



DISINFECTING PROCEDURE FOR THE AKS-HDB AND GEM-FR-2 THROUGH GEM-FR-4 R.O. SYSTEMS USING THE MK231 OR 51-34 STERILIZATION PUMPS

FOR USE WITH PERACETIC ACID OR FORMALDEHYDE.

IF YOUR SYSTEM IS EQUIPPED WITH THE MK 231, MK151-34, OR THE MK171-634 DISINFECT PUMP, THE FOLLOWING PROCEDURE MUST BE FOLLOWED.

- 1) **BE SURE ALL PATIENTS HAVE BEEN TAKEN OFF DIALYSIS AND THAT NO OTHER PATIENTS ARE TO BE DIALYZED.**
- 2) TURN OFF THE R.O. SYSTEM AND ACTIVATE THE KEY SWITCHES AT THE R.O. SYSTEM AND THE NURSES MONITOR.
- 3) PLUG THE DISINFECT PUMP INTO THE OUTLET PROVIDED ON THE R.O. SYSTEM. THIS OUTLET IS LOCATED ON THE RIGHT SIDE OF THE CABINET MODEL R.O. SYSTEMS, AND ON THE BACK OF THE FRAME MODEL R.O. SYSTEMS. DO NOT USE A WALL OUTLET. SET THE SPEED CONTROL DIAL ON THE PUMP TO ZERO. THE DIAL MAY BE DIFFICULT TO TURN ON NEW PUMPS. INSERT BOTH THE DISCHARGE TUBE AND THE INLET PIPE INTO A 1-GALLON CONTAINER OF R.O. OR SOFT WATER.
- 4) PRESS THE "POWER ON" SWITCH ON THE R.O. WITH BOTH KEYS ACTIVATED, AN AUDIBLE AND VISUAL ALARM WILL BE ACTIVATED AT THE NURSES MONITOR, AND A VISUAL ALARM ONLY WILL BE ACTIVATED AT THE R.O. SYSTEM. **ONLY ONE KEY SWITCH NEEDS TO BE TURNED ON TO ACTIVATE THE DISINFECT ALARM MODE, BUT BOTH MUST BE OFF TO DEACTIVATED THE DISINFECT ALARM MODE.** A 15-MINUTE TIME DELAY WILL BE INITIALIZED. THE R.O. SYSTEM WILL NOT START FOR THIS 15-MINUTE PERIOD.
- 5) AFTER THE 15-MINUTE TIME DELAY HAS ELAPSED, THE "LOW PRESSURE" LIGHT WILL COME ON. IF YOUR SYSTEM HAS A BLADDER TANK OR R.O. WATER STORAGE TANK, THE R.O. WILL START AUTOMATICALLY. IF THE R.O. DOES NOT START, BE SURE THE WATER LEVEL IN THE STORAGE TANK IS AT THE RESTART LEVEL. IF THE STORAGE TANK LEVEL IS BETWEEN THE RESTART AND FULL LEVELS, PRESS THE "UNIT ON" SWITCH TO START THE R.O.
- 6) TURN ON THE SWITCH ON THE DISINFECT PUMP OUTLET. TURN THE DISINFECT PUMP SPEED CONTROL DIAL TO "40" TO PRIME THE PUMP. ONCE THE PUMP IS PRIMED, SET THE CONTROL BACK TO "0" AND TURN OFF THE SWITCH ON THE DISINFECTION PUMP OUTLET. **PLEASE USE CAUTION WHEN HANDLING ANY DISINFECTANTS, ESPECIALLY PERACETIC ACID OR FORMALDEHYDE.**
- 7) PLUG THE DISINFECT PUMP QUICK DISCONNECT INTO THE DISINFECT QUICK DISCONNECT ON THE R.O. SYSTEM. ON FRAME MODELS, THE QUICK DISCONNECT IS LOCATED NEXT TO THE INLET ON THE R.O. PUMP. ON CABINET MODELS THE QUICK DISCONNECT IS LOCATED INSIDE THE REAR DOOR OF THE CABINET AT THE INLET OF THE R.O. PUMP.
- 8) WITH THE R.O. SYSTEM ON, ADJUST THE POST ONE-MICRON FILTER PRESSURE TO 40 PSI. THIS CAN BE ACCOMPLISHED BY ADJUSTING THE BOOSTER PUMP BYPASS BALL VALVE (BP2). **40 PSI IS THE IDEAL PRESSURE FOR DISINFECTING THE R.O. SYSTEM AND FOR NORMAL OPERATION.**
- 9) WHEN DISINFECTING R.O. SYSTEMS WITH PERACETIC ACID, THE PERACETIC ACID CONCENTRATION IN THE PRODUCT WATER SHOULD NEVER EXCEED 1%. IF FORMALDEHYDE IS USED, THE DISINFECT SOLUTION CAN BE AS HIGH AS 4% CONCENTRATION. **DO NOT USE BLEACH.**
- 10) TO DETERMINE THE SETTING ON THE DISINFECT PUMP, YOU NEED TO DETERMINE THE TOTAL FLOW DEMANDED BY THE R.O. SYSTEM. THIS CAN BE DETERMINED BY THE PRE-TREATMENT FLOW METER. IF YOUR SYSTEM DOES NOT HAVE A PRE-TREATMENT FLOW METER, YOU CAN ADD THE PRODUCT FLOW TO THE REJECT FLOW.



