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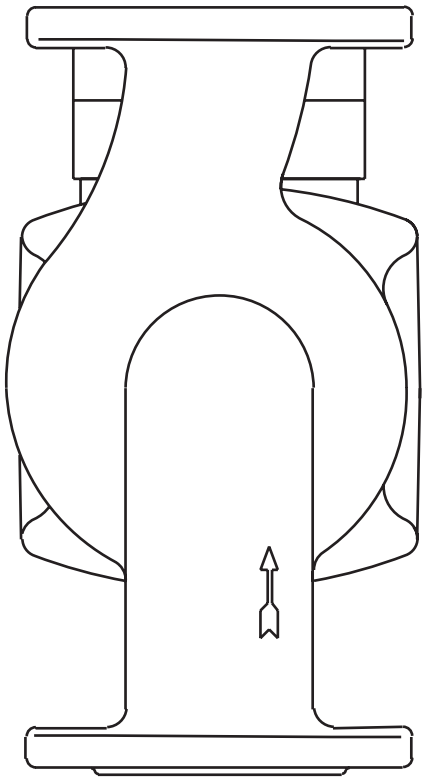


1070-AP SERIES
HIGH EFFICIENCY CIRCULATOR
INSTRUCTION, INSTALLATION, MAINTENANCE AND REPAIR MANUAL

NOTE! To the installer: Please make sure you provide this manual to the owner of the equipment or to the responsible party who maintains the system.

Part # A-03-333 | © 2012 Pentair Ltd. | 11/19/12

IMPORTANT NOTE TO INSTALLER:

Read carefully before installing and operating the circulator. Please leave this manual for the owner's use.

You are about to install a 1070-AP Series circulator – a high-efficiency pump from Aurora. 1070-AP Series circulators are designed for heating and cooling in hydronic, geothermal or solar systems, circulating water or ethylene or propylene glycol/water solutions. For pumping domestic (potable) water, Aurora recommends the use of circulators with bronze body construction.

The 1070-AP Series circulators are extremely efficient and quiet and use a state-of-the-art permanently lubricated bearing system designed for many years of trouble-free operation. They feature a permanent-split capacitor motor with thermal protection.

CALIFORNIA PROPOSITION 65 WARNING:

⚠WARNING **This product and related accessories contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.**

OPERATING LIMITS:

• Maximum operating pressure:
150 psi (1034 kPa)

• Maximum operating temperature:
All Standard Models – 230˚F (110˚C)

Models Ending in 150 – 150˚F (65˚C)

• Electrical Rating:
For models with 1/6 hp motors:
120V, 1 Phase, 60 Hz or 208 / 240V, 1 Phase, 60 Hz

For models with 2/5 hp motors:
120V, 1 Phase, 60 Hz or
208 / 240 / 277V, 1 Phase, 60 Hz

When unpacking the circulator, inspect for any damage that may have occurred during transit. Check for loose, missing or damaged parts.

THIS PUMP IS FOR INDOOR USE ONLY.

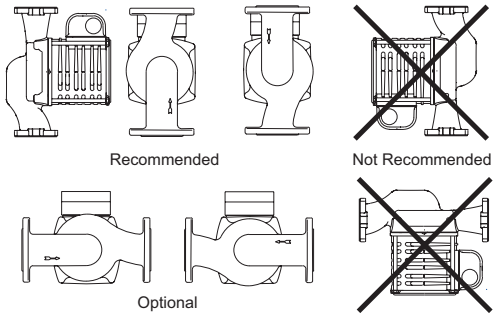
INSTALLATION:

Before installing the circulator, proper installation practice recommends a thorough flush of the hydronic system, ensuring removal of all foreign materials prior to installing the circulator.

Check that the flow direction of the water through the hydronic system matches the arrow on the circulator body. The circulator is supplied for installation with an up discharge direction.

The 1070-AP Series circulators can be installed to discharge up or down, horizontally left or right, but the circulator shaft must remain in the horizontal position. It is recommended that the circulator be installed such that the terminal box is installed on the top or side of the motor housing but NOT underneath the motor housing. The piping can be in a horizontal or vertical run. Isolation valves should be installed on the discharge and suction side of the pump to facilitate service.

Installation Positions:



TERMINAL BOX: If the terminal box is found to be positioned inconveniently, it can be rotated as required through 90˚ increments. See examples shown in "Installation Positions".

