DETERMINING WHEN TO REPLACE CWP MAIN PUMP

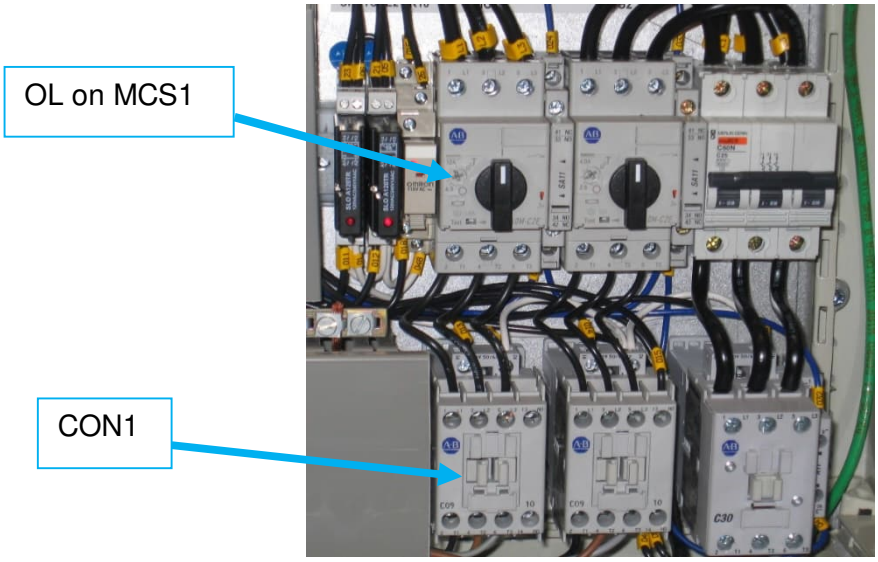
This Tech Note outlines diagnostic steps to determine if the CWP main pump needs to be replaced. Refer to Tech Note 232 (P/N W3T575755) for CWP RO pump replacement part identification. If diagnostics show pump replacement is required, refer to CWP RO pump replacement instructions W3T576168. Any questions can be directed to Technical Support at 1-888-595-0666.

Diagnostic Tools Required

- Multimeter (for AC voltage and resistance measurements)
- Amp clamp

Diagnostic Procedure

1. If motor protector MCS1 is tripping, RO pump replacement may be needed.
   - Verify overload (OL) on MCS1 is set to 115% pump/motor nameplate current rating, or 14 amps.
   - Place amp clamp on each wire at the bottom of contactor CON1 during CWP water system operation. These terminals are marked T1, T2 and T3. Current should not exceed 12.8 amps per phase.



2. Check incoming phase to phase voltage at top of MCS1. The voltage should be 208VAC (+6/-10%) across L1-L2, L2-L3 and L1-L3. Out of tolerance voltage should be corrected by an electrician or utility company.

3. Start CWP water system and verify CON 1 engages (center pulls in) when the CWP water system goes into Operation. Verify phase to phase voltage at the bottom of CON 1. The voltage should be 208VAC (+6/-10%) across T1-T2, T2-T3 and T1-T3. The allowable voltage drop compared to MCS1 (step 2 above) is 2VAC.

4. Check phase to phase resistance (of pump motor windings) at the bottom of CON 1. The resistance of T1-T2, T2-T3 and T1-T3 should be between 1-3 ohms. Values out of this range indicate a damaged motor.

5. With the CWP water system in operation, listen to the pump run. Loud knocking or grinding noises indicate mechanical damage to the pump, shaft, or bearings. This condition may also trip motor protector MCS1.

6. If the CWP water system product water output is unusually low (>10% decline from specified flow rate) despite repeated cleaning, pump replacement may be needed. With the CWP water system in operation, verify the product water flow rates against the values below (at 20°C feed water temperature):
   - CWP 101 13 L/min
   - CWP 102 20 L/min
   - CWP 104 29 L/min
   - CWP 106 35 L/min

   Note: Loss of product output flow may indicate that the RO membranes are fouled, this condition will increase P1 pump pressure from nominal.

   Note: Max product water flow rate should be checked with valve (after endotoxin filter) open to drain.

   Note: Ensure low output is not due to phase reversal of power to pump.

7. If pump pressure is out of specifications, pump replacement may be needed. Mount a 0-25 bar pressure gauge on P1. Place the CWP water system in operation with no patients on the loop. The pump pressure at P1 should be:
   - CWP 101: 15 bar ±1 bar (217.5 PSI ±14.5)
   - CWP 102: 14 bar ±1 bar (203 PSI ±14.5)
   - CWP 104: 12 bar ±1 bar (174 PSI ±14.5)
   - CWP 106: 10 bar ±1 bar (145 PSI ±14.5)

   Note: If P1 pressure is out of range, adjust recirculation (71) needle valve according to the Service Manual to determine if pressure can be restored. Opening valve 71 will lower pump pressure.

8. Place the CWP water system in operation and check product water pressure. Mount a 0-10 bar (0-145psi) pressure gauge on P2; it should be between 40-85 PSI.

9. Improper setting of overflow valves 64 and 52 can also affect product water flow rates. If necessary, adjust overflow valves according to instructions in Service Manual.

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    Note: If performance is not restored following these troubleshooting steps, replacement of the CWP water system main pump is recommended.