

# 2510 AIO Supplemental Insert

## Overview:

The AIO valve is designed for use when water containing contaminants subjected to oxidation is encountered. The water passes through the AIO valve then passes through the tank containing oxygen enriched filter media. The oxygen reduces all contaminants in the water to an oxide, or in the case of hydrogen sulfide gas, it is reduced to a molecule of acid.

## Regeneration as follows:

Backwash (BW): Cycle Step #1	The backwash cycle washes oxidized contaminants to drain and reclassifies the media bed.
Air Draw (BD): Cycle Step #2	Air Draw empties water from tank and replenishes oxygen to filter media.
Rapid Rinse (RR): Cycle Step #3	Rapid Rinse purges excess atmosphere from the media tank and distributor.

**NOTE: Due to the oxygen in the media tank, maximum 80 PSI for operation.**

## SXT Programming: 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. **See also SXT Timer Supplemental Service Manual**

Programming Abbreviation	Programming Definition	* Option Abbreviation	Option Definition
DF	Display Format	GAL	Gallons – 12 hour time
VT	Valve Type	DF 1b	Downflow Single Backwash
CT	Control Type	tc	Time Clock – Regenerates based on days
NT	Number of Tanks	1	Single Tank
DO	Day Override	3	Days Between Regeneration – In conditions of high water usage and/or high levels of contaminants, the AIO may need to regenerate more frequently than once every three days. DO NOT set the regeneration day override for a longer period than three days, as the filter media can become fouled with contaminants, rendering the AIO ineffective.
RT	Regeneration Time	12:00 AM	Regeneration Time – If there is a need to change the factory default, then make sure the time of regeneration is not the same with any other water treatment equipment in the system.
BW	Backwash	14	See AIO Overview Above
BD	Air Draw	40	See AIO Overview Above
RR	Rapid Rinse	1	See AIO Overview Above
BF	Brine Fill	Off	Not Applicable

### \* Factory Defaults

Reference SXT service manual for programming information.

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# SXT Timer

## *Supplemental Service Manual*

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**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.
- This product must be installed in compliance with all state and municipal plumbing and electrical codes. Permits may be required at the time of installation.
- If daytime operating pressure exceeds 80 psi (5.5 bar), nighttime pressures may exceed pressure limits. A pressure reducing valve must be installed.
- Do not install the unit where temperatures may drop below 32°F (0°C) or above 110°F (43°C).
- Do not place the unit in direct sunlight. Black units will absorb radiant heat increasing internal temperatures.
- 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.

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# Job Specification Sheet

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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#: \_\_\_\_\_**

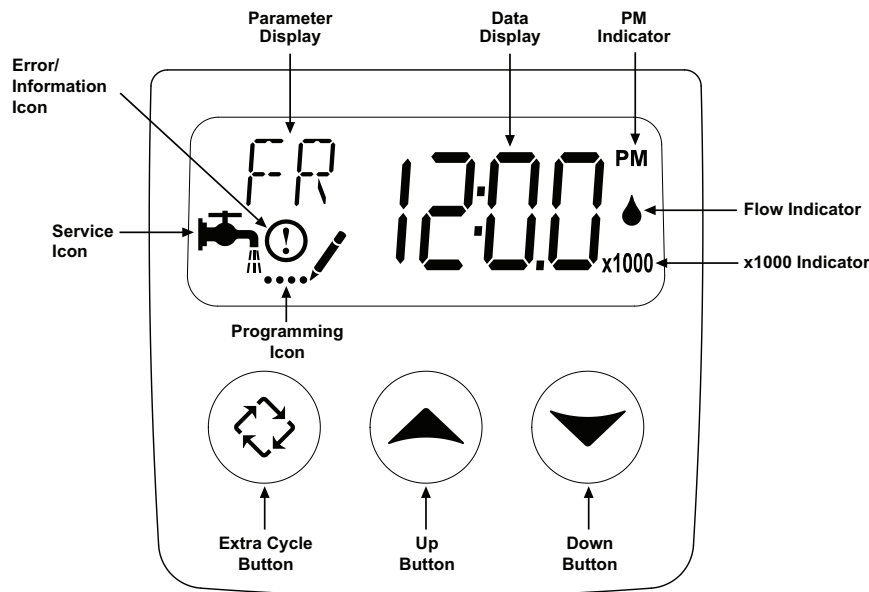
**9. Piston Type:**

- A. Hard Water Bypass
- B. No Hard Water Bypass

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# Timer Features

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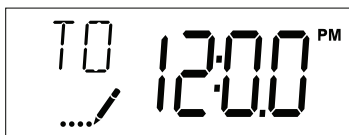


## Features of the SXT:

- 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.

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# Timer Operation

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## 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 initiate 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

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

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

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## **Master Programming Mode Chart**

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<b>Master Programming Options</b>			
CD	Current Day		The Current day of the week
FM	Flow Meter Type	t0.7	3/4" Turbine Meter
		P0.7	3/4" Paddle Wheel Meter
		t1.0	1" Turbine Meter
		P1.0	1" Paddle Wheel Meter
		t1.5	1.5" Turbine Meter
		P1.5	1.5" Paddle Wheel Meter
		Gen	Generic or Other Meter
K	Meter Pulse Setting		Meter pulses per gallon for generic/other flow meter

**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.

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

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# Master Programming Mode

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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.



## 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:

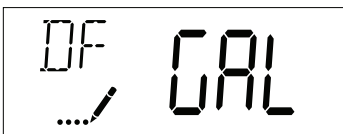
**Soft Reset:** Press and hold the Extra Cycle and Down buttons for 25 seconds while in normal Service mode. This resets all parameters to the system default values, except the volume remaining in meter immediate or meter delayed systems and days since regeneration in the time clock system.