ELECTRICAL WIRING: The electrical wiring must be installed in strict accordance with the U.S. National Electrical Code or the Canadian Electrical Code, as well as local codes and regulations.

a. Electrical installation should be conducted by a qualified electrician.

b. The motors of 1070-AP Series circulators are designed for 60 Hz, 1 Phase, 120V or 240V service only. (Please refer to the rating label on the circulator's terminal box to determine the correct voltage.)

c. Always make sure the electric power is disconnected and locked out before wiring the circulator.

d. To wire, loosen the screw from the terminal box cover and remove the screw and cover.

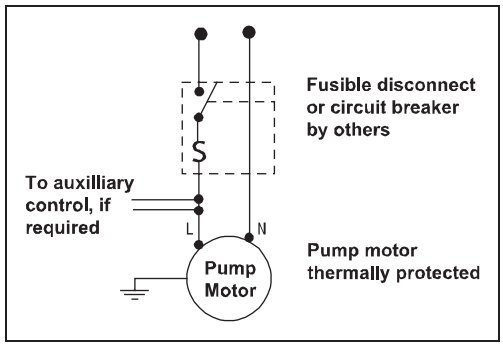
e. Install the appropriate size conduit end to one of the holes on either side of the terminal box.

f. ***For 120V models:***
   - Referring to Diagram 1 on page 2, connect the hot (black, "L") and neutral (white, "N") leads of the supply wire to the black and white motor leads, respectively, inside the terminal box. Connect the ground wire to any one of the four green ground screws inside the terminal box (use a minimum 18 AWG wire size).

For 208 / 240 / 277V models:

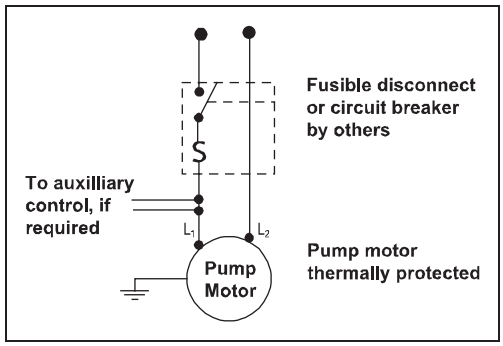
- Referring to Diagram 2 below, connect the black ("L1") and blue ("L2") leads of the supply wire to the black and white motor leads, respectively, inside the terminal box. Connect the ground wire to any one of the four green ground screws inside the terminal box (use a minimum 18 AWG wire size).

Diagram 1 (120V installations)



Typical wiring diagram for
single phase, 120V, 60 Hz power source

Diagram 2 (208 / 240 / 277V installations)



Typical wiring diagram for
a) single phase, 240V, 60 Hz power source, and
b) three phase, 208V / 277V, 60 Hz power source

g. Replace the terminal box cover.

The motor is thermally protected for your safety so overload protection is not necessary. All that is required is a fused plug or circuit breaker in the power line.

Electrical information can be found on the nameplate of the motor.

START-UP:

a. Before starting up the circulator, proper installation practice recommends a thorough flush and draining of the hydronic system, ensuring removal of all foreign materials. Fill the system with clean water or glycol solution before starting.

b. Air must be completely vented from the system before starting up the circulator. **If the system is not completely vented of air and the circulator is allowed to run dry, the mechanical seal will be damaged.**

c. When the system has been completely filled and vented, only then can the pump be started.

1070-AP Series circulators are fitted with permanently lubricated ball bearings and DO NOT require lubrication.

Disconnect and lock out the power before servicing.

REPLACEMENT OF PUMP FROM EXISTING INSTALLATION:

1. If valves have been installed on the suction and discharge sides of the pump, close them before attempting to remove the circulator from the system. If no valves have been installed, it may be necessary to drain the system.

2. For safety, allow water to cool to 100˚F (40˚C) before draining the system. It is best to leave the drain valve open while working on the system.

3. Ensure that electric power is disconnected and locked out before disconnecting the wiring to the circulator. Then, loosen the screw from the terminal box cover and remove the screw and cover. Disconnect the supply wires only to the circulator, leaving the capacitor wires connected.

4. To relieve any residual pressure which may be present in the pump body, loosen the flange bolts and gently move the pump body back and forth a bit to allow the pressurized water to escape.

5. Remove the flange bolts and nuts and then remove the circulator from the piping.

6. Install the 1070-AP Series circulator where there will be sufficient room for inspection and service. It is recommended that isolation valves be installed on both the suction and discharge sides of the circulator for future servicing (this eliminates the need for draining the system when working on the circulator, for example when replacing the mechanical seal).

