



# LANCASTER<sup>®</sup>

# WATER TREATMENT

## INSTALLATION, OPERATING AND SERVICE MANUAL

### ECONO-mist WATER SOFTENER Demand Regeneration

- 7-LMC56-75
- 7-LM56-75
- 7-LM56-100
- 7-LM56-150
- 7-LM56-200

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Congratulations on purchasing your new **Lancaster Water Softener**. This unit is designed to give you many years of trouble free service. When installed in accordance with the following instructions and if given reasonable care, clear-soft water will be the result. For servicing and future inspection purposes, please file this booklet with your important documents.



## INSTALLATION

Place softener in desired location close to water supply inlet, after pressure tank, and near a source for waste water, (utility sink, floor drain or sewer line). Keep far enough away from walls and other obstructions to allow enough room for servicing the unit. All sillcocks and similar fixtures that will use untreated water must have their pipes connected to the hard water side of the softener. A bypass valve (optional accessory) should be installed so that water will be available if it should be necessary to shut off the pressure in order to service the softener.

The cabinet tank or mineral tank must be reasonably level and solidly in place. Prior to beginning work to the system, make sure that water pressure is shut off at the incoming water supply and that several water spigots are open to prove sufficient venting for drainage of that system.

Arrows are molded into the control valve to show the direction of the flow.

**OPTIONAL BYPASS VALVE:** The bypass valve easily connects to the control valve body using screws and adapter clips. Install with red handle in the upward position. Press slip end of bypass valve onto in/out connections of valve. Take care not to crimp o-rings. Place into **BYPASS POSITION**. Do not use Vaseline or other unacceptable lubricants on o-rings. A silicone lubricant may be used on black o-rings.

**DRAIN LINE:** Drain line fitting accommodates 1/2" I.D. flexible poly tube.

It is simplest to run the drain line into a sump pump pit or washing machine drain if possible. If this is not practical, a fitting with a trap must be installed in a sewer line. Place the trap as close to the vent as possible to prevent siphoning of the trap when large amounts of waste water go through the sewer line. **DO NOT** pipe the drain line solidly into the waste line, as this is prohibited by most plumbing codes. The drain line should enter the trap from above so the water will not back up in the drain line if sewer should become plugged up and the trap overflow. The trap should have a short pipe extending from it to prevent splashing when water runs into the trap from drain line.

**BRINE LINE CONNECTIONS:** 3/8" poly tube is shipped inside of the brine tank along with a fittings package.

**MAKE CONNECTION TO BRINE TANK:** Loosen nut on brine tank connection. Push the tube insert into the provided 3/8" poly tube. Push the poly tube and insert into the nut until it is fully seated into the fitting. Do not use pipe dope or any other sealant on threads. Teflon tape is not needed on the threads. Tighten nut securely to create a pressure tight connection. Pliers or crescent wrench may be used. The nut, gripper and retainer sleeve is a three piece assembly that can come apart if removed from the elbow body. Parts must be reassembled exactly as shown to function properly. If the nut is completely removed from the body, slip the nut, plastic gripper and retainer sleeve on to the tube then tighten on to the fitting.

**MAKE CONNECTION TO CONTROL VALVE:** Slide brass nut onto 3/8" poly tube. Slide ferrule onto poly tube **as shown in diagram**. Install tube insert. Press fully into brine valve fitting. Tighten brass nut.

**BRINE TANK OVERFLOW PRECAUTION:** Attach a 1/2" poly tube (not provided) to the barbed fitting on the outside of the tank. This poly tube should be piped to drain to allow brine to discharge to drain in the event of an overflow condition.

**SANITIZING:** Use 2 oz. of 5¼% household chlorine bleach for each cubic foot of resin. Pour bleach directly into the brine well of the softener. Manually index the softener to the **REGEN** position. Allow system to complete the regeneration automatically. Check for other local and state codes which may also specify sanitation methods. This is to be done after placing unit into service. (see next page.)

## PLACING UNIT INTO SERVICE:

1. Manually index the softener control into the backwash position. Slowly open bypass valve and allow water to flow into the resin tank. When the water flows steadily to drain without the presence of air, index control to service position.