**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:

Display Format Setting	Unit of Volume	Time Display
GAL	U.S. Gallons	12-Hour AM/PM
Ltr	Liters	24-Hour
Cu	Cubic Meters	24-Hour



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

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# Master Programming Mode

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## 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:

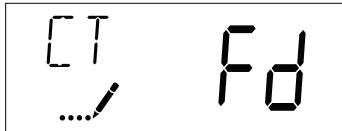
Abbreviation	Parameter
St1b	Standard Downflow/Upflow, Single Backwash
St2b	Standard Downflow/Upflow, Double Backwash
Fltr	Filter
UFbF	Upflow Brine First
8500	TwinFlo 100
Othr	Other



## 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:

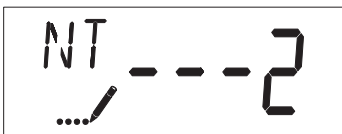
Meter Delayed: Fd  
Meter Immediate: FI  
Time Clock: tc  
Day of Week: dAY



## 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.**

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## Master Programming Mode

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### 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:

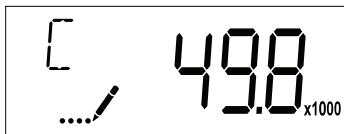
Tank One in Service: U1

Tank Two in Service: U2



### 6. Unit Capacity (Display Code C)

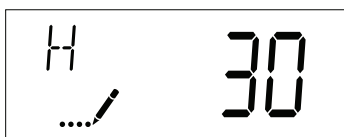
Press the Extra Cycle button. Use this display to set the Unit Capacity. This setting specifies the treatment capacity of the system media. Enter the capacity of the media bed in grains of hardness when configuring a softener system, and in the desired volume capacity when configuring a filter system. 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

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## Master Programming Mode

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### 8. Reserve Selection (Display Code RS)

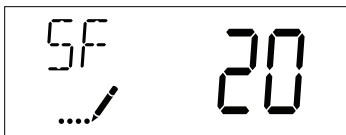
Press the Extra Cycle button. Use this display to set the Safety Factor. Use this display to select the type of reserve to be used in your system. This setting is identified by "RS" in the upper left-hand corner of the screen. The reserve selection parameter is only available if the control type has been set to one of the metered options. There are two possible settings.

FS	Safety Factor
rc	Fixed Reserve Capacity



### 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

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

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# Master Programming Mode

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## 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

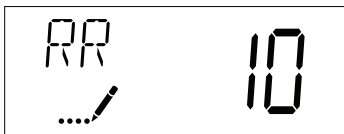
Press the Extra Cycle button. Use this display to set the Regeneration Time. This setting specifies the time of day the control will initiate a delayed, manually queued, or day override triggered regeneration. This option setting is identified by "RT" in the upper left hand corner of the screen. Use 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.

Cycle Step	Abbreviation
BD	Brine Draw
BF	Brine Fill
BW	Backwash
RR	Rapid Rinse
SV	Service



Range: 0-199 minutes

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

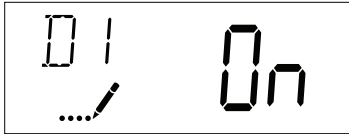
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# Master Programming Mode

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## 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)

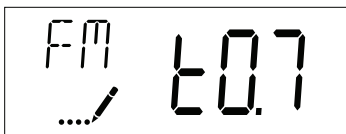
Press the Extra Cycle button. Use this display to set the current day on systems that have been configured as Day of Week controls. This setting is identified by "CD" in the upper left-hand corner of the screen. Use the Up and Down buttons to select from Day 1 through Day 7.



## 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.

t0.7	Fleck 3/4" Turbine Meter
P0.7	Fleck 3/4" Paddle Wheel Meter
t1.0	Fleck 1" Turbine Meter
P1.0	Fleck 1" Paddle Wheel Meter
t1.5	Fleck 1 1/2" Turbine Meter
P1.5	Fleck 1 1/2" Paddle Wheel Meter
GEn	Generic/Other Meter



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



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## Master Programming Mode

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### 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.

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# User Programming Mode

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User Programming Mode Options		
Abbreviation	Parameter	Description
DO	Day Override	The timer's day override setting
RT	Regeneration Time	The time of day that the system will regenerate (meter delayed, timeclock, and day-of-week systems)
H	Feed Water Hardness	The hardness of the inlet water - used to calculate system capacity for metered systems
RC	Reserve Capacity	The fixed reserve capacity
CD	Current Day	The current day of week

## NOTES:

Some items may not be shown depending on timer configuration.

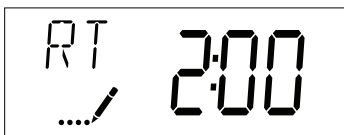
The timer will discard any changes and exit User Mode if any button is not pressed for sixty seconds.

## User Programming Mode Steps

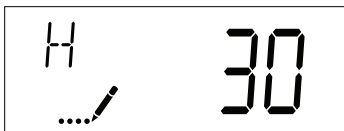
1. Press the Up and Down buttons for five seconds while in service, and the time of day is NOT set to 12:01 PM.
2. Use this display to adjust the Day Override. This option setting is identified by "DO" in the upper left hand corner of the screen.



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.



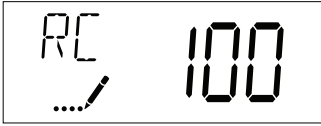
Range: 4-199 hardness

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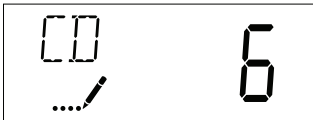
## User Programming Mode

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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.

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# Diagnostic Programming Mode

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

## NOTES:

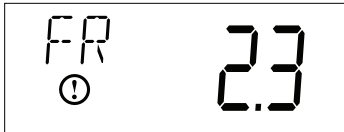
Some items may not be shown depending on timer configuration.

The timer will exit Diagnostic Mode after 60 seconds if no buttons are pressed.

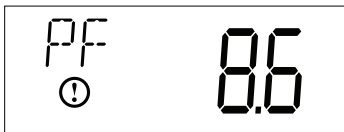
Press the Extra Cycle button to exit Diagnostic Mode at any time.

## Diagnostic Programming Mode Steps

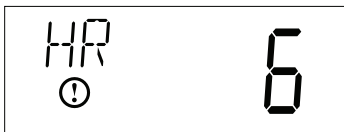
1. Press the Up and Extra Cycle buttons for five seconds while in service.
2. Use this display to view the current Flow Rate. This option setting is identified by "FR" in the upper left hand corner of the screen.



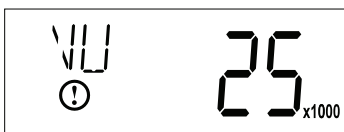
3. Press the Up button. Use this display to view the Peak Flow Rate since the last regeneration cycle. This option setting is identified by "PF" in the upper left hand corner of the screen.



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.



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.



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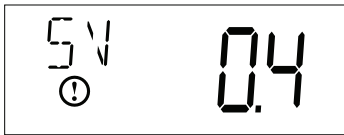
## Diagnostic Programming Mode

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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.