7. Install suction and discharge flanges on the pipe ends. The use of Teflon tape sealer or a high quality thread sealant is recommended.

8. Pipe strain can be minimized by the use of pipe hangers near the pump, positioned to support the suction and discharge piping.

To wire the 1070-AP Series circulator, follow steps c through g in the "Electrical Wiring" section above, noting that electrical supply and grounding wires must be rated for at least 194˚F (90˚C).

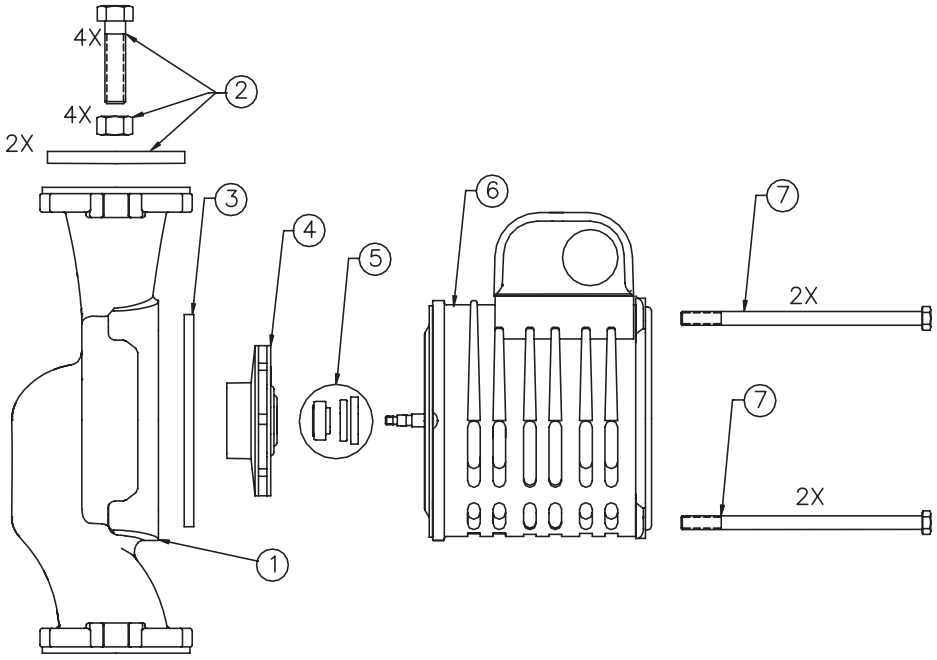
PREVENTIVE MAINTENANCE – INSPECTION:

Although Aurora long-life circulators are designed to provide years of worry-free service, it is good maintenance practice to inspect the entire hydronic system periodically – including the 1070-AP Series circulator – for potential problems. If there is any evidence of leakage or damage, repair or replace the pump.

INSTRUCTIONS FOR REPLACING MECHANICAL SEAL:

(Start by following steps 1 and 2 of section titled "REPLACEMENT OF PUMP FROM EXISTING INSTALLATION".)

REPLACEMENT PARTS LIST FOR 1070-AP SERIES CIRCULATORS:



Model	Body: Cast Iron (1)	Body: Bronze (1)	Flange Hardware Kit (2)	Body Gasket (3)	Impeller (4)	Mechanical Seal (5)	Motor Assembly 120V (6)	Motor Assembly 240V (6)	Motor Housing Cap Screw (7)
1070-AP7	880200-111	880200-141	810120-244	880200-071	880200-033	880200-277	880200-082	880200-182	911117-236
1070-AP8					880200-031				
1070-AP9					880200-030				
1070-AP10	880200-011	880200-041	810120-204		880200-029				
1070-AP11					880200-028				
1070-AP12-150	880210-111	880210-141	810120-244	880210-071	880210-035		880210-182	880210-282	911117-152
1070-AP12							880210-082	880210-382	
1070-AP13	880200-011	880200-041	810120-204	880200-071	880200-034		880200-082	880200-182	911117-236
1070-AP14-150	880210-111	880210-141	810120-244	880210-071	880210-035		880210-182	880210-282	911117-152
1070-AP14							880210-082	880210-382	
1070-AP15	880210-411	880210-441		880200-071	880210-037		880210-182	880210-282	
1070-AP16	880200-211	880200-241	810120-212		880200-032		880200-082	880210-182	911117-236
1070-AP17	880210-411	880210-441	810120-244		880210-038		880210-182	880210-282	911117-152
1070-AP19	880210-211	880210-241	810120-204		880210-030				
1070-AP21					880210-039				
1070-AP22					880210-029				
1070-AP23					880210-028				
1070-AP24					880210-032				
1070-AP28	880210-311	880210-341	810120-208		880210-131				
1070-AP29					880210-132				
1070-AP30	880210-011	80210-041	810120-212		880210-036				
1070-AP303	880210-311	880210-341	810120-208		880210-036				
1070-AP33	880210-011	80210-041	810120-212		880210-033				
1070-AP333	880210-311	880210-341	810120-208						