NOTE: the various regeneration positions may be dialed manually by turning the knob on the front of the control clockwise until the indicator shows that the softener is in the desired position. VARIOUS REGENERATION POSITIONS ARE:

- |                 |              |                  |
|-----------------|--------------|------------------|
| 1. IN SERV.     | 3. RINSE     | 5. BRINE + RINSE |
| 7. SETTLE RINSE |              |                  |
| 2. REGEN.       | 4. BACK WASH | 6. RAPID RINSE   |
| 8. BRINE REFILL |              |                  |

2. Set water usage program wheel using the following procedure:

**Typical Residential Application:** To program the unit, set the correct time of day, set the hardness of your water and the softener will automatically monitor your usage, regenerating only when necessary. To set time of day press red time set button and turn 24 hour gear until present time of day is opposite "time of day." Set program wheel by lifting the "people" dial and rotating it so that the number of people in the household is aligned with the "grains per gallon" water

3. Rotate the program wheel counter clockwise until it stops at regeneration position.
  4. Add 1-1/2 gallons of water to the brine tank.
  5. Plug in the electrical cord and look in the sight hole in the back of the motor to see that it is running.
  6. Manually advance the control to the beginning of the brine refill position and allow the control to return to the service position automatically.
  7. Fill the brine tank with salt. Maintain salt level above water level. We recommend Solar Salt.
  8. Make sure bypass valve(s) is in the service position.
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Item No.	Qty.	Part No.	Description	Item No.	Qty.	Part No.	Description
1	1	15494	Drive Panel	22	1	19205	24 Hour Gear Assy.
2	1	14333	Front Label	24	1	14176	Valve Position Dial
3	1	13018	Idler Pinion	25	1	14177	Knob
4	1	13312	Idler Spring	26	1	15151	Screw - Knob
5	1	13017	Idler Gear	27	1	14207	Knob Label
6	1	13164	Drive Gear	28	1	60405-15	Program Wheel Assy.
7	1	13299	Curved Washer	29	1	13806	Program Wheel Retainer
8	1	13175	Motor Mounting Plate	30	1	13748	Screw - Program Wheel
9	1	18743	Motor - 110 V. 1/30 RPM	31	1	13953	Cover Label - Program Wheel
10	3	11384	Screw	32	1	13830	Drive Pinion - Program Wheel
11	3	13296	Screw	33	1	13831	Clutch - Drive Pinion
12	2	14457	Spring	34	1	14276	Spring
13	2	13300	Ball	35	1	14253	Spring Retainer
14	1	13170	Main Gear & Shaft	36	1	14043	Flexible Cable Assy.
15	1	60514	Brine Cam Assy. LMC56-75, LM56-75, LM56-100	37	1	13547	Strain Relief
	1	60514-01	Brine Cam Assy. LM56-150, LM56-200	38	1	11842	Electrical Cord
20	1	12037	Washer	39	2	12473	Screw-Drive Mounting
21	1	13802	Cycle Actuator Arm	40	1	60226	Black Cover

Item No.	Qty.	Part No.	Description	Item No.	Qty.	Part No.	Description	Item No.	Qty.	Part No.	Description
1	4	13255	Adapter Clips	22	1	13163	Injector Body	42	1	12086	1.5 GPM Button
2	5	13424	Seals	23	1	10913	Injector Nozzle		1	12089	2.4 GPM Button
3	1	61400-12	Valve Body Assy . - 1"	24	1	10914	Injector Throat	43	1	13173	Retainer
4	1	13304	O-Ring	25	1	10227	Injector Screen	44	1	12767	Screen
5	1	12281	O-Ring	26	1	13166	Injector Cover	45	1	13821	Meter Body
6	4	12473	Screw	27	1	13172	Brine Valve Stem	46	1	13497	Air Disperser
7	4	14241	Spacer	28	1	12626	Brine Valve Seat	47	1	13546	End Plug Retainer
8	1	13247	Piston	29	1	13165	Brine Valve Cap	48	3	12112	Screws
9	1	10696	Piston Pin	30	1	13167	Brine Valve Spacer	49	1	13363	Washer
10	1	13001	Piston Rod Assy.	31	1	12550	Quad Ring	50	1	13296	Screw
11	1	12953	Piston Retainer	32	1	11973	Spring	51	1	13398	Yoke, Stainless Steel
12	1	13446	End Plug Assy.	33	1	16098	Washer	52	1	13308	Drain Line Fitting
13	1	13847	O-Ring	34	1	11981	Retaining Ring	53	1	14038	Meter Cover Assy.
14	2	13315	Screw	35	1	10329	Fitting Nut		1	15150	Meter Cover - Extended
15	1	14613	Flow Straightener	36	1	10330	Ferrule	54	1	13509	Impeller
16	4	13305	O-Ring	37	1	10332	Tube Insert	55	1	15348	O-Ring
17	4	13314	Screw	38	1	12094	Button - .25 GPM			60032	Brine Valve Assy.
18	1	12638	O-Ring		1	12095	Button - .50 GPM			60084	Injector/Drain Assy.
19	2	13301	O-Ring	39	1	12977	O-Ring			60102-	Piston Assy.
20	2	13302	O-Ring	40	1	13245	Retainer			60125	Seal Kit
21	1	13303	O-Ring	41	1	13244	B.L.F.C. Fitting				

