IMPORTANT: Fill in Pertinent Information on Page 3 for Future Reference
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IMPORTANT PLEASE READ:

- The information, specifications and illustrations in this manual are based on the latest information available at the time of printing. The manufacturer reserves the right to make changes at any time without notice.
- This manual is intended as a guide for service of the valve only. System installation requires information from a number of suppliers not known at the time of manufacture. This product should be installed by a plumbing professional.
- This unit is designed to be installed on potable water systems only.
- Do not install the unit where temperatures may drop below 32°F (0°C) or above 110°F (43°C).
- Do not strike the valve or any of the components.
- Warranty of this product extends to manufacturing defects. Misapplication of this product may result in failure to properly condition water, or damage to product.
- A prefilter should be used on installations in which free solids are present.
- In some applications local municipalities treat water with Chloramines. High Chloramine levels may damage valve components.
- Correct and constant voltage must be supplied to the control valve to maintain proper function.
Job Specification Sheet

Job Number: __________________
Model Number: __________________
Water Hardness: __________________ ppm or gpg
Capacity Per Unit: ______________
Mineral Tank Size: ___________ Diameter: ___________ Height:
Salt Setting per Regeneration: _____________________________________________

1. **Type of Timer:**
   - A. 7 Day or 12 Day
   - B. Meter Initiated

2. **Downflow:**
   - Upflow
   - Upflow Variable

3. **Meter Size:**
   - A. 3/4” Std Range (125 - 2,100 gallon setting)
   - B. 3/4” Ext Range (625 - 10,625 gallon setting)
   - C. 1” Std Range (310 - 5,270 gallon setting)
   - D. 1” Ext Range (1,150 - 26,350 gallon setting)
   - E. 1-1/2” Std Range (625 - 10,625 gallon setting)
   - F. 1-1/2” Ext Range (3,125 - 53,125 gallon setting)
   - G. 2” Std Range (1,250 - 21,250 gallon setting)
   - H. 2” Ext Range (6,250 - 106,250 gallon setting)
   - I. 3” Std Range (3,750 - 63,750 gallon setting)
   - J. 3” Ext Range (18,750 - 318,750 gallon setting)
   - K. Electronic________ Pulse Count ________ Meter Size

4. **System Type:**
   - A. System #4: 1 Tank, 1 Meter, Immediate, or Delayed Regeneration
   - B. System #4: Time Clock
   - C. System #4: Twin Tank
   - D. System #5: 2-5 Tanks, 2 Meters, Interlock
   - E. System #6: 2-5 Tanks, 1 Meter, Series Regeneration
   - F. System #7: 2-5 Tanks, 1 Meter, Alternating
   - G. System #9: Electronic Only, 2-4 Tanks, Meter per Valve, Alternating
   - H. System #14: Electronic Only, 2-4 Tanks, Meter per Valve. Brings units on and offline based on flow.

5. **Timer Program Settings:**
   - A. Backwash: ________________ Minutes
   - B. Brine and Slow Rinse: ________________ Minutes
   - C. Rapid Rinse: ________________ Minutes
   - D. Brine Tank Refill: ________________ Minutes
   - E. Pause Time: ________________ Minutes
   - F. Second Backwash: ________________ Minutes

6. **Drain Line Flow Control:** ________________ gpm
7. **Brine Line Flow Controller:** ________________ gpm
8. **Injector Size#:** _______________________
9. **Piston Type:**
   - A. Hard Water Bypass
   - B. No Hard Water Bypass
Features of the SXT:
- Power backup that continues to keep time and the passage of days for a minimum of 48 hours in the event of power failure. During a power outage, the control goes into a power-saving mode. It does not monitor water usage during a power failure, but it does store the volume remaining at the time of power failure.
- Settings for both valve (basic system) and control type (method used to trigger a regeneration).
- Day-of-the-Week controls.
- While in service, the display alternates between time of day, volume remaining or days to regeneration, and tank in service (twin tank systems only).
- The Flow Indicator flashes when outlet flow is detected.
- The Service Icon flashes if a regeneration cycle has been queued.
- A Regeneration can be triggered immediately by pressing the Extra Cycle button for five seconds.
- The Parameter Display displays the current Cycle Step (BW, BF, RR, etc) during regeneration, and the data display counts down the time remaining for that cycle step. While the valve is transferring to a new cycle step, the display will flash. The parameter display will identify the destination cycle step (BW, BF, RR, etc) and the data display will read "----". Once the valve reaches the cycle step, the display will stop flashing and the data display will change to the time remaining. During regeneration, the user can force the control to advance to the next cycle step immediately by pressing the extra cycle button.

Setting the Time of Day
1. Press and hold either the Up or Down buttons until the programming icon replaces the service icon and the parameter display reads TD.
2. Adjust the displayed time with the Up and Down buttons.
3. When the desired time is set, press the Extra Cycle button to resume normal operation. The unit will also return to normal operation after 5 seconds if no buttons are pressed.
Queueing a Regeneration
1. Press the Extra Cycle button. The service icon will flash to indicate that a regeneration is queued.
2. To cancel a queued regeneration, press the Extra Cycle button.