1. Turn off the pump leaving it installed in the line.

2. Ensure electrical power is disconnected and locked out.

3. Close the water supply at the points closest to the pump's inlet and outlet.

4. Bleed the water pressure from the pump.

5. Place a pan under the pump to collect the drain water.

6. While holding the motor body, unfasten the four bolts that attach the motor to the pump casing (volute). Start with the two bottom bolts first and remove them, then slowly loosen the top two bolts. Allow the water to drain from the bottom of the pump. When the water has finished draining, remove the two top bolts. Remove the motor straight out from the volute, being careful of its attached impeller. The motor is heavy; do not drop it!

7. Locate the snap bushing in the center of the back of the motor housing and pry it out with a screwdriver. Insert a straight-blade screwdriver into the snap bushing hole and into the slot in the end of the motor shaft to lock the rotor.

8. While holding the rotor (step 7), unscrew the plastic impeller off the motor shaft by hand turning it clockwise (i.e. opposite to most bolts and nuts!). Place the motor on its back, with its shaft up.

9. Remove the rotary part of the mechanical seal by gently pulling it off the shaft. If too tight use two small flat bladed screwdrivers. Gently pry it off the shaft by placing the flat side of the blades onto opposite sides of the mechanical seal.

10. Remove the stationary part of the seal by gently prying it off the steel faceplate.

11. Remove any corrosion present on the stainless steel motor shaft with a nonmetallic brush or scrub pad. Do not use a wire brush or steel wool.

12. Install the new stationary part of the seal into the faceplate: first, the rubber cup by firmly pressing it down until it bottoms, then the ceramic disk. The disk face with a circular groove should be put against the rubber cup (the visible disk face should be smooth). Press the disk firmly down until it too bottoms into the rubber cup. The ceramic disk should be clean. If needed, wipe it with alcohol and a soft cloth.

13. Install the new rotating part of the seal by gently pushing it, by hand, onto the shaft (graphite ring first) until its steel cap stops on the shaft.

    Check that:

    a. The height of the steel cap over the ceramic disk is between 0.33" and 0.35" (8.4 mm and 8.9 mm). If it is more than 0.35" (8.9 mm), then try pushing it farther down, carefully, but harder.

    b. The graphite disk is pressed against the ceramic disk (by a spring inside it).

    If either (a) or (b) is not happening, then contact Aurora Pump: phone (630) 859-7000 or e-mail ap_applications@pentair.com.

14. "Lock" again the motor rotor and shaft as per step 7 above, in order to perform the next step.

15. Fasten the plastic impeller onto the shaft, turning it by hand counterclockwise until it stops (when it touches the seal's steel cap). Do not tighten it excessively.

16. Ensure the gasket is properly seated in the pump casing (volute) gasket groove. Holding the motor body, insert the impeller straight into the volute. Verify the gasket was not dislodged during insertion and is still seated properly. Hold the motor body steady while fastening the four bolts that attach the motor to the pump casing (volute). Tighten evenly and diagonally. There should be a small, even gap of about 0.02" (0.5 mm) all around between the motor flange and the pump casing (volute).