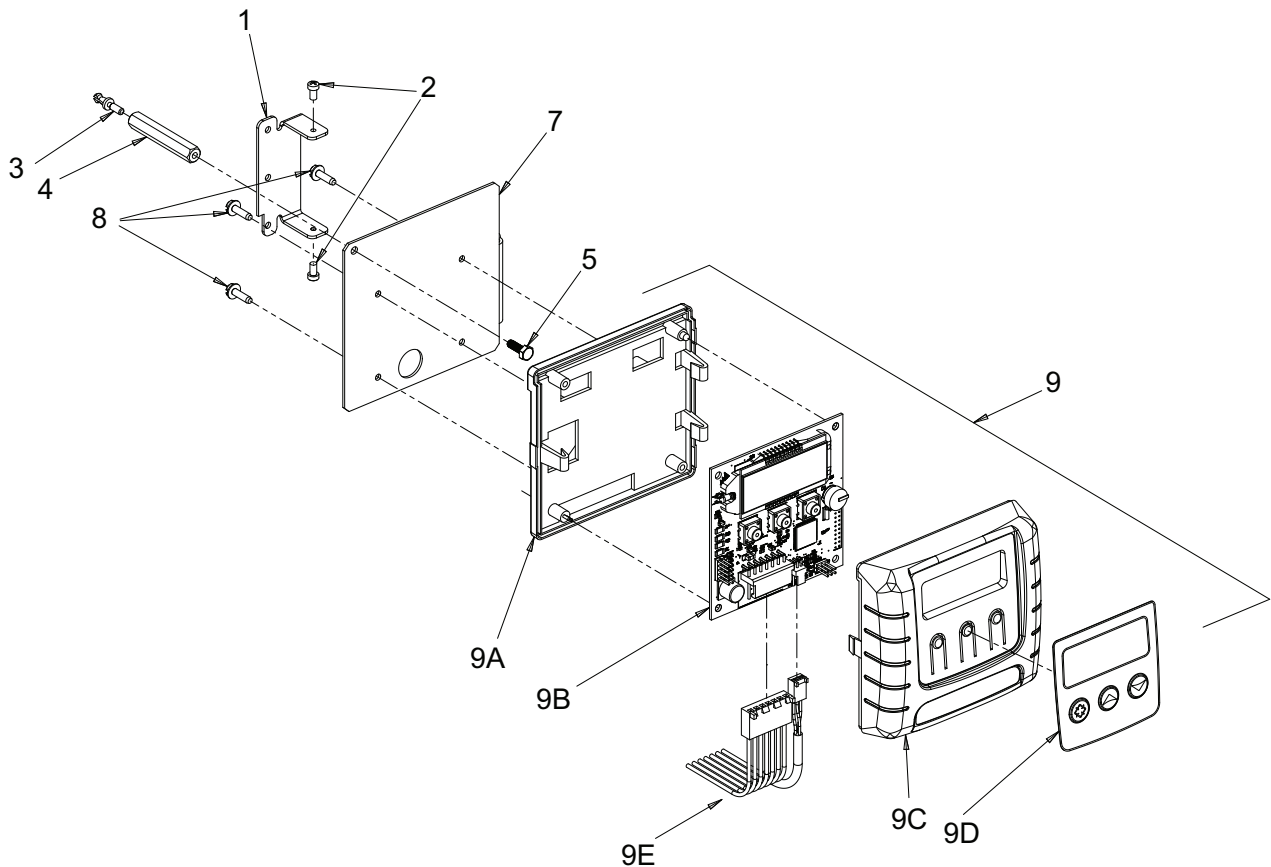


7. Press the Up button. Use this display to view the Software Version. This option setting is identified by “SV” in the upper left hand corner of the screen.



