

## **General Aire Humidifier Owners Manual**

**This is a basic humidifier diagnostic tool for the complete line of General Aire humidifiers. Most of the modern models have complete installation and owner's manuals located on their perspective pages on this website. Go to their specific page to locate it. This is a basic tool which covers the most typical problems on most humidifiers.**

### **General 709, 990, 1040, 1042, SL-16, and 1099 Series Power Humidifiers**

This manual is an aid to servicing and troubleshooting General 709, 990, 1040, 1042, and 1099 Series power humidifiers. These humidifiers operate on the most efficient and economical means of evaporating water to air. Air circulation, water distribution and electrical circuitry all function in an elementary manner providing the utmost in simplicity and therefore the highest degree of reliability.

### **Models 709, 990, 1040, 1042, SL-16, and 1099 (Drain Models)**

Air circulation in these humidifiers is based on the bypass principal. Warm air is bypassed from the warm air plenum or positive pressure side, through the humidifier, and then to the return air or negative pressure side of the blower system. At typical bonnet pressures, 150 to 200 CFM will move through the humidifier. The air flow may be controlled with the manual air control. Closing the manual control will reduce the evaporative capacity of the humidifier.

The water supply for drain type humidifiers is controlled by the electric solenoid valve connected in parallel with the furnace blower circuit. The water flows through a monel wire cloth filter, through a metering orifice to provide the proper amount of water, and to the distributor trough to be evenly distributed over the top of the evaporator pad,.

The evaporator pad is coated with a non-soluble wetting agent to increase humidifier efficiency. Some of the coating may dust off during transit. This will not affect the efficiency of the evaporator pad. In operation, the water flows from the "V" notches in the distributor trough, down through the pad, and aided by the wetting agent, to almost all surfaces of the evaporator pad. As warm air moves through the pad, a percentage of the water is picked up by the air through evaporation. This percentage of evaporation is affected by the temperature of the air, its relative humidity and quantity of air moving through the humidifier. Excess water is collected by the drain pan and is carried off by the drain hose to a suitable sewer or drain connection. The excess water performs a useful function in washing down the evaporator pad to remove some of the minerals and dust that collect on the pad. The 709, 990, 1040, 1042, and 1099 are evaporative humidifiers. Minerals are left on the pad and are not blown into the air stream to collect in the living area.

The standard orifice will supply approximately 3.5 GPH of water on the 709, 990, 1040, and 1042 models and 4.8 GPH on the 1099 model, at a line water pressure of 60 psi. For low water pressure (20-40 psi) a slightly larger orifice is available to provide the same flow at the lower pressure. At typical water rates, the water consumption will cost approximately \$1.50 per month.

### **Models 709-L, 990-L, 1040-L, SL-16, 1099-L, 709-LH, 1040-LH, 1042-LH, and 1099-LH**

These humidifiers are identical to the drain models except that a 24V. solenoid valve and transformer are supplied allowing a 24V. control circuit. This facilitates wiring a humidistat located in the living area or return air duct. The low voltage humidistat is included in the 709-LH, 1040-LH, 1042-LH, and the 1099-LH models.

**Models 709-R, 990-R, 1040-R, 1042-R, 1099-R (Recirculating Models)**

These models are variations of the drain models, eliminating the need for the external drain or sewer.

The electric solenoid valve is eliminated and the water supply is controlled by a motor driven, adjustable flow pump. The pump is mounted in a reservoir where the water level is maintained by a float valve. The pump supplies water to the distributor trough where it is evenly distributed to the evaporator pad. Water that is not evaporated drains back into the reservoir and is recirculated. The pump motor is connected in parallel with the furnace blower circuit. A line voltage humidistat may be installed for automatic control.

If low voltage control is desired for the recirculating models, a Honeywell RA89A low voltage relay may be used for this purpose.

**Troubleshooting**

The following guide to troubleshooting 709, 990, 1040, 1042 and 1099 Series humidifiers lists problems that occasionally occur, their cause and correction. Troubleshooting is a process of elimination. A complaint or problem exists and by noting all possible causes, the fault can be located by inspection and test.

<b>Problem</b>	<b>Cause</b>	<b>Correction</b>
No water flow.	Plugged orifice or orifice strainer.	Disassemble and clean orifice on inlet side of solenoid valve.
	No electric power to humidifier.	Replace blown fuse.  Reset circuit breaker.  Furnace fan not running when humidifier is wired per instructions, furnace fan must be running for humidifier to operate.  If humidistat is applied check for proper setting.
	Solenoid valve not opening.	Solenoid will make audible click when energized. With furnace blower running and humidistat turned on high humidity, check circuit for loose connections. Check continuity through solenoid cell.
	Saddle valve closed or	Open valve and check for

