a film of liquid soap to O-ring of new check valve.
7. Insert new check valve with O-ring leading. Press down firmly until the check valve seats in the housing.
8. Re-install circulator, using new flange gaskets, if necessary.
9. Follow points 6 and 7 under Installation and Start-Up.

TROUBLE SHOOTING (Please contact a specialist if you cannot eliminate the fault)

- | | |
|----------------------------------------------------------|-----------------------------------------------------------------------------|
| 1. Pump does not start when power is supplied | 3. Noisy pump |
| -Check mains and/or fuses | -Purge air from the pump |
| -Check voltage applied to the pump | -Increase the inlet pressure and check the air volume in the expansion tank |
| 2. Noise generated in the system | 4. Building does not heat up |
| -Purge air from the system | -Increase the speed setting |
| -Check the pump speed setting and reduce it if necessary | -Switch off night setback |
| | -Turn the system off and repurge air from system |

DISPLAY

The display comes on as soon as the pump is connected to the voltage supply. It indicates the actual power consumption during operation. Faults are indicated as errors: "E1" (Locked Rotor), "E2" (Over Temperature), or "E3" (Hardware Fault). If the pump operates in night setback, an "-F" is shown in the display.

Push-button for pump curve selection

The pump speed setting is changed by pressing the speed selector button. You run through all possible settings by pressing the push-button seven times.

Variable Speed

Display	Explanation
PD1	Low proportional pressure curve
PD2	Second proportional pressure curve
PD3	Third proportional pressure curve
PD4	High proportional pressure curve

Fixed Speed

Display	Explanation
I	Fixed speed level I
II	Fixed speed level II
III	Fixed speed level III

Push-button for night setback

The automatic night setback is activated by pressing the night setback button. The display will indicate it is on. The night setback is continuously and immediately activated by pressing and holding the night setback button again for 5 sec. The setback is indicated by an F in the display. The night setback is deactivated by pressing the night setback button again.

PUMP SETTINGS:

PROPORTIONAL PRESSURE CONTROL

During operation the pump follows the proportional pressure curve that has been selected. The differential pressure is controlled electronically by changes in the input current. The proportional pressure characteristics are called PD1 to PD4 in the corresponding performance curves.

CONSTANT SPEED CONTROL

The fixed speed characteristics are called I to III on the performance curves. When selecting a fixed speed, the pump speed does not change over the performance range.

REQUIREMENTS FOR AUTOMATIC NIGHT SETBACK

1. The pump must be installed on the supply side
2. The heating system must be equipped with an automatic supply side fluid temperature control.

Note: If the heating system does not deliver sufficient water to the radiators, please check if the automatic night setback is activated. If necessary, switch off the night setback.

NIGHT SETBACK

Press the night set back button to activate the night setback. If the display comes on, the night setback is activated and the pump automatically switches from normal operation to night setback. The change between the two modes depends on the supply side fluid temperature. The pump automatically changes to night setback if the supply side fluid temperature falls by more than 15°F within one hour. The display indicates "-F". As soon as the supply side fluid temperature increases by 5°F the system changes back to normal operation.

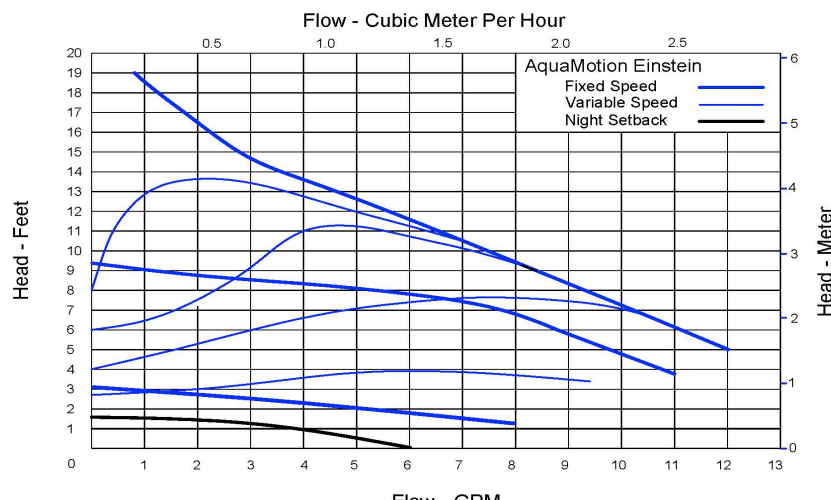
PERMANENT NIGHT SETBACK

For setting the night setback as permanent mode, press the night set back button again and hold for 5 seconds. The display indicates "-F". The pump remains in night setback mode until the night set back button is pressed again.