8. Press the Extra Cycle button to end Diagnostic Programming Mode.

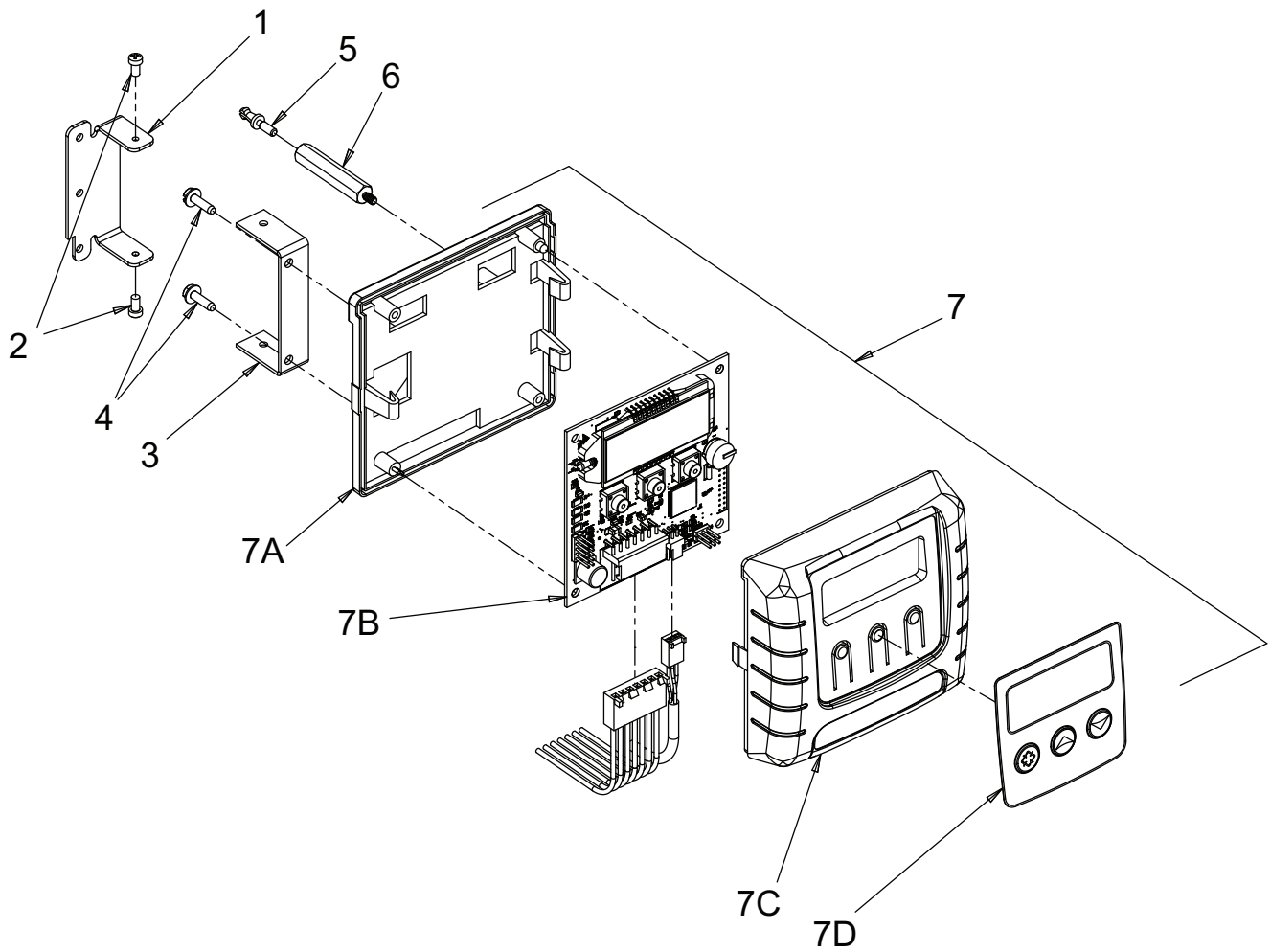
# 2510 / 2750 / 2850s Timer Assembly



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



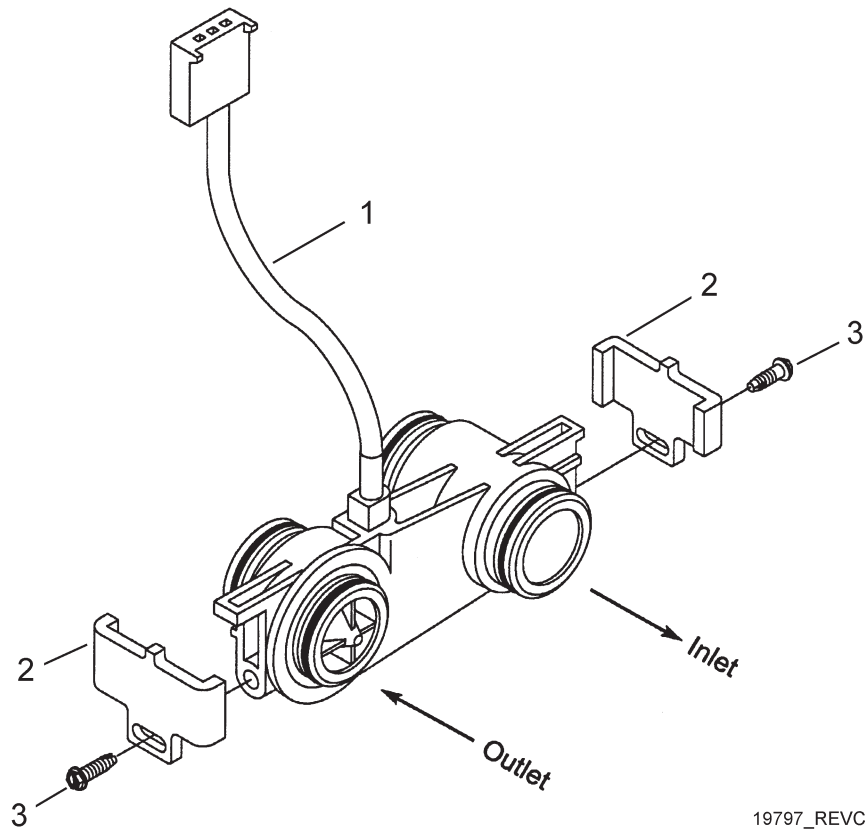
Item No.	Quantity	Part No.	Description
1.....	1.....	13881.....	Bracket, Hinge Timer
2.....	2.....	11384.....	Screw, Phillips, 6-32 X 1/4
3.....	1.....	42732.....	Bracket, Timer, 9000SXT
4.....	2.....	13296.....	Screw, Hex Washer Hd, 6-20 X 1/2
5.....	1.....	14265.....	Clip, Spring
6.....	1.....	42733.....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

For Assembly Numbers, See the Back of this Manual

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## 3/4" Plastic Turbine Meter Assembly

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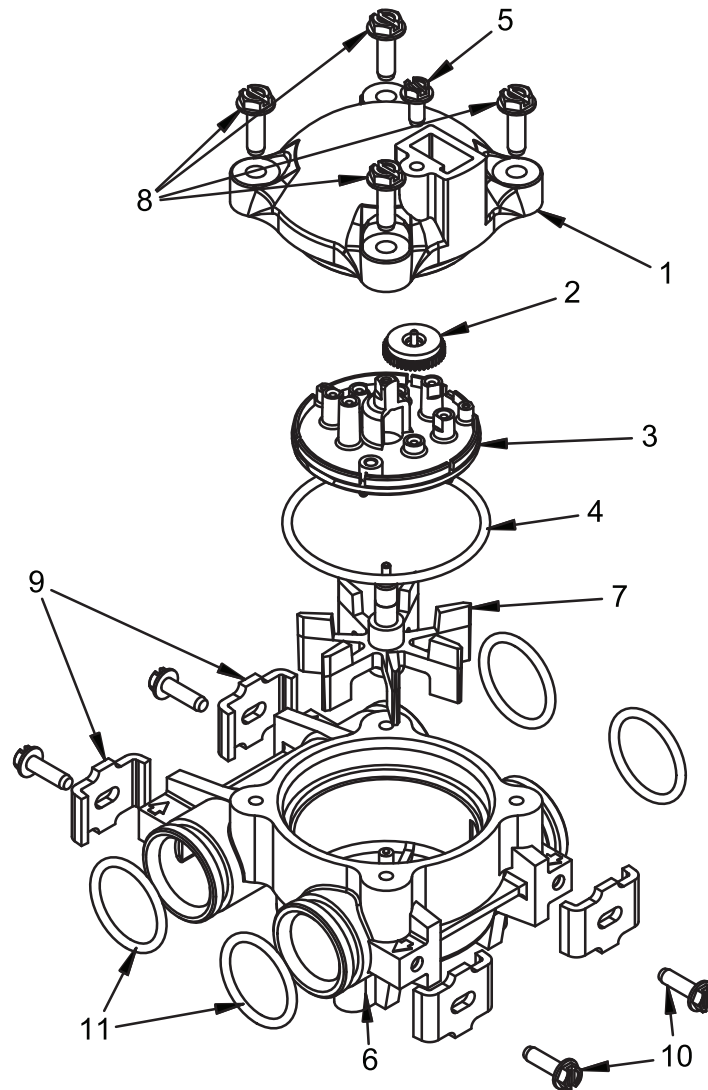
19797\_REVC

Item No.	Quantity	Part No.	Description
1.....	1.....	19791-01.....	Meter Cable Assy, Turbine/SXT
2.....	2.....	19569.....	Clip, Flow Meter
3.....	2.....	13314.....	Screw, Slot Ind Hex, 8-18 x .60

