Model 7000 Master Programming Mode

Note:

1. Set Time of Day Display to 12:01 P.M.
2. Push and hold the Set Up and Set Down buttons for 5 seconds.
3. Press the Extra Cycle Button once per display until all displays are viewed and normal operation is resumed.
4. Option setting display may be changed as required by pushing either the Set Up or Set Down button.
5. Depending on current valve programming, certain displays may not be viewed or set.

With the Time of Day Display set to 12:01 P.M., push and hold the Set Up and Set Down buttons for 5 seconds.

US/Metric Dislay Format

Example:	Gallons	[U--1] = Default
	Metric	[U--2]

Regenerant Flow

Example:	Downflow	[dF] = Default
	Downflow Fill First	[dFFF]
	Filter	[Fltr]

Regeneration Type

Example:	Time Clock Delayed	[7--1]
	Meter Immediate	[7--2]
	Meter Delayed	[7--3] = Default
	Meter Delayed - Variable Brining	[7--4]
	Days of the Week	[7--5]
	*(Skip to Regeneration Time if [7--5]	

System Capacity

Example:	24 Kilogram Capacity, Gallon Format	[C-24] = Default
	180 Degree-Liters, Metric Format	[C180]
	*Not Applicable to [7--5]	

Feed Water Hardness

Example:	15 Grains/Gallon	[H-15] = Default
	25 Degrees, Metric	[H-25]
	*Not Applicable to [7--5]	

Regeneration Time

Example:	2 O'Clock A.M.	[2:00} = Default

Model 7000 *Master Programming Mode*

Regeneration Day Override OR Day of the Week

Example:	Regenerate every 7 days	[A- -7]
	Cancel Setting	[AOFF] = Default

[Day X] (where X = 1 through 7) Set to Current Day
Note: OFF not available
*Day is incremented at midnight.

Regeneration Cycle Step Programming (1-5)

Example:	10 minute Backwash, in US Format, Downflow	[1- 10]
	60 minute Brine Draw/Slow Rinse, in US Format	[2- 60]
	5 minute 2nd Backwash in US Format	[3- - 5]
	10 minute Rapid Rinse in US Format	[4- 10]
	12 minute Brine Refill US format	[5- 12]

Note: All Above Settings Are Shown in Factory Default Settings Based on Downflow Regeneration Type and US-1 Display Format.

Push Extra Cycle button to advance through all [D1--X} settings

Note: Regeneration will occur on the day or days which are set to 1 (enabled) at the regeneration time which was set in the previous program step.

Individual Day of the Week Settings:
[d1--x] where x = 1: d1 enabled regeneration this day
where x = 0: d1 disabled regeneration this day
[d7--1] = Default
***Skip to Line Frequency Setting if [7--1] or [7--5].**

Flow Meter Size

Example:	1-1/4" Turbine Meter, US	[F-82] = Default
	1-1/4" Turbine Meter, metric	[F21.6]

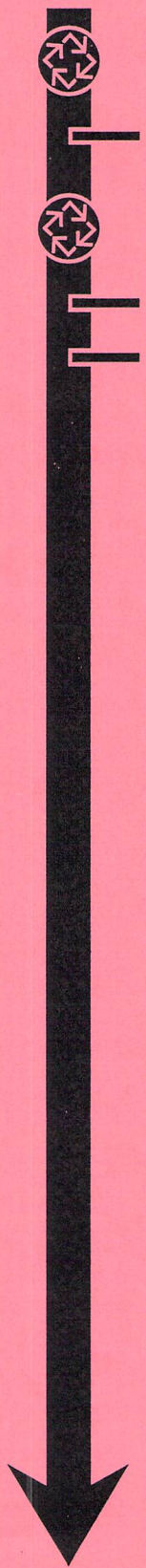
***Not applicable to [7--1] or [7--5]**

Safety Factor

Example:	25% Safety Factor	[cF25]
	0% = No Safety Factor	[cF-O] = Default

***Not Applicable to [7--1] or [7--5].**

Model 7000 *Master Programming Mode*



Line Frequency
Example: 60Hz Line Frequency [LF60] = Default
50Hz Line Frequency [LF50]

Exit the Master Programming Mode

Note: Valve Calculates Programming Changes [CALc] and Returns to the Service Position/Time of Day.