Regenerating Immediately
Press and hold the Extra Cycle button for five seconds.
Timer Operation

Meter Immediate Control
A meter immediate control measures water usage and regenerates the system as soon as the calculated system capacity is depleted. The control calculates the system capacity by dividing the unit capacity (typically expressed in grains/unit volume) by the feedwater hardness and subtracting the reserve. Meter Immediate systems generally do not use a reserve volume. However, in twin tank systems with soft-water regeneration, the reserve capacity should be set to the volume of water used during regeneration to prevent hard water break-through. A Meter Immediate control will also start a regeneration cycle at the programmed regeneration time if a number of days equal to the regeneration day override pass before water usage depletes the calculated system capacity.

Meter Delayed Control
A Meter Delayed Control measures water usage and regenerates the system at the programmed regeneration time after the calculated system capacity is depleted. As with Meter Immediate systems, the control calculates the system capacity by dividing the unit capacity by the feedwater hardness and subtracting the reserve. The reserve should be set to insure that the system delivers treated water between the time the system capacity is depleted and the actual regeneration time. A Meter Delayed control will also start a regeneration cycle at the programmed regeneration time if a number of days equal to the regeneration day override pass before water usage depletes the calculated system capacity.

Time Clock Delayed Control
A Time Clock Delayed Control regenerates the system on a timed interval. The control will initiate a regeneration cycle at the programmed regeneration time when the number of days since the last regeneration equals the regeneration day override value.

Day of the Week Control
This control regenerates the system on a weekly schedule. The schedule is defined in Master Programming by setting each day to either “off” or “on.” The control will initiates a regeneration cycle on days that have been set to “on” at the specified regeneration time.

Control Operation During Regeneration
During regeneration, the control displays a special regeneration display. In this display, the control shows the current regeneration step number the valve is advancing to, or has reached, and the time remaining in that step. The step number that displays flashes until the valve completes driving to this regeneration step position. Once all regeneration steps are complete the valve returns to service and resumes normal operation.

Pressing the Extra Cycle button during a regeneration cycle immediately advances the valve to the next cycle step position and resumes normal step timing.

Control Operation During Programming
The control only enters the Program Mode with the valve in service. While in the Program Mode, the control continues to operate normally monitoring water usage and keeping all displays up to date. Control programming is stored in memory permanently, eliminating the need for battery backup power.

Manually Initiating a Regeneration
1. When timer is in service, press the Extra Cycle button for 5 seconds on the main screen.
2. The timer advances to Regeneration Cycle Step #1 (rapid rinse), and begins programmed time count down.
3. Press the Extra Cycle button once to advance valve to Regeneration Cycle Step #2 (backwash).
4. Press the Extra Cycle button once to advance valve to Regeneration Cycle Step #3 (brine draw & slow rinse).
5. Press the Extra Cycle button once to advance valve to Regeneration Cycle Step #4 (brine refill).
6. Press the Extra Cycle button once more to advance the valve back to in service.

NOTE: If the unit is a filter or upflow, the cycle step order may change.
NOTE: A queued regeneration can be initiated by pressing the Extra Cycle button. To clear a queued regeneration, press the Extra Cycle button again to cancel. If regeneration occurs for any reason prior to the delayed regeneration time, the manual regeneration request shall be cleared.
Control Operation During A Power Failure

The SXT includes integral power backup. In the event of power failure, the control shifts into a power-saving mode. The control stops monitoring water usage, and the display and motor shut down, but it continues to keep track of the time and day for a minimum of 48 hours.

The system configuration settings are stored in a non-volatile memory and are stored indefinitely with or without line power. The Time of Day flashes when there has been a power failure. Press any button to stop the Time of Day from flashing.

If power fails while the unit is in regeneration, the control will save the current valve position before it shuts down. When power is restored, the control will resume the regeneration cycle from the point where power failed. Note that if power fails during a regeneration cycle, the valve will remain in its current position until power is restored. The valve system should include all required safety components to prevent overflows resulting from a power failure during regeneration.

The control will not start a new regeneration cycle without line power. If the valve misses a scheduled regeneration due to a power failure, it will queue a regeneration. Once power is restored, the control will initiate a regeneration cycle the next time that the Time of Day equals the programmed regeneration time. Typically, this means that the valve will regenerate one day after it was originally scheduled. If the treated water output is important and power interruptions are expected, the system should be setup with a sufficient reserve capacity to compensate for regeneration delays.
## Master Programming Mode Chart