### **4740 Brine Valve Assembly**

Item No.	Quantity	Part No.	Description
1	1	H4600	3/8" Safety Brine Valve
2	1	10151	Pin
3	1	H4640-32	Float Assembly
4	1	H4500-30.50	Air Check Assembly

## SERVICE INSTRUCTIONS

**TO REPLACE BRINE VALVE, INJECTORS, AND SCREEN:** Unplug electrical cord from outlet. Turn off water supply to softener. Relieve water pressure in the softener by putting the control in the backwash position momentarily. Return the control to the service position. Disconnect brine tube and drain line connections at the injector body. Remove the two injector body mounting screws. The injector and brine module can now be removed from the control valve. Remove and discard valve body O-Rings.

**TO REPLACE BRINE VALVE:** Pull brine valve from injector body, also remove & discard O-Ring at bottom of brine valve hole. Apply silicone lubricant to new O-Ring and reinstall at bottom of brine valve hole. Apply silicone lubricant to O-Ring on new valve assembly and press into brine valve hole, shoulder on bushing should be flush with injector body.

**TO REPLACE INJECTORS AND SCREEN:** Remove injector cap and screen, discard O-Ring. Unscrew injector nozzle and throat from injector body. Screw in new injector throat and nozzle, be sure they are seated tightly. Install a new screen. Apply silicone lubricant to new O-Ring and install around oval extension on injector cap.

Apply silicone lubricant to the three new O-Rings and install over three bosses on injector body. Insert screws with washers through injector cap and injector. Place this assembly through hole in timer housing and into mating holes in the valve body. Tighten screws. Reconnect brine tube and drain line. Return bypass or inlet valving to normal service position. Water pressure should now be applied to the softener. Check for leaks at all seal areas. Check drain seal with the control in the backwash position. Plug electrical cord into outlet. Set time of day and cycle the control valve manually to assure proper function. Make sure the control valve is returned to the service position. Make sure there is enough brine in the brine tank. Rotate program wheel counter-clockwise until it stops at regeneration position. Start regeneration cycle manually if water is hard.

**TO REPLACE PISTON ASSEMBLY:** Unplug electrical cord from outlet. Turn off water supply to softener. Relieve water pressure in the softener by putting the control in the backwash position momentarily. Return the control to the service position. Pull cable out of meter cover. Remove screw and washer at drive yoke. Remove timer mounting screws. The entire timer assembly will now lift off easily. Remove end plug retainer plate. Pull upward on end of piston yoke until assembly is out of valve. Inspect the inside of the valve to make sure that all spacers and seals are in place, and that there is no foreign matter that would interfere with the valve operation. Take new piston assembly as furnished and push piston into valve by means of the end plug. Twist yoke carefully in a clockwise direction to properly align it with drive gear. Replace end plug retainer plate. Place timer on top of valve. Be sure drive pin on main gear engages slot in drive yoke (rotate control knob if necessary). Replace timer mounting screws. Replace screw and washer at drive yoke. Return bypass or inlet valving to normal service position. Water pressure should now be applied to the softener. Plug electrical cord into outlet. Set time of day. Cycle the control valve manually to assure proper function. Make sure the control valve is returned to the service position. Be sure grommet at cable hole is in place. Make sure there is enough brine in the brine tank. Rotate program wheel counter-clockwise until it stops at regeneration position. Start regeneration cycle manually if water is hard. Plug cable into meter cover. Rotate cable to align drive flat if necessary.