Model 7000 *Master Programming Mode*

Entering Master Programming Mode

Set the Time of Day to 12:01 P.M., then press and hold both the Set Up and Set Down buttons for 5 seconds. The program indicator light turns on to signal that the Master Programming Mode is entered. All program steps may be programmed in this mode.

— Use the Set Up and Set Down buttons to change all settings.
— Press the Extra Cycle button to advance to the next program step.

1. **US / Metric Display Format (Display Code u)**

Use this program step, identified by the letter U in the first digit of the display, to set the desired display format. There are two possible display settings:

US = gallons of water and grains of hardness Setting: **[u - - 1]**
Metric = liters of water and degrees of hardness Setting: **[u - - 2]**

Default = US [u - - 1]

— Use the Set Up and Set Down buttons to adjust this value.
— Press the Extra Cycle button to proceed to the next step.

2. **PISTON / CAM Type (Display Code dF, dFFF, Fltr)**

Use this program step to set the desired piston type. The letters in the display stand for the following piston types:

dF: down flow
dFFF: down Flow Fill First
Fltr: Filter

Default: [dF] down flow

— Use the Set Up and Set Down buttons to select the desired piston type.
— Press the Extra Cycle button to proceed to the next step.

Note: If the US/metric setting or piston/cam type is changed, the valve auto-homes after exiting from the Master Programming Mode.

3. **Regeneration Type (Display Code 7)**

Use this program step, identified by the number 7 in the first digit of the display, to set the **Regeneration Type**. There are 4 possible settings:

Time Clock Delayed **Setting: [7 - - 1]**
The control regenerates on the days set in program step #7, at the Regeneration Time set in program step #6.

Meter Immediate **Setting: [7 - - 2]**
The control regenerates immediately when the available volume of softened water drops to 0.

Meter Delayed **Setting: [7 - - 3]**
The control regenerates on the day the available volume of softened water drops to less than the reserve volume. Regeneration starts at the Regeneration Time set in program step #6.

Meter Delayed - Variable Brining **Setting: [7 - - 4]**
The control regenerates on the day that the available volume of softened water drops to or below the reserve volume. Regeneration starts at the Regeneration Time set in program step #6. With the variable brining option activated, the time setting for Cycle 1 is automatically calculated based on the volume of treated water at the time of regeneration. Cycle time 1 will not exceed the original time setting and is never less than 1 minute.

Day of the Week **Setting: [7--5]**

The control regenerates on the individual day(s) of the week which are set to 1. The regeneration will occur at the programmed regeneration time. If all of the days are set to 0, no regenerations will be initiated and the control will display an [Err2] message on the 8th day.

Default = Meter Delayed Regeneration [7 - - 3]

Available Regeneration Types and their Dependencies

Piston/CAM Type	Regeneration Types Available
dF	[7 - - 1], [7 - - 2], [7 - - 3], [7 - - 5]
dFFF	[7 - - 1], [7 - - 3], [7 - - 4], [7 - - 5]
Fltr	[7 - - 1], [7 - - 5]
Default: dF	**[7 - - 3]**

— Use the Set Up and Set Down buttons to adjust this value.
— Press the Extra Cycle button to proceed to the next step.

4. **System Capacity (Display Code C) for US and metric with an extended (Display Code Ct) in metric where t denotes x 1,000 multiplier**

Example: Ct1.9 = 1,900,000

Note: This program step is not available for **Regeneration Type Time Clock Delayed [7 - - 1] or [7 - - 5].**

Use this program step, identified by the letter C in the first digit of the display, to set the capacity of the system in kilograins (or Cubic meter X degrees for metric systems).

— Use the system capacity to calculate the amount of treated water (gallons or liters) to be treated by the unit before a Regeneration Cycle is required.
— The control automatically determines a reserve capacity based on water use history when Regeneration Type is set to Meter Delayed **[7 - - 3]** or Meter Delayed Variable Brining **[7 - - 4]**.

Range = 1 – 299 kilograins, US **[u - -1]**
Range = 1 – 1,900,000 degree-liters, metric **[u - - 2]**

Default = 24 kilograins, US **[u - -1]**
Default = 180 degree-liters, metric **[u - - 2]**

Example: 24 kilograin system capacity Setting: **[C 24]**

— Use the Set Up and Set Down buttons to adjust this value.
— Press the Extra Cycle button to proceed to the next step.