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Parameter</th>
<th>Option Abbreviation</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF</td>
<td>Display Format</td>
<td>GAL</td>
<td>Gallons</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ltr</td>
<td>Liters</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cu</td>
<td>Cubic Meters</td>
</tr>
<tr>
<td>VT</td>
<td>Valve Type</td>
<td>St1b</td>
<td>Standard Downflow/Upflow Single Backwash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>St2b</td>
<td>Standard Downflow/Upflow Double Backwash</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fltr</td>
<td>Filter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UFBf</td>
<td>Upflow Brine First</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8500</td>
<td>TwinFlo100SXT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Othr</td>
<td>Other</td>
</tr>
<tr>
<td>CT</td>
<td>Control Type</td>
<td>Fd</td>
<td>Meter (Flow) Delayed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fl</td>
<td>Meter (Flow) Immediate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>tc</td>
<td>Time Clock</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dAY</td>
<td>Day of Week</td>
</tr>
<tr>
<td>NT</td>
<td>Number of Tanks</td>
<td>1</td>
<td>Single Tank System</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>Two Tank System</td>
</tr>
<tr>
<td>TS</td>
<td>Tank in Service</td>
<td>U1</td>
<td>Tank 1 in Service</td>
</tr>
<tr>
<td></td>
<td></td>
<td>U2</td>
<td>Tank 2 in Service</td>
</tr>
<tr>
<td>C</td>
<td>Unit Capacity</td>
<td></td>
<td>Unit Capacity (Grains)</td>
</tr>
<tr>
<td>H</td>
<td>Feedwater Hardness</td>
<td></td>
<td>Hardness of Inlet Water</td>
</tr>
<tr>
<td>RS</td>
<td>Reserve Selection</td>
<td>SF</td>
<td>Percentage Safety Factor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>rc</td>
<td>Fixed Reserve Capacity</td>
</tr>
<tr>
<td>SF</td>
<td>Safety Factor</td>
<td></td>
<td>Percentage of the system capacity to be used as a reserve</td>
</tr>
<tr>
<td>RC</td>
<td>Fixed Reserve Capacity</td>
<td></td>
<td>Fixed volume to be used as a reserve</td>
</tr>
<tr>
<td>DO</td>
<td>Day Override</td>
<td></td>
<td>The system's day override setting</td>
</tr>
<tr>
<td>RT</td>
<td>Regen Time</td>
<td></td>
<td>The time of day the system will regenerate</td>
</tr>
<tr>
<td>BW, BD, RR, BF</td>
<td>Regen Cycle Step Times</td>
<td></td>
<td>The time duration for each regeneration step. Adjustable from OFF and 0-199 minutes. <strong>NOTE:</strong> If “Othr” is chosen under “Valve Type”, then R1, R2, R3, etc, will be displayed instead</td>
</tr>
<tr>
<td>D1, D2, D3, D4, D5, D6, &amp; D7</td>
<td>Day of Week Settings</td>
<td></td>
<td>Regeneration setting (On or OFF) for each day of the week on day-of-week systems</td>
</tr>
</tbody>
</table>

**CAUTION:** Before entering Master Programming, please contact your local professional water dealer.
### Master Programming Options

<table>
<thead>
<tr>
<th>CD</th>
<th>Current Day</th>
<th>The Current day of the week</th>
</tr>
</thead>
<tbody>
<tr>
<td>FM</td>
<td>Flow Meter Type</td>
<td></td>
</tr>
<tr>
<td></td>
<td>t0.7</td>
<td>3/4&quot; Turbine Meter</td>
</tr>
<tr>
<td></td>
<td>P0.7</td>
<td>3/4&quot; Paddle Wheel Meter</td>
</tr>
<tr>
<td></td>
<td>t1.0</td>
<td>1&quot; Turbine Meter</td>
</tr>
<tr>
<td></td>
<td>P1.0</td>
<td>1&quot; Paddle Wheel Meter</td>
</tr>
<tr>
<td></td>
<td>t1.5</td>
<td>1.5&quot; Turbine Meter</td>
</tr>
<tr>
<td></td>
<td>P1.5</td>
<td>1.5&quot; Paddle Wheel Meter</td>
</tr>
<tr>
<td></td>
<td>Gen</td>
<td>Generic or Other Meter</td>
</tr>
<tr>
<td>K</td>
<td>Meter Pulse Setting</td>
<td>Meter pulses per gallon for generic/other flow meter</td>
</tr>
</tbody>
</table>

**NOTES:**
Some items may not be shown depending on timer configuration.
The timer will discard any changes and exit Master Programming Mode if any button is not pressed for sixty seconds.

---

**CAUTION:** Before entering Master Programming, please contact your local professional water dealer.
**Master Programming Mode**

When the Master Programming Mode is entered, all available option setting displays may be viewed and set as needed. Depending on current option settings, some parameters cannot be viewed or set.

**Setting the Time of Day**

1. Press and hold either the Up or Down buttons until the programming icon replaces the service icon and the parameter display reads TD.
2. Adjust the displayed time with the Up and Down buttons.
3. When the desired time is set, press the Extra Cycle button to resume normal operation. The unit will also return to normal operation after 5 seconds if no buttons are pressed.

![Time Display](image)

**Entering Master Programming Mode**

Set the Time Of Day display to **12:01 P.M.** Press the Extra Cycle button (to exit Setting Time of Day mode). Then press and hold the Up and Down buttons together until the programming icon replaces the service icon and the Display Format screen appears.

**Exiting Master Programming Mode**

Press the Extra Cycle button to accept the displayed settings and cycle to the next parameter. Press the Extra Cycle button at the last parameter to save all settings and return to normal operation. The control will automatically disregard any programming changes and return to normal operation if it is left in Master Programming mode for 5 minutes without any keypad input.

**Resets:**

**Soft Reset:** Press and hold the Extra Cycle and Down buttons for 25 seconds while in normal Service mode. This resets all parameters to the system default values, except the volume remaining in meter immediate or meter delayed systems and days since regeneration in the time clock system.

**Master Reset:** Hold the Extra Cycle button while powering up the unit. This resets all of the parameters in the unit. Check and verify the choices selected in Master Programming Mode.