For Assembly Numbers, See the Back of this Manual



# Meter Assembly

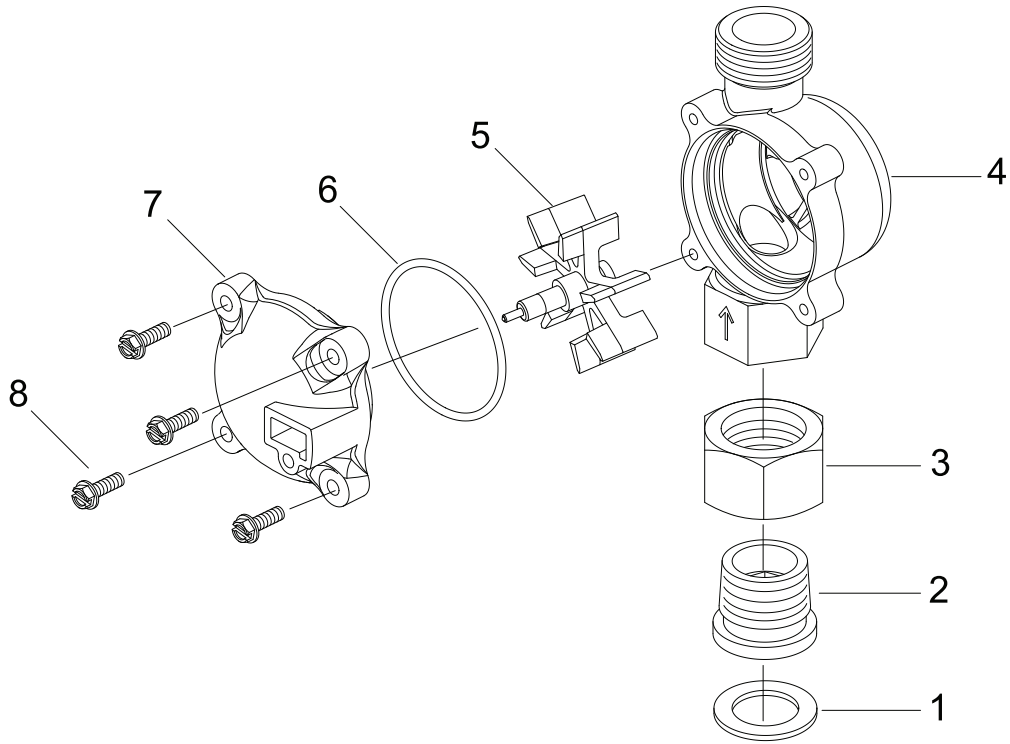


60086\_REVD\_60086-50

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

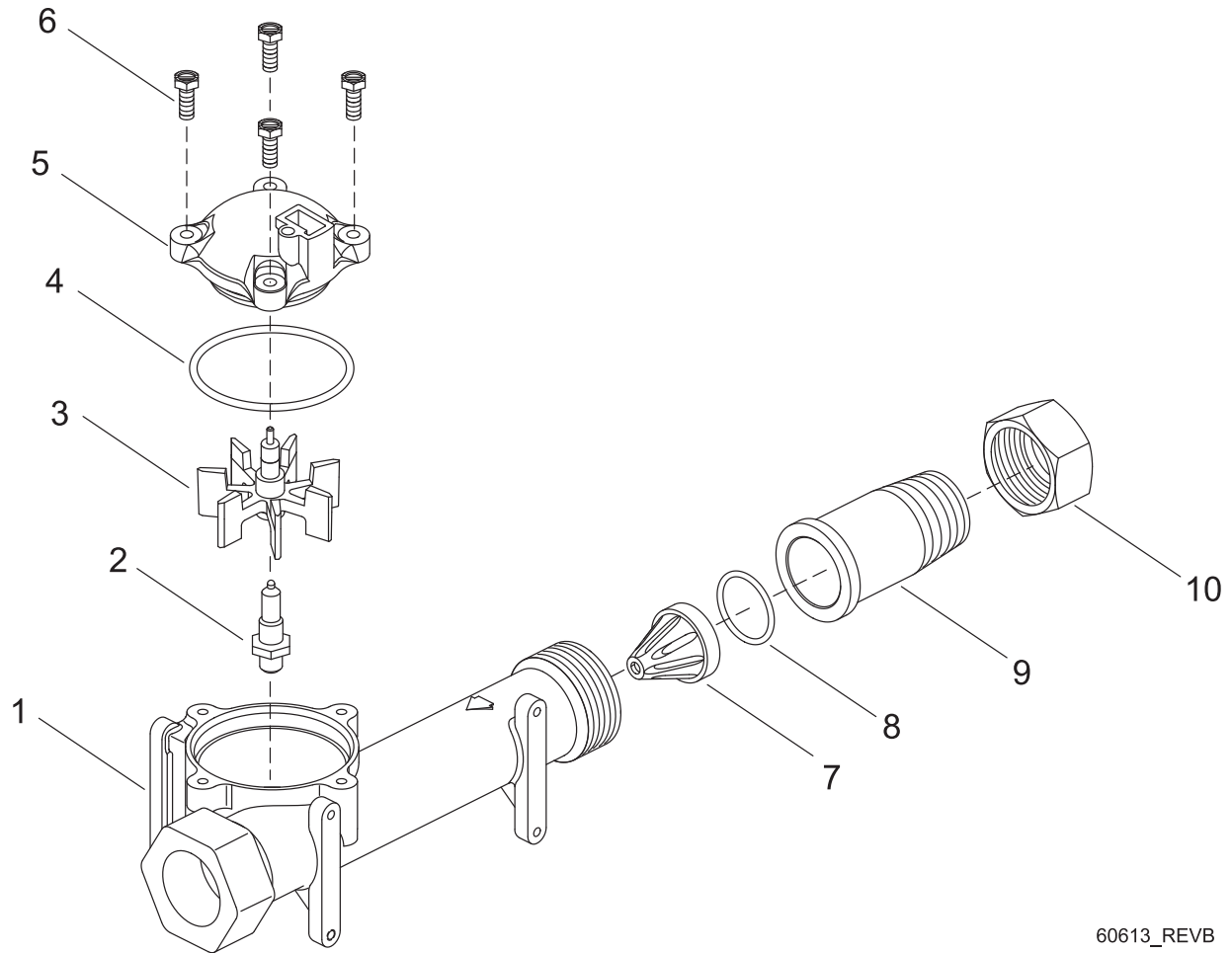


60618\_REVA

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

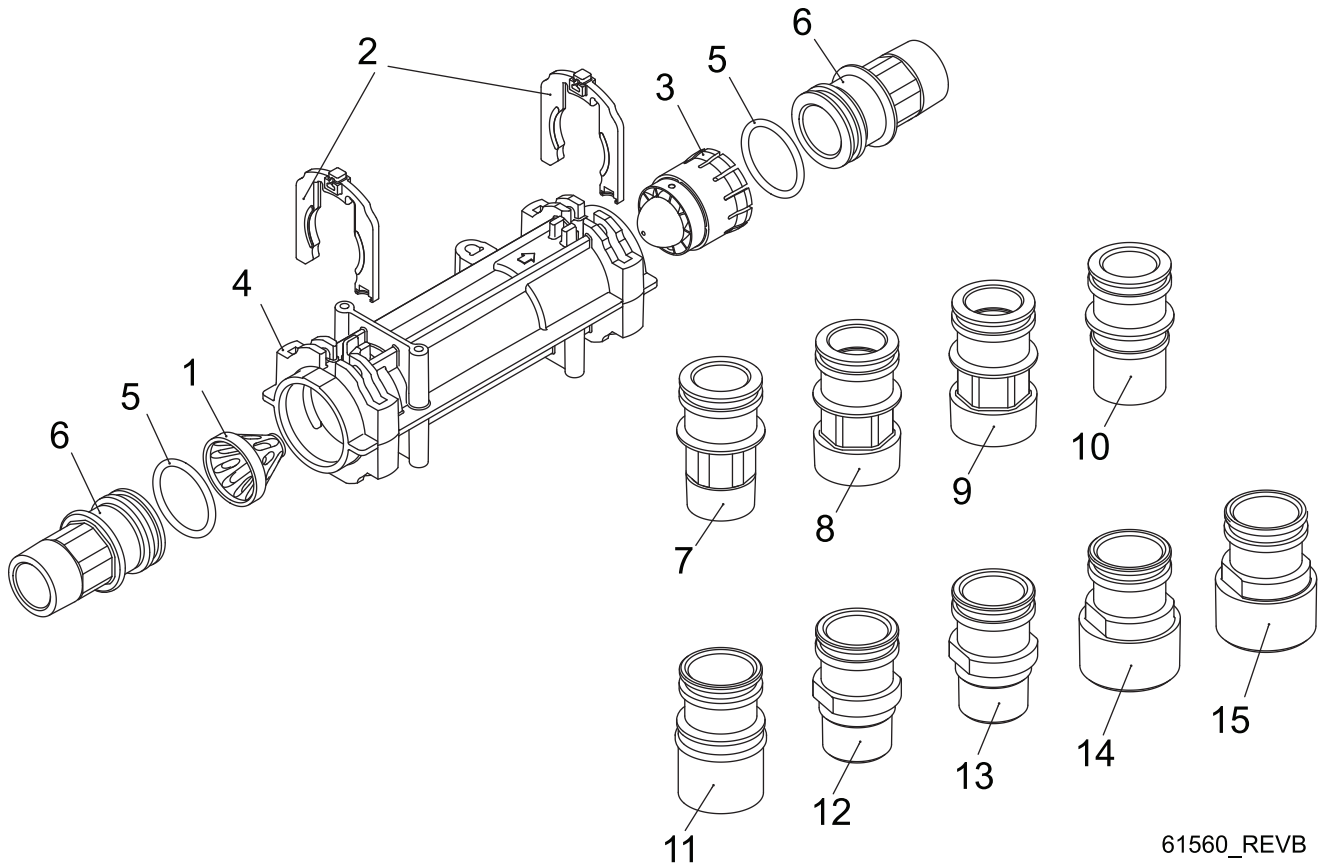