	plugged.	water flow to solenoid valve.
Slow water flow. (Less than 3 gal. per hour or 1 qt. in five minutes on 709, 990, 1040 and 1042 models.) (5 gal. per hour or 1 qt. in three minutes on 1099 models.)	Partially plugged orifice or strainer.	Disassemble and clean orifice and strainer.
	Low water pressure (20-40 psi)	Install low pressure orifice.
Excessive water flow. (Greater than 6 gal. per hour on 709, 990, 1040, and 1042 models.) (Greater than 8 gal. per hour on 1099 models.)	Enlarged orifice.	Replace orifice fitting.  See Installation Instructions for proper orifice size.
Continuous water flow. Electric valve does not shut off supply.	Improper wiring.	Check circuitry. Solenoid should be connected in parallel with furnace blower motor on the blower side of the fan control.
	Worn seat in electric valve.	Use manufacturer's valve wrench to disassemble valve for inspection. If valve leaks at seat, replace valve.
	Valve plunger sticks in open position.	Inspect valve sleeve and plunger for excessive dirt. Clean plunger and sleeve assembly.
	Valve installed incorrectly. Water must flow in direction of arrow or as described by "In and Out" shown on valve.	Assemble correctly.
Noisy or buzzing solenoid valve.	Dirt in valve sleeve and plunger assembly.	Disassemble valve with manufacturer's valve wrench and clean all foreign matter from sleeve assembly and plunger.
Water blowing out of distributor trough.	High bonnet pressure forcing air up through distributor trough.	Install distributor trough and trough cover tightly.
Water blowing off evaporator pad.	Excessive lime accumulation and corrosion on evaporator pad.	Replace evaporator pad.
	Excessive water flow. (Greater than 6 GPH on 709, 990, 1040, and 1042 models.) (Greater than 8 GPH on 1099 models.)	Check orifice for enlargement. Reduce humidifier pump output (recirculating models only.)

	High static pressure--systems equipped with central air conditioning may have high static pressures and/or two speed blowers.	Use "Low" blower speed for heating when humidification is required.  Close manual air control on humidifier to reduce air flow. Install permanent restriction in bypass pipe to reduce air flow through humidifier.
Drain pan overflowing.	Accumulation of mineral deposits plugging pan outlets or drain hose.	Clean drain pan and flush drain hose. Be sure drain line has a continual slope to the drain with no kinks.  Do not connect humidifier drain to a "T". This creates an obstruction which could collect mineral deposits.
Excessive humidification with humidistat installed.	Short in humidistat wires, or unit will not shut off.	Check humidistat wires to be sure they are not shorted. Electricians staples will often short low voltage wires.
	Continuous water flow.	See previous section on continuous water flow.
Excessive humidification without humidistat.	Incorrect setting on manual air control.	If over humidification is a chronic problem reduce air flow through unit by closing air control. A humidistat may be installed to give positive control of relative humidity.
Lack of humidification.	Incorrect measurement of relative humidity.	Check relative humidity with sling psychrometer. Bacharach Model SAC is recommended.
	Periodic cleaning has been neglected.	Thoroughly clean humidifier and replace evaporator pad or any worn part.
	Homeowner not aware of recommended relative humidity.	Bring attention to maximum values on homeowner's service card.
	Incorrect installation.	Review Installation Instructions to determine if unit is installed correctly. The bypass pipe must be installed.
	Water not flowing through all holes in distributor trough.	Adjust humidifier so that the distributor trough is exactly level in all directions. If surface tension seems to prevent flow of water through on or two "V" notches, brush

		notches with a non-sudsing liquid detergent. On 1042 humidifiers, brush detergent on water dividing target area in center of the distributor trough.
	Slow water flow.	See previous section on slow water flow.
	Humidifier air shutter set on low.	Make certain manual air control is open.
	Insufficient air flow. (Less than 100 CFM.)	Seldom a problem with bypass humidifiers. In rare cases, however, such as gravity conversion furnaces, unusually low bonnet pressure (less than .05" of water) may not provide air flow through humidifiers. To correct problem, enlarge bypass duct to the next larger size, using proper transition from humidifier to bypass duct.
	Air changes in home occurring more rapidly than normal (1 air change per hour is average). Excessive infiltration can be caused by open windows and prolonged use of kitchen and bathroom exhaust fans. These factors can increase the air changes in a home to 4 per hour, greatly increasing the humidification load.	Keep windows and dampers closed and exhaust fans off as much as possible. While a fireplace is being used, a lower relative humidity will be experienced due to the large increased draft up chimney.
	Homes with make-up air devices or energy recovery ventilators can increase the air changes in the home many times, lowering the performance of the humidifier.	The output of drain type humidifiers may be increased 4.3 gallons per day with hookup to 140 degrees hot water. Use copper water supply tubing with insulation.
Pump not raising water to humidifier. (Recirculation models only.)	Flow adjustment on recirculating pump set too low.	Set flow rate per Installation Instructions by moving standpipe in the direction shown on pump lid.
	Clogged pump or supply hoses.	Disassemble pump. Clean pump housing, brass supply tubing and vinyl hoses. Reset pump output at no more than 6 GPH (1 qt. in 2/12 minutes

		on 709, 990, 1040, and 1042). (No more than 8 GPH, 1 qt. every 2 minutes on 1099).
Pump reservoir overflowing.	Faulty float valve.	Replace float valve shield and float orifice nut. Remove float assembly and clean mineral deposits from all parts. Reverse position of valve seat if it shows wear.
	Grooves in valve seat.	Replace any worn parts.