**1. Display Format (Display Code DF)**

This is the first screen that appears when entering Master Programming Mode. The Display Format setting specifies the unit of measure that will be used for volume and how the control will display the Time of Day. This option setting is identified by “DF” in the upper left hand corner of the screen. There are three possible settings:

<table>
<thead>
<tr>
<th>Display Format Setting</th>
<th>Unit of Volume</th>
<th>Time Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAL</td>
<td>U.S. Gallons</td>
<td>12-Hour AM/PM</td>
</tr>
<tr>
<td>Ltr</td>
<td>Liters</td>
<td>24-Hour</td>
</tr>
<tr>
<td>Cu</td>
<td>Cubic Meters</td>
<td>24-Hour</td>
</tr>
</tbody>
</table>

![Display Format](image)

**CAUTION:** Before entering Master Programming, please contact your local professional water dealer.
Master Programming Mode

2. Valve Type (Display Code VT)
Press the Extra Cycle button. Use this display to set the Valve Type. The Valve Type setting specifies the type of cycle that the valve follows during regeneration. Note that some valve types require that the valve be built with specific subcomponents. Ensure the valve is configured properly before changing the Valve Type setting. This option setting is identified by “VT” in the upper left hand corner of the screen. There are 5 possible settings:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>St1b</td>
<td>Standard Downflow/Upflow, Single Backwash</td>
</tr>
<tr>
<td>St2b</td>
<td>Standard Downflow/Upflow, Double Backwash</td>
</tr>
<tr>
<td>Fltr</td>
<td>Filter</td>
</tr>
<tr>
<td>UFbF</td>
<td>Upflow Brine First</td>
</tr>
<tr>
<td>8500</td>
<td>TwinFlo 100</td>
</tr>
<tr>
<td>Othr</td>
<td>Other</td>
</tr>
</tbody>
</table>

3. Control Type (Display Code CT)
Press the Extra Cycle button. Use this display to set the Control Type. This specifies how the control determines when to trigger a regeneration. For details on how the various options function, refer to the “Timer Operation” section of this service manual. This option setting is identified by “CT” in the upper left hand corner of the screen. There are four possible settings:

- Meter Delayed: Fd
- Meter Immediate: FI
- Time Clock: tc
- Day of Week: dAY

4. Number of Tanks (Display Code NT)
Press the Extra Cycle button. Use this display to set the Number of Tanks in your system. This option setting is identified by “NT” in the upper left hand corner of the screen. There are two possible settings:

- Single Tank System: 1
- Two-Tank System: 2

CAUTION: Before entering Master Programming, please contact your local professional water dealer.
5. Tank in Service (Display Code TS)
Press the Extra Cycle button. Use this display to set whether tank one or tank two is in service. This option setting is identified by “TS” in the upper left hand corner of the screen. This parameter is only available if the number of tanks has been set to 2. There are two possible settings:

Tank One in Service: U1
Tank Two in Service: U2

6. Unit Capacity (Display Code C)
Press the Extra Cycle button. Use this display to set the Unit Capacity. This setting specifies the treatment capacity of the system media. Enter the capacity of the media bed in grains of hardness when configuring a softener system, and in the desired volume capacity when configuring a filter system. This option setting is identified by “C” in the upper left hand corner of the screen. The Unit Capacity parameter is only available if the control type has been set to one of the metered options. Use the Up and Down buttons to adjust the value as needed.

Range: 1-999,900 grain capacity

7. Feedwater Hardness (Display Code H)
Press the Extra Cycle button. Use this display to set the Feedwater Hardness. Enter the feedwater hardness in grains per unit volume for softener systems, or 1 for filter systems. This option setting is identified by “H” in the upper left hand corner of the screen. The feedwater hardness parameter is only available if the control type has been set to one of the metered options. Use the Up and Down buttons to adjust the value as needed.

Range: 4-199 hardness

CAUTION: Before entering Master Programming, please contact your local professional water dealer.
8. Reserve Selection (Display Code RS)
Press the Extra Cycle button. Use this display to set the Safety Factor. Use this display to select the type of reserve to be used in your system. This setting is identified by "RS" in the upper left-hand corner of the screen. The reserve selection parameter is only available if the control type has been set to one of the metered options. There are two possible settings.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SF</td>
<td>Safety Factor</td>
</tr>
<tr>
<td>rc</td>
<td>Fixed Reserve Capacity</td>
</tr>
</tbody>
</table>

9. Safety Factor (Display Code SF)
Press the Extra Cycle button. Use this display to set the Safety Factor. This setting specifies what percentage of the system capacity will be held as a reserve. Since this value is expressed as a percentage, any change to the unit capacity or feedwater hardness that changes the calculated system capacity will result in a corresponding change to the reserve volume. This option setting is identified by "SF" in the upper left-hand corner of the screen. Use the Up and Down buttons to adjust the value from 0 to 50% as needed.

Range: 0-50%

10. Fixed Reserve Capacity (Display Code RC)
Press the Extra Cycle button. Use this display to set the Reserve Capacity. This setting specifies a fixed volume that will be held as a reserve. The reserve capacity cannot be set to a value greater than one-half of the calculated system capacity. The reserve capacity is a fixed volume and does not change if the unit capacity or feedwater hardness are changed. This option setting is identified by "RC" in the upper left-hand corner of the screen. Use the Up and Down buttons to adjust the value as needed.

Range: 0-half the calculated capacity

CAUTION: Before entering Master Programming, please contact your local professional water dealer.
Master Programming Mode

11. Day Override (Display Code DO)
Press the Extra Cycle button. Use this display to set the Day Override. This setting specifies the maximum number of days between regeneration cycles. If the system is set to a timer-type control, the day override setting determines how often the system will regenerate. A metered system will regenerate regardless of usage if the days since last regeneration cycle equal the day override setting. Setting the day override value to “OFF” disables this function. This option setting is identified by “DO” in the upper left hand corner of the screen. Use the Up and Down buttons to adjust the value as needed.

