

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

Comfort System

Hot Water Recirculation System

US Installation and operating instructions



ANSI/NSF61 and
IAPMO listed

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CONGRATULATIONS! You are now the owner of a Grundfos Comfort System. It has been carefully inspected and tested before shipment. It should give you long, efficient, trouble-free service. For maximum performance and reliability, please follow the simple instructions in this manual. **NOTE:** Please understand this is not an anti-scald device. You may have some warm water in your cold water line under the sink where the valve is installed. Once the cold water line is opened, the warm water will dissipate in a very short time.

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.

Grundfos Hot Water Package Includes:

- One Grundfos UP15 circulator with timer and linecord
- One Under Sink, Thermal By-Pass Valve
- Two Valve mounting screws
- Installation and Operating Instructions

Items that must be supplied by Installer:

- 2- 1/2" NPT X 3/8" compression flex hoses
- 2- 1/2" NPT X 1/2" NPT flex hoses
- Hand Tools

Pre-Installation Checklist

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

Maximum Water Temperature:

UP15 pump with line cord and timer only; The maximum allowable water temperature is 150°F.

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

Pump Mounting: For Indoor Use



Note: Do not energize pump until properly installed

1. Close the supply water valve to the water heater located, in most cases, above the hot water heater on the cold water inlet to the hot water heater.

2. Drain the water from the hot water pipe by opening a hot water faucet in the house. Let the water run until it stops flowing. Then drain remaining water from hot water heater spigot. Leave the faucet open until pump installation is complete. If water does not stop flowing, check to make sure the water to the hot water heater has been completely shut off.

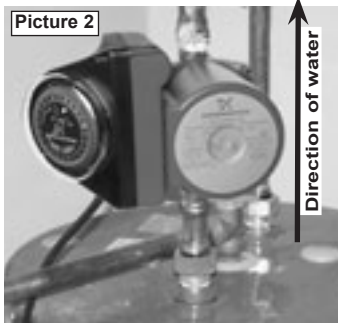
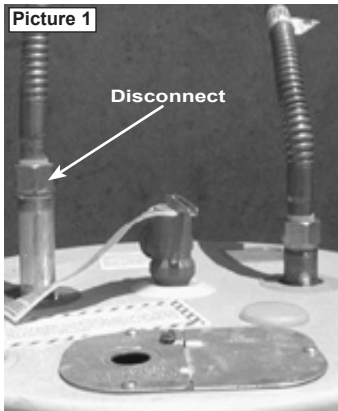
3. Disconnect the hot water heater at the hot water discharge. (see Picture #1)

4. Install pump onto the water heater discharge, using the 3/4" female fitting and gasket supplied on the pump ensuring that the pump shaft is horizontal. The pump should be installed so that the pump is pumping away from the hot water heater, towards the house. Confirm the direction of pumping by observing the flow arrow on the side of the pump housing. Be sure that the pump is not touching the exhaust vent piping (chimney) of a gas or oil fired hot water heater. (See Picture #2)

5. Connect the hot water line to the 3/4" NPT discharge of the pump. Use pipe dope or Teflon tape to seal threads when connecting to a 3/4 female NPT connection. If a gasketed flexible copper water heater connector is used pipe dope or Teflon tape is not required

6. Reopen the supply valve to the hot water heater and allow the water to run until all the air has been purged from the piping.

7. Close faucet inside the house.



8. Plug the line cord of pump into a 115V outlet. Be sure to route the power cord so that it does not touch the exhaust vent piping of a gas or oil fired hot water heater.

9. Using the timer (see pg. 6), set the pump to operate around your peak use times. (eg 30 minutes before the first shower until 15 minutes after last shower).

Valve Location

For the greatest effect, the valve should be located at a faucet with the greatest piping distance from the hot water heater. If your home has a branched hot water line, more than one valve may be necessary.

Valve Installation

Note: Do not use teflon tape or pipe dope on the valve threads.

1. Close both the hot and cold water angle stop valves below the sink. (see Picture #3)
2. Disconnect the risers. (see Picture #4)
3. Connect the 1/2"X1/2" flex hoses to the ports on the valve marked "Hot Out" and "Cold Out". (see Picture #5)
4. Connect the 1/2"X3/8" flex hoses to the ports on the valve marked "Hot In" and "Cold In". (see Picture #5)

Please note: By plumbing convention, the hot water is on the left side and cold water on the right, when looking at the sink. Your piping may be different.

Picture 3



Picture 4

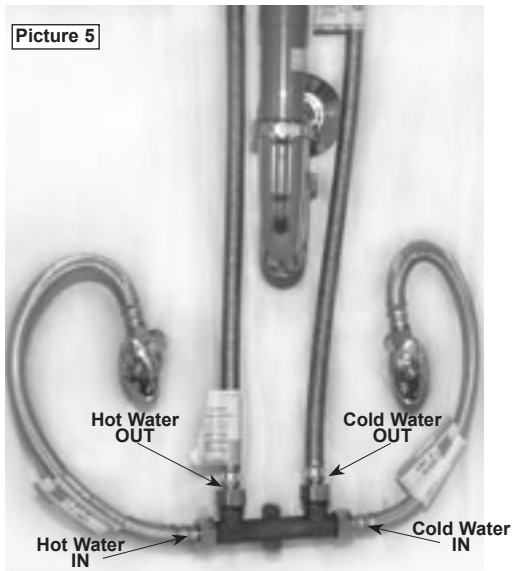


5. Connect the 1/2" hose fitting from the "Hot Out" port to the left side of the faucet. (see Picture #5)
6. Connect the 1/2" hose fitting from the "Cold Out" port to the right side of the faucet. (see Picture #5)
7. Connect the 3/8" hose fitting from the "Hot In" port to the left angle stop valve. (see Picture #5)
8. Connect the 3/8" hose fitting from the "Cold In" port to the right angle stop valve. (see Picture #5)
9. Open both hot and cold water angle stop valves.
10. Valve may be mounted to the wall with supplied mounting screws if desired.