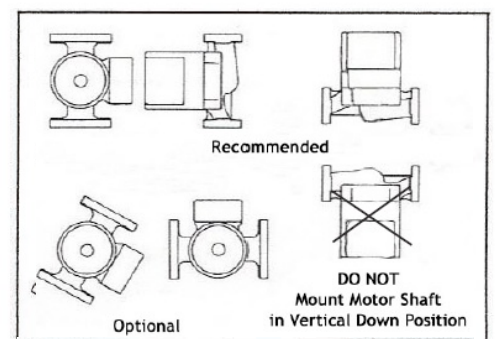
The pump will remain in the setback mode until

- the next key is pressed
- there is an increase of the flow temperature.

After that it will activate the automatic night setback. The same will occur after a power failure.



Mounting Positions



For Indoor Use Only

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WARNING: ALL electrical work should be performed by a qualified electrician in accordance with the latest edition of the National Electrical Code and local codes or regulations.

WARNING: To avoid electrical shock, disconnect power prior to connecting or disconnecting pump.

WARNING: Risk of electric shock. This pump has not been investigated for use in swimming pool or marine areas.

WARNING: This pump is acceptable for indoor use only. Employer uniquement à l'intérieur.

CAUTION: This pump has been evaluated for use with water only. The suitability of this pump for use with liquids other than water is the responsibility of the end-user.

APPLICATION

1. AquaMotion circulators are designed to handle water and mixtures of water and up to 50% ethylene or propylene glycol. The addition of certain chemical additives or petroleum based products voids the warranty.
2. For closed loop systems, circulator with cast iron pump housings may be used.
3. For open loops and fresh or potable water, use pumps with bronze or stainless steel housings only.
4. Operating pressures may not exceed 145psi.
5. Maximum fluid temperatures 230°F.
6. Maximum ambient air temperature is 104°F. (For higher ambient temperatures consult factory).

INSTALLATION AND START- UP

1. Prior to installation, check circulator for damage due to mishandling.
2. Mounting position: The circulator may only be installed with the motor mounted vertically. (Do not install with the motor up or down)
3. Flow directions: An arrow on the pump housing indicates the direction of flow.
4. Rotating motor: The motor can be rotated relative to the pump housing so that the cord is located in the most convenient position. To rotate the motor, remove the four housing bolts, rotate and replace bolts.
5. Electrical connections: **OBSERVE ALL APPLICABLE CODES WHEN CONNECTING POWER.** Check nameplate for voltage and ampere draw. The circulator is thermally protected; no additional overload protection is required. The brown and blue supply wires may be connected to either power lead. The pump cannot run backwards. Use supply wires rated not less than 90°C. Use copper conductors only. **Attention:** Employer des fils d'alimentation pour 90°C. Utilisez des conducteurs en cuivre seulement.
6. Charging the system: The bearings of the AquaMotion pumps are lubricated by the fluid being pumped, hence they never need to be lubricated. However, to assure adequate initial lubrication, the system must be filled and pressurized. **DO NOT OPERATE THE PUMP UNTIL SYSTEM IS PROPERLY FILLED AND PRESSURIZED**
7. Start up program:
Turn the pump on



Press and hold the speed button for 5-10 sec

The display will show a rotating segmented "O" followed by the stage of the bleed cycle. It will count down 16 stages, each is approx. 1 min. long



After completing the bleed cycle the display returns to normal mode.

REPLACING MOTOR ASSEMBLY

1. Disconnect or turn power off.
2. Disconnect the brown and blue power leads and the green/yellow ground lead at the boiler control.
3. Reduce system pressure to zero and let fluid cool down.
4. Close shut off valves. If there are no shut off valves, drain system.
5. Remove pump housing bolts and pull out motor assembly.
6. Install new motor assembly. Make sure gasket is properly placed.
7. Follow installation procedure to start up circulator.

REPLACING CARTRIDGE ASSEMBLY

1. Disconnect power.
2. Reduce system pressure to zero and let fluid cool down.
3. Close shut off valves. If there are no shut off valves, drain system.
4. Remove pump housing bolts and pull out motor assembly.
5. Remove cartridge. Insert flat blade screw drivers between motor housing and the tabs in the stainless cartridge. Slowly twist the screw drivers to free the cartridge. Withdraw the cartridge from the motor.
6. Insert new cartridge into the motor.
7. Follow installation and start up procedure.