Range: Off-99 days

12. Regeneration Time
Press the Extra Cycle button. Use this display to set the Regeneration Time. This setting specifies the time of day the control will initiate a delayed, manually queued, or day override triggered regeneration. This option setting is identified by “RT” in the upper left hand corner of the screen. Use the Up and Down buttons to adjust the value as needed.

13. Regeneration Cycle Step Times
Press the Extra Cycle button. Use this display to set the Regeneration Cycle Step Times. The different regeneration cycles are listed in sequence based on the valve type selected for the system, and are identified by an abbreviation in the upper left-hand corner of the screen. The abbreviations used are listed below. If the system has been configured with the “OTHER” valve type, the regeneration cycles will be identified as R1, R2, R3, R4, R5, and R6. Each cycle step time can be set from 0 to 199 minutes, or “OFF.” Setting a cycle step to “OFF” will disable all of the following steps. Setting a cycle step time to 0 will cause the control to skip that step during regeneration, but keeps the following steps available. Use the Up and Down buttons to adjust the value as needed. Press the Extra Cycle button to accept the current setting and move to the next parameter.

<table>
<thead>
<tr>
<th>Cycle Step</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>BD</td>
<td>Brine Draw</td>
</tr>
<tr>
<td>BF</td>
<td>Brine Fill</td>
</tr>
<tr>
<td>BW</td>
<td>Backwash</td>
</tr>
<tr>
<td>RR</td>
<td>Rapid Rinse</td>
</tr>
<tr>
<td>SV</td>
<td>Service</td>
</tr>
</tbody>
</table>

Range: 0-199 minutes

CAUTION: Before entering Master Programming, please contact your local professional water dealer.
14. Day of Week Settings
Press the Extra Cycle button. Use this display to set the regeneration schedule for a system configured as a Day of Week control. The different days of the week are identified as D1, D2, D3, D4, D5, D6, and D7 in the upper left-hand corner of the display. Set the value to “ON” to schedule a regeneration or “OFF” to skip regeneration for each day. Use the Up and Down buttons to adjust the setting as needed. Press the Extra Cycle button to accept the setting and move to the next day. Note that the control requires at least one day to be set to “ON.” If all 7 days are set to “OFF,” the unit will return to Day One until one or more days are set to “ON.”

15. Current Day (Display Code CD)
Press the Extra Cycle button. Use this display to set the current day on systems that have been configured as Day of Week controls. This setting is identified by “CD” in the upper left-hand corner of the screen. Use the Up and Down buttons to select from Day 1 through Day 7.

16. Flow Meter Type (Display Code FM)
Press the Extra Cycle button. Use this display to set the type of flow meter connected to the control. This option setting is identified by “FM” in the upper left-hand corner of the screen. Use the Up and Down buttons to select one of the 7 available settings.

<table>
<thead>
<tr>
<th>FM Code</th>
<th>Meter Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>t0.7</td>
<td>Fleck 3/4&quot; Turbine Meter</td>
</tr>
<tr>
<td>P0.7</td>
<td>Fleck 3/4&quot; Paddle Wheel Meter</td>
</tr>
<tr>
<td>t1.0</td>
<td>Fleck 1&quot; Turbine Meter</td>
</tr>
<tr>
<td>P1.0</td>
<td>Fleck 1&quot; Paddle Wheel Meter</td>
</tr>
<tr>
<td>t1.5</td>
<td>Fleck 1-1/2&quot; Turbine Meter</td>
</tr>
<tr>
<td>P1.5</td>
<td>Fleck 1-1/2&quot; Paddle Wheel Meter</td>
</tr>
<tr>
<td>GEn</td>
<td>Generic/Other Meter</td>
</tr>
</tbody>
</table>

CAUTION: Before entering Master Programming, please contact your local professional water dealer.
17. Meter Pulse Setting (Display Code K)
Press the Extra Cycle button. Use this display to specify the meter pulse setting for a non-standard flow meter. This option setting is identified by "K" in the upper left-hand corner of the screen. Use the Up and Down buttons to enter the meter constant in pulses per unit volume.

18. Press the Extra Cycle button to save all settings and exit Master Programming Mode.
User Programming Mode

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO</td>
<td>Day Override</td>
<td>The timer’s day override setting</td>
</tr>
<tr>
<td>RT</td>
<td>Regeneration Time</td>
<td>The time of day that the system will regenerate (meter delayed, timeclock, and day-of-week systems)</td>
</tr>
<tr>
<td>H</td>
<td>Feed Water Hardness</td>
<td>The hardness of the inlet water - used to calculate system capacity for metered systems</td>
</tr>
<tr>
<td>RC</td>
<td>Reserve Capacity</td>
<td>The fixed reserve capacity</td>
</tr>
<tr>
<td>CD</td>
<td>Current Day</td>
<td>The current day of week</td>
</tr>
</tbody>
</table>

NOTES:
Some items may not be shown depending on timer configuration.
The timer will discard any changes and exit User Mode if any button is not pressed for sixty seconds.

User Programming Mode Steps
1. Press the Up and Down buttons for five seconds while in service, and the time of day is NOT set to 12:01 PM.
2. Use this display to adjust the Day Override. This option setting is identified by “DO” in the upper left hand corner of the screen.

3. Press the Extra Cycle button. Use this display to adjust the Regeneration Time. This option setting is identified by “RT” in the upper left hand corner of the screen.

