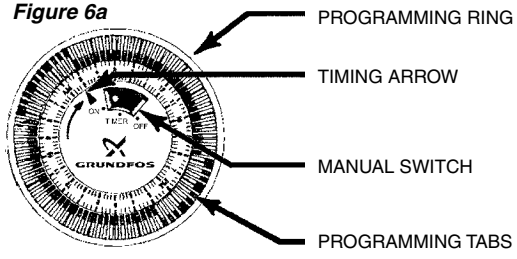
http://waterheatertimer.org/Water-heater-recirculation-system.html

7. Timer Operation

Setting and Operating the Timer Control and Starting the Pump

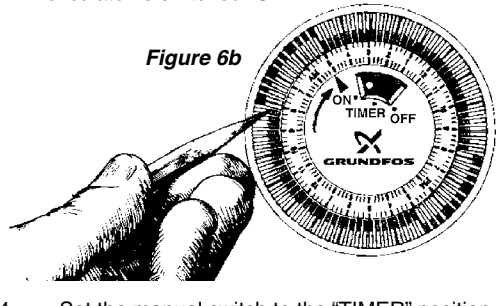
Figure 6a



NOTE: Before the circulator is started, the system must be filled with liquid and vented.

1. Set the timer switch to the actual time by turning the programming ring in the direction of the arrow until the timing arrow points to the actual time on the ring.
2. Switch on the power supply to the circulator and set the manual switch to the “ON” position. The circulator will now start.
3. Set the required “ON”/”OFF” times on the programming ring by pushing the programming tabs either away from or toward the center of the ring. Tabs pushed away from the center indicate the circulator is switched ”ON” while tabs pushed toward the center indicate the circulator is switched “OFF”.

Figure 6b



4. Set the manual switch to the “TIMER” position. The circulator will now start/stop according to the settings of the programming tabs.
5. For continuous operation, set the manual switch to the “ON” position. To switch the circulator off, set the manual switch to the “OFF” position. The “ON”/”OFF” modes may be used without affecting the function of either the programming ring or the timer switch.
6. In case of power outage the timer will not keep time. After power has been restored, the correct time of day must be reset by rotating the programming ring in the direction of the arrow until the timing arrow points to the actual time on the ring.

8. Changing speeds with timer option

- Disconnect line cord from system power.
- Remove (2) timer cover screws.
- Gently rotate speed selection stim to desired speed (see Figure 7a).
- Re-install (2) timer cover screws.

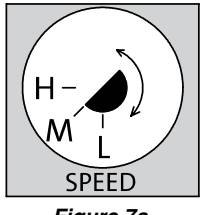


Figure 7a

9. Troubleshooting

When the pump is first started, the shaft may rotate slowly until water has fully penetrated the bearings. If the pump does not run, the shaft can be rotated manually. To accomplish this, switch off the electrical supply, and close the isolation valves on each side of the pump. Remove the large screw in the middle of the nameplate. Insert a small flat blade screwdriver into the end of the shaft, and gently turn until the shaft moves freely (see Figure 8a). Replace and tighten the plug. Open the isolation valves and wait 2 to 3 minutes for the system pressure to equalize before starting the pump.

Figure 8a

9. Limited Warranty

Products manufactured by GRUNDFOS PUMPS CORPORATION (GRUNDFOS) are warranted to the original user only to be free of defects in material and workmanship for a period of 18 months from date of installation, but not more than 24 months from date of manufacture. GRUNDFOS’ liability under this warranty shall be limited to repairing or replacing at GRUNDFOS’ option, without charge, F.O.B. GRUNDFOS’ factory or authorized service station, any product of GRUNDFOS manufacture. GRUNDFOS will not be liable for any costs of removal, installation, transportation, or any other charges which may arise in connection with a warranty claim. Products which are sold but not manufactured by GRUNDFOS are subject to the warranty provided by the manufacturer of said products and not by GRUNDFOS’ warranty. GRUNDFOS will not be liable for damage or wear to products caused by abnormal operating conditions, accident, abuse, misuse, unauthorized alteration or repair, or if the product was not installed in accordance with GRUNDFOS’ printed installation and operation instructions.

To obtain service under this warranty, the defective product must be returned to the distributor or dealer of GRUNDFOS products from which it was purchased together with proof of purchase and installation date, failure date, and supporting installation data. Unless otherwise provided, the distributor or dealer will contact the GRUNDFOS factory or authorized service station for instructions. Any defective product to be returned to the factory or service station must be sent freight prepaid; documentation supporting the warranty claim and/or a Return Authorization must be included if so instructed.

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Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages and some jurisdictions do not allow limitations on how long implied warranties may last. Therefore, the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from jurisdiction to jurisdiction.

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GRUNDFOS

GRUNDFOS **INSTRUCTIONS**
Installation & Operating Instructions

Maintenance-Free Circulators with Line Cord and Optional Timer Control

GRUNDFOS

1. Shipment Inspection

Examine the components carefully to make sure no damage has occurred to the pump during shipment. Care should be taken to ensure the pump is NOT dropped or mishandled; dropping will damage the pump.

2. Pre-Installation Checklist

Before beginning installation procedures, the following checks should be made. They are all important for proper installation of the circulator pump.

1. Uses:

Model UP(S) 15 series pumps are designed to circulate water from 36°F to 230°F (UPS 15-35 from 36°F to 165°F) up to a maximum pressure of 145 PSI. If required, a 50% by volume solution of ethylene or propylene glycol and water can be used, however, a PSI decrease in pump performance may result due to an increase in the viscosity of the solution. Check with manufacturer for information regarding suitability of pumping other fluids.