60613\_REVB

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

For Assembly Numbers, See the Back of this Manual

# Inline Plastic Turbine Meter Assembly

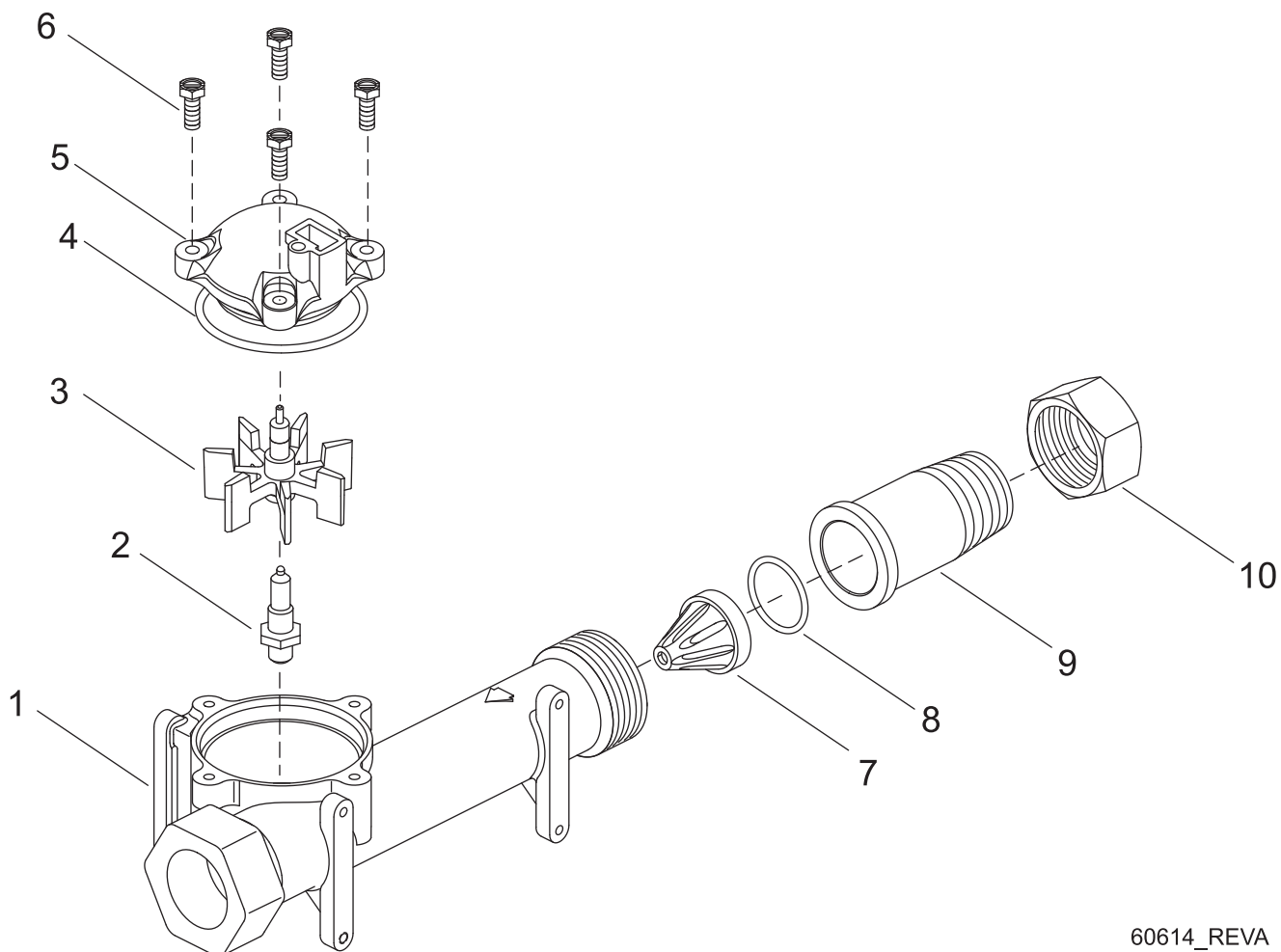


61560\_REVB

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

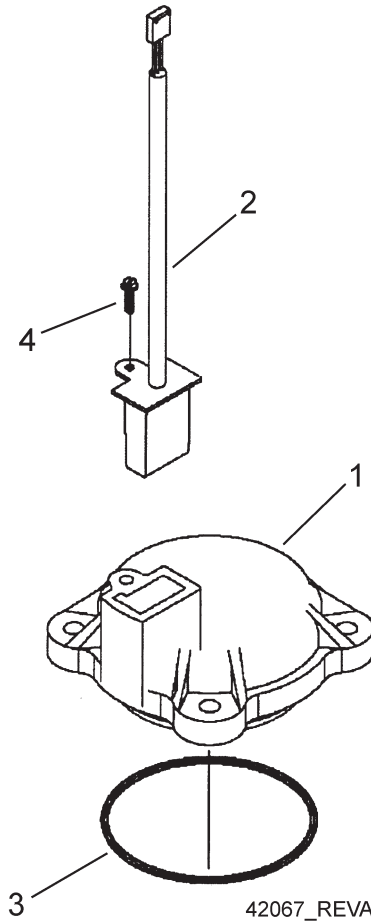


60614\_REVA