- 11) TO DETERMINE THE PUMP SETTING TO ACHIEVE A 1% CONCENTRATION OF PERACETIC ACID, DIVIDE THE DEMAND FLOW BY 100, THEN MULTIPLY THAT BY 3785, WHICH CONVERTS THE GALLONS PER MINUTE VALUE TO CC/MIN. REFER TO THE PUMP VOLUME SETTINGS SHEET TO LOCATE THE CORRECT PUMP SETTING. **THIS SETTING IS AN INITIAL SETTING ONLY AND MUST BE ADJUSTED HIGHER OR LOWER TO ACHIEVE THE SETTING FOR A 1% SOLUTION. TEST THE R.O. PRODUCT WATER TO DETERMINE THE PERACETIC ACID CONCENTRATION.** AS LONG AS THE FEED FLOW AND FEED PRESSURE REMAINS THE SAME; THE SETTING WILL NOT CHANGE. RECORD THIS SETTING IN STEP (12).
- 12) SET THE SPEED CONTROL DIAL ON THE PUMP TO _____ (THIS WILL BE DETERMINED BY THE TYPE OF DISINFECTANT TO BE USED, THE TYPE OF MEMBRANES IN THE R.O. SYSTEM AND THE PERCENT OF DISINFECTANT REQUIRED, GENERALLY 1% FOR PERACETIC ACID OR 4% FOR FORMALDEHYDE.
- 13) ALLOW THE SYSTEM TO RUN UNTIL THE RETURN LINE, ALL POINTS OF USE AND ALL DIALYSIS MACHINES INDICATE A POSITIVE DISINFECTANT TEST. IF THE R.O. IS USED WITH A STORAGE TANK, TEST THE TANK DRAIN FOR POSITIVE DISINFECTANT. ALLOW THE DISINFECTANT TO BE PUMPED FROM THE STORAGE TANK TO ALL POINTS OF USE.
- 14) WHEN ALL POINTS OF USE AND ALL DIALYSIS MACHINES (OR THE STORAGE TANK DRAIN) INDICATE A POSITIVE DISINFECTANT TEST, TURN OFF ALL MACHINES AND THE R.O. SYSTEM. **DO NOT TURN OFF THE KEY SWITCHES. ALLOW THE DISINFECTANT TO REMAIN IN THE R.O., STORAGE TANK AND R.O. LOOP FOR A MINIMUM OF ONE HOUR.**
- 15) DISCONNECT THE DISINFECT PUMP FROM THE R.O. SYSTEM. RINSE THE PUMP BY INSERTING THE FEED PIPE INTO A 1-GALLON CONTAINER OF TAP WATER, AND THE DISCHARGE HOSE INTO A DRAIN. PLUG THE PUMP INTO A WALL OUTLET AND TURN THE SPEED CONTROL DIAL TO 40. ALLOW THE PUMP TO RUN UNTIL THE 1 GALLON CONTAINER IS EMPTY. **DO NOT ALLOW THE PUMP TO RUN DRY FOR MORE THAN 30 SECONDS.**

RINSE PROCEDURE

THE DISINFECTANT MUST REMAIN IN THE SYSTEM FOR AT LEAST 1 HOUR. EXTENDED CONTACT WILL NOT HARM THE SYSTEM.

- 1) TO RINSE THE DISINFECTANT FROM THE SYSTEM, PRESS THE "POWER ON" SWITCH. THIS WILL ACTIVATE THE 15-MINUTE TIME DELAY AGAIN. WHEN THE 15-MINUTE TIME DELAY HAS ELAPSED, START THE R.O. BY PRESSING THE "LOW PRESSURE" SWITCH. IF YOUR SYSTEM HAS A BLADDER TANK OR R.O. WATER STORAGE TANK, THE SYSTEM WILL START AUTOMATICALLY. IF THE R.O. DOES NOT START, BE SURE THE WATER LEVEL IN THE R.O. WATER TANK IS AT THE RESTART LEVEL OR PRESS THE "UNIT ON" SWITCH TO START THE R.O.
- 2) ONCE THE R.O. SYSTEM IS RUNNING, START ALL THE DIALYSIS MACHINES AND RINSE ALL POINTS OF USE TO DRAIN UNTIL A NEGATIVE DISINFECTANT TEST IS OBTAINED. IF THE R.O. IS USED WITH A STORAGE TANK, ALLOW THE R.O. TO RUN UNTIL THE STORAGE TANK DRAIN TESTS NEGATIVE FOR DISINFECTANT.
- 3) WHEN ALL DISINFECTANT HAS BEEN RINSED FROM THE R.O., ALL POINTS OF USE, AND THE DIALYSIS MACHINES, TURN OFF BOTH KEY SWITCHES. THIS WILL DEACTIVATE THE DISINFECT ALARM MODE.
- 4) WATER CULTURE SAMPLES SHOULD BE TAKEN FROM THE R.O., ALL POINTS OF USE AND ALL DIALYSIS MACHINES (AND STORAGE TANK) TO INSURE PROPER DISINFECTION. **ALL POINTS WHERE WATER CULTURE SAMPLES ARE TAKEN SHOULD BE DISINFECTED TO INSURE THE SAMPLES ARE NOT CONTAMINATED.**