4. Press the Extra Cycle button. Use this display to adjust the Feed Water Hardness. This option setting is identified by “FH” in the upper left hand corner of the screen.

Range: 4-199 hardness
User Programming Mode

5. Press the Extra Cycle button. Use this display to adjust the Fixed Reserve Capacity. This option setting is identified by “RC” in the upper left-hand corner of the screen.

6. Press the Extra Cycle button. Use this display to set the Current Day of the Week. This option setting is identified by “CD” in the upper left hand corner of the screen.

7. Press the Extra Cycle button to end User Programming Mode.
Diagnostic Programming Mode

Diagnostic Programming Mode Options

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FR</td>
<td>Flow Rate</td>
<td>Displays the current outlet flow rate</td>
</tr>
<tr>
<td>PF</td>
<td>Peak Flow Rate</td>
<td>Displays the highest flow rate measured since the last regeneration</td>
</tr>
<tr>
<td>HR</td>
<td>Hours in Service</td>
<td>Displays the total hours that the unit has been in service</td>
</tr>
<tr>
<td>VU</td>
<td>Volume Used</td>
<td>Displays the total volume of water treated by the unit</td>
</tr>
<tr>
<td>RC</td>
<td>Reserve Capacity</td>
<td>Displays the system's reserve capacity calculated from the system capacity, feedwater hardness, and safety factor</td>
</tr>
<tr>
<td>SV</td>
<td>Software Version</td>
<td>Displays the software version installed on the controller</td>
</tr>
</tbody>
</table>

NOTES:
Some items may not be shown depending on timer configuration.
The timer will exit Diagnostic Mode after 60 seconds if no buttons are pressed.
Press the Extra Cycle button to exit Diagnostic Mode at any time.

Diagnostic Programming Mode Steps
1. Press the Up and Extra Cycle buttons for five seconds while in service.
2. Use this display to view the current Flow Rate. This option setting is identified by “FR” in the upper left hand corner of the screen.

```
FR
2.3
```

3. Press the Up button. Use this display to view the Peak Flow Rate since the last regeneration cycle. This option setting is identified by “PF” in the upper left hand corner of the screen.

```
PF
8.6
```

4. Press the Up button. Use this display to view the Hours in Service since the last regeneration cycle. This option setting is identified by “HR” in the upper left hand corner of the screen.

```
HR
6
```

5. Press the Up button. Use this display to view the Volume Used since the last regeneration cycle. This option setting is identified by “VU” in the upper left hand corner of the screen.

```
VU
25 \times 1000
```
Diagnostic Programming Mode

6. Press the Up button. Use this display to view the Reserve Capacity. This option setting is identified by “RC” in the upper left hand corner of the screen.

![Reserve Capacity Display]

7. Press the Up button. Use this display to view the Software Version. This option setting is identified by “SV” in the upper left hand corner of the screen.

![Software Version Display]

8. Press the Extra Cycle button to end Diagnostic Programming Mode.
## 2510 / 2750 / 2850s Timer Assembly

### Item No. | Quantity | Part No. | Description
--- | --- | --- | ---
1 | 1 | 13881 | Bracket, Hinge Timer
3 | 1 | 14265 | Clip, Spring
4 | 1 | 27172 | Stand-off, Timer, 2510SXT, 2750SXT
5 | 1 | 21363 | Screw, Hex HD, M4 x 12 MM
7 | 1 | 27168 | Bracket, Timer, 2510SE/2750SXT
8 | 3 | 13296 | Screw, Hex Washer, 6-20 x 1/2
9 | 1 | 42778 | Timer, SXT, 2510/2750, DF
9A | 1 | 19889 | Housing, Circuit Board
9B | 1 | 42196 | Circuit Board, SXT
9C | 1 | 42635-01 | Cover, Front, SXT, Square
9D | 1 | 42637 | Label, Display, SXT
9E | 1 | 42864 | Wire Harness, SXT

For Assembly Numbers, See the Back of this Manual
### 9000/9100/9500 Twin Tank Timer Assembly

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Quantity</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>13881</td>
<td>Bracket, Hinge Timer</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>11384</td>
<td>Screw, Phillips, 6-32 X 1/4</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>42732</td>
<td>Bracket, Timer, 9000SXT</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>13296</td>
<td>Screw, Hex Washer Hd, 6-20 X 1/2</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>14265</td>
<td>Clip, Spring</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>42733</td>
<td>Stand-off, Timer, 9000SXT</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>42777</td>
<td>Timer, SXT, D/F, 9000/9100/9500</td>
</tr>
<tr>
<td>7A</td>
<td>1</td>
<td>19889</td>
<td>Housing, Circuit Board</td>
</tr>
<tr>
<td>7B</td>
<td>1</td>
<td>42196</td>
<td>Circuit Board, SXT</td>
</tr>
<tr>
<td>7C</td>
<td>1</td>
<td>42635-01</td>
<td>Cover, Front, SXT, Square</td>
</tr>
<tr>
<td>7D</td>
<td>1</td>
<td>42637</td>
<td>Label, Display, SXT</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>19474-01</td>
<td>Harness, SXT</td>
</tr>
</tbody>
</table>

For Assembly Numbers, See the Back of this Manual
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Quantity</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>19791-01</td>
<td>Meter Cable Assy, Turbine/SXT</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>19569</td>
<td>Clip, Flow Meter</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>13314</td>
<td>Screw, Slot Ind Hex, 8-18 x .60</td>
</tr>
</tbody>
</table>