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

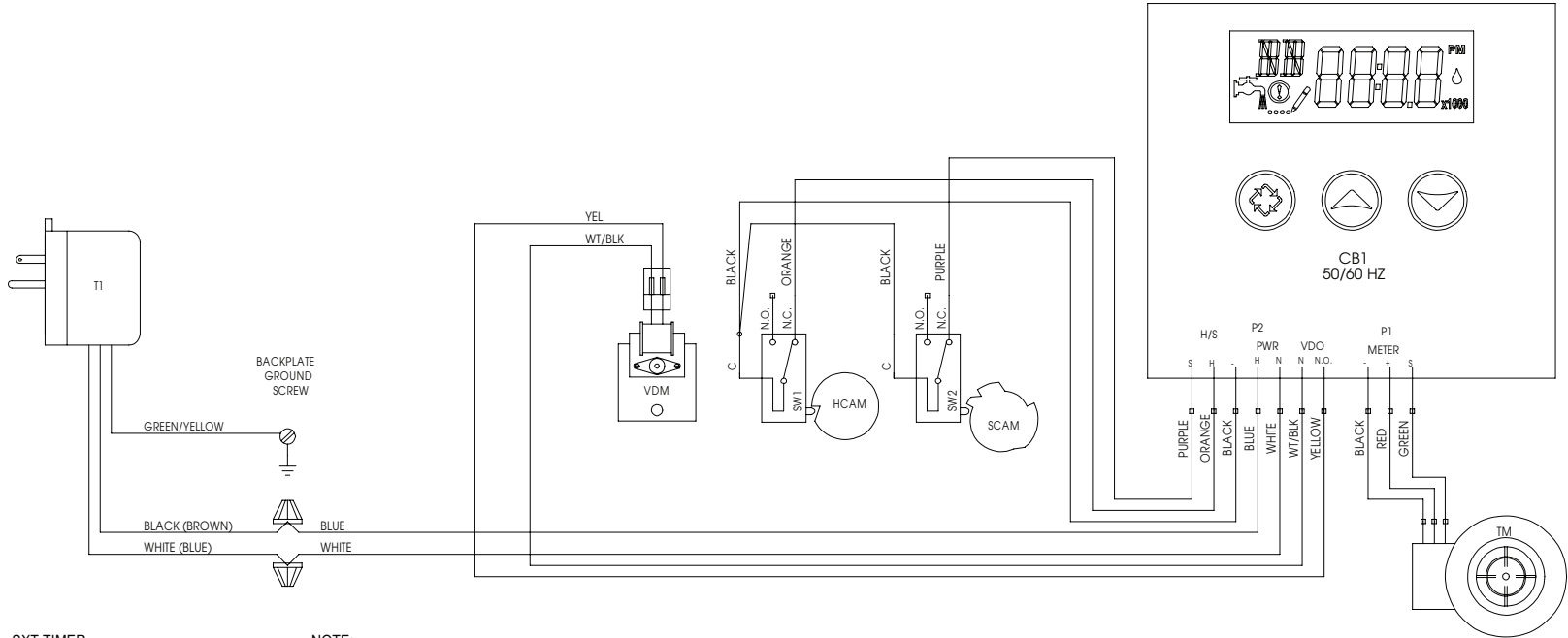
For Assembly Numbers, See the Back of this Manual

# 3/4", 1" or 1-1/2" Paddle Wheel Meter Cap Assembly



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

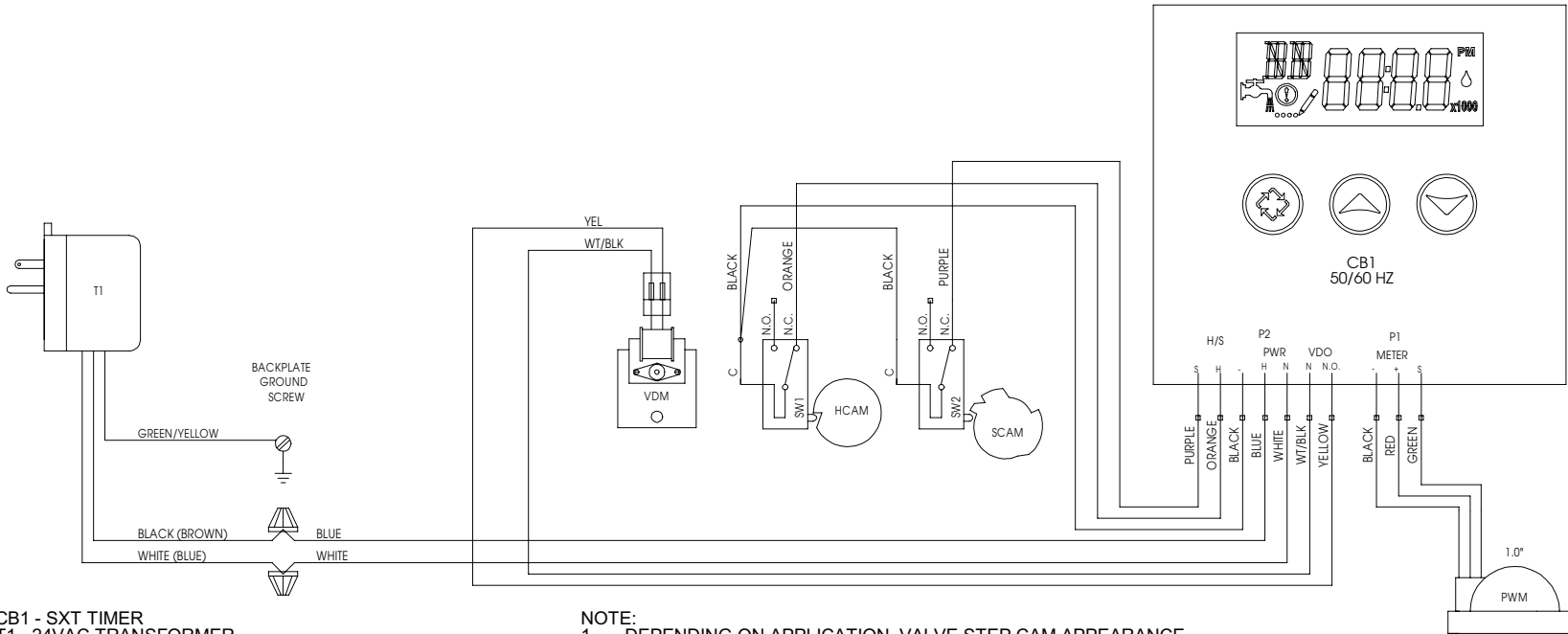
For Assembly Numbers, See the Back of this Manual