**TO REPLACE SEALS AND SPACERS:** Unplug electrical cord from outlet. Turn off water supply to conditioner. Relieve water pressure in the softener by putting the control in the backwash position momentarily. Return the control to the service position. Pull cable out of meter cover. Remove screw and washer at drive yoke. Remove timer mounting screws. The entire timer assembly will now lift off easily. Remove end plug retainer plate. Pull upward on end of piston rod yoke until assembly is out of valve. Remove and replace seals and spacers with fingers.

**TO REPLACE METER:** Unplug electrical cord from outlet. Turn off water supply to conditioner. Relieve water pressure in the softener by putting the control in the backwash position momentarily. Return the control to the service position. Pull cable out of meter cover. Remove two screws and clips at bypass valve or yoke. Pull resin tank away from plumbing connections. Remove two screws and clips at control valve. Pull meter module out of control valve. Apply silicone lubricant to four new O-Rings and assemble to four ports on new meter module. Assemble meter to control valve. Note, meter portion of module must be assembled at valve outlet. Attach two clips and screws at control valve. Be sure clip legs are firmly engaged with lugs. Push resin tank back to the plumbing connections and engage meter ports with bypass valve or yoke. Attach two clips and screws at bypass valve or yoke. Be sure clip legs are firmly engaged with lugs. Return bypass or inlet valving to normal service position. Water pressure should now be applied to the softener. Check for leaks at all seal areas. Plug electrical cord into outlet. Set time of day. Make sure the control valve is in the service position. Rotate program wheel counter-clockwise until it stops at regeneration position. Start regeneration cycle manually if water is hard. Plug cable into meter cover. Rotate cable to align drive flat if necessary.

**TO REPLACE METER COVER AND/OR IMPELLER:** Unplug electrical cord from outlet. Turn off water supply to softener. Relieve water pressure in the softener by putting the control in the backwash position momentarily. Return the control to the service position. Pull cable out of meter cover. Remove four screws on cover. Lift cover off of meter module, discard O-Ring. Remove and inspect impeller for gear or spindle damage, replace if necessary. Apply silicone lubricant to new O-Ring and assemble to the smallest diameter on meter cover. Assemble cover to meter module. Be sure impeller spindle enters freely into cover. Press firmly on cover and rotate if necessary to assist in assembly. Replace four screws and tighten. Return bypass or inlet valving to normal service position. Water pressure should now be applied to the softener. Check for leaks at all seal areas. Plug electrical cord into outlet. Set time of day. Make sure the control valve is in the service position. Rotate program wheel counter-clockwise until it stops at regeneration position. Start regeneration cycle manually if water is hard. Plug cable into meter cover. Rotate cable to align drive flat if necessary.