For Assembly Numbers, See the Back of this Manual
## Meter Assembly

**Item No.** | **Quantity** | **Part No.** | **Description**  
---|---|---|---  
1 | 1 | 13874 | Body, Meter, 5600  
2 | 1 | 14715 | Gear Assy, Electronic Meter Cap  
3 | 1 | 41055 | Plate, Intermediate  
4 | 1 | 13847 | O-ring, -137, Std, Meter  
5 | 5 | 17798 | Screw, Slot Hex Washer Head  
6 | 1 | 13821 | Body, Meter, 5600  
7 | 1 | 13509 | Impeller, Meter  
8 | 4 | 12473 | Screw, Hex Wsh, 10-24 x 5/8  
9 | 4 | 13255 | Clip, Mounting  
10 | 1 | 13314 | Screw, Slot Ind Hex, 8-18 x .60  
11 | 1 | 13305 | O-ring, -119  
12 | 1 | 14613 | Flow Straightener

For Assembly Numbers, See the Back of this Manual
### 3/4" Brass Paddle Meter Assembly

**Item No.** | **Quantity** | **Part No.** | **Description**
---|---|---|---
1 | 1 | 11206 | Gasket, Fitting
2 | 1 | 13942 | Retainer, Nut
3 | 1 | 11207 | Nut, Special, Quick Connect
4 | 1 | 13906 | Body, Meter, 3/4"
5 | 1 | 13509 | Impeller, Meter
   |  | 13509-01 | Impeller, Celcon
6 | 1 | 13847 | O-ring, -137 Std/560CD, Meter
7 | 1 | 14716 | Meter Cap Assy, ET/NT
8 | 1 | 12473 | Screw, Hex Wsh, 10-24 x 5/8
**Not Shown** | | 19121-08 | Meter Cable Assy, NT, 35" w/Connector
| | 19121-09 | Meter Cable Assy, NT, 99.5" w/Connector
| | 19121-10 | Meter Cable Assy, NT, 303.5" w/Connector

For Assembly Numbers, See the Back of this Manual
1" Brass Paddle Meter Assembly

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Quantity</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>14959</td>
<td>Body, Meter, 2750</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>13882</td>
<td>Post, Meter Impeller</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>13509</td>
<td>Impeller, Meter</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>13847</td>
<td>O-ring, -137, Std/560CD, Meter</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>14716</td>
<td>Meter Cap Assy, ET/NT</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>12112</td>
<td>Screw, Hex Hd Mach, 10-24 x 1/2</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>14960</td>
<td>Flow Straightener, 1&quot;</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>13287</td>
<td>O-ring, -123</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>14961</td>
<td>Fitting, 1&quot; Quick Connect</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>14962</td>
<td>Nut, 1&quot; Meter, Quick Connect</td>
</tr>
</tbody>
</table>

For Assembly Numbers, See the Back of this Manual
### Inline Plastic Turbine Meter Assembly

**Item No.** | **Quantity** | **Part No.** | **Description**
--- | --- | --- | ---
1 | 1 | 17542 | Flow Straightener
2 | 2 | 40576 | Clip, H, Plastic, 7000
3 | 1 | 40577 | Turbine Meter Assy, 7000
4 | 1 | 41555 | Body, Remote Meter
5 | 2 | 40951 | O-ring, -220
6 | 2 | 40563 | Connector, 1” NPT, 7000
7 | 2 | 40563-10 | Connector, 1” BSP, 7000
8 | 2 | 40565 | Connector, 1-1/4” NPT, 7000
9 | 2 | 40565-10 | Connector, 1-1/4” BSP, 7000
10 | 2 | 41242 | Connector, 1” & 1-1/4” Sweat
11 | 2 | 41243 | Connector, 1-1/4 & 1-1/2” Sweat
12 | 2 | 41596 | Connector, Brass, 1” NPT
13 | 2 | 41596-10 | Connector, Brass, 1” BSP
14 | 2 | 41597 | Connector, Brass, 1-1/2” NPT
15 | 2 | 41597-10 | Connector, Brass, 1-1/2” BSP

For Assembly Numbers, See the Back of this Manual
### 1-1/2" Brass Paddle Meter Assembly

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Quantity</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>17569</td>
<td>Body, Meter, 2850/9500</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>13882</td>
<td>Post, Meter Impeller</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>13509</td>
<td>Impeller, Meter</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>13847</td>
<td>O-ring, -137, Std/560CD, Meter</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>14716</td>
<td>Meter Cap Assy, NT</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>12112</td>
<td>Screw, Hex Hd Mach, 10-24 x 1/2</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>17542</td>
<td>Flow Straightener, 1-1/2&quot;</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>12733</td>
<td>O-ring, -132</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>17544</td>
<td>Fitting, 1-1/2&quot; Quick Connect</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>17543</td>
<td>Nut, 1-1/2&quot;, Quick Connect</td>
</tr>
</tbody>
</table>

For Assembly Numbers, See the Back of this Manual
### 3/4", 1" or 1-1/2" Paddle Wheel Meter Cap Assembly

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Quantity</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>14716</td>
<td>Meter Cap Assy, NT</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>19121-01</td>
<td>Meter Cable Assy, SXT, Paddle 6700XTR</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>13847</td>
<td>O-ring, -137, Std/560CD, Meter</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>17798</td>
<td>Screw, Slot Hex Wsh Hd</td>
</tr>
</tbody>
</table>