Valve Operation

If there is no hot water at the faucet or there appears to be too much hot water on the cold water side the following steps will determine if the valve is operating correctly:

1. Close the cold water angle stop valve below the sink.
2. Open the cold water faucet.
3. Water should slowly flow from the faucet until hot water reaches the valve. The flow should gradually decrease to a trickle of water until no water is coming from the faucet.



Electrical

SAFETY WARNING

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.

Timer Technical Data

TIMER CONTROL

Supply Voltage: 115-120 VAC, 60 hertz

Contact Rating: 16 amps

Ambient Temperature: -4°F to 175°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.

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.

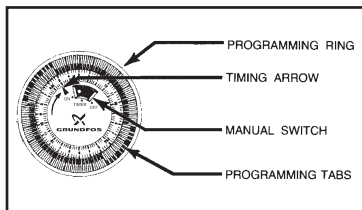
The timer control is designed to turn the circulator on and off at preset times, allowing the user to select operation of the circulator during high use periods of the day.

Timer Operation

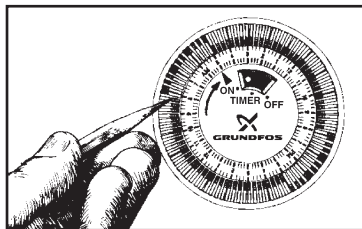
Setting & Operating The Timer Control

Starting the Pump

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. Plug in the power cord from 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”.



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.

Comfort System

The Comfort System uses a patented Comfort Valve® and pump to provide instant availability of hot water at the point of use.

Operation

The Comfort Valve® is installed at the fixture furthest away from the hot-water tank. With a built-in timer, the pump allows hot water to circulate along the loop through the valve using the cold-water side as a return line. As the temperature rises to 100 °F (38 °C), the valve closes directing hot water to the tap, thus resulting in a constant availability of hot water.

Savings

The Comfort System saves up to 16,000 gallons (60,566 liters) of water per year and per household (based on average modern household usage) and uses less energy than a 25 W light bulb.

Applications

- Domestic hot-water recirculation systems in single- and two-family houses.

Pumped liquids

- Domestic hot water
- Potable and non-potable water



Fig. 7 Comfort System

Motor

- Insulation class: F.
- Power consumption: 25 W.
- Voltage: 115 V.
- Current 0.23 A.
- Phase: 1.

Description (UP open systems)	Material
Inlet cone, bearing plate, bearing retainers, rotor can, rotor cladding, shaft retainer	Stainless steel
Volute retainer (SU & SF models) and stator housing	Aluminium
Shaft, upper and lower radial bearings	Aluminium oxide ceramic
Thrust bearing	Carbon bearing and EPDM retainer
Pump housing (volute)	Silicon bronze C875 or stainless steel 300 series.
O-ring and gaskets	EPDM (ethylene propylene rubber)
Impeller	PES composite (30 % glass-filled)
Terminal box	Noryl® with EPDM gasket

Grundfos Comfort Valve body materials

Description	Trade name	Material
Springs, pins, screens	300 Series	Stainless steel
Valve body	Ryton	PPS
Thermal actuator body	300 Series	Stainless steel
Check valve O-ring		EPDM
Check valve body		Acetal
Check valves plunger		Thermoplastic

Ambient and liquid temperatures

Liquid temperature: 36 °F (2 °C) to 150 °F (66 °C).

It is recommended to keep the operating temperature as low as possible (e.g. 140 °F (60 °C)) to avoid calcium precipitation.

The ambient temperature should always be lower than the liquid temperature, as otherwise condensation may form in the stator housing.

Maximum system pressure

145 psi (10 bar).

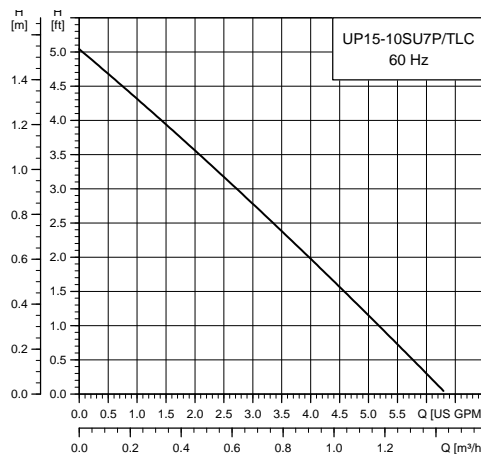


Fig. 8 Performance curve for the Comfort System

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 24 months from date of installation, but not more than 30 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.

GRUNDFOS WILL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSSES, OR EXPENSES ARISING FROM INSTALLATION, USE, OR ANY OTHER CAUSES. THERE ARE NO EXPRESS OR IMPLIED WARRANTIES, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHICH EXTEND BEYOND THOSE WARRANTIES DESCRIBED OR REFERRED TO ABOVE.

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 Pumps Corporation
17100 W. 118th Terrace
Olathe, Kansas 66061
Telephone: (913) 227-3400
Fax: (913) 227-3500

Grundfos Canada, Inc.
2941 Brighton Rd.
Oakville, Ontario L6H 6C9
Telephone: (905) 829-9533
Fax: (905) 829-9512

Bombas Grundfos de Mexico, S.A. de C.V.
Boulevard TLC #15, Parque Industrial Stiva Aeropuerto
C.P. 66600 Apodaca, N.L. Mexico
Telephone: 52-81-8144-4000
Fax: 52-81-8144-4010