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.

# 2750SXT / 2850SXT Wiring Diagram



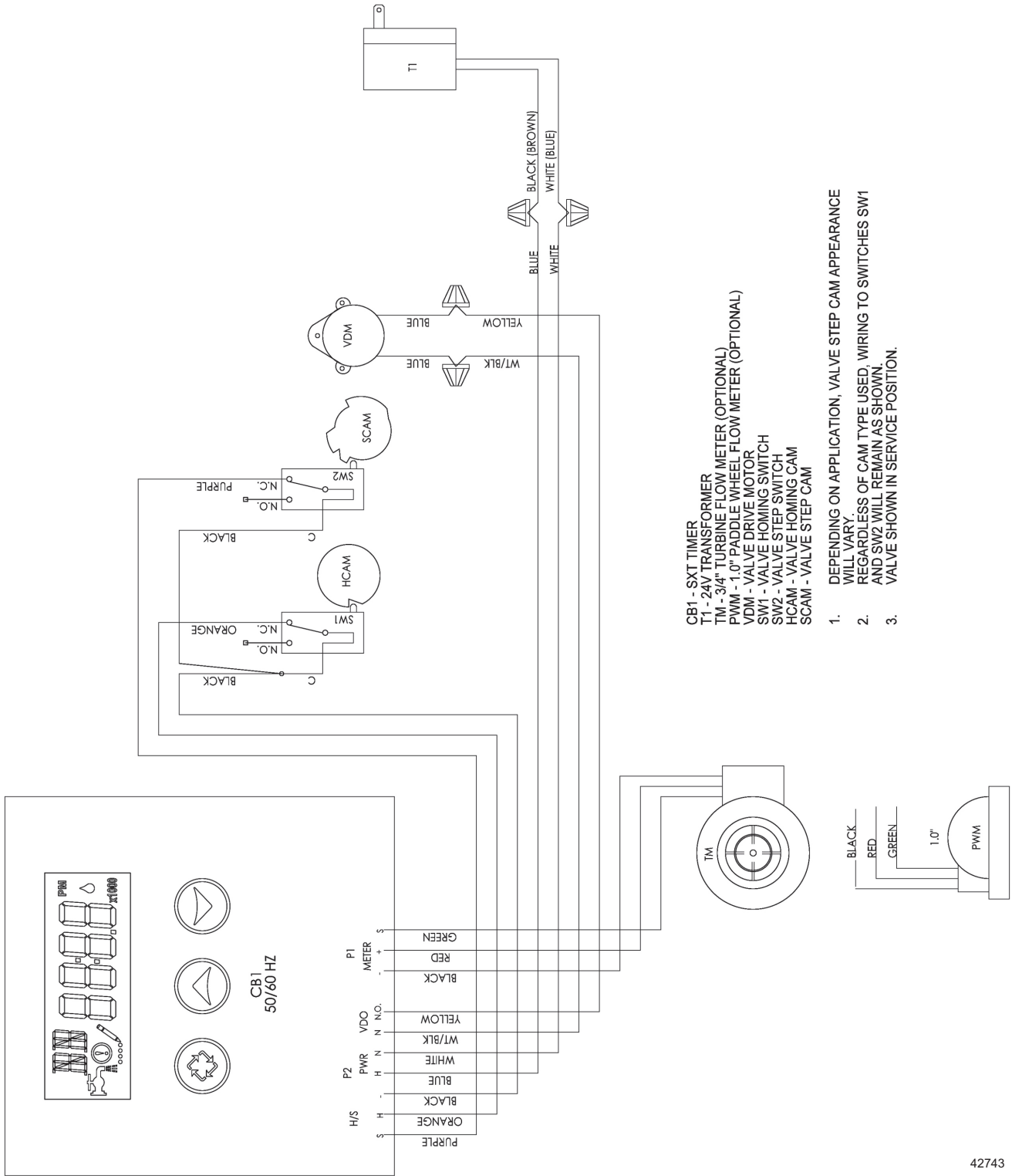
**CB1 - SXT TIMER**  
**T1 - 24VAC TRANSFORMER**  
**K1 - 24VAC VALVE DRIVE RELAY**  
**PWM - 1.0" OR 1.5" PADDLE WHEEL FLOW METER (OPTIONAL)**  
**VDM - VALVE DRIVE MOTOR**  
**SW1 - VALVE HOMING SWITCH**  
**SW2 - VALVE STEP SWITCH**  
**HCAM - VALVE HOMING CAM**  
**SCAM - VALVE STEP CAM**

**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.

42742



# 9000SXT / 9100SXT / 9500SXT Wiring Diagram



42743

## Error Codes

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

Error Code	Error Type	Cause	Reset and Recovery
0	Cam Sense Error	The valve drive took longer than 6 minutes to advance to the next regeneration position.	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.
1	Cycle Step Error	The control experienced an unexpected cycle input	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.
2	Regen Failure	The system has not regenerated for more than 99 days (or 7 days if the Control Type has been set to Day-of-Week).	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.
3	Memory Error	Control board memory failure.	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.
2	There have been more than 99 days since the last		Regeneration must occur for the unit to recover, the display to clear and the valve to function normally.  [ 7 - - 5 ]: To recover from [Err2], the user must initiate a regeneration or set at least one individual day to 1.

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## **Service Assemblies**

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### **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" wit 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