For Assembly Numbers, See the Back of this Manual
CB1 - SXT TIMER
T1 - 24VAC TRANSFORMER
K1 - 24VAC VALVE DRIVE RELAY
TM - 3/4" TURBINE FLOW METER (OPTIONAL)
VDM - VALVE DRIVE MOTOR
SW1 - VALVE HOMING SWITCH
SW2 - VALVE STEP SWITCH
HCAM - VALVE HOMING CAM
SCAM - VALVE STEP CAM

NOTE:
1. DEPENDING ON APPLICATION, VALVE STEP CAM APPEARANCE WILL VARY.
2. REGARDLESS OF CAM TYPE USED, WIRING TO SWITCHES SW1 AND SW2 WILL REMAIN AS SHOWN.
3. VALVE SHOWN IN SERVICE POSITION.
CB1 - SXT TIMER
T1 - 24V AC TRANSFORMER
PWM - 1.0" OR 1.5" PADDLE WHEEL FLOW METER (OPTIONAL)
VDM - VALVE DRIVE MOTOR
SW1 - VALVE HOMING SWITCH
SW2 - VALVE STEP SWITCH
HCAM - VALVE HOMING CAM
SCAM - VALVE STEP CAM

NOTE:
1. DEPENDING ON APPLICATION, VALVE STEP CAM APPEARANCE WILL VARY.
2. REGARDLESS OF CAM TYPE USED, WIRING TO SWITCHES SW1 AND SW2 WILL REMAIN AS SHOWN.
3. VALVE SHOWN IN SERVICE POSITION.
## Troubleshooting

### Error Codes

**Note:** Error codes appear on the In Service display.

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Error Type</th>
<th>Cause</th>
<th>Reset and Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Cam Sense Error</td>
<td>The valve drive took longer than 6 minutes to advance to the next regeneration position.</td>
<td>Unplug the unit and examine the powerhead. Verify that all cam switches are connected to the circuit board and functioning properly. Verify that the motor and drive train components are in good condition and assembled properly. Check the valve and verify that the piston travels freely. Replace/reassemble the various components as necessary. Plug the unit back in and observe its behavior. The unit should cycle to the next valve position and stop. If the error re-occurs, unplug the unit and contact technical support.</td>
</tr>
<tr>
<td>1</td>
<td>Cycle Step Error</td>
<td>The control experienced an unexpected cycle input</td>
<td>Unplug the unit and examine the powerhead. Verify that all cam switches are connected to the circuit board and functioning properly. Enter Master Programming mode and verify that the valve type and system type are set correctly with regard to the unit itself. Step the unit through a manual regeneration and verify that it functions correctly. If the error re-occurs unplug the unit and contact technical support.</td>
</tr>
<tr>
<td>2</td>
<td>Regen Failure</td>
<td>The system has not regenerated for more than 99 days (or 7 days if the Control Type has been set to Day-of-Week).</td>
<td>Perform a Manual Regeneration to reset the error code. If the system is metered, verify that it is measuring flow by running service water and watching for the flow indicator on the display. If the unit does not measure flow, verify that the meter cable is connected properly and that the meter is functioning properly. Enter Master Programming mode and verify that the unit is configured properly. As appropriate for the valve configuration, check that the correct system capacity has been selected, that the day override is set properly, and that the meter is identified correctly. If the unit is configured as a Day-of-Week system, verify that at least one day is set ON. Correct the settings as necessary.</td>
</tr>
<tr>
<td>3</td>
<td>Memory Error</td>
<td>Control board memory failure.</td>
<td>Perform a Master Reset and reconfigure the system via Master Programming mode. After reconfiguring the system, set the valve through a manual regeneration. If the error re-occurs, unplug the unit and contact technical support.</td>
</tr>
</tbody>
</table>
# Service Assemblies

**Meter:**

- 60086-50 ........ Meter Assy, 3/4", Electronic 2510/6600/6700
- 60613 .......... Meter Assy, 2750 Electronic 1"
- 60613-20 ...... Meter Assy, 2750, Electronic 1" BSP/Metric
- 60613NP ...... Meter Assy, 2750, Electronic 1" Nickel Plated
- 60614 .......... Meter Assy, 2850/9500, Electronic 1-1/2" Meter
- 60614NP ...... Meter Assy, 2850/9500, Electronic 1-1/2" Meter, NP
- 60618 .......... Meter Assy, Electronic, 3/4"
- 60619-20 ...... Meter Assy, 1-1/2" Electronic BSP/Metric
- 60626 .......... Meter Assy, Turbine, Electronic 3/4" with Clips and Screws
- 60626-01 ...... Meter Assy, Turbine, 3/4" w/Clips, Screws, Mtr/Cable
- 61560-01 ...... Meter Assy, In-Line, w/1" NPT Plastic Connector
- 61560-02 ...... Meter Assy, In-Line, w/1" BSP Plastic Connector
- 61560-07 ...... Meter Assy, In-Line, w/1" NPT Brass Connector
- 61560-08 ...... Meter Assy, In-Line, w/1" BSP Brass Connector
- 61560-05 ...... Meter Assy, In-Line, w/1" I.D. & 1-1/4" O.D. Sweat Connector
- 61560-09 ...... Meter Assy, In-Line, w/1-1/2" NPT Brass Connector
- 61560-10 ...... Meter Assy, In-Line, w/1-1/2" BSP Brass Connector