5. **Feed water Hardness (Display Code H)**

Note: This program step is not available for Regeneration Type Time Clock Delayed **[7 - - 1]** or Days of the Week **[7 - - 5].**

Use this program step, identified by the letter H in the first digit of the display, to set the feed water hardness.

— Use the Set Up and Set Down buttons to set the amount of feed water hardness. The system automatically calculates treated water capacity based on the feed water hardness entered in this program step and the system capacity entered in program step #4.

Range = 4 – 199 grains/gallon, US **[u - -1]**
Range = 4 – 199 degrees, metric **[u - - 2]**

Default =24 kilograins, US **[u - -1]**
Default = 25 degrees, metric **[u - - 2]**

Example: Feed water hardness = 20 grains/gallon Setting: **[H 20]**

Default = 15 grains/gallon **[H -15]**

— Use the Set Up and Set Down buttons to adjust this value.
— Press the Extra Cycle button to proceed to the next step.

6. **Regeneration Time (No display Code)**

Note: This program step is not available for Regeneration Type Meter Immediate **[7 - - 2].**

Use this program step to set the Time of Day a Regeneration occurs. A non-flashing colon between the hour and minute digits identifies the Regeneration Time display.

Range = 12:00 – 11:59 P.M., US

Range = 00:00 – 23:59, metric

Example: 2 o'clock A.M. regeneration time Setting: **[2:00]**

Default = 2:00 A.M.

— Use the Set Up and Set Down buttons to adjust this value.
— Press the Extra Cycle button to proceed to the next step.

Note: When the piston type is Fltr, Regeneration time defaults to:
— 12:00 A.M., US
— 00:00, Metric

7. **Regeneration Day Override (Display code A): [7 - - 1], [7 - - 2], [7 - - 3], [7 - - 4] ONLY**

Use this program step, identified by the letter A in the first digit, to set the maximum number of days the unit can be In Service without a regeneration.

— For **Regeneration Type Time Clock Delayed [7 - - 1],** the system regenerates at the time set in program step #5 after the number of days programmed in this step.
— For any Meter Regeneration Types **[7 - - 2], [7 - - 3], [7 - - 4],** the system regenerates after the number of days programmed in this step at the Regeneration Time setting, step #6.

Range = 0 – 99, Time Clock Delayed **[7 - - 1]**
Range = 1 – 199, Meter Regeneration Types **[7 - - 2], [7 - - 3], [7 - - 4]**

Default = 7 days, Time Clock Delayed **[7 - - 1]**
Default = Meter Regeneration Types **[7 - - 2], [7 - - 3], [7 - - 4]**

Example:
Override every 7 days Setting: **[A -- 7]**
Option turned off Setting: **[A OFF]**
— Use the Set Up and Set Down buttons to adjust this value.
— Press the Extra Cycle button to proceed to the next step.

8. **Day of the Week: [7 - - 5] ONLY (Display Code "day x") where x is one (1) to seven (7)**

Use this program step, identified by the word Day, to set the current day of the week. The user can select any number in the range of 1 through 7 to represent the current day of the week. The current day number will increment each day at midnight.

Default = Day 7, Day of the Week [7 - - 5]

Example:
Monday = Day 1; Tuesday = Day 2; Wednesday = Day 3; Thursday = Day 4; Friday = Day 5; Saturday = Day 6; and Sunday = Day 7

— Use the Set Up and Set Down buttons to adjust this value.
— Press the Extra Cycle button to proceed to the next step.

9. Regeneration Cycle Step Programming (Display Code 1 – 6)

Use this program step to program the Regeneration Cycle step times.

— The number of Regeneration Cycle steps available is determined by the Piston/Cam type selection entered in step #1.
— The Regeneration Cycle step being programmed is shown in the first digit of the display. Each display is used to set the duration time in minutes of that specific step in the Regeneration Cycle.

Range = 0 – 199 minutes, US **[u - -1]**
Range = 0 – 199 minutes, metric **[u - - 2]**

Default Times for all of the Available Piston/Cam Types

Regeneration Cycle Step Times, in minutes, depend on the Piston / Cam selected.

Cycle Step	dF	dFFF	FLtr
1	10 = Backwash	12 = Fill	10 = Backwash
2	60 = Brine Draw	60 = Brine Making	10 = Rapid Rinse
3	5 = 2nd Backwash	10 = Backwash	
4	10 = Rapid Rinse	60 = Brine Draw	
5	12 = Refill	5= 2nd Backwash	
6		10 = Rapid Rinse	

Note: Cycle step #1 minimal setting is 1 minute.