System Applications: UP(S)15 series pumps with stainless steel or bronze volutes can be used in both open and closed systems.

2. Maximum Water Temperature:

UP(S)15 pump with line cord only. The maximum allowable water temperature is determined by the ambient or surrounding air temperature as shown in Table 2A.

Table 2A – Maximum Water Temperature

Ambient (°F)	95	130	140	160	175
Water (°F)	230	220	210	190	175

Although the pump is designed to operate at maximum water temperature of 230°F, it is recommended to keep the operating temperature as low as possible (i.e. below 140°F to avoid precipitation of calcium).

Note: UP15(S) pump with timer control maximum water temperature: 150°F

3. Inlet Pressure Requirements

The amount of pressure required at the inlet of the pump is a function of the temperature of the water as shown in Table 2B.

Table 2B – Inlet Pressure Requirements

Water (°F)		190	165	140
Required Inlet Pressure	(ft.)	5	4.5	3
	(PSI)	2.2	1.9	1.3

In a pressurized system, the required inlet pressure is the minimum allowable system pressure.

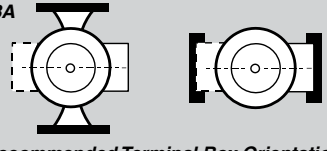
In an open system, the required inlet pressure is the minimum distance the pump must be located below the lowest possible water level of the water source (tank, pool, etc.).

3. Pump Installation

Position of terminal box:

Proper installation of the pump will have the terminal box located to one side of the pump or the other, with the conduit entry down. See Figure 3A.

Figure 3A



Recommended Terminal Box Orientation

If the terminal box position needs to be changed, it is best to do so before installation. However, if the pump is already installed, ensure that the line cord is unplugged and close the isolation valves before removing the Allen screws.
To change terminal box position:

1. Remove the four (4) Allen screws from the pump housing and stator (4 or 5mm wrench) while supporting the stator (motor).
2. Carefully separate the stator from the pump housing and rotate it to the correct terminal box orientation and reseat it.
3. Replace the Allen screws and tighten diagonally and evenly (7 ft.-lb. torque).
4. Check that the motor shaft turns freely. Remove the large screw in the middle of the nameplate, insert a small flat blade screwdriver into the end of the shaft, and turn gently (see fig. 7a).

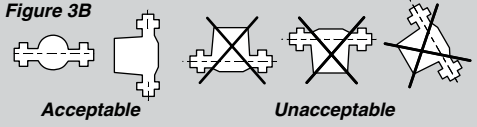
   If the shaft does not turn easily, repeat the disassembly/reassembly process.

NOTE: UPS15-42 does not require manual turning of shaft.

Pump Mounting: For Indoor Use

Arrows on the side or bottom of the pump housing indicate direction of flow through the pump. GRUNDFOS circulators can be installed in both vertical and horizontal lines. The pump must be installed with the motor shaft positioned horizontally. *Under no circumstances should the pump be installed with the shaft vertical or where the shaft falls below the horizontal plane. See Figure 3B.*

Figure 3B



It is recommend that isolation valves be installed on each side of the pump. If possible, do not install elbows, branch tees, and similar fittings just before or after the pump. Provide support to the pump or adjacent plumbing to reduce thermal and mechanical stress on the pump.

Installation Requirements

1. Thoroughly clean and flush the system prior to pump installation.
2. Do not install the pump at the lowest point of the system where dirt and sediment naturally collect.
3. Install an air vent at the high point(s) of the system to remove accumulated air.
4. Ensure that water does not enter the terminal box during the installation process.
5. (Open System) Install the pump in the supply line; the suction side of the pump should be flooded with water. Ensure that the static head requirementfrom Table 2B is achieved.
6. (Closed System) Install a safety relief valve to protect against temperature and pressure build-up.
7. If there are excessive suspended particles in the water, it is recommended that a strainer and/or filter be installed and cleaned regularly.

8. **DO NOT START THE PUMP UNTIL THE SYSTEM HAS BEEN FILLED AND CHECKED FOR LEAKS OR OTHER POSSIBLE COMPONENT FAILURES.**

4. Electrical

CAUTION: Do not energize pump until properly installed

Warning - Risk of electrical shock - This pump is supplied with a grounding conductor. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded grounding type receptacle. The safe operation of this pump requires that it be grounded in accordance with the National Electrical Code and local governing codes and regulations.

Electrical Requirements

The operating voltage and other electrical data are marked on the motor label. Make sure that the motor is suitable for the electrical supply on which it will be used.

Electrical Connection

Insert the 115V plug on the line cord from the pump into a properly grounded 115V outlet as shown in Figure 4a.

5. Timer Technical Data

TIMER CONTROL
- Supply Voltage: 115-120 VAC, 60 hertz
- Contact Rating: 16 amps
- Ambient Temperature: -4°F to 175°F
- Max Fluid Temperature: 150°F
- Shortest Switching Interval: 15 minute increment
- Switch Modes: "Timer", "ON" Override, "OFF" Override
- Protection: Clear plastic cover for dust and moisture protection of the clock face.

6. Timer Technical Application

The Grundfos timer control is designed only for use with specified Grundfos Series UP circulators installed in indoor hot water service systems.

The timer control is designed to turn the circulator on and off at preset times, allowing the user to select operation of the circulator during high use periods of the day.