REPLACEMENT OF BUILT-IN CHECK VALVE (BICV)

All models with a "V" in the model number are equipped with a check valve installed in the outlet of the circulator housing. To replace the check valve, proceed as follows:

1. Disconnect power.
2. Reduce system pressure to zero and let fluid cool down.
3. Remove flange bolts and swing pump away from the pipes. (It is not necessary to break electrical connection in most cases.)
4. Remove the check valve with a rocking / twisting motion, using needle nose pliers.
5. Clean out casing in check valve area.
6. Apply a film of liquid soap to O-ring of new check valve.
7. Insert new check valve with O-ring leading. Press down firmly until the check valve seats in the housing.
8. Re-install circulator, using new flange gaskets, if necessary.
9. Follow points 6 and 7 under Installation and Start-Up.

TROUBLE SHOOTING

1. Pump does not start when power is supplied
 - check mains and/or fuses
 - check voltage applied to the pump
 - Remove the cover from the terminal box and replace the fuse (M3.15/250 E)
2. Noise generated in the system
 - Purge air from the system
 - Check the pump speed setting and reduce it if necessary
3. Noisy pump
 - Purge air from the pump
 - Increase the inlet pressure and check the air volume in the expansion tank
4. Building does not heat up
 - Increase the speed setting
 - Switch off night setback
 - Turn the system off and rerun the start program
5. Locked Rotor - Pump displays repeatedly changing Watt values and then the speed selection
 - remove the motor from the pump and clear the blockage

Please contact a specialist if you cannot eliminate the fault.

DISPLAY

The display comes on as soon as the pump is connected to the power. It indicates the actual power consumption during operation, the type of curve (fixed or variable), and night setback if it has been selected..

"Normal Display" with night setback



Type of curve

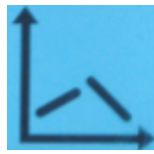
Push speed selector button for pump curve selection



The pump speed setting is changed by pressing the speed selector button. You run through all possible settings by pressing the push-button eleven times.





Fixed Speed (Constant Pressure)



Variable Speed (Proportional Pressure Control)

Constant Pressure	Explanation
1 - 1.5m	Fixed speed level 1
2 - 4.0m	Fixed speed level 2
3 - 7.0m	Fixed speed level 3
4 - 9.5m	Fixed speed level 4
5 - 12.0m	High speed level 5
Proportional Pressure	
1 - 1.5m	Variable speed level 1
2 - 2.0m	Variable speed level 2
3 - 2.5m	Variable speed level 3
4 - 3.0m	Variable speed level 4
5 - 3.5m	Variable speed level 5
6 - 4.0m	Variable speed level 6

Push-button for night setback 

The automatic night setback is activated by pressing the night setback button. The display will indicate . By pressing the night setback button for 5sec the pump will run on the night setback curve continuously. The night setback is deactivated by pressing the night setback button again. When the night setback is set to operate permanently 3 dashes are shown alternately.



PUMP SETTINGS

PROPORTIONAL PRESSURE CONTROL (Variable Speed)



During operation the pump follows the proportional pressure curve that has been selected. The circulator output pressure is controlled electronically as various zones on the installation either open or close. The proportional pressure characteristics are called 1 to 6 in the corresponding performance curves.

CONSTANT SPEED CONTROL



The fixed speed characteristics are called 1 to 5 on the performance curves. When selecting a fixed speed the output pressure does not change over the performance range. On speed 5 the output performance follows the highest performance curve the pump can generate.

AUTOMATIC NIGHT SETBACK



The pump performance follows the night setback curve.

Note: If the heating system does not deliver sufficient water to the radiators, please check if the automatic night setback is activated. If necessary, switch off the night setback.

The following requirements must be met to ensure proper operation of the night setback option:

1. The pump must be installed on the supply side
2. The heating system must be equipped with an automatic supply side fluid temperature control.
3. Requires an automatic night setback boiler.

NIGHT SETBACK

When the night setback is activated the pump automatically switches from normal operation to night setback. Pressing the button again deactivates the night setback. When the night setback is activated the pump automatically changes to night setback if the supply side fluid temperature falls by more than 10° F to 15°F within one hour. The display indicates 3 alternating dashes when operating during the night setback. When the supply side fluid temperature increases by 3°F the system changes back to normal operation.