## TROUBLESHOOTING PROCEDURES

PROBLEM	POSSIBLE CAUSE	SOLUTION
1. Softener fails to regenerate.	<ul style="list-style-type: none"> <li>a. Electrical service to unit has been interrupted.</li> <li>b. Timer is defective.</li> <li>c. Power failure.</li> </ul>	<ul style="list-style-type: none"> <li>a. Assure permanent electrical service.</li> <li>b. Replace timer.</li> <li>c. Reset time of day.</li> </ul>
2. Softener delivers hard water.	<ul style="list-style-type: none"> <li>a. By-pass valve is open.</li> <li>b. No salt in brine tank.</li> <li>c. Injectors or screen plugged.</li> <li>d. Insufficient water flowing into brine tank.</li> <li>e. Hot water tank hardness.</li> <li>f. Leak at distributor tube.</li> <li>g. Internal valve leak.</li> <li>h. Reserve Capacity has been exceeded.</li> <li>i. Program wheel is not rotating with meter output.</li> <li>j. Meter is not measuring flow.</li> </ul>	<ul style="list-style-type: none"> <li>a. Close by-pass valve.</li> <li>b. Maintain salt level above water level.</li> <li>c. Clean or replace injectors and screen.</li> <li>d. Check fill time and clean brine line plug if clogged.</li> <li>e. Empty hot water tank.</li> <li>f. Make sure distributor tube is not cracked. Check O-Ring and tube pilot.</li> <li>g. Replace seals and spacer and/or piston.</li> <li>h. Check Salt dosage requirements and reset program wheel to provide additional reserve.</li> <li>i. Pull cable out of meter cover and rotate manually. Program wheel must move without binding and clutch must give positive "clicks" when program wheel strikes regeneration stop. If it does not, replace timer.</li> <li>j. Check output by observing rotation of small gear on front of timer. Note - program wheel must not be against regeneration stop for this check). Each tooth to tooth is approximately 30 gallons. If not performing properly, replace meter.</li> </ul>
3. Unit uses too much salt.	<ul style="list-style-type: none"> <li>a. Improper salt setting.</li> <li>b. Excessive water in brine tank.</li> </ul>	<ul style="list-style-type: none"> <li>a. Check salt usage and salt setting.</li> <li>b. See problem no. 7.</li> </ul>
4. Loss of water pressure.	<ul style="list-style-type: none"> <li>a. Iron buildup in line to water conditioner.</li> <li>b. Iron buildup in water conditioner.</li> <li>c. Inlet of control plugged by foreign material.</li> </ul>	<ul style="list-style-type: none"> <li>a. Clean line to water conditioner.</li> <li>b. Clean control, increase frequency of regeneration and use a resin cleaner.</li> <li>c. Remove piston and clean control.</li> </ul>
5. Loss of resin out of drain line.	<ul style="list-style-type: none"> <li>a. Air in water system.</li> </ul>	<ul style="list-style-type: none"> <li>a. Assure that well system has proper air eliminator control. Check for dry well condition.</li> </ul>
6. Iron in conditioned water.	<ul style="list-style-type: none"> <li>a. Fouled resin bed.</li> </ul>	<ul style="list-style-type: none"> <li>a. Check backwash, brine draw and brine tank fill. Increase frequency of regeneration and use a resin cleaner.</li> </ul>
7. Excessive water in brine tank.	<ul style="list-style-type: none"> <li>a. Plugged drain line flow control.</li> <li>b. Plugged injector system.</li> <li>c. Timer not cycling.</li> <li>d. Foreign material in brine valve.</li> <li>e. Foreign material in brine line flow control.</li> </ul>	<ul style="list-style-type: none"> <li>a. Clean flow control.</li> <li>b. Clean injector and replace screen.</li> <li>c. Replace timer.</li> <li>d. Clean or replace brine valve.</li> <li>e. Clean brine line flow control.</li> </ul>
8. Softener fails to draw brine.	<ul style="list-style-type: none"> <li>a. Drain line flow control is plugged.</li> <li>b. Injector is plugged.</li> <li>c. Injector screen plugged.</li> <li>d. Line pressure is too low.</li> <li>e. Internal control leak.</li> </ul>	<ul style="list-style-type: none"> <li>a. Clean drain line flow control.</li> <li>b. Clean or replace injectors.</li> <li>c. Replace screen.</li> <li>d. Increase line pressure to at least 20 psi.</li> <li>e. Change seals and spacers and/or piston assy.</li> </ul>
9. Control cycles continuously.	<ul style="list-style-type: none"> <li>a. Faulty timer mechanism</li> </ul>	<ul style="list-style-type: none"> <li>a. Replace timer.</li> </ul>
10. Drain flows continuously.	<ul style="list-style-type: none"> <li>a. Foreign material in control.</li> <li>b. Internal control leak.</li> <li>c. Control valve jammed in brine or backwash position.</li> <li>d. Timer motor stopped or jammed.</li> </ul>	<ul style="list-style-type: none"> <li>a. Advance control through various regeneration positions. Remove foreign material in control.</li> <li>b. Replace seals and/or piston assy.</li> <li>c. Replace piston, seals and spacers.</li> <li>d. Replace timer.</li> </ul>