— Use the Set Up and Set Down buttons to adjust this value.
— Press the Extra Cycle button to proceed to the next step.

10. Regeneration Day Setting

[d1 - -x]
[d2 - -x]
[d3 - -x]
[d4 - -x]
[d5 - -x]
[d6 - -x]
[d7 - -x]

Where x can be set to 1 or 0. Regenerations will occur at the programmed regeneration time on the day(s) which are set to 1. Regenerations will not occur on days which are set to 0. If all days are set to 0, a regeneration will never occur and the control will display [Err2] on the 8th day. To clear this error, the user must program at least one day of the week for regeneration or manually initiate a regeneration.

11. Flow Meter Size (Display Code F)

Note: This program step is not available for **Regeneration Type Time Clock Delayed [7 - - 1].**

Use this program step, identified by the letter F in the first digit, to set the flow meter size. This program step sets the proper number of pulses generated by the flow meter for each gallon or liter of water flow.

Range = 0 – 999 pulses per gallon, US **[u - -1]**
Range = 0 – 99.9 pulses per liter, metric **[u - - 2]**

Default = 82 pulses per gallon, US **[u - - 1]**
Default = 21.6 pulses per liter, metric **[u - - 2]**

Example:

1-1/4" Turbine Meter, US **[u - -1]** Setting: **[F 82]**
1-1/4" Turbine Meter, metric **[u - - 2]** Setting: **[F 21.6]**

— Use the Set Up and Set Down buttons to adjust this value.
— Press the Extra Cycle button to proceed to the next step.

12. Safety Factor (Display Code cF)

Use this program step to provide a safety margin by lowering the available capacity. The setting is in percentage and ranges from 0 – 50%.

Example:

[cF 0] 0% = No safety factor
[cF 35] 35% = The available capacity is lowered by 35%

Default: **[cF 0]** 0% = No safety factor

Note: This program step is not available in the Time Clock mode [7 - - 1] or the Day of the Week Mode [7 - - 5].

— Use the Set Up and Set Down buttons to adjust this value.
— Press the Extra Cycle button to proceed to the next step.

13. Line Frequency (LF)

Use this program step, identified by the letters LF in the first digit of the display, to set the frequency of the power supply. When the line frequency is set properly, all timekeeping functions remain accurate.
There are two possible settings:

60Hz Line Frequency Setting: **[L F 60]**
50Hz Line Frequency Setting: **[L F 50]**

Default = 60 Cycles (program step #2 = u1)
Default = 50 Cycles (program step #2 = u2)

— Use the Set Up and Set Down buttons to adjust this value.
— Press the Extra Cycle button to proceed to the next step.

Exiting the Master Programming Mode

— Press the Extra Cycle button once more to exit the Master Program Mode and resume normal operation.
— Finish the control programming by completing the Control Start-up procedures in the service manual.

Note: If any changes are made to the Piston/Cam setting during the Master Programming Mode, the valve auto-homes when exiting the Master Programming Mode.

If any changes were made to capacity, hardware or safety factor settings, the control recalculates the System Capacity and sets the Starting Reserve to one-third of the new value.

Error Codes

Note: Error codes appear on the In Service display.

Error Code	Probable Cause	Recover and Resetting
[Err 0]	Drive motor is stalled	Unplug the unit from the power source
[Err 1]	Drive motor is running continuously	When power is restored to the unit, the Err _ display code clears. If the condition causing the error has not been resolved the Err _ code reappears in the four digit display. Do not attempt to troubleshoot this problem any further.
[Err 2]	There have been more than 99 days since the last Regeneration. If the Day of the Week mode of regeneration is selected and days since last regeneration exceeds 7 days. **[7 - - 5]**: There have been more than 7 days since the last regeneration. All individual settings (d1, d2, d3, d4, d5, d6, d7) are set to 0.	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.

Resetting The Program To The Default Settings

To reset the controller to the default settings press and hold the Set Up and Set Down buttons for 25 seconds or until the Time of Day display resets to 12:00 P.M. This resets all program step settings to the default values. The program steps must then be reset using the Master Programming procedure in these instructions.

Note: A Master Reset causes the valve to auto-home.