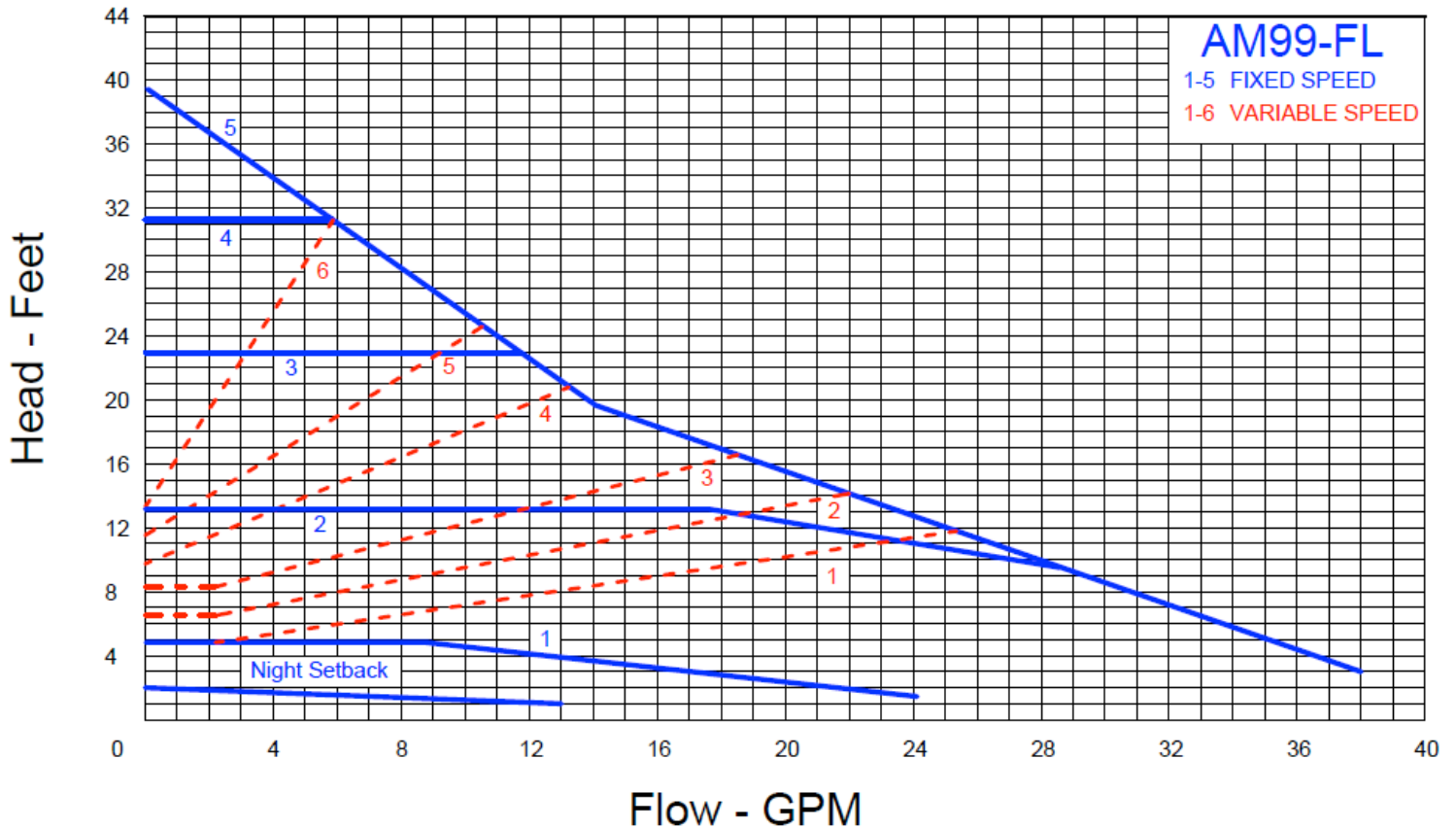
PERMANENT NIGHT SETBACK

For setting the night setback as permanent mode, press the night set back button again and hold for 5 seconds. The display indicates 3 alternating dashes. The pump remains in night setback mode until the night set back button is pressed again.

The pump will remain in the setback mode until

- the night setback is pressed
- there is an increase of the flow temperature.

After that it will activate the automatic night setback. The same will occur after a power failure.



Instruction Sheet
IS-AM09-618
3/13/17