17. Follow the START-UP instructions and check for leaks.

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WARRANTY

Seller warrants equipment (and its component parts) of its own manufacture against defects in materials and workmanship under normal use and service for one (1) year from the date of installation or start-up, or for eighteen (18) months after the date of shipment, whichever occurs first. Seller does not warrant accessories or components that are not manufactured by Seller; however, to the extent possible, Seller agrees to assign to Buyer its rights under the original manufacturer's warranty, without recourse to Seller. Buyer must give Seller notice in writing of any alleged defect covered by this warranty (together with all identifying details, including the serial number, the type of equipment, and the date of purchase) within thirty (30) days of the discovery of such defect during the warranty period. No claim made more than 30 days after the expiration of the warranty period shall be valid. Guarantees of performance and warranties are based on the use of original equipment manufactured (OEM) replacement parts. Seller assumes no responsibility or liability if alterations, non-authorized design modifications and/or non-OEM replacement parts are incorporated If requested by Seller, any equipment (or its component parts) must be promptly returned to Seller prior to any attempted repair, or sent to an authorized service station designated by Seller, and Buyer shall prepay all shipping expenses. Seller shall not be liable for any loss or damage to goods in transit, nor will any warranty claim be valid unless the returned goods are received intact and undamaged as a result of shipment. Repaired or replaced material returned to customer will be shipped F.O.B., Seller's factory. Seller will not give Buyer credit for parts or equipment returned to Seller, and will not accept delivery of any such parts or equipment, unless Buyer has obtained Seller's approval in writing. The warranty extends to repaired or replaced parts of Seller's manufacture for ninety (90) days or for the remainder of the original warranty period applicable to the equipment or parts being repaired or replaced, whichever is greater. This warranty applies to the repaired or replaced part and is not extended to the product or any other component of the product being repaired. Repair parts of its own manufacture sold after the original warranty period are warranted for a period of one (1) year from shipment against defects in materials and workmanship under normal use and service. This warranty applies to the replacement part only and is not extended to the product or any other component of the product being repaired. Seller may substitute new equipment or improve part(s) of any equipment judged defective without further liability. All repairs or services performed by Seller, which are not covered by this warranty, will be charged in accordance with Seller's standard prices then in effect.

THIS WARRANTY IS THE SOLE WARRANTY OF SELLER AND SELLER HEREBY EXPRESSLY DISCLAIMS AND BUYER WAIVES ALL OTHER WARRANTIES EXPRESSED, IMPLIED IN LAW OR IMPLIED IN FACT, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Seller's sole obligation under this warranty shall be, at its option, to repair or replace any equipment (or its component parts) which has a defect covered by this warranty, or to refund the purchase price of such equipment or part. Under the terms of this warranty, Seller shall not be liable for (a) consequential, collateral, special or liquidated losses or damages; (b) equipment conditions caused by normal wear and tear, abnormal conditions of use, accident, neglect, or misuse of said equipment; (c) the expense of, and loss or damage caused by, repairs or alterations made by anyone other than the Seller; (d) damage caused by abrasive materials, chemicals, scale deposits, corrosion, lightning, improper voltage, mishandling, or other similar conditions; (e) any loss, damage, or expense relating to or resulting from installation, removal or reinstallation of equipment; (f) any labor costs or charges incurred in repairing or replacing defective equipment or parts, including the cost of reinstalling parts that are repaired or replaced by Seller; (g) any expense of shipment of equipment or repaired or replacement parts; or (h) any other loss, damage or expense of any nature.

The above warranty shall not apply to any equipment which may be separately covered by any alternate or special warranties.

PERFORMANCE: In the absence of Certified Pump Performance Tests, equipment performance is not warranted or guaranteed. Performance curves and other information submitted to Buyer are approximate and no warranty or guarantee shall be deemed to arise as a result of such submittal. All testing shall be done in accordance with Seller's standard policy under Hydraulic Institute procedures.

LIABILITY LIMITATIONS: Under no circumstances shall the Seller have any liability under the Order or otherwise for liquidated damages or for collateral, consequential or special damages or for loss of profits, or for actual losses or for loss of production or progress of construction, regardless of the cause of such damages or losses. In any event, Seller's aggregate total liability under the Order or otherwise shall not exceed the contract price.

ACTS OF GOD: Seller shall in no event be liable for delays in delivery of the equipment or other failures to perform caused by fires, acts of God, strikes, labor difficulties, acts of governmental or military authorities, delays in transportation or procuring materials, or causes of any kind beyond Seller's control.

COMPLIANCE WITH LAW: Seller agrees to comply with all United States laws and regulations applicable to the manufacturing of the subject equipment. Such compliance shall include: The Fair Labor Standards Acts of 1938, as amended; Equal Employment Opportunity clauses of Executive Order 11246, as amended; Occupational Safety and Health Act of 1970 and the standards promulgated thereunder, if applicable. Since compliance with the various Federal, State, and Local laws and regulations concerning occupational health and safety, pollution or local codes are affected by the use, installation and operation of the equipment and other matters over which Seller has no control, Seller assumes no responsibility for compliance with those laws and regulations, whether by way of indemnity, warranty, or otherwise. It is incumbent upon the Buyer to specify equipment which complies with local codes and ordinances.

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